HPC Wireless Services
22 Shelter Rock Lane.
Building C
Danbury, CT, 06810
P.: 203.797.1112

HPC
WIRELESS SERVICES

June 16, 2014

VIA EMAIL AND OVERNIGHT DELIVERY

Ms. Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Sprint Spectrum, L.P. – Notice of Exempt Modification
462 West Main Street, Meriden, CT

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Sprint Spectrum, L.P. ("Sprint"). Sprint is undertaking modifications to certain existing sites in its Connecticut network in order to implement updated technology. In order to do so, Sprint will modify antenna and equipment configurations at a number of existing sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the Mayor of the City of Meriden.

Sprint plans to modify the existing facility at 462 West Main Street, owned by Crown Castle (coordinates 41°32'24.2"N, -72°49'9.1"W). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to Sprint's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will be unaffected. Sprint proposes to add three (3) antennas and three (3) remote radio heads, all at a centerline height of approximately 79' above the tower base. Additionally, Sprint will install one (1) new hybrid cable along the existing ice bridge to the monopole.

2. The proposed changes will not extend the site boundaries. Sprint will install additional batteries and new rectifiers in its existing equipment shelter. Thus, there will be no effect on the site compound, Sprint's leased area or Crown's leased area.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated in the attached power density calculations, Sprint's operations at the site will result in a power density of 5.99%; the combined site operations will result in a total power density of 54.60%.

Please feel free to call me with any questions or concerns regarding this matter. Thank you for your consideration.

Respectfully submitted,

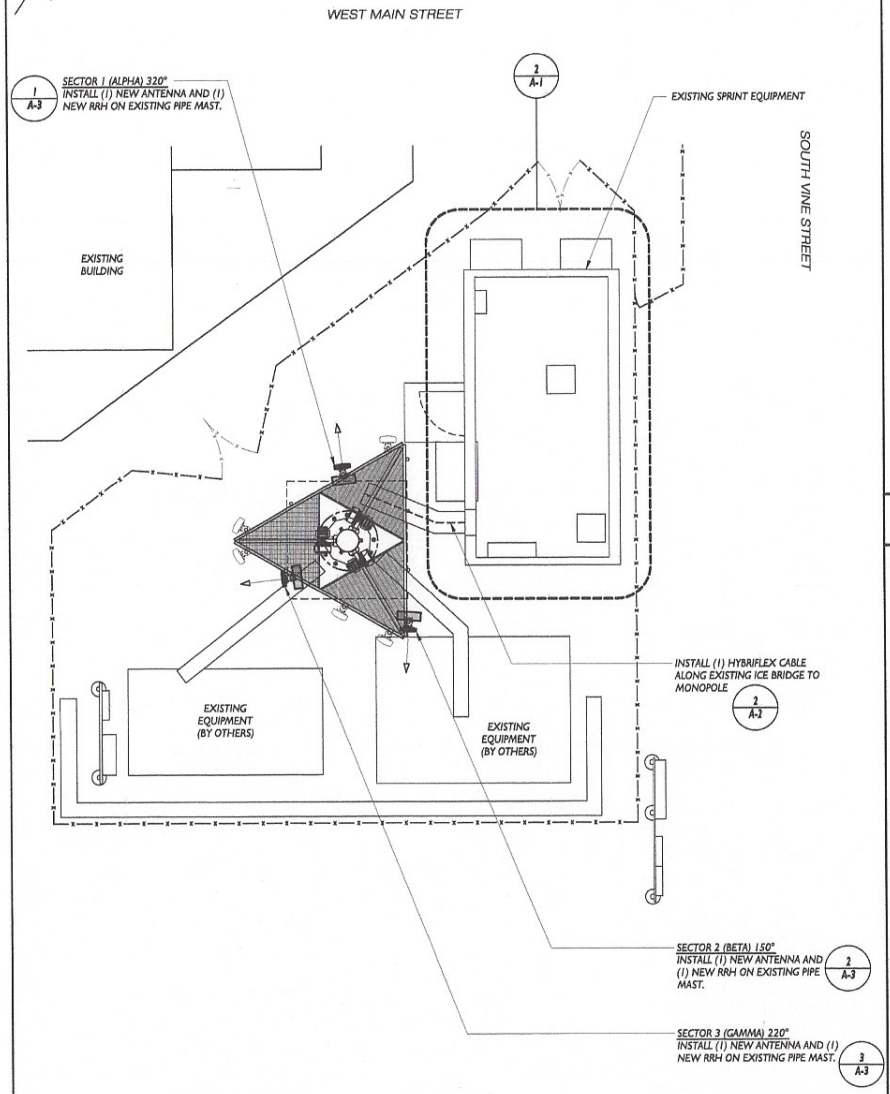
By: _____

Eric Dahl, Consultant
edahl@comcast.net
860-227-1975

Attachments

cc: Honorable Manuel A. Santos, Mayor, City of Meriden
Hunter Family Ltd Partnership, Property Owner

NOTE:
SITE INFORMATION AND PLANS ARE BASED UPON 2.5 AUDIT DOCUMENTATION PROVIDED BY THE SPRINT.

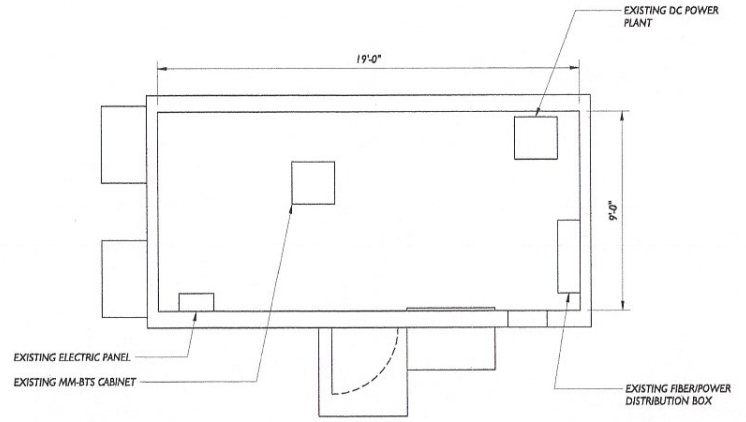


OVERALL SITE PLAN

SCALE	11"x17" : 1/16"= 1'-0"
	24"x36" : 1/8"= 1'-0"

1

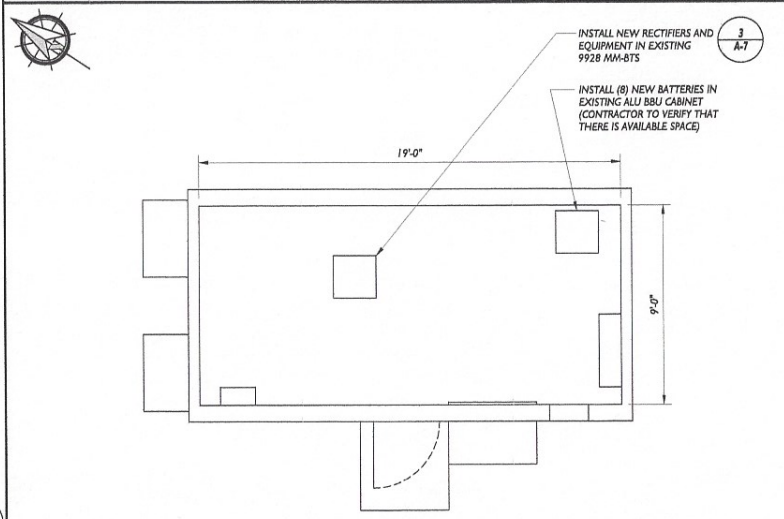
NOTE:
SITE INFORMATION AND PLANS ARE BASED UPON 2.5 AUDIT DOCUMENTATION PROVIDED BY THE SPRINT.



EXISTING SPRINT EQUIPMENT PLAN

SCALE	11"x17" : 3/16" = 1'-0"
	24"x36" : 3/8" = 1'-0"

2



PROPOSED SPRINT EQUIPMENT PLAN

SCALE	11"x17" : 3/16" = 1'-0"
	24"x36" : 3/8" = 1'-0"

3

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
01	3-19-14	REVISED PER CLIENT COMMENTS	CH	KJA
00	3-3-14	INITIAL SUBMISSION	CH	KJA

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251
(517) 436-7466

A SAXON DESIGN GROUP
244 RIVERS EDGE LANE
TOMS RIVER, NJ 08755
(732)978-0155

ENGINEER'S LICENSE

MICHAEL L. BOHLINGER

SIGNATURE:

PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 20405

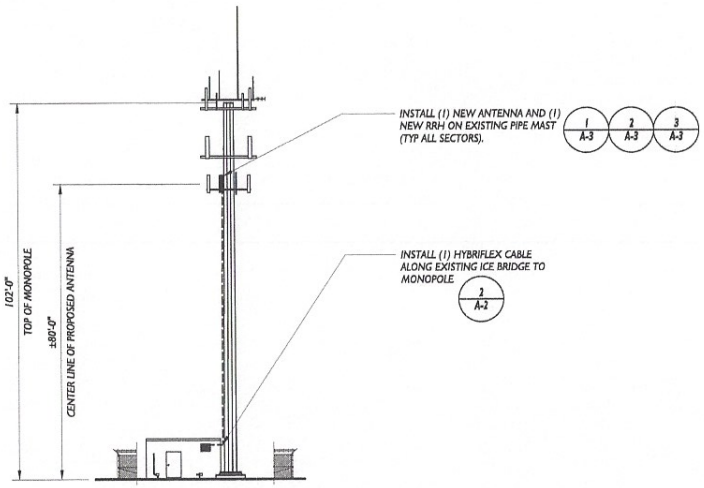
ASDG PROJECT No:	ASDGSP28
CLIENT ID No:	CT25XC840
DESIGN TYPE:	2.5 GHz
SITE INFORMATION:	WEST MERIDEN/HUNTERS AMBULANCE 462 WEST MAIN STREET MERIDEN, CT 06451
DRAWING TITLE	SITE PLAN

MICHAEL L. BOHLINGER
CT LICENSE No. 20405

DATE:	3-2-14
PROJECT No:	ASDGSP28
DRAWING BY:	CD
CHK BY:	
DWG No:	A-1

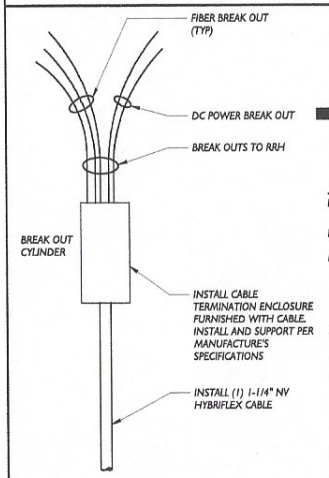
24"x36" SHEETS - SIGN & SEAL AREA

NOTE:
SITE INFORMATION AND PLANS ARE BASED UPON 2.5 AUDIT DOCUMENTATION PROVIDED BY THE SPRINT.



