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

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

Re: Recision Notice of Exempt Modification Approval
227 Boom Bridge Road North Stonington, CT 06359

June 11, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), received CT Siting Council approval for an exempt modification on February 13, 2018; EM-SPRINT-102-180124. Sprint subsequently found the need to change some equipment from that specified in the approved EM. Sprint, therefore, will not proceed with the EM approval received on February 13, 2018 and will instead resubmit for a new exempt modification with the new equipment. Please advise if anything else is required to rescind the original approval, and clear the way for the subsequent resubmittal. Thank you.

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

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

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

Re: Notice of Exempt Modification Application
227 Boom Bridge Road – North Stonington, CT 06359

June 11, 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 6 panel antennas at the 152' level of the Tower. Sprint proposes to replace all 6 existing panel antennas with 6 new panel antennas (1 per sector) and add 9 remote radio units (3 per sector) at 152' tower level and remove 3 ground level RRU's and place those on the tower at the 152' level, as well as 4 new hybrid cables and 36 Antenna-RRH jumper cables, and a new 2.5 MHz equipment in the existing radio cabinet.

The Sprint installation was initially zoning approved by North Stonington on 2/5/1997. The original Building permit for this construction was issued by the Town also on 2/5/1997. 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
227 Boom Bridge Road, North Stonington, CT 06359

Lat: N 41.42881
Long: W71.80911

June 11, 2018

Dear Ms. Bachman:

Sprint currently maintains 6 panel antenna at the 152' level of the above noted wireless tower. Sprint proposes to remove 6 existing panel antennas and replace them with 6 new panel antennas (2 per sector) and add 9 remote radio units (3 per sector) and to replace 3 currently ground mounted RRU's onto the tower at the 152' tower level and add 4 new hybrid cables and 36 Antenna-RRH jumper cables. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone and broadband networks.

The Sprint installation was initially approved by North Stoning zoning of February 5, 1997. A Building permit for this construction was issued by the town on the same day.

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 Mr. Michael A. Urgo the First Selectman for the Town of North Stonington, as well as Mx. Juliette Hodge, Zoning Director for the Town and Ken Thomas for Wireless Solutions LLC, the tower owner.
.
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 North Stonington facility is located at 227 Boom Bridge Road and is owned by for Wireless Solutions LLC, the Site coordinates are: N41.24881, W71.80911. The existing facility consists of a 180' Guyed Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 6 antennas at a centerline of 152' feet on the tower.

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:
Mr. Michael A. Urgo - First Selectman for the Town of North Stonington via Fed Ex
Ms. Juliette Hodge, Zoning Director for the Town via Fed Ex
Ken Thomas for Wireless Solutions LLC, the tower owner via Fed Ex

June 18,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772446833830.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	J.ALLEN	**Delivery location:**	40 MAIN ST NORTH STONINGTON, CT 06359
Service type:	FedEx Express Saver	**Delivery date:**	Jun 15, 2018 11:32
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772446833830	**Ship date:**	Jun 12, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Michael Urgo - First Selectman
Town of North Stonington
40 Main Street
NORTH STONINGTON, CT 06359 US

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

Reference
CT03XC111 CSC to1st Seleceman

Thank you for choosing FedEx.

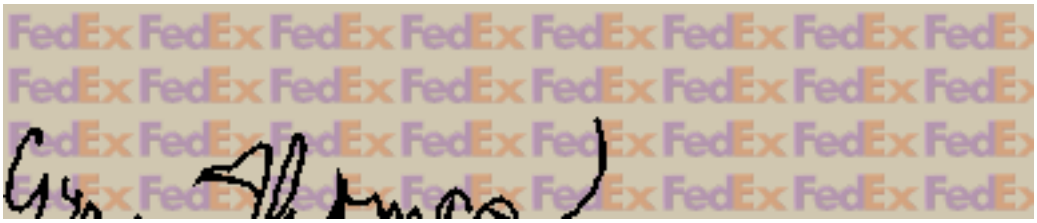
June 28,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772446953032.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	G.THOMAS	**Delivery location:**	11 DELL DR UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Jun 19, 2018 12:26
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		



Shipping Information:

Tracking number:	772446953032	**Ship date:**	Jun 12, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Ken Thomas
Wireless Solutions
11 Dell Drive
UNCASVILLE, CT 06382 US

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

Reference
CT03XC111 CSC Resub

Thank you for choosing FedEx.

June 18,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 772446885790.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	J.ALLEN	**Delivery location:**	40 MAIN ST NORTH STONINGTON, CT 06359
Service type:	FedEx Express Saver	**Delivery date:**	Jun 15, 2018 11:32
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	772446885790	**Ship date:**	Jun 12, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Juliette Hodge - Zoning
Town of North Stonington
40 Main Street
NORTH STONINGTON, CT 06359 US

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

Reference
CT03XC111 CSC to Zoning

Thank you for choosing FedEx.

Map Number: 119

THIS MAP IS PREPARED FOR THE INVENTORY OF REAL PROPERTY FOUND WITHIN THESE JURISDICTION AND IS COMPILED FROM RECORDED DEEDS, PLATS, AND OTHER PUBLIC RECORDS AND DATA. USERS OF THIS MAP ARE HEREBY NOTIFIED THAT THE AFOREMENTIONED PUBLIC PRIMARY INFORMATION CONTAINED ON THIS MAP. THE TOWNS AND THE MAPPING COMPANIES ASSUME NO LEGAL RESPONSIBILITIES FOR THE INFORMATION CONTAINED ON THIS MAP.

NEGEO
New England Geosystems
www.negeosystems.com
282 Main Street Extension - C2
Middletown, CT 06457 • (203) 404 - 7129

Photography Dates:
March 24, 1996 (120 Series)
April 29, 1997 (449 Series)
December 16, 1997
(449 Series, 5-1, 5-3, 5-5)
Completion Date: April 28, 2000
Planimetric Update based on 2010 Photo

Revised Date: October 1, 2016

HORIZONTAL DATUM BASED ON THE CONNECTICUT STATE PLANE COORDINATE SYSTEM, NAD 83 (1986)

Town of North Stonington Connecticut

Planimetric Data and Property Maps 2016

1 inch = 200 Feet

0 100 200 400 600 800 1,000 Feet

0.1 0.05 0 0.1 Miles

- Property Line
- Property Line Along Water
- Parcel in Dispute
- Town Line
- State Line
- ROW / Easement
- Surveyed Wetland
- Parcel Hook and Sub Lot
- Building / Street No.
- Exempt Property
- Record Dimension
- Surveyed Dimension
- Surveyed Acreage
- Computed Acreage
- Wall / Fence
- Deciduous Tree
- Evergreen Tree
- Vegetation
- Water
- Swamps
- Roads, Driveways, Trails, Flat Areas and Structures

25 26 27
32 33 34 35 36 37
42 43 44 45 46 47 48 49
54 55 56 57 58 59 60 61
66 67 68 69 70 71 72 73
76 77 78 79 80 81 82
84 85 86 87 88 89 90
92 93 94 95 96 97 98
99 100 101 102 103 104 105
106 107 108 109 110 111 112
113 114 115 116 117 118 119
120 121 122 123 124
125 126

Map Number: 119

104 105 111 112 118 119 123 124 126

Map Produced: January 2017

Town of North Stonington, CT

Property Listing Report | Map Block Lot 119-6313-A | Account L9857510

Property Information

Property Location	227 BOOMBRIDGE RD
Owner	LEWIS DAVID BABCOCK LLC
Co-Owner	WIRELESS SOLUTIONS INC
Mailing Address	P O BOX 284 OLD LYME CT 06371-0284
Land Use	322V COMM BLDG MDL-00
Land Class	C
Zoning Code	R60
Census Tract	7071
Sub Lot	

Neighborhood	0500
Acreage	0
Utilities	
Lot Setting/Desc	Rural Rolling
Survey Map	
Additional Info	

Photo

No Photo Available

Sketch

Primary Construction Details

Year Built	
Stories	
Building Style	
Building Use	
Building Condition	
Floors	
Total Rooms	

Bedrooms	
Full Bathrooms	
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	
Roof Cover	

Exterior Walls	
Interior Walls	
Heating Type	
Heating Fuel	
AC Type	
Gross Bldg Area	
Total Living Area	

Report Created On 1/12/2018

Town of North Stonington, CT

Property Listing Report | Map Block Lot 119-6313-A | Account L9857510

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Outbuildings	19700	13790
Land	0	0
Total	19700	13790

Outbuilding and Extra Items

Type	Description
COMMUNIC BLD	144.00000000 S.F.
PAVING-CONC	81.00000000 S.F.
W/LIGHTS ETC	168.00000000 S.F.
W/LIGHTS ETC	280.00000000 S.F.
W/LIGHTS ETC	160.00000000 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
LEWIS DAVID BABCOCK LLC	140/ 513	12/28/2001	0
LEWIS ROSALIND M	126/ 960	8/5/1999	
LEWIS DAVID B EST & ROSALIND M	116/ 313	10/15/1997	0
LEWIS DAVID B & ROSALIND M	32/ 296	6/9/1964	0

Report Created On 1/12/2018

Sprint

Sprint PCS

Engineering and Operations
9 Barnes Industrial Road
Wallingford, Connecticut 06492

Telephone: 203 294 5600
Fax: 203 294 5647

February 6, 1997

Scott Chasse
Sprint PCS
9 Barnes Industrial Road
Wallingford, CT. 06492

RE: Building Permit For Site CT03XC111
273 Boombridge Road, North Stonington, CT.

Dear Scott,

Enclosed is the work permit for the above referenced site issued by the Town of North Stonington. The work permit needs to be displayed at the work site during construction.

I'm requesting that you have Bechtel remind their contractors that even though they did not obtain the building permit, they are still responsible for notification of impending inspections as required by the municipality. The name of the building official for this job is Tim York, phone no. 860-535-0318. He is a part time building official so you may have to leave a message on voice mail and he will return your call.

If you have any questions or require additional information, please contact me at 203-294-5609.

Sincerely,

Mike Evanchick
Construction Manager

Town of North Stonington

Building Permit

Date: Feb 5 1997 Permit Number: 97-02

Expiration Date of Permit: Feb 5 1998

Number of Stories: 0 W
(proposed use)

Location: 227 Boom bridge Rd

Zoning District: R-80

Subdivision: _____ Lot: _____ Map: _____

I HEREBY CERTIFY THAT THE PROPOSED WORK IS AUTHORIZED BY THE OWNER OF RECORD AND I HAVE BEEN AUTHORIZED BY THE OWNER TO MAKE THIS APPLICATION AS HIS OR HER AUTHORIZED AGENT.

Signature of Authorized Agent: _____

Address: _____

_____ License Number: _____

Area in Square Feet: N/A

Estimated Cost of Construction: 82,000 Permit Fee: $656

Owner: David Lewis

Address: 273 Boom bridge Rd

Building Official: _____ Date: 2/5/97

Copy Distribution

White - Applicant Canary - File Pink - 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: CT03XC111

Site Name: 227 Boombridge Road

227 Boombridge Road
North Stonington, CT 06359

May 7, 2018

EBI Project Number: 6218003635

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	8.98 %

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

EBI Consulting
environmental | engineering | due diligence

May 7, 2018

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

Emissions Analysis for Site: **CT03XC111 – 227 Boombridge Road**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **227 Boombridge Road, North Stonington, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **227 Boombridge Road, North Stonington, 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 **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** 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 **152 feet** above ground level (AGL) for **Sector A**, **152 feet** above ground level (AGL) for **Sector B** and **152 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:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	6,248.42	ERP (W):	6,248.42	ERP (W):	6,248.42
Antenna A1 MPE%	**1.20 %**	Antenna B1 MPE%	**1.20 %**	Antenna C1 MPE%	**1.20 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**152 feet**	Height (AGL):	**152 feet**	Height (AGL):	**152 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.05 %**	Antenna B2 MPE%	**1.05 %**	Antenna C2 MPE%	**1.05 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.25 %**
AT&T	1.14 %
T-Mobile	3.73 %
Verizon Wireless	1.86 %
Site Total MPE %:	**8.98 %**

SPRINT Sector A Total:	2.25 %
SPRINT Sector B Total:	2.25 %
SPRINT Sector C Total:	2.25 %
Site Total:	8.98 %

SPRINT _ Frequency Band / Technology (All Sectors)	**# Channels**	**Watts ERP (Per Channel)**	**Height (feet)**	**Total Power Density ($\mu W/cm^2$)**	**Frequency (MHz)**	**Allowable MPE ($\mu W/cm^2$)**	**Calculated % MPE**
Sprint 850 MHz CDMA	1	376.73	152	0.64	850 MHz	567	0.11%
Sprint 850 MHz LTE	2	376.73	152	1.27	850 MHz	567	0.22%
Sprint 1900 MHz (PCS) CDMA	5	511.82	152	4.32	1900 MHz (PCS)	1000	0.43%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	152	4.32	1900 MHz (PCS)	1000	0.43%
Sprint 2500 MHz (BRS) LTE	8	778.09	152	10.50	2500 MHz (BRS)	1000	1.05%
						Total:	**2.25%**

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:	2.25 %
Sector B:	2.25 %
Sector C:	2.25 %
SPRINT Maximum Total (per sector):	2.25 %
Site Total:	8.98 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.98 %** 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.

Engineers Planners Surveyors Landscape Architects Environmental Scientists

MASER CONSULTING
— CONNECTICUT —

Guy Tower & Antenna Mount Structural Analysis & Modifications

Rev. 2

FOR

227 Boom Bridge Road

Site ID: CT03XC111
227 Boom Bridge Road
North Stonington, CT 06359

Mount Utilization: 42.2%
Guy Tower Utilization (before Modifications): 100.5%
Guy Tower Utilization (after Modifications): 97.4%

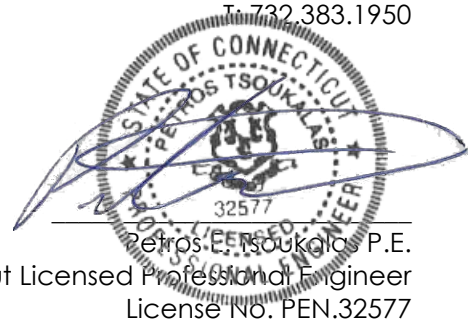
June 6, 2018

Prepared For

Sprint
201 State Route 17 North
Rutherford, NJ 07070

Prepared By

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950



Petros E. Tsoukalas, P.E.
Connecticut Licensed Professional Engineer
License No. PEN.32577

MC Project No. 17924001A

Objective:

The objective of this report is to determine the capacity of the existing modified 180' lattice guyed tower structure and antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

Introduction:

Maser Consulting Connecticut has performed limited field observations on August 14, 2017 to verify the existing condition of the structure and to locate and quantify the existing wireless appurtenances where possible, from ground level. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- Antenna Mount Mapping Notes and Pictures prepared by TEP, dated November 30, 2017
- Construction Drawings, prepared by Maser Consulting Connecticut, dated April 6, 2018
- RFDS 45738 provided by Sprint, dated October 31, 2017
- Previous Structural Analysis report, prepared by Maser Consulting Connecticut, dated April 12, 2018
- Previous Structural Analysis report prepared by EBI Consulting Job# 81150090 dated, February 13, 2015.

The proposed **SPRINT** equipment is supported on an existing 180' modified lattice guyed tower structure. The primary tower structure is constructed of pipe legs with piped diagonals and horizontals. The existing **SPRINT** equipment is supported on an existing antenna support mounts constructed of structural steel antenna support pipes supported by pipes at a centerline of approximately 152'-0" above ground level. This report is based only upon this information, as well as the information obtained in the field.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code, Incorporating the 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed-136 mph (3 Second Gust)
    - Basic Wind Speed – 105 mph (3 Second Gust)
    - Exposure Category – C
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – ¾"
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

Loading used in this analysis is found in Appendix A of this report.

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing modified guyed lattice structure and antenna support mount is structurally adequate to support the proposed equipment per the aforementioned codes and standards, or if the increase in the forces in the structure is deemed to be negligible or acceptable, then the proposed equipment can be installed as intended.

The existing modified guyed tower was modeled in Tower Numerics, tnx Tower, a tower analysis and design program, designed specifically for the telecommunications industry and for all applicable codes and standards was used for this structural analysis.

The existing antenna mount in all sectors has been modeled in RISA-3D, a comprehensive structural analysis program. The program performs design checks of structures under user specified loads. The user specified loads have been calculated separately based on the requirements of the above referenced codes. The program performs an analysis based on the steel code to determine the adequacy of the members, and produces the reactions at the connection points of the mounts to the existing structure. Additional calculations were then prepared to analyze the mount connection points with the proposed loading conditions.

General Site Design Assumption:

- Structural Steel Main Legs are constructed of A572-50 Grade Steel.
- Structural Steel Pipe Diagonals and Girts are constructed of A53- Grade B 42ksi Steel
- Structural Steel Angle and Plate members are constructed of A36 Grade.
- Structural Bolts are assumed to be A325N grade.
- Tower is installed to plumb and is maintained properly without any structural deficiencies or deteriorations to the original design.
- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.

- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Site Specific Design Parameters:

The following design parameters have been utilized in this report:

- *Structural Steel Pipes are constructed of A53 Grade B Steel*
- ***Existing tower members were determined from previous structural analysis report, prepared by EBI Consulting, Job No. 81150090, dated February 13, 2015. Contractor is to field verify tower members and Maser Consulting Connecticut shall be notified with any difference.***

Modification Description:

The proposed modifications for existing guy tower consists of:

- *Re-tension all guy wires @ 162.5' above ground level to 8% as initial tension*
- *Re-tension all guy wires @ 132.2' above ground level to 12% as initial tension*
- *Re-tension all guy wires @ 82.5' above ground level to 8% as initial tension*
- *Re-tension all guy wires @ 49.8' above ground level to 10% as initial tension*

See the latest Construction Drawings prepared by Maser Consulting Connecticut for additional details.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined the existing antenna support mount has **ADEQUATE** structural capacity to support the proposed loading. The proposed antenna support mount has been determined to be stressed to a maximum of **42.2%** of its structural capacity with the maximum usage occurring at the antenna mast pipes. Therefore, the proposed **SPRINT** installation **CAN** be installed as intended.

The existing modified guyed tower was analyzed for the loading in the applicable codes and standards. The tower has been determined to be structurally **ADEQUATE** to support the proposed and existing antennas, based upon the aforementioned assumptions, **once the proposed modifications as described above are properly installed.**

The lattice tower has been determined to be stressed to a maximum of **97.4%** of its structural capacity with the maximum usage occurring at the diagonal bolts at 80-100' elevation. The tower legs are determined to be stressed to a maximum usage of **77.4%** of their structural capacity at 20'-40' elevation.

Foundation Reactions Comparison

	Foundation Capacity (kips)	Current Forces (kips)	Pass/Fail (Utilization %)
Mast Axial	222.75	171.3	Pass **(76.9%)**
Mast Shear	3.645	2.77	Pass **(76.0%)**

Anchor Reactions Comparison

	Foundation Capacity (kips)	Current Forces (kips)	Pass/Fail (Utilization %)
Inner Anchor Uplift	27.81	20.7	Pass **(74.4 %)**
Inner Anchor Shear	38.61	29.1	Pass **(75.4 %)**
Inner Anchor Resultant	47.52	35.7	Pass **(75.1 %)**
Middle Anchor Uplift	42.795	26.4	Pass **(61.7 %)**
Middle Anchor Shear	41.175	25.5	Pass **(61.9 %)**
Middle Anchor Resultant	59.4	36.7	Pass **(61.8 %)**
Outer Anchor Uplift	19.71	10.9	Pass **(55.3 %)**
Outer Anchor Shear	20.655	11.2	Pass **(54.2 %)**
Outer Anchor Resultant	28.485	15.7	Pass **(55.1%)**

*Based on calculations provided in the referenced structural analysis and multiplied by a factor of 1.35 per section 15.5.1 of the TIA-222G.

The foundation in comparison with the capacities from the previous structural analysis referenced above is observed to be **ADEQUATE**. Therefore, the proposed **SPRINT** installation **CAN** be placed as intended.

It should be noted that due to a lack of information Maser Consulting Connecticut did not perform an analysis on the foundation, but a comparison of the capacities summarized in previous analysis with the current forces has been determined. If information is provided, then this report can be amended. The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the existing structural members supporting the proposed **SPRINT** telecommunications installation described herein.

The conclusions reached by Maser Consulting Connecticut in this evaluation are only applicable for the proposed structural members supporting the proposed **SPRINT** telecommunications installation described herein. Further, no structural qualifications are made or implied by this document for the existing structure.

Maser Consulting Connecticut reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting Connecticut in this report are only valid for the appurtenances listed in this report. Any change to the installation will require a revision to this structural analysis.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,

Maser Consulting Connecticut

Petros E. Tsoukalas P.E.
Connecticut Licensed Professional Engineer
License No. PEN.32577

Dejian Xu, P.E.
Project Engineer

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APPENDIX A

Client:	Sprint	Computed By:	AB
Site Name:	227 Boom Vridge Road	Date:	4/10/2018
Project No.	17924001A	Verified By:	JKM
Title:	Antenna Mount Analysis	Page:	1

Version 3.3

1. LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	RFS	APXVTM14-ALU-I20	Proposed	Alpha, Beta, & Gamma
3	COMMSCOPE	NNVV-65B-R4	Proposed	Alpha, Beta, & Gamma
3	ALCATEL-LUCENT	TD-RRH8x20-25	Proposed	Alpha, Beta, & Gamma
3	ALCATEL-LUCENT	RRH4x45-1900	Relocated	Alpha, Beta, & Gamma
6	ALCATEL-LUCENT	RRH 2x50-800	Proposed	Alpha, Beta, & Gamma

ANALYSIS AND DESIGN

Client:	Sprint	Computed By:	AB
Site Name:	227 Boom Vridge Road	Date:	4/10/2018
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I. DESIGN INPUTS

Calculations for gravity and lateral loading on equipment and support mounts are determined as per the ANSI/TIA-222-G Code, Addendum 2

				Reference	Equation
Wind Load Inputs Parameters					
Antenna Centerline	z	152	ft		
Normal Wind Speed (3 sec. Gust):	V	105	mph	Ref. 1, Eqn. 16-33	
Normal Wind Speed with Ice (3 sec. gust):	V_i	50.0	mph	(Figure a5-2a, p. 233)	
Service Wind Speed:	V_s	70.0	mph	(Figure a5-2a, p. 233)	
Design Ice Thickness:	t_i	0.75	in	(Figure A1-2a, p. 233)	
Exposure Category:		C		Ref. 3, Section 2.6.5.1	
Structure Class:		II		Ref. 3, Table 2-1	
Gust Effect Factor:	G_h	0.85		Ref. 3, Section 2.6.7	
Wind Directionality Factor:	K_d	0.85		Ref. 3, Table 2-2	
Topographic Category:		1		Ref. 3, Section 2.6.6.2	
Wind Load Coefficients					
Importance Factors:					
Non-Iced:	I	1		Ref. 3, Table 2-3	
Iced:	I_{ice}	1		(Table 2-3, P. 39)	
Exposure Category Coefficients:					
3-s Gust-Speed Power Law Exponent:	α	9.5		Ref. 3, Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	900	ft	Ref. 3, Table 2-4	
Min. Value for k_z:	Kz_{min}	0.85		Ref. 3, Table 2-4	
Terrain Constant:	K_e	1.00		Ref. 3, Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.382		Ref. 3, Section 2.6.5.2	$=2.01\cdot(z/z_g)^{2/\alpha}$
Topographic Category Coefficients:					
Topographic Constant:	K_t	N/A		Ref. 3, Table 2-5	
Height Attenuation Factor:	f	N/A		Ref. 3, Table 2-5	
Height Reduction Factor:	K_h	N/A		Ref. 3, Section 2.6.6.4	$=e^{(f\cdot z/H)}$
Topographic Factor:	K_{zt}	1.00		Ref.3, Section 2.6.6.4	$=[1+(K_e\cdot K_t/K_h)]^2$
Ice Accumulation:					
Ice Velocity Pressure Exposure Coefficient:	K_{iz}	1.17			$=(z/33)^{0.10}$
Factored Ice Thickness:	t_{iz}	1.75	in	(Section 2.6.8, p. 16)	$=2.0\cdot t_i\cdot I\cdot K_{iz}\cdot K_{zt}$
Ice Density:	ρ_i	56.00	pcf		
Design Wind Pressures:					
Velocity Pressure:	q_z	33.16	psf	Ref. 3, Section 2.6.9.6	$=0.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V^2\cdot I$
Velocity Pressure (With Ice):	q_{zi}	7.52	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^{\,2}\cdot I$
Velocity Pressure (Service):	q_{zs}	14.74	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_i^{\,2}\cdot I$

MASER CONSULTING P.A.

Client:	Sprint	Computed By:	AB
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II. CALCULATIONS

▪ *Wind Load on Appurtenances*

Dimensions and Force Coefficients

Antenna/ Appurtenance	*Non-Iced Condition*								*Iced Condition*							
	Mounting Pipe			Equipment					Mounting Pipe			Equipment				
	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$	Length (in)	Diameter (in)	Force Coefficient C_a	Height (in)	Width (in)	Depth (in)	Force Coefficient $C_{a\ Front}$	Force Coefficient $C_{a\ Side}$
APXVTM14-ALU-I20	92.3	2.375	1.200	56.30	12.60	6.30	1.29	1.46	95.7	5.9	1.007	59.80	16.10	9.80	1.25	1.36
NNVV-65B-R4	92.3	2.375	1.200	72.00	19.60	7.80	1.25	1.47	95.7	5.9	1.007	75.50	23.10	11.30	1.23	1.39
TD-RRH8x20-25	0.0	0.000	0.000	26.10	18.60	6.70	1.20	1.26	0.0	0.0	0.000	29.60	22.10	10.20	1.20	1.22
RRH4x45-1900	0.0	0.000	0.000	25.00	12.00	12.00	1.20	1.20	0.0	0.0	0.000	28.50	15.50	15.50	1.20	1.20
RRH 2x50-800	0.0	0.000	0.000	16.00	13.00	10.00	1.20	1.20	0.0	0.0	0.000	19.50	16.50	13.50	1.20	1.20
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					
	0.0	0.000	0.000						0.0	0.0	0.000					

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition				Iced Condition			
		Wind Force (lbs.) F_N	Wind Force (lbs.) F_T	Controlling Wind Force (lbs.)	Gravity (lbs.)	Wind Force (lbs.) F_N	Wind Force (lbs.) F_T	Controlling Wind Force (lbs.)	Gravity (lbs.)
APXVTM14-ALU-I20	2	99.4	76.6	**99.4**	**33.9**	32.4	30.2	**32.4**	**84.2**
NNVV-65B-R4	2	178.6	106.8	**178.6**	**46.2**	50.9	38.8	**50.9**	**153.4**
TD-RRH8x20-25	2	57.0	21.6	**57.0**	**38.1**	17.4	8.2	**17.4**	**56.6**
RRH4x45-1900	2	35.2	35.2	**35.2**	**34.8**	11.8	11.8	**11.8**	**47.4**
RRH 2x50-800	2	24.4	18.8	**24.4**	**34.6**	8.6	7.0	**8.6**	**31.5**

** ALL CALCULATED LOADS ARE PER MOUNTING BRACKET. TO GET THE TOTAL EQUIPMENT LOAD, MULTIPLY THE INDIVIDUAL LOADS BY THE NUMBER OF BRACKETS*

▪ *Wind Load on Framing Members*

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition					
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)
Pipe	Pipe 2.5	180	Round	2.88	1.20	8.10	6.37	6.37	183.50	1.20	4.07	9.87
Pipe	Pipe 2.0	72	Round	2.38	1.20	6.69	5.87	5.87	75.50	0.93	2.91	8.80
Pipe	Pipe 2.0	50	Round	2.38	1.11	6.20	5.87	5.87	53.50	0.85	2.65	8.80
Pipe	Pipe 1.25	50	Round	1.66	1.20	4.68	5.16	5.16	53.50	0.87	2.40	7.28
Pipe	Pipe 2.0	96	Round	2.38	1.20	6.69	5.87	5.87	99.50	1.02	3.19	8.80

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BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

$$I := \begin{cases} 1.0 & \text{if Class} = \text{"II"} \\ 1.15 & \text{if Class} = \text{"III"} \end{cases}$$

Table 2-3, Pg. 39

Force Coefficient:
(Square)

$$C_{f\_square}(h, w) := \begin{cases} 1.2 & \text{if } \frac{h}{w} \le 2.5 \\ \left[1.2 + \frac{0.2}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[1.4 + \frac{0.6}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 2.0 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Force Coefficient:
(Round)

$$C_{f\_round}(h, w) := \begin{cases} 0.7 & \text{if } \frac{h}{w} \le 2.5 \\ \left[0.7 + \frac{0.1}{4.5} \cdot \left(\frac{h}{w} - 2.5\right)\right] & \text{if } \frac{h}{w} > 2.5 \wedge \frac{h}{w} \le 7 \\ \left[0.8 + \frac{0.4}{18} \cdot \left(\frac{h}{w} - 7\right)\right] & \text{if } \frac{h}{w} > 7 \wedge \frac{h}{w} \le 25 \\ 1.2 & \text{otherwise} \end{cases}$$

Table 2-8, P. 42

Terrain Exposure Constants:

Table 2-4, P. 40

$$\alpha := \begin{cases} 7.0 & \text{if Exp} = \text{"B"} \\ 9.5 & \text{if Exp} = \text{"C"} \\ 11.5 & \text{if Exp} = \text{"D"} \end{cases} \quad Z_g := \begin{cases} 1200\text{ft} & \text{if Exp} = \text{"B"} \\ 900\text{ft} & \text{if Exp} = \text{"C"} \\ 700\text{ft} & \text{if Exp} = \text{"D"} \end{cases} \quad K_{zmin} := \begin{cases} 0.70 & \text{if Exp} = \text{"B"} \\ 0.85 & \text{if Exp} = \text{"C"} \\ 1.03 & \text{if Exp} = \text{"D"} \end{cases}$$

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BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

$$Kz(z) := \left| \begin{array}{l} K_z \leftarrow \max\left[2.01 \cdot \left(\frac{z}{Z_g} \right)^{\frac{2}{\alpha}}, K_{zmin} \right] \\ K_z \leftarrow \min\left(K_z, 2.01 \right) \end{array} \right.$$

$K_z := Kz(z)$ — Section 2.6.5, P. 13

$$Kzt(z) := K_{zt} \leftarrow \left| \begin{array}{l} 1.0 \text{ if } Topo = "1" \\ \text{otherwise} \\ \quad K_e \leftarrow \left| \begin{array}{l} 0.90 \text{ if } Exp = "B" \\ 1.00 \text{ if } Exp = "C" \\ 1.10 \text{ if } Exp = "D" \end{array} \right. \quad \text{Table 2-4 p. 40} \\ \quad K_t \leftarrow \left| \begin{array}{l} 0.43 \text{ if } Topo = "2" \\ 0.53 \text{ if } Topo = "3" \\ 0.72 \text{ if } Topo = "4" \end{array} \right. \quad \text{Table 2-5 p. 40} \\ \quad f \leftarrow \left| \begin{array}{l} 1.25 \text{ if } Topo = "2" \\ 2.00 \text{ if } Topo = "3" \\ 1.50 \text{ if } Topo = "4" \end{array} \right. \quad \text{Table 2-5 p. 40} \\ \quad K_h \leftarrow e^{\left(\frac{f \cdot z}{CH} \right)} \quad \text{Section 2.6.6.4, P. 14} \\ \quad \left(1 + \frac{K_e \cdot K_t}{K_h} \right)^2 \quad \text{Section 2.6.6.4, P. 14} \end{array} \right.$$

$K_{zt} := Kzt(z)$

Velocity Pressure: — Section 2.6.9.6, P. 25

$$q_z := 0.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V^2 \cdot I \cdot psf$$

LOAD EQUATIONS

WIND LOAD

Area (Normal): $AN_{area} = H_{ant} \cdot Want$

Area (Side): $AT_{area} = H_{ant} \cdot Dant$

Force Coefficient (Normal): $C_{fn} = C_{fsquare}(H_{ant}, Want)$

Force Coefficient (Side): $C_{fs} = C_{fsquare}(H_{ant}, Dant)$

Pipe Area (Normal): $AN_p = \max[(L_p - H_{ant}) * Dp, 0]$

Pipe Area (Side): $AT_p = L_p \cdot Dp$

Force Coefficient (Normal): $C_{fp} = C_{fround}(Lp, Dp)$

Normal Effective Projected Area: $E_{pan} = (C_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pat} = (C_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA = max(E_{pan}, Epat)$

Wind Force: $F_{ant} = q_z \cdot Gh \cdot EPA$

ICE DEAD LOAD

Largest Out-to-Out Dimension: $D_{ant} = \sqrt{{D_{ant}}^2 + {W_{ant}}^2}$

Cross Sectional Area of Ice: $A_{ice\_ant} = \pi \cdot tiz \cdot (Dant + tiz)$

Total Ice Dead Load: $DL_{ice\_ant} = \boldsymbol{\rho_i} \cdot (Aice_{\_ant} \cdot Hant)$

ICE WIND LOAD

Dimensions: $H_{i_{ant}} = H_{ant} + 2tiz$

$W_{i_{ant}} = W_{ant} + 2tiz$

$D_{i_{ant}} = D_{ant} + 2tiz$

Area (Normal): $AIN_{area} = H_{i\_ant} \cdot W_{i\_ant}$

Area (Side): $AIT_{area} = H_{i\_ant} \cdot D_{i\_ant}$

Force Coefficient (Normal): $Ci_{fn} = C_{fsquare}(H_{i\_ant}, W_{i\_ant})$

Force Coefficient (Side): $Ci_{fs} = C_{fsquare}(H_{i\_ant}, D_{i\_ant})$

Pipe Area (Normal): $AN_p = \max[(L_{ip} - H_{i\_ant}) * D_{ip}, 0]$

Pipe Area (Side): $AT_p = L_{ip} \cdot Dip$

Force Coefficient (Normal): $C_{fp} = C_{fround}(L_{ip}, D_{ip})$

Normal Effective Projected Area: $E_{pain} = (Ci_{fn} \cdot ANarea) + (Cfp \cdot ANp)$

Side Effective Projected Area: $E_{pait} = (Ci_{fs} \cdot ATarea) + (Cfp \cdot ATp)$

Effective Projected Area: $EPA_i = max(E_{pain}, Epait)$

Wind Force: $F_{i\_ant} = q_z \cdot Gh \cdot EPAi$

III. ATTACHMENTS

Client:	Sprint	Computed By:	AB
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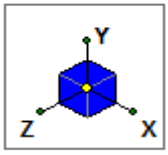
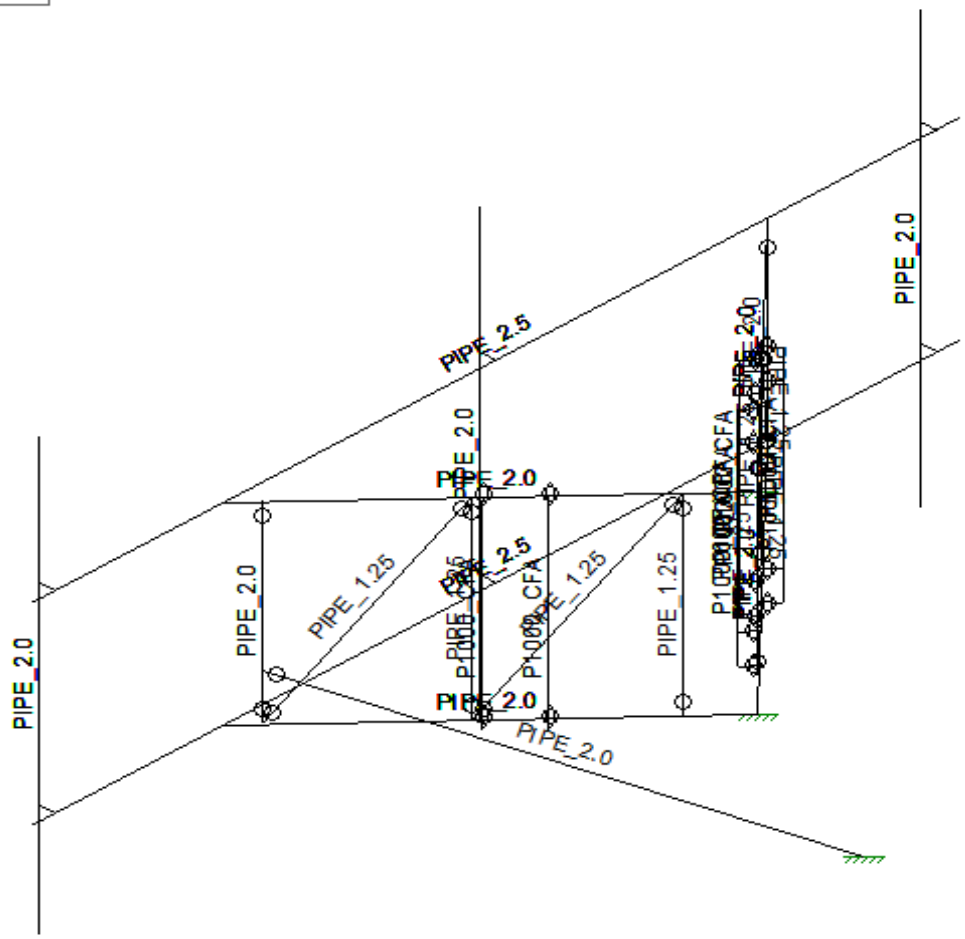
RISA MODEL





