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

Internet: ct.gov/csc

Daniel F. Caruso
Chairman

January 18, 2011

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

RE: **EM-T-MOBILE-014-101217** – T-Mobile USA, Inc. notice of intent to modify an existing telecommunications facility located at 850 West Main Street, Branford, 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 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 December 17, 2010. 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

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Anthony DaRos, First Selectman, Town of Branford
Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine Gillen, Zoning Enforcement Officer, Town of Branford

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

EM-T-mobile-014-101217

ORIGINAL

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

Via Hand Delivery

December 22, 2010

RECEIVED
DEC 22 2010
CONNECTICUT
SITING COUNCIL

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

RE: Notice of Exempt Modification / Branford @ 850 West Main Street

Dear Mr. Caruso:

On behalf of T-Mobile USA, Inc. ("T-Mobile"), enclosed for filing are an original and five (5) copies of T-Mobile's revised power density analysis to be added to its Notice of Exempt Modification for the Facility located at the above-referenced site which was filed on December 17, 2010.

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

By: _____
Thomas J. Regan

Enclosures

cc w/ encl. via 1st Class Mail – First Selectman Anthony DaRos

40280243 v1 - MERCIECM - 025064/0016

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CTNH101A**
Site Address:	**850 West Main Street**
Town:	**Branford**
Tower Height:	**130 ft.**
Tower Style:	**Monopole**

GSM Data		**UMTS Data**	
Base Station TX output	10 W	**Base Station TX output**	40 W
Number of channels	8	**Number of channels**	2
Antenna Model	APXV18-209014-C	**Antenna Model**	[redacted]
Cable Size	1 5/8 in	**Cable Size**	1 5/8 in
Cable Length	[redacted]	**Cable Length**	[redacted]
Antenna Height	[redacted]	**Antenna Height**	[redacted]
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	16.5 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0116 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	1.9140 dB	**Total Cable Loss**	1.9140 dB
Total Attenuation	6.4140 dB	**Total Attenuation**	3.4140 dB
Total EIRP per Channel	50.09 dBm	**Total EIRP per Channel**	60.61 dBm
(In Watts)	102.00 W	**(In Watts)**	1149.90 W
Total EIRP per Sector	59.12 dBm	**Total EIRP per Sector**	63.62 dBm
(In Watts)	816.00 W	**(In Watts)**	2299.80 W
nsg	10.0860	**nsg**	14.5860
Power Density (S) =	**0.011643 mW/cm^2**	**Power Density (S) =**	**0.032815 mW/cm^2**
T-Mobile Worst Case % MPE =		**4.4458%**	

Equation Used :

$$S = \frac{(1000)(grf)^2 (Power) * 10^{(nsg/10)}}{4\pi (R)^2}$$

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

Co-Location Total

Carrier	**% of Standard**
Sprint CDMA	11.2800 %
Sprint WiMAX	4.2000 %
Sprint microwave	0.0220 %
Clearwire	0.7600 %
Clearwire	0.4930 %
Verizon	13.2490 %
Verizon	2.9770 %
Verizon	3.4970 %
Other Antenna Systems	
Total Excluding T-Mobile	**36.4780 %**
T-Mobile	4.4458
Total % MPE for Site	**40.9238%**

T-Mobile

T-Mobile USA Inc.
35 Griffin Rd South, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Transcend
From: Amir Uzzaman - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CTNH101A
Date: December 17, 2010

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 850 West Main Street, Branford, 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 2 antennas per sector.
3) The model number for GSM antenna is APXV18-209014-C.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 130 ft.
4) UMTS antenna center line height is 130 ft.
5) The maximum transmit power from any GSM sector is 816 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2299.8 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 850 West Main Street, Branford, CT, is 0.04446 mW/cm^2. This value represents 4.446% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) 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 36.478%. The combined Power Density for the site is 40.924% of the M.P.E. standard.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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Internet: ct.gov/csc

Daniel F. Caruso
Chairman

December 21, 2010

The Honorable Anthony "Unk" DaRos
First Selectman
Town of Branford
Town Hall
1019 Main Street
P. O. Box 150
Branford, CT 06405-0150

RE: **EM-T-MOBILE-014-101217** – T-Mobile USA, Inc. notice of intent to modify an existing telecommunications facility located at 850 West Main Street, Branford, Connecticut.

Dear First Selectman DaRos:

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

If you have any questions or comments regarding this proposal, please call me or inform the Council by January 6, 2011.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

LR/jbw

Enclosure: Notice of Intent

c: Diana Ross, Inland Wetland Enforcement Officer, Town of Branford
Justine K. Gillen, Zoning Enforcement Officer, Town of Branford

BROWNRUDNICK

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185 Asylum
Street
Hartford
Connecticut
06103
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fax 860.509.6501

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

EM-T-MOBILE-014-101217

ORIGINAL

Via Hand Delivery

December 17, 2010

RECEIVED
DEC 17 2010
CONNECTICUT
SITING COUNCIL

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

RE: Notice of Exempt Modification / Branford @ 850 West Main Street

Dear Mr. Caruso:

On behalf of T-Mobile USA, Inc. ("T-Mobile"), enclosed for filing are an original and five (5) copies of T-Mobile's Notice of Exempt Modification for a Facility located at the above-referenced site.

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

By: Thomas J. Regan
Thomas J. Regan

Enclosures

cc w/ encl. via 1st Class Mail – First Selectman Anthony DaRos

40279561 v1 - REGANTJ - 025064/0016

CONNECTICUT SITING COUNCIL

In re:		
T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility at 850 Main Street, Branford, Connecticut.	:	**EXEMPT MODIFICATION NO. _____**
	:	
	:	December 17, 2010

NOTICE OF EXEMPT MODIFICATION

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 Branford of T-Mobile's intent to make an exempt modification to the existing monopole tower (the "Tower") located at 850 Main Street in Branford, 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

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

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 130-foot monopole tower located at 850 West Main Street in Branford, Connecticut (latitude N 41° 16' 40.19", longitude W -72° 50' 12.7"). The Tower is owned by Crown Castle. Multiple carriers are currently located on the Tower. Currently, T-Mobile has 6 GSM panel antennas and 6 Tower Mounted Amplifiers ("TMA") located on the Tower with a centerline of 130-feet. A site plan with Tower specifications is attached.

T-Mobile plans remove 3 of its 6 existing antennas and replace them with 3 new UMTS panel antennas. In addition, T-Mobile plans to remove and replace its 6 TMAs. Specifically, the existing TMAs will be replaced with 3 PCS TMA and 3 AWS TMA. The centerline of the new antennas and TMAs will remain at 130-feet. T-Mobile will continue to utilize its 6 existing coax cables and plans to install 6 additional 1-5/8 inch coax cables.

To confirm the Tower can support these changes, T-Mobile commissioned Crown Castle to perform a structural analysis of the Tower (attached). According to the Structural Analysis Report, dated October 28, 2010, the Tower has "...sufficient capacity..." to support the existing, reserved and proposed loading. (Page 1, Structural Analysis Report).

In addition, T-Mobile proposes to install 1 new UMTS equipment cabinet on its existing 15-foot by 5-foot (approximately) concrete pad. Since T-Mobile's equipment cabinet will be located on its existing concrete pad, no increase in the boundaries of the site will be necessary.

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 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

BROWN RUDNICK LLP
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(860) 509-6500

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 for the antennas, measured at the base of the Tower, indicates that T-Mobile's proposed antennas will emit 3.75%[1] 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 40.22% of the NCRP's standard for maximum permissible exposure. 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 to add antennas and 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 USA, Inc.

By: Thomas J. Regan

Thomas J. Regan
Brown Rudnick LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Email - tregan@brownrudnick.com
Phone - 860.509.6522 /Fax - 860.509.6501

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[1] Please note that the height of T-Mobile's proposed antennas used in the power density analysis was higher than T-Mobile's actual proposed height. T-Mobile anticipates being well within the NCRP's standard for maximum permissible exposure at the proposed height and will submit a revised power density analysis as soon as possible.

Certificate of Service

This is to certify that on this 17th day of December, 2010, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

Town of Branford
First Selectman Anthony DaRos
1019 Main Street
Branford, CT 06405

By: Thomas J. Regan
Thomas J. Regan

40279536 v1 - 025064/0016

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

1 / L-1 **SITE PLAN**
SCALE: 1" = 40'

APPROXIMATE NORTH

40 0 20 40 80 160
(IN FEET)
1 inch = 40 ft.

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	9/16/10	DEB	CFC	FINAL LEASE EXHIBIT
A	9/28/10	DEB	CFC	LEASE EXHIBIT - CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

