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

April 10, 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 CTHA332C
258 Ridge Road, Madison CT

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, Crown Castle owns the existing monopole telecommunications tower and related facility at 258 Ridge Road, Madison, Connecticut (Latitude: 41.3091944, Longitude: -72.61411111). T-Mobile intends to replace three existing antennas with six new antennas and related equipment at this existing telecommunications facility in Madison ("Madison 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 First Selectman Fillmore McPherson. The Town of Madison is also the property owner.

The existing Madison Facility consists of a 150 foot monopole guyed tower.[1] T-Mobile plans to replace three existing antennas with six new antennas and add three TMAs (tower mounted amplifiers) at a centerline of 150 feet. (See the plans revised to April 8, 2014 attached hereto as Exhibit A). T-Mobile will also install fiber cable and reuse existing coax cables. The existing Madison Facility is structurally capable of supporting T-Mobile's proposed modifications, as indicated in the structural analysis dated March 26, 2014 and attached hereto as Exhibit B.

[1] The Madison Facility was approved as Docket 363. The Decision and Order reflects that the tower must be not taller than 150 feet but does not limit the configuration of antennas. The existing/proposed antenna height is consistent with the D&M Plan dated November 20, 2008.

The planned modifications to the Madison Facility fall squarely within those activities 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 and additional antennas will be installed at a centerline of 150 feet, merely replacing existing antennas located at the same 150 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 or lease area, as depicted on Sheet L-1 of Exhibit A. T-Mobile's equipment will be located entirely within the existing compound area.

3. The proposed modification to the Madison 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 April 7, 2014, T-Mobile's operations would add 0.503% 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 39.773% of the FCC Standard as calculated for a mixed frequency site as evidenced by the engineering exhibit attached hereto as Exhibit C.

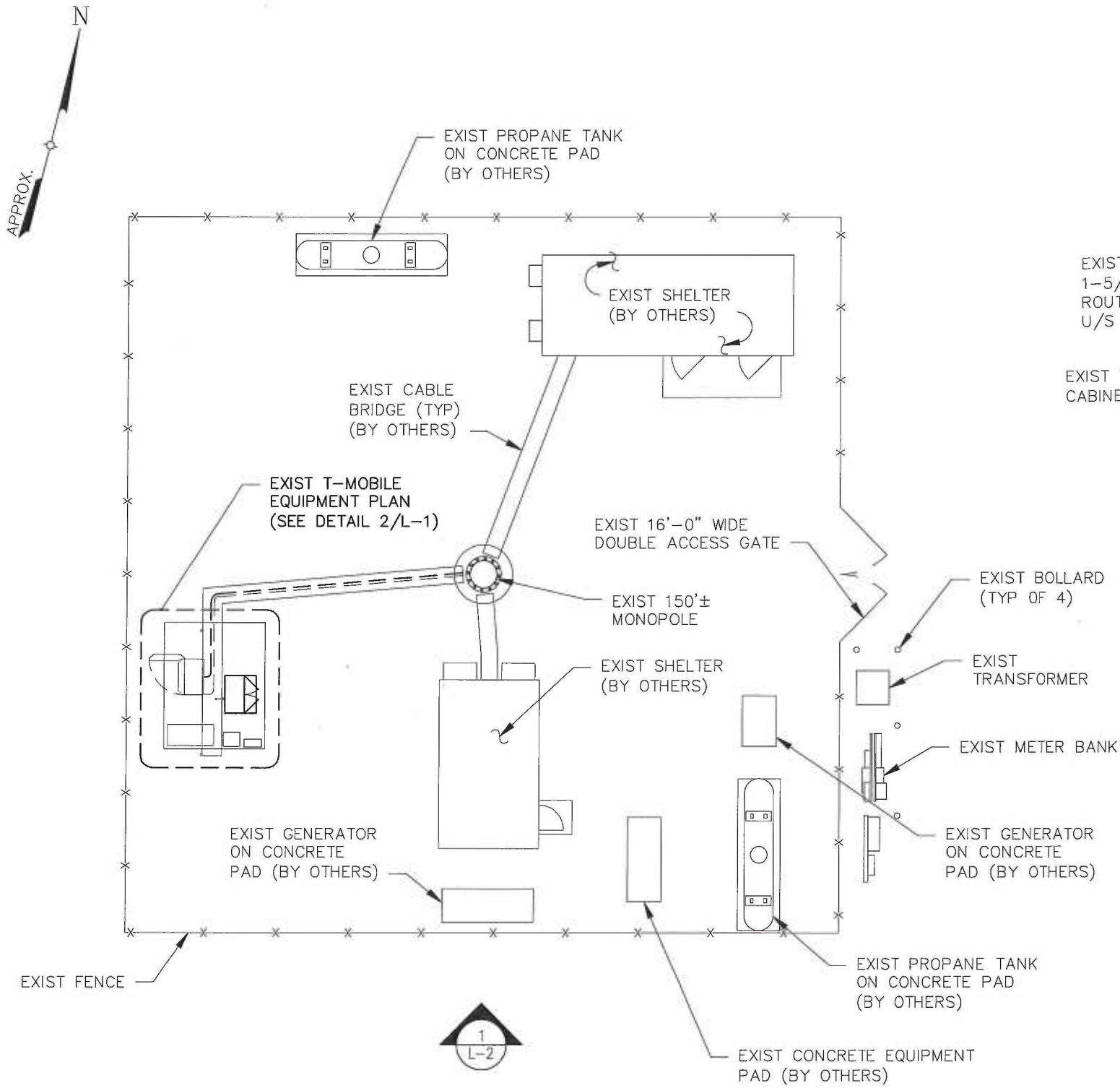
For the foregoing reasons, T-Mobile respectfully submits that the proposed replacement antennas and equipment at the Madison Facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Upon acknowledgement by the Council of this proposed exempt modification, T-Mobile shall commence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

Sincerely,

Julie D. Kohler, Esq.

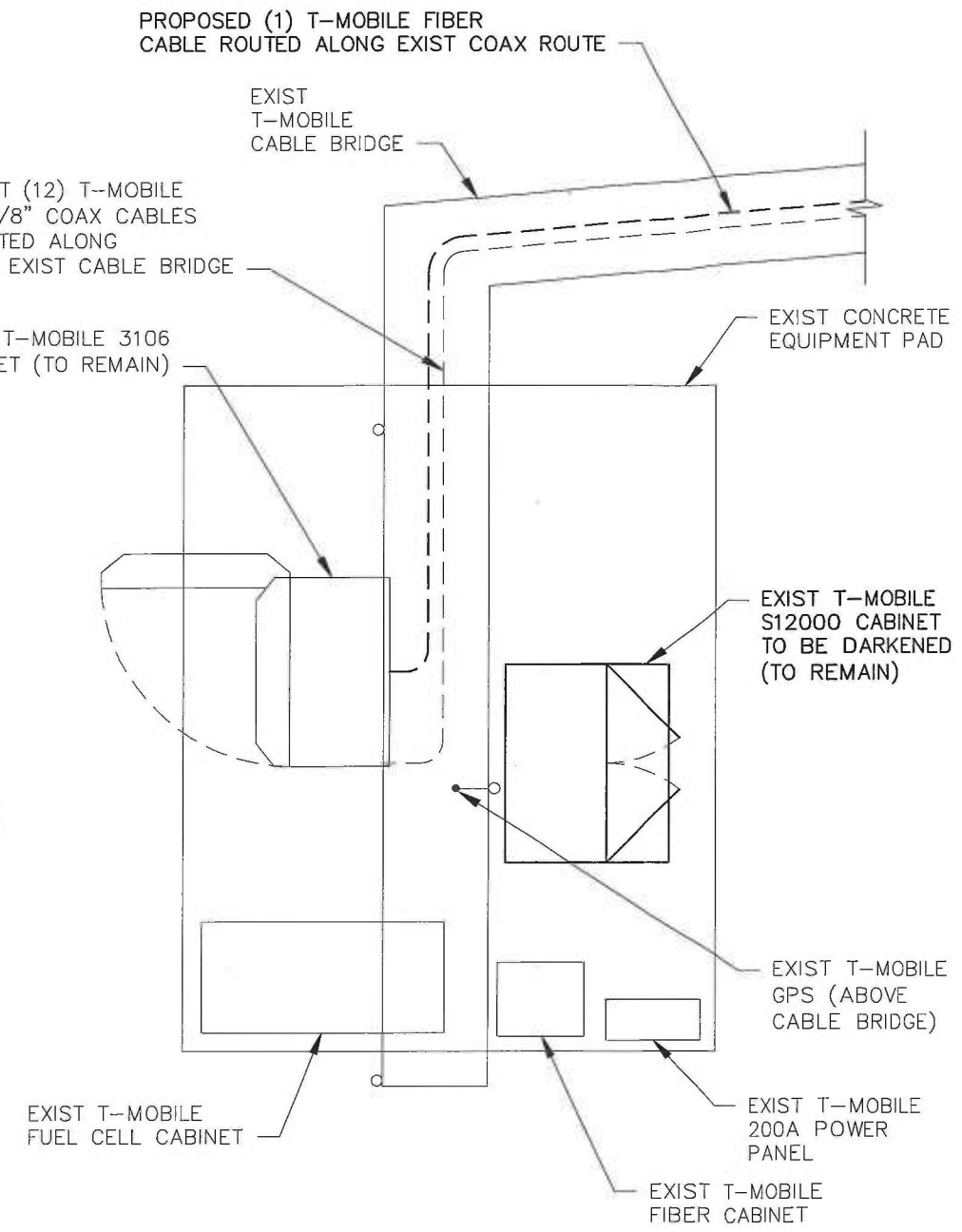
cc: Town of Madison, First Selectman Fillmore McPherson
Crown Castle
Halene Fujimoto, HPC Wireless