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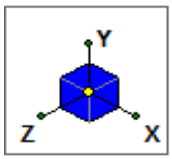
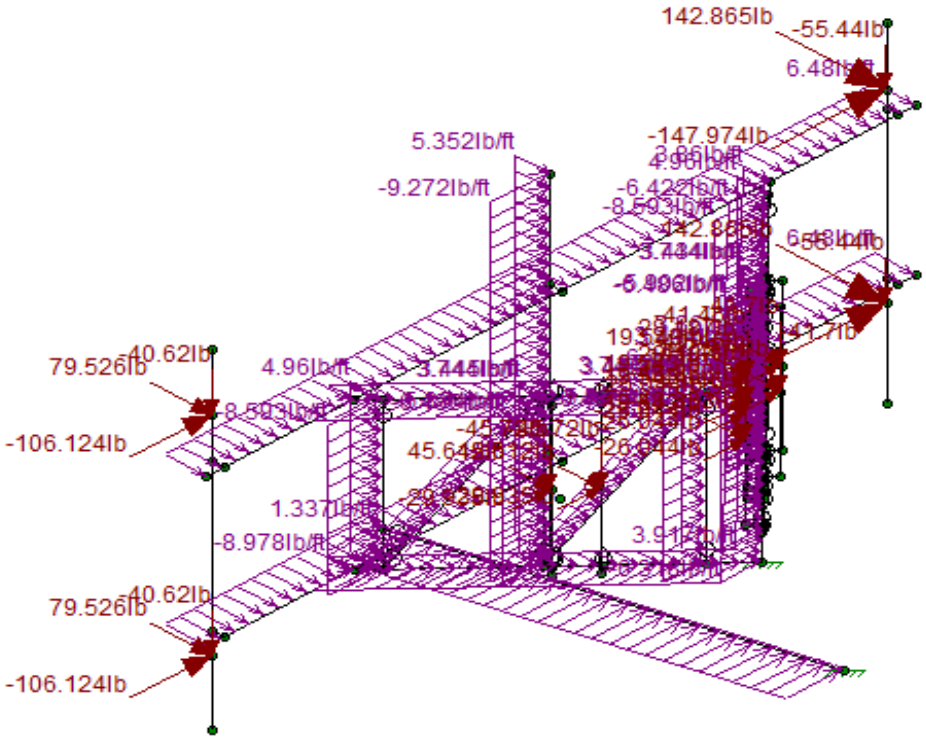
RISA WORST CASE LOADING





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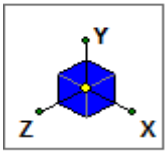
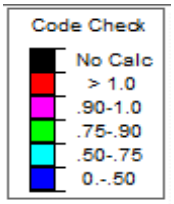
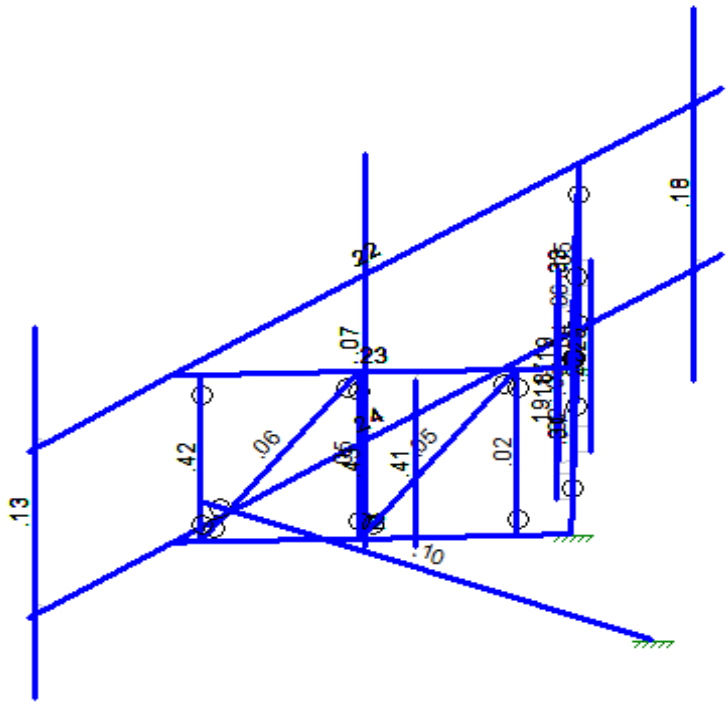
RISA CODE CHECK







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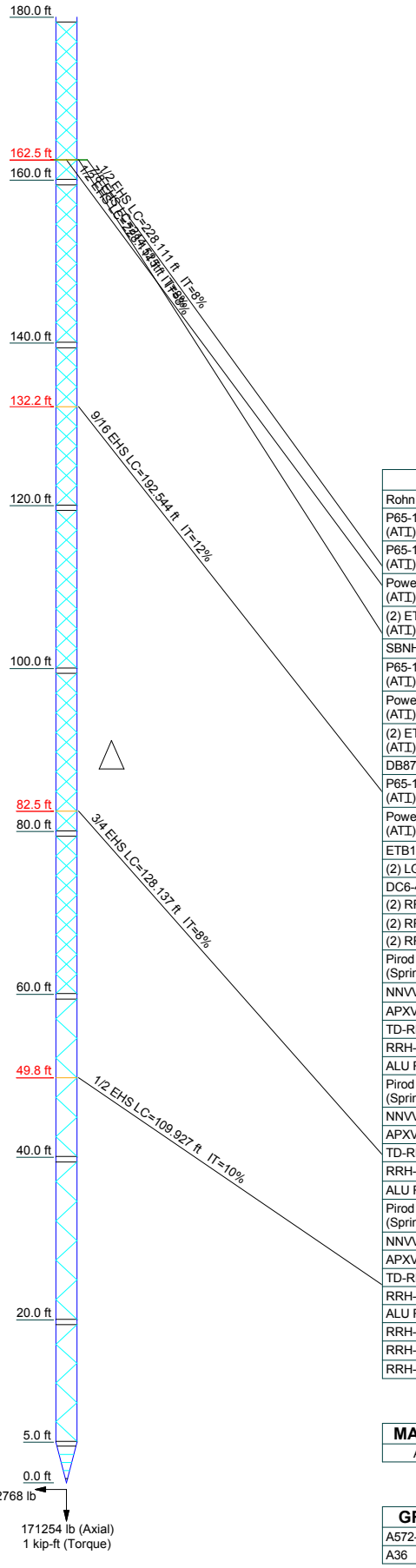
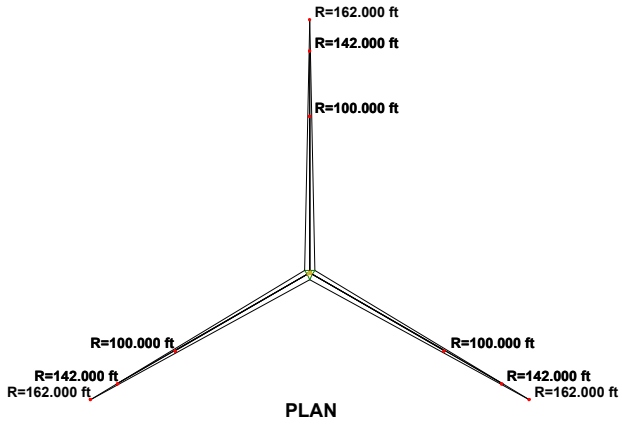
APPENDIX A

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs						ROHN 2.5 X-STR				
Leg Grade						A572-50				
Diagonals	N.A.		ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Diagonal Grade	N.A.					A53-B-42				A36
Top Girts	A		ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Bottom Girts	A	L3x3x1/2	ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Horizontals	A					N.A.				
Top Guy Pull-Offs		N.A.	4x3/8		N.A.	2L2x2x1/4x3/8	N.A.	4x3/8	N.A.	2L2x2x1/4x3/8
Face Width (ft)						64 @ 2.40885				3.42
# Panels @ (ft)	5 @ 1	6 @ 2.37847								
Weight (lb)	293.0	544.9	602.2	654.6	907.5	779.2	907.5	765.9	907.5	1712.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Rohn 6'x15' Boom Gate (3) (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	FRS FD9R6004 Diplexer (Verizon)	136
Powerwave 7770 w/5ft mount pipe (ATI)	177	Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
(2) ETB19G8-12UB / E15Z01P03 (ATI)	177	BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
SBNH-1D6565C (ATI)	177	BXA-171085-8BF W/M PIPE (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
Powerwave 7770 w/5ft mount pipe (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
(2) ETB19G8-12UB / E15Z01P03 (ATI)	177	FRS FD9R6004 Diplexer (Verizon)	136
DB874H120 (ATI)	177	Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
Powerwave 7770 w/5ft mount pipe (ATI)	177	BXA-171085-8BF W/M PIPE (Verizon)	136
ETB19G8-12UB / E15Z01P03 (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
(2) LGP21401 (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
DC6-48-06-18-8F (ATI)	177	FRS FD9R6004 Diplexer (Verizon)	136
(2) RRUS-11 (ATI)	177	Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
(2) RRUS-11 (ATI)	177	BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
(2) RRUS-11 (ATI)	177	BXA-171085-8BF W/M PIPE (Verizon)	136
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152	UMTS DD B4 (T-Mobile)	120
NNVV-65B-R4 (Sprint)	152	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
APXVTM14-ALU-I20 (Sprint)	152	RRUS11 B12 (T-Mobile)	120
TD-RRH8x20-25 (Sprint)	152	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
RRH-2X50-800 (Sprint)	152	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
ALU RRH-4X45-1900 (Sprint)	152	UMTS DD B4 (T-Mobile)	120
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
NNVV-65B-R4 (Sprint)	152	RRUS11 B12 (T-Mobile)	120
APXVTM14-ALU-I20 (Sprint)	152	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
TD-RRH8x20-25 (Sprint)	152	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
RRH-2X50-800 (Sprint)	152	UMTS DD B4 (T-Mobile)	120
ALU RRH-4X45-1900 (Sprint)	152	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152	RRUS11 B12 (T-Mobile)	120
NNVV-65B-R4 (Sprint)	152	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
APXVTM14-ALU-I20 (Sprint)	152	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
TD-RRH8x20-25 (Sprint)	152	1' Standoff (Sprint)	98
RRH-2X50-800 (Sprint)	152	GPS (Sprint)	98
ALU RRH-4X45-1900 (Sprint)	152		
RRH-2X50-800 (Sprint)	152		
RRH-2X50-800 (Sprint)	152		
RRH-2X50-800 (Sprint)	152		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L4x4x1/4		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105.0 mph basic wind in accordance with the TIA-222-G Standard.

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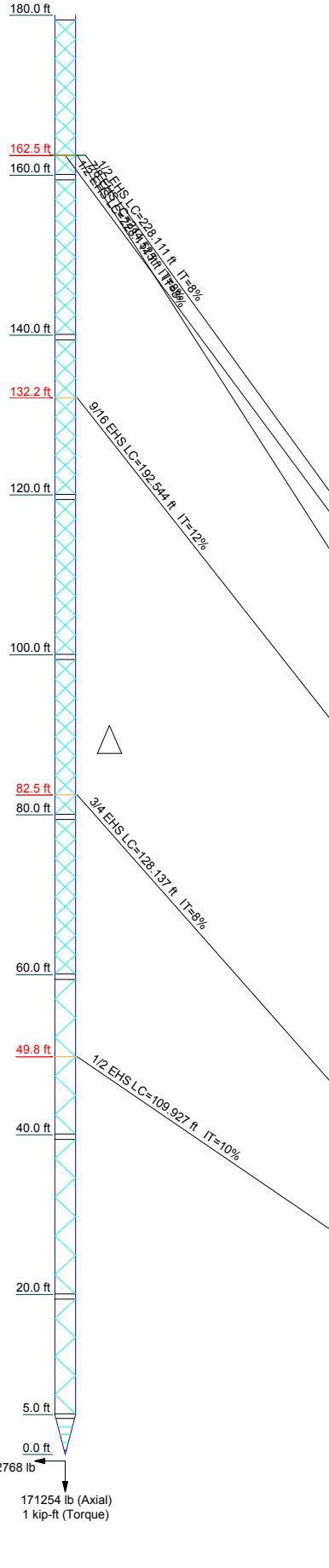
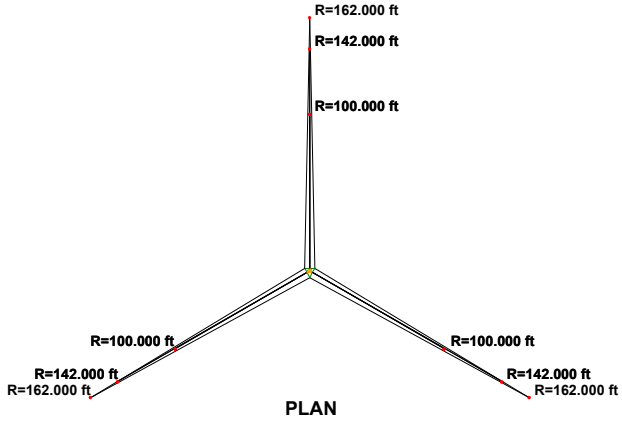
Job: ***Structural Analysis of Guyed Tower***			
Project: ***17924001A***			
Client: Cherundolo	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 05/29/18	Scale: NTS	
Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev 2\tnx Tower\CT03XC111.eri		Dwg No. E-1	

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs						ROHN 2.5 X-STR				
Leg Grade						A572-50				
Diagonals	N.A.		ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Diagonal Grade	N.A.					A53-B-42				A36
Top Girts	A		ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Bottom Girts	A	L3x3x1/2	ROHN TS1.5x16 ga		ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	L2x2x1/4
Horizontals	A					N.A.				
Top Guy Pull-Offs		N.A.		4x3/8	N.A.	2L2x2x1/4x3/8	N.A.	4x3/8	N.A.	2L2x2x1/4x3/8
Face Width (ft)						64 @ 2.40885				3.42
# Panels @ (ft)	5 @ 1	6 @ 2.37847								
Weight (lb)	293.0	544.9	602.2	654.6	907.5	779.2	907.5	765.9	907.5	1712.3





PLAN

SYMBOL LIST

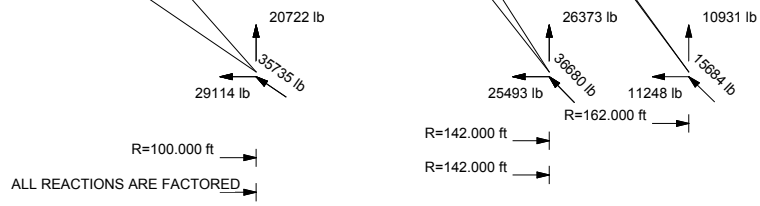
MARK	SIZE	MARK	SIZE
A	L4x4x1/4		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-42	42 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 105.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. TOWER RATING: 97.4%



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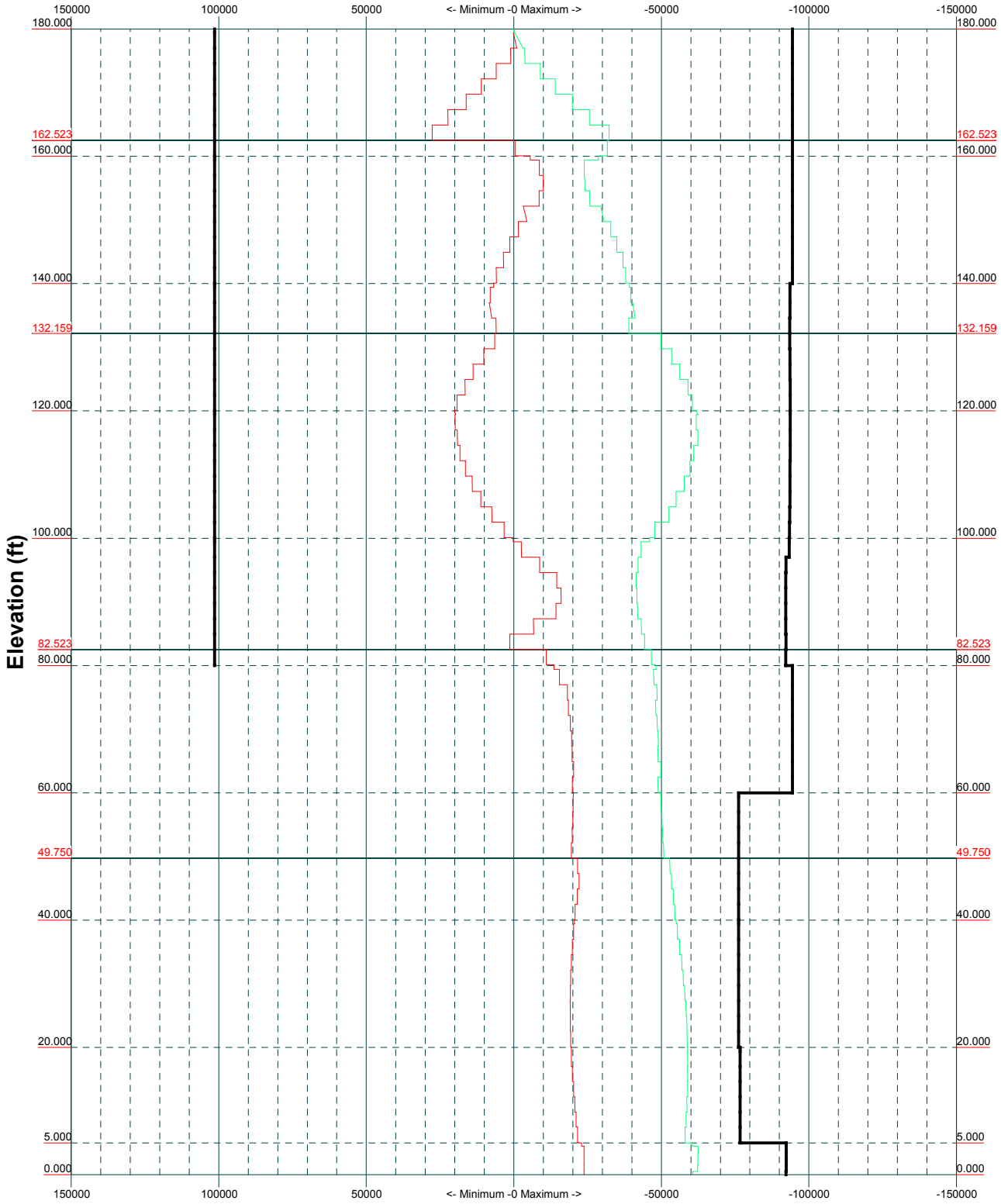
Project: ***17924001A***		
Client: Cherundolo	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 05/29/18	Scale: NTS
Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev 2\tnx Tower\CT03XC111.eri		Dwg No. E-1

TIA-222-G - 105.0 mph/50.0 mph 0.750 in Ice Exposure C

Leg Capacity ——— Leg Compression (lb)



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Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev.2\tnx Tower\CT03XC111.eri		Dwg No. E-3

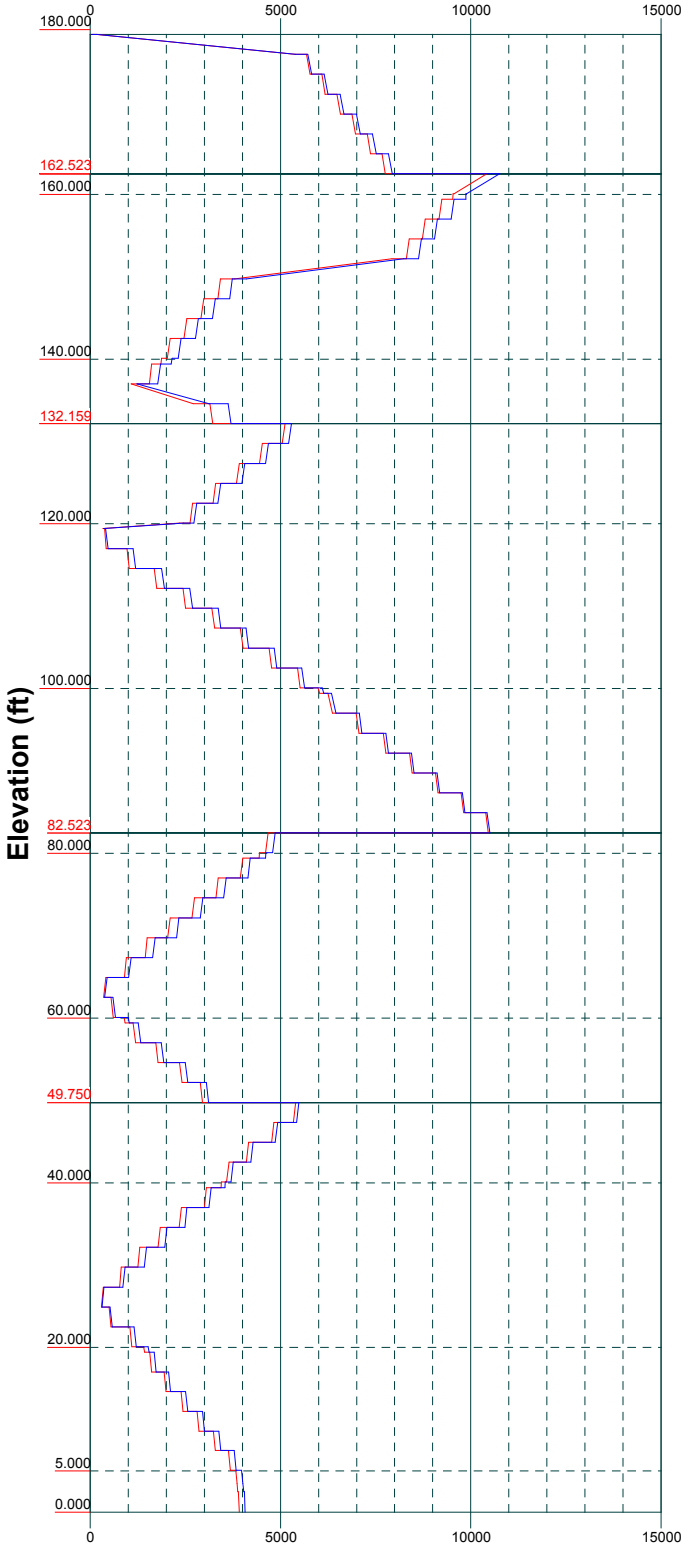
TIA-222-G - 105.0 mph/50.0 mph 0.750 in Ice Exposure C

Vx Vz

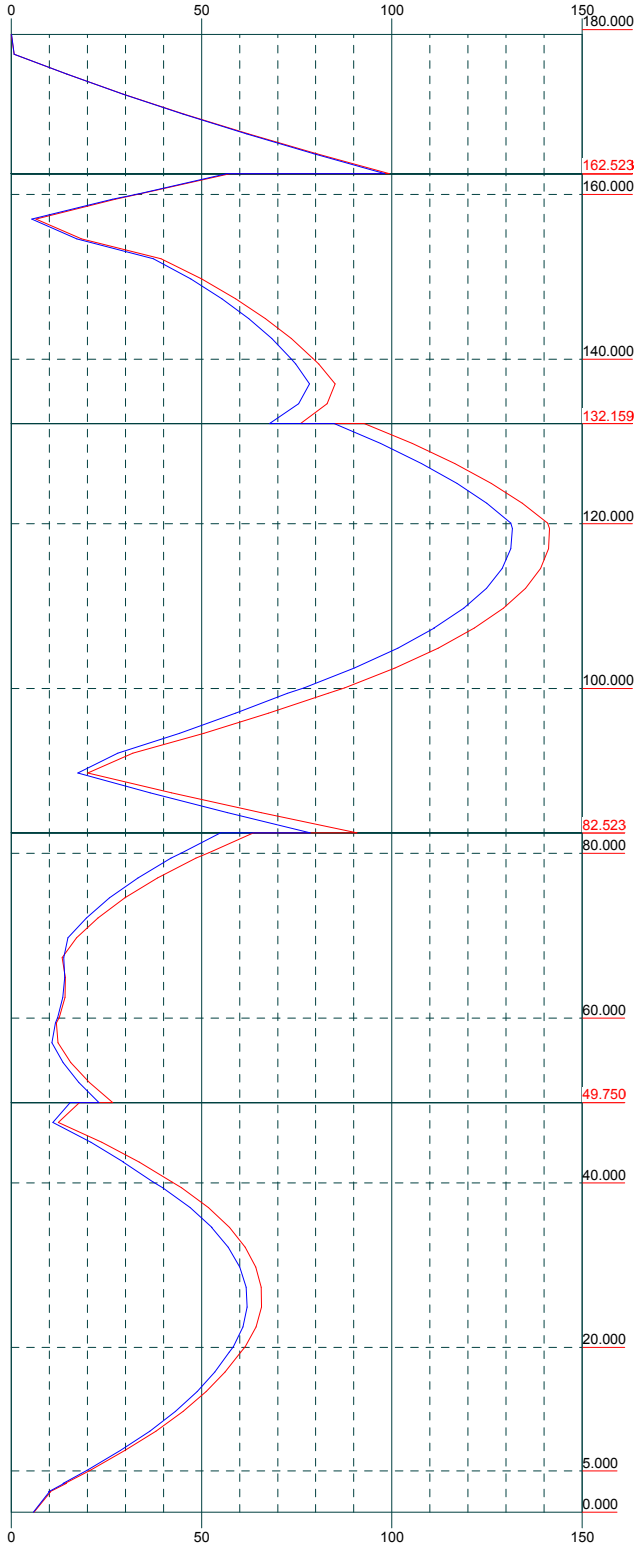
Maximum Values

Mx Mz

Global Mast Shear (lb)



Global Mast Moment (kip-ft)



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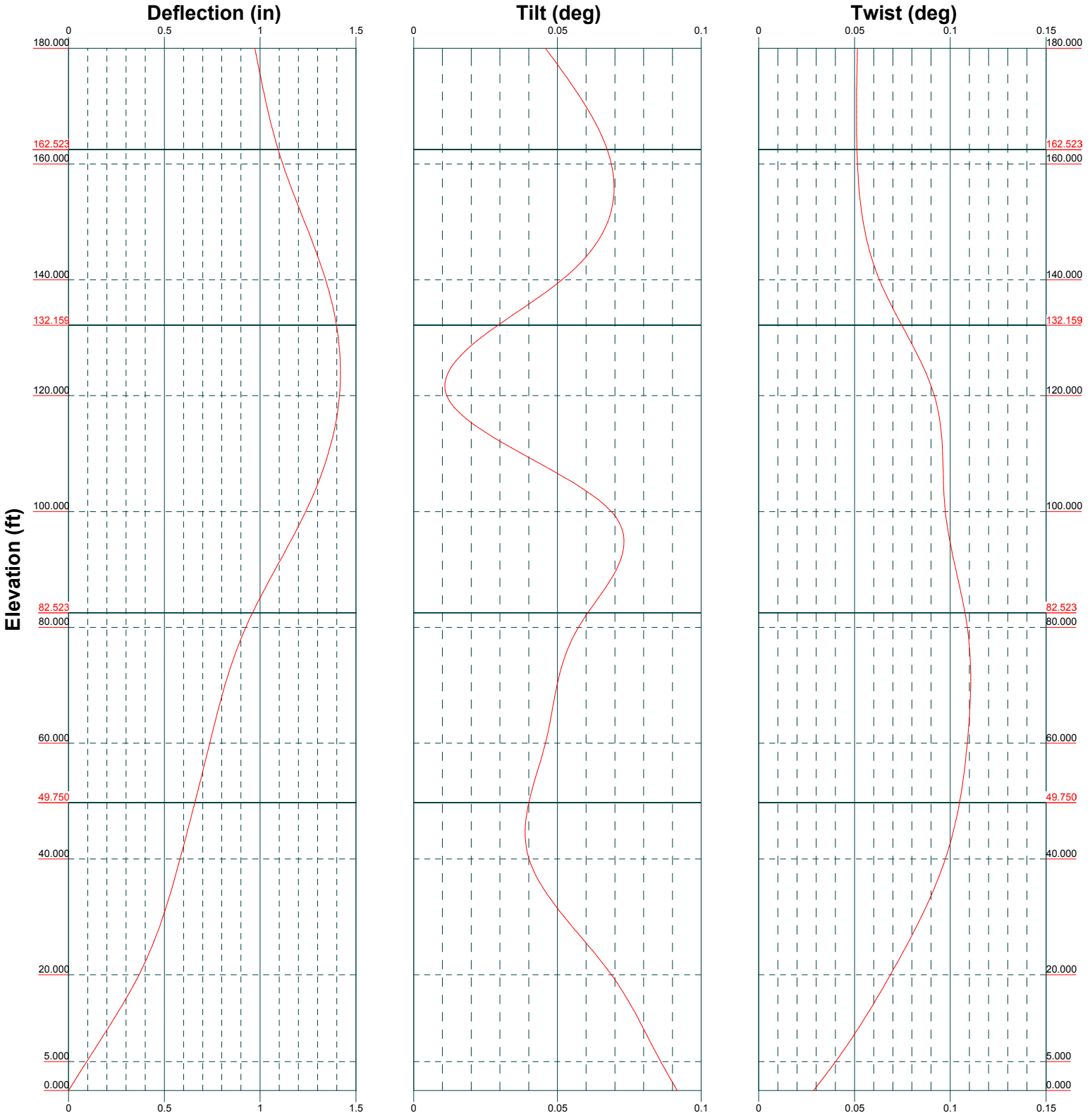
Client: Cherundolo	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 05/29/18	Scale: NTS
Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev.2\tnx Tower\CT03XC111.eri		Dwg No. E-4

TIA-222-G - Service - 60.0 mph

Maximum Values



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Project: ***17924001A***		
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Code: TIA-222-G	Date: 05/29/18	Scale: NTS
Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev 2\tnx Tower\CT03XC111.eri		Dwg No. E-5

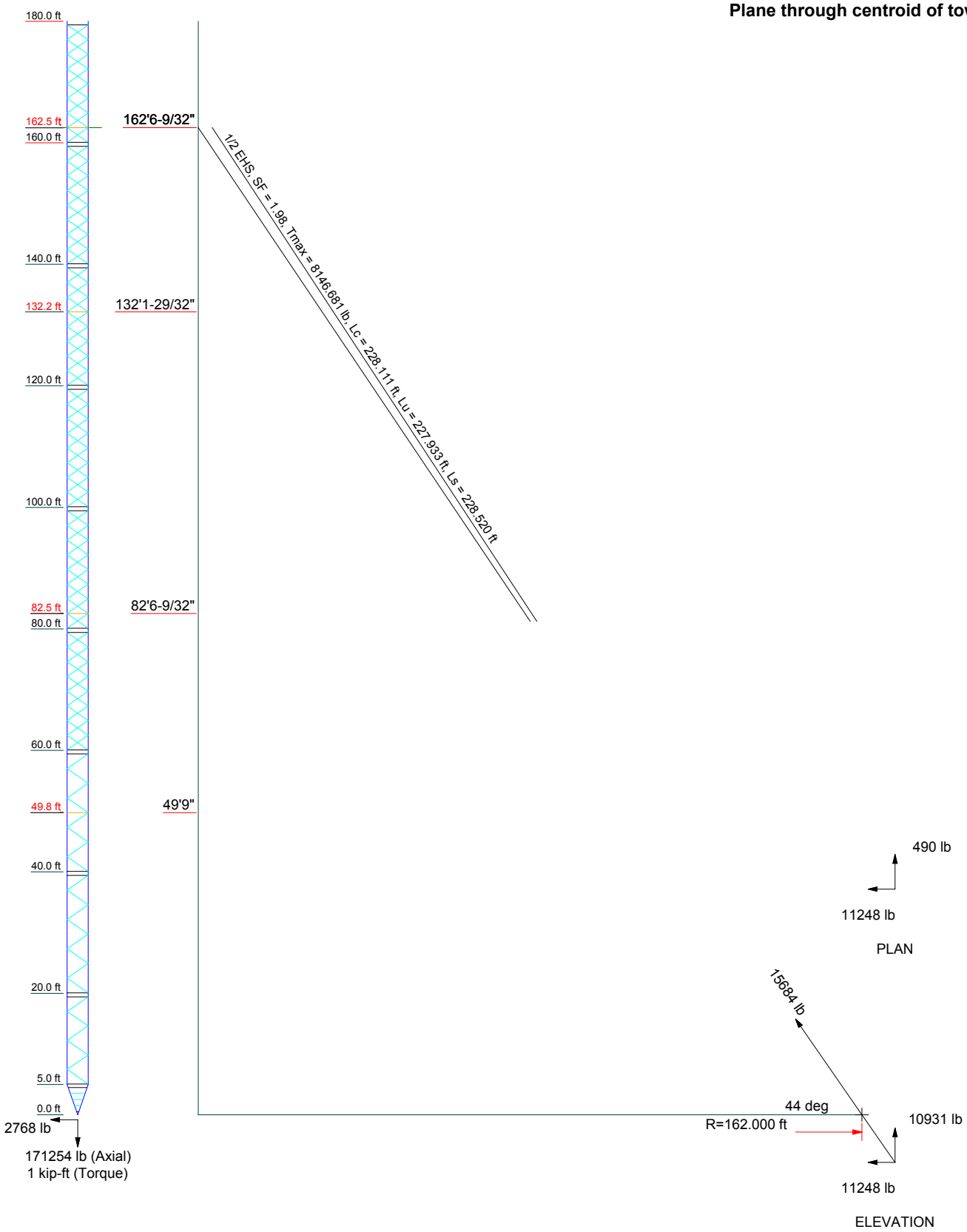
Guy Tensions and Tower Reactions

TIA-222-G - 105.0 mph/50.0 mph 0.750 in Ice Exposure C

Maximum Values

Anchor 'C'@162 ft Azimuth 240 deg Elev 0 ft

Plane through centroid of tower



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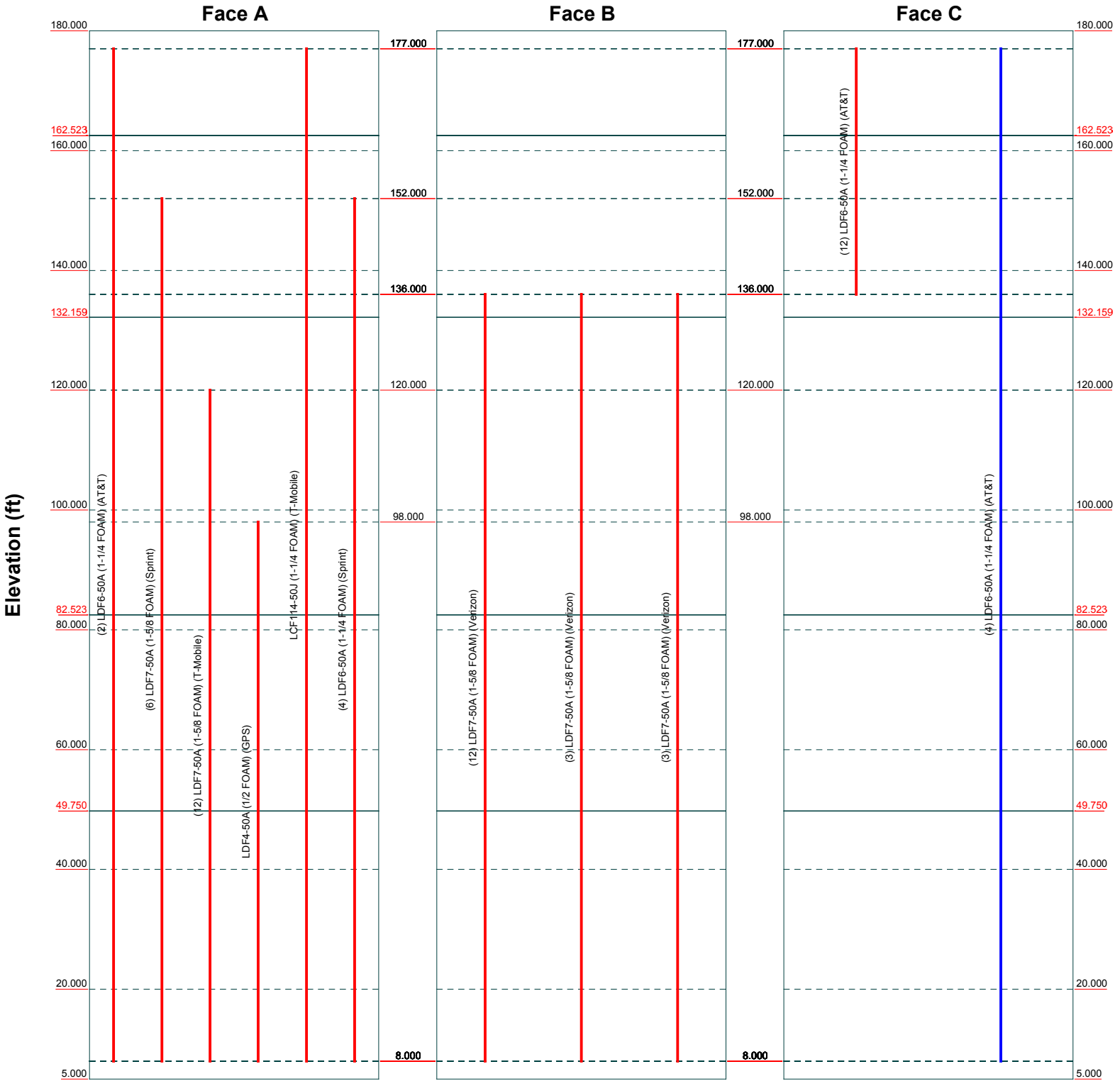
Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev 2\tnx Tower\CT03XC111.eri		Dwg No. E-6

