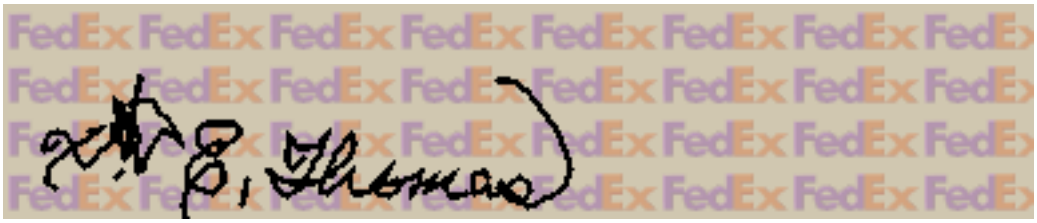
January 26,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 771268357218.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	E.THOMAS	**Delivery location:**	11 DELL DR UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Jan 24, 2018 17:48
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		



Shipping Information:

Tracking number:	771268357218	**Ship date:**	Jan 19, 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
CT23XC500 CSC Submission

Thank you for choosing FedEx.

January 24,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 771268506289.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	S.MCDANIEL	**Delivery location:**	310 NORWICH NEW LONDON TPKE UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Jan 24, 2018 10:54
Special Handling:	Deliver Weekday Direct Signature Required		

Shipping Information:

Tracking number:	771268506289	**Ship date:**	Jan 19, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Hon. Rod Mcdaniel Mayor
Town of Montville
310 Norwich-New London Tpke
2nd Floor
UNCASVILLE, CT 06382 US
Reference

Shipper:
Paul Sagristano
CCC
4 Davis Road West
Suite 5
OLD LYME, CT 06371 US
CT23XC500 CSC Sub

Thank you for choosing FedEx.

January 24,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 771268566321.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	T.WILLIAMS	**Delivery location:**	UNCASVILLE, CT
Service type:	FedEx Express Saver	**Delivery date:**	Jan 24, 2018 10:53
Special Handling:	Deliver Weekday Direct Signature Required		

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

Shipping Information:

Tracking number:	771268566321	**Ship date:**	Jan 19, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
UNCASVILLE, CT US

Shipper:
OLD LYME, CT US

Reference
CT23XC500 CSC Sub

Thank you for choosing FedEx.

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
57 Cook Drive Montville, CT 06382

Lat: N 41.47499
Long: W72.10504

January 19, 2018

Dear Ms. Bachman:

Sprint currently maintains 3 panel antennas at the 151' level of the above noted wireless tower. Sprint proposes to add 3 new panel antennas (1 per sector) and add 6 remote radio units (2 per sector) at the 151' tower level as well as 2 new hybrid cables and 30 Antenna-RRH jumper cables, 4 new Batteries in the existing Battery Cabinet and finally new 2.5 MHz radio equipment in the existing radio cabinet on the existing slab. Sprint is performing a new high-performance upgrade for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

The earliest CT Siting Council approval Available was issued to Springwich Cellular Limited Partnership on September 2, 1998 and the submission for that EM referenced an existing Sprint installation. The original Building permit for the Tower construction was issued by the Town on April 17, 1997.
.
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 Montville facility is located at 57 Cook Drive and is owned by for Wireless Solutions LLC, the Site coordinates are: N41.47499, W72.10504. The existing facility consists of a 193' Guyed Tower. Sprint currently operates wireless communications equipment on a platform on a concrete slab at the facility and has 3 antennas at a centerline of 151' feet on the tower.

Please accept this letter as notification to the Council, pursuant to R.C.S.A. Section 16-50j-73, for construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2).

In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter is being sent to Hon. Rod Mcdaniel the Mayor for the Town of Montville, as well as Ms. Marcia Vlaun, Zoning Director for the Town and Ken Thomas for Wireless Solutions LLC, the tower owner.

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).

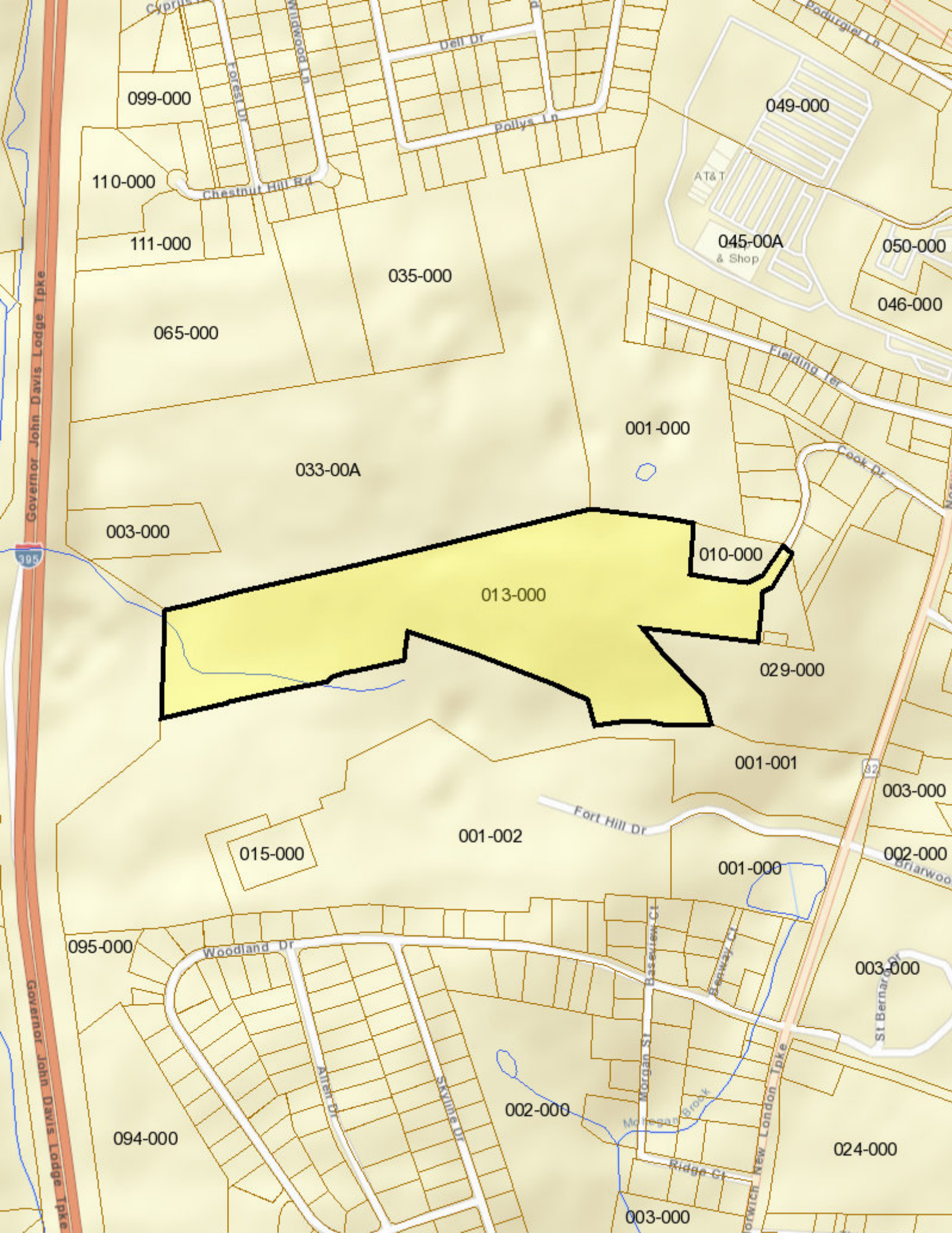
Respectfully submitted,

Paul F. Sagristano

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

PFS/mtf

Additional Recipients:
Hon Rod Mcdaniel – Mayor of the Town of Montville via Fed Ex
Ms. Marcia A. Vlaun, Town Planner for the Town of Montvillevia Fed Ex
Ken Thomas for Wireless Solutions LLC, the tower owner via Fed Ex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Chestnut Hill Rd
Windwood Ln
Forest Dr
Dell Dr
Pollys Ln
Fielding Ter
Cook Dr
Fort Hill Dr
Woodland Dr
Morgan St
Bayview Ct
Baseview Ct
Skyline Dr
Ridge Ct
Norwich New London Tpke
St Bernard Dr
Briarwood
Mohegan Brook
395
82

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

September 2, 1998

Ms. Sandy M. Carter
Regulatory Manager
Bell Atlantic Mobile
20 Alexander Drive, P.O. Box 5029
Wallingford, CT 06492

Re: EM-BAM-086-980821 - Bell Atlantic Mobile notice of intent to modify an existing telecommunications tower located at 57 Cook Drive, Montville, Connecticut.

Dear Ms. Carter:

At a public meeting held on September 1, 1998, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility in Montville, Connecticut, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated August 21, 1998. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequency now used on this tower. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston

Mortimer A. Gelston
Chairman

MAG/RKE/jlh

c: Honorable Patrick Dougherty, Mayor, Town of Montville

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STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

August 25, 1998

Honorable Patrick J. Dougherty
Mayor
Town of Montville, Town Hall
310 Norwich-New London Road
Uncasville, CT 06382

RE: EM-BAM-086-980821 - Bell Atlantic Mobile notice of intent to modify an existing telecommunications tower located at 57 Cook Drive, Montville, Connecticut.

Dear Mayor Dougherty:

On August 21, 1998, the Connecticut Siting Council (Council) received a request from Bell Atlantic Mobile to modify an existing telecommunications facility located at 57 Cook Drive in Montville, Connecticut, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72.

The Council will consider this item at the next meeting scheduled for Tuesday, September 1, 1998, at 10:00 a.m. in Hearing Room Two, Ten Franklin Square, New Britain, Connecticut.

Please call me or inform the Council if you have any questions or comments regarding this modification of an existing facility.

Thank you for your cooperation and consideration.

Very truly yours,

Joel M. Rinebold
Executive Director

JMR/jlh

Enclosure: Notice of Intent

ATTACHMENT ONE

Springwich Cellular Limited Partnership

300 Enterprise Drive
Rocky Hill, Connecticut 06067-3900
Phone: (860) 513-7755
Fax: (860) 513-7614

Peter J. Tyrrell
General Counsel

March 10, 1998

Mr. Mortimer A. Gelston, Chairman
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

RE: Springwich Cellular Limited Partnership—Uncasville (Montville) Cellular Communication Site

Dear Chairman Gelston:

Springwich Cellular Limited Partnership ("SCLP") plans to install cellular antennas and a related equipment at the tower facility in Uncasville, owned by Mr. Ken Thomas in Old Lyme, Connecticut. Please accept this letter as a notice of intent, pursuant to R.C.S.A. Section 16-50j-73, of the placement of associated equipment on an existing non-facility tower pursuant to R.C.S.A. Section 16-50j-72(c). In further compliance with R.C.S.A. Section 16-59j-73, a copy of this letter is being sent to the Mayor.

The existing non-facility tower is a 180' guyed tower located at 57 Cook Drive, Uncasville, (Montville), Connecticut. SCLP plans to install nine panel-type cellular antennas on the tower. SCLP will also install a single story, approximately 12' x 26' equipment building which will contain radio transmission equipment.

Smart SMR of New York, Inc. ("Nextel") is already located on the tower at the 140' level.

The addition of SCLP's antennas and equipment to the tower site does not constitute a substantial environmental affect since such additions do not cause a significant change or alteration in the physical and environmental characteristics of the site (see attached site plan). Rather, the planned changes to the existing non-facility tower falls squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(c).

First, the height of the existing tower will be unaffected. Nine antennas, ALP Model 11011N will be mounted, three per sector on a triangular platform to be attached to the tower. The center of radiation will be 177',6" AGL and the top of the antenna will be 180' high. The tower will not require any structural modification to support the proposed attachments (see attached tower elevation plan).

Second, the proposed addition will not extend the site boundaries. The proposed equipment building will be next to the tower on a parcel of land which will be leased to SCLP (see attached site plan).

Third, the proposed addition will not increase the noise levels at the existing facility by six decibels or more.

Fourth, operation of the additional antennas will not increase the total radio frequency electromagnetic radiation power density, measured at the tower base, to a level at or above the ANSI standard. The following table summarizes the power densities at the site from the various sources on the tower (including proposed herein) in relation to the standard.

TOWN OF MONTVILLE

Building Department

848-7166

APPROVED BUILDING PERMIT OR TRADES PERMIT
For 180 Days

Permit No: 13410 Approval Date: 4/17/97 Expiration Date: 10/17/97

Estimated Cost: Fees: PRF: 16.70 C.O: 25.00

Owner: Ken Thomas Address: 11 Dell Drive Tel: 434-6363

Job Location: 57 Cook Drive Code: 08

Contractor: Northeast Towers Address: Farmington Tel: 673-6044

Stick Built: Modular Home: Manufactured Home: Commercial: x

Addition: Garage: Car Port: Shed: Remodeling: Roofing:

Siding: Fireplace: Chimney: Windows: Pool: Demolition:

Plumbing: Heating: Electrical: Air Conditioning: Gas:

Patio: Porch: Deck: Retaining Wall: New: Repair/Removal:

Type of material used/discription: 180' radio tower

Size: Type of Heat: Fireplace:

No.of Stories: No. Rooms: Breezeway

No. Baths: Garage: Use:

I hereby certify that the proposed work will conform to the Basic Building Code and all other Codes as adopted by the State of Connecticut, and the Town of Montville.

Applicant's Signature: [signature] Date: 4-7-97

If signed by Contractor, type of license/registration & No: 00373

Building Official's Signature: Russell K Stanley Date: 4-17-97

Date of Health Dept. Approval: N/A

Date of Zoning Approval: OK

THIS IS TO INFORM YOU THAT UNDER THE CONNECTICUT AMENDMENT OF THE BUILDING CODE, SECTION 119.3 A CERTIFICATE OF OCCUPANCY IS REQUIRED PRIOR TO ANY USE OF THE STRUCTURE.

A MINIMUM OF 24 HOUR NOTICE TO THE BUILDING DEPARTMENT IS REQUIRED FOR INSPECTIONS.

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: CT23XC500

Mohegan Hill
57 Cook Drive
Montville, CT 06382

December 18, 2017

EBI Project Number: 6217005714

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.23 %

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

EBI Consulting
environmental | engineering | due diligence

December 18, 2017

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

Emissions Analysis for Site: **CT23XC500 – Mohegan Hill**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **57 Cook Drive, Montville, 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 **57 Cook Drive, Montville, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

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

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

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

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

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

6) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

7) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **RFS APXV9ERR18-C-A20 and the RFS DT465B-2XR** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **151 feet** above ground level (AGL) for **Sector A**, **151 feet** above ground level (AGL) for **Sector B** and **151 feet** above ground level (AGL) for Sector C.

10) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXV9ERR18-C-A20	Make / Model:	RFS APXV9ERR18-C-A20	Make / Model:	RFS APXV9ERR18-C-A20
Gain:	11.9 / 14.9 dBd	Gain:	11.9 / 14.9 dBd	Gain:	11.9 / 14.9 dBd
Height (AGL):	**151 feet**	Height (AGL):	**151 feet**	Height (AGL):	**151 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	5,873.76	ERP (W):	5,873.76	ERP (W):	5,873.76
Antenna A1 MPE%	**1.13 %**	Antenna B1 MPE%	**1.13 %**	Antenna C1 MPE%	**1.13 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR	Make / Model:	Commscope DT465B-2XR
Gain:	15.05 dBd	Gain:	15.05 dBd	Gain:	15.05 dBd
Height (AGL):	**151 feet**	Height (AGL):	**151 feet**	Height (AGL):	**151 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	5,118.23	ERP (W):	5,118.23	ERP (W):	5,118.23
Antenna A2 MPE%	**0.88 %**	Antenna B2 MPE%	**0.88 %**	Antenna C2 MPE%	**0.88 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.00 %**
AT&T	1.14 %
Clearwire	0.47 %
Nextel	0.46 %
Verizon Wireless	2.32 %
T-Mobile	0.84 %
Site Total MPE %:	**7.23 %**

SPRINT Sector A Total:	2.00 %
SPRINT Sector B Total:	2.00 %
SPRINT Sector C Total:	2.00 %
Site Total:	7.23 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	309.76	151	0.53	850 MHz	567	0.09%
Sprint 850 MHz LTE	2	309.76	151	1.06	850 MHz	567	0.19%
Sprint 1900 MHz (PCS) CDMA	5	494.45	151	4.23	1900 MHz (PCS)	1000	0.42%
Sprint 1900 MHz (PCS) LTE	2	1,236.12	151	4.23	1900 MHz (PCS)	1000	0.42%
Sprint 2500 MHz (BRS) LTE	8	639.78	151	8.75	2500 MHz (BRS)	1000	0.88%
						Total:	**2.00%**

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:	2.00 %
Sector B:	2.00 %
Sector C:	2.00 %
SPRINT Maximum Total (per sector):	2.00 %
Site Total:	7.23 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.23 %** 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.

MASER CONSULTING
— CONNECTICUT —

331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
T: 732.383.1950
www.maserconsulting.com

Sprint®

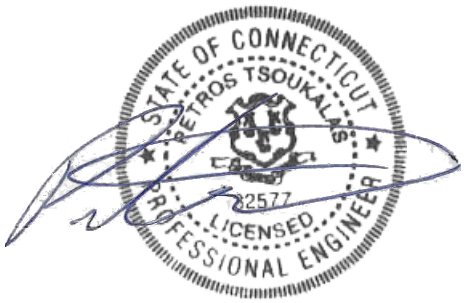
Revision 0

Guy Tower Structural Analysis

Site Name: *Mohegan Hill*
Site ID: *CT23XC500*

Site Address: *57 Cook Drive*
Montville, CT 06382
New London County
Maser Project Number: *17924003A*
October 27, 2017

Analysis Type	*Guy Tower*	*Foundation*
Pass/Fail	*Pass*	*Adequate*
Mount Utilization	*84.4 %*	*N/A*



Petros E. Tsoukalas, P.E.
Connecticut Professional Engineer
PE License # 32577

Objective:

The objective of this report is to determine the capacity of the existing 193' lattice guyed tower structure 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 visually verify the existing condition of the structure from grade and to locate and quantify the existing wireless appurtenances where possible. Maser Consulting Connecticut has reviewed the following documents in completing this report:

- RFDS 45795 provided by Sprint, dated April 11, 2017.
- Previous Structural Modifications Construction Drawings prepared by Hudson Design Group dated, January 21, 2013.
- Previous Structural Analysis report prepared by Hudson Design Group dated, January 18, 2013
- Previous Structural Analysis report prepared by Centek Engineering dated, May 6, 2015.
- Previous Structural Analysis report prepared by Hudson Design Group dated, February 21, 2013.
- Previous Structural Analysis report with Modifications prepared by Hudson Design Group dated, March 14, 2013.

The existing **SPRINT** equipment is supported on an existing 193' lattice guyed tower structure. The primary tower structure is constructed of pipe legs with pipe and angle diagonals and horizontals. The existing **SPRINT** equipment is supported on an existing antenna support mounts constructed of structural steel antenna support pipes supported by Steel Angles and pipes at a centerline of approximately 151'-0" above ground level. This report is based only upon this information, as well as the information obtained in the field.

Discrete and Linear Appurtenances:

Maser Consulting Connecticut understands the existing & proposed **SPRINT** loading to be as follows:

- *(3) RFS APXVSPP18-C-A20 Panel Antennas (Existing)*
- **(3) Commscope DT465B-2XR Panel Antennas (Proposed per RFDS)**
- *(3) ALU 1900 RRH (Existing)*
- *(3) ALU 800 RRH (Existing)*
- **(3) ALU TD-RRH8X20-2.5 (Proposed per RFDS)**
- **(3) ALU RRH-2X50-800 (Proposed per RFDS)**
- ***(5) Hybrid Cable (2 Proposed, 3 Existing)***

The overall antenna loading is found in the Appendix A of this report.

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
    - Exposure Category – B
    - Structure Class – II
    - Topographic Category - 1
    - ASCE 7-10 Ultimate wind speed 133mph-Nominal wind speed 103mph

Analysis Approach & Assumptions:

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

- Structural Steel Main Legs and Diagonals are constructed of A572-50 Grade Steel.
- Structural Steel Round Members are constructed of A500 Gr B 42 Steel.
- Structural Steel Angle members are constructed of A36 Grade.
- Structural Bolts are assumed to be A325N, A490X and A325X grade.
- It is assumed that the modification proposed per the reference documents are assumed to be installed per the construction drawings.
- Tower is installed to plumb and is maintained properly without any structural deficiencies or deteriorations to the original design.
- 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.
- 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 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.
- Proposed equipment and locations should not deviate from the proposed locations noted herein and shown on the associated Maser Consulting Connecticut final Construction Drawings.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

The existing guyed lattice 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.

The lattice tower has been determined to be stressed to a maximum of **84.4%** of its structural capacity with the maximum usage occurring at the guy wire at 162.5' elevation. The main leg members are stressed to a maximum of **74.1%** of their structural capacity at 80'-0" to 100'-0" elevation.

Foundation Reaction Comparison

Tower Base	Foundation Reaction from Previous Analysis using 222F*1.35	Current Forces	Comparison
Shear	5.4 kips	3 kips	Adequate
Axial	267.3 kips	220 kips	Adequate

Anchor Block Reactions

	Anchor @ 88ft radius (Allowable Reactions)	Anchor @ 88ft radius (Current Reactions)	Anchor @ 140 radius (Allowable Reactions)	Anchor @ 140 radius (Current Reactions)	Comparison
Uplift	124.2 kips	34 kips	168.5 kips	43 kips	Adequate
Sliding	162.3 kips	34 kips	120.74 kips	38 kips	Adequate

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

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

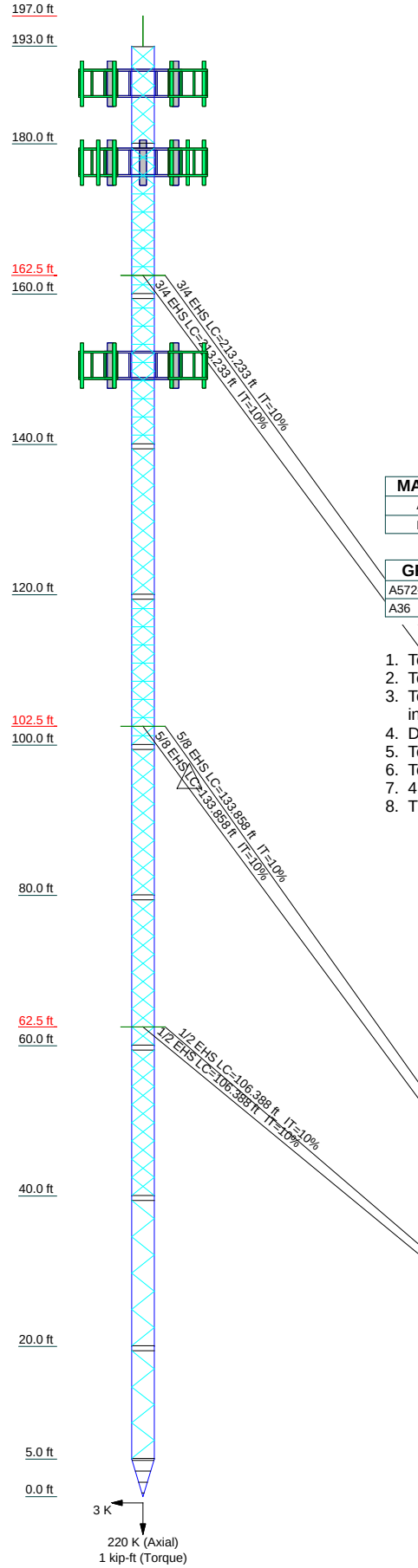
It should be noted that due to a lack of information Maser Consulting Connecticut did not perform an analysis on the foundation, but a comparison of the capacities summarized in previous analysis with the current forces has been determined. If information is provided, then this report can be amended. 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.

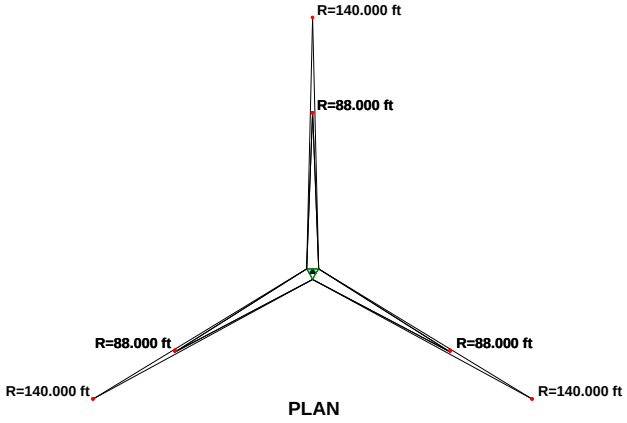
We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,
Maser Consulting Connecticut

Petros E. Tsoukalas, P.E.
Telecommunications Discipline Leader
\\maserconsulting.com\luj\Projects\2017\17924000A\17924003A\Structural\Tower Analysis\Rev 0\Word\CT23XC500.Mohegan Hill.Guy Tower Analysis.Rev 0.doc

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs		P2.5x.276	2.5" STD with 1/3 split HSS 3.5x0.313		P2.5x.276			P3x.3				
Leg Grade							A572-50					
Diagonals	N.A.		L2x2x1/4		ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	L1 3/4x1 3/4x3/16	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	A	
Diagonal Grade	N.A.		A36		A53-B-42	A36	A53-B-42	A36		A53-B-42		
Top Girts	B		L2x2x1/4		ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	A	
Mid Girts	B		N.A.									
Bottom Girts	B		L2x2x1/4		ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	A	
Sec. Horizontals		N.A.			N.A.	L2x2x1/4			N.A.			
Face Width (ft)		3.42										
# Panels @ (ft)	C	5 @ 2.56667					64 @ 2.41276				6 @ 2.38368	
Weight (K)	13.1	0.8	2.6	1.5	0.9	2.3	0.8	1.6	1.0	0.7	0.6	0.4





SYMBOL LIST

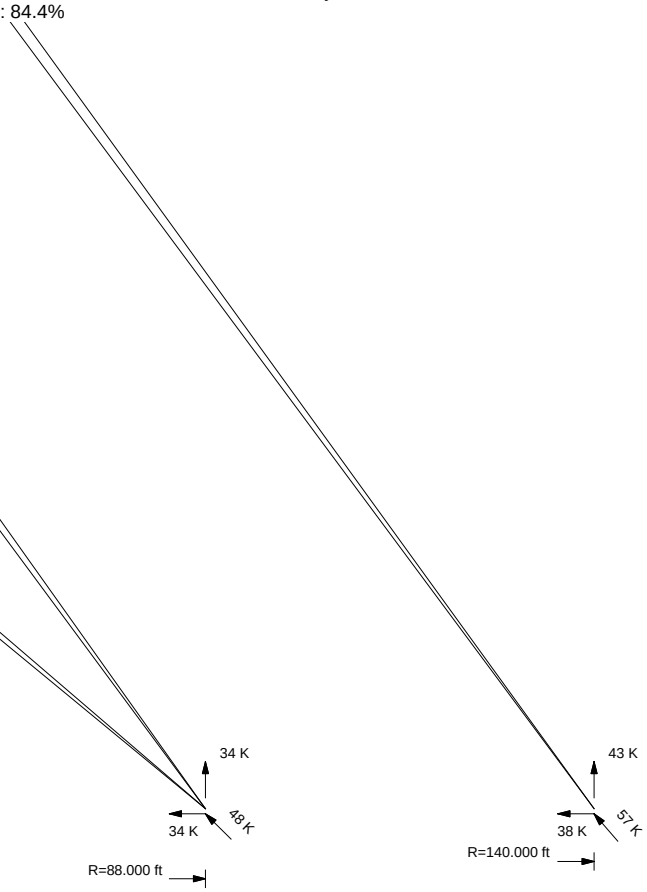
MARK	SIZE	MARK	SIZE
A	ROHN TS1.5x11 ga	C	3 @ 1.44444
B	L3x3x1/2		

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 designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 103 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.000 ft
7. 4.000 ft Lightening Rood is included for load transfer only.
8. TOWER RATING: 84.4%

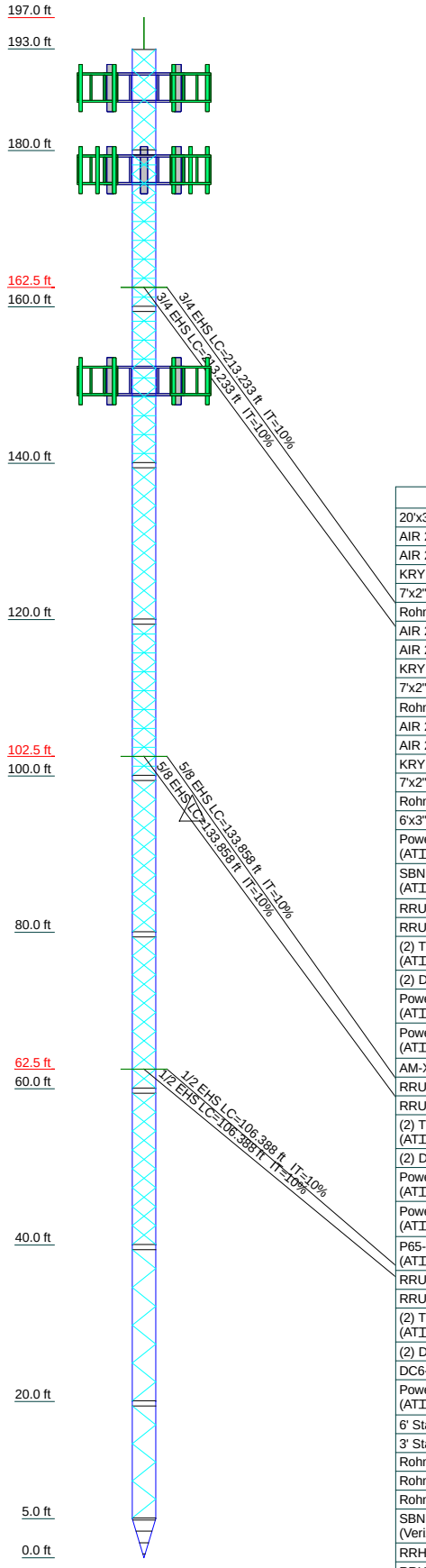


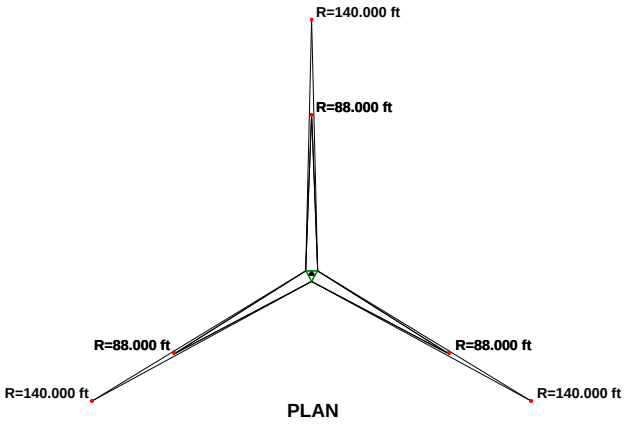
ALL REACTIONS ARE FACTORED

Maser Consulting Connecticut
331 Newman Springs Road, Suite 203
Red Bank, NJ 07701
Phone: 877.627.3772
FAX: 973.398.3199

Job: ***Guyed Tower Analysis***			
Project: ***17924003A***			
Client: Sprint	Drawn by: gpenumatsa	App'd:	
Code: TIA-222-G	Date: 10/27/17	Scale: NTS	
Path: R:\Projects\2017\17924000A\17924003A\Structural\Tower Analysis\TNX\CT23XC500.MOHEGAN HILL Tower Analysis Rev 0.eri		Dwg No. E-1	

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	
Legs		P2.5x.276	2.5" STD with 1/3 split HSS 3.5x0.313		P2.5x.276			P3x.3					
Leg Grade					A572-50								
Diagonals	N.A.	L2x2x1/4			ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	L1 3/4x1 3/4x3/16	ROHN TS1.5x11 ga	ROHN TS1.5x16 ga	A	N.A.	
Diagonal Grade	N.A.	A36			A53-B-42	A36	A53-B-42	A36		A53-B-42		N.A.	
Top Girts	B	L2x2x1/4			ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x16 ga	A	B	
Mid Girts	B			N.A.									
Bottom Girts	B	L2x2x1/4			ROHN TS1.5x11 ga	L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 ga		ROHN TS1.5x16 ga	A	B	
Sec. Horizontals	N.A.	L2x2x1/4			N.A.	L2x2x1/4		N.A.					
Face Width (ft)	3.42						64 @ 2.41276						
# Panels @ (ft)	5 @ 2.56667										6 @ 2.38368	C	
Weight (K)	0.8	2.6	1.5		0.9	2.3	0.8	1.6	1.0	0.7	0.6	0.4	13.1





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20'x3" Dia Omni	188.75	SBNHH-1D65B w/ 8ft mount pipe (Verizon)	169
AIR 21 B4A/B2P (T-Mobile)	188	RRH2X60-07-U (Verizon)	169
AIR 21 B4A/B2P (T-Mobile)	188	RRH2X60-AWS (Verizon)	169
KRY 112 71 (T-Mobile)	188	RRH2X60-PCS (Verizon)	169
7'x2" Antenna Mount Pipe (T-Mobile)	188	Pirod 15' T-Frame Sector Mount (1) (Verizon)	169
Rohn 6'x10' Boom Gate (T-Mobile)	188	LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	169
AIR 21 B4A/B2P (T-Mobile)	188	LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	169
AIR 21 B4A/B2P (T-Mobile)	188	SBNHH-1D65B w/ 8ft mount pipe (Verizon)	169
KRY 112 71 (T-Mobile)	188	SBNHH-1D65B w/ 8ft mount pipe (Verizon)	169
7'x2" Antenna Mount Pipe (T-Mobile)	188	RRH2X60-07-U (Verizon)	169
Rohn 6'x10' Boom Gate (T-Mobile)	188	RRH2X60-AWS (Verizon)	169
AIR 21 B4A/B2P (T-Mobile)	188	RRH2X60-PCS (Verizon)	169
AIR 21 B4A/B2P (T-Mobile)	188	DB-T1-6Z-8AB-0Z (Verizon)	169
KRY 112 71 (T-Mobile)	188	DB-T1-6Z-8AB-0Z (Verizon)	169
7'x2" Antenna Mount Pipe (T-Mobile)	188	LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	169
Rohn 6'x10' Boom Gate (T-Mobile)	188	LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	169
6'x3" Dia Omni	180	SBNHH-1D65B w/ 8ft mount pipe (Verizon)	169
Powerwave 7770 w/5ft mount pipe (ATI)	178.75	Pirod 15' T-Frame Sector Mount (1) (Verizon)	169
SBNH-1D6565C w/8ft 2.0 Std pipe (ATI)	178.75	4 Bay Dipole	155.5
RRUS-11 (ATI)	178.75	ALU RRH-4X45-1900 (Sprint)	151
RRUS-12 (ATI)	178.75	APXVSPP18-C-A20 (Sprint)	151
(2) TT19-08BP111-001 Twin TMA (ATI)	178.75	DT465B-2XR Panel Antenna W/M PIPE (Sprint)	151
(2) Diplexer (ATI)	178.75	TD-RRH8x20-25 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATI)	178.75	(2) RRH-2X50-800 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATI)	178.75	ALU RRH-4X45-1900 (Sprint)	151
AM-X-CD-16-65-OOT-RET (ATI)	178.75	APXVSPP18-C-A20 (Sprint)	151
RRUS-11 (ATI)	178.75	DT465B-2XR Panel Antenna W/M PIPE (Sprint)	151
RRUS-12 (ATI)	178.75	TD-RRH8x20-25 (Sprint)	151
(2) TT19-08BP111-001 Twin TMA (ATI)	178.75	(2) RRH-2X50-800 (Sprint)	151
(2) Diplexer (ATI)	178.75	ALU RRH-4X45-1900 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATI)	178.75	APXVSPP18-C-A20 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATI)	178.75	DT465B-2XR Panel Antenna W/M PIPE (Sprint)	151
P65-17-XLH-RR w/8ft mount pipe (ATI)	178.75	TD-RRH8x20-25 (Sprint)	151
RRUS-11 (ATI)	178.75	(2) RRH-2X50-800 (Sprint)	151
RRUS-12 (ATI)	178.75	3'-6" Standoff	151
(2) TT19-08BP111-001 Twin TMA (ATI)	178.75	Rohn 6'x15' Boom Mount (Sprint)	150.5
(2) Diplexer (ATI)	178.75	Rohn 6'x15' Boom Mount (Sprint)	150.5
DC6-48-06-18-8F (ATI)	178.75	Rohn 6'x15' Boom Mount (Sprint)	150.5
Powerwave 7770 w/5ft mount pipe (ATI)	178.75	(2) 840 10054 (Metro PCS)	130
6' Standoff Arm	178	(2) 860 10025 RCU (Metro PCS)	130
3' Standoff	178	Andrew QT SF12-2-72 (Metro PCS)	130
Rohn 6'x15' Boom Mount (ATI)	177.5	Splice Box (Metro PCS)	130
Rohn 6'x15' Boom Mount (ATI)	177.5	GPS (Metro PCS)	130
Rohn 6'x15' Boom Mount (ATI)	177.5	(2) 840 10054 (Metro PCS)	130
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	169	(2) 860 10025 RCU (Metro PCS)	130
RRH2X60-07-U (Verizon)	169	Andrew QT SF12-2-72 (Metro PCS)	130
RRH2X60-AWS (Verizon)	169	(2) 840 10054 (Metro PCS)	130
RRH2X60-PCS (Verizon)	169	(2) 860 10025 RCU (Metro PCS)	130
Pirod 15' T-Frame Sector Mount (1) (Verizon)	169	Andrew QT SF12-2-72 (Metro PCS)	130
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	169	DB408	126
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	169	3' Standoff	122.5
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	169	PD220	121
		PD220	121

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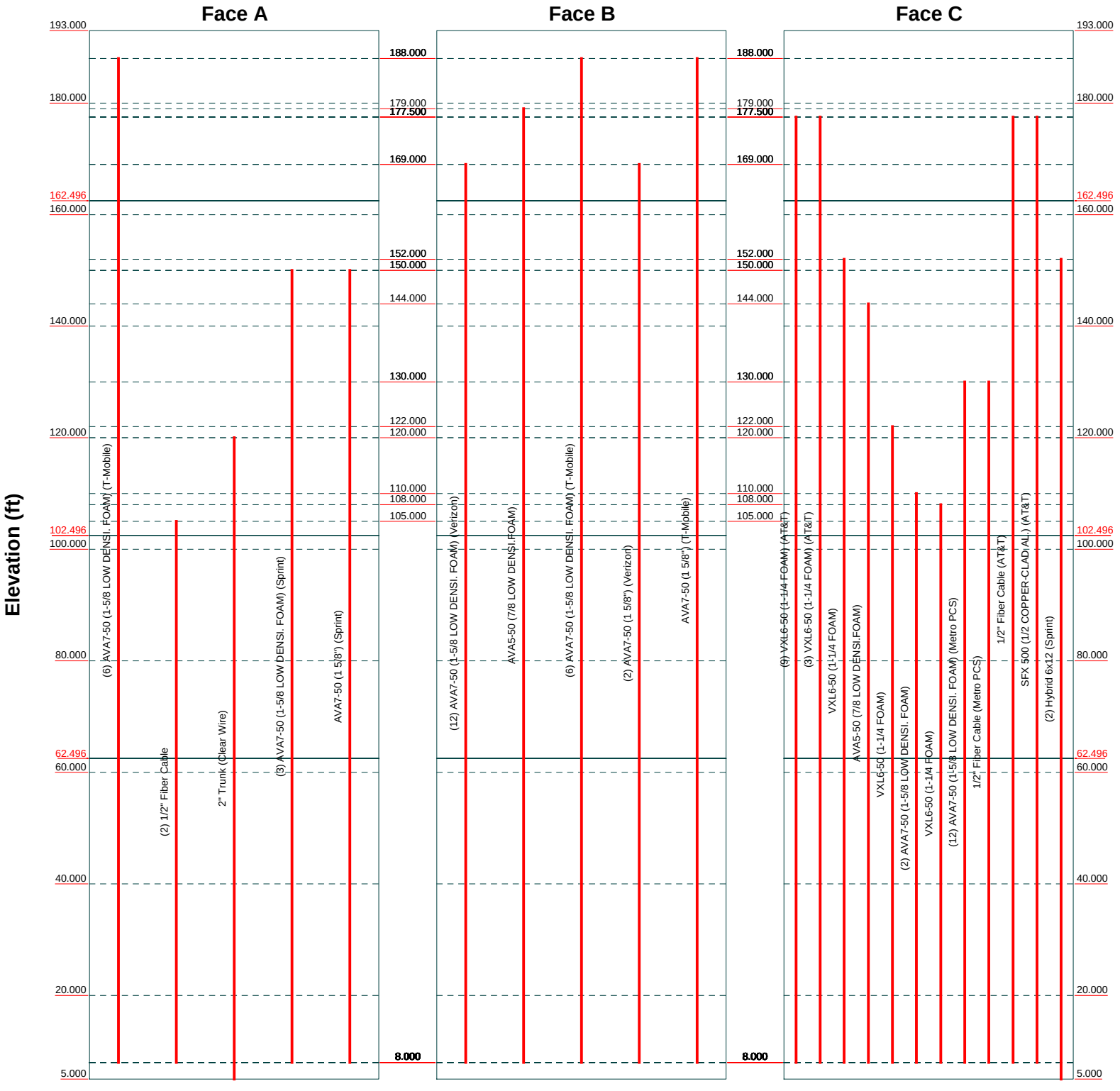
Project:	***17924003A***		
Client: Sprint	Drawn by: gpenumatsa		App'd:
Code: TIA-222-G	Date: 10/27/17		Scale: NTS
Path: R:\Projects\2017\17924000A\17924003A\Structural\Tower Analysis\TNX\CT23XC500.MOHEGAN HILL Tower Analysis Rev 0.eri			Dwg No. E-1

