AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**150 ft Monopole**
ATC Site Name	:	**Woods Chapel, MO**
ATC Asset Number	:	**306042**
Engineering Number	:	**13618801_C3_02**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**WOODS CHAPEL**
Carrier Site Number	:	**KS4070**
Site Location	:	**1204 N.e. Woods Chapel Road** **Lees Summit, MO 64064-1989** **38.983200,-94.350100**
County	:	**Jackson**
Date	:	**May 10, 2021**
Max Usage	:	**102%**
Result	:	**Pass**

STATE OF MISSOURI
SCOTT A. WIRGAU
NUMBER PE-2016036844
PROFESSIONAL ENGINEER

Prepared By:
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Structural Engineer III

Reviewed By:

Authorized by "EOR"
10 May 2021 03:05:34 cosign

COA: 2006031326

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 150 ft monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	Valmont Drawing #DC2215Z, dated March 3, 1995
Foundation Drawing	Valmont Drawing #2721, dated March 8, 1995
Geotechnical Report	Terracon Project #02955036, dated February 24, 1995

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:	90 mph (3-Second Gust, V_{asd}) / 115 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	40 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.11, S_1 = 0.11
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
152.0	3	Powerwave Allgon TT08-19DB111-001	Platform with Handrails	(1) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (12) 1 5/8" Coax (1) 2" conduit (1) 3/8" (0.38"-9.5mm) RET Control Cable	AT&T MOBILITY
	3	Commscope JAH4-65C-R4			
	3	Alcatel-Lucent RRH4X25-WCS			
	1	Raycap DC6-48-60-0-8C			
	1	Raycap DC6-48-60-18-8F(32.8 lbs)			
140.0	3	Kathrein Scala 800 10510V01	Low Profile Platform	(2) 1 1/4" Hybriflex Cable (12) 1 5/8" Coax	VERIZON WIRELESS
	3	Ericsson AIR 32 (57" Height)			
	3	Ericsson RRUS B13 w/ RRUS A2			
	2	RFS DB-B1-6C-12AB-0Z			
	3	Commscope TMA-T-DB78-DD-A			
	3	Commscope CBC78-DF-2X			
	6	Andrew LNX-6515DS-A1M			
126.0	3	Andrew ETW190VS12UB	Platform with Handrails	(6) 1 5/8" Coax (1) 1.46" (37.1mm) Hybrid (6) 7/8" Coax	T-MOBILE
	3	Nokia AirScale Dual RRH 4T4R B12/71 240W AHLOA			
	3	Nokia FRIG w/o Solar Shield			
	3	Nokia FHFB			
	1	Raycap ASU9338TYP01			
	6	Andrew TMBXX-6516-A2M with actuator			
	3	Commscope FFHH-65C-R3			
122.0	9	Generic 48" x 12" Panel	Platform with Handrails	(9) 1 1/4" Coax	SPRINT NEXTEL
115.0	2	DragonWave Horizon DUO (Radio)	Flush	(2) 1/2" Coax (1) 2" conduit	CLEARWIRE CORPORATION
	3	Samsung 2.5GHz nRRHv2			
	3	Argus LLPX310R			
	2	Andrew Microwaves VHLP2.5			

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
152.0	6	Andrew ETD819G-12UB	-	-	AT&T MOBILITY
	3	Alcatel-Lucent RRH2X60-1900A-4R			
	2	Powerwave Allgon P65-17-XLH-RR			
	1	Powerwave Allgon P65-16-XLH-RR			
	6	CSS XDUO6-80-R			
	3	Alcatel-Lucent RRH2x40W-07L (700)			

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
152.0	3	Nokia AirScale RRH 4T4R B5 160W AHCA	Platform with Handrails	(1) 0.39" (10mm) Fiber Trunk (2) 0.78" (19.7mm) 8 AWG 6 (1) 2" conduit	AT&T MOBILITY
	1	Raycap DC6-48-60-18-8C			
	3	Nokia AHLBBA			
	3	Nokia AirScale Dual RRH 4T4R B25/66 320W AHFIB			
	3	Nokia AEQK AirScale MAA 64T64R 192AE n77 200W			
	6	CCI TPA65R-BU8D			

