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Structural Analysis Report

Structure : 149 ft Monopole
ATC Site Name : Lee's Summit 2, MO
ATC Asset Number : 209106
Engineering Number : OAA766911_C3_01
Proposed Carrier : VERIZON WIRELESS
Carrier Site Name : KCYC Lees Summit
Carrier Site Number : 140684
Site Location : 900 Southwest Blue Parkway
Lee's Summit, MO 64063
38.910200005,-94.39127213
County : Jackson
Date : June 21, 2021
Max Usage : 62%
Result : Pass

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CLS Group
PE # PE-2014023899 Exp. 12/31/2022
COA # 2010039825 Exp. 12/31/2022

06/21/2021

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 149 ft monopole to reflect the change in loading by VERIZON WIRELESS.

Supporting Documents

Tower Drawings	Sabre Industries Job #47711, dated August 31, 2011
Foundation Drawing	Sabre Industries Job #47711, dated August 31, 2011
Geotechnical Report	Terracon Project #02115104, dated July 11, 2011

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	109 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	40 mph (3-Second Gust) w/ 1.50" radial ice concurrent
Code:	ANSI/TIA-222-H / 2018 IBC
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Spectral Response:	$S_s = 0.10$, $S_1 = 0.07$
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
150.0	6	ADC CG-1900DDBFDBTBP	Triangular Low Profile Platform	(12) 1 5/8" Coax (1) 1 5/8" Hybriflex	VERIZON WIRELESS
	1	RFS DB-B1-6C-12AB-0Z			
	1	Raycap RRFDC-3315-PF-48			
	3	Andrew LNX-6515DS-A1M			
129.0	1	Generic 15" x 15" Panel	Side Arm	(2) 2" conduit (2) 1/2" Coax (4) 1/4" Coax	CLEARWIRE CORPORATION
	1	Generic 1' Std. Dish			
	1	Motorola PTP 600			
	3	Argus LLPX310R			
	1	Andrew Microwaves VHLP2-23			
	1	Andrew Microwaves VHLP800-11			
	3	Samsung RRH-P4A			
99.0	1	Raycap RNSNDC-7771-PF-48 (20.4" Width)	Triangular Low Profile Platform	(14) 7/8" Coax (2) 1.49" (37.8mm) Hybrid	T-MOBILE
	3	Nokia AHFIG 70.55 lbs			
	4	Generic RRU (Model TBD)			
	3	Nokia AEHC			
	4	Andrew TMBXX-6517-A2M			
	3	Commscope FFHH-65C-R3			
	2	Generic HCS2.0			
	3	Andrew ETW190VS12UB			
	2	Commscope HELIAX FiberFeed 12 RRU Pendant Connect			
85.0	3	Ericsson RRUS 11/61 w/ Solar Shield	Triangular Platform with Handrails	(3) 1.25" (31.8mm) Hybrid	SPRINT NEXTEL
	3	RFS APXV9ERR18-C-A20			
	3	Ericsson RRUS 31 B25 w/ Brackets			

Equipment to be Removed

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
150.0	3	Commscope CBC78-DF-2X	-	(6) 1 5/8" Coax	VERIZON WIRELESS
	3	Generic RRU (Model TBD)			
	6	Amphenol Antel BXA-171063-12CF			
	3	Andrew LNX-6515DS-A1M			
	3	Ericsson RRUS-12 800 MHz			

Proposed Equipment

Elev. ¹ (ft)	Qty	Equipment	Mount Type	Lines	Carrier
150.0	3	Ericsson 8843 Rev 2	-	(1) 1 1/4" Hybriflex Cable	VERIZON WIRELESS
	3	Ericsson Radio 4449 - B13&B5			
	3	Ericsson AIR 6449 B77D/C-Band			
	6	Commscope NHH-65C-R2B			

¹ Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	62%	Pass
Shaft	45%	Pass
Base Plate	59%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	2,439.0	33%
Axial (Kips)	71.4	5%
Shear (Kips)	25.3	37%

The structure base reactions resulting from this analysis were found to be acceptable through analysis based on geotechnical and foundation information, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
150.0	Ericsson 8843 Rev 2	VERIZON WIRELESS	0.7991	0.520
	Ericsson Radio 4449 - B13&B5			
	Ericsson AIR 6449 B77D/C-Band			
	Commscope NHH-65C-R2B			
129.1	Generic 1' Std. Dish	CLEARWIRE CORPORATION	0.773	0.622
129.0	Andrew Microwaves VHLP2-23		0.772	
	Andrew Microwaves VHLP800-11			

*Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H



Standard Conditions

All engineering services performed by ATC Tower Services are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

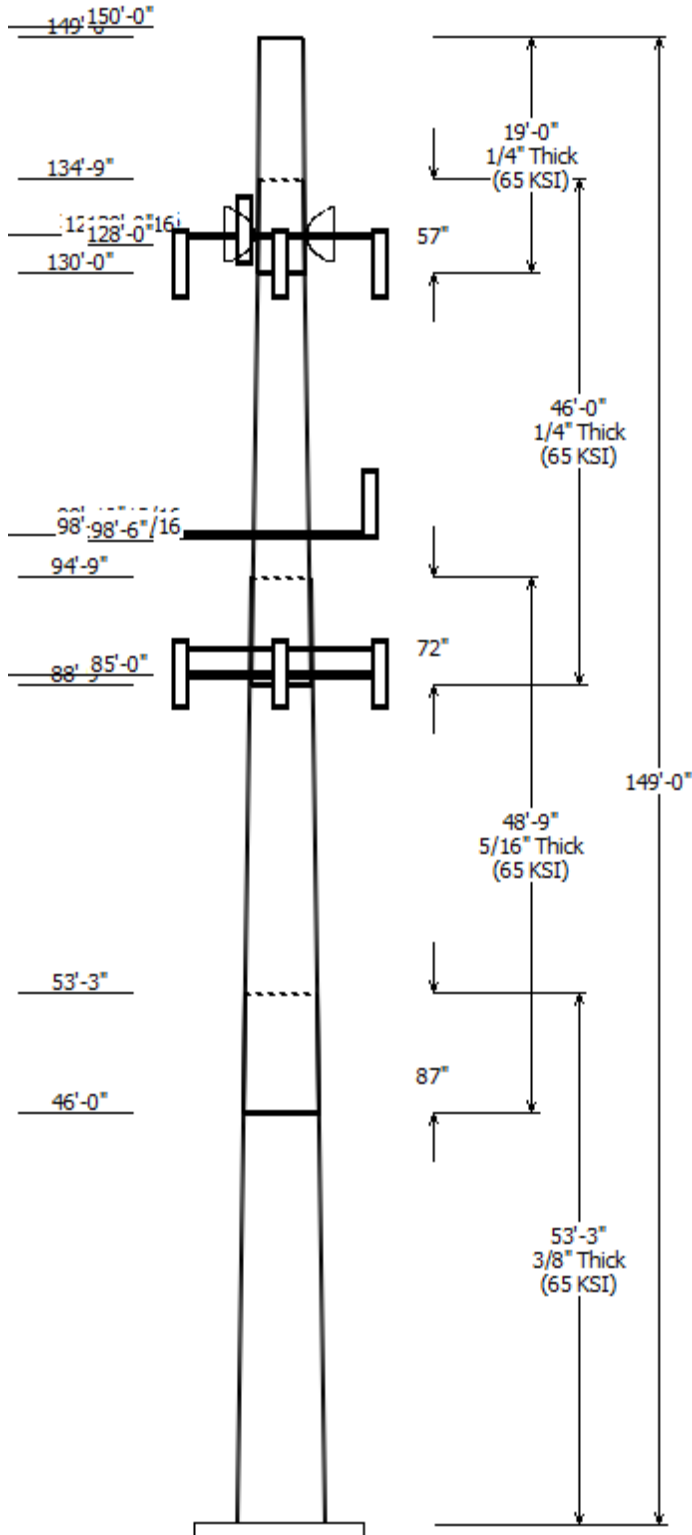
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of ATC Tower Services

It is the responsibility of the client to ensure that the information provided to ATC Tower Services and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates and subsidiaries (collectively “American Tower”) are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and ATC Tower Services, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. ATC Tower Services is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.



Job Information

Client : VERIZON WIRELESS
Pole : 209106 Code: ANSI/TIA-222-H
Location : Lee's Summit 2, MO
Description : Sabre Monopole Risk Category : II
Shape : 18 Sides Exposure : C
Height : 149.00 (ft) Topo Method : Method 1
Base Elev (ft): 0.00 Topographic Category : 1
Taper: 0.21502 in/ft

Sections Properties

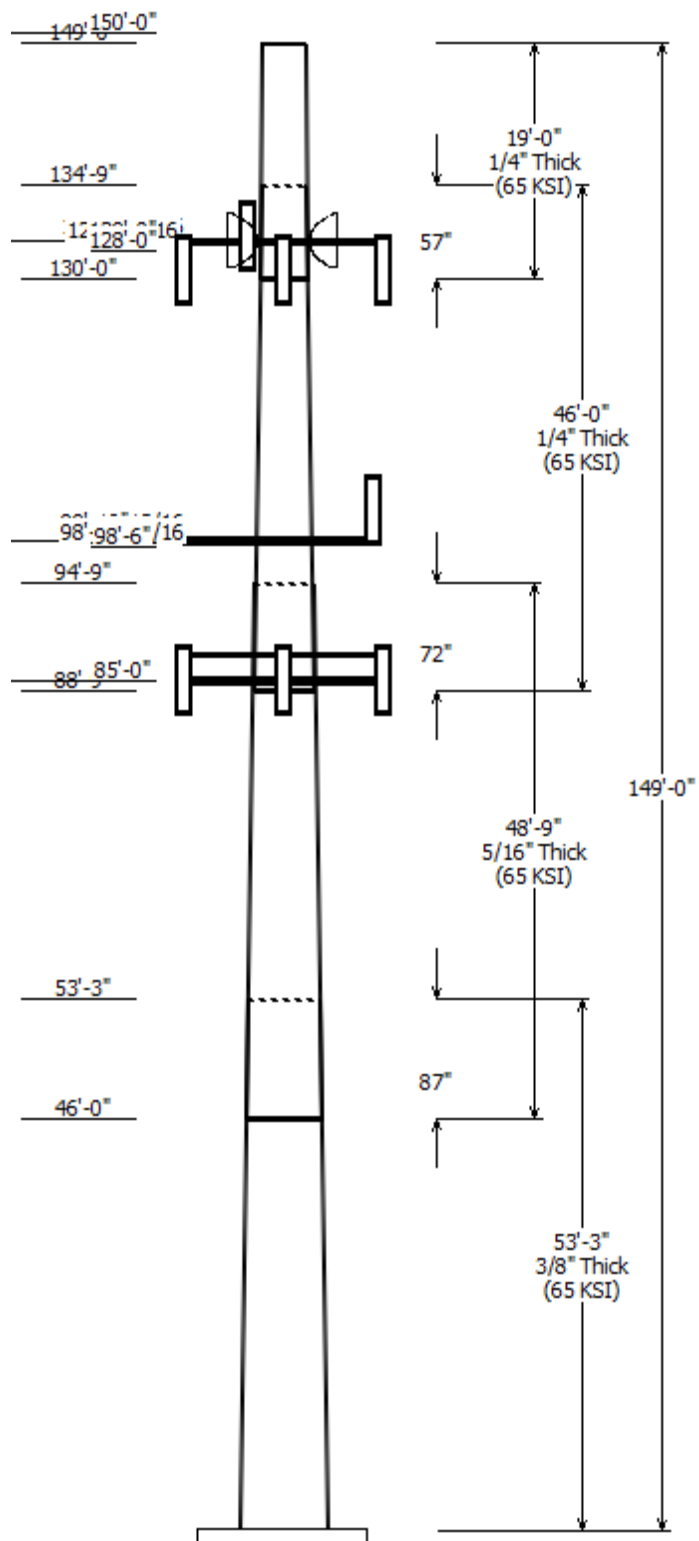
Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Type	Overlap Length (in)	Steel Grade
		Top	Bottom				
1	53.250	48.96	60.41	0.375		0.000	18 Sides 65
2	48.750	40.66	51.14	0.313	Slip Joint	87.000	18 Sides 65
3	46.000	32.56	42.45	0.250	Slip Joint	72.000	18 Sides 65
4	19.000	29.99	34.08	0.250	Slip Joint	57.000	18 Sides 65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
150.000	150.000	1	Generic Round Low Profile
150.000	148.400	3	Andrew LNX-6515DS-A1M
150.000	150.000	6	Commscope NHH-65C-R2B
150.000	150.000	3	Ericsson AIR 6449 B77D/C-Band
150.000	146.200	1	Raycap RRFDC-3315-PF-48
150.000	151.500	1	RFS DB-B1-6C-12AB-0Z
150.000	150.000	3	Ericsson Radio 4449 - B13&B5
150.000	150.000	3	Ericsson 8843 Rev 2
150.000	149.900	6	ADC CG-1900DDBFBDTBP
129.400	129.400	1	Generic 15" x 15" Panel
129.100	129.100	1	Generic 1' Std. Dish
129.000	129.000	3	Generic Round Side Arm
129.000	129.000	1	Andrew Microwaves VHLP800-
129.000	129.000	1	Andrew Microwaves VHLP2-23
129.000	128.000	3	Argus LLPX310R
129.000	129.000	1	Motorola PTP 600
128.000	128.000	3	Samsung RRH-P4A
99.900	99.900	1	Raycap RNSNDC-7771-PF-48
99.000	99.000	1	Generic Round Low Profile
99.000	102.100	3	Commscope FFHH-65C-R3
99.000	100.400	4	Andrew TMBXX-6517-A2M
99.000	100.600	3	Nokia AEHC
99.000	99.000	4	Generic RRU (Model TBD)
99.000	99.000	3	Nokia AHFIG 70.55 lbs
99.000	99.000	2	Generic HCS2.0
98.900	98.900	3	Andrew ETW190VS12UB
98.500	98.500	2	Commscope HELIAX
85.000	85.000	3	RFS APXV9ERR18-C-A20
85.000	85.000	3	Ericsson RRUS 11/61 w/ Solar S
85.000	85.000	1	Generic Round Platform with
85.000	85.000	3	Ericsson RRUS 31 B25 w/

Linear Appurtenance

Elev (ft)		Description	Exposed To Wind
From	To		
0.000	85.000	1.25" (31.8mm)	No
0.000	99.000	1.49" (37.8mm)	No
0.000	100.0	7/8" Coax	No
0.000	129.0	1/2" Coax	No
0.000	129.0	1/4" Coax	No
0.000	130.0	2" conduit	No



