T-Mobile®

March 17, 2009

EM-T-MOBILE-166-090316

Via Federal Express

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

ORIGINAL

RECEIVED
MAR 16 2009
CONNECTICUT
SITING COUNCIL

Re: Notice of Exempt Modification
Crown Castle USA, Inc. Telecommunications Facility
347 East Street, Wolcott, Connecticut
T-Mobile Site CT11494B

Dear Mr. Phelps:

Omnipoint Communications, a subsidiary of T-Mobile USA, Inc. ("T-Mobile"), intends to replace existing antennas, install additional antennas and replace existing ground equipment at 180-foot lattice facility owned by Crown Castle USA, Inc. and located at 347 East Street, Wolcott, Connecticut ("Facility"). T-Mobile is licensed by the Federal Communications Commission (FCC) to provide PCS wireless telecommunications service in the State of Connecticut, which includes the area to be served by the proposed installation. This installation constitutes an exempt modification pursuant to the Public Utility Environmental Standards Act, Connecticut General Statutes Section 16-50g *et. seq.* (PUESA), and Section 16-50j-72(b)(2) of the Regulations of the Connecticut State Agencies adopted pursuant to PUESA. In accordance with R.C.S.A. Section 16-50j-73, a copy of this notice has been sent to Thomas G. Dunn, Mayor, Town of Wolcott.

The existing Facility consists of a 180-foot self-supporting lattice tower capable of supporting multiple carriers within a fenced compound. The coordinates for the Facility are **Lat: 41°-33'-34" and Long: 72°–56 '-51".** The tower is located on the east side of East Street, just north of the intersection with Meriden Road (Route 322). It is in the southeastern corner of Wolcott approximately 600 feet west of the Southington Town Line and approximately 700 feet north of the Cheshire Town Line, and roughly one and a half miles north of Interstate 84. (see Site Map, attached as Exhibit A). The tower currently supports AT&T antennas at the one hundred fifty-eight foot level (158') AGL (above ground level); SNET/Cingular antennas at the one hundred sixty-eight foot level (168') AGL, and Verizon antennas at the one hundred seventy-eight foot level centerline AGL (Verizon also currently has microwave dishes at the 70' and 112' level) Pocket Wireless also has an application pending before the Council to place three RFS APXV18-206517S-C antennas at the one hundred forty-eight foot level (148') AGL. T-Mobile currently has antennas on the tower at the one hundred eighty eight foot (188') level AGL in a pipe mount configuration off the top of the tower. The current T-Mobile antenna configuration is one per sector, for a total of three antennas. T-Mobile proposes to replace the existing antennas with three new ones. T-Mobile proposes to install threeTMZXXX-6516-R2M antennas on the existing pipe mount configuration at the same elevation, (188') level centerline AGL. T-Mobile also intends to add a UMTS 3106 BTS equipment cabinet to its current configuration of one existing S8000 equipment cabinet. The two cabinets will both be mounted on the existing concrete pad located partially beneath the tower. T-Mobile's equipment will be

T-Mobile USA, Inc.
Office: (860) 692-7100
Fax: (860) 692-7159
35 Griffin Rd S
Bloomfield, CT 06002

contained within it's existing lease area. T-Mobile intends to run new coaxial cable on its existing ice bridge from its current equipment pad to the existing tower. Utilities will be run via a proposed underground conduit from existing utility sources at the Facility (See Design Drawings and Equipment Specifications, attached as Exhibits B and C respectively).

For the following reasons, the proposed modifications to the East Street Facility meet the exempt modification criteria set forth in R.C.S.A. Section 16-50j-72(b)(2):

1. The proposed modification will not increase the height of the tower as T-Mobile seeks to replace its existing antennas and install new antennas at a center line height of approximately 188 feet.

2. The installation and replacement of T-Mobile's antennas and ground equipment will not require an extension of the site boundaries.

3. The proposed modifications will not increase the noise levels at the existing Facility by six decibels or more.

4. The operation of the additional antennas will not increase the total radio frequency (RF) power density, measured at the site boundary, to a level at or above the standard adopted by the Connecticut Department of Environmental Protection as set forth in Section 22a-162 of the Connecticut General Statutes and MPE limits established by the Federal Communications Commission. The worst-case RF power density calculations for the proposed T-Mobile antennas would be 20.2690% of the FCC standard. This represents the 17.1590% shown in the attached report, with the 3.11% MPE for Pocket Communications, which we obtained and added to that total (see general power density calculations table, attached as Exhibit D).

Also attached, Exhibit E, is a structural assessment confirming that the tower can support the existing and proposed antennas and associated equipment.

For the foregoing reasons, T-Mobile respectfully submits that the proposed antenna installation and equipment at the Wolcott Facility constitutes an exempt modification under R.C.S.A. Section 16-50j-72(b)(2).

Respectfully Submitted,

Mark Richard
UMTS Project Manager
Agent for T-Mobile

cc: Thomas G. Dunn, Mayor, Town of Wolcott
Agostinho & Joanne Rodrigues, underlying property owner, Carrie L. Larson

Hartford/72800.42/KSHEATHELM/358006v1

35 Griffin Rd S
Bloomfield, CT 06002

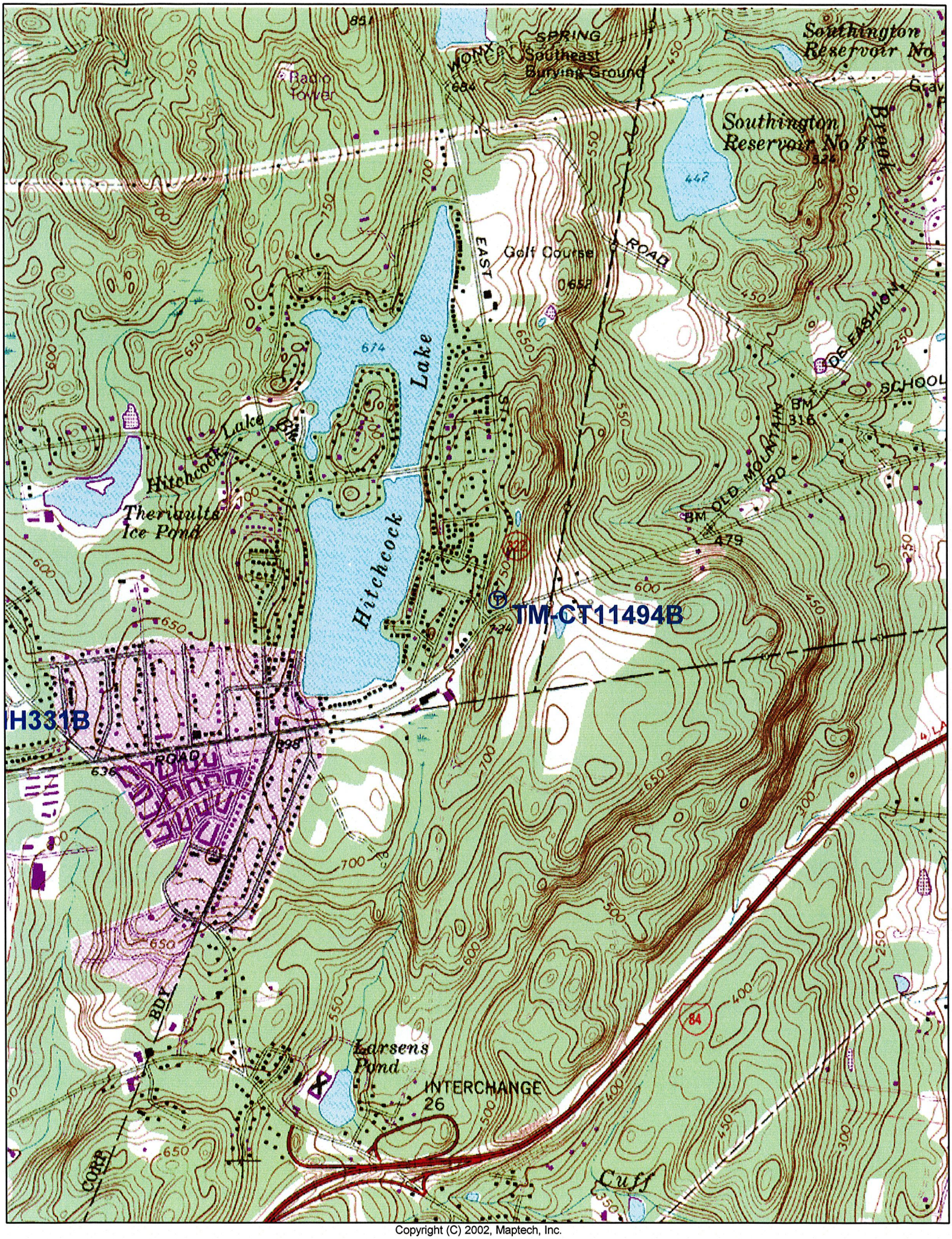
Exhibit A

Site Map

T-Mobile Site CT11494B

347 East Street

Wolcott, Connecticut



Copyright (C) 2002, Maptech, Inc.

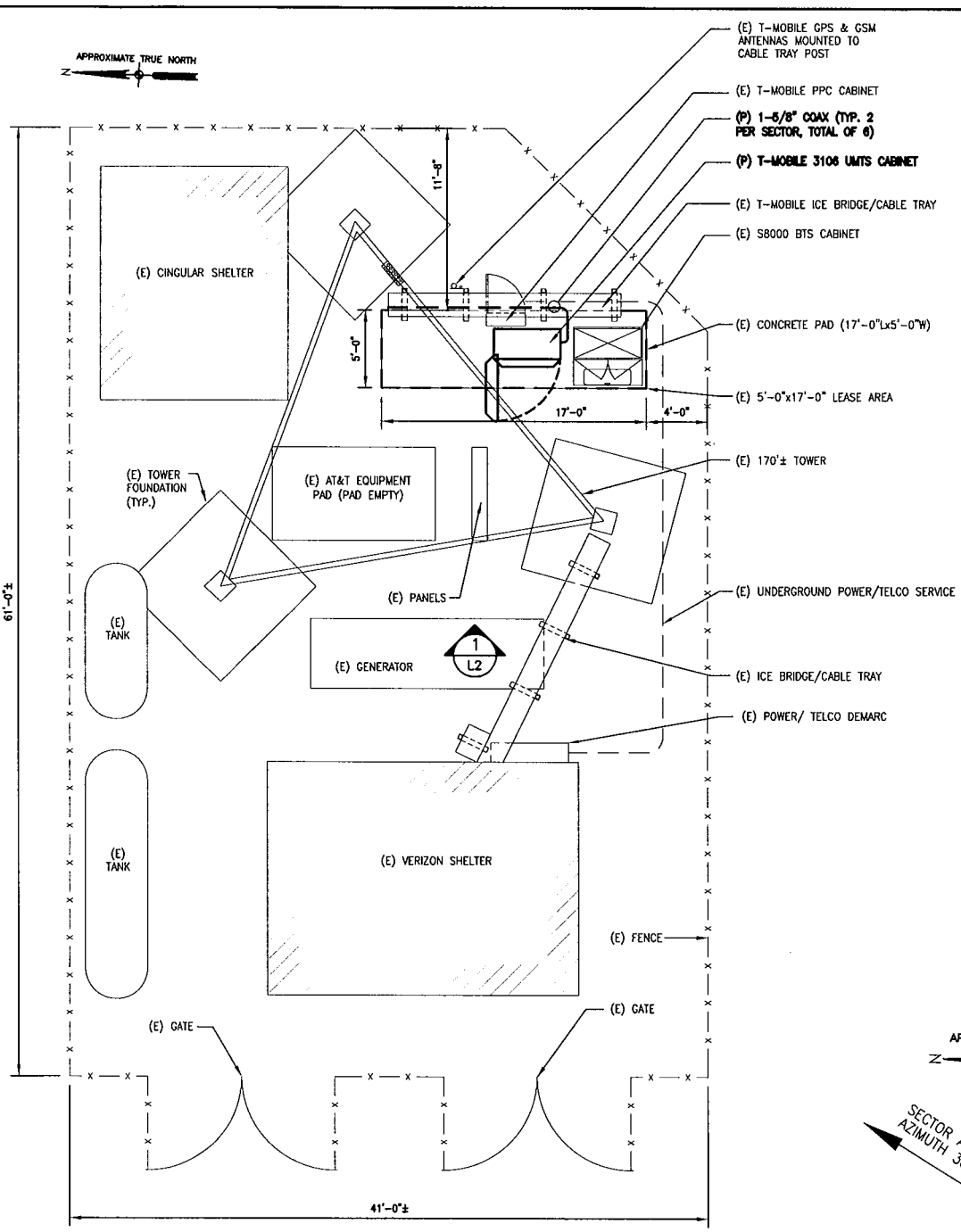
Exhibit B

Design Drawings

T-Mobile Site CT11494B

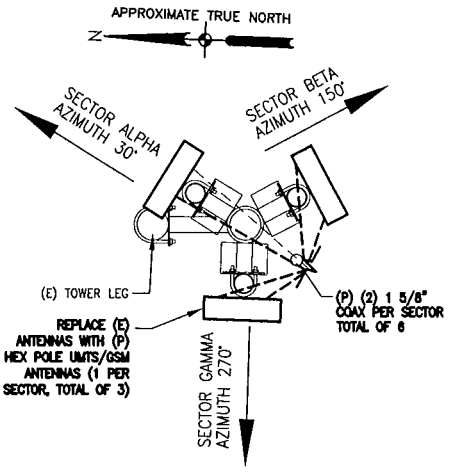
347 East Street

Wolcott, Connecticut



COMPOUND LAYOUT PLAN (1)

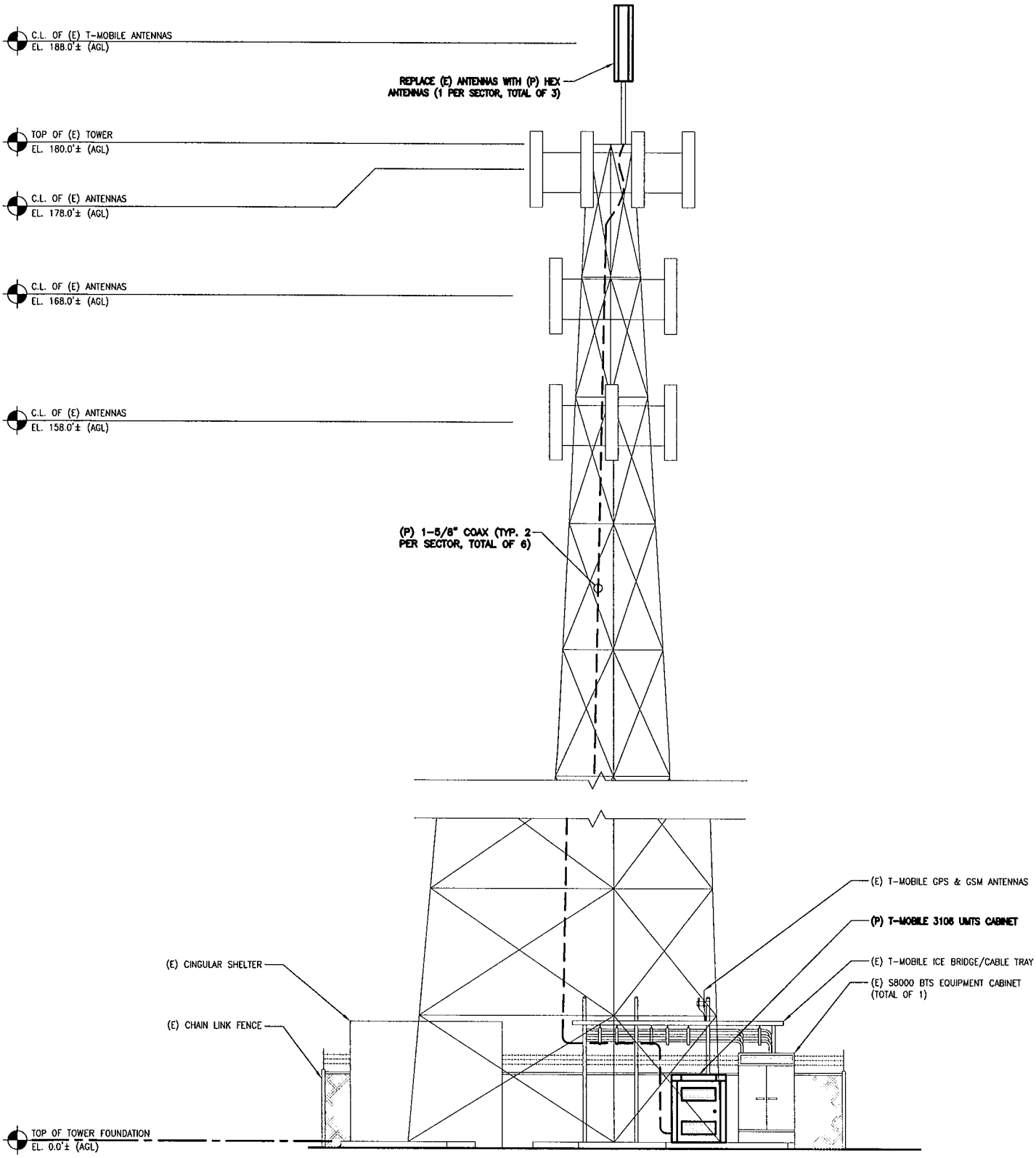
SCALE: 3/32" = 1'-0"



ANTENNA MOUNTING PLAN (2)

SCALE: N.T.S.

