Structural Analysis Report For a 100-ft Guyed Tower

Site Name: West Hartford Center CT
Site No.: 535840
Fuze#: 16273383
Site Address: 14-20 Isham Road
West Hartford, CT 06107
Hartford County

Prepared for:
Verizon Wireless
900 Chelmsford Street
Tower 2 Floor 5
Lowell, MA 01851

July 18, 2023
(Rev. 1)

Prepared by:
Dewberry Engineers Inc.
99 Summer Street, Suite 700
Boston, MA 02110
Dewberry Project Number: 50164391

Tower Controlling Member	% Capacity	Result
Tower Components	57.9	Sufficient
Foundation	-	Sufficient

Tower/Foundation Previously Reinforced?	YES ☐ / NO ☒
Previous Reinforcement Verified?	YES ☐ / NO ☐ Date: **N/A**
Additional Reinforcement Required?	YES ☐ / NO ☒

Prepared by:

Ashley Deuschle, E.I.T. (FL)
Staff Engineer

Reviewed by:

Brandon Kelsey, P.E. (MA)
Project Structural Engineer

Approved by:

STATE OF CONNECTICUT BENJAMIN E. REVETTE 28971 LICENSED PROFESSIONAL ENGINEER

07/19/2023
Benjamin Revette, P.E.
Associate Vice President

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1.0 INTRODUCTION AND PROJECT SUMMARY

The objective of this report is to assess the proposed installation of new antennas, sector frame mounts and support equipment on an existing 100-ft. steel guy tower located in Hartford, CT. This report is limited to the analysis of the tower only. The telecommunication upgrade is proposed by Verizon Wireless at a proposed mount centerline of 102 ft and the tower base elevation is set 25' above ground level.

Please refer to the appendices for the structural analysis package regarding the structural analysis.

2.0 CODES, STANDARDS, AND REFERENCES

The structural analysis was completed according to the provisions of the following Codes and standards:

- *2022 Connecticut State Building Code, Amendments to IBC 2021*
- *International Building Code (IBC) 2021,* International Code Council
- ASCE 7-16 Minimum design Loads for Buildings and Other Structures, American Society of Civil Engineers
- *TIA-222-H, Structural Standard for Antenna Supporting Structures and Antennas*
- *Steel Construction Manual 15th Ed,* American Institute of Steel Construction
- *Site Visit by Dewberry Engineers Inc. on 02/24/2021*
- *CCI Photos dated 07/01/2022*

The analysis was in compliance with the minimum requirements as specified by TIA-222-H for the County of Hartford, CT under the following load parameters:

Risk Category:	II	
Exposure Category:	C	IBC 2021
Design Ultimate Wind Speed	125 mph	2022 CT Bldg. Code
Design Ice Wind Speed:	50 mph	ASCE 7-16 Hazard Tool
Design Ice Thickness:	1.00 in.	ASCE 7-16 Hazard Tool
Serviceability Wind Speed:	60 mph	Sect. 2.8.3, TIA Rev H

The tower geometry, member sizes, existing antenna loading, and foundation design loading were referenced from the following reports:

- Previous structural tower analysis by Dewberry Engineers dated April 27, 2022.
- New/Replacement Antenna Mount Analysis by Maser Consulting dated March 16, 2022.
- Radio Frequency Design Sheet (RFDS Name: West Hartford Center CT) by Verizon Wireless dated October 4, 2023.
- Latest Construction Drawings by Dewberry Engineers, Inc.
- Antenna Mount Analysis by Colliers Engineering & Design dated 07/13/2023
- Structural & Equipment Mapping Report by GPD Group dated 07/09/2012
- Original Tower Drawings by Cianci & Cianci Structural Engineers dated 10/22/1997

3.0 EXISTING AND PROPOSED TOWER LOADING

3.1 Existing (includes Reserved, if applicable) Antenna and Cable Information

Mounting Elevation (ft) AGL	Mounting Elevation (ft) ARL	Center Line Elevation (ft) ARL	Carrier	QTY.	APPURTENANCES DESCRIPTION	COAX
125	100	106	-	1	12' Omni	(1) 1/2" (2) 5/8" (1) 7/8"
		105		1	4 Bay Dipole	
				1	10' Omni	
		103		1	6' Omni	
122	97	97	Clearwire (Abandoned)	12	2-3/8" Mast Pipes	(12) 1-1/4" (1) 2" Flex Conduit (3) 7/8"
				3	13' Standoff Mount	
102	77	80.5	VZW	3*	MTC6407-77A w/ Integrated RRH*	(12) 1-5/8" (2) Hybrid
		79		6	SBNHH-1D65B	
				1*	BXA-80063/4CF*	
				2*	SLCP 2x6014*	
				3	B2/B66A RRH	
				3	B5/B13 RRH	
				1	RVZDC-6627-PF-48	
				3	Sector Mount (VFA12-HD)	
		77		3	CBRS RRH w/ Clip-on Antenna	
69	44	48	-	1	4' Yagi	(1) 1-5/8"
55	30	30		1	4' Yagi	(1) 1/2"
32	7	7		1	2'x2'x1' Junction Box	-

*Equipment to be removed
AGL: At Grade Line
ARL: At Roof Line (Roofline being elevation 25' above ground)

3.2 Proposed Appurtenance Loading Configuration on Tower:

Mounting Elevation (ft) AGL	Mounting Elevation (ft) ARL	Center Line Elevation (ft) ARL	Carrier	QTY.	APPURTENANCES DESCRIPTION	COAX
102	77	77	VZW	3	MT6413-77A w/ Integrated RRH	-

AGL: At Grade Line
ARL: At Roof Line (Roofline being elevation 25' above ground)

3.3 Final Appurtenance Loading Configuration on Tower:

Mounting Elevation (ft) AGL	Mounting Elevation (ft) ARL	Center Line Elevation (ft) ARL	Carrier	QTY.	APPURTENANCES DESCRIPTION	COAX
102	77	80.5	VZW	3	MTC6413-77A w/ Integrated RRH	(12) 1-5/8" (2) Hybrid
		79		6	SBNHH-1D65B	
				3	B2/B66A RRH	
				3	B5/B13 RRH	
				1	RVZDC-6627-PF-48	
		77		3	Sector Mount (VFA12-HD)	
				3	CBRS RRH w/ Clip-on Antenna	

AGL: At Grade Line
ARL: At Roof Line (Roofline being elevation 25’ above ground)

3.4 Method:

tnxTower, a commercially available engineering software program, was used to create a three-dimensional model of the tower members and calculate primary member stresses under various loading conditions. Selected output from the analysis is included in Appendix A.

4.0 TOWER ANALYSIS RESULTS SUMMARY

4.1 Tower Structure Results

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	125 - 105	Leg	2	2	-15046.50	74093.50	20.3	Pass
		Diagonal	7/8	40	-1813.46	9631.38	18.8	Pass
		Horizontal	L2x2x3/16	16	1388.93	23166.00	6.0	Pass
		Top Girt	L2x2x3/16	4	142.81	18739.00	0.8	Pass
		Bottom Girt	L2x2x3/16	7	838.64	23166.00	3.6	Pass
		Guy A@116.958	3/4	258	17884.50	34980.00	51.1	Pass
		Guy B@116.958	3/4	257	19111.50	34980.00	54.6	Pass
		Guy C@116.958	3/4	256	18683.40	34980.00	53.4	Pass
		Top Guy Pull-Off@116.958	3'' x 1/4'' Plate	36	2168.90	24300.00	16.2	Pass
T2	105 - 85	Leg	2	54	-34607.40	74093.50	46.7	Pass
		Diagonal	7/8	64	-4879.23	9631.38	50.7	Pass
		Horizontal	L2x2x3/16	94	1911.50	23166.00	8.3	Pass
		Top Girt	L2x2x3/16	55	856.40	18739.00	4.6	Pass
		Bottom Girt	L2x2x3/16	59	1862.67	23166.00	8.0	Pass
T3	85 - 65	Leg	2 1/4	105	-57303.70	107392.00	53.4	Pass
		Diagonal	7/8	151	-5270.35	9729.92	54.2	Pass
		Horizontal	L2x2x3/16	128	2637.13	23166.00	11.4	Pass
		Top Girt	L2x2x3/16	107	-992.53	17680.00	5.6	Pass
		Bottom Girt	L2x2x3/16	110	-992.53	17079.90	5.8	Pass
		Guy A@76.9583	7/8	261	24508.00	47820.00	51.3	Pass
		Guy B@76.9583	7/8	260	27690.20	47820.00	57.9	Pass
		Guy C@76.9583	7/8	259	26080.80	47820.00	54.5	Pass
		Top Guy Pull-Off@76.9583	3'' x 1/4'' Plate	136	7060.44	24300.00	29.1	Pass
T4	65 - 45	Leg	2	156	-35664.30	74093.50	48.1	Pass
		Diagonal	7/8	204	-4188.89	9631.38	43.5	Pass
		Horizontal	L2x2x1/8	197	2540.63	15693.80	16.2	Pass
		Top Girt	L2x2x1/8	158	1703.35	15693.80	10.9	Pass
		Bottom Girt	L2x2x1/8	160	1491.21	15693.80	9.5	Pass
T5	45 - 29	Leg	2	206	-28139.90	74603.20	37.7	Pass
		Diagonal	7/8	246	-2514.90	9676.41	26.0	Pass
		Horizontal	L2x2x1/8	238	2685.52	15693.80	17.1	Pass
		Top Girt	L2x2x1/8	208	1263.61	15693.80	8.1	Pass
		Bottom Girt	L2x2x1/8	211	4302.56	15693.80	27.4	Pass
T6	29 - 25	Leg	2	248	-31797.70	95668.20	33.2	Pass
		Top Girt	L3x3x1/8	250	4188.05	23793.80	17.6	Pass
		Bottom Girt	12'' x 3/8'' Plate	253	-244.20	116106.00	0.3	Pass
							Summary	
						Leg (T3)	53.4	Pass
						Diagonal (T3)	54.2	Pass
						Horizontal (T5)	17.1	Pass
						Top Girt (T6)	17.6	Pass
						Bottom Girt (T5)	27.4	Pass
						Guy A (T3)	51.3	Pass
						Guy B (T3)	57.9	Pass
						Guy C (T3)	54.5	Pass
						Top Guy Pull-Off (T3)	29.1	Pass
						Bolt Checks	16.2	Pass
						RATING =	**57.9**	**Pass**

Table above displays the summary of the ratio (as the percentage) of force in the member to their capacities. Values greater than 100% indicate the maximum force in the member exceeds its capacity.

4.2 Foundation results

Guy forces are transferred to the existing building structure via three (3) 7/8"ø and three (3) 3/4"ø galvanized steel guy wires with turnbuckles. All guy anchorage posts are positively attached to the existing building structure. Connections to the existing building were originally designed by Cianci & Cianci Structural Engineers job no: 97-113-01 dated October 22, 1997.

Review of the guy anchor and tower base connections consisted of a comparison of the proposed reactions and the design reactions obtained from the aforementioned design documents:

Calculated Proposed + Existing Equipment Loading Reactions Compared to Previous Reactions:

Condition	Calculated Foundation Reactions (Rev H) (kip)	Original Design Reactions (Rev F) (kip)	Original Design Reaction x 1.35 (Rev G) (kip)	% Original Reactions	Pass/Fail
Tower Base Vert.	85.923	106.0	143.10	60.0%	Pass
Tower Base Horiz.	1.652	1.6	2.16	76.5%	Pass
Guy Anchor A @ 45' Vert.	34.575	45.1	60.89	56.8%	Pass
Guy Anchor A @ 45' Horiz.	23.414	31.7	42.80	54.7%	Pass
Guy Anchor B @ 39' Vert.	39.876	51.6	69.66	57.2%	Pass
Guy Anchor B @ 39' Horiz.	23.553	32.0	43.20	54.5%	Pass
Guy Anchor C @ 37.5' Vert.	37.427	47.8	64.53	58.0%	Pass
Guy Anchor C @ 37.5' Horiz.	23.542	31.6	42.66	55.2%	Pass

5.0 CONCLUSIONS AND COMMENTARY

After analysis, it was determined that the existing tower structure and foundation **is adequate** to support the proposed forces as a result of the telecommunication upgrade.

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. Dewberry Engineers Inc. reserves the right to add to or modify this report if more information becomes available. The conclusions reached by Dewberry Engineers Inc. in this report are only applicable to the previously mentioned existing structural elements supporting the proposed wireless telecommunications installation. The results of this report are based on the assumption that existing structural elements have been installed per the original design documents, have been well maintained and are uncompromised. This report does not imply that a thorough inspection of the existing structure has been performed. Any deviation of the support condition, loading, location, placement, equipment configuration, etc, will require Dewberry Engineers Inc. to generate an additional structural analysis.

6.0 ASSUMPTIONS

This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. Dewberry Engineers Inc. has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. The soil parameters are as per data supplied or as assumed and stated in the calculations.
6. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
7. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.
8. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
9. All prior structural modifications are assumed to be as per data supplied/ available and to have been properly installed.
10. Loading interpreted from photos is accurate to ±5' AGL, antenna size accurate to ±3.3 sf, and coax equal to the number of existing antennas without reserves
11. All sector frames have their elevation based on the vertical centerline of the platform – half the distance between the 2 connection points to the tower leg.
12. Analysis considers no additional changes to the tower equipment configuration since photos were taken on July 1, 2022. Sector frame, mast pipes and coax cables have been abandoned and left on the mount and are still considered in this analysis.

    If any of these assumptions are not valid or have been made in error, this analysis may be affected, and Dewberry Engineering Inc. should be allowed to review any new information to determine its effect on the structural integrity of the tower.

7.0 DISCLAIMER OF WARRANTIES

If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by Dewberry Engineers Inc. in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no

other loads are applied. No allowance was made for any damaged, bent, missing, loose or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

Dewberry Engineers Inc. does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. Dewberry Engineers Inc. provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to calculate the structural integrity for the existing tower under existing and proposed loadings.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing condition, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from Dewberry Engineering Inc., but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connections to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

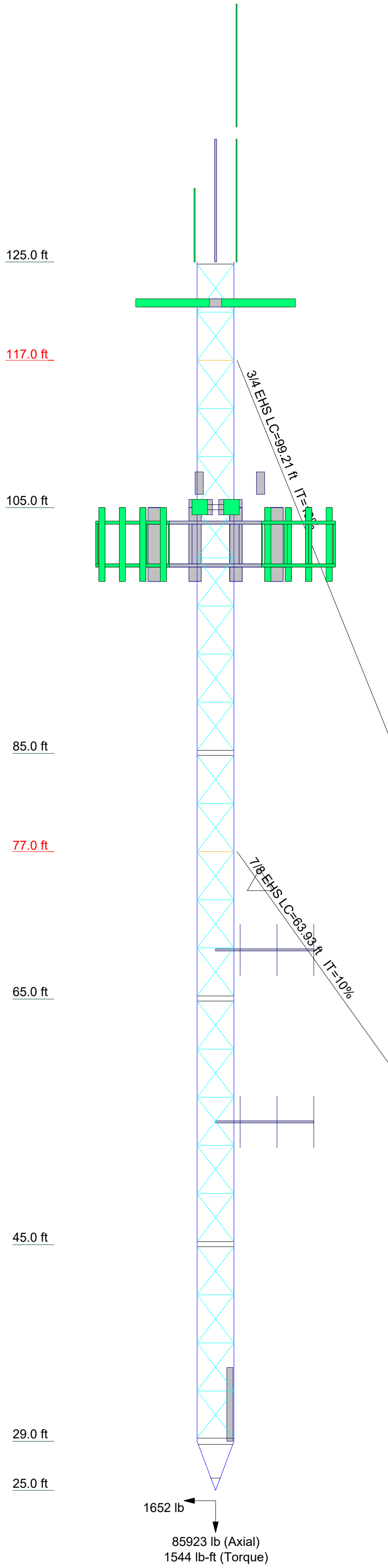
Dewberry Engineers Inc. makes no warranties, expresses and/or implied in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. Dewberry will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of Dewberry pursuant to this report will be limited to the total fee received for preparation of this report.

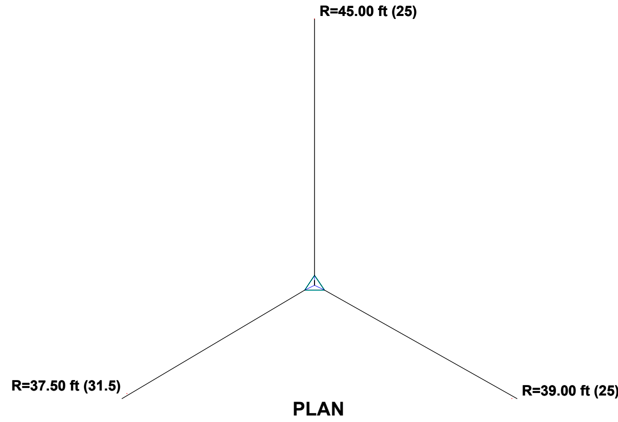
APPENDIX A

tnxTOWER OUTPUT FOR PROPOSED LOADING

Section	T1	T2	T3	T4	T5	T6
Legs	SR 2		SR 2 1/4	SR 2		
Leg Grade	A572-50					
Diagonals	SR 7/8					N.A.
Diagonal Grade	A36					N.A.
Top Girts	L2x2x3/16			L2x2x1/8		A
Bottom Girts	L2x2x3/16			L2x2x1/8		B
Horizontals	L2x2x3/16			L2x2x1/8		N.A.
Top Guy Pull-Offs	3" x 1/4" Plate	N.A.	3" x 1/4" Plate	N.A.		
Face Width (ft)	3.04					
# Panels @ (ft)	20 @ 3.91667				4 @ 3.89583	C
Weight (lb)	1080.0	1078.9	1250.4	1035.9	831.0	196.6

5472.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10'x3" Dia Omni	125	(2) SBNHH-1D65B w/ Mast Pipe (Verizon)	102
4 Bay DiPole	125	MT6413-77A w/ 8' long pipe (Verizon)	102
12'x3" Dia Omni	125	CBRS RRH w/ Clip-on Antenna w/ mast pipe (Verizon)	102
6'x3" Dia Omni	125	(2) SBNHH-1D65B w/ Mast Pipe (Verizon)	102
Valmont 13' standoff Mounting Frame (Clearwire)	122	MT6413-77A w/ 8' long pipe (Verizon)	102
Valmont 13' standoff Mounting Frame (Clearwire)	122	CBRS RRH w/ Clip-on Antenna w/ mast pipe (Verizon)	102
Valmont 13' standoff Mounting Frame (Clearwire)	122	(2) SBNHH-1D65B w/ Mast Pipe (Verizon)	102
(4) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	122	MT6413-77A w/ 8' long pipe (Verizon)	102
(4) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	122	B5/B13 RRH (Verizon)	102
(4) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	122	B5/B13 RRH (Verizon)	102
Valmont VFA12-HD Sector Frame (Verizon)	102	B5/B13 RRH (Verizon)	102
Valmont VFA12-HD Sector Frame (Verizon)	102	B2/B66A RRH (Verizon)	102
Valmont VFA12-HD Sector Frame (Verizon)	102	B2/B66A RRH (Verizon)	102
CBRS RRH w/ Clip-on Antenna w/ mast pipe (Verizon)	102	B2/B66A RRH (Verizon)	102
		(2) DB-T1-6Z-12AB-OZ OVP (Verizon)	102
		4' Yagi	69
		4' Yagi	55
		2'x2'x1' junction box	32

SYMBOL LIST

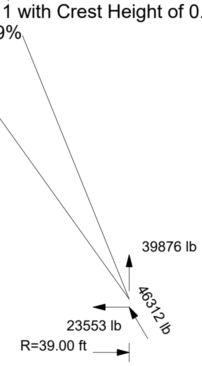
MARK	SIZE	MARK	SIZE
A	L3x3x1/8	C	1 @ 2.78842
B	12" x 3/8" Plate		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 57.9%