Feed Line Distribution Chart
5' - 193'

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



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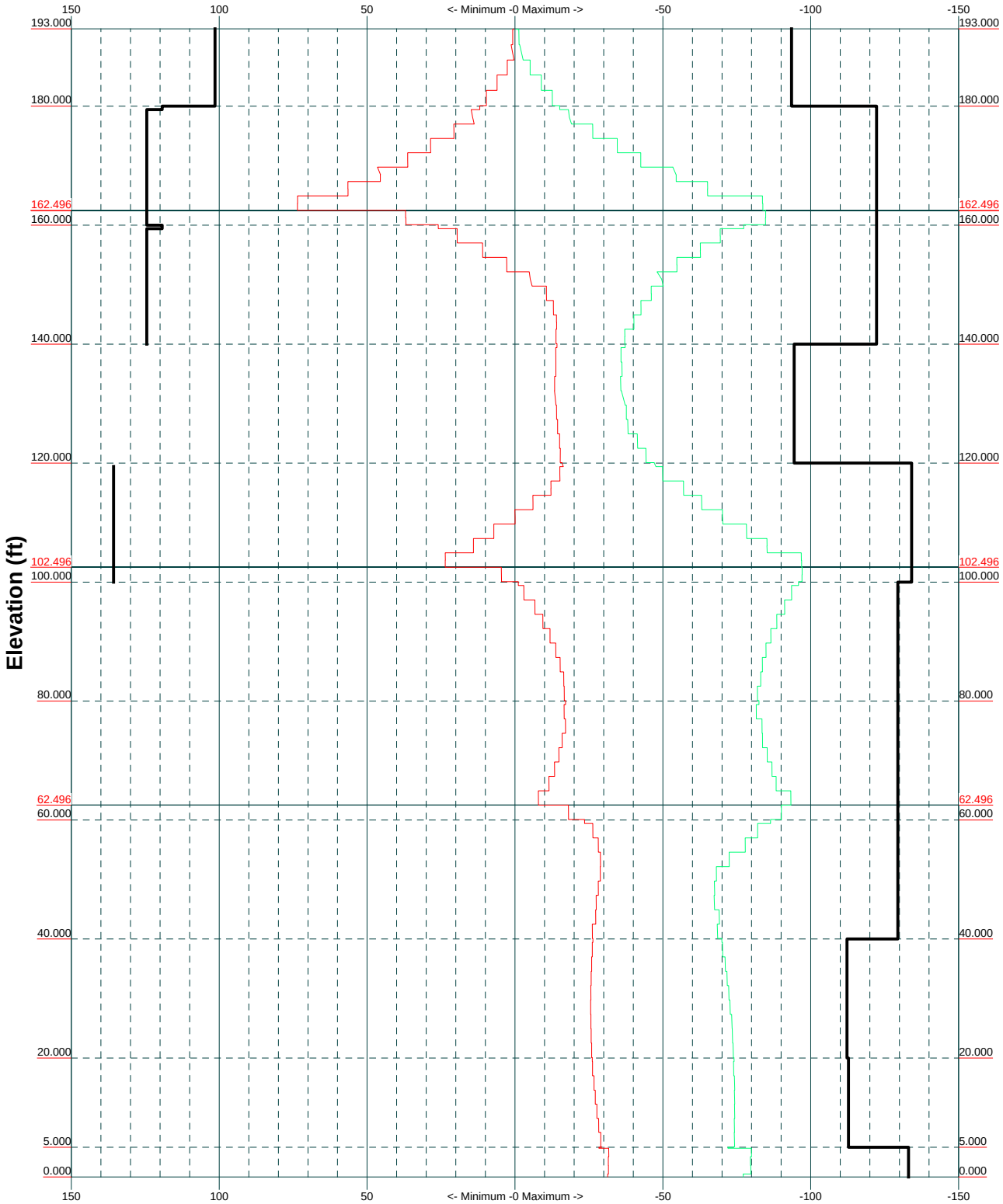
Code: TIA-222-G	Date: 10/27/17	Scale: NTS	
Path: R:\Projects\2017\17924000A\17924003A\Structural\Tower Analysis\TNX\CT23XC500.MOHEGAN HILL Tower Analysis Rev 0.eri		Dwg No. E-7	

TIA-222-G - 103 mph/50 mph 0.750 in Ice Exposure B

Leg Capacity ——— **Leg Compression (K)**



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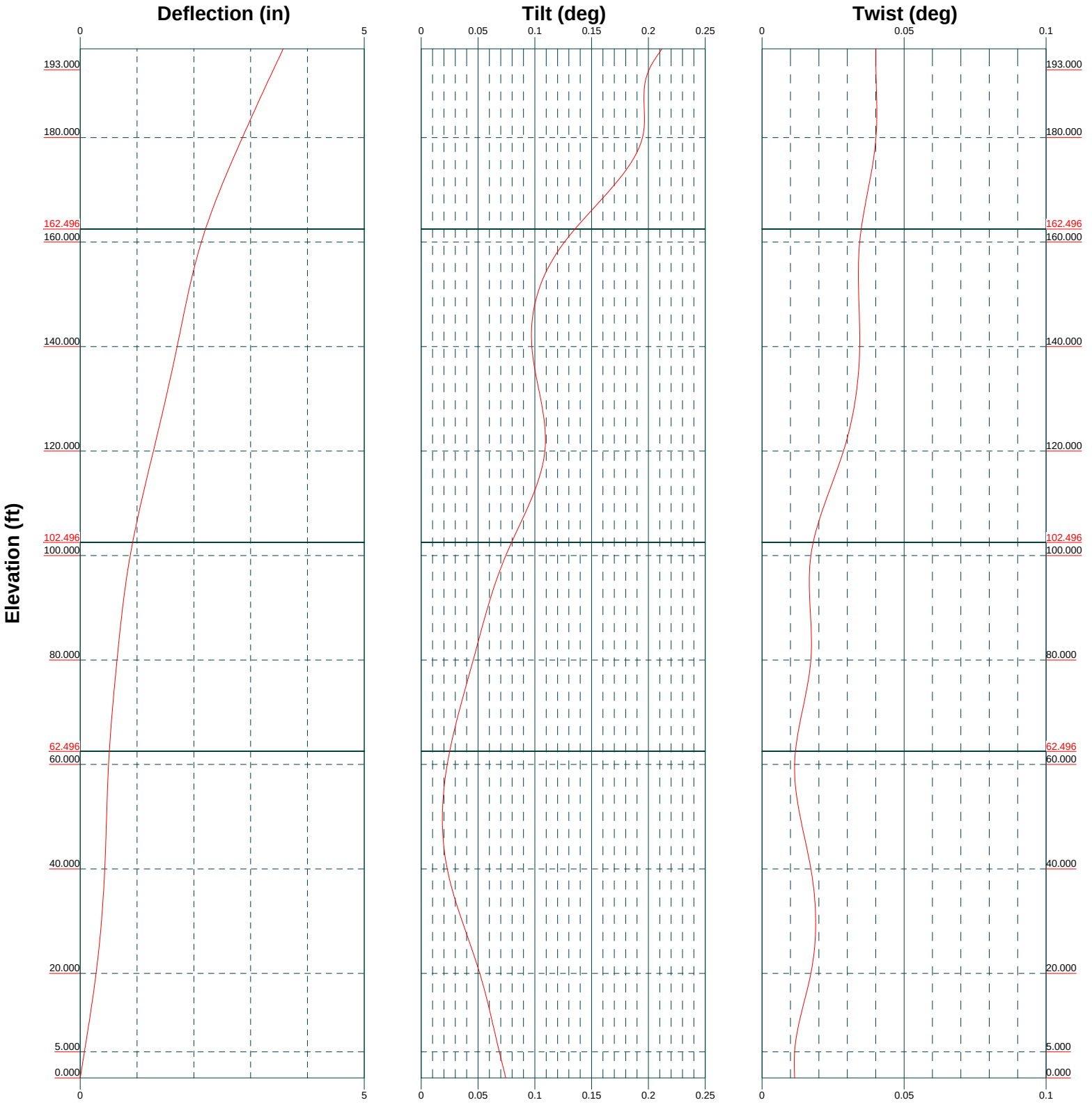
Project: ***17924003A***			
Client: Sprint	Drawn by: gpenumatsa		App'd:
Code: TIA-222-G	Date: 10/27/17		Scale: NTS
Path: R:\Projects\2017\17924000A\17924003A\Structural\Tower Analysis\TNX\CT23XC500.MOHEGAN HILL Tower Analysis Rev 0.eri			Dwg No. E-3

TIA-222-G - Service - 60 mph

Maximum Values



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Job: ***Guyed Tower Analysis***			
Project: ***17924003A***			
Client: Sprint	Drawn by: gpenumatsa	App'd:	
Code: TIA-222-G	Date: 10/27/17	Scale: NTS	
Path: R:\Projects\2017\17924000A\17924003A\Structural\Tower Analysis\TNX\CT23XC500.MOHEGAN HILL Tower Analysis Rev 0.eri		Dwg No. E-5	

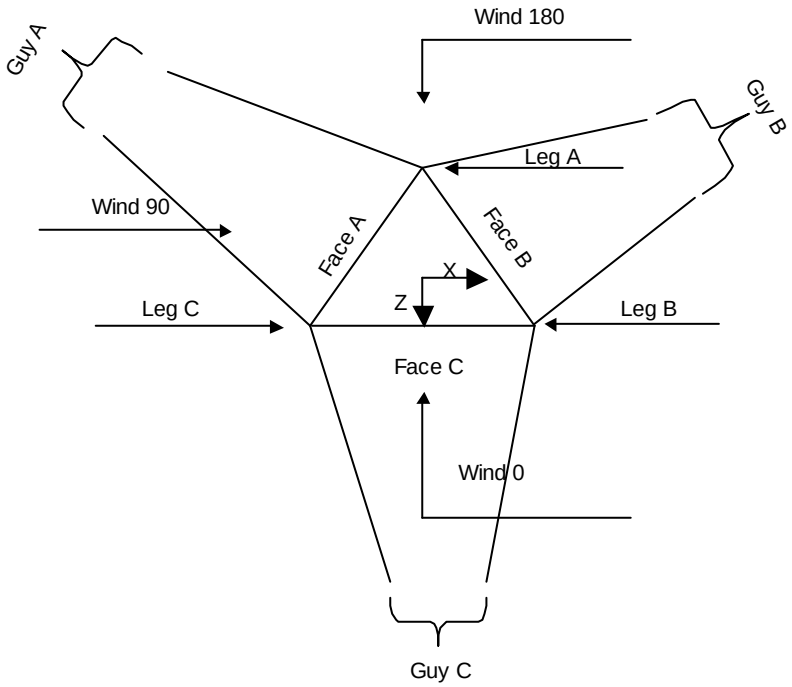
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 193.000 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:

ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 103 mph.
Structure Class II.
Exposure Category B.
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 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 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				



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	193.000-180.000			3.420	1	13.000
T2	180.000-160.000			3.420	1	20.000
T3	160.000-140.000			3.420	1	20.000
T4	140.000-120.000			3.420	1	20.000
T5	120.000-100.000			3.420	1	20.000
T6	100.000-80.000			3.420	1	20.000
T7	80.000-60.000			3.420	1	20.000
T8	60.000-40.000			3.420	1	20.000
T9	40.000-20.000			3.420	1	20.000
T10	20.000-5.000			3.420	1	15.000
T11	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	193.000-180.000	2.567	X Brace	No	No	1.000	1.000
T2	180.000-160.000	2.413	X Brace	No	Yes	7.375	1.000
T3	160.000-140.000	2.413	X Brace	No	Yes	7.375	1.000
T4	140.000-120.000	2.413	CX Brace	No	No	7.375	1.000
T5	120.000-100.000	2.413	X Brace	No	Yes	7.375	1.000
T6	100.000-80.000	2.413	CX Brace	No	No	7.375	1.000
T7	80.000-60.000	2.413	X Brace	No	No	7.375	1.000
T8	60.000-40.000	2.413	CX Brace	No	No	7.375	1.000
T9	40.000-20.000	2.413	K Brace Left	No	No	7.375	1.000
T10	20.000-5.000	2.384	K Brace Left	No	No	7.375	1.000
T11	5.000-0.000	1.444	X Brace	No	Yes	2.000	6.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 193.000-180.000	Pipe	P2.5x.276	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 180.000-160.000	Arbitrary Shape	2.5" STD with 1/3 split HSS 3.5x0.313	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T3 160.000-140.000	Arbitrary Shape	2.5" STD with 1/3 split HSS 3.5x0.313	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T4 140.000-120.000	Pipe	P2.5x.276	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.000-100.000	Pipe	P3x.3	A572-50 (50 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T6 100.000-80.000	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.000-60.000	Pipe	P3x.3	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 60.000-40.000	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T9 40.000-20.000	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.000-5.000	Pipe	P3x.3	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.000-0.000	Pipe	P3x.3	A572-50 (50 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 193.000-180.000	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T2 180.000-160.000	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T3 160.000-140.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.000-120.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.000-100.000	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)
T6 100.000-80.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.000-60.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.000-40.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T9 40.000-20.000	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.000-5.000	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.000-0.000	Single Angle	L3x3x1/2	A36 (36 ksi)	Single Angle	L3x3x1/2	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
T11 5.000-0.000	2	Single Angle	L3x3x1/2	A36 (36 ksi)	Equal Angle		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
T2 180.000-160.000	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T3 160.000-140.000	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 120.000-100.000	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 193.000-180.000	0.280	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T2 180.000-160.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T3 160.000-140.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T4 140.000-120.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T5 120.000-100.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T6 100.000-80.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T7 80.000-60.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T8 60.000-40.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T9 40.000-20.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T10 20.000-5.000	0.070	0.375	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T11 5.000-0.000	0.070	0.375	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 193.000-180.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 180.000-160.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 160.000-140.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 140.000-120.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 120.000-100.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 100.000-80.000	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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
T7	Yes	Yes	1	1	1	1	1	1	1	1
80.000-60.000				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
60.000-40.000				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.000-20.000				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.000-5.000				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
5.000-0.000				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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	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
193.000-180.000														
T2	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
180.000-160.000														
T3	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
160.000-140.000														
T4	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
140.000-120.000														
T5	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
120.000-100.000														
T6	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
100.000-80.000														
T7	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
80.000-60.000														
T8	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
60.000-40.000														
T9	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
40.000-20.000														
T10	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
20.000-5.000														
T11	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
5.000-0.000														

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 193.000-180.000	Flange	0.750 A325N	4	0.625 A325N	2	0.625 A325N	2	0.625 A325N	2	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 180.000-160.000	Flange	0.750 A325N	4	0.625 A325N	2	0.625 A325N	2	0.625 A325N	2	0.625 A325N	0	0.625 A325N	0	0.625 A325N	1
T3 160.000-140.000	Flange	0.750 A325N	4	0.625 A325X	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	1
T4 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
T5 120.000-100.000	Flange	0.750 A325N	4	0.625 A325N	2	0.625 A325N	2	0.625 A325N	2	0.625 A325N	0	0.625 A325N	0	0.625 A325N	1
T6 100.000-80.000	Flange	0.750 A325N	4	0.500 A490X	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 80.000-60.000	Flange	0.750 A325N	4	0.625 A325X	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 60.000-40.000	Flange	0.750 A325N	4	0.500 A325X	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 40.000-20.000	Flange	0.750 A325N	4	0.625 A490X	1	0.500 A325N	1	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T10 20.000-5.000	Flange	0.750 A325N	4	0.500 A490X	1	0.500 A325N	1	0.625 A490X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T11 5.000-0.000	Flange	0.750 A325N	4	0.500 A325N	0	0.500 A325N	0	0.500 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 K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.496	EHS	A	3/4	5.830	10%	19000.000	1.155	213.042	140.000	0.0000	0.000	100%
		B	3/4	5.830	10%	19000.000	1.155	213.042	140.000	0.0000	0.000	100%
		C	3/4	5.830	10%	19000.000	1.155	213.042	140.000	0.0000	0.000	100%
102.496	EHS	A	5/8	4.240	10%	21000.000	0.813	133.744	88.000	0.0000	0.000	100%
		B	5/8	4.240	10%	21000.000	0.813	133.744	88.000	0.0000	0.000	100%
		C	5/8	4.240	10%	21000.000	0.813	133.744	88.000	0.0000	0.000	100%
62.4961	EHS	A	1/2	2.690	10%	21000.000	0.517	106.297	88.000	0.0000	0.000	100%
		B	1/2	2.690	10%	21000.000	0.517	106.297	88.000	0.0000	0.000	100%
		C	1/2	2.690	10%	21000.000	0.517	106.297	88.000	0.0000	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
162.496	Torque Arm	6.830	0.0000	Channel	A36 (36 ksi)	Channel	C15x50
102.496	Torque Arm	6.830	0.0000	Channel	A36 (36 ksi)	Channel	C15x33.9
62.4961	Torque Arm	6.830	0.0000	Channel	A36 (36 ksi)	Channel	C12x25

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
162.496	A36 (36 ksi)	Solid Round				A572-50 (50 ksi)	Single Angle	
102.496	A36 (36 ksi)	Solid Round				A572-50 (50 ksi)	Single Angle	
62.496	A36 (36 ksi)	Solid Round				A572-50 (50 ksi)	Single Angle	

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
162.496	0.246	0.246	0.246		4.429 3.6 sec/pulse	4.429 3.6 sec/pulse	4.429 3.6 sec/pulse	
102.496	0.109	0.109	0.109		1.700 2.3 sec/pulse	1.700 2.3 sec/pulse	1.700 2.3 sec/pulse	
62.4961	0.055	0.055	0.055		1.080 1.8 sec/pulse	1.080 1.8 sec/pulse	1.080 1.8 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
162.496	No	No	1	1	1	1	1	1
102.496	No	No	1	1	1	1	1	1
62.4961	No	No	1	1	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
162.496	0.875 A325N	4	0.000	1	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
102.496	0.875 A325N	4	0.000	1	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
62.4961	0.875 A325N	4	0.000	1	0.625 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 ksf	q_z Ice ksf	Ice Thickness in
162.496	A	81.248	0.021	0.005	1.641
	B	81.248	0.021	0.005	1.641
	C	81.248	0.021	0.005	1.641
102.496	A	51.248	0.019	0.004	1.568
	B	51.248	0.019	0.004	1.568
	C	51.248	0.019	0.004	1.568
62.4961	A	31.248	0.016	0.004	1.492
	B	31.248	0.016	0.004	1.492
	C	31.248	0.016	0.004	1.492

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
162.496	A	49.6459	6.018 5.830	-0.095	4.637	-3.834	-9.143	13.280	-15.836
	A	49.6459	6.018 5.830	0.095	4.637	-3.834	-9.143	-13.280	15.836
	B	49.6459	6.018 5.830	3.368	4.637	1.835	18.285	13.280	0.000
	B	49.6459	6.018 5.830	3.273	4.637	1.999	-9.143	-13.280	-15.836
	C	49.6459	6.018 5.830	-3.273	4.637	1.999	-9.143	13.280	15.836
	C	49.6459	6.018 5.830	-3.368	4.637	1.835	18.285	-13.280	0.000
			Sum:	0.000	27.823	0.000	-0.000	0.000	0.000
102.496	A	49.9699	4.323 4.240	-0.109	3.333	-2.752	-6.571	9.612	-11.382
	A	49.9699	4.323 4.240	0.109	3.333	-2.752	-6.571	-9.612	11.382
	B	49.9699	4.323 4.240	2.438	3.333	1.281	13.142	9.612	0.000
	B	49.9699	4.323 4.240	2.328	3.333	1.470	-6.571	-9.612	-11.382
	C	49.9699	4.323 4.240	-2.328	3.333	1.470	-6.571	9.612	11.382

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
	C	49.9699	4.323 4.240	-2.438	3.333	1.281	13.142	-9.612	0.000
			Sum:	0.000	19.997	0.000	-0.000	0.000	0.000
62.4961	A	35.9754	2.722 2.690	-0.087	1.617	-2.188	-3.188	7.644	-5.523
	A	35.9754	2.722 2.690	0.087	1.617	-2.188	-3.188	-7.644	5.523
	B	35.9754	2.722 2.690	1.938	1.617	1.019	6.377	7.644	0.000
	B	35.9754	2.722 2.690	1.852	1.617	1.169	-3.188	-7.644	-5.523
	C	35.9754	2.722 2.690	-1.852	1.617	1.169	-3.188	7.644	5.523
	C	35.9754	2.722 2.690	-1.938	1.617	1.019	6.377	-7.644	0.000
			Sum:	0.000	9.703	0.000	-0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
162.496	A	49.6459	10.198 9.232	-0.155	8.035	-6.278	-15.843	21.746	-27.440
	A	49.6459	10.198 9.232	0.155	8.035	-6.278	-15.843	-21.746	27.440
	B	49.6459	10.198 9.232	5.515	8.035	3.004	31.685	21.746	0.000
	B	49.6459	10.198 9.232	5.359	8.035	3.274	-15.843	-21.746	-27.440
	C	49.6459	10.198 9.232	-5.359	8.035	3.274	-15.843	21.746	27.440
	C	49.6459	10.198 9.232	-5.515	8.035	3.004	31.685	-21.746	0.000
			Sum:	0.000	48.211	0.000	-0.000	0.000	0.000
102.496	A	49.9699	6.953 6.439	-0.171	5.461	-4.299	-10.768	15.018	-18.651
	A	49.9699	6.953 6.439	0.171	5.461	-4.299	-10.768	-15.018	18.651
	B	49.9699	6.953 6.439	3.808	5.461	2.002	21.536	15.018	0.000
	B	49.9699	6.953 6.439	3.638	5.461	2.297	-10.768	-15.018	-18.651
	C	49.9699	6.953 6.439	-3.638	5.461	2.297	-10.768	15.018	18.651
	C	49.9699	6.953 6.439	-3.808	5.461	2.002	21.536	-15.018	0.000
			Sum:	0.000	32.768	0.000	-0.000	0.000	0.000
62.4961	A	35.9754	4.645 4.386	-0.145	2.873	-3.648	-5.664	12.743	-9.810
	A	35.9754	4.645 4.386	0.145	2.873	-3.648	-5.664	-12.743	9.810

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
	B	35.9754	4.645 4.386	3.231	2.873	1.698	11.327	12.743	0.000
	B	35.9754	4.645 4.386	3.087	2.873	1.949	-5.664	-12.743	-9.810
	C	35.9754	4.645 4.386	-3.087	2.873	1.949	-5.664	12.743	9.810
	C	35.9754	4.645 4.386	-3.231	2.873	1.698	11.327	-12.743	0.000
			Sum:	0.000	17.235	0.000	-0.000	0.000	0.000

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
162.496	A	49.6459	6.018 5.830	-0.095	4.637	-3.834	-9.143	13.280	-15.836
	A	49.6459	6.018 5.830	0.095	4.637	-3.834	-9.143	-13.280	15.836
	B	49.6459	6.018 5.830	3.368	4.637	1.835	18.285	13.280	0.000
	B	49.6459	6.018 5.830	3.273	4.637	1.999	-9.143	-13.280	-15.836
	C	49.6459	6.018 5.830	-3.273	4.637	1.999	-9.143	13.280	15.836
	C	49.6459	6.018 5.830	-3.368	4.637	1.835	18.285	-13.280	0.000
			Sum:	0.000	27.823	0.000	-0.000	0.000	0.000
102.496	A	49.9699	4.323 4.240	-0.109	3.333	-2.752	-6.571	9.612	-11.382
	A	49.9699	4.323 4.240	0.109	3.333	-2.752	-6.571	-9.612	11.382
	B	49.9699	4.323 4.240	2.438	3.333	1.281	13.142	9.612	0.000
	B	49.9699	4.323 4.240	2.328	3.333	1.470	-6.571	-9.612	-11.382
	C	49.9699	4.323 4.240	-2.328	3.333	1.470	-6.571	9.612	11.382
	C	49.9699	4.323 4.240	-2.438	3.333	1.281	13.142	-9.612	0.000
			Sum:	0.000	19.997	0.000	-0.000	0.000	0.000
62.4961	A	35.9754	2.722 2.690	-0.087	1.617	-2.188	-3.188	7.644	-5.523
	A	35.9754	2.722 2.690	0.087	1.617	-2.188	-3.188	-7.644	5.523
	B	35.9754	2.722 2.690	1.938	1.617	1.019	6.377	7.644	0.000
	B	35.9754	2.722 2.690	1.852	1.617	1.169	-3.188	-7.644	-5.523
	C	35.9754	2.722 2.690	-1.852	1.617	1.169	-3.188	7.644	5.523
	C	35.9754	2.722	-1.938	1.617	1.019	6.377	-7.644	0.000

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
			2.690 Sum:	0.000	9.703	0.000	-0.000	0.000	0.000

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation		H	V	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft
162.496	A	138.07	162.50	6.824	3.79	6.490	3.98	6.159	4.20	5.830	4.43	5.505	4.69	5.183	4.97	4.867	5.29
	B	138.07	162.50	6.824	3.79	6.490	3.98	6.159	4.20	5.830	4.43	5.505	4.69	5.183	4.97	4.867	5.29
	C	138.07	162.50	6.824	3.79	6.490	3.98	6.159	4.20	5.830	4.43	5.505	4.69	5.183	4.97	4.867	5.29
102.496	A	86.10	102.50	5.024	1.44	4.762	1.51	4.500	1.60	4.240	1.70	3.981	1.81	3.724	1.93	3.468	2.07
	B	86.10	102.50	5.024	1.44	4.762	1.51	4.500	1.60	4.240	1.70	3.981	1.81	3.724	1.93	3.468	2.07
	C	86.10	102.50	5.024	1.44	4.762	1.51	4.500	1.60	4.240	1.70	3.981	1.81	3.724	1.93	3.468	2.07
62.4961	A	86.10	62.50	3.480	0.84	3.215	0.90	2.952	0.98	2.690	1.08	2.430	1.20	2.173	1.34	1.920	1.51
	B	86.10	62.50	3.480	0.84	3.215	0.90	2.952	0.98	2.690	1.08	2.430	1.20	2.173	1.34	1.920	1.51
	C	86.10	62.50	3.480	0.84	3.215	0.90	2.952	0.98	2.690	1.08	2.430	1.20	2.173	1.34	1.920	1.51

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 klf
AVA7-50 (1-5/8 LOW DENSI. FOAM) (T-Mobile)	A	No	Ar (CaAa)	188.000 - 8.000	0.000	-0.3	6	3	0.500 0.000	1.980		0.001
1/2" Fiber Cable	A	No	Ar (CaAa)	105.000 - 8.000	0.000	-0.1	2	2	0.500 0.580	0.580		0.001
AVA7-50 (1-5/8 LOW DENSI. FOAM) (Verizon)	B	No	Ar (CaAa)	169.000 - 8.000	0.000	-0.2	12	6	0.500 0.750	1.980		0.001
AVA5-50 (7/8 LOW DENSI.FOAM)	B	No	Ar (CaAa)	179.000 - 8.000	3.000	0.25	1	1	1.110 0.000	1.110		0.000
VXL6-50 (1-1/4 FOAM) (AT&T)	C	No	Ar (CaAa)	177.500 - 8.000	0.000	0.1	9	9	1.000 1.550	1.550		0.001
VXL6-50 (1-1/4 FOAM) (AT&T)	C	No	Ar (CaAa)	177.500 - 8.000	0.000	0.3	3	3	0.500 0.000	1.550		0.001
VXL6-50 (1-1/4 FOAM)	C	No	Ar (CaAa)	152.000 - 8.000	0.000	-0.4	1	1	1.550 0.000	1.550		0.001
AVA5-50 (7/8 LOW DENSI.FOA	C	No	Ar (CaAa)	144.000 - 8.000	4.000	-0.35	1	1	1.110 0.000	1.110		0.000

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 klf
M)												
VXL6-50 (1-1/4 FOAM)	C	No	Ar (CaAa)	122.000 - 8.000	2.000	-0.4	1	1	1.550 0.000	1.550		0.001
AVA7-50 (1-5/8 LOW DENSI. FOAM)	C	No	Ar (CaAa)	110.000 - 8.000	2.000	-0.3	2	1	1.980 0.750	1.980		0.001
VXL6-50 (1-1/4 FOAM)	C	No	Ar (CaAa)	108.000 - 8.000	4.000	-0.4	1	1	1.550 0.000	1.550		0.001
AVA7-50 (1-5/8 LOW DENSI. FOAM) (T-Mobile)	B	No	Ar (CaAa)	188.000 - 8.000	0.000	0.35	6	3	0.500 0.750	1.980		0.001
2" Trunk (Clear Wire)	A	No	Ar (CaAa)	120.000 - 0.000	0.000	0	1	1	2.000 1.500	2.000		0.001
AVA7-50 (1-5/8 LOW DENSI. FOAM) (Metro PCS)	C	No	Ar (CaAa)	130.000 - 8.000	2.500	0.15	12	9	1.000 0.000	1.980		0.001
1/2" Fiber Cable (Metro PCS)	C	No	Ar (CaAa)	130.000 - 8.000	0.000	-0.23	1	1	0.580 0.000	0.580		0.001
AVA7-50 (1-5/8 LOW DENSI. FOAM) (Sprint)	A	No	Ar (CaAa)	150.000 - 8.000	2.500	0.05	3	3	0.500 1.000	1.980		0.001
1/2" Fiber Cable (AT&T)	C	No	Ar (CaAa)	177.500 - 8.000	5.000	0.2	1	1	0.500 0.000	0.500		0.001
SFX 500 (1/2 COPPER-CLAD AL.) (AT&T)	C	No	Ar (CaAa)	177.500 - 8.000	5.000	0.3	1	1	0.250 0.000	0.129		0.000
AVA7-50 (1 5/8") (Verizon)	B	No	Ar (CaAa)	169.000 - 8.000	0.000	0	2	1	0.500 0.750	1.980		0.001
AVA7-50 (1 5/8") (Sprint)	A	No	Ar (CaAa)	150.000 - 8.000	5.000	0.08	1	1	1.980	1.980		0.001
AVA7-50 (1 5/8") (T-Mobile)	B	No	Ar (CaAa)	188.000 - 8.000	0.000	0.23	1	1	1.980	1.980		0.001
Hybrid 6x12 (Sprint)	C	No	Ar (CaAa)	152.000 - 0.000	0.000	-0.4	2	2	1.380	1.380		0.002

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	193.000-180.000	A	0.000	0.000	9.504	0.000	0.035
		B	0.000	0.000	11.088	0.000	0.040
		C	0.000	0.000	0.000	0.000	0.000
T2	180.000-160.000	A	0.000	0.000	23.760	0.000	0.086

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	54.777	0.000	0.196
		C	0.000	0.000	33.650	0.000	0.124
T3	160.000-140.000	A	0.000	0.000	31.680	0.000	0.115
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	44.073	0.000	0.189
T4	140.000-120.000	A	0.000	0.000	39.600	0.000	0.144
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	73.947	0.000	0.323
T5	120.000-100.000	A	0.000	0.000	44.180	0.000	0.174
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	106.277	0.000	0.447
T6	100.000-80.000	A	0.000	0.000	45.920	0.000	0.204
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	112.097	0.000	0.467
T7	80.000-60.000	A	0.000	0.000	45.920	0.000	0.204
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	112.097	0.000	0.467
T8	60.000-40.000	A	0.000	0.000	45.920	0.000	0.204
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	112.097	0.000	0.467
T9	40.000-20.000	A	0.000	0.000	45.920	0.000	0.204
		B	0.000	0.000	85.380	0.000	0.307
		C	0.000	0.000	112.097	0.000	0.467
T10	20.000-5.000	A	0.000	0.000	28.152	0.000	0.125
		B	0.000	0.000	51.228	0.000	0.184
		C	0.000	0.000	68.086	0.000	0.290
T11	5.000-0.000	A	0.000	0.000	1.000	0.000	0.005
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	1.380	0.000	0.017

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	193.000-180.000	A	1.784	0.000	0.000	12.925	0.000	0.203
		B		0.000	0.000	17.814	0.000	0.298
		C		0.000	0.000	0.000	0.000	0.000
T2	180.000-160.000	A	1.767	0.000	0.000	32.198	0.000	0.503
		B		0.000	0.000	86.521	0.000	1.464
		C		0.000	0.000	93.280	0.000	1.251
T3	160.000-140.000	A	1.745	0.000	0.000	52.238	0.000	0.766
		B		0.000	0.000	127.111	0.000	2.180
		C		0.000	0.000	127.618	0.000	1.704
T4	140.000-120.000	A	1.720	0.000	0.000	71.991	0.000	1.021
		B		0.000	0.000	126.402	0.000	2.152
		C		0.000	0.000	189.929	0.000	2.629
T5	120.000-100.000	A	1.692	0.000	0.000	86.263	0.000	1.218
		B		0.000	0.000	125.588	0.000	2.120
		C		0.000	0.000	255.331	0.000	3.589
T6	100.000-80.000	A	1.658	0.000	0.000	97.326	0.000	1.314
		B		0.000	0.000	124.628	0.000	2.082
		C		0.000	0.000	271.354	0.000	3.765
T7	80.000-60.000	A	1.617	0.000	0.000	96.144	0.000	1.281
		B		0.000	0.000	123.452	0.000	2.037
		C		0.000	0.000	268.864	0.000	3.671
T8	60.000-40.000	A	1.564	0.000	0.000	94.608	0.000	1.238
		B		0.000	0.000	121.925	0.000	1.978

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	265.628	0.000	3.550
T9	40.000-20.000	A	1.486	0.000	0.000	92.373	0.000	1.177
		B		0.000	0.000	119.703	0.000	1.895
		C		0.000	0.000	260.924	0.000	3.378
T10	20.000-5.000	A	1.361	0.000	0.000	54.699	0.000	0.670
		B		0.000	0.000	69.692	0.000	1.059
		C		0.000	0.000	155.045	0.000	1.902
T11	5.000-0.000	A	1.159	0.000	0.000	2.159	0.000	0.027
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	4.651	0.000	0.052

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	193.000-180.000	0.378	0.651	0.390	0.270
T2	180.000-160.000	0.236	0.744	0.179	0.822
T3	160.000-140.000	0.457	0.135	0.338	0.479
T4	140.000-120.000	0.182	0.625	0.236	0.795
T5	120.000-100.000	0.065	1.033	0.221	1.077
T6	100.000-80.000	0.125	1.119	0.310	1.176
T7	80.000-60.000	0.125	1.114	0.304	1.176
T8	60.000-40.000	0.125	1.119	0.298	1.182
T9	40.000-20.000	0.127	1.132	0.294	1.209
T10	20.000-5.000	0.136	1.117	0.270	1.184
T11	5.000-0.000	-0.028	0.494	-0.238	0.171

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	180.00 - 188.00	1.0000	1.0000
T1	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	180.00 - 188.00	1.0000	1.0000
T1	21	AVA7-50 (1 5/8")	180.00 - 188.00	1.0000	1.0000
T2	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	160.00 - 180.00	1.0000	1.0000
T2	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	160.00 - 169.00	1.0000	1.0000
T2	4	AVA5-50 (7/8 LOW DENSI.FOAM)	160.00 - 179.00	1.0000	1.0000
T2	5	VXL6-50 (1-1/4 FOAM)	160.00 - 177.50	1.0000	1.0000
T2	6	VXL6-50 (1-1/4 FOAM)	160.00 - 177.50	1.0000	1.0000
T2	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	160.00 - 180.00	1.0000	1.0000
T2	17	1/2" Fiber Cable	160.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			177.50		
T2	18	SFX 500 (1/2 COPPER-CLAD AL.)	160.00 - 177.50	1.0000	1.0000
T2	19	AVA7-50 (1 5/8")	160.00 - 169.00	1.0000	1.0000
T2	21	AVA7-50 (1 5/8")	160.00 - 180.00	1.0000	1.0000
T3	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 160.00	1.0000	1.0000
T3	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 160.00	1.0000	1.0000
T3	4	AVA5-50 (7/8 LOW DENSI.FOAM)	140.00 - 160.00	1.0000	1.0000
T3	5	VXL6-50 (1-1/4 FOAM)	140.00 - 160.00	1.0000	1.0000
T3	6	VXL6-50 (1-1/4 FOAM)	140.00 - 160.00	1.0000	1.0000
T3	7	VXL6-50 (1-1/4 FOAM)	140.00 - 152.00	1.0000	1.0000
T3	8	AVA5-50 (7/8 LOW DENSI.FOAM)	140.00 - 144.00	1.0000	1.0000
T3	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 160.00	1.0000	1.0000
T3	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 150.00	1.0000	1.0000
T3	17	1/2" Fiber Cable	140.00 - 160.00	1.0000	1.0000
T3	18	SFX 500 (1/2 COPPER-CLAD AL.)	140.00 - 160.00	1.0000	1.0000
T3	19	AVA7-50 (1 5/8")	140.00 - 160.00	1.0000	1.0000
T3	20	AVA7-50 (1 5/8")	140.00 - 150.00	1.0000	1.0000
T3	21	AVA7-50 (1 5/8")	140.00 - 160.00	1.0000	1.0000
T3	22	Hybrid 6x12	140.00 - 152.00	1.0000	1.0000
T4	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 140.00	1.0000	1.0000
T4	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 140.00	1.0000	1.0000
T4	4	AVA5-50 (7/8 LOW DENSI.FOAM)	120.00 - 140.00	1.0000	1.0000
T4	5	VXL6-50 (1-1/4 FOAM)	120.00 - 140.00	1.0000	1.0000
T4	6	VXL6-50 (1-1/4 FOAM)	120.00 - 140.00	1.0000	1.0000
T4	7	VXL6-50 (1-1/4 FOAM)	120.00 - 140.00	1.0000	1.0000
T4	8	AVA5-50 (7/8 LOW DENSI.FOAM)	120.00 - 140.00	1.0000	1.0000
T4	9	VXL6-50 (1-1/4 FOAM)	120.00 - 122.00	1.0000	1.0000
T4	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 140.00	1.0000	1.0000
T4	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 130.00	1.0000	1.0000
T4	15	1/2" Fiber Cable	120.00 - 130.00	1.0000	1.0000
T4	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 140.00	1.0000	1.0000
T4	17	1/2" Fiber Cable	120.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			140.00		
T4	18	SFX 500 (1/2 COPPER-CLAD AL.)	120.00 - 140.00	1.0000	1.0000
T4	19	AVA7-50 (1 5/8")	120.00 - 140.00	1.0000	1.0000
T4	20	AVA7-50 (1 5/8")	120.00 - 140.00	1.0000	1.0000
T4	21	AVA7-50 (1 5/8")	120.00 - 140.00	1.0000	1.0000
T4	22	Hybrid 6x12	120.00 - 140.00	1.0000	1.0000
T5	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	2	1/2" Fiber Cable	100.00 - 105.00	1.0000	1.0000
T5	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	4	AVA5-50 (7/8 LOW DENSI.FOAM)	100.00 - 120.00	1.0000	1.0000
T5	5	VXL6-50 (1-1/4 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	6	VXL6-50 (1-1/4 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	7	VXL6-50 (1-1/4 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	8	AVA5-50 (7/8 LOW DENSI.FOAM)	100.00 - 120.00	1.0000	1.0000
T5	9	VXL6-50 (1-1/4 FOAM)	100.00 - 120.00	1.0000	1.0000
T5	10	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 110.00	1.0000	1.0000
T5	11	VXL6-50 (1-1/4 FOAM)	100.00 - 108.00	1.0000	1.0000
T5	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	13	2" Trunk	100.00 - 120.00	1.0000	1.0000
T5	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	15	1/2" Fiber Cable	100.00 - 120.00	1.0000	1.0000
T5	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	1.0000	1.0000
T5	17	1/2" Fiber Cable	100.00 - 120.00	1.0000	1.0000
T5	18	SFX 500 (1/2 COPPER-CLAD AL.)	100.00 - 120.00	1.0000	1.0000
T5	19	AVA7-50 (1 5/8")	100.00 - 120.00	1.0000	1.0000
T5	20	AVA7-50 (1 5/8")	100.00 - 120.00	1.0000	1.0000
T5	21	AVA7-50 (1 5/8")	100.00 - 120.00	1.0000	1.0000
T5	22	Hybrid 6x12	100.00 - 120.00	1.0000	1.0000
T6	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 100.00	1.0000	1.0000
T6	2	1/2" Fiber Cable	80.00 - 100.00	1.0000	1.0000
T6	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 100.00	1.0000	1.0000
T6	4	AVA5-50 (7/8 LOW DENSI.FOAM)	80.00 - 100.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	5	VXL6-50 (1-1/4 FOAM)	80.00 - 100.00	1.0000	1.0000
T6	6	VXL6-50 (1-1/4 FOAM)	80.00 - 100.00	1.0000	1.0000
T6	7	VXL6-50 (1-1/4 FOAM)	80.00 - 100.00	1.0000	1.0000
T6	8	AVA5-50 (7/8 LOW DENSI.FOAM)	80.00 - 100.00	1.0000	1.0000
T6	9	VXL6-50 (1-1/4 FOAM)	80.00 - 100.00	1.0000	1.0000
T6	10	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 100.00	1.0000	1.0000
T6	11	VXL6-50 (1-1/4 FOAM)	80.00 - 100.00	1.0000	1.0000
T6	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 100.00	1.0000	1.0000
T6	13	2" Trunk	80.00 - 100.00	1.0000	1.0000
T6	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 100.00	1.0000	1.0000
T6	15	1/2" Fiber Cable	80.00 - 100.00	1.0000	1.0000
T6	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 100.00	1.0000	1.0000
T6	17	1/2" Fiber Cable	80.00 - 100.00	1.0000	1.0000
T6	18	SFX 500 (1/2 COPPER-CLAD AL.)	80.00 - 100.00	1.0000	1.0000
T6	19	AVA7-50 (1 5/8")	80.00 - 100.00	1.0000	1.0000
T6	20	AVA7-50 (1 5/8")	80.00 - 100.00	1.0000	1.0000
T6	21	AVA7-50 (1 5/8")	80.00 - 100.00	1.0000	1.0000
T6	22	Hybrid 6x12	80.00 - 100.00	1.0000	1.0000
T7	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T7	2	1/2" Fiber Cable	60.00 - 80.00	1.0000	1.0000
T7	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T7	4	AVA5-50 (7/8 LOW DENSI.FOAM)	60.00 - 80.00	1.0000	1.0000
T7	5	VXL6-50 (1-1/4 FOAM)	60.00 - 80.00	1.0000	1.0000
T7	6	VXL6-50 (1-1/4 FOAM)	60.00 - 80.00	1.0000	1.0000
T7	7	VXL6-50 (1-1/4 FOAM)	60.00 - 80.00	1.0000	1.0000
T7	8	AVA5-50 (7/8 LOW DENSI.FOAM)	60.00 - 80.00	1.0000	1.0000
T7	9	VXL6-50 (1-1/4 FOAM)	60.00 - 80.00	1.0000	1.0000
T7	10	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T7	11	VXL6-50 (1-1/4 FOAM)	60.00 - 80.00	1.0000	1.0000
T7	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T7	13	2" Trunk	60.00 - 80.00	1.0000	1.0000
T7	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T7	15	1/2" Fiber Cable	60.00 - 80.00	1.0000	1.0000
T7	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	1.0000	1.0000
T7	17	1/2" Fiber Cable	60.00 - 80.00	1.0000	1.0000
T7	18	SFX 500 (1/2 COPPER-CLAD AL.)	60.00 - 80.00	1.0000	1.0000
T7	19	AVA7-50 (1 5/8")	60.00 - 80.00	1.0000	1.0000
T7	20	AVA7-50 (1 5/8")	60.00 - 80.00	1.0000	1.0000
T7	21	AVA7-50 (1 5/8")	60.00 - 80.00	1.0000	1.0000
T7	22	Hybrid 6x12	60.00 - 80.00	1.0000	1.0000
T8	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T8	2	1/2" Fiber Cable	40.00 - 60.00	1.0000	1.0000
T8	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T8	4	AVA5-50 (7/8 LOW DENSI.FOAM)	40.00 - 60.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	5	VXL6-50 (1-1/4 FOAM)	40.00 - 60.00	1.0000	1.0000
T8	6	VXL6-50 (1-1/4 FOAM)	40.00 - 60.00	1.0000	1.0000
T8	7	VXL6-50 (1-1/4 FOAM)	40.00 - 60.00	1.0000	1.0000
T8	8	AVA5-50 (7/8 LOW DENSI.FOAM)	40.00 - 60.00	1.0000	1.0000
T8	9	VXL6-50 (1-1/4 FOAM)	40.00 - 60.00	1.0000	1.0000
T8	10	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T8	11	VXL6-50 (1-1/4 FOAM)	40.00 - 60.00	1.0000	1.0000
T8	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T8	13	2" Trunk	40.00 - 60.00	1.0000	1.0000
T8	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T8	15	1/2" Fiber Cable	40.00 - 60.00	1.0000	1.0000
T8	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	1.0000	1.0000
T8	17	1/2" Fiber Cable	40.00 - 60.00	1.0000	1.0000
T8	18	SFX 500 (1/2 COPPER-CLAD AL.)	40.00 - 60.00	1.0000	1.0000
T8	19	AVA7-50 (1 5/8")	40.00 - 60.00	1.0000	1.0000
T8	20	AVA7-50 (1 5/8")	40.00 - 60.00	1.0000	1.0000
T8	21	AVA7-50 (1 5/8")	40.00 - 60.00	1.0000	1.0000
T8	22	Hybrid 6x12	40.00 - 60.00	1.0000	1.0000
T9	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	1.0000	1.0000
T9	2	1/2" Fiber Cable	20.00 - 40.00	1.0000	1.0000
T9	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	1.0000	1.0000
T9	4	AVA5-50 (7/8 LOW DENSI.FOAM)	20.00 - 40.00	1.0000	1.0000
T9	5	VXL6-50 (1-1/4 FOAM)	20.00 - 40.00	1.0000	1.0000
T9	6	VXL6-50 (1-1/4 FOAM)	20.00 - 40.00	1.0000	1.0000
T9	7	VXL6-50 (1-1/4 FOAM)	20.00 - 40.00	1.0000	1.0000
T9	8	AVA5-50 (7/8 LOW DENSI.FOAM)	20.00 - 40.00	1.0000	1.0000
T9	9	VXL6-50 (1-1/4 FOAM)	20.00 - 40.00	1.0000	1.0000
T9	10	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	1.0000	1.0000
T9	11	VXL6-50 (1-1/4 FOAM)	20.00 - 40.00	1.0000	1.0000
T9	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	1.0000	1.0000
T9	13	2" Trunk	20.00 - 40.00	1.0000	1.0000
T9	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	1.0000	1.0000
T9	15	1/2" Fiber Cable	20.00 - 40.00	1.0000	1.0000
T9	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	1.0000	1.0000
T9	17	1/2" Fiber Cable	20.00 - 40.00	1.0000	1.0000
T9	18	SFX 500 (1/2 COPPER-CLAD AL.)	20.00 - 40.00	1.0000	1.0000
T9	19	AVA7-50 (1 5/8")	20.00 - 40.00	1.0000	1.0000
T9	20	AVA7-50 (1 5/8")	20.00 - 40.00	1.0000	1.0000
T9	21	AVA7-50 (1 5/8")	20.00 - 40.00	1.0000	1.0000
T9	22	Hybrid 6x12	20.00 - 40.00	1.0000	1.0000
T10	1	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T10	2	1/2" Fiber Cable	8.00 - 20.00	1.0000	1.0000
T10	3	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T10	4	AVA5-50 (7/8 LOW DENSI.FOAM)	8.00 - 20.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	5	VXL6-50 (1-1/4 FOAM)	8.00 - 20.00	1.0000	1.0000
T10	6	VXL6-50 (1-1/4 FOAM)	8.00 - 20.00	1.0000	1.0000
T10	7	VXL6-50 (1-1/4 FOAM)	8.00 - 20.00	1.0000	1.0000
T10	8	AVA5-50 (7/8 LOW DENSI.FOAM)	8.00 - 20.00	1.0000	1.0000
T10	9	VXL6-50 (1-1/4 FOAM)	8.00 - 20.00	1.0000	1.0000
T10	10	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T10	11	VXL6-50 (1-1/4 FOAM)	8.00 - 20.00	1.0000	1.0000
T10	12	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T10	13	2" Trunk	5.00 - 20.00	1.0000	1.0000
T10	14	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T10	15	1/2" Fiber Cable	8.00 - 20.00	1.0000	1.0000
T10	16	AVA7-50 (1-5/8 LOW DENSI. FOAM)	8.00 - 20.00	1.0000	1.0000
T10	17	1/2" Fiber Cable	8.00 - 20.00	1.0000	1.0000
T10	18	SFX 500 (1/2 COPPER-CLAD AL.)	8.00 - 20.00	1.0000	1.0000
T10	19	AVA7-50 (1 5/8")	8.00 - 20.00	1.0000	1.0000
T10	20	AVA7-50 (1 5/8")	8.00 - 20.00	1.0000	1.0000
T10	21	AVA7-50 (1 5/8")	8.00 - 20.00	1.0000	1.0000
T10	22	Hybrid 6x12	5.00 - 20.00	1.0000	1.0000
T11	13	2" Trunk	0.00 - 5.00	1.0000	1.0000
T11	22	Hybrid 6x12	0.00 - 5.00	1.0000	1.0000

