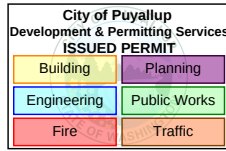


These calculations must be on site and made available by the Permittee for all inspections.

PRCTI20250387

Date: **January 16, 2025**



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
(724) 416-2000

Subject: **Structural Analysis Report**

Carrier Designation: **Verizon Wireless Co-Locate**
Site Number: 5000125815
Site Name: Bradley Park

Crown Castle Designation: **BU Number:** 880329
Site Name: SOUTH HILL MALL
JDE Job Number: 2115661
Work Order Number: 2358314
Order Number: 670680 Rev. 2

Engineering Firm Designation: **Crown Castle Project Number:** 2358314

Site Data: **3150 S Meridian, Puyallup, Pierce County, WA**
Latitude: 47° 9' 43.46" Longitude: -122° 17' 40.04"
120.0 ft - Monopole Tower

Crown Castle is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Proposed Equipment Configuration

Sufficient Capacity

This analysis has been performed in accordance with the 2021 Washington State Building Code (2021 International Building Code) based upon an ultimate 3-second gust wind speed of 104 mph. Applicable standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Matthew Schmitt

01/17/25

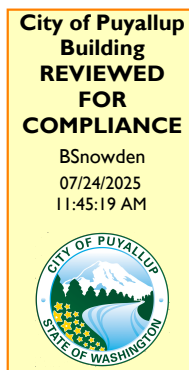
Respectfully submitted by:

Truc Lac, P.E., S.E.
Senior Project Engineer



Truc
Lac

Digitally signed
by Truc Lac
Date:
2025.01.17
11:47:54 -06'00'



License Expires: 02/24/2027

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1) INTRODUCTION

This tower is a 120.0 ft Monopole Tower designed by Napco.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	III
Wind Speed:	104 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.00 in
Wind Speed with Ice:	30 mph
Seismic Ss:	1.264
Seismic S1:	0.436
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
88	92	2	ericsson	4449	2	1-1/2
		3	ericsson	AIR 6449 B77D C-BAND CCIV2 w/ Mount Pipe		
		2	raycap	RVZDC-6627-PF-48		
	91	3	ericsson	RADIO 4490HP 44B5 44B13 C		
	90	3	jma wireless	MX06FRO840-02 w/ Mount Pipe		
		3	jma wireless	MX10FRO840-XX w/ Mount Pipe		
		1	matsing	MS-MBA-3-L4A2 w/ Mount Pipe		
	89	2	ericsson	RADIO 4408		
		3	ericsson	RADIO 8843 B2/B66A		
	88	1	ericsson	RADIO 4408		
		1	tower mounts	T-Arm Mount [TA 602-3]		
		1	tower mounts	T-Arm Mount [TA 602-3_KCKR]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
121	127	1	dbspectra	DS7C06P36U-D w/ Mount Pipe	1 2 6	7/8 1-1/2 1/4
	126	1	dbspectra	DS7C06P36U-D w/ Mount Pipe		
	124	1	radwin	RADWIN 2000C		
	123	3	nokia	AEHC w/ Mount Pipe		
		3	nokia	AHFIG_TMO		
		3	nokia	AHLOA_T-MOBILE		
	122	3	commscope	FFVV-65C-R3-V1_TMO w/ Mount Pipe		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
	121	1	ceragon	FIBEAIR IP-20C		
		2	commscope	HCS 2.0 Part 1		
		1	commscope	VHLPX3-18-2WH		
		2	radwin	RADWIN 2000C		
		1	tower mounts	Platform Mount [LP 602-1]		
	117	1	andrew	VHLP1-23		
		1	dragonwave	HORIZON COMPACT PLUS		
109	112	3	samsung telecommunications	RF4450t-71A	1	1-1/2
		3	samsung telecommunications	RF4451d-70A		
	110	3	commscope	FFVV-65B-R2 w/ Mount Pipe		
	109	1	raycap	RDIDC-9181-PF-48		
		1	tower mounts	Commscope MC-PK8-DSH		
79	80	3	nokia	AHLOA T-MOBILE	1 6	1-3/5 1-5/8
		3	nokia	FHFB		
		3	nokia	FRIG		
	79	6	andrew	TMZXX-6516-R2M w/ Mount Pipe		
		1	tower mounts	Platform Mount [LP 303-1 HR-1]		
	78	3	commscope	FFHH-65C-R3 T-MOBILE w/ Mount Pipe		
		1	raycap	RNSDC-7771-PF-48		
	77	3	andrew	ETW190VS12UB		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Reference	Source
4-GEOTECHNICAL REPORTS	1582988	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	1855128	CCISITES
4-TOWER MANUFACTURER DRAWINGS	6358620	CCISITES

3.1) Analysis Method

tnxTower (version 8.3.0.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A. When applicable, Crown Castle has calculated and provided the effective area for panel antennas using approved methods following the intent of the TIA-222 standard.

3.2) Assumptions

- 1) Tower and structures were maintained in accordance with the TIA-222 Standard.
- 2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass/Fail
L1	120 - 80.25	Pole	TP27.973x20.5x0.25	1	-13.88	1025.88	51.7	Pass
L2	80.25 - 46	Pole	TP33.78x26.721x0.3125	2	-22.48	2014.40	65.9	Pass
L3	46 - 25	Pole	TP36.971x32.2784x0.375	3	-27.28	2645.64	65.7	Pass
L4	25 - 0	Pole	TP40.789x35.2946x0.5	4	-36.69	3064.89	73.2	Pass
							Summary	
						Pole (L4)	73.2	Pass
						RATING =	73.2	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	62.2	Pass
1	Base Plate	0	63.7	Pass
1	Base Foundation (Structural)	0	59.6	Pass
1	Base Foundation (Soil)	0	61.6	Pass

Structure Rating (max from all components) =	73.2%
---	--------------

Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed

4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the considered equipment configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	1	2	3	4
Length (ft)	39.750	38.250	25.750	30.083
Number of Sides	12	12	12	12
Thickness (in)	0.2500	0.3125	0.3750	0.5000
Socket Length (ft)	4.000	4.750	5.083	35.2946
Top Dia (in)	20.5000	26.7210	32.2784	40.7890
Bot Dia (in)	27.9730	33.7800	36.9710	40.7890
Grade	A572-50	A572-50	A572-65	A572-50
Weight (K)	2.6	3.9	3.6	6.2

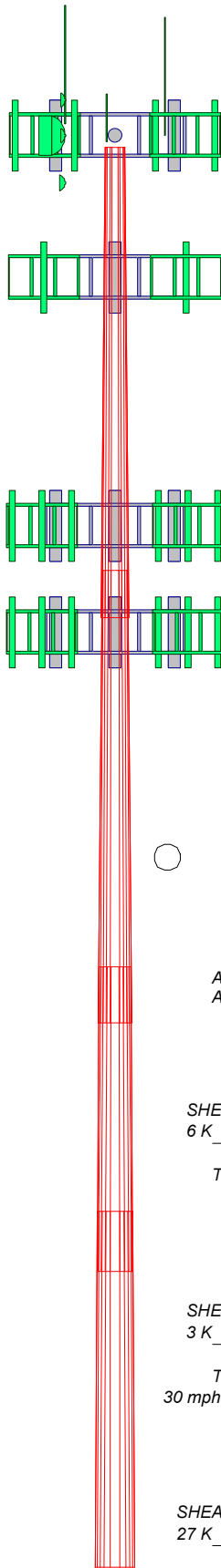
120.0 ft

80.2 ft

46.0 ft

25.0 ft

0.0 ft



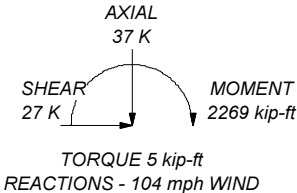
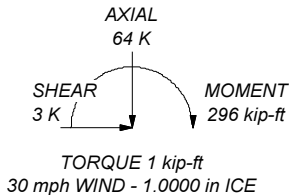
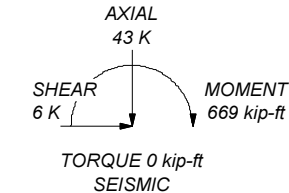
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower is located in Pierce County, Washington.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 104 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 30 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category III.
7. Topographic Category 1 with Crest Height of 0.000 ft
8. CCISismic Note: Seismic loads generated by CCISismic 4.0.2
9. CCISismic Note: Seismic calculations are in accordance with TIA-222-H-1
10. TOWER RATING: 73.2%

ALL REACTIONS
ARE FACTORED



Crown Castle
2000 Corporate Drive
Canonsburg, PA 15317
Phone: (724) 416-2000
FAX:

Job:	BU 880329		
Project:			
Client:	Crown Castle	Drawn by:	Matthew Schmitt
Code:	TIA-222-H	Date:	01/16/25
Path:	C:\SAPI Work Area\880329\WO 2358314 - SAIProd\880329.eri		
Scale:	NTS	Dwg No.	E-1

Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Pierce County, Washington.

Tower base elevation above sea level: 443.000 ft.

Basic wind speed of 104 mph.

Risk Category III.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 30 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

CCISeismic Note: Seismic loads generated by CCISeismic 4.0.2.

CCISeismic Note: Seismic calculations are in accordance with TIA-222-H-1.

Non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

Stress ratio used in pole design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used: $K_{es}(F_w) = 1.0$, $K_{es}(t_i) = 1.0$, $K_{es}(E_v \text{ and } E_h) = 1.0$.

Maximum demand-capacity ratio is: 1.05.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Horizontals	✓ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Consider Moments - Diagonals	✓ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Moment Magnification	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
✓ Use Code Stress Ratios	Retension Guys To Initial Tension	Offset Girt At Foundation
✓ Use Code Safety Factors - Guys	✓ Bypass Mast Stability Checks	✓ Consider Feed Line Torque
Escalate Ice	✓ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Always Use Max Kz	✓ Project Wind Area of Appurtenances	Use TIA-222-H Bracing Resist. Exemption
Kz In Exposure D Hurricane Region	✓ Alternative Appurt. EPA Calculation	Use TIA-222-H Tension Splice Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	✓ Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	✓ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Pole Without Linear Attachments
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole With Shroud Or No Appurtenances
Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules	Outside and Inside Corner Radii Are Known
Use Special Wind Profile		

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	120.000-80.250	39.750	4.000	12	20.5000	27.9730	0.2500	1.0000	A572-50 (50 ksi)
L2	80.250-46.000	38.250	4.750	12	26.7210	33.7800	0.3125	1.2500	A572-65 (65 ksi)
L3	46.000-25.000	25.750	5.083	12	32.2784	36.9710	0.3750	1.5000	A572-65 (65 ksi)
L4	25.000-0.000	30.083		12	35.2946	40.7890	0.5000	2.0000	A572-50 (50 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	21.1350	16.3012	853.2119	7.2495	10.6190	80.3477	1728.8387	8.0230	4.8240	19.296
	28.8716	22.3170	2189.2860	9.9248	14.4900	151.0893	4436.0870	10.9838	6.8268	27.307
L2	28.3176	26.5736	2365.5005	9.4542	13.8415	170.8994	4793.1453	13.0787	6.3237	20.236
	34.8614	33.6767	4814.6161	11.9814	17.4980	275.1517	9755.7174	16.5746	8.2155	26.29
L3	34.1809	38.5233	5004.7648	11.4214	16.7202	299.3243	10141.0103	18.9600	7.6456	20.388
	38.1429	44.1897	7553.9472	13.1014	19.1510	394.4419	15306.3451	21.7488	8.9032	23.742
L4	37.3245	56.0194	8656.6213	12.4565	18.2826	473.4892	17540.6617	27.5710	8.1190	16.238
	42.0515	64.8653	13439.1342	14.4235	21.1287	636.0606	27231.3294	31.9247	9.5915	19.183

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 Horizontal in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.000- 80.250				1	1	1			
L2 80.250- 46.000				1	1	1			
L3 46.000- 25.000				1	1	1			
L4 25.000- 0.000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
CAT6(1/4)	A	No	Surface Ar (CaAa)	120.000 - 0.000	5	1	0.450 0.500	0.2400		0
LDF5-50A(7/8)	A	No	Surface Ar (CaAa)	120.000 - 0.000	1	1	0.425 0.450	1.0900		0
* MLC HYBRID 6POWER/12FIBER(1-1/2) *	C	No	Surface Ar (CaAa)	88.000 - 0.000	2	2	-0.200 -0.100	1.5000		1

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
LDF7-50A(1-5/8)	A	No	Surface Ar (CaAa)	79.000 - 0.000	7	4	0.200 0.300	1.9800		1

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		CAAA ft ² /ft	Weight plf
HCS 2.0 Part 3(1-1/2)	A	No	No	Inside Pole	120.000 - 0.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	2 2 2
LDF1-50A(1/4)	A	No	No	Inside Pole	120.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0 0 0
*									
CU12PSM9P6XXX(1-1/2)	C	No	No	Inside Pole	109.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	2 2 2

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	CAAA In Face ft ²	CAAA Out Face ft ²	Weight K
L1	120.000-80.250	A	0.000	0.000	5.287	0.000	0.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.325	0.000	0.08
L2	80.250-46.000	A	0.000	0.000	30.691	0.000	0.33
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	10.275	0.000	0.15
L3	46.000-25.000	A	0.000	0.000	19.425	0.000	0.21
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	6.300	0.000	0.09
L4	25.000-0.000	A	0.000	0.000	23.125	0.000	0.24
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	7.500	0.000	0.11

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	CAAA In Face ft ²	CAAA Out Face ft ²	Weight K
L1	120.000-80.250	A	1.284	0.000	0.000	25.701	0.000	0.78
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.394	0.000	0.13
L2	80.250-46.000	A	1.226	0.000	0.000	65.408	0.000	1.76
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	$C_A A_A$ In Face ft ²	$C_A A_A$ Out Face ft ²	Weight K
L3	46.000-25.000	C	1.158	0.000	0.000	23.837	0.000	0.36
		A		0.000	0.000	40.323	0.000	1.07
		B		0.000	0.000	0.000	0.000	0.00
L4	25.000-0.000	C	1.042	0.000	0.000	14.314	0.000	0.21
		A		0.000	0.000	46.889	0.000	1.21
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	16.611	0.000	0.24

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
L1	120.000-80.250	0.0293	-0.4025	-0.0519	-1.7325
L2	80.250-46.000	-1.5562	-2.6052	-1.2904	-2.7795
L3	46.000-25.000	-1.6397	-2.7478	-1.4045	-2.9865
L4	25.000-0.000	-1.6608	-2.7824	-1.4558	-3.0701