T··Mobile· 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002	MAXTON 50 Eastman St. South Easton, MA 02375 Phone: (508) 936-6393 Fax: (508) 936-6395	PROJECT LOCATION: 347 EAST STREET CT11494B 347 EAST STREET WOLCOTT, CT 06107	PROJECT MANAGER: KB	DRAWN BY: DM	BSDA PROJ. #: 2898.275
		APPROVED BY:	02/05/09 01/09/09	COMPOUND LAYOUT PLAN	SHEET: L1



ELEVATION

SCALE: 3/32" = 1'-0"

1

T··Mobile·
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

MAXTON
50 Eastman St.
South Easton, MA 02375
Phone: (508) 936-6393
Fax: (508) 936-6395

PROJECT LOCATION: 347 EAST STREET CT11494B 347 EAST STREET WOLCOTT, CT 06107	PROJECT MANAGER: KB	DRAWN BY: DM	BSDA PROJ. #: 2898.275
		ELEVATION	SHEET: L2
APPROVED BY:	02/05/09 01/09/09		

Exhibit C

Equipment Specifications

T-Mobile Site CT11494B

347 East Street

Wolcott, Connecticut

TMZXXX-6516-R2M

DualPol®, Hex Port Panel Antenna

DualPol®
Teletilt®

- Patented cross dipole and feed system
- Rugged, reliable design with excellent PIM suppression
- Includes factory installed AISG RET actuator
- Fully compatible with Andrew Teletilt® remote control antenna system

ELECTRICAL

Frequency Range (MHz):	1710–2155			
Characteristic Impedance (Ohms):	50			
Azimuth BW (Deg):	63 ± 8			
Elevation BW (Deg):	7.3 ± 1.0			
Gain (dBi) :	17.4 ± 0.8			
Polarization:	±45°			
Front-to-Back Ratio (dB)	**2°**	**4°**	**6°**	**8°**
Copol, 180° ± 30°:	>30	>30	>30	>30
Upper Sidelobe (dB)	**2°**	**4°**	**6°**	**8°**
Main Beam to +30°:	>16	>18	>18	>18
VSWR / Return Loss (dB):	1.35:1 / 16.5			
Port-to-Port Isolation (dB):	>30			
Electrical Tilt Range (Deg):	2–8*			
Electrical Downtilt Accuracy (Deg):	± 0.3			
Cross-pol (dB)	**2°**	**4°**	**6°**	**8°**
3 dB Beamwidth:	>13	>13	>12	>12
Intermodulation Products (dBc)				
3rd Order, 2 x 20 Watts:	155			
Max. Input Power (Watts):	250			
Lightning Protection:	DC Ground			

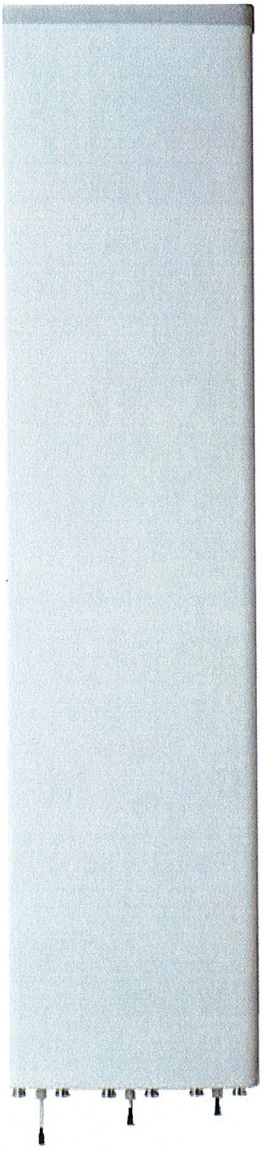
*Antenna full tilt range includes 0–10°, specs reduced at 0°, 1°, 9°, and 10°.

PERFORMANCE TRACKING

Gain Variation (dB) (between UL and DL frequency pair):	1.6
Electrical Tilt Accuracy (Deg) (between UL and DL frequncy pair within 0.5°):	<0.5
Azimuth HPBW (Deg) (between UL and DL frequency pair):	16

MECHANICAL

Net Weight (kg / lbs):	16 / 35.2
Dimensions–LxWxD: (with actuator)	1523 x 500 x 90 mm 60 x 19.7 x 3.5 inch
Max. Wind Area (m² / ft²):	0.65 / 7.0
Max. Wind Load (N / lbf):	990 / 223
Max. Wind Speed (km/h / mph):	241 / 150
Hardware Material:	Hot Dip Galvanized
Connector Type:	7-16 DIN, Female (4)
Color:	Off White
Standard Mounting Hardware:	DB5083



Note: Actuators and protective shrouds included with this antenna are not shown.

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A. 755082-3521
Tel: 214.631.0310

Fax: 214.688.0089
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

bsatech@andrew.com

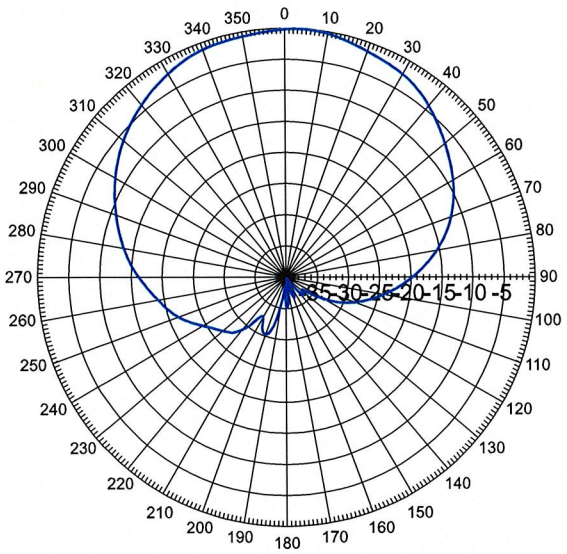
Information correct at date of issue but may be subject to change without notice.

TMZXXX-6516-R2M

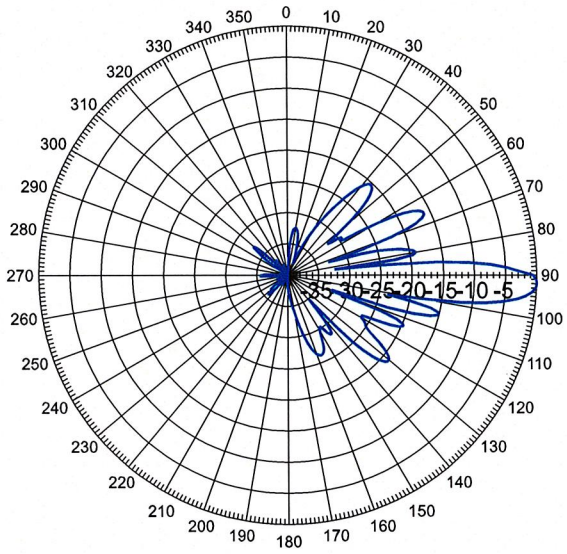
DualPol®, Hex Port Panel Antenna

DualPol®
Teletilt®

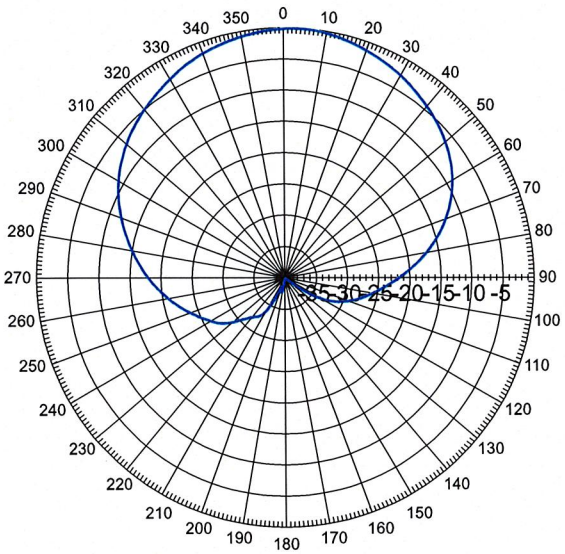
AZIMUTH PATTERN | **ELEVATION PATTERN**



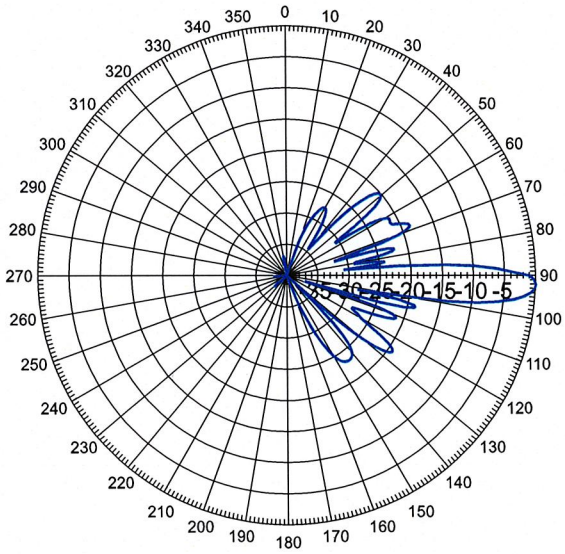
1732 MHz, Tilt: 2°



1732 MHz, Tilt: 2°



1880 MHz, Tilt: 2°



1880 MHz, Tilt: 2°

Note: Scale 5 dB per division.

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A. 755082-3521
Tel: 214.631.0310

Fax: 214.688.0089
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

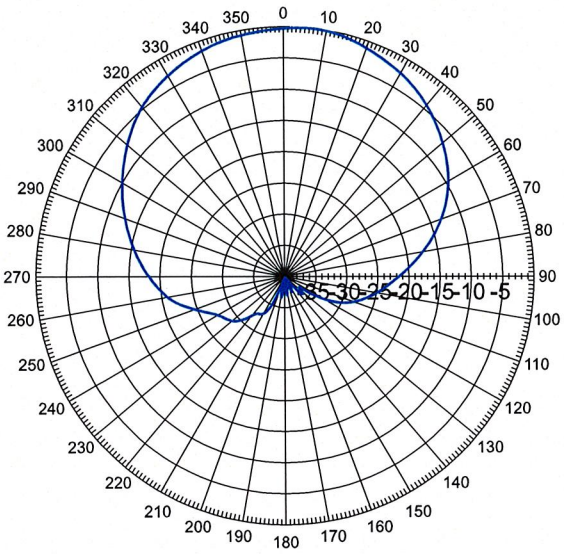
Information correct at date of issue but may be subject to change without notice.

TMZXXX-6516-R2M

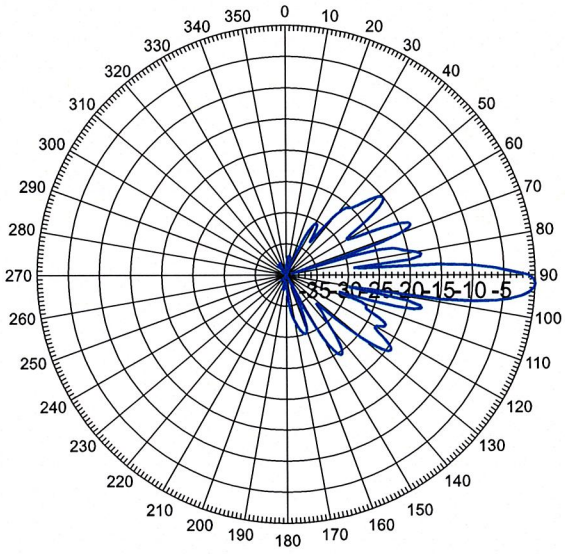
DualPol®, Hex Port Panel Antenna

DualPol®
Teletilt®

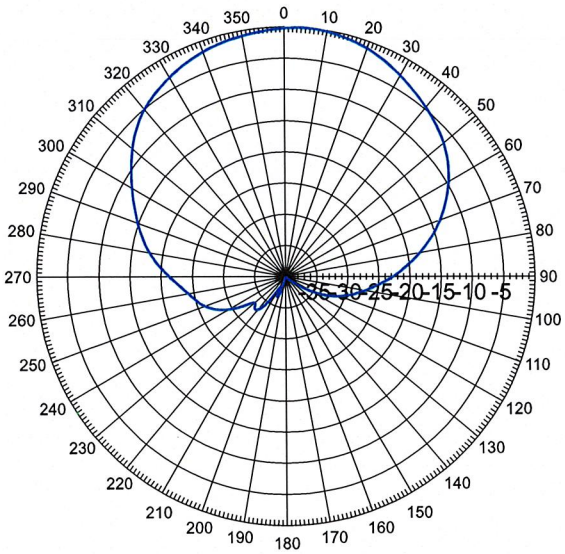
AZIMUTH PATTERN | **ELEVATION PATTERN**



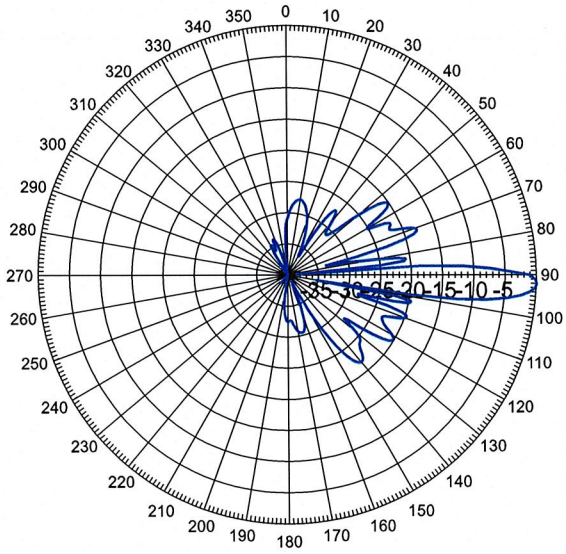
1960 MHz, Tilt: 2°



1960 MHz, Tilt: 2°



2132 MHz, Tilt: 2°



2132 MHz, Tilt: 2°

Note: Scale 5 dB per division.

Andrew Corporation
2601 Telecom Parkway
Richardson, Texas U.S.A. 755082-3521
Tel: 214.631.0310

Fax: 214.688.0089
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

bsatech@andrew.com

Information correct at date of issue but may be subject to change without notice.

3 Dimensions

This section describes the physical characteristics of the RBS, that is, dimensions, weight, and color.