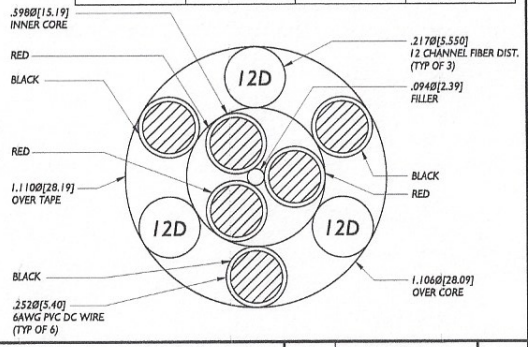
ELEVATION

SCALE: 11"x17" : 1/32" = 1'-0" | 24"x36" : 1/16" = 1'-0" | 1



HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE

CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
FIBER ONLY	VARIES	USE NV HYBRIFLEX	5/8"
HYBRIFLEX	OVER 200'	8 AWG	1 1/4"
HYBRIFLEX	225'-300'	6 AWG	1 1/4"
HYBRIFLEX	325'-375'	4 AWG	1 1/4"



HYBRID BREAK OUT DETAIL

SCALE: 11"x17" : NTS | 24"x36" : NTS | 2

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
01	3-19-14	REVISED PER CLIENT COMMENTS	CN	KLR
00	3-2-14	INITIAL SUBMISSION	CN	KLR

Sprint

6580 SPRINT PARKWAY
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TOMS RIVER, NJ 08755
(732) 878-0155

ENGINEER'S LICENSE

MICHAEL L. BOHLINGER

SIGNATURE:

PROFESSIONAL ENGINEER
CONNECTICUT LICENSE No. 20405

ASDG PROJECT No: ASDGSP28

CLIENT ID No: CT25XC840

DESIGN TYPE: 2.5 GHz

SITE INFORMATION:

WEST MERIDEN/HUNTERS AMBULANCE
462 WEST MAIN STREET
MERIDEN, CT 06451

DRAWING TITLE

BUILDING ELEVATION AND CABLE PLAN

MICHAEL L. BOHLINGER
CT LICENSE No. 20405

DATE: 3-2-14
PROJECT No: ASDGSP28
DRAWING BY: CD
CHK BY:
DWG No: A-2

24"x36" SHEETS - SIGN & SEAL AREA

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RADIO FREQUENCY FCC REGULATORY COMPLIANCE MAXIMUM PERMISSIBLE EXPOSURE (MPE) ASSESSMENT

Sprint Existing Facility

Site ID: CT25XC840

West Meriden / Hunters Ambulance

462 West Main Street
Meriden, CT 06451

June 5, 2014

EBI Project Number: 62143252

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

June 5, 2014

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Re: Radio Frequency Maximum Permissible Exposure (MPE) Assessment for Site:
CT25XC840 - West Meriden / Hunters Ambulance

Site Total: 54.60% - MPE% in full compliance

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 462 West Main Street, Meriden, CT, for the purpose of determining whether the radio frequency (RF) exposure levels from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band (850 MHz Band) is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz and 2500 MHz bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 462 West Main Street, Meriden, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 4 channels in the 1900 MHz Band were considered for each sector of the proposed installation.
2) 1 channel in the 800 MHz Band was considered for each sector of the proposed installation
3) 2 channels in the 2500 MHz Band were considered for each sector of the proposed installation.
4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation 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.
5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the RFS APXVSPP18-C-A20 and the RFS APXVTM14-C-I20. This is based on feedback from the carrier with regards to anticipated antenna selection. The RFS APXVSPP18-C-A20 has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. The RFS APXVTM14-C-I20 has a 15.9 dBd gain value at its main lobe at 2500 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
7) The antenna mounting height centerline for the proposed antennas is **79 feet** above ground level (AGL).
8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT25XC840 - West Meriden / Hunters Ambulance
Site Addresss	462 West Main Street, Meriden, CT, 06451
Site Type	Monopole

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	79	73	1/2 "	0.5	3	139.02	0.94%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	79	73	1/2 "	0.5	3	19.54	0.23%
1B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	79	73	1/2 "	0.5	3	69.51	0.83%
													Sector total Power Density Value:			2.00%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	79	73	1/2 "	0.5	3	139.02	0.94%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	79	73	1/2 "	0.5	3	19.54	0.23%
2B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	79	73	1/2 "	0.5	3	69.51	0.83%
													Sector total Power Density Value:			2.00%

Sector 3

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain (10 db reduction)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss (dB)	ERP	Power Density Percentage
3a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	4	80	5.9	79	73	1/2 "	0.5	3	139.02	0.94%
3a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	1	20	3.4	79	73	1/2 "	0.5	3	19.54	0.23%
3B	RFS	APXVTMM14-C-120	RRH	2500 MHz	CDMA / LTE	20	2	40	5.9	79	73	1/2 "	0.5	3	69.51	0.83%
													Sector total Power Density Value:			2.00%

Site Composite MPE %	
Carrier	MPE %
Sprint	5.99%
AT&T	3.61%
Hunters	44.57%
T-Mobile	0.43%
Total Site MPE %	54.60%

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Summary

All calculations performed for this analysis yielded results that were well within the allowable limits for general public Maximum Permissible Exposure (MPE) to radio frequency energy.

The anticipated Maximum Composite contributions from the Sprint facility are **5.99% (2.00% from sector 1, 2.00% from sector 2 and 2.00% from sector 3)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **54.60%** of the allowable FCC established general public limit sampled at 6 feet above ground level. This total composite site value is based upon MPE values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

May 13, 2014

Patrick Byrum
Crown Castle
3530 Toringdon Way Suite 300
Charlotte, NC 28277
(704) 405-6532

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

Subject:	**Structural Analysis Report**	
Carrier Designation:	***Sprint PCS* Co-Locate – Scenario B**	
	Carrier Site Number:	CT25XC840
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	842869
	Crown Castle Site Name:	Meriden West Central
	Crown Castle JDE Job Number:	282279
	Crown Castle Work Order Number:	762256
	Crown Castle Application Number:	219815 Rev. 1
Engineering Firm Designation:	**B+T Group Project Number:**	92699.001.01
Site Data:	**450-478 WEST MAIN STREET, Meriden, New Haven County, CT** **Latitude *41° 32' 24.2"*, Longitude *-72° 49' 9.1"*** **100 Foot - Monopole Tower**	

Dear Patrick Byrum,

B+T Group is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 646288, in accordance with application 219815, revision 1.

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

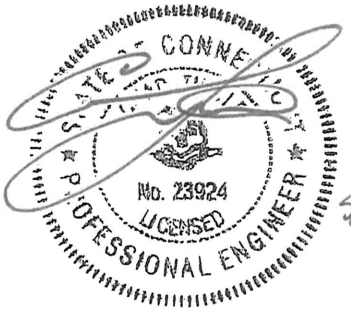
LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the TIA/EIA-222-F standard and 2005 CT State Building Code with 2009 amendment 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 Group* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:
B+T Engineering, Inc.



5/13/14

Brandon Sevier
Project Engineer

Chad E. Tuttle, P.E.
President

tnxTower Report - version 6.1.4.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 100 ft monopole tower designed by Glen Martin Engineering in 2003. The tower was originally designed using the TIA/EIA-222-F with a fastest mile wind speed of 85 mph and 0.5 inch radial ice.

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
76.0	79.0	3	Alcatel Lucent	TD-RRH8x20-25	1 3	1 1/4 5/16	--
		3	RFS Celwave	APXVTM14-C-120			

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
100.0	115.0	1	DBSpectra	DS8A12F36U-N	2 9 1 3	7/8 1/2 3/8 1 1/4	1
	106.0	3	Decibel	DB201-A			
		4	Decibel	DB432-A			
	103.0	6	Ericsson	RRUS 11			
		3	Ericsson	RRUS 11	4	1 1/4	2
		3	Ericsson	RRUS-12 1600MHz			
		3	Kathrein	800 10121			
		6	Powerwave	LGP 21403			
		6	Kathrein	860 10025	--	--	1
		1	Raycap	DC6-48-60-18-8F			
		4	KMW	AM-X-CD-16-65-00T-RET			
	100.0	1	--	Platform Mount [LP 602-1]			
		2	**KMW**	**AM-X-CD-16-65-00T-RET**	**3**	**1 1/4**	**3**
		6	**Powerwave**	**LGP 21401**			
	106.0	**1**	**KMW**	**HB-X-AW-19-65-00T**			
86.0	90.0	6	CSS	CSS-DTMA-BRS	18 1	7/8 1	1
		6	Ericsson	AIR 21			
		3	RFS Celwave	ATMAA1412D-1A20			
		1	RFS Celwave	MA0528-23AN			
		1	RFS Celwave	MA0528-28AN			
	86.0	1	--	Platform Mount [LP 306-1]			
78.0	78.0	3	Alcatel Lucent	800 External Notch Filter	--	--	1
		3	Alcatel Lucent	TME-800MHZ RRH			
		1	--	Pipe Mount [PM 601-3]			
	77.0	3	Alcatel Lucent	1900MHz RRH			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
76.0	79.0	3	RFS Celwave	APXVSPP18-C-A20	3	1 1/4	1
	76.0	1	--	Platform Mount [LP 304-1]			
65.0	65.0	3	Alcatel Lucent	RRH2X40-AWS	2	1 5/8	2
		3	Alcatel Lucent	RRH2x40 700			
		6	Antel	BXA-171063/12CF			
		6	Antel	BXA-70063/6CF			
		1	--	Platform Mount [LP 303-1]			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) To be Removed

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
Information Not Available						

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Application	Sprint Co-Locate Revision#1	219815	CCI Sites
Tower Manufacturer Drawing	Glen Martin Engineering, Date:12/11/2003	4858942	CCI Sites
Foundation Drawing	Glen Martin Engineering, Date:12/13/2003	4858942	CCI Sites
Geotech Report	Tectonic, Date:08/28/2002	4529388	CCI Sites
Antenna Configuration	Crown CAD Package	Date:05/08/2014	CCI Sites

3.1) Analysis Method

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

3.2) Assumptions

1) 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) Mount areas and weights are assumed based on photographs provided.

