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

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

January 18, 2011

Thomas J. Regan, Esq.
Brown Rudnick LLP
CityPlace I, 185 Asylum Street
Hartford, CT 06103

RE: **EM-T-MOBILE-045-101217** – T-Mobile USA, Inc. notice of intent to modify an existing telecommunications facility located at 93 Roxbury Road, East Lyme, Connecticut.

Dear Attorney Regan:

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 December 17, 2010. 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/cm

c: The Honorable Paul Formica, First Selectman, Town of East Lyme
Gary Goeschel, Town Planner, Town of East Lyme
Meg Parulis, Planning Director, Town of East Lyme

BROWNRUDNICK

THOMAS J. REGAN
Direct Dial: (860) 509-6522
tregan@brownrudnick.com

EM-T-MOBILE-045-101217

CityPlace I
185 Asylum
Street
Hartford
Connecticut
06103
tel 860.509.6500
fax 860.509.6501

Via Hand Delivery

December 17, 2010

ORIGINAL

RECEIVED
DEC 17 2010
CONNECTICUT
SITING COUNCIL

Daniel F. Caruso, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification /East Lyme @ 93 Roxbury Road

Dear Mr. Caruso:

On behalf of T-Mobile USA, Inc. ("T-Mobile"), enclosed for filing are an original and five (5) copies of T-Mobile's Notice of Exempt Modification for a Facility located at the above-referenced site.

I also enclose herewith a check in the amount of $625.00 representing the filing fee.

I would appreciate it if you would date-stamp the enclosed copy of this transmittal letter and return it to the courier delivering this package.

If you have any questions, please feel free to contact me.

Very truly yours,

BROWN RUDNICK LLP

By: Thomas J. Regan
Thomas J. Regan

Enclosures

cc w/ encl. via 1st Class Mail – Paul Formica, First Selectman

40279542 v1 - REGANTJ - 025064/0016

CONNECTICUT SITING COUNCIL

In re:		
T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility at 93 Roxbury Road, East Lyme, Connecticut.	:	**EXEMPT MODIFICATION NO. _____**
	:	
	:	December 17, 2010

NOTICE OF EXEMPT MODIFICATION

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc. ("T-Mobile") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of East Lyme of T-Mobile's intent to make an exempt modification to the existing lattice tower (the "Tower") located at 93 Roxbury Road, East Lyme, Connecticut. Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System ("UMTS"). UMTS is a third-generation ("3G") technology that utilizes a code division multiple access ("CDMA") base to allow for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

Once the UMTS upgrade is complete, T-Mobile will operate on a more unified communication system, allowing international wireless telephones to function world-wide. Furthermore, UMTS will enhance global positioning system ("GPS") navigation capabilities and provide emergency responders with more advanced tracking capabilities. The proposed UMTS technology is compatible with the existing second-generation ("2G") Global System for Mobile Communication ("GSM") currently on the Tower and the proposed upgrade is expected to enhance the existing 2G system. In order to accomplish the upgrade at this site, T-Mobile plans to add UMTS technology and install associated equipment at the base of the Tower.

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), T-Mobile's plans do not constitute a modification subject to the Council's review because T-Mobile will not

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CITYPLACE I
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HARTFORD, CT 06103
(860) 509-6500

change the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

The Tower is a 150-foot lattice tower located at 93 Roxbury Road in East Lyme, Connecticut (latitude N 41° 20' 8.35", longitude W -72° 13' 18.28."). The Tower is owned by Crown Castle. Currently, T-Mobile has 6 GSM panel antennas and 6 Tower Mounted Antennas ("TMA") with a centerline of 103 feet. Multiple carriers are currently located on the Tower. A site plan with Tower specifications is attached.

Specifically, T-Mobile plans to install 3 additional UMTS panel antennas and 3 additional TMAs. The centerline of the new antennas and TMAs will remain at 103 feet. T-Mobile will continue to utilize its 12 existing coax cables and plans to install 6 additional 1-5/8 inch coax cables.

To confirm the Tower can support these changes, T-Mobile commissioned Paul J. Ford and Company to perform a structural analysis of the Tower (attached). According to the Structural Analysis Report, dated October 26, 2010, the Tower has "...sufficient capacity..." to support the existing, reserved and proposed loading. (Page 1, Structural Analysis Report).

In addition, T-Mobile proposes to install 1 new UMTS equipment cabinet on the existing concrete pad. T-Mobile's equipment will be located on the existing concrete pad, therefore, no increase in the boundaries of the site will be necessary.

Excluding brief, minor, construction-related noise during the addition of the antennas and the installation of the equipment cabinet, T-Mobile's changes to the Tower will not increase noise levels at the site.

The proposed antennas will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and

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Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). The worst-case power density analysis for the antennas, measured at the base of the Tower, indicates that T-Mobile's proposed antennas will emit 10.20% of the NCRP's standard for maximum permissible exposure. A cumulative power density analysis indicates that together, all of the antennas on the Tower will emit 31.75% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, T-Mobile's proposed plan to add antennas and equipment at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

T-Mobile USA, Inc.

By: Thomas J. Regan

Thomas J. Regan
Brown Rudnick LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Email - tregan@brownrudnick.com
Phone - 860.509.6522 /Fax - 860.509.6501

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

Certificate of Service

This is to certify that on this 17th day of December, 2010, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

Town of East Lyme
First Selectman Paul Formica
108 Pennsylvania Avenue
P.O. Box 519
Niantic, CT 06357

By: Thomas J. Regan
Thomas J. Regan

40279526 v1 - 025064/0016

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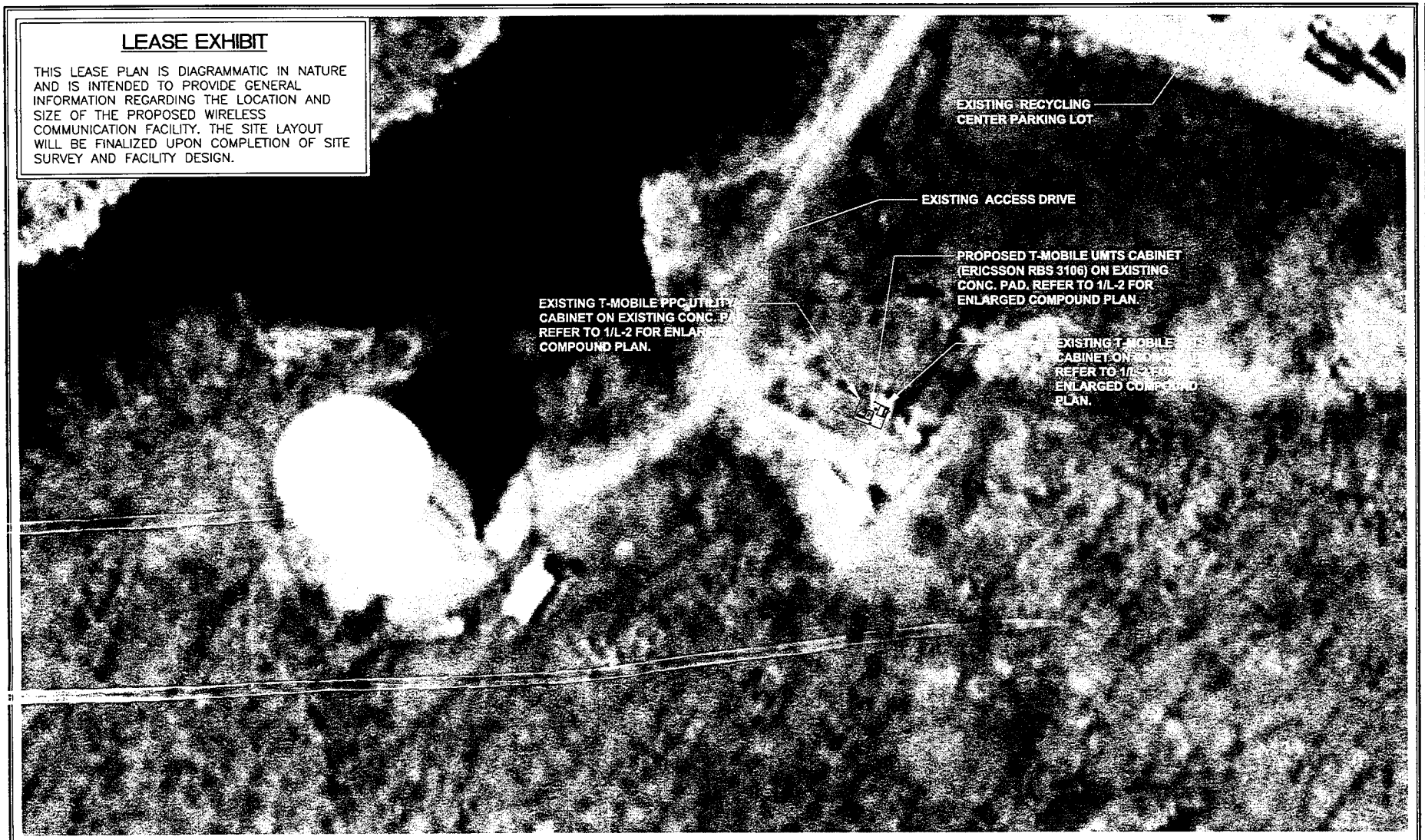
(860) 509-6500

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.



1 / L-1 **SITE PLAN**
SCALE: 1" = 40'

APPROXIMATE NORTH

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

DESIGNED BY:			CFC
DRAWN BY:			DEB
CHK'D BY:			CFC
00	9/28/10	DEB	CFC	FINAL LEASE EXHIBIT
A	9/27/10	DEB	CFC	LEASE EXHIBIT – CLIENT REVIEW
REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION

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www.CentekEng.com

T-Mobile

T-MOBILE
CT11037B
EAST LYME LANDFILL
83 ROSBURY ROAD
NIANTIC, CT 06357

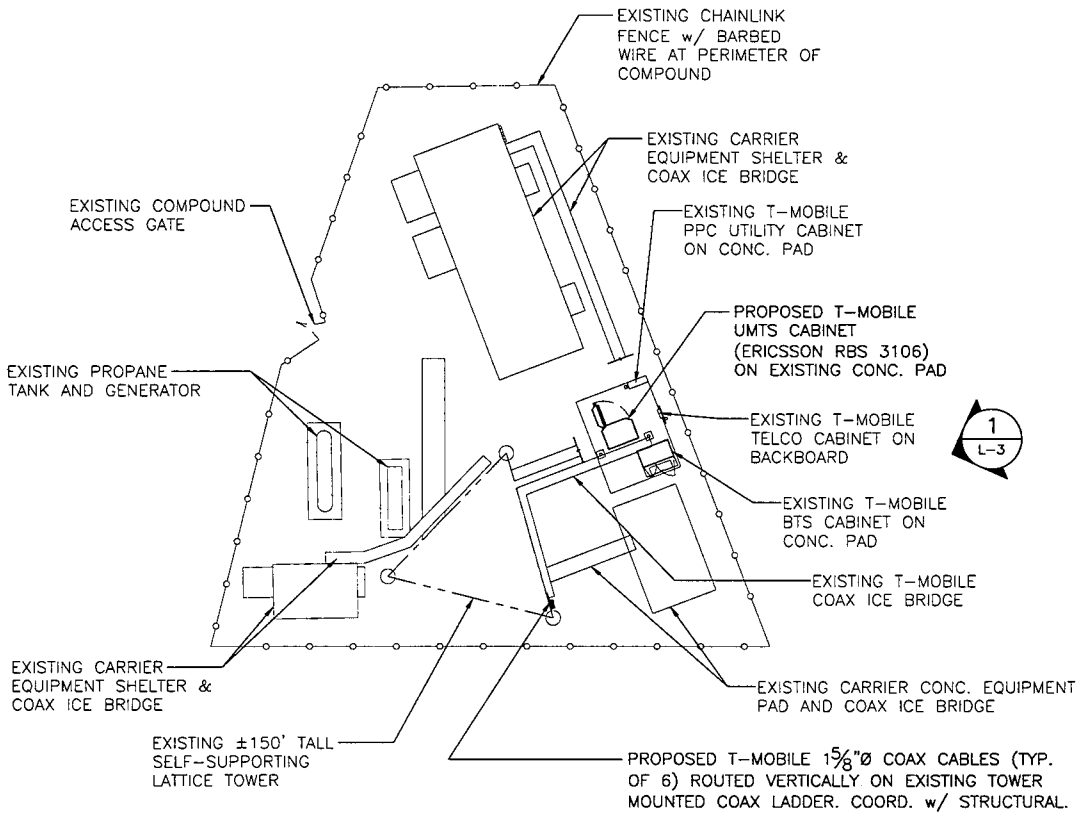
DATE:	9/23/10
SCALE:	AS SHOWN
JOB NO.	10116.C015

LEASE EXHIBIT

SHEET NO.
L-1
Sheet No. 1 of 3

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.