ALL REACTIONS ARE FACTORED

Dewberry Engineers, Inc. 99 Summer Street, Suite 700 Boston, MA 02110 Phone: 617-531-0744 FAX: 631-836-1919	Job: ***West Hartford Center CT***		
	Project: ***50002925 / 50104156***		
	Client: Verizon Wireless	Drawn by: adeuschle	App'd:
	Code: TIA-222-H	Date: 07/18/23	Scale: NTS
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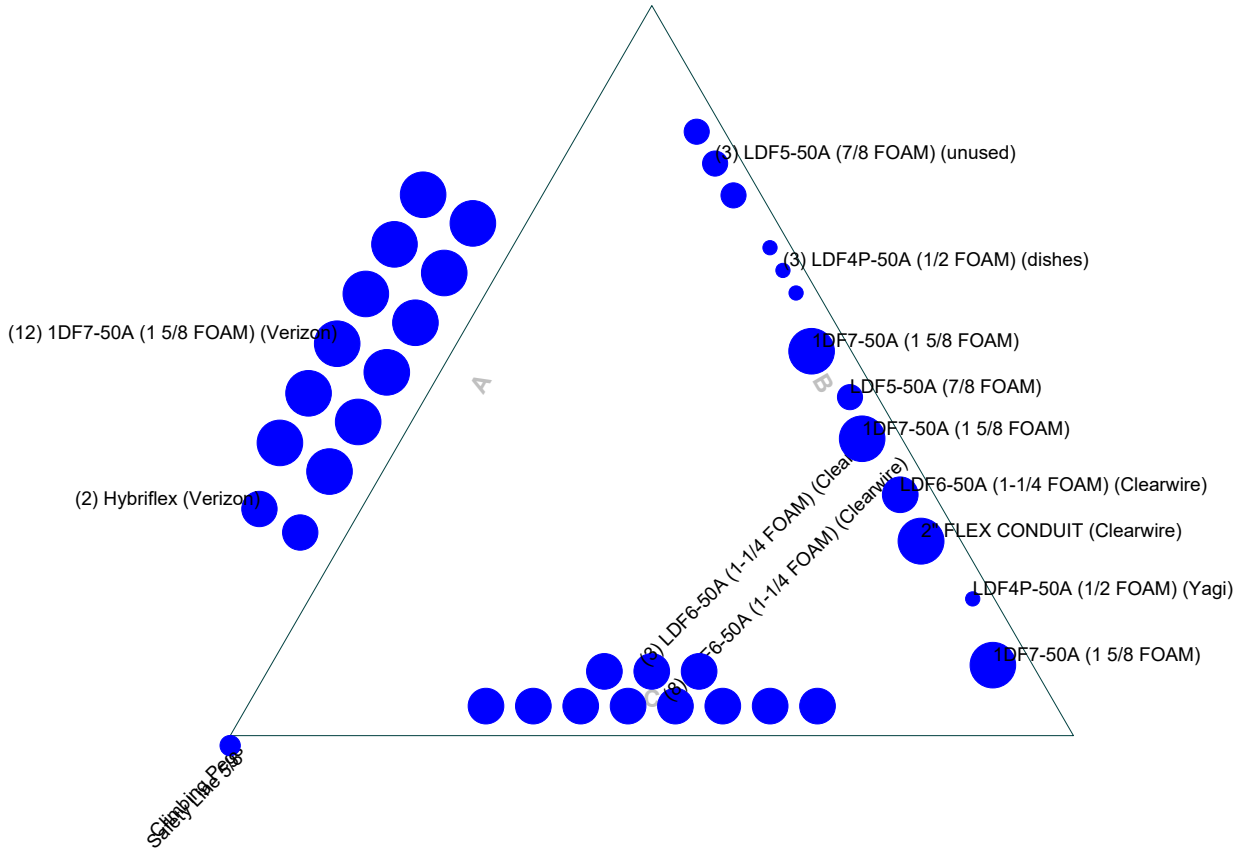
Feed Line Plan

Round Flat App In Face App Out Face



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Job: **West Hartford Center CT**			
Project: ***50002925 / 50104156***			
Client: Verizon Wireless	Drawn by: adeuschle	App'd:	
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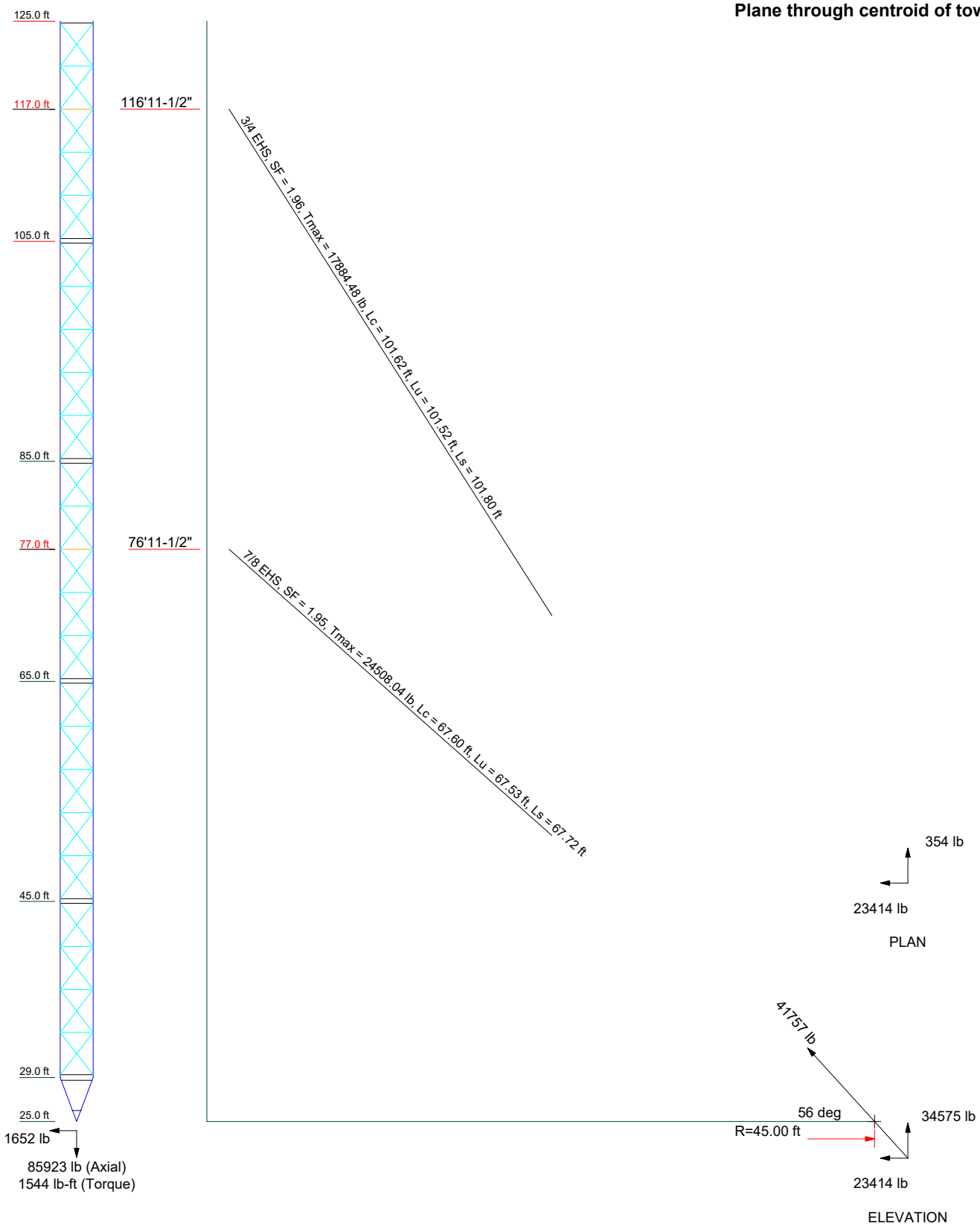
Guy Tensions and Tower Reactions

TIA-222-H - 125 mph/50 mph 1.5000 in Ice Exposure C

Maximum Values
Anchor 'A'@45 ft Azimuth 0 deg Elev 25 ft
Plane through centroid of tower



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	Project: ***50002925 / 50104156***		
	Client: Verizon Wireless	Drawn by: adeuschle	App'd:
	Code: TIA-222-H	Date: 07/18/23	Scale: NTS
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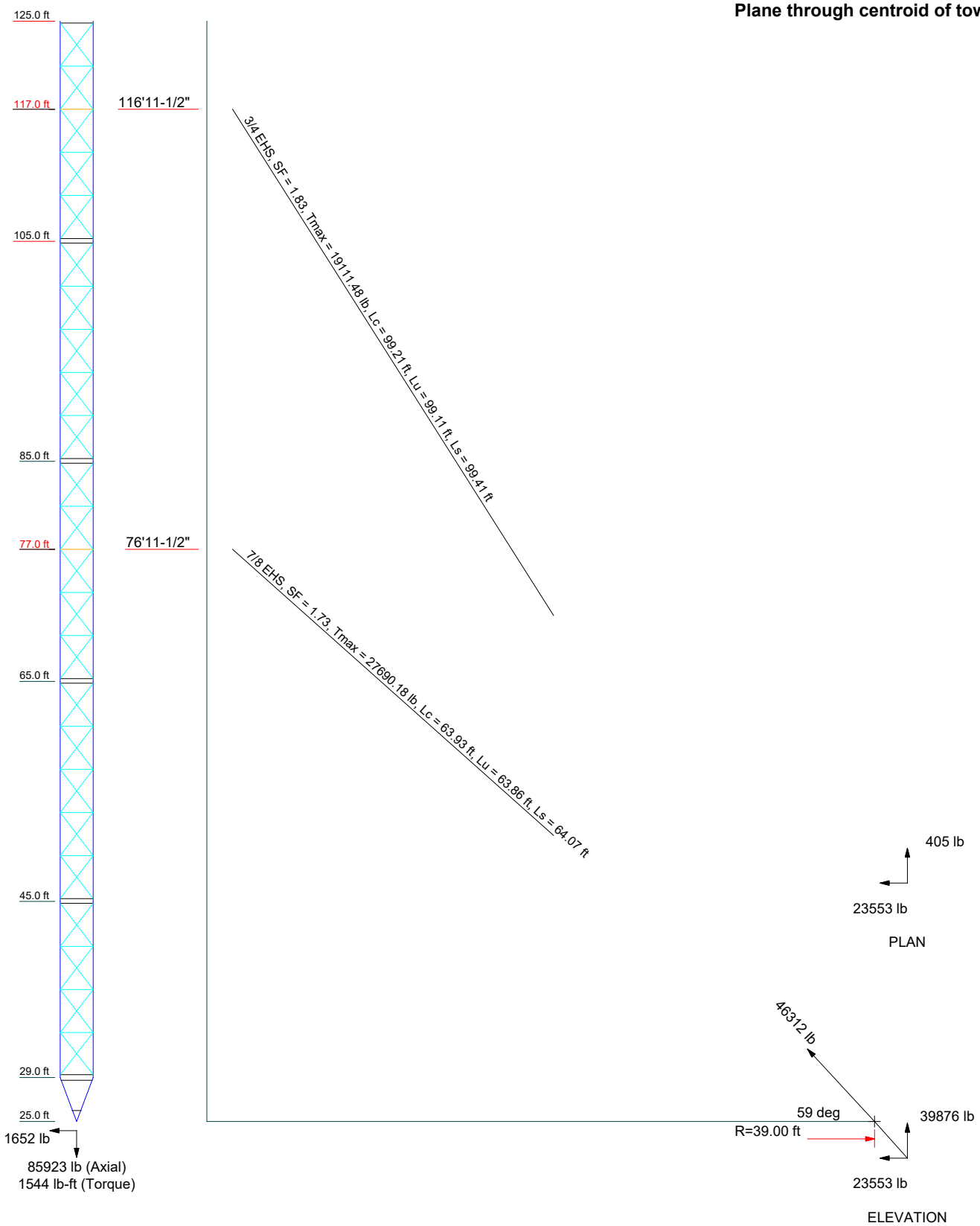
Guy Tensions and Tower Reactions

TIA-222-H - 125 mph/50 mph 1.5000 in Ice Exposure C

Maximum Values

Anchor 'B'@39 ft Azimuth 120 deg Elev 25 ft

Plane through centroid of tower



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	Client: Verizon Wireless	Drawn by: adeuschle	App'd:
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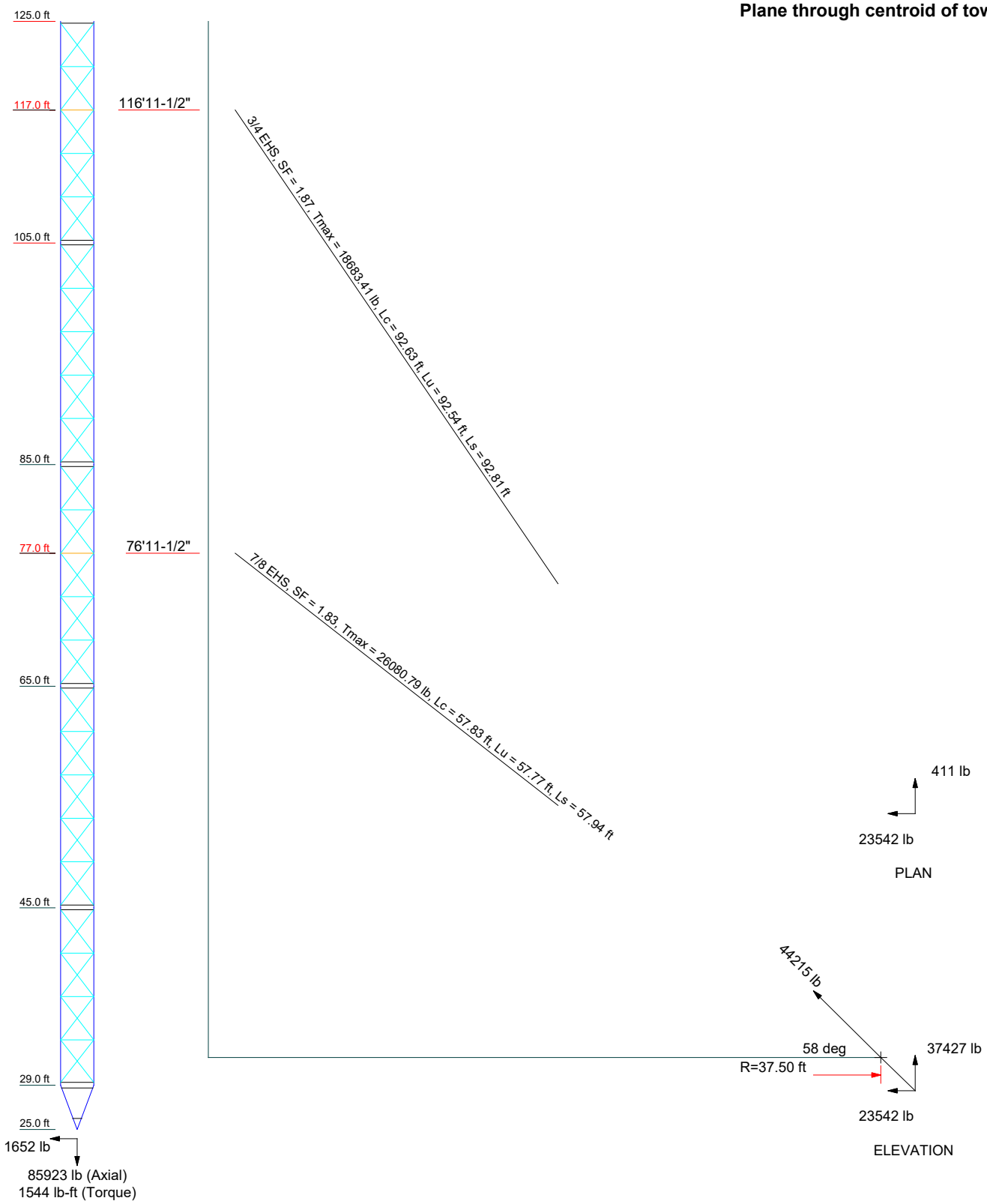
Guy Tensions and Tower Reactions

TIA-222-H - 125 mph/50 mph 1.5000 in Ice Exposure C

Maximum Values

Anchor 'C'@37.5 ft Azimuth 240 deg Elev 31.5 ft

Plane through centroid of tower



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Job: ***West Hartford Center CT***			
Project: ***50002925 / 50104156***			
Client: Verizon Wireless	Drawn by: adeuschle	App'd:	
Code: TIA-222-H	Date: 07/18/23	Scale: NTS	
Path: C:\Users\adeuschle\Desktop\Current Projects\Rev1_Hartford Center\50104156 - West Hartford Center CT.tnl		Dwg No. E-6	

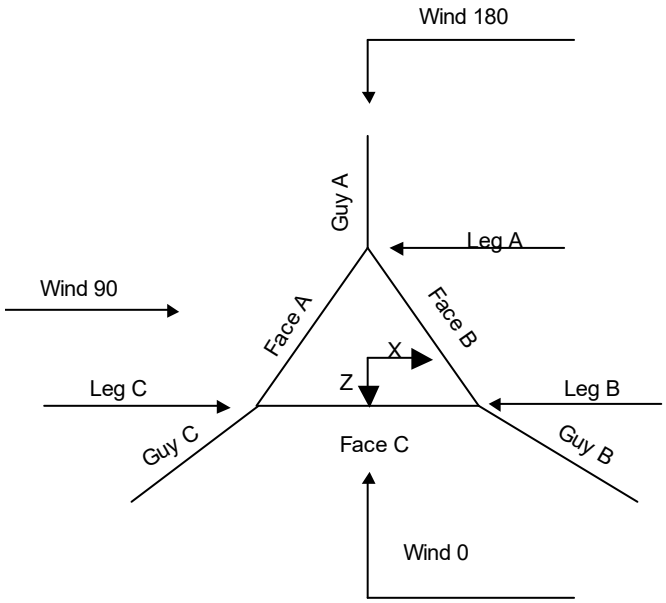
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 125.00 ft above the ground line.
The base of the tower is set at an elevation of 25.00 ft above the ground line.
The face width of the tower is 3.04 ft at the top and tapered at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 25.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 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.
Stress ratio used in tower member design is 1.
Safety factor used in guy 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-H Bracing Resist. Exemption
	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-H 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		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	125.00-105.00			3.04	1	20.00
T2	105.00-85.00			3.04	1	20.00
T3	85.00-65.00			3.04	1	20.00
T4	65.00-45.00			3.04	1	20.00
T5	45.00-29.00			3.04	1	16.00
T6	29.00-25.00			3.04	1	4.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	125.00-105.00	3.92	X Brace	No	Yes	2.5000	2.5000
T2	105.00-85.00	3.92	X Brace	No	Yes	2.5000	2.5000
T3	85.00-65.00	3.92	X Brace	No	Yes	2.5000	2.5000
T4	65.00-45.00	3.92	X Brace	No	Yes	2.5000	2.5000

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
T5	45.00-29.00	3.90	X Brace	No	Yes	2.5000	2.5000
T6	29.00-25.00	2.79	X Brace	No	Yes	2.5390	12.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 125.00-105.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 105.00-85.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 85.00-65.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 65.00-45.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T5 45.00-29.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T6 29.00-25.00	Solid Round	2	A572-50 (50 ksi)	Flat Bar		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 125.00-105.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 105.00-85.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 85.00-65.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 65.00-45.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 45.00-29.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 29.00-25.00	Single Angle	L3x3x1/8	A36 (36 ksi)	Flat Bar	12" x 3/8" Plate	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 125.00-105.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 105.00-85.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 85.00-65.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 65.00-45.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 45.00-29.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 29.00-25.00	1	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		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 125.00-105.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 105.00-85.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 85.00-65.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 65.00-45.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 45.00-29.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 29.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 125.00-105.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 105.00-85.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 85.00-65.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 65.00-45.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 45.00-29.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 29.00-25.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 125.00-105.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 105.00-85.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 85.00-65.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 65.00-45.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 45.00-29.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 29.00-25.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 125.00-105.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 105.00-85.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 85.00-65.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 65.00-45.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 45.00-29.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 29.00-25.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 125.00-105.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 105.00-85.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 85.00-65.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 65.00-45.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 45.00-29.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T6 29.00-25.00	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
116.958	EHS	A	3/4	5830.00	10%	19000	1.155	101.53	45.00	0.0000	25.00	100%
		B	3/4	5830.00	10%	19000	1.155	99.12	39.00	0.0000	25.00	100%
		C	3/4	5830.00	10%	19000	1.155	92.55	37.50	0.0000	31.50	100%
76.9583	EHS	A	7/8	7970.00	10%	19000	1.581	67.54	45.00	0.0000	25.00	100%
		B	7/8	7970.00	10%	19000	1.581	63.87	39.00	0.0000	25.00	100%
		C	7/8	7970.00	10%	19000	1.581	57.78	37.50	0.0000	31.50	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
116.958	Corner						
76.9583	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
116.96	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	3" x 1/4" Plate
76.96	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	3" x 1/4" Plate

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
116.958	117.26	114.49	106.89		1.01 1.7 sec/pulse	0.97 1.7 sec/pulse	0.84 1.6 sec/pulse	
76.9583	106.78	100.98	91.34		0.45 1.2 sec/pulse	0.40 1.1 sec/pulse	0.33 1.0 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
116.958	No	No			1	1	1	1
76.9583	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
116.958	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
76.9583	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
116.958	A	70.98	40	6	1.6194
	B	70.98	40	6	1.6194
	C	74.23	40	6	1.6267
76.9583	A	50.98	37	6	1.5667
	B	50.98	37	6	1.5667
	C	54.23	38	6	1.5764

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
116.958	A	64.8140	5936.11	0.00	5382.38	-2503.49	-9446.85	0.00	0.00

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
			5830.00						
	B	67.9511	5936.11	1912.54	5510.03	1104.20	4835.45	0.00	-8375.24
			5830.00						
	C	67.3018	5928.61	-1964.69	5477.39	1134.31	4806.81	-0.00	8325.63
			5830.00						
			Sum:	**-52.15**	16369.79	**-264.98**	**195.40**	-0.00	**-49.60**
76.9583	A	50.2294	8052.07	0.00	6210.75	-5124.69	-10900.77	0.00	0.00
			7970.00						
	B	54.3662	8052.07	4041.89	6561.50	2333.59	5758.19	0.00	-9973.49
			7970.00						
	C	51.8213	8041.80	-4285.54	6338.99	2474.26	5562.92	-0.00	9635.26
			7970.00						
			Sum:	**-243.65**	19111.24	**-316.84**	**420.35**	-0.00	**-338.22**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
116.958	A	64.8140	8461.34	0.00	7710.33	-3484.97	-13532.74	0.00	0.00
			7924.56						
	B	67.9511	8403.88	2643.70	7829.83	1526.34	6871.25	0.00	-11901.35
			7867.10						
	C	67.3018	8371.40	-2712.63	7763.32	1566.14	6812.88	-0.00	11800.25
			7869.53						
			Sum:	**-68.93**	23303.48	**-392.49**	**151.38**	-0.00	**-101.10**
76.9583	A	50.2294	11202.96	0.00	8696.93	-7061.84	-15264.38	0.00	0.00
			10878.29						
	B	54.3662	11154.92	5545.58	9133.87	3201.74	8015.63	0.00	-13883.48
			10830.25						
	C	51.8213	11121.71	-5876.28	8812.01	3392.67	7733.18	-0.00	13394.26
			10835.49						
			Sum:	**-330.69**	26642.82	**-467.43**	**484.43**	-0.00	**-489.22**

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
116.958	A	64.8140	5936.11	0.00	5382.38	-2503.49	-9446.85	0.00	0.00
			5830.00						
	B	67.9511	5936.11	1912.54	5510.03	1104.20	4835.45	0.00	-8375.24
			5830.00						
	C	67.3018	5928.61	-1964.69	5477.39	1134.31	4806.81	-0.00	8325.63
			5830.00						

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
			Sum:	**-52.15**	16369.79	**-264.98**	**195.40**	-0.00	**-49.60**
76.9583	A	50.2294	8052.07 7970.00	0.00	6210.75	-5124.69	-10900.77	0.00	0.00
	B	54.3662	8052.07 7970.00	4041.89	6561.50	2333.59	5758.19	0.00	-9973.49
	C	51.8213	8041.80 7970.00	-4285.54	6338.99	2474.26	5562.92	-0.00	9635.26
			Sum:	**-243.65**	19111.24	**-316.84**	**420.35**	-0.00	**-338.22**

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning: 0 F Initial Tension lb	0 F Intercept ft	20 F Initial Tension lb	20 F Intercept ft	40 F Initial Tension lb	40 F Intercept ft	60 F Initial Tension lb	60 F Intercept ft	80 F Initial Tension lb	80 F Intercept ft	100 F Initial Tension lb	100 F Intercept ft	120 F Initial Tension lb	120 F Intercept ft
116.958	A	43.24	91.96	6279	0.94	6129	0.96	5979	0.99	5830	1.01	5681	1.04	5531	1.07	5382	1.10
	B	37.24	91.96	6180	0.91	6063	0.93	5946	0.95	5830	0.97	5714	0.99	5597	1.01	5481	1.03
	C	35.74	85.46	6200	0.79	6076	0.81	5953	0.82	5830	0.84	5707	0.86	5584	0.88	5461	0.90
76.9583	A	43.24	51.96	9357	0.38	8894	0.40	8432	0.43	7970	0.45	7509	0.48	7049	0.51	6590	0.54
	B	37.24	51.96	9122	0.35	8737	0.37	8353	0.38	7970	0.40	7587	0.42	7204	0.45	6822	0.47
	C	35.74	45.46	9267	0.28	8834	0.30	8402	0.31	7970	0.33	7539	0.35	7108	0.37	6678	0.39

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Climbing Pegs	C	No	No	Ar (CaAa)	125.00 - 29.00	0.0000	0.5	1	1	0.2500 0.0000	0.1500		0.31
1DF7-50A (1 5/8 FOAM) (Verizon)	A	No	No	Ar (CaAa)	104.00 - 29.00	1.0000	0	12	6	0.5000	1.9800		0.82
Hybriflex (Verizon)	A	No	No	Ar (CaAa)	104.00 - 29.00	1.0000	-0.25	2	1	0.5000	1.5400		1.08
LDF6-50A (1-1/4 FOAM) (Clearwire)	C	No	No	Ar (CaAa)	122.00 - 29.00	-0.5000	0	8	8	0.5000	1.5500		0.66
LDF6-50A (1-1/4 FOAM) (Clearwire)	C	No	No	Ar (CaAa)	122.00 - 29.00	-2.0000	0	3	3	0.5000	1.5500		0.66
1DF7-50A (1 5/8 FOAM)	B	No	No	Ar (CaAa)	125.00 - 29.00	-0.5000	-0.05	1	1	0.5000	1.9800		0.82
1DF7-50A (1 5/8 FOAM)	B	No	No	Ar (CaAa)	125.00 - 29.00	-0.5000	0.07	1	1	0.5000	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	125.00 - 29.00	-0.5000	0.02	1	1	0.5000	1.0900		0.33
LDF4P-50A (1/2 FOAM) (dishes)	B	No	No	Ar (CaAa)	122.00 - 29.00	-0.5000	-0.15	3	3	0.5000	0.6300		0.15
LDF5-50A	B	No	No	Ar (CaAa)	122.00 -	-0.5000	-0.3	3	3	0.5000	1.0900		0.33

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(7/8 FOAM) (unused)					29.00								
LDF6-50A (1-1/4 FOAM) (Clearwire)	B	No	No	Ar (CaAa)	122.00 - 29.00	-0.5000	0.15	1	1	0.5000	1.5500		0.66
2" FLEX CONDUIT (Clearwire)	B	No	No	Ar (CaAa)	122.00 - 29.00	-0.5000	0.21	1	1	0.5000	2.0000		0.32
LDF4P-50A (1/2 FOAM) (Yagi)	B	No	No	Ar (CaAa)	55.00 - 29.00	-0.5000	0.3	1	1	0.5000	0.6300		0.15
1DF7-50A (1 5/8 FOAM)	B	No	No	Ar (CaAa)	69.00 - 29.00	-0.5000	0.38	1	1	0.5000	1.9800		0.82
Safety Line 5/8	C	No	No	Ar (CaAa)	125.00 - 29.00	0.0000	0.5	1	1	0.8800	0.8800		0.40

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	125.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	24.907	0.000	80.54
		C	0.000	0.000	31.045	0.000	137.62
T2	105.00-85.00	A	0.000	0.000	50.996	0.000	228.00
		B	0.000	0.000	27.520	0.000	87.80
		C	0.000	0.000	36.160	0.000	159.40
T3	85.00-65.00	A	0.000	0.000	53.680	0.000	240.00
		B	0.000	0.000	28.312	0.000	91.08
		C	0.000	0.000	36.160	0.000	159.40
T4	65.00-45.00	A	0.000	0.000	53.680	0.000	240.00
		B	0.000	0.000	32.110	0.000	105.70
		C	0.000	0.000	36.160	0.000	159.40
T5	45.00-29.00	A	0.000	0.000	42.944	0.000	192.00
		B	0.000	0.000	26.192	0.000	85.76
		C	0.000	0.000	28.928	0.000	127.52
T6	29.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	125.00-105.00	A	1.699	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	82.839	0.000	1066.02
		C		0.000	0.000	79.910	0.000	1042.29
T2	105.00-85.00	A	1.667	0.000	0.000	66.058	0.000	1178.71
		B		0.000	0.000	90.991	0.000	1143.47
		C		0.000	0.000	90.577	0.000	1168.21
T3	85.00-65.00	A	1.628	0.000	0.000	69.006	0.000	1217.50
		B		0.000	0.000	91.772	0.000	1140.39

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C		0.000	0.000	89.765	0.000	1140.55
T4	65.00-45.00	A	1.579	0.000	0.000	68.333	0.000	1188.15
		B		0.000	0.000	102.062	0.000	1262.13
		C		0.000	0.000	88.729	0.000	1105.68
T5	45.00-29.00	A	1.517	0.000	0.000	54.002	0.000	921.95
		B		0.000	0.000	82.632	0.000	991.90
		C		0.000	0.000	69.962	0.000	850.65
T6	29.00-25.00	A	1.470	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	125.00-105.00	1.4010	-1.1517	0.8746	-0.5898
T2	105.00-85.00	-0.6716	-2.4264	-0.0928	-1.1642
T3	85.00-65.00	-0.6865	-2.4046	-0.1036	-1.1641
T4	65.00-45.00	-0.2837	-2.1101	0.3588	-0.9050
T5	45.00-29.00	-0.1905	-2.0506	0.5673	-0.8208
T6	29.00-25.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Climbing Pegs	105.00 - 125.00	0.6000	0.3979
T1	4	LDF6-50A (1-1/4 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	5	LDF6-50A (1-1/4 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	6	1DF7-50A (1 5/8 FOAM)	105.00 - 125.00	0.6000	0.3979
T1	7	1DF7-50A (1 5/8 FOAM)	105.00 - 125.00	0.6000	0.3979
T1	8	LDF5-50A (7/8 FOAM)	105.00 - 125.00	1.0000	1.0000
T1	9	LDF4P-50A (1/2 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	10	LDF5-50A (7/8 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	11	LDF6-50A (1-1/4 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	12	2" FLEX CONDUIT	105.00 - 122.00	0.6000	0.3979
T1	15	Safety Line 5/8	105.00 - 125.00	1.0000	1.0000
T2	1	Climbing Pegs	85.00 - 105.00	0.6000	0.3990
T2	2	1DF7-50A (1 5/8 FOAM)	85.00 - 104.00	0.6000	0.3990

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	3	Hybriflex	85.00 - 104.00	0.6000	0.3990
T2	4	LDF6-50A (1-1/4 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	5	LDF6-50A (1-1/4 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	6	1DF7-50A (1 5/8 FOAM)	85.00 - 105.00	0.6000	0.3990
T2	7	1DF7-50A (1 5/8 FOAM)	85.00 - 105.00	0.6000	0.3990
T2	8	LDF5-50A (7/8 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	9	LDF4P-50A (1/2 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	10	LDF5-50A (7/8 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	11	LDF6-50A (1-1/4 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	12	2" FLEX CONDUIT	85.00 - 105.00	0.6000	0.3990
T2	15	Safety Line 5/8	85.00 - 105.00	1.0000	1.0000
T3	1	Climbing Pegs	65.00 - 85.00	0.6000	0.4076
T3	2	1DF7-50A (1 5/8 FOAM)	65.00 - 85.00	0.6000	0.4076
T3	3	Hybriflex	65.00 - 85.00	0.6000	0.4076
T3	4	LDF6-50A (1-1/4 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	5	LDF6-50A (1-1/4 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	6	1DF7-50A (1 5/8 FOAM)	65.00 - 85.00	0.6000	0.4076
T3	7	1DF7-50A (1 5/8 FOAM)	65.00 - 85.00	0.6000	0.4076
T3	8	LDF5-50A (7/8 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	9	LDF4P-50A (1/2 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	10	LDF5-50A (7/8 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	11	LDF6-50A (1-1/4 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	12	2" FLEX CONDUIT	65.00 - 85.00	0.6000	0.4076
T3	14	1DF7-50A (1 5/8 FOAM)	65.00 - 69.00	0.6000	0.4076
T3	15	Safety Line 5/8	65.00 - 85.00	1.0000	1.0000
T4	1	Climbing Pegs	45.00 - 65.00	0.6000	0.4186
T4	2	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.4186
T4	3	Hybriflex	45.00 - 65.00	0.6000	0.4186
T4	4	LDF6-50A (1-1/4 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	5	LDF6-50A (1-1/4 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	6	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.4186
T4	7	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.4186
T4	8	LDF5-50A (7/8 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	9	LDF4P-50A (1/2 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	10	LDF5-50A (7/8 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	11	LDF6-50A (1-1/4 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	12	2" FLEX CONDUIT	45.00 - 65.00	0.6000	0.4186
T4	13	LDF4P-50A (1/2 FOAM)	45.00 - 55.00	1.0000	1.0000
T4	14	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.4186
T4	15	Safety Line 5/8	45.00 - 65.00	1.0000	1.0000
T5	1	Climbing Pegs	29.00 - 45.00	0.6000	0.4286
T5	2	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.4286
T5	3	Hybriflex	29.00 - 45.00	0.6000	0.4286
T5	4	LDF6-50A (1-1/4 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	5	LDF6-50A (1-1/4 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	6	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.4286
T5	7	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.4286
T5	8	LDF5-50A (7/8 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	9	LDF4P-50A (1/2 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	10	LDF5-50A (7/8 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	11	LDF6-50A (1-1/4 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	12	2" FLEX CONDUIT	29.00 - 45.00	0.6000	0.4286
T5	13	LDF4P-50A (1/2 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	14	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.4286
T5	15	Safety Line 5/8	29.00 - 45.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert (ft / ft / ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (lb)
10'x3" Dia Omni	A	From Leg	0.25 0.00 5.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.00 4.03 5.03 6.26	3.00 4.03 5.03 6.26	35.00 56.79 85.14 162.16
4 Bay DiPole	B	From Leg	0.25 0.00 5.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.15 5.67 8.19 13.23	3.15 5.67 8.19 13.23	32.00 42.00 52.00 72.00
12'x3" Dia Omni	B	From Leg	0.25 0.00 16.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.60 4.83 6.08 8.02	3.60 4.83 6.08 8.02	36.00 62.06 95.92 187.60
6'x3" Dia Omni	C	From Leg	0.25 0.00 3.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.77 2.13 2.50 3.27	1.77 2.13 2.50 3.27	20.00 33.24 50.59 98.29
Valmont 13' standoff Mounting Frame (Clearwire)	A	From Leg	2.25 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.60 28.80 37.00 53.40	12.90 19.40 25.90 38.90	517.00 784.00 1051.00 1585.00
Valmont 13' standoff Mounting Frame (Clearwire)	B	From Leg	2.25 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.60 28.80 37.00 53.40	12.90 19.40 25.90 38.90	517.00 784.00 1051.00 1585.00
Valmont 13' standoff Mounting Frame (Clearwire)	C	From Leg	2.25 0.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.60 28.80 37.00 53.40	12.90 19.40 25.90 38.90	517.00 784.00 1051.00 1585.00
(4) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	A	From Leg	4.50 2.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	21.96 32.79 47.67 90.24
(4) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	B	From Leg	4.50 2.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	21.96 32.79 47.67 90.24
(4) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	C	From Leg	4.50 2.00 0.00	0.0000	122.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.43 1.92 2.29 3.06	1.43 1.92 2.29 3.06	21.96 32.79 47.67 90.24
Valmont VFA12-HD Sector Frame (Verizon)	A	From Leg	1.50 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.20 19.50 25.80 38.40	9.20 14.60 20.00 30.80	658.00 804.00 950.00 1242.00
Valmont VFA12-HD Sector Frame (Verizon)	B	From Leg	1.50 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.20 19.50 25.80 38.40	9.20 14.60 20.00 30.80	658.00 804.00 950.00 1242.00
Valmont VFA12-HD Sector Frame (Verizon)	C	From Leg	1.50 0.00 0.00	0.0000	102.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.20 19.50 25.80 38.40	9.20 14.60 20.00 30.80	658.00 804.00 950.00 1242.00
CBRS RRH w/ Clip-on Antenna w/ mast pipe	A	From Leg	3.00 -6.00	0.0000	102.00	No Ice 1/2" Ice	2.64 3.19	2.18 2.80	45.20 73.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon)			1.00			1" Ice	3.64	3.29	105.01
						2" Ice	4.58	4.34	184.16
(2) SBNHH-1D65B w/ Mast Pipe	A	From Leg	3.00	0.0000	102.00	No Ice	8.62	7.30	84.80
			-0.50			1/2" Ice	9.28	8.58	156.34
(Verizon)			1.00			1" Ice	9.91	9.72	236.09
						2" Ice	11.11	11.66	424.23
MT6413-77A w/ 8' long pipe	A	From Leg	3.00	0.0000	102.00	No Ice	5.11	3.36	86.50
(Verizon)			2.50			1/2" Ice	5.94	4.38	131.91
			1.00			1" Ice	6.67	5.25	182.84
						2" Ice	7.90	6.65	305.27
CBRS RRH w/ Clip-on Antenna w/ mast pipe	B	From Leg	3.00	0.0000	102.00	No Ice	2.64	2.18	45.20
			-6.00			1/2" Ice	3.19	2.80	73.10
(Verizon)			1.00			1" Ice	3.64	3.29	105.01
						2" Ice	4.58	4.34	184.16
(2) SBNHH-1D65B w/ Mast Pipe	B	From Leg	3.00	0.0000	102.00	No Ice	8.62	7.30	84.80
			-0.50			1/2" Ice	9.28	8.58	156.34
(Verizon)			1.00			1" Ice	9.91	9.72	236.09
						2" Ice	11.11	11.66	424.23
MT6413-77A w/ 8' long pipe	B	From Leg	3.00	0.0000	102.00	No Ice	5.11	3.36	86.50
(Verizon)			2.50			1/2" Ice	5.94	4.38	131.91
			1.00			1" Ice	6.67	5.25	182.84
						2" Ice	7.90	6.65	305.27
CBRS RRH w/ Clip-on Antenna w/ mast pipe	C	From Leg	3.00	0.0000	102.00	No Ice	2.64	2.18	45.20
			-6.00			1/2" Ice	3.19	2.80	73.10
(Verizon)			1.00			1" Ice	3.64	3.29	105.01
						2" Ice	4.58	4.34	184.16
(2) SBNHH-1D65B w/ Mast Pipe	C	From Leg	3.00	0.0000	102.00	No Ice	8.62	7.30	84.80
			-0.50			1/2" Ice	9.28	8.58	156.34
(Verizon)			1.00			1" Ice	9.91	9.72	236.09
						2" Ice	11.11	11.66	424.23
MT6413-77A w/ 8' long pipe	C	From Leg	3.00	0.0000	102.00	No Ice	5.11	3.36	86.50
(Verizon)			2.50			1/2" Ice	5.94	4.38	131.91
			1.00			1" Ice	6.67	5.25	182.84
						2" Ice	7.90	6.65	305.27
B5/B13 RRH	A	From Face	0.50	0.0000	102.00	No Ice	1.88	1.01	82.00
(Verizon)			-1.25			1/2" Ice	2.05	1.14	98.43
			3.00			1" Ice	2.22	1.28	117.53
						2" Ice	2.60	1.59	164.50
B5/B13 RRH	B	From Face	0.50	0.0000	102.00	No Ice	1.88	1.01	82.00
(Verizon)			-1.25			1/2" Ice	2.05	1.14	98.43
			3.00			1" Ice	2.22	1.28	117.53
						2" Ice	2.60	1.59	164.50
B5/B13 RRH	C	From Face	0.50	0.0000	102.00	No Ice	1.88	1.01	82.00
(Verizon)			-1.25			1/2" Ice	2.05	1.14	98.43
			3.00			1" Ice	2.22	1.28	117.53
						2" Ice	2.60	1.59	164.50
B2/B66A RRH	A	From Face	0.50	0.0000	102.00	No Ice	1.88	1.25	97.50
(Verizon)			1.25			1/2" Ice	2.05	1.39	115.84
			3.00			1" Ice	2.22	1.54	136.97
						2" Ice	2.60	1.86	188.37
B2/B66A RRH	B	From Face	0.50	0.0000	102.00	No Ice	1.88	1.25	97.50
(Verizon)			1.25			1/2" Ice	2.05	1.39	115.84
			3.00			1" Ice	2.22	1.54	136.97
						2" Ice	2.60	1.86	188.37
B2/B66A RRH	C	From Face	0.50	0.0000	102.00	No Ice	1.88	1.25	97.50
(Verizon)			1.25			1/2" Ice	2.05	1.39	115.84
			3.00			1" Ice	2.22	1.54	136.97

