

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

September 20, 2011

Jennifer A. Herz, Esq.
Brown Rudnick LLP
CityPlace I, 185 Asylum Street
Hartford, CT 06103

RE: **EM-T-MOBILE-044-110901** - Omnipoint Communications, as subsidiary of T-Mobile USA, Inc., notice of intent to modify an existing telecommunications facility located at 259 Commerce Street, East Haven, Connecticut.

Dear Attorney Herz:

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

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

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated September 1, 2011. 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. Thank you for your attention and cooperation.

Very truly yours,


Linda Roberts

Executive Director

LR/CDM/laf

c: The Honorable April Capone Almon, Mayor, Town of East Haven
George Mingione, Zoning Enforcement Officer, Town of East Haven
Christopher B. Fisher, Esq., Cuddy & Feder LLP



JENNIFER A. HERZ
Direct Dial: (860) 509-6527
jherz@brownrudnick.com

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

ORIGINAL

Via Hand Delivery

September 1, 2011

RECEIVED
SEP - 1 2011
CONNECTICUT
SITING COUNCIL

Robert Stein, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modifications / East Haven @ 259 Commerce Street

Dear Chairman Stein:

On behalf of T-Mobile Northeast, LLC ("T-Mobile"), enclosed for filing is an original and 5 copies of T-Mobile's Notice of Exempt Modification for the Facility located 259 Commerce Street in East Haven.

I also enclose herewith a check in the amount of \$625.00 representing the filing fee.

I would appreciate it if you would date-stamp the enclosed copy of this transmittal letter and return it to the courier delivering this package.

If you have any questions, please feel free to contact me.

Very truly yours,

BROWN RUDNICK LLP


Jennifer A. Herz

JH/bh
Enclosures

cc/encl: Mayor April Capone

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CONNECTICUT SITING COUNCIL

In re:

T-Mobile Northeast, LLC's Notice to Make an : **EXEMPT MODIFICATION NO.** _____
Exempt Modification to an Existing Facility at :
259 Commerce Street, East Haven, Connecticut. : September 1, 2011

NOTICE OF EXEMPT MODIFICATION

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile Northeast, LLC ("T-Mobile") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of East Haven of T-Mobile's intent to make an exempt modification to the existing monopole tower (the "Tower") located at 259 Commerce Street in East Haven, 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 to allow 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 and install associated 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 site, 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 58-foot monopole tower located at 259 Commerce Street in East Haven, Connecticut (latitude N 41° 15' 23.011", longitude W -72° 52' 32.876"). The Tower is owned by AT&T. Multiple carriers are currently located on the Tower. Currently, T-Mobile has 3 panel antennas and 3 Tower Mounted Amplifiers ("TMA") with a centerline of 47 feet mounted on the Tower. A site plan with Tower specifications is attached.

T-Mobile plans to utilize its 3 existing antennas for GSM and UMTS technology. Additionally, T-Mobile plans to remove its existing TMAs and install 3 Twin AWS TMAs and 3 Twin PCS TMAs on the Tower. The centerline of the antennas and TMAs will remain at 47 feet. Additionally, T-Mobile plans to utilize its existing coax cables.

To confirm the Tower can support these changes, T-Mobile commissioned B&T Engineering to perform a Structural Analysis of the Tower (attached). According to the Structural Analysis Report, dated July 27, 2011 the Tower has "...sufficient capacity" (Structural Analysis Report, page 1).

Within the existing compound T-Mobile plans to locate its proposed UMTS equipment cabinet on the existing 10-foot by 13-foot (approximately) concrete pad. Therefore, no increase in the size of the boundaries of the site is necessary. Excluding brief, minor, construction-related noise during the addition of the antennas, TMAs and the installation of the equipment cabinet, the proposed changes to the Tower will not increase noise levels at the site.

The proposed antennas 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 46.65% of the NCRP's standard for maximum permissible exposure. Collectively, the antennas on the Tower will emit 72.61% of the NCRP's standard for maximum permissible exposure.¹ Therefore, the power density levels will be 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 install TMAs and ground equipment 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 NORTHEAST, LLC

By: _____

Jennifer A Herz

Brown Rudnick LLP

185 Asylum Street

Hartford, CT 06103-3402

Email - jherz@brownrudnick.com

Phone - 860.509.6527 /Fax - 860.509.6501

¹ Please note the Power Density Report refers to Metro PCS as Pocket and refers to AT&T as Cingular.

Certificate of Service

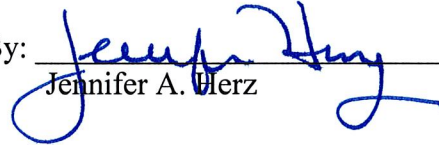
This is to certify that on this 1st day of September, 2011, the foregoing Notice of Exempt

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

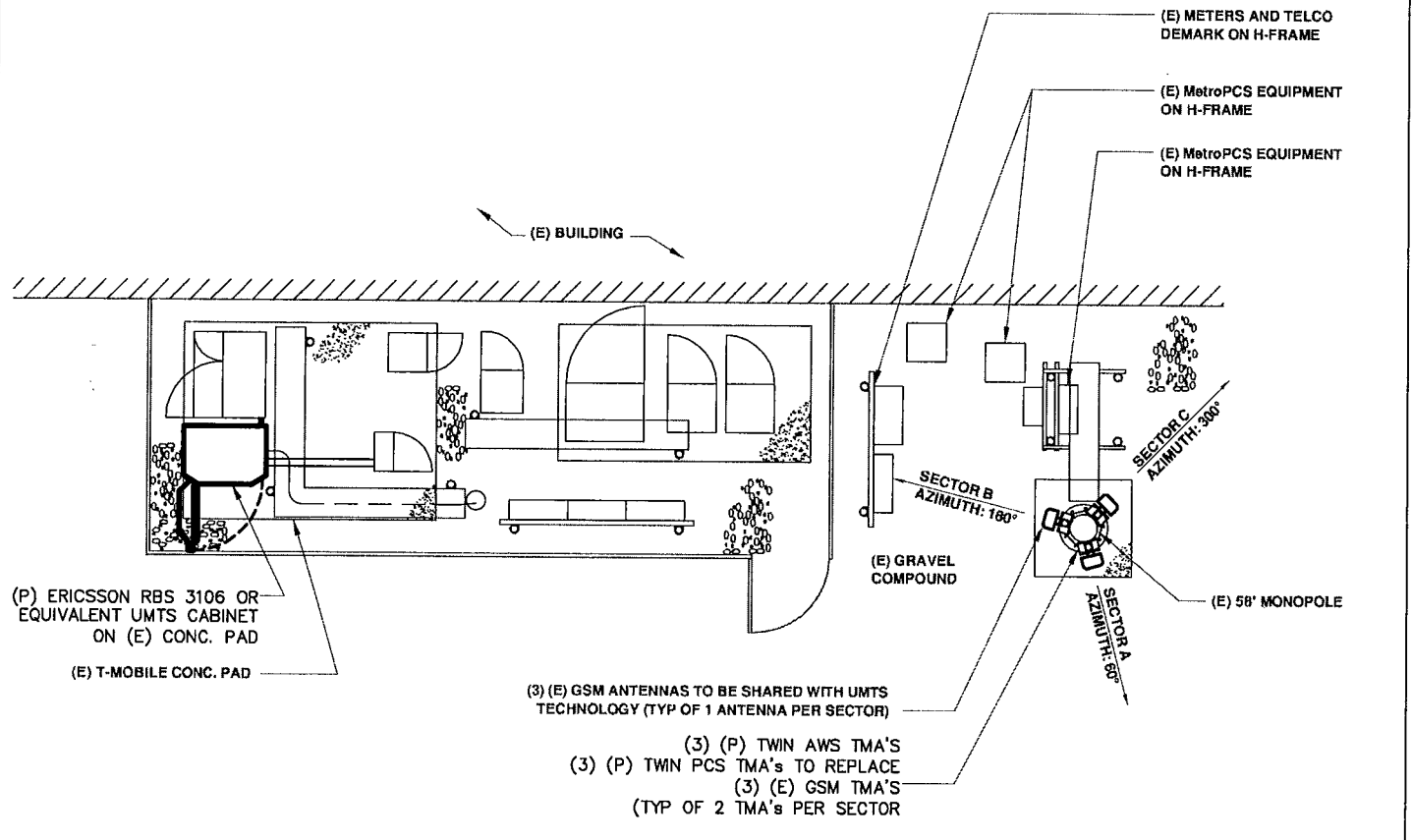
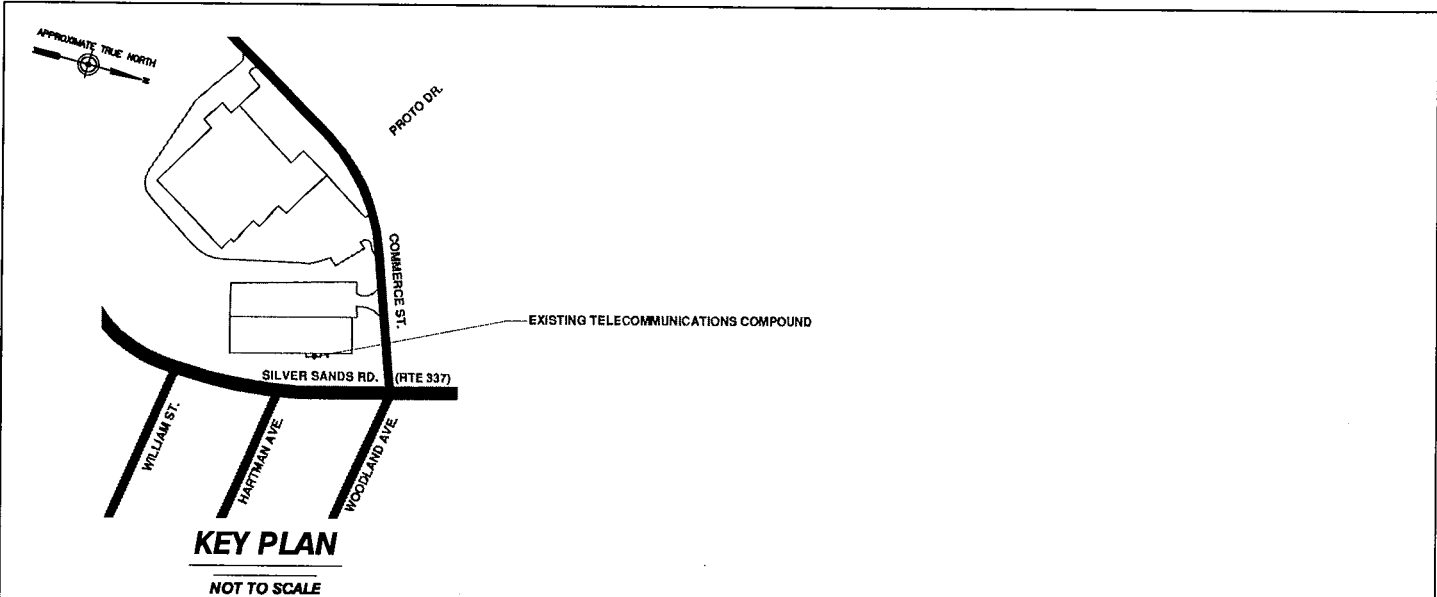
Mayor April Capone
250 Main Street
East Haven, CT 06512