1 / L-2 **COMPOUND PLAN**

SCALE: 1/16" = 1'-0"

TRUE NORTH

16 0 8 16 32 64

(IN FEET)

1 inch = 16 ft.

DESIGNED BY:	CFC
DRAWN BY:	DCB
CHK'D BY:	CFC

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
00	9/15/10	DCB	CFC	FINAL LEASE EXHIBIT
A	9/23/10	DCB	CFC	LEASE EXHIBIT - CLIENT REVIEW

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63-2 North Branford Road
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EAST LYME LANDFILL
83 ROXBURY ROAD
NIANTIC, CT 06357

DATE: 9/23/10
SCALE: AS SHOWN
JOB NO. 10116.CD15

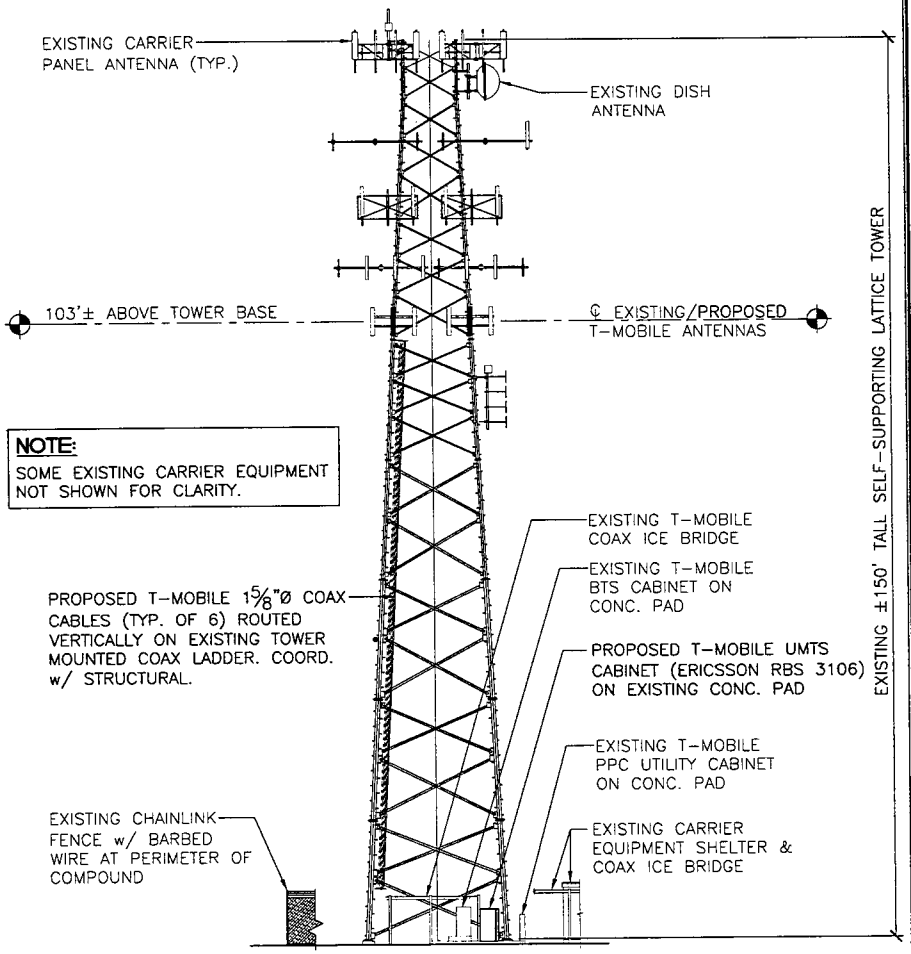
LEASE EXHIBIT

SHEET NO.
L-2
Sheet No. 2 of 2

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

EQUIP. UPGRADE PROJECT SCOPE	
EQUIPMENT TYPE	PROPOSED CHANGES
RADIO CABINET	• (1) EXISTING BTS CABINET ON EXISTING CONC. PAD TO REMAIN. • INSTALL (1) ERICSSON RBS 3106 CABINET ON EXISTING CONC. PAD AS SHOWN HEREIN.
ANTENNAS/ TMAs	• EXISTING (6) EMS RR90-17-02DP PANEL ANTENNAS (2 PER SECTOR) AND SECTOR MOUNTS TO REMAIN. • (3) RFS APX16DWV-16DWV-S PANEL ANTENNAS ARE PROPOSED TO BE INSTALLED (1 PER SECTOR) ON VACANT MOUNT PIPES ON THE EXISTING SECTOR MOUNTS. TOTAL # OF INSTALLED ANTENNAS TO BE (9). • EXISTING (6) TMAs MOUNTED BEHIND ANTENNAS ON EXISTING MOUNT PIPES TO REMAIN. • (3) TWIN AWS TMAs TO BE INSTALLED BEHIND PROPOSED ANTENNAS ON EXISTING MOUNT PIPES. TOTAL # OF INSTALLED TMAs TO BE (9).
COAX CABLES	• NO CHANGE IS PROPOSED FOR THE (12) EXISTING 1 5/8"Ø COAX CABLES ROUTED VERTICALLY ON EXISTING TOWER MOUNTED COAX LADDER. • (6) ADDITIONAL 1 5/8"Ø COAX CABLES ARE PROPOSED TO BE ROUTED VERTICALLY ON THE EXISTING TOWER MOUNTED COAX LADDER. ROUTING TO BE COORDINATED WITH THE TOWER STRUCTURAL ANALYSIS TO BE PROVIDED. TOTAL # OF INSTALLED COAX CABLES TO BE (18) • THE EXISTING COAX CABLE ICE BRIDGE AT GRADE MAY REQUIRE MODIFICATION OR REPLACEMENT TO SUPPORT THE PROPOSED COAX LOADING. CONTRACTOR TO VERIFY DURING CONSTRUCTION PHASE OF PROJECT.
COMPOUND LIMITS	• NO CHANGE TO THE LIMITS OF THE EXISTING FENCED COMPOUND IS PROPOSED.



1 / L-3 **NORTHEAST ELEVATION**

SCALE: 1" = 20'

20 0 10 20 40 80

(IN FEET)
1 inch = 20 ft.

REV	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
00	9/28/10	DEB	CFC	FINAL LEASE EXHIBIT
A	9/27/10	DEB	CFC	LEASE EXHIBIT - CLIENT REVIEW

DESIGNED BY: CFC
DRAWN BY: DEB
CHK'D BY: CFC

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NIANTIC, CT 06357

DATE: 9/23/10
SCALE: AS SHOWN
JOB NO. 10116.CD15

LEASE EXHIBIT

SHEET NO. L-3
Sheet No. 3 of 3

PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 1500 • Columbus, Ohio 43215-3708

Date: **October 26, 2010**

Scott Werner
Crown Castle USA Inc.
2000 Corporate Drive
Canonsburg, PA 15317
724-416-2442

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
614.221.6679
chedges@pjfweb.com

Subject: **Structural Analysis Report**

Carrier Designation:	*T-Mobile* Co-Locate	
	Carrier Site Number:	CT11037B
	Carrier Site Name:	East Lyme
Crown Castle Designation:	**Crown Castle BU Number:**	806384
	Crown Castle Site Name:	NLN 136 943455
	Crown Castle JDE Job Number:	142350
	Crown Castle Work Order Number:	358641
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37510-1440
Site Data:	**93 ROXBURY ROAD, EAST LYME, New London County, CT**	
	Latitude *41° 20' 8.35"*, Longitude *-72° 13' 18.28"*	
	151.292 Foot - Self Support Tower	

Dear Scott Werner,

Paul J Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned 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 388433, in accordance with application 108266, revision 1.

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, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and local code requirements based upon a wind speed of 85 mph fastest mile with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

We at *Paul J Ford and Company* appreciate the opportunity of providing our continuing professional services to you and Crown Castle USA Inc.. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Christina Hedges, E.I.T
Structural Engineer

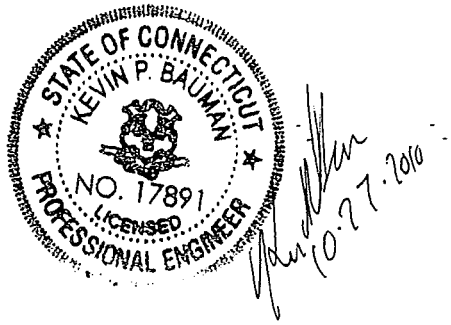


TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 151.292 ft Self Support tower designed by ROHN in March of 1990. The tower was originally designed for a wind speed of 85 mph per EIA-222-D.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
103	103	3	rfs celwave	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	6	1 5/8	
		3	rfs celwave	ATMAA1412D-1A20			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
150	157	1	telewave	ANT150F2	1 1	7/8 1/4	1
	152	1	motorola	PTP 49400 w/ Mount Pipe			
	150	1	tower mounts	Side Arm Mount [SO 304-1]			
148	149	12	bam mla	BAM MLA_ANTENNA w/ Mount Pipe	12	1 5/8	2
		6	decibel	DB846F65ZAXY w/Mount Pipe	6	1 5/8	3
		6	decibel	DB948F85T2E-M w/Mount Pipe	6	7/8	1
		6	swedcom	ALP 9212-N w/Mount Pipe	6	1 5/8	4
	148	1	tower mounts	Sector Mount [SM 510-3]			1
143	143	1		PL6-59W	1	EW52	1
133	134	3	kathrein	800 10504 w/ Mount Pipe	9	1 5/8	1
	133	1	tower mounts	Sector Mount [SM 410-3]			
125	130	1	decibel	DB586-Y	1 1	1/4 7/8	3
	126	1	motorola	PTP 49400 w/ Mount Pipe			
	125	1	tower mounts	Side Arm Mount [SO 303-1]			
122	123	6	decibel	DB980H90E-M w/Mount Pipe	6	1 5/8	1
	122	1	tower mounts	Sector Mount [SM 505-3]			
112	112	9	decibel	DB844H90E-XY w/Mount Pipe	18	7/8	1
		12	swedcom	ALP 9212-N w/Mount Pipe	12	1 1/4	5
		1	tower mounts	Sector Mount [SM 510-3]			1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
103	103	6	ems wireless	RR90-17-02DP w/Mount Pipe	12	1 5/8	1
		6	ericsson amplifiers	Ericsson KRY 112 71/1			
		1	tower mounts	Sector Mount [SM 701-3]			
90	96	1	sinclair	SRL-217	2 1	7/8 1/4	1
	95	1	motorola	PTP 49400 w/ Mount Pipe			
	90	1	telewave	ANT150D3			
		1	tower mounts	Side Arm Mount [SO 301-1]			
		1	tower mounts	Side Arm Mount [SO 302-1]			

Notes:
1) Existing Equipment
2) MLA Equipment. Does not control.
3) Future Equipment
4) Equipment to be Removed
5) SLA equipment controlling.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Tower Drawings	March 5, 1990, Rohn	24792JC	258359
Foundation Drawings	March 5, 1990, Rohn	24792JC	958525
Geotechnical Report	July 19, 1989, Dr. Clarence Welti	-	258373
Modification Drawings	January 16, 2003, All Points Technology	CT105761	801526
Modification Drawings	February 26, 2008, Vertical Structures	2008-004-030	2215933
Modification Drawings	May 14, 2009, PJF	41709-0057	2457486