0.000	150.0	1 1/4" Hybriflex	No
0.000	150.0	1 5/8" Coax	No
0.000	150.0	1 5/8" Hybriflex	No

Load Cases

1.2D + 1.0W	109 mph with No Ice
0.9D + 1.0W	109 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.50 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

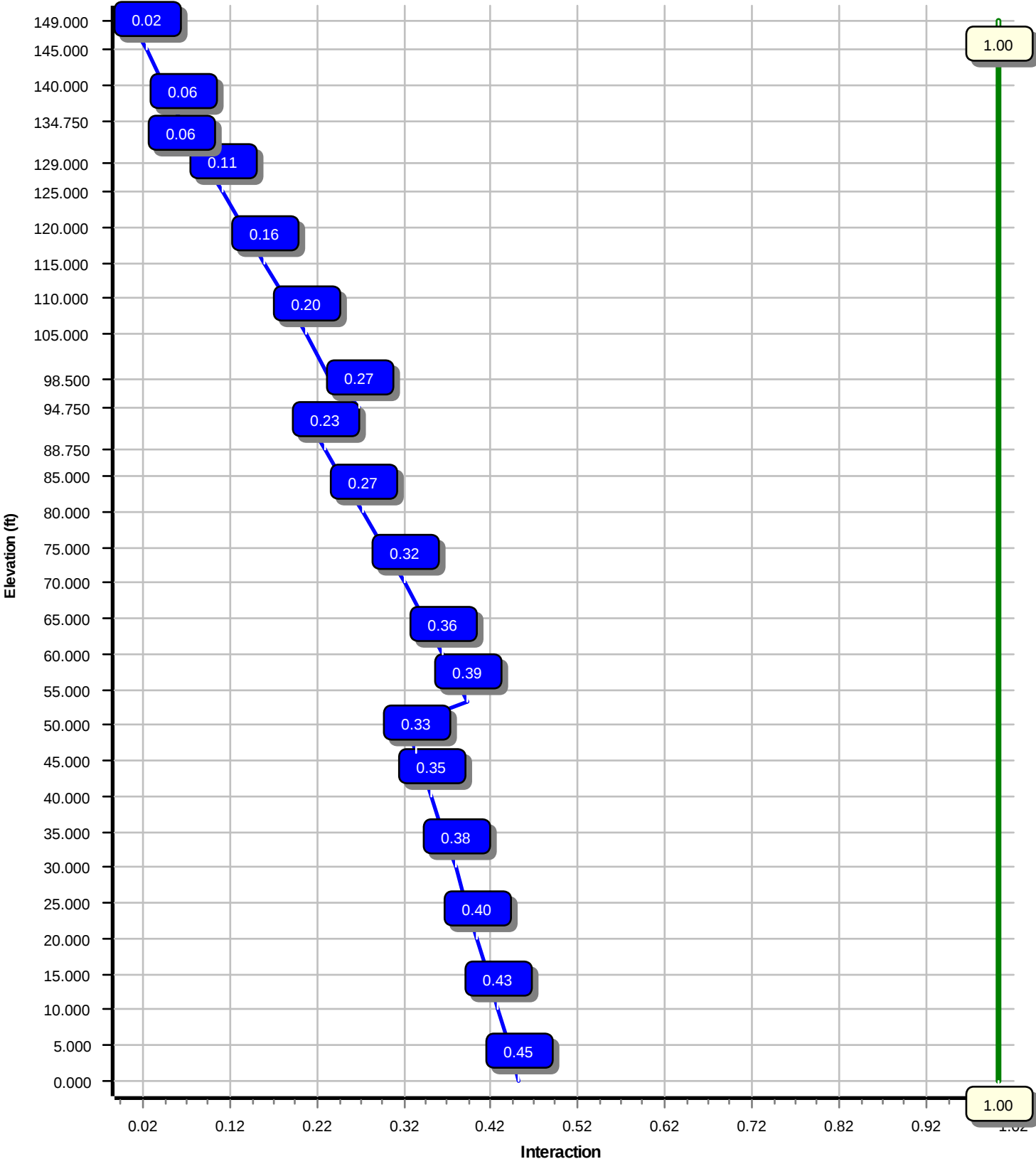
Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.0W	2438.95	25.28	47.92
0.9D + 1.0W	2422.52	25.27	35.94
1.2D + 1.0Di + 1.0Wi	531.47	5.53	71.39
1.2D + 1.0Ev + 1.0Eh	180.37	1.63	47.13
0.9D - 1.0Ev + 1.0Eh	179.01	1.63	33.91
1.0D + 1.0W	658.30	6.85	39.95

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	129.00	9.261	0.622
1.0D + 1.0W	129.00	9.261	0.622
1.0D + 1.0W	129.10	9.274	0.622

Load Case : 1.2D + 1.0W
Max Ratio 44.85% at 0.0 ft



Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

Analysis Parameters

Location :	Jackson County, MO	Height (ft) :	149
Code :	ANSI/TIA-222-H	Base Diameter (in) :	60.41
Shape :	18 Sides	Top Diameter (in) :	30.00
Pole Type :	Taper	Taper (in/ft) :	0.215
Pole Manufacturer :	Sabre	Rotation (deg) :	0.00
Kd (non-service) :	0.95	Ke :	0.96

Ice & Wind Parameters

Exposure Category:	C	Design Wind Speed Without Ice:	109 mph
Risk Category:	II	Design Wind Speed With Ice:	40 mph
Topographic Factor Procedure:	Method 1	Operational Wind Speed:	60 mph
Topographic Category:	1	Design Ice Thickness:	1.50 in
Crest Height:	0 ft	HMSL:	1017.00 ft

Seismic Parameters

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	1.78		
T_L (sec):	12	p:	1
S_s :	0.100	S_1 :	0.068
F_a :	1.600	F_v :	2.400
S_{ds} :	0.107	S_{d1} :	0.109
		C_s :	0.041
		C_s Max:	0.041
		C_s Min:	0.030

Load Cases

1.2D + 1.0W	109 mph with No Ice
0.9D + 1.0W	109 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.50 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom				Top				W/t Ratio	D/t Ratio	Taper (in/ft)
							Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)			
1-18	53.250	0.3750	65		0.00	11,713	60.41	0.00	71.45	32537.9	26.64	161.09	48.96	53.25	57.83	17245.8	0.215023
2-18	48.750	0.3125	65	Slip	87.00	7,501	51.14	46.00	50.42	16458.5	27.09	163.66	40.66	94.75	40.02	8231.8	0.215023
3-18	46.000	0.2500	65	Slip	72.00	4,627	42.45	88.75	33.49	7534.8	28.18	169.81	32.56	134.75	25.64	3381.6	0.215023
4-18	19.000	0.2500	65	Slip	57.00	1,631	34.08	130.00	26.84	3882.1	22.27	136.33	29.99	149.00	23.60	2638.7	0.215023
Shaft Weight						25,472											

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	Weight (lb)	No Ice EPAa (sf)	Orientation Factor	Weight (lb)	Ice EPAa (sf)	Orientation Factor
150.00	ADC CG-1900DDBFBDTBP	6	0.80	-0.100	12.10	1.390	0.50	71.15	2.232	0.50
150.00	Ericsson 8843 Rev 2	3	0.80	0.000	75.00	1.650	0.50	137.07	2.499	0.50
150.00	Ericsson Radio 4449 - B13&B5	3	0.80	0.000	70.00	1.650	0.50	126.33	2.497	0.50
150.00	RFS DB-B1-6C-12AB-0Z	1	0.80	1.500	21.40	2.512	1.00	101.22	3.553	1.00
150.00	Raycap RRFDC-3315-PF-48	1	0.80	-3.800	26.90	2.512	1.00	106.57	3.553	1.00
150.00	Ericsson AIR 6449 B77D/C-Band	3	0.80	0.000	88.00	4.132	0.70	207.80	5.522	0.70
150.00	Commscope NHH-65C-R2B	6	0.80	0.000	51.60	11.389	0.70	280.12	14.618	0.70
150.00	Andrew LNX-6515DS-A1M	3	0.80	-1.600	49.80	11.410	0.70	278.89	14.653	0.70
150.00	Generic Round Low Profile	1	1.00	0.000	1,875.00	21.700	1.00	2,684.89	40.900	1.00
129.40	Generic 15" x 15" Panel	1	0.80	0.000	10.00	1.875	1.00	47.17	2.764	1.00
129.10	Generic 1' Std. Dish	1	0.80	0.000	6.00	1.307	1.00	20.79	2.087	1.00
129.00	Motorola PTP 600	1	0.80	0.000	9.10	1.240	1.00	40.11	1.967	1.00
129.00	Argus LLPX310R	3	0.80	-1.000	28.60	4.292	0.63	117.52	5.923	0.63
129.00	Andrew Microwaves VHLP2-23	1	0.80	0.000	27.00	4.688	1.00	116.38	5.945	1.00
129.00	Generic Round Side Arm	3	1.00	0.000	187.50	5.200	0.67	277.72	7.881	0.67
129.00	Andrew Microwaves VHLP800-11	1	0.80	0.000	48.00	8.430	1.00	219.47	10.110	1.00
128.00	Samsung RRH-P4A	3	0.80	0.000	59.50	2.737	0.67	138.76	3.841	0.67
99.90	Raycap RNSNDC-7771-PF-48	1	0.80	0.000	14.90	3.213	1.00	86.71	4.339	1.00
99.00	Generic HCS2.0	2	0.80	0.000	8.80	1.155	0.50	42.47	1.859	0.50
99.00	Nokia AHFIG 70.55 lbs	3	0.80	0.000	70.60	2.763	0.67	133.67	3.892	0.67
99.00	Generic RRU (Model TBD)	4	0.80	0.000	55.00	4.563	0.59	158.05	5.898	0.59
99.00	Nokia AEHC	3	0.80	1.600	103.60	6.844	0.62	252.20	8.540	0.62
99.00	Andrew TMBXX-6517-A2M	4	0.80	1.400	43.40	8.528	0.68	212.46	11.321	0.68
99.00	Commscope FFHH-65C-R3	3	0.80	3.100	125.70	21.138	0.63	524.77	24.719	0.63
99.00	Generic Round Low Profile	1	1.00	0.000	1,875.00	21.700	1.00	2,653.46	40.155	1.00
98.90	Andrew ETW190VS12UB	3	0.80	0.000	11.00	0.654	0.50	28.75	1.181	0.50
98.50	Commscope HELIAX FiberFeed	2	0.80	0.000	20.00	0.944	0.50	47.43	1.629	0.50
85.00	Ericsson RRUS 31 B25 w/	3	0.75	0.000	59.50	2.016	0.67	126.09	2.928	0.67
85.00	Ericsson RRUS 11/61 w/ Solar	3	0.75	0.000	98.30	2.791	0.67	195.71	3.826	0.67
85.00	RFS APXV9ERR18-C-A20	3	0.75	0.000	62.00	8.024	0.71	232.95	10.657	0.71
85.00	Generic Round Platform with	1	1.00	0.000	2,500.00	27.200	1.00	4,028.86	50.273	1.00
Totals	Num Loadings:31	77			10,514.00			22,209.74		

Linear Appurtenance Properties

Load Case Azimuth (deg) : 0

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Coax / Flat	Dist Between Rows (in)	Dist Between Cols (in)	Dist Azimuth (deg)	Dist Exposed From Face (in)	Exposed To Wind Carrier
0.00	150.00	1	1 1/4" Hybriflex Cable	1.54	1.00	N	0	0.00	0.00	0	VERIZON WIRELESS
0.00	150.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	VERIZON WIRELESS
0.00	150.00	1	1 5/8" Hybriflex	1.98	1.30	N	1	0.00	0.00	0	VERIZON WIRELESS
0.00	130.00	2	2" conduit	2.38	3.65	N	0	0.00	0.00	0	CLEARWIRE
0.00	129.00	2	1/2" Coax	0.63	0.15	N	0	0.00	0.00	0	CLEARWIRE

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number:OAA766911_C3_01

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Customer: VERIZON WIRELESS

0.00	129.00	4	1/4" Coax	0.34	0.06	N	0	0.00	0.00	0	0.00	N	CLEARWIRE
0.00	100.00	14	7/8" Coax	1.09	0.33	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	99.00	2	1.49" (37.8mm) Hybrid	1.49	1.87	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	85.00	3	1.25" (31.8mm) Hybrid	1.25	1.21	N	0	0.00	0.00	0	0.00	N	SPRINT NEXTEL

