July 11, 2012

Mr. Jim Donahue
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Woburn, MA 01801
(781) 771-1111

B+T Group
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Tulsa, OK 74119
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Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5272
	Carrier Site Name:	AWE-Cromwell SE
Crown Castle Designation:	**Crown Castle BU Number:**	876364
	Crown Castle Site Name:	Cromwell / First Line Emergency
	Crown Castle JDE Job Number:	184181
	Crown Castle Application Number:	146450 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	84890.001
Site Data:	**201 Main St., Cromwell, CT, Middlesex County** **Latitude *41° 35' 0.11"*, Longitude *-72° 38' 59.14"*** **125 Foot - Monopole**	

Dear Mr. Donahue,

B+T Group is pleased to submit this **"Structural Modification 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', in accordance with application 146450, 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:

LC4: TSA specified load case with proposed modification. **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code requirements based upon a wind speed of 80 mph fastest mile.

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

We at *B+T 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:

Sachin S. Chougule
Project Engineer

Chad E. Tuttle, P.E.
President

7/11/12

tnxTower Report - version 6.0.4.0

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1) INTRODUCTION

This tower is a 125 ft. Monopole designed by Engineered Endeavors, Inc. in February of 2002. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. The tower has been modified per reinforcement drawings prepared by Semaan Engineering Solutions, in December of 2004. Reinforcement consists of addition of baseplate stiffeners. The tower was later reinforced per reinforcement drawings prepared by Vertical Structures Inc., in October of 2007. Reinforcement consists of re-welding the baseplate stiffeners and the foundation modification. All modifications were incorporated 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 80 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
115.0	117.0	6	Communication Components Inc.	DTMABP7819VG12A	6 2 1	1 1/4 3/4 3/8	--
		6	Ericsson	RRUS-11			
		9	KMW Communications	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			
		1	--	Pipe Mount [PM 601-3]			
	115.0	1	--	Sector Mount [SM 308-3]			

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
125.0	129.0	3	Argus Technologies	LLPX310R-V1	6 3 3 2	1 5/8 5/16 1/4 1/2	1
		3	Samsung Telecommunications	WIMAX DAP HEAD			
	127.0	6	Decibel	DB980H90A-M			
	125.0	9(MLA)	Sprint MLA	SPRINT MLA_ANTENNA	9(MLA)	1 5/8	2
		1	--	Platform Mount [LP 712-1]	--	--	1
	124.0	1	Andrew	VHLP2-11			
		1	Andrew	VHLP2-18			
115.0	115.0	**3**	**Powerwave Technologies**	**7770.00**	--	--	**3**
		6	**Powerwave Technologies**	**LGP21401**			
		1	**--**	**Side Arm [SO 309-3]**			
		--	--	--	6	1 1/4	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
105.0	105.0	2	ADC	DUAL BAND 800/1900 FULL BAND MASTHEAD	12	1 5/8	1
		6	Decibel	DB948F85T2E-M			
		2	Decibel	DB844G65ZAXY			
		4	Andrew	DB846F65ZAXY			
		1	--	Platform Mount [LP 712-1]			
95.0	95.0	12	Decibel	DB844H65E-XY	12	1 5/8	1
		1	--	Platform Mount [LP 303-1]			
85.0	85.0	3	Kathrein	742 213	6	1 5/8	1

Notes:
1) Existing Equipment
2) MLA Equipment; Not Considered in This Analysis
3) **Equipment To Be Removed**

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
125	125	1	--	L.P. Platform	--	--
		6	Decibel	DB980H65		
		3	Decibel	DB980H90		
115	115	1	--	T-Arm	--	--
		6	Allgon	7250		
105	105	1	--	L.P. Platform	--	--
		12	Decibel	DB844		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Location Revision#1	146450	CCI Sites
Tower Manufacturer Drawings	EEI Job No.10554	2068958	CCI Sites
Structural Analysis	Crown Castle Project: 320820	2608627	CCI Sites
Tower Reinforcement Drawings	Semaan Engineering Solutions	2055765	CCI Sites
Post-Modification Inspection	VSI Job No. 2008-004-036	2182292	CCI Sites
Foundation Drawings	EEI Project No.6464	1613909	CCI Sites
Geotechnical Reports	Dr. Clarence Welti, P.E.	1532312	CCI Sites
Antenna Configuration	Crown CAD Package	Date:4/9/2012	CCI Sites

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 areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary) – LC4

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	125 - 85.04	Pole	TP27.09x18.5x0.188	1	-8.176	806.281	90.0	Pass
L2	85.04 - 73.5	Pole	TP29.167x25.873x0.25	2	-10.501	1192.875	96.1	Pass
L3	73.5 - 60.5	Pole	TP31.93x29.167x0.313	3	-12.646	1597.760	90.6	Pass
L4	60.5 - 40.4567	Pole	TP36.18x31.93x0.378	4	-15.585	1952.578	90.0	Pass
L5	40.4567 - 30.5	Pole	TP37.787x34.346x0.432	5	-19.684	2425.167	85.1	Pass
L6	30.5 - 0	Pole	TP44.25x37.787x0.413	6	-26.905	2743.807	92.8	Pass
							Summary	
						Pole (L2)	96.1	Pass
						RATING =	**96.1**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC4

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	86.6	Pass
1	Base Plate	Base	85.1	Pass
1	Base Foundation	Base	65.8	Pass

Structure Rating (max from all components) =	96.1%

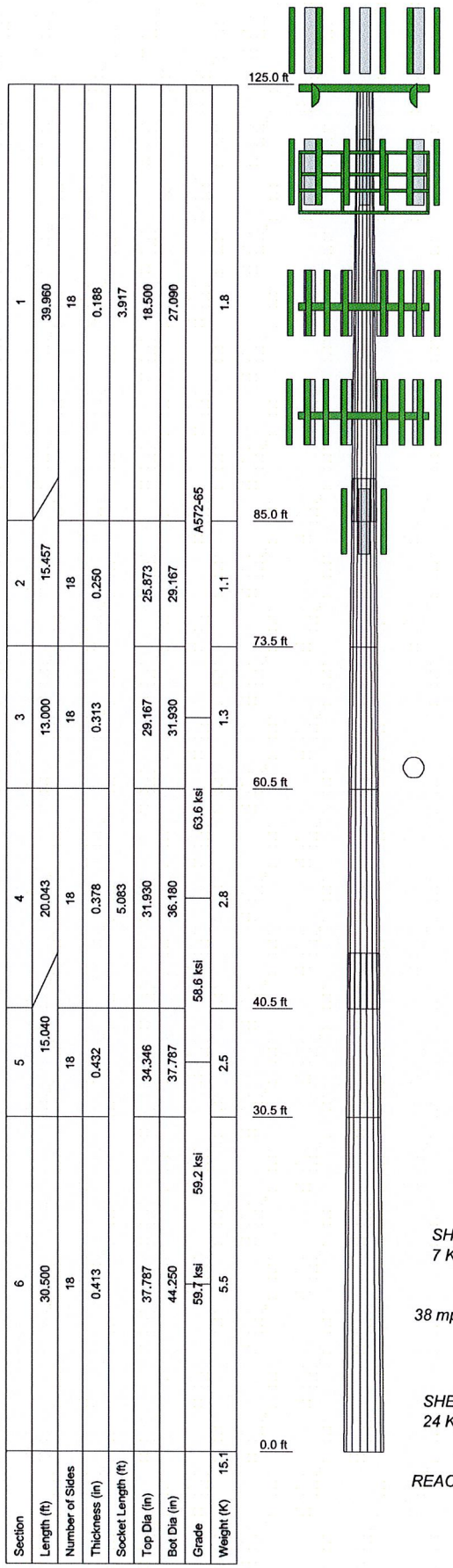
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.
2) Capacities up to 105% are considered acceptable based on analysis methods used.
3) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F.

4.1) Recommendations

1) All modifications proposed in this report shall be installed in accordance with the attached drawings (Appendix D) for the determined available structural capacity to be effective.

APPENDIX A

tnxTOWER OUTPUT



Section	1	2	3	4	5	6
Length (ft)	39.960	15.457	13.000	20.043	15.040	30.500
Number of Sides	18	18	18	18	18	18
Thickness (in)	0.188	0.250	0.313	0.378	0.432	0.413
Socket Length (ft)	3.917			5.083		
Top Dia (in)	18.500	25.873	29.167	31.930	34.346	37.787
Bot Dia (in)	27.090	29.167	31.930	36.180	37.787	44.250
Grade	A572-65			63.6 ksi	58.6 ksi	59.2 ksi / 59.1 ksi
Weight (K)	1.8	1.1	1.3	2.8	2.5	5.5

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R-V1 w/ Mount Pipe (E)	129	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	117
LLPX310R-V1 w/ Mount Pipe (E)	129	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	117
LLPX310R-V1 w/ Mount Pipe (E)	129	Sector Mount [SM 308-3] (P)	115
WIMAX DAP HEAD (E)	129	(2) DB846F65ZAXY w/ Mount Pipe (E)	105
WIMAX DAP HEAD (E)	129	(2) DB948F85T2E-M w/ Mount Pipe (E)	105
WIMAX DAP HEAD (E)	129	(2) DB948F85T2E-M w/ Mount Pipe (E)	105
(2) DB980H90A-M w/ Mount Pipe (E)	127	(2) DB948F85T2E-M w/ Mount Pipe (E)	105
(2) DB980H90A-M w/ Mount Pipe (E)	127	(2) DUAL BAND 800/1900 FULL BAND MASTHEAD (E)	105
(2) DB980H90A-M w/ Mount Pipe (E)	127	Platform Mount [LP 712-1] (E)	105
6' x 2" Mount Pipe (E)	125	(2) DB844G65ZAXY w/ Mount Pipe (E)	105
6' x 2" Mount Pipe (E)	125	(2) DB846F65ZAXY w/ Mount Pipe (E)	105
6' x 2" Mount Pipe (E)	125	(4) DB844H65E-XY w/ Mount Pipe (E)	95
4' x 2" Pipe Mount (E)	125	Platform Mount [LP 303-1] (E)	95
4' x 2" Pipe Mount (E)	125	(4) DB844H65E-XY w/ Mount Pipe (E)	95
4' x 2" Pipe Mount (E)	125	(4) DB844H65E-XY w/ Mount Pipe (E)	95
Platform Mount [LP 712-1] (E)	125	742 213 w/ Mount Pipe (E)	85
VHLP2-11 (E)	124	742 213 w/ Mount Pipe (E)	85
VHLP2-18 (E)	124	742 213 w/ Mount Pipe (E)	85
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	117		
(2) RRUS-11 (P)	117		
(2) RRUS-11 (P)	117		
(2) RRUS-11 (P)	117		
(2) DTMABP7819VG12A (P)	117		
(2) DTMABP7819VG12A (P)	117		
(2) DTMABP7819VG12A (P)	117		
DC6-48-60-18-8F (P)	117		
Pipe Mount [PM 601-3] (P)	117		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	59.2 ksi	59 ksi	65 ksi
63.6 ksi	64 ksi	80 ksi	59.7 ksi	60 ksi	80 ksi
58.6 ksi	59 ksi	65 ksi			

TOWER DESIGN NOTES

1. Tower is located in Middlesex County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.1%

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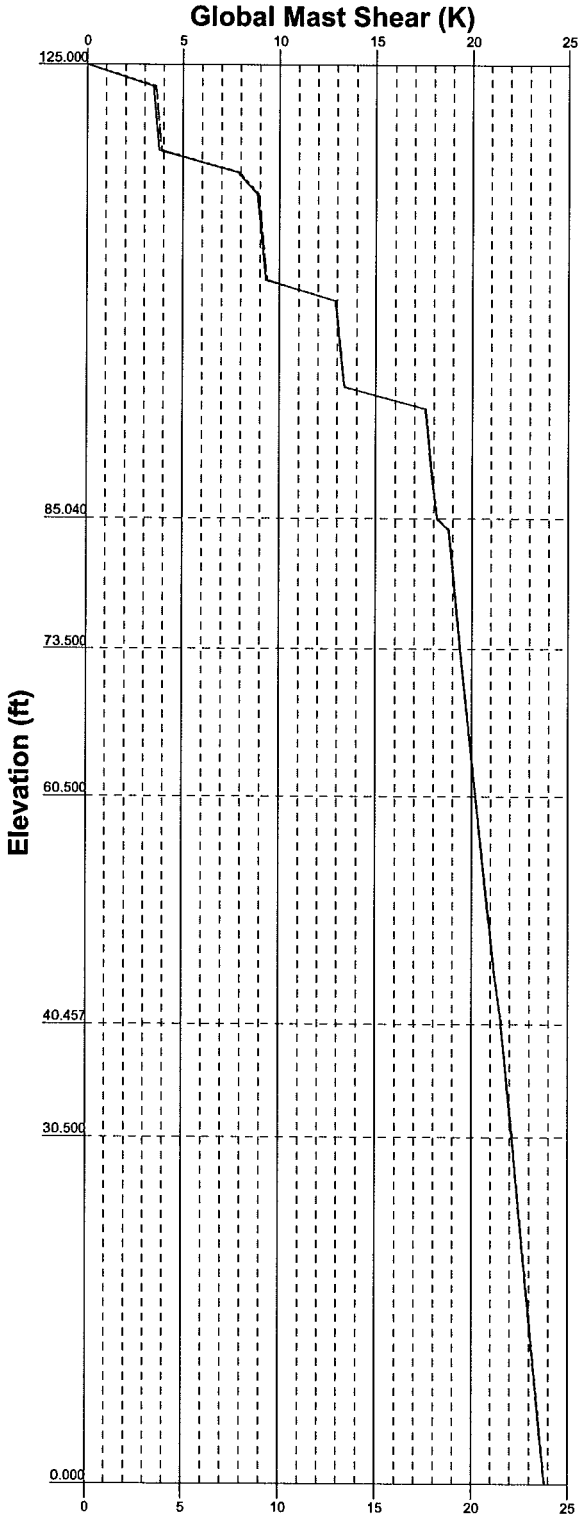
Job: 84890.001 - Cromwell, CT (BU# 876364)			
Project: 125' EEI Monopole / App ID: 146450; Rev# 1			
Client: Crown Castle	Drawn by: S Chougule	App'd:	
Code: TIA/EIA-222-F	Date: 07/11/12	Scale: NTS	
Path: S:\B&T Engineering\Projects\Apex Solutions\84890_876364_CrownEEI\engineering\Tower\84890_001_CrownBCT_MostRecent.eri		Dwg No. E-1	