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

T-Mobile

T-MOBILE
CTNH101A
BRANFORD GLOBAL SIGNAL
850 WEST MAIN STREET
BRANFORD, CT 06405

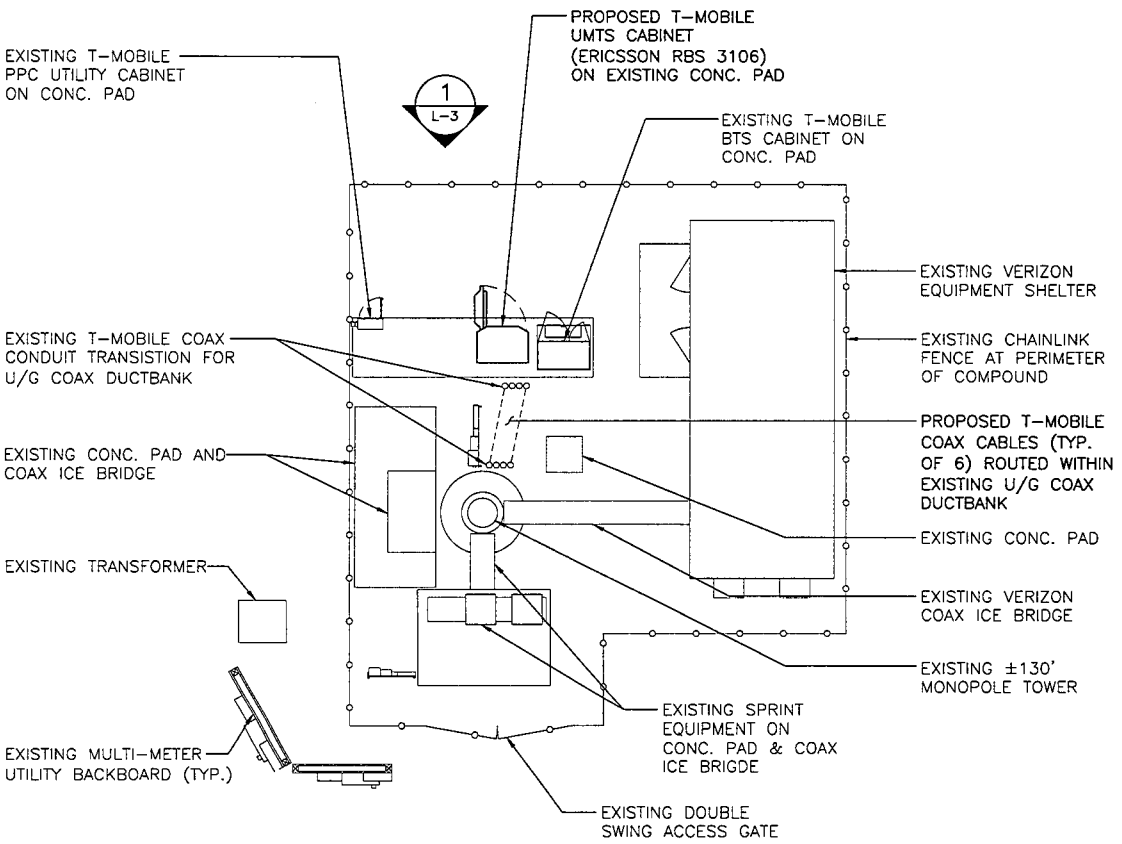
DATE:	9/23/10
SCALE:	AS SHOWN
JOB NO.	10116.004

LEASE EXHIBIT

SHEET NO.
L-1
Sheet No. 1 of 2

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.



1 / L-2 **COMPOUND PLAN**

SCALE: 1" = 10'

TRUE NORTH

10 0 5 10 20 40

(IN FEET)

1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
00	9/28/10	DEB	CFC	FINAL LEASE EXHIBIT
A	9/29/10	DEB	CFC	LEASE EXHIBIT - CLIENT REVIEW

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

PROFESSIONAL ENGINEER SEAL

T-Mobile

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www.CentekEng.com

T-MOBILE
CTNH101A
BRANFORD GLOBAL SIGNAL
850 WEST MAIN STREET
BRANFORD, CT 06405

DATE: 9/23/10
SCALE: AS SHOWN
JOB NO. 10116.C04

LEASE EXHIBIT

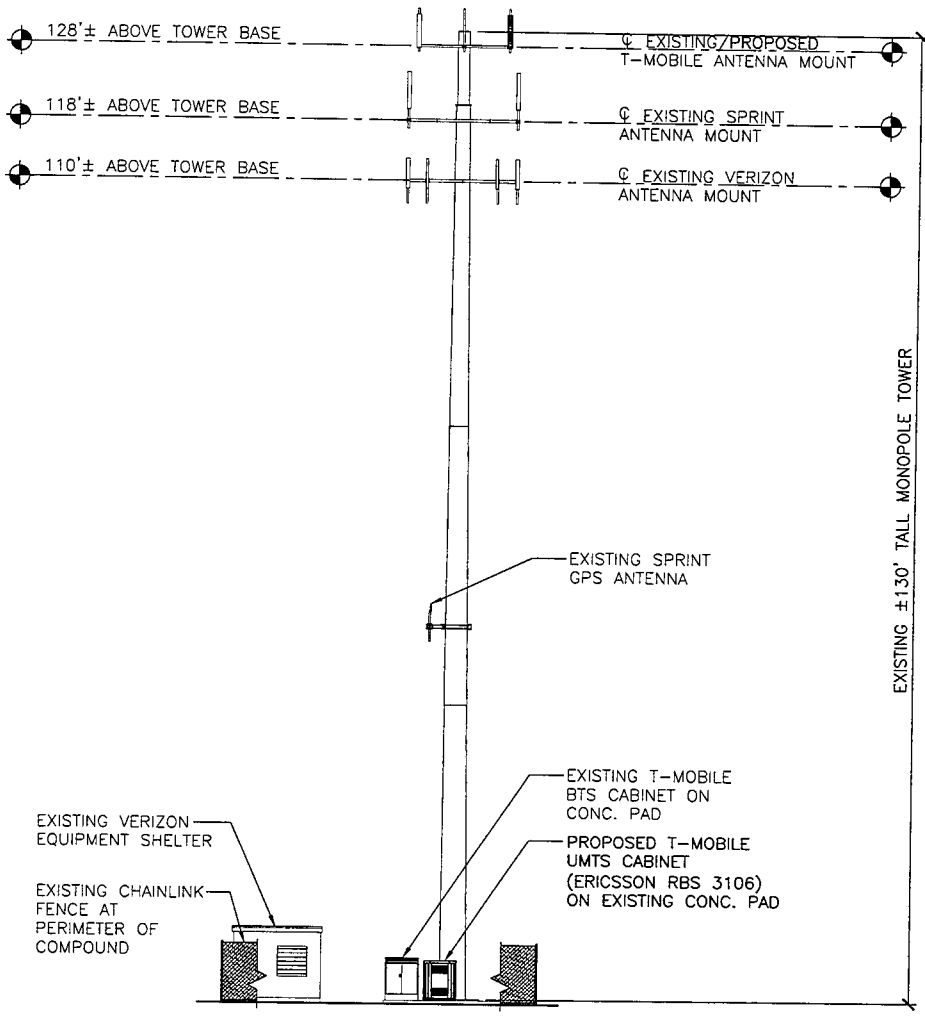
SHEET NO.
L-2
Sheet No. 2 of 3

LEASE EXHIBIT

THIS LEASE PLAN IS DIAGRAMMATIC IN NATURE AND IS INTENDED TO PROVIDE GENERAL INFORMATION REGARDING THE LOCATION AND SIZE OF THE PROPOSED WIRELESS COMMUNICATION FACILITY. THE SITE LAYOUT WILL BE FINALIZED UPON COMPLETION OF SITE SURVEY AND FACILITY DESIGN.

EQUIP. UPGRADE PROJECT SCOPE

EQUIPMENT TYPE	PROPOSED CHANGES
RADIO CABINET	• (1) EXISTING BTS CABINET ON EXISTING CONC. PAD TO REMAIN. • INSTALL (1) ERICSSON RBS 3106 CABINET ON EXISTING CONC. PAD AS SHOWN HEREIN.
ANTENNAS/ TMAs	• REMOVE (3) OF THE EXISTING (6) RFS APXV18-209014 PANEL ANTENNAS (1 PER SECTOR). (3) RFS APXV18-209014 PANEL ANTENNAS (1 PER SECTOR) TO REMAIN. • (3) RFS APX16DWV-16DWV-S PANEL ANTENNAS ARE PROPOSED TO BE INSTALLED ON THE EXISTING LOW-PROFILE ANTENNA PLATFORM. • THE (6) EXISTING TMAs TO BE REPLACED WITH (3) PCS AND (3) AWS TMAs. TOTAL # OF TMAs TO REMAIN (6). • TMAs TO BE INSTALLED ON EXISTING ANTENNA MOUNT PIPES BEHIND ANTENNAS.
COAX CABLES	• NO CHANGE IS PROPOSED FOR THE (6) EXISTING 1 5/8"ø COAX CABLES ROUTED WITHIN THE EXISTING COAX DUCTBANK AND VERTICALLY WITHIN THE EXISTING MONOPOLE TOWER. • (6) ADDITIONAL 1 5/8"ø COAX CABLES ARE PROPOSED TO BE ROUTED WITHIN THE EXISTING COAX DUCTBANK AND VERTICALLY WITHIN THE EXISTING MONOPOLE TOWER. EXISTING PVC CONDUITS WILL BE UTILIZED TO TRANSITION FROM PROPOSED UMTS CABINET TO DUCTBANK/MONOPOLE TOWER ENTRY PORT.
COMPOUND LIMITS	• NO CHANGE TO THE LIMITS OF THE EXISTING FENCED COMPOUND IS PROPOSED.



1 / L-3 **NORTHEAST ELEVATION**
SCALE: 1/16" = 1'-0"

16 0 8 16 32 64
(IN FEET)
1/16 inch = 1 ft.

REV	DATE	DRAWN BY/CHK'D BY	DESCRIPTION
00	9/29/10	DEB	FINAL LEASE EXHIBIT
A	9/29/10	DEB CFC	LEASE EXHIBIT - CLIENT REVIEW

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

PROFESSIONAL ENGINEER SEAL

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www.CentekEng.com

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CTNH101A
BRANFORD GLOBAL SIGNAL
850 WEST MAIN STREET
BRANFORD, CT 06405

DATE: 9/23/10
SCALE: AS SHOWN
JOB NO. 10116.C04

LEASE EXHIBIT

SHEET NO. L-3
Sheet No. 3 of 3

Date: **October 28, 2010**

Molly Carder
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2126

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CTNH101A
	Carrier Site Name:	Global Signal - Branford
Crown Castle Designation:	**Crown Castle BU Number:**	876322
	Crown Castle Site Name:	TARTAGLIA PROPERTY
	Crown Castle JDE Job Number:	142363
	Crown Castle Work Order Number:	366697
Engineering Firm Designation:	**Crown Castle Project Number:**	366697
Site Data:	**850 West Main Street, BRANFORD, New Haven County, CT** **Latitude *41° 16' 40.188"*, Longitude *-72° 50' 12.696"*** **130 Foot - Monopole Tower**	

Dear Molly Carder,

Crown Castle 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 366697, in accordance with application 108267, revision 0.

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

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

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

We at *Crown Castle* 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.