Antenna Pole Forces *Lightening Rood*

Length of Pole	Ix	Iy	Modulus E		Antenna Pole C_AA_A	Antenna Pole Weight	Length of Beacon	Beacon C_AA_A	Beacon Weight
ft	in^4	in^4	ksi		ft^2/ft	klf	ft	ft^2	K
4.000	10.000	10.000	29000.000	No Ice	2.500	0.003	0.000	0.000	0.000
				With Ice	3.000	0.004		0.000	0.000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Rohn 6'x10' Boom Gate (T-Mobile)	A	From Leg	2.000 0.000 0.000		0.0000	188.000	No Ice 1/2" Ice 1" Ice	14.000 20.000 26.000	9.000 12.000 15.000	0.570 0.720 0.930
AIR 21 B4A/B2P (T-Mobile)	A	From Leg	4.000 -4.500 0.000		0.0000	188.000	No Ice 1/2" Ice 1" Ice	5.965 6.333 6.708	4.265 4.619 4.974	0.126 0.167 0.213

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR 21 B4A/B2P	A	From Leg	4.000	0.0000	188.000	No Ice	5.965	4.265	0.126
(T-Mobile)			4.500			1/2" Ice	6.333	4.619	0.167
			0.000			1" Ice	6.708	4.974	0.213
KRY 112 71	A	From Leg	4.000	0.0000	188.000	No Ice	0.583	0.398	0.013
(T-Mobile)			0.000			1/2" Ice	0.688	0.488	0.018
			0.000			1" Ice	0.799	0.586	0.025
7'x2" Antenna Mount Pipe	A	From Leg	4.000	0.0000	188.000	No Ice	1.663	1.663	0.026
(T-Mobile)			0.000			1/2" Ice	2.391	2.391	0.039
			0.000			1" Ice	2.825	2.825	0.056
Rohn 6'x10' Boom Gate	B	From Leg	2.000	0.0000	188.000	No Ice	14.000	9.000	0.570
(T-Mobile)			0.000			1/2" Ice	20.000	12.000	0.720
			0.000			1" Ice	26.000	15.000	0.930
AIR 21 B4A/B2P	B	From Leg	4.000	0.0000	188.000	No Ice	5.965	4.265	0.126
(T-Mobile)			-4.500			1/2" Ice	6.333	4.619	0.167
			0.000			1" Ice	6.708	4.974	0.213
AIR 21 B4A/B2P	B	From Leg	4.000	0.0000	188.000	No Ice	5.965	4.265	0.126
(T-Mobile)			4.500			1/2" Ice	6.333	4.619	0.167
			0.000			1" Ice	6.708	4.974	0.213
KRY 112 71	B	From Leg	4.000	0.0000	188.000	No Ice	0.583	0.398	0.013
(T-Mobile)			0.000			1/2" Ice	0.688	0.488	0.018
			0.000			1" Ice	0.799	0.586	0.025
7'x2" Antenna Mount Pipe	B	From Leg	4.000	0.0000	188.000	No Ice	1.663	1.663	0.026
(T-Mobile)			0.000			1/2" Ice	2.391	2.391	0.039
			0.000			1" Ice	2.825	2.825	0.056
Rohn 6'x10' Boom Gate	C	From Leg	2.000	0.0000	188.000	No Ice	14.000	9.000	0.570
(T-Mobile)			0.000			1/2" Ice	20.000	12.000	0.720
			0.000			1" Ice	26.000	15.000	0.930
AIR 21 B4A/B2P	C	From Leg	4.000	0.0000	188.000	No Ice	5.965	4.265	0.126
(T-Mobile)			-4.500			1/2" Ice	6.333	4.619	0.167
			0.000			1" Ice	6.708	4.974	0.213
AIR 21 B4A/B2P	C	From Leg	4.000	0.0000	188.000	No Ice	5.965	4.265	0.126
(T-Mobile)			4.500			1/2" Ice	6.333	4.619	0.167
			0.000			1" Ice	6.708	4.974	0.213
KRY 112 71	C	From Leg	4.000	0.0000	188.000	No Ice	0.583	0.398	0.013
(T-Mobile)			0.000			1/2" Ice	0.688	0.488	0.018
			0.000			1" Ice	0.799	0.586	0.025
7'x2" Antenna Mount Pipe	C	From Leg	4.000	0.0000	188.000	No Ice	1.663	1.663	0.026
(T-Mobile)			0.000			1/2" Ice	2.391	2.391	0.039
			0.000			1" Ice	2.825	2.825	0.056
Rohn 6'x15' Boom Mount	A	From Leg	2.000	0.0000	177.500	No Ice	17.500	9.000	0.510
(AT&T)			0.000			1/2" Ice	23.500	12.000	0.720
			0.000			1" Ice	29.500	15.000	0.930
Powerwave 7770 w/5ft mount pipe	A	From Leg	4.000	0.0000	178.750	No Ice	5.607	4.116	0.045
			0.000			1/2" Ice	5.992	4.769	0.091
(AT&T)			0.000			1" Ice	6.384	5.432	0.143
Powerwave 7770 w/5ft mount pipe	A	From Leg	4.000	0.0000	178.750	No Ice	5.607	4.116	0.045
			-4.000			1/2" Ice	5.992	4.769	0.091
(AT&T)			0.000			1" Ice	6.384	5.432	0.143
SBNH-1D6565C w/8ft 2.0 Std pipe	A	From Leg	4.000	0.0000	178.750	No Ice	11.445	9.596	0.095
			4.000			1/2" Ice	12.064	11.017	0.182
(AT&T)			0.000			1" Ice	12.689	12.290	0.279
RRUS-11	A	From Leg	4.000	0.0000	178.750	No Ice	2.522	1.020	0.055
(AT&T)			4.000			1/2" Ice	2.719	1.158	0.074
			0.000			1" Ice	2.923	1.304	0.097
RRUS-12	A	From Leg	2.000	0.0000	178.750	No Ice	3.145	1.285	0.058
(AT&T)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(2) TT19-08BP111-001 Twin	A	From Leg	4.000	0.0000	178.750	No Ice	0.553	0.446	0.016
TMA			0.000			1/2" Ice	0.649	0.534	0.022
(AT&T)			0.000			1" Ice	0.752	0.630	0.029
(2) Diplexer	A	From Leg	4.000	0.0000	178.750	No Ice	0.350	0.120	0.001
(AT&T)			0.000			1/2" Ice	0.430	0.170	0.001
			0.000			1" Ice	0.510	0.220	0.001
Rohn 6'x15' Boom Mount	B	From Leg	2.000	0.0000	177.500	No Ice	17.500	9.000	0.510
(AT&T)			0.000			1/2" Ice	23.500	12.000	0.720
			0.000			1" Ice	29.500	15.000	0.930
Powerwave 7770 w/5ft mount	B	From Leg	4.000	0.0000	178.750	No Ice	5.607	4.116	0.045
pipe			0.000			1/2" Ice	5.992	4.769	0.091
(AT&T)			0.000			1" Ice	6.384	5.432	0.143
Powerwave 7770 w/5ft mount	B	From Leg	4.000	0.0000	178.750	No Ice	5.607	4.116	0.045
pipe			-4.000			1/2" Ice	5.992	4.769	0.091
(AT&T)			0.000			1" Ice	6.384	5.432	0.143
AM-X-CD-16-65-OOT-RET	B	From Leg	4.000	0.0000	178.750	No Ice	8.024	4.642	0.049
(AT&T)			4.000			1/2" Ice	8.480	5.088	0.095
			0.000			1" Ice	8.943	5.542	0.147
RRUS-11	B	From Leg	4.000	0.0000	178.750	No Ice	2.522	1.020	0.055
(AT&T)			4.000			1/2" Ice	2.719	1.158	0.074
			0.000			1" Ice	2.923	1.304	0.097
RRUS-12	B	From Leg	2.000	0.0000	178.750	No Ice	3.145	1.285	0.058
(AT&T)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
(2) TT19-08BP111-001 Twin	B	From Leg	4.000	0.0000	178.750	No Ice	0.553	0.446	0.016
TMA			0.000			1/2" Ice	0.649	0.534	0.022
(AT&T)			0.000			1" Ice	0.752	0.630	0.029
(2) Diplexer	B	From Leg	4.000	0.0000	178.750	No Ice	0.350	0.120	0.001
(AT&T)			0.000			1/2" Ice	0.430	0.170	0.001
			0.000			1" Ice	0.510	0.220	0.001
Rohn 6'x15' Boom Mount	C	From Leg	2.000	0.0000	177.500	No Ice	17.500	9.000	0.510
(AT&T)			0.000			1/2" Ice	23.500	12.000	0.720
			0.000			1" Ice	29.500	15.000	0.930
Powerwave 7770 w/5ft mount	C	From Leg	4.000	0.0000	178.750	No Ice	5.607	4.116	0.045
pipe			0.000			1/2" Ice	5.992	4.769	0.091
(AT&T)			0.000			1" Ice	6.384	5.432	0.143
Powerwave 7770 w/5ft mount	C	From Leg	4.000	0.0000	178.750	No Ice	5.607	4.116	0.045
pipe			-4.000			1/2" Ice	5.992	4.769	0.091
(AT&T)			0.000			1" Ice	6.384	5.432	0.143
P65-17-XLH-RR w/8ft mount	C	From Leg	4.000	0.0000	178.750	No Ice	11.467	8.700	0.099
pipe			4.000			1/2" Ice	12.083	10.112	0.182
(AT&T)			0.000			1" Ice	12.707	11.377	0.275
RRUS-11	C	From Leg	4.000	0.0000	178.750	No Ice	2.522	1.020	0.055
(AT&T)			4.000			1/2" Ice	2.719	1.158	0.074
			0.000			1" Ice	2.923	1.304	0.097
RRUS-12	C	From Leg	2.000	0.0000	178.750	No Ice	3.145	1.285	0.058
(AT&T)			0.000			1/2" Ice	3.365	1.438	0.081
			0.000			1" Ice	3.592	1.600	0.108
(2) TT19-08BP111-001 Twin	C	From Leg	4.000	0.0000	178.750	No Ice	0.553	0.446	0.016
TMA			0.000			1/2" Ice	0.649	0.534	0.022
(AT&T)			0.000			1" Ice	0.752	0.630	0.029
(2) Diplexer	C	From Leg	4.000	0.0000	178.750	No Ice	0.350	0.120	0.001
(AT&T)			0.000			1/2" Ice	0.430	0.170	0.001
			0.000			1" Ice	0.510	0.220	0.001
DC6-48-06-18-8F	C	From Leg	4.000	0.0000	178.750	No Ice	1.201	1.201	0.032
(AT&T)			0.000			1/2" Ice	1.877	1.877	0.054
			0.000			1" Ice	2.088	2.088	0.078

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Pirod 15' T-Frame Sector Mount (1) (Verizon)	A	From Leg	2.000 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	15.000 20.600 26.200	15.000 20.600 26.200	0.500 0.650 0.800
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	A	From Leg	3.500 -2.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	3.110 3.585 4.022	6.824 7.651 8.355	0.034 0.083 0.138
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	A	From Leg	3.500 3.500 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	3.110 3.585 4.022	6.824 7.651 8.355	0.034 0.083 0.138
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	A	From Leg	3.500 3.500 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	8.554 9.217 9.848	7.242 8.523 9.656	0.070 0.141 0.220
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	A	From Leg	3.500 -6.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	8.554 9.217 9.848	7.242 8.523 9.656	0.070 0.141 0.220
RRH2X60-07-U (Verizon)	A	From Leg	3.000 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	2.450 2.670 2.890	1.630 1.830 2.030	0.050 0.070 0.090
RRH2X60-AWS (Verizon)	A	From Leg	3.000 -4.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	1.867 2.044 2.228	1.227 1.377 1.535	0.044 0.060 0.079
RRH2X60-PCS (Verizon)	A	From Leg	3.000 4.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	2.200 2.393 2.593	1.723 1.901 2.087	0.055 0.075 0.099
Pirod 15' T-Frame Sector Mount (1) (Verizon)	B	From Leg	2.000 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	15.000 20.600 26.200	15.000 20.600 26.200	0.500 0.650 0.800
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	B	From Leg	3.500 -2.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	3.110 3.585 4.022	6.824 7.651 8.355	0.034 0.083 0.138
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	B	From Leg	3.500 3.500 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	3.110 3.585 4.022	6.824 7.651 8.355	0.034 0.083 0.138
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	B	From Leg	3.500 3.500 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	8.554 9.217 9.848	7.242 8.523 9.656	0.070 0.141 0.220
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	B	From Leg	3.500 -6.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	8.554 9.217 9.848	7.242 8.523 9.656	0.070 0.141 0.220
RRH2X60-07-U (Verizon)	B	From Leg	3.000 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	2.450 2.670 2.890	1.630 1.830 2.030	0.050 0.070 0.090
RRH2X60-AWS (Verizon)	B	From Leg	3.000 -4.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	1.867 2.044 2.228	1.227 1.377 1.535	0.044 0.060 0.079
RRH2X60-PCS (Verizon)	B	From Leg	3.000 4.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	2.200 2.393 2.593	1.723 1.901 2.087	0.055 0.075 0.099
Pirod 15' T-Frame Sector Mount (1) (Verizon)	C	From Leg	2.000 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	15.000 20.600 26.200	15.000 20.600 26.200	0.500 0.650 0.800
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	C	From Leg	3.500 -2.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	3.110 3.585 4.022	6.824 7.651 8.355	0.034 0.083 0.138
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe (Verizon)	C	From Leg	3.500 3.500 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	3.110 3.585 4.022	6.824 7.651 8.355	0.034 0.083 0.138

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNHH-1D65B w/ 8ft mount pipe	C	From Leg	3.500 3.500 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	8.554 9.217 9.848	7.242 8.523 9.656	0.070 0.141 0.220
(Verizon)									
SBNHH-1D65B w/ 8ft mount pipe	C	From Leg	3.500 -6.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	8.554 9.217 9.848	7.242 8.523 9.656	0.070 0.141 0.220
(Verizon)									
RRH2X60-07-U	C	From Leg	3.000 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	2.450 2.670 2.890	1.630 1.830 2.030	0.050 0.070 0.090
(Verizon)									
RRH2X60-AWS	C	From Leg	3.000 -4.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	1.867 2.044 2.228	1.227 1.377 1.535	0.044 0.060 0.079
(Verizon)									
RRH2X60-PCS	C	From Leg	3.000 4.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	2.200 2.393 2.593	1.723 1.901 2.087	0.055 0.075 0.099
(Verizon)									
DB-T1-6Z-8AB-0Z	A	From Leg	1.500 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	2.330 2.560 2.790	0.040 0.080 0.120
(Verizon)									
DB-T1-6Z-8AB-0Z	B	From Leg	1.500 0.000 0.000	0.0000	169.000	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	2.330 2.560 2.790	0.040 0.080 0.120
(Verizon)									
Rohn 6'x15' Boom Mount	A	From Leg	2.000 0.000 0.000	0.0000	150.500	No Ice 1/2" Ice 1" Ice	17.500 23.500 29.500	9.000 12.000 15.000	0.510 0.720 0.930
(Sprint)									
APXVSPP18-C-A20	A	From Leg	3.000 -4.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	8.024 8.480 8.943	5.808 6.266 6.731	0.065 0.116 0.175
(Sprint)									
DT465B-2XR Panel Antenna W/M PIPE	A	From Leg	3.000 4.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	9.222 9.689 10.163	7.292 8.250 9.084	0.095 0.169 0.251
(Sprint)									
TD-RRH8x20-25	A	From Leg	2.000 0.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	4.030 4.281 4.540	1.526 1.705 1.891	0.076 0.103 0.134
(Sprint)									
(2) RRH-2X50-800	A	From Leg	2.000 0.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	1.733 1.898 2.070	1.333 1.481 1.637	0.069 0.087 0.107
(Sprint)									
ALU RRH-4X45-1900	A	From Leg	2.000 0.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	2.500 2.709 2.926	2.500 2.709 2.926	0.070 0.095 0.124
(Sprint)									
Rohn 6'x15' Boom Mount	B	From Leg	2.000 0.000 0.000	0.0000	150.500	No Ice 1/2" Ice 1" Ice	17.500 23.500 29.500	9.000 12.000 15.000	0.510 0.720 0.930
(Sprint)									
APXVSPP18-C-A20	B	From Leg	3.000 -4.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	8.024 8.480 8.943	5.808 6.266 6.731	0.065 0.116 0.175
(Sprint)									
DT465B-2XR Panel Antenna W/M PIPE	B	From Leg	3.000 4.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	9.222 9.689 10.163	7.292 8.250 9.084	0.095 0.169 0.251
(Sprint)									
TD-RRH8x20-25	B	From Leg	2.000 0.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	4.030 4.281 4.540	1.526 1.705 1.891	0.076 0.103 0.134
(Sprint)									
(2) RRH-2X50-800	B	From Leg	2.000 0.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	1.733 1.898 2.070	1.333 1.481 1.637	0.069 0.087 0.107
(Sprint)									
ALU RRH-4X45-1900	B	From Leg	2.000 0.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	2.500 2.709 2.926	2.500 2.709 2.926	0.070 0.095 0.124
(Sprint)									

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Rohn 6'x15' Boom Mount	C	From Leg	2.000	0.0000	150.500	No Ice	17.500	9.000	0.510
(Sprint)			0.000			1/2" Ice	23.500	12.000	0.720
			0.000			1" Ice	29.500	15.000	0.930
APXVSPP18-C-A20	C	From Leg	3.000	0.0000	151.000	No Ice	8.024	5.808	0.065
(Sprint)			-4.000			1/2" Ice	8.480	6.266	0.116
			0.000			1" Ice	8.943	6.731	0.175
DT465B-2XR Panel Antenna	C	From Leg	3.000	0.0000	151.000	No Ice	9.222	7.292	0.095
W/M PIPE			4.000			1/2" Ice	9.689	8.250	0.169
(Sprint)			0.000			1" Ice	10.163	9.084	0.251
TD-RRH8x20-25	C	From Leg	2.000	0.0000	151.000	No Ice	4.030	1.526	0.076
(Sprint)			0.000			1/2" Ice	4.281	1.705	0.103
			0.000			1" Ice	4.540	1.891	0.134
(2) RRH-2X50-800	C	From Leg	2.000	0.0000	151.000	No Ice	1.733	1.333	0.069
(Sprint)			0.000			1/2" Ice	1.898	1.481	0.087
			0.000			1" Ice	2.070	1.637	0.107
ALU RRH-4X45-1900	C	From Leg	2.000	0.0000	151.000	No Ice	2.500	2.500	0.070
(Sprint)			0.000			1/2" Ice	2.709	2.709	0.095
			0.000			1" Ice	2.926	2.926	0.124
(2) 840 10054	A	From Leg	4.000	0.0000	130.000	No Ice	4.578	1.361	0.030
(Metro PCS)			0.000			1/2" Ice	4.874	1.620	0.054
			0.000			1" Ice	5.178	1.886	0.082
(2) 860 10025 RCU	A	From Leg	4.000	0.0000	130.000	No Ice	0.160	0.130	0.000
(Metro PCS)			0.000			1/2" Ice	0.220	0.190	0.000
			0.000			1" Ice	0.280	0.250	0.000
Andrew QT SF12-2-72	A	From Leg	2.000	0.0000	130.000	No Ice	16.300	16.300	0.390
(Metro PCS)			0.000			1/2" Ice	20.600	20.600	0.550
			0.000			1" Ice	24.900	24.900	0.710
(2) 840 10054	B	From Leg	4.000	0.0000	130.000	No Ice	4.578	1.361	0.030
(Metro PCS)			0.000			1/2" Ice	4.874	1.620	0.054
			0.000			1" Ice	5.178	1.886	0.082
(2) 860 10025 RCU	B	From Leg	4.000	0.0000	130.000	No Ice	0.160	0.130	0.000
(Metro PCS)			0.000			1/2" Ice	0.220	0.190	0.000
			0.000			1" Ice	0.280	0.250	0.000
Andrew QT SF12-2-72	B	From Leg	2.000	0.0000	130.000	No Ice	16.300	16.300	0.390
(Metro PCS)			0.000			1/2" Ice	20.600	20.600	0.550
			0.000			1" Ice	24.900	24.900	0.710
(2) 840 10054	C	From Leg	4.000	0.0000	130.000	No Ice	4.578	1.361	0.030
(Metro PCS)			0.000			1/2" Ice	4.874	1.620	0.054
			0.000			1" Ice	5.178	1.886	0.082
(2) 860 10025 RCU	C	From Leg	4.000	0.0000	130.000	No Ice	0.160	0.130	0.000
(Metro PCS)			0.000			1/2" Ice	0.220	0.190	0.000
			0.000			1" Ice	0.280	0.250	0.000
Andrew QT SF12-2-72	C	From Leg	2.000	0.0000	130.000	No Ice	16.300	16.300	0.390
(Metro PCS)			0.000			1/2" Ice	20.600	20.600	0.550
			0.000			1" Ice	24.900	24.900	0.710
Splice Box	A	From Leg	4.000	0.0000	130.000	No Ice	0.160	0.130	0.000
(Metro PCS)			0.000			1/2" Ice	0.220	0.190	0.000
			0.000			1" Ice	0.280	0.250	0.000
GPS	C	From Leg	4.000	0.0000	130.000	No Ice	0.257	0.310	0.025
(Metro PCS)			0.000			1/2" Ice	0.369	0.444	0.030
			0.000			1" Ice	0.494	0.595	0.037
6ft-T Frame	A	From Leg	1.000	0.0000	120.000	No Ice	13.600	13.600	0.380
(Clearwire)			0.000			1/2" Ice	17.500	17.500	0.530
			0.000			1" Ice	21.400	21.400	0.680
LLPX310R	A	From Leg	2.000	0.0000	120.000	No Ice	4.830	1.950	0.030
(Clearwire)			0.000			1/2" Ice	5.180	2.210	0.050
			0.000			1" Ice	5.530	2.470	0.070

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRU Clearwire	A	From Leg	1.000	0.0000	120.000	No Ice	1.800	0.780	0.030
(Clearwire)			0.000			1/2" Ice	2.000	0.920	0.040
			0.000			1" Ice	2.200	1.060	0.050
6ft-T Frame	B	From Leg	1.000	0.0000	120.000	No Ice	13.600	13.600	0.380
(Clearwire)			0.000			1/2" Ice	17.500	17.500	0.530
			0.000			1" Ice	21.400	21.400	0.680
LLPX310R	B	From Leg	2.000	0.0000	120.000	No Ice	4.830	1.950	0.030
(Clearwire)			0.000			1/2" Ice	5.180	2.210	0.050
			0.000			1" Ice	5.530	2.470	0.070
RRU Clearwire	B	From Leg	1.000	0.0000	120.000	No Ice	1.800	0.780	0.030
(Clearwire)			0.000			1/2" Ice	2.000	0.920	0.040
			0.000			1" Ice	2.200	1.060	0.050
6ft-T Frame	C	From Leg	1.000	0.0000	120.000	No Ice	13.600	13.600	0.380
(Clearwire)			0.000			1/2" Ice	17.500	17.500	0.530
			0.000			1" Ice	21.400	21.400	0.680
LLPX310R	C	From Leg	2.000	0.0000	120.000	No Ice	4.830	1.950	0.030
(Clearwire)			0.000			1/2" Ice	5.180	2.210	0.050
			0.000			1" Ice	5.530	2.470	0.070
RRU Clearwire	C	From Leg	1.000	0.0000	120.000	No Ice	1.800	0.780	0.030
(Clearwire)			0.000			1/2" Ice	2.000	0.920	0.040
			0.000			1" Ice	2.200	1.060	0.050
Splice Box	A	From Leg	0.000	0.0000	120.000	No Ice	0.160	0.130	0.000
(Metro PCS)			0.000			1/2" Ice	0.220	0.190	0.000
			0.000			1" Ice	0.280	0.250	0.000
20'x3" Dia Omni	B	From Leg	4.750	0.0000	188.750	No Ice	6.000	6.000	0.050
			0.000			1/2" Ice	8.030	8.030	0.090
			0.000			1" Ice	10.060	10.060	0.130
6' Standoff Arm	B	From Leg	3.000	0.0000	178.000	No Ice	4.800	4.800	0.100
			0.000			1/2" Ice	6.400	6.400	0.140
			0.000			1" Ice	8.000	8.000	0.140
6'x3" Dia Omni	A	From Leg	4.750	0.0000	180.000	No Ice	1.770	1.770	0.020
			0.000			1/2" Ice	2.130	2.130	0.030
			0.000			1" Ice	2.490	2.490	0.040
3' Standoff	A	From Leg	1.500	0.0000	178.000	No Ice	2.400	2.400	0.050
			0.000			1/2" Ice	3.200	3.200	0.070
			0.000			1" Ice	4.000	4.000	0.090
4 Bay Dipole	B	From Leg	4.750	0.0000	155.500	No Ice	1.650	1.650	0.020
			0.000			1/2" Ice	2.610	2.610	0.030
			0.000			1" Ice	3.570	3.570	0.040
3'-6" Standoff	B	From Leg	2.000	0.0000	151.000	No Ice	2.400	2.400	0.500
			0.000			1/2" Ice	3.200	3.200	0.070
			0.000			1" Ice	4.000	4.000	0.090
DB408	B	From Leg	4.750	0.0000	126.000	No Ice	1.650	1.650	0.020
			0.000			1/2" Ice	2.610	2.610	0.030
			0.000			1" Ice	3.570	3.570	0.040
3' Standoff	B	From Leg	1.500	0.0000	122.500	No Ice	2.400	2.400	0.050
			0.000			1/2" Ice	3.200	3.200	0.070
			0.000			1" Ice	4.000	4.000	0.090
PD220	A	From Leg	4.000	0.0000	121.000	No Ice	3.560	3.560	0.023
			0.000			1/2" Ice	7.130	7.130	0.046
			0.000			1" Ice	10.700	10.700	0.069
3' Standoff	A	From Leg	1.500	0.0000	110.000	No Ice	2.400	2.400	0.050
			0.000			1/2" Ice	3.200	3.200	0.070
			0.000			1" Ice	4.000	4.000	0.090
PD220	B	From Leg	4.000	0.0000	121.000	No Ice	3.560	3.560	0.023
			0.000			1/2" Ice	7.130	7.130	0.046
			0.000			1" Ice	10.700	10.700	0.069

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
3' Standoff	B	From Leg	1.500 0.000 0.000	0.0000	110.000	No Ice 1/2" Ice 1" Ice	2.400 3.200 4.000	2.400 3.200 4.000	0.050 0.070 0.090
Folded Dipole	C	From Leg	1.500 0.000 0.000	0.0000	111.000	No Ice 1/2" Ice 1" Ice	1.200 2.400 3.600	1.200 2.400 3.600	0.030 0.040 0.050
6'-3" Pipe Mount	C	From Leg	1.000 0.000 0.000	0.0000	111.000	No Ice 1/2" Ice 1" Ice	1.770 2.130 2.490	1.770 2.130 2.490	0.030 0.050 0.070
2' Standoff	B	From Leg	1.000 0.000 0.000	0.0000	105.000	No Ice 1/2" Ice 1" Ice	0.600 0.800 1.000	0.600 0.800 1.000	0.010 0.020 0.030
2'x2" Omni Antenna	B	From Leg	2.000 0.000 0.000	0.0000	106.000	No Ice 1/2" Ice 1" Ice	0.300 0.430 0.560	0.300 0.430 0.560	0.020 0.020 0.020