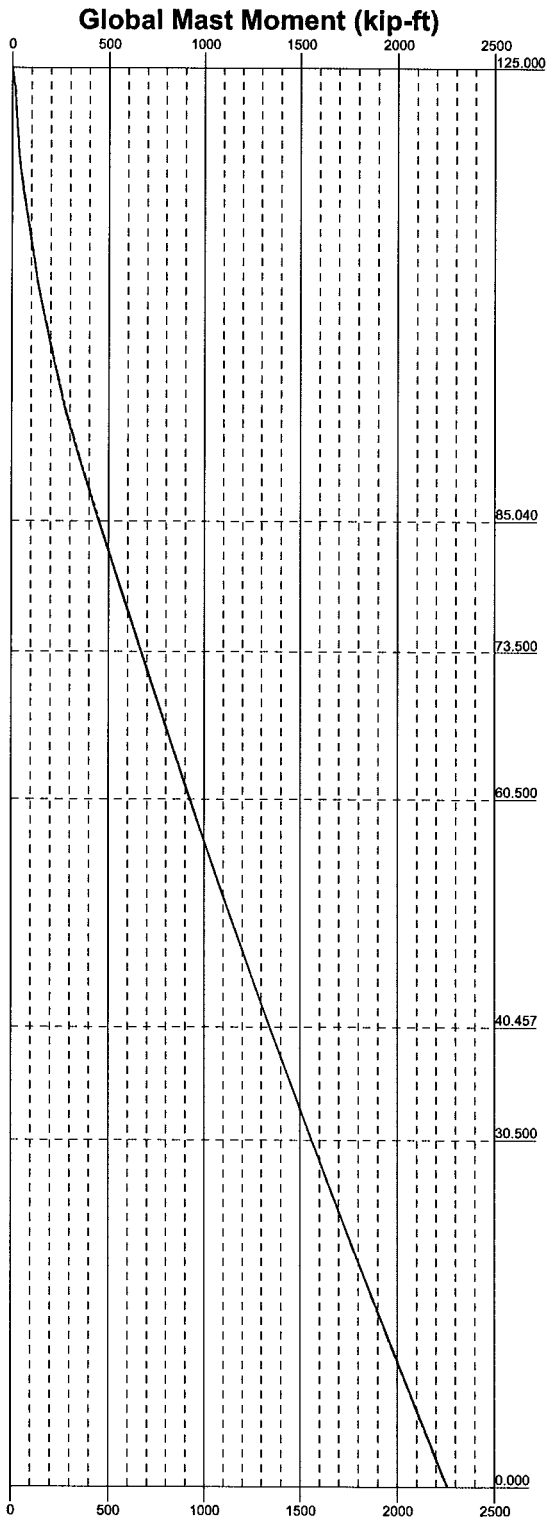
TIA/EIA-222-F - 80 mph/38 mph 0.750 in Ice

——— Vx ---------- Vz

Maximum Values

——— Mx ---------- Mz





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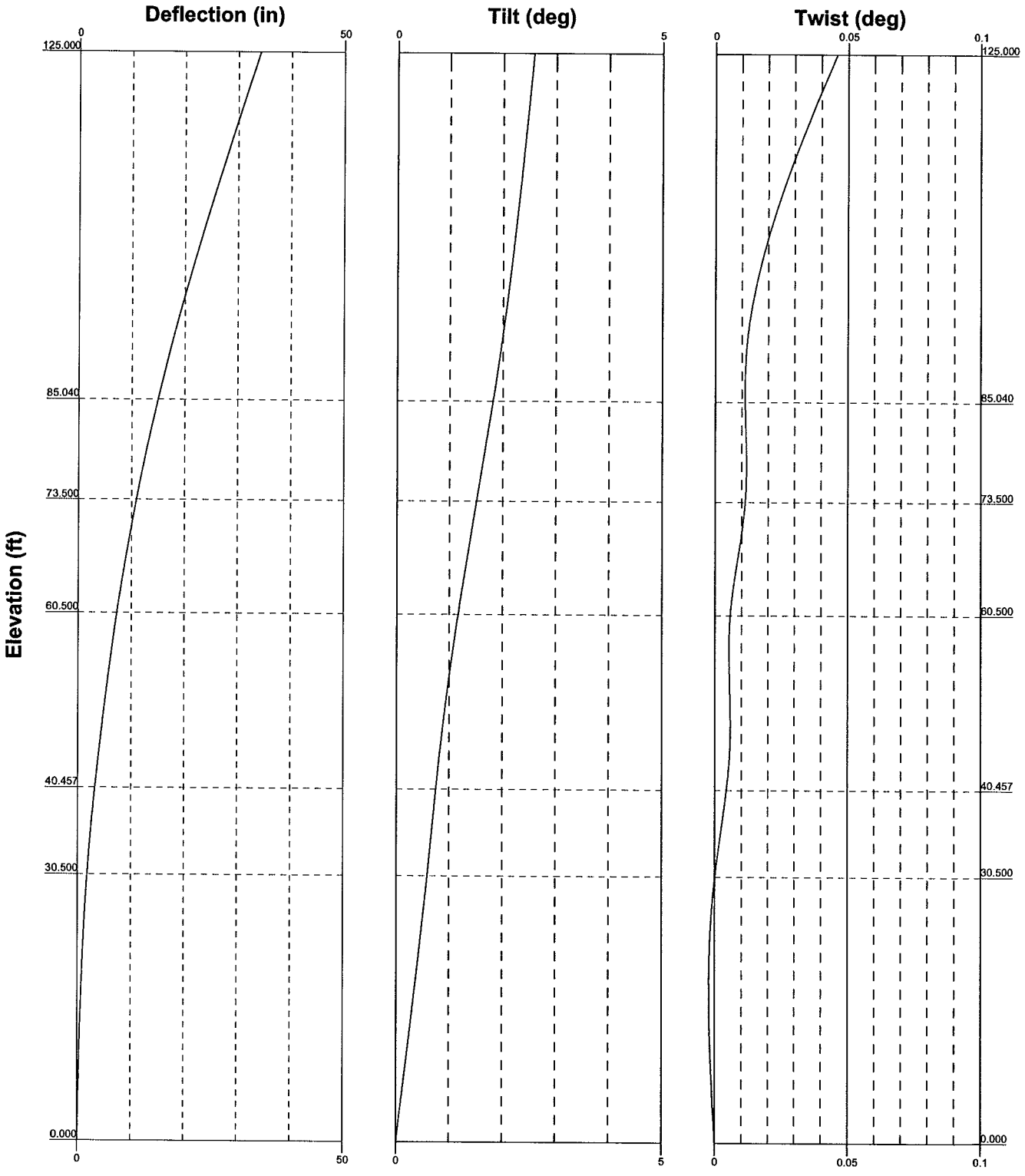
Client: Crown Castle	Drawn by: S Chougule		App'd:
Code: TIA/EIA-222-F	Date: 07/11/12		Scale: NTS
Path:			Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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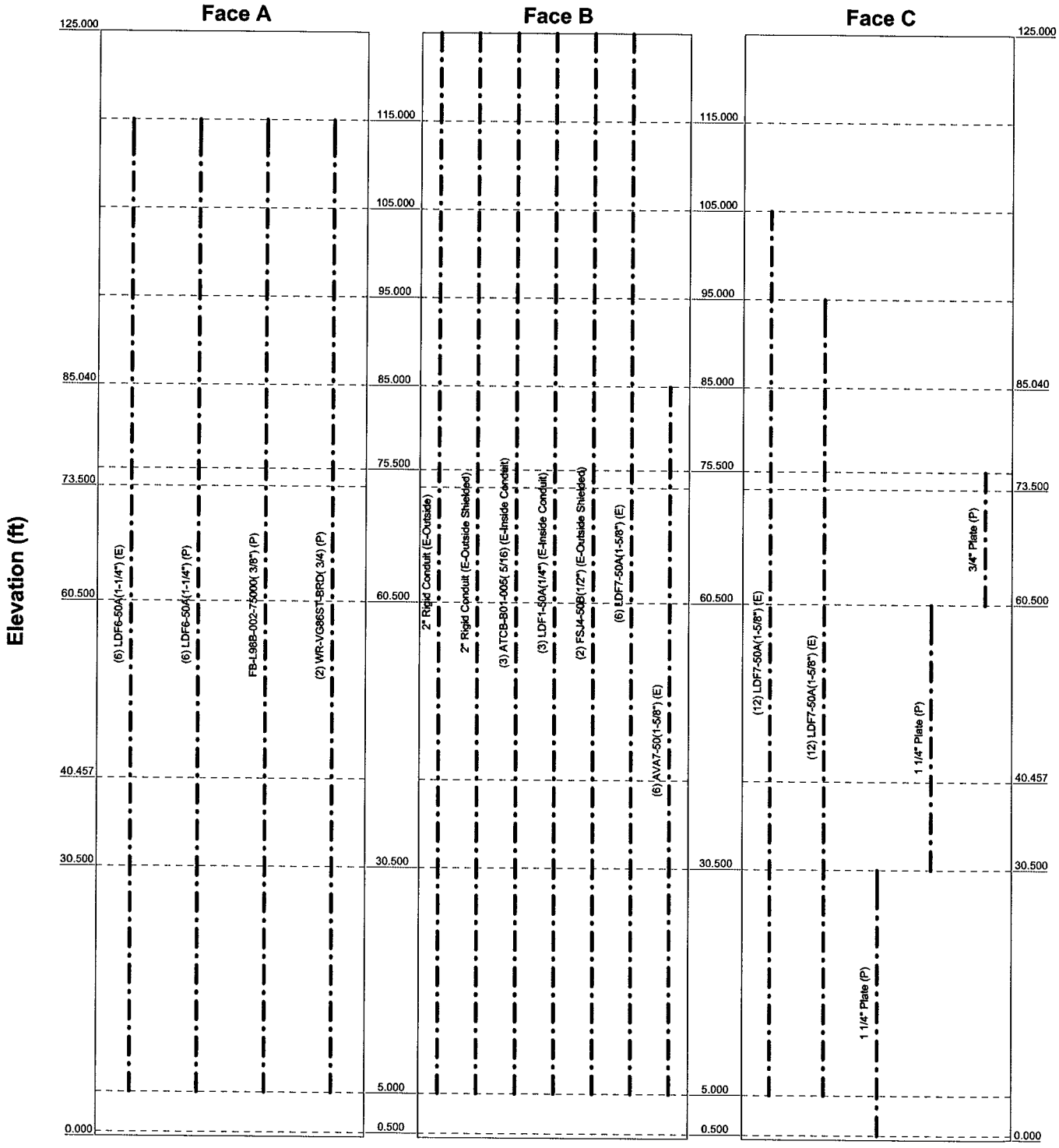
Job: 84890.001 - Cromwell, CT (BU# 876364)		
Project: 125' EEI Monopole / App ID: 146450; Rev# 1		
Client: Crown Castle	Drawn by: S Chougule	App'd:
Code: TIA/EIA-222-F	Date: 07/11/12	Scale: NTS
Path:		Dwg No. E-5

Feedline Distribution Chart
0' - 125'

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



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Project: 125' EEI Monopole / App ID: 146450; Rev# 1		
Client: Crown Castle	Drawn by: S Chougule	App'd:
Code: TIA/EIA-222-F	Date: 07/11/12	Scale: NTS
Path:		Dwg No. E-7