Structural analysis prepared by: Daryoush Hooshyar, Eng. II /FAA

Respectfully submitted by:

Aaron C. Poot, P.E.
Engineering Supervisor

STATE OF CONNECTICUT
AARON C. POOT
No. 25050
LICENSED
PROFESSIONAL ENGINEER

RISA Tower Report - version 5.4.2.0

10/28/10

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by PJF/SUMMIT in July of 1998. The tower was originally designed for a wind speed of 90 mph per TIA/EIA-222-F. The tower was extended up to 130ft per modifications designed by Global Signal in December 2006

2) ANALYSIS CRITERIA

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

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
128	130	3	rfs celwave	APX16DWV-16DWV-S-E-A20 w/Mount Pipe	-	-	-
		3	rfs celwave	ATMAA1412D-1A20			
		3	rfs celwave	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
128	130	12	generic	TMA	12	1-5/8	3
		6	rfs celwave	APX16PV-16PVL-E w/ Mount Pipe			
		3	rfs celwave	APXV18-209014-C w/ Mount Pipe	-	-	4
		6	generic	TMA			
		3	rfs celwave	APXV18-209014-C w/ Mount Pipe	6	1-5/8	1
	128	1	tower mounts	Platform Mount [LP 305-1]			
	124	2	andrew	VHLP2-11	2	1/2	1
118	122	6	andrew	HBX-9014DS-R2M w/ Mount Pipe	-	-	2
		2	communication components inc.	TMA-CE-1819-200MC			
	120	3	argus technologies	LLPX310R w/ Mount Pipe	6	5/16	1
		3	samsung telecommunications	FDD_R6_RRH			
	118	2	tower mounts	Pipe Mount [PM 601-1]	6	1-5/8	1
		1	tower mounts	Platform Mount [LP 712-1]			
110	114	1	kathrein	OG-860/1920/GPS-A	1	1/2	1
	111	6	decibel	DB844H90E-XY w/ Mount Pipe	12	1-5/8	

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
		6	decibel	DB948H90E-M w/ Mount Pipe			
	110	1	tower mounts	Platform Mount [LP 712-1]			
50	52	1	kathrein	OG-860/1920/GPS-A	1	5/16	1
	50	1	tower mounts	Side Arm Mount [SO 701-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) SLA equipment controlling, was considered in analysis
4) 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)
120	120	12	Decibel	DB980H90	-	-
110	110	12	-	Panel Antennas	-	-
100	100	12	-	Panel Antennas	-	-
85	85	2	-	WHAP Antennas	-	-
50	50	1	-	GPS Antenna	-	-

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	Goodkind & O'Dea, Inc.	1614542	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Summit Manufacturing Inc.	1613605	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Summit Manufacturing Inc.	1529811	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Tower Engineering Professionals	2483868	CCISITES
4-POST-MODIFICATION INSPECTION	Tower Engineering Professionals	1956410	CCISITES

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.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle 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	130 - 120.5	Pole	TP18.5x18.5x0.375	1	-2.15	597.73	12.2	Pass
L2	120.5 - 120	Pole	TP22x18.5x0.375	2	-2.15	597.73	12.2	Pass
L3	120 - 77	Pole	TP29.742x22x0.25	3	-9.19	1205.97	67.5	Pass
L4	77 - 37.75	Pole	TP36.308x28.5668x0.3125	4	-15.39	1840.62	83.2	Pass
L5	37.75 - 0	Pole	TP42.48x34.8729x0.375	5	-24.49	2643.11	85.9	Pass
							Summary	
						Pole (L5)	85.9	Pass
						Rating =	85.9	Pass

Table 6 - Tower Component Stresses vs. Capacity - LC1

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	53.0	Pass
1	Base Plate	0	62.7	Pass
1	Base Foundation Soil Interaction	0	42.1	Pass
1	Ext Flange Bolts	120	19.7	Pass
1	Ext Flange Plate	120	12.8	Pass

Structure Rating (max from all components) =	85.9%

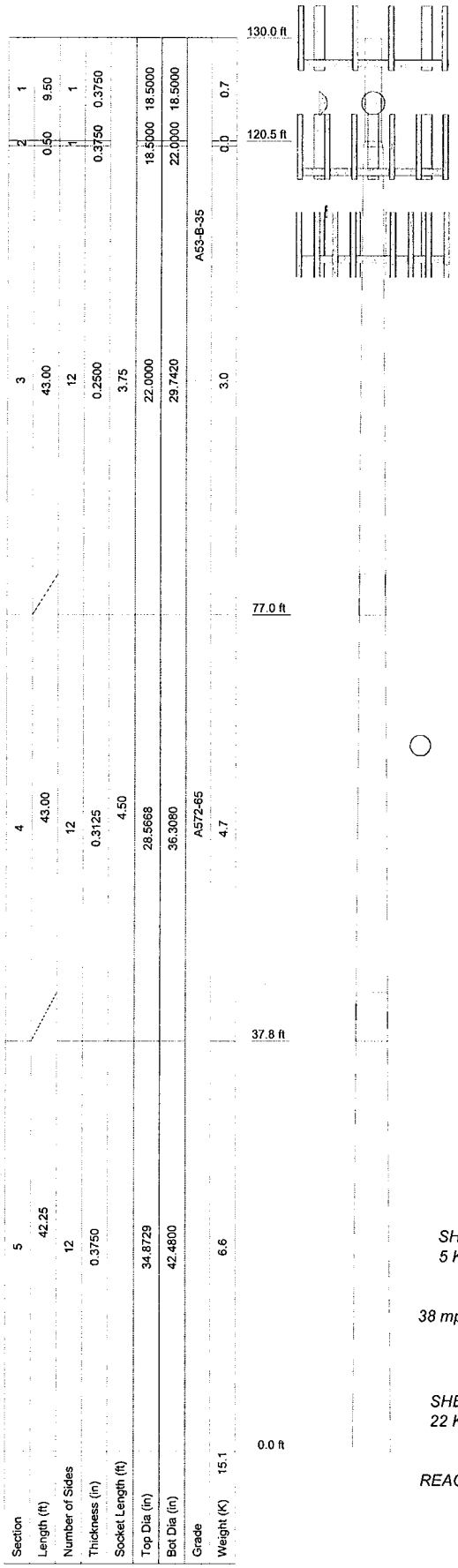
Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

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

APPENDIX A

RISA TOWER OUTPUT



Section	1	2	3	4	5
Length (ft)	9.50	0.50	43.00	43.00	42.25
Number of Sides	1	1	12	12	12
Thickness (in)	0.3750	0.3750	0.2500	0.3125	0.3750
Socket Length (ft)			3.75	4.50	
Top Dia (in)	18.5000	18.5000	22.0000	28.5668	34.8729
Bot Dia (in)	18.5000	22.0000	29.7420	36.3080	42.4800
Grade			A53-B-35	A572-65	
Weight (K)	0.7	0.0	3.0	4.7	6.6

Total Weight: 15.1 K

DESIGNED APPURTENANCE LOADING

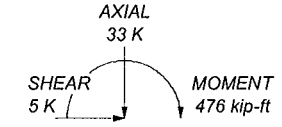
TYPE	ELEVATION	TYPE	ELEVATION
(2) APX16PV-16PVL-E w/ Mount Pipe	128	FDD_R6_RRH	118
		(2) HBX-9014DS-R2M w/ Mount Pipe	118
(4) TMA	128		
(2) APX16PV-16PVL-E w/ Mount Pipe	128	TMA-CE-1819-200MC	118
		Platform Mount [LP 712-1]	118
(4) TMA	128	Pipe Mount [PM 601-1]	118
(2) APX16PV-16PVL-E w/ Mount Pipe	128	Pipe Mount [PM 601-1]	118
		VHLP2-11	118
(4) TMA	128	VHLP2-11	118
6' x 2" Mount Pipe	128	(2) DB844H90E-XY w/ Mount Pipe	110
6' x 2" Mount Pipe	128		
6' x 2" Mount Pipe	128	(2) DB948H90E-M w/ Mount Pipe	110
Platform Mount [LP 305-1]	128	(2) DB844H90E-XY w/ Mount Pipe	110
LLPX310R w/ Mount Pipe	118		
FDD_R6_RRH	118	(2) DB948H90E-M w/ Mount Pipe	110
(2) HBX-9014DS-R2M w/ Mount Pipe	118	OG-860/1920/GPS-A	110
		Platform Mount [LP 712-1]	110
LLPX310R w/ Mount Pipe	118	(2) DB844H90E-XY w/ Mount Pipe	110
FDD_R6_RRH	118		
(2) HBX-9014DS-R2M w/ Mount Pipe	118	(2) DB948H90E-M w/ Mount Pipe	110
		OG-860/1920/GPS-A	50
TMA-CE-1819-200MC	118	Side Arm Mount [SO 701-1]	50
LLPX310R w/ Mount Pipe	118		

MATERIAL STRENGTH

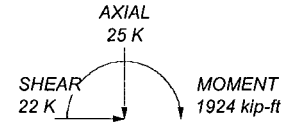
GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi

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 38 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 85.9%



TORQUE 0 kip-ft
38 mph WIND - 0.7500 in ICE



TORQUE 1 kip-ft
REACTIONS - 85 mph WIND

CROWN CASTLE
Shaping the Wireless World

Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2126
FAX: (724) 416-4126

Job: **BU# 876322**			
Project:			
Client: Crown Castle	Drawn by: DHooshyar	App'd:	
Code: TIA/EIA-222-F	Date: 10/28/10	Scale: NTS	
Path: R:\SA Models - Letters\Work Area\DHooshyar\876322 WO 366697\876322 en		Dwg No. E-1	

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 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in 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	130.00-120.50	9.50	0.00	Round	18.5000	18.5000	0.3750		A53-B-35 (35 ksi)
L2	120.50-120.00	0.50	0.00	Round	18.5000	22.0000	0.3750		A53-B-35 (35 ksi)
L3	120.00-77.00	43.00	3.75	12	22.0000	29.7420	0.2500	1.0000	A572-65 (65 ksi)
L4	77.00-37.75	43.00	4.50	12	28.5668	36.3080	0.3125	1.2500	A572-65 (65 ksi)
L5	37.75-0.00	42.25		12	34.8729	42.4800	0.3750	1.5000	A572-65