Feed Line Distribution Chart
5' - 180'

Round | Flat | App In Face | App Out Face | Truss Leg



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Path: R:\Projects\2017\17924000A\17924001A (Temp)\Structural\Tower & Mount Analysis\Rev 2\tnx Tower\CT03XC111.eri		Dwg No. E-7

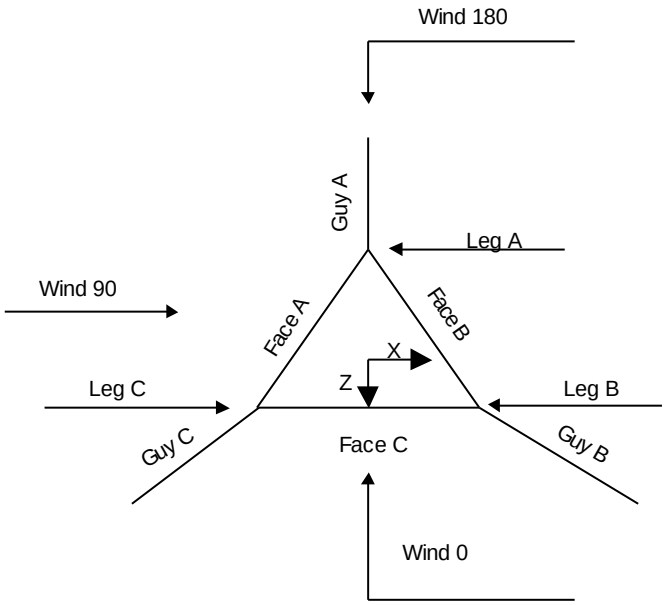
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 3.420 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

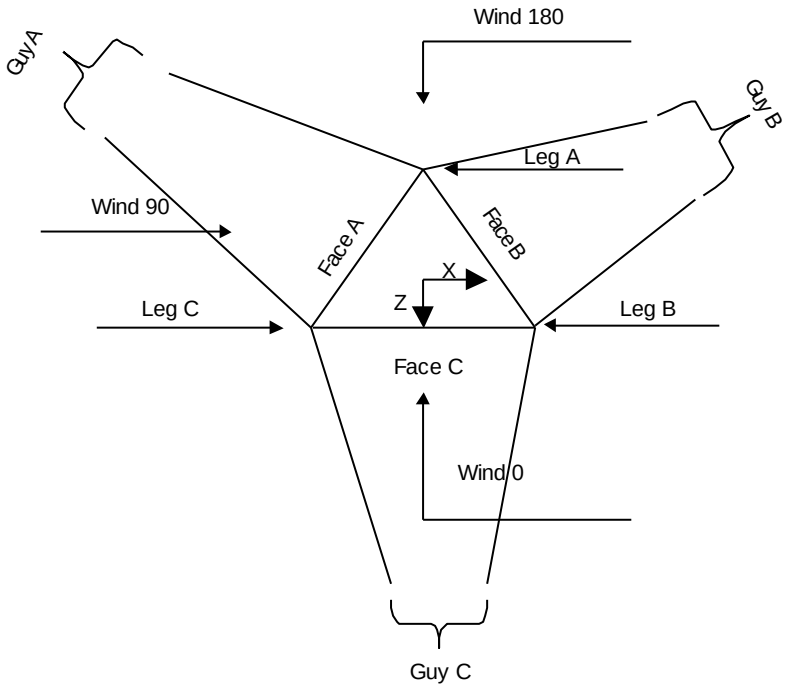
Tower is located in New London County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 105.0 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.000 ft.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50.0 mph is used in combination with ice.
Deflections calculated using a wind speed of 60.0 mph.
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, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.000-160.000			3.420	1	20.000
T2	160.000-140.000			3.420	1	20.000
T3	140.000-120.000			3.420	1	20.000
T4	120.000-100.000			3.420	1	20.000
T5	100.000-80.000			3.420	1	20.000
T6	80.000-60.000			3.420	1	20.000
T7	60.000-40.000			3.420	1	20.000
T8	40.000-20.000			3.420	1	20.000
T9	20.000-5.000			3.420	1	15.000
T10	5.000-0.000			3.420	1	5.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.000-160.000	2.409	X Brace	No	No	7.375	1.375
T2	160.000-140.000	2.409	X Brace	No	No	7.375	1.375
T3	140.000-120.000	2.409	X Brace	No	No	7.375	1.375
T4	120.000-100.000	2.409	X Brace	No	No	7.375	1.375
T5	100.000-80.000	2.409	X Brace	No	No	7.375	1.375
T6	80.000-60.000	2.409	X Brace	No	No	7.375	1.375
T7	60.000-40.000	2.409	K Brace Right	No	No	7.375	1.375
T8	40.000-20.000	2.409	K Brace Right	No	No	7.375	1.375
T9	20.000-5.000	2.378	K Brace Right	No	No	7.375	1.375
T10	5.000-0.000	1.000	X Brace	No	Yes	6.000	6.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.000-160.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160.000-140.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.000-120.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.000-100.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 100.000-80.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T6 80.000-60.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 60.000-40.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 40.000-20.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 20.000-5.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 5.000-0.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Pipe		A53-B-42 (42 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 180.000-160.000	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 160.000-140.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T3 140.000-120.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T4 120.000-100.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5	Pipe	ROHN TS1.5x16 ga	A53-B-42	Pipe	ROHN TS1.5x16 ga	A53-B-42

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
100.000-80.000			(42 ksi)			(42 ksi)
T6 80.000-60.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T7 60.000-40.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T8 40.000-20.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T9 20.000-5.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Single Angle	L3x3x1/2	A36 (36 ksi)
T10 5.000-0.000	Single Angle	L4x4x1/4	A36 (36 ksi)	Single Angle	L4x4x1/4	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
T10 5.000-0.000	None	Single Angle		A36 (36 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T10 5.000-0.000	Single Angle	L4x4x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.000-160.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T2 160.000-140.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T3 140.000-120.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T4	1.210	0.375	A36	1	1	1	36.000	36.000	36.000

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	Double Angle Stitch Bolt Spacing Redundants in
120.000-100.000			(36 ksi)						
T5 100.000-80.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T6 80.000-60.000	1.210	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T7 60.000-40.000	0.740	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T8 40.000-20.000	0.740	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T9 20.000-5.000	0.600	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T10 5.000-0.000	0.000	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000

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 180.000-160.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 160.000-140.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 140.000-120.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 120.000-100.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 100.000-80.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 80.000-60.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 60.000-40.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 40.000-20.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 20.000-5.000	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 5.000-0.000	No	No	0.2	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.000-160.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 160.000-140.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 140.000-120.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 120.000-100.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 100.000-80.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 80.000-60.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 60.000-40.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 40.000-20.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 20.000-5.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 5.000-0.000	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 180.000-160.000	Flange	0.750 A325N	0	0.625 A325N	1	0.625 A325N	1	0.625 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 160.000-140.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T3 140.000-120.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 120.000-100.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 100.000-80.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T6 80.000-60.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 60.000-40.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 40.000-20.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 20.000-5.000	Flange	0.750 A325N	4	0.500 A325N	1	0.500 A325N	1	0.625 A325N	2	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T10 5.000-0.000	Flange	0.750 A325N	4	0.500 A325N	0	0.500 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 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 %
162.523	EHS	A	1/2	2152.000	8%	21000.000	0.517	227.965	162.000	0.000	0.000	100%
		B	1/2	2152.000	8%	21000.000	0.517	227.965	162.000	0.000	0.000	100%
		C	1/2	2152.000	8%	21000.000	0.517	227.965	162.000	0.000	0.000	100%
132.159	EHS	A	9/16	4200.000	12%	21000.000	0.671	192.348	142.000	0.000	0.000	100%
		B	9/16	4200.000	12%	21000.000	0.671	192.348	142.000	0.000	0.000	100%
		C	9/16	4200.000	12%	21000.000	0.671	192.348	142.000	0.000	0.000	100%
82.5234	EHS	A	3/4	4664.000	8%	19000.000	1.155	128.046	100.000	0.000	0.000	100%
		B	3/4	4664.000	8%	19000.000	1.155	128.046	100.000	0.000	0.000	100%
		C	3/4	4664.000	8%	19000.000	1.155	128.046	100.000	0.000	0.000	100%
162.523	EHS	A	7/8	6376.000	8%	19000.000	1.581	214.375	142.000	0.000	0.000	100%
		B	7/8	6376.000	8%	19000.000	1.581	214.375	142.000	0.000	0.000	100%
		C	7/8	6376.000	8%	19000.000	1.581	214.375	142.000	0.000	0.000	100%
49.75	EHS	A	1/2	2690.000	10%	21000.000	0.517	109.835	100.000	0.000	0.000	100%
		B	1/2	2690.000	10%	21000.000	0.517	109.835	100.000	0.000	0.000	100%
		C	1/2	2690.000	10%	21000.000	0.517	109.835	100.000	0.000	0.000	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
162.523	Torque Arm	6.830	0.000	Channel	A36 (36 ksi)	Channel	C12x20.7
132.159	Corner						
82.5234	Corner						
162.523	Corner						
49.75	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
162.523	A36 (36 ksi)	Solid Round				A572-50 (50 ksi)	Double Angle	
132.159	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8
82.523	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
162.523	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Double Angle	2L2x2x1/4x3/8
49.750	A36 (36 ksi)	Solid Round			Yes	A572-50 (50 ksi)	Flat Bar	4x3/8

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
162.523	117.858	117.858	117.858		6.128 4.3 sec/pulse	6.128 4.3 sec/pulse	6.128 4.3 sec/pulse	
132.159	129.065	129.065	129.065		2.928 3.0 sec/pulse	2.928 3.0 sec/pulse	2.928 3.0 sec/pulse	
82.5234	147.893	147.893	147.893		2.011 2.4 sec/pulse	2.011 2.4 sec/pulse	2.011 2.4 sec/pulse	
162.523	338.928	338.928	338.928		5.590 4.1 sec/pulse	5.590 4.1 sec/pulse	5.590 4.1 sec/pulse	
49.75	56.785	56.785	56.785		1.155 1.9 sec/pulse	1.155 1.9 sec/pulse	1.155 1.9 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
162.523	No	No	1	1	1	1	1	1
132.159	No	No			1	1	1	1
82.5234	No	No			1	1	1	1
162.523	No	No			1	1	1	1
49.75	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
162.523	0.000 A325N	0	0.000	1	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
132.159	0.750 A325N	2	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
82.5234	0.625 A325N	0	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
162.523	0.625 A325N	0	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
49.75	0.625 A325N	0	0.000	0.75	0.750 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
162.523	A	81.262	29.065	6.591	1.641
	B	81.262	29.065	6.591	1.641
	C	81.262	29.065	6.591	1.641
132.159	A	66.079	27.827	6.310	1.608
	B	66.079	27.827	6.310	1.608
	C	66.079	27.827	6.310	1.608
82.5234	A	41.262	25.200	5.714	1.534
	B	41.262	25.200	5.714	1.534
	C	41.262	25.200	5.714	1.534
162.523	A	81.262	29.065	6.591	1.641
	B	81.262	29.065	6.591	1.641
	C	81.262	29.065	6.591	1.641
49.75	A	24.875	22.653	5.137	1.458
	B	24.875	22.653	5.137	1.458
	C	24.875	22.653	5.137	1.458

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 kip-ft	M_y kip-ft	M_z kip-ft
162.523	A	45.437	2235.966 2152.000	-32.836	1621.995	-1538.700	-3.198	5.319	-5.539
	A	45.437	2235.966 2152.000	32.836	1621.995	-1538.700	-3.198	-5.319	5.539
	B	45.437	2235.966 2152.000	1348.971	1621.995	740.913	6.396	5.319	0.000
	B	45.437	2235.966 2152.000	1316.135	1621.995	797.787	-3.198	-5.319	-5.539
	C	45.437	2235.966 2152.000	-1316.135	1621.995	797.787	-3.198	5.319	5.539
	C	45.437	2235.966 2152.000	-1348.971	1621.995	740.913	6.396	-5.319	0.000
			Sum:	0.000	9731.972	0.000	-0.000	0.000	0.000

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
132.159	A	43.345	4288.587 4200.000	0.000	2977.686	-3086.318	-5.880	0.000	0.000
	B	43.345	4288.587 4200.000	2672.830	2977.686	1543.159	2.940	0.000	-5.092
	C	43.345	4288.587 4200.000	-2672.830	2977.686	1543.159	2.940	-0.000	5.092
			Sum:	0.000	8933.059	0.000	0.000	0.000	0.000
82.5234	A	40.093	4759.244 4664.000	0.000	3108.272	-3604.033	-6.137	0.000	0.000
	B	40.093	4759.244 4664.000	3121.184	3108.272	1802.016	3.069	0.000	-5.315
	C	40.093	4759.244 4664.000	-3121.184	3108.272	1802.016	3.069	-0.000	5.315
			Sum:	0.000	9324.816	-0.000	0.000	0.000	0.000
162.523	A	49.253	6632.506 6375.751	0.000	5096.678	-4244.291	-10.064	0.000	0.000
	B	49.253	6632.506 6375.751	3675.664	5096.678	2122.146	5.032	0.000	-8.715
	C	49.253	6632.506 6375.751	-3675.664	5096.678	2122.146	5.032	-0.000	8.715
			Sum:	0.000	15290.034	-0.000	0.000	0.000	0.000
49.75	A	26.909	2715.699 2690.000	0.000	1251.597	-2410.088	-2.471	0.000	0.000
	B	26.909	2715.699 2690.000	2087.197	1251.597	1205.044	1.236	0.000	-2.140
	C	26.909	2715.699 2690.000	-2087.197	1251.597	1205.044	1.236	0.000	2.140
			Sum:	0.000	3754.792	-0.000	0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
162.523	A	45.437	5458.004 4677.281	-75.497	4155.489	-3537.798	-8.193	12.230	-14.191
	A	45.437	5458.004 4677.281	75.497	4155.489	-3537.798	-8.193	-12.230	14.191
	B	45.437	5458.004 4677.281	3101.572	4155.489	1703.517	16.386	12.230	0.000
	B	45.437	5458.004 4677.281	3026.075	4155.489	1834.281	-8.193	-12.230	-14.191
	C	45.437	5458.004 4677.281	-3026.075	4155.489	1834.281	-8.193	12.230	14.191
	C	45.437	5458.004 4677.281	-3101.572	4155.489	1703.517	16.386	-12.230	0.000
			Sum:	0.000	24932.932	0.000	-0.000	0.000	0.000
132.159	A	43.345	6574.493 5923.373	0.000	4761.512	-4533.427	-9.402	0.000	0.000
	B	43.345	6574.493 5923.373	3926.063	4761.512	2266.714	4.701	0.000	-8.142
	C	43.345	6574.493	-3926.063	4761.512	2266.714	4.701	-0.000	8.142

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
			5923.373						
			Sum:	0.000	14284.535	0.000	0.000	0.000	0.000
82.5234	A	40.093	6627.992 6179.926	0.000	4471.078	-4892.825	-8.828	0.000	0.000
	B	40.093	6627.992 6179.926	4237.311	4471.078	2446.412	4.414	0.000	-7.646
	C	40.093	6627.992 6179.926	-4237.311	4471.078	2446.412	4.414	-0.000	7.646
			Sum:	0.000	13413.235	-0.000	0.000	0.000	0.000
162.523	A	49.253	10075.748 8999.801	0.000	7933.283	-6211.579	-15.665	0.000	0.000
	B	49.253	10075.748 8999.801	5379.385	7933.283	3105.789	7.832	0.000	-13.566
	C	49.253	10075.748 8999.801	-5379.385	7933.283	3105.789	7.832	-0.000	13.566
			Sum:	0.000	23799.850	-0.000	0.000	0.000	0.000
49.75	A	26.909	4053.105 3854.078	0.000	2008.518	-3520.443	-3.966	0.000	0.000
	B	26.909	4053.105 3854.078	3048.793	2008.518	1760.221	1.983	0.000	-3.435
	C	26.909	4053.105 3854.078	-3048.793	2008.518	1760.221	1.983	-0.000	3.435
			Sum:	0.000	6025.555	-0.000	0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
162.523	A	45.437	2235.966 2152.000	-32.836	1621.995	-1538.700	-3.198	5.319	-5.539
	A	45.437	2235.966 2152.000	32.836	1621.995	-1538.700	-3.198	-5.319	5.539
	B	45.437	2235.966 2152.000	1348.971	1621.995	740.913	6.396	5.319	0.000
	B	45.437	2235.966 2152.000	1316.135	1621.995	797.787	-3.198	-5.319	-5.539
	C	45.437	2235.966 2152.000	-1316.135	1621.995	797.787	-3.198	5.319	5.539
	C	45.437	2235.966 2152.000	-1348.971	1621.995	740.913	6.396	-5.319	0.000
			Sum:	0.000	9731.972	0.000	-0.000	0.000	0.000
132.159	A	43.345	4288.587 4200.000	0.000	2977.686	-3086.318	-5.880	0.000	0.000
	B	43.345	4288.587 4200.000	2672.830	2977.686	1543.159	2.940	0.000	-5.092
	C	43.345	4288.587 4200.000	-2672.830	2977.686	1543.159	2.940	-0.000	5.092
			Sum:	0.000	8933.059	0.000	0.000	0.000	0.000
82.5234	A	40.093	4759.244 4664.000	0.000	3108.272	-3604.033	-6.137	0.000	0.000
	B	40.093	4759.244	3121.184	3108.272	1802.016	3.069	0.000	-5.315

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	kip-ft	kip-ft	kip-ft
			4664.000						
	C	40.093	4759.244	-3121.184	3108.272	1802.016	3.069	-0.000	5.315
			4664.000						
			Sum:	0.000	9324.816	-0.000	0.000	0.000	0.000
162.523	A	49.253	6632.506	0.000	5096.678	-4244.291	-10.064	0.000	0.000
			6375.751						
	B	49.253	6632.506	3675.664	5096.678	2122.146	5.032	0.000	-8.715
			6375.751						
	C	49.253	6632.506	-3675.664	5096.678	2122.146	5.032	-0.000	8.715
			6375.751						
			Sum:	0.000	15290.034	-0.000	0.000	0.000	0.000
49.75	A	26.909	2715.699	0.000	1251.597	-2410.088	-2.471	0.000	0.000
			2690.000						
	B	26.909	2715.699	2087.197	1251.597	1205.044	1.236	0.000	-2.140
			2690.000						
	C	26.909	2715.699	-2087.197	1251.597	1205.044	1.236	0.000	2.140
			2690.000						
			Sum:	0.000	3754.792	-0.000	0.000	0.000	0.000

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning: 0 F Initial Tension	0 F Intercept	20 F Initial Tension	20 F Intercept	40 F Initial Tension	40 F Intercept	60 F Initial Tension	60 F Intercept	80 F Initial Tension	80 F Intercept	100 F Initial Tension	100 F Intercept	120 F Initial Tension	120 F Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
162.523	A	160.06	162.52	2690	4.92	2507	5.27	2327	5.67	2152	6.13	1983	6.64	1821	7.22	1668	7.86
	B	160.06	162.52	2690	4.92	2507	5.27	2327	5.67	2152	6.13	1983	6.64	1821	7.22	1668	7.86
	C	160.06	162.52	2690	4.92	2507	5.27	2327	5.67	2152	6.13	1983	6.64	1821	7.22	1668	7.86
132.159	A	140.03	132.16	5018	2.45	4744	2.59	4471	2.75	4200	2.93	3931	3.13	3664	3.35	3401	3.61
	B	140.03	132.16	5018	2.45	4744	2.59	4471	2.75	4200	2.93	3931	3.13	3664	3.35	3401	3.61
	C	140.03	132.16	5018	2.45	4744	2.59	4471	2.75	4200	2.93	3931	3.13	3664	3.35	3401	3.61
82.5234	A	98.03	82.52	6060	1.55	5590	1.68	5124	1.83	4664	2.01	4213	2.22	3773	2.48	3349	2.79
	B	98.03	82.52	6060	1.55	5590	1.68	5124	1.83	4664	2.01	4213	2.22	3773	2.48	3349	2.79
	C	98.03	82.52	6060	1.55	5590	1.68	5124	1.83	4664	2.01	4213	2.22	3773	2.48	3349	2.79
162.523	A	140.03	162.52	7699	4.64	7251	4.93	6809	5.24	6376	5.59	5952	5.98	5540	6.42	5143	6.90
	B	140.03	162.52	7699	4.64	7251	4.93	6809	5.24	6376	5.59	5952	5.98	5540	6.42	5143	6.90
	C	140.03	162.52	7699	4.64	7251	4.93	6809	5.24	6376	5.59	5952	5.98	5540	6.42	5143	6.90
49.75	A	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	B	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	C	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75

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
LDF6-50A (1-1/4 FOAM) (AT&T)	A	No	Ar (CaAa)	177.000 - 8.000	2.500	0.18	2	2	1.550	1.550		0.660
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	Ar (CaAa)	177.000 - 136.000	0.000	0.18	12	6	1.000 1.550	1.550		0.660
LDF7-50A	A	No	Ar (CaAa)	152.000 - 8.000	0.000	0.15	6	6	1.980	1.980		0.820

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 FOAM) (Sprint)												
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	136.000 - 8.000	0.000	0	12	6	0.500 1.000	1.980		0.820
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	136.000 - 8.000	0.000	0.28	3	3	0.500	1.980		0.820
LDF7-50A (1-5/8 FOAM) (Verizon)	B	No	Ar (CaAa)	136.000 - 8.000	0.000	0.28	3	3	0.500	1.980		0.820
LDF7-50A (1-5/8 FOAM) (T-Mobile)	A	No	Ar (CaAa)	120.000 - 8.000	0.000	0.1	12	6	0.000 1.980	1.980		0.820
LDF4-50A (1/2 FOAM) (GPS)	A	No	Ar (CaAa)	98.000 - 8.000	0.000	0.4	1	1	0.630	0.630		0.150
LCF114-50J (1-1/4 FOAM) (T-Mobile)	A	No	Ar (CaAa)	177.000 - 8.000	0.000	0.15	1	1	1.500 0.000	1.570		0.700
LDF6-50A (1-1/4 FOAM) (Sprint)	A	No	Ar (CaAa)	152.000 - 8.000	1.500	0	4	4	1.000 0.500	1.000		0.660

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
LDF6-50A (1-1/4 FOAM) (AT&T)	C	No	CaAa (In Face)	177.000 - 8.000	0.000	0.5	4	No Ice 1/2" Ice 1" Ice	0.155 0.255 0.355	0.660 1.912 3.775

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	180.000-160.000	A	0.000	0.000	7.939	0.000	34.340
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	42.160	0.000	179.520
T2	160.000-140.000	A	0.000	0.000	28.396	0.000	131.120
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	49.600	0.000	211.200
T3	140.000-120.000	A	0.000	0.000	41.100	0.000	191.600
		B	0.000	0.000	57.024	0.000	236.160
		C	0.000	0.000	19.840	0.000	84.480
T4	120.000-100.000	A	0.000	0.000	88.620	0.000	388.400
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T5	100.000-80.000	A	0.000	0.000	89.754	0.000	391.100
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T6	80.000-60.000	A	0.000	0.000	89.880	0.000	391.400

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
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T7	60.000-40.000	A	0.000	0.000	89.880	0.000	391.400
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T8	40.000-20.000	A	0.000	0.000	89.880	0.000	391.400
		B	0.000	0.000	71.280	0.000	295.200
		C	0.000	0.000	12.400	0.000	52.800
T9	20.000-5.000	A	0.000	0.000	53.928	0.000	234.840
		B	0.000	0.000	42.768	0.000	177.120
		C	0.000	0.000	7.440	0.000	31.680
T10	5.000-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	180.000-160.000	A	1.767	0.000	0.000	29.152	0.000	370.308
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	76.272	0.000	1459.981
T2	160.000-140.000	A	1.745	0.000	0.000	89.958	0.000	1233.780
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	89.234	0.000	1699.711
T3	140.000-120.000	A	1.720	0.000	0.000	126.645	0.000	1746.960
		B		0.000	0.000	86.247	0.000	1405.401
		C		0.000	0.000	49.676	0.000	833.835
T4	120.000-100.000	A	1.692	0.000	0.000	170.694	0.000	2688.704
		B		0.000	0.000	107.235	0.000	1734.268
		C		0.000	0.000	39.471	0.000	609.735
T5	100.000-80.000	A	1.658	0.000	0.000	176.782	0.000	2732.101
		B		0.000	0.000	106.559	0.000	1707.906
		C		0.000	0.000	38.933	0.000	594.787
T6	80.000-60.000	A	1.617	0.000	0.000	176.164	0.000	2685.775
		B		0.000	0.000	105.731	0.000	1675.854
		C		0.000	0.000	38.274	0.000	576.485
T7	60.000-40.000	A	1.564	0.000	0.000	174.336	0.000	2613.845
		B		0.000	0.000	104.656	0.000	1634.553
		C		0.000	0.000	37.418	0.000	552.689
T8	40.000-20.000	A	1.486	0.000	0.000	171.679	0.000	2510.665
		B		0.000	0.000	103.094	0.000	1575.199
		C		0.000	0.000	36.172	0.000	518.060
T9	20.000-5.000	A	1.361	0.000	0.000	100.464	0.000	1409.601
		B		0.000	0.000	60.361	0.000	889.270
		C		0.000	0.000	20.508	0.000	277.605
T10	5.000-0.000	A	1.159	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	180.000-160.000	-1.621	1.449	-0.956	0.559
T2	160.000-140.000	-1.895	0.832	-1.319	0.257
T3	140.000-120.000	0.014	-0.644	-0.611	-0.295
T4	120.000-100.000	-0.157	-1.222	-0.608	-0.525
T5	100.000-80.000	-0.159	-1.243	-0.594	-0.598
T6	80.000-60.000	-0.160	-1.251	-0.610	-0.634
T7	60.000-40.000	-0.164	-1.285	-0.695	-0.738
T8	40.000-20.000	-0.166	-1.296	-0.700	-0.770
T9	20.000-5.000	-0.160	-1.248	-0.657	-0.765
T10	5.000-0.000	0.000	0.000	0.000	0.000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF6-50A (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T1	2	LDF6-50A (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T1	9	LCF114-50J (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T1	10	LDF6-50A (1-1/4 FOAM)	160.00 - 177.00	0.6000	0.2562
T2	1	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	2	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	3	LDF7-50A (1-5/8 FOAM)	140.00 - 152.00	0.6000	0.3197
T2	9	LCF114-50J (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	10	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.3197
T2	11	LDF6-50A (1-1/4 FOAM)	140.00 - 152.00	0.6000	0.3197
T3	1	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	2	LDF6-50A (1-1/4 FOAM)	136.00 - 140.00	0.6000	0.2982
T3	3	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	4	LDF7-50A (1-5/8 FOAM)	120.00 - 136.00	0.6000	0.2982
T3	5	LDF7-50A (1-5/8 FOAM)	120.00 - 136.00	0.6000	0.2982
T3	6	LDF7-50A (1-5/8 FOAM)	120.00 - 136.00	0.6000	0.2982
T3	9	LCF114-50J (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	10	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T3	11	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.2982
T4	1	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	3	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	4	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	5	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	6	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	7	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	9	LCF114-50J (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	10	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313
T4	11	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.3313
T5	1	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	3	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	4	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	5	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	6	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	7	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	8	LDF4-50A (1/2 FOAM)	80.00 - 98.00	0.6000	0.3193
T5	9	LCF114-50J (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	10	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T5	11	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.3193
T6	1	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	3	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	4	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	5	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	6	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	7	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	8	LDF4-50A (1/2 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	9	LCF114-50J (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	10	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T6	11	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.3475
T7	1	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	3	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	4	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	5	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	6	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	7	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	8	LDF4-50A (1/2 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	9	LCF114-50J (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	10	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T7	11	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.5055
T8	1	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	3	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	4	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	5	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	6	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	7	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	8	LDF4-50A (1/2 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	9	LCF114-50J (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	10	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T8	11	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.5435
T9	1	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	3	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	4	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	5	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	6	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	7	LDF7-50A (1-5/8 FOAM)	8.00 - 20.00	0.6000	0.5442

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	8	LDF4-50A (1/2 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	9	LCF114-50J (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	10	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442
T9	11	LDF6-50A (1-1/4 FOAM)	8.00 - 20.00	0.6000	0.5442

Discrete Tower Loads

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
Rohn 6'x15' Boom Gate (3)	A	None		0.000	177.000	No Ice	53.200	53.200	1790.000
(AT&T)						1/2" Ice	63.300	63.300	2230.000
						1" Ice	73.400	73.400	2670.000
P65-17-XLH-RR w/8ft mount pipe	A	From Leg	4.750 0.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
P65-17-XLH-RR w/8ft mount pipe	A	From Leg	4.750 3.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
Powerwave 7770 w/5ft mount pipe	A	From Leg	4.750 -3.000	0.000	177.000	No Ice 1/2" Ice	5.607 5.992	4.116 4.769	45.250 91.165
(AT&T)			0.000			1" Ice	6.384	5.432	143.354
(2) ETB19G8-12UB / E15Z01P03	A	From Leg	4.700 0.000	0.000	177.000	No Ice 1/2" Ice	0.909 1.038	0.424 0.528	15.900 22.428
(AT&T)			0.000			1" Ice	1.176	0.639	30.811
SBNH-1D6565C	B	From Leg	4.750	0.000	177.000	No Ice	11.445	9.596	86.200
(AT&T)			0.000			1/2" Ice	12.064	11.017	173.166
			0.000			1" Ice	12.689	12.290	269.888
P65-17-XLH-RR w/8ft mount pipe	B	From Leg	4.750 3.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
Powerwave 7770 w/5ft mount pipe	B	From Leg	4.750 -3.000	0.000	177.000	No Ice 1/2" Ice	5.607 5.992	4.116 4.769	45.250 91.165
(AT&T)			0.000			1" Ice	6.384	5.432	143.354
(2) ETB19G8-12UB / E15Z01P03	B	From Leg	4.700 0.000	0.000	177.000	No Ice 1/2" Ice	0.909 1.038	0.424 0.528	15.900 22.428
(AT&T)			0.000			1" Ice	1.176	0.639	30.811
DB874H120	C	From Leg	4.750	0.000	177.000	No Ice	5.486	3.665	32.250
(AT&T)			0.000			1/2" Ice	5.876	4.278	76.934
			0.000			1" Ice	6.273	4.902	127.534
P65-17-XLH-RR w/8ft mount pipe	C	From Leg	4.750 3.000	0.000	177.000	No Ice 1/2" Ice	11.467 12.083	8.700 10.112	99.200 182.359
(AT&T)			0.000			1" Ice	12.707	11.377	275.183
Powerwave 7770 w/5ft mount pipe	C	From Leg	4.750 -3.000	0.000	177.000	No Ice 1/2" Ice	5.607 5.992	4.116 4.769	45.250 91.165
(AT&T)			0.000			1" Ice	6.384	5.432	143.354
ETB19G8-12UB / E15Z01P03	C	From Leg	4.700 0.000	0.000	177.000	No Ice 1/2" Ice	0.909 1.038	0.424 0.528	15.900 22.428
(AT&T)			0.000			1" Ice	1.176	0.639	30.811
(2) LGP21401	C	From Leg	4.750	0.000	177.000	No Ice	1.656	0.445	35.000
(AT&T)			0.000			1/2" Ice	1.816	0.542	45.888

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
			0.000			1" Ice	1.984	0.647	59.037
DC6-48-06-18-8F	C	From Leg	0.500	0.000	177.000	No Ice	1.201	1.201	32.000
(AT&T)			0.000			1/2" Ice	1.877	1.877	53.813
			0.000			1" Ice	2.088	2.088	78.477
(2) RRUS-11	A	From Leg	4.750	0.000	177.000	No Ice	2.522	1.020	55.000
(AT&T)			0.000			1/2" Ice	2.719	1.158	74.320
			0.000			1" Ice	2.923	1.304	96.557
(2) RRUS-11	B	From Leg	4.750	0.000	177.000	No Ice	2.522	1.020	55.000
(AT&T)			0.000			1/2" Ice	2.719	1.158	74.320
			0.000			1" Ice	2.923	1.304	96.557
(2) RRUS-11	C	From Leg	4.750	0.000	177.000	No Ice	2.522	1.020	55.000
(AT&T)			0.000			1/2" Ice	2.719	1.158	74.320
			0.000			1" Ice	2.923	1.304	96.557
Pirod 15' T-Frame Sector	A	From Leg	0.000	0.000	152.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Sprint)			0.000			1" Ice	26.200	26.200	800.000
NNVV-65B-R4	A	From Leg	3.500	0.000	152.000	No Ice	12.746	7.650	113.900
(Sprint)			-3.000			1/2" Ice	13.448	8.935	207.140
			0.000			1" Ice	14.118	10.072	309.099
APXVTM14-ALU-I20	A	From Leg	3.500	0.000	152.000	No Ice	7.128	5.507	85.400
(Sprint)			3.000			1/2" Ice	7.845	6.695	146.024
			0.000			1" Ice	8.504	7.734	213.799
TD-RRH8x20-25	A	From Leg	3.000	0.000	152.000	No Ice	4.030	1.526	76.200
(Sprint)			1.000			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
RRH-2X50-800	A	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
ALU RRH-4X45-1900	A	From Leg	3.000	0.000	152.000	No Ice	2.500	2.500	69.500
(Sprint)			0.000			1/2" Ice	2.709	2.709	95.231
			0.000			1" Ice	2.926	2.926	124.333
Pirod 15' T-Frame Sector	B	From Leg	0.000	0.000	152.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Sprint)			0.000			1" Ice	26.200	26.200	800.000
NNVV-65B-R4	B	From Leg	3.500	0.000	152.000	No Ice	12.746	7.650	113.900
(Sprint)			-3.000			1/2" Ice	13.448	8.935	207.140
			0.000			1" Ice	14.118	10.072	309.099
APXVTM14-ALU-I20	B	From Leg	3.500	0.000	152.000	No Ice	7.128	5.507	85.400
(Sprint)			3.000			1/2" Ice	7.845	6.695	146.024
			0.000			1" Ice	8.504	7.734	213.799
TD-RRH8x20-25	B	From Leg	3.000	0.000	152.000	No Ice	4.030	1.526	76.200
(Sprint)			1.000			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
RRH-2X50-800	B	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
ALU RRH-4X45-1900	B	From Leg	3.000	0.000	152.000	No Ice	2.500	2.500	69.500
(Sprint)			0.000			1/2" Ice	2.709	2.709	95.231
			0.000			1" Ice	2.926	2.926	124.333
Pirod 15' T-Frame Sector	C	From Leg	0.000	0.000	152.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Sprint)			0.000			1" Ice	26.200	26.200	800.000
NNVV-65B-R4	C	From Leg	3.500	0.000	152.000	No Ice	12.746	7.650	113.900
(Sprint)			-3.000			1/2" Ice	13.448	8.935	207.140
			0.000			1" Ice	14.118	10.072	309.099
APXVTM14-ALU-I20	C	From Leg	3.500	0.000	152.000	No Ice	7.128	5.507	85.400
(Sprint)			3.000			1/2" Ice	7.845	6.695	146.024

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
			0.000			1" Ice	8.504	7.734	213.799
TD-RRH8x20-25	C	From Leg	3.000	0.000	152.000	No Ice	4.030	1.526	76.200
(Sprint)			1.000			1/2" Ice	4.281	1.705	103.251
			0.000			1" Ice	4.540	1.891	133.822
RRH-2X50-800	C	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
ALU RRH-4X45-1900	C	From Leg	3.000	0.000	152.000	No Ice	2.500	2.500	69.500
(Sprint)			0.000			1/2" Ice	2.709	2.709	95.231
			0.000			1" Ice	2.926	2.926	124.333
Pirod 15' T-Frame Sector	A	From Leg	2.000	0.000	136.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Verizon)			0.000			1" Ice	26.200	26.200	800.000
BXA-70063-6CF-EDIN W/M	A	From Leg	3.000	0.000	136.000	No Ice	7.826	5.821	56.550
PIPE			-1.000			1/2" Ice	8.386	6.986	117.530
(Verizon)			0.000			1" Ice	8.907	7.865	186.250
BXA-171085-8BF W/M	A	From Leg	3.000	0.000	136.000	No Ice	2.953	3.056	29.408
PIPE			1.000			1/2" Ice	3.274	3.612	59.186
(Verizon)			0.000			1" Ice	3.593	4.184	94.252
LPA-80080/4CF W/M PIPE	A	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			-4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
LPA-80080/4CF W/M PIPE	A	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
FRS FD9R6004 Diplexer	A	From Leg	3.000	0.000	136.000	No Ice	0.370	0.080	2.600
(Verizon)			0.000			1/2" Ice	0.450	0.140	4.900
			0.000			1" Ice	0.530	0.200	7.200
Pirod 15' T-Frame Sector	B	From Leg	2.000	0.000	136.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Verizon)			0.000			1" Ice	26.200	26.200	800.000
BXA-70063-6CF-EDIN W/M	B	From Leg	3.000	0.000	136.000	No Ice	7.826	5.821	56.550
PIPE			-1.000			1/2" Ice	8.386	6.986	117.530
(Verizon)			0.000			1" Ice	8.907	7.865	186.250
BXA-171085-8BF W/M	B	From Leg	3.000	0.000	136.000	No Ice	2.953	3.056	29.408
PIPE			1.000			1/2" Ice	3.274	3.612	59.186
(Verizon)			0.000			1" Ice	3.593	4.184	94.252
LPA-80080/4CF W/M PIPE	B	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			-4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
LPA-80080/4CF W/M PIPE	B	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
FRS FD9R6004 Diplexer	B	From Leg	3.000	0.000	136.000	No Ice	0.370	0.080	2.600
(Verizon)			0.000			1/2" Ice	0.450	0.140	4.900
			0.000			1" Ice	0.530	0.200	7.200
Pirod 15' T-Frame Sector	C	From Leg	2.000	0.000	136.000	No Ice	15.000	15.000	500.000
Mount (1)			0.000			1/2" Ice	20.600	20.600	650.000
(Verizon)			0.000			1" Ice	26.200	26.200	800.000
BXA-70063-6CF-EDIN W/M	C	From Leg	3.000	0.000	136.000	No Ice	7.826	5.821	56.550
PIPE			-1.000			1/2" Ice	8.386	6.986	117.530
(Verizon)			0.000			1" Ice	8.907	7.865	186.250
BXA-171085-8BF W/M	C	From Leg	3.000	0.000	136.000	No Ice	2.953	3.056	29.408
PIPE			1.000			1/2" Ice	3.274	3.612	59.186
(Verizon)			0.000			1" Ice	3.593	4.184	94.252
LPA-80080/4CF W/M PIPE	C	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			-4.000			1/2" Ice	2.987	6.898	85.443

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
			0.000			1" Ice	3.313	7.496	135.452
LPA-80080/4CF W/M PIPE	C	From Leg	3.000	0.000	136.000	No Ice	2.670	6.316	41.208
(Verizon)			4.000			1/2" Ice	2.987	6.898	85.443
			0.000			1" Ice	3.313	7.496	135.452
FRS FD9R6004 Diplexer	C	From Leg	3.000	0.000	136.000	No Ice	0.370	0.080	2.600
(Verizon)			0.000			1/2" Ice	0.450	0.140	4.900
			0.000			1" Ice	0.530	0.200	7.200
GPS	A	From Leg	1.000	0.000	98.000	No Ice	0.257	0.310	24.867
(Sprint)			0.000			1/2" Ice	0.369	0.444	30.019
			0.000			1" Ice	0.494	0.595	36.751
1' Standoff	A	From Leg	1.000	0.000	98.000	No Ice	1.000	1.000	100.000
(Sprint)			0.000			1/2" Ice	2.000	2.000	150.000
			0.000			1" Ice	3.000	3.000	200.000
AIR 21 B4A B2P W/Mount	A	From Leg	3.000	0.000	120.000	No Ice	6.366	5.722	147.900
Pipe			1.500			1/2" Ice	6.846	6.574	205.399
(T-Mobile)			0.000			1" Ice	7.305	7.298	269.688
UMTS DD B4	A	From Leg	3.000	0.000	120.000	No Ice	1.840	2.450	40.000
(T-Mobile)			0.000			1/2" Ice	2.040	2.670	52.000
			0.000			1" Ice	2.240	2.890	64.000
KRC 118 57/1B4/B12P W/M	A	From Leg	3.000	0.000	120.000	No Ice	7.935	6.738	142.900
Pipe			-1.500			1/2" Ice	8.425	7.611	212.538
(T-Mobile)			0.000			1" Ice	8.898	8.360	289.448
RRUS11 B12	A	From Leg	1.500	0.000	120.000	No Ice	2.833	1.182	50.700
(T-Mobile)			0.000			1/2" Ice	3.043	1.330	71.570
			0.000			1" Ice	3.259	1.485	95.487
Pirod 4' Side Mount Standoff	A	From Leg	1.500	0.000	120.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(T-Mobile)			0.000			1" Ice	7.100	7.100	128.000
AIR 21 B4A B2P W/Mount	B	From Leg	3.000	0.000	120.000	No Ice	6.366	5.722	147.900
Pipe			1.500			1/2" Ice	6.846	6.574	205.399
(T-Mobile)			0.000			1" Ice	7.305	7.298	269.688
UMTS DD B4	B	From Leg	3.000	0.000	120.000	No Ice	1.840	2.450	40.000
(T-Mobile)			0.000			1/2" Ice	2.040	2.670	52.000
			0.000			1" Ice	2.240	2.890	64.000
KRC 118 57/1B4/B12P W/M	B	From Leg	3.000	0.000	120.000	No Ice	7.935	6.738	142.900
Pipe			-1.500			1/2" Ice	8.425	7.611	212.538
(T-Mobile)			0.000			1" Ice	8.898	8.360	289.448
RRUS11 B12	B	From Leg	1.500	0.000	120.000	No Ice	2.833	1.182	50.700
(T-Mobile)			0.000			1/2" Ice	3.043	1.330	71.570
			0.000			1" Ice	3.259	1.485	95.487
Pirod 4' Side Mount Standoff	B	From Leg	1.500	0.000	120.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(T-Mobile)			0.000			1" Ice	7.100	7.100	128.000
AIR 21 B4A B2P W/Mount	C	From Leg	3.000	0.000	120.000	No Ice	6.366	5.722	147.900
Pipe			1.500			1/2" Ice	6.846	6.574	205.399
(T-Mobile)			0.000			1" Ice	7.305	7.298	269.688
UMTS DD B4	C	From Leg	3.000	0.000	120.000	No Ice	1.840	2.450	40.000
(T-Mobile)			0.000			1/2" Ice	2.040	2.670	52.000
			0.000			1" Ice	2.240	2.890	64.000
KRC 118 57/1B4/B12P W/M	C	From Leg	3.000	0.000	120.000	No Ice	7.935	6.738	142.900
Pipe			-1.500			1/2" Ice	8.425	7.611	212.538
(T-Mobile)			0.000			1" Ice	8.898	8.360	289.448
RRUS11 B12	C	From Leg	1.500	0.000	120.000	No Ice	2.833	1.182	50.700
(T-Mobile)			0.000			1/2" Ice	3.043	1.330	71.570
			0.000			1" Ice	3.259	1.485	95.487
Pirod 4' Side Mount Standoff	C	From Leg	1.500	0.000	120.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000

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
(T-Mobile)			0.000			1" Ice	7.100	7.100	128.000
RRH-2X50-800	A	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
RRH-2X50-800	B	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693
RRH-2X50-800	C	From Leg	3.000	0.000	152.000	No Ice	1.733	1.333	69.100
(Sprint)			-1.000			1/2" Ice	1.898	1.481	86.535
			0.000			1" Ice	2.070	1.637	106.693

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % 	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	170.000	1.415	33.95	73.192	A	14.075	9.583	9.583	40.51	7.939	0.000
180.000-160.0			1		B	14.075	9.583		40.51	0.000	0.000
00					C	14.075	9.583		40.51	42.160	0.000
T2	150.000	1.378	33.06	73.192	A	1.210	18.805	9.583	47.88	28.396	0.000
160.000-140.0			8		B	1.210	18.805		47.88	0.000	0.000
00					C	1.210	18.805		47.88	49.600	0.000
T3	130.000	1.337	32.08	73.192	A	2.350	18.805	9.583	45.30	41.100	0.000
140.000-120.0			7		B	2.350	18.805		45.30	57.024	0.000
00					C	2.350	18.805		45.30	19.840	0.000
T4	110.000	1.291	30.97	73.192	A	1.210	18.805	9.583	47.88	88.620	0.000
120.000-100.0			8		B	1.210	18.805		47.88	71.280	0.000
00					C	1.210	18.805		47.88	12.400	0.000
T5	90.000	1.238	29.69	73.192	A	1.780	18.805	9.583	46.56	89.754	0.000
100.000-80.00			7		B	1.780	18.805		46.56	71.280	0.000
0					C	1.780	18.805		46.56	12.400	0.000
T6	70.000	1.174	28.16	73.192	A	1.210	18.805	9.583	47.88	89.880	0.000
80.000-60.000			6		B	1.210	18.805		47.88	71.280	0.000
					C	1.210	18.805		47.88	12.400	0.000
T7	50.000	1.094	26.24	73.192	A	1.880	14.622	9.583	58.08	89.880	0.000
60.000-40.000			0		B	1.880	14.622		58.08	71.280	0.000
					C	1.880	14.622		58.08	12.400	0.000
T8	30.000	0.982	23.56	73.192	A	0.740	14.622	9.583	62.39	89.880	0.000
40.000-20.000			5		B	0.740	14.622		62.39	71.280	0.000
					C	0.740	14.622		62.39	12.400	0.000
T9	12.500	0.85	20.39	54.894	A	1.455	10.739	7.188	58.94	53.928	0.000
20.000-5.000			2		B	1.455	10.739		58.94	42.768	0.000
					C	1.455	10.739		58.94	7.440	0.000
T10	2.500	0.85	20.39	9.816	A	2.850	2.576	2.576	47.47	0.000	0.000
5.000-0.000			2		B	2.850	2.576		47.47	0.000	0.000
					C	2.850	2.576		47.47	0.000	0.000

Tower Pressure - With Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 180.000-160.000	170.000	1.415	7.699	1.767	79.082	A	14.075	44.748	21.365	36.32	29.152	0.000
						B	14.075	44.748		36.32	0.000	0.000
						C	14.075	44.748		36.32	76.272	0.000
T2 160.000-140.000	150.000	1.378	7.498	1.745	79.009	A	1.210	52.537	21.218	39.48	89.958	0.000
						B	1.210	52.537		39.48	0.000	0.000
						C	1.210	52.537		39.48	89.234	0.000
T3 140.000-120.000	130.000	1.337	7.276	1.720	78.926	A	2.350	53.038	21.053	38.01	126.645	0.000
						B	2.350	53.038		38.01	86.247	0.000
						C	2.350	53.038		38.01	49.676	0.000
T4 120.000-100.000	110.000	1.291	7.025	1.692	78.831	A	1.210	51.507	20.863	39.58	170.694	0.000
						B	1.210	51.507		39.58	107.235	0.000
						C	1.210	51.507		39.58	39.471	0.000
T5 100.000-80.000	90.000	1.238	6.734	1.658	78.719	A	1.780	51.802	20.639	38.52	176.782	0.000
						B	1.780	51.802		38.52	106.559	0.000
						C	1.780	51.802		38.52	38.933	0.000
T6 80.000-60.000	70.000	1.174	6.387	1.617	78.582	A	1.210	50.062	20.364	39.72	176.164	0.000
						B	1.210	50.062		39.72	105.731	0.000
						C	1.210	50.062		39.72	38.274	0.000
T7 60.000-40.000	50.000	1.094	5.950	1.564	78.404	A	1.880	36.889	20.008	51.61	174.336	0.000
						B	1.880	36.889		51.61	104.656	0.000
						C	1.880	36.889		51.61	37.418	0.000
T8 40.000-20.000	30.000	0.982	5.343	1.486	78.144	A	0.740	34.933	19.488	54.63	171.679	0.000
						B	0.740	34.933		54.63	103.094	0.000
						C	0.740	34.933		54.63	36.172	0.000
T9 20.000-5.000	12.500	0.85	4.624	1.361	58.297	A	1.455	25.119	13.994	52.66	100.464	0.000
						B	1.455	25.119		52.66	60.361	0.000
						C	1.455	25.119		52.66	20.508	0.000
T10 5.000-0.000	2.500	0.85	4.624	1.159	10.837	A	2.850	6.304	4.652	50.83	0.000	0.000
						B	2.850	6.304		50.83	0.000	0.000
						C	2.850	6.304		50.83	0.000	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 180.000-160.00	170.000	1.415	11.08	73.192	A	14.075	9.583	9.583	40.51	7.939	0.000
			6		B	14.075	9.583		40.51	0.000	0.000
					C	14.075	9.583		40.51	42.160	0.000
T2 160.000-140.00	150.000	1.378	10.79	73.192	A	1.210	18.805	9.583	47.88	28.396	0.000
			8		B	1.210	18.805		47.88	0.000	0.000
					C	1.210	18.805		47.88	49.600	0.000
T3 140.000-120.0	130.000	1.337	10.47	73.192	A	2.350	18.805	9.583	45.30	41.100	0.000
			7		B	2.350	18.805		45.30	57.024	0.000
00					C	2.350	18.805		45.30	19.840	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
T4	110.000	1.291	10.11	73.192	A	1.210	18.805	9.583	47.88	88.620	0.000
120.000-100.0			5		B	1.210	18.805		47.88	71.280	0.000
00					C	1.210	18.805		47.88	12.400	0.000
T5	90.000	1.238	9.697	73.192	A	1.780	18.805	9.583	46.56	89.754	0.000
100.000-80.00					B	1.780	18.805		46.56	71.280	0.000
0					C	1.780	18.805		46.56	12.400	0.000
T6	70.000	1.174	9.197	73.192	A	1.210	18.805	9.583	47.88	89.880	0.000
80.000-60.000					B	1.210	18.805		47.88	71.280	0.000
					C	1.210	18.805		47.88	12.400	0.000
T7	50.000	1.094	8.568	73.192	A	1.880	14.622	9.583	58.08	89.880	0.000
60.000-40.000					B	1.880	14.622		58.08	71.280	0.000
					C	1.880	14.622		58.08	12.400	0.000
T8	30.000	0.982	7.695	73.192	A	0.740	14.622	9.583	62.39	89.880	0.000
40.000-20.000					B	0.740	14.622		62.39	71.280	0.000
					C	0.740	14.622		62.39	12.400	0.000
T9	12.500	0.85	6.659	54.894	A	1.455	10.739	7.188	58.94	53.928	0.000
20.000-5.000					B	1.455	10.739		58.94	42.768	0.000
					C	1.455	10.739		58.94	7.440	0.000
T10	2.500	0.85	6.659	9.816	A	2.850	2.576	2.576	47.47	0.000	0.000
5.000-0.000					B	2.850	2.576		47.47	0.000	0.000
					C	2.850	2.576		47.47	0.000	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	269.444	1232.122	A	0.323	2.236	33.95	1	1	19.887	2150.772	107.539	C
180.000-160.0		TA	B	0.323	2.236	1	1	1	19.887			
00		424.613	C	0.323	2.236		1	1	19.887			
T2	397.904	851.888	A	0.273	2.369	33.06	1	1	12.326	2136.142	106.807	C
160.000-140.0			B	0.273	2.369	8	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T3	567.824	710.341	A	0.289	2.326	32.08	1	1	13.550	2789.837	139.492	C
140.000-120.0			B	0.289	2.326	7	1	1	13.550			
00			C	0.289	2.326		1	1	13.550			
T4	791.984	851.888	A	0.273	2.369	30.97	1	1	12.326	3491.010	174.550	C
120.000-100.0			B	0.273	2.369	8	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T5	794.684	723.607	A	0.281	2.347	29.69	1	1	12.937	3393.169	169.658	C
100.000-80.00			B	0.281	2.347	7	1	1	12.937			
0			C	0.281	2.347		1	1	12.937			
T6	794.984	851.888	A	0.273	2.369	28.16	1	1	12.326	3192.238	159.612	C
80.000-60.000			B	0.273	2.369	6	1	1	12.326			
			C	0.273	2.369		1	1	12.326			
T7	773.394	620.578	A	0.225	2.513	26.24	1	1	10.352	2902.916	145.146	C
60.000-40.000			B	0.225	2.513	0	1	1	10.352			
			C	0.225	2.513		1	1	10.352			
T8	773.394	568.209	A	0.21	2.563	23.56	1	1	9.166	2556.456	127.823	C
40.000-20.000			B	0.21	2.563	5	1	1	9.166			
			C	0.21	2.563		1	1	9.166			
T9	471.203	517.299	A	0.222	2.524	20.39	1	1	7.670	1418.508	94.567	C
20.000-5.000			B	0.222	2.524	2	1	1	7.670			
			C	0.222	2.524		1	1	7.670			
T10	0.000	292.995	A	0.553	1.841	20.39	1	1	4.691	149.692	29.938	C
5.000-0.000			B	0.553	1.841	2	1	1	4.691			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	5634.817	8074.484	C	0.553	1.841		1	1	4.691	24180.740		

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 ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	33.95	0.8	1	17.072	1969.123	98.456	C
180.000-160.0		TA	B	0.323	2.236	1	0.8	1	17.072			
00		424.613	C	0.323	2.236		0.8	1	17.072			
T2	397.904	851.888	A	0.273	2.369	33.06	0.8	1	12.084	2120.028	106.001	C
160.000-140.0			B	0.273	2.369	8	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T3	567.824	710.341	A	0.289	2.326	32.08	0.8	1	13.080	2760.026	138.001	C
140.000-120.0			B	0.289	2.326	7	0.8	1	13.080			
00			C	0.289	2.326		0.8	1	13.080			
T4	791.984	851.888	A	0.273	2.369	30.97	0.8	1	12.084	3475.914	173.796	C
120.000-100.0			B	0.273	2.369	8	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T5	794.684	723.607	A	0.281	2.347	29.69	0.8	1	12.581	3372.077	168.604	C
100.000-80.00			B	0.281	2.347	7	0.8	1	12.581			
0			C	0.281	2.347		0.8	1	12.581			
T6	794.984	851.888	A	0.273	2.369	28.16	0.8	1	12.084	3178.513	158.926	C
80.000-60.000			B	0.273	2.369	6	0.8	1	12.084			
			C	0.273	2.369		0.8	1	12.084			
T7	773.394	620.578	A	0.225	2.513	26.24	0.8	1	9.976	2881.839	144.092	C
60.000-40.000			B	0.225	2.513	0	0.8	1	9.976			
			C	0.225	2.513		0.8	1	9.976			
T8	773.394	568.209	A	0.21	2.563	23.56	0.8	1	9.018	2548.857	127.443	C
40.000-20.000			B	0.21	2.563	5	0.8	1	9.018			
			C	0.21	2.563		0.8	1	9.018			
T9	471.203	517.299	A	0.222	2.524	20.39	0.8	1	7.379	1405.778	93.719	C
20.000-5.000			B	0.222	2.524	2	0.8	1	7.379			
			C	0.222	2.524		0.8	1	7.379			
T10	0.000	292.995	A	0.553	1.841	20.39	0.8	1	4.121	131.505	26.301	C
5.000-0.000			B	0.553	1.841	2	0.8	1	4.121			
			C	0.553	1.841		0.8	1	4.121			
Sum Weight:	5634.817	8074.484								23843.660		

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 ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	33.95	0.85	1	17.776	2014.535	100.727	C
180.000-160.0		TA	B	0.323	2.236	1	0.85	1	17.776			

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
00		424.613	C	0.323	2.236		0.85	1	17.776			
T2	397.904	851.888	A	0.273	2.369	33.06	0.85	1	12.144	2124.056	106.203	C
160.000-140.0			B	0.273	2.369	8	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T3	567.824	710.341	A	0.289	2.326	32.08	0.85	1	13.197	2767.479	138.374	C
140.000-120.0			B	0.289	2.326	7	0.85	1	13.197			
00			C	0.289	2.326		0.85	1	13.197			
T4	791.984	851.888	A	0.273	2.369	30.97	0.85	1	12.144	3479.688	173.984	C
120.000-100.0			B	0.273	2.369	8	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T5	794.684	723.607	A	0.281	2.347	29.69	0.85	1	12.670	3377.350	168.868	C
100.000-80.00			B	0.281	2.347	7	0.85	1	12.670			
0			C	0.281	2.347		0.85	1	12.670			
T6	794.984	851.888	A	0.273	2.369	28.16	0.85	1	12.144	3181.944	159.097	C
80.000-60.000			B	0.273	2.369	6	0.85	1	12.144			
			C	0.273	2.369		0.85	1	12.144			
T7	773.394	620.578	A	0.225	2.513	26.24	0.85	1	10.070	2887.109	144.355	C
60.000-40.000			B	0.225	2.513	0	0.85	1	10.070			
			C	0.225	2.513		0.85	1	10.070			
T8	773.394	568.209	A	0.21	2.563	23.56	0.85	1	9.055	2550.757	127.538	C
40.000-20.000			B	0.21	2.563	5	0.85	1	9.055			
			C	0.21	2.563		0.85	1	9.055			
T9	471.203	517.299	A	0.222	2.524	20.39	0.85	1	7.452	1408.961	93.931	C
20.000-5.000			B	0.222	2.524	2	0.85	1	7.452			
			C	0.222	2.524		0.85	1	7.452			
T10	0.000	292.995	A	0.553	1.841	20.39	0.85	1	4.264	136.052	27.210	C
5.000-0.000			B	0.553	1.841	2	0.85	1	4.264			
			C	0.553	1.841		0.85	1	4.264			
Sum Weight:	5634.817	8074.484								23927.930		

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	1953.966	4165.433	A	0.744	1.785	7.699	1	1	51.247	775.400	38.770	C
180.000-160.0		TA	B	0.744	1.785		1	1	51.247			
00		1049.377	C	0.744	1.785		1	1	51.247			
T2	3056.268	2974.305	A	0.68	1.776	7.498	1	1	42.582	847.226	42.361	C
160.000-140.0			B	0.68	1.776		1	1	42.582			
00			C	0.68	1.776		1	1	42.582			
T3	4107.959	2911.681	A	0.702	1.776	7.276	1	1	44.923	977.737	48.887	C
140.000-120.0			B	0.702	1.776		1	1	44.923			
00			C	0.702	1.776		1	1	44.923			
T4	5153.310	2878.495	A	0.669	1.777	7.025	1	1	41.369	988.447*	49.422	C
120.000-100.0			B	0.669	1.777		1	1	41.369			
00			C	0.669	1.777		1	1	41.369			
T5	5154.031	2816.207	A	0.681	1.776	6.734	1	1	42.606	946.212*	47.311	C
100.000-80.00			B	0.681	1.776		1	1	42.606			
0			C	0.681	1.776		1	1	42.606			
T6	5055.684	2747.378	A	0.652	1.781	6.387	1	1	39.702	895.887*	44.794	C
80.000-60.000			B	0.652	1.781		1	1	39.702			
			C	0.652	1.781		1	1	39.702			

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
T7	4872.840	1946.407	A	0.494	1.907	5.950	1	1	26.734	832.727*	41.636	C
60.000-40.000			B	0.494	1.907		1	1	26.734			
			C	0.494	1.907		1	1	26.734			
T8	4673.689	1698.495	A	0.457	1.963	5.343	1	1	23.600	745.345*	37.267	C
40.000-20.000			B	0.457	1.963		1	1	23.600			
			C	0.457	1.963		1	1	23.600			
T9	2630.893	1335.567	A	0.456	1.964	4.624	1	1	17.855	481.173*	32.078	C
20.000-5.000			B	0.456	1.964		1	1	17.855			
			C	0.456	1.964		1	1	17.855			
T10	0.000	632.621	A	0.845	1.856	4.624	1	1	8.654	63.126	12.625	C
5.000-0.000			B	0.845	1.856		1	1	8.654			
			C	0.845	1.856		1	1	8.654			
Sum Weight:	36658.639	25585.023			*2.1A_g limit					7553.278		

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	1953.966	4165.433	A	0.744	1.785	7.699	0.8	1	48.432	742.515	37.126	C
180.000-160.0		TA	B	0.744	1.785		0.8	1	48.432			
00		1049.377	C	0.744	1.785		0.8	1	48.432			
T2	3056.268	2974.305	A	0.68	1.776	7.498	0.8	1	42.340	844.486	42.224	C
160.000-140.0			B	0.68	1.776		0.8	1	42.340			
00			C	0.68	1.776		0.8	1	42.340			
T3	4107.959	2911.681	A	0.702	1.776	7.276	0.8	1	44.453	972.574	48.629	C
140.000-120.0			B	0.702	1.776		0.8	1	44.453			
00			C	0.702	1.776		0.8	1	44.453			
T4	5153.310	2878.495	A	0.669	1.777	7.025	0.8	1	41.127	988.447*	49.422	C
120.000-100.0			B	0.669	1.777		0.8	1	41.127			
00			C	0.669	1.777		0.8	1	41.127			
T5	5154.031	2816.207	A	0.681	1.776	6.734	0.8	1	42.250	946.212*	47.311	C
100.000-80.00			B	0.681	1.776		0.8	1	42.250			
0			C	0.681	1.776		0.8	1	42.250			
T6	5055.684	2747.378	A	0.652	1.781	6.387	0.8	1	39.460	895.887*	44.794	C
80.000-60.000			B	0.652	1.781		0.8	1	39.460			
			C	0.652	1.781		0.8	1	39.460			
T7	4872.840	1946.407	A	0.494	1.907	5.950	0.8	1	26.358	832.727*	41.636	C
60.000-40.000			B	0.494	1.907		0.8	1	26.358			
			C	0.494	1.907		0.8	1	26.358			
T8	4673.689	1698.495	A	0.457	1.963	5.343	0.8	1	23.452	745.345*	37.267	C
40.000-20.000			B	0.457	1.963		0.8	1	23.452			
			C	0.457	1.963		0.8	1	23.452			
T9	2630.893	1335.567	A	0.456	1.964	4.624	0.8	1	17.564	481.173*	32.078	C
20.000-5.000			B	0.456	1.964		0.8	1	17.564			
			C	0.456	1.964		0.8	1	17.564			
T10	0.000	632.621	A	0.845	1.856	4.624	0.8	1	8.084	58.969	11.794	C
5.000-0.000			B	0.845	1.856		0.8	1	8.084			
			C	0.845	1.856		0.8	1	8.084			
Sum Weight:	36658.639	25585.023			*2.1A_g limit					7508.333		

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	1953.966	4165.433	A	0.744	1.785	7.699	0.85	1	49.136	750.736	37.537	C
180.000-160.0		TA	B	0.744	1.785		0.85	1	49.136			
00		1049.377	C	0.744	1.785		0.85	1	49.136			
T2	3056.268	2974.305	A	0.68	1.776	7.498	0.85	1	42.400	845.171	42.259	C
160.000-140.0			B	0.68	1.776		0.85	1	42.400			
00			C	0.68	1.776		0.85	1	42.400			
T3	4107.959	2911.681	A	0.702	1.776	7.276	0.85	1	44.570	973.865	48.693	C
140.000-120.0			B	0.702	1.776		0.85	1	44.570			
00			C	0.702	1.776		0.85	1	44.570			
T4	5153.310	2878.495	A	0.669	1.777	7.025	0.85	1	41.188	988.447*	49.422	C
120.000-100.0			B	0.669	1.777		0.85	1	41.188			
00			C	0.669	1.777		0.85	1	41.188			
T5	5154.031	2816.207	A	0.681	1.776	6.734	0.85	1	42.339	946.212*	47.311	C
100.000-80.00			B	0.681	1.776		0.85	1	42.339			
0			C	0.681	1.776		0.85	1	42.339			
T6	5055.684	2747.378	A	0.652	1.781	6.387	0.85	1	39.520	895.887*	44.794	C
80.000-60.000			B	0.652	1.781		0.85	1	39.520			
			C	0.652	1.781		0.85	1	39.520			
T7	4872.840	1946.407	A	0.494	1.907	5.950	0.85	1	26.452	832.727*	41.636	C
60.000-40.000			B	0.494	1.907		0.85	1	26.452			
			C	0.494	1.907		0.85	1	26.452			
T8	4673.689	1698.495	A	0.457	1.963	5.343	0.85	1	23.489	745.345*	37.267	C
40.000-20.000			B	0.457	1.963		0.85	1	23.489			
			C	0.457	1.963		0.85	1	23.489			
T9	2630.893	1335.567	A	0.456	1.964	4.624	0.85	1	17.637	481.173*	32.078	C
20.000-5.000			B	0.456	1.964		0.85	1	17.637			
			C	0.456	1.964		0.85	1	17.637			
T10	0.000	632.621	A	0.845	1.856	4.624	0.85	1	8.227	60.008	12.002	C
5.000-0.000			B	0.845	1.856		0.85	1	8.227			
			C	0.845	1.856		0.85	1	8.227			
Sum Weight:	36658.639	25585.023			*2.1A_g limit					7519.569		

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	269.444	1232.122	A	0.323	2.236	11.08	1	1	19.887	702.293	35.115	C
180.000-160.0		TA	B	0.323	2.236	6	1	1	19.887			
00		424.613	C	0.323	2.236		1	1	19.887			
T2	397.904	851.888	A	0.273	2.369	10.79	1	1	12.326	697.516	34.876	C
160.000-140.0			B	0.273	2.369	8	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T3	567.824	710.341	A	0.289	2.326	10.47	1	1	13.550	910.967	45.548	C
140.000-120.0			B	0.289	2.326	7	1	1	13.550			
00			C	0.289	2.326		1	1	13.550			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T4	791.984	851.888	A	0.273	2.369	10.11	1	1	12.326	1139.922	56.996	C
120.000-100.0			B	0.273	2.369	5	1	1	12.326			
00			C	0.273	2.369		1	1	12.326			
T5	794.684	723.607	A	0.281	2.347	9.697	1	1	12.937	1107.973	55.399	C
100.000-80.00			B	0.281	2.347		1	1	12.937			
0			C	0.281	2.347		1	1	12.937			
T6	794.984	851.888	A	0.273	2.369	9.197	1	1	12.326	1042.363	52.118	C
80.000-60.000			B	0.273	2.369		1	1	12.326			
			C	0.273	2.369		1	1	12.326			
T7	773.394	620.578	A	0.225	2.513	8.568	1	1	10.352	947.891	47.395	C
60.000-40.000			B	0.225	2.513		1	1	10.352			
			C	0.225	2.513		1	1	10.352			
T8	773.394	568.209	A	0.21	2.563	7.695	1	1	9.166	834.761	41.738	C
40.000-20.000			B	0.21	2.563		1	1	9.166			
			C	0.21	2.563		1	1	9.166			
T9	471.203	517.299	A	0.222	2.524	6.659	1	1	7.670	463.186	30.879	C
20.000-5.000			B	0.222	2.524		1	1	7.670			
			C	0.222	2.524		1	1	7.670			
T10	0.000	292.995	A	0.553	1.841	6.659	1	1	4.691	48.879	9.776	C
5.000-0.000			B	0.553	1.841		1	1	4.691			
			C	0.553	1.841		1	1	4.691			
Sum Weight:	5634.817	8074.484								7895.752		

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 ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	11.08	0.8	1	17.072	642.979	32.149	C
180.000-160.0		TA	B	0.323	2.236	6	0.8	1	17.072			
00		424.613	C	0.323	2.236		0.8	1	17.072			
T2	397.904	851.888	A	0.273	2.369	10.79	0.8	1	12.084	692.254	34.613	C
160.000-140.0			B	0.273	2.369	8	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T3	567.824	710.341	A	0.289	2.326	10.47	0.8	1	13.080	901.233	45.062	C
140.000-120.0			B	0.289	2.326	7	0.8	1	13.080			
00			C	0.289	2.326		0.8	1	13.080			
T4	791.984	851.888	A	0.273	2.369	10.11	0.8	1	12.084	1134.992	56.750	C
120.000-100.0			B	0.273	2.369	5	0.8	1	12.084			
00			C	0.273	2.369		0.8	1	12.084			
T5	794.684	723.607	A	0.281	2.347	9.697	0.8	1	12.581	1101.087	55.054	C
100.000-80.00			B	0.281	2.347		0.8	1	12.581			
0			C	0.281	2.347		0.8	1	12.581			
T6	794.984	851.888	A	0.273	2.369	9.197	0.8	1	12.084	1037.882	51.894	C
80.000-60.000			B	0.273	2.369		0.8	1	12.084			
			C	0.273	2.369		0.8	1	12.084			
T7	773.394	620.578	A	0.225	2.513	8.568	0.8	1	9.976	941.009	47.050	C
60.000-40.000			B	0.225	2.513		0.8	1	9.976			
			C	0.225	2.513		0.8	1	9.976			
T8	773.394	568.209	A	0.21	2.563	7.695	0.8	1	9.018	832.280	41.614	C
40.000-20.000			B	0.21	2.563		0.8	1	9.018			
			C	0.21	2.563		0.8	1	9.018			
T9	471.203	517.299	A	0.222	2.524	6.659	0.8	1	7.379	459.030	30.602	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
20.000-5.000			B	0.222	2.524		0.8	1	7.379			
			C	0.222	2.524		0.8	1	7.379			
T10	0.000	292.995	A	0.553	1.841	6.659	0.8	1	4.121	42.940	8.588	C
5.000-0.000			B	0.553	1.841		0.8	1	4.121			
			C	0.553	1.841		0.8	1	4.121			
Sum Weight:	5634.817	8074.484								7785.685		

