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April 7, 2015

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Street
New Britain, CT 06051

Regarding:	Notice of Exempt Modification – Addition of 3 radio heads previously approved
Property Address:	197 South Street Vernon, CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 132 foot self-supporting lattice tower ("tower") location on the Property. AT&T's facility consists of nine (9) wireless telecommunications antennas at 106'feet. The tower is controlled by Crown Castle. The Council approved the previous application on June 1, 2012 reference number EM-CING-146-120517. This application (attached) granted AT&T the use of 6 radio heads at this location. The approval expired one year from the issue date. During that time AT&T made the changes to the site per the approval but only installed three (3) of the six (6) radio heads that they received approval. AT&T would now like to install the additional three (3) radio heads that were originally approved under EM-CING-146-120517.

Please accept this application as notification pursuant to R.C.S.A. § 16-50j-73, for construction that 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, and the Town Planner for the Town of Vernon. A copy of this letter is also being sent to AT&T Towers, the owner of the structure that AT&T is located.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The planned modifications will not result in an increase in the height of the existing structure. AT&T's additional, previously approved 3 radio heads will be installed at 106' foot level of the 132 foot self support tower
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore will not require an extension of the site boundary.
3. The proposed modification will not increase the noise level at the facility by six decibel or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety

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standard. An RF emissions calculation (attached) for AT&T's modified facility was provided in the application which led to the June 1, 2012 Decision.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (Please see attached Structural analysis completed by PSec dated April 19,2012 and SSOE Group June 4, 2014).

For the foregoing reasons AT&T respectfully requests that the proposed addition of 3 radio heads previously approved be allowed within the exempt modifications under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

David P. Cooper
Director of Site Acquisition
Empire Telecom

CC: Daniel A. Champagne, Mayor, for the town of Vernon
Brianan Nolan – Planning & Development
Connecticut Water Co. – Underlying property owner
Crown Castle

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Date: **June 4, 2014**

Patrick Byrum
Crown Castle
3530 Torrington Way Suite 300
Charlotte, NC 28277
(704) 405-6532

SSOE Group
320 Seven Springs Way, Suite 350
Brentwood, TN 37027
(615) 661-7585
djones@ssoe.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5B
	Carrier Site Number:	CT60XC935
Crown Castle Designation:	**Crown Castle BU Number:**	806377
	Crown Castle Site Name:	HRT 084 943242
	Crown Castle JDE Job Number:	286421
	Crown Castle Work Order Number:	773066
	Crown Castle Application Number:	245730 Rev. 4
Engineering Firm Designation:	**SSOE Group Project Number:**	014-00564-00
Site Data:	**197 South Street, Vernon, CT 06066, Tolland County** **Latitude *41° 51' 12.51"*, Longitude *-72° 27' 7.52"*** **132 Foot – Modified Rohn Self Support Tower**	

Dear Mr. Patrick Byrum,

SSOE Group 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 652500, in accordance with application 245730, revision 4.

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

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, exposure category B.

We at *SSOE Group* 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: Dominique E. Jones

Respectfully submitted by:

STATE OF CONNECTICUT BARRY W. BURGESS NO. 26165 LICENSED PROFESSIONAL ENGINEER

6/4/14

Barry W. Burgess, PE
Section Manager

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1) INTRODUCTION

The existing 132' tower is supported on three legs and has seven major sections. It has a triangular cross section made of bolted connections, with an "X" frame configuration. The tower is fabricated with pipe legs and angle diagonals.

The tower was originally designed for Motorola, Inc. and Metro Mobile CTS by Rohn in accordance with E.I.A. Zone "A" with 0.5" radial ice.

All modifications designed by L&W Engineering (W.O. #: 2106-2, dated 10/31/95), which consisted of replacing tower legs from the 60' to 80' elevations and replacing tower diagonals from the 100' to 120' elevations, have been considered.

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, 28 mph with 1.0" 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
130.0	130.0	3	Alcatel Lucent	TD-RRH8x20-25	1	1-1/4	1
		3	RFS Celwave	APXVTM14-C-120 w/ Mount Pipe			
		1		Sector Mount [SM 803-3]			

Notes:
1) See Appendix B for the proposed coax layout.

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
130.0	149.0	1	Telewave	ANT450D6-9			1
	142.0	1	Telewave	ANT450D6-9			
	130.0	1		Pipe Mount [PM 601-1]			
	130.0	3	RFS Celwave	APXVSPP18-C-A20 w/ Mount Pipe	3	1-1/4	
		3	Alcatel Lucent	800MHz 2X50W RRH W/FILTER			
		3	Alcatel Lucent	1900MHz RRH (65MHz)			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
117.0	117.0	3	Alcatel Lucent	RRH2X40-AWS	12 1	7/8 1-5/8	
		2	Andrew	LBX-6515DS-T0M w/ Mount Pipe			
		2	Andrew	LNX-6514DS-T4M w/ Mount Pipe			
		1	Andrew	LNX-6514DS-T6M w/ Mount Pipe			
		3	RFS Celwave	APX18-206516L-CT2 w/ Mount Pipe			
		3	RFS Celwave	APX18-206517-CT2 w/ Mount Pipe			
		1	RFS Celwave	DB-T1-6Z-8AB-0Z			
		6	RFS Celwave	FD9R6004/2C-3L			
		1		Sector Mount [SM 504-3]			
		1	Antel	BXA-70063-6CF-2 w/Mount Pipe			2
104.0	106.0	1	Raycap	DC6-48-60-18-8F	1 2 12	3/8 3/4 7/8	
		2	Andrew	SBNH-1D6565C w/ Mount Pipe			
		3	Communication Components	DTMABP7819VG12A			
		3	CSS	DBC-750			
		3	Kathrein	782-10250			
		3	Kathrein	800 10121 w/ Mount Pipe			
		4	KMW Communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe			
		6	Ericsson	RRUS-11			
	104.0			Sector Mount [SM 504-3]			
92.0	92.0	3	Kathrein	742 213 w/ Mount Pipe	6	1-5/8	
84.0	84.0	3	Ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1 12	1-5/8 7/8	
		3	Ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	Ericsson	KRY 112 144/1			
		1		Sector Mount [SM 308-3]			
61.0	61.0	1	Maxrad	MPRC2449	2	3/8	
		1	Redline Communications	RDL-3000			
		1		Side Arm Mount [SO 311-1]			
58.0	61.0	1	Maxrad	GPS-TMG-20N	1	1/2	
	58.0	1	Tower Mounts	Side Arm Mount [SO 311-1]			
46.0	47.0	1	Lucent	KS24019-L112A	1	1/2	
	46.0	1		Side Arm Mount [SO 701-1]			

Notes:
1) Existing equipment to be removed; has not been considered in analysis.
2) Reserved loading.

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)
127.0	127.0	4	Celwave	PD10017	-	-
		4	Generic	3' Side Arm Mount	-	-
124.0	124.0	2	Generic	8' Ø STD Dishes	-	-
112.0	112.0	6	Celwave	PD1132	-	-
		3	Generic	6' Side Arm Mount	-	-
80.0	80.0	1	Celwave	PD1109	-	-
		1	Generic	6' Side Arm Mount	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Rohn File #: 22731JC, dated 7/24/87	Doc ID#: 529704	Crown DMZ
Foundation Drawings	ERI Project #: ST/536, dated 3/11/97	Doc ID#: 1014812	Crown DMZ
Geotechnical Reports	FDH Project #: 04-1212E, dated 12/30/04	Doc ID#: 1014866	Crown DMZ
Tower Reinforcement Drawings	L&W Work Order #: 2106-2, dated 10/31/95	Doc ID#: 2240842	Crown DMZ

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) The tower was constructed in accordance with its original design and maintained per the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by SSOE.
4) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
5) All foundation steel reinforcing is assumed to have been designed to meet or exceed the load carrying capacity of the surrounding soils unless otherwise specified in this report.
6) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package, dated 5/23/14 with any adjustments as noted below.

This analysis may be affected if any assumptions are not valid or have been made in error. SSOE Group 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
T1	132 - 124	Leg	ROHN 2 STD	3	-3.33	32.30	10.3	Pass
T2	124 - 120	Leg	ROHN 2 STD	21	-6.74	32.30	20.9	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	33	-31.83	50.25	63.3	Pass
T4	100 - 80	Leg	ROHN 3 STD	60	-61.37	62.82	97.7	Pass
T5	80 - 60	Leg	ROHN 3 XX-STR	80	-91.64	143.51	63.9	Pass
T6	60 - 40	Leg	ROHN 4 X-STR	101	-119.56	139.07	86.0	Pass
T7	40 - 20	Leg	ROHN 5 X-STR	122	-143.70	177.46	81.0	Pass
T8	20 - 0	Leg	ROHN 5 X-STR	137	-168.30	177.46	94.8	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.82	7.67	23.8 32.8 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	28	-1.66	7.65	21.7 29.6 (b)	Pass
T3	120 - 100	Diagonal	L2x2x3/16	36	-4.44	6.70	66.3 69.0 (b)	Pass
T4	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	63	-5.62	8.33	67.5 75.8 (b)	Pass
T5	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	84	-5.78	6.32	91.5	Pass
T6	60 - 40	Diagonal	L3x3x3/16	105	-6.25	8.79	71.1 84.8 (b)	Pass
T7	40 - 20	Diagonal	L3x3x1/4	127	-7.21	7.82	92.2	Pass
T8	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	142	-7.48	10.60	70.5	Pass
T1	132 - 124	Top Girt	L2x2x3/16	5	-0.06	3.03	2.1	Pass
T2	124 - 120	Top Girt	L2x2x3/16	22	-0.25	4.00	6.3	Pass
							Summary	
						Leg (T4)	97.7	Pass
						Diagonal (T7)	92.2	Pass
						Top Girt (T2)	6.3	Pass
						Bolt Checks	85.7	Pass
						Rating =	**97.7**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Base Foundation		91.8%	Pass
	Anchor Rods		85.7%	Pass

Structure Rating (max from all components) =	97.7%

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

4.1) Recommendations

The existing tower and its foundations are sufficient for the proposed loads and do not require modifications.

5) DISCLAIMER OF WARRANTIES

SSOE Group has not performed a site visit to the tower to verify member sizes or antenna/coax loading. SSOE Group shall be contacted immediately if the existing conditions are not as represented on the tower elevation contained in this report in order to evaluate the significance of the discrepancy. SSOE Group has not performed a condition assessment of the tower foundation. This report does not replace a full tower inspection. The tower and foundation are assumed to have been properly fabricated, erected and maintained and to be in good condition, twist free, and plumb.

The engineering services rendered by SSOE Group in connection with this structural analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to resist dead loads only when no other loads are applied. No allowance has been made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance has been made for any loose bolts or cracked welds.

For the purposes of this report, SSOE Group has assumed that all connections in the tower are sufficient to develop the allowable strength of the associated members. SSOE Group has not performed engineering analysis to verify adequacy of these connections.

It is the owner's responsibility to determine the amount of ice accumulation, if any, that should be considered in the structural analysis.

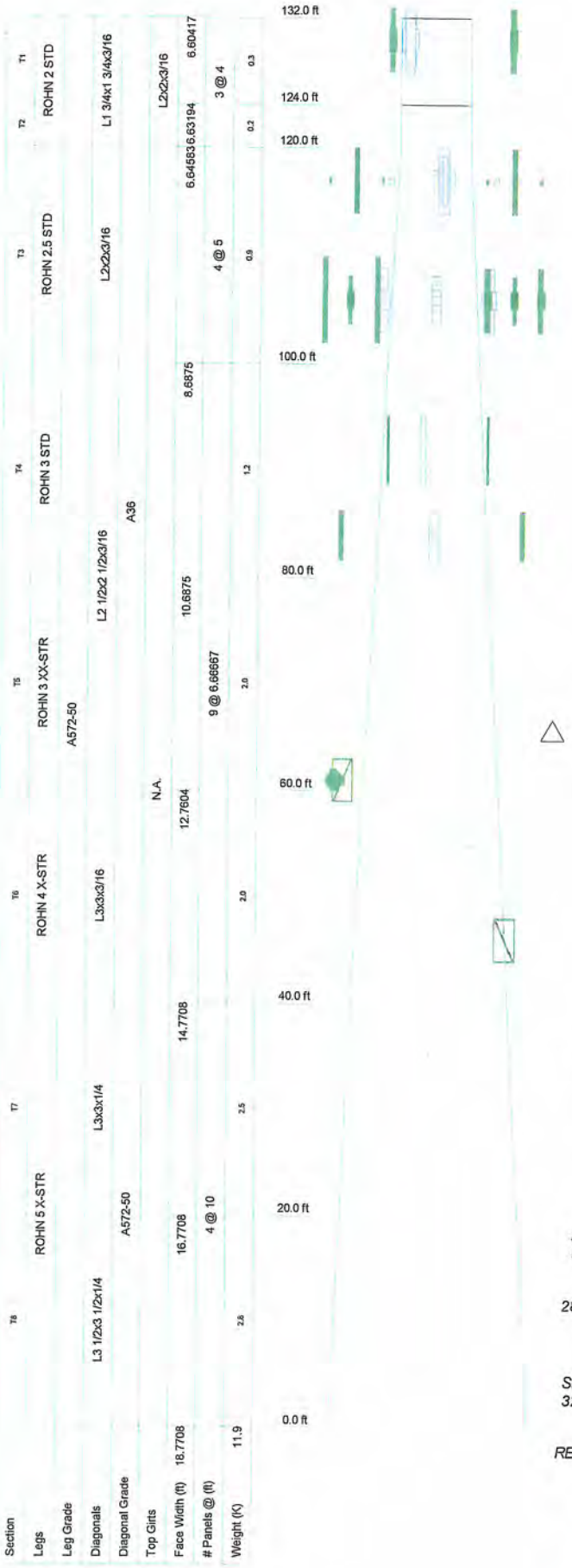
The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearances in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a construction document. Construction documents depicting the required modification are obtainable from SSOE Group, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as part of our work. We recommend that material of suitable size and strength be purchased from a reputable tower manufacturer.

SSOE Group makes no warranty, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. SSOE Group will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of SSOE Group pursuant to this report will be limited to the total fee received for preparation of this report.