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

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	101 - 48	Pole	TP40.72x28x0.313	1	-15.579	2019.468	39.7	Pass
L2	48 - 1	Pole	TP51.37x38.655x0.375	2	-27.650	3171.353	58.9	Pass
							Summary	
						Pole (L2)	58.9	Pass
						RATING =	58.9	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	50.8	Pass
1	Base Plate	Base	30.4	Pass
1	Base Foundation	Base	69.3	Pass

Structure Rating (max from all components) =	69.3%

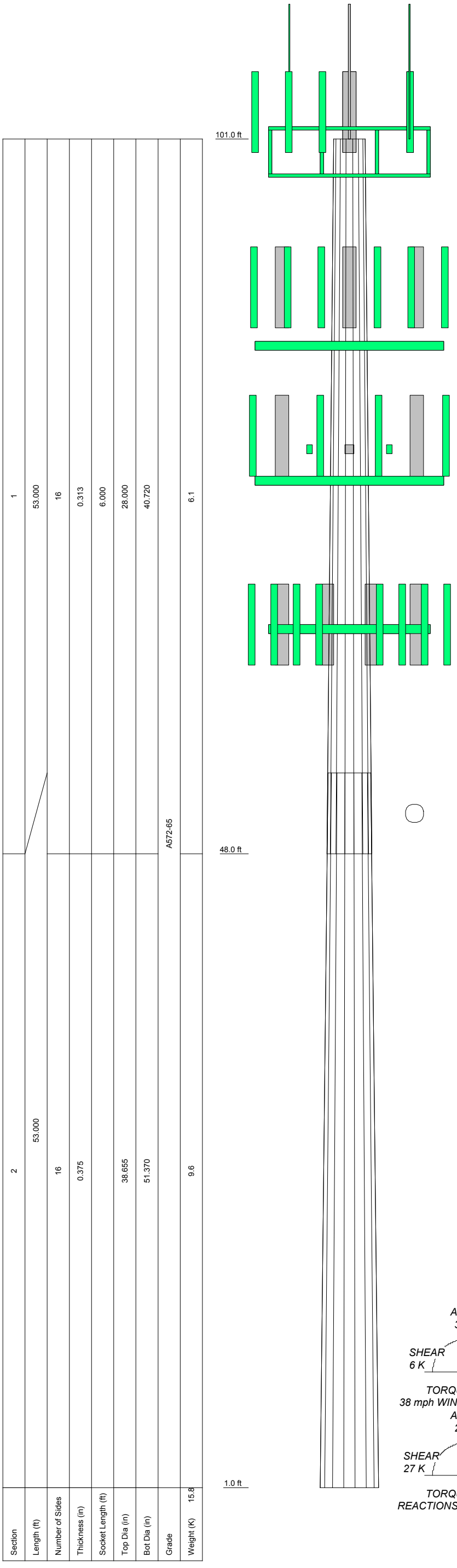
Notes:
1) See additional documentation in "Appendix C - Additional Calculations" for calculations supporting the % capacity listed.

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT



Section	1	2
Length (ft)	53.000	53.000
Number of Sides	16	16
Thickness (in)	0.313	0.375
Socket Length (ft)	6.000	
Top Dia (in)	28.000	38.655
Bot Dia (in)	40.720	51.370
Grade		A572-65
Weight (K)	6.1	9.6

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	100	ATMAA1412D-1A20 (E)	86
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	100	ATMAA1412D-1A20 (E)	86
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	100	Platform Mount [LP 306-1] (E)	86
DB201-A (E)	100	1900MHz RRH (E)	78
DB201-A (E)	100	1900MHz RRH (E)	78
DB201-A (E)	100	1900MHz RRH (E)	78
(2) DB432-A (E)	100	800 EXTERNAL NOTCH FILTER (E)	78
(2) DB432-A (E)	100	800 EXTERNAL NOTCH FILTER (E)	78
(2) RRUS 11 (E)	100	800 EXTERNAL NOTCH FILTER (E)	78
(2) RRUS 11 (E)	100	TME-800MHZ RRH (E)	78
(2) RRUS 11 (E)	100	TME-800MHZ RRH (E)	78
(2) 860 10025 (E)	100	TME-800MHZ RRH (E)	78
(2) 860 10025 (E)	100	Pipe Mount [PM 601-3] (E)	78
(2) 860 10025 (E)	100	APXVSPP18-C-A20 w/ Mount Pipe (E)	76
DS8A12F36U-N (E)	100	APXVSPP18-C-A20 w/ Mount Pipe (E)	76
DC6-48-60-18-8F (E)	100	APXVSPP18-C-A20 w/ Mount Pipe (E)	76
800 10121 w/ Mount Pipe (R)	100	APXVTM14-C-120 w/ Mount Pipe (P)	76
800 10121 w/ Mount Pipe (R)	100	APXVTM14-C-120 w/ Mount Pipe (P)	76
800 10121 w/ Mount Pipe (R)	100	APXVTM14-C-120 w/ Mount Pipe (P)	76
RRUS-12 1600MHz (R)	100	TD-RRH8x20-25 (P)	76
RRUS-12 1600MHz (R)	100	TD-RRH8x20-25 (P)	76
RRUS-12 1600MHz (R)	100	TD-RRH8x20-25 (P)	76
RRUS 11 (R)	100	(2) 6' x 2" Mount Pipe (E)	76
RRUS 11 (R)	100	(2) 6' x 2" Mount Pipe (E)	76
RRUS 11 (R)	100	(2) 6' x 2" Mount Pipe (E)	76
(2) LGP 21403 (R)	100	Platform Mount [LP 304-1] (E)	76
(2) LGP 21403 (R)	100	(2) BXA-171063/12CF w/ Mount Pipe (R)	65
(2) LGP 21403 (R)	100	(2) BXA-171063/12CF w/ Mount Pipe (R)	65
Platform Mount [LP 602-1] (E)	100	(2) BXA-171063/12CF w/ Mount Pipe (R)	65
(3) AIR 21 w/ Mount Pipe (E)	86	(2) BXA-70063/6CF w/ Mount Pipe (R)	65
AIR 21 w/ Mount Pipe (E)	86	(2) BXA-70063/6CF w/ Mount Pipe (R)	65
(2) AIR 21 w/ Mount Pipe (E)	86	(2) BXA-70063/6CF w/ Mount Pipe (R)	65
MA0528-23AN w/ Mount Pipe (E)	86	RRH2x40 700 (R)	65
MA0528-28AN w/ Mount Pipe (E)	86	RRH2x40 700 (R)	65
(2) CSS-DTMA-BRS (E)	86	RRH2x40 700 (R)	65
(2) CSS-DTMA-BRS (E)	86	RRH2X40-AWS (R)	65
(2) CSS-DTMA-BRS (E)	86	RRH2X40-AWS (R)	65
ATMAA1412D-1A20 (E)	86	RRH2X40-AWS (R)	65
		Platform Mount [LP 303-1] (R)	65

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 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: 58.9%

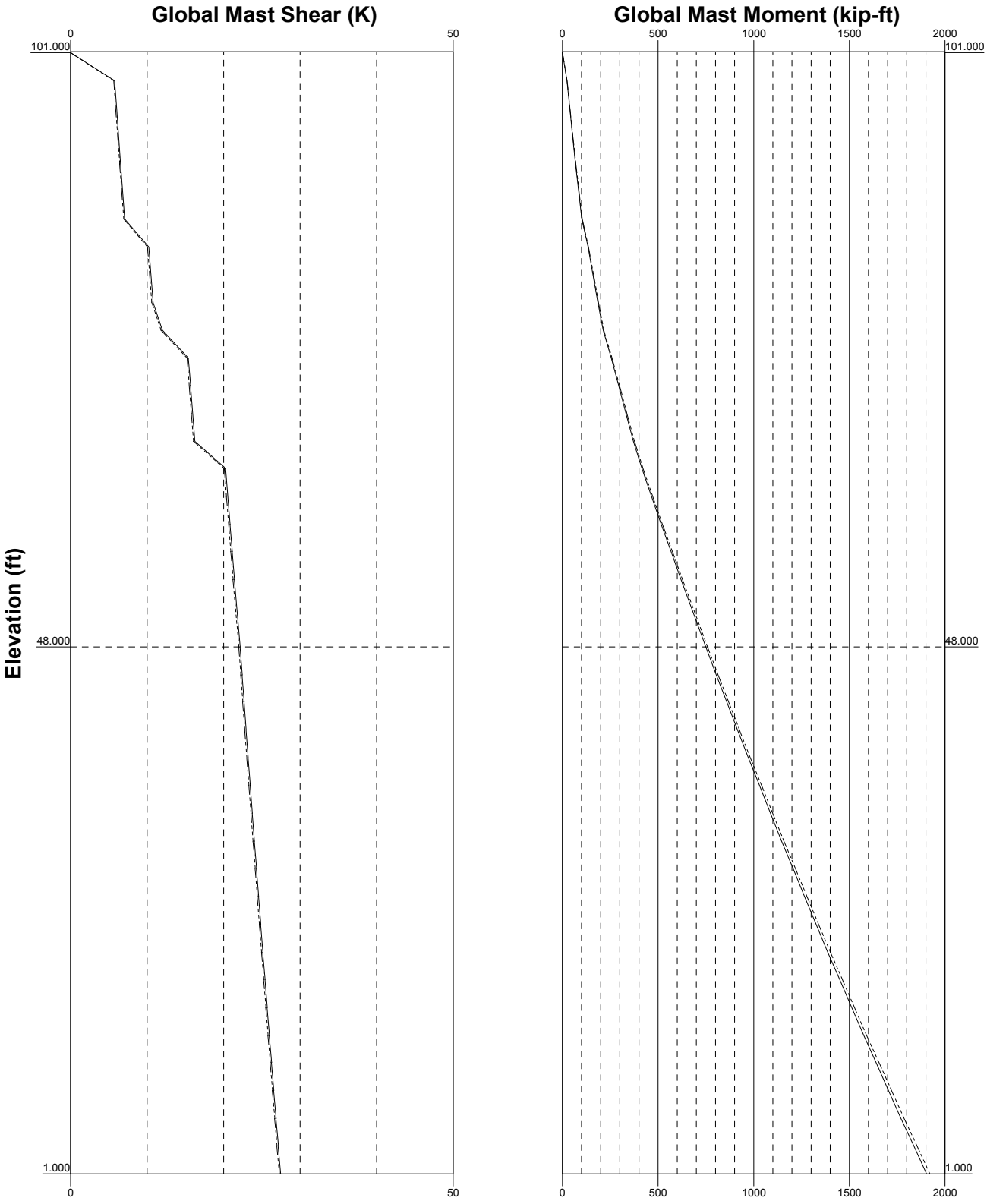
B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 92699.001.01- Meriden West Central, CT (BU# 84286			
Project:			
Client: Crown Castle	Drawn by: B. Sevier	App'd:	
Code: TIA/EIA-222-F	Date: 05/13/14	Scale: NTS	
Path: S:\Projects\Crown Castle\92699_842869_Meriden West Central\Engineering\tnxTower\92699_001_01_Meriden West Central_CT.eri		Dwg No. E-1	