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	186.500	1.181	0.027	47.575	A	7.968	6.229	6.229	43.88	9.504	0.000
193.000-180.0					B	7.968	6.229		43.88	11.088	0.000
00					C	7.968	6.229		43.88	0.000	0.000
T2	170.000	1.15	0.027	74.233	A	27.160	0.000	11.667	42.96	23.760	0.000
180.000-160.0					B	27.160	0.000		42.96	54.777	0.000
00					C	27.160	0.000		42.96	33.650	0.000
T3	150.000	1.11	0.026	74.233	A	26.117	0.782	11.667	43.37	31.680	0.000
160.000-140.0					B	26.117	0.782		43.37	85.380	0.000
00					C	26.117	0.782		43.37	44.073	0.000
T4	130.000	1.065	0.025	73.192	A	0.070	18.163	9.583	52.56	39.600	0.000
140.000-120.0					B	0.070	18.163		52.56	85.380	0.000
00					C	0.070	18.163		52.56	73.947	0.000
T5	110.000	1.016	0.023	74.233	A	15.493	11.667	11.667	42.96	44.180	0.000
120.000-100.0					B	15.493	11.667		42.96	85.380	0.000
00					C	15.493	11.667		42.96	106.277	0.000
T6	90.000	0.959	0.022	74.233	A	0.070	20.106	11.667	57.83	45.920	0.000
100.000-80.00					B	0.070	20.106		57.83	85.380	0.000
0					C	0.070	20.106		57.83	112.097	0.000
T7	70.000	0.892	0.021	74.233	A	9.003	12.449	11.667	54.39	45.920	0.000
80.000-60.000					B	9.003	12.449		54.39	85.380	0.000
					C	9.003	12.449		54.39	112.097	0.000
T8	50.000	0.811	0.019	74.233	A	0.070	20.106	11.667	57.83	45.920	0.000
60.000-40.000					B	0.070	20.106		57.83	85.380	0.000
					C	0.070	20.106		57.83	112.097	0.000
T9	30.000	0.701	0.016	74.233	A	0.070	16.277	11.667	71.37	45.920	0.000
40.000-20.000					B	0.070	16.277		71.37	85.380	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	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
					C	0.070	16.277		71.37	112.097	0.000
T10	12.500	0.7	0.016	55.675	A	0.070	12.392	8.750	70.21	28.152	0.000
20.000-5.000					B	0.070	12.392		70.21	51.228	0.000
					C	0.070	12.392		70.21	68.086	0.000
T11	2.500	0.7	0.016	10.091	A	1.602	3.136	3.136	66.18	1.000	0.000
5.000-0.000					B	1.602	3.136		66.18	0.000	0.000
					C	1.602	3.136		66.18	1.380	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	186.500	1.181	0.006	1.784	51.439	A	7.968	27.985	13.958	38.82	12.925	0.000
193.000-180.000						B	7.968	27.985		38.82	17.814	0.000
						C	7.968	27.985		38.82	0.000	0.000
T2	170.000	1.15	0.006	1.767	80.124	A	35.014	27.412	19.521	31.27	32.198	0.000
180.000-160.000						B	35.014	27.412		31.27	86.521	0.000
						C	35.014	27.412		31.27	93.280	0.000
T3	150.000	1.11	0.006	1.745	80.051	A	33.874	27.853	19.423	31.47	52.238	0.000
160.000-140.000						B	33.874	27.853		31.47	127.111	0.000
						C	33.874	27.853		31.47	127.618	0.000
T4	130.000	1.065	0.006	1.720	78.926	A	0.070	49.465	21.053	42.50	71.991	0.000
140.000-120.000						B	0.070	49.465		42.50	126.402	0.000
						C	0.070	49.465		42.50	189.929	0.000
T5	110.000	1.016	0.006	1.692	79.873	A	15.493	49.190	22.946	35.47	86.263	0.000
120.000-100.000						B	15.493	49.190		35.47	125.588	0.000
						C	15.493	49.190		35.47	255.331	0.000
T6	90.000	0.959	0.005	1.658	79.761	A	0.070	49.967	22.722	45.41	97.326	0.000
100.000-80.000						B	0.070	49.967		45.41	124.628	0.000
						C	0.070	49.967		45.41	271.354	0.000
T7	70.000	0.892	0.005	1.617	79.624	A	9.003	41.569	22.448	44.39	96.144	0.000
80.000-60.000						B	9.003	41.569		44.39	123.452	0.000
						C	9.003	41.569		44.39	268.864	0.000
T8	50.000	0.811	0.004	1.564	79.445	A	0.070	48.262	22.091	45.71	94.608	0.000
60.000-40.000						B	0.070	48.262		45.71	121.925	0.000
						C	0.070	48.262		45.71	265.628	0.000
T9	30.000	0.701	0.004	1.486	79.186	A	0.070	35.447	21.572	60.74	92.373	0.000
40.000-20.000						B	0.070	35.447		60.74	119.703	0.000
						C	0.070	35.447		60.74	260.924	0.000
T10	12.500	0.7	0.004	1.361	59.078	A	0.070	25.928	15.556	59.84	54.699	0.000
20.000-5.000						B	0.070	25.928		59.84	69.692	0.000
						C	0.070	25.928		59.84	155.045	0.000
T11 5.000-0.000	2.500	0.7	0.004	1.159	11.112	A	1.602	6.499	5.212	64.34	2.159	0.000
						B	1.602	6.499		64.34	0.000	0.000
						C	1.602	6.499		64.34	4.651	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	186.500	1.181	0.009	47.575	A	7.968	6.229	6.229	43.88	9.504	0.000
193.000-180.0					B	7.968	6.229		43.88	11.088	0.000
00					C	7.968	6.229		43.88	0.000	0.000
T2	170.000	1.15	0.009	74.233	A	27.160	0.000	11.667	42.96	23.760	0.000
180.000-160.0					B	27.160	0.000		42.96	54.777	0.000
00					C	27.160	0.000		42.96	33.650	0.000
T3	150.000	1.11	0.009	74.233	A	26.117	0.782	11.667	43.37	31.680	0.000
160.000-140.0					B	26.117	0.782		43.37	85.380	0.000
00					C	26.117	0.782		43.37	44.073	0.000
T4	130.000	1.065	0.008	73.192	A	0.070	18.163	9.583	52.56	39.600	0.000
140.000-120.0					B	0.070	18.163		52.56	85.380	0.000
00					C	0.070	18.163		52.56	73.947	0.000
T5	110.000	1.016	0.008	74.233	A	15.493	11.667	11.667	42.96	44.180	0.000
120.000-100.0					B	15.493	11.667		42.96	85.380	0.000
00					C	15.493	11.667		42.96	106.277	0.000
T6	90.000	0.959	0.008	74.233	A	0.070	20.106	11.667	57.83	45.920	0.000
100.000-80.00					B	0.070	20.106		57.83	85.380	0.000
0					C	0.070	20.106		57.83	112.097	0.000
T7	70.000	0.892	0.007	74.233	A	9.003	12.449	11.667	54.39	45.920	0.000
80.000-60.000					B	9.003	12.449		54.39	85.380	0.000
					C	9.003	12.449		54.39	112.097	0.000
T8	50.000	0.811	0.006	74.233	A	0.070	20.106	11.667	57.83	45.920	0.000
60.000-40.000					B	0.070	20.106		57.83	85.380	0.000
					C	0.070	20.106		57.83	112.097	0.000
T9	30.000	0.701	0.005	74.233	A	0.070	16.277	11.667	71.37	45.920	0.000
40.000-20.000					B	0.070	16.277		71.37	85.380	0.000
					C	0.070	16.277		71.37	112.097	0.000
T10	12.500	0.7	0.005	55.675	A	0.070	12.392	8.750	70.21	28.152	0.000
20.000-5.000					B	0.070	12.392		70.21	51.228	0.000
					C	0.070	12.392		70.21	68.086	0.000
T11	2.500	0.7	0.005	10.091	A	1.602	3.136	3.136	66.18	1.000	0.000
5.000-0.000					B	1.602	3.136		66.18	0.000	0.000
					C	1.602	3.136		66.18	1.380	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.088	0.774	A	0.298	2.3	0.027	1	1	11.695	1.100	0.085	C
193.000-180.0			B	0.298	2.3		1	1	11.695			
00			C	0.298	2.3		1	1	11.695			
T2	0.410	1.534	A	0.366	2.136	0.027	1	1	27.160	3.518*	0.176	C
180.000-160.0		TA 1.025	B	0.366	2.136		1	1	27.160			
00			C	0.366	2.136		1	1	27.160			
T3	0.615	1.504	A	0.362	2.143	0.026	1	1	26.603	3.394*	0.170	C
160.000-140.0			B	0.362	2.143		1	1	26.603			
00			C	0.362	2.143		1	1	26.603			
T4	0.777	0.852	A	0.249	2.44	0.025	1	1	10.691	3.213*	0.161	C
140.000-120.0			B	0.249	2.44		1	1	10.691			
00			C	0.249	2.44		1	1	10.691			
T5	0.931	1.584	A	0.366	2.136	0.023	1	1	22.752	3.106*	0.155	C
120.000-100.0		TA 0.694	B	0.366	2.136		1	1	22.752			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
00			C	0.366	2.136		1	1	22.752			
T6	0.981	0.814	A	0.272	2.374	0.022	1	1	11.946	2.933*	0.147	C
100.000-80.00			B	0.272	2.374		1	1	11.946			
0			C	0.272	2.374		1	1	11.946			
T7	0.981	1.077	A	0.289	2.326	0.021	1	1	16.417	2.730*	0.137	C
80.000-60.000		TA 0.512	B	0.289	2.326		1	1	16.417			
			C	0.289	2.326		1	1	16.417			
T8	0.981	1.008	A	0.272	2.374	0.019	1	1	11.946	2.480*	0.124	C
60.000-40.000			B	0.272	2.374		1	1	11.946			
			C	0.272	2.374		1	1	11.946			
T9	0.981	0.724	A	0.22	2.53	0.016	1	1	9.483	2.143*	0.107	C
40.000-20.000			B	0.22	2.53		1	1	9.483			
			C	0.22	2.53		1	1	9.483			
T10	0.603	0.631	A	0.224	2.518	0.016	1	1	7.246	1.606*	0.107	C
20.000-5.000			B	0.224	2.518		1	1	7.246			
			C	0.224	2.518		1	1	7.246			
T11	0.025	0.370	A	0.47	1.943	0.016	1	1	3.700	0.131	0.026	C
5.000-0.000			B	0.47	1.943		1	1	3.700			
			C	0.47	1.943		1	1	3.700			
Sum Weight:	7.372	13.149			*2.1A_g limit					26.355		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.088	0.774	A	0.298	2.3	0.027	0.8	1	10.102	1.016	0.078	C
193.000-180.0			B	0.298	2.3		0.8	1	10.102			
00			C	0.298	2.3		0.8	1	10.102			
T2	0.410	1.534	A	0.366	2.136	0.027	0.8	1	21.728	3.518*	0.176	C
180.000-160.0		TA 1.025	B	0.366	2.136		0.8	1	21.728			
00			C	0.366	2.136		0.8	1	21.728			
T3	0.615	1.504	A	0.362	2.143	0.026	0.8	1	21.379	3.394*	0.170	C
160.000-140.0			B	0.362	2.143		0.8	1	21.379			
00			C	0.362	2.143		0.8	1	21.379			
T4	0.777	0.852	A	0.249	2.44	0.025	0.8	1	10.677	3.213*	0.161	C
140.000-120.0			B	0.249	2.44		0.8	1	10.677			
00			C	0.249	2.44		0.8	1	10.677			
T5	0.931	1.584	A	0.366	2.136	0.023	0.8	1	19.653	3.106*	0.155	C
120.000-100.0		TA 0.694	B	0.366	2.136		0.8	1	19.653			
00			C	0.366	2.136		0.8	1	19.653			
T6	0.981	0.814	A	0.272	2.374	0.022	0.8	1	11.932	2.933*	0.147	C
100.000-80.00			B	0.272	2.374		0.8	1	11.932			
0			C	0.272	2.374		0.8	1	11.932			
T7	0.981	1.077	A	0.289	2.326	0.021	0.8	1	14.617	2.730*	0.137	C
80.000-60.000		TA 0.512	B	0.289	2.326		0.8	1	14.617			
			C	0.289	2.326		0.8	1	14.617			
T8	0.981	1.008	A	0.272	2.374	0.019	0.8	1	11.932	2.480*	0.124	C
60.000-40.000			B	0.272	2.374		0.8	1	11.932			
			C	0.272	2.374		0.8	1	11.932			
T9	0.981	0.724	A	0.22	2.53	0.016	0.8	1	9.469	2.143*	0.107	C
40.000-20.000			B	0.22	2.53		0.8	1	9.469			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
			C	0.22	2.53		0.8	1	9.469			
T10	0.603	0.631	A	0.224	2.518	0.016	0.8	1	7.232	1.606*	0.107	C
20.000-5.000			B	0.224	2.518		0.8	1	7.232			
			C	0.224	2.518		0.8	1	7.232			
T11	0.025	0.370	A	0.47	1.943	0.016	0.8	1	3.380	0.123	0.025	C
5.000-0.000			B	0.47	1.943		0.8	1	3.380			
			C	0.47	1.943		0.8	1	3.380			
Sum Weight:	7.372	13.149			*2.1A_g limit					26.262		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.088	0.774	A	0.298	2.3	0.027	0.85	1	10.500	1.037	0.080	C
193.000-180.0			B	0.298	2.3		0.85	1	10.500			
00			C	0.298	2.3		0.85	1	10.500			
T2	0.410	1.534	A	0.366	2.136	0.027	0.85	1	23.086	3.518*	0.176	C
180.000-160.0		TA 1.025	B	0.366	2.136		0.85	1	23.086			
00			C	0.366	2.136		0.85	1	23.086			
T3	0.615	1.504	A	0.362	2.143	0.026	0.85	1	22.685	3.394*	0.170	C
160.000-140.0			B	0.362	2.143		0.85	1	22.685			
00			C	0.362	2.143		0.85	1	22.685			
T4	0.777	0.852	A	0.249	2.44	0.025	0.85	1	10.681	3.213*	0.161	C
140.000-120.0			B	0.249	2.44		0.85	1	10.681			
00			C	0.249	2.44		0.85	1	10.681			
T5	0.931	1.584	A	0.366	2.136	0.023	0.85	1	20.428	3.106*	0.155	C
120.000-100.0		TA 0.694	B	0.366	2.136		0.85	1	20.428			
00			C	0.366	2.136		0.85	1	20.428			
T6	0.981	0.814	A	0.272	2.374	0.022	0.85	1	11.935	2.933*	0.147	C
100.000-80.00			B	0.272	2.374		0.85	1	11.935			
0			C	0.272	2.374		0.85	1	11.935			
T7	0.981	1.077	A	0.289	2.326	0.021	0.85	1	15.067	2.730*	0.137	C
80.000-60.000		TA 0.512	B	0.289	2.326		0.85	1	15.067			
			C	0.289	2.326		0.85	1	15.067			
T8	0.981	1.008	A	0.272	2.374	0.019	0.85	1	11.935	2.480*	0.124	C
60.000-40.000			B	0.272	2.374		0.85	1	11.935			
			C	0.272	2.374		0.85	1	11.935			
T9	0.981	0.724	A	0.22	2.53	0.016	0.85	1	9.473	2.143*	0.107	C
40.000-20.000			B	0.22	2.53		0.85	1	9.473			
			C	0.22	2.53		0.85	1	9.473			
T10	0.603	0.631	A	0.224	2.518	0.016	0.85	1	7.235	1.606*	0.107	C
20.000-5.000			B	0.224	2.518		0.85	1	7.235			
			C	0.224	2.518		0.85	1	7.235			
T11	0.025	0.370	A	0.47	1.943	0.016	0.85	1	3.460	0.125	0.025	C
5.000-0.000			B	0.47	1.943		0.85	1	3.460			
			C	0.47	1.943		0.85	1	3.460			
Sum Weight:	7.372	13.149			*2.1A_g limit					26.285		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.532	2.665	A	0.699	1.776	0.006	1	1	30.389	0.463	0.036	C
193.000-180.0			B	0.699	1.776		1	1	30.389			
00			C	0.699	1.776		1	1	30.389			
T2	3.226	5.289	A	0.779	1.802	0.006	1	1	58.712	0.895*	0.045	C
180.000-160.0		TA 1.787	B	0.779	1.802		1	1	58.712			
00			C	0.779	1.802		1	1	58.712			
T3	4.659	5.141	A	0.771	1.797	0.006	1	1	57.787	0.863*	0.043	C
160.000-140.0			B	0.771	1.797		1	1	57.787			
00			C	0.771	1.797		1	1	57.787			
T4	5.809	2.930	A	0.628	1.789	0.006	1	1	37.624	0.816*	0.041	C
140.000-120.0			B	0.628	1.789		1	1	37.624			
00			C	0.628	1.789		1	1	37.624			
T5	6.935	5.064	A	0.81	1.824	0.006	1	1	59.295	0.788*	0.039	C
120.000-100.0		TA 1.418	B	0.81	1.824		1	1	59.295			
00			C	0.81	1.824		1	1	59.295			
T6	7.169	2.858	A	0.627	1.79	0.005	1	1	38.002	0.743*	0.037	C
100.000-80.00			B	0.627	1.79		1	1	38.002			
0			C	0.627	1.79		1	1	38.002			
T7	6.996	3.434	A	0.635	1.786	0.005	1	1	40.757	0.690*	0.035	C
80.000-60.000		TA 1.079	B	0.635	1.786		1	1	40.757			
			C	0.635	1.786		1	1	40.757			
T8	6.775	2.884	A	0.608	1.799	0.004	1	1	36.119	0.625*	0.031	C
60.000-40.000			B	0.608	1.799		1	1	36.119			
			C	0.608	1.799		1	1	36.119			
T9	6.458	1.923	A	0.449	1.976	0.004	1	1	23.328	0.539*	0.027	C
40.000-20.000			B	0.449	1.976		1	1	23.328			
			C	0.449	1.976		1	1	23.328			
T10	3.638	1.449	A	0.44	1.99	0.004	1	1	16.961	0.402*	0.027	C
20.000-5.000			B	0.44	1.99		1	1	16.961			
			C	0.44	1.99		1	1	16.961			
T11	0.086	0.644	A	0.729	1.781	0.004	1	1	6.924	0.062	0.012	C
5.000-0.000			B	0.729	1.781		1	1	6.924			
			C	0.729	1.781		1	1	6.924			
Sum Weight:	52.283	38.611			*2.1A_g limit					6.884		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.532	2.665	A	0.699	1.776	0.006	0.8	1	28.796	0.447	0.034	C
193.000-180.0			B	0.699	1.776		0.8	1	28.796			
00			C	0.699	1.776		0.8	1	28.796			
T2	3.226	5.289	A	0.779	1.802	0.006	0.8	1	51.709	0.895*	0.045	C
180.000-160.0		TA 1.787	B	0.779	1.802		0.8	1	51.709			
00			C	0.779	1.802		0.8	1	51.709			
T3	4.659	5.141	A	0.771	1.797	0.006	0.8	1	51.013	0.863*	0.043	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
160.000-140.0			B	0.771	1.797		0.8	1	51.013			
00			C	0.771	1.797		0.8	1	51.013			
T4	5.809	2.930	A	0.628	1.789	0.006	0.8	1	37.610	0.816*	0.041	C
140.000-120.0			B	0.628	1.789		0.8	1	37.610			
00			C	0.628	1.789		0.8	1	37.610			
T5	6.935	5.064	A	0.81	1.824	0.006	0.8	1	56.196	0.788*	0.039	C
120.000-100.0		TA 1.418	B	0.81	1.824		0.8	1	56.196			
00			C	0.81	1.824		0.8	1	56.196			
T6	7.169	2.858	A	0.627	1.79	0.005	0.8	1	37.988	0.743*	0.037	C
100.000-80.00			B	0.627	1.79		0.8	1	37.988			
0			C	0.627	1.79		0.8	1	37.988			
T7	6.996	3.434	A	0.635	1.786	0.005	0.8	1	38.956	0.690*	0.035	C
80.000-60.000		TA 1.079	B	0.635	1.786		0.8	1	38.956			
			C	0.635	1.786		0.8	1	38.956			
T8	6.775	2.884	A	0.608	1.799	0.004	0.8	1	36.105	0.625*	0.031	C
60.000-40.000			B	0.608	1.799		0.8	1	36.105			
			C	0.608	1.799		0.8	1	36.105			
T9	6.458	1.923	A	0.449	1.976	0.004	0.8	1	23.314	0.539*	0.027	C
40.000-20.000			B	0.449	1.976		0.8	1	23.314			
			C	0.449	1.976		0.8	1	23.314			
T10	3.638	1.449	A	0.44	1.99	0.004	0.8	1	16.947	0.402*	0.027	C
20.000-5.000			B	0.44	1.99		0.8	1	16.947			
			C	0.44	1.99		0.8	1	16.947			
T11	0.086	0.644	A	0.729	1.781	0.004	0.8	1	6.604	0.060	0.012	C
5.000-0.000			B	0.729	1.781		0.8	1	6.604			
			C	0.729	1.781		0.8	1	6.604			
Sum Weight:	52.283	38.611			*2.1A_g limit					6.867		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.532	2.665	A	0.699	1.776	0.006	0.85	1	29.194	0.451	0.035	C
193.000-180.0			B	0.699	1.776		0.85	1	29.194			
00			C	0.699	1.776		0.85	1	29.194			
T2	3.226	5.289	A	0.779	1.802	0.006	0.85	1	53.460	0.895*	0.045	C
180.000-160.0		TA 1.787	B	0.779	1.802		0.85	1	53.460			
00			C	0.779	1.802		0.85	1	53.460			
T3	4.659	5.141	A	0.771	1.797	0.006	0.85	1	52.706	0.863*	0.043	C
160.000-140.0			B	0.771	1.797		0.85	1	52.706			
00			C	0.771	1.797		0.85	1	52.706			
T4	5.809	2.930	A	0.628	1.789	0.006	0.85	1	37.614	0.816*	0.041	C
140.000-120.0			B	0.628	1.789		0.85	1	37.614			
00			C	0.628	1.789		0.85	1	37.614			
T5	6.935	5.064	A	0.81	1.824	0.006	0.85	1	56.971	0.788*	0.039	C
120.000-100.0		TA 1.418	B	0.81	1.824		0.85	1	56.971			
00			C	0.81	1.824		0.85	1	56.971			
T6	7.169	2.858	A	0.627	1.79	0.005	0.85	1	37.991	0.743*	0.037	C
100.000-80.00			B	0.627	1.79		0.85	1	37.991			
0			C	0.627	1.79		0.85	1	37.991			
T7	6.996	3.434	A	0.635	1.786	0.005	0.85	1	39.406	0.690*	0.035	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
80.000-60.000		TA 1.079	B	0.635	1.786		0.85	1	39.406			
			C	0.635	1.786		0.85	1	39.406			
T8	6.775	2.884	A	0.608	1.799	0.004	0.85	1	36.109	0.625*	0.031	C
60.000-40.000			B	0.608	1.799		0.85	1	36.109			
			C	0.608	1.799		0.85	1	36.109			
T9	6.458	1.923	A	0.449	1.976	0.004	0.85	1	23.317	0.539*	0.027	C
40.000-20.000			B	0.449	1.976		0.85	1	23.317			
			C	0.449	1.976		0.85	1	23.317			
T10	3.638	1.449	A	0.44	1.99	0.004	0.85	1	16.951	0.402*	0.027	C
20.000-5.000			B	0.44	1.99		0.85	1	16.951			
			C	0.44	1.99		0.85	1	16.951			
T11	0.086	0.644	A	0.729	1.781	0.004	0.85	1	6.684	0.061	0.012	C
5.000-0.000			B	0.729	1.781		0.85	1	6.684			
			C	0.729	1.781		0.85	1	6.684			
Sum Weight:	52.283	38.611			*2.1A_g limit					6.871		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.088	0.774	A	0.298	2.3	0.009	1	1	11.695	0.373	0.029	C
193.000-180.0			B	0.298	2.3		1	1	11.695			
00			C	0.298	2.3		1	1	11.695			
T2	0.410	1.534	A	0.366	2.136	0.009	1	1	27.160	1.194*	0.060	C
180.000-160.0		TA 1.025	B	0.366	2.136		1	1	27.160			
00			C	0.366	2.136		1	1	27.160			
T3	0.615	1.504	A	0.362	2.143	0.009	1	1	26.603	1.152*	0.058	C
160.000-140.0			B	0.362	2.143		1	1	26.603			
00			C	0.362	2.143		1	1	26.603			
T4	0.777	0.852	A	0.249	2.44	0.008	1	1	10.691	1.090*	0.055	C
140.000-120.0			B	0.249	2.44		1	1	10.691			
00			C	0.249	2.44		1	1	10.691			
T5	0.931	1.584	A	0.366	2.136	0.008	1	1	22.752	1.054*	0.053	C
120.000-100.0		TA 0.694	B	0.366	2.136		1	1	22.752			
00			C	0.366	2.136		1	1	22.752			
T6	0.981	0.814	A	0.272	2.374	0.008	1	1	11.946	0.995*	0.050	C
100.000-80.00			B	0.272	2.374		1	1	11.946			
0			C	0.272	2.374		1	1	11.946			
T7	0.981	1.077	A	0.289	2.326	0.007	1	1	16.417	0.926*	0.046	C
80.000-60.000		TA 0.512	B	0.289	2.326		1	1	16.417			
			C	0.289	2.326		1	1	16.417			
T8	0.981	1.008	A	0.272	2.374	0.006	1	1	11.946	0.841*	0.042	C
60.000-40.000			B	0.272	2.374		1	1	11.946			
			C	0.272	2.374		1	1	11.946			
T9	0.981	0.724	A	0.22	2.53	0.005	1	1	9.483	0.727*	0.036	C
40.000-20.000			B	0.22	2.53		1	1	9.483			
			C	0.22	2.53		1	1	9.483			
T10	0.603	0.631	A	0.224	2.518	0.005	1	1	7.246	0.545*	0.036	C
20.000-5.000			B	0.224	2.518		1	1	7.246			
			C	0.224	2.518		1	1	7.246			
T11	0.025	0.370	A	0.47	1.943	0.005	1	1	3.700	0.045	0.009	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
5.000-0.000			B	0.47	1.943		1	1	3.700			
			C	0.47	1.943		1	1	3.700			
Sum Weight:	7.372	13.149			*2.1A_g limit					8.943		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft^2	F K	w klf	Ctrl. Face
T1	0.088	0.774	A	0.298	2.3	0.009	0.8	1	10.102	0.345	0.027	C
193.000-180.0			B	0.298	2.3		0.8	1	10.102			
00			C	0.298	2.3		0.8	1	10.102			
T2	0.410	1.534	A	0.366	2.136	0.009	0.8	1	21.728	1.194*	0.060	C
180.000-160.0		TA 1.025	B	0.366	2.136		0.8	1	21.728			
00			C	0.366	2.136		0.8	1	21.728			
T3	0.615	1.504	A	0.362	2.143	0.009	0.8	1	21.379	1.152*	0.058	C
160.000-140.0			B	0.362	2.143		0.8	1	21.379			
00			C	0.362	2.143		0.8	1	21.379			
T4	0.777	0.852	A	0.249	2.44	0.008	0.8	1	10.677	1.090*	0.055	C
140.000-120.0			B	0.249	2.44		0.8	1	10.677			
00			C	0.249	2.44		0.8	1	10.677			
T5	0.931	1.584	A	0.366	2.136	0.008	0.8	1	19.653	1.054*	0.053	C
120.000-100.0		TA 0.694	B	0.366	2.136		0.8	1	19.653			
00			C	0.366	2.136		0.8	1	19.653			
T6	0.981	0.814	A	0.272	2.374	0.008	0.8	1	11.932	0.995*	0.050	C
100.000-80.00			B	0.272	2.374		0.8	1	11.932			
0			C	0.272	2.374		0.8	1	11.932			
T7	0.981	1.077	A	0.289	2.326	0.007	0.8	1	14.617	0.926*	0.046	C
80.000-60.000		TA 0.512	B	0.289	2.326		0.8	1	14.617			
			C	0.289	2.326		0.8	1	14.617			
T8	0.981	1.008	A	0.272	2.374	0.006	0.8	1	11.932	0.841*	0.042	C
60.000-40.000			B	0.272	2.374		0.8	1	11.932			
			C	0.272	2.374		0.8	1	11.932			
T9	0.981	0.724	A	0.22	2.53	0.005	0.8	1	9.469	0.727*	0.036	C
40.000-20.000			B	0.22	2.53		0.8	1	9.469			
			C	0.22	2.53		0.8	1	9.469			
T10	0.603	0.631	A	0.224	2.518	0.005	0.8	1	7.232	0.545*	0.036	C
20.000-5.000			B	0.224	2.518		0.8	1	7.232			
			C	0.224	2.518		0.8	1	7.232			
T11	0.025	0.370	A	0.47	1.943	0.005	0.8	1	3.380	0.042	0.008	C
5.000-0.000			B	0.47	1.943		0.8	1	3.380			
			C	0.47	1.943		0.8	1	3.380			
Sum Weight:	7.372	13.149			*2.1A_g limit					8.911		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.088	0.774	A	0.298	2.3	0.009	0.85	1	10.500	0.352	0.027	C
193.000-180.0			B	0.298	2.3		0.85	1	10.500			
00			C	0.298	2.3		0.85	1	10.500			
T2	0.410	1.534	A	0.366	2.136	0.009	0.85	1	23.086	1.194*	0.060	C
180.000-160.0		TA 1.025	B	0.366	2.136		0.85	1	23.086			
00			C	0.366	2.136		0.85	1	23.086			
T3	0.615	1.504	A	0.362	2.143	0.009	0.85	1	22.685	1.152*	0.058	C
160.000-140.0			B	0.362	2.143		0.85	1	22.685			
00			C	0.362	2.143		0.85	1	22.685			
T4	0.777	0.852	A	0.249	2.44	0.008	0.85	1	10.681	1.090*	0.055	C
140.000-120.0			B	0.249	2.44		0.85	1	10.681			
00			C	0.249	2.44		0.85	1	10.681			
T5	0.931	1.584	A	0.366	2.136	0.008	0.85	1	20.428	1.054*	0.053	C
120.000-100.0		TA 0.694	B	0.366	2.136		0.85	1	20.428			
00			C	0.366	2.136		0.85	1	20.428			
T6	0.981	0.814	A	0.272	2.374	0.008	0.85	1	11.935	0.995*	0.050	C
100.000-80.00			B	0.272	2.374		0.85	1	11.935			
0			C	0.272	2.374		0.85	1	11.935			
T7	0.981	1.077	A	0.289	2.326	0.007	0.85	1	15.067	0.926*	0.046	C
80.000-60.000		TA 0.512	B	0.289	2.326		0.85	1	15.067			
			C	0.289	2.326		0.85	1	15.067			
T8	0.981	1.008	A	0.272	2.374	0.006	0.85	1	11.935	0.841*	0.042	C
60.000-40.000			B	0.272	2.374		0.85	1	11.935			
			C	0.272	2.374		0.85	1	11.935			
T9	0.981	0.724	A	0.22	2.53	0.005	0.85	1	9.473	0.727*	0.036	C
40.000-20.000			B	0.22	2.53		0.85	1	9.473			
			C	0.22	2.53		0.85	1	9.473			
T10	0.603	0.631	A	0.224	2.518	0.005	0.85	1	7.235	0.545*	0.036	C
20.000-5.000			B	0.224	2.518		0.85	1	7.235			
			C	0.224	2.518		0.85	1	7.235			
T11	0.025	0.370	A	0.47	1.943	0.005	0.85	1	3.460	0.042	0.008	C
5.000-0.000			B	0.47	1.943		0.85	1	3.460			
			C	0.47	1.943		0.85	1	3.460			
Sum Weight:	7.372	13.149			*2.1A_g limit					8.919		

Discrete Appurtenance Pressures - No Ice

G_H = 0.850 (base tower), 1.350 (antenna pole)

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft²	C_AA_C Side ft²
Torque Arm Face C	180.0000	0.000	0.000	2.465	162.496	1.135	0.026	5.130	8.868
Torque Arm Face B	60.0000	0.000	2.135	-1.233	162.496	1.135	0.026	5.130	8.868
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	162.496	1.135	0.026	5.130	8.868
Torque Arm Face C	180.0000	0.000	0.000	2.465	102.496	0.995	0.023	5.130	8.868
Torque Arm Face B	60.0000	0.000	2.135	-1.233	102.496	0.995	0.023	5.130	8.868
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	102.496	0.995	0.023	5.130	8.868
Torque Arm Face C	180.0000	0.000	0.000	2.465	62.496	0.864	0.020	4.104	7.214
Torque Arm Face B	60.0000	0.000	2.135	-1.233	62.496	0.864	0.020	4.104	7.214
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	62.496	0.864	0.020	4.104	7.214
Antenna Pole	0.0000	0.010	0.000	0.000	195.000	1.196	0.028	10.000	10.000
Rohn 6'x10' Boom Gate	0.0000	0.570	0.000	-3.975	188.000	1.184	0.027	14.000	9.000
AIR 21 B4A/B2P	0.0000	0.126	-4.500	-5.975	188.000	1.184	0.027	5.965	4.265
AIR 21 B4A/B2P	0.0000	0.126	4.500	-5.975	188.000	1.184	0.027	5.965	4.265

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
KRY 112 71	0.0000	0.013	0.000	-5.975	188.000	1.184	0.027	0.583	0.398
7'x2" Antenna Mount Pipe	0.0000	0.026	0.000	-5.975	188.000	1.184	0.027	1.663	1.663
Rohn 6'x10' Boom Gate	120.0000	0.570	3.442	1.987	188.000	1.184	0.027	14.000	9.000
AIR 21 B4A/B2P	120.0000	0.126	7.424	-0.910	188.000	1.184	0.027	5.965	4.265
AIR 21 B4A/B2P	120.0000	0.126	2.924	6.884	188.000	1.184	0.027	5.965	4.265
KRY 112 71	120.0000	0.013	5.174	2.987	188.000	1.184	0.027	0.583	0.398
7'x2" Antenna Mount Pipe	120.0000	0.026	5.174	2.987	188.000	1.184	0.027	1.663	1.663
Rohn 6'x10' Boom Gate	240.0000	0.570	-3.442	1.987	188.000	1.184	0.027	14.000	9.000
AIR 21 B4A/B2P	240.0000	0.126	-2.924	6.884	188.000	1.184	0.027	5.965	4.265
AIR 21 B4A/B2P	240.0000	0.126	-7.424	-0.910	188.000	1.184	0.027	5.965	4.265
KRY 112 71	240.0000	0.013	-5.174	2.987	188.000	1.184	0.027	0.583	0.398
7'x2" Antenna Mount Pipe	240.0000	0.026	-5.174	2.987	188.000	1.184	0.027	1.663	1.663
Rohn 6'x15' Boom Mount	0.0000	0.510	0.000	-3.975	177.500	1.164	0.027	17.500	9.000
Powerwave 7770 w/5ft mount pipe	0.0000	0.045	0.000	-5.975	178.750	1.167	0.027	5.607	4.116
Powerwave 7770 w/5ft mount pipe	0.0000	0.045	-4.000	-5.975	178.750	1.167	0.027	5.607	4.116
SBNH-1D6565C w/8ft 2.0 Std pipe	0.0000	0.095	4.000	-5.975	178.750	1.167	0.027	11.445	9.596
RRUS-11	0.0000	0.055	4.000	-5.975	178.750	1.167	0.027	2.522	1.020
RRUS-12	0.0000	0.058	0.000	-3.975	178.750	1.167	0.027	3.145	1.285
TT19-08BP111-001 Twin TMA	0.0000	0.032	0.000	-5.975	178.750	1.167	0.027	1.105	0.891
Diplexer	0.0000	0.002	0.000	-5.975	178.750	1.167	0.027	0.700	0.240
Rohn 6'x15' Boom Mount	120.0000	0.510	3.442	1.987	177.500	1.164	0.027	17.500	9.000
Powerwave 7770 w/5ft mount pipe	120.0000	0.045	5.174	2.987	178.750	1.167	0.027	5.607	4.116
Powerwave 7770 w/5ft mount pipe	120.0000	0.045	7.174	-0.477	178.750	1.167	0.027	5.607	4.116
AM-X-CD-16-65-OOT-RET	120.0000	0.049	3.174	6.451	178.750	1.167	0.027	8.024	4.642
RRUS-11	120.0000	0.055	3.174	6.451	178.750	1.167	0.027	2.522	1.020
RRUS-12	120.0000	0.058	3.442	1.987	178.750	1.167	0.027	3.145	1.285
TT19-08BP111-001 Twin TMA	120.0000	0.032	5.174	2.987	178.750	1.167	0.027	1.105	0.891
Diplexer	120.0000	0.002	5.174	2.987	178.750	1.167	0.027	0.700	0.240
Rohn 6'x15' Boom Mount	240.0000	0.510	-3.442	1.987	177.500	1.164	0.027	17.500	9.000
Powerwave 7770 w/5ft mount pipe	240.0000	0.045	-5.174	2.987	178.750	1.167	0.027	5.607	4.116
Powerwave 7770 w/5ft mount pipe	240.0000	0.045	-3.174	6.451	178.750	1.167	0.027	5.607	4.116
P65-17-XLH-RR w/8ft mount pipe	240.0000	0.099	-7.174	-0.477	178.750	1.167	0.027	11.467	8.700
RRUS-11	240.0000	0.055	-7.174	-0.477	178.750	1.167	0.027	2.522	1.020
RRUS-12	240.0000	0.058	-3.442	1.987	178.750	1.167	0.027	3.145	1.285
TT19-08BP111-001 Twin TMA	240.0000	0.032	-5.174	2.987	178.750	1.167	0.027	1.105	0.891
Diplexer	240.0000	0.002	-5.174	2.987	178.750	1.167	0.027	0.700	0.240
DC6-48-06-18-8F	240.0000	0.032	-5.174	2.987	178.750	1.167	0.027	1.201	1.201
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.500	0.000	-3.975	169.000	1.148	0.027	15.000	15.000
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	0.0000	0.034	-2.000	-5.475	169.000	1.148	0.027	3.110	6.824
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	0.0000	0.034	3.500	-5.475	169.000	1.148	0.027	3.110	6.824

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
SBNHH-1D65B w/ 8ft mount pipe	0.0000	0.070	3.500	-5.475	169.000	1.148	0.027	8.554	7.242
SBNHH-1D65B w/ 8ft mount pipe	0.0000	0.070	-6.000	-5.475	169.000	1.148	0.027	8.554	7.242
RRH2X60-07-U	0.0000	0.050	0.000	-4.975	169.000	1.148	0.027	2.450	1.630
RRH2X60-AWS	0.0000	0.044	-4.000	-4.975	169.000	1.148	0.027	1.867	1.227
RRH2X60-PCS	0.0000	0.055	4.000	-4.975	169.000	1.148	0.027	2.200	1.723
Pirod 15' T-Frame Sector Mount (1)	120.0000	0.500	3.442	1.987	169.000	1.148	0.027	15.000	15.000
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	120.0000	0.034	5.741	1.005	169.000	1.148	0.027	3.110	6.824
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	120.0000	0.034	2.991	5.768	169.000	1.148	0.027	3.110	6.824
SBNHH-1D65B w/ 8ft mount pipe	120.0000	0.070	2.991	5.768	169.000	1.148	0.027	8.554	7.242
SBNHH-1D65B w/ 8ft mount pipe	120.0000	0.070	7.741	-2.459	169.000	1.148	0.027	8.554	7.242
RRH2X60-07-U	120.0000	0.050	4.308	2.487	169.000	1.148	0.027	2.450	1.630
RRH2X60-AWS	120.0000	0.044	6.308	-0.977	169.000	1.148	0.027	1.867	1.227
RRH2X60-PCS	120.0000	0.055	2.308	5.951	169.000	1.148	0.027	2.200	1.723
Pirod 15' T-Frame Sector Mount (1)	240.0000	0.500	-3.442	1.987	169.000	1.148	0.027	15.000	15.000
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	240.0000	0.034	-3.741	4.469	169.000	1.148	0.027	3.110	6.824
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	240.0000	0.034	-6.491	-0.294	169.000	1.148	0.027	3.110	6.824
SBNHH-1D65B w/ 8ft mount pipe	240.0000	0.070	-6.491	-0.294	169.000	1.148	0.027	8.554	7.242
SBNHH-1D65B w/ 8ft mount pipe	240.0000	0.070	-1.741	7.933	169.000	1.148	0.027	8.554	7.242
RRH2X60-07-U	240.0000	0.050	-4.308	2.487	169.000	1.148	0.027	2.450	1.630
RRH2X60-AWS	240.0000	0.044	-2.308	5.951	169.000	1.148	0.027	1.867	1.227
RRH2X60-PCS	240.0000	0.055	-6.308	-0.977	169.000	1.148	0.027	2.200	1.723
DB-T1-6Z-8AB-0Z	0.0000	0.040	0.000	-3.475	169.000	1.148	0.027	0.000	2.330
DB-T1-6Z-8AB-0Z	120.0000	0.040	3.009	1.737	169.000	1.148	0.027	0.000	2.330
Rohn 6'x15' Boom Mount	0.0000	0.510	0.000	-3.975	150.500	1.111	0.026	17.500	9.000
APXVSPP18-C-A20	0.0000	0.065	-4.000	-4.975	151.000	1.112	0.026	8.024	5.808
DT465B-2XR Panel Antenna W/M PIPE	0.0000	0.095	4.000	-4.975	151.000	1.112	0.026	9.222	7.292
TD-RRH8x20-25	0.0000	0.076	0.000	-3.975	151.000	1.112	0.026	4.030	1.526
RRH-2X50-800	0.0000	0.138	0.000	-3.975	151.000	1.112	0.026	3.467	2.667
ALU RRH-4X45-1900	0.0000	0.070	0.000	-3.975	151.000	1.112	0.026	2.500	2.500
Rohn 6'x15' Boom Mount	120.0000	0.510	3.442	1.987	150.500	1.111	0.026	17.500	9.000
APXVSPP18-C-A20	120.0000	0.065	6.308	-0.977	151.000	1.112	0.026	8.024	5.808
DT465B-2XR Panel Antenna W/M PIPE	120.0000	0.095	2.308	5.951	151.000	1.112	0.026	9.222	7.292
TD-RRH8x20-25	120.0000	0.076	3.442	1.987	151.000	1.112	0.026	4.030	1.526
RRH-2X50-800	120.0000	0.138	3.442	1.987	151.000	1.112	0.026	3.467	2.667
ALU RRH-4X45-1900	120.0000	0.070	3.442	1.987	151.000	1.112	0.026	2.500	2.500
Rohn 6'x15' Boom Mount	240.0000	0.510	-3.442	1.987	150.500	1.111	0.026	17.500	9.000
APXVSPP18-C-A20	240.0000	0.065	-2.308	5.951	151.000	1.112	0.026	8.024	5.808
DT465B-2XR Panel Antenna W/M PIPE	240.0000	0.095	-6.308	-0.977	151.000	1.112	0.026	9.222	7.292
TD-RRH8x20-25	240.0000	0.076	-3.442	1.987	151.000	1.112	0.026	4.030	1.526
RRH-2X50-800	240.0000	0.138	-3.442	1.987	151.000	1.112	0.026	3.467	2.667
ALU RRH-4X45-1900	240.0000	0.070	-3.442	1.987	151.000	1.112	0.026	2.500	2.500
840 10054	0.0000	0.060	0.000	-5.975	130.000	1.065	0.025	9.156	2.722
860 10025 RCU	0.0000	0.000	0.000	-5.975	130.000	1.065	0.025	0.320	0.260

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
Andrew QT SF12-2-72	0.0000	0.390	0.000	-3.975	130.000	1.065	0.025	16.300	16.300
840 10054	120.0000	0.060	5.174	2.987	130.000	1.065	0.025	9.156	2.722
860 10025 RCU	120.0000	0.000	5.174	2.987	130.000	1.065	0.025	0.320	0.260
Andrew QT SF12-2-72	120.0000	0.390	3.442	1.987	130.000	1.065	0.025	16.300	16.300
840 10054	240.0000	0.060	-5.174	2.987	130.000	1.065	0.025	9.156	2.722
860 10025 RCU	240.0000	0.000	-5.174	2.987	130.000	1.065	0.025	0.320	0.260
Andrew QT SF12-2-72	240.0000	0.390	-3.442	1.987	130.000	1.065	0.025	16.300	16.300
Splice Box	0.0000	0.000	0.000	-5.975	130.000	1.065	0.025	0.160	0.130
GPS	240.0000	0.025	-5.174	2.987	130.000	1.065	0.025	0.257	0.310
6ft-T Frame	0.0000	0.380	0.000	-2.975	120.000	1.041	0.024	13.600	13.600
LLPX310R	0.0000	0.030	0.000	-3.975	120.000	1.041	0.024	4.830	1.950
RRU Clearwire	0.0000	0.030	0.000	-2.975	120.000	1.041	0.024	1.800	0.780
6ft-T Frame	120.0000	0.380	2.576	1.487	120.000	1.041	0.024	13.600	13.600
LLPX310R	120.0000	0.030	3.442	1.987	120.000	1.041	0.024	4.830	1.950
RRU Clearwire	120.0000	0.030	2.576	1.487	120.000	1.041	0.024	1.800	0.780
6ft-T Frame	240.0000	0.380	-2.576	1.487	120.000	1.041	0.024	13.600	13.600
LLPX310R	240.0000	0.030	-3.442	1.987	120.000	1.041	0.024	4.830	1.950
RRU Clearwire	240.0000	0.030	-2.576	1.487	120.000	1.041	0.024	1.800	0.780
Splice Box	0.0000	0.000	0.000	-1.975	120.000	1.041	0.024	0.160	0.130
20'x3" Dia Omni	120.0000	0.050	5.824	3.362	188.750	1.185	0.027	6.000	6.000
6' Standoff Arm	120.0000	0.100	4.308	2.487	178.000	1.165	0.027	4.800	4.800
6'x3" Dia Omni	0.0000	0.020	0.000	-6.725	180.000	1.169	0.027	1.770	1.770
3' Standoff	0.0000	0.050	0.000	-3.475	178.000	1.165	0.027	2.400	2.400
4 Bay Dipole	120.0000	0.020	5.824	3.362	155.500	1.121	0.026	1.650	1.650
3'-6" Standoff	120.0000	0.500	3.442	1.987	151.000	1.112	0.026	2.400	2.400
DB408	120.0000	0.020	5.824	3.362	126.000	1.056	0.024	1.650	1.650
3' Standoff	120.0000	0.050	3.009	1.737	122.500	1.047	0.024	2.400	2.400
PD220	0.0000	0.023	0.000	-5.975	121.000	1.044	0.024	3.560	3.560
3' Standoff	0.0000	0.050	0.000	-3.475	110.000	1.016	0.023	2.400	2.400
PD220	120.0000	0.023	5.174	2.987	121.000	1.044	0.024	3.560	3.560
3' Standoff	120.0000	0.050	3.009	1.737	110.000	1.016	0.023	2.400	2.400
Folded Dipole	240.0000	0.030	-3.009	1.737	111.000	1.018	0.024	1.200	1.200
6'-3" Pipe Mount	240.0000	0.030	-2.576	1.487	111.000	1.018	0.024	1.770	1.770
2' Standoff	120.0000	0.010	2.576	1.487	105.000	1.002	0.023	0.600	0.600
2'x2" Omni Antenna	120.0000	0.020	3.442	1.987	106.000	1.005	0.023	0.300	0.300
	Sum Weight:	14.363							

Discrete Appurtenance Pressures - With Ice

G_H = 0.850 (base tower), 1.350 (antenna pole)

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Torque Arm Face C	180.0000	0.000	0.000	2.465	162.496	1.135	0.006	5.936	10.261	1.767
Torque Arm Face B	60.0000	0.000	2.135	-1.233	162.496	1.135	0.006	5.936	10.261	1.767
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	162.496	1.135	0.006	5.936	10.261	1.767
Torque Arm Face C	180.0000	0.000	0.000	2.465	102.496	0.995	0.005	5.902	10.202	1.692
Torque Arm Face B	60.0000	0.000	2.135	-1.233	102.496	0.995	0.005	5.902	10.202	1.692
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	102.496	0.995	0.005	5.902	10.202	1.692
Torque Arm Face C	180.0000	0.000	0.000	2.465	62.496	0.864	0.005	4.841	8.418	1.617
Torque Arm Face B	60.0000	0.000	2.135	-1.233	62.496	0.864	0.005	4.841	8.418	1.617
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	62.496	0.864	0.005	4.841	8.418	1.617
Antenna Pole	0.0000	0.016	0.000	0.000	195.000	1.196	0.007	12.000	12.000	1.792
Rohn 6'x10' Boom Gate	0.0000	1.260	0.000	-3.975	188.000	1.184	0.006	35.421	19.710	1.785
AIR 21 B4A/B2P	0.0000	0.298	-4.500	-5.975	188.000	1.184	0.006	7.314	5.548	1.785
AIR 21 B4A/B2P	0.0000	0.298	4.500	-5.975	188.000	1.184	0.006	7.314	5.548	1.785
KRY 112 71	0.0000	0.040	0.000	-5.975	188.000	1.184	0.006	0.992	0.758	1.785
7'x2" Antenna Mount	0.0000	0.094	0.000	-5.975	188.000	1.184	0.006	3.516	3.516	1.785

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Pipe										
Rohn 6'x10' Boom Gate	120.0000	1.260	3.442	1.987	188.000	1.184	0.006	35.421	19.710	1.785
AIR 21 B4A/B2P	120.0000	0.298	7.424	-0.910	188.000	1.184	0.006	7.314	5.548	1.785
AIR 21 B4A/B2P	120.0000	0.298	2.924	6.884	188.000	1.184	0.006	7.314	5.548	1.785
KRY 112 71	120.0000	0.040	5.174	2.987	188.000	1.184	0.006	0.992	0.758	1.785
7'x2" Antenna Mount Pipe	120.0000	0.094	5.174	2.987	188.000	1.184	0.006	3.516	3.516	1.785
Rohn 6'x10' Boom Gate	240.0000	1.260	-3.442	1.987	188.000	1.184	0.006	35.421	19.710	1.785
AIR 21 B4A/B2P	240.0000	0.298	-2.924	6.884	188.000	1.184	0.006	7.314	5.548	1.785
AIR 21 B4A/B2P	240.0000	0.298	-7.424	-0.910	188.000	1.184	0.006	7.314	5.548	1.785
KRY 112 71	240.0000	0.040	-5.174	2.987	188.000	1.184	0.006	0.992	0.758	1.785
7'x2" Antenna Mount Pipe	240.0000	0.094	-5.174	2.987	188.000	1.184	0.006	3.516	3.516	1.785
Rohn 6'x15' Boom Mount	0.0000	1.255	0.000	-3.975	177.500	1.164	0.006	38.798	19.649	1.775
Powerwave 7770 w/5ft mount pipe	0.0000	0.241	0.000	-5.975	178.750	1.167	0.006	7.010	6.501	1.776
Powerwave 7770 w/5ft mount pipe	0.0000	0.241	-4.000	-5.975	178.750	1.167	0.006	7.010	6.501	1.776
SBNH-1D6565C w/8ft 2.0 Std pipe	0.0000	0.455	4.000	-5.975	178.750	1.167	0.006	13.661	14.010	1.776
RRUS-11	0.0000	0.138	4.000	-5.975	178.750	1.167	0.006	3.258	1.547	1.776
RRUS-12	0.0000	0.157	0.000	-3.975	178.750	1.167	0.006	3.962	1.875	1.776
TT19-08BP111-001 Twin TMA	0.0000	0.090	0.000	-5.975	178.750	1.167	0.006	1.859	1.593	1.776
Diplexer	0.0000	0.002	0.000	-5.975	178.750	1.167	0.006	1.268	0.595	1.776
Rohn 6'x15' Boom Mount	120.0000	1.255	3.442	1.987	177.500	1.164	0.006	38.798	19.649	1.775
Powerwave 7770 w/5ft mount pipe	120.0000	0.241	5.174	2.987	178.750	1.167	0.006	7.010	6.501	1.776
Powerwave 7770 w/5ft mount pipe	120.0000	0.241	7.174	-0.477	178.750	1.167	0.006	7.010	6.501	1.776
AM-X-CD-16-65-OOT-RET	120.0000	0.244	3.174	6.451	178.750	1.167	0.006	9.677	6.265	1.776
RRUS-11	120.0000	0.138	3.174	6.451	178.750	1.167	0.006	3.258	1.547	1.776
RRUS-12	120.0000	0.157	3.442	1.987	178.750	1.167	0.006	3.962	1.875	1.776
TT19-08BP111-001 Twin TMA	120.0000	0.090	5.174	2.987	178.750	1.167	0.006	1.859	1.593	1.776
Diplexer	120.0000	0.002	5.174	2.987	178.750	1.167	0.006	1.268	0.595	1.776
Rohn 6'x15' Boom Mount	240.0000	1.255	-3.442	1.987	177.500	1.164	0.006	38.798	19.649	1.775
Powerwave 7770 w/5ft mount pipe	240.0000	0.241	-5.174	2.987	178.750	1.167	0.006	7.010	6.501	1.776
Powerwave 7770 w/5ft mount pipe	240.0000	0.241	-3.174	6.451	178.750	1.167	0.006	7.010	6.501	1.776
P65-17-XLH-RR w/8ft mount pipe	240.0000	0.445	-7.174	-0.477	178.750	1.167	0.006	13.670	13.085	1.776
RRUS-11	240.0000	0.138	-7.174	-0.477	178.750	1.167	0.006	3.258	1.547	1.776
RRUS-12	240.0000	0.157	-3.442	1.987	178.750	1.167	0.006	3.962	1.875	1.776
TT19-08BP111-001 Twin TMA	240.0000	0.090	-5.174	2.987	178.750	1.167	0.006	1.859	1.593	1.776
Diplexer	240.0000	0.002	-5.174	2.987	178.750	1.167	0.006	1.268	0.595	1.776
DC6-48-06-18-8F	240.0000	0.124	-5.174	2.987	178.750	1.167	0.006	2.448	2.448	1.776
Pirod 15' T-Frame Sector Mount (1)	0.0000	1.030	0.000	-3.975	169.000	1.148	0.006	34.781	34.781	1.766
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	0.0000	0.239	-2.000	-5.475	169.000	1.148	0.006	4.695	9.470	1.766
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	0.0000	0.239	3.500	-5.475	169.000	1.148	0.006	4.695	9.470	1.766
SBNHH-1D65B w/ 8ft mount pipe	0.0000	0.364	3.500	-5.475	169.000	1.148	0.006	10.765	11.142	1.766

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
SBNHH-1D65B w/ 8ft mount pipe	0.0000	0.364	-6.000	-5.475	169.000	1.148	0.006	10.765	11.142	1.766
RRH2X60-07-U	0.0000	0.121	0.000	-4.975	169.000	1.148	0.006	3.227	2.336	1.766
RRH2X60-AWS	0.0000	0.114	-4.000	-4.975	169.000	1.148	0.006	2.528	1.801	1.766
RRH2X60-PCS	0.0000	0.142	4.000	-4.975	169.000	1.148	0.006	2.916	2.388	1.766
Pirod 15' T-Frame Sector Mount (1)	120.0000	1.030	3.442	1.987	169.000	1.148	0.006	34.781	34.781	1.766
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	120.0000	0.239	5.741	1.005	169.000	1.148	0.006	4.695	9.470	1.766
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	120.0000	0.239	2.991	5.768	169.000	1.148	0.006	4.695	9.470	1.766
SBNHH-1D65B w/ 8ft mount pipe	120.0000	0.364	2.991	5.768	169.000	1.148	0.006	10.765	11.142	1.766
SBNHH-1D65B w/ 8ft mount pipe	120.0000	0.364	7.741	-2.459	169.000	1.148	0.006	10.765	11.142	1.766
RRH2X60-07-U	120.0000	0.121	4.308	2.487	169.000	1.148	0.006	3.227	2.336	1.766
RRH2X60-AWS	120.0000	0.114	6.308	-0.977	169.000	1.148	0.006	2.528	1.801	1.766
RRH2X60-PCS	120.0000	0.142	2.308	5.951	169.000	1.148	0.006	2.916	2.388	1.766
Pirod 15' T-Frame Sector Mount (1)	240.0000	1.030	-3.442	1.987	169.000	1.148	0.006	34.781	34.781	1.766
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	240.0000	0.239	-3.741	4.469	169.000	1.148	0.006	4.695	9.470	1.766
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	240.0000	0.239	-6.491	-0.294	169.000	1.148	0.006	4.695	9.470	1.766
SBNHH-1D65B w/ 8ft mount pipe	240.0000	0.364	-6.491	-0.294	169.000	1.148	0.006	10.765	11.142	1.766
SBNHH-1D65B w/ 8ft mount pipe	240.0000	0.364	-1.741	7.933	169.000	1.148	0.006	10.765	11.142	1.766
RRH2X60-07-U	240.0000	0.121	-4.308	2.487	169.000	1.148	0.006	3.227	2.336	1.766
RRH2X60-AWS	240.0000	0.114	-2.308	5.951	169.000	1.148	0.006	2.528	1.801	1.766
RRH2X60-PCS	240.0000	0.142	-6.308	-0.977	169.000	1.148	0.006	2.916	2.388	1.766
DB-T1-6Z-8AB-0Z	0.0000	0.181	0.000	-3.475	169.000	1.148	0.006	0.000	3.142	1.766
DB-T1-6Z-8AB-0Z	120.0000	0.181	3.009	1.737	169.000	1.148	0.006	0.000	3.142	1.766
Rohn 6'x15' Boom Mount	0.0000	1.243	0.000	-3.975	150.500	1.111	0.006	38.450	19.475	1.746
APXVSPP18-C-A20	0.0000	0.276	-4.000	-4.975	151.000	1.112	0.006	9.649	7.441	1.746
DT465B-2XR Panel Antenna W/M PIPE	0.0000	0.393	4.000	-4.975	151.000	1.112	0.006	10.885	10.367	1.746
TD-RRH8x20-25	0.0000	0.188	0.000	-3.975	151.000	1.112	0.006	4.943	2.184	1.746
RRH-2X50-800	0.0000	0.287	0.000	-3.975	151.000	1.112	0.006	4.688	3.772	1.746
ALU RRH-4X45-1900	0.0000	0.176	0.000	-3.975	151.000	1.112	0.006	3.266	3.266	1.746
Rohn 6'x15' Boom Mount	120.0000	1.243	3.442	1.987	150.500	1.111	0.006	38.450	19.475	1.746
APXVSPP18-C-A20	120.0000	0.276	6.308	-0.977	151.000	1.112	0.006	9.649	7.441	1.746
DT465B-2XR Panel Antenna W/M PIPE	120.0000	0.393	2.308	5.951	151.000	1.112	0.006	10.885	10.367	1.746
TD-RRH8x20-25	120.0000	0.188	3.442	1.987	151.000	1.112	0.006	4.943	2.184	1.746
RRH-2X50-800	120.0000	0.287	3.442	1.987	151.000	1.112	0.006	4.688	3.772	1.746
ALU RRH-4X45-1900	120.0000	0.176	3.442	1.987	151.000	1.112	0.006	3.266	3.266	1.746
Rohn 6'x15' Boom Mount	240.0000	1.243	-3.442	1.987	150.500	1.111	0.006	38.450	19.475	1.746
APXVSPP18-C-A20	240.0000	0.276	-2.308	5.951	151.000	1.112	0.006	9.649	7.441	1.746
DT465B-2XR Panel Antenna W/M PIPE	240.0000	0.393	-6.308	-0.977	151.000	1.112	0.006	10.885	10.367	1.746
TD-RRH8x20-25	240.0000	0.188	-3.442	1.987	151.000	1.112	0.006	4.943	2.184	1.746
RRH-2X50-800	240.0000	0.287	-3.442	1.987	151.000	1.112	0.006	4.688	3.772	1.746
ALU RRH-4X45-1900	240.0000	0.176	-3.442	1.987	151.000	1.112	0.006	3.266	3.266	1.746
840 10054	0.0000	0.263	0.000	-5.975	130.000	1.065	0.006	11.261	4.570	1.720
860 10025 RCU	0.0000	0.000	0.000	-5.975	130.000	1.065	0.006	0.733	0.673	1.720
Andrew QT SF12-2-72	0.0000	0.941	0.000	-3.975	130.000	1.065	0.006	31.096	31.096	1.720
840 10054	120.0000	0.263	5.174	2.987	130.000	1.065	0.006	11.261	4.570	1.720

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
860 10025 RCU	120.0000	0.000	5.174	2.987	130.000	1.065	0.006	0.733	0.673	1.720
Andrew QT SF12-2-72	120.0000	0.941	3.442	1.987	130.000	1.065	0.006	31.096	31.096	1.720
840 10054	240.0000	0.263	-5.174	2.987	130.000	1.065	0.006	11.261	4.570	1.720
860 10025 RCU	240.0000	0.000	-5.174	2.987	130.000	1.065	0.006	0.733	0.673	1.720
Andrew QT SF12-2-72	240.0000	0.941	-3.442	1.987	130.000	1.065	0.006	31.096	31.096	1.720
Splice Box	0.0000	0.000	0.000	-5.975	130.000	1.065	0.006	0.366	0.336	1.720
GPS	240.0000	0.051	-5.174	2.987	130.000	1.065	0.006	0.707	0.849	1.720
6ft-T Frame	0.0000	0.892	0.000	-2.975	120.000	1.041	0.006	26.912	26.912	1.707
LLPX310R	0.0000	0.098	0.000	-3.975	120.000	1.041	0.006	6.025	2.837	1.707
RRU Clearwire	0.0000	0.064	0.000	-2.975	120.000	1.041	0.006	2.483	1.258	1.707
6ft-T Frame	120.0000	0.892	2.576	1.487	120.000	1.041	0.006	26.912	26.912	1.707
LLPX310R	120.0000	0.098	3.442	1.987	120.000	1.041	0.006	6.025	2.837	1.707
RRU Clearwire	120.0000	0.064	2.576	1.487	120.000	1.041	0.006	2.483	1.258	1.707
6ft-T Frame	240.0000	0.892	-2.576	1.487	120.000	1.041	0.006	26.912	26.912	1.707
LLPX310R	240.0000	0.098	-3.442	1.987	120.000	1.041	0.006	6.025	2.837	1.707
RRU Clearwire	240.0000	0.064	-2.576	1.487	120.000	1.041	0.006	2.483	1.258	1.707
Splice Box	0.0000	0.000	0.000	-1.975	120.000	1.041	0.006	0.365	0.335	1.707
20'x3" Dia Omni	120.0000	0.193	5.824	3.362	188.750	1.185	0.006	13.250	13.250	1.786
6' Standoff Arm	120.0000	0.140	4.308	2.487	178.000	1.165	0.006	10.481	10.481	1.775
6'x3" Dia Omni	0.0000	0.056	0.000	-6.725	180.000	1.169	0.006	3.050	3.050	1.777
3' Standoff	0.0000	0.121	0.000	-3.475	178.000	1.165	0.006	5.241	5.241	1.775
4 Bay Dipole	120.0000	0.055	5.824	3.362	155.500	1.121	0.006	5.013	5.013	1.752
3'-6" Standoff	120.0000	0.120	3.442	1.987	151.000	1.112	0.006	5.194	5.194	1.746
DB408	120.0000	0.054	5.824	3.362	126.000	1.056	0.006	4.943	4.943	1.715
3' Standoff	120.0000	0.118	3.009	1.737	122.500	1.047	0.006	5.136	5.136	1.710
PD220	0.0000	0.102	0.000	-5.975	121.000	1.044	0.006	15.756	15.756	1.708
3' Standoff	0.0000	0.118	0.000	-3.475	110.000	1.016	0.006	5.107	5.107	1.692
PD220	120.0000	0.102	5.174	2.987	121.000	1.044	0.006	15.756	15.756	1.708
3' Standoff	120.0000	0.118	3.009	1.737	110.000	1.016	0.006	5.107	5.107	1.692
Folded Dipole	240.0000	0.064	-3.009	1.737	111.000	1.018	0.006	5.264	5.264	1.693
6'-3" Pipe Mount	240.0000	0.098	-2.576	1.487	111.000	1.018	0.006	2.989	2.989	1.693
2' Standoff	120.0000	0.044	2.576	1.487	105.000	1.002	0.005	1.274	1.274	1.684
2'x2" Omni Antenna	120.0000	0.020	3.442	1.987	106.000	1.005	0.005	0.738	0.738	1.686
	Sum Weight:	37.866								

Discrete Appurtenance Pressures - Service

G_H = 0.850 (base tower), 1.350 (antenna pole)

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
Torque Arm Face C	180.0000	0.000	0.000	2.465	162.496	1.135	0.009	5.130	8.868
Torque Arm Face B	60.0000	0.000	2.135	-1.233	162.496	1.135	0.009	5.130	8.868
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	162.496	1.135	0.009	5.130	8.868
Torque Arm Face C	180.0000	0.000	0.000	2.465	102.496	0.995	0.008	5.130	8.868
Torque Arm Face B	60.0000	0.000	2.135	-1.233	102.496	0.995	0.008	5.130	8.868
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	102.496	0.995	0.008	5.130	8.868
Torque Arm Face C	180.0000	0.000	0.000	2.465	62.496	0.864	0.007	4.104	7.214
Torque Arm Face B	60.0000	0.000	2.135	-1.233	62.496	0.864	0.007	4.104	7.214
Torque Arm Face A	300.0000	0.000	-2.135	-1.233	62.496	0.864	0.007	4.104	7.214
Antenna Pole	0.0000	0.010	0.000	0.000	195.000	1.196	0.009	10.000	10.000
Rohn 6'x10' Boom Gate	0.0000	0.570	0.000	-3.975	188.000	1.184	0.009	14.000	9.000
AIR 21 B4A/B2P	0.0000	0.126	-4.500	-5.975	188.000	1.184	0.009	5.965	4.265
AIR 21 B4A/B2P	0.0000	0.126	4.500	-5.975	188.000	1.184	0.009	5.965	4.265
KRY 112 71	0.0000	0.013	0.000	-5.975	188.000	1.184	0.009	0.583	0.398
7'x2" Antenna Mount Pipe	0.0000	0.026	0.000	-5.975	188.000	1.184	0.009	1.663	1.663
Rohn 6'x10' Boom Gate	120.0000	0.570	3.442	1.987	188.000	1.184	0.009	14.000	9.000

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
AIR 21 B4A/B2P	120.0000	0.126	7.424	-0.910	188.000	1.184	0.009	5.965	4.265
AIR 21 B4A/B2P	120.0000	0.126	2.924	6.884	188.000	1.184	0.009	5.965	4.265
KRY 112 71	120.0000	0.013	5.174	2.987	188.000	1.184	0.009	0.583	0.398
7'x2" Antenna Mount Pipe	120.0000	0.026	5.174	2.987	188.000	1.184	0.009	1.663	1.663
Rohn 6'x10' Boom Gate	240.0000	0.570	-3.442	1.987	188.000	1.184	0.009	14.000	9.000
AIR 21 B4A/B2P	240.0000	0.126	-2.924	6.884	188.000	1.184	0.009	5.965	4.265
AIR 21 B4A/B2P	240.0000	0.126	-7.424	-0.910	188.000	1.184	0.009	5.965	4.265
KRY 112 71	240.0000	0.013	-5.174	2.987	188.000	1.184	0.009	0.583	0.398
7'x2" Antenna Mount Pipe	240.0000	0.026	-5.174	2.987	188.000	1.184	0.009	1.663	1.663
Rohn 6'x15' Boom Mount	0.0000	0.510	0.000	-3.975	177.500	1.164	0.009	17.500	9.000
Powerwave 7770 w/5ft mount pipe	0.0000	0.045	0.000	-5.975	178.750	1.167	0.009	5.607	4.116
Powerwave 7770 w/5ft mount pipe	0.0000	0.045	-4.000	-5.975	178.750	1.167	0.009	5.607	4.116
SBNH-1D6565C w/8ft 2.0 Std pipe	0.0000	0.095	4.000	-5.975	178.750	1.167	0.009	11.445	9.596
RRUS-11	0.0000	0.055	4.000	-5.975	178.750	1.167	0.009	2.522	1.020
RRUS-12	0.0000	0.058	0.000	-3.975	178.750	1.167	0.009	3.145	1.285
TT19-08BP111-001 Twin TMA	0.0000	0.032	0.000	-5.975	178.750	1.167	0.009	1.105	0.891
Diplexer	0.0000	0.002	0.000	-5.975	178.750	1.167	0.009	0.700	0.240
Rohn 6'x15' Boom Mount	120.0000	0.510	3.442	1.987	177.500	1.164	0.009	17.500	9.000
Powerwave 7770 w/5ft mount pipe	120.0000	0.045	5.174	2.987	178.750	1.167	0.009	5.607	4.116
Powerwave 7770 w/5ft mount pipe	120.0000	0.045	7.174	-0.477	178.750	1.167	0.009	5.607	4.116
AM-X-CD-16-65-OOT-RET	120.0000	0.049	3.174	6.451	178.750	1.167	0.009	8.024	4.642
RRUS-11	120.0000	0.055	3.174	6.451	178.750	1.167	0.009	2.522	1.020
RRUS-12	120.0000	0.058	3.442	1.987	178.750	1.167	0.009	3.145	1.285
TT19-08BP111-001 Twin TMA	120.0000	0.032	5.174	2.987	178.750	1.167	0.009	1.105	0.891
Diplexer	120.0000	0.002	5.174	2.987	178.750	1.167	0.009	0.700	0.240
Rohn 6'x15' Boom Mount	240.0000	0.510	-3.442	1.987	177.500	1.164	0.009	17.500	9.000
Powerwave 7770 w/5ft mount pipe	240.0000	0.045	-5.174	2.987	178.750	1.167	0.009	5.607	4.116
Powerwave 7770 w/5ft mount pipe	240.0000	0.045	-3.174	6.451	178.750	1.167	0.009	5.607	4.116
P65-17-XLH-RR w/8ft mount pipe	240.0000	0.099	-7.174	-0.477	178.750	1.167	0.009	11.467	8.700
RRUS-11	240.0000	0.055	-7.174	-0.477	178.750	1.167	0.009	2.522	1.020
RRUS-12	240.0000	0.058	-3.442	1.987	178.750	1.167	0.009	3.145	1.285
TT19-08BP111-001 Twin TMA	240.0000	0.032	-5.174	2.987	178.750	1.167	0.009	1.105	0.891
Diplexer	240.0000	0.002	-5.174	2.987	178.750	1.167	0.009	0.700	0.240
DC6-48-06-18-8F	240.0000	0.032	-5.174	2.987	178.750	1.167	0.009	1.201	1.201
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.500	0.000	-3.975	169.000	1.148	0.009	15.000	15.000
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	0.0000	0.034	-2.000	-5.475	169.000	1.148	0.009	3.110	6.824
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	0.0000	0.034	3.500	-5.475	169.000	1.148	0.009	3.110	6.824
SBNHH-1D65B w/ 8ft mount pipe	0.0000	0.070	3.500	-5.475	169.000	1.148	0.009	8.554	7.242
SBNHH-1D65B w/ 8ft mount pipe	0.0000	0.070	-6.000	-5.475	169.000	1.148	0.009	8.554	7.242

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
RRH2X60-07-U	0.0000	0.050	0.000	-4.975	169.000	1.148	0.009	2.450	1.630
RRH2X60-AWS	0.0000	0.044	-4.000	-4.975	169.000	1.148	0.009	1.867	1.227
RRH2X60-PCS	0.0000	0.055	4.000	-4.975	169.000	1.148	0.009	2.200	1.723
Pirod 15' T-Frame Sector Mount (1)	120.0000	0.500	3.442	1.987	169.000	1.148	0.009	15.000	15.000
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	120.0000	0.034	5.741	1.005	169.000	1.148	0.009	3.110	6.824
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	120.0000	0.034	2.991	5.768	169.000	1.148	0.009	3.110	6.824
SBNHH-1D65B w/ 8ft mount pipe	120.0000	0.070	2.991	5.768	169.000	1.148	0.009	8.554	7.242
SBNHH-1D65B w/ 8ft mount pipe	120.0000	0.070	7.741	-2.459	169.000	1.148	0.009	8.554	7.242
RRH2X60-07-U	120.0000	0.050	4.308	2.487	169.000	1.148	0.009	2.450	1.630
RRH2X60-AWS	120.0000	0.044	6.308	-0.977	169.000	1.148	0.009	1.867	1.227
RRH2X60-PCS	120.0000	0.055	2.308	5.951	169.000	1.148	0.009	2.200	1.723
Pirod 15' T-Frame Sector Mount (1)	240.0000	0.500	-3.442	1.987	169.000	1.148	0.009	15.000	15.000
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	240.0000	0.034	-3.741	4.469	169.000	1.148	0.009	3.110	6.824
LPA-80080/4CF Panel Antenna W 6ft 2.0" Pipe	240.0000	0.034	-6.491	-0.294	169.000	1.148	0.009	3.110	6.824
SBNHH-1D65B w/ 8ft mount pipe	240.0000	0.070	-6.491	-0.294	169.000	1.148	0.009	8.554	7.242
SBNHH-1D65B w/ 8ft mount pipe	240.0000	0.070	-1.741	7.933	169.000	1.148	0.009	8.554	7.242
RRH2X60-07-U	240.0000	0.050	-4.308	2.487	169.000	1.148	0.009	2.450	1.630
RRH2X60-AWS	240.0000	0.044	-2.308	5.951	169.000	1.148	0.009	1.867	1.227
RRH2X60-PCS	240.0000	0.055	-6.308	-0.977	169.000	1.148	0.009	2.200	1.723
DB-T1-6Z-8AB-0Z	0.0000	0.040	0.000	-3.475	169.000	1.148	0.009	0.000	2.330
DB-T1-6Z-8AB-0Z	120.0000	0.040	3.009	1.737	169.000	1.148	0.009	0.000	2.330
Rohn 6'x15' Boom Mount	0.0000	0.510	0.000	-3.975	150.500	1.111	0.009	17.500	9.000
APXVSPP18-C-A20	0.0000	0.065	-4.000	-4.975	151.000	1.112	0.009	8.024	5.808
DT465B-2XR Panel Antenna W/M PIPE	0.0000	0.095	4.000	-4.975	151.000	1.112	0.009	9.222	7.292
TD-RRH8x20-25	0.0000	0.076	0.000	-3.975	151.000	1.112	0.009	4.030	1.526
RRH-2X50-800	0.0000	0.138	0.000	-3.975	151.000	1.112	0.009	3.467	2.667
ALU RRH-4X45-1900	0.0000	0.070	0.000	-3.975	151.000	1.112	0.009	2.500	2.500
Rohn 6'x15' Boom Mount	120.0000	0.510	3.442	1.987	150.500	1.111	0.009	17.500	9.000
APXVSPP18-C-A20	120.0000	0.065	6.308	-0.977	151.000	1.112	0.009	8.024	5.808
DT465B-2XR Panel Antenna W/M PIPE	120.0000	0.095	2.308	5.951	151.000	1.112	0.009	9.222	7.292
TD-RRH8x20-25	120.0000	0.076	3.442	1.987	151.000	1.112	0.009	4.030	1.526
RRH-2X50-800	120.0000	0.138	3.442	1.987	151.000	1.112	0.009	3.467	2.667
ALU RRH-4X45-1900	120.0000	0.070	3.442	1.987	151.000	1.112	0.009	2.500	2.500
Rohn 6'x15' Boom Mount	240.0000	0.510	-3.442	1.987	150.500	1.111	0.009	17.500	9.000
APXVSPP18-C-A20	240.0000	0.065	-2.308	5.951	151.000	1.112	0.009	8.024	5.808
DT465B-2XR Panel Antenna W/M PIPE	240.0000	0.095	-6.308	-0.977	151.000	1.112	0.009	9.222	7.292
TD-RRH8x20-25	240.0000	0.076	-3.442	1.987	151.000	1.112	0.009	4.030	1.526
RRH-2X50-800	240.0000	0.138	-3.442	1.987	151.000	1.112	0.009	3.467	2.667
ALU RRH-4X45-1900	240.0000	0.070	-3.442	1.987	151.000	1.112	0.009	2.500	2.500
840 10054	0.0000	0.060	0.000	-5.975	130.000	1.065	0.008	9.156	2.722
860 10025 RCU	0.0000	0.000	0.000	-5.975	130.000	1.065	0.008	0.320	0.260
Andrew QT SF12-2-72	0.0000	0.390	0.000	-3.975	130.000	1.065	0.008	16.300	16.300
840 10054	120.0000	0.060	5.174	2.987	130.000	1.065	0.008	9.156	2.722
860 10025 RCU	120.0000	0.000	5.174	2.987	130.000	1.065	0.008	0.320	0.260
Andrew QT SF12-2-72	120.0000	0.390	3.442	1.987	130.000	1.065	0.008	16.300	16.300

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z ksf	C_AA_C Front ft^2	C_AA_C Side ft^2
840 10054	240.0000	0.060	-5.174	2.987	130.000	1.065	0.008	9.156	2.722
860 10025 RCU	240.0000	0.000	-5.174	2.987	130.000	1.065	0.008	0.320	0.260
Andrew QT SF12-2-72	240.0000	0.390	-3.442	1.987	130.000	1.065	0.008	16.300	16.300
Splice Box	0.0000	0.000	0.000	-5.975	130.000	1.065	0.008	0.160	0.130
GPS	240.0000	0.025	-5.174	2.987	130.000	1.065	0.008	0.257	0.310
6ft-T Frame	0.0000	0.380	0.000	-2.975	120.000	1.041	0.008	13.600	13.600
LLPX310R	0.0000	0.030	0.000	-3.975	120.000	1.041	0.008	4.830	1.950
RRU Clearwire	0.0000	0.030	0.000	-2.975	120.000	1.041	0.008	1.800	0.780
6ft-T Frame	120.0000	0.380	2.576	1.487	120.000	1.041	0.008	13.600	13.600
LLPX310R	120.0000	0.030	3.442	1.987	120.000	1.041	0.008	4.830	1.950
RRU Clearwire	120.0000	0.030	2.576	1.487	120.000	1.041	0.008	1.800	0.780
6ft-T Frame	240.0000	0.380	-2.576	1.487	120.000	1.041	0.008	13.600	13.600
LLPX310R	240.0000	0.030	-3.442	1.987	120.000	1.041	0.008	4.830	1.950
RRU Clearwire	240.0000	0.030	-2.576	1.487	120.000	1.041	0.008	1.800	0.780
Splice Box	0.0000	0.000	0.000	-1.975	120.000	1.041	0.008	0.160	0.130
20'x3" Dia Omni	120.0000	0.050	5.824	3.362	188.750	1.185	0.009	6.000	6.000
6' Standoff Arm	120.0000	0.100	4.308	2.487	178.000	1.165	0.009	4.800	4.800
6'x3" Dia Omni	0.0000	0.020	0.000	-6.725	180.000	1.169	0.009	1.770	1.770
3' Standoff	0.0000	0.050	0.000	-3.475	178.000	1.165	0.009	2.400	2.400
4 Bay Dipole	120.0000	0.020	5.824	3.362	155.500	1.121	0.009	1.650	1.650
3'-6" Standoff	120.0000	0.500	3.442	1.987	151.000	1.112	0.009	2.400	2.400
DB408	120.0000	0.020	5.824	3.362	126.000	1.056	0.008	1.650	1.650
3' Standoff	120.0000	0.050	3.009	1.737	122.500	1.047	0.008	2.400	2.400
PD220	0.0000	0.023	0.000	-5.975	121.000	1.044	0.008	3.560	3.560
3' Standoff	0.0000	0.050	0.000	-3.475	110.000	1.016	0.008	2.400	2.400
PD220	120.0000	0.023	5.174	2.987	121.000	1.044	0.008	3.560	3.560
3' Standoff	120.0000	0.050	3.009	1.737	110.000	1.016	0.008	2.400	2.400
Folded Dipole	240.0000	0.030	-3.009	1.737	111.000	1.018	0.008	1.200	1.200
6'-3" Pipe Mount	240.0000	0.030	-2.576	1.487	111.000	1.018	0.008	1.770	1.770
2' Standoff	120.0000	0.010	2.576	1.487	105.000	1.002	0.008	0.600	0.600
2'x2" Omni Antenna	120.0000	0.020	3.442	1.987	106.000	1.005	0.008	0.300	0.300
	Sum Weight:	14.363							

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	5.595			
Bracing Weight	7.509			
Total Member Self-Weight	13.104			
Gusset Weight	0.045			
Guy Weight	2.459			
Total Weight	37.297			
Wind 0 deg - No Ice		0.013	-38.609	2.576
Wind 30 deg - No Ice		19.301	-33.382	3.151
Wind 60 deg - No Ice		33.398	-19.269	2.883
Wind 90 deg - No Ice		38.580	-0.013	1.845
Wind 120 deg - No Ice		33.466	19.293	0.313
Wind 150 deg - No Ice		19.279	33.369	-1.306
Wind 180 deg - No Ice		-0.013	38.515	-2.573
Wind 210 deg - No Ice		-19.301	33.382	-3.151
Wind 240 deg - No Ice		-33.479	19.315	-2.889
Wind 270 deg - No Ice		-38.580	0.013	-1.845
Wind 300 deg - No Ice		-33.385	-19.246	-0.310
Wind 330 deg - No Ice		-19.279	-33.369	1.306

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Member Ice	25.462			
Gusset Ice	0.066			
Guy Ice	11.815			
Total Weight Ice	142.988			
Wind 0 deg - Ice		0.000	-11.807	1.509
Wind 30 deg - Ice		5.905	-10.214	1.615
Wind 60 deg - Ice		10.224	-5.895	1.288
Wind 90 deg - Ice		11.810	-0.000	0.617
Wind 120 deg - Ice		10.239	5.903	-0.220
Wind 150 deg - Ice		5.905	10.214	-0.998
Wind 180 deg - Ice		-0.000	11.790	-1.508
Wind 210 deg - Ice		-5.905	10.214	-1.615
Wind 240 deg - Ice		-10.239	5.904	-1.289
Wind 270 deg - Ice		-11.810	0.000	-0.617
Wind 300 deg - Ice		-10.224	-5.895	0.220
Wind 330 deg - Ice		-5.905	-10.214	0.998
Total Weight	37.297			
Wind 0 deg - Service		0.004	-13.101	0.874
Wind 30 deg - Service		6.550	-11.328	1.069
Wind 60 deg - Service		11.333	-6.539	0.978
Wind 90 deg - Service		13.092	-0.004	0.626
Wind 120 deg - Service		11.356	6.547	0.106
Wind 150 deg - Service		6.542	11.323	-0.443
Wind 180 deg - Service		-0.004	13.069	-0.873
Wind 210 deg - Service		-6.550	11.328	-1.069
Wind 240 deg - Service		-11.360	6.554	-0.980
Wind 270 deg - Service		-13.092	0.004	-0.626
Wind 300 deg - Service		-11.329	-6.531	-0.105
Wind 330 deg - Service		-6.542	-11.323	0.443

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy

Comb. No.	Description
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	193 - 180	Leg	Max Tension	8	11.909	0.064	0.399
			Max. Compression	6	-15.118	0.200	0.130
			Max. Mx	23	-0.085	-1.398	0.783
			Max. My	15	-0.085	-0.004	-1.603
			Max. Vy	20	14.638	0.174	0.135
			Max. Vx	15	-16.608	-0.005	-0.218
		Diagonal	Max Tension	5	2.250	0.000	0.000
			Max. Compression	10	-2.375	0.000	0.000
			Max. Mx	22	0.973	0.044	-0.000
			Max. My	4	-1.615	0.002	-0.005
			Max. Vy	22	-0.033	0.044	-0.000
			Max. Vx	4	-0.003	0.000	0.000
		Top Girt	Max Tension	26	8.701	0.000	0.000
			Max. Compression	2	-0.001	0.000	0.000
			Max. Mx	25	8.701	-0.020	0.000
			Max. My	3	0.000	0.000	0.000
			Max. Vy	25	0.024	0.000	0.000
			Max. Vx	3	-0.000	0.000	0.000
		Bottom Girt	Max Tension	8	0.722	0.000	0.000
			Max. Compression	6	-0.654	0.000	0.000
			Max. Mx	25	0.210	-0.020	0.000
			Max. My	3	0.048	0.000	0.000
			Max. Vy	25	0.024	0.000	0.000
			Max. Vx	3	-0.000	0.000	0.000
		Pole Antenna	Max Tension	2	0.007	-0.005	1.192
			Max. Compression	14	-0.018	0.000	0.000
			Max. Mx	11	0.003	1.193	-0.000
			Max. My	8	-0.000	-0.006	-1.193
			Max. Vy	11	-0.596	1.193	-0.000
			Max. Vx	8	0.596	-0.006	-1.193
			Max. Torque	3			-0.000
T2	180 - 160	Leg	Max Tension	4	73.564	-1.563	0.008
			Max. Compression	6	-84.784	1.597	0.002
			Max. Mx	4	25.931	-2.272	-0.035
			Max. My	3	-4.877	-0.441	-5.203

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	4	-6.384	-2.272	-0.035
			Max. Vx	3	5.164	-0.441	-5.203
		Diagonal	Max Tension	8	8.268	0.020	-0.017
			Max. Compression	9	-9.896	0.000	0.000
			Max. Mx	3	0.840	-0.175	-0.046
			Max. My	7	-5.596	-0.067	0.083
			Max. Vy	3	-0.087	0.000	0.000
			Max. Vx	7	0.040	-0.067	0.083
		Secondary Horizontal	Max Tension	8	5.825	0.000	0.000
			Max. Compression	2	-5.266	0.114	0.010
			Max. Mx	4	5.821	-0.152	-0.009
			Max. My	9	1.757	-0.003	0.025
			Max. Vy	4	-0.092	0.000	0.000
			Max. Vx	9	0.015	0.000	0.000
		Top Girt	Max Tension	6	0.505	0.000	0.000
			Max. Compression	12	-0.486	0.000	0.000
			Max. Mx	25	-0.123	-0.020	0.000
			Max. My	3	0.008	0.000	0.000
			Max. Vy	25	0.024	0.000	0.000
			Max. Vx	3	-0.000	0.000	0.000
		Bottom Girt	Max Tension	6	6.218	0.000	0.000
			Max. Compression	4	-4.774	0.000	0.000
			Max. Mx	14	0.798	-0.020	0.000
			Max. My	3	1.138	0.000	0.000
			Max. Vy	14	0.024	0.000	0.000
			Max. Vx	3	-0.000	0.000	0.000
		Guy A	Bottom Tension	9	29.354		
			Top Tension	9	29.538		
			Top Cable Vert	9	22.562		
			Top Cable Norm	9	19.065		
			Top Cable Tan	9	0.072		
			Bot Cable Vert	9	-22.152		
			Bot Cable Norm	9	19.258		
			Bot Cable Tan	9	0.275		
		Guy B	Bottom Tension	11	29.059		
			Top Tension	11	29.243		
			Top Cable Vert	11	22.339		
			Top Cable Norm	11	18.872		
			Top Cable Tan	11	0.072		
			Bot Cable Vert	11	-21.929		
			Bot Cable Norm	11	19.065		
			Bot Cable Tan	11	0.275		
		Guy C	Bottom Tension	3	29.337		
			Top Tension	3	29.522		
			Top Cable Vert	3	22.549		
			Top Cable Norm	3	19.054		
			Top Cable Tan	3	0.071		
			Bot Cable Vert	3	-22.139		
			Bot Cable Norm	3	19.247		
			Bot Cable Tan	3	0.274		
		Torque Arm Top	Max Tension	7	20.753	0.000	0.000
			Max. Compression	7	-10.172	0.000	0.000
			Max. Mx	7	-0.080	-77.069	0.000
			Max. My	9	-9.955	-74.930	-0.000
			Max. Vy	7	22.670	-77.069	0.000
			Max. Vx	9	-0.000	-74.930	-0.000
T3	160 - 140	Leg	Max Tension	4	25.932	-1.741	-0.027
			Max. Compression	6	-77.349	-2.284	0.028
			Max. Mx	6	-69.395	-2.284	0.028
			Max. My	9	-26.360	-0.209	-0.527

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	4	-6.354	-1.741	-0.027
			Max. Vx	9	1.319	-0.035	0.276
		Diagonal	Max Tension	4	5.619	0.000	0.000
			Max. Compression	5	-7.392	0.033	-0.001
			Max. Mx	2	1.662	-0.072	-0.009
			Max. My	10	1.523	-0.071	-0.010
			Max. Vy	2	-0.037	0.000	0.000
			Max. Vx	10	-0.005	-0.071	-0.010
		Secondary Horizontal	Max Tension	6	2.893	0.000	0.000
			Max. Compression	4	-1.535	0.000	0.000
			Max. Mx	10	-0.502	-0.029	-0.003
			Max. My	9	1.960	0.020	-0.010
			Max. Vy	18	0.025	0.023	-0.005
			Max. Vx	9	-0.006	0.000	0.000
		Top Girt	Max Tension	10	0.668	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.447	0.013	0.000
			Max. My	3	0.528	0.000	-0.000
			Max. Vy	14	-0.015	0.000	0.000
			Max. Vx	3	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	0.577	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.454	0.013	0.000
			Max. My	9	0.449	0.000	-0.000
			Max. Vy	14	-0.015	0.000	0.000
			Max. Vx	9	0.000	0.000	0.000
T4	140 - 120	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-47.110	0.157	0.091
			Max. Mx	11	-26.000	-0.588	-0.147
			Max. My	8	-22.736	0.045	0.596
			Max. Vy	11	-2.186	-0.406	-0.101
			Max. Vx	8	2.227	0.016	0.410
		Diagonal	Max Tension	13	1.877	0.000	0.000
			Max. Compression	2	-2.768	0.000	0.000
			Max. Mx	18	0.051	0.016	0.000
			Max. My	2	-0.211	0.000	-0.000
			Max. Vy	18	-0.015	0.000	0.000
			Max. Vx	2	0.000	0.000	0.000
		Top Girt	Max Tension	6	0.762	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.672	0.013	0.000
			Max. My	9	0.586	0.000	-0.000
			Max. Vy	14	0.015	0.000	0.000
			Max. Vx	9	0.000	0.000	0.000
		Bottom Girt	Max Tension	5	0.888	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.701	0.013	0.000
			Max. My	9	0.682	0.000	-0.000
			Max. Vy	14	0.015	0.000	0.000
			Max. Vx	9	0.000	0.000	0.000
T5	120 - 100	Leg	Max Tension	4	23.576	-0.501	0.289
			Max. Compression	6	-97.088	-1.452	-0.833
			Max. Mx	11	-24.221	4.196	-0.933
			Max. My	3	-24.387	-1.338	4.175
			Max. Vy	11	-3.947	4.196	-0.933
			Max. Vx	3	-4.111	-1.338	4.175
		Diagonal	Max Tension	8	4.542	0.005	-0.004
			Max. Compression	2	-6.739	0.000	0.000
			Max. Mx	5	-0.443	0.126	-0.022
			Max. My	11	-3.741	0.081	-0.039

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	5	-0.064	0.126	-0.022
			Max. Vx	11	0.019	0.081	-0.039
		Secondary Horizontal	Max Tension	9	5.102	0.000	0.000
			Max. Compression	2	-2.943	0.041	0.009
			Max. Mx	12	3.266	0.074	-0.007
			Max. My	7	-1.483	-0.068	-0.018
			Max. Vy	12	0.047	0.074	-0.007
			Max. Vx	7	0.010	0.000	0.000
		Top Girt	Max Tension	10	1.157	0.000	0.000
			Max. Compression	12	-0.303	0.000	0.000
			Max. Mx	14	0.585	-0.019	0.000
			Max. My	9	0.497	0.000	0.000
			Max. Vy	14	-0.023	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
		Bottom Girt	Max Tension	10	3.263	0.000	0.000
			Max. Compression	12	-1.671	0.000	0.000
			Max. Mx	14	1.033	-0.019	0.000
			Max. My	9	1.011	0.000	0.000
			Max. Vy	14	-0.023	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
		Guy A	Bottom Tension	9	16.403		
			Top Tension	9	16.485		
			Top Cable Vert	9	12.652		
			Top Cable Norm	9	10.567		
			Top Cable Tan	9	0.016		
			Bot Cable Vert	9	-12.469		
			Bot Cable Norm	9	10.657		
			Bot Cable Tan	9	0.112		
		Guy B	Bottom Tension	11	16.179		
			Top Tension	11	16.262		
			Top Cable Vert	11	12.482		
			Top Cable Norm	11	10.423		
			Top Cable Tan	11	0.016		
			Bot Cable Vert	11	-12.299		
			Bot Cable Norm	11	10.512		
			Bot Cable Tan	11	0.112		
		Guy C	Bottom Tension	3	16.372		
			Top Tension	3	16.454		
			Top Cable Vert	3	12.629		
			Top Cable Norm	3	10.547		
			Top Cable Tan	3	0.016		
			Bot Cable Vert	3	-12.445		
			Bot Cable Norm	3	10.636		
			Bot Cable Tan	3	0.112		
		Torque Arm Top	Max Tension	11	11.246	0.000	0.000
			Max. Compression	11	-5.687	0.000	0.000
			Max. Mx	11	0.119	-42.410	0.000
			Max. My	9	-2.710	-22.589	-0.000
			Max. Vy	11	12.488	-42.410	0.000
			Max. Vx	9	-0.000	-22.589	-0.000
T6	100 - 80	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-95.877	0.168	0.084
			Max. Mx	12	-1.359	0.974	0.501
			Max. My	8	-1.257	0.058	-1.103
			Max. Vy	12	2.387	0.974	0.501
			Max. Vx	8	-2.716	0.058	-1.103
		Diagonal	Max Tension	8	1.742	0.000	0.000
			Max. Compression	3	-2.352	0.000	0.000
			Max. Mx	20	-0.743	0.013	0.000
			Max. My	22	-0.511	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	20	-0.013	0.000	0.000
			Max. Vx	22	-0.000	0.000	0.000
		Top Girt	Max Tension	19	0.629	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.608	0.011	0.000
			Max. My	9	0.575	0.000	-0.000
			Max. Vy	14	-0.013	0.000	0.000
			Max. Vx	9	0.000	0.000	0.000
		Bottom Girt	Max Tension	10	0.459	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.424	0.011	0.000
			Max. My	9	0.391	0.000	-0.000
			Max. Vy	14	-0.013	0.000	0.000
			Max. Vx	9	0.000	0.000	0.000
T7	80 - 60	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	10	-93.311	-0.611	0.403
			Max. Mx	11	-40.339	2.177	-0.341
			Max. My	3	-40.200	-0.821	2.096
			Max. Vy	10	3.499	1.829	-1.022
			Max. Vx	2	3.975	-0.010	2.089
		Diagonal	Max Tension	3	3.404	-0.050	-0.008
			Max. Compression	12	-4.779	0.000	0.000
			Max. Mx	11	0.085	0.074	0.008
			Max. My	11	-4.205	0.004	-0.019
			Max. Vy	11	-0.038	0.074	0.008
			Max. Vx	11	-0.009	0.004	-0.019
		Top Girt	Max Tension	6	0.924	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.835	0.012	0.000
			Max. My	10	0.924	0.000	0.000
			Max. Vy	14	0.014	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Bottom Girt	Max Tension	10	1.933	0.000	0.000
			Max. Compression	8	-0.531	0.000	0.000
			Max. Mx	14	0.972	0.012	0.000
			Max. My	10	0.321	0.000	0.000
			Max. Vy	14	0.014	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Guy A	Bottom Tension	9	8.512		
			Top Tension	9	8.544		
			Top Cable Vert	9	5.044		
			Top Cable Norm	9	6.896		
			Top Cable Tan	9	0.004		
			Bot Cable Vert	9	-4.955		
			Bot Cable Norm	9	6.922		
			Bot Cable Tan	9	0.042		
		Guy B	Bottom Tension	11	8.436		
			Top Tension	11	8.468		
			Top Cable Vert	11	4.997		
			Top Cable Norm	11	6.836		
			Top Cable Tan	11	0.002		
			Bot Cable Vert	11	-4.908		
			Bot Cable Norm	11	6.861		
			Bot Cable Tan	11	0.037		
		Guy C	Bottom Tension	3	8.500		
			Top Tension	3	8.532		
			Top Cable Vert	3	5.037		
			Top Cable Norm	3	6.886		
			Top Cable Tan	3	0.004		
			Bot Cable Vert	3	-4.948		
			Bot Cable Norm	3	6.912		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Tan	3	0.042		
		Torque Arm Top	Max Tension	11	7.760	0.000	0.000
			Max. Compression	11	-3.997	0.000	0.000
			Max. Mx	11	-0.062	-16.702	0.000
			Max. My	10	-3.371	-13.436	-0.000
			Max. Vy	11	4.942	-16.702	0.000
			Max. Vx	10	-0.000	-13.436	-0.000
T8	60 - 40	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	10	-86.432	-0.626	0.327
			Max. Mx	10	-86.423	1.538	-0.862
			Max. My	2	-86.128	-0.008	1.758
			Max. Vy	10	3.532	1.538	-0.862
			Max. Vx	2	4.016	-0.008	1.758
		Diagonal	Max Tension	11	2.854	0.000	0.000
			Max. Compression	11	-4.166	0.000	0.000
			Max. Mx	22	0.050	0.014	0.000
			Max. My	10	-0.458	0.000	0.000
			Max. Vy	22	-0.014	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	15	0.903	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.873	0.012	0.000
			Max. My	10	0.764	0.000	0.000
			Max. Vy	14	-0.014	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Bottom Girt	Max Tension	13	1.144	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	19	0.945	0.012	0.000
			Max. My	10	0.906	0.000	0.000
			Max. Vy	19	-0.014	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
T9	40 - 20	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	25	-74.063	-0.423	0.063
			Max. Mx	6	-51.812	-0.829	-0.436
			Max. My	2	-51.601	0.014	0.930
			Max. Vy	11	1.529	0.813	-0.294
			Max. Vx	2	1.548	0.014	0.930
		Diagonal	Max Tension	5	2.143	0.000	0.000
			Max. Compression	11	-2.586	0.000	0.000
			Max. Mx	26	-0.063	0.012	0.000
			Max. My	17	-0.076	0.000	-0.000
			Max. Vy	26	-0.011	0.000	0.000
			Max. Vx	17	0.000	0.000	0.000
		Top Girt	Max Tension	11	0.854	0.000	0.000
			Max. Compression	5	-0.516	0.000	0.000
			Max. Mx	14	0.206	0.009	0.000
			Max. Vy	14	0.011	0.000	0.000
		Bottom Girt	Max Tension	9	0.301	0.000	0.000
			Max. Compression	4	-0.060	0.000	0.000
			Max. Mx	17	0.148	0.009	0.000
			Max. Vy	17	0.011	0.000	0.000
T10	20 - 5	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	25	-74.317	-0.132	-0.073
			Max. Mx	25	-73.952	1.485	0.762
			Max. My	21	-73.586	-0.078	-1.652
			Max. Vy	18	7.609	-1.400	0.911
			Max. Vx	22	8.606	-0.066	-1.650
		Diagonal	Max Tension	5	2.942	0.000	0.000
			Max. Compression	11	-2.514	0.000	0.000
			Max. Mx	26	0.836	0.012	0.000
			Max. My	10	0.358	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	26	0.012	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	4	0.613	0.000	0.000
			Max. Compression	12	-0.026	0.000	0.000
			Max. Mx	17	0.310	0.010	0.000
			Max. My	10	-0.008	0.000	0.000
			Max. Vy	17	-0.012	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Bottom Girt	Max Tension	24	4.621	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	4.496	0.010	0.000
			Max. My	5	3.030	0.000	0.000
			Max. Vy	14	-0.012	0.000	0.000
			Max. Vx	5	-0.000	0.000	0.000
T11	5 - 0	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	25	-79.987	0.169	-0.036
			Max. Mx	19	-77.068	-1.929	0.046
			Max. My	4	-37.753	-1.241	-0.301
			Max. Vy	15	19.179	-1.792	-0.101
			Max. Vx	5	-0.851	-1.062	0.077
		Top Girt	Max Tension	26	12.548	0.264	-0.120
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	11	10.080	0.409	-0.081
			Max. My	10	9.132	0.311	-0.161
			Max. Vy	11	-0.119	0.409	-0.081
			Max. Vx	10	-0.039	0.148	-0.044
		Bottom Girt	Max Tension	1	0.000	0.000	0.000
			Max. Compression	15	-3.344	0.663	-0.292
			Max. Mx	5	-2.696	0.866	-0.260
			Max. My	6	-2.864	0.674	-0.325
			Max. Vy	5	2.199	0.866	-0.260
			Max. Vx	6	0.460	0.349	-0.168
		Mid Girt	Max Tension	10	0.103	0.000	0.000
			Max. Compression	25	-0.680	0.000	0.000
			Max. Mx	19	-0.674	-0.012	0.000
			Max. My	17	-0.648	0.000	-0.002
			Max. Vy	19	0.021	0.000	0.000
			Max. Vx	17	0.004	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	19	219.925	-0.352	-0.088
	Max. H_x	12	128.728	2.828	1.661
	Max. H_z	2	177.070	-0.001	2.076
	Max. M_x	1	0.000	0.001	0.015
	Max. M_z	1	0.000	0.001	0.015
	Max. Torsion	10	0.367	1.776	-1.005
	Min. Vert	1	92.336	0.001	0.015
	Min. H_x	4	128.801	-2.826	1.662
	Min. H_z	8	128.750	0.003	-3.253
	Min. M_x	1	0.000	0.001	0.015
	Min. M_z	1	0.000	0.001	0.015
	Min. Torsion	4	-0.582	-2.826	1.662
Guy C @ 140 ft	Max. Vert	10	-0.410	-0.182	0.105

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Elev 0 ft Azimuth 240 deg					
	Max. H_x	10	-0.410	-0.182	0.105
	Max. H_z	3	-43.176	-32.275	19.211
	Min. Vert	5	-43.292	-32.869	18.384
	Min. H_x	5	-43.292	-32.869	18.384
	Min. H_z	10	-0.410	-0.182	0.105
Guy B @ 140 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.409	0.181	0.105
	Max. H_x	11	-43.143	32.756	18.321
	Max. H_z	13	-43.029	32.158	19.158
	Min. Vert	11	-43.143	32.756	18.321
	Min. H_x	6	-0.409	0.181	0.105
	Min. H_z	6	-0.409	0.181	0.105
Guy A @ 140 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.411	0.000	-0.211
	Max. H_x	10	-37.176	0.758	-32.257
	Max. H_z	2	-0.411	0.000	-0.211
	Min. Vert	7	-43.195	-0.515	-37.572
	Min. H_x	6	-37.177	-0.766	-32.258
	Min. H_z	7	-43.195	-0.515	-37.572
Guy C @ 88 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.277	-0.148	0.086
	Max. H_x	10	-0.277	-0.148	0.086
	Max. H_z	3	-33.664	-29.367	17.238
	Min. Vert	3	-33.664	-29.367	17.238
	Min. H_x	5	-33.654	-29.611	16.785
	Min. H_z	10	-0.277	-0.148	0.086
Guy B @ 88 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.278	0.149	0.086
	Max. H_x	11	-33.780	29.723	16.846
	Max. H_z	13	-33.767	29.445	17.306
	Min. Vert	11	-33.780	29.723	16.846
	Min. H_x	6	-0.278	0.149	0.086
	Min. H_z	6	-0.278	0.149	0.086
Guy A @ 88 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.278	0.000	-0.171
	Max. H_x	10	-28.938	0.416	-29.167
	Max. H_z	2	-0.278	0.000	-0.171
	Min. Vert	9	-33.706	0.245	-34.089
	Min. H_x	6	-28.902	-0.426	-29.128
	Min. H_z	9	-33.706	0.245	-34.089

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	92.336	-0.001	-0.015	0.000	0.000	0.042
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	177.070	0.001	-2.076	0.000	0.000	0.228
1.2 Dead+1.6 Wind 30 deg - No	162.274	1.686	-1.938	0.000	0.000	0.427

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Ice+1.0 Guy						
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	128.801	2.826	-1.662	0.000	0.000	0.582
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	162.488	2.501	-0.522	0.000	0.000	0.497
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	177.302	1.777	1.007	0.000	0.000	0.378
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	162.405	0.816	2.401	0.000	0.000	0.165
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	128.750	-0.003	3.253	0.000	0.000	-0.162
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	162.465	-0.816	2.399	0.000	0.000	-0.281
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	177.352	-1.776	1.005	0.000	0.000	-0.367
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	162.498	-2.502	-0.524	0.000	0.000	-0.355
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	128.728	-2.828	-1.661	0.000	0.000	-0.256
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	162.222	-1.685	-1.940	0.000	0.000	-0.020
1.2 Dead+1.0 Ice+1.0 Temp+Guy	217.322	-0.028	-0.131	0.000	0.000	0.095
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.781	-0.027	-0.574	0.000	0.000	0.154
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.307	0.188	-0.516	0.000	0.000	0.190
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.960	0.349	-0.351	0.000	0.000	0.191
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.401	0.411	-0.128	0.000	0.000	0.167
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.925	0.352	0.088	0.000	0.000	0.132
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.419	0.195	0.247	0.000	0.000	0.087
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.999	-0.028	0.305	0.000	0.000	0.034
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.372	-0.251	0.247	0.000	0.000	-0.001
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.853	-0.408	0.088	0.000	0.000	-0.002
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.336	-0.467	-0.128	0.000	0.000	0.022
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.921	-0.405	-0.351	0.000	0.000	0.056
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.291	-0.243	-0.517	0.000	0.000	0.101
Dead+Wind 0 deg - Service+Guy	92.750	-0.001	-0.782	0.000	0.000	0.065
Dead+Wind 30 deg - Service+Guy	92.694	0.381	-0.677	0.000	0.000	0.105
Dead+Wind 60 deg - Service+Guy	92.671	0.660	-0.396	0.000	0.000	0.124
Dead+Wind 90 deg - Service+Guy	92.702	0.764	-0.014	0.000	0.000	0.121
Dead+Wind 120 deg - Service+Guy	92.764	0.663	0.369	0.000	0.000	0.101
Dead+Wind 150 deg - Service+Guy	92.702	0.382	0.647	0.000	0.000	0.064
Dead+Wind 180 deg - Service+Guy	92.671	-0.001	0.748	0.000	0.000	0.018

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 210 deg - Service+Guy	92.696	-0.383	0.647	0.000	0.000	-0.022
Dead+Wind 240 deg - Service+Guy	92.753	-0.665	0.369	0.000	0.000	-0.042
Dead+Wind 270 deg - Service+Guy	92.694	-0.765	-0.014	0.000	0.000	-0.039
Dead+Wind 300 deg - Service+Guy	92.666	-0.661	-0.396	0.000	0.000	-0.019
Dead+Wind 330 deg - Service+Guy	92.692	-0.382	-0.677	0.000	0.000	0.018

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-37.297	0.000	0.003	37.282	0.001	0.040%
2	0.021	-44.424	-65.099	-0.021	44.423	65.075	0.030%
3	32.543	-44.264	-56.288	-32.543	44.264	56.270	0.023%
4	56.316	-44.105	-32.492	-56.313	44.105	32.497	0.006%
5	65.051	-44.264	-0.021	-65.046	44.264	0.023	0.007%
6	56.425	-44.424	32.532	-56.424	44.424	-32.531	0.002%
7	32.508	-44.264	56.267	-32.507	44.264	-56.267	0.001%
8	-0.021	-44.105	64.949	0.024	44.105	-64.949	0.004%
9	-32.543	-44.264	56.288	32.542	44.264	-56.287	0.001%
10	-56.446	-44.424	32.567	56.444	44.424	-32.567	0.002%
11	-65.051	-44.264	0.021	65.046	44.264	-0.018	0.007%
12	-56.295	-44.105	-32.457	56.293	44.105	32.459	0.004%
13	-32.508	-44.264	-56.267	32.507	44.264	56.249	0.023%
14	0.000	-149.953	0.000	0.003	149.953	0.003	0.003%
15	0.000	-150.091	-14.623	-0.000	150.091	14.617	0.004%
16	7.312	-149.953	-12.650	-7.312	149.953	12.642	0.006%
17	12.663	-149.815	-7.303	-12.657	149.815	7.301	0.004%
18	14.623	-149.953	-0.000	-14.619	149.953	0.003	0.003%
19	12.678	-150.091	7.311	-12.671	150.091	-7.308	0.005%
20	7.312	-149.953	12.650	-7.307	149.953	-12.648	0.003%
21	-0.000	-149.815	14.606	0.001	149.815	-14.600	0.004%
22	-7.312	-149.953	12.650	7.308	149.953	-12.648	0.003%
23	-12.678	-150.091	7.312	12.672	150.091	-7.308	0.004%
24	-14.623	-149.953	0.000	14.616	149.953	0.005	0.006%
25	-12.663	-149.815	-7.303	12.658	149.815	7.300	0.004%
26	-7.312	-149.953	-12.650	7.312	149.953	12.642	0.006%
27	0.004	-37.330	-13.806	-0.004	37.330	13.802	0.011%
28	6.902	-37.297	-11.938	-6.902	37.297	11.931	0.018%
29	11.944	-37.263	-6.891	-11.938	37.263	6.888	0.017%
30	13.796	-37.297	-0.004	-13.790	37.297	0.008	0.019%
31	11.967	-37.330	6.899	-11.963	37.330	-6.897	0.011%
32	6.894	-37.297	11.933	-6.892	37.297	-11.932	0.007%
33	-0.004	-37.263	13.775	0.005	37.263	-13.768	0.016%
34	-6.902	-37.297	11.938	6.899	37.297	-11.936	0.007%
35	-11.971	-37.330	6.907	11.968	37.330	-6.905	0.011%
36	-13.796	-37.297	0.004	13.790	37.297	-0.001	0.018%
37	-11.939	-37.263	-6.884	11.934	37.263	6.880	0.016%
38	-6.894	-37.297	-11.933	6.894	37.297	11.926	0.018%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00093141
2	Yes	19	0.00045681	0.00076534
3	Yes	19	0.00038681	0.00061063
4	Yes	17	0.00019790	0.00059856
5	Yes	21	0.00012068	0.00098303
6	Yes	24	0.00002533	0.00060491
7	Yes	24	0.00000001	0.00061198
8	Yes	16	0.00013872	0.00096630
9	Yes	24	0.00000001	0.00060539
10	Yes	24	0.00000001	0.00059959
11	Yes	21	0.00012018	0.00097194
12	Yes	16	0.00012648	0.00084301
13	Yes	19	0.00038629	0.00060536
14	Yes	9	0.00064990	0.00008680
15	Yes	15	0.00069659	0.00018616
16	Yes	14	0.00088714	0.00027258
17	Yes	13	0.00052777	0.00075333
18	Yes	15	0.00051365	0.00014035
19	Yes	15	0.00076270	0.00075983
20	Yes	15	0.00050882	0.00085109
21	Yes	13	0.00051822	0.00023623
22	Yes	15	0.00046358	0.00076128
23	Yes	15	0.00071852	0.00070081
24	Yes	14	0.00094998	0.00024440
25	Yes	13	0.00051515	0.00070879
26	Yes	14	0.00091074	0.00025618
27	Yes	11	0.00045151	0.00026226
28	Yes	10	0.00069362	0.00039118
29	Yes	9	0.00059435	0.00061134
30	Yes	10	0.00073442	0.00039757
31	Yes	11	0.00047468	0.00077789
32	Yes	11	0.00030991	0.00086566
33	Yes	9	0.00059089	0.00033377
34	Yes	11	0.00029405	0.00080525
35	Yes	11	0.00045447	0.00073858
36	Yes	10	0.00070649	0.00037718
37	Yes	9	0.00058044	0.00055452
38	Yes	10	0.00070169	0.00037962

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	197 - 193	3.574	31	0.2107	0.0403
Antenna					
T1	193 - 180	3.400	31	0.2011	0.0404
T2	180 - 160	2.854	31	0.1946	0.0376
T3	160 - 140	2.132	31	0.1271	0.0327
T4	140 - 120	1.706	35	0.0993	0.0322
T5	120 - 100	1.288	37	0.1069	0.0265
T6	100 - 80	0.880	37	0.0745	0.0197
T7	80 - 60	0.648	37	0.0470	0.0148
T8	60 - 40	0.499	37	0.0211	0.0127

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T9	40 - 20	0.432	37	0.0249	0.0160
T10	20 - 5	0.279	37	0.0526	0.0184
T11	5 - 0	0.074	37	0.0679	0.0124

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.750	20'x3" Dia Omni	31	3.217	0.1974	0.0399	58488
188.000	Rohn 6'x10' Boom Gate	31	3.186	0.1972	0.0398	59580
180.000	6'x3" Dia Omni	31	2.854	0.1946	0.0376	59133
178.750	Powerwave 7770 w/5ft mount pipe	31	2.803	0.1927	0.0372	50743
178.000	6' Standoff Arm	31	2.772	0.1913	0.0370	45670
177.500	Rohn 6'x15' Boom Mount	31	2.752	0.1902	0.0368	42511
169.000	Pirod 15' T-Frame Sector Mount (1)	31	2.425	0.1620	0.0343	17750
162.496	Guy	31	2.206	0.1359	0.0330	12377
155.500	4 Bay Dipole	31	2.015	0.1144	0.0324	15120
151.000	APXVSPP18-C-A20	31	1.914	0.1058	0.0325	24554
150.500	Rohn 6'x15' Boom Mount	31	1.904	0.1051	0.0325	26384
130.000	(2) 840 10054	35	1.505	0.1051	0.0300	54826
126.000	DB408	37	1.419	0.1072	0.0287	75288
122.500	3' Standoff	37	1.344	0.1077	0.0274	114199
121.000	PD220	37	1.311	0.1074	0.0269	158345
120.000	6ft-T Frame	37	1.288	0.1069	0.0265	230330
111.000	Folded Dipole	37	1.091	0.0958	0.0233	40719
110.000	3' Standoff	37	1.070	0.0940	0.0230	36365
106.000	2'x2" Omni Antenna	37	0.988	0.0862	0.0216	25472
105.000	2' Standoff	37	0.969	0.0841	0.0213	23698
102.496	Guy	37	0.923	0.0792	0.0205	20417
62.496	Guy	37	0.512	0.0233	0.0128	36508

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	197 - 193	35.786	6	1.6925	0.2608
Antenna					
T1	193 - 180	34.378	6	1.6472	0.2739
T2	180 - 160	29.900	6	1.6180	0.2628
T3	160 - 140	23.563	6	1.2995	0.2346
T4	140 - 120	18.609	10	1.1512	0.2233
T5	120 - 100	13.862	10	1.1108	0.1846
T6	100 - 80	9.579	10	0.8554	0.1490
T7	80 - 60	6.604	10	0.6116	0.1178
T8	60 - 40	4.516	2	0.3786	0.0983
T9	40 - 20	3.241	2	0.3116	0.1051
T10	20 - 5	1.870	2	0.3945	0.0867
T11	5 - 0	0.486	2	0.4527	0.0683

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.750	20'x3" Dia Omni	6	32.897	1.6297	0.2720	12667
188.000	Rohn 6'x10' Boom Gate	6	32.638	1.6291	0.2715	12904
180.000	6'x3" Dia Omni	6	29.900	1.6180	0.2628	12763
178.750	Powerwave 7770 w/5ft mount pipe	6	29.477	1.6091	0.2610	10927
178.000	6' Standoff Arm	6	29.224	1.6024	0.2599	9821
177.500	Rohn 6'x15' Boom Mount	6	29.056	1.5973	0.2592	9134
169.000	Pirod 15' T-Frame Sector Mount (1)	6	26.265	1.4645	0.2458	3790
162.496	Guy	6	24.277	1.3415	0.2371	2638
155.500	4 Bay Dipole	6	22.350	1.2389	0.2318	3146
151.000	APXVSPP18-C-A20	6	21.215	1.1966	0.2301	4851
150.500	Rohn 6'x15' Boom Mount	6	21.093	1.1929	0.2299	5162
130.000	(2) 840 10054	10	16.236	1.1460	0.2061	17553
126.000	DB408	10	15.282	1.1393	0.1975	28558
122.500	3' Standoff	10	14.451	1.1262	0.1898	16326
121.000	PD220	10	14.097	1.1176	0.1866	13444
120.000	6ft-T Frame	10	13.862	1.1108	0.1846	11844
111.000	Folded Dipole	10	11.809	1.0130	0.1695	4868
110.000	3' Standoff	10	11.591	0.9993	0.1679	4556
106.000	2'x2" Omni Antenna	10	10.745	0.9418	0.1610	3626
105.000	2' Standoff	10	10.542	0.9271	0.1591	3450
102.496	Guy	10	10.048	0.8907	0.1543	3101
62.496	Guy	2	4.725	0.4017	0.0989	4578

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	193	Leg	A325N	0.750	4	0.119	29.821	0.004 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	2	1.187	12.425	0.096 ✔	1	Bolt Shear
		Top Girt	A325N	0.625	2	4.350	12.425	0.350 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.625	2	0.361	12.425	0.029 ✔	1	Bolt Shear
T2	180	Leg	A325N	0.750	4	2.978	29.821	0.100 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	2	4.948	12.425	0.398 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.625	1	5.825	10.440	0.558 ✔	1	Member Bearing
		Top Girt	A325N	0.625	2	0.252	12.425	0.020 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.625	2	3.109	12.425	0.250 ✔	1	Bolt Shear
		Torque Arm Top@162.496	A325N	0.875	4	5.188	24.354	0.213 ✔	1	Bolt Shear
T3	160	Leg	A325N	0.750	4	6.483	29.821	0.217 ✔	1	Bolt Tension
		Diagonal	A325X	0.625	1	5.619	10.440	0.538 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.625	1	2.893	10.440	0.277 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.668	7.952	0.084 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Bottom Girt	A325N	0.500	1	0.577	7.952	0.073 ✔	1	Bolt Shear
T4	140	Leg	A325N	0.750	4	3.104	29.821	0.104 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2.768	7.952	0.348 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	0.762	7.952	0.096 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	0.888	7.952	0.112 ✔	1	Bolt Shear
T5	120	Leg	A325N	0.750	4	3.970	29.821	0.133 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	2	3.370	12.425	0.271 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.625	1	5.102	10.440	0.489 ✔	1	Member Bearing
		Top Girt	A325N	0.625	2	0.579	12.425	0.047 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.625	2	1.631	12.425	0.131 ✔	1	Bolt Shear
		Torque Arm Top@102.496	A325N	0.875	4	2.811	24.354	0.115 ✔	1	Bolt Shear
T6	100	Leg	A325N	0.750	4	7.990	29.821	0.268 ✔	1	Bolt Tension
		Diagonal	A490X	0.500	1	1.742	4.166	0.418 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.629	4.166	0.151 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	0.459	4.166	0.110 ✔	1	Member Bearing
T7	80	Leg	A325N	0.750	4	6.876	29.821	0.231 ✔	1	Bolt Tension
		Diagonal	A325X	0.625	1	3.404	7.830	0.435 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.924	7.952	0.116 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	1.933	7.952	0.243 ✔	1	Bolt Shear
		Torque Arm Top@62.4961	A325N	0.875	4	1.940	24.354	0.080 ✔	1	Bolt Shear
T8	60	Leg	A325N	0.750	4	7.203	29.821	0.242 ✔	1	Bolt Tension
		Diagonal	A325X	0.500	1	4.167	9.719	0.429 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	0.903	7.952	0.113 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	1.144	7.952	0.144 ✔	1	Bolt Shear
T9	40	Leg	A325N	0.750	4	5.832	29.821	0.196 ✔	1	Bolt Tension
		Diagonal	A490X	0.625	1	2.143	5.262	0.407 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.854	4.166	0.205 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	0.301	4.166	0.072 ✔	1	Member Bearing
T10	20	Leg	A325N	0.750	4	6.174	29.821	0.207 ✔	1	Bolt Tension
		Diagonal	A490X	0.500	1	2.942	8.618	0.341 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.613	7.952	0.077 ✔	1	Bolt Shear
		Bottom Girt	A490X	0.625	1	4.621	10.886	0.424 ✔	1	Member Bearing
T11	5	Leg	A325N	0.750	4	6.001	29.821	0.201 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T2	162.496 (A) (595)	3/4 EHS	5.830	58.300	29.538	34.980	1.000	1.184 ✔
	162.496 (A) (596)	3/4 EHS	5.830	58.300	29.212	34.980	1.000	1.197 ✔
	162.496 (B) (591)	3/4 EHS	5.830	58.300	29.091	34.980	1.000	1.202 ✔
	162.496 (B) (592)	3/4 EHS	5.830	58.300	29.243	34.980	1.000	1.196 ✔
	162.496 (C) (587)	3/4 EHS	5.830	58.300	29.352	34.980	1.000	1.192 ✔
	162.496 (C) (588)	3/4 EHS	5.830	58.300	29.522	34.980	1.000	1.185 ✔
T5	102.496 (A) (607)	5/8 EHS	4.240	42.400	16.485	25.440	1.000	1.543 ✔
	102.496 (A) (608)	5/8 EHS	4.240	42.400	16.234	25.440	1.000	1.567 ✔
	102.496 (B) (603)	5/8 EHS	4.240	42.400	16.261	25.440	1.000	1.564 ✔
	102.496 (B) (604)	5/8 EHS	4.240	42.400	16.262	25.440	1.000	1.564 ✔
	102.496 (C) (599)	5/8 EHS	4.240	42.400	16.212	25.440	1.000	1.569 ✔
	102.496 (C) (600)	5/8 EHS	4.240	42.400	16.454	25.440	1.000	1.546 ✔
T7	62.496 (A) (619)	1/2 EHS	2.690	26.900	8.544	16.140	1.000	1.889 ✔
	62.496 (A) (620)	1/2 EHS	2.690	26.900	8.430	16.140	1.000	1.915 ✔
	62.496 (B) (615)	1/2 EHS	2.690	26.900	8.468	16.140	1.000	1.906 ✔
	62.496 (B) (616)	1/2 EHS	2.690	26.900	8.374	16.140	1.000	1.927 ✔
	62.496 (C) (611)	1/2 EHS	2.690	26.900	8.349	16.140	1.000	1.933 ✔
	62.496 (C) (612)	1/2 EHS	2.690	26.900	8.532	16.140	1.000	1.892 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	P2.5x.276	13.000	2.567	33.3 K=1.00	2.254	-15.118	93.497	0.162 [1] ✔
T2	180 - 160	2.5" STD with 1/3 split HSS 3.5x0.313	20.000	1.206	15.8 K=1.00	2.767	-84.784	122.253	0.694 [1] ✔
T3	160 - 140	2.5" STD with 1/3 split HSS 3.5x0.313	20.000	1.206	15.8 K=1.00	2.767	-77.349	122.253	0.633 [1] ✔
T4	140 - 120	P2.5x.276	20.000	2.413	31.3 K=1.00	2.254	-47.110	94.385	0.499 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100	P3x.3	20.000	1.206	12.7 K=1.00	3.016	-97.088	134.116	0.724 [1] ✔
T6	100 - 80	P3x.3	20.000	2.413	25.5 K=1.00	3.016	-95.877	129.425	0.741 [1] ✔
T7	80 - 60	P3x.3	20.000	2.413	25.5 K=1.00	3.016	-93.311	129.425	0.721 [1] ✔
T8	60 - 40	P3x.3	20.000	2.413	25.5 K=1.00	3.016	-86.432	129.425	0.668 [1] ✔
T9	40 - 20	P3x.3	20.000	2.413	51.0 K=2.00	3.016	-74.063	112.247	0.660 [1] ✔
T10	20 - 5	P3x.3	15.000	2.384	50.3 K=2.00	3.016	-74.317	112.758	0.659 [1] ✔
T11	5 - 0	P3x.3	5.376	1.553	16.4 K=1.00	3.016	-79.987	133.074	0.601 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	4.276	1.790	71.2 K=1.30	0.938	-2.375	23.271	0.102 [1] ✔
T2	180 - 160	L2x2x1/4	4.185	1.716	69.5 K=1.32	0.938	-9.896	23.566	0.420 [1] ✔
T3	160 - 140	L2x2x1/4	4.185	1.794	71.3 K=1.29	0.938	-7.392	23.254	0.318 [1] ✔
T4	140 - 120	ROHN TS1.5x11 ga	4.185	3.892	95.4 K=1.00	0.520	-2.768	11.249	0.246 [1] ✔
T5	120 - 100	L2x2x1/4	4.185	1.716	69.5 K=1.32	0.938	-6.739	23.566	0.286 [1] ✔
T6	100 - 80	ROHN TS1.5x16 ga	4.185	3.828	90.0 K=1.00	0.263	-2.352	6.036	0.390 [1] ✔
T7	80 - 60	L1 3/4x1 3/4x3/16	4.185	1.794	77.0 K=1.23	0.621	-4.779	14.725	0.325 [1] ✔
T8	60 - 40	ROHN TS1.5x11 ga	4.185	3.828	93.8 K=1.00	0.520	-4.167	11.454	0.364 [1] ✔
T9	40 - 20	ROHN TS1.5x16 ga	4.185	3.828	90.0 K=1.00	0.263	-2.586	6.036	0.428 [1] ✔
T10	20 - 5	ROHN TS1.5x11 ga	4.169	3.813	93.4 K=1.00	0.520	-2.514	11.504	0.219 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/4	3.420	2.889	88.5 K=1.55	0.938	-5.266	20.130	0.262 [1] ✔
T3	160 - 140	L2x2x1/4	3.420	2.889	88.5 K=1.55	0.938	-1.535	20.130	0.076 [1] ✔
T5	120 - 100	L2x2x1/4	3.420	2.889	88.5 K=1.55	0.938	-2.943	20.130	0.146 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	3.420	2.785	102.7 K=1.20	0.938	-0.001	17.437	0.000 [1] ✔
T2	180 - 160	L2x2x1/4	3.420	2.733	101.9 K=1.22	0.938	-0.486	17.587	0.028 [1] ✔
T5	120 - 100	L2x2x1/4	3.420	2.733	101.9 K=1.22	0.938	-0.303	17.587	0.017 [1] ✔
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6 K=1.00	0.263	-0.516	7.123	0.072 [1] ✔
T10	20 - 5	ROHN TS1.5x11 ga	3.420	3.128	76.7 K=1.00	0.520	-0.026	13.708	0.002 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	3.420	2.785	102.7 K=1.20	0.938	-0.654	17.437	0.038 [1] ✔
T2	180 - 160	L2x2x1/4	3.420	2.733	101.9 K=1.22	0.938	-4.774	17.587	0.271 [1] ✔
T5	120 - 100	L2x2x1/4	3.420	2.733	101.9 K=1.22	0.938	-1.671	17.587	0.095 [1] ✔
T7	80 - 60	ROHN TS1.5x11 ga	3.420	3.128	76.7 K=1.00	0.520	-0.531	13.708	0.039 [1] ✔
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6 K=1.00	0.263	-0.060	7.123	0.008 [1] ✔
T11	5 - 0	L3x3x1/2	0.342	0.050	60.5 K=58.51	2.750	-3.344	73.476	0.046 [1] ✔

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	5 - 0	L3x3x1/2	2.318	2.026	80.8 K=1.94	2.750	-0.680	63.175	0.011 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (589)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-0.211	427.615	0.000
T2	180 - 160 (590)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-0.080	427.615	0.000
T2	180 - 160 (593)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.116	427.615	0.024
T2	180 - 160 (594)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.146	427.615	0.024
T2	180 - 160 (597)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.136	427.615	0.024
T2	180 - 160 (598)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.170	427.615	0.024
T5	120 - 100 (601)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.530	292.246	0.019
T5	120 - 100 (602)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.538	292.246	0.019
T5	120 - 100 (605)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.686	292.246	0.019
T5	120 - 100 (606)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.658	292.246	0.019
T5	120 - 100 (609)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.677	292.246	0.019
T5	120 - 100 (610)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.661	292.246	0.019
T7	80 - 60 (613)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-0.079	208.448	0.000
T7	80 - 60 (614)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-0.192	208.448	0.001
T7	80 - 60 (617)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-3.996	208.448	0.019
T7	80 - 60 (618)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-3.974	208.448	0.019
T7	80 - 60 (621)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-0.062	208.448	0.000
T7	80 - 60 (622)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-3.930	208.448	0.019

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 $\frac{M_{uy}}{\phi M_{ny}}$
T2	180 - 160 (589)	C15x50	-76.995	145.260	0.530	-0.000	22.059	0.000
T2	180 - 160 (590)	C15x50	-77.069	145.260	0.531	0.000	22.059	0.000
T2	180 - 160 (593)	C15x50	-75.517	145.260	0.520	0.000	22.059	0.000
T2	180 - 160 (594)	C15x50	-75.799	145.260	0.522	-0.000	22.059	0.000
T2	180 - 160 (597)	C15x50	-75.456	145.260	0.519	-0.000	22.059	0.000
T2	180 - 160 (598)	C15x50	-75.778	145.260	0.522	0.000	22.059	0.000
T5	120 - 100 (601)	C15x33.9	-40.243	113.400	0.355	0.000	16.821	0.000
T5	120 - 100 (602)	C15x33.9	-40.307	113.400	0.355	-0.000	16.821	0.000
T5	120 - 100 (605)	C15x33.9	-40.995	113.400	0.362	0.000	16.821	0.000
T5	120 - 100 (606)	C15x33.9	-40.856	113.400	0.360	0.000	16.821	0.000
T5	120 - 100 (609)	C15x33.9	-40.892	113.400	0.361	-0.000	16.821	0.000
T5	120 - 100 (610)	C15x33.9	-40.843	113.400	0.360	0.000	16.821	0.000
T7	80 - 60 (613)	C12x25	-16.629	65.070	0.256	-0.000	10.368	0.000
T7	80 - 60 (614)	C12x25	-16.511	65.070	0.254	0.000	10.368	0.000
T7	80 - 60 (617)	C12x25	-16.153	65.070	0.248	-0.000	10.368	0.000
T7	80 - 60 (618)	C12x25	-16.078	65.070	0.247	0.000	10.368	0.000
T7	80 - 60 (621)	C12x25	-16.702	65.070	0.257	0.000	10.368	0.000
T7	80 - 60 (622)	C12x25	-15.943	65.070	0.245	0.000	10.368	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
T2	180 - 160 (589)	C15x50	0.000	0.530	0.000	0.530 ✔	1.000	4.8.1 ✔
T2	180 - 160 (590)	C15x50	0.000	0.531	0.000	0.531 ✔	1.000	4.8.1 ✔
T2	180 - 160 (593)	C15x50	0.024	0.520	0.000	0.532 ✔	1.000	4.8.1 ✔
T2	180 - 160 (594)	C15x50	0.024	0.522	0.000	0.534 ✔	1.000	4.8.1 ✔
T2	180 - 160 (597)	C15x50	0.024	0.519	0.000	0.531 ✔	1.000	4.8.1 ✔
T2	180 - 160 (598)	C15x50	0.024	0.522	0.000	0.534 ✔	1.000	4.8.1 ✔
T5	120 - 100 (601)	C15x33.9	0.019	0.355	0.000	0.364 ✔	1.000	4.8.1 ✔
T5	120 - 100 (602)	C15x33.9	0.019	0.355	0.000	0.365 ✔	1.000	4.8.1 ✔
T5	120 - 100 (605)	C15x33.9	0.019	0.362	0.000	0.371 ✔	1.000	4.8.1 ✔
T5	120 - 100 (606)	C15x33.9	0.019	0.360	0.000	0.370 ✔	1.000	4.8.1 ✔
T5	120 - 100 (609)	C15x33.9	0.019	0.361	0.000	0.370 ✔	1.000	4.8.1 ✔
T5	120 - 100 (610)	C15x33.9	0.019	0.360	0.000	0.370 ✔	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
T7	80 - 60 (613)	C12x25	0.000	0.256	0.000	0.256	1.000	4.8.1
T7	80 - 60 (614)	C12x25	0.001	0.254	0.000	0.254	1.000	4.8.1
T7	80 - 60 (617)	C12x25	0.019	0.248	0.000	0.258	1.000	4.8.1
T7	80 - 60 (618)	C12x25	0.019	0.247	0.000	0.257	1.000	4.8.1
T7	80 - 60 (621)	C12x25	0.000	0.257	0.000	0.257	1.000	4.8.1
T7	80 - 60 (622)	C12x25	0.019	0.245	0.000	0.254	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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	P2.5x.276	13.000	2.567	33.3	2.254	11.909	101.409	0.117 [1]
T2	180 - 160	2.5" STD with 1/3 split HSS 3.5x0.313	20.000	1.206	15.8	2.767	73.564	124.493	0.591 [1]
T3	160 - 140	2.5" STD with 1/3 split HSS 3.5x0.313	20.000	1.206	15.8	2.767	25.932	124.493	0.208 [1]
T5	120 - 100	P3x.3	20.000	1.206	12.7	3.016	23.576	135.717	0.174 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	4.276	1.790	39.2	0.563	2.250	24.485	0.092 [1]
T2	180 - 160	L2x2x1/4	4.185	1.716	37.7	0.563	8.268	24.485	0.338 [1]
T3	160 - 140	L2x2x1/4	4.185	1.794	37.7	0.563	5.619	24.485	0.229 [1]
T4	140 - 120	ROHN TS1.5x11 ga	4.185	3.892	95.4	0.520	1.877	19.665	0.095 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	120 - 100	L2x2x1/4	4.185	1.716	37.7	0.563	4.542	24.485	0.186 [1] ✔
T6	100 - 80	ROHN TS1.5x16 ga	4.185	3.828	90.0	0.263	1.742	9.932	0.175 [1] ✔
T7	80 - 60	L1 3/4x1 3/4x3/16	4.185	1.794	42.8	0.360	3.404	15.675	0.217 [1] ✔
T8	60 - 40	ROHN TS1.5x11 ga	4.185	3.828	93.8	0.520	2.854	19.665	0.145 [1] ✔
T9	40 - 20	ROHN TS1.5x16 ga	4.185	3.828	90.0	0.263	2.143	9.932	0.216 [1] ✔
T10	20 - 5	ROHN TS1.5x11 ga	4.169	3.813	93.4	0.520	2.942	19.665	0.150 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160	L2x2x1/4	3.420	2.889	61.6	0.563	5.825	24.485	0.238 [1] ✔
T3	160 - 140	L2x2x1/4	3.420	2.889	61.6	0.563	2.893	24.485	0.118 [1] ✔
T5	120 - 100	L2x2x1/4	3.420	2.889	61.6	0.563	5.102	24.485	0.208 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	3.420	2.785	62.7	0.563	8.701	24.485	0.355 [1] ✔
T2	180 - 160	L2x2x1/4	3.420	2.733	61.6	0.563	0.505	24.485	0.021 [1] ✔
T3	160 - 140	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.668	19.665	0.034 [1] ✔
T4	140 - 120	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	0.762	19.665	0.039 [1] ✔
T5	120 - 100	L2x2x1/4	3.420	2.733	61.6	0.563	1.157	24.485	0.047 [1] ✔
T6	100 - 80	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.629	9.932	0.063 [1] ✔
T7	80 - 60	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.924	19.665	0.047 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	60 - 40	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.903	19.665	0.046 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.854	9.932	0.086 [1]
T10	20 - 5	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.613	19.665	0.031 [1]
T11	5 - 0	L3x3x1/2	3.306	3.014	40.3	2.750	12.549	89.100	0.141 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 180	L2x2x1/4	3.420	2.785	62.7	0.563	0.722	24.485	0.030 [1]
T2	180 - 160	L2x2x1/4	3.420	2.733	61.6	0.563	6.218	24.485	0.254 [1]
T3	160 - 140	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.577	19.665	0.029 [1]
T4	140 - 120	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	0.888	19.665	0.045 [1]
T5	120 - 100	L2x2x1/4	3.420	2.733	61.6	0.563	3.263	24.485	0.133 [1]
T6	100 - 80	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.459	9.932	0.046 [1]
T7	80 - 60	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	1.933	19.665	0.098 [1]
T8	60 - 40	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	1.144	19.665	0.058 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.301	9.932	0.030 [1]
T10	20 - 5	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	4.621	19.665	0.235 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T11	5 - 0	L3x3x1/2	1.330	1.038	13.9	2.750	0.103	89.100	0.001 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
									✔