Table 1 RBS 3106 Dimensions

Unit	Dimensions (mm)
Height (including installation frame)	1626
Width	1300
Depth	710
Depth including door	926

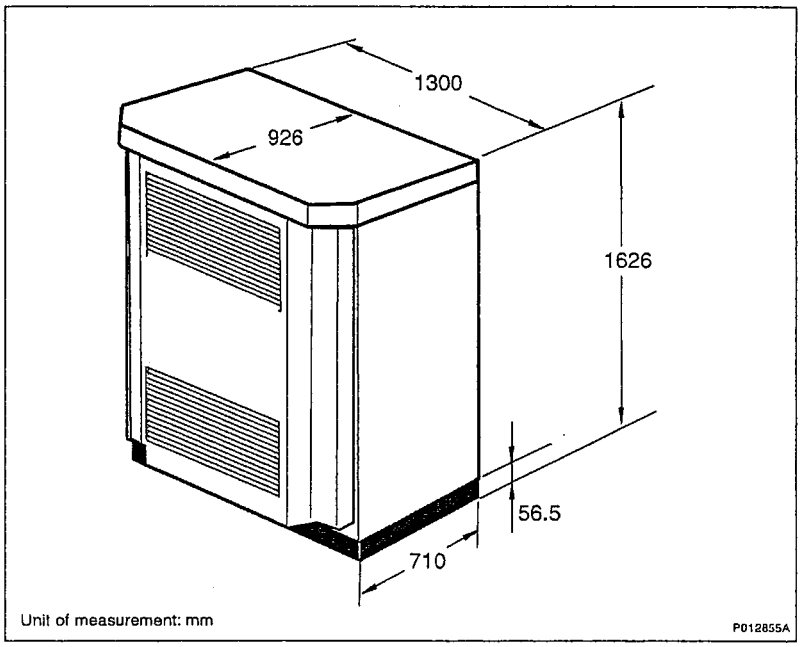


Figure 2 RBS 3106 Dimensions

The various weights of the RBS 3106 are shown in the table below.

Table 2 RBS 3106 Weights

Unit	Type	Weight (kg)
RBS fully equipped excluding batteries	AC-powered	560
RBS fully equipped including batteries	AC-powered	850

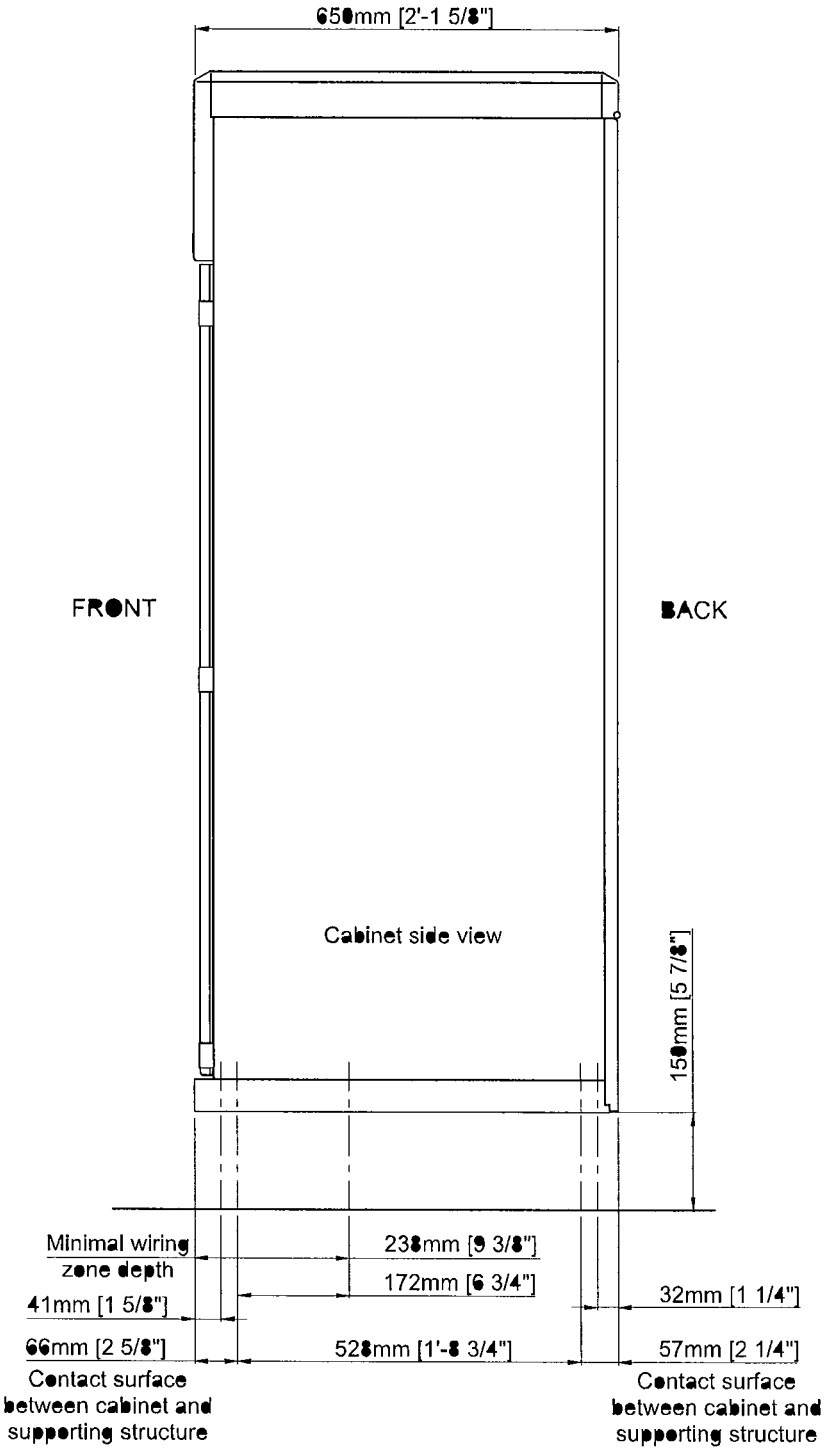
Unit	Type	Weight (kg)
RBS fully equipped including batteries and future expansion of hardware (not yet available)	AC-powered	875
RBS fully equipped	DC-powered	510
Installation frame	AC- and DC-powered	12

The color of RBS 3106 is shown in the table below.

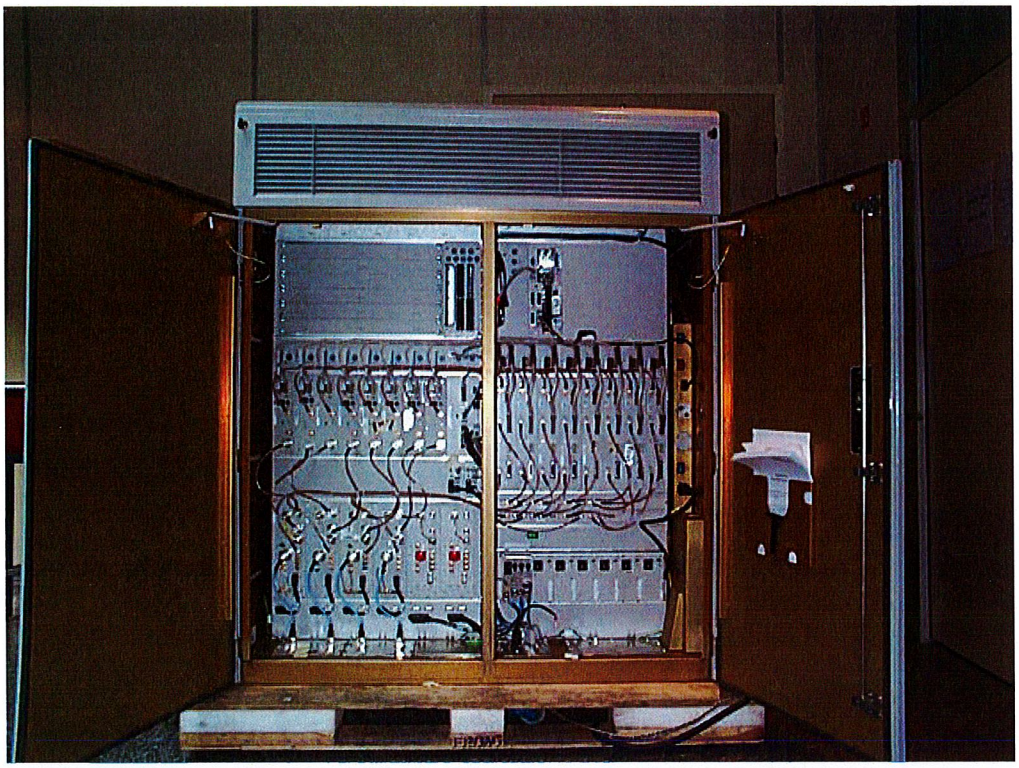
Table 3 RBS 3106 Color

Color	Color Standard
Gray	RAL 7035
Green	NCS 8010–G 10 Y

Cabinet side view



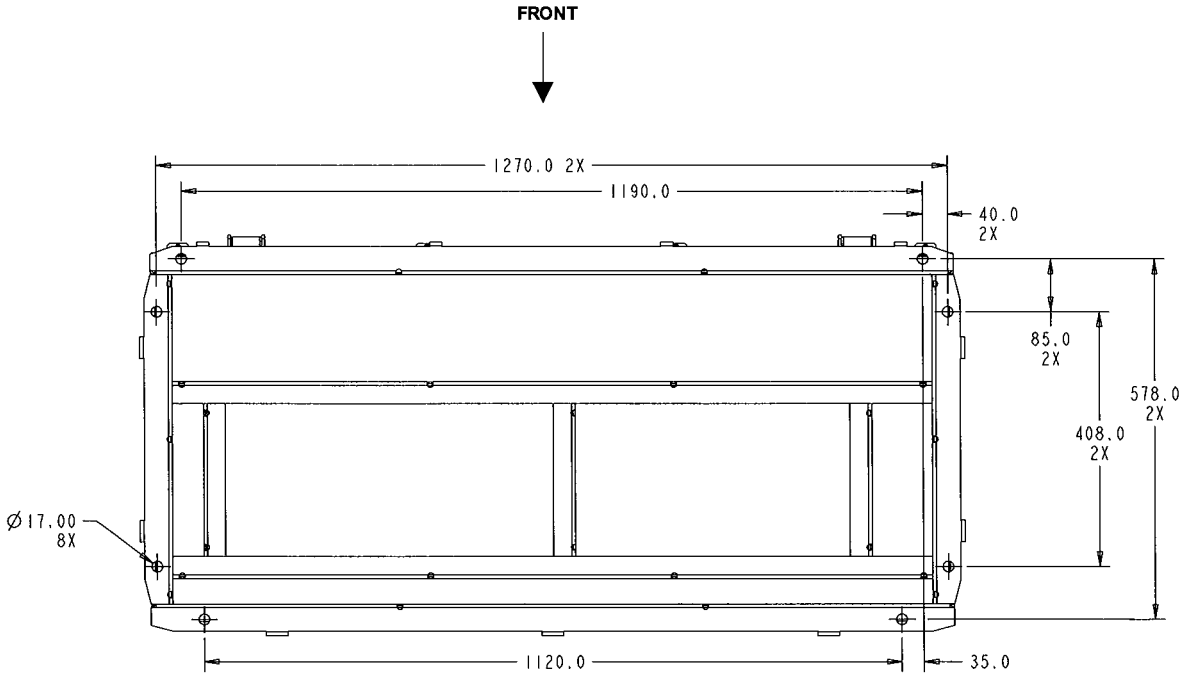
This confidential document is the property of NORTEL MATRA CELLULAR and should not be copied or circulated without permission.



S8000 outdoor EP2 CBCF

This confidential document is the property of NORTEL MATRA CELLULAR and should not be copied or circulated without permission.

Appendix 2 BTS floor print



Note: - All dimensions are expressed in mm.

- Mention '2X' or '8X' means that the same dimension applies to another part of the print (symmetrical part).

This confidential document is the property of NORTEL MATRA CELLULAR and should not be copied or circulated without permission.

Exhibit D

Power Density Calculations

T-Mobile Site CT11494B

347 East Street

Wolcott, Connecticut

T-Mobile

T-Mobile USA Inc.
35 Griffin Rd South, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Maxton
From: Farid Marbouh - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11494B
Date: March 11, 2009

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Self Support Tower at 347 East Street, Wolcott, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

2. Discussion:

The following assumptions were used in the calculations:

1) The emissions from T-Mobile transmitters are in the (1935-1944.8), (1980.2-1984.8), (2140-2145), (2110-2120)MHz frequency Band.
2) The antenna array consists of three sectors, with 1 antennas per sector.
3) The model number for GSM antenna is TMZXX-6516-R2M.
3) The model number for UMTS antenna is APX16PV-16PVL.
4) GSM antenna center line height is 188 ft.
4) UMTS antenna center line height is 188 ft.
5) The maximum transmit power from any GSM sector is 1794.73 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 1963.22 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
8) The average ground level of the studied area does not change significantly with respect to the transmitting location

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Self Support Tower at 347 East Street, Wolcott, CT, is 0.02489 mW/cm^2. This value represents 2.489% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.
The combined Power Density from other carriers is 14.67%. The combined Power Density for the site is 17.159% of the M.P.E. standard.

VoiceStream Wireless Corporation Proprietary

Connecticut Market

T · · Mobile ·

Worst Case Power Density

Site:	CT11494B
Site Address:	347 East Street
Town:	Wolcott
Tower Height:	180 ft.
Tower Style:	Self Support Tower

GSM Data		UMTS Data	
Base Station TX output	20 W	Base Station TX output	40 W
Number of channels	8	Number of channels	2
Antenna Model	TMZXX-6516-R2M	Antenna Model	APX16PV-16PVL
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	207 ft.	Cable Length	207 ft.
Antenna Height	188.0 ft.	Antenna Height	188.0 ft.
Ground Reflection	1.6	Ground Reflection	1.6
Frequency	1945.0 MHz	Frequency	2.1 GHz
Jumper & Connector loss	4.50 dB	Jumper & Connector loss	1.50 dB
Antenna Gain	17.4 dBi	Antenna Gain	17.8 dBi
Cable Loss per foot	0.0116 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	2.4012 dB	Total Cable Loss	2.4012 dB
Total Attenuation	6.9012 dB	Total Attenuation	3.9012 dB
Total EIRP per Channel	53.51 dBm	Total EIRP per Channel	59.92 dBm
(In Watts)	224.34 W	(In Watts)	981.61 W
Total EIRP per Sector	62.54 dBm	Total EIRP per Sector	62.93 dBm
(In Watts)	1794.73 W	(In Watts)	1963.22 W
nsg	10.4988	nsg	13.8988
Power Density (S) =	0.011887 mW/cm^2	Power Density (S) =	0.013003 mW/cm^2

T-Mobile Worst Case % MPE = 2.4890%

Equation Used :

$$S = \frac{(1000)(grf)^2(Power)*10^{(nsg/10)}}{4\pi(R)^2}$$

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

Co-Location Total

Carrier	% of Standard
Verizon	6.4000 %
Cingular	8.2700 %
Sprint	
AT&T Wireless	
Nextel	
MetroPCS	
Other Antenna Systems	
Total Excluding T-Mobile	**14.6700 %**
T-Mobile	2.4890
Total % MPE for Site	**17.1590%**

Exhibit E

Structural Analysis

T-Mobile Site CT11494B

347 East Street

Wolcott, Connecticut

Date: **February 27, 2009**

Ms. Veronica Harris
Crown Castle International
1200 McArthur Blvd., Suite 200
Mahwah, NJ 07430
(201) 236-9094

FDH Engineering, Inc.
2730 Rowland Rd.
Raleigh, NC 27615
(919) 755-1012
info@FDH-Inc.com

Subject: Structural Analysis Report

Carrier Designation:	**T-Mobile**	
	Carrier Site Number:	CT11494B
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	806362
	Crown Castle Site Name:	NHV 108 943133
	Crown Castle JDE Job Number:	114602
Engineering Firm Designation:	**FDH Engineering, Inc. Project Number: *09-02092E S2***	
Site Data:	**Intersection of Rte 322/Meridian Rd, Wolcott, CT, New Haven Co.** **Latitude *41°-33'-34.41"*, Longitude *-72°-56'-49.1"*** **180 Foot – Self Support Tower**	

Dear Ms. Harris,

FDH Engineering, Inc. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the aforementioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 320664, in accordance with application 73689, revision 4.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC1: Existing + Reserved + Proposed Equipment — Sufficient Capacity
Note: See Table I and Table II for the proposed and existing/reserved loading.