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	CAT6(1/4)	80.25 - 120.00	1.0000	1.0000
L1	2	LDF5-50A(7/8)	80.25 - 120.00	1.0000	1.0000
L1	8	MLC HYBRID	80.25 - 88.00	1.0000	1.0000
		6POWER/12FIBER(1-1/2)			
L2	1	CAT6(1/4)	46.00 - 80.25	1.0000	1.0000
L2	2	LDF5-50A(7/8)	46.00 - 80.25	1.0000	1.0000
L2	8	MLC HYBRID	46.00 - 80.25	1.0000	1.0000
		6POWER/12FIBER(1-1/2)			
L2	10	LDF7-50A(1-5/8)	46.00 - 79.00	1.0000	1.0000
L3	1	CAT6(1/4)	25.00 - 46.00	1.0000	1.0000
L3	2	LDF5-50A(7/8)	25.00 - 46.00	1.0000	1.0000
L3	8	MLC HYBRID	25.00 - 46.00	1.0000	1.0000
		6POWER/12FIBER(1-1/2)			
L3	10	LDF7-50A(1-5/8)	25.00 - 46.00	1.0000	1.0000
L4	1	CAT6(1/4)	0.00 - 25.00	1.0000	1.0000
L4	2	LDF5-50A(7/8)	0.00 - 25.00	1.0000	1.0000
L4	8	MLC HYBRID	0.00 - 25.00	1.0000	1.0000
		6POWER/12FIBER(1-1/2)			
L4	10	LDF7-50A(1-5/8)	0.00 - 25.00	1.0000	1.0000

User Defined Loads - Seismic

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic Tower Section 1 - 1	115.125	0.000	0.0000	0.11	0.00	0.00	0.26
CCISeismic Tower Section 1 - 2	105.250	0.000	0.0000	0.13	0.00	0.00	0.25
CCISeismic Tower Section 1 - 3	95.250	0.000	0.0000	0.14	0.00	0.00	0.22
CCISeismic Tower Section 1 - 4	85.250	0.000	0.0000	0.15	0.00	0.00	0.19
CCISeismic Tower Section 2 - 1	80.125	0.000	0.0000	0.15	0.00	0.00	0.17
CCISeismic Tower Section 2 - 2	71.000	0.000	0.0000	0.20	0.00	0.00	0.18
CCISeismic Tower Section 2 - 3	61.000	0.000	0.0000	0.21	0.00	0.00	0.14
CCISeismic Tower Section 2 - 4	51.000	0.000	0.0000	0.23	0.00	0.00	0.10
CCISeismic Tower Section 3 - 1	47.875	0.000	0.0000	0.15	0.00	0.00	0.06
CCISeismic Tower Section 3 - 2	40.000	0.000	0.0000	0.28	0.00	0.00	0.08
CCISeismic Tower Section 3 - 3	30.000	0.000	0.0000	0.30	0.00	0.00	0.05
CCISeismic Tower Section 4 - 1	30.042	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic Tower Section 4 - 2	25.000	0.000	0.0000	0.40	0.00	0.00	0.04
CCISeismic Tower Section 4 - 3	15.000	0.000	0.0000	0.42	0.00	0.00	0.02
CCISeismic Tower Section 4 - 4	5.000	0.000	0.0000	0.44	0.00	0.00	0.00
CCISeismic lightning rod 5/8-in x 5-ft L-Rod	120.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic miscel Top Hat 14"x24"	120.000	0.000	0.0000	0.02	0.00	0.00	0.05
CCISeismic commscope FFVV- 65C-R3-V1_TMO w/ Mount Pipe	121.000	0.000	0.0000	0.03	0.00	0.00	0.08
CCISeismic commscope FFVV- 65C-R3-V1_TMO w/ Mount Pipe	121.000	0.000	0.0000	0.03	0.00	0.00	0.08
CCISeismic commscope FFVV- 65C-R3-V1_TMO w/ Mount Pipe	121.000	0.000	0.0000	0.03	0.00	0.00	0.08
CCISeismic dbspectra	121.000	0.000	0.0000	0.01	0.00	0.00	0.03
DS7C06P36U-D w/ Mount Pipe	121.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic nokia AEHC w/ Mount Pipe	121.000	0.000	0.0000	0.02	0.00	0.00	0.06
CCISeismic nokia AEHC w/ Mount Pipe	121.000	0.000	0.0000	0.02	0.00	0.00	0.06
CCISeismic nokia AEHC w/ Mount Pipe	121.000	0.000	0.0000	0.02	0.00	0.00	0.06
CCISeismic ceragon FIBEAIR IP- 20C	121.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic commscope HCS 2.0 Part 1	121.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic commscope HCS 2.0 Part 1	121.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic dragonwave HORIZON COMPACT PLUS	121.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic nokia AHFIG_TMO	121.000	0.000	0.0000	0.01	0.00	0.00	0.04
CCISeismic nokia AHFIG_TMO	121.000	0.000	0.0000	0.01	0.00	0.00	0.04
CCISeismic nokia AHFIG_TMO	121.000	0.000	0.0000	0.01	0.00	0.00	0.04
CCISeismic nokia AHLOA_T- MOBILE	121.000	0.000	0.0000	0.02	0.00	0.00	0.04
CCISeismic nokia AHLOA_T- MOBILE	121.000	0.000	0.0000	0.02	0.00	0.00	0.04
CCISeismic nokia AHLOA_T- MOBILE	121.000	0.000	0.0000	0.02	0.00	0.00	0.04
CCISeismic tower mounts Platform Mount [LP 602-1]	121.000	0.000	0.0000	0.27	0.00	0.00	0.69
CCISeismic tower mounts Transition Ladder	121.000	0.000	0.0000	0.03	0.00	0.00	0.08
CCISeismic (2) tower mounts 8' x 2" Mount Pipe	121.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic (2) tower mounts 8' x	121.000	0.000	0.0000	0.01	0.00	0.00	0.03

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
2" Mount Pipe							
CCISeismic (2) tower mounts 8' x 2" Mount Pipe	121.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic tower mounts 4' x 2" Pipe Mount	121.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic (2) tower mounts 6' x 2" Horizontal Mount Pipe	121.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic commscope FFVV-65B-R2 w/ Mount Pipe	109.000	0.000	0.0000	0.02	0.00	0.00	0.05
CCISeismic commscope FFVV-65B-R2 w/ Mount Pipe	109.000	0.000	0.0000	0.02	0.00	0.00	0.05
CCISeismic commscope FFVV-65B-R2 w/ Mount Pipe	109.000	0.000	0.0000	0.02	0.00	0.00	0.05
CCISeismic raycap RDIDC-9181-PF-48	109.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic samsung telecommunications RF4450t-71A	109.000	0.000	0.0000	0.02	0.00	0.00	0.04
CCISeismic samsung telecommunications RF4450t-71A	109.000	0.000	0.0000	0.02	0.00	0.00	0.04
CCISeismic samsung telecommunications RF4450t-71A	109.000	0.000	0.0000	0.02	0.00	0.00	0.04
CCISeismic samsung telecommunications RF4451d-70A	109.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic samsung telecommunications RF4451d-70A	109.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic samsung telecommunications RF4451d-70A	109.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic tower mounts Commscope MC-PK8-DSH	109.000	0.000	0.0000	0.35	0.00	0.00	0.73
CCISeismic tower mounts 5' x 2" Pipe Mount	109.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic matsing MS-MBA-3-L4A2 w/ Mount Pipe	88.000	0.000	0.0000	0.04	0.00	0.00	0.06
CCISeismic ericsson RADIO 4490HP 44B5 44B13 C	88.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic ericsson RADIO 4490HP 44B5 44B13 C	88.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic ericsson RADIO 4490HP 44B5 44B13 C	88.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic ericsson AIR 6449 B77D C-BAND_CCIV2 w/ Mount Pipe	88.000	0.000	0.0000	0.02	0.00	0.00	0.03
CCISeismic ericsson AIR 6449 B77D C-BAND_CCIV2 w/ Mount Pipe	88.000	0.000	0.0000	0.02	0.00	0.00	0.03
CCISeismic ericsson AIR 6449 B77D C-BAND_CCIV2 w/ Mount Pipe	88.000	0.000	0.0000	0.02	0.00	0.00	0.03
CCISeismic jma wireless MX06FRO840-02 w/ Mount Pipe	88.000	0.000	0.0000	0.03	0.00	0.00	0.03
CCISeismic jma wireless MX06FRO840-02 w/ Mount Pipe	88.000	0.000	0.0000	0.03	0.00	0.00	0.03
CCISeismic jma wireless MX06FRO840-02 w/ Mount Pipe	88.000	0.000	0.0000	0.03	0.00	0.00	0.03
CCISeismic jma wireless	88.000	0.000	0.0000	0.03	0.00	0.00	0.05

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
MX10FRO840-XX w/ Mount Pipe							
CCISeismic jma wireless	88.000	0.000	0.0000	0.03	0.00	0.00	0.05
MX10FRO840-XX w/ Mount Pipe							
CCISeismic jma wireless	88.000	0.000	0.0000	0.03	0.00	0.00	0.05
MX10FRO840-XX w/ Mount Pipe							
CCISeismic ericsson 4449	88.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic ericsson 4449	88.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic ericsson RADIO 4408	88.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RADIO 4408	88.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RADIO 4408	88.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic ericsson RADIO 8843	88.000	0.000	0.0000	0.02	0.00	0.00	0.02
B2/B66A							
CCISeismic ericsson RADIO 8843	88.000	0.000	0.0000	0.02	0.00	0.00	0.02
B2/B66A							
CCISeismic ericsson RADIO 8843	88.000	0.000	0.0000	0.02	0.00	0.00	0.02
B2/B66A							
CCISeismic raycap RVZDC-6627-PF-48	88.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic raycap RVZDC-6627-PF-48	88.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic tower mounts T-Arm Mount [TA 602-3_KCKR]	88.000	0.000	0.0000	0.21	0.00	0.00	0.29
CCISeismic tower mounts T-Arm Mount [TA 602-3]	88.000	0.000	0.0000	0.16	0.00	0.00	0.21
CCISeismic tower mounts 8' x 2" Mount Pipe	88.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic tower mounts 8' x 2" Mount Pipe	88.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic tower mounts 6' x 2" Mount Pipe	88.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic tower mounts 6' x 2" Mount Pipe	88.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic (2) andrew TMZXX-6516-R2M w/ Mount Pipe	79.000	0.000	0.0000	0.02	0.00	0.00	0.02
CCISeismic (2) andrew TMZXX-6516-R2M w/ Mount Pipe	79.000	0.000	0.0000	0.02	0.00	0.00	0.02
CCISeismic (2) andrew TMZXX-6516-R2M w/ Mount Pipe	79.000	0.000	0.0000	0.02	0.00	0.00	0.02
CCISeismic commscope FFHH-65C-R3_T-MOBILE w/ Mount Pipe	79.000	0.000	0.0000	0.03	0.00	0.00	0.04
CCISeismic commscope FFHH-65C-R3_T-MOBILE w/ Mount Pipe	79.000	0.000	0.0000	0.03	0.00	0.00	0.04
CCISeismic commscope FFHH-65C-R3_T-MOBILE w/ Mount Pipe	79.000	0.000	0.0000	0.03	0.00	0.00	0.04
CCISeismic nokia FRIG	79.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic nokia FRIG	79.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic nokia FRIG	79.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic raycap RNSDC-7771-PF-48	79.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic nokia AHLOA_T-MOBILE	79.000	0.000	0.0000	0.02	0.00	0.00	0.02
CCISeismic nokia AHLOA_T-MOBILE	79.000	0.000	0.0000	0.02	0.00	0.00	0.02
CCISeismic nokia AHLOA_T-MOBILE	79.000	0.000	0.0000	0.02	0.00	0.00	0.02
CCISeismic andrew ETW190VS12UB	79.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew	79.000	0.000	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
ETW190VS12UB							
CCISeismic andrew	79.000	0.000	0.0000	0.00	0.00	0.00	0.00
ETW190VS12UB							
CCISeismic nokia FHFB	79.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic nokia FHFB	79.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic nokia FHFB	79.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic tower mounts	79.000	0.000	0.0000	0.30	0.00	0.00	0.33
Platform Mount [LP 303-1_HR-1]							
CCISeismic andrew VHLP1-23	121.000	0.000	0.0000	0.00	0.00	0.00	0.01
CCISeismic commscope VHLPX3-18-2WH	121.000	0.000	0.0000	0.01	0.00	0.00	0.03
CCISeismic radwin RADWIN 2000C	121.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic radwin RADWIN 2000C	121.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic radwin RADWIN 2000C	121.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (110ft to120ft)	115.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (100ft to110ft)	105.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (90ft to100ft)	95.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (80ft to90ft)	85.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (70ft to80ft)	75.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (60ft to70ft)	65.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (50ft to60ft)	55.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (40ft to50ft)	45.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (30ft to40ft)	35.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (20ft to30ft)	25.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (10ft to20ft)	15.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (0ft to10ft)	5.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (110ft to120ft)	115.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (100ft to110ft)	105.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (90ft to100ft)	95.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (80ft to90ft)	85.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (70ft to80ft)	75.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (60ft to70ft)	65.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (50ft	55.000	0.000	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
to60ft)							
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (40ft to50ft)	45.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (30ft to40ft)	35.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (20ft to30ft)	25.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (10ft to20ft)	15.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF5-50A(7/8) From 0 to 120 (0ft to10ft)	5.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (110ft to120ft)	115.000	0.000	0.0000	0.01	0.00	0.00	0.02
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (100ft to110ft)	105.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (90ft to100ft)	95.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (80ft to90ft)	85.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (70ft to80ft)	75.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (60ft to70ft)	65.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (50ft to60ft)	55.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (40ft to50ft)	45.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (30ft to40ft)	35.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (20ft to30ft)	25.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (10ft to20ft)	15.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120 (0ft to10ft)	5.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (110ft to120ft)	115.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (100ft to110ft)	105.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (90ft to100ft)	95.000	0.000	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (80ft to 90ft)	85.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (70ft to 80ft)	75.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (60ft to 70ft)	65.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (50ft to 60ft)	55.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (40ft to 50ft)	45.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (30ft to 40ft)	35.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (20ft to 30ft)	25.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (10ft to 20ft)	15.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic andrew LDF1-50A(1/4) From 0 to 120 (0ft to 10ft)	5.000	0.000	0.0000	0.00	0.00	0.00	0.00
CCISeismic cui	104.500	0.000	0.0000	0.00	0.00	0.00	0.01
CU12PSM9P6XXX(1-1/2) From 0 to 109 (100ft to 109ft)							
CCISeismic cui	95.000	0.000	0.0000	0.00	0.00	0.00	0.01
CU12PSM9P6XXX(1-1/2) From 0 to 109 (90ft to 100ft)							
CCISeismic cui	85.000	0.000	0.0000	0.00	0.00	0.00	0.01
CU12PSM9P6XXX(1-1/2) From 0 to 109 (80ft to 90ft)							
CCISeismic cui	75.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (70ft to 80ft)							
CCISeismic cui	65.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (60ft to 70ft)							
CCISeismic cui	55.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (50ft to 60ft)							
CCISeismic cui	45.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (40ft to 50ft)							
CCISeismic cui	35.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (30ft to 40ft)							
CCISeismic cui	25.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (20ft to 30ft)							
CCISeismic cui	15.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (10ft to 20ft)							
CCISeismic cui	5.000	0.000	0.0000	0.00	0.00	0.00	0.00
CU12PSM9P6XXX(1-1/2) From 0 to 109 (0ft to 10ft)							
CCISeismic (2) huber and suhner	84.000	0.000	0.0000	0.00	0.00	0.00	0.00