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 ft^2	F lb	w plf	Ctrl. Face
T1	269.444	1232.122	A	0.323	2.236	11.08	0.85	1	17.776	657.807	32.890	C
180.000-160.0		TA	B	0.323	2.236	6	0.85	1	17.776			
00		424.613	C	0.323	2.236		0.85	1	17.776			
T2	397.904	851.888	A	0.273	2.369	10.79	0.85	1	12.144	693.569	34.678	C
160.000-140.0			B	0.273	2.369	8	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T3	567.824	710.341	A	0.289	2.326	10.47	0.85	1	13.197	903.666	45.183	C
140.000-120.0			B	0.289	2.326	7	0.85	1	13.197			
00			C	0.289	2.326		0.85	1	13.197			
T4	791.984	851.888	A	0.273	2.369	10.11	0.85	1	12.144	1136.225	56.811	C
120.000-100.0			B	0.273	2.369	5	0.85	1	12.144			
00			C	0.273	2.369		0.85	1	12.144			
T5	794.684	723.607	A	0.281	2.347	9.697	0.85	1	12.670	1102.808	55.140	C
100.000-80.00			B	0.281	2.347		0.85	1	12.670			
0			C	0.281	2.347		0.85	1	12.670			
T6	794.984	851.888	A	0.273	2.369	9.197	0.85	1	12.144	1039.002	51.950	C
80.000-60.000			B	0.273	2.369		0.85	1	12.144			
			C	0.273	2.369		0.85	1	12.144			
T7	773.394	620.578	A	0.225	2.513	8.568	0.85	1	10.070	942.729	47.136	C
60.000-40.000			B	0.225	2.513		0.85	1	10.070			
			C	0.225	2.513		0.85	1	10.070			
T8	773.394	568.209	A	0.21	2.563	7.695	0.85	1	9.055	832.900	41.645	C
40.000-20.000			B	0.21	2.563		0.85	1	9.055			
			C	0.21	2.563		0.85	1	9.055			
T9	471.203	517.299	A	0.222	2.524	6.659	0.85	1	7.452	460.069	30.671	C
20.000-5.000			B	0.222	2.524		0.85	1	7.452			
			C	0.222	2.524		0.85	1	7.452			
T10	0.000	292.995	A	0.553	1.841	6.659	0.85	1	4.264	44.425	8.885	C
5.000-0.000			B	0.553	1.841		0.85	1	4.264			
			C	0.553	1.841		0.85	1	4.264			
Sum Weight:	5634.817	8074.484								7813.202		

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 kip-ft
Leg Weight	4149.540			
Bracing Weight	3495.888			
Total Member Self-Weight	7645.428			
Gusset Weight	429.057			
Guy Weight	2725.158			
Total Weight	25339.792			
Wind 0 deg - No Ice		19.244	-33933.514	-0.186
Wind 30 deg - No Ice		16858.118	-29177.968	-1.077
Wind 60 deg - No Ice		29106.892	-16814.883	-1.700
Wind 90 deg - No Ice		33682.903	-19.244	-1.869
Wind 120 deg - No Ice		29379.567	16950.091	-1.518
Wind 150 deg - No Ice		16824.785	29158.724	-0.792
Wind 180 deg - No Ice		-19.244	33596.435	0.158
Wind 210 deg - No Ice		-16858.118	29177.968	1.077
Wind 240 deg - No Ice		-29398.811	16983.423	1.704
Wind 270 deg - No Ice		-33682.903	19.244	1.869
Wind 300 deg - No Ice		-29087.648	-16781.551	1.542
Wind 330 deg - No Ice		-16824.785	-29158.724	0.792
Member Ice	17510.538			
Gusset Ice	492.504			
Guy Ice	14373.290			
Total Weight Ice	103996.840			
Wind 0 deg - Ice		8.357	-11133.706	-0.276
Wind 30 deg - Ice		5560.000	-9617.058	-0.439
Wind 60 deg - Ice		9612.114	-5551.618	-0.487
Wind 90 deg - Ice		11105.525	-8.357	-0.405
Wind 120 deg - Ice		9642.681	5559.616	-0.211
Wind 150 deg - Ice		5545.525	9608.701	0.035
Wind 180 deg - Ice		-8.357	11088.761	0.273
Wind 210 deg - Ice		-5560.000	9617.058	0.439
Wind 240 deg - Ice		-9651.038	5574.090	0.487
Wind 270 deg - Ice		-11105.525	8.357	0.405
Wind 300 deg - Ice		-9603.758	-5537.143	0.214
Wind 330 deg - Ice		-5545.525	-9608.701	-0.035
Total Weight	25339.792			
Wind 0 deg - Service		6.284	-11080.331	-0.061
Wind 30 deg - Service		5504.691	-9527.500	-0.352
Wind 60 deg - Service		9504.291	-5490.574	-0.555
Wind 90 deg - Service		10998.499	-6.284	-0.610
Wind 120 deg - Service		9593.328	5534.724	-0.496
Wind 150 deg - Service		5493.807	9521.216	-0.259
Wind 180 deg - Service		-6.284	10970.264	0.052
Wind 210 deg - Service		-5504.691	9527.500	0.352
Wind 240 deg - Service		-9599.612	5545.608	0.556
Wind 270 deg - Service		-10998.499	6.284	0.610
Wind 300 deg - Service		-9498.007	-5479.690	0.504
Wind 330 deg - Service		-5493.807	-9521.216	0.259

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy

Comb. No.	Description
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+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+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 Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	180 - 160	Leg	Max Tension	4	27672.422	-0.043	0.028
			Max. Compression	10	-32312.634	-0.161	0.086
			Max. Mx	11	-25867.808	1.306	-0.212
			Max. My	2	-28405.464	-0.045	1.449
			Max. Vy	11	3386.615	1.255	0.101
			Max. Vx	2	3693.557	-0.045	1.449
		Diagonal	Max Tension	3	3954.178	0.000	0.000
			Max. Compression	10	-6143.005	0.000	0.000
			Max. Mx	10	-2520.534	-0.040	0.004
			Max. My	13	-2503.591	0.001	-0.008
			Max. Vy	23	-25.471	0.029	0.001
			Max. Vx	13	3.870	0.000	0.000
		Top Girt	Max Tension	4	406.055	0.000	0.000
			Max. Compression	10	-467.377	0.000	0.000
			Max. Mx	14	-68.510	-0.020	0.000
			Max. My	5	-37.558	0.000	-0.000
			Max. Vy	14	23.516	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	2	2008.624	0.000	0.000
			Max. Compression	12	-163.200	0.000	0.000
			Max. Mx	14	1127.638	-0.020	0.000
			Max. My	5	760.849	0.000	-0.000
			Max. Vy	14	23.516	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Guy A	Bottom Tension	9	8062.891		
			Top Tension	9	8145.740		
			Top Cable Vert	9	5896.973		
			Top Cable Norm	9	5619.118		
			Top Cable Tan	9	65.665		
			Bot Cable Vert	9	-5623.480		
			Bot Cable Norm	9	5777.161		
			Bot Cable Tan	9	105.337		
		Guy A	Bottom Tension	8	21751.856		
			Top Tension	8	22007.008		
			Top Cable Vert	8	16848.030		
			Top Cable Norm	8	14158.118		
			Top Cable Tan	8	0.413		
			Bot Cable Vert	8	-16231.424		
			Bot Cable Norm	8	14480.474		
			Bot Cable Tan	8	0.413		
		Guy B	Bottom Tension	13	8043.425		
			Top Tension	13	8126.280		
			Top Cable Vert	13	5883.182		
			Top Cable Norm	13	5605.378		
			Top Cable Tan	13	65.826		
			Bot Cable Vert	13	-5609.688		
			Bot Cable Norm	13	5763.422		
			Bot Cable Tan	13	105.176		
		Guy B	Bottom Tension	12	21743.313		
			Top Tension	12	21998.466		
			Top Cable Vert	12	16841.576		
			Top Cable Norm	12	14152.520		
			Top Cable Tan	12	0.619		
			Bot Cable Vert	12	-16224.969		
			Bot Cable Norm	12	14474.876		
			Bot Cable Tan	12	0.619		
		Guy C	Bottom Tension	3	8063.830		
			Top Tension	3	8146.681		
			Top Cable Vert	3	5897.646		
			Top Cable Norm	3	5619.773		
			Top Cable Tan	3	65.711		
			Bot Cable Vert	3	-5624.153		
			Bot Cable Norm	3	5777.817		
			Bot Cable Tan	3	105.291		
		Guy C	Bottom Tension	4	21773.530		
			Top Tension	4	22028.680		
			Top Cable Vert	4	16864.366		
			Top Cable Norm	4	14172.363		
			Top Cable Tan	4	1.035		
			Bot Cable Vert	4	-16247.760		
			Bot Cable Norm	4	14494.719		
			Bot Cable Tan	4	1.035		
		Top Guy Pull-Off	Max Tension	11	7396.738	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	4246.282	0.031	0.000
			Max. My	5	5230.323	0.000	0.000
			Max. Vy	14	-35.804	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Torque Arm Top	Max Tension	3	5959.888	-4.629	0.000
			Max. Compression	9	-2458.555	-17.965	-0.000
			Max. Mx	9	407.211	-18.477	0.000
			Max. My	5	4221.338	-11.992	-0.000
			Max. Vy	9	5452.889	-18.477	0.000
			Max. Vx	5	-0.001	-11.992	-0.000
T2	160 - 140	Leg	Max Tension	2	6850.602	-0.009	0.321
			Max. Compression	5	-39150.761	0.019	-0.015
			Max. Mx	11	-8479.713	-1.213	-0.285
			Max. My	8	-5576.086	-0.039	1.303
			Max. Vy	11	3386.997	0.867	0.041
			Max. Vx	2	3702.652	-0.032	1.026
		Diagonal	Max Tension	3	4432.225	0.000	0.000
			Max. Compression	9	-4895.666	0.000	0.000
			Max. Mx	17	-319.623	-0.023	0.001
			Max. My	9	-3663.714	-0.003	-0.005
			Max. Vy	17	18.732	-0.023	0.001
			Max. Vx	9	2.375	0.000	0.000
		Top Girt	Max Tension	12	1617.230	0.000	0.000
			Max. Compression	10	-1137.733	0.000	0.000
			Max. Mx	14	351.942	0.013	0.000
			Max. My	5	341.460	0.000	0.000
			Max. Vy	14	-15.465	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
		Bottom Girt	Max Tension	2	731.464	0.000	0.000
			Max. Compression	12	-23.447	0.000	0.000
			Max. Mx	14	389.920	0.013	0.000
			Max. My	5	223.876	0.000	0.000
			Max. Vy	14	-15.465	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T3	140 - 120	Leg	Max Tension	2	20201.236	-0.007	0.016
			Max. Compression	5	-61880.489	0.278	-0.049
			Max. Mx	5	-23711.616	0.668	-0.002
			Max. My	8	-7527.699	0.034	0.646
			Max. Vy	11	855.007	0.019	0.092
			Max. Vx	2	1006.050	-0.006	0.206
		Diagonal	Max Tension	3	2113.025	0.000	0.000
			Max. Compression	3	-2237.821	0.000	0.000
			Max. Mx	5	470.051	-0.018	0.001
			Max. My	10	-1351.169	0.007	-0.004
			Max. Vy	18	14.933	-0.017	-0.000
			Max. Vx	10	-1.863	0.000	0.000
		Top Girt	Max Tension	23	212.793	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	185.564	0.011	0.000
			Max. My	5	165.225	0.000	0.000
			Max. Vy	14	13.410	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
		Bottom Girt	Max Tension	2	752.013	0.000	0.000
			Max. Compression	12	-256.049	0.000	0.000
			Max. Mx	14	282.386	0.011	0.000
			Max. Vy	14	13.410	0.000	0.000
			Max. Vx	4	-0.000	0.000	0.000
		Guy A	Bottom Tension	9	15014.396		
			Top Tension	9	15101.592		
			Top Cable Vert	9	10436.489		
			Top Cable Norm	9	10914.993		
			Top Cable Tan	9	26.755		
			Bot Cable Vert	9	-10169.974		
			Bot Cable Norm	9	11044.738		
			Bot Cable Tan	9	132.246		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Guy B	Bottom Tension	13	15030.358		
			Top Tension	13	15117.554		
			Top Cable Vert	13	10447.365		
			Top Cable Norm	13	10926.678		
			Top Cable Tan	13	26.762		
			Bot Cable Vert	13	-10180.850		
			Bot Cable Norm	13	11056.423		
			Bot Cable Tan	13	132.238		
		Guy C	Bottom Tension	3	15041.191		
			Top Tension	3	15128.384		
			Top Cable Vert	3	10454.750		
			Top Cable Norm	3	10934.600		
			Top Cable Tan	3	26.568		
			Bot Cable Vert	3	-10188.235		
			Bot Cable Norm	3	11064.346		
			Bot Cable Tan	3	132.433		
		Top Guy Pull-Off	Max Tension	2	6009.544	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	2940.626	0.027	0.000
			Max. My	5	3576.771	0.000	0.000
			Max. Vy	14	-31.097	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T4	120 - 100	Leg	Max Tension	2	20199.722	-0.004	-0.089
			Max. Compression	5	-62401.647	0.318	-0.232
			Max. Mx	5	-45955.640	1.119	-0.239
			Max. My	8	-42266.993	0.009	1.215
			Max. Vy	5	2374.686	0.847	-0.189
			Max. Vx	8	2633.573	0.007	0.914
		Diagonal	Max Tension	5	2543.871	0.000	0.000
			Max. Compression	5	-3222.729	0.000	0.000
			Max. Mx	5	-881.776	0.034	0.003
			Max. My	11	-3217.687	-0.007	-0.005
			Max. Vy	18	22.172	-0.031	-0.000
			Max. Vx	11	-2.321	0.000	0.000
		Top Girt	Max Tension	6	972.607	0.000	0.000
			Max. Compression	4	-162.554	0.000	0.000
			Max. Mx	14	497.477	0.013	0.000
			Max. My	11	342.535	0.000	-0.000
			Max. Vy	14	14.915	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
		Bottom Girt	Max Tension	8	762.938	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	574.131	0.013	0.000
			Max. My	11	302.261	0.000	-0.000
			Max. Vy	14	14.915	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
T5	100 - 80	Leg	Max Tension	4	1362.256	-0.011	0.007
			Max. Compression	17	-48137.742	-0.049	-0.012
			Max. Mx	5	-45955.334	0.847	-0.189
			Max. My	8	-42267.765	0.007	0.914
			Max. Vy	5	2397.861	-0.626	0.079
			Max. Vx	8	2657.939	-0.006	-0.718
		Diagonal	Max Tension	5	4059.048	0.000	0.000
			Max. Compression	5	-4181.653	0.000	0.000
			Max. Mx	17	-402.542	-0.017	0.000
			Max. My	9	-4130.153	0.007	-0.002
			Max. Vy	17	14.688	-0.017	0.000
			Max. Vx	9	-1.020	0.000	0.000
		Top Girt	Max Tension	6	926.331	0.000	0.000
			Max. Compression	8	-440.249	0.000	0.000
			Max. Mx	14	304.698	0.011	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	11	217.658	0.000	-0.000
			Max. Vy	14	-12.776	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
		Bottom Girt	Max Tension	2	793.456	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	691.898	0.011	0.000
			Max. My	11	480.194	0.000	-0.000
			Max. Vy	14	-12.776	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
		Guy A	Bottom Tension	7	24351.457		
			Top Tension	7	24445.442		
			Top Cable Vert	7	15785.389		
			Top Cable Norm	7	18665.460		
			Top Cable Tan	7	41.727		
			Bot Cable Vert	7	-15532.341		
			Bot Cable Norm	7	18754.002		
			Bot Cable Tan	7	164.977		
		Guy B	Bottom Tension	13	24371.082		
			Top Tension	13	24465.066		
			Top Cable Vert	13	15797.940		
			Top Cable Norm	13	18680.545		
			Top Cable Tan	13	41.890		
			Bot Cable Vert	13	-15544.893		
			Bot Cable Norm	13	18769.088		
			Bot Cable Tan	13	165.140		
		Guy C	Bottom Tension	3	24366.127		
			Top Tension	3	24460.109		
			Top Cable Vert	3	15794.765		
			Top Cable Norm	3	18676.738		
			Top Cable Tan	3	42.316		
			Bot Cable Vert	3	-15541.717		
			Bot Cable Norm	3	18765.281		
			Bot Cable Tan	3	165.566		
		Top Guy Pull-Off	Max Tension	2	9825.170	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	3935.010	0.029	0.000
			Max. My	11	6100.441	0.000	-0.000
			Max. Vy	14	-34.029	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
T6	80 - 60	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	18	-49904.162	0.014	-0.252
			Max. Mx	11	-25349.022	-0.843	-0.256
			Max. My	8	-15524.361	-0.006	0.913
			Max. Vy	11	1882.289	0.313	0.083
			Max. Vx	8	-2096.641	0.003	-0.374
		Diagonal	Max Tension	3	1666.283	0.022	0.001
			Max. Compression	3	-2546.966	-0.007	0.001
			Max. Mx	18	-728.720	-0.035	0.000
			Max. My	10	-2367.507	0.021	-0.002
			Max. Vy	18	23.595	-0.035	0.000
			Max. Vx	10	-0.775	0.000	0.000
		Top Girt	Max Tension	12	1396.212	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	889.975	0.012	0.000
			Max. My	11	566.885	0.000	-0.000
			Max. Vy	14	14.164	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
		Bottom Girt	Max Tension	6	758.285	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	696.573	0.012	0.000
			Max. My	11	680.287	0.000	-0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	14	14.164	0.000	0.000
			Max. Vx	11	0.000	0.000	0.000
T7	60 - 40	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	20	-55008.779	-0.207	0.077
			Max. Mx	5	-29201.793	-0.651	-0.080
			Max. My	13	-29154.623	0.221	0.604
			Max. Vy	11	1660.010	0.602	-0.200
			Max. Vx	8	-1510.152	-0.283	-0.411
		Diagonal	Max Tension	5	3961.844	0.000	0.000
			Max. Compression	5	-4173.052	0.000	0.000
			Max. Mx	16	175.617	0.012	0.000
			Max. My	18	-355.361	0.000	0.000
			Max. Vy	16	-11.857	0.000	0.000
			Max. Vx	18	-0.025	0.000	0.000
		Top Girt	Max Tension	6	276.016	0.000	0.000
			Max. Compression	11	-337.249	0.000	0.000
			Max. Mx	14	8.639	0.010	0.000
			Max. My	5	-138.111	0.000	-0.000
			Max. Vy	14	-11.843	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	12	1185.292	0.000	0.000
			Max. Compression	6	-936.763	0.000	0.000
			Max. Mx	23	143.572	0.010	0.000
			Max. My	5	-901.486	0.000	-0.000
			Max. Vy	23	-11.843	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Guy A	Bottom Tension	7	11579.468		
			Top Tension	7	11604.834		
			Top Cable Vert	7	5276.445		
			Top Cable Norm	7	10335.917		
			Top Cable Tan	7	11.744		
			Bot Cable Vert	7	-5182.099		
			Bot Cable Norm	7	10354.982		
			Bot Cable Tan	7	65.484		
		Guy B	Bottom Tension	13	11567.992		
			Top Tension	13	11593.359		
			Top Cable Vert	13	5271.290		
			Top Cable Norm	13	10325.664		
			Top Cable Tan	13	11.590		
			Bot Cable Vert	13	-5176.945		
			Bot Cable Norm	13	10344.729		
			Bot Cable Tan	13	65.331		
		Guy C	Bottom Tension	5	11569.335		
			Top Tension	5	11594.711		
			Top Cable Vert	5	5271.906		
			Top Cable Norm	5	10326.869		
			Top Cable Tan	5	9.675		
			Bot Cable Vert	5	-5177.561		
			Bot Cable Norm	5	10345.934		
			Bot Cable Tan	5	63.416		
		Top Guy Pull-Off	Max Tension	11	6131.890	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	23	2706.145	0.025	0.000
			Max. My	5	5517.918	0.000	-0.000
			Max. Vy	15	28.706	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
T8	40 - 20	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	21	-58954.364	-0.161	0.211
			Max. Mx	5	-50430.685	0.629	-0.111
			Max. My	8	-44648.219	-0.031	0.687
			Max. Vy	11	1666.012	0.412	-0.209

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	8	-1508.727	-0.245	-0.238
		Diagonal	Max Tension	11	2832.040	0.000	0.000
			Max. Compression	5	-3089.350	0.000	0.000
			Max. Mx	20	25.036	0.012	0.000
			Max. My	18	-3.719	0.000	0.000
			Max. Vy	20	-11.120	0.000	0.000
			Max. Vx	18	0.020	0.000	0.000
		Top Girt	Max Tension	5	981.418	0.000	0.000
			Max. Compression	11	-871.694	0.000	0.000
			Max. Mx	14	168.021	0.009	0.000
			Max. My	5	981.389	0.000	-0.000
			Max. Vy	14	11.103	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	545.651	0.000	0.000
			Max. Compression	6	-353.159	0.000	0.000
			Max. Mx	14	75.570	0.009	0.000
			Max. My	5	272.593	0.000	-0.000
			Max. Vy	14	11.103	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
T9	20 - 5	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	21	-58982.575	-0.169	0.134
			Max. Mx	24	-57629.118	1.630	0.813
			Max. My	21	-58002.384	-0.088	-1.842
			Max. Vy	25	-15463.242	1.623	0.834
			Max. Vx	21	17978.140	-0.088	-1.842
		Diagonal	Max Tension	3	2955.293	0.000	0.000
			Max. Compression	9	-3167.091	0.000	0.000
			Max. Mx	20	481.842	0.010	0.000
			Max. My	18	302.527	0.000	0.000
			Max. Vy	20	-9.990	0.000	0.000
			Max. Vx	18	-0.017	0.000	0.000
		Top Girt	Max Tension	4	631.418	0.000	0.000
			Max. Compression	10	-521.000	0.000	0.000
			Max. Mx	14	172.200	0.009	0.000
			Max. My	5	-190.329	0.000	-0.000
			Max. Vy	14	-9.971	0.000	0.000
			Max. Vx	5	0.000	0.000	0.000
		Bottom Girt	Max Tension	20	10491.385	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	25	10103.001	-0.030	0.000
			Max. My	5	8114.567	0.000	0.000
			Max. Vy	25	35.138	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T10	5 - 0	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	21	-62522.731	-0.034	-0.022
			Max. Mx	21	-60549.261	1.842	-0.082
			Max. My	5	-46366.247	-0.780	-0.476
			Max. Vy	18	4647.740	-0.667	-0.080
			Max. Vx	5	1255.762	-0.734	-0.451
		Horizontal	Max Tension	6	162.246	-0.088	-0.039
			Max. Compression	20	-320.089	0.123	-0.044
			Max. Mx	5	-61.076	0.556	-0.128
			Max. My	10	-178.288	0.018	-0.220
			Max. Vy	5	-779.228	0.556	-0.128
			Max. Vx	10	211.563	0.374	-0.004
		Top Girt	Max Tension	19	3098.666	0.300	-0.079
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	6	2079.673	0.483	-0.112
			Max. My	6	2230.116	0.195	-0.184
			Max. Vy	6	-208.687	0.483	-0.112
			Max. Vx	6	-56.163	0.192	-0.019

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Bottom Girt	Max Tension	1	0.000	0.000	0.000
			Max. Compression	5	-2157.068	0.384	-0.413
			Max. Mx	10	-1992.067	1.076	-0.444
			Max. My	10	-2003.567	0.456	-0.505
			Max. Vy	10	3464.172	1.076	-0.444
			Max. Vx	10	1330.245	0.517	-0.050

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	15	171253.738	-36.453	348.599
	Max. H_x	11	121745.617	2469.856	166.562
	Max. H_z	2	130502.457	-1.036	2250.315
	Max. M_x	1	0.000	-2.562	-17.981
	Max. M_z	1	0.000	-2.562	-17.981
	Max. Torsion	5	1.222	-2477.807	171.129
	Min. Vert	1	69624.760	-2.562	-17.981
	Min. H_x	5	121675.626	-2477.807	171.129
	Min. H_z	8	104799.251	-5.264	-2767.876
	Min. M_x	1	0.000	-2.562	-17.981
	Min. M_z	1	0.000	-2.562	-17.981
	Min. Torsion	11	-1.214	2469.856	166.562
Guy C @ 162 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-865.683	-561.000	323.760
	Max. H_x	10	-865.683	-561.000	323.760
	Max. H_z	3	-10909.503	-9601.094	5803.365
	Min. Vert	4	-10930.889	-9738.854	5627.245
	Min. H_x	5	-10893.471	-9809.785	5410.014
	Min. H_z	10	-865.683	-561.000	323.760
Guy B @ 162 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-868.132	563.079	324.971
	Max. H_x	11	-10901.113	9816.479	5413.625
	Max. H_z	13	-10887.743	9582.538	5792.240
	Min. Vert	12	-10915.860	9726.096	5619.465
	Min. H_x	6	-868.132	563.079	324.971
	Min. H_z	6	-868.132	563.079	324.971
Guy A @ 162 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-866.466	-0.008	-648.488
	Max. H_x	11	-6561.233	493.722	-6587.337
	Max. H_z	2	-866.466	-0.008	-648.488
	Min. Vert	8	-10919.810	0.404	-11236.681
	Min. H_x	5	-6532.414	-493.453	-6558.791
	Min. H_z	8	-10919.810	0.404	-11236.681
Guy C @ 142 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-846.585	-497.608	287.254
	Max. H_x	10	-846.585	-497.608	287.254
	Max. H_z	3	-26287.273	-21839.126	13005.049
	Min. Vert	4	-26373.246	-22076.530	12748.106
	Min. H_x	5	-26253.855	-22153.768	12397.682
	Min. H_z	10	-846.585	-497.608	287.254
Guy B @ 142 ft	Max. Vert	6	-848.730	499.213	288.188

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Elev 0 ft Azimuth 120 deg					
	Max. H_x	11	-26263.548	22161.022	12401.321
	Max. H_z	13	-26246.671	21807.468	12986.194
	Min. Vert	12	-26344.128	22053.740	12734.320
	Min. H_x	6	-848.730	499.213	288.188
	Min. H_z	6	-848.730	499.213	288.188
Guy A @ 142 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-847.029	-0.005	-574.902
	Max. H_x	11	-13652.673	657.125	-13015.728
	Max. H_z	2	-847.029	-0.005	-574.902
	Min. Vert	8	-26337.944	0.541	-25458.288
	Min. H_x	5	-13595.172	-656.665	-12964.653
	Min. H_z	8	-26337.944	0.541	-25458.288
Guy C @ 100 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-40.565	-50.387	29.076
	Max. H_x	10	-40.565	-50.387	29.076
	Max. H_z	3	-20718.920	-25094.841	14755.531
	Min. Vert	3	-20718.920	-25094.841	14755.531
	Min. H_x	5	-20717.784	-25321.866	14360.018
	Min. H_z	10	-40.565	-50.387	29.076
Guy B @ 100 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-40.530	50.341	29.052
	Max. H_x	11	-20707.453	25309.936	14353.338
	Max. H_z	13	-20721.838	25098.069	14756.502
	Min. Vert	13	-20721.838	25098.069	14756.502
	Min. H_x	6	-40.530	50.341	29.052
	Min. H_z	6	-40.530	50.341	29.052
Guy A @ 100 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-40.524	-0.002	-58.125
	Max. H_x	10	-17737.916	369.499	-24967.148
	Max. H_z	2	-40.524	-0.002	-58.125
	Min. Vert	7	-20714.441	-230.462	-29108.984
	Min. H_x	6	-17753.639	-369.482	-24991.337
	Min. H_z	7	-20714.441	-230.462	-29108.984

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	69624.760	2.562	17.981	0.000	0.000	-0.005
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	130502.457	1.036	-2250.315	0.000	0.000	-0.134
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	121788.062	1401.569	-2022.765	0.000	0.000	-0.534
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	104843.752	2381.317	-1349.718	0.000	0.000	-1.094
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	121675.626	2477.807	-171.129	0.000	0.000	-1.222
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	130378.574	1975.992	1156.383	0.000	0.000	-0.855
1.2 Dead+1.6 Wind 150 deg -	121637.186	1078.088	2257.254	0.000	0.000	-0.309

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice+1.0 Guy						
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	104799.251	5.264	2767.876	0.000	0.000	0.139
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	121766.843	-1067.604	2258.699	0.000	0.000	0.533
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	130508.120	-1965.991	1160.040	0.000	0.000	0.981
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	121745.617	-2469.856	-166.562	0.000	0.000	1.214
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	104810.535	-2375.557	-1348.458	0.000	0.000	0.946
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	121730.695	-1398.849	-2022.113	0.000	0.000	0.301
1.2 Dead+1.0 Ice+Guy	167978.664	36.402	110.210	0.000	0.000	-0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Guy	171253.738	36.453	-348.599	0.000	0.000	-0.121
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Guy	170666.395	252.643	-287.780	0.000	0.000	-0.079
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Guy	170244.864	421.372	-109.951	0.000	0.000	-0.199
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Guy	170651.133	492.305	124.121	0.000	0.000	-0.265
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Guy	171213.623	437.943	340.391	0.000	0.000	-0.078
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Guy	170632.321	276.381	495.616	0.000	0.000	0.129
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Guy	170204.066	36.471	552.086	0.000	0.000	0.119
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Guy	170604.297	-203.484	496.550	0.000	0.000	0.076
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Guy	171185.450	-365.082	341.835	0.000	0.000	0.194
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Guy	170636.249	-419.440	125.653	0.000	0.000	0.260
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Guy	170251.100	-348.442	-108.663	0.000	0.000	0.075
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Guy	170679.670	-179.711	-286.996	0.000	0.000	-0.132
Dead+Wind 0 deg - Service+Guy	70294.237	2.226	-620.596	0.000	0.000	-0.033
Dead+Wind 30 deg - Service+Guy	70271.728	316.781	-528.867	0.000	0.000	-0.126
Dead+Wind 60 deg - Service+Guy	70295.381	545.720	-296.115	0.000	0.000	-0.230
Dead+Wind 90 deg - Service+Guy	70272.547	633.190	18.469	0.000	0.000	-0.272
Dead+Wind 120 deg - Service+Guy	70293.847	555.797	336.886	0.000	0.000	-0.199
Dead+Wind 150 deg - Service+Guy	70271.129	318.980	563.393	0.000	0.000	-0.074
Dead+Wind 180 deg - Service+Guy	70293.825	2.854	645.349	0.000	0.000	0.028
Dead+Wind 210 deg - Service+Guy	70269.694	-313.366	563.938	0.000	0.000	0.122
Dead+Wind 240 deg - Service+Guy	70291.895	-550.425	337.813	0.000	0.000	0.225
Dead+Wind 270 deg - Service+Guy	70271.594	-628.115	19.499	0.000	0.000	0.268
Dead+Wind 300 deg - Service+Guy	70295.491	-540.946	-295.243	0.000	0.000	0.196
Dead+Wind 330 deg -	70272.162	-312.239	-528.365	0.000	0.000	0.070

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	kip-ft	kip-ft	kip-ft
Service+Guy						

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	-0.000	-25339.397	0.000	-0.058	25339.196	0.023	0.001%
2	30.791	-30157.485	-59333.432	-30.790	30157.322	59330.977	0.004%
3	29488.967	-29862.321	-51042.551	-29489.011	29862.217	51040.754	0.003%
4	50935.631	-29567.158	-29423.719	-50934.604	29567.117	29423.336	0.002%
5	58924.601	-29862.321	-30.791	-58923.078	29862.218	31.735	0.003%
6	51371.910	-30157.485	29640.050	-51369.793	30157.323	-29638.819	0.004%
7	29435.635	-29862.321	51011.760	-29434.062	29862.218	-51010.905	0.003%
8	-30.791	-29567.158	58794.105	30.979	29567.118	-58793.026	0.002%
9	-29488.967	-29862.322	51042.551	29487.392	29862.218	-51041.693	0.003%
10	-51402.702	-30157.485	29693.382	51400.582	30157.323	-29692.148	0.004%
11	-58924.601	-29862.322	30.791	58923.078	29862.218	-29.848	0.003%
12	-50904.840	-29567.158	-29370.387	50903.973	29567.118	29369.722	0.002%
13	-29435.635	-29862.321	-51011.760	29435.680	29862.218	51009.966	0.003%
14	-0.000	-108517.344	0.000	0.121	108517.343	-1.915	0.002%
15	8.357	-108781.310	-15574.332	-8.361	108781.280	15572.267	0.002%
16	7776.730	-108517.344	-13456.547	-7776.895	108517.329	13455.199	0.001%
17	13457.809	-108253.378	-7771.931	-13455.815	108253.346	7770.385	0.002%
18	15538.985	-108517.344	-8.357	-15537.982	108517.330	9.100	0.001%
19	13488.376	-108781.310	7779.929	-13486.690	108781.282	-7778.945	0.002%
20	7762.255	-108517.344	13448.190	-7761.093	108517.330	-13447.679	0.001%
21	-8.357	-108253.378	15529.387	8.444	108253.348	-15526.942	0.002%
22	-7776.730	-108517.344	13456.547	7775.612	108517.331	-13456.060	0.001%
23	-13496.733	-108781.311	7794.403	13495.102	108781.284	-7793.457	0.002%
24	-15538.985	-108517.344	8.357	15538.021	108517.332	-7.645	0.001%
25	-13449.453	-108253.378	-7757.457	13447.508	108253.346	7755.842	0.002%
26	-7762.255	-108517.344	-13448.190	7762.413	108517.329	13446.841	0.001%
27	6.284	-25399.634	-12108.864	-6.284	25399.629	12108.151	0.003%
28	6018.156	-25339.397	-10416.847	-6018.110	25339.394	10416.376	0.002%
29	10395.027	-25279.159	-6004.841	-10394.246	25279.154	6004.379	0.003%
30	12025.429	-25339.397	-6.284	-12025.002	25339.394	6.475	0.002%
31	10484.063	-25399.634	6048.990	-10483.453	25399.629	-6048.638	0.003%
32	6007.272	-25339.397	10410.563	-6006.892	25339.394	-10410.291	0.002%
33	-6.284	-25279.159	11998.797	6.285	25279.154	-11997.902	0.003%
34	-6018.156	-25339.397	10416.847	6017.779	25339.394	-10416.577	0.002%
35	-10490.347	-25399.634	6059.874	10489.742	25399.629	-6059.524	0.002%
36	-12025.429	-25339.397	6.284	12025.005	25339.394	-6.093	0.002%
37	-10388.743	-25279.159	-5993.957	10387.965	25279.154	5993.497	0.003%
38	-6007.272	-25339.397	-10410.563	6007.227	25339.394	10410.092	0.002%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00002442
2	Yes	18	0.00000001	0.00007344
3	Yes	18	0.00000001	0.00005611

4	Yes	13	0.00000001	0.00006786
5	Yes	18	0.00000001	0.00005674
6	Yes	18	0.00000001	0.00007378
7	Yes	18	0.00000001	0.00005585
8	Yes	13	0.00000001	0.00006573
9	Yes	18	0.00000001	0.00005607
10	Yes	18	0.00000001	0.00007404
11	Yes	18	0.00000001	0.00005675
12	Yes	13	0.00000001	0.00006451
13	Yes	18	0.00000001	0.00005593
14	Yes	9	0.00000001	0.00005507
15	Yes	14	0.00000001	0.00006279
16	Yes	14	0.00000001	0.00004224
17	Yes	12	0.00000001	0.00008385
18	Yes	14	0.00000001	0.00003905
19	Yes	14	0.00000001	0.00005937
20	Yes	14	0.00000001	0.00003974
21	Yes	12	0.00000001	0.00008114
22	Yes	14	0.00000001	0.00003790
23	Yes	14	0.00000001	0.00005725
24	Yes	14	0.00000001	0.00003739
25	Yes	12	0.00000001	0.00008392
26	Yes	14	0.00000001	0.00004242
27	Yes	11	0.00000001	0.00005735
28	Yes	11	0.00000001	0.00003898
29	Yes	10	0.00000001	0.00006463
30	Yes	11	0.00000001	0.00003859
31	Yes	11	0.00000001	0.00005680
32	Yes	11	0.00000001	0.00003851
33	Yes	10	0.00000001	0.00006354
34	Yes	11	0.00000001	0.00003819
35	Yes	11	0.00000001	0.00005631
36	Yes	11	0.00000001	0.00003832
37	Yes	10	0.00000001	0.00006431
38	Yes	11	0.00000001	0.00003898

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	0.973	33	0.044	0.052
T2	160 - 140	1.118	37	0.068	0.053
T3	140 - 120	1.342	29	0.049	0.065
T4	120 - 100	1.414	29	0.012	0.089
T5	100 - 80	1.238	27	0.068	0.099
T6	80 - 60	0.925	27	0.057	0.107
T7	60 - 40	0.737	31	0.044	0.107
T8	40 - 20	0.582	31	0.042	0.095
T9	20 - 5	0.368	31	0.070	0.066
T10	5 - 0	0.095	31	0.088	0.040

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	Rohn 6'x15' Boom Gate (3)	33	0.991	0.049	0.052	117548
162.523	Guy	37	1.094	0.066	0.052	34262
162.523	Guy	37	1.094	0.066	0.052	34262
152.000	Pirod 15' T-Frame Sector Mount (1)	29	1.208	0.068	0.056	223428
136.000	Pirod 15' T-Frame Sector Mount (1)	29	1.375	0.037	0.070	21439
132.159	Guy	29	1.399	0.024	0.075	19608
120.000	AIR 21 B4A B2P W/Mount Pipe	29	1.414	0.012	0.089	15876
98.000	GPS	27	1.209	0.071	0.100	28275
82.523	Guy	27	0.961	0.060	0.106	24535
49.750	Guy	31	0.659	0.040	0.102	322533