3.1) Analysis Method

RISATower (version 5.4.2.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. 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 specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T1	151.292 - 141.167	Leg	ROHN 2.5 STD	2	-5839.19	50293.16	13.7	Pass
T2	141.167 - 121.042	Leg	ROHN 2.5 EH	20	-24411.80	52977.02	46.1	Pass
T3	121.042 - 114.313	Leg	ROHN 2.5 EH (GR)	44	-27633.30	61869.99	44.7	Pass
T4	114.313 - 107.646	Leg	ROHN 2.5 EH (GR)	53	-36664.40	61867.72	59.3	Pass
T5	107.646 - 100.917	Leg	ROHN 2.5 EH (GR)	62	-52312.40	91492.98	57.2	Pass
T6	100.917 - 94.2014	Leg	ROHN 3 EH (GR)	74	-57289.30	102414.52	55.9	Pass
T7	94.2014 - 87.4861	Leg	ROHN 3 EH (GR)	83	-68102.50	132155.48	51.5	Pass
T8	87.4861 - 80.7708	Leg	ROHN 3 EH (GR)	95	-85204.40	132524.46	64.3	Pass
T9	80.7708 - 70.6875	Leg	ROHN 4 EH (GR)	107	-92936.60	136793.79	67.9	Pass
T10	70.6875 - 60.6041	Leg	ROHN 4 EH (GR)	116	-108709.00	193618.24	56.1 63.0 (b)	Pass
T11	60.6041 - 50.5104	Leg	ROHN 4 EH (GR)	128	-133363.00	194567.34	68.5	Pass
T12	50.5104 - 40.4166	Leg	ROHN 4 EH (GR)	140	-148892.00	194647.32	76.5	Pass
T13	40.4166 - 30.3125	Leg	ROHN 5 EH (GR)	152	-156202.00	231920.66	67.4	Pass
T14	30.3125 - 20.2083	Leg	ROHN 5 EH (GR)	161	-179902.00	291605.73	61.7 71.3 (b)	Pass
T15	20.2083 - 10.1041	Leg	ROHN 5 EH (GR)	173	-187038.00	291672.38	64.1	Pass
T16	10.1041 - 0	Leg	ROHN 5 EH (GR)	185	-210672.00	291724.37	72.2	Pass
T1	151.292 - 141.167	Diagonal	L1 1/2x1 1/2x3/16	9	-2224.01	2917.39	76.2	Pass
T2	141.167 - 121.042	Diagonal	L2 1/2x2 1/2x3/16	27	-3731.25	8577.46	43.5 67.9 (b)	Pass
T3	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	48	-4362.58	7802.10	55.9	Pass
T4	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	57	-5387.67	7121.94	75.6	Pass
T5	107.646 - 100.917	Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	66	-6494.61	27668.41	23.5 59.1 (b)	Pass
T6	100.917 - 94.2014	Diagonal	L3x3x3/16	78	-7168.47	10656.04	67.3	Pass
T7	94.2014 - 87.4861	Diagonal	L3x3x3/16	87	-7688.69	9740.18	78.9	Pass
T8	87.4861 - 80.7708	Diagonal	2L 3 x 3 x 3/16 (1/4)	99	-8075.73	35614.03	22.7 73.5 (b)	Pass
T9	80.7708 - 70.6875	Diagonal	2L3x3x3/16x1/4	111	-9020.72	29260.28	30.8 78.7 (b)	Pass
T10	70.6875 - 60.6041	Diagonal	2L3x3x3/16x1/4	120	-9337.35	26882.74	34.7 79.0 (b)	Pass
T11	60.6041 - 50.5104	Diagonal	2L3x3x1/4x1/4	132	-9548.76	32676.90	29.2 82.2 (b)	Pass
T12	50.5104 - 40.4166	Diagonal	2L3x3x1/4x1/4	144	-9917.40	29874.53	33.2 57.7 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail
T13	40.4166 - 30.3125	Diagonal	2L3 1/2x3 1/2x1/4x1/4	156	-10144.50	43629.75	23.3 59.1 (b)	Pass
T14	30.3125 - 20.2083	Diagonal	2L3 1/2x3 1/2x1/4x1/4	165	-10618.40	40231.14	26.4 61.8 (b)	Pass
T15	20.2083 - 10.1041	Diagonal	2L 4 x 4 x 1/4 (1/4)	177	-10770.00	55366.02	19.5 62.7 (b)	Pass
T16	10.1041 - 0	Diagonal	2L 4 x 4 x 1/4 (1/4)	189	-11611.90	51311.17	22.6 67.6 (b)	Pass
T5	107.646 - 100.917	Secondary Horizontal	L 2 x 2 x 3/16	70	-907.23	4253.63	21.3	Pass
T7	94.2014 - 87.4861	Secondary Horizontal	L 2 x 2 x 3/16	91	-1181.16	3443.41	34.3	Pass
T8	87.4861 - 80.7708	Secondary Horizontal	L 2 x 2 x 3/16	103	-1477.77	3111.40	47.5	Pass
T10	70.6875 - 60.6041	Secondary Horizontal	L2 1/2x2 1/2x3/16	124	-1885.20	4890.70	38.5	Pass
T11	60.6041 - 50.5104	Secondary Horizontal	L3x3x1/4	137	-2312.95	9857.64	23.5 42.1 (b)	Pass
T12	50.5104 - 40.4166	Secondary Horizontal	L3x3x1/4	148	-2582.28	8745.97	29.5 47.0 (b)	Pass
T14	30.3125 - 20.2083	Secondary Horizontal	L 3 x 3 x 3/16	169	-3119.85	5467.17	57.1	Pass
T15	20.2083 - 10.1041	Secondary Horizontal	L3x3x3/16	181	-3243.56	4943.07	65.6	Pass
T16	10.1041 - 0	Secondary Horizontal	L 3.5 x 3.5 x 1/4	193	-3653.40	9469.10	38.6 42.5 (b)	Pass
T1	151.292 - 141.167	Top Girt	L2 1/2x2 1/2x3/16	5	-61.91	3308.68	1.9	Pass
T2	141.167 - 121.042	Top Girt	L2 1/2x2 1/2x3/16	23	-221.06	4403.90	5.0	Pass
							Summary	
						Leg (T12)	76.5	Pass
						Diagonal (T11)	82.2	Pass
						Secondary Horizontal (T15)	65.6	Pass
						Top Girt (T2)	5.0	Pass
						Bolt Checks	82.2	Pass
						Rating =	82.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods		65.7	Pass
1	Base Foundation		33.9	Pass
1	Base Foundation Soil Interaction		83.1	Pass

Structure Rating (max from all components) =	83.1%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

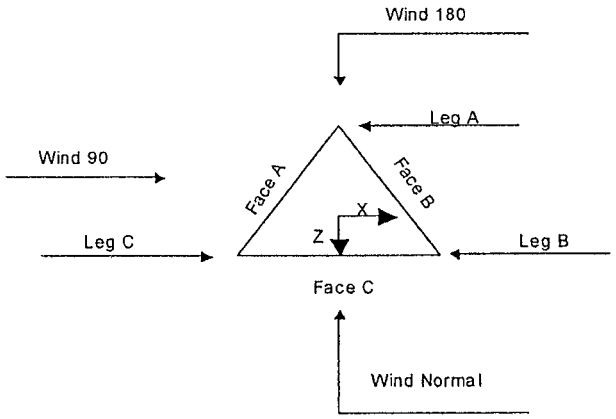
APPENDIX A

RISA TOWER OUTPUT

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 151.29 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 8.56 ft at the top and 22.78 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

6) Tower is located in New London County, Connecticut.
7) Basic wind speed of 85 mph.
8) Nominal ice thickness of 0.7500 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56 pcf.
11) A wind speed of 38 mph is used in combination with ice.
12) Deflections calculated using a wind speed of 50 mph.
13) A non-linear (P-delta) analysis was used.
14) Grouted pipe f'_c is 7 ksi.
15) Pressures are calculated at each section.
16) Stress ratio used in tower member design is 1.333.
17) Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.



Triangular Tower

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

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	151.29-141.17	5.00	X Brace	No	No	0.7500	0.7500
T2	141.17-121.04	6.67	X Brace	No	No	0.7500	0.7500
T3	121.04-114.31	6.67	X Brace	No	No	0.7500	0.0000
T4	114.31-107.65	6.67	X Brace	No	No	0.0000	0.0000
T5	107.65-100.92	6.67	X Brace	No	Yes	0.0000	0.7500
T6	100.92-94.20	6.65	X Brace	No	No	0.7500	0.0000
T7	94.20-87.49	6.72	X Brace	No	Yes	0.0000	0.0000
T8	87.49-80.77	6.63	X Brace	No	Yes	0.0000	1.0000
T9	80.77-70.69	10.00	X Brace	No	No	1.0000	0.0000
T10	70.69-60.60	10.08	X Brace	No	Yes	0.0000	0.0000
T11	60.60-50.51	9.91	X Brace	No	Yes	1.0000	1.2500
T12	50.51-40.42	9.91	X Brace	No	Yes	1.0000	1.2500
T13	40.42-30.31	10.00	X Brace	No	No	1.2500	0.0000
T14	30.31-20.21	10.00	X Brace	No	Yes	0.0000	1.2500
T15	20.21-10.10	10.00	X Brace	No	Yes	1.2500	0.0000
T16	10.10-0.00	10.00	X Brace	No	Yes	0.0000	1.2500

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 151.29-141.17	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 141.17-121.04	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 121.04-114.31	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 114.31-107.65	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 107.65-100.92	Grouted Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Double Angle	2L 2.5 x 2.5 x 3/16 (3/16)	A36 (36 ksi)
T6 100.92-94.20	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T7 94.20-87.49	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T8 87.49-80.77	Grouted Pipe	ROHN 3 EH	A572-50 (50 ksi)	Double Angle	2L 3 x 3 x 3/16 (1/4)	A36 (36 ksi)
T9 80.77-70.69	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T10 70.69-60.60	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x3/16x1/4	A36 (36 ksi)
T11 60.60-50.51	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T12 50.51-40.42	Grouted Pipe	ROHN 4 EH	A572-50 (50 ksi)	Double Angle	2L3x3x1/4x1/4	A572-50 (50 ksi)
T13 40.42-30.31	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T14 30.31-20.21	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x1/4x1/4	A572-50 (50 ksi)
T15 20.21-10.10	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L 4 x 4 x 1/4 (1/4)	A572-50 (50 ksi)
T16 10.10-0.00	Grouted Pipe	ROHN 5 EH	A572-50 (50 ksi)	Double Angle	2L 4 x 4 x 1/4 (1/4)	A572-50 (50 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 151.29-141.17	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T2 141.17-121.04	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T5 107.65-100.92	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T7 94.20-87.49	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T8 87.49-80.77	Single Angle	L 2 x 2 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T10 70.69-60.60	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T11 60.60-50.51	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T12 50.51-40.42	Single Angle	L3x3x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T14 30.31-20.21	Single Angle	L 3 x 3 x 3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T15 20.21-10.10	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T16 10.10-0.00	Single Angle	L 3.5 x 3.5 x 1/4	A36 (36 ksi)	Single 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 151.29-141.17	0.60	0.1875	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T2 141.17-121.04	0.80	0.1875	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T3 121.04-114.31	0.27	0.4375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T4 114.31-107.65	0.27	0.4375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T5 107.65-100.92	1.25	0.4375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T6 100.92-94.20	0.93	0.4375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T7 94.20-87.49	0.47	0.4375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T8 87.49-80.77	0.47	0.4375	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T9 80.77-70.69	0.45	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T10 70.69-60.60	0.45	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T11 60.60-50.51	0.45	0.2500	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T12 50.51-40.42	0.45	0.5000	A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T13 40.42-	0.45	0.5000	A36	1	1	1	Mid-Pt	30.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
30.31 T14 30.31-20.21	0.45	0.5000	(36 ksi) A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T15 20.21-10.10	1.50	0.5000	(36 ksi) A36 (36 ksi)	1	1	1	Mid-Pt	30.0000
T16 10.10-0.00	1.50	0.5000	(36 ksi) A36 (36 ksi)	1	1	1	Mid-Pt	30.0000

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 151.29-141.17	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 141.17-121.04	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 121.04-114.31	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 114.31-107.65	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 107.65-100.92	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T6 100.92-94.20	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 94.20-87.49	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T8 87.49-80.77	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T9 80.77-70.69	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 70.69-60.60	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T11 60.60-50.51	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T12 50.51-40.42	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T13 40.42-30.31	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T14 30.31-20.21	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T15 20.21-10.10	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T16 10.10-0.00	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	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 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 151.29-141.17	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

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.
T2 141.17-121.04	Flange	0.6250 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T3 121.04-114.31	Flange	0.7500 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T4 114.31-107.65	Flange	0.7500 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T5 107.65-100.92	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	1
T6 100.92-94.20	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T7 94.20-87.49	Flange	0.8750 A325N	0	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T8 87.49-80.77	Flange	0.8750 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T9 80.77-70.69	Flange	0.8750 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T10 70.69-60.60	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T11 60.60-50.51	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T12 50.51-40.42	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T13 40.42-30.31	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T14 30.31-20.21	Flange	1.0625 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T15 20.21-10.10	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T16 10.10-0.00	Flange	1.0000 A354-BC	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 2.5 EH (GR)	50	2.2535	4.2383	16.498	4769	36175	61
ROHN 3 EH (GR)	50	3.0159	6.6052	24.023	4769	37356	63
ROHN 4 EH (GR)	50	4.4074	11.4969	38.949	4769	38952	66
ROHN 5 EH (GR)	50	6.1120	18.1937	58.701	4769	40357	68

