4 Davis Road West, Old Lyme, CT 06371

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

Re: Notice of Rescission Exempt Modification Approval
57 Cook Drive – Montville, CT 06382

August 13, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), received CT Siting Council approval for an exempt modification on February 13, 2018; EM-SPRINT- 085-180124. Sprint subsequently found the need to change some equipment from that specified in the approved EM. Sprint, therefore, will not proceed with the EM approval received on that date and will instead resubmit for a new exempt modification with the revised equipment. Please advise if anything else is required to rescind the original approval, and clear the way for the subsequent resubmittal. Thank you.

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

Thank you,

By: *Paul F. Sagristano*

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

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

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

Re: Notice of Exempt Modification Application
57 Cook Drive – Montville, CT 06382

August 13, 2018

Dear Ms. Bachman:

Sprint Spectrum Realty Company, L.P. ("Sprint"), is submitting to the Connecticut Siting Council for a Notice of Exempt Modification for Proposed Modifications to an Existing Telecommunications Facility located at the above-referenced site. Sprint currently maintains 3 panel antennas at the 151' level of the Tower. Sprint proposes to add 3 new panel antennas (1 per sector) and 3 new remote radio units (3 per sector) at 151' tower level as well as 3 new hybrid cables and 24 Antenna-RRH jumper cables.

The earliest CT Siting Council approval I could find 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 actual tower construction was issued by the Town on April 17, 1997. The attached construction and structural documents enclosed reflect the current reality of all the installations on the Tower.

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

Thank you,

By: *Paul F. Sagristano*

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

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

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

Re: Notice of Exempt Modification Application
57 Cook Drive Montville, CT 06382

Lat: N 41.47499
Long: W72.10504

August 13, 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 3 remote radio units (1 per sector) at the 151' tower level as well as 3 new hybrid cables and 24 Antenna-RRH jumper cables and Install 4 new batteries inside existing BBU cabinet. 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, Ken Thomas for Wireless Solutions LLC, the tower owner and Robert & Karen Kingsbrough, the property owners.

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
Robert & Karen Kingsborough, Landowners via Fed Ex

August 28,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 773030029485.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	M.VLAUN	**Delivery location:**	310 NORWICH NEW LONDON TPKE UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Aug 28, 2018 11:38
Special Handling:	Deliver Weekday Direct Signature Required		

NO SIGNATURE IMAGE IS AVAILABLE VIA THIS TRACKING APPLICATION.
The proof of delivery details appear below; however, no signature image is available at this time.

Shipping Information:

Tracking number:	773030029485	**Ship date:**	Aug 23, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Ms. Marcia Vlaun Town Planner
Town of Montville
310 Norwich-New London Tpke
Room 101
UNCASVILLE, CT 06382 US

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

Reference
CT23XC500 CSC Resubmission

Thank you for choosing FedEx.

August 28,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 773029988717.

Delivery Information:

Status:	Delivered	**Delivered to:**	Receptionist/Front Desk
Signed for by:	C.ONSTANCE	**Delivery location:**	310 NORWICH NEW LONDON TPKE UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Aug 28, 2018 11:40
Special Handling:	Deliver Weekday Direct Signature Required		

NO SIGNATURE IMAGE IS AVAILABLE VIA THIS TRACKING APPLICATION.
The proof of delivery details appear below; however, no signature image is available at this time.

Shipping Information:

Tracking number:	773029988717	**Ship date:**	Aug 23, 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

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

Reference
CT23XC500 CSC resubmission

Thank you for choosing FedEx.

August30,2018

DearCustomer:

The following is the proof-of-delivery for tracking number **773022971218**.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	Wireless Solutions	**Delivery location:**	11 Dell DR UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Aug 30, 2018 12:18
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

NO SIGNATURE IMAGE IS AVAILABLE VIA THIS TRACKING APPLICATION.
The proof of delivery details appear below; however, no signature image is available at this time.

Shipping Information:

Tracking number:	773022971218	**Ship date:**	Aug 24, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Wireless Solutions
11 Dell Dr. UNCASVILLE,
CT 06382 US

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

Reference
CT23XC500 Towerowner Resub

Thank you for choosing FedEx.

August 28,2018

Dear Customer:

The following is the proof-of-delivery for tracking number 773030075587.

Delivery Information:

Status:	Delivered	**Delivered to:**	Residence
Signed for by:	M.KINGSBOROUGH	**Delivery location:**	57 COOK DR UNCASVILLE, CT 06382
Service type:	FedEx Express Saver	**Delivery date:**	Aug 28, 2018 12:18
Special Handling:	Deliver Weekday Residential Delivery Direct Signature Required		

NO SIGNATURE IMAGE IS AVAILABLE VIA THIS TRACKING APPLICATION.
The proof of delivery details appear below; however, no signature image is available at this time.

Shipping Information:

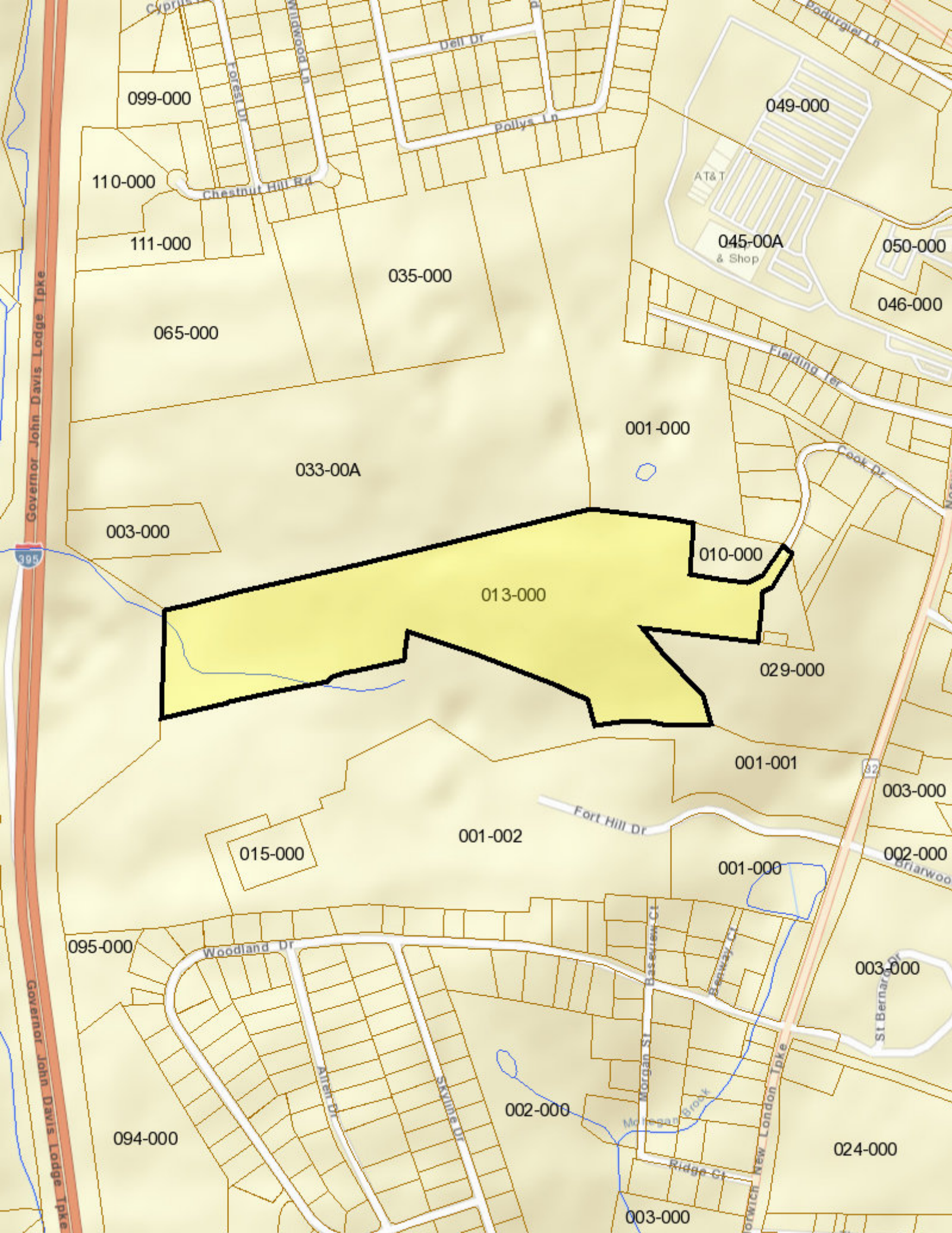
Tracking number:	773030075587	**Ship date:**	Aug 23, 2018
		Weight:	0.5 lbs/0.2 kg

Recipient:
Robert Kingsborough
57 Cook Road
UNCASVILLE, CT 06382 US

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

Reference
CT23XC500 Landowner Resub

Thank you for choosing FedEx.


099-000
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049-000
045-00A
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003-000
Governor John Davis Lodge Tpke
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

Property Location 57 COOK RD | Map ID 040/ 013/ 000/ / | Bldg Name SFR & L LSE & TOWER | State Use 1010
Vision ID 2568 | Account # K0555700 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 9/11/2017 10:37:52 A

CURRENT OWNER

KINGSBOROUGH ROBERT W & KAR

57 COOK RD

UNCASVILLE CT 06382

TOPO		UTILITIES		STRT / ROAD		LOCATION	
1	Level	7	Electric	2	Semi-Improve	S	Mohegan Schl
		5	Well			F	Mohegan
		6	Septic				

SUPPLEMENTAL DATA

Alt Parcel ID	040/013-000		
Census	695100		
Dev Lot			
Subdiv			
Map #		Callback	R
Zoning Notes	C3		
Gis ID	040/013-000	ASSOC PID#	

CURRENT ASSESSMENT

Description	Code	Appraised	Assessed
Res Land	1-1	60,800	42,560
Res Exces	1-2	330	230
Dwelling	1-3	306,940	214,860
Res OB	1-4	696,810	487,770
Forest	6-2	103,750	6,970
	Total	1,168,630	752,390

6086

MONTVILLE, CT

RECORD OF OWNERSHIP

	BK-VOL/PAGE		SALE DATE	Q/U	V/I	SALE PRICE	VC
KINGSBOROUGH ROBERT W & KAREN A	0546	0511	03-04-2010	U	I	0	29
KINGSBOROUGH ROBERT W	0292	0446	10-23-1996		I	0	
KINGSBOROUGH ROBERT W & D L MARIE	0207	0299	11-12-1988		I	0	

PREVIOUS ASSESSMENTS (HISTORY)

Year	Code	Assessed	Year	Code	Assessed	Year	Code	Assessed
2016	1-1	42,560	2015	1-1	53,760	2014	1-1	53,760
	1-2	230		1-2	410		1-2	410
	1-3	214,860		1-3	172,880		1-3	172,880
	1-4	487,770		1-4	487,770		1-4	487,770
	Total	752,390		Total	718,600		Total	718,600

EXEMPTIONS

Year	Code	Description	Amount
		Total	0.00

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm Int

This signature acknowledges a visit by a Data Collector or Assessor

ASSESSING NEIGHBORHOOD

NBHD	NBHD Name	Street Index Name	Tracing	Batch
0001				

NOTES

AT&T ANTENNAE =$163,600 PER SITE = $654,400

L: OLD MAPBLOLOT WAS 098/002-000

VC09: ADDITION

CELL TOWER VALUE = $2000 MO LESS

25% EXPENSES = $18,000 CAPPED AT 11%

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	302,740
Appraised XF (B) Value (Bldg)	4,200
Appraised OB (B) Value (Bldg)	696,810
Appraised Land Value (Bldg)	164,880
Special Land Value	6,970
Total Appraised Parcel Value	1,168,630
Valuation Method	C
Adjustment	
Total Appraised Parcel Value	1,168,630

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp Date	% Comp	Date Comp	Comments
B2017-0123	04-20-2017	79		15,000		0		VERIZON TO REPL
B2015-0505	11-17-2015	79	Misc	33,434		100	10-27-2016	CA-THREE ANTEN
B2015-0345	08-13-2015	79		15,000		100		REPL ANTENNA PA
E2015-0022	02-09-2015	00		5,700		100	02-11-2015	CA-REPAIR/RELOC
B2015-0035	02-03-2015	79	Misc	8,000		100	08-03-2015	CA-3 RADIO HEAD
B2014-0221	06-25-2014	79	Misc	15,000		100		REPLACE 6 ANTEN
B2013-0052	03-20-2013	79	Misc	129,000		100		STRUCTURAL CHA

VISIT / CHANGE HISTORY

Date	Type	IS	ID	Cd	Purpost/Result
03-28-2013			BAA	BN	BAA No Change
09-12-2011			RH	00	Interior + Exterior Inspe
07-01-2011			KN	09	All Refused- Estimated
10-26-2009			LB	08	Interior Refused-Exteri

LAND LINE VALUATION SECTION

B	Use co	Description	Zone	D	Fronta	Depth	Units		Unit Price	I. Fact	S.A.	Ac Di	C. Fact	St. Idx	Adj	Notes	Special Pricing Spec Use	Special Pricing Spec Calc	S Adj	Adj Unit Pric	Land Value
1	1010	Single Family	C-3				160,000	SF	0.38	1.000	5	1.000	1.00	002	1.00		0		1.000		60,800
1	1010	Single Family	C3				0	AC	2,500.00	1.000	0	1.000	1.00	002	1.00		0		0.000		330
1	700	Forest	C-3				42	AC	2,500.00	1.000	0	1.000	1.00	002	1.00		490		0.000		103,750
1	4340	Cell Tower						SF	2,500.00	1.000		1.000	1.00		1.00		240		0.000		0
																	0				
							Total Card Land Units		45.303	AC	Parcel Total Land Area		45.3031							Total Land Value	164,880

Property Location 57 COOK RD | Map ID 040/ 013/ 000/ / | Bldg Name SFR & L LSE & TOWER | State Use 1010
Vision ID 2568 | Account # K0555700 | Bldg # 1 | Sec # 1 of 1 | Card # 1 of 1 | Print Date 9/11/2017 10:37:52 A

CONSTRUCTION DETAIL

Element	Cd	Description
Style	01	Ranch
Model	01	Residential
Grade:	11	B
Stories:	1	
Occupancy	1	
Exterior Wall A	25	Vinyl Siding
Exterior Wall B		
Roof Structure:	03	Gable
Roof Cover	03	Asphalt
Interior Wall A	05	Drywall
Interior Wall B		
Interior Flr A	14	Carpet
Interior Flr B		
Heat Fuel	02	Oil
Heat Type:	05	Hot Water
AC Type:	01	None
Total Bedrooms	05	5 Bedrooms
Total Bthrms:	3	
Total Half Baths	0	0
Total Xtra Fixtrs	0	
Total Rooms:	9	
Bath Style:	02	Average
Kitchen Style:	02	Average
Whirlpool Tub		
Fireplaces	1	
Fin Bsmnt		
Fin Bsmnt Qual		
Attic Access	01	None
Basement Gara	0	
	1	
MH Basement		
MHP/Complex		

CONSTRUCTION DETAIL (CONTINUED)

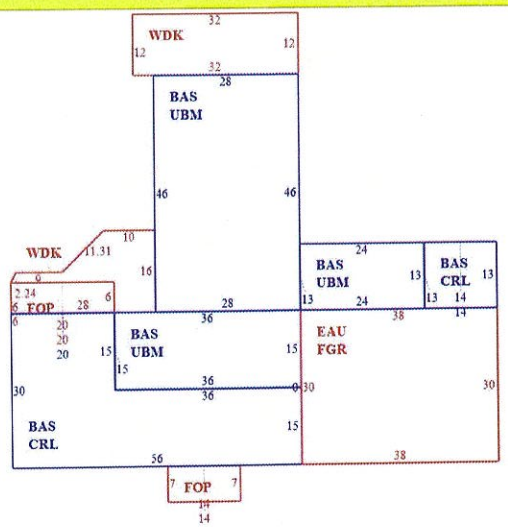
Element	Cd	Description

MIXED USE

Code	Description	Percentage
1010	Single Family	100
		0
		0

COST / MARKET VALUATION

Base Rate	90.00
RCN	
Net Other Adj	
Year Built	1989
Effective Year Built	
Depreciation Code	G
Remodel Rating	MJ
Year Remodeled	2009
Depreciation %	16
Functional Obsol	
Economic Obsol	
Cost Trend Factor	1
Condition	
% Complete	
	84
RCNLD	302,740
Dep % Ovr	
Dep Ovr Comment	
Misc Imp Ovr	
Misc Imp Ovr Comment	
Cost to Cure Ovr	
Cost to Cure Ovr Comment	



OB - OUTBUILDING & YARD ITEMS(L) / XF - BUILDING EXTRA FEATURES(B)

Code	Description	Su	Sub Type	Lan	Units	Unit Price	Year	Pct	Depre	Ccnditio	Qu		Apprais Va
SHD1	Shed			B	168	12.00	1999	50	0.00	AV	A	1.00	1,010
KIT	Kitchen			B	1	5000.00	2000	84	1.00			0.00	4,200
CELL	Cell Tower			B	4	163600.0	2009	100	0.00			0.00	654,400
CELS	Cell Shed			B	240	100.00	2009	50	0.00	AV	08	1.00	12,000
CELS	Cell Shed			B	240	100.00	2009	50	0.00	AV	08	1.00	12,000
CELS	Cell Shed			B	144	100.00	2009	50	0.00	AV	08	1.00	7,200
CELS	Cell Shed			B	192	100.00	2009	50	0.00	AV	08	1.00	9,600
FN3	6' Chain Fen			B	100	12.00	2009	50	0.00	AV	08	1.00	600

BUILDING SUB-AREA SUMMARY SECTION

Subarea	Description	Living	Gross	Eff Area	Unit Cost	Undeprec Value
BAS	First Floor	3,462	3,462		79.60	275,560
CRL	Crawl Space	0	1,322		0.00	0
EAU	Unfinished Expansion Attic	0	1,140		14.31	16,317
FGR	Garage	0	1,140		23.88	27,222
FOP	Open Porch	0	218		12.05	2,627
UBM	Basement	0	2,140		15.92	34,067
WDK	Wood Deck	0	719		6.42	4,617
	Ttl Gross Liv / Lease Area	3,462	10,141			

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

July 23, 2018

EBI Project Number: 6218005144

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	7.70 %

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

EBI Consulting
environmental | engineering | due diligence

July 23, 2018

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 50 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 APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **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):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	6,803.05	ERP (W):	6,803.05	ERP (W):	6,803.05
Antenna A1 MPE%	**1.41 %**	Antenna B1 MPE%	**1.41 %**	Antenna C1 MPE%	**1.41 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**151 feet**	Height (AGL):	**151 feet**	Height (AGL):	**151 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**1.06 %**	Antenna B2 MPE%	**1.06 %**	Antenna C2 MPE%	**1.06 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.47 %**
AT&T	1.14 %
Clearwire	0.47 %
Nextel	0.46 %
Verizon Wireless	2.32 %
T-Mobile	0.84 %
Site Total MPE %:	**7.70 %**

SPRINT Sector A Total:	2.47 %
SPRINT Sector B Total:	2.47 %
SPRINT Sector C Total:	2.47 %
Site Total:	7.70 %

SPRINT _ Frequency Band / Technology Max Power Values (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	774.41	151	2.65	850 MHz	567	0.48%
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	778.09	151	10.64	2500 MHz (BRS)	1000	1.06%
						Total:	**2.47%**

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:	2.47 %
Sector B:	2.47 %
Sector C:	2.47 %
SPRINT Maximum MPE% (per sector):	2.47 %
Site Total:	7.70 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.70 %** 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 —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Guyed Tower Structural Analysis

FOR

CT23XC500 – Mohegan Hill

57 Cook Drive
Montville, CT 06382
New London County

Tower Utilization: 84.1%
Tower Base & Guy Anchors Utilization: 82.0%

June 29, 2018

Prepared For

Sprint
201 State Route 17 North
Rutherford, NJ 07070

Prepared By

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

STATE OF CONNECTICUT
PETROS TSOUKALAS
32577
PROFESSIONAL ENGINEER

Petros Tsoukalas, P.E.
Geogrephic Discipline Leader
CT License No. 32577

MC Project No. 17924003A

Objective:

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

Introduction:

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

• RFDS 45795 provided by Sprint, dated May 21, 2018.
• 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 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.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code, Incorporating the 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 133 mph (3 Second Gust)
    - Nominal Wind Speed – 103 mph (3 Second Gust)
    - Exposure Category – B
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 0.75"
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

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

Analysis Approach & Assumptions:

The analysis approach used in this structural analysis is based on the premise that if the existing guyed tower 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. TNX, a 3D finite element modeling and analysis program, was used to determine the capacity and usage of the existing self-support tower.

The following assumptions were utilized in this report:

- Structural steel tower legs are constructed of A572-50 grade steel
- Structural steel tower diagonals and horizontals are constructed of A36/A53-B-42 Grade Steel
- The existing tower is constructed to plumb and is properly maintained with no structural deficiencies and deteriorations.
- 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.
- 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.
- It is assumed that all foundation and geotechnical information from previous Structural Analysis report by Centek Engineering dated, May 6, 2015 is accurate.

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined the existing guyed tower has **ADEQUATE** structural capacity to support the proposed loading. The existing guyed tower has been determined to be stressed to a maximum of **84.1%** of its structural capacity with the maximum usage occurring at guy wires. The existing tower base foundation and guy anchors have been determined to be a maximum of **82.0%** of their capacities with the maximum usage occurring at outer guy anchor sliding check. Therefore, the proposed **Sprint** installation **CAN** be installed as intended.