Description	Elevation	Offset From Centroid	Azimuth Angle	E_v	E_{hx}	E_{hz}	E_h
	ft	ft	°	K	K	K	K
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (80ft to88ft)							
CCISeismic (2) huber and suhner	75.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (70ft to80ft)							
CCISeismic (2) huber and suhner	65.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (60ft to70ft)							
CCISeismic (2) huber and suhner	55.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (50ft to60ft)							
CCISeismic (2) huber and suhner	45.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (40ft to50ft)							
CCISeismic (2) huber and suhner	35.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (30ft to40ft)							
CCISeismic (2) huber and suhner	25.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (20ft to30ft)							
CCISeismic (2) huber and suhner	15.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (10ft to20ft)							
CCISeismic (2) huber and suhner	5.000	0.000	0.0000	0.00	0.00	0.00	0.00
MLC HYBRID							
6POWER/12FIBER(1-1/2) From 0 to 88 (0ft to10ft)							
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (70ft to79ft)	74.500	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (60ft to70ft)	65.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (50ft to60ft)	55.000	0.000	0.0000	0.01	0.00	0.00	0.01
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (40ft to50ft)	45.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (30ft to40ft)	35.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (20ft to30ft)	25.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (10ft to20ft)	15.000	0.000	0.0000	0.01	0.00	0.00	0.00
CCISeismic (7) andrew LDF7-50A(1-5/8) From 0 to 79 (0ft to10ft)	5.000	0.000	0.0000	0.01	0.00	0.00	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
5/8-in x 5-ft L-Rod	C	From Leg	0.000 0.000 2.500	0.0000	120.000
Top Hat 14"x24"	C	From Leg	0.000 0.000 1.000	0.0000	120.000

FFVV-65C-R3-V1_TMO w/ Mount Pipe	A	From Leg	4.000 0.000 1.000	0.0000	121.000
FFVV-65C-R3-V1_TMO w/ Mount Pipe	B	From Leg	4.000 0.000 1.000	0.0000	121.000
FFVV-65C-R3-V1_TMO w/ Mount Pipe	C	From Leg	4.000 0.000 1.000	0.0000	121.000
DS7C06P36U-D w/ Mount Pipe	B	From Leg	4.000 0.000 5.000	0.0000	121.000
DS7C06P36U-D w/ Mount Pipe	C	From Leg	4.000 0.000 6.000	0.0000	121.000
AEHC w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.0000	121.000
AEHC w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.0000	121.000
AEHC w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.0000	121.000
FIBEAIR IP-20C	C	From Leg	4.000 0.000 0.000	0.0000	121.000
HCS 2.0 Part 1	A	From Leg	4.000 0.000 0.000	0.0000	121.000
HCS 2.0 Part 1	B	From Leg	4.000 0.000 0.000	0.0000	121.000
HORIZON COMPACT PLUS	A	From Leg	4.000 0.000 -4.000	0.0000	121.000
AHFIG_TMO	A	From Leg	4.000 0.000 2.000	0.0000	121.000
AHFIG_TMO	B	From Leg	4.000 0.000 2.000	0.0000	121.000
AHFIG_TMO	C	From Leg	4.000 0.000 2.000	0.0000	121.000
AHLOA_T-MOBILE	A	From Leg	4.000	0.0000	121.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
			0.000		
AHLOA_T-MOBILE	B	From Leg	2.000		
			4.000	0.0000	121.000
			0.000		
AHLOA_T-MOBILE	C	From Leg	2.000		
			4.000	0.0000	121.000
			0.000		
Platform Mount [LP 602-1]	C	None	2.000	0.0000	121.000
Transition Ladder	A	From Leg	0.000	0.0000	121.000
			0.000		
(2) 8' x 2" Mount Pipe	A	From Leg	4.000	0.0000	121.000
			0.000		
(2) 8' x 2" Mount Pipe	B	From Leg	4.000	0.0000	121.000
			0.000		
(2) 8' x 2" Mount Pipe	C	From Leg	4.000	0.0000	121.000
			0.000		
4' x 2" Pipe Mount	C	From Leg	4.000	0.0000	121.000
			0.000		
(2) 6' x 2" Horizontal Mount Pipe	C	From Leg	4.000	0.0000	121.000
			0.000		
*			0.000		
FFVV-65B-R2 w/ Mount Pipe	A	From Leg	4.000	0.0000	109.000
			0.000		
FFVV-65B-R2 w/ Mount Pipe	B	From Leg	1.000		
			4.000	0.0000	109.000
			0.000		
FFVV-65B-R2 w/ Mount Pipe	C	From Leg	1.000		
			4.000	0.0000	109.000
			0.000		
RDIDC-9181-PF-48	A	From Leg	1.000		
			2.000	0.0000	109.000
			0.000		
RF4450t-71A	A	From Leg	0.000		
			4.000	0.0000	109.000
			0.000		
RF4450t-71A	B	From Leg	3.000		
			4.000	0.0000	109.000
			0.000		
RF4450t-71A	C	From Leg	3.000		
			4.000	0.0000	109.000
			0.000		
RF4451d-70A	A	From Leg	3.000		
			4.000	0.0000	109.000
			0.000		
RF4451d-70A	B	From Leg	3.000		
			4.000	0.0000	109.000
			0.000		
RF4451d-70A	C	From Leg	3.000		
			4.000	0.0000	109.000
			0.000		
			3.000		

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
Commscope MC-PK8-DSH 5' x 2" Pipe Mount	C A	None From Leg	2.000 0.000 0.000	0.0000 0.0000	109.000 109.000
* MS-MBA-3-L4A2 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.0000	88.000
RADIO 4490HP 44B5 44B13 C	A	From Leg	4.000 0.000 3.000	0.0000	88.000
RADIO 4490HP 44B5 44B13 C	B	From Leg	4.000 0.000 3.000	0.0000	88.000
RADIO 4490HP 44B5 44B13 C	C	From Leg	4.000 0.000 3.000	0.0000	88.000
AIR 6449 B77D C- BAND_CCIV2 w/ Mount Pipe	A	From Leg	4.000 0.000 4.000	0.0000	88.000
AIR 6449 B77D C- BAND_CCIV2 w/ Mount Pipe	B	From Leg	4.000 0.000 4.000	0.0000	88.000
AIR 6449 B77D C- BAND_CCIV2 w/ Mount Pipe	C	From Leg	4.000 0.000 4.000	0.0000	88.000
MX06FRO840-02 w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.0000	88.000
MX06FRO840-02 w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.0000	88.000
MX06FRO840-02 w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.0000	88.000
MX10FRO840-XX w/ Mount Pipe	A	From Leg	4.000 0.000 2.000	0.0000	88.000
MX10FRO840-XX w/ Mount Pipe	B	From Leg	4.000 0.000 2.000	0.0000	88.000
MX10FRO840-XX w/ Mount Pipe	C	From Leg	4.000 0.000 2.000	0.0000	88.000
4449	B	From Leg	4.000 0.000 4.000	0.0000	88.000
4449	C	From Leg	4.000 0.000 4.000	0.0000	88.000
RADIO 4408	A	From Leg	4.000 0.000 1.000	0.0000	88.000
RADIO 4408	B	From Leg	4.000 0.000 1.000	0.0000	88.000
RADIO 4408	C	From Leg	4.000 0.000	0.0000	88.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RADIO 8843 B2/B66A	A	From Leg	0.000 4.000 0.000	0.0000	88.000
RADIO 8843 B2/B66A	B	From Leg	1.000 4.000 0.000	0.0000	88.000
RADIO 8843 B2/B66A	C	From Leg	1.000 4.000 0.000	0.0000	88.000
RVZDC-6627-PF-48	A	From Leg	1.000 4.000 0.000	0.0000	88.000
RVZDC-6627-PF-48	B	From Leg	4.000 0.000 4.000	0.0000	88.000
T-Arm Mount [TA 602-3_KCKR]	C	None	4.000	0.0000	88.000
T-Arm Mount [TA 602-3]	C	None		0.0000	88.000
8' x 2" Mount Pipe	A	From Face	0.000 0.000	0.0000	88.000
8' x 2" Mount Pipe	B	From Face	0.000 4.000 0.000	0.0000	88.000
6' x 2" Mount Pipe	A	From Face	0.000 2.000 0.000	0.0000	88.000
6' x 2" Mount Pipe	B	From Face	0.000 2.000 0.000 0.000	0.0000	88.000
*			0.000		
(2) TMZXX-6516-R2M w/ Mount Pipe	A	From Leg	4.000 0.000 0.000	0.0000	79.000
(2) TMZXX-6516-R2M w/ Mount Pipe	B	From Leg	4.000 0.000 0.000	0.0000	79.000
(2) TMZXX-6516-R2M w/ Mount Pipe	C	From Leg	4.000 0.000 0.000	0.0000	79.000
FFHH-65C-R3_T-MOBILE w/ Mount Pipe	A	From Leg	4.000 0.000 -1.000	0.0000	79.000
FFHH-65C-R3_T-MOBILE w/ Mount Pipe	B	From Leg	4.000 0.000 -1.000	0.0000	79.000
FFHH-65C-R3_T-MOBILE w/ Mount Pipe	C	From Leg	4.000 0.000 -1.000	0.0000	79.000
FRIG	A	From Leg	4.000 0.000 1.000	0.0000	79.000
FRIG	B	From Leg	4.000 0.000 1.000	0.0000	79.000
FRIG	C	From Leg	4.000 0.000	0.0000	79.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft
RNSDC-7771-PF-48	A	From Leg	1.000 4.000 0.000	0.0000	79.000
AHLOA_T-MOBILE	A	From Leg	-1.000 4.000 0.000	0.0000	79.000
AHLOA_T-MOBILE	B	From Leg	1.000 4.000 0.000	0.0000	79.000
AHLOA_T-MOBILE	C	From Leg	1.000 4.000 0.000	0.0000	79.000
ETW190VS12UB	A	From Leg	1.000 4.000 0.000	0.0000	79.000
ETW190VS12UB	B	From Leg	-2.000 4.000 0.000	0.0000	79.000
ETW190VS12UB	C	From Leg	-2.000 4.000 0.000	0.0000	79.000
FHFB	A	From Leg	-2.000 4.000 0.000	0.0000	79.000
FHFB	B	From Leg	1.000 4.000 0.000	0.0000	79.000
FHFB	C	From Leg	1.000 4.000 0.000	0.0000	79.000
Platform Mount [LP 303- 1_HR-1] ***	C	None	1.000	0.0000	79.000

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight K
VHLP1-23	C	Paraboloid w/o Radome	From Leg	4.000 0.000 -4.000	0.0000		121.000	1.275	No Ice 1.280 1/2" Ice 1.450 1" Ice 1.620	0.01 0.02 0.02
VHLPX3-18-2WH	C	Paraboloid w/Shroud (HP)	From Leg	4.000 0.000 0.000	0.0000		121.000	3.283	No Ice 8.467 1/2" Ice 8.902 1" Ice 9.337	0.05 0.10 0.14
RADWIN 2000C	A	Paraboloid w/o Radome	From Leg	4.000 0.000 0.000	0.0000		121.000	1.218	No Ice 1.164 1/2" Ice 1.329 1" Ice 1.494	0.01 0.01 0.02
RADWIN 2000C	C	Paraboloid w/o Radome	From Leg	4.000 0.000	0.0000		121.000	1.218	No Ice 1.164 1/2" Ice 1.329	0.01 0.01

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft²	Weight K	
RADWIN 2000C	C	Paraboloid w/o Radome	From Leg	3.000	0.0000		121.000	1.218	1" Ice	1.494	0.02
				4.000					No Ice	1.164	0.01
				0.000					1/2" Ice	1.329	0.01
				0.000					1" Ice	1.494	0.02

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service

Comb. No.	Description
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service
51	1.2 Dead+1.0 Ev+1.0 Eh 0 deg
52	0.9 Dead-1.0 Ev+1.0 Eh 0 deg
53	1.2 Dead+1.0 Ev+1.0 Eh 30 deg
54	0.9 Dead-1.0 Ev+1.0 Eh 30 deg
55	1.2 Dead+1.0 Ev+1.0 Eh 60 deg
56	0.9 Dead-1.0 Ev+1.0 Eh 60 deg
57	1.2 Dead+1.0 Ev+1.0 Eh 90 deg
58	0.9 Dead-1.0 Ev+1.0 Eh 90 deg
59	1.2 Dead+1.0 Ev+1.0 Eh 120 deg
60	0.9 Dead-1.0 Ev+1.0 Eh 120 deg
61	1.2 Dead+1.0 Ev+1.0 Eh 150 deg
62	0.9 Dead-1.0 Ev+1.0 Eh 150 deg
63	1.2 Dead+1.0 Ev+1.0 Eh 180 deg
64	0.9 Dead-1.0 Ev+1.0 Eh 180 deg
65	1.2 Dead+1.0 Ev+1.0 Eh 210 deg
66	0.9 Dead-1.0 Ev+1.0 Eh 210 deg
67	1.2 Dead+1.0 Ev+1.0 Eh 240 deg
68	0.9 Dead-1.0 Ev+1.0 Eh 240 deg
69	1.2 Dead+1.0 Ev+1.0 Eh 270 deg
70	0.9 Dead-1.0 Ev+1.0 Eh 270 deg
71	1.2 Dead+1.0 Ev+1.0 Eh 300 deg
72	0.9 Dead-1.0 Ev+1.0 Eh 300 deg
73	1.2 Dead+1.0 Ev+1.0 Eh 330 deg
74	0.9 Dead-1.0 Ev+1.0 Eh 330 deg