EXHIBIT A



1 L-1 SITE PLAN

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



2 L-1 EQUIPMENT PLAN

SCALE: 1/4" = 1'-0"

STRUCTURAL NOTE:
EXIST MOUNTS AND 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) 567-6556
Fax: (845) 567-8703

T-Mobile
NORTHEAST LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

APPROVALS
T-MOBILE
LANDLORD
RF
CONSTRUCTION

PROJECT NUMBER	DESIGNED BY
6644.CTHA332C	JQ

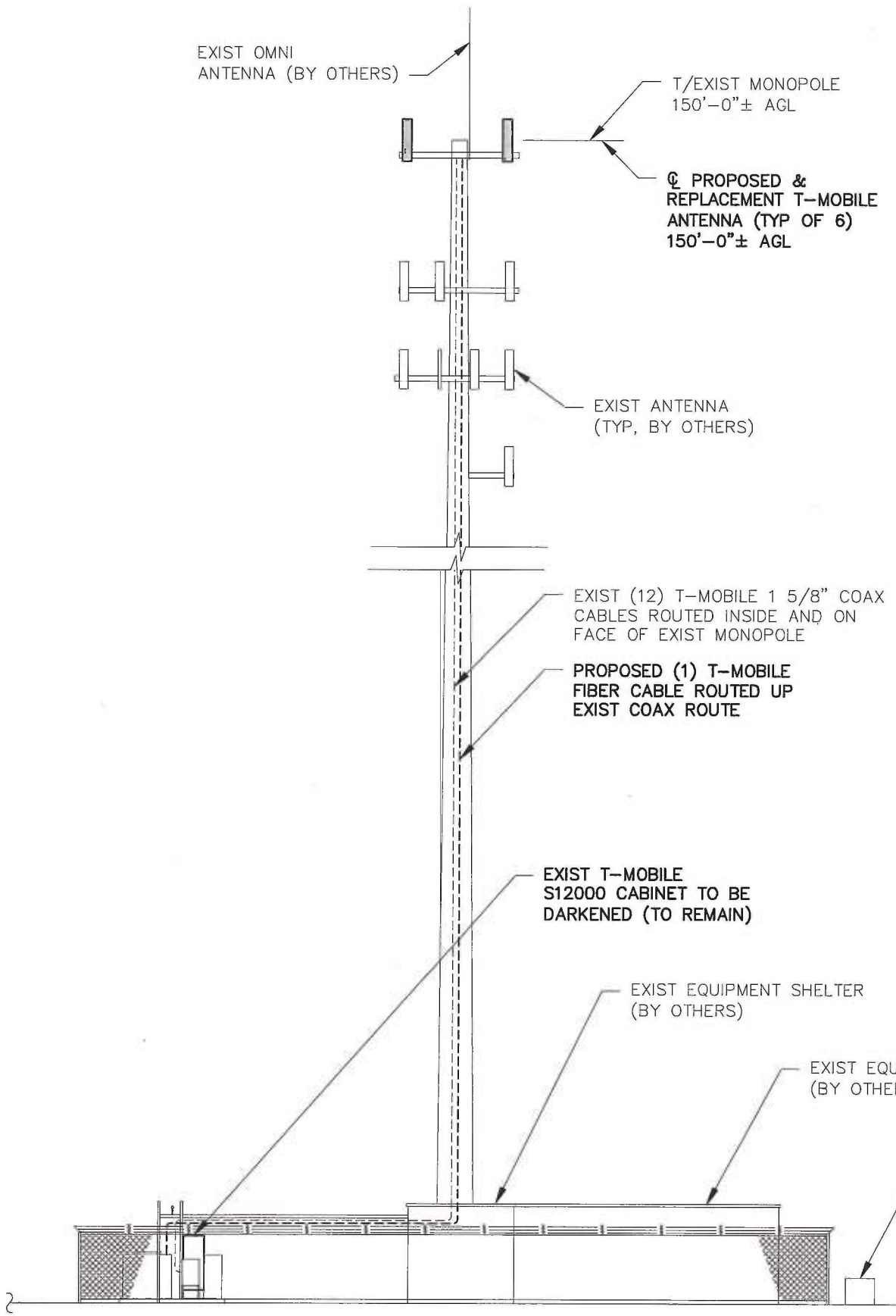
REV	DATE	REVISION	DRAWN BY
0	03/05/14	FOR COMMENT	GZ
1	04/08/14	PER SA	AS

ISSUED BY | DATE

SITE INFORMATION
CTHA332C
HA332/WASTE STATION
258 RIDGE ROAD
MADISON, CT 06443

SHEET TITLE
SITE PLAN AND
EQUIPMENT PLAN

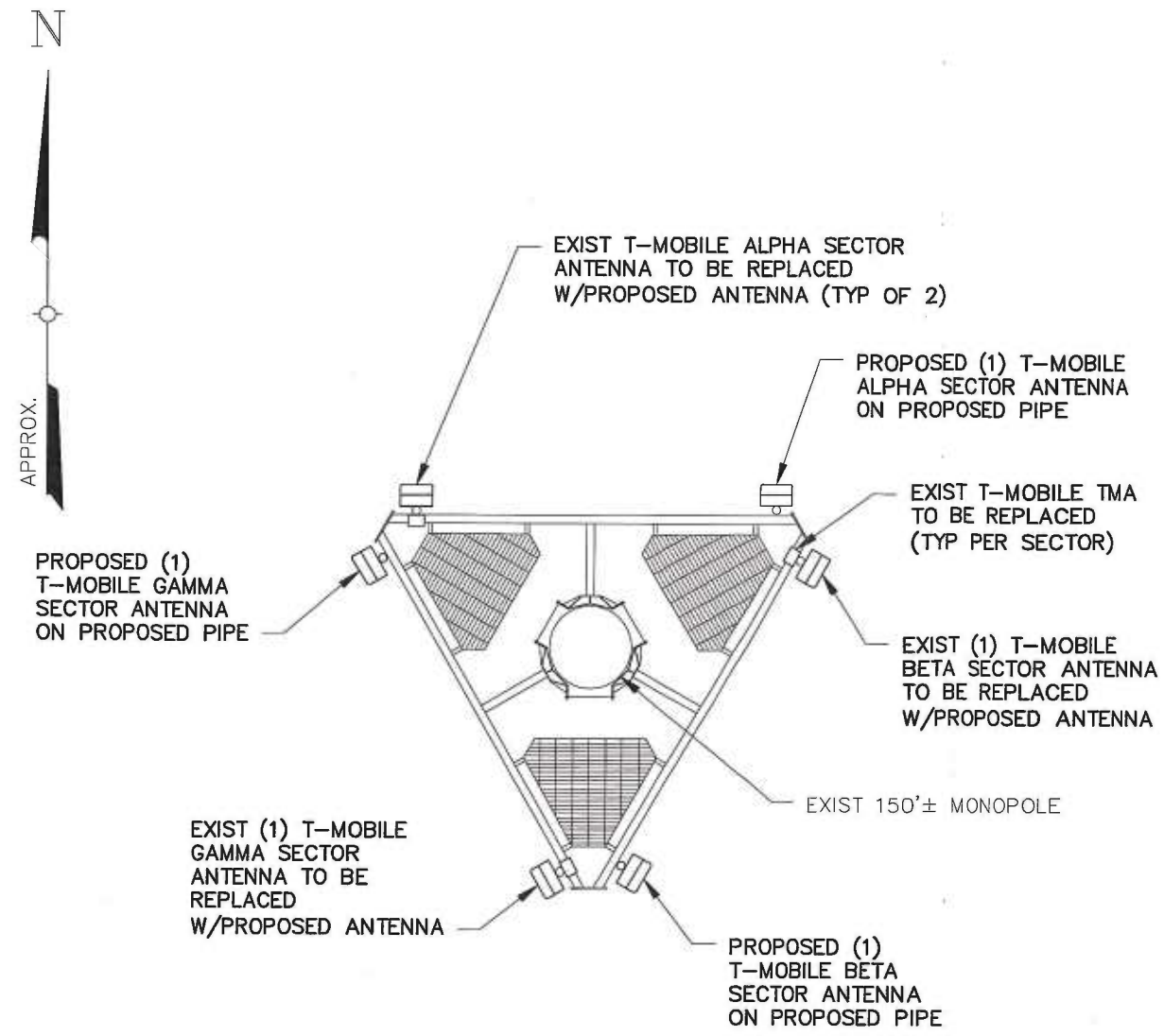
SHEET NUMBER
L-1



NOTE: SOME EXISTING SITE FEATURES BY OTHERS NOT SHOWN FOR CLARITY.

1/L-2 ELEVATION

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



2/L-2 ANTENNA PLAN

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

STRUCTURAL NOTE:
EXIST MOUNTS AND 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
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ISSUED BY | DATE

SITE INFORMATION
CTHA332C
HA332/WASTE STATION
258 RIDGE ROAD
MADISON, CT 06443

SHEET TITLE
ELEVATION & ANTENNA PLAN

SHEET NUMBER
L-2

EXHIBIT B

Date: **March 26, 2014**

AeroSolutions LLC
Optimizing Your Tower Infrastructure

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

Aero Solutions, LLC
5500 Flatiron Parkway, Suite 100
Boulder, CO 80503
720-381-2843

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTHA332A
	Carrier Site Name:	HA332/Waste Station
Crown Castle Designation:	**Crown Castle BU Number:**	5800059
	Crown Castle Site Name:	Ridge Road, Madison
	Crown Castle JDE Job Number:	267470
	Crown Castle Work Order Number:	731844
	Crown Castle Application Number:	221966 Rev. 3
Engineering Firm Designation:	**Aero Solutions, LLC Project Number:**	003-14-0248
Site Data:	**258 Ridge Road, MADISON, New Haven County, CT** **Latitude *41° 18' 33.3"*, Longitude *-72° 36' 51.57"*** **150 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 629919, in accordance with application 221966, revision 3.