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	2.60	1.86	188.37
(2) DB-T1-6Z-12AB-OZ	B	From Face	0.50	0.0000	102.00	No Ice	2.82	1.85	26.00
OVP			0.00			1/2" Ice	3.04	2.03	51.02
(Verizon)			5.00			1" Ice	3.25	2.22	79.31
						2" Ice	3.71	2.62	146.52
4' Yagi	A	From Leg	2.00	0.0000	69.00	No Ice	1.20	1.20	20.00
			0.00			1/2" Ice	1.80	1.80	30.00
			0.00			1" Ice	2.40	2.40	40.00
						2" Ice	3.60	3.60	60.00
4' Yagi	A	From Leg	2.00	0.0000	55.00	No Ice	1.20	1.20	20.00
			0.00			1/2" Ice	1.80	1.80	30.00
			0.00			1" Ice	2.40	2.40	40.00
						2" Ice	3.60	3.60	60.00
2'x2'x1' junction box	B	From Face	0.50	0.0000	32.00	No Ice	4.80	2.40	30.00
			0.00			1/2" Ice	5.07	2.60	69.31
			0.00			1" Ice	5.35	2.81	112.70
						2" Ice	5.93	3.26	212.52

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	115.00	1.303	44	64.133	A	2.454	10.084	6.667	53.17	0.000	0.000
125.00-105.00					B	2.454	10.084		53.17	24.907	0.000
					C	2.454	10.084		53.17	31.045	0.000
T2	95.00	1.252	43	64.133	A	2.873	10.084	6.667	51.45	50.996	0.000
105.00-85.00					B	2.873	10.084		51.45	27.520	0.000
					C	2.873	10.084		51.45	36.160	0.000
T3 85.00-65.00	75.00	1.191	41	64.550	A	2.437	10.892	7.500	56.27	53.680	0.000
					B	2.437	10.892		56.27	28.312	0.000
					C	2.437	10.892		56.27	36.160	0.000
T4 65.00-45.00	55.00	1.116	38	64.133	A	2.873	10.084	6.667	51.45	53.680	0.000
					B	2.873	10.084		51.45	32.110	0.000
					C	2.873	10.084		51.45	36.160	0.000
T5 45.00-29.00	37.00	1.027	35	51.307	A	2.394	8.058	5.333	51.03	42.944	0.000
					B	2.394	8.058		51.03	26.192	0.000
					C	2.394	8.058		51.03	28.928	0.000
T6 29.00-25.00	27.00	0.961	33	6.793	A	0.697	1.456	1.456	67.64	0.000	0.000
					B	0.697	1.456		67.64	0.000	0.000
					C	0.697	1.456		67.64	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	115.00	1.303	7	1.6995	69.798	A	2.454	39.570	17.996	42.82	0.000	0.000
125.00-105.00						B	2.454	39.570		42.82	82.839	0.000
						C	2.454	39.570		42.82	79.910	0.000
T2 105.00-85.00	95.00	1.252	7	1.6673	69.691	A	2.873	39.012	17.782	42.45	66.058	0.000
						B	2.873	39.012		42.45	90.991	0.000
						C	2.873	39.012		42.45	90.577	0.000
T3 85.00-65.00	75.00	1.191	6	1.6283	69.978	A	2.437	39.018	18.356	44.28	69.006	0.000
						B	2.437	39.018		44.28	91.772	0.000
						C	2.437	39.018		44.28	89.765	0.000
T4 65.00-45.00	55.00	1.116	6	1.5786	69.395	A	2.873	37.473	17.191	42.61	68.333	0.000
						B	2.873	37.473		42.61	102.062	0.000
						C	2.873	37.473		42.61	88.729	0.000
T5 45.00-29.00	37.00	1.027	6	1.5173	55.353	A	2.394	29.232	13.425	42.45	54.002	0.000
						B	2.394	29.232		42.45	82.632	0.000
						C	2.394	29.232		42.45	69.962	0.000
T6 29.00-25.00	27.00	0.961	5	1.4702	7.842	A	0.697	4.407	3.597	70.48	0.000	0.000
						B	0.697	4.407		70.48	0.000	0.000
						C	0.697	4.407		70.48	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	115.00	1.303	10	64.133	A	2.454	10.084	6.667	53.17	0.000	0.000
125.00-105.00					B	2.454	10.084		53.17	24.907	0.000
					C	2.454	10.084		53.17	31.045	0.000
T2	95.00	1.252	10	64.133	A	2.873	10.084	6.667	51.45	50.996	0.000
105.00-85.00					B	2.873	10.084		51.45	27.520	0.000
					C	2.873	10.084		51.45	36.160	0.000
T3 85.00-65.00	75.00	1.191	9	64.550	A	2.437	10.892	7.500	56.27	53.680	0.000
					B	2.437	10.892		56.27	28.312	0.000
					C	2.437	10.892		56.27	36.160	0.000
T4 65.00-45.00	55.00	1.116	9	64.133	A	2.873	10.084	6.667	51.45	53.680	0.000
					B	2.873	10.084		51.45	32.110	0.000
					C	2.873	10.084		51.45	36.160	0.000
T5 45.00-29.00	37.00	1.027	8	51.307	A	2.394	8.058	5.333	51.03	42.944	0.000
					B	2.394	8.058		51.03	26.192	0.000
					C	2.394	8.058		51.03	28.928	0.000
T6 29.00-25.00	27.00	0.961	8	6.793	A	0.697	1.456	1.456	67.64	0.000	0.000
					B	0.697	1.456		67.64	0.000	0.000
					C	0.697	1.456		67.64	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	218.16	1079.98	A	0.195	2.611	44	1	1	8.239	2659.06	132.95	C
125.00-105.00			B	0.195	2.611		1	1	8.239			
			C	0.195	2.611		1	1	8.239			
T2	475.20	1078.89	A	0.202	2.589	43	1	1	8.670	3329.64	166.48	C
105.00-85.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T3	490.48	1250.35	A	0.206	2.574	41	1	1	8.707	3207.49	160.37	C
85.00-65.00			B	0.206	2.574		1	1	8.707			
			C	0.206	2.574		1	1	8.707			
T4	505.10	1035.95	A	0.202	2.589	38	1	1	8.670	3087.44	154.37	C
65.00-45.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T5	405.28	830.96	A	0.204	2.584	35	1	1	7.029	2293.11	143.32	C
45.00-29.00			B	0.204	2.584		1	1	7.029			
			C	0.204	2.584		1	1	7.029			
T6	0.00	196.59	A	0.317	2.252	33	1	1	1.577	98.58	24.65	C
29.00-25.00			B	0.317	2.252		1	1	1.577			
			C	0.317	2.252		1	1	1.577			
Sum Weight:	2094.22	5472.71								14675.31		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	218.16	1079.98	A	0.195	2.611	44	0.8	1	7.749	2610.78	130.54	A
125.00-105.00			B	0.195	2.611		0.8	1	7.749			
			C	0.195	2.611		0.8	1	7.749			
T2	475.20	1078.89	A	0.202	2.589	43	0.8	1	8.095	3275.80	163.79	A
105.00-85.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T3	490.48	1250.35	A	0.206	2.574	41	0.8	1	8.219	3164.30	158.21	A
85.00-65.00			B	0.206	2.574		0.8	1	8.219			
			C	0.206	2.574		0.8	1	8.219			
T4	505.10	1035.95	A	0.202	2.589	38	0.8	1	8.095	3039.45	151.97	A
65.00-45.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T5	405.28	830.96	A	0.204	2.584	35	0.8	1	6.550	2256.40	141.03	A
45.00-29.00			B	0.204	2.584		0.8	1	6.550			
			C	0.204	2.584		0.8	1	6.550			
T6	0.00	196.59	A	0.317	2.252	33	0.8	1	1.437	89.87	22.47	C
29.00-25.00			B	0.317	2.252		0.8	1	1.437			
			C	0.317	2.252		0.8	1	1.437			
Sum Weight:	2094.22	5472.71								14436.60		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	218.16	1079.98	A	0.195	2.611	44	0.85	1	7.871	2706.74	135.34	A
125.00-105.00			B	0.195	2.611		0.85	1	7.871			
			C	0.195	2.611		0.85	1	7.871			
T2	475.20	1078.89	A	0.202	2.589	43	0.85	1	8.239	3400.63	170.03	B
105.00-85.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T3	490.48	1250.35	A	0.206	2.574	41	0.85	1	8.341	3292.80	164.64	B
85.00-65.00			B	0.206	2.574		0.85	1	8.341			
			C	0.206	2.574		0.85	1	8.341			
T4	505.10	1035.95	A	0.202	2.589	38	0.85	1	8.239	3161.71	158.09	B
65.00-45.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T5	405.28	830.96	A	0.204	2.584	35	0.85	1	6.670	2346.73	146.67	B
45.00-29.00			B	0.204	2.584		0.85	1	6.670			
			C	0.204	2.584		0.85	1	6.670			
T6	0.00	196.59	A	0.317	2.252	33	0.85	1	1.472	92.05	23.01	C
29.00-25.00			B	0.317	2.252		0.85	1	1.472			
			C	0.317	2.252		0.85	1	1.472			
Sum Weight:	2094.22	5472.71								15000.66		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	2108.31	2853.78	A	0.602	1.803	7	1	1	31.937	883.41*	44.17	C
125.00-105.00			B	0.602	1.803		1	1	31.937			
			C	0.602	1.803		1	1	31.937			
T2	3490.38	2798.48	A	0.601	1.803	7	1	1	31.914	847.28*	42.36	C
105.00-85.00			B	0.601	1.803		1	1	31.914			
			C	0.601	1.803		1	1	31.914			
T3	3498.44	2942.50	A	0.592	1.809	6	1	1	31.270	809.46*	40.47	C
85.00-65.00			B	0.592	1.809		1	1	31.270			
			C	0.592	1.809		1	1	31.270			
T4	3555.96	2619.02	A	0.581	1.817	6	1	1	30.309	751.99*	37.60	C
65.00-45.00			B	0.581	1.817		1	1	30.309			
			C	0.581	1.817		1	1	30.309			
T5	2764.50	2037.16	A	0.571	1.825	6	1	1	23.616	551.79*	34.49	C
45.00-29.00			B	0.571	1.825		1	1	23.616			
			C	0.571	1.825		1	1	23.616			
T6	0.00	422.09	A	0.651	1.781	5	1	1	4.121	32.61	8.15	C
29.00-25.00			B	0.651	1.781		1	1	4.121			
			C	0.651	1.781		1	1	4.121			
Sum Weight:	15417.60	13673.03			*2.1A_g limit					3876.54		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	2108.31	2853.78	A	0.602	1.803	7	0.8	1	31.446	883.41*	44.17	C
125.00-105.00			B	0.602	1.803		0.8	1	31.446			
			C	0.602	1.803		0.8	1	31.446			
T2	3490.38	2798.48	A	0.601	1.803	7	0.8	1	31.339	847.28*	42.36	C
105.00-85.00			B	0.601	1.803		0.8	1	31.339			
			C	0.601	1.803		0.8	1	31.339			
T3	3498.44	2942.50	A	0.592	1.809	6	0.8	1	30.783	809.46*	40.47	C
85.00-65.00			B	0.592	1.809		0.8	1	30.783			
			C	0.592	1.809		0.8	1	30.783			
T4	3555.96	2619.02	A	0.581	1.817	6	0.8	1	29.734	751.99*	37.60	C
65.00-45.00			B	0.581	1.817		0.8	1	29.734			
			C	0.581	1.817		0.8	1	29.734			
T5	2764.50	2037.16	A	0.571	1.825	6	0.8	1	23.138	551.79*	34.49	C
45.00-29.00			B	0.571	1.825		0.8	1	23.138			
			C	0.571	1.825		0.8	1	23.138			
T6	0.00	422.09	A	0.651	1.781	5	0.8	1	3.981	31.50	7.88	C
29.00-25.00			B	0.651	1.781		0.8	1	3.981			
			C	0.651	1.781		0.8	1	3.981			
Sum Weight:	15417.60	13673.03			*2.1A_g limit					3875.44		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	2108.31	2853.78	A	0.602	1.803	7	0.85	1	31.569	883.41*	44.17	B
125.00-105.00			B	0.602	1.803		0.85	1	31.569			
			C	0.602	1.803		0.85	1	31.569			
T2	3490.38	2798.48	A	0.601	1.803	7	0.85	1	31.483	847.28*	42.36	C
105.00-85.00			B	0.601	1.803		0.85	1	31.483			
			C	0.601	1.803		0.85	1	31.483			
T3	3498.44	2942.50	A	0.592	1.809	6	0.85	1	30.905	809.46*	40.47	C
85.00-65.00			B	0.592	1.809		0.85	1	30.905			
			C	0.592	1.809		0.85	1	30.905			
T4	3555.96	2619.02	A	0.581	1.817	6	0.85	1	29.878	751.99*	37.60	C
65.00-45.00			B	0.581	1.817		0.85	1	29.878			
			C	0.581	1.817		0.85	1	29.878			
T5	2764.50	2037.16	A	0.571	1.825	6	0.85	1	23.257	551.79*	34.49	C
45.00-29.00			B	0.571	1.825		0.85	1	23.257			
			C	0.571	1.825		0.85	1	23.257			
T6	0.00	422.09	A	0.651	1.781	5	0.85	1	4.016	31.78	7.94	C
29.00-25.00			B	0.651	1.781		0.85	1	4.016			
			C	0.651	1.781		0.85	1	4.016			
Sum Weight:	15417.60	13673.03			*2.1A_g limit					3875.71		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	218.16	1079.98	A	0.195	2.611	10	1	1	8.239	612.65	30.63	C
125.00-105.00			B	0.195	2.611		1	1	8.239			
			C	0.195	2.611		1	1	8.239			
T2	475.20	1078.89	A	0.202	2.589	10	1	1	8.670	767.15	38.36	C
105.00-85.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T3	490.48	1250.35	A	0.206	2.574	9	1	1	8.707	739.01	36.95	C
85.00-65.00			B	0.206	2.574		1	1	8.707			
			C	0.206	2.574		1	1	8.707			
T4	505.10	1035.95	A	0.202	2.589	9	1	1	8.670	711.35	35.57	C
65.00-45.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T5	405.28	830.96	A	0.204	2.584	8	1	1	7.029	528.33	33.02	C
45.00-29.00			B	0.204	2.584		1	1	7.029			
			C	0.204	2.584		1	1	7.029			
T6	0.00	196.59	A	0.317	2.252	8	1	1	1.577	22.71	5.68	C
29.00-25.00			B	0.317	2.252		1	1	1.577			
			C	0.317	2.252		1	1	1.577			
Sum Weight:	2094.22	5472.71								3381.19		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	218.16	1079.98	A	0.195	2.611	10	0.8	1	7.749	601.52	30.08	A
125.00-105.00			B	0.195	2.611		0.8	1	7.749			
			C	0.195	2.611		0.8	1	7.749			
T2	475.20	1078.89	A	0.202	2.589	10	0.8	1	8.095	754.74	37.74	A
105.00-85.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T3	490.48	1250.35	A	0.206	2.574	9	0.8	1	8.219	729.05	36.45	A
85.00-65.00			B	0.206	2.574		0.8	1	8.219			
			C	0.206	2.574		0.8	1	8.219			
T4	505.10	1035.95	A	0.202	2.589	9	0.8	1	8.095	700.29	35.01	A
65.00-45.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T5	405.28	830.96	A	0.204	2.584	8	0.8	1	6.550	519.88	32.49	A
45.00-29.00			B	0.204	2.584		0.8	1	6.550			
			C	0.204	2.584		0.8	1	6.550			
T6	0.00	196.59	A	0.317	2.252	8	0.8	1	1.437	20.71	5.18	C
29.00-25.00			B	0.317	2.252		0.8	1	1.437			
			C	0.317	2.252		0.8	1	1.437			
Sum Weight:	2094.22	5472.71								3326.19		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	218.16	1079.98	A	0.195	2.611	10	0.85	1	7.871	623.63	31.18	A
125.00-105.00			B	0.195	2.611		0.85	1	7.871			
			C	0.195	2.611		0.85	1	7.871			
T2	475.20	1078.89	A	0.202	2.589	10	0.85	1	8.239	783.51	39.18	B
105.00-85.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T3	490.48	1250.35	A	0.206	2.574	9	0.85	1	8.341	758.66	37.93	B
85.00-65.00			B	0.206	2.574		0.85	1	8.341			
			C	0.206	2.574		0.85	1	8.341			
T4	505.10	1035.95	A	0.202	2.589	9	0.85	1	8.239	728.46	36.42	B
65.00-45.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T5	405.28	830.96	A	0.204	2.584	8	0.85	1	6.670	540.69	33.79	B
45.00-29.00			B	0.204	2.584		0.85	1	6.670			
			C	0.204	2.584		0.85	1	6.670			
T6	0.00	196.59	A	0.317	2.252	8	0.85	1	1.472	21.21	5.30	C
29.00-25.00			B	0.317	2.252		0.85	1	1.472			
			C	0.317	2.252		0.85	1	1.472			
Sum Weight:	2094.22	5472.71								3456.15		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3389.24			
Bracing Weight	2083.48			
Total Member Self-Weight	5472.71			
Guy Weight	637.74			
Total Weight	13680.59			
Wind 0 deg - No Ice		61.18	-20745.80	416.56
Wind 30 deg - No Ice		10347.37	-17799.81	1661.84
Wind 60 deg - No Ice		16175.76	-9339.08	-106.84
Wind 90 deg - No Ice		17724.41	-61.18	-2336.75
Wind 120 deg - No Ice		17017.68	9754.52	-333.17
Wind 150 deg - No Ice		10421.54	18050.64	1390.04
Wind 180 deg - No Ice		-61.18	20507.09	-416.56
Wind 210 deg - No Ice		-10347.37	17799.81	-1661.84
Wind 240 deg - No Ice		-16382.49	9458.44	106.84
Wind 270 deg - No Ice		-17724.41	61.18	2336.75
Wind 300 deg - No Ice		-16810.95	-9635.16	333.17
Wind 330 deg - No Ice		-10421.54	-18050.64	-1390.04
Member Ice	8200.32			
Guy Ice	2264.63			
Total Weight Ice	46060.01			
Wind 0 deg - Ice		10.71	-5871.08	315.08
Wind 30 deg - Ice		2950.58	-5089.15	408.87
Wind 60 deg - Ice		5099.62	-2944.26	22.36
Wind 90 deg - Ice		5877.34	-10.71	-361.97
Wind 120 deg - Ice		5089.86	2926.27	-191.24
Wind 150 deg - Ice		2932.04	5078.44	-78.35
Wind 180 deg - Ice		-10.71	5869.98	-316.00
Wind 210 deg - Ice		-2950.58	5089.15	-408.87

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 240 deg - Ice		-5100.57	2944.82	-22.54
Wind 270 deg - Ice		-5877.34	10.71	361.97
Wind 300 deg - Ice		-5088.91	-2925.72	191.25
Wind 330 deg - Ice		-2932.04	-5078.44	78.35
Total Weight	13680.59			
Wind 0 deg - Service		14.10	-4779.83	95.98
Wind 30 deg - Service		2384.03	-4101.08	382.89
Wind 60 deg - Service		3726.89	-2151.72	-24.62
Wind 90 deg - Service		4083.70	-14.10	-538.39
Wind 120 deg - Service		3920.87	2247.44	-76.76
Wind 150 deg - Service		2401.12	4158.87	320.27
Wind 180 deg - Service		-14.10	4724.83	-95.98
Wind 210 deg - Service		-2384.03	4101.08	-382.89
Wind 240 deg - Service		-3774.53	2179.22	24.62
Wind 270 deg - Service		-4083.70	14.10	538.39
Wind 300 deg - Service		-3873.24	-2219.94	76.76
Wind 330 deg - Service		-2401.12	-4158.87	-320.27

Load Combinations

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

Comb. No.	Description
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	125 - 105	Leg	Max Tension	8	4206.22	-1.37	-239.54
			Max. Compression	13	-17261.54	87.49	159.06
			Max. Mx	11	962.71	-382.97	1.77
			Max. My	2	237.49	-7.53	-384.24
			Max. Vy	11	-566.63	251.58	7.64
			Max. Vx	2	-565.35	-7.53	245.52
		Diagonal	Max Tension	8	2181.28	0.00	0.00
			Max. Compression	2	-1813.46	0.00	0.00
			Max. Mx	24	-449.71	-4.45	-0.01
			Max. My	2	-962.03	-0.79	0.49
			Max. Vy	22	7.72	-4.41	-0.15
			Max. Vx	2	0.22	-0.79	0.49
		Horizontal	Max Tension	2	1388.93	0.00	0.00
			Max. Compression	9	-158.04	0.00	0.00
			Max. Mx	14	908.00	-14.23	0.00
			Max. My	11	929.30	0.00	0.00
			Max. Vy	14	-18.73	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Top Girt	Max Tension	2	142.81	0.00	0.00
			Max. Compression	8	-105.67	0.00	0.00
			Max. Mx	14	37.27	-14.23	0.00
			Max. My	11	31.86	0.00	0.00
			Max. Vy	14	-18.73	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	838.64	0.00	0.00
			Max. Compression	8	-0.52	0.00	0.00
			Max. Mx	14	474.58	-14.23	0.00
			Max. My	11	492.87	0.00	0.00
			Max. Vy	14	-18.73	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Guy A	Bottom Tension	9	17779.81		
			Top Tension	9	17884.48		
			Top Cable Vert	9	16205.42		
			Top Cable Norm	9	7565.65		
			Top Cable Tan	9	12.89		
			Bot Cable Vert	9	-16007.84		
			Bot Cable Norm	9	7736.47		
			Bot Cable Tan	9	133.32		
		Guy B	Bottom Tension	13	19007.08		
			Top Tension	13	19111.48		
			Top Cable Vert	13	17722.31		
			Top Cable Norm	13	7153.16		
			Top Cable Tan	13	25.41		
			Bot Cable Vert	13	-17535.75		
			Bot Cable Norm	13	7331.14		
			Bot Cable Tan	13	145.02		
		Guy C	Bottom Tension	3	18586.35		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Tension	3	18683.41		
			Top Cable Vert	3	17245.55		
			Top Cable Norm	3	7187.49		
			Top Cable Tan	3	29.73		
			Bot Cable Vert	3	-17069.39		
			Bot Cable Norm	3	7353.11		
			Bot Cable Tan	3	142.09		
		Top Guy Pull-Off	Max Tension	2	3603.98	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1743.89	14.83	0.00
			Max. My	11	2142.81	0.00	-0.00
			Max. Vy	14	-19.52	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T2	105 - 85	Leg	Max Tension	4	14654.67	291.17	-154.75
			Max. Compression	2	-42013.76	1.65	155.09
			Max. Mx	11	-8906.08	-645.63	-0.81
			Max. My	8	-5408.68	0.04	643.35
			Max. Vy	10	-2077.33	125.42	-65.14
			Max. Vx	2	-2565.64	1.65	155.09
		Diagonal	Max Tension	8	2523.52	0.00	0.00
			Max. Compression	2	-4879.23	0.00	0.00
			Max. Mx	18	-128.61	-4.95	-0.01
			Max. My	4	-1813.69	-0.23	1.89
			Max. Vy	16	7.82	-4.95	0.07
			Max. Vx	4	0.77	-0.23	1.89
		Horizontal	Max Tension	2	1911.50	0.00	0.00
			Max. Compression	8	-16.70	0.00	0.00
			Max. Mx	14	1351.46	-13.95	0.00
			Max. My	11	1055.48	0.00	0.00
			Max. Vy	14	-18.36	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Top Girt	Max Tension	2	856.40	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	528.22	-13.95	0.00
			Max. My	11	497.21	0.00	0.00
			Max. Vy	14	-18.36	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Bottom Girt	Max Tension	3	1862.67	0.00	0.00
			Max. Compression	2	-821.97	0.00	0.00
			Max. Mx	14	703.66	-13.95	0.00
			Max. My	11	596.48	0.00	0.00
			Max. Vy	14	-18.36	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
T3	85 - 65	Leg	Max Tension	4	28137.60	118.64	-62.05
			Max. Compression	2	-57303.65	-5.94	49.39
			Max. Mx	10	-38399.51	557.46	-281.90
			Max. My	2	-42017.56	22.43	688.60
			Max. Vy	10	-2074.79	557.46	-281.90
			Max. Vx	2	-2562.05	22.43	688.60
		Diagonal	Max Tension	8	3806.07	0.00	0.00
			Max. Compression	2	-5270.35	0.00	0.00
			Max. Mx	18	-1904.74	-5.62	0.07
			Max. My	4	-2175.27	0.08	3.64
			Max. Vy	18	7.93	-5.62	0.07
			Max. Vx	4	1.47	0.08	3.64
		Horizontal	Max Tension	3	2637.13	0.00	0.00
			Max. Compression	2	-1202.25	0.00	0.00
			Max. Mx	14	1827.77	-13.62	0.00
			Max. My	11	638.85	0.00	0.00
			Max. Vy	14	-17.91	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Top Girt	Max Tension	2	789.31	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	610.28	-13.62	0.00
			Max. My	11	456.44	0.00	0.00
			Max. Vy	14	-17.91	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	1305.29	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1022.10	-13.62	0.00
			Max. My	11	922.84	0.00	0.00
			Max. Vy	14	-17.91	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Guy A	Bottom Tension	7	24426.56		
			Top Tension	7	24508.04		
			Top Cable Vert	7	18857.12		
			Top Cable Norm	7	15654.15		
			Top Cable Tan	7	22.07		
			Bot Cable Vert	7	-18683.86		
			Bot Cable Norm	7	15734.04		
			Bot Cable Tan	7	100.14		
		Guy B	Bottom Tension	13	27608.87		
			Top Tension	13	27690.18		
			Top Cable Vert	13	22504.31		
			Top Cable Norm	13	16133.82		
			Top Cable Tan	13	47.06		
			Bot Cable Vert	13	-22340.54		
			Bot Cable Norm	13	16221.43		
			Bot Cable Tan	13	123.63		
		Guy C	Bottom Tension	3	26009.60		
			Top Tension	3	26080.79		
			Top Cable Vert	3	20506.31		
			Top Cable Norm	3	16115.10		
			Top Cable Tan	3	48.95		
			Bot Cable Vert	3	-20357.20		
			Bot Cable Norm	3	16188.57		
			Bot Cable Tan	3	117.59		
		Top Guy Pull-Off	Max Tension	2	7060.44	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4121.77	14.20	0.00
			Max. My	11	4642.12	0.00	-0.00
			Max. Vy	14	-18.68	0.00	0.00
			Max. Vx	11	0.00	0.00	0.00
T4	65 - 45	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-42065.83	10.69	-260.83
			Max. Mx	6	-31766.81	212.80	113.45
			Max. My	2	-35612.31	10.76	-260.86
			Max. Vy	6	-1429.17	-84.86	-44.35
			Max. Vx	2	1752.50	-5.82	104.13
		Diagonal	Max Tension	8	625.96	0.00	0.00
			Max. Compression	2	-4188.89	0.00	0.00
			Max. Mx	18	-2168.20	-5.02	-0.07
			Max. My	2	-4184.10	-0.49	2.10
			Max. Vy	18	7.50	-5.02	-0.07
			Max. Vx	2	-0.86	-3.37	2.10
		Horizontal	Max Tension	2	2540.63	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2235.12	-12.10	0.00
			Max. My	11	1923.36	0.00	0.00
			Max. Vy	14	-15.93	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Top Girt	Max Tension	3	1703.35	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1044.58	-12.10	0.00
			Max. My	11	972.31	0.00	0.00
			Max. Vy	14	-15.93	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	1491.21	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1200.31	-12.10	0.00
			Max. My	11	1017.84	0.00	0.00
			Max. Vy	14	-15.93	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
T5	45 - 29	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	13	-30411.11	-17.23	-77.11
			Max. Mx	2	-29061.89	1045.49	586.34
			Max. My	21	-28672.84	26.81	-1171.59
			Max. Vy	13	-5129.24	964.67	680.03
			Max. Vx	21	5702.36	26.81	-1171.59
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	3	-2514.90	0.00	0.00
			Max. Mx	21	-1980.88	-4.79	-0.01
			Max. My	2	-2175.02	0.48	1.23
			Max. Vy	21	7.17	-4.79	-0.01
			Max. Vx	2	0.51	0.48	1.23
		Horizontal	Max Tension	2	2685.52	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2102.45	-11.59	0.00
			Max. My	11	1724.22	0.00	0.00
			Max. Vy	14	-15.25	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Top Girt	Max Tension	2	1263.61	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1192.64	-11.59	0.00
			Max. My	11	1029.64	0.00	0.00
			Max. Vy	14	-15.25	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
		Bottom Girt	Max Tension	2	4302.56	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4146.43	-11.59	0.00
			Max. My	11	3355.45	0.00	0.00
			Max. Vy	14	-15.25	0.00	0.00
			Max. Vx	11	-0.00	0.00	0.00
T6	29 - 25	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-31797.74	46.10	94.52
			Max. Mx	2	-28981.59	1198.61	-13.65
			Max. My	5	-22667.54	32.40	-558.78
			Max. Vy	17	6385.66	-297.54	0.37
			Max. Vx	11	-495.00	-247.15	-31.94
		Top Girt	Max Tension	2	4188.05	104.82	-11.70
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	11	3380.29	217.45	70.26
			Max. My	11	3215.68	-20.33	-135.18
			Max. Vy	5	-108.24	217.14	70.42
			Max. Vx	11	75.01	159.03	78.11
		Bottom Girt	Max Tension	8	135.56	-12.58	-161.28
			Max. Compression	13	-325.37	31.57	-150.00
			Max. Mx	11	15.15	-69.39	-177.88
			Max. My	13	-192.92	-38.47	-240.31
			Max. Vy	11	-186.85	-69.39	-177.88
			Max. Vx	13	262.95	-38.47	-240.31

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	17	85922.50	-165.00	58.11
	Max. H_x	12	57824.88	1256.93	692.96
	Max. H_z	13	76381.16	868.70	1038.47
	Max. M_x	1	0.00	8.36	-20.38
	Max. M_z	1	0.00	8.36	-20.38
	Max. Torsion	5	1544.33	-922.83	109.99
	Min. Vert	35	48102.03	290.61	-194.50
	Min. H_x	4	58106.57	-1024.46	580.96
	Min. H_z	8	56234.59	20.24	-1652.30
	Min. M_x	1	0.00	8.36	-20.38
	Min. M_z	1	0.00	8.36	-20.38
	Min. Torsion	11	-1537.94	936.30	92.99
Guy C @ 37.5 ft Elev 31.5 ft Azimuth 240 deg	Max. Vert	10	-745.18	-207.52	120.28
	Max. H_x	10	-745.18	-207.52	120.28
	Max. H_z	3	-37426.59	-20257.85	11995.73
	Min. Vert	3	-37426.59	-20257.85	11995.73
	Min. H_x	3	-37426.59	-20257.85	11995.73
	Min. H_z	10	-745.18	-207.52	120.28
Guy B @ 39 ft Elev 25 ft Azimuth 120 deg	Max. Vert	6	-948.90	272.89	157.65
	Max. H_x	13	-39876.29	20262.79	12008.94
	Max. H_z	13	-39876.29	20262.79	12008.94
	Min. Vert	13	-39876.29	20262.79	12008.94
	Min. H_x	6	-948.90	272.89	157.65
	Min. H_z	6	-948.90	272.89	157.65
Guy A @ 45 ft Elev 25 ft Azimuth 0 deg	Max. Vert	2	-674.38	0.32	-239.61
	Max. H_x	10	-27619.42	353.67	-18629.47
	Max. H_z	2	-674.38	0.32	-239.61
	Min. Vert	7	-34574.92	-228.33	-23414.30
	Min. H_x	6	-28255.36	-343.28	-19130.26
	Min. H_z	7	-34574.92	-228.33	-23414.30

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	48450.33	-8.36	20.38	0.00	0.00	-2.76
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	83615.53	-14.01	-977.99	0.00	0.00	262.54
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	75207.18	749.32	-875.42	0.00	0.00	1036.93
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	58106.57	1024.46	-580.96	0.00	0.00	-94.11
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	66688.35	922.83	-109.99	0.00	0.00	-1544.33

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	76248.41	937.62	654.99	0.00	0.00	-234.75
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	71476.94	552.83	1460.08	0.00	0.00	850.46
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	56234.59	-20.24	1652.30	0.00	0.00	-281.60
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	72241.45	-479.05	1285.15	0.00	0.00	-1023.33
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	76629.38	-728.47	522.91	0.00	0.00	84.03
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	68111.26	-936.30	-92.99	0.00	0.00	1537.94
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	57824.88	-1256.93	-692.96	0.00	0.00	251.83
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	76381.16	-868.70	-1038.47	0.00	0.00	-842.43
1.2 Dead+1.0 Ice+1.0 Temp+Guy	84652.07	5.70	46.04	0.00	0.00	-1.15
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	85229.55	6.82	-235.51	0.00	0.00	230.16
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	85700.69	94.64	-169.16	0.00	0.00	304.27
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	85922.50	165.00	-58.11	0.00	0.00	6.15
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	85643.32	211.90	67.00	0.00	0.00	-286.03
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	85155.18	211.45	186.05	0.00	0.00	-151.22
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	85088.63	120.07	249.53	0.00	0.00	-50.12
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	84982.89	1.95	270.00	0.00	0.00	-227.11
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	84665.53	-115.82	251.66	0.00	0.00	-303.64
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	84399.00	-207.14	191.13	0.00	0.00	-6.19
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	84748.64	-201.26	72.73	0.00	0.00	289.06
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	85131.30	-150.82	-52.07	0.00	0.00	152.27
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	85239.15	-80.12	-165.53	0.00	0.00	51.52
Dead+Wind 0 deg - Service+Guy	48618.05	-7.39	-400.62	0.00	0.00	71.65
Dead+Wind 30 deg - Service+Guy	48816.10	180.46	-325.39	0.00	0.00	281.37
Dead+Wind 60 deg - Service+Guy	48887.59	262.01	-144.89	0.00	0.00	-21.63
Dead+Wind 90 deg - Service+Guy	48855.42	288.22	21.14	0.00	0.00	-398.18
Dead+Wind 120 deg - Service+Guy	48756.90	323.56	222.17	0.00	0.00	-61.62
Dead+Wind 150 deg - Service+Guy	48573.91	203.11	403.44	0.00	0.00	232.00
Dead+Wind 180 deg - Service+Guy	48358.89	-9.38	428.19	0.00	0.00	-69.86
Dead+Wind 210 deg - Service+Guy	48171.55	-199.40	366.26	0.00	0.00	-280.62
Dead+Wind 240 deg - Service+Guy	48102.03	-290.61	194.50	0.00	0.00	22.16
Dead+Wind 270 deg -	48147.84	-305.24	24.27	0.00	0.00	401.96

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Service+Guy						
Dead+Wind 300 deg - Service+Guy	48235.66	-328.80	-172.80	0.00	0.00	61.51
Dead+Wind 330 deg - Service+Guy	48407.73	-217.68	-363.09	0.00	0.00	-233.72

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-13680.53	0.00	-3.51	13680.47	-5.28	0.046%
2	60.62	-16290.52	-21782.99	-62.42	16289.84	21756.88	0.096%
3	10877.59	-16269.33	-18699.47	-10878.51	16268.93	18681.95	0.065%
4	17101.40	-16253.65	-9860.52	-17091.24	16253.44	9851.83	0.052%
5	18796.70	-16281.27	-61.08	-18778.66	16280.82	71.41	0.084%
6	17943.52	-16310.89	10276.72	-17924.08	16310.33	-10265.44	0.085%
7	10952.42	-16301.03	18951.25	-10937.12	16300.63	-18942.09	0.065%
8	-60.62	-16287.68	21544.28	65.95	16287.47	-21530.31	0.055%
9	-10877.59	-16308.86	18699.47	10862.00	16308.48	-18691.59	0.064%
10	-17308.13	-16324.55	9979.88	17287.99	16324.00	-9969.98	0.087%
11	-18796.70	-16296.93	61.08	18775.22	16296.41	-50.63	0.096%
12	-17736.79	-16267.31	-10157.36	17730.74	16267.06	10140.96	0.067%
13	-10952.42	-16277.17	-18951.25	10950.68	16276.68	18930.88	0.075%
14	0.00	-48668.29	0.00	-0.87	48668.28	-3.37	0.007%
15	10.17	-48668.95	-6710.00	-11.00	48668.92	6705.34	0.010%
16	3379.02	-48652.92	-5816.71	-3377.97	48652.89	5812.36	0.009%
17	5847.41	-48641.16	-3365.85	-5844.54	48641.13	3363.66	0.007%
18	6743.61	-48662.64	-10.52	-6739.91	48662.62	10.57	0.008%
19	5838.00	-48685.56	3348.67	-5835.02	48685.55	-3347.34	0.007%
20	3361.21	-48678.01	5806.92	-3358.82	48677.99	-5804.37	0.007%
21	-10.17	-48667.62	6708.90	11.09	48667.60	-6702.36	0.013%
22	-3379.02	-48683.66	5816.71	3374.68	48683.64	-5811.84	0.013%
23	-5848.37	-48695.42	3366.40	5841.20	48695.40	-3365.19	0.015%
24	-6743.61	-48673.94	10.52	6739.18	48673.92	-11.72	0.009%
25	-5837.05	-48651.02	-3348.12	5832.93	48650.99	3344.49	0.011%
26	-3361.21	-48658.57	-5806.92	3358.49	48658.53	5801.50	0.012%
27	13.98	-13680.47	-5019.64	-14.90	13680.46	5015.79	0.027%
28	2506.20	-13675.98	-4308.36	-2504.90	13675.96	4305.25	0.023%
29	3940.16	-13672.36	-2271.86	-3937.32	13672.35	2270.29	0.023%
30	4330.76	-13678.73	-14.07	-4327.32	13678.71	14.11	0.024%
31	4134.19	-13685.55	2367.76	-4130.72	13685.54	-2366.13	0.026%
32	2523.44	-13683.28	4366.37	-2521.08	13683.27	-4363.61	0.025%
33	-13.97	-13680.20	4963.80	14.31	13680.19	-4960.91	0.020%
34	-2506.20	-13685.08	4308.36	2504.35	13685.08	-4306.25	0.019%
35	-3987.79	-13688.70	2299.36	3984.39	13688.69	-2298.82	0.024%
36	-4330.76	-13682.33	14.07	4326.72	13682.33	-15.18	0.029%
37	-4086.56	-13675.51	-2340.26	4082.46	13675.50	2337.58	0.034%
38	-2523.44	-13677.78	-4366.37	2520.45	13677.77	4362.59	0.033%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00042276
2	Yes	15	0.00077535	0.00074547
3	Yes	15	0.00064538	0.00054710
4	Yes	9	0.00064436	0.00092360
5	Yes	13	0.00095303	0.00075104
6	Yes	14	0.00078590	0.00072696
7	Yes	14	0.00068021	0.00061373
8	Yes	9	0.00069201	0.00081280
9	Yes	15	0.00065862	0.00053830
10	Yes	15	0.00075455	0.00065293
11	Yes	14	0.00098162	0.00077189
12	Yes	10	0.00083405	0.00071768
13	Yes	15	0.00067923	0.00063623
14	Yes	7	0.00000001	0.00019776
15	Yes	9	0.00000001	0.00023458
16	Yes	9	0.00000001	0.00026277
17	Yes	9	0.00000001	0.00022660
18	Yes	9	0.00000001	0.00022379
19	Yes	9	0.00000001	0.00017172
20	Yes	9	0.00000001	0.00019347
21	Yes	8	0.00096136	0.00039246
22	Yes	8	0.00096241	0.00041417
23	Yes	8	0.00097218	0.00040867
24	Yes	9	0.00000001	0.00026400
25	Yes	9	0.00000001	0.00030340
26	Yes	9	0.00067984	0.00032843
27	Yes	8	0.00000001	0.00035826
28	Yes	8	0.00000001	0.00033846
29	Yes	8	0.00000001	0.00034543
30	Yes	8	0.00000001	0.00035416
31	Yes	8	0.00000001	0.00036673
32	Yes	8	0.00000001	0.00033046
33	Yes	8	0.00000001	0.00027297
34	Yes	8	0.00000001	0.00029582
35	Yes	8	0.00000001	0.00036197
36	Yes	8	0.00000001	0.00041619
37	Yes	8	0.00000001	0.00045754
38	Yes	8	0.00000001	0.00043306

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 105	1.355	38	0.0789	0.2237
T2	105 - 85	1.031	38	0.0822	0.2253
T3	85 - 65	0.666	38	0.0769	0.2225
T4	65 - 45	0.417	38	0.0468	0.2155
T5	45 - 29	0.233	38	0.0495	0.2022
T6	29 - 25	0.050	38	0.0578	0.1835

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	10'x3" Dia Omni	38	1.355	0.0789	0.2237	174999
122.00	Valmont 13' standoff Mounting Frame	38	1.309	0.0794	0.2244	174999
116.96	Guy	38	1.231	0.0803	0.2254	108808
102.00	Valmont VFA12-HD Sector Frame	38	0.976	0.0825	0.2244	74568
76.96	Guy	38	0.550	0.0647	0.2277	31369
69.00	4' Yagi	38	0.458	0.0515	0.2248	40805
55.00	4' Yagi	38	0.326	0.0441	0.1776	214321
32.00	2'x2'x1' junction box	38	0.086	0.0572	0.2608	140456

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 105	10.574	2	0.6301	0.8587
T2	105 - 85	7.955	2	0.6369	0.8677
T3	85 - 65	5.250	2	0.5801	0.8591
T4	65 - 45	3.226	2	0.4081	0.8362
T5	45 - 29	1.664	2	0.3813	0.7891
T6	29 - 25	0.343	2	0.4049	0.7175

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	10'x3" Dia Omni	2	10.574	0.6301	0.8587	47293
122.00	Valmont 13' standoff Mounting Frame	2	10.190	0.6326	0.8618	47293
116.96	Guy	2	9.542	0.6363	0.8664	29405
102.00	Valmont VFA12-HD Sector Frame	2	7.540	0.6340	0.8647	21444
76.96	Guy	2	4.344	0.5253	0.8807	6023
69.00	4' Yagi	2	3.574	0.4518	0.8713	7867
55.00	4' Yagi	2	2.430	0.3122	0.6906	31970
32.00	2'x2'x1' junction box	2	0.598	0.5457	1.0196	35649

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	125	Leg	A325N	0.7500	3	1917.95	30101.40	0.064 ✔	1	Bolt Tension
		Top Girt	A325N	0.6250	1	142.81	6830.86	0.021 ✔	1	Member Block Shear
T2	105	Leg	A325N	0.7500	3	4884.89	30101.40	0.162 ✔	1	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A325N	0.6250	1	856.40	6830.86	0.125 ✔	1	Member Block Shear
T3	85	Leg	A325N	0.7500	3	4673.69	30101.40	0.155 ✔	1	Bolt Tension
		Top Girt	A325N	0.6250	1	992.53	6830.86	0.145 ✔	1	Member Block Shear
T4	65	Leg	A325N	0.7500	3	3378.81	30101.40	0.112 ✔	1	Bolt Tension
T5	45	Leg	A325N	0.7500	3	3229.10	30101.40	0.107 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	116.96 (A) (258)	3/4 EHS	5830.00	58299.91	17884.50	34980.00	1.000	1.956 ✔
	116.96 (B) (257)	3/4 EHS	5830.00	58299.91	19111.50	34980.00	1.000	1.830 ✔
	116.96 (C) (256)	3/4 EHS	5830.00	58299.91	18683.40	34980.00	1.000	1.872 ✔
T3	76.96 (A) (261)	7/8 EHS	7970.00	79699.84	24508.00	47820.00	1.000	1.951 ✔
	76.96 (B) (260)	7/8 EHS	7970.00	79699.84	27690.20	47820.00	1.000	1.727 ✔
	76.96 (C) (259)	7/8 EHS	7970.00	79699.84	26080.80	47820.00	1.000	1.834 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $P_u / \phi P_n$
T1	125 - 105	2	20.00	3.92	94.0 K=1.00	3.1416	1.00	-15046.50	74093.50	0.203 [1] ✔
T2	105 - 85	2	20.00	3.92	94.0 K=1.00	3.1416	1.00	-34607.40	74093.50	0.467 [1] ✔
T3	85 - 65	2 1/4	20.00	3.92	83.6 K=1.00	3.9761	1.00	-57303.70	107392.00	0.534 [1] ✔
T4	65 - 45	2	20.00	3.92	94.0 K=1.00	3.1416	1.00	-35664.30	74093.50	0.481 [1] ✔
T5	45 - 29	2	16.00	3.90	93.5 K=1.00	3.1416	1.00	-28139.90	74603.20	0.377 [1] ✔
T6	29 - 25	2	4.37	3.05	73.1	3.1416	1.00	-31797.70	95668.20	0.332 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00					✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	7/8	4.96	2.34	115.7 K=0.90	0.6013	-1813.46	9631.38	0.188 [1] ✔
T2	105 - 85	7/8	4.96	2.34	115.7 K=0.90	0.6013	-4879.23	9631.38	0.507 [1] ✔
T3	85 - 65	7/8	4.96	2.33	114.8 K=0.90	0.6013	-5270.35	9729.92	0.542 [1] ✔
T4	65 - 45	7/8	4.96	2.34	115.7 K=0.90	0.6013	-4188.89	9631.38	0.435 [1] ✔
T5	45 - 29	7/8	4.94	2.34	115.3 K=0.90	0.6013	-2514.90	9676.41	0.260 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	103.8 K=1.19	0.7150	-298.98	17026.70	0.018 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.87	103.8 K=1.19	0.7150	-727.70	17026.70	0.043 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	103.4 K=1.19	0.7150	-1202.25	17079.90	0.070 [1] ✔
T4	65 - 45	L2x2x1/8	3.04	2.87	103.4 K=1.19	0.4844	-728.60	11378.60	0.064 [1] ✔
T5	45 - 29	L2x2x1/8	3.04	2.87	103.4 K=1.19	0.4844	-526.74	11378.60	0.046 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.63	100.1 K=1.25	0.7150	-105.67	17628.70	0.006 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.63	100.1 K=1.25	0.7150	-727.70	17628.70	0.041 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.61	99.8 K=1.25	0.7150	-992.53	17680.00	0.056 [1] ✔
T4	65 - 45	L2x2x1/8	3.04	2.87	103.4 K=1.19	0.4844	-728.60	11378.60	0.064 [1] ✔
T5	45 - 29	L2x2x1/8	3.04	2.87	103.4 K=1.19	0.4844	-526.74	11378.60	0.046 [1] ✔
T6	29 - 25	L3x3x1/8	2.88	2.71	87.1 K=1.61	0.7344	-587.47	12827.10	0.046 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	103.8 K=1.19	0.7150	-298.98	17026.70	0.018 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.87	103.8 K=1.19	0.7150	-821.97	17026.70	0.048 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	103.4 K=1.19	0.7150	-992.53	17079.90	0.058 [1] ✔
T4	65 - 45	L2x2x1/8	3.04	2.87	103.4 K=1.19	0.4844	-728.60	11378.60	0.064 [1] ✔
T5	45 - 29	L2x2x1/8	3.04	2.87	103.4 K=1.19	0.4844	-526.74	11378.60	0.046 [1] ✔
T6	29 - 25	12" x 3/8" Plate	0.76	0.59	65.8 K=1.00	4.5000	-325.37	116106.00	0.003 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	2	20.00	3.92	94.0	3.1416	4206.22	141372.00	0.030 [1] ✔
T2	105 - 85	2	20.00	0.21	5.0	3.1416	14654.70	141372.00	0.104 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	85 - 65	2 1/4	20.00	3.92	83.6	3.9761	28137.60	178924.00	0.157 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	7/8	4.96	2.34	128.5	0.6013	2181.28	19482.80	0.112 [1]
T2	105 - 85	7/8	4.96	2.34	128.5	0.6013	2523.52	19482.80	0.130 [1]
T3	85 - 65	7/8	4.96	2.33	127.6	0.6013	3806.07	19482.80	0.195 [1]
T4	65 - 45	7/8	4.96	2.34	128.5	0.6013	625.96	19482.80	0.032 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	55.9	0.7150	1388.93	23166.00	0.060 [1]
T2	105 - 85	L2x2x3/16	3.04	2.87	55.9	0.7150	1911.50	23166.00	0.083 [1]
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	0.7150	2637.13	23166.00	0.114 [1]
T4	65 - 45	L2x2x1/8	3.04	2.87	55.1	0.4844	2540.63	15693.80	0.162 [1]
T5	45 - 29	L2x2x1/8	3.04	2.87	55.1	0.4844	2685.52	15693.80	0.171 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.63	55.9	0.4308	142.81	18739.00	0.008 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.63	55.9	0.4308	856.40	18739.00	0.046 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.61	55.5	0.4308	992.53	18739.00	0.053 [1] ✔
T4	65 - 45	L2x2x1/8	3.04	2.87	55.1	0.4844	1703.35	15693.80	0.109 [1] ✔
T5	45 - 29	L2x2x1/8	3.04	2.87	55.1	0.4844	1263.61	15693.80	0.081 [1] ✔
T6	29 - 25	L3x3x1/8	2.88	2.71	34.3	0.7344	4188.05	23793.80	0.176 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	55.9	0.7150	838.64	23166.00	0.036 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.87	55.9	0.7150	1862.67	23166.00	0.080 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	0.7150	1305.29	23166.00	0.056 [1] ✔
T4	65 - 45	L2x2x1/8	3.04	2.87	55.1	0.4844	1491.21	15693.80	0.095 [1] ✔
T5	45 - 29	L2x2x1/8	3.04	2.87	55.1	0.4844	4302.56	15693.80	0.274 [1] ✔
T6	29 - 25	12" x 3/8" Plate	0.76	0.59	65.8	4.5000	135.56	145800.00	0.001 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	3" x 1/4" Plate	3.04	2.87	477.8	0.7500	2168.90	24300.00	0.089
T3	85 - 65	3" x 1/4" Plate	3.04	2.85	474.3	0.7500	7060.44	24300.00	0.291 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	125 - 105	3" x 1/4" Plate	14.83	126.56	0.117	0.00	1518.75	0.000
T3	85 - 65	3" x 1/4" Plate	0.00	126.56	0.000	0.00	1518.75	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	125 - 105	3" x 1/4" Plate	0.089	0.117	0.000	0.162 ✔	1.000	4.8.1 ✔
T3	85 - 65	3" x 1/4" Plate	0.291	0.000	0.000	0.291 [1] ✔	1.000	4.8.1 ✔

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	125 - 105	Leg	2	2	-15046.50	74093.50	20.3	Pass
		Diagonal	7/8	40	-1813.46	9631.38	18.8	Pass
		Horizontal	L2x2x3/16	16	1388.93	23166.00	6.0	Pass
		Top Girt	L2x2x3/16	4	142.81	18739.00	0.8	Pass
		Bottom Girt	L2x2x3/16	7	838.64	23166.00	3.6	Pass
		Guy A@116.958	3/4	258	17884.50	34980.00	51.1	Pass
		Guy B@116.958	3/4	257	19111.50	34980.00	54.6	Pass
		Guy C@116.958	3/4	256	18683.40	34980.00	53.4	Pass
		Top Guy Pull-Off@116.958	3" x 1/4" Plate	36	2168.90	24300.00	16.2	Pass
T2	105 - 85	Leg	2	54	-34607.40	74093.50	46.7	Pass
		Diagonal	7/8	64	-4879.23	9631.38	50.7	Pass
		Horizontal	L2x2x3/16	94	1911.50	23166.00	8.3	Pass
		Top Girt	L2x2x3/16	55	856.40	18739.00	4.6	Pass
		Bottom Girt	L2x2x3/16	59	1862.67	23166.00	8.0	Pass
T3	85 - 65	Leg	2 1/4	105	-57303.70	107392.00	53.4	Pass
		Diagonal	7/8	151	-5270.35	9729.92	54.2	Pass
		Horizontal	L2x2x3/16	128	2637.13	23166.00	11.4	Pass
		Top Girt	L2x2x3/16	107	-992.53	17680.00	5.6	Pass
		Bottom Girt	L2x2x3/16	110	-992.53	17079.90	5.8	Pass
		Guy A@76.9583	7/8	261	24508.00	47820.00	51.3	Pass
		Guy B@76.9583	7/8	260	27690.20	47820.00	57.9	Pass
		Guy C@76.9583	7/8	259	26080.80	47820.00	54.5	Pass
		Top Guy Pull-Off@76.9583	3" x 1/4" Plate	136	7060.44	24300.00	29.1	Pass
T4	65 - 45	Leg	2	156	-35664.30	74093.50	48.1	Pass
		Diagonal	7/8	204	-4188.89	9631.38	43.5	Pass
		Horizontal	L2x2x1/8	197	2540.63	15693.80	16.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Top Girt	L2x2x1/8	158	1703.35	15693.80	10.9	Pass
		Bottom Girt	L2x2x1/8	160	1491.21	15693.80	9.5	Pass
T5	45 - 29	Leg	2	206	-28139.90	74603.20	37.7	Pass
		Diagonal	7/8	246	-2514.90	9676.41	26.0	Pass
		Horizontal	L2x2x1/8	238	2685.52	15693.80	17.1	Pass
		Top Girt	L2x2x1/8	208	1263.61	15693.80	8.1	Pass
		Bottom Girt	L2x2x1/8	211	4302.56	15693.80	27.4	Pass
T6	29 - 25	Leg	2	248	-31797.70	95668.20	33.2	Pass
		Top Girt	L3x3x1/8	250	4188.05	23793.80	17.6	Pass
		Bottom Girt	12" x 3/8" Plate	253	-244.20	116106.00	0.3	Pass
							Summary	
						Leg (T3)	53.4	Pass
						Diagonal (T3)	54.2	Pass
						Horizontal (T5)	17.1	Pass
						Top Girt (T6)	17.6	Pass
						Bottom Girt (T5)	27.4	Pass
						Guy A (T3)	51.3	Pass
						Guy B (T3)	57.9	Pass
						Guy C (T3)	54.5	Pass
						Top Guy Pull-Off (T3)	29.1	Pass
						Bolt Checks	16.2	Pass
						RATING =	**57.9**	**Pass**

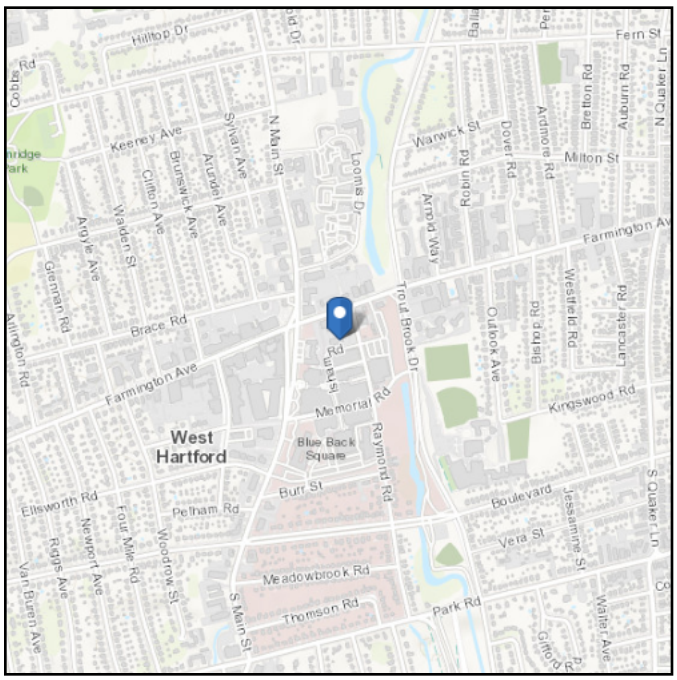
APPENDIX B

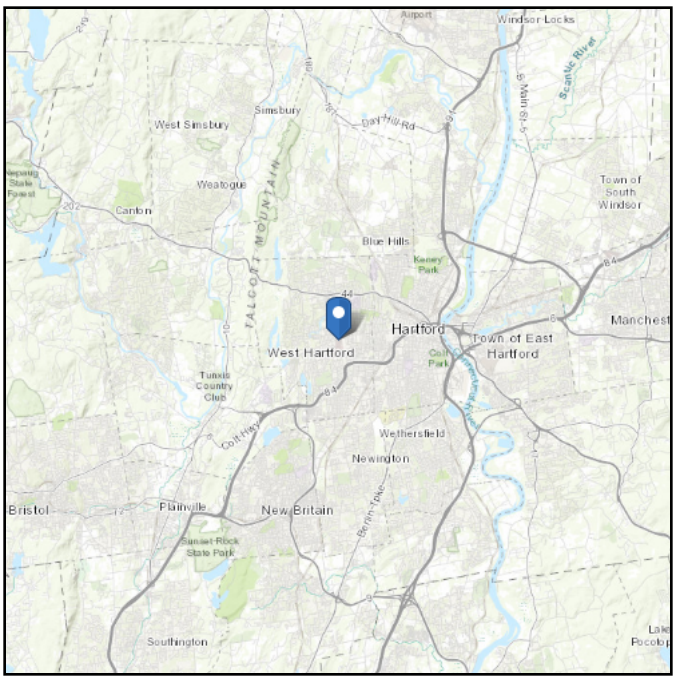
REFERENCE MATERIAL

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-16	**Latitude:**	41.76156
Risk Category:	II	**Longitude:**	-72.74038
Soil Class:	D - Default (see Section 11.4.3)	**Elevation:**	99.63853158738304 ft (NAVD 88)





Wind

Results:

Wind Speed	117 Vmph
10-year MRI	75 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	97 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Sun Jul 09 2023

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

Seismic

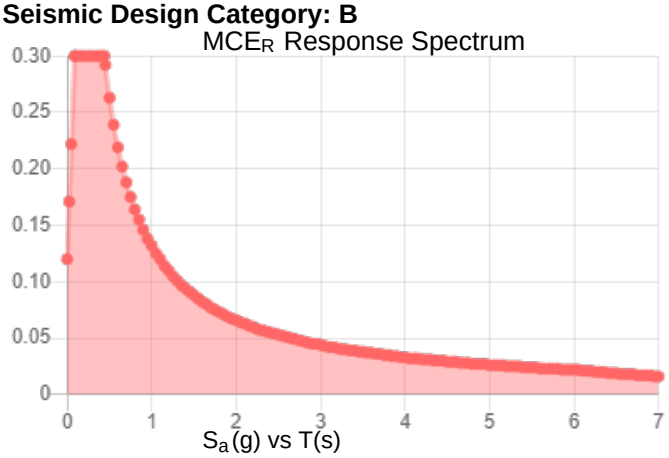
D - Default (see Section 11.4.3)

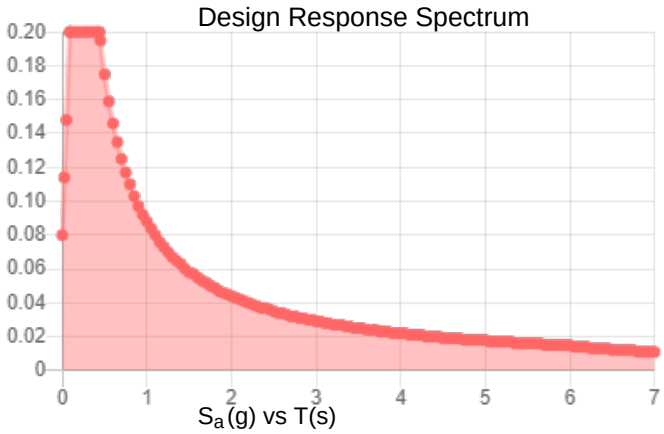
Site Soil Class:

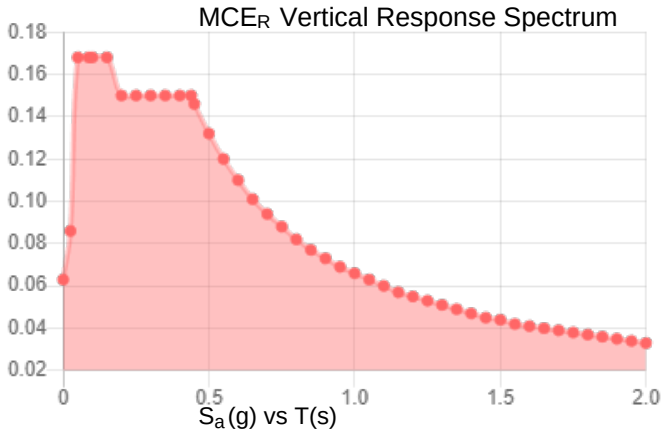
Results:

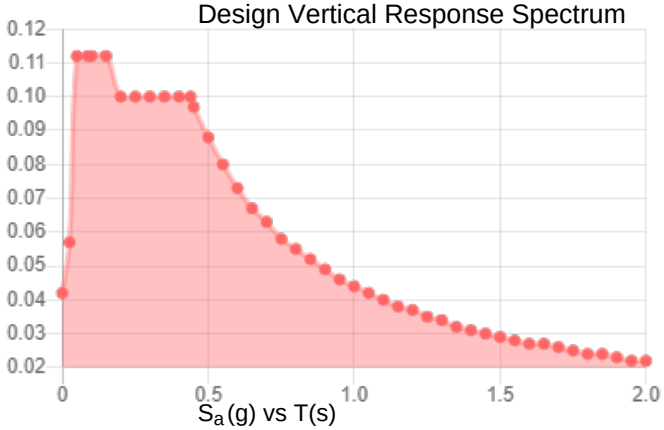
S_S :	0.187	S_{D1} :	0.088
S_1 :	0.055	T_L :	6
F_a :	1.6	PGA :	0.101
F_v :	2.4	PGA_M :	0.161
S_{MS} :	0.3	F_{PGA} :	1.598
S_{M1} :	0.132	I_e :	1
S_{DS} :	0.2	C_v :	0.7

Seismic Design Category: B









Data Accessed: **Sun Jul 09 2023**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	1.50 in.
Concurrent Temperature:	5 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sun Jul 09 2023

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

verizon
NPP RFDS

EAST > New England > > North East > WEST HARTFORD CENTER CT

Latorre, Juan - jay.latorre@verizonwireless.com - 10042023

Project Details

Carrier Aggregation:	☐
Ecip:	☐
Project Name:	RADIO SWAP
Project Alt Name:	WEST HARTFORD CENTER CT - C BAND GEN 2 MMU FOA
Project ID:	17082761
Designed Sector Carrier 4G:	15
Designed Sector Carrier 5G:	6
Additional Sector Carrier 4G:	0
Additional Sector Carrier 5G:	0
Suffix:	
FP Solution Type & Tech Type:	MODIFICATION;5G_Radio Swap
RFDS Project Scope:	

Location Information

Site ID:	325091
Search Ring#:	
E-NodeB ID#:	068960|0689551
PSLC#:	535840
Switch Name:	Windsor-3
Tower Type:	
Site Type:	MACRO
Street Address:	14-20 Isham Road
City:	West Hartford
State:	CT
Zip Code:	06107
County:	Hartford
Latitude:	41.76156
Longitude:	-72.74038

RFDS Project Scope

C Band Gen 1 to Gen 2 MMU upgrade.

Antenna Summary

Added Antennas

L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	Install Type	Quantity
5G	Samsung	MT6413-77A	101	102.2	60(A),180(B),290(C)	PHYSICAL	3

All items per page — 1 - 1 of 1 items

Removed Antennas

L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	Install Type	Quantity	Notes
	SWEDCOM	SLCP 2X6014	106	108.2	180(),290()	SPARE	2	CDMA Spare,CDMA Spare
	AMPHENOL	**BXA-80063/4**	**106**	**108**	**60()**	**SPARE**	**1**	**CDMA Spare**
5G	Samsung	MT6407-77A	101	102.5	60(A),180(B),290(C)	PHYSICAL	3	

All items per page — 1 - 3 of 3 items

Retained Antennas

700	850	1900	AWS	CBRS	Make	Model	Centerline	Tip Height	Azimuth	Install Type	Quantity
LTE	5G,LTE	LTE	LTE		ANDREW	SBNHH-1D65B	99.2	102.2	60(A),180(B),290(C)	PHYSICAL	6
				LTE	SAMSUNG	XXDWMM-12.5-65	97.6	98.1	60(A),180(B),290(C)	PHYSICAL	3

All items per page — 1 - 2 of 2 items

Added : 3 | Removed : 6 | Retained : 9

Non Antenna Summary

Added Non Antennas

Equipment Type	Location	L-Sub6	Make	Model	Install Type	Hide on PDF

All items per page 1 - 1 of 1 items

Removed Non Antennas

Equipment Type	Location	L-Sub6	Make	Model	Install Type	Hide on PDF

All items per page 1 - 1 of 1 items

Retained Non Antennas

Equipment Type	Location	700	850	1900	AWS	CBRS	Make	Model	Install Type	Quantity
RRU	Tower					LTE	Samsung	CBRS RRH - RT4401-48A	PHYSICAL	3
RRU	Tower			LTE	LTE		Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)	PHYSICAL	3
RRU	Tower	LTE	5G,LTE				Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)	PHYSICAL	3

All items per page 1 - 3 of 3 items

Added : 0 | Removed : 0 | Retained : 9

	Current Version 0000 Site Record Id:8002490 Last Import:2023-04-10 08:50:33			Proposed Version 0002 Site Record Id:8595128 Last Import:2023-04-10 08:50:33		
1900 LTE	0000			0002		
Sector:	01	02	03	01	02	03
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	068960	068960	068960	068960	068960	068960
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	99.2	99.2	99.2	99.2	99.2	99.2
DLEARFCN:	1050	1050	1050	1050	1050	1050
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	0	0	0	0	0	0
Tip Height:	102.2	102.2	102.2	102.2	102.2	102.2
Regulatory Power:	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP	290.31 (W/MHz) EIRP
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Position:	3	3	3	3	3	3
Transmitter Id:	9038532	9038542	9038546	16565037	16565040	16565043
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

700 LTE	0000			0002		
Sector:	01	02	03	01	02	03
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	068960	068960	068960	068960	068960	068960
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	99.2	99.2	99.2	99.2	99.2	99.2
DLEARFCN:	5230	5230	5230	5230	5230	5230
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	3	5	5	3	5	5
Tip Height:	102.2	102.2	102.2	102.2	102.2	102.2
Regulatory Power:	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP	77.46 (W/MHz) ERP
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Position:	2,3	2,3	2,3	2,3	2,3	2,3
Transmitter Id:	9038525	9038541	9038545	16565036	16565039	16565042
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

850 LTE	0000			0002		
Sector:	01	02	03	01	02	03
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	068960	068960	068960	068960	068960	068960
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	99.2	99.2	99.2	99.2	99.2	99.2
DLEARFCN:	2450	2450	2450	2450	2450	2450
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	3	5	5	3	5	5
Tip Height:	102.2	102.2	102.2	102.2	102.2	102.2
Regulatory Power:	366.87 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD	366.87 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Position:	2,3	2,3	2,3	2,3	2,3	2,3
Transmitter Id:	9038539	9038544	9038548	16565033	16565034	16565035
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

850 NR	0000			0002		
Sector:	0046	0047	0048	0046	0047	0048
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	0689551	0689551	0689551	0689551	0689551	0689551
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	99.2	99.2	99.2	99.2	99.2	99.2
DLEARFCN:	2450	2450	2450	2450	2450	2450
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	3	5	5	3	5	5
Tip Height:	102.2	102.2	102.2	102.2	102.2	102.2
Regulatory Power:	366.87 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD	366.87 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD	366.96 (W/MHz) ERPSD
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Position:	2,3	2,3	2,3	2,3	2,3	2,3
Transmitter Id:	9038539	9038544	9038548	16565033	16565034	16565035
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

AWS LTE	0000			0002		
Sector:	01	02	03	01	02	03
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	068960	068960	068960	068960	068960	068960
Antenna Model:	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B	SBNHH-1D65B
Antenna Make:	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Antenna CenterLine(Ft):	99.2	99.2	99.2	99.2	99.2	99.2
DLEARFCN:	2050	2050	2050	2050	2050	2050
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	0	0	0	0	0	0
Tip Height:	102.2	102.2	102.2	102.2	102.2	102.2
Regulatory Power:	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP	144.05 (W/MHz) EIRP
Cell Max Power:	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm	46 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines:	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Position:	2	2	2	2	2	2
Transmitter Id:	9038536	9038543	9038547	16565038	16565041	16565044
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	20	20	20	20	20	20

CBAND NR	0000			0002		
Sector:	0046	0047	0048	0046	0047	0048
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	0689551	0689551	0689551	0689551	0689551	0689551
Antenna Model:	MT6407-77A	MT6407-77A	MT6407-77A	MT6413-77A	MT6413-77A	MT6413-77A
Antenna Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
Antenna CenterLine(Ft):	101	101	101	101	101	101
DLEARFCN:	648672	648672	648672	648672	648672	648672
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	1	1	1	3	3	3
Tip Height:	102.5	102.5	102.5	102.2	102.2	102.2
Regulatory Power:	767.64 (W/MHz) EIRP	767.64 (W/MHz) EIRP	767.64 (W/MHz) EIRP	1603.82 (W/MHz) EIRP	1603.82 (W/MHz) EIRP	1603.82 (W/MHz) EIRP
Cell Max Power:	47.8 dBm	47.8 dBm	47.8 dBm	51.1 dBm	51.1 dBm	51.1 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	MT6407-77A	MT6407-77A	MT6407-77A	MT6413-77A	MT6413-77A	MT6413-77A
Number of Tx, Rx Lines:	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2	2 , 2
Position:	4	4	4	4	4	4
Transmitter Id:	9038566	9038567	9038568	16565030	16565031	16565032
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	60	60	60	60	60	60

CBRS LTE	0000			0002		
Sector:	19	20	21	19	20	21
Azimuth:	60	180	290	60	180	290
Cell/E-NodeB Id:	068960	068960	068960	068960	068960	068960
Antenna Model:	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65	XXDWMM-12.5-65
Antenna Make:	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG	SAMSUNG
Antenna CenterLine(Ft):	97.6	97.6	97.6	97.6	97.6	97.6
DLEARFCN:	55790	55790	55790	55790	55790	55790
Mechanical Down-Tilt(Deg.):	0	0	0	0	0	0
Electrical Down-Tilt:	8	8	8	8	8	8
Tip Height:	98.1	98.1	98.1	98.1	98.1	98.1
Regulatory Power:	9.72 (W/MHz) EIRPSD	9.72 (W/MHz) EIRPSD	9.72 (W/MHz) EIRPSD	9.72 (W/MHz) EIRPSD	9.72 (W/MHz) EIRPSD	9.72 (W/MHz) EIRPSD
Cell Max Power:	31 dBm	31 dBm	31 dBm	31 dBm	31 dBm	31 dBm
TMA Make:	null	null	null	null	null	null
TMA Model:	null	null	null	null	null	null
RRU Make:	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
RRU Model:	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A	CBRS RRH - RT4401-48A
Number of Tx, Rx Lines:	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4	4 , 4
Position:	4	4	4	4	4	4
Transmitter Id:	9038549	9038550	9038552	16565045	16565046	16565047
Source:	SHASU2I	SHASU2I	SHASU2I	LATORJU	LATORJU	LATORJU
Bandwidth	10	10	10	10	10	10

Callsigns per Antenna - Propose

☐ Select PSD/non PSD per sector

Sector	Antenna Make	Antenna Model	Ant CL	Tip Height	Azimuth	Electr Tilt	Mechanical Tilt	Gain	Beam	Regulatory Power	Callsigns								
											700	850	1900	2100	28 GHz	31 GHz	39 GHz	L-Sub6	CBRS
03	ANDREW	SBNHH-1D	99.2	102.2	290	5	0	12.383	66	366.96 - PSD		KNKA404							
01	ANDREW	SBNHH-1D	99.2	102.2	60	0	0	16.188999	53	290.31			KNLH251,WPO						
02	ANDREW	SBNHH-1D	99.2	102.2	180	5	0	12.383	66	366.96 - PSD		KNKA404							
01	ANDREW	SBNHH-1D	99.2	102.2	60	0	0	16.188	60.25	144.05				WQGA906,WQ					
0048	ANDREW	SBNHH-1D	99.2	102.2	290	5	0	12.383	66	366.96 - PSD		KNKA404							
03	ANDREW	SBNHH-1D	99.2	102.2	290	0	0	16.188	60.25	144.05				WQGA906,WQ					
0046	ANDREW	SBNHH-1D	99.2	102.2	60	3	0	12.491	66	366.87 - PSD		KNKA404							
02	ANDREW	SBNHH-1D	99.2	102.2	180	0	0	16.188	60.25	144.05				WQGA906,WQ					
03	ANDREW	SBNHH-1D	99.2	102.2	290	5	0	12.632	69.25	77.46	WQJQ689								
0047	ANDREW	SBNHH-1D	99.2	102.2	180	5	0	12.383	66	366.96 - PSD		KNKA404							
01	ANDREW	SBNHH-1D	99.2	102.2	60	3	0	12.491	66	366.87 - PSD		KNKA404							
02	ANDREW	SBNHH-1D	99.2	102.2	180	5	0	12.632	69.25	77.46	WQJQ689								
03	ANDREW	SBNHH-1D	99.2	102.2	290	0	0	16.188999	53	290.31			KNLH251,WPO						
02	ANDREW	SBNHH-1D	99.2	102.2	180	0	0	16.188999	53	290.31			KNLH251,WPO						
01	ANDREW	SBNHH-1D	99.2	102.2	60	3	0	12.607	69	77.46	WQJQ689								

All items per page

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Callsigns

Callsign	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range	Freq Range	Freq Range	Freq Range	Regulatory Power	Threshold	POPs/Sq MI	Action	Approved for Insvc
WQJQ689	Northeast	WU	REA001	C	CT	Hartford	Cellco Partnership	Yes	22.000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	746.000 - 757.000/.000 - .000	776.000 - 787.000/.000 - .000	77.46	1000	1223.64	retained	1
KNKA404	Hartford-New Britain-Bristol, CT	CL	CMA032	A	CT	Hartford	Cellco Partnership	Yes	25.000	824.000 - 835.000/845. - 846.500	869.000 - 880.000/890. - 891.500	824.000 - 835.000/845. - 846.500	869.000 - 880.000/890. - 891.500	366.87	400	1223.64	retained	1
										1895.000 -	1975.000 -	1895.000 -	1975.000 -					

WPOJ730	Hartford, CT	CW	BTA184	C	CT	Hartford	Cellco Partnership	Yes	10.000	1900.000/.00 - .000	1980.000/.00 - .000	1900.000/.00 - .000	1980.000/.00 - .000	290.31	1640	1223.64	retained	1
KNLH251	Hartford, CT	CW	BTA184	F	CT	Hartford	Cellco Partnership	Yes	10.000	1890.000 - 1895.000/.00 - .000	1970.000 - 1975.000/.00 - .000	1890.000 - 1895.000/.00 - .000	1970.000 - 1975.000/.00 - .000	290.31	1640	1223.64	retained	1
WRLD513	D09003 - Hartford, CT	PL	D09003	0	CT	Hartford	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000		501	1223.64		1
WRLD514	D09003 - Hartford, CT	PL	D09003	0	CT	Hartford	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000		501	1223.64		1
WRLD515	D09003 - Hartford, CT	PL	D09003	0	CT	Hartford	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000	3550.000 - 3650.000/.00 - .000	.000 -000/.000 -000		501	1223.64		1
WQGB276	Hartford-New Britain-Bristol, CT	AW	CMA032	A	CT	Hartford	Cellco Partnership	Yes	20.000	1710.000 - 1720.000/.00 - .000	2110.000 - 2120.000/.00 - .000	1710.000 - 1720.000/.00 - .000	2110.000 - 2120.000/.00 - .000	144.05	1640	1223.64	retained	1
WRNE581	New York, NY	PM	PEA001	A1	CT	Hartford	Cellco Partnership	Yes	20.000	3700.000 - 3720.000/.00 - .000	.000 -000/.000 -000	3700.000 - 3720.000/.00 - .000	.000 -000/.000 -000		1640	1223.64		1
WRNE582	New York, NY	PM	PEA001	A2	CT	Hartford	Cellco Partnership	Yes	20.000	3720.000 - 3740.000/.00 - .000	.000 -000/.000 -000	3720.000 - 3740.000/.00 - .000	.000 -000/.000 -000		1640	1223.64		1
WRNE583	New York, NY	PM	PEA001	A3	CT	Hartford	Cellco Partnership	Yes	20.000	3740.000 - 3760.000/.00 - .000	.000 -000/.000 -000	3740.000 - 3760.000/.00 - .000	.000 -000/.000 -000		1640	1223.64		1
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	Hartford	Cellco Partnership	Yes	20.000	1720.000 - 1730.000/.00 - .000	2120.000 - 2130.000/.00 - .000	1720.000 - 1730.000/.00 - .000	2120.000 - 2130.000/.00 - .000	144.05	1640	1223.64	retained	1
WRBA708	Hartford, CT	UU	BTA184	L1	CT	Hartford	Cellco Partnership	Yes	325.000	27500.000 - 27600.000/.0 - .000	27700.000 - 27925.000/.0 - .000	27500.000 - 27600.000/.0 - .000	27700.000 - 27925.000/.0 - .000			1223.64		1
WRBA709	Hartford, CT	UU	BTA184	L2	CT	Hartford	Cellco Partnership	Yes	325.000	27925.000 - 28050.000/.0 - .000	28150.000 - 28350.000/.0 - .000	27925.000 - 28050.000/.0 - .000	28150.000 - 28350.000/.0 - .000			1223.64		1
WRHD609	New York, NY	UU	PEA001	M1	CT	Hartford	Cellco Partnership	Yes	100.000	37600.000 - 37700.000/.0 - .000	.000 -000/.000 -000	37600.000 - 37700.000/.0 - .000	.000 -000/.000 -000			1223.64		1
										38500.000		38500.000						

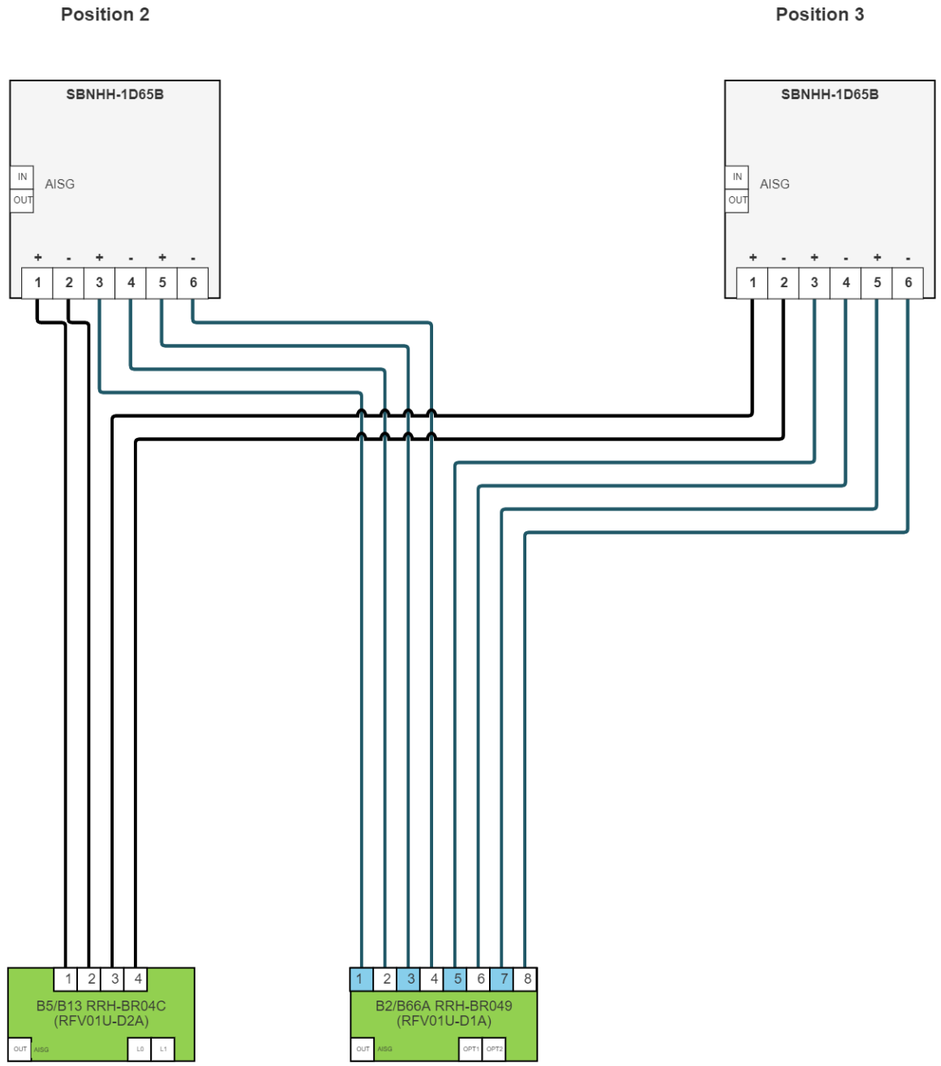
WRHD610	New York, NY	UU	PEA001	M10	CT	Hartford	Cellco Partnership	Yes	100.000	-38600.000/.0 - .000	.000 -000/.000 -000	-38600.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD611	New York, NY	UU	PEA001	M2	CT	Hartford	Cellco Partnership	Yes	100.000	37700.000 - 37800.000/.0 - .000	.000 -000/.000 -000	37700.000 - 37800.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD612	New York, NY	UU	PEA001	M3	CT	Hartford	Cellco Partnership	Yes	100.000	37800.000 - 37900.000/.0 - .000	.000 -000/.000 -000	37800.000 - 37900.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD613	New York, NY	UU	PEA001	M4	CT	Hartford	Cellco Partnership	Yes	100.000	37900.000 - 38000.000/.0 - .000	.000 -000/.000 -000	37900.000 - 38000.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD614	New York, NY	UU	PEA001	M5	CT	Hartford	Cellco Partnership	Yes	100.000	38000.000 - 38100.000/.0 - .000	.000 -000/.000 -000	38000.000 - 38100.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD615	New York, NY	UU	PEA001	M6	CT	Hartford	Cellco Partnership	Yes	100.000	38100.000 - 38200.000/.0 - .000	.000 -000/.000 -000	38100.000 - 38200.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD616	New York, NY	UU	PEA001	M7	CT	Hartford	Cellco Partnership	Yes	100.000	38200.000 - 38300.000/.0 - .000	.000 -000/.000 -000	38200.000 - 38300.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD617	New York, NY	UU	PEA001	M8	CT	Hartford	Cellco Partnership	Yes	100.000	38300.000 - 38400.000/.0 - .000	.000 -000/.000 -000	38300.000 - 38400.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD618	New York, NY	UU	PEA001	M9	CT	Hartford	Cellco Partnership	Yes	100.000	38400.000 - 38500.000/.0 - .000	.000 -000/.000 -000	38400.000 - 38500.000/.0 - .000	.000 -000/.000 -000		1223.64	1
WRHD619	New York, NY	UU	PEA001	N1	CT	Hartford	Cellco Partnership	Yes	100.000	38600.000 - 38700.000/.0 - .000	.000 -000/.000 -000	38600.000 - 38700.000/.0 - .000	.000 -000/.000 -000		1223.64	1
PEND1050	Northeast	CC	REA001	A	CT	Hartford	Cellco Partnership	Yes	.000	.000 -000/.000 -000	.000 -000/.000 -000	.000 -000/.000 -000	.000 -000/.000 -000	1640	1223.64	0
WRNE584	New York, NY	PM	PEA001	A4	CT	Hartford	Cellco Partnership	Yes	20.000	3760.000 - 3780.000/.00 - .000	.000 -000/.000 -000	3760.000 - 3780.000/.00 - .000	.000 -000/.000 -000	1640	1223.64	0
WRNE585	New York, NY	PM	PEA001	A5	CT	Hartford	Cellco Partnership	Yes	20.000	3780.000 - 3800.000/.00 - .000	.000 -000/.000 -000	3780.000 - 3800.000/.00 - .000	.000 -000/.000 -000	1640	1223.64	0
WRNE586	New York, NY	PM	PEA001	B1	CT	Hartford	Cellco Partnership	Yes	20.000	3800.000 - 3820.000/.00 - .000	.000 -000/.000 -000	3800.000 - 3820.000/.00 - .000	.000 -000/.000 -000	1640	1223.64	0

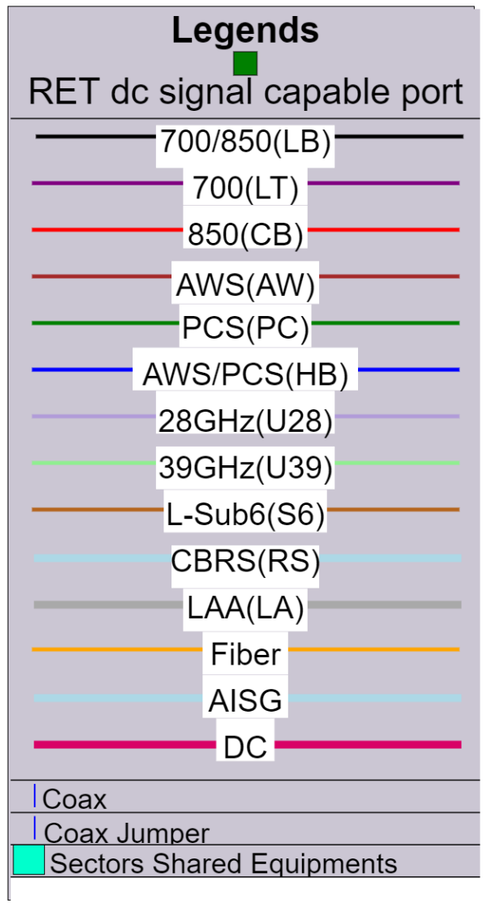
WRNE587	New York, NY	PM	PEA001	B2	CT	Hartford	Cellco Partnership	Yes	20.000	3820.000 - 3840.000/.000 - .000	.000 -000/.000 -000	3820.000 - 3840.000/.000 - .000	.000 -000/.000 -000	1640	1223.64	0
WRNE588	New York, NY	PM	PEA001	B3	CT	Hartford	Cellco Partnership	Yes	20.000	3840.000 - 3860.000/.000 - .000	.000 -000/.000 -000	3840.000 - 3860.000/.000 - .000	.000 -000/.000 -000	1640	1223.64	0

All items per page

1 - 31 of 31 items

Alpha
(Proposed)

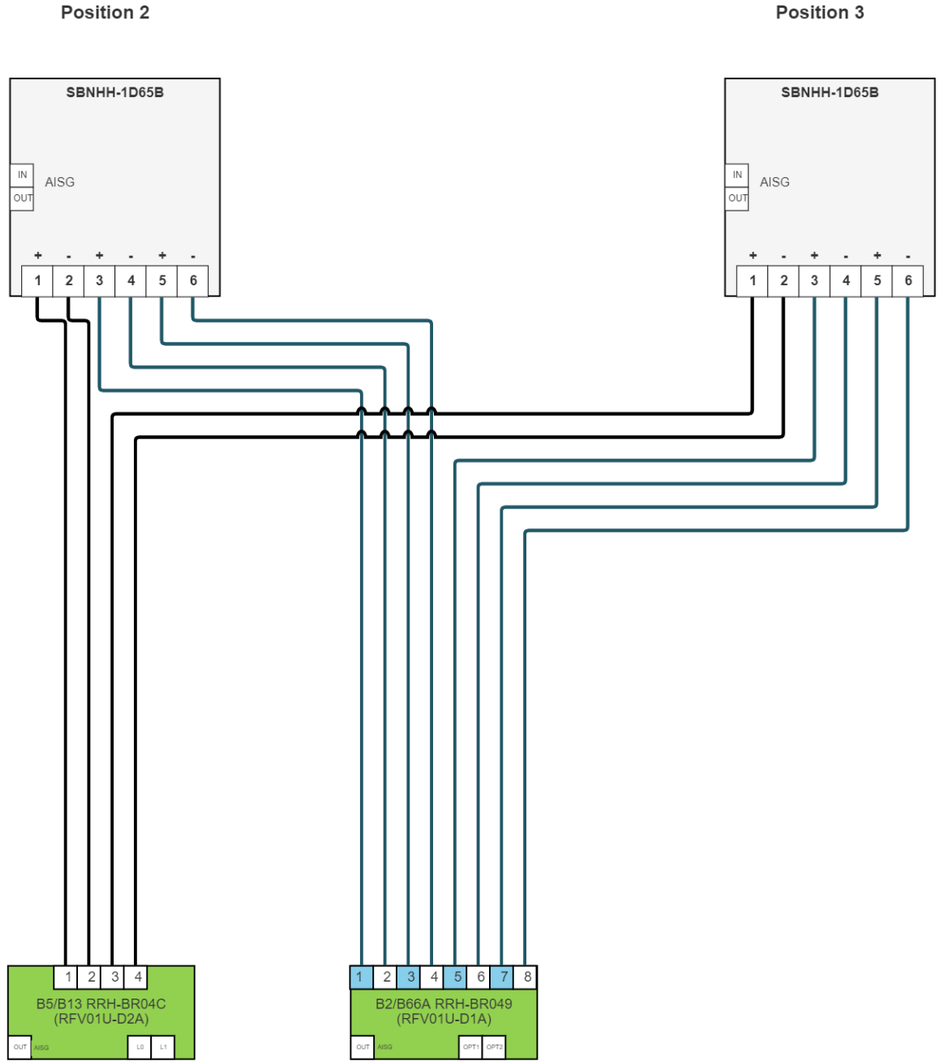


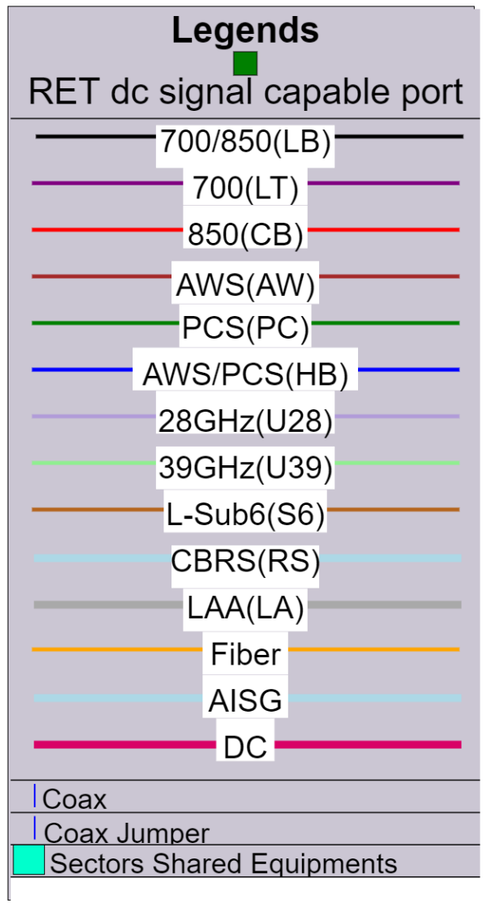


Notes:

-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
-Size of objects in drawing doesn't reflect equipment true dimensions

Beta
(Proposed)

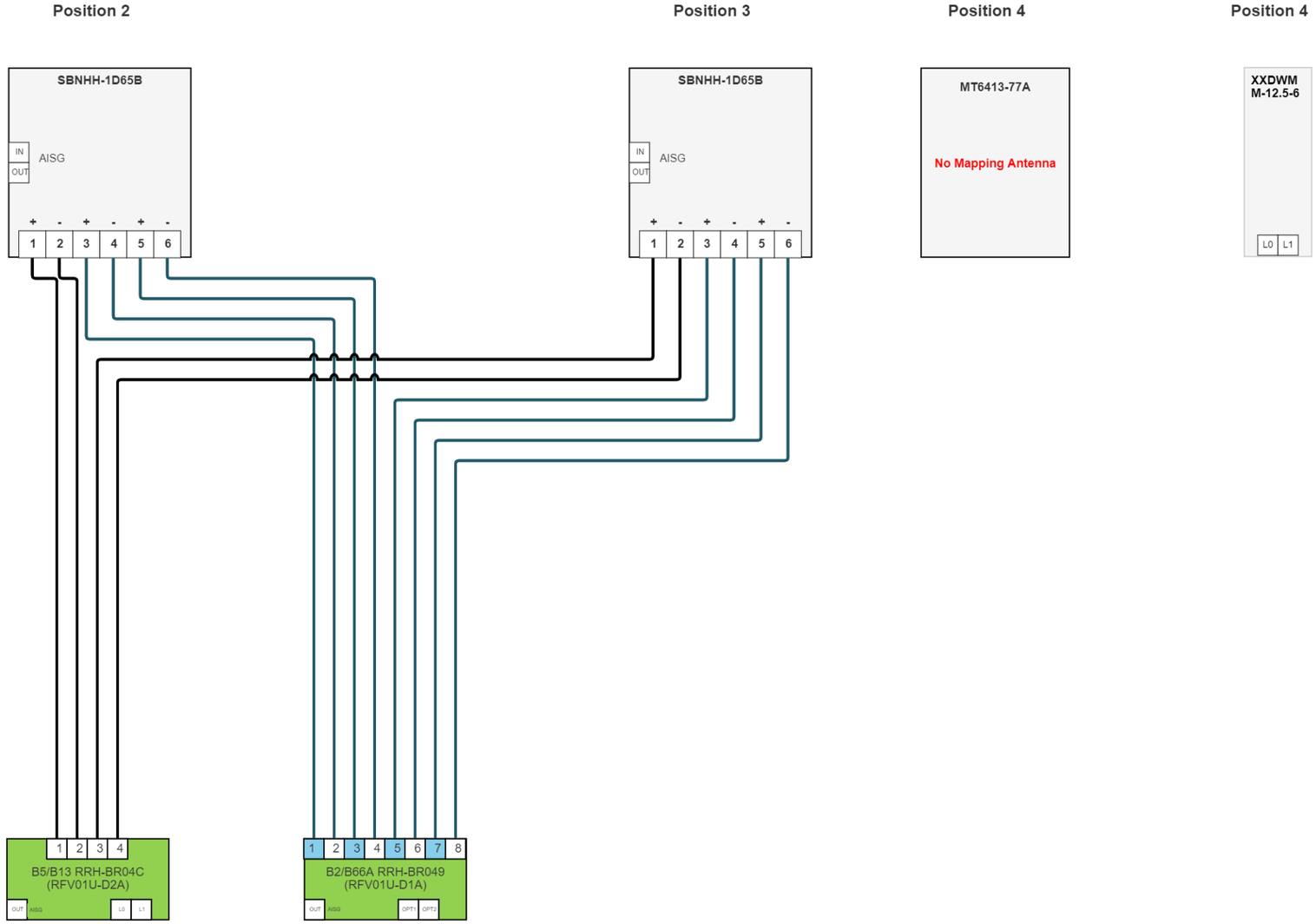


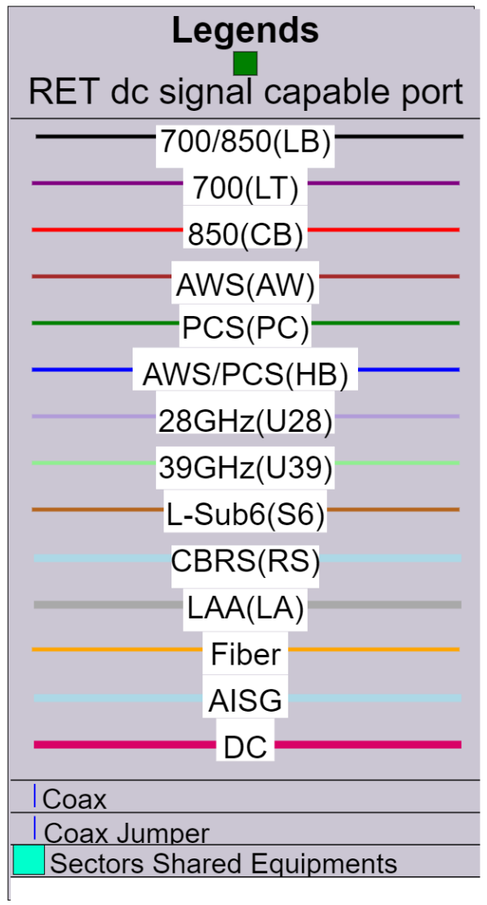


Notes:

-Antenna view is from the back of the antennas
-Colors of connections are just for clarification
-Size of objects in drawing doesn't reflect equipment true dimensions

Gamma
(Proposed)





Notes:

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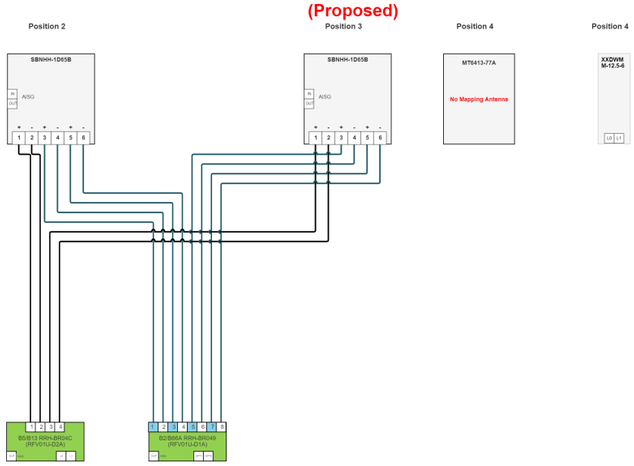
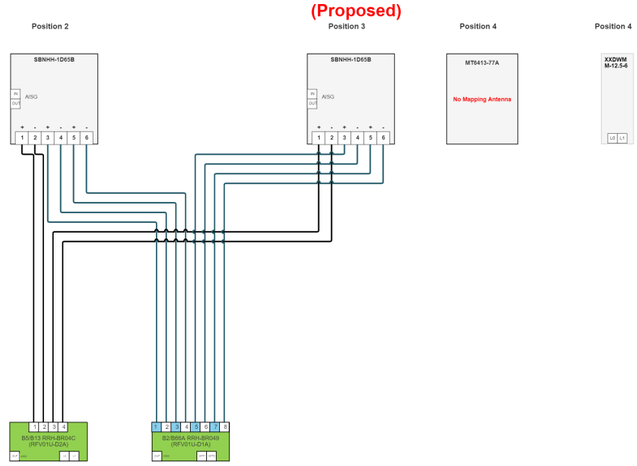
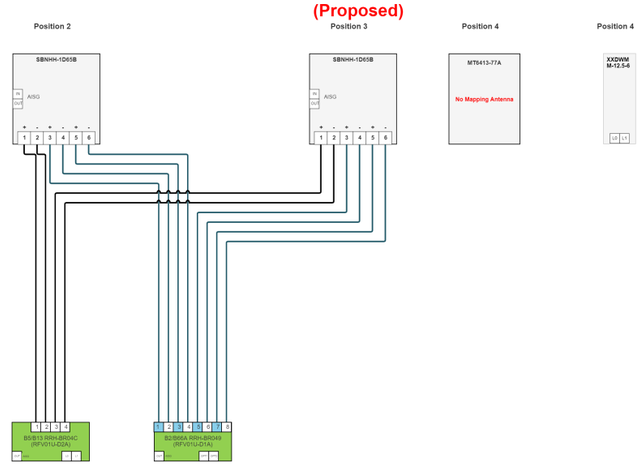
Alpha
(Proposed)



Beta
(Proposed)

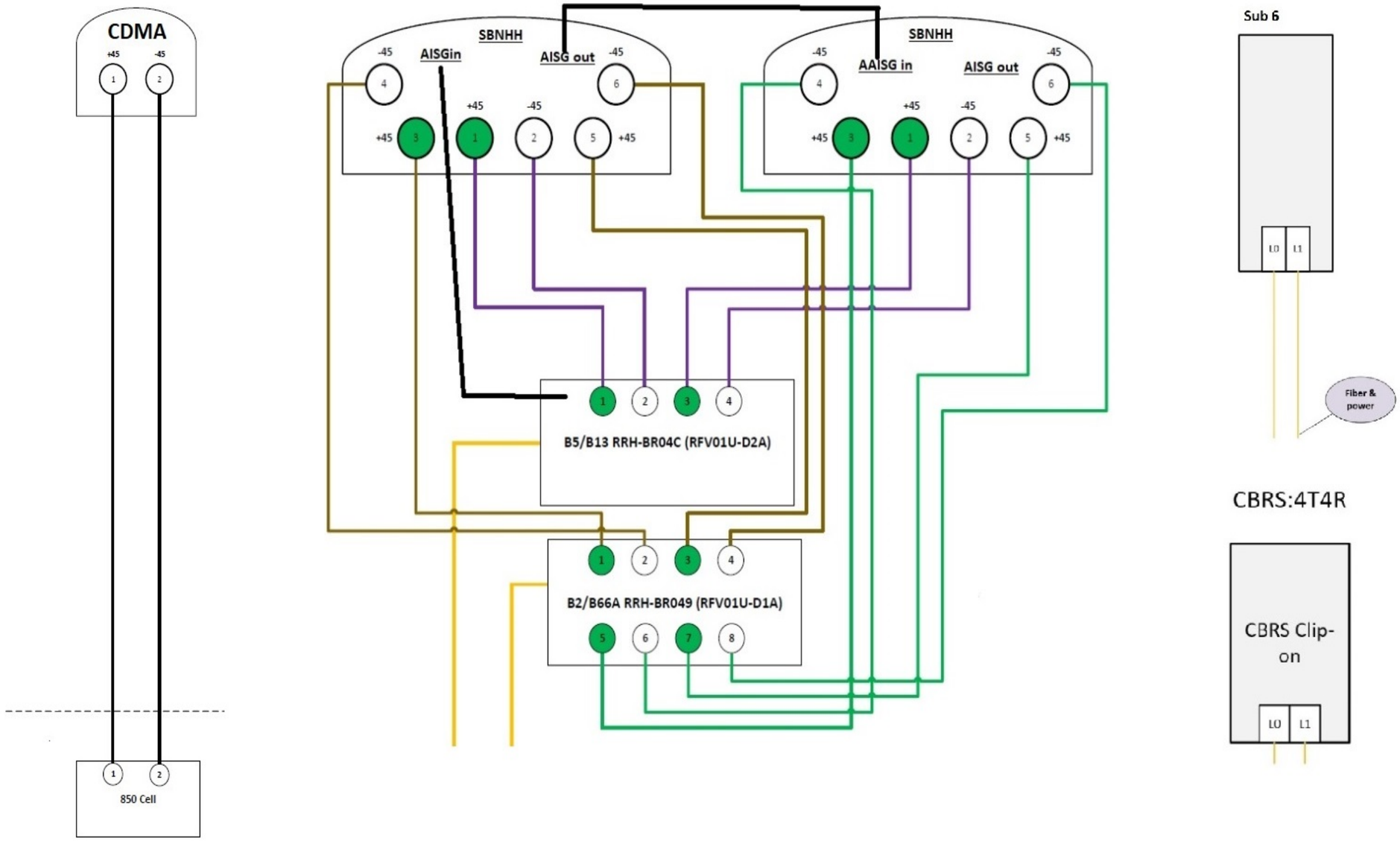


Gamma
(Proposed)



Sector design

Shelter


CDMA
+45
-45
1
2
SBNHH
-45
AISGin
AISG out
-45
4
6
+45
-45
+45
3
1
2
5
+45
SBNHH
-45
AAISG in
AISG out
-45
4
6
+45
-45
+45
3
1
2
5
+45
1
2
3
4
B5/B13 RRH-BR04C (RFV01U-D2A)
1
2
3
4
B2/B66A RRH-BR049 (RFV01U-D1A)
5
6
7
8
1
2
850 Cell
Sub 6
L0
L1
Fiber & power
CBRS:4T4R
CBRS Clip-on
L0
L1