APPENDIX A

TNXTOWER OUTPUT



MATERIAL STRENGTH

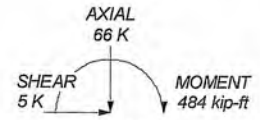
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

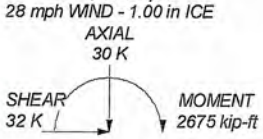
1. Tower is located in Tolland County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 28 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 97.7%

MAX. CORNER REACTIONS AT BASE:
DOWN: 174 K
SHEAR: 20 K

UPLIFT: -147 K
SHEAR: 17 K



TORQUE 3 kip-ft
28 mph WIND - 1.00 in ICE



TORQUE 22 kip-ft
REACTIONS - 85 mph WIND

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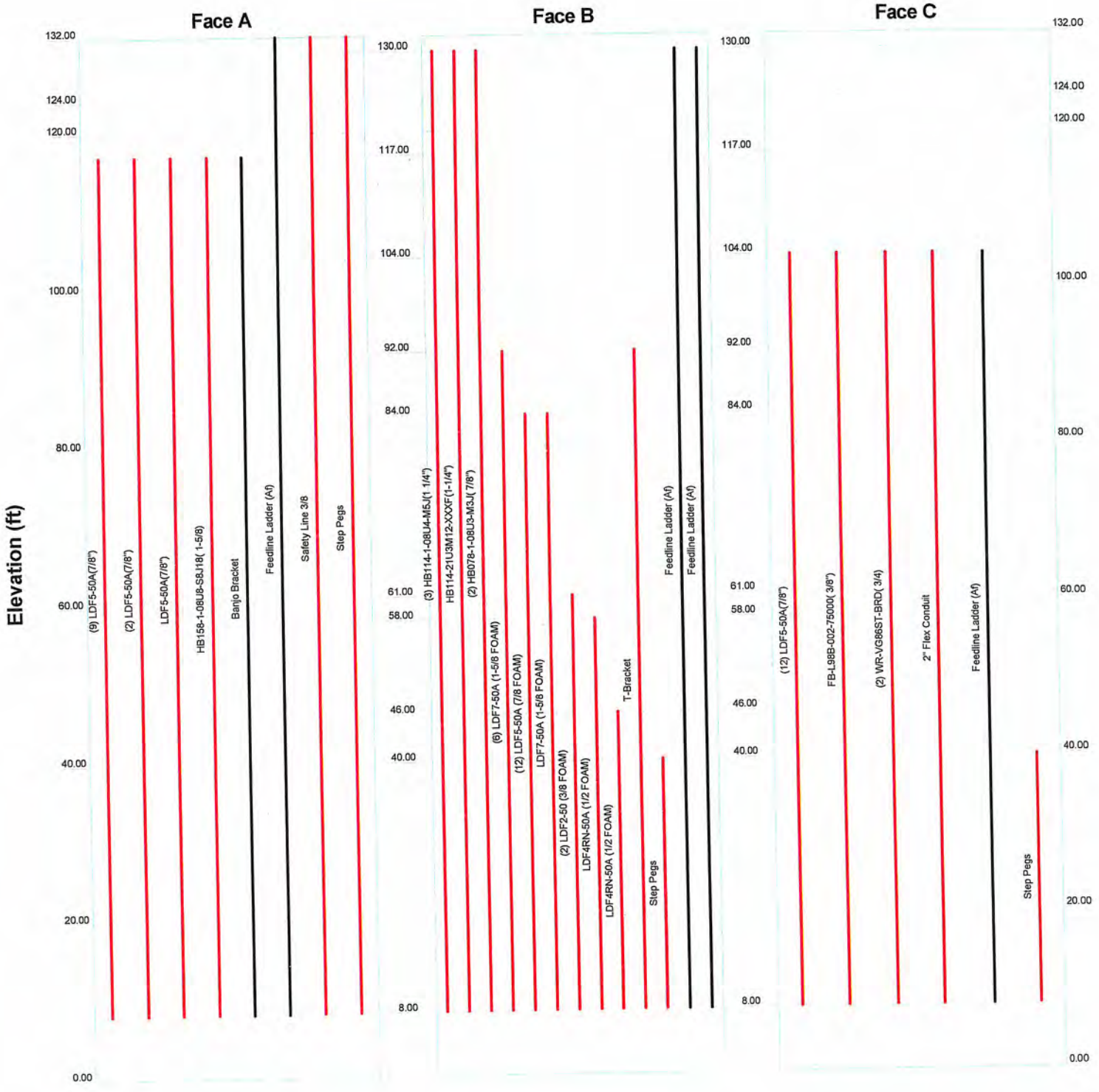
Brentwood, TN 37027
Phone: (615) 661-7585
FAX: (615) 661-7569

Job: BU 806377 HRT 084 943242			
Project: 014-00546-00			
Client: CCI	Drawn by: 15310	App'd:	
Code: TIA/EIA-222-F	Date: 06/04/14	Scale: NTS	
Path: F:\Projects\June\806377\tnx\806377.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 132'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job: *BU 806377 HRT 084 943242*			
Project: *014-00546-00*			
Client: CCI	Drawn by: 15310	App'd:	
Code: TIA/EIA-222-F	Date: 06/04/14	Scale: NTS	
Path: F:\Projects\June\806377\tnx\806377.eri		Dwg No. E-7	

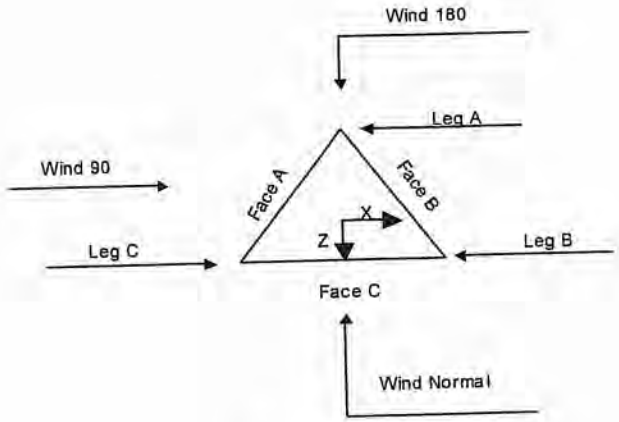
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 132.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 6.60 ft at the top and 18.77 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 1.00 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 28 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
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	



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	132.00-124.00			6.60	1	8.00
T2	124.00-120.00			6.63	1	4.00
T3	120.00-100.00			6.65	1	20.00
T4	100.00-80.00			8.69	1	20.00
T5	80.00-60.00			10.69	1	20.00
T6	60.00-40.00			12.76	1	20.00
T7	40.00-20.00			14.77	1	20.00
T8	20.00-0.00			16.77	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	132.00-124.00	4.00	X Brace	No	No	0.00	0.00
T2	124.00-120.00	4.00	X Brace	No	No	0.00	0.00
T3	120.00-100.00	5.00	X Brace	No	No	0.00	0.00
T4	100.00-80.00	6.67	X Brace	No	No	0.00	0.00
T5	80.00-60.00	6.67	X Brace	No	No	0.00	0.00
T6	60.00-40.00	6.67	X Brace	No	No	0.00	0.00
T7	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T8	20.00-0.00	10.00	X Brace	No	No	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 132.00-124.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 124.00-120.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 120.00-100.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 100.00-80.00	Pipe	ROHN 3 STD	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 80.00-60.00	Pipe	ROHN 3 XX-STR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 60.00-40.00	Pipe	ROHN 4 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 40.00-20.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T8 20.00-0.00	Pipe	ROHN 5 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 132.00-124.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)
T2 124.00-120.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 132.00-124.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T2 124.00-120.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T3 120.00-100.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T4 100.00-80.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T5 80.00-60.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T6 60.00-40.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T7 40.00-20.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00
T8 20.00-0.00	0.00	0.00	A36 (36 ksi)	1	1	1.05	36.00	36.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 132.00-124.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 124.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 132.00-124.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T2 124.00-120.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T3 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T4 100.00-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T8 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 132.00-124.00	Flange	0.00 A325N	0	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T2 124.00-120.00	Flange	0.63 A325N	4	0.63 A325N	1	0.63 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T3 120.00-100.00	Flange	0.75 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T4 100.00-80.00	Flange	0.88 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T5 80.00-60.00	Flange	0.88 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T6 60.00-40.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T7 40.00-20.00	Flange	1.00 A325N	4	0.63 A325N	1	0.50 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T8 20.00-0.00	Flange	1.00 A449	4	0.75 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
HB114-1-08U4-M5J(1 1/4")	B	Yes	Ar (CfAe)	130.00 - 8.00	0.00	0.4	3	3	0.00	1.54		0.00
HB114-21U3M12-XXXF(1-1/4")	B	Yes	Ar (CfAe)	130.00 - 8.00	0.00	0.45	1	1	0.00	1.54		0.00
HB078-1-08U3-M3J(7/8")	B	Yes	Ar (CfAe)	130.00 - 8.00	0.00	-0.35	2	2	0.00	1.09		0.00
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	117.00 - 8.00	0.00	0.4	9	9	0.00	1.09		0.00
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	117.00 - 8.00	2.00	0.2	2	1	0.00	1.09		0.00
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	117.00 - 8.00	0.00	0.27	1	1	0.00	1.09		0.00
HB158-1-08U8-S8J18(1-5/8)	A	Yes	Ar (CfAe)	117.00 - 8.00	1.00	0.3	1	1	0.00	1.98		0.00
LDF5-50A(7/8")	C	Yes	Ar (CfAe)	104.00 - 8.00	0.00	-0.4	12	12	0.00	1.09		0.00
FB-L98B-002-75000(3/8")	C	Yes	Ar (CfAe)	104.00 - 8.00	0.00	-0.47	1	1	0.00	0.00		0.00
WR-VG86ST-BRD(3/4)	C	Yes	Ar (CfAe)	104.00 - 8.00	0.00	-0.45	2	1	0.00	0.00		0.00
2" Flex Conduit	C	Yes	Ar (CfAe)	104.00 - 8.00	0.00	-0.45	1	1	0.00	2.00		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (Leg)	92.00 - 8.00	0.00	0.08	6	2	0.00	1.98		0.00
LDF5-50A (7/8 FOAM)	B	No	Ar (Leg)	84.00 - 8.00	0.00	0.05	12	3	0.00	1.09		0.00
LDF7-50A (1-5/8 FOAM)	B	No	Ar (Leg)	84.00 - 8.00	0.00	0.06	1	1	0.00	1.98		0.00
LDF2-50 (3/8 FOAM)	B	Yes	Ar (CfAe)	61.00 - 8.00	0.00	-0.35	2	2	0.00	0.44		0.00
LDF4RN-50A	B	Yes	Ar (CfAe)	58.00 - 8.00	0.00	-0.43	1	1	0.00	0.63		0.00

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
(1/2 FOAM) LDF4RN-50A	B	Yes	Ar (CfAe)	46.00 - 8.00	0.00	0.45	1	1	0.00	0.63		0.00
(1/2 FOAM) Banjo	A	Yes	Af (CfAe)	117.00 - 8.00	0.00	0.33	1	1	0.00	0.00	0.50	0.01
Bracket Feedline	A	Yes	Af (CfAe)	132.00 - 8.00	0.00	0.4	1	1	0.00	3.00	12.00	0.01
Ladder (Af) Safety Line 3/8	A	No	Ar (Leg)	132.00 - 8.00	0.00	0	1	1	0.00	0.38		0.00
Step Pegs	A	No	Ar (Leg)	132.00 - 8.00	0.00	0	1	1	0.00	0.80		0.00
T-Bracket	B	No	Ar (Leg)	92.00 - 8.00	0.00	0	1	1	0.00	1.00		0.01
Step Pegs	B	No	Ar (Leg)	40.00 - 8.00	0.00	0	1	1	0.00	0.80		0.00
Feedline	B	Yes	Af (CfAe)	130.00 - 8.00	0.00	0.4	1	1	0.00	3.00	12.00	0.01
Ladder (Af) Feedline	B	Yes	Af (CfAe)	130.00 - 8.00	0.00	-0.4	1	1	0.00	3.00	12.00	0.01
Ladder (Af) Feedline	C	Yes	Af (CfAe)	104.00 - 8.00	0.00	-0.4	1	1	0.00	3.00	12.00	0.01
Ladder (Af) Step Pegs	C	No	Ar (Leg)	40.00 - 8.00	0.00	0	1	1	0.00	0.80		0.00

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
T1	132.00-124.00	A	0.783	2.000	0.000	0.000	0.09
		B	4.953	3.000	0.000	0.000	0.14
		C	0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	0.392	1.000	0.000	0.000	0.05
		B	3.172	2.000	0.000	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	21.749	5.000	0.000	0.000	0.49
		B	15.858	10.000	0.000	0.000	0.46
		C	5.027	1.000	0.000	0.000	0.06
T4	100.00-80.00	A	25.242	5.000	0.000	0.000	0.53
		B	22.568	10.000	0.000	0.000	0.65
		C	31.843	5.000	0.000	0.000	0.28
T5	80.00-60.00	A	25.242	5.000	0.000	0.000	0.53
		B	32.948	10.000	0.000	0.000	0.85
		C	42.150	5.000	0.000	0.000	0.28
T6	60.00-40.00	A	25.242	5.000	0.000	0.000	0.53
		B	35.602	10.000	0.000	0.000	0.86
		C	42.150	5.000	0.000	0.000	0.28
T7	40.00-20.00	A	26.575	5.000	0.000	0.000	0.53
		B	37.775	10.000	0.000	0.000	0.91
		C	44.817	5.000	0.000	0.000	0.33
T8	20.00-0.00	A	15.945	3.000	0.000	0.000	0.32
		B	22.665	6.000	0.000	0.000	0.55
		C	26.890	3.000	0.000	0.000	0.20

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
T1	132.00-124.00	A	1.177	3.921	3.046	0.000	0.000	0.19
		B		9.536	6.654	0.000	0.000	0.32
		C		0.000	0.000	0.000	0.000	0.00
T2	124.00-120.00	A	1.170	1.952	1.520	0.000	0.000	0.10
		B		5.681	4.430	0.000	0.000	0.21
		C		0.000	0.000	0.000	0.000	0.00
T3	120.00-100.00	A	1.155	30.194	22.103	0.000	0.000	1.21
		B		28.166	22.085	0.000	0.000	1.05
		C		4.111	5.510	0.000	0.000	0.18

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
T4	100.00-80.00	A	1.128	33.267	24.546	0.000	0.000	1.31
		B		37.726	24.670	0.000	0.000	1.45
		C		30.208	30.197	0.000	0.000	0.89
T5	80.00-60.00	A	1.094	32.597	24.397	0.000	0.000	1.28
		B		52.044	28.784	0.000	0.000	1.94
		C		44.418	34.349	0.000	0.000	0.87
T6	60.00-40.00	A	1.051	31.731	24.205	0.000	0.000	1.24
		B		60.227	29.288	0.000	0.000	1.99
		C		43.263	34.253	0.000	0.000	0.84
T7	40.00-20.00	A	1.000	35.375	23.978	0.000	0.000	1.19
		B		66.492	29.061	0.000	0.000	2.05
		C		51.233	34.139	0.000	0.000	0.91
T8	20.00-0.00	A	1.000	21.225	14.387	0.000	0.000	0.72
		B		39.895	17.437	0.000	0.000	1.23
		C		30.740	20.483	0.000	0.000	0.54

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	132.00-124.00	A	0.000	0.496	0.212	0.378
		B	0.000	1.816	0.760	1.384
		C	0.000	0.000	0.000	0.000
T2	124.00-120.00	A	0.000	0.289	0.127	0.226
		B	0.000	1.411	0.606	1.101
		C	0.000	0.000	0.000	0.000
T3	120.00-100.00	A	0.000	4.148	1.977	3.590
		B	0.000	3.978	1.906	3.443
		C	0.000	0.910	0.481	0.788
T4	100.00-80.00	A	0.000	3.485	2.149	3.862
		B	0.000	2.927	1.816	3.244
		C	0.000	3.354	2.289	3.717
T5	80.00-60.00	A	0.000	3.161	2.035	3.610
		B	0.000	2.671	1.725	3.050
		C	0.000	3.047	2.168	3.481
T6	60.00-40.00	A	0.000	2.880	2.358	4.110
		B	0.000	3.029	2.220	4.323
		C	0.000	2.784	2.512	3.973
T7	40.00-20.00	A	0.000	1.906	1.675	2.860
		B	0.000	2.137	1.627	3.206
		C	0.000	1.848	1.785	2.772
T8	20.00-0.00	A	0.000	1.108	1.136	1.940
		B	0.000	1.243	1.103	2.175
		C	0.000	1.074	1.210	1.880

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	132.00-124.00	4.36	-3.63	1.83	-3.52
T2	124.00-120.00	5.05	-3.30	2.01	-3.04
T3	120.00-100.00	6.06	-8.62	3.09	-7.00
T4	100.00-80.00	13.28	-2.85	8.77	-3.44
T5	80.00-60.00	17.08	-1.18	11.32	-2.32
T6	60.00-40.00	17.54	-1.84	12.15	-3.05
T7	40.00-20.00	20.18	-1.46	14.59	-2.05
T8	20.00-0.00	15.59	-1.10	11.75	-1.62

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
TME-1900MHz RRH (65MHz)	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
800MHz 2x50W RRH W/FILTER	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
TD-RRH8x20-25	A	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	8.26	6.71	0.08
						1/2" Ice	8.81	7.66	0.14
						1" Ice	9.36	8.49	0.22
						2" Ice	10.50	10.20	0.39
						4" Ice	12.88	13.98	0.87
1900MHZ RRH (65MHz)	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
800MHz 2x50W RRH W/FILTER	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
TD-RRH8x20-25	B	From Leg	3.15 -2.46 0.00	-38.00	130.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	2.68 -2.97	-48.00	130.00	No Ice	8.26	6.71	0.08
						1/2"	8.81	7.66	0.14

