



# 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](mailto:siting.council@ct.gov)

Internet: [ct.gov/csc](http://ct.gov/csc)

Daniel F. Caruso

Chairman

May 11, 2009

Thomas J. Regan, Esq.  
Brown Rudnick LLP  
CityPlace I, 185 Asylum Street  
Hartford, CT 06103

RE: **EM-T-MOBILE-052-090406** - Omnipoint Communications, as subsidiary of T-Mobile USA, Inc., notice of intent to modify an existing telecommunications facility located at 130 Birdseye Road, Farmington, Connecticut.

Dear Attorney Regan:

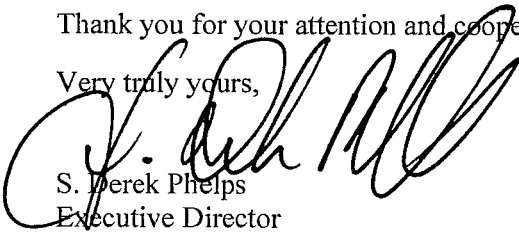
The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated April 6, 2009, including the placement of all necessary equipment and shelters within the tower compound. 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 with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

  
S. Derek Phelps  
Executive Director

SDP/MP/laf

c: The Honorable Mike Clark, Chairman Town Council, Town of Farmington  
Kathleen Eagen (via e-mail service), Town Manager, Town of Farmington  
Jeffrey Ollendorf (via e-mail service), Town Planner, Town of Farmington  
Crown Castle USA, Inc.



CONNECTICUT SITING COUNCIL  
Affirmative Action / Equal Opportunity Employer

C

**EM-T-MOBILE-052-090406**

In re:

T-Mobile USA, Inc. Notice to Make an Exempt : **EXEMPT MODIFICATION NO.** \_\_\_\_\_  
Modification to an Existing Facility at 130 :  
Birdseye Road, Farmington, Connecticut. : April 6, 2009

ORIGINAL

RECEIVED  
APR - 6 2009

NOTICE OF EXEMPT MODIFICATION CONNECTICUT  
SITING COUNCIL

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc. (“T-Mobile”) hereby gives notice to the Connecticut Siting Council (“Council”) and the Town of Farmington of T-Mobile’s intent to make an exempt modification to an existing monopole (the “Tower”) located at 130 Birdseye Road in Farmington, Connecticut. Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System (“UMTS”). UMTS is a third-generation (“3G”) technology that utilizes a code division multiple access (“CDMA”) base that allows for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

Once the UMTS upgrade is complete, T-Mobile will operate on a more unified communication system, allowing international wireless telephones to function world-wide. Furthermore, UMTS will enhance Global Positioning System (“GPS”) navigation capabilities and provide emergency responders with more advanced tracking capabilities. The proposed UMTS technology is compatible with the existing second-generation (“2G”) Global System for Mobile Communication (“GSM”) currently on the Tower and the proposed upgrade is expected to enhance the existing 2G system. In order to accomplish the upgrade at this site, T-Mobile

plans to add UMTS technology, update GSM technology and install associated electronic equipment at the base of the Tower.

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), T-Mobile's plans do not constitute a modification subject to the Council's review because T-Mobile will not change the height of the Tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

The Tower is a 140-foot monopole located at 130 Birdseye Road in Farmington, Connecticut (41° 42' 56.58", -72° 48' 39.08"). There are multiple carriers on the Tower. The Tower is owned by Crown Castle International. Currently, T-Mobile has 3 antennas and 6 Tower Mounted Amplifiers ("TMA") located on the Tower with a centerline of 100 feet. A site plan with Tower specifications is attached.

T-Mobile plans to remove and replace its 3 existing antennas and remove and replace its 6 existing TMA on the Tower. The 3 existing antenna will be replaced with 3 Quad Pole antennas that will include UMTS and GSM technology on the same antenna. T-Mobile plans to remove and replace its 6 existing TMA with 6 Twin TMA. The replaced TMA will include 3 new GSM Twin TMA and 3 UMTS Twin TMA. The replaced antennas and TMA will have the same centerline as the existing antennas and TMA – 100 feet. To confirm the Tower can support these changes, T-Mobile commissioned B&T Engineering, Inc. to perform a structural analysis of the Tower (attached). According to the structural analysis, dated March 19, 2009, "the tower stress level for the structure and foundation, under the following load case, to be: LC1: Existing + Reserved + Proposed Equipment - sufficient capacity" (Page 1, Structural Analysis Report).

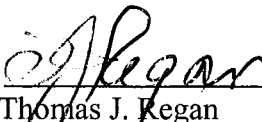
In addition, T-Mobile proposes to locate 6, 7/8 inch coax cables under the existing ice bridge. The existing ice bridge connects the proposed UMTS equipment cabinet and the proposed antennas. T-Mobile also proposes to install the UMTS equipment cabinet on its existing 5-foot by 12-foot (approximately) concrete pad. Hence, no increase in the size of the concrete pad is necessary. T-Mobile proposes to install electric wiring that will run inside the existing conduit from the existing meter to the proposed UMTS equipment cabinet. T-Mobile also proposes to run telephone wiring inside the existing underground conduit to the existing power protection cabinet.

Therefore, excluding brief, minor, construction-related noise during the addition of the antennas and the installation of the equipment cabinet, T-Mobile's changes to the Tower will not increase noise levels at the site.

The proposed antennas and TMA will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). The worst-case power density analysis measured at the base of the Tower indicates that T-Mobile's antennas will emit 12.89% of the NCRP's standard for maximum permissible exposure. A cumulative power density analysis indicates that together, all of the antennas on the Tower will emit only 34.82% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, T-Mobile's proposed plan to remove and replace 3 existing antennas and remove and replace 6 existing TMA at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

T-Mobile USA, Inc.

By:   
Thomas J. Regan  
Brown Rudnick LLP  
185 Asylum Street, CityPlace I  
Hartford, CT 06103-3402  
Email - [tregan@brownrudnick.com](mailto:tregan@brownrudnick.com)  
Phone - 860.509.6522  
Fax - 860.509.6622

**Certificate of Service**

This is to certify that on this 6<sup>th</sup> day of April, 2009, the foregoing Notice of Exempt

Modification was sent, via first class mail, to the following:

Town of Farmington  
Chairman Michael Clark  
Town Council  
One Monteith Drive  
Farmington, CT 06032

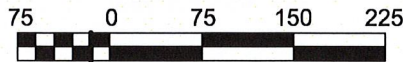
By:   
Thomas J. Regan

# 40258209 v1 - 025064/0016



**SITE PLAN**

SCALE: 1"=150'-0"



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

**TRANSCEND WIRELESS, LLC**

10 INDUSTRIAL AVE.  
MAHWAH, NJ 07400  
OFFICE: (210) 316-2085  
FAX: (210) 684-0066

FOR

**OMNIPOINT COMMUNICATIONS, INC.  
DBA T-MOBILE USA, INC**

35 GRIFIN ROAD SOUTH  
BLOOMFIELD, CT 06002  
OFFICE: (860) 692-7100  
FAX: (860) 692-7159



**15 Cypress St., Suite 300  
Newton Centre, MA 02459  
Office: 617-965-0789  
Fax: 617-663-6032**

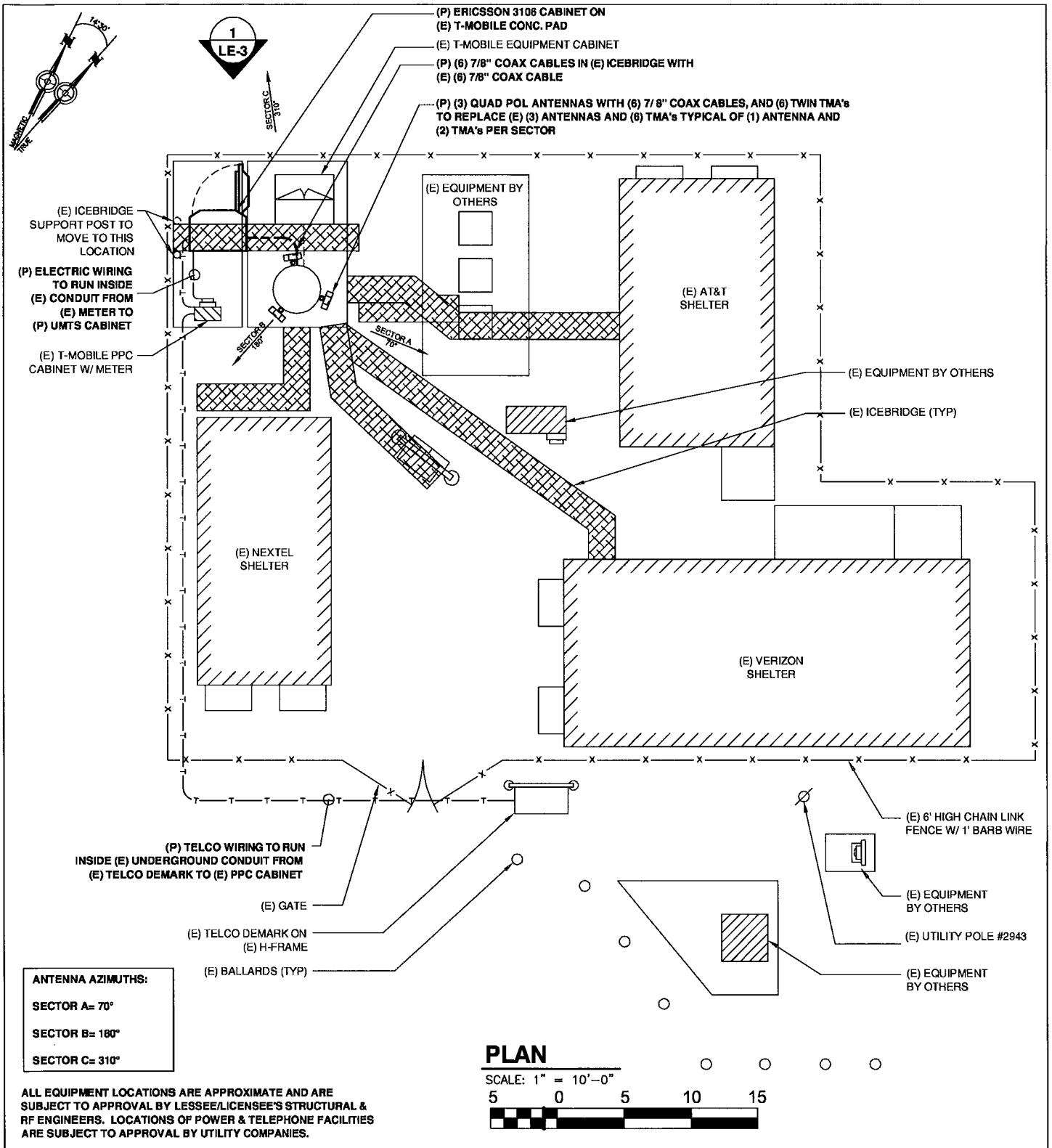
SITE NUMBER:  
**CTHA233B**  
SITE NAME:  
**CT233/GLOBAL SIGNAL MP**  
ADDRESS:  
**130 BIRDSEYE ROAD  
FARMINGTON, CT 06032**  
DRAWN BY  
**G.C.**