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.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment based upon a wind speed of 85 mph fastest mile.

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

We at *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: Benjamin Ude

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 150 ft Monopole tower designed by VALMONT in October of 2008. The tower was originally designed for a wind speed of 115 mph per TIA-222-G.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 38 mph with 1.25 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
148.0	150.0	3	ericsson	ERICSSON AIR 21 B2P w/ Mount Pipe	1	1-5/8"	
		3	ericsson	ERICSSON AIR 21 B4P 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
148.0	157.0	1	dbspectra	DS4C06F36D-N	2	7/8"	1
	149.0	3	remec	GSM PCS 1900 MASTHEAD AMPLIFIER			3
		3	rfs celwave	APX16PV-16PVL-E w/ Mount Pipe			
	148.0	1	tower mounts	Platform Mount [LP 303-1]	12	1-5/8"	1
141.0	143.0	1	raycap	DC6-48-60-18-8F			1
	142.0	3	ericsson	TME-RRUS-11			
	141.0	1	tower mounts	Side Arm Mount [SO 102-3]			
140.0	141.0	3	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe	3 12	3/8" 1-5/8"	1
		6	powerwave technologies	7770.00 w/ Mount Pipe			
		6	powerwave technologies	LGP21401			
		6	powerwave technologies	LGP21903			
	140.0	1	tower mounts	Platform Mount [LP 304-1]			
132.0	132.0	3	alcatel lucent	RRH2X40-AWS			2
		1	tower mounts	Side Arm Mount [SO 102-3]			
130.0	131.0	3	antel	BXA-185063/8CF w/	12	1-5/8"	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
				Mount Pipe			
		3	antel	BXA-70063/6CF w/ Mount Pipe			
		6	decibel	DB846F65ZAXY w/ Mount Pipe			
		3	kathrein	742 213 w/ Mount Pipe	7	1-5/8"	2
		1	rfs celwave	DB-T1-6Z-8AB-0Z			
	130.0	1	tower mounts	Platform Mount [LP 304-1]			1
124.0	125.0	1	radiowaves	HP2-4.7NS	1 1	11/32 7/8"	1
	124.0	1	kathrein	800 10251 w/ Mount Pipe			
		1	tower mounts	Side Arm Mount [SO 701-1]			
113.0	113.0	3	kathrein	800 10252 w/ Mount Pipe	3	7/8"	1
		1	tower mounts	T-Arm Mount [TA 702-1]			

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)
150	150	12	allgon	7273	0	-
		2	decibel	DB616		
		6	generic	TMA		
140	140	12	antel	RWA-80017	0	-
		6	generic	TMA		
130	130	12	allgon	7273	0	-
		6	generic	TMA		
120	120	12	allgon	7273	0	-
		6	generic	TMA		
80	80	1	generic	4-FT STD. MICROWAVE		-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	ANS Consultants, Inc.	2354009	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Valmont	2354010	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Valmont	2354011	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	150 - 110	Pole	TP39.633x28.4x0.25	1	-10.30	1556.78	31.6	Pass
L2	110 - 94.25	Pole	TP43.556x37.659x0.281	2	-13.48	1936.62	41.1	Pass
L3	94.25 - 46.25	Pole	TP56.472x41.449x0.375	3	-25.10	3345.18	47.1	Pass
L4	46.25 - 0	Pole	TP68.71x53.686x0.438	4	-44.34	4844.04	48.5	Pass
							Summary	
						Pole (L4)	48.5	Pass
						Rating =	48.5	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	42.8	Pass
1	Base Plate	0	38.7	Pass
1	Base Foundation	0	55.6	Pass
1	Base Foundation Soil Interaction	0	32.1	Pass

Structure Rating (max from all components) =	55.6%

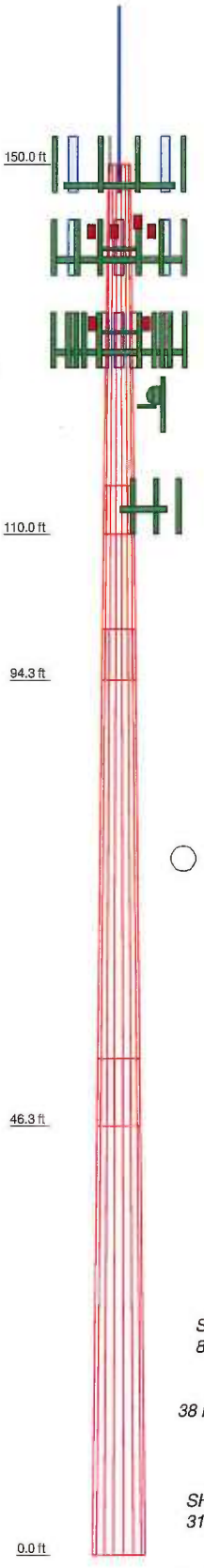
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

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	1	2	3	4		
Length (ft)	40.000	21.000	53.500	53.500		
Number of Sides	18	18	18	18		
Thickness (in)	0.250	0.281	0.375	0.438		
Socket Length (ft)	5.250	5.500	7.250			
Top Dia (in)	28.400	37.659	41.449	53.686		
Bot Dia (in)	39.633	43.556	56.472	68.710		
Grade					A572-65	
Weight (K)	3.6	2.6	10.5	16.4		32.1

AXIAL 75 K
SHEAR 8 K
MOMENT 921 kip-ft
TORQUE 1 kip-ft
38 mph WIND - 1.250 in ICE

AXIAL 44 K
SHEAR 31 K
MOMENT 3242 kip-ft
TORQUE 6 kip-ft
REACTIONS - 85 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lighting Rod 5/8" x 2'	150	(2) LGP21401	140
DS4C06F36D-N	148	(2) LGP21903	140
ERICSSON AIR 21 B2P w/ Mount Pipe	148	(2) LGP21903	140
ERICSSON AIR 21 B4P w/ Mount Pipe	148	(2) LGP21903	140
KRY 112 144/1	148	Platform Mount [LP 304-1]	140
ERICSSON AIR 21 B2P w/ Mount Pipe	148	RRH2X40-AWS	132
ERICSSON AIR 21 B4P w/ Mount Pipe	148	RRH2X40-AWS	132
KRY 112 144/1	148	RRH2X40-AWS	132
ERICSSON AIR 21 B2P w/ Mount Pipe	148	5' x 2" Pipe Mount	132
ERICSSON AIR 21 B4P w/ Mount Pipe	148	5' x 2" Pipe Mount	132
KRY 112 144/1	148	5' x 2" Pipe Mount	132
Platform Mount [LP 303-1]	148	Side Arm Mount [SO 102-3]	132
TME-RRUS-11	141	(2) DB846F65ZAXY w/ Mount Pipe	130
TME-RRUS-11	141	(2) DB846F65ZAXY w/ Mount Pipe	130
DC6-48-60-18-8F	141	(2) DB846F65ZAXY w/ Mount Pipe	130
TME-RRUS-11	141	BXA-185063/8CF w/ Mount Pipe	130
6' x 3" Horizontal Mount Pipe	141	BXA-185063/8CF w/ Mount Pipe	130
6' x 3" Horizontal Mount Pipe	141	BXA-185063/8CF w/ Mount Pipe	130
6' x 3" Horizontal Mount Pipe	141	BXA-70063/6CF w/ Mount Pipe	130
6' x 2" Mount Pipe	141	BXA-70063/6CF w/ Mount Pipe	130
Side Arm Mount [SO 102-3]	141	BXA-70063/6CF w/ Mount Pipe	130
(2) 7770.00 w/ Mount Pipe	140	742 213 w/ Mount Pipe	130
(2) 7770.00 w/ Mount Pipe	140	742 213 w/ Mount Pipe	130
(2) 7770.00 w/ Mount Pipe	140	742 213 w/ Mount Pipe	130
AM-X-CD-16-65-00T-RET w/ Mount Pipe	140	DB-T1-6Z-8AB-0Z	130
		Platform Mount [LP 304-1]	130
AM-X-CD-16-65-00T-RET w/ Mount Pipe	140	800 10251 w/ Mount Pipe	124
		5' x 2" Pipe Mount	124
AM-X-CD-16-65-00T-RET w/ Mount Pipe	140	Side Arm Mount [SO 701-1]	124
		HP2-4.7NS	124
(2) LGP21401	140	T-Arm Mount [TA 702-1]	113
(2) LGP21401	140	(3) 800 10252 w/ Mount Pipe	113

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 48.5%

Aero Solutions, LLC
5500 Flatiron Parkway, Suite 100
Boulder, CO 80503
Phone: 720-381-2843
FAX: 720-304-6883