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 80.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-30.06	6.63	-2.36
			Max. Mx	8	-13.89	-335.11	9.25
			Max. My	2	-13.94	-13.72	330.69
			Max. Vy	8	15.30	-335.11	9.25
			Max. Vx	2	-15.16	-13.72	330.69
			Max. Torque	12			-4.96
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-45.58	9.18	-1.21
			Max. Mx	8	-22.49	-994.79	17.68
L2	80.25 - 46	Pole	Max. My	2	-22.60	-26.68	966.16
			Max. Vy	8	22.19	-994.79	17.68
			Max. Vx	2	-20.62	-26.68	966.16
			Max. Torque	12			-4.96
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-52.30	10.81	-0.66
			Max. Mx	8	-27.28	-1478.43	22.71
			Max. My	2	-27.38	-34.48	1407.29
			Max. Vy	8	24.57	-1478.43	22.71
			Max. Vx	2	-22.01	-34.48	1407.29
L3	46 - 25	Pole	Max. Torque	12			-4.86
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.30	13.03	0.19
			Max. Mx	8	-36.69	-2257.04	29.84
			Max. My	2	-36.69	-45.50	2097.01
			Max. Vy	8	26.99	-2257.04	29.84
			Max. Vx	2	-23.74	-45.50	2097.01
			Max. Torque	12			-4.85
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.30	13.03	0.19
L4	25 - 0	Pole	Max. Mx	8	-36.69	-2257.04	29.84
			Max. My	2	-36.69	-45.50	2097.01
			Max. Vy	8	26.99	-2257.04	29.84
			Max. Vx	2	-23.74	-45.50	2097.01
			Max. Torque	12			-4.85
			Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.30	13.03	0.19
			Max. Mx	8	-36.69	-2257.04	29.84
			Max. My	2	-36.69	-45.50	2097.01
			Max. Vy	8	26.99	-2257.04	29.84

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
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Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	64.30	0.00	-0.00
	Max. H _x	21	27.53	26.83	-0.10
	Max. H _z	2	36.71	-0.37	23.72
	Max. M _x	2	2097.01	-0.37	23.72
	Max. M _z	8	2257.04	-26.97	0.23
	Max. Torsion	24	4.77	11.78	20.40
	Min. Vert	56	21.35	-5.61	3.24
	Min. H _x	8	36.71	-26.97	0.23
	Min. H _z	14	36.71	0.14	-23.67
	Min. M _x	14	-2091.33	0.14	-23.67
	Min. M _z	20	-2244.51	26.83	-0.10
	Min. Torsion	12	-4.85	-11.70	-20.47

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	30.59	-0.00	0.00	0.34	2.20	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	36.71	0.37	-23.72	-2097.01	-45.50	-3.98
0.9 Dead+1.0 Wind 0 deg - No Ice	27.53	0.37	-23.72	-2073.90	-45.56	-3.96
1.2 Dead+1.0 Wind 30 deg - No Ice	36.71	12.20	-20.74	-1828.69	-1084.18	-2.50
0.9 Dead+1.0 Wind 30 deg - No Ice	27.53	12.20	-20.74	-1808.59	-1072.79	-2.48
1.2 Dead+1.0 Wind 60 deg - No Ice	36.71	23.43	-13.58	-1138.92	-1962.42	-1.78
0.9 Dead+1.0 Wind 60 deg - No Ice	27.53	23.43	-13.58	-1126.73	-1941.92	-1.78
1.2 Dead+1.0 Wind 90 deg - No Ice	36.71	26.97	-0.23	-29.84	-2257.04	0.54
0.9 Dead+1.0 Wind 90 deg - No Ice	27.53	26.97	-0.23	-29.54	-2233.40	0.52
1.2 Dead+1.0 Wind 120 deg - No Ice	36.71	20.63	11.59	1013.61	-1827.69	3.52
0.9 Dead+1.0 Wind 120 deg - No Ice	27.53	20.63	11.59	1002.37	-1808.09	3.49
1.2 Dead+1.0 Wind 150 deg - No Ice	36.71	11.70	20.47	1806.65	-1025.93	4.85
0.9 Dead+1.0 Wind 150 deg - No Ice	27.53	11.70	20.47	1786.57	-1015.29	4.82
1.2 Dead+1.0 Wind 180 deg - No Ice	36.71	-0.14	23.67	2091.33	21.75	4.37
0.9 Dead+1.0 Wind 180 deg - No Ice	27.53	-0.14	23.67	2068.08	20.77	4.34
1.2 Dead+1.0 Wind 210 deg - No Ice	36.71	-12.00	20.72	1826.32	1064.36	2.73

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
0.9 Dead+1.0 Wind 210 deg - No Ice	27.53	-12.00	20.72	1806.03	1051.88	2.71
1.2 Dead+1.0 Wind 240 deg - No Ice	36.71	-23.30	13.56	1137.20	1950.74	1.74
0.9 Dead+1.0 Wind 240 deg - No Ice	27.53	-23.30	13.56	1124.81	1929.03	1.73
1.2 Dead+1.0 Wind 270 deg - No Ice	36.71	-26.83	0.10	14.49	2244.51	-0.85
0.9 Dead+1.0 Wind 270 deg - No Ice	27.53	-26.83	0.10	14.18	2219.66	-0.84
1.2 Dead+1.0 Wind 300 deg - No Ice	36.71	-20.47	-11.70	-1026.81	1811.72	-3.85
0.9 Dead+1.0 Wind 300 deg - No Ice	27.53	-20.47	-11.70	-1015.60	1790.96	-3.83
1.2 Dead+1.0 Wind 330 deg - No Ice	36.71	-11.78	-20.40	-1796.87	1041.70	-4.77
0.9 Dead+1.0 Wind 330 deg - No Ice	27.53	-11.78	-20.40	-1777.13	1029.50	-4.73
1.2 Dead+1.0 Ice+1.0 Temp	64.30	-0.00	0.00	-0.19	13.03	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	64.30	0.04	-2.86	-271.80	7.57	-0.42
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	64.30	1.46	-2.48	-235.72	-126.65	-0.27
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	64.30	2.68	-1.55	-143.65	-234.54	-0.18
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	64.30	3.09	-0.03	-3.80	-271.97	0.05
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	64.30	2.49	1.40	131.56	-223.83	0.36
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	64.30	1.42	2.47	233.71	-120.47	0.50
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	64.30	-0.02	2.86	270.70	15.40	0.46
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	64.30	-1.44	2.48	235.09	150.04	0.30
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	64.30	-2.66	1.55	143.05	258.88	0.17
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	64.30	-3.07	0.01	1.59	296.24	-0.09
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	64.30	-2.47	-1.41	-133.43	247.65	-0.40
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	64.30	-1.42	-2.46	-233.14	147.71	-0.49
Dead+Wind 0 deg - Service	30.59	0.11	-7.07	-620.26	-11.99	-1.19
Dead+Wind 30 deg - Service	30.59	3.63	-6.18	-540.89	-319.34	-0.75
Dead+Wind 60 deg - Service	30.59	6.98	-4.04	-336.86	-579.35	-0.53
Dead+Wind 90 deg - Service	30.59	8.03	-0.07	-8.59	-666.55	0.16
Dead+Wind 120 deg - Service	30.59	6.15	3.45	300.16	-539.33	1.05
Dead+Wind 150 deg - Service	30.59	3.48	6.10	534.79	-302.10	1.45
Dead+Wind 180 deg - Service	30.59	-0.04	7.05	619.03	7.88	1.31
Dead+Wind 210 deg - Service	30.59	-3.57	6.17	540.62	316.39	0.81
Dead+Wind 240 deg - Service	30.59	-6.94	4.04	336.79	578.80	0.52
Dead+Wind 270 deg - Service	30.59	-7.99	0.03	4.51	665.73	-0.26
Dead+Wind 300 deg - Service	30.59	-6.09	-3.48	-303.60	537.51	-1.15
Dead+Wind 330 deg - Service	30.59	-3.51	-6.07	-531.44	309.68	-1.42
1.2 Dead+1.0 Ev+1.0 Eh 0 deg	42.89	-0.00	-6.48	-665.31	2.78	-0.04
0.9 Dead-1.0 Ev+1.0 Eh 0 deg	21.35	0.00	-6.48	-647.38	2.00	-0.03
1.2 Dead+1.0 Ev+1.0 Eh 30 deg	42.89	3.24	-5.61	-576.13	-330.10	-0.03
0.9 Dead-1.0 Ev+1.0 Eh 30 deg	21.35	3.24	-5.61	-560.61	-321.84	-0.02
1.2 Dead+1.0 Ev+1.0 Eh 60 deg	42.89	5.61	-3.24	-332.44	-573.78	-0.00
0.9 Dead-1.0 Ev+1.0 Eh 60 deg	21.35	5.61	-3.24	-323.54	-558.91	-0.00
1.2 Dead+1.0 Ev+1.0 Eh 90 deg	42.89	6.48	0.00	0.43	-662.97	0.02

Load Combination	Vertical K	Shear _x K	Shear _y K	Overturning Moment, M _x kip-ft	Overturning Moment, M _y kip-ft	Torque kip-ft
0.9 Dead-1.0 Ev+1.0 Eh 90 deg	21.35	6.48	0.00	0.31	-645.68	0.01
1.2 Dead+1.0 Ev+1.0 Eh 120 deg	42.89	5.61	3.24	333.31	-573.78	0.04
0.9 Dead-1.0 Ev+1.0 Eh 120 deg	21.35	5.61	3.24	324.15	-558.91	0.03
1.2 Dead+1.0 Ev+1.0 Eh 150 deg	42.89	3.24	5.61	576.99	-330.10	0.05
0.9 Dead-1.0 Ev+1.0 Eh 150 deg	21.35	3.24	5.61	561.22	-321.84	0.03
1.2 Dead+1.0 Ev+1.0 Eh 180 deg	42.89	-0.00	6.48	666.18	2.78	0.04
0.9 Dead-1.0 Ev+1.0 Eh 180 deg	21.35	0.00	6.48	647.99	2.00	0.03
1.2 Dead+1.0 Ev+1.0 Eh 210 deg	42.89	-3.24	5.61	576.99	335.65	0.03
0.9 Dead-1.0 Ev+1.0 Eh 210 deg	21.35	-3.24	5.61	561.22	325.84	0.02
1.2 Dead+1.0 Ev+1.0 Eh 240 deg	42.89	-5.61	3.24	333.31	579.33	0.00
0.9 Dead-1.0 Ev+1.0 Eh 240 deg	21.35	-5.61	3.24	324.15	562.91	0.00
1.2 Dead+1.0 Ev+1.0 Eh 270 deg	42.89	-6.48	0.00	0.43	668.52	-0.02
0.9 Dead-1.0 Ev+1.0 Eh 270 deg	21.35	-6.48	0.00	0.31	649.69	-0.01
1.2 Dead+1.0 Ev+1.0 Eh 300 deg	42.89	-5.61	-3.24	-332.44	579.33	-0.04
0.9 Dead-1.0 Ev+1.0 Eh 300 deg	21.35	-5.61	-3.24	-323.54	562.91	-0.03
1.2 Dead+1.0 Ev+1.0 Eh 330 deg	42.89	-3.24	-5.61	-576.12	335.65	-0.05
0.9 Dead-1.0 Ev+1.0 Eh 330 deg	21.35	-3.24	-5.61	-560.61	325.84	-0.03

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-30.59	0.00	0.00	30.59	0.00	0.000%
2	0.37	-36.71	-23.72	-0.37	36.71	23.72	0.000%
3	0.37	-27.53	-23.72	-0.37	27.53	23.72	0.000%
4	12.20	-36.71	-20.74	-12.20	36.71	20.74	0.000%
5	12.20	-27.53	-20.74	-12.20	27.53	20.74	0.000%
6	23.43	-36.71	-13.58	-23.43	36.71	13.58	0.000%
7	23.43	-27.53	-13.58	-23.43	27.53	13.58	0.000%
8	26.97	-36.71	-0.23	-26.97	36.71	0.23	0.000%
9	26.97	-27.53	-0.23	-26.97	27.53	0.23	0.000%
10	20.63	-36.71	11.59	-20.63	36.71	-11.59	0.000%
11	20.63	-27.53	11.59	-20.63	27.53	-11.59	0.000%
12	11.70	-36.71	20.47	-11.70	36.71	-20.47	0.000%
13	11.70	-27.53	20.47	-11.70	27.53	-20.47	0.000%
14	-0.14	-36.71	23.67	0.14	36.71	-23.67	0.000%
15	-0.14	-27.53	23.67	0.14	27.53	-23.67	0.000%
16	-12.00	-36.71	20.72	12.00	36.71	-20.72	0.000%
17	-12.00	-27.53	20.72	12.00	27.53	-20.72	0.000%
18	-23.30	-36.71	13.56	23.30	36.71	-13.56	0.000%
19	-23.30	-27.53	13.56	23.30	27.53	-13.56	0.000%
20	-26.83	-36.71	0.10	26.83	36.71	-0.10	0.000%
21	-26.83	-27.53	0.10	26.83	27.53	-0.10	0.000%
22	-20.47	-36.71	-11.70	20.47	36.71	11.70	0.000%
23	-20.47	-27.53	-11.70	20.47	27.53	11.70	0.000%
24	-11.78	-36.71	-20.40	11.78	36.71	20.40	0.000%
25	-11.78	-27.53	-20.40	11.78	27.53	20.40	0.000%
26	0.00	-64.30	0.00	0.00	64.30	-0.00	0.000%
27	0.04	-64.30	-2.86	-0.04	64.30	2.86	0.000%
28	1.46	-64.30	-2.48	-1.46	64.30	2.48	0.000%
29	2.68	-64.30	-1.55	-2.68	64.30	1.55	0.000%
30	3.09	-64.30	-0.03	-3.09	64.30	0.03	0.000%
31	2.49	-64.30	1.40	-2.49	64.30	-1.40	0.000%
32	1.42	-64.30	2.47	-1.42	64.30	-2.47	0.000%
33	-0.02	-64.30	2.86	0.02	64.30	-2.86	0.000%
34	-1.44	-64.30	2.48	1.44	64.30	-2.48	0.000%
35	-2.66	-64.30	1.55	2.66	64.30	-1.55	0.000%
36	-3.07	-64.30	0.01	3.07	64.30	-0.01	0.000%
37	-2.47	-64.30	-1.41	2.47	64.30	1.41	0.000%