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
			0.00			Ice	9.36	8.49	0.22
						1" Ice	10.50	10.20	0.39
						2" Ice	12.88	13.98	0.87
						4" Ice			
TME-1900MHz RRH (65MHz)	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	No Ice	2.70	2.77	0.06
						1/2" Ice	2.94	3.01	0.08
						1" Ice	3.18	3.26	0.11
						2" Ice	3.70	3.78	0.18
						4" Ice	4.85	4.93	0.35
800MHz 2x50W RRH W/FILTER	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	No Ice	2.40	2.25	0.06
						1/2" Ice	2.61	2.46	0.09
						1" Ice	2.83	2.68	0.11
						2" Ice	3.30	3.13	0.17
						4" Ice	4.34	4.15	0.34
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	No Ice	7.13	4.96	0.08
						1/2" Ice	7.66	5.75	0.13
						1" Ice	8.18	6.47	0.19
						2" Ice	9.26	8.01	0.34
						4" Ice	11.53	11.41	0.75
TD-RRH8x20-25	C	From Leg	2.68 -2.97 0.00	-48.00	130.00	No Ice	4.72	1.70	0.07
						1/2" Ice	5.01	1.92	0.10
						1" Ice	5.32	2.15	0.13
						2" Ice	5.95	2.62	0.20
						4" Ice	7.31	3.68	0.40
Sector Mount [SM 803-3]	C	None		0.00	130.00	No Ice	40.40	40.40	0.98
						1/2" Ice	51.20	51.20	1.23
						1" Ice	62.00	62.00	1.47
						2" Ice	83.60	83.60	1.95
						4" Ice	126.80	126.80	2.91
LBX-6515DS-T0M w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice	8.92	6.10	0.05
						1/2" Ice	9.58	7.27	0.11
						1" Ice	10.20	8.16	0.19
						2" Ice	11.47	9.97	0.36
						4" Ice	14.13	13.79	0.85
LNX-6514DS-T4M w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice	8.57	7.00	0.06
						1/2" Ice	9.22	8.19	0.13
						1" Ice	9.84	9.08	0.20
						2" Ice	11.10	10.90	0.38
						4" Ice	13.75	14.93	0.89
APX18-206516L-CT2 w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice	4.12	3.67	0.04
						1/2" Ice	4.73	4.72	0.08
						1" Ice	5.26	5.48	0.13
						2" Ice	6.41	7.05	0.24
						4" Ice	8.85	10.39	0.58
APX18-206517-CT2 w/ Mount Pipe	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice	5.36	4.73	0.05
						1/2" Ice	5.91	5.90	0.09
						1" Ice	6.44	6.79	0.15
						2" Ice	7.51	8.58	0.28
						4" Ice	9.86	12.36	0.68
(2) FD9R6004/2C-3L	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice	0.37	0.08	0.00
						1/2" Ice	0.45	0.14	0.01
						1" Ice	0.54	0.20	0.01
						2" Ice	0.75	0.34	0.02
						4" Ice	1.28	0.74	0.06
DB-T1-6Z-8AB-0Z	A	From Leg	3.91	12.00	117.00	No Ice	5.60	2.33	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
			0.83 0.00			1/2" Ice	5.92 6.24	2.56 2.79	0.08 0.12
						1" Ice	6.91	3.28	0.21
						2" Ice	8.37	4.37	0.45
						4" Ice			
RRH2X40-AWS	A	From Leg	3.91 0.83 0.00	12.00	117.00	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75 2.99	1.80 2.01	0.06 0.08
						1" Ice	3.44	2.43	0.12
						2" Ice	4.36	3.27	0.20
						4" Ice			
LBX-6515DS-T0M w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice	8.92	6.10	0.05
						1/2" Ice	9.58 10.20	7.27 8.16	0.11 0.19
						1" Ice	11.47	9.97	0.36
						2" Ice	14.13	13.79	0.85
						4" Ice			
APX18-206517-CT2 w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice	5.36	4.73	0.05
						1/2" Ice	5.91 6.44	5.90 6.79	0.09 0.15
						1" Ice	7.51	8.58	0.28
						2" Ice	9.86	12.36	0.68
						4" Ice			
LNX-6514DS-T4M w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice	8.57	7.00	0.06
						1/2" Ice	9.22 9.84	8.19 9.08	0.13 0.20
						1" Ice	11.10	10.90	0.38
						2" Ice	13.75	14.93	0.89
						4" Ice			
APX18-206516L-CT2 w/ Mount Pipe	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice	4.12	3.67	0.04
						1/2" Ice	4.73 5.26	4.72 5.48	0.08 0.13
						1" Ice	6.41	7.05	0.24
						2" Ice	8.85	10.39	0.58
						4" Ice			
(2) FD9R6004/2C-3L	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice	0.37	0.08	0.00
						1/2" Ice	0.45 0.54	0.14 0.20	0.01 0.01
						1" Ice	0.75	0.34	0.02
						2" Ice	1.28	0.74	0.06
						4" Ice			
RRH2X40-AWS	B	From Leg	3.53 -1.88 0.00	-28.00	117.00	No Ice	2.52	1.59	0.04
						1/2" Ice	2.75 2.99	1.80 2.01	0.06 0.08
						1" Ice	3.44	2.43	0.12
						2" Ice	4.36	3.27	0.20
						4" Ice			
LNX-6514DS-T6M w/ Mount Pipe	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice	8.57	7.00	0.06
						1/2" Ice	9.22 9.84	8.19 9.08	0.13 0.20
						1" Ice	11.10	10.90	0.38
						2" Ice	13.75	14.93	0.89
						4" Ice			
APX18-206516L-CT2 w/ Mount Pipe	C	From Leg	3.71 1.50 0.00	-28.00	117.00	No Ice	4.12	3.67	0.04
						1/2" Ice	4.73 5.26	4.72 5.48	0.08 0.13
						1" Ice	6.41	7.05	0.24
						2" Ice	8.85	10.39	0.58
						4" Ice			
BXA-70063-6CF-2 w/Mount Pipe	C	From Leg	3.71 1.50 0.00	32.00	117.00	No Ice	7.77	5.18	0.04
						1/2" Ice	8.31 8.86	6.11 6.92	0.10 0.16
						1" Ice	9.99	8.59	0.31
						2" Ice	12.35	12.13	0.75
						4" Ice			

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
APX18-206517-CT2 w/ Mount Pipe	C	From Leg	3.71 1.50 0.00	22.00	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.36 5.91 6.44 7.51 9.86	4.73 5.90 6.79 8.58 12.36	0.05 0.09 0.15 0.28 0.68
(2) FD9R6004/2C-3L	C	From Leg	3.71 1.50 0.00	32.00	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.37 0.45 0.54 0.75 1.28	0.08 0.14 0.20 0.34 0.74	0.00 0.01 0.01 0.02 0.06
RRH2X40-AWS	C	From Leg	3.71 1.50 0.00	32.00	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.52 2.75 2.99 3.44 4.36	1.59 1.80 2.01 2.43 3.27	0.04 0.06 0.08 0.12 0.20
Sector Mount [SM 504-3]	C	None		0.00	117.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	34.25 48.98 63.71 93.17 152.09	34.25 48.98 63.71 93.17 152.09	1.71 2.29 2.86 4.02 6.33
800 10121 w/ Mount Pipe	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.69 6.18 6.67 7.69 9.84	4.60 5.34 6.04 7.51 10.82	0.07 0.11 0.17 0.30 0.67
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.50 9.15 9.77 11.03 13.68	6.30 7.48 8.37 10.18 14.02	0.07 0.14 0.21 0.38 0.87
782-10250	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.52 0.63 0.75 1.01 1.63	0.27 0.36 0.46 0.69 1.24	0.01 0.01 0.02 0.03 0.09
DBC-750	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.51 0.60 0.71 0.95 1.53	0.10 0.16 0.23 0.40 0.84	0.00 0.01 0.01 0.02 0.07
DC6-48-60-18-8F	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.22 2.44 2.66 3.15 4.21	2.22 2.44 2.66 3.15 4.21	0.02 0.04 0.06 0.12 0.27
(2) RRUS-11	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.25 3.49 3.74 4.27 5.43	1.37 1.55 1.74 2.14 3.04	0.05 0.07 0.09 0.15 0.31
DTMABP7819VG12A	A	From Leg	4.00 0.14 2.00	2.00	104.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.14 1.28 1.44 1.77 2.54	0.39 0.49 0.59 0.83 1.41	0.02 0.03 0.04 0.06 0.14

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
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.14	2.00	104.00	4" Ice			
							No Ice	5.69	4.60	0.07
							1/2" Ice	6.18	5.34	0.11
							1" Ice	6.67	6.04	0.17
							2" Ice	7.69	7.51	0.30
							4" Ice	9.84	10.82	0.67
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.14	2.00	104.00	No Ice	8.50	6.30	0.07
							1/2" Ice	9.15	7.48	0.14
							1" Ice	9.77	8.37	0.21
							2" Ice	11.03	10.18	0.38
							4" Ice	13.68	14.02	0.87
782-10250	B	From Leg	4.00	0.14	2.00	104.00	No Ice	0.52	0.27	0.01
							1/2" Ice	0.63	0.36	0.01
							1" Ice	0.75	0.46	0.02
							2" Ice	1.01	0.69	0.03
							4" Ice	1.63	1.24	0.09
DBC-750	B	From Leg	4.00	0.14	2.00	104.00	No Ice	0.51	0.10	0.00
							1/2" Ice	0.60	0.16	0.01
							1" Ice	0.71	0.23	0.01
							2" Ice	0.95	0.40	0.02
							4" Ice	1.53	0.84	0.07
(3) RRUS-11	B	From Leg	4.00	0.14	2.00	104.00	No Ice	3.25	1.37	0.05
							1/2" Ice	3.49	1.55	0.07
							1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15
							4" Ice	5.43	3.04	0.31
DTMABP7819VG12A	B	From Leg	4.00	0.14	2.00	104.00	No Ice	1.14	0.39	0.02
							1/2" Ice	1.28	0.49	0.03
							1" Ice	1.44	0.59	0.04
							2" Ice	1.77	0.83	0.06
							4" Ice	2.54	1.41	0.14
800 10121 w/ Mount Pipe	C	From Leg	3.91	0.83	12.00	104.00	No Ice	5.69	4.60	0.07
							1/2" Ice	6.18	5.34	0.11
							1" Ice	6.67	6.04	0.17
							2" Ice	7.69	7.51	0.30
							4" Ice	9.84	10.82	0.67
(2) SBNH-1D6565C w/ Mount Pipe	C	From Leg	3.91	0.83	12.00	104.00	No Ice	11.68	9.84	0.09
							1/2" Ice	12.40	11.37	0.18
							1" Ice	13.14	12.91	0.28
							2" Ice	14.60	15.27	0.52
							4" Ice	17.87	20.14	1.16
782-10250	C	From Leg	3.91	0.83	12.00	104.00	No Ice	0.52	0.27	0.01
							1/2" Ice	0.63	0.36	0.01
							1" Ice	0.75	0.46	0.02
							2" Ice	1.01	0.69	0.03
							4" Ice	1.63	1.24	0.09
DBC-750	C	From Leg	3.91	0.83	12.00	104.00	No Ice	0.51	0.10	0.00
							1/2" Ice	0.60	0.16	0.01
							1" Ice	0.71	0.23	0.01
							2" Ice	0.95	0.40	0.02
							4" Ice	1.53	0.84	0.07
RRUS-11	C	From Leg	3.91	0.83	12.00	104.00	No Ice	3.25	1.37	0.05
							1/2" Ice	3.49	1.55	0.07
							1" Ice	3.74	1.74	0.09
							2" Ice	4.27	2.14	0.15

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	5.43	3.04	0.31
						4" Ice			
DTMABP7819VG12A	C	From Leg	3.91 0.83 2.00	12.00	104.00	No Ice	1.14	0.39	0.02
						1/2" Ice	1.28	0.49	0.03
						1" Ice	1.44	0.59	0.04
						2" Ice	1.77	0.83	0.06
						4" Ice	2.54	1.41	0.14
Sector Mount [SM 504-3]	C	None		0.00	104.00	No Ice	34.25	34.25	1.71
						1/2" Ice	48.98	48.98	2.29
						1" Ice	63.71	63.71	2.86
						2" Ice	93.17	93.17	4.02
						4" Ice	152.09	152.09	6.33
742 213 w/ Mount Pipe	A	From Leg	0.00 -1.00 0.03	-88.00	92.00	No Ice	5.37	4.62	0.05
						1/2" Ice	5.95	6.00	0.09
						1" Ice	6.50	6.98	0.15
						2" Ice	7.61	8.85	0.28
						4" Ice	9.93	12.79	0.68
742 213 w/ Mount Pipe	B	From Leg	0.00 -1.00 0.03	-88.00	92.00	No Ice	5.37	4.62	0.05
						1/2" Ice	5.95	6.00	0.09
						1" Ice	6.50	6.98	0.15
						2" Ice	7.61	8.85	0.28
						4" Ice	9.93	12.79	0.68
742 213 w/ Mount Pipe	C	From Leg	0.00 -1.00 0.03	-88.00	92.00	No Ice	5.37	4.62	0.05
						1/2" Ice	5.95	6.00	0.09
						1" Ice	6.50	6.98	0.15
						2" Ice	7.61	8.85	0.28
						4" Ice	9.93	12.79	0.68
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	A	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02
						2" Ice	0.81	0.53	0.03
						4" Ice	1.36	1.00	0.08
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	B	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02

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	0.81	0.53	0.03
						2" Ice	1.36	1.00	0.08
						4" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	6.83	5.64	0.11
						1/2" Ice	7.35	6.48	0.17
						1" Ice	7.86	7.26	0.23
						2" Ice	8.93	8.86	0.38
						4" Ice	11.18	12.29	0.81
KRY 112 144/1	C	From Leg	4.00 0.14 0.00	2.00	84.00	No Ice	0.41	0.20	0.01
						1/2" Ice	0.50	0.27	0.01
						1" Ice	0.59	0.35	0.02
						2" Ice	0.81	0.53	0.03
						4" Ice	1.36	1.00	0.08
Sector Mount [SM 308-3]	C	None		0.00	84.00	No Ice	22.34	22.34	0.38
						1/2" Ice	31.70	31.70	0.83
						1" Ice	41.06	41.06	1.28
						2" Ice	59.78	59.78	2.19
						4" Ice	97.22	97.22	3.99
Side Arm Mount [SO 311-1]	C	From Leg	0.00 4.00 0.00	90.00	61.00	No Ice	2.97	3.51	0.06
						1/2" Ice	4.39	5.33	0.09
						1" Ice	5.81	7.15	0.13
						2" Ice	8.65	10.79	0.19
						4" Ice	14.33	18.07	0.32
RDL-3000	C	From Leg	0.00 4.00 0.00	90.00	61.00	No Ice	1.18	0.28	0.01
						1/2" Ice	1.32	0.37	0.01
						1" Ice	1.48	0.48	0.02
						2" Ice	1.82	0.71	0.04
						4" Ice	2.59	1.28	0.12
Side Arm Mount [SO 311-1]	A	From Leg	1.70 1.06 0.00	32.00	58.00	No Ice	2.97	3.51	0.06
						1/2" Ice	4.39	5.33	0.09
						1" Ice	5.81	7.15	0.13
						2" Ice	8.65	10.79	0.19
						4" Ice	14.33	18.07	0.32
GPS-TMG-20N	A	From Leg	3.39 2.12 0.00	32.00	58.00	No Ice	0.16	0.16	0.00
						1/2" Ice	0.21	0.21	0.00
						1" Ice	0.28	0.28	0.01
						2" Ice	0.44	0.44	0.01
						4" Ice	0.86	0.86	0.05
Side Arm Mount [SO 701-1]	B	From Leg	0.23 0.44 0.00	62.00	46.00	No Ice	0.85	1.67	0.07
						1/2" Ice	1.14	2.34	0.08
						1" Ice	1.43	3.01	0.09
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18
KS24019-L112A	B	From Leg	0.47 0.88 1.00	62.00	46.00	No Ice	0.16	0.16	0.01
						1/2" Ice	0.22	0.22	0.01
						1" Ice	0.30	0.30	0.01
						2" Ice	0.48	0.48	0.02
						4" Ice	0.95	0.95	0.06

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 ft²	Weight K
MPRC2449	C	Paraboloid w/Radome	From Leg	0.00 4.00 0.00	90.00		61.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.69 3.98 4.27 4.84 6.00	0.02 0.04 0.06 0.11 0.19

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	132	Diagonal	A325N	0.63	1	1.78	4.08	0.437 ✓	1.333	Member Block Shear
		Top Girt	A325N	0.63	1	0.06	6.44	0.010 ✓	1	Bolt Shear
T2	124	Leg	A325N	0.63	4	1.19	13.50	0.088 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	1.61	4.08	0.394 ✓	1.333	Member Block Shear
		Top Girt	A325N	0.63	1	0.30	4.55	0.065 ✓	1.333	Member Block Shear
T3	120	Leg	A325N	0.75	4	6.15	19.43	0.316 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	4.38	4.76	0.920 ✓	1.333	Member Block Shear
T4	100	Leg	A325N	0.88	4	12.80	26.46	0.484 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	5.50	5.44	1.011 ✓	1.333	Member Bearing
T5	80	Leg	A325N	0.88	4	19.39	26.46	0.733 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	5.77	5.44	1.062 ✓	1.333	Member Bearing
T6	60	Leg	A325N	1.00	4	25.38	34.56	0.735 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	6.14	5.44	1.130 ✓	1.333	Member Bearing
T7	40	Leg	A325N	1.00	4	30.42	34.56	0.880 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.63	1	7.21	6.44	1.118 ✓	1.333	Bolt Shear
T8	20	Leg	A449	1.00	4	35.53	31.10	1.142 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.75	1	7.21	8.13	0.887 ✓	1.333	Member Bearing