Job: ***BU#5800059 Ridge Road- Madison***			
Project: ***Existing 150 ft. Monopole***			
Client: Crown Castle	Drawn by: Benjamin Ude	App'd:	
Code: TIA/EIA-222-F	Date: 03/26/14	Scale: NTS	
Path:		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 New Haven County, Connecticut.
5) Basic wind speed of 85 mph.
6) Nominal ice thickness of 1.250 in.
7) Ice thickness is considered to increase with height.
8) Ice density of 56.000 pcf.
9) A wind speed of 38 mph is used in combination with ice.
10) Temperature drop of 50.000 °F.
11) Deflections calculated using a wind speed of 50 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		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice		
			Capacity Exemption		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	150.000-110.000	40.000	5.250	18	28.400	39.633	0.250	1.000	A572-65 (65 ksi)
L2	110.000-94.250	21.000	5.500	18	37.659	43.556	0.281	1.125	A572-65 (65 ksi)
L3	94.250-46.250	53.500	7.250	18	41.449	56.472	0.375	1.500	A572-65 (65 ksi)
L4	46.250-0.000	53.500		18	53.686	68.710	0.438	1.750	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	28.838	22.337	2236.246	9.993	14.427	155.002	4475.435	11.171	4.558	18.234
	40.244	31.250	6123.656	13.981	20.134	304.152	12255.369	15.628	6.535	26.142
L2	39.737	33.366	5889.316	13.269	19.131	307.848	11786.381	16.686	6.133	21.806
	44.228	38.631	9139.882	15.363	22.126	413.075	18291.791	19.319	7.171	25.496
L3	43.657	48.888	10420.184	14.581	21.056	494.878	20854.080	24.449	6.635	17.693
	57.343	66.769	26545.722	19.914	28.688	925.332	53126.374	33.391	9.279	24.744
L4	56.582	73.942	26487.970	18.903	27.273	971.231	53010.794	36.978	8.679	19.837
	69.770	94.805	55829.000	24.237	34.905	1599.470	111731.461	47.411	11.323	25.881

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 150.000-110.000				1	1	1		
L2 110.000-94.250				1	1	1		
L3 94.250-46.250				1	1	1		
L4 46.250-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
**										

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 klf
**								
LDF5-50A(7/8")	A	No	Inside Pole	148.000 - 6.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LCF158-50A(1-5/8")	A	No	Inside Pole	148.000 - 6.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	A	No	CaAa (Out Of Face)	148.000 - 6.000	1	No Ice	0.163	0.001
						1/2" Ice	0.263	0.002
						1" Ice	0.362	0.004
						2" Ice	0.562	0.010
						4" Ice	0.962	0.029
**								
AVA7-50(1-5/8)	C	No	Inside Pole	140.000 - 2.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-002-75000(3/8")	C	No	Inside Pole	140.000 - 2.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						4" Ice	0.000	0.000
2" Rigid Conduit	C	No	Inside Pole	140.000 - 2.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003
						2" Ice	0.000	0.003
						4" Ice	0.000	0.003
**								
AVA7-50(1-5/8)	B	No	Inside Pole	130.000 - 6.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
AVA7-50(1-5/8)	B	No	CaAa (Out Of Face)	130.000 - 6.000	1	No Ice	0.201	0.001
						1/2" Ice	0.301	0.002
						1" Ice	0.401	0.004
						2" Ice	0.601	0.010
						4" Ice	1.001	0.030
AVA7-50(1-5/8)	B	No	CaAa (Out Of Face)	130.000 - 6.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.002
						1" Ice	0.000	0.004
						2" Ice	0.000	0.010
						4" Ice	0.000	0.030
HB158-1-08U8-S8J18(1-5/8)	B	No	CaAa (Out Of Face)	130.000 - 6.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.005
						2" Ice	0.000	0.011
						4" Ice	0.000	0.031
**								
LDF5-50A(7/8")	C	No	Inside Pole	124.000 - 2.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
7921A(11/32")	C	No	Inside Pole	124.000 - 2.000	1	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
**								
LDF5-50A(7/8")	C	No	Inside Pole	113.000 - 2.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	124.000 - 113.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	CaAa (Out Of Face)	124.000 - 113.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.003
						2" Ice	0.000	0.008
						4" Ice	0.000	0.025
**								

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	150.000-110.000	A	0.000	0.000	0.000	6.175	0.43
		B	0.000	0.000	0.000	4.020	0.28
		C	0.000	0.000	0.000	0.000	0.38
L2	110.000-94.250	A	0.000	0.000	0.000	2.559	0.18
		B	0.000	0.000	0.000	3.166	0.22

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
		C	0.000	0.000	0.000	0.000	0.21
L3	94.250-46.250	A	0.000	0.000	0.000	7.800	0.54
		B	0.000	0.000	0.000	9.648	0.67
		C	0.000	0.000	0.000	0.000	0.63
L4	46.250-0.000	A	0.000	0.000	0.000	6.541	0.46
		B	0.000	0.000	0.000	8.090	0.56
		C	0.000	0.000	0.000	0.000	0.58

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	150.000-110.000	A	1.472	0.000	0.000	0.000	17.365	0.65
		B		0.000	0.000	0.000	9.909	1.20
		C		0.000	0.000	0.000	0.000	0.54
L2	110.000-94.250	A	1.431	0.000	0.000	0.000	7.197	0.27
		B		0.000	0.000	0.000	7.804	0.94
		C		0.000	0.000	0.000	0.000	0.21
L3	94.250-46.250	A	1.367	0.000	0.000	0.000	21.540	0.81
		B		0.000	0.000	0.000	23.388	2.79
		C		0.000	0.000	0.000	0.000	0.63
L4	46.250-0.000	A	1.250	0.000	0.000	0.000	17.549	0.67
		B		0.000	0.000	0.000	19.098	2.23
		C		0.000	0.000	0.000	0.000	0.58

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	150.000-110.000	0.130	-0.139	0.263	-0.343
L2	110.000-94.250	0.236	-0.084	0.478	-0.233
L3	94.250-46.250	0.240	-0.086	0.493	-0.240
L4	46.250-0.000	0.211	-0.075	0.442	-0.214

Discrete Tower Loads

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
**									
Lighting Rod 5/8" x 2'	C	From Leg	0.000 0.000 1.000	0.000	150.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.125 0.278 0.410 0.719 1.533	0.125 0.278 0.410 0.719 1.533	0.01 0.01 0.01 0.03 0.07
**									
DS4C06F36D-N	A	From Leg	4.000 0.000 9.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice	5.500 7.367 9.250 13.067 19.246	5.500 7.367 9.250 13.067 19.246	0.07 0.11 0.16 0.30 0.72

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
						4" Ice			
ERICSSON AIR 21 B2P w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4P w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	A	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.408 0.497 0.594 0.815 1.359	0.175 0.238 0.309 0.477 0.918	0.01 0.01 0.02 0.03 0.08
ERICSSON AIR 21 B2P w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4P w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	B	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.408 0.497 0.594 0.815 1.359	0.175 0.238 0.309 0.477 0.918	0.01 0.01 0.02 0.03 0.08
ERICSSON AIR 21 B2P w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.11 0.17 0.23 0.38 0.81
ERICSSON AIR 21 B4P w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.825 7.347 7.863 8.926 11.175	5.642 6.480 7.257 8.864 12.293	0.11 0.17 0.23 0.38 0.81
KRY 112 144/1	C	From Leg	4.000 0.000 2.000	0.000	148.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.408 0.497 0.594 0.815 1.359	0.175 0.238 0.309 0.477 0.918	0.01 0.01 0.02 0.03 0.08
Platform Mount [LP 303-1]	C	None		0.000	148.000	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	1.25 1.48 1.71 2.18 3.10
**									
TME-RRUS-11	A	From Leg	1.000 -3.000 1.000	20.000	141.000	No Ice 1/2" Ice	3.249 3.491 3.741	1.373 1.551 1.738	0.05 0.07 0.09

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	4.268	2.138	0.15
						2" Ice	5.426	3.042	0.31
						4" Ice			
TME-RRUS-11	B	From Leg	1.000	20.000	141.000	No Ice	3.249	1.373	0.05
			-3.000			1/2"	3.491	1.551	0.07
			1.000			Ice	3.741	1.738	0.09
						1" Ice	4.268	2.138	0.15
						2" Ice	5.426	3.042	0.31
						4" Ice			
DC6-48-60-18-8F	B	From Leg	1.000	20.000	141.000	No Ice	2.567	2.567	0.03
			0.000			1/2"	2.798	2.798	0.06
			2.000			Ice	3.038	3.038	0.08
						1" Ice	3.543	3.543	0.14
						2" Ice	4.658	4.658	0.31
						4" Ice			
TME-RRUS-11	C	From Leg	1.000	30.000	141.000	No Ice	3.249	1.373	0.05
			-3.000			1/2"	3.491	1.551	0.07
			1.000			Ice	3.741	1.738	0.09
						1" Ice	4.268	2.138	0.15
						2" Ice	5.426	3.042	0.31
						4" Ice			
6' x 3" Horizontal Mount Pipe	A	From Leg	0.500	20.000	141.000	No Ice	1.767	1.767	0.03
			0.000			1/2"	2.129	2.129	0.04
			0.000			Ice	2.501	2.501	0.06
						1" Ice	3.272	3.272	0.11
						2" Ice	4.926	4.926	0.26
						4" Ice			
6' x 3" Horizontal Mount Pipe	B	From Leg	0.500	20.000	141.000	No Ice	1.767	1.767	0.03
			0.000			1/2"	2.129	2.129	0.04
			0.000			Ice	2.501	2.501	0.06
						1" Ice	3.272	3.272	0.11
						2" Ice	4.926	4.926	0.26
						4" Ice			
6' x 3" Horizontal Mount Pipe	C	From Leg	0.500	20.000	141.000	No Ice	1.767	1.767	0.03
			0.000			1/2"	2.129	2.129	0.04
			0.000			Ice	2.501	2.501	0.06
						1" Ice	3.272	3.272	0.11
						2" Ice	4.926	4.926	0.26
						4" Ice			
6' x 2" Mount Pipe	B	From Leg	0.500	20.000	141.000	No Ice	1.425	1.425	0.02
			0.000			1/2"	1.925	1.925	0.03
			1.000			Ice	2.294	2.294	0.05
						1" Ice	3.060	3.060	0.09
						2" Ice	4.702	4.702	0.23
						4" Ice			
Side Arm Mount [SO 102-3]	C	None		0.000	141.000	No Ice	3.000	3.000	0.08
						1/2"	3.480	3.480	0.11
						Ice	3.960	3.960	0.14
						1" Ice	4.920	4.920	0.20
						2" Ice	6.840	6.840	0.32
						4" Ice			
**									
(2) 7770.00 w/ Mount Pipe	A	From Leg	4.000	20.000	140.000	No Ice	6.119	4.254	0.06
			0.000			1/2"	6.626	5.014	0.10
			1.000			Ice	7.128	5.711	0.16
						1" Ice	8.164	7.155	0.29
						2" Ice	10.360	10.412	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	B	From Leg	4.000	20.000	140.000	No Ice	6.119	4.254	0.06
			0.000			1/2"	6.626	5.014	0.10
			1.000			Ice	7.128	5.711	0.16
						1" Ice	8.164	7.155	0.29
						2" Ice	10.360	10.412	0.66
						4" Ice			
(2) 7770.00 w/ Mount Pipe	C	From Leg	4.000	30.000	140.000	No Ice	6.119	4.254	0.06