[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	102%	Pass
Shaft	58%	Pass
Base Plate	28%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	4,267.7	69%
Axial (Kips)	104.3	5%
Shear (Kips)	40.2	56%

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) (°)
152.0	Nokia AirScale RRH 4T4R B5 160W AHCA	AT&T MOBILITY	0.000	0.000
	Raycap DC6-48-60-18-8C			
	Nokia AHLBBA			
	Nokia AirScale Dual RRH 4T4R B25/66 320W AHFIB			
	Nokia AEQK AirScale MAA 64T64R 192AE n77 200W			
	CCI TPA65R-BU8D			
115.0	Andrew Microwaves VHLP2.5	CLEARWIRE CORPORATION	0.851	0.879

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

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:

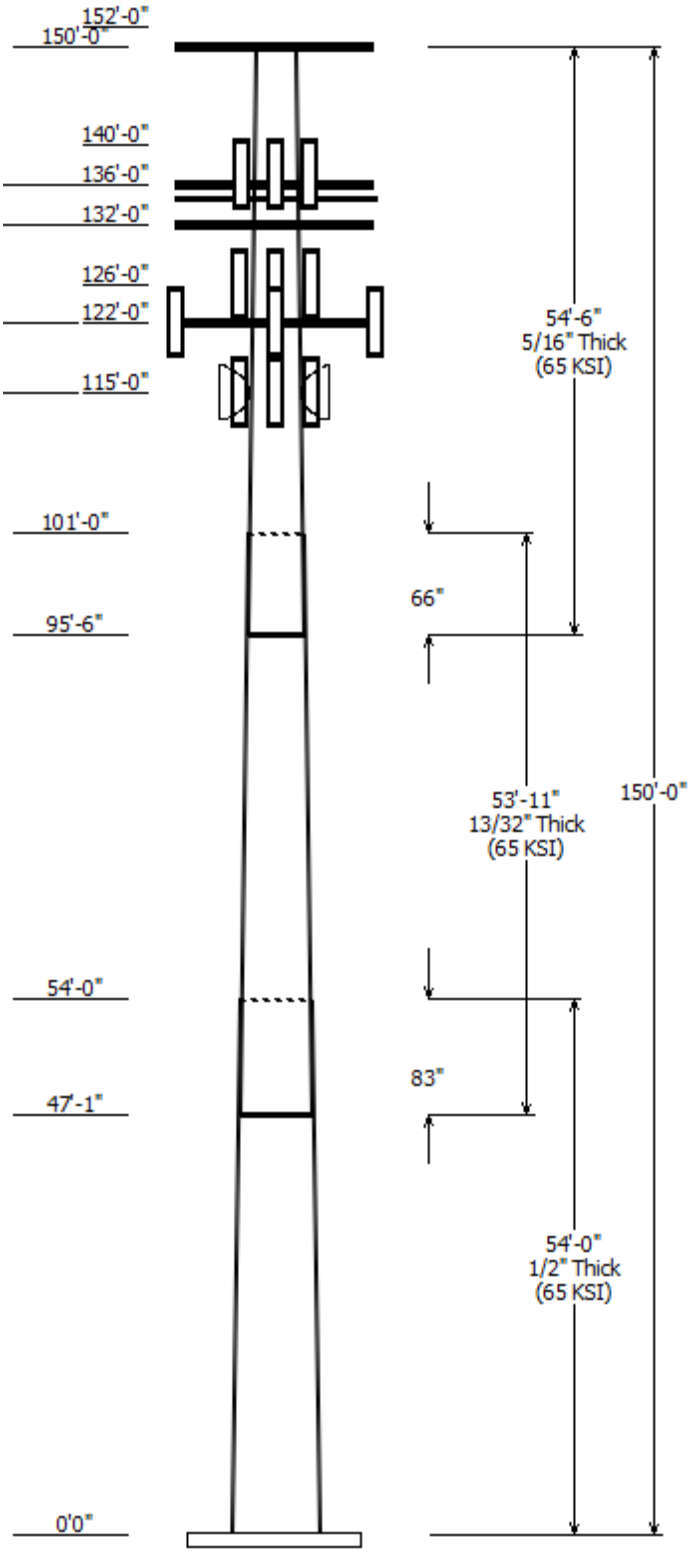
- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of ATC Tower Services