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" flat Cable Ladder Rail	A	Yes	Af (CfAe)	133.00 - 8.00	0.5000	0.4	2	2	12.0000 1.5000	1.5000	6.0000	1.80
FXL 1873 PE(1 5/8") **	A	Yes	Ar (CfAe)	133.00 - 8.00	1.0000	0.4	9	5	0.2700	1.9800		0.01
1.5" flat Cable Ladder Rail	B	Yes	Af (CfAe)	103.00 - 8.00	0.5000	0.45	2	2	12.0000 1.5000	1.5000	6.0000	1.80
LDF7-50A (1-5/8	B	Yes	Ar (CfAe)	103.00 - 8.00	1.0000	0.45	18	6	0.2700	1.9800		0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
FOAM) **												
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	112.00 - 8.00	-1.0000	-0.3	24	6	0.2700 1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	122.00 - 112.00	-1.0000	-0.3	18	6	0.2700 1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	Yes	Ar (CfAe)	148.00 - 122.00	-1.0000	-0.3	12	6	0.2700 1.0000	1.9800		0.82
LDF6-50A (1-1/4 FOAM)	B	Yes	Ar (CfAe)	90.00 - 8.00	1.0000	-0.37	9	6	1.5500	1.5500		0.66
LDF6-50A (1-1/4 FOAM)	B	Yes	Ar (CfAe)	112.00 - 90.00	1.0000	-0.37	7	7	1.5500	1.5500		0.66
LDF5-50A (7/8 FOAM)	B	Yes	Ar (CfAe)	125.00 - 112.00	1.0000	-0.37	2	1	1.0000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	Yes	Ar (CfAe)	150.00 - 125.00	1.0000	-0.37	1	1	1.0000	1.0900		0.33
LDF1-50A (1/4 FOAM)	B	Yes	Ar (CfAe)	125.00 - 90.00	1.0000	-0.4	3	2	0.3500	0.3500		0.06
LDF1-50A (1/4 FOAM)	B	Yes	Ar (CfAe)	150.00 - 125.00	1.0000	-0.4	2	1	0.3500	0.3500		0.06
EW52	B	Yes	Af (CfAe)	143.00 - 8.00	1.0000	-0.29	1	1	1.7426	1.7426	5.5505	0.59
1.5" flat Cable Ladder Rail **	B	Yes	Af (CfAe)	148.00 - 8.00	0.5000	-0.35	2	2	30.0000 1.5000	1.5000	6.0000	1.80

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Side Arm Mount [SO 304-1]	A	From Leg	1.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.63 1.00 1.37 2.11 3.59	0.94 1.45 1.96 2.98 5.02	23.00 31.92 40.83 58.66 94.32
PTP 49400 w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.22 2.48 2.75 3.35 4.72	0.92 1.18 1.48 2.15 3.74	20.16 36.69 57.73 111.16 280.95
ANT150F2 **	A	From Leg	2.00 0.00 0.00	0.0000	157.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.23 1.53 1.84 2.49 3.97	1.23 1.53 1.84 2.49 3.97	13.00 22.47 35.41 72.28 194.27
Sector Mount [SM 510-3]	B	None		0.0000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	40.10 57.33 74.56 109.02 177.94	40.10 57.33 74.56 109.02 177.94	2396.40 3089.00 3781.60 5166.80 7937.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) DB846F65ZAXY w/Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.88 8.48 9.72 12.33	7.82 9.01 9.91 11.81 15.98	46.55 111.10 187.61 367.24 867.25
(2) DB846F65ZAXY w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.88 8.48 9.72 12.33	7.82 9.01 9.91 11.81 15.98	46.55 111.10 187.61 367.24 867.25
(2) DB846F65ZAXY w/Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.27 7.88 8.48 9.72 12.33	7.82 9.01 9.91 11.81 15.98	46.55 111.10 187.61 367.24 867.25
(2) DB948F85T2E-M w/Mount Pipe	A	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 3.23 3.72 4.73 6.98	4.92 6.01 6.81 8.46 11.98	34.05 68.79 113.43 223.18 558.87
(2) DB948F85T2E-M w/Mount Pipe	B	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 3.23 3.72 4.73 6.98	4.92 6.01 6.81 8.46 11.98	34.05 68.79 113.43 223.18 558.87
(2) DB948F85T2E-M w/Mount Pipe	C	From Face	4.00 0.00 0.00	0.0000	149.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.62 3.23 3.72 4.73 6.98	4.92 6.01 6.81 8.46 11.98	34.05 68.79 113.43 223.18 558.87
**									
Sector Mount [SM 410-3]	A	None		0.0000	133.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	23.96 34.06 44.16 64.36 104.76	23.96 34.06 44.16 64.36 104.76	1100.47 1599.78 2099.09 3097.71 5094.95
800 10504 w/ Mount Pipe	A	From Leg	3.50 3.50 0.00	44.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	37.75 68.19 107.66 206.58 513.48
800 10504 w/ Mount Pipe	B	From Leg	3.50 3.50 0.00	44.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	37.75 68.19 107.66 206.58 513.48
800 10504 w/ Mount Pipe	C	From Leg	3.50 3.50 0.00	44.0000	134.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.59 4.01 4.42 5.34 7.38	3.18 3.91 4.58 5.98 8.98	37.75 68.19 107.66 206.58 513.48
**									
Side Arm Mount [SO 303-1]	B	None		0.0000	125.00	No Ice 1/2" Ice Ice	2.24 3.19 4.14	5.32 7.69 10.06	115.00 158.73 202.46

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
							1" Ice	6.04	14.80	289.92
							2" Ice	9.84	24.28	464.85
							4" Ice			
DB586-Y	B	From Leg	6.00	0.00	0.0000	130.00	No Ice	1.01	1.01	8.25
			0.00				1/2" Ice	1.28	1.28	16.59
			0.00				1" Ice	1.56	1.56	28.01
							2" Ice	2.14	2.14	60.71
							4" Ice	3.53	3.53	169.83
PTP 49400 w/ Mount Pipe	B	From Leg	6.00	0.00	0.0000	126.00	No Ice	2.22	0.92	20.16
			0.00				1/2" Ice	2.48	1.18	36.69
			0.00				1" Ice	2.75	1.48	57.73
							2" Ice	3.35	2.15	111.16
							4" Ice	4.72	3.74	280.95
**										
Sector Mount [SM 505-3]	A	None			0.0000	122.00	No Ice	34.86	34.86	1725.30
							1/2" Ice	49.79	49.79	2316.90
							1" Ice	64.72	64.72	2908.50
							2" Ice	94.58	94.58	4091.70
							4" Ice	154.30	154.30	6458.10
(2) DB980H90E-M w/Mount Pipe	A	From Leg	4.00	0.00	14.0000	123.00	No Ice	4.27	3.86	34.05
			0.00				1/2" Ice	4.86	4.95	69.84
			0.00				1" Ice	5.37	5.75	116.19
							2" Ice	6.42	7.39	231.29
							4" Ice	8.86	10.87	585.45
(2) DB980H90E-M w/Mount Pipe	B	From Leg	4.00	0.00	14.0000	123.00	No Ice	4.27	3.86	34.05
			0.00				1/2" Ice	4.86	4.95	69.84
			0.00				1" Ice	5.37	5.75	116.19
							2" Ice	6.42	7.39	231.29
							4" Ice	8.86	10.87	585.45
(2) DB980H90E-M w/Mount Pipe	C	From Leg	4.00	0.00	14.0000	123.00	No Ice	4.27	3.86	34.05
			0.00				1/2" Ice	4.86	4.95	69.84
			0.00				1" Ice	5.37	5.75	116.19
							2" Ice	6.42	7.39	231.29
							4" Ice	8.86	10.87	585.45
**										
Sector Mount [SM 510-3]	B	None			0.0000	112.00	No Ice	40.10	40.10	2396.40
							1/2" Ice	57.33	57.33	3089.00
							1" Ice	74.56	74.56	3781.60
							2" Ice	109.02	109.02	5166.80
							4" Ice	177.94	177.94	7937.20
(4) ALP 9212-N w/Mount Pipe	A	From Face	4.00	0.00	0.0000	112.00	No Ice	6.42	7.45	42.71
			0.00				1/2" Ice	7.11	8.59	103.63
			0.00				1" Ice	7.70	9.45	175.50
							2" Ice	8.91	11.20	342.81
							4" Ice	11.47	14.93	806.03
(4) ALP 9212-N w/Mount Pipe	B	From Face	4.00	0.00	0.0000	112.00	No Ice	6.42	7.45	42.71
			0.00				1/2" Ice	7.11	8.59	103.63
			0.00				1" Ice	7.70	9.45	175.50
							2" Ice	8.91	11.20	342.81
							4" Ice	11.47	14.93	806.03
(4) ALP 9212-N w/Mount Pipe	C	From Face	4.00	0.00	0.0000	112.00	No Ice	6.42	7.45	42.71
			0.00				1/2" Ice	7.11	8.59	103.63
			0.00				1" Ice	7.70	9.45	175.50
							2" Ice	8.91	11.20	342.81
							4" Ice	11.47	14.93	806.03

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
**									
Sector Mount [SM 701-3]	A	None		0.0000	103.00	No Ice	19.73	19.73	825.00
						1/2" Ice	27.41	27.41	1165.99
						1" Ice	35.09	35.09	1506.98
						2" Ice	50.45	50.45	2188.96
						4" Ice	81.17	81.17	3552.92
(2) RR90-17-02DP w/Mount Pipe	A	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
						1" Ice	6.14	5.48	130.14
						2" Ice	7.32	7.08	249.13
						4" Ice	9.81	10.47	609.39
(2) RR90-17-02DP w/Mount Pipe	B	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
						1" Ice	6.14	5.48	130.14
						2" Ice	7.32	7.08	249.13
						4" Ice	9.81	10.47	609.39
(2) RR90-17-02DP w/Mount Pipe	C	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	4.91	3.64	43.55
						1/2" Ice	5.57	4.70	81.64
						1" Ice	6.14	5.48	130.14
						2" Ice	7.32	7.08	249.13
						4" Ice	9.81	10.47	609.39
(2) Ericsson KRY 112 71/1	A	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) Ericsson KRY 112 71/1	B	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
(2) Ericsson KRY 112 71/1	C	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	0.68	0.45	13.20
						1/2" Ice	0.80	0.56	18.38
						1" Ice	0.93	0.68	25.16
						2" Ice	1.22	0.94	44.33
						4" Ice	1.90	1.57	110.52
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	A	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	7.47	3.49	61.35
						1/2" Ice	7.99	4.26	107.59
						1" Ice	8.52	4.96	163.58
						2" Ice	9.59	6.40	297.50
						4" Ice	11.87	9.49	682.77
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	B	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	7.47	3.49	61.35
						1/2" Ice	7.99	4.26	107.59
						1" Ice	8.52	4.96	163.58
						2" Ice	9.59	6.40	297.50
						4" Ice	11.87	9.49	682.77
APX16DWV-16DWVS-E-A20 w/ Mount Pipe	C	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	7.47	3.49	61.35
						1/2" Ice	7.99	4.26	107.59
						1" Ice	8.52	4.96	163.58
						2" Ice	9.59	6.40	297.50
						4" Ice	11.87	9.49	682.77
ATMAA1412D-1A20	A	From Leg	1.50 0.00 0.00	0.0000	103.00	No Ice	1.17	0.47	13.00
						1/2" Ice	1.31	0.57	20.62
						1" Ice	1.47	0.69	30.11
						1" Ice	1.81	0.95	55.52

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	2.58	1.57	137.44
						4" Ice			
ATMAA1412D-1A20	B	From Leg	1.50	0.0000	103.00	No Ice	1.17	0.47	13.00
			0.00			1/2" Ice	1.31	0.57	20.62
			0.00			1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
ATMAA1412D-1A20	C	From Leg	1.50	0.0000	103.00	No Ice	1.17	0.47	13.00
			0.00			1/2" Ice	1.31	0.57	20.62
			0.00			1" Ice	1.47	0.69	30.11
						2" Ice	1.81	0.95	55.52
						4" Ice	2.58	1.57	137.44
**									
PTP 49400 w/ Mount Pipe	A	From Leg	4.00	0.0000	90.00 - 95.00	No Ice	2.22	0.92	20.16
			0.00			1/2" Ice	2.48	1.18	36.69
			0.00			1" Ice	2.75	1.48	57.73
						2" Ice	3.35	2.15	111.16
						4" Ice	4.72	3.74	280.95
ANT150D3	A	From Leg	4.00	0.0000	90.00	No Ice	1.60	1.60	18.00
			0.00			1/2" Ice	2.88	2.88	23.40
			0.00			1" Ice	4.16	4.16	28.80
						2" Ice	6.72	6.72	39.60
						4" Ice	11.84	11.84	61.20
Side Arm Mount [SO 302-1]	A	From Leg	2.00	0.0000	90.00	No Ice	1.67	3.27	55.00
			0.00			1/2" Ice	2.51	4.99	88.07
			0.00			1" Ice	3.35	6.71	121.14
						2" Ice	5.03	10.15	187.28
						4" Ice	8.39	17.03	319.57
SRL-217	B	From Leg	2.00	0.0000	96.00	No Ice	24.53	24.53	6.50
			0.00			1/2" Ice	25.33	25.33	289.97
			0.00			1" Ice	26.13	26.13	583.16
						2" Ice	27.78	27.78	1199.32
						4" Ice	31.20	31.20	2555.03
Side Arm Mount [SO 301-1]	B	From Leg	1.00	0.0000	90.00	No Ice	1.00	0.90	23.00
			0.00			1/2" Ice	1.39	1.42	32.57
			0.00			1" Ice	1.78	1.94	42.14
						2" Ice	2.56	2.98	61.28
						4" Ice	4.12	5.06	99.56
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
PL6-59W	A	Paraboloid w/Radome	From Leg	1.50	-30.0000		143.00	6.00	No Ice	28.27	143.00
				0.00					1/2" Ice	29.05	292.13
				0.00					1" Ice	29.83	441.25
									2" Ice	31.39	739.50
									4" Ice	34.51	1336.01