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"	6.626	5.014	0.10
			1.000			Ice	7.128	5.711	0.16
						1" Ice	8.164	7.155	0.29
						2" Ice	10.360	10.412	0.66
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.000	20.000	140.000	No Ice	8.498	6.304	0.07
			0.000			1/2"	9.149	7.479	0.14
			1.000			Ice	9.767	8.368	0.21
						1" Ice	11.031	10.179	0.38
						2" Ice	13.679	14.024	0.87
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.000	20.000	140.000	No Ice	8.498	6.304	0.07
			0.000			1/2"	9.149	7.479	0.14
			1.000			Ice	9.767	8.368	0.21
						1" Ice	11.031	10.179	0.38
						2" Ice	13.679	14.024	0.87
						4" Ice			
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.000	30.000	140.000	No Ice	8.498	6.304	0.07
			0.000			1/2"	9.149	7.479	0.14
			1.000			Ice	9.767	8.368	0.21
						1" Ice	11.031	10.179	0.38
						2" Ice	13.679	14.024	0.87
						4" Ice			
(2) LGP21401	A	From Leg	4.000	20.000	140.000	No Ice	1.288	0.233	0.01
			0.000			1/2"	1.445	0.313	0.02
			1.000			Ice	1.611	0.403	0.03
						1" Ice	1.969	0.608	0.05
						2" Ice	2.788	1.121	0.14
						4" Ice			
(2) LGP21401	B	From Leg	4.000	20.000	140.000	No Ice	1.288	0.233	0.01
			0.000			1/2"	1.445	0.313	0.02
			1.000			Ice	1.611	0.403	0.03
						1" Ice	1.969	0.608	0.05
						2" Ice	2.788	1.121	0.14
						4" Ice			
(2) LGP21401	C	From Leg	4.000	30.000	140.000	No Ice	1.288	0.233	0.01
			0.000			1/2"	1.445	0.313	0.02
			1.000			Ice	1.611	0.403	0.03
						1" Ice	1.969	0.608	0.05
						2" Ice	2.788	1.121	0.14
						4" Ice			
(2) LGP21903	A	From Leg	4.000	20.000	140.000	No Ice	0.270	0.184	0.01
			0.000			1/2"	0.343	0.248	0.01
			1.000			Ice	0.425	0.322	0.02
						1" Ice	0.616	0.494	0.03
						2" Ice	1.101	0.943	0.07
						4" Ice			
(2) LGP21903	B	From Leg	4.000	20.000	140.000	No Ice	0.270	0.184	0.01
			0.000			1/2"	0.343	0.248	0.01
			1.000			Ice	0.425	0.322	0.02
						1" Ice	0.616	0.494	0.03
						2" Ice	1.101	0.943	0.07
						4" Ice			
(2) LGP21903	C	From Leg	4.000	30.000	140.000	No Ice	0.270	0.184	0.01
			0.000			1/2"	0.343	0.248	0.01
			1.000			Ice	0.425	0.322	0.02
						1" Ice	0.616	0.494	0.03
						2" Ice	1.101	0.943	0.07
						4" Ice			
Platform Mount [LP 304-1]	C	None		0.000	140.000	No Ice	17.460	17.460	1.35
						1/2"	22.440	22.440	1.62
						Ice	27.420	27.420	1.90
						1" Ice	37.380	37.380	2.45
						2" Ice	57.300	57.300	3.55
						4" Ice			

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
**									
RRH2X40-AWS	A	From Leg	2.000 0.000 0.000	-10.000	132.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	B	From Leg	2.000 0.000 0.000	-40.000	132.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.04 0.06 0.08 0.13 0.28
RRH2X40-AWS	C	From Leg	2.000 0.000 0.000	20.000	132.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.04 0.06 0.08 0.13 0.28
5' x 2" Pipe Mount	A	From Leg	2.000 0.000 0.000	0.000	132.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.393 1.703 2.351 3.778	1.000 1.393 1.703 2.351 3.778	0.03 0.04 0.05 0.08 0.20
5' x 2" Pipe Mount	B	From Leg	2.000 0.000 0.000	0.000	132.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.393 1.703 2.351 3.778	1.000 1.393 1.703 2.351 3.778	0.03 0.04 0.05 0.08 0.20
5' x 2" Pipe Mount	C	From Leg	2.000 0.000 0.000	0.000	132.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.393 1.703 2.351 3.778	1.000 1.393 1.703 2.351 3.778	0.03 0.04 0.05 0.08 0.20
Side Arm Mount [SO 102-3]	C	None		0.000	132.000	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	0.08 0.11 0.14 0.20 0.32
**									
(2) DB846F65ZAXY w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	-10.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.033 7.536 8.080 9.195 11.528	7.583 8.544 9.381 11.166 15.103	0.04 0.11 0.18 0.35 0.83
(2) DB846F65ZAXY w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.033 7.536 8.080 9.195 11.528	7.583 8.544 9.381 11.166 15.103	0.04 0.11 0.18 0.35 0.83
(2) DB846F65ZAXY w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.033 7.536 8.080 9.195 11.528	7.583 8.544 9.381 11.166 15.103	0.04 0.11 0.18 0.35 0.83
BXA-185063/8CF w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	-10.000	130.000	No Ice 1/2" Ice	3.181 3.559 3.963	2.997 3.614 4.236	0.03 0.06 0.09

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	4.855	5.529	0.19
						2" Ice	6.773	8.423	0.47
						4" Ice			
BXA-185063/8CF w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.181 3.559 3.963 4.855 6.773	2.997 3.614 4.236 5.529 8.423	0.03 0.06 0.09 0.19 0.47
BXA-185063/8CF w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.181 3.559 3.963 4.855 6.773	2.997 3.614 4.236 5.529 8.423	0.03 0.06 0.09 0.19 0.47
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	-10.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.407 6.558 7.422 9.198 12.952	0.04 0.10 0.17 0.33 0.79
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.407 6.558 7.422 9.198 12.952	0.04 0.10 0.17 0.33 0.79
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.407 6.558 7.422 9.198 12.952	0.04 0.10 0.17 0.33 0.79
742 213 w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	-10.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.05 0.09 0.15 0.28 0.68
742 213 w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	-40.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.05 0.09 0.15 0.28 0.68
742 213 w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.373 5.950 6.501 7.611 9.933	4.620 6.000 6.982 8.852 12.794	0.05 0.09 0.15 0.28 0.68
DB-T1-6Z-8AB-0Z	C	From Leg	4.000 0.000 1.000	20.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.04 0.08 0.12 0.21 0.45
Platform Mount [LP 304-1]	C	None		0.000	130.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.460 22.440 27.420 37.380 57.300	17.460 22.440 27.420 37.380 57.300	1.35 1.62 1.90 2.45 3.55
**									
800 10251 w/ Mount Pipe	B	From Leg	4.000	-55.000	124.000	No Ice	4.883	2.256	0.04

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	5.288 5.703	2.773 3.306	0.08 0.11
						1" Ice	6.567	4.424	0.21
						2" Ice	8.448	7.080	0.50
						4" Ice			
5' x 2" Pipe Mount	B	From Leg	2.000 0.000 0.000	0.000	124.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.000 1.393 1.703 2.351 3.778	1.000 1.393 1.703 2.351 3.778	0.03 0.04 0.05 0.08 0.20
Side Arm Mount [SO 701-1]	B	From Leg	2.000 0.000 0.000	-55.000	124.000	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	0.07 0.08 0.09 0.12 0.18
**									
(3) 800 10252 w/ Mount Pipe	B	From Leg	3.000 0.000 0.000	-55.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.578 8.022 8.476 9.418 11.461	3.787 4.352 4.935 6.154 8.932	0.04 0.09 0.15 0.29 0.66
T-Arm Mount [TA 702-1]	B	From Leg	1.500 0.000 0.000	-55.000	113.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.780 3.390 4.000 5.220 7.660	2.230 2.430 2.630 3.030 3.830	0.11 0.14 0.17 0.23 0.35
**									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
**											
HP2-4.7NS	B	Paraboloid w/Shroud (HP)	From Leg	2.000 0.000 1.000	-11.000		124.000	2.042	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.274 3.547 3.819 4.365 5.456	0.03 0.05 0.06 0.10 0.17
**											