Site Number: 209106

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Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in ³)	Z (in ³)	Weight (lb)
0.00		0.3750	60.410	71.454	32,537.9	26.64	161.09	70.1	1060.	0.0	0.0
5.00		0.3750	59.335	70.174	30,820.9	26.14	158.23	70.7	1023.	0.0	1,204.8
10.00		0.3750	58.260	68.895	29,165.4	25.63	155.36	71.3	986.0	0.0	1,183.1
15.00		0.3750	57.185	67.615	27,570.3	25.13	152.49	71.8	949.6	0.0	1,161.3
20.00		0.3750	56.110	66.336	26,034.5	24.62	149.63	72.4	913.9	0.0	1,139.5
25.00		0.3750	55.034	65.056	24,556.7	24.11	146.76	73.0	878.9	0.0	1,117.7
30.00		0.3750	53.959	63.776	23,136.0	23.61	143.89	73.6	844.5	0.0	1,096.0
35.00		0.3750	52.884	62.497	21,771.1	23.10	141.02	74.2	810.8	0.0	1,074.2
40.00		0.3750	51.809	61.217	20,461.1	22.60	138.16	74.8	777.9	0.0	1,052.4
45.00		0.3750	50.734	59.938	19,204.6	22.09	135.29	75.4	745.6	0.0	1,030.7
46.00	Bot - Section 2	0.3750	50.519	59.682	18,959.7	21.99	134.72	75.5	739.2	0.0	203.5
50.00		0.3750	49.659	58.658	18,000.7	21.59	132.42	76.0	714.0	0.0	1,485.8
53.25	Top - Section 1	0.3125	49.585	48.870	14,990.2	26.21	158.67	70.6	595.4	0.0	1,188.4
55.00		0.3125	49.209	48.497	14,649.4	26.00	157.47	70.8	586.4	0.0	289.9
60.00		0.3125	48.134	47.431	13,704.2	25.40	154.03	71.5	560.8	0.0	816.1
65.00		0.3125	47.058	46.364	12,800.5	24.79	150.59	72.2	535.8	0.0	797.9
70.00		0.3125	45.983	45.298	11,937.5	24.18	147.15	73.0	511.3	0.0	779.8
75.00		0.3125	44.908	44.232	11,114.1	23.58	143.71	73.7	487.4	0.0	761.6
80.00		0.3125	43.833	43.165	10,329.5	22.97	140.27	74.4	464.2	0.0	743.5
85.00		0.3125	42.758	42.099	9,582.7	22.36	136.83	75.1	441.4	0.0	725.3
88.75	Bot - Section 3	0.3125	41.952	41.299	9,046.9	21.91	134.25	75.6	424.7	0.0	532.1
90.00		0.3125	41.683	41.033	8,872.9	21.76	133.39	75.8	419.3	0.0	317.1
94.75	Top - Section 2	0.2500	41.162	32.462	6,864.7	27.27	164.65	69.3	328.5	0.0	1,186.3
95.00		0.2500	41.108	32.419	6,837.7	27.23	164.43	69.4	327.6	0.0	27.6
98.50		0.2500	40.355	31.822	6,466.8	26.70	161.42	70.0	315.6	0.0	382.6
98.90		0.2500	40.269	31.754	6,425.2	26.64	161.08	70.1	314.3	0.0	43.3
99.00		0.2500	40.248	31.737	6,414.9	26.62	160.99	70.1	313.9	0.0	10.8
99.90		0.2500	40.054	31.583	6,322.2	26.49	160.22	70.2	310.9	0.0	97.0
100.0		0.2500	40.033	31.566	6,312.0	26.47	160.13	70.3	310.6	0.0	10.7
105.0		0.2500	38.958	30.713	5,813.9	25.71	155.83	71.2	293.9	0.0	529.8
110.0		0.2500	37.882	29.860	5,342.8	24.96	151.53	72.0	277.8	0.0	515.3
115.0		0.2500	36.807	29.007	4,897.9	24.20	147.23	72.9	262.1	0.0	500.8
120.0		0.2500	35.732	28.154	4,478.3	23.44	142.93	73.8	246.9	0.0	486.3
125.0		0.2500	34.657	27.301	4,083.5	22.68	138.63	74.7	232.1	0.0	471.8
128.0		0.2500	34.012	26.789	3,858.1	22.23	136.05	75.3	223.4	0.0	276.1
129.0		0.2500	33.797	26.619	3,784.8	22.07	135.19	75.4	220.6	0.0	90.9
129.1		0.2500	33.775	26.602	3,777.5	22.06	135.10	75.5	220.3	0.0	9.1
129.4		0.2500	33.711	26.550	3,755.8	22.01	134.84	75.5	219.4	0.0	27.1
130.0	Bot - Section 4	0.2500	33.582	26.448	3,712.5	21.92	134.33	75.6	217.7	0.0	54.1
134.7	Top - Section 3	0.2500	33.061	26.034	3,541.0	21.55	132.24	76.0	211.0	0.0	848.3
135.0		0.2500	33.007	25.992	3,523.6	21.52	132.03	76.1	210.3	0.0	22.1
140.0		0.2500	31.932	25.139	3,187.9	20.76	127.73	77.0	196.6	0.0	435.0
145.0		0.2500	30.857	24.285	2,874.3	20.00	123.43	77.9	183.5	0.0	420.4
149.0		0.2500	29.997	23.603	2,638.7	19.39	119.99	78.6	173.3	0.0	325.9
											25,471.7

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:01 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0W

109 mph with No Ice

22 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.20

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
Seg			Dead		Torsion	Moment	Dead		Dead		Torsion	Moment	
Elev		Wind FX	Load	Wind FX	MY	MZ	Load	Wind FX	Load	Wind FX	Load	MY	MZ
(ft)	Description	(lb)	(lb)	(lb)	(lb-ft)	(lb-ft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb-ft)	(lb)
0.00		240.8	0.0					0.0	0.0	240.8	0.0	0.0	0.0
5.00		477.2	1,445.8					0.0	191.8	477.2	1,637.6	0.0	0.0
10.00		468.6	1,419.7					0.0	191.8	468.6	1,611.5	0.0	0.0
15.00		467.1	1,393.5					0.0	191.8	467.1	1,585.4	0.0	0.0
20.00		478.1	1,367.4					0.0	191.8	478.1	1,559.2	0.0	0.0
25.00		491.7	1,341.3					0.0	191.8	491.7	1,533.1	0.0	0.0
30.00		501.1	1,315.2					0.0	191.8	501.1	1,507.0	0.0	0.0
35.00		507.4	1,289.0					0.0	191.8	507.4	1,480.9	0.0	0.0
40.00		511.3	1,262.9					0.0	191.8	511.3	1,454.7	0.0	0.0
45.00		307.8	1,236.8					0.0	191.8	307.8	1,428.6	0.0	0.0
46.00	Bot - Section 2	259.5	244.2					0.0	38.4	259.5	282.6	0.0	0.0
50.00		377.2	1,782.9					0.0	153.5	377.2	1,936.4	0.0	0.0
53.25	Top - Section 1	260.1	1,426.1					0.0	124.7	260.1	1,550.8	0.0	0.0
55.00		350.3	347.9					0.0	67.1	350.3	415.0	0.0	0.0
60.00		517.5	979.3					0.0	191.8	517.5	1,171.1	0.0	0.0
65.00		514.6	957.5					0.0	191.8	514.6	1,149.3	0.0	0.0
70.00		510.7	935.7					0.0	191.8	510.7	1,127.5	0.0	0.0
75.00		506.1	914.0					0.0	191.8	506.1	1,105.8	0.0	0.0
80.00		500.7	892.2					0.0	191.8	500.7	1,084.0	0.0	0.0
85.00	Appurtenance(s)	433.6	870.4	1,770.9	0.0	0.0	3,791.3	0.0	191.8	2,204.5	4,853.5	0.0	0.0
88.75	Bot - Section 3	246.5	638.5					0.0	127.5	246.5	766.0	0.0	0.0
90.00		295.0	380.5					0.0	42.5	295.0	423.0	0.0	0.0
94.75	Top - Section 2	245.3	1,423.5					0.0	161.5	245.3	1,585.1	0.0	0.0
95.00		181.7	33.1					0.0	8.5	181.7	41.6	0.0	0.0
98.50	Appurtenance(s)	188.8	459.1	29.2	0.0	0.0	48.0	0.0	119.0	218.0	626.1	0.0	0.0
98.90		24.1	51.9					0.0	13.6	24.1	65.5	0.0	0.0
99.00	Appurtenance(s)	48.0	13.0	3,740.6	0.0	5,499.1	3,823.1	0.0	3.4	3,788.7	3,839.4	0.0	0.0
99.90		48.0	116.4					0.0	26.6	48.0	142.9	0.0	0.0
100.00		242.5	12.9					0.0	3.0	242.5	15.8	0.0	0.0
105.00		471.3	635.8					0.0	119.9	471.3	755.7	0.0	0.0
110.00		462.8	618.4					0.0	119.9	462.8	738.2	0.0	0.0
115.00		453.9	600.9					0.0	119.9	453.9	720.8	0.0	0.0
120.00		444.6	583.5					0.0	119.9	444.6	703.4	0.0	0.0
125.00		349.5	566.1					0.0	119.9	349.5	686.0	0.0	0.0
128.00	Appurtenance(s)	172.4	331.3	179.7	0.0	0.0	214.2	0.0	71.9	352.2	617.4	0.0	0.0
129.00	Appurtenance(s)	47.1	109.0	1,162.5	0.0	-265.0	878.9	0.0	24.0	1,209.6	1,011.9	0.0	0.0
129.10		17.1	10.9					0.0	2.3	17.1	13.2	0.0	0.0
129.40		38.3	32.6					0.0	7.0	38.3	39.6	0.0	0.0
130.00	Bot - Section 4	228.1	64.9					0.0	14.0	228.1	78.9	0.0	0.0
134.75	Top - Section 3	213.1	1,017.9					0.0	69.2	213.1	1,087.1	0.0	0.0
135.00		218.4	26.6					0.0	3.6	218.4	30.2	0.0	0.0
140.00		410.4	522.0					0.0	72.8	410.4	594.8	0.0	0.0
145.00		360.6	504.5					0.0	72.8	360.6	577.4	0.0	0.0
149.00		158.1	391.1					0.0	58.3	158.1	449.4	0.0	0.0
Totals:										21,130.0	44,083.4	0.00	0.00

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:04 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0W

109 mph with No Ice

22 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.20

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-47.92	-25.28	0.00	-2,438.95	0.00	2,438.95	4,505.81	1,254.02	6,799.61	5,574.76	0.00	0.00	0.449
5.00	-46.24	-24.88	0.00	-2,312.57	0.00	2,312.57	4,462.67	1,231.56	6,558.27	5,421.89	0.06	-0.10	0.437
10.00	-44.58	-24.49	0.00	-2,188.15	0.00	2,188.15	4,418.16	1,209.10	6,321.30	5,269.32	0.22	-0.21	0.426
15.00	-42.96	-24.09	0.00	-2,065.70	0.00	2,065.70	4,372.28	1,186.65	6,088.69	5,117.12	0.50	-0.31	0.414
20.00	-41.36	-23.68	0.00	-1,945.24	0.00	1,945.24	4,325.03	1,164.19	5,860.44	4,965.40	0.88	-0.41	0.402
25.00	-39.79	-23.25	0.00	-1,826.84	0.00	1,826.84	4,276.41	1,141.73	5,636.54	4,814.25	1.37	-0.52	0.389
30.00	-38.25	-22.80	0.00	-1,710.60	0.00	1,710.60	4,226.43	1,119.28	5,417.01	4,663.75	1.97	-0.62	0.376
35.00	-36.73	-22.34	0.00	-1,596.60	0.00	1,596.60	4,175.07	1,096.82	5,201.84	4,514.00	2.67	-0.72	0.363
40.00	-35.25	-21.87	0.00	-1,484.90	0.00	1,484.90	4,122.35	1,074.36	4,991.03	4,365.09	3.48	-0.82	0.349
45.00	-33.80	-21.58	0.00	-1,375.55	0.00	1,375.55	4,068.25	1,051.90	4,784.58	4,217.12	4.40	-0.92	0.335
46.00	-33.50	-21.34	0.00	-1,353.98	0.00	1,353.98	4,057.27	1,047.41	4,743.81	4,187.64	4.59	-0.94	0.332
50.00	-31.55	-20.97	0.00	-1,268.61	0.00	1,268.61	4,012.79	1,029.45	4,582.49	4,070.16	5.42	-1.02	0.320
53.25	-29.98	-20.71	0.00	-1,200.46	0.00	1,200.46	3,103.79	857.68	3,816.84	3,151.41	6.14	-1.08	0.391
55.00	-29.55	-20.39	0.00	-1,164.23	0.00	1,164.23	3,090.99	851.13	3,758.77	3,114.29	6.54	-1.12	0.384
60.00	-28.35	-19.90	0.00	-1,062.30	0.00	1,062.30	3,053.48	832.41	3,595.31	3,008.43	7.77	-1.23	0.363
65.00	-27.18	-19.41	0.00	-962.82	0.00	962.82	3,014.61	813.70	3,435.48	2,902.92	9.11	-1.33	0.341
70.00	-26.03	-18.91	0.00	-865.79	0.00	865.79	2,974.36	794.98	3,279.29	2,797.85	10.56	-1.43	0.319
75.00	-24.91	-18.42	0.00	-771.22	0.00	771.22	2,932.75	776.27	3,126.73	2,693.32	12.12	-1.53	0.295
80.00	-23.81	-17.93	0.00	-679.12	0.00	679.12	2,889.76	757.55	2,977.80	2,589.42	13.77	-1.62	0.271
85.00	-19.00	-15.61	0.00	-589.49	0.00	589.49	2,845.41	738.84	2,832.51	2,486.24	15.52	-1.71	0.244
88.75	-18.24	-15.35	0.00	-530.96	0.00	530.96	2,811.24	724.80	2,725.93	2,409.39	16.89	-1.77	0.227
90.00	-17.81	-15.06	0.00	-511.78	0.00	511.78	2,799.68	720.13	2,690.85	2,383.88	17.36	-1.79	0.221
94.75	-16.22	-14.77	0.00	-440.26	0.00	440.26	2,025.49	569.71	2,105.10	1,707.99	19.18	-1.87	0.266
95.00	-16.18	-14.60	0.00	-436.56	0.00	436.56	2,024.13	568.96	2,099.57	1,704.58	19.28	-1.87	0.265
98.50	-15.55	-14.37	0.00	-385.47	0.00	385.47	2,004.73	558.48	2,022.95	1,656.96	20.67	-1.93	0.241
98.90	-15.45	-14.31	0.00	-379.72	0.00	379.72	2,002.47	557.28	2,014.28	1,651.52	20.84	-1.94	0.238
99.00	-11.74	-10.40	0.00	-372.79	0.00	372.79	2,001.90	556.98	2,012.12	1,650.16	20.88	-1.94	0.232
99.90	-11.58	-10.25	0.00	-363.44	0.00	363.44	1,996.78	554.29	1,992.70	1,637.92	21.24	-1.95	0.228
100.00	-11.57	-10.01	0.00	-362.41	0.00	362.41	1,996.21	553.99	1,990.54	1,636.56	21.28	-1.95	0.228
105.00	-10.82	-9.53	0.00	-312.36	0.00	312.36	1,966.92	539.02	1,884.42	1,568.70	23.37	-2.03	0.205
110.00	-10.08	-9.05	0.00	-264.73	0.00	264.73	1,936.25	524.05	1,781.20	1,501.07	25.54	-2.10	0.182
115.00	-9.37	-8.58	0.00	-219.48	0.00	219.48	1,904.22	509.08	1,680.89	1,433.79	27.77	-2.17	0.158
120.00	-8.68	-8.12	0.00	-176.58	0.00	176.58	1,870.82	494.10	1,583.49	1,366.93	30.08	-2.22	0.134
125.00	-8.00	-7.75	0.00	-136.00	0.00	136.00	1,836.04	479.13	1,488.99	1,300.59	32.43	-2.27	0.109
128.00	-7.40	-7.37	0.00	-112.76	0.00	112.76	1,814.52	470.15	1,433.69	1,261.07	33.87	-2.30	0.094
129.00	-6.43	-6.12	0.00	-105.39	0.00	105.39	1,807.24	467.16	1,415.49	1,247.95	34.35	-2.31	0.088
129.10	-6.41	-6.06	0.00	-104.78	0.00	104.78	1,806.51	466.86	1,413.67	1,246.64	34.40	-2.31	0.088
129.40	-6.37	-5.96	0.00	-102.96	0.00	102.96	1,804.31	465.96	1,408.24	1,242.71	34.54	-2.31	0.087
130.00	-6.30	-5.73	0.00	-99.38	0.00	99.38	1,799.90	464.16	1,397.40	1,234.86	34.83	-2.32	0.084
134.75	-5.22	-5.48	0.00	-72.16	0.00	72.16	1,781.88	456.90	1,354.03	1,203.23	37.15	-2.35	0.063
135.00	-5.19	-5.26	0.00	-70.79	0.00	70.79	1,780.01	456.15	1,349.60	1,199.98	37.28	-2.35	0.062
140.00	-4.62	-4.82	0.00	-44.50	0.00	44.50	1,741.76	441.18	1,262.47	1,135.37	39.75	-2.37	0.042
145.00	-4.05	-4.44	0.00	-20.38	0.00	20.38	1,702.15	426.21	1,178.25	1,071.60	42.24	-2.39	0.022