Tower Input Data

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

Tower is located in Middlesex County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	125.000-85.040	39.960	3.917	18	18.500	27.090	0.188	0.750	A572-65 (65 ksi)
L2	85.040-73.500	15.457	0.000	18	25.873	29.167	0.250	1.000	A572-65 (65 ksi)
L3	73.500-60.500	13.000	0.000	18	29.167	31.930	0.313	1.252	63.6 ksi (64 ksi)
L4	60.500-40.457	20.043	5.083	18	31.930	36.180	0.378	1.512	58.6 ksi (59 ksi)
L5	40.457-30.500	15.040	0.000	18	34.346	37.787	0.432	1.728	59.2 ksi (59 ksi)
L6	30.500-0.000	30.500		18	37.787	44.250	0.413	1.652	59.7 ksi (60 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.785	10.898	461.730	6.501	9.398	49.131	924.069	5.450	2.926	15.605
	27.508	16.010	1463.941	9.550	13.762	106.378	2929.808	8.007	4.438	23.668
L2	27.120	20.332	1686.463	9.096	13.144	128.311	3375.144	10.168	4.114	16.455
	29.617	22.946	2424.064	10.266	14.817	163.602	4851.318	11.475	4.693	18.774
L3	29.617	28.665	3015.135	10.243	14.817	203.494	6034.238	14.335	4.583	14.641
	32.423	31.410	3966.895	11.224	16.220	244.561	7939.009	15.708	5.069	16.194
L4	32.423	37.855	4761.205	11.201	16.220	293.531	9528.674	18.931	4.954	13.107
	36.738	42.954	6955.975	12.710	18.379	378.465	13921.104	21.481	5.702	15.086
L5	36.057	46.502	6757.254	12.040	17.448	387.283	13523.399	23.255	5.285	12.233
	38.370	51.220	9029.721	13.261	19.196	470.401	18071.324	25.615	5.890	13.635
L6	38.370	48.992	8645.760	13.268	19.196	450.399	17302.896	24.501	5.924	14.343
	44.933	57.464	13951.371	15.562	22.479	620.640	27921.100	28.738	7.061	17.097

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft^2	in					in	in
L1 125.000-85.040				1	1	1		
L2 85.040-73.500				1	1	1		
L3 73.500-60.500				1	1	1		
L4 60.500-40.457				1	1	1		
L5 40.457-30.500				1	1	1		
L6 30.500-0.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
2" Rigid Conduit (E-Outside)	B	No	CaAa (Out Of Face)	125.000 - 5.000	1	No Ice	0.200	0.003
						1/2" Ice	0.300	0.004
						1" Ice	0.400	0.006
						2" Ice	0.600	0.013
						4" Ice	1.000	0.032
2" Rigid Conduit (E-Outside Shielded)	B	No	CaAa (Out Of Face)	125.000 - 5.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.004
						1" Ice	0.000	0.006
						2" Ice	0.000	0.013
						4" Ice	0.000	0.032
ATCB-B01-005(5/16) (E-Inside Conduit)	B	No	CaAa (Out Of Face)	125.000 - 5.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.021
LDF1-50A(1/4") (E-Inside Conduit)	B	No	CaAa (Out Of Face)	125.000 - 5.000	3	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.021
FSJ4-50B(1/2") (E-Outside Shielded)	B	No	CaAa (Out Of Face)	125.000 - 5.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.002
						2" Ice	0.000	0.006
						4" Ice	0.000	0.022
LDF7-50A(1-5/8") (E)	B	No	Inside Pole	125.000 - 5.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
-								
LDF6-50A(1-1/4") (E)	A	No	Inside Pole	115.000 - 5.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LDF6-50A(1-1/4") (P)	A	No	Inside Pole	115.000 - 5.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
FB-L98B-002-75000(3/8") (P)	A	No	Inside Pole	115.000 - 5.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
WR-VG86ST-BRD(3/4) (P)	A	No	Inside Pole	115.000 - 5.000	2	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
-								
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	105.000 - 5.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
-								
LDF7-50A(1-5/8") (E)	C	No	Inside Pole	95.000 - 5.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
-								
AVA7-50(1-5/8") (E)	B	No	Inside Pole	85.000 - 5.000	6	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
-								
1 1/4" Plate (P)	C	No	CaAa (Out Of Face)	30.500 - 0.500	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
1 1/4" Plate (P)	C	No	CaAa (Out Of Face)	60.500 - 30.500	1	No Ice	0.208	0.000
						1/2" Ice	0.292	0.000
						1" Ice	0.375	0.000
						2" Ice	0.542	0.000
						4" Ice	0.875	0.000
3/4" Plate (P)	C	No	CaAa (Out Of Face)	75.500 - 60.500	1	No Ice	0.125	0.000
						1/2" Ice	0.208	0.000
						1" Ice	0.292	0.000
						2" Ice	0.458	0.000
						4" Ice	0.792	0.000
-								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	125.000-85.040	A	0.000	0.000	0.000	0.000	0.274
		B	0.000	0.000	0.000	7.992	0.448
		C	0.000	0.000	0.000	0.000	0.294
L2	85.040-73.500	A	0.000	0.000	0.000	0.000	0.106
		B	0.000	0.000	0.000	2.308	0.178
		C	0.000	0.000	0.000	0.250	0.227
L3	73.500-60.500	A	0.000	0.000	0.000	0.000	0.119
		B	0.000	0.000	0.000	2.600	0.200
		C	0.000	0.000	0.000	1.625	0.256
L4	60.500-40.457	A	0.000	0.000	0.000	0.000	0.184
		B	0.000	0.000	0.000	4.009	0.309
		C	0.000	0.000	0.000	4.176	0.394
L5	40.457-30.500	A	0.000	0.000	0.000	0.000	0.091
		B	0.000	0.000	0.000	1.991	0.153
		C	0.000	0.000	0.000	2.074	0.196
L6	30.500-0.000	A	0.000	0.000	0.000	0.000	0.234
		B	0.000	0.000	0.000	5.100	0.393
		C	0.000	0.000	0.000	6.250	0.502

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	125.000-85.040	A	0.861	0.000	0.000	0.000	0.000	0.274
		B		0.000	0.000	0.000	14.871	1.129
		C		0.000	0.000	0.000	0.000	0.294
L2	85.040-73.500	A	0.833	0.000	0.000	0.000	0.000	0.106
		B		0.000	0.000	0.000	4.295	0.374
		C		0.000	0.000	0.000	0.537	0.227
L3	73.500-60.500	A	0.816	0.000	0.000	0.000	0.000	0.119
		B		0.000	0.000	0.000	4.723	0.406
		C		0.000	0.000	0.000	3.394	0.256
L4	60.500-40.457	A	0.789	0.000	0.000	0.000	0.000	0.184
		B		0.000	0.000	0.000	7.171	0.612
		C		0.000	0.000	0.000	6.811	0.394
L5	40.457-30.500	A	0.756	0.000	0.000	0.000	0.000	0.091
		B		0.000	0.000	0.000	3.562	0.304
		C		0.000	0.000	0.000	3.383	0.196
L6	30.500-0.000	A	0.750	0.000	0.000	0.000	0.000	0.234
		B		0.000	0.000	0.000	8.925	0.752
		C		0.000	0.000	0.000	10.000	0.502

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	125.000-85.040	0.235	0.136	0.380	0.220
L2	85.040-73.500	0.211	0.152	0.339	0.254
L3	73.500-60.500	0.086	0.216	0.102	0.361
L4	60.500-40.457	-0.009	0.268	0.018	0.405
L5	40.457-30.500	-0.010	0.270	0.018	0.411
L6	30.500-0.000	-0.046	0.250	-0.041	0.379

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
LLPX310R-V1 w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	129.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.429 5.990 6.506 7.574 9.862	3.382 4.151 4.796 6.194 9.254	0.051 0.090 0.139 0.255 0.597
LLPX310R-V1 w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	129.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.429 5.990 6.506 7.574 9.862	3.382 4.151 4.796 6.194 9.254	0.051 0.090 0.139 0.255 0.597
LLPX310R-V1 w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	129.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.429 5.990 6.506 7.574 9.862	3.382 4.151 4.796 6.194 9.254	0.051 0.090 0.139 0.255 0.597
WIMAX DAP HEAD (E)	C	From Leg	4.000 0.000 0.000	0.000	129.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
WIMAX DAP HEAD (E)	B	From Leg	4.000 0.000 0.000	0.000	129.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
WIMAX DAP HEAD (E)	A	From Leg	4.000 0.000 0.000	0.000	129.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.804 1.988 2.180 2.589 3.512	0.778 0.918 1.067 1.391 2.143	0.033 0.045 0.058 0.094 0.201
(2) DB980H90A-M w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.036 4.499 4.947 5.870 8.046	3.619 4.481 5.219 6.744 9.995	0.030 0.064 0.107 0.216 0.549
(2) DB980H90A-M w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.036 4.499 4.947 5.870 8.046	3.619 4.481 5.219 6.744 9.995	0.030 0.064 0.107 0.216 0.549
(2) DB980H90A-M w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	127.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.036 4.499 4.947 5.870 8.046	3.619 4.481 5.219 6.744 9.995	0.030 0.064 0.107 0.216 0.549
6' x 2" Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
6' x 2" Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice	1.425 1.925 2.294 3.060	1.425 1.925 2.294 3.060	0.022 0.033 0.048 0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.702	4.702	0.231
6' x 2" Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
4' x 2" Pipe Mount (E)	C	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.866 1.111 1.365 1.901 3.228	0.866 1.111 1.365 1.901 3.228	0.015 0.022 0.032 0.062 0.161
4' x 2" Pipe Mount (E)	B	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.866 1.111 1.365 1.901 3.228	0.866 1.111 1.365 1.901 3.228	0.015 0.022 0.032 0.062 0.161
4' x 2" Pipe Mount (E)	A	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.866 1.111 1.365 1.901 3.228	0.866 1.111 1.365 1.901 3.228	0.015 0.022 0.032 0.062 0.161
Platform Mount [LP 712-1] (E)	C	From Leg	4.000 0.000 0.000	0.000	125.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.530 29.940 35.350 46.170 67.810	24.530 29.940 35.350 46.170 67.810	1.335 1.646 1.956 2.577 3.820
-									
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	C	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.136 0.210 0.385 0.874
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	B	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.136 0.210 0.385 0.874
(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe (P)	A	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.136 0.210 0.385 0.874
(2) RRUS-11 (P)	C	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.424 4.708 5.001 5.613 6.940	1.186 1.351 1.526 1.900 2.753	0.055 0.081 0.110 0.179 0.368
(2) RRUS-11 (P)	B	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.424 4.708 5.001 5.613 6.940	1.186 1.351 1.526 1.900 2.753	0.055 0.081 0.110 0.179 0.368
(2) RRUS-11 (P)	A	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.424 4.708 5.001 5.613 6.940	1.186 1.351 1.526 1.900 2.753	0.055 0.081 0.110 0.179 0.368

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
(2) DTMABP7819VG12A (P)	C	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
(2) DTMABP7819VG12A (P)	B	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
(2) DTMABP7819VG12A (P)	A	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.139 1.284 1.437 1.769 2.538	0.391 0.488 0.595 0.833 1.414	0.019 0.026 0.036 0.060 0.140
DC6-48-60-18-8F (P)	A	From Leg	4.000 0.000 0.000	0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.567 2.798 3.038 3.543 4.658	4.317 4.596 4.885 5.488 6.797	0.019 0.050 0.085 0.167 0.383
Sector Mount [SM 308-3] (P)	C	None		0.000	115.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	22.340 31.700 41.060 59.780 97.220	22.340 31.700 41.060 59.780 97.220	0.381 0.832 1.284 2.187 3.992
Pipe Mount [PM 601-3] (P)	C	None		0.000	117.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.390 5.480 6.570 8.750 13.110	4.390 5.480 6.570 8.750 13.110	0.195 0.237 0.280 0.365 0.534
-									
(2) DB846F65ZAXY w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.033 7.536 8.080 9.195 11.528	7.583 8.544 9.381 11.166 15.103	0.043 0.105 0.179 0.352 0.831
(2) DB844G65ZAXY w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.904 5.346 5.797 6.731 8.735	4.921 5.596 6.284 7.712 10.833	0.034 0.078 0.131 0.257 0.617
(2) DB846F65ZAXY w/ Mount Pipe (E)	A	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.033 7.536 8.080 9.195 11.528	7.583 8.544 9.381 11.166 15.103	0.043 0.105 0.179 0.352 0.831
(2) DB948F85T2E-M w/ Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.132 2.490 2.857 3.617 5.364	4.454 5.123 5.804 7.220 10.315	0.027 0.057 0.096 0.192 0.486
(2) DB948F85T2E-M w/ Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	105.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.132 2.490 2.857 3.617 5.364	4.454 5.123 5.804 7.220 10.315	0.027 0.057 0.096 0.192 0.486
(2) DB948F85T2E-M w/	A	From Leg	4.000	0.000	105.000	No Ice	2.132	4.454	0.027

tnxTower	Job: 84890.001 - Cromwell, CT (BU# 876364)	Page: 8 of 12
B+T Group 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Project: 125' EEI Monopole / App ID: 146450; Rev# 1	Date: 11:44:15 07/11/12
	Client: Crown Castle	Designed by: S Chougule