By: _____

Jennifer A. Herz



40286002 v1 - 029431/0001



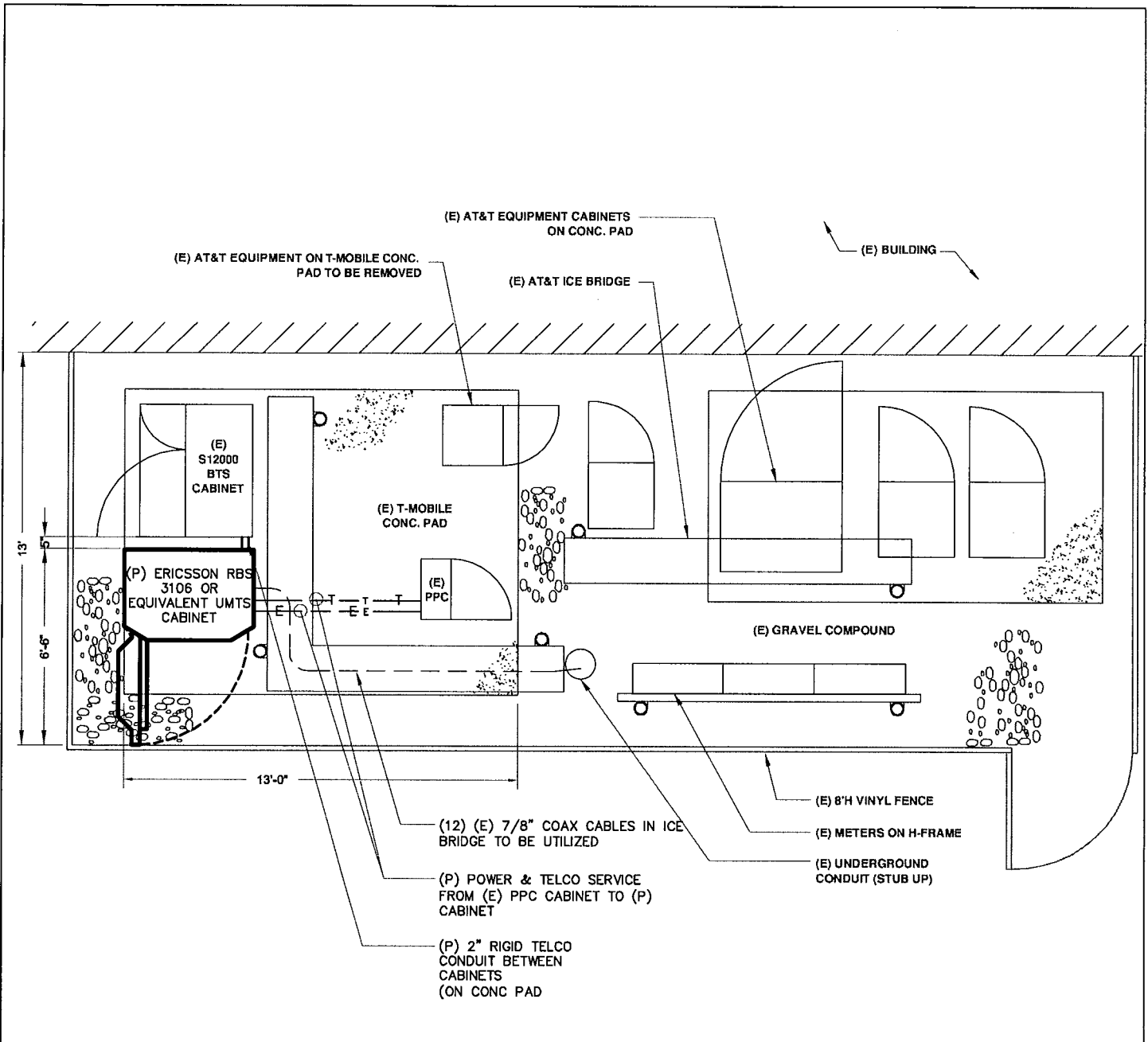
SUBMITTALS	
LE REV A	05-07-11
LE REV 0	08-05-11

ATLANTIS GROUP
1340 Centre Street
Suite 203
Newton, MA 02459
Office: 617-965-0789
Fax: 617-213-5056

LEASE EXHIBIT
SITE NUMBER: CT11623B
SITE NAME: EAST HAVEN AT&T MP

259 COMMERCE STREET
EAST HAVEN, CT 06512

NORTHEAST TOWERS
199 BRICKYARD ROAD
FARMINGTON, CT 06032
OFFICE: (860) 677-1999
FOR
T-MOBILE NORTHEAST, LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX: (860) 692-7139



EQUIPMENT LAYOUT PLAN

NOT TO SCALE

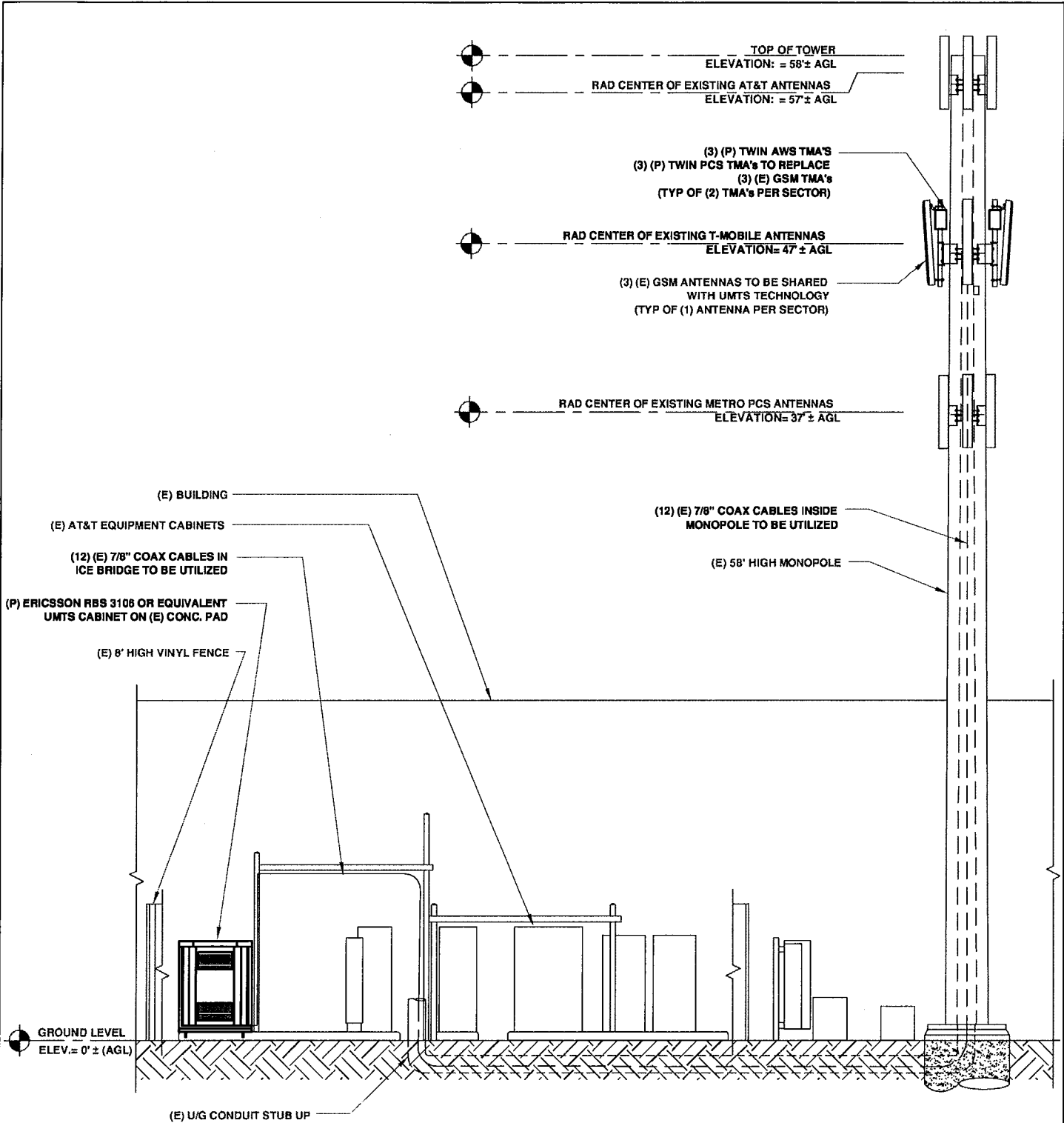
SUBMITTALS	
LE REV A	05-07-11
LE REV 0	08-05-11