0: FINAL	03-13-09
A: REVIEW	02-03-09
REVISION	DATE

**APPROVALS**

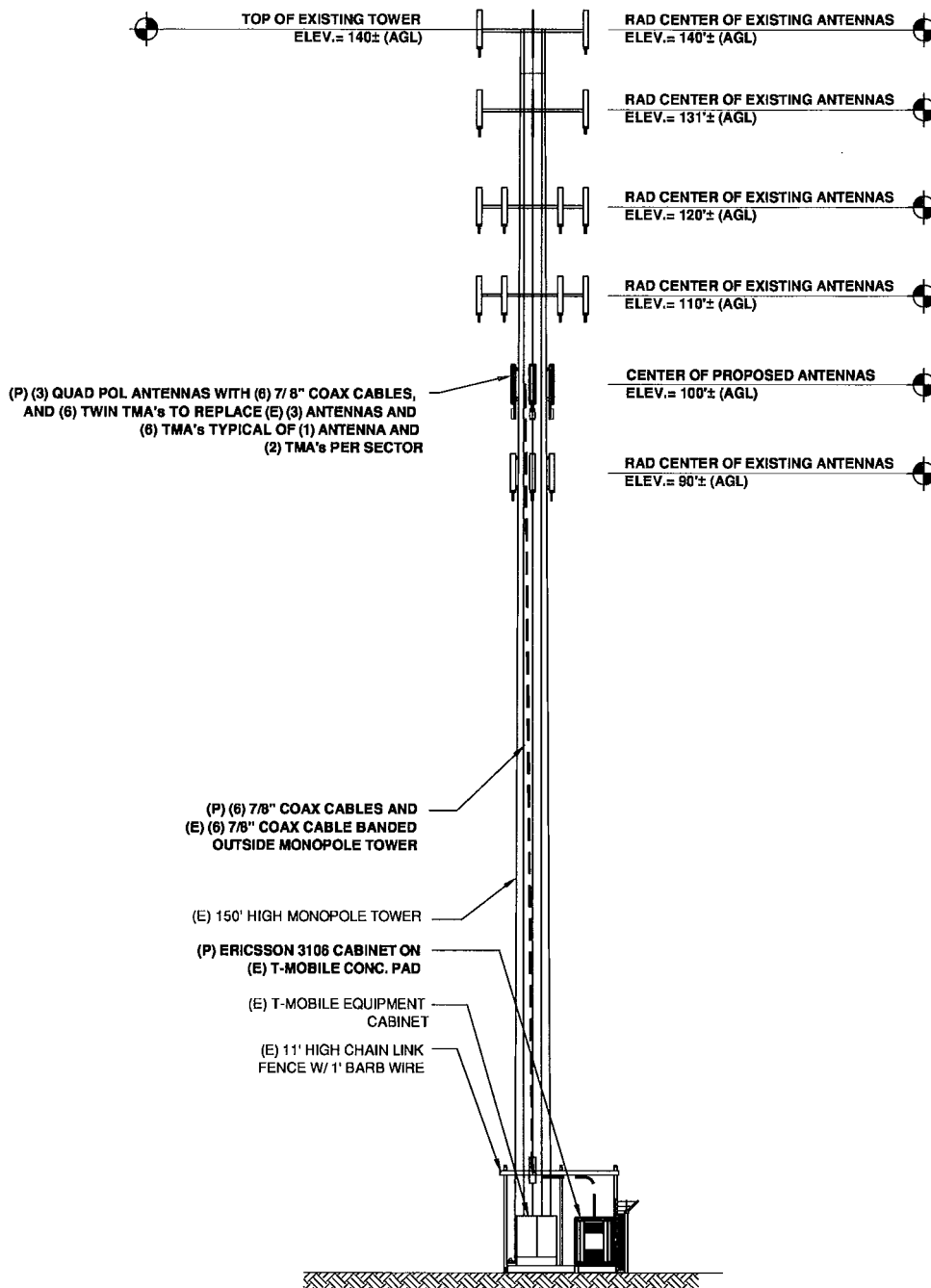
Site Owner	_____	Date	_____
Construction Manager	_____	Date	_____
RF Engineer	_____	Date	_____
Site Acquisition	_____	Date	_____

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.



<b>TRANSCEND WIRELESS, LLC</b> 10 INDUSTRIAL AVE. MAHWAH, NJ 0740 OFFICE: (210) 316-2085 FAX: (210) 684-0066  FOR <b>OMNIPPOINT          COMMUNICATIONS, INC.          DBA T-MOBILE USA, INC</b> 35 GRIPIN ROAD SOUTH BLOOMFIELD, CT 06002 OFFICE: (860) 692-7100 FAX: (860) 692-7159	 <b>ATLANTIS          GROUP</b> 15 Cypress St., Suite 300 Newton Centre, MA 02459 Office: 617-965-0789 Fax: 617-663-6032	SITE NUMBER: <b>CTHA233B</b>	<b>APPROVALS</b>	
		SITE NAME: <b>CT233/GLOBAL SIGNAL MP</b>	Site Owner _____ Date _____	ADDRESS: 130 BIRDSEYE ROAD FARMINGTON, CT 06032
DRAWN BY G.C.		RF Engineer _____ Date _____	Site Acquisition _____ Date _____	
The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.		O: FINAL 03-13-09 A: REVIEW 02-03-09 REVISION DATE		

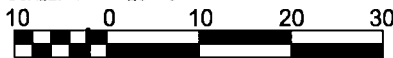




ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE  
SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S  
STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER &  
TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY  
UTILITY COMPANIES.

### ELEVATION

SCALE: 1" = 20'-0"



#### TRANSCEND WIRELESS, LLC

10 INDUSTRIAL AVE.  
MARTHA, NJ 07940  
OFFICE: (210) 316-2085  
FAX: (210) 684-0066

FOR

#### OMNIPPOINT COMMUNICATIONS, INC. DBA T-MOBILE USA, INC

35 GRIFFIN ROAD SOUTH  
BLOOMFIELD, CT 06002  
OFFICE: (860) 692-7100  
FAX: (860) 692-7159



15 Cypress St., Suite 300  
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SITE NUMBER:  
CTHA233B  
SITE NAME:  
CT233/GLOBAL SIGNAL MP  
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130 BIRDSEYE ROAD  
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DRAWN BY  
G.C.

0: FINAL	03-13-09
A: REVIEW	02-03-09
REVISION	DATE

#### APPROVALS

Site Owner	Date
Construction Manager	Date
RF Engineer	Date
Site Acquisition	Date

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein. All construction documents are subject to review by the local building department and any changes or modifications they may impose.



Date: **March 19, 2009**

Mr. Kevin DePatie  
Crown Castle USA Inc.  
12725 Morris Road Ext. Suite 400  
Alpharetta, GA 30004  
(678) 366-1228

B&T Engineering, Inc.  
1717 S. Boulder, Suite 300  
Tulsa, OK 74119  
(918) 587-4630  
ctuttle@btengineering.com

**Subject:** **Structural Analysis Report**

**Carrier Designation:** **Omnipoint Communications Co-Locate**  
**Carrier Site Number:** CTHA233B  
**Carrier Site Name:** CT233/Global Signal MP

**Crown Castle Designation:** **Crown Castle BU Number:** 876335  
**Crown Castle Site Name:** East Farmington  
**Crown Castle JDE Job Number:** 116649  
**Crown Castle Work Order Number:** 259452

**Engineering Firm Designation:** **B&T Engineering, Inc. Project Number:** 77969

**Site Data:** **3 A Birdseye Road, Farmington, CT, Hartford County**  
**Latitude 41° 42' 56.58", Longitude -72° 48' 39.08"**  
**140 Foot - Monopole Tower**

Dear Mr. DePatie,

*B&T Engineering, Inc.* 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 323510, in accordance with application 75993, 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:

LC1: Existing + Reserved + Proposed Equipment

**Sufficient Capacity**

Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

The analysis has been performed in accordance with the TIA/EIA-222-F standard and the 2003 International Building Code w/ 2005 State Supplement based upon a wind speed of 80 mph fastest mile (100 mph 3-sec gust).

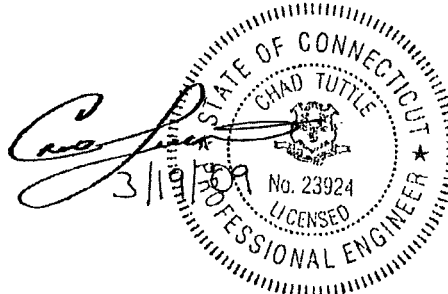
All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

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

Respectfully submitted by:

Jerod Dotson  
Project Engineer

Chad E. Tuttle, P.E.  
President



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**1) INTRODUCTION**

This tower is a 140 ft Monopole tower designed by Summit Manufacturing in November of 1997. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. The tower has been reinforced as specified by B&T Engineering in 2008 and those reinforcements are 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, 69.3 mph with 0.5 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
100	100	3	Andrew	ONEBASE TWIN DUAL DUPLEX TMA	6	7/8	4
		3	RFS/Celwave	APX16DWV-16DWV-S-E-ACU			

**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			
139	139	1	--	Low Profile Platform	6	1 5/8	1			
		6	Decibel	DB980H90A-M						
		9 (MLA)	MLA ANTENNA	6' x 1' x 0.5' 35 LB	9 (MLA)	1 5/8	3			
130	130	1	--	(3) T-Arms	9	7/8	1			
		3	Powerwave	7770.00						
		6	Powerwave	LGP21401 TMA						
120	120	1	--	Low Profile Platform	12	1 1/4	1			
		12	Swedcom	ALP 9212-N						
110	110	1	--	Low Profile Platform	12	1 5/8	1			
		6	Antel	LPA-185063/12CF						
		6	Antel	LPD-6513						
100	100	3	--	Mount Pipe	6	7/8	1,4			
		3	Andrew	ONEBASE TWIN DUAL DUPLEX TMA						
		--	--	--				12 (SLA)	1 5/8	4
		3	RFS/Celwave	APX16PV-16PVL-E				--	--	5
90	90	1	--	(3) Flush Mounts	6	1 5/8	2			
		3	KathreinScala	742 213						
70	72	1	lucent	KS24019-L112A	1	1/2	1			
	70	1		2' Standoff						
49	51	1	lucent	KS24019-L112A	1	1/2	1			
	49	1		2' Standoff						

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) MLA Equipment Controlling
- 4) Analysis ran with Existing and Proposed Equipment with SLA feedlines
- 5) **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)
Information Not Available						

