COHEN and WOLF P.C.
ATTORNEYS AT LAW

JULIE D. KOHLER

PLEASE REPLY TO: Bridgeport
WRITER'S DIRECT DIAL: (203) 337-4157
E-Mail Address: jkohler@cohenandwolf.com

March 25, 2014

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

Re: Notice of Exempt Modification
Crown Castle/T-Mobile co-location
Site ID CT11369A
218 Wheeler Rd., Torrington, Connecticut

Dear Attorney Bachman:

This office represents T-Mobile Northeast LLC ("T-Mobile") and has been retained to file exempt modification filings with the Connecticut Siting Council on its behalf.

In this case, T-Mobile owns the existing monopole telecommunications tower and related facility located at 218 Wheeler Rd., Torrington, Connecticut (Latitude: 41.780639 Longitude: -73.136056). T-Mobile intends to replace four antennas with six antennas and related equipment at this existing telecommunications facility in Torrington ("Torrington Facility"). Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Mayor, Elinor Carbone and the property owner, Lucile Lefevre; copy to Robert Lefevre.

The existing Torrington Facility consists of a 160 foot tall monopole tower.[1] T-Mobile plans to replace four antennas and three TMAs (tower mounted amplifiers) with six antennas and three TMAs at a centerline of 160 feet. (See the plans revised to February 25, 2014 attached hereto as Exhibit A). T-Mobile will also install a new equipment cabinet on the existing concrete pad, install fiber cable, and reuse coax cable. The existing Torrington Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated March 13, 2014 and attached hereto as Exhibit B.

The planned modifications to the Torrington Facility fall squarely within those activities

[1] While the online docket for the Connecticut Siting Council does not provide a docket or petition number for the approval of this structure, it does reference this structure in connection with notices of intent captioned EM-CING-143-080625, EM-VER-143-120917, and EM-SPRINT-143-130604.

explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modification will not increase the height of the tower. T-Mobile's replacement antennas will be installed at a centerline of 160 feet, merely replacing existing antennas located at the same 160 foot elevation. The enclosed tower drawing confirms that the proposed modification will not increase the height of the tower.

2. The proposed modifications will not require an extension of the site boundaries. T-Mobile's equipment will be located entirely within the existing compound and leased area as shown on Page 1 of Exhibit A.

3. The proposed modification to the Torrington Facility will not increase the noise levels at the existing facility by six decibels or more.

4. The operation of the replacement antennas will not increase the total radio frequency (RF) power density, measured at the base of the tower, to a level at or above the applicable standard. According to a Radio Frequency Emissions Analysis Report prepared by EBI dated March 14, 2014, T-Mobile's operations would add 0.440% of the FCC Standard. Therefore, the calculated "worst case" power density for the planned combined operation at the site including all of the proposed antennas would be 47.010% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

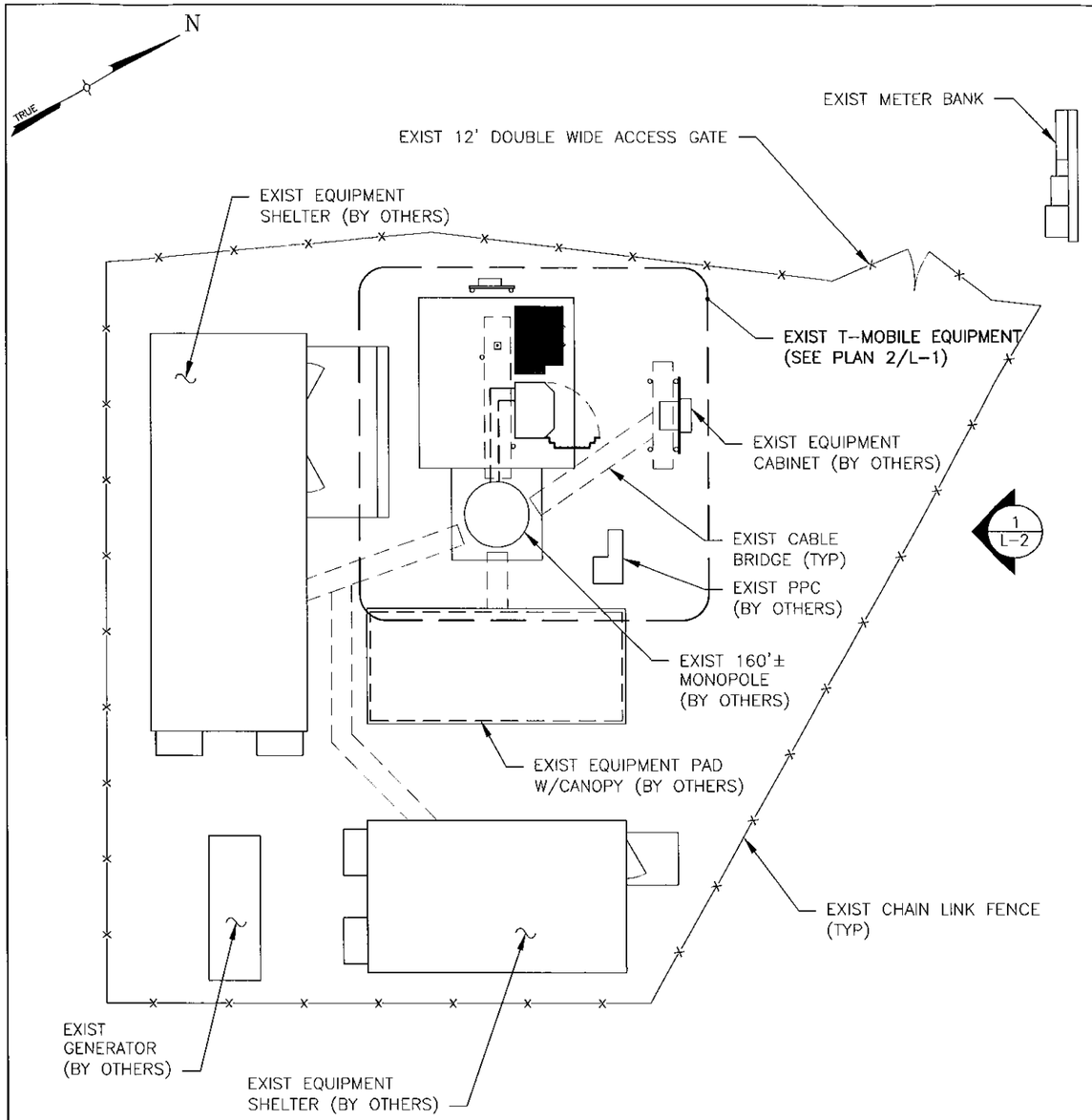
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Torrington Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence construction approximately sixty days from the date of the Council's notice of acknowledgement.

Sincerely,

Julie D. Kohler, Esq.

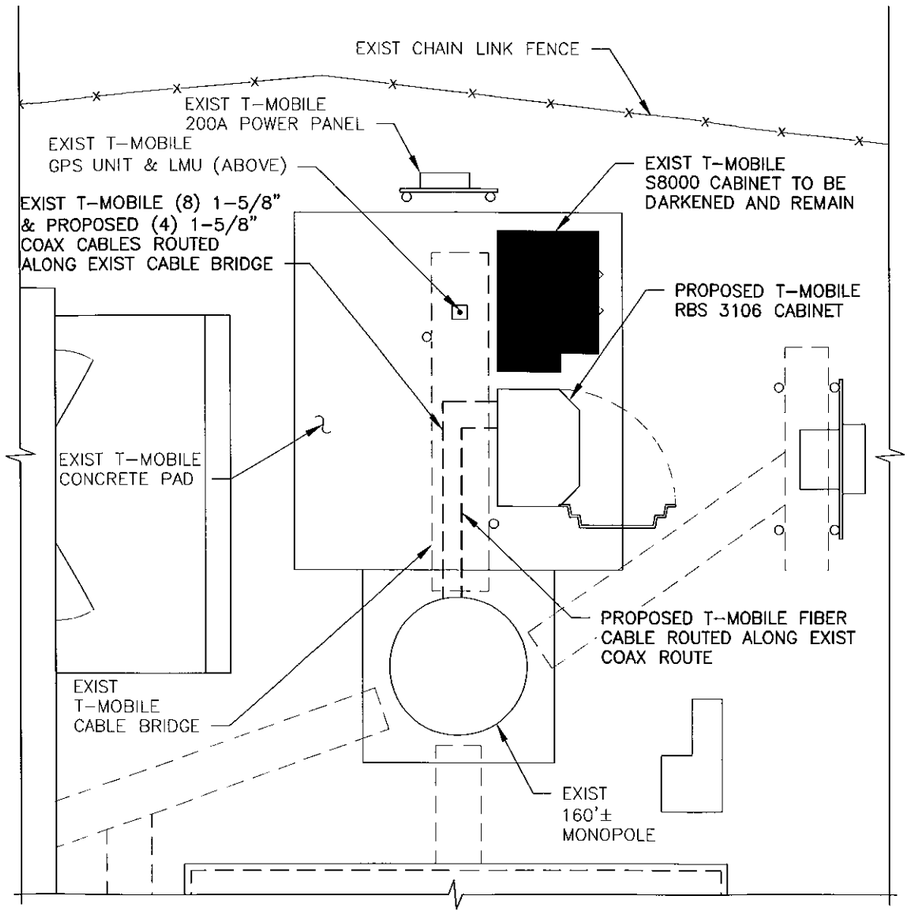
cc: City of Torrington, Mayor Elinor Carbone
Crown Castle
Lucile Lefevre; copy to Robert Lefevre
HPC Wireless, Halene Fujimoto

EXHIBIT A



1/L-1 SITE PLAN

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



2/L-1 EQUIPMENT PLAN

SCALE: 3/16" = 1'-0"

STRUCTURAL NOTE:
EXIST MOUNTS AND EXIST MONOPOLE TO BE VERIFIED FOR STRUCTURAL SUITABILITY BY A STATE LICENSED P.E.

CONFIGURATION
2C

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • SURVEYING
• ENGINEERING • CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
Fax: (845) 567-8703

T-Mobile
NORTHEAST LLC.

T-MOBILE NORTHEAST, LLC.
4 SYLVAN DRIVE
PARSIPPANY, NJ 07054
PHONE: (973) 686-8500

APPROVALS
T-MOBILE
LANDLORD
RF
CONSTRUCTION

PROJECT NUMBER	DESIGNED BY
6644.CT11369A	TN

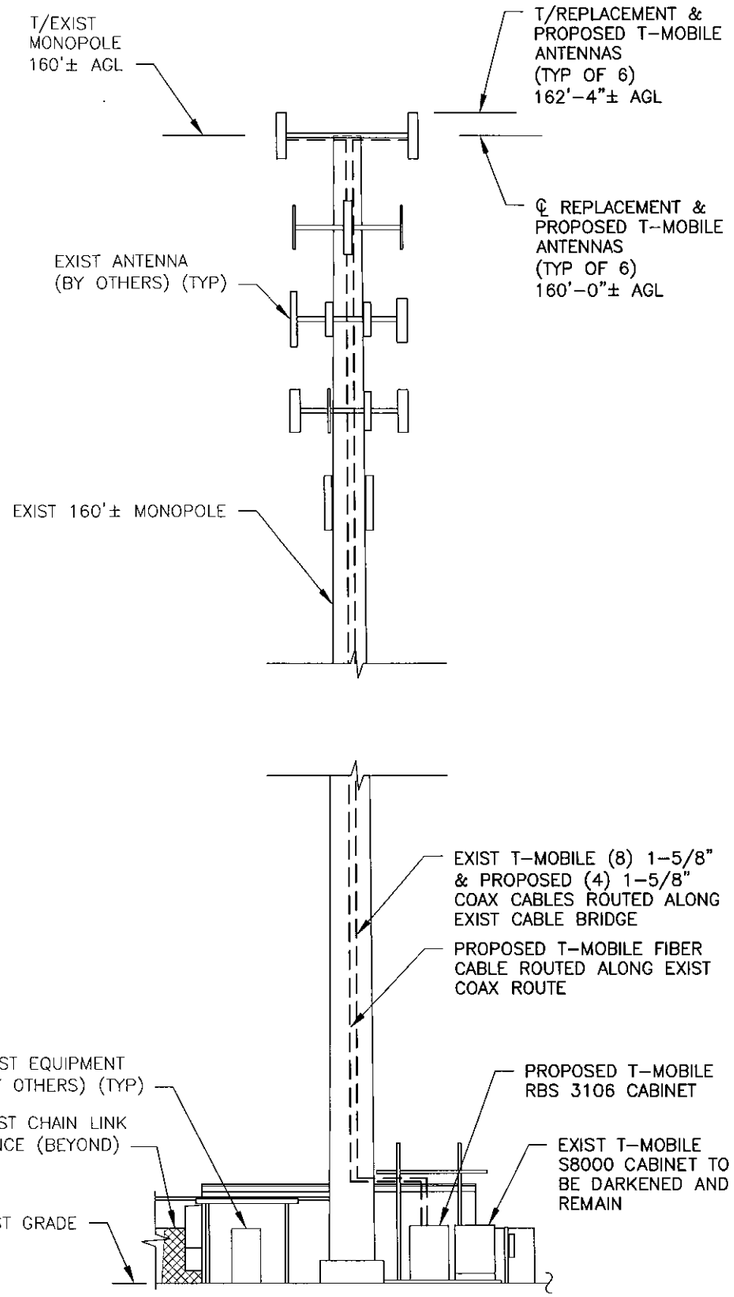
REV	DATE	REVISION	DRAWN BY
0	02/25/14	FOR COMMENT	GZ