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 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	18.5000	21.3530	877.5217	6.4162	9.2500	94.8672	1752.6528	10.6701	0.0000	0
	18.5000	21.3530	877.5217	6.4162	9.2500	94.8672	1752.6528	10.6701	0.0000	0
L2	18.5000	21.3530	877.5217	6.4162	9.2500	94.8672	1752.6528	10.6701	0.0000	0
	22.0000	25.4764	1490.3634	7.6552	11.0000	135.4876	2976.6666	12.7306	0.0000	0
L3	22.7761	17.5087	1057.2060	7.7865	11.3960	92.7699	2142.1860	8.6173	5.2260	20.904
	30.7912	23.7411	2635.6911	10.5581	15.4064	171.0782	5340.6247	11.6846	7.3009	29.203
L4	30.2735	28.4309	2896.9879	10.1150	14.7976	195.7740	5870.0829	13.9928	6.8184	21.819
	37.5888	36.2205	5990.1331	12.8864	18.8075	318.4963	12137.6337	17.8266	8.8930	28.458
L5	36.9419	41.6562	6327.7630	12.3502	18.0642	350.2940	12821.7633	20.5019	8.3409	22.242
	43.9785	50.8418	11504.6684	15.0736	22.0046	522.8292	23311.5772	25.0228	10.3796	27.679

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 130.00-120.50				1	1	1		
L2 120.50-120.00				1	1	1		
L3 120.00-77.00				1	1	1		
L4 77.00-37.75				1	1	1		
L5 37.75-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8")	A	No	Inside Pole	128.00 - 5.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82

***

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
7983A(1/2")	C	No	Inside Pole	120.00 - 5.00	2	No Ice	0.00	0.08
						1/2" Ice	0.00	0.08
						1" Ice	0.00	0.08
						2" Ice	0.00	0.08
						4" Ice	0.00	0.08
9207(5/16")	C	No	Inside Pole	120.00 - 5.00	6	No Ice	0.00	0.60
						1/2" Ice	0.00	0.60
						1" Ice	0.00	0.60
						2" Ice	0.00	0.60
						4" Ice	0.00	0.60
FLC 158-50J(1-5/8")	C	No	Inside Pole	118.00 - 5.00	6	No Ice	0.00	0.92
						1/2" Ice	0.00	0.92
						1" Ice	0.00	0.92
						2" Ice	0.00	0.92
						4" Ice	0.00	0.92
2" Rigid Conduit	C	No	Inside Pole	120.00 - 5.00	2	No Ice	0.00	2.80
						1/2" Ice	0.00	2.80
						1" Ice	0.00	2.80
						2" Ice	0.00	2.80
						4" Ice	0.00	2.80
***								
LDF4-50A(1/2")	B	No	Inside Pole	110.00 - 5.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
						2" Ice	0.00	0.15
						4" Ice	0.00	0.15
LDF7-50A(1-5/8")	B	No	Inside Pole	110.00 - 5.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
						2" Ice	0.00	0.82
						4" Ice	0.00	0.82
***								
860 10000(5/16")	B	No	Inside Pole	50.00 - 5.00	1	No Ice	0.00	0.04
						1/2" Ice	0.00	0.04
						1" Ice	0.00	0.04
						2" Ice	0.00	0.04
						4" Ice	0.00	0.04
***								
Safety Line 3/8	C	No	CaAa (Out Of Face)	130.00 - 0.00	1	No Ice	0.04	0.22
						1/2" Ice	0.14	0.75
						1" Ice	0.24	1.28
						2" Ice	0.44	2.34
						4" Ice	0.84	4.46
**********								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-120.50	A	0.000	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.356	0.00
L2	120.50-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.019	0.00
L3	120.00-77.00	A	0.000	0.000	0.000	0.000	0.42
		B	0.000	0.000	0.000	0.000	0.33

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	0.000	1.613	0.64
L4	77.00-37.75	A	0.000	0.000	0.000	0.000	0.39
		B	0.000	0.000	0.000	0.000	0.39
		C	0.000	0.000	0.000	1.472	0.59
L5	37.75-0.00	A	0.000	0.000	0.000	0.000	0.32
		B	0.000	0.000	0.000	0.000	0.33
		C	0.000	0.000	0.000	1.416	0.50

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	130.00-120.50	A	0.880	0.000	0.000	0.000	0.000	0.07
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.029	0.01
L2	120.50-120.00	A	0.876	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.106	0.00
L3	120.00-77.00	A	0.854	0.000	0.000	0.000	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	8.960	0.68
L4	77.00-37.75	A	0.801	0.000	0.000	0.000	0.000	0.39
		B		0.000	0.000	0.000	0.000	0.39
		C		0.000	0.000	0.000	8.179	0.63
L5	37.75-0.00	A	0.750	0.000	0.000	0.000	0.000	0.32
		B		0.000	0.000	0.000	0.000	0.33
		C		0.000	0.000	0.000	7.464	0.53

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	130.00-120.50	-0.0476	0.0275	-0.2249	0.1298
L2	120.50-120.00	-0.0477	0.0275	-0.2279	0.1315
L3	120.00-77.00	-0.0479	0.0276	-0.2328	0.1344
L4	77.00-37.75	-0.0481	0.0277	-0.2399	0.1385
L5	37.75-0.00	-0.0482	0.0278	-0.2331	0.1346

Discrete Tower Loads

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

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) APX16PV-16PVL-E w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.29 4.00 4.66 6.04 9.02	0.06 0.10 0.16 0.28 0.65
(4) TMA	A	From Leg	0.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.68 0.80 0.93 1.22 1.90	0.45 0.56 0.68 0.94 1.57	0.01 0.02 0.03 0.04 0.11
(2) APX16PV-16PVL-E w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.29 4.00 4.66 6.04 9.02	0.06 0.10 0.16 0.28 0.65
(4) TMA	B	From Leg	0.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.68 0.80 0.93 1.22 1.90	0.45 0.56 0.68 0.94 1.57	0.01 0.02 0.03 0.04 0.11
(2) APX16PV-16PVL-E w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.94 7.44 7.94 8.98 11.17	3.29 4.00 4.66 6.04 9.02	0.06 0.10 0.16 0.28 0.65
(4) TMA	C	From Leg	0.00 0.00 2.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.68 0.80 0.93 1.22 1.90	0.45 0.56 0.68 0.94 1.57	0.01 0.02 0.03 0.04 0.11
6' x 2" Mount Pipe	A	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	B	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
6' x 2" Mount Pipe	C	From Leg	4.00 0.00 0.00	0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.43 1.92 2.29 3.06 4.70	1.43 1.92 2.29 3.06 4.70	0.02 0.03 0.05 0.09 0.23
Platform Mount [LP 305-1]	C	None		0.0000	128.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	18.01 23.33 28.65 39.29 60.57	18.01 23.33 28.65 39.29 60.57	1.12 1.35 1.58 2.05 2.97
***									
LLPX310R w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.07 5.48 5.91 6.79 8.70	2.98 3.53 4.09 5.31 8.13	0.05 0.08 0.13 0.23 0.54
FDD_R6_RRH	A	From Leg	4.00	0.0000	118.00	No Ice	1.79	0.78	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
(2) HBX-9014DS-R2M w/ Mount Pipe	A	From Leg	4.00	0.0000	118.00	No Ice	3.59	3.37	0.03
			0.00			1/2" Ice	4.00	4.02	0.06
			4.00			1" Ice	4.45	4.66	0.10
						2" Ice	5.37	5.99	0.20
						4" Ice	7.34	8.99	0.51
LLPX310R w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			2.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
FDD_R6_RRH	B	From Leg	4.00	0.0000	118.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
(2) HBX-9014DS-R2M w/ Mount Pipe	B	From Leg	4.00	0.0000	118.00	No Ice	3.59	3.37	0.03
			0.00			1/2" Ice	4.00	4.02	0.06
			4.00			1" Ice	4.45	4.66	0.10
						2" Ice	5.37	5.99	0.20
						4" Ice	7.34	8.99	0.51
TMA-CE-1819-200MC	B	From Leg	4.00	0.0000	118.00	No Ice	1.17	0.44	0.01
			0.00			1/2" Ice	1.32	0.56	0.02
			4.00			1" Ice	1.48	0.69	0.03
						2" Ice	1.83	0.97	0.05
						4" Ice	2.62	1.63	0.13
LLPX310R w/ Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	5.07	2.98	0.05
			0.00			1/2" Ice	5.48	3.53	0.08
			2.00			1" Ice	5.91	4.09	0.13
						2" Ice	6.79	5.31	0.23
						4" Ice	8.70	8.13	0.54
FDD_R6_RRH	C	From Leg	4.00	0.0000	118.00	No Ice	1.79	0.78	0.03
			0.00			1/2" Ice	1.97	0.92	0.04
			2.00			1" Ice	2.16	1.07	0.06
						2" Ice	2.57	1.39	0.09
						4" Ice	3.49	2.14	0.20
(2) HBX-9014DS-R2M w/ Mount Pipe	C	From Leg	4.00	0.0000	118.00	No Ice	3.59	3.37	0.03
			0.00			1/2" Ice	4.00	4.02	0.06
			4.00			1" Ice	4.45	4.66	0.10
						2" Ice	5.37	5.99	0.20
						4" Ice	7.34	8.99	0.51
TMA-CE-1819-200MC	C	From Leg	4.00	0.0000	118.00	No Ice	1.17	0.44	0.01
			0.00			1/2" Ice	1.32	0.56	0.02
			4.00			1" Ice	1.48	0.69	0.03
						2" Ice	1.83	0.97	0.05
						4" Ice	2.62	1.63	0.13
Platform Mount [LP 712-1]	C	None		0.0000	118.00	No Ice	24.53	24.53	1.34
						1/2" Ice	29.94	29.94	1.65
						1" Ice	35.35	35.35	1.96
						2" Ice	46.17	46.17	2.58
						4" Ice	67.81	67.81	3.82
Pipe Mount [PM 601-1]	A	From Leg	4.00	0.0000	118.00	No Ice	3.00	0.90	0.07
			0.00			1/2" Ice	3.74	1.12	0.08
			0.00			1" Ice	4.48	1.34	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	5.96	1.78	0.12
						4" Ice	8.92	2.66	0.18
Pipe Mount [PM 601-1]	C	From Leg	4.00 0.00 0.00	0.0000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.00 3.74 4.48 5.96 8.92	0.90 1.12 1.34 1.78 2.66	0.07 0.08 0.09 0.12 0.18
***									
(2) DB844H90E-XY w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(2) DB948H90E-M w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.03 2.39 2.76 3.51 5.23	3.67 4.28 4.90 6.23 9.28	0.03 0.05 0.09 0.18 0.45
(2) DB844H90E-XY w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(2) DB948H90E-M w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.03 2.39 2.76 3.51 5.23	3.67 4.28 4.90 6.23 9.28	0.03 0.05 0.09 0.18 0.45
(2) DB844H90E-XY w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.30 3.69 4.12 5.01 6.92	4.92 5.60 6.28 7.71 10.83	0.03 0.07 0.12 0.23 0.56
(2) DB948H90E-M w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.03 2.39 2.76 3.51 5.23	3.67 4.28 4.90 6.23 9.28	0.03 0.05 0.09 0.18 0.45
OG-860/1920/GPS-A	C	From Leg	4.00 0.00 4.00	0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.33 0.43 0.55 0.80 1.41	0.40 0.51 0.63 0.89 1.52	0.00 0.01 0.01 0.03 0.08
Platform Mount [LP 712-1]	C	None		0.0000	110.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	24.53 29.94 35.35 46.17 67.81	24.53 29.94 35.35 46.17 67.81	1.34 1.65 1.96 2.58 3.82
**									
OG-860/1920/GPS-A	A	From Leg	2.00 0.00 2.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.33 0.43 0.55 0.80 1.41	0.40 0.51 0.63 0.89 1.52	0.00 0.01 0.01 0.03 0.08
Side Arm Mount [SO 701-1]	A	From Leg	1.00 0.00 0.00	0.0000	50.00	No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43	1.67 2.34 3.01	0.07 0.08 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.01	4.35	0.12
						4" Ice	3.17	7.03	0.18