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

Comb. No.	Description
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	150 - 110	Pole	Max Tension	24	0.00	-0.00	-0.00
			Max. Compression	14	-24.00	-2.15	-0.85
			Max. Mx	5	-10.30	-374.88	-1.41
			Max. My	8	-10.34	-2.04	-368.02
			Max. Vy	11	-17.33	374.12	1.17
			Max. Vx	8	16.86	-2.04	-368.02
			Max. Torque	3			-3.90
L2	110 - 94.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30.00	-6.28	-3.09
			Max. Mx	5	-13.48	-671.01	0.50
			Max. My	8	-13.52	-0.85	-652.65
			Max. Vy	11	-20.11	669.09	-1.42
			Max. Vx	8	19.30	-0.85	-652.65
			Max. Torque	3			-6.16
L3	94.25 - 46.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-48.12	-10.56	-4.90
			Max. Mx	5	-25.10	-1723.42	8.63
			Max. My	8	-25.12	6.03	-1669.30
			Max. Vy	11	-25.47	1722.47	-9.52
			Max. Vx	8	24.66	6.03	-1669.30
			Max. Torque	3			-6.23
L4	46.25 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-75.08	-15.39	-6.93
			Max. Mx	11	-44.34	3241.78	-18.79
			Max. My	8	-44.34	13.97	-3146.49
			Max. Vy	11	-31.35	3241.78	-18.79
			Max. Vx	8	30.55	13.97	-3146.49

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	3			-6.30

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	18	75.08	-8.32	0.02
	Max. H_x	11	44.35	31.33	-0.17
	Max. H_z	2	44.35	-0.14	30.53
	Max. M_x	2	3144.22	-0.14	30.53
	Max. M_z	5	3241.71	-31.29	0.18
	Max. Torsion	9	6.27	15.82	-26.53
	Min. Vert	1	44.35	0.00	0.00
	Min. H_x	5	44.35	-31.29	0.18
	Min. H_z	8	44.35	0.16	-30.54
	Min. M_x	8	-3146.49	0.16	-30.54
	Min. M_z	11	-3241.78	31.33	-0.17
	Min. Torsion	3	-6.30	-15.83	26.53

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	44.35	0.00	0.00	1.00	-2.47	0.00
Dead+Wind 0 deg - No Ice	44.35	0.14	-30.53	-3144.22	-16.67	4.57
Dead+Wind 30 deg - No Ice	44.35	15.83	-26.53	-2731.54	-1642.61	6.30
Dead+Wind 60 deg - No Ice	44.35	27.21	-15.40	-1584.84	-2820.51	6.16
Dead+Wind 90 deg - No Ice	44.35	31.29	-0.18	-18.02	-3241.71	4.46
Dead+Wind 120 deg - No Ice	44.35	27.00	15.10	1555.81	-2797.79	1.55
Dead+Wind 150 deg - No Ice	44.35	15.51	26.33	2712.68	-1608.62	-1.71
Dead+Wind 180 deg - No Ice	44.35	-0.16	30.54	3146.49	13.97	-4.64
Dead+Wind 210 deg - No Ice	44.35	-15.82	26.53	2733.48	1636.54	-6.27
Dead+Wind 240 deg - No Ice	44.35	-27.24	15.38	1585.44	2819.53	-6.15
Dead+Wind 270 deg - No Ice	44.35	-31.33	0.17	18.79	3241.78	-4.47
Dead+Wind 300 deg - No Ice	44.35	-27.04	-15.12	-1555.46	2797.52	-1.60
Dead+Wind 330 deg - No Ice	44.35	-15.54	-26.35	-2712.82	1607.31	1.67
Dead+Ice+Temp	75.08	0.00	0.00	6.93	-15.39	-0.00
Dead+Wind 0 deg+Ice+Temp	75.08	0.01	-8.22	-886.37	-16.66	1.23
Dead+Wind 30 deg+Ice+Temp	75.08	4.19	-7.13	-767.67	-471.40	1.33
Dead+Wind 60 deg+Ice+Temp	75.08	7.22	-4.12	-440.92	-801.82	1.02
Dead+Wind 90 deg+Ice+Temp	75.08	8.32	-0.02	4.63	-921.16	0.47
Dead+Wind 120 deg+Ice+Temp	75.08	7.19	4.08	451.31	-798.53	-0.21
Dead+Wind 150 deg+Ice+Temp	75.08	4.14	7.10	778.82	-467.04	-0.82
Dead+Wind 180 deg+Ice+Temp	75.08	-0.02	8.22	900.43	-13.82	-1.24
Dead+Wind 210 deg+Ice+Temp	75.08	-4.18	7.13	781.63	440.06	-1.32
Dead+Wind 240 deg+Ice+Temp	75.08	-7.23	4.12	454.55	771.77	-1.02
Dead+Wind 270 deg+Ice+Temp	75.08	-8.33	0.02	9.04	891.36	-0.47
Dead+Wind 300 deg+Ice+Temp	75.08	-7.20	-4.09	-437.73	768.65	0.20

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+Wind 330 deg+Ice+Temp	75.08	-4.15	-7.10	-765.38	436.91	0.81
Dead+Wind 0 deg - Service	44.35	0.05	-10.57	-1087.52	-7.42	1.58
Dead+Wind 30 deg - Service	44.35	5.48	-9.18	-944.70	-570.15	2.19
Dead+Wind 60 deg - Service	44.35	9.42	-5.33	-547.83	-977.82	2.14
Dead+Wind 90 deg - Service	44.35	10.83	-0.06	-5.56	-1123.60	1.55
Dead+Wind 120 deg - Service	44.35	9.34	5.23	539.13	-969.95	0.54
Dead+Wind 150 deg - Service	44.35	5.37	9.11	939.51	-558.38	-0.59
Dead+Wind 180 deg - Service	44.35	-0.05	10.57	1089.65	3.18	-1.61
Dead+Wind 210 deg - Service	44.35	-5.47	9.18	946.71	564.74	-2.17
Dead+Wind 240 deg - Service	44.35	-9.43	5.32	549.39	974.18	-2.13
Dead+Wind 270 deg - Service	44.35	-10.84	0.06	7.18	1120.32	-1.55
Dead+Wind 300 deg - Service	44.35	-9.36	-5.23	-537.67	966.56	-0.55
Dead+Wind 330 deg - Service	44.35	-5.38	-9.12	-938.22	554.63	0.58

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-44.35	0.00	0.00	44.35	0.00	0.000%
2	0.14	-44.35	-30.53	-0.14	44.35	30.53	0.000%
3	15.83	-44.35	-26.53	-15.83	44.35	26.53	0.000%
4	27.21	-44.35	-15.40	-27.21	44.35	15.40	0.000%
5	31.29	-44.35	-0.18	-31.29	44.35	0.18	0.000%
6	27.00	-44.35	15.10	-27.00	44.35	-15.10	0.000%
7	15.51	-44.35	26.33	-15.51	44.35	-26.33	0.000%
8	-0.16	-44.35	30.54	0.16	44.35	-30.54	0.000%
9	-15.82	-44.35	26.53	15.82	44.35	-26.53	0.000%
10	-27.24	-44.35	15.38	27.24	44.35	-15.38	0.000%
11	-31.33	-44.35	0.17	31.33	44.35	-0.17	0.000%
12	-27.04	-44.35	-15.12	27.04	44.35	15.12	0.000%
13	-15.54	-44.35	-26.35	15.54	44.35	26.35	0.000%
14	0.00	-75.08	0.00	-0.00	75.08	-0.00	0.000%
15	0.01	-75.08	-8.22	-0.01	75.08	8.22	0.000%
16	4.19	-75.08	-7.13	-4.19	75.08	7.13	0.000%
17	7.22	-75.08	-4.12	-7.22	75.08	4.12	0.000%
18	8.32	-75.08	-0.02	-8.32	75.08	0.02	0.000%
19	7.19	-75.08	4.08	-7.19	75.08	-4.08	0.000%
20	4.14	-75.08	7.10	-4.14	75.08	-7.10	0.000%
21	-0.02	-75.08	8.22	0.02	75.08	-8.22	0.000%
22	-4.18	-75.08	7.13	4.18	75.08	-7.13	0.000%
23	-7.23	-75.08	4.12	7.23	75.08	-4.12	0.000%
24	-8.33	-75.08	0.02	8.33	75.08	-0.02	0.000%
25	-7.20	-75.08	-4.09	7.20	75.08	4.09	0.000%
26	-4.15	-75.08	-7.10	4.15	75.08	7.10	0.000%
27	0.05	-44.35	-10.57	-0.05	44.35	10.57	0.000%
28	5.48	-44.35	-9.18	-5.48	44.35	9.18	0.000%
29	9.42	-44.35	-5.33	-9.42	44.35	5.33	0.000%
30	10.83	-44.35	-0.06	-10.83	44.35	0.06	0.000%
31	9.34	-44.35	5.23	-9.34	44.35	-5.23	0.000%
32	5.37	-44.35	9.11	-5.37	44.35	-9.11	0.000%
33	-0.05	-44.35	10.57	0.05	44.35	-10.57	0.000%
34	-5.47	-44.35	9.18	5.47	44.35	-9.18	0.000%
35	-9.43	-44.35	5.32	9.43	44.35	-5.32	0.000%
36	-10.84	-44.35	0.06	10.84	44.35	-0.06	0.000%
37	-9.36	-44.35	-5.23	9.36	44.35	5.23	0.000%
38	-5.38	-44.35	-9.12	5.38	44.35	9.12	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	0.00038506
3	Yes	5	0.00000001	0.00003079
4	Yes	5	0.00000001	0.00002117
5	Yes	4	0.00000001	0.00036794
6	Yes	5	0.00000001	0.00002554
7	Yes	5	0.00000001	0.00002522
8	Yes	4	0.00000001	0.00036612
9	Yes	5	0.00000001	0.00002159
10	Yes	5	0.00000001	0.00003113
11	Yes	4	0.00000001	0.00040045
12	Yes	5	0.00000001	0.00002251
13	Yes	5	0.00000001	0.00002269
14	Yes	4	0.00000001	0.00001909
15	Yes	4	0.00000001	0.00090556
16	Yes	5	0.00000001	0.00004222
17	Yes	5	0.00000001	0.00004225
18	Yes	4	0.00000001	0.00094250
19	Yes	5	0.00000001	0.00004286
20	Yes	5	0.00000001	0.00004262
21	Yes	4	0.00000001	0.00092416
22	Yes	4	0.00000001	0.00098824
23	Yes	4	0.00000001	0.00099442
24	Yes	4	0.00000001	0.00090354
25	Yes	4	0.00000001	0.00097073
26	Yes	4	0.00000001	0.00096612
27	Yes	4	0.00000001	0.00006217
28	Yes	4	0.00000001	0.00014129
29	Yes	4	0.00000001	0.00008971
30	Yes	4	0.00000001	0.00006344
31	Yes	4	0.00000001	0.00009602
32	Yes	4	0.00000001	0.00009355
33	Yes	4	0.00000001	0.00006187
34	Yes	4	0.00000001	0.00009177
35	Yes	4	0.00000001	0.00014322
36	Yes	4	0.00000001	0.00006502
37	Yes	4	0.00000001	0.00007506
38	Yes	4	0.00000001	0.00007580