TIA/EIA-222-F - 85 mph/38 mph 0.750 in Ice

Maximum Values

Vx Vz Mx Mz



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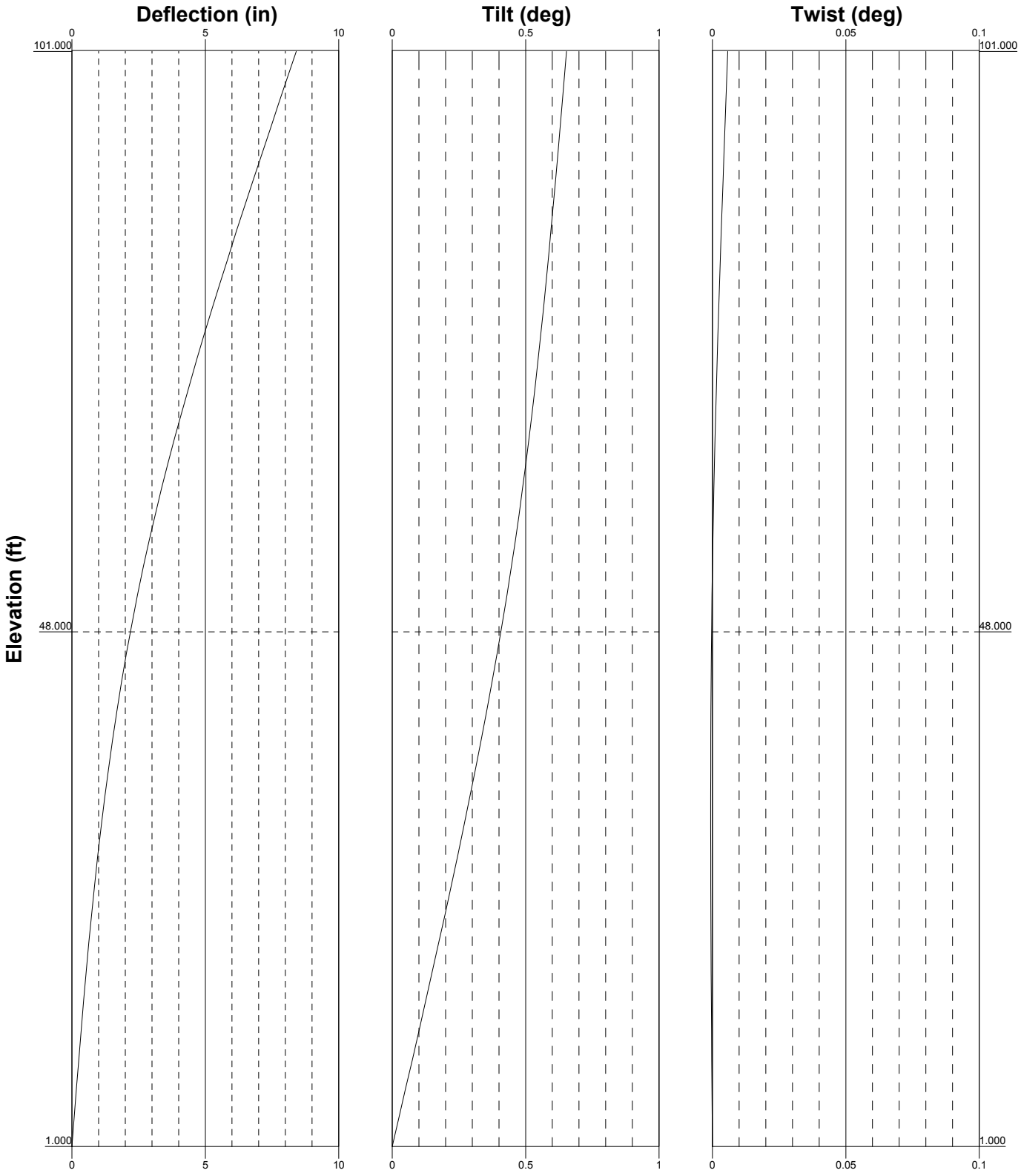
Project:			
Client: Crown Castle	Drawn by: B. Sevier	App'd:	
Code: TIA/EIA-222-F	Date: 05/13/14	Scale: NTS	
Path: S:\Projects\Crown Castle\92699_842869_Meriden West Central\Engineering\tnxTower\92699_001_01_Meriden West Central_CT.eri		Dwg No. E-4	

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

Maximum Values



B+T GRP

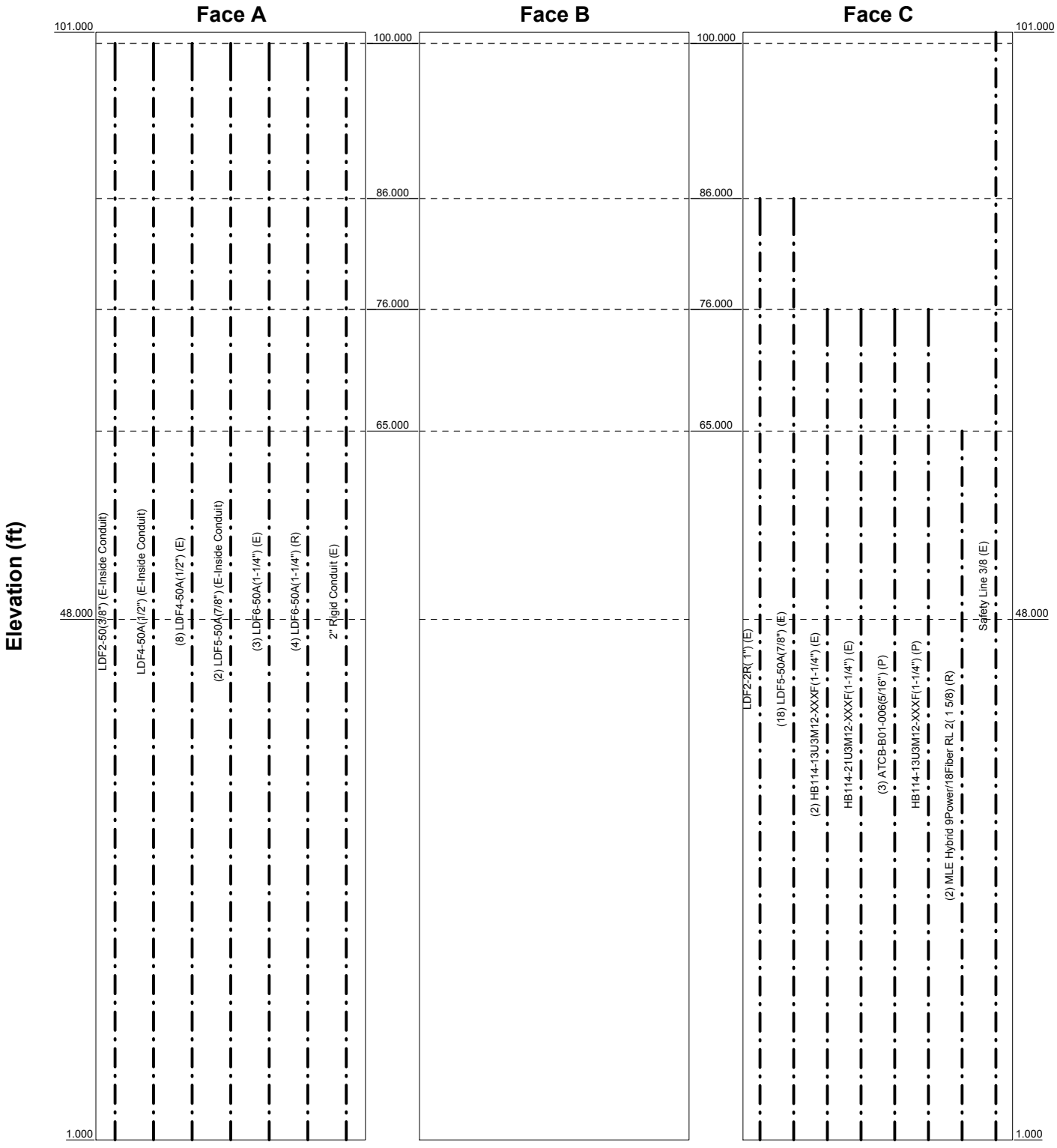
B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job:	***92699.001.01- Meriden West Central, CT (BU# 84286*****		
Project:			
Client: Crown Castle		Drawn by: B. Sevier	App'd:
Code: TIA/EIA-222-F		Date: 05/13/14	Scale: NTS
Path: S:\Projects\Crown Castle\92699_842869_Meriden West Central\Engineering\tnxTower\92699_001_01_Meriden West Central_CT.eri			Dwg No. E-5

Feed Line Distribution Chart

1' - 101'

Round Flat App In Face App Out Face Truss Leg



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Job:	***92699.001.01- Meriden West Central, CT (BU# 84286*****		
Project:			
Client: Crown Castle		Drawn by: B. Sevier	App'd:
Code: TIA/EIA-222-F		Date: 05/13/14	Scale: NTS
Path: S:\Projects\Crown Castle\92699_842869_Meriden West Central\Engineering\tnxTower\92699_001_01_Meriden West Central_CT.eri			Dwg No. E-7

Tower Input Data

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

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Treat Feedline Bundles As Cylinder
	Consider Moments - Horizontals		Assume Legs Pinned		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Calculate Redundant Bracing Forces
	Use Moment Magnification	√	Use Clear Spans For Wind Area		Ignore Redundant Members in FEA
√	Use Code Stress Ratios		Use Clear Spans For KL/r		SR Leg Bolts Resist Compression
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		All Leg Panels Have Same Allowable
√	Escalate Ice	√	Bypass Mast Stability Checks		Offset Girt At Foundation
	Always Use Max Kz	√	Use Azimuth Dish Coefficients	√	Consider Feedline Torque
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Include Angle Block Shear Check
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Poles
	Leg Bolts Are At Top Of Section		SR Members Have Cut Ends	√	Include Shear-Torsion Interaction
	Secondary Horizontal Braces Leg		Sort Capacity Reports By Component		Always Use Sub-Critical Flow
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Use Top Mounted Sockets
	Add IBC .6D+W Combination		Use TIA-222-G Tension Splice Capacity Exemption		

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	101.000-48.000	53.000	6.000	16	28.000	40.720	0.313	1.250	A572-65 (65 ksi)
L2	48.000-1.000	53.000		16	38.655	51.370	0.375	1.500	A572-65 (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	28.549	27.601	2673.045	9.857	14.280	187.188	5386.564	13.647	4.950	15.84
	41.518	40.281	8308.852	14.385	20.767	400.095	16743.510	19.917	7.481	23.94
L2	40.880	45.792	8477.194	13.628	19.714	430.008	17082.742	22.642	6.946	18.523
	52.376	61.003	20040.987	18.154	26.199	764.961	40385.419	30.163	9.476	25.27