<u>Load Case:</u> 1.2D + 1.0W				109 mph with No Ice							22 Iterations		
Gust Response Factor :1.10													
Dead Load Factor :1.20													
Wind Load Factor :1.00													
149.00	0.00	-4.27	0.00	-2.61	0.00	2.61	1,669.47	414.23	1,112.97	1,021.25	44.24	-2.39	0.003

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:04 AM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.0W

109 mph with No Ice (Reduced DL)

22 Iterations

Gust Response Factor :1.10

Dead Load Factor :0.90

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
Seg			Dead	Torsion		Moment	Dead			Dead	Torsion	Moment	
Elev		Wind FX	Load	Wind FX	MY	MZ	Load	Wind FX	Load	Wind FX	Load	MY	MZ
(ft)	Description	(lb)	(lb)	(lb)	(lb-ft)	(lb-ft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb-ft)	(lb)
0.00		240.8	0.0					0.0	0.0	240.8	0.0	0.0	0.0
5.00		477.2	1,084.3					0.0	143.9	477.2	1,228.2	0.0	0.0
10.00		468.6	1,064.7					0.0	143.9	468.6	1,208.6	0.0	0.0
15.00		467.1	1,045.2					0.0	143.9	467.1	1,189.0	0.0	0.0
20.00		478.1	1,025.6					0.0	143.9	478.1	1,169.4	0.0	0.0
25.00		491.7	1,006.0					0.0	143.9	491.7	1,149.8	0.0	0.0
30.00		501.1	986.4					0.0	143.9	501.1	1,130.2	0.0	0.0
35.00		507.4	966.8					0.0	143.9	507.4	1,110.6	0.0	0.0
40.00		511.3	947.2					0.0	143.9	511.3	1,091.1	0.0	0.0
45.00		307.8	927.6					0.0	143.9	307.8	1,071.5	0.0	0.0
46.00	Bot - Section 2	259.5	183.2					0.0	28.8	259.5	211.9	0.0	0.0
50.00		377.2	1,337.2					0.0	115.1	377.2	1,452.3	0.0	0.0
53.25	Top - Section 1	260.1	1,069.6					0.0	93.5	260.1	1,163.1	0.0	0.0
55.00		350.3	260.9					0.0	50.4	350.3	311.3	0.0	0.0
60.00		517.5	734.4					0.0	143.9	517.5	878.3	0.0	0.0
65.00		514.6	718.1					0.0	143.9	514.6	862.0	0.0	0.0
70.00		510.7	701.8					0.0	143.9	510.7	845.7	0.0	0.0
75.00		506.1	685.5					0.0	143.9	506.1	829.3	0.0	0.0
80.00		500.7	669.1					0.0	143.9	500.7	813.0	0.0	0.0
85.00	Appurtenance(s)	433.6	652.8	1,770.9	0.0	0.0	2,843.5	0.0	143.9	2,204.5	3,640.1	0.0	0.0
88.75	Bot - Section 3	246.5	478.9					0.0	95.6	246.5	574.5	0.0	0.0
90.00		295.0	285.4					0.0	31.9	295.0	317.3	0.0	0.0
94.75	Top - Section 2	245.3	1,067.6					0.0	121.2	245.3	1,188.8	0.0	0.0
95.00		181.7	24.8					0.0	6.4	181.7	31.2	0.0	0.0
98.50	Appurtenance(s)	188.8	344.3	29.2	0.0	0.0	36.0	0.0	89.3	218.0	469.6	0.0	0.0
98.90		24.1	38.9					0.0	10.2	24.1	49.1	0.0	0.0
99.00	Appurtenance(s)	48.0	9.7	3,740.6	0.0	5,499.1	2,867.3	0.0	2.6	3,788.7	2,879.6	0.0	0.0
99.90		48.0	87.3					0.0	19.9	48.0	107.2	0.0	0.0
100.00		242.5	9.7					0.0	2.2	242.5	11.9	0.0	0.0
105.00		471.3	476.8					0.0	89.9	471.3	566.7	0.0	0.0
110.00		462.8	463.8					0.0	89.9	462.8	553.7	0.0	0.0
115.00		453.9	450.7					0.0	89.9	453.9	540.6	0.0	0.0
120.00		444.6	437.6					0.0	89.9	444.6	527.6	0.0	0.0
125.00		349.5	424.6					0.0	89.9	349.5	514.5	0.0	0.0
128.00	Appurtenance(s)	172.4	248.5	179.7	0.0	0.0	160.6	0.0	53.9	352.2	463.1	0.0	0.0
129.00	Appurtenance(s)	47.1	81.8	1,162.5	0.0	-265.0	659.2	0.0	18.0	1,209.6	758.9	0.0	0.0
129.10		17.1	8.1					0.0	1.7	17.1	9.9	0.0	0.0
129.40		38.3	24.4					0.0	5.2	38.3	29.7	0.0	0.0
130.00	Bot - Section 4	228.1	48.7					0.0	10.5	228.1	59.2	0.0	0.0
134.75	Top - Section 3	213.1	763.5					0.0	51.9	213.1	815.4	0.0	0.0
135.00		218.4	19.9					0.0	2.7	218.4	22.6	0.0	0.0
140.00		410.4	391.5					0.0	54.6	410.4	446.1	0.0	0.0
145.00		360.6	378.4					0.0	54.6	360.6	433.0	0.0	0.0
149.00		158.1	293.3					0.0	43.7	158.1	337.0	0.0	0.0
Totals:										21,130.0	33,062.6	0.00	0.00

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:07 AM

Customer: VERIZON WIRELESS

Load Case: 0.9D + 1.0W

109 mph with No Ice (Reduced DL)

22 Iterations

Gust Response Factor :1.10

Dead Load Factor :0.90

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-35.94	-25.27	0.00	-2,422.52	0.00	2,422.52	4,505.81	1,254.02	6,799.61	5,574.76	0.00	0.00	0.443
5.00	-34.66	-24.85	0.00	-2,296.19	0.00	2,296.19	4,462.67	1,231.56	6,558.27	5,421.89	0.06	-0.10	0.432
10.00	-33.41	-24.44	0.00	-2,171.94	0.00	2,171.94	4,418.16	1,209.10	6,321.30	5,269.32	0.22	-0.21	0.420
15.00	-32.18	-24.02	0.00	-2,049.75	0.00	2,049.75	4,372.28	1,186.65	6,088.69	5,117.12	0.49	-0.31	0.408
20.00	-30.97	-23.59	0.00	-1,929.63	0.00	1,929.63	4,325.03	1,164.19	5,860.44	4,965.40	0.87	-0.41	0.396
25.00	-29.79	-23.15	0.00	-1,811.66	0.00	1,811.66	4,276.41	1,141.73	5,636.54	4,814.25	1.36	-0.51	0.384
30.00	-28.62	-22.68	0.00	-1,695.93	0.00	1,695.93	4,226.43	1,119.28	5,417.01	4,663.75	1.95	-0.62	0.371
35.00	-27.48	-22.21	0.00	-1,582.52	0.00	1,582.52	4,175.07	1,096.82	5,201.84	4,514.00	2.65	-0.72	0.358
40.00	-26.36	-21.73	0.00	-1,471.46	0.00	1,471.46	4,122.35	1,074.36	4,991.03	4,365.09	3.46	-0.82	0.344
45.00	-25.27	-21.43	0.00	-1,362.80	0.00	1,362.80	4,068.25	1,051.90	4,784.58	4,217.12	4.36	-0.91	0.330
46.00	-25.04	-21.19	0.00	-1,341.37	0.00	1,341.37	4,057.27	1,047.41	4,743.81	4,187.64	4.56	-0.93	0.327
50.00	-23.57	-20.82	0.00	-1,256.60	0.00	1,256.60	4,012.79	1,029.45	4,582.49	4,070.16	5.38	-1.01	0.315
53.25	-22.39	-20.56	0.00	-1,188.94	0.00	1,188.94	3,103.79	857.68	3,816.84	3,151.41	6.09	-1.08	0.385
55.00	-22.06	-20.23	0.00	-1,152.96	0.00	1,152.96	3,090.99	851.13	3,758.77	3,114.29	6.49	-1.11	0.378
60.00	-21.16	-19.73	0.00	-1,051.82	0.00	1,051.82	3,053.48	832.41	3,595.31	3,008.43	7.71	-1.22	0.357
65.00	-20.28	-19.23	0.00	-953.16	0.00	953.16	3,014.61	813.70	3,435.48	2,902.92	9.04	-1.32	0.336
70.00	-19.41	-18.74	0.00	-856.99	0.00	856.99	2,974.36	794.98	3,279.29	2,797.85	10.48	-1.42	0.313
75.00	-18.56	-18.24	0.00	-763.31	0.00	763.31	2,932.75	776.27	3,126.73	2,693.32	12.02	-1.52	0.290
80.00	-17.74	-17.75	0.00	-672.10	0.00	672.10	2,889.76	757.55	2,977.80	2,589.42	13.66	-1.61	0.266
85.00	-14.14	-15.46	0.00	-583.38	0.00	583.38	2,845.41	738.84	2,832.51	2,486.24	15.39	-1.70	0.240
88.75	-13.57	-15.20	0.00	-525.42	0.00	525.42	2,811.24	724.80	2,725.93	2,409.39	16.75	-1.76	0.223
90.00	-13.25	-14.91	0.00	-506.42	0.00	506.42	2,799.68	720.13	2,690.85	2,383.88	17.21	-1.78	0.218
94.75	-12.06	-14.63	0.00	-435.61	0.00	435.61	2,025.49	569.71	2,105.10	1,707.99	19.02	-1.85	0.262
95.00	-12.02	-14.46	0.00	-431.95	0.00	431.95	2,024.13	568.96	2,099.57	1,704.58	19.12	-1.85	0.260
98.50	-11.55	-14.23	0.00	-381.36	0.00	381.36	2,004.73	558.48	2,022.95	1,656.96	20.50	-1.91	0.237
98.90	-11.47	-14.17	0.00	-375.67	0.00	375.67	2,002.47	557.28	2,014.28	1,651.52	20.66	-1.92	0.234
99.00	-8.72	-10.29	0.00	-368.75	0.00	368.75	2,001.90	556.98	2,012.12	1,650.16	20.70	-1.92	0.228
99.90	-8.60	-10.14	0.00	-359.49	0.00	359.49	1,996.78	554.29	1,992.70	1,637.92	21.06	-1.94	0.224
100.00	-8.59	-9.90	0.00	-358.47	0.00	358.47	1,996.21	553.99	1,990.54	1,636.56	21.10	-1.94	0.224
105.00	-8.03	-9.42	0.00	-308.95	0.00	308.95	1,966.92	539.02	1,884.42	1,568.70	23.17	-2.01	0.201
110.00	-7.49	-8.95	0.00	-261.83	0.00	261.83	1,936.25	524.05	1,781.20	1,501.07	25.32	-2.08	0.179
115.00	-6.95	-8.48	0.00	-217.08	0.00	217.08	1,904.22	509.08	1,680.89	1,433.79	27.53	-2.15	0.155
120.00	-6.43	-8.03	0.00	-174.66	0.00	174.66	1,870.82	494.10	1,583.49	1,366.93	29.81	-2.20	0.131
125.00	-5.93	-7.66	0.00	-134.53	0.00	134.53	1,836.04	479.13	1,488.99	1,300.59	32.15	-2.25	0.107
128.00	-5.48	-7.29	0.00	-111.55	0.00	111.55	1,814.52	470.15	1,433.69	1,261.07	33.57	-2.28	0.092
129.00	-4.77	-6.05	0.00	-104.26	0.00	104.26	1,807.24	467.16	1,415.49	1,247.95	34.05	-2.29	0.086
129.10	-4.76	-5.99	0.00	-103.66	0.00	103.66	1,806.51	466.86	1,413.67	1,246.64	34.10	-2.29	0.086
129.40	-4.72	-5.89	0.00	-101.86	0.00	101.86	1,804.31	465.96	1,408.24	1,242.71	34.24	-2.29	0.085
130.00	-4.67	-5.66	0.00	-98.32	0.00	98.32	1,799.90	464.16	1,397.40	1,234.86	34.53	-2.29	0.082
134.75	-3.86	-5.42	0.00	-71.42	0.00	71.42	1,781.88	456.90	1,354.03	1,203.23	36.83	-2.32	0.062
135.00	-3.85	-5.20	0.00	-70.07	0.00	70.07	1,780.01	456.15	1,349.60	1,199.98	36.95	-2.33	0.061
140.00	-3.42	-4.77	0.00	-44.06	0.00	44.06	1,741.76	441.18	1,262.47	1,135.37	39.40	-2.35	0.041
145.00	-3.00	-4.40	0.00	-20.20	0.00	20.20	1,702.15	426.21	1,178.25	1,071.60	41.86	-2.36	0.021

<u>Load Case:</u> 0.9D + 1.0W				109 mph with No Ice (Reduced DL)								22 Iterations	
Gust Response Factor :1.10													
Dead Load Factor :0.90													
Wind Load Factor :1.00													
149.00	0.00	-4.27	0.00	-2.61	0.00	2.61	1,669.47	414.23	1,112.97	1,021.25	43.85	-2.37	0.003

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:07 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi

40 mph with 1.50 in Radial Ice

21 Iterations

Gust Response Factor :1.10

Ice Dead Load Factor 1.00

Dead Load Factor :1.20

Ice Importance Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
Seg			Dead		Torsion	Moment	Dead		Dead		Torsion	Moment	
Elev		Wind FX	Load	Wind FX	MY	MZ	Load	Wind FX	Load	Wind FX	Load	MY	MZ
(ft)	Description	(lb)	(lb)	(lb)	(lb-ft)	(lb-ft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb-ft)	(lb)
0.00		55.3	0.0					0.0	0.0	55.3	0.0	0.0	0.0
5.00		109.9	1,885.0					0.0	191.8	109.9	2,076.8	0.0	0.0
10.00		108.4	1,902.2					0.0	191.8	108.4	2,094.0	0.0	0.0
15.00		108.3	1,892.8					0.0	191.8	108.3	2,084.6	0.0	0.0
20.00		111.1	1,874.7					0.0	191.8	111.1	2,066.5	0.0	0.0
25.00		114.5	1,852.0					0.0	191.8	114.5	2,043.9	0.0	0.0
30.00		117.0	1,826.6					0.0	191.8	117.0	2,018.4	0.0	0.0
35.00		118.6	1,799.2					0.0	191.8	118.6	1,991.1	0.0	0.0
40.00		119.8	1,770.4					0.0	191.8	119.8	1,962.2	0.0	0.0
45.00		72.2	1,740.5					0.0	191.8	72.2	1,932.3	0.0	0.0
46.00	Bot - Section 2	60.9	345.3					0.0	38.4	60.9	383.6	0.0	0.0
50.00		88.6	2,187.5					0.0	153.5	88.6	2,340.9	0.0	0.0
53.25	Top - Section 1	61.2	1,752.8					0.0	124.7	61.2	1,877.5	0.0	0.0
55.00		82.5	523.4					0.0	67.1	82.5	590.5	0.0	0.0
60.00		122.0	1,473.1					0.0	191.8	122.0	1,664.9	0.0	0.0
65.00		121.6	1,444.8					0.0	191.8	121.6	1,636.6	0.0	0.0
70.00		120.9	1,416.1					0.0	191.8	120.9	1,607.9	0.0	0.0
75.00		120.0	1,386.9					0.0	191.8	120.0	1,578.7	0.0	0.0
80.00		119.0	1,357.4					0.0	191.8	119.0	1,549.2	0.0	0.0
85.00	Appurtenance(s)	103.3	1,327.6	390.9	0.0	0.0	5,939.7	0.0	191.8	494.2	7,459.1	0.0	0.0
88.75	Bot - Section 3	58.8	977.0					0.0	127.5	58.8	1,104.5	0.0	0.0
90.00		70.4	494.2					0.0	42.5	70.4	536.8	0.0	0.0
94.75	Top - Section 2	58.6	1,847.2					0.0	161.5	58.6	2,008.7	0.0	0.0
95.00		43.5	55.4					0.0	8.5	43.5	63.9	0.0	0.0
98.50	Appurtenance(s)	45.2	766.8	6.8	0.0	0.0	94.7	0.0	119.0	52.0	980.5	0.0	0.0
98.90		5.8	87.1					0.0	13.6	5.8	100.7	0.0	0.0
99.00	Appurtenance(s)	11.5	21.8	698.8	0.0	894.1	7,027.1	0.0	3.4	710.3	7,052.2	0.0	0.0
99.90		11.5	195.1					0.0	26.6	11.5	221.7	0.0	0.0
100.00		58.2	21.6					0.0	3.0	58.2	24.6	0.0	0.0
105.00		113.2	1,063.3					0.0	119.9	113.2	1,183.2	0.0	0.0
110.00		111.5	1,036.7					0.0	119.9	111.5	1,156.6	0.0	0.0
115.00		109.6	1,009.8					0.0	119.9	109.6	1,129.7	0.0	0.0
120.00		107.7	982.8					0.0	119.9	107.7	1,102.7	0.0	0.0
125.00		84.9	955.6					0.0	119.9	84.9	1,075.5	0.0	0.0
128.00	Appurtenance(s)	41.9	561.6	34.0	0.0	0.0	417.3	0.0	71.9	75.9	1,050.9	0.0	0.0
129.00	Appurtenance(s)	11.5	185.5	216.0	0.0	-49.3	1,587.5	0.0	24.0	227.4	1,796.9	0.0	0.0
129.10		4.2	18.5					0.0	2.3	4.2	20.8	0.0	0.0
129.40		9.3	55.4					0.0	7.0	9.3	62.4	0.0	0.0
130.00	Bot - Section 4	55.6	110.6					0.0	14.0	55.6	124.5	0.0	0.0
134.75	Top - Section 3	52.0	1,374.6					0.0	69.2	52.0	1,443.8	0.0	0.0
135.00		53.4	45.3					0.0	3.6	53.4	49.0	0.0	0.0
140.00		100.6	886.6					0.0	72.8	100.6	959.5	0.0	0.0
145.00		88.7	858.9					0.0	72.8	88.7	931.7	0.0	0.0
149.00		38.9	668.0					0.0	58.3	38.9	726.3	0.0	0.0
Totals:										4,727.83	63,865.8	0.00	0.00

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:10 AM

Customer: VERIZON WIRELESS

Load Case: 1.2D + 1.0Di + 1.0Wi

40 mph with 1.50 in Radial Ice

21 Iterations

Gust Response Factor :1.10

Ice Dead Load Factor 1.00

Dead Load Factor :1.20

Ice Importance Factor :1.00

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-71.39	-5.53	0.00	-531.47	0.00	531.47	4,505.81	1,254.02	6,799.61	5,574.76	0.00	0.00	0.111
5.00	-69.31	-5.45	0.00	-503.80	0.00	503.80	4,462.67	1,231.56	6,558.27	5,421.89	0.01	-0.02	0.108
10.00	-67.21	-5.37	0.00	-476.55	0.00	476.55	4,418.16	1,209.10	6,321.30	5,269.32	0.05	-0.05	0.106
15.00	-65.12	-5.28	0.00	-449.71	0.00	449.71	4,372.28	1,186.65	6,088.69	5,117.12	0.11	-0.07	0.103
20.00	-63.06	-5.19	0.00	-423.29	0.00	423.29	4,325.03	1,164.19	5,860.44	4,965.40	0.19	-0.09	0.100
25.00	-61.01	-5.10	0.00	-397.33	0.00	397.33	4,276.41	1,141.73	5,636.54	4,814.25	0.30	-0.11	0.097
30.00	-58.99	-5.00	0.00	-371.83	0.00	371.83	4,226.43	1,119.28	5,417.01	4,663.75	0.43	-0.14	0.094
35.00	-57.00	-4.90	0.00	-346.83	0.00	346.83	4,175.07	1,096.82	5,201.84	4,514.00	0.58	-0.16	0.091
40.00	-55.03	-4.79	0.00	-322.33	0.00	322.33	4,122.35	1,074.36	4,991.03	4,365.09	0.76	-0.18	0.087
45.00	-53.10	-4.73	0.00	-298.36	0.00	298.36	4,068.25	1,051.90	4,784.58	4,217.12	0.96	-0.20	0.084
46.00	-52.72	-4.68	0.00	-293.63	0.00	293.63	4,057.27	1,047.41	4,743.81	4,187.64	1.00	-0.20	0.083
50.00	-50.37	-4.59	0.00	-274.93	0.00	274.93	4,012.79	1,029.45	4,582.49	4,070.16	1.18	-0.22	0.080
53.25	-48.50	-4.53	0.00	-260.01	0.00	260.01	3,103.79	857.68	3,816.84	3,151.41	1.34	-0.24	0.098
55.00	-47.90	-4.46	0.00	-252.08	0.00	252.08	3,090.99	851.13	3,758.77	3,114.29	1.42	-0.24	0.096
60.00	-46.24	-4.35	0.00	-229.78	0.00	229.78	3,053.48	832.41	3,595.31	3,008.43	1.69	-0.27	0.092
65.00	-44.60	-4.24	0.00	-208.03	0.00	208.03	3,014.61	813.70	3,435.48	2,902.92	1.98	-0.29	0.086
70.00	-42.99	-4.12	0.00	-186.85	0.00	186.85	2,974.36	794.98	3,279.29	2,797.85	2.30	-0.31	0.081
75.00	-41.41	-4.01	0.00	-166.23	0.00	166.23	2,932.75	776.27	3,126.73	2,693.32	2.63	-0.33	0.076
80.00	-39.86	-3.90	0.00	-146.18	0.00	146.18	2,889.76	757.55	2,977.80	2,589.42	2.99	-0.35	0.070
85.00	-32.41	-3.36	0.00	-126.71	0.00	126.71	2,845.41	738.84	2,832.51	2,486.24	3.37	-0.37	0.062
88.75	-31.30	-3.30	0.00	-114.10	0.00	114.10	2,811.24	724.80	2,725.93	2,409.39	3.67	-0.38	0.059
90.00	-30.76	-3.23	0.00	-109.97	0.00	109.97	2,799.68	720.13	2,690.85	2,383.88	3.77	-0.39	0.057
94.75	-28.76	-3.16	0.00	-94.62	0.00	94.62	2,025.49	569.71	2,105.10	1,707.99	4.17	-0.40	0.070
95.00	-28.69	-3.12	0.00	-93.83	0.00	93.83	2,024.13	568.96	2,099.57	1,704.58	4.19	-0.41	0.069
98.50	-27.71	-3.07	0.00	-82.89	0.00	82.89	2,004.73	558.48	2,022.95	1,656.96	4.49	-0.42	0.064
98.90	-27.53	-3.05	0.00	-81.66	0.00	81.66	2,002.47	557.28	2,014.28	1,651.52	4.52	-0.42	0.063
99.00	-20.48	-2.29	0.00	-80.46	0.00	80.46	2,001.90	556.98	2,012.12	1,650.16	4.53	-0.42	0.059
99.90	-20.18	-2.26	0.00	-78.40	0.00	78.40	1,996.78	554.29	1,992.70	1,637.92	4.61	-0.42	0.058
100.00	-20.15	-2.21	0.00	-78.17	0.00	78.17	1,996.21	553.99	1,990.54	1,636.56	4.62	-0.42	0.058
105.00	-18.97	-2.09	0.00	-67.14	0.00	67.14	1,966.92	539.02	1,884.42	1,568.70	5.07	-0.44	0.052
110.00	-17.82	-1.97	0.00	-56.69	0.00	56.69	1,936.25	524.05	1,781.20	1,501.07	5.54	-0.45	0.047
115.00	-16.69	-1.86	0.00	-46.82	0.00	46.82	1,904.22	509.08	1,680.89	1,433.79	6.03	-0.47	0.041
120.00	-15.58	-1.75	0.00	-37.53	0.00	37.53	1,870.82	494.10	1,583.49	1,366.93	6.53	-0.48	0.036
125.00	-14.51	-1.65	0.00	-28.80	0.00	28.80	1,836.04	479.13	1,488.99	1,300.59	7.04	-0.49	0.030
128.00	-13.46	-1.57	0.00	-23.84	0.00	23.84	1,814.52	470.15	1,433.69	1,261.07	7.35	-0.50	0.026
129.00	-11.66	-1.33	0.00	-22.28	0.00	22.28	1,807.24	467.16	1,415.49	1,247.95	7.45	-0.50	0.024
129.10	-11.62	-1.31	0.00	-22.14	0.00	22.14	1,806.51	466.86	1,413.67	1,246.64	7.46	-0.50	0.024
129.40	-11.52	-1.29	0.00	-21.75	0.00	21.75	1,804.31	465.96	1,408.24	1,242.71	7.49	-0.50	0.024
130.00	-11.39	-1.23	0.00	-20.97	0.00	20.97	1,799.90	464.16	1,397.40	1,234.86	7.55	-0.50	0.023
134.75	-9.95	-1.17	0.00	-15.11	0.00	15.11	1,781.88	456.90	1,354.03	1,203.23	8.06	-0.51	0.018
135.00	-9.90	-1.12	0.00	-14.82	0.00	14.82	1,780.01	456.15	1,349.60	1,199.98	8.08	-0.51	0.018
140.00	-8.94	-1.01	0.00	-9.23	0.00	9.23	1,741.76	441.18	1,262.47	1,135.37	8.62	-0.51	0.013
145.00	-8.01	-0.91	0.00	-4.19	0.00	4.19	1,702.15	426.21	1,178.25	1,071.60	9.16	-0.52	0.009

<u>Load Case:</u> 1.2D + 1.0Di + 1.0Wi				40 mph with 1.50 in Radial Ice				21 Iterations					
Gust Response Factor :1.10		Ice Dead Load Factor 1.00											
Dead Load Factor :1.20										Ice Importance Factor :1.00			
Wind Load Factor :1.00													
149.00	0.00	-0.84	0.00	-0.54	0.00	0.54	1,669.47	414.23	1,112.97	1,021.25	9.59	-0.52	0.001

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:10 AM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W