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
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	10	204481.35	22596.38	-13851.38
	Max. H_x	10	204481.35	22596.38	-13851.38
	Max. H_z	4	-168690.27	-19029.86	11718.86
	Min. Vert	4	-168690.27	-19029.86	11718.86
	Min. H_x	4	-168690.27	-19029.86	11718.86
	Min. H_z	10	204481.35	22596.38	-13851.38
Leg B	Max. Vert	6	209500.48	-22467.05	-14713.17
	Max. H_x	12	-168261.38	18756.01	12371.27
	Max. H_z	12	-168261.38	18756.01	12371.27
	Min. Vert	12	-168261.38	18756.01	12371.27
	Min. H_x	6	209500.48	-22467.05	-14713.17
	Min. H_z	6	209500.48	-22467.05	-14713.17
Leg A	Max. Vert	2	208477.06	780.84	26662.07
	Max. H_x	11	15465.74	4530.09	1272.50
	Max. H_z	2	208477.06	780.84	26662.07
	Min. Vert	8	-169207.15	-720.05	-22564.76
	Min. H_x	6	-82069.21	-4555.19	-11493.47

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	8	-169207.15	-720.05	-22564.76

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	151.292 - 141.167	3.398	27	0.1843	0.0322
T2	141.167 - 121.042	3.011	27	0.1827	0.0307
T3	121.042 - 114.313	2.253	27	0.1690	0.0245
T4	114.313 - 107.646	2.015	27	0.1620	0.0223
T5	107.646 - 100.917	1.787	27	0.1533	0.0200
T6	100.917 - 94.2014	1.577	27	0.1425	0.0186
T7	94.2014 - 87.4861	1.371	27	0.1335	0.0163
T8	87.4861 - 80.7708	1.179	27	0.1232	0.0138
T9	80.7708 - 70.6875	1.008	27	0.1115	0.0123
T10	70.6875 - 60.6041	0.773	27	0.0985	0.0104
T11	60.6041 - 50.5104	0.569	27	0.0843	0.0085
T12	50.5104 - 40.4166	0.396	27	0.0686	0.0069
T13	40.4166 - 30.3125	0.261	27	0.0522	0.0053
T14	30.3125 - 20.2083	0.153	27	0.0398	0.0039
T15	20.2083 - 10.1041	0.075	31	0.0271	0.0025
T16	10.1041 - 0	0.020	31	0.0137	0.0012

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.00	ANT150F2	27	3.398	0.1843	0.0322	553101
152.00	PTP 49400 w/ Mount Pipe	27	3.398	0.1843	0.0322	553101
150.00	Side Arm Mount [SO 304-1]	27	3.348	0.1842	0.0320	553101
149.00	(2) DB846F65ZAXY w/Mount Pipe	27	3.310	0.1841	0.0319	553101
148.00	Sector Mount [SM 510-3]	27	3.272	0.1840	0.0318	553101
143.00	PL6-59W	27	3.081	0.1832	0.0310	374990
134.00	800 10504 w/ Mount Pipe	27	2.737	0.1794	0.0288	167573
133.00	Sector Mount [SM 410-3]	27	2.699	0.1788	0.0285	140047
130.00	DB586-Y	27	2.585	0.1767	0.0275	93816
126.00	PTP 49400 w/ Mount Pipe	27	2.435	0.1735	0.0262	65144
125.00	Side Arm Mount [SO 303-1]	27	2.398	0.1727	0.0259	60623
123.00	(2) DB980H90E-M w/Mount Pipe	27	2.325	0.1709	0.0252	55043
122.00	Sector Mount [SM 505-3]	27	2.288	0.1699	0.0249	54360
112.00	Sector Mount [SM 510-3]	27	1.935	0.1593	0.0214	43759
103.00	Sector Mount [SM 701-3]	27	1.641	0.1458	0.0190	76367
96.00	SRL-217	27	1.425	0.1359	0.0170	51802

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
95.00	PTP 49400 w/ Mount Pipe	27	1.395	0.1346	0.0166	41193
92.50	PTP 49400 w/ Mount Pipe	27	1.320	0.1312	0.0156	29493
90.00	PTP 49400 w/ Mount Pipe	27	1.248	0.1274	0.0146	25147

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	151.292 - 141.167	9.727	6	0.5240	0.0930
T2	141.167 - 121.042	8.627	6	0.5203	0.0886
T3	121.042 - 114.313	6.463	6	0.4828	0.0709
T4	114.313 - 107.646	5.781	6	0.4630	0.0644
T5	107.646 - 100.917	5.128	6	0.4383	0.0577
T6	100.917 - 94.2014	4.525	6	0.4077	0.0538
T7	94.2014 - 87.4861	3.934	6	0.3821	0.0470
T8	87.4861 - 80.7708	3.385	6	0.3528	0.0398
T9	80.7708 - 70.6875	2.895	6	0.3192	0.0357
T10	70.6875 - 60.6041	2.220	6	0.2823	0.0302
T11	60.6041 - 50.5104	1.636	6	0.2415	0.0245
T12	50.5104 - 40.4166	1.140	6	0.1968	0.0199
T13	40.4166 - 30.3125	0.750	6	0.1495	0.0152
T14	30.3125 - 20.2083	0.442	6	0.1142	0.0112
T15	20.2083 - 10.1041	0.215	6	0.0776	0.0071
T16	10.1041 - 0	0.059	6	0.0392	0.0035

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
157.00	ANT150F2	6	9.727	0.5240	0.0930	200813
152.00	PTP 49400 w/ Mount Pipe	6	9.727	0.5240	0.0930	200813
150.00	Side Arm Mount [SO 304-1]	6	9.587	0.5238	0.0926	200813
149.00	(2) DB846F65ZAXY w/Mount Pipe	6	9.479	0.5236	0.0922	200813
148.00	Sector Mount [SM 510-3]	6	9.370	0.5234	0.0918	200813
143.00	PL6-59W	6	8.826	0.5215	0.0896	136788
134.00	800 10504 w/ Mount Pipe	6	7.844	0.5115	0.0833	63253
133.00	Sector Mount [SM 410-3]	6	7.735	0.5098	0.0824	52205
130.00	DB586-Y	6	7.410	0.5041	0.0796	34255
126.00	PTP 49400 w/ Mount Pipe	6	6.982	0.4954	0.0757	23423
125.00	Side Arm Mount [SO 303-1]	6	6.876	0.4930	0.0748	21696
123.00	(2) DB980H90E-M w/Mount Pipe	6	6.666	0.4880	0.0728	19570
122.00	Sector Mount [SM 505-3]	6	6.562	0.4854	0.0719	19290
112.00	Sector Mount [SM 510-3]	6	5.550	0.4552	0.0619	15342

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
103.00	Sector Mount [SM 701-3]	6	4.709	0.4170	0.0550	27547
96.00	SRL-217	6	4.091	0.3889	0.0491	18235
95.00	PTP 49400 w/ Mount Pipe	6	4.003	0.3851	0.0479	14425
92.50	PTP 49400 w/ Mount Pipe	6	3.790	0.3754	0.0450	10293
90.00	PTP 49400 w/ Mount Pipe	6	3.584	0.3647	0.0422	8786

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	151.292	Leg	A325N	0.6250	4	882.20	13417.90	0.066 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2177.09	3126.56	0.696 ✓	1.333	Member Block Shear
		Top Girt	A325N	0.5000	1	63.73	4123.34	0.015 ✓	1.333	Bolt Shear
T2	141.167	Leg	A325N	0.6250	4	4500.98	13293.50	0.339 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3731.25	4123.34	0.905 ✓	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	273.65	4123.34	0.066 ✓	1.333	Bolt Shear
T3	121.042	Diagonal	A325N	0.5000	2	2181.29	4123.34	0.529 ✓	1.333	Bolt Shear
T4	114.313	Diagonal	A325N	0.5000	2	2693.84	4123.34	0.653 ✓	1.333	Bolt Shear
T5	107.646	Leg	A325N	0.7500	4	10052.30	18988.00	0.529 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	6494.61	8246.68	0.788 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	907.23	5165.63	0.176 ✓	1.333	Member Block Shear
T6	100.917	Diagonal	A325N	0.5000	2	3610.65	4123.34	0.876 ✓	1.333	Bolt Shear
T7	94.2014	Diagonal	A325N	0.5000	2	3844.34	4123.34	0.932 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	1181.16	5165.63	0.229 ✓	1.333	Member Block Shear
T8	87.4861	Leg	A325N	0.8750	4	17218.20	26021.40	0.662 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	8075.73	8246.68	0.979 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	1477.77	5165.63	0.286 ✓	1.333	Member Block Shear
T9	80.7708	Diagonal	A325N	0.6250	1	9036.58	8609.38	1.050 ✓	1.333	Gusset Bearing
T10	70.6875	Leg	A325N	0.8750	4	22226.50	26458.00	0.840 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	9068.92	8609.38	1.053 ✓	1.333	Gusset Bearing
		Secondary Horizontal	A325N	0.6250	1	1885.20	6117.19	0.308 ✓	1.333	Member Bearing
T11	60.6041	Diagonal	A325N	0.6250	1	9436.23	8609.38	1.096 ✓	1.333	Gusset Bearing
		Secondary Horizontal	A325N	0.5000	1	2312.95	4123.34	0.561 ✓	1.333	Bolt Shear
T12	50.5104	Leg	A325N	1.0000	4	30521.20	34099.10	0.895 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	9917.40	12885.40	0.770 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.5000	1	2582.28	4123.34	0.626 ✓	1.333	Bolt Shear
T13	40.4166	Diagonal	A325N	0.6250	1	10144.50	12885.40	0.787 ✓	1.333	Bolt Shear
T14	30.3125	Leg	A325N	1.0625	4	36643.00	38530.10	0.951 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	10618.40	12885.40	0.824 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3119.85	6117.19	0.510 ✓	1.333	Member Bearing
T15	20.2083	Diagonal	A325N	0.6250	1	10770.00	12885.40	0.836 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3243.56	6117.19	0.530 ✓	1.333	Member Bearing

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
T16	10.1041	Leg	A354-BC	1.0000	6	28372.90	32397.70	0.876 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	11611.90	12885.40	0.901 ✓	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	3653.40	6442.72	0.567 ✓	1.333	Bolt 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 P / P_a
T1	151.292 - 141.167	ROHN 2.5 STD	10.13	5.00	63.3 K=1.00	22.141	1.7040	-6151.18	37729.30	0.163 ✓
T2	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7 K=1.00	17.636	2.2535	-24411.80	39742.70	0.614 ✓
T3	121.042 - 114.313	ROHN 2.5 EH (GR)	6.74	6.68	86.7 K=1.00	20.596	2.2535	-27633.30	46414.10	0.595 ✓
T4	114.313 - 107.646	ROHN 2.5 EH (GR)	6.68	6.68	86.7 K=1.00	20.595	2.2535	-36664.40	46412.40	0.790 ✓
T5	107.646 - 100.917	ROHN 2.5 EH (GR)	6.74	3.43	44.6 K=1.00	30.457	2.2535	-52312.40	68636.90	0.762 ✓
T6	100.917 - 94.2014	ROHN 3 EH (GR)	6.73	6.66	70.4 K=1.00	25.475	3.0159	-57289.30	76830.10	0.746 ✓
T7	94.2014 - 87.4861	ROHN 3 EH (GR)	6.73	3.45	36.4 K=1.00	32.873	3.0159	-68102.50	99141.40	0.687 ✓
T8	87.4861 - 80.7708	ROHN 3 EH (GR)	6.73	3.40	35.9 K=1.00	32.964	3.0159	-85204.40	99418.20	0.857 ✓
T9	80.7708 - 70.6875	ROHN 4 EH (GR)	10.10	10.02	81.4 K=1.00	23.284	4.4074	-92936.60	102621.00	0.906 ✓
T10	70.6875 - 60.6041	ROHN 4 EH (GR)	10.10	5.21	42.3 K=1.00	32.956	4.4074	-108709.00	145250.00	0.748 ✓
T11	60.6041 - 50.5104	ROHN 4 EH (GR)	10.11	5.11	41.5 K=1.00	33.117	4.4074	-133363.00	145962.00	0.914 ✓
T12	50.5104 - 40.4166	ROHN 4 EH (GR)	10.11	5.10	41.4 K=1.00	33.131	4.4074	-148892.00	146022.00	1.020 ✓
T13	40.4166 - 30.3125	ROHN 5 EH (GR)	10.12	10.02	65.4 K=1.00	28.466	6.1120	-156202.00	173984.00	0.898 ✓
T14	30.3125 - 20.2083	ROHN 5 EH (GR)	10.12	5.13	33.5 K=1.00	35.792	6.1120	-179902.00	218759.00	0.822 ✓
T15	20.2083 - 10.1041	ROHN 5 EH (GR)	10.12	5.12	33.4 K=1.00	35.800	6.1120	-187038.00	218809.00	0.855 ✓
T16	10.1041 - 0	ROHN 5 EH (GR)	10.12	5.12	33.4 K=1.00	35.807	6.1120	-210672.00	218848.00	0.963 ✓