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 101.000-48.000				1	1	1		
L2 48.000-1.000				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
LDF2-50(3/8") (E-Inside Conduit)	A	No	Inside Pole	100.000 - 1.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF4-50A(1/2") (E-Inside Conduit)	A	No	Inside Pole	100.000 - 1.000	1	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF4-50A(1/2") (E)	A	No	Inside Pole	100.000 - 1.000	8	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF5-50A(7/8") (E-Inside Conduit)	A	No	Inside Pole	100.000 - 1.000	2	No Ice	0.000	0.000
						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF6-50A(1-1/4") (E)	A	No	Inside Pole	100.000 - 1.000	3	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
LDF6-50A(1-1/4") (R)	A	No	Inside Pole	100.000 - 1.000	4	No Ice	0.000	0.001
						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
2" Rigid Conduit (E)	A	No	Inside Pole	100.000 - 1.000	1	No Ice	0.000	0.003
						1/2" Ice	0.000	0.003
						1" Ice	0.000	0.003

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight klf
						2" Ice	0.000	0.003
						4" Ice	0.000	0.003
//								
LDF2-2R(1")	C	No	Inside Pole	86.000 - 1.000	1	No Ice	0.000	0.000
(E)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
LDF5-50A(7/8")	C	No	Inside Pole	86.000 - 1.000	18	No Ice	0.000	0.000
(E)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
//								
HB114-13U3M12-XXX F(1-1/4")	C	No	Inside Pole	76.000 - 1.000	2	No Ice	0.000	0.001
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
HB114-21U3M12-XXX F(1-1/4")	C	No	Inside Pole	76.000 - 1.000	1	No Ice	0.000	0.001
(E)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
ATCB-B01-006(5/16")	C	No	Inside Pole	76.000 - 1.000	3	No Ice	0.000	0.000
(P)						1/2" Ice	0.000	0.000
						1" Ice	0.000	0.000
						2" Ice	0.000	0.000
						4" Ice	0.000	0.000
HB114-13U3M12-XXX F(1-1/4")	C	No	Inside Pole	76.000 - 1.000	1	No Ice	0.000	0.001
(P)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
//								
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	65.000 - 1.000	2	No Ice	0.000	0.001
(R)						1/2" Ice	0.000	0.001
						1" Ice	0.000	0.001
						2" Ice	0.000	0.001
						4" Ice	0.000	0.001
//								
Safety Line 3/8	C	No	CaAa (Out Of Face)	101.000 - 1.000	1	No Ice	0.037	0.000
(E)						1/2" Ice	0.137	0.001
						1" Ice	0.238	0.001
						2" Ice	0.437	0.002
						4" Ice	0.838	0.004

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	101.000-48.000	A	0.000	0.000	0.000	0.000	0.495
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.987	0.408
L2	48.000-1.000	A	0.000	0.000	0.000	0.000	0.447
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	1.763	0.611

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	101.000-48.000	A	0.826	0.000	0.000	0.000	0.000	0.495
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	10.740	0.455
L2	48.000-1.000	A	0.750	0.000	0.000	0.000	0.000	0.447
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	9.524	0.652

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	101.000-48.000	-0.048	0.028	-0.235	0.136
L2	48.000-1.000	-0.048	0.028	-0.242	0.140

Discrete Tower Loads

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
//									
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	A	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	B	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe (E)	C	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.498 9.149 9.767 11.031 13.679	6.304 7.479 8.368 10.179 14.024	0.074 0.139 0.212 0.385 0.874
DB201-A (E)	A	From Leg	4.000 0.000 6.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.100 1.980 2.860 4.620 8.140	1.100 1.980 2.860 4.620 8.140	0.025 0.033 0.040 0.055 0.085
DB201-A (E)	B	From Leg	4.000 0.000	0.000	100.000	No Ice 1/2" Ice	1.100 1.980	1.100 1.980	0.025 0.033

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
			6.000			1" Ice	2.860	2.860	0.040
						2" Ice	4.620	4.620	0.055
						4" Ice	8.140	8.140	0.085
DB201-A	C	From Leg	4.000	0.000	100.000	No Ice	1.100	1.100	0.025
(E)			0.000			1/2" Ice	1.980	1.980	0.033
			6.000			1" Ice	2.860	2.860	0.040
						2" Ice	4.620	4.620	0.055
						4" Ice	8.140	8.140	0.085
(2) DB432-A	A	From Leg	4.000	0.000	100.000	No Ice	0.300	0.300	0.005
(E)			0.000			1/2" Ice	0.540	0.540	0.006
			6.000			1" Ice	0.780	0.780	0.008
						2" Ice	1.260	1.260	0.011
						4" Ice	2.220	2.220	0.017
(2) DB432-A	B	From Leg	4.000	0.000	100.000	No Ice	0.300	0.300	0.005
(E)			0.000			1/2" Ice	0.540	0.540	0.006
			6.000			1" Ice	0.780	0.780	0.008
						2" Ice	1.260	1.260	0.011
						4" Ice	2.220	2.220	0.017
(2) RRUS 11	A	From Leg	4.000	0.000	100.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS 11	B	From Leg	4.000	0.000	100.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) RRUS 11	C	From Leg	4.000	0.000	100.000	No Ice	3.249	1.373	0.048
(E)			0.000			1/2" Ice	3.491	1.551	0.068
			3.000			1" Ice	3.741	1.738	0.092
						2" Ice	4.268	2.138	0.150
						4" Ice	5.426	3.042	0.310
(2) 860 10025	A	From Leg	4.000	0.000	100.000	No Ice	0.163	0.136	0.001
(E)			0.000			1/2" Ice	0.229	0.199	0.003
			3.000			1" Ice	0.302	0.270	0.005
						2" Ice	0.476	0.439	0.014
						4" Ice	0.927	0.879	0.051
(2) 860 10025	B	From Leg	4.000	0.000	100.000	No Ice	0.163	0.136	0.001
(E)			0.000			1/2" Ice	0.229	0.199	0.003
			3.000			1" Ice	0.302	0.270	0.005
						2" Ice	0.476	0.439	0.014
						4" Ice	0.927	0.879	0.051
(2) 860 10025	C	From Leg	4.000	0.000	100.000	No Ice	0.163	0.136	0.001
(E)			0.000			1/2" Ice	0.229	0.199	0.003
			3.000			1" Ice	0.302	0.270	0.005
						2" Ice	0.476	0.439	0.014
						4" Ice	0.927	0.879	0.051
DS8A12F36U-N	A	From Leg	4.000	0.000	100.000	No Ice	5.128	5.128	0.071
(E)			0.000			1/2" Ice	7.595	7.595	0.110
			15.000			1" Ice	10.079	10.079	0.164
						2" Ice	15.098	15.098	0.319
						4" Ice	25.334	25.334	0.820
DC6-48-60-18-8F	A	From Leg	4.000	0.000	100.000	No Ice	2.567	4.317	0.019
(E)			0.000			1/2" Ice	2.798	4.596	0.050
			3.000			1" Ice	3.038	4.885	0.085
						2" Ice	3.543	5.488	0.167

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.658	6.797	0.383
800 10121 w/ Mount Pipe (R)	A	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.066 0.114 0.168 0.298 0.675
800 10121 w/ Mount Pipe (R)	B	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.066 0.114 0.168 0.298 0.675
800 10121 w/ Mount Pipe (R)	C	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.066 0.114 0.168 0.298 0.675
RRUS-12 1600MHz (R)	C	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.150 3.387 3.634 4.152 5.293	1.416 1.590 1.772 2.164 3.051	0.060 0.081 0.106 0.164 0.327
RRUS-12 1600MHz (R)	A	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.150 3.387 3.634 4.152 5.293	1.416 1.590 1.772 2.164 3.051	0.060 0.081 0.106 0.164 0.327
RRUS-12 1600MHz (R)	B	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.150 3.387 3.634 4.152 5.293	1.416 1.590 1.772 2.164 3.051	0.060 0.081 0.106 0.164 0.327
RRUS 11 (R)	A	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS 11 (R)	B	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
RRUS 11 (R)	C	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.249 3.491 3.741 4.268 5.426	1.373 1.551 1.738 2.138 3.042	0.048 0.068 0.092 0.150 0.310
(2) LGP 21403 (R)	A	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.364 0.479 0.602 0.874 1.522	0.014 0.021 0.030 0.055 0.135
(2) LGP 21403 (R)	B	From Leg	4.000 0.000 3.000	0.000	100.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.288 1.445 1.611 1.969 2.788	0.364 0.479 0.602 0.874 1.522	0.014 0.021 0.030 0.055 0.135
(2) LGP 21403	C	From Leg	4.000	0.000	100.000	No Ice	1.288	0.364	0.014

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
(R)			0.000			1/2" Ice	1.445	0.479	0.021
			3.000			1" Ice	1.611	0.602	0.030
						2" Ice	1.969	0.874	0.055
						4" Ice	2.788	1.522	0.135
Platform Mount [LP 602-1]	C	None		0.000	100.000	No Ice	32.030	32.030	1.343
(E)						1/2" Ice	38.710	38.710	1.800
						1" Ice	45.390	45.390	2.257
						2" Ice	58.750	58.750	3.170
						4" Ice	85.470	85.470	4.998
//									
(3) AIR 21 w/ Mount Pipe	A	From Leg	4.000	0.000	86.000	No Ice	6.771	5.701	0.112
(E)			0.000			1/2" Ice	7.292	6.552	0.169
			4.000			1" Ice	7.807	7.329	0.232
						2" Ice	8.869	8.938	0.383
						4" Ice	11.116	12.371	0.807
AIR 21 w/ Mount Pipe	B	From Leg	4.000	0.000	86.000	No Ice	6.771	5.701	0.112
(E)			0.000			1/2" Ice	7.292	6.552	0.169
			4.000			1" Ice	7.807	7.329	0.232
						2" Ice	8.869	8.938	0.383
						4" Ice	11.116	12.371	0.807
(2) AIR 21 w/ Mount Pipe	C	From Leg	4.000	0.000	86.000	No Ice	6.771	5.701	0.112
(E)			0.000			1/2" Ice	7.292	6.552	0.169
			4.000			1" Ice	7.807	7.329	0.232
						2" Ice	8.869	8.938	0.383
						4" Ice	11.116	12.371	0.807
MA0528-23AN w/ Mount Pipe	B	From Leg	4.000	0.000	86.000	No Ice	1.572	0.475	0.010
			0.000			1/2" Ice	1.797	0.682	0.022
(E)			4.000			1" Ice	2.044	0.934	0.036
						2" Ice	2.587	1.515	0.075
						4" Ice	3.843	2.912	0.209
MA0528-28AN w/ Mount Pipe	B	From Leg	4.000	0.000	86.000	No Ice	5.608	0.971	0.022
			0.000			1/2" Ice	5.981	1.302	0.052
(E)			4.000			1" Ice	6.366	1.650	0.086
						2" Ice	7.180	2.441	0.170
						4" Ice	8.986	4.407	0.419
(2) CSS-DTMA-BRS	A	From Leg	4.000	0.000	86.000	No Ice	0.580	0.186	0.025
(E)			0.000			1/2" Ice	0.710	0.248	0.031
			4.000			1" Ice	0.849	0.318	0.039
						2" Ice	1.152	0.484	0.060
						4" Ice	1.863	0.921	0.133
(2) CSS-DTMA-BRS	B	From Leg	4.000	0.000	86.000	No Ice	0.580	0.186	0.025
(E)			0.000			1/2" Ice	0.710	0.248	0.031
			4.000			1" Ice	0.849	0.318	0.039
						2" Ice	1.152	0.484	0.060
						4" Ice	1.863	0.921	0.133
(2) CSS-DTMA-BRS	C	From Leg	4.000	0.000	86.000	No Ice	0.580	0.186	0.025
(E)			0.000			1/2" Ice	0.710	0.248	0.031
			4.000			1" Ice	0.849	0.318	0.039
						2" Ice	1.152	0.484	0.060
						4" Ice	1.863	0.921	0.133
ATMAA1412D-1A20	A	From Leg	4.000	0.000	86.000	No Ice	1.167	0.467	0.013
(E)			0.000			1/2" Ice	1.314	0.575	0.021
			4.000			1" Ice	1.469	0.691	0.030
						2" Ice	1.806	0.951	0.056
						4" Ice	2.584	1.573	0.137
ATMAA1412D-1A20	B	From Leg	4.000	0.000	86.000	No Ice	1.167	0.467	0.013
(E)			0.000			1/2" Ice	1.314	0.575	0.021