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

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

Maser Consulting Connecticut

Petros Tsoukalas, P.E.
Geographic Discipline Leader

Dejian Xu, P.E.
Project Engineer

\\maserconsulting.com\luj\AllOffices\Montvale\Projects\2017\17924000A\17924003A\Structural\Mount Analysis\Rev 1\Word\Antenna Mount Analysis - Maser Consulting Connecticut.docx

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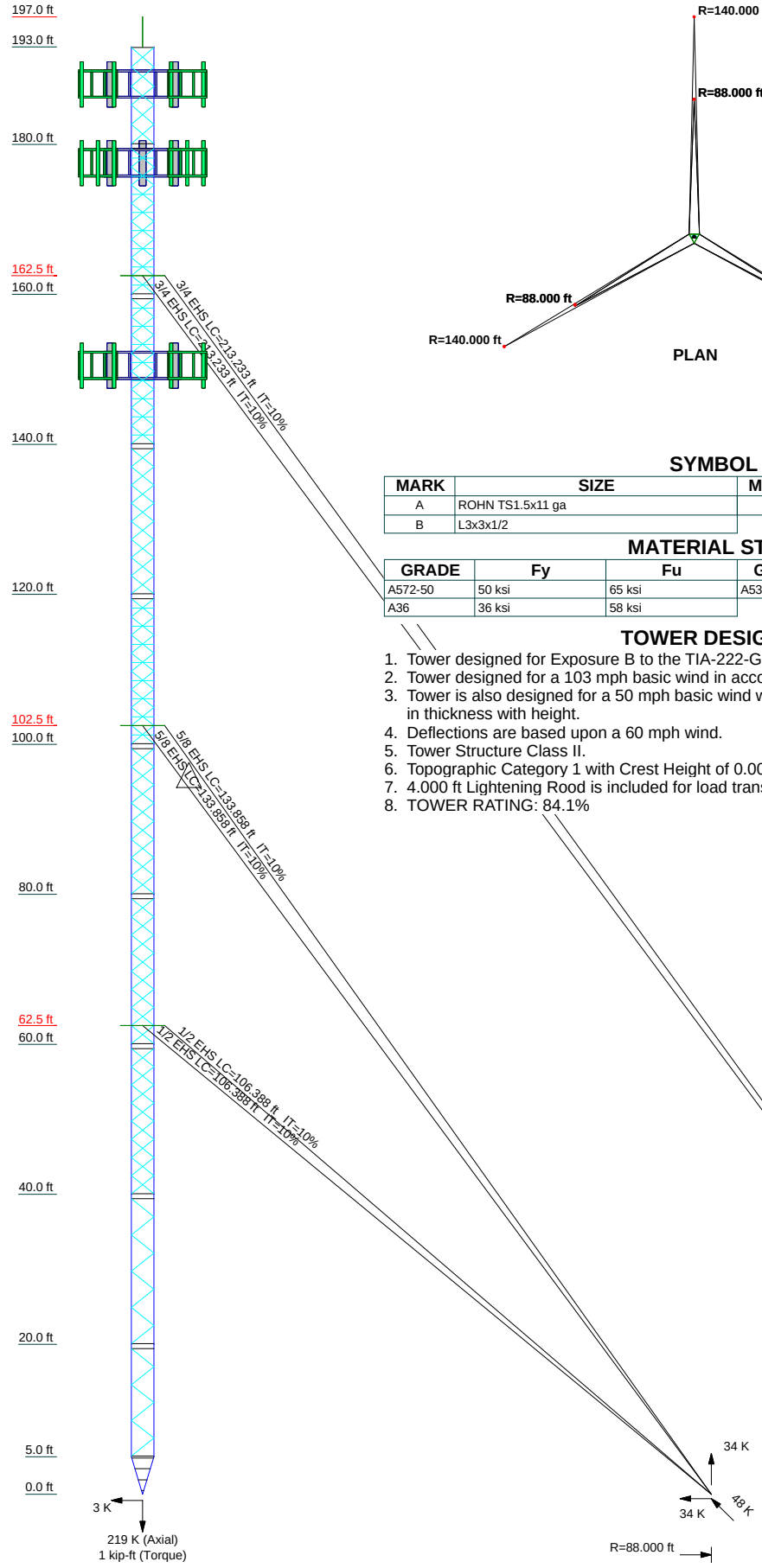
— CONNECTICUT—

APPENDIX A

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		
Top Girts	B	L2x2x1/4		ROHN TS1.5x11 ga		L2x2x1/4	ROHN TS1.5x16 ga	ROHN TS1.5x11 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	A	
Sec. Horizontals		N.A.		L2x2x1/4	N.A.	L2x2x1/4			N.A.			
Face Width (ft)		3.42					64 @ 2.41276				6 @ 2.38368	
# Panels @ (ft)	C	5 @ 2.56667										
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: 84.1%

ALL REACTIONS ARE FACTORED

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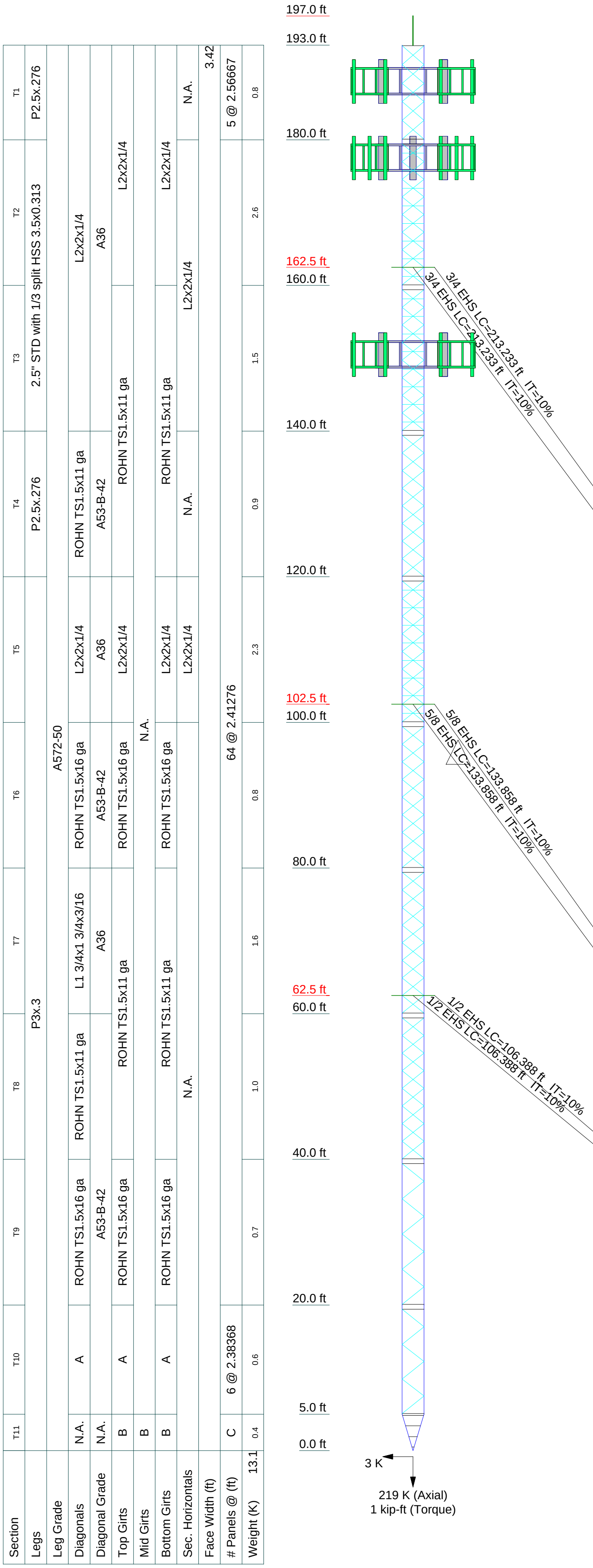
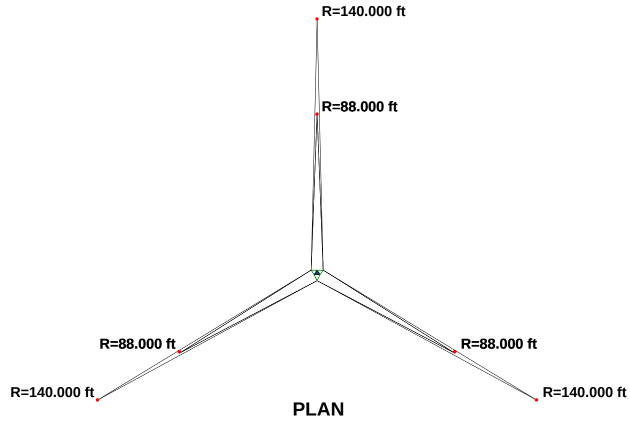
Consulting Engineers

Job: CT23XC500 - Mohegan Hill			
Project: 17924003A			
Client: Sprint	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 06/28/18	Scale: NTS	
Path: C:\Users\dxu\Desktop\Local\CT23XC500.MOHEGAN HILL.Tower Analysis.Rev 1.er		Dwg No. E-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 (ATT)	178.75	Pirod 15' T-Frame Sector Mount (1) (Verizon)	169
SBNH-1D6565C w/8ft 2.0 Std pipe (ATT)	178.75	4 Bay Dipole	155.5
RRUS-11 (ATT)	178.75	ALU RRH-4X45-1900 (Sprint)	151
RRUS-12 (ATT)	178.75	RFS APXVTM14-C-120 w/ mt pipe (Sprint)	151
(2) TT19-08BP111-001 Twin TMA (ATT)	178.75	RFS APXV9ERR18-C (Sprint)	151
(2) Diplexer (ATT)	178.75	TD-RRH8x20-25 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATT)	178.75	RRH-2X50-800 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATT)	178.75	ALU RRH-4X45-1900 (Sprint)	151
AM-X-CD-16-65-OOT-RET (ATT)	178.75	RFS APXVTM14-C-120 w/ mt pipe (Sprint)	151
RRUS-11 (ATT)	178.75	RFS APXV9ERR18-C (Sprint)	151
RRUS-12 (ATT)	178.75	TD-RRH8x20-25 (Sprint)	151
(2) TT19-08BP111-001 Twin TMA (ATT)	178.75	RRH-2X50-800 (Sprint)	151
(2) Diplexer (ATT)	178.75	ALU RRH-4X45-1900 (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATT)	178.75	RFS APXVTM14-C-120 w/ mt pipe (Sprint)	151
Powerwave 7770 w/5ft mount pipe (ATT)	178.75	RFS APXV9ERR18-C (Sprint)	151
P65-17-XLH-RR w/8ft mount pipe (ATT)	178.75	TD-RRH8x20-25 (Sprint)	151
RRUS-11 (ATT)	178.75	RRH-2X50-800 (Sprint)	151
RRUS-12 (ATT)	178.75	3'-6" Standoff	151
(2) TT19-08BP111-001 Twin TMA (ATT)	178.75	Rohn 6'x15' Boom Mount (Sprint)	150.5
(2) Diplexer (ATT)	178.75	Rohn 6'x15' Boom Mount (Sprint)	150.5
DC6-48-06-18-8F (ATT)	178.75	Rohn 6'x15' Boom Mount (Sprint)	150.5
Powerwave 7770 w/5ft mount pipe (ATT)	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 (ATT)	177.5	Splice Box (Metro PCS)	130
Rohn 6'x15' Boom Mount (ATT)	177.5	GPS (Metro PCS)	130
Rohn 6'x15' Boom Mount (ATT)	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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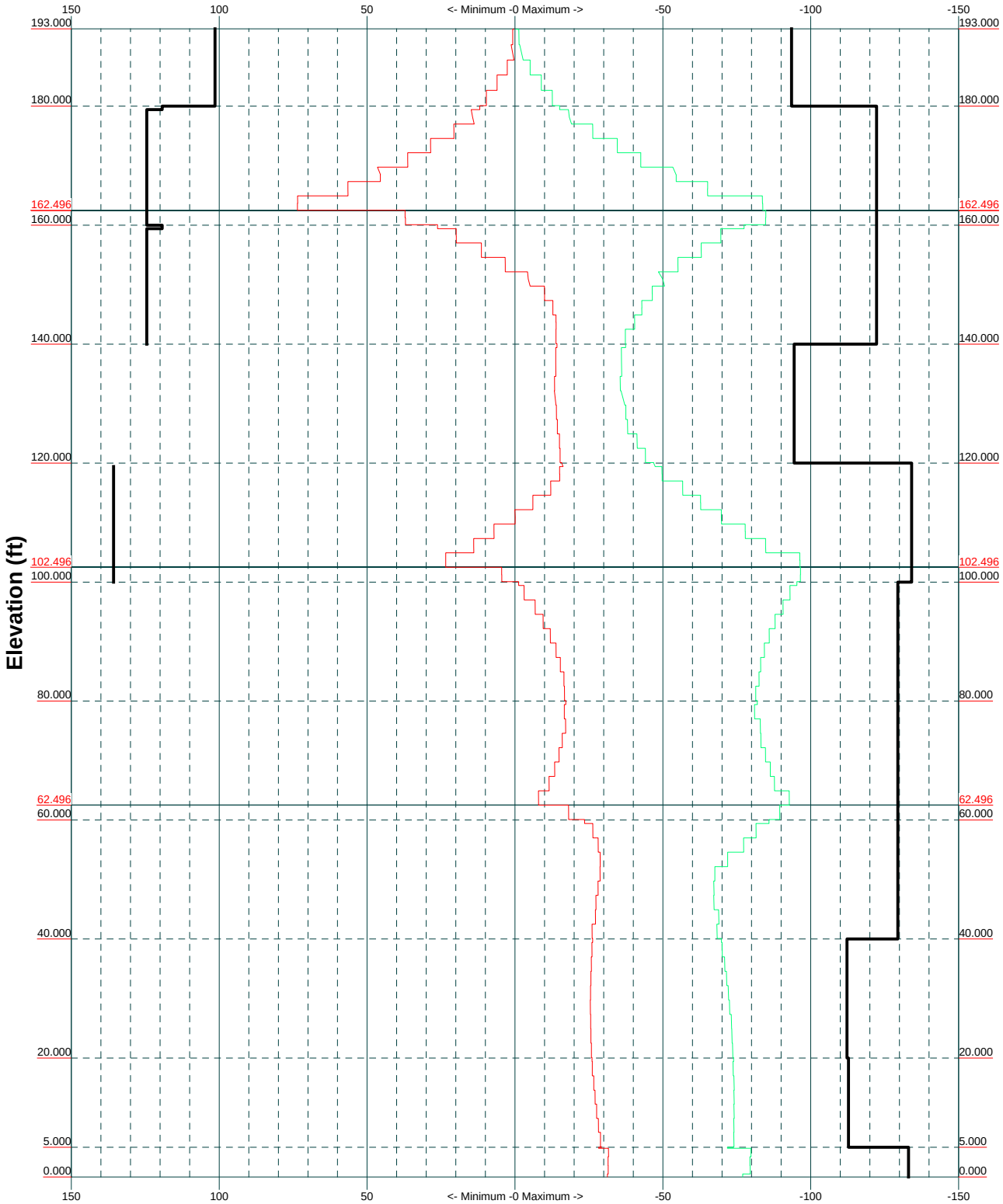
Job: **CT23XC500 - Mohegan Hill**		
Project: **17924003A**		
Client: Sprint	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 06/28/18	Scale: NTS
Path: C:\Users\dxu\Desktop\Local\CT23XC500.MOHEGAN HILL.Tower Analysis.Rev 1.eri		Dwg No. E-1

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

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



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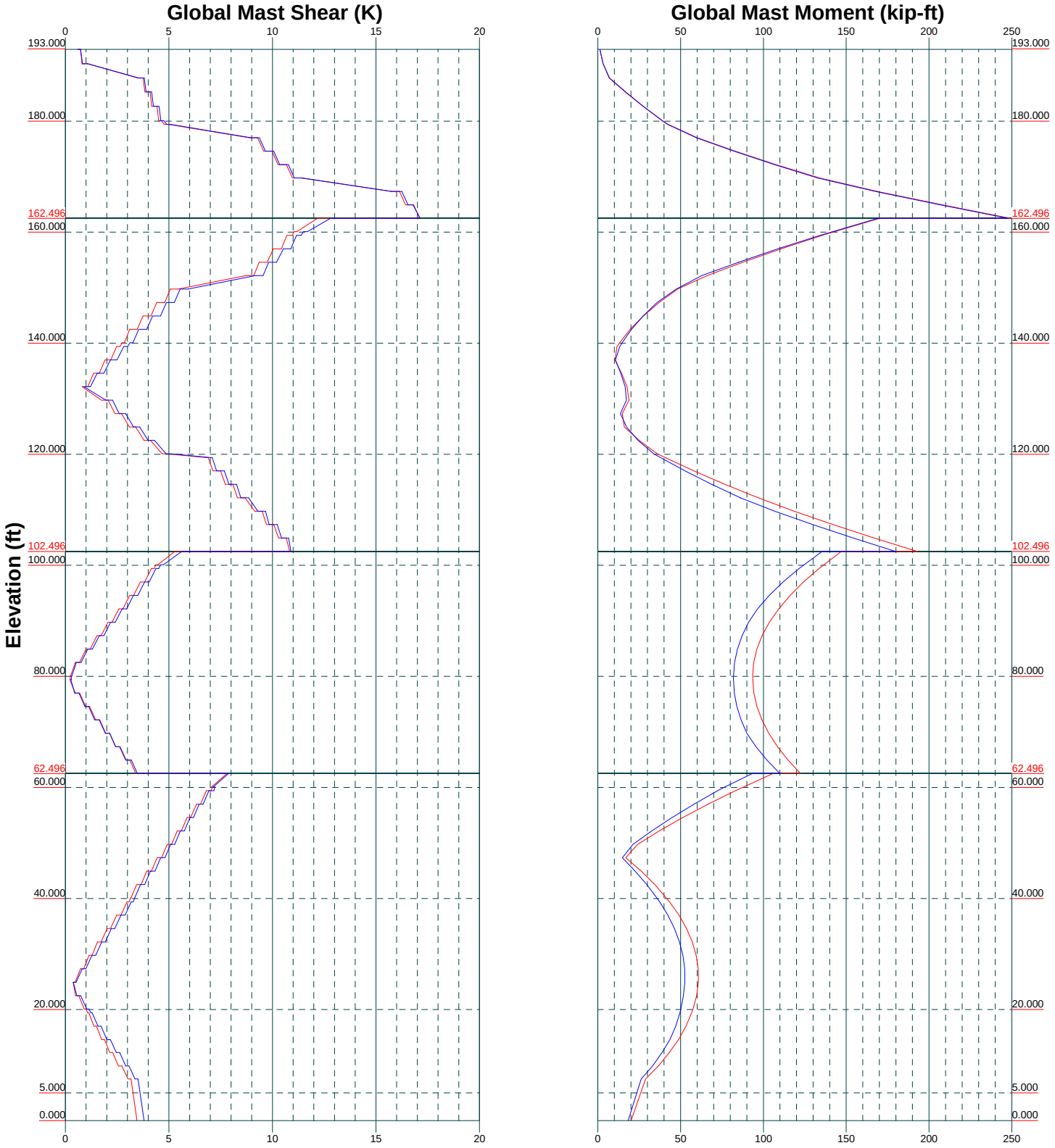
Path: C:\Users\dxu\Desktop\Local\CT23XC500.MOHEGAN HILL.Tower Analysis.Rev 1.er		Dwg No. E-3

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

Maximum Values

Vx Vz Mx Mz



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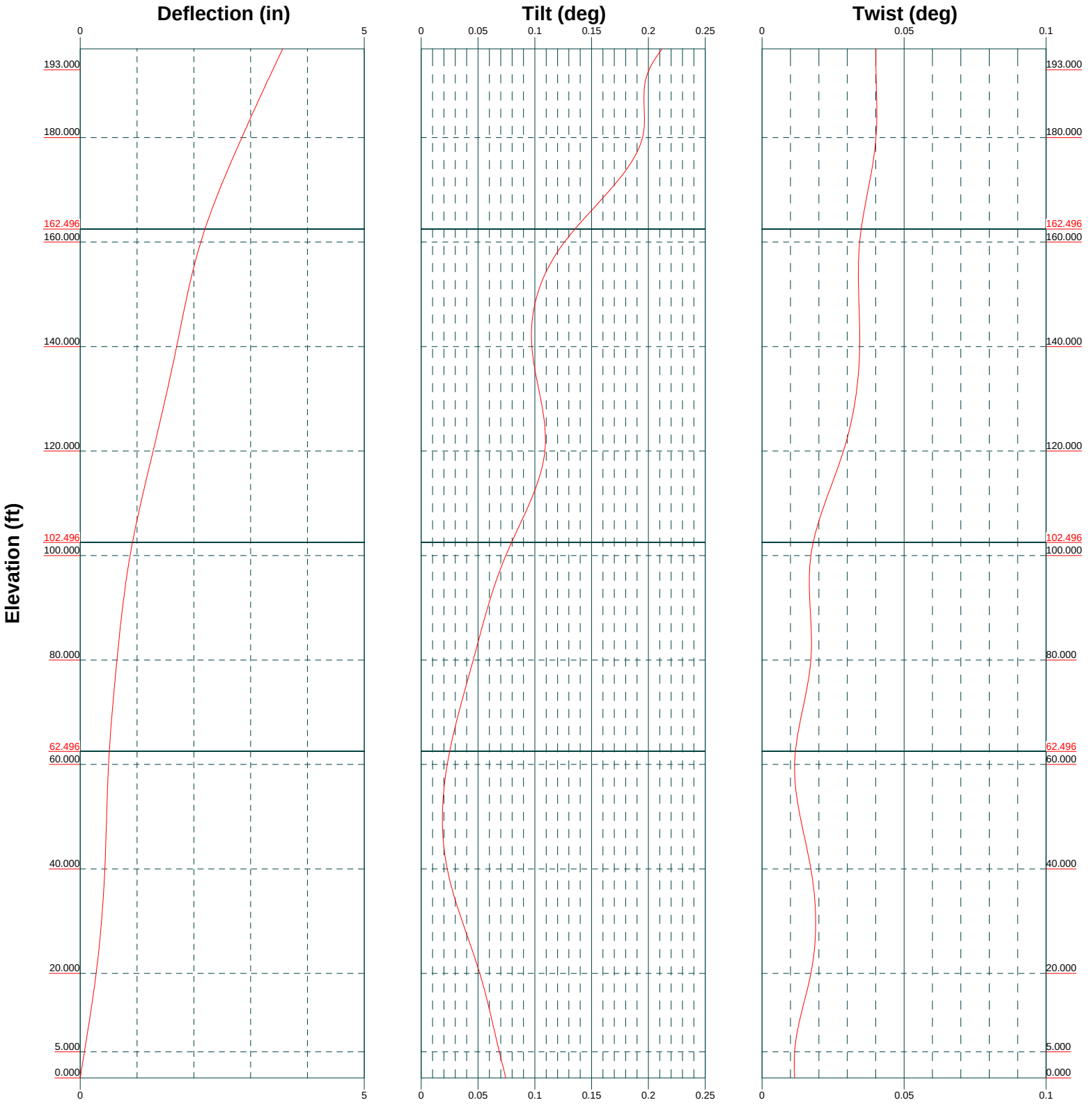
Project: 17924003A			
Client: Sprint	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 06/28/18	Scale: NTS	
Path: C:\Users\dxu\Desktop\Local\CT23XC500.MOHEGAN HILL.Tower Analysis.Rev 1.er		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



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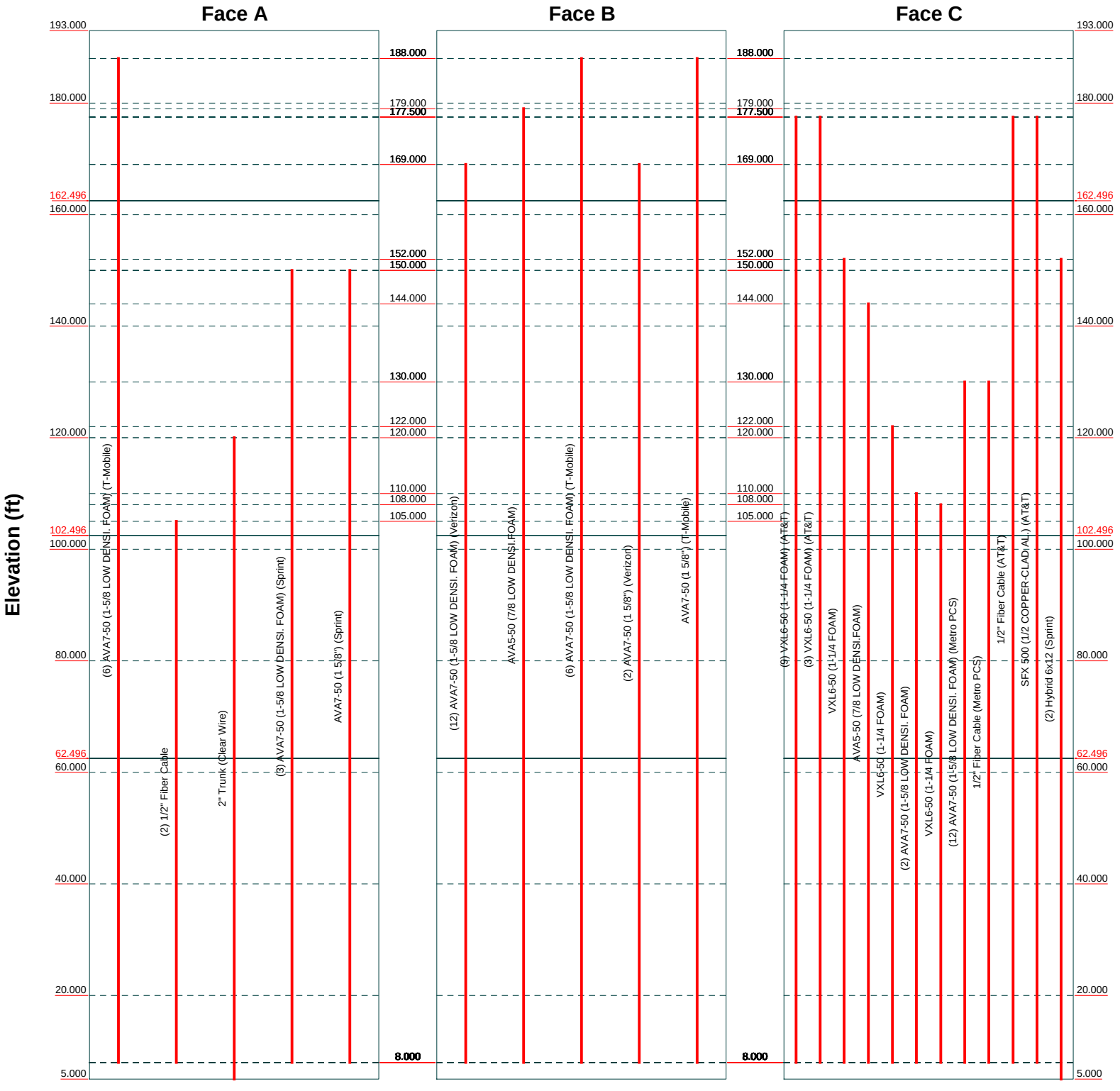
FAX:

Job: ***CT23XC500 - Mohegan Hill***			
Project: ***17924003A***			
Client: Sprint	Drawn by: dxu	App'd:	
Code: TIA-222-G	Date: 06/28/18	Scale: NTS	
Path: C:\Users\dxu\Desktop\Local\CT23XC500.MOHEGAN HILL.Tower Analysis.Rev 1.er		Dwg No. E-5	

Feed Line Distribution Chart
5' - 193'