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
Mount Pipe			0.000			1/2" Ice	2.490	5.123	0.057
(E)			0.000			1" Ice	2.857	5.804	0.096
						2" Ice	3.617	7.220	0.192
						4" Ice	5.364	10.315	0.486
(2) DUAL BAND 800/1900	C	From Leg	4.000	0.000	105.000	No Ice	1.549	0.809	0.027
FULL BAND MASTHEAD			0.000			1/2" Ice	1.718	0.943	0.038
(E)			0.000			1" Ice	1.896	1.085	0.052
						2" Ice	2.277	1.396	0.086
						4" Ice	3.143	2.122	0.189
Platform Mount [LP 712-1]	C	None		0.000	105.000	No Ice	24.530	24.530	1.335
(E)						1/2" Ice	29.940	29.940	1.646
						1" Ice	35.350	35.350	1.956
						2" Ice	46.170	46.170	2.577
						4" Ice	67.810	67.810	3.820
-									
(4) DB844H65E-XY w/	C	From Leg	4.000	0.000	95.000	No Ice	10.038	5.154	0.038
Mount Pipe			0.000			1/2" Ice	10.551	5.833	0.104
(E)			0.000			1" Ice	11.073	6.523	0.179
						2" Ice	12.150	7.959	0.351
						4" Ice	14.438	11.092	0.813
(4) DB844H65E-XY w/	B	From Leg	4.000	0.000	95.000	No Ice	10.038	5.154	0.038
Mount Pipe			0.000			1/2" Ice	10.551	5.833	0.104
(E)			0.000			1" Ice	11.073	6.523	0.179
						2" Ice	12.150	7.959	0.351
						4" Ice	14.438	11.092	0.813
(4) DB844H65E-XY w/	A	From Leg	4.000	0.000	95.000	No Ice	10.038	5.154	0.038
Mount Pipe			0.000			1/2" Ice	10.551	5.833	0.104
(E)			0.000			1" Ice	11.073	6.523	0.179
						2" Ice	12.150	7.959	0.351
						4" Ice	14.438	11.092	0.813
Platform Mount [LP 303-1]	C	None		0.000	95.000	No Ice	14.660	14.660	1.250
(E)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
-									
742 213 w/ Mount Pipe	C	From Leg	1.000	0.000	85.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			0.000			1" Ice	6.501	6.982	0.144
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.682
742 213 w/ Mount Pipe	B	From Leg	1.000	0.000	85.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			0.000			1" Ice	6.501	6.982	0.144
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.682
742 213 w/ Mount Pipe	A	From Leg	1.000	0.000	85.000	No Ice	5.373	4.620	0.049
(E)			0.000			1/2" Ice	5.950	6.000	0.091
			0.000			1" Ice	6.501	6.982	0.144
						2" Ice	7.611	8.852	0.277
						4" Ice	9.933	12.794	0.682
-									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
VHLP2-11 (E)	C	Paraboloid w/o Radome	From Leg	4.000 0.000 0.000	0.000		124.000	2.175	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.715 4.006 4.296 4.876 6.037	0.027 0.048 0.068 0.109 0.191
VHLP2-18 (E)	B	Paraboloid w/o Radome	From Leg	4.000 0.000 0.000	62.000		124.000	2.175	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.715 4.006 4.296 4.876 6.037	0.031 0.052 0.072 0.113 0.195
-											

Load Combinations

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 85.04	34.144	35	2.581	0.047
L2	88.9567 - 73.5	16.527	35	1.911	0.014
L3	73.5 - 60.5	10.918	35	1.506	0.009
L4	60.5 - 40.4567	7.274	35	1.168	0.006
L5	45.54 - 30.5	4.132	35	0.838	0.004
L6	30.5 - 0	1.840	35	0.587	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
129.000	LLPX310R-V1 w/ Mount Pipe	35	34.144	2.581	0.047	13399
127.000	(2) DB980H90A-M w/ Mount Pipe	35	34.144	2.581	0.047	13399
125.000	6' x 2" Mount Pipe	35	34.144	2.581	0.047	13399
124.000	VHLP2-11	35	33.616	2.565	0.046	13399
117.000	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	35	29.938	2.453	0.038	8374
115.000	Sector Mount [SM 308-3]	35	28.897	2.420	0.036	6699
105.000	(2) DB846F65ZAXY w/ Mount Pipe	35	23.830	2.247	0.026	3348
95.000	(4) DB844H65E-XY w/ Mount Pipe	35	19.122	2.049	0.018	2231
85.000	742 213 w/ Mount Pipe	35	14.951	1.813	0.012	1914

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	125 - 85.04	85.894	10	6.400	0.120
L2	88.9567 - 73.5	41.862	10	4.827	0.036
L3	73.5 - 60.5	27.698	4	3.815	0.022
L4	60.5 - 40.4567	18.483	4	2.963	0.015
L5	45.54 - 30.5	10.511	4	2.130	0.009
L6	30.5 - 0	4.684	4	1.493	0.006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
129.000	LLPX310R-V1 w/ Mount Pipe	10	85.894	6.400	0.120	5639
127.000	(2) DB980H90A-M w/ Mount Pipe	10	85.894	6.400	0.120	5639
125.000	6' x 2" Mount Pipe	10	85.894	6.400	0.120	5639
124.000	VHLP2-11	10	84.579	6.364	0.117	5639
117.000	(3) AM-X-CD-16-65-00T-RET w/ Mount Pipe	10	75.408	6.111	0.097	3523
115.000	Sector Mount [SM 308-3]	10	72.812	6.036	0.092	2818
105.000	(2) DB846F65ZAXY w/ Mount Pipe	10	60.163	5.636	0.066	1407
95.000	(4) DB844H65E-XY w/ Mount Pipe	10	48.380	5.164	0.045	935
85.000	742 213 w/ Mount Pipe	10	37.892	4.583	0.031	791

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	125 - 85.04 (1)	TP27.09x18.5x0.188	39.960	0.000	0.0	39.0000	15.509	-8.176	604.862	0.014
L2	85.04 - 73.5 (2)	TP29.167x25.873x0.25	15.457	0.000	0.0	39.0000	22.946	-10.501	894.880	0.012
L3	73.5 - 60.5 (3)	TP31.93x29.167x0.313	13.000	0.000	0.0	38.1600	31.410	-12.646	1198.620	0.011
L4	60.5 - 40.4567 (4)	TP36.18x31.93x0.378	20.043	0.000	0.0	35.1600	41.661	-15.585	1464.800	0.011
L5	40.4567 - 30.5 (5)	TP37.787x34.346x0.432	15.040	0.000	0.0	35.5200	51.220	-19.684	1819.330	0.011
L6	30.5 - 0 (6)	TP44.25x37.787x0.413	30.500	0.000	0.0	35.8200	57.464	-26.905	2058.370	0.013

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	125 - 85.04 (1)	TP27.09x18.5x0.188	384.025	46.1748	39.0000	1.184	0.000	0.0000	39.0000	0.000
L2	85.04 - 73.5 (2)	TP29.167x25.873x0.25	673.938	49.4325	39.0000	1.268	0.000	0.0000	39.0000	0.000
L3	73.5 - 60.5 (3)	TP31.93x29.167x0.313	930.725	45.6684	38.1600	1.197	0.000	0.0000	38.1600	0.000
L4	60.5 - 40.4567 (4)	TP36.18x31.93x0.378	1239.375	41.7879	35.1600	1.189	0.000	0.0000	35.1600	0.000
L5	40.4567 - 30.5 (5)	TP37.787x34.346x0.432	1564.700	39.9157	35.5200	1.124	0.000	0.0000	35.5200	0.000
L6	30.5 - 0 (6)	TP44.25x37.787x0.413	2268.017	43.8518	35.8200	1.224	0.000	0.0000	35.8200	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	125 - 85.04 (1)	TP27.09x18.5x0.188	17.875	1.1526	26.0000	0.089	1.065	0.0625	26.0000	0.002
L2	85.04 - 73.5 (2)	TP29.167x25.873x0.25	19.361	0.8438	26.0000	0.065	1.043	0.0373	26.0000	0.001
L3	73.5 - 60.5 (3)	TP31.93x29.167x0.313	20.172	0.6422	25.4400	0.050	1.024	0.0245	25.4400	0.001
L4	60.5 - 40.4567 (4)	TP36.18x31.93x0.378	21.121	0.5070	23.4400	0.043	1.004	0.0165	23.4400	0.001
L5	40.4567 - 30.5 (5)	TP37.787x34.346x0.432	22.235	0.4341	23.6800	0.037	0.399	0.0049	23.6800	0.000
L6	30.5 - 0 (6)	TP44.25x37.787x0.413	23.912	0.4161	23.8800	0.035	0.364	0.0034	23.8800	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	125 - 85.04 (1)	0.014	1.184	0.000	0.089	0.002	1.200 ✔	1.333	H1-3+VT ✔
L2	85.04 - 73.5 (2)	0.012	1.268	0.000	0.065	0.001	1.280 ✔	1.333	H1-3+VT ✔
L3	73.5 - 60.5 (3)	0.011	1.197	0.000	0.050	0.001	1.208 ✔	1.333	H1-3+VT ✔
L4	60.5 - 40.4567 (4)	0.011	1.189	0.000	0.043	0.001	1.200 ✔	1.333	H1-3+VT ✔
L5	40.4567 - 30.5 (5)	0.011	1.124	0.000	0.037	0.000	1.135 ✔	1.333	H1-3+VT ✔
L6	30.5 - 0 (6)	0.013	1.224	0.000	0.035	0.000	1.238 ✔	1.333	H1-3+VT ✔

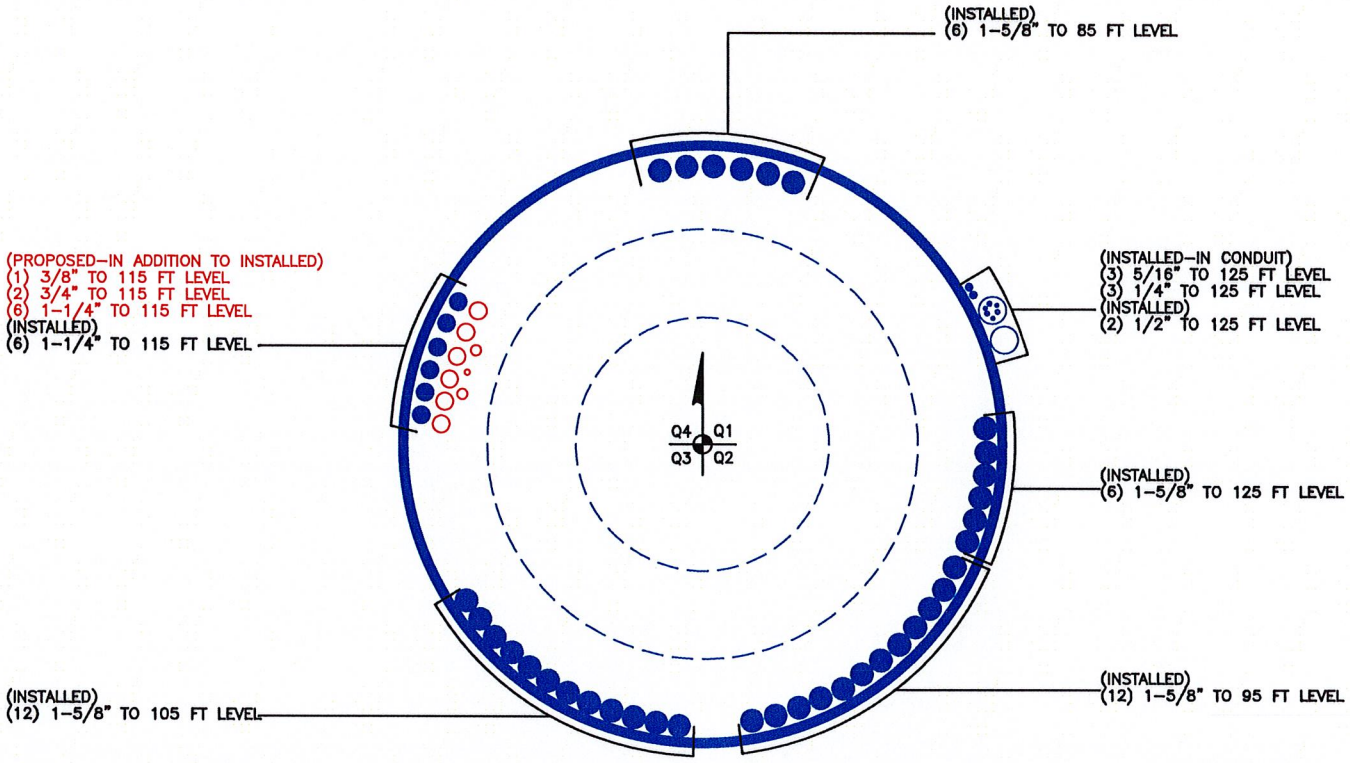
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	125 - 85.04	Pole	TP27.09x18.5x0.188	1	-8.176	806.281	90.0	Pass
L2	85.04 - 73.5	Pole	TP29.167x25.873x0.25	2	-10.501	1192.875	96.1	Pass
L3	73.5 - 60.5	Pole	TP31.93x29.167x0.313	3	-12.646	1597.760	90.6	Pass
L4	60.5 - 40.4567	Pole	TP36.18x31.93x0.378	4	-15.585	1952.578	90.0	Pass
L5	40.4567 - 30.5	Pole	TP37.787x34.346x0.432	5	-19.684	2425.167	85.1	Pass
L6	30.5 - 0	Pole	TP44.25x37.787x0.413	6	-26.905	2743.807	92.8	Pass
							Summary	
						Pole (L2)	96.1	Pass
						RATING =	**96.1**	**Pass**