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			4.000			1" Ice	1.469	0.691	0.030
						2" Ice	1.806	0.951	0.056
						4" Ice	2.584	1.573	0.137
ATMAA1412D-1A20 (E)	C	From Leg	4.000 0.000 4.000	0.000	86.000	No Ice 1/2" Ice 1" Ice	1.167 1.314 1.469	0.467 0.575 0.691	0.013 0.021 0.030
						2" Ice	1.806	0.951	0.056
						4" Ice	2.584	1.573	0.137
Platform Mount [LP 306-1] (E)	C	None		0.000	86.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	20.810 26.900 32.990 45.170 69.530	20.810 26.900 32.990 45.170 69.530	1.616 1.892 2.167 2.719 3.821
//									
1900MHz RRH (E)	A	From Leg	2.000 0.000 -1.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
1900MHz RRH (E)	B	From Leg	2.000 0.000 -1.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
1900MHz RRH (E)	C	From Leg	2.000 0.000 -1.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.907 3.145 3.391 3.909 5.050	3.801 4.065 4.337 4.908 6.152	0.044 0.075 0.110 0.192 0.407
800 EXTERNAL NOTCH FILTER (E)	A	From Leg	2.000 0.000 0.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	0.011 0.017 0.024 0.045 0.114
800 EXTERNAL NOTCH FILTER (E)	B	From Leg	2.000 0.000 0.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	0.011 0.017 0.024 0.045 0.114
800 EXTERNAL NOTCH FILTER (E)	C	From Leg	2.000 0.000 0.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.770 0.890 1.018 1.301 1.970	0.375 0.465 0.563 0.787 1.337	0.011 0.017 0.024 0.045 0.114
TME-800MHZ RRH (E)	A	From Leg	2.000 0.000 0.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
TME-800MHZ RRH (E)	B	From Leg	2.000 0.000 0.000	0.000	78.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.490 2.706 2.931 3.407 4.462	2.068 2.271 2.481 2.928 3.927	0.053 0.074 0.098 0.157 0.318
TME-800MHZ RRH (E)	C	From Leg	2.000 0.000 0.000	0.000	78.000	No Ice 1/2" Ice 1" Ice	2.490 2.706 2.931	2.068 2.271 2.481	0.053 0.074 0.098

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	3.407	2.928	0.157
						4" Ice	4.462	3.927	0.318
Pipe Mount [PM 601-3]	C	None		0.000	78.000	No Ice	4.390	4.390	0.195
(E)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
						2" Ice	8.750	8.750	0.365
						4" Ice	13.110	13.110	0.534
//									
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	76.000	No Ice	8.498	6.946	0.083
Mount Pipe			0.000			1/2" Ice	9.149	8.127	0.151
(E)			3.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	76.000	No Ice	8.498	6.946	0.083
Mount Pipe			0.000			1/2" Ice	9.149	8.127	0.151
(E)			3.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	76.000	No Ice	8.498	6.946	0.083
Mount Pipe			0.000			1/2" Ice	9.149	8.127	0.151
(E)			3.000			1" Ice	9.767	9.021	0.227
						2" Ice	11.031	10.844	0.406
						4" Ice	13.679	14.851	0.909
APXVTM14-C-120 w/	A	From Leg	4.000	0.000	76.000	No Ice	7.134	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.662	5.754	0.131
(P)			3.000			1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.338
						4" Ice	11.526	11.412	0.752
APXVTM14-C-120 w/	B	From Leg	4.000	0.000	76.000	No Ice	7.134	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.662	5.754	0.131
(P)			3.000			1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.338
						4" Ice	11.526	11.412	0.752
APXVTM14-C-120 w/	C	From Leg	4.000	0.000	76.000	No Ice	7.134	4.959	0.077
Mount Pipe			0.000			1/2" Ice	7.662	5.754	0.131
(P)			3.000			1" Ice	8.183	6.472	0.193
						2" Ice	9.256	8.010	0.338
						4" Ice	11.526	11.412	0.752
TD-RRH8x20-25	A	From Leg	4.000	0.000	76.000	No Ice	4.720	1.703	0.070
(P)			0.000			1/2" Ice	5.014	1.920	0.097
			3.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
TD-RRH8x20-25	B	From Leg	4.000	0.000	76.000	No Ice	4.720	1.703	0.070
(P)			0.000			1/2" Ice	5.014	1.920	0.097
			3.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
TD-RRH8x20-25	C	From Leg	4.000	0.000	76.000	No Ice	4.720	1.703	0.070
(P)			0.000			1/2" Ice	5.014	1.920	0.097
			3.000			1" Ice	5.316	2.145	0.128
						2" Ice	5.948	2.622	0.201
						4" Ice	7.314	3.680	0.397
(2) 6' x 2" Mount Pipe	A	From Leg	4.000	0.000	76.000	No Ice	1.425	1.425	0.022
(E)			0.000			1/2" Ice	1.925	1.925	0.033
			0.000			1" Ice	2.294	2.294	0.048
						2" Ice	3.060	3.060	0.090

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						4" Ice	4.702	4.702	0.231
(2) 6' x 2" Mount Pipe (E)	B	From Leg	4.000 0.000 0.000	0.000	76.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
(2) 6' x 2" Mount Pipe (E)	C	From Leg	4.000 0.000 0.000	0.000	76.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.425 1.925 2.294 3.060 4.702	1.425 1.925 2.294 3.060 4.702	0.022 0.033 0.048 0.090 0.231
Platform Mount [LP 304-1] (E)	C	None		0.000	76.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	17.460 22.440 27.420 37.380 57.300	17.460 22.440 27.420 37.380 57.300	1.349 1.625 1.900 2.451 3.554
//									
(2) BXA-171063/12CF w/ Mount Pipe (R)	A	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
(2) BXA-171063/12CF w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
(2) BXA-171063/12CF w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.029 5.583 6.103 7.166 9.438	5.289 6.459 7.348 9.148 12.947	0.041 0.087 0.140 0.273 0.677
(2) BXA-70063/6CF w/ Mount Pipe (R)	A	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.407 6.558 7.422 9.198 12.952	0.042 0.101 0.168 0.328 0.788
(2) BXA-70063/6CF w/ Mount Pipe (R)	B	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.407 6.558 7.422 9.198 12.952	0.042 0.101 0.168 0.328 0.788
(2) BXA-70063/6CF w/ Mount Pipe (R)	C	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	7.979 8.621 9.228 10.473 13.082	5.407 6.558 7.422 9.198 12.952	0.042 0.101 0.168 0.328 0.788
RRH2x40 700 (R)	A	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.290 2.493 2.705 3.155 4.158	1.206 1.363 1.529 1.887 2.706	0.050 0.067 0.086 0.134 0.271
RRH2x40 700 (R)	B	From Leg	4.000 0.000 0.000	0.000	65.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.290 2.493 2.705 3.155 4.158	1.206 1.363 1.529 1.887 2.706	0.050 0.067 0.086 0.134 0.271

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
RRH2x40 700	C	From Leg	4.000	0.000	65.000	No Ice	2.290	1.206	0.050
(R)			0.000			1/2" Ice	2.493	1.363	0.067
			0.000			1" Ice	2.705	1.529	0.086
						2" Ice	3.155	1.887	0.134
						4" Ice	4.158	2.706	0.271
RRH2X40-AWS	A	From Leg	4.000	0.000	65.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-AWS	B	From Leg	4.000	0.000	65.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
RRH2X40-AWS	C	From Leg	4.000	0.000	65.000	No Ice	2.522	1.589	0.044
(R)			0.000			1/2" Ice	2.753	1.795	0.061
			0.000			1" Ice	2.993	2.010	0.082
						2" Ice	3.499	2.465	0.132
						4" Ice	4.615	3.479	0.275
Platform Mount [LP 303-1]	C	None		0.000	65.000	No Ice	14.660	14.660	1.250
(R)						1/2" Ice	18.870	18.870	1.481
						1" Ice	23.080	23.080	1.713
						2" Ice	31.500	31.500	2.175
						4" Ice	48.340	48.340	3.101
//									

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	101 - 48	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-24.672	1.350	2.092
			Max. Mx	11	-15.579	627.419	2.124
			Max. My	2	-15.588	1.696	619.805
			Max. Vy	11	-21.417	627.419	2.124
			Max. Vx	2	-21.237	1.696	619.805
			Max. Torque	10			-3.787
L2	48 - 1	Pole	Max Tension	1	0.000	0.000	0.000
			Max. Compression	14	-38.825	1.443	2.039
			Max. Mx	11	-27.649	1920.815	4.449
			Max. My	2	-27.650	4.037	1903.732
			Max. Vy	11	-27.452	1920.815	4.449
			Max. Vx	2	-27.276	4.037	1903.732
			Max. Torque	10			-3.785

