Robinson+Cole

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Also admitted in Massachusetts

March 8, 2018

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **EM-VER-086-170201 – Cellco Partnership d/b/a Verizon Wireless**
57 Cook Road, Montville, Connecticut

Dear Ms. Bachman:

On March 6, 2017, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its existing telecommunications facility at 57 Cook Road in Montville, Connecticut. Cellco's modifications involved the replacement of antennas and remote radio heads.

As a condition of its approval, Cellco was required to provide the Council with a letter stating that it had complied with the recommendations made in the February 1, 2017 structural report, which was attached to the exempt modification filing. During construction of the approved modifications it was discovered that some of the assumptions in the February 1, 2017 structural were incorrect. For example, certain coax cables were supposed to have been removed during some prior modification work, but were not. To avoid any confusion, Cellco had a new structural analysis completed on October 18, 2017, which took into account existing conditions prior to the completion of work approved in EM-VER-086-170201. A copy of the updated "passing" structural is attached. Also attached is a Notice of Completion Certification from a professional engineer verifying that Cellco's modifications were completed in accordance with the new, October 18, 2017, Structural Analysis Report.

If you have any questions please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Attachment
Copy to:
Tim Parks

HUDSON
Design Group LLC

February 9, 2018

Mr. Tim Parks
Verizon Wireless
99 East Drive
East Hartford, CT 06108

RE: Notice of Completion Certification

Project: Montville 4 CT
57 Cook Drive
Montville, CT 06382

Engineer: Derek J. Creaser, P.E.
Hudson Design Group LLC
1600 Osgood St. Building 20 North, Suite 3090
North Andover, MA 01845

CSC Exempt Mod Reference No.: EM-VER-086-170210

Dear Mr. Parks,

HDG is providing this "Notice of Completion Certification" with regard to the wireless telecommunications facility installation at the above referenced project.

The following are the basis for submitting compliance with following:

- Review of the Hudson Design Group LLC Structural Analysis dated October 18, 2017
- Field Observations by Hudson Design Group personnel on January 6, 2018 and Closeout Photos dated Feb. 5, 2018 of the completed installation which was installed in general compliance with the aforementioned Structural Analysis.

The structural analysis prepared by Hudson Design Group LLC demonstrates the tower will not exceed 100 percent of the post construction structural rating. The work under this Contract has been reviewed and found, to the Engineer's best knowledge, information and belief, to be completed in general compliance with the document(s) referenced above. This certification is not a review of the adequacy or effectiveness of the modification/reinforcement solution.

Respectfully Submitted,
Hudson Design Group LLC

Derek J. Creaser, P.E.

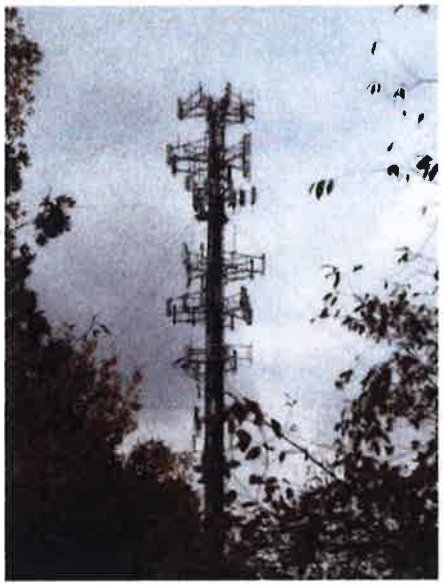
STRUCTURAL ANALYSIS REPORT

For

MONTVILLE 4 CT

57 COOK DRIVE
MONTVILLE, CT 06382

Antennas Mounted to the Guyed Tower



Prepared for:

verizon

99 East River Road, 9th Floor
East Hartford, CT 06108

Dated: October 18, 2017

Prepared by:

HUDSON Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com

10/18/2017

HUDSON
Design Group LLC

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 193' guyed tower supporting the proposed Verizon's antennas located at elevation 169' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of Verizon's existing and proposed antennas listed below.

Record drawings of the existing tower were not available for our use. This office conducted an on-site visual survey and tower mapping on October 15, 2012 to record dimensional properties of the existing tower and its appurtenances. The previous structural analysis report prepared by Centek Engineering Inc., dated May 6, 2015, was available and obtained for our use.

Construction drawings prepared by ProTerra Design Group, dated July 20, 2017, was provided to this office.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing tower and foundation **are in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The tower structure is rated at **88.7%** - (Guys at EL.162.6' Controlling).

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APPURTENANCES CONFIGURATION:

Tenant	Appurtenances	Elev.	Mount
	(6) AIR 21 Antennas	188'	Boom Gate
	(3) TMAs	188'	Boom Gate
	20' Omni	189'	Side Mount Standoff
	6' Omni	180'	Side Mount Standoff
	(6) Powerwave 7770 Antennas	179'	Boom Gate
	SBNH-1D6565C Antenna	179'	Boom Gate
	AM-X-CD-16-65-00 Antenna	179'	Boom Gate
	P65-17-XLH-RR Antenna	179'	Boom Gate
	(6) TT19-08BP111 TMAs	179'	Boom Gate
	(6) Diplexers	179'	Boom Gate
	(6) RRUS 11	179'	Boom Gate
	Surge Arrestor DC6-48-60-18-8F	179'	Boom Gate
Verizon	(3) LPA-80080-4CF Antennas	169'	***VFA12 - HD***
Verizon	(9) SBNHH-1D65B Antennas	169'	***VFA12 - HD***
Verizon	***(3) RRH2X60 700***	169'	***VFA12 - HD***
Verizon	***(3) RRH2X60 PCS***	169'	***VFA12 - HD***
Verizon	***(3) RRH4X45***	169'	***VFA12 - HD***
Verizon	***(3) UBFIX***	169'	***VFA12 - HD***
Verizon	(2) DB-T1-6Z-8AB-0Z	169'	Tower Leg
	4 Bay Dipole	156'	Side Mount Standoff
	(3) APXVSPP18-C Antennas	150'	Boom Gate
	(3) FD-RRH-4X40 1900	150'	Boom Gate
	(3) FD-RRH-2X50 800	150'	Boom Gate
	(6) Kathrein 800 10504 Antennas	130'	T - Frame
	(6) Kathrein 860 10025	130'	T - Frame
	Junction Box	130'	T - Frame
	GPS	130'	T - Frame
	DB408	126'	Side Mount Standoff
	(2) PD220	121'	Side Mount Standoff
	(3) LLPX310R Antennas	120'	T - Frame
	(3) RRH	120'	T - Frame
	Junction Box	120'	T - Frame
	Dipole	111'	Pipe Mount
	2' Omni	106'	Side Mount Standoff

Proposed Verizon Appurtenances shown in Bold.

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VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
Verizon	(12) 1 5/8" Cables	169'	Face of Tower
Verizon	(2) Fiber Cables	169'	Face of Tower

Proposed Verizon Coax Cables shown in Bold.

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Leg	80.3 %	100 – 120	PASS	
Diagonal	58.7 %	20 – 40	PASS	
Horizontal	2.3 %	0 – 5	PASS	
Sec. Horizontals	27.6 %	160 – 180	PASS	
Top Girt	11.7 %	20 – 40	PASS	
Bottom Girt	33.4 %	5 – 20	PASS	
Guy	**88.7 %**	162.6	PASS	**Controlling**
Torque Arm	61.4 %	162.6	PASS	

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DESIGN CRITERIA:

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

   City/Town: Montville, CT
   County: New London
   Wind Load: 105 mph (3 second gust)
   Structural Class: II
   Exposure Category: B
   Topographic Category: 1
   Nominal Ice Thickness: 0.75 inch

2. Approximate height above grade to proposed antennas: 169'

Calculations and referenced documents are attached

ASSUMPTIONS:

1. Material strength of the existing structure was not available for structural analysis, and was assumed as follows:

   Tower Legs (Pipes): Fy=50 ksi
   Tower Diagonals (Pipes): Fy=42 ksi
   Angles and Channels: Fy=36 ksi

2. The appurtenances configuration is as stated in the previous structural analysis report prepared by Centek Engineering Inc., dated May 6, 2015. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.

3. The tower and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.

4. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.

5. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed RRHs and UBFIX be mounted on the proposed steel frames supported by the tower.