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 :	AT&T MOBILITY		
Pole :	306042	Code:	ANSI/TIA-222-G
Location :	Woods Chapel, MO		
Description :	150 ft Valmont Monopole	Struct Class :	II
Shape :	12 Sides	Exposure :	C
Height :	150.00 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.247980 (in/ft)		

Sections Properties

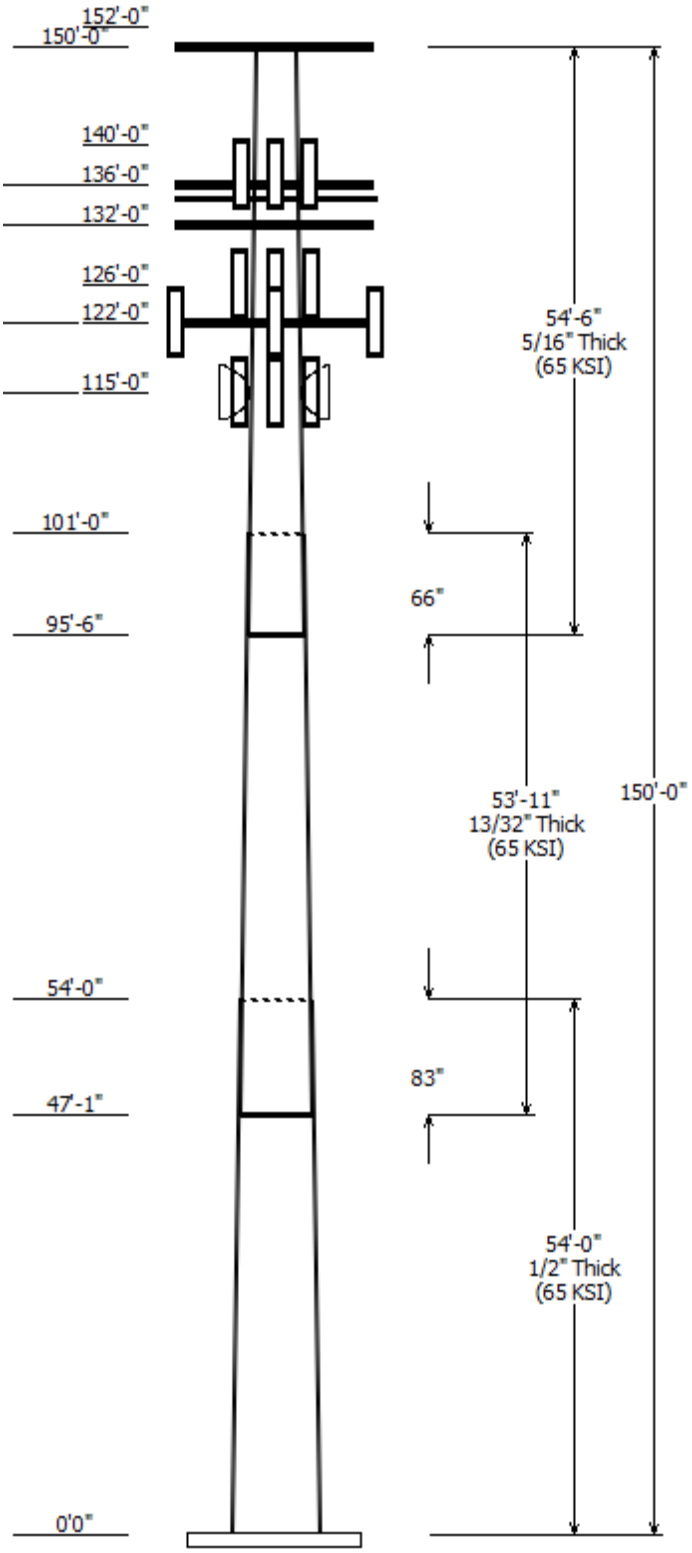
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	54.000	47.10	60.50	0.500		0.000	12 Sides	65
2	53.917	36.26	49.63	0.406	Slip Joint	83.000	12 Sides	65
3	54.500	24.74	38.25	0.313	Slip Joint	66.000	12 Sides	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
152.000	152.000	3	Commscope JAH4-65C-R4
152.000	152.000	6	CCI TPA65R-BU8D
152.000	152.000	3	Nokia AEQK AirScale MAA
152.000	152.000	3	Nokia AirScale Dual RRH 4T4R B
152.000	152.000	3	Alcatel-Lucent RRH4X25-WCS
152.000	152.000	3	Nokia AHLBBA
152.000	152.000	1	Raycap DC6-48-60-0-8C
152.000	152.000	1	Raycap DC6-48-60-18-8C
152.000	152.000	1	Raycap DC6-48-60-18-8F(32.8 lb
152.000	152.000	3	Nokia AirScale RRH 4T4R B5 160
152.000	152.000	3	Powerwave Allgon TT08-
150.000	150.000	1	Flat Platform with Handrails
140.000	136.000	6	Andrew LNX-6515DS-A1M
140.000	136.000	3	Kathrein Scala 800 10510V01
140.000	136.000	3	Ericsson AIR 32 (57" Height)
140.000	136.000	3	Ericsson RRUS B13 w/ RRUS A2
140.000	136.000	2	RFS DB-B1-6C-12AB-0Z
140.000	136.000	3	Commscope TMA-T-DB78-DD-
140.000	136.000	3	Commscope CBC78-DF-2X
136.000	136.000	1	Round Low Profile Platform
132.000	132.000	1	Round Platform w/ Handrails
126.000	126.000	3	Commscope FFHH-65C-R3
126.000	126.000	6	Andrew TMBXX-6516-A2M
126.000	126.000	1	Raycap ASU9338TYP01
126.000	126.000	3	Nokia FHFB
126.000	126.000	3	Nokia FRIG w/o Solar Shield
126.000	126.000	3	Nokia AirScale Dual RRH 4T4R B
126.000	126.000	3	Andrew ETW190VS12UB
122.000	122.000	1	Flat Platform with Handrails
122.000	122.000	9	Generic 48" x 12" Panel
115.000	115.000	1	Side Arms
115.000	115.000	2	Andrew Microwaves VHLP2.5
115.000	115.000	3	Argus LLPX310R
115.000	115.000	3	Samsung 2.5GHz nRRHv2
115.000	115.000	2	DragonWave Horizon DUO

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
5.000	115.0	2" conduit	Yes
5.000	140.0	1 1/4" Hybriflex	No
5.000	140.0	1 5/8" Coax	No
5.000	152.0	0.39" (10mm)	No



5.000	152.0	0.78" (19.7mm) 8	No
5.000	152.0	0.78" (19.7mm) 8	No
5.000	152.0	1 5/8" Coax	No
5.000	152.0	2" conduit	No
5.000	152.0	2" conduit	No
0.000	115.0	1/2" Coax	No
0.000	152.0	0.39" (10mm)	No
0.000	152.0	3/8" (0.38"-	No
0.000	122.0	1 1/4" Coax	No
0.000	126.0	1 5/8" Coax	Yes
0.000	126.0	1.46" (37.1mm)	Yes
0.000	126.0	7/8" Coax	Yes

Load Cases

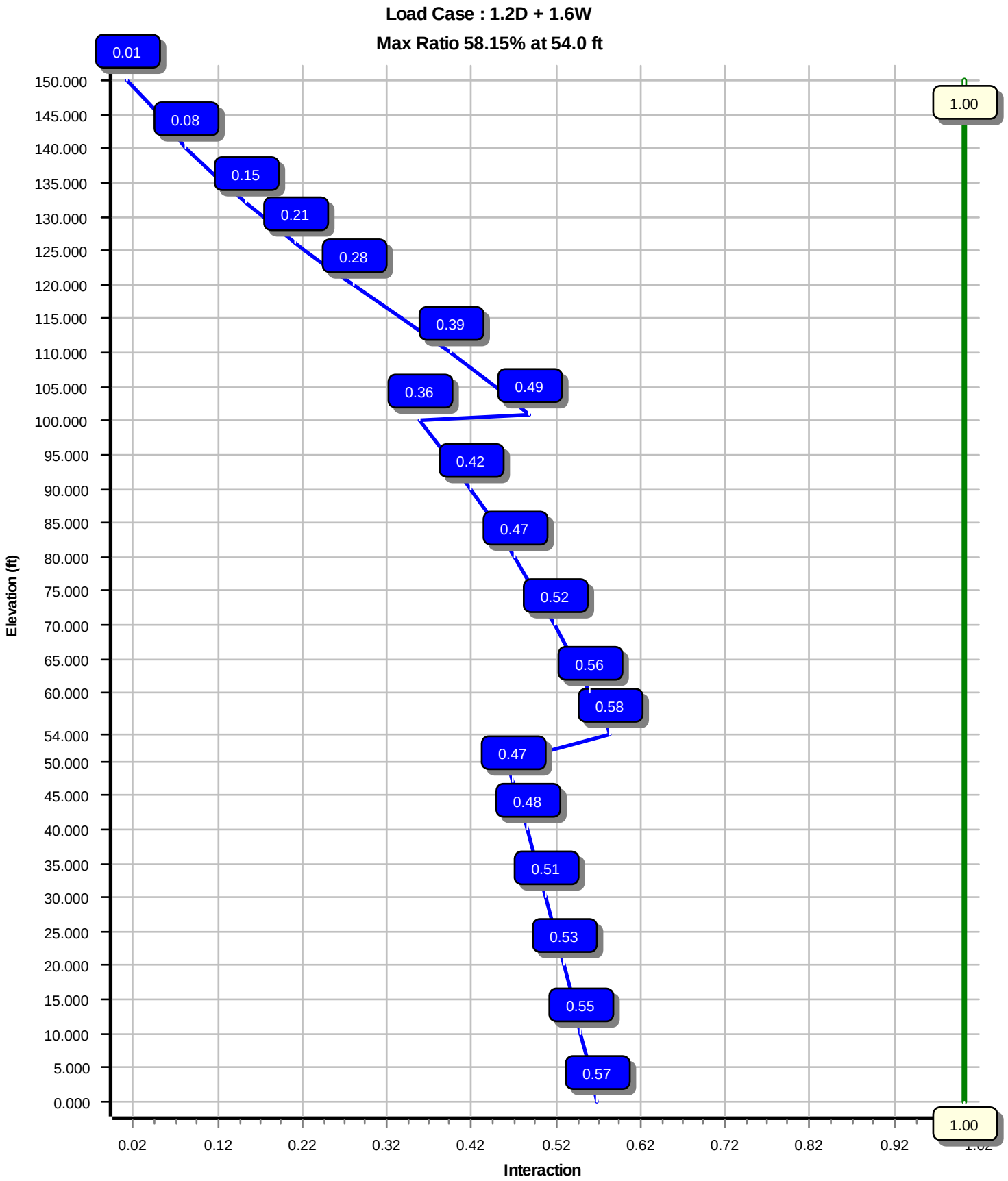
1.2D + 1.6W	90 mph with No Ice
0.9D + 1.6W	90 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	4267.67	40.25	61.99
0.9D + 1.6W	4231.44	40.23	46.48
1.2D + 1.0Di + 1.0Wi	1106.07	11.44	104.32
(1.2 + 0.2Sds) * DL + E ELFM	353.98	2.91	61.20
(1.2 + 0.2Sds) * DL + E EMAM	319.79	2.56	61.20
(0.9 - 0.2Sds) * DL + E ELFM	350.55	2.91	43.79
(0.9 - 0.2Sds) * DL + E EMAM	316.58	2.56	43.79
1.0D + 1.0W	1055.29	10.00	51.70

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W	115.00	10.209	0.879


Load Case : 1.2D + 1.6W
Max Ratio 58.15% at 54.0 ft
0.01
0.08
0.15
0.21
0.28
0.39
0.49
0.36
0.42
0.47
0.52
0.56
0.58
0.47
0.48
0.51
0.53
0.55
0.57
1.00
1.00
150.000
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
54.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
Elevation (ft)
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
Interaction

Site Number: 306042 **Code: ANSI/TIA-222-G**

Site Name: Woods Chapel, MO **Engineering Number:13618801_C3_02** **5/10/2021 2:32:53 PM**