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	25	38.825	5.590	3.216
	Max. H_x	11	27.666	27.435	0.043
	Max. H_z	2	27.666	0.043	27.259
	Max. M_x	2	1903.732	0.043	27.259
	Max. M_z	5	1919.412	-27.435	-0.043
	Max. Torsion	4	3.776	-23.738	13.592
	Min. Vert	1	27.666	0.000	0.000
	Min. H_x	5	27.666	-27.435	-0.043
	Min. H_z	8	27.666	-0.043	-27.259
	Min. M_x	8	-1901.503	-0.043	-27.259
	Min. M_z	11	-1920.815	27.435	0.043
	Min. Torsion	10	-3.783	23.738	-13.592

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	27.666	0.000	0.000	-1.090	0.687	0.000
Dead+Wind 0 deg - No Ice	27.666	-0.043	-27.259	-1903.732	4.037	-1.977
Dead+Wind 30 deg - No Ice	27.666	13.680	-23.586	-1647.160	-956.471	-3.323
Dead+Wind 60 deg - No Ice	27.666	23.738	-13.592	-949.529	-1660.501	-3.776
Dead+Wind 90 deg - No Ice	27.666	27.435	0.043	2.224	-1919.412	-3.220
Dead+Wind 120 deg - No Ice	27.666	23.781	13.667	953.081	-1663.834	-1.807
Dead+Wind 150 deg - No Ice	27.666	13.755	23.629	1648.266	-962.247	0.087
Dead+Wind 180 deg - No Ice	27.666	0.043	27.259	1901.503	-2.636	1.960
Dead+Wind 210 deg - No Ice	27.666	-13.680	23.586	1644.933	957.871	3.314
Dead+Wind 240 deg - No Ice	27.666	-23.738	13.592	947.305	1661.902	3.783
Dead+Wind 270 deg - No Ice	27.666	-27.435	-0.043	-4.449	1920.815	3.236
Dead+Wind 300 deg - No Ice	27.666	-23.781	-13.667	-955.308	1665.238	1.816
Dead+Wind 330 deg - No Ice	27.666	-13.755	-23.629	-1650.495	963.650	-0.094
Dead+Ice+Temp	38.825	0.000	0.000	-2.039	1.443	0.000
Dead+Wind 0 deg+Ice+Temp	38.825	-0.013	-6.408	-463.599	2.602	-0.478
Dead+Wind 30 deg+Ice+Temp	38.825	3.212	-5.543	-401.209	-230.202	-0.850
Dead+Wind 60 deg+Ice+Temp	38.825	5.577	-3.193	-231.877	-400.927	-0.994
Dead+Wind 90 deg+Ice+Temp	38.825	6.447	0.013	-0.976	-463.826	-0.872
Dead+Wind 120 deg+Ice+Temp	38.825	5.590	3.216	229.626	-402.047	-0.516
Dead+Wind 150 deg+Ice+Temp	38.825	3.235	5.556	398.137	-232.142	-0.022
Dead+Wind 180 deg+Ice+Temp	38.825	0.013	6.408	459.407	0.361	0.478
Dead+Wind 210 deg+Ice+Temp	38.825	-3.212	5.543	397.017	233.165	0.850
Dead+Wind 240 deg+Ice+Temp	38.825	-5.577	3.193	227.685	403.890	0.995
Dead+Wind 270 deg+Ice+Temp	38.825	-6.447	-0.013	-3.216	466.789	0.873
Dead+Wind 300 deg+Ice+Temp	38.825	-5.590	-3.216	-233.817	405.010	0.517
Dead+Wind 330 deg+Ice+Temp	38.825	-3.235	-5.556	-402.329	235.106	0.022
Dead+Wind 0 deg - Service	27.666	-0.015	-9.432	-659.570	1.857	-0.683
Dead+Wind 30 deg - Service	27.666	4.734	-8.161	-570.777	-330.554	-1.150
Dead+Wind 60 deg - Service	27.666	8.214	-4.703	-329.343	-574.205	-1.309
Dead+Wind 90 deg - Service	27.666	9.493	0.015	0.039	-663.810	-1.117
Dead+Wind 120 deg - Service	27.666	8.229	4.729	329.112	-575.359	-0.627
Dead+Wind 150 deg - Service	27.666	4.759	8.176	569.700	-332.554	0.031
Dead+Wind 180 deg - Service	27.666	0.015	9.432	657.339	-0.452	0.681
Dead+Wind 210 deg - Service	27.666	-4.734	8.161	568.546	331.959	1.149
Dead+Wind 240 deg - Service	27.666	-8.214	4.703	327.112	575.610	1.310
Dead+Wind 270 deg - Service	27.666	-9.493	-0.015	-2.270	665.215	1.119
Dead+Wind 300 deg - Service	27.666	-8.229	-4.729	-331.343	576.764	0.628
Dead+Wind 330 deg - Service	27.666	-4.759	-8.176	-571.931	333.959	-0.032

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-27.666	0.000	0.000	27.666	0.000	0.000%
2	-0.043	-27.666	-27.259	0.043	27.666	27.259	0.000%
3	13.680	-27.666	-23.586	-13.680	27.666	23.586	0.000%
4	23.738	-27.666	-13.592	-23.738	27.666	13.592	0.000%
5	27.435	-27.666	0.043	-27.435	27.666	-0.043	0.000%
6	23.781	-27.666	13.667	-23.781	27.666	-13.667	0.000%
7	13.755	-27.666	23.629	-13.755	27.666	-23.629	0.000%
8	0.043	-27.666	27.259	-0.043	27.666	-27.259	0.000%
9	-13.680	-27.666	23.586	13.680	27.666	-23.586	0.000%
10	-23.738	-27.666	13.592	23.738	27.666	-13.592	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
11	-27.435	-27.666	-0.043	27.435	27.666	0.043	0.000%
12	-23.781	-27.666	-13.667	23.781	27.666	13.667	0.000%
13	-13.755	-27.666	-23.629	13.755	27.666	23.629	0.000%
14	0.000	-38.825	0.000	0.000	38.825	0.000	0.000%
15	-0.013	-38.825	-6.408	0.013	38.825	6.408	0.000%
16	3.212	-38.825	-5.543	-3.212	38.825	5.543	0.000%
17	5.577	-38.825	-3.193	-5.577	38.825	3.193	0.000%
18	6.447	-38.825	0.013	-6.447	38.825	-0.013	0.000%
19	5.590	-38.825	3.216	-5.590	38.825	-3.216	0.000%
20	3.235	-38.825	5.556	-3.235	38.825	-5.556	0.000%
21	0.013	-38.825	6.408	-0.013	38.825	-6.408	0.000%
22	-3.212	-38.825	5.543	3.212	38.825	-5.543	0.000%
23	-5.577	-38.825	3.193	5.577	38.825	-3.193	0.000%
24	-6.447	-38.825	-0.013	6.447	38.825	0.013	0.000%
25	-5.590	-38.825	-3.216	5.590	38.825	3.216	0.000%
26	-3.235	-38.825	-5.556	3.235	38.825	5.556	0.000%
27	-0.015	-27.666	-9.432	0.015	27.666	9.432	0.000%
28	4.734	-27.666	-8.161	-4.734	27.666	8.161	0.000%
29	8.214	-27.666	-4.703	-8.214	27.666	4.703	0.000%
30	9.493	-27.666	0.015	-9.493	27.666	-0.015	0.000%
31	8.229	-27.666	4.729	-8.229	27.666	-4.729	0.000%
32	4.759	-27.666	8.176	-4.759	27.666	-8.176	0.000%
33	0.015	-27.666	9.432	-0.015	27.666	-9.432	0.000%
34	-4.734	-27.666	8.161	4.734	27.666	-8.161	0.000%
35	-8.214	-27.666	4.703	8.214	27.666	-4.703	0.000%
36	-9.493	-27.666	-0.015	9.493	27.666	0.015	0.000%
37	-8.229	-27.666	-4.729	8.229	27.666	4.729	0.000%
38	-4.759	-27.666	-8.176	4.759	27.666	8.176	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00003708
3	Yes	4	0.00000001	0.00012025
4	Yes	4	0.00000001	0.00018357
5	Yes	4	0.00000001	0.00005935
6	Yes	4	0.00000001	0.00012443
7	Yes	4	0.00000001	0.00013658
8	Yes	4	0.00000001	0.00003562
9	Yes	4	0.00000001	0.00017512
10	Yes	4	0.00000001	0.00011911
11	Yes	4	0.00000001	0.00006085
12	Yes	4	0.00000001	0.00015896
13	Yes	4	0.00000001	0.00013913
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00010299
16	Yes	4	0.00000001	0.00010626
17	Yes	4	0.00000001	0.00010688
18	Yes	4	0.00000001	0.00010274
19	Yes	4	0.00000001	0.00010545
20	Yes	4	0.00000001	0.00010488
21	Yes	4	0.00000001	0.00010113
22	Yes	4	0.00000001	0.00010573
23	Yes	4	0.00000001	0.00010637

24	Yes	4	0.00000001	0.00010399
25	Yes	4	0.00000001	0.00010803
26	Yes	4	0.00000001	0.00010734
27	Yes	4	0.00000001	0.00000667
28	Yes	4	0.00000001	0.00001083
29	Yes	4	0.00000001	0.00001847
30	Yes	4	0.00000001	0.00001061
31	Yes	4	0.00000001	0.00000874
32	Yes	4	0.00000001	0.00000941
33	Yes	4	0.00000001	0.00000654
34	Yes	4	0.00000001	0.00001692
35	Yes	4	0.00000001	0.00001165
36	Yes	4	0.00000001	0.00001074
37	Yes	4	0.00000001	0.00001345
38	Yes	4	0.00000001	0.00000984

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 48	8.410	37	0.653	0.006
L2	54 - 1	2.683	36	0.447	0.002

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	37	8.271	0.649	0.006	52788
86.000	(3) AIR 21 w/ Mount Pipe	37	6.357	0.600	0.004	17596
78.000	1900MHz RRH	37	5.314	0.569	0.004	11475
76.000	APXVSPP18-C-A20 w/ Mount Pipe	37	5.063	0.560	0.003	10557
65.000	(2) BXA-171063/12CF w/ Mount Pipe	37	3.774	0.509	0.003	7331

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	101 - 48	24.258	11	1.882	0.016
L2	54 - 1	7.744	11	1.290	0.005

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.000	AM-X-CD-16-65-00T-RET w/ Mount Pipe	11	23.858	1.872	0.016	18349
86.000	(3) AIR 21 w/ Mount Pipe	11	18.337	1.730	0.012	6116
78.000	1900MHz RRH	11	15.333	1.640	0.010	3988
76.000	APXVSPP18-C-A20 w/ Mount Pipe	11	14.609	1.616	0.010	3669
65.000	(2) BXA-171063/12CF w/ Mount Pipe	11	10.891	1.469	0.007	2547