### 3) ANALYSIS PROCEDURE

**Table 4 - Documents Provided**

Document	Remarks	Reference	Source
Online Application	Omnipoint Communications Co- Locate Revision #1	75993	Crown OTG
Tower Manufacturing Drawing	Summit Manufacturing, Dtd 11/03/1997	1615361	Crown OTG
Tower Modification Drawing	B&T Engineering, Project No. 79807	Date: 12/09/08	Crown OTG
Foundation Drawing	Summit Manufacturing, Job No. 2933	1440555	Crown OTG
Geotech Report	Dr. Clarence Welti Geotechnical Engineering, Dtd. 06/19/06	1850446	Crown OTG
Antenna Configuration	Crown CAD Package	Date: 03/12/09	Crown OTG

#### 3.1) Analysis Method

RISA Tower (version 5.3.1.0), 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. This structural analysis **does not** include a grouted base plate.
2. Tower and structures were built in accordance with the manufacturer's specifications.
3. The tower and structures have been maintained in accordance with manufacturer's specifications.
4. The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
5. When applicable, transmission cables are considered to be structural components for calculating wind loads, as allowed by TIA/EIA-222-F.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and B&T Engineering, Inc. should be allowed to review any new information to determine its effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	140 - 91.75	Pole	TP25.89x16x0.25	1	-9.087	964.748	90.2	Pass
L2	91.75 - 77.1667	Pole	TP28.38x24.724x0.313	2	-12.128	1468.259	91.0	Pass
L3	77.1667 - 67	Pole	TP30.465x28.38x0.313	3	-13.985	1577.352	99.2	Pass
L4	67 - 46.5	Pole	TP34.67x30.465x0.462	4	-17.641	2575.289	74.4	Pass
L5	46.5 - 42	Pole	TP34.967x32.823x0.375	5	-20.365	2171.484	97.8	Pass
L6	42 - 0	Pole	TP43.58x34.967x0.497	6	-31.731	3584.370	80.3	Pass
							Summary	
						Pole (L3)	99.2	Pass
						Rating =	99.2	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	98.8	Pass
1	Base Plate	Base	65.9	Pass
1	Base Foundation	Base	89.9	Pass

<b>Structure Rating (max from all components) =</b>	<b>99.2%</b>
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Notes:

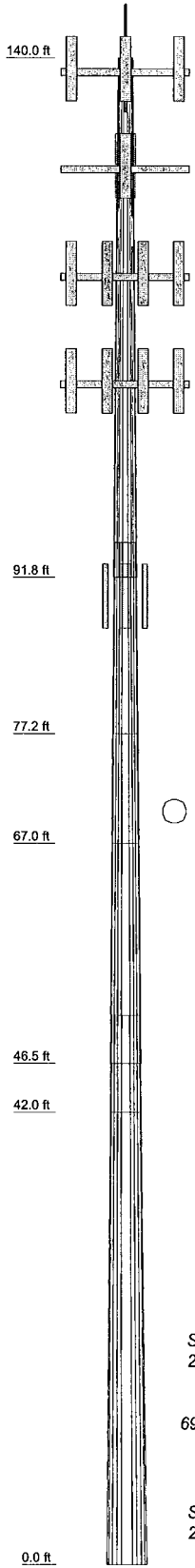
- 1) See additional documentation in "Appendix C -- Additional Calculations" for calculations supporting the % capacity consumed.
- 2) The percent capacities shown above (excluding foundations) include the 1/3 increase in allowable stresses as allowed by TIA/EIA-222-F.

4.1) Recommendations

N/A

**APPENDIX A**  
**RISA TOWER OUTPUT**

Section	1	2	3	4	5	6		
Length (ft)	48.250	17.833	10.167	20.500	9.000	42.000		
Number of Sides	12	12	12	12	12	12		
Thickness (in)	0.250	0.313	0.313	0.462	0.375	0.497		
Lap Splice (ft)		3.250		4.500				
Top Dia (in)	16.000	24.724	28.380	30.465	32.823	34.967		
Bot Dia (in)	25.890	28.380	30.465	34.670	34.967	43.580		
Grade	A607-60						A607-65	
Weight (K)	2.7	1.6	1.0	3.3	1.2	8.9	18.8	



### DESIGNED APPURTENANCE LOADING

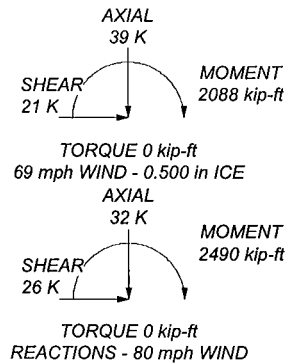
TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod (E)	140	APX16DWV-16DWV-S-E-ACU (P)	100
(3) MLA ANTENNA (6' x 1' x 0.5' 35 LB) (MLA)	139	APX16DWV-16DWV-S-E-ACU (P)	100
(3) MLA ANTENNA (6' x 1' x 0.5' 35 LB) (MLA)	139	ONEBASE TWIN DUAL DUPLEX TMA (E)	100
(3) MLA ANTENNA (6' x 1' x 0.5' 35 LB) (MLA)	139	ONEBASE TWIN DUAL DUPLEX TMA (E)	100
Low Profile Platform (E)	139	ONEBASE TWIN DUAL DUPLEX TMA (E)	100
7770.00 (E)	130	ONEBASE TWIN DUAL DUPLEX TMA (E)	100
7770.00 (E)	130	ONEBASE TWIN DUAL DUPLEX TMA (E)	100
(2) LGP21401 (E)	130	ONEBASE TWIN DUAL DUPLEX TMA (P)	100
(2) LGP21401 (E)	130	ONEBASE TWIN DUAL DUPLEX TMA (P)	100
(2) LGP21401 (E)	130	ONEBASE TWIN DUAL DUPLEX TMA (P)	100
(3) T-Arms (E)	130	Mount Pipe (E)	100
(4) ALP 9212-N (E)	120	Mount Pipe (E)	100
(4) ALP 9212-N (E)	120	Mount Pipe (E)	100
(4) ALP 9212-N (E)	120	Mount Pipe (E)	100
Low Profile Platform (E)	120	742 213 (R)	90
(2) LPD-6513 (E)	110	742 213 (R)	90
(2) LPD-6513 (E)	110	742 213 (R)	90
(2) LPD-6513 (E)	110	(3) Flush Mounts (R)	90
(2) LPA-185063/12CF (E)	110	KS24019-L112A (E)	72
(2) LPA-185063/12CF (E)	110	2' Standoff (E)	70
(2) LPA-185063/12CF (E)	110	KS24019-L112A (E)	51
Low Profile Platform (E)	110	2' Standoff (E)	49
APX16DWV-16DWV-S-E-ACU (P)	100		

### MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A607-60	60 ksi	75 ksi	A607-65	65 ksi	80 ksi

### TOWER DESIGN NOTES

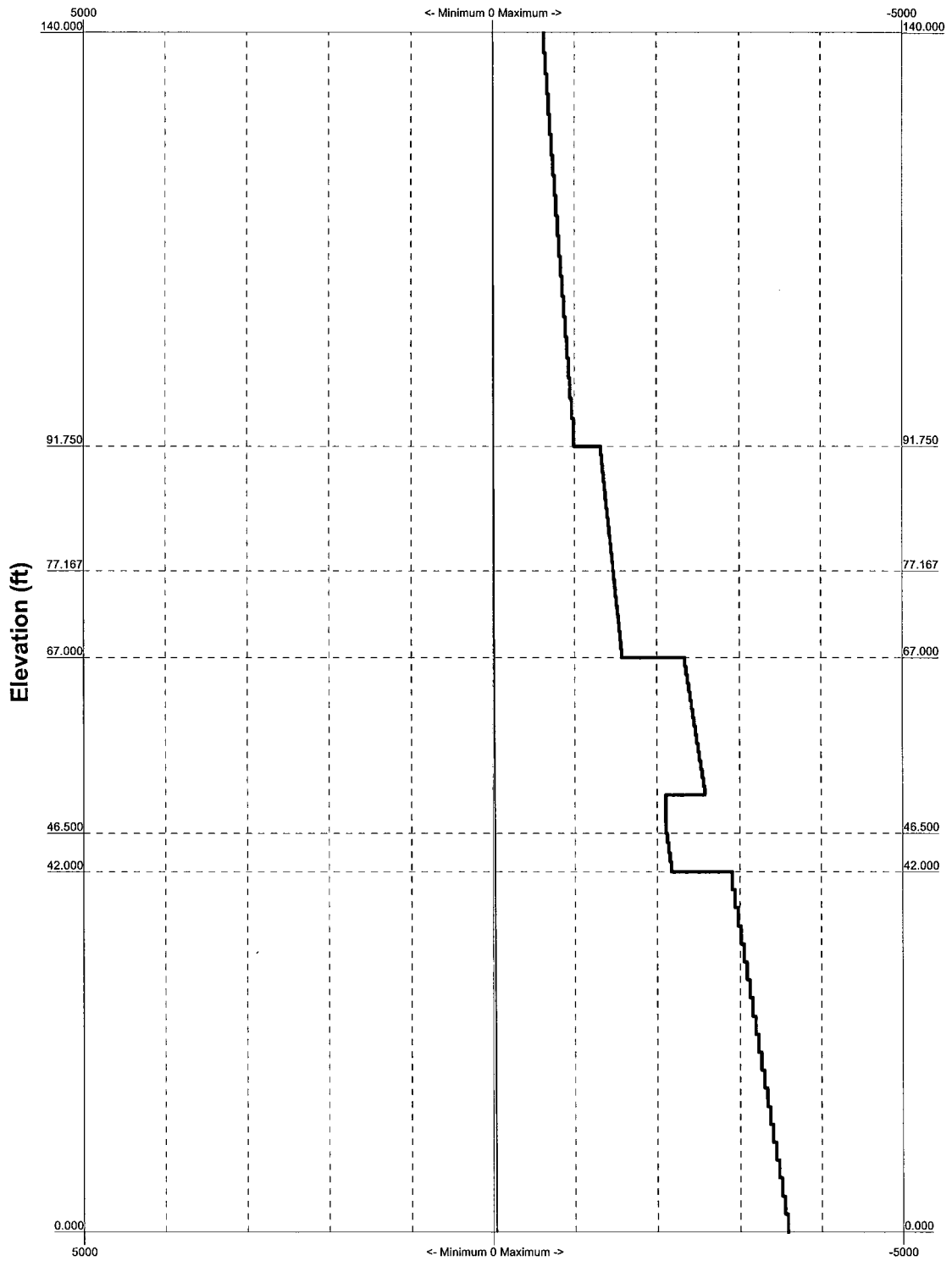
1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 99.2%




	<b>B &amp; T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265			<b>Job: 77969 - East Farmington, CT (BU# 876335)</b> <b>Project: 140' Summit Monopole / App ID: 75993; Rev: 1</b>		
	Client: Crown Castle USA, Inc. Code: TIA/EIA-222-F Path:	Drawn by: JDotson Date: 03/19/09	App'd: Scale: NTS Dwg No. E-1			