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 P / P_a

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T1	151.292 - 141.167	L1 1/2x1 1/2x3/16	9.27	4.64	189.7 K=1.00	4.150	0.5273	-2224.01	2188.59	1.016 ✓
T2	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	144.7 K=1.00	7.134	0.9020	-3731.25	6434.70	0.580 ✓
T3	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	151.7 K=1.00	6.489	0.9020	-4362.58	5853.04	0.745 ✓
T4	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	158.8 K=1.00	5.923	0.9020	-5387.67	5342.79	1.008 ✓
T5	107.646 - 100.917	2L 2.5 x 2.5 x 3/16 (3/16)	13.32	6.84	111.3 K=1.00	11.501	1.8047	-6494.61	20756.50	0.313 ✓
T6	100.917 - 94.2014	2L 'a' > 39.1618 in - 66 L3x3x3/16	13.81	7.09	142.7 K=1.00	7.334	1.0900	-7168.47	7994.03	0.897 ✓
T7	94.2014 - 87.4861	L3x3x3/16	14.46	7.41	149.3 K=1.00	6.704	1.0900	-7688.69	7306.96	1.052 ✓
T8	87.4861 - 80.7708	2L 3 x 3 x 3/16 (1/4)	15.05	7.71	104.1 K=1.00	12.257	2.1797	-8075.73	26717.20	0.302 ✓
T9	80.7708 - 70.6875	2L 'a' > 44.0220 in - 99 2L3x3x3/16x1/4	17.36	8.97	121.1 K=1.00	10.071	2.1797	-9020.72	21950.70	0.411 ✓
T10	70.6875 - 60.6041	2L 'a' > 51.2231 in - 111 2L3x3x3/16x1/4	18.25	9.41	127.0 K=1.00	9.252	2.1797	-9337.35	20167.10	0.463 ✓
T11	60.6041 - 50.5104	2L 'a' > 53.7356 in - 120 2L3x3x1/4x1/4	19.03	9.80	132.3 K=1.00	8.527	2.8750	-9548.76	24513.80	0.390 ✓
T12	50.5104 - 40.4166	2L 'a' > 56.1325 in - 132 2L3x3x1/4x1/4	19.93	10.24	138.4 K=1.00	7.795	2.8750	-9917.40	22411.50	0.443 ✓
T13	40.4166 - 30.3125	2L 'a' > 58.7062 in - 144 2L3 1/2x3 1/2x1/4x1/4	20.81	10.67	124.1 K=1.00	9.698	3.3750	-10144.50	32730.50	0.310 ✓
T14	30.3125 - 20.2083	2L 'a' > 61.0427 in - 156 2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	129.2 K=1.00	8.942	3.3750	-10618.40	30180.90	0.352 ✓
T15	20.2083 - 10.1041	2L 'a' > 63.5688 in - 165 2L 4 x 4 x 1/4 (1/4)	22.61	11.57	118.0 K=1.00	10.719	3.8750	-10770.00	41534.90	0.259 ✓
T16	10.1041 - 0	2L 'a' > 66.0834 in - 177 2L 4 x 4 x 1/4 (1/4)	23.51	12.01	122.6 K=1.00	9.934	3.8750	-11611.90	38493.00	0.302 ✓
		2L 'a' > 68.6449 in - 189								

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio P / P_a
T5	107.646 - 100.917	L 2 x 2 x 3/16	12.25	12.01	182.9 K=0.50	4.463	0.7150	-907.23	3191.02	0.284 ✓
T7	94.2014 - 87.4861	L 2 x 2 x 3/16	13.64	13.35	203.3 K=0.50	3.613	0.7150	-1181.16	2583.20	0.457 ✓
T8	87.4861 - 80.7708	L 2 x 2 x 3/16	14.34	14.04	213.9 K=0.50	3.265	0.7150	-1477.77	2334.13	0.633 ✓
T10	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	15.81	191.6 K=0.50	4.068	0.9020	-1885.20	3668.94	0.514 ✓
T11	60.6041 - 50.5104	L3x3x1/4	17.20	16.82	170.5 K=0.50	5.135	1.4400	-2312.95	7395.08	0.313 ✓

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 P / P_a
T12	50.5104 - 40.4166	L3x3x1/4	18.24	17.86	181.0 K=0.50	4.556	1.4400	-2582.28	6561.12	0.394 ✓
T14	30.3125 - 20.2083	L 3 x 3 x 3/16	20.26	19.80	199.2 K=0.50	3.763	1.0898	-3119.85	4101.40	0.761 ✓
T15	20.2083 - 10.1041	L3x3x3/16	21.27	20.81	209.5 K=0.50	3.402	1.0900	-3243.56	3708.23	0.875 ✓
T16	10.1041 - 0	L 3.5 x 3.5 x 1/4	22.27	21.80	188.5 K=0.50	4.203	1.6900	-3653.40	7103.60	0.514 ✓

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 P / P_a
T1	151.292 - 141.167	L2 1/2x2 1/2x3/16	8.56	8.32	201.8 K=1.00	3.668	0.9020	-61.91	3308.68	0.019* ✓
T2	141.167 - 121.042	KL/R > 200 (C) - 5 L2 1/2x2 1/2x3/16 KL/R > 200 (C) - 23	8.57	8.33	201.9 K=1.00	3.663	0.9020	-221.06	3303.75	0.067 ✓

* DL controls

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 P / P_a
T1	151.292 - 141.167	ROHN 2.5 STD	10.13	5.00	63.3	30.000	1.7040	3528.81	51121.50	0.069 ✓
T2	141.167 - 121.042	ROHN 2.5 EH	20.16	6.68	86.7	30.000	2.2535	18003.90	67606.20	0.266 ✓
T3	121.042 - 114.313	ROHN 2.5 EH (GR)	6.74	6.68	86.7	30.000	2.2535	20895.60	67606.20	0.309 ✓
T4	114.313 - 107.646	ROHN 2.5 EH (GR)	6.68	6.68	86.7	30.000	2.2535	28134.10	67606.20	0.416 ✓
T5	107.646 - 100.917	ROHN 2.5 EH (GR)	6.74	3.43	44.6	30.000	2.2535	40209.00	67606.20	0.595 ✓
T6	100.917 - 94.2014	ROHN 3 EH (GR)	6.73	6.66	70.4	30.000	3.0159	44533.00	90477.90	0.492 ✓
T7	94.2014 - 87.4861	ROHN 3 EH (GR)	6.73	3.45	36.4	30.000	3.0159	54260.70	90477.90	0.600 ✓
T8	87.4861 - 80.7708	ROHN 3 EH (GR)	6.73	3.40	35.9	30.000	3.0159	68873.00	90477.90	0.761 ✓
T9	80.7708 - 70.6875	ROHN 4 EH (GR)	10.10	10.02	81.4	30.000	4.4074	75453.20	132223.00	0.571 ✓
T10	70.6875 - 60.6041	ROHN 4 EH (GR)	10.10	5.21	42.3	30.000	4.4074	89161.40	132223.00	0.674 ✓
T11	60.6041 - 50.5104	ROHN 4 EH (GR)	10.11	5.11	41.5	30.000	4.4074	109455.00	132223.00	0.828 ✓
T12	50.5104 -	ROHN 4 EH (GR)	10.11	5.10	41.4	30.000	4.4074	122085.00	132223.00	0.923

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 $\frac{P}{P_a}$
	40.4166									✓
T13	40.4166 - 30.3125	ROHN 5 EH (GR)	10.12	10.02	65.4	30.000	6.1120	127949.00	183359.00	0.698 ✓
T14	30.3125 - 20.2083	ROHN 5 EH (GR)	10.12	5.13	33.5	30.000	6.1120	146572.00	183359.00	0.799 ✓
T15	20.2083 - 10.1041	ROHN 5 EH (GR)	10.12	5.12	33.4	30.000	6.1120	152071.00	183359.00	0.829 ✓
T16	10.1041 - 0	ROHN 5 EH (GR)	10.12	5.12	33.4	30.000	6.1120	170237.00	183359.00	0.928 ✓

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	151.292 - 141.167	L1 1/2x1 1/2x3/16	9.27	4.64	121.8	29.000	0.3076	2177.09	8920.90	0.244 ✓
T2	141.167 - 121.042	L2 1/2x2 1/2x3/16	11.56	5.97	92.1	29.000	0.5886	3665.60	17069.70	0.215 ✓
T3	121.042 - 114.313	L2 1/2x2 1/2x3/16	12.14	6.26	96.5	29.000	0.5886	4324.98	17069.70	0.253 ✓
T4	114.313 - 107.646	L2 1/2x2 1/2x3/16	12.73	6.55	101.0	29.000	0.5886	5307.04	17069.70	0.311 ✓
T5	107.646 - 100.917	2L 2.5 x 2.5 x 3/16 (3/16)	13.32	6.84	105.5	29.000	1.1777	6355.47	34154.30	0.186 ✓
T6	100.917 - 94.2014	2L 'a' > 39.1618 in - 67 L3x3x3/16	13.81	7.09	90.6	29.000	0.7296	7221.31	21158.70	0.341 ✓
T7	94.2014 - 87.4861	L3x3x3/16	14.46	7.41	94.7	29.000	0.7296	7535.19	21158.70	0.356 ✓
T8	87.4861 - 80.7708	2L 3 x 3 x 3/16 (1/4)	15.05	7.71	98.4	29.000	1.4590	7967.22	42310.50	0.188 ✓
T9	80.7708 - 70.6875	2L 'a' > 44.0220 in - 100 2L3x3x3/16x1/4	17.36	8.97	114.5	29.000	1.4238	9036.58	41291.00	0.219 ✓
T10	70.6875 - 60.6041	2L 'a' > 51.2231 in - 112 2L3x3x3/16x1/4	18.25	9.41	120.2	29.000	1.4238	9068.92	41291.00	0.220 ✓
T11	60.6041 - 50.5104	2L 'a' > 53.7356 in - 121 2L3x3x1/4x1/4	19.03	9.80	126.3	32.500	1.8750	9436.23	60937.50	0.155 ✓
T12	50.5104 - 40.4166	2L 'a' > 56.1325 in - 133 2L3x3x1/4x1/4	19.93	10.24	132.1	32.500	1.8750	9714.38	60937.50	0.159 ✓
T13	40.4166 - 30.3125	2L 'a' > 58.7062 in - 145 2L3 1/2x3 1/2x1/4x1/4	20.81	10.67	117.3	32.500	2.2500	10072.10	73125.00	0.138 ✓
T14	30.3125 - 20.2083	2L 'a' > 61.0427 in - 157 2L3 1/2x3 1/2x1/4x1/4	21.69	11.11	122.2	32.500	2.2500	10267.90	73125.00	0.140 ✓
T15	20.2083 - 10.1041	2L 'a' > 63.5688 in - 166 2L 4 x 4 x 1/4 (1/4)	22.61	11.57	110.8	32.500	2.6250	10718.50	85312.50	0.126 ✓
T16	10.1041 - 0	2L 'a' > 66.0834 in - 178 2L 4 x 4 x 1/4 (1/4)	23.51	12.01	115.1	32.500	2.6250	10882.40	85312.50	0.128 ✓
		2L 'a' > 68.6449 in - 190								

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T5	107.646 - 100.917	L 2 x 2 x 3/16	12.25	12.01	233.6	29.000	0.4308	907.23	12492.70	0.073 ✓
T7	94.2014 - 87.4861	L 2 x 2 x 3/16	13.64	13.35	259.7	29.000	0.4308	1181.16	12492.70	0.095 ✓
T8	87.4861 - 80.7708	L 2 x 2 x 3/16	14.34	14.04	273.2	29.000	0.4308	1477.77	12492.70	0.118 ✓
T10	70.6875 - 60.6041	L2 1/2x2 1/2x3/16	16.18	15.81	243.8	29.000	0.5710	1885.20	16559.90	0.114 ✓
T11	60.6041 - 50.5104	L3x3x1/4	17.20	16.82	217.1	29.000	0.9628	2312.95	27921.60	0.083 ✓
T12	50.5104 - 40.4166	L3x3x1/4	18.24	17.86	230.5	29.000	0.9628	2582.28	27921.60	0.092 ✓
T14	30.3125 - 20.2083	L 3 x 3 x 3/16	20.26	19.80	252.9	29.000	0.7119	3119.85	20645.50	0.151 ✓
T15	20.2083 - 10.1041	L3x3x3/16	21.27	20.81	266.0	29.000	0.7120	3243.56	20648.90	0.157 ✓
T16	10.1041 - 0	L 3.5 x 3.5 x 1/4	22.27	21.80	239.9	29.000	1.1269	3653.40	32679.40	0.112 ✓