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
38	-1.42	-64.30	-2.46	1.42	64.30	2.46	0.000%
39	0.11	-30.59	-7.07	-0.11	30.59	7.07	0.000%
40	3.63	-30.59	-6.18	-3.63	30.59	6.18	0.000%
41	6.98	-30.59	-4.04	-6.98	30.59	4.04	0.000%
42	8.03	-30.59	-0.07	-8.03	30.59	0.07	0.000%
43	6.15	-30.59	3.45	-6.15	30.59	-3.45	0.000%
44	3.48	-30.59	6.10	-3.48	30.59	-6.10	0.000%
45	-0.04	-30.59	7.05	0.04	30.59	-7.05	0.000%
46	-3.57	-30.59	6.17	3.57	30.59	-6.17	0.000%
47	-6.94	-30.59	4.04	6.94	30.59	-4.04	0.000%
48	-7.99	-30.59	0.03	7.99	30.59	-0.03	0.000%
49	-6.09	-30.59	-3.48	6.09	30.59	3.48	0.000%
50	-3.51	-30.59	-6.07	3.51	30.59	6.07	0.000%
51	0.00	-42.89	-6.48	0.00	42.89	6.48	0.000%
52	0.00	-21.35	-6.48	0.00	21.35	6.48	0.000%
53	3.24	-42.89	-5.61	-3.24	42.89	5.61	0.000%
54	3.24	-21.35	-5.61	-3.24	21.35	5.61	0.000%
55	5.61	-42.89	-3.24	-5.61	42.89	3.24	0.000%
56	5.61	-21.35	-3.24	-5.61	21.35	3.24	0.000%
57	6.48	-42.89	0.00	-6.48	42.89	-0.00	0.000%
58	6.48	-21.35	0.00	-6.48	21.35	0.00	0.000%
59	5.61	-42.89	3.24	-5.61	42.89	-3.24	0.000%
60	5.61	-21.35	3.24	-5.61	21.35	-3.24	0.000%
61	3.24	-42.89	5.61	-3.24	42.89	-5.61	0.000%
62	3.24	-21.35	5.61	-3.24	21.35	-5.61	0.000%
63	0.00	-42.89	6.48	0.00	42.89	-6.48	0.000%
64	0.00	-21.35	6.48	0.00	21.35	-6.48	0.000%
65	-3.24	-42.89	5.61	3.24	42.89	-5.61	0.000%
66	-3.24	-21.35	5.61	3.24	21.35	-5.61	0.000%
67	-5.61	-42.89	3.24	5.61	42.89	-3.24	0.000%
68	-5.61	-21.35	3.24	5.61	21.35	-3.24	0.000%
69	-6.48	-42.89	0.00	6.48	42.89	-0.00	0.000%
70	-6.48	-21.35	0.00	6.48	21.35	0.00	0.000%
71	-5.61	-42.89	-3.24	5.61	42.89	3.24	0.000%
72	-5.61	-21.35	-3.24	5.61	21.35	3.24	0.000%
73	-3.24	-42.89	-5.61	3.24	42.89	5.61	0.000%
74	-3.24	-21.35	-5.61	3.24	21.35	5.61	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	5	0.00000001	0.00011514
3	Yes	5	0.00000001	0.00005502
4	Yes	5	0.00000001	0.00081977
5	Yes	5	0.00000001	0.00037197
6	Yes	5	0.00000001	0.00093821
7	Yes	5	0.00000001	0.00042243
8	Yes	4	0.00000001	0.00048143
9	Yes	4	0.00000001	0.00021156
10	Yes	5	0.00000001	0.00089559
11	Yes	5	0.00000001	0.00041395
12	Yes	5	0.00000001	0.00071744
13	Yes	5	0.00000001	0.00032736
14	Yes	5	0.00000001	0.00020481
15	Yes	5	0.00000001	0.00009736
16	Yes	5	0.00000001	0.00091023

17	Yes	5	0.00000001	0.00041708
18	Yes	5	0.00000001	0.00087975
19	Yes	5	0.00000001	0.00039393
20	Yes	5	0.00000001	0.00007355
21	Yes	4	0.00000001	0.00086086
22	Yes	5	0.00000001	0.00073610
23	Yes	5	0.00000001	0.00033530
24	Yes	5	0.00000001	0.00092801
25	Yes	5	0.00000001	0.00042980
26	Yes	4	0.00000001	0.00014493
27	Yes	5	0.00000001	0.00023797
28	Yes	5	0.00000001	0.00023775
29	Yes	5	0.00000001	0.00023989
30	Yes	5	0.00000001	0.00023031
31	Yes	5	0.00000001	0.00023200
32	Yes	5	0.00000001	0.00023611
33	Yes	5	0.00000001	0.00024192
34	Yes	5	0.00000001	0.00025939
35	Yes	5	0.00000001	0.00026989
36	Yes	5	0.00000001	0.00026113
37	Yes	5	0.00000001	0.00025786
38	Yes	5	0.00000001	0.00025226
39	Yes	4	0.00000001	0.00028046
40	Yes	4	0.00000001	0.00047710
41	Yes	4	0.00000001	0.00061726
42	Yes	4	0.00000001	0.00010921
43	Yes	4	0.00000001	0.00064471
44	Yes	4	0.00000001	0.00044543
45	Yes	4	0.00000001	0.00034751
46	Yes	4	0.00000001	0.00063485
47	Yes	4	0.00000001	0.00054011
48	Yes	4	0.00000001	0.00014499
49	Yes	4	0.00000001	0.00043710
50	Yes	4	0.00000001	0.00071359
51	Yes	4	0.00000001	0.00020894
52	Yes	4	0.00000001	0.00004784
53	Yes	5	0.00000001	0.00006749
54	Yes	4	0.00000001	0.00043177
55	Yes	5	0.00000001	0.00006798
56	Yes	4	0.00000001	0.00043430
57	Yes	4	0.00000001	0.00020609
58	Yes	4	0.00000001	0.00004680
59	Yes	5	0.00000001	0.00006879
60	Yes	4	0.00000001	0.00043855
61	Yes	5	0.00000001	0.00006770
62	Yes	4	0.00000001	0.00043270
63	Yes	4	0.00000001	0.00020971
64	Yes	4	0.00000001	0.00004796
65	Yes	5	0.00000001	0.00007049
66	Yes	4	0.00000001	0.00044696
67	Yes	5	0.00000001	0.00007001
68	Yes	4	0.00000001	0.00044445
69	Yes	4	0.00000001	0.00020917
70	Yes	4	0.00000001	0.00004726
71	Yes	5	0.00000001	0.00006917
72	Yes	4	0.00000001	0.00044011
73	Yes	5	0.00000001	0.00007028
74	Yes	4	0.00000001	0.00044599

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 80.25	21.542	47	1.5268	0.0129
L2	84.25 - 46	10.917	47	1.2367	0.0080
L3	50.75 - 25	3.841	41	0.7217	0.0030
L4	30.0833 - 0	1.343	41	0.3999	0.0013

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.000	RADWIN 2000C	47	21.542	1.5268	0.0129	29563
121.000	VHLPX3-18-2WH	47	21.542	1.5268	0.0129	29563
120.000	5/8-in x 5-ft L-Rod	47	21.542	1.5268	0.0129	29563
117.000	VHLP1-23	47	20.598	1.5083	0.0125	29563
115.125	CCiSeismic Tower Section 1 - 1	47	20.010	1.4967	0.0123	29563
115.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (110ft to120ft)	47	19.971	1.4959	0.0122	29563
109.000	FFVV-65B-R2 w/ Mount Pipe	47	18.100	1.4572	0.0115	13437
105.250	CCiSeismic Tower Section 1 - 2	47	16.946	1.4313	0.0110	10021
105.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (100ft to110ft)	47	16.870	1.4295	0.0110	9854
104.500	CCiSeismic cui CU12PSM9P6XXX(1- 1/2) From 0 to 109 (100ft to109ft)	47	16.717	1.4259	0.0109	9536
95.250	CCiSeismic Tower Section 1 - 3	47	13.963	1.3514	0.0096	5971
95.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (90ft to100ft)	47	13.891	1.3491	0.0096	5912
88.000	MS-MBA-3-L4A2 w/ Mount Pipe	47	11.922	1.2797	0.0086	4620
85.250	CCiSeismic Tower Section 1 - 4	47	11.181	1.2486	0.0082	4296
85.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (80ft to90ft)	47	11.115	1.2457	0.0081	4274
84.000	CCiSeismic (2) huber and suhner MLC HYBRID 6POWER/12FIBER(1- 1/2) From 0 to 88 (80ft to88ft)	47	10.852	1.2337	0.0080	4198
80.125	CCiSeismic Tower Section 2 - 1	47	9.859	1.1843	0.0074	4052
79.000	(2) TMZXX-6516-R2M w/ Mount Pipe	47	9.579	1.1691	0.0072	4030
75.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (70ft to80ft)	47	8.615	1.1126	0.0065	3955
74.500	CCiSeismic (7) andrew LDF7-50A(1- 5/8) From 0 to 79 (70ft to79ft)	47	8.498	1.1052	0.0064	3946
71.000	CCiSeismic Tower Section 2 - 2	47	7.699	1.0525	0.0059	3883
65.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (60ft to70ft)	47	6.418	0.9574	0.0049	3779
61.000	CCiSeismic Tower Section 2 - 3	47	5.628	0.8918	0.0043	3713
55.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (50ft to60ft)	41	4.539	0.7921	0.0035	3618
51.000	CCiSeismic Tower Section 2 - 4	41	3.880	0.7258	0.0030	3551
47.875	CCiSeismic Tower Section 3 - 1	41	3.403	0.6746	0.0027	3489
45.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (40ft to50ft)	41	2.993	0.6282	0.0024	3428
40.000	CCiSeismic Tower Section 3 - 2	41	2.349	0.5492	0.0020	3326
35.000	CCiSeismic (5) belkin CAT6(1/4) From 0 to 120 (30ft to40ft)	41	1.796	0.4727	0.0016	3230
30.042	CCiSeismic Tower Section 4 - 1	41	1.339	0.3993	0.0013	3248
30.000	CCiSeismic Tower Section 3 - 3	41	1.336	0.3987	0.0013	3250
25.000	CCiSeismic Tower Section 4 - 2	41	0.968	0.3277	0.0011	3779
15.000	CCiSeismic Tower Section 4 - 3	41	0.453	0.1926	0.0006	6299
5.000	CCiSeismic Tower Section 4 - 4	41	0.130	0.0635	0.0002	18896

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 80.25	72.945	6	5.1696	0.0428
L2	84.25 - 46	37.000	6	4.1932	0.0267
L3	50.75 - 25	13.020	6	2.4481	0.0099
L4	30.0833 - 0	4.549	6	1.3558	0.0045

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
124.000	RADWIN 2000C	6	72.945	5.1696	0.0428	8879
121.000	VHLPX3-18-2WH	6	72.945	5.1696	0.0428	8879
120.000	5/8-in x 5-ft L-Rod	6	72.945	5.1696	0.0428	8879
117.000	VHLP1-23	6	69.755	5.1077	0.0416	8879
115.125	CCISeismic Tower Section 1 - 1	6	67.765	5.0686	0.0408	8879
115.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (110ft to120ft)	6	67.632	5.0660	0.0407	8879
109.000	FFVV-65B-R2 w/ Mount Pipe	6	61.305	4.9362	0.0382	4035
105.250	CCISeismic Tower Section 1 - 2	6	57.402	4.8491	0.0366	3008
105.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (100ft to110ft)	6	57.143	4.8430	0.0365	2958
104.500	CCISeismic cui CU12PSM9P6XXX(1- 1/2) From 0 to 109 (100ft to109ft)	6	56.627	4.8309	0.0363	2862
95.250	CCISeismic Tower Section 1 - 3	6	47.309	4.5803	0.0321	1791
95.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (90ft to100ft)	6	47.065	4.5727	0.0320	1773
88.000	MS-MBA-3-L4A2 w/ Mount Pipe	6	40.400	4.3384	0.0286	1384
85.250	CCISeismic Tower Section 1 - 4	6	37.894	4.2334	0.0272	1286
85.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (80ft to90ft)	6	37.670	4.2235	0.0271	1280
84.000	CCISeismic (2) huber and suhner MLC HYBRID 6POWER/12FIBER(1- 1/2) From 0 to 88 (80ft to88ft)	6	36.778	4.1830	0.0266	1256
80.125	CCISeismic Tower Section 2 - 1	6	33.417	4.0159	0.0245	1211
79.000	(2) TMZXX-6516-R2M w/ Mount Pipe	6	32.469	3.9646	0.0239	1204
75.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (70ft to80ft)	6	29.202	3.7732	0.0217	1180
74.500	CCISeismic (7) andrew LDF7-50A(1- 5/8) From 0 to 79 (70ft to79ft)	6	28.806	3.7484	0.0215	1177
71.000	CCISeismic Tower Section 2 - 2	6	26.099	3.5697	0.0196	1156
65.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (60ft to70ft)	6	21.759	3.2475	0.0164	1123
61.000	CCISeismic Tower Section 2 - 3	6	19.079	3.0252	0.0143	1102
55.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (50ft to60ft)	6	15.389	2.6870	0.0116	1072
51.000	CCISeismic Tower Section 2 - 4	6	13.153	2.4620	0.0100	1051
47.875	CCISeismic Tower Section 3 - 1	6	11.534	2.2885	0.0089	1032
45.000	CCISeismic (5) belkin CAT6(1/4) From 0 to 120 (40ft to50ft)	6	10.144	2.1310	0.0080	1013
40.000	CCISeismic Tower Section 3 - 2	6	7.963	1.8627	0.0066	982
35.000	CCISeismic (5) belkin CAT6(1/4)	6	6.087	1.6026	0.0055	954

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
	From 0 to 120 (30ft to 40ft)					
30.042	CCISeismic Tower Section 4 - 1	6	4.537	1.3537	0.0045	958
30.000	CCISeismic Tower Section 3 - 3	6	4.526	1.3517	0.0045	959
25.000	CCISeismic Tower Section 4 - 2	6	3.278	1.1106	0.0036	1115
15.000	CCISeismic Tower Section 4 - 3	6	1.536	0.6526	0.0020	1858
5.000	CCISeismic Tower Section 4 - 4	6	0.440	0.2152	0.0007	5572

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in ²	K	K	
L1	120 - 80.25 (1)	TP27.973x20.5x0.25	39.750	0.000	0.0	21.7117	-13.88	977.02	0.014
L2	80.25 - 46 (2)	TP33.78x26.721x0.3125	38.250	0.000	0.0	32.7946	-22.48	1918.48	0.012
L3	46 - 25 (3)	TP36.971x32.2784x0.375	25.750	0.000	0.0	43.0711	-27.28	2519.66	0.011
L4	25 - 0 (4)	TP40.789x35.2946x0.5	30.083	0.000	0.0	64.8653	-36.69	2918.94	0.013

Pole Bending Design Data

Section No.	Elevation	Size	M _{ux}	ϕM_{nx}	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M _{uy}	ϕM_{ny}	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
	ft		kip-ft	kip-ft		kip-ft	kip-ft	
L1	120 - 80.25 (1)	TP27.973x20.5x0.25	338.46	644.04	0.526	0.00	644.04	0.000
L2	80.25 - 46 (2)	TP33.78x26.721x0.3125	1001.38	1475.17	0.679	0.00	1475.17	0.000
L3	46 - 25 (3)	TP36.971x32.2784x0.375	1487.09	2193.85	0.678	0.00	2193.85	0.000
L4	25 - 0 (4)	TP40.789x35.2946x0.5	2268.97	3005.38	0.755	0.00	3005.38	0.000