Program Version 6.0.4.0 - 1/27/2012 File: 84890_001_CromwellCT_Modified.eri

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876364 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *876364*
Site Name: *Cromwell, CT*
App #: *146450; Rev# 1*

Pole Manufacturer:	*Other*

Reactions		
Moment:	2268	ft-kips
Axial:	27	kips
Shear:	24	kips

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

Anchor Rod Data		
Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	53	in

Plate Data		
Diam:	59	in
Thick:	1.75	in
Grade:	60	ksi
Single-Rod B-eff:	11.70	in

Stiffener Data (Welding at both sides)		
Config:	1	*
Weld Type:	Fillet	
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:	0.625	in
Fillet V. Weld:	0.375	in
Width:	7	in
Height:	22	in
Thick:	0.75	in
Notch:	0.75	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	44.25	in
Thick:	0.3125	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Anchor Rod Results

		Stiffened
Maximum Rod Tension:	168.9 Kips	Service, ASD
Allowable Tension:	195.0 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	86.6% **Pass**	

Base Plate Results

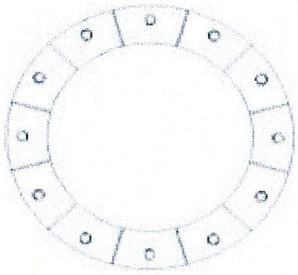
	Flexural Check	Stiffened
Base Plate Stress:	51.0 ksi	Service, ASD
Allowable Plate Stress:	60.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	85.1% **Pass**	Y.L. Length: N/A, Roark

Stiffener Results

Horizontal Weld :	75.5% **Pass**
Vertical Weld:	40.2% **Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	16.1% **Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	65.9% **Pass**
Plate Comp. (AISC Bracket):	66.3% **Pass**

Pole Results

Pole Punching Shear Check:	12.5% **Pass**



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

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

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

Site Data

BU#: *876364*
Site Name: *Cromwell, CT*
App #: *146450 Rev#1*

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

Pad & Pier Data		
Base PL Dist. Above Pier:	0	in
Pier Dist. Above Grade:	12	in
Pad Bearing Depth, D:	5	ft
Pad Thickness, T:	3	ft
Pad Width=Length, L:	24	ft
Pier Cross Section Shape:	Square	<--Pull Down
Enter Pier Side Width:	14	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	196.00	ft^2
Pier Height:	3.00	ft
Soil (above pad) Height:	2.00	ft

Soil Parameters		
Unit Weight, γ:	125.0	pcf
Ultimate Bearing Capacity, qn:	8.00	ksf
Strength Reduct. factor, ϕ:	0.75	
Angle of Friction, Φ:	30.0	degrees
Undrained Shear Strength, Cu:	0.00	ksf
Allowable Bearing: ϕ*qn:	6.00	ksf
Passive Pres. Coeff., Kp	3.00	

Forces/Moments due to Wind and Lateral Soil		
Minimum of (φ*Ultimate Pad Passive Force, Vu):	32.4	kips
Pad Force Location Above D:	1.29	ft
ϕ(Passive Pressure Moment):	41.66	ft-kips
Factored O.T. M(WL), "1.6W":	3256.2	ft-kips
Factored OT (MW-Msoil), M1	3214.54	ft-kips

Resistance due to Foundation Gravity		
Soil Wedge Projection grade, a:	1.15	ft
Sum of Soil Wedges Wt:	7.69	kips
Soil Wedges ecc, K1:	8.58	ft
Ftg+Soil above Pad wt:	442.4	kips
Unfactored (Total ftg-soil Wt):	450.09	kips
1.2D. **No Soil Wedges.**	585.45	kips
0.9D. **With Soil Wedges**	455.12	kips

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

Monopole Base Reaction Forces		
TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	15.1	kips
Unfactored WL Axial, PW:	27	kips
Unfactored WL Shear, V:	24	kips
Unfactored WL Moment, M:	2268	ft-kips

Load Factor	Shaft Factored Loads		
1.20	1.2D+1.6W, Pu:	54.57	kips
0.90	0.9D+1.6W, Pu:	50.04	kips
1.35	Vu:	32.4	kips
	Mu:	3061.8	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(**No Soil Wedges**) [Reaction+Conc+Soil]	585.45	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	3214.54	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 =	5.49	ft
Orthogonal qu=	1.95	ksf
qu/ϕ*qn Ratio=	**32.44%**	**Pass**

Diagonal Direction:

ecc2 = (0.707M1)/P1 =	3.88	ft
Diagonal qu=	2.22	ksf
qu/ϕ*qn Ratio=	**37.01%**	**Pass**

Run <-- Press Upon Completing All Input

Overturning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(**w/ Soil Wedges**) [Reaction+Conc+Soil]	455.12	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	3155.19	ft-kips

Orthogonal ecc3 = M2/P2 =	6.93	ft
Ortho Non Bearing Length,NBL=	13.87	ft
Orthogonal qu=	1.87	ksf
Diagonal qu=	2.26	ksf

Max Reaction Moment (ft-kips) so that qu=φ*qn = 100% Capacity Rating			
Actual M:	2268.00		
M Orthogonal:	3448.25	**65.77%**	**Pass**
M Diagonal:	3448.25	**65.77%**	**Pass**

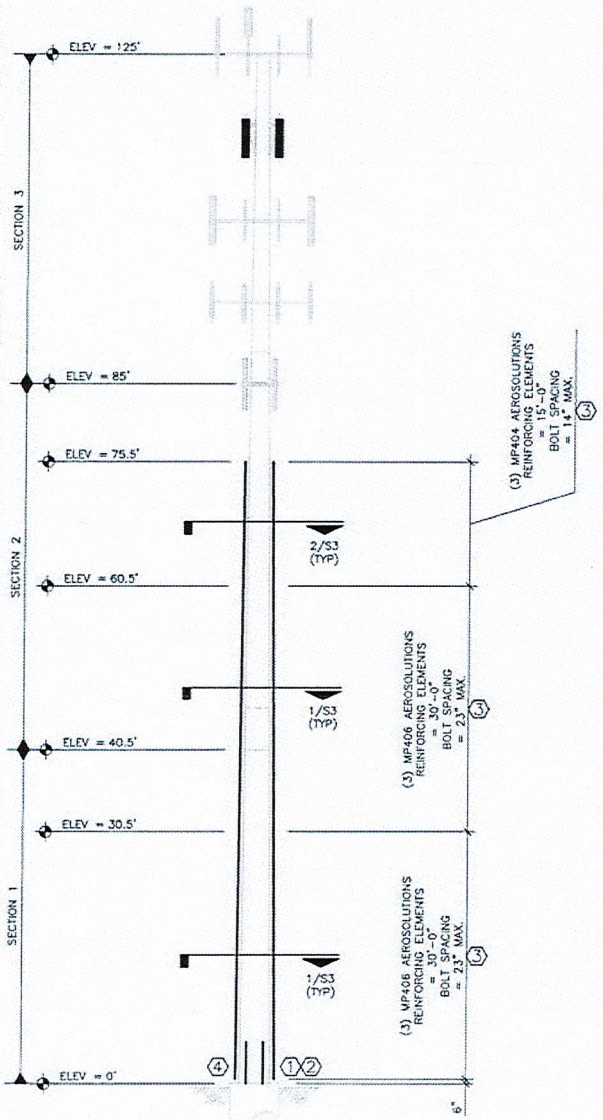
APPENDIX D

TOWER MODIFICATION DRAWINGS

MODIFICATIONS BASED ON STRUCTURAL ANALYSIS FROM B+T ENGINEERING DATED 04/20/12 AND ACCOMPANIED BY ANALYSIS FROM B+T GROUP DATED 07/11/12.

EXISTING MEMBER SCHEDULE

SECTION	NUMBER OF SIDES	THICKNESS	BOTTOM DIAMETER	TOP DIAMETER
1	18	0.313"	44.250"	34.600"
2	18	0.250"	36.180"	25.823"
3	18	0.188"	27.096"	18.500"



1 TOWER ELEVATION
SCALE: N.T.S.

TOWER MODIFICATIONS:

1. CONTRACTOR SHALL BUDGET A SITE VISIT TO CHECK CRITICAL DIMENSIONS AND VERIFY UNKNOWN CONDITIONS PRIOR TO STEEL FABRICATION.
2. THE NEW AND EXISTING TRANSMISSION MUST BE DISTRIBUTED AS SHOWN IN THE LISE DISTRIBUTION DIAGRAM RE: DETAIL 2/S1.
3. INSTALL NEW AEROSOLUTIONS REINFORCING ELEMENTS RE: SHEET S3.
4. INSTALL NEW TRANSITION STIFFENERS RE: SHEET S3.

* CONTRACTOR SHALL PROVIDE TEMPORARY BRACING FOR ALL REMOVE AND REPLACE PROCEDURES.
** MODIFICATIONS SHALL BE COMPLETED PRIOR TO ADDING THE PROPOSED APPURTENANCES.

GENERAL NOTES

1.1 ALL WORK SHALL COMPLY WITH THE TIA/EIA-222-F STANDARD AS WELL AS ANY OTHER GOVERNING BUILDING CODES.
1.2 FIELD WORK WILL BE DONE AROUND EXISTING COAXIAL CABLE AND EQUIPMENT. ALL WORK SHALL BE DONE IN A MANNER SUCH THAT NO DAMAGE OCCURS TO THE EXISTING EQUIPMENT OR THE STRUCTURE.
1.3 THE USE OF A GAS TORCH OR WELDER WILL NOT BE PERMITTED ON THE TOWER WITHOUT THE CONSENT OF THE OWNER.
1.4 ALL FIELD CONNECTIONS SHALL BE MADE WITH A325X BOLTS, U.N.O.
1.5 PREPARE ALL FIELD WELDS ACCORDING TO AWS D1.1. REMOVE EXISTING GALVANIZING IN AREAS OF FIELD WELDS PRIOR TO WELDING.
1.6 PRIOR TO INSTALLATION OF SHAFT STEEL REINFORCING, JACK SLIP JOINTS WITHIN REINFORCED TOWER SECTIONS WITH (2) 6 TON COME-A-LONGS. NOTE ANY MOVEMENT AND REPORT TO AEROSOLUTIONS FIELD PERSONNEL.
1.7 PRIOR TO CONSTRUCTION, CONTRACTOR SHALL NUMBER ALL FLATS WITH PERMANENT MARKER. NUMBERING MUST BE INSPECTED AND APPROVED BY AEROSOLUTIONS FIELD PERSONNEL.
1.8 ONCE ALL CONSTRUCTION HAS BEEN COMPLETED, ANY AND ALL DAMAGED AREAS OF GALVANIZING SHALL BE TOUCHED UP WITH A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
1.9 CONTRACTOR SHALL COMPLY WITH, COOPERATE WITH, AND FOLLOW THE INSTRUCTIONS OF THE AEROSOLUTIONS FIELD PERSONNEL.
1.10 ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CCUSA POLICY "CUTTING AND WELDING PLAN" (DOC #ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.

FABRICATION

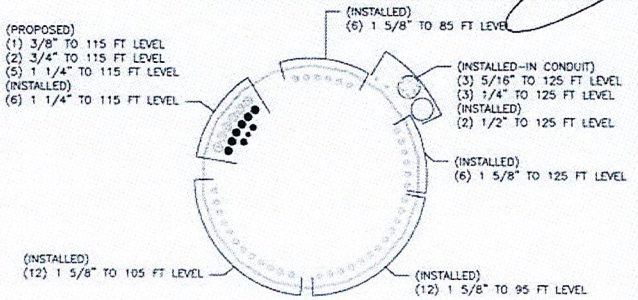
2.1 ALL WORK SHALL BE DONE IN ACCORDANCE WITH A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.
2.2 STRUCTURAL STEEL SHALL MEET THE FOLLOWING SPECIFICATIONS:

	YIELD	ASTM SPECS
A. STEEL SHAPES AND PLATES, U.N.O.	65ksi	A572
B. SHIM PLATES	36ksi	A36

2.3 ALL NEW MATERIAL INCLUDING STRUCTURAL STEEL AND FASTENERS SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 AND A153.
2.4 WELDING SHALL MEET ANSI/AWS D1.1 STRUCTURAL WELDING CODE (LATEST REVISION). ELECTRODES SHALL BE E80 SERIES.
2.5 CONTRACTOR SHALL PROVIDE SHOP FABRICATION DRAWINGS TO B+T GROUP 2 WEEKS PRIOR TO FABRICATION.

KEY NOTES

(#) TOWER MODIFICATION I.D.



2 TX LINE DISTRIBUTION DIAGRAM
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH (918) 587-4630
www.btgrp.com

AeroSolutions LLC
Optimizing Your Tower Infrastructure

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/11/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	84890.001
PROJECT ENG:	SACHIN CHOUGULE
DRAWN BY:	VAT
CHECKED BY:	SSV

B+T ENGINEERING, INC.