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	151.292 - 141.167	L2 1/2x2 1/2x3/16	8.56	8.32	128.4	29.000	0.5886	1.96	17069.70	0.000 ✓
T2	141.167 - 121.042	L2 1/2x2 1/2x3/16	8.57	8.33	128.5	29.000	0.5886	273.65	17069.70	0.016 ✓

Section Capacity Table

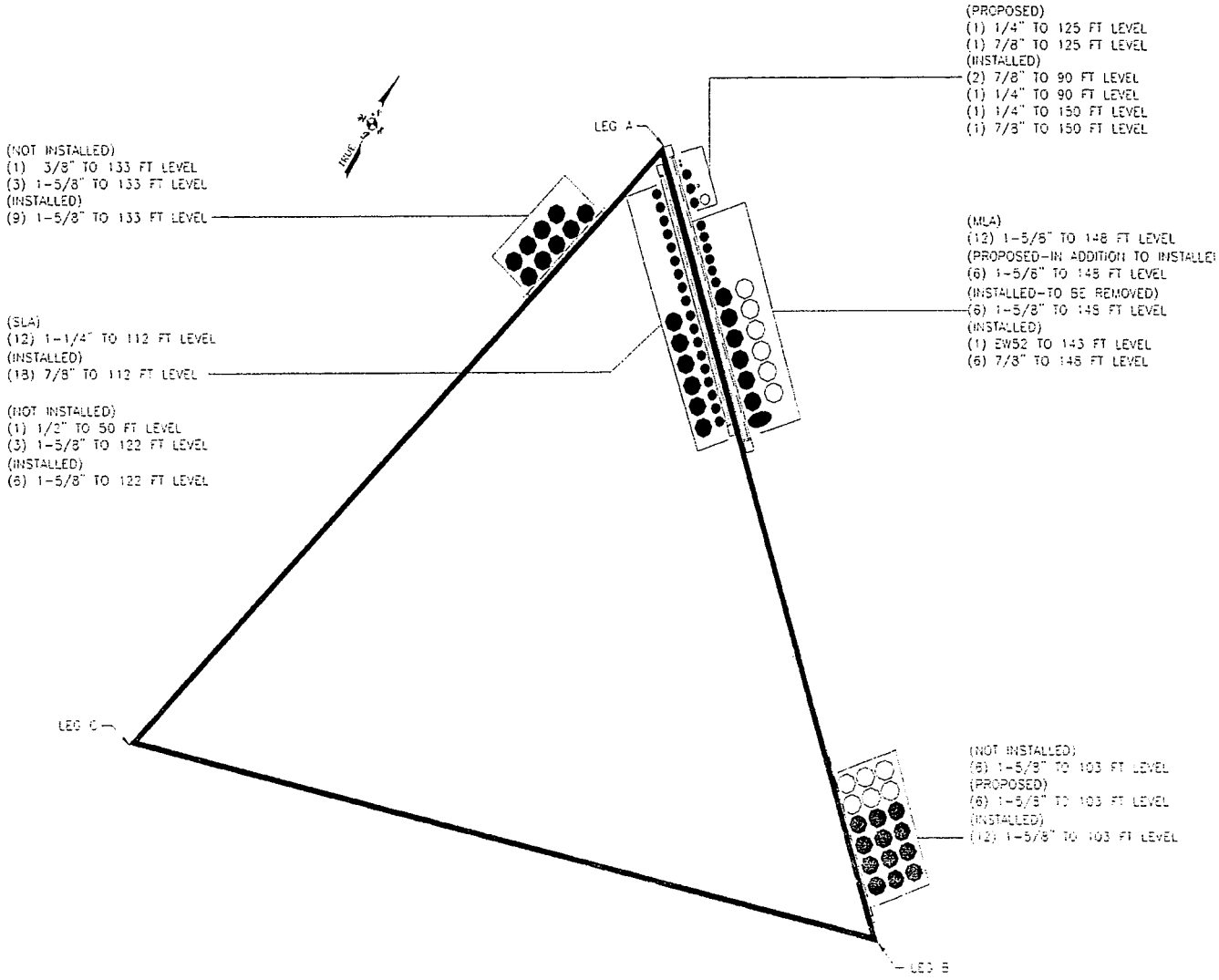
Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	151.292 - 141.167	Leg	ROHN 2.5 STD	2	-5839.19	50293.16	13.7	Pass
T2	141.167 - 121.042	Leg	ROHN 2.5 EH	20	-24411.80	52977.02	46.1	Pass
T3	121.042 - 114.313	Leg	ROHN 2.5 EH (GR)	44	-27633.30	61869.99	44.7	Pass
T4	114.313 - 107.646	Leg	ROHN 2.5 EH (GR)	53	-36664.40	61867.72	59.3	Pass
T5	107.646 - 100.917	Leg	ROHN 2.5 EH (GR)	62	-52312.40	91492.98	57.2	Pass
T6	100.917 - 94.2014	Leg	ROHN 3 EH (GR)	74	-57289.30	102414.52	55.9	Pass
T7	94.2014 - 87.4861	Leg	ROHN 3 EH (GR)	83	-68102.50	132155.48	51.5	Pass
T8	87.4861 - 80.7708	Leg	ROHN 3 EH (GR)	95	-85204.40	132524.46	64.3	Pass
T9	80.7708 - 70.6875	Leg	ROHN 4 EH (GR)	107	-92936.60	136793.79	67.9	Pass
T10	70.6875 -	Leg	ROHN 4 EH (GR)	116	-108709.00	193618.24	56.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
	60.6041						63.0 (b)	
T11	60.6041 - 50.5104	Leg	ROHN 4 EH (GR)	128	-133363.00	194567.34	68.5	Pass
T12	50.5104 - 40.4166	Leg	ROHN 4 EH (GR)	140	-148892.00	194647.32	76.5	Pass
T13	40.4166 - 30.3125	Leg	ROHN 5 EH (GR)	152	-156202.00	231920.66	67.4	Pass
T14	30.3125 - 20.2083	Leg	ROHN 5 EH (GR)	161	-179902.00	291605.73	61.7	Pass
T15	20.2083 - 10.1041	Leg	ROHN 5 EH (GR)	173	-187038.00	291672.38	71.3 (b) 64.1	Pass
T16	10.1041 - 0	Leg	ROHN 5 EH (GR)	185	-210672.00	291724.37	72.2	Pass
T1	151.292 - 141.167	Diagonal	L1 1/2x1 1/2x3/16	9	-2224.01	2917.39	76.2	Pass
T2	141.167 - 121.042	Diagonal	L2 1/2x2 1/2x3/16	27	-3731.25	8577.46	43.5	Pass
T3	121.042 - 114.313	Diagonal	L2 1/2x2 1/2x3/16	48	-4362.58	7802.10	67.9 (b) 55.9	Pass
T4	114.313 - 107.646	Diagonal	L2 1/2x2 1/2x3/16	57	-5387.67	7121.94	75.6	Pass
T5	107.646 - 100.917	Diagonal	2L 2.5 x 2.5 x 3/16 (3/16)	66	-6494.61	27668.41	23.5	Pass
T6	100.917 - 94.2014	Diagonal	L3x3x3/16	78	-7168.47	10656.04	59.1 (b) 67.3	Pass
T7	94.2014 - 87.4861	Diagonal	L3x3x3/16	87	-7688.69	9740.18	78.9	Pass
T8	87.4861 - 80.7708	Diagonal	2L 3 x 3 x 3/16 (1/4)	99	-8075.73	35614.03	22.7	Pass
T9	80.7708 - 70.6875	Diagonal	2L3x3x3/16x1/4	111	-9020.72	29260.28	73.5 (b) 30.8	Pass
T10	70.6875 - 60.6041	Diagonal	2L3x3x3/16x1/4	120	-9337.35	26882.74	78.7 (b) 34.7	Pass
T11	60.6041 - 50.5104	Diagonal	2L3x3x1/4x1/4	132	-9548.76	32676.90	79.0 (b) 29.2	Pass
T12	50.5104 - 40.4166	Diagonal	2L3x3x1/4x1/4	144	-9917.40	29874.53	82.2 (b) 33.2	Pass
T13	40.4166 - 30.3125	Diagonal	2L3 1/2x3 1/2x1/4x1/4	156	-10144.50	43629.75	57.7 (b) 23.3	Pass
T14	30.3125 - 20.2083	Diagonal	2L3 1/2x3 1/2x1/4x1/4	165	-10618.40	40231.14	59.1 (b) 26.4	Pass
T15	20.2083 - 10.1041	Diagonal	2L 4 x 4 x 1/4 (1/4)	177	-10770.00	55366.02	61.8 (b) 19.5	Pass
T16	10.1041 - 0	Diagonal	2L 4 x 4 x 1/4 (1/4)	189	-11611.90	51311.17	62.7 (b) 22.6	Pass
T5	107.646 - 100.917	Secondary Horizontal	L 2 x 2 x 3/16	70	-907.23	4253.63	67.6 (b) 21.3	Pass
T7	94.2014 - 87.4861	Secondary Horizontal	L 2 x 2 x 3/16	91	-1181.16	3443.41	34.3	Pass
T8	87.4861 - 80.7708	Secondary Horizontal	L 2 x 2 x 3/16	103	-1477.77	3111.40	47.5	Pass
T10	70.6875 - 60.6041	Secondary Horizontal	L2 1/2x2 1/2x3/16	124	-1885.20	4890.70	38.5	Pass
T11	60.6041 - 50.5104	Secondary Horizontal	L3x3x1/4	137	-2312.95	9857.64	23.5	Pass
T12	50.5104 - 40.4166	Secondary Horizontal	L3x3x1/4	148	-2582.28	8745.97	42.1 (b) 29.5	Pass
T14	30.3125 - 20.2083	Secondary Horizontal	L 3 x 3 x 3/16	169	-3119.85	5467.17	47.0 (b) 57.1	Pass
T15	20.2083 - 10.1041	Secondary Horizontal	L3x3x3/16	181	-3243.56	4943.07	65.6	Pass
T16	10.1041 - 0	Secondary Horizontal	L 3.5 x 3.5 x 1/4	193	-3653.40	9469.10	38.6	Pass
T1	151.292 - 141.167	Top Girt	L2 1/2x2 1/2x3/16	5	-61.91	3308.68	42.5 (b) 1.9	Pass
T2	141.167 - 121.042	Top Girt	L2 1/2x2 1/2x3/16	23	-221.06	4403.90	5.0	Pass
							Summary	
						Leg (T12)	76.5	Pass
						Diagonal (T11)	82.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Secondary Horizontal (T15)	65.6	Pass
						Top Girt (T2)	5.0	Pass
						Bolt Checks	82.2	Pass
						RATING =	**82.2**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

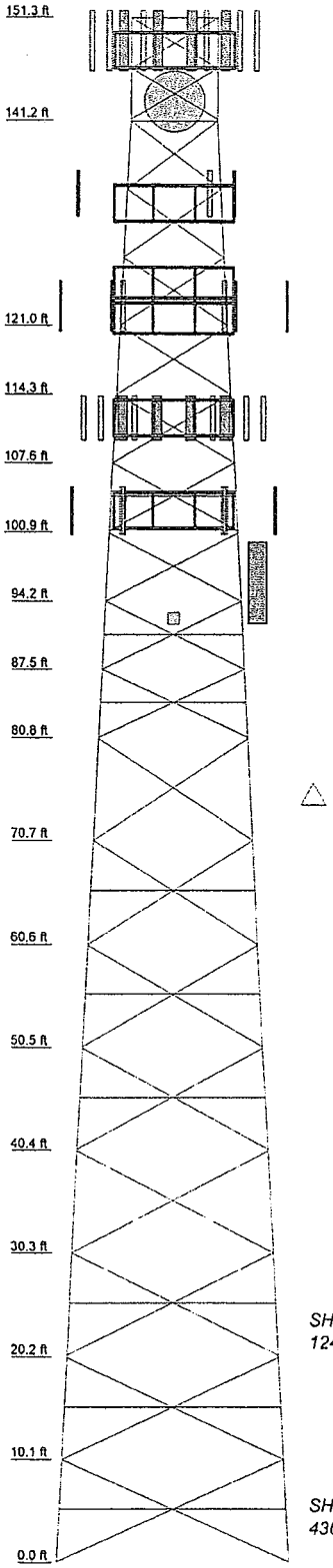


APPENDIX C

ADDITIONAL CALCULATIONS

Program Version 5.4.2.0 - 6/17/2010 File:T:/375_Crown_Castle/2010/37510-1440 BU 806384/37510-1440.eri

