1280 Route 46 West, Suite 9, Parsippany NJ, 07054

Ms. Melanie Bachman
Executive Director
CT Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification Application
33 South Road Stafford, CT 06076

May 1, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. Sprint currently maintains 3 panel antennas and 6 Remote Radio at the 140' level of the Tower. Sprint proposes to add 3 new panel antennas (1 per sector) and 6 new Remote Radio Heads (2 per sector) and further proposes to add 1 new hybrid cable.

The earliest CT Siting Council submission I could find was issued to Sprint on May 30, 2014. The original Building permit for the actual tower construction issued by the Town was unavailable but there is a Building Permit from June 11, 2014. The attached construction and structural documents enclosed reflect the current reality of all the installations on the Tower.

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

Thank you,

By: *Paul F. Sagristano*

Paul F. Sagristano
Cherundolo Consulting
917.841.0247
psagristano@lrivassoc.com

4 Davis Road West, Suite 5 – Old Lyme, CT 06371

Ms. Melanie Bachman
Executive Director
CT Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification Application
33 South Road, Stafford, CT 06067

Lat: N 41.9689
Long: W72.2372

May 1, 2018

Dear Ms. Bachman:

Sprint currently maintains 3 panel antennas and 6 Remote Radio Heads at the 180' level of the above noted wireless tower. Sprint proposes to add 3 panel antennas (1 per sector) and add 6 remote radio heads (2 per sector) at the 180' tower level as well as 1 new hybrid cable. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The earliest CT Siting Council approval available was from May 30, 2014. The earliest building permit for the Tower construction was not available but a recent one from June 11, 2014 is included.
.
Attached is a summary of the planned modifications, including power density calculations reflecting the change in Sprint's operations at the site. Also included is documentation of the structural sufficiency of the tower with proposed modifications to accommodate the revised antenna configuration.

Existing Facility

The Eastford facility is located at 33 South Road Stafford. The Site coordinates are: N41.9689, W72.2372. The existing facility consists of a 180' Guyed Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has3 antennas and 6 remote radio heads at a centerline of 180' feet on the tower. Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for 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 is being sent to:

Mary Mitta, 1st Selectman of Stafford – Via Fed Ex
David Perkins, Zoning Enforcement Officer – Via Fed Ex
Cordless Data Transfer, Inc., the tower owner – Via Fed Ex
James Tumel – Land Owner – Via Fed Ex

Statutory Considerations

The planned modifications to the facility fall within the activities explicitly provided for in R.C.S.A. 16-50j-72(b)(2)

1. The height of the overall structure will be unaffected.

2. The proposed changes will not require an extension of the property boundaries.

3. The proposed additions will not increase the noise level at the existing facility by

six decibels or more, or to levels that exceed state and/or local criteria

4. The changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, Sprint respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A Section §16-50j-72(b)(2).

Respectfully submitted,

Paul F. Sagristano

Paul F. Sagristano
Charles Cherundolo Consulting
917-841-0247
psagristano@lrivassoc.com

PFS/mtf

Additional Recipients:
Mary Mitta, 1st Selectman of Stafford – Via Fed Ex
David Perkins, Zoning Enforcement Officer – Via Fed Ex
Cordless Data Transfer, Inc., Tower Owner – Via Fed Ex
James Tumel – Land Owner – Via Fed Ex

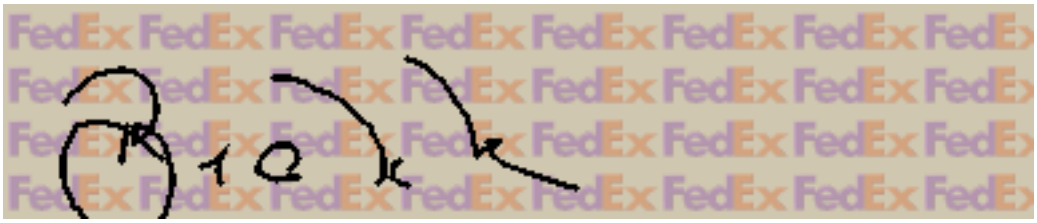
May 9,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **772144771366**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	B.DADALT	**Delivery location:**	1 MAIN ST , STAFFORD SPRINGS, CT 06076
Service type:	FedEx Express Saver	**Delivery date:**	May 8, 2018 11:54
Special Handling:	Deliver Weekday Direct Signature Required		



Shipping Information:

Tracking number:	772144771366	**Ship date:**	May 3, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Mary Mitta, 1st Selectman
Town of Stafford
1 Main St.,
2nd floor
STAFFORD SPRINGS, CT 06076 US
Reference

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CT33XC004 CSC sub

Thank you for choosing FedEx.

May 9,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772144708397.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	L.MURRAY	**Delivery location:**	1 MAIN ST STAFFORD SPRINGS, CT 06076
Service type:	FedEx Express Saver	**Delivery date:**	May 8, 2018 11:52
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772144708397	**Ship date:**	May 3, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
David Perkins, ZEO
Town of Stafford
1 Main St.,
1st floor
STAFFORD SPRINGS, CT 06076 US
Reference

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CT33XC004 CSC sub

Thank you for choosing FedEx.

May 9,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772144652140.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	J.LEGAULT	**Delivery location:**	600 OLD HARTFORD ROAD COLCHESTER, CT 06415
Service type:	FedEx Express Saver	**Delivery date:**	May 8, 2018 12:19
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

Shipping Information:

Tracking number:	772144652140	**Ship date:**	May 3, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Mark Legault
CDT, Inc
600 Old Hartford Road
COLCHESTER, CT 06415 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT33XC004 & 553 CSC Sub

Thank you for choosing FedEx.

May 9,2018

Dear Customer:

The following is the proof-of-delivery for tracking number **772144747052**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	M.GOODHALL	**Delivery location:**	25 LEONARD RD STAFFORD SPRINGS, CT 06076
Service type:	FedEx Express Saver	**Delivery date:**	May 8, 2018 11:30
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

Shipping Information:

Tracking number:	772144747052	**Ship date:**	May 3, 2018
		Weight:	0.5 lbs/0.2 kg

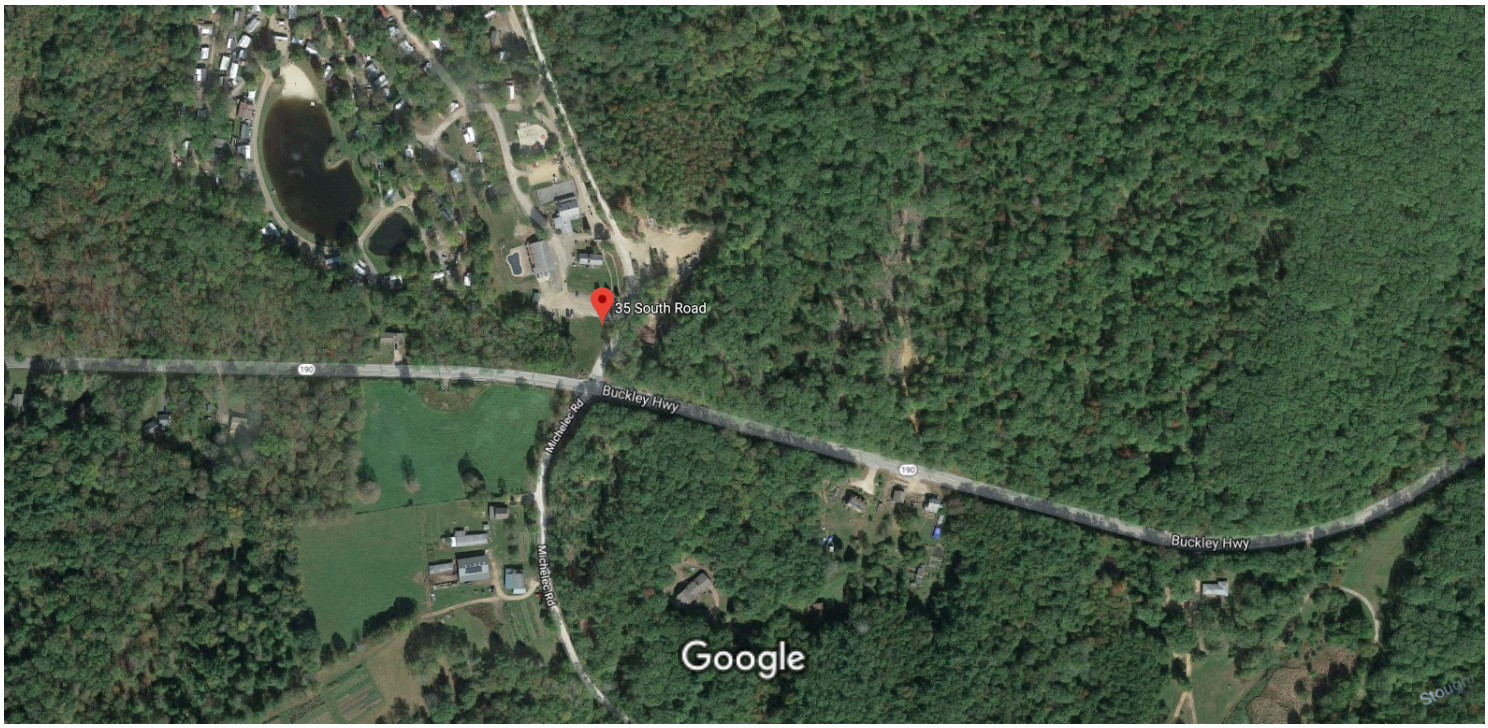
Recipient:
Jim Tumel
25 Leonard Road
STAFFORD SPRINGS, CT 06076 US

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US

Reference
CT33XC004 CSC Sub

Thank you for choosing FedEx.

Google Maps 35 S Rd



Imagery ©2018 Google, Map data ©2018 Google 200 ft

35 SOUTH RD

Location	35 SOUTH RD	**Mblu**	42/ / 9/ /
Acct#	42/009	**Owner**	TUMMEL JAMES
Assessment	$282,070	**Appraisal**	$771,300
PID	2687	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$123,000	$648,300	$771,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$86,100	$195,970	$282,070

Owner of Record

Owner	TUMMEL JAMES	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	25 LEONARD RD STAFFORD SPRGS, CT 06076	**Book & Page**	598/ 545
		Sale Date	01/10/2013
		Instrument	01

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
TUMMEL JAMES	$0		598/ 545	01	01/10/2013
TUMMEL JAMES+GARY	$0	1	366/ 139		12/21/1998
EGNATOWICH JENNIE EST	$0	2	347/ 311	01	05/13/1997
EGNATOWICH JENNIE EST	$0	3	341/ 302		10/03/1996
EGNATOWICH JENNIE	$0	4	269/ 638		10/01/1989

Building Information

Building 1 : Section 1

Year Built:	1991
Living Area:	1,326
Replacement Cost:	$144,687

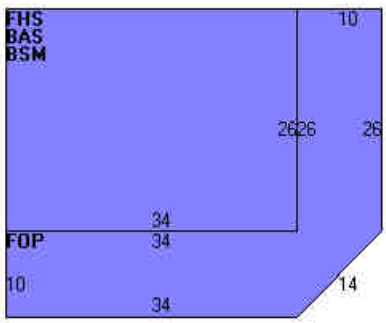
Building Percent Good:	85
Replacement Cost Less Depreciation:	$123,000

Building Attributes	
Field	**Description**
Style	Cape
Model	Residential
Grade:	C
Occupancy	1
Exterior Wall 1	Clapboard
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Minimum
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	1
Full Bthrms:	1
Half Baths:	1
Extra Fixtures	0
Total Rooms:	4
Bath Style:	Average
Kitchen Style:	Average
Num Kitchens	1
Fireplaces	1
Extra Openings	
Prefab Fpl(s)	
Attic Type	None
Bsmt Type	Full
Bsmt Garage(s)	0
Fin Bsmnt	0
Fn. Bmt. Qual.	
Unfin Area	0

Building Photo

(http://images.vgsi.com/photos2/StaffordCTPhotos//default.jpg)

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	884	884
FHS	Finished Half Story	884	442
BSM	Basement	884	0
FOP	Open Porch	650	0
		3,302	1,326

Extra Features

Extra Features	Legend

No Data for Extra Features

Land

Land Use

Use Code	101
Description	Res Dwelling
Zone	
Neighborhood	240
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	173
Frontage	
Depth	
Assessed Value	$195,970
Appraised Value	$648,300

Outbuildings

Outbuildings	Legend
No Data for Outbuildings	

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$123,000	$648,300	$771,300
2014	$123,600	$648,300	$771,900
2013	$123,600	$648,300	$771,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$86,100	$195,970	$282,070
2014	$86,520	$182,870	$269,390
2013	$86,520	$182,870	$269,390

EBI Consulting
environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

SPRINT Existing Facility

Site ID: CT33XC004

33 South Road_Stafford
33 South Road
Stafford, CT 06067

January 22, 2018

EBI Project Number: 6218000300

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	5.42 %

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

EBI Consulting
environmental | engineering | due diligence

January 22, 2018

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

Emissions Analysis for Site: **CT33XC004 – 33 South Road_Stafford**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **33 South Road, Stafford, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located 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 $\mu W/cm^2$ 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 population 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 population 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.

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) 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 SPRINT Wireless antenna facility located at **33 South Road, Stafford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, 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 equipment was calculated using the following assumptions:

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

6) 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.

7) For the following calculations, the sample point was the top of a 6-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.

8) The antennas used in this modeling are the **RFS APXV9ERR18-C-A20 and the Commscope DT465B-2XR** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. 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.

9) The antenna mounting height centerlines of the proposed antennas are **180.5 feet** above ground level (AGL) for **Sector A**, **180.5 feet** above ground level (AGL) for **Sector B** and **180.5 feet** above ground level (AGL) for Sector C.

10) 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 calculations were done with respect to uncontrolled / general population threshold limits.

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXV9ERR18-C-A20	Make / Model:	RFS APXV9ERR18-C-A20	Make / Model:	RFS APXV9ERR18-C-A20
Gain:	11.9 / 14.9 dBd	Gain:	11.9 / 14.9 dBd	Gain:	11.9 / 14.9 dBd
Height (AGL):	**180.5 feet**	Height (AGL):	**180.5 feet**	Height (AGL):	**180.5 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	5,873.76	ERP (W):	5,873.76	ERP (W):	5,873.76
Antenna A1 MPE%	**0.78 %**	Antenna B1 MPE%	**0.78 %**	Antenna C1 MPE%	**0.78 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR
Gain:	15.05 dBd	Gain:	15.05 dBd	Gain:	15.05 dBd
Height (AGL):	**180.5 feet**	Height (AGL):	**180.5 feet**	Height (AGL):	**180.5 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	5,118.23	ERP (W):	5,118.23	ERP (W):	5,118.23
Antenna A2 MPE%	**0.60 %**	Antenna B2 MPE%	**0.60 %**	Antenna C2 MPE%	**0.60 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.38 %**
AT&T	1.81 %
Nextel	0.20 %
Verizon Wireless	2.03 %
Site Total MPE %:	**5.42 %**

SPRINT Sector A Total:	1.38 %
SPRINT Sector B Total:	1.38 %
SPRINT Sector C Total:	1.38 %
Site Total:	5.42 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	309.76	180.5	0.37	850 MHz	567	0.06%
Sprint 850 MHz LTE	2	309.76	180.5	0.73	850 MHz	567	0.13%
Sprint 1900 MHz (PCS) CDMA	5	494.45	180.5	2.92	1900 MHz (PCS)	1000	0.29%
Sprint 1900 MHz (PCS) LTE	2	1,236.12	180.5	2.92	1900 MHz (PCS)	1000	0.29%
Sprint 2500 MHz (BRS) LTE	8	639.78	180.5	6.04	2500 MHz (BRS)	1000	0.60%
						Total:*	**1.38%**

*NOTE: Totals may vary by 0.01% due to summing of remainders

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	1.38 %
Sector B:	1.38 %
Sector C:	1.38 %
SPRINT Maximum Total (per sector):	1.38 %
Site Total:	5.42 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.42 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon 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.

FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249

www.nuddtowers.com

Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
January 15, 2018

Fred A. Nudd Job Number: 117-23243.7

Location: 33 South Road, Stafford, CT 06076, Tolland County

Subject: Structural Analysis of a 180 ft Guyed Tower

Fred A. Nudd Corporation has completed a structural analysis of an existing 180 ft guyed tower. The tower was originally designed by Fred A. Nudd Corporation. The design loading criteria and strength design are per the ANSI/TIA-222-G standard, which is the recommended design standard per the 2012 International Building Code (Sec. 1609 & 3108), , and the 2016 Connecticut State Building Code. Tower and foundation dimensions have been taken from drawings by Fred A. Nudd, project number 7063, dated September 3, 1999. Design criteria per each analysis are noted on the following page. The tower is assumed to be in good, undamaged and equivalent to as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new Sprint equipment installed at a rad center of 180.5 ft above ground level (AGL). The new equipment to be installed, which included antennas, coax, mounts and associated hardware are listed on the following page in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following pages when considering the existing and proposed loading. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 95%.

The tower base foundation and anchors were analyzed using assumed soil properties. Detailed calculation of the applied forces and member capacities are provided in the following pages.

In conclusion, the tower superstructure and substructure can support the existing and proposed equipment, including after tower upgrades noted above.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,

Fred. A. Nudd Corporation

Code Design Criteria

ANSI/TIA-222-G
Windspeed = 98 mph, 3-second gust, V_{asd} / 124 mph, 3-second gust, V_{ult}
Exposure = B
Radial Ice = 0.875 inch
Ice Windspeed = 50 mph, 3-second gust
Structure Class = II
Topographic Category = 1
S_s < 1.0, thus seismic loading does not need to be considered

Appurtenance Loading – Existing and To Remain on Tower

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
170	--	--	(3) Boom / Frame	--
150	AT&T	(3) Powerwave 7750 (1) Andrew SBNH-1D6565C (1) KMV AM-X-CD-14-65-00T (1) Powerwave P65-17-XLH-RR (6) Powerwave 100860 (6) Ericsson RRUs11	(3) 10 ft Boom / Frame	(6) 1-1/4 (1) 3 in Conduit (2) 19.7 mm (1) 10 mm Fiber
140	Verizon	(6) Antel BXA-171063-12CF (6) Antel BXA-70063-6CF (3) Alcatel Lucent RRH2x40-AWS (3) Alcatel Lucent RRH2x40-700 (1) RFS DBT1-6Z-8AB-0Z	(3) 12 ft Pipe Boom / Frame	(9) 1-5/8 Foam Helix (3) 1-5/8 Fiber Cable

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*

Appurtenance Loading – Final Equipment Configuration For Sprint

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
180.5	Sprint	(3) RFS APXV9ERR18-C-A20 (3) Alcatel Lucent 4x45W, 1900 MHz (3) Alcatel Lucent TD-RRH8x200-25 (6) Alcatel Lucent RRH 2x50, 800 Mhz (3) Commscope DT465B-2XR	(3) 12 ft Boom / Frame	(4) 1-1/4 Hybrid

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*
- *The proposed coax can be installed on any tower face.*

Maximum Member Usage

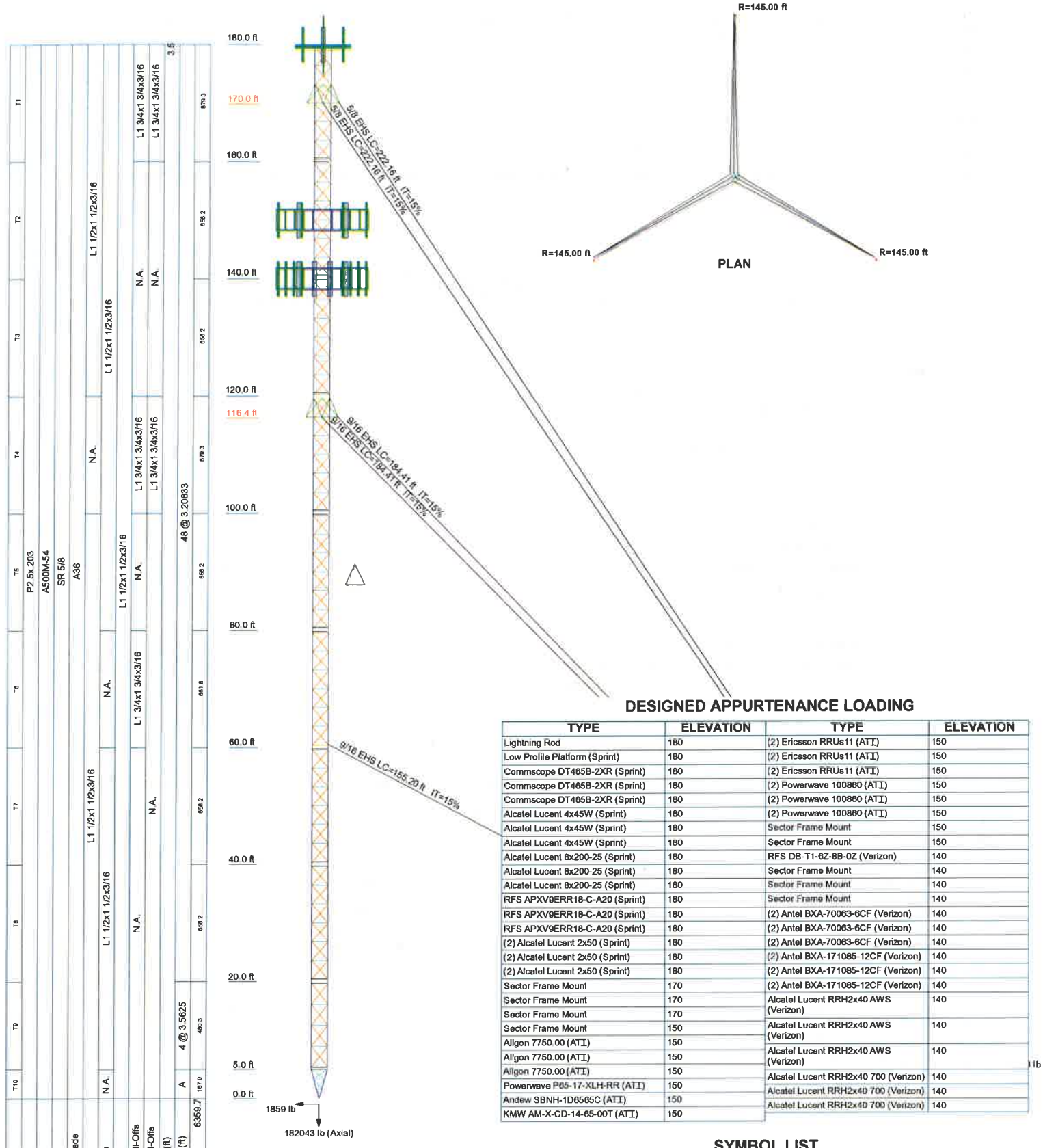
Member	Percentage
Leg	93
Diagonal	72
Horizontal	59
Guys	48
Anchor Rod	56
Splice/Connection Bolts	35

- *Percentage equal to or less than 100% denote member stress levels are satisfactory for loading.*
- *Percentage greater than 100% indicates member strengthening is required.*

Foundation Usage

Design Load	Capacity (kips)	Analysis (kips)	Percentage
Base Axial	217.8	182.0	85
Anchor Uplift	83.8	33.5	40
Anchor Shear	83.4	39.4	47

- *Percentage less than 100% denote foundation is satisfactory for loading*
- *Percentage greater than 100% indicates foundation analysis is required*



Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs						P2.5x.203				
Leg Grade						A500M-54				
Diagonals						SR 5/8				
Diagonal Grade						A36				
Top Girts			L1 1/2x1 1/2x3/16				N.A.	L1 1/2x1 1/2x3/16		
Bottom Girts	N.A.		L1 1/2x1 1/2x3/16		N.A.			L1 1/2x1 1/2x3/16		
Horizontals						L1 1/2x1 1/2x3/16				
Top Guy Pull-Offs			N.A.		L1 3/4x1 3/4x3/16	N.A.	L1 3/4x1 3/4x3/16	N.A.	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Bot Guy Pull-Offs				N.A.			L1 3/4x1 3/4x3/16	N.A.	L1 3/4x1 3/4x3/16	L1 3/4x1 3/4x3/16
Face Width (ft)						48 @ 3.20833				3.5
# Panels @ (ft)	A	4 @ 3.5625								
Weight (lb)	157.9	490.3	659.2	659.2	661.6	658.2	679.3	658.2	658.2	679.3

6359.7

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	180	(2) Ericsson RRUs11 (ATI)	150
Low Profile Platform (Sprint)	180	(2) Ericsson RRUs11 (ATI)	150
Commscope DT465B-2XR (Sprint)	180	(2) Ericsson RRUs11 (ATI)	150
Commscope DT465B-2XR (Sprint)	180	(2) Powerwave 100860 (ATI)	150
Commscope DT465B-2XR (Sprint)	180	(2) Powerwave 100860 (ATI)	150
Alcatel Lucent 4x45W (Sprint)	180	(2) Powerwave 100860 (ATI)	150
Alcatel Lucent 4x45W (Sprint)	180	Sector Frame Mount	150
Alcatel Lucent 4x45W (Sprint)	180	Sector Frame Mount	150
Alcatel Lucent 8x200-25 (Sprint)	180	RFS DB-T1-6Z-8B-0Z (Verizon)	140
Alcatel Lucent 8x200-25 (Sprint)	180	Sector Frame Mount	140
Alcatel Lucent 8x200-25 (Sprint)	180	Sector Frame Mount	140
RFS APXV9ERR18-C-A20 (Sprint)	180	Sector Frame Mount	140
RFS APXV9ERR18-C-A20 (Sprint)	180	(2) Antel BXA-70063-6CF (Verizon)	140
RFS APXV9ERR18-C-A20 (Sprint)	180	(2) Antel BXA-70063-6CF (Verizon)	140
(2) Alcatel Lucent 2x50 (Sprint)	180	(2) Antel BXA-70063-6CF (Verizon)	140
(2) Alcatel Lucent 2x50 (Sprint)	180	(2) Antel BXA-171085-12CF (Verizon)	140
(2) Alcatel Lucent 2x50 (Sprint)	180	(2) Antel BXA-171085-12CF (Verizon)	140
Sector Frame Mount	170	(2) Antel BXA-171085-12CF (Verizon)	140
Sector Frame Mount	170	Alcatel Lucent RRH2x40 AWS (Verizon)	140
Sector Frame Mount	170		
Sector Frame Mount	150	Alcatel Lucent RRH2x40 AWS (Verizon)	140
Allgon 7750.00 (ATI)	150		
Allgon 7750.00 (ATI)	150	Alcatel Lucent RRH2x40 AWS (Verizon)	140
Allgon 7750.00 (ATI)	150		
Powerwave P65-17-XLH-RR (ATI)	150	Alcatel Lucent RRH2x40 700 (Verizon)	140
Andew SBNH-1D6565C (ATI)	150	Alcatel Lucent RRH2x40 700 (Verizon)	140
KMW AM-X-CD-14-65-00T (ATI)	150	Alcatel Lucent RRH2x40 700 (Verizon)	140

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	3 @ 1.66667		

MATERIAL STRENGTH

GRADE	Fy	Fu

Job: 117-23243.7			
Project: Stafford Tumel, CT			
Client: CDT	Drawn by: FAN	App'd:	
Code: TIA-222-G	Date: 01/15/18	Scale: NTS	
Path:		Dwg No. E-1	

Phone:
FAX:

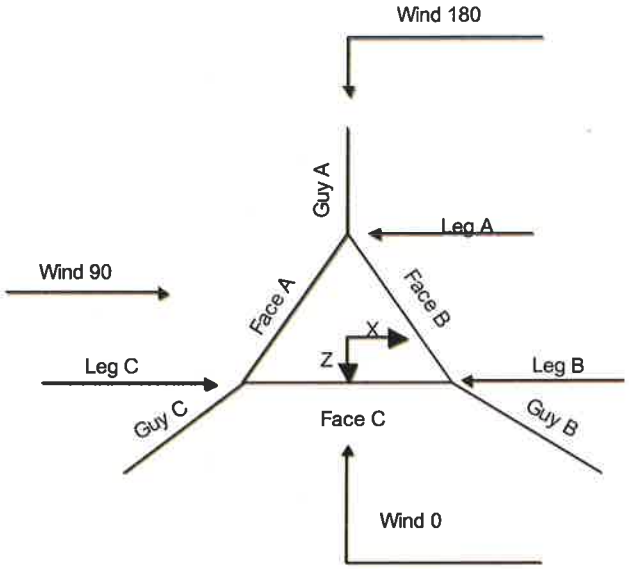
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.50 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

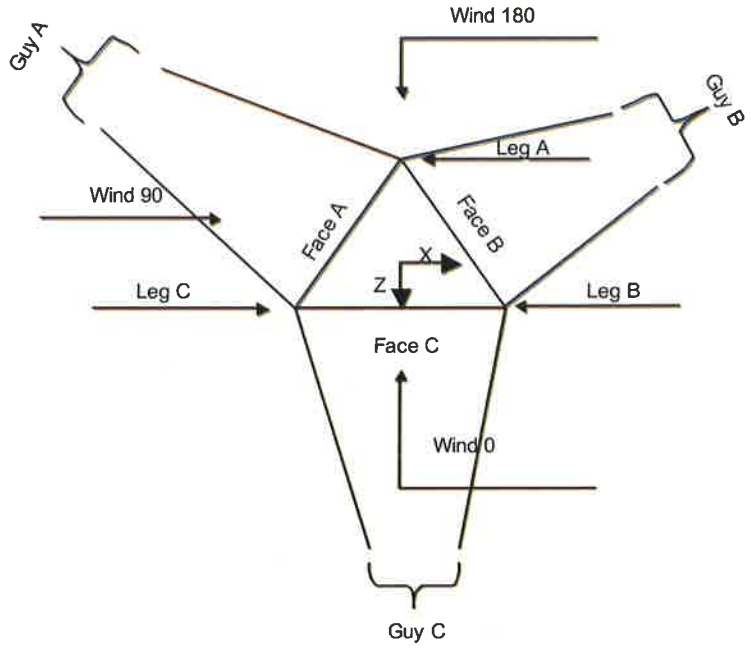
Tower is located in Tolland County, Connecticut.
Basic wind speed of 98 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.8750 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Tension only take-up is 0.0313 in.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
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		



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-160.00			3.50	1	20.00
T2	160.00-140.00			3.50	1	20.00
T3	140.00-120.00			3.50	1	20.00
T4	120.00-100.00			3.50	1	20.00
T5	100.00-80.00			3.50	1	20.00
T6	80.00-60.00			3.50	1	20.00
T7	60.00-40.00			3.50	1	20.00
T8	40.00-20.00			3.50	1	20.00
T9	20.00-5.00			3.50	1	15.00
T10	5.00-0.00			3.50	1	5.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-160.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T2	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T3	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	120.00-100.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5	100.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T6	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	60.00-40.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8	40.00-20.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T9	20.00-5.00	3.56	TX Brace	No	Yes	4.5000	4.5000
T10	5.00-0.00	1.67	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 160.00-140.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 140.00-120.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 100.00-80.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 80.00-60.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 60.00-40.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 40.00-20.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 20.00-5.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 5.00-0.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.00-160.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36	Equal Angle	L1 1/2x1 1/2x3/16	A36

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 80.00-60.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 60.00-40.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 40.00-20.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 20.00-5.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 5.00-0.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 20.00-5.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000

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
140.00-120.00 T4	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
120.00-100.00 T5	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
100.00-80.00 T6	80.00-60.00 0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 60.00-40.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 40.00-20.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 20.00-5.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 5.00-0.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	Yes	1	1	1	1	0.65	0.65	1	1
180.00-160.00				1	1	1	0.65	0.65	1	1
T2	No	Yes	1	1	1	1	0.65	0.65	1	1
160.00-140.00				1	1	1	0.65	0.65	1	1
T3	No	Yes	1	1	1	1	0.65	0.65	1	1
140.00-120.00				1	1	1	0.65	0.65	1	1
T4	No	Yes	1	1	1	1	0.65	0.65	1	1
120.00-100.00				1	1	1	0.65	0.65	1	1
T5	No	Yes	1	1	1	1	0.65	0.65	1	1
100.00-80.00				1	1	1	0.65	0.65	1	1
T6	No	Yes	1	1	1	1	0.65	0.65	1	1
80.00-60.00				1	1	1	0.65	0.65	1	1
T7	No	Yes	1	1	1	1	0.65	0.65	1	1
60.00-40.00				1	1	1	0.65	0.65	1	1
T8	No	Yes	1	1	1	1	0.65	0.65	1	1
40.00-20.00				1	1	1	0.65	0.65	1	1
T9 20.00-5.00	No	Yes	1	1	1	1	0.65	0.65	1	1
				1	1	1	0.65	0.65	1	1
T10 5.00-0.00	No	Yes	1	1	1	1	0.65	0.65	1	1
				1	1	1	0.65	0.65	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T9 20.00-5.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T10 5.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 60.00-40.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 40.00-20.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 20.00-5.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 5.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
170	EHS	A	3/8	6360.00	15%	21000	0.813	221.88	145.00	0.0000	0.00	100%
		B	3/8	6360.00	15%	21000	0.813	221.88	145.00	0.0000	0.00	100%
		C	3/8	6360.00	15%	21000	0.813	221.88	145.00	0.0000	0.00	100%
116.417	EHS	A	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
60.375	EHS	A	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
170	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
116.417	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
60.375	Corner						

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
170.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16
116.42	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16
60.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
170	180.38	180.38	180.38		3.12 3.0 sec/pulse	3.12 3.0 sec/pulse	3.12 3.0 sec/pulse	
116.417	123.58	123.58	123.58		2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	
60.375	104.01	104.01	104.01		1.53 2.1 sec/pulse	1.53 2.1 sec/pulse	1.53 2.1 sec/pulse	

Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
170	No	No	1	1	0.65	0.65	1	1
116.417	No	No	1	1	0.65	0.65	1	1
60.375	No	No			0.65	0.65	1	1

Guy Data (cont'd)

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
170	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
116.417	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
60.375	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
170	A	85.00	20	5	1.9237
	B	85.00	20	5	1.9237
	C	85.00	20	5	1.9237
116.417	A	58.21	18	5	1.8522
	B	58.21	18	5	1.8522
	C	58.21	18	5	1.8522
60.375	A	30.19	15	4	1.7345
	B	30.19	15	4	1.7345
	C	30.19	15	4	1.7345

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
170	A	49.9259	6498.03 6360.00	-101.28	5009.66	-4137.32	-10123.16	14685.27	-17533.82
	A	49.9259	6498.03	101.28	5009.66	-4137.32	-10123.16	-14685.27	17533.82

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			6360.00						
	B	49.9259	6498.03	3633.66	5009.66	1980.95	20246.31	14685.27	0.00
			6360.00						
	B	49.9259	6498.03	3532.39	5009.66	2156.37	-10123.16	-14685.27	-17533.82
			6360.00						
	C	49.9259	6498.03	-3532.39	5009.66	2156.37	-10123.16	14685.27	17533.82
			6360.00						
	C	49.9259	6498.03	-3633.66	5009.66	1980.95	20246.31	-14685.27	0.00
			6360.00						
			Sum:	0.00	30057.98	0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71
			5250.00						
	C	22.8926	5290.46	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			5250.00						
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
170	A	49.9259	10532.75	-156.48	8369.69	-6392.38	-16912.86	22689.54	-29293.93
			9378.21						
	A	49.9259	10532.75	156.48	8369.69	-6392.38	-16912.86	-22689.54	29293.93
			9378.21						
	B	49.9259	10532.75	5614.20	8369.69	3060.68	33825.72	22689.54	0.00
			9378.21						
	B	49.9259	10532.75	5457.73	8369.69	3331.71	-16912.86	-22689.54	-29293.93
			9378.21						
	C	49.9259	10532.75	-5457.73	8369.69	3331.71	-16912.86	22689.54	29293.93
			9378.21						
	C	49.9259	10532.75	-5614.20	8369.69	3060.68	33825.72	-22689.54	0.00
			9378.21						
			Sum:	0.00	50218.17	0.00	-0.00	0.00	0.00
116.417	A	39.1448	8772.76	-159.42	5875.56	-6512.57	-11872.91	23116.15	-20564.48
			8059.77						
	A	39.1448	8772.76	159.42	5875.56	-6512.57	-11872.91	-23116.15	20564.48

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			8059.77						
	B	39.1448	8772.76	5719.76	5875.56	3118.22	23745.81	23116.15	0.00
			8059.77						
	B	39.1448	8772.76	5560.34	5875.56	3394.35	-11872.91	-23116.15	-20564.48
			8059.77						
	C	39.1448	8772.76	-5560.34	5875.56	3394.35	-11872.91	23116.15	20564.48
			8059.77						
	C	39.1448	8772.76	-5719.76	5875.56	3118.22	23745.81	-23116.15	0.00
			8059.77						
			Sum:	0.00	35253.39	0.00	-0.00	0.00	0.00
60.375	A	22.8926	8320.60	0.00	3599.82	-7501.58	-7274.24	0.00	0.00
			7986.77						
	B	22.8926	8320.60	6496.55	3599.82	3750.79	3637.12	0.00	-6299.68
			7986.77						
	C	22.8926	8320.60	-6496.55	3599.82	3750.79	3637.12	-0.00	6299.68
			7986.77						
			Sum:	0.00	10799.45	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
170	A	49.9259	6498.03	-101.28	5009.66	-4137.32	-10123.16	14685.27	-17533.82
			6360.00						
	A	49.9259	6498.03	101.28	5009.66	-4137.32	-10123.16	-14685.27	17533.82
			6360.00						
	B	49.9259	6498.03	3633.66	5009.66	1980.95	20246.31	14685.27	0.00
			6360.00						
	B	49.9259	6498.03	3532.39	5009.66	2156.37	-10123.16	-14685.27	-17533.82
			6360.00						
	C	49.9259	6498.03	-3532.39	5009.66	2156.37	-10123.16	14685.27	17533.82
			6360.00						
	C	49.9259	6498.03	-3633.66	5009.66	1980.95	20246.31	-14685.27	0.00
			6360.00						
			Sum:	0.00	30057.98	0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
	C	22.8926	5250.00 5290.46 5250.00	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 1/4 (Sprint)	A	No	Ar (CaAa)	180.00 - 0.00	0.0000	0	4	4	1.5500	1.5500		0.66
Safety Line 3/8	C	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.25	1	1	0.3750	0.3750		0.22
LDF6-50A (1-1/4 FOAM) (AT&T)	B	No	Ar (CaAa)	150.00 - 0.00	6.0000	0.5	6	2	1.5500	1.5500		0.66
3" Rigid Conduit with Fiber Cables (AT&T)	B	No	Ar (CaAa)	150.00 - 0.00	1.0000	0.5	1	1	1.0000	3.0000		2.00
LDF7-50A (1-5/8 FOAM) (Verizon)	C	No	Ar (CaAa)	140.00 - 0.00	0.0000	0.25	12	6	1.9800	1.9800		0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
T1	180.00-160.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.750	0.000	4.40
T2	160.00-140.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	12.300	0.000	59.60
		C	0.000	0.000	0.750	0.000	4.40
T3	140.00-120.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	24.600	0.000	119.20
		C	0.000	0.000	48.270	0.000	201.20
T4	120.00-100.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	24.600	0.000	119.20
		C	0.000	0.000	48.270	0.000	201.20
T5	100.00-80.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	24.600	0.000	119.20
		C	0.000	0.000	48.270	0.000	201.20
T6	80.00-60.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	24.600	0.000	119.20
		C	0.000	0.000	48.270	0.000	201.20
T7	60.00-40.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	24.600	0.000	119.20

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 lb
		C	0.000	0.000	48.270	0.000	201.20
T8	40.00-20.00	A	0.000	0.000	12.400	0.000	52.80
		B	0.000	0.000	24.600	0.000	119.20
		C	0.000	0.000	48.270	0.000	201.20
T9	20.00-5.00	A	0.000	0.000	9.300	0.000	39.60
		B	0.000	0.000	18.450	0.000	89.40
		C	0.000	0.000	36.203	0.000	150.90
T10	5.00-0.00	A	0.000	0.000	3.100	0.000	13.20
		B	0.000	0.000	6.150	0.000	29.80
		C	0.000	0.000	12.068	0.000	50.30

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 lb
T1	180.00-160.00	A	2.062	0.000	0.000	40.031	0.000	601.10
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	8.997	0.000	127.16
T2	160.00-140.00	A	2.036	0.000	0.000	39.865	0.000	593.85
		B		0.000	0.000	25.437	0.000	515.47
		C		0.000	0.000	8.894	0.000	124.35
T3	140.00-120.00	A	2.007	0.000	0.000	39.679	0.000	585.71
		B		0.000	0.000	50.555	0.000	1017.82
		C		0.000	0.000	77.900	0.000	1967.73
T4	120.00-100.00	A	1.974	0.000	0.000	39.465	0.000	576.41
		B		0.000	0.000	50.190	0.000	1002.85
		C		0.000	0.000	77.552	0.000	1947.06
T5	100.00-80.00	A	1.935	0.000	0.000	39.213	0.000	565.51
		B		0.000	0.000	49.759	0.000	985.32
		C		0.000	0.000	77.142	0.000	1922.82
T6	80.00-60.00	A	1.887	0.000	0.000	38.905	0.000	552.26
		B		0.000	0.000	49.231	0.000	964.07
		C		0.000	0.000	76.640	0.000	1893.34
T7	60.00-40.00	A	1.824	0.000	0.000	38.506	0.000	535.20
		B		0.000	0.000	48.545	0.000	936.78
		C		0.000	0.000	75.988	0.000	1855.36
T8	40.00-20.00	A	1.733	0.000	0.000	37.926	0.000	510.72
		B		0.000	0.000	47.547	0.000	897.74
		C		0.000	0.000	75.039	0.000	1800.76
T9	20.00-5.00	A	1.588	0.000	0.000	27.752	0.000	354.30
		B		0.000	0.000	34.464	0.000	627.74
		C		0.000	0.000	55.144	0.000	1286.33
T10	5.00-0.00	A	1.352	0.000	0.000	8.879	0.000	103.09
		B		0.000	0.000	10.840	0.000	185.66
		C		0.000	0.000	17.768	0.000	395.09

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-1.1324	-0.5472	-0.5092	-0.0563
T2	160.00-140.00	1.1132	0.1615	0.0868	0.1283

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T3	140.00-120.00	0.1038	2.0271	-0.0405	0.9014
T4	120.00-100.00	0.1036	2.0238	-0.0426	0.9109
T5	100.00-80.00	0.1038	2.0271	-0.0455	0.9283
T6	80.00-60.00	0.1037	2.0254	-0.0488	0.9445
T7	60.00-40.00	0.1038	2.0271	-0.0535	0.9686
T8	40.00-20.00	0.1038	2.0271	-0.0605	1.0013
T9	20.00-5.00	0.1042	2.0348	-0.0745	1.0811
T10	5.00-0.00	0.3996	1.4828	0.0381	0.3758

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	1 1/4	160.00 - 180.00	0.6000	0.3245
T1	2	Safety Line 3/8	160.00 - 180.00	0.6000	0.3245
T2	1	1 1/4	140.00 - 160.00	0.6000	0.3316
T2	2	Safety Line 3/8	140.00 - 160.00	0.6000	0.3316
T2	3	LDF6-50A (1-1/4 FOAM)	140.00 - 150.00	0.6000	0.3316
T2	4	3" Rigid Conduit with Fiber Cables	140.00 - 150.00	0.6000	0.3316
T3	1	1 1/4	120.00 - 140.00	0.6000	0.3376
T3	2	Safety Line 3/8	120.00 - 140.00	0.6000	0.3376
T3	3	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.3376
T3	4	3" Rigid Conduit with Fiber Cables	120.00 - 140.00	0.6000	0.3376
T3	5	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.3376
T4	1	1 1/4	100.00 - 120.00	0.6000	0.3429
T4	2	Safety Line 3/8	100.00 - 120.00	0.6000	0.3429
T4	3	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3429
T4	4	3" Rigid Conduit with Fiber Cables	100.00 - 120.00	0.6000	0.3429
T4	5	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3429
T5	1	1 1/4	80.00 - 100.00	0.6000	0.3529
T5	2	Safety Line 3/8	80.00 - 100.00	0.6000	0.3529
T5	3	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3529
T5	4	3" Rigid Conduit with Fiber Cables	80.00 - 100.00	0.6000	0.3529
T5	5	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3529
T6	1	1 1/4	60.00 - 80.00	0.6000	0.3622
T6	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.3622
T6	3	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3622
T6	4	3" Rigid Conduit with Fiber	60.00 - 80.00	0.6000	0.3622

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		Cables			
T6	5	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3622
T7	1	1 1/4	40.00 - 60.00	0.6000	0.3763
T7	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.3763
T7	3	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.3763
T7	4	3" Rigid Conduit with Fiber Cables	40.00 - 60.00	0.6000	0.3763
T7	5	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.3763
T8	1	1 1/4	20.00 - 40.00	0.6000	0.3958
T8	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.3958
T8	3	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.3958
T8	4	3" Rigid Conduit with Fiber Cables	20.00 - 40.00	0.6000	0.3958
T8	5	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.3958
T9	1	1 1/4	5.00 - 20.00	0.6000	0.4461
T9	2	Safety Line 3/8	5.00 - 20.00	0.6000	0.4461
T9	3	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.4461
T9	4	3" Rigid Conduit with Fiber Cables	5.00 - 20.00	0.6000	0.4461
T9	5	LDF7-50A (1-5/8 FOAM)	5.00 - 20.00	0.6000	0.4461
T10	1	1 1/4	0.00 - 5.00	0.6000	0.0986
T10	2	Safety Line 3/8	0.00 - 5.00	0.6000	0.0986
T10	3	LDF6-50A (1-1/4 FOAM)	0.00 - 5.00	0.6000	0.0986
T10	4	3" Rigid Conduit with Fiber Cables	0.00 - 5.00	0.6000	0.0986
T10	5	LDF7-50A (1-5/8 FOAM)	0.00 - 5.00	0.6000	0.0986

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 lb
Sector Frame Mount	A	From Leg	1.50	0.0000	150.00	No Ice	18.00	9.00	465.00
			0.00			1/2" Ice	22.00	11.00	600.00
			0.00			1" Ice	23.20	23.20	735.00
Sector Frame Mount	B	From Leg	1.50	0.0000	150.00	No Ice	18.00	9.00	465.00
			0.00			1/2" Ice	22.00	11.00	600.00
			0.00			1" Ice	23.20	23.20	735.00
Sector Frame Mount	C	From Leg	1.50	0.0000	150.00	No Ice	18.00	9.00	465.00
			0.00			1/2" Ice	22.00	11.00	600.00
			0.00			1" Ice	23.20	23.20	735.00
Allgon 7750.00 (AT&T)	A	From Leg	3.00	0.0000	150.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.25	3.29	67.60
			0.00			1" Ice	6.64	3.64	105.10
Allgon 7750.00 (AT&T)	B	From Leg	3.00	0.0000	150.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.25	3.29	67.60
			0.00			1" Ice	6.64	3.64	105.10
Allgon 7750.00 (AT&T)	C	From Leg	3.00	0.0000	150.00	No Ice	5.88	2.93	35.00
			0.00			1/2" Ice	6.25	3.29	67.60
			0.00			1" Ice	6.64	3.64	105.10
Powerwave P65-17-XLH-RR	A	From Leg	3.00	0.0000	150.00	No Ice	11.47	6.80	62.00

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 lb
(AT&T)			0.00				1/2" Ice	12.08	7.48	124.10
			0.00				1" Ice	12.69	8.12	193.70
Andew SBNH-1D6565C	B	From Leg	3.00		0.0000	150.00	No Ice	11.41	7.70	60.90
(AT&T)			0.00				1/2" Ice	12.03	8.36	126.60
			0.00				1" Ice	12.64	9.00	199.90
KMW AM-X-CD-14-65-00T	C	From Leg	3.00		0.0000	150.00	No Ice	5.51	2.83	36.40
(AT&T)			0.00				1/2" Ice	5.84	3.13	68.40
			0.00				1" Ice	6.19	3.45	104.80
(2) Ericsson RRUs11	A	From Leg	3.00		0.0000	150.00	No Ice	2.99	0.36	50.00
(AT&T)			0.00				1/2" Ice	3.19	0.48	63.50
			0.00				1" Ice	3.41	0.60	79.60
(2) Ericsson RRUs11	B	From Leg	3.00		0.0000	150.00	No Ice	2.99	0.36	50.00
(AT&T)			0.00				1/2" Ice	3.19	0.48	63.50
			0.00				1" Ice	3.41	0.60	79.60
(2) Ericsson RRUs11	C	From Leg	3.00		0.0000	150.00	No Ice	2.99	0.36	50.00
(AT&T)			0.00				1/2" Ice	3.19	0.48	63.50
			0.00				1" Ice	3.41	0.60	79.60
(2) Powerwave 100860	A	From Leg	3.00		0.0000	150.00	No Ice	1.95	0.51	25.00
(AT&T)			0.00				1/2" Ice	2.11	0.61	36.00
			0.00				1" Ice	2.28	0.73	60.00
(2) Powerwave 100860	B	From Leg	3.00		0.0000	150.00	No Ice	1.95	0.51	25.00
(AT&T)			0.00				1/2" Ice	2.11	0.61	36.00
			0.00				1" Ice	2.28	0.73	60.00
(2) Powerwave 100860	C	From Leg	3.00		0.0000	150.00	No Ice	1.95	0.51	25.00
(AT&T)			0.00				1/2" Ice	2.11	0.61	36.00
			0.00				1" Ice	2.28	0.73	60.00
Lightning Rod	C	None			0.0000	180.00	No Ice	1.00	1.00	40.00
							1/2" Ice	2.02	2.02	49.26
							1" Ice	3.05	3.05	64.89
Low Profile Platform	C	None			0.0000	180.00	No Ice	30.00	30.00	1500.00
(Sprint)							1/2" Ice	39.00	39.00	2200.00
							1" Ice	48.00	48.00	2900.00
Sector Frame Mount	A	From Leg	1.50		0.0000	170.00	No Ice	18.00	9.00	465.00
			0.00				1/2" Ice	22.00	11.00	600.00
			0.00				1" Ice	23.20	23.20	735.00
Sector Frame Mount	B	From Leg	1.50		0.0000	170.00	No Ice	18.00	9.00	465.00
			0.00				1/2" Ice	22.00	11.00	600.00
			0.00				1" Ice	23.20	23.20	735.00
Sector Frame Mount	C	From Leg	1.50		0.0000	170.00	No Ice	18.00	9.00	465.00
			0.00				1/2" Ice	22.00	11.00	600.00
			0.00				1" Ice	23.20	23.20	735.00
Sector Frame Mount	A	From Leg	1.50		0.0000	140.00	No Ice	15.00	7.50	465.00
			0.00				1/2" Ice	19.00	9.50	600.00
			0.00				1" Ice	21.00	16.00	735.00
Sector Frame Mount	B	From Leg	1.50		0.0000	140.00	No Ice	15.00	7.50	465.00
			0.00				1/2" Ice	19.00	9.50	600.00
			0.00				1" Ice	21.00	16.00	735.00
Sector Frame Mount	C	From Leg	1.50		0.0000	140.00	No Ice	15.00	7.50	465.00
			0.00				1/2" Ice	19.00	9.50	600.00
			0.00				1" Ice	21.00	16.00	735.00
(2) Antel BXA-70063-6CF	A	From Leg	3.00		0.0000	140.00	No Ice	7.73	5.08	17.00
(Verizon)			0.00				1/2" Ice	8.19	5.54	63.80
			0.00				1" Ice	8.67	6.00	116.60
(2) Antel BXA-70063-6CF	B	From Leg	3.00		0.0000	140.00	No Ice	7.73	5.08	17.00
(Verizon)			0.00				1/2" Ice	8.19	5.54	63.80
			0.00				1" Ice	8.67	6.00	116.60
(2) Antel BXA-70063-6CF	C	From Leg	3.00		0.0000	140.00	No Ice	7.73	5.08	17.00

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 lb
(Verizon)			0.00				1/2" Ice	8.19	5.54	63.80
			0.00				1" Ice	8.67	6.00	116.60
(2) Antel BXA-171085-12CF	A	From Leg	3.00		0.0000	140.00	No Ice	4.79	3.62	15.00
(Verizon)			0.00				1/2" Ice	5.27	4.14	42.50
			0.00				1" Ice	5.74	4.62	75.50
(2) Antel BXA-171085-12CF	B	From Leg	3.00		0.0000	140.00	No Ice	4.79	3.62	15.00
(Verizon)			0.00				1/2" Ice	5.27	4.14	42.50
			0.00				1" Ice	5.74	4.62	75.50
(2) Antel BXA-171085-12CF	C	From Leg	3.00		0.0000	140.00	No Ice	4.79	3.62	15.00
(Verizon)			0.00				1/2" Ice	5.27	4.14	42.50
			0.00				1" Ice	5.74	4.62	75.50
Alcatel Lucent RRH2x40 AWS	A	From Leg	3.00		0.0000	140.00	No Ice	2.52	1.59	44.00
(Verizon)			0.00				1/2" Ice	2.72	1.77	61.40
			0.00				1" Ice	2.93	1.96	81.70
Alcatel Lucent RRH2x40 AWS	B	From Leg	3.00		0.0000	140.00	No Ice	2.52	1.59	44.00
(Verizon)			0.00				1/2" Ice	2.72	1.77	61.40
			0.00				1" Ice	2.93	1.96	81.70
Alcatel Lucent RRH2x40 AWS	C	From Leg	3.00		0.0000	140.00	No Ice	2.52	1.59	44.00
(Verizon)			0.00				1/2" Ice	2.72	1.77	61.40
			0.00				1" Ice	2.93	1.96	81.70
Alcatel Lucent RRH2x40 700	A	From Leg	3.00		0.0000	140.00	No Ice	3.31	1.94	62.00
(Verizon)			0.00				1/2" Ice	3.52	2.12	86.60
			0.00				1" Ice	3.74	2.30	114.40
Alcatel Lucent RRH2x40 700	A	From Leg	3.00		0.0000	140.00	No Ice	3.31	1.94	62.00
(Verizon)			0.00				1/2" Ice	3.52	2.12	86.60
			0.00				1" Ice	3.74	2.30	114.40
Alcatel Lucent RRH2x40 700	A	From Leg	3.00		0.0000	140.00	No Ice	3.31	1.94	62.00
(Verizon)			0.00				1/2" Ice	3.52	2.12	86.60
			0.00				1" Ice	3.74	2.30	114.40
RFS DB-T1-6Z-8B-0Z	A	From Leg	3.00		0.0000	140.00	No Ice	5.60	2.33	62.00
(Verizon)			0.00				1/2" Ice	5.87	2.53	86.60
			0.00				1" Ice	6.16	2.73	114.40
Commscope DT465B-2XR	A	From Leg	3.00		0.0000	180.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00				1/2" Ice	9.68	6.33	108.00
			0.00				1" Ice	10.14	6.79	172.40
Commscope DT465B-2XR	A	From Leg	3.00		0.0000	180.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00				1/2" Ice	9.68	6.33	108.00
			0.00				1" Ice	10.14	6.79	172.40
Commscope DT465B-2XR	B	From Leg	3.00		0.0000	180.00	No Ice	9.22	5.87	50.00
(Sprint)			0.00				1/2" Ice	9.68	6.33	108.00
			0.00				1" Ice	10.14	6.79	172.40
Alcatel Lucent 4x45W	A	From Leg	3.00		0.0000	180.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 4x45W	B	From Leg	3.00		0.0000	180.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 4x45W	C	From Leg	3.00		0.0000	180.00	No Ice	2.54	1.61	51.00
(Sprint)			0.00				1/2" Ice	2.72	1.78	71.10
			0.00				1" Ice	2.92	1.96	94.30
Alcatel Lucent 8x200-25	A	From Leg	3.00		0.0000	180.00	No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
Alcatel Lucent 8x200-25	B	From Leg	3.00		0.0000	180.00	No Ice	4.05	1.53	70.00
(Sprint)			0.00				1/2" Ice	4.27	1.70	97.10
			0.00				1" Ice	4.50	1.88	127.80
Alcatel Lucent 8x200-25	C	From Leg	3.00		0.0000	180.00	No Ice	4.05	1.53	70.00

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 lb
(Sprint)			0.00			1/2" Ice	4.27	1.70	97.10
			0.00			1" Ice	4.50	1.88	127.80
RFS APXV9ERR18-C-A20 (Sprint)	A	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
RFS APXV9ERR18-C-A20 (Sprint)	B	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
RFS APXV9ERR18-C-A20 (Sprint)	C	From Leg	3.00	0.0000	180.00	No Ice	8.02	5.81	62.00
			0.00			1/2" Ice	8.48	6.27	114.00
			0.00			1" Ice	8.93	6.73	172.10
(2) Alcatel Lucent 2x50 (Sprint)	A	From Leg	3.00	0.0000	180.00	No Ice	2.27	1.35	42.00
			0.00			1/2" Ice	2.45	1.51	59.30
			0.00			1" Ice	2.64	1.68	79.60
(2) Alcatel Lucent 2x50 (Sprint)	B	From Leg	3.00	0.0000	180.00	No Ice	2.27	1.35	42.00
			0.00			1/2" Ice	2.45	1.51	59.30
			0.00			1" Ice	2.64	1.68	79.60
(2) Alcatel Lucent 2x50 (Sprint)	C	From Leg	3.00	0.0000	180.00	No Ice	2.27	1.35	42.00
			0.00			1/2" Ice	2.45	1.51	59.30
			0.00			1" Ice	2.64	1.68	79.60

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	170.00	1.15	24	74.792	A	2.989	12.348	9.583	62.49	12.400	0.000
180.00-160.00					B	2.989	12.348		62.49	0.000	0.000
					C	2.989	12.348		62.49	0.750	0.000
T2	150.00	1.11	23	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
160.00-140.00					B	2.853	12.348		63.05	12.300	0.000
					C	2.853	12.348		63.05	0.750	0.000
T3	130.00	1.065	22	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
140.00-120.00					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T4	110.00	1.016	21	74.792	A	2.989	12.348	9.583	62.49	12.400	0.000
120.00-100.00					B	2.989	12.348		62.49	24.600	0.000
					C	2.989	12.348		62.49	48.270	0.000
T5	90.00	0.959	20	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
100.00-80.00					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T6 80.00-60.00	70.00	0.892	19	74.792	A	2.921	12.348	9.583	62.77	12.400	0.000
					B	2.921	12.348		62.77	24.600	0.000
					C	2.921	12.348		62.77	48.270	0.000
T7 60.00-40.00	50.00	0.811	17	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T8 40.00-20.00	30.00	0.701	15	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T9 20.00-5.00	12.50	0.7	15	56.094	A	2.038	9.126	7.188	64.38	9.300	0.000
					B	2.038	9.126		64.38	18.450	0.000
					C	2.038	9.126		64.38	36.203	0.000
T10 5.00-0.00	2.50	0.7	15	10.019	A	0.785	3.127	2.584	66.05	3.100	0.000
					B	0.785	3.127		66.05	6.150	0.000
					C	0.785	3.127		66.05	12.068	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 180.00-160.00	170.00	1.15	6	2.0617	81.664	A	2.989	52.173	23.328	42.29	40.031	0.000
						B	2.989	52.173		42.29	0.000	0.000
						C	2.989	52.173		42.29	8.997	0.000
T2 160.00-140.00	150.00	1.11	6	2.0361	81.579	A	2.853	51.678	23.157	42.47	39.865	0.000
						B	2.853	51.678		42.47	25.437	0.000
						C	2.853	51.678		42.47	8.894	0.000
T3 140.00-120.00	130.00	1.065	6	2.0072	81.482	A	2.853	51.119	22.964	42.55	39.679	0.000
						B	2.853	51.119		42.55	50.555	0.000
						C	2.853	51.119		42.55	77.900	0.000
T4 120.00-100.00	110.00	1.016	6	1.9739	81.371	A	2.989	50.476	22.743	42.54	39.465	0.000
						B	2.989	50.476		42.54	50.190	0.000
						C	2.989	50.476		42.54	77.552	0.000
T5 100.00-80.00	90.00	0.959	5	1.9347	81.241	A	2.853	49.719	22.481	42.76	39.213	0.000
						B	2.853	49.719		42.76	49.759	0.000
						C	2.853	49.719		42.76	77.142	0.000
T6 80.00-60.00	70.00	0.892	5	1.8867	81.081	A	2.921	48.791	22.161	42.85	38.905	0.000
						B	2.921	48.791		42.85	49.231	0.000
						C	2.921	48.791		42.85	76.640	0.000
T7 60.00-40.00	50.00	0.811	4	1.8242	80.872	A	2.853	47.586	21.745	43.11	38.506	0.000
						B	2.853	47.586		43.11	48.545	0.000
						C	2.853	47.586		43.11	75.988	0.000
T8 40.00-20.00	30.00	0.701	4	1.7334	80.570	A	2.853	45.831	21.139	43.42	37.926	0.000
						B	2.853	45.831		43.42	47.547	0.000
						C	2.853	45.831		43.42	75.039	0.000
T9 20.00-5.00	12.50	0.7	4	1.5881	60.064	A	2.038	31.232	15.128	45.47	27.752	0.000
						B	2.038	31.232		45.47	34.464	0.000
						C	2.038	31.232		45.47	55.144	0.000
T10 5.00-0.00	2.50	0.7	4	1.3520	11.213	A	0.785	9.322	5.015	49.61	8.879	0.000
						B	0.785	9.322		49.61	10.840	0.000
						C	0.785	9.322		49.61	17.768	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 180.00-160.00	170.00	1.15	9	74.792	A	2.989	12.348	9.583	62.49	12.400	0.000
					B	2.989	12.348		62.49	0.000	0.000
					C	2.989	12.348		62.49	0.750	0.000
T2 160.00-140.00	150.00	1.11	9	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	12.300	0.000
					C	2.853	12.348		63.05	0.750	0.000
T3 140.00-120.00	130.00	1.065	8	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T4 120.00-100.00	110.00	1.016	8	74.792	A	2.989	12.348	9.583	62.49	12.400	0.000
					B	2.989	12.348		62.49	24.600	0.000
					C	2.989	12.348		62.49	48.270	0.000
T5 100.00-80.00	90.00	0.959	8	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T6 80.00-60.00	70.00	0.892	7	74.792	A	2.921	12.348	9.583	62.77	12.400	0.000
					B	2.921	12.348		62.77	24.600	0.000
					C	2.921	12.348		62.77	48.270	0.000
T7 60.00-40.00	50.00	0.811	6	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T8 40.00-20.00	30.00	0.701	5	74.792	A	2.853	12.348	9.583	63.05	12.400	0.000
					B	2.853	12.348		63.05	24.600	0.000
					C	2.853	12.348		63.05	48.270	0.000
T9 20.00-5.00	12.50	0.7	5	56.094	A	2.038	9.126	7.188	64.38	9.300	0.000
					B	2.038	9.126		64.38	18.450	0.000
					C	2.038	9.126		64.38	36.203	0.000
T10 5.00-0.00	2.50	0.7	5	10.019	A	0.785	3.127	2.584	66.05	3.100	0.000
					B	0.785	3.127		66.05	6.150	0.000
					C	0.785	3.127		66.05	12.068	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1 180.00-160.00	57.20	664.94	A	0.205	2.579	24	1	1	10.093	692.98	34.65	C
		TA 214.38	B	0.205	2.579		1	1	10.093			
			C	0.205	2.579		1	1	10.093			
T2 160.00-140.00	116.80	658.24	A	0.203	2.585	23	1	1	9.953	808.17	40.41	C
			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3 140.00-120.00	373.20	658.24	A	0.203	2.585	22	1	1	9.953	1454.91	72.75	C
			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4 120.00-100.00	373.20	664.94	A	0.205	2.579	21	1	1	10.093	1392.53	69.63	C
		TA 214.38	B	0.205	2.579		1	1	10.093			
			C	0.205	2.579		1	1	10.093			
T5 100.00-80.00	373.20	658.24	A	0.203	2.585	20	1	1	9.953	1309.81	65.49	C
			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6 80.00-60.00	373.20	661.59	A	0.204	2.582	19	1	1	10.023	1221.44	61.07	C
			B	0.204	2.582		1	1	10.023			
			C	0.204	2.582		1	1	10.023			
T7	373.20	658.24	A	0.203	2.585	17	1	1	9.953	1107.32	55.37	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	373.20	658.24	A	0.203	2.585	15	1	1	9.953	956.94	47.85	C
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	279.90	480.27	A	0.199	2.599	15	1	1	7.279	712.39	47.49	C
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	93.30	167.93	A	0.39	2.083	15	1	1	2.762	230.59	46.12	C
			B	0.39	2.083		1	1	2.762			
			C	0.39	2.083		1	1	2.762			
Sum Weight:	2786.40	6359.66								9887.08		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	57.20	664.94	A	0.205	2.579	24	0.8	1	9.496	661.49	33.07	C
180.00-160.00		TA 214.38	B	0.205	2.579		0.8	1	9.496			
			C	0.205	2.579		0.8	1	9.496			
T2	116.80	658.24	A	0.203	2.585	23	0.8	1	9.383	779.10	38.95	C
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	373.20	658.24	A	0.203	2.585	22	0.8	1	9.383	1427.00	71.35	C
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	373.20	664.94	A	0.205	2.579	21	0.8	1	9.496	1364.72	68.24	C
120.00-100.00		TA 214.38	B	0.205	2.579		0.8	1	9.496			
			C	0.205	2.579		0.8	1	9.496			
T5	373.20	658.24	A	0.203	2.585	20	0.8	1	9.383	1284.68	64.23	C
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	373.20	661.59	A	0.204	2.582	19	0.8	1	9.439	1197.53	59.88	C
80.00-60.00			B	0.204	2.582		0.8	1	9.439			
			C	0.204	2.582		0.8	1	9.439			
T7	373.20	658.24	A	0.203	2.585	17	0.8	1	9.383	1086.07	54.30	C
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	373.20	658.24	A	0.203	2.585	15	0.8	1	9.383	938.59	46.93	C
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	279.90	480.27	A	0.199	2.599	15	0.8	1	6.871	699.22	46.61	C
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	93.30	167.93	A	0.39	2.083	15	0.8	1	2.605	226.52	45.30	C
			B	0.39	2.083		0.8	1	2.605			
			C	0.39	2.083		0.8	1	2.605			
Sum Weight:	2786.40	6359.66								9664.91		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	57.20	664.94	A	0.205	2.579	24	0.85	1	9.645	669.36	33.47	C
180.00-160.00		TA 214.38	B	0.205	2.579		0.85	1	9.645			
			C	0.205	2.579		0.85	1	9.645			
T2	116.80	658.24	A	0.203	2.585	23	0.85	1	9.526	786.37	39.32	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	373.20	658.24	A	0.203	2.585	22	0.85	1	9.526	1433.98	71.70	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T4	373.20	664.94	A	0.205	2.579	21	0.85	1	9.645	1371.67	68.58	C
120.00-100.00		TA 214.38	B	0.205	2.579		0.85	1	9.645			
			C	0.205	2.579		0.85	1	9.645			
T5	373.20	658.24	A	0.203	2.585	20	0.85	1	9.526	1290.96	64.55	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	373.20	661.59	A	0.204	2.582	19	0.85	1	9.585	1203.51	60.18	C
80.00-60.00			B	0.204	2.582		0.85	1	9.585			
			C	0.204	2.582		0.85	1	9.585			
T7	373.20	658.24	A	0.203	2.585	17	0.85	1	9.526	1091.39	54.57	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	373.20	658.24	A	0.203	2.585	15	0.85	1	9.526	943.18	47.16	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	279.90	480.27	A	0.199	2.599	15	0.85	1	6.973	702.51	46.83	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	93.30	167.93	A	0.39	2.083	15	0.85	1	2.644	227.54	45.51	C
			B	0.39	2.083		0.85	1	2.644			
			C	0.39	2.083		0.85	1	2.644			
Sum Weight:	2786.40	6359.66								9720.45		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	728.26	3360.94	A	0.675	1.777	6	1	1	44.406	504.12	25.21	C
180.00-160.00		TA 898.76	B	0.675	1.777		1	1	44.406			
			C	0.675	1.777		1	1	44.406			
T2	1233.68	3282.82	A	0.668	1.777	6	1	1	43.626	524.09	26.20	C
160.00-140.00			B	0.668	1.777		1	1	43.626			
			C	0.668	1.777		1	1	43.626			
T3	3571.27	3223.94	A	0.662	1.779	6	1	1	42.973	656.03	32.80	C
140.00-120.00			B	0.662	1.779		1	1	42.973			
			C	0.662	1.779		1	1	42.973			
T4	3526.32	3181.62	A	0.657	1.78	6	1	1	42.422	623.78	31.19	C
120.00-100.00		TA 859.13	B	0.657	1.78		1	1	42.422			
			C	0.657	1.78		1	1	42.422			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T5	3473.65	3079.16	A	0.647	1.782	5	1	1	41.360	386.79	29.34	C
100.00-80.00			B	0.647	1.782		1	1	41.360			
			C	0.647	1.782		1	1	41.360			
T6	3409.67	2997.29	A	0.638	1.785	5	1	1	40.406	544.02	27.20	C
80.00-60.00			B	0.638	1.785		1	1	40.406			
			C	0.638	1.785		1	1	40.406			
T7	3327.34	2866.03	A	0.624	1.791	4	1	1	38.969	491.66	24.58	C
60.00-40.00			B	0.624	1.791		1	1	38.969			
			C	0.624	1.791		1	1	38.969			
T8	3209.22	2697.51	A	0.604	1.801	4	1	1	37.063	422.08	21.10	C
40.00-20.00			B	0.604	1.801		1	1	37.063			
			C	0.604	1.801		1	1	37.063			
T9 20.00-5.00	2268.37	1762.46	A	0.554	1.84	4	1	1	24.385	314.67	20.98	C
			B	0.554	1.84		1	1	24.385			
			C	0.554	1.84		1	1	24.385			
T10 5.00-0.00	683.84	515.33	A	0.901	1.926	4	1	1	9.798	73.04	14.61	C
			B	0.901	1.926		1	1	9.798			
			C	0.901	1.926		1	1	9.798			
Sum Weight:	25431.62	28724.99								4740.30		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	728.26	3360.94	A	0.675	1.777	6	0.8	1	43.809	498.48	24.92	C
180.00-160.00		TA 898.76	B	0.675	1.777		0.8	1	43.809			
			C	0.675	1.777		0.8	1	43.809			
T2	1233.68	3282.82	A	0.668	1.777	6	0.8	1	43.056	518.89	25.94	C
160.00-140.00			B	0.668	1.777		0.8	1	43.056			
			C	0.668	1.777		0.8	1	43.056			
T3	3571.27	3223.94	A	0.662	1.779	6	0.8	1	42.402	651.03	32.55	C
140.00-120.00			B	0.662	1.779		0.8	1	42.402			
			C	0.662	1.779		0.8	1	42.402			
T4	3526.32	3181.62	A	0.657	1.78	6	0.8	1	41.824	618.79	30.94	C
120.00-100.00		TA 859.13	B	0.657	1.78		0.8	1	41.824			
			C	0.657	1.78		0.8	1	41.824			
T5	3473.65	3079.16	A	0.647	1.782	5	0.8	1	40.790	582.28	29.11	C
100.00-80.00			B	0.647	1.782		0.8	1	40.790			
			C	0.647	1.782		0.8	1	40.790			
T6	3409.67	2997.29	A	0.638	1.785	5	0.8	1	39.822	539.72	26.99	C
80.00-60.00			B	0.638	1.785		0.8	1	39.822			
			C	0.638	1.785		0.8	1	39.822			
T7	3327.34	2866.03	A	0.624	1.791	4	0.8	1	38.399	487.83	24.39	C
60.00-40.00			B	0.624	1.791		0.8	1	38.399			
			C	0.624	1.791		0.8	1	38.399			
T8	3209.22	2697.51	A	0.604	1.801	4	0.8	1	36.493	418.75	20.94	C
40.00-20.00			B	0.604	1.801		0.8	1	36.493			
			C	0.604	1.801		0.8	1	36.493			
T9 20.00-5.00	2268.37	1762.46	A	0.554	1.84	4	0.8	1	23.978	312.25	20.82	C
			B	0.554	1.84		0.8	1	23.978			
			C	0.554	1.84		0.8	1	23.978			
T10 5.00-0.00	683.84	515.33	A	0.901	1.926	4	0.8	1	9.641	72.06	14.41	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			B	0.901	1.926		0.8	1	9.641			
			C	0.901	1.926		0.8	1	9.641			
Sum Weight:	25431.62	28724.99								4700.08		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	728.26	3360.94	A	0.675	1.777	6	0.85	1	43.958	499.89	24.99	C
180.00-160.00		TA 898.76	B	0.675	1.777		0.85	1	43.958			
			C	0.675	1.777		0.85	1	43.958			
T2	1233.68	3282.82	A	0.668	1.777	6	0.85	1	43.198	520.19	26.01	C
160.00-140.00			B	0.668	1.777		0.85	1	43.198			
			C	0.668	1.777		0.85	1	43.198			
T3	3571.27	3223.94	A	0.662	1.779	6	0.85	1	42.545	652.28	32.61	C
140.00-120.00			B	0.662	1.779		0.85	1	42.545			
			C	0.662	1.779		0.85	1	42.545			
T4	3526.32	3181.62	A	0.657	1.78	6	0.85	1	41.973	620.04	31.00	C
120.00-100.00		TA 859.13	B	0.657	1.78		0.85	1	41.973			
			C	0.657	1.78		0.85	1	41.973			
T5	3473.65	3079.16	A	0.647	1.782	5	0.85	1	40.932	583.41	29.17	C
100.00-80.00			B	0.647	1.782		0.85	1	40.932			
			C	0.647	1.782		0.85	1	40.932			
T6	3409.67	2997.29	A	0.638	1.785	5	0.85	1	39.968	540.80	27.04	C
80.00-60.00			B	0.638	1.785		0.85	1	39.968			
			C	0.638	1.785		0.85	1	39.968			
T7	3327.34	2866.03	A	0.624	1.791	4	0.85	1	38.542	488.78	24.44	C
60.00-40.00			B	0.624	1.791		0.85	1	38.542			
			C	0.624	1.791		0.85	1	38.542			
T8	3209.22	2697.51	A	0.604	1.801	4	0.85	1	36.635	419.59	20.98	C
40.00-20.00			B	0.604	1.801		0.85	1	36.635			
			C	0.604	1.801		0.85	1	36.635			
T9 20.00-5.00	2268.37	1762.46	A	0.554	1.84	4	0.85	1	24.080	312.85	20.86	C
			B	0.554	1.84		0.85	1	24.080			
			C	0.554	1.84		0.85	1	24.080			
T10 5.00-0.00	683.84	515.33	A	0.901	1.926	4	0.85	1	9.680	72.31	14.46	C
			B	0.901	1.926		0.85	1	9.680			
			C	0.901	1.926		0.85	1	9.680			
Sum Weight:	25431.62	28724.99								4710.13		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	57.20	664.94	A	0.205	2.579	9	1	1	10.093	259.76	12.99	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
180.00-160.00		TA 214.38	B	0.205	2.579		1	1	10.093			
			C	0.205	2.579		1	1	10.093			
T2	116.80	658.24	A	0.203	2.585	9	1	1	9.953	302.94	15.15	C
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	373.20	658.24	A	0.203	2.585	8	1	1	9.953	545.36	27.27	C
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	373.20	664.94	A	0.205	2.579	8	1	1	10.093	521.98	26.10	C
120.00-100.00		TA 214.38	B	0.205	2.579		1	1	10.093			
			C	0.205	2.579		1	1	10.093			
T5	373.20	658.24	A	0.203	2.585	8	1	1	9.953	490.97	24.55	C
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	373.20	661.59	A	0.204	2.582	7	1	1	10.023	457.85	22.89	C
80.00-60.00			B	0.204	2.582		1	1	10.023			
			C	0.204	2.582		1	1	10.023			
T7	373.20	658.24	A	0.203	2.585	6	1	1	9.953	415.07	20.75	C
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	373.20	658.24	A	0.203	2.585	5	1	1	9.953	358.70	17.94	C
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	279.90	480.27	A	0.199	2.599	5	1	1	7.279	267.03	17.80	C
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	93.30	167.93	A	0.39	2.083	5	1	1	2.762	86.43	17.29	C
			B	0.39	2.083		1	1	2.762			
			C	0.39	2.083		1	1	2.762			
Sum Weight:	2786.40	6359.66								3706.11		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	57.20	664.94	A	0.205	2.579	9	0.8	1	9.496	247.96	12.40	C
180.00-160.00		TA 214.38	B	0.205	2.579		0.8	1	9.496			
			C	0.205	2.579		0.8	1	9.496			
T2	116.80	658.24	A	0.203	2.585	9	0.8	1	9.383	292.04	14.60	C
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	373.20	658.24	A	0.203	2.585	8	0.8	1	9.383	534.90	26.75	C
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	373.20	664.94	A	0.205	2.579	8	0.8	1	9.496	511.56	25.58	C
120.00-100.00		TA 214.38	B	0.205	2.579		0.8	1	9.496			
			C	0.205	2.579		0.8	1	9.496			
T5	373.20	658.24	A	0.203	2.585	8	0.8	1	9.383	481.55	24.08	C
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	373.20	661.59	A	0.204	2.582	7	0.8	1	9.439	448.89	22.44	C
80.00-60.00			B	0.204	2.582		0.8	1	9.439			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.204	2.582		0.8	1	9.439			
T7	373.20	658.24	A	0.203	2.585	6	0.8	1	9.383	407.11	20.36	C
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	373.20	658.24	A	0.203	2.585	5	0.8	1	9.383	351.82	17.59	C
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	279.90	480.27	A	0.199	2.599	5	0.8	1	6.871	262.10	17.47	C
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	93.30	167.93	A	0.39	2.083	5	0.8	1	2.605	84.91	16.98	C
			B	0.39	2.083		0.8	1	2.605			
			C	0.39	2.083		0.8	1	2.605			
Sum Weight:	2786.40	6359.66								3622.83		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	57.20	664.94	A	0.205	2.579	9	0.85	1	9.645	250.91	12.55	C
180.00-160.00		TA 214.38	B	0.205	2.579		0.85	1	9.645			
			C	0.205	2.579		0.85	1	9.645			
T2	116.80	658.24	A	0.203	2.585	9	0.85	1	9.526	294.76	14.74	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	373.20	658.24	A	0.203	2.585	8	0.85	1	9.526	537.52	26.88	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T4	373.20	664.94	A	0.205	2.579	8	0.85	1	9.645	514.16	25.71	C
120.00-100.00		TA 214.38	B	0.205	2.579		0.85	1	9.645			
			C	0.205	2.579		0.85	1	9.645			
T5	373.20	658.24	A	0.203	2.585	8	0.85	1	9.526	483.91	24.20	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	373.20	661.59	A	0.204	2.582	7	0.85	1	9.585	451.13	22.56	C
80.00-60.00			B	0.204	2.582		0.85	1	9.585			
			C	0.204	2.582		0.85	1	9.585			
T7	373.20	658.24	A	0.203	2.585	6	0.85	1	9.526	409.10	20.45	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	373.20	658.24	A	0.203	2.585	5	0.85	1	9.526	353.54	17.68	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	279.90	480.27	A	0.199	2.599	5	0.85	1	6.973	263.33	17.56	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	93.30	167.93	A	0.39	2.083	5	0.85	1	2.644	85.29	17.06	C
			B	0.39	2.083		0.85	1	2.644			
			C	0.39	2.083		0.85	1	2.644			
Sum Weight:	2786.40	6359.66								3643.65		

Discrete Appurtenance Pressures - No Ice $G_H = 0.850$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Torque Arm Face C	180.0000	0.00	0.00	2.53	170.89	1.152	24	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	170.89	1.152	24	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	170.89	1.152	24	3.54	5.32
Torque Arm Face C	180.0000	0.00	0.00	2.53	117.30	1.034	22	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	117.30	1.034	22	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	117.30	1.034	22	3.54	5.32
Sector Frame Mount	0.0000	465.00	0.00	-3.52	150.00	1.110	23	18.00	9.00
Sector Frame Mount	120.0000	465.00	3.05	1.76	150.00	1.110	23	18.00	9.00
Sector Frame Mount	240.0000	465.00	-3.05	1.76	150.00	1.110	23	18.00	9.00
Allgon 7750.00	0.0000	35.00	0.00	-5.02	150.00	1.110	23	5.88	2.93
Allgon 7750.00	120.0000	35.00	4.35	2.51	150.00	1.110	23	5.88	2.93
Allgon 7750.00	240.0000	35.00	-4.35	2.51	150.00	1.110	23	5.88	2.93
Powerwave P65-17-XLH-RR	0.0000	62.00	0.00	-5.02	150.00	1.110	23	11.47	6.80
Andew SBNH-1D6565C	120.0000	60.90	4.35	2.51	150.00	1.110	23	11.41	7.70
KMW AM-X-CD-14-65-00T	240.0000	36.40	-4.35	2.51	150.00	1.110	23	5.51	2.83
Ericsson RRUs11	0.0000	100.00	0.00	-5.02	150.00	1.110	23	5.98	0.72
Ericsson RRUs11	120.0000	100.00	4.35	2.51	150.00	1.110	23	5.98	0.72
Ericsson RRUs11	240.0000	100.00	-4.35	2.51	150.00	1.110	23	5.98	0.72
Powerwave 100860	0.0000	50.00	0.00	-5.02	150.00	1.110	23	3.90	1.02
Powerwave 100860	120.0000	50.00	4.35	2.51	150.00	1.110	23	3.90	1.02
Powerwave 100860	240.0000	50.00	-4.35	2.51	150.00	1.110	23	3.90	1.02
Lightning Rod	0.0000	40.00	0.00	0.00	180.00	1.169	24	1.00	1.00
Low Profile Platform	0.0000	1500.00	0.00	0.00	180.00	1.169	24	30.00	30.00
Sector Frame Mount	0.0000	465.00	0.00	-3.52	170.00	1.150	24	18.00	9.00
Sector Frame Mount	120.0000	465.00	3.05	1.76	170.00	1.150	24	18.00	9.00
Sector Frame Mount	240.0000	465.00	-3.05	1.76	170.00	1.150	24	18.00	9.00
Sector Frame Mount	0.0000	465.00	0.00	-3.52	140.00	1.088	23	15.00	7.50
Sector Frame Mount	120.0000	465.00	3.05	1.76	140.00	1.088	23	15.00	7.50
Sector Frame Mount	240.0000	465.00	-3.05	1.76	140.00	1.088	23	15.00	7.50
Antel BXA-70063-6CF	0.0000	34.00	0.00	-5.02	140.00	1.088	23	15.46	10.16
Antel BXA-70063-6CF	120.0000	34.00	4.35	2.51	140.00	1.088	23	15.46	10.16
Antel BXA-70063-6CF	240.0000	34.00	-4.35	2.51	140.00	1.088	23	15.46	10.16
Antel BXA-171085-12CF	0.0000	30.00	0.00	-5.02	140.00	1.088	23	9.58	7.24
Antel BXA-171085-12CF	120.0000	30.00	4.35	2.51	140.00	1.088	23	9.58	7.24
Antel BXA-171085-12CF	240.0000	30.00	-4.35	2.51	140.00	1.088	23	9.58	7.24
Alcatel Lucent RRH2x40 AWS	0.0000	44.00	0.00	-5.02	140.00	1.088	23	2.52	1.59
Alcatel Lucent RRH2x40 AWS	120.0000	44.00	4.35	2.51	140.00	1.088	23	2.52	1.59
Alcatel Lucent RRH2x40 AWS	240.0000	44.00	-4.35	2.51	140.00	1.088	23	2.52	1.59
Alcatel Lucent RRH2x40 700	0.0000	62.00	0.00	-5.02	140.00	1.088	23	3.31	1.94
Alcatel Lucent RRH2x40 700	0.0000	62.00	0.00	-5.02	140.00	1.088	23	3.31	1.94
Alcatel Lucent RRH2x40 700	0.0000	62.00	0.00	-5.02	140.00	1.088	23	3.31	1.94
RFS DB-T1-6Z-8B-0Z	0.0000	62.00	0.00	-5.02	140.00	1.088	23	5.60	2.33
Commscope DT465B-2XR	0.0000	50.00	0.00	-5.02	180.00	1.169	24	9.22	5.87

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Commscope DT465B-2XR	0.0000	50.00	0.00	-5.02	180.00	1.169	24	9.22	5.87
Commscope DT465B-2XR	120.0000	50.00	4.35	2.51	180.00	1.169	24	9.22	5.87
Alcatel Lucent 4x45W	0.0000	51.00	0.00	-5.02	180.00	1.169	24	2.54	1.61
Alcatel Lucent 4x45W	120.0000	51.00	4.35	2.51	180.00	1.169	24	2.54	1.61
Alcatel Lucent 4x45W	240.0000	51.00	-4.35	2.51	180.00	1.169	24	2.54	1.61
Alcatel Lucent 8x200-25	0.0000	70.00	0.00	-5.02	180.00	1.169	24	4.05	1.53
Alcatel Lucent 8x200-25	120.0000	70.00	4.35	2.51	180.00	1.169	24	4.05	1.53
Alcatel Lucent 8x200-25	240.0000	70.00	-4.35	2.51	180.00	1.169	24	4.05	1.53
RFS APXV9ERR18-C-A20	0.0000	62.00	0.00	-5.02	180.00	1.169	24	8.02	5.81
RFS APXV9ERR18-C-A20	120.0000	62.00	4.35	2.51	180.00	1.169	24	8.02	5.81
RFS APXV9ERR18-C-A20	240.0000	62.00	-4.35	2.51	180.00	1.169	24	8.02	5.81
Alcatel Lucent 2x50	0.0000	84.00	0.00	-5.02	180.00	1.169	24	4.54	2.70
Alcatel Lucent 2x50	120.0000	84.00	4.35	2.51	180.00	1.169	24	4.54	2.70
Alcatel Lucent 2x50	240.0000	84.00	-4.35	2.51	180.00	1.169	24	4.54	2.70
	Sum Weight:	7962.30							

Discrete Appurtenance Pressures - With Ice $G_H = 0.850$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Torque Arm Face C	180.0000	0.00	0.00	2.53	170.89	1.152	6	6.36	9.35	2.0617
Torque Arm Face B	60.0000	0.00	2.19	-1.26	170.89	1.152	6	6.36	9.35	2.0617
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	170.89	1.152	6	6.36	9.35	2.0617
Torque Arm Face C	180.0000	0.00	0.00	2.53	117.30	1.034	6	6.24	9.19	1.9739
Torque Arm Face B	60.0000	0.00	2.19	-1.26	117.30	1.034	6	6.24	9.19	1.9739
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	117.30	1.034	6	6.24	9.19	1.9739
Sector Frame Mount	0.0000	1014.74	0.00	-3.52	150.00	1.110	6	33.15	33.15	2.0361
Sector Frame Mount	120.0000	1014.74	3.05	1.76	150.00	1.110	6	33.15	33.15	2.0361
Sector Frame Mount	240.0000	1014.74	-3.05	1.76	150.00	1.110	6	33.15	33.15	2.0361
Allgon 7750.00	0.0000	1014.74	0.00	-5.02	150.00	1.110	6	33.15	33.15	2.0361
Allgon 7750.00	120.0000	1014.74	4.35	2.51	150.00	1.110	6	33.15	33.15	2.0361
Allgon 7750.00	240.0000	1014.74	-4.35	2.51	150.00	1.110	6	33.15	33.15	2.0361
Powerwave P65-17-XLH-RR	0.0000	1014.74	0.00	-5.02	150.00	1.110	6	33.15	33.15	2.0361
Andew SBNH-1D6565C	120.0000	1014.74	4.35	2.51	150.00	1.110	6	33.15	33.15	2.0361
KMW AM-X-CD-14-65-00T	240.0000	1014.74	-4.35	2.51	150.00	1.110	6	33.15	33.15	2.0361
Ericsson RRUs11	0.0000	2029.49	0.00	-5.02	150.00	1.110	6	66.29	66.29	2.0361
Ericsson RRUs11	120.0000	2029.49	4.35	2.51	150.00	1.110	6	66.29	66.29	2.0361
Ericsson RRUs11	240.0000	2029.49	-4.35	2.51	150.00	1.110	6	66.29	66.29	2.0361
Powerwave 100860	0.0000	2029.49	0.00	-5.02	150.00	1.110	6	66.29	66.29	2.0361
Powerwave 100860	120.0000	2029.49	4.35	2.51	150.00	1.110	6	66.29	66.29	2.0361
Powerwave 100860	240.0000	2029.49	-4.35	2.51	150.00	1.110	6	66.29	66.29	2.0361
Lightning Rod	0.0000	122.65	0.00	0.00	180.00	1.169	6	5.24	5.24	2.0735
Low Profile Platform	0.0000	4402.97	0.00	0.00	180.00	1.169	6	67.32	67.32	2.0735
Sector Frame Mount	0.0000	1021.67	0.00	-3.52	170.00	1.150	6	33.39	33.39	2.0617
Sector Frame Mount	120.0000	1021.67	3.05	1.76	170.00	1.150	6	33.39	33.39	2.0617
Sector Frame Mount	240.0000	1021.67	-3.05	1.76	170.00	1.150	6	33.39	33.39	2.0617
Sector Frame Mount	0.0000	1010.96	0.00	-3.52	140.00	1.088	6	33.01	33.01	2.0221
Sector Frame Mount	120.0000	1010.96	3.05	1.76	140.00	1.088	6	33.01	33.01	2.0221
Sector Frame Mount	240.0000	1010.96	-3.05	1.76	140.00	1.088	6	33.01	33.01	2.0221

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Antel BXA-70063-6CF	0.0000	239.74	0.00	-5.02	140.00	1.088	6	10.76	7.40	2.0221
Antel BXA-70063-6CF	120.0000	239.74	4.35	2.51	140.00	1.088	6	10.76	7.40	2.0221
Antel BXA-70063-6CF	240.0000	239.74	-4.35	2.51	140.00	1.088	6	10.76	7.40	2.0221
Antel BXA-171085-12CF	0.0000	239.74	0.00	-5.02	140.00	1.088	6	10.76	7.40	2.0221
Antel BXA-171085-12CF	120.0000	239.74	4.35	2.51	140.00	1.088	6	10.76	7.40	2.0221
Antel BXA-171085-12CF	240.0000	239.74	-4.35	2.51	140.00	1.088	6	10.76	7.40	2.0221
Alcatel Lucent RRH2x40 AWS	0.0000	119.87	0.00	-5.02	140.00	1.088	6	5.38	3.70	2.0221
Alcatel Lucent RRH2x40 AWS	120.0000	119.87	4.35	2.51	140.00	1.088	6	5.38	3.70	2.0221
Alcatel Lucent RRH2x40 AWS	240.0000	119.87	-4.35	2.51	140.00	1.088	6	5.38	3.70	2.0221
Alcatel Lucent RRH2x40 700	0.0000	119.87	0.00	-5.02	140.00	1.088	6	5.38	3.70	2.0221
Alcatel Lucent RRH2x40 700	0.0000	119.87	0.00	-5.02	140.00	1.088	6	5.38	3.70	2.0221
Alcatel Lucent RRH2x40 700	0.0000	119.87	0.00	-5.02	140.00	1.088	6	5.38	3.70	2.0221
RFS DB-T1-6Z-8B-0Z	0.0000	119.87	0.00	-5.02	140.00	1.088	6	5.38	3.70	2.0221
Commscope DT465B-2XR	0.0000	334.70	0.00	-5.02	180.00	1.169	6	11.14	7.77	2.0735
Commscope DT465B-2XR	0.0000	334.70	0.00	-5.02	180.00	1.169	6	11.14	7.77	2.0735
Commscope DT465B-2XR	120.0000	334.70	4.35	2.51	180.00	1.169	6	11.14	7.77	2.0735
Alcatel Lucent 4x45W	0.0000	156.74	0.00	-5.02	180.00	1.169	6	3.39	2.36	2.0735
Alcatel Lucent 4x45W	120.0000	156.74	4.35	2.51	180.00	1.169	6	3.39	2.36	2.0735
Alcatel Lucent 4x45W	240.0000	156.74	-4.35	2.51	180.00	1.169	6	3.39	2.36	2.0735
Alcatel Lucent 8x200-25	0.0000	207.71	0.00	-5.02	180.00	1.169	6	5.03	2.29	2.0735
Alcatel Lucent 8x200-25	120.0000	207.71	4.35	2.51	180.00	1.169	6	5.03	2.29	2.0735
Alcatel Lucent 8x200-25	240.0000	207.71	-4.35	2.51	180.00	1.169	6	5.03	2.29	2.0735
RFS APXV9ERR18-C-A20	0.0000	320.58	0.00	-5.02	180.00	1.169	6	9.93	7.71	2.0735
RFS APXV9ERR18-C-A20	120.0000	320.58	4.35	2.51	180.00	1.169	6	9.93	7.71	2.0735
RFS APXV9ERR18-C-A20	240.0000	320.58	-4.35	2.51	180.00	1.169	6	9.93	7.71	2.0735
Alcatel Lucent 2x50	0.0000	269.75	0.00	-5.02	180.00	1.169	6	6.17	4.14	2.0735
Alcatel Lucent 2x50	120.0000	269.75	4.35	2.51	180.00	1.169	6	6.17	4.14	2.0735
Alcatel Lucent 2x50	240.0000	269.75	-4.35	2.51	180.00	1.169	6	6.17	4.14	2.0735
	Sum Weight:	38079.07								

Discrete Appurtenance Pressures - Service $G_H = 0.850$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Torque Arm Face C	180.0000	0.00	0.00	2.53	170.89	1.152	9	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	170.89	1.152	9	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	170.89	1.152	9	3.54	5.32
Torque Arm Face C	180.0000	0.00	0.00	2.53	117.30	1.034	8	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	117.30	1.034	8	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	117.30	1.034	8	3.54	5.32
Sector Frame Mount	0.0000	465.00	0.00	-3.52	150.00	1.110	9	18.00	9.00

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Sector Frame Mount	120.0000	465.00	3.05	1.76	150.00	1.110	9	18.00	9.00
Sector Frame Mount	240.0000	465.00	-3.05	1.76	150.00	1.110	9	18.00	9.00
Allgon 7750.00	0.0000	35.00	0.00	-5.02	150.00	1.110	9	5.88	2.93
Allgon 7750.00	120.0000	35.00	4.35	2.51	150.00	1.110	9	5.88	2.93
Allgon 7750.00	240.0000	35.00	-4.35	2.51	150.00	1.110	9	5.88	2.93
Powerwave P65-17-XLH-RR	0.0000	62.00	0.00	-5.02	150.00	1.110	9	11.47	6.80
Andew SBNH-1D6565C	120.0000	60.90	4.35	2.51	150.00	1.110	9	11.41	7.70
KMW AM-X-CD-14-65-00T	240.0000	36.40	-4.35	2.51	150.00	1.110	9	5.51	2.83
Ericsson RRUs11	0.0000	100.00	0.00	-5.02	150.00	1.110	9	5.98	0.72
Ericsson RRUs11	120.0000	100.00	4.35	2.51	150.00	1.110	9	5.98	0.72
Ericsson RRUs11	240.0000	100.00	-4.35	2.51	150.00	1.110	9	5.98	0.72
Powerwave 100860	0.0000	50.00	0.00	-5.02	150.00	1.110	9	3.90	1.02
Powerwave 100860	120.0000	50.00	4.35	2.51	150.00	1.110	9	3.90	1.02
Powerwave 100860	240.0000	50.00	-4.35	2.51	150.00	1.110	9	3.90	1.02
Lightning Rod	0.0000	40.00	0.00	0.00	180.00	1.169	9	1.00	1.00
Low Profile Platform	0.0000	1500.00	0.00	0.00	180.00	1.169	9	30.00	30.00
Sector Frame Mount	0.0000	465.00	0.00	-3.52	170.00	1.150	9	18.00	9.00
Sector Frame Mount	120.0000	465.00	3.05	1.76	170.00	1.150	9	18.00	9.00
Sector Frame Mount	240.0000	465.00	-3.05	1.76	170.00	1.150	9	18.00	9.00
Sector Frame Mount	0.0000	465.00	0.00	-3.52	140.00	1.088	9	15.00	7.50
Sector Frame Mount	120.0000	465.00	3.05	1.76	140.00	1.088	9	15.00	7.50
Sector Frame Mount	240.0000	465.00	-3.05	1.76	140.00	1.088	9	15.00	7.50
Antel BXA-70063-6CF	0.0000	34.00	0.00	-5.02	140.00	1.088	9	15.46	10.16
Antel BXA-70063-6CF	120.0000	34.00	4.35	2.51	140.00	1.088	9	15.46	10.16
Antel BXA-70063-6CF	240.0000	34.00	-4.35	2.51	140.00	1.088	9	15.46	10.16
Antel BXA-171085-12CF	0.0000	30.00	0.00	-5.02	140.00	1.088	9	9.58	7.24
Antel BXA-171085-12CF	120.0000	30.00	4.35	2.51	140.00	1.088	9	9.58	7.24
Antel BXA-171085-12CF	240.0000	30.00	-4.35	2.51	140.00	1.088	9	9.58	7.24
Alcatel Lucent RRH2x40 AWS	0.0000	44.00	0.00	-5.02	140.00	1.088	9	2.52	1.59
Alcatel Lucent RRH2x40 AWS	120.0000	44.00	4.35	2.51	140.00	1.088	9	2.52	1.59
Alcatel Lucent RRH2x40 AWS	240.0000	44.00	-4.35	2.51	140.00	1.088	9	2.52	1.59
Alcatel Lucent RRH2x40 700	0.0000	62.00	0.00	-5.02	140.00	1.088	9	3.31	1.94
Alcatel Lucent RRH2x40 700	0.0000	62.00	0.00	-5.02	140.00	1.088	9	3.31	1.94
Alcatel Lucent RRH2x40 700	0.0000	62.00	0.00	-5.02	140.00	1.088	9	3.31	1.94
RFS DB-T1-6Z-8B-0Z	0.0000	62.00	0.00	-5.02	140.00	1.088	9	5.60	2.33
Commscope DT465B-2XR	0.0000	50.00	0.00	-5.02	180.00	1.169	9	9.22	5.87
Commscope DT465B-2XR	0.0000	50.00	0.00	-5.02	180.00	1.169	9	9.22	5.87
Commscope DT465B-2XR	120.0000	50.00	4.35	2.51	180.00	1.169	9	9.22	5.87
Alcatel Lucent 4x45W	0.0000	51.00	0.00	-5.02	180.00	1.169	9	2.54	1.61
Alcatel Lucent 4x45W	120.0000	51.00	4.35	2.51	180.00	1.169	9	2.54	1.61
Alcatel Lucent 4x45W	240.0000	51.00	-4.35	2.51	180.00	1.169	9	2.54	1.61
Alcatel Lucent 8x200-25	0.0000	70.00	0.00	-5.02	180.00	1.169	9	4.05	1.53
Alcatel Lucent 8x200-25	120.0000	70.00	4.35	2.51	180.00	1.169	9	4.05	1.53
Alcatel Lucent 8x200-25	240.0000	70.00	-4.35	2.51	180.00	1.169	9	4.05	1.53
RFS APXV9ERR18-C-A20	0.0000	62.00	0.00	-5.02	180.00	1.169	9	8.02	5.81
RFS	120.0000	62.00	4.35	2.51	180.00	1.169	9	8.02	5.81

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
APXV9ERR18-C-A20 RFS APXV9ERR18-C-A20	240.0000	62.00	-4.35	2.51	180.00	1.169	9	8.02	5.81
Alcatel Lucent 2x50	0.0000	84.00	0.00	-5.02	180.00	1.169	9	4.54	2.70
Alcatel Lucent 2x50	120.0000	84.00	4.35	2.51	180.00	1.169	9	4.54	2.70
Alcatel Lucent 2x50	240.0000	84.00	-4.35	2.51	180.00	1.169	9	4.54	2.70
	Sum Weight:	7962.30							

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3138.04			
Bracing Weight	3221.62			
Total Member Self-Weight	6359.66			
Guy Weight	2135.83			
Total Weight	19244.19			
Wind 0 deg - No Ice		-31.13	-16115.42	845.69
Wind 30 deg - No Ice		7837.02	-13796.50	670.21
Wind 60 deg - No Ice		13749.55	-8030.75	333.46
Wind 90 deg - No Ice		15727.96	31.13	-122.76
Wind 120 deg - No Ice		13780.68	8084.67	-512.23
Wind 150 deg - No Ice		7890.94	13827.63	-792.98
Wind 180 deg - No Ice		31.13	16115.42	-845.69
Wind 210 deg - No Ice		-7837.02	13796.50	-670.21
Wind 240 deg - No Ice		-13749.55	8030.75	-333.46
Wind 270 deg - No Ice		-15727.96	-31.13	122.76
Wind 300 deg - No Ice		-13780.68	-8084.67	512.23
Wind 330 deg - No Ice		-7890.94	-13827.63	792.98
Member Ice	22365.34			
Guy Ice	16275.66			
Total Weight Ice	110647.17			
Wind 0 deg - Ice		-6.32	-9734.06	113.55
Wind 30 deg - Ice		4822.03	-8400.66	-31.62
Wind 60 deg - Ice		8384.44	-4861.56	-167.18
Wind 90 deg - Ice		9654.99	6.32	-260.33
Wind 120 deg - Ice		8390.75	4872.50	-280.73
Wind 150 deg - Ice		4832.97	8406.98	-228.71
Wind 180 deg - Ice		6.32	9734.06	-113.55
Wind 210 deg - Ice		-4822.03	8400.66	31.62
Wind 240 deg - Ice		-8384.44	4861.56	167.18
Wind 270 deg - Ice		-9654.99	-6.32	260.33
Wind 300 deg - Ice		-8390.75	-4872.50	280.73
Wind 330 deg - Ice		-4832.97	-8406.98	228.71
Total Weight	19244.19			
Wind 0 deg - Service		-11.67	-6040.77	317.00
Wind 30 deg - Service		2937.66	-5171.53	251.23
Wind 60 deg - Service		5153.93	-3010.28	125.00
Wind 90 deg - Service		5895.53	11.67	-46.02
Wind 120 deg - Service		5165.60	3030.49	-192.01
Wind 150 deg - Service		2957.87	5183.20	-297.24
Wind 180 deg - Service		11.67	6040.77	-317.00
Wind 210 deg - Service		-2937.66	5171.53	-251.23
Wind 240 deg - Service		-5153.93	3010.28	-125.00
Wind 270 deg - Service		-5895.53	-11.67	46.02

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 300 deg - Service		-5165.60	-3030.49	192.01
Wind 330 deg - Service		-2957.87	-5183.20	297.24

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	19	182042.97	-249.12	-4.05
	Max. H_x	11	79846.01	1774.17	16.91
	Max. H_z	2	78769.88	2.61	1859.03
	Max. M_x	1	0.00	2.32	16.48
	Max. M_z	1	0.00	2.32	16.48
	Max. Torsion	1	0.00	2.32	16.48
	Min. Vert	1	73872.40	2.32	16.48
	Min. H_x	5	79856.68	-1768.68	16.73
	Min. H_z	8	80542.38	2.27	-1727.65
	Min. M_x	1	0.00	2.32	16.48
	Min. M_z	1	0.00	2.32	16.48
	Min. Torsion	1	0.00	2.32	16.48
Guy C @ 145 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-4512.09	-4283.03	2474.23
	Max. H_x	10	-4512.09	-4283.03	2474.23
	Max. H_z	4	-33282.94	-33922.24	19583.69
	Min. Vert	4	-33282.94	-33922.24	19583.69
	Min. H_x	4	-33282.94	-33922.24	19583.69
	Min. H_z	10	-4512.09	-4283.03	2474.23
Guy B @ 145 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-4446.06	4238.27	2445.48
	Max. H_x	12	-33351.26	33971.90	19617.06
	Max. H_z	12	-33351.26	33971.90	19617.06
	Min. Vert	12	-33351.26	33971.90	19617.06
	Min. H_x	6	-4446.06	4238.27	2445.48
	Min. H_z	6	-4446.06	4238.27	2445.48
Guy A @ 145 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-4312.25	2.49	-4776.90
	Max. H_x	24	-22553.51	859.00	-29872.31
	Max. H_z	2	-4312.25	2.49	-4776.90
	Min. Vert	8	-33527.59	-4.08	-39415.59
	Min. H_x	18	-22564.73	-858.88	-29880.00
	Min. H_z	8	-33527.59	-4.08	-39415.59

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	73872.40	-2.32	-16.48	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	78769.88	-2.61	-1859.03	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	79925.85	880.86	-1550.24	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	80483.74	1516.10	-893.54	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	79856.68	1768.68	-16.73	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	78725.00	1593.82	899.54	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	79926.22	885.03	1507.77	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	80542.38	-2.27	1727.65	0.00	0.00	0.00

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	79895.16	-889.79	1508.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	78697.51	-1599.17	899.61	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	79846.01	-1774.17	-16.91	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	80502.25	-1521.40	-893.96	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	79946.52	-885.93	-1550.64	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	180432.95	-2.04	-139.33	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	182017.89	-1.58	-432.37	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	181570.12	135.17	-395.61	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	181183.69	243.31	-283.43	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	181582.11	286.08	-133.42	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	182042.97	249.12	4.05	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	181601.44	149.48	105.02	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	181212.91	-1.13	143.02	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	181599.49	-151.76	104.80	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	182039.70	-251.60	3.62	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	181580.03	-288.87	-133.93	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	181182.89	-246.33	-283.91	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	181569.99	-138.34	-395.90	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	74005.40	-2.31	-446.11	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	73969.14	208.70	-382.89	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	73935.46	361.91	-226.54	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	73969.77	421.03	-16.03	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	74006.22	370.41	197.80	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	73969.66	210.09	348.41	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	73935.62	-2.27	402.58	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	73970.03	-214.57	348.41	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	74006.66	-374.92	197.77	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	73970.05	-425.58	-16.07	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	73935.47	-366.48	-226.59	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	73969.05	-213.26	-382.93	0.00	0.00	0.00

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	0.00	-19243.70	0.00	0.01	19243.70	-0.02	0.000%
2	-49.81	-22833.46	-28539.29	49.76	22833.30	28524.35	0.041%
3	13913.31	-22665.37	-24454.36	-13915.13	22664.96	24424.36	0.083%
4	24077.00	-22497.29	-14048.77	-24067.66	22497.15	14042.69	0.031%
5	27912.89	-22665.37	49.81	-27889.25	22665.00	-34.41	0.078%
6	24434.66	-22833.46	14312.78	-24422.10	22833.31	-14305.63	0.040%
7	13999.58	-22665.37	24504.17	-13973.27	22664.98	-24490.95	0.081%
8	49.81	-22497.29	28183.82	-49.70	22497.16	-28172.48	0.031%
9	-13913.31	-22665.37	24454.36	13887.42	22665.00	-24441.50	0.080%
10	-24384.85	-22833.46	14226.51	24372.50	22833.32	-14219.54	0.039%
11	-27912.89	-22665.37	-49.81	27889.54	22665.01	65.04	0.078%
12	-24126.81	-22497.29	-14135.04	24117.49	22497.15	14128.84	0.031%
13	-13999.58	-22665.37	-24504.17	14001.29	22664.95	24473.95	0.084%
14	0.00	-114064.68	0.00	-0.07	114063.29	0.84	0.001%
15	-6.32	-114265.37	-13004.77	6.28	114264.06	12975.40	0.026%
16	6453.54	-114064.68	-11226.53	-6449.43	114063.44	11205.68	0.019%
17	11182.12	-113863.99	-6476.81	-11160.70	113862.37	6466.03	0.021%
18	12918.02	-114064.68	6.32	-12896.68	114063.42	1.76	0.020%
19	11223.27	-114265.37	6507.86	-11196.36	114264.04	-6492.26	0.027%
20	6464.48	-114064.68	11232.84	-6447.30	114063.42	-11218.34	0.020%
21	6.32	-113863.99	12964.55	-6.44	113862.36	-12940.17	0.021%
22	-6453.54	-114064.68	11226.53	6436.16	114063.42	-11211.99	0.020%
23	-11216.96	-114265.37	6496.92	11189.86	114264.04	-6481.25	0.027%
24	-12918.02	-114064.68	-6.32	12896.54	114063.42	14.46	0.020%
25	-11188.44	-113863.99	-6487.74	11166.86	113862.37	6477.04	0.021%
26	-6464.48	-114064.68	-11232.84	6460.30	114063.43	11212.04	0.019%
27	-11.67	-19283.08	-6686.11	11.67	19283.08	6685.05	0.005%
28	3259.57	-19243.70	-5729.10	-3259.13	19243.70	5728.25	0.005%
29	5640.70	-19204.32	-3291.31	-5639.89	19204.32	3290.86	0.005%
30	6539.36	-19243.70	11.67	-6538.39	19243.70	-11.62	0.005%
31	5724.49	-19283.08	3353.16	-5723.55	19283.08	-3352.62	0.005%
32	3279.79	-19243.70	5740.77	-3279.26	19243.70	-5739.95	0.005%
33	11.67	-19204.32	6602.83	-11.68	19204.32	-6601.90	0.005%
34	-3259.57	-19243.70	5729.10	3259.04	19243.70	-5728.28	0.005%
35	-5712.82	-19283.08	3332.95	5711.87	19283.08	-3332.40	0.005%
36	-6539.36	-19243.70	-11.67	6538.38	19243.70	11.73	0.005%
37	-5652.37	-19204.32	-3311.52	5651.56	19204.32	3311.07	0.005%
38	-3279.79	-19243.70	-5740.77	3279.34	19243.70	5739.93	0.005%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	13	0.00000001	0.00000001
2	Yes	13	0.00032043	0.00013605
3	Yes	13	0.00069523	0.00024993
4	Yes	13	0.00021915	0.00010201
5	Yes	13	0.00064803	0.00023156
6	Yes	13	0.00030437	0.00013299
7	Yes	13	0.00067446	0.00024293
8	Yes	13	0.00022023	0.00010378

9	Yes	13	0.00065734	0.00023615
10	Yes	13	0.00029674	0.00013244
11	Yes	13	0.00063705	0.00022761
12	Yes	13	0.00022032	0.00010310
13	Yes	13	0.00070189	0.00025307
14	Yes	14	0.00148468	0.00127295
15	Yes	15	0.00136712	0.00115115
16	Yes	15	0.00111567	0.00114687
17	Yes	14	0.00139472	0.00130017
18	Yes	15	0.00114708	0.00114773
19	Yes	15	0.00139904	0.00115268
20	Yes	15	0.00112981	0.00114819
21	Yes	14	0.00138501	0.00130198
22	Yes	15	0.00113162	0.00114961
23	Yes	15	0.00139996	0.00115268
24	Yes	15	0.00114744	0.00114780
25	Yes	14	0.00139528	0.00130019
26	Yes	15	0.00111583	0.00114720
27	Yes	13	0.00000001	0.00001536
28	Yes	13	0.00000001	0.00001351
29	Yes	13	0.00000001	0.00001233
30	Yes	13	0.00000001	0.00001391
31	Yes	13	0.00000001	0.00001587
32	Yes	13	0.00000001	0.00001358
33	Yes	13	0.00000001	0.00001210
34	Yes	13	0.00000001	0.00001382
35	Yes	13	0.00000001	0.00001605
36	Yes	13	0.00000001	0.00001399
37	Yes	13	0.00000001	0.00001223
38	Yes	13	0.00000001	0.00001337

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	0.926	38	0.0133	0.0302
T2	160 - 140	0.974	33	0.0134	0.0219
T3	140 - 120	0.952	33	0.0329	0.0161
T4	120 - 100	0.748	33	0.0402	0.0127
T5	100 - 80	0.646	33	0.0192	0.0273
T6	80 - 60	0.566	35	0.0237	0.0434
T7	60 - 40	0.465	35	0.0192	0.0550
T8	40 - 20	0.402	35	0.0240	0.0640
T9	20 - 5	0.252	35	0.0489	0.0691
T10	5 - 0	0.069	31	0.0625	0.0708

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod	38	0.926	0.0133	0.0302	424322
170.00	Guy	38	0.949	0.0122	0.0254	212161
150.00	Sector Frame Mount	33	0.986	0.0194	0.0200	26297
140.00	Sector Frame Mount	33	0.952	0.0329	0.0161	16672

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
116.42	Guy	33	0.720	0.0375	0.0141	23689
60.38	Guy	35	0.466	0.0193	0.0548	53912

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	4.494	8	0.1082	0.1429
T2	160 - 140	4.617	8	0.0764	0.1053
T3	140 - 120	4.401	8	0.1581	0.0756
T4	120 - 100	3.426	8	0.1924	0.0735
T5	100 - 80	2.913	8	0.0987	0.1208
T6	80 - 60	2.505	8	0.1116	0.1895
T7	60 - 40	2.021	8	0.0886	0.2386
T8	40 - 20	1.752	10	0.1072	0.2770
T9	20 - 5	1.102	10	0.2135	0.2991
T10	5 - 0	0.299	10	0.2727	0.3063

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod	8	4.494	0.1082	0.1429	45378
170.00	Guy	8	4.566	0.0913	0.1214	22689
150.00	Sector Frame Mount	8	4.604	0.0804	0.0955	6283
140.00	Sector Frame Mount	8	4.401	0.1581	0.0756	3973
116.42	Guy	8	3.289	0.1781	0.0796	5245
60.38	Guy	8	2.028	0.0891	0.2378	12259

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.7500	4	319.12	29820.60	0.011 ✔	1	Bolt Tension
		Torque Arm Top@170	A325N	0.7500	2	6175.26	17892.40	0.345 ✔	1	Bolt Shear
		Torque Arm Bottom@170	A325N	0.7500	2	4069.25	17892.40	0.227 ✔	1	Bolt Shear
T2	160	Leg	A325N	0.7500	4	2459.42	29820.60	0.082 ✔	1	Bolt Tension
T3	140	Leg	A325N	0.7500	4	3637.62	29820.60	0.122 ✔	1	Bolt Tension
T4	120	Leg	A325N	0.7500	4	3220.20	29820.60	0.108 ✔	1	Bolt Tension
		Torque Arm	A325N	0.7500	2	4600.98	17892.40	0.257 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top@116.417 Torque Arm Bottom@116.417	A325N	0.7500	2	2845.26	17892.40	0.159 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.7500	4	4073.35	29820.60	0.137 ✔	1	Bolt Tension
T6	80	Leg	A325N	0.7500	4	4160.46	29820.60	0.140 ✔	1	Bolt Tension
T7	60	Leg	A325N	0.7500	4	4794.45	29820.60	0.161 ✔	1	Bolt Tension
T8	40	Leg	A325N	0.7500	4	4843.45	29820.60	0.162 ✔	1	Bolt Tension
T9	20	Leg	A325N	0.7500	4	5090.81	29820.60	0.171 ✔	1	Bolt Tension
T10	5	Leg	A325N	0.7500	4	5406.54	29820.60	0.181 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	170.00 (A) (559)	5/8 EHS	6360.00	42399.99	11860.00	25440.00	1.000	2.145 ✔
	170.00 (A) (560)	5/8 EHS	6360.00	42399.99	11740.50	25440.00	1.000	2.167 ✔
	170.00 (B) (553)	5/8 EHS	6360.00	42399.99	11650.90	25440.00	1.000	2.184 ✔
	170.00 (B) (554)	5/8 EHS	6360.00	42399.99	11835.70	25440.00	1.000	2.149 ✔
	170.00 (C) (547)	5/8 EHS	6360.00	42399.99	11737.30	25440.00	1.000	2.167 ✔
	170.00 (C) (548)	5/8 EHS	6360.00	42399.99	11671.80	25440.00	1.000	2.180 ✔
T4	116.42 (A) (577)	9/16 EHS	5250.00	35000.04	10042.20	21000.00	1.000	2.091 ✔
	116.42 (A) (578)	9/16 EHS	5250.00	35000.04	9967.14	21000.00	1.000	2.107 ✔
	116.42 (B) (571)	9/16 EHS	5250.00	35000.04	9955.50	21000.00	1.000	2.109 ✔
	116.42 (B) (572)	9/16 EHS	5250.00	35000.04	9914.70	21000.00	1.000	2.118 ✔
	116.42 (C) (565)	9/16 EHS	5250.00	35000.04	9868.75	21000.00	1.000	2.128 ✔
	116.42 (C) (566)	9/16 EHS	5250.00	35000.04	9984.35	21000.00	1.000	2.103 ✔
T6	60.38 (A) (585)	9/16 EHS	5250.00	35000.04	9339.32	21000.00	1.000	2.249 ✔
	60.38 (B) (584)	9/16 EHS	5250.00	35000.04	9334.31	21000.00	1.000	2.250 ✔
	60.38 (C) (583)	9/16 EHS	5250.00	35000.04	9338.40	21000.00	1.000	2.249 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-31819.90	72691.90	0.438 [1] ✓
T2	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-46450.10	72691.90	0.639 [1] ✓
T3	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-45381.20	72691.90	0.624 [1] ✓
T4	120 - 100	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-52392.80	72691.90	0.721 [1] ✓
T5	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-51403.20	72691.90	0.707 [1] ✓
T6	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-57518.80	72691.90	0.791 [1] ✓
T7	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-58818.40	71456.30	0.823 [1] ✓
T8	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-61926.60	71479.80	0.866 [1] ✓
T9	20 - 5	P2.5x.203	15.00	3.56	45.1 K=1.00	1.7040	1.00	-61714.40	70516.80	0.875 [1] ✓
T10	5 - 0	P2.5x.203	5.39	1.80	22.8 K=1.00	1.7040	0.90	-66115.70	71564.00	0.924 [1] ✓

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	5 - 0	5/8	2.44	1.46	105.4 K=0.94	0.3068	-3972.10	5538.29	0.717 [1] ✓

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-5813.09	11503.00	0.505 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-5522.71	11503.00	0.480 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-5035.00	11503.00	0.438 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4134.33	11503.00	0.359 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4011.25	11503.00	0.349 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4334.82	11503.00	0.377 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3864.81	11503.00	0.336 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4041.16	11503.00	0.351 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3465.25	11503.00	0.301 [1]
T10	5 - 0	L1 1/2x1 1/2x3/16	2.33	2.09	55.7 K=0.65	0.5273	-1210.67	14513.70	0.083 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3498.59	11503.00	0.304 [1]
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2704.38	11503.00	0.235 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3289.46	11503.00	0.286 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2304.83	11503.00	0.200 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2162.84	11503.00	0.188 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2103.30	11503.00	0.183 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1953.96	11503.00	0.170 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1886.54	11503.00	0.164 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3080.49	11503.00	0.268 [1]
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2765.95	11503.00	0.240 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3711.65	11503.00	0.323 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2242.74	11503.00	0.195 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2055.41	11503.00	0.179 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2234.05	11503.00	0.194 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2012.65	11503.00	0.175 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	0.6211	-7549.24	15078.10	0.501 [1]
T4	120 - 100	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	0.6211	-4092.93	15078.10	0.271 [1]
T6	80 - 60	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	0.6211	-790.51	15078.10	0.052 [1]

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	0.6211	-6214.34	15078.10	0.412 [1]
T4	120 - 100	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	0.6211	-6760.45	15078.10	0.448 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (551)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8033.01	36439.50	0.220 [1] ✔
T1	180 - 160 (552)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8087.01	36439.50	0.222 [1] ✔
T1	180 - 160 (557)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8048.78	36439.50	0.221 [1] ✔
T1	180 - 160 (558)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8046.06	36439.50	0.221 [1] ✔
T1	180 - 160 (563)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8087.74	36439.50	0.222 [1] ✔
T1	180 - 160 (564)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8138.50	36439.50	0.223 [1] ✔
T4	120 - 100 (569)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5479.22	36439.50	0.150 [1] ✔
T4	120 - 100 (570)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5501.16	36439.50	0.151 [1] ✔
T4	120 - 100 (575)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5690.14	36439.50	0.156 [1] ✔
T4	120 - 100 (576)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5690.53	36439.50	0.156 [1] ✔
T4	120 - 100 (581)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5498.82	36439.50	0.151 [1] ✔
T4	120 - 100 (582)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-5521.17	36439.50	0.152 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6	1.7040	0.01	82816.80	0.000 [1] ✔
T2	160 - 140	P2.5x.203	20.00	3.21	40.6	1.7040	2861.29	82816.80	0.035 [1] ✔
T3	140 - 120	P2.5x.203	20.00	3.21	40.6	1.7040	2858.90	82816.80	0.035 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	5/8	4.75	4.42	339.7	0.3068	5834.68	9940.20	0.587 [1]
T2	160 - 140	5/8	4.75	4.42	339.7	0.3068	4968.04	9940.20	0.500 [1]
T3	140 - 120	5/8	4.75	4.42	339.7	0.3068	6300.89	9940.20	0.634 [1]
T4	120 - 100	5/8	4.75	4.42	339.7	0.3068	4398.07	9940.20	0.442 [1]
T5	100 - 80	5/8	4.75	4.42	339.7	0.3068	3821.84	9940.20	0.384 [1]
T6	80 - 60	5/8	4.75	4.42	339.7	0.3068	4076.41	9940.20	0.410 [1]
T7	60 - 40	5/8	4.75	4.42	339.7	0.3068	4218.65	9940.20	0.424 [1]
T8	40 - 20	5/8	4.75	4.42	339.7	0.3068	3264.13	9940.20	0.328 [1]
T9	20 - 5	5/8	4.99	4.65	357.3	0.3068	3253.63	9940.20	0.327 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	551.14	17085.90	0.032 [1]
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	804.54	17085.90	0.047 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	786.03	17085.90	0.046 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	907.47	17085.90	0.053 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	890.33	17085.90	0.052 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	996.25	17085.90	0.058 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1018.76	17085.90	0.060 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1072.60	17085.90	0.063 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1068.93	17085.90	0.063 [1]
T10	5 - 0	L1 1/2x1 1/2x3/16	2.33	2.09	55.0	0.5273	3552.63	17085.90	0.208 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	12.77	17085.90	0.001 [1] ✔
T10	5 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	10060.60	17085.90	0.589 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	3537.76	17085.90	0.207 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	80 - 60	L1 3/4x1 3/4x3/16	3.50	3.26	72.9	0.6211	3114.38	20123.40	0.155 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (549)	L2x2x5/16	4.75	4.59	91.6	1.1500	12338.40	37260.00	0.331 [1] ✔
T1	180 - 160 (550)	L2x2x5/16	4.75	4.59	91.6	1.1500	12282.10	37260.00	0.330 [1] ✔
T1	180 - 160 (555)	L2x2x5/16	4.75	4.59	91.6	1.1500	12332.60	37260.00	0.331 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (556)	L2x2x5/16	4.75	4.59	91.6	1.1500	12350.50	37260.00	0.331 [1]
T1	180 - 160 (561)	L2x2x5/16	4.75	4.59	91.6	1.1500	12304.20	37260.00	0.330 [1]
T1	180 - 160 (562)	L2x2x5/16	4.75	4.59	91.6	1.1500	12263.90	37260.00	0.329 [1]
T4	120 - 100 (567)	L2x2x5/16	4.75	4.59	91.6	1.1500	9193.89	37260.00	0.247 [1]
T4	120 - 100 (568)	L2x2x5/16	4.75	4.59	91.6	1.1500	9183.58	37260.00	0.246 [1]
T4	120 - 100 (573)	L2x2x5/16	4.75	4.59	91.6	1.1500	9124.75	37260.00	0.245 [1]
T4	120 - 100 (574)	L2x2x5/16	4.75	4.59	91.6	1.1500	9109.26	37260.00	0.244 [1]
T4	120 - 100 (579)	L2x2x5/16	4.75	4.59	91.6	1.1500	9196.80	37260.00	0.247 [1]
T4	120 - 100 (580)	L2x2x5/16	4.75	4.59	91.6	1.1500	9201.97	37260.00	0.247 [1]

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (551)	L3x3x1/4	3.50	3.38	43.6	1.4400	1253.81	46656.00	0.027 [1]
T1	180 - 160 (552)	L3x3x1/4	3.50	3.38	43.6	1.4400	1394.10	46656.00	0.030 [1]
T1	180 - 160 (557)	L3x3x1/4	3.50	3.38	43.6	1.4400	1333.04	46656.00	0.029 [1]
T1	180 - 160 (558)	L3x3x1/4	3.50	3.38	43.6	1.4400	1293.30	46656.00	0.028 [1]
T1	180 - 160 (563)	L3x3x1/4	3.50	3.38	43.6	1.4400	1307.05	46656.00	0.028 [1]
T1	180 - 160 (564)	L3x3x1/4	3.50	3.38	43.6	1.4400	1406.85	46656.00	0.030 [1]
T4	120 - 100 (569)	L3x3x1/4	3.50	3.38	43.6	1.4400	2473.12	46656.00	0.053 [1]
T4	120 - 100 (570)	L3x3x1/4	3.50	3.38	43.6	1.4400	2515.99	46656.00	0.054 [1]
T4	120 - 100 (575)	L3x3x1/4	3.50	3.38	43.6	1.4400	2664.40	46656.00	0.057 [1]
T4	120 - 100 (576)	L3x3x1/4	3.50	3.38	43.6	1.4400	2661.23	46656.00	0.057 [1]
T4	120 - 100 (581)	L3x3x1/4	3.50	3.38	43.6	1.4400	2481.07	46656.00	0.053 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100 (582)	L3x3x1/4	3.50	3.38	43.6	1.4400	2521.33	46656.00	0.054 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	P2.5x.203	3	-31819.90	72691.90	43.8	Pass
		Diagonal	5/8	58	5834.68	9940.20	58.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	52	-5813.09	11503.00	50.5	Pass
		Top Girt	L1 1/2x1 1/2x3/16	4	-3498.59	11503.00	30.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	7	-3080.49	11503.00	26.8	Pass
		Guy A@170	5/8	559	11860.00	25440.00	46.6	Pass
		Guy B@170	5/8	554	11835.70	25440.00	46.5	Pass
		Guy C@170	5/8	547	11737.30	25440.00	46.1	Pass
		Top Guy Pull-Off@170	L1 3/4x1 3/4x3/16	43	-7549.24	15078.10	50.1	Pass
		Bottom Guy Pull-Off@170	L1 3/4x1 3/4x3/16	34	-6214.34	15078.10	41.2	Pass
		Torque Arm Top@170	L2x2x5/16	556	12350.50	37260.00	33.1 34.5 (b)	Pass
		Torque Arm Bottom@170	L3x3x1/4	564	-8138.50	36439.50	22.3 22.7 (b)	Pass
T2	160 - 140	Leg	P2.5x.203	63	-46450.10	72691.90	63.9	Pass
		Diagonal	5/8	116	4968.04	9940.20	50.0	Pass
		Horizontal	L1 1/2x1 1/2x3/16	94	-5522.71	11503.00	48.0	Pass
		Top Girt	L1 1/2x1 1/2x3/16	64	-2704.38	11503.00	23.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	67	-2765.95	11503.00	24.0	Pass
T3	140 - 120	Leg	P2.5x.203	123	-45381.20	72691.90	62.4	Pass
		Diagonal	5/8	133	6300.89	9940.20	63.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	172	-5035.00	11503.00	43.8	Pass
		Top Girt	L1 1/2x1 1/2x3/16	124	-3289.46	11503.00	28.6	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	127	-3711.65	11503.00	32.3	Pass
T4	120 - 100	Leg	P2.5x.203	183	-52392.80	72691.90	72.1	Pass
		Diagonal	5/8	226	4398.07	9940.20	44.2	Pass
		Horizontal	L1 1/2x1 1/2x3/16	223	-4134.33	11503.00	35.9	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	188	-2242.74	11503.00	19.5	Pass
		Guy A@116.417	9/16	577	10042.20	21000.00	47.8	Pass
		Guy B@116.417	9/16	571	9955.50	21000.00	47.4	Pass
		Guy C@116.417	9/16	566	9984.35	21000.00	47.5	Pass
		Top Guy Pull-Off@116.417	L1 3/4x1 3/4x3/16	184	-4092.93	15078.10	27.1	Pass
		Bottom Guy Pull-Off@116.417	L1 3/4x1 3/4x3/16	232	-6760.45	15078.10	44.8	Pass
		Torque Arm Top@116.417	L2x2x5/16	580	9201.97	37260.00	24.7 25.7 (b)	Pass
		Torque Arm Bottom@116.417	L3x3x1/4	576	-5690.53	36439.50	15.6 15.9 (b)	Pass
T5	100 - 80	Leg	P2.5x.203	242	-51403.20	72691.90	70.7	Pass
		Diagonal	5/8	296	3821.84	9940.20	38.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	257	-4011.25	11503.00	34.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	244	-2304.83	11503.00	20.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	247	-2055.41	11503.00	17.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T6	80 - 60	Leg	P2.5x.203	301	-37518.80	72691.90	79.1	Pass
		Diagonal	5/8	315	4076.41	9940.20	41.0	Pass
		Horizontal	L1 1/2x1 1/2x3/16	317	-4334.82	11503.00	37.7	Pass
		Top Girt	L1 1/2x1 1/2x3/16	305	-2162.84	11503.00	18.8	Pass
		Guy A@60.375	9/16	585	9339.32	21000.00	44.5	Pass
		Guy B@60.375	9/16	584	9334.31	21000.00	44.4	Pass
		Guy C@60.375	9/16	583	9338.40	21000.00	44.5	Pass
		Top Guy Pull-Off@60.375	L1 3/4x1 3/4x3/16	308	3114.38	20123.40	15.5	Pass
T7	60 - 40	Leg	P2.5x.203	361	-58818.40	71456.30	82.3	Pass
		Diagonal	5/8	416	4218.65	9940.20	42.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	377	-3864.81	11503.00	33.6	Pass
		Top Girt	L1 1/2x1 1/2x3/16	366	-2103.30	11503.00	18.3	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	367	-2234.05	11503.00	19.4	Pass
T8	40 - 20	Leg	P2.5x.203	421	-61926.60	71479.80	86.6	Pass
		Diagonal	5/8	475	3264.13	9940.20	32.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	437	-4041.16	11503.00	35.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	426	-1953.96	11503.00	17.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	427	-2012.65	11503.00	17.5	Pass
T9	20 - 5	Leg	P2.5x.203	481	-61714.40	70516.80	87.5	Pass
		Diagonal	5/8	494	3253.63	9940.20	32.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	497	-3465.25	11503.00	30.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	486	-1886.54	11503.00	16.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	489	3537.76	17085.90	20.7	Pass
T10	5 - 0	Leg	P2.5x.203	524	-66115.70	71564.00	92.4	Pass
		Diagonal	5/8	535	-3972.10	5538.29	71.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	538	3552.63	17085.90	20.8	Pass
		Top Girt	L1 1/2x1 1/2x3/16	526	10060.60	17085.90	58.9	Pass

Summary		
Leg (T10)	92.4	Pass
Diagonal (T10)	71.7	Pass
Horizontal (T1)	50.5	Pass
Top Girt (T10)	58.9	Pass
Bottom Girt (T3)	32.3	Pass
Guy A (T4)	47.8	Pass
Guy B (T4)	47.4	Pass
Guy C (T4)	47.5	Pass
Top Guy Pull-Off (T1)	50.1	Pass
Bottom Guy Pull-Off (T4)	44.8	Pass
Torque Arm Top (T1)	34.5	Pass
Torque Arm Bottom (T1)	22.7	Pass
Bolt Checks	34.5	Pass
RATING =	92.4	Pass

Site Name:	Stafford Tumel
Job Number:	117-22243.7
Date:	1/15/2018

Design Base Loads (Factored) per TIA-222-G

Moment (M_u):	0.0	k-ft	Concrete Compressive Strength (f'_c):	3000	psi
Shear/Leg (V_u):	1.9	k	Vertical Steel Rebar Size #:	5	
Compression/Leg (P_u):	182.0	k	Vertical Steel Rebar Area:	0.31	in^2
Uplift/Leg (T_u):	0.0	k	# of Vertical Steel Rebars:	8	
Tower Type (GT / SST):	GT		Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Diameter of Prismatic Portion of Pier (d):	2.0	ft	Tie / Stirrup Size #:	4	
Depth to Base of Foundation:	4.5	ft	Tie / Stirrup Area:	0.20	in^2
Pier Height Above Ground (h):	0.50	ft	Tie / Stirrup Spacing:	10.0	in
Length / Width of Pad (w):	5.5	ft	Tie / Stirrup Steel Yield Strength (F_y):	40	ksi
Thickness of Pad (t):	1.5	ft	Rebar Cage Diameter:	16.0	in
Depth Below Ground Surface to Water Table (w):	10.0	ft	Bending/Tension Reduction Factor (ϕ_B):	0.90	
Unit Weight of Concrete:	150.0	pcf	Shear Reduction Factor (ϕ_V):	0.75	
Unit Weight of Water:	62.4	pcf	Compression Reduction Factor (ϕ_V):	0.65	
Unit Weight of Soil Above Water Table:	110.0	pcf	Steel Elastic Modulus:	29000	ksi
Unit Weight of Soil Below Water Table:	55.0	pcf	Pad Steel Rebar Size #:	5	
Friction Angle of Uplift from Top of Pad:	30	Degrees	Pad Steel Rebar Area:	0.31	in^2
Friction Angle of Uplift from Base of Pad:	30	Degrees	Pad Steel Rebar Yield Strength (F_y):	60	ksi
Uplift Angle Started at Top or Base of Pad (T/B):	T		# of Rebar in Top of Pad:	0	
Ultimate Skin Friction:	0	psf	# of Rebar in Base of Pad:	5	
Ultimate Compressive Bearing Pressure:	12000	psf	Pad Clear Cover:	3	in
Capacity Increase (Due to Transient Loads):	1.00				
Bearing Strength Reduction Factor (ϕ_s):	0.60				
Uplift Strength Reduction Factor (ϕ_s):	0.75				

Axial Capacities and Design Moment

Weight of Concrete (Bouyancy Considered):	8.5	k
Weight of Soil (Bouyancy Considered):	16.6	k
Ultimate Skin Friction Resistance:	0.0	k
Controlling Failure Mode (Top / Base):	Top	
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	18.8	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	217.8	k
P_u:	184.9	k
$T_u/\phi_s T_n$:	0.00	Result: OK
$P_u/\phi_s P_n$:	0.85	Result: OK

Depth (ft) Top	Depth (ft) Bottom	Ultimate Lateral Bearing Pressure (psf)	Increment (psf/ft)	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)
0.0	2.0	0.0	110.0	110	0	0
2	3.0	660.0	330.0	110	0	30

Inflection Point (Below Ground Surface):	2.9	ft
Factored Design Moment At Inflection Point (M_u):	3.9	k-ft

Pad Strength Capacity

β:	0.85	ACI318-05 - 10.2.7.3
Lower Pad Flexural Reinforcement Ratio:	0.0016	OK - Minimum Reinforcement Ratio Met - #
Upper Pad Flexural Reinforcement Ratio:	0.0000	OK - Minimum Reinforcement Ratio Met - #
Lower Pad Flexural Reinforcement Spacing:	15	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Flexural Reinforcement Spacing:	0	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
One Way Design Shear (V_u):	17.6	k
One Way Shear Capacity (ϕV_c):	81.2	k - ACI318-05 - 11.3.1.1
$V_u / \phi V_c$:	0.22	Result: OK
Punching Design Shear (V_u):	132.2	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	293.3	k - ACI318-05 - 11.12.2.1
$V_u / \phi V_c$:	0.45	Result: OK
Flexural Loading Due to Soil Pressure (M_u):	51.3	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	100.5	k-ft - ACI318-05 - 10.3
$M_u / \phi M_n$:	0.51	Result: OK
Flexural Loading Due to Uplift (M_u):	0.0	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	0.0	k-ft - ACI318-05 - 10.3
$M_u / \phi M_n$:	0.00	Result: OK

Pier Strength Capacity

Design Moment (M_u):	3.9	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	88.9	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.04	Result: OK
Design Shear (V_u):	1.9	k
Nominal Shear Capacity ($\phi_V V_n$):	67.9	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.03	Result: OK
Design Tension (T_u):	0.0	k
Nominal Tension Capacity ($\phi_T T_n$):	133.9	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	182.0	k
Nominal Compression Capacity ($\phi_P P_n$):	701.9	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.26	Result: OK
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is Satisfactory - ACI318-05 - 10.9.1 & 10.8.4
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.04	Result: OK

Site Name:	Stafford Tumel
Site Number:	117-23243.7
Date:	1/15/2018

Design Standard per TIA-222-G

Anchor Radius:	145.0	ft
Uplift (Factored - P_u):	33.5	k
Shear (Factored - V_u):	39.4	k
Anchor Base Depth (d):	8.0	ft
Width of Anchor (W):	5.5	ft
Length of Anchor (L):	11.5	ft
Thickness of Anchor (t):	2.0	ft
Depth Below Ground Surface to Water Table (w):	10.0	ft
Soil Uplift at Base / Top of Anchor (B/T):	T	
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	110.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	50.0	pcf
Internal Angle of Friction:	0	Degrees
Cohesion:	1800	psf
Ultimate Skin Friction of Pad Sides to Soil:	0	psf
Ultimate Coefficient of Shear Friction:	0.30	
Maximum Top Conical Failure Angle:	30	Degrees
Maximum Base Conical Failure Angle:	30	Degrees
Uplift Strength Reduction Factor (ϕ_u):	0.75	
Shear Strength Reduction Factor (ϕ_v):	0.75	
Concrete Uplift Strength Reduction Factor (ϕ_u):	0.90	

Uplift

Weight of Concrete (Buoyancy Effect Considered):	19.0	k
Weight of Soil (Buoyancy Effect Considered):	88.9	k
Ultimate Uplift Resistance from Skin Friction:	0.0	k
Nominal Factored Uplift Resistance ($\phi_u P_n$)::	83.8	k
P_u / $\phi_u P_n$:	0.40	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	10.7	k
Passive Pressure:	4370	psf
Ultimate Passure Pressure Resistance:	100.5	k
Nominal Shear Resistance ($\phi_v V_n$):	83.4	k
V_u / $\phi_v V_n$:	0.47	Result: OK

Anchor Rod Capacity

# of Anchor Rods:	1		Rod F_y:	48 ksi
Anchor Rod Gross Area:	2.41	in^2	Rod F_u:	62 ksi
Anchor Rod Net Area:	2.41	in^2	ϕ_y:	0.80
Resultant Tensile Load (T_u):	51.7	k	ϕ_t:	0.65
Anchor Rod Tensile Resistance (ϕT_n)::	92.4	k		
T_u / ϕT_n:	0.56	Result: OK		

Strength Analysis of Reinforced Concrete

Concrete Compressive Srength (f'_c):	3000	psi	
Longitudinal Rebar Yield Strength:	60000	psi	
# Longitudinal Rebar (Top):	9		
# Longitudinal Rebar (1 Side):	3		
Rebar Size:	4		
Strength Reduction Factor for Shear (ϕ_v):	0.75		
Strength Reduction Factor for Flexure (ϕ_b):	0.9		
Compression Zone Factor (β_1):	0.85		
Area of Single Rebar:	0.20	in^2	
One Way Shear due to Shear Load (V_u):	10.8	k	
Nominal One Way Shear Capacity for Shear Load ($\phi_v V_n$):	122.3	k	
$V_u/\phi_v V_n$:	0.09	Result:	OK
One Way Shear due to Uplift (V_u):	14.3	k	
Nominal One Way Shear Capacity for Uplift ($\phi_v V_n$):	108.4	k	
$V_u/\phi_v V_n$:	0.13	Result:	OK
Pad Flexure due to Shear Load (M_u):	56.6	k-ft	
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	167.4	k-ft	
Pad Flexure due to Uplift (M_u):	48.1	k-ft	
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	161.9	k-ft	
$M_u/\phi_b M_n$ (Max.):	0.34	Result:	OK

PROJECT INFORMATION:

TOWER INFORMATION

LAT: 41.9689°

LONG: -72.2372°

SITE TYPE: 180' GUYED TOWER

COUNTY: TOLLAND

APPLICANT

SPRINT
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251
CONTACT: TBD
PHONE:
EMAIL:

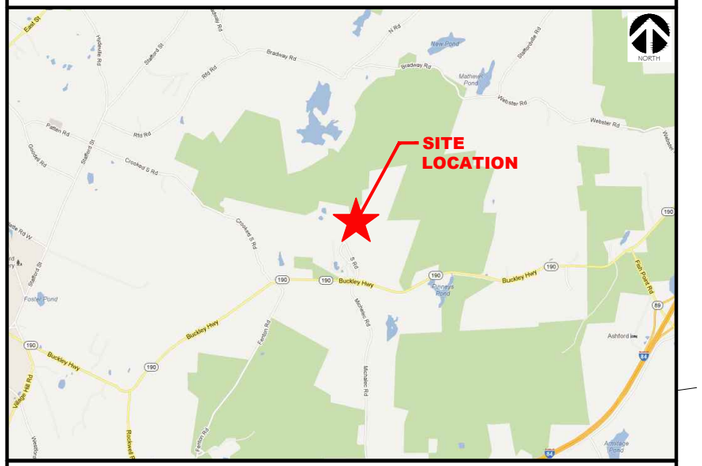
LANDLORD

CORDLESS DATA TRANSFER INC.
P.O. BOX 363
MARLBOROUGH, CT 06447

A&E FIRM

RAMAKER & ASSOCIATES, INC.
CONTACT: KEITH BOHNSACK
PROJECT MANAGER
PHONE: (608) 643-4100
EMAIL: KBOHNSACK@RAMAKER.COM

VICINITY MAP:



AERIAL MAP:

SHEET INDEX:

SHEET #	SHEET DESCRIPTION	REVISION
T-1	COVER SHEET & SITE PLAN	-
A-1	ANTENNA LAYOUTS & EQUIPMENT LAYOUT	-
A-2	TOWER ELEVATION	-
A-3	ANTENNA DETAILS	-
A-4	ANTENNA SCHEDULE & DETAILS	-
A-5	FIBER PLUMBING DIAGRAM	-
A-6	CABLE COLOR CODING	-
E-1	DC POWER & FIBER DISTRIBUTION DETAIL	-

CODE COMPLIANCE:

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

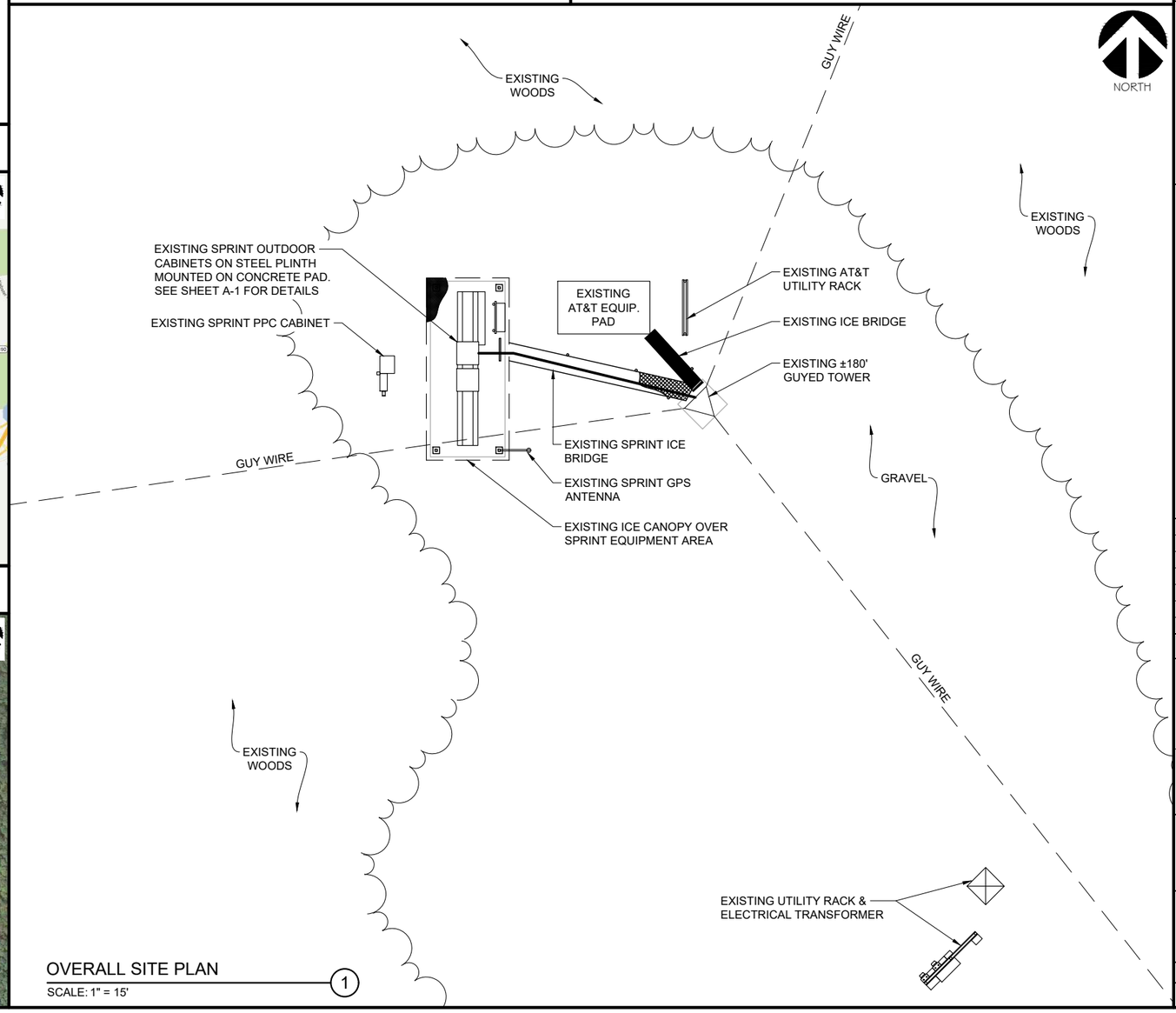
1. INTERNATIONAL BUILDING CODE
2. ANSI/TIA-222 STRUCTURAL STANDARD FOR ANTENNA STRUCTURES
3. NFPA 780 - LIGHTNING PROTECTION CODE
4. NATIONAL ELECTRIC CODE

811 Know what's below. Call before you dig. www.call811.com

DO MACRO UPGRADE

SITE CASCADE:

CT33XC004



OVERALL SITE PLAN (1)
SCALE: 1" = 15'

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

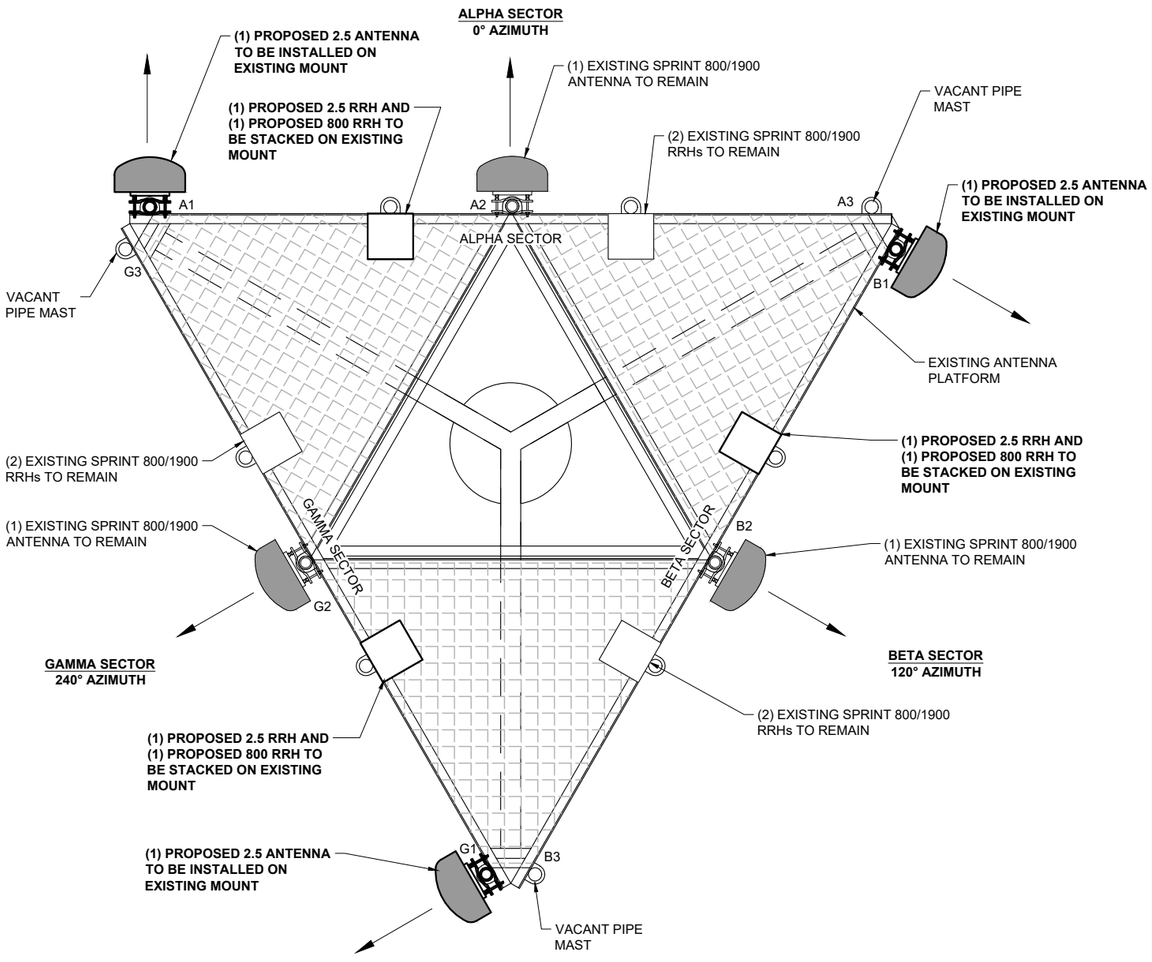
PROJECT TITLE:
CT33XC004

PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
TITLE SHEET

0 7.5' 15' 30'
11" x 17" - 1" = 15'
22" x 34" - 1" = 7.5'

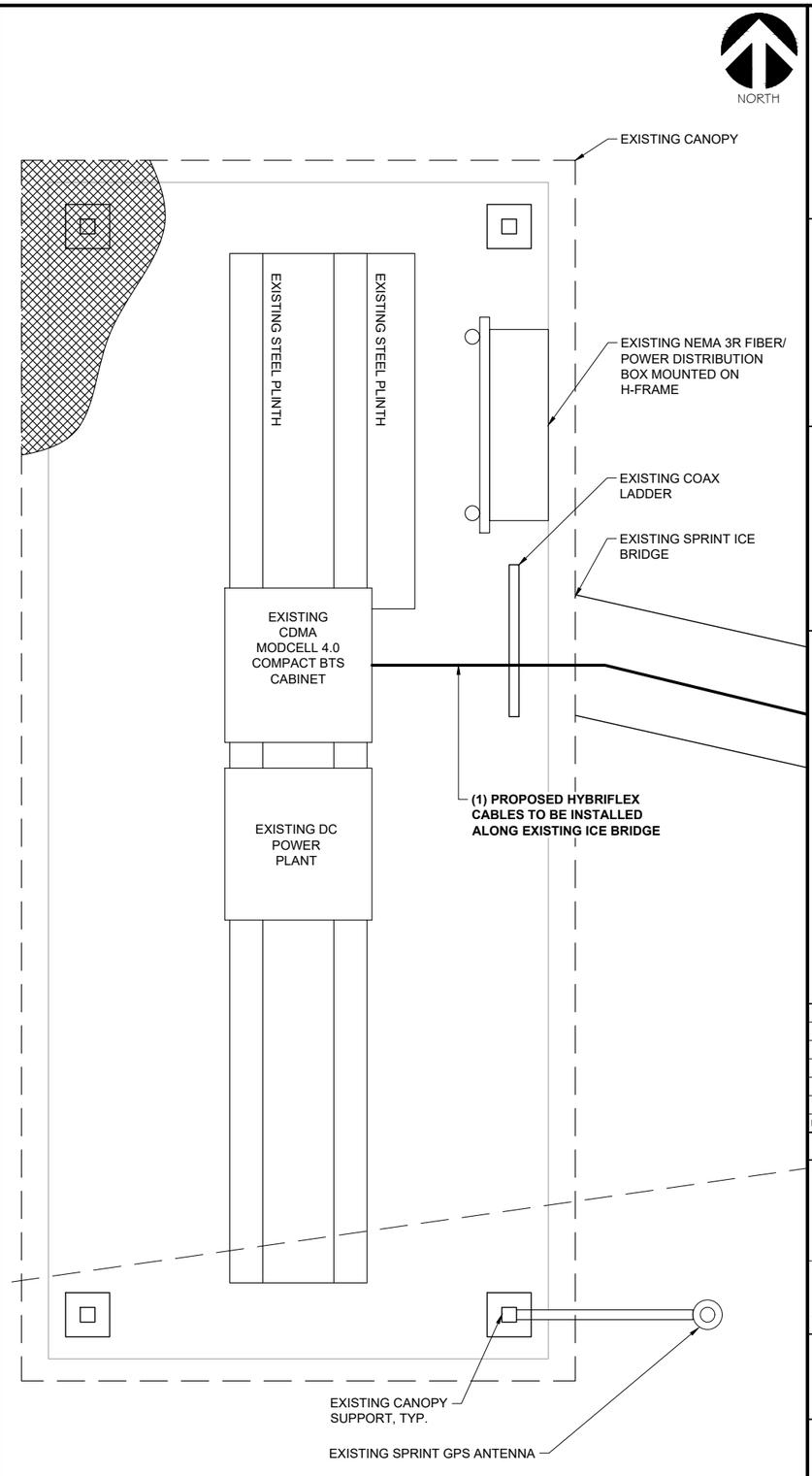
PROJECT NUMBER: 22972
SHEET NUMBER: T-1



ANTENNA PLAN

SCALE: 1" = 2.5'

(1)



EQUIPMENT PLAN

SCALE: 1" = 2.5'

(2)

Sprint

6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

PROJECT TITLE:
CT33XC004

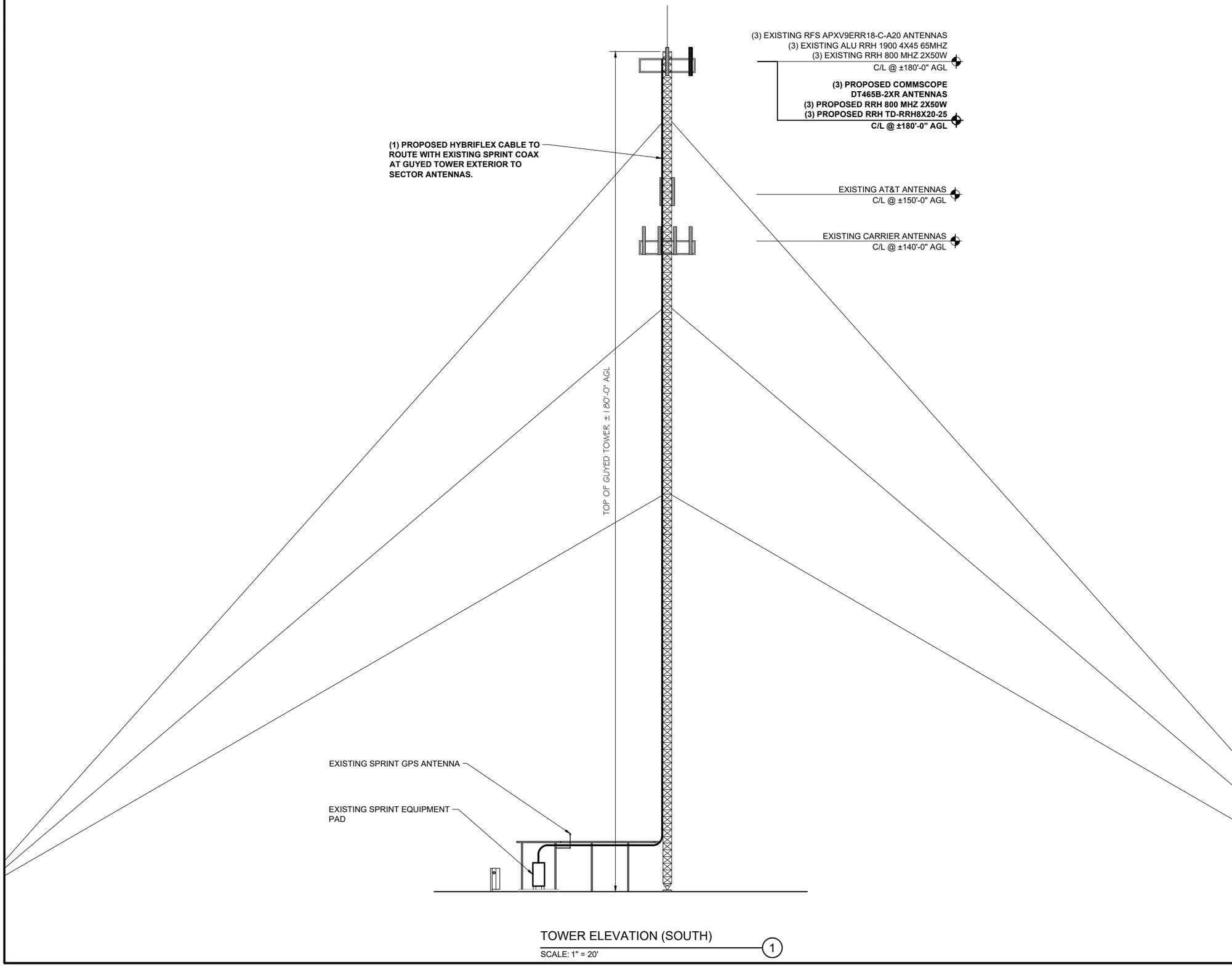
PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
PROPOSED ANTENNA LAYOUT & EQUIPMENT LAYOUT

0 1.25' 2.5' 5'
11" x 17" - 1" = 2.5'
22" x 34" - 1" = 1.25'

PROJECT NUMBER: 22972
SHEET NUMBER: A-1

DRAWN BY: CKF CHECKED BY: KAB



TOWER ELEVATION (SOUTH) 1

SCALE: 1" = 20'

Sprint

6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

PROJECT TITLE:
CT33XC004

PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
TOWER ELEVATION

0 10' 20' 40'
11" x 17" - 1" = 20'
22" x 34" - 1" = 10'