7/11/12

CROMWELL / FIRST LINE EMERGENCY
876364
201 MAIN ST.,
CROMWELL, CT
EXISTING 125' MONOPOLE

SHEET TITLE
TOWER ELEV., SCHEDULES, TX LINE DIST. DIAGRAM AND GENERAL NOTES

SHEET NUMBER:	REVISION:
S1	0

MI CHECKLIST

REQUIRED	REPORT ITEM	BRIEF DESCRIPTION
		PRE-CONSTRUCTION
X	MI CHECKLIST DRAWING	THIS CHECKLIST SHALL BE INCLUDED IN THE MI REPORT.
X	EOR APPROVED SHOP DRAWINGS	FABRICATION DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW. THE CONTRACTOR SHALL PROVIDE APPROVED SHOP DRAWINGS TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATION INSPECTION	A LETTER FROM THE FABRICATOR, STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THE CONTRACT DOCUMENTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR CERTIFIED WELD INSPECTION	A VISUAL OBSERVATION BY A CWI OF A PORTION OF WELDING ON THE PROPOSED STRUCTURAL MEMBERS IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	MATERIAL TEST REPORT (MTR)	MILL CERTIFICATION SHALL BE PROVIDED FOR ALL STEEL AS SPECIFIED IN THE MODIFICATION DRAWINGS AND THIS DOCUMENTATION SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FABRICATOR NDE INSPECTION	CRITICAL SHOP WELDS THAT REQUIRE TESTING (PER ENG-STD-10069) ARE NOTED ON THESE CONTRACT DRAWINGS. A CERTIFIED WELD INSPECTOR SHALL PERFORM NON-DESTRUCTIVE EXAMINATION AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	NDE REPORT OF MONOPOLE BASE PLATE	A NDE (PER ENG-SOW-10033) OF THE POLE TO BASE PLATE CONNECTION IS REQUIRED AND A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PACKING SLIPS	THE MATERIAL SHIPPING LIST SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
		CONSTRUCTION
X	CONSTRUCTION INSPECTIONS	A LETTER FROM THE GENERAL CONTRACTOR STATING THAT THE WORKMANSHIP WAS PERFORMED IN ACCORDANCE WITH INDUSTRY STANDARDS AND THESE CONTRACT DRAWINGS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	FOUNDATION INSPECTIONS	A VISUAL OBSERVATION OF THE EXCAVATION AND REBAR SHALL BE PERFORMED BEFORE PLACING THE CONCRETE. A WRITTEN REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	CONCRETE COMP. STRENGTH AND SLUMP TESTS	THE CONCRETE MIX DESIGN, SLUMP TEST, AND COMPRESSIVE STRENGTH TESTS SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	POST INSTALLED ANCHOR ROD VERIFICATION	POST INSTALLED ANCHOR ROD VERIFICATION SHALL BE PERFORMED IN ACCORDANCE WITH CROWN REQUIREMENTS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	BASE PLATE GROUT VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR THAT CERTIFIES THAT THE GROUT WAS INSTALLED IN ACCORDANCE WITH CROWN ENG-PRC-10012 FOR INCLUSION IN THE MI REPORT.
X	CONTRACTOR'S CERTIFIED WELD INSPECTION	A CERTIFIED WELD INSPECTOR SHALL INSPECT AND TEST AS NECESSARY ALL FIELD WELDS AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
N/A	EARTHWORK: LIFT AND DENSITY	FOUNDATION SUB-GRADES SHALL BE INSPECTED AND APPROVED BY A GEOTECHNICAL ENGINEER AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	ON SITE COLD GALVANIZING VERIFICATION	THE GENERAL CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE MI INSPECTOR VERIFYING THAT ANY ON-SITE COLD GALVANIZING WAS APPLIED IN ACCORDANCE WITH ENG-BUL-10149.
N/A	GUY WIRE TENSION REPORT	THE GENERAL CONTRACTOR SHALL PROVIDE A REPORT TO THE MI INSPECTOR INDICATING THE TEMPERATURE AND TENSION IN EVERY GUY CABLE AS PART OF PLUMB AND TENSION PROCEDURE FOR INCLUSION IN THE MI REPORT.
X	GC AS-BUILT DOCUMENTS	THE GENERAL CONTRACTOR SHALL SUBMIT A COPY OF THE CONTRACT DRAWINGS EITHER STATING "INSTALLED AS DESIGNED" OR NOTING ANY CHANGES THAT WERE REQUIRED AND APPROVED BY THE ENGINEER OF RECORD DUE TO FIELD CONDITIONS.
		POST-CONSTRUCTION
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)	THE MI INSPECTOR SHALL OBSERVE AND REPORT ANY DISCREPANCIES BETWEEN THE CONTRACTORS REDLINE DRAWING AND THE ACTUAL COMPLETED INSTALLATION.
N/A	POST INSTALLED ANCHOR ROD PULL-OUT TESTING	POST-INSTALLED ANCHOR RODS SHALL BE TESTED IN ACCORDANCE WITH ENG-PRC-10119 AND A REPORT SHALL BE PROVIDED TO THE MI INSPECTOR FOR INCLUSION IN THE MI REPORT.
X	PHOTOGRAPHS	PHOTOGRAPHS SHALL BE SUBMITTED TO THE MI WHICH DOCUMENT ALL PHASES OF THE CONSTRUCTION. THE PHOTOS SHALL BE ORGANIZED IN A MANNER THAT EASILY IDENTIFIES THE EXACT LOCATION OF THE PHOTO.
ADDITIONAL TESTING AND INSPECTIONS:		

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE MI REPORT
N/A DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE MI REPORT

MODIFICATION INSPECTION NOTES:

GENERAL

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE MI INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AND ENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLY 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS.
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MI'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

REQUIRED PHOTOS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
  - RAW MATERIALS
  - PHOTOS OF ALL CRITICAL DETAILS
  - FOUNDATION MODIFICATIONS
  - WELD PREPARATION
  - BOLT INSTALLATION AND TORQUE
  - FINAL INSTALLED CONDITION
  - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
  - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH. (918) 587-4630
www.btgrp.com

AeroSolutions LLC
Optimizing Your Tower Infrastructure

CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/11/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	84890.001
PROJECT ENG:	SACHIN CHOUGULE
DRAWN BY:	VAT
CHECKED BY:	SSV

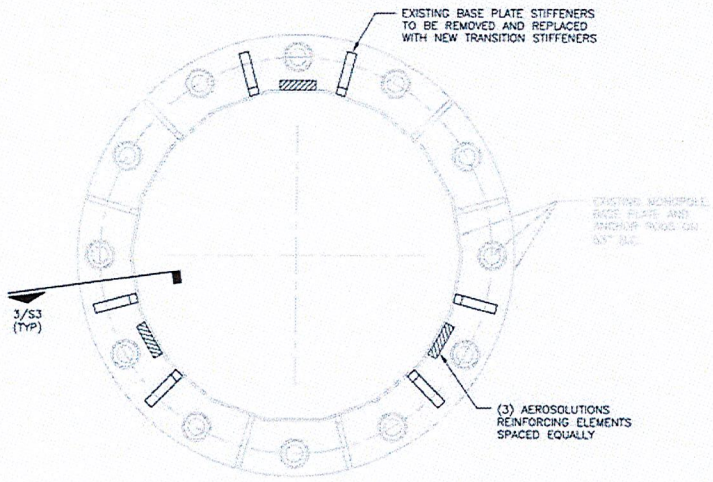
B+T ENGINEERING, INC.

7/11/12

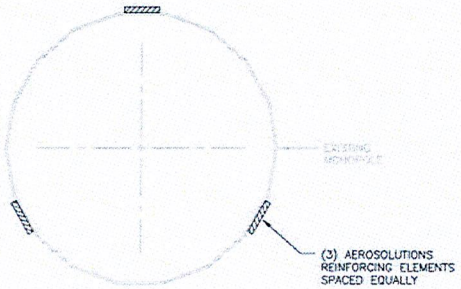
CROMWELL / FIRST LINE EMERGENCY
876364
201 MAIN ST.
CROMWELL, CT
EXISTING 125' MONOPOLE

SHEET TITLE
MODIFICATION INSPECTION NOTES AND CHECKLIST

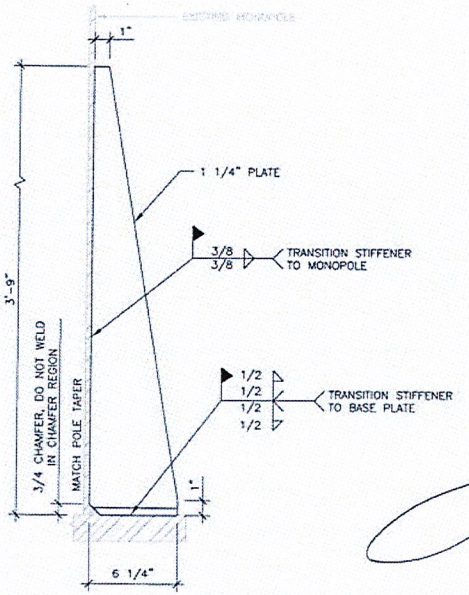
SHEET NUMBER:	REVISION:
S2	0



1 TOWER SECTION (0'-60.5')
SCALE: N.T.S.



2 TOWER SECTION (60.5'-75.5')
SCALE: N.T.S.



3 TRANSITION STIFFENER DETAIL
SCALE: N.T.S.

B+T GRP
1717 S. BOULDER
SUITE 300
TULSA, OK 74119
PH (918) 587-4630
www.btgrp.com

AeroSolutions LLC
Optimizing Your Tower Infrastructure

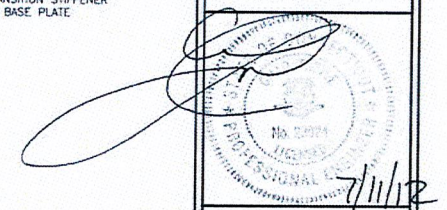
CROWN CASTLE

ISSUED FOR:

REV	DATE	DESCRIPTION
0	07/11/12	ISSUED FOR CONSTRUCTION

PROJECT NO:	84890.001
PROJECT ENG:	SACHIN CHOUGULE
DRAWN BY:	VAT
CHECKED BY:	SSV

B+T ENGINEERING, INC.



CROMWELL / FIRST LINE EMERGENCY
876364
201 MAIN ST.,
CROMWELL, CT
EXISTING 125' MONOPOLE

SHEET TITLE
TOWER SECTIONS
0'-60.5' , 60.5'-75.5' AND
STIFFENER DETAIL

SHEET NUMBER:	REVISION:
S3	0

EM-CING-033-120713

ORIGINAL

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

July 12, 2012

RECEIVED
JUL 13 2012
CONNECTICUT
SITING COUNCIL

VIA OVERNIGHT COURIER

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

Re: New Cingular Wireless PCS, LLC – exempt modification
201 Main Street, Cromwell, 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 Section 16-50j-73 of the Regulations of Connecticut State Agencies ("R.S.C.A."), 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 First Selectman of the Town of Cromwell.

AT&T plans to modify the existing wireless communications facility owned by Crown Castle, which is located at 201 Main Street, Cromwell (coordinates 41°-35'-00.1" N, 72°-38'-59.4" 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, subject to modifications detailed in the attached structural documentation. 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 remove the three existing antennas, and will install T-arms with three antennas per sector at a center line of approximately 117'. Six (6) RRUs (remote radio units) will be mounted directly behind the antennas, and a surge arrestor will be mounted to the platform on a new pipe mount. AT&T will also place a DC power and fiber run

from the equipment to the antennas along the existing coaxial cable run. The changes will not extend the height of the approximately 125' structure.

2. AT&T will remove and replace one (1) cabinet and add one (1) cabinet on the existing concrete pad. A new GPS antenna will be mounted to the existing ice bridge. 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 (6) decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by C Squared Systems, LLC, AT&T's operations at the site will result in a power density of approximately 3.85%; the combined site operations will result in a total power density of approximately 49.10%.