Customer: AT&T MOBILITY

Analysis Parameters

Location :	**Jackson County, MO**	**Height (ft) :**	**150**
Code :	**ANSI/TIA-222-G**	**Base Diameter (in) :**	**60.50**
Shape :	**12 Sides**	**Top Diameter (in) :**	**24.74**
Pole Type :	**Taper**	**Taper (in/ft) :**	**0.248**
Pole Manfacturer :	**Valmont**	**Rotation (deg) :**	**0.00**

Ice & Wind Parameters

Structure Class:	**II**	**Design Wind Speed Without Ice:**	**90 mph**
Exposure Category:	**C**	**Design Wind Speed With Ice:**	**40 mph**
Topographic Category:	**1**	**Operational Wind Speed:**	**60 mph**
Crest Height:	**0 ft**	**Design Ice Thickness:**	**1.00 in**

Seismic Parameters

Analysis Method: **Equivalent Modal Analysis & Equivalent Lateral Force Methods**

Site Class: **D - Stiff Soil**

Period Based on Rayleigh Method (sec): **2.05**

T_L (sec):	**12**	**p:**	**1**	**C_s:**	**0.056**
S_s:	**0.113**	**S_1:**	**0.110**	**C_s Max:**	**0.056**
F_a:	**1.600**	**F_v:**	**2.360**	**C_s Min:**	**0.030**
S_{ds}:	**0.121**	**S_{d1}:**	**0.173**		

Load Cases

1.2D + 1.6W	**90 mph with No Ice**
0.9D + 1.6W	**90 mph with No Ice (Reduced DL)**
1.2D + 1.0Di + 1.0Wi	**40 mph with 1.00 in Radial Ice**
(1.2 + 0.2Sds) * DL + E ELFM	**Seismic Equivalent Lateral Forces Method**
(1.2 + 0.2Sds) * DL + E EMAM	**Seismic Equivalent Modal Analysis Method**
(0.9 - 0.2Sds) * DL + E ELFM	**Seismic (Reduced DL) Equivalent Lateral Forces Method**
(0.9 - 0.2Sds) * DL + E EMAM	**Seismic (Reduced DL) Equivalent Modal Analysis Method**
1.0D + 1.0W	**Serviceability 60 mph**