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	10.911	10	0.235	0.272
T2	160 - 140	11.981	10	0.351	0.273
T3	140 - 120	13.395	2	0.233	0.321
T4	120 - 100	13.846	2	0.114	0.418
T5	100 - 80	12.623	2	0.455	0.457
T6	80 - 60	10.281	2	0.501	0.479
T7	60 - 40	8.231	6	0.514	0.481
T8	40 - 20	6.099	6	0.554	0.424
T9	20 - 5	3.491	6	0.733	0.302
T10	5 - 0	0.890	6	0.832	0.172

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.000	Rohn 6'x15' Boom Gate (3)	10	11.052	0.259	0.271	24372
162.523	Guy	10	11.819	0.346	0.271	7117
162.523	Guy	10	11.819	0.346	0.271	7117
152.000	Pirod 15' T-Frame Sector Mount (1)	10	12.556	0.336	0.284	64432
136.000	Pirod 15' T-Frame Sector Mount (1)	2	13.602	0.181	0.340	3615
132.159	Guy	2	13.751	0.131	0.360	3299
120.000	AIR 21 B4A B2P W/Mount Pipe	2	13.846	0.114	0.418	2652
98.000	GPS	2	12.415	0.480	0.459	4059
82.523	Guy	2	10.577	0.506	0.477	5088
49.750	Guy	6	7.173	0.522	0.459	17324

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Diagonal	A325N	0.625	1	6143.000	12425.200	0.494 ✔	1	Bolt Shear
		Top Girt	A325N	0.625	1	406.055	9107.810	0.045 ✔	1	Member Block Shear
		Bottom Girt	A325N	0.625	1	2008.620	9107.810	0.221 ✔	1	Member Block Shear
T2	160	Leg	A325N	0.750	4	3262.560	29820.600	0.109 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	4895.670	7952.160	0.616 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	1617.230	7952.160	0.203 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	731.464	7952.160	0.092 ✔	1	Bolt Shear
T3	140	Leg	A325N	0.750	4	5156.710	29820.600	0.173 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2113.030	4165.560	0.507 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	212.793	4165.560	0.051 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	752.013	4165.560	0.181 ✔	1	Member Bearing
T4	120	Leg	A325N	0.750	4	3829.880	29820.600	0.128 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	3222.730	7952.160	0.405 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	972.607	7952.160	0.122 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	762.938	7952.160	0.096 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.750	4	4011.480	29820.600	0.135 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	4059.050	4165.560	0.974 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	926.331	4165.560	0.222 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	793.456	4165.560	0.190 ✔	1	Member Bearing
T6	80	Leg	A325N	0.750	4	4147.840	29820.600	0.139 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2546.970	7952.160	0.320 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	1396.210	7952.160	0.176 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	758.285	7952.160	0.095 ✔	1	Bolt Shear
T7	60	Leg	A325N	0.750	4	4584.060	29820.600	0.154 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	3961.840	4165.560	0.951 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	276.016	4165.560	0.066 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	1185.290	4165.560	0.285 ✔	1	Member Bearing
T8	40	Leg	A325N	0.750	4	4912.860	29820.600	0.165 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2832.040	4165.560	0.680 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	981.418	4165.560	0.236 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	545.651	4165.560	0.131 ✔	1	Member Bearing
T9	20	Leg	A325N	0.750	4	4833.530	29820.600	0.162 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2955.290	4165.560	0.709 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	631.418	4165.560	0.152 ✔	1	Member Bearing
		Bottom Girt	A325N	0.625	2	5245.690	12425.200	0.422 ✔	1	Bolt Shear
T10	5	Leg	A325N	0.750	4	5052.090	29820.600	0.169 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	162.523 (A) (462)	1/2 EHS	2152.000	26900.043	8119.370	16140.000	1.000	1.988 ✔
	162.523 (A) (463)	1/2 EHS	2152.000	26900.043	8145.740	16140.000	1.000	1.981 ✔
	162.523 (B) (458)	1/2 EHS	2152.000	26900.043	7984.010	16140.000	1.000	2.022 ✔
	162.523 (B) (459)	1/2 EHS	2152.000	26900.043	8126.280	16140.000	1.000	1.986 ✔
	162.523 (C) (454)	1/2 EHS	2152.000	26900.043	8146.680	16140.000	1.000	1.981 ✔
	162.523 (C) (455)	1/2 EHS	2152.000	26900.043	7981.210	16140.000	1.000	2.022 ✔
	162.523 (A) (483)	7/8 EHS	6376.000	79699.844	22007.000	47820.000	1.000	2.173 ✔
	162.523 (B) (482)	7/8 EHS	6376.000	79699.844	21998.500	47820.000	1.000	2.174 ✔
	162.523 (C) (478)	7/8 EHS	6376.000	79699.844	22028.699	47820.000	1.000	2.171 ✔
T3	132.159 (A) (471)	9/16 EHS	4200.000	35000.035	15101.600	21000.000	1.000	1.391 ✔
	132.159 (B) (470)	9/16 EHS	4200.000	35000.035	15117.600	21000.000	1.000	1.389 ✔
	132.159 (C) (466)	9/16 EHS	4200.000	35000.035	15128.400	21000.000	1.000	1.388 ✔
T5	82.523 (A) (477)	3/4 EHS	4664.000	58299.914	24445.400	34980.000	1.000	1.431 ✔
	82.523 (B) (476)	3/4 EHS	4664.000	58299.914	24465.100	34980.000	1.000	1.430 ✔
	82.523 (C) (472)	3/4 EHS	4664.000	58299.914	24460.100	34980.000	1.000	1.430 ✔
T7	49.750 (A) (489)	1/2 EHS	2690.000	26900.043	11604.800	16140.000	1.000	1.391 ✔
	49.750 (B) (488)	1/2 EHS	2690.000	26900.043	11593.400	16140.000	1.000	1.392 ✔
	49.750 (C) (484)	1/2 EHS	2690.000	26900.043	11594.700	16140.000	1.000	1.392 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	1.00	-32312.600	94406.898	0.342 [1] ✔
T2	160 - 140	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	1.00	-39150.801	94406.898	0.415 [1] ✔
T3	140 - 120	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	0.99	-61880.500	93680.203	0.661 [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 $\frac{P_u}{\phi P_n}$
					K=1.00					✔
T4	120 - 100	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	0.99	-62401.602	93666.203	0.666 [1] ✔
T5	100 - 80	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	0.98	-48137.699	92170.602	0.522 [1] ✔
T6	80 - 60	ROHN 2.5 X-STR	20.000	2.409	31.3 K=1.00	2.254	1.00	-49904.199	94406.898	0.529 [1] ✔
T7	60 - 40	ROHN 2.5 X-STR	20.000	2.409	62.6 K=2.00	2.254	1.00	-55008.801	76169.703	0.722 [1] ✔
T8	40 - 20	ROHN 2.5 X-STR	20.000	2.409	62.6 K=2.00	2.254	1.00	-58954.398	76169.703	0.774 [1] ✔
T9	20 - 5	ROHN 2.5 X-STR	15.000	2.378	61.8 K=2.00	2.254	1.00	-58982.602	76718.102	0.769 [1] ✔
T10	5 - 0	ROHN 2.5 X-STR	5.376	1.075	2.8 K=0.20	2.254	0.91	-62522.699	92290.000	0.677 [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 $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	4.183	1.945	59.7 K=1.00	0.938	-6143.000	25192.699	0.244 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	4.183	1.945	47.7 K=1.00	0.520	-4895.670	17104.699	0.286 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	4.183	1.945	45.7 K=1.00	0.263	-2237.820	8734.080	0.256 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	4.183	1.945	47.7 K=1.00	0.520	-3222.730	17104.699	0.188 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	4.183	1.945	45.7 K=1.00	0.263	-4181.650	8734.080	0.479 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	4.183	1.945	47.7 K=1.00	0.520	-2546.970	17104.699	0.149 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	4.183	3.890	91.5 K=1.00	0.263	-4173.050	5939.690	0.703 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	4.183	3.890	91.5 K=1.00	0.263	-3089.350	5939.690	0.520 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	4.166	3.874	91.1 K=1.00	0.263	-3167.090	5965.130	0.531 [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 $\frac{P_u}{\phi P_n}$
T10	5 - 0	L4x4x1/4	2.394	2.154	32.5 K=1.00	1.940	-320.089	57548.199	0.006 [1] ✔

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	97.6 K=1.00	0.938	-467.377	18404.301	0.025 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9 K=1.00	0.520	-1137.730	13543.100	0.084 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	3.420	3.180	77.9 K=1.00	0.520	-162.554	13543.100	0.012 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-440.249	7043.680	0.063 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-337.249	7043.680	0.048 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-871.694	7043.680	0.124 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-521.000	7043.680	0.074 [1] ✔

[1] $P_u / \phi P_n$ controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	97.6 K=1.00	0.938	-163.200	18404.301	0.009 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9 K=1.00	0.520	-23.447	13543.100	0.002 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-256.049	7043.680	0.036 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-936.763	7043.680	0.133 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8 K=1.00	0.263	-353.159	7043.680	0.050 [1] ✔
T10	5 - 0	L4x4x1/4	0.342	0.102	1.5 K=1.00	1.940	-2157.070	60720.898	0.036 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (456)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1515.330	173446.000	0.009
T1	180 - 160 (457)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1430.870	173446.000	0.008
T1	180 - 160 (460)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1338.010	173446.000	0.008
T1	180 - 160 (461)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1334.160	173446.000	0.008
T1	180 - 160 (464)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1501.300	173446.000	0.009
T1	180 - 160 (465)	C12x20.7	3.415	3.295	49.5 K=1.00	6.090	-1410.810	173446.000	0.008

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160 (456)	C12x20.7	-18.422	58.050	0.317	-0.000	9.423	0.000
T1	180 - 160 (457)	C12x20.7	-18.402	58.050	0.317	0.000	9.423	0.000
T1	180 - 160 (460)	C12x20.7	-18.390	58.050	0.317	0.000	9.423	0.000
T1	180 - 160 (461)	C12x20.7	-18.417	58.050	0.317	-0.000	9.423	0.000
T1	180 - 160 (464)	C12x20.7	-18.393	58.050	0.317	0.000	9.423	0.000
T1	180 - 160 (465)	C12x20.7	-18.400	58.050	0.317	0.000	9.423	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.009	0.317	0.000	0.322 ✔	1.000	4.8.1 ✔
T1	180 - 160 (457)	C12x20.7	0.008	0.317	0.000	0.321 ✔	1.000	4.8.1 ✔
T1	180 - 160 (460)	C12x20.7	0.008	0.317	0.000	0.321 ✔	1.000	4.8.1 ✔
T1	180 - 160 (461)	C12x20.7	0.008	0.317	0.000	0.321 ✔	1.000	4.8.1 ✔
T1	180 - 160 (464)	C12x20.7	0.009	0.317	0.000	0.321 ✔	1.000	4.8.1 ✔
T1	180 - 160 (465)	C12x20.7	0.008	0.317	0.000	0.321 ✔	1.000	4.8.1 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	27672.400	101409.000	0.273 [1] ✔
T2	160 - 140	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	6850.600	101409.000	0.068 [1] ✔
T3	140 - 120	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	20201.199	101409.000	0.199 [1] ✔
T4	120 - 100	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	20199.699	101409.000	0.199 [1] ✔
T5	100 - 80	ROHN 2.5 X-STR	20.000	2.409	31.3	2.254	1362.260	101409.000	0.013 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	4.183	1.945	38.3	0.563	3954.180	24485.100	0.161 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	4.183	1.945	47.7	0.520	4432.220	19665.400	0.225 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	4.183	1.945	45.7	0.263	2113.030	9931.960	0.213 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	4.183	1.945	47.7	0.520	2543.870	19665.400	0.129 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	4.183	1.945	45.7	0.263	4059.050	9931.960	0.409 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	4.183	1.945	47.7	0.520	1666.280	19665.400	0.085 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	4.183	3.890	91.5	0.263	3961.840	9931.960	0.399 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	4.183	3.890	91.5	0.263	2832.040	9931.960	0.285 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	4.166	3.874	91.1	0.263	2955.290	9931.960	0.298 [1] ✔

[1] $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T10	5 - 0	L4x4x1/4	1.026	0.786	7.5	1.940	162.246	62856.000	0.003 [1] ✔

[1] $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	62.7	0.563	406.055	24485.100	0.017 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	1617.230	19665.400	0.082 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	212.793	9931.960	0.021 [1] ✔
T4	120 - 100	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	972.607	19665.400	0.049 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	926.331	9931.960	0.093 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	1396.210	19665.400	0.071 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	276.016	9931.960	0.028 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	981.418	9931.960	0.099 [1] ✔
T9	20 - 5	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	631.418	9931.960	0.064 [1] ✔
T10	5 - 0	L4x4x1/4	3.078	2.838	27.2	1.940	3098.670	62856.000	0.049 [1] ✔

[1] $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T1	180 - 160	L2x2x1/4	3.420	3.180	62.7	0.563	2008.620	24485.100	0.082 [1] ✔
T2	160 - 140	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	731.464	19665.400	0.037 [1] ✔
T3	140 - 120	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	752.013	9931.960	0.076 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	762.938	19665.400	0.039 [1] ✔
T5	100 - 80	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	793.456	9931.960	0.080 [1] ✔
T6	80 - 60	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	758.285	19665.400	0.039 [1] ✔
T7	60 - 40	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	1185.290	9931.960	0.119 [1] ✔
T8	40 - 20	ROHN TS1.5x16 ga	3.420	3.180	74.8	0.263	545.651	9931.960	0.055 [1] ✔
T9	20 - 5	L3x3x1/2	3.420	3.180	42.5	1.781	10491.400	77484.398	0.135 [1] ✔

[1] $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$
T1	180 - 160	2L2x2x1/4x3/8 2L 'a' > 18.377 in - 481	3.420	3.180	62.7	1.410	7396.740	68737.500	0.108 [1]
T3	140 - 120	4x3/8	3.420	3.180	352.6	1.125	6009.540	54843.801	0.110 [1]
T5	100 - 80	2L2x2x1/4x3/8 2L 'a' > 18.377 in - 473	3.420	3.180	62.7	1.410	9825.170	68737.500	0.143 [1]
T7	60 - 40	4x3/8	3.420	3.180	352.6	1.125	6131.890	54843.801	0.112 [1]

[1] $P_u / \phi P_n$ controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160	2L2x2x1/4x3/8	0.000	2.779	0.000	0.000	4.711	0.000
T3	140 - 120	4x3/8	0.009	5.625	0.002	0.000	0.527	0.000
T5	100 - 80	2L2x2x1/4x3/8	0.000	2.779	0.000	0.000	4.711	0.000
T7	60 - 40	4x3/8	0.000	5.625	0.000	0.000	0.527	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	2L2x2x1/4x3/8	0.108	0.000	0.000	0.108 [1]	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T3	140 - 120	4x3/8	0.110	0.002	0.000	0.110 [1]	1.000	4.8.1
T5	100 - 80	2L2x2x1/4x3/8	0.143	0.000	0.000	0.143 [1]	1.000	4.8.1
T7	60 - 40	4x3/8	0.112	0.000	0.000	0.112 [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (456)	C12x20.7	3.415	3.295	49.5	6.090	215.481	197316.000	0.001
T1	180 - 160 (457)	C12x20.7	3.415	3.295	49.5	6.090	388.097	197316.000	0.002
T1	180 - 160 (460)	C12x20.7	3.415	3.295	49.5	6.090	396.001	197316.000	0.002
T1	180 - 160 (461)	C12x20.7	3.415	3.295	49.5	6.090	398.629	197316.000	0.002
T1	180 - 160 (464)	C12x20.7	3.415	3.295	49.5	6.090	227.659	197316.000	0.001
T1	180 - 160 (465)	C12x20.7	3.415	3.295	49.5	6.090	407.211	197316.000	0.002

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	180 - 160 (456)	C12x20.7	-18.238	58.050	0.314	-0.000	9.423	0.000
T1	180 - 160 (457)	C12x20.7	-18.414	58.050	0.317	0.000	9.423	0.000
T1	180 - 160 (460)	C12x20.7	-18.429	58.050	0.317	0.000	9.423	0.000
T1	180 - 160 (461)	C12x20.7	-18.472	58.050	0.318	-0.000	9.423	0.000
T1	180 - 160 (464)	C12x20.7	-18.251	58.050	0.314	0.000	9.423	0.000
T1	180 - 160 (465)	C12x20.7	-18.477	58.050	0.318	0.000	9.423	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (456)	C12x20.7	0.001	0.314	0.000	0.315	1.000	4.8.1
T1	180 - 160 (457)	C12x20.7	0.002	0.317	0.000	0.318	1.000	4.8.1
T1	180 - 160 (460)	C12x20.7	0.002	0.317	0.000	0.318	1.000	4.8.1

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160 (461)	C12x20.7	0.002	0.318	0.000	0.319 ✔	1.000	4.8.1 ✔
T1	180 - 160 (464)	C12x20.7	0.001	0.314	0.000	0.315 ✔	1.000	4.8.1 ✔
T1	180 - 160 (465)	C12x20.7	0.002	0.318	0.000	0.319 ✔	1.000	4.8.1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	ROHN 2.5 X-STR	1	-32312.600	94406.898	34.2	Pass
T2	160 - 140	Leg	ROHN 2.5 X-STR	58	-39150.801	94406.898	41.5	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR	115	-61880.500	93680.203	66.1	Pass
T4	120 - 100	Leg	ROHN 2.5 X-STR	172	-62401.602	93666.203	66.6	Pass
T5	100 - 80	Leg	ROHN 2.5 X-STR	231	-48137.699	92170.602	52.2	Pass
T6	80 - 60	Leg	ROHN 2.5 X-STR	288	-49904.199	94406.898	52.9	Pass
T7	60 - 40	Leg	ROHN 2.5 X-STR	345	-55008.801	76169.703	72.2	Pass
T8	40 - 20	Leg	ROHN 2.5 X-STR	378	-58954.398	76169.703	77.4	Pass
T9	20 - 5	Leg	ROHN 2.5 X-STR	411	-58982.602	76718.102	76.9	Pass
T10	5 - 0	Leg	ROHN 2.5 X-STR	438	-62522.699	92290.000	67.7	Pass
T1	180 - 160	Diagonal	L2x2x1/4	14	-6143.000	25192.699	24.4 49.4 (b)	Pass
T2	160 - 140	Diagonal	ROHN TS1.5x11 ga	113	-4895.670	17104.699	28.6 61.6 (b)	Pass
T3	140 - 120	Diagonal	ROHN TS1.5x16 ga	153	-2237.820	8734.080	25.6 50.7 (b)	Pass
T4	120 - 100	Diagonal	ROHN TS1.5x11 ga	182	-3222.730	17104.699	18.8 40.5 (b)	Pass
T5	100 - 80	Diagonal	ROHN TS1.5x16 ga	245	-4181.650	8734.080	47.9 97.4 (b)	Pass
T6	80 - 60	Diagonal	ROHN TS1.5x11 ga	342	-2546.970	17104.699	14.9 32.0 (b)	Pass
T7	60 - 40	Diagonal	ROHN TS1.5x16 ga	361	-4173.050	5939.690	70.3 95.1 (b)	Pass
T8	40 - 20	Diagonal	ROHN TS1.5x16 ga	406	-3089.350	5939.690	52.0 68.0 (b)	Pass
T9	20 - 5	Diagonal	ROHN TS1.5x16 ga	420	-3167.090	5965.130	53.1 70.9 (b)	Pass
T10	5 - 0	Horizontal	L4x4x1/4	446	-200.717	60294.602	4.0	Pass
T1	180 - 160	Top Girt	L2x2x1/4	5	-467.377	18404.301	2.5 4.5 (b)	Pass
T2	160 - 140	Top Girt	ROHN TS1.5x11 ga	62	-1137.730	13543.100	8.4 20.3 (b)	Pass
T3	140 - 120	Top Girt	ROHN TS1.5x16 ga	120	212.793	9931.960	2.1 5.1 (b)	Pass
T4	120 - 100	Top Girt	ROHN TS1.5x11 ga	177	972.607	19665.400	4.9 12.2 (b)	Pass
T5	100 - 80	Top Girt	ROHN TS1.5x16 ga	234	926.331	9931.960	9.3 22.2 (b)	Pass
T6	80 - 60	Top Girt	ROHN TS1.5x11 ga	291	1396.210	19665.400	7.1 17.6 (b)	Pass
T7	60 - 40	Top Girt	ROHN TS1.5x16 ga	348	-337.249	7043.680	4.8 6.6 (b)	Pass
T8	40 - 20	Top Girt	ROHN TS1.5x16 ga	379	-871.694	7043.680	12.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							23.6 (b)	
T9	20 - 5	Top Girt	ROHN TS1.5x16 ga	414	-521.000	7043.680	7.4	Pass
							15.2 (b)	
T10	5 - 0	Top Girt	L4x4x1/4	441	3098.670	62856.000	4.9	Pass
T1	180 - 160	Bottom Girt	L2x2x1/4	7	2008.620	24485.100	8.2	Pass
							22.1 (b)	
T2	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	64	731.464	19665.400	3.7	Pass
							9.2 (b)	
T3	140 - 120	Bottom Girt	ROHN TS1.5x16 ga	121	752.013	9931.960	7.6	Pass
							18.1 (b)	
T4	120 - 100	Bottom Girt	ROHN TS1.5x11 ga	178	762.938	19665.400	3.9	Pass
							9.6 (b)	
T5	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	235	793.456	9931.960	8.0	Pass
							19.0 (b)	
T6	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	293	758.285	19665.400	3.9	Pass
							9.5 (b)	
T7	60 - 40	Bottom Girt	ROHN TS1.5x16 ga	349	-936.763	7043.680	13.3	Pass
							28.5 (b)	
T8	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	384	545.651	9931.960	5.5	Pass
							13.1 (b)	
T9	20 - 5	Bottom Girt	L3x3x1/2	417	10491.400	77484.398	13.5	Pass
							42.2 (b)	
T10	5 - 0	Bottom Girt	L4x4x1/4	444	-2151.110	60720.898	17.8	Pass
T1	180 - 160	Guy A@162.523	1/2	463	8145.740	16140.000	50.5	Pass
		Guy A@162.523	7/8	483	22007.000	47820.000	46.0	Pass
T3	140 - 120	Guy A@132.159	9/16	471	15101.600	21000.000	71.9	Pass
T5	100 - 80	Guy A@82.5234	3/4	477	24445.400	34980.000	69.9	Pass
T7	60 - 40	Guy A@49.75	1/2	489	11604.800	16140.000	71.9	Pass
T1	180 - 160	Guy B@162.523	1/2	459	8126.280	16140.000	50.3	Pass
		Guy B@162.523	7/8	482	21998.500	47820.000	46.0	Pass
T3	140 - 120	Guy B@132.159	9/16	470	15117.600	21000.000	72.0	Pass
T5	100 - 80	Guy B@82.5234	3/4	476	24465.100	34980.000	69.9	Pass
T7	60 - 40	Guy B@49.75	1/2	488	11593.400	16140.000	71.8	Pass
T1	180 - 160	Guy C@162.523	1/2	454	8146.680	16140.000	50.5	Pass
		Guy C@162.523	7/8	478	22028.699	47820.000	46.1	Pass
T3	140 - 120	Guy C@132.159	9/16	466	15128.400	21000.000	72.0	Pass
T5	100 - 80	Guy C@82.5234	3/4	472	24460.100	34980.000	69.9	Pass
T7	60 - 40	Guy C@49.75	1/2	484	11594.700	16140.000	71.8	Pass
T1	180 - 160	Top Guy Pull-Off@162.523	2L2x2x1/4x3/8	481	7396.740	68737.500	10.8	Pass
T3	140 - 120	Top Guy Pull-Off@132.159	4x3/8	467	6009.540	54843.801	11.0	Pass
T5	100 - 80	Top Guy Pull-Off@82.5234	2L2x2x1/4x3/8	473	9825.170	68737.500	14.3	Pass
T7	60 - 40	Top Guy Pull-Off@49.75	4x3/8	486	6131.890	54843.801	11.2	Pass
T1	180 - 160	Torque Arm Top@162.523	C12x20.7	456	-1515.330	173446.000	32.2	Pass

Summary		
Leg (T8)	77.4	Pass
Diagonal (T5)	97.4	Pass
Horizontal (T10)	4.0	Pass
Top Girt (T8)	23.6	Pass
Bottom Girt (T9)	42.2	Pass
Guy A (T3)	71.9	Pass
Guy B (T3)	72.0	Pass
Guy C (T3)	72.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Top Guy Pull-Off (T5)	14.3	Pass
						Torque Arm Top (T1)	32.2	Pass
						Bolt Checks	97.4	Pass
						RATING =	**97.4**	**Pass**

SITE ID: CT03XC111
SITE NAME: 227 BOOMBRIDGE ROAD

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

DO MACRO PROJECT

SITE INFORMATION

ADDRESS:	227 BOOM BRIDGE ROAD NORTH STONINGTON, CT 06359
JURISDICTION:	TOWN OF NORTH STONINGTON
COUNTY :	NEW LONDON
PROPERTY OWNER:	LEWIS DAVID BABCOCK LLC 273 BOOM BRIDGE ROAD NORTH STONINGTON, CT 06359
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 41.42881°
LONGITUDE (NAD 83):	W 71.80911°
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:	PETROS TSOUKALAS	MASER CONSULTING P.A.	856.797.0412
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.

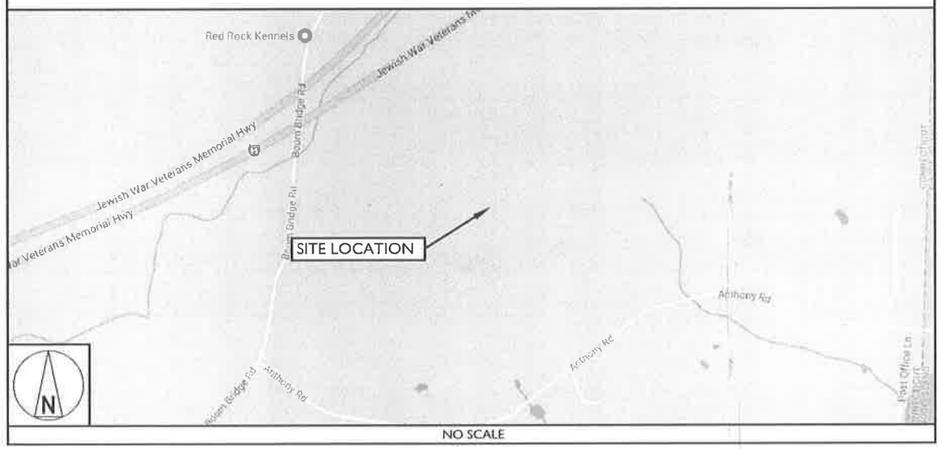
CONSTRUCTION: _____ DATE: _____

LEASING/SITE ACQUISITION: _____ DATE: _____

RF ENGINEERING: _____ DATE: _____

LANDLORD/PROPERTY OWNER: _____ DATE: _____

LOCAL MAP



NO SCALE

DRIVING DIRECTIONS

FROM SPRINT OFFICES, MAHWAH, NJ: TAKE INTERNATIONAL BLVD AND LEISURE LN TO NJ-17 N. HEAD NORTHWEST ON INTERNATIONAL BLVD/PARK ST TOWARD QUEENSLAND RD. CONTINUE TO FOLLOW INTERNATIONAL BLVD. INTERNATIONAL BLVD TURNS SLIGHTLY LEFT AND BECOMES PARK ST. TURN RIGHT ONTO PARK LN. CONTINUE ONTO LEISURE LN. FOLLOW I-287 E AND CT-15 N TO I-95 N IN NORTH STONINGTON. MERGE ONTO NJ-17 N. USE THE LEFT 3 LANES TO MERGE ONTO I-287 N/NJ-17 N TOWARD NY THRUWAY. ENTERING NEW YORK. USE THE RIGHT 2 LANES TO MERGE ONTO I-287 E/I-87 S TOWARD TAPPAN ZEE BR/NEW YORK CITY. KEEP LEFT AT THE FORK TO CONTINUE ON I-287 E. FOLLOW SIGNS FOR WHITE PLAINS/RYE. TAKE EXIT 9N-95 FOR HUTCHINSON PKWY TOWARD WHITESTONE BRIDGE/MERRITT PKWY. KEEP LEFT AT THE FORK, FOLLOW SIGNS FOR WESTCHESTER AVE AND MERGE ONTO WESTCHESTER AVE. USE THE RIGHT LANE TO TAKE THE HUTCHINSON PKWY N RAMP TO MERRITT PKWY. MERGE ONTO HUTCHINSON RIVER PKWY N. KEEP RIGHT AT THE FORK TO STAY ON HUTCHINSON RIVER PKWY N. ENTERING CONNECTICUT. CONTINUE ONTO CT-15 N. TAKE EXIT 54 TOWARD INTERSTATE 95/U.S. 1/MILFORD/NEW LONDON MERGE ONTO MILFORD PKWY. TAKE THE INTERSTATE 95 N EXIT TOWARD NEW LONDON/NEW HAVEN. MERGE ONTO I-95 N. KEEP RIGHT AT THE FORK TO STAY ON I-95 N, FOLLOW SIGNS FOR NEW LONDON/PROVIDENCE.

DRAWING INDEX

NYC DOB NUMBER	SHEET TITLE	REV.
T-001.00	TITLE SHEET	3
ANT-001.00	GENERAL NOTES - 1	3
ANT-002.00	GENERAL NOTES - 2	3
ANT-003.00	GENERAL NOTES - 3	3
ANT-004.00	SITE PLAN	3
ANT-005.00	EQUIPMENT PLAN AND ELEVATION	3
ANT-006.00	ANTENNA ORIENTATION PLANS	3
ANT-007.00	DETAILS	3
ANT-008.00	ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES	3
ANT-009.00	FIBER PLUMBING DIAGRAMS - 1	3
ANT-010.00	FIBER PLUMBING DIAGRAMS - 2	3
ANT-011.00	CABLE COLOR CODING, DC POWER DETAILS & PANEL SCHEDULES	3
ANT-012.00	ELECTRICAL AND GROUNDING NOTES	3
ANT-013.00	GROUNDING SCHEMATIC AND DETAILS	3
ANT-014.00	MODIFICATION DETAILS	3
ANT-015.00	MODIFICATION NOTES	3

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 (6) NEW PANEL ANTENNAS
- INSTALL (6) NEW 800 RRH'S
- INSTALL (3) NEW 2500 RRH'S
- RELOCATE (3) EXISTING 1900 RRH'S
- INSTALL (36) JUMPER CABLES
- INSTALL (4) HYBRID CABLES
- RE-TENSION EXISTING GUY WIRES

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Cherundolo Consulting

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

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

SCALE:	JOB NUMBER:
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
3	06/08/18	REVISED PER COMMENTS	AMN	PET
2	04/04/18	REVISED PER COMMENTS	JNF	JKM
1	02/2018	REVISED PER RFDS	JCM	PET
0	10/2017	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NO. PEN.0.22577

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

RED BANK OFFICE
231 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 RFI FVANT 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.

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3	06/08/18	REVISED PER COMMENTS	AMN	PET
2	04/06/18	REVISED PER COMMENTS	JRF	JKM
1	03/30/18	REVISED PER RFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/16/17	ISSUED FOR REVIEW	DTS	PEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER LICENSE NUMBER PEN 22577

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: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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 - 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, FILTERS, 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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3	06/08/18	REVISED PER COMMENTS	AMN	PET
2	04/06/18	REVISED PER COMMENTS	JAS	JKM
1	03/30/18	REVISED PER AFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NO. PEN.32577

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
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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 SPRINTS 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. WEATHERPROOFED 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 CONDUITS 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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Phone: 973-207-4248
Fax: 570-842-5592

SCALE:	JOB NUMBER:
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
3	06/08/18	REVISED PER COMMENTS	AMN	PET
2	04/04/18	REVISED PER COMMENTS	JRF	JKM
1	03/30/18	REVISED PER RFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN 23577

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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 - 3

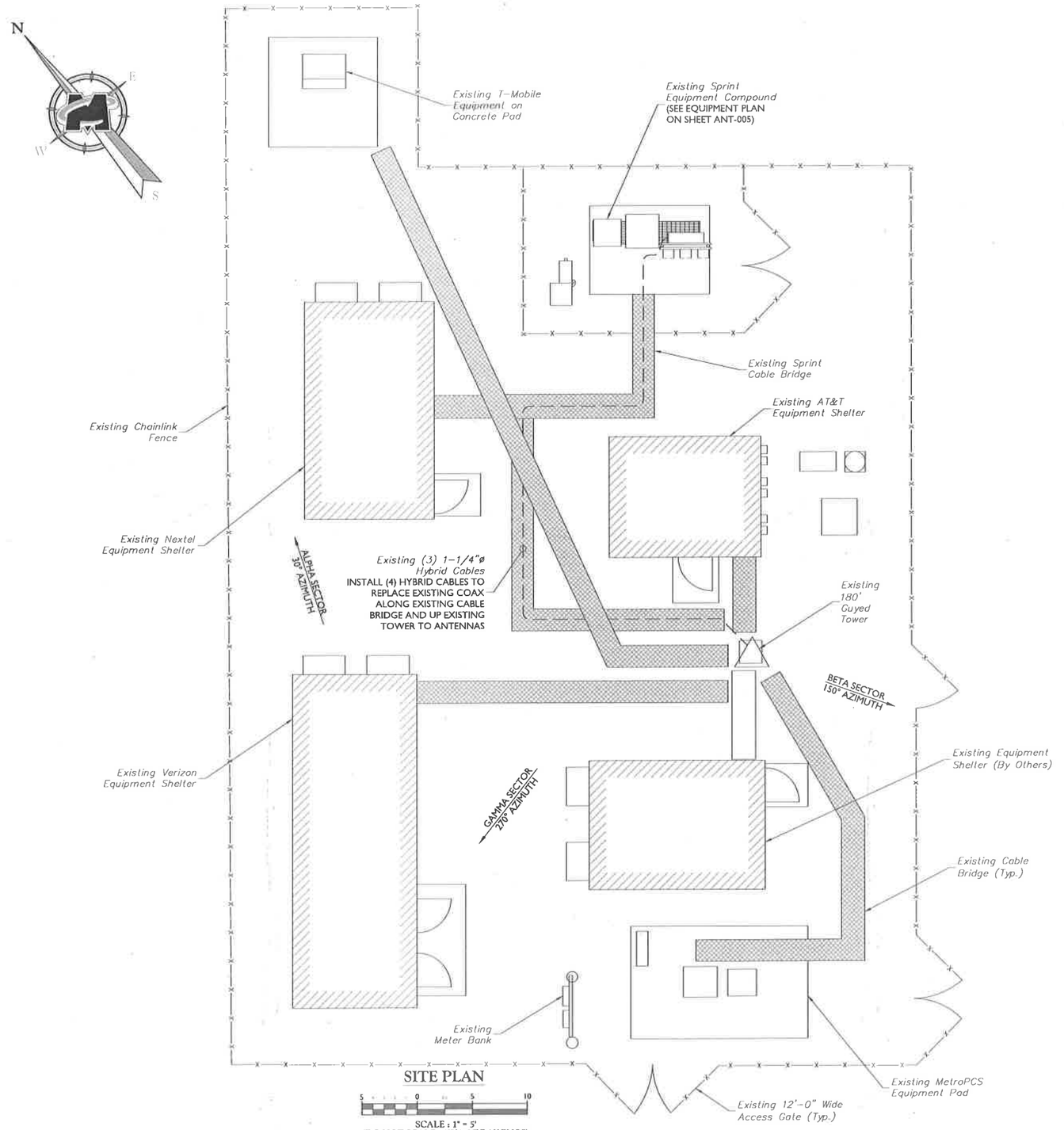
SHEET NUMBER:
ANT-003.00

GENERAL NOTES:

1. SITE INFORMATION OBTAINED FROM THE FOLLOWING:

   A. DRAWINGS ENTITLED "227 BOOMBRIDGE ROAD," PREPARED BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. OF NEWBURGH, NEW YORK DATED 11/21/12.

2. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.



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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SCALE:	JOB NUMBER:
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
3	06/08/18	REVISED PER COMMENTS	AMN	PET
2	04/04/18	REVISED PER COMMENTS	JNF	JKM
1	03/30/18	REVISED PER RFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

PETROS E. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER: PEN.32577

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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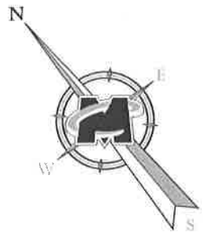
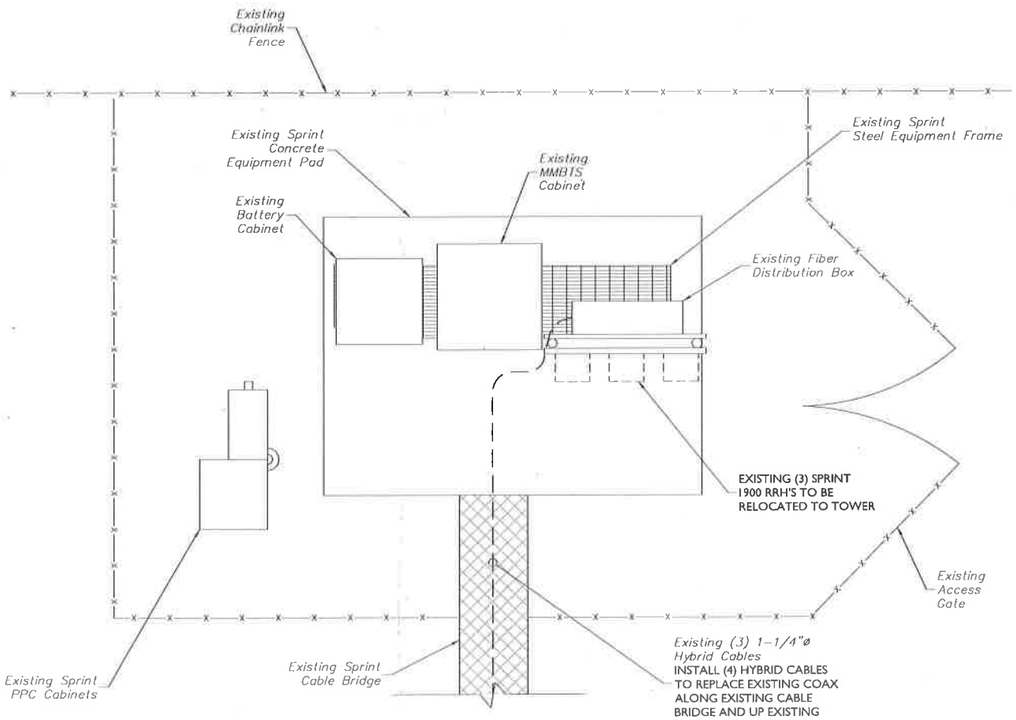
SHEET TITLE
SITE PLAN

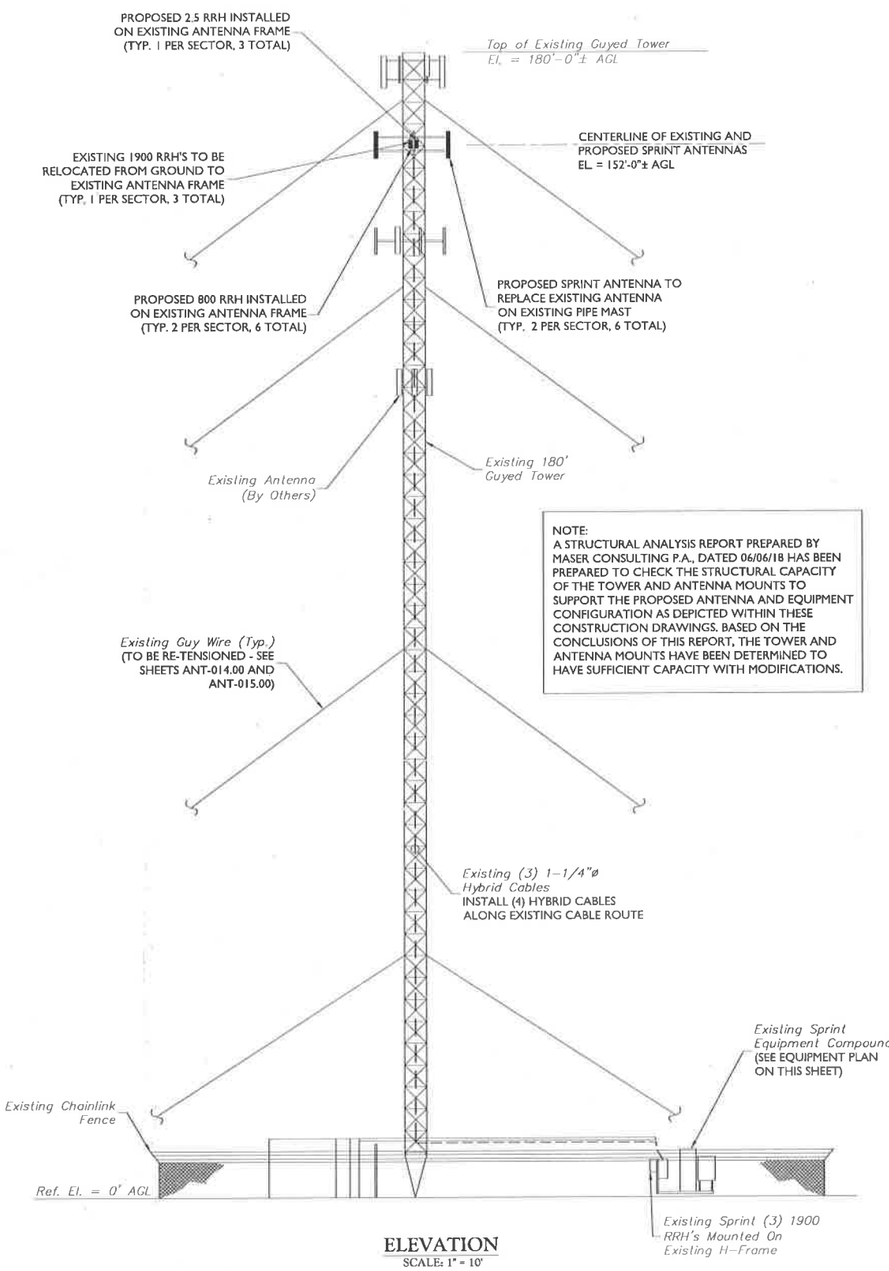
SHEET NUMBER
ANT-004.00





EQUIPMENT PLAN

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



NOTE:
A STRUCTURAL ANALYSIS REPORT PREPARED BY MASER CONSULTING P.A., DATED 06/06/18 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE TOWER AND ANTENNA MOUNTS TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE TOWER AND ANTENNA MOUNTS HAVE BEEN DETERMINED TO HAVE SUFFICIENT CAPACITY WITH MODIFICATIONS.

ELEVATION

SCALE: 1" = 10'

LEGEND

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

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AS SHOWN	17924001A

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0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	PEP

PETROS E. TSOUKALAS
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SITE ID: CT03XC111

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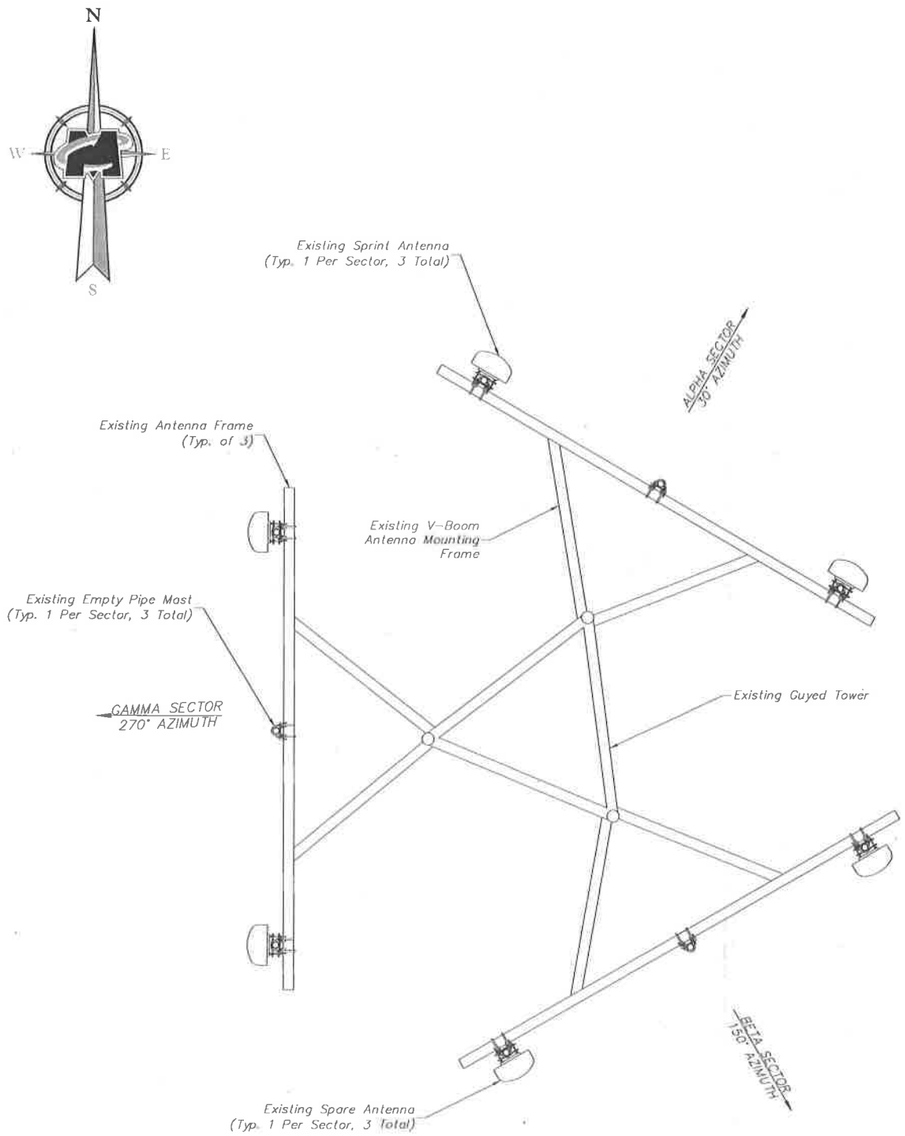
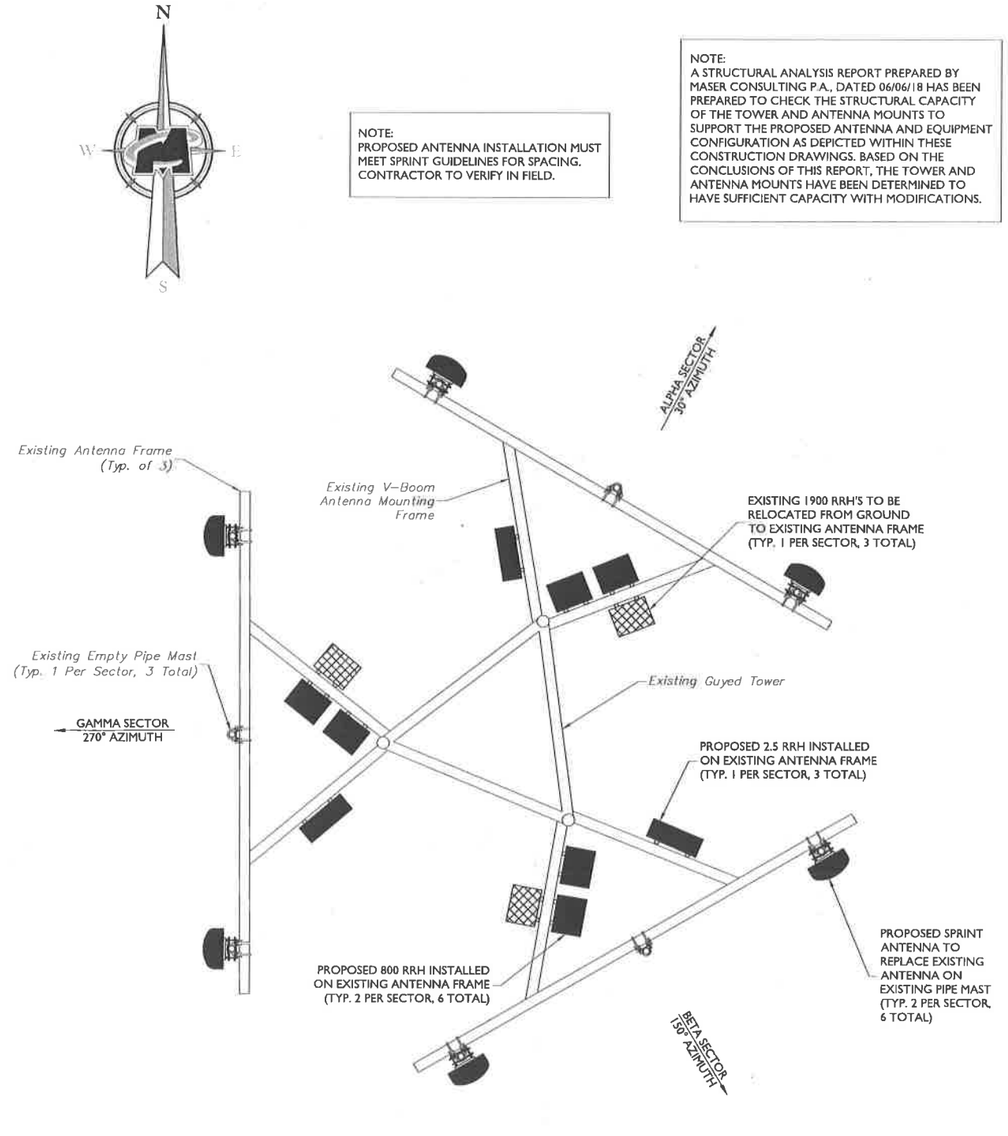
SHEET TITLE:
EQUIPMENT PLAN AND ELEVATION

SHEET NUMBER:
ANT-005.00



EXISTING ANTENNA LAYOUT

SCALE: 1" = 2'-0"



PROPOSED ANTENNA LAYOUT

SCALE: 1" = 2'-0"

NOTE:
PROPOSED ANTENNA INSTALLATION MUST MEET SPRINT GUIDELINES FOR SPACING. CONTRACTOR TO VERIFY IN FIELD.

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1	03/30/18	REVISED PER RFDS	JCM	PET
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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NO. PEN.31577

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SITE ID: CT03XC111

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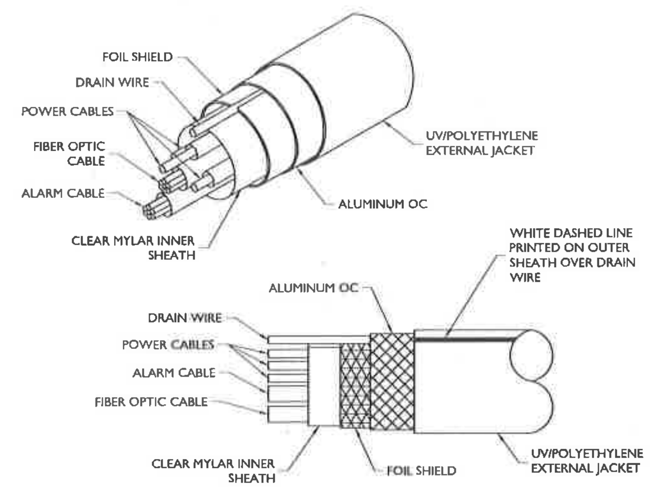
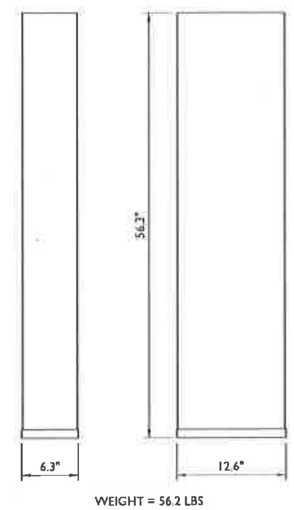
SHEET TITLE:
ANTENNA
ORIENTATION PLANS

SHEET NUMBER:
ANT-006.00

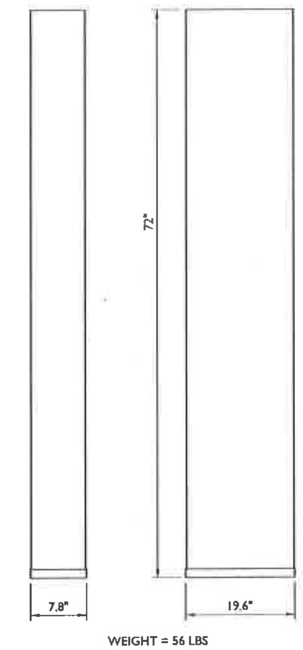


HYBRID CABLE
NOT TO SCALE



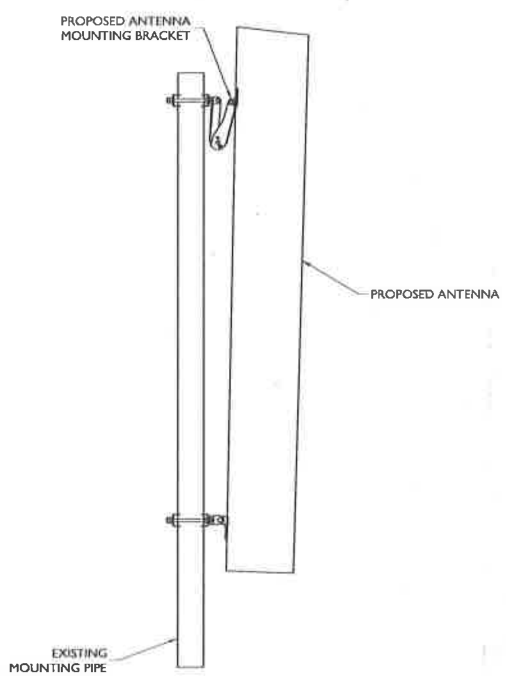
RFS APXVTM14-ALU-I20

ANTENNA DETAIL
NOT TO SCALE

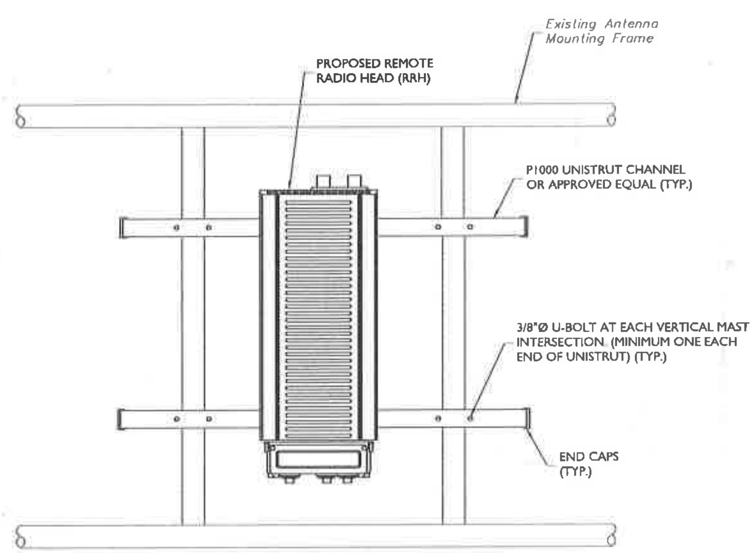


COMMSCOPE NNVV-65B-R4

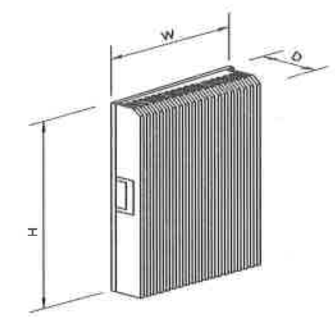
ANTENNA DETAIL
NOT TO SCALE



ANTENNA MOUNTING DETAIL
NOT TO SCALE



REMOTE RADIO HEAD (RRH) MOUNTING DETAIL
NOT TO SCALE



MODEL:	HEIGHT (H)	WIDTH (W)	DEPTH (D)	WEIGHT	STATUS
ALU TD-RRH8x20-25	26"	18.6"	6.7"	76.2 LBS	PROPOSED
ALU RRH-4x45-1900	25"	12"	12"	69.5 LBS	RELOCATED
ALU RRH-2x50-800	16"	13"	10"	69.1 LBS	PROPOSED

RRH SPECIFICATIONS
NOT TO SCALE

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AS SHOWN	17924001A

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2	04/06/18	REVISED PER COMMENTS	JRF	JCM
1	03/30/18	REVISED PER RFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

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: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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331 Newman Springs Road
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SHEET TITLE:
DETAILS - 1

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.

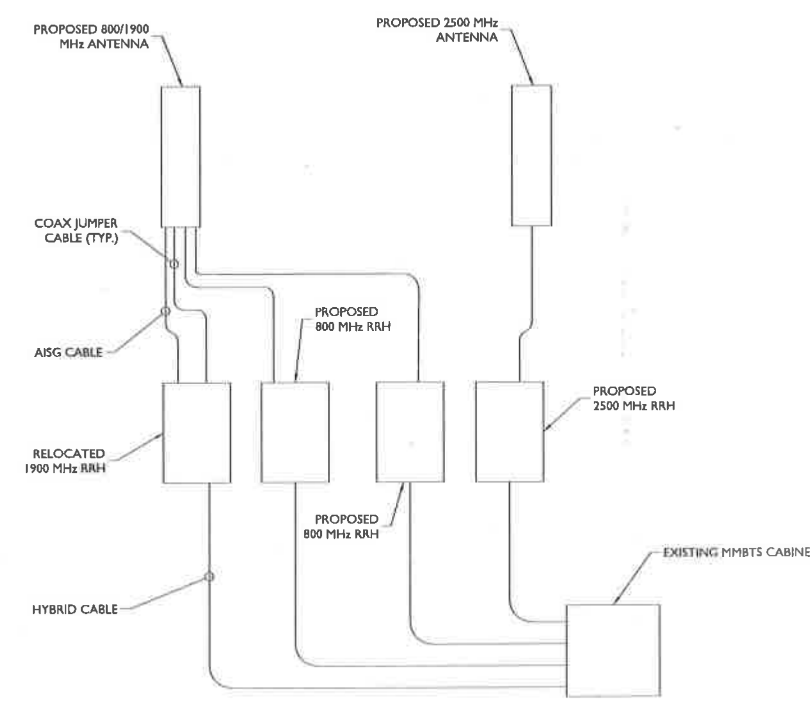
   ALSO ACCEPTABLE IS THE USE OF BUTYL RUBBER WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURE AND CONTRACTOR. START BUTYL RUBBER TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE 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	RFS APXVTM14-ALU-I20	2500	REPLACED	56.3	12.6	6.3	56.2	30°	152'	2°	0°
	A2	COMMSCOPE NNVV-65B-R4	800/1900	REPLACED	72	19.6	7.8	84.7	30°	152'	3°	0°
BETA	B1	RFS APXVTM14-ALU-I20	2500	REPLACED	56.3	12.6	6.3	56.2	150°	152'	2°	0°
	B2	COMMSCOPE NNVV-65B-R4	800/1900	REPLACED	72	19.6	7.8	84.7	150°	152'	3°	0°
GAMMA	C1	RFS APXVTM14-ALU-I20	2500	REPLACED	56.3	12.6	6.3	56.2	270°	152'	2°	0°
	C2	COMMSCOPE NNVV-65B-R4	800/1900	REPLACED	72	19.6	7.8	84.7	270°	152'	3°	0°

BILL OF MATERIALS

NUMBER	QUANTITY	DESCRIPTION	MANUFACTURER	MODEL NUMBER
1	3	PANEL ANTENNA	RFS	APXVTM14-ALU-I20
2	3	PANEL ANTENNA	COMMSCOPE	NNVV-65B-R4
3	3	2500MHZ RRH	ALU	TD-RRH8X20-25
4	6	800MHZ RRH	ALU	RRH-2X50-800
5	940 LF	1-1/4"Ø HYBRID FIBER RISER	ALU	TBD
6	48	1/2"Ø JUMPER CABLE (8' LONG)	TBD	



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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER. LICENSE NO. PEN 23577

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SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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331 Newman Springs Road
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Red Bank, NJ 07701-5699
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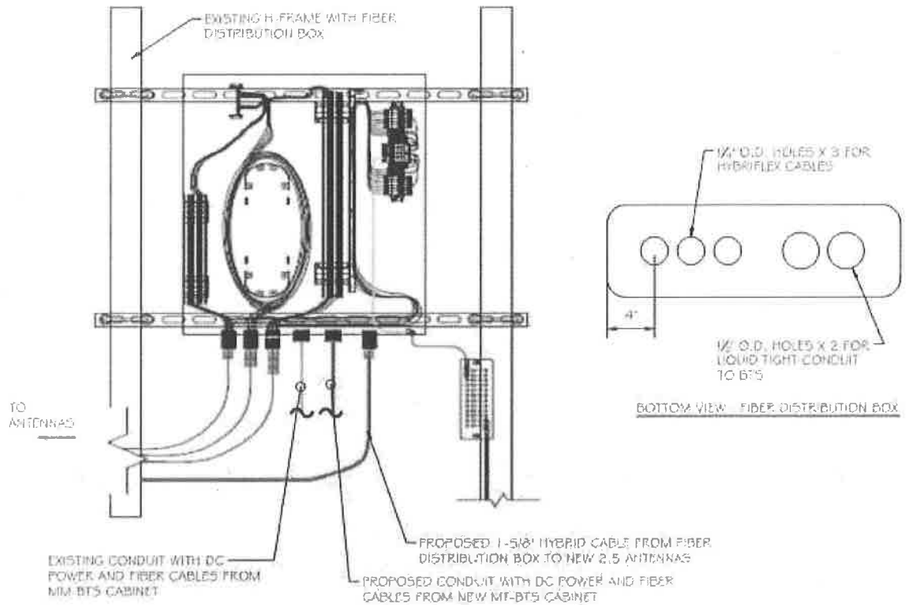
SHEET TITLE: ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES

SHEET NUMBER: ANT-008.00



TYPICAL FIBER DISTRIBUTION BOX DETAIL
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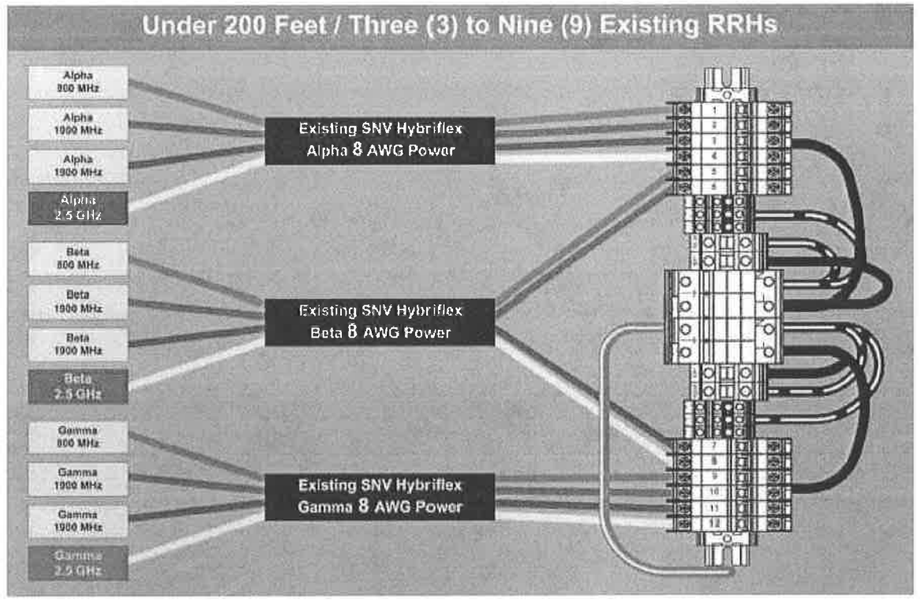

RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL
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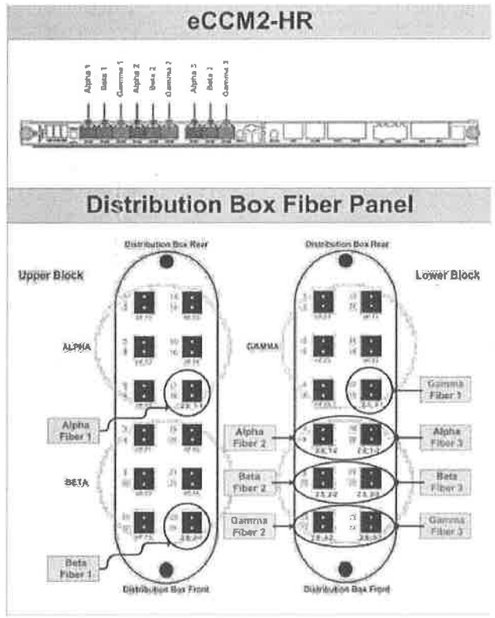

BTS TO DISTRIBUTION BOX FIBER CONNECTIVITY DETAIL
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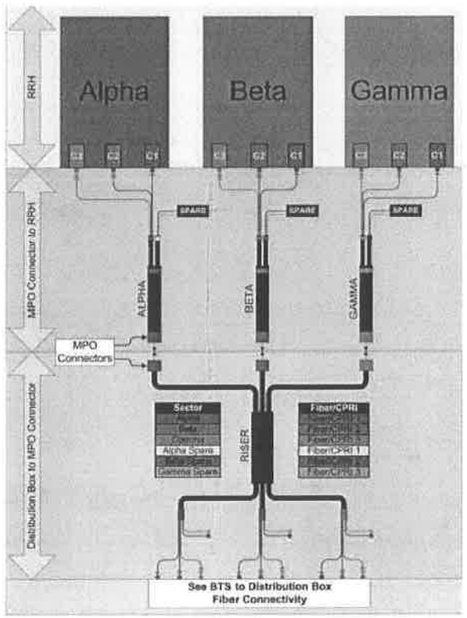

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SHEET TITLE:
FIBER PLUMBING DIAGRAMS - 1

SHEET NUMBER:
ANT-009.00

Prepared By	Revision Date	Revision Number
Mark Elliott	March 13, 2018	R1
Approved By	Approval Date	
RAN Hardware & Antenna Teams	Final-Macro Generated	

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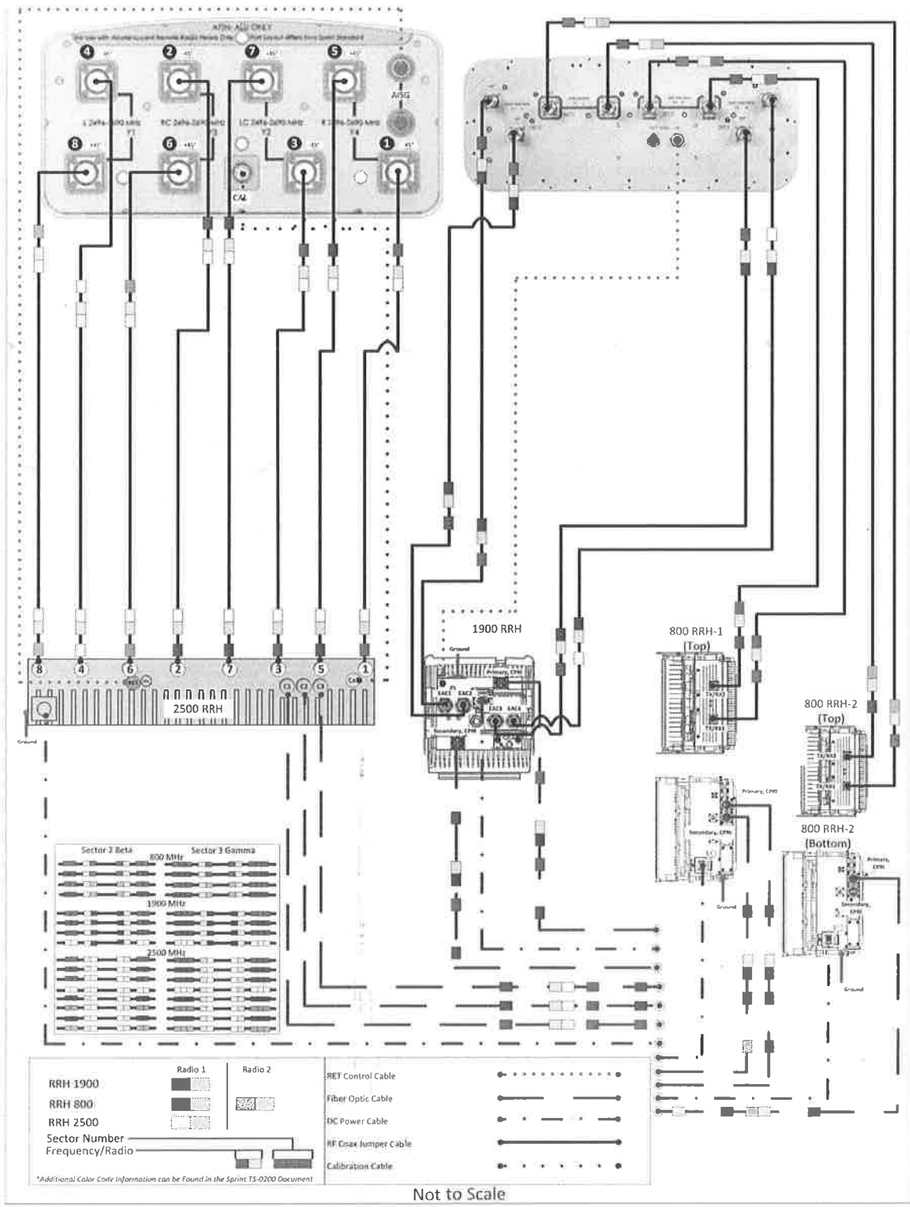
ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



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SHEET TITLE:
FIBER PLUMBING DIAGRAMS - 2

SHEET NUMBER:
ANT-010.00

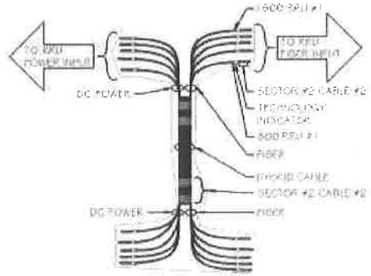
CABLE MARKING NOTES

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	BPL

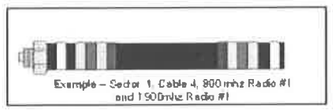
NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	BPL

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2		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			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			
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




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


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


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

COLOR CODING CHARTS
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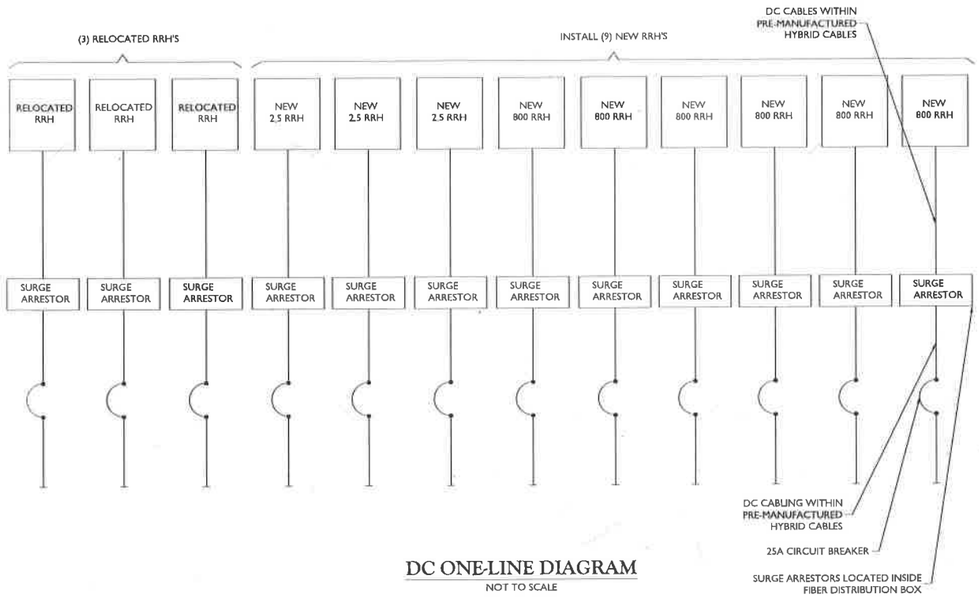

DC ONE-LINE DIAGRAM
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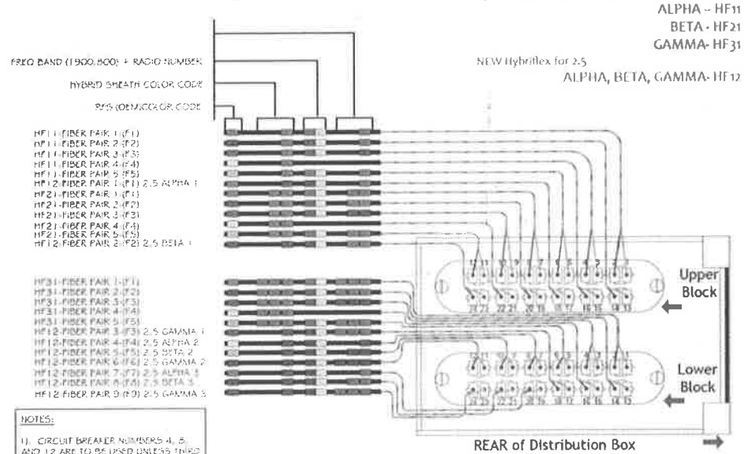
Each sector has separate Hybriflex cable .
Hybriflex cable naming as follows:

ALPHA -- HF11
BETA - HF21
GAMMA- HF31

NEW Hybriflex for 2.5
ALPHA, BETA, GAMMA- HF12



NOTES:
1). CIRCUIT BREAKER NUMBERS 4, 5, 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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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NO. 32577 (PENGR)

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

SHEET NUMBER:
ANT-011.00

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 PRIOR 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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SCALE:	JOB NUMBER:
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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-	-	-	-	-
-	-	-	-	-
3	06/08/18	REVISED PER COMMENTS	APN	PET
2	04/04/18	REVISED PER COMMENTS	JAF	JKM
1	01/30/18	REVISED PER RFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

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

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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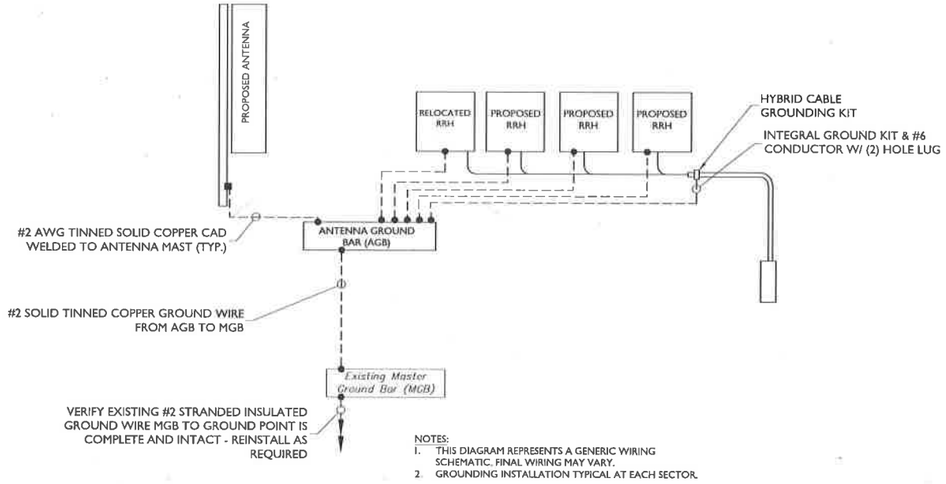
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

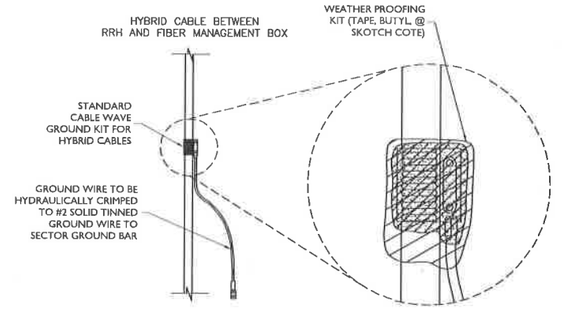
SHEET TITLE:
ELECTRICAL AND GROUNDING NOTES

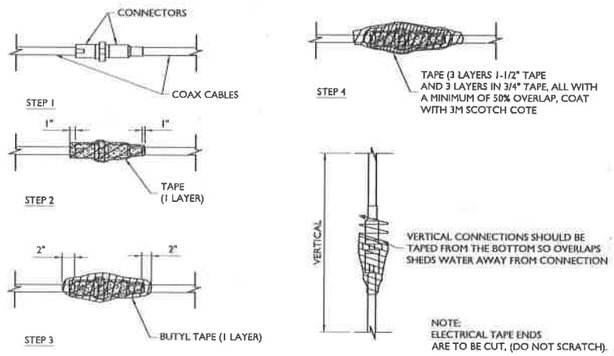
SHEET NUMBER:
ANT-012.00



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

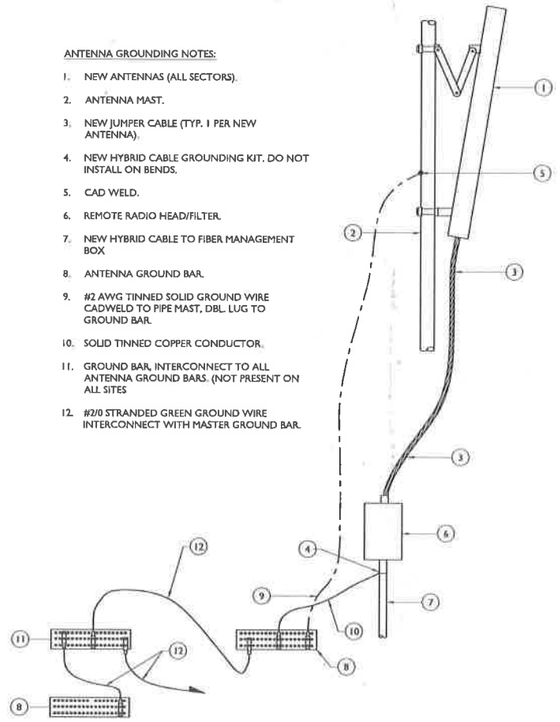




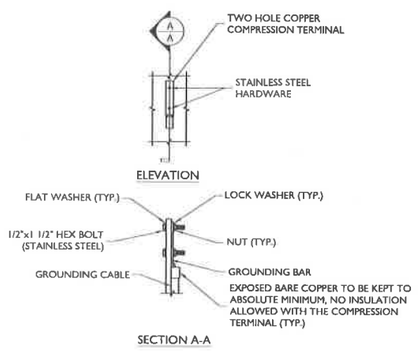
CABLE WRAPPING DETAIL
NOT TO SCALE

ANTENNA GROUNDING NOTES:

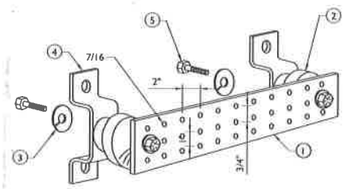
1. NEW ANTENNAS (ALL SECTORS).
2. ANTENNA MAST.
3. NEW JUMPER CABLE (TYP. 1 PER NEW ANTENNA).
4. NEW HYBRID CABLE GROUNDING KIT. DO NOT INSTALL ON BENDS.
5. CAD WELD.
6. REMOTE RADIO HEAD/FILTER.
7. NEW HYBRID CABLE TO FIBER MANAGEMENT BOX
8. ANTENNA GROUND BAR.
9. #2 AWG TINNED SOLID GROUND WIRE CADWELD 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



TYPICAL GROUND BAR CONNECTION 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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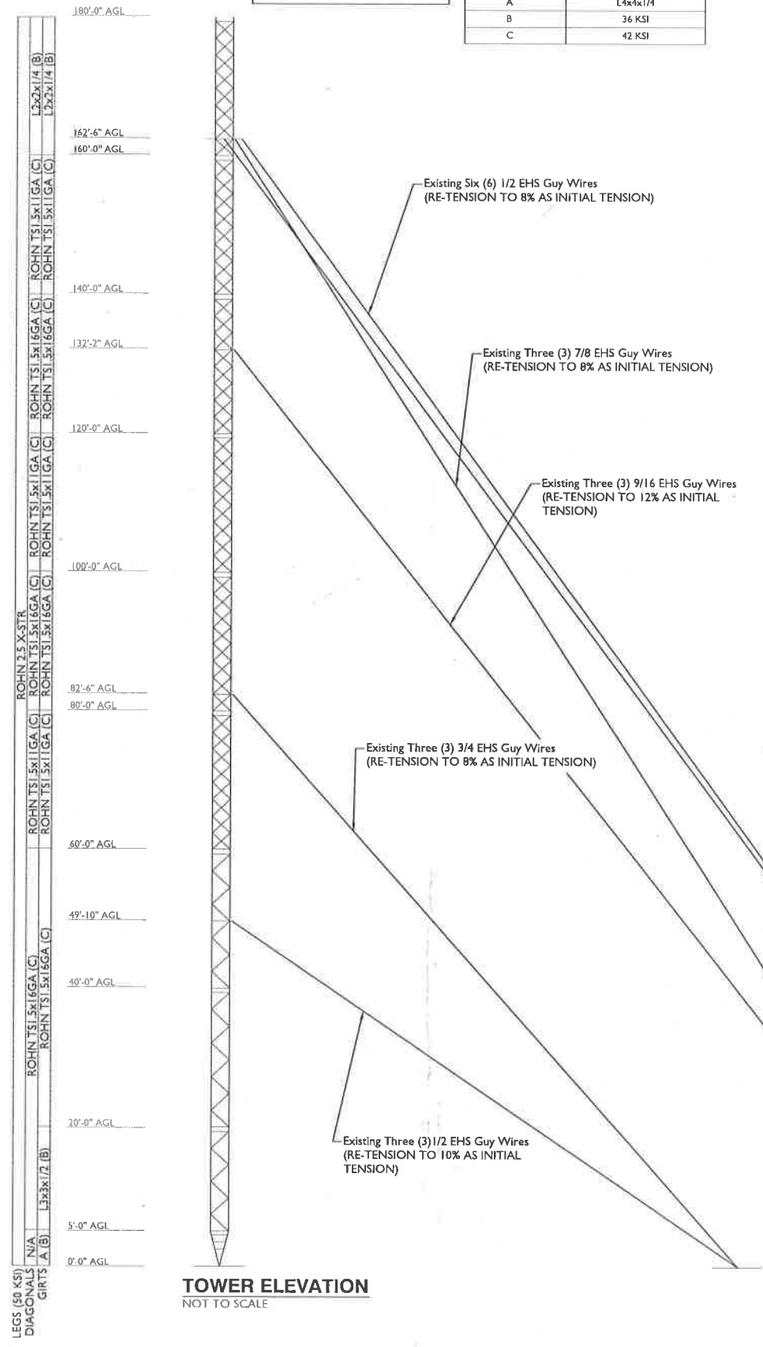
SHEET TITLE: GROUNDING SCHEMATIC AND DETAILS

SHEET NUMBER: ANT-013.00

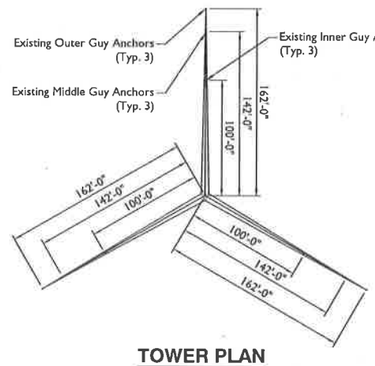
NOTES:

EQUIPMENT NOT SHOWN FOR CLARITY

SYMBOL LIST	
MARK	SIZE/GRADE
A	L4x4x1/4
B	36 KSI
C	42 KSI



TOWER ELEVATION
NOT TO SCALE



TOWER PLAN
NOT TO SCALE

NOTES:

1. YIELD STRENGTH OF EXISTING TOWER MEMBERS IS ASSUMED.
2. EXISTING TOWER MEMBERS WERE DETERMINED FROM PREVIOUS STRUCTURAL ANALYSIS REPORT, PREPARED BY EBI CONSULTING, JOB NO. B1150090, DATED FEBRUARY 13, 2015. CONTRACTOR IS TO FIELD VERIFY TOWER MEMBERS AND MASER CONSULTING CONNECTICUT SHALL BE NOTIFIED WITH ANY DEFERENCE.
3. CONTRACTOR IS TO REMOVE AND REPLACE EXISTING APPURTENANCES, MOUNTS AND TOWER HARDWARE AS REQUIRED TO INSTALL THE PROPOSED REINFORCEMENTS.
4. CONTRACTOR IS TO CHECK CONDITIONS OF ALL EXISTING GUY WIRE ASSEMBLY PRIOR TO RE-TENSION ALL EXISTING GUY WIRES. MASER CONSULTING CONNECTICUT SHALL BE NOTIFIED IF ANY DEFICIENCY IS INSPECTED ABOUT THE EXISTING GUY WIRE ASSEMBLY.
5. CONTRACTOR SHALL RE-TENSION GUY WIRES ONE LEVEL AT A TIME.
6. CONTRACTOR SHALL PERFORM A TOWER INSPECTION PRIOR TO PURCHASE AND/OR FABRICATION OF MATERIAL.
7. THE MEANS AND METHODS OF INSTALLATION ARE THE RESPONSIBILITIES OF THE CONTRACTOR.
8. ONCE THE TOWER MODIFICATIONS HAVE BEEN COMPLETED, THE OVERALL TOWER USAGE WILL BE DETERMINED TO BE 97.4% FOR THE EXISTING AND PROPOSED LOADING.

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
162.523	A	160.06	162.52	2690	4.92	2507	5.27	2327	5.67	2152	6.13	1983	6.64	1821	7.22	1668	7.86
	B	160.06	162.52	2690	4.92	2507	5.27	2327	5.67	2152	6.13	1983	6.64	1821	7.22	1668	7.86
	C	160.06	162.52	2690	4.92	2507	5.27	2327	5.67	2152	6.13	1983	6.64	1821	7.22	1668	7.86
132.159	A	140.03	132.16	5018	2.45	4744	2.59	4471	2.75	4200	2.93	3931	3.13	3664	3.35	3401	3.61
	B	140.03	132.16	5018	2.45	4744	2.59	4471	2.75	4200	2.93	3931	3.13	3664	3.35	3401	3.61
	C	140.03	132.16	5018	2.45	4744	2.59	4471	2.75	4200	2.93	3931	3.13	3664	3.35	3401	3.61
82.5234	A	98.03	82.52	6060	1.55	5590	1.68	5124	1.83	4664	2.01	4213	2.22	3773	2.48	3349	2.79
	B	98.03	82.52	6060	1.55	5590	1.68	5124	1.83	4664	2.01	4213	2.22	3773	2.48	3349	2.79
	C	98.03	82.52	6060	1.55	5590	1.68	5124	1.83	4664	2.01	4213	2.22	3773	2.48	3349	2.79
162.523	A	140.03	162.52	10971	3.27	10500	3.42	10031	3.58	9564	3.75	9100	3.94	8639	4.15	8181	4.38
	B	140.03	162.52	10971	3.27	10500	3.42	10031	3.58	9564	3.75	9100	3.94	8639	4.15	8181	4.38
	C	140.03	162.52	10971	3.27	10500	3.42	10031	3.58	9564	3.75	9100	3.94	8639	4.15	8181	4.38
49.75	A	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	B	98.03	49.75	3645	0.85	3325	0.93	3006	1.03	2690	1.15	2377	1.31	2070	1.50	1773	1.75
	C	98.03	49.75	3919	0.79	3598	0.86	3277	0.95	2959	1.05	2643	1.18	2331	1.33	2026	1.53

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Rohn 8'x15' Boom Gate (3) (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	FRS FD9R6004 Diplexer (Verizon)	136
Powerwave 7770 w/5ft mount pipe (ATI)	177	Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
(2) ETB19G8-12UB / E15Z01P03 (ATI)	177	BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
SBNH-1D6565C (ATI)	177	BXA-171085-6BF W/M PIPE (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
Powerwave 7770 w/5ft mount pipe (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
(2) ETB19G8-12UB / E15Z01P03 (ATI)	177	LPA-80080/4CF W/M PIPE (Verizon)	136
DB874H120 (ATI)	177	FRS FD9R6004 Diplexer (Verizon)	136
P65-17-XLH-RR w/8ft mount pipe (ATI)	177	Pirod 15' T-Frame Sector Mount (1) (Verizon)	136
Powerwave 7770 w/5ft mount pipe (ATI)	177	BXA-70063-6CF-EDIN W/M PIPE (Verizon)	136
ETB19G8-12UB / E15Z01P03 (ATI)	177	BXA-171085-6BF W/M PIPE (Verizon)	136
(2) LGP21401 (ATI)	177	UMTS DD B4 (T-Mobile)	120
DC6-48-60-18-8F (ATI)	177	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
(2) RRUS-11 (ATI)	177	RRUS11 B12 (T-Mobile)	120
(2) RRUS-11 (ATI)	177	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
(2) RRUS-11 (ATI)	177	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152	UMTS DD B4 (T-Mobile)	120
NNVV-65B-R4 (Sprint)	152	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
APXVTM14-ALU-I20 (Sprint)	152	RRUS11 B12 (T-Mobile)	120
TD-RRH8x20-25 (Sprint)	152	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
RRH-2X50-800 (Sprint)	152	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
ALU RRH-4X45-1900 (Sprint)	152	UMTS DD B4 (T-Mobile)	120
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
NNVV-65B-R4 (Sprint)	152	RRUS11 B12 (T-Mobile)	120
APXVTM14-ALU-I20 (Sprint)	152	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
TD-RRH8x20-25 (Sprint)	152	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
RRH-2X50-800 (Sprint)	152	UMTS DD B4 (T-Mobile)	120
ALU RRH-4X45-1900 (Sprint)	152	KRC 118 57/1B4/B12P W/M Pipe (T-Mobile)	120
Pirod 15' T-Frame Sector Mount (1) (Sprint)	152	RRUS11 B12 (T-Mobile)	120
NNVV-65B-R4 (Sprint)	152	Pirod 4' Side Mount Standoff (1) (T-Mobile)	120
APXVTM14-ALU-I20 (Sprint)	152	AIR 21 B4A B2P W/Mount Pipe (T-Mobile)	120
TD-RRH8x20-25 (Sprint)	152	1' Standoff (Sprint)	98
RRH-2X50-800 (Sprint)	152	GPS (Sprint)	98
ALU RRH-4X45-1900 (Sprint)	152		
RRH-2X50-800 (Sprint)	152		
RRH-2X50-800 (Sprint)	152		

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NORTH STONINGTON, CT 06359

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Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE:
MODIFICATION DETAILS

SHEET NUMBER:
ANT-014.00

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR DISSEMINATION OF REVISIONS TO CONTRACT DOCUMENTS AND REQUIREMENTS TO ALL SUBCONTRACTORS. THE CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES AND EQUIPMENT MANUFACTURERS.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS AND EXISTING FIELD CONDITIONS BEFORE PROCEEDING WITH CONSTRUCTION. DETERMINE EXACT LOCATIONS OF EXISTING UTILITIES, GROUNDS, DRAIN PIPES AND VENTS BEFORE COMMENCING WORK. CONTRACTOR SHALL NOTIFY ENGINEER IF ACTUAL CONDITIONS DIFFER SIGNIFICANTLY FROM WHAT IS SHOWN ON DRAWINGS.
3. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING A NEAT AND ORDERLY PROJECT SITE, REMOVE AND DISPOSE OF OFF SITE RUBBISH, WASTE MATERIALS, LITTER, AND ALL FOREIGN SUBSTANCES DAILY.
4. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE OWNER'S WRITTEN APPROVAL.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUCH COVERING, SHIELDING, AND BARRICADES AS REQUIRED TO PROTECT BYSTANDERS AND PASSERSBY, EQUIPMENT, SUPPLIES, ETC. FROM DUST, DEBRIS AND OTHER CAUSE OF DAMAGE RESULTING FROM CONSTRUCTION. ANY DAMAGE DURING CONSTRUCTION SHALL BE RESTORED TO PREVIOUS CONDITIONS.
6. IN AREAS WHERE EXISTING ANTENNA MOUNTS, TRANSMISSION LINES OR OTHER SUPPORTING EQUIPMENT IS TO BE REMOVED, THE EXISTING STRUCTURE SHALL BE REPAIRED AS REQUIRED.
7. ALL SAFETY AND OSHA REGULATIONS SHALL BE FOLLOWED STRICTLY. METHODS OF CONSTRUCTION AND ERECTION OF STRUCTURAL MATERIAL ARE THE CONTRACTOR'S RESPONSIBILITY.
8. CONTRACTOR TO PROVIDE TEMPORARY SUPPORT FOR ALL EXISTING ANTENNAS, TRANSMISSION LINES OR OTHER APPURTENANCES DURING CONSTRUCTION.
9. CONTRACTOR SHALL PROTECT EXISTING APPURTENANCES FROM DAMAGE DURING CONSTRUCTION.
10. NO ANTENNAS, CABLES, OR OTHER APPURTENANCES SHALL BE ADDED TO THE TOWER UNTIL THE MODIFICATION WORK IS COMPLETE.
11. ALL DIMENSIONS SHOWN ARE APPROXIMATE. CONTRACTOR SHALL COORDINATE DIMENSIONS WITH TOWER MANUFACTURER OR FIELD VERIFY DIMENSIONS PRIOR TO FABRICATING MEMBERS.
12. THE CONTRACTOR SHALL LOCATE ALL UTILITIES IN THE AREA OF CONSTRUCTION AND PREVENT DAMAGE TO THEM. SHOULD DAMAGE OCCUR TO ANY UTILITIES, THE CONTRACTOR IS REQUIRED TO REPAIR THE DAMAGE TO THE SATISFACTION OF THE OWNER AT HIS OWN EXPENSE.
13. ALL EXISTING PLANS, DETAILS, DIMENSIONS, AND ELEVATIONS INDICATE EXISTING CONDITIONS AS KNOWN. THE EXISTING INFORMATION SHOWN IS NOT INTENDED TO BE "AS BUILT" AND THE ACTUAL CONSTRUCTION MAY DIFFER FROM THAT SHOWN. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS INCLUDING DIMENSIONS AND ELEVATIONS PRIOR TO STARTING CONSTRUCTION. MINOR VARIATIONS CAN BE EXPECTED AND ANY REQUIRED DEVIATION FROM THE CONTRACT DOCUMENTS SHALL BE APPROVED BY THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
14. MODIFICATION DETAILS REPRESENTS TYPICAL CONDITIONS. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DEVIATION AS A RESULT OF SITE SPECIFIC CONDITIONS. REINFORCE ALL TOWER FACES IDENTICALLY, UNLESS OTHERWISE NOTED.
15. IN AREAS TO BE MODIFIED, ANY ANTENNA, COAX, OR CONDUIT SHALL BE TEMPORARILY MOVED AND THEN REPLACED AFTER COMPLETION OF WORK. COORDINATE WITH OWNER.
16. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL MATERIAL TO BE REMOVED.
17. CONTRACTOR SHALL ENSURE STABILITY OF TOWER DURING ALL WORK.
18. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE TEMPORARY BRACING OF THE STRUCTURE DURING ALL STAGES OF CONSTRUCTION. THE STRUCTURE IS DESIGNED FOR A COMPLETED CONDITION ONLY AND THEREFORE MAY REQUIRE ADDITIONAL SUPPORT BEFORE COMPLETIONS.
19. THIS DESIGN ASSUMES THE TOWER AND FOUNDATIONS HAVE BEEN WELL MAINTAINED, IN GOOD CONDITION, AND ARE WITHOUT DEFECT. BENT MEMBERS, CORRODED MEMBERS, LOOSE BOLTS, CRACKED WELDS AND OTHER MEMBER DEFECTS HAVE NOT BEEN CONSIDERED. THE TOWER IS ASSUMED TO BE PLUMB AND THE SITE IS ASSUMED TO BE LEVEL. THIS DESIGN IS BEING PROVIDED WITHOUT THE BENEFIT OF A COMMON ASSESSMENT BY MASER CONSULTING P.A. CONTRACTOR SHALL COMMISSION A COMPLETE CONDITION ASSESSMENT PRIOR TO ORDERING ANY REINFORCING MATERIALS. CONTRACTOR SHALL SUPPLY CONDITION ASSESSMENT TO ENGINEER FOR REVIEW. SEE CONTRACTOR NOTES.
20. ALL SUBSTITUTES PROPOSED BY THE CONTRACTOR SHALL BE APPROVED IN WRITING BY THE ENGINEER. CONTRACTOR SHALL PROVIDE DOCUMENTATION TO ENGINEER FOR DETERMINING IF SUBSTITUTE IS SUITABLE FOR USE AND MEETS THE ORIGINAL DESIGN CRITERIA. DIFFERENCES FROM THE ORIGINAL DESIGN, INCLUDING MAINTENANCE, REPAIR AND REPLACEMENT, SHALL BE NOTED. ESTIMATES OF COSTS/CREDITS ASSOCIATED WITH THE SUBSTITUTION (INCLUDING RE-DESIGN COSTS AND COSTS TO SUB-CONTRACTORS) SHALL BE PROVIDED TO THE ENGINEER. CONTRACTOR SHALL PROVIDE ADDITIONAL DOCUMENTATION AND/OR SPECIFICATIONS TO THE ENGINEER AS REQUESTED.
21. PROVIDE STRUCTURAL STEEL SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO FABRICATION.
22. INSPECTION OF THE MODIFICATIONS SHALL BE COMPLETED BY A THIRD PARTY. INSPECTION SHALL TAKE PLACE WITHIN 72 HOURS OF THE COMPLETION OF THE TOWER MODIFICATIONS. NO PROPOSED LOADING SHALL BE INSTALLED PRIOR TO INSPECTOR APPROVAL.

DESIGN LOADS

1. WIND: EIA/TIA-222-G
   NOMINAL WIND SPEED: 105 MPH
   EXPOSURE CATEGORY C
   TOPOGRAPHIC CATEGORY 1
2. DESIGN BASED ON THE SAME TOWER LOADING AND ASSUMPTIONS NOTED IN STRUCTURAL ANALYSIS REPORT BY MASER CONSULTING CONNECTICUT DATED JUNE 06, 2018.
3. TOWER MODIFICATIONS WERE DESIGNED IN ACCORDANCE TO TIA-222-G AND 2016 CONNECTICUT STATE BUILDING CODE (IBC 2015), AS WELL AS APPLICABLE LOCAL BUILDING CODES.

STRUCTURAL STEEL

1. DESIGN, FABRICATION, ERECTION AND WORKMANSHIP SHALL CONFORM TO AISC MANUAL OF STEEL CONSTRUCTION, FOURTEENTH EDITION.
2. CONNECTION BOLTS SHALL BE 3/4"Ø ASTM A325N UNLESS OTHERWISE NOTED.
3. FIELD WELDING SHALL BE PERFORMED BY WELDERS THAT ARE CERTIFIED (AWS "STANDARD QUALIFICATION PROCEDURE") TO PERFORM THE TYPE OF WORK REQUIRED. WELDS SHALL CONFORM TO AMERICAN WELDING SOCIETY (AWS) D1.1 "STRUCTURAL WELDING CODE - STEEL". PROVIDE THE MINIMUM SIZE PER PART 8 IN THE AISC "MANUAL OF STEEL CONSTRUCTION", 14TH EDITION, WHEN WELD SIZES ARE NOT SHOWN. USE E70XX ELECTRODES FOR ALL WELDING.
4. RETURN ALL WELDS AT CORNERS TWICE THE NOMINAL SIZE OF THE WELD MINIMUM, UNLESS OTHERWISE NOTED.
5. TO REDUCE WARPING TO A MINIMUM WHEN WELDING TO EXISTING MEMBERS CARRYING LOAD, SHORE OR BRACE EXISTING MEMBER DURING WELDING.
6. ALL COPES, BLOCKS, CUT OUTS, AND OTHER CUTTING OF STRUCTURAL MEMBERS SHALL HAVE ALL RE-ENTRANT CORNERS SHAPED, NOTCHED FREE TO A RADIUS OF AT LEAST 1/2".
7. CONTRACTOR IS RESPONSIBLE FOR ADEQUATE BRACING OF STEEL CONSTRUCTION.
8. ALL NEW STRUCTURAL STEEL SHAPES SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.
9. ALL NEW STEEL BOLTS, NUTS, AND HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL STRUCTURAL STEEL SHALL ABIDE BY THE FOLLOWING MATERIAL STRENGTH LIST UNLESS OTHERWISE NOTED:

PLATES	ASTM A572 (GR 36)
ANGLES	ASTM A36 (GR 36) (U.N.O)
SOLID ROUND	ASTM A572 (GR 50)
BOLTS	ASTM A325 (ALL BOLT HOLES STANDARD SIZE U.N.O.)
NUTS	ASTM A194-2H
WASHERS	ASTM F436
HOT-DIPPED GALVANIZING	ASTM A123
WELDS	E70XX
PAINT	NEW STEEL TO BE PAINTED TO MATCH EXISTING TOWER

SITE PREPARATION

1. PLACE CONCRETE AS SOON AS PRACTICAL AFTER EXCAVATION IS MADE TO PRESERVE THE INTEGRITY OF THE FOUNDATION, EXCAVATION AND BEARING CAPACITY. REMOVAL OF ANY WATER ACCUMULATED IN EXCAVATION IS REQUIRED PRIOR TO PLACEMENT OF CONCRETE.
2. ALL EXCAVATIONS SHALL CONFORM TO CURRENT OSHA REQUIREMENTS. CONTRACTOR WILL BE RESPONSIBLE FOR SAFEGUARDING AND PROTECTING, ALL EXCAVATIONS AND EXISTING STRUCTURES DURING CONSTRUCTION BY PROPER SAFEGUARDS WHICH MAY INCLUDE BRACING.
3. EXCAVATIONS SHALL BE FLAT AND LEVEL AND WELL CLEANED OF ALL LOOSE, WET SOIL OR ROCK. EXCAVATIONS SHALL BE FINISHED BY HAND. BACKFILL ANY OVEREXCAVATIONS.

TOWER FOUNDATION REACTIONS	
REACTION TYPE	FORCE
COMPRESSION (KIP)	171.3
SHEAR (KIP)	2.8
TORQUE (KIP-FT)	1
INNER GUY ANCHOR REACTIONS	
REACTION TYPE	FORCE
UPLIFT (KIP)	20.7
SHEAR (KIP)	29.1
MIDDLE GUY ANCHOR REACTIONS	
REACTION TYPE	FORCE
UPLIFT (KIP)	26.4
SHEAR (KIP)	25.5
OUTER GUY ANCHOR REACTIONS	
REACTION TYPE	FORCE
UPLIFT (KIP)	10.9
SHEAR (KIP)	11.2

CONTRACTOR NOTES

1. ALL CONTRACTORS AND LOWER TIER CONTRACTORS MUST ACKNOWLEDGE IN WRITING TO TOWER OWNER AND MASER CONSULTING P.A. THAT THEY HAVE OBTAINED, UNDERSTAND, AND WILL FOLLOW TOWER OWNER STANDARDS OF PRACTICE, CONSTRUCTION GUIDELINES, ALL SITE AND TOWER SAFETY PROCEDURES, ALL PRODUCT LIMITATIONS AND INSTALLATION PROCEDURES USED ON SITE, AND PROPOSED MODIFICATIONS DESCRIBED. RECEIPT OF ACKNOWLEDGMENT MUST OCCUR PRIOR TO BEGINNING CONSTRUCTION OR CLIMBING. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO PROVIDE THIS DOCUMENTATION FOR TOWER OWNER AND MASER CONSULTING P.A. ON COMPANY LETTERHEAD AND THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN THIS DOCUMENTATION FROM LOWER TIER SUBCONTRACTORS (ON SUBCONTRACTOR LETTERHEAD) AND DELIVER IT TO TOWER OWNER AND MASER CONSULTING P.A.
2. IF THE CONTRACTOR DISCOVERS ANY EXISTING CONDITIONS THAT ARE NOT REPRESENTED ON THESE DRAWINGS, OR ANY CONDITIONS THAT WOULD INTERFERE WITH THE INSTALLATION OF THE MODIFICATIONS, MASER CONSULTING P.A. SHALL BE CONTACTED IMMEDIATELY TO EVALUATE THE SIGNIFICANCE OF THE DEVIATION.
3. IT IS ASSUMED THAT ANY STRUCTURAL MODIFICATION WORK SPECIFIED ON THESE PLANS WILL BE ACCOMPLISHED BY KNOWLEDGEABLE WORKMEN WITH TOWER CONSTRUCTION EXPERIENCE. THIS INCLUDES PROVIDING THE NECESSARY CERTIFICATIONS TO THE TOWER OWNER AND ENGINEER.
4. THESE DRAWINGS DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION METHODS, MEANS, TECHNIQUES, SEQUENCES, AND PROCEDURES.
5. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PROGRAMS AND PRECAUTIONS IN CONNECTION WITH THIS WORK.
6. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING; ANY PROBLEMS WITH ACCESS, INTERFERENCE, ETC. SHALL BE RESOLVED PRIOR TO MOBILIZATION. THE CONTRACTOR MUST VISIT THE SITE PRIOR TO ORDERING ANY MATERIAL AND MUST RESOLVE ALL ISSUES WITH THE OWNER PREVENTING A CONTINUOUS INSTALLATION. CONTRACTOR SHALL NOTE ALL ANTENNAS, MOUNTS, COAX, LIGHTING, CLIMBING SUPPORTS, STEP BOLTS, PORT HOLES, AND ANY OTHER TOWER APPURTENANCES IN THE REGION OF THE MODIFICATIONS.
7. CONTRACTOR IS RESPONSIBLE FOR TEMPORARILY REMOVING ALL COAX, T-BRACKETS, ANTENNA MOUNTS, AND ANY OTHER TOWER APPURTENANCE THAT MAY INTERFERE WITH THE TOWER MODIFICATIONS. ALL TOWER APPURTENANCES MUST BE REPLACED AND/OR RESTORED TO ITS ORIGINAL LOCATION. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
8. SOME ATTACHMENTS MAY REQUIRE CUSTOM MODIFICATIONS TO PROPERLY FIT THE MODIFIED REGION OF THE STRUCTURE. THESE CUSTOMIZATIONS ARE DESIGNED BY OTHERS AND MUST BE APPROVED BY THE ENGINEER PRIOR TO REMOVING SUCH ATTACHMENTS. ANY CARRIER DOWNTIME MUST BE COORDINATED WITH THE TOWER OWNER IN WRITING.
9. CONTRACTOR SHALL ONLY WORK WITHIN THE LIMITS OF THE TOWER OWNER'S PROPERTY OR LEASE AREA AND APPROVED EASEMENTS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY WORK IS WITHIN THESE BOUNDARIES. CONTRACTOR SHALL EMPLOY A SURVEYOR AS REQUIRED. ANY WORK OUTSIDE THESE BOUNDARIES SHALL BE APPROVED IN WRITING BY THE LAND OWNER PRIOR TO MOBILIZATION. CONSTRUCTION STAKING AND BOUNDARY MARKING IS THE RESPONSIBILITY OF THE CONTRACTOR.
10. WORK SHALL ONLY BE PERFORMED DURING CALM DRY DAYS (WINDS LESS THAN 10-MPH) CONTRACTOR IS RESPONSIBLE FOR ALL TEMPORARY LOCAL TOWER SHORING, TEMPORARY GLOBAL TOWER SHORING, AND ALL SHORING OF SURROUNDING BUILDINGS, PADS, AND OTHER OUTDOOR SITE OBSTRUCTIONS. ALL SHORING. TEMPORARY BRACING, AND TEMPORARY SUPPORTS ARE THE RESPONSIBILITY OF THE CONTRACTOR.
11. MODIFICATIONS SHOWN SHALL BE INSTALLED ON ALL TOWER LEGS/FACES.

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SCALE:	JOB NUMBER:
AS SHOWN	17924001A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
3	06/06/18	REVISED PER COMMENTS	AMN	PET
2	04/06/18	REVISED PER COMMENTS	JRF	JKM
1	01/30/18	REVISED PER RFDS	JCM	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	DTS	PET
A	08/18/17	ISSUED FOR REVIEW	DTS	FEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN 31577

SITE NAME: 227 BOOMBRIDGE ROAD
SITE ID: CT03XC111

227 BOOM BRIDGE ROAD
NORTH STONINGTON, CT 06359

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SHEET TITLE:
MODIFICATION NOTES

SHEET NUMBER:
ANT-015.00