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April 3, 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:	2755 State Street, Hamden CT (the "Property")
Applicant:	AT&T Mobility ("AT&T")

Dear Ms. Bachman:

AT&T currently maintains a wireless telecommunications facility on an existing 120 Monopole tower ("tower") location on the Property. AT&T's facility consists of nine (9) wireless telecommunications antennas at 112 feet. The tower is controlled by Crown Castle. The Council approved the previous application on June 15, 2012, reference number EM-CING-062-120601. 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-062-120601.

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 Hamden. 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 112 foot level of the 120 foot monopole.
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

16 Esquire Road, Billerica, MA 01862 Mobile 617-639-4908 Email: Dcooper@empiretelecomm.com

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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 15, 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 GPD Group dated April 24, 2012 and Morrison Hershfield dated January 13, 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: Scott D. Jackson, Mayor, for the Town of Hamden CT
James Pascarella, Council President
Amodio Louis G & Debjay LLC – underlying property owners
Crown Castle

16 Esquire Road, Billerica, MA 01862 Mobile 617-639-4908 Email: Dcooper@empiretelecomm.com

Date: **January 13, 2014**

MORRISON HERSHFIELD

Ms. Amber Puckett
Crown Castle
5350 North 48th Street Suite 305
Chandler, AZ 85226

Morrison Hershfield
1455 Lincoln Parkway
Atlanta, GA 30346
(770) 379-8500

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	Scenario 2.5B
	Carrier Site Number:	CT03XC011
	Carrier Site Name:	Montowese Amodio Self Storage
Crown Castle Designation:	**Crown Castle BU Number:**	876312
	Crown Castle Site Name:	Montowese Amodio Self Store
	Crown Castle JDE Job Number:	252025
	Crown Castle Work Order Number:	692984
	Crown Castle Application Number:	205510 Rev. 1
Engineering Firm Designation:	**Morrison Hershfield Project Number:**	CN3-350 / 614000101
Site Data:	**2755 State Street, Hamden, New Haven County, CT**	
	Latitude *41° 21' 19.67"*, Longitude *-72° 53' 25.13"*	
	120 Foot - Self Support Tower	

Dear Ms. Puckett,

Morrison Hershfield 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 605756, in accordance with application 205510, revision 1.

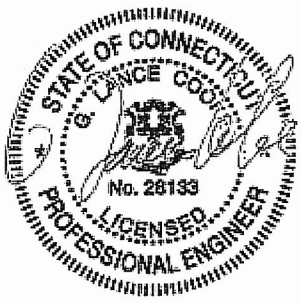
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Existing + Proposed Equipment for all applicants **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 2005 Connecticut State Building Code with 2009 Amendments (IBC 2003) based upon a wind speed of 85 mph fastest mile.

We at *Morrison Hershfield* 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.

Respectfully submitted by:



G. Lance Cooke, P.E (CT License No. PEN.0028133)
Senior Engineer

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft Self Support tower designed by Pirod Manufactures Inc. in November of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	120.0	3	Lucent	TD-RRH8x20-25	1	1-1/4"	1
		3	RFS	APXVTM14-C-I20 w/ pipe mount			

Notes:
1) The proposed equipment is to be installed in addition to the existing 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
120.0	122.0	3	Dragonwave	A-ANT-23G-2-C	3	1/2"	1
	120.0	3	-	2' Standoff Mount			
		1	-	Platform Mount (LP 405-1)			
		1	Lucent	1900 MHz RRH (65 MHz)			
		2	Lucent	1900 MHz RRH (65 MHz)	-	-	3
		3	RFS	ACU-A20-N			
		3	Lucent	800 MHz RRH			
		2	Powerwave	P40-16-XLPP-RR-A w/ pipe mount	6 3 2	5/16" 1-1/4" 2" Conduit	1
		6	RFS	ACU-A20-N			
		1	Lucent	800 MHz RRH			
		1	RFS	APXVSPP18-C-A20 w/ pipe mount			
	118.0	3	Argus	LLPX310R w/ pipe mount			
		3	Samsung	FDD-R6 RRH			
110.0	112.0	6	Powerwave	7770.00 w/ pipe mount	12	1-5/8"	1
	110.0	3	-	Sector Mount [SM 407-1]			
		6	Ericsson	RRUS-11	1 2	3/8" 3/4"	2
		3	KMW Communications	AM-X-CD-16-65-00T-RET w/ pipe mount			
		6	Powerwave	LGP21403	-	-	1
		1	Raycap	DC6-48-60-18-8F			2

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
100.0	100.0	3	-	Pipe Mount [PM 601-1]	6	1-5/8"	1
		3	RFS	APXV18-206517S-C w/ pipe mount			
40.0	40.0	1	Trimble	BULLET III	1	1/2"	1

Notes:
1) Existing Equipment
2) This equipment is reserved and has been considered in this analysis.
3) The existing equipment is to be removed and has not been considered in the calculations for this analysis.

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)
120	120	1	Unknown	LP Platform	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Dr. Clarence Welti, P.E., P.C., dated 9/12/1996	1529742	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod, Job # A-113604, dated 11/04/1997	1611716	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod, Job # A-113604, dated 11/04/1997	1611638	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD Associates, Job # 2008281.30, dated 11/10/2008	2486404	CCISITES

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) The tower and structures were built in accordance with the manufacturer's specifications and applicable ANSI/TIA/EIA standards.
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) The foundation was properly designed and constructed for the original design loads.

This analysis may be affected if any assumptions are not valid or have been made in error. Morrison Hershfield 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	120 - 110	Leg	1 1/2	2	-13.73	35.44	34.7	Pass
T2	110 - 90	Leg	1 3/4	38	-61.09	52.97	86.5	Pass
T3	90 - 70	Leg	2	102	-107.23	85.99	93.5	Pass
T4	70 - 50	Leg	2 1/2	204	-150.55	164.50	91.5	Pass
T5	50 - 40	Leg	Pirod 105245	268	-144.83	184.67	78.4	Pass
T6	40 - 20	Leg	Pirod 105217	277	-153.40	184.67	83.1	Pass
T7	20 - 0	Leg	Pirod 105217 Reinf w/ (2) 1-1/4" SR	292	-161.99	272.03	59.5	Pass
T1	120 - 110	Diagonal	5/8	14	-2.77	4.48	61.8	Pass
T2	110 - 90	Diagonal	3/4	50	-4.68	7.69	60.8	Pass
T3	90 - 70	Diagonal	7/8	198	-5.42	13.07	41.4	Pass
T4	70 - 50	Diagonal	7/8	266	-5.58	11.59	48.1	Pass
T5	50 - 40	Diagonal	L2 1/2x2 1/2x3/16	272	-5.43	12.05	45.0 60.0 (b)	Pass
T6	40 - 20	Diagonal	L2 1/2x2 1/2x3/16	283	-2.12	9.51	22.3 24.1 (b)	Pass
T7	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	298	-3.31	7.29	45.4	Pass
T1	120 - 110	Horizontal	5/8	30	-0.15	1.86	8.3	Pass
T2	110 - 90	Horizontal	3/4	59	-0.91	3.16	28.8	Pass
T3	90 - 70	Horizontal	7/8	188	-1.81	5.31	34.0	Pass
T4	70 - 50	Horizontal	7/8	260	-1.66	4.26	39.0	Pass
T3	90 - 70	Secondary Horizontal	1 1/4	120	-1.86	18.39	10.1	Pass
T1	120 - 110	Top Girt	3/4	5	-0.74	3.85	19.2	Pass
T2	110 - 90	Top Girt	7/8	41	-1.70	7.14	23.8	Pass
T3	90 - 70	Top Girt	1	105	-0.93	9.34	10.0	Pass
T4	70 - 50	Top Girt	1	207	-1.43	7.46	19.2	Pass
T1	120 - 110	Bottom Girt	3/4	9	-0.94	3.85	24.3	Pass
T2	110 - 90	Bottom Girt	7/8	45	-2.37	5.51	43.0	Pass
T3	90 - 70	Bottom Girt	1	107	-2.32	7.43	31.2	Pass
T4	70 - 50	Bottom Girt	1	209	-1.64	6.07	27.1	Pass
							Summary	
						Leg (T3)	93.5	Pass
						Diagonal (T1)	61.8	Pass
						Horizontal (T4)	39.0	Pass
						Secondary Horizontal (T3)	10.1	Pass
						Top Girt (T2)	23.8	Pass
						Bottom Girt (T2)	43.0	Pass
						Bolt Checks	80.6	Pass
						Rating =	91.5	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	47.0	Pass
1	Base Foundation	0	58.9	Pass

Structure Rating (max from all components) =	**93.5%**

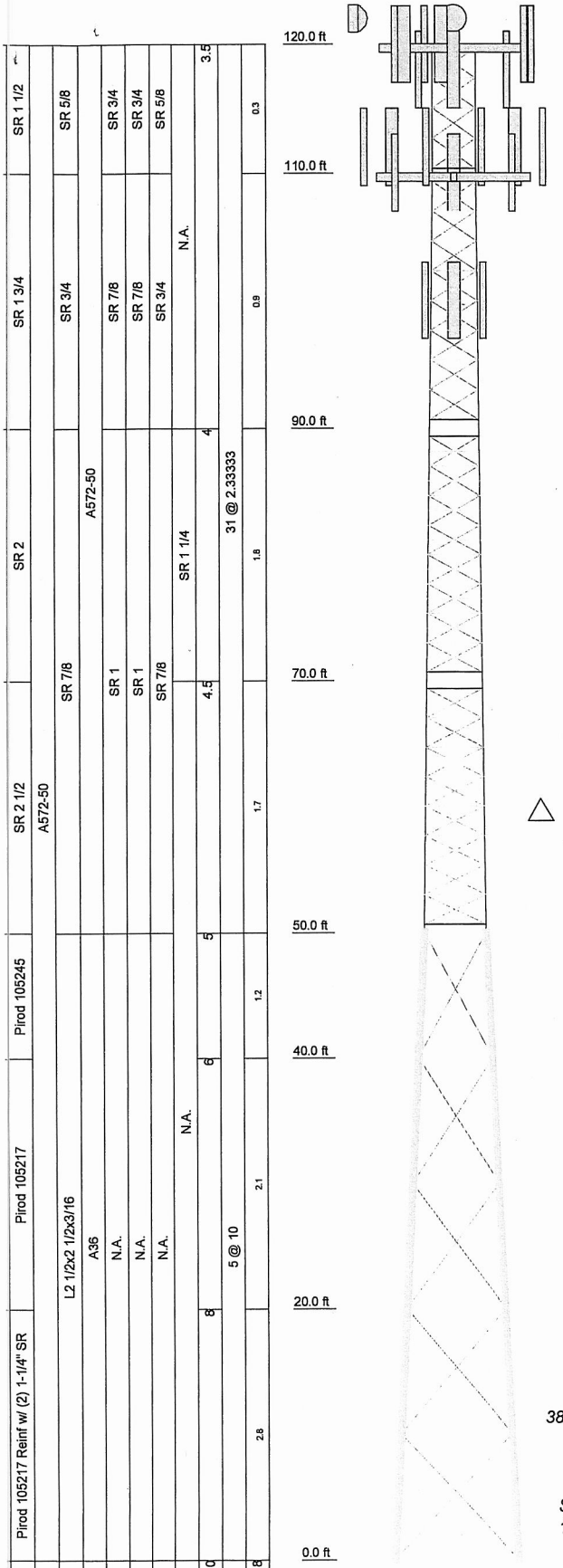
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Platform Mount (LP 405-1)	120	(2) 7770.00 w/ pipe mount	110
LLPX310R w/ pipe mount	120	(2) 7770.00 w/ pipe mount	110
LLPX310R w/ pipe mount	120	(2) LGP21403	110
LLPX310R w/ pipe mount	120	(2) LGP21403	110
FDD-R6 RRH	120	(2) LGP21403	110
FDD-R6 RRH	120	AM-X-CD-16-65-00T-RET w/ pipe mount	110
FDD-R6 RRH	120		
APXVSPP18-C-A20 w/ pipe mount	120	AM-X-CD-16-65-00T-RET w/ pipe mount	110
(3) ACU-A20-N	120		
800 MHz RRH	120	AM-X-CD-16-65-00T-RET w/ pipe mount	110
P40-16-XLPP-RR-A w/ pipe mount	120		
P40-16-XLPP-RR-A w/ pipe mount	120	(2) RRUS-11	110
1900 MHz RRH (65 MHz)	120	(2) RRUS-11	110
(3) ACU-A20-N	120	(2) RRUS-11	110
2' Standoff Mount	120	DC6-48-60-18-8F	110
(2) 2' Standoff Mount	120	Sector Mount [SM 407-1]	110
APXVTM14-C-I20 w/ pipe mount	120	Sector Mount [SM 407-1]	110
APXVTM14-C-I20 w/ pipe mount	120	Sector Mount [SM 407-1]	110
APXVTM14-C-I20 w/ pipe mount	120	APXV18-206517S-C w/ pipe mount	100
TD-RRH8x20-25	120	APXV18-206517S-C w/ pipe mount	100
TD-RRH8x20-25	120	APXV18-206517S-C w/ pipe mount	100
TD-RRH8x20-25	120	Pipe Mount [PM 601-1]	100
A-ANT-23G-2-C	120	Pipe Mount [PM 601-1]	100
A-ANT-23G-2-C	120	Pipe Mount [PM 601-1]	100
A-ANT-23G-2-C	120	BULLET III	40
(2) 7770.00 w/ pipe mount	110		

MATERIAL STRENGTH

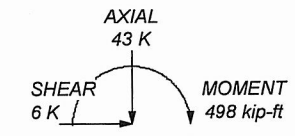
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

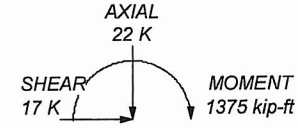
1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.

MAX. CORNER REACTIONS AT BASE:
DOWN: 166 K
SHEAR: 13 K

UPLIFT: -149 K
SHEAR: 11 K



TORQUE 1 kip-ft
38 mph WIND - 0.7500 in ICE



TORQUE 4 kip-ft
REACTIONS - 85 mph WIND

Morrison Hershfield
Consulting Engineers
1455 Lincoln Parkway
Atlanta, GA 30346
Phone: (770) 379-8500
FAX: (770) 379-8501

Job: CN3-350 / 614000101			
Project: 876312 / Montowese Amodio Self Store			
Client: Crown Castle USA	Drawn by: cmackay	App'd:	
Code: TIA/EIA-222-F	Date: 01/13/14	Scale:	
Path: P:\Projects\Tower Projects\Crown Analyses-3\CN3-350 - 876312 - MONTOWESE AMODIO SELF STOR\CN3-350 SA\Analysis\CN3-350.eri		Dwg No.	