Serviceability 60 mph

21 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.00

Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
Seg			Dead		Torsion	Moment	Dead		Dead		Torsion	Moment	
Elev		Wind FX	Load	Wind FX	MY	MZ	Load	Wind FX	Load	Wind FX	Load	MY	MZ
(ft)	Description	(lb)	(lb)	(lb)	(lb-ft)	(lb-ft)	(lb)	(lb)	(lb)	(lb)	(lb)	(lb-ft)	(lb)
0.00		65.3	0.0					0.0	0.0	65.3	0.0	0.0	0.0
5.00		129.4	1,204.8					0.0	159.9	129.4	1,364.7	0.0	0.0
10.00		127.0	1,183.1					0.0	159.9	127.0	1,342.9	0.0	0.0
15.00		126.6	1,161.3					0.0	159.9	126.6	1,321.1	0.0	0.0
20.00		129.6	1,139.5					0.0	159.9	129.6	1,299.4	0.0	0.0
25.00		133.3	1,117.7					0.0	159.9	133.3	1,277.6	0.0	0.0
30.00		135.9	1,096.0					0.0	159.9	135.9	1,255.8	0.0	0.0
35.00		137.6	1,074.2					0.0	159.9	137.6	1,234.0	0.0	0.0
40.00		138.6	1,052.4					0.0	159.9	138.6	1,212.3	0.0	0.0
45.00		83.4	1,030.7					0.0	159.9	83.4	1,190.5	0.0	0.0
46.00	Bot - Section 2	70.4	203.5					0.0	32.0	70.4	235.5	0.0	0.0
50.00		102.3	1,485.8					0.0	127.9	102.3	1,613.7	0.0	0.0
53.25	Top - Section 1	70.5	1,188.4					0.0	103.9	70.5	1,292.3	0.0	0.0
55.00		95.0	289.9					0.0	55.9	95.0	345.9	0.0	0.0
60.00		140.3	816.1					0.0	159.9	140.3	975.9	0.0	0.0
65.00		139.5	797.9					0.0	159.9	139.5	957.8	0.0	0.0
70.00		138.5	779.8					0.0	159.9	138.5	939.6	0.0	0.0
75.00		137.2	761.6					0.0	159.9	137.2	921.5	0.0	0.0
80.00		135.8	743.5					0.0	159.9	135.8	903.3	0.0	0.0
85.00	Appurtenance(s)	117.6	725.3	480.1	0.0	0.0	3,159.4	0.0	159.9	597.7	4,044.6	0.0	0.0
88.75	Bot - Section 3	66.8	532.1					0.0	106.3	66.8	638.4	0.0	0.0
90.00		80.0	317.1					0.0	35.4	80.0	352.5	0.0	0.0
94.75	Top - Section 2	66.5	1,186.3					0.0	134.6	66.5	1,320.9	0.0	0.0
95.00		49.3	27.6					0.0	7.1	49.3	34.7	0.0	0.0
98.50	Appurtenance(s)	51.2	382.6	7.9	0.0	0.0	40.0	0.0	99.2	59.1	521.7	0.0	0.0
98.90		6.5	43.3					0.0	11.3	6.5	54.6	0.0	0.0
99.00	Appurtenance(s)	13.0	10.8	1,014.1	0.0	1,490.8	3,185.9	0.0	2.8	1,027.1	3,199.5	0.0	0.0
99.90		13.0	97.0					0.0	22.1	13.0	119.1	0.0	0.0
100.00		65.7	10.7					0.0	2.5	65.7	13.2	0.0	0.0
105.00		127.8	529.8					0.0	99.9	127.8	629.7	0.0	0.0
110.00		125.5	515.3					0.0	99.9	125.5	615.2	0.0	0.0
115.00		123.1	500.8					0.0	99.9	123.1	600.7	0.0	0.0
120.00		120.5	486.3					0.0	99.9	120.5	586.2	0.0	0.0
125.00		94.8	471.8					0.0	99.9	94.8	571.7	0.0	0.0
128.00	Appurtenance(s)	46.7	276.1	48.7	0.0	0.0	178.5	0.0	59.9	95.5	514.5	0.0	0.0
129.00	Appurtenance(s)	12.8	90.9	315.2	0.0	-71.9	732.4	0.0	20.0	327.9	843.2	0.0	0.0
129.10		4.6	9.1					0.0	1.9	4.6	11.0	0.0	0.0
129.40		10.4	27.1					0.0	5.8	10.4	33.0	0.0	0.0
130.00	Bot - Section 4	61.8	54.1					0.0	11.7	61.8	65.8	0.0	0.0
134.75	Top - Section 3	57.8	848.3					0.0	57.7	57.8	905.9	0.0	0.0
135.00		59.2	22.1					0.0	3.0	59.2	25.2	0.0	0.0
140.00		111.3	435.0					0.0	60.7	111.3	495.7	0.0	0.0
145.00		97.8	420.4					0.0	60.7	97.8	481.1	0.0	0.0
149.00		42.9	325.9					0.0	48.6	42.9	374.5	0.0	0.0
Totals:										5,728.57	36,736.2	0.00	0.00

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:12 AM

Customer: VERIZON WIRELESS

Load Case: 1.0D + 1.0W

Serviceability 60 mph

21 Iterations

Gust Response Factor :1.10

Dead Load Factor :1.00

Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-39.95	-6.85	0.00	-658.30	0.00	658.30	4,505.81	1,254.02	6,799.61	5,574.76	0.00	0.00	0.127
5.00	-38.58	-6.74	0.00	-624.05	0.00	624.05	4,462.67	1,231.56	6,558.27	5,421.89	0.02	-0.03	0.124
10.00	-37.24	-6.63	0.00	-590.35	0.00	590.35	4,418.16	1,209.10	6,321.30	5,269.32	0.06	-0.06	0.120
15.00	-35.91	-6.52	0.00	-557.20	0.00	557.20	4,372.28	1,186.65	6,088.69	5,117.12	0.13	-0.08	0.117
20.00	-34.61	-6.40	0.00	-524.61	0.00	524.61	4,325.03	1,164.19	5,860.44	4,965.40	0.24	-0.11	0.114
25.00	-33.33	-6.28	0.00	-492.59	0.00	492.59	4,276.41	1,141.73	5,636.54	4,814.25	0.37	-0.14	0.110
30.00	-32.07	-6.16	0.00	-461.18	0.00	461.18	4,226.43	1,119.28	5,417.01	4,663.75	0.53	-0.17	0.107
35.00	-30.84	-6.03	0.00	-430.38	0.00	430.38	4,175.07	1,096.82	5,201.84	4,514.00	0.72	-0.19	0.103
40.00	-29.62	-5.90	0.00	-400.21	0.00	400.21	4,122.35	1,074.36	4,991.03	4,365.09	0.94	-0.22	0.099
45.00	-28.43	-5.82	0.00	-370.70	0.00	370.70	4,068.25	1,051.90	4,784.58	4,217.12	1.19	-0.25	0.095
46.00	-28.19	-5.76	0.00	-364.87	0.00	364.87	4,057.27	1,047.41	4,743.81	4,187.64	1.24	-0.25	0.094
50.00	-26.58	-5.66	0.00	-341.84	0.00	341.84	4,012.79	1,029.45	4,582.49	4,070.16	1.46	-0.28	0.091
53.25	-25.29	-5.59	0.00	-323.45	0.00	323.45	3,103.79	857.68	3,816.84	3,151.41	1.65	-0.29	0.111
55.00	-24.94	-5.50	0.00	-313.67	0.00	313.67	3,090.99	851.13	3,758.77	3,114.29	1.76	-0.30	0.109
60.00	-23.96	-5.36	0.00	-286.18	0.00	286.18	3,053.48	832.41	3,595.31	3,008.43	2.10	-0.33	0.103
65.00	-23.00	-5.23	0.00	-259.36	0.00	259.36	3,014.61	813.70	3,435.48	2,902.92	2.46	-0.36	0.097
70.00	-22.06	-5.10	0.00	-233.21	0.00	233.21	2,974.36	794.98	3,279.29	2,797.85	2.85	-0.39	0.091
75.00	-21.14	-4.96	0.00	-207.72	0.00	207.72	2,932.75	776.27	3,126.73	2,693.32	3.27	-0.41	0.084
80.00	-20.23	-4.83	0.00	-182.91	0.00	182.91	2,889.76	757.55	2,977.80	2,589.42	3.71	-0.44	0.078
85.00	-16.19	-4.20	0.00	-158.77	0.00	158.77	2,845.41	738.84	2,832.51	2,486.24	4.19	-0.46	0.070
88.75	-15.55	-4.14	0.00	-143.00	0.00	143.00	2,811.24	724.80	2,725.93	2,409.39	4.55	-0.48	0.065
90.00	-15.20	-4.06	0.00	-137.84	0.00	137.84	2,799.68	720.13	2,690.85	2,383.88	4.68	-0.48	0.063
94.75	-13.88	-3.98	0.00	-118.57	0.00	118.57	2,025.49	569.71	2,105.10	1,707.99	5.17	-0.50	0.076
95.00	-13.84	-3.93	0.00	-117.57	0.00	117.57	2,024.13	568.96	2,099.57	1,704.58	5.20	-0.50	0.076
98.50	-13.32	-3.87	0.00	-103.81	0.00	103.81	2,004.73	558.48	2,022.95	1,656.96	5.57	-0.52	0.069
98.90	-13.24	-3.86	0.00	-102.26	0.00	102.26	2,002.47	557.28	2,014.28	1,651.52	5.62	-0.52	0.069
99.00	-10.05	-2.80	0.00	-100.38	0.00	100.38	2,001.90	556.98	2,012.12	1,650.16	5.63	-0.52	0.066
99.90	-9.91	-2.76	0.00	-97.86	0.00	97.86	1,996.78	554.29	1,992.70	1,637.92	5.73	-0.53	0.065
100.00	-9.90	-2.70	0.00	-97.59	0.00	97.59	1,996.21	553.99	1,990.54	1,636.56	5.74	-0.53	0.065
105.00	-9.27	-2.57	0.00	-84.11	0.00	84.11	1,966.92	539.02	1,884.42	1,568.70	6.30	-0.55	0.058
110.00	-8.65	-2.44	0.00	-71.28	0.00	71.28	1,936.25	524.05	1,781.20	1,501.07	6.89	-0.57	0.052
115.00	-8.05	-2.31	0.00	-59.10	0.00	59.10	1,904.22	509.08	1,680.89	1,433.79	7.49	-0.58	0.045
120.00	-7.47	-2.19	0.00	-47.55	0.00	47.55	1,870.82	494.10	1,583.49	1,366.93	8.11	-0.60	0.039
125.00	-6.90	-2.09	0.00	-36.63	0.00	36.63	1,836.04	479.13	1,488.99	1,300.59	8.74	-0.61	0.032
128.00	-6.38	-1.99	0.00	-30.37	0.00	30.37	1,814.52	470.15	1,433.69	1,261.07	9.13	-0.62	0.028
129.00	-5.54	-1.65	0.00	-28.39	0.00	28.39	1,807.24	467.16	1,415.49	1,247.95	9.26	-0.62	0.026
129.10	-5.53	-1.63	0.00	-28.22	0.00	28.22	1,806.51	466.86	1,413.67	1,246.64	9.27	-0.62	0.026
129.40	-5.48	-1.60	0.00	-27.73	0.00	27.73	1,804.31	465.96	1,408.24	1,242.71	9.31	-0.62	0.025
130.00	-5.42	-1.54	0.00	-26.77	0.00	26.77	1,799.90	464.16	1,397.40	1,234.86	9.39	-0.62	0.025
134.75	-4.51	-1.48	0.00	-19.44	0.00	19.44	1,781.88	456.90	1,354.03	1,203.23	10.02	-0.63	0.019
135.00	-4.49	-1.42	0.00	-19.07	0.00	19.07	1,780.01	456.15	1,349.60	1,199.98	10.05	-0.63	0.018
140.00	-4.00	-1.30	0.00	-11.99	0.00	11.99	1,741.76	441.18	1,262.47	1,135.37	10.72	-0.64	0.013
145.00	-3.52	-1.20	0.00	-5.49	0.00	5.49	1,702.15	426.21	1,178.25	1,071.60	11.39	-0.64	0.007

<u>Load Case:</u> 1.0D + 1.0W				Serviceability 60 mph								21 Iterations	
Gust Response Factor :1.10													
Dead Load Factor :1.00													
Wind Load Factor :1.00													
149.00	0.00	-1.16	0.00	-0.71	0.00	0.71	1,669.47	414.23	1,112.97	1,021.25	11.93	-0.64	0.001

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

Equivalent Lateral Forces Method Analysis

Spectral Response Acceleration for Short Period (S_s):	0.10
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07
Long-Period Transition Period (T_L):	12
Importance Factor (I_E):	1.00
Site Coefficient F_a :	1.60
Site Coefficient F_v :	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.11
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11
Seismic Response Coefficient (C_s):	0.04
Upper Limit C_s	0.04
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	1.78
Redundancy Factor (p):	1.00
Seismic Force Distribution Exponent (k):	1.64
Total Unfactored Dead Load:	39.95 k
Seismic Base Shear (E):	1.63 k

Load Case 1.2D + 1.0Ev + 1.0Eh

Seismic

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
43	147.00	374	1,353	0.024	39	457
42	142.50	481	1,652	0.029	47	588
41	137.50	496	1,605	0.028	46	605
40	134.88	25	79	0.001	2	31
39	132.38	906	2,756	0.049	79	1,106
38	129.70	66	193	0.003	6	80
37	129.25	33	96	0.002	3	40
36	129.05	11	32	0.001	1	13
35	128.50	111	321	0.006	9	135
34	126.50	336	949	0.017	27	410
33	122.50	572	1,531	0.027	44	698
32	117.50	586	1,466	0.026	42	716
31	112.50	601	1,399	0.025	40	734
30	107.50	615	1,330	0.024	38	751
29	102.50	630	1,259	0.022	36	769
28	99.95	13	25	0.000	1	16
27	99.45	119	227	0.004	7	145
26	98.95	14	26	0.000	1	17
25	98.70	55	103	0.002	3	67
24	96.75	482	876	0.015	25	588
23	94.88	35	61	0.001	2	42
22	92.38	1,321	2,226	0.039	64	1,613
21	89.38	353	563	0.010	16	431
20	86.88	638	973	0.017	28	780
19	82.50	885	1,239	0.022	36	1,081

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

18	77.50	903	1,141	0.020	33	1,103
17	72.50	921	1,043	0.018	30	1,125
16	67.50	940	946	0.017	27	1,148
15	62.50	958	850	0.015	24	1,170
14	57.50	976	755	0.013	22	1,192
13	54.13	346	242	0.004	7	422
12	51.63	1,292	838	0.015	24	1,578
11	48.00	1,614	928	0.016	27	1,971
10	45.50	235	124	0.002	4	288
9	42.50	1,191	561	0.010	16	1,454
8	37.50	1,212	465	0.008	13	1,481
7	32.50	1,234	374	0.007	11	1,507
6	27.50	1,256	290	0.005	8	1,534
5	22.50	1,278	212	0.004	6	1,560
4	17.50	1,299	143	0.003	4	1,587
3	12.50	1,321	83	0.001	2	1,614
2	7.50	1,343	37	0.001	1	1,640
1	2.50	1,365	6	0.000	0	1,667
ADC CG-1900DBFBDBTBP	149.00	73	268	0.005	8	89
Ericsson 8843 Rev 2	149.00	225	831	0.015	24	275
Ericsson Radio 4449	149.00	210	776	0.014	22	256
RFS DB-B1-6C-12AB-0Z	149.00	21	79	0.001	2	26
Raycap RRFDC-3315-PF	149.00	27	99	0.002	3	33
Ericsson AIR 6449 B7	149.00	264	975	0.017	28	322
Commscope NHH-65C-R2	149.00	310	1,144	0.020	33	378
Andrew LNX-6515DS-A1	149.00	149	552	0.010	16	182
Generic Round Low Pr	149.00	1,875	6,926	0.122	199	2,290
Generic 15" x 15" Pa	129.40	10	29	0.001	1	12
Generic 1' Std. Dish	129.10	6	18	0.000	1	7
Motorola PTP 600	129.00	9	27	0.000	1	11
Argus LLPX310R	129.00	86	250	0.004	7	105
Andrew Microwaves VH	129.00	27	79	0.001	2	33
Generic Round Side A	129.00	563	1,640	0.029	47	687
Andrew Microwaves VH	129.00	48	140	0.002	4	59
Samsung RRH-P4A	128.00	178	514	0.009	15	218
Raycap RNSNDC-7771-P	99.90	15	29	0.001	1	18
Generic HCS2.0	99.00	18	33	0.001	1	21
Nokia AHFIG 70.55 lb	99.00	212	400	0.007	11	259
Generic RRU (Model T	99.00	220	415	0.007	12	269
Nokia AEHC	99.00	311	587	0.010	17	380
Andrew TMBXX-6517-A2	99.00	174	328	0.006	9	212
Commscope FFHH-65C-R	99.00	377	712	0.013	20	461
Generic Round Low Pr	99.00	1,875	3,540	0.063	102	2,290
Andrew ETW190VS12UB	98.90	33	62	0.001	2	40
Commscope HELIAX Fib	98.50	40	75	0.001	2	49
Ericsson RRUS 31 B25	85.00	178	262	0.005	8	218
Ericsson RRUS 11/61	85.00	295	433	0.008	12	360
RFS APXV9ERR18-C-A20	85.00	186	273	0.005	8	227
Generic Round Platfo	85.00	2,500	3,675	0.065	106	3,053
		39,954	56,545	1.000	1,625	48,797