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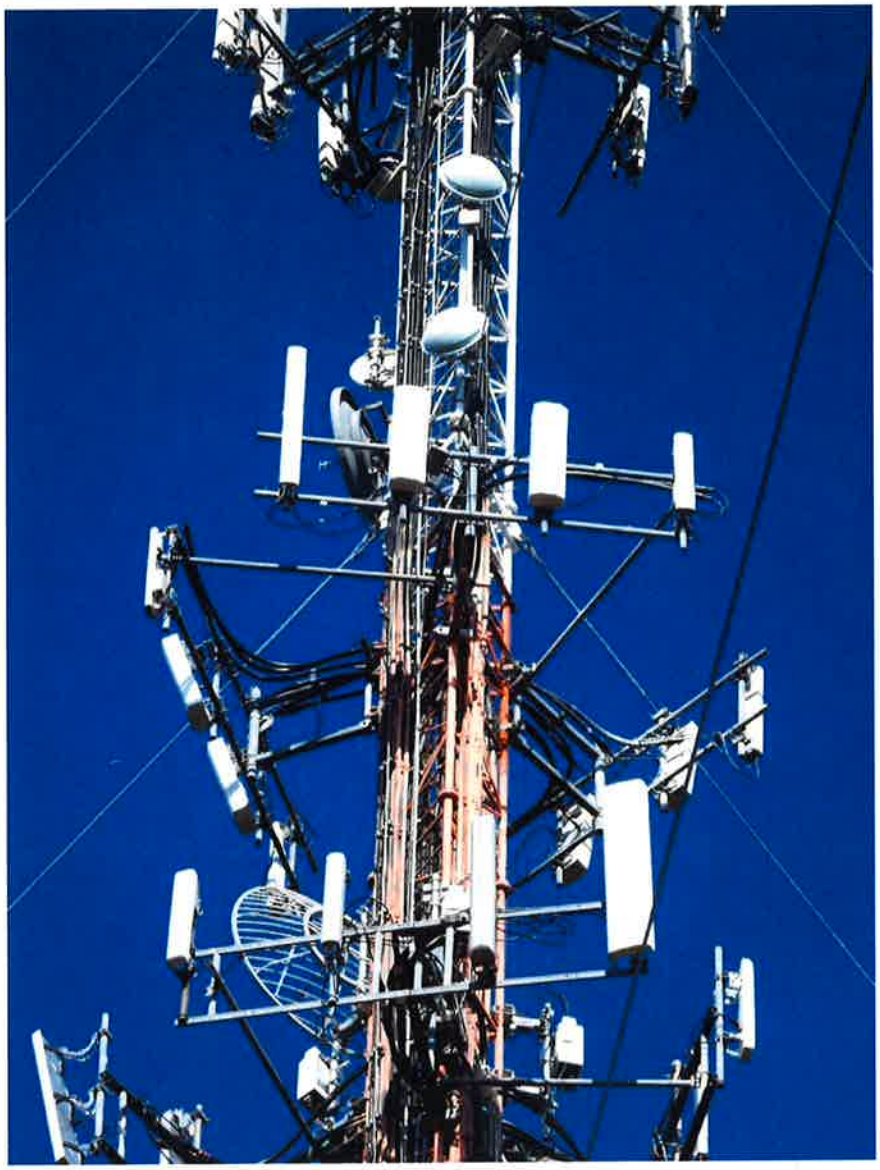

Photo 1: Photo illustrating the Tower with Appurtenances shown.

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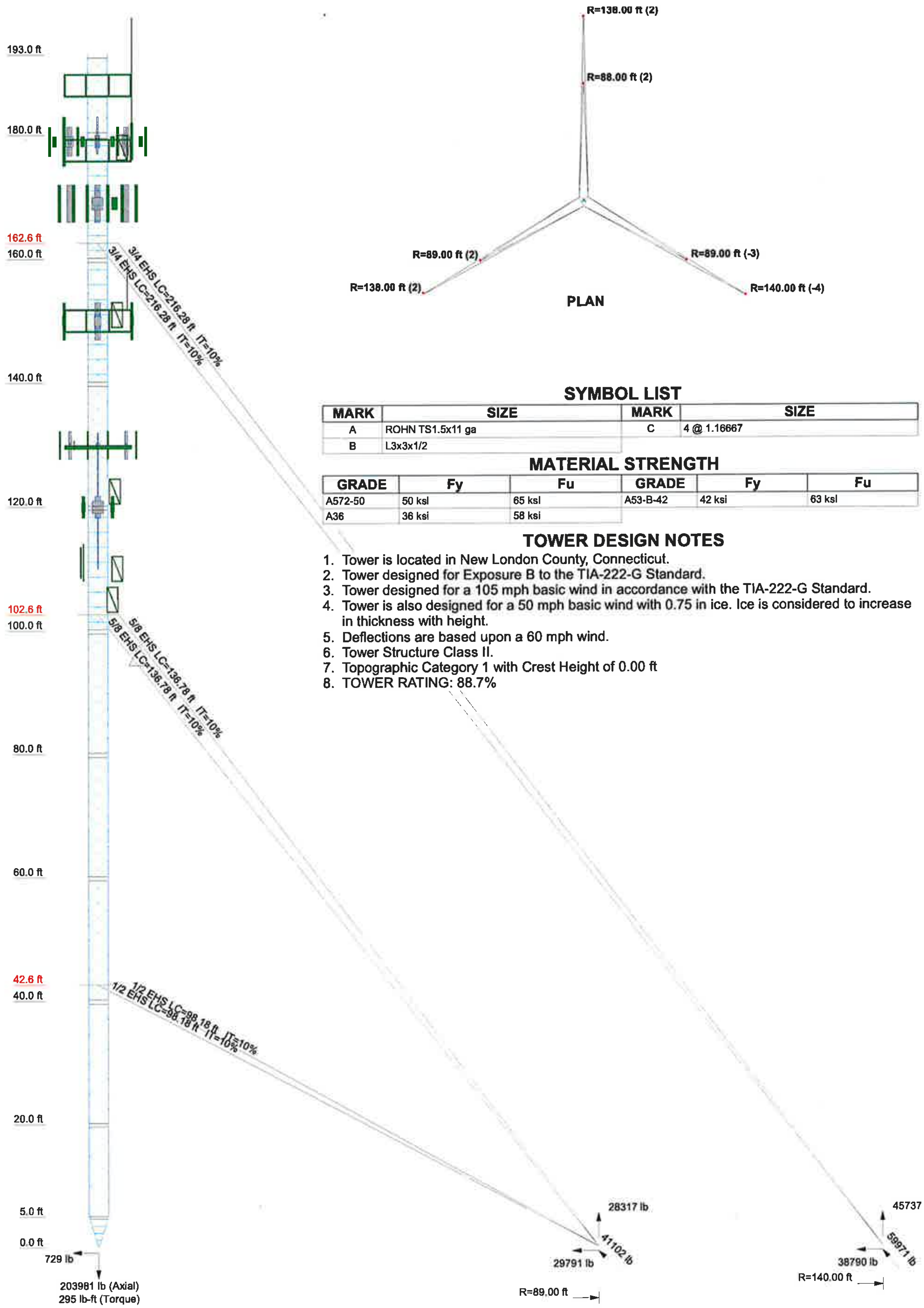
CALCULATIONS

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Sec. Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (lb)
[illegible]	ROHN 2.5 EH	A572-50						N.A.	3.42	75 @ 2.41667	765.5
[illegible]	ROHN 2.5 EH (CT2171)		L2x2x1/4	A36	L2x2x1/4	L2x2x1/4		L2x2x1/4			2888.1
[illegible]					ROHN TS1.5x11 ga	ROHN TS1.5x11 ga					1558.1
[illegible]	ROHN 2.5 EH		ROHN TS1.5x11 ga	A53-B-42				N.A.			852.3
[illegible]	ROHN 3 EH		L2x2x1/4	A36	L2x2x1/4	L2x2x1/4		L2x2x1/4			2468.4
[illegible]			ROHN TS1.5x16 ga	A53-B-42	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga	N.A.				813.8
[illegible]			L1 3/4x1 3/4x3/16	A36	ROHN TS1.5x11 ga	ROHN TS1.5x11 ga					1076.9
[illegible]			ROHN TS1.5x11 ga					N.A.			1558.3
[illegible]			ROHN TS1.5x16 ga	A53-B-42	ROHN TS1.5x16 ga	ROHN TS1.5x16 ga					724.0
[illegible]			A		A	A					831.6
[illegible]			N.A.	N.A.	B	N.A.	B			C	389.5
											13526.5



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN TS1.5x11 ga	C	4 @ 1.16667
B	L3x3x1/2		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 88.7%

ALL REACTIONS ARE FACTORED

Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	Job: **MONTVILLE 4 CT**		
	Project: **193 ft Guyed Tower**		
	Client: VERIZON	Drawn by: kw	App'd:
	Code: TIA-222-G	Date: 10/18/17	Scale: N
	Path:		Dwg No.