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

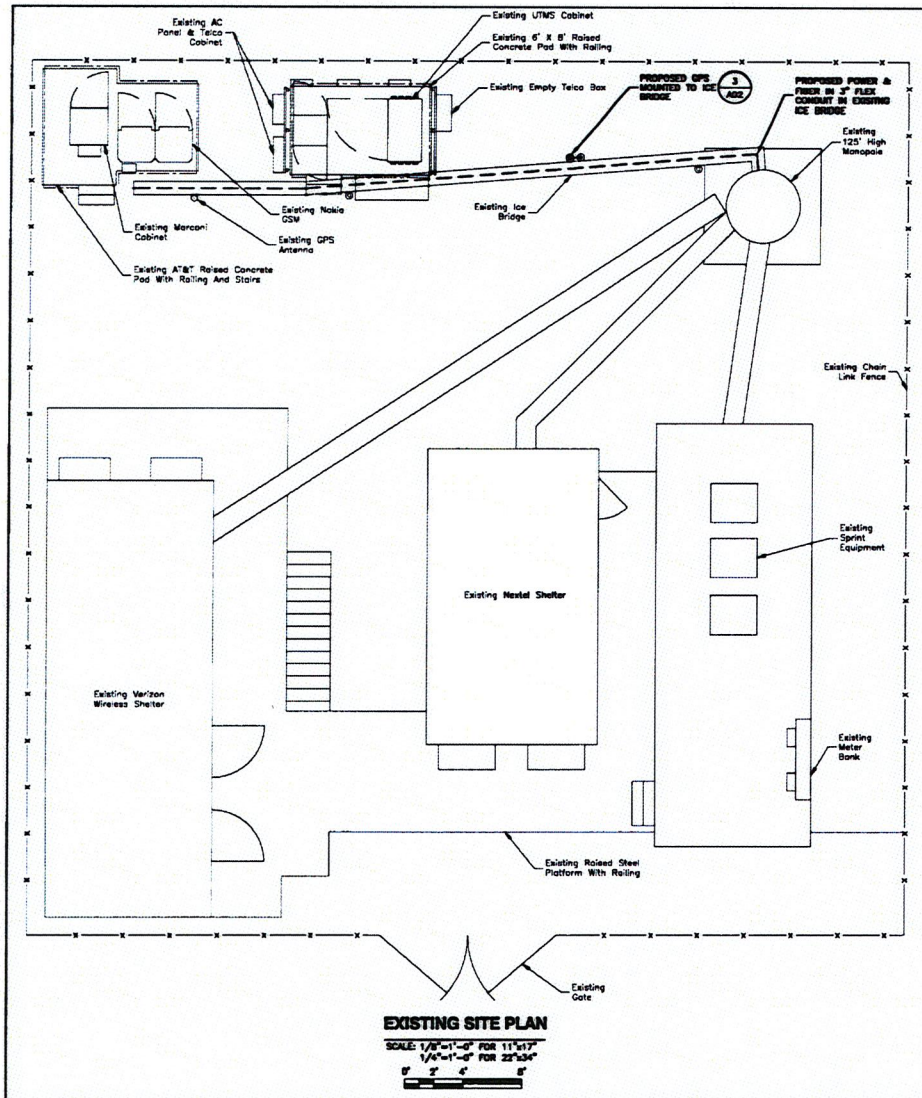
Respectfully yours,

Jennifer Young Gaudet

Jennifer Young Gaudet

Attachments

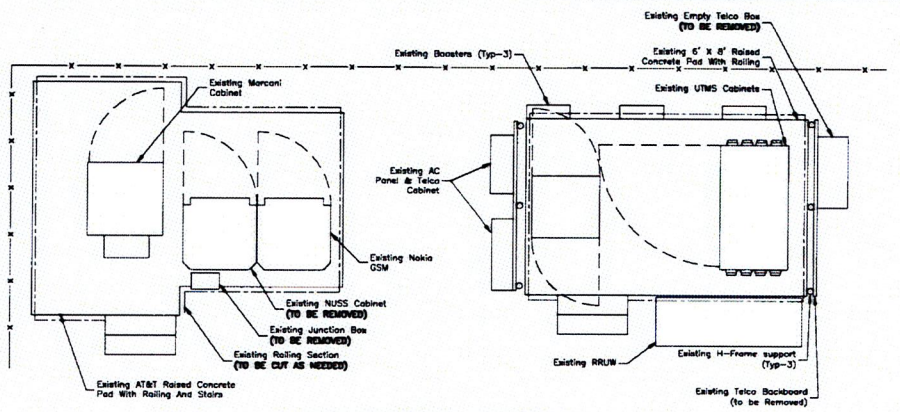
cc: Honorable Mertie Terry, First Selectman, Town of Cromwell
S&S Partners, Inc. (underlying property owner)



EXISTING SITE PLAN

SCALE: 1/8"=1'-0" FOR 11"x17"
1/4"=1'-0" FOR 22"x34"

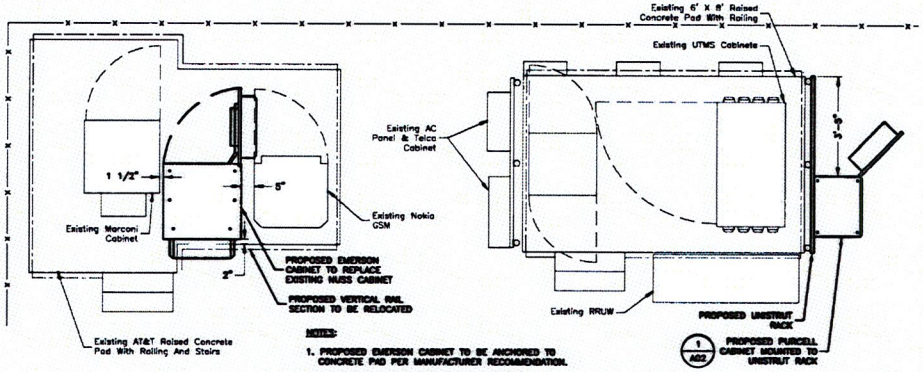
0' 2' 4' 8'



EXISTING EQUIPMENT PLAN

SCALE: 1/4"=1'-0" FOR 11"x17"
1/2"=1'-0" FOR 22"x34"

0' 1' 2' 4'



NOTES:

1. PROPOSED EMERSON CABINET TO BE ANCHORED TO CONCRETE PAD PER MANUFACTURER RECOMMENDATION.
2. EXISTING RAILING SECTION BEHIND PROPOSED EMERSON CABINET IS TO BE CUT AS NEEDED. REUSE EXISTING RAILING & FIELD WELD VERTICAL POST TO EXISTING RAILING. REPAINT RAILING PER NOTE 1 UNDER STRUCTURAL STEEL NOTES.

PROPOSED EQUIPMENT PLAN

SCALE: 1/4"=1'-0" FOR 11"x17"
1/2"=1'-0" FOR 22"x34"

0' 1' 2' 4'

Dewberry
Dewberry Engineers Inc.
920 PASSAIC AVENUE
SUITE 201
PASSAIC, NJ 07055
PHONE: 973.739.0400
FAX: 973.739.0710

NEXLINK GLOBAL SERVICES
600 MARSHALL PHELPS ROAD, #3A
WINDSOR, CT 06095

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

SITE NAME: CROMWELL SE
SITE NO.: CT5272
201 MAIN STREET
CROMWELL, CT 06416
CROWN CASTLE #876364

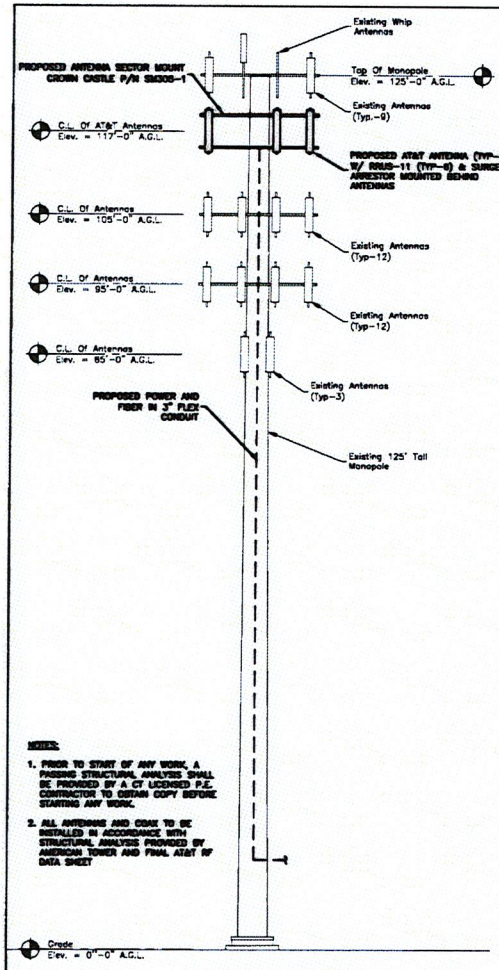
NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/25/12	ISSUED FOR SUBMITTAL	JRF	GMN	GMN
0	04/17/12	PRELIMINARY SUBMISSION	JRF	GMN	GMN

SCALE: AS SHOWN | DESIGNED BY: GMN | DRAWN BY: JRF

STATE OF CONNECTICUT
FRANK E. PAZDON
No. 25188
LICENSED PROFESSIONAL ENGINEER

SITE PLAN & SHELTER LAYOUT

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50048388	A01	1



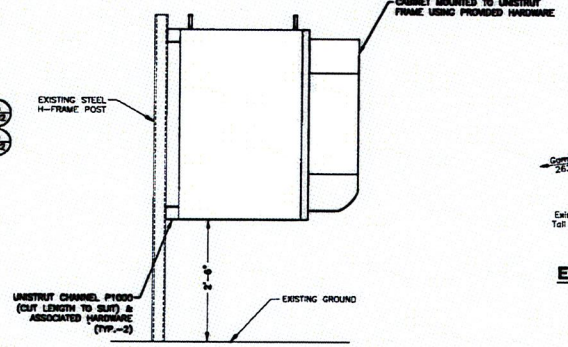
PROPOSED ELEVATION

SCALE: 1"=200' FOR 11"x17"
1"=100' FOR 22"x34"

0' 100' 200'

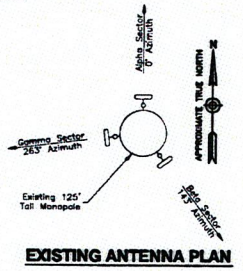
NOTES:

1. PRIOR TO START OF ANY WORK, A PASSING STRUCTURAL ANALYSIS SHALL BE PROVIDED BY A CT LICENSED P.E. CONTRACTOR TO OBTAIN COPY BEFORE STARTING ANY WORK.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY AMERICAN TOWER AND FINAL AT&T RF DATA SHEET

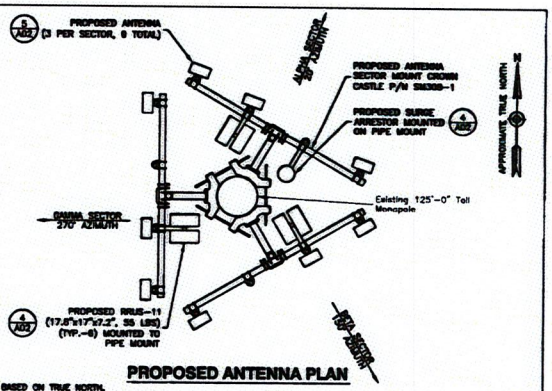


PURCELL CABINET MOUNTING DETAIL 1

SCALE: N.T.S.



EXISTING ANTENNA PLAN



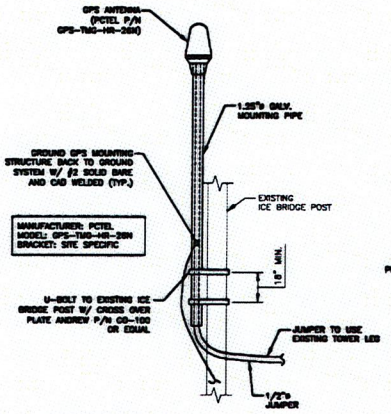
PROPOSED ANTENNA PLAN

NOTE:

1. AZIMUTHS BASED ON TRUE NORTH.

PLATFORM ANTENNA ORIENTATION 2

SCALE: N.T.S.

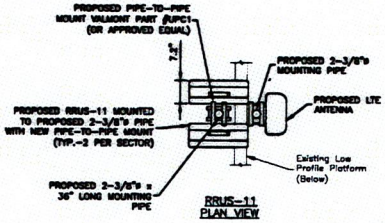


GPS ANTENNA NOTES:

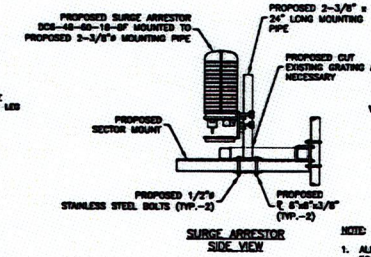
1. GROUND ANTENNAS AND MOUNTS PER MANUFACTURERS RECOMMENDATIONS AND AT&T STANDARDS.
2. FIELD LOCATE GPS ANTENNA A MINIMUM OF 10 FEET HORIZONTALLY FROM EXISTING GPS ANTENNA WITH AT&T CM APPROVAL.

GPS ANTENNA MOUNT 3

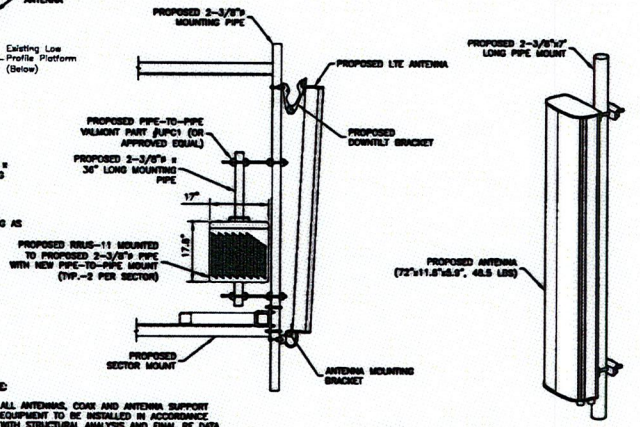
SCALE: N.T.S.



RRUS-11 PLAN VIEW



SURGE ARRESTOR SIDE VIEW



NOTE:

1. ALL ANTENNAS, COAX AND ANTENNA SUPPORT EQUIPMENT TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS AND FINAL RF DATA SHEET.

RRUS-11 AND SURGE ARRESTOR MOUNTING DETAIL 4

SCALE: N.T.S.

NOTE:

1. PLEASE SEE RFDS FOR SPECIFIC ANTENNA MODEL.

ISOMETRIC ANTENNA DETAIL 5

SCALE: N.T.S.