Pole Shear Design Data

Section No.	Elevation	Size	Actual V _u	ϕV_n	Ratio $\frac{V_u}{\phi V_n}$	Actual T _u	ϕT_n	Ratio $\frac{T_u}{\phi T_n}$
	ft		K	K		kip-ft	kip-ft	
L1	120 - 80.25 (1)	TP27.973x20.5x0.25	15.38	293.11	0.052	0.37	695.38	0.001
L2	80.25 - 46 (2)	TP33.78x26.721x0.3125	22.28	575.54	0.039	1.18	1649.97	0.001
L3	46 - 25 (3)	TP36.971x32.2784x0.375	24.67	755.90	0.033	1.66	2371.71	0.001
L4	25 - 0 (4)	TP40.789x35.2946x0.5	27.10	875.68	0.031	1.78	3103.36	0.001

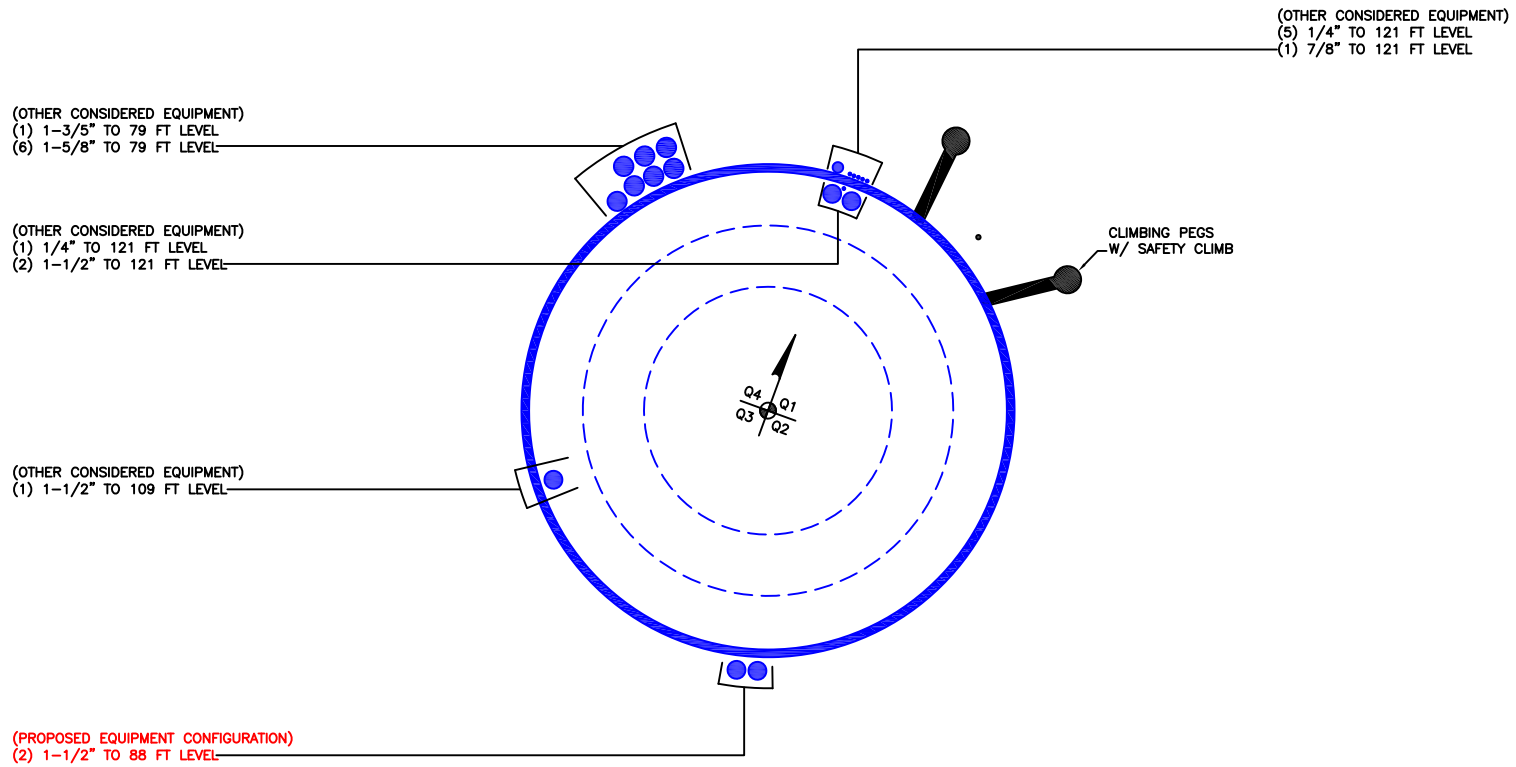
Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 80.25 (1)	0.014	0.526	0.000	0.052	0.001	0.543	1.050	
L2	80.25 - 46 (2)	0.012	0.679	0.000	0.039	0.001	0.692	1.050	
L3	46 - 25 (3)	0.011	0.678	0.000	0.033	0.001	0.690	1.050	
L4	25 - 0 (4)	0.013	0.755	0.000	0.031	0.001	0.769	1.050	

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	120 - 80.25	Pole	TP27.973x20.5x0.25	1	-13.88	1025.88	51.7	Pass
L2	80.25 - 46	Pole	TP33.78x26.721x0.3125	2	-22.48	2014.40	65.9	Pass
L3	46 - 25	Pole	TP36.971x32.2784x0.375	3	-27.28	2645.64	65.7	Pass
L4	25 - 0	Pole	TP40.789x35.2946x0.5	4	-36.69	3064.89	73.2	Pass
							Summary	
							Pole (L4)	73.2 Pass
							RATING =	73.2 Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Monopole Base Plate Connection

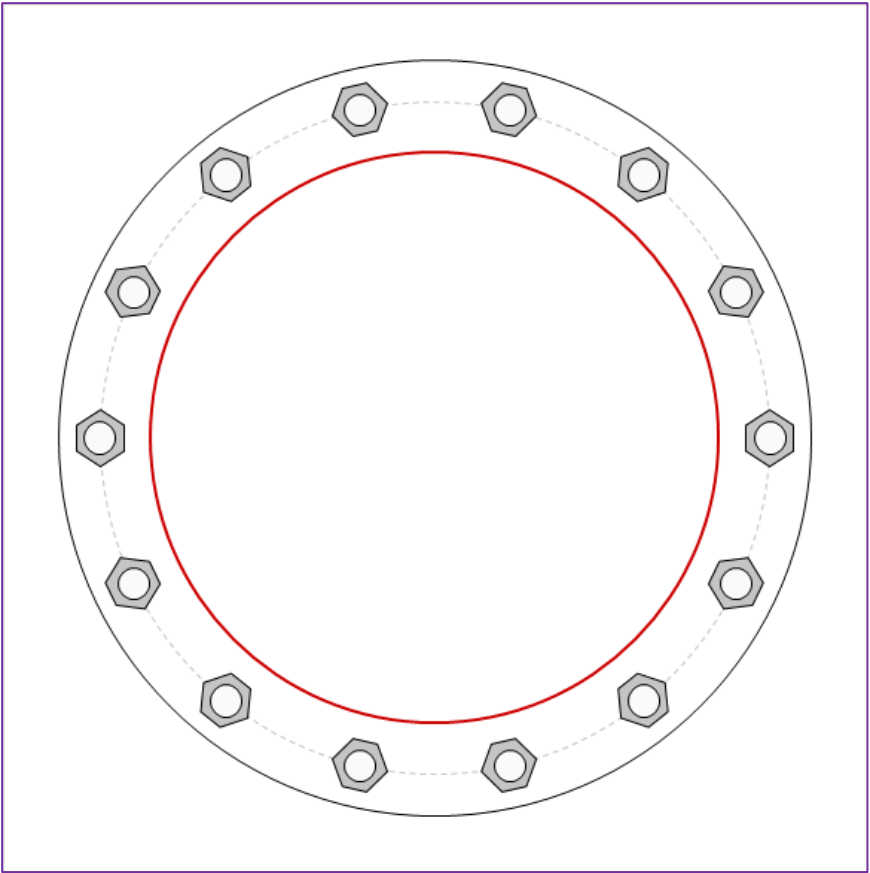


Site Info	
BU #	880329
Site Name	SOUTH HILL MALL
Order #	670680 REV. 2

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
I_{ar} (in)	1.125

Applied Loads	
Moment (kip-ft)	2268.97
Axial Force (kips)	36.69
Shear Force (kips)	27.10

*TIA-222-H Section 15.5 Applied



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary <i>(units of kips, kip-in)</i>	
(14) 2-1/4" ϕ bolts (A615-75 N; Fy=75 ksi, Fu=100 ksi) on 48" BC		$Pu_t = 159.3$	$\phi Pn_t = 243.75$ Stress Rating
Base Plate Data		$Vu = 1.94$	$\phi Vn = 149.1$ 62.2%
54" OD x 2.25" Plate (A572-50; Fy=50 ksi, Fu=65 ksi)		$Mu = n/a$	$\phi Mn = n/a$ Pass
Stiffener Data		Base Plate Summary	
N/A		Max Stress (ksi):	30.11 (Flexural)
Pole Data		Allowable Stress (ksi):	45
40.789" x 0.5" 12-sided pole (A572-50; Fy=50 ksi, Fu=65 ksi)		Stress Rating:	63.7% Pass

Monopole Base Plate Connection - Seismic



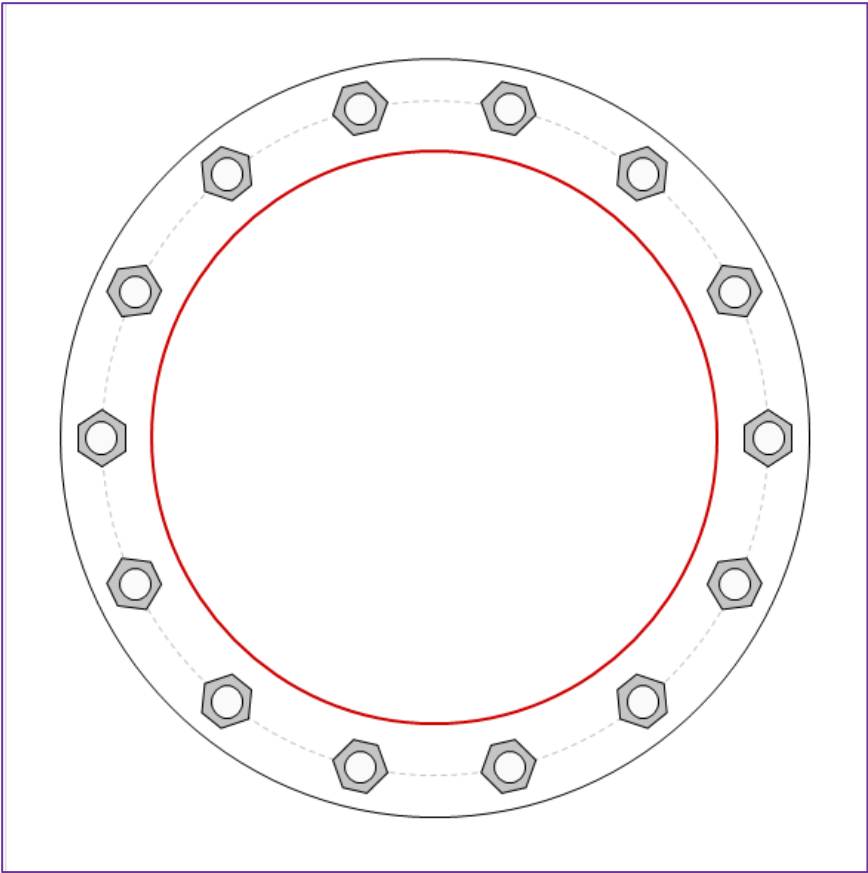
Site Info	
BU #	880329
Site Name	SOUTH HILL MALL
Order #	670680 REV. 2

Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	1.125

Applied Loads	
Moment (kip-ft)	668.52
Axial Force (kips)	42.89
Shear Force (kips)	6.48

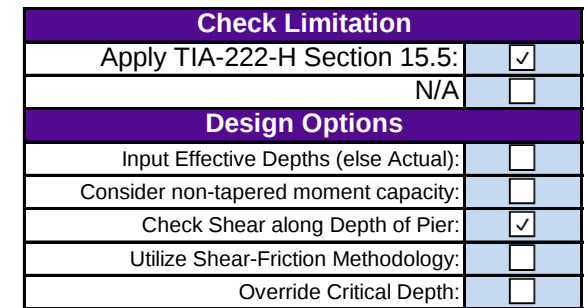
*TIA-222-H Section 15.5 Applied

*1.5 Overstrength Factor Applied



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary <i>(units of kips, kip-in)</i>	
(14) 2-1/4" ϕ bolts (A615-75 N; F_y =75 ksi, F_u =100 ksi) on 48" BC		$P_{u,t}$ = 68.5	$\phi P_{n,t}$ = 243.75 Stress Rating
Base Plate Data		V_u = 0.69	ϕV_n = 149.1 26.8%
54" OD x 2.25" Plate (A572-50; F_y =50 ksi, F_u =65 ksi)		M_u = n/a	ϕM_n = n/a Pass
Stiffener Data		Base Plate Summary	
N/A		Max Stress (ksi):	9.3 (Flexural)
Pole Data		Allowable Stress (ksi):	45
40.789" x 0.5" 12-sided pole (A572-50; F_y =50 ksi, F_u =65 ksi)		Stress Rating:	19.7% Pass

BU #:	880329
Site Name:	SOUTH HILL MALL
Order Number:	670680 REV. 2
IA-222 Revision:	H
Tower Type:	Monopole



Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	2268.97	
Axial Force (kips)	36.71	
Shear Force (kips)	27.08	

Rebar & Pier Options

Embedded Pole Inputs

Belled Pier Inputs

Analysis Results		
Soil Lateral Check	<i>Compression</i>	<i>Uplift</i>
D _{v=0} (ft from TOC)	5.51	-
Soil Safety Factor	2.05	-
Max Moment (kip-ft)	2396.63	-
Rating*	61.6%	-
Soil Vertical Check	<i>Compression</i>	<i>Uplift</i>
Skin Friction (kips)	170.42	-
End Bearing (kips)	3526.52	-
Weight of Concrete (kips)	82.92	-
Total Capacity (kips)	3696.94	-
Axial (kips)	119.63	-
Rating*	3.1%	-
Reinforced Concrete Flexure	<i>Compression</i>	<i>Uplift</i>
Critical Depth (ft from TOC)	5.42	-
Critical Moment (kip-ft)	2396.55	-
Critical Moment Capacity	8133.64	-
Rating*	28.1%	-
Reinforced Concrete Shear	<i>Compression</i>	<i>Uplift</i>
Critical Depth (ft from TOC)	13.44	-
Critical Shear (kip)	361.39	-
Critical Shear Capacity	577.08	-
Rating*	59.6%	-

*Rating per TIA-222-H Section 15.5

Soil Profile			
Groundwater Depth	12	# of Layers	7

Version 6.3.6



BU: 880329
 WO: 2358314
 Order: 670680

Structure: A
 Rev: 2

Location				
	Decimal Degrees	Deg	Min	Sec
Lat:	47.162072	+	47	9
Long:	-122.294456	-	122	17
				40.04
Code and Site Parameters				
Seismic Design Code:		TIA-222-H-1		
Site Soil:		D (Default) Default		
Risk Category:		III		
<u>USGS Seismic Reference</u>				
	S _s :	1.2640	g	
	S ₁ :	0.4360	g	
	T _L :	6	s	
Seismic Design Category Determination				
Importance Factor, I _e :		1.25		
Acceleration-based site coefficient, F _a :		1.2000		
Velocity-based site coefficient, F _v :		1.8640		
Design spectral response acceleration short period, S _{DS} :		1.0112	g	
Design spectral response acceleration 1 s period, S _{D1} :		0.5418	g	
		T _s :	0.5358	
Seismic Design Category Based on S _{DS} :		D		
Seismic Design Category Based on S _{D1} :		D		
Seismic Design Category Based on S ₁ :		N/A		
Controlling Seismic Design Category:		D		



BU: 880329
WO: 2358314
Order: 670680

Structure: A
Rev: 2

Tower Details		
Tower Type:	Tapered Monopole	
Height, h:	120	ft
Effective Seismic Weight, W:	30.57	kips
Amplification Factor, A _s :	1.0	2.7.8.1

Seismic Base Shear		
Response Modification Factor, R:	1.5	
Discrete Appurtenance Weight in Top 1/3 of Structure, W _u :	9.946192	kips
W _L :	20.61890579	kips
E:	29000.0	ksi
g:	386.088	in/s ²
Average Moment of Inertia, I _{avg} :	5099.055549	in ⁴
F _a :	0.313194027	hz
Approximate Fundamental Period Monopole, T _a :	3.1929	s
		2.7.7.1.3.3
Seismic Response Coefficient, C _s	0.2121	Table 2-12 Note 3
Seismic Response Coefficient Max 1, C _{smax}	N/A	
Seismic Response Coefficient Max 2, C _{smax}	N/A	
Seismic Response Coefficient Min 1, C _{smin}	0.0556	2.7.7.1.1
Seismic Response Coefficient Min 2, C _{smin}	N/A	2.7.7.1.1
Controlling Seismic Response Coefficient, C _{sc}	0.2121	
Seismic Base Shear, V	6.483	kips
		2.7.7.1.1

Vertical Distribution Factors		
Period Related Exponent, k:	2.000	
Sum of w _i h _i ^k	183600.16	

Tower Section Loads								
Section Number	Length	Top Height	Mid Height, h_x	Section Weight, w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
1 - 1	9.75	120.00	115.13	0.5645	7481.70	0.0407	0.2642	0.1142
1 - 2	10.00	110.25	105.25	0.6298	6976.11	0.0380	0.2463	0.1274
1 - 3	10.00	100.25	95.25	0.6812	6180.01	0.0337	0.2182	0.1378
1 - 4	10.00	90.25	85.25	0.7326	5324.21	0.0290	0.1880	0.1482
2 - 1	8.25	84.25	80.13	0.7664	4920.32	0.0268	0.1737	0.1550
2 - 2	10.00	76.00	71.00	0.9866	4973.21	0.0271	0.1756	0.1995
2 - 3	10.00	66.00	61.00	1.0497	3905.75	0.0213	0.1379	0.2123
2 - 4	10.00	56.00	51.00	1.1128	2894.27	0.0158	0.1022	0.2250
3 - 1	5.75	50.75	47.88	0.7650	1753.46	0.0096	0.0619	0.1547
3 - 2	10.00	45.00	40.00	1.3894	2222.99	0.0121	0.0785	0.2810
3 - 3	10.00	35.00	30.00	1.4641	1317.72	0.0072	0.0465	0.2961
4 - 1	0.08	30.08	30.04	0.0159	14.32	0.0001	0.0005	0.0032
4 - 2	10.00	30.00	25.00	1.9543	1221.42	0.0067	0.0431	0.3952
4 - 3	10.00	20.00	15.00	2.0542	462.19	0.0025	0.0163	0.4154
4 - 4	10.00	10.00	5.00	2.1541	53.85	0.0003	0.0019	0.4356
Sum				16.3203	49701.53			

Discrete Loads						
Name	h _x	w _x	w _x h _x ^k	C _{vx}	F _{xh}	F _{xv}
lightning rod 5/8-in x 5-ft L-Rod	120.00	0.0050	72.00	0.0004	0.0025	0.0010
miscl Top Hat 14"x24"	120.00	0.1000	1440.00	0.0078	0.0508	0.0202
commscope FFVV-65C-R3-V1_TMO w/ Mount Pipe	121.00	0.1575	2305.62	0.0126	0.0814	0.0318
commscope FFVV-65C-R3-V1_TMO w/ Mount Pipe	121.00	0.1575	2305.62	0.0126	0.0814	0.0318
commscope FFVV-65C-R3-V1_TMO w/ Mount Pipe	121.00	0.1575	2305.62	0.0126	0.0814	0.0318
dbspectra DS7C06P36U-D w/ Mount Pipe	121.00	0.0600	878.46	0.0048	0.0310	0.0121
dbspectra DS7C06P36U-D w/ Mount Pipe	121.00	0.0600	878.46	0.0048	0.0310	0.0121
nokia AEHC w/ Mount Pipe	121.00	0.1136	1663.85	0.0091	0.0588	0.0230
nokia AEHC w/ Mount Pipe	121.00	0.1136	1663.85	0.0091	0.0588	0.0230
nokia AEHC w/ Mount Pipe	121.00	0.1136	1663.85	0.0091	0.0588	0.0230
ceragon FIBEAIR IP-20C	121.00	0.0100	146.41	0.0008	0.0052	0.0020
commscope HCS 2.0 Part 1	121.00	0.0200	292.82	0.0016	0.0103	0.0040
commscope HCS 2.0 Part 1	121.00	0.0200	292.82	0.0016	0.0103	0.0040
dragonwave HORIZON COMPACT PLUS	121.00	0.0075	109.81	0.0006	0.0039	0.0015
nokia AHFIG_TMO	121.00	0.0700	1024.87	0.0056	0.0362	0.0142
nokia AHFIG_TMO	121.00	0.0700	1024.87	0.0056	0.0362	0.0142
nokia AHFIG_TMO	121.00	0.0700	1024.87	0.0056	0.0362	0.0142
nokia AHLOA_T-MOBILE	121.00	0.0800	1171.28	0.0064	0.0414	0.0162
nokia AHLOA_T-MOBILE	121.00	0.0800	1171.28	0.0064	0.0414	0.0162
nokia AHLOA_T-MOBILE	121.00	0.0800	1171.28	0.0064	0.0414	0.0162
tower mounts Platform Mount [LP 602-1]	121.00	1.3433	19667.26	0.1071	0.6945	0.2717
tower mounts Transition Ladder	121.00	0.1600	2342.56	0.0128	0.0827	0.0324
(2) tower mounts 8' x 2" Mount Pipe	121.00	0.0600	878.46	0.0048	0.0310	0.0121
(2) tower mounts 8' x 2" Mount Pipe	121.00	0.0600	878.46	0.0048	0.0310	0.0121
(2) tower mounts 8' x 2" Mount Pipe	121.00	0.0600	878.46	0.0048	0.0310	0.0121
tower mounts 4' x 2" Pipe Mount	121.00	0.0300	439.23	0.0024	0.0155	0.0061
(2) tower mounts 6' x 2" Horizontal Mount Pipe	121.00	0.0326	477.30	0.0026	0.0169	0.0066
commscope FFVV-65B-R2 w/ Mount Pipe	109.00	0.1101	1307.98	0.0071	0.0462	0.0223
commscope FFVV-65B-R2 w/ Mount Pipe	109.00	0.1101	1307.98	0.0071	0.0462	0.0223
commscope FFVV-65B-R2 w/ Mount Pipe	109.00	0.1101	1307.98	0.0071	0.0462	0.0223
raycap RDIDC-9181-PF-48	109.00	0.0200	237.62	0.0013	0.0084	0.0040
samsung telecommunications RF4450t-71A	109.00	0.0900	1069.29	0.0058	0.0378	0.0182
samsung telecommunications RF4450t-71A	109.00	0.0900	1069.29	0.0058	0.0378	0.0182
samsung telecommunications RF4450t-71A	109.00	0.0900	1069.29	0.0058	0.0378	0.0182
samsung telecommunications RF4451d-70A	109.00	0.0600	712.86	0.0039	0.0252	0.0121
samsung telecommunications RF4451d-70A	109.00	0.0600	712.86	0.0039	0.0252	0.0121
samsung telecommunications RF4451d-70A	109.00	0.0600	712.86	0.0039	0.0252	0.0121
tower mounts Commscope MC-PK8-DSH	109.00	1.7490	20779.87	0.1132	0.7338	0.3537
tower mounts 5' x 2" Pipe Mount	109.00	0.0200	237.62	0.0013	0.0084	0.0040
matsing MS-MBA-3-L4A2 w/ Mount Pipe	88.00	0.2089	1617.80	0.0088	0.0571	0.0422
ericsson RADIO 4490HP 44B5 44B13 C	88.00	0.0700	542.08	0.0030	0.0191	0.0142
ericsson RADIO 4490HP 44B5 44B13 C	88.00	0.0700	542.08	0.0030	0.0191	0.0142
ericsson RADIO 4490HP 44B5 44B13 C	88.00	0.0700	542.08	0.0030	0.0191	0.0142
ericsson AIR 6449 B77D C-BAND_CCIV2 w/ Mount Pipe	88.00	0.1009	781.52	0.0043	0.0276	0.0204
ericsson AIR 6449 B77D C-BAND_CCIV2 w/ Mount Pipe	88.00	0.1009	781.52	0.0043	0.0276	0.0204
ericsson AIR 6449 B77D C-BAND_CCIV2 w/ Mount Pipe	88.00	0.1009	781.52	0.0043	0.0276	0.0204
jma wireless MX06FRO840-02 w/ Mount Pipe	88.00	0.1259	974.79	0.0053	0.0344	0.0255
jma wireless MX06FRO840-02 w/ Mount Pipe	88.00	0.1259	974.79	0.0053	0.0344	0.0255
jma wireless MX06FRO840-02 w/ Mount Pipe	88.00	0.1259	974.79	0.0053	0.0344	0.0255
jma wireless MX10FRO840-XX w/ Mount Pipe	88.00	0.1703	1318.63	0.0072	0.0466	0.0344
jma wireless MX10FRO840-XX w/ Mount Pipe	88.00	0.1703	1318.63	0.0072	0.0466	0.0344
jma wireless MX10FRO840-XX w/ Mount Pipe	88.00	0.1703	1318.63	0.0072	0.0466	0.0344
ericsson 4449	88.00	0.0700	542.08	0.0030	0.0191	0.0142
ericsson 4449	88.00	0.0700	542.08	0.0030	0.0191	0.0142
ericsson RADIO 4408	88.00	0.0101	78.52	0.0004	0.0028	0.0021
ericsson RADIO 4408	88.00	0.0101	78.52	0.0004	0.0028	0.0021
ericsson RADIO 4408	88.00	0.0101	78.52	0.0004	0.0028	0.0021
ericsson RADIO 8843 B2/B66A	88.00	0.0800	619.52	0.0034	0.0219	0.0162
ericsson RADIO 8843 B2/B66A	88.00	0.0800	619.52	0.0034	0.0219	0.0162
ericsson RADIO 8843 B2/B66A	88.00	0.0800	619.52	0.0034	0.0219	0.0162
raycap RVZDC-6627-PF-48	88.00	0.0300	232.32	0.0013	0.0082	0.0061
raycap RVZDC-6627-PF-48	88.00	0.0300	232.32	0.0013	0.0082	0.0061
tower mounts T-Arm Mount [TA 602-3 KCKR]	88.00	1.0493	8125.86	0.0443	0.2869	0.2122
tower mounts T-Arm Mount [TA 602-3]	88.00	0.7743	5996.18	0.0327	0.2117	0.1566
tower mounts 8' x 2" Mount Pipe	88.00	0.0300	232.32	0.0013	0.0082	0.0061
tower mounts 8' x 2" Mount Pipe	88.00	0.0300	232.32	0.0013	0.0082	0.0061
tower mounts 6' x 2" Mount Pipe	88.00	0.0200	154.88	0.0008	0.0055	0.0040
tower mounts 6' x 2" Mount Pipe	88.00	0.0200	154.88	0.0008	0.0055	0.0040
(2) andrew TMZXX-6516-R2M w/ Mount Pipe	79.00	0.1107	691.13	0.0038	0.0244	0.0224
(2) andrew TMZXX-6516-R2M w/ Mount Pipe	79.00	0.1107	691.13	0.0038	0.0244	0.0224
(2) andrew TMZXX-6516-R2M w/ Mount Pipe	79.00	0.1107	691.13	0.0038	0.0244	0.0224
commscope FFHH-65C-R3_T-MOBILE w/ Mount Pipe	79.00	0.1605	1001.54	0.0055	0.0354	0.0325
commscope FFHH-65C-R3_T-MOBILE w/ Mount Pipe	79.00	0.1605	1001.54	0.0055	0.0354	0.0325
commscope FFHH-65C-R3_T-MOBILE w/ Mount Pipe	79.00	0.1605	1001.54	0.0055	0.0354	0.0325
nokia FRIG	79.00	0.0600	374.46	0.0020	0.0132	0.0121
nokia FRIG	79.00	0.0600	374.46	0.0020	0.0132	0.0121
nokia FRIG	79.00	0.0600	374.46	0.0020	0.0132	0.0121
raycap RNSDC-7771-PF-48	79.00	0.0200	124.82	0.0007	0.0044	0.0040
nokia AHLOA_T-MOBILE	79.00	0.0800	499.28	0.0027	0.0176	0.0162
nokia AHLOA_T-MOBILE	79.00	0.0800	499.28	0.0027	0.0176	0.0162
nokia AHLOA_T-MOBILE	79.00	0.0800	499.28	0.0027	0.0176	0.0162

andrew ETW190VS12UB	79.00	0.0100	62.41	0.0003	0.0022	0.0020
andrew ETW190VS12UB	79.00	0.0100	62.41	0.0003	0.0022	0.0020
andrew ETW190VS12UB	79.00	0.0100	62.41	0.0003	0.0022	0.0020
nokia FHFB	79.00	0.0500	312.05	0.0017	0.0110	0.0101
nokia FHFB	79.00	0.0500	312.05	0.0017	0.0110	0.0101
nokia FHFB	79.00	0.0500	312.05	0.0017	0.0110	0.0101
tower mounts Platform Mount [LP 303-1_HR-1]	79.00	1.4950	9330.30	0.0508	0.3295	0.3023
andrew VHLP1-23	121.00	0.0100	146.41	0.0008	0.0052	0.0020
commscope VHLPX3-18-2WH	121.00	0.0500	732.05	0.0040	0.0258	0.0101
radwin RADWIN 2000C	121.00	0.0070	102.49	0.0006	0.0036	0.0014
radwin RADWIN 2000C	121.00	0.0070	102.49	0.0006	0.0036	0.0014
radwin RADWIN 2000C	121.00	0.0070	102.49	0.0006	0.0036	0.0014
Sum		12.8748	129166.71			