Load Case 0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
43	147.00	374	1,353	0.024	39	329
42	142.50	481	1,652	0.029	47	423
41	137.50	496	1,605	0.028	46	436
40	134.88	25	79	0.001	2	22
39	132.38	906	2,756	0.049	79	796
38	129.70	66	193	0.003	6	58

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

37	129.25	33	96	0.002	3	29
36	129.05	11	32	0.001	1	10
35	128.50	111	321	0.006	9	97
34	126.50	336	949	0.017	27	295
33	122.50	572	1,531	0.027	44	502
32	117.50	586	1,466	0.026	42	515
31	112.50	601	1,399	0.025	40	528
30	107.50	615	1,330	0.024	38	541
29	102.50	630	1,259	0.022	36	553
28	99.95	13	25	0.000	1	12
27	99.45	119	227	0.004	7	105
26	98.95	14	26	0.000	1	12
25	98.70	55	103	0.002	3	48
24	96.75	482	876	0.015	25	423
23	94.88	35	61	0.001	2	30
22	92.38	1,321	2,226	0.039	64	1,161
21	89.38	353	563	0.010	16	310
20	86.88	638	973	0.017	28	561
19	82.50	885	1,239	0.022	36	778
18	77.50	903	1,141	0.020	33	794
17	72.50	921	1,043	0.018	30	810
16	67.50	940	946	0.017	27	826
15	62.50	958	850	0.015	24	842
14	57.50	976	755	0.013	22	857
13	54.13	346	242	0.004	7	304
12	51.63	1,292	838	0.015	24	1,135
11	48.00	1,614	928	0.016	27	1,418
10	45.50	235	124	0.002	4	207
9	42.50	1,191	561	0.010	16	1,046
8	37.50	1,212	465	0.008	13	1,065
7	32.50	1,234	374	0.007	11	1,084
6	27.50	1,256	290	0.005	8	1,103
5	22.50	1,278	212	0.004	6	1,123
4	17.50	1,299	143	0.003	4	1,142
3	12.50	1,321	83	0.001	2	1,161
2	7.50	1,343	37	0.001	1	1,180
1	2.50	1,365	6	0.000	0	1,199
ADC CG-1900DDBFBDTBP	149.00	73	268	0.005	8	64
Ericsson 8843 Rev 2	149.00	225	831	0.015	24	198
Ericsson Radio 4449	149.00	210	776	0.014	22	185
RFS DB-B1-6C-12AB-0Z	149.00	21	79	0.001	2	19
Raycap RRFDC-3315-PF	149.00	27	99	0.002	3	24
Ericsson AIR 6449 B7	149.00	264	975	0.017	28	232
Commscope NHH-65C-R2	149.00	310	1,144	0.020	33	272
Andrew LNX-6515DS-A1	149.00	149	552	0.010	16	131
Generic Round Low Pr	149.00	1,875	6,926	0.122	199	1,647
Generic 15" x 15" Pa	129.40	10	29	0.001	1	9
Generic 1' Std. Dish	129.10	6	18	0.000	1	5
Motorola PTP 600	129.00	9	27	0.000	1	8
Argus LLPX310R	129.00	86	250	0.004	7	75
Andrew Microwaves VH	129.00	27	79	0.001	2	24
Generic Round Side A	129.00	563	1,640	0.029	47	494
Andrew Microwaves VH	129.00	48	140	0.002	4	42
Samsung RRH-P4A	128.00	178	514	0.009	15	157
Raycap RNSNDC-7771-P	99.90	15	29	0.001	1	13
Generic HCS2.0	99.00	18	33	0.001	1	15
Nokia AHFIG 70.55 lb	99.00	212	400	0.007	11	186
Generic RRU (Model T	99.00	220	415	0.007	12	193
Nokia AEHC	99.00	311	587	0.010	17	273
Andrew TMBXX-6517-A2	99.00	174	328	0.006	9	153
Commscope FFHH-65C-R	99.00	377	712	0.013	20	331
Generic Round Low Pr	99.00	1,875	3,540	0.063	102	1,647
Andrew ETW190VS12UB	98.90	33	62	0.001	2	29
Commscope HELIAX Fib	98.50	40	75	0.001	2	35

Site Number: 209106

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Site Name: Lee's Summit 2, MO

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Customer: VERIZON WIRELESS

Ericsson RRUS 31 B25	85.00	178	262	0.005	8	157
Ericsson RRUS 11/61	85.00	295	433	0.008	12	259
RFS APXV9ERR18-C-A20	85.00	186	273	0.005	8	163
Generic Round Platfo	85.00	2,500	3,675	0.065	106	2,197
		39,954	56,545	1.000	1,625	35,106

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

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Customer: VERIZON WIRELESS

Load Case 1.2D + 1.0Ev + 1.0Eh

Seismic

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-47.13	-1.63	0.00	-180.37	0.00	180.37	4,505.81	1,254.02	6,799.61	5,574.76	0.00	0.00	0.043
5.00	-45.49	-1.63	0.00	-172.24	0.00	172.24	4,462.67	1,231.56	6,558.27	5,421.89	0.00	-0.01	0.042
10.00	-43.88	-1.64	0.00	-164.08	0.00	164.08	4,418.16	1,209.10	6,321.30	5,269.32	0.02	-0.02	0.041
15.00	-42.29	-1.64	0.00	-155.90	0.00	155.90	4,372.28	1,186.65	6,088.69	5,117.12	0.04	-0.02	0.040
20.00	-40.73	-1.64	0.00	-147.72	0.00	147.72	4,325.03	1,164.19	5,860.44	4,965.40	0.07	-0.03	0.039
25.00	-39.19	-1.63	0.00	-139.54	0.00	139.54	4,276.41	1,141.73	5,636.54	4,814.25	0.10	-0.04	0.038
30.00	-37.69	-1.62	0.00	-131.39	0.00	131.39	4,226.43	1,119.28	5,417.01	4,663.75	0.15	-0.05	0.037
35.00	-36.21	-1.61	0.00	-123.26	0.00	123.26	4,175.07	1,096.82	5,201.84	4,514.00	0.20	-0.05	0.036
40.00	-34.75	-1.60	0.00	-115.19	0.00	115.19	4,122.35	1,074.36	4,991.03	4,365.09	0.26	-0.06	0.035
45.00	-34.46	-1.60	0.00	-107.18	0.00	107.18	4,068.25	1,051.90	4,784.58	4,217.12	0.33	-0.07	0.034
46.00	-32.49	-1.57	0.00	-105.58	0.00	105.58	4,057.27	1,047.41	4,743.81	4,187.64	0.35	-0.07	0.033
50.00	-30.91	-1.55	0.00	-99.29	0.00	99.29	4,012.79	1,029.45	4,582.49	4,070.16	0.41	-0.08	0.032
53.25	-30.49	-1.55	0.00	-94.25	0.00	94.25	3,103.79	857.68	3,816.84	3,151.41	0.46	-0.08	0.040
55.00	-29.30	-1.52	0.00	-91.54	0.00	91.54	3,090.99	851.13	3,758.77	3,114.29	0.49	-0.09	0.039
60.00	-28.13	-1.50	0.00	-83.92	0.00	83.92	3,053.48	832.41	3,595.31	3,008.43	0.59	-0.09	0.037
65.00	-26.98	-1.48	0.00	-76.41	0.00	76.41	3,014.61	813.70	3,435.48	2,902.92	0.69	-0.10	0.035
70.00	-25.86	-1.45	0.00	-69.02	0.00	69.02	2,974.36	794.98	3,279.29	2,797.85	0.80	-0.11	0.033
75.00	-24.75	-1.42	0.00	-61.78	0.00	61.78	2,932.75	776.27	3,126.73	2,693.32	0.92	-0.12	0.031
80.00	-23.67	-1.38	0.00	-54.69	0.00	54.69	2,889.76	757.55	2,977.80	2,589.42	1.05	-0.13	0.029
85.00	-19.03	-1.21	0.00	-47.78	0.00	47.78	2,845.41	738.84	2,832.51	2,486.24	1.19	-0.13	0.026
88.75	-18.60	-1.20	0.00	-43.23	0.00	43.23	2,811.24	724.80	2,725.93	2,409.39	1.29	-0.14	0.025
90.00	-16.99	-1.13	0.00	-41.74	0.00	41.74	2,799.68	720.13	2,690.85	2,383.88	1.33	-0.14	0.024
94.75	-16.95	-1.13	0.00	-36.37	0.00	36.37	2,025.49	569.71	2,105.10	1,707.99	1.47	-0.15	0.030
95.00	-16.36	-1.10	0.00	-36.09	0.00	36.09	2,024.13	568.96	2,099.57	1,704.58	1.48	-0.15	0.029
98.50	-16.20	-1.10	0.00	-32.23	0.00	32.23	2,004.73	558.48	2,022.95	1,656.96	1.59	-0.15	0.028
98.90	-16.19	-1.10	0.00	-31.79	0.00	31.79	2,002.47	557.28	2,014.28	1,651.52	1.60	-0.15	0.027
99.00	-12.13	-0.90	0.00	-31.68	0.00	31.68	2,001.90	556.98	2,012.12	1,650.16	1.60	-0.15	0.025
99.90	-12.12	-0.90	0.00	-30.87	0.00	30.87	1,996.78	554.29	1,992.70	1,637.92	1.63	-0.15	0.025
100.00	-11.35	-0.87	0.00	-30.78	0.00	30.78	1,996.21	553.99	1,990.54	1,636.56	1.64	-0.15	0.024
105.00	-10.60	-0.83	0.00	-26.45	0.00	26.45	1,966.92	539.02	1,884.42	1,568.70	1.80	-0.16	0.022
110.00	-9.86	-0.79	0.00	-22.31	0.00	22.31	1,936.25	524.05	1,781.20	1,501.07	1.97	-0.17	0.020
115.00	-9.15	-0.74	0.00	-18.38	0.00	18.38	1,904.22	509.08	1,680.89	1,433.79	2.15	-0.17	0.018
120.00	-8.45	-0.70	0.00	-14.66	0.00	14.66	1,870.82	494.10	1,583.49	1,366.93	2.33	-0.18	0.015
125.00	-8.04	-0.67	0.00	-11.17	0.00	11.17	1,836.04	479.13	1,488.99	1,300.59	2.51	-0.18	0.013
128.00	-7.69	-0.64	0.00	-9.16	0.00	9.16	1,814.52	470.15	1,433.69	1,261.07	2.63	-0.18	0.012
129.00	-6.76	-0.58	0.00	-8.52	0.00	8.52	1,807.24	467.16	1,415.49	1,247.95	2.66	-0.18	0.011
129.10	-6.72	-0.58	0.00	-8.46	0.00	8.46	1,806.51	466.86	1,413.67	1,246.64	2.67	-0.18	0.011
129.40	-6.64	-0.57	0.00	-8.29	0.00	8.29	1,804.31	465.96	1,408.24	1,242.71	2.68	-0.18	0.010
130.00	-5.53	-0.49	0.00	-7.95	0.00	7.95	1,799.90	464.16	1,397.40	1,234.86	2.70	-0.18	0.010
134.75	-5.50	-0.48	0.00	-5.63	0.00	5.63	1,781.88	456.90	1,354.03	1,203.23	2.89	-0.19	0.008
135.00	-4.90	-0.44	0.00	-5.51	0.00	5.51	1,780.01	456.15	1,349.60	1,199.98	2.90	-0.19	0.007
140.00	-4.31	-0.39	0.00	-3.33	0.00	3.33	1,741.76	441.18	1,262.47	1,135.37	3.09	-0.19	0.005
145.00	-3.85	-0.35	0.00	-1.39	0.00	1.39	1,702.15	426.21	1,178.25	1,071.60	3.29	-0.19	0.004
149.00	0.00	-0.33	0.00	0.00	0.00	0.00	1,669.47	414.23	1,112.97	1,021.25	3.45	-0.19	0.000