ISSUED BY	DATE

SITE INFORMATION
CT11369A
TORINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

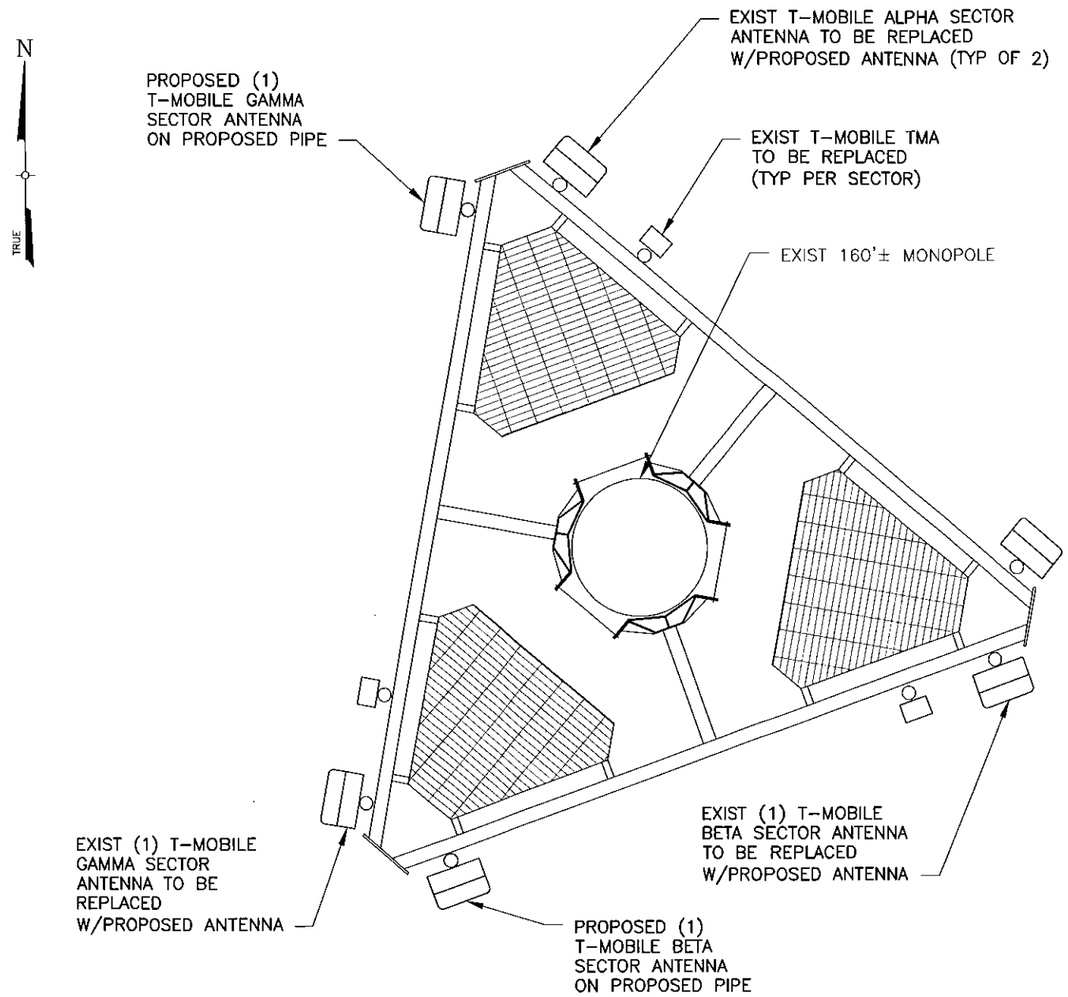
SHEET TITLE
SITE PLAN & EQUIPMENT PLAN

SHEET NUMBER
L-1



1 / L-2 ELEVATION

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



2 / L-2 ANTENNA PLAN

SCALE: 3/8" = 1'-0"

STRUCTURAL NOTE:
EXIST MOUNTS AND EXIST MONOPOLE TO BE VERIFIED FOR STRUCTURAL SUITABILITY BY A STATE LICENSED P.E.

CONFIGURATION
2C

0 1 2 3
ORIGINAL SIZE IN INCHES

TECTONIC
• PLANNING • SURVEYING
• ENGINEERING • CONSTRUCTION MANAGEMENT
TECTONIC Engineering & Surveying Consultants P.C.
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Phone: (845) 567-6656
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T-Mobile
NORTHEAST LLC.

T-MOBILE NORTHEAST, LLC.
4 SYLVAN DRIVE
PARSIPPANY, NJ 07054
PHONE: (973) 686-6500

APPROVALS
T-MOBILE
LANDLORD
RF
CONSTRUCTION

PROJECT NUMBER	DESIGNED BY
6644.CT11369A	TN

REV	DATE	REVISION	DRAWN BY
0	02/25/14	FOR COMMENT	GZ

ISSUED BY | DATE

SITE INFORMATION
CT11369A
TORINGTON/RT 8
218 WHEELER ROAD
TORRINGTON, CT 06790

SHEET TITLE
ELEVATION &
ANTENNA PLAN

SHEET NUMBER
L-2

EXHIBIT B

Date: **March 13, 2014**

Patrick Byrum
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Aero Solutions LLC
5500 Flatiron Parkway, Suite 100
Boulder, CO 80301
(720) 304-6882

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11369A
	Carrier Site Name:	Torrington/Rt 8
Crown Castle Designation:	**Crown Castle BU Number:**	828540
	Crown Castle Site Name:	TORRINGTON/RT 8
	Crown Castle JDE Job Number:	259661
	Crown Castle Work Order Number:	711117
	Crown Castle Application Number:	216333 Rev. 2
Engineering Firm Designation:	**Aero Solutions LLC Project Number:**	003-14-0138
Site Data:	**218 Wheeler Road, Torrington, CT, Litchfield County**	
	Latitude *41° 46' 50.33"*, Longitude *-73° 8' 10.02"*	
	160 Foot - Monopole Tower	

Dear Patrick Byrum,

Aero Solutions LLC 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 617283, in accordance with application 216333, revision 2.

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:

LC7: 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 the 2005 CT State Building Code based upon a wind speed of 80 mph fastest mile.

We at *Aero Solutions LLC* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Shawn D. Cook, P.E.

Respectfully submitted by:

Shraddha Dharia, P.E.
Structural Engineer
CT PE#: PEN0028187
Expires: 1/31/2015

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 160 ft Monopole tower designed by PiRod Manufactures Inc. in November of 2000. The tower was originally designed for a wind speed of 80 mph per TIA/EIA-222-F.

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 80 mph with no ice, 28.1 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
160.0	160.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	5	1-5/8"	
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			

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
160.0	170.0	1	rfi antennas	OA40-41	1	7/8"	2
	160.0	6	andrew	ETW190VS12UB	17	1-5/8"	3
		1	andrew	HP4-102			
		12	andrew	TMBXX-6516-R2M w/ Mount Pipe			
		1	tower mounts	Platform Mount [LP 405-1]	8	1-5/8"	1
150.0	150.0	3	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4"	1
		1	tower mounts	Platform Mount [LP 712-1]			
148.0	148.0	3	alcatel lucent	800MHZ 2X50W RRH			1
		3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
		1	tower mounts	Side Arm Mount [SO 102-3]			
140.0	140.0	3	antel	BXA-171063/12CF w/ Mount Pipe	12	1-5/8"	1
		2	antel	LPA-80063/6CF w/ Mount Pipe			
		1	gps	GPS_A			
		6	rfs celwave	FD9R6004/2C-3L			
		4	swedcom	SC-E 6014 rev2 w/ Mount Pipe			
		3	swedcom	SLXW 5512 w/ Mount			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
				Pipe			
		1	tower mounts	Platform Mount [LP 303-1]			
130.0	130.0	6	ericsson	RRUS 11	1 2 12	3/8" 3/4" 1-5/8"	1
		3	kathrein	800 10764 w/ Mount Pipe			
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP 21403			
		6	powerwave technologies	LGP21903			
		1	raycap	DC6-48-60-18-8F			
		1	tower mounts	Platform Mount [LP 304-1]			
120.0	120.0	3	rfs celwave	APXV18-206517-C w/ Mount Pipe	6	1-5/8"	1
100.0	100.0	2	maxrad	MPRC2449	4	1/4"	2
		2	tower mounts	Pipe Mount [PM 601-1]			
79.0	80.0	1	gps	GPS_A	1	1/2"	1
	79.0	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

Table 3 - Design 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)
185	185	12	ems wireless	RR65-19	12	1-5/8
175	175	12	ems wireless	RR65-19	12	1-5/8
160	160	12	ems wireless	RR65-19	12	1-5/8
150	150	12	ems wireless	RR65-19	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Jaworski Geotech, Inc.	3463255	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	PiROD	3464896	CCISITES
4-TOWER MANUFACTURER DRAWINGS	PiROD	3463264	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), 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. Aero Solutions LLC should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_{allow} (K)	% Capacity	Pass / Fail
L1	160 - 140	Pole	P36x3/8	1	-7.764	1325.678	13.3	Pass
L2	140 - 120	Pole	P42x3/8	2	-15.583	1484.549	34.6	Pass
L3	120 - 100	Pole	P48x3/8	3	-20.388	1643.282	52.4	Pass
L4	100 - 80	Pole	P54x3/8	4	-25.735	1801.923	65.8	Pass
L5	80 - 60	Pole	P60x3/8	5	-31.509	1960.483	76.0	Pass
L6	60 - 40	Pole	P60x1/2	6	-38.830	2780.331	70.5	Pass
L7	40 - 20	Pole	P60x1/2	7	-46.218	2780.331	88.4	Pass
L8	20 - 0	Pole	P60x5/8	8	-54.862	3682.439	81.3	Pass
							Summary	
						Pole (L7)	88.4	Pass
						Rating =	88.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Section No.	Component (ft)	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	59.9	Pass
1	Base Plate	0	81.3	Pass
1	Base Foundation	0	71.9	Pass
1	Base Foundation Soil Interaction	0	66.3	Pass
1	Flange Connection	20	88.4	Pass
1	Flange Connection	40	70.5	Pass
1	Flange Connection	60	76.0	Pass
1	Flange Connection	80	65.8	Pass
1	Flange Connection	100	52.4	Pass
1	Flange Connection	120	34.6	Pass
1	Flange Connection	140	13.3	Pass

Structure Rating (max from all components)	88.9%

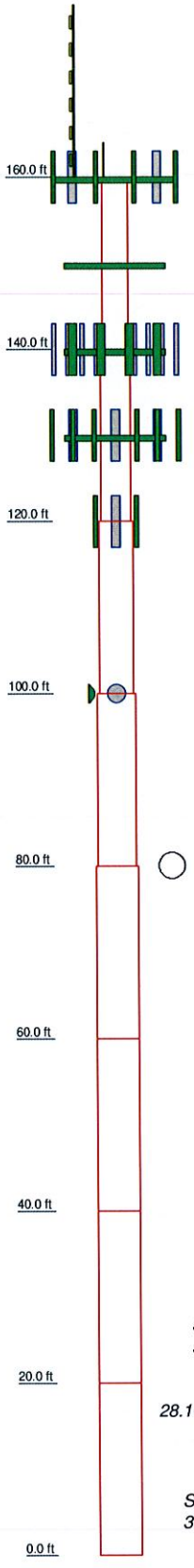
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.
2) Base and flange plate design methodology of the manufacturer has been reviewed and found to be an acceptable means of designing to resist the full capacity of the bolts and shaft. Flange plates have the same capacity as their respective shaft

4.1) Recommendations

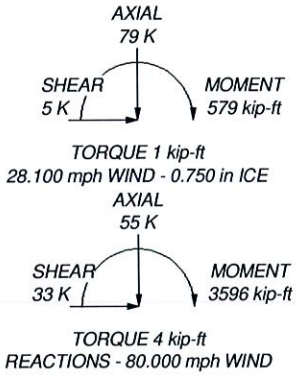
The tower and its foundation have sufficient capacity to carry the existing, reserved, and proposed loads. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT



Section	Size	Length (ft)	Grade	Weight (K)
1	P36x3/8	20.000	A53-B-42	2.9
2	P42x3/8	20.000		3.3
3	P48x3/8	20.000		3.8
4	P54x3/8	20.000		4.3
5	P60x3/8	20.000		4.8
6	P60x1/2	20.000		6.4
7	P60x1/2	20.000		6.4
8	P60x5/8	20.000		7.9
				39.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 3/4" x 4'	160	BXA-171063/12CF w/ Mount Pipe	140
OA40-41	160	LPA-80063/6CF w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) FD9R6004/2C-3L	140
		SC-E 6014 rev2 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	SLXW 5512 w/ Mount Pipe	140
		GPS_A	140
KRY 112 144/1	160	LPA-80063/6CF w/ Mount Pipe	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) FD9R6004/2C-3L	140
		SC-E 6014 rev2 w/ Mount Pipe	140
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	SLXW 5512 w/ Mount Pipe	140
		BXA-171063/12CF w/ Mount Pipe	140
KRY 112 144/1	160	Platform Mount [LP 303-1]	140
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	160	(2) 7770.00 w/ Mount Pipe	130
		(2) LGP 21403	130
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	160	(2) LGP21903	130
		(2) RRUS 11	130
KRY 112 144/1	160	800 10764 w/ Mount Pipe	130
(2) Pipe Mount 2 x 6'	160	(2) 7770.00 w/ Mount Pipe	130
(2) Pipe Mount 2 x 6'	160	(2) LGP 21403	130
(2) Pipe Mount 2 x 6'	160	(2) LGP21903	130
Platform Mount [LP 405-1]	160	(2) RRUS 11	130
APXVSPP18-C-A20 w/ Mount Pipe	150	800 10764 w/ Mount Pipe	130
APXVSPP18-C-A20 w/ Mount Pipe	150	DC6-48-60-18-8F	130
APXVSPP18-C-A20 w/ Mount Pipe	150	(2) 7770.00 w/ Mount Pipe	130
Platform Mount [LP 712-1]	150	(2) LGP 21403	130
(3) Pipe Mount 2 x 6'	150	(2) LGP21903	130
(3) Pipe Mount 2 x 6'	150	(2) RRUS 11	130
(3) Pipe Mount 2 x 6'	150	800 10764 w/ Mount Pipe	130
800MHZ 2X50W RRH	148	Platform Mount [LP 304-1]	130
800MHZ 2X50W RRH	148	APXV18-206517-C w/ Mount Pipe	120
800MHZ 2X50W RRH	148	APXV18-206517-C w/ Mount Pipe	120
PCS 1900MHz 4x45W-65MHz	148	APXV18-206517-C w/ Mount Pipe	120
PCS 1900MHz 4x45W-65MHz	148	Pipe Mount [PM 601-1]	100
PCS 1900MHz 4x45W-65MHz	148	Pipe Mount [PM 601-1]	100
Side Arm Mount [SO 102-3]	148	MPRC2449	100
(2) FD9R6004/2C-3L	140	MPRC2449	100
(2) SC-E 6014 rev2 w/ Mount Pipe	140	GPS_A	79
SLXW 5512 w/ Mount Pipe	140	Side Arm Mount [SO 701-1]	79
BXA-171063/12CF w/ Mount Pipe	140		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Litchfield County, Connecticut.
2. Tower designed for a 80.000 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28.100 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50.000 mph wind.
5. TOWER RATING: 88.4%

Aero Solutions LLC
5500 Flatiron Parkway, Suite 100
Boulder, CO 80301
Phone: (720) 304-6882
FAX: (720) 304-6883

Job: ***BU#828540 TORRINGTON/RT 8***		
Project: ***160' PiRod Monopole***		
Client: Crown Castle	Drawn by: Shawn D. Cook, P.E.	App'd:
Code: TIA/EIA-222-F	Date: 03/13/14	Scale: NTS
Path: C:\DC\828540 TORRINGTON-RT 8\003-14\03E Engineering\Aero Calculations\Working FILES\828540 TORRINGTON-RT 8.eri		Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

4) Tower is located in Litchfield County, Connecticut.
5) Basic wind speed of 80.000 mph.
6) Nominal ice thickness of 0.750 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56.000 pcf.
9) A wind speed of 28.100 mph is used in combination with ice.
10) Temperature drop of 50.000 °F.
11) Deflections calculated using a wind speed of 50.000 mph.
12) A non-linear (P-delta) analysis was used.
13) Pressures are calculated at each section.
14) Stress ratio used in pole design is 1.333.
15) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
√ Escalate Ice	√ Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	[redacted]
Leg Bolts Are At Top Of Section	SR Members Have Cut Ends	√ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination	Use TIA-222-G Tension Splice	
	Capacity Exemption	

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	160.000-140.000	20.000	P36x3/8	A53-B-42 (42 ksi)	
L2	140.000-120.000	20.000	P42x3/8	A53-B-42 (42 ksi)	
L3	120.000-100.000	20.000	P48x3/8	A53-B-42 (42 ksi)	
L4	100.000-80.000	20.000	P54x3/8	A53-B-42 (42 ksi)	
L5	80.000-60.000	20.000	P60x3/8	A53-B-42 (42 ksi)	
L6	60.000-40.000	20.000	P60x1/2	A53-B-42 (42 ksi)	
L7	40.000-20.000	20.000	P60x1/2	A53-B-42 (42 ksi)	
L8	20.000-0.000	20.000	P60x5/8	A53-B-42 (42 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 160.000-140.000				1	1	1		
L2 140.000-120.000				1	1	1		
L3 120.000-100.000				1	1	1		
L4 100.000-80.000				1	1	1		
L5 80.000-60.000				1	1	1		
L6 60.000-40.000				1	1	1		
L7 40.000-20.000				1	1	1		
L8 20.000-0.000				1	1	1		

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
LDF7-50A(1-5/8")	A	No	Inside Pole	160.000 - 8.000	8	No Ice	0.000	0.820
						1/2" Ice	0.000	0.820
						1" Ice	0.000	0.820
						2" Ice	0.000	0.820
						4" Ice	0.000	0.820
LDF7-50A(1-5/8")	A	No	Inside Pole	160.000 - 8.000	5	No Ice	0.000	0.820
						1/2" Ice	0.000	0.820
						1" Ice	0.000	0.820
						2" Ice	0.000	0.820
						4" Ice	0.000	0.820
810921-001(7/8")	C	No	CaAa (Out Of Face)	160.000 - 8.000	1	No Ice	0.000	0.400
						1/2" Ice	0.000	1.385
						1" Ice	0.000	2.980
						2" Ice	0.000	8.004
						4" Ice	0.000	25.382
HB114-1-08U4-M5J(1 1/4")	B	No	CaAa (Out Of Face)	150.000 - 8.000	3	No Ice	0.000	1.080
						1/2" Ice	0.000	2.326
						1" Ice	0.000	4.183
						2" Ice	0.000	9.730
						4" Ice	0.000	28.154
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	140.000 - 8.000	1	No Ice	0.198	0.820
						1/2" Ice	0.298	2.335
						1" Ice	0.398	4.461
						2" Ice	0.598	10.545
						4" Ice	0.998	30.044
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	140.000 - 8.000	1	No Ice	0.198	0.820
						1/2" Ice	0.298	2.335
						1" Ice	0.398	4.461
						2" Ice	0.598	10.545
						4" Ice	0.998	30.044
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	140.000 - 8.000	11	No Ice	0.000	0.820
						1/2" Ice	0.000	2.335
						1" Ice	0.000	4.461
						2" Ice	0.000	10.545
						4" Ice	0.000	30.044
2" Flex Conduit	C	No	Inside Pole	130.000 - 8.000	1	No Ice	0.000	0.320
						1/2" Ice	0.000	0.320
						1" Ice	0.000	0.320
						2" Ice	0.000	0.320
						4" Ice	0.000	0.320

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
2" Flex Conduit	C	No	Inside Pole	130.000 - 8.000	1	No Ice	0.000	0.320
						1/2" Ice	0.000	0.320
						1" Ice	0.000	0.320
						2" Ice	0.000	0.320
						4" Ice	0.000	0.320
LDF7-50A(1-5/8")	C	No	Inside Pole	130.000 - 8.000	12	No Ice	0.000	0.820
						1/2" Ice	0.000	0.820
						1" Ice	0.000	0.820
						2" Ice	0.000	0.820
						4" Ice	0.000	0.820
FB-L98-002-XXX(3/8)	C	No	Inside Pole	130.000 - 8.000	1	No Ice	0.000	0.065
						1/2" Ice	0.000	0.065
						1" Ice	0.000	0.065
						2" Ice	0.000	0.065
						4" Ice	0.000	0.065
WR-VG86T(3/4)	C	No	Inside Pole	130.000 - 8.000	2	No Ice	0.000	0.529
						1/2" Ice	0.000	0.529
						1" Ice	0.000	0.529
						2" Ice	0.000	0.529
						4" Ice	0.000	0.529
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	120.000 - 8.000	1	No Ice	0.198	0.820
						1/2" Ice	0.298	2.335
						1" Ice	0.398	4.461
						2" Ice	0.598	10.545
						4" Ice	0.998	30.044
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	120.000 - 8.000	1	No Ice	0.198	0.820
						1/2" Ice	0.298	2.335
						1" Ice	0.398	4.461
						2" Ice	0.598	10.545
						4" Ice	0.998	30.044
LDF7-50A(1-5/8")	A	No	CaAa (Out Of Face)	120.000 - 8.000	5	No Ice	0.000	0.820
						1/2" Ice	0.000	2.335
						1" Ice	0.000	4.461
						2" Ice	0.000	10.545
						4" Ice	0.000	30.044
CAT5E(1/4")	C	No	CaAa (Out Of Face)	100.000 - 8.000	4	No Ice	0.000	0.100
						1/2" Ice	0.000	0.558
						1" Ice	0.000	1.627
						2" Ice	0.000	5.598
						4" Ice	0.000	20.869
LDF4-50A(1/2")	B	No	CaAa (Out Of Face)	79.000 - 8.000	1	No Ice	0.000	0.150
						1/2" Ice	0.000	0.840
						1" Ice	0.000	2.141
						2" Ice	0.000	6.576
						4" Ice	0.000	22.776

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	160.000-140.000	A	0.000	0.000	0.000	0.000	0.213
		B	0.000	0.000	0.000	0.000	0.032
		C	0.000	0.000	0.000	0.000	0.008
L2	140.000-120.000	A	0.000	0.000	0.000	0.000	0.213
		B	0.000	0.000	0.000	0.000	0.065
		C	0.000	0.000	0.000	7.920	0.337
L3	120.000-100.000	A	0.000	0.000	0.000	7.920	0.328
		B	0.000	0.000	0.000	0.000	0.065
		C	0.000	0.000	0.000	7.920	0.453
L4	100.000-80.000	A	0.000	0.000	0.000	7.920	0.328
		B	0.000	0.000	0.000	0.000	0.065
		C	0.000	0.000	0.000	7.920	0.461
L5	80.000-60.000	A	0.000	0.000	0.000	7.920	0.328
		B	0.000	0.000	0.000	0.000	0.068
		C	0.000	0.000	0.000	7.920	0.461

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
L6	60.000-40.000	A	0.000	0.000	0.000	7.920	0.328
		B	0.000	0.000	0.000	0.000	0.068
		C	0.000	0.000	0.000	7.920	0.461
L7	40.000-20.000	A	0.000	0.000	0.000	7.920	0.328
		B	0.000	0.000	0.000	0.000	0.068
		C	0.000	0.000	0.000	7.920	0.461
L8	20.000-0.000	A	0.000	0.000	0.000	4.752	0.197
		B	0.000	0.000	0.000	0.000	0.041
		C	0.000	0.000	0.000	4.752	0.277

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	160.000-140.000	A	0.899	0.000	0.000	0.000	0.000	0.213
		B		0.000	0.000	0.000	0.000	0.114
		C		0.000	0.000	0.000	0.000	0.053
L2	140.000-120.000	A	0.884	0.000	0.000	0.000	0.000	0.213
		B		0.000	0.000	0.000	0.000	0.225
		C		0.000	0.000	0.000	14.993	1.200
L3	120.000-100.000	A	0.867	0.000	0.000	0.000	14.853	0.758
		B		0.000	0.000	0.000	0.000	0.221
		C		0.000	0.000	0.000	14.853	1.295
L4	100.000-80.000	A	0.846	0.000	0.000	0.000	14.688	0.746
		B		0.000	0.000	0.000	0.000	0.217
		C		0.000	0.000	0.000	14.688	1.375
L5	80.000-60.000	A	0.821	0.000	0.000	0.000	14.487	0.731
		B		0.000	0.000	0.000	0.000	0.243
		C		0.000	0.000	0.000	14.487	1.341
L6	60.000-40.000	A	0.788	0.000	0.000	0.000	14.227	0.712
		B		0.000	0.000	0.000	0.000	0.236
		C		0.000	0.000	0.000	14.227	1.298
L7	40.000-20.000	A	0.750	0.000	0.000	0.000	13.920	0.689
		B		0.000	0.000	0.000	0.000	0.225
		C		0.000	0.000	0.000	13.920	1.247
L8	20.000-0.000	A	0.750	0.000	0.000	0.000	8.352	0.413
		B		0.000	0.000	0.000	0.000	0.135
		C		0.000	0.000	0.000	8.352	0.748