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



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Job: ***CT23XC500 - Mohegan Hill***		
Project: ***17924003A***		
Client: Sprint	Drawn by: dxu	App'd:
Code: TIA-222-G	Date: 06/28/18	Scale: NTS
Path: C:\Users\dxu\Desktop\Local\CT23XC500.MOHEGAN HILL.Tower Analysis.Rev 1.er		Dwg No. E-7

able

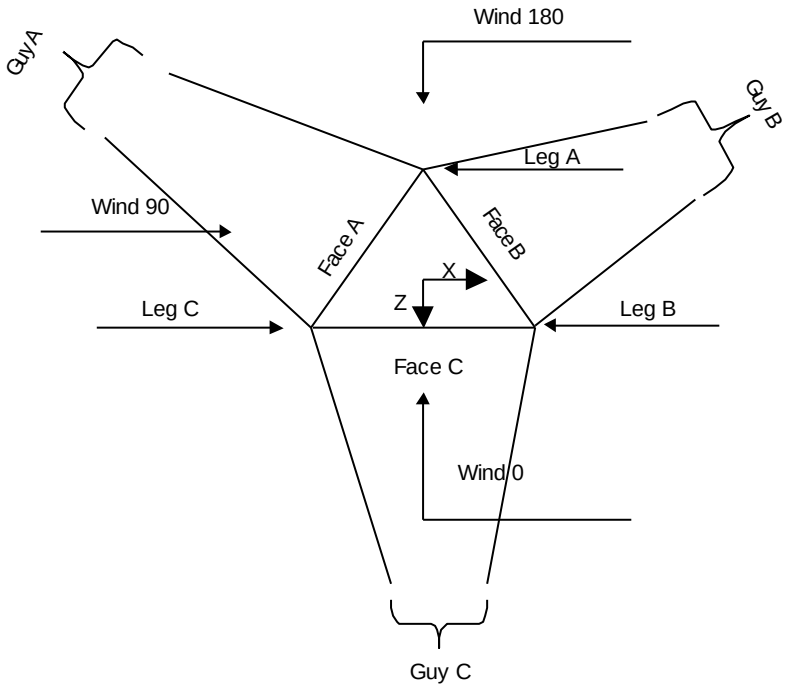
Tower Input Data

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*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*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 Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
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				Pull Off				Diagonal			
	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	U	Bolt Size in	Number	Net Width Deduct in	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	-2.438	3.333	1.281	13.142	-9.612	0.000
			4.240						
			Sum:	0.000	19.997	0.000	-0.000	0.000	0.000
62.4961	A	35.9754	2.722	-0.087	1.617	-2.188	-3.188	7.644	-5.523
			2.690						
	A	35.9754	2.722	0.087	1.617	-2.188	-3.188	-7.644	5.523
			2.690						
	B	35.9754	2.722	1.938	1.617	1.019	6.377	7.644	0.000
			2.690						
	B	35.9754	2.722	1.852	1.617	1.169	-3.188	-7.644	-5.523
			2.690						
	C	35.9754	2.722	-1.852	1.617	1.169	-3.188	7.644	5.523
			2.690						
	C	35.9754	2.722	-1.938	1.617	1.019	6.377	-7.644	0.000
			2.690						
			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	-0.155	8.035	-6.278	-15.843	21.746	-27.440
			9.232						
	A	49.6459	10.198	0.155	8.035	-6.278	-15.843	-21.746	27.440
			9.232						
	B	49.6459	10.198	5.515	8.035	3.004	31.685	21.746	0.000
			9.232						
	B	49.6459	10.198	5.359	8.035	3.274	-15.843	-21.746	-27.440
			9.232						
	C	49.6459	10.198	-5.359	8.035	3.274	-15.843	21.746	27.440
			9.232						
	C	49.6459	10.198	-5.515	8.035	3.004	31.685	-21.746	0.000
			9.232						
			Sum:	0.000	48.211	0.000	-0.000	0.000	0.000
102.496	A	49.9699	6.953	-0.171	5.461	-4.299	-10.768	15.018	-18.651
			6.439						
	A	49.9699	6.953	0.171	5.461	-4.299	-10.768	-15.018	18.651
			6.439						
	B	49.9699	6.953	3.808	5.461	2.002	21.536	15.018	0.000
			6.439						
	B	49.9699	6.953	3.638	5.461	2.297	-10.768	-15.018	-18.651
			6.439						
	C	49.9699	6.953	-3.638	5.461	2.297	-10.768	15.018	18.651
			6.439						
	C	49.9699	6.953	-3.808	5.461	2.002	21.536	-15.018	0.000
			6.439						
			Sum:	0.000	32.768	0.000	-0.000	0.000	0.000
62.4961	A	35.9754	4.645	-0.145	2.873	-3.648	-5.664	12.743	-9.810
			4.386						
	A	35.9754	4.645	0.145	2.873	-3.648	-5.664	-12.743	9.810
			4.386						

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	0.375		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	33.431	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	43.823	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	73.697	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	106.027	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	111.847	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	111.847	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	111.847	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	111.847	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	67.936	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	93.061	0.000	1.246
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	127.368	0.000	1.699
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	189.679	0.000	2.623
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	255.081	0.000	3.584
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	271.104	0.000	3.760
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	268.614	0.000	3.666
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	265.378	0.000	3.545
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	260.674	0.000	3.373
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	154.895	0.000	1.899
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	0.240	0.737	0.181	0.819
T3	160.000-140.000	0.461	0.128	0.339	0.476
T4	140.000-120.000	0.185	0.620	0.237	0.793
T5	120.000-100.000	0.068	1.030	0.223	1.075
T6	100.000-80.000	0.127	1.115	0.311	1.174
T7	80.000-60.000	0.127	1.111	0.305	1.174
T8	60.000-40.000	0.127	1.115	0.300	1.180
T9	40.000-20.000	0.129	1.129	0.295	1.207
T10	20.000-5.000	0.138	1.113	0.271	1.182
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 / 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 ft / Vert 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 (Verizon)	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
SBNHH-1D65B w/ 8ft mount pipe (Verizon)	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
RRH2X60-07-U (Verizon)	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
RRH2X60-AWS (Verizon)	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
RRH2X60-PCS (Verizon)	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
DB-T1-6Z-8AB-0Z (Verizon)	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
DB-T1-6Z-8AB-0Z (Verizon)	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
Rohn 6'x15' Boom Mount (Sprint)	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
RFS APXVTM14-C-120 w/ mt pipe (Sprint)	A	From Leg	3.000 -4.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	9.346 9.846 10.332	6.191 7.085 7.845	0.092 0.165 0.245
RFS APXV9ERR18-C (Sprint)	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	0.062 0.114 0.172
TD-RRH8x20-25 (Sprint)	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
RRH-2X50-800 (Sprint)	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
ALU RRH-4X45-1900 (Sprint)	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
Rohn 6'x15' Boom Mount (Sprint)	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
RFS APXVTM14-C-120 w/ mt pipe (Sprint)	B	From Leg	3.000 -4.000 0.000	0.0000	151.000	No Ice 1/2" Ice 1" Ice	9.346 9.846 10.332	6.191 7.085 7.845	0.092 0.165 0.245
RFS APXV9ERR18-C (Sprint)	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	0.062 0.114 0.172
TD-RRH8x20-25 (Sprint)	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
RRH-2X50-800 (Sprint)	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
ALU RRH-4X45-1900 (Sprint)	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

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
RFS APXVTM14-C-120 w/	C	From Leg	3.000	0.0000	151.000	No Ice	9.346	6.191	0.092
mt pipe			-4.000			1/2" Ice	9.846	7.085	0.165
(Sprint)			0.000			1" Ice	10.332	7.845	0.245
RFS APXV9ERR18-C	C	From Leg	3.000	0.0000	151.000	No Ice	8.024	5.808	0.062
(Sprint)			4.000			1/2" Ice	8.480	6.266	0.114
			0.000			1" Ice	8.943	6.731	0.172
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
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 ft / Vert 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

Load Combinations

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

Comb. No.	Description
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	-15.117	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	14.634	0.175	0.135
			Max. Vx	15	-16.608	-0.005	-0.218
		Diagonal	Max Tension	5	2.250	0.000	0.000
			Max. Compression	10	-2.374	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	0.723	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	73.553	-1.561	0.008
			Max. Compression	6	-84.813	1.597	0.002
			Max. Mx	4	26.181	-2.250	-0.035
			Max. My	3	-4.878	-0.440	-5.187
			Max. Vy	4	-6.322	-2.250	-0.035
			Max. Vx	3	5.147	-0.440	-5.187
		Diagonal	Max Tension	8	8.263	0.020	-0.017
			Max. Compression	9	-9.826	0.000	0.000
			Max. Mx	3	0.818	-0.175	-0.046
			Max. My	7	-5.605	-0.067	0.083
			Max. Vy	3	-0.087	0.000	0.000
			Max. Vx	7	0.039	-0.067	0.083
		Secondary Horizontal	Max Tension	8	5.811	0.000	0.000
			Max. Compression	2	-5.252	0.114	0.010

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	4	5.807	-0.151	-0.009
			Max. My	9	1.736	-0.003	0.025
			Max. Vy	4	-0.092	0.000	0.000
			Max. Vx	9	0.014	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	6.181	0.000	0.000
			Max. Compression	4	-4.742	0.000	0.000
			Max. Mx	14	0.798	-0.020	0.000
			Max. My	3	1.134	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	29.244		
			Top Tension	9	29.428		
			Top Cable Vert	9	22.478		
			Top Cable Norm	9	18.993		
			Top Cable Tan	9	0.070		
			Bot Cable Vert	9	-22.068		
			Bot Cable Norm	9	19.186		
			Bot Cable Tan	9	0.273		
		Guy B	Bottom Tension	11	28.949		
			Top Tension	11	29.133		
			Top Cable Vert	11	22.256		
			Top Cable Norm	11	18.800		
			Top Cable Tan	11	0.070		
			Bot Cable Vert	11	-21.846		
			Bot Cable Norm	11	18.993		
			Bot Cable Tan	11	0.273		
		Guy C	Bottom Tension	3	29.227		
			Top Tension	3	29.412		
			Top Cable Vert	3	22.466		
			Top Cable Norm	3	18.982		
			Top Cable Tan	3	0.070		
			Bot Cable Vert	3	-22.056		
			Bot Cable Norm	3	19.175		
			Bot Cable Tan	3	0.273		
		Torque Arm Top	Max Tension	7	20.669	0.000	0.000
			Max. Compression	7	-10.128	0.000	0.000
			Max. Mx	7	-0.076	-76.785	0.000
			Max. My	9	-9.911	-74.648	-0.000
			Max. Vy	7	22.587	-76.785	0.000
			Max. Vx	9	-0.000	-74.648	-0.000
T3	160 - 140	Leg	Max Tension	4	26.182	-1.724	-0.027
			Max. Compression	6	-77.460	-2.263	0.027
			Max. Mx	6	-69.572	-2.263	0.027
			Max. My	9	-26.284	-0.209	-0.518
			Max. Vy	4	-6.293	-1.724	-0.027
			Max. Vx	9	1.296	-0.035	0.271
		Diagonal	Max Tension	4	5.565	0.000	0.000
			Max. Compression	5	-7.325	0.033	-0.001
			Max. Mx	2	1.620	-0.072	-0.009
			Max. My	10	1.480	-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	2.882	0.000	0.000
			Max. Compression	4	-1.529	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. Mx	10	-0.495	-0.029	-0.003
			Max. My	9	1.966	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	0.666	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	0.526	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	0.576	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.452	0.013	0.000
			Max. My	9	0.446	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	-46.887	0.156	0.090
			Max. Mx	11	-25.823	-0.583	-0.146
			Max. My	8	-22.558	0.045	0.591
			Max. Vy	11	-2.161	-0.403	-0.101
			Max. Vx	8	2.202	0.016	0.407
		Diagonal	Max Tension	13	1.853	0.000	0.000
			Max. Compression	2	-2.743	0.000	0.000
			Max. Mx	18	0.045	0.016	0.000
			Max. My	2	-0.206	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	0.763	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.669	0.013	0.000
			Max. My	9	0.583	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	0.881	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.697	0.013	0.000
			Max. My	9	0.679	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	23.432	-0.499	0.287
			Max. Compression	6	-96.552	-1.444	-0.829
			Max. Mx	11	-24.095	4.180	-0.929
			Max. My	3	-24.260	-1.334	4.158
			Max. Vy	11	-3.932	4.180	-0.929
			Max. Vx	3	-4.095	-1.334	4.158
		Diagonal	Max Tension	8	4.521	0.005	-0.004
			Max. Compression	2	-6.708	0.000	0.000
			Max. Mx	5	-0.441	0.126	-0.022
			Max. My	11	-3.732	0.081	-0.039
			Max. Vy	5	-0.063	0.126	-0.022
			Max. Vx	11	0.019	0.081	-0.039
		Secondary Horizontal	Max Tension	9	5.080	0.000	0.000
			Max. Compression	2	-2.932	0.041	0.009
			Max. Mx	12	3.252	0.074	-0.007
			Max. My	7	-1.474	-0.068	-0.017
			Max. Vy	12	0.047	0.074	-0.007
			Max. Vx	7	0.010	0.000	0.000
		Top Girt	Max Tension	10	1.149	0.000	0.000
			Max. Compression	12	-0.300	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. Mx	14	0.583	-0.019	0.000
			Max. My	9	0.494	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	3.256	0.000	0.000
			Max. Compression	12	-1.668	0.000	0.000
			Max. Mx	14	1.028	-0.019	0.000
			Max. My	9	1.006	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	16.350		
			Top Tension	9	16.433		
			Top Cable Vert	9	12.612		
			Top Cable Norm	9	10.533		
			Top Cable Tan	9	0.016		
			Bot Cable Vert	9	-12.429		
			Bot Cable Norm	9	10.623		
			Bot Cable Tan	9	0.112		
		Guy B	Bottom Tension	11	16.127		
			Top Tension	11	16.209		
			Top Cable Vert	11	12.443		
			Top Cable Norm	11	10.389		
			Top Cable Tan	11	0.016		
			Bot Cable Vert	11	-12.259		
			Bot Cable Norm	11	10.478		
			Bot Cable Tan	11	0.112		
		Guy C	Bottom Tension	3	16.319		
			Top Tension	3	16.402		
			Top Cable Vert	3	12.589		
			Top Cable Norm	3	10.513		
			Top Cable Tan	3	0.016		
			Bot Cable Vert	3	-12.405		
			Bot Cable Norm	3	10.603		
			Bot Cable Tan	3	0.112		
		Torque Arm Top	Max Tension	11	11.214	0.000	0.000
			Max. Compression	11	-5.670	0.000	0.000
			Max. Mx	11	0.119	-42.268	0.000
			Max. My	9	-2.704	-22.526	-0.000
			Max. Vy	11	12.447	-42.268	0.000
			Max. Vx	9	-0.000	-22.526	-0.000
T6	100 - 80	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	6	-95.325	0.170	0.085
			Max. Mx	12	-1.455	0.972	0.500
			Max. My	8	-1.353	0.057	-1.101
			Max. Vy	12	2.384	0.972	0.500
			Max. Vx	8	-2.712	0.057	-1.101
		Diagonal	Max Tension	8	1.740	0.000	0.000
			Max. Compression	9	-2.352	0.000	0.000
			Max. Mx	20	-0.741	0.013	0.000
			Max. My	22	-0.510	0.000	0.000
			Max. Vy	20	-0.013	0.000	0.000
			Max. Vx	22	-0.000	0.000	0.000
		Top Girt	Max Tension	19	0.627	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.606	0.011	0.000
			Max. My	9	0.572	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	0.456	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.422	0.011	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. My	9	0.389	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	-92.751	-0.610	0.402
			Max. Mx	11	-40.217	2.176	-0.339
			Max. My	3	-40.077	-0.821	2.094
			Max. Vy	10	3.496	1.825	-1.020
			Max. Vx	2	3.971	-0.010	2.084
		Diagonal	Max Tension	3	3.403	-0.050	-0.008
			Max. Compression	12	-4.775	0.000	0.000
			Max. Mx	11	0.092	0.074	0.008
			Max. My	11	-4.198	0.004	-0.019
			Max. Vy	11	-0.037	0.074	0.008
			Max. Vx	11	-0.009	0.004	-0.019
		Top Girt	Max Tension	6	0.919	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.832	0.012	0.000
			Max. My	10	0.918	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	1.932	0.000	0.000
			Max. Compression	8	-0.534	0.000	0.000
			Max. Mx	14	0.969	0.012	0.000
			Max. My	10	0.316	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	8.511		
			Top Tension	9	8.543		
			Top Cable Vert	9	5.044		
			Top Cable Norm	9	6.895		
			Top Cable Tan	9	0.004		
			Bot Cable Vert	9	-4.954		
			Bot Cable Norm	9	6.920		
			Bot Cable Tan	9	0.042		
		Guy B	Bottom Tension	11	8.437		
			Top Tension	11	8.469		
			Top Cable Vert	11	4.998		
			Top Cable Norm	11	6.837		
			Top Cable Tan	11	0.002		
			Bot Cable Vert	11	-4.909		
			Bot Cable Norm	11	6.862		
			Bot Cable Tan	11	0.037		
		Guy C	Bottom Tension	3	8.499		
			Top Tension	3	8.531		
			Top Cable Vert	3	5.036		
			Top Cable Norm	3	6.885		
			Top Cable Tan	3	0.004		
			Bot Cable Vert	3	-4.947		
			Bot Cable Norm	3	6.910		
			Bot Cable Tan	3	0.042		
		Torque Arm Top	Max Tension	11	7.761	0.000	0.000
			Max. Compression	11	-3.997	0.000	0.000
			Max. Mx	11	-0.065	-16.696	0.000
			Max. My	10	-3.372	-13.430	-0.000
			Max. Vy	11	4.940	-16.696	0.000
			Max. Vx	10	-0.000	-13.430	-0.000
T8	60 - 40	Leg	Max Tension	1	0.000	0.000	0.000
			Max. Compression	10	-85.889	-0.628	0.328
			Max. Mx	10	-85.880	1.534	-0.860
			Max. My	2	-85.586	-0.008	1.753

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	10	3.528	1.534	-0.860
			Max. Vx	2	4.012	-0.008	1.753
		Diagonal	Max Tension	11	2.849	0.000	0.000
			Max. Compression	11	-4.158	0.000	0.000
			Max. Mx	22	0.049	0.014	0.000
			Max. My	10	-0.457	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	0.901	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	0.871	0.012	0.000
			Max. My	10	0.759	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	1.141	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	19	0.943	0.012	0.000
			Max. My	10	0.901	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	-73.898	-0.422	0.063
			Max. Mx	6	-51.353	-0.824	-0.433
			Max. My	2	-51.143	0.014	0.925
			Max. Vy	11	1.522	0.808	-0.291
			Max. Vx	2	1.541	0.014	0.925
		Diagonal	Max Tension	5	2.132	0.000	0.000
			Max. Compression	11	-2.573	0.000	0.000
			Max. Mx	26	-0.060	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	0.850	0.000	0.000
			Max. Compression	5	-0.514	0.000	0.000
			Max. Mx	14	0.205	0.009	0.000
			Max. Vy	14	0.011	0.000	0.000
		Bottom Girt	Max Tension	9	0.300	0.000	0.000
			Max. Compression	4	-0.062	0.000	0.000
			Max. Mx	17	0.147	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	-74.145	-0.132	-0.072
			Max. Mx	25	-73.776	1.481	0.761
			Max. My	21	-73.410	-0.078	-1.648
			Max. Vy	18	7.592	-1.397	0.909
			Max. Vx	22	8.586	-0.066	-1.646
		Diagonal	Max Tension	5	2.952	0.000	0.000
			Max. Compression	11	-2.525	0.000	0.000
			Max. Mx	26	0.837	0.012	0.000
			Max. My	10	0.358	0.000	0.000
			Max. Vy	26	0.012	0.000	0.000
			Max. Vx	10	-0.000	0.000	0.000
		Top Girt	Max Tension	4	0.614	0.000	0.000
			Max. Compression	12	-0.027	0.000	0.000
			Max. Mx	17	0.309	0.010	0.000
			Max. My	10	-0.013	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	4.610	0.000	0.000
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	14	4.485	0.010	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. My	5	3.016	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	-79.797	0.169	-0.036
			Max. Mx	19	-76.878	-1.924	0.046
			Max. My	4	-37.606	-1.238	-0.301
			Max. Vy	15	19.132	-1.788	-0.101
			Max. Vx	5	-0.854	-1.056	0.078
		Top Girt	Max Tension	26	12.518	0.263	-0.119
			Max. Compression	1	0.000	0.000	0.000
			Max. Mx	11	10.047	0.409	-0.081
			Max. My	10	9.088	0.311	-0.160
			Max. Vy	11	-0.119	0.409	-0.081
			Max. Vx	10	-0.039	0.147	-0.043
		Bottom Girt	Max Tension	1	0.000	0.000	0.000
			Max. Compression	15	-3.336	0.661	-0.292
			Max. Mx	5	-2.688	0.865	-0.260
			Max. My	6	-2.855	0.674	-0.325
			Max. Vy	5	2.204	0.865	-0.260
			Max. Vx	6	0.462	0.345	-0.167
		Mid Girt	Max Tension	10	0.103	0.000	0.000
			Max. Compression	25	-0.679	0.000	0.000
			Max. Mx	19	-0.672	-0.012	0.000
			Max. My	17	-0.646	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	219.378	-0.354	-0.089
	Max. H_x	12	128.299	2.836	1.666
	Max. H_z	2	176.385	-0.001	2.096
	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	1.794	-1.015
	Min. Vert	1	92.111	0.001	0.015
	Min. H_x	4	128.372	-2.834	1.666
	Min. H_z	8	128.321	0.003	-3.262
	Min. M_x	1	0.000	0.001	0.015
	Min. M_z	1	0.000	0.001	0.015
	Min. Torsion	4	-0.581	-2.834	1.666
Guy C @ 140 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.411	-0.183	0.106
	Max. H_x	10	-0.411	-0.183	0.106
	Max. H_z	3	-43.010	-32.151	19.136
	Min. Vert	5	-43.126	-32.742	18.314
	Min. H_x	5	-43.126	-32.742	18.314
	Min. H_z	10	-0.411	-0.183	0.106
Guy B @ 140 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.411	0.182	0.105
	Max. H_x	11	-42.977	32.629	18.251

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_z	13	-42.863	32.035	19.083
	Min. Vert	11	-42.977	32.629	18.251
	Min. H_x	6	-0.411	0.182	0.105
	Min. H_z	6	-0.411	0.182	0.105
Guy A @ 140 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.412	0.000	-0.212
	Max. H_x	10	-37.028	0.754	-32.129
	Max. H_z	2	-0.412	0.000	-0.212
	Min. Vert	7	-43.028	-0.512	-37.428
	Min. H_x	6	-37.030	-0.762	-32.131
	Min. H_z	7	-43.028	-0.512	-37.428
Guy C @ 88 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.278	-0.149	0.086
	Max. H_x	10	-0.278	-0.149	0.086
	Max. H_z	3	-33.593	-29.315	17.207
	Min. Vert	3	-33.593	-29.315	17.207
	Min. H_x	5	-33.583	-29.559	16.755
	Min. H_z	10	-0.278	-0.149	0.086
Guy B @ 88 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.279	0.149	0.086
	Max. H_x	11	-33.709	29.670	16.816
	Max. H_z	13	-33.695	29.393	17.275
	Min. Vert	11	-33.709	29.670	16.816
	Min. H_x	6	-0.279	0.149	0.086
	Min. H_z	6	-0.279	0.149	0.086
Guy A @ 88 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.278	0.000	-0.172
	Max. H_x	10	-28.877	0.415	-29.115
	Max. H_z	2	-0.278	0.000	-0.172
	Min. Vert	9	-33.635	0.244	-34.028
	Min. H_x	6	-28.841	-0.426	-29.076
	Min. H_z	9	-33.635	0.244	-34.028

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	92.111	-0.001	-0.015	0.000	0.000	0.042
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	176.385	0.001	-2.096	0.000	0.000	0.228
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	161.653	1.690	-1.954	0.000	0.000	0.427
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	128.372	2.834	-1.666	0.000	0.000	0.581
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	161.867	2.518	-0.517	0.000	0.000	0.496
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	176.617	1.794	1.017	0.000	0.000	0.376
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	161.784	0.829	2.412	0.000	0.000	0.163
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	128.321	-0.003	3.262	0.000	0.000	-0.163

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
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	161.844	-0.828	2.410	0.000	0.000	-0.282
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	176.667	-1.794	1.015	0.000	0.000	-0.367
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	161.877	-2.519	-0.519	0.000	0.000	-0.354
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	128.299	-2.836	-1.666	0.000	0.000	-0.254
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	161.602	-1.689	-1.956	0.000	0.000	-0.019
1.2 Dead+1.0 Ice+1.0 Temp+Guy	216.794	-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	219.236	-0.027	-0.576	0.000	0.000	0.154
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.765	0.189	-0.518	0.000	0.000	0.190
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.420	0.351	-0.352	0.000	0.000	0.191
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.855	0.413	-0.128	0.000	0.000	0.166
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.378	0.354	0.089	0.000	0.000	0.132
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.875	0.196	0.249	0.000	0.000	0.087
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.459	-0.028	0.307	0.000	0.000	0.034
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.829	-0.252	0.249	0.000	0.000	-0.001
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	219.307	-0.410	0.090	0.000	0.000	-0.003
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.793	-0.469	-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	218.382	-0.407	-0.352	0.000	0.000	0.056
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	218.749	-0.244	-0.518	0.000	0.000	0.101
Dead+Wind 0 deg - Service+Guy	92.521	-0.001	-0.783	0.000	0.000	0.065
Dead+Wind 30 deg - Service+Guy	92.467	0.382	-0.678	0.000	0.000	0.104
Dead+Wind 60 deg - Service+Guy	92.444	0.661	-0.397	0.000	0.000	0.124
Dead+Wind 90 deg - Service+Guy	92.474	0.765	-0.014	0.000	0.000	0.121
Dead+Wind 120 deg - Service+Guy	92.534	0.665	0.370	0.000	0.000	0.100
Dead+Wind 150 deg - Service+Guy	92.474	0.382	0.648	0.000	0.000	0.064
Dead+Wind 180 deg - Service+Guy	92.444	-0.001	0.750	0.000	0.000	0.017
Dead+Wind 210 deg - Service+Guy	92.468	-0.384	0.648	0.000	0.000	-0.023
Dead+Wind 240 deg - Service+Guy	92.523	-0.666	0.369	0.000	0.000	-0.042
Dead+Wind 270 deg - Service+Guy	92.466	-0.766	-0.014	0.000	0.000	-0.039
Dead+Wind 300 deg - Service+Guy	92.439	-0.663	-0.397	0.000	0.000	-0.019
Dead+Wind 330 deg - Service+Guy	92.464	-0.383	-0.678	0.000	0.000	0.018

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.000	-37.072	0.000	0.003	37.057	0.001	0.040%
2	0.021	-44.154	-64.930	-0.021	44.153	64.906	0.030%
3	32.458	-43.994	-56.141	-32.458	43.994	56.123	0.023%
4	56.169	-43.835	-32.408	-56.167	43.835	32.412	0.006%
5	64.881	-43.994	-0.021	-64.876	43.994	0.023	0.007%
6	56.278	-44.154	32.447	-56.277	44.154	-32.446	0.002%
7	32.423	-43.994	56.121	-32.422	43.994	-56.120	0.001%
8	-0.021	-43.835	64.780	0.024	43.835	-64.779	0.004%
9	-32.458	-43.994	56.141	32.458	43.994	-56.141	0.001%
10	-56.299	-44.154	32.483	56.298	44.154	-32.482	0.002%
11	-64.881	-43.994	0.021	64.876	43.994	-0.018	0.007%
12	-56.149	-43.835	-32.372	56.147	43.835	32.375	0.004%
13	-32.423	-43.994	-56.121	32.423	43.994	56.103	0.023%
14	0.000	-149.402	0.000	0.003	149.402	0.003	0.003%
15	0.000	-149.540	-14.590	-0.000	149.540	14.583	0.004%
16	7.295	-149.402	-12.621	-7.296	149.401	12.613	0.006%
17	12.634	-149.263	-7.286	-12.629	149.263	7.284	0.004%
18	14.590	-149.402	-0.000	-14.582	149.401	0.006	0.006%
19	12.649	-149.540	7.295	-12.643	149.540	-7.291	0.005%
20	7.295	-149.402	12.621	-7.291	149.401	-12.619	0.003%
21	-0.000	-149.263	14.572	0.001	149.263	-14.567	0.004%
22	-7.295	-149.402	12.621	7.291	149.402	-12.620	0.003%
23	-12.649	-149.540	7.295	12.643	149.540	-7.292	0.004%
24	-14.590	-149.402	0.000	14.583	149.401	0.005	0.006%
25	-12.634	-149.263	-7.286	12.629	149.263	7.284	0.004%
26	-7.295	-149.402	-12.621	7.295	149.401	12.613	0.006%
27	0.004	-37.105	-13.771	-0.004	37.105	13.766	0.011%
28	6.884	-37.072	-11.907	-6.884	37.072	11.900	0.017%
29	11.913	-37.038	-6.873	-11.907	37.038	6.870	0.017%
30	13.760	-37.072	-0.004	-13.754	37.072	0.008	0.018%
31	11.936	-37.106	6.882	-11.932	37.105	-6.879	0.011%
32	6.876	-37.072	11.902	-6.874	37.072	-11.901	0.007%
33	-0.004	-37.038	13.739	0.005	37.038	-13.732	0.016%
34	-6.884	-37.072	11.907	6.882	37.072	-11.905	0.007%
35	-11.940	-37.105	6.889	11.936	37.105	-6.887	0.011%
36	-13.760	-37.072	0.004	13.754	37.072	-0.001	0.018%
37	-11.908	-37.038	-6.866	11.903	37.038	6.863	0.016%
38	-6.876	-37.072	-11.902	6.876	37.072	11.895	0.017%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00093132
2	Yes	19	0.00045446	0.00076082
3	Yes	19	0.00038486	0.00060723
4	Yes	17	0.00019434	0.00059362
5	Yes	21	0.00011997	0.00097013
6	Yes	24	0.00000001	0.00059907
7	Yes	24	0.00000001	0.00060706
8	Yes	16	0.00013658	0.00096104

9	Yes	24	0.00000001	0.00060054
10	Yes	24	0.00000001	0.00059381
11	Yes	21	0.00011947	0.00095917
12	Yes	16	0.00012438	0.00083605
13	Yes	19	0.00038434	0.00060262
14	Yes	9	0.00065401	0.00008793
15	Yes	15	0.00068723	0.00018387
16	Yes	14	0.00087626	0.00027120
17	Yes	13	0.00052602	0.00075160
18	Yes	14	0.00099882	0.00026318
19	Yes	15	0.00075255	0.00075121
20	Yes	15	0.00050207	0.00084216
21	Yes	13	0.00051663	0.00023566
22	Yes	15	0.00045717	0.00075274
23	Yes	15	0.00070870	0.00069259
24	Yes	14	0.00093824	0.00024160
25	Yes	13	0.00051354	0.00070700
26	Yes	14	0.00089977	0.00025454
27	Yes	11	0.00044533	0.00025909
28	Yes	10	0.00068649	0.00038805
29	Yes	9	0.00059138	0.00061050
30	Yes	10	0.00072687	0.00039393
31	Yes	11	0.00046807	0.00076989
32	Yes	11	0.00030649	0.00085883
33	Yes	9	0.00058793	0.00033256
34	Yes	11	0.00029080	0.00079874
35	Yes	11	0.00044822	0.00073129
36	Yes	10	0.00069927	0.00037371
37	Yes	9	0.00057750	0.00055364
38	Yes	10	0.00069455	0.00037633

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	197 - 193	3.565	31	0.2109	0.0402
Antenna					
T1	193 - 180	3.390	31	0.2013	0.0403
T2	180 - 160	2.844	31	0.1948	0.0376
T3	160 - 140	2.122	31	0.1272	0.0326
T4	140 - 120	1.697	35	0.0988	0.0322
T5	120 - 100	1.283	37	0.1060	0.0265
T6	100 - 80	0.878	37	0.0738	0.0197
T7	80 - 60	0.647	37	0.0467	0.0147
T8	60 - 40	0.499	37	0.0210	0.0127
T9	40 - 20	0.433	37	0.0248	0.0159
T10	20 - 5	0.280	37	0.0527	0.0183
T11	5 - 0	0.074	37	0.0680	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	3.208	0.1975	0.0399	58509

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
188.000	Rohn 6'x10' Boom Gate	31	3.176	0.1974	0.0398	59627
180.000	6'x3" Dia Omni	31	2.844	0.1948	0.0376	59373
178.750	Powerwave 7770 w/5ft mount pipe	31	2.793	0.1929	0.0372	50899
178.000	6' Standoff Arm	31	2.763	0.1914	0.0369	45780
177.500	Rohn 6'x15' Boom Mount	31	2.743	0.1904	0.0368	42595
169.000	Pirod 15' T-Frame Sector Mount (1)	31	2.415	0.1622	0.0343	17721
162.496	Guy	31	2.196	0.1361	0.0330	12347
155.500	4 Bay Dipole	31	2.005	0.1144	0.0324	15037
151.000	RFS APXVTM14-C-120 w/ mt pipe	31	1.904	0.1057	0.0324	24264
150.500	Rohn 6'x15' Boom Mount	31	1.893	0.1049	0.0325	26040
130.000	(2) 840 10054	35	1.497	0.1043	0.0300	56004
126.000	DB408	37	1.413	0.1064	0.0287	76533
122.500	3' Standoff	37	1.337	0.1069	0.0274	115147
121.000	PD220	37	1.304	0.1065	0.0269	158797
120.000	6ft-T Frame	37	1.283	0.1060	0.0265	229640
111.000	Folded Dipole	37	1.086	0.0950	0.0233	41049
110.000	3' Standoff	37	1.065	0.0932	0.0230	36649
106.000	2'x2" Omni Antenna	37	0.985	0.0854	0.0216	25651
105.000	2' Standoff	37	0.966	0.0834	0.0213	23861
102.496	Guy	37	0.920	0.0785	0.0205	20553
62.496	Guy	37	0.512	0.0232	0.0127	36705

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
Pole	197 - 193	35.630	6	1.6888	0.2612
Antenna					
T1	193 - 180	34.225	6	1.6435	0.2740
T2	180 - 160	29.757	6	1.6143	0.2630
T3	160 - 140	23.435	6	1.2957	0.2347
T4	140 - 120	18.503	10	1.1443	0.2234
T5	120 - 100	13.790	10	1.1024	0.1847
T6	100 - 80	9.540	10	0.8485	0.1489
T7	80 - 60	6.589	10	0.6069	0.1175
T8	60 - 40	4.516	2	0.3762	0.0981
T9	40 - 20	3.247	2	0.3111	0.1048
T10	20 - 5	1.874	2	0.3951	0.0865
T11	5 - 0	0.487	2	0.4537	0.0682

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	32.747	1.6260	0.2721	12672
188.000	Rohn 6'x10' Boom Gate	6	32.488	1.6254	0.2716	12915
180.000	6'x3" Dia Omni	6	29.757	1.6143	0.2630	12820
178.750	Powerwave 7770 w/5ft mount pipe	6	29.335	1.6054	0.2612	10963
178.000	6' Standoff Arm	6	29.082	1.5987	0.2601	9847
177.500	Rohn 6'x15' Boom Mount	6	28.914	1.5937	0.2593	9154

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
169.000	Pirod 15' T-Frame Sector Mount (1)	6	26.130	1.4611	0.2460	3783
162.496	Guy	6	24.147	1.3379	0.2372	2631
155.500	4 Bay Dipole	6	22.226	1.2346	0.2319	3128
151.000	RFS APXVTM14-C-120 w/ mt pipe	6	21.095	1.1916	0.2302	4796
150.500	Rohn 6'x15' Boom Mount	6	20.973	1.1878	0.2300	5099
130.000	(2) 840 10054	10	16.146	1.1379	0.2063	18140
126.000	DB408	10	15.199	1.1311	0.1976	28038
122.500	3' Standoff	10	14.374	1.1178	0.1899	16354
121.000	PD220	10	14.023	1.1093	0.1867	13515
120.000	6ft-T Frame	10	13.790	1.1024	0.1847	11921
111.000	Folded Dipole	10	11.753	1.0051	0.1695	4899
110.000	3' Standoff	10	11.536	0.9915	0.1678	4585
106.000	2'x2" Omni Antenna	10	10.697	0.9343	0.1609	3648
105.000	2' Standoff	10	10.495	0.9197	0.1591	3471
102.496	Guy	10	10.005	0.8835	0.1542	3120
62.496	Guy	2	4.724	0.3990	0.0986	4617

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	4.913	12.425	0.395 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.625	1	5.811	10.440	0.557 ✔	1	Member Bearing
		Top Girt	A325N	0.625	2	0.252	12.425	0.020 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.625	2	3.091	12.425	0.249 ✔	1	Bolt Shear
		Torque Arm Top@162.496	A325N	0.875	4	5.167	24.354	0.212 ✔	1	Bolt Shear
T3	160	Leg	A325N	0.750	4	6.546	29.821	0.219 ✔	1	Bolt Tension
		Diagonal	A325X	0.625	1	5.565	10.440	0.533 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.625	1	2.882	10.440	0.276 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.666	7.952	0.084 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	0.576	7.952	0.072 ✔	1	Bolt Shear
T4	140	Leg	A325N	0.750	4	3.118	29.821	0.105 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	2.743	7.952	0.345 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	0.763	7.952	0.096 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	0.881	7.952	0.111 ✔	1	Bolt Shear
T5	120	Leg	A325N	0.750	4	3.951	29.821	0.132 ✔	1	Bolt Tension
		Diagonal	A325N	0.625	2	3.354	12.425	0.270 ✔	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
		Secondary Horizontal	A325N	0.625	1	5.080	10.440	0.487 ✔	1	Member Bearing
		Top Girt	A325N	0.625	2	0.574	12.425	0.046 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.625	2	1.628	12.425	0.131 ✔	1	Bolt Shear
		Torque Arm Top@102.496	A325N	0.875	4	2.803	24.354	0.115 ✔	1	Bolt Shear
T6	100	Leg	A325N	0.750	4	7.944	29.821	0.266 ✔	1	Bolt Tension
		Diagonal	A490X	0.500	1	1.740	4.166	0.418 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.627	4.166	0.150 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	0.456	4.166	0.109 ✔	1	Member Bearing
T7	80	Leg	A325N	0.750	4	6.828	29.821	0.229 ✔	1	Bolt Tension
		Diagonal	A325X	0.625	1	3.403	7.830	0.435 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.919	7.952	0.116 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	1.932	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	7.157	29.821	0.240 ✔	1	Bolt Tension
		Diagonal	A325X	0.500	1	4.158	9.719	0.428 ✔	1	Bolt Shear
		Top Girt	A325N	0.500	1	0.901	7.952	0.113 ✔	1	Bolt Shear
		Bottom Girt	A325N	0.500	1	1.141	7.952	0.144 ✔	1	Bolt Shear
T9	40	Leg	A325N	0.750	4	5.819	29.821	0.195 ✔	1	Bolt Tension
		Diagonal	A490X	0.625	1	2.132	5.262	0.405 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.850	4.166	0.204 ✔	1	Member Bearing
		Bottom Girt	A325N	0.500	1	0.300	4.166	0.072 ✔	1	Member Bearing
T10	20	Leg	A325N	0.750	4	6.161	29.821	0.207 ✔	1	Bolt Tension
		Diagonal	A490X	0.500	1	2.952	8.618	0.342 ✔	1	Member Bearing
		Top Girt	A325N	0.500	1	0.614	7.952	0.077 ✔	1	Bolt Shear
		Bottom Girt	A490X	0.625	1	4.610	10.886	0.423 ✔	1	Member Bearing
T11	5	Leg	A325N	0.750	4	5.987	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	29.428	34.980	1.000	1.189 ✔
	162.496 (A) (596)	3/4 EHS	5.830	58.300	29.101	34.980	1.000	1.202 ✔
	162.496 (B) (591)	3/4 EHS	5.830	58.300	28.980	34.980	1.000	1.207 ✔
	162.496 (B) (592)	3/4 EHS	5.830	58.300	29.133	34.980	1.000	1.201 ✔

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.
	162.496 (C) (587)	3/4 EHS	5.830	58.300	29.242	34.980	1.000	1.196 ✔
	162.496 (C) (588)	3/4 EHS	5.830	58.300	29.412	34.980	1.000	1.189 ✔
T5	102.496 (A) (607)	5/8 EHS	4.240	42.400	16.433	25.440	1.000	1.548 ✔
	102.496 (A) (608)	5/8 EHS	4.240	42.400	16.181	25.440	1.000	1.572 ✔
	102.496 (B) (603)	5/8 EHS	4.240	42.400	16.208	25.440	1.000	1.570 ✔
	102.496 (B) (604)	5/8 EHS	4.240	42.400	16.209	25.440	1.000	1.569 ✔
	102.496 (C) (599)	5/8 EHS	4.240	42.400	16.160	25.440	1.000	1.574 ✔
	102.496 (C) (600)	5/8 EHS	4.240	42.400	16.402	25.440	1.000	1.551 ✔
T7	62.496 (A) (619)	1/2 EHS	2.690	26.900	8.543	16.140	1.000	1.889 ✔
	62.496 (A) (620)	1/2 EHS	2.690	26.900	8.428	16.140	1.000	1.915 ✔
	62.496 (B) (615)	1/2 EHS	2.690	26.900	8.469	16.140	1.000	1.906 ✔
	62.496 (B) (616)	1/2 EHS	2.690	26.900	8.377	16.140	1.000	1.927 ✔
	62.496 (C) (611)	1/2 EHS	2.690	26.900	8.348	16.140	1.000	1.933 ✔
	62.496 (C) (612)	1/2 EHS	2.690	26.900	8.531	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	-15.117	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	-84.813	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	-77.460	122.253	0.634 [1] ✔
T4	140 - 120	P2.5x.276	20.000	2.413	31.3 K=1.00	2.254	-46.887	94.385	0.497 [1] ✔
T5	120 - 100	P3x.3	20.000	1.206	12.7 K=1.00	3.016	-96.552	134.116	0.720 [1] ✔
T6	100 - 80	P3x.3	20.000	2.413	25.5 K=1.00	3.016	-95.325	129.425	0.737 [1] ✔
T7	80 - 60	P3x.3	20.000	2.413	25.5 K=1.00	3.016	-92.751	129.425	0.717 [1] ✔
T8	60 - 40	P3x.3	20.000	2.413	25.5	3.016	-85.889	129.425	0.664 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔
T9	40 - 20	P3x.3	20.000	2.413	51.0	3.016	-73.898	112.247	0.658 [1]
					K=2.00				✔
T10	20 - 5	P3x.3	15.000	2.384	50.3	3.016	-74.145	112.758	0.658 [1]
					K=2.00				✔
T11	5 - 0	P3x.3	5.376	1.553	16.4	3.016	-79.797	133.074	0.600 [1]
					K=1.00				✔

[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	0.938	-2.374	23.271	0.102 [1]
					K=1.30				✔
T2	180 - 160	L2x2x1/4	4.185	1.716	69.5	0.938	-9.826	23.566	0.417 [1]
					K=1.32				✔
T3	160 - 140	L2x2x1/4	4.185	1.794	71.3	0.938	-7.325	23.254	0.315 [1]
					K=1.29				✔
T4	140 - 120	ROHN TS1.5x11 ga	4.185	3.892	95.4	0.520	-2.743	11.249	0.244 [1]
					K=1.00				✔
T5	120 - 100	L2x2x1/4	4.185	1.716	69.5	0.938	-6.708	23.566	0.285 [1]
					K=1.32				✔
T6	100 - 80	ROHN TS1.5x16 ga	4.185	3.828	90.0	0.263	-2.352	6.036	0.390 [1]
					K=1.00				✔
T7	80 - 60	L1 3/4x1 3/4x3/16	4.185	1.794	77.0	0.621	-4.775	14.725	0.324 [1]
					K=1.23				✔
T8	60 - 40	ROHN TS1.5x11 ga	4.185	3.828	93.8	0.520	-4.158	11.454	0.363 [1]
					K=1.00				✔
T9	40 - 20	ROHN TS1.5x16 ga	4.185	3.828	90.0	0.263	-2.573	6.036	0.426 [1]
					K=1.00				✔
T10	20 - 5	ROHN TS1.5x11 ga	4.169	3.813	93.4	0.520	-2.525	11.504	0.219 [1]
					K=1.00				✔

[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	0.938	-5.252	20.130	0.261 [1]
					K=1.55				✔
T3	160 - 140	L2x2x1/4	3.420	2.889	88.5	0.938	-1.529	20.130	0.076 [1]
					K=1.55				

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	3.420	2.889	88.5 K=1.55	0.938	-2.932	20.130	0.146 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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	-0.300	17.587	0.017 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6 K=1.00	0.263	-0.514	7.123	0.072 [1]
T10	20 - 5	ROHN TS1.5x11 ga	3.420	3.128	76.7 K=1.00	0.520	-0.027	13.708	0.002 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u 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	-4.742	17.587	0.270 [1]
T5	120 - 100	L2x2x1/4	3.420	2.733	101.9 K=1.22	0.938	-1.668	17.587	0.095 [1]
T7	80 - 60	ROHN TS1.5x11 ga	3.420	3.128	76.7 K=1.00	0.520	-0.534	13.708	0.039 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6 K=1.00	0.263	-0.062	7.123	0.009 [1]
T11	5 - 0	L3x3x1/2	0.342	0.050	60.5 K=58.51	2.750	-3.336	73.476	0.045 [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	-0.679	63.175	0.011 [1] ✔

[1] $P_u / \phi P_n$ 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	-0.208	427.615	0.000
T2	180 - 160 (590)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-0.076	427.615	0.000
T2	180 - 160 (593)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.072	427.615	0.024
T2	180 - 160 (594)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.102	427.615	0.024
T2	180 - 160 (597)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.092	427.615	0.024
T2	180 - 160 (598)	C15x50	3.415	3.269	45.2 K=1.00	14.700	-10.127	427.615	0.024
T5	120 - 100 (601)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.513	292.246	0.019
T5	120 - 100 (602)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.521	292.246	0.019
T5	120 - 100 (605)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.669	292.246	0.019
T5	120 - 100 (606)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.641	292.246	0.019
T5	120 - 100 (609)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.661	292.246	0.019
T5	120 - 100 (610)	C15x33.9	3.415	3.269	43.4 K=1.00	9.960	-5.645	292.246	0.019
T7	80 - 60 (613)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-0.082	208.448	0.000
T7	80 - 60 (614)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-0.194	208.448	0.001
T7	80 - 60 (617)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-3.997	208.448	0.019
T7	80 - 60 (618)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-3.975	208.448	0.019
T7	80 - 60 (621)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-0.065	208.448	0.000
T7	80 - 60 (622)	C12x25	3.415	3.269	50.3 K=1.00	7.350	-3.931	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	-76.708	145.260	0.528	-0.000	22.059	0.000
T2	180 - 160 (590)	C15x50	-76.785	145.260	0.529	0.000	22.059	0.000
T2	180 - 160 (593)	C15x50	-75.234	145.260	0.518	0.000	22.059	0.000
T2	180 - 160 (594)	C15x50	-75.515	145.260	0.520	-0.000	22.059	0.000
T2	180 - 160 (597)	C15x50	-75.175	145.260	0.518	-0.000	22.059	0.000
T2	180 - 160 (598)	C15x50	-75.496	145.260	0.520	0.000	22.059	0.000
T5	120 - 100 (601)	C15x33.9	-40.109	113.400	0.354	0.000	16.821	0.000
T5	120 - 100 (602)	C15x33.9	-40.174	113.400	0.354	-0.000	16.821	0.000
T5	120 - 100 (605)	C15x33.9	-40.861	113.400	0.360	0.000	16.821	0.000
T5	120 - 100 (606)	C15x33.9	-40.721	113.400	0.359	-0.000	16.821	0.000
T5	120 - 100 (609)	C15x33.9	-40.760	113.400	0.359	-0.000	16.821	0.000
T5	120 - 100 (610)	C15x33.9	-40.710	113.400	0.359	0.000	16.821	0.000
T7	80 - 60 (613)	C12x25	-16.624	65.070	0.255	-0.000	10.368	0.000
T7	80 - 60 (614)	C12x25	-16.507	65.070	0.254	0.000	10.368	0.000
T7	80 - 60 (617)	C12x25	-16.148	65.070	0.248	-0.000	10.368	0.000
T7	80 - 60 (618)	C12x25	-16.073	65.070	0.247	0.000	10.368	0.000
T7	80 - 60 (621)	C12x25	-16.696	65.070	0.257	0.000	10.368	0.000
T7	80 - 60 (622)	C12x25	-15.939	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	0.528	0.000	0.528 ✔	1.000	4.8.1 ✔
T2	180 - 160 (590)	C15x50	0.000	0.529	0.000	0.529 ✔	1.000	4.8.1 ✔
T2	180 - 160 (593)	C15x50	0.024	0.518	0.000	0.530 ✔	1.000	4.8.1 ✔
T2	180 - 160 (594)	C15x50	0.024	0.520	0.000	0.532 ✔	1.000	4.8.1 ✔
T2	180 - 160 (597)	C15x50	0.024	0.518	0.000	0.529 ✔	1.000	4.8.1 ✔
T2	180 - 160 (598)	C15x50	0.024	0.520	0.000	0.532 ✔	1.000	4.8.1 ✔
T5	120 - 100 (601)	C15x33.9	0.019	0.354	0.000	0.363 ✔	1.000	4.8.1 ✔
T5	120 - 100 (602)	C15x33.9	0.019	0.354	0.000	0.364 ✔	1.000	4.8.1 ✔
T5	120 - 100 (605)	C15x33.9	0.019	0.360	0.000	0.370 ✔	1.000	4.8.1 ✔
T5	120 - 100 (606)	C15x33.9	0.019	0.359	0.000	0.369 ✔	1.000	4.8.1 ✔
T5	120 - 100 (609)	C15x33.9	0.019	0.359	0.000	0.369 ✔	1.000	4.8.1 ✔
T5	120 - 100 (610)	C15x33.9	0.019	0.359	0.000	0.369 ✔	1.000	4.8.1 ✔
T7	80 - 60 (613)	C12x25	0.000	0.255	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 ✔

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 (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	73.553	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	26.182	124.493	0.210 [1] ✔
T5	120 - 100	P3x.3	20.000	1.206	12.7	3.016	23.432	135.717	0.173 [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	8.263	24.485	0.337 [1] ✔
T3	160 - 140	L2x2x1/4	4.185	1.794	37.7	0.563	5.565	24.485	0.227 [1] ✔
T4	140 - 120	ROHN TS1.5x11 ga	4.185	3.892	95.4	0.520	1.853	19.665	0.094 [1] ✔
T5	120 - 100	L2x2x1/4	4.185	1.716	37.7	0.563	4.521	24.485	0.185 [1] ✔
T6	100 - 80	ROHN TS1.5x16 ga	4.185	3.828	90.0	0.263	1.740	9.932	0.175 [1] ✔
T7	80 - 60	L1 3/4x1 3/4x3/16	4.185	1.794	42.8	0.360	3.403	15.675	0.217 [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	4.185	3.828	93.8	0.520	2.849	19.665	0.145 [1]
T9	40 - 20	ROHN TS1.5x16 ga	4.185	3.828	90.0	0.263	2.132	9.932	0.215 [1]
T10	20 - 5	ROHN TS1.5x11 ga	4.169	3.813	93.4	0.520	2.952	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	5.811	24.485	0.237 [1]
T3	160 - 140	L2x2x1/4	3.420	2.889	61.6	0.563	2.882	24.485	0.118 [1]
T5	120 - 100	L2x2x1/4	3.420	2.889	61.6	0.563	5.080	24.485	0.207 [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	0.666	19.665	0.034 [1]
T4	140 - 120	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	0.763	19.665	0.039 [1]
T5	120 - 100	L2x2x1/4	3.420	2.733	61.6	0.563	1.149	24.485	0.047 [1]
T6	100 - 80	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.627	9.932	0.063 [1]
T7	80 - 60	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.919	19.665	0.047 [1]
T8	60 - 40	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.901	19.665	0.046 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.850	9.932	0.086 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 5	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.614	19.665	0.031 [1]
T11	5 - 0	L3x3x1/2	3.306	3.014	40.3	2.750	12.518	89.100	0.140 [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	0.723	24.485	0.030 [1]
T2	180 - 160	L2x2x1/4	3.420	2.733	61.6	0.563	6.181	24.485	0.252 [1]
T3	160 - 140	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	0.576	19.665	0.029 [1]
T4	140 - 120	ROHN TS1.5x11 ga	3.420	3.180	77.9	0.520	0.881	19.665	0.045 [1]
T5	120 - 100	L2x2x1/4	3.420	2.733	61.6	0.563	3.256	24.485	0.133 [1]
T6	100 - 80	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.456	9.932	0.046 [1]
T7	80 - 60	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	1.932	19.665	0.098 [1]
T8	60 - 40	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	1.141	19.665	0.058 [1]
T9	40 - 20	ROHN TS1.5x16 ga	3.420	3.128	73.6	0.263	0.300	9.932	0.030 [1]
T10	20 - 5	ROHN TS1.5x11 ga	3.420	3.128	76.7	0.520	4.610	19.665	0.234 [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]

[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	8.627	476.280	0.018
T2	180 - 160 (590)	C15x50	3.415	3.269	45.2	14.700	8.788	476.280	0.018
T2	180 - 160 (593)	C15x50	3.415	3.269	45.2	14.700	8.972	476.280	0.019
T2	180 - 160 (594)	C15x50	3.415	3.269	45.2	14.700	8.358	476.280	0.018
T2	180 - 160 (597)	C15x50	3.415	3.269	45.2	14.700	8.923	476.280	0.019
T2	180 - 160 (598)	C15x50	3.415	3.269	45.2	14.700	8.463	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	0.093	322.704	0.000
T5	120 - 100 (605)	C15x33.9	3.415	3.269	43.4	9.960	0.083	322.704	0.000
T5	120 - 100 (606)	C15x33.9	3.415	3.269	43.4	9.960	4.608	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	4.594	322.704	0.014
T7	80 - 60 (613)	C12x25	3.415	3.269	50.3	7.350	3.105	238.140	0.013
T7	80 - 60 (614)	C12x25	3.415	3.269	50.3	7.350	2.972	238.140	0.012
T7	80 - 60 (617)	C12x25	3.415	3.269	50.3	7.350	3.107	238.140	0.013
T7	80 - 60 (618)	C12x25	3.415	3.269	50.3	7.350	2.994	238.140	0.013
T7	80 - 60 (621)	C12x25	3.415	3.269	50.3	7.350	3.196	238.140	0.013
T7	80 - 60 (622)	C12x25	3.415	3.269	50.3	7.350	2.903	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	-67.068	145.260	0.462	0.000	22.059	0.000
T2	180 - 160 (590)	C15x50	-67.271	145.260	0.463	0.000	22.059	0.000
T2	180 - 160 (593)	C15x50	-67.315	145.260	0.463	-0.000	22.059	0.000
T2	180 - 160 (594)	C15x50	-66.304	145.260	0.456	-0.000	22.059	0.000
T2	180 - 160 (597)	C15x50	-67.434	145.260	0.464	0.000	22.059	0.000
T2	180 - 160 (598)	C15x50	-66.617	145.260	0.459	0.000	22.059	0.000
T5	120 - 100 (601)	C15x33.9	-42.128	113.400	0.372	-0.000	16.821	0.000
T5	120 - 100 (602)	C15x33.9	-42.189	113.400	0.372	0.000	16.821	0.000
T5	120 - 100 (605)	C15x33.9	-42.243	113.400	0.373	-0.000	16.821	0.000
T5	120 - 100 (606)	C15x33.9	-37.131	113.400	0.327	-0.000	16.821	0.000
T5	120 - 100 (609)	C15x33.9	-42.268	113.400	0.373	0.000	16.821	0.000
T5	120 - 100 (610)	C15x33.9	-37.231	113.400	0.328	0.000	16.821	0.000
T7	80 - 60 (613)	C12x25	-14.660	65.070	0.225	-0.000	10.368	0.000
T7	80 - 60 (614)	C12x25	-14.508	65.070	0.223	-0.000	10.368	0.000
T7	80 - 60 (617)	C12x25	-14.777	65.070	0.227	-0.000	10.368	0.000
T7	80 - 60 (618)	C12x25	-14.502	65.070	0.223	-0.000	10.368	0.000
T7	80 - 60 (621)	C12x25	-14.866	65.070	0.228	0.000	10.368	0.000
T7	80 - 60 (622)	C12x25	-14.404	65.070	0.221	0.000	10.368	0.000

Torque-Arm Top Interaction Design Data

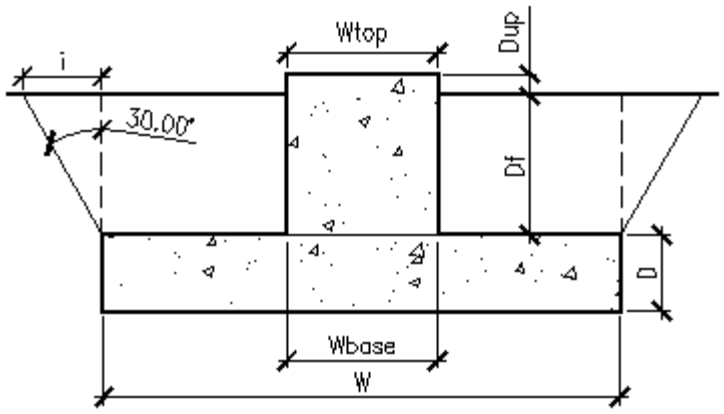
Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	180 - 160 (589)	C15x50	0.018	0.462	0.000	0.471 ✔	1.000	4.8.1 ✔
T2	180 - 160 (590)	C15x50	0.018	0.463	0.000	0.472 ✔	1.000	4.8.1 ✔
T2	180 - 160 (593)	C15x50	0.019	0.463	0.000	0.473 ✔	1.000	4.8.1 ✔
T2	180 - 160 (594)	C15x50	0.018	0.456	0.000	0.465 ✔	1.000	4.8.1 ✔
T2	180 - 160 (597)	C15x50	0.019	0.464	0.000	0.474 ✔	1.000	4.8.1 ✔
T2	180 - 160 (598)	C15x50	0.018	0.459	0.000	0.467 ✔	1.000	4.8.1 ✔
T5	120 - 100 (601)	C15x33.9	0.000	0.372	0.000	0.372 ✔	1.000	4.8.1 ✔
T5	120 - 100 (602)	C15x33.9	0.000	0.372	0.000	0.372 ✔	1.000	4.8.1 ✔
T5	120 - 100 (605)	C15x33.9	0.000	0.373	0.000	0.373 ✔	1.000	4.8.1 ✔
T5	120 - 100 (606)	C15x33.9	0.014	0.327	0.000	0.335 ✔	1.000	4.8.1 ✔
T5	120 - 100 (609)	C15x33.9	0.000	0.373	0.000	0.373 ✔	1.000	4.8.1 ✔
T5	120 - 100 (610)	C15x33.9	0.014	0.328	0.000	0.335 ✔	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	0.228	0.000	0.235 ✔	1.000	4.8.1 ✔
T7	80 - 60 (622)	C12x25	0.012	0.221	0.000	0.227 ✔	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
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	-84.813	122.253	69.4	Pass
T3	160 - 140	Leg	2.5" STD with 1/3 split HSS 3.5x0.313	123	-77.460	122.253	63.4	Pass
T4	140 - 120	Leg	P2.5x.276	204	-46.887	94.385	49.7	Pass
T5	120 - 100	Leg	P3x.3	261	-96.552	134.116	72.0	Pass
T6	100 - 80	Leg	P3x.3	342	-95.325	129.425	73.7	Pass
T7	80 - 60	Leg	P3x.3	398	-92.751	129.425	71.7	Pass
T8	60 - 40	Leg	P3x.3	455	-85.889	129.425	66.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	40 - 20	Leg	P3x.3	513	-73.898	112.247	65.8	Pass
T10	20 - 5	Leg	P3x.3	546	-74.145	112.758	65.8	Pass
T11	5 - 0	Leg	P3x.3	573	-79.797	133.074	60.0	Pass
T1	193 - 180	Diagonal	L2x2x1/4	11	-2.374	23.271	10.2	Pass
T2	180 - 160	Diagonal	L2x2x1/4	53	-9.826	23.566	41.7	Pass
T3	160 - 140	Diagonal	L2x2x1/4	194	-7.325	23.254	31.5	Pass
							53.3 (b)	
T4	140 - 120	Diagonal	ROHN TS1.5x11 ga	215	-2.743	11.249	24.4	Pass
							34.5 (b)	
T5	120 - 100	Diagonal	L2x2x1/4	290	-6.708	23.566	28.5	Pass
T6	100 - 80	Diagonal	ROHN TS1.5x16 ga	396	-2.352	6.036	39.0	Pass
							41.8 (b)	
T7	80 - 60	Diagonal	L1 3/4x1 3/4x3/16	408	-4.775	14.725	32.4	Pass
							43.5 (b)	
T8	60 - 40	Diagonal	ROHN TS1.5x11 ga	507	-4.158	11.454	36.3	Pass
							42.8 (b)	
T9	40 - 20	Diagonal	ROHN TS1.5x16 ga	542	-2.573	6.036	42.6	Pass
T10	20 - 5	Diagonal	ROHN TS1.5x11 ga	554	-2.525	11.504	21.9	Pass
							34.2 (b)	
T2	180 - 160	Secondary Horizontal	L2x2x1/4	65	-5.252	20.130	26.1	Pass
							55.7 (b)	
T3	160 - 140	Secondary Horizontal	L2x2x1/4	200	2.882	24.485	11.8	Pass
							27.6 (b)	
T5	120 - 100	Secondary Horizontal	L2x2x1/4	284	5.080	24.485	20.7	Pass
							48.7 (b)	
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	0.666	19.665	3.4	Pass
							8.4 (b)	
T4	140 - 120	Top Girt	ROHN TS1.5x11 ga	207	0.763	19.665	3.9	Pass
							9.6 (b)	
T5	120 - 100	Top Girt	L2x2x1/4	264	1.149	24.485	4.7	Pass
T6	100 - 80	Top Girt	ROHN TS1.5x16 ga	344	0.627	9.932	6.3	Pass
							15.0 (b)	
T7	80 - 60	Top Girt	ROHN TS1.5x11 ga	401	0.919	19.665	4.7	Pass
							11.6 (b)	
T8	60 - 40	Top Girt	ROHN TS1.5x11 ga	458	0.901	19.665	4.6	Pass
							11.3 (b)	
T9	40 - 20	Top Girt	ROHN TS1.5x16 ga	515	0.850	9.932	8.6	Pass
							20.4 (b)	
T10	20 - 5	Top Girt	ROHN TS1.5x11 ga	548	0.614	19.665	3.1	Pass
							7.7 (b)	
T11	5 - 0	Top Girt	L3x3x1/2	575	12.518	89.100	14.0	Pass
T1	193 - 180	Bottom Girt	L2x2x1/4	10	-0.654	17.437	3.8	Pass
T2	180 - 160	Bottom Girt	L2x2x1/4	48	-4.742	17.587	27.0	Pass
T3	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	129	0.576	19.665	2.9	Pass
							7.2 (b)	
T4	140 - 120	Bottom Girt	ROHN TS1.5x11 ga	210	0.881	19.665	4.5	Pass
							11.1 (b)	
T5	120 - 100	Bottom Girt	L2x2x1/4	267	3.256	24.485	13.3	Pass
T6	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	349	0.456	9.932	4.6	Pass
							10.9 (b)	
T7	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	405	1.932	19.665	9.8	Pass
							24.3 (b)	
T8	60 - 40	Bottom Girt	ROHN TS1.5x11 ga	461	1.141	19.665	5.8	Pass
							14.4 (b)	
T9	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	519	0.300	9.932	3.0	Pass
							7.2 (b)	
T10	20 - 5	Bottom Girt	ROHN TS1.5x11 ga	551	4.610	19.665	23.4	Pass
							42.3 (b)	
T11	5 - 0	Bottom Girt	L3x3x1/2	578	-3.328	73.476	7.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T11	5 - 0	Mid Girt	L3x3x1/2	584	-0.679	63.175	1.1	Pass
T2	180 - 160	Guy A@162.496	3/4	595	29.428	34.980	84.1	Pass
T5	120 - 100	Guy A@102.496	5/8	607	16.433	25.440	64.6	Pass
T7	80 - 60	Guy A@62.4961	1/2	619	8.543	16.140	52.9	Pass
T2	180 - 160	Guy B@162.496	3/4	592	29.133	34.980	83.3	Pass
T5	120 - 100	Guy B@102.496	5/8	604	16.209	25.440	63.7	Pass
T7	80 - 60	Guy B@62.4961	1/2	615	8.469	16.140	52.5	Pass
T2	180 - 160	Guy C@162.496	3/4	588	29.412	34.980	84.1	Pass
T5	120 - 100	Guy C@102.496	5/8	600	16.402	25.440	64.5	Pass
T7	80 - 60	Guy C@62.4961	1/2	612	8.531	16.140	52.9	Pass
T2	180 - 160	Torque Arm Top@162.496	C15x50	594	-10.102	427.615	53.2	Pass
T5	120 - 100	Torque Arm Top@102.496	C15x33.9	609	-5.661	292.246	37.3	Pass
T7	80 - 60	Torque Arm Top@62.4961	C12x25	617	-3.997	208.448	25.8	Pass
							Summary	
						Leg (T6)	73.7	Pass
						Diagonal (T3)	53.3	Pass
						Secondary Horizontal (T2)	55.7	Pass
						Top Girt (T1)	35.5	Pass
						Bottom Girt (T10)	42.3	Pass
						Mid Girt (T11)	1.1	Pass
						Guy A (T2)	84.1	Pass
						Guy B (T2)	83.3	Pass
						Guy C (T2)	84.1	Pass
						Torque Arm Top (T2)	53.2	Pass
						Bolt Checks	55.7	Pass
						RATING =	**84.1**	**Pass**



Design Parameters:

Axial Load on Base Footing:	$P_{app} := 219 \cdot kip$	(PerTNX Output)
Shear Load on Base Footing:	$V_{app} := 3kip$	(PerTNX Output)
Depth to Top of Footing:	$D_f := 3.25 \cdot ft$	(Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)
Width of Pier:	$W_{pier} := 2.5 \cdot ft$	
Width of Mat:	$W_{mat} := 7 \cdot ft$	
Depth of Mat:	$D_{mat} := 7 \cdot ft$	
Thickness of Mat:	$D := 1.75 \cdot ft$	
Height of Pier Above Grade:	$D_{up} := 0.5 \cdot ft$	

Concrete Volumes:

Circular Pier Volume: $V_{pier} := \frac{W_{pier}^2 \cdot \pi}{4} \cdot (D_f + D_{up}) = 18.408 \cdot ft^3$

Mat Volume: $V_{mat} := W_{mat} \cdot D_{mat} \cdot D = 85.75 \cdot ft^3$

Total Volume: $V_{conc} := 1 \cdot V_{pier} + V_{mat} = 104.158 \cdot ft^3$

Soil Volume:

Total Volume of Soil $V_{soil} := W_{mat} \cdot D_{mat} \cdot D_f - 1 \cdot V_{pier} = 140.842 \cdot ft^3$

Concrete and Soil Weights:

Unit Weight of Soil: $\gamma_{soil} := 125pcf$ (Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)

Unit Weight of Concrete: $\gamma_{conc} := 150pcf$

Total Concrete Weight: $W_{conc} := V_{conc} \cdot \gamma_{conc} = 15.624 \cdot kip$

Total Soil Weight: $W_{soil} := V_{soil} \cdot \gamma_{soil} = 17.605 \cdot kip$

Bearing Capacity Check:

Total Applied Moment: $P_a := P_{app} + W_{conc} + W_{soil}$

Bearing Area: $A_b := W_{mat} \cdot D_{mat}$

Bearing Pressure: $\sigma := \frac{P_a}{A_b} = 5.148 \cdot ksf$

Reduction Factor: $\phi_{fs} := 0.75$ (Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)

Factor of Safety: $SF_{bearing} := 2$

Allowable Bearing Pressure: $\sigma_a := 6 \cdot ksf$

Ultimate Bearing Pressure: $\sigma_u := SF_{bearing} \cdot \sigma_a$

Bearing Check: $Test := \begin{cases} \text{"GOOD"} & \text{if } \sigma \le \phi_{fs} \cdot \sigma_u \\ \text{"No Good"} & \text{otherwise} \end{cases}$ Test = "GOOD"

Usage: $Usage := \frac{\sigma}{\phi_{fs} \cdot \sigma_u}$ $Usage = 57.2 \cdot \%$

Guy Inner Foundation Check (Inner):

Uplift Force: $P_u := 34 \cdot kip$ (Per TNX Output)

Sliding Force: $P_h := 34 \cdot kip$ (Per TNX Output)

Resultant Force: $P_r := \sqrt{P_u^2 + P_h^2} = 48.083 \cdot kip$

Check Uplift Capacity

Depth of Footing $d_f := 4 \cdot ft$ (Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)

Width of Footing $w_f := 6 \cdot ft$

Length of Footing $l_f := 12 \cdot ft$

Height of Footing $d := 4 \cdot ft$

Depth of water: $d_w := 6ft$

Soil unit weight : $\gamma_{soil} := 120pcf$

Soil effective unit weight : $\gamma_{soil.sub} := \gamma_{soil} - 62.4pcf = 57.6\,pcf$

Concrete effective unit weight : $\gamma_{conc.sub} := \gamma_{conc} - 62.4pcf = 87.6\,pcf$

$i := d_f \cdot \tan(30 \cdot deg) = 2.309\,ft$

Volume of Soil $a_1 := w_f + 2 \cdot i = 10.619\,ft$

$a_2 := w_f = 6\,ft$

$b_1 := l_f + 2 \cdot i = 16.619\,ft$

$b_2 := l_f = 12\,ft$

Volume of Soil $V_s := \left(a_1 \cdot b_1 + \sqrt{a_1 \cdot b_1 \cdot a_2 \cdot b_2} + a_2 \cdot b_2\right) \cdot \frac{d_f}{3} = 481.59 \cdot ft^3$

Weight of Soil $W_{soil} := V_s \cdot \gamma_{soil} = 57.791 \cdot kip$

Volume of Concrete $V_{conc1} := w_f \cdot \left(d_w - d_f\right) \cdot l_f = 144\,ft^3$

$V_{conc2} := w_f \cdot \left(d_f + d - d_w\right) \cdot l_f = 144 \cdot ft^3$

Weight of Concrete $W_{conc} := V_{conc1} \cdot \gamma_{conc} + V_{conc2} \cdot \gamma_{conc.sub} = 34.214 \cdot kip$

Reduction Factor: $\phi_{fs} = 0.75$

$P_r := \phi_{fs} \cdot (W_{conc} + W_{soil}) = 69.004 \cdot kip$

$Test := \begin{cases} \text{"GOOD"} & \text{if } P_r > P_u \\ \text{"Increase Depth"} & \text{otherwise} \end{cases}$ Test = "GOOD"

Usage: $Usage := \frac{P_u}{P_r} = 49 \cdot \%$

Check Sliding Capacity

Weight of Soil: $W_s := d_f \cdot l_f \cdot w_f \cdot \gamma_{soil} = 34.56 \cdot kip$

Friction Angle: $\theta := 30 \cdot deg$ (Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)

Factor of Safety $\phi_{fs} := .75$

Soil Coefficient of Friction: $\mu := 0.45$

Passive Earth Pressure Coeffiecent: $K_p := \frac{(1 + \sin(\theta))}{(1 - \sin(\theta))} = 3$

Passive Earth Pressure (top): $P_{patop} := K_p \cdot \gamma_{soil} \cdot d_f = 1.44 \cdot \frac{kip}{ft^2}$

Passive Earth Pressure (bottom): $P_{pabot} := K_p \cdot \gamma_{soil} \cdot (d_f + d) = 2.88 \cdot \frac{kip}{ft^2}$

Passive Earth Force Per Foot: $R_p := \frac{(P_{patop} + P_{pabot})}{2} \cdot d = 8.64 \cdot \frac{kip}{ft}$

Total Passive Force: $F_p := R_p \cdot l_f = 103.68 \cdot kip$

Friction due to weight: $F_f := \mu \cdot (W_s + W_{conc} - P_u) = 15.648\ kip$

Resisting Force: $R_f := F_p + F_f = 119.328 \cdot kip$

Design Resisting Force: $R_d := \phi_{fs} \cdot R_f = 89.496 \cdot kip$

$Test := \begin{cases} \text{"GOOD"} & \text{if } R_d > P_h \\ \text{"Increase Width"} & \text{otherwise} \end{cases}$ $Usage := \frac{P_h}{R_d} = 38 \cdot \%$

Test = "GOOD"

Guy Inner Foundation Check (Outer):

Uplift Force: $P_u := 43 \cdot kip$ (Per TNX Output)

Sliding Force: $P_h := 38 \cdot kip$ (Per TNX Output)

Resultant Force: $P_r := \sqrt{P_u^{\,2} + P_h^{\,2}} = 57.385 \cdot kip$

Check Uplift Capacity

Depth of Footing $d_f := 8 \cdot ft$ (Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)

Width of Footing $w_f := 5 \cdot ft$

Length of Footing $l_f := 9 \cdot ft$

Height of Footing $d := 2 \cdot ft$

Depth of water: $d_w := 6ft$

Soil unit weight : $\gamma_{soil} := 120pcf$

Soil effective unit weight : $\gamma_{soil.sub} := \gamma_{soil} - 62.4pcf = 57.6\,pcf$

Concrete effective unit weight : $\gamma_{conc.sub} := \gamma_{conc} - 62.4pcf = 87.6\,pcf$

$i := (d_f - d_w) \cdot \tan(30 \cdot deg) = 1.155\,ft$

Volume of Soil $a_1 := w_f + 2 \cdot i = 7.309\,ft$

$a_2 := w_f = 5\,ft$

$b_1 := l_f + 2 \cdot i = 11.309\,ft$

$b_2 := l_f = 9\,ft$

Volume of Soil $V_{s1} := \left(a_1 \cdot b_1 + \sqrt{a_1 \cdot b_1 \cdot a_2 \cdot b_2} + a_2 \cdot b_2\right) \cdot \frac{(d_f - d_w)}{3} = 125.771 \cdot ft^3$

$i := (d_w) \cdot \tan(30 \cdot deg) = 3.464\,ft$

Volume of Soil $a_{11} := a_1 + 2 \cdot i = 14.238\,ft$

$a_{22} := a_2 = 5\,ft$

$b_{11} := b_1 + 2 \cdot i = 18.238\,ft$

$b_{22} := b_2 = 9\,ft$

Volume of Soil $V_{s2} := \left(a_{11}\cdot b_{11} + \sqrt{a_{11}\cdot b_{11}\cdot a_{22}\cdot b_{22}} + a_{22}\cdot b_{22}\right)\cdot\frac{\left(d_w\right)}{3} = 825.511\cdot ft^3$

Weight of Soil $W_{soil} := V_{s1}\cdot\gamma_{soil.sub} + V_{s2}\cdot\gamma_{soil} = 106.306\cdot kip$

Volume of Concrete $V_{conc} := w_f\cdot d\cdot l_f = 90\cdot ft^3$

Weight of Concrete $W_{conc} := V_{conc}\cdot\gamma_{conc.sub} = 7.884\cdot kip$

Reduction Factor: $\phi_{fs} = 0.75$

$P_r := \phi_{fs}\cdot\left(W_{conc} + W_{soil}\right) = 85.642\cdot kip$

$Test := \begin{cases} \text{"GOOD"} & \text{if } P_r > P_u \\ \text{"Increase Depth"} & \text{otherwise} \end{cases}$ Test = "GOOD"

Usage: $Usage := \frac{P_u}{P_r} = 50\cdot\%$

Check Sliding Capacity

Weight of Soil: $W_s := d_f\cdot l_f\cdot w_f\cdot\gamma_{soil} = 43.2\cdot kip$

Friction Angle: $\theta := 30\cdot deg$ (Per Previous Structural Analysis by Centek Engineering, dated May 06, 2015)

Factor of Safety $\phi_{fs} := .75$

Soil Coefficient of Friction: $\mu := 0.45$

Passive Earth Pressure Coeffiecent: $K_p := \frac{(1 + \sin(\theta))}{(1 - \sin(\theta))} = 3$

Passive Earth Pressure (top): $P_{patop} := K_p\cdot\gamma_{soil}\cdot d_f = 2.88\cdot\frac{kip}{ft^2}$

Passive Earth Pressure (bottom): $P_{pabot} := K_p\cdot\gamma_{soil}\cdot\left(d_f + d\right) = 3.6\cdot\frac{kip}{ft^2}$

Passive Earth Force Per Foot: $R_p := \frac{\left(P_{patop} + P_{pabot}\right)}{2}\cdot d = 6.48\cdot\frac{kip}{ft}$

Total Passive Force: $F_p := R_p\cdot l_f = 58.32\cdot kip$

Friction due to weight: $F_f := \mu\cdot\left(W_s + W_{conc} - P_u\right) = 3.638\ kip$

Resisting Force: $R_f := F_p + F_f = 61.958 \cdot kip$

Design Resisting Force: $R_d := \phi_{fs} \cdot R_f = 46.468 \cdot kip$

$$Test := \begin{cases} \text{"GOOD"} & \text{if } R_d > P_h \\ \text{"Increase Width"} & \text{otherwise} \end{cases}$$

$$Usage := \frac{P_h}{R_d} = 82 \cdot \%$$

Test = "GOOD"

MASER CONSULTING
— CONNECTICUT —

Engineers Planners Surveyors Landscape Architects Environmental Scientists

Antenna Mount Analysis

FOR

CT23XC500 – Mohegan Hill

57 Cook Drive
Montville, CT 06382
New London County

Mount Utilization: 39.8%

June 28, 2018

Prepared For

Sprint
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Rutherford, NJ 07070

Prepared By

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STATE OF CONNECTICUT
PETROS TSOUKALAS
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Petros Tsoukalas, P.E.
Geographic Discipline Leader
CT License No. 32577

MC Project No. 17924003A

Objective:

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

Introduction:

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

• RFDS 45795 provided by Sprint, dated May 21, 2018.
• Antenna Mount Mapping Notes and Pictures prepared by TEP, dated November 30, 2017.
• Previous Structural Modifications Construction Drawings prepared by Hudson Design Group, dated January 21, 2013.

The existing **Sprint** equipment is to be 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.

Codes, Standards and Loading:

Maser Consulting Connecticut utilized the following codes and standards:

- 2016 Connecticut State Building Code, Incorporating the 2012 IBC
- Structural Standards for Antenna Supporting Structures and Antennas ANSI/TIA-222-G
    - Ultimate Wind Speed – 133 mph (3 Second Gust)
    - Nominal Wind Speed – 103 mph (3 Second Gust)
    - Exposure Category – B
    - Structural Class – II
    - Topographic Category – 1
    - Ice Wind – 50 mph
    - Ice Thickness – 0.75"
- Specification for Structural Steel Buildings ANSI/AISC 360-10, American Institute of Steel Construction (AISC)

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

Analysis Approach & Assumptions:

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

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

General Site Design Assumption:

- All engineering services are performed on the basis that the information used is current and correct.
- It is assumed that the telecommunication equipment supports, antenna supports, and existing structure have been designed by a registered licensed professional engineer for the existing loads acting on the structure, as required by all applicable codes, prior to the proposed modifications listed within this report, if any.
- It is assumed that information provided by the client regarding the structure itself, the antenna models, feed lines, and other relevant information is current and correct.
- It is the responsibility of the client to ensure that the information provided to Maser Consulting Connecticut and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that the original design, material production, fabrication, and erection of the existing structure was performed in accordance with accepted industry design standards and in accordance with all applicable codes. Further, it is assumed that the existing structure and appurtenances have been properly maintained in accordance with all applicable codes and manufacturer's specifications and no structural defects and/or deterioration to the structural members has occurred.
- It is assumed all other existing appurtenances, antennas, cables, etc. belonging to others have been installed and supported per code and per specifications so as not to damage any existing structural support members, and that any contributing loads from adjacent equipment has been taken into consideration for their design.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Maser Consulting Connecticut is not responsible for the conclusion, opinions, and recommendations made by others based on the information we supply.

Site Specific Design Parameters:

The following design parameters have been utilized in this report:

- *Structural Steel Pipes are constructed of A53 Grade B Steel*

Calculations:

The calculations are found in Appendix A of this report.

Conclusion:

Maser Consulting Connecticut has determined the existing antenna support mount has **ADEQUATE** structural capacity to support the proposed loading. The existing antenna support mount has been determined to be stressed to a maximum of **39.8%** of its structural capacity with the maximum usage occurring at the antenna support pipes. Therefore, the proposed **Sprint** installation **CAN** be installed as intended.

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

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

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

Maser Consulting Connecticut

Petros Tsoukalas, P.E.
Geographic Discipline Leader

Dejian Xu, P.E.
Project Engineer

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APPENDIX A

Client:	Sprint	Computed By:	DX
Site Name:	Mohegan Hill	Date:	6/28/2018
Project No.	17924003A	Verified By:	PET
Title:	Antenna Mount Analysis	Page:	1

Version 4.0

LOADING SUMMARY

Quantity	Manufacturer	Antenna/ Appurtenance	Status	Sector
3	**RFS**	**APXVTM14-ALU-I20**	**Proposed**	**Alpha, Beta, & Gamma**
3	**ALCATEL-LUCENT**	**TD-RRH 8x20**	**Proposed**	**Alpha, Beta, & Gamma**
3	RFS	APXV9ERR18-C-A20	Existing	Alpha, Beta, & Gamma
3	ALCATEL-LUCENT	1900 MHz RRH	Existing	Alpha, Beta, & Gamma
3	ALCATEL-LUCENT	800 2x50W	Existing	Alpha, Beta, & Gamma

The worst case loading occurs in the Alpha Sector

Quantity	Manufacturer	Antenna/ Appurtenance	Status
1	**RFS**	**APXVTM14-ALU-I20**	**Proposed**
1	**ALCATEL-LUCENT**	**TD-RRH 8x20**	**Proposed**
1	RFS	APXV9ERR18-C-A20	Existing
1	ALCATEL-LUCENT	1900 MHz RRH	Existing
1	ALCATEL-LUCENT	800 2x50W	Existing

Client:	Sprint	Computed By:	DX
Site Name:	Mohegan Hill	Date:	6/28/2018
Project No.	17924003A	Verified By:	PET
Title:	Antenna Mount Analysis	Page:	2

I. DESIGN INPUTS

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

				Reference	Equation
Wind Load Inputs Parameters					
Antenna Centerline	z	151	ft		
Ultimate Wind Speed	V_U	133	mph		
Nominal Wind Speed (3 sec. Gust):	V	103	mph	Ref. 1, Eqn. 16-33	
Nominal Wind Speed with Ice (3 sec. gust):	V_i	50.0	mph	(Figure a5-2a, p. 233)	
Maintenance Wind Speed:	V_m	30.0	mph		
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	$=e^{(f-z/H)}$
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	25.67	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 (Maintenance):	q_{zm}	2.18	psf	(Section 2.6.9.6, P. 25)	$=.00256\cdot K_z\cdot K_{zt}\cdot K_d\cdot V_m^2\cdot I$
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 $C_{a\ Side}$
APXVTM14-ALU-I20	96.0	2.375	1.200	56.30	12.60	6.30	1.29	1.46	99.5	5.9	1.021	59.79	16.09	9.79	1.25	1.36
TD-RRH 8x20	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
APXV9ERR18-C-A20	96.0	2.375	1.200	72.00	11.80	7.90	1.36	1.47	99.5	5.9	1.021	75.49	15.29	11.39	1.31	1.38
1900 MHz RRH	0.0	0.000	0.000	25.00	12.40	12.20	1.20	1.20	0.0	0.0	0.000	28.49	15.89	15.69	1.20	1.20
800 2x50W	0.0	0.000	0.000	19.00	13.00	8.61	1.20	1.20	0.0	0.0	0.000	22.49	16.49	12.10	1.20	1.20

Antenna/ Appurtenance	# of Brackets	Non-Iced Condition			Iced Condition		
		Wind Force (lbs.)		Gravity (lbs.)	Wind Force (lbs.)		Gravity (lbs.)
		F_N	F_T		F_N	F_T	
APXVTM14-ALU-I20	2	77.8	60.1	**33.9**	26.5	24.9	**84.2**
TD-RRH 8x20	2	44.1	16.7	**35.0**	14.0	6.6	**56.6**
APXV9ERR18-C-A20	2	92.7	84.1	**34.8**	30.0	31.9	**107.0**
1900 MHz RRH	1	56.4	55.5	**60.0**	19.4	19.2	**97.0**
800 2x50W	1	44.9	29.8	**53.0**	15.9	11.7	**69.3**

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

- ***Wind Load on Framing Members***

Member Category	Member Shape	Length (in)	Member Surface	Non-Iced Condition			Iced Condition					
				Exposed Wind Height (in)	Force Coefficient C_a	Wind Load (plf)	Exposed Wind Height (in)	Depth (in)	Length (in)	Force Coefficient C_a	Wind Load (plf)	Ice Weight (plf)
Pipe	Pipe 2.5	180	Round	2.88	1.20	6.27	6.37	6.37	183.49	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

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BASIC EQUATIONS

ANSI/TIA-222-G Reference

Importance Factor:

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

Table 2-3, Pg. 39

Force Coefficient:
(Square)

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

˙able 2-8, P. 42

Force Coefficient:
(Round)

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

Table 2-8, P. 42

Terrain Exposure Constants:

Table 2-4, P. 40

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

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BASIC EQUATIONS

ANSI/TIA-222-G Reference

Velocity Pressure Coefficient:

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

$K_z := Kz(z)$ Section 2.6.5, P. 13

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

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

Velocity Pressure: Section 2.6.9.6, P. 25

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

LOAD EQUATIONS

WIND LOAD

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

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

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

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

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

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

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

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

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

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

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

ICE DEAD LOAD

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

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

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

ICE WIND LOAD

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

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

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

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

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

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

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

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

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

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

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

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

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

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

III. ATTACHMENTS

Client:	Sprint	Computed By:	DX
Site Name:	Mohegan Hill	Date:	6/28/2018
Project No.	17924003A	Verified By:	PET
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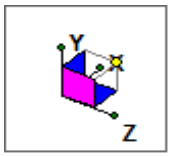
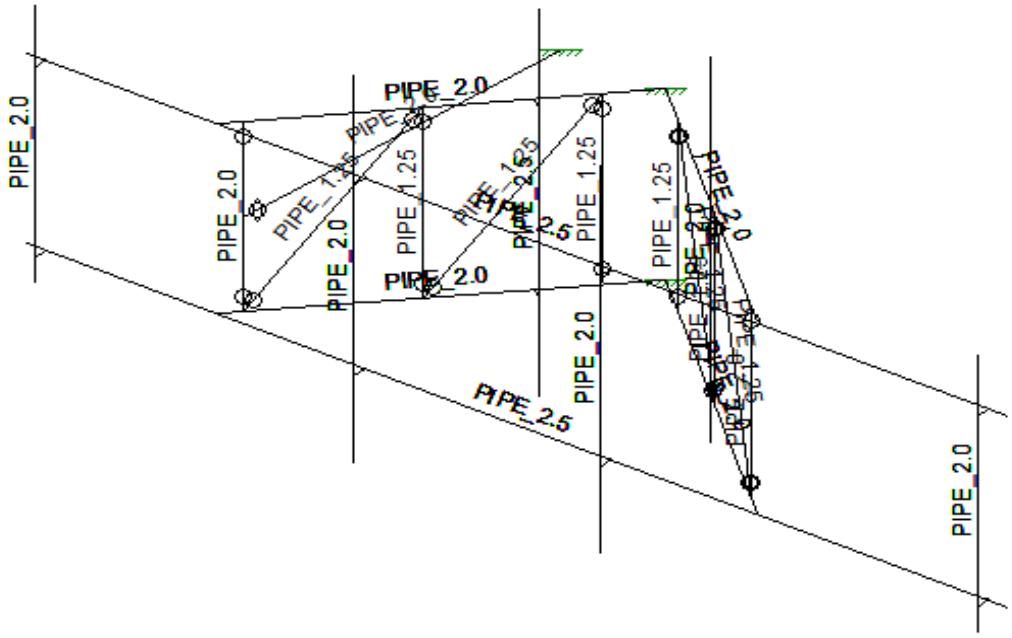
RISA MODEL





Envelope Only Solution

Client:	Sprint	Computed By:	DX
Site Name:	Mohegan Hill	Date:	6/28/2018
Project No.	17924003A	Verified By:	PET
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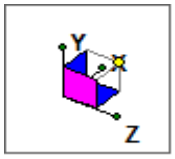
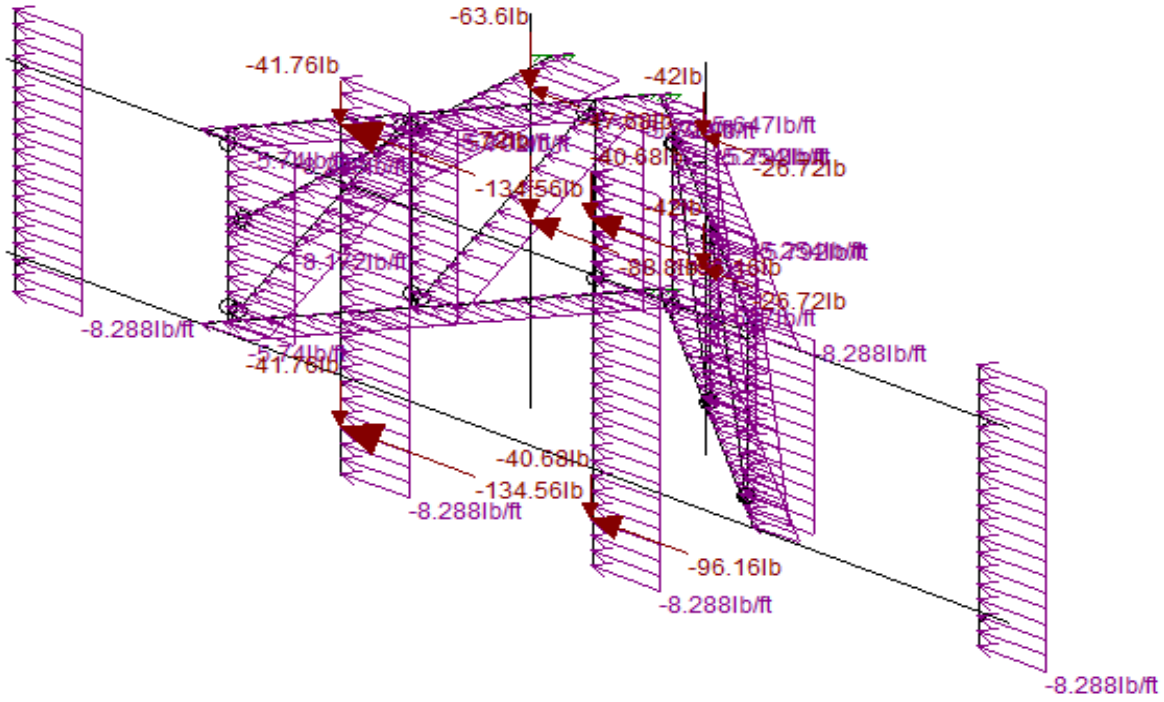
RISA WORST CASE LOADING





Loads: LC 11, 1.2D+1.6W10
Envelope Only Solution

Client:	Sprint	Computed By:	DX
Site Name:	Mohegan Hill	Date:	6/28/2018
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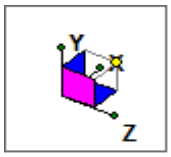
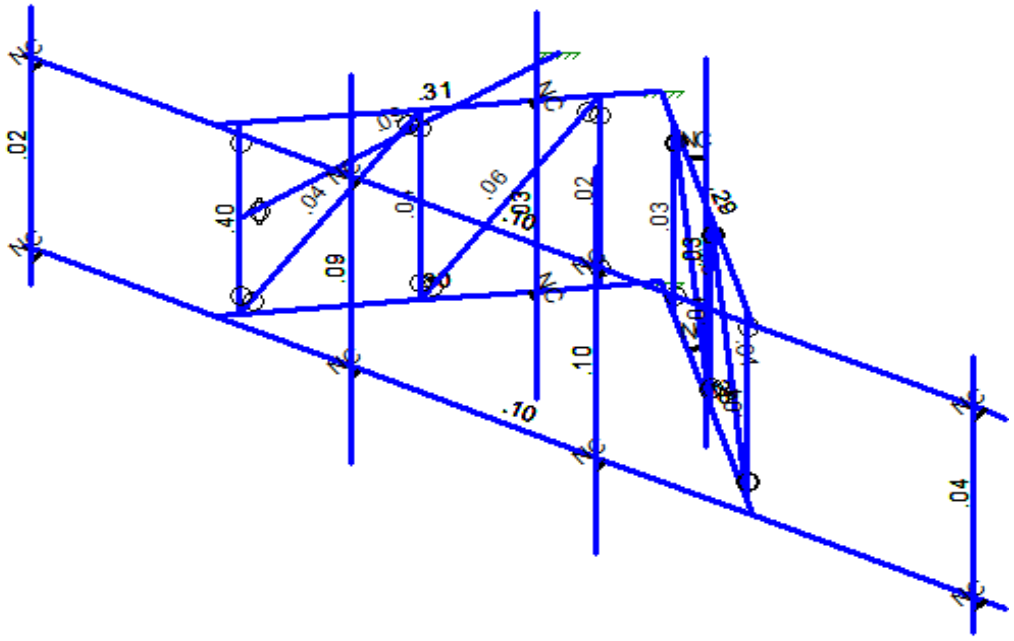
RISA CODE CHECK





Member Code Checks Displayed
Envelope Only Solution

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.

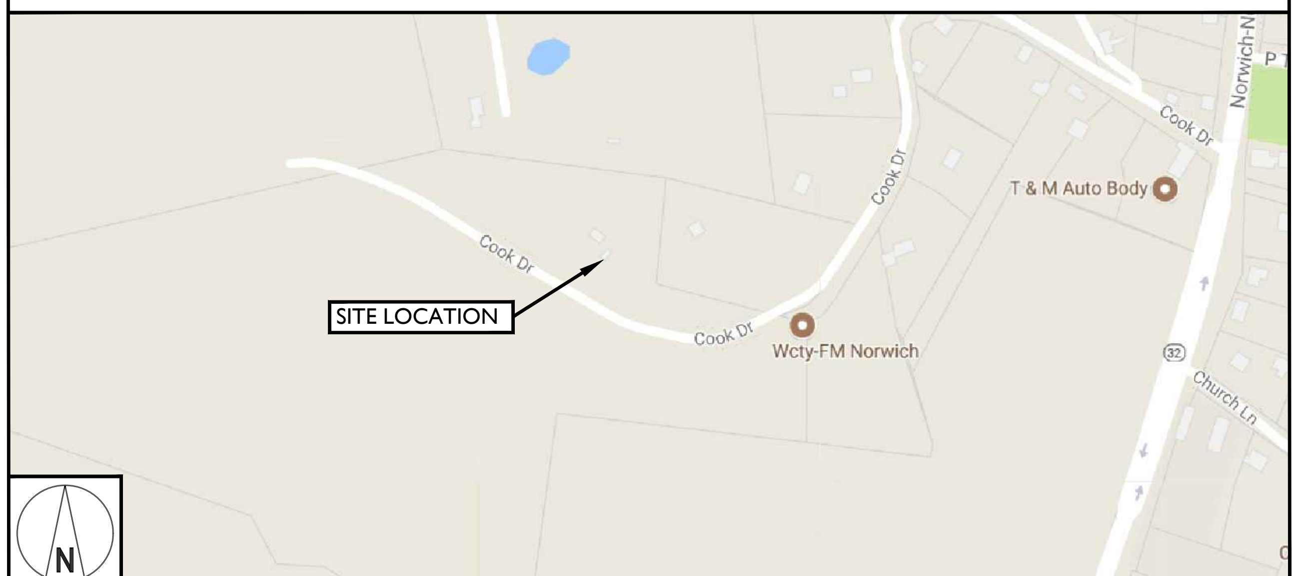
CONSTRUCTION: ____________________ DATE: ________

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

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 (3) NEW RRH'S
- INSTALL (24) JUMPER CABLES
- INSTALL (3) HYBRID CABLE

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

Cherundolo Consulting

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

SCALE :	JOB NUMBER :
AS SHOWN	17924003A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
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1	06/29/18	REVISED PER NEW RFDS	JRF	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	JRF	PET
A	08/[illegible]	ISSUED FOR REVIEW	[illegible]	FEP

STATE OF CONNECTICUT PETROS TSOUKALAS LICENSED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER LICENSE NUMBER: PEN.32??7

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

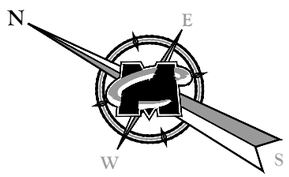
SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

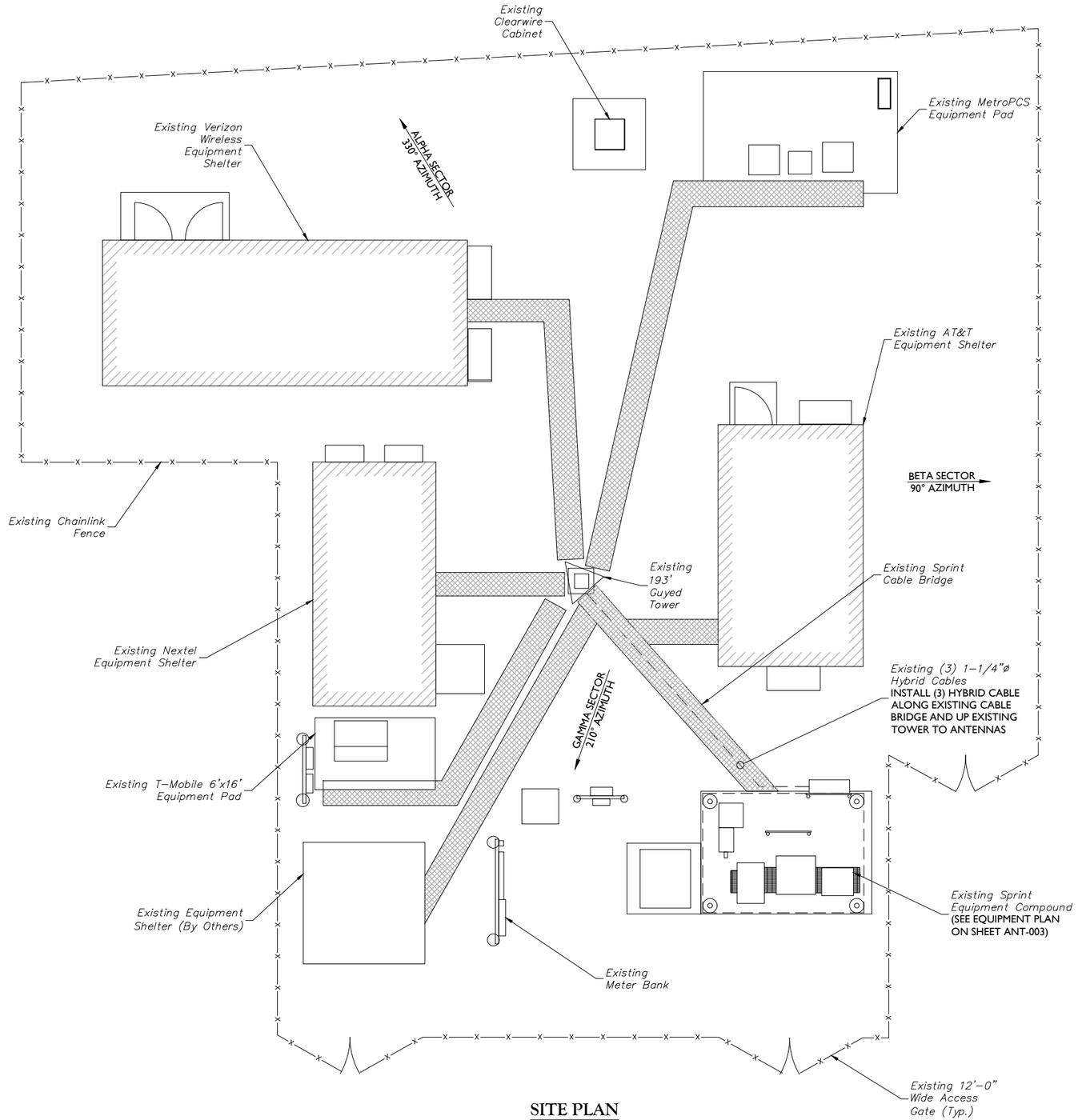
57 COOK DRIVE
MONTVILLE, CT 06382

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

SHEET TITLE :
GENERAL NOTES

SHEET NUMBER :
ANT-001.00





SITE PLAN

5 4 3 2 1 0 3.5 5 10

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

LEGEND

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

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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN.[illegible]

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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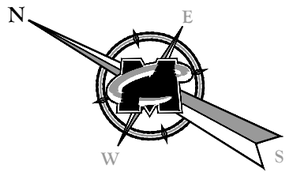
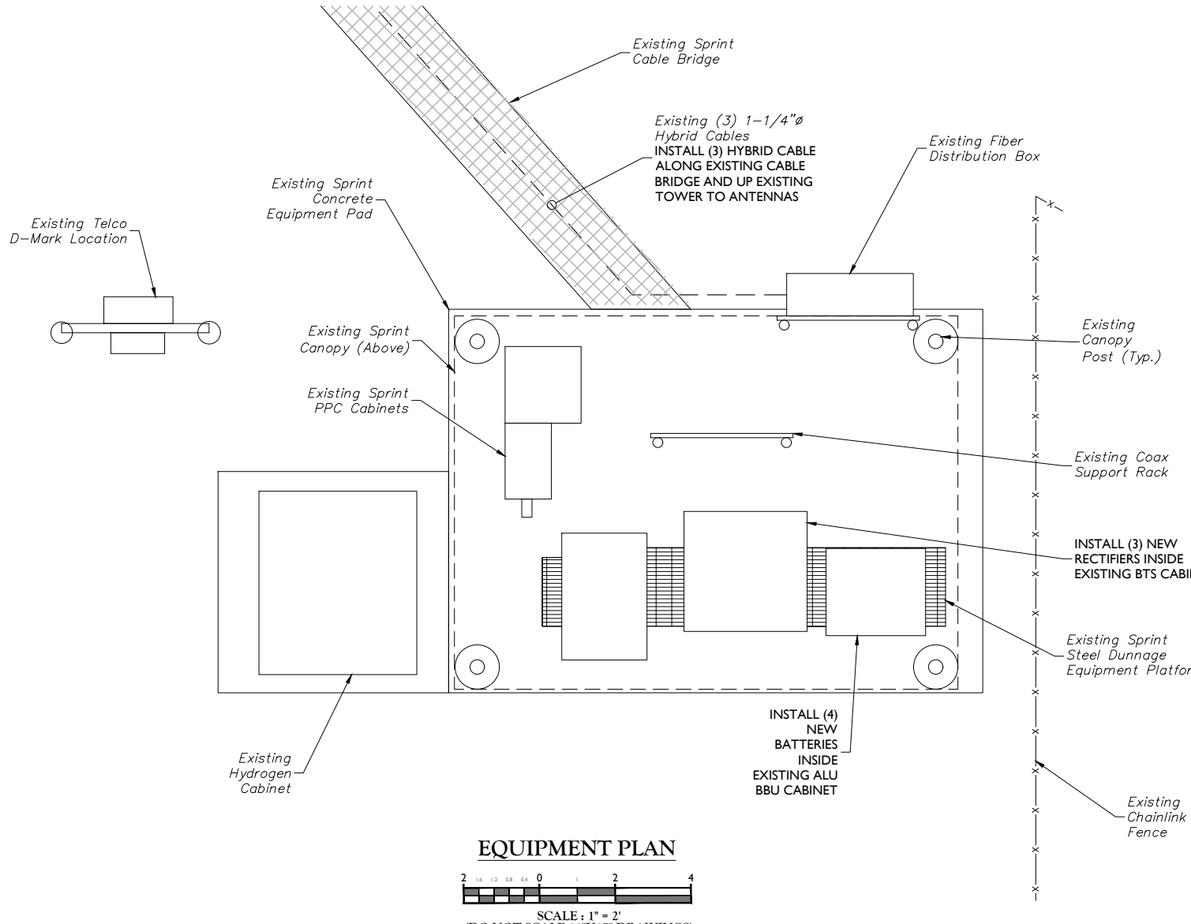
SHEET TITLE :
SITE PLAN

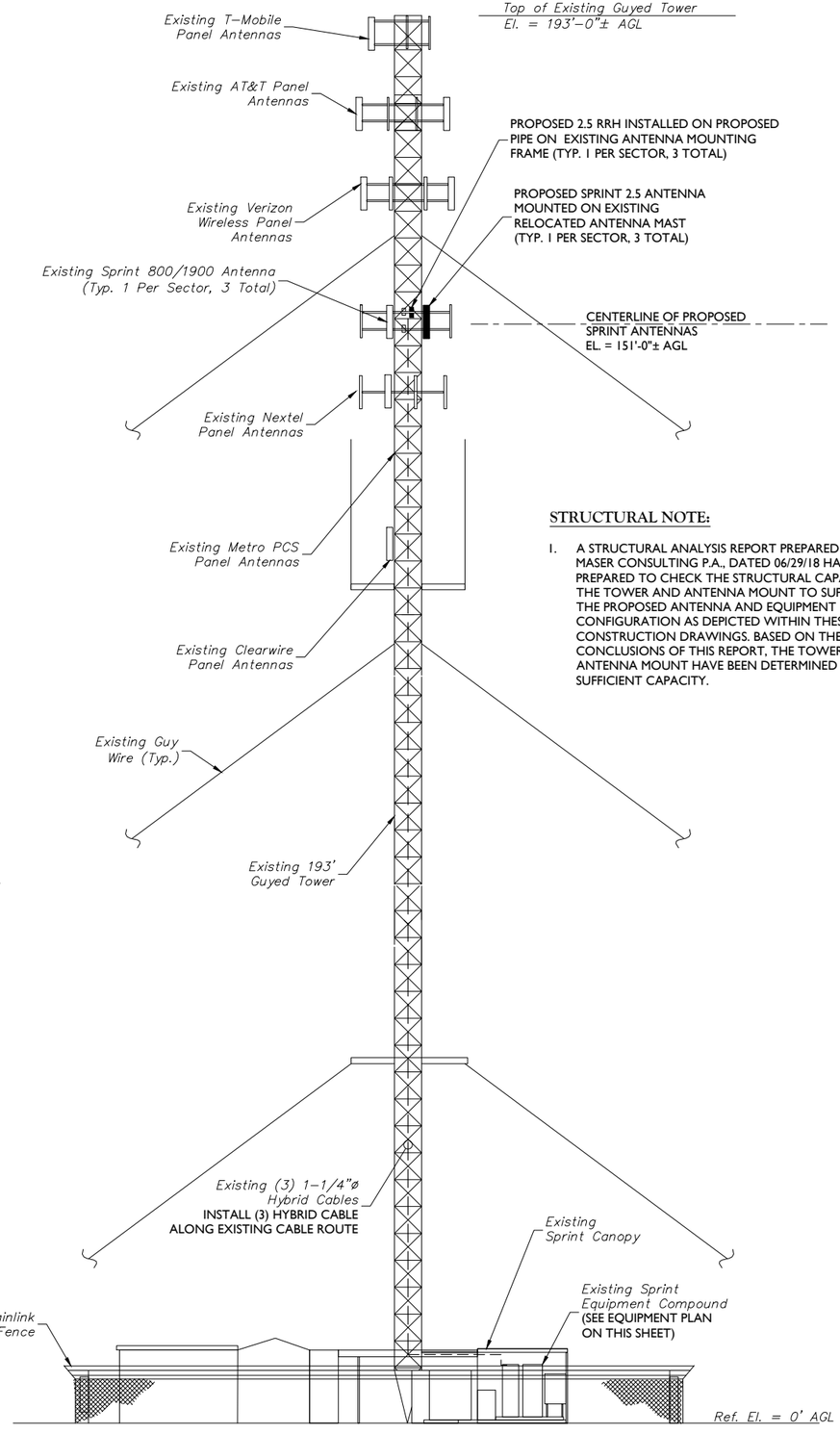
SHEET NUMBER :
ANT-002.00





EQUIPMENT PLAN

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



ELEVATION

SCALE: 1" = 10'

STRUCTURAL NOTE:

1. A STRUCTURAL ANALYSIS REPORT PREPARED BY MASER CONSULTING P.A., DATED 06/29/18 HAS BEEN PREPARED TO CHECK THE STRUCTURAL CAPACITY OF THE TOWER AND ANTENNA MOUNT TO SUPPORT THE PROPOSED ANTENNA AND EQUIPMENT CONFIGURATION AS DEPICTED WITHIN THESE CONSTRUCTION DRAWINGS. BASED ON THE CONCLUSIONS OF THIS REPORT, THE TOWER AND ANTENNA MOUNT HAVE BEEN DETERMINED TO HAVE SUFFICIENT CAPACITY.

LEGEND

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

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A	08/	ISSUED FOR REVIEW		FEP

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
12

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN.29067

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

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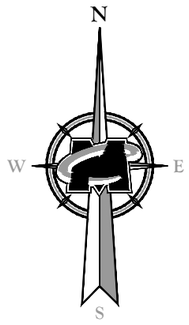
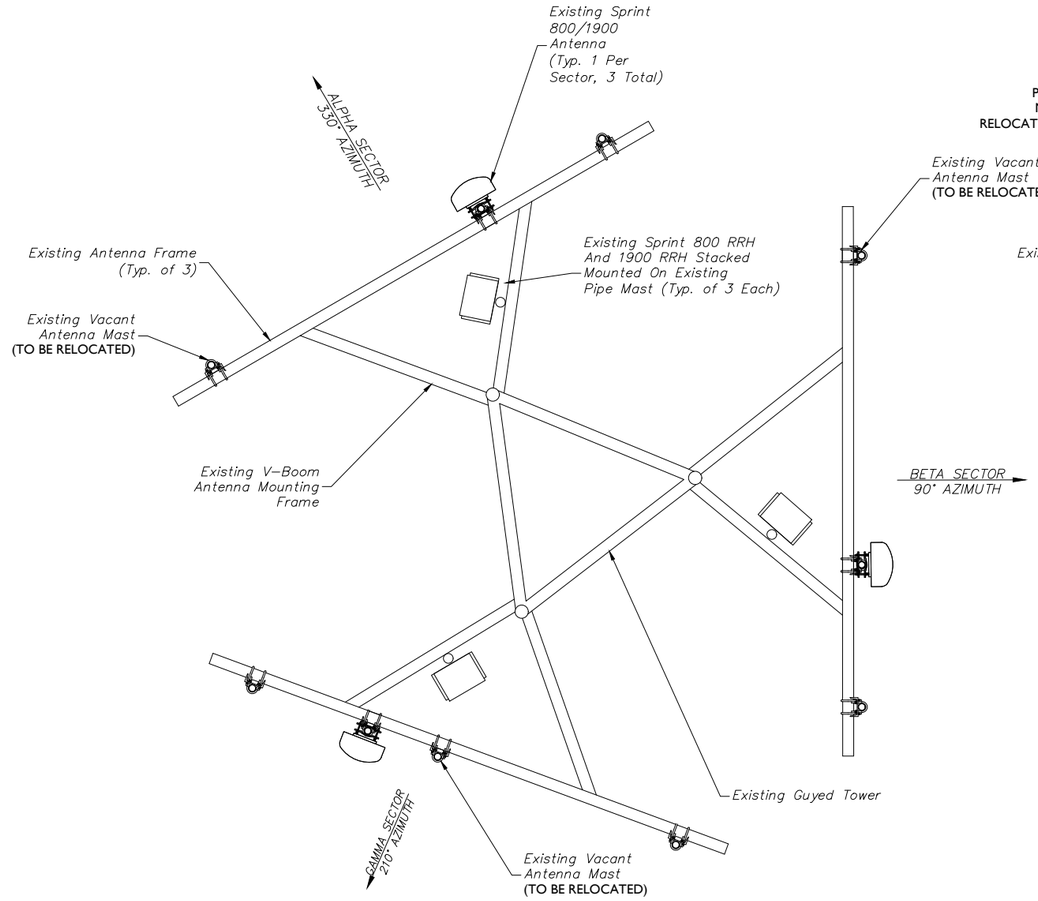
SHEET TITLE :
EQUIPMENT PLAN AND ELEVATION

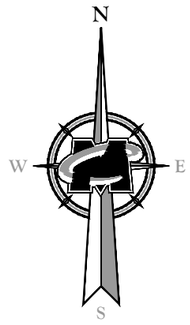
SHEET NUMBER :
ANT-003.00

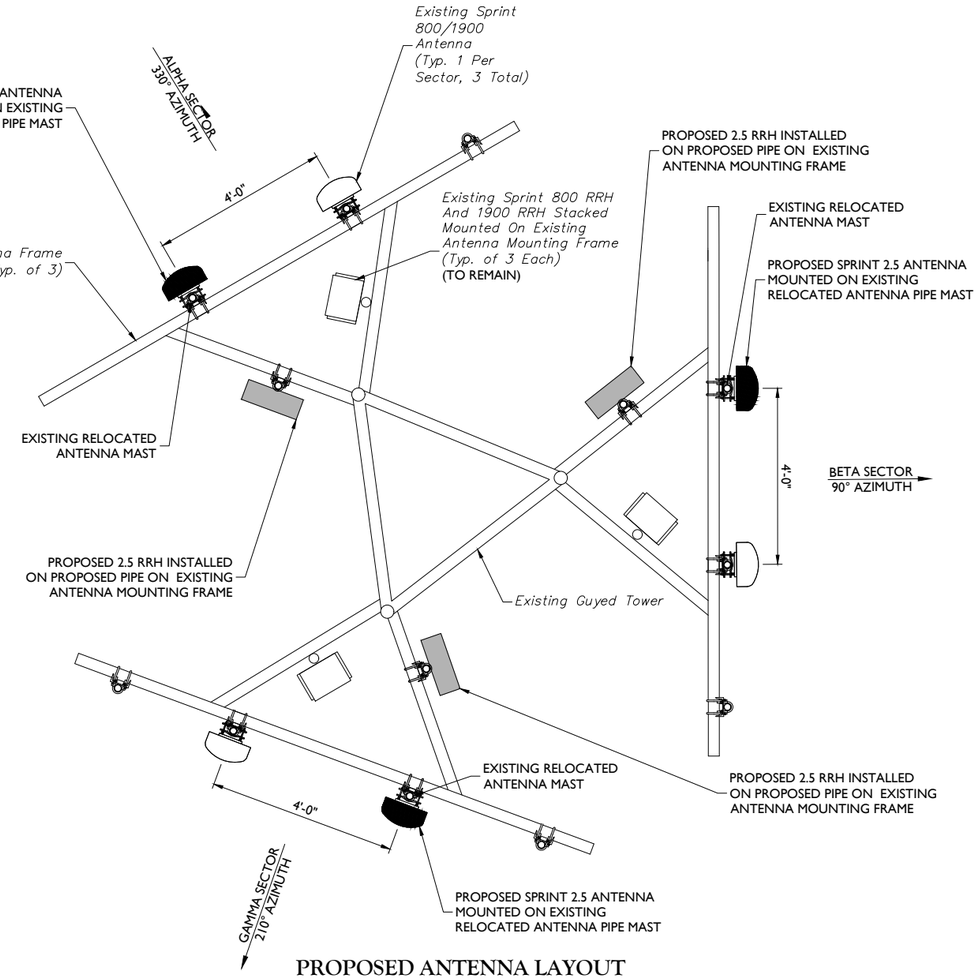




EXISTING ANTENNA LAYOUT

SCALE: 1" = 2'-0"





PROPOSED ANTENNA LAYOUT

SCALE: 1" = 2'-0"

STRUCTURAL NOTE:

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

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STATE OF CONNECTICUT
PETROS E. TSOUKALAS
12-10-18

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN.29067

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

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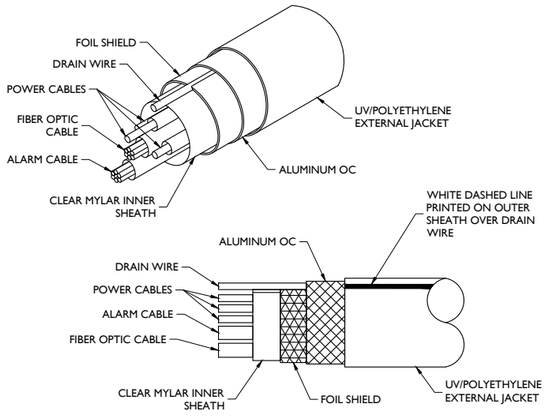
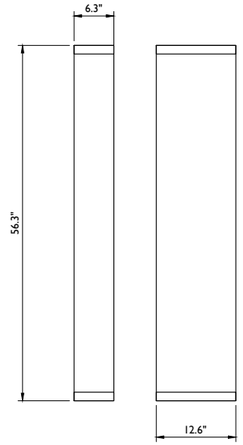
SHEET TITLE:
ANTENNA
ORIENTATION PLANS

SHEET NUMBER:
ANT-004.00

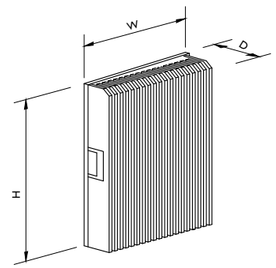


HYBRID CABLE
NOT TO SCALE



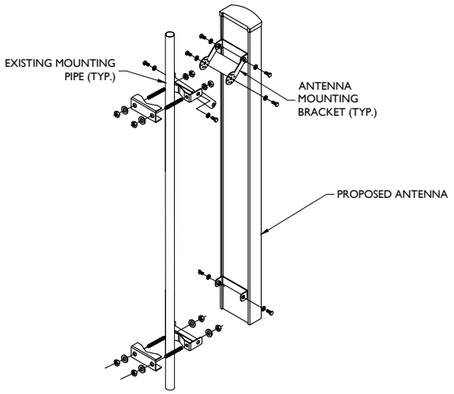
WEIGHT = 56.2 LBS
WEIGHT WITH BRACKETS = 67.7 LBS

RFS APXVTM-14-ALU-I20 ANTENNA
NOT TO SCALE

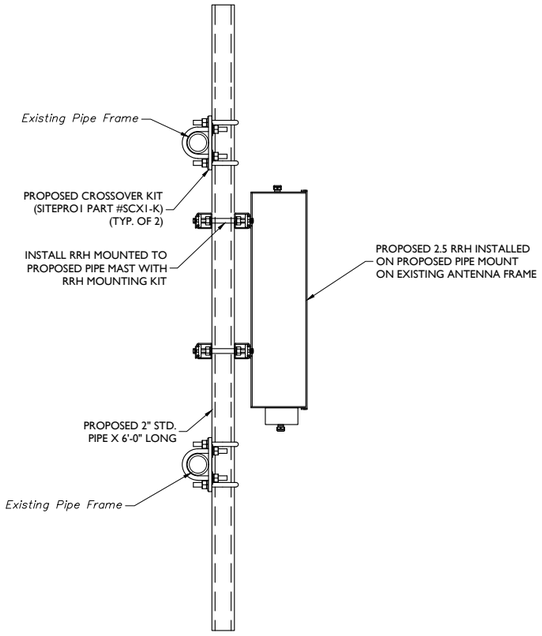


MODEL:	HEIGHT (H)	WIDTH (W)	DEPTH (D)	WEIGHT
ALU TD-RRH8x20-25	26"	18.6"	6.7"	76.2 LBS

RRH SPECIFICATIONS
NOT TO SCALE



ANTENNA MOUNTING DETAIL
NOT TO SCALE



RRH MOUNTING DETAIL
NOT TO SCALE

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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN.[illegible]

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.