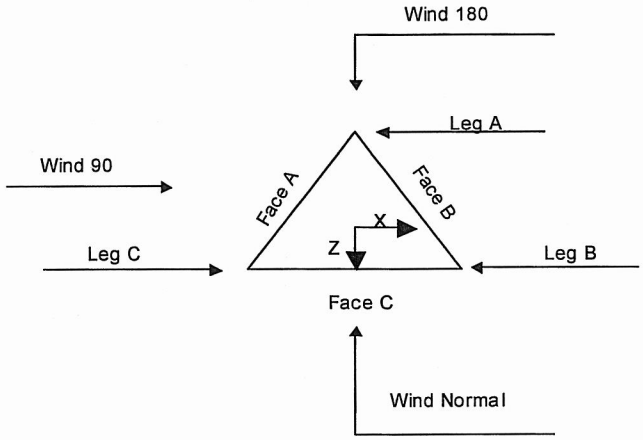
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 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 3.50 ft at the top and 10.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

2) Tower is located in New Haven County, Connecticut.
3) Basic wind speed of 85 mph.
4) Nominal ice thickness of 0.7500 in.
5) Ice thickness is considered to increase with height.
6) Ice density of 56 pcf.
7) A wind speed of 38 mph is used in combination with ice.
8) Temperature drop of 50 °F.
9) Deflections calculated using a wind speed of 50 mph.
10) A non-linear (P-delta) analysis was used.
11) Pressures are calculated at each section.
12) Stress ratio used in tower member design is 1.333.
13) 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	120.00-110.00			3.50	1	10.00
T2	110.00-90.00			3.50	1	20.00
T3	90.00-70.00			4.00	1	20.00
T4	70.00-50.00			4.50	1	20.00
T5	50.00-40.00			5.00	1	10.00
T6	40.00-20.00			6.00	1	20.00
T7	20.00-0.00			8.00	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	120.00-110.00	2.33	X Brace	No	Steps	4.0000	4.0000
T2	110.00-90.00	2.33	X Brace	No	Steps	8.0000	8.0000
T3	90.00-70.00	2.33	X Brace	No	Yes	8.0000	8.0000
T4	70.00-50.00	2.33	X Brace	No	Steps	8.0000	8.0000
T5	50.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T6	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T7	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 120.00-	Solid Round	1 1/2	A572-50	Solid Round	5/8	A572-50

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
110.00			(50 ksi)			(50 ksi)
T2 110.00-90.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 90.00-70.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 70.00-50.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 50.00-40.00	Truss Leg	Pirod 105245	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 40.00-20.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 20.00-0.00	Truss Leg	Pirod 105217 Reinf w/ (2) 1-1/4" SR	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 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 120.00-110.00	Solid Round	3/4	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 110.00-90.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 90.00-70.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 70.00-50.00	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 120.00-110.00	None	Flat Bar		A36 (36 ksi)	Solid Round	5/8	A572-50 (50 ksi)
T2 110.00-90.00	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 90.00-70.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 70.00-50.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T3 90.00-70.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 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 120.00-110.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 110.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 90.00-70.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 70.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1.107	1.06	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 120.00-110.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 110.00-90.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 90.00-70.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 70.00-50.00	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 50.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 20.00-0.00	Yes	Yes	1.279	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	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T5 50.00-40.00	1	1	1	1	0.5	0.85
T6 40.00-20.00	1	1	1	1	0.5	0.85
T7 20.00-0.00	1	1	1	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 120.00-110.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 110.00-90.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 90.00-70.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 70.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 50.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		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 120.00-110.00	Sleeve DS	0.6250 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 110.00-90.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 90.00-70.00	Sleeve DS	0.7500 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 70.00-50.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 50.00-40.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 40.00-20.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 20.00-0.00	Flange	1.0000 A687	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8"	C	Yes	Ar (CfAe)	120.00 - 6.00	0.0000	-0.5	1	1	0.3750	0.3750		0.22
1-5/8"	A	Yes	Ar (CfAe)	110.00 - 6.00	-6.0000	-0.4	12	6	0.5000	1.9800		1.04
Fiber (3/8")	A	Yes	Ar (CfAe)	110.00 - 6.00	-6.0000	-0.405	1	1	0.3250	0.3250		0.12
Power Cable (3/4")	A	Yes	Ar (CfAe)	110.00 - 6.00	-6.0000	-0.41	2	2	0.7500	0.7500		0.88
Feedline Ladder (Af) ******	A	Yes	Af (CfAe)	110.00 - 6.00	-6.0000	-0.415	1	1	3.0000	3.0000	12.0000	8.40
1-5/8"	C	Yes	Ar (CfAe)	100.00 - 6.00	-3.0000	-0.4	6	6	0.5000	1.9800		1.04
Feedline Ladder (Af)	C	Yes	Af (CfAe)	100.00 - 6.00	-3.5000	-0.41	1	1	3.0000	3.0000	12.0000	8.40

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
******												
Feedline Ladder (Af)	B	Yes	Af (CfAe)	120.00 - 6.00	-3.5000	-0.41	1	1	3.0000	3.0000	12.0000	8.40
1-1/4"	B	Yes	Ar (CfAe)	120.00 - 6.00	-3.5000	-0.41	3	3	1.5500	1.5500		0.66
1-1/4"	B	Yes	Ar (CfAe)	120.00 - 6.00	-3.5000	-0.41	1	1	1.5500	1.5500		0.66
1/2"	B	No	Ar (CfAe)	40.00 - 6.00	-3.5000	-0.41	1	1	0.5800	0.5800		0.25
1/2"	B	No	Ar (CfAe)	120.00 - 6.00	-3.5000	-0.41	3	3	0.5800	0.5800		0.25
5/16"	B	No	Ar (CfAe)	120.00 - 6.00	-3.5000	-0.41	6	6	0.0000	0.0000		0.03
2" Conduit	B	No	Ar (CfAe)	120.00 - 6.00	-3.5000	-0.41	2	2	2.0000	2.0000		2.80

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	120.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	9.950	2.500	0.000	0.000	0.18
		C	0.313	0.000	0.000	0.000	0.00
T2	110.00-90.00	A	22.842	5.000	0.000	0.000	0.46
		B	19.900	5.000	0.000	0.000	0.35
		C	10.525	2.500	0.000	0.000	0.15
T3	90.00-70.00	A	22.842	5.000	0.000	0.000	0.46
		B	19.900	5.000	0.000	0.000	0.35
		C	20.425	5.000	0.000	0.000	0.30
T4	70.00-50.00	A	22.842	5.000	0.000	0.000	0.46
		B	19.900	5.000	0.000	0.000	0.35
		C	20.425	5.000	0.000	0.000	0.30
T5	50.00-40.00	A	11.421	2.500	0.000	0.000	0.23
		B	9.950	2.500	0.000	0.000	0.18
		C	10.213	2.500	0.000	0.000	0.15
T6	40.00-20.00	A	22.842	5.000	0.000	0.000	0.46
		B	20.867	5.000	0.000	0.000	0.36
		C	20.425	5.000	0.000	0.000	0.30
T7	20.00-0.00	A	15.989	3.500	0.000	0.000	0.32
		B	14.607	3.500	0.000	0.000	0.25
		C	14.298	3.500	0.000	0.000	0.21

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	120.00-110.00	A	0.871	0.000	0.000	0.000	0.000	0.00
		B		15.112	10.568	0.000	0.000	0.45
		C		1.765	0.000	0.000	0.000	0.02
T2	110.00-90.00	A	0.857	13.659	30.070	0.000	0.000	1.10
		B		29.934	21.104	0.000	0.000	0.89
		C		6.559	13.785	0.000	0.000	0.38
T3	90.00-70.00	A	0.834	13.433	30.020	0.000	0.000	1.09
		B		29.482	21.054	0.000	0.000	0.87
		C		9.486	27.520	0.000	0.000	0.71
T4	70.00-50.00	A	0.806	13.149	29.957	0.000	0.000	1.07
		B		28.916	20.991	0.000	0.000	0.85
		C		9.297	27.457	0.000	0.000	0.70
T5	50.00-40.00	A	0.778	6.438	14.948	0.000	0.000	0.53
		B		14.184	10.465	0.000	0.000	0.42
		C		4.557	13.698	0.000	0.000	0.34
T6	40.00-20.00	A	0.750	12.592	29.833	0.000	0.000	1.04
		B		41.433	10.533	0.000	0.000	0.81
		C		8.925	27.333	0.000	0.000	0.67
T7	20.00-0.00	A	0.750	8.814	20.883	0.000	0.000	0.73

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
		B		29.003	7.373	0.000	0.000	0.57
		C		6.247	19.133	0.000	0.000	0.47

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	120.00-110.00	A	0.000	0.000	0.000	0.000
		B	0.480	3.377	0.000	0.000
		C	0.024	0.512	0.000	0.000
T2	110.00-90.00	A	1.843	9.610	0.000	0.000
		B	1.015	6.252	0.000	0.000
		C	1.147	5.974	0.000	0.000
T3	90.00-70.00	A	3.956	17.182	0.000	0.000
		B	2.179	11.166	0.000	0.000
		C	3.613	14.686	0.000	0.000
T4	70.00-50.00	A	2.042	9.086	0.000	0.000
		B	1.125	5.897	0.000	0.000
		C	2.514	10.505	0.000	0.000
T5	50.00-40.00	A	0.000	1.174	1.202	1.884
		B	0.000	0.761	0.662	1.221
		C	0.000	1.005	1.098	1.614
T6	40.00-20.00	A	0.000	1.892	2.030	3.154
		B	0.000	1.218	1.118	2.029
		C	0.000	1.623	1.854	2.704
T7	20.00-0.00	A	0.000	1.134	1.216	1.889
		B	0.000	0.729	0.670	1.216
		C	0.000	0.972	1.111	1.620

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	120.00-110.00	-0.6444	-8.3042	-0.0770	-4.4198
T2	110.00-90.00	-2.2018	-0.5495	-1.0871	-1.4119
T3	90.00-70.00	-0.0690	0.2167	0.0750	-1.0954
T4	70.00-50.00	-0.2456	0.3343	-0.2602	-1.1312
T5	50.00-40.00	-0.1369	0.2607	0.0127	-0.6463
T6	40.00-20.00	-0.2364	0.0865	-0.0033	-1.8779
T7	20.00-0.00	-0.2568	0.0658	-0.0038	-1.6063

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Platform Mount (LP 405-1)	C	None		0.0000	120.00	No Ice	20.80	20.80	1.80
						1/2" Ice	28.09	28.09	2.07
						1" Ice	35.38	35.38	2.33
							49.96	49.96	2.86

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
						2" Ice	79.12	79.12	3.93
						4" Ice			
LLPX310R w/ pipe mount	A	From Face	4.00 3.00 -2.00	0.0000	120.00	No Ice	5.24	3.29	0.06
						1/2" Ice	5.68	3.86	0.10
						1" Ice	6.14	4.45	0.15
						2" Ice	7.08	5.74	0.26
						4" Ice	9.14	8.67	0.59
LLPX310R w/ pipe mount	B	From Face	4.00 0.00 -2.00	0.0000	120.00	No Ice	5.24	3.29	0.06
						1/2" Ice	5.68	3.86	0.10
						1" Ice	6.14	4.45	0.15
						2" Ice	7.08	5.74	0.26
						4" Ice	9.14	8.67	0.59
LLPX310R w/ pipe mount	C	From Face	4.00 0.00 -2.00	0.0000	120.00	No Ice	5.24	3.29	0.06
						1/2" Ice	5.68	3.86	0.10
						1" Ice	6.14	4.45	0.15
						2" Ice	7.08	5.74	0.26
						4" Ice	9.14	8.67	0.59
FDD-R6 RRH	A	From Face	3.75 3.00 -2.00	0.0000	120.00	No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
						1" Ice	2.18	1.07	0.06
						2" Ice	2.59	1.39	0.09
						4" Ice	3.51	2.14	0.20
FDD-R6 RRH	B	From Face	3.75 0.00 -2.00	0.0000	120.00	No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
						1" Ice	2.18	1.07	0.06
						2" Ice	2.59	1.39	0.09
						4" Ice	3.51	2.14	0.20
FDD-R6 RRH	C	From Face	3.75 0.00 -2.00	0.0000	120.00	No Ice	1.80	0.78	0.03
						1/2" Ice	1.99	0.92	0.04
						1" Ice	2.18	1.07	0.06
						2" Ice	2.59	1.39	0.09
						4" Ice	3.51	2.14	0.20
APXVSPP18-C-A20 w/ pipe mount	A	From Face	4.00 4.00 0.00	0.0000	120.00	No Ice	8.50	6.95	0.09
						1/2" Ice	9.15	8.13	0.16
						1" Ice	9.77	9.02	0.23
						2" Ice	11.03	10.84	0.41
						4" Ice	13.68	14.85	0.92
(3) ACU-A20-N	A	From Face	3.75 4.00 0.00	0.0000	120.00	No Ice	0.14	0.08	0.00
						1/2" Ice	0.19	0.12	0.00
						1" Ice	0.25	0.17	0.00
						2" Ice	0.40	0.30	0.01
						4" Ice	0.80	0.67	0.04
800 MHz RRH	A	From Face	3.75 4.00 0.00	0.0000	120.00	No Ice	2.49	2.91	0.07
						1/2" Ice	2.71	3.14	0.09
						1" Ice	2.93	3.38	0.12
						2" Ice	3.41	3.89	0.19
						4" Ice	4.46	5.00	0.38
P40-16-XLPP-RR-A w/ pipe mount	B	From Face	4.00 4.00 0.00	0.0000	120.00	No Ice	9.49	4.94	0.09
						1/2" Ice	10.08	5.79	0.15
						1" Ice	10.65	6.51	0.22
						2" Ice	11.82	8.11	0.39
						4" Ice	14.29	11.53	0.84
P40-16-XLPP-RR-A w/ pipe mount	C	From Face	4.00 4.00 0.00	0.0000	120.00	No Ice	9.49	4.94	0.09
						1/2" Ice	10.08	5.79	0.15
						1" Ice	10.65	6.51	0.22

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	11.82	8.11	0.39
						2" Ice	14.29	11.53	0.84
						4" Ice			
1900 MHz RRH (65 MHz)	C	From Face	3.75 4.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.71 2.95 3.20 3.72 4.86	2.61 2.85 3.10 3.61 4.75	0.06 0.08 0.11 0.17 0.35
(3) ACU-A20-N	C	From Face	3.75 4.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.14 0.19 0.25 0.40 0.80	0.08 0.12 0.17 0.30 0.67	0.00 0.00 0.00 0.01 0.04
2' Standoff Mount	A	From Leg	5.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
(2) 2' Standoff Mount	C	From Leg	5.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.94 1.48 2.02 3.10 5.26	1.41 2.17 2.93 4.45 7.49	0.03 0.04 0.06 0.08 0.14
APXVTM14-C-I20 w/ pipe mount	A	From Leg	4.00 -1.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.21 7.77 8.31 9.42 11.77	5.03 5.89 6.63 8.20 11.67	0.09 0.15 0.21 0.36 0.78
APXVTM14-C-I20 w/ pipe mount	B	From Leg	4.00 -1.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.21 7.77 8.31 9.42 11.77	5.03 5.89 6.63 8.20 11.67	0.09 0.15 0.21 0.36 0.78
APXVTM14-C-I20 w/ pipe mount	C	From Leg	4.00 -1.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.21 7.77 8.31 9.42 11.77	5.03 5.89 6.63 8.20 11.67	0.09 0.15 0.21 0.36 0.78
TD-RRH8x20-25	A	From Leg	4.00 -1.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.32 4.60 4.89 5.50 6.82	1.41 1.61 1.83 2.28 3.30	0.07 0.09 0.12 0.18 0.36
TD-RRH8x20-25	B	From Leg	4.00 -1.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.32 4.60 4.89 5.50 6.82	1.41 1.61 1.83 2.28 3.30	0.07 0.09 0.12 0.18 0.36
TD-RRH8x20-25	C	From Leg	4.00 -1.00 0.00	0.0000	120.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.32 4.60 4.89 5.50 6.82	1.41 1.61 1.83 2.28 3.30	0.07 0.09 0.12 0.18 0.36
***** Sector Mount [SM 407-1]	A	From Leg	1.75	0.0000	110.00	No Ice	10.27	7.94	0.32

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
			0.00			1/2"	15.29	11.73	0.46
			0.00			Ice	20.31	15.52	0.60
						1" Ice	30.35	23.10	0.88
						2" Ice	50.43	38.26	1.44
						4" Ice			
Sector Mount [SM 407-1]	B	From Leg	1.75	0.0000	110.00	No Ice	10.27	7.94	0.32
			0.00			1/2"	15.29	11.73	0.46
			0.00			Ice	20.31	15.52	0.60
						1" Ice	30.35	23.10	0.88
						2" Ice	50.43	38.26	1.44
						4" Ice			
Sector Mount [SM 407-1]	C	From Leg	1.75	0.0000	110.00	No Ice	10.27	7.94	0.32
			0.00			1/2"	15.29	11.73	0.46
			0.00			Ice	20.31	15.52	0.60
						1" Ice	30.35	23.10	0.88
						2" Ice	50.43	38.26	1.44
						4" Ice			
(2) 7770.00 w/ pipe mount	A	From Leg	3.50	0.0000	110.00	No Ice	6.22	4.35	0.06
			0.00			1/2"	6.77	5.20	0.11
			2.00			Ice	7.30	5.92	0.16
						1" Ice	8.38	7.41	0.30
						2" Ice	10.69	10.76	0.68
						4" Ice			
(2) 7770.00 w/ pipe mount	B	From Leg	3.50	0.0000	110.00	No Ice	6.22	4.35	0.06
			0.00			1/2"	6.77	5.20	0.11
			2.00			Ice	7.30	5.92	0.16
						1" Ice	8.38	7.41	0.30
						2" Ice	10.69	10.76	0.68
						4" Ice			
(2) 7770.00 w/ pipe mount	C	From Leg	3.50	0.0000	110.00	No Ice	6.22	4.35	0.06
			0.00			1/2"	6.77	5.20	0.11
			2.00			Ice	7.30	5.92	0.16
						1" Ice	8.38	7.41	0.30
						2" Ice	10.69	10.76	0.68
						4" Ice			
(2) LGP21403	A	From Leg	3.25	0.0000	110.00	No Ice	1.26	0.38	0.01
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
						1" Ice	1.94	0.89	0.05
						2" Ice	2.75	1.54	0.13
						4" Ice			
(2) LGP21403	B	From Leg	3.25	0.0000	110.00	No Ice	1.26	0.38	0.01
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
						1" Ice	1.94	0.89	0.05
						2" Ice	2.75	1.54	0.13
						4" Ice			
(2) LGP21403	C	From Leg	3.25	0.0000	110.00	No Ice	1.26	0.38	0.01
			0.00			1/2"	1.42	0.49	0.02
			0.00			Ice	1.58	0.62	0.03
						1" Ice	1.94	0.89	0.05
						2" Ice	2.75	1.54	0.13
						4" Ice			
AM-X-CD-16-65-00T-RET w/ pipe mount	A	From Leg	3.50	0.0000	110.00	No Ice	8.50	6.30	0.08
			0.00			1/2"	9.15	7.48	0.15
			0.00			Ice	9.77	8.37	0.22
						1" Ice	11.03	10.18	0.39
						2" Ice	13.68	14.02	0.88
						4" Ice			
AM-X-CD-16-65-00T-RET w/ pipe mount	B	From Leg	3.50	0.0000	110.00	No Ice	8.50	6.30	0.08
			0.00			1/2"	9.15	7.48	0.15
			0.00			Ice	9.77	8.37	0.22
						1" Ice	11.03	10.18	0.39
						2" Ice	13.68	14.02	0.88
						4" Ice			

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
AM-X-CD-16-65-00T-RET w/ pipe mount	C	From Leg	3.50 0.00 0.00	0.0000	110.00	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	0.08 0.15 0.22 0.39 0.88
(2) RRUS-11	A	From Leg	3.25 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	B	From Leg	3.25 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
(2) RRUS-11	C	From Leg	3.25 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.94 3.17 3.41 3.91 5.02	1.25 1.41 1.59 1.96 2.82	0.06 0.07 0.10 0.15 0.30
DC6-48-60-18-8F	A	From Leg	3.25 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.60 1.81 2.02 2.49 3.56	1.60 1.81 2.02 2.49 3.56	0.03 0.05 0.07 0.13 0.27
******									
Pipe Mount [PM 601-1]	A	From Leg	0.25 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
Pipe Mount [PM 601-1]	B	From Leg	0.25 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
Pipe Mount [PM 601-1]	C	From Leg	0.25 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
APXV18-206517S-C w/ pipe mount	A	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.06 0.11 0.16 0.29 0.69
APXV18-206517S-C w/ pipe mount	B	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.40 5.96 6.48 7.55 9.92	4.70 5.86 6.73 8.51 12.28	0.06 0.11 0.16 0.29 0.69
APXV18-206517S-C w/ pipe mount	C	From Leg	0.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.40 5.96 6.48 7.55	4.70 5.86 6.73 8.51	0.06 0.11 0.16 0.29

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
							2" Ice	9.92	12.28	0.69
							4" Ice			
*****										
BULLET III	A	From Leg	0.50	0.00	0.0000	40.00	No Ice	0.10	0.10	0.00
			0.00				1/2" Ice	0.18	0.18	0.00
			0.00				1" Ice	0.26	0.26	0.00
							2" Ice	0.42	0.42	0.00
							4" Ice	0.74	0.74	0.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-2-C	A	Paraboloid w/Shroud (HP)	From Leg	6.00	0.00	-80.0000		120.00	2.17	No Ice	3.72	0.03
				0.00						1/2" Ice	4.01	0.05
				2.00						1" Ice	4.30	0.07
										2" Ice	4.88	0.11
										4" Ice	6.04	0.19
A-ANT-23G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	6.00	0.00	30.0000		120.00	2.17	No Ice	3.72	0.03
				0.00						1/2" Ice	4.01	0.05
				2.00						1" Ice	4.30	0.07
										2" Ice	4.88	0.11
										4" Ice	6.04	0.19
A-ANT-23G-2-C	C	Paraboloid w/Shroud (HP)	From Leg	6.00	0.00	-90.0000		120.00	2.17	No Ice	3.72	0.03
				0.00						1/2" Ice	4.01	0.05
				2.00						1" Ice	4.30	0.07
										2" Ice	4.88	0.11
										4" Ice	6.04	0.19

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105245	1090.3344	2417.2301	0.64	0.42	7.5718	16.7863	5.3014
Pirod 105217	2296.2363	4562.6756	0.56	0.76	7.9730	15.8426	5.3014
Pirod 105217 Reinf w/ (2) 1-1/4" SR	2395.2746	5024.9572	0.76	0.75	8.3169	17.4478	7.7558

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice

Comb. No.	Description
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	120 - 110	Leg	Max Tension	12	11.61	-0.65	-0.36
			Max. Compression	2	-13.73	0.02	-0.24
			Max. Mx	5	-1.26	0.76	0.01
			Max. My	2	3.60	-0.05	-0.85
			Max. Vy	10	-1.43	-0.26	0.13
			Max. Vx	2	-1.68	-0.01	-0.28
		Diagonal	Max Tension	3	2.79	0.00	0.00
			Max. Compression	3	-2.77	0.00	0.00
			Max. Mx	22	0.81	-0.00	0.00
			Max. My	3	-2.76	-0.00	-0.00
			Max. Vy	22	0.00	-0.00	0.00
			Max. Vx	3	0.00	-0.00	-0.00
		Horizontal	Max Tension	8	0.24	0.00	0.00
			Max. Compression	2	-0.15	0.00	0.00
			Max. Mx	14	0.08	0.00	0.00
			Max. My	10	0.14	0.00	-0.00
			Max. Vy	14	-0.00	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Top Girt	Max Tension	6	0.75	0.00	0.00
			Max. Compression	4	-0.74	0.00	0.00
			Max. Mx	14	-0.00	0.00	0.00
			Max. My	3	0.00	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	0.86	0.00	0.00
			Max. Compression	6	-0.94	0.00	0.00
			Max. Mx	14	-0.01	0.00	0.00
			Max. My	3	0.14	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
T2	110 - 90	Leg	Max Tension	12	56.01	1.43	-0.02
			Max. Compression	2	-61.09	0.43	0.07
			Max. Mx	6	-60.73	-1.50	-0.01
			Max. My	13	-3.43	0.03	-1.49
			Max. Vy	6	-2.91	0.43	0.00
			Max. Vx	13	-2.85	-0.01	0.40
		Diagonal	Max Tension	3	4.80	0.00	0.00
			Max. Compression	3	-4.68	0.00	0.00
			Max. Mx	11	2.64	-0.00	-0.00
			Max. My	3	-4.41	-0.00	-0.00
			Max. Vy	22	0.00	-0.00	-0.00
			Max. Vx	3	0.00	-0.00	-0.00
		Horizontal	Max Tension	8	1.08	0.00	0.00
			Max. Compression	2	-0.91	0.00	0.00
			Max. Mx	21	0.30	0.01	0.00
			Max. My	10	0.53	0.00	-0.00
			Max. Vy	21	-0.01	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Top Girt	Max Tension	6	1.75	0.00	0.00
			Max. Compression	4	-1.70	0.00	0.00
			Max. Mx	14	0.01	0.01	0.00
			Max. My	3	-0.13	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	0.00	0.00	0.00
		Bottom Girt	Max Tension	8	2.14	0.00	0.00
			Max. Compression	6	-2.37	0.00	0.00
			Max. Mx	14	0.04	0.01	0.00
			Max. My	3	0.61	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
T3	90 - 70	Leg	Max Tension	12	99.65	1.40	-0.01
			Max. Compression	2	-107.23	0.77	0.10
			Max. Mx	6	-60.74	2.31	0.01
			Max. My	13	-3.48	-0.04	2.30
			Max. Vy	2	-3.44	0.77	0.10
			Max. Vx	13	-2.84	-0.04	2.30
		Diagonal	Max Tension	3	5.06	0.00	0.00
			Max. Compression	3	-5.42	0.00	0.00
			Max. Mx	12	3.97	-0.01	0.00
			Max. My	3	-5.40	0.00	-0.00
			Max. Vy	23	0.01	-0.00	-0.00
			Max. Vx	3	0.00	0.00	-0.00
		Horizontal	Max Tension	12	1.96	0.00	0.00
			Max. Compression	2	-1.81	0.00	0.00
			Max. Mx	14	0.19	0.01	0.00
			Max. My	3	0.21	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	2	1.86	0.00	0.00
			Max. Compression	2	-1.86	0.00	0.00
			Max. Mx	14	0.12	0.02	0.00
			Max. My	3	1.60	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Top Girt	Max Tension	6	1.30	0.00	0.00
			Max. Compression	4	-0.93	0.00	0.00
			Max. Mx	14	0.11	0.01	0.00
			Max. My	3	-0.37	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	2.27	0.00	0.00
			Max. Compression	2	-2.32	0.00	0.00
			Max. Mx	14	0.12	0.01	0.00
			Max. My	3	0.41	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T4	70 - 50	Leg	Max Tension	12	140.41	-0.07	-0.02
			Max. Compression	6	-150.55	2.56	0.01
			Max. Mx	2	-107.25	2.98	0.40
			Max. My	13	-5.14	0.04	2.49
			Max. Vy	6	-3.79	2.56	0.01
			Max. Vx	13	-2.76	0.04	2.49
		Diagonal	Max Tension	3	5.27	0.00	0.00
			Max. Compression	9	-5.58	0.00	0.00
			Max. Mx	7	2.64	-0.01	-0.00
			Max. My	3	-5.52	0.00	-0.00
			Max. Vy	15	0.01	-0.00	0.00
			Max. Vx	3	0.00	0.00	-0.00
		Horizontal	Max Tension	8	1.82	0.00	0.00
			Max. Compression	2	-1.66	0.00	0.00
			Max. Mx	14	0.14	0.01	0.00
			Max. My	4	-0.77	0.00	-0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
		Top Girt	Max Tension	6	1.69	0.00	0.00
			Max. Compression	4	-1.43	0.00	0.00
			Max. Mx	14	0.03	0.01	0.00
			Max. My	3	-0.51	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Bottom Girt	Max Tension	8	1.77	0.00	0.00
			Max. Compression	2	-1.64	0.00	0.00
			Max. Mx	14	0.06	0.01	0.00
			Max. My	3	-0.16	0.00	0.00
			Max. Vy	14	0.01	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
T5	50 - 40	Leg	Max Tension	12	135.38	-2.35	0.01
			Max. Compression	6	-144.83	6.26	-0.04
			Max. Mx	12	135.09	-6.58	0.03
			Max. My	13	-5.95	-0.15	11.12
			Max. Vy	4	0.50	-6.58	-0.04
			Max. Vx	3	1.04	-0.18	-11.00
		Diagonal	Max Tension	3	4.89	0.00	0.00
			Max. Compression	3	-5.43	0.00	0.00
			Max. Mx	4	0.20	0.10	-0.01
			Max. My	3	-0.06	-0.08	0.03
			Max. Vy	5	-0.02	0.09	-0.02
			Max. Vx	3	-0.01	0.00	0.00
T6	40 - 20	Leg	Max Tension	12	140.75	-6.27	0.01
			Max. Compression	6	-153.40	5.04	-0.01
			Max. Mx	12	138.92	-6.58	0.03
			Max. My	13	-6.75	-0.15	11.12
			Max. Vy	4	-0.22	-6.26	-0.01
			Max. Vx	13	0.61	-0.15	11.12
		Diagonal	Max Tension	2	1.96	0.05	-0.00
			Max. Compression	8	-2.14	0.00	0.00
			Max. Mx	2	0.87	0.10	0.01
			Max. My	8	0.03	0.08	-0.01
			Max. Vy	2	-0.02	0.10	0.01
			Max. Vx	8	0.00	0.00	0.00
T7	20 - 0	Leg	Max Tension	12	146.04	-3.69	0.01
			Max. Compression	6	-161.98	0.00	-0.00
			Max. Mx	6	-158.50	5.04	-0.01
			Max. My	13	-7.99	-0.16	5.79
			Max. Vy	4	-0.45	-3.69	-0.03
			Max. Vx	13	0.65	-0.16	5.79
		Diagonal	Max Tension	4	2.75	0.00	0.00
			Max. Compression	2	-3.31	0.00	0.00
			Max. Mx	2	1.05	0.05	0.00
			Max. My	2	0.61	0.04	0.01
			Max. Vy	25	0.02	0.04	-0.01
			Max. Vx	23	0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	166.01	10.86	-6.46
	Max. H_x	10	166.01	10.86	-6.46
	Max. H_z	4	-148.80	-9.71	5.79
	Min. Vert	4	-148.80	-9.71	5.79
	Min. H_x	4	-148.80	-9.71	5.79
	Min. H_z	10	166.01	10.86	-6.46
Leg B	Max. Vert	6	166.19	-10.97	-6.33
	Max. H_x	12	-148.93	9.79	5.63
	Max. H_z	12	-148.93	9.79	5.63
	Min. Vert	12	-148.93	9.79	5.63
	Min. H_x	6	166.19	-10.97	-6.33
	Min. H_z	6	166.19	-10.97	-6.33
Leg A	Max. Vert	2	166.07	-0.19	12.65
	Max. H_x	5	6.98	0.61	0.52
	Max. H_z	2	166.07	-0.19	12.65
	Min. Vert	8	-148.14	0.16	-11.26
	Min. H_x	12	85.35	-0.64	6.45
	Min. H_z	8	-148.14	0.16	-11.26

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	22.10	0.00	0.00	-0.24	2.80	-0.00
Dead+Wind 0 deg - No Ice	22.10	-0.06	-17.15	-1374.42	9.72	-3.15
Dead+Wind 30 deg - No Ice	22.10	8.43	-14.52	-1171.52	-679.70	-3.52
Dead+Wind 60 deg - No Ice	22.10	14.51	-8.29	-669.14	-1175.37	-2.61
Dead+Wind 90 deg - No Ice	22.10	16.84	0.03	3.38	-1358.41	-1.35
Dead+Wind 120 deg - No Ice	22.10	14.90	8.57	685.66	-1192.42	0.06
Dead+Wind 150 deg - No Ice	22.10	8.49	14.49	1167.50	-686.50	1.41
Dead+Wind 180 deg - No Ice	22.10	0.01	16.65	1346.75	1.11	2.81
Dead+Wind 210 deg - No Ice	22.10	-8.41	14.52	1170.73	682.85	3.39
Dead+Wind 240 deg - No Ice	22.10	-14.85	8.54	681.90	1192.73	2.78
Dead+Wind 270 deg - No Ice	22.10	-16.78	-0.05	-6.66	1357.65	1.05
Dead+Wind 300 deg - No Ice	22.10	-14.45	-8.34	-675.35	1173.08	-0.42
Dead+Wind 330 deg - No Ice	22.10	-8.45	-14.52	-1171.52	687.44	-1.87
Dead+Ice+Temp	43.36	-0.00	0.00	-0.82	6.27	-0.00
Dead+Wind 0 deg+Ice+Temp	43.36	-0.01	-6.32	-494.95	8.10	-0.80
Dead+Wind 30 deg+Ice+Temp	43.36	3.08	-5.32	-417.76	-235.66	-1.13
Dead+Wind 60 deg+Ice+Temp	43.36	5.29	-3.03	-238.48	-410.00	-1.07
Dead+Wind 90 deg+Ice+Temp	43.36	6.16	0.01	0.25	-477.25	-0.81
Dead+Wind 120 deg+Ice+Temp	43.36	5.48	3.16	246.17	-422.93	-0.40
Dead+Wind 150 deg+Ice+Temp	43.36	3.10	5.32	415.52	-237.66	0.13
Dead+Wind 180 deg+Ice+Temp	43.36	0.00	6.09	476.97	5.68	0.72
Dead+Wind 210 deg+Ice+Temp	43.36	-3.08	5.32	416.01	247.77	1.10
Dead+Wind 240 deg+Ice+Temp	43.36	-5.47	3.15	244.91	434.10	1.13
Dead+Wind 270 deg+Ice+Temp	43.36	-6.15	-0.01	-2.48	488.42	0.75
Dead+Wind 300 deg+Ice+Temp	43.36	-5.28	-3.05	-240.29	421.07	0.30
Dead+Wind 330 deg+Ice+Temp	43.36	-3.09	-5.32	-418.00	249.16	-0.23

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 0 deg - Service	22.10	-0.02	-5.94	-475.79	5.21	-1.09
Dead+Wind 30 deg - Service	22.10	2.92	-5.02	-405.57	-233.37	-1.22
Dead+Wind 60 deg - Service	22.10	5.02	-2.87	-231.71	-404.89	-0.91
Dead+Wind 90 deg - Service	22.10	5.83	0.01	1.02	-468.24	-0.46
Dead+Wind 120 deg - Service	22.10	5.15	2.96	237.12	-410.80	0.02
Dead+Wind 150 deg - Service	22.10	2.94	5.01	403.86	-235.73	0.48
Dead+Wind 180 deg - Service	22.10	0.00	5.76	465.89	2.23	0.97
Dead+Wind 210 deg - Service	22.10	-2.91	5.02	404.98	238.15	1.18
Dead+Wind 240 deg - Service	22.10	-5.14	2.95	235.83	414.60	0.96
Dead+Wind 270 deg - Service	22.10	-5.81	-0.02	-2.46	471.67	0.36
Dead+Wind 300 deg - Service	22.10	-5.00	-2.89	-233.86	407.80	-0.14
Dead+Wind 330 deg - Service	22.10	-2.92	-5.02	-405.58	239.73	-0.64

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-22.10	0.00	0.00	22.10	0.00	0.000%
2	-0.06	-22.10	-17.15	0.06	22.10	17.15	0.000%
3	8.43	-22.10	-14.52	-8.43	22.10	14.52	0.000%
4	14.51	-22.10	-8.29	-14.51	22.10	8.29	0.000%
5	16.84	-22.10	0.03	-16.84	22.10	-0.03	0.000%
6	14.90	-22.10	8.57	-14.90	22.10	-8.57	0.000%
7	8.49	-22.10	14.49	-8.49	22.10	-14.49	0.000%
8	0.01	-22.10	16.65	-0.01	22.10	-16.65	0.000%
9	-8.41	-22.10	14.52	8.41	22.10	-14.52	0.000%
10	-14.85	-22.10	8.54	14.85	22.10	-8.54	0.000%
11	-16.78	-22.10	-0.05	16.78	22.10	0.05	0.000%
12	-14.45	-22.10	-8.34	14.45	22.10	8.34	0.000%
13	-8.45	-22.10	-14.52	8.45	22.10	14.52	0.000%
14	0.00	-43.36	0.00	0.00	43.36	-0.00	0.000%
15	-0.01	-43.36	-6.32	0.01	43.36	6.32	0.000%
16	3.08	-43.36	-5.32	-3.08	43.36	5.32	0.000%
17	5.29	-43.36	-3.03	-5.29	43.36	3.03	0.000%
18	6.16	-43.36	0.01	-6.16	43.36	-0.01	0.000%
19	5.48	-43.36	3.16	-5.48	43.36	-3.16	0.000%
20	3.10	-43.36	5.32	-3.10	43.36	-5.32	0.000%
21	0.00	-43.36	6.09	-0.00	43.36	-6.09	0.000%
22	-3.08	-43.36	5.32	3.08	43.36	-5.32	0.000%
23	-5.47	-43.36	3.15	5.47	43.36	-3.15	0.000%
24	-6.15	-43.36	-0.01	6.15	43.36	0.01	0.000%
25	-5.28	-43.36	-3.05	5.28	43.36	3.05	0.000%
26	-3.09	-43.36	-5.32	3.09	43.36	5.32	0.000%
27	-0.02	-22.10	-5.94	0.02	22.10	5.94	0.000%
28	2.92	-22.10	-5.02	-2.92	22.10	5.02	0.000%
29	5.02	-22.10	-2.87	-5.02	22.10	2.87	0.000%
30	5.83	-22.10	0.01	-5.83	22.10	-0.01	0.000%
31	5.15	-22.10	2.96	-5.15	22.10	-2.96	0.000%
32	2.94	-22.10	5.01	-2.94	22.10	-5.01	0.000%
33	0.00	-22.10	5.76	-0.00	22.10	-5.76	0.000%
34	-2.91	-22.10	5.02	2.91	22.10	-5.02	0.000%
35	-5.14	-22.10	2.95	5.14	22.10	-2.95	0.000%
36	-5.81	-22.10	-0.02	5.81	22.10	0.02	0.000%
37	-5.00	-22.10	-2.89	5.00	22.10	2.89	0.000%
38	-2.92	-22.10	-5.02	2.92	22.10	5.02	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00002096
3	Yes	4	0.00000001	0.00002084
4	Yes	4	0.00000001	0.00001708
5	Yes	4	0.00000001	0.00001262
6	Yes	4	0.00000001	0.00000568
7	Yes	4	0.00000001	0.00001114
8	Yes	4	0.00000001	0.00001773
9	Yes	4	0.00000001	0.00002049
10	Yes	4	0.00000001	0.00001932
11	Yes	4	0.00000001	0.00001229
12	Yes	4	0.00000001	0.00000649
13	Yes	4	0.00000001	0.00001513
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00004002
16	Yes	4	0.00000001	0.00004087
17	Yes	4	0.00000001	0.00004168
18	Yes	4	0.00000001	0.00004081
19	Yes	4	0.00000001	0.00003991
20	Yes	4	0.00000001	0.00004073
21	Yes	4	0.00000001	0.00004163
22	Yes	4	0.00000001	0.00004090
23	Yes	4	0.00000001	0.00004011
24	Yes	4	0.00000001	0.00004070
25	Yes	4	0.00000001	0.00004132
26	Yes	4	0.00000001	0.00004065
27	Yes	4	0.00000001	0.00000687
28	Yes	4	0.00000001	0.00000712
29	Yes	4	0.00000001	0.00000730
30	Yes	4	0.00000001	0.00000701
31	Yes	4	0.00000001	0.00000670
32	Yes	4	0.00000001	0.00000700
33	Yes	4	0.00000001	0.00000732
34	Yes	4	0.00000001	0.00000711
35	Yes	4	0.00000001	0.00000685
36	Yes	4	0.00000001	0.00000698
37	Yes	4	0.00000001	0.00000715
38	Yes	4	0.00000001	0.00000702

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 110	7.433	35	0.5750	0.2200
T2	110 - 90	6.198	35	0.5618	0.1716
T3	90 - 70	3.877	35	0.4725	0.0936
T4	70 - 50	2.076	35	0.3311	0.0481
T5	50 - 40	0.882	35	0.2047	0.0215
T6	40 - 20	0.515	35	0.1456	0.0124
T7	20 - 0	0.109	35	0.0518	0.0040

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
122.00	A-ANT-23G-2-C	35	7.433	0.5750	0.2200	89646
120.00	Platform Mount (LP 405-1)	35	7.433	0.5750	0.2200	89646

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
110.00	Sector Mount [SM 407-1]	35	6.198	0.5618	0.1716	40269
100.00	Pipe Mount [PM 601-1]	35	4.994	0.5277	0.1286	13352
40.00	BULLET III	35	0.515	0.1456	0.0124	10681

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 110	21.378	2	1.6471	0.6381
T2	110 - 90	17.831	2	1.6141	0.4981
T3	90 - 70	11.159	6	1.3588	0.2721
T4	70 - 50	5.977	6	0.9525	0.1392
T5	50 - 40	2.542	6	0.5889	0.0619
T6	40 - 20	1.486	6	0.4190	0.0357
T7	20 - 0	0.314	6	0.1492	0.0116

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
122.00	A-ANT-23G-2-C	2	21.378	1.6471	0.6381	35544
120.00	Platform Mount (LP 405-1)	2	21.378	1.6471	0.6381	35544
110.00	Sector Mount [SM 407-1]	2	17.831	1.6141	0.4981	15536
100.00	Pipe Mount [PM 601-1]	6	14.369	1.5174	0.3738	4768
40.00	BULLET III	6	1.486	0.4190	0.0357	3695

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	120	Leg	A325N	0.6250	4	2.90	12.89	0.225 ✓	1.333	Bolt DS
T2	110	Leg	A325N	0.6250	5	11.20	12.89	0.869 ✓	1.333	Bolt DS
T3	90	Leg	A325N	0.7500	5	19.93	18.56	1.074 ✓	1.333	Bolt DS
T4	70	Leg	A325N	1.0000	6	23.40	34.54	0.678 ✓	1.333	Bolt Tension
T5	50	Leg	A325N	1.0000	6	22.56	34.56	0.653 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	4.89	6.12	0.799 ✓	1.333	Member Block Shear
T6	40	Leg	A325N	1.0000	6	23.46	34.56	0.679 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	1.96	6.12	0.321 ✓	1.333	Member Block Shear
T7	20	Leg	A687	1.0000	6	24.34	38.88	0.626 ✓	1.333	Bolt Tension
		Diagonal	A325N	1.0000	1	2.75	6.12	0.449 ✓	1.333	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 110	1 1/2	10.00	2.33	74.7 K=1.00	20.058	1.7672	-13.73	35.44	0.387 ✓
T2	110 - 90	1 3/4	20.00	2.33	64.0 K=1.00	22.022	2.4053	-61.09	52.97	1.153 ✓
T3	90 - 70	H2-1 (1.37 CR) - 39 2	20.00	1.18	28.2 K=1.00	27.372	3.1416	-107.23	85.99	1.247 ✓
T4	70 - 50	H2-1 (1.94 CR) - 103 2 1/2	20.00	2.33	44.8 K=1.00	25.140	4.9087	-150.55	123.40	1.220 ✓
T5	50 - 40	Pirod 105245	10.02	10.02	37.8 K=1.00	26.132	5.3014	-144.83	138.54	1.045 ✓
T6	40 - 20	Pirod 105217	20.03	10.02	37.8 K=1.00	26.132	5.3014	-153.40	138.54	1.107 ✓
T7	20 - 0	Pirod 105217 Reinf w/ (2) 1-1/4" SR	20.03	10.02	36.5 K=1.28	26.312	7.7558	-161.99	204.07	0.794 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T5	50 - 40	0.5	1.47	141.2	7.490	0.1963	1.04	1.65	0.630 ✓
T6	40 - 20	0.5	1.47	141.2	7.490	0.1963	0.61	1.65	0.368 ✓
T7	20 - 0	0.5	1.38	132.1	8.562	0.1963	0.66	1.71	0.384 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 110	5/8	4.21	2.03	116.8 K=0.75	10.943	0.3068	-2.77	3.36	0.824 ✓
T2	110 - 90	3/4	4.59	2.23	106.9 K=0.75	13.058	0.4418	-4.68	5.77	0.811 ✓
T3	90 - 70	7/8	4.67	2.26	92.9 K=0.75	16.307	0.6013	-5.42	9.81	0.552 ✓
T4	70 - 50	7/8	5.11	2.46	101.1 K=0.75	14.462	0.6013	-5.58	8.70	0.642 ✓
T5	50 - 40	L2 1/2x2 1/2x3/16	11.42	5.02	121.8 K=1.00	10.024	0.9020	-5.43	9.04	0.600 ✓
T6	40 - 20	L2 1/2x2 1/2x3/16	12.50	5.67	137.4 K=1.00	7.907	0.9020	-2.12	7.13	0.297 ✓
T7	20 - 0	L2 1/2x2 1/2x3/16	13.80	6.47	157.0 K=1.00	6.062	0.9020	-3.31	5.47	0.605 ✓

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 $\frac{P}{P_a}$

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 110	5/8	3.50	3.38	181.4 K=0.70	4.536	0.3068	-0.15	1.39	0.111
T2	110 - 90	3/4	3.87	3.72	166.7 K=0.70	5.374	0.4418	-0.91	2.37	0.384
T3	90 - 70	7/8	4.08	3.91	150.1 K=0.70	6.630	0.6013	-1.81	3.99	0.454
T4	70 - 50	7/8	4.58	4.37	167.7 K=0.70	5.311	0.6013	-1.66	3.19	0.520

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T3	90 - 70	1 1/4	4.45	4.29	115.2 K=0.70	11.244	1.2272	-1.86	13.80	0.135

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 $\frac{P}{P_a}$
T1	120 - 110	3/4	3.50	3.38	151.2 K=0.70	6.532	0.4418	-0.74	2.89	0.256
T2	110 - 90	7/8	3.52	3.37	129.4 K=0.70	8.913	0.6013	-1.70	5.36	0.318
T3	90 - 70	1	4.02	3.85	129.4 K=0.70	8.924	0.7854	-0.93	7.01	0.133
T4	70 - 50	1	4.52	4.31	144.8 K=0.70	7.126	0.7854	-1.43	5.60	0.256

Bottom 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 $\frac{P}{P_a}$
T1	120 - 110	3/4	3.50	3.38	151.2 K=0.70	6.532	0.4418	-0.94	2.89	0.325
T2	110 - 90	7/8	3.98	3.84	147.4 K=0.70	6.877	0.6013	-2.37	4.14	0.573
T3	90 - 70	1	4.48	4.32	145.0 K=0.70	7.099	0.7854	-2.32	5.58	0.415
T4	70 - 50	1	4.98	4.77	160.4	5.801	0.7854	-1.64	4.56	0.361

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 $\frac{P}{P_a}$
					K=0.70					✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 110	1 1/2	10.00	2.33	74.7	32.500	0.7732	11.61	70.8	0.164 ✓
T2	110 - 90	1 3/4	20.00	2.33	64.0	32.500	1.2339	56.01	96.2	0.582 ✓
T3	90 - 70	2	20.00	1.18	28.2	32.500	1.5625	99.65	125.66	0.595 ✓
T4	70 - 50	2 1/2	20.00	2.33	44.8	30.000	4.9087	140.41	196.35	0.536 ✓
T5	50 - 40	Pirod 105245	10.02	10.02	37.8	30.000	5.3014	135.38	159.04	0.851 ✓
T6	40 - 20	Pirod 105217	20.03	10.02	37.8	30.000	5.3014	140.75	159.04	0.885 ✓
T7	20 - 0	Pirod 105217 Reinf w/ (2) 1-1/4" SR	20.03	10.02	31.3	30.000	7.7558	146.04	232.68	0.628 ✓

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	F_a ksi	A in^2	Actual V K	Allow. V_a K	Stress Ratio
T5	50 - 40	0.5	1.47	141.2	7.490	0.1963	1.04	1.65	0.630 ✓
T6	40 - 20	0.5	1.47	141.2	7.490	0.1963	0.61	1.65	0.368 ✓
T7	20 - 0	0.5	1.38	132.1	8.562	0.1963	0.66	1.71	0.384 ✓

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	120 - 110	5/8	4.21	2.03	155.8	30.000	0.3068	2.79	9.20	0.303 ✓
T2	110 - 90	3/4	4.59	2.23	142.6	30.000	0.4418	4.80	13.25	0.362 ✓
T3	90 - 70	7/8	4.67	2.26	123.9	30.000	0.6013	5.06	18.04	0.280 ✓
T4	70 - 50	7/8	5.11	2.46	134.7	30.000	0.6013	5.27	18.04	0.292 ✓
T5	50 - 40	L2 1/2x2 1/2x3/16	11.42	5.02	80.1	29.000	0.5183	4.89	15.03	0.325

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	40 - 20	L2 1/2x2 1/2x3/16	11.93	5.42	86.2	29.000	0.5183	1.96	15.03	0.131
T7	20 - 0	L2 1/2x2 1/2x3/16	13.80	6.47	102.4	29.000	0.5183	2.75	15.03	0.183

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	120 - 110	5/8	3.50	3.38	259.2	30.000	0.3068	0.24	9.20	0.026
T2	110 - 90	3/4	3.87	3.72	238.1	30.000	0.4418	1.08	13.25	0.081
T3	90 - 70	7/8	4.08	3.91	214.4	30.000	0.6013	1.96	18.04	0.109
T4	70 - 50	7/8	4.58	4.37	239.5	30.000	0.6013	1.82	18.04	0.101

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T3	90 - 70	1 1/4	4.45	4.29	164.6	30.000	1.2272	1.86	36.82	0.050

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	120 - 110	3/4	3.50	3.38	216.0	30.000	0.4418	0.75	13.25	0.056
T2	110 - 90	7/8	3.52	3.37	184.9	30.000	0.6013	1.75	18.04	0.097
T3	90 - 70	1	4.02	3.85	184.8	30.000	0.7854	1.30	23.56	0.055
T4	70 - 50	1	4.52	4.31	206.8	30.000	0.7854	1.69	23.56	0.072

Bottom 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	120 - 110	3/4	3.50	3.38	216.0	30.000	0.4418	0.86	13.25	0.065

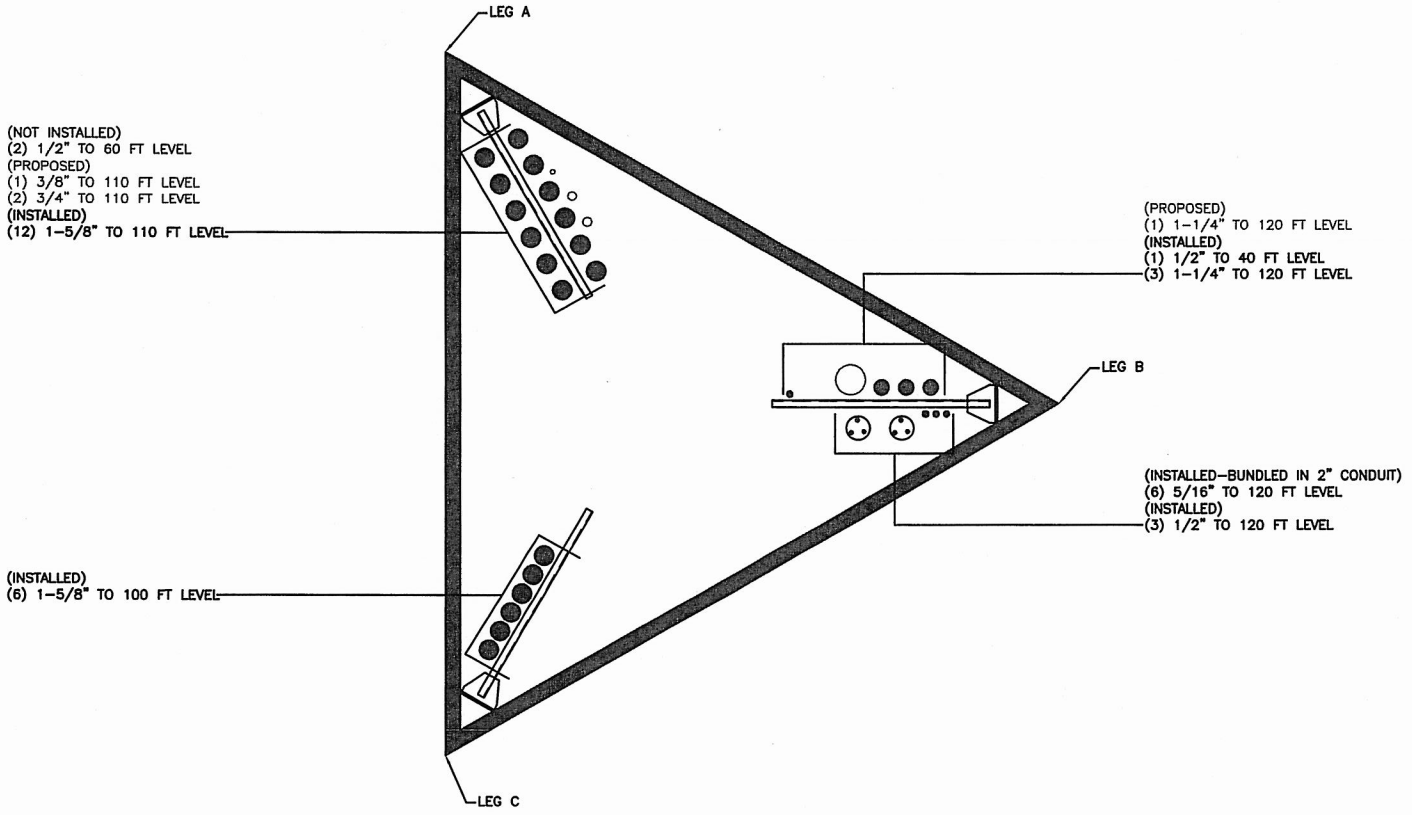
Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	110 - 90	7/8	3.98	3.84	210.5	30.000	0.6013	2.14	18.04	0.119 ✓
T3	90 - 70	1	4.48	4.32	207.2	30.000	0.7854	2.27	23.56	0.096 ✓
T4	70 - 50	1	4.98	4.77	229.2	30.000	0.7854	1.77	23.56	0.075 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	120 - 110	Leg	1 1/2	2	-13.73	35.44	34.7	Pass
T2	110 - 90	Leg	1 3/4	38	-61.09	52.97	86.5	Pass
T3	90 - 70	Leg	2	102	-107.23	85.99	93.5	Pass
T4	70 - 50	Leg	2 1/2	204	-150.55	164.50	91.5	Pass
T5	50 - 40	Leg	Pirod 105245	268	-144.83	184.67	78.4	Pass
T6	40 - 20	Leg	Pirod 105217	277	-153.40	184.67	83.1	Pass
T7	20 - 0	Leg	Pirod 105217 Reinf w/ (2) 1-1/4" SR	292	-161.99	272.03	59.5	Pass
T1	120 - 110	Diagonal	5/8	14	-2.77	4.48	61.8	Pass
T2	110 - 90	Diagonal	3/4	50	-4.68	7.69	60.8	Pass
T3	90 - 70	Diagonal	7/8	198	-5.42	13.07	41.4	Pass
T4	70 - 50	Diagonal	7/8	266	-5.58	11.59	48.1	Pass
T5	50 - 40	Diagonal	L2 1/2x2 1/2x3/16	272	-5.43	12.05	45.0 60.0 (b)	Pass
T6	40 - 20	Diagonal	L2 1/2x2 1/2x3/16	283	-2.12	9.51	22.3 24.1 (b)	Pass
T7	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	298	-3.31	7.29	45.4	Pass
T1	120 - 110	Horizontal	5/8	30	-0.15	1.86	8.3	Pass
T2	110 - 90	Horizontal	3/4	59	-0.91	3.16	28.8	Pass
T3	90 - 70	Horizontal	7/8	188	-1.81	5.31	34.0	Pass
T4	70 - 50	Horizontal	7/8	260	-1.66	4.26	39.0	Pass
T3	90 - 70	Secondary Horizontal	1 1/4	120	-1.86	18.39	10.1	Pass
T1	120 - 110	Top Girt	3/4	5	-0.74	3.85	19.2	Pass
T2	110 - 90	Top Girt	7/8	41	-1.70	7.14	23.8	Pass
T3	90 - 70	Top Girt	1	105	-0.93	9.34	10.0	Pass
T4	70 - 50	Top Girt	1	207	-1.43	7.46	19.2	Pass
T1	120 - 110	Bottom Girt	3/4	9	-0.94	3.85	24.3	Pass
T2	110 - 90	Bottom Girt	7/8	45	-2.37	5.51	43.0	Pass
T3	90 - 70	Bottom Girt	1	107	-2.32	7.43	31.2	Pass
T4	70 - 50	Bottom Girt	1	209	-1.64	6.07	27.1	Pass
						Summary		
						Leg (T3)	93.5	Pass
						Diagonal (T1)	61.8	Pass
						Horizontal (T4)	39.0	Pass
						Secondary Horizontal (T3)	10.1	Pass
						Top Girt (T2)	23.8	Pass
						Bottom Girt (T2)	43.0	Pass
						Bolt Checks	80.6	Pass
						RATING =	**93.5**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT:876312 TOWER ID:C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

TIA-222-F	Bolts					Leg					
Elevation	# Bolts	Bolt Dia	Maximum Load Per Bolt	Bolt Allowable Load	Bolt Capacity	Leg Diameter	Leg Area	Leg Area w/ Holes	Leg Tension (Actual P)	Allowable Leg Tension (Allowable Pa)	Leg Capacity
110	4	0.625	2.9	12.89	16.9%	1.5	1.77	1.7700	11.61	53.10	16.4%
90	5	0.625	11.2	12.89	65.2%	1.75	2.41	1.2339	11.61	37.02	23.5%
70	5	0.75	19.9	18.56	80.5%	2	3.14	1.7942	56.01	53.83	78.1%
50	6	1				2.5	4.91	2.9138	99.65	87.41	85.5%

MORRISON HERSHFIELD

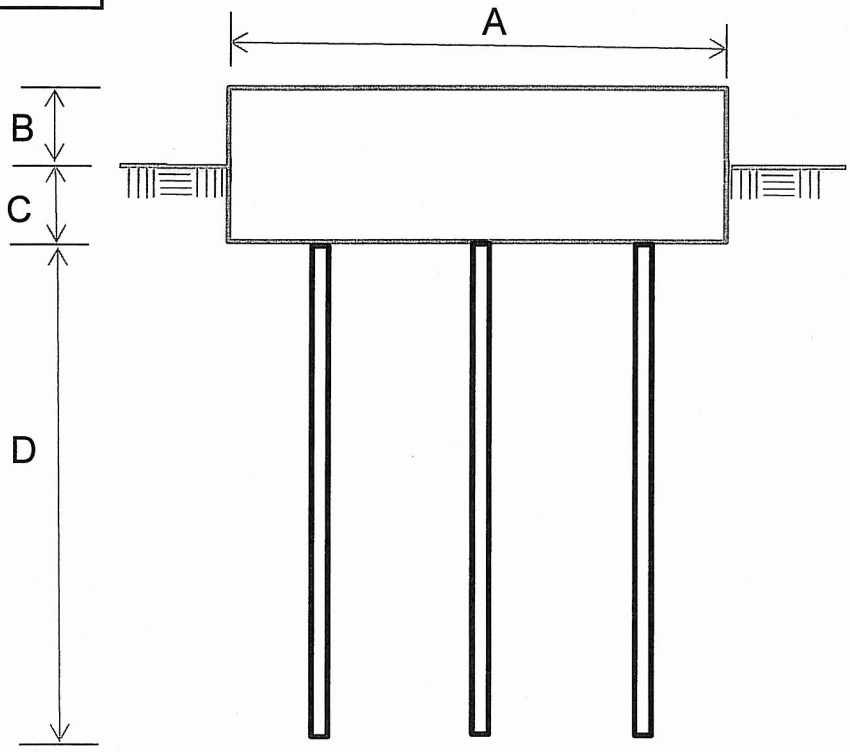
n Calculations

mber	CN3-350 / 614000101
Date	1/13/2014
mber	876312
Name	Montowese Amodio Self Store

A :	6	ft
B :	2	ft
C :	2	ft
D :	41	ft
sion :	40	kips / pile
ssion :	95	kips / pile
piles :	6	per pad
eight :	42.75	kips
eight :	41.4	kips
eight :	42.2	kips
eight :	39.9	kips

Load:	166	k
Load:	149	k

acity:	58.9%	*Pass*
acity:	57.8%	*Pass*



CT 2173

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

June 15, 2012

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

RE: **EM-CING-062-120601** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 2755 State Street, Hamden, 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 31, 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 Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change

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

June 1, 2012

The Honorable Scott D. Jackson
Mayor
Town of Hamden
Town Hall
2372 Whitney Avenue
Hamden, CT 06518

RE: **EM-CING-062-120601** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 2755 State Street, Hamden, Connecticut.

Dear Mayor Jackson:

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 15, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts MMB

Linda Roberts
Executive Director

LR/cm

Enclosure: Notice of Intent

c: Leslie Creane, Town Planner, Town of Hamden

CSC
CONNECTICUT SITING COUNCIL

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

EM-CING-062-120601

HPC WIRELESS SERVICES

May 31, 2012

ORIGINAL

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
2755 State Street, Hamden, 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 Hamden.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 2755 State Street in the Town of Hamden (coordinates 41°-21'-19.72" N, 72°-53'-25.18" 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 panel antennas to existing mounting frames at a center line of approximately 112', for a total of nine (9) antennas. Six (6) RRUs (remote

radio units) will be attached to the back of the mounting frame, and a surge arrestor will be mounted to the tower leg at the same height. AT&T will also place a DC power and fiber run from the equipment to the antennas, up the tower along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 120' lattice structure.

2. The proposed changes will not extend the site boundaries. AT&T will place related equipment within its existing equipment shelter, and mount a GPS antenna on 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 2.56%; the combined site operations will result in a total power density of approximately 14.45%.

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.

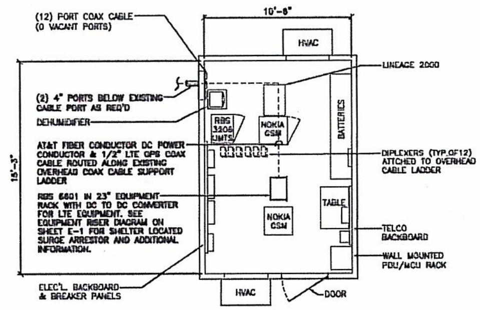
Respectfully yours,

Jennifer Young Gaudet

cc: Honorable Scott D. Jackson, Mayor, Town of Hamden
Louis G. Amodio and Debjay LLC (underlying property owners)

TOWER STRUCTURAL NOTES:

1. REFER TO CROWN CASTLE STRUCTURAL ANALYSIS REPORT PREPARED BY GPD GROUP, PROJ. NO. 2012775.876312.01, DATED APRIL 24, 2012 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



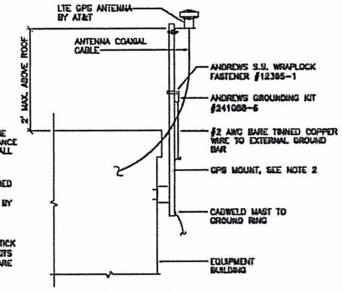
(12) PORT COAX CABLE (0 VACANT PORTS)
10'-8"
15'-3"
HVAC
LINEAGE 2000
(2) 4" PORTS BELOW EXISTING CABLE PORT AS REQ'D
DEHUMIDIFIER
RBS 3206 UMTS
NOKIA GSM
BATTERIES
AT&T FIBER CONDUCTOR DC POWER CONDUCTOR & 1/2" LTE GPS COAX CABLE ROUTED ALONG EXISTING OVERHEAD COAX CABLE SUPPORT LADDER
DIPLEXERS (TYP.OF12) ATTACHED TO OVERHEAD CABLE LADDER
RBS 6601 IN 23" EQUIPMENT RACK WITH DC TO DC CONVERTER FOR LTE EQUIPMENT. SEE EQUIPMENT RISER DIAGRAM ON SHEET E-1 FOR SHELTER LOCATED SURGE ARRESTOR AND ADDITIONAL INFORMATION.
TABLE
TELCO BACKBOARD
WALL MOUNTED PDU/MCU RACK
ELEC'L. BACKBOARD & BREAKER PANELS
DOOR

3 C-1 **EQUIPMENT ROOM**
SCALE: 1/4" = 1'-0"

GRAPHIC SCALE (IN FEET) 1 inch = 4 ft.

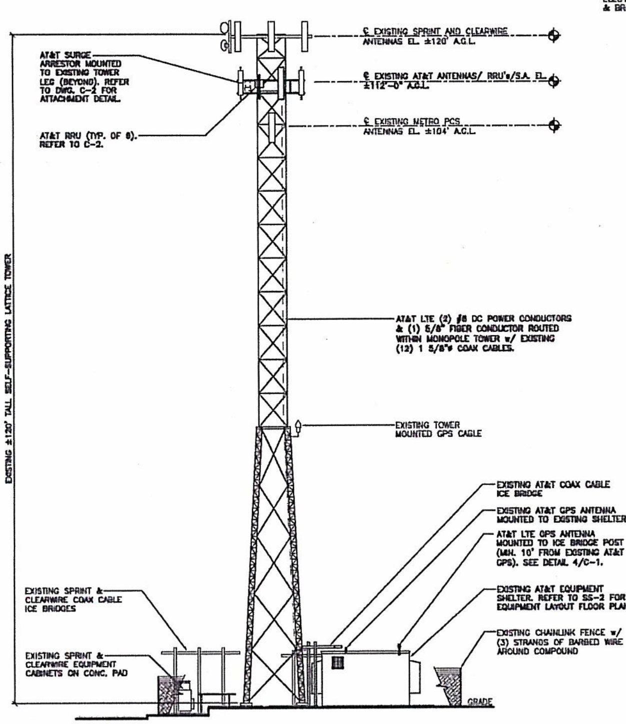
GPS ANTENNA MOUNTING NOTES:

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT AND SHALL BE COORDINATED WITH AT&T'S CONSTRUCTION MANAGER.
2. GPS ANTENNA MOUNT, 3/4"Ø THREADED MAST, 4 FEET LONG WITH (4) 7/16" MOUNTING HOLES AND 6" STANDOFF BY SITE PRO 1, INC., TELEPHONE 1-800-438-7761, PART NUMBER GPS1.
3. HOLLOW WALL KITS (HWK38) FOR "STICK BUILD" SHELTERS AND SOLID WALL KITS (SWK38) FOR CONCRETE SHELTERS ARE ALSO AVAILABLE FROM SITE PRO 1.



LTE GPS ANTENNA BY AT&T
ANTENNA COAXIAL CABLE
2' MAX. ABOVE ROOF
ANDREWS S.S. WRAPLOCK FASTENER #12305-1
ANDREWS GROUNDING KIT #241088-6
#2 AWG BARE TINNED COPPER WIRE TO EXTERNAL GROUND BAR
GPS MOUNT, SEE NOTE 2
CADWELD MAST TO GROUND RING
EQUIPMENT BUILDING

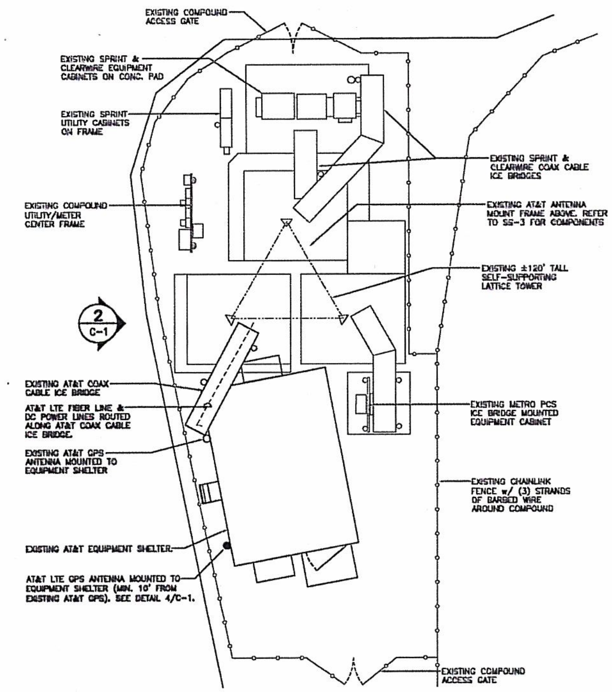
4 C-1 **GPS ANTENNA MOUNTING DETAIL**
NOT TO SCALE



EXISTING ±120' TALL SELF-SUPPORTING LATICE TOWER
AT&T SURGE ARRESTOR MOUNTED TO EXISTING TOWER LEG (BEYOND). REFER TO DWG. C-2 FOR ATTACHMENT DETAIL.
AT&T RRU (TYP. OF 6). REFER TO C-2.
℄ EXISTING SPRINT AND CLEARWIRE ANTENNAS EL. ±120' A.G.L.
℄ EXISTING AT&T ANTENNAS/ RRU's/S.A. EL. ±112'-0" A.G.L.
℄ EXISTING METRO PCS ANTENNAS EL. ±104' A.G.L.
AT&T LTE (2) #8 DC POWER CONDUCTORS & (1) 5/8" FIBER CONDUCTOR ROUTED WITHIN MONOPOLE TOWER w/ EXISTING (12) 1 5/8"Ø COAX CABLES.
EXISTING TOWER MOUNTED GPS CABLE
EXISTING AT&T COAX CABLE ICE BRIDGE
EXISTING AT&T GPS ANTENNA MOUNTED TO EXISTING SHELTER
AT&T LTE GPS ANTENNA MOUNTED TO ICE BRIDGE POST (MIN. 10' FROM EXISTING AT&T GPS). SEE DETAIL 4/C-1.
EXISTING AT&T EQUIPMENT SHELTER. REFER TO SS-2 FOR EQUIPMENT LAYOUT FLOOR PLAN.
EXISTING CHAINLINK FENCE w/ (3) STRANDS OF BARBED WIRE AROUND COMPOUND
EXISTING SPRINT & CLEARWIRE COAX CABLE ICE BRIDGES
EXISTING SPRINT & CLEARWIRE EQUIPMENT CABINETS ON CONC. PAD
GRADE

2 C-1 **WEST ELEVATION**
SCALE: 1" = 10'-0"

GRAPHIC SCALE (IN FEET) 1 inch = 10 ft.



EXISTING COMPOUND ACCESS GATE
EXISTING SPRINT & CLEARWIRE EQUIPMENT CABINETS ON CONC. PAD
EXISTING SPRINT UTILITY CABINETS ON FRAME
EXISTING COMPOUND UTILITY/METER CENTER FRAME
EXISTING SPRINT & CLEARWIRE COAX CABLE ICE BRIDGES
EXISTING AT&T ANTENNA MOUNT FRAME ABOVE. REFER TO SS-3 FOR COMPONENTS
EXISTING ±120' TALL SELF-SUPPORTING LATTICE TOWER
EXISTING AT&T COAX CABLE ICE BRIDGE
AT&T LTE FIBER LINE & DC POWER LINES ROUTED ALONG AT&T COAX CABLE ICE BRIDGE.
EXISTING AT&T GPS ANTENNA MOUNTED TO EQUIPMENT SHELTER
EXISTING METRO PCS ICE BRIDGE MOUNTED EQUIPMENT CABINET
EXISTING CHAINLINK FENCE w/ (3) STRANDS OF BARBED WIRE AROUND COMPOUND
EXISTING AT&T EQUIPMENT SHELTER.
AT&T LTE GPS ANTENNA MOUNTED TO EQUIPMENT SHELTER (MIN. 10' FROM EXISTING AT&T GPS). SEE DETAIL 4/C-1.
EXISTING COMPOUND ACCESS GATE

1 C-1 **COMPOUND PLAN**
SCALE: 1" = 5'-0"

APPROX. NORTH

GRAPHIC SCALE (IN FEET) 1 inch = 5 ft.

DESIGNED BY:	DEB			
DRAWN BY:	FLO			
CHK'D BY:	CFC			
REV.	DATE	DRAWN BY	CHK'D BY	
0	5/29/12	FLO	DEB	CONSTRUCTION
1	6/20/12	FLO	DEB	CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

NEXLINK

CENTEK engineering
Centered on Solutions™
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

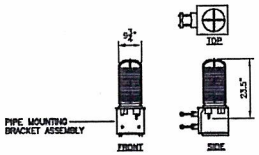
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE
CT2173
CROWN SITE # 876312
HAMDEN SE
2755 STATE STREET
HAMDEN, CT 06517

DATE:	03/13/12
SCALE:	AS NOTED
JOB NO.	11118.0026

PLANS, ELEVATION AND DETAIL

C-1

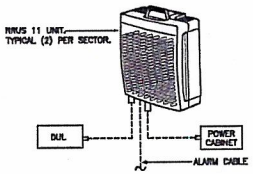
Sheet No. 3 of 8



SURGE ARRESTOR				
SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
TOWER	MAKE: RAYCAP (SOLID) MODEL: DCS-48-60-18-8F	(1) PER SITE	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

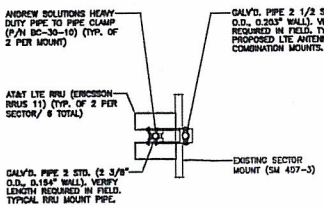
6 C-2 **SURGE ARRESTOR DETAIL**
NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 11	17.8"L x 17.3"W x 7.2"D	BAND 4: 44 LBS. BAND 12: 50 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. SIDE: 0" MIN.

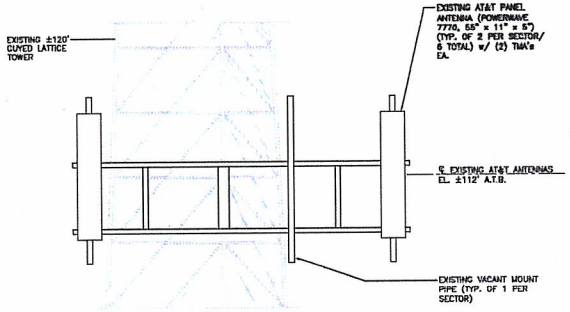
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

7 C-2 **RRU DETAIL**
NOT TO SCALE



PLAN DETAIL

5 C-2 **LTE ANTENNA/RRU MOUNT DETAILS**
SCALE: 1/2" = 1'-0"



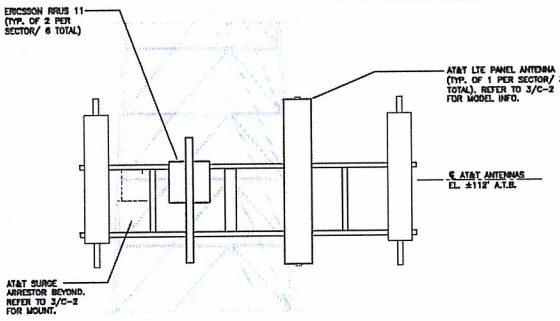
2 C-2 **TYP. SECTOR ELEVATION - EXISTING**
SCALE: 1/2" = 1'-0"

PAINT TO MATCH NOTE:

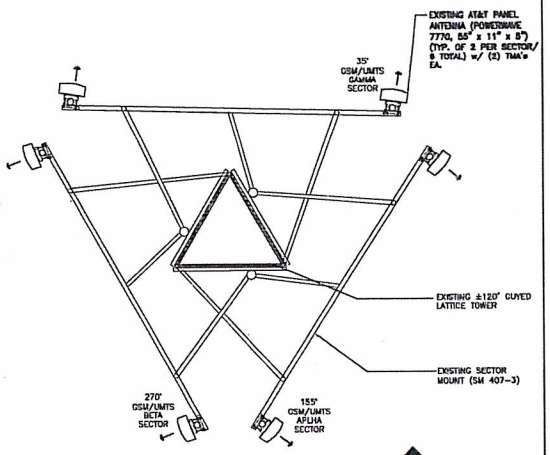
PROPOSED LTE ANTENNAS, RRU's, SURGE ARRESTORS, EXPOSED CABLING AND ASSOCIATED MOUNTING HARDWARE TO BE PAINTED TO MATCH COLOR AND PATTERN OF EXISTING MONOPOLE TOWER.

GRAPHIC SCALE
2 0 1 2 4 8
(IN FEET)
1/2 inch = 1 ft.

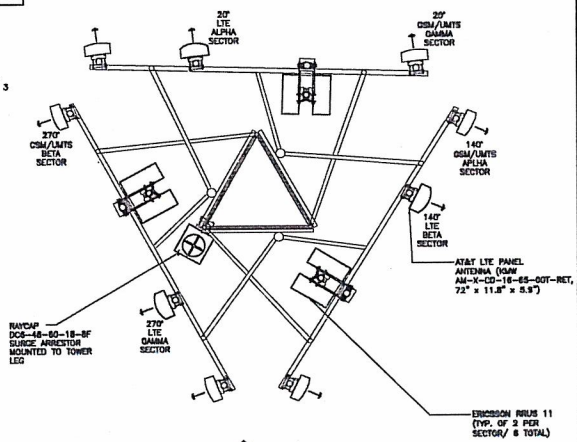
ANTENNA MOUNTING NOTES:
1. PROVIDE REPLACEMENT/ADDITIONAL ANTENNA MOUNT PIPES TO ACCOMMODATE LTE PANEL ANTENNA LENGTH & RRU LOCATIONS.
2. LOCATE RAYCAP DCS-48-60-18-8F SURGE ARRESTOR TO AVOID INTERFERENCE WITH EXISTING TOWER MOUNTED COMPONENTS.



4 C-2 **TYP. SECTOR ELEVATION - PROPOSED**
SCALE: 1/2" = 1'-0"



1 C-2 **EXISTING ANTENNA PLAN**
SCALE: 1/2" = 1'-0"
APPROX. NORTH
2 C-2



4 C-2

3 C-2 **PROPOSED ANTENNA PLAN**
SCALE: 1/2" = 1'-0"
APPROX. NORTH

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

REV.	DATE	DRAWN BY	CHK'D BY	
0	5/25/12	FLO	CFC	CONSTRUCTION
1	6/8/12	FLO	CFC	CONSTRUCTION

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AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE
CT2173
CROWN SITE # 876312
HAMDEN SE
2755 STATE STREET
HAMDEN, CT 06517

DATE: 03/13/12
SCALE: AS NOTED
JOB NO. 11118.0028

LTE EQUIPMENT DETAILS

C-2

Sheet No. 4 of 8

Date: **April 24, 2012**

James Williams
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6521

GPD GROUP
Gibus, Pyle, Schomer, Burns & DeHaven, Inc.
GPD Group
520 South Main Street, Suite 2531
Akron, OH 44311
(330) 572-2137
jcheronis@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2173
	Carrier Site Name:	Hamden-Amodio
Crown Castle Designation:	**Crown Castle BU Number:**	876312
	Crown Castle Site Name:	Monotowese Amodio Self Store
	Crown Castle JDE Job Number:	183526
	Crown Castle Work Order Number:	485629
	Crown Castle Application Number:	144907 Rev. 1
Engineering Firm Designation:	**GPD Group Project Number:**	2012775.876312.01
Site Data:	**2755 State St., Hamden, Connecticut 06473, New Haven County**	
	Latitude *41° 21' 19.67"*, Longitude *-72° 53' 25.13"*	
	120 Foot – Modified PiROD Self Support Tower	

Dear Mr. James Williams,

GPD 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 460470, in accordance with application 144907, revision 1.

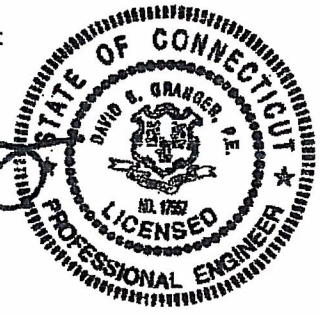
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: 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 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

We at *GPD 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.

Respectfully submitted by:



David B. Granger, P.E.
Connecticut #: 17557

TABLE OF CONTENTS

1) INTRODUCTION

The 120' tower is supported on three legs and has seven major sections. It has a triangular cross section made of bolted connections from 0' – 50' and welded connections from 50' – 120', with an "X" frame configuration. The tower is fabricated with PiROD truss legs and angle diagonals from 0' – 50' and solid round legs and diagonals from 50' – 120'.

This tower is a 120 ft Self Support tower designed by PiROD in November of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

In 2008 the tower was modified by GPD (Project #: 2008281.30, dated 11/10/08) by adding secondary horizontals from 70'-90', adding tie rod reinforcement to the truss tower legs from 0'-20', and adding concrete collars to the existing mat foundations. These modifications were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37 mph with 0.75 inch ice thickness (in accordance with ASCE 7-05) 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
110.0	112.0	6	Ericsson	RRUS 11	2 1	3/4 3/8	1
		3	KMW Communications	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			

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
120.0	122.0	3	Dragonwave	A-ANT-23G-2-C	6 6 3	1-1/4 5/16 1/2	
	120.0	1		Platform Mount [LP 405-1]			
		4	Decibel	DB950F40T2E-M			
		2	Decibel	DB950G65E-M			
	118.0	3	Argus Technologies	LLPX310R			
		3	Samsung	FDD R6 RRH			
110.0	112.0	6	Powerwave	7770.00	12	1-5/8	
	110.0	6	Powerwave	LGP21403			
		1		Sector Mount [SM 407-3]			
100.0	100.0	3	RFS Celwave	APXV18-206517S-C	6	1-5/8	
40.0	41.0	1	Trimble	BULLET III	1	1/2	

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)
120	120	6		Panel Antennas on a 10.5' LP Platform	6	1-5/8
100	100	12		ALP9212 on (3) T-Frames	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Pirod File # A-113604, dated 11/4/97	Doc ID #: 1611638	Crown DMZ
Foundation Drawings	Pirod File # A-113604, dated 11/4/97	Doc ID #: 1611716	Cro-wn DMZ
Geotechnical Report	Welti Engineering, dated 9/12/96	Doc ID #: 1529742	Crown DMZ
Previous Analysis	CCI Project #: 291194, dated 9/3/09	Doc ID #: 2492775	Crown DMZ
Modification Drawings	GPD Project #: 2008281.30, dated 11/10/08	Doc ID #: 2486404	Crown DMZ

3.1) Analysis Method

tnxTower (version 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.
5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
7) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package dated 04/10/12 with any adjustments as noted below.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD 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	120 - 110	Leg	1 1/2	2	-12.26	47.25	25.9	Pass
T2	110 - 90	Leg	1 3/4	38	53.04	53.45	82.2	Pass
T3	90 - 70	Leg	2	102	97.51	77.73	91.5	Pass
T4	70 - 50	Leg	2 1/2	204	141.81	126.23	92.1	Pass
T5	50 - 40	Leg	Pirod 105245	268	-146.47	184.67	79.3	Pass
T6	40 - 20	Leg	Pirod 105217	277	-158.16	184.67	85.6	Pass
T7	20 - 0	Leg	PiRod 105217 Modified	292	-168.84	279.07	60.5	Pass
T1	120 - 110	Diagonal	5/8	14	-2.18	3.11	70.0	Pass
T2	110 - 90	Diagonal	3/4	50	-4.16	5.34	77.9	Pass
T3	90 - 70	Diagonal	7/8	114	-4.61	8.27	55.7	Pass
T4	70 - 50	Diagonal	7/8	265	-5.44	8.14	66.9	Pass
T5	50 - 40	Diagonal	L2 1/2x2 1/2x3/16	272	-4.82	12.23	39.4 46.0 (b)	Pass
T6	40 - 20	Diagonal	L2 1/2x2 1/2x3/16	283	-2.35	9.65	24.3	Pass
T7	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	298	-3.96	7.63	51.9	Pass
T1	120 - 110	Horizontal	5/8	30	-0.14	1.86	7.4	Pass
T2	110 - 90	Horizontal	3/4	59	-0.84	3.16	26.7	Pass
T3	90 - 70	Horizontal	7/8	190	-1.73	5.31	32.6	Pass
T4	70 - 50	Horizontal	7/8	260	-1.65	4.26	38.8	Pass
T3	90 - 70	Secondary Horizontal	1 1/4	119	-1.82	18.39	9.9	Pass
T1	120 - 110	Top Girt	3/4	6	-0.66	3.85	17.2	Pass
T2	110 - 90	Top Girt	7/8	42	-1.55	7.14	21.7	Pass
T3	90 - 70	Top Girt	1	106	-0.92	9.34	9.9	Pass
T4	70 - 50	Top Girt	1	208	-1.56	7.46	20.9	Pass
T1	120 - 110	Bottom Girt	3/4	9	-0.84	3.85	21.7	Pass
T2	110 - 90	Bottom Girt	7/8	45	-2.28	5.51	41.4	Pass
T3	90 - 70	Bottom Girt	1	107	-2.34	7.43	31.5	Pass
T4	70 - 50	Bottom Girt	1	209	-1.64	6.07	27.0	Pass
						Summary	ELC:	Load Case 5
						Leg (T3)	92.1	Pass
						Diagonal (T2)	77.9	Pass
						Horizontal (T4)	38.8	Pass
						Secondary Horizontal (T3)	9.9	Pass
						Top Girt (T2)	21.7	Pass
						Bottom Girt (T2)	41.4	Pass
						Bolt Checks	84.8	Pass
						Rating =	92.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	49.5	Pass
1	Base Foundation	0	94.4	Pass

Structure Rating (max from all components) =	94.4%

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

4.1) Recommendations

The designs of the modified tower and its modified foundations are sufficient for the proposed loading and will not require modification.

5) DISCLAIMER OF WARRANTIES

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

The engineering services rendered by GPD 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 only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

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 clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

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

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD 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 GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

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

Calculated Radio Frequency Emissions

CT2173 – Hamden-Amodio

2755 State Street, Hamden, CT 06514

May 11, 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 self-supporting tower located at 2755 State Street in Hamden, CT. The coordinates of the tower are 41° 21' 19.67"N, 72° 53' 25.13"W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (one 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	*110*	*1935*	*1*	*500*	*0.0149*	*1.0000*	*1.49%*
Cingular GSM	*110*	*880*	*20*	*250*	*0.1486*	*0.5867*	*25.33%*
Cingular GSM	*110*	*1930*	*3*	*427*	*0.0381*	*1.0000*	*3.81%*
Pocket	100	2130	3	631	0.0681	1.0000	6.81%
Clearwire	118	2496	2	153	0.0079	1.0000	0.79%
Clearwire	118	11 GHz	1	211	0.0054	1.0000	0.54%
Sprint	120	1962.5	11	137	0.0375	1.0000	3.75%
AT&T UMTS	112	880	2	565	0.0032	0.5867	0.55%
AT&T UMTS	112	1900	2	875	0.0050	1.0000	0.50%
AT&T LTE	112	734	1	1313	0.0038	0.4893	0.77%
AT&T GSM	112	880	1	283	0.0008	0.5867	0.14%
AT&T GSM	112	1900	4	525	0.0060	1.0000	0.60%
						Total	14.45%

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 GPD Group Structural Analysis Report dated 4/24/2012.