[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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	180 - 160 (589)	C15x50	3.415	3.269	45.2	14.700	8.663	476.280	0.018
T2	180 - 160 (590)	C15x50	3.415	3.269	45.2	14.700	8.822	476.280	0.019
T2	180 - 160 (593)	C15x50	3.415	3.269	45.2	14.700	9.007	476.280	0.019
T2	180 - 160 (594)	C15x50	3.415	3.269	45.2	14.700	8.393	476.280	0.018
T2	180 - 160 (597)	C15x50	3.415	3.269	45.2	14.700	8.958	476.280	0.019
T2	180 - 160 (598)	C15x50	3.415	3.269	45.2	14.700	8.498	476.280	0.018
T5	120 - 100 (601)	C15x33.9	3.415	3.269	43.4	9.960	0.125	322.704	0.000
T5	120 - 100 (602)	C15x33.9	3.415	3.269	43.4	9.960	0.092	322.704	0.000
T5	120 - 100 (605)	C15x33.9	3.415	3.269	43.4	9.960	0.082	322.704	0.000
T5	120 - 100 (606)	C15x33.9	3.415	3.269	43.4	9.960	4.624	322.704	0.014
T5	120 - 100 (609)	C15x33.9	3.415	3.269	43.4	9.960	0.119	322.704	0.000
T5	120 - 100 (610)	C15x33.9	3.415	3.269	43.4	9.960	4.610	322.704	0.014
T7	80 - 60 (613)	C12x25	3.415	3.269	50.3	7.350	3.106	238.140	0.013
T7	80 - 60 (614)	C12x25	3.415	3.269	50.3	7.350	2.973	238.140	0.012
T7	80 - 60 (617)	C12x25	3.415	3.269	50.3	7.350	3.108	238.140	0.013
T7	80 - 60 (618)	C12x25	3.415	3.269	50.3	7.350	2.995	238.140	0.013
T7	80 - 60 (621)	C12x25	3.415	3.269	50.3	7.350	3.197	238.140	0.013
T7	80 - 60 (622)	C12x25	3.415	3.269	50.3	7.350	2.904	238.140	0.012

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 $\frac{M_{uy}}{\phi M_{ny}}$
T2	180 - 160 (589)	C15x50	-67.324	145.260	0.463	0.000	22.059	0.000
T2	180 - 160 (590)	C15x50	-67.524	145.260	0.465	0.000	22.059	0.000
T2	180 - 160 (593)	C15x50	-67.569	145.260	0.465	-0.000	22.059	0.000
T2	180 - 160 (594)	C15x50	-66.559	145.260	0.458	-0.000	22.059	0.000
T2	180 - 160 (597)	C15x50	-67.690	145.260	0.466	0.000	22.059	0.000
T2	180 - 160 (598)	C15x50	-66.871	145.260	0.460	0.000	22.059	0.000
T5	120 - 100 (601)	C15x33.9	-42.270	113.400	0.373	-0.000	16.821	0.000
T5	120 - 100 (602)	C15x33.9	-42.327	113.400	0.373	0.000	16.821	0.000
T5	120 - 100 (605)	C15x33.9	-42.382	113.400	0.374	-0.000	16.821	0.000
T5	120 - 100 (606)	C15x33.9	-37.257	113.400	0.329	-0.000	16.821	0.000
T5	120 - 100 (609)	C15x33.9	-42.410	113.400	0.374	0.000	16.821	0.000
T5	120 - 100 (610)	C15x33.9	-37.355	113.400	0.329	0.000	16.821	0.000
T7	80 - 60 (613)	C12x25	-14.666	65.070	0.225	-0.000	10.368	0.000
T7	80 - 60 (614)	C12x25	-14.513	65.070	0.223	-0.000	10.368	0.000
T7	80 - 60 (617)	C12x25	-14.782	65.070	0.227	-0.000	10.368	0.000
T7	80 - 60 (618)	C12x25	-14.509	65.070	0.223	-0.000	10.368	0.000
T7	80 - 60 (621)	C12x25	-14.872	65.070	0.229	0.000	10.368	0.000
T7	80 - 60 (622)	C12x25	-14.409	65.070	0.221	0.000	10.368	0.000

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 $\frac{M_{uy}}{\phi M_{ny}}$

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
T2	180 - 160 (589)	C15x50	0.018	0.463	0.000	0.473 ✔	1.000	4.8.1 ✔
T2	180 - 160 (590)	C15x50	0.019	0.465	0.000	0.474 ✔	1.000	4.8.1 ✔
T2	180 - 160 (593)	C15x50	0.019	0.465	0.000	0.475 ✔	1.000	4.8.1 ✔
T2	180 - 160 (594)	C15x50	0.018	0.458	0.000	0.467 ✔	1.000	4.8.1 ✔
T2	180 - 160 (597)	C15x50	0.019	0.466	0.000	0.475 ✔	1.000	4.8.1 ✔
T2	180 - 160 (598)	C15x50	0.018	0.460	0.000	0.469 ✔	1.000	4.8.1 ✔
T5	120 - 100 (601)	C15x33.9	0.000	0.373	0.000	0.373 ✔	1.000	4.8.1 ✔
T5	120 - 100 (602)	C15x33.9	0.000	0.373	0.000	0.373 ✔	1.000	4.8.1 ✔
T5	120 - 100 (605)	C15x33.9	0.000	0.374	0.000	0.374 ✔	1.000	4.8.1 ✔
T5	120 - 100 (606)	C15x33.9	0.014	0.329	0.000	0.336 ✔	1.000	4.8.1 ✔
T5	120 - 100 (609)	C15x33.9	0.000	0.374	0.000	0.374 ✔	1.000	4.8.1 ✔
T5	120 - 100 (610)	C15x33.9	0.014	0.329	0.000	0.337 ✔	1.000	4.8.1 ✔
T7	80 - 60 (613)	C12x25	0.013	0.225	0.000	0.232 ✔	1.000	4.8.1 ✔
T7	80 - 60 (614)	C12x25	0.012	0.223	0.000	0.229 ✔	1.000	4.8.1 ✔
T7	80 - 60 (617)	C12x25	0.013	0.227	0.000	0.234 ✔	1.000	4.8.1 ✔
T7	80 - 60 (618)	C12x25	0.013	0.223	0.000	0.229 ✔	1.000	4.8.1 ✔
T7	80 - 60 (621)	C12x25	0.013	0.229	0.000	0.235 ✔	1.000	4.8.1 ✔
T7	80 - 60 (622)	C12x25	0.012	0.221	0.000	0.228 ✔	1.000	4.8.1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	193 - 180	Leg	P2.5x.276	2	-0.445	93.497	32.8	Pass
T2	180 - 160	Leg	2.5" STD with 1/3 split HSS 3.5x0.313	42	-84.784	122.253	69.4	Pass
T3	160 - 140	Leg	2.5" STD with 1/3 split HSS 3.5x0.313	123	-77.349	122.253	63.3	Pass
T4	140 - 120	Leg	P2.5x.276	204	-47.110	94.385	49.9	Pass
T5	120 - 100	Leg	P3x.3	261	-97.088	134.116	72.4	Pass
T6	100 - 80	Leg	P3x.3	342	-95.877	129.425	74.1	Pass
T7	80 - 60	Leg	P3x.3	398	-93.311	129.425	72.1	Pass
T8	60 - 40	Leg	P3x.3	455	-86.432	129.425	66.8	Pass
T9	40 - 20	Leg	P3x.3	513	-74.063	112.247	66.0	Pass
T10	20 - 5	Leg	P3x.3	546	-74.317	112.758	65.9	Pass
T11	5 - 0	Leg	P3x.3	573	-79.987	133.074	60.1	Pass
T1	193 - 180	Diagonal	L2x2x1/4	11	-2.375	23.271	10.2	Pass
T2	180 - 160	Diagonal	L2x2x1/4	53	-9.896	23.566	42.0	Pass
T3	160 - 140	Diagonal	L2x2x1/4	194	-7.392	23.254	31.8 53.8 (b)	Pass
T4	140 - 120	Diagonal	ROHN TS1.5x11 ga	215	-2.768	11.249	24.6 34.8 (b)	Pass
T5	120 - 100	Diagonal	L2x2x1/4	290	-6.739	23.566	28.6	Pass
T6	100 - 80	Diagonal	ROHN TS1.5x16 ga	396	-2.352	6.036	39.0 41.8 (b)	Pass
T7	80 - 60	Diagonal	L1 3/4x1 3/4x3/16	408	-4.779	14.725	32.5 43.5 (b)	Pass
T8	60 - 40	Diagonal	ROHN TS1.5x11 ga	507	-4.167	11.454	36.4 42.9 (b)	Pass
T9	40 - 20	Diagonal	ROHN TS1.5x16 ga	542	-2.586	6.036	42.8	Pass
T10	20 - 5	Diagonal	ROHN TS1.5x11 ga	554	-2.514	11.504	21.9 34.1 (b)	Pass
T2	180 - 160	Secondary Horizontal	L2x2x1/4	65	-5.266	20.130	26.2 55.8 (b)	Pass
T3	160 - 140	Secondary Horizontal	L2x2x1/4	200	2.893	24.485	11.8 27.7 (b)	Pass
T5	120 - 100	Secondary Horizontal	L2x2x1/4	284	5.102	24.485	20.8 48.9 (b)	Pass
T1	193 - 180	Top Girt	L2x2x1/4	7	8.701	24.485	35.5	Pass
T2	180 - 160	Top Girt	L2x2x1/4	46	-0.486	17.587	2.8	Pass
T3	160 - 140	Top Girt	ROHN TS1.5x11 ga	126	0.668	19.665	3.4 8.4 (b)	Pass
T4	140 - 120	Top Girt	ROHN TS1.5x11 ga	207	0.762	19.665	3.9 9.6 (b)	Pass
T5	120 - 100	Top Girt	L2x2x1/4	264	1.157	24.485	4.7	Pass
T6	100 - 80	Top Girt	ROHN TS1.5x16 ga	344	0.629	9.932	6.3 15.1 (b)	Pass
T7	80 - 60	Top Girt	ROHN TS1.5x11 ga	401	0.924	19.665	4.7 11.6 (b)	Pass
T8	60 - 40	Top Girt	ROHN TS1.5x11 ga	458	0.903	19.665	4.6 11.3 (b)	Pass
T9	40 - 20	Top Girt	ROHN TS1.5x16 ga	515	0.854	9.932	8.6 20.5 (b)	Pass
T10	20 - 5	Top Girt	ROHN TS1.5x11 ga	548	0.613	19.665	3.1 7.7 (b)	Pass
T11	5 - 0	Top Girt	L3x3x1/2	575	12.549	89.100	14.1	Pass
T1	193 - 180	Bottom Girt	L2x2x1/4	10	-0.654	17.437	3.8	Pass
T2	180 - 160	Bottom Girt	L2x2x1/4	48	-4.774	17.587	27.1	Pass
T3	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	129	0.577	19.665	2.9 7.3 (b)	Pass
T4	140 - 120	Bottom Girt	ROHN TS1.5x11 ga	210	0.888	19.665	4.5 11.2 (b)	Pass
T5	120 - 100	Bottom Girt	L2x2x1/4	267	3.263	24.485	13.3	Pass
T6	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	349	0.459	9.932	4.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							11.0 (b)	
T7	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	405	1.933	19.665	9.8	Pass
							24.3 (b)	
T8	60 - 40	Bottom Girt	ROHN TS1.5x11 ga	461	1.144	19.665	5.8	Pass
							14.4 (b)	
T9	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	519	0.301	9.932	3.0	Pass
							7.2 (b)	
T10	20 - 5	Bottom Girt	ROHN TS1.5x11 ga	551	4.621	19.665	23.5	Pass
							42.4 (b)	
T11	5 - 0	Bottom Girt	L3x3x1/2	578	-3.336	73.476	7.5	Pass
T11	5 - 0	Mid Girt	L3x3x1/2	584	-0.680	63.175	1.1	Pass
T2	180 - 160	Guy A@162.496	3/4	595	29.538	34.980	84.4	Pass
T5	120 - 100	Guy A@102.496	5/8	607	16.485	25.440	64.8	Pass
T7	80 - 60	Guy A@62.4961	1/2	619	8.544	16.140	52.9	Pass
T2	180 - 160	Guy B@162.496	3/4	592	29.243	34.980	83.6	Pass
T5	120 - 100	Guy B@102.496	5/8	604	16.262	25.440	63.9	Pass
T7	80 - 60	Guy B@62.4961	1/2	615	8.468	16.140	52.5	Pass
T2	180 - 160	Guy C@162.496	3/4	588	29.522	34.980	84.4	Pass
T5	120 - 100	Guy C@102.496	5/8	600	16.454	25.440	64.7	Pass
T7	80 - 60	Guy C@62.4961	1/2	612	8.532	16.140	52.9	Pass
T2	180 - 160	Torque Arm Top@162.496	C15x50	594	-10.146	427.615	53.4	Pass
T5	120 - 100	Torque Arm Top@102.496	C15x33.9	609	-5.677	292.246	37.4	Pass
T7	80 - 60	Torque Arm Top@62.4961	C12x25	617	-3.996	208.448	25.8	Pass
							Summary	
						Leg (T6)	74.1	Pass
						Diagonal (T3)	53.8	Pass
						Secondary Horizontal (T2)	55.8	Pass
						Top Girt (T1)	35.5	Pass
						Bottom Girt (T10)	42.4	Pass
						Mid Girt (T11)	1.1	Pass
						Guy A (T2)	84.4	Pass
						Guy B (T2)	83.6	Pass
						Guy C (T2)	84.4	Pass
						Torque Arm Top (T2)	53.4	Pass
						Bolt Checks	55.8	Pass
						RATING =	**84.4**	**Pass**

MASER CONSULTING
— CONNECTICUT —

2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
T: 856.797.0412
F: 856.722.1120
www.maserconsulting.com

Sprint

550 Cochituate Road
Framingham, MA 01701

DO Macro Project

Mount Analysis
Rev 0

SITE ID: *CT23XC500*
SITE NAME: *Mohegan Hill*

Site Address: *57 Cook Drive*
Montville, CT 06382
New London County

Maser Project Number: *17924003A*

December 8, 2017

Analysis Type	*Sector Frame*
Pass/Fail	*Pass*
Member Utilization	*45%*

Reviewed By:

STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
PROFESSIONAL ENGINEER

Petros ENTsoukalas, P.E.
Connecticut Professional Engineer
PE License # 32557

Prepared by:

Clara Basanti

TABLE OF CONTENTS

1. OBJECTIVE

The objective of this report is to determine the capacity of the existing antenna support mounts at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards.

2. CODES, STANDARDS, AND LOADING:

Maser Consulting P.A. utilized the following codes and standards:

- 2016 Connecticut State Buidling Code, Incorporating the 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - o Basic Wind Speed – 103 mph (3 Second Gust)
    - o Exposure Category – DO Macro I B
    - o Structure Class – II
    - o Topographic Category – 1
    - o Ice Wind – 50 mph
    - o Ice Thickness – 0.75 in

3. INTRODUCTION

Maser Consulting P.A. 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 P.A. has reviewed the following documents in completing this report:

- Antenna Mount Mapping Notes and Pictures prepared by TEP, dated November 30, 2017.
- RFDS 45795 provided by Sprint, dated April 11, 2017.
- Previous Structural Modifications Construction Drawings prepared by Hudson Design Group dated, January 21, 2013.
- Construction Drawings, prepared by Maser Consulting P.A., Dated October 27, 2017

The existing equipment is supported on existing antenna support mounts constructed of structural steel antenna support pipes supported by pipe arms at a centerline of approximately 151’-0” above ground level. This report is based only upon this information, as well as the information obtained in the field.

Note About Proposed Equipment:

- The proposed antennas are to be installed on three (3) proposed 7'-0" long 2.0 STD pipes, which are to be attached to the existing antenna mount via U-bolts, in position 2 in all sectors.
- The proposed RRH's are to be installed on three (3) proposed 5'-0" long 2.0 STD pipes, which to be attached to the existing support pipe arms via U-bolts.

4. ANALYSIS APPROACH AND ASSUMPTIONS

The analysis approach used in this structural analysis is based on the premise that if the existing antenna support mounts are structurally adequate to support the existing and 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. Risa-3D, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the existing antenna support mounts.

GENERAL DESIGN ASSUMPTIONS

The following assumptions were utilized in the report:

• 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.

• 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 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 P.A. is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

SITE SPECIFIC DESIGN ASSUMPTIONS

The following assumptions were utilized in the calculations:

• Structural Steel Pipes are constructed of A53 Grade B Steel.

5. LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	**Commscope**	**DT465B-2XR**	**Proposed**	**Alpha, Beta, & Gamma**
3	**Alcatel-Lucent**	**TD-RRH8x20-25**	**Proposed**	**Alpha, Beta, & Gamma**
3	Alcatel-Lucent	RRH4x45-1900	Existing	Alpha, Beta, & Gamma
6	**Alcatel-Lucent**	**RRH 2x50-800**	**Existing/Proposed**	**Alpha, Beta, & Gamma**
3	RFS	APXV9ERR18	Existing	Alpha, Beta, & Gamma

The worst case loading occurs in the Alpha Sector

Quantity	Manufacturer	Antenna/ Appurtenance	Status
1	Commscope	DT465B-2XR	Proposed
1	Alcatel-Lucent	TD-RRH8x20-25	Proposed
1	Alcatel-Lucent	RRH4x45-1900	Existing
2	Alcatel-Lucent	RRH 2x50-800	Existing/Proposed
1	RFS	APXV9ERR18	Existing

6. CONCLUSION

Maser Consulting P.A. has determined the existing sector frames have **ADEQUATE** structural capacity to support the proposed and existing loading. The sector frames have been determined to be stressed to a maximum of **59.1%** of their structural capacity with the maximum usage occurring at the main horizontal support angles. Therefore, the proposed **Sprint** installation **CAN** be installed as intended.

Prior to the installation of the proposed equipment, the contractor shall verify that all bolted connections are properly fastened from the original installation. Additionally, the contractor shall inspect all existing hardware and verify that it is in its original condition and free of rust and deterioration. If any deficiencies are noted the contractor shall notify the engineer of the conditions prior to installation of any equipment for additional evaluation.

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

Maser Consulting P.A. reserves the right to amend this report if additional information about the existing members is provided. The conclusions reached by Maser Consulting P.A. 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.

Client:	Sprint	Computed By:	CB
Site Name:	CT23XC500	Date:	12/8/2017
Project No.	17924003A	Verified By:	PET
Title:	Mount Analysis	Page:	7

ANALYSIS AND DESIGN

Client:	Sprint	Computed By:	CB
Site Name:	CT23XC500	Date:	12/8/2017
Project No.	17924003A	Verified By:	PET
Title:	Mount Analysis	Page:	8

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

Wind Load Inputs Parameters

				Reference	Equation
Antenna Centerline	z	151	ft		
Normal Wind Speed (3 sec. Gust):	V	103	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	60.0	mph	(Figure a5-2a, p. 233)	
Design Ice Thickness:	t_i	0.75	in	(Figure A1-2a, p. 233)	
Exposure Category:		B		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	7.0		Ref. 3, Table 2-4	
Nominal Height of the Atmospheric Boundary Layer:	Z_g	1200	ft	Ref. 3, Table 2-4	
Min. Value for k_z:	Kz_{min}	0.70		Ref. 3, Table 2-4	
Terrain Constant:	K_e	0.90		Ref. 3, Table 2-4	
Velocity Pressure Exposure Coefficient:	K_z	1.112		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}	1.16			$=(z/33)^{0.10}$
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	25.66	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}	6.05	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}	8.71	psf	(Section 2.6.9.6, P. 25)	$=.00256 \cdot K_z \cdot K_{zt} \cdot K_d \cdot V_i^2 \cdot I$

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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 $C_{a\ Side}$
DT465B-2XR	84.0	2.375	1.200	72.00	14.00	8.00	1.32	1.47	87.5	5.9	0.976	75.49	17.49	11.49	1.28	1.38
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	29.59	22.09	10.19	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	28.49	15.49	15.49	1.20	1.20
RRH 2x50-800	0.0	0.000	0.000	16.00	13.00	12.00	1.20	1.20	0.0	0.0	0.000	19.49	16.49	15.49	1.20	1.20
APXV9ERR18	84.0	3.750	1.142	72.00	11.80	7.90	1.36	1.47	87.5	7.2	0.913	75.49	15.29	11.39	1.31	1.38

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition				Iced Condition			
		Wind Force (lbs.)		Controlling Wind Force (lbs.)	Gravity (lbs.)	Wind Force (lbs.)		Controlling Wind Force (lbs.)	Gravity (lbs.)
		F_N	F_T			F_N	F_T		
DT465B-2XR	2	103.2	82.1	**103.2**	**36.5**	31.7	30.3	**31.7**	**119.9**
TD-RRH8x20-25	1	88.3	33.4	**88.3**	**76.2**	28.0	13.1	**28.0**	**113.2**
RRH4x45-1900	1	54.5	54.5	**54.5**	**84.5**	18.9	18.9	**18.9**	**94.8**
RRH 2x50-800	1	37.8	34.9	**37.8**	**84.1**	13.8	12.9	**13.8**	**67.4**
APXV9ERR18	2	91.4	90.6	**91.4**	**38.5**	28.7	31.6	**31.6**	**107.0**

** 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	192	Round	2.88	1.20	6.27	6.37	6.37	195.49	1.20	3.27	9.86
Pipe	Pipe 2.0	96	Round	2.38	1.20	5.18	5.87	5.87	99.49	1.02	2.57	8.79
Pipe	Pipe 2.0	72	Round	2.38	1.20	5.18	5.87	5.87	75.49	0.93	2.34	8.79
Pipe	Pipe 1.25	50	Round	1.66	1.20	3.62	5.15	5.15	53.49	0.88	1.93	7.27

BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

$$I := \begin{cases} 1.0 & \text{if Class = "II"} \\ 1.15 & \text{if Class = "III"} \end{cases} \quad = 1$$

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

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

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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

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

Section 2.6.6.4, p. 14

Table 2-4 p. 40

Table 2-5 p. 40

Table 2-5 p. 40

Section 2.6.6.4, P. 14

Section 2.6.6.4, P. 14

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

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

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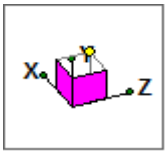
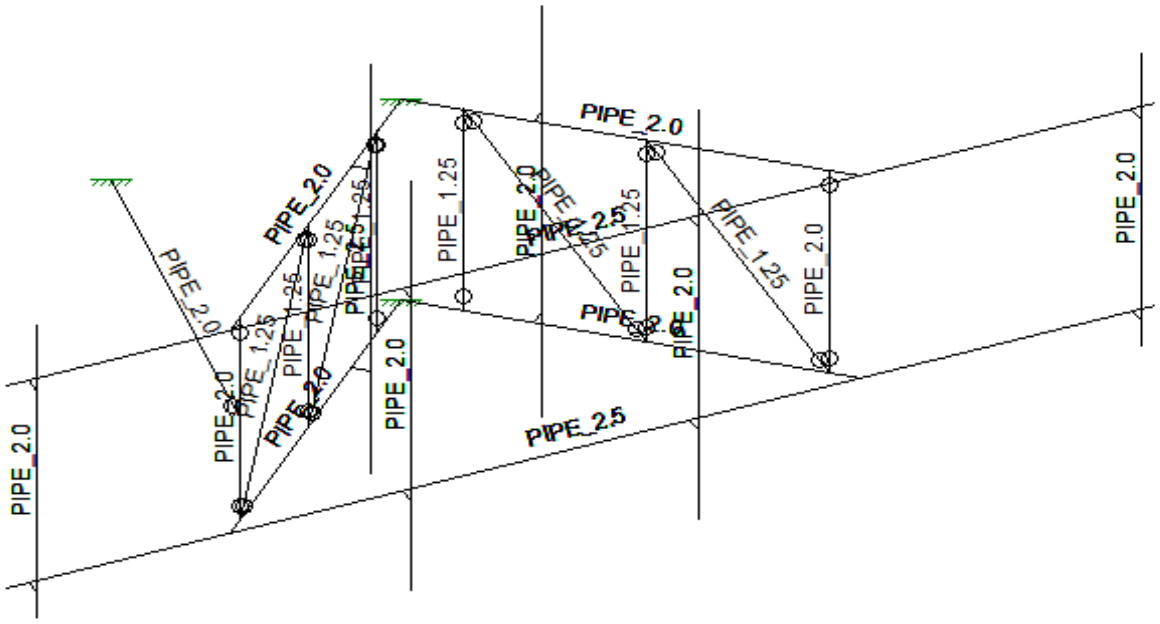
RISA MODEL





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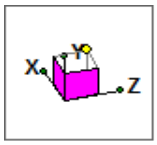
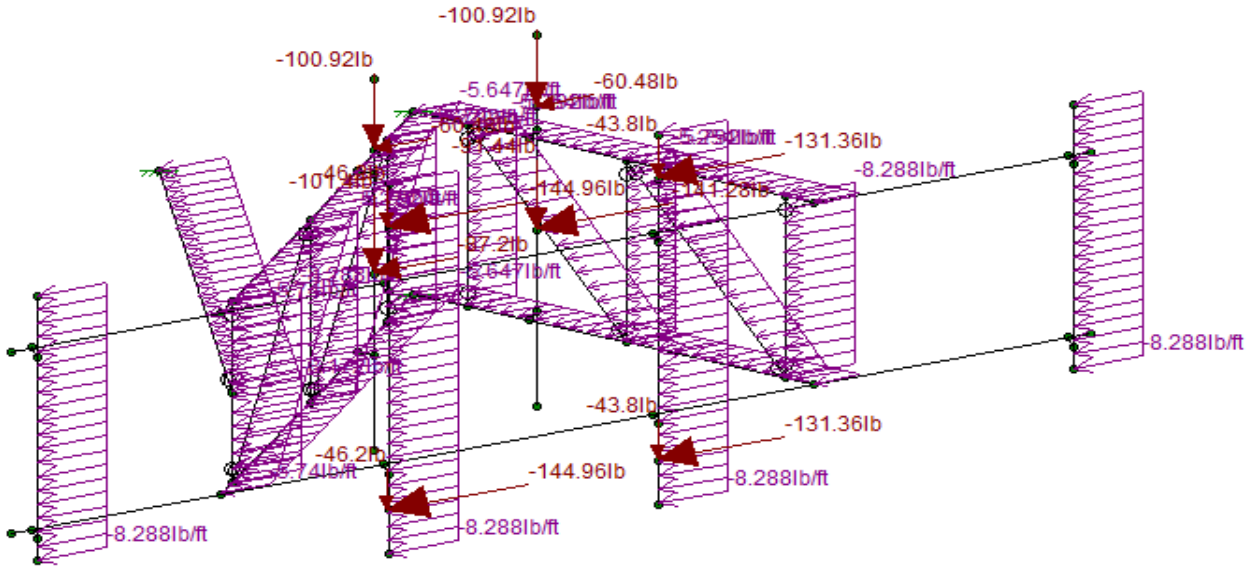
RISA WORST CASE LOADING





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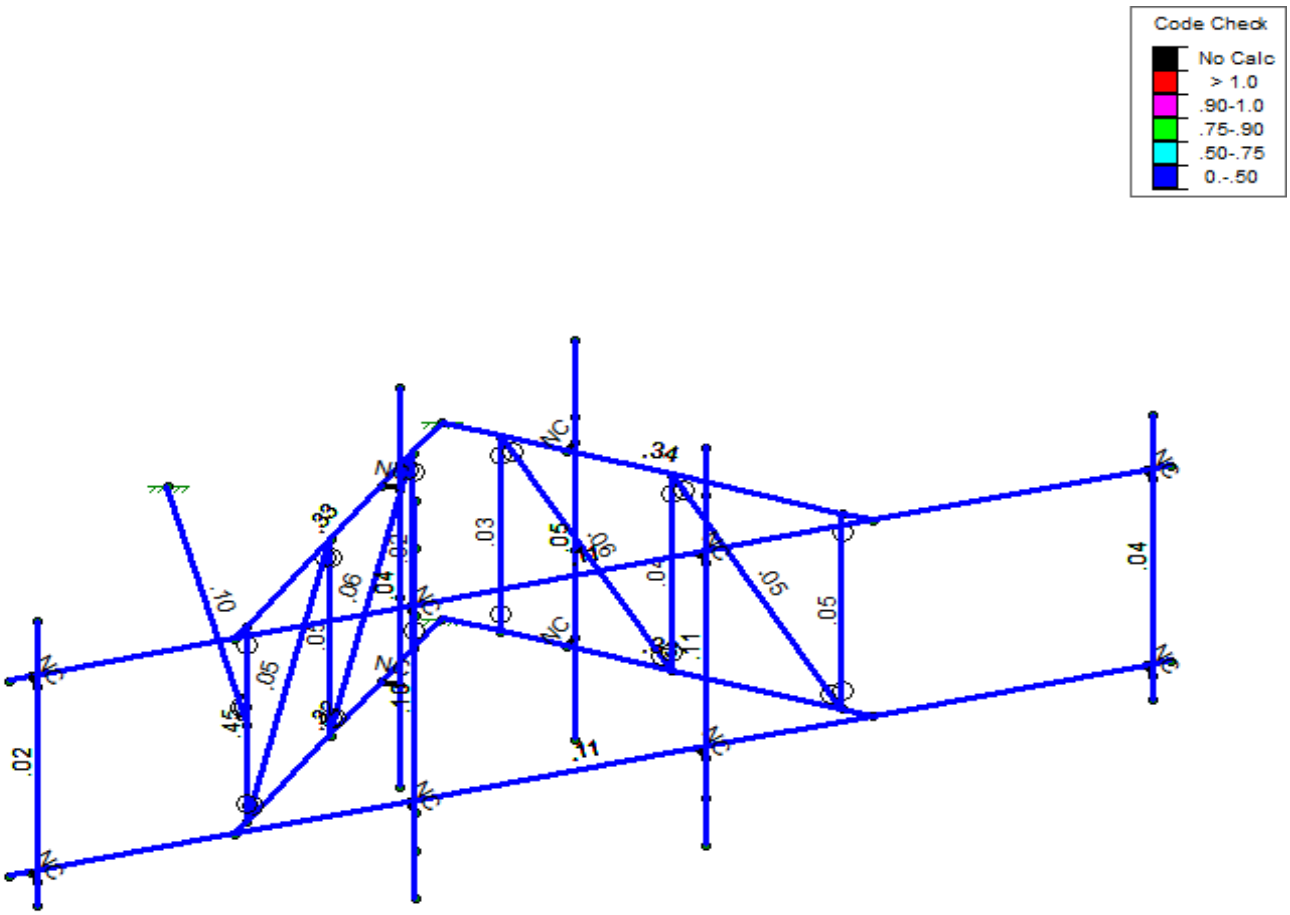
RISA CODE CHECK



SITE ID: CT23XC500
SITE NAME: MOHEGAN HILL

57 COOK DRIVE
MONTVILLE, CT 06382

DO MACRO PROJECT

SITE INFORMATION

ADDRESS:	57 COOK DRIVE MONTVILLE, CT 06382
JURISDICTION:	TOWN OF MONTVILLE
COUNTY :	NEW LONDON
PROPERTY OWNER:	WIRELESS SOLUTIONS PO BOX 284 OLD LYME, CT 06371
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 41.47499444°
LONGITUDE (NAD 83):	W 72.10504166°
CURRENT USE:	UNMANNED TELECOMMUNICATIONS FACILITY
PROPOSED USE:	NO CHANGE
UTILITY COMPANY:	CONNECTICUT LIGHT AND POWER PHONE: 800-266-2000

RF CONFIGURATION

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

PROJECT CONTACTS

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

STRUCTURAL STATEMENT

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

APPROVALS

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

CONSTRUCTION:_____ DATE: _____

LEASING/SITE ACQUISITION: _____ DATE: _____

RF ENGINEERING: _____ DATE: _____

LANDLORD/PROPERTY OWNER: _____ DATE: _____

LOCAL MAP

NO SCALE

DRIVING DIRECTIONS

FROM SPRINT OFFICES, 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 I-95 N TO CT-32 S IN MONTVILLE. TAKE EXIT 5 FROM CT-2A E. 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. KEEP LEFT TO STAY ON I-287 E. MERGE ONTO I-95 N. ENTERING CONNECTICUT. KEEP LEFT AT THE FORK TO CONTINUE ON I-395 N, FOLLOW SIGNS FOR INTERSTATE 395 N/NORWICH/PLAINFIELD. TAKE EXIT 79A FOR CONNECTICUT 2 ALTERNATE E TOWARD PRESTON/LEDYARD CONTINUE ONTO CT-2A E TAKE EXIT 5 FOR CT-32 TOWARD NORWICH/UNCASVILLE. FOLLOW CT-32 S TO COOK DR. TURN RIGHT ONTO CT-32 S. TURN RIGHT ONTO COOK DR. SLIGHT LEFT TO STAY ON COOK DR.