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 204
PARSIPPANY, NJ 07054
PHONE: 973.739.0100
FAX: 973.739.0710

NEXLINK GLOBAL SERVICES
600 MARSHALL PHELPS ROAD, #3A
WINDSOR, CT 06095

SITE NAME: CROMWELL SE
SITE NO.: CT5272
201 MAIN STREET
CROMWELL, CT 06416
CROWN CASTLE #876364

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	04/25/12	ISSUED FOR SUBMITTAL	JAF	GMN	GMN
0	04/17/12	PRELIMINARY SUBMISSION	JAF	GMN	GMN

SCALE: AS SHOWN | DESIGNED BY: GMN | DRAWN BY: JAF

STATE OF CONNECTICUT
FRANK E. PASSEN
No. 21180
LICENSED PROFESSIONAL ENGINEER

ELEVATION & CONSTRUCTION DETAILS

DEWBERRY NO.	DRAWING NUMBER	REV
50048347/50048388	A02	1

July 11, 2012

Mr. Jim Donahue
Crown Castle
500 West Cummings Park, Ste 3600
Woburn, MA 01801
(781) 771-1111

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
(918) 587-4630
ctuttle@btgrp.com

Subject:	**Structural Modification Report**	
Carrier Designation:	***AT&T Mobility* Co-Locate**	
	Carrier Site Number:	CT5272
	Carrier Site Name:	AWE-Cromwell SE
Crown Castle Designation:	**Crown Castle BU Number:**	876364
	Crown Castle Site Name:	Cromwell / First Line Emergency
	Crown Castle JDE Job Number:	184181
	Crown Castle Application Number:	146450 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	84890.001
Site Data:	**201 Main St., Cromwell, CT, Middlesex County**	
	Latitude *41° 35' 0.11"*, Longitude *-72° 38' 59.14"*	
	125 Foot - Monopole	

Dear Mr. Donahue,

B+T Group is pleased to submit this **"Structural Modification 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', in accordance with application 146450, 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:

LC4: TSA specified load case with proposed modification. **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code requirements based upon a wind speed of 80 mph fastest mile.

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

We at *B+T 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:

Sachin S. Chougule
Project Engineer

Chad E. Tuttle, P.E.
President

No. 23024 LICENSED PROFESSIONAL ENGINEER

7/11/12

tnxTower Report - version 6.0.4.0

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1) INTRODUCTION

This tower is a 125 ft. Monopole designed by Engineered Endeavors, Inc. in February of 2002. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. The tower has been modified per reinforcement drawings prepared by Semaan Engineering Solutions, in December of 2004. Reinforcement consists of addition of baseplate stiffeners. The tower was later reinforced per reinforcement drawings prepared by Vertical Structures Inc., in October of 2007. Reinforcement consists of re-welding the baseplate stiffeners and the foundation modification. All modifications were incorporated 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 80 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
115.0	117.0	6	Communication Components Inc.	DTMABP7819VG12A	6 2 1	1 1/4 3/4 3/8	--
		6	Ericsson	RRUS-11			
		9	KMW Communications	AM-X-CD-16-65-00T-RET			
		1	Raycap	DC6-48-60-18-8F			
		1	--	Pipe Mount [PM 601-3]			
	115.0	1	--	Sector Mount [SM 308-3]			

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
125.0	129.0	3	Argus Technologies	LLPX310R-V1	6 3 3 2	1 5/8 5/16 1/4 1/2	1
		3	Samsung Telecommunications	WIMAX DAP HEAD			
	127.0	6	Decibel	DB980H90A-M			
	125.0	9(MLA)	Sprint MLA	SPRINT MLA_ANTENNA	9(MLA)	1 5/8	2
		1	--	Platform Mount [LP 712-1]	--	--	1
	124.0	1	Andrew	VHLP2-11			
		1	Andrew	VHLP2-18			
115.0	115.0	**3**	**Powerwave Technologies**	**7770.00**	--	--	**3**
		6	**Powerwave Technologies**	**LGP21401**			
		1	**--**	**Side Arm [SO 309-3]**			
		--	--	--	6	1 1/4	1

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
105.0	105.0	2	ADC	DUAL BAND 800/1900 FULL BAND MASTHEAD	12	1 5/8	1
		6	Decibel	DB948F85T2E-M			
		2	Decibel	DB844G65ZAXY			
		4	Andrew	DB846F65ZAXY			
		1	--	Platform Mount [LP 712-1]			
95.0	95.0	12	Decibel	DB844H65E-XY	12	1 5/8	1
		1	--	Platform Mount [LP 303-1]			
85.0	85.0	3	Kathrein	742 213	6	1 5/8	1

Notes:
1) Existing Equipment
2) MLA Equipment; Not Considered in This Analysis
3) **Equipment To Be Removed**

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
125	125	1	--	L.P. Platform	--	--
		6	Decibel	DB980H65		
		3	Decibel	DB980H90		
115	115	1	--	T-Arm	--	--
		6	Allgon	7250		
105	105	1	--	L.P. Platform	--	--
		12	Decibel	DB844		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	AT&T Mobility Co-Location Revision#1	146450	CCI Sites
Tower Manufacturer Drawings	EEI Job No.10554	2068958	CCI Sites
Structural Analysis	Crown Castle Project: 320820	2608627	CCI Sites
Tower Reinforcement Drawings	Semaan Engineering Solutions	2055765	CCI Sites
Post-Modification Inspection	VSI Job No. 2008-004-036	2182292	CCI Sites
Foundation Drawings	EEI Project No.6464	1613909	CCI Sites
Geotechnical Reports	Dr. Clarence Welti, P.E.	1532312	CCI Sites
Antenna Configuration	Crown CAD Package	Date:4/9/2012	CCI Sites

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 areas and weights are assumed based on photographs provided.

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

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Calculated Radio Frequency Emissions

at&t

CT5272 AWE-Cromwell SE

201 Main Street, Cromwell, CT 06416

July 9, 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 monopole tower located at 201 Main Street in Cromwell, CT. The coordinates of the tower are 41° 35' 0.11" N, 72° 38' 59.14" W.

AT&T is proposing the following modifications:

1) Replace three dual-band (850/1900 MHz) panel antennas with nine multi-band (700/850/1900/2100 MHz) panel antennas

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 GSM	*115*	*1900*	*3*	*655*	*0.0534*	*1.0000*	*5.34%*
Cingular UMTS	*115*	*880*	*1*	*500*	*0.0136*	*0.5867*	*2.32%*
Sprint	125	1962.5			0.0309	1.0000	3.09%
Clearwire	125	2496	2	153	0.0070	1.0000	0.70%
Clearwire	121	11 GHz	1	211	0.0052	1.0000	0.52%
Pocket	85	2130	3	631	0.0942	1.0000	9.42%
Verizon	105	869	9	405	0.1189	0.5793	20.52%
Verizon	105	1970	3	312	0.0305	1.0000	3.05%
Nextel	95	851	12	100	0.0478	0.5673	8.43%
AT&T UMTS	117	880	2	982	0.0052	0.5867	0.88%
AT&T UMTS	117	1900	2	1355	0.0071	1.0000	0.71%
AT&T LTE	117	734	1	1313	0.0034	0.4893	0.70%
AT&T GSM	117	880	1	491	0.0013	0.5867	0.22%
AT&T GSM	117	1900	4	813	0.0085	1.0000	0.85%
						Total	**49.10%**

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 B+T Group Structural Analysis Report dated April 20, 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 **49.10% 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

July 9, 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

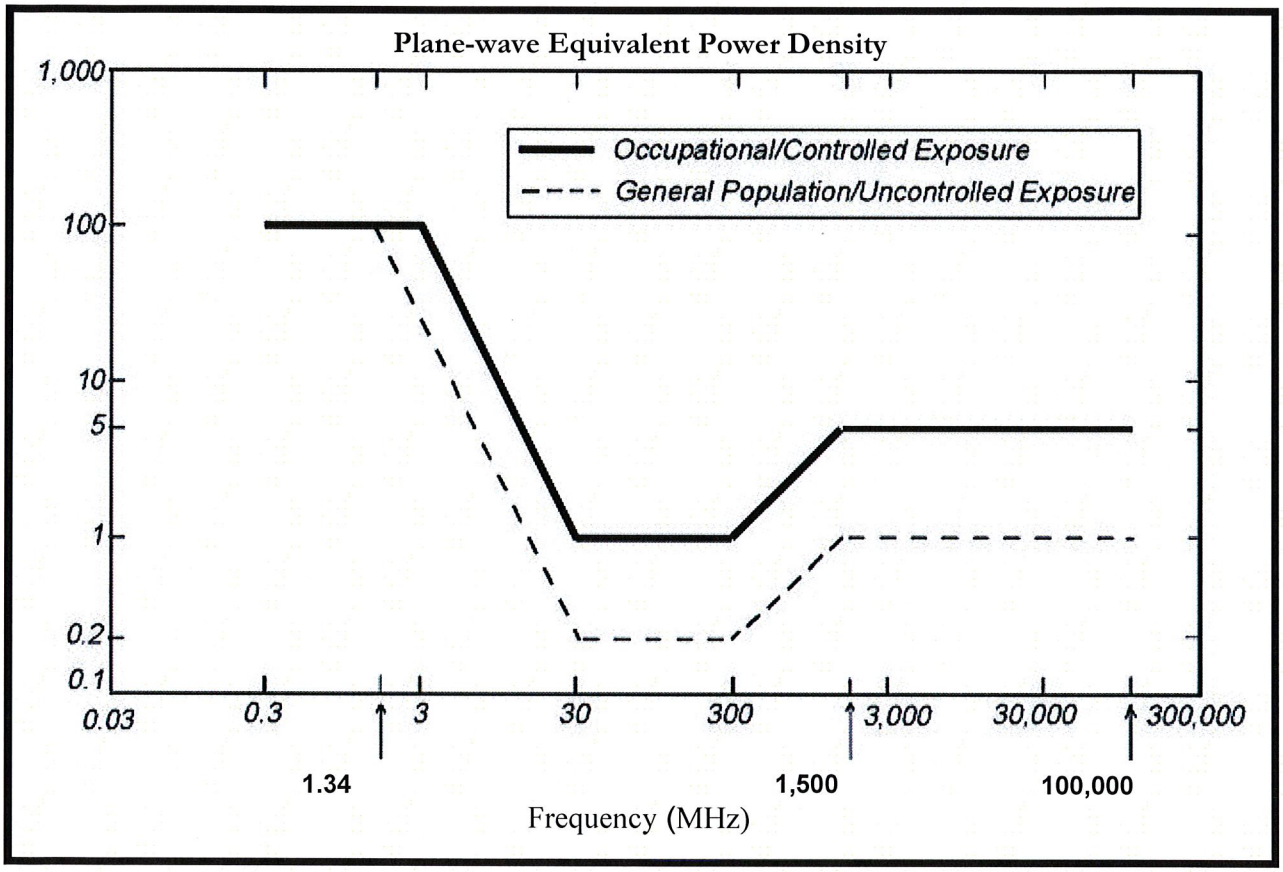
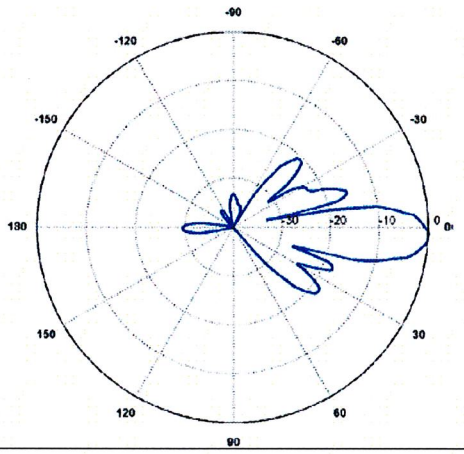


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

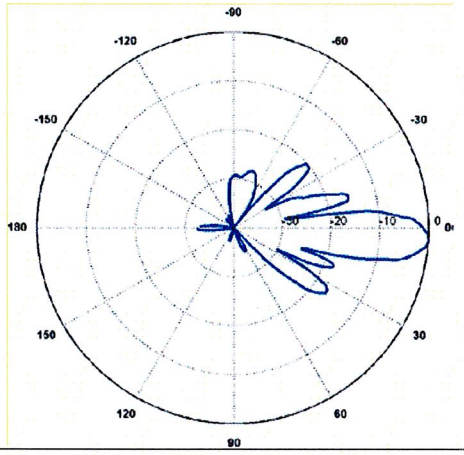
700 MHz

Manufacturer:	KMW Communications
Model #:	AM-X-CD-16-65-00T
Frequency Band:	698-806 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	12.3°
Horizontal Beamwidth:	65°
Polarization:	± 45°
Size L x W x D:	72" x 11.8" x 5.9"



850 MHz

Manufacturer:	KMW Communications
Model #:	AM-X-CD-16-65-00T
Frequency Band:	824-894 MHz
Gain:	13.9 dBd
Vertical Beamwidth:	11.5°
Horizontal Beamwidth:	63°
Polarization:	± 45°
Size L x W x D:	72" x 11.8" x 5.9"



1900 MHz

Manufacturer:	KMW Communications
Model #:	AM-X-CD-16-65-00T
Frequency Band:	1850-1900 MHz
Gain:	15.3 dBd
Vertical Beamwidth:	6.0°
Horizontal Beamwidth:	67°
Polarization:	± 45°
Size L x W x D:	72" x 11.8" x 5.9"