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP2-11	A	Paraboloid w/o Radome	From Leg	4.00 0.00 6.00	0.0000		118.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19
VHLP2-11	C	Paraboloid w/o Radome	From Leg	4.00 0.00 6.00	0.0000		118.00	2.17	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.72 4.01 4.30 4.88 6.04	0.03 0.05 0.07 0.11 0.19

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp

Comb. No.	Description
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	130 - 120.5	Pole	Max Tension	36	0.00	-0.00	0.00
			Max. Compression	14	-3.91	0.28	0.15
			Max. Mx	5	-2.16	-28.35	0.55
			Max. My	2	-2.16	-0.69	28.80
			Max. Vy	5	3.66	-28.35	0.55
			Max. Vx	8	3.75	0.20	-28.71
			Max. Torque	8			-0.42
L2	120.5 - 120	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-3.96	0.28	0.15
			Max. Mx	5	-2.21	-30.19	0.62
			Max. My	2	-2.20	-0.81	30.68
			Max. Vy	5	3.69	-30.19	0.62
			Max. Vx	8	3.78	0.21	-30.60
			Max. Torque	8			-0.42
L3	120 - 77	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-15.28	0.77	0.19
			Max. Mx	5	-9.21	-465.47	7.98
			Max. My	8	-9.19	3.25	-470.03
			Max. Vy	5	13.83	-465.47	7.98
			Max. Vx	8	13.93	3.25	-470.03
			Max. Torque	8			-0.70
L4	77 - 37.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-22.63	0.82	0.41
			Max. Mx	5	-15.40	-1073.79	15.33
			Max. My	8	-15.40	6.02	-1082.00
			Max. Vy	5	17.77	-1073.79	15.33
			Max. Vx	8	17.84	6.02	-1082.00
			Max. Torque	8			-0.71
L5	37.75 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32.90	0.88	0.37
			Max. Mx	5	-24.49	-1908.16	23.03
			Max. My	8	-24.49	8.97	-1919.41
			Max. Vy	5	21.73	-1908.16	23.03
			Max. Vx	8	21.80	8.97	-1919.41
			Max. Torque	8			-0.73

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	22	32.90	2.55	-4.45
	Max. H_x	11	24.51	21.63	-0.05
	Max. H_z	2	24.51	-0.26	21.76
	Max. M_x	2	1918.21	-0.26	21.76
	Max. M_z	5	1908.16	-21.71	0.18
	Max. Torsion	4	0.68	-18.88	10.95
	Min. Vert	1	24.51	0.00	0.00
	Min. H_x	5	24.51	-21.71	0.18
	Min. H_z	8	24.51	0.07	-21.78
	Min. M_x	8	-1919.41	0.07	-21.78
	Min. M_z	11	-1898.95	21.63	-0.05
	Min. Torsion	8	-0.73	0.07	-21.78

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	24.51	0.00	0.00	-0.32	0.45	0.00
Dead+Wind 0 deg - No Ice	24.51	0.26	-21.76	-1918.21	-32.94	-0.49
Dead+Wind 30 deg - No Ice	24.51	11.04	-18.82	-1657.43	-978.03	-0.65
Dead+Wind 60 deg - No Ice	24.51	18.88	-10.95	-967.57	-1662.48	-0.68
Dead+Wind 90 deg - No Ice	24.51	21.71	-0.18	-23.03	-1908.16	-0.49
Dead+Wind 120 deg - No Ice	24.51	18.84	10.85	954.19	-1657.47	0.04
Dead+Wind 150 deg - No Ice	24.51	10.70	18.84	1659.28	-934.20	0.56
Dead+Wind 180 deg - No Ice	24.51	-0.07	21.78	1919.41	8.97	0.73
Dead+Wind 210 deg - No Ice	24.51	-10.82	18.95	1673.28	950.33	0.66
Dead+Wind 240 deg - No Ice	24.51	-18.77	11.11	987.53	1649.34	0.45
Dead+Wind 270 deg - No Ice	24.51	-21.63	0.05	5.30	1898.95	0.10
Dead+Wind 300 deg - No Ice	24.51	-18.72	-10.78	-945.94	1642.95	-0.05
Dead+Wind 330 deg - No Ice	24.51	-10.78	-18.70	-1642.65	944.84	-0.18
Dead+Ice+Temp	32.90	-0.00	-0.00	-0.37	0.88	-0.00
Dead+Wind 0 deg+Ice+Temp	32.90	0.06	-5.11	-474.84	-6.95	-0.17
Dead+Wind 30 deg+Ice+Temp	32.90	2.59	-4.42	-410.56	-240.88	-0.19
Dead+Wind 60 deg+Ice+Temp	32.90	4.44	-2.57	-239.76	-410.36	-0.17
Dead+Wind 90 deg+Ice+Temp	32.90	5.10	-0.04	-5.85	-471.18	-0.10
Dead+Wind 120 deg+Ice+Temp	32.90	4.42	2.55	235.57	-408.92	0.05
Dead+Wind 150 deg+Ice+Temp	32.90	2.51	4.42	410.04	-230.39	0.19
Dead+Wind 180 deg+Ice+Temp	32.90	-0.02	5.12	474.49	3.17	0.22
Dead+Wind 210 deg+Ice+Temp	32.90	-2.55	4.45	413.53	236.25	0.19
Dead+Wind 240 deg+Ice+Temp	32.90	-4.41	2.61	243.67	409.04	0.12
Dead+Wind 270 deg+Ice+Temp	32.90	-5.08	0.01	1.19	470.75	0.01
Dead+Wind 300 deg+Ice+Temp	32.90	-4.40	-2.53	-234.32	407.28	-0.05
Dead+Wind 330 deg+Ice+Temp	32.90	-2.53	-4.39	-406.88	234.48	-0.10
Dead+Wind 0 deg - Service	24.51	0.09	-7.53	-664.75	-11.10	-0.17
Dead+Wind 30 deg - Service	24.51	3.82	-6.51	-574.41	-338.51	-0.23
Dead+Wind 60 deg - Service	24.51	6.53	-3.79	-335.42	-575.63	-0.24
Dead+Wind 90 deg - Service	24.51	7.51	-0.06	-8.20	-660.72	-0.17
Dead+Wind 120 deg - Service	24.51	6.52	3.75	330.33	-573.88	0.02
Dead+Wind 150 deg - Service	24.51	3.70	6.52	574.59	-323.31	0.20
Dead+Wind 180 deg - Service	24.51	-0.02	7.54	664.72	3.42	0.26
Dead+Wind 210 deg - Service	24.51	-3.74	6.56	579.46	329.54	0.23
Dead+Wind 240 deg - Service	24.51	-6.49	3.84	341.89	571.70	0.15

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 270 deg - Service	24.51	-7.48	0.02	1.61	658.15	0.03
Dead+Wind 300 deg - Service	24.51	-6.48	-3.73	-327.91	569.46	-0.02
Dead+Wind 330 deg - Service	24.51	-3.73	-6.47	-569.27	327.62	-0.06