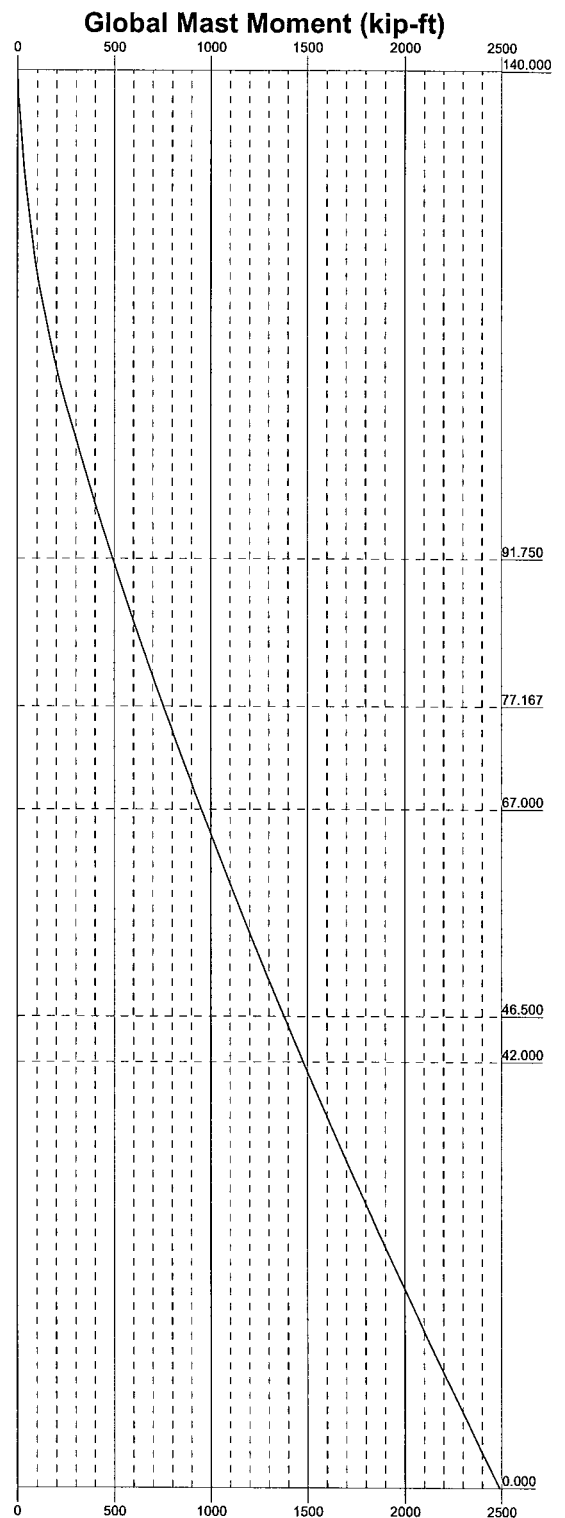
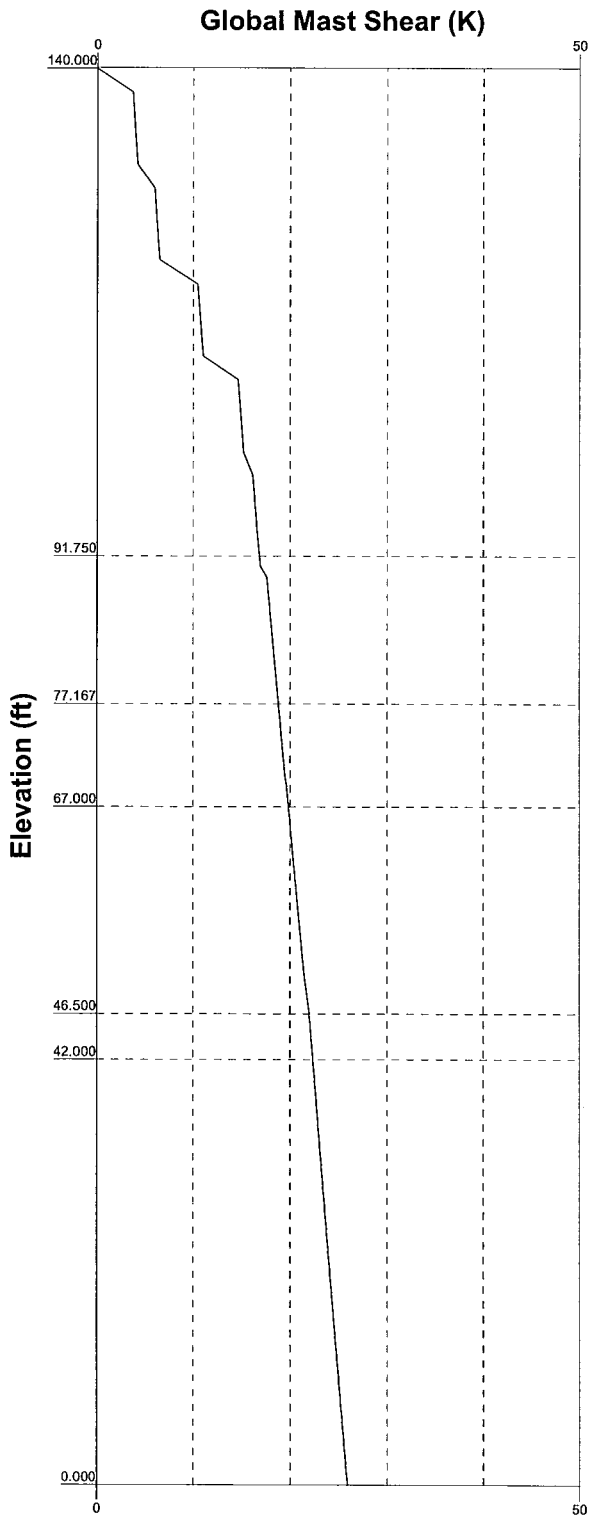
TIA/EIA-222-F - 80 mph/69 mph 0.500 in Ice  
 Leg Capacity ——— Leg Compression (K)



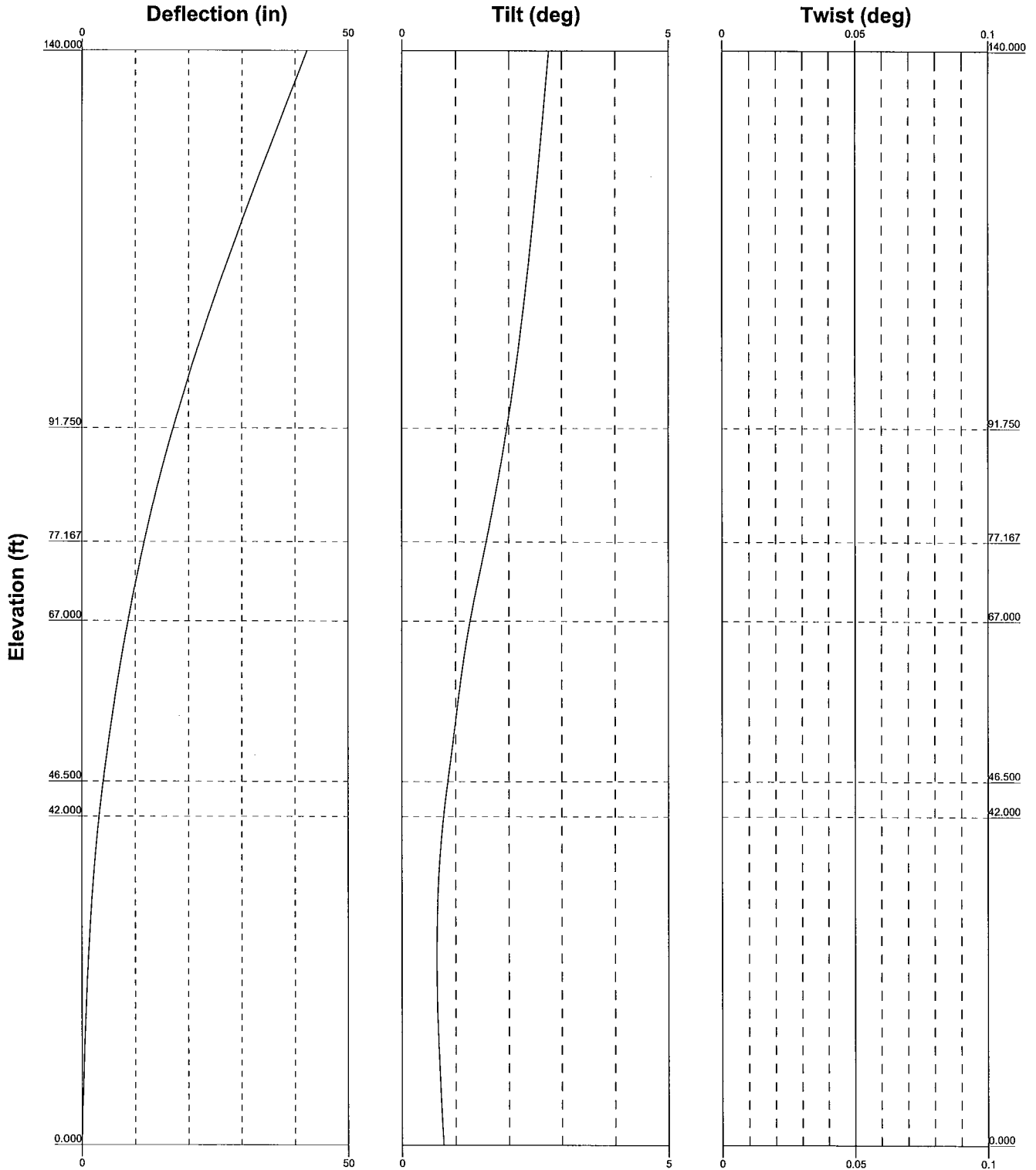
 <b>B &amp; T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job: 77969 - East Farmington, CT (BU# 876335)</b>		
	<b>Project: 140' Summit Monopole / App ID: 75993; Rev: 1</b>		
	Client: Crown Castle USA, Inc.	Drawn by: JDotson	App'd:
	Code: TIA/EIA-222-F	Date: 03/19/09	Scale: NTS
	Path:	Dwg No: E-3	


—— Vx    - - - - Vz

—— Mx    - - - - Mz



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	<b>Project: 140' Summit Monopole / App ID: 75993; Rev: 1</b>		
	Client: Crown Castle USA, Inc.	Drawn by: JDotson	App'd:
	Code: TIA/EIA-222-F	Date: 03/19/09	Scale: NTS
	Path:		Dwg No: E-4