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in²	Actual P K	Allow. P_a K	Ratio P / P_a
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0 K=1.00	22.55	1.07	-3.33	24.23	0.137 ✓
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0 K=1.00	22.55	1.07	-6.74	24.23	0.278 ✓
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4 K=1.00	22.12	1.70	-31.83	37.70	0.844 ✓
T4	100 - 80	ROHN 3 STD	20.03	6.68	68.9 K=1.00	21.15	2.23	-61.37	47.12	1.302 ✓
T5	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5 K=1.00	19.69	5.47	-91.64	107.66	0.851 ✓
T6	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3	23.67	4.41	-119.56	104.33	1.146

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
					K=1.00					✓
T7	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4 K=1.00	21.78	6.11	-143.70	133.13	1.079 ✓
T8	20 - 0	ROHN 5 X-STR	20.03	10.02	65.4 K=1.00	21.78	6.11	-168.30	133.13	1.264 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	126.9 K=1.00	9.27	0.62	-1.82	5.76	0.317 ✓
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	127.1 K=1.00	9.24	0.62	-1.66	5.74	0.289 ✓
T3	120 - 100	L2x2x3/16	9.80	4.79	145.8 K=1.00	7.03	0.71	-4.44	5.02	0.884 ✓
T4	100 - 80	L2 1/2x2 1/2x3/16	12.32	6.06	146.9 K=1.00	6.92	0.90	-5.62	6.25	0.900 ✓
T5	80 - 60	L2 1/2x2 1/2x3/16	14.09	6.95	168.5 K=1.00	5.26	0.90	-5.78	4.74	1.220 ✓
T6	60 - 40	L3x3x3/16	15.90	7.80	157.1 K=1.00	6.05	1.09	-6.25	6.59	0.948 ✓
T7	40 - 20	L3x3x1/4	19.10	9.45	191.5 K=1.00	4.07	1.44	-7.21	5.86	1.229 ✓
T8	20 - 0	L3 1/2x3 1/2x1/4	20.83	10.30	178.1 K=1.00	4.71	1.69	-7.48	7.96	0.940 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	132 - 124	L2x2x3/16	6.60	6.17	187.8 K=1.00	4.23	0.71	-0.06	3.03	0.021* ✓
T2	124 - 120	L2x2x3/16	6.63	6.19	188.7 K=1.00	4.20	0.71	-0.25	3.00	0.085 ✓

* DL contr

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	132 - 124	ROHN 2 STD	8.00	4.00	61.0	30.00	1.07	1.69	32.24	0.052 ✓
T2	124 - 120	ROHN 2 STD	4.00	4.00	61.0	30.00	1.07	4.77	32.24	0.148 ✓
T3	120 - 100	ROHN 2.5 STD	20.03	5.01	63.4	30.00	1.70	24.58	51.12	0.481 ✓
T4	100 - 80	ROHN 3 STD	20.03	6.68	68.9	30.00	2.23	51.21	66.85	0.766 ✓
T5	80 - 60	ROHN 3 XX-STR	20.04	6.68	76.5	30.00	5.47	77.57	163.99	0.473 ✓
T6	60 - 40	ROHN 4 X-STR	20.03	6.68	54.3	30.00	4.41	101.54	132.22	0.768

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 $\frac{P}{P_a}$
T7	40 - 20	ROHN 5 X-STR	20.03	10.02	65.4	30.00	6.11	121.69	183.36	0.664
T8	20 - 0	ROHN 5 X-STR	20.03	10.02	65.4	30.00	6.11	142.13	183.36	0.775

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	132 - 124	L1 3/4x1 3/4x3/16	7.74	3.63	84.0	29.00	0.36	1.78	10.45	0.170
T2	124 - 120	L1 3/4x1 3/4x3/16	7.75	3.64	84.1	29.00	0.36	1.61	10.45	0.154
T3	120 - 100	L2x2x3/16	9.80	4.79	95.5	29.00	0.43	4.38	12.49	0.350
T4	100 - 80	L2 1/2x2 1/2x3/16	12.32	6.06	95.4	29.00	0.57	5.50	16.56	0.332
T5	80 - 60	L2 1/2x2 1/2x3/16	12.89	6.36	100.0	29.00	0.57	5.77	16.56	0.349
T6	60 - 40	L3x3x3/16	15.90	7.80	101.3	29.00	0.71	6.14	20.65	0.298
T7	40 - 20	L3x3x1/4	19.10	9.45	123.5	32.50	0.94	7.03	30.53	0.230
T8	20 - 0	L3 1/2x3 1/2x1/4	20.83	10.30	114.9	32.50	1.10	7.21	35.86	0.201

Top Girt Design Data (Tension)

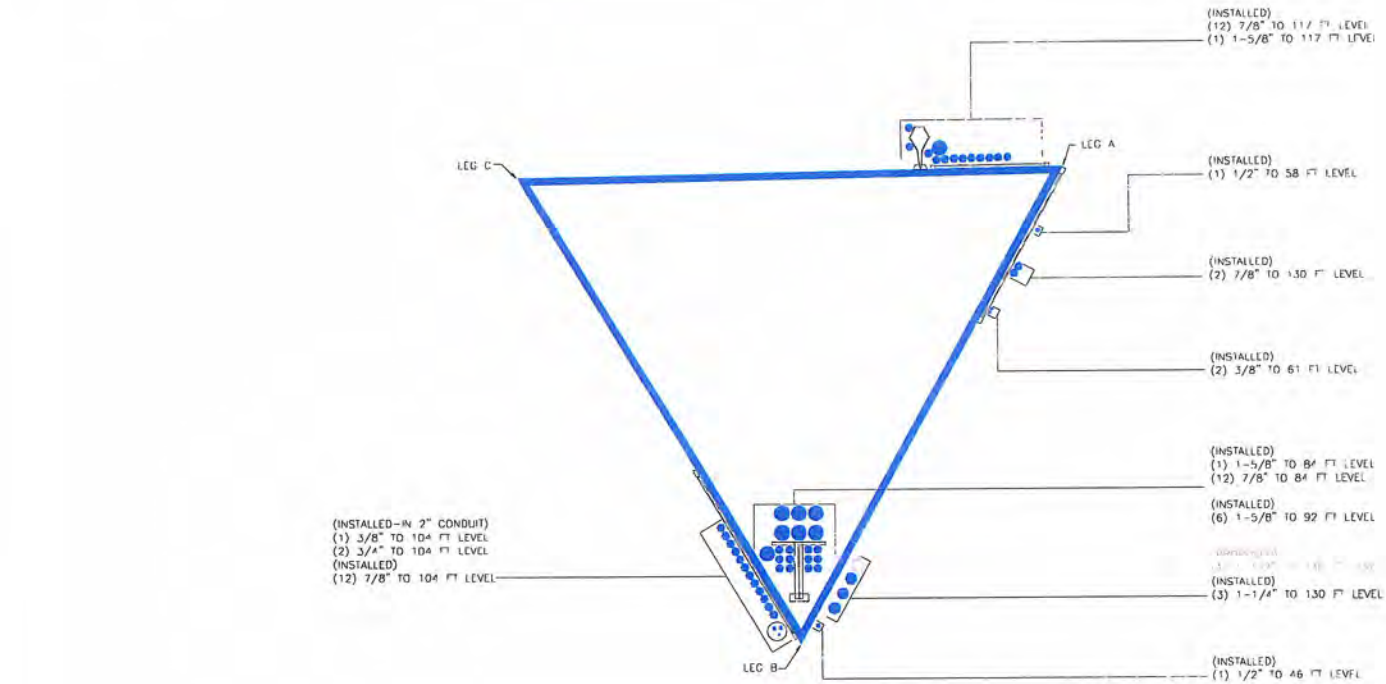
Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	132 - 124	L2x2x3/16	6.60	6.17	124.6	29.00	0.43	0.02	12.49	0.001
T2	124 - 120	L2x2x3/16	6.63	6.19	125.1	29.00	0.43	0.30	12.49	0.024

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	132 - 124	Leg	ROHN 2 STD	3	-3.33	32.30	10.3	Pass
T2	124 - 120	Leg	ROHN 2 STD	21	-6.74	32.30	20.9	Pass
T3	120 - 100	Leg	ROHN 2.5 STD	33	-31.83	50.25	63.3	Pass
T4	100 - 80	Leg	ROHN 3 STD	60	-61.37	62.82	97.7	Pass
T5	80 - 60	Leg	ROHN 3 XX-STR	80	-91.64	143.51	63.9	Pass
T6	60 - 40	Leg	ROHN 4 X-STR	101	-119.56	139.07	86.0	Pass
T7	40 - 20	Leg	ROHN 5 X-STR	122	-143.70	177.46	81.0	Pass
T8	20 - 0	Leg	ROHN 5 X-STR	137	-168.30	177.46	94.8	Pass
T1	132 - 124	Diagonal	L1 3/4x1 3/4x3/16	9	-1.82	7.67	23.8 32.8 (b)	Pass
T2	124 - 120	Diagonal	L1 3/4x1 3/4x3/16	28	-1.66	7.65	21.7 29.6 (b)	Pass
T3	120 - 100	Diagonal	L2x2x3/16	36	-4.44	6.70	66.3 69.0 (b)	Pass
T4	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	63	-5.62	8.33	67.5 75.8 (b)	Pass
T5	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	84	-5.78	6.32	91.5	Pass
T6	60 - 40	Diagonal	L3x3x3/16	105	-6.25	8.79	71.1 84.8 (b)	Pass
T7	40 - 20	Diagonal	L3x3x1/4	127	-7.21	7.82	92.2	Pass
T8	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	142	-7.48	10.60	70.5	Pass
T1	132 - 124	Top Girt	L2x2x3/16	5	-0.06	3.03	2.1	Pass
T2	124 - 120	Top Girt	L2x2x3/16	22	-0.25	4.00	6.3	Pass
						Summary	ELC:	LC7
						Leg (T4)	97.7	Pass
						Diagonal (T7)	92.2	Pass
						Top Girt (T2)	6.3	Pass
						Bolt Checks	85.7	Pass
						Rating =	97.7	Pass

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 806377 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

Site Data

BU#: *806377*
Site Name: *HRT 084 943242*
App #: *245730 Rev. 4*

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:	3	in
Pier Dist. Above Grade:	27.6	in
Pad Bearing Depth, D:	4.2	ft
Pad Thickness, T:	4.2	ft
Pad Width=Length, L:	24	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	3.3	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	10.89	ft^2
Pier Height:	2.30	ft
Soil (above pad) Height:	0.00	ft

Soil Parameters		
Unit Weight, γ:	115.0	pcf
Ultimate Bearing Capacity, qn:	30.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	33.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	22.50	ksf
Passive Pres. Coeff., Kp	3.39	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	43.2	kips
Pad Force Location Above D:	1.40	ft
ϕ(Passive Pressure Moment):	60.48	ft-kips
Factored O.T. M(WL), "1.6W":	3902.9	ft-kips
Factored OT (MW-Msoil), M1	3842.37	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	0.00	ft
Sum of Soil Wedges Wt:	0.00	kips
Soil Wedges ecc, K1:	0.00	ft
Ftg+Soil above Pad wt:	366.6	kips
Unfactored (Total ftg-soil Wt):	366.64	kips
1.2D. **No Soil Wedges.**	475.96	kips
0.9D. **With Soil Wedges**	356.97	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:	30	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	32	kips
Unfactored WL Moment, M:	2675	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	36	kips
0.90	0.9D+1.6W, Pu:	27	kips
1.35	Vu:	43.2	kips
	Mu:	3611.25	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	475.96	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	3842.37	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	8.07	ft
Orthogonal qu=	2.52	ksf
qu/ϕ*qn Ratio=	**11.22%**	Pass

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	5.71	ft
Diagonal qu=	3.01	ksf
qu/ϕ*qn Ratio=	**13.36%**	Pass

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	356.97	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	3842.37	ft-kips

Orthogonal ecc3 = M2/P2 =	10.76	ft
Ortho Non Bearing Length,NBL=	21.53	ft
Orthogonal qu=	6.02	ksf
Diagonal qu=	4.63	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2675.00		
M Orthogonal:	2914.50	**91.78%**	Pass
M Diagonal:	2914.50	**91.78%**	Pass

Monopole or Self Support Pad Foundation Reinforcing
HRT 084 943242 - BU#: 806377
SSOE Project Number: 014-00546-00

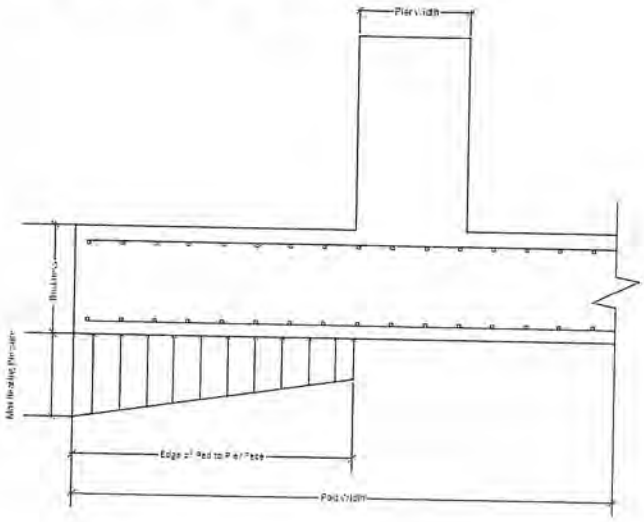
Analysis Code	F
Compression	174 k
Uplift	147 k

Pad Geometry & Reinforcing	
Pad Length	24 ft
Pad Width	24 ft
Pad Thickness	4.2 ft
Pad Top Rebar Size	# 8
Pad Top Rebar Quantity	24
Pad Bottom Rebar Size	# 8
Pad Bottom Rebar Quantity	24
Clear Cover	3 in
f_c'	3 ksi
Rebar Fy	60 ksi
Minimum Steel Assumed?	NO
Pier Shape	Square
Pier Rebar Size	# 9
Pier Rebar Quantity	16
Pier Width	3.3 ft
Anchor Rod Circle	9.5 in
Anchor Rod Embedment	66.5 in
Pier Tie Size	# 5

Bearing Calculation	
Max Bearing Pressure	6.02 ksf
Edge of Pad to Pier Face	2.20833 ft
Distance Between Piers	18.8 ft
ecc3 (From Crown Spreadsheet)	10.76
Non-Bearing Length	21.52 ft

Reinforcing Calculations	
Minimum Reinforcement Check	
A_s Min =	1.08864 in^2/ft
As =	1.58 in^2/ft
Punching Shear	
φ (Shear) =	0.75
V_u =	226.20 k
ϕV_c =	3430.62 k
Shear Capacity	6.6%
Pad Flexure	
φ (Tension) =	0.9
M_u	13.42 k-ft
ϕM_n =	230.97 k-ft
Moment Capacity	5.8%
Beam Shear	
V_u	9.59 k
ϕV_n =	60.19 k
Shear Capacity	15.9%
Pier Compression	
P_u	226.2 k
ϕP_n =	3401.2943 k
Compression Capacity	6.7%
Pier Tension	
Pu=	191.10 k
ϕPn=	979.05 k
Tension Capacity =	19.5%
Plain Concrete Interaction	
Moment Capacity	N/A
Shear Capacity	N/A
Pier Compression Capacity	N/A

Overall Capacity	19.5%



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

CT1082

June 1, 2012

Jennifer Young Gaudet
HPC Wireless Services
46 Mill Plain Road, Floor 2
Danbury, CT 06811

RE: **EM-CING-146-120517** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 197 South Street, Vernon, Connecticut.

Dear Ms. Gaudet:

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

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

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

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies

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

May 18, 2012

The Honorable George F. Apel
Mayor
Town of Vernon
Municipal Building
14 Park Place
Vernon, CT 06066

RE: **EM-CING-146-120517** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 197 South Street, Vernon, Connecticut.

Dear Mayor Apel:

The Connecticut Siting Council (Council) received this request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

If you have any questions or comments regarding this proposal, please call me or inform the Council by June 1, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/cm

Enclosure: Notice of Intent

c: Abraham Ford, Zoning Enforcement Officer, Town of Vernon

EM-CING-146-120517

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

May 16, 2012

VIA OVERNIGHT COURIER

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

Re: New Cingular Wireless PCS, LLC – exempt modification
197 South Street, Vernon, Connecticut

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"). AT&T is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the Town of Vernon.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 197 South Street,in the Town of Vernon (coordinates 41°-51'-12.46" N, 72°-27'-7.55" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to AT&T's operations at the site.

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

1. AT&T will add three (3) LTE antennas, 6 RRHs (remote radio heads) and a surge arrestor to the existing lattice tower. The antennas will be mounted to a frame; the RRHs

will be mounted on pipes at the tower legs behind the antennas, and the surge arrestor will be mounted to the tower leg. In addition, AT&T will relocate its three (3) existing UMTS antennas on the frame, replace its three (3) GSM antennas with other GSM antennas and replace six (6) TMAs. All antennas will be at an approximate center line of 106'. AT&T will also place a DC power and fiber run from the equipment to the antennas along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 132' lattice structure.

2. The proposed changes will not extend the site boundaries. AT&T will place related equipment within its existing equipment shelter, and will mount a GPS antenna to the shelter. These changes will be within the existing compound and will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 3.70%; the combined site operations will result in a total power density of approximately 62.21%.

Please feel free to contact me by phone at (860) 798-7454 or by e-mail at jgaudet@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

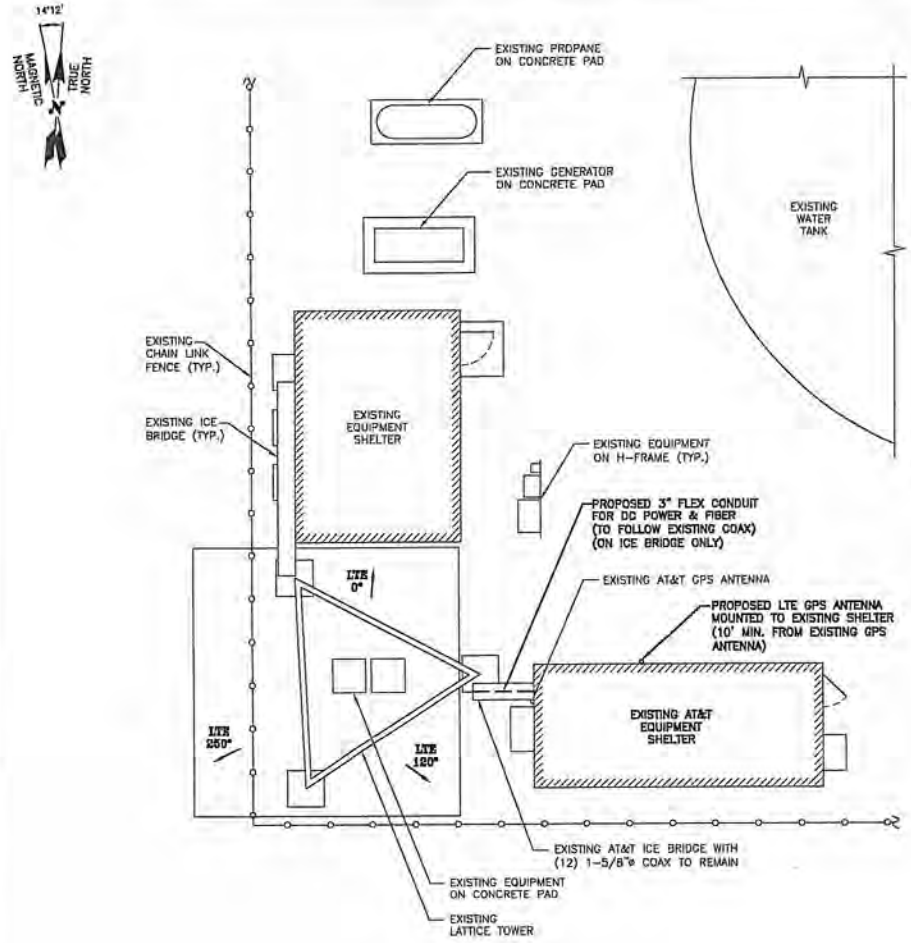
Respectfully yours,

Jennifer Young Gaudet

Jennifer Young Gaudet

Attachments

cc: Honorable George F. Apel, Mayor, Town of Vernon
Connecticut Water Company (underlying property owner)



COMPOUND PLAN

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

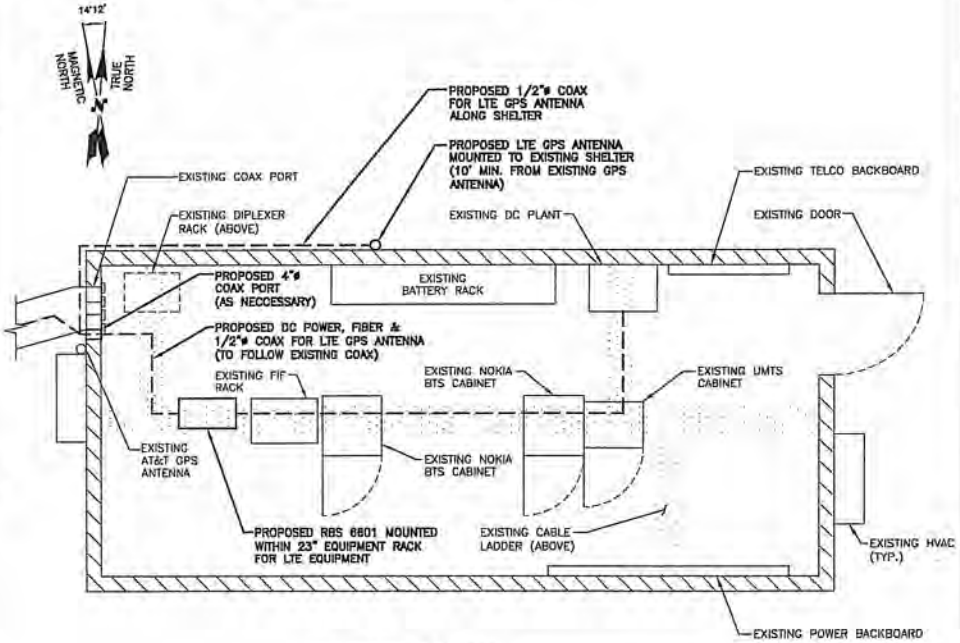
0 2'-8" 5'-4" 10'-8" 16'-0"

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



EQUIPMENT PLAN

SCALE: 1/2"= 1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

Hudson Design Group LLC
1400 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 557-5558

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1082
SITE NAME: VERNON NE
CROWN CASTLE ID: 806377
197 SOUTH STREET
VERNON, CT 06066
TOLLAND COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/24/12	ISSUED FOR CONSTRUCTION	MA	DC	DPH
0	04/03/12	ISSUED FOR REVIEW	DB	DC	DPH

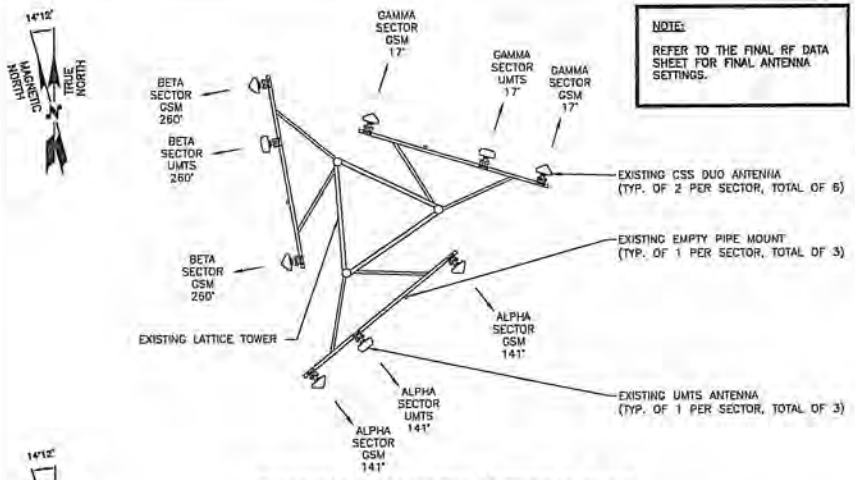
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1082.01	A-1	1



EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.

NOTE:

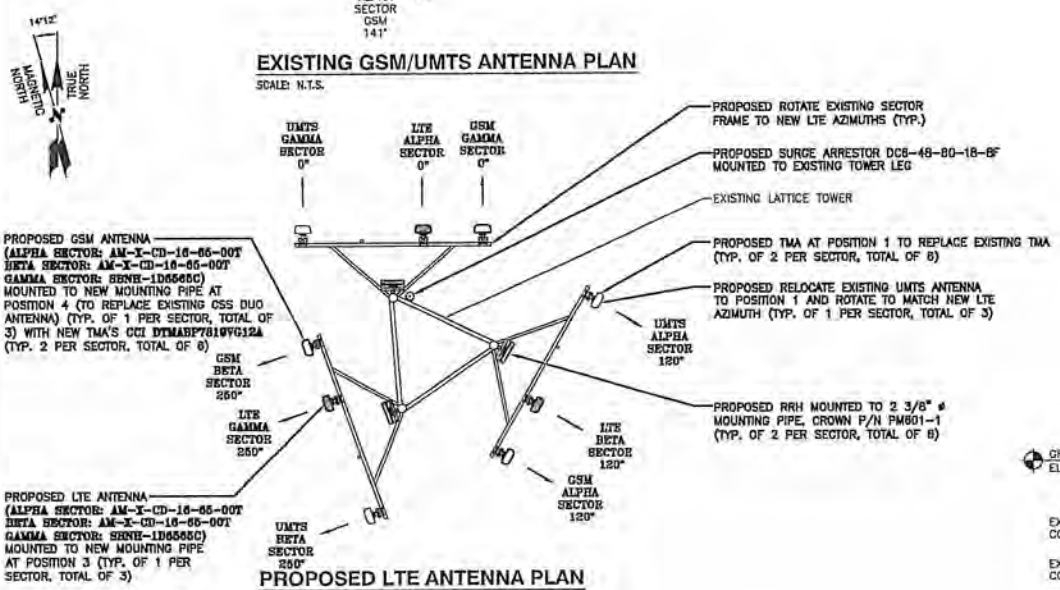
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

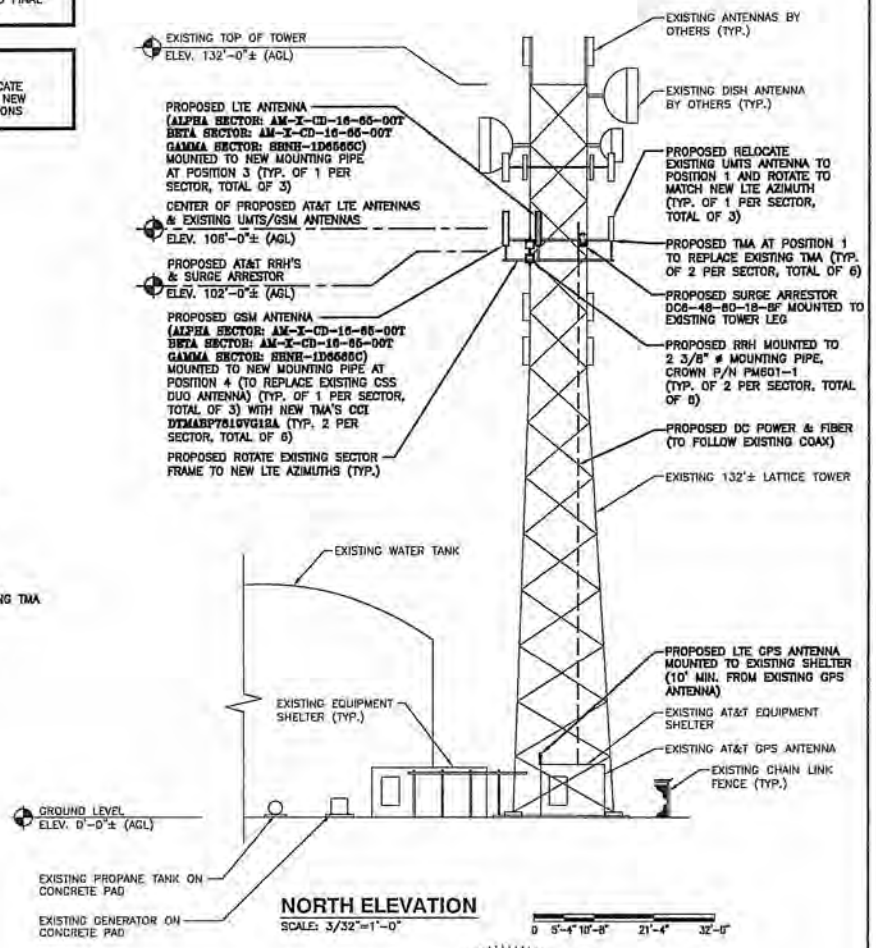
NOTE:

CONTRACTOR TO RELOCATE EXISTING JUMPERS TO NEW SECTOR MOUNT LOCATIONS



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



NORTH ELEVATION

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

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
129 CEDAR STREET, BUILDING 2 NORTH, SUITE 245, HANOVER, MA 02340
TEL: (978) 657-5500
FAX: (978) 659-5184

NEXLINK
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800 MARSHALL PHELPS ROAD UNIT #: 2A
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SITE NUMBER: CT1082
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NO.	DATE	REVISIONS	BY	CHK	APP'D
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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATION & ANTENNA PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1082.01	A-2	1

Pier Structural Engineering Corp.
55 Northfield Drive E, Suite 198
Waterloo, ON N2K 3T6
Tel: 519-885-3806
Fax: 519-886-0076
www.p-sec.ca

Specializing in Communication Tower Engineering

April 19, 2012

Eva Morales, Tower Structural Analyst
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Subject:	**Structural Analysis Report**	
Carrier Designation:	Carrier Co-Locate:	**AT&T Mobility**
	Carrier Site Number:	**CT1082**
	Carrier Site Name:	**Vernon**
Crown Castle Designation:	Crown Castle BU Number:	**806377**
	Crown Castle Site Name:	**HRT 084 943242**
	Crown Castle JDE Job Number:	**183417**
	Crown Castle WO Number:	**484694**
Engineering Firm Designation:	P-SEC Project Number:	**6459**
Site Data:	**197 South St., VERNON, Tolland County, CT** **Latitude *41° 51' 12.51"*, Longitude *-72° 27' 7.52"*** **132-ft ROHN Self Support Tower**	

Dear Eva Morales,

Pier Structural Engineering Corp. (P-SEC) 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 459649, in accordance with application 144303, revision 0.

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 local code requirements based upon a wind speed of 85 mph fastest mile.

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

Respectfully submitted by:

Martin Piercey, P.E., P.Eng.
CT PE#25582

tnxTower Report - version 6.0.4.0

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1) INTRODUCTION

This tower is a 132-ft self-support tower originally designed by ROHN in July of 1987. The tower was originally designed for a wind load in accordance with E.I.A. Zone "A". The tower was reinforced in 1995 as specified by L&W Engineering.

2) ANALYSIS CRITERIA

The following design parameters have been used in our analysis:

Design Standard:		TIA/EIA-222-F standard and 2005 CT state building code
County/State:		Tolland County, CT
Wind Speeds:	*CASE 1*	85.0 mph (fastest mile)
	CASE 2	28.1 mph (fastest mile) with 1" radial solid ice *(per ASCE7 ice map)*
	CASE 3	50.0 mph (fastest mile) for Serviceability
Allowable Stress:		Increased 1/3rd

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
104	106	4	kmw	AM-X-CD-16-65-00T-RET	2 1	3/4 3/8	1
		2	andrew	SBNH-1D6565C			
		6	communication	DTMABP7819VG12A			
		1	raycap	DC6-48-60-18-8F			
		6	powerwave	TMA DD 1900 with 850 BYPASS			
102	102	6	ericsson	RRUS-11			
		3	--	Pipe Mount [PM 601-1]			

Notes:
1) Proposed equipment

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
131	149	1	telewave	ANT45D6-9	2	7/8	1
	142	1	telewave	ANT45D6-9			
	137	3	andrew	UMWD-06516-XD	6	1-5/8	1
	131	2	--	8'x2" Antenna Mount Pipe			
128	128	1	csa wireless	HP-60A72DL-S	1	EW52	1
		1	--	Pipe Mount [PM 601-1]			
121	121	1	andrew	HP4-107	1 1	EW52 EW90	1
		1	csa wireless	HP-60A72DL-S			
		2	--	Pipe Mount [PM 601-1]			
113	113	6	andrew	DB846F65ZAXY	12	7/8	1
		2	andrew	LNX-6514DS-T4M			
		3	rfs celwave	APX18-206516L-CT2			
		1	swedcom	SLXW 5514			
		3	--	Sector Mount [SM 504-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
104	104	9	css	DU04-8670	9	1-5/8	2
		6	lgp telecom	TMA-DDD 850/1900			
		6	css	DUO1417-8686	--	--	3
		6	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD			
		3	katherin	80010121	12	7/8	1
		6	powerwave	LGP13519			
		3	--	Sector Mount [SM 504-1]			
98	98	1	scala	PR-460	1	7/8	1
		1	--	Leg Mount			
94	94	3	kathrein	742 213	6	1-5/8	1
		3	--	Pipe Mount			
86	86	3	rfs celwave	APX17DWV-17DWV-S-E-ACU	12	7/8	1
		6	andrew	ONEBASE TWIN DUAL DUPLEX TMA			
		3	--	Pipe Mount			
61	62	1	maxrad	MPRC2449	2	1/2	1
	62	1	--	TMA			
	61	1	--	Side Arm Mount [SO 302-1]			
59	60	1	maxrad	GPS-TMG-20N	1	1/2	1
	59	1	--	Side Arm Mount [SO 302-1]			
46	46	1	unknown	GPS	1	1/2	1
		1	--	Leg Mount			

Notes:
1) Existing equipment
2) SLA equipment not controlling; not considered in analysis
3) Existing equipment to be replaced by proposed

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)
127	127	4	refs/celwave	PD10017	--	--
124	124	2	generic	8' Dish	--	--
112	112	6	refs/celwave	PD1132	--	--
80	80	1	refs/celwave	PD1109	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, Proj. No. 04-1212E dated 12/30/2004	1014866	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	IETS, Proj. No. 2004-71387 dated 1/7/2005	1014812	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ROHN, Proj. No. 22731JC dated 7/24/1987	529704	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	L&W, Proj. No. 2106-2 dated 10/31/1995	2240842	CCISITES
APPLICATION	AT&T, Revision #0 dated 3/26/2012	144303	CCISITES

3.1) Analysis Method

tnxTower (6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. P-SEC should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary) – LC7

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	132 - 120	Leg	ROHN 2 STD	3	-4.1	32.3	12.7	Pass
T2	120 - 100	Leg	ROHN 2.5 STD	27	-25.5	50.2	50.7	Pass
T3	100 - 80	Leg	ROHN 3 STD	56	-55.8	62.8	88.9	Pass
T4	80 - 60	Leg	ROHN 3 EHH	77	-85.6	114.1	75.0	Pass
T5	60 - 40	Leg	ROHN 4 X-STR	98	-113.1	139.1	81.3	Pass
T6	40 - 20	Leg	ROHN 5 X-STR	119	-136.9	177.5	77.2	Pass
T7	20 - 0	Leg	ROHN 5 X-STR	134	-161.6	177.5	91.0	Pass
T1	132 - 120	Diagonal	L1 3/4x1 3/4x3/16	11	-1.4	7.6	17.9 25.2 (b)	Pass
T2	120 - 100	Diagonal	L2x2x3/16	35	-4.4	6.7	65.6 71.3 (b)	Pass
T3	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	60	-5.5	8.3	65.7 78.9 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T4	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	81	-5.5	6.3	87.8	Pass
T5	60 - 40	Diagonal	L3x3x3/16	102	-6.0	8.8	68.8 87.4 (b)	Pass
T6	40 - 20	Diagonal	L3x3x1/4	123	-7.0	7.8	90.0	Pass
T7	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	138	-7.4	10.6	69.9	Pass
T1	132 - 120	Top Girt	L2x2x3/16	4	-0.1	4.0	1.6	Pass
T2	120 - 100	Top Girt	L2x2x3/16	28	-0.2	4.0	4.2	Pass
							Summary	
						Leg (T7)	91.0	Pass
						Diagonal (T6)	90.0	Pass
						Top Girt (T2)	4.2	Pass
						Bolt Checks	87.4	Pass
						RATING =	**91.0**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
2	Anchor Rods	--	83.3	Pass
2	Base Foundation	--	91.0	Pass

Structure Rating (max from all components) =	91.0%

Notes: 1) See full member breakdown and section capacities in Appendix A.
2) See additional documentation in Appendix C for supporting calculations.
3) Stresses up to 105% (steel) and 110% (foundations) are within engineering tolerance and considered acceptable.

4.1) Recommendations

The existing 132-ft self-support tower located in Tolland County (HRT 084 943242), CT **is structurally acceptable** based on the TIA/EIA-222-F standard and 2005 CT state building code based upon a wind speed of 85 mph fastest mile.

No modifications are required for the proposed loading.

Should you have any questions, please call us anytime at 519-885-3806.

encl.
806377-144303 SA Report - 20120419.doc

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

CT1082

(Vernon)

197 South Street, Vernon, CT 06066

May 3, 2012

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the lattice tower located at 197 South Street in Vernon, CT. The coordinates of the tower are 41-51-12.5 N, 72-27-07.6 W.

AT&T is proposing the following modifications:

1) Replace six of nine existing dual-band (850/1900 MHz) panel antennas with six multi-band (700/850/1900/2100 MHz) antennas (two per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

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

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular UMTS	*109*	*880*	*1*	*500*	*0.0151*	*0.5867*	*2.58%*
Cingular GSM	*109*	*880*	*3*	*296*	*0.0269*	*0.5867*	*4.58%*
Cingular GSM	*109*	*1900*	*1*	*427*	*0.0129*	*1.0000*	*1.29%*
Verizon	117	757	1	612	0.0161	0.5047	3.19%
Verizon	117	869	9	349	0.0825	0.5793	14.24%
Verizon	117	1970	3	272	0.0214	1.0000	2.14%
XM Sat Radio	132	2337.49	2	312	0.0129	1.0000	1.29%
Town	98	954.1	1	63	0.0024	0.6361	0.37%
Town	85	460.325	1	200	0.0100	0.3069	3.24%
Town	135	453.8125	1	75	0.0015	0.3025	0.49%
Town	50	4900	1	228	0.0328	1.0000	3.28%
Pocket	84	2130	3	631	0.0965	1.0000	9.65%
Sprint	135	1962.5	11	359	0.0779	1.0000	7.79%
Clearwire	137	2496	2	153	0.0059	1.0000	0.59%
Clearwire	137	18000	1	211	0.0040	1.0000	0.40%
T-Mobile GSM	92	1945	8	156	0.0530	1.0000	5.30%
T-Mobile UMTS	92	2100	2	770	0.0654	1.0000	6.54%
AT&T UMTS	106	880	2	565	0.0036	0.5867	0.62%
AT&T UMTS	106	1900	2	1077	0.0069	1.0000	0.69%
AT&T LTE	106	734	1	1375	0.0044	0.4893	0.90%
AT&T GSM	106	880	1	538	0.0017	0.5867	0.29%
AT&T GSM	106	1900	4	934	0.0120	1.0000	1.20%
						Total	**62.21%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the P-SEC Structural Analysis Report dated 4/19/2012

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **62.21% of the FCC limit.**

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

May 3, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

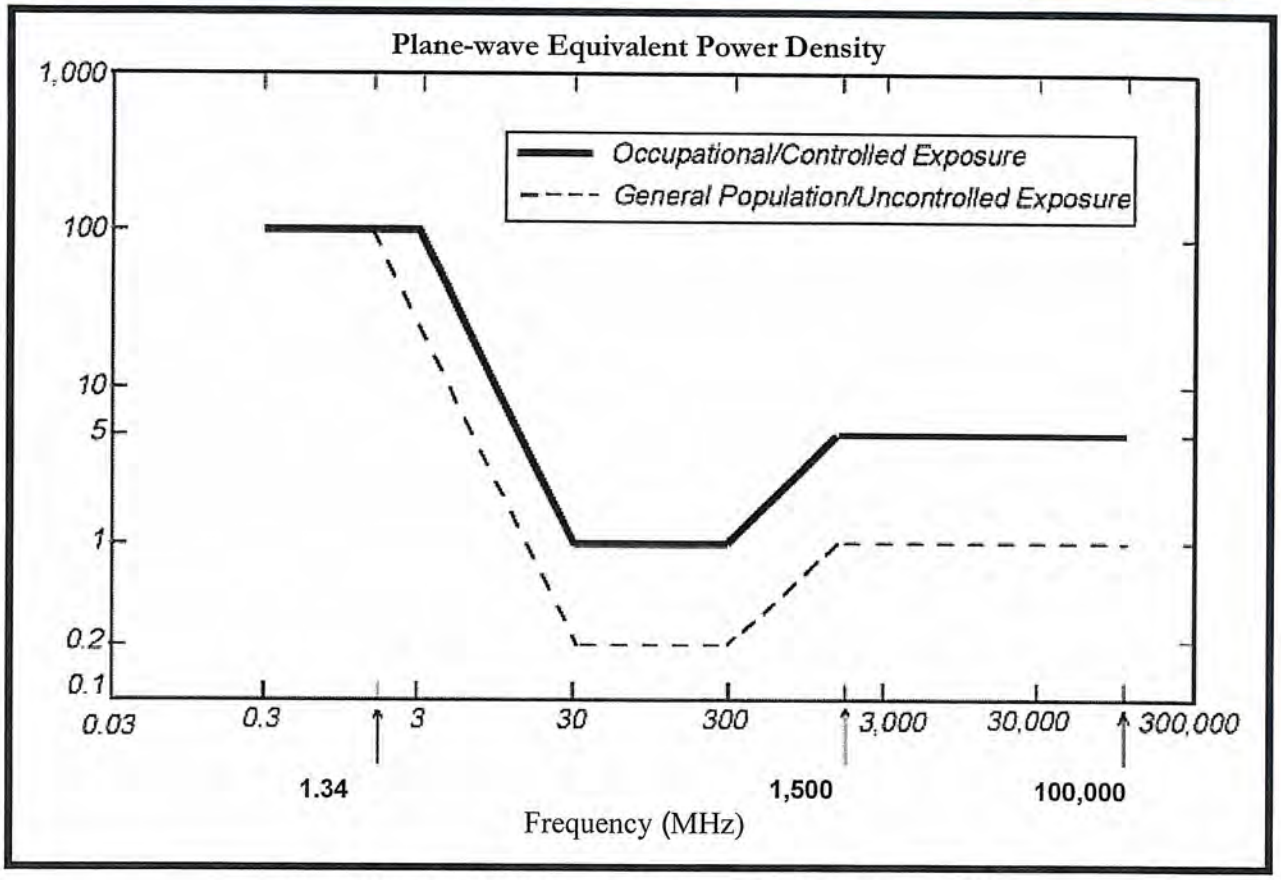
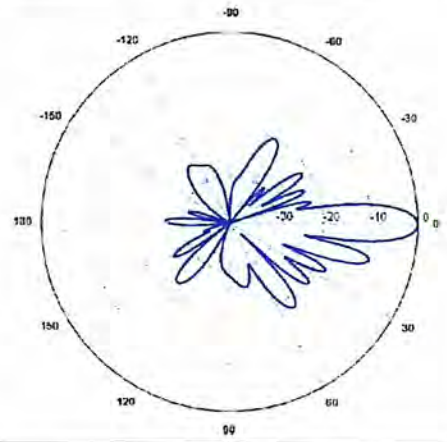


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

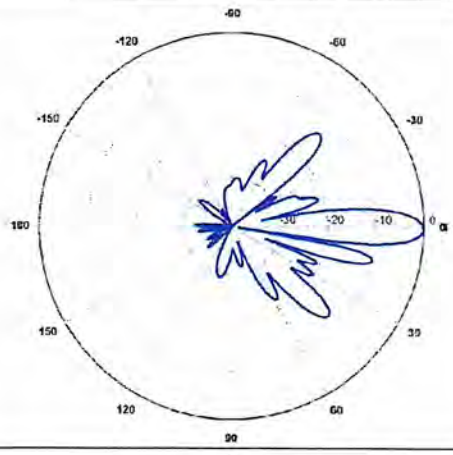
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.8" x 7.1"



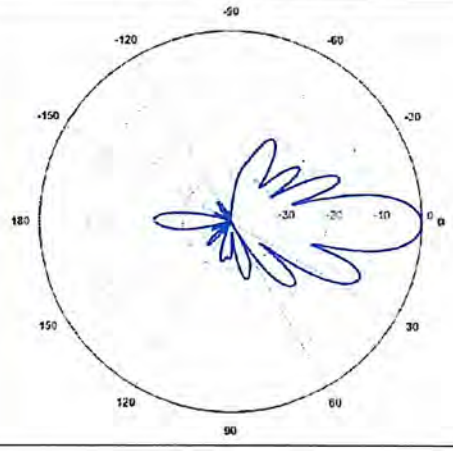
850 MHz GSM

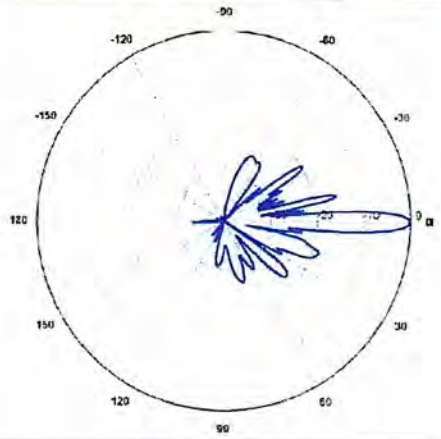
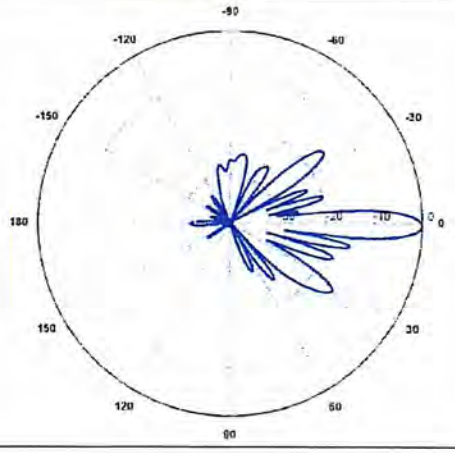
Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	806-896 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	7.8°
Horizontal Beamwidth:	67°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.8" x 7.1"



850 MHz UMTS

Manufacturer:	Kathrein-Scala
Model #:	800 10121
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	14.5°
Horizontal Beamwidth:	86°
Polarization:	±45°
Size L x W x D:	54.5" x 10.3" x 5.9"



1900 MHz GSM Manufacturer: Commscope Model #: SBNH-1D6565C Frequency Band: 1850-1990 MHz Gain: 15.9 dBd Vertical Beamwidth: 5.1° Horizontal Beamwidth: 57° Polarization: ± 45° Size L x W x D: 96.4" x 11.8" x 7.1"	
1900 MHz UMTS Manufacturer: Kathrein-Scala Model #: 800 10121 Frequency Band: 1850-1990 MHz Gain: 14.3 dBd Vertical Beamwidth: 6.6° Horizontal Beamwidth: 85° Polarization: ±45° Size L x W x D: 54.5" x 10.3" x 5.9"	

EM-CING-146-120517

HPC Wireless Services
46 Mill Plain Rd.
Floor 2
Danbury, CT, 06811
P.: 203.797.1112

HPC
WIRELESS SERVICES

May 16, 2012

RECEIVED
MAY 17 2012
CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

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

Re: New Cingular Wireless PCS, LLC – exempt modification
197 South Street, Vernon, Connecticut

Dear Ms. Roberts:

This letter and attachments are submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"). AT&T is making modifications to certain existing sites in its Connecticut system in order to implement LTE technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the Town of Vernon.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 197 South Street,in the Town of Vernon (coordinates 41°-51'-12.46" N, 72°-27'-7.55" W). Attached are a compound plan and elevation depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to AT&T's operations at the site.

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

1. AT&T will add three (3) LTE antennas, 6 RRHs (remote radio heads) and a surge arrestor to the existing lattice tower. The antennas will be mounted to a frame; the RRHs

will be mounted on pipes at the tower legs behind the antennas, and the surge arrestor will be mounted to the tower leg. In addition, AT&T will relocate its three (3) existing UMTS antennas on the frame, replace its three (3) GSM antennas with other GSM antennas and replace six (6) TMAs. All antennas will be at an approximate center line of 106'. AT&T will also place a DC power and fiber run from the equipment to the antennas along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 132' lattice structure.

2. The proposed changes will not extend the site boundaries. AT&T will place related equipment within its existing equipment shelter, and will mount a GPS antenna to the shelter. These changes will be within the existing compound and will have no effect on the site boundaries.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 3.70%; the combined site operations will result in a total power density of approximately 62.21%.

Please feel free to contact me by phone at (860) 798-7454 or by e-mail at jgaudet@hpcwireless.com with questions concerning this matter. Thank you for your consideration.