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	14.198	30	0.816	0.005
L2	115.25 - 94.25	8.492	30	0.709	0.005
L3	99.75 - 46.25	6.320	30	0.613	0.003
L4	53.5 - 0	1.780	30	0.305	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	Lighting Rod 5/8" x 2'	30	14.198	0.816	0.005	67114

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
148.000	DS4C06F36D-N	30	13.855	0.812	0.005	67114
141.000	TME-RRUS-11	30	12.660	0.798	0.005	37285
140.000	(2) 7770.00 w/ Mount Pipe	30	12.490	0.795	0.005	33557
132.000	RRH2X40-AWS	30	11.147	0.775	0.005	18642
130.000	(2) DB846F65ZAXY w/ Mount Pipe	30	10.818	0.769	0.005	16778
125.000	HP2-4.7NS	30	10.006	0.752	0.005	13422
124.000	800 10251 w/ Mount Pipe	30	9.846	0.749	0.005	12906
113.000	(3) 800 10252 w/ Mount Pipe	30	8.158	0.697	0.004	9672

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	150 - 110	40.918	5	2.352	0.014
L2	115.25 - 94.25	24.480	5	2.044	0.013
L3	99.75 - 46.25	18.221	5	1.767	0.009
L4	53.5 - 0	5.133	5	0.879	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	Lighting Rod 5/8" x 2'	5	40.918	2.352	0.014	23380
148.000	DS4C06F36D-N	5	39.930	2.340	0.014	23380
141.000	TME-RRUS-11	5	36.486	2.298	0.014	12988
140.000	(2) 7770.00 w/ Mount Pipe	5	35.997	2.292	0.014	11689
132.000	RRH2X40-AWS	5	32.130	2.233	0.015	6493
130.000	(2) DB846F65ZAXY w/ Mount Pipe	5	31.180	2.216	0.014	5844
125.000	HP2-4.7NS	5	28.842	2.167	0.014	4674
124.000	800 10251 w/ Mount Pipe	5	28.382	2.157	0.014	4495
113.000	(3) 800 10252 w/ Mount Pipe	5	23.518	2.009	0.013	3368

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	150 - 110 (1)	TP39.633x28.4x0.25	40.000	0.000	0.0	38.825	30.080	-10.30	1167.88	0.009
L2	110 - 94.25 (2)	TP43.556x37.659x0.281	21.000	0.000	0.0	39.000	37.252	-13.48	1452.83	0.009
L3	94.25 - 46.25 (3)	TP56.472x41.449x0.375	53.500	0.000	0.0	39.000	64.346	-25.10	2509.51	0.010
L4	46.25 - 0 (4)	TP68.71x53.686x0.438	53.500	0.000	0.0	38.331	94.805	-44.34	3633.94	0.012

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	150 - 110 (1)	TP39.633x28.4x0.25	374.88	15.967	38.825	0.411	0.00	0.000	38.825	0.000
L2	110 - 94.25 (2)	TP43.556x37.659x0.281	671.01	20.968	39.000	0.538	0.00	0.000	39.000	0.000
L3	94.25 - 46.25 (3)	TP56.472x41.449x0.375	1723.44	24.071	39.000	0.617	0.00	0.000	39.000	0.000
L4	46.25 - 0 (4)	TP68.71x53.686x0.438	3241.84	24.322	38.331	0.635	0.00	0.000	38.331	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	150 - 110 (1)	TP39.633x28.4x0.25	17.29	0.575	26.000	0.044	1.46	0.030	26.000	0.001
L2	110 - 94.25 (2)	TP43.556x37.659x0.281	20.07	0.539	26.000	0.041	4.54	0.069	26.000	0.003
L3	94.25 - 46.25 (3)	TP56.472x41.449x0.375	25.43	0.395	26.000	0.030	4.50	0.031	26.000	0.001
L4	46.25 - 0 (4)	TP68.71x53.686x0.438	31.35	0.331	26.000	0.025	4.48	0.016	26.000	0.001

Pole Interaction Design Data

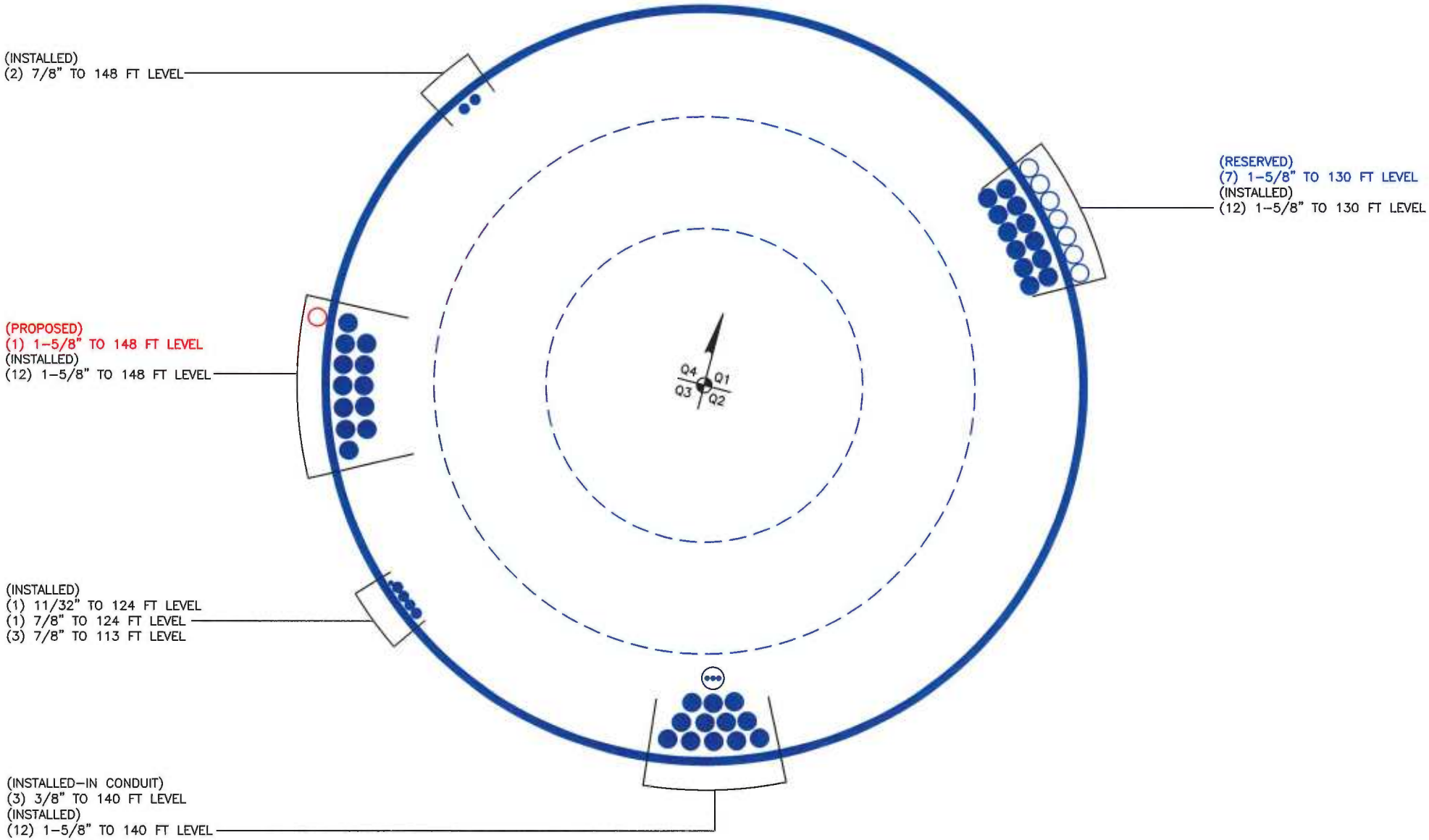
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	150 - 110 (1)	0.009	0.411	0.000	0.044	0.001	0.421 ✔	1.333	H1-3+VT ✔
L2	110 - 94.25 (2)	0.009	0.538	0.000	0.041	0.003	0.547 ✔	1.333	H1-3+VT ✔
L3	94.25 - 46.25 (3)	0.010	0.617	0.000	0.030	0.001	0.627 ✔	1.333	H1-3+VT ✔
L4	46.25 - 0 (4)	0.012	0.635	0.000	0.025	0.001	0.647 ✔	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	150 - 110	Pole	TP39.633x28.4x0.25	1	-10.30	1556.78	31.6	Pass
L2	110 - 94.25	Pole	TP43.556x37.659x0.281	2	-13.48	1936.62	41.1	Pass
L3	94.25 - 46.25	Pole	TP56.472x41.449x0.375	3	-25.10	3345.18	47.1	Pass
L4	46.25 - 0	Pole	TP68.71x53.686x0.438	4	-44.34	4844.04	48.5	Pass
							Summary	
						Pole (L4)	48.5	Pass
						RATING =	**48.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(2) 7/8" TO 148 FT LEVEL
(RESERVED)
(7) 1-5/8" TO 130 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 130 FT LEVEL
(PROPOSED)
(1) 1-5/8" TO 148 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 148 FT LEVEL
Q4
Q1
Q3
Q2
(INSTALLED)
(1) 11/32" TO 124 FT LEVEL
(1) 7/8" TO 124 FT LEVEL
(3) 7/8" TO 113 FT LEVEL
(INSTALLED-IN CONDUIT)
(3) 3/8" TO 140 FT LEVEL
(INSTALLED)
(12) 1-5/8" TO 140 FT LEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Square, Stiffened / Unstiffened Base Plate, Any Rod Material - Rev. F /C