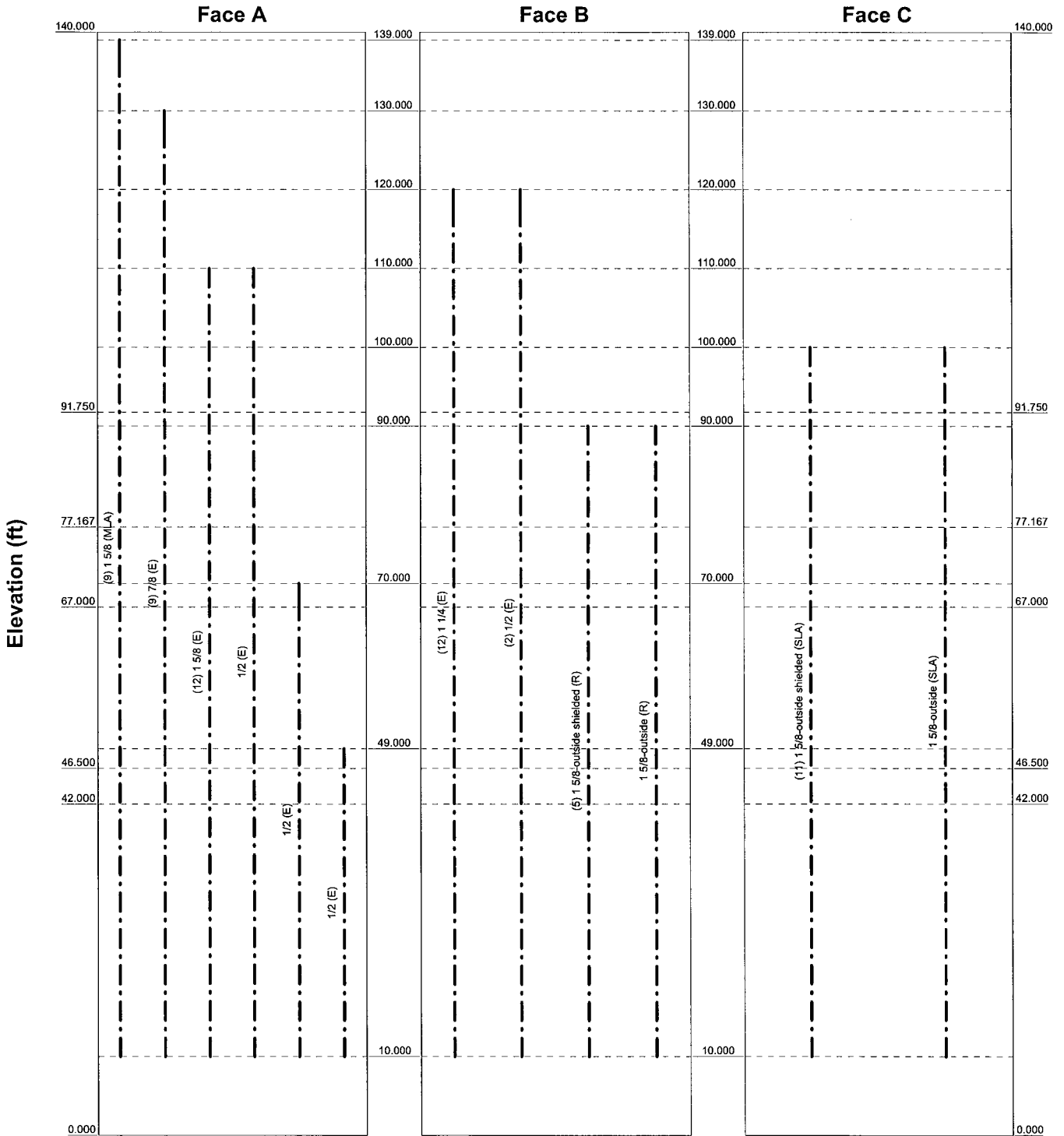


 <p><b>B &amp; T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	<b>Job: 77969 - East Farmington, CT (BU# 876335)</b>		
	Project: <b>140' Summit Monopole / App ID: 75993; Rev: 1</b>		
	Client: Crown Castle USA, Inc.	Drawn by: JDotson	App'd:
	Code: TIA/EIA-222-F	Date: 03/19/09	Scale: NTS
	Path:		Dwg No. E-5

# Feedline Distribution Chart

## 0' - 140'

Round   
  Flat   
  App In Face   
  App Out Face   
  Truss Leg



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	<b>Project: 140' Summit Monopole / App ID: 75993; Rev: 1</b>		
	Client: Crown Castle USA, Inc.	Drawn by: JDotson	App'd:
	Code: TIA/EIA-222-F	Date: 03/19/09	Scale: NTS
	Path:	Dwg No: E-7	

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	<b>Project</b> 140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b> 13:38:35 03/19/09
	<b>Client</b> Crown Castle USA, Inc.	<b>Designed by</b> JDotson

## 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 Hartford County, Connecticut.

Basic wind speed of 80 mph.

Nominal ice thickness of 0.500 in.

Ice density of 56.000 pcf.

A wind speed of 69 mph is used in combination with ice.

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.

## 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		

## 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	140.000-91.750	48.250	3.250	12	16.000	25.890	0.250	1.000	A607-60 (60 ksi)
L2	91.750-77.167	17.833	0.000	12	24.724	28.380	0.313	1.250	A607-65 (65 ksi)
L3	77.167-67.000	10.167	0.000	12	28.380	30.465	0.313	1.250	A607-65 (65 ksi)
L4	67.000-46.500	20.500	4.500	12	30.465	34.670	0.462	1.849	A607-65 (65 ksi)
L5	46.500-42.000	9.000	0.000	12	32.823	34.967	0.375	1.500	A607-65 (65 ksi)
L6	42.000-0.000	42.000		12	34.967	43.580	0.497	1.988	A607-65 (65 ksi)

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	<b>Project</b> 140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b> 13:38:35 03/19/09
	<b>Client</b> Crown Castle USA, Inc.	<b>Designed by</b> JDotson

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	16.564	12.679	401.443	5.638	8.288	48.437	813.432	6.240	3.618	14.472
	26.803	20.640	1731.952	9.179	13.411	129.144	3509.405	10.158	6.269	25.074
L2	26.286	24.564	1868.385	8.739	12.807	145.888	3785.855	12.090	5.788	18.523
	29.381	28.243	2839.900	10.048	14.701	193.179	5754.407	13.900	6.768	21.659
L3	29.381	28.243	2839.900	10.048	14.701	193.179	5754.407	13.900	6.768	21.659
	31.540	30.341	3521.071	10.795	15.781	223.121	7134.644	14.933	7.327	23.447
L4	31.540	44.653	5130.624	10.741	15.781	325.113	10396.034	21.977	6.926	14.985
	35.893	50.911	7604.089	12.246	17.959	423.412	15407.946	25.057	8.053	17.423
L5	35.090	39.180	5265.280	11.616	17.002	309.684	10668.886	19.283	7.791	20.777
	36.201	41.770	6379.698	12.384	18.113	352.218	12926.997	20.558	8.366	22.31
L6	36.201	55.164	8366.081	12.340	18.113	461.885	16951.948	27.150	8.039	16.175
	45.117	68.947	16334.883	15.424	22.574	723.601	33098.901	33.934	10.347	20.82

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals
ft	ft <sup>2</sup>	in					in	in
L1				1	1	1		
140.000-91.75								
L2				1	1	1		
91.750-77.167								
L3				1	1	1		
77.167-67.000								
L4				1	1	1		
67.000-46.500								
L5				1	1	1		
46.500-42.000								
L6				1	1	1		
42.000-0.000								

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement	Total Number	C <sub>AA</sub>	Weight
				ft		ft <sup>2</sup> /ft	klf
1 5/8 (MLA)	A	No	Inside Pole	139.000 - 10.000	9	No Ice 1/2" Ice	0.000 0.001
**							
7/8 (E)	A	No	Inside Pole	130.000 - 10.000	9	No Ice 1/2" Ice	0.000 0.001
**							
1 1/4 (E)	B	No	Inside Pole	120.000 - 10.000	12	No Ice 1/2" Ice	0.000 0.001

# RISATower

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<b>Job</b>	77969 - East Farmington, CT (BU# 876335)	<b>Page</b>	3 of 8
<b>Project</b>	140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b>	13:38:35 03/19/09
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Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C <sub>AA</sub>		Weight klf
						No Ice	1/2" Ice	
1/2 (E) **	B	No	Inside Pole	120.000 - 10.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
1 5/8 (E) **	A	No	Inside Pole	110.000 - 10.000	12	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
1/2 (E) **	A	No	Inside Pole	110.000 - 10.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
1 5/8-outside shielded (SLA) **	C	No	Inside Pole	100.000 - 10.000	11	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
1 5/8-outside (SLA) **	C	No	CaAa (Out Of Face)	100.000 - 10.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
1 5/8-outside shielded (R) **	B	No	Inside Pole	90.000 - 10.000	5	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
1 5/8-outside (R) **	B	No	CaAa (Out Of Face)	90.000 - 10.000	1	No Ice	0.198	0.001
						1/2" Ice	0.298	0.003
1/2 (E) **	A	No	Inside Pole	70.000 - 10.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
1/2 (E) **	A	No	Inside Pole	49.000 - 10.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000

## Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A <sub>R</sub>	A <sub>F</sub>	C <sub>AA</sub> In Face	C <sub>AA</sub> Out Face	Weight K
			ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	ft <sup>2</sup>	
L1	140.000-91.750	A	0.000	0.000	0.000	0.000	0.860
		B	0.000	0.000	0.000	0.000	0.238
		C	0.000	0.000	0.000	1.634	0.103
L2	91.750-77.167	A	0.000	0.000	0.000	0.000	0.393
		B	0.000	0.000	0.000	2.541	0.203
		C	0.000	0.000	0.000	2.887	0.182
L3	77.167-67.000	A	0.000	0.000	0.000	0.000	0.275
		B	0.000	0.000	0.000	2.013	0.149
		C	0.000	0.000	0.000	2.013	0.127
L4	67.000-46.500	A	0.000	0.000	0.000	0.000	0.558
		B	0.000	0.000	0.000	4.059	0.301
		C	0.000	0.000	0.000	4.059	0.256
L5	46.500-42.000	A	0.000	0.000	0.000	0.000	0.124
		B	0.000	0.000	0.000	0.891	0.066
		C	0.000	0.000	0.000	0.891	0.056
L6	42.000-0.000	A	0.000	0.000	0.000	0.000	0.878
		B	0.000	0.000	0.000	6.336	0.469
		C	0.000	0.000	0.000	6.336	0.399

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	<b>Project</b> 140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b> 13:38:35 03/19/09
	<b>Client</b> Crown Castle USA, Inc.	<b>Designed by</b> JDotson

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A <sub>R</sub> ft <sup>2</sup>	A <sub>F</sub> ft <sup>2</sup>	C <sub>AA</sub> In Face ft <sup>2</sup>	C <sub>AA</sub> Out Face ft <sup>2</sup>	Weight K
L1	140.000-91.750	A	0.500	0.000	0.000	0.000	0.000	0.860
		B		0.000	0.000	0.000	0.000	0.238
		C		0.000	0.000	0.000	2.458	0.115
L2	91.750-77.167	A	0.500	0.000	0.000	0.000	0.000	0.393
		B		0.000	0.000	0.000	3.824	0.222
		C		0.000	0.000	0.000	4.346	0.204
L3	77.167-67.000	A	0.500	0.000	0.000	0.000	0.000	0.275
		B		0.000	0.000	0.000	3.030	0.164
		C		0.000	0.000	0.000	3.030	0.142
L4	67.000-46.500	A	0.500	0.000	0.000	0.000	0.000	0.558
		B		0.000	0.000	0.000	6.109	0.331
		C		0.000	0.000	0.000	6.109	0.287
L5	46.500-42.000	A	0.500	0.000	0.000	0.000	0.000	0.124
		B		0.000	0.000	0.000	1.341	0.073
		C		0.000	0.000	0.000	1.341	0.063
L6	42.000-0.000	A	0.500	0.000	0.000	0.000	0.000	0.878
		B		0.000	0.000	0.000	9.536	0.517
		C		0.000	0.000	0.000	9.536	0.448