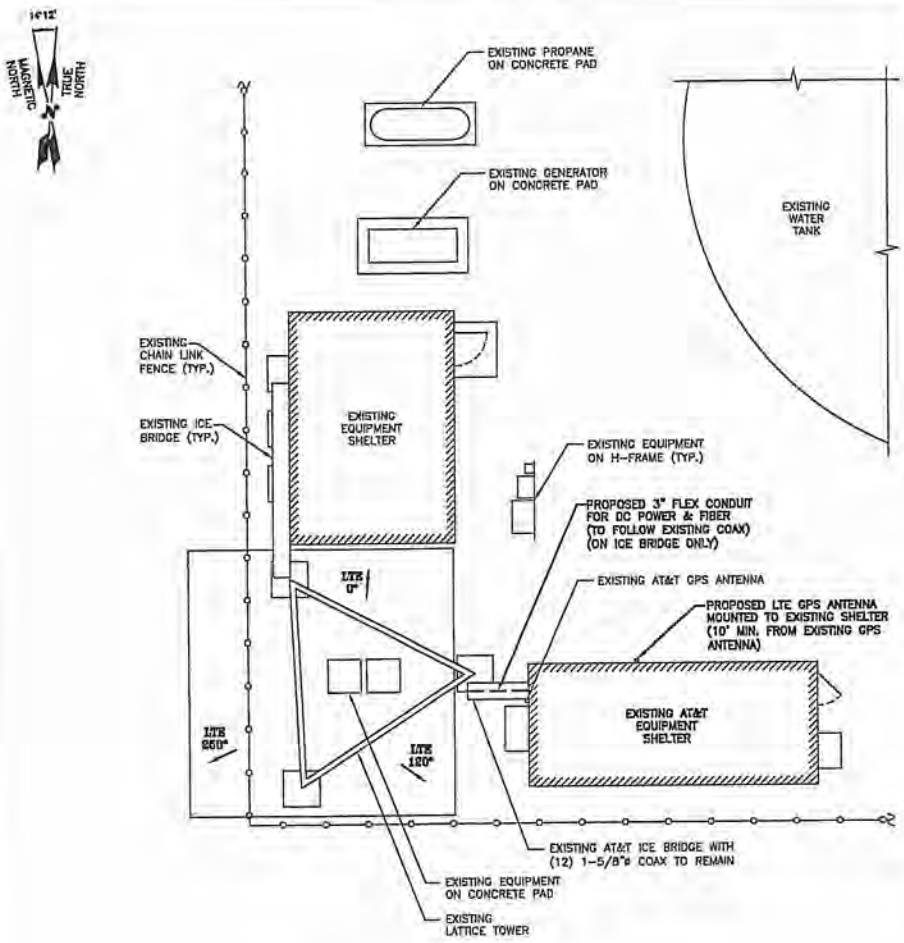
Respectfully yours,

Jennifer Young Gaudet

Jennifer Young Gaudet

Attachments

cc: Honorable George F. Apel, Mayor, Town of Vernon
Connecticut Water Company (underlying property owner)



COMPOUND PLAN

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

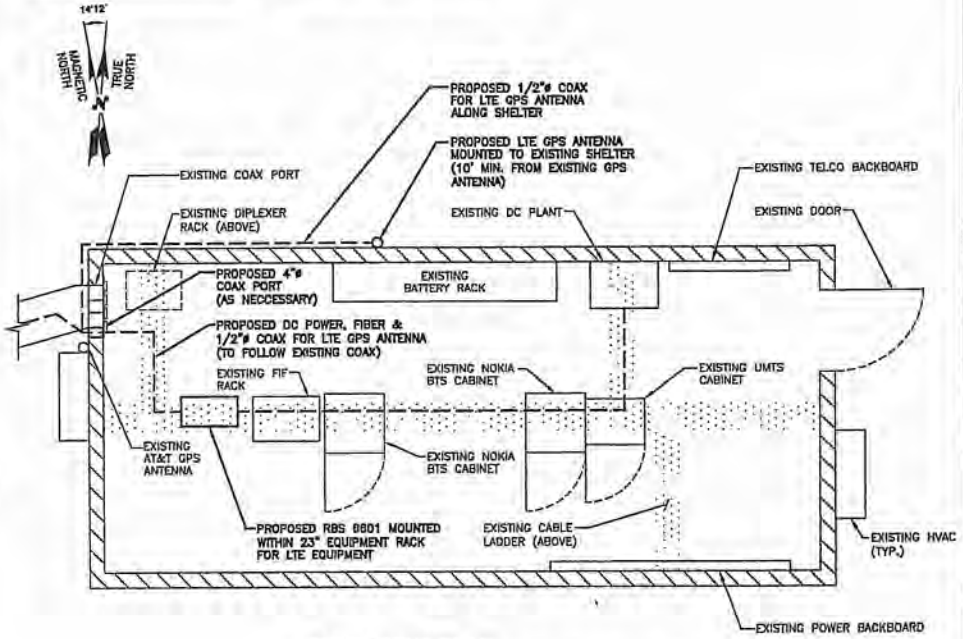
0 2'-8" 5'-4" 10'-8" 16'-0"

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



EQUIPMENT PLAN

SCALE: 1/2"= 1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

Hudson Design Groupus

NEXLINK GLOBAL SERVICES

a UniTek GLOBAL SERVICES company

800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1082
SITE NAME: VERNON NE
CROWN CASTLE ID: 806377
197 SOUTH STREET
VERNON, CT 06066
TOLLAND COUNTY

at&t

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP
1	04/24/12	ISSUED FOR CONSTRUCTION	MA	DC	DPH
0	04/03/12	ISSUED FOR REVIEW	DB	DC	DPH

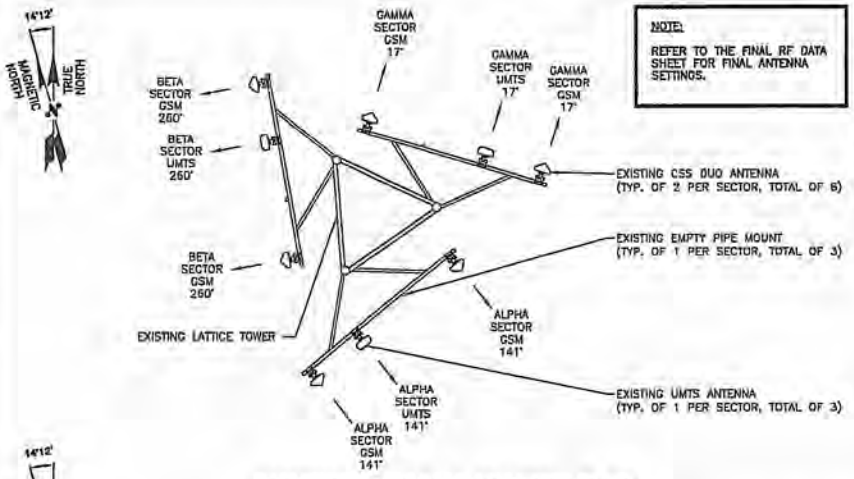
SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
1082.01	A-1	1



EXISTING GSM/UMTS ANTENNA PLAN

SCALE: N.T.S.

NOTE:

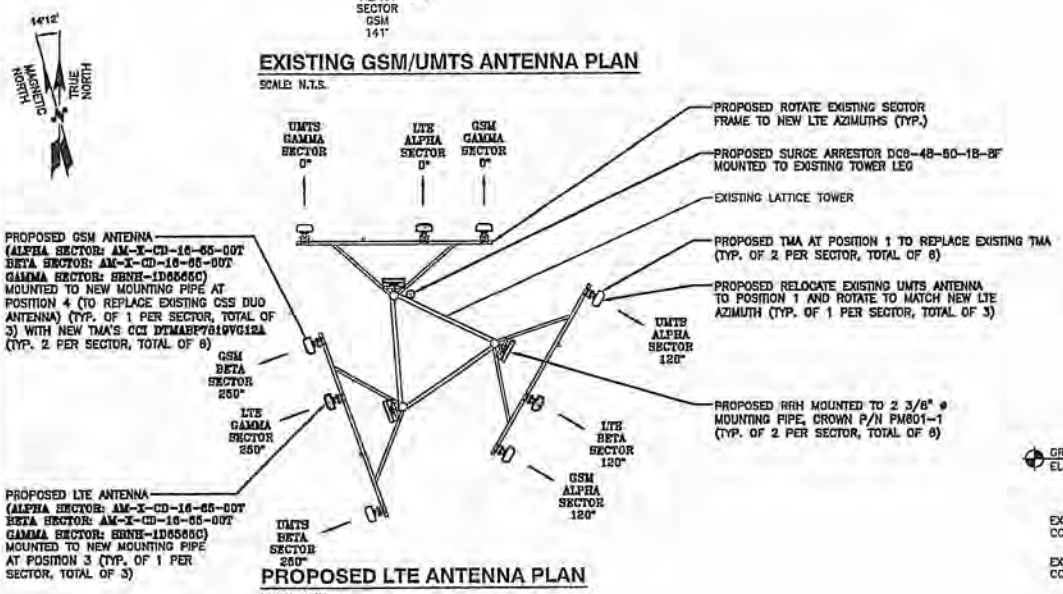
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.

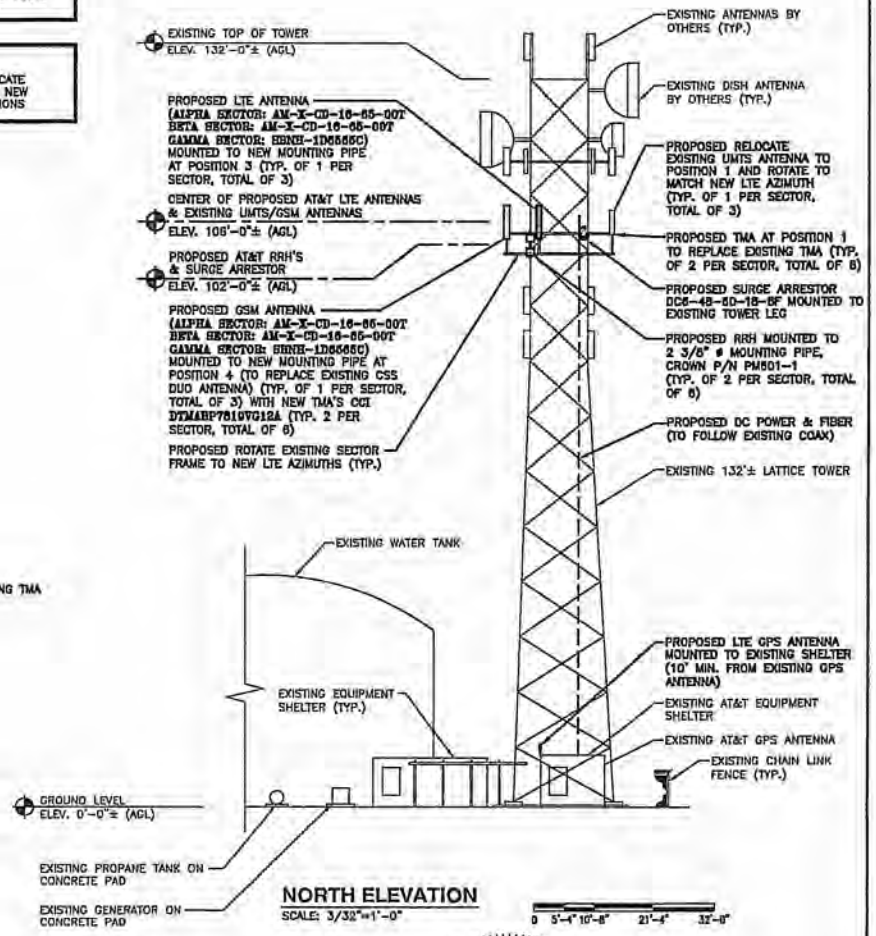
NOTE:

CONTRACTOR TO RELOCATE EXISTING JUMPERS TO NEW SECTOR MOUNT LOCATIONS



PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



NORTH ELEVATION

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

0 5'-4" 10'-8" 21'-4" 32'-0"

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 2-101
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT1052
SITE NAME: VERNON NE
CROWN CASTLE ID: 806377
197 SOUTH STREET
VERNON, CT 06066
TOLLAND COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/26/12	ISSUED FOR CONSTRUCTION	DB	DC	DPH
0	04/03/12	ISSUED FOR REVIEW	DB	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: DB

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATION & ANTENNA PLAN (LTE)

JOB NUMBER: 1082.01 | DRAWING NUMBER: A-2 | REV: 1

Pier Structural Engineering Corp.
55 Northfield Drive E, Suite 198
Waterloo, ON N2K 3T6
Tel: 519-885-3806
Fax: 519-886-0076
www.p-sec.ca

Specializing in Communication Tower Engineering

April 19, 2012

Eva Morales, Tower Structural Analyst
Crown Castle USA Inc.
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Subject:	**Structural Analysis Report**	
Carrier Designation:	Carrier Co-Locate:	**AT&T Mobility**
	Carrier Site Number:	**CT1082**
	Carrier Site Name:	**Vernon**
Crown Castle Designation:	Crown Castle BU Number:	**806377**
	Crown Castle Site Name:	**HRT 084 943242**
	Crown Castle JDE Job Number:	**183417**
	Crown Castle WO Number:	**484694**
Engineering Firm Designation:	P-SEC Project Number:	**6459**
Site Data:	**197 South St., VERNON, Tolland County, CT** **Latitude *41° 51' 12.51"*, Longitude *-72° 27' 7.52"*** **132-ft ROHN Self Support Tower**	

Dear Eva Morales,

Pier Structural Engineering Corp. (P-SEC) 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 459649, in accordance with application 144303, revision 0.

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 local code requirements based upon a wind speed of 85 mph fastest mile.

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

Respectfully submitted by:

Martin Piercey, P.E., P.Eng.
CT PE#25582

tnxTower Report - version 6.0.4.0

STATE OF CONNECTICUT
MARTIN L. PIERCEY
No. 25582
LICENSED PROFESSIONAL ENGINEER
4/19/12

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7) APPENDIX C
Additional Calculations

1) INTRODUCTION

This tower is a 132-ft self-support tower originally designed by ROHN in July of 1987. The tower was originally designed for a wind load in accordance with E.I.A. Zone "A". The tower was reinforced in 1995 as specified by L&W Engineering.

2) ANALYSIS CRITERIA

The following design parameters have been used in our analysis:

Design Standard:		TIA/EIA-222-F standard and 2005 CT state building code
County/State:		Tolland County, CT
Wind Speeds:	*CASE 1*	85.0 mph (fastest mile)
	CASE 2	28.1 mph (fastest mile) with 1" radial solid ice *(per ASCE7 ice map)*
	CASE 3	50.0 mph (fastest mile) for Serviceability
Allowable Stress:		Increased 1/3rd

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
104	106	4	kmw	AM-X-CD-16-65-00T-RET	2 1	3/4 3/8	1
		2	andrew	SBNH-1D6565C			
		6	communication	DTMABP7819VG12A			
		1	raycap	DC6-48-60-18-8F			
		6	powerwave	TMA DD 1900 with 850 BYPASS			
102	102	6	ericsson	RRUS-11			
		3	--	Pipe Mount [PM 601-1]			

Notes:
1) Proposed equipment

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
131	149	1	telewave	ANT45D6-9	2	7/8	1
	142	1	telewave	ANT45D6-9			
	137	3	andrew	UMWD-06516-XD	6	1-5/8	1
	131	2	--	8'x2" Antenna Mount Pipe			
128	128	1	csa wireless	HP-60A72DL-S	1	EW52	1
		1	--	Pipe Mount [PM 601-1]			
121	121	1	andrew	HP4-107	1 1	EW52 EW90	1
		1	csa wireless	HP-60A72DL-S			
		2	--	Pipe Mount [PM 601-1]			
113	113	6	andrew	DB846F65ZAXY	12	7/8	1
		2	andrew	LNX-6514DS-T4M			
		3	rfs celwave	APX18-206516L-CT2			
		1	swedcom	SLXW 5514			
		3	--	Sector Mount [SM 504-1]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
104	104	9	css	DU04-8670	9	1-5/8	2
		6	lgp telecom	TMA-DDD 850/1900			
		6	css	DUO1417-8686	--	--	3
		6	adc	DUAL BAND 800/1900 FULL BAND MASTHEAD			
		3	katherin	80010121	12	7/8	1
		6	powerwave	LGP13519			
		3	--	Sector Mount [SM 504-1]			
98	98	1	scala	PR-460	1	7/8	1
		1	--	Leg Mount			
94	94	3	kathrein	742 213	6	1-5/8	1
		3	--	Pipe Mount			
86	86	3	rfs celwave	APX17DWV-17DWV-S-E-ACU	12	7/8	1
		6	andrew	ONEBASE TWIN DUAL DUPLEX TMA			
		3	--	Pipe Mount			
61	62	1	maxrad	MPRC2449	2	1/2	1
	62	1	--	TMA			
	61	1	--	Side Arm Mount [SO 302-1]			
59	60	1	maxrad	GPS-TMG-20N	1	1/2	1
	59	1	--	Side Arm Mount [SO 302-1]			
46	46	1	unknown	GPS	1	1/2	1
		1	--	Leg Mount			

Notes:
1) Existing equipment
2) SLA equipment not controlling; not considered in analysis
3) Existing equipment to be replaced by proposed

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)
127	127	4	refs/celwave	PD10017	--	--
124	124	2	generic	8' Dish	--	--
112	112	6	refs/celwave	PD1132	--	--
80	80	1	refs/celwave	PD1109	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, Proj. No. 04-1212E dated 12/30/2004	1014866	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	IETS, Proj. No. 2004-71387 dated 1/7/2005	1014812	CCISITES
4-TOWER MANUFACTURER DRAWINGS	ROHN, Proj. No. 22731JC dated 7/24/1987	529704	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	L&W, Proj. No. 2106-2 dated 10/31/1995	2240842	CCISITES
APPLICATION	AT&T, Revision #0 dated 3/26/2012	144303	CCISITES

3.1) Analysis Method

tnxTower (6.0.4.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
4) When applicable, transmission cables are considered as structural components for calculating wind loads as allowed by TIA/EIA-222-F.