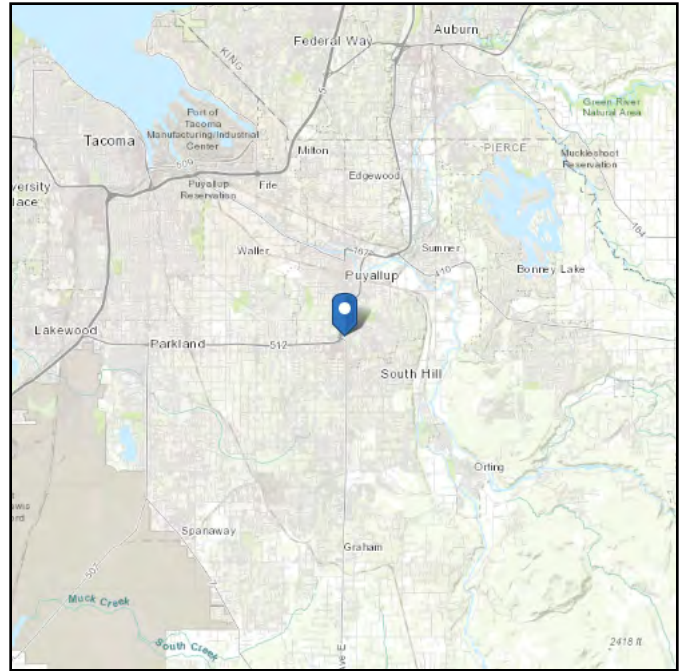
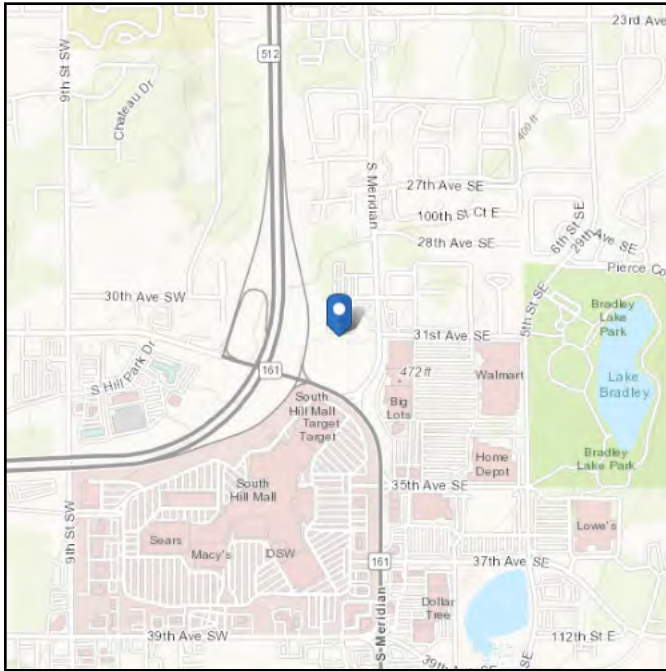
Linear Loads								
Name	Start Height	End Height	h_x	w_x	$w_x h_x^k$	C_{vx}	F_{xh}	F_{xv}
(5) belkin CAT6(1/4) From 0 to 120	110.00	120.00	115.00	0.0025	33.06	0.0002	0.0012	0.0005
(5) belkin CAT6(1/4) From 0 to 120	100.00	110.00	105.00	0.0025	27.56	0.0002	0.0010	0.0005
(5) belkin CAT6(1/4) From 0 to 120	90.00	100.00	95.00	0.0025	22.56	0.0001	0.0008	0.0005
(5) belkin CAT6(1/4) From 0 to 120	80.00	90.00	85.00	0.0025	18.06	0.0001	0.0006	0.0005
(5) belkin CAT6(1/4) From 0 to 120	70.00	80.00	75.00	0.0025	14.06	0.0001	0.0005	0.0005
(5) belkin CAT6(1/4) From 0 to 120	60.00	70.00	65.00	0.0025	10.56	0.0001	0.0004	0.0005
(5) belkin CAT6(1/4) From 0 to 120	50.00	60.00	55.00	0.0025	7.56	0.0000	0.0003	0.0005
(5) belkin CAT6(1/4) From 0 to 120	40.00	50.00	45.00	0.0025	5.06	0.0000	0.0002	0.0005
(5) belkin CAT6(1/4) From 0 to 120	30.00	40.00	35.00	0.0025	3.06	0.0000	0.0001	0.0005
(5) belkin CAT6(1/4) From 0 to 120	20.00	30.00	25.00	0.0025	1.56	0.0000	0.0001	0.0005
(5) belkin CAT6(1/4) From 0 to 120	10.00	20.00	15.00	0.0025	0.56	0.0000	0.0000	0.0005
(5) belkin CAT6(1/4) From 0 to 120	0.00	10.00	5.00	0.0025	0.06	0.0000	0.0000	0.0005
andrew LDF5-50A(7/8) From 0 to 120	110.00	120.00	115.00	0.0033	43.64	0.0002	0.0015	0.0007
andrew LDF5-50A(7/8) From 0 to 120	100.00	110.00	105.00	0.0033	36.38	0.0002	0.0013	0.0007
andrew LDF5-50A(7/8) From 0 to 120	90.00	100.00	95.00	0.0033	29.78	0.0002	0.0011	0.0007
andrew LDF5-50A(7/8) From 0 to 120	80.00	90.00	85.00	0.0033	23.84	0.0001	0.0008	0.0007
andrew LDF5-50A(7/8) From 0 to 120	70.00	80.00	75.00	0.0033	18.56	0.0001	0.0007	0.0007
andrew LDF5-50A(7/8) From 0 to 120	60.00	70.00	65.00	0.0033	13.94	0.0001	0.0005	0.0007
andrew LDF5-50A(7/8) From 0 to 120	50.00	60.00	55.00	0.0033	9.98	0.0001	0.0004	0.0007
andrew LDF5-50A(7/8) From 0 to 120	40.00	50.00	45.00	0.0033	6.68	0.0000	0.0002	0.0007
andrew LDF5-50A(7/8) From 0 to 120	30.00	40.00	35.00	0.0033	4.04	0.0000	0.0001	0.0007
andrew LDF5-50A(7/8) From 0 to 120	20.00	30.00	25.00	0.0033	2.06	0.0000	0.0001	0.0007
andrew LDF5-50A(7/8) From 0 to 120	10.00	20.00	15.00	0.0033	0.74	0.0000	0.0000	0.0007
andrew LDF5-50A(7/8) From 0 to 120	0.00	10.00	5.00	0.0033	0.08	0.0000	0.0000	0.0007
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	110.00	120.00	115.00	0.0342	452.30	0.0025	0.0160	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	100.00	110.00	105.00	0.0342	377.06	0.0021	0.0133	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	90.00	100.00	95.00	0.0342	308.66	0.0017	0.0109	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	80.00	90.00	85.00	0.0342	247.10	0.0013	0.0087	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	70.00	80.00	75.00	0.0342	192.38	0.0010	0.0068	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	60.00	70.00	65.00	0.0342	144.50	0.0008	0.0051	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	50.00	60.00	55.00	0.0342	103.46	0.0006	0.0037	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	40.00	50.00	45.00	0.0342	69.26	0.0004	0.0024	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	30.00	40.00	35.00	0.0342	41.90	0.0002	0.0015	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	20.00	30.00	25.00	0.0342	21.38	0.0001	0.0008	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	10.00	20.00	15.00	0.0342	7.70	0.0000	0.0003	0.0069
(2) nokia HCS 2.0 Part 3(1-1/2) From 0 to 120	0.00	10.00	5.00	0.0342	0.86	0.0000	0.0000	0.0069
andrew LDF1-50A(1/4) From 0 to 120	110.00	120.00	115.00	0.0006	7.94	0.0000	0.0003	0.0001
andrew LDF1-50A(1/4) From 0 to 120	100.00	110.00	105.00	0.0006	6.62	0.0000	0.0002	0.0001
andrew LDF1-50A(1/4) From 0 to 120	90.00	100.00	95.00	0.0006	5.42	0.0000	0.0002	0.0001
andrew LDF1-50A(1/4) From 0 to 120	80.00	90.00	85.00	0.0006	4.34	0.0000	0.0002	0.0001
andrew LDF1-50A(1/4) From 0 to 120	70.00	80.00	75.00	0.0006	3.38	0.0000	0.0001	0.0001
andrew LDF1-50A(1/4) From 0 to 120	60.00	70.00	65.00	0.0006	2.54	0.0000	0.0001	0.0001
andrew LDF1-50A(1/4) From 0 to 120	50.00	60.00	55.00	0.0006	1.82	0.0000	0.0001	0.0001
andrew LDF1-50A(1/4) From 0 to 120	40.00	50.00	45.00	0.0006	1.22	0.0000	0.0000	0.0001
andrew LDF1-50A(1/4) From 0 to 120	30.00	40.00	35.00	0.0006	0.74	0.0000	0.0000	0.0001
andrew LDF1-50A(1/4) From 0 to 120	20.00	30.00	25.00	0.0006	0.38	0.0000	0.0000	0.0001
andrew LDF1-50A(1/4) From 0 to 120	10.00	20.00	15.00	0.0006	0.14	0.0000	0.0000	0.0001
andrew LDF1-50A(1/4) From 0 to 120	0.00	10.00	5.00	0.0006	0.02	0.0000	0.0000	0.0001
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	100.00	109.00	104.50	0.0212	230.96	0.0013	0.0082	0.0043
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	90.00	100.00	95.00	0.0235	212.09	0.0012	0.0075	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	80.00	90.00	85.00	0.0235	169.79	0.0009	0.0060	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	70.00	80.00	75.00	0.0235	132.19	0.0007	0.0047	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	60.00	70.00	65.00	0.0235	99.29	0.0005	0.0035	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	50.00	60.00	55.00	0.0235	71.09	0.0004	0.0025	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	40.00	50.00	45.00	0.0235	47.59	0.0003	0.0017	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	30.00	40.00	35.00	0.0235	28.79	0.0002	0.0010	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	20.00	30.00	25.00	0.0235	14.69	0.0001	0.0005	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	10.00	20.00	15.00	0.0235	5.29	0.0000	0.0002	0.0048
cui CU12PSM9P6XXX(1-1/2) From 0 to 109	0.00	10.00	5.00	0.0235	0.59	0.0000	0.0000	0.0048
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	80.00	88.00	84.00	0.0157	111.03	0.0006	0.0039	0.0032
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	70.00	80.00	75.00	0.0197	110.64	0.0006	0.0039	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	60.00	70.00	65.00	0.0197	83.11	0.0005	0.0029	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	50.00	60.00	55.00	0.0197	59.50	0.0003	0.0021	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	40.00	50.00	45.00	0.0197	39.83	0.0002	0.0014	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	30.00	40.00	35.00	0.0197	24.10	0.0001	0.0009	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	20.00	30.00	25.00	0.0197	12.29	0.0001	0.0004	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	10.00	20.00	15.00	0.0197	4.43	0.0000	0.0002	0.0040
(2) huber and suhner MLC HYBRID 6POWER/12FIBER(1-1/2) From 0 to 88	0.00	10.00	5.00	0.0197	0.49	0.0000	0.0000	0.0040
(7) andrew LDF7-50A(1-5/8) From 0 to 79	70.00	79.00	74.50	0.0517	286.73	0.0016	0.0101	0.0104
(7) andrew LDF7-50A(1-5/8) From 0 to 79	60.00	70.00	65.00	0.0574	242.52	0.0013	0.0086	0.0116
(7) andrew LDF7-50A(1-5/8) From 0 to 79	50.00	60.00	55.00	0.0574	173.64	0.0009	0.0061	0.0116
(7) andrew LDF7-50A(1-5/8) From 0 to 79	40.00	50.00	45.00	0.0574	116.24	0.0006	0.0041	0.0116
(7) andrew LDF7-50A(1-5/8) From 0 to 79	30.00	40.00	35.00	0.0574	70.32	0.0004	0.0025	0.0116
(7) andrew LDF7-50A(1-5/8) From 0 to 79	20.00	30.00	25.00	0.0574	35.88	0.0002	0.0013	0.0116
(7) andrew LDF7-50A(1-5/8) From 0 to 79	10.00	20.00	15.00	0.0574	12.92	0.0001	0.0005	0.0116
(7) andrew LDF7-50A(1-5/8) From 0 to 79	0.00	10.00	5.00	0.0574	1.44	0.0000	0.0001	0.0116
Sum					1.3699	4731.91		

ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: III
Soil Class: D - Default (see Section 11.4.3)

Latitude: 47.162072
Longitude: -122.294456
Elevation: 441.95481961171384 ft (NAVD 88)



Wind

Results:

Wind Speed	104 Vmph
10-year MRI	67 Vmph
25-year MRI	73 Vmph
50-year MRI	78 Vmph
100-year MRI	83 Vmph

Data Source: ASCE/SEI 7-16, Fig. 26.5-1C and Figs. CC.2-1–CC.2-4, and Section 26.5.2

Date Accessed: Thu Jan 16 2025

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 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	1.264	S_{D1} :	N/A
S_1 :	0.436	T_L :	6
F_a :	1.2	PGA :	0.5
F_v :	N/A	PGA_M :	0.6
S_{MS} :	1.517	F_{PGA} :	1.2
S_{M1} :	N/A	I_e :	1.25
S_{DS} :	1.011	C_v :	1.353

Ground motion hazard analysis may be required. See ASCE/SEI 7-16 Section 11.4.8.

Data Accessed: Thu Jan 16 2025

Date Source: [USGS Seismic Design Maps](#)

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 25 F
Gust Speed 30 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Thu Jan 16 2025

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.

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