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 **14.45% 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 11, 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.

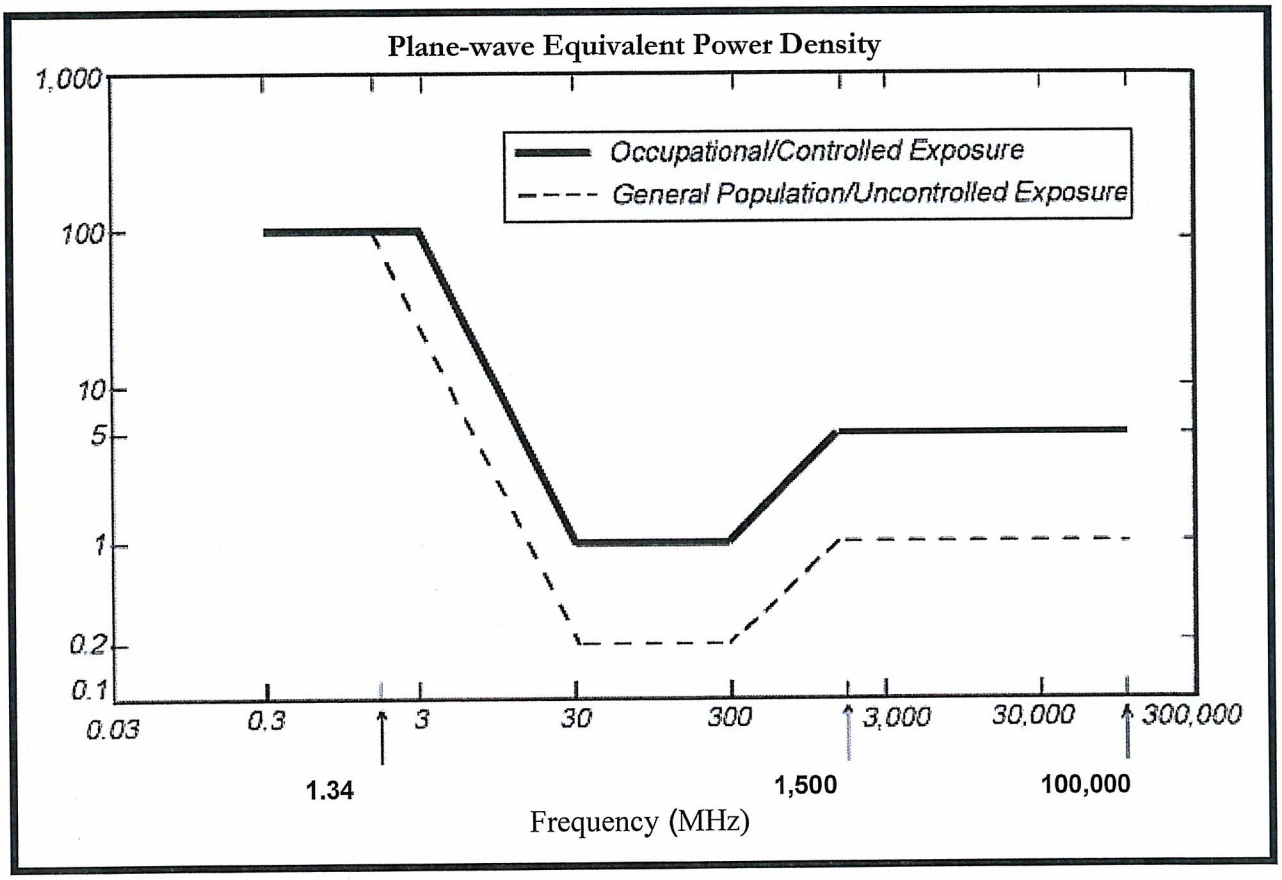
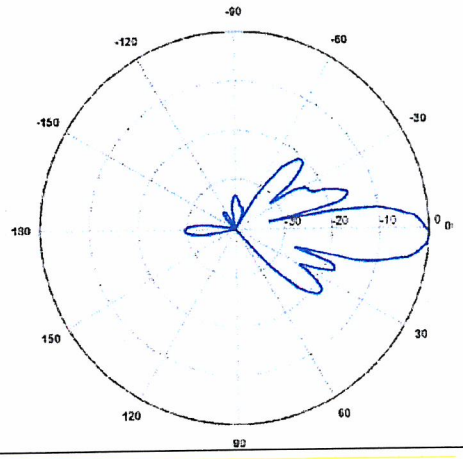


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

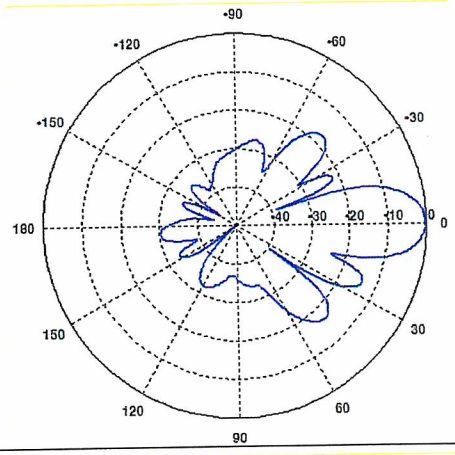
700 MHz

Manufacturer:	KMW
Model #:	AM-X-CD-16-65-00T
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3 °
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ± 45°
Size L x W x D:	72"x11.8"x5.9"



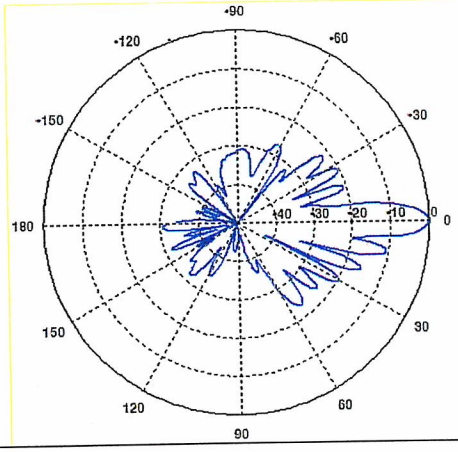
850 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	824-896 MHz
Gain:	11.4 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	85°
Polarization:	Dual Slant ± 45°
Size L x W x D:	55.4"x11.0"x5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	90°
Polarization:	Dual Slant ± 45°
Size L x W x D:	55.4"x11.0"x5.0"



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

EM-CING-062-120601

HPC WIRELESS SERVICES

May 31, 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
2755 State Street, Hamden, 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 Hamden.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle and located at 2755 State Street in the Town of Hamden (coordinates 41°-21'-19.72" N, 72°-53'-25.18" 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 panel antennas to existing mounting frames at a center line of approximately 112', for a total of nine (9) antennas. Six (6) RRUs (remote

radio units) will be attached to the back of the mounting frame, and a surge arrestor will be mounted to the tower leg at the same height. AT&T will also place a DC power and fiber run from the equipment to the antennas, up the tower along the existing coaxial cable run. The proposed modifications will not extend the height of the approximately 120' lattice structure.

2. The proposed changes will not extend the site boundaries. AT&T will place related equipment within its existing equipment shelter, and mount a GPS antenna on 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 2.56%; the combined site operations will result in a total power density of approximately 14.45%.

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.

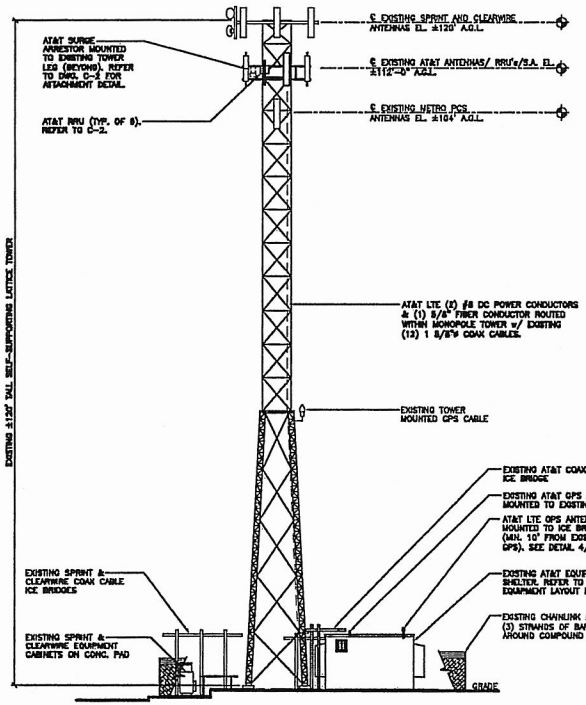
Respectfully yours,

Jennifer Young Gaudet (EHM)

cc: Honorable Scott D. Jackson, Mayor, Town of Hamden
Louis G. Amodio and Debjay LLC (underlying property owners)

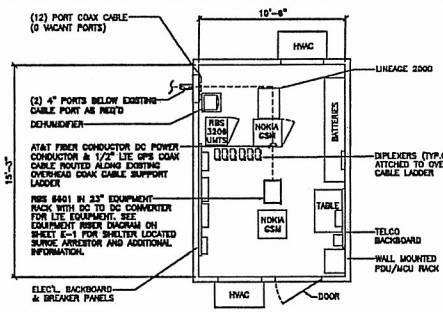
TOWER STRUCTURAL NOTES:

1. REFER TO CROWN CASTLE STRUCTURAL ANALYSIS REPORT PREPARED BY CPG GROUP, PROJ. NO. 2011775.S73312.01, DATED APRIL 24, 2012 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAE AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CROWN CASTLE AND FINAL AT&T RF DATA SHEET.



2 C-1 **WEST ELEVATION**
SCALE: 1" = 10'-0"

GRAPHIC SCALE
10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

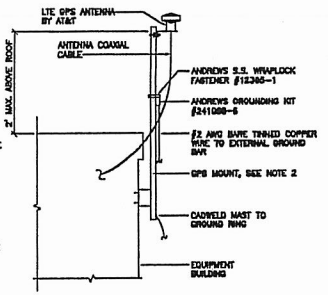


3 C-1 **EQUIPMENT ROOM**
SCALE: 1/4" = 1'-0"

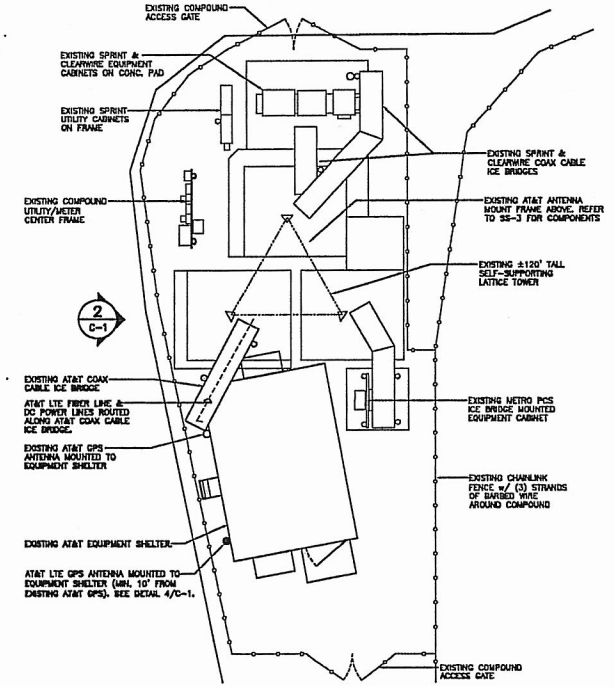
GRAPHIC SCALE
4 0 2 4 8 16
(IN FEET)
1 inch = 4 ft.

GPS ANTENNA MOUNTING NOTES:

1. THE ELEVATION AND LOCATION OF THE GPS ANTENNA SHALL BE IN ACCORDANCE WITH THE FINAL RF REPORT AND SHALL BE COORDINATED WITH AT&T'S CONSTRUCTION MANAGER.
2. GPS ANTENNA MOUNT, 3/4"ø THREADED MAST, 4 FEET LONG WITH (4) 7/16" MOUNTING HOLES AND 6" STANDOFF BY SITE PRO 1, INC., TELEPHONE 1-800-438-7781, PART NUMBER GPS1.
3. HOLLOW WALL KITS (HWK36) FOR "STICK BUILT" SHELTERS AND SOLID WALL KITS (SWK36) FOR CONCRETE SHELTERS ARE ALSO AVAILABLE FROM SITE PRO 1.



4 C-1 **GPS ANTENNA MOUNTING DETAIL**
NOT TO SCALE



1 C-1 **COMPOUND PLAN**
SCALE: 1" = 5'-0"

APPROX. NORTH

GRAPHIC SCALE
5 0 2.5 5 10 20
(IN FEET)
1 inch = 5 ft.

DESIGNED BY:	DES
DRAWN BY:	FLD
CHK'D BY:	CPC

REV.	DATE	DRAWN BY	CHK'D BY	
1	6/25/13	FLD	DES	CONSTRUCTION
0	4/29/13	FLD	DES	CONSTRUCTION

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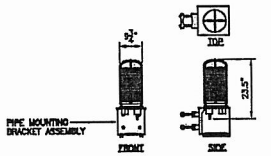
WIRELESS COMMUNICATIONS FACILITY LTE UPGRADE
CT2173
CROWN SITE # 876312
HAMDEN SE
2758 STATE STREET
HAMDEN, CT 06517

DATE: 03/13/13
SCALE: AS NOTED
JOB NO. 11116.0026

PLANS, ELEVATION AND DETAIL

C-1

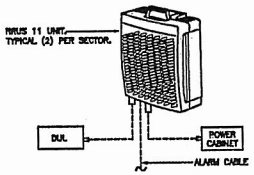
Sheet No. 3 of 5



SURGE ARRESTOR				
SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
TOWER	MAKE: RAYCAP (SOLID) MODEL: DC6-48-60-18-8F	(1) PER SITE	TOWER, ADJACENT TO AT&T ANTENNAS AND RRUs.	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

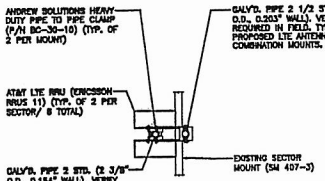
6 C-2 **SURGE ARRESTOR DETAIL**
NOT TO SCALE



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 11	17.8"L x 17.3"W x 7.3"D	BAND 4: 44 LBS. BAND 12: 50 LBS.	ABOVE: 18" MIN. BELOW: 12" MIN. SIDE: 0" MIN.

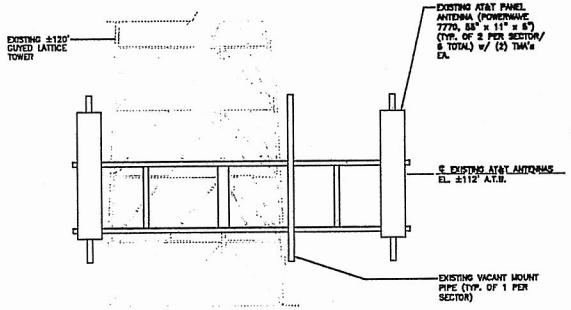
NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

7 C-2 **RRU DETAIL**
NOT TO SCALE



PLAN DETAIL

5 C-2 **LTE ANTENNA/RRU MOUNT DETAILS**
SCALE: 1/2" = 1'-0"

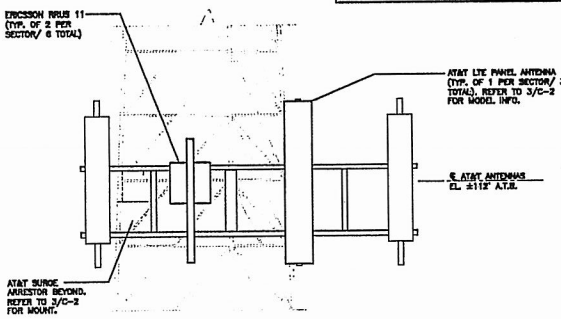


2 C-2 **TYP. SECTOR ELEVATION - EXISTING**
SCALE: 1/2" = 1'-0"

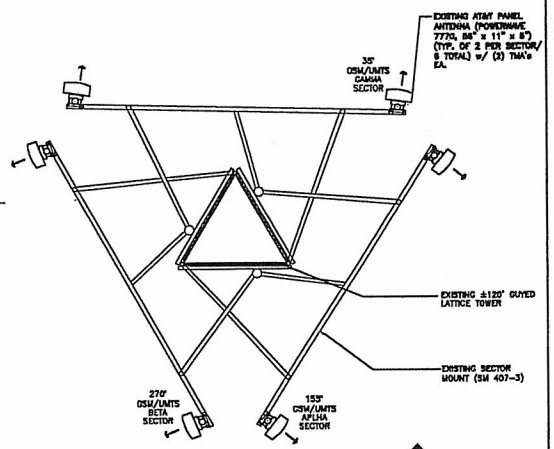
PAINT TO MATCH NOTE:
PROPOSED LTE ANTENNAS, RRU's, SURGE ARRESTORS, EXPOSED CABLING AND ASSOCIATED MOUNTING HARDWARE TO BE PAINTED TO MATCH COLOR AND PATTERN OF EXISTING MONOPOLE TOWER.