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	160.000-140.000	0.000	0.000	0.000	0.000
L2	140.000-120.000	-0.462	0.267	-0.775	0.448
L3	120.000-100.000	-0.429	-0.248	-0.685	-0.396
L4	100.000-80.000	-0.437	-0.253	-0.703	-0.406
L5	80.000-60.000	-0.444	-0.256	-0.714	-0.412
L6	60.000-40.000	-0.444	-0.256	-0.705	-0.407
L7	40.000-20.000	-0.444	-0.256	-0.694	-0.400
L8	20.000-0.000	-0.282	-0.163	-0.455	-0.263

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lighting Rod 3/4" x 4'	C	From Leg	0.000	0.000	0.000	160.000	No Ice	0.300	0.300	0.030
			0.000				1/2" Ice	0.715	0.715	0.033
			2.000				1" Ice	1.001	1.001	0.039
							2" Ice	1.523	1.523	0.059
							4" Ice	2.722	2.722	0.138
***										
OA40-41	C	From Leg	4.000	0.000	0.000	160.000	No Ice	9.550	9.550	0.065
			0.000				1/2" Ice	14.830	14.830	0.105
			10.000				1" Ice	20.110	20.110	0.145
							2" Ice	30.670	30.670	0.225
							4" Ice	51.790	51.790	0.386
***										
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	160.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			0.000				1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.000	0.000	0.000	160.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			0.000				1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
KRY 112 144/1	A	From Leg	4.000	0.000	0.000	160.000	No Ice	0.408	0.175	0.011
			0.000				1/2" Ice	0.497	0.238	0.014
			0.000				1" Ice	0.594	0.309	0.019
							2" Ice	0.815	0.477	0.032
							4" Ice	1.359	0.918	0.082
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	160.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			0.000				1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.000	0.000	0.000	160.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			0.000				1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
KRY 112 144/1	B	From Leg	4.000	0.000	0.000	160.000	No Ice	0.408	0.175	0.011
			0.000				1/2" Ice	0.497	0.238	0.014
			0.000				1" Ice	0.594	0.309	0.019
							2" Ice	0.815	0.477	0.032
							4" Ice	1.359	0.918	0.082
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	160.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			0.000				1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.000	0.000	0.000	160.000	No Ice	6.825	5.642	0.112
			0.000				1/2" Ice	7.347	6.480	0.169
			0.000				1" Ice	7.863	7.257	0.233
							2" Ice	8.926	8.864	0.383
							4" Ice	11.175	12.293	0.807
KRY 112 144/1	C	From Leg	4.000	0.000	0.000	160.000	No Ice	0.408	0.175	0.011
			0.000				1/2" Ice	0.497	0.238	0.014
			0.000				Ice	0.594	0.309	0.019

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
						1" Ice	0.815	0.477	0.032
						2" Ice	1.359	0.918	0.082
						4" Ice			
(2) Pipe Mount 2 x 6'	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
(2) Pipe Mount 2 x 6'	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
(2) Pipe Mount 2 x 6'	A	From Leg	4.000 0.000 0.000	0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Platform Mount [LP 405-1]	C	None		0.000	160.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	20.800 28.100 35.400 50.000 79.200	20.800 28.100 35.400 50.000 79.200	1.800 2.066 2.332 2.864 3.928
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.946 8.127 9.021 10.844 14.851	0.083 0.151 0.227 0.406 0.909
Platform Mount [LP 712-1]	C	None		0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
(3) Pipe Mount 2 x 6'	A	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
(3) Pipe Mount 2 x 6'	B	From Leg	4.000 0.000 0.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
(3) Pipe Mount 2 x 6'	C	From Leg	4.000	0.000	150.000	No Ice	1.425	1.425	0.022

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
			0.000 0.000			1/2" Ice 1" Ice 2" Ice 4" Ice	1.925 2.294 3.060 4.702	1.925 2.294 3.060 4.702	0.033 0.048 0.090 0.231
***									
800MHZ 2X50W RRH	A	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800MHZ 2X50W RRH	B	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
800MHZ 2X50W RRH	C	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
PCS 1900MHz 4x45W-65MHz	A	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
PCS 1900MHz 4x45W-65MHz	B	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
PCS 1900MHz 4x45W-65MHz	C	From Leg	2.000 0.000 0.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.709 2.948 3.195 3.716 4.862	2.611 2.847 3.092 3.608 4.744	0.060 0.083 0.110 0.173 0.347
Side Arm Mount [SO 102-3]	C	None		0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.480 3.960 4.920 6.840	3.000 3.480 3.960 4.920 6.840	0.081 0.111 0.141 0.201 0.321
***									
(2) FD9R6004/2C-3L	B	From Face	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.003 0.005 0.009 0.020 0.063
(2) SC-E 6014 rev2 w/ Mount Pipe	B	From Face	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.783 4.182 4.591 5.442 7.293	4.396 5.009 5.640 6.956 9.897	0.032 0.071 0.116 0.225 0.544
SLXW 5512 w/ Mount Pipe	B	From Face	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice	7.860 8.394 8.922 10.010	6.246 7.103 7.887 9.508	0.046 0.109 0.179 0.344

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" Ice	12.308	12.967	0.799
						4" Ice			
BXA-171063/12CF w/ Mount Pipe	B	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	5.029	5.289	0.041
						1/2" Ice	5.583	6.459	0.087
						1" Ice	6.103	7.348	0.140
						2" Ice	7.166	9.148	0.273
						4" Ice	9.438	12.947	0.677
BXA-171063/12CF w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	5.029	5.289	0.041
						1/2" Ice	5.583	6.459	0.087
						1" Ice	6.103	7.348	0.140
						2" Ice	7.166	9.148	0.273
						4" Ice	9.438	12.947	0.677
LPA-80063/6CF w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	10.330	10.430	0.049
						1/2" Ice	10.898	11.479	0.139
						1" Ice	11.474	12.405	0.237
						2" Ice	12.650	14.310	0.461
						4" Ice	15.108	18.337	1.053
(2) FD9R6004/2C-3L	C	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
SC-E 6014 rev2 w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	3.783	4.396	0.032
						1/2" Ice	4.182	5.009	0.071
						1" Ice	4.591	5.640	0.116
						2" Ice	5.442	6.956	0.225
						4" Ice	7.293	9.897	0.544
SLXW 5512 w/ Mount Pipe	C	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	7.860	6.246	0.046
						1/2" Ice	8.394	7.103	0.109
						1" Ice	8.922	7.887	0.179
						2" Ice	10.010	9.508	0.344
						4" Ice	12.308	12.967	0.799
GPS_A	B	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	0.297	0.297	0.001
						1/2" Ice	0.374	0.374	0.005
						1" Ice	0.459	0.459	0.010
						2" Ice	0.655	0.655	0.025
						4" Ice	1.151	1.151	0.079
LPA-80063/6CF w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	10.330	10.430	0.049
						1/2" Ice	10.898	11.479	0.139
						1" Ice	11.474	12.405	0.237
						2" Ice	12.650	14.310	0.461
						4" Ice	15.108	18.337	1.053
(2) FD9R6004/2C-3L	A	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	0.367	0.085	0.003
						1/2" Ice	0.451	0.136	0.005
						1" Ice	0.543	0.196	0.009
						2" Ice	0.755	0.343	0.020
						4" Ice	1.281	0.740	0.063
SC-E 6014 rev2 w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	3.783	4.396	0.032
						1/2" Ice	4.182	5.009	0.071
						1" Ice	4.591	5.640	0.116
						2" Ice	5.442	6.956	0.225
						4" Ice	7.293	9.897	0.544
SLXW 5512 w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.000	140.000	No Ice	7.860	6.246	0.046
						1/2" Ice	8.394	7.103	0.109
						1" Ice	8.922	7.887	0.179

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 K
						1" Ice	10.010	9.508	0.344
						2" Ice	12.308	12.967	0.799
						4" Ice			
BXA-171063/12CF w/ Mount Pipe	A	From Face	4.000 0.000 0.000	0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
Platform Mount [LP 303-1]	C	None		0.000	140.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	14.660 18.870 23.080 31.500 48.340	14.660 18.870 23.080 31.500 48.340	1.250 1.481 1.713 2.175 3.101
***									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
(2) LGP 21403	A	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.953 1.093 1.242 1.566 2.318	0.367 0.480 0.601 0.870 1.510	0.018 0.023 0.031 0.052 0.123
(2) LGP21903	A	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.011 0.013 0.017 0.028 0.072
(2) RRUS 11	A	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.051 0.071 0.095 0.153 0.313
800 10764 w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.203 6.690 7.178 8.186 10.328	4.294 4.992 5.662 7.100 10.300	0.064 0.112 0.166 0.296 0.673
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.119 6.626 7.128 8.164 10.360	4.254 5.014 5.711 7.155 10.412	0.055 0.103 0.157 0.287 0.665
(2) LGP 21403	B	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.953 1.093 1.242 1.566 2.318	0.367 0.480 0.601 0.870 1.510	0.018 0.023 0.031 0.052 0.123
(2) LGP21903	B	From Leg	4.000 0.000 0.000	30.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.270 0.343 0.425 0.616 1.101	0.184 0.248 0.322 0.494 0.943	0.011 0.013 0.017 0.028 0.072
(2) RRUS 11	B	From Leg	4.000	30.000	130.000	No Ice	3.249	1.373	0.051

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
			0.000			1/2"	3.491	1.551	0.071
			0.000			Ice	3.741	1.738	0.095
						1" Ice	4.268	2.138	0.153
						2" Ice	5.426	3.042	0.313
						4" Ice			
800 10764 w/ Mount Pipe	B	From Leg	4.000	30.000	130.000	No Ice	6.203	4.294	0.064
			0.000			1/2"	6.690	4.992	0.112
			0.000			Ice	7.178	5.662	0.166
						1" Ice	8.186	7.100	0.296
						2" Ice	10.328	10.300	0.673
						4" Ice			
DC6-48-60-18-8F	B	From Leg	4.000	30.000	130.000	No Ice	2.567	2.567	0.033
			0.000			1/2"	2.798	2.798	0.055
			0.000			Ice	3.038	3.038	0.081
						1" Ice	3.543	3.543	0.143
						2" Ice	4.658	4.658	0.313
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	30.000	130.000	No Ice	6.119	4.254	0.055
			0.000			1/2"	6.626	5.014	0.103
			0.000			Ice	7.128	5.711	0.157
						1" Ice	8.164	7.155	0.287
						2" Ice	10.360	10.412	0.665
						4" Ice			
(2) LGP 21403	C	From Leg	4.000	30.000	130.000	No Ice	0.953	0.367	0.018
			0.000			1/2"	1.093	0.480	0.023
			0.000			Ice	1.242	0.601	0.031
						1" Ice	1.566	0.870	0.052
						2" Ice	2.318	1.510	0.123
						4" Ice			
(2) LGP21903	C	From Leg	4.000	30.000	130.000	No Ice	0.270	0.184	0.011
			0.000			1/2"	0.343	0.248	0.013
			0.000			Ice	0.425	0.322	0.017
						1" Ice	0.616	0.494	0.028
						2" Ice	1.101	0.943	0.072
						4" Ice			
(2) RRUS 11	C	From Leg	4.000	30.000	130.000	No Ice	3.249	1.373	0.051
			0.000			1/2"	3.491	1.551	0.071
			0.000			Ice	3.741	1.738	0.095
						1" Ice	4.268	2.138	0.153
						2" Ice	5.426	3.042	0.313
						4" Ice			
800 10764 w/ Mount Pipe	C	From Leg	4.000	30.000	130.000	No Ice	6.203	4.294	0.064
			0.000			1/2"	6.690	4.992	0.112
			0.000			Ice	7.178	5.662	0.166
						1" Ice	8.186	7.100	0.296
						2" Ice	10.328	10.300	0.673
						4" Ice			
Platform Mount [LP 304-1]	C	None		0.000	130.000	No Ice	17.460	17.460	1.349
						1/2"	22.440	22.440	1.625
						Ice	27.420	27.420	1.900
						1" Ice	37.380	37.380	2.451
						2" Ice	57.300	57.300	3.554
						4" Ice			
***									
APXV18-206517-C w/ Mount Pipe	A	From Leg	1.000	30.000	120.000	No Ice	5.404	4.700	0.052
			0.000			1/2"	5.960	5.860	0.097
			0.000			Ice	6.481	6.734	0.150
						1" Ice	7.547	8.515	0.280
						2" Ice	9.919	12.277	0.679
						4" Ice			
APXV18-206517-C w/ Mount Pipe	B	From Leg	1.000	30.000	120.000	No Ice	5.404	4.700	0.052
			0.000			1/2"	5.960	5.860	0.097
			0.000			Ice	6.481	6.734	0.150
						1" Ice	7.547	8.515	0.280
						2" Ice	9.919	12.277	0.679