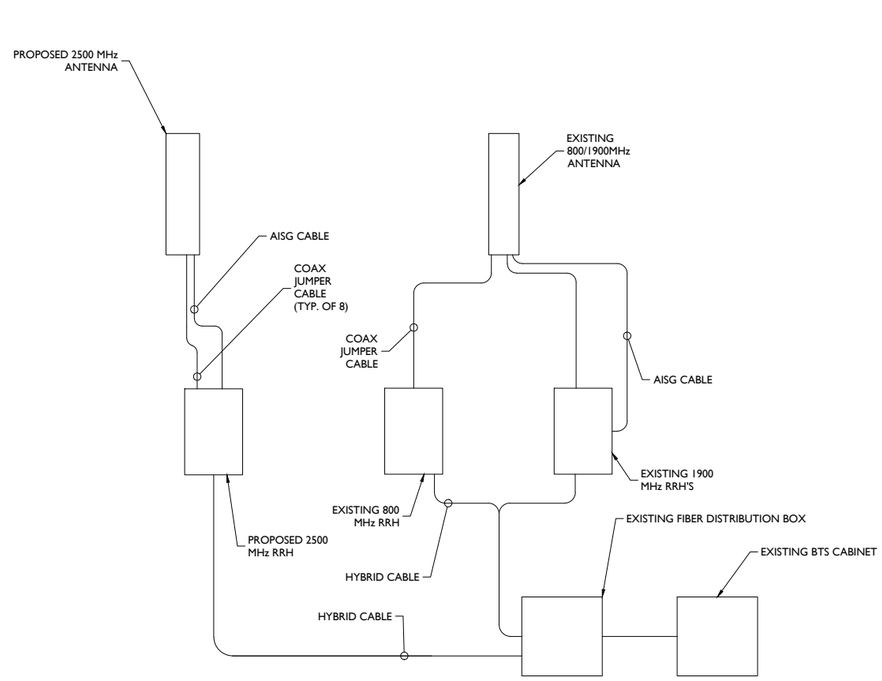
   ALSO ACCEPTABLE IS THE USE OF BUTYL RUBBER WEATHERPROOFING KIT APPROVED BY CABLE MANUFACTURE AND CONTRACTOR. START BUTYL RUBBER TAPE APPROXIMATELY 5 INCHES FROM THE CONNECTOR AND WRAP 2 INCHES TOWARD THE CONNECTOR, THEN REVERSE THE TAPE SO THAT THE STICKY SIDE IS UP. TAPE OVER THE CONNECTOR OR SURGE 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	RFS APXVTM14-ALU-I20	800/2500	NEW	56.3	12.6	6.3	56.2	330°	151'	2°	0°
BETA	B1	RFS APXVTM14-ALU-I20	800/2500	NEW	56.3	12.6	6.3	56.2	90°	151'	2°	0°
GAMMA	C1	RFS APXVTM14-ALU-I20	800/2500	NEW	56.3	12.6	6.3	56.2	210°	151'	2°	0°

BILL OF MATERIALS

NUMBER	TOTAL QUANTITY	DESCRIPTION	MANUFACTURER	MODEL NUMBER
1	3	PANEL ANTENNA	COMMSCOPE	DT464B-2XR
2	3	2500MHZ RRH	ALU	TD-RRH8X20-25
3	400 LF	1-1/4"Ø HYBRID FIBER RISER X3	ALU	TBD
4	24	1/2"Ø JUMPER CABLE (8' LONG)	TBD	
5	3	0.315"Ø AISG CABLE (8' LONG)	COMMSCOPE	ATCB-B01-006



ANTENNA WIRING DIAGRAM

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REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	06/29/18	REVISED PER NEW RFDS	JRF	PET
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A	08/[illegible]	ISSUED FOR REVIEW	[illegible]	FEP

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN.[illegible]

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

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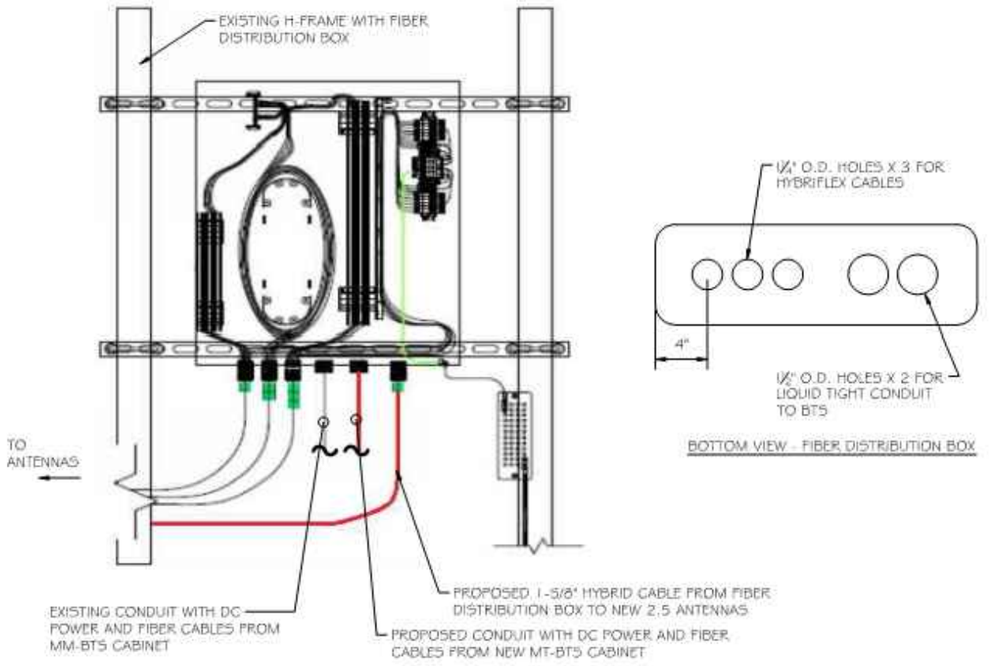
Fax: 732.383.1984

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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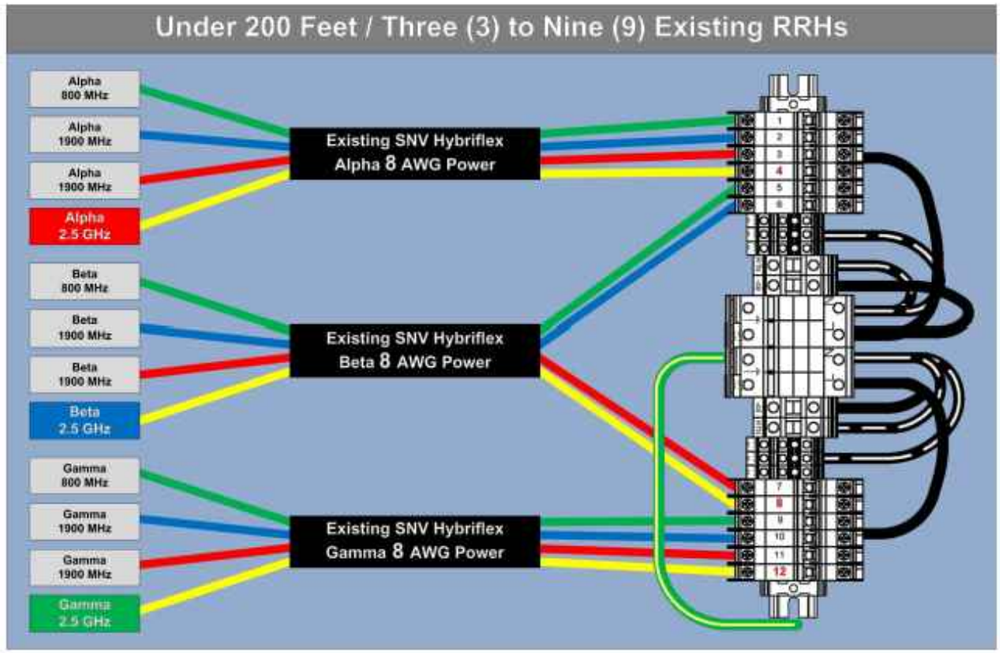

RRH TO DISTRIBUTION BOX POWER CONNECTIVITY DETAIL
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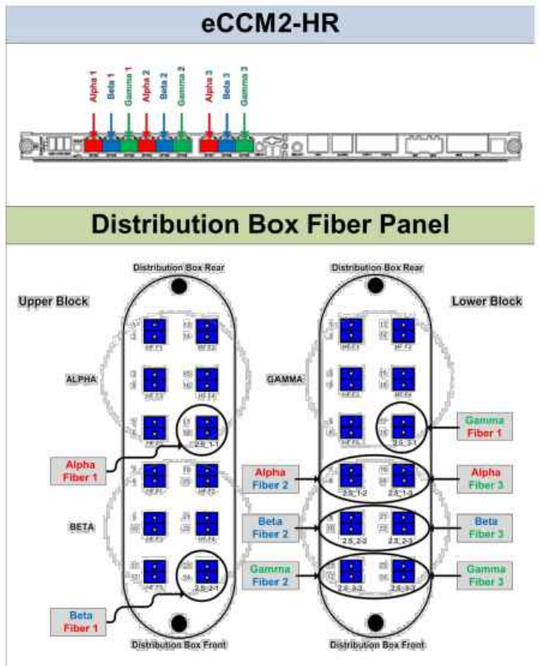

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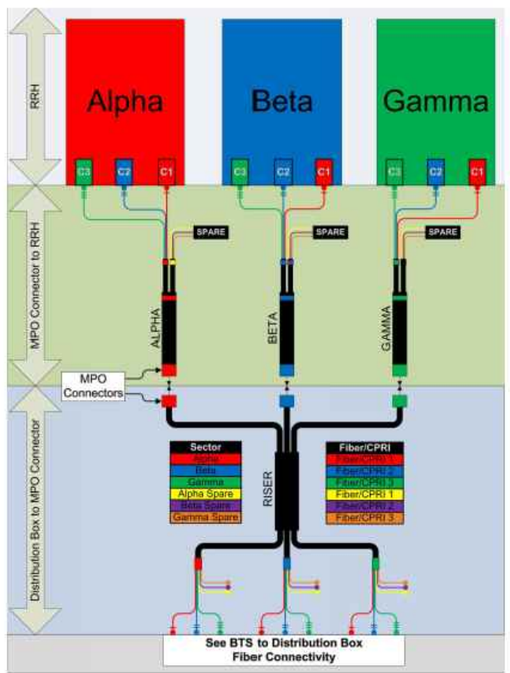

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STATE OF CONNECTICUT
PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER LICENSE NUMBER PEN.0027
PROFESSIONAL ENGINEER

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

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SHEET TITLE: FIBER PLUMBING DIAGRAMS - 1

SHEET NUMBER: ANT-007.00

Prepared By	Revision Date	Revision Number
Mark Elliott	March 24, 2018	R7
Approved By	**Approval Date**	
RAN Hardware & Antenna Teams	Final-Macro Generated	

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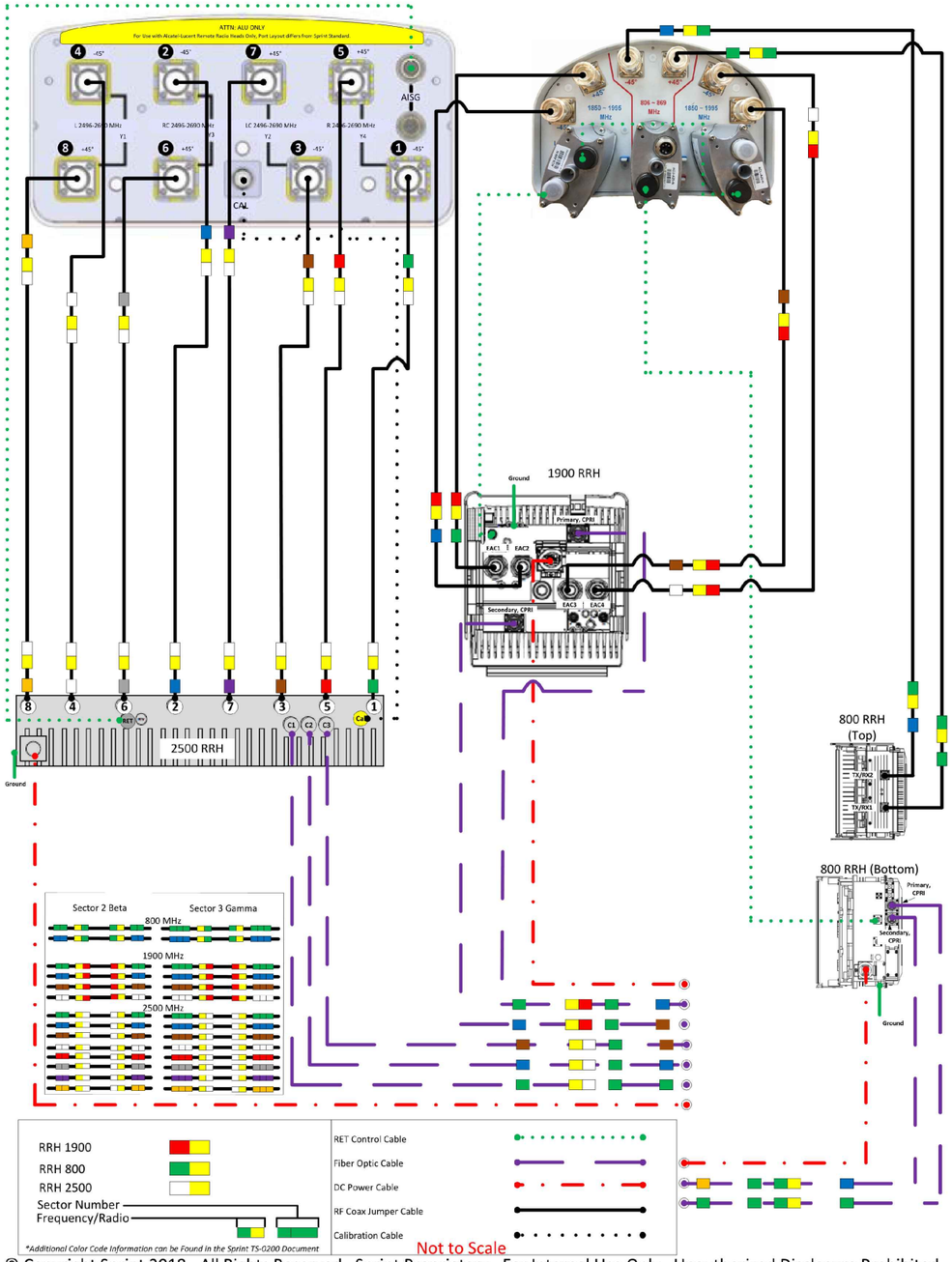

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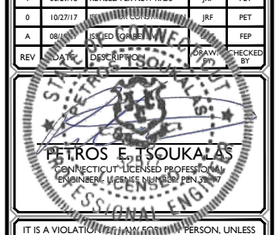

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

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SHEET TITLE :
FIBER PLUMBING DIAGRAMS - II

SHEET NUMBER :
ANT-008.00

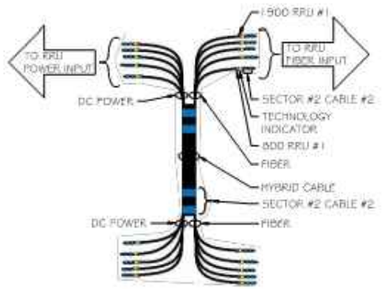
CABLE MARKING NOTES

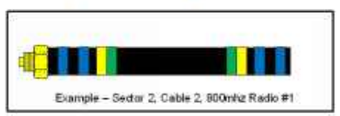
1. ALL CABLES SHALL BE MARKED WITH 2" WIDE, UV STABILIZED, UL APPROVED TAPE.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM THE END CONNECTOR, WEATHERPROOFING, OR BREAKOUT UNIT. THERE SHALL BE 1" SPACE BETWEEN EACH RING.
3. A 2" GAP SHALL SEPARATE THE CABLE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

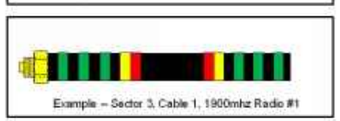
2.5 FREQUENCY	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

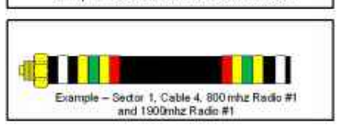
NV FREQUENCY	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

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

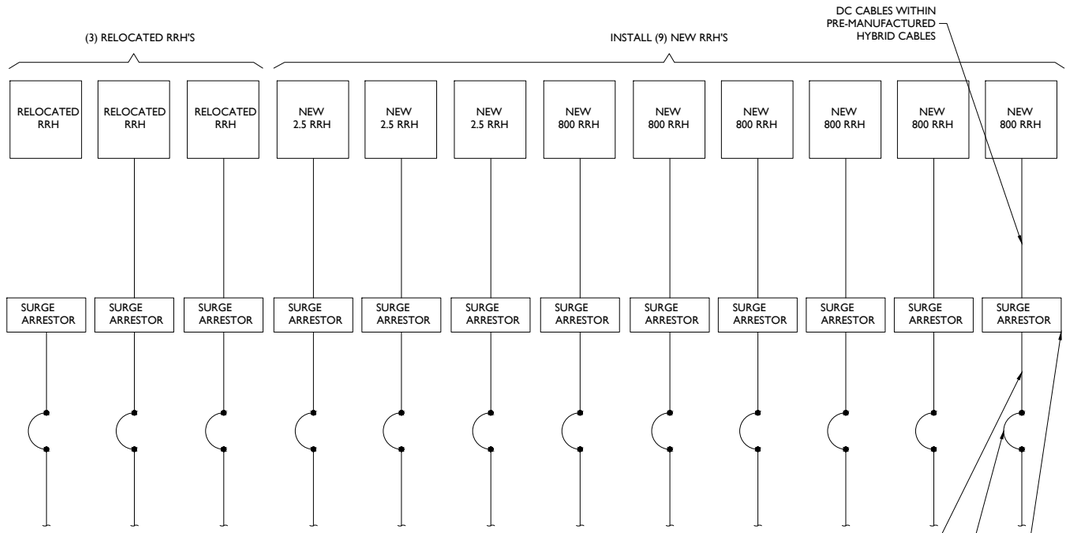








COLOR CODING CHARTS
NOT TO SCALE



DC ONE-LINE DIAGRAM
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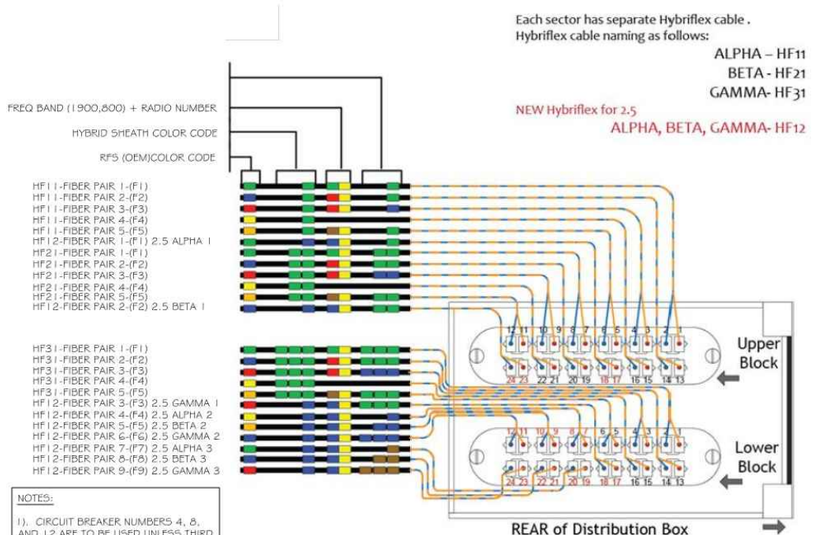

NOTES:

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

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PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, VERNON, NEW JERSEY, 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

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

SHEET NUMBER: ANT-009.00

GENERAL REQUIREMENTS:

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

PROJECT COORDINATION:

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

PROTECTION OF WORK:

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

WARRANTIES AND BONDS:

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

PERMITS:

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

RACEWAYS:

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

WIRING:

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

GROUNDING:

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

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SCALE :	JOB NUMBER :
AS SHOWN	17924003A

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY
1	06/29/18	REVISED PER NEW RFDS	JRF	PET
0	10/27/17	ISSUED FOR CONSTRUCTION	JRF	PET
A	08/[illegible]	ISSUED FOR REVIEW	[illegible]	FEP

STATE OF CONNECTICUT
PETROS E. TSOUKALAS
12921
REGISTERED PROFESSIONAL ENGINEER

PETROS E. TSOUKALAS
CONNECTICUT LICENSED PROFESSIONAL ENGINEER, LICENSE NUMBER PEN.[illegible]

12-20-17

SITE NAME: MOHEGAN HILL
SITE ID: CT23XC500

57 COOK DRIVE
MONTVILLE, CT 06382

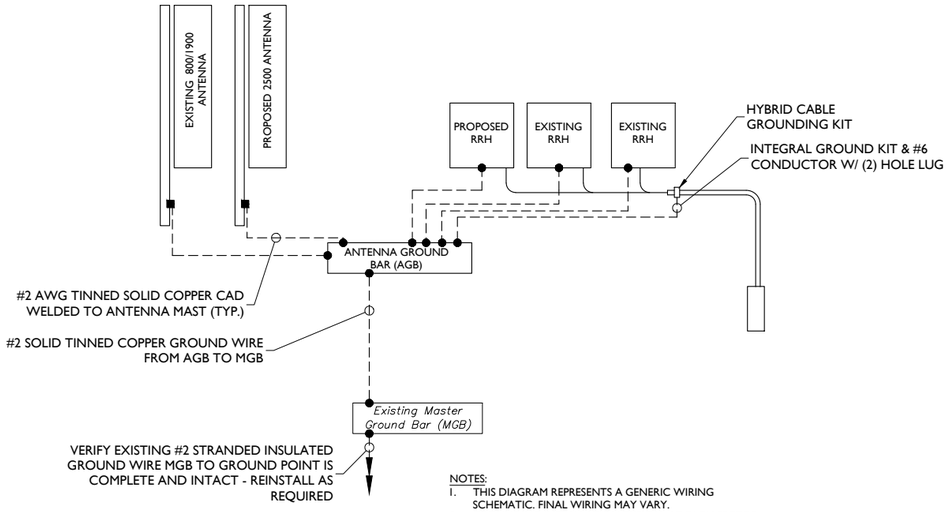
RED BANK OFFICE
331 Newman Springs Road
Suite 203
Red Bank, NJ 07701-5699
Phone: 732.383.1950
Fax: 732.383.1984

SHEET TITLE :

ELECTRICAL AND GROUNDING NOTES

SHEET NUMBER :

ANT-010.00

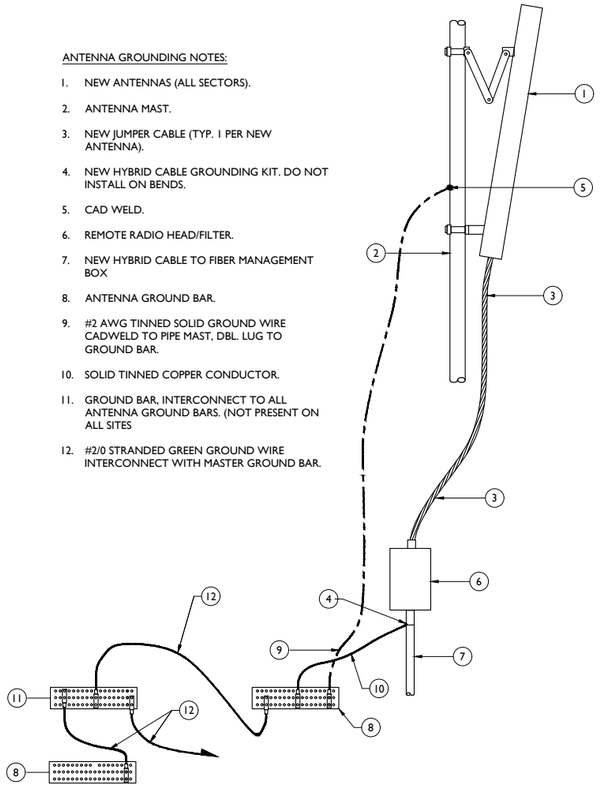


NOTES:
1. THIS DIAGRAM REPRESENTS A GENERIC WIRING SCHEMATIC. FINAL WIRING MAY VARY.
2. GROUNDING INSTALLATION TYPICAL AT EACH SECTOR.

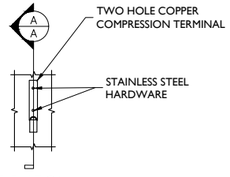
GROUNDING SCHEMATIC
NOT TO SCALE

ANTENNA GROUNDING NOTES:

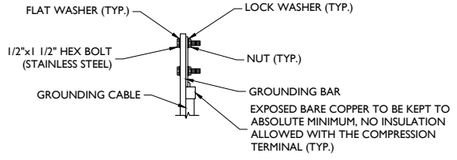
1. NEW ANTENNAS (ALL SECTORS).
2. ANTENNA MAST.
3. NEW JUMPER CABLE (TYP. 1 PER NEW ANTENNA).
4. NEW HYBRID CABLE GROUNDING KIT. DO NOT INSTALL ON BENDS.
5. CAD WELD.
6. REMOTE RADIO HEAD/FILTER.
7. NEW HYBRID CABLE TO FIBER MANAGEMENT BOX
8. ANTENNA GROUND BAR.
9. #2 AWG TINNED SOLID GROUND WIRE CADWELD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



ANTENNA GROUNDING SCHEMATIC
NOT TO SCALE

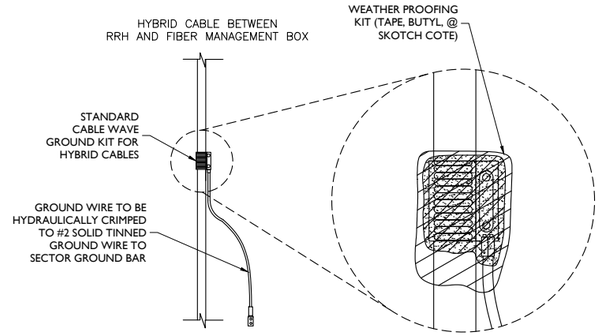


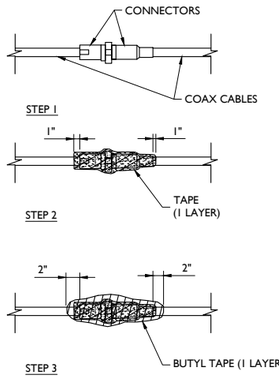
ELEVATION

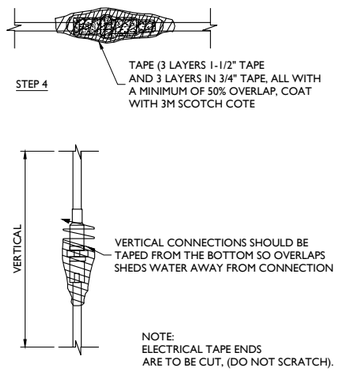


SECTION A-A

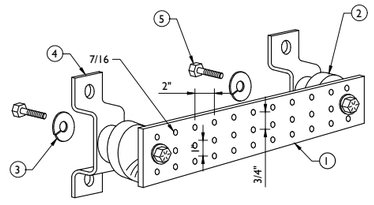
TYPICAL GROUND BAR CONNECTION DETAIL
NOT TO SCALE







CABLE WRAPPING DETAIL
NOT TO SCALE



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

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

GROUND BAR DETAIL
NOT TO SCALE

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SHEET TITLE :
GROUNDING SCHEMATIC AND DETAILS

SHEET NUMBER :
ANT-011.00