GRAPHIC SCALE
2 0 1 2 4 8
(IN FEET)
1/2 inch = 1 ft.

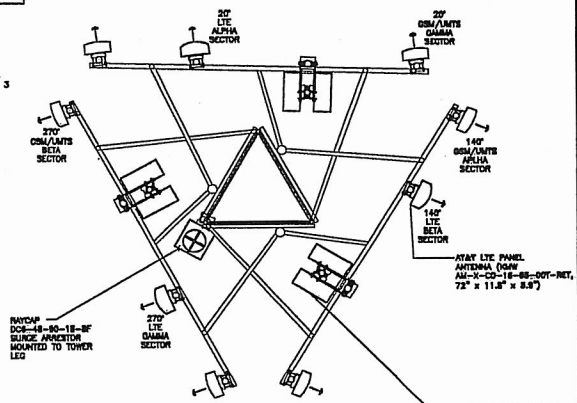
ANTENNA MOUNTING NOTES:
1. PROVIDE REPLACEMENT/ADDITIONAL ANTENNA MOUNT PIPES TO ACCOMMODATE LTE PANEL ANTENNA LENGTH & RRU LOCATIONS.
2. LOCATE RAYCAP DC6-48-60-18-8F SURGE ARRESTOR TO AVOID INTERFERENCE WITH EXISTING TOWER MOUNTED COMPONENTS.



4 C-2 **TYP. SECTOR ELEVATION - PROPOSED**
SCALE: 1/2" = 1'-0"



1 C-2 **EXISTING ANTENNA PLAN**
SCALE: 1/2" = 1'-0"
APPROX. NORTH
2 C-2



4 C-2

3 C-2 **PROPOSED ANTENNA PLAN**
SCALE: 1/2" = 1'-0"
APPROX. NORTH

REV.	DATE	DRAWN BY	CHK'D BY
1	5/25/12	PLD	DCB
0	3/30/12	PLD	RSB

DESIGNED BY: CPC
DRAWN BY: PLD
CHK'D BY: CPC

CONSTRUCTION
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CROWN SITE # 876312
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2725 STATE STREET
HAMDEN, CT 06517

DATE: 03/13/12
SCALE: AS NOTED
JOB NO. 11118.0068

LTE EQUIPMENT DETAILS

C-2

Sheet No. 4 of 8

Date: **April 24, 2012**

James Williams
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6521

GPD GROUP
Glaus, Pyle, Schomer, Burns & DeHaven, Inc.
GPD Group
520 South Main Street, Suite 2531
Akron, OH 44311
(330) 572-2137
jcheronis@gpdgroup.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT2173
	Carrier Site Name:	Hamden-Amodio
Crown Castle Designation:	**Crown Castle BU Number:**	876312
	Crown Castle Site Name:	Monotowese Amodio Self Store
	Crown Castle JDE Job Number:	183526
	Crown Castle Work Order Number:	485629
	Crown Castle Application Number:	144907 Rev. 1
Engineering Firm Designation:	**GPD Group Project Number:**	2012775.876312.01
Site Data:	**2755 State St., Hamden, Connecticut 06473, New Haven County**	
	Latitude *41° 21' 19.67"*, Longitude *-72° 53' 25.13"*	
	120 Foot – Modified PiROD Self Support Tower	

Dear Mr. James Williams,

GPD 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 460470, in accordance with application 144907, revision 1.

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

LC5: 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 2005 CT State Building Code based upon a wind speed of 85 mph fastest mile.

We at *GPD 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.

Respectfully submitted by:

David B. Granger, P.E.
Connecticut #: 17557

STATE OF CONNECTICUT
DAVID B. GRANGER, P.E.
LICENSED
PROFESSIONAL ENGINEER

TABLE OF CONTENTS

1) INTRODUCTION

The 120' tower is supported on three legs and has seven major sections. It has a triangular cross section made of bolted connections from 0' – 50' and welded connections from 50' – 120', with an "X" frame configuration. The tower is fabricated with PiROD truss legs and angle diagonals from 0' – 50' and solid round legs and diagonals from 50' – 120'.

This tower is a 120 ft Self Support tower designed by PiROD in November of 1997. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F.

In 2008 the tower was modified by GPD (Project #: 2008281.30, dated 11/10/08) by adding secondary horizontals from 70'-90', adding tie rod reinforcement to the truss tower legs from 0'-20', and adding concrete collars to the existing mat foundations. These modifications were considered in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 37 mph with 0.75 inch ice thickness (in accordance with ASCE 7-05) 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
110.0	112.0	6	Ericsson	RRUS 11	2 1	3/4 3/8	1
		3	KMW Communications	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			

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
120.0	122.0	3	Dragonwave	A-ANT-23G-2-C	6 6 3	1-1/4 5/16 1/2	
	120.0	1		Platform Mount [LP 405-1]			
		4	Decibel	DB950F40T2E-M			
		2	Decibel	DB950G65E-M			
	118.0	3	Argus Technologies	LLPX310R			
		3	Samsung	FDD R6 RRH			
110.0	112.0	6	Powerwave	7770.00	12	1-5/8	
	110.0	6	Powerwave	LGP21403			
		1		Sector Mount [SM 407-3]			
100.0	100.0	3	RFS Celwave	APXV18-206517S-C	6	1-5/8	
40.0	41.0	1	Trimble	BULLET III	1	1/2	

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)
120	120	6		Panel Antennas on a 10.5' LP Platform	6	1-5/8
100	100	12		ALP9212 on (3) T-Frames	12	1-5/8

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Original Tower Drawings	Pirod File # A-113604, dated 11/4/97	Doc ID #: 1611638	Crown DMZ
Foundation Drawings	Pirod File # A-113604, dated 11/4/97	Doc ID #: 1611716	Cro-wn DMZ
Geotechnical Report	Welti Engineering, dated 9/12/96	Doc ID #: 1529742	Crown DMZ
Previous Analysis	CCI Project #: 291194, dated 9/3/09	Doc ID #: 2492775	Crown DMZ
Modification Drawings	GPD Project #: 2008281.30, dated 11/10/08	Doc ID #: 2486404	Crown DMZ

3.1) Analysis Method

tnxTower (version 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.
5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
7) All equipment model numbers, quantities, and centerline elevations are as provided in the CCI CAD package dated 04/10/12 with any adjustments as noted below.

This analysis may be affected if any assumptions are not valid or have been made in error. GPD 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	120 - 110	Leg	1 1/2	2	-12.26	47.25	25.9	Pass
T2	110 - 90	Leg	1 3/4	38	53.04	53.45	82.2	Pass
T3	90 - 70	Leg	2	102	97.51	77.73	91.5	Pass
T4	70 - 50	Leg	2 1/2	204	141.81	126.23	92.1	Pass
T5	50 - 40	Leg	Pirod 105245	268	-146.47	184.67	79.3	Pass
T6	40 - 20	Leg	Pirod 105217	277	-158.16	184.67	85.6	Pass
T7	20 - 0	Leg	PiRod 105217 Modified	292	-168.84	279.07	60.5	Pass
T1	120 - 110	Diagonal	5/8	14	-2.18	3.11	70.0	Pass
T2	110 - 90	Diagonal	3/4	50	-4.16	5.34	77.9	Pass
T3	90 - 70	Diagonal	7/8	114	-4.61	8.27	55.7	Pass
T4	70 - 50	Diagonal	7/8	265	-5.44	8.14	66.9	Pass
T5	50 - 40	Diagonal	L2 1/2x2 1/2x3/16	272	-4.82	12.23	39.4 46.0 (b)	Pass
T6	40 - 20	Diagonal	L2 1/2x2 1/2x3/16	283	-2.35	9.65	24.3	Pass
T7	20 - 0	Diagonal	L2 1/2x2 1/2x3/16	298	-3.96	7.63	51.9	Pass
T1	120 - 110	Horizontal	5/8	30	-0.14	1.86	7.4	Pass
T2	110 - 90	Horizontal	3/4	59	-0.84	3.16	26.7	Pass
T3	90 - 70	Horizontal	7/8	190	-1.73	5.31	32.6	Pass
T4	70 - 50	Horizontal	7/8	260	-1.65	4.26	38.8	Pass
T3	90 - 70	Secondary Horizontal	1 1/4	119	-1.82	18.39	9.9	Pass
T1	120 - 110	Top Girt	3/4	6	-0.66	3.85	17.2	Pass
T2	110 - 90	Top Girt	7/8	42	-1.55	7.14	21.7	Pass
T3	90 - 70	Top Girt	1	106	-0.92	9.34	9.9	Pass
T4	70 - 50	Top Girt	1	208	-1.56	7.46	20.9	Pass
T1	120 - 110	Bottom Girt	3/4	9	-0.84	3.85	21.7	Pass
T2	110 - 90	Bottom Girt	7/8	45	-2.28	5.51	41.4	Pass
T3	90 - 70	Bottom Girt	1	107	-2.34	7.43	31.5	Pass
T4	70 - 50	Bottom Girt	1	209	-1.64	6.07	27.0	Pass
						Summary	ELC:	Load Case 5
						Leg (T3)	92.1	Pass
						Diagonal (T2)	77.9	Pass
						Horizontal (T4)	38.8	Pass
						Secondary Horizontal (T3)	9.9	Pass
						Top Girt (T2)	21.7	Pass
						Bottom Girt (T2)	41.4	Pass
						Bolt Checks	84.8	Pass
						Rating =	92.1	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	49.5	Pass
1	Base Foundation	0	94.4	Pass

Structure Rating (max from all components) =	94.4%

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

4.1) Recommendations

The designs of the modified tower and its modified foundations are sufficient for the proposed loading and will not require modification.

5) DISCLAIMER OF WARRANTIES

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

The engineering services rendered by GPD 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 only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

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 clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

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

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD 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 GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

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Calculated Radio Frequency Emissions

at&t

CT2173 – Hamden-Amodio

2755 State Street, Hamden, CT 06514

May 11, 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 self-supporting tower located at 2755 State Street in Hamden, CT. The coordinates of the tower are 41° 21' 19.67"N, 72° 53' 25.13"W.

AT&T is proposing the following modifications:

1) Install three 700 MHz LTE antennas (one 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	*110*	*1935*	*1*	*500*	*0.0149*	*1.0000*	*1.49%*
Cingular GSM	*110*	*880*	*20*	*250*	*0.1486*	*0.5867*	*25.33%*
Cingular GSM	*110*	*1930*	*3*	*427*	*0.0381*	*1.0000*	*3.81%*
Pocket	100	2130	3	631	0.0681	1.0000	6.81%
Clearwire	118	2496	2	153	0.0079	1.0000	0.79%
Clearwire	118	11 GHz	1	211	0.0054	1.0000	0.54%
Sprint	120	1962.5	11	137	0.0375	1.0000	3.75%
AT&T UMTS	112	880	2	565	0.0032	0.5867	0.55%
AT&T UMTS	112	1900	2	875	0.0050	1.0000	0.50%
AT&T LTE	112	734	1	1313	0.0038	0.4893	0.77%
AT&T GSM	112	880	1	283	0.0008	0.5867	0.14%
AT&T GSM	112	1900	4	525	0.0060	1.0000	0.60%
						Total	**14.45%**

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 GPD Group Structural Analysis Report dated 4/24/2012.

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 **14.45% 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 11, 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.

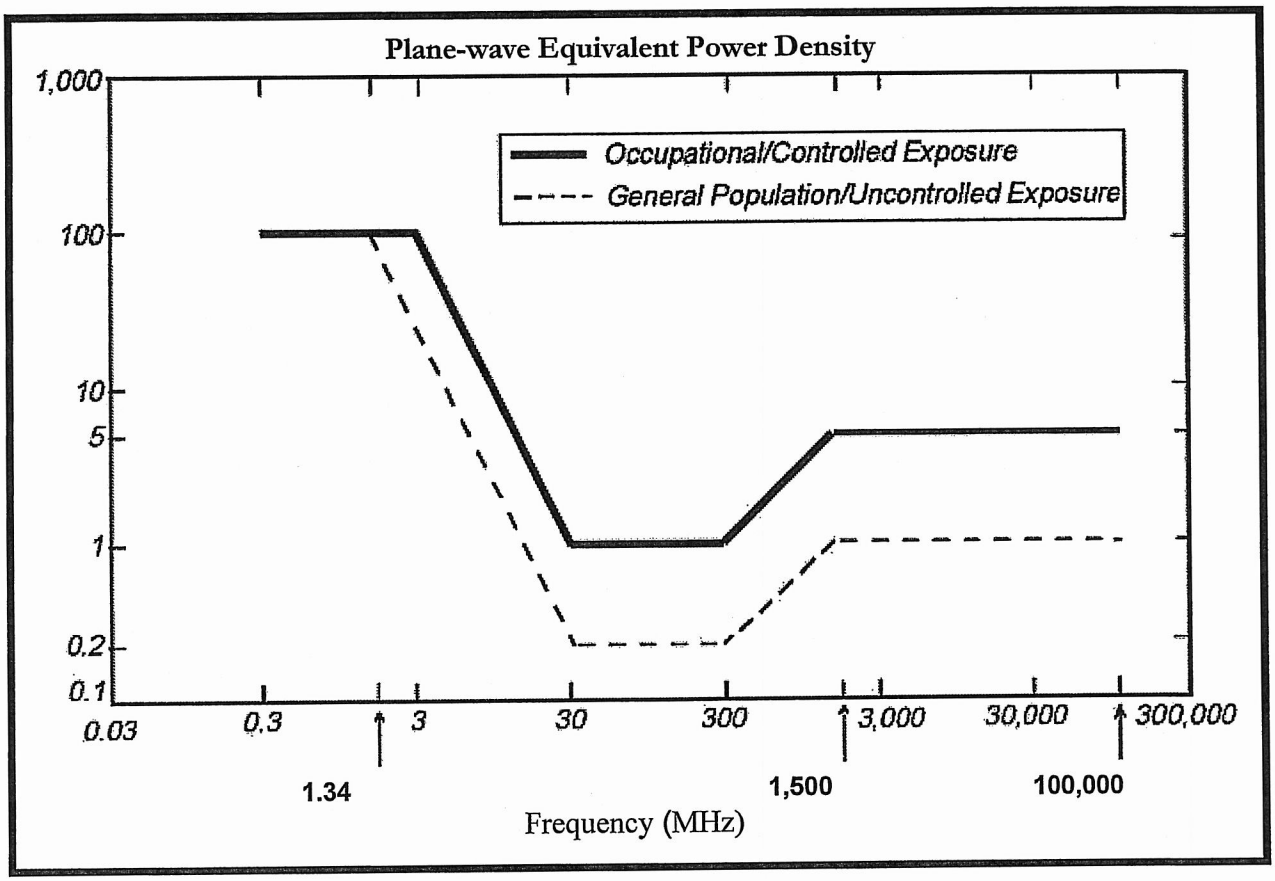
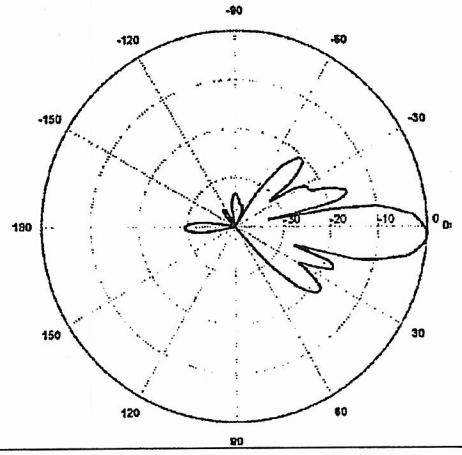


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

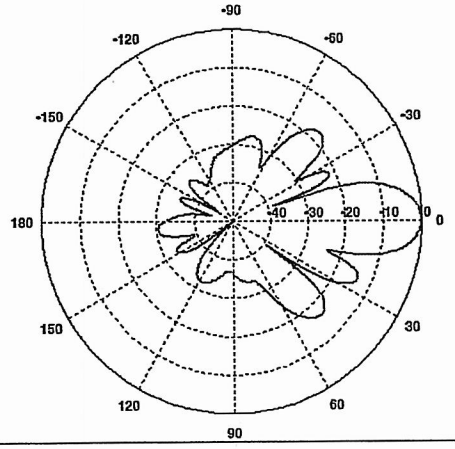
700 MHz

Manufacturer:	KMW
Model #:	AM-X-CD-16-65-00T
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3 °
Horizontal Beamwidth:	65°
Polarization:	Dual Slant ± 45°
Size L x W x D:	72"x11.8"x5.9"



850 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	824-896 MHz
Gain:	11.4 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	85°
Polarization:	Dual Slant ± 45°
Size L x W x D:	55.4"x11.0"x5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	90°
Polarization:	Dual Slant ± 45°
Size L x W x D:	55.4"x11.0"x5.0"