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 K
						4" Ice			
APXV18-206517-C w/ Mount Pipe	C	From Leg	1.000 0.000 0.000	30.000	120.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.404 5.960 6.481 7.547 9.919	4.700 5.860 6.734 8.515 12.277	0.052 0.097 0.150 0.280 0.679
***									
Pipe Mount [PM 601-1]	A	From Leg	0.500 0.000 0.000	7.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.740 4.480 5.960 8.920	0.900 1.120 1.340 1.780 2.660	0.065 0.079 0.093 0.122 0.178
Pipe Mount [PM 601-1]	C	From Leg	0.500 0.000 0.000	63.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.740 4.480 5.960 8.920	0.900 1.120 1.340 1.780 2.660	0.065 0.079 0.093 0.122 0.178
***									
GPS_A	A	From Leg	4.000 0.000 1.000	0.000	79.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.297 0.374 0.459 0.655 1.151	0.297 0.374 0.459 0.655 1.151	0.001 0.005 0.010 0.025 0.079
Side Arm Mount [SO 701-1]	A	From Leg	2.000 0.000 0.000	0.000	79.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.850 1.140 1.430 2.010 3.170	1.670 2.340 3.010 4.350 7.030	0.065 0.079 0.093 0.121 0.177
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
**											
MPRC2449	A	Paraboloid w/o Radome	From Leg	1.000 0.000 0.000	7.000		100.000	2.167	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.690 3.980 4.270 4.840 6.000	0.020 0.040 0.060 0.110 0.190
MPRC2449	C	Paraboloid w/o Radome	From Leg	1.000 0.000 0.000	63.000		100.000	2.167	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.690 3.980 4.270 4.840 6.000	0.020 0.040 0.060 0.110 0.190
***											

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
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	160 - 140	Pole	Max Tension	14	0.000	-0.000	0.000
			Max. Compression	14	-11.810	0.649	0.948
			Max. Mx	11	-7.765	122.618	0.466
			Max. My	2	-7.764	0.272	122.800
			Max. Vy	11	-8.490	122.618	0.466
			Max. Vx	8	8.491	0.255	-121.817
			Max. Torque	9			-2.212
L2	140 - 120	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-25.214	2.112	-0.700
			Max. Mx	11	-15.585	426.193	0.295
			Max. My	2	-15.584	0.629	426.060
			Max. Vy	11	-18.024	426.193	0.295
			Max. Vx	8	18.037	0.202	-425.875
			Max. Torque	8			-3.224
L3	120 - 100	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-32.751	3.641	-0.906
			Max. Mx	11	-20.390	824.537	0.423
			Max. My	2	-20.388	1.133	824.306
			Max. Vy	11	-21.163	824.537	0.423
			Max. Vx	8	21.176	0.279	-824.262
			Max. Torque	8			-2.822
L4	100 - 80	Pole	Max Tension	1	0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	14	-40.809	5.825	-1.051
			Max. Mx	11	-25.744	1280.149	-0.034
			Max. My	8	-25.736	-2.949	-1284.253
			Max. Vy	5	24.096	-1278.913	-2.862
			Max. Vx	8	24.279	-2.949	-1284.253
			Max. Torque	8			-3.844
L5	80 - 60	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-49.222	7.701	-0.997
			Max. Mx	11	-31.516	1788.028	-0.326
			Max. My	8	-31.510	-6.326	-1795.951
			Max. Vy	5	26.711	-1787.370	-5.189
			Max. Vx	8	26.864	-6.326	-1795.951
			Max. Torque	8			-3.938
L6	60 - 40	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-58.998	9.499	-1.377
			Max. Mx	11	-38.835	2344.094	-0.909
			Max. My	8	-38.830	-9.706	-2356.104
			Max. Vy	5	28.980	-2344.017	-7.804
			Max. Vx	8	29.133	-9.706	-2356.104
			Max. Torque	8			-4.024
L7	40 - 20	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-68.633	11.208	-1.737
			Max. Mx	5	-46.220	-2942.111	-10.412
			Max. My	8	-46.218	-13.084	-2957.691
			Max. Vy	5	30.853	-2942.111	-10.412
			Max. Vx	8	31.005	-13.084	-2957.691
			Max. Torque	8			-4.100
L8	20 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-78.977	12.233	-1.954
			Max. Mx	5	-54.862	-3575.133	-12.967
			Max. My	8	-54.862	-16.585	-3594.007
			Max. Vy	5	32.460	-3575.133	-12.967
			Max. Vx	8	32.610	-16.585	-3594.007
			Max. Torque	8			-4.145

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	78.977	0.000	-0.000
	Max. H_x	11	54.867	32.386	-0.025
	Max. H_z	2	54.867	0.052	32.465
	Max. M_x	2	3580.333	0.052	32.465
	Max. M_z	5	3575.133	-32.450	-0.125
	Max. Torsion	2	3.715	0.052	32.465
	Min. Vert	33	54.867	-0.072	-12.735
	Min. H_x	5	54.867	-32.450	-0.125
	Min. H_z	8	54.867	-0.185	-32.601
	Min. M_x	8	-3594.007	-0.185	-32.601
	Min. M_z	11	-3573.769	32.386	-0.025
	Min. Torsion	8	-4.145	-0.185	-32.601

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	54.867	0.000	0.000	-0.082	2.509	0.000
Dead+Wind 0 deg - No Ice	54.867	-0.052	-32.465	-3580.333	8.276	-3.715
Dead+Wind 30 deg - No Ice	54.867	16.145	-28.063	-3095.208	-1777.855	-3.518

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 60 deg - No Ice	54.867	28.157	-16.061	-1772.451	-3101.197	-1.769
Dead+Wind 90 deg - No Ice	54.867	32.450	0.125	12.967	-3575.133	-0.005
Dead+Wind 120 deg - No Ice	54.867	28.124	16.479	1815.391	-3098.195	1.865
Dead+Wind 150 deg - No Ice	54.867	16.295	28.271	3116.497	-1793.676	3.416
Dead+Wind 180 deg - No Ice	54.867	0.185	32.601	3594.007	-16.585	4.145
Dead+Wind 210 deg - No Ice	54.867	-16.096	28.175	3106.412	1777.915	3.393
Dead+Wind 240 deg - No Ice	54.867	-28.012	16.333	1799.974	3091.581	2.128
Dead+Wind 270 deg - No Ice	54.867	-32.386	0.025	2.039	3573.769	0.459
Dead+Wind 300 deg - No Ice	54.867	-28.089	-16.294	-1796.836	3099.700	-1.535
Dead+Wind 330 deg - No Ice	54.867	-16.252	-28.136	-3102.955	1794.504	-2.972
Dead+Ice+Temp	78.977	-0.000	0.000	1.954	12.233	0.000
Dead+Wind 0 deg+Ice+Temp	78.977	-0.007	-4.990	-565.262	13.229	-0.798
Dead+Wind 30 deg+Ice+Temp	78.977	2.484	-4.315	-488.513	-269.917	-0.745
Dead+Wind 60 deg+Ice+Temp	78.977	4.329	-2.471	-279.164	-479.416	-0.408
Dead+Wind 90 deg+Ice+Temp	78.977	4.990	0.017	3.791	-554.607	-0.025
Dead+Wind 120 deg+Ice+Temp	78.977	4.325	2.530	289.159	-478.950	0.379
Dead+Wind 150 deg+Ice+Temp	78.977	2.505	4.344	495.481	-272.079	0.707
Dead+Wind 180 deg+Ice+Temp	78.977	0.026	5.010	571.195	9.801	0.858
Dead+Wind 210 deg+Ice+Temp	78.977	-2.477	4.330	494.098	294.129	0.728
Dead+Wind 240 deg+Ice+Temp	78.977	-4.309	2.509	287.054	502.261	0.458
Dead+Wind 270 deg+Ice+Temp	78.977	-4.981	0.003	2.331	578.618	0.089
Dead+Wind 300 deg+Ice+Temp	78.977	-4.320	-2.504	-282.536	503.366	-0.332
Dead+Wind 330 deg+Ice+Temp	78.977	-2.499	-4.325	-489.566	296.400	-0.644
Dead+Wind 0 deg - Service	54.867	-0.020	-12.681	-1398.866	4.798	-1.453
Dead+Wind 30 deg - Service	54.867	6.307	-10.962	-1209.330	-693.030	-1.376
Dead+Wind 60 deg - Service	54.867	10.999	-6.274	-692.539	-1210.051	-0.692
Dead+Wind 90 deg - Service	54.867	12.676	0.049	5.012	-1395.215	-0.002
Dead+Wind 120 deg - Service	54.867	10.986	6.437	709.207	-1208.879	0.730
Dead+Wind 150 deg - Service	54.867	6.365	11.043	1217.541	-699.212	1.336
Dead+Wind 180 deg - Service	54.867	0.072	12.735	1404.101	-4.914	1.621
Dead+Wind 210 deg - Service	54.867	-6.287	11.006	1213.599	696.184	1.327
Dead+Wind 240 deg - Service	54.867	-10.942	6.380	703.182	1209.423	0.832
Dead+Wind 270 deg - Service	54.867	-12.651	0.010	0.742	1397.810	0.180
Dead+Wind 300 deg - Service	54.867	-10.972	-6.365	-702.065	1212.596	-0.600
Dead+Wind 330 deg - Service	54.867	-6.349	-10.991	-1212.357	702.665	-1.162

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.000	-54.867	0.000	0.000	54.867	0.000	0.000%
2	-0.052	-54.867	-32.465	0.052	54.867	32.465	0.000%
3	16.145	-54.867	-28.063	-16.145	54.867	28.063	0.000%
4	28.157	-54.867	-16.061	-28.157	54.867	16.061	0.000%
5	32.450	-54.867	0.125	-32.450	54.867	-0.125	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
6	28.124	-54.867	16.479	-28.124	54.867	-16.479	0.000%
7	16.295	-54.867	28.271	-16.295	54.867	-28.271	0.000%
8	0.185	-54.867	32.601	-0.185	54.867	-32.601	0.000%
9	-16.096	-54.867	28.175	16.096	54.867	-28.175	0.000%
10	-28.012	-54.867	16.333	28.012	54.867	-16.333	0.000%
11	-32.386	-54.867	0.025	32.386	54.867	-0.025	0.000%
12	-28.089	-54.867	-16.294	28.089	54.867	16.294	0.000%
13	-16.252	-54.867	-28.136	16.252	54.867	28.136	0.000%
14	0.000	-78.977	0.000	0.000	78.977	-0.000	0.000%
15	-0.007	-78.977	-4.990	0.007	78.977	4.990	0.000%
16	2.484	-78.977	-4.315	-2.484	78.977	4.315	0.000%
17	4.329	-78.977	-2.471	-4.329	78.977	2.471	0.000%
18	4.990	-78.977	0.017	-4.990	78.977	-0.017	0.000%
19	4.325	-78.977	2.530	-4.325	78.977	-2.530	0.000%
20	2.505	-78.977	4.344	-2.505	78.977	-4.344	0.000%
21	0.026	-78.977	5.010	-0.026	78.977	-5.010	0.000%
22	-2.477	-78.977	4.330	2.477	78.977	-4.330	0.000%
23	-4.309	-78.977	2.509	4.309	78.977	-2.509	0.000%
24	-4.981	-78.977	0.003	4.981	78.977	-0.003	0.000%
25	-4.320	-78.977	-2.504	4.320	78.977	2.504	0.000%
26	-2.499	-78.977	-4.325	2.499	78.977	4.325	0.000%
27	-0.020	-54.867	-12.681	0.020	54.867	12.681	0.000%
28	6.307	-54.867	-10.962	-6.307	54.867	10.962	0.000%
29	10.999	-54.867	-6.274	-10.999	54.867	6.274	0.000%
30	12.676	-54.867	0.049	-12.676	54.867	-0.049	0.000%
31	10.986	-54.867	6.437	-10.986	54.867	-6.437	0.000%
32	6.365	-54.867	11.043	-6.365	54.867	-11.043	0.000%
33	0.072	-54.867	12.735	-0.072	54.867	-12.735	0.000%
34	-6.287	-54.867	11.006	6.287	54.867	-11.006	0.000%
35	-10.942	-54.867	6.380	10.942	54.867	-6.380	0.000%
36	-12.651	-54.867	0.010	12.651	54.867	-0.010	0.000%
37	-10.972	-54.867	-6.365	10.972	54.867	6.365	0.000%
38	-6.349	-54.867	-10.991	6.349	54.867	10.991	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00093535
3	Yes	5	0.00000001	0.00008405
4	Yes	5	0.00000001	0.00009669
5	Yes	4	0.00000001	0.00019295
6	Yes	5	0.00000001	0.00009942
7	Yes	5	0.00000001	0.00008524
8	Yes	4	0.00000001	0.00096128
9	Yes	5	0.00000001	0.00010275
10	Yes	5	0.00000001	0.00008790
11	Yes	4	0.00000001	0.00019188
12	Yes	5	0.00000001	0.00008862
13	Yes	5	0.00000001	0.00010267
14	Yes	4	0.00000001	0.00004042
15	Yes	5	0.00000001	0.00005846
16	Yes	5	0.00000001	0.00005836
17	Yes	5	0.00000001	0.00005796
18	Yes	5	0.00000001	0.00005709
19	Yes	5	0.00000001	0.00005846
20	Yes	5	0.00000001	0.00005908
21	Yes	5	0.00000001	0.00005907
22	Yes	5	0.00000001	0.00006054
23	Yes	5	0.00000001	0.00006089
24	Yes	5	0.00000001	0.00006002
25	Yes	5	0.00000001	0.00006070
26	Yes	5	0.00000001	0.00006020
27	Yes	4	0.00000001	0.00019279