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	101 - 48 (1)	TP40.72x28x0.313	53.000	0.000	0.0	39.000	38.846	-15.579	1514.980	0.010
L2	48 - 1 (2)	TP51.37x38.655x0.375	53.000	0.000	0.0	39.000	61.003	-27.650	2379.110	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	101 - 48 (1)	TP40.72x28x0.313	627.423	20.241	39.000	0.519	0.000	0.000	39.000	0.000
L2	48 - 1 (2)	TP51.37x38.655x0.375	1920.817	30.132	39.000	0.773	0.000	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	101 - 48 (1)	TP40.72x28x0.313	21.417	0.551	26.000	0.043	3.254	0.051	26.000	0.002
L2	48 - 1 (2)	TP51.37x38.655x0.375	27.452	0.450	26.000	0.035	3.237	0.025	26.000	0.001

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	101 - 48 (1)	0.010	0.519	0.000	0.043	0.002	0.530 ✔	1.333	H1-3+VT ✔
L2	48 - 1 (2)	0.012	0.773	0.000	0.035	0.001	0.785 ✔	1.333	H1-3+VT ✔

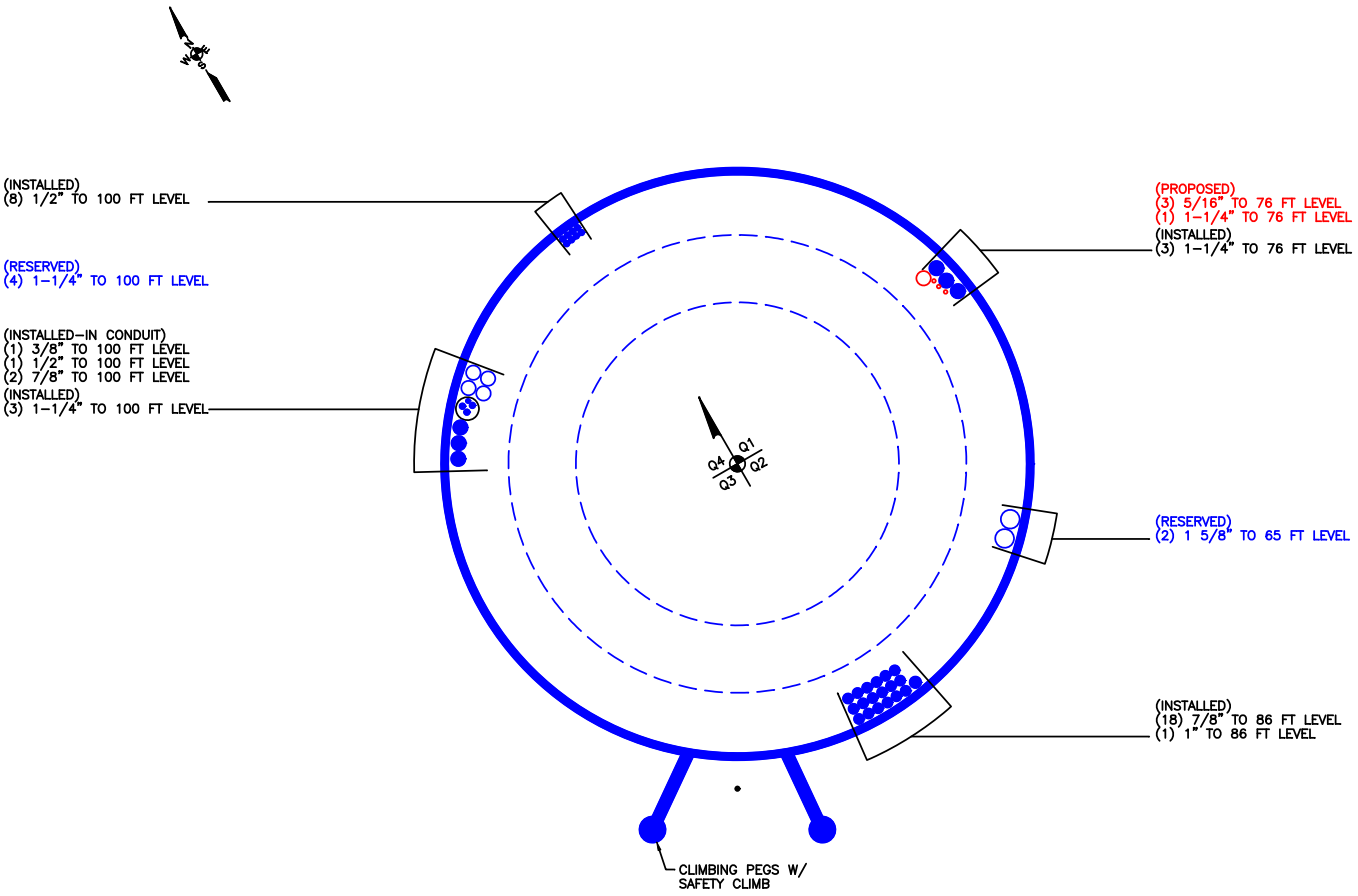
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	101 - 48	Pole	TP40.72x28x0.313	1	-15.579	2019.468	39.7	Pass
L2	48 - 1	Pole	TP51.37x38.655x0.375	2	-27.650	3171.353	58.9	Pass
							Summary	
						Pole (L2)	58.9	Pass
						RATING =	**58.9**	**Pass**

Program Version 6.1.4.1 - 12/17/2013

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842869 TOWER ID: C_BASELEVEL

APPENDIX C

ADDITIONAL CALCULATIONS

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

TIA Rev F

Site Data

BU#: *842869*
Site Name: *Meriden West Central, CT*
Application: *219815 Rev: 1*

Pole Manufacturer:	*Other*

Reactions		
Moment:	1921	ft-kips
Axial:	28	kips
Shear:	27	kips

Anchor Rod Data		
Qty:	20	
Diam:	2.5	in
Rod Material:	Other	
Strength (Fu):	70	ksi
Yield (Fy):	55	ksi
Bolt Circle:	59	in

Plate Data		
Diam:	69	in
Thick:	3	in
Grade:	50	ksi
Single-Rod B-eff:	8.17	in

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	5	in
Height:	18	in
Thick:	0.75	in
Notch:	0.5	in
Grade:	50	ksi
Weld str.:	70	ksi

Pole Data		
Diam:	51.37	in
Thick:	0.375	in
Grade:	65	ksi
# of Sides:	16	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor		
ASIF:	1.333	

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

Anchor Rod Results

		Rigid
Maximum Rod Tension:	76.7 Kips	Service, ASD
Allowable Tension:	151.2 Kips	Fty*ASIF
Anchor Rod Stress Ratio:	50.8% **Pass**	

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	15.2 ksi	Service ASD
Allowable Plate Stress:	50.0 ksi	0.75*Fy*ASIF
Base Plate Stress Ratio:	30.4% **Pass**	Y.L. Length: 29.02

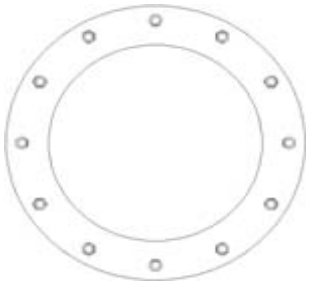
n/a

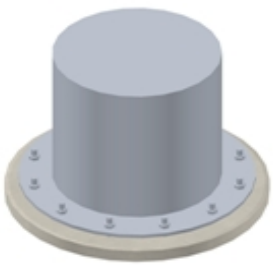
Stiffener Results

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

PROJECT	**842869 - Meriden West Central, CT**				
SUBJECT	**Foundation Analysis**				
DATE	**05/13/14**	PAGE	1	OF	1

B+T GRP
1717 S. Boulder, Suite 300
Tulsa, OK 74159
(918) 587-4630

Monopole Pad & Pier Foundation Analysis

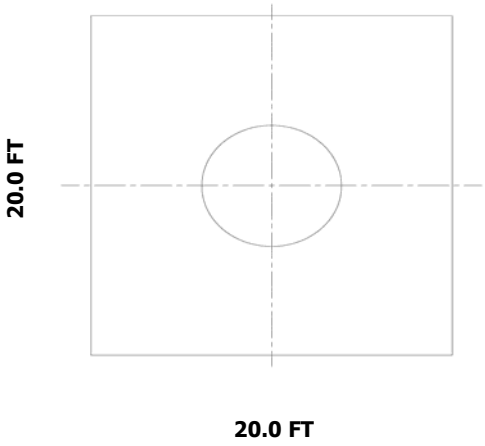
Rev. Type: F

Design Loads:

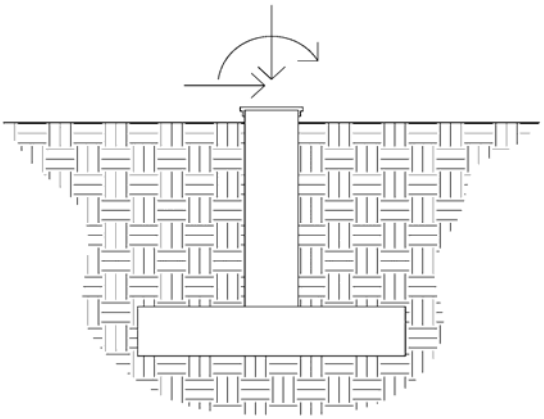
	Input unfactored loads	
Shear:	27.0	kips
Moment:	1,921.0	ft-kips
Tower Height:	100.0	ft
Tower Weight:	28.0	kips

Pad & Pier Dimensions / Properties:

Pole Diameter at Base:	51.36	in
Bearing Depth:	7.5	ft
Pad Width:	20.0	ft
Neglected Depth:	3.5	ft
Thickness:	2.5	ft
Pier Diameter:	8.0	ft
Pier Height Above Grade:	1.0	ft
BP Dist. Above Pier:	3.0	in
Clear Cover:	3.0	in
Pier Rebar Size:	11	
Pier Rebar Quanity:	60	
Pad Rebar Size:	9	
Pad Rebar Quanity:	32	
Pier Tie Size:	4	
Tie Quanity:	6	
Rebar Yield Strength:	60000	psi
Concrete Strength:	4000	psi
Concrete Unit Weight:	0.15	kcf



Elevation Overview



Soil Data:

	Allowable Values	
Soil Unit Weight:	0.110	kcf
Ult. Bearing Capacity:	16.000	ksf
Angle of Friction:	30.000	deg
Cohesion:	0.000	ksf
Passive Pressure:	0.000	ksf
Base Friction:	0.350	

Summary of Results

Req'd Pier Diam.	OK
Overturning	69.3%
Shear Capacity	31.8%
Bearing	29.5%
Pad Shear - 1-way	42.2%
Pad Shear - 2-way	6.2%
Pad Moment Capacity	18.2%
Pier Moment Capacity	19.7%

** Notes: