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
12 Polly Lane, Bozrah, CT 06334

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 150' 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 05, 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
12 Polly Lane Bozrah, CT 06334

Lat: N 41.5742
Long: W72.2004

May 1, 2018

Dear Ms. Bachman:

Sprint currently maintains 3 panel antennas and 6 Remote Radio Heads at the 150' 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 150' 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 5, 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 Bozrah facility is located at 12 Polly Lane. The Site coordinates are: N41.5742, W72.2004. The existing facility consists of a 187' Guyed Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 3 antennas and 6 remote radio heads at a centerline of 150' 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:

Glenn Pinka, 1st Selectman of Bozrah – Via Fed Ex
Seymour Adelman, Planning Board Chair – Via Fed Ex
Cordless Data Transfer, Inc., the tower owner – Via Fed Ex
Barbara Maynard – 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:
Glenn Pinka, 1st Selectman of Bozrah – Via Fed Ex
Seymour Adelman, Planning Board Chair – Via Fed Ex
Cordless Data Transfer, Inc., the tower owner – Via Fed Ex
Barbara Maynard – Land Owner – Via Fed Ex

May 10,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772159699900.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	N.RENSHAW	**Delivery location:**	1 RIVER RD BOZRAH, CT 06334
Service type:	FedEx Express Saver	**Delivery date:**	May 9, 2018 15:26
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772159699900	**Ship date:**	May 4, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Glen Pianka, 1st Selectman
Town of Bozrah
1 River Road
Bozrah Town Hall
BOZRAH, CT 06334 US
Reference

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CGT33XC570 CSC sub

Thank you for choosing FedEx.

May 10,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772159720060.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	N.RENSHAW	**Delivery location:**	1 RIVER RD BOZRAH, CT 06334
Service type:	FedEx Express Saver	**Delivery date:**	May 9, 2018 15:26
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772159720060	**Ship date:**	May 4, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Seymour Adelman, Planning Chair
Town of Bozrah
1 River Road
Bozrah Town Hall
BOZRAH, CT 06334 US
Reference

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CGT33XC570 CSC sub

Thank you for choosing FedEx.

May 10,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772159758751.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	B.MAYNARD	**Delivery location:**	37 SAW MILL ROAD DAYVILLE, CT 06241
Service type:	FedEx Express Saver	**Delivery date:**	May 9, 2018 15:52
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

Shipping Information:

Tracking number:	772159758751	**Ship date:**	May 4, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Barbara Maynard
37 Saw Mill Road
DAYVILLE, CT 06241 US

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

Reference
CT33XC570 CSC to LL

Thank you for choosing FedEx.

May 10,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772159650975.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	M.LEGALT	**Delivery location:**	600 OLD HARTFORD RD COLCHESTER, CT 06415
Service type:	FedEx Express Saver	**Delivery date:**	May 9, 2018 14:59
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

Shipping Information:

Tracking number:	772159650975	**Ship date:**	May 4, 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
CT33XC570 CSC Sub

Thank you for choosing FedEx.

Google Maps

Imagery ©2018 Google, Map data ©2018 Google 100 ft

All information is for assessment purposes only. Assessments are calculated at 70% of the estimated October 1, 2017 market value which was the date of the last revaluation as completed by eQuality Valuation Services, LLC.

Information on the Property Records for the Municipality of Bozrah was last updated on 5/2/2018.

Parcel Information

Location:	POLLY LA	Property Use:	Vacant Land	Primary Use:	Commercial Vacant Land
Unique ID:	00073200	Map Block Lot:	02/039	Acres:	8.40
490 Acres:	0.00	Zone:	I-80	Volume / Page:	0084/0593
Developers Map / Lot:		Census:	7131		

Value Information

	Appraised Value	Assessed Value
Land	149,520	104,660
Buildings	0	0
Detached Outbuildings	0	0
Total	149,520	104,660

Owner's Information

Owner's Data
MAYNARD LEONARD P BARBARA A MAYNARD EXECUTRIX 37 SAW MILL ROAD DAYVILLE, CT 06241

Owner History - Sales

Owner Name	Volume	Page	Sale Date	Deed Type	Valid Sale	Sale Price
MAYNARD LEONARD P	0084	0593	09/19/2006		No	$0
MAYNARD ALICE M	0021	0524			No	$0

Information Published With Permission From The Assessor

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: CT33XC570

Bozrah
12 Polly Lane
Bozrah, CT 06334

October 20, 2017

EBI Project Number: 6217004507

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	6.89 %

EBI Consulting
environmental | engineering | due diligence

October 20, 2017

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

Emissions Analysis for Site: **CT33XC570 – Bozrah**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **12 Polly Lane, Bozrah, 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.

Public 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 **12 Polly Lane, Bozrah, 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 **150.4 feet** above ground level (AGL) for **Sector A**, **150.4 feet** above ground level (AGL) for **Sector B** and **150.4 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:	14.9 dBd	Gain:	14.9 dBd	Gain:	14.9 dBd
Height (AGL):	**150.4 feet**	Height (AGL):	**150.4 feet**	Height (AGL):	**150.4 feet**
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	7	Channel Count	7	Channel Count	7
Total TX Power(W):	140 Watts	Total TX Power(W):	140 Watts	Total TX Power(W):	140 Watts
ERP (W):	4,326.41	ERP (W):	4,326.41	ERP (W):	4,326.41
Antenna A1 MPE%	**0.75 %**	Antenna B1 MPE%	**0.75 %**	Antenna C1 MPE%	**0.75 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR
Gain:	15.05 / 13.35 dBd	Gain:	15.05 / 13.35 dBd	Gain:	15.05 / 13.35 dBd
Height (AGL):	**150.4 feet**	Height (AGL):	**150.4 feet**	Height (AGL):	**150.4 feet**
Frequency Bands	2500 MHz (BRS) / 850 MHz	Frequency Bands	2500 MHz (BRS) / 850 MHz	Frequency Bands	2500 MHz (BRS) / 850 MHz
Channel Count	11	Channel Count	11	Channel Count	11
Total TX Power(W):	310 Watts	Total TX Power(W):	310 Watts	Total TX Power(W):	310 Watts
ERP (W):	8,362.31	ERP (W):	8,362.31	ERP (W):	8,362.31
Antenna A2 MPE%	**1.87 %**	Antenna B2 MPE%	**1.87 %**	Antenna C2 MPE%	**1.87 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.61 %**
AT&T	1.04 %
Nextel	0.20 %
T-Mobile	0.98 %
Verizon Wireless	2.06 %
Site Total MPE %:	**6.89 %**

SPRINT Sector A Total:	2.61 %
SPRINT Sector B Total:	2.61 %
SPRINT Sector C Total:	2.61 %
Site Total:	6.89 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# 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 1900 MHz (PCS) CDMA	5	618.06	150.4	5.33	1900 MHz (PCS)	1000	0.53%
Sprint 1900 MHz (PCS) LTE	2	618.06	150.4	2.13	1900 MHz (PCS)	1000	0.21%
Sprint 2500 MHz (BRS) LTE	8	639.78	150.4	8.82	2500 MHz (BRS)	1000	0.88%
Sprint 850 MHz CDMA	1	648.82	150.4	1.12	850 MHz	567	0.20%
Sprint 850 MHz LTE	2	1,297.63	150.4	4.47	850 MHz	567	0.79%
						Total:	**2.61%**

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:	2.61 %
Sector B:	2.61 %
Sector C:	2.61 %
SPRINT Maximum Total (per sector):	2.61 %
Site Total:	6.89 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.89 %** 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
December 28, 2017

Nudd Job Number: 117-23243.4

Site Location: 3 Polly Lane, Bozrah, CT 06334, New London County (Latitude and Longitude: 41-34-24, -72-12-12)

Subject: Structural Analysis of an existing 187 ft Guyed Tower

Fred A. Nudd Corporation has completed a three-dimensional, finite element model structural analysis of the above noted guyed tower. This tower was analyzed considered appurtenance loads noted in the appurtenance loading table on the following page. The tower analysis was completed considering TIA-222-G design standards, which is the enforced design standard of the 2012 International Building Code, including 2016 Connecticut Building Code and Errata. The original tower and foundation dimensions have been taken from original design drawings by Fred A. Nudd Corporation (Drawing Number 02-8869-1 & 97-5463-2, dated March 27, 2002 & November 3, 1997). A 7 ft, 2 bay extension has been installed in this tower, raising the overall tower height to 187 ft (Project Number 209-13046, dated April 10, 2009) and this addition has been included in this analysis. Modifications to the tower, designed and installed by Fred A. Nudd Corporation (Project Number 113-13004, dated January 27, 2013) have been included in this analysis. Subsurface soil conditions were taken from a geotechnical report by Tower Engineering Professionals, Inc. (TEP Project Number 080004.46E, dated August 24, 2009). Additional tower information was taken from a post modification inspection report by Tower Engineering Professionals, Inc. (TEP Project Number 080004.46, dated July 24, 2009). 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 150 ft above ground level (AGL). The new equipment to be installed, which includes antennas 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 93%.

The tower base foundation and anchors were analyzed considering onsite soil information from the aforementioned geotechnical report. Based on this analysis, the foundation and anchors will be able support the proposed appurtenance loading, in addition to the existing wireless equipment and tower superstructure. Specific design loads, capacities and stress ratios are provided on 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,

STATE OF CONNECTICUT
H. DAVID TAYLOR
No. 22092
LICENSED PROFESSIONAL ENGINEER

Fred A. Nudd Corporation

Code Design Criteria

ANSI/TIA-222-G
Windspeed = 104 mph, 3-second gust, V_{asd} / 131 mph, 3-second gust, V_{ult}
Exposure = B
Radial Ice = 0.75 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 / Remaining

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
188	AT&T Mobility	(6) Powerwave 7770 (6) Powerwave LGP17201 (2) Powerwave P65-17-XLH-RR (1) Andrew SBNH-1D6565C (1) Raycap DC6-48-60-18-8F (6) Ericsson RRUs-11	(3) 10 ft Boom / Frame	(12) 1-5/8 (1) 1.34 Fiber (2) 0.65 DC
182	T-Mobile	(3) EMS RR90-17-02DP (3) Ericsson KRY112 71 (3) Commscope LNX-6515DS-VTM (3) Andrew Smart Bias Tee	(3) 12 ft Boom / Frame	(12) 1-5/8
173	--	--	(3) 12 ft Boom / Frame	--
136	Verizon	(3) Antel BXA-70063-6CF (6) Antel LPA-80080-4CF (3) Antel BXA-171085-8BF (6) RFS FD0R6004/2C-3L	(3) 12 ft Boom / Frame	(12) 1-5/8

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

Proposed Combined Appurtenance Loading – Sprint

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
150	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.*
- *Sprint's proposed coax may be installed on any tower face.*

Foundation Reaction Comparison

Design Load	Capacity (kips)	Analysis (kips)	Percentage
Base Axial	215.5	195.7	93
Anchor Uplift	86.8	57.4	66
Anchor Shear	91.7	53.1	58

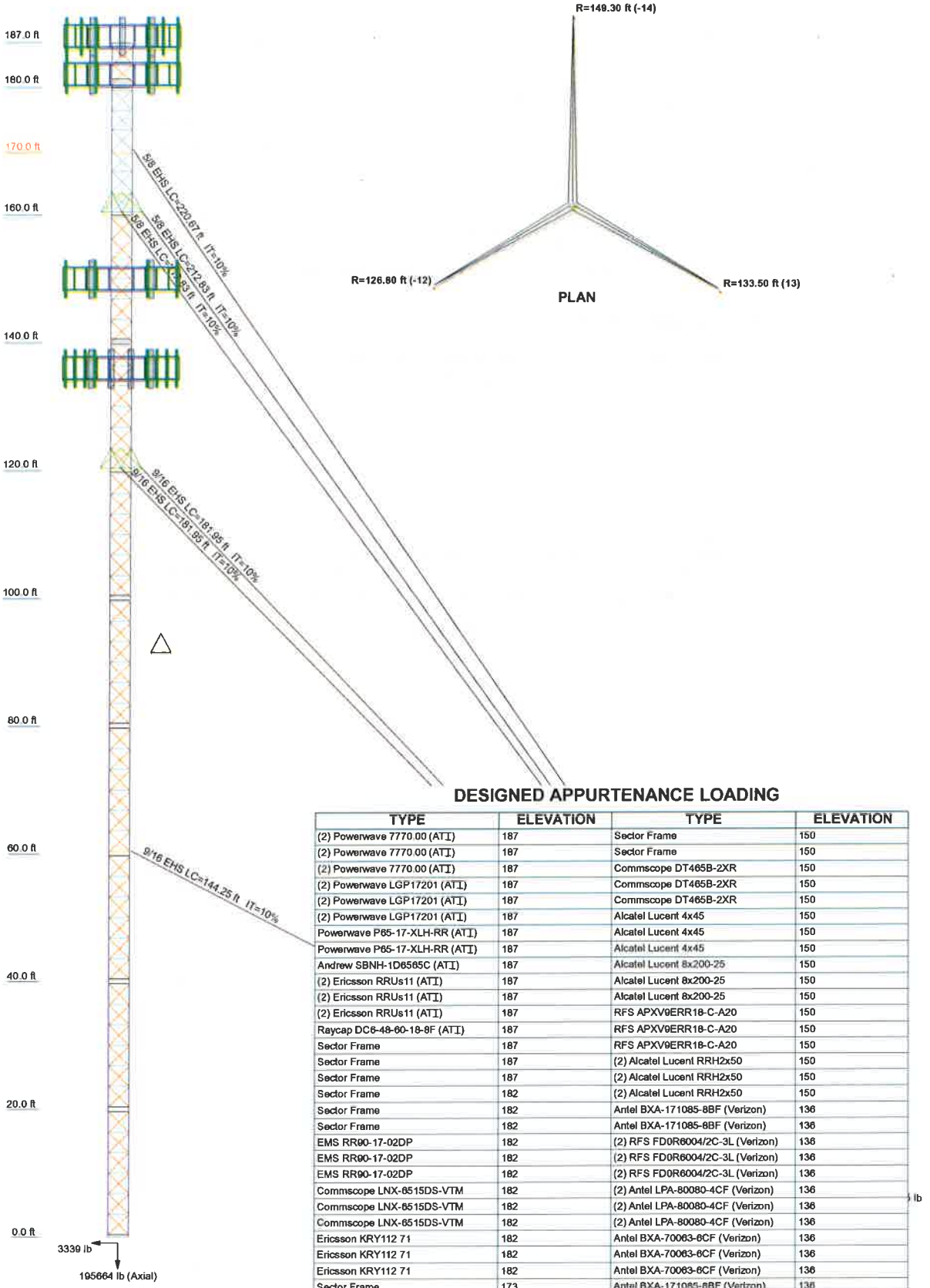
- *Percentage less than 100% denote foundation is satisfactory for loading*
- *Percentage greater than 100% indicates foundation analysis is required*

Maximum Member Usage

Member	Percentage
Leg	86
Diagonal	80
Horizontal	57
Bolts	39
Guys	67
Anchor Rod	85

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

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs					P2.5x.203					A
Leg Grade					A500M-60					SR 5/8
Diagonals					SR 5/8				C3x4.1	
Diagonal Grade					A36					
Top Girts					L1 1/2x1 1/2x3/16					
Bottom Girts		L1 1/2x1 1/2x3/16		N.A.			L1 1/2x1 1/2x3/16			
Horizontals										
Top Guy Pull-Offs		N.A.		L1 1/2x1 1/2x3/16		N.A.	L2x2x5/16	N.A.	L2x2x5/16	N.A.
Face Width (ft)					3.5					
# Panels @ (ft)					54 @ 3.20833					B
Weight (lb)	658.2	658.2	658.2	658.2	658.2	658.2	823.0	659.2	1446.3	734.8
7213.8										



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(2) Powerwave 7770.00 (ATI)	187	Sector Frame	150
(2) Powerwave 7770.00 (ATI)	187	Sector Frame	150
(2) Powerwave 7770.00 (ATI)	187	Commscope DT465B-2XR	150
(2) Powerwave LGP17201 (ATI)	187	Commscope DT465B-2XR	150
(2) Powerwave LGP17201 (ATI)	187	Commscope DT465B-2XR	150
(2) Powerwave LGP17201 (ATI)	187	Alcatel Lucent 4x45	150
Powerwave P65-17-XLH-RR (ATI)	187	Alcatel Lucent 4x45	150
Powerwave P65-17-XLH-RR (ATI)	187	Alcatel Lucent 4x45	150
Andrew SBNH-1D6565C (ATI)	187	Alcatel Lucent 8x200-25	150
(2) Ericsson RRUs11 (ATI)	187	Alcatel Lucent 8x200-25	150
(2) Ericsson RRUs11 (ATI)	187	Alcatel Lucent 8x200-25	150
(2) Ericsson RRUs11 (ATI)	187	RFS APXV9ERR18-C-A20	150
Raycap DC6-48-60-18-8F (ATI)	187	RFS APXV9ERR18-C-A20	150
Sector Frame	187	RFS APXV9ERR18-C-A20	150
Sector Frame	187	(2) Alcatel Lucent RRH2x50	150
Sector Frame	187	(2) Alcatel Lucent RRH2x50	150
Sector Frame	182	(2) Alcatel Lucent RRH2x50	150
Sector Frame	182	Antel BXA-171085-8BF (Verizon)	136
Sector Frame	182	Antel BXA-171085-8BF (Verizon)	136
EMS RR90-17-02DP	182	(2) RFS FD0R6004/2C-3L (Verizon)	136
EMS RR90-17-02DP	182	(2) RFS FD0R6004/2C-3L (Verizon)	136
EMS RR90-17-02DP	182	(2) RFS FD0R6004/2C-3L (Verizon)	136
Commscope LNX-6515DS-VTM	182	(2) Antel LPA-80080-4CF (Verizon)	136
Commscope LNX-6515DS-VTM	182	(2) Antel LPA-80080-4CF (Verizon)	136
Commscope LNX-6515DS-VTM	182	(2) Antel LPA-80080-4CF (Verizon)	136
Ericsson KRY112 71	182	Antel BXA-70063-6CF (Verizon)	136
Ericsson KRY112 71	182	Antel BXA-70063-6CF (Verizon)	136
Ericsson KRY112 71	182	Antel BXA-70063-6CF (Verizon)	136
Sector Frame	173	Antel BXA-171085-8BF (Verizon)	136
Sector Frame	173	Sector Frame	136
Sector Frame	173	Sector Frame	136
Sector Frame	150	Sector Frame	136

lb

SYMBOL LIST

	Job: 117-23243.4		
	Project: 187' G42WPAR GT Bozrah, CT		
	Client: CDT	Drawn by: FAN	App'd:
Phone:	Code: TIA-222-G	Date: 12/28/17	Scale: NTS
FAX:	Path:		Dwg No E-1

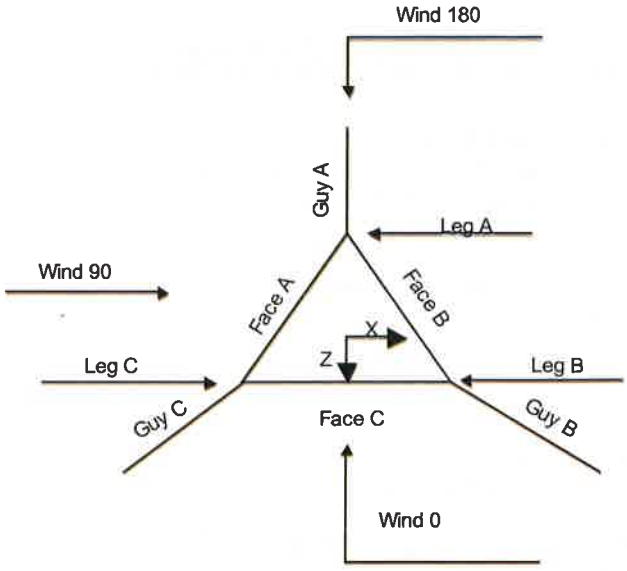
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 187.00 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 3.50 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

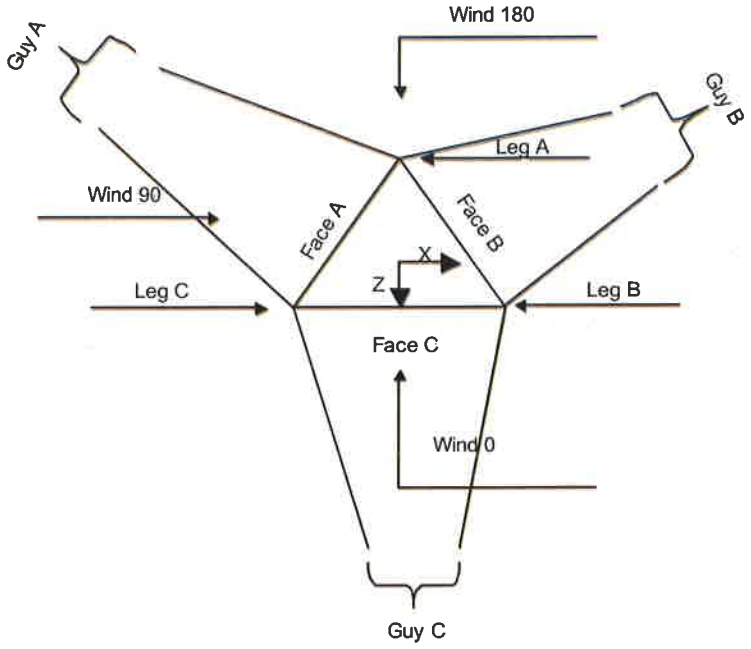
Tower is located in New London County, Connecticut.
Basic wind speed of 104 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph 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	187.00-180.00			3.50	1	7.00
T2	180.00-160.00			3.50	1	20.00
T3	160.00-140.00			3.50	1	20.00
T4	140.00-120.00			3.50	1	20.00
T5	120.00-100.00			3.50	1	20.00
T6	100.00-80.00			3.50	1	20.00
T7	80.00-60.00			3.50	1	20.00
T8	60.00-40.00			3.50	1	20.00
T9	40.00-20.00			3.50	1	20.00
T10	20.00-0.00			3.50	1	20.00

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	187.00-180.00	2.85	TX Brace	No	Yes	3.7500	11.8750
T2	180.00-160.00	3.21	X Brace	No	Yes	4.5000	4.5000
T3	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5	120.00-100.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T6	100.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8	60.00-40.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T9	40.00-20.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T10	20.00-0.00	3.21	TX Brace	No	Yes	4.5000	4.5000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 187.00-180.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 180.00-160.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Channel	C3x4.1	A36 (36 ksi)
T3 160.00-140.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 140.00-120.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 120.00-100.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 100.00-80.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 80.00-60.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 60.00-40.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 40.00-20.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 20.00-0.00	Pipe	P2.5x.203	A500M-60 (60 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 187.00-180.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 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)
T3 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)
T4 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)
T5 120.00-100.00	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 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T7 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)
T8 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)
T9 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)
T10 20.00-0.00	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 187.00-180.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T2 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 20.00-0.00	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) ft²	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 187.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 180.00-160.00	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) ft²	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
160.00-140.00			(36 ksi)					
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000
140.00-120.00			(36 ksi)					
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000
120.00-100.00			(36 ksi)					
T6	0.00	0.0000	A36	1	1	1	36.0000	36.0000
100.00-80.00			(36 ksi)					
T7 80.00-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T8 60.00-40.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T9 40.00-20.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T10 20.00-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					

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	No	1	1	1	1	0.65	0.65	1	1
187.00-180.00				1	1	1	0.65	0.65	1	1
T2	No	No	1	2.84	1	2.84	0.65	0.65	1	1
180.00-160.00				2.84	1	2.84	0.65	0.65	1	1
T3	No	No	1	1	1	1	0.65	0.65	1	1
160.00-140.00				1	1	1	0.65	0.65	1	1
T4	No	No	1	1	1	1	0.65	0.65	1	1
140.00-120.00				1	1	1	0.65	0.65	1	1
T5	No	No	1	1	1	1	0.65	0.65	1	1
120.00-100.00				1	1	1	0.65	0.65	1	1
T6	No	No	1	1	1	1	0.65	0.65	1	1
100.00-80.00				1	1	1	0.65	0.65	1	1
T7	No	No	1	1	1	1	0.65	0.65	1	1
80.00-60.00				1	1	1	0.65	0.65	1	1
T8	No	No	1	1	1	1	0.65	0.65	1	1
60.00-40.00				1	1	1	0.65	0.65	1	1
T9	No	No	1	1	1	1	0.65	0.65	1	1
40.00-20.00				1	1	1	0.65	0.65	1	1
T10	No	No	1	1	1	1	0.65	0.65	1	1
20.00-0.00				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 187.00-180.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 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
T3 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
T4 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
T5 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
T6 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
T7 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
T8 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
T9 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
T10 20.00-0.00	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 187.00-180.00	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 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
T3 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
T4 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
T5 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
T6 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
T7 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
T8 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
T9 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
T10 20.00-0.00	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 %
160.375	EHS	A	5/8	4240.00	10%	21000	0.813	228.08	149.30	0.0000	-14.00	100%
		B	5/8	4240.00	10%	21000	0.813	197.36	133.50	0.0000	13.00	100%
		C	5/8	4240.00	10%	21000	0.813	212.65	126.80	0.0000	-12.00	100%
120.375	EHS	A	9/16	3500.00	10%	21000	0.671	199.23	149.30	0.0000	-14.00	100%
		B	9/16	3500.00	10%	21000	0.671	169.65	133.50	0.0000	13.00	100%
		C	9/16	3500.00	10%	21000	0.671	181.79	126.80	0.0000	-12.00	100%
60.375	EHS	A	9/16	3500.00	10%	21000	0.671	164.86	149.30	0.0000	-14.00	100%
		B	9/16	3500.00	10%	21000	0.671	139.64	133.50	0.0000	13.00	100%
		C	9/16	3500.00	10%	21000	0.671	144.13	126.80	0.0000	-12.00	100%
170	EHS	A	5/8	4240.00	10%	21000	0.813	235.49	149.30	0.0000	-14.00	100%
		B	5/8	4240.00	10%	21000	0.813	204.61	133.50	0.0000	13.00	100%
		C	5/8	4240.00	10%	21000	0.813	220.48	126.80	0.0000	-12.00	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
160.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L3x3x1/4
120.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L3x3x1/4
60.375	Corner						
170	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
160.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L2x2x5/16
120.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L2x2x5/16
60.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16
170.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16

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

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
160.375	185.43	160.46	172.88		4.91 3.8 sec/pulse	3.69 3.3 sec/pulse	4.27 3.6 sec/pulse	
120.375	133.69	113.83	121.98		3.76 3.3 sec/pulse	2.73 2.9 sec/pulse	3.13 3.1 sec/pulse	
60.375	110.62	93.70	96.71		2.59 2.8 sec/pulse	1.86 2.4 sec/pulse	1.98 2.4 sec/pulse	
170	191.45	166.35	179.25		5.23 3.9 sec/pulse	3.96 3.4 sec/pulse	4.58 3.7 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
160.375	No	No	1	1	1	1	1	1
120.375	No	No	1	1	1	1	1	1
60.375	No	No			1	1	1	1
170	No	No			1	1	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
160.375	0.7500 A325N	2	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
120.375	0.7500 A325N	2	0.0000	0.75	0.7500 A325N	2	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
60.375	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
170	0.6250 A325N	0	0.0000	0.75	0.0000 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
160.375	A	73.19	21	5	1.6244
	B	86.69	22	5	1.6521
	C	74.19	21	5	1.6266
120.375	A	53.19	19	4	1.5733
	B	66.69	21	5	1.6093
	C	54.19	20	5	1.5763
60.375	A	23.19	16	4	1.4480
	B	36.69	17	4	1.5160

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
170	C	24.19	16	4	1.4541
	A	78.00	22	5	1.6347
	B	91.50	23	5	1.6610
	C	79.00	22	5	1.6368

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
160.375	A	49.8072	4381.64 4240.00	-66.08	3385.51	-2780.78	-6841.19	9866.26	-11849.29
	A	49.8072	4381.64 4240.00	66.08	3385.51	-2780.78	-6841.19	-9866.26	11849.29
	B	48.2525	4359.71 4240.00	2516.34	3288.21	1364.85	13289.14	10169.67	0.00
	B	48.2525	4359.71 4240.00	2440.16	3288.21	1496.79	-6644.57	-10169.67	-11508.73
	C	54.0892	4380.02 4240.00	-2152.63	3577.15	1324.66	-7228.44	8986.18	12520.03
	C	54.0892	4380.02 4240.00	-2223.50	3577.15	1201.91	14456.88	-8986.18	0.00
			Sum:	580.37	20501.74	-173.35	190.62	-0.00	1011.30
120.375	A	42.3687	3590.09 3500.00	-62.22	2455.77	-2618.03	-4962.43	9288.82	-8595.18
	A	42.3687	3590.09 3500.00	62.22	2455.77	-2618.03	-4962.43	-9288.82	8595.18
	B	39.2275	3571.99 3500.00	2407.49	2293.02	1305.81	9267.15	9729.75	0.00
	B	39.2275	3571.99 3500.00	2334.61	2293.02	1432.04	-4633.57	-9729.75	-8025.58
	C	46.6806	3588.75 3500.00	-2070.72	2639.61	1274.25	-5333.93	8644.21	9238.63
	C	46.6806	3588.75 3500.00	-2138.89	2639.61	1156.17	10667.85	-8644.21	0.00
			Sum:	532.49	14776.80	-67.79	42.64	-0.00	1213.05
60.375	A	26.7935	3549.86 3500.00	0.00	1644.21	-3146.13	-3322.49	0.00	0.00
	B	19.8153	3531.76 3500.00	2864.32	1238.65	1653.71	1251.49	0.00	-2167.64
	C	30.1148	3548.52 3500.00	-2639.91	1816.55	1524.15	1835.37	-0.00	3178.96
			Sum:	224.41	4699.41	31.74	-235.63	0.00	1011.32
170	A	51.3251	4389.46 4240.00	0.00	3464.12	-2695.78	-7000.04	0.00	0.00
	B	50.0556	4367.53 4240.00	2392.65	3382.65	1381.40	3417.70	0.00	-5919.63
	C	55.5654	4387.84 4240.00	-2112.22	3647.53	1219.49	3685.33	-0.00	6383.18
			Sum:	280.43	10494.30	-94.89	102.99	0.00	463.55

Guy-Mast Forces (Excluding Wind) - 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
160.375	A	49.8072	8275.16 / 7356.15	-119.55	6569.51	-5030.46	-13275.18	17848.18	-22993.29
	A	49.8072	8275.16 / 7356.15	119.55	6569.51	-5030.46	-13275.18	-17848.18	22993.29
	B	48.2525	7995.64 / 7199.44	4437.90	6200.10	2407.09	25057.42	17935.55	0.00
	B	48.2525	7995.64 / 7199.44	4303.55	6200.10	2639.79	-12528.71	-17935.55	-21700.36
	C	54.0892	7894.21 / 6983.87	-3707.68	6585.29	2281.58	-13307.06	15477.75	23048.50
	C	54.0892	7894.21 / 6983.87	-3829.75	6585.29	2070.16	26614.12	-15477.75	0.00
			Sum:	1204.01	38709.80	-662.30	-714.59	-0.00	1348.14
120.375	A	42.3687	6971.46 / 6330.47	-116.49	4955.77	-4901.84	-10014.26	17391.84	-17345.20
	A	42.3687	6971.46 / 6330.47	116.49	4955.77	-4901.84	-10014.26	-17391.84	17345.20
	B	39.2275	6735.18 / 6205.29	4397.78	4509.14	2385.33	18223.46	17773.42	0.00
	B	39.2275	6735.18 / 6205.29	4264.65	4509.14	2615.93	-9111.73	-17773.42	-15781.98
	C	46.6806	6625.83 / 5992.56	-3679.23	5023.83	2264.07	-10151.79	15358.97	17583.42
	C	46.6806	6625.83 / 5992.56	-3800.36	5023.83	2054.27	20303.58	-15358.97	0.00
			Sum:	1182.84	28977.48	-484.09	-765.00	-0.00	1801.44
60.375	A	26.7935	6514.42 / 6200.37	0.00	3213.09	-5666.90	-6492.77	0.00	0.00
	B	19.8153	6377.33 / 6163.43	5102.55	2440.41	2945.96	2465.70	0.00	-4270.71
	C	30.1148	6217.58 / 5910.08	-4537.29	3347.99	2619.60	3382.68	-0.00	5858.98
			Sum:	565.27	9001.48	-101.33	-644.39	0.00	1588.27
170	A	51.3251	8332.77 / 7353.98	0.00	6747.91	-4888.83	-13635.68	0.00	0.00
	B	50.0556	8048.03 / 7193.07	4228.11	6398.04	2441.10	6464.34	0.00	-11196.57
	C	55.5654	7947.61 / 6977.59	-3645.70	6741.14	2104.85	6811.00	-0.00	11797.00
			Sum:	582.41	19887.09	-342.89	-360.33	0.00	600.43

Guy-Mast Forces (Excluding Wind) - Service

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
160.375	A	49.8072	4381.64 / 4240.00	-66.08	3385.51	-2780.78	-6841.19	9866.26	-11849.29
	A	49.8072	4381.64	66.08	3385.51	-2780.78	-6841.19	-9866.26	11849.29

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
			4240.00						
	B	48.2525	4359.71	2516.34	3288.21	1364.85	13289.14	10169.67	0.00
			4240.00						
	B	48.2525	4359.71	2440.16	3288.21	1496.79	-6644.37	-10169.67	-11308.73
			4240.00						
	C	54.0892	4380.02	-2152.63	3577.15	1324.66	-7228.44	8986.18	12520.03
			4240.00						
	C	54.0892	4380.02	-2223.50	3577.15	1201.91	14456.88	-8986.18	0.00
			4240.00						
			Sum:	580.37	20501.74	-173.35	190.62	-0.00	1011.30
120.375	A	42.3687	3590.09	-62.22	2455.77	-2618.03	-4962.43	9288.82	-8595.18
			3500.00						
	A	42.3687	3590.09	62.22	2455.77	-2618.03	-4962.43	-9288.82	8595.18
			3500.00						
	B	39.2275	3571.99	2407.49	2293.02	1305.81	9267.15	9729.75	0.00
			3500.00						
	B	39.2275	3571.99	2334.61	2293.02	1432.04	-4633.57	-9729.75	-8025.58
			3500.00						
	C	46.6806	3588.75	-2070.72	2639.61	1274.25	-5333.93	8644.21	9238.63
			3500.00						
	C	46.6806	3588.75	-2138.89	2639.61	1156.17	10667.85	-8644.21	0.00
			3500.00						
			Sum:	532.49	14776.80	-67.79	42.64	-0.00	1213.05
60.375	A	26.7935	3549.86	0.00	1644.21	-3146.13	-3322.49	0.00	0.00
			3500.00						
	B	19.8153	3531.76	2864.32	1238.65	1653.71	1251.49	0.00	-2167.64
			3500.00						
	C	30.1148	3548.52	-2639.91	1816.55	1524.15	1835.37	-0.00	3178.96
			3500.00						
			Sum:	224.41	4699.41	31.74	-235.63	0.00	1011.32
170	A	51.3251	4389.46	0.00	3464.12	-2695.78	-7000.04	0.00	0.00
			4240.00						
	B	50.0556	4367.53	2392.65	3382.65	1381.40	3417.70	0.00	-5919.63
			4240.00						
	C	55.5654	4387.84	-2112.22	3647.53	1219.49	3685.33	-0.00	6383.18
			4240.00						
			Sum:	280.43	10494.30	-94.89	102.99	0.00	463.55

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 5/8 (T-Mobile)	A	No	Ar (CaAa)	182.00 - 0.00	0.0000	0.25	12	9	1.9800	1.9800		1.04
1 1/4 (Sprint)	B	No	Ar (CaAa)	150.00 - 0.00	0.0000	0.25	4	4	1.5500	1.5500		0.66
1 5/8 (AT&T)	B	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	12	4	1.9800	1.9800		1.04
1 5/8 (Verizon)	A	No	Ar (CaAa)	136.00 - 0.00	0.0000	0.4	12	6	1.9800	1.9800		1.04
0.65 DC (AT&T)	B	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	2	2	0.5800	0.0000		0.25
1.34 Fiber	B	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	0.5800	0.0000		0.25

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
(AT&T) 3" Conduit	B	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	1.0000	3.0000		2.80
(AT&T) Safety Line 3/8	C	No	Ar (CaAa)	187.00 - 0.00	0.0000	0.25	1	1	0.3750	0.3750		0.22

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	187.00-180.00	A	0.000	0.000	4.752	0.000	24.96
		B	0.000	0.000	18.732	0.000	112.21
		C	0.000	0.000	0.263	0.000	1.54
T2	180.00-160.00	A	0.000	0.000	47.520	0.000	249.60
		B	0.000	0.000	53.520	0.000	320.60
		C	0.000	0.000	0.750	0.000	4.40
T3	160.00-140.00	A	0.000	0.000	47.520	0.000	249.60
		B	0.000	0.000	59.720	0.000	347.00
		C	0.000	0.000	0.750	0.000	4.40
T4	140.00-120.00	A	0.000	0.000	85.536	0.000	449.28
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40
T5	120.00-100.00	A	0.000	0.000	95.040	0.000	499.20
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40
T6	100.00-80.00	A	0.000	0.000	95.040	0.000	499.20
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40
T7	80.00-60.00	A	0.000	0.000	95.040	0.000	499.20
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40
T8	60.00-40.00	A	0.000	0.000	95.040	0.000	499.20
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40
T9	40.00-20.00	A	0.000	0.000	95.040	0.000	499.20
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40
T10	20.00-0.00	A	0.000	0.000	95.040	0.000	499.20
		B	0.000	0.000	65.920	0.000	373.40
		C	0.000	0.000	0.750	0.000	4.40

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	187.00-180.00	A	1.781	0.000	0.000	9.604	0.000	191.70
		B		0.000	0.000	31.130	0.000	764.77
		C		0.000	0.000	2.756	0.000	34.37
T2	180.00-160.00	A	1.767	0.000	0.000	95.955	0.000	1907.81
		B		0.000	0.000	88.644	0.000	2174.41
		C		0.000	0.000	7.819	0.000	96.90
T3	160.00-140.00	A	1.745	0.000	0.000	95.822	0.000	1892.88

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
		B		0.000	0.000	107.139	0.000	2414.16
		C		0.000	0.000	7.731	0.000	94.81
T4	140.00-120.00	A	1.720	0.000	0.000	149.489	0.000	3278.72
		B		0.000	0.000	125.455	0.000	2645.20
		C		0.000	0.000	7.632	0.000	92.49
T5	120.00-100.00	A	1.692	0.000	0.000	162.587	0.000	3595.80
		B		0.000	0.000	124.644	0.000	2615.61
		C		0.000	0.000	7.518	0.000	89.85
T6	100.00-80.00	A	1.658	0.000	0.000	162.167	0.000	3556.29
		B		0.000	0.000	123.689	0.000	2580.97
		C		0.000	0.000	7.383	0.000	86.79
T7	80.00-60.00	A	1.617	0.000	0.000	161.654	0.000	3508.05
		B		0.000	0.000	122.520	0.000	2538.94
		C		0.000	0.000	7.219	0.000	83.12
T8	60.00-40.00	A	1.564	0.000	0.000	160.987	0.000	3445.57
		B		0.000	0.000	121.001	0.000	2484.90
		C		0.000	0.000	7.005	0.000	78.47
T9	40.00-20.00	A	1.486	0.000	0.000	160.017	0.000	3355.14
		B		0.000	0.000	118.792	0.000	2407.51
		C		0.000	0.000	6.693	0.000	71.95
T10	20.00-0.00	A	1.331	0.000	0.000	158.098	0.000	3177.30
		B		0.000	0.000	114.412	0.000	2258.28
		C		0.000	0.000	6.075	0.000	59.90

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	187.00-180.00	2.4943	-0.5606	0.9527	-0.2423
T2	180.00-160.00	1.0555	-1.4645	0.2564	-0.8107
T3	160.00-140.00	1.3298	-1.5170	0.4750	-0.9653
T4	140.00-120.00	0.8558	-2.3594	0.3865	-1.3870
T5	120.00-100.00	0.7460	-2.5347	0.3435	-1.5073
T6	100.00-80.00	0.7460	-2.5347	0.3452	-1.5254
T7	80.00-60.00	0.7460	-2.5347	0.3473	-1.5477
T8	60.00-40.00	0.7460	-2.5347	0.3498	-1.5767
T9	40.00-20.00	0.7460	-2.5347	0.3532	-1.6190
T10	20.00-0.00	0.7460	-2.5347	0.3594	-1.7036

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	1 5/8	180.00 - 182.00	0.6000	0.3806
T1	3	1 5/8	180.00 - 187.00	0.6000	0.3806
T1	6	0.65 DC	180.00 - 187.00	0.6000	0.3806
T1	7	1.34 Fiber	180.00 -	0.6000	0.3806

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	8	3" Conduit	187.00 - 180.00	0.6000	0.3806
T1	9	Safety Line 3/8	187.00 - 180.00	0.6000	0.3806
T2	1	1 5/8	187.00 - 160.00	0.6000	0.2566
T2	3	1 5/8	180.00 - 160.00	0.6000	0.2566
T2	6	0.65 DC	180.00 - 160.00	0.6000	0.2566
T2	7	1.34 Fiber	180.00 - 160.00	0.6000	0.2566
T2	8	3" Conduit	180.00 - 160.00	0.6000	0.2566
T2	9	Safety Line 3/8	180.00 - 160.00	0.6000	0.2566
T3	1	1 5/8	160.00 - 140.00	0.6000	0.3932
T3	2	1 1/4	160.00 - 140.00	0.6000	0.3932
T3	3	1 5/8	150.00 - 140.00	0.6000	0.3932
T3	6	0.65 DC	160.00 - 140.00	0.6000	0.3932
T3	7	1.34 Fiber	160.00 - 140.00	0.6000	0.3932
T3	8	3" Conduit	160.00 - 140.00	0.6000	0.3932
T3	9	Safety Line 3/8	160.00 - 140.00	0.6000	0.3932
T4	1	1 5/8	140.00 - 120.00	0.6000	0.3969
T4	2	1 1/4	140.00 - 120.00	0.6000	0.3969
T4	3	1 5/8	140.00 - 120.00	0.6000	0.3969
T4	5	1 5/8	140.00 - 120.00	0.6000	0.3969
T4	6	0.65 DC	136.00 - 120.00	0.6000	0.3969
T4	7	1.34 Fiber	140.00 - 120.00	0.6000	0.3969
T4	8	3" Conduit	140.00 - 120.00	0.6000	0.3969
T4	9	Safety Line 3/8	140.00 - 120.00	0.6000	0.3969
T5	1	1 5/8	140.00 - 100.00	0.6000	0.4047
T5	2	1 1/4	120.00 - 100.00	0.6000	0.4047
T5	3	1 5/8	120.00 - 100.00	0.6000	0.4047
T5	5	1 5/8	120.00 - 100.00	0.6000	0.4047
T5	6	0.65 DC	120.00 - 100.00	0.6000	0.4047
T5	7	1.34 Fiber	120.00 - 100.00	0.6000	0.4047
T5	8	3" Conduit	120.00 - 100.00	0.6000	0.4047
T5	9	Safety Line 3/8	120.00 - 100.00	0.6000	0.4047

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			120.00		
T6	1	1 5/8	80.00 - 100.00	0.6000	0.4119
T6	2	1 1/4	80.00 - 100.00	0.6000	0.4119
T6	3	1 5/8	80.00 - 100.00	0.6000	0.4119
T6	5	1 5/8	80.00 - 100.00	0.6000	0.4119
T6	6	0.65 DC	80.00 - 100.00	0.6000	0.4119
T6	7	1.34 Fiber	80.00 - 100.00	0.6000	0.4119
T6	8	3" Conduit	80.00 - 100.00	0.6000	0.4119
T6	9	Safety Line 3/8	80.00 - 100.00	0.6000	0.4119
T7	1	1 5/8	60.00 - 80.00	0.6000	0.4208
T7	2	1 1/4	60.00 - 80.00	0.6000	0.4208
T7	3	1 5/8	60.00 - 80.00	0.6000	0.4208
T7	5	1 5/8	60.00 - 80.00	0.6000	0.4208
T7	6	0.65 DC	60.00 - 80.00	0.6000	0.4208
T7	7	1.34 Fiber	60.00 - 80.00	0.6000	0.4208
T7	8	3" Conduit	60.00 - 80.00	0.6000	0.4208
T7	9	Safety Line 3/8	60.00 - 80.00	0.6000	0.4208
T8	1	1 5/8	40.00 - 60.00	0.6000	0.4325
T8	2	1 1/4	40.00 - 60.00	0.6000	0.4325
T8	3	1 5/8	40.00 - 60.00	0.6000	0.4325
T8	5	1 5/8	40.00 - 60.00	0.6000	0.4325
T8	6	0.65 DC	40.00 - 60.00	0.6000	0.4325
T8	7	1.34 Fiber	40.00 - 60.00	0.6000	0.4325
T8	8	3" Conduit	40.00 - 60.00	0.6000	0.4325
T8	9	Safety Line 3/8	40.00 - 60.00	0.6000	0.4325
T9	1	1 5/8	20.00 - 40.00	0.6000	0.4495
T9	2	1 1/4	20.00 - 40.00	0.6000	0.4495
T9	3	1 5/8	20.00 - 40.00	0.6000	0.4495
T9	5	1 5/8	20.00 - 40.00	0.6000	0.4495
T9	6	0.65 DC	20.00 - 40.00	0.6000	0.4495
T9	7	1.34 Fiber	20.00 - 40.00	0.6000	0.4495
T9	8	3" Conduit	20.00 - 40.00	0.6000	0.4495
T9	9	Safety Line 3/8	20.00 - 40.00	0.6000	0.4495
T10	1	1 5/8	0.00 - 20.00	0.6000	0.4836
T10	2	1 1/4	0.00 - 20.00	0.6000	0.4836
T10	3	1 5/8	0.00 - 20.00	0.6000	0.4836
T10	5	1 5/8	0.00 - 20.00	0.6000	0.4836
T10	6	0.65 DC	0.00 - 20.00	0.6000	0.4836
T10	7	1.34 Fiber	0.00 - 20.00	0.6000	0.4836
T10	8	3" Conduit	0.00 - 20.00	0.6000	0.4836
T10	9	Safety Line 3/8	0.00 - 20.00	0.6000	0.4836

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(2) Antel LPA-80080-4CF	A	From Leg	3.00		0.0000	136.00	No Ice	2.62	5.40	12.00
(Verizon)			0.00				1/2" Ice	2.92	5.71	45.10
			0.00				1" Ice	3.52	4.72	66.78
(2) Antel LPA-80080-4CF	B	From Leg	3.00		0.0000	136.00	No Ice	2.62	5.40	12.00

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	2.92	5.71	45.10
			0.00				1" Ice	3.52	4.72	66.78
(2) Antel LPA-80080-4CF (Verizon)	C	From Leg	3.00	0.0000		136.00	No Ice	2.62	5.40	12.00
			0.00				1/2" Ice	2.92	5.71	45.10
			0.00				1" Ice	3.52	4.72	66.78
Antel BXA-70063-6CF (Verizon)	A	From Leg	3.00	0.0000		136.00	No Ice	7.57	2.43	17.00
			0.00				1/2" Ice	8.02	2.91	59.50
			0.00				1" Ice	2.53	3.99	50.65
Antel BXA-70063-6CF (Verizon)	B	From Leg	3.00	0.0000		136.00	No Ice	7.57	2.43	17.00
			0.00				1/2" Ice	8.02	2.91	59.50
			0.00				1" Ice	2.53	3.99	50.65
Antel BXA-70063-6CF (Verizon)	C	From Leg	3.00	0.0000		136.00	No Ice	7.57	2.43	17.00
			0.00				1/2" Ice	8.02	2.91	59.50
			0.00				1" Ice	2.53	3.99	50.65
(2) Powerwave 7770.00 (AT&T)	A	From Leg	3.00	0.0000		187.00	No Ice	5.88	2.93	35.00
			0.00				1/2" Ice	6.25	3.29	67.60
			1.00				1" Ice	6.64	3.64	105.10
(2) Powerwave 7770.00 (AT&T)	B	From Leg	3.00	0.0000		187.00	No Ice	5.88	2.93	35.00
			0.00				1/2" Ice	6.25	3.29	67.60
			1.00				1" Ice	6.64	3.64	105.10
(2) Powerwave 7770.00 (AT&T)	C	From Leg	3.00	0.0000		187.00	No Ice	5.88	2.93	35.00
			0.00				1/2" Ice	6.25	3.29	67.60
			1.00				1" Ice	6.64	3.64	105.10
(2) Powerwave LGP17201 (AT&T)	A	From Leg	3.00	0.0000		187.00	No Ice	1.95	0.50	31.00
			0.00				1/2" Ice	2.11	0.60	41.90
			1.00				1" Ice	2.28	0.72	55.20
(2) Powerwave LGP17201 (AT&T)	B	From Leg	3.00	0.0000		187.00	No Ice	1.95	0.50	31.00
			0.00				1/2" Ice	2.11	0.60	41.90
			1.00				1" Ice	2.28	0.72	55.20
(2) Powerwave LGP17201 (AT&T)	C	From Leg	3.00	0.0000		187.00	No Ice	1.95	0.50	31.00
			0.00				1/2" Ice	2.11	0.60	41.90
			1.00				1" Ice	2.28	0.72	55.20
Antel BXA-171085-8BF (Verizon)	A	From Leg	3.00	0.0000		136.00	No Ice	2.94	2.16	10.50
			0.00				1/2" Ice	3.25	2.48	29.30
			0.00				1" Ice	2.53	3.99	50.65
Antel BXA-171085-8BF (Verizon)	B	From Leg	3.00	0.0000		136.00	No Ice	2.94	2.16	10.50
			0.00				1/2" Ice	3.25	2.48	29.30
			0.00				1" Ice	2.53	3.99	50.65
Antel BXA-171085-8BF (Verizon)	C	From Leg	3.00	0.0000		136.00	No Ice	2.94	2.16	10.50
			0.00				1/2" Ice	3.25	2.48	29.30
			0.00				1" Ice	2.53	3.99	50.65
(2) RFS FD0R6004/2C-3L (Verizon)	A	From Leg	3.00	0.0000		136.00	No Ice	0.00	0.08	2.60
			0.00				1/2" Ice	0.00	0.12	4.90
			0.00				1" Ice	2.53	3.99	50.65
(2) RFS FD0R6004/2C-3L (Verizon)	B	From Leg	3.00	0.0000		136.00	No Ice	0.00	0.08	2.60
			0.00				1/2" Ice	0.00	0.12	4.90
			0.00				1" Ice	2.53	3.99	50.65
(2) RFS FD0R6004/2C-3L (Verizon)	A	From Leg	3.00	0.0000		136.00	No Ice	0.00	0.08	2.60
			0.00				1/2" Ice	0.00	0.12	4.90
			0.00				1" Ice	2.53	3.99	50.65
Powerwave P65-17-XLH-RR (AT&T)	A	From Leg	3.00	0.0000		187.00	No Ice	11.47	4.00	62.00
			0.00				1/2" Ice	12.08	4.68	124.10
			1.00				1" Ice	12.69	5.32	193.70
Powerwave P65-17-XLH-RR (AT&T)	B	From Leg	3.00	0.0000		187.00	No Ice	11.47	4.00	62.00
			0.00				1/2" Ice	12.08	4.68	124.10
			1.00				1" Ice	12.69	5.32	193.70
Andrew SBNH-1D6565C	C	From Leg	3.00	0.0000		187.00	No Ice	11.41	7.70	60.90

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	12.03	8.36	126.60
			1.00				1" Ice	12.64	9.00	199.90
(2) Ericsson RRUs11 (AT&T)	A	From Leg	3.00	0.0000	187.00		No Ice	2.99	0.36	50.00
			0.00				1/2" Ice	3.19	0.48	63.50
			1.00				1" Ice	3.41	0.60	79.60
(2) Ericsson RRUs11 (AT&T)	B	From Leg	3.00	0.0000	187.00		No Ice	2.99	0.36	50.00
			0.00				1/2" Ice	3.19	0.48	63.50
			1.00				1" Ice	3.41	0.60	79.60
(2) Ericsson RRUs11 (AT&T)	C	From Leg	3.00	0.0000	187.00		No Ice	2.99	0.36	50.00
			0.00				1/2" Ice	3.19	0.48	63.50
			1.00				1" Ice	3.41	0.60	79.60
Raycap DC6-48-60-18-8F (AT&T)	A	From Leg	3.00	0.0000	187.00		No Ice	2.57	2.57	31.80
			0.00				1/2" Ice	2.77	2.77	54.40
			1.00				1" Ice	2.98	2.98	80.10
Sector Frame	A	From Leg	0.00	0.0000	136.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	B	From Leg	0.00	0.0000	136.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	C	From Leg	0.00	0.0000	136.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	A	From Leg	0.00	0.0000	173.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	B	From Leg	0.00	0.0000	173.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	C	From Leg	0.00	0.0000	173.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	A	From Leg	0.00	0.0000	182.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	B	From Leg	0.00	0.0000	182.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	C	From Leg	0.00	0.0000	182.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	A	From Leg	0.00	0.0000	187.00		No Ice	14.40	7.00	251.00
			0.00				1/2" Ice	18.00	9.00	344.00
			0.00				1" Ice	24.00	12.00	437.00
Sector Frame	B	From Leg	0.00	0.0000	187.00		No Ice	14.40	7.00	251.00
			0.00				1/2" Ice	18.00	9.00	344.00
			0.00				1" Ice	24.00	12.00	437.00
Sector Frame	C	From Leg	0.00	0.0000	187.00		No Ice	14.40	7.00	251.00
			0.00				1/2" Ice	18.00	9.00	344.00
			0.00				1" Ice	24.00	12.00	437.00
Sector Frame	A	From Leg	0.00	0.0000	150.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	B	From Leg	0.00	0.0000	150.00		No Ice	17.50	8.75	465.00
			0.00				1/2" Ice	22.50	11.00	600.00
			0.00				1" Ice	28.50	14.00	735.00
Sector Frame	C	From Leg	0.00	0.0000	150.00		No Ice	17.50	8.75	465.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	22.50	11.00	600.00
			0.00			1" Ice	28.50	14.00	735.00
EMS RR90-17-02DP	A	From Leg	3.00	0.0000	182.00	No Ice	4.36	2.00	14.00
			0.00			1/2" Ice	4.71	2.40	36.50
			0.00			1" Ice	5.06	2.80	59.00
EMS RR90-17-02DP	B	From Leg	3.00	0.0000	182.00	No Ice	4.36	2.00	14.00
			0.00			1/2" Ice	4.71	2.40	36.50
			0.00			1" Ice	5.06	2.80	59.00
EMS RR90-17-02DP	C	From Leg	3.00	0.0000	182.00	No Ice	4.36	2.00	14.00
			0.00			1/2" Ice	4.71	2.40	36.50
			0.00			1" Ice	5.06	2.80	59.00
Commscope LNX-6515DS-VTM	A	From Leg	3.00	0.0000	182.00	No Ice	11.39	4.47	44.00
			0.00			1/2" Ice	12.00	5.13	109.60
			0.00			1" Ice	5.06	2.80	59.00
Commscope LNX-6515DS-VTM	B	From Leg	3.00	0.0000	182.00	No Ice	11.39	4.47	44.00
			0.00			1/2" Ice	12.00	5.13	109.60
			0.00			1" Ice	5.06	2.80	59.00
Commscope LNX-6515DS-VTM	C	From Leg	3.00	0.0000	182.00	No Ice	11.39	4.47	44.00
			0.00			1/2" Ice	12.00	5.13	109.60
			0.00			1" Ice	5.06	2.80	59.00
Ericsson KRY112 71	A	From Leg	3.00	0.0000	182.00	No Ice	0.58	0.23	20.00
			0.00			1/2" Ice	0.68	0.32	25.20
			0.00			1" Ice	5.06	2.80	59.00
Ericsson KRY112 71	A	From Leg	3.00	0.0000	182.00	No Ice	0.58	0.23	20.00
			0.00			1/2" Ice	0.68	0.32	25.20
			0.00			1" Ice	5.06	2.80	59.00
Ericsson KRY112 71	A	From Leg	3.00	0.0000	182.00	No Ice	0.58	0.23	20.00
			0.00			1/2" Ice	0.68	0.32	25.20
			0.00			1" Ice	5.06	2.80	59.00
Commscope DT465B-2XR	A	From Leg	3.00	0.0000	150.00	No Ice	9.22	5.87	50.00
			0.00			1/2" Ice	10.14	6.79	172.40
			0.00			1" Ice	11.07	7.70	320.70
Commscope DT465B-2XR	B	From Leg	3.00	0.0000	150.00	No Ice	9.22	5.87	50.00
			0.00			1/2" Ice	10.14	6.79	172.40
			0.00			1" Ice	11.07	7.70	320.70
Commscope DT465B-2XR	C	From Leg	3.00	0.0000	150.00	No Ice	9.22	5.87	50.00
			0.00			1/2" Ice	10.14	6.79	172.40
			0.00			1" Ice	11.07	7.70	320.70
Alcatel Lucent 4x45	A	From Leg	3.00	0.0000	150.00	No Ice	2.54	1.61	51.00
			0.00			1/2" Ice	2.92	1.96	94.30
			0.00			1" Ice	3.35	2.33	150.90
Alcatel Lucent 4x45	B	From Leg	3.00	0.0000	150.00	No Ice	2.54	1.61	51.00
			0.00			1/2" Ice	2.92	1.96	94.30
			0.00			1" Ice	3.35	2.33	150.90
Alcatel Lucent 4x45	C	From Leg	3.00	0.0000	150.00	No Ice	2.54	1.61	51.00
			0.00			1/2" Ice	2.92	1.96	94.30
			0.00			1" Ice	3.35	2.33	150.90
Alcatel Lucent 8x200-25	A	From Leg	3.00	0.0000	150.00	No Ice	4.05	1.53	70.00
			0.00			1/2" Ice	4.50	1.88	127.80
			0.00			1" Ice	4.99	2.26	200.50
Alcatel Lucent 8x200-25	B	From Leg	3.00	0.0000	150.00	No Ice	4.05	1.53	70.00
			0.00			1/2" Ice	4.50	1.88	127.80
			0.00			1" Ice	4.99	2.26	200.50
Alcatel Lucent 8x200-25	C	From Leg	3.00	0.0000	150.00	No Ice	4.05	1.53	70.00
			0.00			1/2" Ice	4.50	1.88	127.80
			0.00			1" Ice	4.99	2.26	200.50
RFS APXV9ERR18-C-A20	A	From Leg	3.00	0.0000	150.00	No Ice	8.02	5.81	62.00

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
			0.00					1/2" Ice	8.93	6.73	172.10
			0.00					1" Ice	9.86	7.64	307.60
RFS APXV9ERR18-C-A20	B	From Leg	3.00			0.0000	150.00	No Ice	8.02	5.81	62.00
			0.00					1/2" Ice	8.93	6.73	172.10
			0.00					1" Ice	9.86	7.64	307.60
RFS APXV9ERR18-C-A20	C	From Leg	3.00			0.0000	150.00	No Ice	8.02	5.81	62.00
			0.00					1/2" Ice	8.93	6.73	172.10
			0.00					1" Ice	9.86	7.64	307.60
(2) Alcatel Lucent RRH2x50	A	From Leg	3.00			0.0000	150.00	No Ice	2.27	1.35	42.00
			0.00					1/2" Ice	2.64	1.68	79.60
			0.00					1" Ice	3.05	2.04	129.60
(2) Alcatel Lucent RRH2x50	B	From Leg	3.00			0.0000	150.00	No Ice	2.27	1.35	42.00
			0.00					1/2" Ice	2.64	1.68	79.60
			0.00					1" Ice	3.05	2.04	129.60
(2) Alcatel Lucent RRH2x50	C	From Leg	3.00			0.0000	150.00	No Ice	2.27	1.35	42.00
			0.00					1/2" Ice	2.64	1.68	79.60
			0.00					1" Ice	3.05	2.04	129.60

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	183.50	1.175	28	26.177	A	1.223	4.230	3.354	61.51	4.752	0.000
187.00-180.00					B	1.223	4.230		61.51	18.732	0.000
					C	1.223	4.230		61.51	0.263	0.000
T2	170.00	1.15	27	74.792	A	16.258	9.583	9.583	37.09	47.520	0.000
180.00-160.00					B	16.258	9.583		37.09	53.520	0.000
					C	16.258	9.583		37.09	0.750	0.000
T3	150.00	1.11	26	74.792	A	2.853	12.348	9.583	63.05	47.520	0.000
160.00-140.00					B	2.853	12.348		63.05	59.720	0.000
					C	2.853	12.348		63.05	0.750	0.000
T4	130.00	1.065	25	74.792	A	2.989	12.348	9.583	62.49	85.536	0.000
140.00-120.00					B	2.989	12.348		62.49	65.920	0.000
					C	2.989	12.348		62.49	0.750	0.000
T5	110.00	1.016	24	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
120.00-100.00					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T6	90.00	0.959	23	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
100.00-80.00					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T7 80.00-60.00	70.00	0.892	21	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T8 60.00-40.00	50.00	0.811	19	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	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
T9 40.00-20.00	30.00	0.701	16	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T10 20.00-0.00	10.00	0.7	16	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	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 187.00-180.00	183.50	1.175	6	1.7808	28.255	A	1.223	16.279	7.509	42.91	9.604	0.000
						B	1.223	16.279		42.91	31.130	0.000
						C	1.223	16.279		42.91	2.756	0.000
T2 180.00-160.00	170.00	1.15	6	1.7672	80.682	A	16.258	43.719	21.365	35.62	95.955	0.000
						B	16.258	43.719		35.62	88.644	0.000
						C	16.258	43.719		35.62	7.819	0.000
T3 160.00-140.00	150.00	1.11	6	1.7452	80.609	A	2.853	46.059	21.218	43.38	95.822	0.000
						B	2.853	46.059		43.38	107.159	0.000
						C	2.853	46.059		43.38	7.731	0.000
T4 140.00-120.00	130.00	1.065	6	1.7204	80.526	A	2.989	45.580	21.053	43.35	149.489	0.000
						B	2.989	45.580		43.35	125.455	0.000
						C	2.989	45.580		43.35	7.632	0.000
T5 120.00-100.00	110.00	1.016	6	1.6919	80.431	A	2.853	45.030	20.863	43.57	162.587	0.000
						B	2.853	45.030		43.57	124.644	0.000
						C	2.853	45.030		43.57	7.518	0.000
T6 100.00-80.00	90.00	0.959	5	1.6583	80.319	A	2.853	44.380	20.639	43.70	162.167	0.000
						B	2.853	44.380		43.70	123.689	0.000
						C	2.853	44.380		43.70	7.383	0.000
T7 80.00-60.00	70.00	0.892	5	1.6171	80.182	A	2.853	43.585	20.364	43.85	161.654	0.000
						B	2.853	43.585		43.85	122.520	0.000
						C	2.853	43.585		43.85	7.219	0.000
T8 60.00-40.00	50.00	0.811	4	1.5636	80.004	A	2.853	42.552	20.008	44.07	160.987	0.000
						B	2.853	42.552		44.07	121.001	0.000
						C	2.853	42.552		44.07	7.005	0.000
T9 40.00-20.00	30.00	0.701	4	1.4858	79.744	A	2.853	41.048	19.488	44.39	160.017	0.000
						B	2.853	41.048		44.39	118.792	0.000
						C	2.853	41.048		44.39	6.693	0.000
T10 20.00-0.00	10.00	0.7	4	1.3312	79.229	A	2.853	38.062	18.458	45.11	158.098	0.000
						B	2.853	38.062		45.11	114.412	0.000
						C	2.853	38.062		45.11	6.075	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	183.50	1.175	9	26.177	A	1.223	4.230	3.354	61.31	4.752	0.000
187.00-180.00					B	1.223	4.230		61.31	18.732	0.000
					C	1.223	4.230		61.31	0.263	0.000
T2	170.00	1.15	9	74.792	A	16.258	9.583	9.583	37.09	47.520	0.000
180.00-160.00					B	16.258	9.583		37.09	53.520	0.000
					C	16.258	9.583		37.09	0.750	0.000
T3	150.00	1.11	9	74.792	A	2.853	12.348	9.583	63.05	47.520	0.000
160.00-140.00					B	2.853	12.348		63.05	59.720	0.000
					C	2.853	12.348		63.05	0.750	0.000
T4	130.00	1.065	8	74.792	A	2.989	12.348	9.583	62.49	85.536	0.000
140.00-120.00					B	2.989	12.348		62.49	65.920	0.000
					C	2.989	12.348		62.49	0.750	0.000
T5	110.00	1.016	8	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
120.00-100.00					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T6	90.00	0.959	8	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
100.00-80.00					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T7 80.00-60.00	70.00	0.892	7	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T8 60.00-40.00	50.00	0.811	6	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T9 40.00-20.00	30.00	0.701	5	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	0.000
T10 20.00-0.00	10.00	0.7	5	74.792	A	2.853	12.348	9.583	63.05	95.040	0.000
					B	2.853	12.348		63.05	65.920	0.000
					C	2.853	12.348		63.05	0.750	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	138.71	234.83	A	0.208	2.569	28	1	1	3.659	556.02	79.43	C
187.00-180.00			B	0.208	2.569		1	1	3.659			
			C	0.208	2.569		1	1	3.659			
T2	574.60	1205.82	A	0.346	2.182	27	1	1	22.146	2516.78	125.84	C
180.00-160.00		TA 242.49	B	0.346	2.182		1	1	22.146			
			C	0.346	2.182		1	1	22.146			
T3	601.00	658.24	A	0.203	2.585	26	1	1	9.953	2009.50	100.47	C
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	827.08	680.49	A	0.205	2.579	25	1	1	10.093	2500.72	125.04	C
140.00-120.00		TA 242.49	B	0.205	2.579		1	1	10.093			
			C	0.205	2.579		1	1	10.093			
T5	877.00	658.24	A	0.203	2.585	24	1	1	9.953	2493.90	124.69	C
120.00-100.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	877.00	658.24	A	0.203	2.585	23	1	1	9.953	2354.93	117.75	C
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	877.00	658.24	A	0.203	2.585	21	1	1	9.953	2191.77	109.59	C
80.00-60.00			B	0.203	2.585		1	1	9.953			

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	0.203	2.585		1	1	9.953			
T8	877.00	658.24	A	0.203	2.585	19	1	1	9.953	1990.87	99.54	C
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9	877.00	658.24	A	0.203	2.585	16	1	1	9.953	1720.52	86.03	C
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T10	877.00	658.24	A	0.203	2.585	16	1	1	9.953	1719.06	85.95	C
20.00-0.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
Sum Weight:	7403.39	7213.83								20054.08		

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	138.71	234.83	A	0.208	2.569	28	0.8	1	3.415	541.25	77.32	C
187.00-180.00			B	0.208	2.569		0.8	1	3.415			
			C	0.208	2.569		0.8	1	3.415			
T2	574.60	1205.82	A	0.346	2.182	27	0.8	1	18.894	2353.55	117.68	C
180.00-160.00		TA 242.49	B	0.346	2.182		0.8	1	18.894			
			C	0.346	2.182		0.8	1	18.894			
T3	601.00	658.24	A	0.203	2.585	26	0.8	1	9.383	1976.75	98.84	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			
T4	827.08	680.49	A	0.205	2.579	25	0.8	1	9.496	2467.87	123.39	C
140.00-120.00		TA 242.49	B	0.205	2.579		0.8	1	9.496			
			C	0.205	2.579		0.8	1	9.496			
T5	877.00	658.24	A	0.203	2.585	24	0.8	1	9.383	2463.93	123.20	C
120.00-100.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	877.00	658.24	A	0.203	2.585	23	0.8	1	9.383	2326.64	116.33	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			
T7	877.00	658.24	A	0.203	2.585	21	0.8	1	9.383	2165.43	108.27	C
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	877.00	658.24	A	0.203	2.585	19	0.8	1	9.383	1966.95	98.35	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			
T9	877.00	658.24	A	0.203	2.585	16	0.8	1	9.383	1699.84	84.99	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			
T10	877.00	658.24	A	0.203	2.585	16	0.8	1	9.383	1698.41	84.92	C
20.00-0.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
Sum Weight:	7403.39	7213.83								19660.63		

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	138.71	234.83	A	0.208	2.569	28	0.85	1	3.476	544.94	77.85	C
187.00-180.00			B	0.208	2.569		0.85	1	3.476			
			C	0.208	2.569		0.85	1	3.476			
T2	574.60	1205.82	A	0.346	2.182	27	0.85	1	19.707	2394.36	119.72	C
180.00-160.00		TA 242.49	B	0.346	2.182		0.85	1	19.707			
			C	0.346	2.182		0.85	1	19.707			
T3	601.00	658.24	A	0.203	2.585	26	0.85	1	9.526	1984.94	99.25	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			
T4	827.08	680.49	A	0.205	2.579	25	0.85	1	9.645	2476.08	123.80	C
140.00-120.00		TA 242.49	B	0.205	2.579		0.85	1	9.645			
			C	0.205	2.579		0.85	1	9.645			
T5	877.00	658.24	A	0.203	2.585	24	0.85	1	9.526	2471.42	123.57	C
120.00-100.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	877.00	658.24	A	0.203	2.585	23	0.85	1	9.526	2333.71	116.69	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			
T7	877.00	658.24	A	0.203	2.585	21	0.85	1	9.526	2172.02	108.60	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	877.00	658.24	A	0.203	2.585	19	0.85	1	9.526	1972.93	98.65	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			
T9	877.00	658.24	A	0.203	2.585	16	0.85	1	9.526	1705.01	85.25	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			
T10	877.00	658.24	A	0.203	2.585	16	0.85	1	9.526	1703.57	85.18	C
20.00-0.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
Sum Weight:	7403.39	7213.83								19759.00		

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	990.84	998.40	A	0.619	1.793	6	1	1	13.533	221.85	31.69	C
187.00-180.00			B	0.619	1.793		1	1	13.533			
			C	0.619	1.793		1	1	13.533			
T2	4179.13	4315.74	A	0.743	1.785	6	1	1	53.094	766.56	38.33	C
180.00-160.00		TA 884.62	B	0.743	1.785		1	1	53.094			
			C	0.743	1.785		1	1	53.094			
T3	4401.85	2719.08	A	0.607	1.8	6	1	1	37.308	769.67	38.48	C
160.00-140.00			B	0.607	1.8		1	1	37.308			
			C	0.607	1.8		1	1	37.308			
T4	6016.41	2711.79	A	0.603	1.802	6	1	1	36.980	832.89*	41.64	C
140.00-120.00		TA 862.76	B	0.603	1.802		1	1	36.980			
			C	0.603	1.802		1	1	36.980			
T5	6301.26	2622.61	A	0.595	1.807	6	1	1	36.211	793.14*	39.66	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
120.00-100.00			B	0.595	1.807		1	1	36.211			
			C	0.595	1.807		1	1	36.211			
T6	6224.05	2562.85	A	0.588	1.812	5	1	1	35.529	747.90*	37.39	C
100.00-80.00			B	0.588	1.812		1	1	35.529			
			C	0.588	1.812		1	1	35.529			
T7	6130.10	2490.82	A	0.579	1.818	5	1	1	34.703	694.89*	34.74	C
80.00-60.00			B	0.579	1.818		1	1	34.703			
			C	0.579	1.818		1	1	34.703			
T8	6008.94	2399.07	A	0.568	1.828	4	1	1	33.646	629.79*	31.49	C
60.00-40.00			B	0.568	1.828		1	1	33.646			
			C	0.568	1.828		1	1	33.646			
T9	5834.61	2269.35	A	0.551	1.843	4	1	1	32.141	542.50*	27.13	C
40.00-20.00			B	0.551	1.843		1	1	32.141			
			C	0.551	1.843		1	1	32.141			
T10	5495.48	2025.19	A	0.516	1.88	4	1	1	29.267	538.54*	26.93	C
20.00-0.00			B	0.516	1.88		1	1	29.267			
			C	0.516	1.88		1	1	29.267			
Sum Weight:	51582.69	26862.27			*2.1A_g limit					6537.73		

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	990.84	998.40	A	0.619	1.793	6	0.8	1	13.288	219.47	31.35	C
187.00-180.00			B	0.619	1.793		0.8	1	13.288			
			C	0.619	1.793		0.8	1	13.288			
T2	4179.13	4315.74	A	0.743	1.785	6	0.8	1	49.843	735.69	36.78	C
180.00-160.00		TA 884.62	B	0.743	1.785		0.8	1	49.843			
			C	0.743	1.785		0.8	1	49.843			
T3	4401.85	2719.08	A	0.607	1.8	6	0.8	1	36.738	764.40	38.22	C
160.00-140.00			B	0.607	1.8		0.8	1	36.738			
			C	0.607	1.8		0.8	1	36.738			
T4	6016.41	2711.79	A	0.603	1.802	6	0.8	1	36.382	832.89*	41.64	C
140.00-120.00		TA 862.76	B	0.603	1.802		0.8	1	36.382			
			C	0.603	1.802		0.8	1	36.382			
T5	6301.26	2622.61	A	0.595	1.807	6	0.8	1	35.641	793.14*	39.66	C
120.00-100.00			B	0.595	1.807		0.8	1	35.641			
			C	0.595	1.807		0.8	1	35.641			
T6	6224.05	2562.85	A	0.588	1.812	5	0.8	1	34.958	747.90*	37.39	C
100.00-80.00			B	0.588	1.812		0.8	1	34.958			
			C	0.588	1.812		0.8	1	34.958			
T7	6130.10	2490.82	A	0.579	1.818	5	0.8	1	34.133	694.89*	34.74	C
80.00-60.00			B	0.579	1.818		0.8	1	34.133			
			C	0.579	1.818		0.8	1	34.133			
T8	6008.94	2399.07	A	0.568	1.828	4	0.8	1	33.076	629.79*	31.49	C
60.00-40.00			B	0.568	1.828		0.8	1	33.076			
			C	0.568	1.828		0.8	1	33.076			
T9	5834.61	2269.35	A	0.551	1.843	4	0.8	1	31.571	542.50*	27.13	C
40.00-20.00			B	0.551	1.843		0.8	1	31.571			
			C	0.551	1.843		0.8	1	31.571			
T10	5495.48	2025.19	A	0.516	1.88	4	0.8	1	28.697	538.54*	26.93	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
20.00-0.00			B	0.516	1.88		0.8	1	28.697			
			C	0.516	1.88		0.8	1	28.697			
Sum Weight:	51582.69	26862.27			*2.1A_g limit					6499.22		

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	990.84	998.40	A	0.619	1.793	6	0.85	1	13.350	220.06	31.44	C
187.00-180.00			B	0.619	1.793		0.85	1	13.350			
			C	0.619	1.793		0.85	1	13.350			
T2	4179.13	4315.74	A	0.743	1.785	6	0.85	1	50.656	743.41	37.17	C
180.00-160.00		TA 884.62	B	0.743	1.785		0.85	1	50.656			
			C	0.743	1.785		0.85	1	50.656			
T3	4401.85	2719.08	A	0.607	1.8	6	0.85	1	36.880	765.72	38.29	C
160.00-140.00			B	0.607	1.8		0.85	1	36.880			
			C	0.607	1.8		0.85	1	36.880			
T4	6016.41	2711.79	A	0.603	1.802	6	0.85	1	36.532	832.89*	41.64	C
140.00-120.00		TA 862.76	B	0.603	1.802		0.85	1	36.532			
			C	0.603	1.802		0.85	1	36.532			
T5	6301.26	2622.61	A	0.595	1.807	6	0.85	1	35.783	793.14*	39.66	C
120.00-100.00			B	0.595	1.807		0.85	1	35.783			
			C	0.595	1.807		0.85	1	35.783			
T6	6224.05	2562.85	A	0.588	1.812	5	0.85	1	35.101	747.90*	37.39	C
100.00-80.00			B	0.588	1.812		0.85	1	35.101			
			C	0.588	1.812		0.85	1	35.101			
T7	6130.10	2490.82	A	0.579	1.818	5	0.85	1	34.275	694.89*	34.74	C
80.00-60.00			B	0.579	1.818		0.85	1	34.275			
			C	0.579	1.818		0.85	1	34.275			
T8	6008.94	2399.07	A	0.568	1.828	4	0.85	1	33.218	629.79*	31.49	C
60.00-40.00			B	0.568	1.828		0.85	1	33.218			
			C	0.568	1.828		0.85	1	33.218			
T9	5834.61	2269.35	A	0.551	1.843	4	0.85	1	31.713	542.50*	27.13	C
40.00-20.00			B	0.551	1.843		0.85	1	31.713			
			C	0.551	1.843		0.85	1	31.713			
T10	5495.48	2025.19	A	0.516	1.88	4	0.85	1	28.839	538.54*	26.93	C
20.00-0.00			B	0.516	1.88		0.85	1	28.839			
			C	0.516	1.88		0.85	1	28.839			
Sum Weight:	51582.69	26862.27			*2.1A_g limit					6508.84		

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	138.71	234.83	A	0.208	2.569	9	1	1	3.659	185.07	26.44	C
187.00-180.00			B	0.208	2.569		1	1	3.659			
			C	0.208	2.569		1	1	3.659			
T2	574.60	1205.82	A	0.346	2.182	9	1	1	22.146	837.69	41.88	C
180.00-160.00		TA 242.49	B	0.346	2.182		1	1	22.146			
			C	0.346	2.182		1	1	22.146			
T3	601.00	658.24	A	0.203	2.585	9	1	1	9.953	668.84	33.44	C
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	827.08	680.49	A	0.205	2.579	8	1	1	10.093	832.34	41.62	C
140.00-120.00		TA 242.49	B	0.205	2.579		1	1	10.093			
			C	0.205	2.579		1	1	10.093			
T5	877.00	658.24	A	0.203	2.585	8	1	1	9.953	830.07	41.50	C
120.00-100.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	877.00	658.24	A	0.203	2.585	8	1	1	9.953	783.82	39.19	C
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	877.00	658.24	A	0.203	2.585	7	1	1	9.953	729.51	36.48	C
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	877.00	658.24	A	0.203	2.585	6	1	1	9.953	662.64	33.13	C
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9	877.00	658.24	A	0.203	2.585	5	1	1	9.953	572.66	28.63	C
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T10	877.00	658.24	A	0.203	2.585	5	1	1	9.953	572.17	28.61	C
20.00-0.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
Sum Weight:	7403.39	7213.83								6674.80		

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	138.71	234.83	A	0.208	2.569	9	0.8	1	3.415	180.15	25.74	C
187.00-180.00			B	0.208	2.569		0.8	1	3.415			
			C	0.208	2.569		0.8	1	3.415			
T2	574.60	1205.82	A	0.346	2.182	9	0.8	1	18.894	783.36	39.17	C
180.00-160.00		TA 242.49	B	0.346	2.182		0.8	1	18.894			
			C	0.346	2.182		0.8	1	18.894			
T3	601.00	658.24	A	0.203	2.585	9	0.8	1	9.383	657.94	32.90	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			
T4	827.08	680.49	A	0.205	2.579	8	0.8	1	9.496	821.41	41.07	C
140.00-120.00		TA 242.49	B	0.205	2.579		0.8	1	9.496			
			C	0.205	2.579		0.8	1	9.496			
T5	877.00	658.24	A	0.203	2.585	8	0.8	1	9.383	820.10	41.00	C
120.00-100.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	877.00	658.24	A	0.203	2.585	8	0.8	1	9.383	774.40	38.72	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
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	877.00	658.24	A	0.203	2.585	7	0.8	1	9.383	720.74	36.04	C
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	877.00	658.24	A	0.203	2.585	6	0.8	1	9.383	654.68	32.73	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			
T9	877.00	658.24	A	0.203	2.585	5	0.8	1	9.383	565.78	28.29	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			
T10	877.00	658.24	A	0.203	2.585	5	0.8	1	9.383	565.30	28.26	C
20.00-0.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
Sum Weight:	7403.39	7213.83								6543.85		

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	138.71	234.83	A	0.208	2.569	9	0.85	1	3.476	181.38	25.91	C
187.00-180.00			B	0.208	2.569		0.85	1	3.476			
			C	0.208	2.569		0.85	1	3.476			
T2	574.60	1205.82	A	0.346	2.182	9	0.85	1	19.707	796.94	39.85	C
180.00-160.00		TA 242.49	B	0.346	2.182		0.85	1	19.707			
			C	0.346	2.182		0.85	1	19.707			
T3	601.00	658.24	A	0.203	2.585	9	0.85	1	9.526	660.67	33.03	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			
T4	827.08	680.49	A	0.205	2.579	8	0.85	1	9.645	824.14	41.21	C
140.00-120.00		TA 242.49	B	0.205	2.579		0.85	1	9.645			
			C	0.205	2.579		0.85	1	9.645			
T5	877.00	658.24	A	0.203	2.585	8	0.85	1	9.526	822.59	41.13	C
120.00-100.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	877.00	658.24	A	0.203	2.585	8	0.85	1	9.526	776.75	38.84	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			
T7	877.00	658.24	A	0.203	2.585	7	0.85	1	9.526	722.93	36.15	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	877.00	658.24	A	0.203	2.585	6	0.85	1	9.526	656.67	32.83	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			
T9	877.00	658.24	A	0.203	2.585	5	0.85	1	9.526	567.50	28.37	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			
T10	877.00	658.24	A	0.203	2.585	5	0.85	1	9.526	567.02	28.35	C
20.00-0.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
Sum Weight:	7403.39	7213.83								6576.59		

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	161.37	1.133	27	4.25	6.25
Torque Arm Face B	60.0000	0.00	2.19	-1.26	161.37	1.133	27	4.25	6.25
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	161.37	1.133	27	4.25	6.25
Torque Arm Face C	180.0000	0.00	0.00	2.53	121.37	1.044	25	4.25	6.25
Torque Arm Face B	60.0000	0.00	2.19	-1.26	121.37	1.044	25	4.25	6.25
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	121.37	1.044	25	4.25	6.25
Antel LPA-80080-4CF	0.0000	24.00	0.00	-5.02	136.00	1.079	25	5.24	10.80
Antel LPA-80080-4CF	120.0000	24.00	4.35	2.51	136.00	1.079	25	5.24	10.80
Antel LPA-80080-4CF	240.0000	24.00	-4.35	2.51	136.00	1.079	25	5.24	10.80
Antel BXA-70063-6CF	0.0000	17.00	0.00	-5.02	136.00	1.079	25	7.57	2.43
Antel BXA-70063-6CF	120.0000	17.00	4.35	2.51	136.00	1.079	25	7.57	2.43
Antel BXA-70063-6CF	240.0000	17.00	-4.35	2.51	136.00	1.079	25	7.57	2.43
Powerwave 7770.00	0.0000	70.00	0.00	-5.02	188.00	1.184	28	11.76	5.86
Powerwave 7770.00	120.0000	70.00	4.35	2.51	188.00	1.184	28	11.76	5.86
Powerwave 7770.00	240.0000	70.00	-4.35	2.51	188.00	1.184	28	11.76	5.86
Powerwave LGP17201	0.0000	62.00	0.00	-5.02	188.00	1.184	28	3.90	1.00
Powerwave LGP17201	120.0000	62.00	4.35	2.51	188.00	1.184	28	3.90	1.00
Powerwave LGP17201	240.0000	62.00	-4.35	2.51	188.00	1.184	28	3.90	1.00
Antel BXA-171085-8BF	0.0000	10.50	0.00	-5.02	136.00	1.079	25	2.94	2.16
Antel BXA-171085-8BF	120.0000	10.50	4.35	2.51	136.00	1.079	25	2.94	2.16
Antel BXA-171085-8BF	240.0000	10.50	-4.35	2.51	136.00	1.079	25	2.94	2.16
RFS FD0R6004/2C-3L	0.0000	5.20	0.00	-5.02	136.00	1.079	25	0.00	0.16
RFS FD0R6004/2C-3L	120.0000	5.20	4.35	2.51	136.00	1.079	25	0.00	0.16
RFS FD0R6004/2C-3L	0.0000	5.20	0.00	-5.02	136.00	1.079	25	0.00	0.16
Powerwave P65-17-XLH-RR	0.0000	62.00	0.00	-5.02	188.00	1.184	28	11.47	4.00
Powerwave P65-17-XLH-RR	120.0000	62.00	4.35	2.51	188.00	1.184	28	11.47	4.00
Andrew SBNH-1D6565C	240.0000	60.90	-4.35	2.51	188.00	1.184	28	11.41	7.70
Ericsson RRUs11	0.0000	100.00	0.00	-5.02	188.00	1.184	28	5.98	0.72
Ericsson RRUs11	120.0000	100.00	4.35	2.51	188.00	1.184	28	5.98	0.72
Ericsson RRUs11	240.0000	100.00	-4.35	2.51	188.00	1.184	28	5.98	0.72
Raycap DC6-48-60-18-8F	0.0000	31.80	0.00	-5.02	188.00	1.184	28	2.57	2.57
Sector Frame	0.0000	465.00	0.00	-2.02	136.00	1.079	25	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	136.00	1.079	25	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	136.00	1.079	25	17.50	8.75
Sector Frame	0.0000	465.00	0.00	-2.02	173.00	1.156	27	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	173.00	1.156	27	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	173.00	1.156	27	17.50	8.75
Sector Frame	0.0000	465.00	0.00	-2.02	182.00	1.173	28	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	182.00	1.173	28	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	182.00	1.173	28	17.50	8.75
Sector Frame	0.0000	251.00	0.00	-2.02	187.00	1.182	28	14.40	7.00
Sector Frame	120.0000	251.00	1.75	1.01	187.00	1.182	28	14.40	7.00
Sector Frame	240.0000	251.00	-1.75	1.01	187.00	1.182	28	14.40	7.00
Sector Frame	0.0000	465.00	0.00	-2.02	150.00	1.110	26	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	150.00	1.110	26	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	150.00	1.110	26	17.50	8.75
EMS RR90-17-02DP	0.0000	14.00	0.00	-5.02	182.00	1.173	28	4.36	2.00
EMS RR90-17-02DP	120.0000	14.00	4.35	2.51	182.00	1.173	28	4.36	2.00
EMS RR90-17-02DP	240.0000	14.00	-4.35	2.51	182.00	1.173	28	4.36	2.00
Commscope	0.0000	44.00	0.00	-5.02	182.00	1.173	28	11.39	4.47

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
LNX-6515DS-VTM Commscope	120.0000	44.00	4.35	2.51	182.00	1.173	28	11.39	4.47
LNX-6515DS-VTM Commscope	240.0000	44.00	-4.35	2.51	182.00	1.173	28	11.39	4.47
LNX-6515DS-VTM Ericsson KRY112 71	0.0000	20.00	0.00	-5.02	182.00	1.173	28	0.58	0.23
Ericsson KRY112 71	0.0000	20.00	0.00	-5.02	182.00	1.173	28	0.58	0.23
Ericsson KRY112 71	0.0000	20.00	0.00	-5.02	182.00	1.173	28	0.58	0.23
Commscope DT465B-2XR	0.0000	50.00	0.00	-5.02	150.00	1.110	26	9.22	5.87
Commscope DT465B-2XR	120.0000	50.00	4.35	2.51	150.00	1.110	26	9.22	5.87
Commscope DT465B-2XR	240.0000	50.00	-4.35	2.51	150.00	1.110	26	9.22	5.87
Alcatel Lucent 4x45	0.0000	51.00	0.00	-5.02	150.00	1.110	26	2.54	1.61
Alcatel Lucent 4x45	120.0000	51.00	4.35	2.51	150.00	1.110	26	2.54	1.61
Alcatel Lucent 4x45	240.0000	51.00	-4.35	2.51	150.00	1.110	26	2.54	1.61
Alcatel Lucent 8x200-25	0.0000	70.00	0.00	-5.02	150.00	1.110	26	4.05	1.53
Alcatel Lucent 8x200-25	120.0000	70.00	4.35	2.51	150.00	1.110	26	4.05	1.53
Alcatel Lucent 8x200-25	240.0000	70.00	-4.35	2.51	150.00	1.110	26	4.05	1.53
RFS APXV9ERR18-C-A20	0.0000	62.00	0.00	-5.02	150.00	1.110	26	8.02	5.81
RFS APXV9ERR18-C-A20	120.0000	62.00	4.35	2.51	150.00	1.110	26	8.02	5.81
RFS APXV9ERR18-C-A20	240.0000	62.00	-4.35	2.51	150.00	1.110	26	8.02	5.81
Alcatel Lucent RRH2x50	0.0000	84.00	0.00	-5.02	150.00	1.110	26	4.54	2.70
Alcatel Lucent RRH2x50	120.0000	84.00	4.35	2.51	150.00	1.110	26	4.54	2.70
Alcatel Lucent RRH2x50	240.0000	84.00	-4.35	2.51	150.00	1.110	26	4.54	2.70
	Sum Weight:	8600.80							

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	161.37	1.133	6	6.67	9.66	1.7672
Torque Arm Face B	60.0000	0.00	2.19	-1.26	161.37	1.133	6	6.67	9.66	1.7672
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	161.37	1.133	6	6.67	9.66	1.7672
Torque Arm Face C	180.0000	0.00	0.00	2.53	121.37	1.044	6	6.61	9.57	1.7204
Torque Arm Face B	60.0000	0.00	2.19	-1.26	121.37	1.044	6	6.61	9.57	1.7204
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	121.37	1.044	6	6.61	9.57	1.7204
Antel LPA-80080-4CF	0.0000	242.11	0.00	-5.02	136.00	1.079	6	8.13	10.57	1.7282
Antel LPA-80080-4CF	120.0000	242.11	4.35	2.51	136.00	1.079	6	8.13	10.57	1.7282
Antel LPA-80080-4CF	240.0000	242.11	-4.35	2.51	136.00	1.079	6	8.13	10.57	1.7282
Antel BXA-70063-6CF	0.0000	93.60	0.00	-5.02	136.00	1.079	6	2.99	4.55	1.7282
Antel BXA-70063-6CF	120.0000	93.60	4.35	2.51	136.00	1.079	6	2.99	4.55	1.7282
Antel BXA-70063-6CF	240.0000	93.60	-4.35	2.51	136.00	1.079	6	2.99	4.55	1.7282
Powerwave 7770.00	0.0000	313.81	0.00	-5.02	188.00	1.184	6	15.01	8.73	1.7841
Powerwave 7770.00	120.0000	313.81	4.35	2.51	188.00	1.184	6	15.01	8.73	1.7841
Powerwave 7770.00	240.0000	313.81	-4.35	2.51	188.00	1.184	6	15.01	8.73	1.7841
Powerwave LGP17201	0.0000	489.39	0.00	-5.02	188.00	1.184	6	12.24	11.56	1.7841
Powerwave LGP17201	120.0000	489.39	4.35	2.51	188.00	1.184	6	12.24	11.56	1.7841
Powerwave LGP17201	240.0000	489.39	-4.35	2.51	188.00	1.184	6	12.24	11.56	1.7841
Antel BXA-171085-8BF	0.0000	93.60	0.00	-5.02	136.00	1.079	6	2.99	4.55	1.7282
Antel BXA-171085-8BF	120.0000	93.60	4.35	2.51	136.00	1.079	6	2.99	4.55	1.7282
Antel BXA-171085-8BF	240.0000	93.60	-4.35	2.51	136.00	1.079	6	2.99	4.55	1.7282

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
RFS FD0R6004/2C-3L	0.0000	187.20	0.00	-5.02	136.00	1.079	6	5.98	9.10	1.7282
RFS FD0R6004/2C-3L	120.0000	187.20	4.35	2.51	136.00	1.079	6	5.98	9.10	1.7282
RFS FD0R6004/2C-3L	0.0000	187.20	0.00	-5.02	136.00	1.079	6	5.98	9.10	1.7282
Powerwave P65-17-XLH-RR	0.0000	176.03	0.00	-5.02	188.00	1.184	6	8.81	4.73	1.7841
Powerwave P65-17-XLH-RR	120.0000	176.03	4.35	2.51	188.00	1.184	6	8.81	4.73	1.7841
Andrew SBNH-1D6565C	240.0000	177.37	-4.35	2.51	188.00	1.184	6	8.80	5.52	1.7841
Ericsson RRUs11	0.0000	302.80	0.00	-5.02	188.00	1.184	6	13.62	7.42	1.7841
Ericsson RRUs11	120.0000	302.80	4.35	2.51	188.00	1.184	6	13.62	7.42	1.7841
Ericsson RRUs11	240.0000	302.80	-4.35	2.51	188.00	1.184	6	13.62	7.42	1.7841
Raycap DC6-48-60-18-8F	0.0000	151.51	0.00	-5.02	188.00	1.184	6	6.71	4.22	1.7841
Sector Frame	0.0000	931.61	0.00	-2.02	136.00	1.079	6	31.63	27.69	1.7282
Sector Frame	120.0000	931.61	1.75	1.01	136.00	1.079	6	31.63	27.69	1.7282
Sector Frame	240.0000	931.61	-1.75	1.01	136.00	1.079	6	31.63	27.69	1.7282
Sector Frame	0.0000	942.98	0.00	-2.02	173.00	1.156	6	31.81	28.48	1.7703
Sector Frame	120.0000	942.98	1.75	1.01	173.00	1.156	6	31.81	28.48	1.7703
Sector Frame	240.0000	942.98	-1.75	1.01	173.00	1.156	6	31.81	28.48	1.7703
Sector Frame	0.0000	945.41	0.00	-2.02	182.00	1.173	6	31.85	28.65	1.7793
Sector Frame	120.0000	945.41	1.75	1.01	182.00	1.173	6	31.85	28.65	1.7793
Sector Frame	240.0000	945.41	-1.75	1.01	182.00	1.173	6	31.85	28.65	1.7793
Sector Frame	0.0000	582.85	0.00	-2.02	187.00	1.182	6	28.78	26.19	1.7841
Sector Frame	120.0000	582.85	1.75	1.01	187.00	1.182	6	28.78	26.19	1.7841
Sector Frame	240.0000	582.85	-1.75	1.01	187.00	1.182	6	28.78	26.19	1.7841
Sector Frame	0.0000	936.21	0.00	-2.02	150.00	1.110	6	31.70	28.01	1.7452
Sector Frame	120.0000	936.21	1.75	1.01	150.00	1.110	6	31.70	28.01	1.7452
Sector Frame	240.0000	936.21	-1.75	1.01	150.00	1.110	6	31.70	28.01	1.7452
EMS RR90-17-02DP	0.0000	94.07	0.00	-5.02	182.00	1.173	6	5.61	3.42	1.7793
EMS RR90-17-02DP	120.0000	94.07	4.35	2.51	182.00	1.173	6	5.61	3.42	1.7793
EMS RR90-17-02DP	240.0000	94.07	-4.35	2.51	182.00	1.173	6	5.61	3.42	1.7793
Commscope LNX-6515DS-VTM	0.0000	94.07	0.00	-5.02	182.00	1.173	6	5.61	3.42	1.7793
Commscope LNX-6515DS-VTM	120.0000	94.07	4.35	2.51	182.00	1.173	6	5.61	3.42	1.7793
Commscope LNX-6515DS-VTM	240.0000	94.07	-4.35	2.51	182.00	1.173	6	5.61	3.42	1.7793
Ericsson KRY112 71	0.0000	94.07	0.00	-5.02	182.00	1.173	6	5.61	3.42	1.7793
Ericsson KRY112 71	0.0000	94.07	0.00	-5.02	182.00	1.173	6	5.61	3.42	1.7793
Ericsson KRY112 71	0.0000	94.07	0.00	-5.02	182.00	1.173	6	5.61	3.42	1.7793
Commscope DT465B-2XR	0.0000	483.83	0.00	-5.02	150.00	1.110	6	12.43	9.08	1.7452
Commscope DT465B-2XR	120.0000	483.83	4.35	2.51	150.00	1.110	6	12.43	9.08	1.7452
Commscope DT465B-2XR	240.0000	483.83	-4.35	2.51	150.00	1.110	6	12.43	9.08	1.7452
Alcatel Lucent 4x45	0.0000	440.57	0.00	-5.02	150.00	1.110	6	10.47	7.71	1.7452
Alcatel Lucent 4x45	120.0000	440.57	4.35	2.51	150.00	1.110	6	10.47	7.71	1.7452
Alcatel Lucent 4x45	240.0000	440.57	-4.35	2.51	150.00	1.110	6	10.47	7.71	1.7452
Alcatel Lucent 8x200-25	0.0000	453.20	0.00	-5.02	150.00	1.110	6	10.88	7.69	1.7452
Alcatel Lucent 8x200-25	120.0000	453.20	4.35	2.51	150.00	1.110	6	10.88	7.69	1.7452
Alcatel Lucent 8x200-25	240.0000	453.20	-4.35	2.51	150.00	1.110	6	10.88	7.69	1.7452
RFS APXV9ERR18-C-A20	0.0000	480.49	0.00	-5.02	150.00	1.110	6	12.13	9.06	1.7452
RFS APXV9ERR18-C-A20	120.0000	480.49	4.35	2.51	150.00	1.110	6	12.13	9.06	1.7452
RFS APXV9ERR18-C-A20	240.0000	480.49	-4.35	2.51	150.00	1.110	6	12.13	9.06	1.7452
Alcatel Lucent RRH2x50	0.0000	870.28	0.00	-5.02	150.00	1.110	6	20.78	15.27	1.7452
Alcatel Lucent RRH2x50	120.0000	870.28	4.35	2.51	150.00	1.110	6	20.78	15.27	1.7452

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
Alcatel Lucent RRH2x30	240.0000	870.28	-4.35	2.51	150.00	1.110	6	20.78	15.27	1.7452
	Sum Weight:	27897.32								

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	161.37	1.133	9	4.25	6.25
Torque Arm Face B	60.0000	0.00	2.19	-1.26	161.37	1.133	9	4.25	6.25
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	161.37	1.133	9	4.25	6.25
Torque Arm Face C	180.0000	0.00	0.00	2.53	121.37	1.044	8	4.25	6.25
Torque Arm Face B	60.0000	0.00	2.19	-1.26	121.37	1.044	8	4.25	6.25
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	121.37	1.044	8	4.25	6.25
Antel LPA-80080-4CF	0.0000	24.00	0.00	-5.02	136.00	1.079	8	5.24	10.80
Antel LPA-80080-4CF	120.0000	24.00	4.35	2.51	136.00	1.079	8	5.24	10.80
Antel LPA-80080-4CF	240.0000	24.00	-4.35	2.51	136.00	1.079	8	5.24	10.80
Antel BXA-70063-6CF	0.0000	17.00	0.00	-5.02	136.00	1.079	8	7.57	2.43
Antel BXA-70063-6CF	120.0000	17.00	4.35	2.51	136.00	1.079	8	7.57	2.43
Antel BXA-70063-6CF	240.0000	17.00	-4.35	2.51	136.00	1.079	8	7.57	2.43
Powerwave 7770.00	0.0000	70.00	0.00	-5.02	188.00	1.184	9	11.76	5.86
Powerwave 7770.00	120.0000	70.00	4.35	2.51	188.00	1.184	9	11.76	5.86
Powerwave 7770.00	240.0000	70.00	-4.35	2.51	188.00	1.184	9	11.76	5.86
Powerwave LGP17201	0.0000	62.00	0.00	-5.02	188.00	1.184	9	3.90	1.00
Powerwave LGP17201	120.0000	62.00	4.35	2.51	188.00	1.184	9	3.90	1.00
Powerwave LGP17201	240.0000	62.00	-4.35	2.51	188.00	1.184	9	3.90	1.00
Antel BXA-171085-8BF	0.0000	10.50	0.00	-5.02	136.00	1.079	8	2.94	2.16
Antel BXA-171085-8BF	120.0000	10.50	4.35	2.51	136.00	1.079	8	2.94	2.16
Antel BXA-171085-8BF	240.0000	10.50	-4.35	2.51	136.00	1.079	8	2.94	2.16
RFS FD0R6004/2C-3L	0.0000	5.20	0.00	-5.02	136.00	1.079	8	0.00	0.16
RFS FD0R6004/2C-3L	120.0000	5.20	4.35	2.51	136.00	1.079	8	0.00	0.16
RFS FD0R6004/2C-3L	0.0000	5.20	0.00	-5.02	136.00	1.079	8	0.00	0.16
Powerwave P65-17-XLH-RR	0.0000	62.00	0.00	-5.02	188.00	1.184	9	11.47	4.00
Powerwave P65-17-XLH-RR	120.0000	62.00	4.35	2.51	188.00	1.184	9	11.47	4.00
Andrew SBNH-1D6565C	240.0000	60.90	-4.35	2.51	188.00	1.184	9	11.41	7.70
Ericsson RRUs11	0.0000	100.00	0.00	-5.02	188.00	1.184	9	5.98	0.72
Ericsson RRUs11	120.0000	100.00	4.35	2.51	188.00	1.184	9	5.98	0.72
Ericsson RRUs11	240.0000	100.00	-4.35	2.51	188.00	1.184	9	5.98	0.72
Raycap DC6-48-60-18-8F	0.0000	31.80	0.00	-5.02	188.00	1.184	9	2.57	2.57
Sector Frame	0.0000	465.00	0.00	-2.02	136.00	1.079	8	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	136.00	1.079	8	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	136.00	1.079	8	17.50	8.75
Sector Frame	0.0000	465.00	0.00	-2.02	173.00	1.156	9	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	173.00	1.156	9	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	173.00	1.156	9	17.50	8.75
Sector Frame	0.0000	465.00	0.00	-2.02	182.00	1.173	9	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	182.00	1.173	9	17.50	8.75
Sector Frame	240.0000	465.00	-1.75	1.01	182.00	1.173	9	17.50	8.75
Sector Frame	0.0000	251.00	0.00	-2.02	187.00	1.182	9	14.40	7.00
Sector Frame	120.0000	251.00	1.75	1.01	187.00	1.182	9	14.40	7.00
Sector Frame	240.0000	251.00	-1.75	1.01	187.00	1.182	9	14.40	7.00
Sector Frame	0.0000	465.00	0.00	-2.02	150.00	1.110	9	17.50	8.75
Sector Frame	120.0000	465.00	1.75	1.01	150.00	1.110	9	17.50	8.75

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	240.0000	463.00	-1.75	1.01	150.00	1.110	9	17.30	8.73
EMS RR90-17-02DP	0.0000	14.00	0.00	-5.02	182.00	1.173	9	4.36	2.00
EMS RR90-17-02DP	120.0000	14.00	4.35	2.51	182.00	1.173	9	4.36	2.00
EMS RR90-17-02DP	240.0000	14.00	-4.35	2.51	182.00	1.173	9	4.36	2.00
Commscope LNX-6515DS-VTM	0.0000	44.00	0.00	-5.02	182.00	1.173	9	11.39	4.47
Commscope LNX-6515DS-VTM	120.0000	44.00	4.35	2.51	182.00	1.173	9	11.39	4.47
Commscope LNX-6515DS-VTM	240.0000	44.00	-4.35	2.51	182.00	1.173	9	11.39	4.47
Ericsson KRY112 71	0.0000	20.00	0.00	-5.02	182.00	1.173	9	0.58	0.23
Ericsson KRY112 71	0.0000	20.00	0.00	-5.02	182.00	1.173	9	0.58	0.23
Ericsson KRY112 71	0.0000	20.00	0.00	-5.02	182.00	1.173	9	0.58	0.23
Commscope DT465B-2XR	0.0000	50.00	0.00	-5.02	150.00	1.110	9	9.22	5.87
Commscope DT465B-2XR	120.0000	50.00	4.35	2.51	150.00	1.110	9	9.22	5.87
Commscope DT465B-2XR	240.0000	50.00	-4.35	2.51	150.00	1.110	9	9.22	5.87
Alcatel Lucent 4x45	0.0000	51.00	0.00	-5.02	150.00	1.110	9	2.54	1.61
Alcatel Lucent 4x45	120.0000	51.00	4.35	2.51	150.00	1.110	9	2.54	1.61
Alcatel Lucent 4x45	240.0000	51.00	-4.35	2.51	150.00	1.110	9	2.54	1.61
Alcatel Lucent 8x200-25	0.0000	70.00	0.00	-5.02	150.00	1.110	9	4.05	1.53
Alcatel Lucent 8x200-25	120.0000	70.00	4.35	2.51	150.00	1.110	9	4.05	1.53
Alcatel Lucent 8x200-25	240.0000	70.00	-4.35	2.51	150.00	1.110	9	4.05	1.53
RFS APXV9ERR18-C-A20	0.0000	62.00	0.00	-5.02	150.00	1.110	9	8.02	5.81
RFS APXV9ERR18-C-A20	120.0000	62.00	4.35	2.51	150.00	1.110	9	8.02	5.81
RFS APXV9ERR18-C-A20	240.0000	62.00	-4.35	2.51	150.00	1.110	9	8.02	5.81
Alcatel Lucent RRH2x50	0.0000	84.00	0.00	-5.02	150.00	1.110	9	4.54	2.70
Alcatel Lucent RRH2x50	120.0000	84.00	4.35	2.51	150.00	1.110	9	4.54	2.70
Alcatel Lucent RRH2x50	240.0000	84.00	-4.35	2.51	150.00	1.110	9	4.54	2.70
	Sum Weight:	8600.80							

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	3252.97			
Bracing Weight	3960.86			
Total Member Self-Weight	7213.83			
Guy Weight	2614.62			
Total Weight	25832.65			
Wind 0 deg - No Ice		-29.64	-28037.93	1220.52
Wind 30 deg - No Ice		13820.17	-24011.19	-874.33
Wind 60 deg - No Ice		24222.42	-13993.29	-2738.93
Wind 90 deg - No Ice		27691.68	29.64	-3820.16
Wind 120 deg - No Ice		24252.07	14044.64	-3959.44
Wind 150 deg - No Ice		13871.51	24040.83	-2945.83
Wind 180 deg - No Ice		29.64	28037.93	-1220.52
Wind 210 deg - No Ice		-13820.17	24011.19	874.33
Wind 240 deg - No Ice		-24222.42	13993.29	2738.93
Wind 270 deg - No Ice		-27691.68	-29.64	3820.16

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 300 deg - No Ice		-24252.07	-14044.64	3959.44
Wind 330 deg - No Ice		-13871.51	-24040.83	2945.83
Member Ice	19648.44			
Guy Ice	14985.26			
Total Weight Ice	123942.16			
Wind 0 deg - Ice		3.87	-10286.56	348.87
Wind 30 deg - Ice		5121.00	-8885.34	-353.85
Wind 60 deg - Ice		8890.97	-5146.63	-962.22
Wind 90 deg - Ice		10235.29	-3.87	-1310.57
Wind 120 deg - Ice		8887.11	5139.93	-1311.08
Wind 150 deg - Ice		5114.30	8881.47	-956.73
Wind 180 deg - Ice		-3.87	10286.56	-348.87
Wind 210 deg - Ice		-5121.00	8885.34	353.85
Wind 240 deg - Ice		-8890.97	5146.63	962.22
Wind 270 deg - Ice		-10235.29	3.87	1310.57
Wind 300 deg - Ice		-8887.11	-5139.93	1311.08
Wind 330 deg - Ice		-5114.30	-8881.47	956.73
Total Weight	25832.65			
Wind 0 deg - Service		-9.87	-9332.15	406.24
Wind 30 deg - Service		4599.91	-7991.89	-291.01
Wind 60 deg - Service		8062.20	-4657.53	-911.62
Wind 90 deg - Service		9216.90	9.87	-1271.50
Wind 120 deg - Service		8072.06	4674.62	-1317.86
Wind 150 deg - Service		4617.00	8001.76	-980.49
Wind 180 deg - Service		9.87	9332.15	-406.24
Wind 210 deg - Service		-4599.91	7991.89	291.01
Wind 240 deg - Service		-8062.20	4657.53	911.62
Wind 270 deg - Service		-9216.90	-9.87	1271.50
Wind 300 deg - Service		-8072.06	-4674.62	1317.86
Wind 330 deg - Service		-4617.00	-8001.76	980.49

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

Comb. No.	Description
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
Guy C @ 126.8 ft Elev -12 ft Azimuth 240 deg	Max. Vert	10	-2169.22	-1153.51	664.50
	Max. H_x	10	-2169.22	-1153.51	664.50
	Max. H_z	3	-57375.44	-45690.54	27089.06
	Min. Vert	3	-57375.44	-45690.54	27089.06
	Min. H_x	5	-56693.40	-45792.21	25758.67
	Min. H_z	10	-2169.22	-1153.51	664.50
Guy B @ 133.5 ft Elev 13 ft Azimuth 120 deg	Max. Vert	6	-985.88	698.08	403.12
	Max. H_x	11	-44856.56	46169.97	26069.18
	Max. H_z	13	-44902.60	45715.36	27064.65
	Min. Vert	12	-44984.89	45794.42	26492.76
	Min. H_x	6	-985.88	698.08	403.12
	Min. H_z	6	-985.88	698.08	403.12
Guy A @ 149.3 ft Elev -14 ft Azimuth 0 deg	Max. Vert	2	-1472.58	-0.95	-1106.76
	Max. H_x	11	-26276.82	1159.01	-27753.88
	Max. H_z	2	-1472.58	-0.95	-1106.76
	Min. Vert	9	-49189.45	580.07	-52806.00
	Min. H_x	5	-25533.38	-1196.41	-27087.61
	Min. H_z	9	-49189.45	580.07	-52806.00
Mast	Max. Vert	18	195663.79	-298.29	-350.08
	Max. H_x	11	105425.88	3196.38	-6.34
	Max. H_z	2	119182.26	73.90	2899.35
	Max. M_x	1	0.00	21.86	-48.67
	Max. M_z	1	0.00	21.86	-48.67
	Max. Torsion	1	0.00	21.86	-48.67
	Min. Vert	33	73460.09	20.63	-764.00
	Min. H_x	5	114963.20	-2942.67	14.05
	Min. H_z	8	95445.82	33.44	-3339.20
	Min. M_x	1	0.00	21.86	-48.67

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. M_z	1	0.00	21.86	-48.67
	Min. Torsion	1	0.00	21.86	-48.67

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	73673.97	-21.86	48.67	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	119182.26	-73.90	-2899.35	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	114541.79	1496.98	-2492.73	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	101850.26	2696.01	-1505.99	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	114963.20	2942.67	-14.05	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	121862.86	2445.59	1514.62	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	111361.51	1427.10	2767.48	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	95445.82	-33.44	3339.20	0.00	0.00	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	107002.39	-1540.80	2805.58	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	113358.75	-2665.91	1569.74	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	105425.88	-3196.38	6.34	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	96104.92	-2838.25	-1572.52	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	109320.89	-1645.22	-2610.04	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	192512.28	-183.28	328.15	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	195613.67	-194.70	-158.92	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	195625.47	40.73	-91.85	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	195495.84	224.91	100.05	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	195663.79	298.29	350.08	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	195466.66	238.76	576.11	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	194085.95	72.79	741.31	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	192924.66	-179.94	801.78	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	192711.92	-440.35	741.97	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	193013.45	-618.63	574.63	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	193174.17	-682.75	340.50	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	193497.23	-608.32	85.40	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+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	194471.43	-427.36	-103.24	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	74429.23	-24.13	-677.25	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	74334.73	328.50	-572.54	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	74188.26	586.34	-305.93	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	73993.98	686.51	53.61	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	73779.32	600.87	415.78	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	73544.56	335.83	672.64	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	73460.09	-20.63	764.00	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	73544.26	-377.19	669.77	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	73760.23	-642.94	411.36	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	74008.20	-730.61	49.06	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	74212.10	-633.04	-309.35	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	74349.38	-376.59	-574.15	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	-25832.01	0.00	1.83	25832.18	6.38	0.026%
2	25.59	-30607.38	-48763.98	-27.27	30604.25	48704.74	0.103%
3	24173.57	-30438.50	-41864.59	-24182.62	30436.75	41823.95	0.073%
4	41747.37	-30284.20	-24104.24	-41748.71	30284.14	24101.26	0.006%
5	48353.66	-30524.61	2.61	-48317.06	30522.54	30.38	0.086%
6	42260.44	-30758.46	24370.91	-42193.06	30754.22	-24333.98	0.133%
7	24131.05	-30561.72	41785.73	-24065.17	30558.87	-41767.65	0.120%
8	-25.59	-30343.85	48134.48	70.60	30343.99	-48138.04	0.079%
9	-24173.57	-30512.73	41864.59	24110.44	30510.38	-41851.43	0.113%
10	-42292.54	-30667.03	24418.99	42210.12	30662.41	-24379.92	0.158%
11	-48353.66	-30426.62	-2.61	48315.03	30424.66	35.76	0.089%
12	-41715.27	-30192.77	-24056.16	41723.11	30192.69	24042.09	0.028%
13	-24131.05	-30389.51	-41785.73	24139.97	30387.48	41739.16	0.083%
14	-0.00	-128565.46	0.00	4.61	128565.38	-4.15	0.005%
15	77.29	-128693.30	-13870.50	-76.38	128693.19	13865.44	0.004%
16	7015.61	-128532.61	-12054.92	-7014.37	128532.47	12048.51	0.005%
17	12099.52	-128384.94	-6996.32	-12094.98	128384.79	6992.75	0.004%
18	13938.42	-128601.96	-50.03	-13928.84	128601.82	53.72	0.008%
19	12047.15	-128815.53	6876.84	-12038.80	128815.43	-6872.49	0.007%
20	6882.26	-128634.81	11924.00	-6865.75	128634.65	-11916.04	0.014%
21	-77.29	-128437.62	13831.98	87.65	128437.54	-13823.29	0.010%
22	-7015.61	-128598.31	12054.92	7010.54	128598.28	-12042.77	0.010%
23	-12132.88	-128745.98	7015.58	12117.74	128745.91	-7006.34	0.014%
24	-13938.42	-128528.96	50.03	13933.14	128528.84	-51.65	0.004%
25	-12013.79	-128315.39	-6857.58	12014.17	128315.32	6854.72	0.002%
26	-6882.26	-128496.11	-11924.00	6883.19	128496.03	11920.36	0.003%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
27	5.32	-25859.42	-10144.14	-3.98	25859.34	10132.33	0.043%
28	5028.71	-25824.29	-8708.89	-5027.03	25824.24	8700.07	0.032%
29	8684.50	-25792.19	-5014.29	-8680.69	25792.16	5010.82	0.019%
30	10058.78	-25842.20	0.54	-10051.72	25842.17	1.73	0.027%
31	8791.23	-25890.85	5069.76	-8780.93	25890.79	-5064.24	0.042%
32	5019.87	-25849.92	8692.48	-5013.34	25849.90	-8688.53	0.028%
33	-5.32	-25804.60	10013.18	6.31	25804.61	-10009.98	0.012%
34	-5028.71	-25839.73	8708.89	5025.14	25839.73	-8705.44	0.018%
35	-8797.91	-25871.83	5079.76	8792.30	25871.81	-5075.79	0.025%
36	-10058.78	-25821.82	-0.54	10055.30	25821.80	2.39	0.014%
37	-8677.83	-25773.17	-5004.29	8677.09	25773.15	5001.68	0.010%
38	-5019.87	-25814.10	-8692.48	5020.98	25814.05	8684.60	0.029%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	13	0.00000001	0.00010377
2	Yes	26	0.00033877	0.00023224
3	Yes	26	0.00027409	0.00018013
4	Yes	20	0.00033430	0.00014975
5	Yes	28	0.00028079	0.00016403
6	Yes	28	0.00031543	0.00021812
7	Yes	27	0.00036678	0.00021853
8	Yes	20	0.00035862	0.00012006
9	Yes	25	0.00029352	0.00020215
10	Yes	25	0.00036285	0.00026001
11	Yes	25	0.00029302	0.00016506
12	Yes	20	0.00028679	0.00007957
13	Yes	25	0.00037526	0.00020845
14	Yes	18	0.00040000	0.00006745
15	Yes	22	0.00030688	0.00004951
16	Yes	21	0.00036228	0.00006335
17	Yes	20	0.00035459	0.00007386
18	Yes	20	0.00028699	0.00006153
19	Yes	21	0.00025699	0.00003862
20	Yes	19	0.00040000	0.00007410
21	Yes	18	0.00040000	0.00007712
22	Yes	17	0.00040000	0.00008369
23	Yes	17	0.00040000	0.00009648
24	Yes	18	0.00040000	0.00009341
25	Yes	21	0.00028976	0.00004361
26	Yes	22	0.00026949	0.00004064
27	Yes	13	0.00000001	0.00012313
28	Yes	13	0.00000001	0.00009751
29	Yes	13	0.00000001	0.00007048
30	Yes	13	0.00000001	0.00009332
31	Yes	13	0.00000001	0.00013784
32	Yes	13	0.00000001	0.00009611
33	Yes	13	0.00000001	0.00006193
34	Yes	13	0.00000001	0.00007384
35	Yes	13	0.00000001	0.00008919
36	Yes	13	0.00000001	0.00005936
37	Yes	13	0.00000001	0.00004361
38	Yes	13	0.00000001	0.00008216

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	187 - 180	2.094	29	0.1283	0.0426
T2	180 - 160	1.890	29	0.1238	0.0411
T3	160 - 140	1.485	29	0.0624	0.0404
T4	140 - 120	1.310	29	0.0385	0.0547
T5	120 - 100	1.183	29	0.0130	0.0630
T6	100 - 80	1.191	29	0.0178	0.1113
T7	80 - 60	1.109	28	0.0366	0.1492
T8	60 - 40	0.929	28	0.0373	0.1768
T9	40 - 20	0.784	28	0.0520	0.1973
T10	20 - 0	0.479	28	0.0955	0.2092

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	(2) Powerwave 7770.00	29	2.094	0.1283	0.0426	23216
182.00	Sector Frame	29	1.946	0.1261	0.0416	23216
173.00	Sector Frame	29	1.715	0.1064	0.0395	15539
170.00	Guy	29	1.651	0.0961	0.0390	15127
160.38	Guy	29	1.490	0.0634	0.0402	13758
150.00	Sector Frame	29	1.383	0.0469	0.0478	30920
136.00	(2) Antel LPA-80080-4CF	29	1.279	0.0337	0.0557	492350
120.38	Guy	29	1.184	0.0132	0.0625	19525
60.38	Guy	28	0.932	0.0373	0.1764	37533

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	187 - 180	16.643	6	0.8110	0.3369
T2	180 - 160	15.414	6	0.7904	0.3296
T3	160 - 140	12.778	6	0.4888	0.3263
T4	140 - 120	11.445	6	0.3069	0.3901
T5	120 - 100	10.555	6	0.1207	0.4258
T6	100 - 80	10.561	6	0.0816	0.7053
T7	80 - 60	9.980	6	0.2489	0.8625
T8	60 - 40	8.573	6	0.3620	0.9718
T9	40 - 20	6.874	6	0.5403	1.0907
T10	20 - 0	3.987	6	0.8333	1.1514

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
187.00	(2) Powerwave 7770.00	6	16.643	0.8110	0.3369	5159
182.00	Sector Frame	6	15.756	0.8012	0.3318	5159
173.00	Sector Frame	6	14.323	0.7078	0.3219	3284
170.00	Guy	6	13.909	0.6581	0.3197	3177
160.38	Guy	6	12.813	0.4942	0.3255	2971
150.00	Sector Frame	6	12.017	0.3827	0.3600	6203
136.00	(2) Antel LPA-80080-4CF	6	11.222	0.2713	0.3932	20984
120.38	Guy	6	10.562	0.1236	0.4232	3260
60.38	Guy	6	8.601	0.3599	0.9695	8557

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	187	Leg	A325N	0.7500	4	206.85	29820.60	0.007 ✔	1	Bolt Tension
T2	180	Leg	A325N	0.7500	4	2076.30	29820.60	0.070 ✔	1	Bolt Tension
		Top Guy Pull-Off@160.375	A325N	0.7500	2	4486.01	17892.40	0.251 ✔	1	Bolt Shear
		Torque Arm Top@160.375	A325N	0.7500	2	6782.80	17617.50	0.385 ✔	1	Member Bearing
		Torque Arm Bottom@160.375	A325N	0.7500	2	5913.96	17892.40	0.331 ✔	1	Bolt Shear
T3	160	Leg	A325N	0.7500	4	4363.47	29820.60	0.146 ✔	1	Bolt Tension
T4	140	Leg	A325N	0.7500	4	2743.98	29820.60	0.092 ✔	1	Bolt Tension
		Top Guy Pull-Off@120.375	A325N	0.7500	2	3847.32	17892.40	0.215 ✔	1	Bolt Shear
		Torque Arm Top@120.375	A325N	0.7500	2	5163.85	17617.50	0.293 ✔	1	Member Bearing
		Torque Arm Bottom@120.375	A325N	0.7500	2	4982.27	17892.40	0.278 ✔	1	Bolt Shear
T5	120	Leg	A325N	0.7500	4	4658.50	29820.60	0.156 ✔	1	Bolt Tension
T6	100	Leg	A325N	0.7500	4	4138.46	29820.60	0.139 ✔	1	Bolt Tension
T7	80	Leg	A325N	0.7500	4	4464.82	29820.60	0.150 ✔	1	Bolt Tension
T8	60	Leg	A325N	0.7500	4	4876.91	29820.60	0.164 ✔	1	Bolt Tension
T9	40	Leg	A325N	0.7500	4	5338.79	29820.60	0.179 ✔	1	Bolt Tension
T10	20	Leg	A325N	0.7500	4	5563.32	29820.60	0.187 ✔	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.
T2	160.38 (A) (577)	5/8 EHS	4240.00	42399.99	12712.60	25440.00	1.000	2.001 ✔
	160.38 (A) (578)	5/8 EHS	4240.00	42399.99	12659.00	25440.00	1.000	2.010 ✔
	160.38 (B) (571)	5/8 EHS	4240.00	42399.99	12354.90	25440.00	1.000	2.059 ✔
	160.38 (B) (572)	5/8 EHS	4240.00	42399.99	12741.70	25440.00	1.000	1.997 ✔
	160.38 (C) (565)	5/8 EHS	4240.00	42399.99	13994.70	25440.00	1.000	1.818 ✔
	160.38 (C) (566)	5/8 EHS	4240.00	42399.99	13923.30	25440.00	1.000	1.827 ✔
	170.00 (A) (606)	5/8 EHS	4240.00	42399.99	13092.90	25440.00	1.000	1.943 ✔
	170.00 (B) (605)	5/8 EHS	4240.00	42399.99	13218.50	25440.00	1.000	1.925 ✔
	170.00 (C) (604)	5/8 EHS	4240.00	42399.99	14212.20	25440.00	1.000	1.790 ✔
T4	120.38 (A) (595)	9/16 EHS	3500.00	35000.04	11213.90	21000.00	1.000	1.873 ✔
	120.38 (A) (596)	9/16 EHS	3500.00	35000.04	11172.80	21000.00	1.000	1.880 ✔
	120.38 (B) (589)	9/16 EHS	3500.00	35000.04	10142.20	21000.00	1.000	2.071 ✔
	120.38 (B) (590)	9/16 EHS	3500.00	35000.04	10759.60	21000.00	1.000	1.952 ✔
	120.38 (C) (583)	9/16 EHS	3500.00	35000.04	12091.00	21000.00	1.000	1.737 ✔
	120.38 (C) (584)	9/16 EHS	3500.00	35000.04	11710.20	21000.00	1.000	1.793 ✔
T7	60.38 (A) (603)	9/16 EHS	3500.00	35000.04	13240.70	21000.00	1.000	1.586 ✔
	60.38 (B) (602)	9/16 EHS	3500.00	35000.04	12753.90	21000.00	1.000	1.647 ✔
	60.38 (C) (601)	9/16 EHS	3500.00	35000.04	14039.70	21000.00	1.000	1.496 ✔

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	187 - 180	P2.5x.203	7.00	2.85	36.1 K=1.00	1.7040	1.00	-13468.50	74724.40	0.180 [1] ✔
T2	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-52357.20	79606.90	0.658 [1] ✔
T3	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-52439.20	79606.90	0.659 [1] ✔
T4	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-59298.00	79606.90	0.745 [1] ✔
T5	120 - 100	P2.5x.203	20.00	3.21	40.6	1.7040	0.99	-56022.10	78919.70	0.710 [1]

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 $\frac{P_u}{\phi P_n}$
T6	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-55055.30	78293.30	0.703 [1]
T7	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-58484.00	78267.70	0.747 [1]
T8	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-64541.90	78165.00	0.826 [1]
T9	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-67467.80	78174.90	0.863 [1]
T10	20 - 0	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-67463.60	78166.10	0.863 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160	C3x4.1	4.75	2.21	186.6 K=2.84	1.2100	-5165.87	7854.51	0.658 [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	187 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-6601.57	11503.00	0.574 [1]
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2153.52	11503.00	0.187 [1]
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4814.48	11503.00	0.419 [1]
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4511.44	11503.00	0.392 [1]
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-5307.40	11503.00	0.461 [1]
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4257.28	11503.00	0.370 [1]
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3987.27	11503.00	0.347 [1]
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3938.01	11503.00	0.342 [1]
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4190.32	11503.00	0.364 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3929.08	11503.00	0.342 [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	187 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3657.78	11503.00	0.318 [1]
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-426.42	11503.00	0.037 [1]
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3845.49	11503.00	0.334 [1]
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2337.77	11503.00	0.203 [1]
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3597.55	11503.00	0.313 [1]
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1922.19	11503.00	0.167 [1]
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2392.94	11503.00	0.208 [1]
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1945.89	11503.00	0.169 [1]
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1917.93	11503.00	0.167 [1]
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2346.30	11503.00	0.204 [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	187 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4254.01	11503.00	0.370 [1]
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1045.61	11503.00	0.091 [1]
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2265.01	11503.00	0.197 [1]
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4636.52	11503.00	0.403 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2471.21	11503.00	0.215 [1]
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1970.19	11503.00	0.171 [1]
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2384.44	11503.00	0.207 [1]
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1945.39	11503.00	0.169 [1]
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-468.97	11503.00	0.041 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x5/16	3.50	3.26	100.3 K=1.00	1.1500	-3240.19	21935.30	0.148 [1]
T4	140 - 120	L2x2x5/16	3.50	3.26	100.3 K=1.00	1.1500	-7694.63	21935.30	0.351 [1]
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	133.4 K=1.00	0.5273	-1937.09	6697.95	0.289 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160 (569)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-11827.90	36439.50	0.325 [1]
T2	180 - 160 (570)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-10822.80	36439.50	0.297 [1]
T2	180 - 160 (575)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-11496.20	36439.50	0.315 [1]
T2	180 - 160 (576)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-10318.10	36439.50	0.283 [1]
T2	180 - 160 (581)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-10664.70	36439.50	0.293 [1]
T2	180 - 160 (582)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-10874.70	36439.50	0.298 [1]
T4	140 - 120 (587)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9964.53	36439.50	0.273 [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	140 - 120 (588)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8908.21	36439.50	0.244 [1]
T4	140 - 120 (593)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9330.87	36439.50	0.256 [1]
T4	140 - 120 (594)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-7687.59	36439.50	0.211 [1]
T4	140 - 120 (599)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-8468.76	36439.50	0.232 [1]
T4	140 - 120 (600)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-9089.63	36439.50	0.249 [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	187 - 180	P2.5x.203	7.00	2.85	36.1	1.7040	8321.06	82816.80	0.100 [1]
T2	180 - 160	P2.5x.203	20.00	3.21	40.6	1.7040	27085.00	92018.70	0.294 [1]
T3	160 - 140	P2.5x.203	20.00	3.21	40.6	1.7040	14195.10	92018.70	0.154 [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	187 - 180	5/8	4.51	4.20	322.9	0.3068	6847.62	9940.20	0.689 [1]
T2	180 - 160	C3x4.1	4.75	2.21	65.7	1.2100	5176.38	39204.00	0.132 [1]
T3	160 - 140	5/8	4.75	4.42	339.7	0.3068	7035.13	9940.20	0.708 [1]
T4	140 - 120	5/8	4.75	4.42	339.7	0.3068	5195.31	9940.20	0.523 [1]
T5	120 - 100	5/8	4.75	4.42	339.7	0.3068	7897.81	9940.20	0.795 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	100 - 80	5/8	4.75	4.42	339.7	0.3068	4268.52	9940.20	0.429 [1]
T7	80 - 60	5/8	4.75	4.42	339.7	0.3068	4968.88	9940.20	0.500 [1]
T8	60 - 40	5/8	4.75	4.42	339.7	0.3068	5675.14	9940.20	0.571 [1]
T9	40 - 20	5/8	4.75	4.42	339.7	0.3068	3154.97	9940.20	0.317 [1]
T10	20 - 0	5/8	4.75	4.42	339.7	0.3068	4200.61	9940.20	0.423 [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	187 - 180	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	233.28	17085.90	0.014 [1]
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	3615.40	17085.90	0.212 [1]
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	908.27	17085.90	0.053 [1]
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1027.07	17085.90	0.060 [1]
T5	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	970.33	17085.90	0.057 [1]
T6	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	953.59	17085.90	0.056 [1]
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1012.97	17085.90	0.059 [1]
T8	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1117.90	17085.90	0.065 [1]
T9	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1168.58	17085.90	0.068 [1]
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1168.50	17085.90	0.068 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	571.39	17085.90	0.033 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	51.24	17085.90	0.003 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	4765.95	17085.90	0.279 [1]
T4	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	740.14	17085.90	0.043 [1]
T10	20 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	820.23	17085.90	0.048 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x5/16	3.50	3.26	65.1	0.6574	8972.02	28597.90	0.314 [1]
T2	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	3853.66	17085.90	0.226 [1]
T7	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	4189.21	17085.90	0.245 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160 (567)	L3x3x1/4	4.75	4.59	59.2	0.9159	13511.30	39843.30	0.339 [1]
T2	180 - 160 (568)	L3x3x1/4	4.75	4.59	59.2	0.9159	13277.10	39843.30	0.333 [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	180 - 160 (573)	L3x3x1/4	4.75	4.59	59.2	0.9159	12978.60	39843.30	0.326 [1]
T2	180 - 160 (574)	L3x3x1/4	4.75	4.59	59.2	0.9159	13563.60	39843.30	0.340 [1]
T2	180 - 160 (579)	L3x3x1/4	4.75	4.59	59.2	0.9159	12157.70	39843.30	0.305 [1]
T2	180 - 160 (580)	L3x3x1/4	4.75	4.59	59.2	0.9159	12492.50	39843.30	0.314 [1]
T4	140 - 120 (585)	L3x3x1/4	4.75	4.59	59.2	0.9159	10327.70	39843.30	0.259 [1]
T4	140 - 120 (586)	L3x3x1/4	4.75	4.59	59.2	0.9159	9848.24	39843.30	0.247 [1]
T4	140 - 120 (591)	L3x3x1/4	4.75	4.59	59.2	0.9159	9094.85	39843.30	0.228 [1]
T4	140 - 120 (592)	L3x3x1/4	4.75	4.59	59.2	0.9159	10141.90	39843.30	0.255 [1]
T4	140 - 120 (597)	L3x3x1/4	4.75	4.59	59.2	0.9159	8670.81	39843.30	0.218 [1]
T4	140 - 120 (598)	L3x3x1/4	4.75	4.59	59.2	0.9159	9211.06	39843.30	0.231 [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 $\frac{P_u}{\phi P_n}$
T2	180 - 160 (569)	L3x3x1/4	3.50	3.38	43.6	0.9159	3966.66	39843.30	0.100 [1]
T2	180 - 160 (570)	L3x3x1/4	3.50	3.38	43.6	0.9159	3425.06	39843.30	0.086 [1]
T2	180 - 160 (575)	L3x3x1/4	3.50	3.38	43.6	0.9159	4079.90	39843.30	0.102 [1]
T2	180 - 160 (576)	L3x3x1/4	3.50	3.38	43.6	0.9159	3483.60	39843.30	0.087 [1]
T2	180 - 160 (581)	L3x3x1/4	3.50	3.38	43.6	0.9159	4297.22	39843.30	0.108 [1]
T2	180 - 160 (582)	L3x3x1/4	3.50	3.38	43.6	0.9159	4399.62	39843.30	0.110 [1]
T4	140 - 120 (587)	L3x3x1/4	3.50	3.38	43.6	0.9159	4852.48	39843.30	0.122 [1]
T4	140 - 120 (588)	L3x3x1/4	3.50	3.38	43.6	0.9159	4565.58	39843.30	0.115 [1]
T4	140 - 120 (593)	L3x3x1/4	3.50	3.38	43.6	0.9159	4634.59	39843.30	0.116 [1]
T4	140 - 120 (594)	L3x3x1/4	3.50	3.38	43.6	0.9159	4295.91	39843.30	0.108 [1]
T4	140 - 120 (599)	L3x3x1/4	3.50	3.38	43.6	0.9159	5122.39	39843.30	0.129 [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	140 - 120 (600)	L3x3x1/4	3.50	3.38	43.6	0.9139	5252.50	39843.30	0.132 [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	187 - 180	Leg	P2.5x.203	3	-13468.50	74724.40	18.0	Pass
		Diagonal	5/8	15	6847.62	9940.20	68.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	16	-6601.57	11503.00	57.4	Pass
		Top Girt	L1 1/2x1 1/2x3/16	4	-3657.78	11503.00	31.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	7	-4254.01	11503.00	37.0	Pass
T2	180 - 160	Leg	P2.5x.203	27	-52357.20	79606.90	65.8	Pass
		Diagonal	C3x4.1	39	-5165.87	7854.51	65.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	51	3615.40	17085.90	21.2	Pass
		Top Girt	L1 1/2x1 1/2x3/16	28	-426.42	11503.00	3.7	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	33	4765.95	17085.90	27.9	Pass
		Guy A@160.375	5/8	577	12712.60	25440.00	50.0	Pass
		Guy A@170	5/8	606	13092.90	25440.00	51.5	Pass
		Guy B@160.375	5/8	572	12741.70	25440.00	50.1	Pass
		Guy B@170	5/8	605	13218.50	25440.00	52.0	Pass
		Guy C@160.375	5/8	565	13994.70	25440.00	55.0	Pass
		Guy C@170	5/8	604	14212.20	25440.00	55.9	Pass
		Top Guy Pull-Off@160.375	L2x2x5/16	41	8972.02	28597.90	31.4	Pass
		Top Guy Pull-Off@170	L1 1/2x1 1/2x3/16	60	3853.66	17085.90	22.6	Pass
		Torque Arm Top@160.375	L3x3x1/4	574	13565.60	39843.30	34.0 38.5 (b)	Pass
		Torque Arm Bottom@160.375	L3x3x1/4	569	-11827.90	36439.50	32.5 33.1 (b)	Pass
T3	160 - 140	Leg	P2.5x.203	87	-52439.20	79606.90	65.9	Pass
		Diagonal	5/8	142	7035.13	9940.20	70.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	137	-4814.48	11503.00	41.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	89	-3845.49	11503.00	33.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	93	-2265.01	11503.00	19.7	Pass
T4	140 - 120	Leg	P2.5x.203	147	-59298.00	79606.90	74.5	Pass
		Diagonal	5/8	163	5195.31	9940.20	52.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	170	-4511.44	11503.00	39.2	Pass
		Top Girt	L1 1/2x1 1/2x3/16	148	-2337.77	11503.00	20.3	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	152	-4636.52	11503.00	40.3	Pass
		Guy A@120.375	9/16	595	11213.90	21000.00	53.4	Pass
		Guy B@120.375	9/16	590	10759.60	21000.00	51.2	Pass
		Guy C@120.375	9/16	583	12091.00	21000.00	57.6	Pass
		Top Guy Pull-Off@120.375	L2x2x5/16	162	-7694.63	21935.30	35.1	Pass
		Torque Arm Top@120.375	L3x3x1/4	585	10327.70	39843.30	25.9 29.3 (b)	Pass
		Torque Arm Bottom@120.375	L3x3x1/4	587	-9964.53	36439.50	27.3 27.8 (b)	Pass
T5	120 - 100	Leg	P2.5x.203	207	-56022.10	78919.70	71.0	Pass
		Diagonal	5/8	261	7897.81	9940.20	79.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Horizontal	L1 1/2x1 1/2x3/16	257	-5307.40	11503.00	46.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	209	-3597.55	11503.00	31.3	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	211	-2471.21	11503.00	21.5	Pass
T6	100 - 80	Leg	P2.5x.203	267	-55055.30	78293.30	70.3	Pass
		Diagonal	5/8	321	4268.52	9940.20	42.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	280	-4257.28	11503.00	37.0	Pass
		Top Girt	L1 1/2x1 1/2x3/16	268	-1922.19	11503.00	16.7	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	271	-1970.19	11503.00	17.1	Pass
T7	80 - 60	Leg	P2.5x.203	327	-58484.00	78267.70	74.7	Pass
		Diagonal	5/8	335	4968.88	9940.20	50.0	Pass
		Horizontal	L1 1/2x1 1/2x3/16	376	-3987.27	11503.00	34.7	Pass
		Top Girt	L1 1/2x1 1/2x3/16	328	-2392.94	11503.00	20.8	Pass
		Guy A@60.375	9/16	603	13240.70	21000.00	63.1	Pass
		Guy B@60.375	9/16	602	12753.90	21000.00	60.7	Pass
		Guy C@60.375	9/16	601	14039.70	21000.00	66.9	Pass
		Top Guy Pull-Off@60.375	L1 1/2x1 1/2x3/16	331	-1937.09	6697.95	28.9	Pass
T8	60 - 40	Leg	P2.5x.203	387	-64541.90	78165.00	82.6	Pass
		Diagonal	5/8	442	5675.14	9940.20	57.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	400	-3938.01	11503.00	34.2	Pass
		Top Girt	L1 1/2x1 1/2x3/16	389	-1945.89	11503.00	16.9	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	391	-2384.44	11503.00	20.7	Pass
T9	40 - 20	Leg	P2.5x.203	447	-67467.80	78174.90	86.3	Pass
		Diagonal	5/8	504	3154.97	9940.20	31.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	496	-4190.32	11503.00	36.4	Pass
		Top Girt	L1 1/2x1 1/2x3/16	448	-1917.93	11503.00	16.7	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	451	-1945.39	11503.00	16.9	Pass
T10	20 - 0	Leg	P2.5x.203	507	-67463.60	78166.10	86.3	Pass
		Diagonal	5/8	518	4200.61	9940.20	42.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	556	-3929.08	11503.00	34.2	Pass
		Top Girt	L1 1/2x1 1/2x3/16	508	-2346.30	11503.00	20.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	512	820.23	17085.90	4.8	Pass
							Summary	
						Leg (T10)	86.3	Pass
						Diagonal (T5)	79.5	Pass
						Horizontal (T1)	57.4	Pass
						Top Girt (T3)	33.4	Pass
						Bottom Girt (T4)	40.3	Pass
						Guy A (T7)	63.1	Pass
						Guy B (T7)	60.7	Pass
						Guy C (T7)	66.9	Pass
						Top Guy Pull-Off (T4)	35.1	Pass
						Torque Arm Top (T2)	38.5	Pass
						Torque Arm Bottom (T2)	33.1	Pass
						Bolt Checks	38.5	Pass
						RATING =	86.3	Pass

Site Name:	Bozrah
Site Number:	CDT
Engineering Number:	117-23243.4
Date:	12/28/2017

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

Foundation Mapped:	N				
Moment (M_u):	0.0	k-ft	Concrete Compressive Strength (f'_c):	3000	psi
Shear/Leg (V_u):	9.3	k	Vertical Steel Rebar Size #:	5	
Compression/Leg (P_u):	195.7	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):	SST		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):	1.00	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):	20.0	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:	100.0	pcf	Steel Elastic Modulus:	29000	ksi
Unit Weight of Soil Below Water Table:	50.0	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:		
Ultimate Skin Friction:	0	psf	# of Rebar in Base of Pad:	10	
Ultimate Compressive Bearing Pressure:	9500	psf	Pad Clear Cover:	3	in
Capacity Increase (Due to Transient Loads):	1.00				
Bearing Strength Reduction Factor (ϕ_s):	0.75				
Uplift Strength Reduction Factor (ϕ_s):	0.75				

Axial Capacities and Design Moment

Weight of Concrete (Bouyancy Considered):	8.7	k
Weight of Soil (Bouyancy Considered):	15.0	k
Ultimate Skin Friction Resistance:	0.0	k
Controlling Failure Mode (Top / Base):	Top	
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	17.8	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	215.5	k
P_u:	199.5	k
$T_u/\phi_s T_n$:	0.00	Result: OK
$P_u/\phi_s P_n$:	0.93	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	115.0	115	0	0
2.0	3.0	885.9	443.0	115	0	36

Inflection Point (Below Ground Surface):	3.0	ft
Factored Design Moment At Inflection Point (M_u):	7.6	k-ft

Pad Strength Capacity

β:	0.85	ACI318-05 - 10.2.7.3
Lower Pad Flexural Reinforcement Ratio:	0.0033	OK - Minimum Reinforcement Ratio Met - #
Upper Pad Flexural Reinforcement Ratio:	0.0000	OK - Minimum Reinforcement Ratio Met - #
Lower Pad Flexural Reinforcement Spacing:	7	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):	19.0	k
One Way Shear Capacity (ϕV_c):	81.2	k - ACI318-05 - 11.3.1.1
$V_u / \phi V_c$:	0.23	Result: OK
Punching Design Shear (V_u):	142.0	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	293.3	k - ACI318-05 - 11.12.2.1
$V_u / \phi V_c$:	0.48	Result: OK
Flexural Loading Due to Soil Pressure (M_u):	55.4	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	197.2	k-ft - ACI318-05 - 10.3
$M_u / \phi M_n$:	0.28	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):	7.6	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	88.9	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.09	Result: OK
Design Shear (V_u):	3.3	k
Nominal Shear Capacity ($\phi_V V_n$):	67.9	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.05	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):	195.7	k
Nominal Compression Capacity ($\phi_P P_n$):	701.9	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.28	Result: OK
Pier Reinforcement Ratio:	0.005	Reinforcement Ratio is Satisfactory - ACI318-05 - 10.9.1 & 10.8.4
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.09	Result: OK

Site Name:	Bozrah
Site Number:	CDT
Engineering Number:	115-35035
Date:	12/28/2017

Design Standard per TIA-222-G

Anchor Radius:	150.0	ft
Uplift (Factored - P_u):	57.4	k
Shear (Factored - V_u):	53.1	k
Berm Present:	N	
Design Anchor Rod:	Y	
Mapped Foundation:	N	
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):	20.0	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:	115.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	50.0	pcf
Internal Angle of Friction:	36	Degrees
Cohesion:	500	psf
Ultimate Skin Friction of Pad Sides to Soil:	500	psf
Ultimate Coefficient of Shear Friction:	0.30	
Maximum Top Conical Failure Angle:	30	Degrees
Maximum Base Conical Failure Angle:	30	Degrees
Allowable Capacity Increase:	1.00	(Due to Transient Loads)
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):	92.9	k
Ultimate Uplift Resistance from Skin Friction:	22.5	k
Nominal Factored Uplift Resistance ($\phi_u P_n$)::	86.8	k
P_u / $\phi_u P_n$:	0.66	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	5.9	k
Passive Pressure:	5063	psf
Ultimate Passure Pressure Resistance:	116.5	k
Nominal Shear Resistance ($\phi_v V_n$):	91.7	k
V_u / $\phi_v V_n$:	0.58	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):	78.2	k	ϕ_t:	0.65	
Anchor Rod Tensile Resistance (ϕT_n)::	92.4	k			

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):	14.6	k	
Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$):	122.3	k	
$V_u/\phi_v V_n$:	0.12	Result:	OK
One Way Shear due to Uplift (V_u):	24.5	k	
Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$):	108.4	k	
$V_u/\phi_v V_n$:	0.23	Result:	OK
Pad Flexure due to Shear Load (M_u):	76.4	k-ft	
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	167.4	k-ft	
Pad Flexure due to Uplift (M_u):	82.5	k-ft	
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	161.9	k-ft	
$M_u/\phi_b M_n$ (Max.):	0.51	Result:	OK

SITE ID: CT33XC570
SITE NAME: BOZRAH

12 POLLY LANE
BOZRAH, CT 06334

DO MACRO PROJECT

SITE INFORMATION

ADDRESS:	12 POLLY LANE BOZRAH, CT 06334
JURISDICTION:	TOWN OF BOZRAH
COUNTY :	NEW LONDON
PROPERTY OWNER:	CORDLESS DATA TRANSFER, INC 600 HARTFORD ROAD COLCHESTER, CT
TOWER OWNER:	NORTHEAST TOWERS, INC 199 BRICKYARD ROAD FARMINGTON, CT 06032 PHONE: 860-677-1999
APPLICANT:	SPRINT 201 STATE ROUTE 17 NORTH RUTHERFORD, NJ 07070
LATITUDE (NAD 83):	N 41.574253°
LONGITUDE (NAD 83):	W 72.200406°
CURRENT USE:	UNMANNED TELECOMMUNICATIONS FACILITY
PROPOSED USE:	NO CHANGE
UTILITY COMPANY:	CONNECTICUT LIGHT AND POWER PHONE: 800-266-2000

RF CONFIGURATION

THE CONTRACTOR SHALL OBTAIN THE LATEST RF DATA SHEET AND CONFIRM SAME WITH THE SPRINT CONSTRUCTION MANAGER PRIOR TO START OF CONSTRUCTION.

PROJECT CONTACTS

	NAME:	COMPANY:	PHONE #:
ENGINEER:	JEREMY MCKEON	MASER CONSULTING P.A.	973.398.3110
CONSTRUCTION:	TOM JUPIN	CHERUNDOLO CONSULTING	973.819.9033

STRUCTURAL STATEMENT

THE PROPOSED ANTENNA AND EQUIPMENT INSTALLATION SHALL BE EVALUATED INCLUDING THE NEW LOAD CONDITIONS ON THE SUPPORTING ELEMENTS OF THE EXISTING STRUCTURE. THESE PLANS HAVE BEEN DEVELOPED FOR THE PROPOSED TELECOMMUNICATION FACILITY TO BE OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY CHERUNDOLO CONSULTING. MASER HAS INCORPORATED THE SCOPE OF WORK WITHIN THESE PLANS. ELEMENTS OF THE STRUCTURE AFFECTED BY THE SCOPE OF WORK SHALL BE ANALYZED UNDER SEPARATE COVER. MASER ASSUMES NO RESPONSIBILITY FOR ANY ELEMENTS OF THE SITE NOT AFFECTED BY THE SCOPE OR FOR CHANGES TO THE SCOPE OF WORK NOT SPECIFICALLY SHOWN ON THESE DRAWINGS.

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

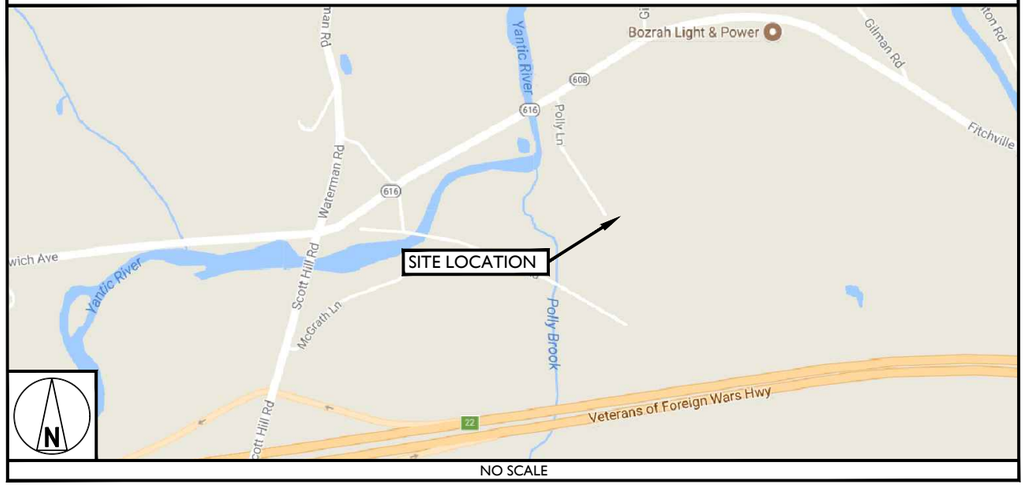
CONSTRUCTION:_____ DATE: _____

LEASING/SITE ACQUISITION: _____ DATE: _____

RF ENGINEERING: _____ DATE: _____

LANDLORD/PROPERTY OWNER: _____ DATE: _____

LOCAL MAP



NO SCALE

DRIVING DIRECTIONS

FROM SPRINT OFFICES, RUTHERFORD, NJ: TAKE VETERANS BLVD TO NJ-17 N. HEAD SOUTH. CONTINUE STRAIGHT. TURN LEFT ONTO VETERANS BLVD. TURN LEFT ONTO BOROUGH ST. FOLLOW NJ-17 N, GARDEN STATE PKWY AND I-87 S TO SAW MILL PKWY N/SAW MILL RIVER PKWY N IN ELMSFORD. TAKE EXIT 8A FROM I-87 S. TURN RIGHT ONTO NJ-17 N. TAKE THE GARDEN STATE PARKWAY N EXIT. MERGE ONTO GARDEN STATE PKWY. ENTERING NEW YORK. USE THE RIGHT 2 LANES TO TAKE EXIT 14-1 TO MERGE ONTO I-287 E/I-87 S. USE THE RIGHT LANE TO KEEP RIGHT AT THE FORK, CONTINUE ON I-87 S AND FOLLOW SIGNS FOR NEW YORK CITY/SAW MILL PKWY S. TAKE EXIT 8A FOR NY-119/SAW MILL PKWY N TOWARD ELMSFORD. KEEP LEFT, FOLLOW SIGNS FOR KATONAH/SAW MILL RIVER PKWY N AND MERGE ONTO SAW MILL PKWY N/SAW MILL RIVER PKWY N. GET ON I-684 N IN BEDFORD. MERGE ONTO SAW MILL PKWY N/SAW MILL RIVER PKWY N. KEEP LEFT, FOLLOW SIGNS FOR I-684/BREWSTER AND MERGE ONTO I-684 N. CONTINUE ON I-684 N. TAKE I-84 E, I-691 E, I-91 N AND CT-2 E TO SCOTT HILL RD IN LEBANON. TAKE EXIT 22 FROM CT-2 E/HWY 2 E. MERGE ONTO I-684 N. TAKE EXIT 9E FOR INTERSTATE 84 E TOWARD DANBURY. MERGE ONTO I-84 E. ENTERING CONNECTICUT. KEEP RIGHT TO STAY ON I-84 E. TAKE EXIT 27 FOR I-691 E TOWARD MERIDEN. CONTINUE ONTO I-691 E. USE THE LEFT LANE TO TAKE EXIT 11 TO MERGE ONTO I-91 N TOWARD HARTFORD/SPRINGFIELD. TAKE EXIT 25-26 TO MERGE ONTO CT-3 N TOWARD GLASTONBURY. TAKE THE EXIT ONTO CT-2 E TOWARD NORWICH. KEEP LEFT AT THE FORK TO CONTINUE ON CT-2 E/HWY 2 E. TAKE EXIT 22 TOWARD LEBANON/GILMAN. CONTINUE ON SCOTT HILL RD. TAKE STATE HWY 616 TO POLLY LN IN BOZRAH. TURN LEFT ONTO SCOTT HILL RD. TURN RIGHT ONTO STATE HWY 616. TURN RIGHT ONTO POLLY LN

DRAWING INDEX

NYC DOB NUMBER	SHEET TITLE	REV.
T-001.00	TITLE SHEET	0
ANT-001.00	GENERAL NOTES - 1	0
ANT-002.00	GENERAL NOTES - 2	0
ANT-003.00	GENERAL NOTES - 3	0
ANT-004.00	SITE PLAN	0
ANT-005.00	EQUIPMENT PLAN AND ELEVATION	0
ANT-006.00	ANTENNA ORIENTATION PLANS	0
ANT-007.00	DETAILS	0
ANT-008.00	ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES	0
ANT-009.00	FIBER PLUMBING DIAGRAMS	0
ANT-010.00	CABLE COLOR CODING, DC POWER DETAILS & PANEL SCHEDULES	0
ANT-011.00	ELECTRICAL AND GROUNDING NOTES	0
ANT-012.00	GROUNDING SCHEMATIC AND DETAILS	0

APPLICABLE BUILDING CODES & STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND 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 THE LATEST EDITIONS OF THE FOLLOWING CODES.

1. 2016 CONNECTICUT STATE BUILDING CODE, INCORPORATING THE 2012 INTERNATIONAL BUILDING CODE
2. TIA/EIA-222-G OR LATEST EDITION
3. NFPA 780-LIGHTNING PROTECTION CODE 201
4. 2014 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

SCOPE OF WORK

SPRINT PROPOSED TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL (3) NEW PANEL ANTENNAS
- INSTALL (6) NEW RRH'S
- INSTALL (30) JUMPER CABLES
- INSTALL (1) HYBRID CABLE

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Cherundolo Consulting

Charles Cherundulo Consulting, Inc.
713 Clover Lane
Moscow, PA 18444
Phone: 973-207-4248
Fax: 570-842-5592

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SCALE :	JOB NUMBER :
AS SHOWN	17924005A

REV	DATE	DESCRIPTION	BY	CHECKED BY
0	09/27/17	CONSTRUCTION	DTS	PET
A	08/[illegible]/17	REVISED DOCUMENTS	DTS	FEP

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.[illegible]7

IT IS A VIOLATION FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFESIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME: BOZRAH
SITE ID: CT33XC570

12 POLLY LANE
BOZRAH, CT 06334

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
TITLE SHEET

SHEET NUMBER :
T-001.00

GENERAL NOTES

1. CONTRACTOR SHALL NOT COMMENCE ANY WORK UNTIL HE OBTAINS, AT HIS OWN EXPENSE, ALL INSURANCE REQUIRED BY SPRINT, THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
2. THIS SET OF PLANS HAS BEEN PREPARED FOR THE PURPOSES OF MUNICIPAL AND AGENCY REVIEW AND APPROVAL. THIS SET OF PLANS SHALL NOT BE UTILIZED AS CONSTRUCTION DOCUMENTS UNTIL ALL CONDITIONS OF APPROVAL HAVE BEEN SATISFIED AND EACH OF THE DRAWINGS HAVE BEEN REVISED TO INDICATE "ISSUED FOR CONSTRUCTION.
3. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES OR OTHER PUBLIC AUTHORITIES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
5. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS FOR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THIS PROJECT IN ACCORDANCE WITH THE OVERALL INTENT OF THESE DRAWINGS.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING DEMOLITION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF REMOVAL OF THIS FACILITY.
7. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR AS REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
8. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE REMOVED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
9. THE DEMOLITION CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ALL REMOVAL MEANS AND METHODS. THE DEMOLITION CONTRACTOR IS ALSO RESPONSIBLE FOR ALL JOB SITE SAFETY.
10. THE CONTRACTOR IS TO REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. THE CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND RELATED PARTIES. THE SUBCONTRACTOR SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT EFFECTS THEIR WORK.
11. THE CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON THE SITE AT ALL TIMES AND INSURE THE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA CONTRACTOR FURNISH 3 SETS OF REDLINE "AS-REMOVED" DRAWINGS TO SPRINT UPON COMPLETION OF THE WORK.
12. REPAIR MATERIALS INSTALLED SHALL MEET REQUIREMENTS OF CONTRACTORS DOCUMENTS. NO SUBSTITUTIONS ARE ALLOWED.
13. THE CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
14. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS EXISTING WHICH ARE NOT FOUND TO BE IN THE FIELD.
15. DEMOLITION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST-ACCEPTED PRACTICE. ALL SURFACES SHALL BE REPAIRED TO MATCH THEIR SURROUNDINGS AND PROVIDE WEATHER TIGHT SEAL ON SAME DAY AS REMOVAL.
16. THE CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROPERTY OWNER AND/OR PROPERTY MANAGEMENT COMPANY.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
18. THE CONTRACTOR SHALL REPAIR ALL EXISTING SURFACES DAMAGED DURING REMOVAL SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
19. THE CONTRACTOR SHALL KEEP CONTRACT AREA CLEAN, HAZARD FREE AND DISPOSE OF ALL DEBRIS AND RUBBISH. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
20. BEFORE FINAL ACCEPTANCE OF THE WORK, THE CONTRACTOR SHALL REMOVE ALL EQUIPMENT, TEMPORARY WORKS, UNUSED AND USELESS MATERIALS, RUBBISH AND TEMPORARY STRUCTURES.

TENANT SAFETY NOTES

1. CONSTRUCTION WORK SHALL BE CONFINED TO THE DESIGNATED AREA OF WORK SHOWN, AND WILL NOT CREATE DUST, OR OTHER SUCH INCONVENIENCES TO OTHER UNITS WITHIN THE BUILDING.
2. ALL EXISTING MEANS OF EGRESS FROM THE BUILDING ARE TO BE MAINTAINED CLEAR AND FREE OF ALL OBSTRUCTIONS, SUCH AS BUILDING MATERIALS, TOOLS, ETC.
3. CONSTRUCTION OPERATIONS SHALL NOT INVOLVE UNSCHEDULED INTERRUPTION OF HEATING, GAS, WATER, OR ELECTRICAL SERVICES TO OTHER UNITS OF THE BUILDING.
4. CONSTRUCTION OPERATIONS WILL BE CONFINED TO THE HOURS SET BY THE OWNER, CONDO BOARD, CO-OP BOARD, BUILDING MANAGER OR OTHER APPLICABLE GOVERNING ENTITY.
5. CONTRACTOR SHALL PROVIDE ADEQUATE TEMPORARY SHORING AND BRACING WHEREVER STRUCTURAL WORK IS INVOLVED.
6. ALL BUILDING MATERIALS IN THE CONSTRUCTION AREA OR IN ANY AREA OF THE BUILDING ARE TO BE SECURED IN A LOCKED AREA. ACCESS TO SUCH AREA IS TO BE CONTROLLED BY THE OWNER AND GENERAL CONTRACTOR.
7. ALL FLAMMABLE MATERIALS ARE TO BE KEPT TIGHTLY SEALED IN THEIR RESPECTIVE MANUFACTURER'S CONTAINERS. SUCH MATERIALS ARE TO BE KEPT AWAY FROM ANY SOURCE OF HEAT.
8. ALL FLAMMABLE MATERIALS ARE TO BE USED AND STORED IN AN ADEQUATELY VENTED SPACE.
9. ALL ELECTRICAL POWER TO BE SHUT-OFF WHERE THERE IS EXPOSED CONDUIT.
10. THE CONTRACTOR SHALL PROVIDE FOR FULLY CHARGED AND OPERABLE FIRE EXTINGUISHERS MADE ACCESSIBLE DURING ALL PHASES OF DEMOLITION AND CONSTRUCTION.

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SCALE : AS SHOWN

JOB NUMBER : 17924005A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
0	09/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/[illegible]/17	REVISED PER [illegible]	[illegible]	FEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.[illegible]7

SITE NAME: BOZRAH
SITE ID: CT33XC570

12 POLLY LANE
BOZRAH, CT 06334

RED BANK OFFICE
331 Newman Springs Road
Suite 203
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Fax: 732.383.1984

SHEET TITLE : GENERAL NOTES - 1

SHEET NUMBER : ANT-001.00

SECTION 01 100 - SCOPE OF WORK

THE WORK:
THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE CONSTRUCTION DRAWINGS AND ASSOCIATED OUTLINE SPECIFICATIONS AND THE SITE SPECIFIC WORK ORDER, DESCRIBE THE WORK TO BE PERFORMED BY THIS CONSTRUCTION CONTRACTOR (SUPPLIER).

RELATED DOCUMENTS:
A. THE REQUIREMENTS OF EACH SECTION OF THIS SPECIFICATION APPLY TO ALL SECTIONS, INDIVIDUALLY AND COLLECTIVELY.
B. RELATED DOCUMENTS: THE CONTRACTOR SHALL COMPLY WITH THE MOST CURRENT VERSION OF THE FOLLOWING SUPPLEMENTAL REQUIREMENTS FOR INSTALLATION AND TESTING.
1.EN-2012-001: (FIBER OPTIC, DC CABLE, AND DC CIRCUIT BREAKER TAGGING STANDARDS)
2.TS-0200 - (TRANSMISSION ANTENNA LINE ACCEPTANCE STANDARDS)
3.EL-0568: (FIBER TESTING POLICY)
4.NP-312-201: (EXTERIOR GROUNDING SYSTEM TESTING)
5.NP-760-500: ETHERNET, MICROWAVE, TESTING AND ACCEPTANCE

PRECEDENCE:
SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

NATIONALLY RECOGNIZED CODES AND STANDARDS:

THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
C. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
D. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
G. AMERICAN CONCRETE INSTITUTE (ACI)
H. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
I. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
J. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
K. PORTLAND CEMENT ASSOCIATION (PCA)
L. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
M. BRICK INDUSTRY ASSOCIATION (BIA)
N. AMERICAN WELDING SOCIETY (AWS)
O. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
P. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
Q. DOOR AND HARDWARE INSTITUTE (DHI)
R. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
S. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

DEFINITIONS:
A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: "SPRINT"; SPRINT NEXTEL CORPORATION AND IT'S OPERATING ENTITIES.
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR, SUPPLIER, CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. CONSTRUCTION MANAGER - ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT.

SITE FAMILIARITY:
CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

POINT OF CONTACT:
COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

ON-SITE SUPERVISION:
THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

DRAWINGS REQUIRED AT JOBSITE:
THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.
B. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

USE OF JOB SITE:
THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

UTILITY SERVICES:
WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

PERMITS/FEES:
WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

CONTRACTOR:
CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

TEMPORARY UTILITIES AND FACILITIES:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSOR'S OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

ACCESS TO WORK:
THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

DIMENSIONS:
VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

EXISTING CONDITIONS:
NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

FURNISHED MATERIALS:
COMPANY FURNISHED MATERIALS AND EQUIPMENT TO BE INSTALLED BY THE CONTRACTOR (OFIC) IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

RECEIPT OF MATERIAL AND EQUIPMENT:
A. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
B. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
C. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
D. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

DELIVERABLES:
A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

SECTION 01 300 - CELL SITE CONSTRUCTION

NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S ISSUANCE OF THE WORK ORDER.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

GENERAL REQUIREMENTS FOR CONSTRUCTION:
A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.
B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.
C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.
D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

FUNCTIONAL REQUIREMENTS:
A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. CONTRACTOR SHALL TAKE ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.
B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.
C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND BACKHAUL (FIBER, COPPER, OR MICROWAVE).
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS, CONDUIT AND BOXES.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H-FRAMES", CABINETS AND PADS AND PLATFORMS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. CONDUCT ALL REQUIRED TESTS AND INSPECTIONS
19. PERFORM, DOCUMENT, AND CLOSE OUT ALL JURISDICTIONAL PERMITTING REQUIREMENTS AND ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
20. PERFORM ALL ADDITIONAL WORK AS IDENTIFIED IN SCOPE OF SERVICES ATTACHED TO THE SUPPLIER AGREEMENT FOR THIS PROJECT. THIS WORK MAY INCLUDE COMMISSIONING, INTEGRATION, SPECIAL WAREHOUSING, REVERSE LOGISTICS ACTIVITIES, ETC. PERFORM COMMISSIONING AND INTEGRATION ACTIVITIES PER APPLICABLE MOPS.

DELIVERABLES:
A. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED TEST REPORTS AND DOCUMENTATION INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
1. PRODUCT SPECIFICATIONS FOR MATERIALS OR SPECIAL CONSTRUCTION IF REQUESTED BY SPRINT
2. ACTUALIZE ALL CONSTRUCTION RELATED MILESTONES IN SITERRA AND COMPLETE ALL ON-LINE FORMS AND COMPLETE DOCUMENT UP-LOADS. UPLOAD ALL REQUIRED CLOSEOUT DOCUMENTS AND FINAL SITE PHOTOS
3. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT LEFT ON SITE INSIDE BASE OF MAIN RF CABINET IN A PROTECTIVE POUCH.
4. ALL REQUIRED TEST REPORTS.
5. REQUIRED CLOSEOUT DOCUMENTATION INCLUDING BUT NOT LIMITED TO:
a. ALL JURISDICTIONAL PERMITTING AND OCCUPANCY INFORMATION
b. PDF SCAN OF REDLINES PRODUCED IN THE FIELD
c. ELECTRONIC AS-BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS
d. LIEN WAIVERS
e. FINAL PAYMENT APPLICATION
f. REQUIRED FINAL CONSTRUCTION PHOTOS
g. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
h. LISTS OF SUBCONTRACTORS
B. PROVIDE ADDITIONAL DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. PRE-CONSTRUCTION MEETING NOTES.

SECTION 01 400 - TESTS, INSPECTIONS, SUBMITTALS, AND PROJECT CLOSEOUT

TESTS AND INSPECTIONS:
A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER TS-0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS
2. POST CONSTRUCTION HEIGHT VERIFICATION, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONCRETE BREAK TESTS
4. SITE RESISTANCE TO EARTH TEST
5. STRUCTURAL BACKFILL COMPACTION TESTS
6. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
7. ADDITIONAL TESTING AS REQUIRED ELSEWHERE IN THIS SPECIFICATION.

SUBMITTALS:
A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.
B. UPLOAD THE FOLLOWING TO SITERRA AS APPLICABLE INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. CONCRETE MIX-DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. CHEMICAL GROUNDING SYSTEM .
4. REINFORCEMENT CERTIFICATIONS
5. STRUCTURAL BACKFILL TEST RESULTS
6. SWEEP AND FIBER TESTS
7. ANTENNA AZIMUTH AND DOWN-TILT VERIFICATION
8. POST CONSTRUCTION HEIGHT VERIFICATION
9. ADDITIONAL SUBMITTALS MAY BE REQUIRED FOR SPECIAL CONSTRUCTION OR MINOR MATERIALS
C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

TESTING BY THIRD PARTY AGENCY:
A. EMPLOY AN AGENCY OF ENGINEERS AND SCIENTISTS WHO IS REGULARLY ENGAGED IN FIELD AND LABORATORY TESTING AND ANALYSIS. AGENCY SHALL HAVE BEEN IN BUSINESS A MINIMUM OF FIVE YEARS, AND BE LICENSED AS PROFESSIONAL ENGINEERS IN THE STATE WHERE THE PROJECT IS LOCATED. AGENCY IS SUBJECT TO APPROVAL BY COMPANY.
1. AGENCY MUST HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
2. AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
B. REQUIRED THIRD PARTY TESTS:
1. SITE RESISTANCE TO EARTH TEST PER NP-312-201
2. CONCRETE CYLINDER BREAK TESTS FOR TOWER PIER AND ANCHORS PER NATIONALLY RECOGNIZED STANDARDS
3. STRUCTURAL SOILS COMPACTION TESTS PER NATIONALLY RECOGNIZED STANDARDS
4. REBAR PLACEMENT VERIFICATION WITH REPORT
5. TESTING TENSION STUDY FOR ROCK ANCHORS
6. ALL THIRD PARTY TESTS AS REQUIRED BY LOCAL JURISDICTION
C. REQUIRED TESTS BY CONTRACTOR
1. COAX SWEEP TESTS PER SPRINT STANDARD TS-0200
2. FIBER TESTS PER SPRINT STANDARD EL-0568
3. MICROWAVE LINK TESTS PER NP-760-500
4. ANTENNA AZIMUTHS AND DOWN TILT USING ELECTRONIC ALIGNMENT TOOL PER ANTENNA INSTALLATION SPECIFICATION HEREIN.
5. POST CONSTRUCTION HEIGHT VERIFICATION AS REQUIRED HEREWITH IN THE TOWER INSTALLATION SPECIFICATIONS.
6. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED HEREWITH IN THE ASPHALT PAVING SPECIFICATIONS.
7. FIELD QUALITY CONTROL TESTING AS SPECIFIED HEREWITH IN THE CONCRETE PAVING SPECIFICATIONS.
8. TESTING REQUIRED HEREWITH UNDER SPECIFICATIONS FOR AGGREGATE BASE FOR ROADWAYS
9. ALL OTHER TESTS REQUIRED BY LOCAL JURISDICTION
D. INSPECTIONS BY COMPANY: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN INSPECTION ACTIVITIES, FINAL ACCEPTANCE / PUNCH WALK REVIEW, AND/OR AS A RESULT OF TESTING
E. SPRINT RESERVES THE RIGHT TO INSPECT THE CONSTRUCTION SITE AT ANY TIME VIA SITE WALKS AND/OR PHOTO REVIEWS. CONTRACTOR SHALL GIVE SPRINT 24 HOURS NOTICE PRIOR TO THE COMMENCEMENT OF THE FOLLOWING CONSTRUCTION ACTIVITIES AND PHOTOGRAPHS OF THE IN-PROGRESS WORK.
1. GROUNDING SYSTEM AND BURIED UTILITIES INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS, AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS, ASPHALT PAVING, AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE AND POST CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES. PRIOR TO CONSTRUCTION ACTIVITIES AND AFTER CONSTRUCTION IS COMPLETE, PROVIDE PHOTOGRAPHIC DOCUMENTATION OF ROOF, FLASHINGS, AND PARAPETS, BOTH BEFORE AND AFTER CONSTRUCTION IS COMPLETE.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. TOWER TOP AND INACCESSIBLE EQUIPMENT (RRUS, ANTENNAS, AND CABLING): PROVIDE PHOTOS OF THE BACKS OF ALL ANTENNAS, RRUS, COMBINERS, FIBER AND DC CABLING, CABLE COLOR CODING, EQUIPMENT GROUNDING AND CONNECTOR WATER PROOFING INCLUDING NAME PLATE AND SERIAL NUMBER FOR ALL SERIALIZED EQUIPMENT.

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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.32577

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF THE RESPONSIBLE LICENSED PROFFESIONAL ENGINEER, TO ALTER THIS DOCUMENT.

SITE NAME: BOZRAH
SITE ID: CT33XC570

12 POLLY LANE
BOZRAH, CT 06334

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
GENERAL NOTES - 2

SHEET NUMBER :
ANT-002.00

PROJECT CLOSEOUT:
A. FINAL ACCEPTANCE PUNCH WALK AND INSPECTION: AS IDENTIFIED IN THE SCOPE OF SERVICES, SPRINT WILL CONDUCT A FINAL PUNCH WALK OR FINAL DESK TOP PHOTO REVIEW (SITE MODIFICATIONS). PUNCH WALKS MUST BE SCHEDULED IN ADVANCE AS REQUIRED. AT THE PUNCH WALK / REVIEW, SPRINT MAY IDENTIFY CRITICAL DEFICIENCIES WHICH MUST BE CORRECTED PRIOR TO PUTTING SITE ON AIR. MINOR DEFICIENCIES MUST BE CORRECTED WITHIN 30 DAYS EXCEPT AS OTHERWISE REQUIRED. VERIFICATIONS OF CORRECTIONS MAY BE MADE BY COMPANY DURING A REPEAT SITE WALK OR DESK TOP PHOTO REVIEW AT COMPANY'S SOLE DISCRETION.
B. CLOSEOUT DOCUMENTATION: ALL CLOSEOUT DOCUMENTATION AND PHOTOGRAPHS SHALL BE UPLOADED PRIOR TO FINAL ACCEPTANCE. SPRINT WILL REVIEW CLOSEOUT DOCUMENTATION FOR PRESENCE AND CONTENT. CLOSEOUT DOCUMENTATION SHALL INCLUDE BUT IS NOT LIMITED TO THE FOLLOWING AS APPLICABLE:
1. COAX SWEEP TESTS:
2. FIBER TESTS:
3. JURISDICTION FINAL INSPECTION DOCUMENTATION
4. REINFORCEMENT CERTIFICATION (MILL CERTIFICATION)
5. CONCRETE MIX DESIGN AND PRODUCT DATA (TOWER FOUNDATION)
6. LIEN WAIVERS AND RELEASES.
7. POST -CONSTRUCTION HEIGHT VERIFICATION
8. JURISDICTION CERTIFICATE OF OCCUPANCY
9. ELECTRONIC ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
10. STRUCTURAL BACKFILL TEST RESULTS (IF APPLICABLE)
11. CELL SITE UTILITY SETUP
12. AS-BUILT REDLINE CONSTRUCTION DRAWINGS (PDF SCAN OF FIELD MARKS)
13. AS-BUILT CONSTRUCTION DRAWINGS IN DWG AND PDF FORMATS
14. LIST OF SUB CONTRACTORS
15. APPROVED PERMITTING DOCUMENTS
16. FINAL SITE PHOTOS UP-LOADED TO SITERRA. INCLUDE THE FOLLOWING AS APPLICABLE:
    a. TOWER, ANTENNAS, RRUS, AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX/CABLE LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING - TOP AND BOTTOM; PHOTOS OF COAX GROUNDING--TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
    b. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
    c. SITE LAYOUT - PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
    d. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

PROJECT PHOTOGRAPHS:
A. PROVIDE PROJECT CLOSEOUT GENERAL ARRANGEMENT PHOTOS OF ALL NEW WORK. THE FOLLOWING LIST REPRESENTS MINIMUM REQUIREMENTS AND MINIMUM QUANTITY. ADDITIONAL PHOTOS MAY BE REQUIRED TO ADEQUATELY DOCUMENT THE WORK.
1. ASR AND RF MPE SIGNAGE (IF NOT IN PLACE, SUPPLIER NOTIFIES EMS FIELD REPRESENTATIVE)
2. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR)
3. BACK OF ANTENNAS AND RRUS (1 EACH SECTOR) CLOSE UP SHOWING WEATHERPROOFING AND GROUNDING (AS REQUIRED). CLOSE-UP OF BACK SIDE OF EACH PERMANENT RRU SHOWING SERIAL NUMBER/BAR CODE.
4. VIEW (1 EACH SECTOR) ALONG THE AZIMUTH AND TILT OF THE ANTENNAS
5. TOP OF TOWER FROM GROUND, 1 EACH SECTOR
6. MAINLINE HYBRID CABLE ROUTE DOWN TOWER SHOWING FASTENERS AND SUPPORT
7. MAINLINE/HYBRID CABLE ROUTE ALONG ICE BRIDGE OR IN CABLE TRAY SHOWING FASTENERS AND SUPPORT
8. GROUND MOUNTED RRU RACKS (FRONT AND BACK)
9. FRONT, SIDE AND BACK ELEVATIONS OF ALL GROUND CABINETS
10. VIEW OF COMPOUND FROM A DISTANCE
11. VIEW OF EACH GROUND CABINET (POWER, RF, FIBER SPOOL, PPC POWER, PPC TELCO WITH DOOR OPEN)
12. BACKHAUL FIBER MEET-ME-POINT AND CONDUIT ROUTE (MICROWAVE INSTALLATION IF NOT FIBER)
13. AAV NETWORK INTERFACE DEVICE OR MICROWAVE RADIO INSTALLATION

DEFICIENCY CORRECTIONS:
CONTRACTOR IS RESPONSIBLE FOR ALL CORRECTIONS TO DEFICIENCIES IDENTIFIED THROUGH TESTING, REVIEW OF SUBMITTALS, INSPECTIONS AND CLOSEOUT REVIEWS.

SECTION 01 500 - PROJECT REPORTING

WEEKLY REPORTS:
A. CONTRACTOR SHALL REPORT TO SPRINT AT MINIMUM ON A WEEKLY BASIS VIA SITERRA BY UPDATING ALL APPLICABLE POST END KEEPING MILESTONES WITH ACTUAL AND FORECASTED COMPLETION DATES.
B. ADDITIONAL REQUIREMENTS FOR REPORTING MAY BE IDENTIFIED ELSEWHERE OR REQUIRED BY THE SCOPE OF SERVICES OR SPRINT'S LOCAL MARKET CONSTRUCTION MANAGER. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.
PROJECT CONFERENCE CALLS:
SPRINT MAY HOLD PERIODIC PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.
FINAL PROJECT ACCEPTANCE: PRIOR TO SPRINTS FINAL PROJECT ACCEPTANCE. ALL REQUIRED MILESTONE ACTUALS MUST BE UPDATED IN SITERRA AND ALL REQUIRED REPORTING TASKS MUST BE COMPLETE.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRU'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRU'S:
THE NUMBER AND TYPE OF ANTENNAS AND RRU'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN. LENGTH FOR JUMPER SHALL BE 10"-0".

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:
INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.
A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.
B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLE INSTALLATION:
A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.
C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
    a. FIBER: SUPPORT FIBER BUNDLES USING 1/2 " VELCRO STRAPS OF THE REQUIRED LENGTH AT 18" O.C. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
    b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
    a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
    b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
    c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURER'S RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED IN TS 0200 (CURRENT VERSION).
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:
A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
B. WEATHERPROOF USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2 " WIDE ELECTRICAL TAPE EXTENDING 2 " BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE STATIONS (MMBS) AND RELATED EQUIPMENT

SUMMARY:
A. THIS SECTION SPECIFIES MMBS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRED BY THE APPLICABLE INSTALLATION MOPS.
C. COMPLY WITH MANUFACTURER'S INSTALLATION AND START-UP REQUIREMENTS.

DC CIRCUIT BREAKER LABELING
A. NEW DC CIRCUIT IS REQUIRED IN MMBS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED.

SECTION 26 100 - BASIC ELECTRICAL REQUIREMENTS

SUMMARY:
THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS

QUALITY ASSURANCE:
A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.
B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.
C. MATERIALS AND EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:
A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT.
2. B-LINE SYSTEM.
3. UNISTRUT DIVERSIFIED PRODUCTS.
4. THOMAS & BETTS.
B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:
A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.
B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.
C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:
1. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
2. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:
A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.
B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR UNDERGROUND RUNS. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED - SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.
B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.
C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.
E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRED BY NEC. MANUFACTURERS OF FLEXIBLE CONDUIT'S SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.
F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:
A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
B. CABLE TERMINATION FITTINGS FOR CONDUIT
1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL BY ROXTEC.
2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.
C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.
D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKET COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.
E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM:
A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM TO THE EXTENT INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS EXCEPT AS OTHERWISE NOTED.
B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO-OX.
C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:
A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:
A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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SCALE : AS SHOWN
JOB NUMBER : 17924005A

REV	DATE	DESCRIPTION	BY	CHECKED BY
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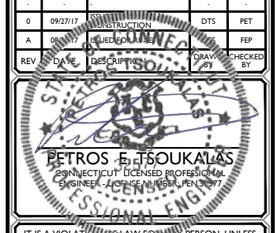
A	08/	PRELIMINARY	DTS	FEP



PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0029077

SITE NAME: BOZRAH
SITE ID: CT33XC570

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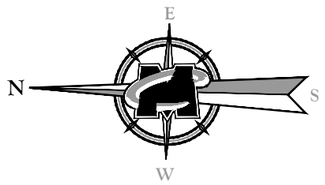
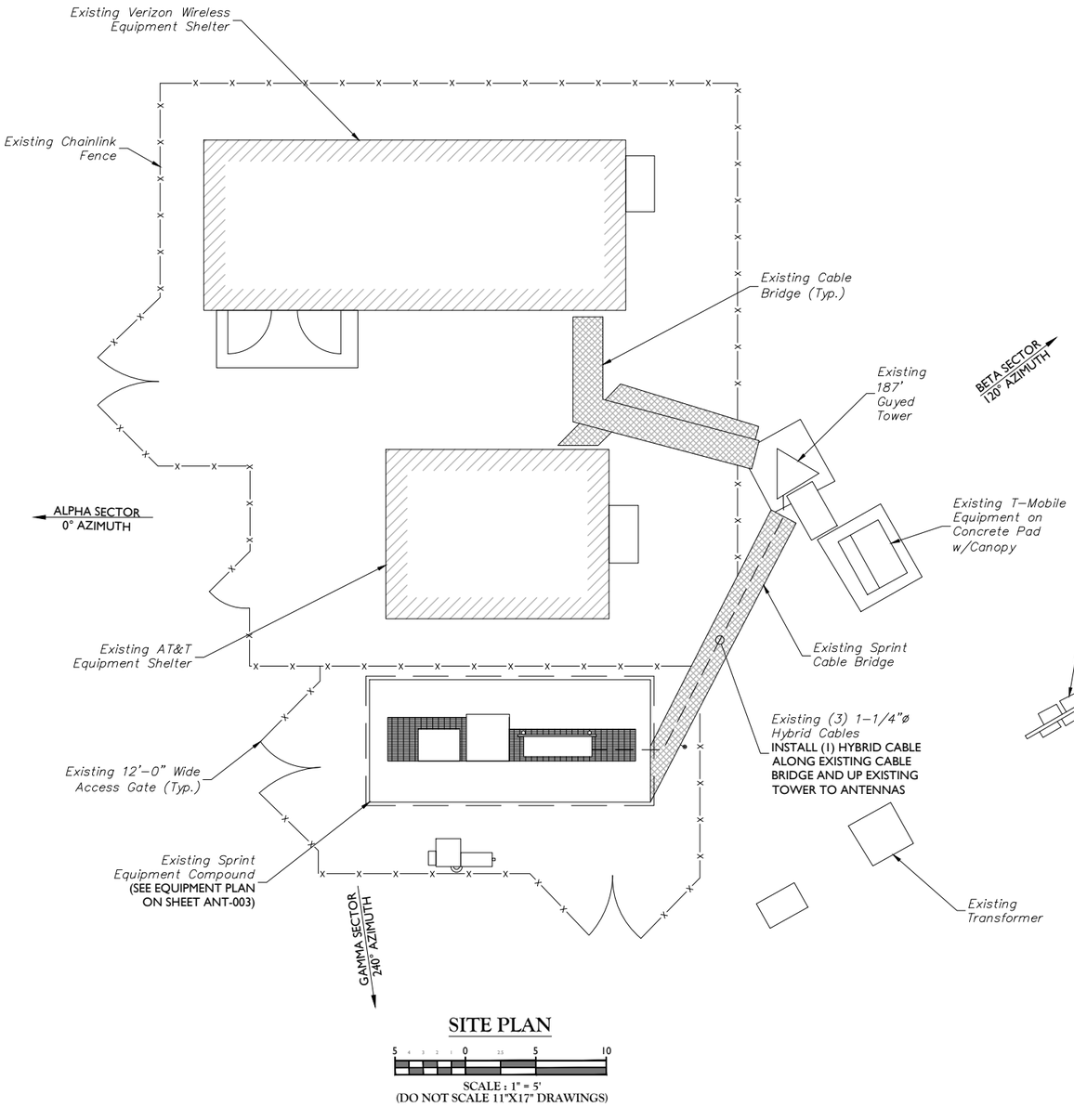
SHEET TITLE :
GENERAL NOTES - 3

SHEET NUMBER :
ANT-003.00





SITE PLAN

SCALE : 1" = 5'
(DO NOT SCALE 11"X17" DRAWINGS)

LEGEND

LIGHT LINE WORK INDICATES EXISTING OBJECTS
HEAVY LINE WORK INDICATED PROPOSED OBJECTS

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PETROS E. TSOUKALAS
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SITE NAME: BOZRAH
SITE ID: CT33XC570

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SITE PLAN

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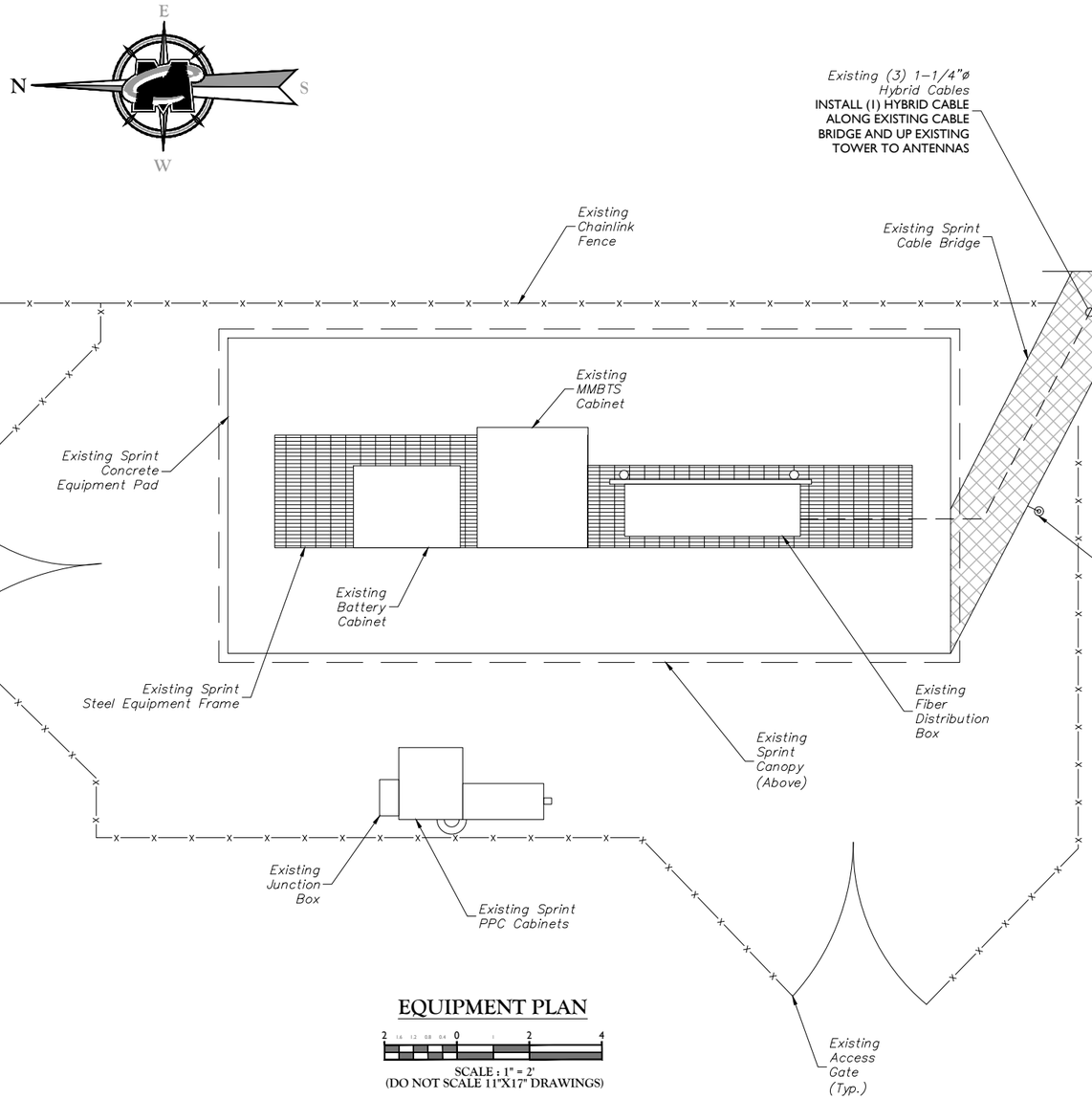
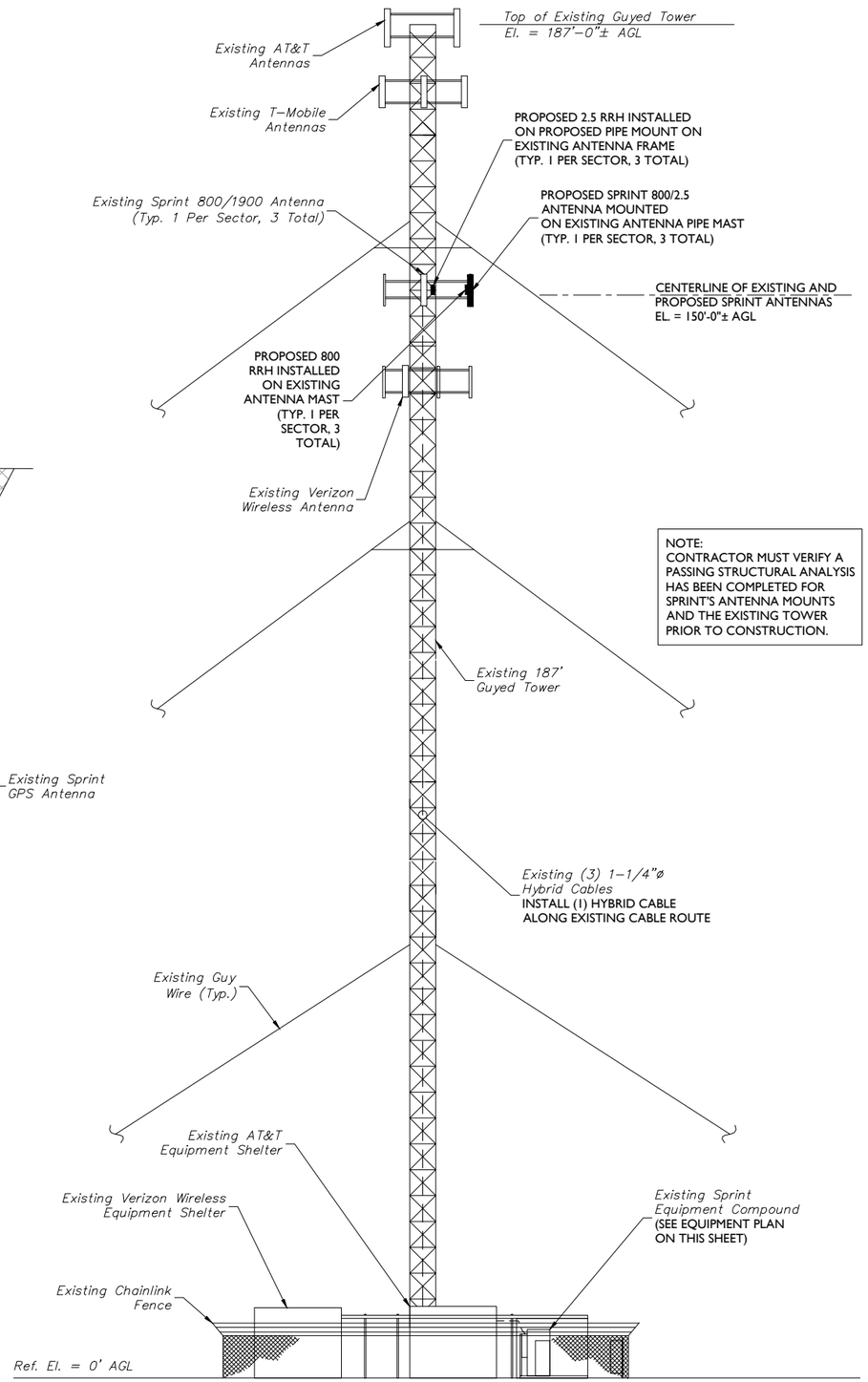


EQUIPMENT PLAN

2 1.6 1.2 0.8 0.4 0 1 2 4

SCALE : 1" = 2'
(DO NOT SCALE 11"X17" DRAWINGS)



NOTE:
CONTRACTOR MUST VERIFY A PASSING STRUCTURAL ANALYSIS HAS BEEN COMPLETED FOR SPRINT'S ANTENNA MOUNTS AND THE EXISTING TOWER PRIOR TO CONSTRUCTION.

ELEVATION (LOOKING SOUTH)

SCALE: 1" = 10'

LEGEND

LIGHT LINE WORK INDICATES EXISTING OBJECTS
HEAVY LINE WORK INDICATED PROPOSED OBJECTS

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SHEET TITLE :
EQUIPMENT PLAN AND ELEVATION

SHEET NUMBER :
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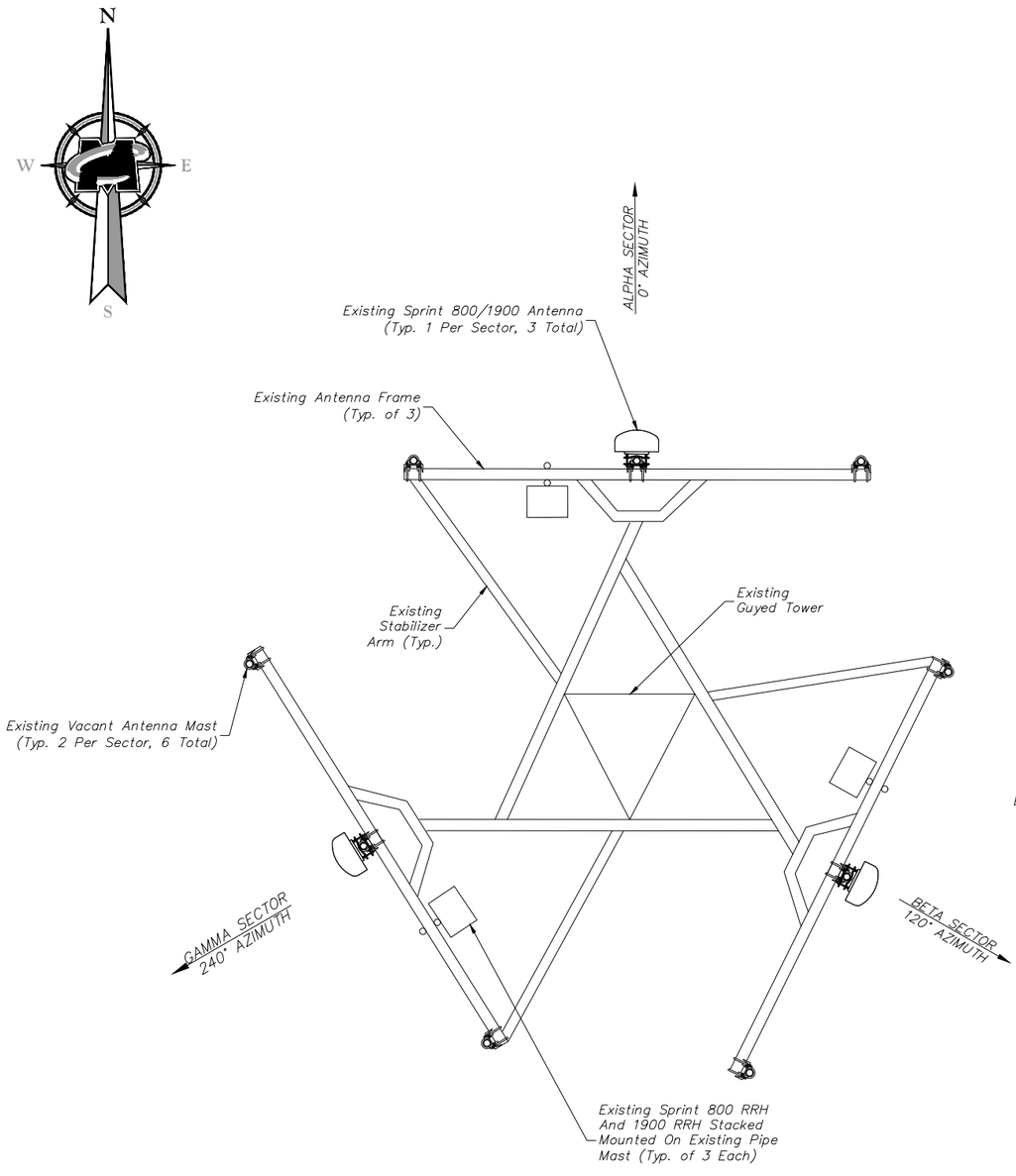
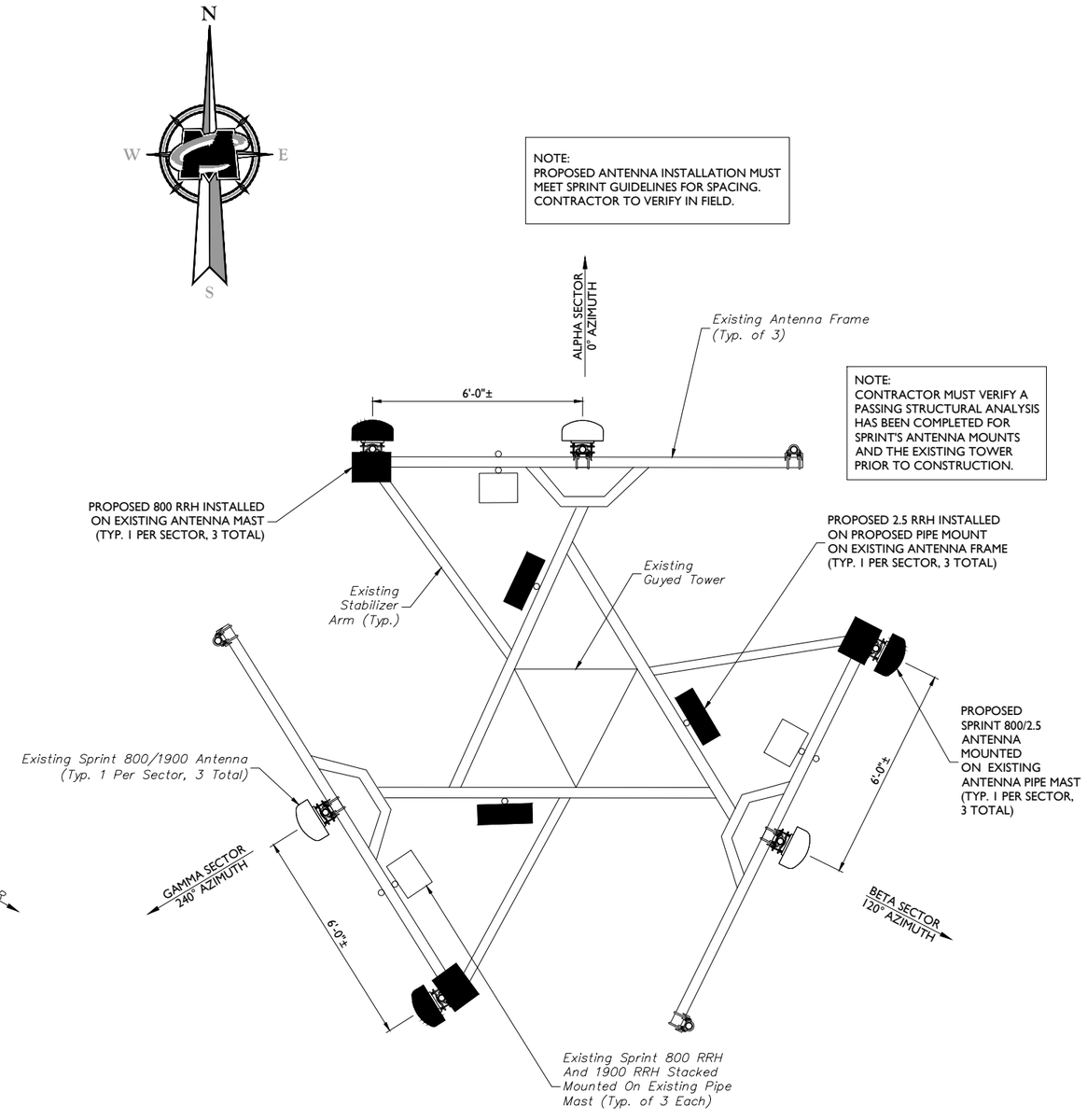


EXISTING ANTENNA LAYOUT

SCALE: 1" = 2'-0"



PROPOSED ANTENNA LAYOUT

SCALE: 1" = 2'-0"

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PETROS E. TSOUKALAS
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SHEET TITLE:
ANTENNA
ORIENTATION PLANS

SHEET NUMBER:
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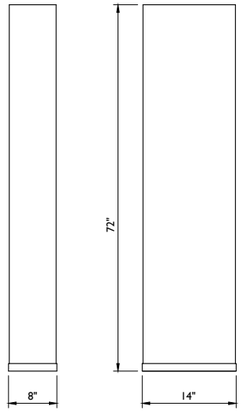
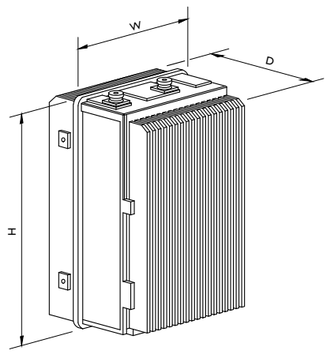


WEIGHT = 58 LBS

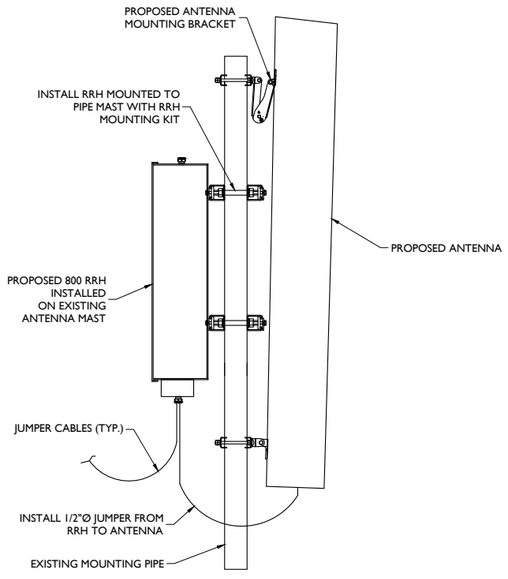
COMMSCOPE DT465B-2XR

ANTENNA DETAIL
NOT TO SCALE

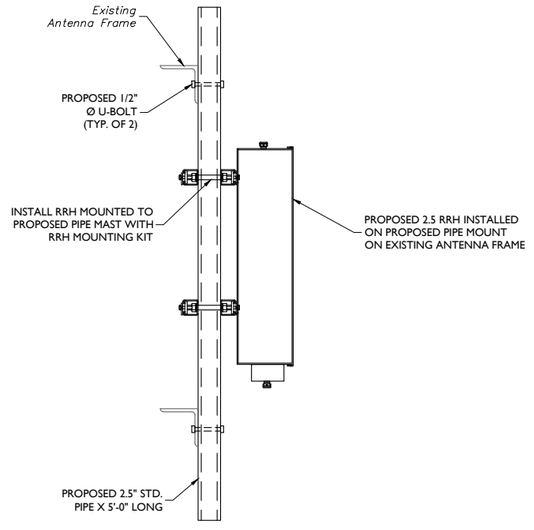


MODEL:	HEIGHT (H)	WIDTH (W)	DEPTH (D)	WEIGHT
ALU TD-RRH8x20-25	26"	18.6"	6.7"	76.2 LBS
ALU RRH-2x50-800	16"	13"	10"	69.1 LBS

RRH SPECIFICATIONS
NOT TO SCALE



ANTENNA AND RRH MOUNTING DETAIL
NOT TO SCALE



RRH MOUNTING DETAIL
NOT TO SCALE

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SHEET TITLE :
DETAILS

SHEET NUMBER :
ANT-007.00

RF NOTES

1. ACTUAL CABLE LENGTHS SHALL BE DETERMINED PER SITE CONDITION BY SUBCONTRACTOR.
2. THE DESIGN IS BASED ON RF DATA SHEETS, SIGNED AND APPROVED.
3. RADIO SIGNAL CABLE AND RACEWAY SHALL COMPLY WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC, NFPA 70), CHAPTER 8.
4. ALL SPECIFIED MATERIAL FOR EACH LOCATION (E.G., OUTDOORS, INDOORS-OCCUPIED, INDOORS-UNOCCUPIED, PLENUMS, RISER SHAFTS, ETC.) SHALL BE APPROVED, LISTED, OR LABELED AS REQUIRED BY THE NEC.
5. HARDLINE AND JUMPER CABLES SHALL BE SUPPORTED WITH HANGERS AND AT INTERVALS AS REQUIRED BY THE MANUFACTURER FOR 125 mph WIND SPEED AND EXPECTED ICE CONDITIONS. FOR SITES WITH TOWER HEIGHT OVER 300' OR ARE LOCATED IN THE EXTREME WEATHER/OPERATION AREAS, THE WORST CASE SCENARIO FOR 150 mph WIND SPEED AND 1" ICE CONDITION SHOULD BE APPLIED. ALL CABLES SHOULD BE SUPPORTED AT HALF THE DISTANCE OF THE MAXIMUM HANGER SPACING FROM THE CABLE CONNECTOR LOCATION TO THE 1ST HANGER. MANUFACTURER RECOMMENDED CABLE SUPPORT ACCESSORIES SHALL BE USED. PLASTIC CABLE TIES ARE NOT ACCEPTABLE. HANGER STACKING LIMIT SHOULD ALSO REFER TO VENDOR'S RECOMMENDATION.
6. THE OUTDOOR CABLE SUPPORT SYSTEM SHALL BE PROVIDED WITH AN ICE SHIELD TO SUPPORT AND PROTECT ANTENNA CABLE RUNS.
7. DRIP LOOPS SHALL BE REQUIRED ON ALL OUTSIDE CABLES. CABLES SHALL BE SLOPED AWAY FROM THE BUILDING OR OUTDOOR BTS CABINETS TO PREVENT WATER FROM ENTERING THROUGH THE COAXIAL CABLE PORT.
8. ALL FEEDER LINE AND JUMPER CONNECTORS SHALL BE 7/16 DIN CABLE CONNECTORS THAT MEET IP68 STANDARDS.
9. CONNECTORS IN INDOOR APPLICATIONS REQUIRE NO WEATHERPROOFING. OUTDOOR APPLICATIONS REQUIRE WEATHERPROOFING AND THE FOLLOWING PROCEDURES SHOULD BE FOLLOWED:

   RE-ENTERABLE AND RE-SEALABLE PLASTIC ENCLOSURE APPROVED BY CABLE MANUFACTURER AND CONTRACTOR IS RECOMMENDED METHOD TO WEATHERPROOF CONNECTORS.

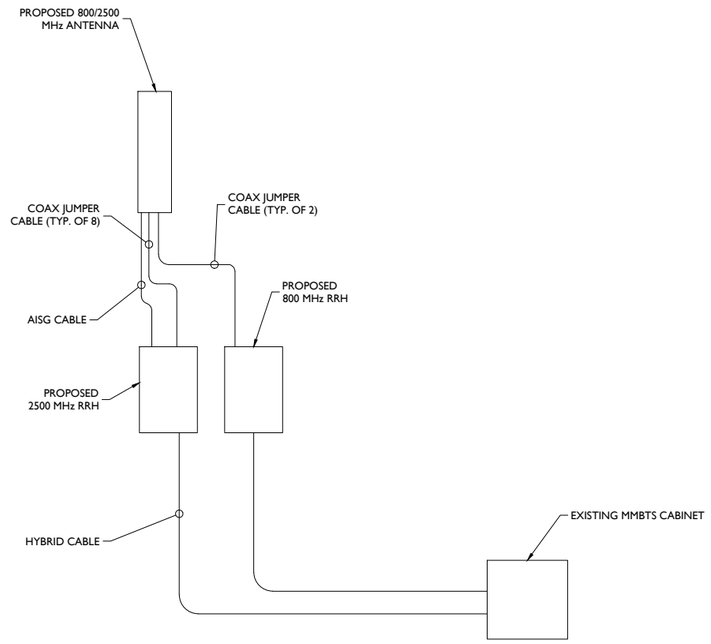
   ALSO ACCEPTABLE IS THE USE OF BUTYL RUBBER WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURE AND CONTRACTOR. START BUTYL RUBBER TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE ARRESTOR UNTIL THREE (3) TO FOUR (4) INCHES BEYOND THE CONNECTOR AND REVERSE AGAIN WITH THE STICKY SIDE DOWN FOR ANOTHER TWO INCHES. FINISH WITH TWO LAYERS OF VINYL TAPE. COLD SHRINK IS STRICTLY PROHIBITED. SELF-BONDING, AMALGAMATING TAPE MAYBE USED AS AN ALTERNATIVE TO BUTYL RUBBER TAPE.
10. ANTENNAS SHALL BE PAINTED, WHEN REQUIRED, BY THE LANDLORD OR AUTHORITY HAVING JURISDICTION IN ACCORDANCE WITH ANTENNA MANUFACTURERS' SURFACE PREPARATION AND PAINTING REQUIREMENTS.
11. CABLE SHIELDS, AND TOWER CONDUITS SHALL BE GROUNDED AT THE TOP OF THE TOWER, WITHIN 10 FEET OF THEIR CONNECTORS, AND AT THE BOTTOM OF THE TOWER ABOUT 6 INCHES BEFORE THEY TURN TOWARD THE FACILITY. THEY SHALL BE GROUNDED AT THE MIDPOINT OF TOWERS THAT ARE BETWEEN 100 FEET AND 200 FEET HIGH, AND AT INTERVALS OF 100 FEET OR LESS ON TOWERS THAT ARE HIGHER THAN 200 FEET.
12. APPROVED GROUNDING KITS, WHICH INCLUDE GROUNDING STRAPS, SHALL BE USED TO GROUND THE COAXIAL CABLE SHIELDS, AND CONDUITS. THE GROUND CONDUCTORS FOR THE KITS AT THE TOP OF THE TOWER, AND IN THE MIDDLE SECTION OF THE TOWER, ARE BONDED DIRECTLY TO TOWER STEEL USING BOLTED, OR APPROVED CLAMP CONNECTIONS. EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTORS STRUCTURAL ENGINEER.
13. ALL RADIO SIGNAL CABLE SHALL BE LABELED AND COLOR CODED PER MARKET REQUIREMENTS.
14. ANTENNA FEED LINE SYSTEM SWEEP TESTING SHALL BE PERFORMED AND REPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF PROJECT SPECIFICATIONS. CONTRACTOR WILL NOT ACCEPT A RADIO SIGNAL CABLE INSTALLATION WITH UNSATISFACTORY SWEEP TEST RESULTS.
15. PIM TESTS SHALL BE PERFORMED ON NEW AND MOVED OR MODIFIED COAXIAL CABLE INSTALLATIONS. TEST SHALL BE PERFORMED AND REPORTED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
16. DC CONNECTORS AT OUTDOOR BIAS-Ts OR DIPLEXER/TRIPLEXER PORTS SHALL BE WEATHERPROOFED PER MANUFACTURER RECOMMENDATIONS.
17. AISG CONNECTIONS DO NOT REQUIRE ADDITIONAL WEATHERPROOFING UNLESS RECOMMENDED BY MANUFACTURER OR BY MARKET REQUIREMENTS.
18. INSTALL ONLY STANDARD RF JUMPER CABLES (e.g. LDF4 OR LCF12) AT TOWER-TOP APPLICATIONS. FLEXIBLE RF CABLES (e.g. FSJ4 OR SCF12) SHALL NOT BE USED.
19. CABLES AND CONNECTORS MUST BE PREPARED AND INSTALLED USING THE TOOLS RECOMMENDED BY THE COAXIAL CABLE MANUFACTURER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE CORRECT TOOLS ARE USED FOR THE SIZE AND TYPE OF COAX AND CONNECTOR. ALL ASPECTS OF INSTALLATION OF ALL COAXIAL CABLE SHALL FOLLOW THE CABLE MANUFACTURER'S RECOMMENDATIONS, INCLUDING THOSE FOR PULLING, MOUNTING AND GROUNDING.

PROPOSED ANTENNA CONFIGURATION

SECTOR		PROPOSED ANTENNA	TECH.	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	ELECTRICAL DOWNTILT	MECHANICAL DOWNTILT
ALPHA	A1	COMMSCOPE DT465B-2XR	800/2500	NEW	72	14	8	58	0°	150'	5°/2°	0°
BETA	B1	COMMSCOPE DT465B-2XR	800/2500	NEW	72	14	8	58	120°	150'	5°/2°	0°
GAMMA	C1	COMMSCOPE DT465B-2XR	800/2500	NEW	72	14	8	58	240°	150'	5°/2°	0°

BILL OF MATERIALS

NUMBER	QUANTITY	DESCRIPTION	MANUFACTURER	MODEL NUMBER
1	3	PANEL ANTENNA	COMMSCOPE	DT465B-2XR
2	3	2500MHZ RRH	ALU	TD-RRH8X20-25
3	3	800MHZ RRH	ALU	RRH-2X50-800
4	200 LF	1-1/4"Ø HYBRID FIBER RISER	ALU	TBD
5	30	1/2"Ø JUMPER CABLE (8' LONG)	TBD	
6	3	0.315"Ø AISG CABLE (8' LONG)	COMMSCOPE	ATCB-B01-006



ANTENNA WIRING DIAGRAM

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STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.29077
LICENSED PROFESSIONAL ENGINEER

SITE NAME: BOZRAH
SITE ID: CT33XC570

12 POLLY LANE
BOZRAH, CT 06334

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331 Newman Springs Road
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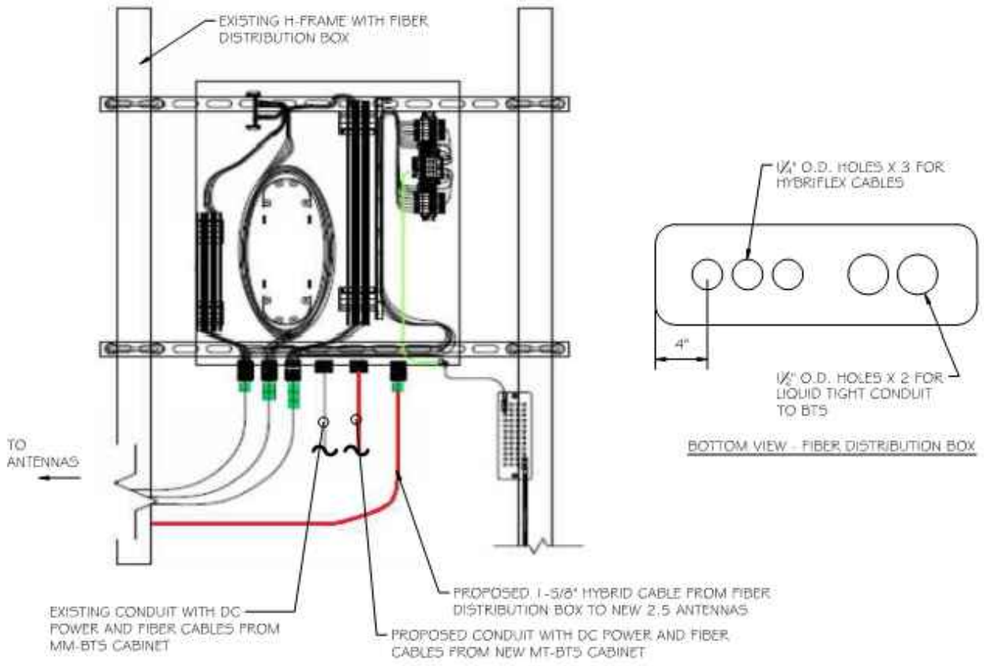
SHEET TITLE :
ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES

SHEET NUMBER :
ANT-008.00



TYPICAL FIBER DISTRIBUTION BOX DETAIL
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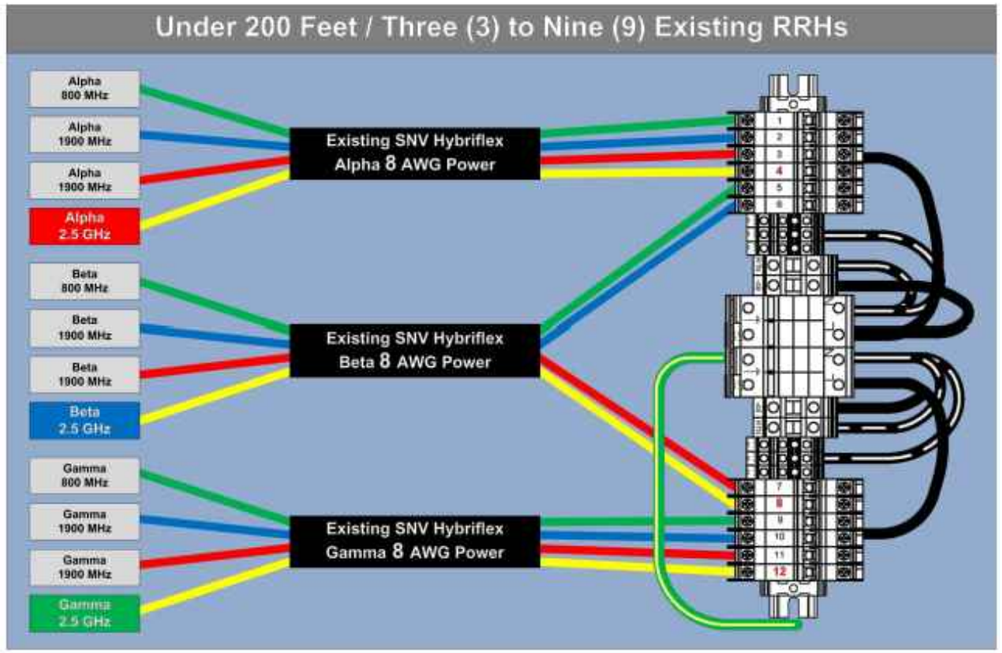

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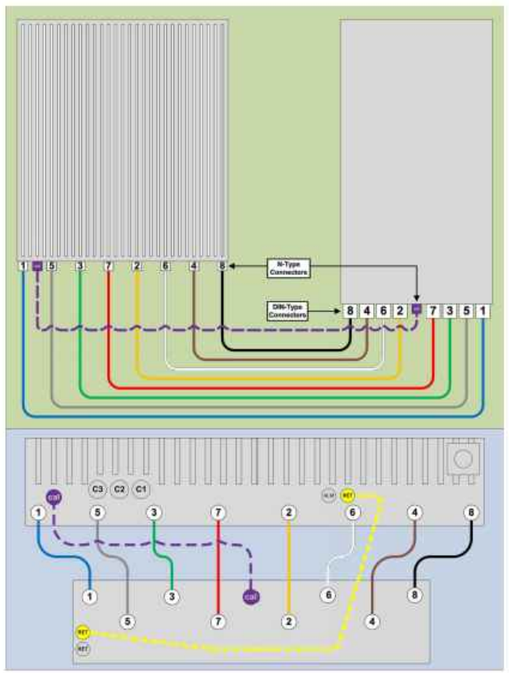

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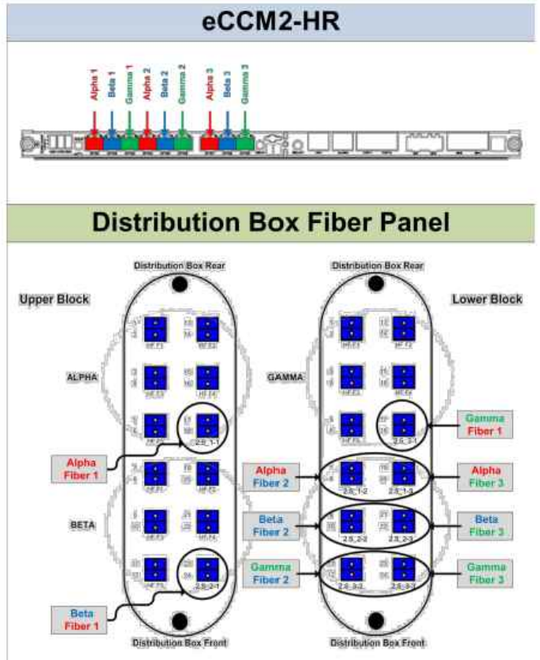

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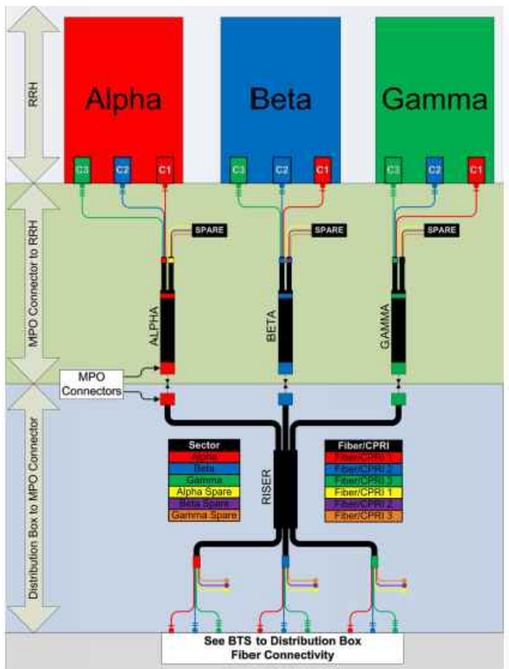

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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.[illegible]7

SITE NAME: BOZRAH
SITE ID: CT33XC570

12 POLLY LANE
BOZRAH, CT 06334

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SHEET TITLE :
FIBER PLUMBING DIAGRAMS

SHEET NUMBER :
ANT-009.00

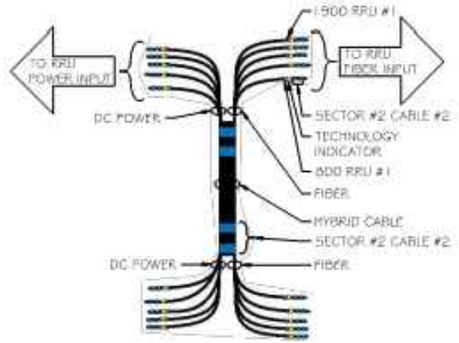
CABLE MARKING NOTES

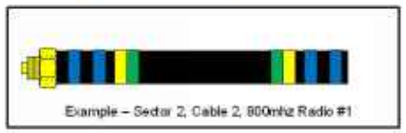
1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE 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 LABEL

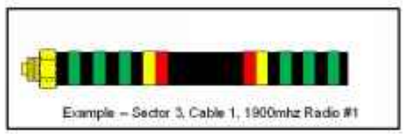
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

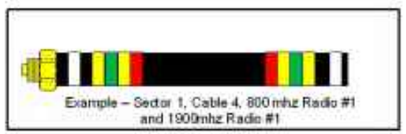
NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

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









COLOR CODING CHARTS
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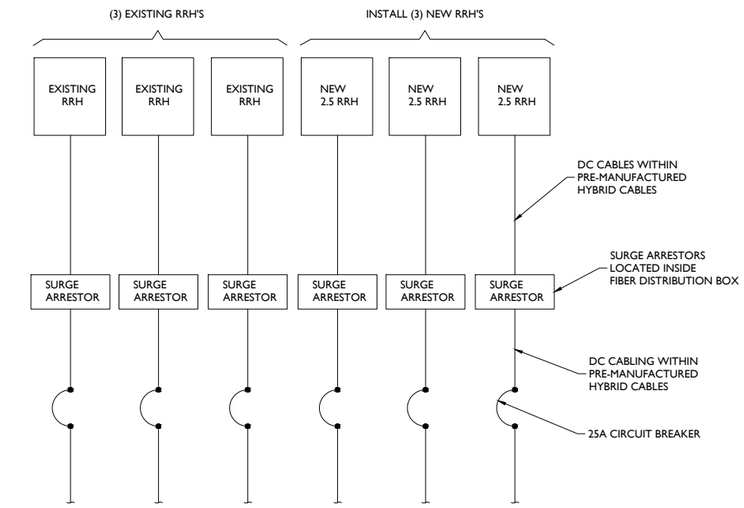

DC ONE-LINE DIAGRAM
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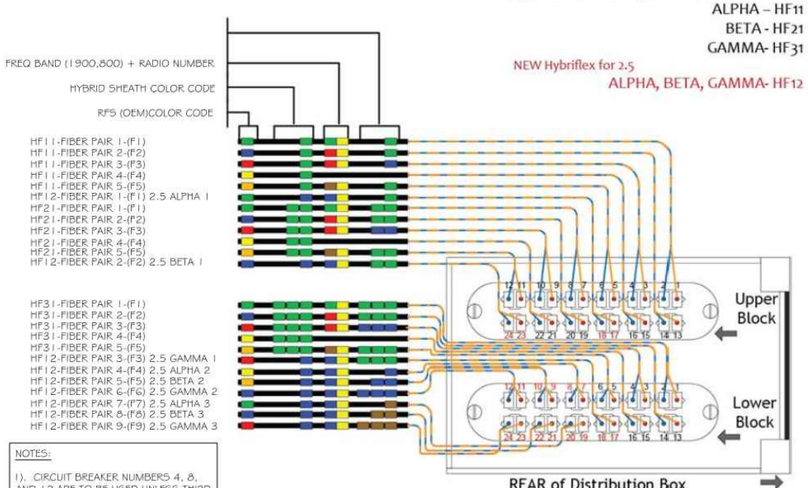
Each sector has separate Hybriflex cable .
Hybriflex cable naming as follows:
ALPHA – HF11
BETA - HF21
GAMMA- HF31

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.

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CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.25977
LICENSED PROFESSIONAL ENGINEER

SITE NAME: BOZRAH
SITE ID: CT33XC570

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BOZRAH, CT 06334

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SHEET TITLE
CABLE COLOR CODING, DC POWER DETAILS & PANEL SCHEDULES

SHEET NUMBER :
ANT-010.00

GENERAL REQUIREMENTS:

1. THE WORK TO BE DONE UNDER THIS PROJECT INCLUDES PROVIDING ALL EQUIPMENT, MATERIALS, LABOR AND SERVICES, AND PERFORMING ALL OPERATIONS FOR COMPLETE AND OPERATING SYSTEMS. ANY WORK NOT SPECIFICALLY COVERED BY NECESSARY TO COMPLETE THIS INSTALLATION, SHALL BE PROVIDED. ALL EQUIPMENT AND WIRING TO BE NEW AND PROVIDED UNDER THIS CONTRACT UNLESS OTHERWISE NOTED.
2. ENTIRE INSTALLATION, INCLUDING MATERIALS, EQUIPMENT AND WORKMANSHIP, SHALL CONFORM TO THE 2011 EDITION OF THE NATIONAL ELECTRIC CODE (NEC) AS WELL AS ALL APPLICABLE LAWS AND REGULATIONS AND REGULATORY BODIES HAVING JURISDICTION OVER THIS WORK.
3. THE TERM "FURNISH" SHALL MEAN TO OBTAIN AND SUPPLY THE JOB SITE. THE TERM "INSTALL" SHALL MEAN TO FIX IN POSITION AND CONNECT FOR USE. THE TERM "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL. THE TERM "CONTRACTOR" SHALL MEAN ELECTRICAL CONTRACTOR.
4. ONLY WRITTEN CHANGES AND/OR MODIFICATIONS APPROVED BY THE ENGINEER, CONSULTING ENGINEER OR OWNER'S REPRESENTATIVE WILL BE RECOGNIZED.
5. THE ELECTRICAL CONTRACTOR SHALL SUBMIT, FOR THE ENGINEER'S APPROVAL, DETAILED SHOP DRAWINGS OF ALL EQUIPMENT SPECIFIED.
6. CONTRACTOR SHALL COORDINATE WITH SPECIFICATIONS BY OTHER TRADES.
7. PROVIDE OPERATING AND MAINTENANCE MANUALS, PER SPECIFICATIONS, AND GIVE INSTRUCTIONS TO USER FOR ALL EQUIPMENT AND SYSTEMS PROVIDED UNDER THIS CONTRACT AFTER ALL ARE CLEANED AND OPERATING.
8. KEEP PREMISES FREE FROM RUBBISH. REMOVE ALL ELECTRICAL RUBBISH FROM SITE.
9. ALL WORK SHALL BE INSTALLED CONCEALED UNLESS OTHERWISE NOTED.
10. THE WORK SHALL INCLUDE ALL PANELS, DEVICES, FEEDERS AND BRANCH CIRCUIT WIRING AS REQUIRED FOR THE DISTRIBUTION SYSTEM INDICATED AND CALLED FOR ON THE DRAWINGS. REQUIRED BY SPECIFICATIONS AND AS NECESSARY FOR COMPLETE FUNCTIONAL SYSTEMS PRESENTED AND INTENDED.
11. THE CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, TOOLS, EQUIPMENT, CONSUMABLES AND SERVICES REQUIRED FOR OBTAINING, DELIVERY, INSTALLATION, CONNECTION, DISCONNECTION, REMOVAL, RELOCATION, REPAIR, REPLACEMENT, TESTING AND COMMISSIONING OF ALL EQUIPMENT AND DEVICES INCLUDED IN OR NECESSARY FOR THE WORK, AS APPLICABLE. THIS INCLUDES SCAFFOLDING, LADDERS, RIGGING, HOISTING, ETC.
12. ELECTRICAL WORK SHALL INCLUDE ALL REQUIRED CUTTING, PATCHING AND THE FULL RESTORATION OF WALL AND FLOOR STRUCTURE AND SURFACES. ALL EQUIPMENT, WALLS, FLOORS, ETC., DISTURBED OR DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THE SATISFACTION OF THE OWNER, AT THE CONTRACTORS EXPENSE.
13. BEFORE SUBMITTING HIS BID, THE CONTRACTOR SHALL FULLY ACQUAINT HIMSELF/HERSELF WITH THE JOB CONDITIONS AND DIFFICULTIES THAT WILL PERTAIN TO THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR. EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED, WHICH COULD NOT HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
14. THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR REPAIRING ANY DAMAGE TO EXISTING UTILITIES.
15. UPON COMPLETION OF THE ELECTRICAL WORK, THE CONTRACTOR SHALL TEST THE COMPLETE ELECTRICAL SYSTEM FOR SHORTS, GROUNDS, AND PROPER OPERATION, IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
16. UPON COMPLETION OF WORK, THE CONTRACTOR SHALL CLEAN AND ADJUST ALL EQUIPMENT AND LIGHTING AND TEST SYSTEMS TO THE SATISFACTION OF OWNER AND ENGINEER. RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.
17. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS OF FINISHED CONSTRUCTION PRI9OR TO FABRICATION AND INSTALLATION OF FIXTURES AND EQUIPMENT.
18. EXACT ROUTING OF CONDUITS AND "MC" CABLES SHALL BE DETERMINED IN THE FIELD.
19. IF THE OWNER AND/OR HIS REPRESENTATIVE CONSIDERS ANY WORK TO BE INFERIOR, THE RESPECTIVE CONTRACTOR SHALL REPLACE SAME WITH CONTRACT STANDARD WORK WITHOUT ADDITIONAL CHARGE. ALL WORK SHALL BE DONE IN A NEAT, WORKMANLIKE MANNER. LEFT CLEAN AND FREE FROM DEFECTS, AND COMPLETELY OPERABLE.
20. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS AS SHOWN ON THE DRAWINGS AND/OR AS SPECIFIED. ALL MATERIALS SHALL BE NEW, AND BEAR THE UL LABEL. ALL WORK SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE BY THE OWNER.
21. DRAWINGS ARE TO BE CONSIDERED DIAGRAMMATIC, AND SHALL BE FOLLOWED AS CLOSELY AS CONDITIONS ALLOW TO COMPLETE THE INTENT OF THE CONTRACT. THE DRAWINGS AND SPECIFICATIONS COMPLIMENT AND VICE VERSA, IS TO BE INCLUDED IN THE SCOPE OF WORK.
22. ALL EQUIPMENT CONNECTIONS SHALL BE INSTALLED PER APPLICABLE SEISMIC REQUIREMENTS.
23. ENGINEER WILL MAKE A FINAL INSPECTION WITH THE OWNER AND CONTRACTOR AND WILL NOTIFY THE CONTRACTOR IN WRITING OF ALL PARTICULARS IN WHICH THIS INSPECTION REVEALS THAT THE WORK IS INCOMPLETE OR DEFECTIVE. THE CONTRACTOR SHALL IMMEDIATELY TAKE SUCH MEASURES AS ARE NECESSARY TO COMPLETE SUCH WORK OR REMEDY SUCH DEFICIENCIES.
24. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, TRENCHING, AND BACKFILL AS REQUIRED FOR ELECTRICAL WORK. BACKFILL SHALL BE SUITABLE MATERIAL PROPERLY COMPACTED TO 95% DENSITY IN EACH LAYER OF SIX (6) INCH DEPTH. CONDUIT SHALL BE MINIMUM 36" BELOW FINISHED GRADE.

PROJECT COORDINATION:

1. THE CONTRACTOR SHALL VERIFY FIELD CONDITIONS AT THE SITE AND NOTIFY THE OWNER OF ANY DISCREPANCIES, PRIOR TO COMMENCING WITH THE WORK.
2. THE CONTRACTOR SHALL REVIEW AND COORDINATE WITH THE DOCUMENTS OF ALL TRADES.
3. THE CONTRACTOR SHALL FURNISH A SCHEDULE INDICATING HIS PORTION OF TIME, WITHIN THE OVERALL SCHEDULE, REQUIRED TO COMPLETE THE WORK, IN CONJUNCTION WITH ALL TRADES. ALL WORK THAT MAY AFFECT OPERATION OF BUILDING SYSTEMS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE.
4. SHUT DOWN OF POWER SHALL BE COORDINATED WITH THE OWNER, ARCHITECT AND PROJECT MANAGER AT LEAST 14 WORKING DAYS PRIOR TO SHUT DOWN. SHUT DOWNS LONGER THAN 2 DAYS SHALL BE COORDINATED WITH THE ABOVE PERSONNEL AT LEAST ONCE A MONTH IN ADVANCE. TEMPORARY POWER FOR CONSTRUCTION SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR FOR SHUT DOWNS OVER 2 DAYS.
5. ALL CONDUITS AND DEVICE BOXES SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR, INCLUDING ALL TECHNOLOGY CONDUITS AND BOXES.
6. INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. TEMPORARY SHUT DOWNS OF ANY SYSTEMS SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER AND ARCHITECT.

PROTECTION OF WORK:

1. EFFECTIVELY PROTECT ALL MATERIALS AND EQUIPMENT FROM ENVIRONMENTAL AND PHYSICAL DAMAGE UNTIL FINAL ACCEPTANCE. CLOSE AND PROTECT ALL OPENINGS DURING CONSTRUCTION. PROVIDE NEW MATERIALS AND EQUIPMENT TO REPLACE ITEMS DAMAGED.

WARRANTIES AND BONDS:

1. ALL MATERIALS, EQUIPMENT AND WORKMANSHIP SHALL BE GUARANTEED IN WRITING FOR A MINIMUM OF ONE YEAR AFTER FINAL ACCEPTANCE BY OWNER.
2. OBTAIN AND DELIVER TO THE OWNER'S REPRESENTATIVE ALL GUARANTEES AND CERTIFICATES OF COMPLIANCE.

PERMITS:

1. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION FEES FOR ELECTRICAL WORK.

RACEWAYS:

1. ALL CONDUIT SHALL BE MINIMUM SIZE OF 3/4" FOR POWER CIRCUITS AND CONTROL CIRCUITS EXCEPT WHERE FLEXIBLE CONDUIT IS CALLED FOR ON PROJECT DOCUMENTS. ALL EXTERIOR EXPOSED CONDUIT SHALL BE GRC (GALVANIZED RIGID METAL CONDUIT). ALL UNDERGROUND, IN SLAB OR UNDER SLAB SHALL BE RNC (RIGID NONMETALLIC CONDUIT). CHANGE RIGID METALLIC CONDUIT FOR INTERMEDIATE METALLIC CONDUIT BEFORE EXITING OUT OF CONCRETE OR PENETRATING A WALL, FLOOR OR ROOF. EMT IS ALLOWED IN INTERIOR DRY LOCATIONS WHERE NOT SUBJECT TO DAMAGE.
2. ALL FLEXIBLE CONDUIT IN WET OR DRY AREAS SHALL BE LIQUID TIGHT CONDUIT. NONMETALLIC FLEXIBLE CONDUIT IS SPECIFICALLY PROHIBITED.
3. CONDUIT SHALL BE RUN AT RIGHT ANGLES AND PARALLEL TO BUILDING LINES, SHALL BE NEATLY RACKED AND SECURELY FASTENED. JUNCTION BOXES SHALL BE PROVIDED WHERE REQUIRED TO FACILITATE INSTALLATION OF WIRES.
4. ALL CONDUIT AND ELECTRICAL EQUIPMENT SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE IN AN APPROVED MANNER.
5. ALL EMPTY RACEWAYS SHALL BE FURNISHED WITH A 200 LB. TEST NYLON DRAG LINE.
6. ARRANGEMENT OF CONDUIT AND EQUIPMENT SHALL BE AS INDICATED, UNLESS MODIFICATION IS REQUIRED TO AVOID INTERFERENCES.
7. FOR CONDUITS CROSSING EXPANSION JOINTS, PROVIDE EXPANSION FITTINGS FOR SIZE 1 1/4" AND LARGER. PROVIDE SECTIONS OF FLEXIBLE CONDUIT WITH GROUNDING JUMPERS FOR SIZES 1" AND SMALLER.
8. THE CONTRACTOR SHALL INSTALL DETECTABLE UNDERGROUND TAPES FOR THE PROTECTION, LOCATION AND IDENTIFICATION OF UNDERGROUND CONDUIT INSTALLATION.
9. EXACT ROUTING OF CONDUITS AND CABLES SHALL BE DETERMINED IN FIELD.

WIRING:

1. ALL WIRE SHALL BE COPPER WITH TYPE THNN/THWN 600 VOLT INSULATION, MINIMUM #12 AWG FOR POWER AND LIGHTING CIRCUITS AND #16 AWG FOR CONTROL CIRCUITS.
2. UNDER NO CIRCUMSTANCES SHALL FEEDERS BE SPLICED.
3. ALL COMPUTER CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTORS. ALL OTHER CIRCUITS MAY SHARE GROUND AND NEUTRAL CONDUCTORS.
4. WHERE EQUIPMENT, LIGHTING FIXTURES AND WIRING DEVICES ARE SHOWN WITH CIRCUIT NUMBERS ONLY, THE MINIMUM BRANCH CIRCUITING REQUIREMENTS SHALL BE AS FOLLOWS.
5. CONTRACTOR SHALL INCREASE SIZE OF CIRCUIT WIRING/CONDUCTORS TO COMPENSATE FOR VOLTAGE DROP.
6. WIRE SIZES SHALL BE INCREASED TO COMPENSATE FOR VOLTAGE DROP AS FOLLOWS:

GROUNDING:

1. PROVIDE A COMPLETE EQUIPMENT GROUND SYSTEM FOR THE ELECTRICAL SYSTEM AS REQUIRED BY ARTICLE 250, OF THE NEC, AND AS SPECIFIED HEREIN.
2. ALL BRANCH CIRCUITS FOR POWER WIRING SHALL CONTAIN A COPPER GROUND WIRE. NO FLEXIBLE METAL CONDUIT OF ANY KIND OR LENGTH SHALL BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR.
3. THE EQUIPMENT BONDING JUMPER SHALL BE PERMITTED TO BE INSTALLED INSIDE OR OUTSIDE OF A RACEWAY OR ENCLOSURE. WHERE INSTALLED ON OUTSIDE, THE LENGTH OF THE EQUIPMENT BONDING JUMPER SHALL NOT EXCEED 6 FEET AND SHALL BE ROUTED WITH THE RACEWAY OR ENCLOSURE. REFER TO NEC 2011 - 250.102 (E)
4. ALL GROUNDING DEVICES SHALL BE U.L. APPROVED OR LISTED FOR THEIR INTENDED USE.
5. ALL WIRES SHALL BE AWG THHN/THWN COPPER UNLESS NOTED OTHERWISE.
6. GROUNDING CONNECTIONS TO GROUND RODS, GROUND RING WIRE, TOWER BASE AND FENCE POSTS SHALL BE EXOTHERMIC ("CADWELDS") UNLESS NOTED OTHERWISE. CLEAN SURFACES TO SHINY METAL. WHERE GROUND WIRES ARE CADWELDED TO GALVANIZED SURFACES, SPRAY CADWELD WITH GALVANIZING PAINT.
7. GROUNDING CONNECTIONS TO GROUND BARS ARE TO BE TWO-HOLE BRASS MECHANICAL CONNECTORS WITH STAINLESS STEEL HARDWARE (INCLUDE SCREW SET). CLEAN GROUND BAR TO SHINY METAL. AFTER MECHANICAL CONNECTION, TREAT WITH PROTECTIVE ANTIOXIDANT COATING.
8. GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH MANUFACTURERS' GROUNDING KITS.
9. ROUTE GROUNDING CONDUCTORS THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 12" RADIUS.
10. INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 BARE TINNED COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.
11. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELDS") TO GROUND RING. REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO-HOLE LUGS.
12. EXOTHERMIC WELDS SHALL BE MADE IN ACCORDANCE WITH ERICO PRODUCTS BULLETIN A-AT.
13. CONSTRUCTION OF GROUND RING AND CONNECTIONS TO EXISTING GROUND RING SYSTEM SHALL BE DOCUMENTED WITH PHOTOGRAPHS PRIOR TO BACKFILLING SITE. PROVIDE PHOTOS TO CARRIER'S CONSTRUCTION MANAGER.
14. ALL GROUND LEADS EXCEPT THOSE TO THE EQUIPMENT ARE TO BE #2/0 TINNED. ALL EXTERIOR GROUND BARS TINNED COPPER.
15. PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS & BETTS KOPR-SHIELD (TM OF JET LUBE INC.) PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
16. ENGAGE IN INDEPENDENTLY ELECTRICAL TESTING FIRM TO TEST AND VERIFY THAT IMPEDANCE DOES NOT EXCEED FIVE OHMS TO GROUND BY MEANS OF "FALL OF POTENTIAL TEST". TEST SHALL BE WITNESSED BY CARRIER REPRESENTATIVE, AND RECORDED ON CARRIER'S "GROUND RESISTANCE TEST" FORM.
17. WHERE BARE COPPER GROUND WIRES ARE ROUTED FROM ANY CONNECTION ABOVE GRADE TO GROUND RING, INSTALL WIRE IN 3/4" PVC SLEEVE, FROM 1' BELOW GRADE AND SEAL TOP WITH SILICONE MATERIAL.
18. PREPARE ALL BONDING SURFACES FOR GROUNDING CONNECTIONS BY REMOVING ALL PAINT AND CORROSION DOWN TO SHINY METAL. FOLLOWING CONNECTION, APPLY APPROPRIATE ANTI-OXIDIZATION PAINT.
19. ANY SITE WHERE THE EQUIPMENT (BTS, CABLE BRIDGE, PPC, GENERATOR, ETC.) IS LOCATED WITHIN 6 FEET OF METAL FENCING THE BGR SHALL BE BONDED TO THE NEAREST FENCE POST USING (2) RUNS OF #2 BARE TINNED COPPER WIRE.

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A	08/31/17	ISSUED DOCUMENT	DTS	FEP

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
LICENSED PROFESSIONAL ENGINEER
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.30977

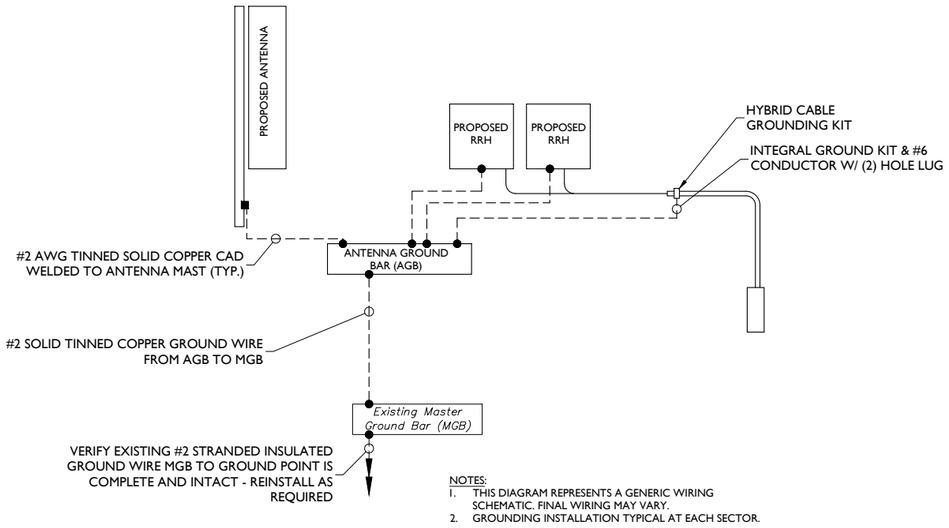
SITE NAME: BOZRAH
SITE ID: CT33XC570

12 POLLY LANE
BOZRAH, CT 06334

RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
ELECTRICAL AND GROUNDING NOTES

SHEET NUMBER :
ANT-011.00

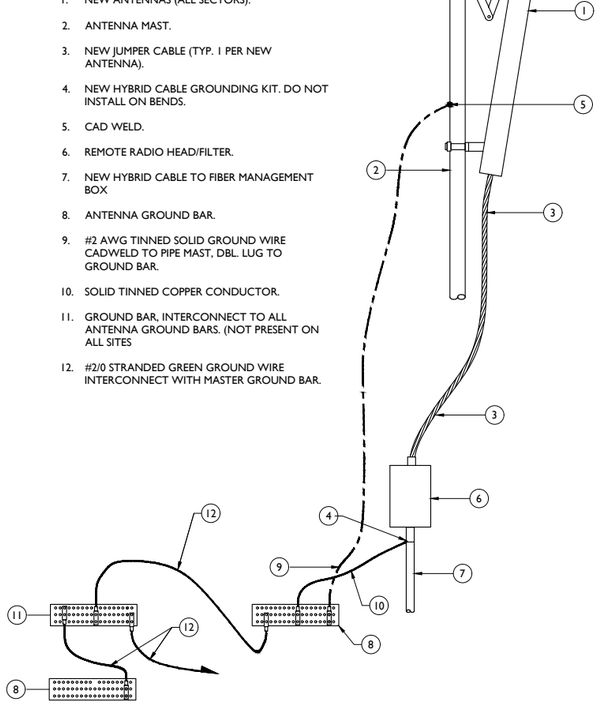


NOTES:
1. THIS DIAGRAM REPRESENTS A GENERIC WIRING SCHEMATIC. FINAL WIRING MAY VARY.
2. GROUNDING INSTALLATION TYPICAL AT EACH SECTOR.

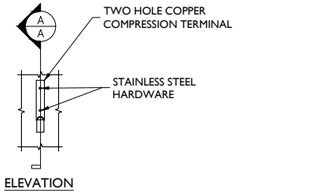
GROUNDING SCHEMATIC
NOT TO SCALE

ANTENNA GROUNDING NOTES:

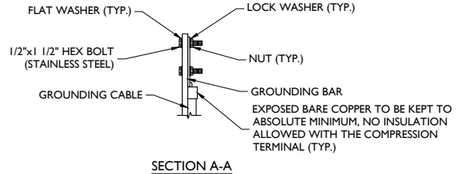
1. NEW ANTENNAS (ALL SECTORS).
2. ANTENNA MAST.
3. NEW JUMPER CABLE (TYP. 1 PER NEW ANTENNA).
4. NEW HYBRID CABLE GROUNDING KIT. DO NOT INSTALL ON BENDS.
5. CAD WELD.
6. REMOTE RADIO HEAD/FILTER.
7. NEW HYBRID CABLE TO FIBER MANAGEMENT BOX
8. ANTENNA GROUND BAR.
9. #2 AWG TINNED SOLID GROUND WIRE CADWELD TO PIPE MAST, DBL. LUG TO GROUND BAR.
10. SOLID TINNED COPPER CONDUCTOR.
11. GROUND BAR, INTERCONNECT TO ALL ANTENNA GROUND BARS. (NOT PRESENT ON ALL SITES
12. #2/0 STRANDED GREEN GROUND WIRE INTERCONNECT WITH MASTER GROUND BAR.



ANTENNA GROUNDING SCHEMATIC
NOT TO SCALE

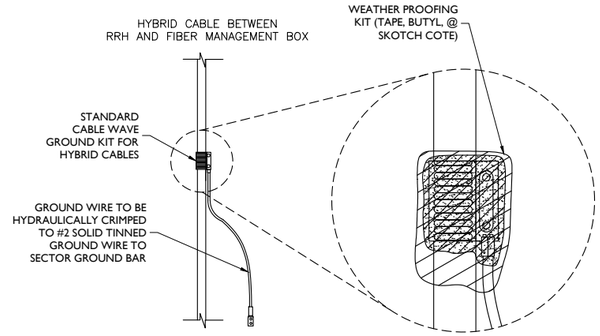


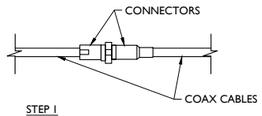
ELEVATION



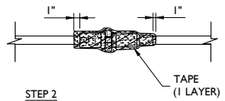
SECTION A-A

TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE





STEP 1



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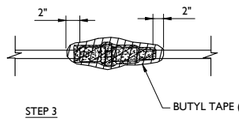
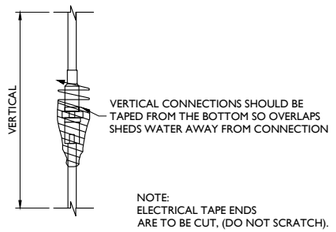
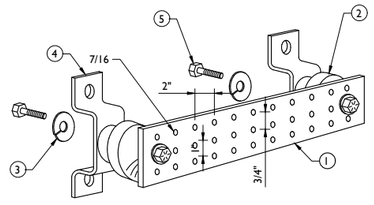


STEP 3

STEP 4



CABLE WRAPPING DETAIL
NOT TO SCALE



1. COPPER GROUND BAR, 1/4" X 4" X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8 OR EQUAL
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056 OR EQUAL
5. 5/8-11 X 1" HHCS BOLTS, NEWTON INSTRUMENT CO. CAT NO. 3012-1 OR EQUAL

NOTE: INSULATORS SHALL BE ELIMINATED WHEN BONDING DIRECTLY TO MONOPOLE STRUCTURE. CONNECTION TO MONOPOLE STRUCTURE SHALL BE PER MANUFACTURERS RECOMMENDATIONS.

GROUND BAR DETAIL
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SHEET TITLE : GROUNDING SCHEMATIC AND DETAILS

SHEET NUMBER : ANT-012.00