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 259 COMMERCE STREET
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 199 BRICKYARD ROAD
 FARMINGTON, CT 06032
 OFFICE: (860) 677-1999
 FOR
T-MOBILE NORTHEAST, LLC
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 692-7000
 FAX: (860) 692-7159



ELEVATION

SCALE: 1/8" = 1'-0"

SUBMITTALS	
LE REVA	05-07-11
LE REV0	08-05-11


ATLANTIS GROUP
 1340 Centre Street
 Suite 203
 Newton, MA 02459
 Office: 617-985-0789
 Fax: 617-213-5058

LEASE EXHIBIT
 SITE NUMBER: CT11623B
 SITE NAME: EAST HAVEN AT&T MP

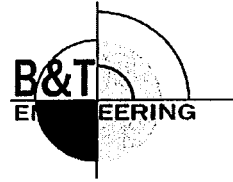
259 COMMERCE STREET
EAST HAVEN, CT 06512
 DRAWN BY: CF CHECKED BY: SM

NORTHEAST TOWERS
 199 BRICKYARD ROAD
 FARMINGTON, CT 06032
 OFFICE: (860) 677-1999
 FOR
T-MOBILE NORTHEAST, LLC
 35 GRIFFIN ROAD SOUTH
 BLOOMFIELD, CT 06002
 OFFICE: (860) 692-7000
 FAX: (860) 692-7559
 PAGE 3 OF 3



July 27, 2011

Mr. Lee Cash
5405 Winward Pkwy
Workspace 1295-D
Alpharetta, GA 30004
(770) 708-6144



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

Subject: **Structural Analysis Report**

Carrier Designation: **T-Mobile Northeast, LLC, Co-Locate**
Carrier Site Number: CT11623B
Carrier Site Name: Chesire/AT&T

AT&T Towers Designation: **AT&T Site Number:** 24481-A
AT&T Site Name: East Haven South

Engineering Firm Designation: **B&T Engineering, Inc. Project Number:** 83031

Site Data: **259 Commerce Street, Connecticut, CT, New Haven County**
Latitude 41° 15' 23.011", Longitude -72° 52' 32.876"
58 Foot - Monopole Tower

Dear Mr. Cash,

B&T Engineering, Inc. is pleased to submit this "Structural Analysis Report" to determine the structural integrity of the above mentioned tower.

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:

Existing + Reserved + Proposed Equipment	Sufficient Capacity
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.	Tower: 56.5%
	Foundation: 38.9%

The analysis has been performed in accordance with the TIA/EIA-222-F standard and 2003 IBC; 2003 IRC (State Building Code, 2005 CT supplement) based upon a wind speed of 85 mph fastest mile.

All 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 AT&T Towers. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Kristin Mears, E.I.
Project Engineer

Chad E. Tuttle, P.E.
President

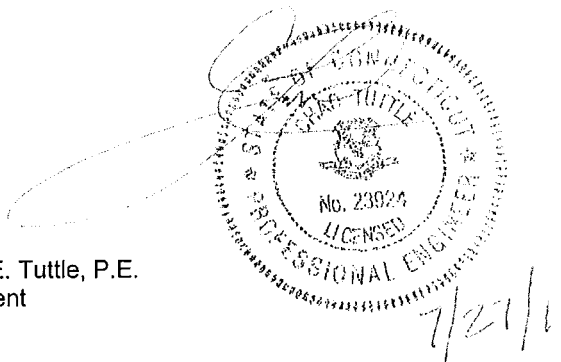


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1) INTRODUCTION

This tower is a 58 ft. monopole tower designed by FWT, Inc. in September of 2003. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 85 mph with no ice, 73.6 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
47	47	3	RFS	ATMAA1412D-1A20	--	--	T-Mobile
		3	RFS	ATMPP1412D-1CWA			

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
57	57	3	Kathrein	800 10121	6	7/8	AT&T Existing
		3	Powerwave	LGP21401			
		3	--	Pipe Mount	--	--	To Be Replaced by Future
		6	Ericsson	RRUL	3	1 1/4	AT&T Future
		3	Powerwave	P65-16-XLH-RR			
		1	--	LP Platform			
47	47	3	Celwave	APX16DWV-16DWVS-C	12	7/8	T-Mobile Existing
		6	Ericsson	ddTMA 1.9GHz	1	1/4	T-Mobile Remove
		3	--	Pipe Mount	--	--	Existing
37	37	3	Celwave	APXV18-206517S-C	6	7/8	Pocket Existing
		3	--	Pipe Mount			

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)
57	57	1	--	10' L.P Sectored Mount	--	--
		9	--	6'x1'x3" Panel Antenna		
52	52	2	--	4' STD Dish	--	--

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
47	47	1	--	10' L.P Sected Mount	--	--
		9	--	6'x1'x3" Panel Antenna		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Tower Data	FWT, Inc. Job No. J030902001	Date: 9/02/03	Siterra
Foundation Information	FWT, Inc. Job No. J030902001	Date: 9/02/03	Siterra
Soil Properties	JGI Project No. 03368G	Date: 7/01/03	Siterra
Loading	Previous SA by GPD Job No. 2008265.20	Date: 10/27/08	Siterra
	NOC2	Date: 5/17/11	Siterra
	Site Lease Application	Date: 5/17/11 Updated: 6/14/11	Siterra
	E-mail from Lee Cash	Date: 6/17/2011	On File
	E-mail from Lee Cash	Date: 7/27/2011	On File

3.1) Analysis Method

RISATower (version 5.4.2.0), 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) This analysis is a rerun of the 06/21/2011 analysis to show a future LP Platform mount for AT&T. AT&T future loading is to be installed on that platform with the same centerline as the existing antennas.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	58 - 50.5	Pole	TP19.078x17.393x0.188	1	-2.181	567.072	6.4	Pass
L2	50.5 - 0	Pole	TP30.05x18.141x0.188	2	-6.280	899.526	56.5	Pass
							Summary	
						Pole (L2)	56.5	Pass
						RATING =	56.5	Pass

Table 6 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	50.6	Pass
1	Base Plate	Base	53.2	Pass
1	Base Foundation	Base	38.9	Pass
Structure Rating (max from all components) =				56.5%

Notes:

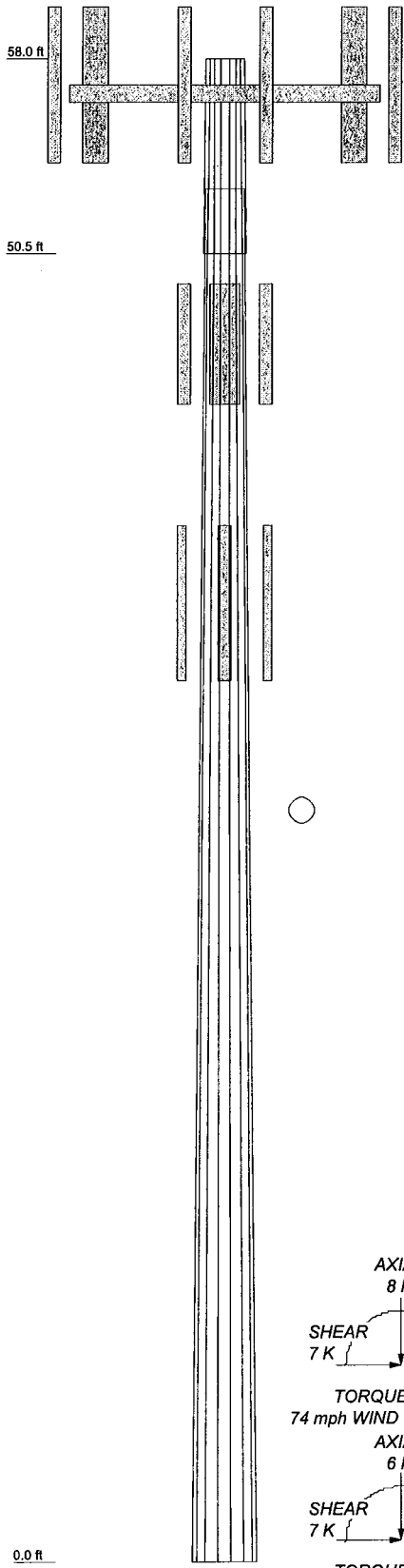
- 1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

N/A

APPENDIX A
RISATOWER OUTPUT

Section	1	2
Length (ft)	7.500	53.000
Number of Sides	18	18
Thickness (in)	0.188	0.188
Socket Length (ft)	2.500	18.141
Top Dia (in)	17.393	30.050
Bot Dia (in)	19.078	2.6
Grade	A572-65	
Weight (K)	0.3	2.8



DESIGNED APPURTENANCE LOADING

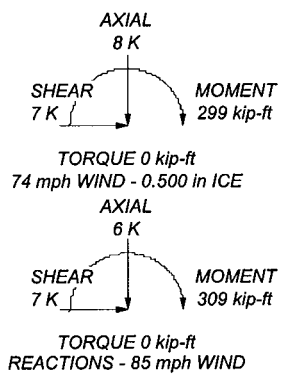
TYPE	ELEVATION	TYPE	ELEVATION
800 10121 w/ Mount Pipe (ATI-E)	57	APX16DWV-16DWVS-C w/Mount Pipe (T-Mobile-E)	47
800 10121 w/ Mount Pipe (ATI-E)	57	ATMAA1412D-1A20 (T-Mobile-P)	47
800 10121 w/ Mount Pipe (ATI-E)	57	ATMAA1412D-1A20 (T-Mobile-P)	47
LGP21401 (ATI-E)	57	ATMAA1412D-1A20 (T-Mobile-P)	47
LGP21401 (ATI-E)	57	ATMAA1412D-1A20 (T-Mobile-P)	47
LGP21401 (ATI-E)	57	ATMPP1412D-1CWA (T-Mobile-P)	47
Platform Mount [LP 602-1] (ATI-F)	57	ATMPP1412D-1CWA (T-Mobile-P)	47
P65-16-XLH-RR w/Mount Pipe (ATI-Future)	57	ATMPP1412D-1CWA (T-Mobile-P)	47
P65-16-XLH-RR w/Mount Pipe (ATI-Future)	57	Pipe Mount [PM 601-3] (T-Mobile-E)	47
P65-16-XLH-RR w/Mount Pipe (ATI-Future)	57	APXV18-206517S-C (Pocket Comm-E)	37
P65-16-XLH-RR w/Mount Pipe (ATI-Future)	57	APXV18-206517S-C (Pocket Comm-E)	37
(2) RRUL (ATI-Future)	57	APXV18-206517S-C (Pocket Comm-E)	37
(2) RRUL (ATI-Future)	57	APXV18-206517S-C (Pocket Comm-E)	37
(2) RRUL (ATI-Future)	57	Pipe Mount [PM 601-3] (Pocket Comm-E)	37
APX18DWV-16DWVS-C w/Mount Pipe (T-Mobile-E)	47		
APX18DWV-16DWVS-C w/Mount Pipe (T-Mobile-E)	47		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