### Feed Line Center of Pressure

Section	Elevation ft	CP <sub>X</sub> in	CP <sub>Z</sub> in	CP <sub>X</sub> Ice in	CP <sub>Z</sub> Ice in
L1	140.000-91.750	-0.052	0.030	-0.073	0.042
L2	91.750-77.167	-0.025	0.240	-0.034	0.327
L3	77.167-67.000	0.000	0.256	0.000	0.350
L4	67.000-46.500	0.000	0.259	0.000	0.358
L5	46.500-42.000	0.000	0.261	0.000	0.361
L6	42.000-0.000	0.000	0.202	0.000	0.285

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
Lightning Rod (E)	C	None		0.000	140.000	No Ice 1/2" Ice	0.500 0.750	0.100 0.200
(3) MLA ANTENNA (6' x 1' x 0.5' 35 LB) (MLA)	C	From Face	0.000 0.000 0.000	0.000	139.000	No Ice 1/2" Ice	8.400 8.949	4.700 5.147
(3) MLA ANTENNA (6' x 1' x 0.5' 35 LB) (MLA)	B	From Face	0.000 0.000 0.000	0.000	139.000	No Ice 1/2" Ice	8.400 8.949	4.700 5.147
(3) MLA ANTENNA (6' x 1' x 0.5' 35 LB) (MLA)	A	From Face	0.000 0.000 0.000	0.000	139.000	No Ice 1/2" Ice	8.400 8.949	4.700 5.147



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	77969 - East Farmington, CT (BU# 876335)	5 of 8
	<b>Project</b>	<b>Date</b>
140' Summit Monopole / App ID: 75993; Rev: 1	13:38:35 03/19/09	
<b>Client</b>	<b>Designed by</b>	
Crown Castle USA, Inc.	JDotson	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub>		Weight	
			Horz	Lateral			Front	Side		
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
Low Profile Platform (E) **	C	None			0.000	139.000	No Ice 1/2" Ice	21.000 24.000	21.000 24.000	1.500 2.000
7770.00 (E)	C	From Face	0.000 0.000 0.000		0.000	130.000	No Ice 1/2" Ice	5.882 6.314	2.928 3.273	0.035 0.068
7770.00 (E)	B	From Face	0.000 0.000 0.000		0.000	130.000	No Ice 1/2" Ice	5.882 6.314	2.928 3.273	0.035 0.068
7770.00 (E)	A	From Face	0.000 0.000 0.000		0.000	130.000	No Ice 1/2" Ice	5.882 6.314	2.928 3.273	0.035 0.068
(2) LGP21401 (E)	C	From Face	0.000 0.000 0.000		0.000	130.000	No Ice 1/2" Ice	1.288 1.445	0.233 0.313	0.014 0.021
(2) LGP21401 (E)	B	From Face	0.000 0.000 0.000		0.000	130.000	No Ice 1/2" Ice	1.288 1.445	0.233 0.313	0.014 0.021
(2) LGP21401 (E)	A	From Face	0.000 0.000 0.000		0.000	130.000	No Ice 1/2" Ice	1.288 1.445	0.233 0.313	0.014 0.021
(3) T-Arms (E) **	C	None			0.000	130.000	No Ice 1/2" Ice	18.000 21.000	18.000 21.000	0.900 1.200
(4) ALP 9212-N (E)	C	From Face	0.000 0.000 0.000		0.000	120.000	No Ice 1/2" Ice	5.784 6.199	5.784 6.199	0.017 0.062
(4) ALP 9212-N (E)	B	From Face	0.000 0.000 0.000		0.000	120.000	No Ice 1/2" Ice	5.784 6.199	5.784 6.199	0.017 0.062
(4) ALP 9212-N (E)	A	From Face	0.000 0.000 0.000		0.000	120.000	No Ice 1/2" Ice	5.784 6.199	5.784 6.199	0.017 0.062
Low Profile Platform (E) **	C	None			0.000	120.000	No Ice 1/2" Ice	21.000 24.000	21.000 24.000	1.500 2.000
(2) LPD-6513 (E)	C	From Face	0.000 0.000 0.000		0.000	110.000	No Ice 1/2" Ice	6.415 6.816	5.149 5.532	0.028 0.051
(2) LPD-6513 (E)	B	From Face	0.000 0.000 0.000		0.000	110.000	No Ice 1/2" Ice	6.415 6.816	5.149 5.532	0.028 0.051
(2) LPD-6513 (E)	A	From Face	0.000 0.000 0.000		0.000	110.000	No Ice 1/2" Ice	6.415 6.816	5.149 5.532	0.028 0.051
(2) LPA-185063/12CF (E)	C	From Face	0.000 0.000 0.000		0.000	110.000	No Ice 1/2" Ice	4.972 5.417	4.511 4.952	0.014 0.046
(2) LPA-185063/12CF (E)	B	From Face	0.000 0.000 0.000		0.000	110.000	No Ice 1/2" Ice	4.972 5.417	4.511 4.952	0.014 0.046
(2) LPA-185063/12CF (E)	A	From Face	0.000 0.000 0.000		0.000	110.000	No Ice 1/2" Ice	4.972 5.417	4.511 4.952	0.014 0.046
Low Profile Platform (E) **	C	None			0.000	110.000	No Ice 1/2" Ice	21.000 24.000	21.000 24.000	1.500 2.000

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 Phone: (918) 587-4630  
 FAX: (918) 295-0265

<b>Job</b>	77969 - East Farmington, CT (BU# 876335)	<b>Page</b>	6 of 8
<b>Project</b>	140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b>	13:38:35 03/19/09
<b>Client</b>	Crown Castle USA, Inc.	<b>Designed by</b>	JDotson

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Lateral						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
APX16DWV-16DWV-S-E-A	C	From Leg	1.000	0.000	0.000	100.000	No Ice	6.699	2.003	0.040
CU			0.000	0.000			1/2" Ice	7.131	2.326	0.071
(P)			0.000							
APX16DWV-16DWV-S-E-A	B	From Leg	1.000	0.000	0.000	100.000	No Ice	6.699	2.003	0.040
CU			0.000	0.000			1/2" Ice	7.131	2.326	0.071
(P)			0.000							
APX16DWV-16DWV-S-E-A	A	From Leg	1.000	0.000	0.000	100.000	No Ice	6.699	2.003	0.040
CU			0.000	0.000			1/2" Ice	7.131	2.326	0.071
(P)			0.000							
ONEBASE TWIN DUAL	C	From Leg	1.000	0.000	0.000	100.000	No Ice	0.674	0.306	0.011
DUPLEX TMA			0.000	0.000			1/2" Ice	0.786	0.392	0.016
(E)			0.000							
ONEBASE TWIN DUAL	B	From Leg	1.000	0.000	0.000	100.000	No Ice	0.674	0.306	0.011
DUPLEX TMA			0.000	0.000			1/2" Ice	0.786	0.392	0.016
(E)			0.000							
ONEBASE TWIN DUAL	A	From Leg	1.000	0.000	0.000	100.000	No Ice	0.674	0.306	0.011
DUPLEX TMA			0.000	0.000			1/2" Ice	0.786	0.392	0.016
(E)			0.000							
ONEBASE TWIN DUAL	C	From Leg	1.000	0.000	0.000	100.000	No Ice	0.674	0.306	0.011
DUPLEX TMA			0.000	0.000			1/2" Ice	0.786	0.392	0.016
(P)			0.000							
ONEBASE TWIN DUAL	B	From Leg	1.000	0.000	0.000	100.000	No Ice	0.674	0.306	0.011
DUPLEX TMA			0.000	0.000			1/2" Ice	0.786	0.392	0.016
(P)			0.000							
ONEBASE TWIN DUAL	A	From Leg	1.000	0.000	0.000	100.000	No Ice	0.674	0.306	0.011
DUPLEX TMA			0.000	0.000			1/2" Ice	0.786	0.392	0.016
(P)			0.000							
Mount Pipe	C	From Leg	0.000	0.000	0.000	100.000	No Ice	1.000	1.000	0.100
(E)			0.000	0.000			1/2" Ice	2.000	2.000	0.150
			0.000							
Mount Pipe	B	From Leg	0.000	0.000	0.000	100.000	No Ice	1.000	1.000	0.100
(E)			0.000	0.000			1/2" Ice	2.000	2.000	0.150
			0.000							
Mount Pipe	A	From Leg	0.000	0.000	0.000	100.000	No Ice	1.000	1.000	0.100
(E)			0.000	0.000			1/2" Ice	2.000	2.000	0.150
			0.000							
**										
742 213	C	From Leg	1.000	0.000	0.000	90.000	No Ice	5.135	2.869	0.022
(R)			0.000	0.000			1/2" Ice	5.609	3.483	0.047
			0.000							
742 213	B	From Leg	1.000	0.000	0.000	90.000	No Ice	5.135	2.869	0.022
(R)			0.000	0.000			1/2" Ice	5.609	3.483	0.047
			0.000							
742 213	A	From Leg	1.000	0.000	0.000	90.000	No Ice	5.135	2.869	0.022
(R)			0.000	0.000			1/2" Ice	5.609	3.483	0.047
			0.000							
(3) Flush Mounts	C	None		0.000	0.000	90.000	No Ice	3.000	3.000	0.100
(R)							1/2" Ice	6.000	6.000	0.180
**										
KS24019-L112A	A	From Leg	0.000	0.000	0.000	72.000	No Ice	0.100	0.100	0.005
(E)			0.000	0.000			1/2" Ice	0.180	0.180	0.006
			0.000							
2' Standoff	A	From Leg	0.000	0.000	0.000	70.000	No Ice	2.000	2.000	0.100
(E)			0.000	0.000			1/2" Ice	4.000	4.000	0.180
			0.000							
**										
KS24019-L112A	A	From Leg	0.000	0.000	0.000	51.000	No Ice	0.100	0.100	0.005

<b>RISATower</b>  <b>B &amp; T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 77969 - East Farmington, CT (BU# 876335)	<b>Page</b> 7 of 8
	<b>Project</b> 140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b> 13:38:35 03/19/09
	<b>Client</b> Crown Castle USA, Inc.	<b>Designed by</b> JDotson

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	C <sub>AA</sub> Front ft <sup>2</sup>	C <sub>AA</sub> Side ft <sup>2</sup>	Weight K
			Horz ft	Vert ft					
(E)			0.000	0.000		1/2" Ice	0.180	0.180	0.006
2' Standoff	A	From Leg	0.000	0.000	0.000	No Ice	2.000	2.000	0.100
(E)			0.000	0.000		1/2" Ice	4.000	4.000	0.180
**			0.000						