28	Yes	4	0.00000001	0.00032044
29	Yes	4	0.00000001	0.00038801
30	Yes	4	0.00000001	0.00008869
31	Yes	4	0.00000001	0.00040209
32	Yes	4	0.00000001	0.00032507
33	Yes	4	0.00000001	0.00020337
34	Yes	4	0.00000001	0.00043751
35	Yes	4	0.00000001	0.00033056
36	Yes	4	0.00000001	0.00008931
37	Yes	4	0.00000001	0.00033349
38	Yes	4	0.00000001	0.00043369

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	15.868	33	0.767	0.004
L2	140 - 120	12.681	33	0.749	0.003
L3	120 - 100	9.635	33	0.694	0.002
L4	100 - 80	6.889	33	0.608	0.002
L5	80 - 60	4.543	33	0.505	0.001
L6	60 - 40	2.644	33	0.396	0.001
L7	40 - 20	1.209	33	0.284	0.001
L8	20 - 0	0.306	33	0.142	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.000	Lighting Rod 3/4" x 4'	33	15.868	0.767	0.004	138881
150.000	APXVSPP18-C-A20 w/ Mount Pipe	33	14.266	0.761	0.003	69440
148.000	800MHZ 2X50W RRH	33	13.947	0.759	0.003	57867
140.000	(2) FD9R6004/2C-3L	33	12.681	0.749	0.003	34345
130.000	(2) 7770.00 w/ Mount Pipe	33	11.130	0.727	0.002	21286
120.000	APXV18-206517-C w/ Mount Pipe	33	9.635	0.694	0.002	15497
100.000	MPRC2449	33	6.889	0.608	0.002	11755
79.000	GPS_A	33	4.437	0.500	0.001	10599

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	160 - 140	40.623	7	1.962	0.010
L2	140 - 120	32.464	7	1.918	0.007
L3	120 - 100	24.668	7	1.778	0.005
L4	100 - 80	17.638	7	1.556	0.004
L5	80 - 60	11.631	7	1.293	0.003
L6	60 - 40	6.770	7	1.013	0.002
L7	40 - 20	3.097	7	0.728	0.001
L8	20 - 0	0.784	7	0.363	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
160.000	Lighting Rod 3/4" x 4'	7	40.623	1.962	0.010	54986
150.000	APXVSPP18-C-A20 w/ Mount Pipe	7	36.522	1.948	0.009	27493
148.000	800MHZ 2X50W RRH	7	35.705	1.943	0.008	22910
140.000	(2) FD9R6004/2C-3L	7	32.464	1.918	0.007	13584
130.000	(2) 7770.00 w/ Mount Pipe	7	28.495	1.861	0.006	8367
120.000	APXV18-206517-C w/ Mount Pipe	7	24.668	1.778	0.005	6076
100.000	MPRC2449	7	17.638	1.556	0.004	4607
79.000	GPS_A	7	11.361	1.279	0.003	4145

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 $\frac{P}{P_a}$
L1	160 - 140 (1)	P36x3/8	20.000	0.000	0.0	23.696	41.970	-7.764	994.507	0.008
L2	140 - 120 (2)	P42x3/8	20.000	0.000	0.0	22.711	49.038	-15.583	1113.690	0.014
L3	120 - 100 (3)	P48x3/8	20.000	0.000	0.0	21.972	56.107	-20.388	1232.770	0.017
L4	100 - 80 (4)	P54x3/8	20.000	0.000	0.0	21.397	63.175	-25.735	1351.780	0.019
L5	80 - 60 (5)	P60x3/8	20.000	0.000	0.0	20.938	70.244	-31.509	1470.730	0.021
L6	60 - 40 (6)	P60x1/2	20.000	0.000	0.0	22.317	93.462	-38.830	2085.770	0.019
L7	40 - 20 (7)	P60x1/2	20.000	0.000	0.0	22.317	93.462	-46.218	2085.770	0.022
L8	20 - 0 (8)	P60x5/8	20.000	0.000	0.0	23.696	116.583	-54.862	2762.520	0.020

Pole Bending Design Data

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 $\frac{f_{by}}{F_{by}}$
L1	160 - 140 (1)	P36x3/8	122.896	3.986	23.696	0.168	0.000	0.000	23.696	0.000
L2	140 - 120 (2)	P42x3/8	426.398	10.116	22.711	0.445	0.000	0.000	22.711	0.000
L3	120 - 100 (3)	P48x3/8	824.907	14.934	21.972	0.680	0.000	0.000	21.972	0.000
L4	100 - 80 (4)	P54x3/8	1284.308	18.323	21.397	0.856	0.000	0.000	21.397	0.000
L5	80 - 60 (5)	P60x3/8	1796.450	20.717	20.938	0.989	0.000	0.000	20.938	0.000
L6	60 - 40 (6)	P60x1/2	2357.017	20.514	22.317	0.919	0.000	0.000	22.317	0.000
L7	40 - 20 (7)	P60x1/2	2959.008	25.754	22.317	1.154	0.000	0.000	22.317	0.000
L8	20 - 0 (8)	P60x5/8	3595.808	25.194	23.696	1.063	0.000	0.000	23.696	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	160 - 140 (1)	P36x3/8	8.491	0.405	16.800	0.024	1.321	0.021	11.901	0.002
L2	140 - 120 (2)	P42x3/8	18.041	0.736	16.800	0.044	2.428	0.029	9.661	0.003
L3	120 - 100 (3)	P48x3/8	21.180	0.755	16.800	0.045	2.478	0.022	8.740	0.003
L4	100 - 80 (4)	P54x3/8	24.302	0.769	16.800	0.046	3.415	0.024	8.001	0.003
L5	80 - 60 (5)	P60x3/8	26.894	0.766	16.800	0.046	3.298	0.019	7.394	0.003
L6	60 - 40 (6)	P60x1/2	29.163	0.624	16.800	0.037	3.347	0.015	10.593	0.001
L7	40 - 20 (7)	P60x1/2	31.035	0.664	16.800	0.040	3.391	0.015	10.593	0.001
L8	20 - 0 (8)	P60x5/8	32.640	0.560	16.800	0.033	3.416	0.012	14.001	0.001

Pole Interaction Design Data

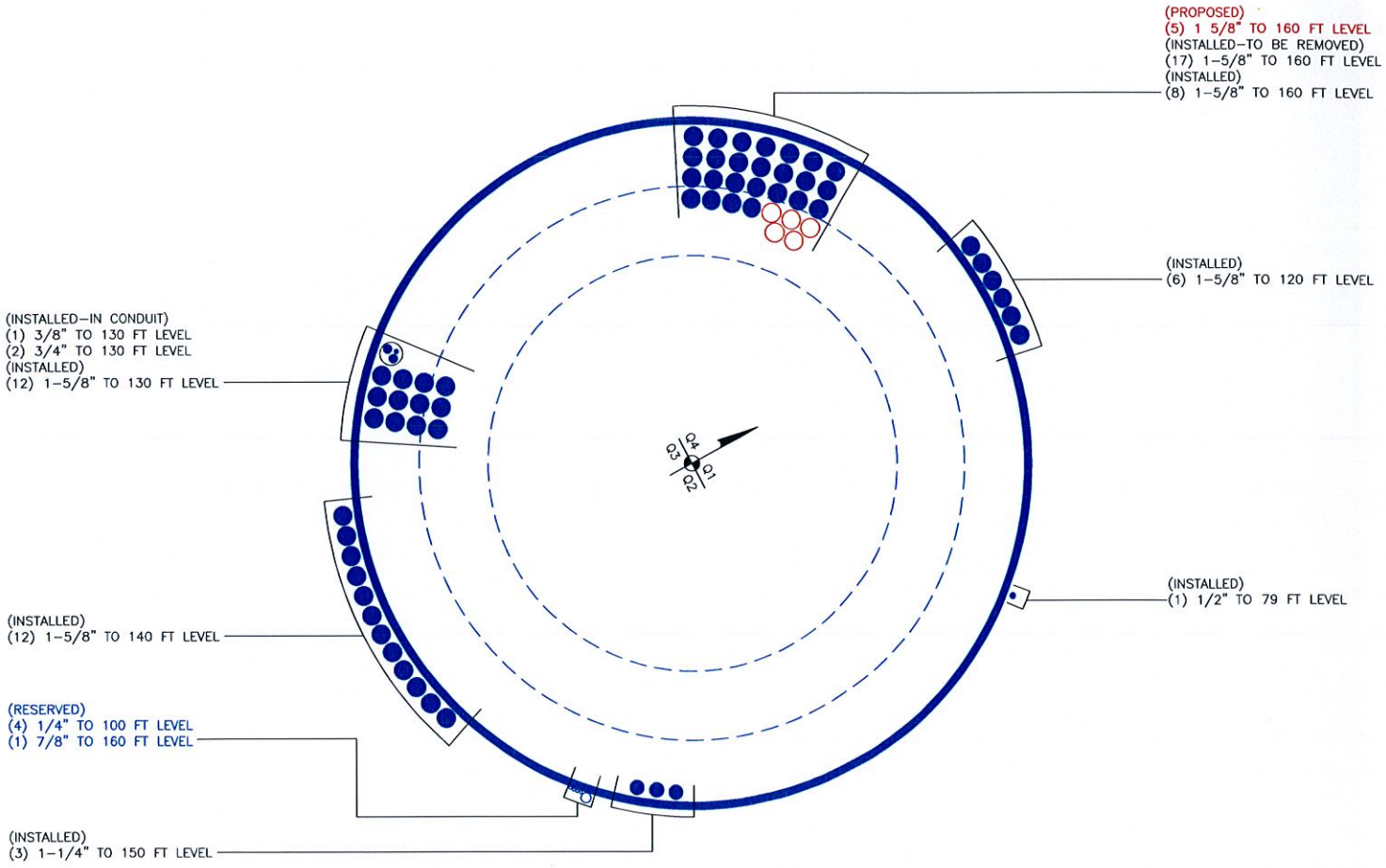
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 140 (1)	0.008	0.168	0.000	0.024	0.002	0.177 ✔	1.333	H1-3+VT ✔
L2	140 - 120 (2)	0.014	0.445	0.000	0.044	0.003	0.462 ✔	1.333	H1-3+VT ✔
L3	120 - 100 (3)	0.017	0.680	0.000	0.045	0.003	0.698 ✔	1.333	H1-3+VT ✔
L4	100 - 80 (4)	0.019	0.856	0.000	0.046	0.003	0.878 ✔	1.333	H1-3+VT ✔
L5	80 - 60 (5)	0.021	0.989	0.000	0.046	0.003	1.013 ✔	1.333	H1-3+VT ✔
L6	60 - 40 (6)	0.019	0.919	0.000	0.037	0.001	0.939 ✔	1.333	H1-3+VT ✔
L7	40 - 20 (7)	0.022	1.154	0.000	0.040	0.001	1.178 ✔	1.333	H1-3+VT ✔
L8	20 - 0 (8)	0.020	1.063	0.000	0.033	0.001	1.084 ✔	1.333	H1-3+VT ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	160 - 140	Pole	P36x3/8	1	-7.764	1325.678	13.3	Pass
L2	140 - 120	Pole	P42x3/8	2	-15.583	1484.549	34.6	Pass
L3	120 - 100	Pole	P48x3/8	3	-20.388	1643.282	52.4	Pass
L4	100 - 80	Pole	P54x3/8	4	-25.735	1801.923	65.8	Pass
L5	80 - 60	Pole	P60x3/8	5	-31.509	1960.483	76.0	Pass
L6	60 - 40	Pole	P60x1/2	6	-38.830	2780.331	70.5	Pass
L7	40 - 20	Pole	P60x1/2	7	-46.218	2780.331	88.4	Pass
L8	20 - 0	Pole	P60x5/8	8	-54.862	3682.439	81.3	Pass
							Summary	
						Pole (L7)	88.4	Pass
						RATING =	**88.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(PROPOSED)
(5) 1 5/8" TO 160 FT LEVEL
(INSTALLED–TO BE REMOVED)
(17) 1–5/8" TO 160 FT LEVEL
(INSTALLED)
(8) 1–5/8" TO 160 FT LEVEL
(INSTALLED)
(6) 1–5/8" TO 120 FT LEVEL
(INSTALLED–IN CONDUIT)
(1) 3/8" TO 130 FT LEVEL
(2) 3/4" TO 130 FT LEVEL
(INSTALLED)
(12) 1–5/8" TO 130 FT LEVEL
Q4
Q1
Q3
Q2
(INSTALLED)
(1) 1/2" TO 79 FT LEVEL
(INSTALLED)
(12) 1–5/8" TO 140 FT LEVEL
(RESERVED)
(4) 1/4" TO 100 FT LEVEL
(1) 7/8" TO 160 FT LEVEL
(INSTALLED)
(3) 1–1/4" TO 150 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Re