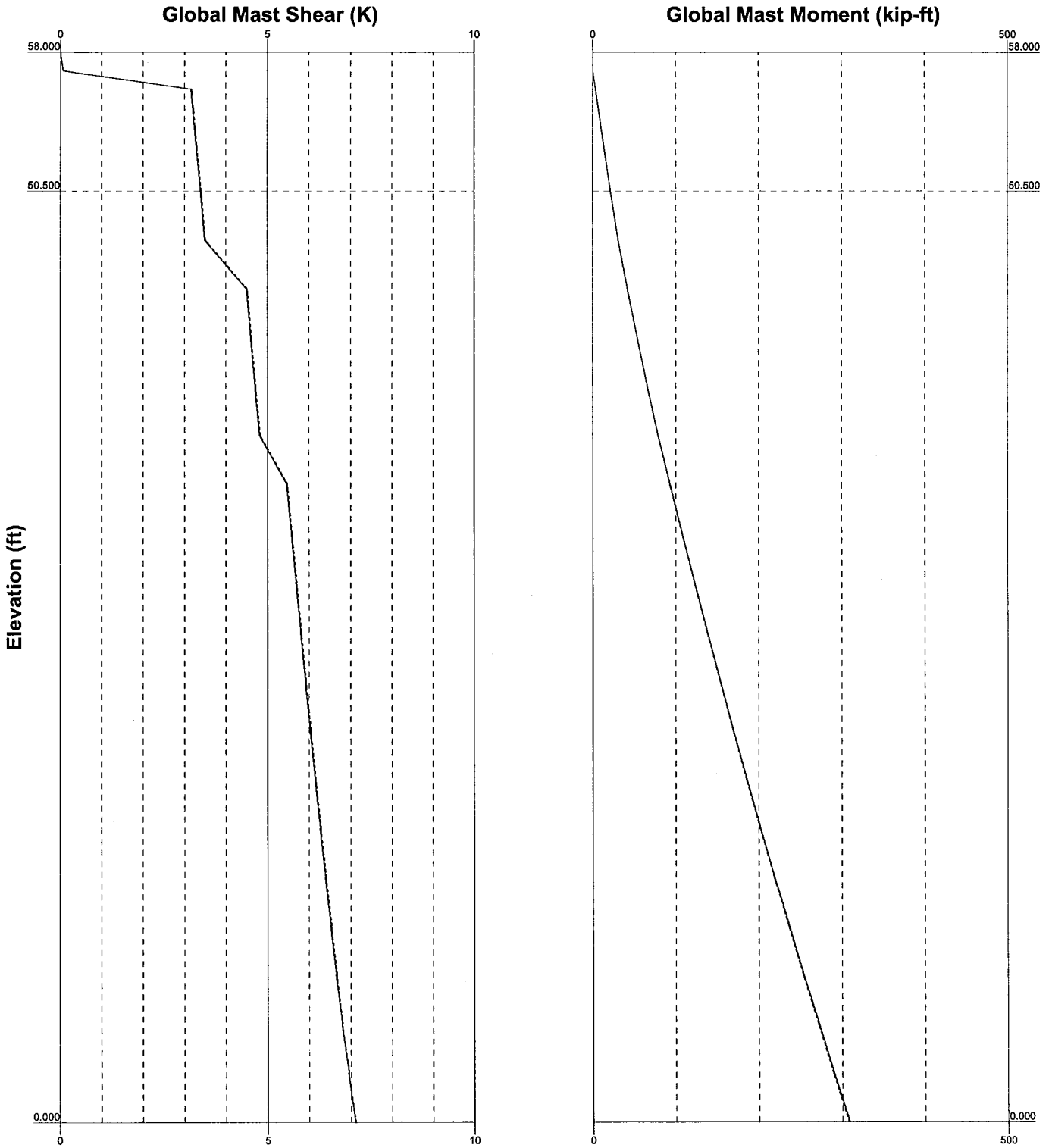
1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. RE: Feedline Distribution Chart for transmission lines distribution.
6. TOWER RATING: 56.5%




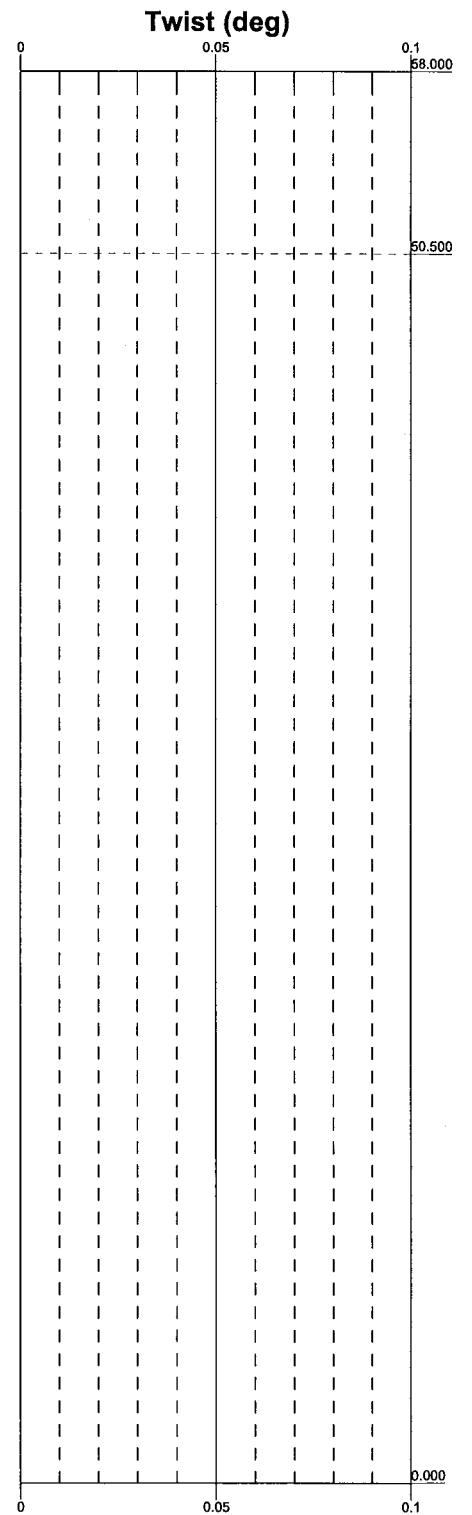
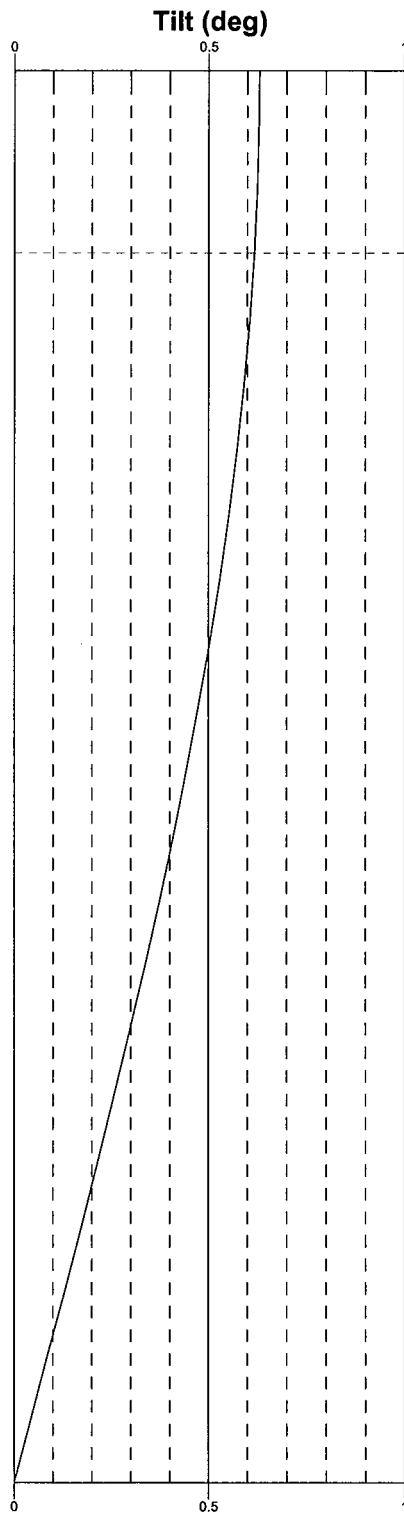
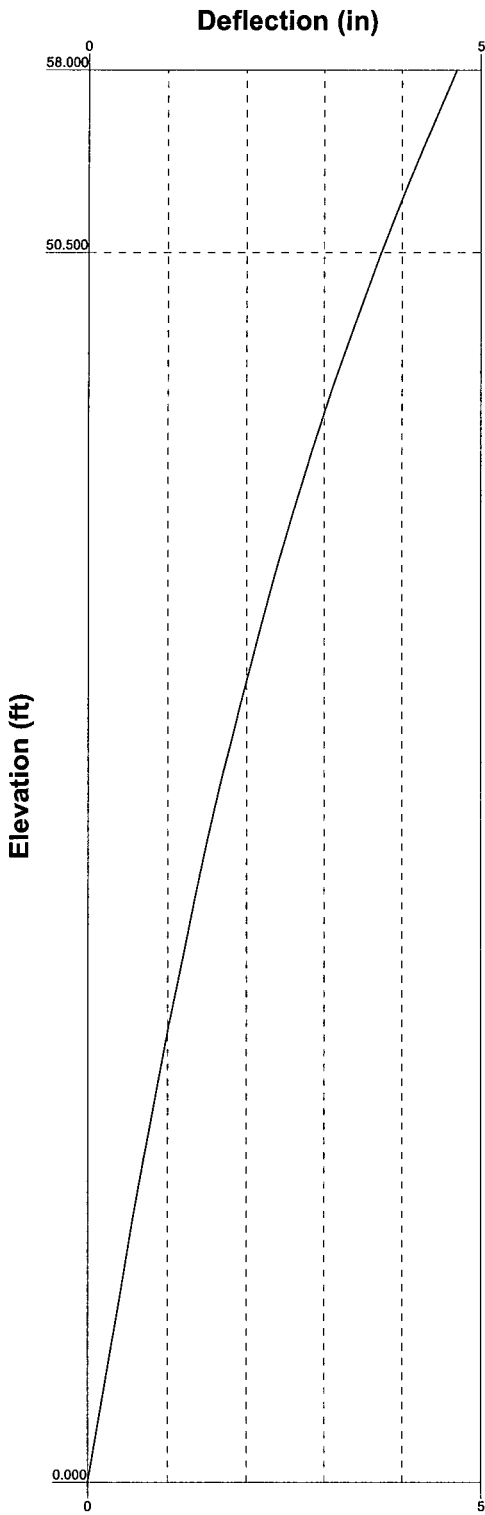
<p>B&T Engineering, Inc. 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	Job: 83031 - East Haven South (Site# 24481-A)
	Project: 58' FWT Monopole / T-Mobile Northeast, LLC Co-Local
	Client: AT&T Towers
	Code: TIA/EIA-222-F
	Path: <small>\\B&T\Projects\83031\83031.dwg</small>
Drawn by: K. Mears	App'd:
Date: 07/27/11	Scale: NTS
	Dwg No. E-1