### Compression Checks

### Pole Design Data

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	F <sub>a</sub> ksi	A in <sup>2</sup>	Actual P K	Allow. P <sub>a</sub> K	Ratio P/P <sub>a</sub>
L1	140 - 91.75 (1)	TP25.89x16x0.25	48.250	0.000	0.0	36.0000	20.104	-9.087	723.742	0.013
L2	91.75 - 77.1667 (2)	TP28.38x24.724x0.313	17.833	0.000	0.0	39.0000	28.243	-12.128	1101.470	0.011
L3	77.1667 - 67 (3)	TP30.465x28.38x0.313	10.167	0.000	0.0	39.0000	30.341	-13.985	1183.310	0.012
L4	67 - 46.5 (4)	TP34.67x30.465x0.462	20.500	0.000	0.0	39.0000	49.537	-17.641	1931.950	0.009
L5	46.5 - 42 (5)	TP34.967x32.823x0.375	9.000	0.000	0.0	39.0000	41.770	-20.365	1629.020	0.013
L6	42 - 0 (6)	TP43.58x34.967x0.497	42.000	0.000	0.0	39.0000	68.947	-31.731	2688.950	0.012

### Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M <sub>x</sub> kip-ft	Actual f <sub>bx</sub> ksi	Allow. F <sub>bx</sub> ksi	Ratio f <sub>bx</sub> /F <sub>bx</sub>	Actual M <sub>y</sub> kip-ft	Actual f <sub>by</sub> ksi	Allow. F <sub>by</sub> ksi	Ratio f <sub>by</sub> /F <sub>by</sub>
L1	140 - 91.75 (1)	TP25.89x16x0.25	437.027	-42.8148	36.0000	1.189	0.000	0.0000	36.0000	0.000
L2	91.75 - 77.1667 (2)	TP28.38x24.724x0.313	754.434	-46.8643	39.0000	1.202	0.000	0.0000	39.0000	0.000
L3	77.1667 - 67 (3)	TP30.465x28.38x0.313	950.692	-51.1306	39.0000	1.311	0.000	0.0000	39.0000	0.000
L4	67 - 46.5 (4)	TP34.67x30.465x0.462	1280.30	-38.3395	39.0000	0.983	0.000	0.0000	39.0000	0.000
L5	46.5 - 42 (5)	TP34.967x32.823x0.375	1477.70	-50.3450	39.0000	1.291	0.000	0.0000	39.0000	0.000
L6	42 - 0 (6)	TP43.58x34.967x0.497	2489.84	-41.2908	39.0000	1.059	0.000	0.0000	39.0000	0.000

<b>RISATower</b>  <b>B &amp; T Engineering, Inc.</b> 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	<b>Job</b> 77969 - East Farmington, CT (BU# 876335)	<b>Page</b> 8 of 8
	<b>Project</b> 140' Summit Monopole / App ID: 75993; Rev: 1	<b>Date</b> 13:38:35 03/19/09
	<b>Client</b> Crown Castle USA, Inc.	<b>Designed by</b> JDotson

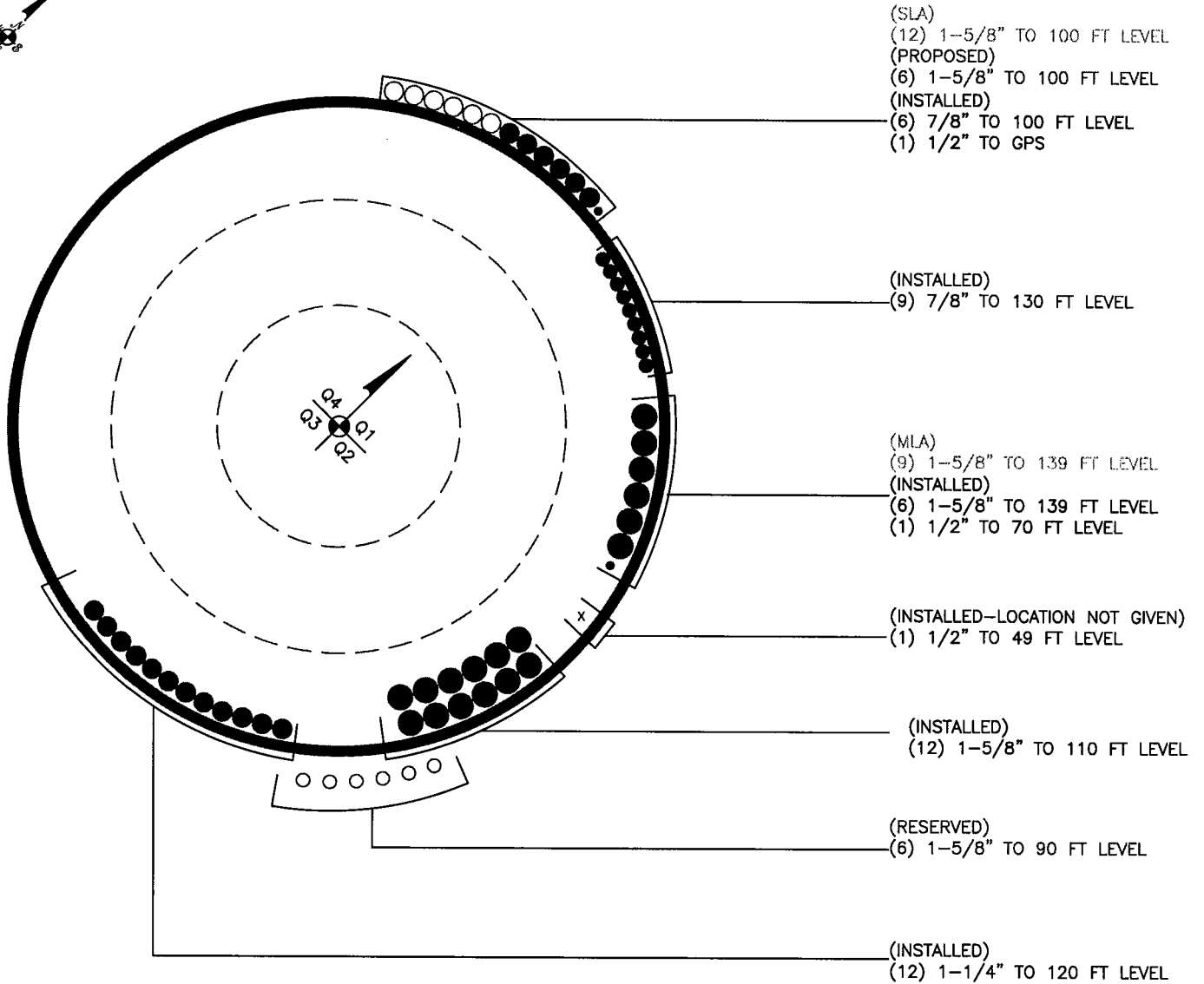
**Pole Interaction Design Data**

Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$\frac{P}{P_a}$	$\frac{f_{bx}}{F_{bx}}$	$\frac{f_{by}}{F_{by}}$			
L1	140 - 91.75 (1)	TP25.89x16x0.25	0.013	1.189	0.000	1.202	1.333	H1-3 ✓
L2	91.75 - 77.1667 (2)	TP28.38x24.724x0.313	0.011	1.202	0.000	1.213	1.333	H1-3 ✓
L3	77.1667 - 67 (3)	TP30.465x28.38x0.313	0.012	1.311	0.000	1.323	1.333	H1-3 ✓
L4	67 - 46.5 (4)	TP34.67x30.465x0.462	0.009	0.983	0.000	0.992	1.333	H1-3 ✓
L5	46.5 - 42 (5)	TP34.967x32.823x0.375	0.013	1.291	0.000	1.303	1.333	H1-3 ✓
L6	42 - 0 (6)	TP43.58x34.967x0.497	0.012	1.059	0.000	1.071	1.333	H1-3 ✓

**Section Capacity Table**

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P <sub>allow</sub> K	% Capacity	Pass Fail
L1	140 - 91.75	Pole	TP25.89x16x0.25	1	-9.087	964.748	90.2	Pass
L2	91.75 - 77.1667	Pole	TP28.38x24.724x0.313	2	-12.128	1468.259	91.0	Pass
L3	77.1667 - 67	Pole	TP30.465x28.38x0.313	3	-13.985	1577.352	99.2	Pass
L4	67 - 46.5	Pole	TP34.67x30.465x0.462	4	-17.641	2575.289	74.4	Pass
L5	46.5 - 42	Pole	TP34.967x32.823x0.375	5	-20.365	2171.484	97.8	Pass
L6	42 - 0	Pole	TP43.58x34.967x0.497	6	-31.731	3584.370	80.3	Pass
Summary								
Pole (L3)							99.2	Pass
<b>RATING =</b>							<b>99.2</b>	<b>Pass</b>

**APPENDIX B**  
**BASE LEVEL DRAWING**



BUSINESS UNIT: 876335

**APPENDIX C**  
**ADDITIONAL CALCULATIONS**

## Square, Unstiffened Base Plate, Any Rod Material - Rev. F

**Assumptions:** Rod groups at corners. Total # rods divisible by 4. Maximum total # of rods = 48.  
Rod Spacing = Straight Center-to-Center distance between any (2) adjacent rods (same corner)

### Site Data

BU#: 876335  
Site Name: East Farmington, CT  
App #: 75993 Rev1  
B&T #: 77969

### Reactions

Moment:	2490	ft-kips
Axial:	32	kips
Shear:	26	kips

Connection Type: Butt

### Anchor Rod Data

Qty:	12	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Circle:	51	in
Bolt Spacing, D:	6	in

### Anchor Rod Results

Maximum Rod Tension: 192.6 Kips  
Allowable Tension: 195.0 Kips  
Anchor Rod Stress Ratio: 98.8% Pass

### Plate Data

W=Side:	49.5	in
Thick:	3	in
Grade:	50	ksi
B effective	26.18	in

### Base Plate Results

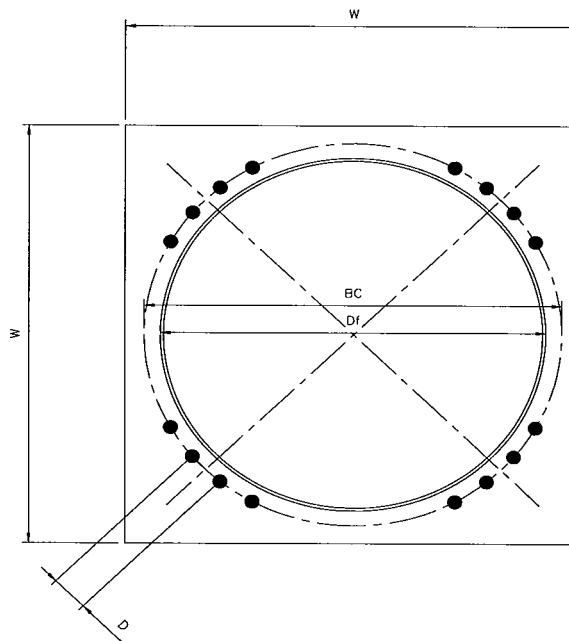
Base Plate Stress: 31.5 ksi  
Allowable Plate Stress: 50.0 ksi  
Base Plate Stress Ratio: 62.9% Pass