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Pole Manufacturer:	Pirod

Bolt Data			
Qty:	25		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	39		

Plate Data		
Diam:	42	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.52	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	122.89538	ft-kips
Axial:	7.764	kips
Shear:	8.490912	kips
Elevation:	140	feet

If No stiffeners, Criteria: AISC ASD <-Only Applcable to Unstiff

Flange Bolt Results

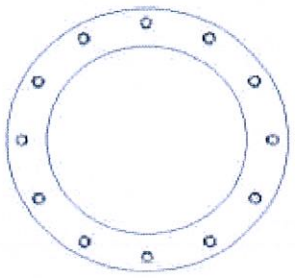
Bolt Tension Capacity, **B**:	46.07 kips
Max Bolt directly applied T:	5.74 Kips
Min. PL "tc" for **B** cap. **w/o** Pry:	1.303 in
Min PL "treq" for actual **T w/ Pry**:	0.346 in
Min PL "t1" for actual **T w/o Pry**:	0.460 in
T allowable with Prying:	44.84 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	5.74 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	12.5% **Pass**

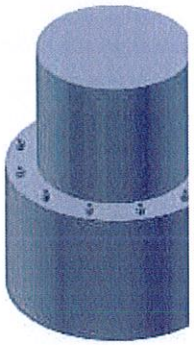
Exterior Flange Plate Results Flexural Check

Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	7.7% **Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Manufacturer:	Pirod

Reactions		
Moment:	122.89538	ft-kips
Axial:	7.764	kips
Shear:	8.490912	kips
Exterior Flange Run, T+Q:	5.7396742	kips

Elevation: 140 feet

Bolt Data			
Qty:	25		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	39	in	

Plate Data		
Plate Outer Diam:	41.25	in
Plate Inner Diam:	35.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.18	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Pole OuterDiam:	42	in
Thick:	0.375	in
Pole Inner Diam:	41.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi

Stress Increase Factor		
ASIF:	1.333	

Interior Flange Bolt Results

Maximum Bolt Tension:	5.7	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	12.5%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	6.4	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

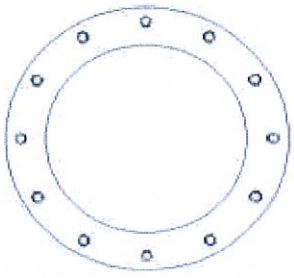
n/a

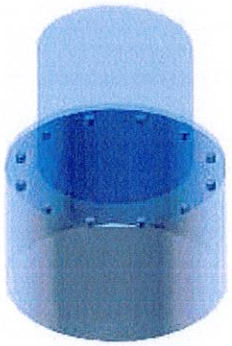
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Re

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Pole Manufacturer:	Pirod

Reactions		
Moment:	426.41956	ft-kips
Axial:	15.5836	kips
Shear:	18.035766	kips
Elevation:	120	feet

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiff

Bolt Data			
Qty:	29		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	45		

Plate Data		
Diam:	48	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.55	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	42	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

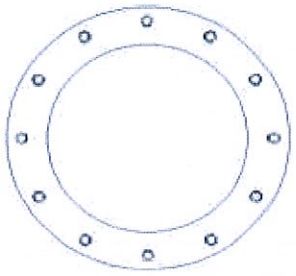
Flange Bolt Results

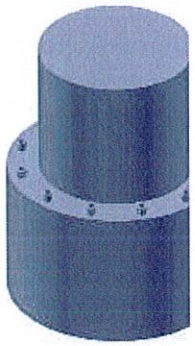
Bolt Tension Capacity, **B**:	46.07 kips
Max Bolt directly applied T:	15.15 Kips
Min. PL "tc" for **B** cap. **w/o** Pry:	1.299 in
Min PL "treq" for actual **T w/ Pry**:	0.561 in
Min PL "t1" for actual **T w/o Pry**:	0.745 in
T allowable with Prying:	44.92 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	15.15 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	32.9% **Pass**

Exterior Flange Plate Results	Flexural Check
Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	20.1% **Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Reactions		
Moment:	426.41956	ft-kips
Axial:	15.5836	kips
Shear:	18.035766	kips
Exterior Flange Run, T+Q:	15.147032	kips

Manufacturer:	Pirod

Elevation: 120 feet

Bolt Data			
Qty:	29		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle:	45	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	15.1	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	32.9%	**Pass**

Plate Data		
Plate Outer Diam:	47.25	in
Plate Inner Diam:	41.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.12	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	16.2	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

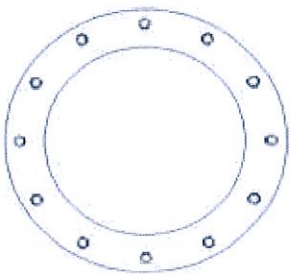
Stiffener Results N/A for Rohn / Pirod

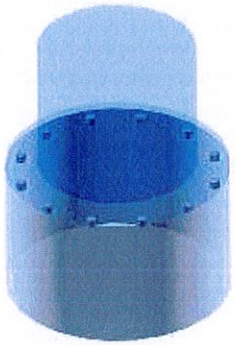
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	48	in
Thick:	0.375	in
Pole Inner Diam:	47.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi





Stress Increase Factor		
ASIF:	1.333	

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Re

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Pole Manufacturer:	Pirod

Reactions		
Moment:	824.93538	ft-kips
Axial:	20.3881	kips
Shear:	21.174646	kips
Elevation:	100	feet

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiff

Bolt Data			
Qty:	33		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	51		

Plate Data		
Diam:	54	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	48	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

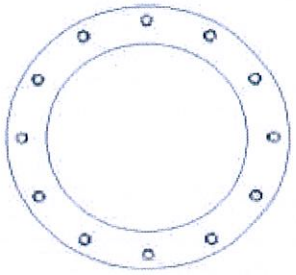
Flange Bolt Results

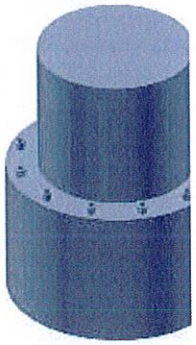
Bolt Tension Capacity, **B**:	46.07 kips
Max Bolt directly applied T:	22.91 Kips
Min. PL "tc" for **B** cap. **w/o** Pry:	1.296 in
Min PL "treq" for actual **T w/ Pry**:	0.688 in
Min PL "t1" for actual **T w/o Pry**:	0.914 in
T allowable with Prying:	44.99 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	22.91 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	49.7% **Pass**

Exterior Flange Plate Results	Flexural Check
Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	30.3% **Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Manufacturer:	Pirod

Reactions		
Moment:	824.93538	ft-kips
Axial:	20.3881	kips
Shear:	21.174646	kips
Exterior Flange Run, T+Q:	22.909748	kips

Elevation: 100 feet

Bolt Data			
Qty:	33		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	51	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	22.9	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	49.7%	**Pass**

Plate Data		
Plate Outer Diam:	53.25	in
Plate Inner Diam:	47.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.07	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	24.1	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

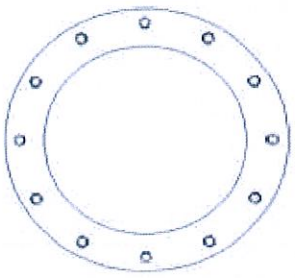
Stiffener Results N/A for Rohn / Pirod

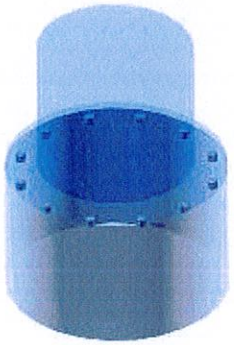
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	54	in
Thick:	0.375	in
Pole Inner Diam:	53.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi





Stress Increase Factor		
ASIF:	1.333	

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Re

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Pole Manufacturer:	Pirod

Reactions		
Moment:	1284.3101	ft-kips
Axial:	25.7352	kips
Shear:	24.301655	kips
Elevation:	80	feet

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiff

Bolt Data			
Qty:	45		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty:
N/A:		<-- Disregard	44.00
Circle (in.):	57		

Plate Data		
Diam:	60	in
Thick, t:	1.25	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	3.77	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	54	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

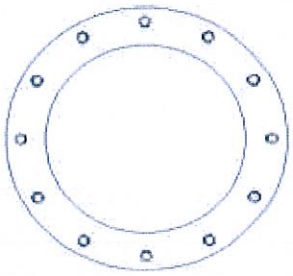
Flange Bolt Results

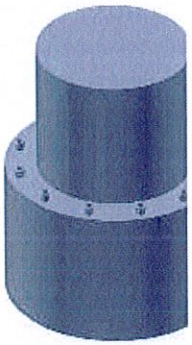
Bolt Tension Capacity, **B**:	46.07 kips
Max Bolt directly applied T:	23.46 Kips
Min. PL "tc" for **B** cap. **w/o** Pry:	1.427 in
Min PL "treq" for actual **T w/ Pry**:	0.777 in
Min PL "t1" for actual **T w/o Pry**:	1.019 in
T allowable with Prying:	42.49 kips
Prying Force, Q:	0.00 kips
Total Bolt Tension=T+Q:	23.46 kips
Prying Bolt Stress Ratio=(T+Q)/(B):	50.9% **Pass**

Exterior Flange Plate Results	Flexural Check
Compression Side Plate Stress:	Rohn/Pirod, OK
Allowable Plate Stress:	36.0 ksi
Compression Plate Stress Ratio:	Rohn/Pirod, OK
No Prying	
Tension Side Stress Ratio, (treq/t)^2:	38.6% **Pass**

n/a

Stiffener Results	N/A for Rohn / Pirod
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A
Pole Results	
Pole Punching Shear Check:	N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Reactions		
Moment:	1284.3101	ft-kips
Axial:	25.7352	kips
Shear:	24.301655	kips
Exterior Flange Run, T+Q:	23.461981	kips

Manufacturer:	Pirod

Elevation: 80 feet

Bolt Data			
Qty:	45		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	57	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	23.5	Kips, Ext. T=Interior T
Allowable Tension:	46.1	Kips
Bolt Stress Ratio:	50.9%	**Pass**

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	53.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.14	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	24.6	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

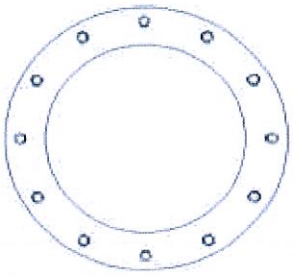
Stiffener Results N/A for Rohn / Pirod

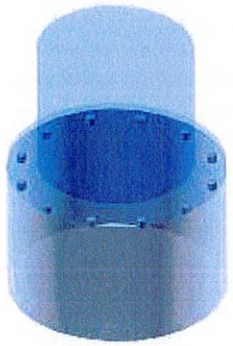
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi





Stress Increase Factor		
ASIF:	1.333	

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Reactions		
Moment:	1796.4501	ft-kips
Axial:	31.516	kips
Shear:	26.885996	kips
Exterior Flange Run, T+Q:		kips

Manufacturer:	Pirod

Elevation: 60 feet

Bolt Data			
Qty:	64		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	56.25	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	23.5	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	32.6%	**Pass**

Plate Data		
Plate Outer Diam:	59.25	in
Plate Inner Diam:	53.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	2.91	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	24.4	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