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-24.51	0.00	0.00	24.51	0.00	0.000%
2	0.26	-24.51	-21.76	-0.26	24.51	21.76	0.000%
3	11.04	-24.51	-18.82	-11.04	24.51	18.82	0.000%
4	18.88	-24.51	-10.95	-18.88	24.51	10.95	0.000%
5	21.71	-24.51	-0.18	-21.71	24.51	0.18	0.000%
6	18.84	-24.51	10.85	-18.84	24.51	-10.85	0.000%
7	10.70	-24.51	18.84	-10.70	24.51	-18.84	0.000%
8	-0.07	-24.51	21.78	0.07	24.51	-21.78	0.000%
9	-10.82	-24.51	18.95	10.82	24.51	-18.95	0.000%
10	-18.77	-24.51	11.11	18.77	24.51	-11.11	0.000%
11	-21.63	-24.51	0.05	21.63	24.51	-0.05	0.000%
12	-18.72	-24.51	-10.78	18.72	24.51	10.78	0.000%
13	-10.78	-24.51	-18.70	10.78	24.51	18.70	0.000%
14	0.00	-32.90	0.00	0.00	32.90	0.00	0.000%
15	0.06	-32.90	-5.11	-0.06	32.90	5.11	0.000%
16	2.59	-32.90	-4.42	-2.59	32.90	4.42	0.000%
17	4.44	-32.90	-2.57	-4.44	32.90	2.57	0.000%
18	5.10	-32.90	-0.04	-5.10	32.90	0.04	0.000%
19	4.42	-32.90	2.55	-4.42	32.90	-2.55	0.000%
20	2.51	-32.90	4.42	-2.51	32.90	-4.42	0.000%
21	-0.02	-32.90	5.12	0.02	32.90	-5.12	0.000%
22	-2.55	-32.90	4.45	2.55	32.90	-4.45	0.000%
23	-4.41	-32.90	2.61	4.41	32.90	-2.61	0.000%
24	-5.08	-32.90	0.01	5.08	32.90	-0.01	0.000%
25	-4.40	-32.90	-2.53	4.40	32.90	2.53	0.000%
26	-2.53	-32.90	-4.39	2.53	32.90	4.39	0.000%
27	0.09	-24.51	-7.53	-0.09	24.51	7.53	0.000%
28	3.82	-24.51	-6.51	-3.82	24.51	6.51	0.000%
29	6.53	-24.51	-3.79	-6.53	24.51	3.79	0.000%
30	7.51	-24.51	-0.06	-7.51	24.51	0.06	0.000%
31	6.52	-24.51	3.75	-6.52	24.51	-3.75	0.000%
32	3.70	-24.51	6.52	-3.70	24.51	-6.52	0.000%
33	-0.02	-24.51	7.54	0.02	24.51	-7.54	0.000%
34	-3.74	-24.51	6.56	3.74	24.51	-6.56	0.000%
35	-6.49	-24.51	3.84	6.49	24.51	-3.84	0.000%
36	-7.48	-24.51	0.02	7.48	24.51	-0.02	0.000%
37	-6.48	-24.51	-3.73	6.48	24.51	3.73	0.000%
38	-3.73	-24.51	-6.47	3.73	24.51	6.47	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001

2	Yes	5	0.00000001	0.00004014
3	Yes	6	0.00000001	0.00008089
4	Yes	6	0.00000001	0.00008448
5	Yes	6	0.00000001	0.00000539
6	Yes	6	0.00000001	0.00008169
7	Yes	6	0.00000001	0.00007765
8	Yes	6	0.00000001	0.00000561
9	Yes	6	0.00000001	0.00008412
10	Yes	6	0.00000001	0.00008198
11	Yes	5	0.00000001	0.00002201
12	Yes	6	0.00000001	0.00007944
13	Yes	6	0.00000001	0.00008064
14	Yes	4	0.00000001	0.00001320
15	Yes	6	0.00000001	0.00001696
16	Yes	6	0.00000001	0.00002663
17	Yes	6	0.00000001	0.00002712
18	Yes	6	0.00000001	0.00001678
19	Yes	6	0.00000001	0.00002637
20	Yes	6	0.00000001	0.00002550
21	Yes	6	0.00000001	0.00001705
22	Yes	6	0.00000001	0.00002721
23	Yes	6	0.00000001	0.00002704
24	Yes	6	0.00000001	0.00001676
25	Yes	6	0.00000001	0.00002608
26	Yes	6	0.00000001	0.00002638
27	Yes	5	0.00000001	0.00000660
28	Yes	6	0.00000001	0.00000701
29	Yes	6	0.00000001	0.00000769
30	Yes	5	0.00000001	0.00001666
31	Yes	6	0.00000001	0.00000716
32	Yes	6	0.00000001	0.00000648
33	Yes	5	0.00000001	0.00002377
34	Yes	6	0.00000001	0.00000764
35	Yes	6	0.00000001	0.00000722
36	Yes	4	0.00000001	0.00007632
37	Yes	6	0.00000001	0.00000684
38	Yes	6	0.00000001	0.00000706

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 120.5	28.694	34	1.8321	0.0034
L2	120.5 - 120	25.057	34	1.8189	0.0032
L3	120 - 77	24.867	34	1.8179	0.0032
L4	80.75 - 37.75	11.432	28	1.3427	0.0012
L5	42.25 - 0	3.116	28	0.6755	0.0004

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	(2) APX16PV-16PVL-E w/ Mount Pipe	34	27.927	1.8298	0.0034	38395

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.00	VHLP2-11	34	26.394	1.8246	0.0033	30648
118.00	LLPX310R w/ Mount Pipe	34	24.109	1.8122	0.0031	9886
110.00	(2) DB844H90E-XY w/ Mount Pipe	34	21.131	1.7623	0.0027	6797
50.00	OG-860/1920/GPS-A	28	4.306	0.8071	0.0005	2819

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	130 - 120.5	82.646	9	5.2818	0.0096
L2	120.5 - 120	72.184	9	5.2438	0.0090
L3	120 - 77	71.637	9	5.2410	0.0090
L4	80.75 - 37.75	32.961	3	3.8729	0.0034
L5	42.25 - 0	8.991	3	1.9491	0.0012

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128.00	(2) APX16PV-16PVL-E w/ Mount Pipe	9	80.438	5.2751	0.0096	13587
124.00	VHLP2-11	9	76.029	5.2604	0.0093	10849
118.00	LLPX310R w/ Mount Pipe	9	69.454	5.2246	0.0088	3513
110.00	(2) DB844H90E-XY w/ Mount Pipe	9	60.887	5.0810	0.0077	2406
50.00	OG-860/1920/GPS-A	3	12.423	2.3286	0.0014	981

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	130 - 120.5 (1)	TP18.5x18.5x0.375	9.50	0.00	0.0	21.000	21.3530	-2.15	448.41	0.005
L2	120.5 - 120 (2)	TP22x18.5x0.375	0.50	0.00	0.0	21.000	21.3530	-2.15	448.41	0.005
L3	120 - 77 (3)	TP29.742x22x0.25	43.00	0.00	0.0	39.000	23.1975	-9.19	904.70	0.010
L4	77 - 37.75 (4)	TP36.308x28.5668x0.3125	43.00	0.00	0.0	39.000	35.4053	-15.39	1380.81	0.011
L5	37.75 - 0 (5)	TP42.48x34.8729x0.375	42.25	0.00	0.0	39.000	50.8418	-24.49	1982.83	0.012

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	130 - 120.5 (1)	TP18.5x18.5x0.375	28.82	3.645	23.100	0.158	0.00	0.000	23.100	0.000
L2	120.5 - 120 (2)	TP22x18.5x0.375	28.82	3.645	23.100	0.158	0.00	0.000	23.100	0.000
L3	120 - 77 (3)	TP29.742x22x0.25	471.67	34.660	39.000	0.889	0.00	0.000	39.000	0.000
L4	77 - 37.75 (4)	TP36.308x28.5668x0.3125	1085.27	42.803	39.000	1.097	0.00	0.000	39.000	0.000
L5	37.75 - 0 (5)	TP42.48x34.8729x0.375	1924.47	44.171	39.000	1.133	0.00	0.000	39.000	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	130 - 120.5 (1)	TP18.5x18.5x0.375	3.74	0.175	14.000	0.025	0.16	0.010	14.000	0.001
L2	120.5 - 120 (2)	TP22x18.5x0.375	3.77	0.177	14.000	0.021	0.16	0.010	14.000	0.001
L3	120 - 77 (3)	TP29.742x22x0.25	13.97	0.602	26.000	0.047	0.54	0.019	26.000	0.001
L4	77 - 37.75 (4)	TP36.308x28.5668x0.3125	17.89	0.505	26.000	0.039	0.64	0.012	26.000	0.000
L5	37.75 - 0 (5)	TP42.48x34.8729x0.375	21.84	0.430	26.000	0.034	0.65	0.007	26.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	130 - 120.5 (1)	0.005	0.158	0.000	0.025	0.001	0.163 ✓	1.333	H1-3+VT ✓
L2	120.5 - 120 (2)	0.005	0.158	0.000	0.021	0.001	0.163 ✓	1.333	H1-3+VT ✓
L3	120 - 77 (3)	0.010	0.889	0.000	0.047	0.001	0.899 ✓	1.333	H1-3+VT ✓
L4	77 - 37.75 (4)	0.011	1.097	0.000	0.039	0.000	1.109 ✓	1.333	H1-3+VT ✓
L5	37.75 - 0 (5)	0.012	1.133	0.000	0.034	0.000	1.145 ✓	1.333	H1-3+VT ✓