—— Vx - - - - Vz

—— Mx - - - - Mz



 B&T Engineering, Inc. 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job: 83031 - East Haven South (Site# 24481-A)		
	Project: 58' FWT Monopole / T-Mobile Northeast, LLC Co-Local		
	Client: AT&T Towers	Drawn by: K. Mears	App'd:
	Code: TIA/EIA-222-F	Date: 07/27/11	Scale: NTS
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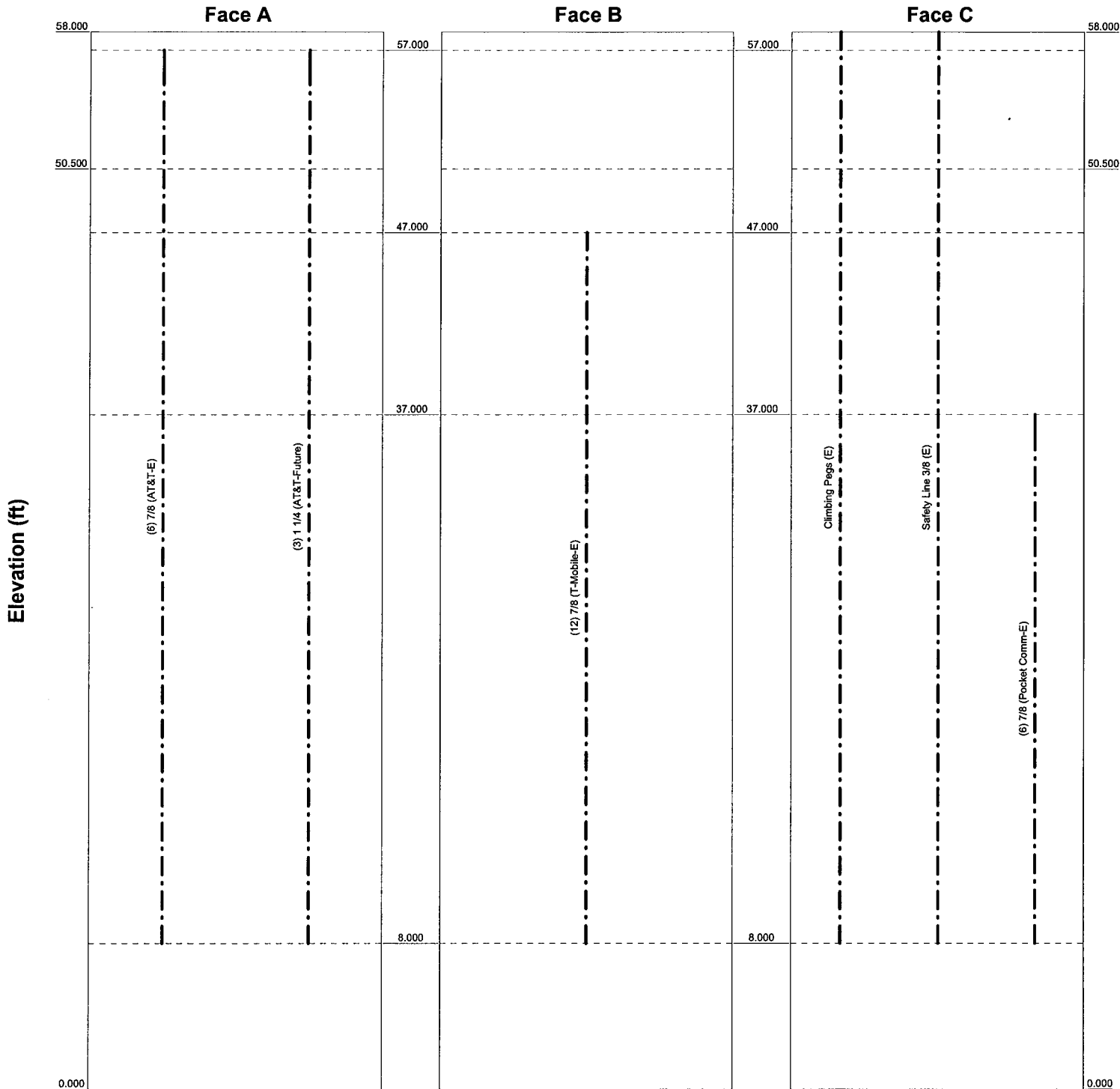


 <p>B&T Engineering, Inc. 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265</p>	Job: 83031 - East Haven South (Site# 24481-A)		
	Project: 58' FWT Monopole / T-Mobile Northeast, LLC Co-Local		
	Client: AT&T Towers	Drawn by: K. Mears	App'd:
	Code: TIA/EIA-222-F	Date: 07/27/11	Scale: NTS
	Path:	Dwg No. E-5	

Feedline Distribution Chart

0' - 58'

Round
Flat
App In Face
App Out Face
Truss Leg



B&T Engineering, Inc. 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job: 83031 - East Haven South (Site# 24481-A)		
	Project: 58' FWT Monopole / T-Mobile Northeast, LLC Co-Location		
	Client: AT&T Towers	Drawn by: K. Mears	App'd:
	Code: TIA/EIA-222-F	Date: 07/27/11	Scale: NTS
	Path:	Dwg No. E-7	

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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 New Haven County, Connecticut.

Basic wind speed of 85 mph.

Nominal ice thickness of 0.500 in.

Ice density of 56.000 pcf.

A wind speed of 74 mph is used in combination with ice.

Deflections calculated using a wind speed of 50 mph.

RE: Feedline Distribution Chart for transmission lines distribution..

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

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg √ Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension √ Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas SR Members Have Cut Ends √ Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque Include Angle Block Shear Check <li style="text-align: center;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

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	58.000-50.500	7.500	2.500	18	17.393	19.078	0.188	0.750	A572-65 (65 ksi)
L2	50.500-0.000	53.000		18	18.141	30.050	0.188	0.750	A572-65 (65 ksi)

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	58.000-50.500	A	0.000	0.000	0.000	0.000	0.034
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.881	0.005
L2	50.500-0.000	A	0.000	0.000	0.000	0.000	0.222
		B	0.000	0.000	0.000	0.000	0.253
		C	0.000	0.000	0.000	4.994	0.120

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	58.000-50.500	A	0.500	0.000	0.000	0.000	0.000	0.034
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	8.531	0.006
L2	50.500-0.000	A	0.500	0.000	0.000	0.000	0.000	0.222
		B		0.000	0.000	0.000	0.000	0.253
		C		0.000	0.000	0.000	48.344	0.126

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
L1	58.000-50.500	-0.142	0.082	-0.819	0.473
L2	50.500-0.000	-0.118	0.068	-0.792	0.457

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	

800 10121 w/ Mount Pipe (AT&T-E)	C	From Leg	4.000 0.000 0.000	20.000	57.000	No Ice 1/2" Ice	5.804 6.350	4.718 5.564	0.068 0.115
800 10121 w/ Mount Pipe (AT&T-E)	B	From Leg	4.000 0.000 0.000	30.000	57.000	No Ice 1/2" Ice	5.804 6.350	4.718 5.564	0.068 0.115
800 10121 w/ Mount Pipe (AT&T-E)	A	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	5.804 6.350	4.718 5.564	0.068 0.115
LGP21401 (AT&T-E)	C	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	1.288 1.445	0.233 0.313	0.014 0.021
LGP21401 (AT&T-E)	B	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	1.288 1.445	0.233 0.313	0.014 0.021
LGP21401	A	From Leg	4.000	0.000	57.000	No Ice	1.288	0.233	0.014

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
(AT&T-E)			0.000 0.000		1/2" Ice	1.445	0.313	0.021	
Platform Mount [LP 602-1] (AT&T-F) *	C	None		0.000	57.000	No Ice 1/2" Ice	32.030 38.710	1.343 1.800	
P65-16-XLH-RR w/Mount Pipe (AT&T-Future)	C	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	8.637 9.290	6.362 7.538	0.079 0.141
P65-16-XLH-RR w/Mount Pipe (AT&T-Future)	B	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	8.637 9.290	6.362 7.538	0.079 0.141
P65-16-XLH-RR w/Mount Pipe (AT&T-Future)	A	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	8.637 9.290	6.362 7.538	0.079 0.141
(2) RRUL (AT&T-Future)	C	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	1.918 2.109	1.465 1.638	0.042 0.058
(2) RRUL (AT&T-Future)	B	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	1.918 2.109	1.465 1.638	0.042 0.058
(2) RRUL (AT&T-Future)	A	From Leg	4.000 0.000 0.000	0.000	57.000	No Ice 1/2" Ice	1.918 2.109	1.465 1.638	0.042 0.058

APX16DWV-16DWVS-C w/Mount Pipe (T-Mobile-E)	C	From Leg	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	7.547 8.111	3.575 4.415	0.063 0.110
APX16DWV-16DWVS-C w/Mount Pipe (T-Mobile-E)	B	From Leg	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	7.547 8.111	3.575 4.415	0.063 0.110
APX16DWV-16DWVS-C w/Mount Pipe (T-Mobile-E)	A	From Leg	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	7.547 8.111	3.575 4.415	0.063 0.110
ATMAA1412D-1A20 (T-Mobile-P)	C	From Face	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	1.167 1.314	0.467 0.575	0.013 0.021
ATMAA1412D-1A20 (T-Mobile-P)	B	From Face	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	1.167 1.314	0.467 0.575	0.013 0.021
ATMAA1412D-1A20 (T-Mobile-P)	A	From Face	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	1.167 1.314	0.467 0.575	0.013 0.021
ATMPP1412D-1CWA (T-Mobile-P)	C	From Face	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	1.167 1.317	0.416 0.530	0.013 0.020
ATMPP1412D-1CWA (T-Mobile-P)	B	From Face	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	1.167 1.317	0.416 0.530	0.013 0.020
ATMPP1412D-1CWA (T-Mobile-P)	A	From Face	1.000 0.000 0.000	0.000	47.000	No Ice 1/2" Ice	1.167 1.317	0.416 0.530	0.013 0.020
Pipe Mount [PM 601-3] (T-Mobile-E) *****	C	None		0.000	47.000	No Ice 1/2" Ice	4.390 5.480	4.390 5.480	0.195 0.237
APXV18-206517S-C (Pocket Comm-E)	C	From Leg	1.000 0.000 0.000	0.000	37.000	No Ice 1/2" Ice	5.167 5.618	3.038 3.469	0.026 0.053

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _{Front}	C _A A _{Side}	Weight	
			Horz Lateral	Vert						
			ft	ft	°	ft	ft ²	ft ²	K	
APXV18-206517S-C (Pocket Comm-E)	B	From Leg	1.000	0.000	0.000	37.000	No Ice	5.167	3.038	0.026
			0.000	0.000			1/2" Ice	5.618	3.469	0.053
			0.000	0.000						
APXV18-206517S-C (Pocket Comm-E)	A	From Leg	1.000	0.000	0.000	37.000	No Ice	5.167	3.038	0.026
			0.000	0.000			1/2" Ice	5.618	3.469	0.053
			0.000	0.000						
Pipe Mount [PM 601-3] (Pocket Comm-E) *****	C	None		0.000	0.000	37.000	No Ice	4.390	4.390	0.195
							1/2" Ice	5.480	5.480	0.237

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
15	Dead+Wind 0 deg+Ice
16	Dead+Wind 30 deg+Ice
17	Dead+Wind 60 deg+Ice
18	Dead+Wind 90 deg+Ice
19	Dead+Wind 120 deg+Ice
20	Dead+Wind 150 deg+Ice
21	Dead+Wind 180 deg+Ice
22	Dead+Wind 210 deg+Ice
23	Dead+Wind 240 deg+Ice
24	Dead+Wind 270 deg+Ice
25	Dead+Wind 300 deg+Ice
26	Dead+Wind 330 deg+Ice
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

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Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	58 - 50.5	Pole	Max Tension	11	0.000	-0.000	0.000
			Max. Compression	14	-3.242	0.002	-0.001
			Max. Mx	11	-2.183	12.807	0.041
			Max. My	8	-2.181	-0.038	-12.897
			Max. Vy	5	3.278	-12.803	-0.043
			Max. Vx	8	3.301	-0.038	-12.897
			Max. Torque	2			-0.092
L2	50.5 - 0	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-8.403	0.031	-0.018
			Max. Mx	11	-6.280	307.425	0.587
			Max. My	8	-6.280	-0.576	-308.707
			Max. Vy	24	-7.109	297.837	0.310
			Max. Vx	21	7.121	-0.297	-298.525
			Max. Torque	20			-0.209

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	8.403	0.000	0.000
	Max. H _x	24	8.403	7.100	0.006
	Max. H _z	15	8.403	0.006	7.112
	Max. M _x	2	308.677	0.010	7.044
	Max. M _z	5	307.381	-7.022	-0.010
	Max. Torsion	26	0.209	3.555	6.162
	Min. Vert	11	6.287	7.021	0.010
	Min. H _x	18	8.403	-7.100	-0.006
	Min. H _z	21	8.403	-0.006	-7.112
	Min. M _x	8	-308.707	-0.010	-7.044
	Min. M _z	11	-307.425	7.021	0.010
	Min. Torsion	20	-0.209	-3.555	-6.162

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	6.287	0.000	0.000	0.015	0.025	0.000
Dead+Wind 0 deg - No Ice	6.287	-0.010	-7.044	-308.677	0.627	0.066
Dead+Wind 30 deg - No Ice	6.287	3.502	-6.095	-267.021	-153.157	0.073
Dead+Wind 60 deg - No Ice	6.287	6.076	-3.513	-153.811	-265.896	0.060
Dead+Wind 90 deg - No Ice	6.287	7.022	0.010	0.616	-307.381	0.031
Dead+Wind 120 deg - No Ice	6.287	6.086	3.531	154.882	-266.497	-0.006
Dead+Wind 150 deg - No Ice	6.287	3.520	6.105	267.652	-154.198	-0.042
Dead+Wind 180 deg - No Ice	6.287	0.010	7.044	308.707	-0.576	-0.067
Dead+Wind 210 deg - No Ice	6.287	-3.502	6.095	267.051	153.209	-0.073
Dead+Wind 240 deg - No Ice	6.287	-6.076	3.513	153.841	265.948	-0.060
Dead+Wind 270 deg - No Ice	6.287	-7.021	-0.010	-0.587	307.425	-0.031
Dead+Wind 300 deg - No Ice	6.287	-6.086	-3.531	-154.853	266.549	0.006

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Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead+Wind 330 deg - No Ice	6.287	-3.520	-6.105	-267.622	154.250	0.042
Dead+Ice	8.403	0.000	0.000	0.018	0.031	0.000
Dead+Wind 0 deg+Ice	8.403	-0.006	-7.112	-298.489	0.359	-0.165
Dead+Wind 30 deg+Ice	8.403	3.545	-6.157	-258.334	-148.588	-0.076
Dead+Wind 60 deg+Ice	8.403	6.146	-3.551	-148.952	-257.713	0.033
Dead+Wind 90 deg+Ice	8.403	7.100	0.006	0.346	-297.774	0.133
Dead+Wind 120 deg+Ice	8.403	6.152	3.561	149.556	-258.041	0.198
Dead+Wind 150 deg+Ice	8.403	3.555	6.162	258.698	-149.156	0.209
Dead+Wind 180 deg+Ice	8.403	0.006	7.112	298.525	-0.297	0.165
Dead+Wind 210 deg+Ice	8.403	-3.545	6.157	258.370	148.651	0.076
Dead+Wind 240 deg+Ice	8.403	-6.146	3.551	148.988	257.776	-0.033
Dead+Wind 270 deg+Ice	8.403	-7.100	-0.006	-0.310	297.837	-0.133
Dead+Wind 300 deg+Ice	8.403	-6.152	-3.561	-149.520	258.104	-0.198
Dead+Wind 330 deg+Ice	8.403	-3.555	-6.162	-258.662	149.219	-0.209
Dead+Wind 0 deg - Service	6.287	-0.004	-2.437	-106.815	0.234	0.023
Dead+Wind 30 deg - Service	6.287	1.212	-2.109	-92.399	-52.986	0.025
Dead+Wind 60 deg - Service	6.287	2.102	-1.216	-53.220	-92.002	0.021
Dead+Wind 90 deg - Service	6.287	2.430	0.004	0.223	-106.359	0.011
Dead+Wind 120 deg - Service	6.287	2.106	1.222	53.610	-92.210	-0.002
Dead+Wind 150 deg - Service	6.287	1.218	2.113	92.636	-53.347	-0.015
Dead+Wind 180 deg - Service	6.287	0.004	2.437	106.845	-0.182	-0.023
Dead+Wind 210 deg - Service	6.287	-1.212	2.109	92.428	53.038	-0.025
Dead+Wind 240 deg - Service	6.287	-2.102	1.216	53.250	92.054	-0.021
Dead+Wind 270 deg - Service	6.287	-2.430	-0.004	-0.193	106.411	-0.011
Dead+Wind 300 deg - Service	6.287	-2.106	-1.222	-53.580	92.262	0.002
Dead+Wind 330 deg - Service	6.287	-1.218	-2.113	-92.607	53.398	0.015

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.000	-6.287	0.000	0.000	6.287	0.000	0.000%
2	-0.010	-6.287	-7.044	0.010	6.287	7.044	0.000%
3	3.502	-6.287	-6.095	-3.502	6.287	6.095	0.000%
4	6.076	-6.287	-3.513	-6.076	6.287	3.513	0.000%
5	7.022	-6.287	0.010	-7.022	6.287	-0.010	0.000%
6	6.086	-6.287	3.531	-6.086	6.287	-3.531	0.000%
7	3.520	-6.287	6.105	-3.520	6.287	-6.105	0.000%
8	0.010	-6.287	7.044	-0.010	6.287	-7.044	0.000%
9	-3.502	-6.287	6.095	3.502	6.287	-6.095	0.000%
10	-6.076	-6.287	3.513	6.076	6.287	-3.513	0.000%
11	-7.022	-6.287	-0.010	7.021	6.287	0.010	0.002%
12	-6.086	-6.287	-3.531	6.086	6.287	3.531	0.000%
13	-3.520	-6.287	-6.105	3.520	6.287	6.105	0.000%
14	0.000	-8.403	0.000	0.000	8.403	0.000	0.000%
15	-0.006	-8.403	-7.112	0.006	8.403	7.112	0.000%
16	3.545	-8.403	-6.157	-3.545	8.403	6.157	0.000%
17	6.146	-8.403	-3.551	-6.146	8.403	3.551	0.000%
18	7.100	-8.403	0.006	-7.100	8.403	-0.006	0.000%
19	6.152	-8.403	3.561	-6.152	8.403	-3.561	0.000%
20	3.555	-8.403	6.162	-3.555	8.403	-6.162	0.000%
21	0.006	-8.403	7.112	-0.006	8.403	-7.112	0.000%
22	-3.545	-8.403	6.157	3.545	8.403	-6.157	0.000%
23	-6.146	-8.403	3.551	6.146	8.403	-3.551	0.000%
24	-7.100	-8.403	-0.006	7.100	8.403	0.006	0.000%
25	-6.152	-8.403	-3.561	6.152	8.403	3.561	0.000%
26	-3.555	-8.403	-6.162	3.555	8.403	6.162	0.000%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
27	-0.004	-6.287	-2.437	0.004	6.287	2.437	0.001%
28	1.212	-6.287	-2.109	-1.212	6.287	2.109	0.001%
29	2.102	-6.287	-1.216	-2.102	6.287	1.216	0.001%
30	2.430	-6.287	0.004	-2.430	6.287	-0.004	0.001%
31	2.106	-6.287	1.222	-2.106	6.287	-1.222	0.001%
32	1.218	-6.287	2.113	-1.218	6.287	-2.113	0.001%
33	0.004	-6.287	2.437	-0.004	6.287	-2.437	0.001%
34	-1.212	-6.287	2.109	1.212	6.287	-2.109	0.001%
35	-2.102	-6.287	1.216	2.102	6.287	-1.216	0.001%
36	-2.430	-6.287	-0.004	2.430	6.287	0.004	0.001%
37	-2.106	-6.287	-1.222	2.106	6.287	1.222	0.001%
38	-1.218	-6.287	-2.113	1.218	6.287	2.113	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00000001
3	Yes	6	0.00000001	0.00000001
4	Yes	6	0.00000001	0.00000001
5	Yes	5	0.00000001	0.00000001
6	Yes	6	0.00000001	0.00000001
7	Yes	6	0.00000001	0.00000001
8	Yes	5	0.00000001	0.00002211
9	Yes	6	0.00000001	0.00000001
10	Yes	6	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00014857
12	Yes	6	0.00000001	0.00000001
13	Yes	6	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	5	0.00000001	0.00002321
16	Yes	6	0.00000001	0.00002413
17	Yes	6	0.00000001	0.00002372
18	Yes	5	0.00000001	0.00002503
19	Yes	6	0.00000001	0.00002522
20	Yes	6	0.00000001	0.00002361
21	Yes	5	0.00000001	0.00002286
22	Yes	6	0.00000001	0.00002420
23	Yes	6	0.00000001	0.00002457
24	Yes	5	0.00000001	0.00002450
25	Yes	6	0.00000001	0.00002350
26	Yes	6	0.00000001	0.00002515
27	Yes	4	0.00000001	0.00007591
28	Yes	4	0.00000001	0.00011564
29	Yes	4	0.00000001	0.00010037
30	Yes	4	0.00000001	0.00007338
31	Yes	4	0.00000001	0.00010458
32	Yes	4	0.00000001	0.00011384
33	Yes	4	0.00000001	0.00007616
34	Yes	4	0.00000001	0.00009923
35	Yes	4	0.00000001	0.00011255
36	Yes	4	0.00000001	0.00007336
37	Yes	4	0.00000001	0.00010900
38	Yes	4	0.00000001	0.00010172

RISATower B&T Engineering, Inc. 1717 S. Boulder, Suite 300 Tulsa, OK 74119 Phone: (918) 587-4630 FAX: (918) 295-0265	Job 83031 - East Haven South (Site# 24481-A)	Page 9 of 10
	Project 58' FWT Monopole / T-Mobile Northeast, LLC Co-Locate	Date 10:36:12 07/27/11
	Client AT&T Towers	Designed by K. Mears

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	58 - 50.5	4.696	32	0.628	0.001
L2	53 - 0	4.040	32	0.622	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
57.000	800 10121 w/ Mount Pipe	32	4.563	0.627	0.001	5164
47.000	APX16DWV-16DWVS-C w/Mount Pipe	32	3.331	0.600	0.000	4761
37.000	APXV18-206517S-C	32	2.344	0.526	0.000	6047

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	58 - 50.5	13.566	7	1.814	0.002
L2	53 - 0	11.672	7	1.798	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
57.000	800 10121 w/ Mount Pipe	7	13.181	1.812	0.002	1790
47.000	APX16DWV-16DWVS-C w/Mount Pipe	7	9.622	1.735	0.002	1650
37.000	APXV18-206517S-C	7	6.773	1.520	0.001	2095

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	Project 58' FWT Monopole / T-Mobile Northeast, LLC Co-Locate	Date 10:36:12 07/27/11
	Client AT&T Towers	Designed by K. Mears

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 P P _a
L1	58 - 50.5 (1)	TP19.078x17.393x0.188	7.500	0.000	0.0	39.000	10.908	-2.181	425.410	0.005
L2	50.5 - 0 (2)	TP30.05x18.141x0.188	53.000	0.000	0.0	37.971	17.772	-6.280	674.813	0.009

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	58 - 50.5 (1)	TP19.078x17.393x0.188	12.909	-3.147	39.000	0.081	0.000	0.000	39.000	0.000
L2	50.5 - 0 (2)	TP30.05x18.141x0.188	308.892	-28.260	37.971	0.744	0.000	0.000	37.971	0.000

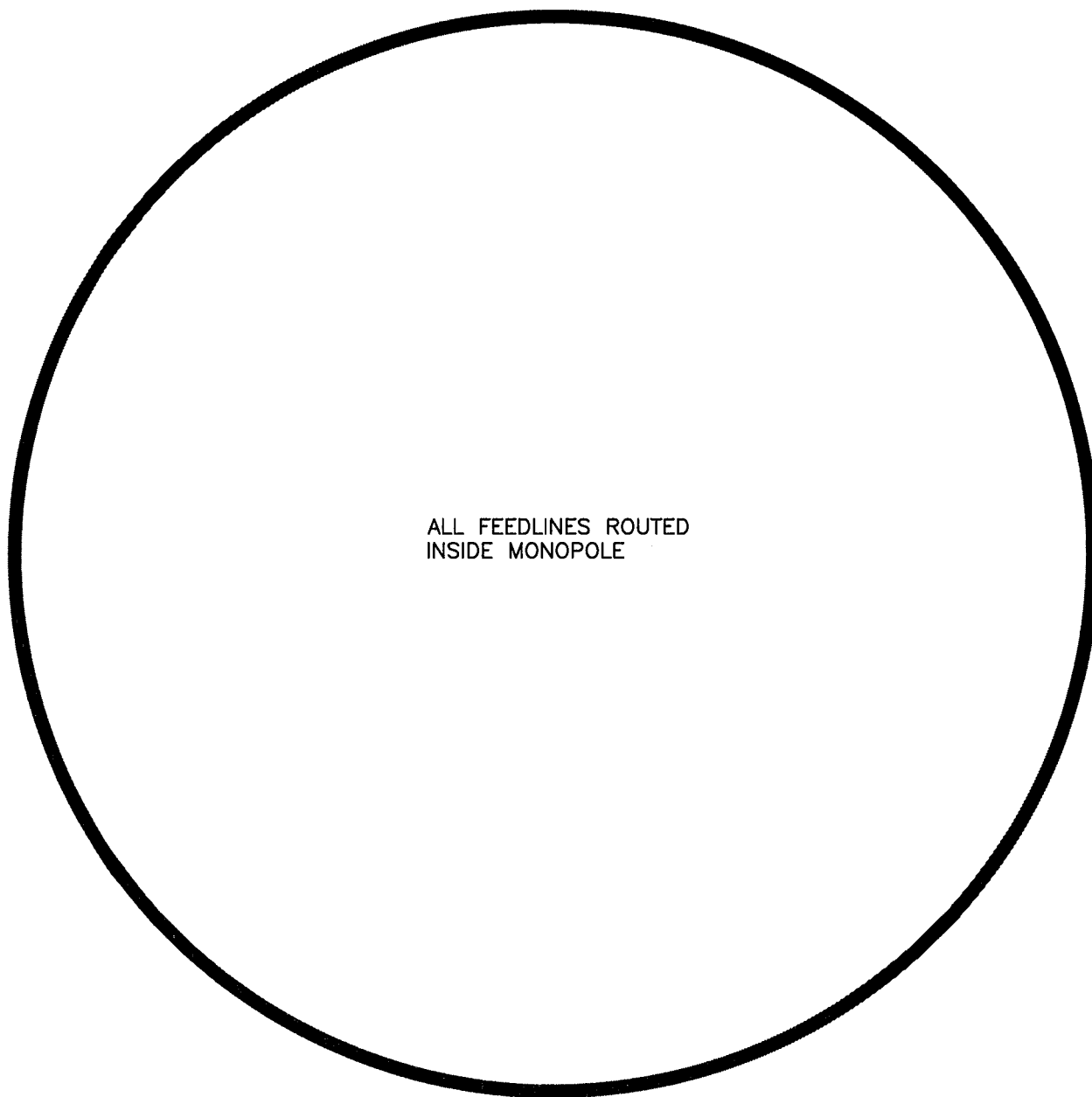
Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	58 - 50.5 (1)	TP19.078x17.393x0.188	0.005	0.081	0.000	0.086	1.333	H1-3 ✓
L2	50.5 - 0 (2)	TP30.05x18.141x0.188	0.009	0.744	0.000	0.754	1.333	H1-3 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	58 - 50.5	Pole	TP19.078x17.393x0.188	1	-2.181	567.072	6.4	Pass
L2	50.5 - 0	Pole	TP30.05x18.141x0.188	2	-6.280	899.526	56.5	Pass
Summary								
Pole (L2)							56.5	Pass
RATING =							56.5	Pass

APPENDIX B
BASE LEVEL DRAWING



ALL FEEDLINES ROUTED
INSIDE MONOPOLE

PROJECT#: 83031

APPENDIX C
ADDITIONAL CALCULATIONS

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

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

Site Data		
Site#:	24481-A	
Site Name:	East Haven South, CT	
Project #:	83031	
Anchor Rod Data		
Qty:	4	
Diam:	2.25	in
Rod Material:	A615-J	
Yield, Fy:	75	ksi
Strength, Fu:	100	ksi
Bolt Circle:	37	in

Plate Data		
W=Side:	33	in
Thick:	2	in
Grade:	60	ksi
Clip Distance:	0	in

Stiffener Data (Welding at both sides)		
Configuration:	Unstiffened	
Weld Type:	Fillet	**
Groove Depth:	0.375	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	10	in
Height:	24	in
Thick:	1.25	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi
Clear Space between Stiffeners at B.C.	6.5	in

Pole Data		
Diam:	30.05	in
Thick:	0.1875	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round

Stress Increase Factor		
ASD ASIF:	1.333	

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

Base Reactions		
TIA Revision:	F	
Unfactored Moment, M:	309	ft-kips
Unfactored Axial, P:	6	kips
Unfactored Shear, V:	7	kips

Anchor Rod Results

TIA F --> Maximum Rod Tension: 98.7 Kips
 Allowable Tension: 195.0 Kips
 Anchor Rod Stress Ratio: 50.6% Pass

Base Plate Results

Base Plate Stress: 31.9 ksi
 Allowable PL Bending Stress: 60.0 ksi
 Base Plate Stress Ratio: 53.2% Pass

Flexural Check

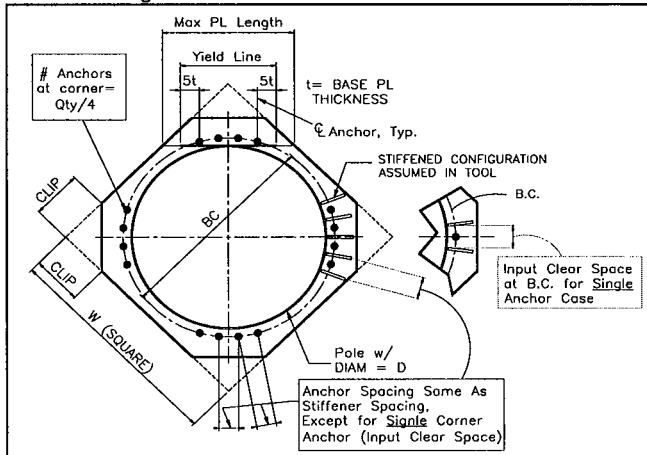
PL Ref. Data	
Yield Line (in):	16.62
Max PL Length:	16.62

N/A - Unstiffened Stiffener Results

Horizontal Weld : N/A
 Vertical Weld: N/A
 Plate Flex+Shear, $f_b/F_b + (f_v/F_v)^2$: N/A
 Plate Tension+Shear, $f_t/F_t + (f_v/F_v)^2$: N/A
 Plate Comp. (AISC Bracket): N/A

Pole Results

Pole Punching Shear Check: N/A



(Bearing and Stability Checks) Tool for TIA Rev F or G - Any application (MP, SST, GT)

Site Data

Site# 24481-A
Site Name: East Haven South
Project# 83031

Enter Load Factors Below:

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

Pad & Pier Data

Base PL Dist. Above Pier:	3	in
Pier Dist. Above Grade:	6	in
Pad Bearing Depth, D:	6.5	ft
Pad Thickness, T:	2.5	ft
Pad Width=Length, L:	14	ft
Pier Cross Section Shape:	Round	<--Pull Down
Enter Pier Diameter:	5	ft
Concrete Density:	150.0	pcf
Pier Cross Section Area:	19.63	ft^2
Pier Height:	4.50	ft
Soil (above pad) Height:	4.00	ft

Soil Parameters

Unit Weight, γ :	120.0	pcf
Ultimate Bearing Capacity, q_n :	10.00	ksf
Strength Reduct. factor, ϕ :	0.75	
Angle of Friction, Φ :	30.0	degrees
Undrained Shear Strength, C_u :	0.00	ksf
Allowable Bearing: $\phi * q_n$:	7.50	ksf
Passive Pres. Coeff., K_p :	3.00	

Forces/Moments due to Wind and Lateral Soil

Factored Pad Passive Force:	66.2	kips
Pad Force Location Above D:	1.15	ft
ϕ (Passive Pressure Moment):	57.09	ft-kips
Factored O.T. M(WL), "1.6W":	485.7	ft-kips
Factored OT (MW-Msoil), M1	428.57	ft-kips

Resistance due to Foundation Gravity

Soil Wedge Projection grade, a:	2.31	ft
Sum of Soil Wedges Wt:	20.72	kips
Soil Wedges ecc, K1:	4.60	ft
Ftg+Soil above Pad wt:	171.4	kips
Unfactored (Total ftg-soil Wt):	192.13	kips
1.2D. No Soil Wedges.	212.89	kips
0.9D. With Soil Wedges	178.32	kips

Resistance due to Cohesion (Vertical)

$\phi * (1/2 * C_u) (\text{Total Vert. Planes})$	0.00	kips
Cohesion Force Eccentricity, K2	0.00	ft

Monopole Base Reaction Forces

TIA Revision:	F	<--Pull Down
Unfactored DL Axial, PD:	6	kips
Unfactored WL Axial, PW:	0	kips
Unfactored WL Shear, V:	7	kips
Unfactored WL Moment, M:	309	ft-kips

Load Factor Shaft Factored Loads

1.20	1.2D+1.6W, Pu:	7.2	kips
0.90	0.9D+1.6W, Pu:	5.4	kips
1.35	Vu:	9.45	kips
	Mu:	417.15	ft-kips

1.2D+1.6W Load Combination, Bearing Results:

(No Soil Wedges) [Reaction+Conc+Soil]	212.89	P1="1.2D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil), M1	428.57	ft-kips

Orthogonal Direction:

ecc1 = M1/P1 = 2.01 ft
 Orthogonal qu = 1.71 ksf
 qu/ $\phi * q_n$ Ratio = **22.81%** Pass

Diagonal Direction:

ecc2 = (0.707M1)/P1 = 1.42 ft
 Diagonal qu = 2.42 ksf
 qu/ $\phi * q_n$ Ratio = **32.27%** Pass

<-- Press Upon Completing All Input

Overtuning Stability Check

0.9D+1.6W Load Combination, Bearing Results:

(w/ Soil Wedges) [Reaction+Conc+Soil]	178.32	P2="0.9D+1.6W" (Kips)
Factored "1.6W" Overturning Moment (MW-Msoil) - 0.9(M of Wedge + M of Cohesion), M2	342.75	ft-kips

Orthogonal ecc3 = M2/P2 = 1.92 ft
 Ortho Non Bearing Length, NBL = 10.16 ft
 Orthogonal qu = 1.41 ksf
 Diagonal qu = 1.98 ksf

Max Reaction Moment (ft-kips) so that qu= $\phi * q_n$ = 100% Capacity Rating

Actual M:	309.00		
M Orthogonal:	826.83	37.37%	Pass
M Diagonal:	793.95	38.92%	Pass

Technical Memo

To: Northeast Tower Inc
From: Amir Uzzaman - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CT11623B
Date: August 25, 2011

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 259 Commerce Street, East Haven, 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), (1980.2-1984.8), (2140-2145), (2110-2120)MHz frequency Band.
- 2) The antenna array consists of three sectors, with 1 antenna 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 47 ft.
- 4) UMTS antenna center line height is 47 ft.
- 5) The maximum transmit power from any GSM sector is 649.47 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
- 5) The maximum transmit power from any UMTS sector is 2924.76 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 259 Commerce Street, East Haven, CT, is 0.46648 mW/cm². This value represents 46.648% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm²) 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 25.96331%. The combined Power Density for the site is 72.612% of the M.P.E. standard.

Connecticut Market



Worst Case Power Density

Site: CT11623B
Site Address: 259 Commerce Street
Town: East Haven
Tower Height: 58 ft.
Tower Style: Monopole

GSM Data		UMTS Data	
Base Station TX output	20 W	Base Station TX output	40 W
Number of channels	2	Number of channels	2
Antenna Model	APX16DWV-16DWV	Antenna Model	APX16DWV-16DWV
Cable Size	7/8 in.	Cable Size	7/8 in.
Cable Length	75 ft.	Cable Length	75 ft.
Antenna Height	47.0 ft.	Antenna Height	47.0 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	0.0186 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	1.3950 dB	Total Cable Loss	0.8700 dB
Total Attenuation	5.8950 dB	Total Attenuation	2.3700 dB
Total EIRP per Channel (In Watts)	55.12 dBm 324.74 W	Total EIRP per Channel (In Watts)	61.65 dBm 1462.38 W
Total EIRP per Sector (In Watts)	58.13 dBm 649.47 W	Total EIRP per Sector (In Watts)	64.66 dBm 2924.76 W
nsg	12.1050	nsg	15.6300
Power Density (S) = 0.084764 mW/cm²		Power Density (S) = 0.381718 mW/cm²	
T-Mobile Worst Case % MPE =		46.6482%	

Equation Used :

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

Co-Location Total

Carrier	% of Standard
Cingular GSM	9.4512 %
Cingular UMTS	9.4321 %
Pocket	7.0800 %
Other Antenna Systems	
Total Excluding T-Mobile	25.9633 %
T-Mobile	46.6482
Total % MPE for Site	72.6115%