This analysis may be affected if any assumptions are not valid or have been made in error. P-SEC should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary) – LC7

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	132 - 120	Leg	ROHN 2 STD	3	-4.1	32.3	12.7	Pass
T2	120 - 100	Leg	ROHN 2.5 STD	27	-25.5	50.2	50.7	Pass
T3	100 - 80	Leg	ROHN 3 STD	56	-55.8	62.8	88.9	Pass
T4	80 - 60	Leg	ROHN 3 EHH	77	-85.6	114.1	75.0	Pass
T5	60 - 40	Leg	ROHN 4 X-STR	98	-113.1	139.1	81.3	Pass
T6	40 - 20	Leg	ROHN 5 X-STR	119	-136.9	177.5	77.2	Pass
T7	20 - 0	Leg	ROHN 5 X-STR	134	-161.6	177.5	91.0	Pass
T1	132 - 120	Diagonal	L1 3/4x1 3/4x3/16	11	-1.4	7.6	17.9 25.2 (b)	Pass
T2	120 - 100	Diagonal	L2x2x3/16	35	-4.4	6.7	65.6 71.3 (b)	Pass
T3	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	60	-5.5	8.3	65.7 78.9 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T4	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	81	-5.5	6.3	87.8	Pass
T5	60 - 40	Diagonal	L3x3x3/16	102	-6.0	8.8	68.8 87.4 (b)	Pass
T6	40 - 20	Diagonal	L3x3x1/4	123	-7.0	7.8	90.0	Pass
T7	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	138	-7.4	10.6	69.9	Pass
T1	132 - 120	Top Girt	L2x2x3/16	4	-0.1	4.0	1.6	Pass
T2	120 - 100	Top Girt	L2x2x3/16	28	-0.2	4.0	4.2	Pass
							Summary	
						Leg (T7)	91.0	Pass
						Diagonal (T6)	90.0	Pass
						Top Girt (T2)	4.2	Pass
						Bolt Checks	87.4	Pass
						RATING =	**91.0**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
2	Anchor Rods	--	83.3	Pass
2	Base Foundation	--	91.0	Pass

Structure Rating (max from all components) =	91.0%

Notes: 1) See full member breakdown and section capacities in Appendix A.
2) See additional documentation in Appendix C for supporting calculations.
3) Stresses up to 105% (steel) and 110% (foundations) are within engineering tolerance and considered acceptable.

4.1) Recommendations

The existing 132-ft self-support tower located in Tolland County (HRT 084 943242), CT **is structurally acceptable** based on the TIA/EIA-222-F standard and 2005 CT state building code based upon a wind speed of 85 mph fastest mile.

No modifications are required for the proposed loading.

Should you have any questions, please call us anytime at 519-885-3806.

encl.
806377-144303 SA Report - 20120419.doc

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Calculated Radio Frequency Emissions

CT1082

(Vernon)

197 South Street, Vernon, CT 06066

May 3, 2012

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the lattice tower located at 197 South Street in Vernon, CT. The coordinates of the tower are 41-51-12.5 N, 72-27-07.6 W.

AT&T is proposing the following modifications:

1) Replace six of nine existing dual-band (850/1900 MHz) panel antennas with six multi-band (700/850/1900/2100 MHz) antennas (two per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

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

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular UMTS	*109*	*880*	*1*	*500*	*0.0151*	*0.5867*	*2.58%*
Cingular GSM	*109*	*880*	*3*	*296*	*0.0269*	*0.5867*	*4.58%*
Cingular GSM	*109*	*1900*	*1*	*427*	*0.0129*	*1.0000*	*1.29%*
Verizon	117	757	1	612	0.0161	0.5047	3.19%
Verizon	117	869	9	349	0.0825	0.5793	14.24%
Verizon	117	1970	3	272	0.0214	1.0000	2.14%
XM Sat Radio	132	2337.49	2	312	0.0129	1.0000	1.29%
Town	98	954.1	1	63	0.0024	0.6361	0.37%
Town	85	460.325	1	200	0.0100	0.3069	3.24%
Town	135	453.8125	1	75	0.0015	0.3025	0.49%
Town	50	4900	1	228	0.0328	1.0000	3.28%
Pocket	84	2130	3	631	0.0965	1.0000	9.65%
Sprint	135	1962.5	11	359	0.0779	1.0000	7.79%
Clearwire	137	2496	2	153	0.0059	1.0000	0.59%
Clearwire	137	18000	1	211	0.0040	1.0000	0.40%
T-Mobile GSM	92	1945	8	156	0.0530	1.0000	5.30%
T-Mobile UMTS	92	2100	2	770	0.0654	1.0000	6.54%
AT&T UMTS	106	880	2	565	0.0036	0.5867	0.62%
AT&T UMTS	106	1900	2	1077	0.0069	1.0000	0.69%
AT&T LTE	106	734	1	1375	0.0044	0.4893	0.90%
AT&T GSM	106	880	1	538	0.0017	0.5867	0.29%
AT&T GSM	106	1900	4	934	0.0120	1.0000	1.20%
						Total	**62.21%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 3/29/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the P-SEC Structural Analysis Report dated 4/19/2012

5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **62.21% of the FCC limit.**

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

May 3, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

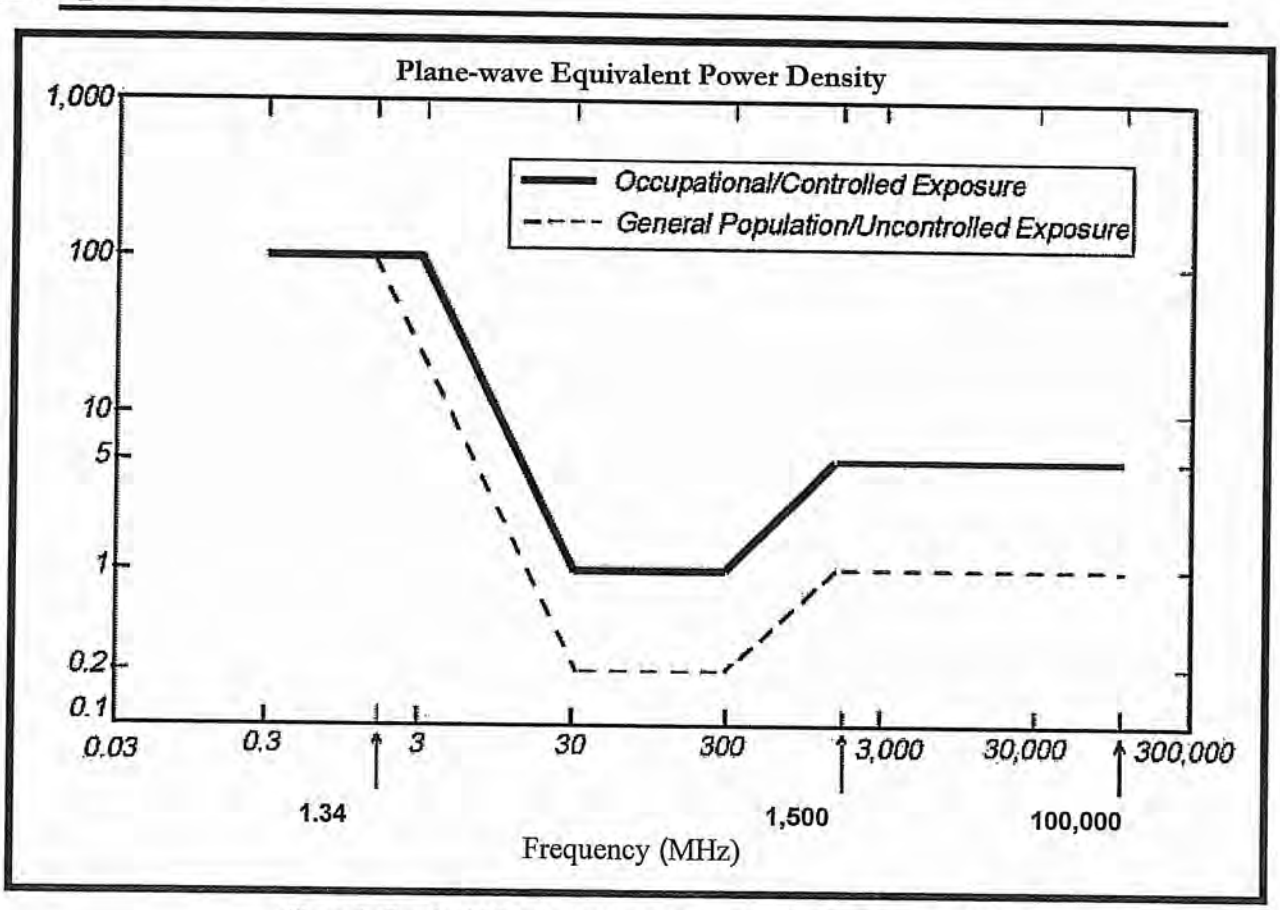
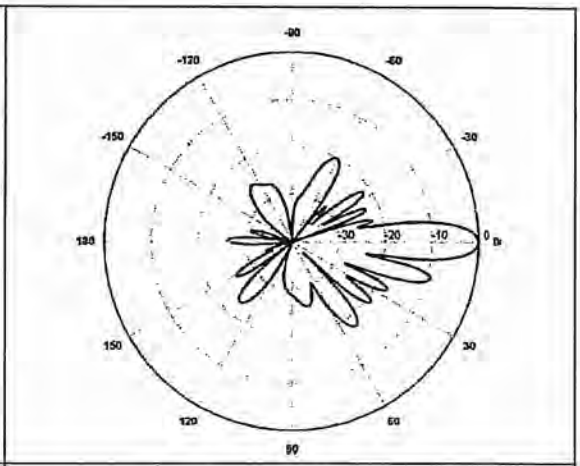


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

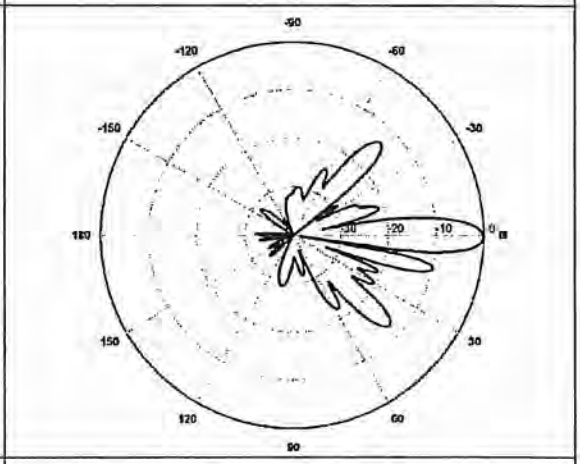
700 MHz

Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	698-806 MHz
Gain:	13.6 dBd
Vertical Beamwidth:	8.6°
Horizontal Beamwidth:	71°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.8" x 7.1"



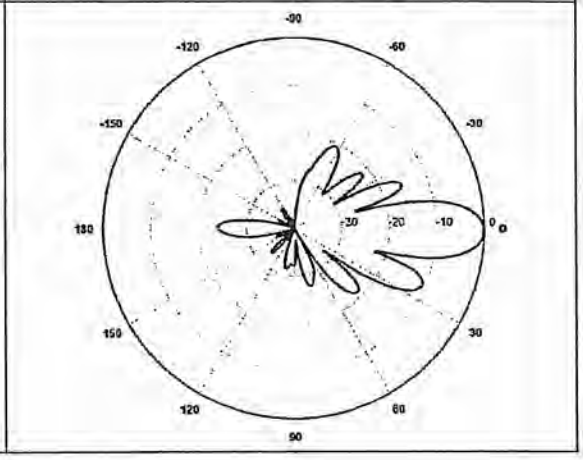
850 MHz GSM

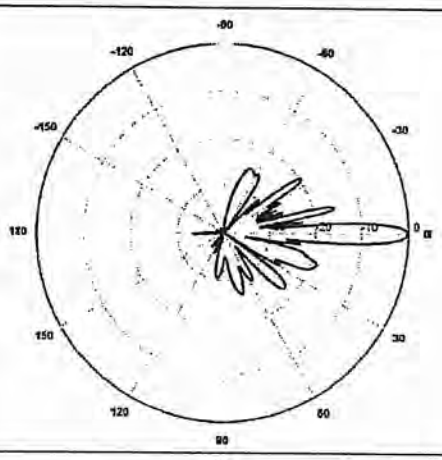
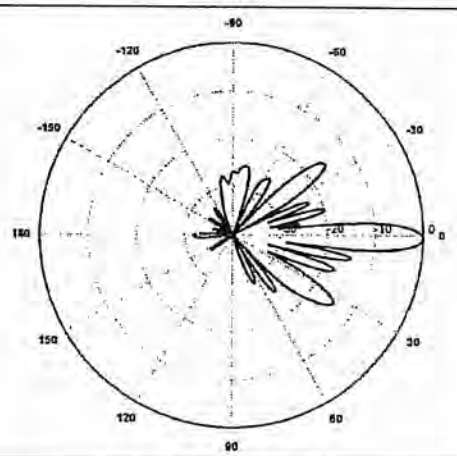
Manufacturer:	Commscope
Model #:	SBNH-1D6565C
Frequency Band:	806-896 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	7.8°
Horizontal Beamwidth:	67°
Polarization:	± 45°
Size L x W x D:	96.4" x 11.8" x 7.1"



850 MHz UMTS

Manufacturer:	Kathrein-Scala
Model #:	800 10121
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	14.5°
Horizontal Beamwidth:	86°
Polarization:	±45°
Size L x W x D:	54.5" x 10.3" x 5.9"



1900 MHz GSM Manufacturer: Commscope Model #: SBNH-1D6565C Frequency Band: 1850-1990 MHz Gain: 15.9 dBd Vertical Beamwidth: 5.1° Horizontal Beamwidth: 57° Polarization: ± 45° Size L x W x D: 96.4" x 11.8" x 7.1"	
1900 MHz UMTS Manufacturer: Kathrein-Scala Model #: 800 10121 Frequency Band: 1850-1990 MHz Gain: 14.3 dBd Vertical Beamwidth: 6.6° Horizontal Beamwidth: 85° Polarization: ±45° Size L x W x D: 54.5" x 10.3" x 5.9"	

Pinnacle Wireless

800 Marshall Phelps Rd
Building 2A
Windsor, CT 06095

ORIGINAL

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JUN 18 2014
CONNECTICUT
SITING COUNCIL

June 17, 2014

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

RE: **EM-CING-146-120517** – New Cingular Wireless PCS, LLC (AT&T) notification of completion of construction at 197 South Street, Vernon, CT.

Dear Ms. Bachman:

This letter is submitted on behalf of New Cingular Wireless PCS, LLC ("AT&T"), whose notice of intent to modify an existing telecommunications facility was acknowledged by the Connecticut Siting Council ("Council") on June 1, 2012.

Please accept this letter as notification of completion of construction by AT&T as required as a condition of the Council's acknowledgement.

Respectfully Yours,

Cecilia Post
Project Coordinator

Cc: Kevin Mason, AT&T