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 193.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
Basic wind speed of 105 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	193.00-180.00			3.42	1	13.00
T2	180.00-160.00			3.42	1	20.00
T3	160.00-140.00			3.42	1	20.00
T4	140.00-120.00			3.42	1	20.00
T5	120.00-100.00			3.42	1	20.00
T6	100.00-80.00			3.42	1	20.00
T7	80.00-60.00			3.42	1	20.00
T8	60.00-40.00			3.42	1	20.00
T9	40.00-20.00			3.42	1	20.00
T10	20.00-5.00			3.42	1	15.00
T11	5.00-0.00			3.42	1	5.00

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	193.00-180.00	2.42	X Brace	No	No	6.0000	5.0000
T2	180.00-160.00	2.42	X Brace	No	Yes	6.0000	2.0000

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
T3	160.00-140.00	2.42	X Brace	No	Yes	6.0000	2.0000
T4	140.00-120.00	2.42	CX Brace	No	No	6.0000	2.0000
T5	120.00-100.00	2.42	X Brace	No	Yes	6.0000	2.0000
T6	100.00-80.00	2.42	CX Brace	No	No	6.0000	2.0000
T7	80.00-60.00	2.42	X Brace	No	No	6.0000	2.0000
T8	60.00-40.00	2.42	CX Brace	No	No	6.0000	2.0000
T9	40.00-20.00	2.42	K Brace Left	No	No	6.0000	2.0000
T10	20.00-5.00	2.42	K Brace Left	No	No	5.0000	1.0000
T11	5.00-0.00	1.17	X Brace	No	Yes	4.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 193.00-180.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Pipe	ROHN 2.5 EH (CT2171)	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 2.5 EH (CT2171)	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T4 140.00-120.00	Pipe	ROHN 2.5 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 60.00-40.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 193.00-180.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 180.00-160.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T4 140.00-120.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T5 120.00-100.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 100.00-80.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T7 80.00-60.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T8 60.00-40.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T9 40.00-20.00	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-42 (42 ksi)
T10 20.00-5.00	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)	Pipe	ROHN TS1.5x11 ga	A53-B-42 (42 ksi)
T11 5.00-0.00	Equal Angle	L3x3x1/2	A36 (36 ksi)	Equal Angle	L3x3x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 5.00-0.00	None	Solid Round		A572-50 (50 ksi)	Equal Angle	L3x3x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T2 180.00-160.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T3 160.00-140.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T5 120.00-100.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
162.583	EHS	A	3/4	5830.00	10%	19000	1.155	210.20	138.00	0.0000	2.00	100%
		B	3/4	5830.00	10%	19000	1.155	216.08	140.00	0.0000	-4.00	100%
		C	3/4	5830.00	10%	19000	1.155	210.20	138.00	0.0000	2.00	100%
102.583	EHS	A	5/8	4240.00	10%	21000	0.813	132.20	88.00	0.0000	2.00	100%
		B	5/8	4240.00	10%	21000	0.813	136.67	89.00	0.0000	-3.00	100%
		C	5/8	4240.00	10%	21000	0.813	132.85	89.00	0.0000	2.00	100%
42.5833	EHS	A	1/2	2690.00	10%	21000	0.517	94.98	88.00	0.0000	2.00	100%
		B	1/2	2690.00	10%	21000	0.517	98.10	89.00	0.0000	-3.00	100%
		C	1/2	2690.00	10%	21000	0.517	95.88	89.00	0.0000	2.00	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
162.583	Torque Arm	7.33	0.0000	Channel	A36 (36 ksi)	Channel	C15x50
102.583	Torque Arm	7.33	0.0000	Channel	A36 (36 ksi)	Channel	C15x40
42.5833	Torque Arm	7.33	0.0000	Channel	A36 (36 ksi)	Channel	C12x25

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8	A	No	Ar (CaAa)	188.00 - 8.00	0.0000	-0.3	6	3	0.0000	1.9800		1.04
1 5/8	B	No	Ar (CaAa)	188.00 - 8.00	0.0000	0.35	6	3	0.0000	1.9800		1.04
1 5/8 Fiber Cable	B	No	Ar (CaAa)	188.00 - 8.00	0.0000	0.23	1	1	0.0000	1.9800		1.04
7/8	B	No	Ar (CaAa)	179.00 - 8.00	3.0000	0.25	1	1	0.0000	1.1100		0.54
**********												
1 1/4 (AT&T)	C	No	Ar (CaAa)	177.50 - 8.00	0.0000	0.3	12	6	0.0000	1.5500		0.66
FB-L98B-002	C	No	Ar (CaAa)	177.50 - 8.00	0.0000	0.42	1	1	0.0000	0.4000		0.25
WR-VG122ST-BRDA	C	No	Ar (CaAa)	177.50 - 8.00	0.0000	0.4	2	2	0.0000	0.4000		0.25
**********												
1 5/8 (VERIZON - existing)	B	No	Ar (CaAa)	169.00 - 8.00	0.0000	-0.2	12	6	0.0000	1.9800		1.04
1 5/8 Fiber Cable	B	No	Ar (CaAa)	169.00 - 8.00	0.0000	0	2	2	1.9800	1.9800		1.04
**********												
1 1/4	C	No	Ar (CaAa)	152.00 - 8.00	0.0000	-0.4	1	1	0.0000	1.5500		0.66
1 5/8	A	No	Ar (CaAa)	150.00 - 8.00	0.0000	0.3	6	3	0.0000	1.9800		1.04
1 5/8 Fiber Cable	A	No	Ar (CaAa)	150.00 - 8.00	2.5000	0.1	1	1	0.0000	1.9800		1.04
7/8	C	No	Ar (CaAa)	144.00 - 8.00	0.0000	-0.35	1	1	0.0000	1.1100		0.54
1 5/8	C	No	Ar (CaAa)	130.00 - 8.00	0.0000	0	12	6	0.0000	1.9800		1.04
1/2	C	No	Ar (CaAa)	130.00 - 8.00	0.0000	-0.2	1	1	0.0000	0.5800		0.25
1 1/4	C	No	Ar (CaAa)	122.00 - 8.00	0.0000	-0.4	1	1	0.0000	1.5500		0.66
2" Conduit	A	No	Ar (CaAa)	120.00 - 8.00	0.0000	-0.1	1	1	0.0000	2.0000		2.80
1 5/8	C	No	Ar (CaAa)	110.00 - 8.00	0.0000	-0.3	2	2	0.0000	1.9800		1.04
1/2	A	No	Ar (CaAa)	105.00 - 8.00	0.0000	0.1	2	2	0.0000	0.5800		0.25
1 1/4	C	No	Ar (CaAa)	108.00 - 8.00	2.0000	-0.4	1	1	0.0000	1.5500		0.66