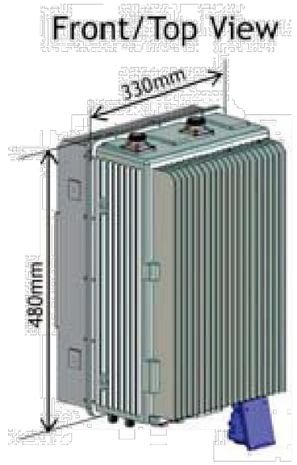
PROJECT NUMBER: 22972
SHEET NUMBER: A-2

MECHANICAL	
DIMENSION (HxWxD)	72" x 13.8" x 8.2"
WEIGHT	58 lbs

COMMSCOPE ANTENNA MODEL # DT465B-2XR - ANTENNA SPECS

MECHANICAL	
DIMENSION (HxWxD)	26"x18.6"x6.7"
WEIGHT	76.2 lbs

ALU- TD-RRH8X20-25 - RADIO SPECS



MECHANICAL	
DIMENSION (HxWxD)	9" x 9" x 4"
WEIGHT	11 lbs

ALU- 800 MHz 2x50W - RADIO SPECS

Sprint

6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

PROJECT TITLE:
CT33XC004

PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

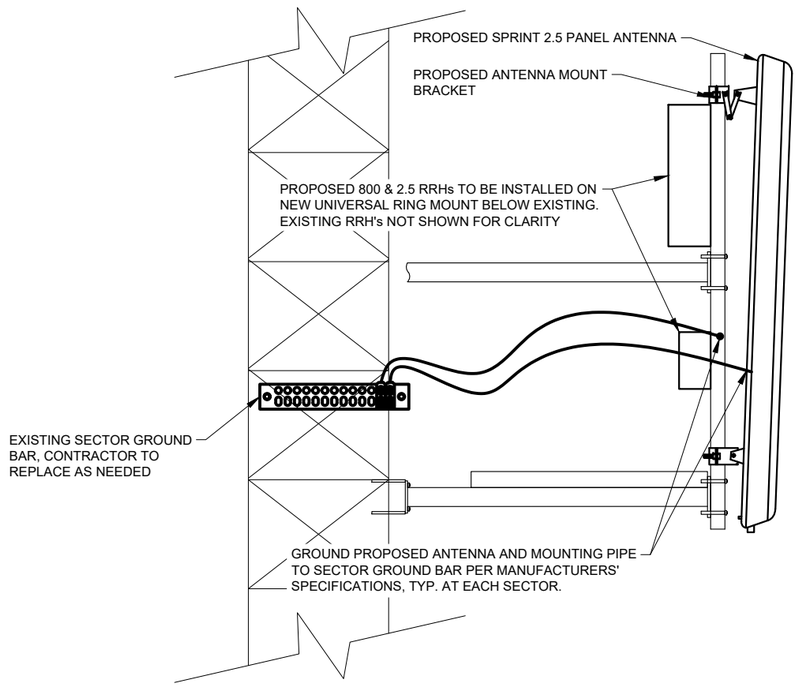
SHEET TITLE:
ANTENNA DETAILS

SCALE: NONE

PROJECT NUMBER: 22972
SHEET NUMBER: A-3

800/1900/2.5 EQUIPMENT SCHEDULE								
SECTOR	POSITION	ANTENNA MAKE/MODEL	AZIMUTH	CENTERLINE	RRH	CABLE TYPE	CABLE LENGTH	JUMPER TYPE
ALPHA	1	PROPOSED COMMSCOPE DT465B-2XR	0°	180'-0"	(1) PROPOSED 2.5 (TD-RRH8x20-25)	(1) PROPOSED HYBRIFLEX	230'-0"	8' HYBRID
	2	EXISTING RFS APXV9ERR18-C-A20	0°	180'-0"	(1) PROPOSED RRH 800 MHz 2x50W (1) EXISTING RRH 1900 4X45 65 MHz (1) EXISTING RRH 800 MHz 2x50W	EXISTING HYBRIFLEX	230'-0"	EXISTING
	3	VACANT MOUNT	-	180'-0"	-	-	-	-
BETA	1	PROPOSED COMMSCOPE DT465B-2XR	120°	180'-0"	(1) PROPOSED 2.5 (TD-RRH8x20-25)	(1) PROPOSED HYBRIFLEX	230'-0"	8' HYBRID
	2	EXISTING RFS APXV9ERR18-C-A20	120°	180'-0"	(1) PROPOSED RRH 800 MHz 2x50W (1) EXISTING RRH 1900 4X45 65 MHz (1) EXISTING RRH 800 MHz 2x50W	EXISTING HYBRIFLEX	230'-0"	EXISTING
	3	VACANT MOUNT	-	180'-0"	-	-	-	-
GAMMA	1	PROPOSED COMMSCOPE DT465B-2XR	240°	180'-0"	(1) PROPOSED 2.5 (TD-RRH8x20-25)	(1) PROPOSED HYBRIFLEX	230'-0"	8' HYBRID
	2	EXISTING RFS APXV9ERR18-C-A20	240°	180'-0"	(1) PROPOSED RRH 800 MHz 2x50W (1) EXISTING RRH 1900 4X45 65 MHz (1) EXISTING RRH 800 MHz 2x50W	EXISTING HYBRIFLEX	230'-0"	EXISTING
	3	VACANT MOUNT	-	180'-0"	-	-	-	-

EQUIPMENT & CABLE SCHEDULE (1)
SCALE: NTS



ANTENNA & RRH MOUNTING DETAIL (2)
SCALE: NTS

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

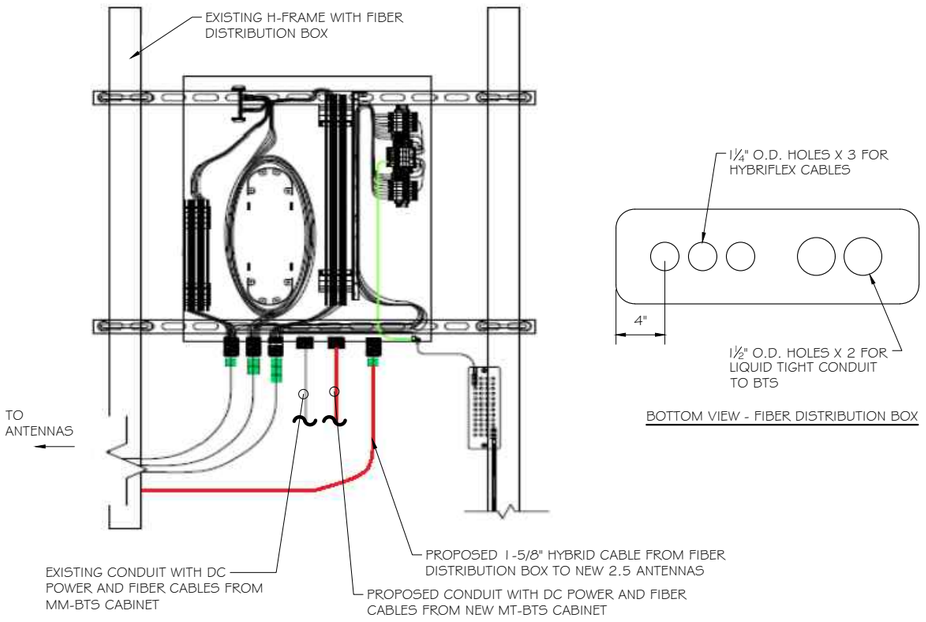
PROJECT TITLE:
CT33XC004

PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
ANTENNA SCHEDULE & DETAIL

SCALE: NONE

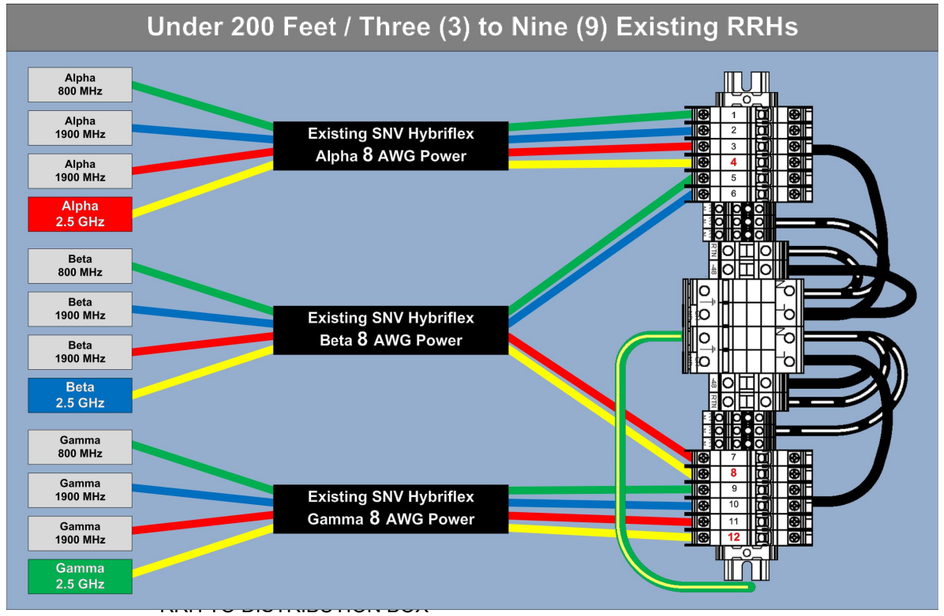
PROJECT NUMBER: 22972
SHEET NUMBER: A-4



BOTTOM VIEW - FIBER DISTRIBUTION BOX

TYPICAL FIBER DISTRIBUTION BOX DETAIL (1)

SCALE: NTS



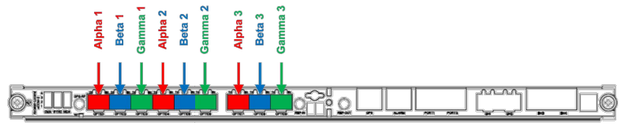
POWER CONNECTIVITY DETAIL (2)

SCALE: NTS

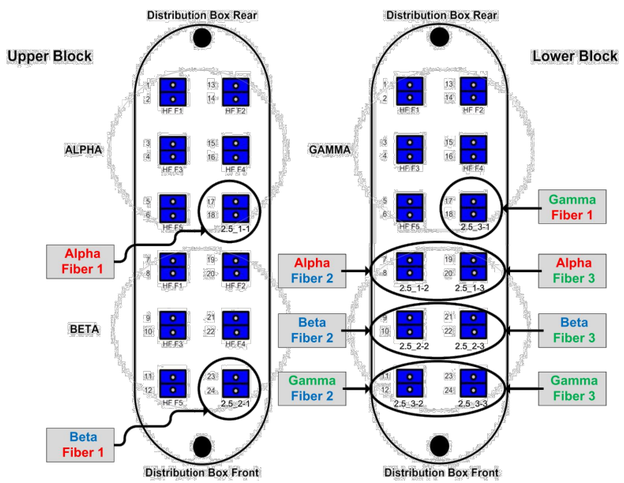
8T8R DETAIL (3)

SCALE: NTS

eCCM2-HR



Distribution Box Fiber Panel



BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (4)

SCALE: NTS

RRH TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL (5)

SCALE: NTS

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

PROJECT TITLE:
CT33XC004

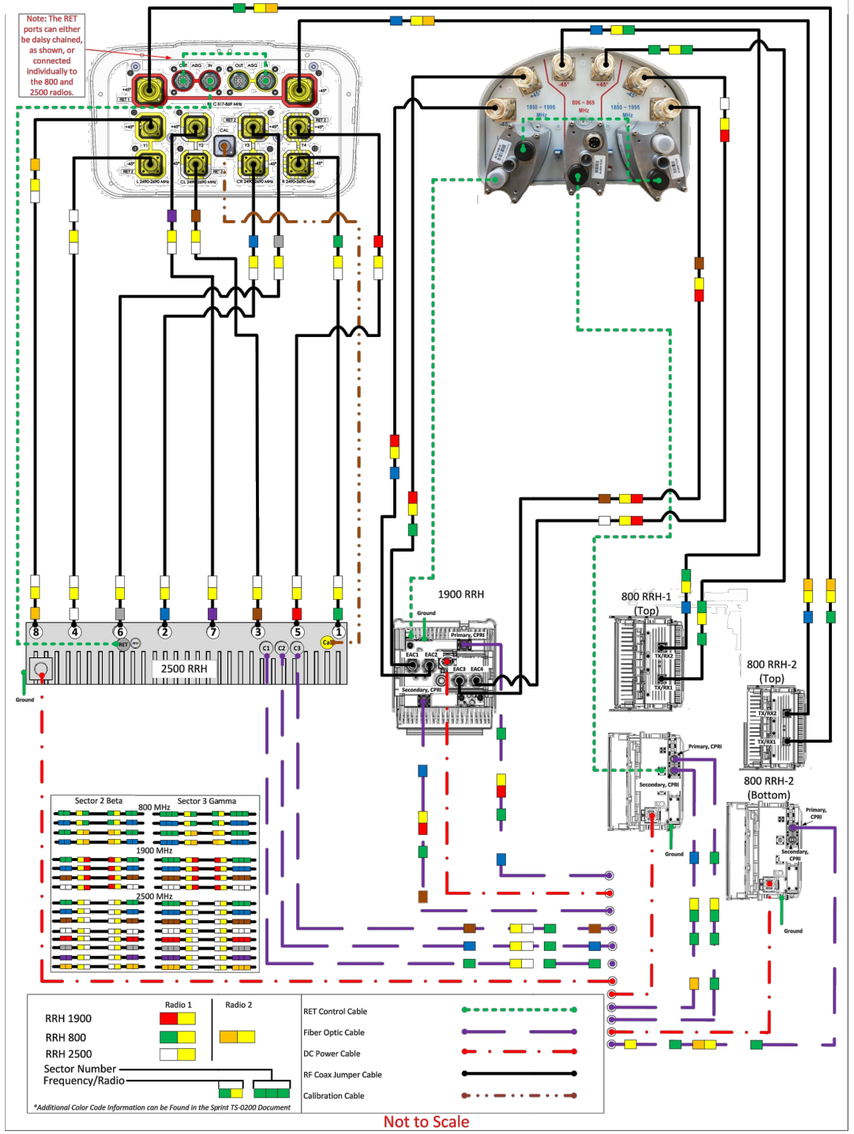
PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
FIBER PLUMBING DIAGRAM

SCALE: NONE

PROJECT NUMBER: 22972
SHEET NUMBER: A-5

ALU 211 DT465B-2XR & APXVSPP18-C-A20 wo Filters



ANTENNA COLOR CODING CHART

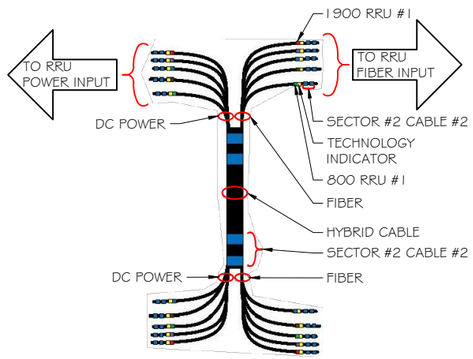
SCALE: NTS

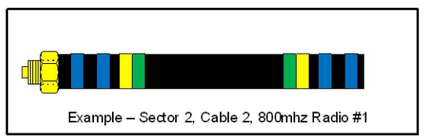
(1)

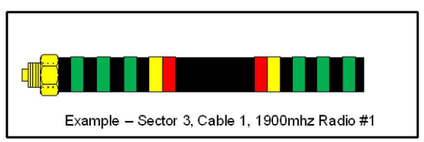
Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

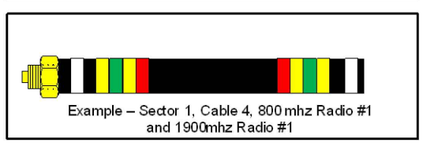
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL




Example – Sector 2, Cable 2, 800mhz Radio #1


Example – Sector 3, Cable 1, 1900mhz Radio #1


Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

COLOR CODING CHARTS

SCALE: NTS

(2)

CABLE MARKING NOTES

1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
4. THE 2" COLORED TAPE(S) SHALL BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
5. SITES WITH MORE THAN FOUR (4) SECTORS WILL REQUIRE ADDITIONAL RINGS FOR EACH SECTOR, FOLLOWING THE PATTERN. HIGH CAPACITY SITES WILL USE THE SECOND CABLE IDENTIFIED BY BLUE BANDS OF TAPE
6. HYBRID FIBER CABLE SHALL BE SECTOR IDENTIFIED INSIDE THE CABINET ON FREQUENCY BUNDLES, ON THE SEALTITE, ON THE MAIN LINE UPON EXIT OF SEALTITE, AND BEFORE AND AFTER THE BREAKOUT UNIT (MEDUSA), AS WELL AS BEFORE AND AFTER ANY ENTRANCE OR EXIT.
7. HFC "MAIN TRUNK" WILL NOT BE MARKED WITH THE FREQUENCY CODES, AS IT CONTAINS ALL FREQUENCIES.
8. INDIVIDUAL POWER PAIRS AND FIBER BUNDLES SHALL BE LABELED WITH BOTH THE CABLE AND FREQUENCY.

Sprint

6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT
JAMES R. SKOWRONSKI
26266
LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

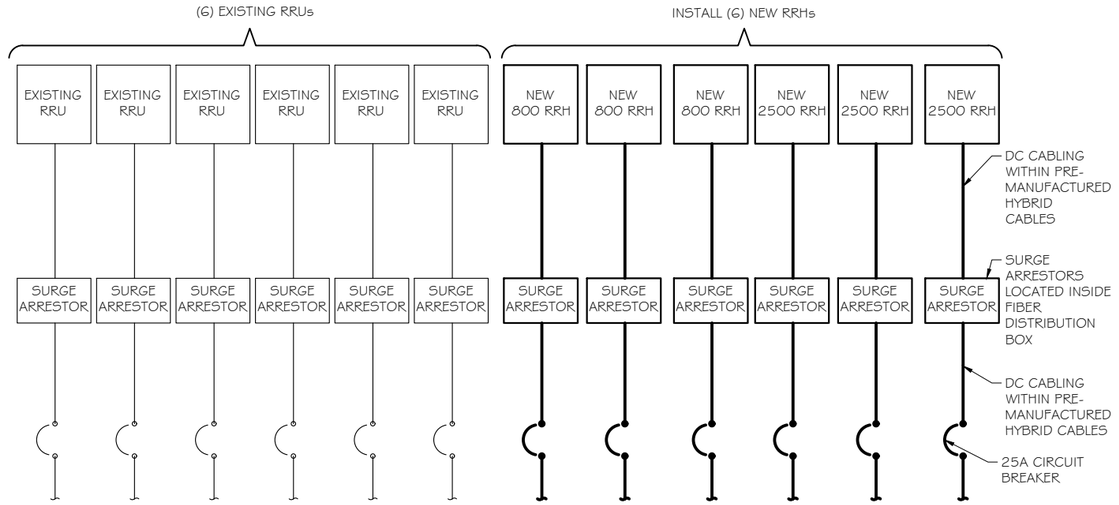
PROJECT TITLE:
CT33XC004

PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
CABLE COLOR CODING

SCALE: NONE

PROJECT NUMBER: 22972
SHEET NUMBER: A-6

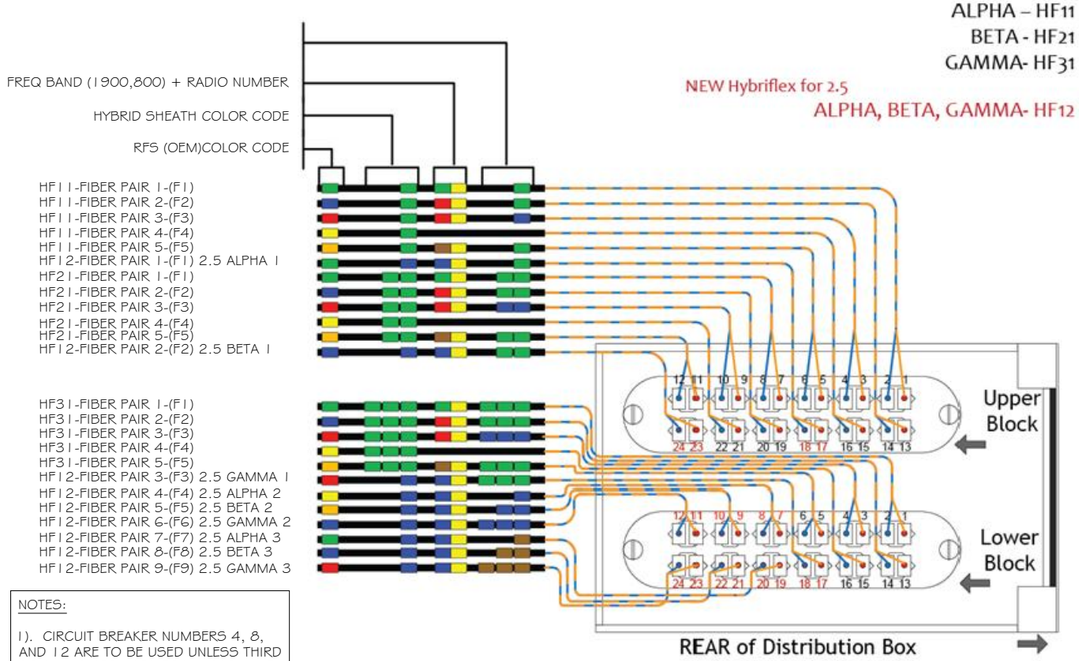


DC ONE-LINE DIAGRAM (1)
SCALE: NTS

Each sector has separate Hybriflex cable .
Hybriflex cable naming as follows:

ALPHA – HF11
BETA - HF21
GAMMA- HF31

NEW Hybriflex for 2.5
ALPHA, BETA, GAMMA- HF12



NOTES:

1). CIRCUIT BREAKER NUMBERS 4, 8, AND 12 ARE TO BE USED UNLESS THIRD DC RAIL IS REQUIRED FOR MICROWAVE.
2). USE DC POWER LOOP.
3). ALL UNUSED DC FEEDERS TO BE TERMINATED WITH WIRE NUTS AND TAPED.
4). REMOVE ALL DEBRIS FROM INTERIOR OF FIBER DISTRIBUTION BOX WHEN COMPLETE.

TYPICAL FIBER DISTRIBUTION (2)
SCALE: NTS

Sprint
6391 SPRINT PARKWAY
OVERLAND PARK, KS 66251

RAMAKER & ASSOCIATES, INC.
100% EMPLOYEE-OWNED
855 Community Dr, Sauk City, WI 53583
608-643-4100 www.Ramaker.com
Sauk City, WI • Willmar, MN
Woodcliff Lake, NJ • Bayamon, PR

Charles Cherundolo Consulting, Inc.
713 Clover Lane, Moscow, PA 18444
Phone: 570-840-5084 Fax: 570-842-5592

Certification & Seal:
I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Connecticut.

STATE OF CONNECTICUT · JAMES R. SKOWRONSKI · 26266 · LICENSED PROFESSIONAL ENGINEER

Signature: Date: 1/12/2018

MARK	DATE	DESCRIPTION

ISSUE PHASE: FINAL
DATE ISSUED: 01/12/2018

PROJECT TITLE:
CT33XC004

PROJECT INFORMATION:
33 SOUTH ROAD
STAFFORD, CT 06067
TOLLAND COUNTY

SHEET TITLE:
DC POWER & FIBER DISTRIBUTION DETAIL

SCALE: NONE

PROJECT NUMBER: 22972
SHEET NUMBER: E-1