The analysis has been performed in accordance with the TIA/EIA-222-F standard based upon a wind speed of 85 mph without ice and 74 mph with 1/2" ice (fastest mile).

All equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at FDH Engineering, Inc. appreciate the opportunity of providing our continuing professional services to you and Crown Castle International. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted,

Bradley Newman, EI
Project Engineer

Christopher M. Murphy, PE
Vice President
CT PE License No. 25842

STATE OF CONNECTICUT
Christopher Michael Murphy
No. 25842
LICENSED
PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1) INTRODUCTION

2) ANALYSIS CRITERIA
- Table 1 – Proposed Antenna and Cable Information
- Table 2 – Existing and Reserved Antenna and Cable Information
- Table 3 – Design Antenna and Cable Information

3) ANALYSIS PROCEDURE
- Table 4 – Documents Provided
- 3.1) Analysis Method
- 3.2) Assumptions

4) ANALYSIS RESULTS
- Table 5 – Tower Component Stresses vs. Capacity
- 4.1) Recommendations

5) APPENDIX A
- RISA Tower Output

6) APPENDIX B
- Base Level Drawing

1) INTRODUCTION

The subject tower is a 180 foot self support tower manufactured in 1986 by Rohn.

2) ANALYSIS CRITERIA

- TIA-222-F – Structural Standard for Steel Antenna Towers and Antenna Supporting Structures
- TIA-222-F – Wind speed without ice: 85 mph (fastest mile)
- TIA-222-F – Wind speed with 1/2" ice: 74 mph (fastest mile)

Table 1 – Proposed Antenna and Cable Information

Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
188[1]	3 3 3	Andrew RFS RFS	TMZXXX-6516-R2M ATMAA1412D-1A20 TMA ATMPP1412D-1CWA TMA	18	1-5/8

1 Proposed loading to replace existing.

Table 2 – Existing and Reserved Antenna and Cable Information

Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
188[1]	3 6	RFS Decibel	APX15PV-15PV-2 PCS 1900 TMAs	12 1	1-5/8 3/8
179	4 2 6	Antel Antel Decibel	LPD-4019 LPA-80063/8CF DB948F65T2E-M	12	1-5/8
168[1]	3	EMS	RR90-17-02DP	6	1-5/8
158	6 3 6 6	CSS Powerwave ADC Powerwave	DUO1417/8686 7770.00 DB800/1900 TMAs LGP13519 diplexers	9	1-1/4
148	3	RFS	APXV18-206517S-C	6	1-5/8
123[2]	1	Andrew	HP8-59E	1	EW52
112	1	Andrew	HP8-59E	2	EW63
70	1	Andrew	HP10-59E	1	WE61
40	1	---	GPS	1	1/2

1 Existing loading to be removed.
2 Reserved loading.

Table 3 – Design Antenna and Cable Information

Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
180	4	Cellwave	PD10017	4 (assumed)	1-5/8 (assumed)
170	3	Cellwave	PD1132D	3 (assumed)	1-5/8 (assumed)
160	2	---	6' Dishes	2 (assumed)	1-5/8 (assumed)

3) ANALYSIS PROCEDURE

Table 4 – Documents Provided

Document	Remarks	Reference	Source
Tower Design Drawings	Rohn File No. 21917JC	Doc # 529684	Crown Castle
Foundation Modification Drawings	All-Points Technology Corp, P.C. Job No. CT105680	Doc # 903539	Crown Castle
Structural Analysis Report	All-Points Technology Corp, P.C. Job No. CT105681	Doc # 903516	Crown Castle
CAD Level Drawings	BU806362	---	Crown Castle

3.1) Analysis Method

RISA Tower (version 5.3.0.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind, and ice load cases. All loads were computed in accordance with the TIA/EIA-222-F and the local building code requirements. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1. Tower and structures were built in accordance with the manufacturer's specifications.
2. The tower and structures have been maintained in accordance with the manufacturer's specifications.
3. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the reference drawings.
4. All tower pipe steel has F_y = 50 ksi and all angles have F_y = 36 ksi.
5. Antenna mount pipe supporting the loading at 188' is a 5" SCH 40 pipe (Fy = 36 ksi, assumed) per All-Points Technology Corporation, PC.
6. The antenna mount pipe extension connections have sufficient strength to support the pipe at capacity.
7. The foundation modifications have been constructed to support the original foundation modification design reactions.
8. Analysis performed with the existing abandoned coax, antennas, and mounts at 168' removed.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and FDH Engineering, Inc. should be allowed to review any new information to determine its effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 – Tower Component Stresses vs. Capacity – LC1

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	190 - 180	Pole	P5x.258	1	-0.18	78.18	6.1	Pass
T1	180 - 160	Leg	ROHN 2.5 STD	3	-14.39	41.14	35.0	Pass
		Diagonal	ROHN 2 STD	7	-4.94	15.54	31.8	Pass
		Horizontal	ROHN 1.5 STD	5	-2.63	20.29	13.0	Pass
							19.1 (b)	
		Inner Bracing	L2x2x1/8	14	-0.05	5.82	0.8	Pass
T2	160 - 140	Leg	ROHN 3 X-STR	42	-39.78	83.78	47.5	Pass
		Diagonal	ROHN 2 STD	49	-6.32	13.38	47.3	Pass
		Horizontal	ROHN 1.5 STD	47	-3.91	17.38	22.5	Pass
							22.8 (b)	
		Inner Bracing	L2x2x1/8	53	-0.07	4.29	1.6	Pass
T3	140 - 120	Leg	ROHN 4 X-STR	81	-65.04	139.07	46.8	Pass
		Diagonal	ROHN 2 STD	85	-6.53	11.51	56.7	Pass
		Horizontal	ROHN 2 STD	83	-4.44	24.65	18.0	Pass
							26.2 (b)	
		Inner Bracing	L2x2x1/8	92	-0.08	2.93	2.6	Pass
T4	120 - 100	Leg	ROHN 5 X-STR	120	-85.65	177.42	48.3	Pass
		Diagonal	ROHN 2.5 STD	124	-9.79	14.43	67.8	Pass
		Horizontal	ROHN 2 STD	122	-5.73	20.43	28.0	Pass
							34.1 (b)	
		Inner Bracing	L2x2x1/8	131	-0.10	2.21	4.5	Pass
T5	100 - 80	Leg	ROHN 5 X-STR	147	-109.24	177.35	61.6	Pass
		Diagonal	ROHN 2.5 STD	151	-8.48	12.60	67.3	Pass
		Horizontal	ROHN 2 STD	149	-5.53	14.77	37.4	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	158	-0.10	4.63	2.1	Pass
T6	80 - 60	Leg	ROHN 6 EHS	174	-130.52	212.13	61.5	Pass
		Diagonal	ROHN 2.5 STD	177	-9.63	11.15	86.4	Pass
		Horizontal	ROHN 2.5 STD	176	-6.81	25.42	26.8	Pass
							39.9 (b)	
		Inner Bracing	L3x3x3/16	185	-0.12	6.06	1.9	Pass
T7	60 - 40	Leg	ROHN 6 X-STR	201	-153.16	264.22	58.0	Pass
		Diagonal	ROHN 2.5 X-STR	204	-9.53	12.30	77.5	Pass
		Horizontal	ROHN 2.5 STD	203	-6.91	19.66	35.2	Pass
							40.7 (b)	
		Inner Bracing	L3 1/2x3 1/2x1/4	214	-0.12	9.93	1.2	Pass
T8	40 - 20	Leg	ROHN 6 X-STR	228	-174.11	264.19	65.9	Pass
		Diagonal	ROHN 3 STD	231	-9.09	16.86	53.9	Pass
		Horizontal	ROHN 2.5 STD	230	-6.82	15.57	43.8	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	239	-0.12	7.91	1.5	Pass
T9	20 - 0	Leg	HSS8.75x.375	255	-183.61	316.36	58.0	Pass
		Diagonal	ROHN 3 STD	258	-13.87	28.18	49.2	Pass
							53.8 (b)	
		Horizontal	ROHN 3 STD	257	-7.55	27.51	27.4	Pass
							43.9 (b)	
		Redund Horz 1 Bracing	ROHN TS1.5x11 ga	262	-3.19	4.91	65.0	Pass
		Redund Diag 1 Bracing	ROHN 1.5 STD	263	-2.91	3.58	81.4	Pass
		Redund Hip 1 Bracing	ROHN TS1.5x11 ga	282	-0.04	4.35	0.9	Pass
		Redund Hip Diagonal Bracing	ROHN 2.5 STD	272	-0.06	9.30	0.6	Pass
		Inner Bracing	ROHN 3 STD	284	-0.13	26.32	0.5	Pass
							Summary	
						Pole (L1)	6.1	Pass
						Leg (T8)	65.9	Pass
						Diagonal (T6)	86.4	Pass
						Horizontal (T9)	43.9	Pass
						Redund Horz 1 Bracing (T9)	65.0	Pass
						Redund Diag 1 Bracing (T9)	81.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Redund Hip 1 Bracing (T9)	0.9	Pass
						Redund Hip Diagonal Bracing (T9)	0.6	Pass
						Inner Bracing (T4)	4.5	Pass
						Bolt Checks	53.8	Pass
						RATING =	**86.4**	**Pass**

Notes	Component	Elevation (ft)	% Capacity	Pass/Fail
Individual Components:				
Notes:	**Component**	**Elevation**	**% Capacity**	**Pass/Fail**
2	Base Foundation	---	75.4%	Pass
Structure Rating (max from all components) =				**86.4%**

*Notes:

1) Capacities up to 105% are considered acceptable by engineering standards.
2) Foundation capacity based upon foundation modification design reaction comparison.

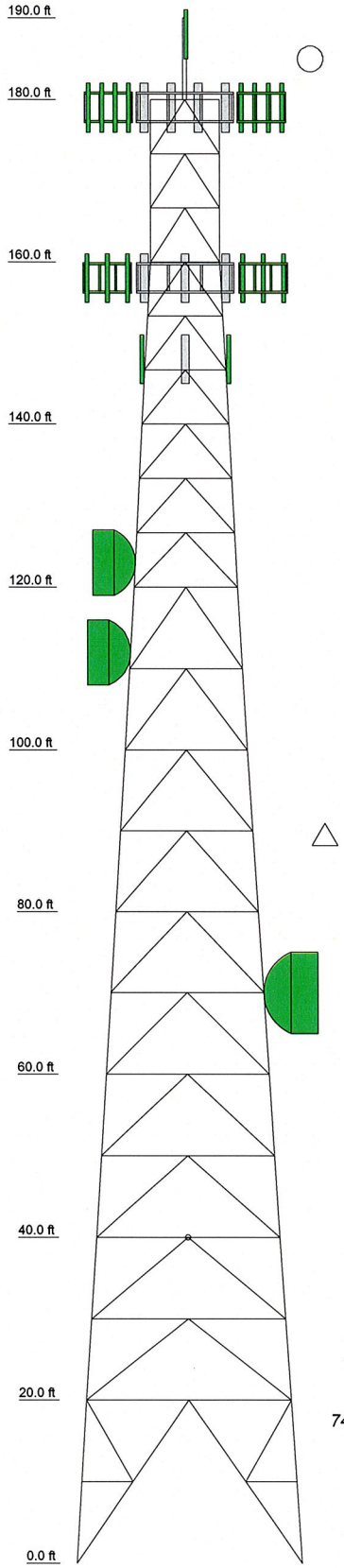
4.1) Recommendations

1. The proposed coax should be installed per the Base Level Drawing. See Appendix B.
2. The existing abandoned coax, antennas, and mounts at 168' should be removed prior to installation of proposed loading.
3. The proposed TMAs should be installed directly behind the proposed panel antennas.

APPENDIX A

RISA TOWER OUTPUT

Section	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs	HSS8.75x.375	ROHN 6 X-STR		ROHN 6 EHS	ROHN 5 X-STR		ROHN 4 X-STR	ROHN 3 X-STR	ROHN 2.5 STD	P5x.258
Leg Grade					A572-50					A36
Diagonals	ROHN 3 STD		ROHN 2.5 X-STR		ROHN 2.5 STD		ROHN 2 STD			N.A.
Diagonal Grade					A572-50					N.A.
Horizontals	ROHN 3 STD		ROHN 2.5 STD			ROHN 2 STD			ROHN 1.5 STD	N.A.
Red. Horizontals	ROHN TS1.5x11 ga					N.A.				
Red. Diagonals	ROHN 1.5 STD					N.A.				
Red. Hips	ROHN TS1.5x11 ga					N.A.				
Inner Bracing	ROHN 3 STD		L3 1/2x3 1/2x1/4	L3x3x3/16	L2 1/2x2 1/2x3/16		L2x2x1/8			N.A.
Face Width (ft)	27.677	25.177	22.5417	20.042	17.5417	14.958	12.708	10.625	8.542	8.5	0.463583
# Panels @ (ft)		1 @ 20		10 @ 10			9 @ 6.66667			N.A.
Weight (K)	25.9	4.4	4.4	4.2	3.2	2.6	2.5	1.9	1.5	1.1	0.1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) TMZXXX-6516-R2M w/ Mount Pipe	180	T-Frame Sector Mount (1)	158
(3) ATMPP1412D-1CWA TMA	180	(2) DB800/1900 TMA	158
(3) ATMAA1412D-1A20 TMA	180	(2) DB800/1900 TMA	158
(2) LPD-4019 w/Mount Pipe	177	(2) DB800/1900 TMA	158
(2) LPA-80063/8CF w/ Mount Pipe	177	(2) LGP13519 Diplexer	158
(2) LPD-4019 w/Mount Pipe	177	(2) LGP13519 Diplexer	158
T-Frame Sector Mount (1)	177	(2) LGP13519 Diplexer	158
T-Frame Sector Mount (1)	177	APXV18-206517S-C w/Mount Pipe	148
T-Frame Sector Mount (1)	177	APXV18-206517S-C w/Mount Pipe	148
(2) DB948F65T2E-M w/Mount Pipe	177	APXV18-206517S-C w/Mount Pipe	148
(2) DB948F65T2E-M w/Mount Pipe	177	Pipe Mount	148
(2) DB948F65T2E-M w/Mount Pipe	177	Pipe Mount	148
(2) DUO1417-8686 w/Mount Pipe	158	Pipe Mount	148
(2) DUO1417-8686 w/Mount Pipe	158	Pipe Mount	123
(2) DUO1417-8686 w/Mount Pipe	158	HP8-59E	123
7770.00 w/ Pipe Mount	158	Pipe Mount	112
7770.00 w/ Pipe Mount	158	HP8-59E	112
7770.00 w/ Pipe Mount	158	Pipe Mount	70
T-Frame Sector Mount (1)	158	HP10-59E	70
T-Frame Sector Mount (1)	158	GPS	40

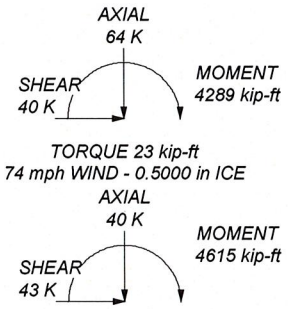
MATERIAL STRENGTH

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 50 mph wind.
5. TOWER RATING: 86.4%

MAX. CORNER REACTIONS AT BASE:
DOWN: 202 K
UPLIFT: -178 K
SHEAR: 25 K



FDH Engineering, Inc.
2730 Rowland Rd
Raleigh, NC 27615
Phone: (919) 755-1012
FAX: (919) 755-1031

Job: NHV 108 943133, CT BU# 806362		
Project: 09-02092E S2		
Client: Crown Castle	Drawn by: BRN	App'd:
Code: TIA/EIA-222-F	Date: 02/27/09	Scale: NTS
Path: \\Fdh-server\projects\2009 Projects\S2 - February\09-02092E\NHV 108 943133, CT\B2\Construction\C1\806362 -NHV 108 943133, CT1.prt		Dwg No. E-1