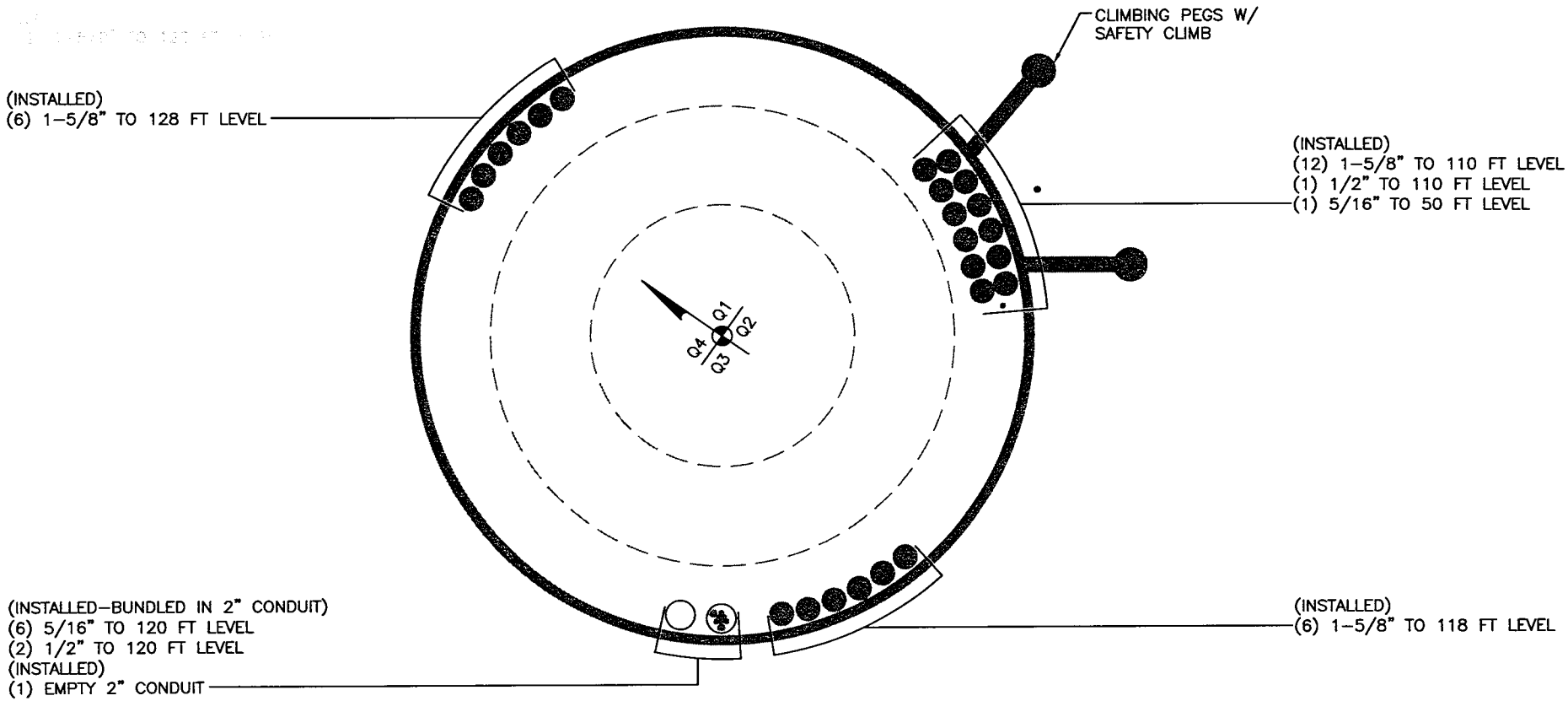
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	130 - 120.5	Pole	TP18.5x18.5x0.375	1	-2.15	597.73	12.2	Pass
L2	120.5 - 120	Pole	TP22x18.5x0.375	2	-2.15	597.73	12.2	Pass
L3	120 - 77	Pole	TP29.742x22x0.25	3	-9.19	1205.97	67.5	Pass
L4	77 - 37.75	Pole	TP36.308x28.5668x0.3125	4	-15.39	1840.62	83.2	Pass
L5	37.75 - 0	Pole	TP42.48x34.8729x0.375	5	-24.49	2643.11	85.9	Pass
							Summary	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Pole (L5)	85.9	Pass
						RATING =	**85.9**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 876322 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

Moment Capacity of Drilled Concrete Shaft (Caisson) for TIA Rev F or G

Note: Shaft assumed to have ties, not spiral, transverse reinforcing

Site Data

BU#: *876322*
Site Name: *TARTAGLIA PROPERTY*
App #: *108276, rev.0*

Maximum Shaft Superimposed Forces		
TIA Revision:	F	
Max. Service Shaft M:	2162.346	ft-kips **(* Note)**
Max. Service Shaft P:	24	kips
Max Axial Force Type:	Comp.	

(*) Note: Max Shaft Superimposed Moment does not necessarily equal to the shaft top reaction moment

Enter Load Factors Below:		
For M (WL)	1.3	<---- Enter Factor
For P (DL)	1.3	<---- Enter Factor

Load Factor	Shaft Factored Loads		
1.30	Mu:	2811.049	ft-kips
1.30	Pu:	31.2	kips

Pier Properties		
Concrete:		
Pier Diameter =	7.0	ft
Concrete Area =	5541.8	in^2
Reinforcement:		
Clear Cover to **Tie**=	4.00	in
Horiz. **Tie** Bar Size=	5	
Vert. Cage Diameter =	6.11	ft
Vert. Cage Diameter =	73.34	in
Vertical Bar Size =	11	
Bar Diameter =	1.41	in
Bar Area =	1.56	in^2
Number of Bars =	32	
As Total=	49.92	in^2
A s/ Aconc, Rho:	0.0090	0.90%

Material Properties		
Concrete Comp. strength, f'c =	3000	psi
Reinforcement yield strength, Fy =	60	ksi
Reinforcing Modulus of Elasticity, E =	29000	ksi
Reinforcement yield strain =	0.00207	
Limiting compressive strain =	0.003	
ACI 318 Code		
Select Analysis ACI Code=	2002	
Seismic Properties		
Seismic Design Category =	B	
Seismic Risk =	**Low**	

Solve (Run) <-- Press Upon Completing All Input

ACI 10.5 , ACI 21.10.4, and IBC 1810.
Min As for Flexural, Tension Controlled, Shafts:

(3)*(Sqrt(f'c)/Fy:	0.0027	
200 / Fy:	0.0033	
IBC 1810.1.2:	None	SDC A or B
Governing:	0.0033	**0.33%**

ACI 10.8 and 10.9
Min As for Columns, Comp. Controlled, Shafts:

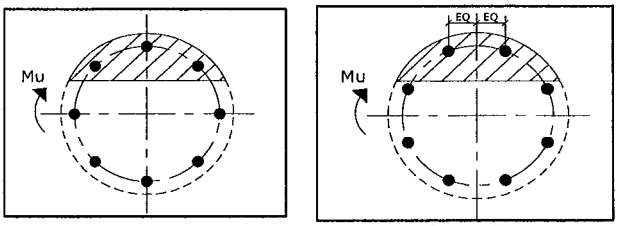
Min As:	0.0050	**0.50%**

Minimum Rho Check:

Actual Req'd Min. Rho:	0.33%	Flexural
Provided Rho:	0.90%	**OK**

Results:

Governing Orientation Case: **2**



Case 1 Case 2

Dist. From Edge to Neutral Axis: **16.78** in
Extreme Steel Strain, εt: **0.0110**
εt > 0.0050, Tension Controlled
Reduction Factor,φ: **0.900**

<-- Comment Box

Ref. Shaft Max Axial Capacities, ϕ Max(Pn or Tn):		
Max Pu = (φ=0.65) Pn.		
Pn per ACI 318 (10-2)	8839.70	kips
at Mu=(ϕ=0.65)Mn=	5309.39	ft-kips
Max Tu, (φ=0.9) Tn =	2695.68	kips
at Mu=ϕ=(0.90)Mn=	0.00	ft-kips

Output Note: Negative Pu=Tension

For Axial Compression, φ Pn = Pu:	31.20	kips
Drilled Shaft Moment Capacity, φMn:	**7432.61**	ft-kips
Drilled Shaft Superimposed Mu:	**2811.05**	ft-kips

(Mu/φMn, Drilled Shaft Flexure CSR:	**37.82%**

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev F

Site Data

BU#: *876322*
Site Name: *TARTAGLIA PROPERTY*
App #: *108267, rev.0*

Connection Type:	*Butt*
Pole Manufacturer:	Other

Reactions		
Moment:	28.82	ft-kips
Axial:	2.15	kips
Shear:	3.77	kips
Elevation:	120	feet

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

Bolt Data			
Qty:	8		
Diameter (in.):	0.875	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	75	<-- Disregard	Bolt Fty:
N/A:	55	<-- Disregard	44.00
Circle (in.):	24		

Plate Data		
Diam:	26.25	in
Thick, t:	1.25	in
Grade (Fy):	50	ksi
Strength, Fu:	65	ksi
Single-Rod B-eff:	7.26	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.25	in
Fillet V. Weld:	0.25	in
Width:	3	in
Height:	8	in
Thick:	0.5	in
Notch:	0.375	in
Grade:	36	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	18.5	in
Thick:	0.375	in
Grade:	35	ksi
# of Sides:	0	"0" IF Round
Fu	58	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

Flange Bolt Results

		Rigid
Bolt Tension Capacity, **B**:	35.27 kips	Service, ASD
Max Bolt directly applied T:	6.94 Kips	Fty*ASIF
Min. PL "tc" for **B** cap. **w/o** Pry:	1.161 in	
Min PL "treq" for actual **T w/ Pry:**	0.376 in	
Min PL "t1" for actual **T w/o Pry:**	0.515 in	
T allowable w/o Prying:	35.27 kips	α'<0 case
Prying Force, Q:	0.00 kips	
Total Bolt Tension=T+Q:	6.94 kips	
Non-Prying Bolt Stress Ratio, T/B:	19.7% **Pass**	

Exterior Flange Plate Results Flexural Check

		Rigid
Compression Side Plate Stress:	6.4 ksi	Service ASD
Allowable Plate Stress:	50.0 ksi	0.75*Fy*ASIF
Compression Plate Stress Ratio:	12.8% **Pass**	Comp. Y.L. Length:
No Prying		15.29
Tension Side Stress Ratio, (treq/t)^2:	9.1% **Pass**	

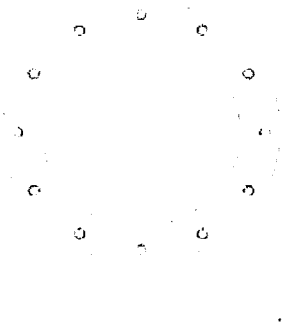
n/a

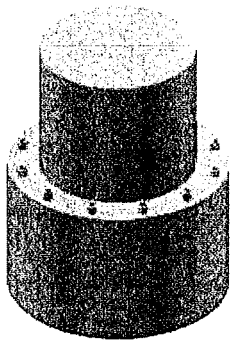
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Results

Pole Punching Shear Check: n/a





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

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

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#:	*876322*
Site Name:	*TARTAGLIA PROPEI*
App #:	*108267, rev.0*

Reactions		
Moment:	1924	ft-kips
Axial:	25	kips
Shear:	22	kips

Connection Type:	*Butt*

Anchor Rod Data		
Qty:	16	
Diam:	2.25	in
Rod Material:	A615-J	
Grade(Fy):	75	ksi
Bolt Circle:	55	in
Anchor Spacing:	6	in