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number: OAA766911_C3_01

6/21/2021 9:15:13 AM

Customer: VERIZON WIRELESS

Load Case 0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-33.91	-1.63	0.00	-179.01	0.00	179.01	4,505.81	1,254.02	6,799.61	5,574.76	0.00	0.00	0.040
5.00	-32.73	-1.63	0.00	-170.88	0.00	170.88	4,462.67	1,231.56	6,558.27	5,421.89	0.00	-0.01	0.039
10.00	-31.57	-1.63	0.00	-162.73	0.00	162.73	4,418.16	1,209.10	6,321.30	5,269.32	0.02	-0.02	0.038
15.00	-30.42	-1.63	0.00	-154.57	0.00	154.57	4,372.28	1,186.65	6,088.69	5,117.12	0.04	-0.02	0.037
20.00	-29.30	-1.63	0.00	-146.42	0.00	146.42	4,325.03	1,164.19	5,860.44	4,965.40	0.06	-0.03	0.036
25.00	-28.20	-1.62	0.00	-138.28	0.00	138.28	4,276.41	1,141.73	5,636.54	4,814.25	0.10	-0.04	0.035
30.00	-27.11	-1.61	0.00	-130.17	0.00	130.17	4,226.43	1,119.28	5,417.01	4,663.75	0.15	-0.05	0.034
35.00	-26.05	-1.60	0.00	-122.09	0.00	122.09	4,175.07	1,096.82	5,201.84	4,514.00	0.20	-0.05	0.033
40.00	-25.00	-1.59	0.00	-114.07	0.00	114.07	4,122.35	1,074.36	4,991.03	4,365.09	0.26	-0.06	0.032
45.00	-24.79	-1.59	0.00	-106.12	0.00	106.12	4,068.25	1,051.90	4,784.58	4,217.12	0.33	-0.07	0.031
46.00	-23.38	-1.56	0.00	-104.53	0.00	104.53	4,057.27	1,047.41	4,743.81	4,187.64	0.34	-0.07	0.031
50.00	-22.24	-1.54	0.00	-98.28	0.00	98.28	4,012.79	1,029.45	4,582.49	4,070.16	0.41	-0.08	0.030
53.25	-21.94	-1.53	0.00	-93.28	0.00	93.28	3,103.79	857.68	3,816.84	3,151.41	0.46	-0.08	0.037
55.00	-21.08	-1.51	0.00	-90.60	0.00	90.60	3,090.99	851.13	3,758.77	3,114.29	0.49	-0.08	0.036
60.00	-20.24	-1.49	0.00	-83.04	0.00	83.04	3,053.48	832.41	3,595.31	3,008.43	0.58	-0.09	0.034
65.00	-19.41	-1.46	0.00	-75.60	0.00	75.60	3,014.61	813.70	3,435.48	2,902.92	0.69	-0.10	0.032
70.00	-18.60	-1.43	0.00	-68.29	0.00	68.29	2,974.36	794.98	3,279.29	2,797.85	0.80	-0.11	0.031
75.00	-17.81	-1.40	0.00	-61.12	0.00	61.12	2,932.75	776.27	3,126.73	2,693.32	0.92	-0.12	0.029
80.00	-17.03	-1.37	0.00	-54.11	0.00	54.11	2,889.76	757.55	2,977.80	2,589.42	1.04	-0.12	0.027
85.00	-13.69	-1.20	0.00	-47.27	0.00	47.27	2,845.41	738.84	2,832.51	2,486.24	1.18	-0.13	0.024
88.75	-13.38	-1.18	0.00	-42.78	0.00	42.78	2,811.24	724.80	2,725.93	2,409.39	1.28	-0.14	0.023
90.00	-12.22	-1.12	0.00	-41.30	0.00	41.30	2,799.68	720.13	2,690.85	2,383.88	1.32	-0.14	0.022
94.75	-12.19	-1.12	0.00	-35.99	0.00	35.99	2,025.49	569.71	2,105.10	1,707.99	1.46	-0.14	0.027
95.00	-11.77	-1.09	0.00	-35.71	0.00	35.71	2,024.13	568.96	2,099.57	1,704.58	1.47	-0.14	0.027
98.50	-11.66	-1.08	0.00	-31.89	0.00	31.89	2,004.73	558.48	2,022.95	1,656.96	1.57	-0.15	0.025
98.90	-11.65	-1.08	0.00	-31.46	0.00	31.46	2,002.47	557.28	2,014.28	1,651.52	1.59	-0.15	0.025
99.00	-8.73	-0.90	0.00	-31.35	0.00	31.35	2,001.90	556.98	2,012.12	1,650.16	1.59	-0.15	0.023
99.90	-8.72	-0.90	0.00	-30.54	0.00	30.54	1,996.78	554.29	1,992.70	1,637.92	1.62	-0.15	0.023
100.00	-8.16	-0.86	0.00	-30.46	0.00	30.46	1,996.21	553.99	1,990.54	1,636.56	1.62	-0.15	0.023
105.00	-7.62	-0.82	0.00	-26.17	0.00	26.17	1,966.92	539.02	1,884.42	1,568.70	1.78	-0.16	0.021
110.00	-7.10	-0.78	0.00	-22.07	0.00	22.07	1,936.25	524.05	1,781.20	1,501.07	1.95	-0.16	0.018
115.00	-6.58	-0.74	0.00	-18.18	0.00	18.18	1,904.22	509.08	1,680.89	1,433.79	2.13	-0.17	0.016
120.00	-6.08	-0.69	0.00	-14.50	0.00	14.50	1,870.82	494.10	1,583.49	1,366.93	2.31	-0.17	0.014
125.00	-5.78	-0.66	0.00	-11.05	0.00	11.05	1,836.04	479.13	1,488.99	1,300.59	2.49	-0.18	0.012
128.00	-5.53	-0.64	0.00	-9.07	0.00	9.07	1,814.52	470.15	1,433.69	1,261.07	2.60	-0.18	0.010
129.00	-4.86	-0.57	0.00	-8.43	0.00	8.43	1,807.24	467.16	1,415.49	1,247.95	2.64	-0.18	0.009
129.10	-4.83	-0.57	0.00	-8.37	0.00	8.37	1,806.51	466.86	1,413.67	1,246.64	2.64	-0.18	0.009
129.40	-4.77	-0.56	0.00	-8.20	0.00	8.20	1,804.31	465.96	1,408.24	1,242.71	2.65	-0.18	0.009
130.00	-3.98	-0.48	0.00	-7.86	0.00	7.86	1,799.90	464.16	1,397.40	1,234.86	2.68	-0.18	0.009
134.75	-3.96	-0.48	0.00	-5.58	0.00	5.58	1,781.88	456.90	1,354.03	1,203.23	2.86	-0.18	0.007
135.00	-3.52	-0.43	0.00	-5.46	0.00	5.46	1,780.01	456.15	1,349.60	1,199.98	2.87	-0.18	0.007
140.00	-3.10	-0.38	0.00	-3.29	0.00	3.29	1,741.76	441.18	1,262.47	1,135.37	3.06	-0.19	0.005
145.00	-2.77	-0.34	0.00	-1.38	0.00	1.38	1,702.15	426.21	1,178.25	1,071.60	3.26	-0.19	0.003
149.00	0.00	-0.33	0.00	0.00	0.00	0.00	1,669.47	414.23	1,112.97	1,021.25	3.41	-0.19	0.000

Site Number: 209106

Code: ANSI/TIA-222-H

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Site Name: Lee's Summit 2, MO

Engineering Number:OAA766911_C3_01

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Customer: VERIZON WIRELESS

Analysis Summary

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	25.28	0.00	47.92	0.00	0.00	2438.95	0.00	0.45
0.9D + 1.0W	25.27	0.00	35.94	0.00	0.00	2422.52	0.00	0.44
1.2D + 1.0Di + 1.0Wi	5.53	0.00	71.39	0.00	0.00	531.47	0.00	0.11
1.2D + 1.0Ev + 1.0Eh	1.63	0.00	47.13	0.00	0.00	180.37	0.00	0.04
0.9D - 1.0Ev + 1.0Eh	1.63	0.00	33.91	0.00	0.00	179.01	0.00	0.04
1.0D + 1.0W	6.85	0.00	39.95	0.00	0.00	658.30	0.00	0.13



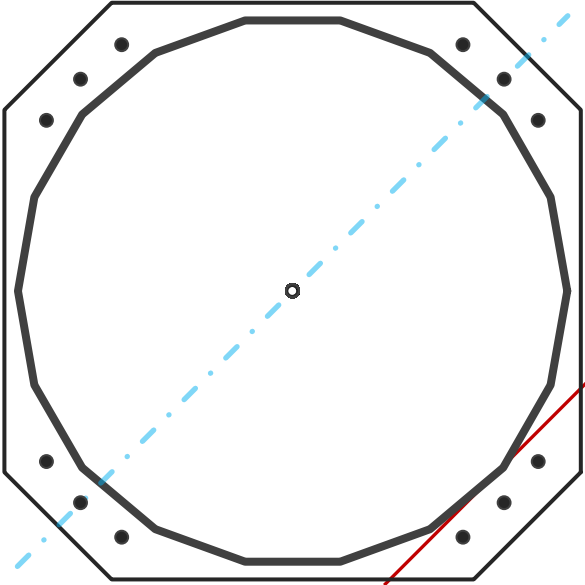
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	18	-
Diameter	60.41	in
Thickness	3/8	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	2,439.0	k-ft
Axial, Pu	47.9	k
Shear, Vu	25.3	k
Neutral Axis	225	°

Report Capacities		
Component	Capacity	Result
Base Plate	59%	Pass
Anchor Rods	62%	Pass
Dwyidag	-	-

Base Plate		
Shape	Square	-
Width	64.5	in
Thickness	2 1/2	in
Grade	A572-50	
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Clip	12	in
Orientation Offset	0	°
Anchor Rod Detail	d	η=0.5
Clear Distance	3 3/4	in
Applied Moment, Mu	1277.3	k
Bending Stress, φMn	2157.3	k



Original Anchor Rods		
Arrangement	Cluster	-
Quantity	12	-
Diameter, ø	2 1/4	in
Bolt Circle	67	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	6.0	in
Orientation Offset	0	°
Applied Force, Pu	149.5	k
Anchor Rods, φPn	243.6	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	25.3	2439.0	1.00
Anchor Rod Forces	25.3	2439.0	1.00
Additional Bolt (Grp1) Forces	0.0	0.0	0.00
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	0.0	0.00
Stiffener Forces	0.0	0.0	0.00

Geometric Properties

Section	Gross Area	Net Area	Individual Inertia	Threads per Inch	Moment of Inertia
-	in ²	in ²	in ⁴	#	in ⁴
Pole	70.3685	3.9094	0.1838		31706.10
Bolt	3.9761	3.2477	0.8393	4.5	21878.39
Bolt1	0.0000	0.0000	0.0000	0	0.00
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	0.0000	0.0000	0.0000		0.00
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate		
Shape	Square	-
Width, W	64.5	in
Thickness, t	2.5	in
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Base Plate Chord	22.603	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	3.75	-

Anchor Rods		
Anchor Rod Quantity, N	12	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	67	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	149.5	k
Applied Shear, Vu	0.7	k
Compressive Capacity, ϕP_n	243.6	k
Tensile Capacity, ϕR_n	0.614	OK
Interaction Capacity	0.619	OK

External Base Plate		
Chord Length AA	30.682	in
Additional AA	0.000	in
Section Modulus, Z	47.940	in ³
Applied Moment, Mu	1277.3	k-ft
Bending Capacity, ϕM_n	2157.3	k-ft
Capacity, Mu/ ϕM_n	0.592	OK

Chord Length AB	29.748	in
Additional AB	0.000	in
Section Modulus, Z	46.481	in ³
Applied Moment, Mu	1070.0	k-ft
Bending Capacity, ϕM_n	2091.7	k-ft
Capacity, Mu/ ϕM_n	0.512	OK

Bend Line Length	0.000	in
Additional Bend Line	0.000	in
Section Modulus, Z	0.000	in ³
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕM_n	0.0	k-ft
Capacity, Mu/ ϕM_n		

Internal Base Plate		
Arc Length	0.000	in
Section Modulus, Z	0.000	in ³
Moment Arm	0.000	in
Applied Moment, Mu	0.0	k-ft
Bending Capacity, ϕM_n	0.0	k-ft
Capacity, Mu/ ϕM_n		

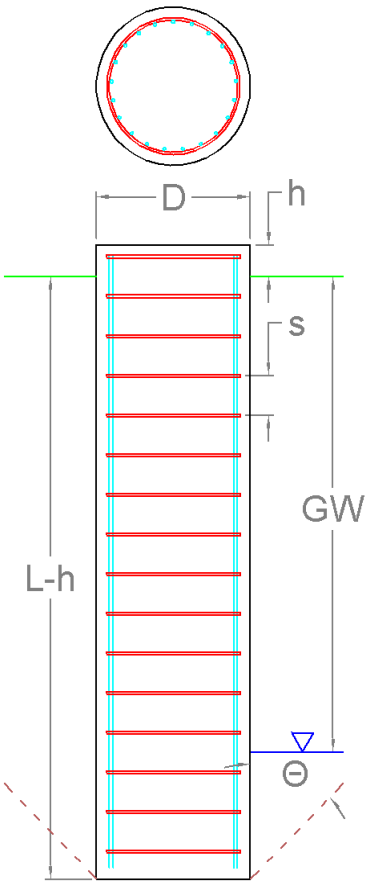
Pier Foundation Analysis (ANSI/TIA-222-H)

Foundation Analysis Parameters				
Pier Diameter	D	8.00	ft	
Pier Embedment	$L-h$	24.0	ft	
Pier Height above Ground	H	0.50	ft	
Water Table Depth [BGL]	GW	14	ft	
Pullout Angle	Θ	30	°	
Unit Weight of Concrete		150	pcf	
Uplift Skin Friction Factor		1.000		

Reactions		
Moment, M_u	2,439.0	k-ft
Shear, V_u	25.3	k
Axial, P_u	47.9	k
Uplift, T_u	0.0	k

Soil Properties						
Layer Depth (ft)		Unit Weight	Cohesion	Friction Angle	Ultimate Skin Friction	Ultimate Bearing Pressure
TOP	BTM	pcf	psf	°	psf	psf
0.0	3.0	120	0	0	0	0
3.0	8.5	125	2,000	0	1,000	0
8.5	14.5	125	0	35	4,000	0
14.5	25.0	130	8,000	0	2,000	20,000

Soil Strength Capacities		
Volume of Concrete	1,231.5	ft³
Weight of Concrete [Buoyancy Considered]	153.4	k
Average Soil Unit Weight	100.4	pcf
Skin Friction Resistance	1,218.9	k
Compressive Bearing Resistance	1,005.3	k
Pullout Weight [Minus Concrete Weight]	903.6	k
Compressive Force, P_u	82.2	k
Nominal Compressive Capacity, $\phi_s P_n$	1,668.2	k
$P_u / \phi_s P_n$	4.9%	
Total Lateral Resistance	5,747.1	k
Inflection Point [BGL]	18.0	ft
Moment at Inflection Point, M_D	2,907.6	k-ft
Nominal Moment Capacity, $\phi_s M_n$	17,839.4	k-ft
$M_D / \phi_s M_n$	16.3%	



Pier Strength Capacities		
Concrete Compressive Strength, f'_c	4,000	psi
Rebar Size #	9	
Rebar Area (Single)	1.00	in ²
Rebar Quantity	38	
Rebar Yield Strength, F_y	60	ksi
Vertical Rebar Clear Cover	3	in
Tie Rebar Size #	4	
Tie Rebar Area (Single)	0.20	in ²
Tie Rebar Spacing	12.0	in
Tie Rebar Yield Strength, F_y	60	ksi
Rebar Cage Diameter	87.87	in
Strength Bending/Tension Reduction Factor, ϕ_B	0.90	
Strength Shear Reduction Factor, ϕ_V	0.75	
Strength Compression Reduction Factor, ϕ_C	0.65	
Steel Elastic Modulus	29,000	ksi
Design Moment, M_u	2,452.8	k-ft
Moment Capacity, $\phi_B M_n$	7,350.9	k-ft
$M_u / \phi_B M_n$	33.4%	
Design Shear, V_u	293.6	k
Shear Capacity, $\phi_V V_n$	804.2	k
$V_u / \phi_V V_n$	36.5%	
Design Compression, P_u	82.2	k
Compression Capacity, $\phi_P P_n$	13,915.6	k
$P_u / \phi_P P_n$	0.6%	
Bending Reinforcement Ratio	0.005	