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 190.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 8.50 ft at the top and 27.68 ft at the base.
An index plate is provided at the 3x free standing -tower connection.
There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

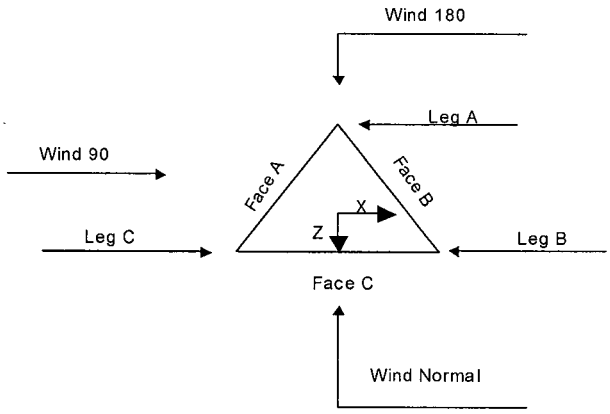
Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.0664.
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
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination

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

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



Triangular Tower

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	190.00-180.00	10.00	P5x.258	A36 (36 ksi)	

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
L1 190.00-180.00				1	1	1		

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-160.00			8.50	1	20.00
T2	160.00-140.00			8.54	1	20.00
T3	140.00-120.00			10.63	1	20.00
T4	120.00-100.00			12.71	1	20.00

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T5	100.00-80.00			14.96	1	20.00
T6	80.00-60.00			17.54	1	20.00
T7	60.00-40.00			20.04	1	20.00
T8	40.00-20.00			22.54	1	20.00
T9	20.00-0.00			25.18	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-160.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T2	160.00-140.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T3	140.00-120.00	6.67	K Brace Down	No	Yes	0.0000	0.0000
T4	120.00-100.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T5	100.00-80.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T6	80.00-60.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T7	60.00-40.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T8	40.00-20.00	10.00	K Brace Down	No	Yes	0.0000	0.0000
T9	20.00-0.00	20.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T2 160.00-140.00	Pipe	ROHN 3 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T3 140.00-120.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 120.00-100.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T5 100.00-80.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T6 80.00-60.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 60.00-40.00	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)
T8 40.00-20.00	Pipe	ROHN 6 X-STR	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)
T9 20.00-0.00	Pipe	HSS8.75x.375	A572-50 (50 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 1.5 STD	A572-50 (50 ksi)
T3 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T4 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T5 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2 STD	A572-50 (50 ksi)
T6 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T7 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T8 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)
T9 20.00-0.00	None	Flat Bar		A36 (36 ksi)	Pipe	ROHN 3 STD	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 180.00-160.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T2 160.00-140.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T3 140.00-120.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T4 120.00-100.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2x2x1/8	A36 (36 ksi)
T5 100.00-80.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 80.00-60.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 60.00-40.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T8 40.00-20.00	Solid Round		A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T9 20.00-0.00	Solid Round		A572-50 (50 ksi)	Pipe	ROHN 3 STD	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T9 20.00-0.00	A572-50	Horizontal (1)	Pipe	ROHN TS1.5x11 ga	1

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
	(50 ksi)	Diagonal (1)	Pipe	ROHN 1.5 STD	1
		Hip (1)	Pipe	ROHN TS1.5x11 ga	1
		Hip Diagonal		ROHN 2.5 STD	1

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 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 180.00-160.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 160.00-140.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 140.00-120.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 120.00-100.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 100.00-80.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 80.00-60.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 60.00-40.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 40.00-	No	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
20.00				1	1	1	1	1	1	1
T9 20.00-0.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	3	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T2 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T3 140.00-120.00	Flange	1.0000 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T4 120.00-100.00	Flange	1.0000 A325N	4	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T5 100.00-80.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T6 80.00-60.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0

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.
T7 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T8 40.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0
T9 20.00-0.00	Flange	1.0000 A449	8	0.6250 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	2	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8	A	Yes	Ar (CfAe)	177.00 - 5.00	0.0000	-0.4	12	2	1.9800	1.9800		1.04
1 5/8	C	Yes	Ar (CfAe)	180.00 - 158.00	-4.0000	-0.4	18	6	1.9800	1.9800		1.04
1/2	A	Yes	Ar (CfAe)	40.00 - 5.00	0.0000	-0.45	1	1	0.5800	0.0000		0.25
EW63	A	Yes	Ar (CfAe)	112.00 - 5.00	0.0000	-0.45	2	1	1.5742	1.5742		0.51
1 5/8	C	Yes	Ar (CfAe)	158.00 - 5.00	-4.0000	-0.4	24	6	1.9800	1.9800		1.04
EW52	A	Yes	Ar (CfAe)	123.00 - 5.00	0.0000	-0.45	1	1	1.7426	0.0000		0.59
1 5/8	A	Yes	Ar (CfAe)	148.00 - 5.00	0.0000	0.4	6	3	1.9800	1.9800		1.04
1 1/4	C	Yes	Ar (CfAe)	158.00 - 5.00	0.0000	-0.3	6	6	1.5500	1.5500		0.66

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
1 5/8	A	No	CaAa (Out Of Face)	170.00 - 5.00	2	No Ice	0.20	1.04
						1/2" Ice	0.30	2.55

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 K
L1	190.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	180.00-160.00	A	5.610	0.000	0.000	3.960	0.23
		B	0.000	0.000	0.000	0.000	0.00
		C	19.800	0.000	0.000	0.000	0.37
T2	160.00-140.00	A	10.560	0.000	0.000	7.920	0.34
		B	0.000	0.000	0.000	0.000	0.00
		C	33.750	0.000	0.000	0.000	0.56
T3	140.00-120.00	A	16.500	0.000	0.000	7.920	0.42
		B	0.000	0.000	0.000	0.000	0.00
		C	35.300	0.000	0.000	0.000	0.58
T4	120.00-100.00	A	18.074	0.000	0.000	7.920	0.44

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 K
		B	0.000	0.000	0.000	0.000	0.00
		C	35.300	0.000	0.000	0.000	0.58
T5	100.00-80.00	A	19.124	0.000	0.000	7.920	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	35.300	0.000	0.000	0.000	0.58
T6	80.00-60.00	A	19.124	0.000	0.000	7.920	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	35.300	0.000	0.000	0.000	0.58
T7	60.00-40.00	A	19.124	0.000	0.000	7.920	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	35.300	0.000	0.000	0.000	0.58
T8	40.00-20.00	A	19.124	0.000	0.000	7.920	0.45
		B	0.000	0.000	0.000	0.000	0.00
		C	35.300	0.000	0.000	0.000	0.58
T9	20.00-0.00	A	14.343	0.000	0.000	5.940	0.34
		B	0.000	0.000	0.000	0.000	0.00
		C	26.475	0.000	0.000	0.000	0.43

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 K
L1	190.00-180.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	180.00-160.00	A	0.500	8.443	0.000	0.000	5.960	0.57
		B		0.000	0.000	0.000	0.000	0.00
		C		29.800	0.000	0.000	0.000	0.92
T2	160.00-140.00	A	0.500	15.893	0.000	0.000	11.920	0.84
		B		0.000	0.000	0.000	0.000	0.00
		C		52.750	0.000	0.000	0.000	1.40
T3	140.00-120.00	A	0.500	25.083	0.000	0.000	11.920	1.02
		B		0.000	0.000	0.000	0.000	0.00
		C		55.300	0.000	0.000	0.000	1.46
T4	120.00-100.00	A	0.500	29.074	0.000	0.000	11.920	1.08
		B		0.000	0.000	0.000	0.000	0.00
		C		55.300	0.000	0.000	0.000	1.46
T5	100.00-80.00	A	0.500	30.790	0.000	0.000	11.920	1.11
		B		0.000	0.000	0.000	0.000	0.00
		C		55.300	0.000	0.000	0.000	1.46
T6	80.00-60.00	A	0.500	30.790	0.000	0.000	11.920	1.11
		B		0.000	0.000	0.000	0.000	0.00
		C		55.300	0.000	0.000	0.000	1.46
T7	60.00-40.00	A	0.500	30.790	0.000	0.000	11.920	1.11
		B		0.000	0.000	0.000	0.000	0.00
		C		55.300	0.000	0.000	0.000	1.46
T8	40.00-20.00	A	0.500	32.457	0.000	0.000	11.920	1.12
		B		0.000	0.000	0.000	0.000	0.00
		C		55.300	0.000	0.000	0.000	1.46
T9	20.00-0.00	A	0.500	24.343	0.000	0.000	8.940	0.84
		B		0.000	0.000	0.000	0.000	0.00
		C		41.475	0.000	0.000	0.000	1.09

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
L1	190.00-180.00		0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
T1	180.00-160.00	A	0.442	0.967	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.561	3.413	0.000	0.000
T2	160.00-140.00	A	0.777	1.701	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.482	5.645	0.000	0.000
T3	140.00-120.00	A	1.223	2.641	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.615	5.822	0.000	0.000
T4	120.00-100.00	A	1.099	2.426	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.147	4.614	0.000	0.000
T5	100.00-80.00	A	1.089	2.407	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.010	4.324	0.000	0.000
T6	80.00-60.00	A	1.116	2.422	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.060	4.350	0.000	0.000
T7	60.00-40.00	A	1.079	2.341	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.991	4.204	0.000	0.000
T8	40.00-20.00	A	1.178	2.619	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.175	4.462	0.000	0.000
T9	20.00-0.00	A	0.896	2.107	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	1.654	3.590	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
L1	190.00-180.00	0.0000	0.0000	0.0000	0.0000
T1	180.00-160.00	4.2857	3.3977	4.3328	3.3460
T2	160.00-140.00	5.9504	2.8357	6.2954	3.0110
T3	140.00-120.00	6.2711	1.1727	6.7502	1.4391
T4	120.00-100.00	6.4864	1.7205	6.7480	2.3665
T5	100.00-80.00	7.0190	2.2280	7.2524	3.0106
T6	80.00-60.00	7.3992	2.3369	7.8056	3.2249
T7	60.00-40.00	8.2143	2.6017	8.6735	3.5901
T8	40.00-20.00	8.5805	2.6839	8.4688	4.0744
T9	20.00-0.00	6.9195	2.1585	6.9771	3.3171

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) DB948F65T2E-M w/Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice	5.65 6.35	4.96 6.06	0.04 0.09
(2) DB948F65T2E-M w/Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice	5.65 6.35	4.96 6.06	0.04 0.09
(2) DB948F65T2E-M w/Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice	5.65 6.35	4.96 6.06	0.04 0.09
(2) LPD-4019 w/Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice	19.55 20.32	14.44 15.97	0.10 0.18
(2) LPA-80063/8CF w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice	13.97 14.68	13.84 15.22	0.06 0.18
(2) LPD-4019 w/Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	177.00	No Ice 1/2" Ice	19.55 20.32	14.44 15.97	0.10 0.18
T-Frame Sector Mount (1)	A	From Leg	0.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
T-Frame Sector Mount (1)	B	From Leg	0.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
T-Frame Sector Mount (1)	C	From Leg	0.00 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
***									
(3) TMZXXX-6516-R2M w/ Mount Pipe	B	From Leg	0.00 0.00 8.00	0.0000	180.00	No Ice 1/2" Ice	10.51 11.25	3.74 4.78	0.06 0.12
(3) ATMPP1412D-1CWA TMA	B	From Leg	0.00 0.00 8.00	0.0000	180.00	No Ice 1/2" Ice	0.00 0.00	0.55 0.67	0.00 0.01
(3) ATMAA1412D-1A20 TMA	B	From Leg	0.00 0.00 8.00	0.0000	180.00	No Ice 1/2" Ice	0.00 0.00	0.55 0.67	0.00 0.01
*** ***									
(2) DUO1417-8686 w/Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	7.25 7.96	5.86 6.96	0.05 0.10
(2) DUO1417-8686 w/Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	7.25 7.96	5.86 6.96	0.05 0.10
(2) DUO1417-8686 w/Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	7.25 7.96	5.86 6.96	0.05 0.10
7770.00 w/ Pipe Mount	A	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	6.96 7.51	4.93 5.83	0.06 0.11
7770.00 w/ Pipe Mount	B	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	6.96 7.51	4.93 5.83	0.06 0.11
7770.00 w/ Pipe Mount	C	From Leg	3.00 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	6.96 7.51	4.93 5.83	0.06 0.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
T-Frame Sector Mount (1)	A	From Leg	0.00	0.0000	158.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
			0.00						
T-Frame Sector Mount (1)	B	From Leg	0.00	0.0000	158.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
			0.00						
T-Frame Sector Mount (1)	C	From Leg	0.00	0.0000	158.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
			0.00						
(2) DB800/1900 TMA	A	From Leg	3.00	0.0000	158.00	No Ice	0.00	0.55	0.00
			0.00			1/2" Ice	0.00	0.67	0.01
			0.00						
(2) DB800/1900 TMA	B	From Leg	3.00	0.0000	158.00	No Ice	0.00	0.55	0.00
			0.00			1/2" Ice	0.00	0.67	0.01
			0.00						
(2) DB800/1900 TMA	C	From Leg	3.00	0.0000	158.00	No Ice	0.00	0.55	0.00
			0.00			1/2" Ice	0.00	0.67	0.01
			0.00						
(2) LGP13519 Diplexer	A	From Leg	3.00	0.0000	158.00	No Ice	1.40	0.55	0.00
			0.00			1/2" Ice	1.56	0.67	0.01
			0.00						
(2) LGP13519 Diplexer	B	From Leg	3.00	0.0000	158.00	No Ice	1.40	0.55	0.00
			0.00			1/2" Ice	1.56	0.67	0.01
			0.00						
(2) LGP13519 Diplexer	C	From Leg	3.00	0.0000	158.00	No Ice	1.40	0.55	0.00
			0.00			1/2" Ice	1.56	0.67	0.01
			0.00						
***									
Pipe Mount	C	From Leg	0.00	0.0000	123.00	No Ice	0.00	2.60	0.07
			0.00			1/2" Ice	0.00	3.01	0.09
			0.00						
***									
Pipe Mount	C	From Leg	0.00	0.0000	112.00	No Ice	0.00	2.60	0.07
			0.00			1/2" Ice	0.00	3.01	0.09
			0.00						
***									
Pipe Mount	C	From Leg	0.00	0.0000	70.00	No Ice	0.00	2.60	0.07
			0.00			1/2" Ice	0.00	3.01	0.09
			0.00						
***									
APXV18-206517S-C w/Mount Pipe	A	From Leg	0.50	0.0000	148.00	No Ice	5.40	4.69	0.05
			0.00			1/2" Ice	5.96	5.85	0.09
			0.00						
APXV18-206517S-C w/Mount Pipe	B	From Leg	0.50	0.0000	148.00	No Ice	5.40	4.69	0.05
			0.00			1/2" Ice	5.96	5.85	0.09
			0.00						
APXV18-206517S-C w/Mount Pipe	C	From Leg	0.50	0.0000	148.00	No Ice	5.40	4.69	0.05
			0.00			1/2" Ice	5.96	5.85	0.09
			0.00						
Pipe Mount	A	From Leg	0.00	0.0000	148.00	No Ice	0.00	2.60	0.07
			0.00			1/2" Ice	0.00	3.01	0.09
			0.00						
Pipe Mount	B	From Leg	0.00	0.0000	148.00	No Ice	0.00	2.60	0.07
			0.00			1/2" Ice	0.00	3.01	0.09
			0.00						
Pipe Mount	C	From Leg	0.00	0.0000	148.00	No Ice	0.00	2.60	0.07
			0.00			1/2" Ice	0.00	3.01	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft	ft^2	ft^2	K
			0.00					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter		Aperture Area	Weight
				ft	°	°	ft	ft		ft^2	K
HP8-59E	C	Paraboloid w/Shroud (HP)	From Leg	0.00 0.00 0.00	0.0000		123.00	8.00	No Ice	50.26	0.25
									1/2" Ice	51.29	0.51
HP8-59E	C	Paraboloid w/Shroud (HP)	From Leg	0.00 0.00 0.00	0.0000		112.00	8.00	No Ice	50.26	0.25
									1/2" Ice	51.29	0.51
HP10-59E	B	Paraboloid w/Shroud (HP)	From Leg	0.00 0.00 0.00	0.0000		70.00	10.00	No Ice	78.54	0.32
									1/2" Ice	79.81	0.73
GPS	A	Paraboloid w/Radome	From Leg	0.00 0.00 0.00	0.0000		40.00	0.75	No Ice	0.44	0.00
									1/2" Ice	0.55	0.00

Load Combinations

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	190 - 180	Pole	Max Tension	11	0.00	0.00	0.00
			Max. Compression	14	-0.18	0.00	0.00
			Max. Mx	18	-0.18	-0.67	-0.00
			Max. My	21	-0.18	-0.00	-0.67
			Max. Vy	18	0.13	-0.67	-0.00
			Max. Vx	21	0.13	-0.00	-0.67
			Max. Torque	11			-0.00
T1	180 - 160	Leg	Max Tension	12	11.93	0.22	0.00
			Max. Compression	6	-14.39	0.44	-0.00
			Max. Mx	4	-0.24	-2.10	0.06
			Max. My	9	0.04	0.00	2.13
			Max. Vy	10	1.30	2.10	-0.07
			Max. Vx	3	-1.31	0.00	-2.13
		Diagonal	Max Tension	5	4.88	0.00	0.00
			Max. Compression	5	-4.94	0.00	0.00
			Max. Mx	18	4.36	0.02	0.00
			Max. My	17	-1.86	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	18	3.27	-0.01	-0.00
			Max. Compression	5	-2.63	-0.01	-0.00
			Max. Mx	25	0.01	-0.02	-0.00
			Max. My	17	0.51	-0.01	-0.01
			Max. Vy	25	-0.01	-0.02	-0.00
			Max. Vx	17	0.00	-0.01	-0.01
		Inner Bracing	Max Tension	5	0.05	0.00	0.00
			Max. Compression	5	-0.05	0.00	0.00
			Max. Mx	14	-0.00	-0.01	0.00
			Max. My	19	0.02	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	12	34.08	-0.06	-0.00
			Max. Compression	6	-39.78	0.10	-0.00
			Max. Mx	12	18.14	1.20	-0.00
			Max. My	3	-2.18	-0.02	1.18
			Max. Vy	12	-0.84	-0.47	0.00
			Max. Vx	9	0.83	-0.01	0.45

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	5	6.28	0.00	0.00
			Max. Compression	5	-6.35	0.00	0.00
			Max. Mx	18	5.79	0.03	0.00
			Max. My	17	-0.15	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	13	3.90	-0.01	0.00
			Max. Compression	13	-3.91	-0.01	0.00
			Max. Mx	21	-0.10	-0.02	-0.01
			Max. My	6	0.93	0.00	0.01
			Max. Vy	21	-0.02	-0.02	-0.01
			Max. Vx	6	-0.00	0.00	0.01
		Inner Bracing	Max Tension	13	0.07	0.00	0.00
			Max. Compression	13	-0.07	0.00	0.00
			Max. Mx	14	-0.00	-0.01	0.00
			Max. My	19	0.06	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	12	57.19	-0.28	0.16
			Max. Compression	6	-65.04	0.67	-0.45
			Max. Mx	4	55.69	-0.90	-0.02
			Max. My	7	-3.32	0.02	-0.89
			Max. Vy	4	0.48	-0.90	-0.02
			Max. Vx	7	0.48	0.02	-0.89
		Diagonal	Max Tension	5	6.43	0.00	0.00
			Max. Compression	5	-6.53	0.00	0.00
			Max. Mx	18	6.01	0.04	0.00
			Max. My	17	-0.28	0.00	-0.00
			Max. Vy	18	-0.02	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	5	4.51	-0.02	0.00
			Max. Compression	11	-4.44	-0.02	-0.00
			Max. Mx	21	-0.07	-0.04	-0.01
			Max. My	4	-0.18	-0.04	-0.01
			Max. Vy	21	-0.02	-0.04	-0.01
			Max. Vx	12	0.00	-0.03	-0.01
		Inner Bracing	Max Tension	11	0.08	0.00	0.00
			Max. Compression	11	-0.08	0.00	0.00
			Max. Mx	14	-0.00	-0.02	0.00
			Max. My	19	0.06	0.00	-0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T4	120 - 100	Leg	Max Tension	12	75.56	-0.53	0.18
			Max. Compression	6	-85.65	0.33	0.05
			Max. Mx	4	63.35	-0.90	-0.02
			Max. My	7	-3.57	0.02	-0.89
			Max. Vy	4	0.56	-0.65	-0.02
			Max. Vx	7	0.57	0.00	-0.62
		Diagonal	Max Tension	5	9.64	0.00	0.00
			Max. Compression	5	-9.79	0.00	0.00
			Max. Mx	18	8.80	0.09	0.00
			Max. My	17	-0.42	0.00	-0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	5	5.86	-0.02	0.00
			Max. Compression	5	-5.73	-0.02	0.00
			Max. Mx	21	-0.31	-0.05	-0.01
			Max. My	4	-0.39	-0.04	-0.01
			Max. Vy	21	-0.03	-0.05	-0.01
			Max. Vx	4	0.00	-0.04	-0.01
		Inner Bracing	Max Tension	5	0.10	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	5	-0.10	0.00	0.00
			Max. Mx	14	0.00	-0.02	0.00
			Max. My	21	0.07	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	21	-0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	4	97.59	-0.36	-0.02
			Max. Compression	6	-109.24	0.40	-0.01
			Max. Mx	12	95.99	-0.43	0.01
			Max. My	3	-8.74	-0.01	-0.48
			Max. Vy	12	0.08	-0.43	0.01
			Max. Vx	9	-0.09	-0.02	0.48
		Diagonal	Max Tension	5	8.52	0.00	0.00
			Max. Compression	5	-8.70	0.00	0.00
			Max. Mx	18	7.68	0.12	0.00
			Max. My	17	-0.49	0.00	-0.00
			Max. Vy	18	-0.03	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	5	5.49	-0.03	0.00
			Max. Compression	5	-5.53	-0.03	0.00
			Max. Mx	21	-0.07	-0.06	-0.01
			Max. My	4	-0.33	-0.05	-0.01
			Max. Vy	21	-0.03	-0.06	-0.01
			Max. Vx	4	0.00	-0.05	-0.01
		Inner Bracing	Max Tension	5	0.10	0.00	0.00
			Max. Compression	5	-0.10	0.00	0.00
			Max. Mx	14	0.00	-0.04	0.00
			Max. My	17	0.07	0.00	0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	4	116.97	-0.49	0.07
			Max. Compression	6	-130.52	0.49	-0.02
			Max. Mx	12	113.53	-0.53	0.02
			Max. My	3	-11.64	-0.00	-0.60
			Max. Vy	12	-0.96	-0.45	0.00
			Max. Vx	9	0.91	-0.03	0.38
		Diagonal	Max Tension	11	9.36	0.00	0.00
			Max. Compression	11	-9.63	0.00	0.00
			Max. Mx	18	8.54	0.14	0.00
			Max. My	17	-0.56	0.00	-0.00
			Max. Vy	18	-0.04	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	11	6.85	-0.07	0.00
			Max. Compression	5	-6.81	-0.07	-0.00
			Max. Mx	17	-0.77	-0.12	-0.01
			Max. My	12	-0.79	-0.10	-0.01
			Max. Vy	17	-0.05	-0.12	-0.01
			Max. Vx	12	0.00	-0.10	-0.01
		Inner Bracing	Max Tension	5	0.12	0.00	0.00
			Max. Compression	5	-0.12	0.00	0.00
			Max. Mx	14	0.00	-0.07	0.00
			Max. My	17	0.08	0.00	0.00
			Max. Vy	14	0.03	0.00	0.00
			Max. Vx	17	-0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	4	136.57	-0.50	-0.01
			Max. Compression	6	-153.16	0.38	-0.02
			Max. Mx	12	123.92	-0.53	0.02
			Max. My	3	-12.64	-0.00	-0.60
			Max. Vy	12	-0.09	-0.50	0.01
			Max. Vx	3	-0.10	-0.00	-0.60
		Diagonal	Max Tension	11	9.26	0.00	0.00
			Max. Compression	11	-9.62	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	18	8.39	0.21	0.00
			Max. My	17	-0.69	0.00	-0.00
			Max. Vy	18	-0.05	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	11	6.99	-0.09	0.00
			Max. Compression	11	-6.91	-0.09	0.00
			Max. Mx	17	-0.50	-0.14	-0.01
			Max. My	12	-0.32	-0.10	-0.01
			Max. Vy	17	-0.05	-0.14	-0.01
			Max. Vx	12	0.00	-0.10	-0.01
		Inner Bracing	Max Tension	11	0.12	0.00	0.00
			Max. Compression	11	-0.12	0.00	0.00
			Max. Mx	14	-0.01	-0.13	0.00
			Max. My	17	0.09	0.00	0.00
			Max. Vy	14	0.05	0.00	0.00
			Max. Vx	17	-0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	4	154.10	-0.82	-0.00
			Max. Compression	6	-174.11	-1.37	-0.09
			Max. Mx	6	-174.11	-1.37	-0.09
			Max. My	3	-17.08	-0.29	-1.88
			Max. Vy	10	0.27	0.90	-0.01
			Max. Vx	3	0.25	-0.29	-1.88
		Diagonal	Max Tension	11	8.68	0.00	0.00
			Max. Compression	11	-9.10	0.00	0.00
			Max. Mx	18	7.95	0.25	0.00
			Max. My	17	-0.75	0.00	-0.00
			Max. Vy	18	-0.06	0.00	0.00
			Max. Vx	17	-0.00	0.00	0.00
		Horizontal	Max Tension	11	6.99	-0.11	-0.00
			Max. Compression	11	-6.82	-0.11	-0.00
			Max. Mx	17	-0.26	-0.16	-0.01
			Max. My	12	-0.48	-0.12	-0.01
			Max. Vy	17	-0.06	-0.16	-0.01
			Max. Vx	12	0.00	-0.12	-0.01
		Inner Bracing	Max Tension	11	0.12	0.00	0.00
			Max. Compression	11	-0.12	0.00	0.00
			Max. Mx	14	-0.01	-0.16	0.00
			Max. My	17	0.09	0.00	0.00
			Max. Vy	14	0.05	0.00	0.00
			Max. Vx	17	-0.00	0.00	0.00
T9	20 - 0	Leg	Max Tension	4	160.57	0.81	-0.10
			Max. Compression	6	-183.61	-0.00	0.00
			Max. Mx	6	-183.29	5.30	0.09
			Max. My	3	-18.13	-0.29	-1.88
			Max. Vy	6	-0.73	5.30	0.09
			Max. Vx	3	-0.40	-0.29	-1.88
		Diagonal	Max Tension	11	13.41	-0.15	-0.03
			Max. Compression	11	-13.87	0.00	0.00
			Max. Mx	21	9.52	-0.20	0.06
			Max. My	11	-13.43	0.02	-0.09
			Max. Vy	21	0.05	-0.20	0.06
			Max. Vx	11	-0.01	0.00	0.00
		Horizontal	Max Tension	11	7.45	-0.16	0.00
			Max. Compression	11	-7.55	-0.16	0.00
			Max. Mx	17	0.18	-0.25	-0.02
			Max. My	12	-0.37	-0.23	-0.02
			Max. Vy	17	0.08	-0.25	-0.02
			Max. Vx	12	0.00	-0.23	-0.02
		Redund Horz 1 Bracing	Max Tension	6	3.19	0.00	0.00
			Max. Compression	6	-3.19	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	21	1.73	0.01	0.00
			Max. Vy	21	-0.01	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	6	2.91	0.00	0.00
			Max. Compression	6	-2.91	0.00	0.00
			Max. Mx	19	2.86	0.03	0.00
			Max. My	21	0.81	0.00	0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	21	-0.00	0.00	0.00
		Redund Hip 1 Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	5	-0.04	0.00	0.00
			Max. Mx	14	-0.01	0.01	0.00
			Max. Vy	14	-0.01	0.00	0.00
		Redund Hip Diagonal Bracing	Max Tension	18	0.07	0.00	0.00
			Max. Compression	23	-0.06	0.00	0.00
			Max. Mx	17	0.06	0.17	0.00
			Max. My	17	0.06	0.00	-0.00
			Max. Vy	17	-0.04	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Inner Bracing	Max Tension	11	0.13	0.00	0.00
			Max. Compression	11	-0.13	0.00	0.00
			Max. Mx	14	-0.01	0.20	0.00
			Max. My	17	0.10	0.00	-0.00
			Max. Vy	14	-0.06	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	201.45	21.95	-12.02
	Max. H_x	10	201.45	21.95	-12.02
	Max. H_z	3	-153.19	-16.65	11.22
	Min. Vert	4	-177.74	-20.34	11.13
	Min. H_x	4	-177.74	-20.34	11.13
	Min. H_z	10	201.45	21.95	-12.02
Leg B	Max. Vert	6	202.34	-21.88	-12.31
	Max. H_x	12	-174.72	20.08	11.30
	Max. H_z	13	-149.74	16.28	11.56
	Min. Vert	12	-174.72	20.08	11.30
	Min. H_x	6	202.34	-21.88	-12.31
	Min. H_z	7	174.88	-17.88	-12.38
Leg A	Max. Vert	2	197.69	0.29	24.70
	Max. H_x	11	11.20	3.61	1.18
	Max. H_z	2	197.69	0.29	24.70
	Min. Vert	8	-171.88	-0.28	-22.36
	Min. H_x	5	15.02	-3.60	1.40
	Min. H_z	8	-171.88	-0.28	-22.36

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	39.94	-0.00	-0.00	23.65	-8.56	0.00
Dead+Wind 0 deg - No Ice	39.94	0.42	-41.14	-4419.23	-111.63	13.16
Dead+Wind 30 deg - No Ice	39.94	22.03	-35.50	-3823.99	-2400.44	23.24
Dead+Wind 60 deg - No Ice	39.94	37.06	-20.35	-2201.17	-4017.03	21.62
Dead+Wind 90 deg - No Ice	39.94	42.53	-0.34	-40.91	-4614.67	15.08
Dead+Wind 120 deg - No Ice	39.94	37.08	19.33	2094.08	-4022.69	6.68
Dead+Wind 150 deg - No Ice	39.94	20.92	35.36	3848.10	-2249.81	1.64
Dead+Wind 180 deg - No Ice	39.94	-0.19	40.86	4438.90	44.15	-13.10
Dead+Wind 210 deg - No Ice	39.94	-21.08	35.19	3824.31	2289.25	-24.31
Dead+Wind 240 deg - No Ice	39.94	-36.76	19.62	2180.12	3948.46	-19.84
Dead+Wind 270 deg - No Ice	39.94	-42.29	-0.04	50.80	4544.87	-15.06
Dead+Wind 300 deg - No Ice	39.94	-37.01	-20.11	-2126.78	3976.46	-8.50
Dead+Wind 330 deg - No Ice	39.94	-21.87	-35.39	-3787.13	2326.45	-0.59
Dead+Ice+Temp	64.19	-0.00	-0.00	58.39	-25.92	-0.00
Dead+Wind 0 deg+Ice+Temp	64.19	0.33	-38.69	-4084.02	-107.48	13.81
Dead+Wind 30 deg+Ice+Temp	64.19	20.45	-33.41	-3530.21	-2227.29	22.45
Dead+Wind 60 deg+Ice+Temp	64.19	34.58	-19.18	-2017.32	-3733.58	20.88
Dead+Wind 90 deg+Ice+Temp	64.19	39.72	-0.27	6.70	-4288.60	14.41
Dead+Wind 120 deg+Ice+Temp	64.19	34.59	18.39	2012.13	-3735.63	5.72
Dead+Wind 150 deg+Ice+Temp	64.19	19.59	33.30	3627.22	-2107.90	-0.56
Dead+Wind 180 deg+Ice+Temp	64.19	-0.15	38.48	4179.91	16.74	-13.75
Dead+Wind 210 deg+Ice+Temp	64.19	-19.73	33.18	3611.22	2103.38	-23.26
Dead+Wind 240 deg+Ice+Temp	64.19	-34.35	18.63	2082.22	3642.08	-19.54
Dead+Wind 270 deg+Ice+Temp	64.19	-39.53	-0.02	81.74	4196.17	-14.39
Dead+Wind 300 deg+Ice+Temp	64.19	-34.53	-18.98	-1956.28	3661.34	-7.11
Dead+Wind 330 deg+Ice+Temp	64.19	-20.31	-33.32	-3499.61	2127.67	1.36
Dead+Wind 0 deg - Service	39.94	0.14	-14.26	-1517.73	-44.23	4.56
Dead+Wind 30 deg - Service	39.94	7.63	-12.30	-1311.24	-838.21	8.04
Dead+Wind 60 deg - Service	39.94	12.84	-7.05	-748.17	-1399.10	7.48
Dead+Wind 90 deg - Service	39.94	14.74	-0.12	1.34	-1606.47	5.22
Dead+Wind 120 deg - Service	39.94	12.85	6.70	742.15	-1401.09	2.31
Dead+Wind 150 deg - Service	39.94	7.25	12.25	1350.57	-786.14	0.57
Dead+Wind 180 deg - Service	39.94	-0.06	14.16	1555.51	9.67	-4.53
Dead+Wind 210 deg - Service	39.94	-7.31	12.20	1342.32	788.61	-8.42
Dead+Wind 240 deg - Service	39.94	-12.74	6.80	771.92	1364.20	-6.87
Dead+Wind 270 deg - Service	39.94	-14.65	-0.01	33.08	1571.11	-5.21
Dead+Wind 300 deg - Service	39.94	-12.83	-6.97	-722.44	1373.86	-2.94
Dead+Wind 330 deg - Service	39.94	-7.58	-12.26	-1298.47	801.44	-0.20

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-39.94	0.00	0.00	39.94	0.00	0.000%
2	0.42	-39.94	-41.14	-0.42	39.94	41.14	0.001%
3	22.03	-39.94	-35.50	-22.03	39.94	35.50	0.001%
4	37.06	-39.94	-20.35	-37.06	39.94	20.35	0.001%
5	42.53	-39.94	-0.34	-42.53	39.94	0.34	0.001%
6	37.09	-39.94	19.33	-37.08	39.94	-19.33	0.001%
7	20.92	-39.94	35.36	-20.92	39.94	-35.36	0.001%
8	-0.19	-39.94	40.86	0.19	39.94	-40.86	0.001%
9	-21.08	-39.94	35.19	21.08	39.94	-35.19	0.001%
10	-36.76	-39.94	19.62	36.76	39.94	-19.62	0.001%
11	-42.29	-39.94	-0.04	42.29	39.94	0.04	0.001%
12	-37.01	-39.94	-20.11	37.01	39.94	20.11	0.001%
13	-21.87	-39.94	-35.39	21.87	39.94	35.39	0.001%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
14	0.00	-64.19	0.00	0.00	64.19	0.00	0.000%
15	0.33	-64.19	-38.69	-0.33	64.19	38.69	0.000%
16	20.45	-64.19	-33.41	-20.45	64.19	33.41	0.000%
17	34.58	-64.19	-19.18	-34.58	64.19	19.18	0.000%
18	39.72	-64.19	-0.27	-39.72	64.19	0.27	0.000%
19	34.59	-64.19	18.39	-34.59	64.19	-18.39	0.000%
20	19.59	-64.19	33.30	-19.59	64.19	-33.30	0.000%
21	-0.15	-64.19	38.48	0.15	64.19	-38.48	0.000%
22	-19.73	-64.19	33.18	19.73	64.19	-33.18	0.000%
23	-34.35	-64.19	18.63	34.35	64.19	-18.63	0.000%
24	-39.53	-64.19	-0.02	39.53	64.19	0.02	0.000%
25	-34.53	-64.19	-18.98	34.53	64.19	18.98	0.000%
26	-20.31	-64.19	-33.32	20.31	64.19	33.32	0.000%
27	0.14	-39.94	-14.26	-0.14	39.94	14.26	0.001%
28	7.63	-39.94	-12.30	-7.63	39.94	12.30	0.001%
29	12.84	-39.94	-7.05	-12.84	39.94	7.05	0.001%
30	14.74	-39.94	-0.12	-14.74	39.94	0.12	0.001%
31	12.85	-39.94	6.70	-12.85	39.94	-6.70	0.001%
32	7.25	-39.94	12.25	-7.25	39.94	-12.25	0.001%
33	-0.06	-39.94	14.16	0.06	39.94	-14.16	0.001%
34	-7.31	-39.94	12.20	7.31	39.94	-12.20	0.001%
35	-12.74	-39.94	6.80	12.74	39.94	-6.80	0.001%
36	-14.65	-39.94	-0.01	14.65	39.94	0.01	0.001%
37	-12.83	-39.94	-6.97	12.83	39.94	6.97	0.001%
38	-7.58	-39.94	-12.26	7.58	39.94	12.26	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	8	0.00000001	0.00010002
3	Yes	8	0.00000001	0.00009397
4	Yes	8	0.00000001	0.00008856
5	Yes	8	0.00000001	0.00009445
6	Yes	8	0.00000001	0.00010032
7	Yes	8	0.00000001	0.00009494
8	Yes	8	0.00000001	0.00008896
9	Yes	8	0.00000001	0.00009488
10	Yes	8	0.00000001	0.00010026
11	Yes	8	0.00000001	0.00009506
12	Yes	8	0.00000001	0.00008893
13	Yes	8	0.00000001	0.00009422
14	Yes	6	0.00000001	0.00006362
15	Yes	9	0.00000001	0.00004066
16	Yes	9	0.00000001	0.00003920
17	Yes	9	0.00000001	0.00003797
18	Yes	9	0.00000001	0.00003944
19	Yes	9	0.00000001	0.00004086
20	Yes	9	0.00000001	0.00003950
21	Yes	9	0.00000001	0.00003806
22	Yes	9	0.00000001	0.00003946
23	Yes	9	0.00000001	0.00004083
24	Yes	9	0.00000001	0.00003957
25	Yes	9	0.00000001	0.00003803
26	Yes	9	0.00000001	0.00003926

27	Yes	8	0.00000001	0.00009323
28	Yes	8	0.00000001	0.00009126
29	Yes	8	0.00000001	0.00008968
30	Yes	8	0.00000001	0.00009168
31	Yes	8	0.00000001	0.00009374
32	Yes	8	0.00000001	0.00009185
33	Yes	8	0.00000001	0.00008994
34	Yes	8	0.00000001	0.00009184
35	Yes	8	0.00000001	0.00009365
36	Yes	8	0.00000001	0.00009190
37	Yes	8	0.00000001	0.00008990
38	Yes	8	0.00000001	0.00009136

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.7500	4	2.98	19.44	0.153 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	1.65	6.44	0.256 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	1.64	6.44	0.254 ✓	1.333	Bolt Shear
T2	160	Leg	A325N	0.8750	4	8.52	26.46	0.322 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.12	6.44	0.328 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	1.96	6.44	0.303 ✓	1.333	Bolt Shear
T3	140	Leg	A325N	1.0000	4	14.30	34.56	0.414 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.18	6.44	0.338 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.25	6.44	0.350 ✓	1.333	Bolt Shear
T4	120	Leg	A325N	1.0000	4	18.89	34.56	0.547 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.26	6.44	0.506 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.93	6.44	0.455 ✓	1.333	Bolt Shear
T5	100	Leg	A325N	1.0000	6	16.26	34.56	0.471 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	2.90	6.44	0.450 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	2.76	6.44	0.429 ✓	1.333	Bolt Shear
T6	80	Leg	A325N	1.0000	6	19.49	34.56	0.564 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.21	6.44	0.498 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.42	6.44	0.532 ✓	1.333	Bolt Shear
T7	60	Leg	A325N	1.0000	6	22.76	34.56	0.659 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.21	6.44	0.498 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.50	6.44	0.543 ✓	1.333	Bolt Shear
T8	40	Leg	A325N	1.0000	8	19.26	34.56	0.557 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	3.03	6.44	0.471 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.49	6.44	0.542 ✓	1.333	Bolt Shear
T9	20	Leg	A449	1.0000	8	20.02	31.10	0.644 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	3	4.62	6.44	0.718 ✓	1.333	Bolt Shear
		Horizontal	A325N	0.6250	2	3.77	6.44	0.586 ✓	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
L1	190 - 180 (1)	P5x.258	10.00	10.00	63.9	17.049	4.2999	-0.18	73.31	0.002

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio f_{bx} / F_{bx}	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio f_{by} / F_{by}
L1	190 - 180 (1)	P5x.258	0.67	-1.486	23.760	0.063	0.00	0.000	23.760	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio P / P_a	Ratio f_{bx} / F_{bx}	Ratio f_{by} / F_{by}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	190 - 180 (1)	P5x.258	0.002	0.063	0.000	0.065 ✓	1.066	H1-3 ✓

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	180 - 160	ROHN 2.5 STD	20.00	6.67	84.4 K=1.00	18.110	1.7040	-14.39	30.86	0.466
T2	160 - 140	ROHN 3 X-STR	20.04	6.68	70.5 K=1.00	20.840	3.0159	-39.78	62.85	0.633
T3	140 - 120	ROHN 4 X-STR	20.04	6.68	54.3 K=1.00	23.671	4.4074	-65.04	104.33	0.623
T4	120 - 100	ROHN 5 X-STR	20.04	10.02	65.4 K=1.00	21.776	6.1120	-85.65	133.10	0.643
T5	100 - 80	ROHN 5 X-STR	20.06	10.03	65.4 K=1.00	21.769	6.1120	-109.24	133.05	0.821

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	80 - 60	ROHN 6 EHS	20.05	10.03	54.1 K=1.00	23.705	6.7133	-130.52	159.14	0.820
T7	60 - 40	ROHN 6 X-STR	20.05	10.03	54.8 K=1.00	23.583	8.4049	-153.16	198.21	0.773
T8	40 - 20	ROHN 6 X-STR	20.06	10.03	54.8 K=1.00	23.580	8.4049	-174.11	198.19	0.878
T9	20 - 0	HSS8.75x.375	20.05	10.03	40.5 K=1.00	25.766	9.2110	-183.61	237.33	0.774

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	180 - 160	ROHN 2.5 STD	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T2	160 - 140	ROHN 3 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T3	140 - 120	ROHN 4 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T4	120 - 100	ROHN 5 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T5	100 - 80	ROHN 5 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T6	80 - 60	ROHN 6 EHS	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T7	60 - 40	ROHN 6 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T8	40 - 20	ROHN 6 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T9	20 - 0	HSS8.75x.375	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	ROHN 2.5 STD	0.466	0.000	0.000	0.466 ✓	1.333	H1-3 ✓
T2	160 - 140	ROHN 3 X-STR	0.633	0.000	0.000	0.633 ✓	1.333	H1-3 ✓
T3	140 - 120	ROHN 4 X-STR	0.623	0.000	0.000	0.623 ✓	1.333	H1-3 ✓
T4	120 - 100	ROHN 5 X-STR	0.643	0.000	0.000	0.643 ✓	1.333	H1-3 ✓
T5	100 - 80	ROHN 5 X-STR	0.821	0.000	0.000	0.821 ✓	1.333	H1-3 ✓
T6	80 - 60	ROHN 6 EHS	0.820	0.000	0.000	0.820 ✓	1.333	H1-3 ✓
T7	60 - 40	ROHN 6 X-STR	0.773	0.000	0.000	0.773 ✓	1.333	H1-3 ✓
T8	40 - 20	ROHN 6 X-STR	0.878	0.000	0.000	0.878 ✓	1.333	H1-3 ✓
T9	20 - 0	HSS8.75x.375	0.774	0.000	0.000	0.774 ✓	1.333	H1-3 ✓

Diagonal Design Data (Compression)

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

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2 STD	7.92	7.70	117.3 K=1.00	10.850	1.0745	-4.94	11.66	0.424 ✓
T2	160 - 140	ROHN 2 STD	8.53	8.29	126.4 K=1.00	9.342	1.0745	-6.32	10.04	0.630 ✓
T3	140 - 120	ROHN 2 STD	9.21	8.94	136.3 K=1.00	8.039	1.0745	-6.53	8.64	0.756 ✓
T4	120 - 100	ROHN 2.5 STD	12.49	12.10	153.3 K=1.00	6.353	1.7040	-9.79	10.83	0.904 ✓
T5	100 - 80	ROHN 2.5 STD	13.31	12.96	164.1 K=1.00	5.546	1.7040	-8.48	9.45	0.898 ✓
T6	80 - 60	ROHN 2.5 STD	14.16	13.77	174.4 K=1.00	4.908	1.7040	-9.63	8.36	1.151 ✓
T7	60 - 40	ROHN 2.5 X-STR	15.07	14.70	190.9 K=1.00	4.096	2.2535	-9.53	9.23	1.033 ✓
T8	40 - 20	ROHN 3 STD	16.08	15.73	162.2 K=1.00	5.675	2.2285	-9.09	12.65	0.719 ✓
T9	20 - 0	ROHN 3 STD	24.33	12.17	125.5 K=1.00	9.486	2.2285	-13.87	21.14	0.656 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.53	4.14	79.9 K=1.00	19.037	0.7995	-2.63	15.22	0.173 ✓
T2	160 - 140	ROHN 1.5 STD	9.93	4.82	92.9 K=1.00	16.309	0.7995	-3.91	13.04	0.300 ✓
T3	140 - 120	ROHN 2 STD	12.01	5.82	88.7 K=1.00	17.212	1.0745	-4.44	18.50	0.240 ✓
T4	120 - 100	ROHN 2 STD	13.83	6.68	101.9 K=1.00	14.261	1.0745	-5.73	15.32	0.374 ✓
T5	100 - 80	ROHN 2 STD	16.25	7.89	120.3 K=1.00	10.313	1.0745	-5.53	11.08	0.499 ✓
T6	80 - 60	ROHN 2.5 STD	18.79	9.12	115.5 K=1.00	11.192	1.7040	-6.81	19.07	0.357 ✓
T7	60 - 40	ROHN 2.5 STD	21.29	10.37	131.3 K=1.00	8.656	1.7040	-6.91	14.75	0.469 ✓
T8	40 - 20	ROHN 2.5 STD	23.86	11.65	147.6 K=1.00	6.854	1.7040	-6.82	11.68	0.584 ✓
T9	20 - 0	ROHN 3 STD	25.18	12.31	127.0 K=1.00	9.262	2.2285	-7.55	20.64	0.366 ✓

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN TS1.5x11 ga	6.29	5.93	145.3 K=1.00	7.074	0.5202	-3.19	3.68	0.866 ✓

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 1.5 STD	11.50	10.94	210.9 K=1.00	3.357	0.7995	-2.91	2.68	1.085 ✓

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN TS1.5x11 ga	6.29	6.29	154.2 K=1.00	6.278	0.5202	-0.04	3.27	0.012 ✓

Redundant Hip Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 2.5 STD	15.07	15.07	190.9 K=1.00	4.096	1.7040	-0.06	6.98	0.008 ✓

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8	4.26	4.26	128.7 K=1.00	9.014	0.4844	-0.05	4.37	0.010 ✓
T2	160 - 140	L2x2x1/8	4.97	4.97	149.9 K=1.00	6.648	0.4844	-0.07	3.22	0.021 ✓
T3	140 - 120	L2x2x1/8	6.01	6.01	181.3 K=1.00	4.542	0.4844	-0.08	2.20	0.035 ✓
T4	120 - 100	L2x2x1/8	6.92	6.92	208.8 K=1.00	3.426	0.4844	-0.10	1.66	0.060 ✓
T5	100 - 80	L2 1/2x2 1/2x3/16	8.12	8.12	197.0 K=1.00	3.849	0.9020	-0.10	3.47	0.028