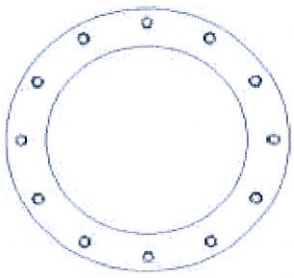
Stiffener Results N/A for Rohn / Pirod

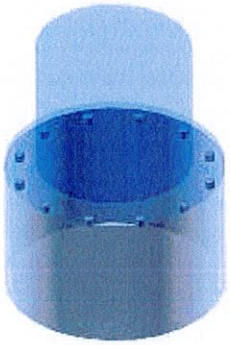
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.375	in
Pole Inner Diam:	59.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi





Stress Increase Factor		
ASIF:	1.333	

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Manufacturer:	Pirod

Reactions		
Moment:	2357.0131	ft-kips
Axial:	38.8382	kips
Shear:	29.1516	kips
Exterior Flange Run, T+Q:		kips

Elevation: 40 feet

Bolt Data			
Qty:	64		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	56	in	

Interior Flange Bolt Results

Maximum Bolt Tension:	31.0	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	43.0%	**Pass**

Plate Data		
Plate Outer Diam:	59	in
Plate Inner Diam:	53	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	2.90	in

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	32.2	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

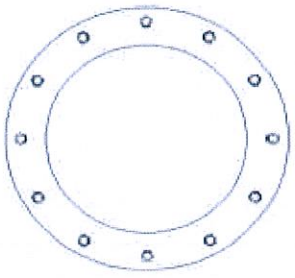
Stiffener Results N/A for Rohn / Pirod

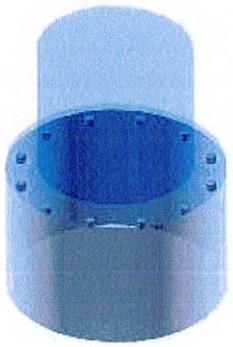
Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.5	in
Pole Inner Diam:	59	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi





Stress Increase Factor		
ASIF:	1.333	

* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Manufacturer:	Pirod

Bolt Data			
Qty:	64		
Diam:	1.25	Bolt Fu:	105
Bolt Material:	A325	Bolt Fy:	81
N/A:		<-- Disregard	Bolt Fty: 44.00
N/A:		<-- Disregard	
Circle:	56	in	

Plate Data		
Plate Outer Diam:	58.75	in
Plate Inner Diam:	52.75	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	2.88	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Pole OuterDiam:	60	in
Thick:	0.625	in
Pole Inner Diam:	58.75	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi

Stress Increase Factor		
ASIF:	1.333	

Reactions		
Moment:	2959.0096	ft-kips
Axial:	46.228	kips
Shear:	31.020228	kips
Exterior Flange Run, T+Q:		kips

Elevation: 20 feet

Interior Flange Bolt Results

Maximum Bolt Tension:	38.9	Kips, Ext. T=Interior T
Allowable Tension:	72.0	Kips
Bolt Stress Ratio:	54.1%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	40.4	Kips, Ext. C= Interior C
Plate Stress:	Rohn/Pirod	OK
Allowable Plate Stress:	36.0	ksi
Plate Stress Ratio:	Rohn/Pirod	OK

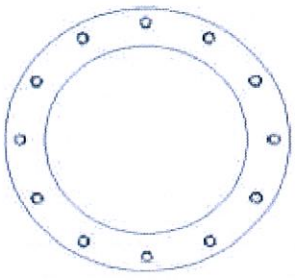
n/a

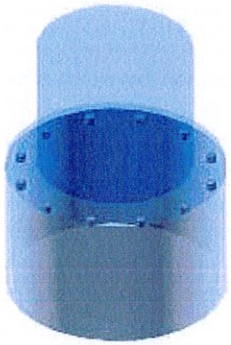
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Pole Manufacturer:	*Pirod*

Reactions		
Moment:	3595.8068	ft-kips
Axial:	54.8617	kips
Shear:	32.640028	kips

Anchor Rod Data		
Qty:	52	
Diam:	1.25	in
Rod Material:	Other	
Strength (Fu):	150	ksi
Yield (Fy):	105	ksi
Bolt Circle:	67	in

Plate Data		
Diam:	70	in
Thick:	1	in
Grade:	36	ksi
Single-Rod B-eff:	3.62	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

Pole Data		
Diam:	60	in
Thick:	0.625	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	57	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

If No stiffeners, Criteria:	AISC ASD	<-Only Applcable to Unstiffened Cases

Anchor Rod Results

Maximum Rod Tension:	48.5 Kips	Non-Rigid
Allowable Tension:	81.0 Kips	Service, ASD
Anchor Rod Stress Ratio:	59.9% **Pass**	Fty*ASIF

Base Plate Results Flexural Check

Base Plate Stress:	Rohn/Pirod, OK	Non-Rigid
Allowable Plate Stress:	36.0 ksi	Service ASD
Base Plate Stress Ratio:	Rohn/Pirod, OK	0.75*Fy*ASIF
		Y.L. Length: 29.82

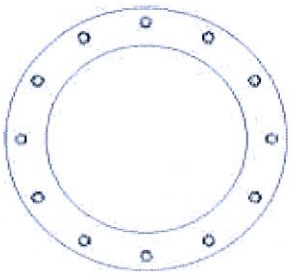
n/a

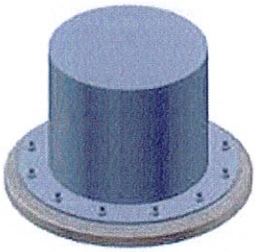
Stiffener Results N/A for Rohn / Pirod

Horizontal Weld :	N/A
Vertical Weld:	N/A
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	N/A
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	N/A
Plate Comp. (AISC Bracket):	N/A

Pole Results

Pole Punching Shear Check: N/A





* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

(Bearing and Stability Checks) Tool for TIA Rev F or G - Application (MP, SST with unitbase)

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *????*

Enter Load Factors Below:		
For P (DL)	1.2	<---- Enter Factor
For P,V, and M (WL)	1.35	<---- Enter Factor

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	30	in
Pad Bearing Depth, D:	5	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	28	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	7	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	49.00	ft^2
Pier Height:	4.50	ft
Soil (above pad) Height:	2.00	ft

Soil Parameters		
Unit Weight, γ:	125.0	pcf
Ultimate Bearing Capacity, qn:	16.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	12.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	44.1	kips
Pad Force Location Above D:	1.29	ft
ϕ(Passive Pressure Moment):	56.65	ft-kips
Factored O.T. M(WL), "1.6W":	5184.8	ft-kips
Factored OT (MW-Msoil), M1	5128.17	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.15	ft
Sum of Soil Wedges Wt:	9.37	kips
Soil Wedges ecc, K1:	9.35	ft
Ftg+Soil above Pad wt:	569.6	kips
Unfactored (Total ftg-soil Wt):	579.00	kips
1.2D. **No Soil Wedges.**	749.38	kips
0.9D. **With Soil Wedges**	570.47	kips

Resistance due to Cohesion (Vertical)		
ϕ*(1/2*Cu)(Total Vert. Planes)	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	54.8617	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	32.64003	kips
Unfactored WL Moment, M:	3595.807	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	65.83404	kips
0.90	0.9D+1.6W, Pu:	49.37553	kips
1.35	Vu:	44.06404	kips
	Mu:	4854.339	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(No Soil Wedges) [Reaction+Conc+Soil]	749.38	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	5128.17	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	6.84	ft
Orthogonal qu=	1.89	ksf
qu/ϕ*qn Ratio=	**15.75%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	4.84	ft
Diagonal qu=	2.23	ksf
qu/ϕ*qn Ratio=	**18.60%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(w/ Soil Wedges) [Reaction+Conc+Soil]	570.47	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	5049.28	ft-kips

Orthogonal ecc3 = M2/P2 =	8.85	ft
Ortho Non Bearing Length,NBL=	17.70	ft
Orthogonal qu=	1.98	ksf
Diagonal qu=	2.38	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	3595.81		
M Orthogonal:	5420.01	**66.34%**	**Pass**
M Diagonal:	5420.01	**66.34%**	**Pass**

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *828540*
Site Name: *TORRINGTON-RT 8*
App #: *216333 R2*

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Pier Properties

Concrete:

Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	4	
Vert. Cage Diameter =	6.32	ft
Vert. Cage Diameter =	75.87	in
Vertical Bar Size =	9	
Bar Diameter =	1.13	in
Bar Area =	1	in^2
Number of Bars =	42	
As Total=	42	in^2
A s/ Aconc, Rho:	0.0076	0.76%

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0032
200 / Fy:	0.0033

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.76%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	11033.99	kips
at Mu=(ϕ=0.65)Mn=	6742.63	ft-kips
Max Tu, (φ=0.9) Tn =	2268	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	3742.687	ft-kips **(* Note)**
Max. Service Shaft P:	54.8617	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Load Factor	Shaft Factored Loads		
1.30	Mu:	4865.493	ft-kips
1.30	Pu:	71.32021	kips

Material Properties

Concrete Comp. strength, f'c =	4000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	

ACI 318 Code

Select Analysis ACI Code= 2002

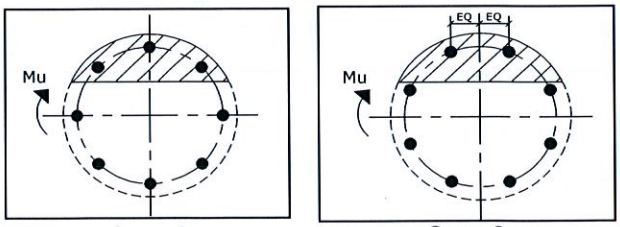
Seismic Properties

Seismic Design Category =	D
Seismic Risk =	**High**

Solve (Run) <-- Press Upon Completing All Input

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis:	**13.41**	in
Extreme Steel Strain, εt:	**0.0149**	
	εt > 0.0050, Tension Controlled	
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	71.32	kips
Drilled Shaft Moment Capacity, φMn:	**6770.33**	ft-kips
Drilled Shaft Superimposed Mu:	**4865.49**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**71.9%**

EXHIBIT C

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11369A

Torrington / Route 8

218 Wheeler Road
Torrington, CT 06790

March 14, 2014

EBI PROJECT NUMBER: 62141311

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

EBI Consulting
environmental | engineering | due diligence

March 14, 2014

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Re: Emissions Values for Site: **CT11369A - Torrington / Route 8**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 218 Wheeler Road, Torrington, CT, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μW/cm2). The general population exposure limit for the cellular band is 567 μW/cm2, and the general population exposure limit for the PCS and AWS bands is 1000 μW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 218 Wheeler Road, Torrington, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, the actual antenna pattern gain value in the direction of the sample area was used. For this report the sample point is a 6 foot person standing at the base of the tower

For all calculations, all equipment was calculated using the following assumptions:

1) 2 GSM channels (1935.000 MHz—to 1945.000 MHz / 1980.000 MHz—to 1985.000 MHz) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
3) 2 LTE channels (2110.000 to 2120.000 MHz / 2140.000 MHz to 2145.000 MHz) were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
6) The antenna used in this modeling is the Ericsson AIR21 for LTE, UMTS and GSM. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.6 dBd gain value at its main lobe. Actual antenna gain values were used for all calculations as per the manufacturers specifications

7) The antenna mounting height centerline of the proposed antennas is **160 feet** above ground level (AGL)
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

9A - Torrington / Route 8
r Road, Torrington, CT 06790
Monopole

Sector 1

Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	160	154	None	0	0	48.326044	0.732564	0.07326%
Not Used	-	-			0	-3.95	160	154	None	0	0	0	0	0.00000%
Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	160	154	1-5/8"	0	0	24.163022	0.366282	0.03663%
Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	160	154	1-5/8"	0	0	24.163022	0.366282	0.03663%
											Sector total Power Density Value:		0.147%	

Sector 2

Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	160	154	None	0	0	48.326044	0.732564	0.07326%
Not Used	-	-			0	-3.95	160	154	None	0	0	0	0	0.00000%
Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	160	154	1-5/8"	0	0	24.163022	0.366282	0.03663%
Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	160	154	1-5/8"	0	0	24.163022	0.366282	0.03663%
											Sector total Power Density Value:		0.147%	

Sector 3

Status	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	160	154	None	0	0	48.326044	0.732564	0.07326%
Not Used	-	-			0	-3.95	160	154	None	0	0	0	0	0.00000%
Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	160	154	1-5/8"	0	0	24.163022	0.366282	0.03663%
Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	160	154	1-5/8"	0	0	24.163022	0.366282	0.03663%
											Sector total Power Density Value:		0.147%	

Site Composite MPE %

Carrier	MPE %
T-Mobile	0.440%
Sprint	4.400%
MetroPCS	8.440%
Verizon Wireless	14.710%
AT&T	19.020%
Total Site MPE %	**47.010%**

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Summary

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

The anticipated Maximum Composite contributions from the T-Mobile facility are **0.440% (0.147% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **47.010%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

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