Plate Data		
W=Side:	55	in
Thick:	3.5	in
Grade:	50	ksi
B effective	35.30	in

Pole Data		
Diam:	42.48	in
Thick:	0.375	in
Grade:	65	ksi

Stress Increase Factor		
ASIF:	1.333	

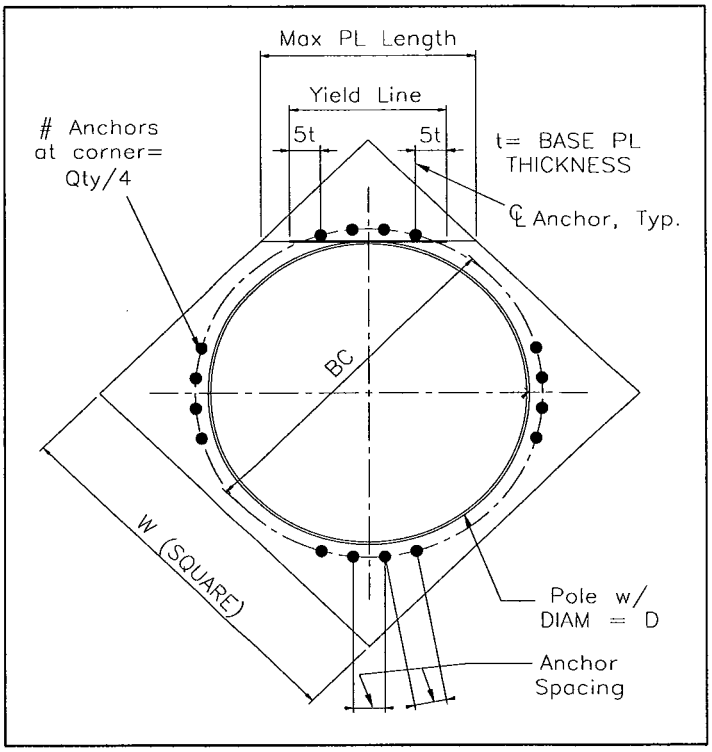
Anchor Rod Results

Maximum Rod Tension:	103.4 Kips	
Allowable Tension:	195.0 Kips	
Anchor Rod Stress Ratio:	53.0%	**Pass**

Base Plate Results

Base Plate Stress:	31.3 ksi	
Allowable Plate Stress:	50.0 ksi	
Base Plate Stress Ratio:	62.7%	**Pass**

PL Ref. Data
Yield Line (in):
35.30
Max PL Length:
35.30



Monopole Drilled Pier

Checks capacity of a single drilled shaft foundation for a monopole

BU#: 876322
Site Name: *TARTAGLIA PROPERTY*
App Number: *108276, rev.0*

CROWN CASTLE

ACI 318 Version:	2002

Design Reactions		
Shear, **S**:	22.00	kips
Moment, **Mt**:	1924.00	ft-kips
Tower Weight, **Wt**:	25.00	kips
Tower Height, **H**:	130	ft
Base Diameter, **BD**:	42.5	in

Foundation Dimensions		
Caisson Diameter, **CD**:	7.0	ft
Ext. Above Grade, **E**:	0.5	ft
Depth Below Grade, **L**:	24.0	ft
Neglected Depth, **N**:	5.0	ft
Rebar Size, **Sp**:	11	
Rebar Quantity, **mp**:	32	
Tie Size, **tp**:	5	

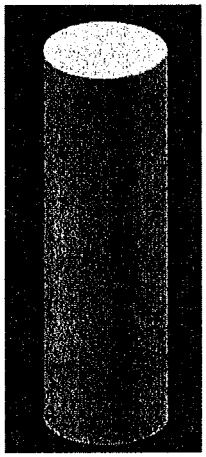
Material Properties		
Rebar Tensile, **Fy**:	60	ksi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δx**:	150	pcf
Clear Cover, **cc**:	4	in

Soil Properties		
Soil Unit Weight, **γ**:	120	pcf
Allowable Bearing, **Bc**:	10.000	ksf
Seismic Design Cat, **z**:	B	

Caisson Analysis		
Depth to Zero Shear	7.4	ft
Max Factored Moment	2811.05	ft-kips
Overturning FOS	4.75	

Depth		Shear		Moment	
4.9	ft	22	kips	2126.6	ft-kips
7.35	ft	0.6	kips	2161.8	ft-kips
9.8	ft	-38.1	kips	2118.2	ft-kips

Design Checks	*Capacity/ Availability*	*Demand/ Limits*	*Check*
Minimum Req'd Dia. 1 (ft):	7.00	1.78	OK
Minimum Req'd Dia. 2 (ft):	7.00	5.04	OK
Bearing (ksf):	10.00	0.65	OK
Rebar Area (in^2):	49.92	18.47	OK
Pier moment capacity (k-ft):	7435.52	2811.05	OK
Rebar spacing (in):	6.05	2 < Bs <18	OK
Development Length (in)	195.34	12.00	OK
Soil moment capacity(FOS):	4.75	2.00	OK



Bearing: 6.5%

Steel: 37.8%

Soil: 42.1%

CAISSON Version 10.40 10:52:39 AM Thursday, October 28, 2010
Crown Castle USA

Project Title: BU#876322
Project Notes: WO: 366697

Calculation Method: Full 8CD

******* I N P U T D A T A

Pier Properties

Diameter (ft)	Distance of Top of Pier above Ground (ft)	Concrete Strength (ksi)	Steel Yield Strength (ksi)
7.00	0.50	3.00	60.00

Soil Properties

Layer	Type	Thickness (ft)	Depth at Top of Layer (ft)	Density (lbs/ft^3)	CU (psf)	KP	PHI (deg)
1	Clay	5.00	0.00	120.0			
2	Sand	5.00	5.00	120.0		3.690	35.00
3	Sand	10.00	10.00	60.0		4.599	40.00
4	Sand	4.00	20.00	63.0		5.289	43.00

Design (Factored) Loads at Top of Pier

Moment (ft-k)	Axial Load (kips)	Shear Load (kips)	Additional Safety Factor Against Soil Failure
1924.0	25.0	22.00	4.75

******* R E S U L T S

Calculated Pier Properties

Length (ft)	Weight (kips)	End Bearing Pressure (psf)
24.500	141.431	649.6

Ultimate Resisting Forces Along Pier

Type	Distance of Top of Layer to Top of Pier (ft)	Thickness (ft)	Density (lbs/ft^3)	CU (psf)	KP	Force (kips)	Arm (ft)
Clay	0.50	5.00	120.0			0.00	3.00
Sand	5.50	5.00	120.0		3.690	348.70	8.28
Sand	10.50	7.49	60.0		4.599	1030.18	14.44
Sand	17.99	2.51	60.0		4.599	-418.50	19.26
Sand	20.50	4.00	63.0		5.289	-855.68	22.54

Shear and Moments Along Pier

Distance below Top of Pier (ft)	Shear (with Safety Factor) (kips)	Moment (with Safety Factor) (ft-k)	Shear (without Safety Factor) (kips)	Moment (without Safety Factor) (ft-k)
0.00	104.7	9588.5	22.0	2018.6
2.45	104.7	9845.0	22.0	2072.6
4.90	104.7	10101.5	22.0	2126.6
7.35	2.8	10268.7	0.6	2161.8
9.80	-181.2	10061.5	-38.1	2118.2
12.25	-455.7	9303.3	-95.9	1958.6
14.70	-781.9	7794.4	-164.6	1640.9
17.15	-1142.8	5443.8	-240.6	1146.1
19.60	-1009.8	2588.5	-212.6	544.9
22.05	-537.4	666.9	-113.1	140.4
24.50	-0.0	0.0	-0.0	0.0

T-Mobile

T-Mobile USA Inc.
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Technical Memo

To: Transcend
From: Amir Uzzaman - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CTNH101A
Date: November 22, 2010

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 850 West Main Street, Branford, 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 2 antennas per sector.
3) The model number for GSM antenna is APXV18-209014-C.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 165 ft.
4) UMTS antenna center line height is 165 ft.
5) The maximum transmit power from any GSM sector is 1791.93 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2525.17 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 850 West Main Street, Branford, CT, is 0.03746 mW/cm^2. This value represents 3.746% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) 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 36.478%. The combined Power Density for the site is 40.224% of the M.P.E. standard.

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	**CTNH101A**
Site Address:	**850 West Main Street**
Town:	**Branford**
Tower Height:	**130 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	APXV18-209014-C	**Antenna Model**	APX16DWV-16DWV
Cable Size	1 5/8 in.	**Cable Size**	1 5/8 in.
Cable Length	130 ft.	**Cable Length**	130 ft.
Antenna Height	165.0 ft.	**Antenna Height**	165.0 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	16.5 dBi	**Antenna Gain**	18.0 dBi
Cable Loss per foot	0.0116 dB	**Cable Loss per foot**	0.0116 dB
Total Cable Loss	1.5080 dB	**Total Cable Loss**	1.5080 dB
Total Attenuation	6.0080 dB	**Total Attenuation**	3.0080 dB
Total EIRP per Channel	53.50 dBm	**Total EIRP per Channel**	61.01 dBm
(In Watts)	223.99 W	**(In Watts)**	1262.58 W
Total EIRP per Sector	62.53 dBm	**Total EIRP per Sector**	64.02 dBm
(In Watts)	1791.93 W	**(In Watts)**	2525.17 W
nsg	10.4920	**nsg**	14.9920
Power Density (S) =	**0.015551 mW/cm^2**	**Power Density (S) =**	**0.021914 mW/cm^2**
T-Mobile Worst Case % MPE =		**3.7464%**	

Equation Used :

$$S = \frac{(1000)(grf)^2 (Power) * 10^{(nsg/10)}}{4\pi (R)^2}$$

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

Co-Location Total

Carrier	% of Standard
Sprint CDMA	11.2800 %
Sprint WiMAX	4.2000 %
Sprint microwave	0.0220 %
Clearwire	0.7600 %
Clearwire	0.4930 %
Verizon	13.2490 %
Verizon	2.9770 %
Verizon	3.4970 %
Other Antenna Systems	
Total Excluding T-Mobile	**36.4780 %**
T-Mobile	3.7464
Total % MPE for Site	**40.2244%**