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	80 - 60	L3x3x3/16	9.40	9.40	189.2 K=1.00	4.173	1.0900	-0.12	4.55	0.026 ✓
T7	60 - 40	L3 1/2x3 1/2x1/4	10.65	10.65	184.1 K=1.00	4.407	1.6900	-0.12	7.45	0.016 ✓
T8	40 - 20	L3 1/2x3 1/2x1/4	11.93	11.93	206.3 K=1.00	3.510	1.6900	-0.12	5.93	0.020 ✓
T9	20 - 0	ROHN 3 STD	12.59	12.59	129.8 K=1.00	8.860	2.2285	-0.13	19.74	0.007 ✓

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 K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2.5 STD	20.00	6.67	84.4	30.000	1.7040	11.93	51.12	0.233
T2	160 - 140	ROHN 3 X-STR	20.04	6.68	70.5	30.000	3.0159	34.08	90.48	0.377
T3	140 - 120	ROHN 4 X-STR	20.04	6.68	54.3	30.000	4.4074	57.19	132.22	0.433
T4	120 - 100	ROHN 5 X-STR	20.04	10.02	65.4	30.000	6.1120	75.56	183.36	0.412
T5	100 - 80	ROHN 5 X-STR	20.06	10.03	65.4	30.000	6.1120	97.59	183.36	0.532
T6	80 - 60	ROHN 6 EHS	20.05	10.03	54.1	30.000	6.7133	116.94	201.40	0.581
T7	60 - 40	ROHN 6 X-STR	20.05	10.03	54.8	30.000	8.4049	136.57	252.15	0.542
T8	40 - 20	ROHN 6 X-STR	20.06	10.03	54.8	30.000	8.4049	154.10	252.15	0.611
T9	20 - 0	HSS8.75x.375	20.05	10.03	40.5	30.000	9.2110	160.57	276.33	0.581

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	180 - 160	ROHN 2.5 STD	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T2	160 - 140	ROHN 3 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T3	140 - 120	ROHN 4 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T4	120 - 100	ROHN 5 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T5	100 - 80	ROHN 5 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T6	80 - 60	ROHN 6 EHS	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T7	60 - 40	ROHN 6 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T8	40 - 20	ROHN 6 X-STR	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000
T9	20 - 0	HSS8.75x.375	0.00	0.000	33.000	0.000	0.00	0.000	33.000	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	ROHN 2.5 STD	0.233	0.000	0.000	0.233 ✓	1.333	H2-1 ✓
T2	160 - 140	ROHN 3 X-STR	0.377	0.000	0.000	0.377 ✓	1.333	H2-1 ✓
T3	140 - 120	ROHN 4 X-STR	0.433	0.000	0.000	0.433 ✓	1.333	H2-1 ✓
T4	120 - 100	ROHN 5 X-STR	0.412	0.000	0.000	0.412 ✓	1.333	H2-1 ✓
T5	100 - 80	ROHN 5 X-STR	0.532	0.000	0.000	0.532 ✓	1.333	H2-1 ✓
T6	80 - 60	ROHN 6 EHS	0.581	0.000	0.000	0.581 ✓	1.333	H2-1 ✓
T7	60 - 40	ROHN 6 X-STR	0.542	0.000	0.000	0.542 ✓	1.333	H2-1 ✓
T8	40 - 20	ROHN 6 X-STR	0.611	0.000	0.000	0.611 ✓	1.333	H2-1 ✓
T9	20 - 0	HSS8.75x.375	0.581	0.000	0.000	0.581 ✓	1.333	H2-1 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 2 STD	7.92	7.70	117.3	30.000	1.0745	4.88	32.24	0.151 ✓
T2	160 - 140	ROHN 2 STD	8.31	8.08	123.2	30.000	1.0745	6.28	32.24	0.195 ✓
T3	140 - 120	ROHN 2 STD	9.21	8.94	136.3	30.000	1.0745	6.43	32.24	0.199 ✓
T4	120 - 100	ROHN 2.5 STD	12.49	12.10	153.3	30.000	1.7040	9.64	51.12	0.189 ✓
T5	100 - 80	ROHN 2.5 STD	12.89	12.54	158.8	30.000	1.7040	8.52	51.12	0.167 ✓
T6	80 - 60	ROHN 2.5 STD	14.16	13.77	174.4	30.000	1.7040	9.36	51.12	0.183 ✓
T7	60 - 40	ROHN 2.5 X-STR	14.61	14.24	184.9	30.000	2.2535	9.26	67.61	0.137 ✓
T8	40 - 20	ROHN 3 STD	15.57	15.22	157.0	30.000	2.2285	8.68	66.85	0.130 ✓
T9	20 - 0	ROHN 3 STD	24.33	12.17	125.5	30.000	2.2285	13.41	66.85	0.201 ✓

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	ROHN 1.5 STD	8.51	4.14	79.7	30.000	0.7995	3.27	23.98	0.137 ✓
T2	160 - 140	ROHN 1.5 STD	9.93	4.82	92.9	30.000	0.7995	3.90	23.98	0.163 ✓
T3	140 - 120	ROHN 2 STD	12.01	5.82	88.7	30.000	1.0745	4.51	32.24	0.140

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	120 - 100	ROHN 2 STD	13.83	6.68	101.9	30.000	1.0745	5.86	32.24	0.182 ✓
T5	100 - 80	ROHN 2 STD	16.25	7.89	120.3	30.000	1.0745	5.49	32.24	0.170 ✓
T6	80 - 60	ROHN 2.5 STD	18.79	9.12	115.5	30.000	1.7040	6.85	51.12	0.134 ✓
T7	60 - 40	ROHN 2.5 STD	21.29	10.37	131.3	30.000	1.7040	6.99	51.12	0.137 ✓
T8	40 - 20	ROHN 2.5 STD	23.86	11.65	147.6	30.000	1.7040	6.99	51.12	0.137 ✓
T9	20 - 0	ROHN 3 STD	25.18	12.31	127.0	30.000	2.2285	7.45	66.85	0.111 ✓

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN TS1.5x11 ga	6.29	5.93	145.3	30.000	0.5202	3.19	15.61	0.204 ✓

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 1.5 STD	11.50	10.94	210.9	30.000	0.7995	2.91	23.98	0.121 ✓

Redundant Hip Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T9	20 - 0	ROHN 2.5 STD	15.07	15.07	190.9	30.000	1.7040	0.07	51.12	0.001 ✓

Inner Bracing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	180 - 160	L2x2x1/8	4.26	4.26	81.7	21.600	0.4844	0.05	10.46	0.004 ✓
T2	160 - 140	L2x2x1/8	4.97	4.97	95.1	21.600	0.4844	0.07	10.46	0.006 ✓
T3	140 - 120	L2x2x1/8	6.01	6.01	115.1	21.600	0.4844	0.08	10.46	0.007 ✓
T4	120 - 100	L2x2x1/8	6.92	6.92	132.5	21.600	0.4844	0.10	10.46	0.009 ✓
T5	100 - 80	L2 1/2x2 1/2x3/16	8.12	8.12	125.3	21.600	0.9020	0.10	19.48	0.005 ✓
T6	80 - 60	L3x3x3/16	9.40	9.40	120.1	21.600	1.0900	0.12	23.54	0.005 ✓
T7	60 - 40	L3 1/2x3 1/2x1/4	10.65	10.65	117.2	21.600	1.6900	0.12	36.50	0.003 ✓
T8	40 - 20	L3 1/2x3 1/2x1/4	11.93	11.93	131.3	21.600	1.6900	0.12	36.50	0.003 ✓
T9	20 - 0	ROHN 3 STD	12.59	12.59	129.8	21.600	2.2285	0.13	48.13	0.003 ✓

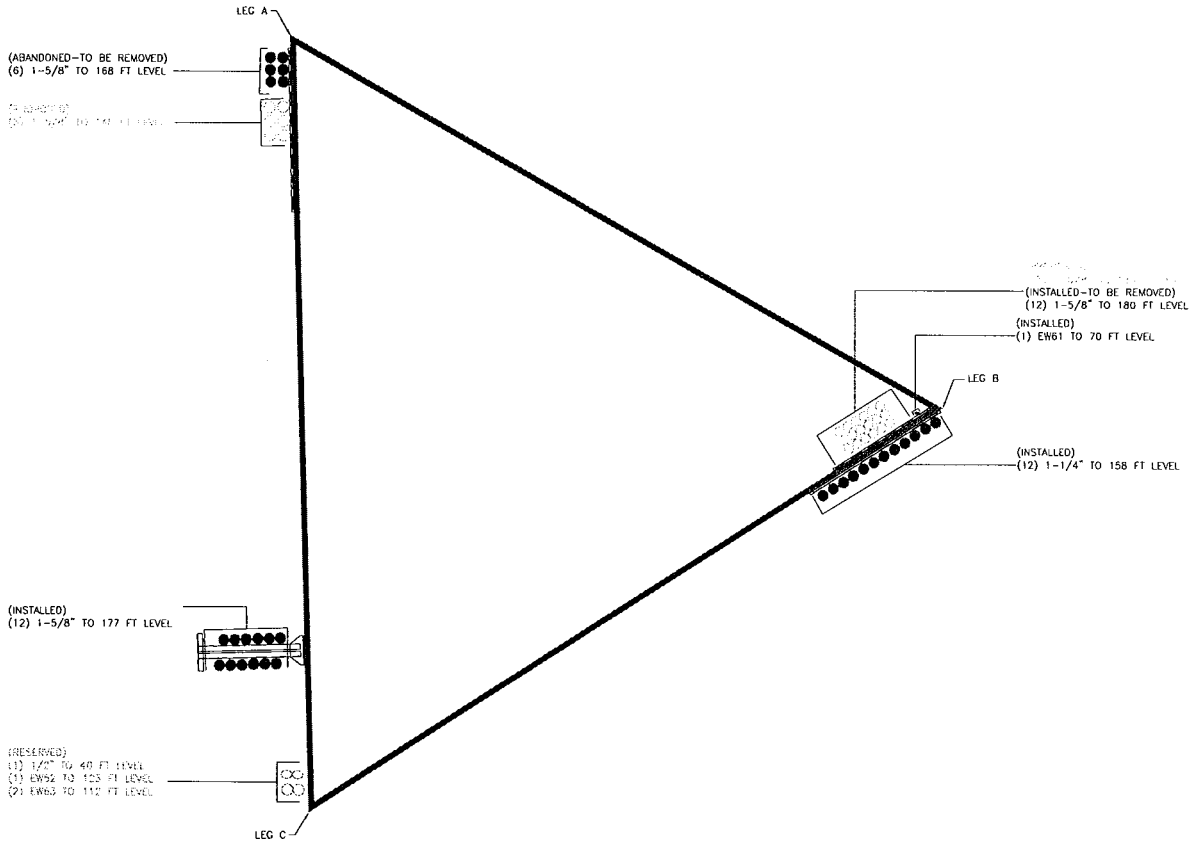
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	190 - 180	Pole	P5x.258	1	-0.18	78.18	6.1	Pass
T1	180 - 160	Leg	ROHN 2.5 STD	3	-14.39	41.14	35.0	Pass
		Diagonal	ROHN 2 STD	7	-4.94	15.54	31.8	Pass
		Horizontal	ROHN 1.5 STD	5	-2.63	20.29	13.0	Pass
							19.1 (b)	
		Inner Bracing	L2x2x1/8	14	-0.05	5.82	0.8	Pass
T2	160 - 140	Leg	ROHN 3 X-STR	42	-39.78	83.78	47.5	Pass
		Diagonal	ROHN 2 STD	49	-6.32	13.38	47.3	Pass
		Horizontal	ROHN 1.5 STD	47	-3.91	17.38	22.5	Pass
							22.8 (b)	
		Inner Bracing	L2x2x1/8	53	-0.07	4.29	1.6	Pass
T3	140 - 120	Leg	ROHN 4 X-STR	81	-65.04	139.07	46.8	Pass
		Diagonal	ROHN 2 STD	85	-6.53	11.51	56.7	Pass
		Horizontal	ROHN 2 STD	83	-4.44	24.65	18.0	Pass
							26.2 (b)	
		Inner Bracing	L2x2x1/8	92	-0.08	2.93	2.6	Pass
T4	120 - 100	Leg	ROHN 5 X-STR	120	-85.65	177.42	48.3	Pass
		Diagonal	ROHN 2.5 STD	124	-9.79	14.43	67.8	Pass
		Horizontal	ROHN 2 STD	122	-5.73	20.43	28.0	Pass
							34.1 (b)	
		Inner Bracing	L2x2x1/8	131	-0.10	2.21	4.5	Pass
T5	100 - 80	Leg	ROHN 5 X-STR	147	-109.24	177.35	61.6	Pass
		Diagonal	ROHN 2.5 STD	151	-8.48	12.60	67.3	Pass
		Horizontal	ROHN 2 STD	149	-5.53	14.77	37.4	Pass
		Inner Bracing	L2 1/2x2 1/2x3/16	158	-0.10	4.63	2.1	Pass
T6	80 - 60	Leg	ROHN 6 EHS	174	-130.52	212.13	61.5	Pass
		Diagonal	ROHN 2.5 STD	177	-9.63	11.15	86.4	Pass
		Horizontal	ROHN 2.5 STD	176	-6.81	25.42	26.8	Pass
							39.9 (b)	
		Inner Bracing	L3x3x3/16	185	-0.12	6.06	1.9	Pass
T7	60 - 40	Leg	ROHN 6 X-STR	201	-153.16	264.22	58.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
		Diagonal	ROHN 2.5 X-STR	204	-9.53	12.30	77.5	Pass
		Horizontal	ROHN 2.5 STD	203	-6.91	19.66	35.2 40.7 (b)	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	214	-0.12	9.93	1.2	Pass
T8	40 - 20	Leg	ROHN 6 X-STR	228	-174.11	264.19	65.9	Pass
		Diagonal	ROHN 3 STD	231	-9.09	16.86	53.9	Pass
		Horizontal	ROHN 2.5 STD	230	-6.82	15.57	43.8	Pass
		Inner Bracing	L3 1/2x3 1/2x1/4	239	-0.12	7.91	1.5	Pass
T9	20 - 0	Leg	HSS8.75x.375	255	-183.61	316.36	58.0	Pass
		Diagonal	ROHN 3 STD	258	-13.87	28.18	49.2 53.8 (b)	Pass
		Horizontal	ROHN 3 STD	257	-7.55	27.51	27.4 43.9 (b)	Pass
		Redund Horz 1 Bracing	ROHN TS1.5x11 ga	262	-3.19	4.91	65.0	Pass
		Redund Diag 1 Bracing	ROHN 1.5 STD	263	-2.91	3.58	81.4	Pass
		Redund Hip 1 Bracing	ROHN TS1.5x11 ga	282	-0.04	4.35	0.9	Pass
		Redund Hip Diagonal Bracing	ROHN 2.5 STD	272	-0.06	9.30	0.6	Pass
		Inner Bracing	ROHN 3 STD	284	-0.13	26.32	0.5	Pass
							Summary	
						Pole (L1)	6.1	Pass
						Leg (T8)	65.9	Pass
						Diagonal (T6)	86.4	Pass
						Horizontal (T9)	43.9	Pass
						Redund Horz 1 Bracing (T9)	65.0	Pass
						Redund Diag 1 Bracing (T9)	81.4	Pass
						Redund Hip 1 Bracing (T9)	0.9	Pass
						Redund Hip Diagonal Bracing (T9)	0.6	Pass
						Inner Bracing (T4)	4.5	Pass
						Bolt Checks	53.8	Pass
						RATING =	**86.4**	**Pass**

APENDIX B

BASE LEVEL DRAWING


LEG A
(ABANDONED-TO BE REMOVED)
(6) 1-5/8" TO 168 FT LEVEL
(INSTALLED-TO BE REMOVED)
(12) 1-5/8" TO 180 FT LEVEL
(INSTALLED)
(1) EW61 TO 70 FT LEVEL
LEG B
(INSTALLED)
(12) 1-1/4" TO 158 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 177 FT LEVEL
(RESERVED)
(1) 1/2" TO 40 FT LEVEL
(1) EW52 TO 105 FT LEVEL
(2) EW63 TO 112 FT LEVEL
LEG C