DRAWING INDEX

NYC DOB NUMBER	SHEET TITLE	REV.
T-001.00	TITLE SHEET	0
ANT-001.00	GENERAL NOTES	0
ANT-002.00	SITE PLAN	0
ANT-003.00	EQUIPMENT PLAN AND ELEVATION	0
ANT-004.00	ANTENNA ORIENTATION PLANS	0
ANT-005.00	DETAILS-1	0
ANT-006.00	ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES	0
ANT-007.00	ELECTRICAL AND GROUNDING NOTES	0
ANT-008.00	GROUNDING SCHEMATIC AND DETAILS	0

APPLICABLE BUILDING CODES & STANDARDS

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

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

SCOPE OF WORK

SPRINT PROPOSED TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL (3) NEW PANEL ANTENNAS
- INSTALL (6) NEW RRH'S
- INSTALL (30) JUMPER CABLES
- INSTALL (2) HYBRID CABLE

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Sprint

201 STATE ROUTE 17 NORTH
RUTHERFORD, NJ 07070
PHONE: (201) 684-4000 FAX: (201) 684-4223

Cherundolo Consulting

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

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ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

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

SCALE : AS SHOWN

JOB NUMBER : 17924003A

REV	DATE	DESCRIPTION	DRAWN	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	JRF	JKM
A	08/[illegible]	ISSUED FOR REVIEW	DTS	FEP

STATE OF CONNECTICUT
PETROS E. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.24977
LICENSED PROFESSIONAL ENGINEER

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: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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

SHEET TITLE : TITLE SHEET

SHEET NUMBER : T-001.00

GENERAL NOTES

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

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PETROS L. TSOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS L. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0029

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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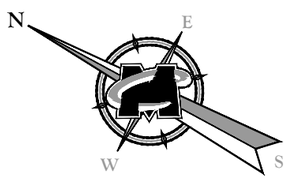
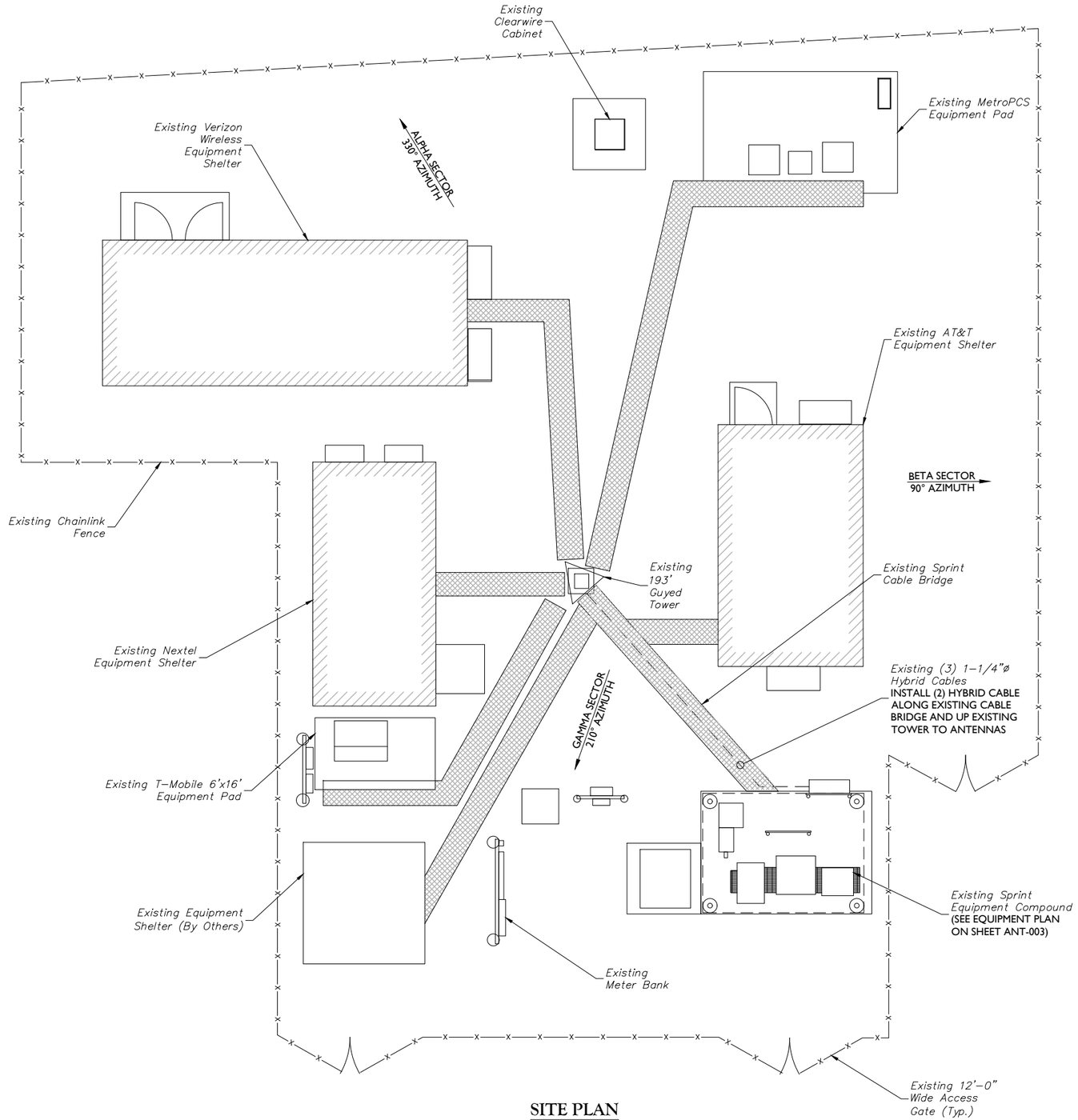
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
ANT-001.00





SITE PLAN

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

LEGEND

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

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STATE OF CONNECTICUT
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CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.24977
LICENSED PROFESSIONAL ENGINEER

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

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MONTVILLE, CT 06382

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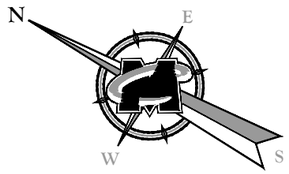
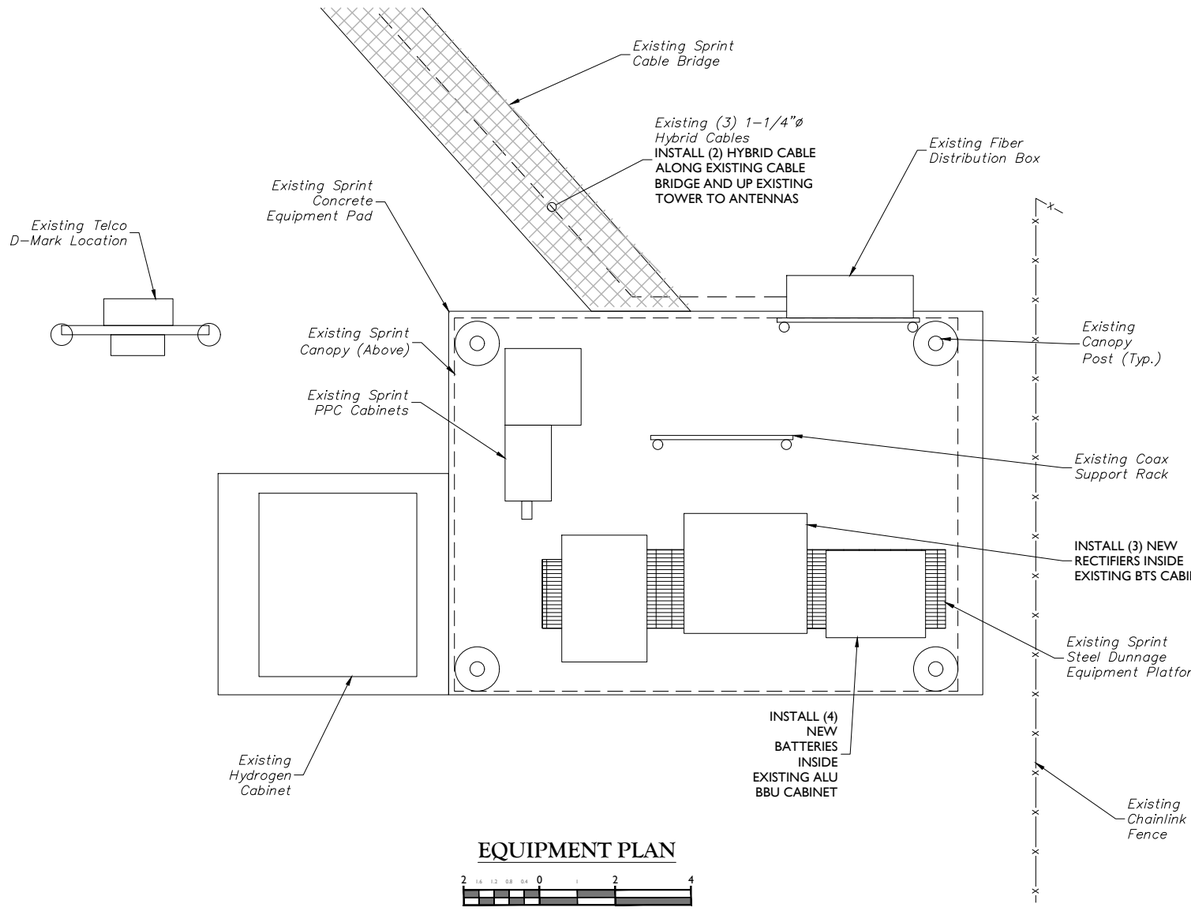
SHEET TITLE :
SITE PLAN

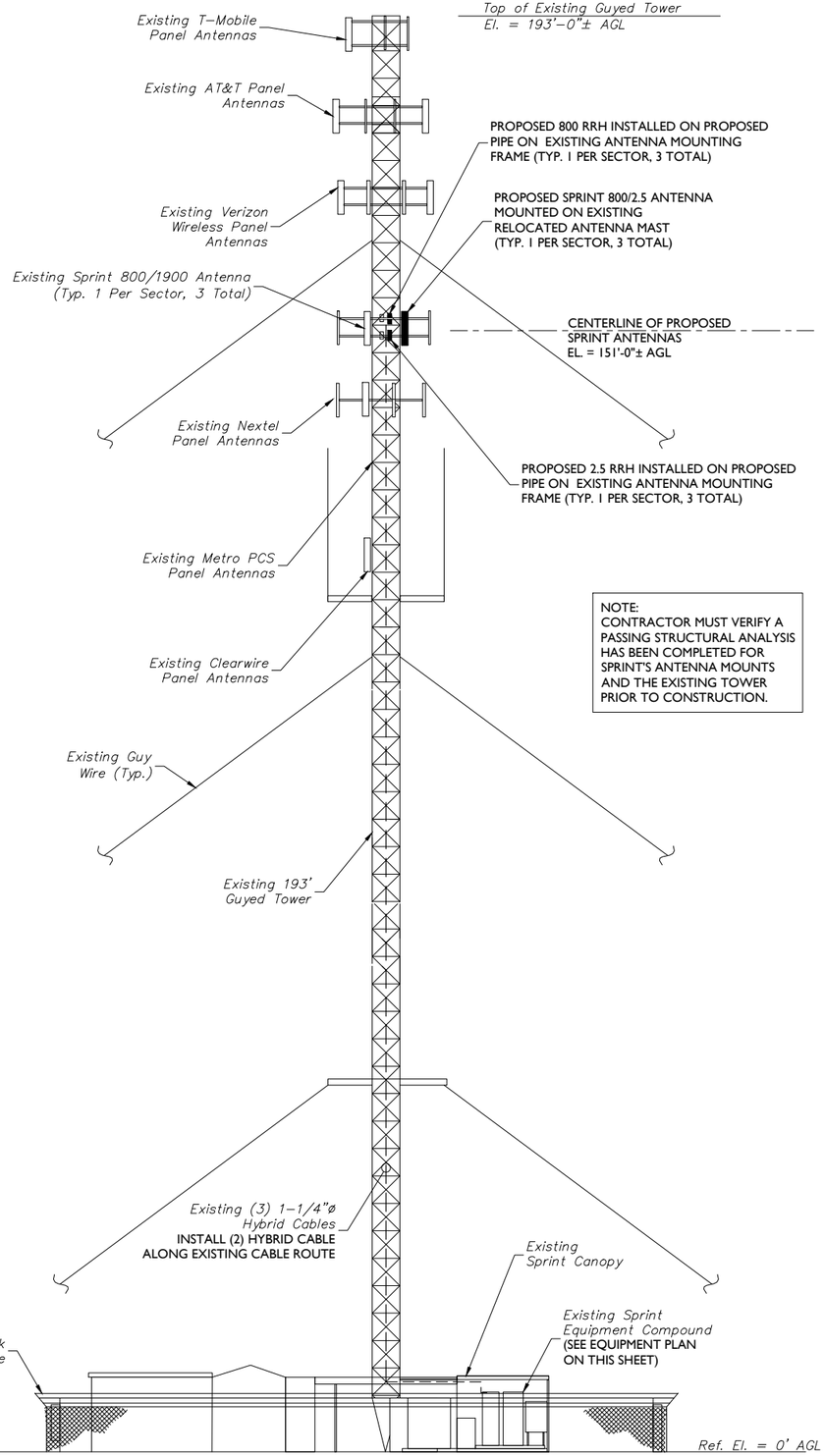
SHEET NUMBER :
ANT-002.00





EQUIPMENT PLAN

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



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

ELEVATION

SCALE: 1" = 10'

LEGEND

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

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STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0029177
LICENSED PROFESSIONAL ENGINEER

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

RED BANK OFFICE
331 Newman Springs Road
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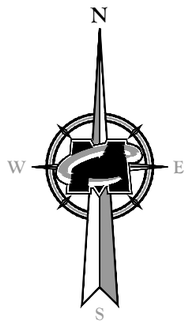
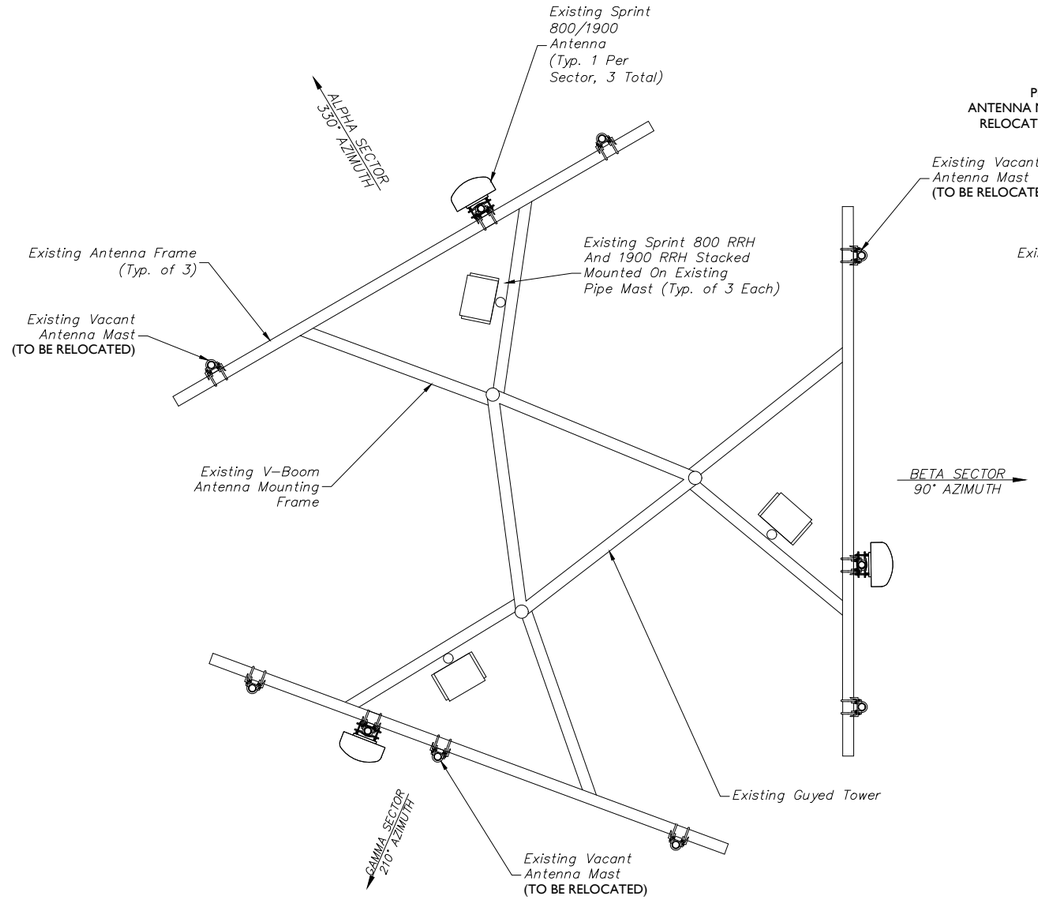
SHEET TITLE :
EQUIPMENT PLAN AND ELEVATION

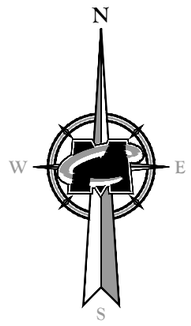
SHEET NUMBER :
ANT-003.00





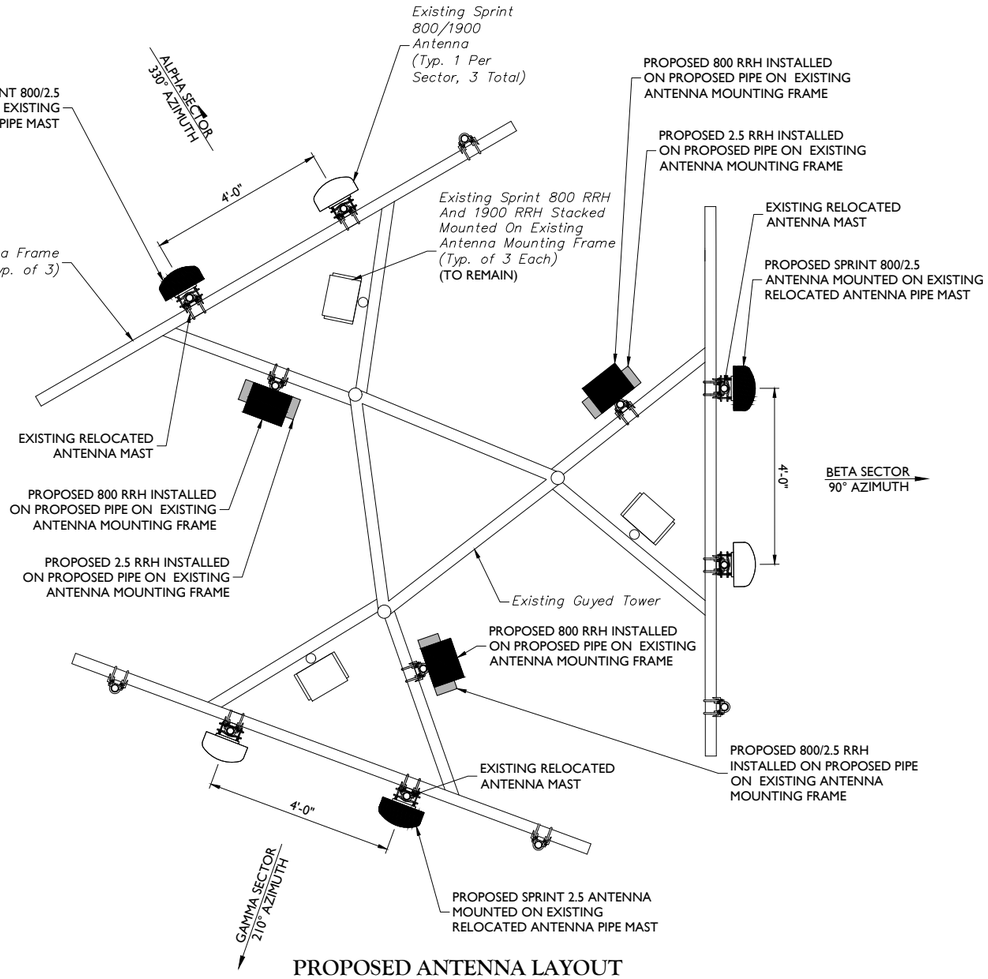
EXISTING ANTENNA LAYOUT

SCALE: 1" = 2'-0"



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

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



PROPOSED ANTENNA LAYOUT

SCALE: 1" = 2'-0"

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STATE OF CONNECTICUT
PETROS E. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS E. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.21577

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

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SHEET TITLE:
ANTENNA
ORIENTATION PLANS

SHEET NUMBER:
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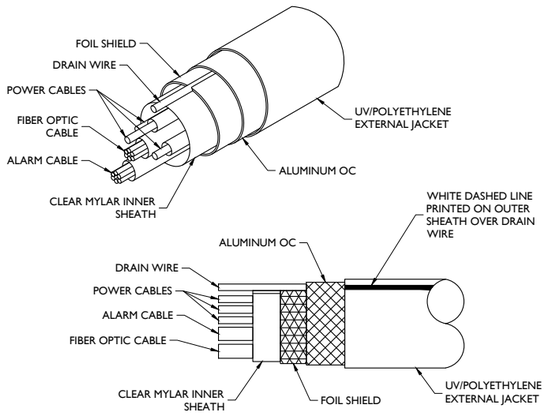
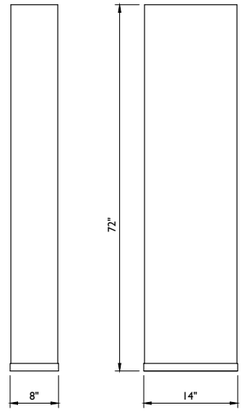


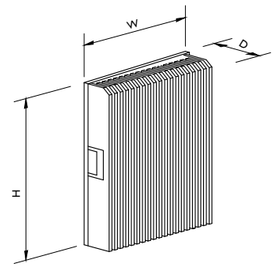
HYBRID CABLE
NOT TO SCALE



WEIGHT = 58 LBS

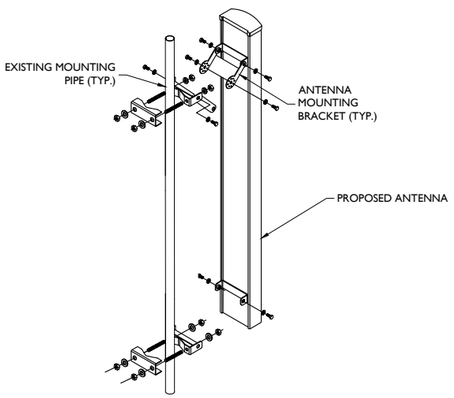
COMMSCOPE DT464B-2XR

ANTENNA DETAIL
NOT TO SCALE

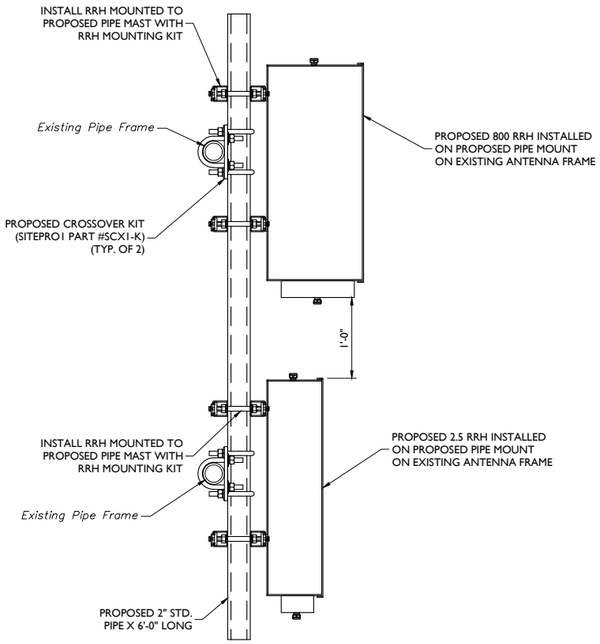


MODEL:	HEIGHT (H)	WIDTH (W)	DEPTH (D)	WEIGHT
ALU TD-RRH8x20-25	26"	18.6"	6.7"	76.2 LBS
ALU RRH-2x50-800	16"	13"	10"	69.1 LBS

RRH SPECIFICATIONS
NOT TO SCALE



ANTENNA MOUNTING DETAIL
NOT TO SCALE



RRH MOUNTING DETAIL
NOT TO SCALE

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STATE OF CONNECTICUT
PETROS L. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.25077
LICENSED PROFESSIONAL ENGINEER

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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SHEET TITLE:
DETAILS - 1

SHEET NUMBER:
ANT-005.00

RF NOTES

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

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

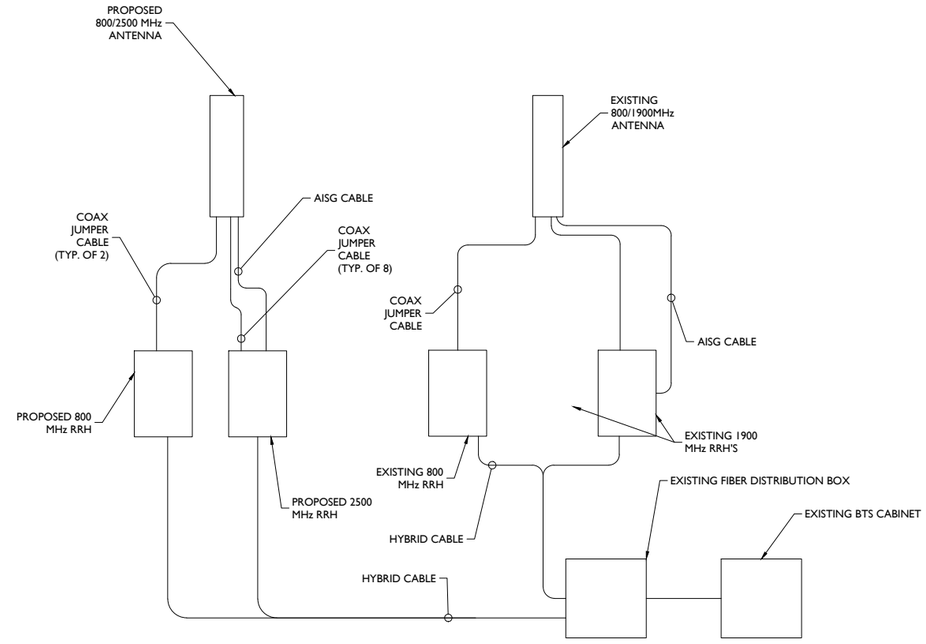
   ALSO ACCEPTABLE IS THE USE OF BUTYL RUBBER WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURE AND CONTRACTOR. START BUTYL RUBBER TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE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

PROPOSED ANTENNA CONFIGURATION

SECTOR		PROPOSED ANTENNA	TECH.	ANTENNA STATUS	HEIGHT (in)	WIDTH (in)	DEPTH (in)	WEIGHT (lbs)	ANTENNA AZIMUTH	ANT. CL. ELEV (ft.)	ELECTRICAL DOWNTILT	MECHANICAL DOWNTILT
ALPHA	A1	COMMSCOPE DT465B-2XR	800/2500	NEW	72	14	8	58	330°	151'	2°/2°	0°
BETA	B1	COMMSCOPE DT465B-2XR	800/2500	NEW	72	14	8	58	90°	151'	2°/2°	0°
GAMMA	C1	COMMSCOPE DT465B-2XR	800/2500	NEW	72	14	8	58	210°	151'	2°/2°	0°

BILL OF MATERIALS

NUMBER	QUANTITY	DESCRIPTION	MANUFACTURER	MODEL NUMBER
1	3	PANEL ANTENNA	COMMSCOPE	DT464B-2XR
2	3	2500MHZ RRH	ALU	TD-RRH8X20-25
3	3	800MHZ RRH	ALU	RRH-2X50-800
4	200 LF	1-1/4"Ø HYBRID FIBER RISER X2	ALU	TBD
5	32	1/2"Ø JUMPER CABLE (8' LONG)	TBD	
6	3	0.315"Ø AISG CABLE (8' LONG)	COMMSCOPE	ATCB-B01-006



ANTENNA WIRING DIAGRAM

NOT TO SCALE

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STATE OF CONNECTICUT
PETROS L. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.21977
LICENSED PROFESSIONAL ENGINEER

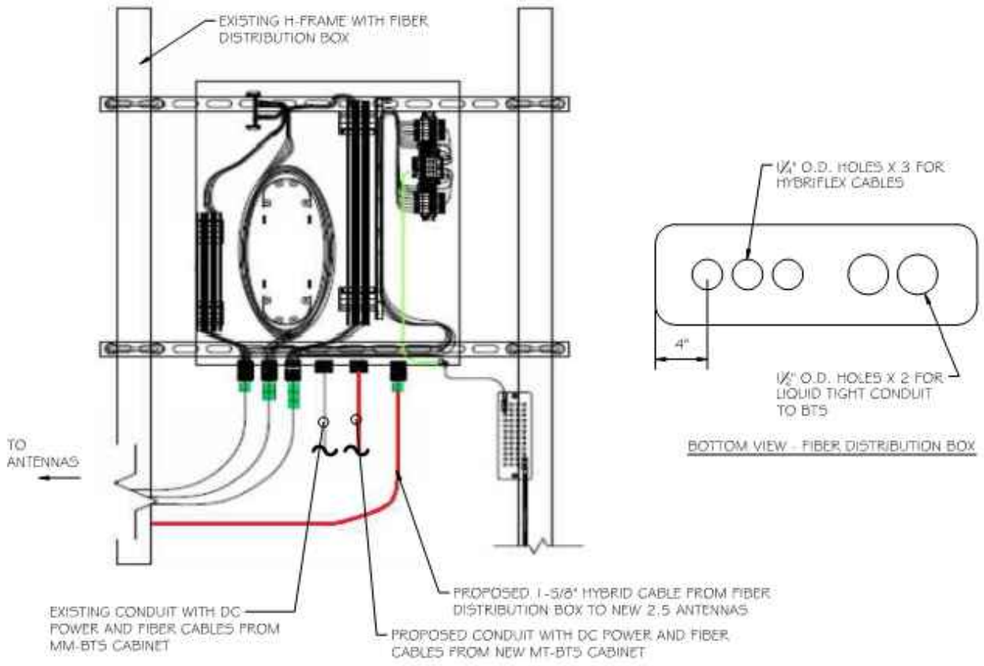
SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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

SHEET TITLE
ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES

SHEET NUMBER :
ANT-006.00



TYPICAL FIBER DISTRIBUTION BOX DETAIL
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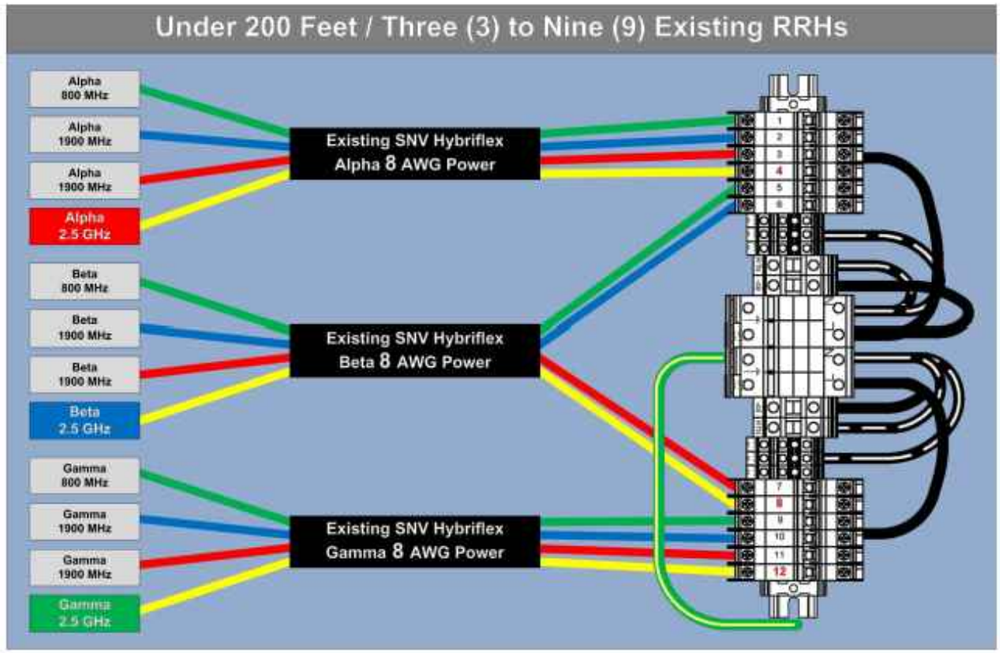

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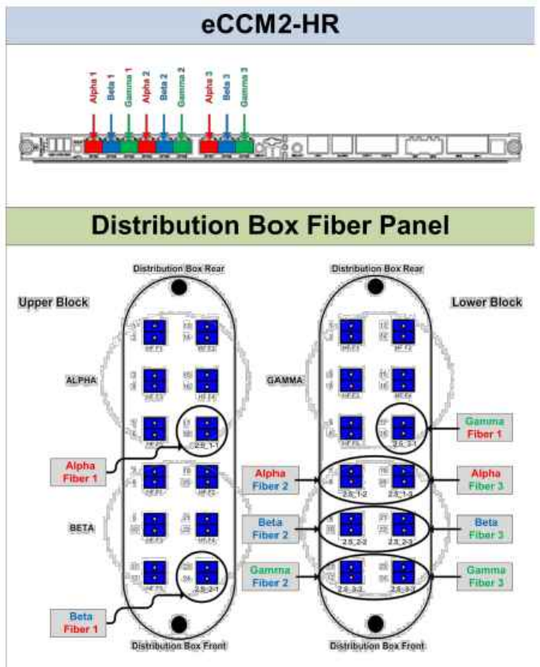

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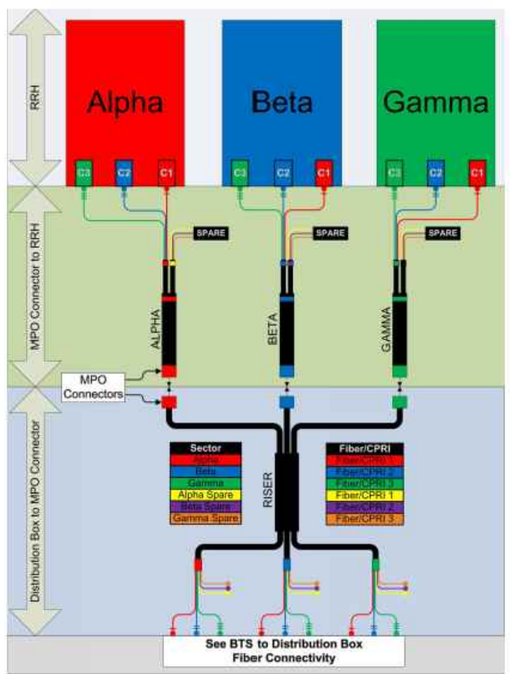

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SCALE :	JOB NUMBER :
AS SHOWN	17924003A

REV	DATE	DESCRIPTION	DRWN	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	JRF	JKM
A	08/	ISSUED FOR REVIEW	DTS	FEP

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.0027
LICENSED PROFESSIONAL ENGINEER

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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

SHEET TITLE :
ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES

SHEET NUMBER :
ANT-007.00

Prepared By	Revision Date	Revision Number
Mark Elliott	August 23, 2017	R4
Approved By	**Approval Date**	
RAN Hardware & Antenna Teams	DRAFT-Macro Generated	

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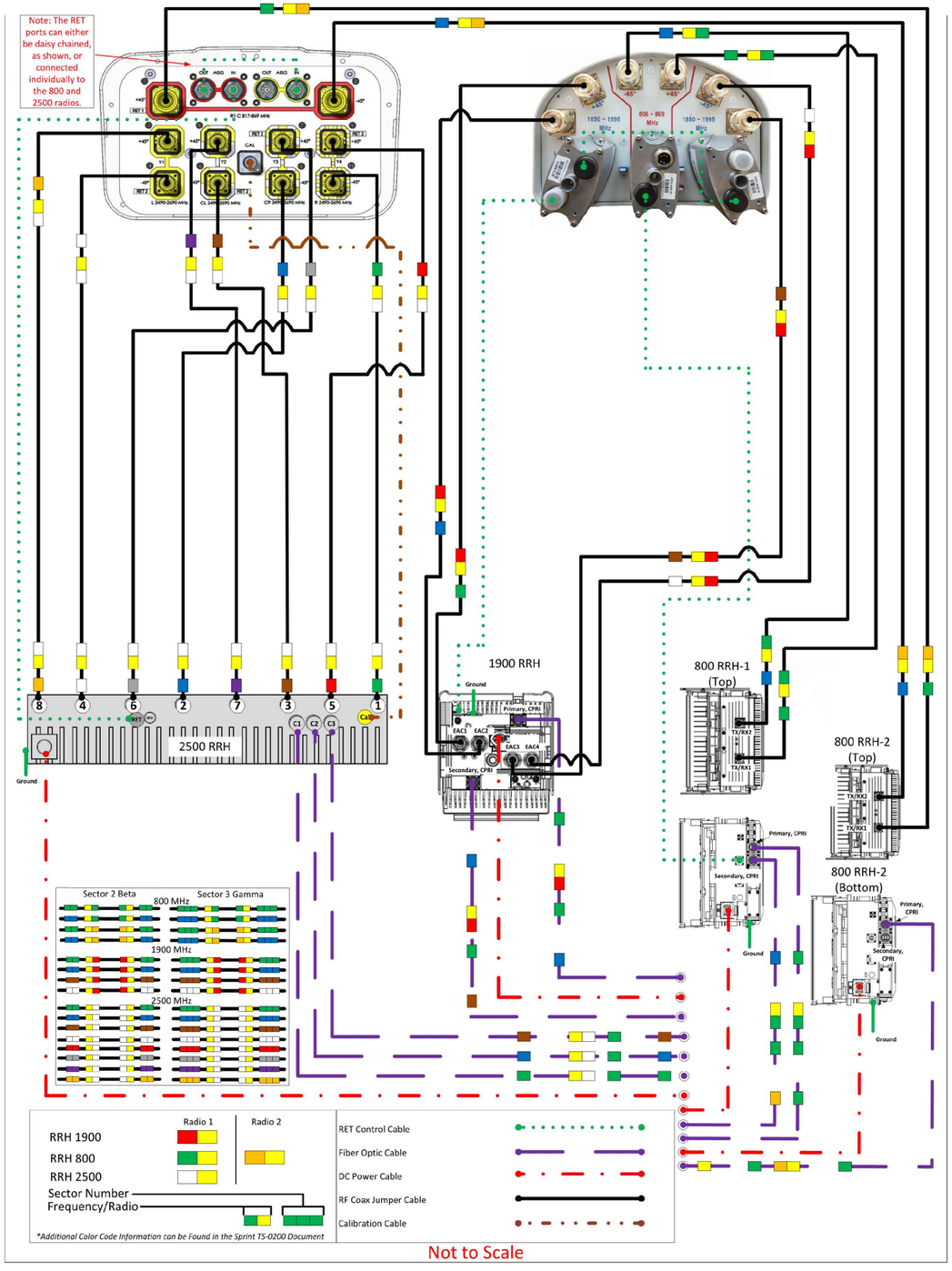

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STATE OF CONNECTICUT
PETROS E. SOUKALAS
LICENSED PROFESSIONAL ENGINEER

PETROS E. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.31977

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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

SHEET TITLE
ANTENNA SCHEDULE, WIRING DIAGRAM, BILL OF MATERIALS AND NOTES

SHEET NUMBER :
ANT-008.00

GENERAL REQUIREMENTS:

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

PROJECT COORDINATION:

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

PROTECTION OF WORK:

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

WARRANTIES AND BONDS:

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

PERMITS:

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

RACEWAYS:

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

WIRING:

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

GROUNDING:

1. PROVIDE A COMPLETE EQUIPMENT GROUND SYSTEM FOR THE ELECTRICAL SYSTEM AS REQUIRED BY ARTICLE 250, OF THE NEC, AND AS SPECIFIED HEREIN.
2. ALL BRANCH CIRCUITS FOR POWER WIRING SHALL CONTAIN A COPPER GROUND WIRE. NO FLEXIBLE METAL CONDUIT OF ANY KIND OR LENGTH SHALL BE USED AS THE EQUIPMENT GROUNDING CONDUCTOR.
3. THE EQUIPMENT BONDING JUMPER SHALL BE PERMITTED TO BE INSTALLED INSIDE OR OUTSIDE OF A RACEWAY OR ENCLOSURE. WHERE INSTALLED ON OUTSIDE, THE LENGTH OF THE EQUIPMENT BONDING JUMPER SHALL NOT EXCEED 6 FEET AND SHALL BE ROUTED WITH THE RACEWAY OR ENCLOSURE. REFER TO NEC 2011 - 250.102 (E)
4. ALL GROUNDING DEVICES SHALL BE U.L. APPROVED OR LISTED FOR THEIR INTENDED USE.
5. ALL WIRES SHALL BE AWG THHN/THWN COPPER UNLESS NOTED OTHERWISE.
6. GROUNDING CONNECTIONS TO GROUND RODS, GROUND RING WIRE, TOWER BASE AND FENCE POST'S 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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CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.31977

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: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

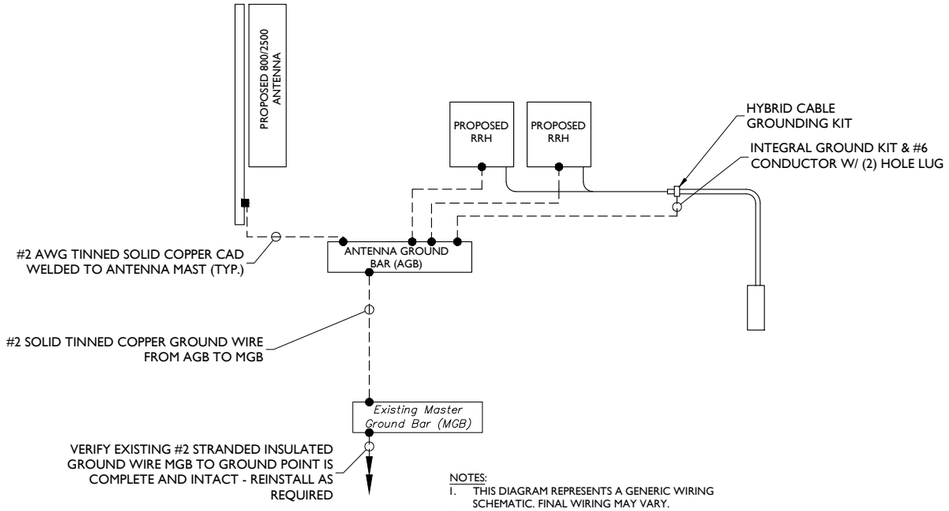
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :

ELECTRICAL AND GROUNDING NOTES

SHEET NUMBER :

ANT-009.00

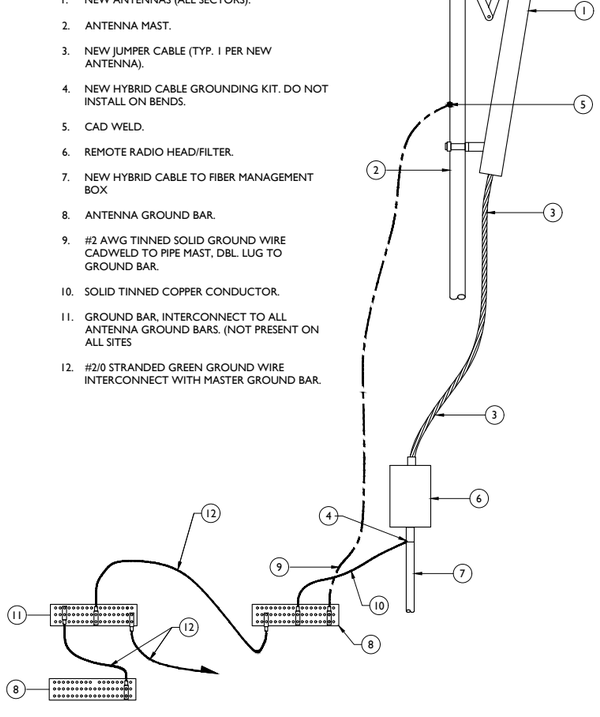


NOTES:
1. THIS DIAGRAM REPRESENTS A GENERIC WIRING SCHEMATIC. FINAL WIRING MAY VARY.
2. GROUNDING INSTALLATION TYPICAL AT EACH SECTOR.

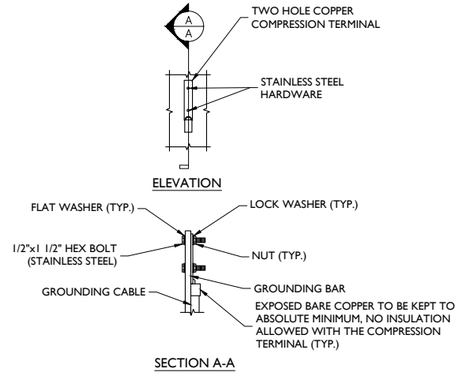
GROUNDING SCHEMATIC
NOT TO SCALE

ANTENNA GROUNDING NOTES:

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



ANTENNA GROUNDING SCHEMATIC
NOT TO SCALE



TYPICAL GROUND BAR CONNECTION DETAIL
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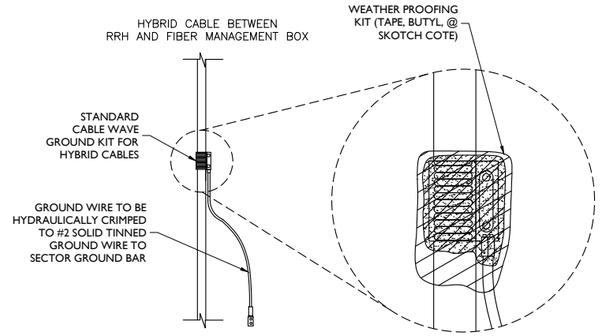

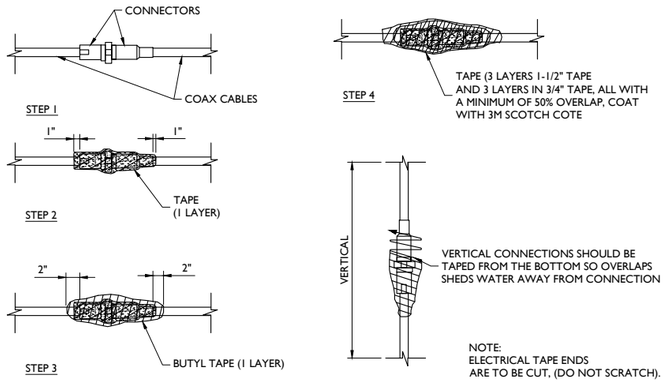

CABLE WRAPPING DETAIL
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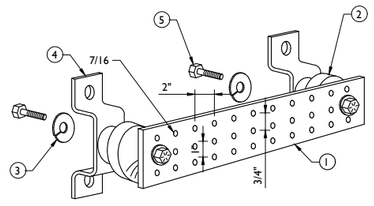

1. COPPER GROUND BAR, 1/4" X 4" X 20", NEWTON INSTRUMENT CO. CAT. NO. B-6142 OR EQUAL. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION. (ACTUAL GROUND BAR SIZE WILL VARY BASED ON NUMBER OF GROUND CONNECTIONS)
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4 OR EQUAL
3. 5/8" LOCKWASHERS, NEWTON INSTRUMENT 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
NOT TO SCALE

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ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

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

SCALE :	JOB NUMBER :
AS SHOWN	17924003A

REV	DATE	DESCRIPTION	BY	CHECKED BY
0	10/27/17	ISSUED FOR CONSTRUCTION	JRF	JKM
A	08/	ISSUED FOR REVIEW	DTS	FEP

STATE OF CONNECTICUT
PETROS E. SOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER - LICENSE NUMBER: PEN.21577
LICENSED PROFESSIONAL ENGINEER

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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

SHEET TITLE :
GROUNDING SCHEMATIC AND DETAILS

SHEET NUMBER :
ANT-010.00