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Rohn 6'x12' Boom Gate (3)	A	None		0.0000	188.00	No Ice	49.80	49.80	1680.00
						1/2" Ice	59.30	59.30	2100.00
						1" Ice	68.80	68.80	2520.00
(2) AIR 21 w/ Mount Pipe	A	From Leg	5.00	0.0000	188.00	No Ice	6.29	5.70	111.68
			0.00			1/2" Ice	6.73	6.48	168.60
			0.00			1" Ice	7.17	7.19	232.26
(2) AIR 21 w/ Mount Pipe	B	From Leg	5.00	0.0000	188.00	No Ice	6.29	5.70	111.68
			0.00			1/2" Ice	6.73	6.48	168.60
			0.00			1" Ice	7.17	7.19	232.26
(2) AIR 21 w/ Mount Pipe	C	From Leg	5.00	0.0000	188.00	No Ice	6.29	5.70	111.68
			0.00			1/2" Ice	6.73	6.48	168.60
			0.00			1" Ice	7.17	7.19	232.26
KRY 112 71/2	A	From Leg	5.00	0.0000	188.00	No Ice	0.58	0.45	13.20
			0.00			1/2" Ice	0.69	0.54	18.69
			0.00			1" Ice	0.80	0.64	25.81
KRY 112 71/2	B	From Leg	5.00	0.0000	188.00	No Ice	0.58	0.45	13.20
			0.00			1/2" Ice	0.69	0.54	18.69
			0.00			1" Ice	0.80	0.64	25.81
KRY 112 71/2	C	From Leg	5.00	0.0000	188.00	No Ice	0.58	0.45	13.20
			0.00			1/2" Ice	0.69	0.54	18.69
			0.00			1" Ice	0.80	0.64	25.81
**********									
Pirod 6' Side Mount Standoff (1)	B	From Leg	3.00	0.0000	178.00	No Ice	4.97	4.97	70.00
			0.00			1/2" Ice	6.12	6.12	130.00
			0.00			1" Ice	7.27	7.27	190.00
Omni 3"x20'	B	From Leg	5.00	0.0000	189.00	No Ice	6.00	6.00	50.00
			0.00			1/2" Ice	8.03	8.03	93.17
			0.00			1" Ice	10.08	10.08	149.01
3' Side Mount Standoff	A	From Leg	1.50	0.0000	178.00	No Ice	1.50	1.50	45.00
			0.00			1/2" Ice	2.20	2.20	70.00
			0.00			1" Ice	2.90	2.90	95.00
Omni 3"x6'	A	From Leg	3.00	0.0000	180.00	No Ice	1.77	1.77	20.00
			0.00			1/2" Ice	2.13	2.13	33.24
			0.00			1" Ice	2.50	2.50	50.59
**********									
Rohn 6'x15' Boom Gate (3) (AT&T - Existing)	A	None		0.0000	177.50	No Ice	53.20	53.20	1790.00
						1/2" Ice	63.30	63.30	2230.00
						1" Ice	73.40	73.40	2670.00
(2) Powerwave 7770 w/mount pipe	A	From Leg	5.00	0.0000	179.00	No Ice	5.65	4.10	57.25
			0.00			1/2" Ice	6.03	4.75	103.17
			0.00			1" Ice	6.42	5.42	155.38
(2) Powerwave 7770 w/mount pipe	B	From Leg	5.00	0.0000	179.00	No Ice	5.65	4.10	57.25
			0.00			1/2" Ice	6.03	4.75	103.17
			0.00			1" Ice	6.42	5.42	155.38
(2) Powerwave 7770 w/mount pipe	C	From Leg	5.00	0.0000	179.00	No Ice	5.65	4.10	57.25
			0.00			1/2" Ice	6.03	4.75	103.17
			0.00			1" Ice	6.42	5.42	155.38
SBNH-1D6565C w/mount pipe	A	From Leg	5.00	0.0000	179.00	No Ice	11.69	10.29	113.11
			0.00			1/2" Ice	12.40	11.81	206.76
			0.00			1" Ice	13.11	13.16	311.52
KMW AM-X-CD-16-65-00T-RET w/mount pipe	B	From Leg	5.00	0.0000	179.00	No Ice	8.26	6.30	74.05
			0.00			1/2" Ice	8.82	7.48	139.04
			0.00			1" Ice	9.35	8.37	211.91
Powerwave P65-17-XLH-RR w/mount pipe	C	From Leg	5.00	0.0000	179.00	No Ice	11.75	9.39	122.11
			0.00			1/2" Ice	12.47	10.90	212.11
			0.00			1" Ice	13.18	12.24	313.12
(2) Powerwave	A	From Leg	5.00	0.0000	179.00	No Ice	0.55	0.45	16.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
TT19-08BP111-001			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
(2) Powerwave	B	From Leg	5.00	0.0000	179.00	No Ice	0.55	0.45	16.00
TT19-08BP111-001			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
(2) Powerwave	C	From Leg	5.00	0.0000	179.00	No Ice	0.55	0.45	16.00
TT19-08BP111-001			0.00			1/2" Ice	0.65	0.53	21.80
			0.00			1" Ice	0.75	0.63	29.22
(2) Powerwave	A	From Leg	5.00	0.0000	179.00	No Ice	0.37	0.25	6.50
CM1007-DBPXBC			0.00			1/2" Ice	0.45	0.32	9.99
			0.00			1" Ice	0.54	0.39	14.78
(2) Powerwave	B	From Leg	5.00	0.0000	179.00	No Ice	0.37	0.25	6.50
CM1007-DBPXBC			0.00			1/2" Ice	0.45	0.32	9.99
			0.00			1" Ice	0.54	0.39	14.78
(2) Powerwave	C	From Leg	5.00	0.0000	179.00	No Ice	0.37	0.25	6.50
CM1007-DBPXBC			0.00			1/2" Ice	0.45	0.32	9.99
			0.00			1" Ice	0.54	0.39	14.78
(2) Ericsson RRUS-11	A	From Leg	4.00	0.0000	179.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
(2) Ericsson RRUS-11	B	From Leg	4.00	0.0000	179.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
(2) Ericsson RRUS-11	C	From Leg	4.00	0.0000	179.00	No Ice	2.79	1.19	50.70
			0.00			1/2" Ice	3.00	1.34	71.57
			0.00			1" Ice	3.21	1.50	95.48
DC6-48-60-18-8F	A	From Leg	0.50	0.0000	179.00	No Ice	0.79	0.79	20.00
			0.00			1/2" Ice	1.27	1.27	35.12
			0.00			1" Ice	1.45	1.45	52.57
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LPA-80080-4CF w/mount pipe	A	From Leg	3.00	0.0000	169.00	No Ice	2.87	6.59	30.25
			0.00			1/2" Ice	3.24	7.22	76.66
(VERIZON - existing)			0.00			1" Ice	3.62	7.87	129.00
(3) SBNHH-1D65B w/ Mount Pipe	A	From Leg	3.00	0.0000	169.00	No Ice	8.42	7.09	66.55
			0.00			1/2" Ice	8.98	8.27	135.68
			0.00			1" Ice	9.50	9.17	212.84
LPA-80080-4CF w/mount pipe	B	From Leg	3.00	0.0000	169.00	No Ice	2.87	6.59	30.25
			0.00			1/2" Ice	3.24	7.22	76.66
			0.00			1" Ice	3.62	7.87	129.00
(3) SBNHH-1D65B w/ Mount Pipe	B	From Leg	3.00	0.0000	169.00	No Ice	8.42	7.09	66.55
			0.00			1/2" Ice	8.98	8.27	135.68
			0.00			1" Ice	9.50	9.17	212.84
LPA-80080-4CF w/mount pipe	C	From Leg	3.00	0.0000	169.00	No Ice	2.87	6.59	30.25
			0.00			1/2" Ice	3.24	7.22	76.66
			0.00			1" Ice	3.62	7.87	129.00
(3) SBNHH-1D65B w/ Mount Pipe	C	From Leg	3.00	0.0000	169.00	No Ice	8.42	7.09	66.55
			0.00			1/2" Ice	8.98	8.27	135.68
			0.00			1" Ice	9.50	9.17	212.84
**********									
SM 503-1	A	From Leg	1.50	0.0000	169.00	No Ice	15.90	14.00	564.00
(VERIZON - proposed)			0.00			1/2" Ice	22.01	20.81	752.00
			0.00			1" Ice	28.12	27.62	940.00
SM 503-1	B	From Leg	1.50	0.0000	169.00	No Ice	15.90	14.00	564.00
			0.00			1/2" Ice	22.01	20.81	752.00
			0.00			1" Ice	28.12	27.62	940.00
SM 503-1	C	From Leg	1.50	0.0000	169.00	No Ice	15.90	14.00	564.00
			0.00			1/2" Ice	22.01	20.81	752.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	28.12	27.62	940.00
RRH2x60-700	A	From Leg	3.00	0.0000	169.00	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
RRH2x60-700	B	From Leg	3.00	0.0000	169.00	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
RRH2x60-700	C	From Leg	3.00	0.0000	169.00	No Ice	3.50	1.82	60.00
			0.00			1/2" Ice	3.76	2.05	82.72
			0.00			1" Ice	4.03	2.29	109.06
RRH2x60 PCS	A	From Leg	3.00	0.0000	169.00	No Ice	2.15	1.35	55.00
			0.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2x60 PCS	B	From Leg	3.00	0.0000	169.00	No Ice	2.15	1.35	55.00
			0.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
RRH2x60 PCS	C	From Leg	3.00	0.0000	169.00	No Ice	2.15	1.35	55.00
			0.00			1/2" Ice	2.34	1.50	72.75
			0.00			1" Ice	2.54	1.67	93.35
B66A RRH 4X45	A	From Leg	3.00	0.0000	169.00	No Ice	2.66	1.59	64.00
			0.00			1/2" Ice	2.88	1.77	84.35
			0.00			1" Ice	3.10	1.96	107.85
B66A RRH 4X45	B	From Leg	3.00	0.0000	169.00	No Ice	2.66	1.59	64.00
			0.00			1/2" Ice	2.88	1.77	84.35
			0.00			1" Ice	3.10	1.96	107.85
B66A RRH 4X45	C	From Leg	3.00	0.0000	169.00	No Ice	2.66	1.59	64.00
			0.00			1/2" Ice	2.88	1.77	84.35
			0.00			1" Ice	3.10	1.96	107.85
UBFIX	A	From Leg	3.00	0.0000	169.00	No Ice	0.65	0.54	20.00
			0.00			1/2" Ice	0.76	0.65	26.42
			0.00			1" Ice	0.88	0.76	34.58
UBFIX	B	From Leg	3.00	0.0000	169.00	No Ice	0.65	0.54	20.00
			0.00			1/2" Ice	0.76	0.65	26.42
			0.00			1" Ice	0.88	0.76	34.58
UBFIX	C	From Leg	3.00	0.0000	169.00	No Ice	0.65	0.54	20.00
			0.00			1/2" Ice	0.76	0.65	26.42
			0.00			1" Ice	0.88	0.76	34.58
RFS DB-T1-6Z-8AB-0Z	A	From Leg	1.50	0.0000	169.00	No Ice	4.80	2.00	44.00
			0.00			1/2" Ice	5.07	2.19	80.13
			0.00			1" Ice	5.35	2.39	120.22
RFS DB-T1-6Z-8AB-0Z	B	From Leg	1.50	0.0000	169.00	No Ice	4.80	2.00	44.00
			0.00			1/2" Ice	5.07	2.19	80.13
			0.00			1" Ice	5.35	2.39	120.22
**********									
Rohn 6'x15' Boom Gate (3) (SPRINT)	A	None		0.0000	150.00	No Ice	53.20	53.20	1790.00
						1/2" Ice	63.30	63.30	2230.00
						1" Ice	73.40	73.40	2670.00
APXVSPP18-C w/mount pipe	A	From Leg	5.00	0.0000	150.00	No Ice	8.26	6.95	82.55
			0.00			1/2" Ice	8.82	8.13	150.56
			0.00			1" Ice	9.35	9.02	226.53
APXVSPP18-C w/mount pipe	B	From Leg	5.00	0.0000	150.00	No Ice	8.26	6.95	82.55
			0.00			1/2" Ice	8.82	8.13	150.56
			0.00			1" Ice	9.35	9.02	226.53
APXVSPP18-C w/mount pipe	C	From Leg	5.00	0.0000	150.00	No Ice	8.26	6.95	82.55
			0.00			1/2" Ice	8.82	8.13	150.56
			0.00			1" Ice	9.35	9.02	226.53
FD-RRH4x40 1900	A	From Leg	5.00	0.0000	150.00	No Ice	2.24	2.32	60.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	2.44	2.53	83.13
			0.00			1" Ice	2.65	2.74	109.50
FD-RRH4x40 1900	B	From Leg	5.00	0.0000	150.00	No Ice	2.24	2.32	60.00
			0.00			1/2" Ice	2.44	2.53	83.13
			0.00			1" Ice	2.65	2.74	109.50
FD-RRH4x40 1900	C	From Leg	5.00	0.0000	150.00	No Ice	2.24	2.32	60.00
			0.00			1/2" Ice	2.44	2.53	83.13
			0.00			1" Ice	2.65	2.74	109.50
FD-RRH2x50 800	A	From Leg	5.00	0.0000	150.00	No Ice	2.06	1.93	64.00
			0.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
FD-RRH2x50 800	B	From Leg	5.00	0.0000	150.00	No Ice	2.06	1.93	64.00
			0.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
FD-RRH2x50 800	C	From Leg	5.00	0.0000	150.00	No Ice	2.06	1.93	64.00
			0.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
**********									
3.5' Side Mount Standoff	B	From Leg	2.00	0.0000	151.00	No Ice	1.70	1.70	50.00
			0.00			1/2" Ice	2.50	2.50	80.00
			0.00			1" Ice	3.30	3.30	110.00
8' 4-Bay Dipole	B	From Leg	4.00	0.0000	156.00	No Ice	1.60	1.60	25.00
			0.00			1/2" Ice	2.42	2.42	37.45
			0.00			1" Ice	3.24	3.24	55.14
**********									
PiROD 12' Lightweight T-Frame	A	From Leg	1.50	0.0000	130.00	No Ice	10.20	10.20	253.00
			0.00			1/2" Ice	16.20	16.20	355.00
			0.00			1" Ice	22.20	22.20	457.00
PiROD 12' Lightweight T-Frame	B	From Leg	1.50	0.0000	130.00	No Ice	10.20	10.20	253.00
			0.00			1/2" Ice	16.20	16.20	355.00
			0.00			1" Ice	22.20	22.20	457.00
PiROD 12' Lightweight T-Frame	C	From Leg	1.50	0.0000	130.00	No Ice	10.20	10.20	253.00
			0.00			1/2" Ice	16.20	16.20	355.00
			0.00			1" Ice	22.20	22.20	457.00
(2) Kathrein 800 10504 w/mount pipe	A	From Leg	3.00	0.0000	130.00	No Ice	3.71	3.29	41.90
			0.00			1/2" Ice	4.18	4.11	75.82
			0.00			1" Ice	4.62	4.82	115.69
(2) Kathrein 800 10504 w/mount pipe	B	From Leg	3.00	0.0000	130.00	No Ice	3.71	3.29	41.90
			0.00			1/2" Ice	4.18	4.11	75.82
			0.00			1" Ice	4.62	4.82	115.69
(2) Kathrein 800 10504 w/mount pipe	C	From Leg	3.00	0.0000	130.00	No Ice	3.71	3.29	41.90
			0.00			1/2" Ice	4.18	4.11	75.82
			0.00			1" Ice	4.62	4.82	115.69
(2) Kathrein 860 10025 RCU	A	From Leg	3.00	0.0000	130.00	No Ice	0.14	0.12	1.20
			0.00			1/2" Ice	0.20	0.17	2.76
			0.00			1" Ice	0.26	0.23	5.24
(2) Kathrein 860 10025 RCU	B	From Leg	3.00	0.0000	130.00	No Ice	0.14	0.12	1.20
			0.00			1/2" Ice	0.20	0.17	2.76
			0.00			1" Ice	0.26	0.23	5.24
(2) Kathrein 860 10025 RCU	C	From Leg	3.00	0.0000	130.00	No Ice	0.14	0.12	1.20
			0.00			1/2" Ice	0.20	0.17	2.76
			0.00			1" Ice	0.26	0.23	5.24
Box 8"x8"x2"	A	From Leg	3.00	0.0000	130.00	No Ice	0.53	0.14	10.00
			0.00			1/2" Ice	0.63	0.20	13.73
			0.00			1" Ice	0.73	0.26	18.81
GPS	C	From Leg	3.00	0.0000	130.00	No Ice	0.21	0.21	5.00
			0.00			1/2" Ice	0.31	0.31	7.52