### Pole Data

Diam:	43.58	in
Thick:	0.375	in
Grade:	65	ksi

### Stress Increase Factor

ASIF:	1.333
-------	-------





Slab Size

Program: Pad and Pedestal Date: 3/19/2009  
File Name: 77969  
Location: East Farmington, CT (BU 876335)

**INPUT Bold Values Only are Input**

20.00 Length, L (ft.)	Conc. Unit Weight	0.088 kcf
20.00 Width, B (ft.)	Soil Unit Weight	0.11 kcf
4.00 Thickness, T (ft)		
0.50 Height of Pier Above Grade, (ft.)	** See Design Notes Below	
9.00 Depth to Base, D (ft.)		
1.00 Round Pedestal =0, Else Square Pedestal		
8.00 Pedestal Diameter or Width, (ft.)		
30.00 Phi Angle, (deg.)	0.5236 Phi in Radians	
0.00 Cohesion, c (ksf)		
3000 Conc. f'c, (psi)		
1.30 USD Load Factor		
12.00 Net Allow Bearing Stress, include Code Increase when approp., (ksf)		
1.50 Allow O.T. Factor of Safety		
2490 Tower O.T. Moment, (ft.-kips)	O.T. Moment @ fdn Base:	2737.00 ft.-kips
32 Leg Download, kips		
0 Leg Uplift, kips		
26 Leg Shear, kips		

Check of Punching Shear

43.50 d, top of conc. To middle of bottom rebar mat, (in.)  
558.00 Bo, The circumference at d/2 from face of pier, (in.)  
41.6 Factored Leg Download, (kips)  
4520.3  $\Phi * V_n$ , Conc. 2-way Shear Resistance, (kips)

Check of One Way Shear Shear

443.5 Factored Shear at Face of Pier  
972.1  $\Phi * V_n$ , Conc. 1-way Shear Resistance, (kips)

Mat Thickness is acceptable

72.30 Concrete Volume (c.y.)

## Slab Size

Program: Pad and Pedestal  
File Name: 77969  
Location: East Farmington, CT (BU 876335)

Check Net Vert. Soil Pressure Eccentricity = 7.04 > 3.33 ft. (L/6)

Vert. Loads in kips

32.00 Tower

184.80 Soil

171.78 Conc

388.58 Sum of the Verticals, (kips)

RESULTANT IS OUTSIDE MIDDLE THIRD OF THE PAD

L-PRIME= 8.87

0.00 Net q-min. (ksf)

3.39 Net q-max, (ksf)

Status: OK 28.3%

1.67 O.T. Factor of Safety

Status: OK 89.9%

3.48 q-Bottom Design, (ksf)

The Net q-max minus the opposing effect of conc DW

0.90 q-TopDesign, (ksf)

Deadweight TO BE USED FOR CONCRETE SLAB DESIGN  
of top mat reinforcing steel

Conservatively assume maximum moment at the pier centerline with maximum mat edge distance

Pier Design, Max Moment = 31596 in.-kips

Pad Bottom Design, Moment Arm: 6.00 ft.

Pad Bottom Design, Max Moment: 3758 in.-kips

Pad Top Design, Moment Arm: 6.00 ft.

Pad Top Design, Max Moment: 974 in.-kips

Use the above moments in the Pier, Pad Bottom & Top design sheets  
in this Workbook to determine reinforcing steel requirements.

### Design Notes:

1. Assumed water table at 5' below grade per the original foundation design.
2. Analysis considers a soil weight of 110 pcf (above the water table).
3. Analysis considers bouyant weight for concrete.

## Technical Memo

To: Transcend  
From: Farid Marbough - Radio Frequency Engineer  
cc: Jason Overbey  
Subject: Power Density Report for CTHA233B  
Date: March 26, 2009

### 1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Monopole at 130 Birdseye Rd, Farmington, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

### 2. Discussion:

The following assumptions were used in the calculations:

- 1) The emissions from T-Mobile transmitters are in the (1935-1944.8), (2140-2145), (2110-2120)MHz frequency Band.
- 2) The antenna array consists of three sectors, with 1 antennas per sector.
- 3) The model number for GSM antenna is APX16DWV-16DWV.
- 3) The model number for UMTS antenna is APX16DWV-16DWV.
- 4) GSM antenna center line height is 100 ft.
- 4) UMTS antenna center line height is 100 ft.
- 5) The maximum transmit power from any GSM sector is 2599.68 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2593.52 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
- 6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
- 7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
- 8) The average ground level of the studied area does not change significantly with respect to the transmitting location

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

### 3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Monopole at 130 Birdseye Rd, Farmington, CT, is 0.12894 mW/cm<sup>2</sup>. This value represents 12.894% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm<sup>2</sup>) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area. The combined Power Density from other carriers is 21.93%. The combined Power Density for the site is 34.824% of the M.P.E. standard.

# Connecticut Market



## Worst Case Power Density

**Site:** CTHA233B  
**Site Address:** 130 Birdseye Rd  
**Town:** Farmington  
**Tower Height:** 140 ft.  
**Tower Style:** Monopole

GSM Data		UMTS Data	
Base Station TX output	20 W	Base Station TX output	40 W
Number of channels	8	Number of channels	2
Antenna Model	APX16DWV-16DWV	Antenna Model	APX16DWV-16DWV
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	120 ft.	Cable Length	120 ft.
Antenna Height	100.0 ft.	Antenna Height	100.0 ft.
Ground Reflection	1.6	Ground Reflection	1.6
Frequency	1945.0 MHz	Frequency	2.1 GHz
Jumper & Connector loss	4.50 dB	Jumper & Connector loss	1.50 dB
Antenna Gain	18.0 dBi	Antenna Gain	18.0 dBi
Cable Loss per foot	0.0116 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	1.3920 dB	Total Cable Loss	1.3920 dB
Total Attenuation	5.8920 dB	Total Attenuation	2.8920 dB
Total EIRP per Channel (In Watts)	55.12 dBm 324.96 W	Total EIRP per Channel (In Watts)	61.13 dBm 1296.76 W
Total EIRP per Sector (In Watts)	64.15 dBm 2599.68 W	Total EIRP per Sector (In Watts)	64.14 dBm 2593.52 W
nsg	12.1080	nsg	15.1080
Power Density (S) = 0.064548 mW/cm <sup>2</sup>		Power Density (S) = 0.064395 mW/cm <sup>2</sup>	
T-Mobile Worst Case % MPE =		12.8944%	
Equation Used : $S = \frac{(1000)(grf)^2 (Power) \cdot 10^{(nsg/10)}}{4\pi (R)^2}$			
Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997			

## Co-Location Total

Carrier	% of Standard
Verizon	11.0200 %
Cingular	4.4900 %
Sprint	2.4600 %
AT&T Wireless	
Nextel	3.9600 %
MetroPCS	
Other Antenna Systems	
<b>Total Excluding T-Mobile</b>	<b>21.9300 %</b>
T-Mobile	12.8944
<b>Total % MPE for Site</b>	<b>34.8244%</b>



THOMAS J. REGAN  
Direct Dial: (860) 509-6522  
tregan@brownrudnick.com

CityPlace I  
185 Asylum  
Street  
Hartford  
Connecticut  
06103  
tel 860.509.6500  
fax 860.509.6501

*Via Hand Delivery*

April 6, 2009

Daniel F. Caruso, Chairman  
Connecticut Siting Council  
10 Franklin Square  
New Britain, CT 06051

**RE: T-Mobile USA, Inc - Exempt Modification**

Dear Mr. Caruso:

On behalf of T-Mobile USA, Inc., enclosed for filing are an original and five (5) copies of a Notice to Make an Exempt Modification to an Existing Facility for each of the following:

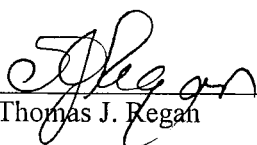
1. Berlin @ 260 Beckley Road;
2. Bloomfield @ 28 Brewer Street;
3. Enfield @ 5 Town Farm Road, a/k/a 85 Post Office Road;
4. Farmington @ 130 Birdseye Road;
5. Hartford @ 305 West Service Road;
6. Rocky Hill @ 949 France Street;
7. South Windsor @ 59 McGuire Road;
8. Suffield @ 848 East Street South;
9. Vernon @ 197 South Street;
10. Wallingford @ 90 North Plains Industrial Road;
11. Wallingford @ 992 Northrop Road; and
12. Windsor @ 440 Hayden Station Road.

I have also enclosed a sixth copy of each Notice which I would like to have date-stamped and returned to the courier delivering this package.

Also enclosed are twelve (12) checks in the amount of \$500.00 each to cover the filing fee. If you have any questions, please feel free to contact me.

Very truly yours,

**BROWN RUDNICK BERLACK ISRAELS LLP**

By:   
Thomas J. Regan

TJR/bh  
Enclosures

b  
r  
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c  
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m



Daniel F. Caruso, Chairman  
April 6, 2009  
Re: T-Mobile USA, Inc. Notice of Exempt Modifications  
Page 2

cc/encls: via 1<sup>st</sup> Class Mail:

Adam P. Salina, Mayor  
Town of Berlin  
240 Kensington Road  
Berlin, CT 06037

Sydney T. Schulman, Mayor  
Town of Bloomfield  
Town Hall  
800 Bloomfield Avenue  
Bloomfield, CT 06002

Scott R. Kaupin, Mayor  
Town of Enfield  
Town Hall  
820 Enfield Street  
Enfield, CT 06082

Michael Clark, Chairman  
Town Council  
Town of Farmington  
One Monteith Drive  
Farmington, CT 06032-1053

Eddie A. Perez, Mayor  
City of Hartford  
Municipal Building  
550 Main Street  
Hartford, CT 06103-2992

Anthony LaRosa, Mayor  
Town of Rocky Hill  
Town Hall  
761 Old Main Street  
Rocky Hill, CT 06067-1519

Cary Prague, Mayor  
Town of South Windsor  
Town Hall  
1540 Sullivan Avenue  
South Windsor, CT 06074



Daniel F. Caruso, Chairman  
April 6, 2009  
Re: T-Mobile USA, Inc. Notice of Exempt Modifications  
Page 3

Scott Lingenfelter, First Selectman  
Town of Suffield  
Town Hall  
83 Mountain Road  
Suffield, CT 06078

Jason L. McCoy, Mayor  
Town of Vernon  
Memorial Building  
14 Park Place  
Vernon, CT 06066

William W. Dickinson, Jr., Mayor  
Town of Wallingford  
Town Hall  
45 South Main Street, Room 310  
Wallingford, CT 06492

Donald Trinks, Mayor  
Town of Windsor  
Town Hall  
275 Broad Street  
PO Box 472  
Windsor, CT 06095-0472