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16
Legs	ROHN 2.5 STD	ROHN 2.5 EH	ROHN 2.5 EH (GR)	ROHN 2.5 EH (GR)	ROHN 3 EH (GR)	ROHN 4 EH (GR)								ROHN 5 EH (GR)		
Leg Grade	A572-50															
Diagonals	A	L2 1/2x2 1/2x3/16			B	L3x3x3/16		C	2L3x3x16x1/4		2L3x3x1/4x1/4		2L3 1/2x3 1/2x1/4x1/4		2L 4 x 4 x 1/4 (1/4)	
Diagonal Grade	A36											A572-50				
Top Girts	N.A.															
Sec. Horizontals	N.A.				D	N.A.	L 2 x 2 x 3/16	E	N.A.		L3x3x1/4		N.A.	L 3 x 3 x 3/16	L3x3x3/16	L 3.5 x 3.5 x 1/4
Face Width (ft)	8.5625		10.5625	11.243	11.9236	12.6041	13.302	14	14.6979	15.6979	16.6979	17.7343	18.7708	19.7761	20.7813	21.7813
# Panels @ (ft)	2 @ 5		6 @ 6.66667				@ 6.71528	@ 6.63194	1 @ 10	1 @ 10.0833		2 @ 9.90625		3 @ 10		1 @ 9.99997
Weight (lb)	409.5	1169.5	492.2	490.7	891.5	703.2	782.3	1145.3	1603.6	1792.1	2201.8	2283.9	2666.2	2954.6	3324.1	3542.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
ANT150F2	157	(4) ALP 9212-N w/Mount Pipe	112
PTP 49400 w/ Mount Pipe	152	Sector Mount [SM 510-3]	112
Side Arm Mount [SO 304-1]	150	(2) RR90-17-02DP w/Mount Pipe	103
(2) DB846F65ZAXY w/Mount Pipe	149	(2) RR90-17-02DP w/Mount Pipe	103
(2) DB846F65ZAXY w/Mount Pipe	149	(2) RR90-17-02DP w/Mount Pipe	103
(2) DB846F65ZAXY w/Mount Pipe	149	(2) Ericsson KRY 112 71/1	103
(2) DB948F85T2E-M w/Mount Pipe	149	(2) Ericsson KRY 112 71/1	103
(2) DB948F85T2E-M w/Mount Pipe	149	(2) Ericsson KRY 112 71/1	103
(2) DB948F85T2E-M w/Mount Pipe	149	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	103
Sector Mount [SM 510-3]	148		
PL6-59W	143	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	103
800 10504 w/ Mount Pipe	134		
800 10504 w/ Mount Pipe	134	APX16DWV-16DWVS-E-A20 w/ Mount Pipe	103
800 10504 w/ Mount Pipe	134		
Sector Mount [SM 410-3]	133	ATMAA1412D-1A20	103
DB586-Y	130	ATMAA1412D-1A20	103
PTP 49400 w/ Mount Pipe	126	ATMAA1412D-1A20	103
Side Arm Mount [SO 303-1]	125	Sector Mount [SM 701-3]	103
(2) DB980H90E-M w/Mount Pipe	123	SRL-217	96
(2) DB980H90E-M w/Mount Pipe	123	PTP 49400 w/ Mount Pipe	95 - 90
(2) DB980H90E-M w/Mount Pipe	123	ANT150D3	90
Sector Mount [SM 505-3]	122	Side Arm Mount [SO 301-1]	90
(4) ALP 9212-N w/Mount Pipe	112	Side Arm Mount [SO 302-1]	90
(4) ALP 9212-N w/Mount Pipe	112		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 1/2x1 1/2x3/16	D	L 2 x 2 x 3/16
B	2L 2.5 x 2.5 x 3/16 (3/16)	E	L2 1/2x2 1/2x3/16
C	2L 3 x 3 x 3/16 (1/4)		

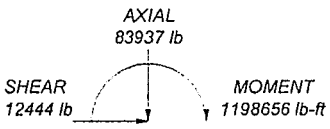
MATERIAL STRENGTH

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

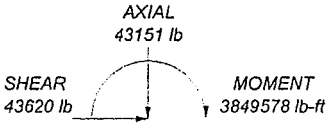
TOWER DESIGN NOTES

1. Tower is located in New London 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 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. Grouted pipe f'c is 7 ksi
6. TOWER RATING: 82.2%

MAX. CORNER REACTIONS AT BASE:
DOWN: 209500 lb
UPLIFT: -169207 lb
SHEAR: 26856 lb



TORQUE 14098 lb-ft
38 mph WIND - 0.7500 in ICE



TORQUE 58905 lb-ft
REACTIONS - 85 mph WIND

Paul J Ford and Company
250 E. Broad Street Suite 1500
Columbus, OH 43215
Phone: 614.221.6679
FAX: 614.448.4105

Job:	*Modified 152-ft S/S Tower; East Lyme, CT*
Project:	*BU #806384 (PJF #37510-1440)*
Client: Crown Castle	Drawn by: Christina Hedges App'd:
Code: TIA/EIA-222-F	Date: 09/22/10 Scale: NTS
Path: T:\375 Crown Castle\2010\37510-1440 BU 806384\37510-1440 etc	Dwg No. E-1

PJF job no. **37510-1440** Project name **BU806384**

Foundation Loads:

Tower leg compression =	**209.5**	(kips)
Tower leg tension =	**169.21**	(kips)
Horizontal load at top of pier =	**0**	(kips)
Overturning moment at top of pier=	**0**	(ft-kips)

Design criteria:

Safety factor against overturning =	**1.5**	
Uplift safety factor: conc. weight =	**1.25**	
Uplift safety factor for soil weight =	**2**	

Soil Properties:

Soil density =	**125**	(pcf)
Allowable soil bearing =	**6**	(ksf)
Soil cone of uplift =	**31**	(degrees)
Uplift cone from top or bottom of ftg	**B**	("T" or "B")
Depth to water table =	**99**	(ft)

Dimensions:

Pier shape (round or square)	**R**	("R" or "S")
Pier width =	**3**	(ft)
Pier height above grade =	**0.5**	(ft)
depth to bottom of footing =	**12**	(ft)
Footing thickness =	**2**	(ft)
Footing width =	**8.25**	(ft)
Footing length =	**8.25**	(ft)

Concrete:

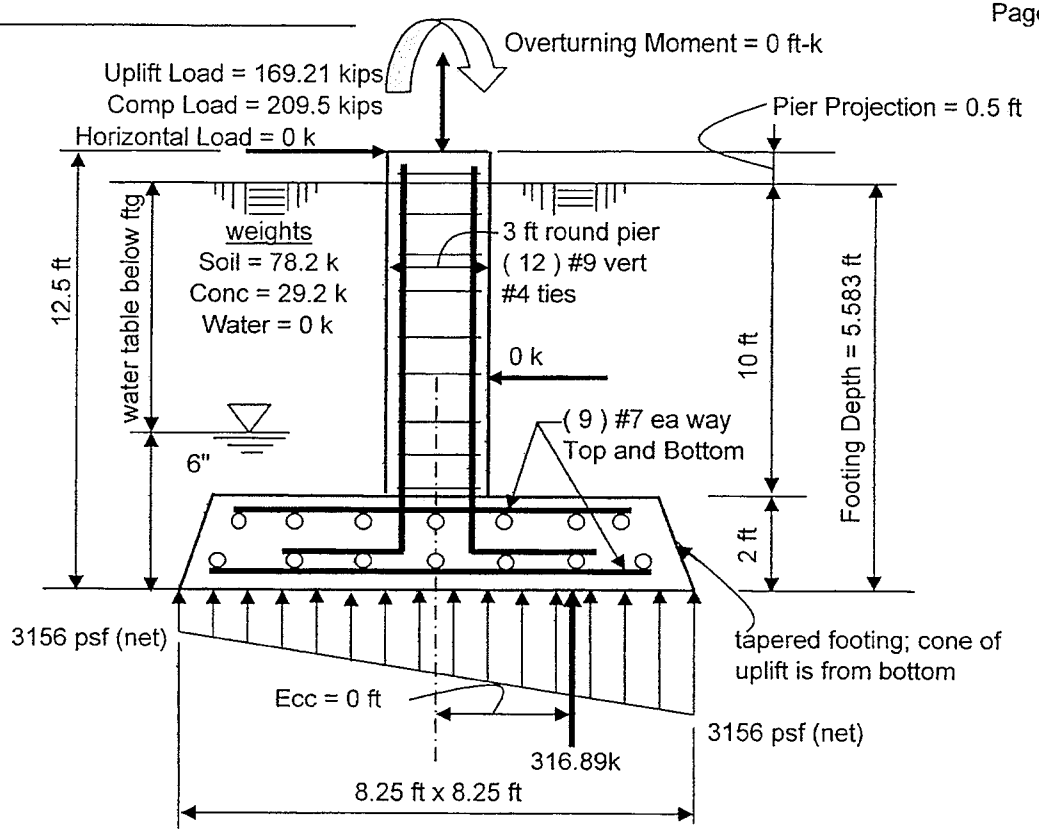
Concrete strength =	**3**	(ksi)
Rebar strength =	**60**	(ksi)
ultimate load factor =	**1.3**	

Reinforcing Steel:

	Pad	
minimum cover over rebar =	**3**	inches
size of pad rebar =	**#7**	bar
quantity of pad rebar =	**9**	(ea direction)
	Pier	
size of vert rebar in pier=	**#9**	bar
vertical rebar quantity =	**12**	
size of pier ties =	**#4**	bar
minimum cover over rebar =	**3**	inches

Total volume of concrete = 7.2 cu yd each

(Total volume of concrete = 21.6 cu yd for 3)



Summary of analysis results	
Maximum Net Soil Bearing = 3.156 ksf Allowable Net Soil Bearing = 6 ksf **Soil Bearing Stress Ratio = 0.53 Okay**	Ult Punching Shear Capacity = 641 kips Ult Punching Shear Force = 99 kips **Punching Shear Stress Ratio = 0.15 OK**
Net Ftg Uplift Resistance = 203.7 kips Uplift Force = 169.207 kips Net Uplift Safety Factor = 2.3 **Ratio to Required Safety factor = 0.83 OK**	Ult Bending Shear Capacity = 110 psi Ult Bending Shear Stress = 36 psi **Bending Shear Stress Ratio = 0.33 Okay**
Ftg Overturning Resistance = 1307 ft-kips Overturning Moment = 0 ft-kips Required Overturning Safety Factor = 1.5 Overturning Safety Factor = 999 **Ratio = 0 Okay**	Pad Bending Moment Capacity= 463 ft-k Pad Bending Moment = 115 ft-k **Bending Moment Stress Ratio = 0.25 OK**
	Allow Tension in Pier Rebar = 41.54 ksi Calc Vert Rebar Tension = 14.1 ksi **Ratio = 0.339 Okay**

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: Transcend
From: Amir Uzzaman - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11037B
Date: December 16, 2010

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 93 Roxbury Rd., East Lyme, 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), (1983-1984), (2140-2145)MHz frequency Band.
2) The antenna array consists of three sectors, with 3 antennas per sector.
3) The model number for GSM antenna is RR90-17-02DP.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 103 ft.
4) UMTS antenna center line height is 103 ft.
5) The maximum transmit power from any GSM sector is 1816.02 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2559.12 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 93 Roxbury Rd., East Lyme, CT, is 0.10202 mW/cm^2. This value represents 10.202% 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 21.54704%. The combined Power Density for the site is 31.749% of the M.P.E. standard.

Connecticut Market

T · ·Mobile·

Worst Case Power Density

Site:	**CT11037B**
Site Address:	**93 Roxbury Rd.**
Town:	**East Lyme**
Tower Height:	**151 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	RR90-17-02DP	**Antenna Model**	APX16DWV-16DWV
Cable Size	1 5/8	**Cable Size**	1 5/8
Cable Length	125 ft	**Cable Length**	125 ft
Antenna Height	106.0 ft	**Antenna Height**	106.0 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	16.5 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0116 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	1.4500 dB	**Total Cable Loss**	1.4500 dB
Total Attenuation	5.9500 dB	**Total Attenuation**	2.9500 dB
Total EIRP per Channel	53.56 dBm	**Total EIRP per Channel**	61.07 dBm
(In Watts)	227.00 W	**(In Watts)**	1279.56 W
Total EIRP per Sector	62.59 dBm	**Total EIRP per Sector**	64.08 dBm
(In Watts)	1816.02 W	**(In Watts)**	2559.12 W
nsg	10.5500	**nsg**	15.0500
Power Density (S) =	**0.042344 mW/cm^2**	**Power Density (S) =**	**0.059671 mW/cm^2**
T-Mobile Worst Case % MPE =		**10.2016%**	

Equation Used :

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

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Co-Location Total

Carrier	**% of Standard**
Verizon	9.6199 %
Verizon	1.0736 %
MetroPCS	4.3674 %
Nextel	2.5206 %
Sprint	3.2156 %
Town	0.7500 %
Other Antenna Systems	
Total Excluding T-Mobile	**21.5470 %**
T-Mobile	10.2016
Total % MPE for Site	**31.7486%**