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	0.42	0.42	11.31
**********									
3' Side Mount Standoff	B	From Leg	1.50	0.0000	122.50	No Ice	1.50	1.50	45.00
			0.00			1/2" Ice	2.20	2.20	70.00
			0.00			1" Ice	2.90	2.90	95.00
DB408	B	From Leg	3.00	0.0000	126.00	No Ice	1.90	1.90	17.00
			0.00			1/2" Ice	3.42	3.42	22.10
			0.00			1" Ice	4.94	4.94	27.20
3.5' Side Mount Standoff	A	From Leg	2.00	0.0000	110.00	No Ice	1.70	1.70	50.00
			0.00			1/2" Ice	2.50	2.50	80.00
			0.00			1" Ice	3.30	3.30	110.00
PD220	A	From Leg	4.00	0.0000	121.00	No Ice	3.08	3.08	23.00
			0.00			1/2" Ice	5.30	5.30	48.68
			0.00			1" Ice	7.54	7.54	88.10
3.5' Side Mount Standoff	B	From Leg	2.00	0.0000	110.00	No Ice	1.70	1.70	50.00
			0.00			1/2" Ice	2.50	2.50	80.00
			0.00			1" Ice	3.30	3.30	110.00
PD220	B	From Leg	4.00	0.0000	121.00	No Ice	3.08	3.08	23.00
			0.00			1/2" Ice	5.30	5.30	48.68
			0.00			1" Ice	7.54	7.54	88.10
**********									
1' Standoff T-Arm (6' face width)	A	From Leg	0.50	0.0000	120.00	No Ice	3.50	3.50	85.00
			0.00			1/2" Ice	4.20	4.20	110.00
			0.00			1" Ice	4.90	4.90	135.00
1' Standoff T-Arm (6' face width)	B	From Leg	0.50	0.0000	120.00	No Ice	3.50	3.50	85.00
			0.00			1/2" Ice	4.20	4.20	110.00
			0.00			1" Ice	4.90	4.90	135.00
1' Standoff T-Arm (6' face width)	C	From Leg	0.50	0.0000	120.00	No Ice	3.50	3.50	85.00
			0.00			1/2" Ice	4.20	4.20	110.00
			0.00			1" Ice	4.90	4.90	135.00
Argus LLPX310R w/mount pipe	A	From Leg	1.00	0.0000	120.00	No Ice	4.41	2.81	43.60
			0.00			1/2" Ice	4.73	3.32	80.16
			0.00			1" Ice	5.06	3.85	121.97
Argus LLPX310R w/mount pipe	B	From Leg	1.00	0.0000	120.00	No Ice	4.41	2.81	43.60
			0.00			1/2" Ice	4.73	3.32	80.16
			0.00			1" Ice	5.06	3.85	121.97
Argus LLPX310R w/mount pipe	C	From Leg	1.00	0.0000	120.00	No Ice	4.41	2.81	43.60
			0.00			1/2" Ice	4.73	3.32	80.16
			0.00			1" Ice	5.06	3.85	121.97
RRH	A	From Leg	1.00	0.0000	120.00	No Ice	2.39	1.45	51.00
			0.00			1/2" Ice	2.58	1.61	72.75
			0.00			1" Ice	2.78	1.77	97.53
RRH	B	From Leg	1.00	0.0000	120.00	No Ice	2.39	1.45	51.00
			0.00			1/2" Ice	2.58	1.61	72.75
			0.00			1" Ice	2.78	1.77	97.53
RRH	C	From Leg	1.00	0.0000	120.00	No Ice	2.39	1.45	51.00
			0.00			1/2" Ice	2.58	1.61	72.75
			0.00			1" Ice	2.78	1.77	97.53
Junction Box 2'x2'	A	From Leg	0.50	0.0000	120.00	No Ice	4.80	1.27	15.00
			0.00			1/2" Ice	5.07	1.43	44.78
			0.00			1" Ice	5.35	1.60	78.26
**********									
3"x6' pipe	C	From Leg	1.00	0.0000	111.00	No Ice	1.93	1.93	46.00
			0.00			1/2" Ice	2.29	2.29	61.18
			0.00			1" Ice	2.67	2.67	80.53
5' Dipole	C	From Leg	1.50	0.0000	111.00	No Ice	1.65	1.65	15.00
			0.00			1/2" Ice	2.49	2.49	36.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	2.81	2.81	61.02
2' Side Mount Standoff	B	From Leg	1.00	0.0000	105.00	No Ice	1.00	1.00	30.00
			0.00			1/2" Ice	1.50	1.50	50.00
			0.00			1" Ice	2.00	2.00	70.00
Omni 2"x2'	B	From Leg	2.00	0.0000	106.00	No Ice	0.30	0.30	10.00
			0.00			1/2" Ice	0.43	0.43	13.28
			0.00			1" Ice	0.57	0.57	18.14

Load Combinations

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

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	23	203981.30	163.23	-39.37
	Max. H_x	12	127480.21	559.61	337.82
	Max. H_z	11	158826.10	-211.37	556.43
	Max. M_x	1	0.00	3.12	9.79
	Max. M_z	1	0.00	3.12	9.79
	Max. Torsion	9	30.70	-570.52	-168.98
	Min. Vert	1	91360.51	3.12	9.79
	Min. H_x	4	126484.18	-620.68	382.56
	Min. H_z	8	126727.48	10.22	-699.86
	Min. M_x	1	0.00	3.12	9.79
	Min. M_z	1	0.00	3.12	9.79
	Min. Torsion	3	-294.93	-454.34	-384.41
Guy C @ 138 ft Elev 2 ft Azimuth 240 deg	Max. Vert	10	-440.71	-190.62	110.21
	Max. H_x	10	-440.71	-190.62	110.21
	Max. H_z	3	-44816.24	-33365.64	19876.65
	Min. Vert	5	-44864.34	-33932.22	18978.10
	Min. H_x	5	-44864.34	-33932.22	18978.10
	Min. H_z	10	-440.71	-190.62	110.21
Guy B @ 140 ft Elev -4 ft Azimuth 120 deg	Max. Vert	6	-493.08	213.47	123.22
	Max. H_x	11	-45736.57	33863.20	18927.29
	Max. H_z	13	-45734.66	33319.08	19866.67
	Min. Vert	11	-45736.57	33863.20	18927.29
	Min. H_x	6	-493.08	213.47	123.22
	Min. H_z	6	-493.08	213.47	123.22
Guy A @ 138 ft Elev 2 ft Azimuth 0 deg	Max. Vert	2	-440.67	0.15	-220.15
	Max. H_x	10	-38807.69	808.64	-33542.00
	Max. H_z	2	-440.67	0.15	-220.15
	Min. Vert	7	-44857.75	-536.45	-38869.73
	Min. H_x	6	-38840.07	-800.48	-33569.48
	Min. H_z	7	-44857.75	-536.45	-38869.73
Guy C @ 89 ft Elev 2 ft Azimuth 240 deg	Max. Vert	10	-400.82	-417.41	241.28
	Max. H_x	10	-400.82	-417.41	241.28
	Max. H_z	3	-26581.12	-25596.89	14993.69
	Min. Vert	5	-26653.98	-25854.48	14702.25
	Min. H_x	5	-26653.98	-25854.48	14702.25
	Min. H_z	10	-400.82	-417.41	241.28
Guy B @ 89 ft Elev -3 ft Azimuth 120 deg	Max. Vert	6	-470.85	417.57	241.00
	Max. H_x	11	-28317.49	25902.46	14717.61
	Max. H_z	13	-28320.30	25692.41	15074.80
	Min. Vert	13	-28320.30	25692.41	15074.80
	Min. H_x	6	-470.85	417.57	241.00
	Min. H_z	6	-470.85	417.57	241.00
Guy A @ 88 ft Elev 2 ft Azimuth 0 deg	Max. Vert	2	-409.37	0.25	-477.47
	Max. H_x	11	-14476.43	381.15	-15917.29
	Max. H_z	2	-409.37	0.25	-477.47
	Min. Vert	7	-26973.93	-202.48	-29783.75

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_x	5	-14554.03	-377.69	-15989.42
	Min. H_z	7	-26973.93	-202.48	-29783.75

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	91360.51	-3.12	-9.79	0.00	0.00	76.79
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	172970.20	58.45	620.20	0.00	0.00	267.43
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	157457.39	454.34	384.41	0.00	0.00	294.93
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	126484.18	620.68	-382.56	0.00	0.00	246.94
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	156642.66	-90.23	-555.59	0.00	0.00	200.48
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	171132.45	-473.39	-294.82	0.00	0.00	165.79
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	156776.48	-516.63	166.57	0.00	0.00	97.29
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	126727.48	-10.22	699.86	0.00	0.00	-24.05
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	157761.68	570.52	168.98	0.00	0.00	-30.70
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	173227.42	575.37	-290.40	0.00	0.00	1.13
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	158826.10	211.37	-556.43	0.00	0.00	46.30
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	127480.21	-559.61	-337.82	0.00	0.00	94.92
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	158657.08	-359.51	442.84	0.00	0.00	181.85
1.2 Dead+1.0 Ice+1.0 Temp+Guy	201218.31	-21.83	-48.90	0.00	0.00	166.34
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	203910.02	-14.77	-218.10	0.00	0.00	211.18
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	203355.29	59.80	-199.00	0.00	0.00	220.23
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	202946.58	119.46	-134.35	0.00	0.00	208.98
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	203374.30	143.67	-46.29	0.00	0.00	186.93
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	203931.43	123.04	33.85	0.00	0.00	167.16
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	203417.52	63.82	91.85	0.00	0.00	146.16
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	203016.44	-24.65	114.86	0.00	0.00	124.48
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	203434.29	-110.03	95.05	0.00	0.00	114.70
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	203981.30	-163.23	39.37	0.00	0.00	125.80
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	203393.92	-180.75	-38.67	0.00	0.00	148.14
1.2 Dead+1.0 Wind 300	202939.19	-153.90	-126.51	0.00	0.00	168.85

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
deg+1.0 Ice+1.0 Temp+1.0 Guy 1.2 Dead+1.0 Wind 330	203357.89	-91.11	-193.95	0.00	0.00	189.02
deg+1.0 Ice+1.0 Temp+1.0 Guy Dead+Wind 0 deg - Service+Guy	91658.47	0.62	-207.88	0.00	0.00	93.58
Dead+Wind 30 deg - Service+Guy	91678.88	98.33	-184.08	0.00	0.00	101.37
Dead+Wind 60 deg - Service+Guy	91735.68	169.49	-111.08	0.00	0.00	99.66
Dead+Wind 90 deg - Service+Guy	91831.18	195.35	-11.51	0.00	0.00	91.02
Dead+Wind 120 deg - Service+Guy	91920.47	166.26	86.93	0.00	0.00	82.92
Dead+Wind 150 deg - Service+Guy	91847.63	94.58	161.05	0.00	0.00	72.51
Dead+Wind 180 deg - Service+Guy	91763.47	-5.50	188.59	0.00	0.00	59.86
Dead+Wind 210 deg - Service+Guy	91710.38	-104.94	163.99	0.00	0.00	51.55
Dead+Wind 240 deg - Service+Guy	91685.32	-174.58	92.08	0.00	0.00	53.46
Dead+Wind 270 deg - Service+Guy	91549.08	-200.63	-5.81	0.00	0.00	61.84
Dead+Wind 300 deg - Service+Guy	91485.93	-171.65	-106.36	0.00	0.00	70.38
Dead+Wind 330 deg - Service+Guy	91534.02	-98.11	-181.38	0.00	0.00	80.37

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	193 - 180	3.605	31	0.2334	0.0341
T2	180 - 160	2.969	31	0.2281	0.0305
T3	160 - 140	2.109	37	0.1611	0.0248
T4	140 - 120	1.590	37	0.1184	0.0230
T5	120 - 100	1.158	37	0.0983	0.0179
T6	100 - 80	0.818	37	0.0589	0.0127
T7	80 - 60	0.641	37	0.0428	0.0102
T8	60 - 40	0.457	37	0.0458	0.0083
T9	40 - 20	0.272	37	0.0360	0.0049
T10	20 - 5	0.153	37	0.0339	0.0126
T11	5 - 0	0.040	37	0.0374	0.0040

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
189.00	Omni 3"x20'	31	3.408	0.2342	0.0330	182781
188.00	Rohn 6'x12' Boom Gate (3)	31	3.359	0.2342	0.0327	182781

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Omni 3"x6'	31	2.969	0.2281	0.0305	60199
179.00	(2) Powerwave 7770 w/mount pipe	31	2.920	0.2262	0.0301	51533
178.00	Pirod 6' Side Mount Standoff (1)	31	2.872	0.2240	0.0298	44137
177.50	Rohn 6'x15' Boom Gate (3)	31	2.849	0.2228	0.0297	40952
169.00	LPA-80080-4CF w/mount pipe	31	2.459	0.1949	0.0270	17311
162.58	Guy	37	2.198	0.1703	0.0253	12140
156.00	8' 4-Bay Dipole	37	1.984	0.1487	0.0243	13241
151.00	3.5' Side Mount Standoff	37	1.847	0.1362	0.0240	18757
150.00	Rohn 6'x15' Boom Gate (3)	37	1.822	0.1340	0.0239	20467
130.00	PiROD 12' Lightweight T-Frame	37	1.369	0.1093	0.0207	92804
126.00	DB408	37	1.283	0.1057	0.0196	74879
122.50	3' Side Mount Standoff	37	1.209	0.1018	0.0186	63537
121.00	PD220	37	1.178	0.0998	0.0182	58485
120.00	1' Standoff T-Arm (6' face width)	37	1.158	0.0983	0.0179	54830
111.00	3"x6' pipe	37	0.985	0.0814	0.0153	29431
110.00	3.5' Side Mount Standoff	37	0.968	0.0793	0.0150	27902
106.00	Omni 2"x2'	37	0.902	0.0707	0.0139	23103
105.00	2' Side Mount Standoff	37	0.886	0.0686	0.0137	22150
102.58	Guy	37	0.851	0.0638	0.0132	20344
42.58	Guy	37	0.292	0.0373	0.0043	43549

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	193 - 180	Leg	ROHN 2.5 EH	2	-14414.90	101192.00	14.2	Pass
T2	180 - 160	Leg	ROHN 2.5 EH (CT2171)	41	-96100.90	133862.00	71.8	Pass
T3	160 - 140	Leg	ROHN 2.5 EH (CT2171)	122	-89489.50	132213.00	67.7	Pass
T4	140 - 120	Leg	ROHN 2.5 EH	204	-64715.80	92395.50	70.0	Pass
T5	120 - 100	Leg	ROHN 3 EH	261	-104909.00	130586.00	80.3	Pass
T6	100 - 80	Leg	ROHN 3 EH	342	-97537.70	125729.00	77.6	Pass
T7	80 - 60	Leg	ROHN 3 EH	399	-75069.10	127797.00	58.7	Pass
T8	60 - 40	Leg	ROHN 3 EH	454	-85921.40	124799.00	68.8	Pass
T9	40 - 20	Leg	ROHN 3 EH	511	-79784.70	112178.00	71.1	Pass
T10	20 - 5	Leg	ROHN 3 EH	545	-68369.20	112178.00	60.9	Pass
T11	5 - 0	Leg	ROHN 3 EH	572	-74086.80	126504.00	58.6	Pass
T1	193 - 180	Diagonal	L2x2x1/4	10	-2610.27	22634.00	11.5	Pass
T2	180 - 160	Diagonal	L2x2x1/4	70	-10591.10	22654.90	46.7	Pass
T3	160 - 140	Diagonal	L2x2x1/4	193	-5947.18	22654.90	26.3	Pass
T4	140 - 120	Diagonal	ROHN TS1.5x11 ga	214	-2333.39	11241.80	20.8	Pass
T5	120 - 100	Diagonal	L2x2x1/4	289	-6024.69	22764.60	26.5	Pass
T6	100 - 80	Diagonal	ROHN TS1.5x16 ga	396	-2938.38	6033.25	48.7	Pass
T7	80 - 60	Diagonal	L1 3/4x1 3/4x3/16	453	-1938.10	14344.50	13.5	Pass
T8	60 - 40	Diagonal	ROHN TS1.5x11 ga	465	-3368.71	11447.80	29.4	Pass
T9	40 - 20	Diagonal	ROHN TS1.5x16 ga	541	-3544.19	6033.25	58.7	Pass
T10	20 - 5	Diagonal	ROHN TS1.5x11 ga	570	-1700.24	11447.80	14.9	Pass
T11	5 - 0	Horizontal	L3x3x1/2	583	-1465.13	62754.40	2.3	Pass
T2	180 - 160	Secondary Horizontal	L2x2x1/4	55	-5407.13	19605.00	27.6	Pass
T3	160 - 140	Secondary Horizontal	L2x2x1/4	199	2517.81	30391.20	8.3	Pass
T5	120 - 100	Secondary Horizontal	L2x2x1/4	284	5616.40	30391.20	18.5	Pass
T1	193 - 180	Top Girt	L2x2x1/4	4	-84.30	16296.10	0.5	Pass
T2	180 - 160	Top Girt	L2x2x1/4	45	-908.33	16320.00	5.6	Pass
T3	160 - 140	Top Girt	ROHN TS1.5x11 ga	125	530.20	19665.40	2.7	Pass
T4	140 - 120	Top Girt	ROHN TS1.5x11 ga	206	973.33	19665.40	4.9	Pass
T5	120 - 100	Top Girt	L2x2x1/4	263	721.81	30391.20	2.4	Pass
T6	100 - 80	Top Girt	ROHN TS1.5x16 ga	344	662.44	9931.96	6.7	Pass
T7	80 - 60	Top Girt	ROHN TS1.5x11 ga	401	983.41	19665.40	5.0	Pass

tnxTower	Job	Page
	MONTVILLE 4 CT	15 of 15
Hudson Design Group LLC 45 Beechwood Drive North Andover, MA 01845 Phone: (978) 557-5553 FAX: (978) 336-5586	**Project** 193 ft Guyed Tower	**Date** 09:15:33 10/18/17
	Client VERIZON	**Designed by** kw

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T8	60 - 40	Top Girt	ROHN TS1.5x11 ga	458	772.84	19665.40	3.9	Pass
T9	40 - 20	Top Girt	ROHN TS1.5x16 ga	514	-835.04	7122.75	11.7	Pass
T10	20 - 5	Top Girt	ROHN TS1.5x11 ga	549	575.57	19665.40	2.9	Pass
T11	5 - 0	Top Girt	L3x3x1/2	574	9696.18	89100.00	10.9	Pass
T1	193 - 180	Bottom Girt	L2x2x1/4	9	-950.81	16296.10	5.8	Pass
T2	180 - 160	Bottom Girt	L2x2x1/4	46	-5163.05	16320.00	31.6	Pass
T3	160 - 140	Bottom Girt	ROHN TS1.5x11 ga	129	413.81	19665.40	2.1	Pass
T4	140 - 120	Bottom Girt	ROHN TS1.5x11 ga	210	990.95	19665.40	5.0	Pass
T5	120 - 100	Bottom Girt	L2x2x1/4	266	3282.12	30391.20	10.8	Pass
T6	100 - 80	Bottom Girt	ROHN TS1.5x16 ga	348	424.29	9931.96	4.3	Pass
T7	80 - 60	Bottom Girt	ROHN TS1.5x11 ga	405	885.72	19665.40	4.5	Pass
T8	60 - 40	Bottom Girt	ROHN TS1.5x11 ga	460	1504.07	19665.40	7.6	Pass
T9	40 - 20	Bottom Girt	ROHN TS1.5x16 ga	519	365.87	9931.96	3.7	Pass
T10	20 - 5	Bottom Girt	ROHN TS1.5x11 ga	550	6572.53	19665.40	33.4	Pass
T2	180 - 160	Guy A@162.583	3/4	594	30850.00	34980.00	88.2	Pass
T5	120 - 100	Guy A@102.583	5/8	606	15346.30	25440.00	60.3	Pass
T8	60 - 40	Guy A@42.5833	1/2	618	6083.18	16140.00	37.7	Pass
T2	180 - 160	Guy B@162.583	3/4	591	31023.10	34980.00	88.7	Pass
T5	120 - 100	Guy B@102.583	5/8	603	15562.70	25440.00	61.2	Pass
T8	60 - 40	Guy B@42.5833	1/2	615	6101.04	16140.00	37.8	Pass
T2	180 - 160	Guy C@162.583	3/4	587	30855.70	34980.00	88.2	Pass
T5	120 - 100	Guy C@102.583	5/8	599	15265.50	25440.00	60.0	Pass
T8	60 - 40	Guy C@42.5833	1/2	611	6016.52	16140.00	37.3	Pass
T2	180 - 160	Torque Arm Top@162.583	C15x50	592	9157.78	476280.00	61.4	Pass
T5	120 - 100	Torque Arm Top@102.583	C15x40	604	4553.13	382320.00	35.0	Pass
T8	60 - 40	Torque Arm Top@42.5833	C12x25	616	-2271.85	204038.00	15.8	Pass

	Summary	
Leg (T5)	80.3	Pass
Diagonal (T9)	58.7	Pass
Horizontal (T11)	2.3	Pass
Secondary Horizontal (T2)	27.6	Pass
Top Girt (T9)	11.7	Pass
Bottom Girt (T10)	33.4	Pass
Guy A (T2)	88.2	Pass
Guy B (T2)	88.7	Pass
Guy C (T2)	88.2	Pass
Torque Arm Top (T2)	61.4	Pass
RATING =	**88.7**	**Pass**

Guyed Tower Pier and Pad Foundation

BU #:
Site Name: MONTVILLE 4 CT
App Number:

Design Reactions		
Shear, S:	1	kips
Compression, Cn:	204	kips
Tower Height, H:	193	ft

Pad Properties		
Depth, D:	5	ft
Pad Width, W:	7	ft
Pad Thickness, T:	1.75	ft
Ext. Above Grade, E:	0.5	ft
Neglected Depth, N:	0	ft
Pad Rebar Size, Sp:	7	
Pad Rebar Quanity, mp:		

Pier Properties		
Pier Diameter, Pd:	2.5	ft
Pier Rebar Size, Sc:		
Pier Rebar Quanity, mc:		#N/A
Pier Tie Size, St:		3
Tie Quanity, mt:		8.42857143

Material Properties		
Rebar Tensile, Fy:	60000	psi
Concrete Strength, F'c:	3000	psi
Concrete Density, δc:	0.15	kcf
Clear Cover, cc:	3	in

Soil Properties		
Soil Unit Weight, γ:	0.125	kcf
Ultimate Bearing, Bc:	12.000	ksf
Cohesion, Co:	0	ksf
Friction Angle, Φ:	35	deg
Passive Pressure, Pp:		pcf
Base Friction, μ:	0.45	
Seismic Zone, z:	1	

Design Checks

	Capacity/ Availability	Demand/ Limits	Check	
Shear Capacity (kips)	91.94	1.00	OK	1.1%
Bearing (ksf)	7.20	5.66	OK	78.5%
Pad Shear - 1-way (kips)	#N/A	#N/A	#N/A	#N/A
Pad Shear - 2-way (kips)	#N/A	#N/A	#N/A	#N/A
Pier Rebar Area (in²)	#N/A	3.53	#N/A	
Pad Rebar Area (in2)	0.00	#N/A	#N/A	
Pier Moment Capacity (k-ft)	922.17	3.75	OK	0.4%
Pier Bar Spacing (in)	#DIV/0!	12 > s > 4.5	#DIV/0!	
Pad Bar Spacing (in)	-78.00	12 > s > 4.5	OK	
Pier Development Length (in)	42	#N/A	#N/A	
Pad Development Length (in)	18	#N/A	OK	
Hook Development Length (in)	39.00	#N/A	#N/A	
Rebar Hook Length (in)	27.00	#N/A	#N/A	
Rebar Hook Length (in)	27.00	#N/A	#N/A	

Modification Checks

	Capacity/ Availability	Demand/ Limits	Check
Sleeve Rebar Area (in2):	15.8	#N/A	Not Used
Sleeve Moment Capacity (k-ft):	922.17	3.75	Not Used
Sleeve Rebar Spacing (in):	N/a	12 > s > 4.5	Not Used
Sleeve Tie Spacing (in):	N/A	0 > s > 4.5	Not Used
Minimum Extra Thickness (in):	0	0	Not Used
Pad Rebar Area-short (in2):	14	#N/A	Not Used
Pad Rebar Area-long (in2):	14	#N/A	Not Used
Pad Rebar Spacing-short (in):	4.79	12 > s > 4.5	Not Used
Pad Rebar Spacing-long (in):	4.79	12 > s > 4.5	Not Used
End Cap Width (ft):	0	0	Not Used
End Cap Rebar Area (in2):	3.16	0	Not Used
Rebar Spacing (in):	-3	12 > s > 4.5	Not Used
Tie Spacing (in):	5.1	78 > s > 4.5	Not Used
Dowel Area (in2):	2.2	#N/A	Not Used
Dowel Embedment (in):	9	6	Not Used
Shear Strength of Cone (kips):	21.78	23.76	Not Used
Dowel Edge Dist (in):	12	3.43	Not Used
Dowel Spacing (in):	15.0	18	Not Used
Dowel Edge Dist (vert) (in):	0	3.43	Not Used
Dowel Devel. Length (in):	-3.00	15.38	Not Used

Modifications

Pier Sleeve, ds:	0	in	**End Cap Width, Wec:**	0	ft
Revised Pier Diameter, dx:	0	ft	**Revised Width, Wx:**	7	ft
PS Rebar Size, Ss:	8		**EC Rebar Size, Sec:**	8	per side, top & bottom
Rebar Quanity, ms:	20	0	**Rebar Quanity, mec:**	4	0
Tie Size, Sst:	5		**EC Tie Size, Sect:**	4	per side
Tie Quanity, mst:	9	#DIV/0!	**Tie Quanity, mect:**	15	0
Pad Thickness, Te:	0	in	**EC Dowel Size, Secd:**	6	per side
Revised Pad Thickness, Tx:	0.00	ft	**Dowel Quanity, mecd:**	5	#N/A
Rebar Size, Se:	9		**Rows of Dowels, Nd:**	1	
Rebar Quanity (long), me:	14	#N/A	**Dowel Depth, decd:**	9	in
Rebar Quanity (short), mex:	14	#N/A	**Edge Distance, eecd:**	12	in
Dowel Size, Sed:	4				
Dowel Quanity, med:	16	0			

Anchor Block Foundation

Checks capacity of anchor blocks with or without a berm for a guyed tower per TIA-222-G

BU#:
Site Name: *MONTVILLE 4 CT*
App Number:
Location: *Inner*

Design Reactions		
Shear, **S**:	29.8	kips
Uplift, **Ua**:	28.3	kips
Resultant Force, **Rf**:	41.1	kips
Tower Height, **H**:	193.00	ft
Guy Anchor Radius, **R**:	89.00	ft

Guyed Anchor Properties		
Depth to Bottom of Deadman, **Da**:	8.0	ft
Anchor Width, **Wa**:	6.0	ft
Anchor Thickness, **Ta**:	4.0	ft
Anchor Length, **La**:	12.0	ft
Concrete Volume, **Vc**:	10.7	yd^3
Frost Depth, **Fd**:	0	ft
Guyed Anchor Rebar Size, **Sa**:	5	
No. of Bars in Top of Block:	0	
No. of Bars in Front of Block:	0	#DIV/0!
Anchor Shaft Diameter, **ds**:	0.000	in

Material Properties		
Rebar Tensile, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Strength Reduction Factor, **φ**:		
Anchor Shaft Grade, **Fy'**:	50	ksi

Skin Friction		
Ultimate Soil Friction, f_s =		ksf

Design Checks	Capacity/ Availability	Demand/ Limits	Check	%
Shear (kips):	85.67	29.80	**OK**	**34.8%**
Uplift Capacity (kips):	86.66	28.30	**OK**	**32.7%**
Uplift Rebar Area (sq.in.):	0	0.28	**No Good!**	**N/A**
Shear Rebar Area (sq.in):	0	#DIV/0!	**#DIV/0!**	**N/A**
Top Rebar Spacing (in):	-66.00	4.5<s<12	**No Good!**	**N/A**
Front Rebar Spacing (in):	-42.00	4.5<s<12	**No Good!**	**N/A**
Anchor Shaft (kips):	0.00	41.10	**#DIV/0!**	**#DIV/0!**

Soil Properties	No. of Soil Layers?	2		
Layer	**φ, deg**	**c, ksf**	**δ, kcf**	**d, ft**
Berm	0	0.000	0.000	0.00
1	33	0.000	0.125	5.50
2	33	0.000	0.063	8.00

Backfill	35	0.000	0.120	☐ use

*key: φ = *Internal Angle of Friction*
δ = *Soil Unit Weight*
d = Depth to Bottom of Layer

Anchor Block Foundation

Checks capacity of anchor blocks with or without a berm for a guyed tower per TIA-222-G

BU#:
Site Name: *MONTVILLE 4 CT*
App Number:
Location: *Outer*

Design Reactions		
Shear, **S**:	38.8	kips
Uplift, **Ua**:	45.7	kips
Resultant Force, **Rf**:	60.0	kips
Tower Height, **H**:	193.00	ft
Guy Anchor Radius, **R**:	140.00	ft

Guyed Anchor Properties		
Depth to Bottom of Deadman, **Da**:	10.0	ft
Anchor Width, **Wa**:	5.0	ft
Anchor Thickness, **Ta**:	2.0	ft
Anchor Length, **La**:	9.0	ft
Concrete Volume, **Vc**:	3.3	yd^3
Frost Depth, **Fd**:	0	ft
Guyed Anchor Rebar Size, **Sa**:	5	
No. of Bars in Top of Block:	0	3
No. of Bars in Front of Block:	0	#DIV/0!
Anchor Shaft Diameter, **ds**:	0.000	in

Material Properties		
Rebar Tensile, **Fy**:	60000	psi
Concrete Strength, **F'c**:	3000	psi
Concrete Density, **δx**:	0.150	kcf
Clear Cover, **cc**:	3	in
Strength Reduction Factor, **φ**:		
Anchor Shaft Grade, **Fy'**:	50	ksi

Skin Friction		
Ultimate Soil Friction, f_s =		ksf

Design Checks				
	Capacity/ Availability	***Demand/ Limits***	***Check***	***%***
Shear (kips):	41.58	38.80	**OK**	**93.3%**
Uplift Capacity (kips):	119.05	45.70	**OK**	**38.4%**
Uplift Rebar Area (sq.in.):	0	0.76	**No Good!**	**N/A**
Shear Rebar Area (sq.in):	0	#DIV/0!	**#DIV/0!**	**N/A**
Top Rebar Spacing (in):	-54.00	4.5<s<12	**No Good!**	**N/A**
Front Rebar Spacing (in):	-18.00	4.5<s<12	**No Good!**	**N/A**
Anchor Shaft (kips):	0.00	60.00	**#DIV/0!**	**#DIV/0!**

Soil Properties	No. of Soil Layers?	2		
Layer	**φ, deg**	**c, ksf**	**δ, kcf**	**d, ft**
Berm	0	0.000	0.000	0.00
1	33	0.000	0.125	5.50
2	33	0.000	0.063	10.00

Backfill	35	0.000	0.120	☐ use

*key: φ = *Internal Angle of Friction*
δ = *Soil Unit Weight*
d = Depth to Bottom of Layer