Assumptions: 1) Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48 (12 per Corner).
2) Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)
3) Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#: *5800059*
Site Name: *Ridge Road- Madison*
App #: *221966 R2*

Anchor Rod Data		
Qty:	24	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	76	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	77	in
Thick:	3	in
Grade:	50	ksi
Clip Distance:	12	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
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:	68.71	in
Thick:	0.4375	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	3241.83777	ft-kips
Unfactored Axial, P:	44.3394	kips
Unfactored Shear, V:	31.345851	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension	83.5 Kips
Allowable Tension:	195.0 Kips
Anchor Rod Stress Ratio:	42.8% Pass

Base Plate Results Flexural Check

Base Plate Stress:	19.3 ksi
Allowable PL Bending Stress:	50.0 ksi
Base Plate Stress Ratio:	38.7% Pass

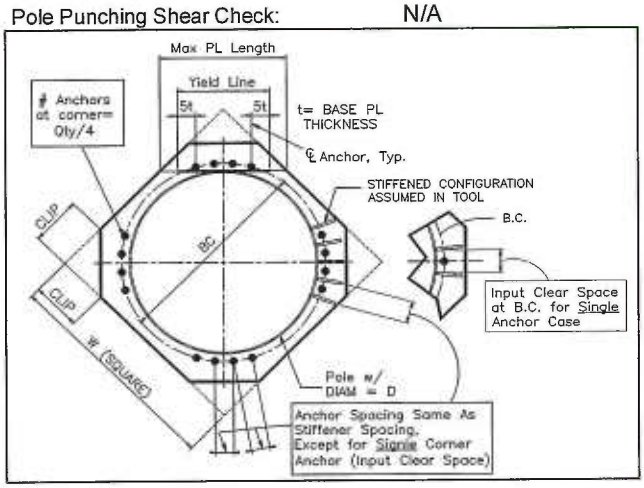
N/A - Unstiffened

Stiffener Results

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



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

AeroSolutions LLC
Optimizing Your Tower Infrastructure

Site Number	5800059
Site Name	Ridge Road- Madison

Caisson Analysis

Pier Properties		
Moment	3242	kip-ft
Shear	31	kip
Pier Diameter	8.0	ft
Height Above Grade	0.50	ft
Depth Below Grade	41.00	ft
Donut Diameter		ft
Donut Depth		ft

Analysis Properties		
TIA Code	F	
Soil Safety Factor	2.00	
Water Table Depth	7.0	ft
Ignored Soil Depth	4.0	ft
Cohesion Based on	PLS Caisson	
Max Soil Capacity	100%	

Soil Properties

Layer	Top of Soil Layer (ft)	Layer Thickness (ft)	Bottom of Soil Layer (ft)	Soil Unit Weight (pcf)	Cohesion (psf)	Friction Angle (degrees)
Soil.Layer	*Soil.Top*	*Soil.Thick*	*Soil.Bottom*	*Soil.Weight*	*Soil.Cohesion*	*Soil.Phi*
1	0.00	12	12.00	65	100	22
2	12.00	8	20.00	105	400	27
3	20.00	21	41.00	125	200	31
4						
5						
6						
7						
8						
9						
10						

Critical Depths Below Grade		
Rotation Axis	30.30	ft
Zero Shear	10.89	ft

Results		
Soil Capacity	32.1%	OK
Max Pier Moment	3497	kip-ft

Moment At User Defined Depths Below Grade			
	kip-ft		kip-ft
	kip-ft		kip-ft

V1.0

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#: *5800059*
Site Name: *Ridge Road- Madison*
App #: *221966 R2*

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

Pier Properties

Concrete:

Pier Diameter =	8.0	ft
Concrete Area =	7238.2	in^2

Reinforcement:

Clear Cover to **Tie**=	3.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	7.28	ft
Vert. Cage Diameter =	87.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	28	
As Total=	43.68	in^2
A s/ Aconc, Rho:	0.0060	0.60%

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:	0.60%	OK

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	14082.78	kips
at Mu=(ϕ=0.65)Mn=	9861.88	ft-kips
Max Tu, (φ=0.9) Tn =	2358.72	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Maximum Shaft Superimposed Forces

TIA Revision:	F	
Max. Service Shaft M:	3497.302	ft-kips **(* Note)**
Max. Service Shaft P:	44.3394	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:	4546.493	ft-kips
1.30	Pu:	57.64122	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

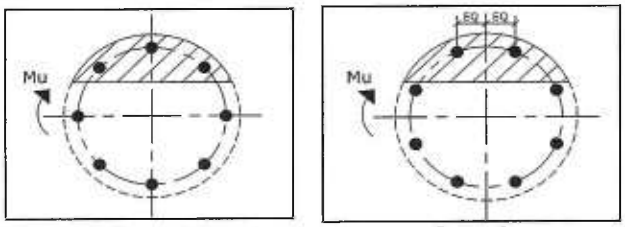
Seismic Properties

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

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

Results:

Governing Orientation Case: **1**



Case 1 Case 2

Dist. From Edge to Neutral Axis:	**13.53**	in
Extreme Steel Strain, εt:	**0.0173**	
εt > 0.0050, Tension Controlled		
Reduction Factor,φ:	**0.900**	

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	57.64	kips
Drilled Shaft Moment Capacity, φMn:	**8180.94**	ft-kips
Drilled Shaft Superimposed Mu:	**4546.49**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**55.6%**

EXHIBIT C

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

T-Mobile Existing Facility

Site ID: CTHA332C
HA332/Waste Station

258 Ridge Road
Madison, CT 06443

April 7, 2014

EBI Project Number: 62142260

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

EBI Consulting
environmental | engineering | due diligence

April 7, 2014

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

Re: Emissions Values for Site: **CTHA332C – HA332/Waste Station**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at 258 Ridge Road, Madison, 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 258 Ridge Road, Madison, 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) were considered for each sector of the proposed installation.
2) 2 UMTS channels (2110.000 MHz 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 MHz 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 **150 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 calculations were done with respect to uncontrolled / general public threshold limits.

Site ID	CTHA332C - HA332/ Waste Station
Site Addresss	258 Ridge Road, Madison, CT 06443
Site Type	Monopole

Sector 1																	
Antenna Number	Antenna Make	Antenna Model	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
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	150	144	None	0	0	48.326044	0.837842	0.08378%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	150	144	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	150	144	1-5/8"	0	0	24.163022	0.418921	0.04189%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	150	144	1-5/8"	0	0	24.163022	0.418921	0.04189%
														Sector total Power Density Value:		0.168%	

Sector 2																	
Antenna Number	Antenna Make	Antenna Model	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
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	150	144	None	0	0	48.326044	0.837842	0.08378%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	150	144	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	150	144	1-5/8"	0	0	24.163022	0.418921	0.04189%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	150	144	1-5/8"	0	0	24.163022	0.418921	0.04189%
														Sector total Power Density Value:		0.168%	

Sector 3																	
Antenna Number	Antenna Make	Antenna Model	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
1a	Ericsson	AIR21 B4A/B2P	Active	AWS - 2100 MHz	LTE	60	2	120	-3.95	150	144	None	0	0	48.326044	0.837842	0.08378%
1b	Ericsson	AIR21 B4A/B2P	Not Used	-	-			0	-3.95	150	144	None	0	0	0	0	0.00000%
2a	Ericsson	AIR21 B2A / B4P	Active	PCS - 1950 MHz	GSM / UMTS	30	2	60	-3.95	150	144	1-5/8"	0	0	24.163022	0.418921	0.04189%
2B	Ericsson	AIR21 B2A / B4P	Passive	AWS - 2100 MHz	UMTS	30	2	60	-3.95	150	144	1-5/8"	0	0	24.163022	0.418921	0.04189%
														Sector total Power Density Value:		0.168%	

Site Composite MPE %	
Carrier	MPE %
T-Mobile	0.503%
AT&T	16.400%
Verizon	22.870%
Total Site MPE %	**39.773%**

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environmental | engineering | due diligence

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 **0.503% (0.168% 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 **39.773%** 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 well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803