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	54.000	0.5000	65		0.00	15,769	60.50	0.00	96.60	44388.0	29.74	121.00	47.10	54.00	75.04	20807.7	22.57	94.22	0.247980
2-12	53.917	0.4060	65	Slip	83.00	10,204	49.63	47.08	64.36	19909.7	30.08	122.26	36.26	101.00	46.88	7694.8	21.26	89.33	0.247980
3-12	54.500	0.3125	65	Slip	66.00	5,819	38.25	95.50	38.18	7015.6	30.12	122.42	24.74	150.00	24.58	1872.1	18.53	79.17	0.247980
				Shaft Weight		31,793													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor
152.00	Powerwave Allgon TT08-	3	0.75	0.000	22.00	0.793	0.50	57.43	1.641	0.50
152.00	Nokia AirScale RRH 4T4R B5	3	0.75	0.000	36.80	1.286	0.50	89.19	1.334	0.50
152.00	Raycap DC6-48-60-18-8F(32.8	1	0.75	0.000	32.80	1.470	1.00	115.09	2.402	1.00
152.00	Raycap DC6-48-60-18-8C	1	0.75	0.000	16.00	2.030	1.00	93.65	3.043	1.00
152.00	Raycap DC6-48-60-0-8C	1	0.75	0.000	16.00	2.030	1.00	81.39	3.043	1.00
152.00	Nokia AHLBBA	3	0.75	0.000	94.80	2.820	0.50	197.78	4.335	0.50
152.00	Alcatel-Lucent RRH4X25-WCS	3	0.75	0.000	70.00	3.165	0.50	191.89	4.897	0.50
152.00	Nokia AirScale Dual RRH 4T4R	3	0.75	0.000	88.20	3.683	0.50	225.64	5.432	0.50
152.00	Nokia AEQK AirScale MAA	3	0.75	0.000	99.20	4.351	0.67	254.06	6.219	0.67
152.00	Commscope JAH4-65C-R4	3	0.75	0.000	87.30	12.862	0.67	440.26	17.858	0.67
152.00	CCI TPA65R-BU8D	6	0.75	0.000	82.50	18.089	0.63	542.39	23.014	0.63
150.00	Flat Platform with Handrails	1	1.00	0.000	2,000.00	42.400	1.00	3,895.61	70.373	1.00
140.00	Commscope CBC78-DF-2X	3	0.80	-4.000	13.20	0.388	0.50	35.00	0.957	0.50
140.00	Commscope TMA-T-DB78-DD-A	3	0.80	-4.000	38.50	1.484	0.50	91.24	2.550	0.50
140.00	RFS DB-B1-6C-12AB-0Z	2	0.80	-4.000	21.40	2.512	0.67	127.16	3.892	0.67
140.00	Ericsson RRUS B13 w/ RRUS A2	3	0.80	-4.000	72.00	2.791	0.50	168.30	4.241	0.50
140.00	Ericsson AIR 32 (57" Height)	3	0.80	-4.000	99.00	6.175	0.67	295.56	9.093	0.67
140.00	Kathrein Scala 800 10510V01	3	0.80	-4.000	37.50	6.177	0.59	180.28	8.982	0.59
140.00	Andrew LNX-6515DS-A1M	6	0.80	-4.000	49.80	11.410	0.67	353.33	15.707	0.67
136.00	Round Low Profile Platform	1	1.00	0.000	1,500.00	21.700	1.00	2,356.87	47.092	1.00
132.00	Round Platform w/ Handrails	1	1.00	0.000	2,000.00	27.200	1.00	3,707.96	59.420	1.00
126.00	Andrew ETW190VS12UB	3	0.75	0.000	11.00	0.654	0.50	35.24	1.373	0.50
126.00	Nokia AirScale Dual RRH 4T4R	3	0.75	0.000	83.80	2.218	0.67	167.39	3.552	0.67
126.00	Nokia FRIG w/o Solar Shield	3	0.75	0.000	54.00	2.293	0.50	130.33	3.599	0.50
126.00	Nokia FHFB	3	0.75	0.000	48.50	2.415	0.50	139.14	3.808	0.50
126.00	Raycap ASU9338TYP01	1	0.75	0.000	14.90	3.213	1.00	112.89	4.749	1.00
126.00	Andrew TMBXX-6516-A2M with	6	0.75	0.000	34.60	6.160	0.67	209.70	9.607	0.67
126.00	Commscope FFHH-65C-R3	3	0.75	0.000	125.70	21.138	0.63	670.59	26.028	0.63
122.00	Generic 48" x 12" Panel	9	0.75	0.000	30.00	5.067	0.66	178.05	7.513	0.66
122.00	Flat Platform with Handrails	1	1.00	0.000	2,000.00	42.400	1.00	3,858.43	69.825	1.00
115.00	DragonWave Horizon DUO	2	0.80	0.000	7.00	0.200	1.00	23.97	0.539	1.00
115.00	Samsung 2.5GHz nRRHv2	3	0.80	0.000	50.70	2.496	0.67	143.37	3.875	0.67
115.00	Argus LLPX310R	3	0.80	0.000	28.60	4.292	0.63	145.59	6.439	0.63
115.00	Andrew Microwaves VHLP2.5	2	1.00	0.000	47.60	8.430	1.00	271.32	10.641	1.00
115.00	Side Arms	1	1.00	0.000	560.00	8.500	1.00	1,066.46	16.187	1.00
Totals	Num Loadings:35	99			13,045.50			35,343.03		

Linear Appurtenance Properties

Load Case Azimuth (deg) : 0

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax / Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	152.00	1	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	152.00	1	3/8" (0.38"- 9.5mm)	0.38	0.23	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
5.00	152.00	1	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY

5.00	152.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
5.00	152.00	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
5.00	152.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
5.00	152.00	1	2" conduit	2.38	3.65	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
5.00	152.00	1	2" conduit	2.38	3.65	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
5.00	140.00	2	1 1/4" Hybriflex Cable	1.54	1.00	N	0	0.00	0.00	90	0.00	N	VERIZON WIRELESS
5.00	140.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	90	0.00	N	VERIZON WIRELESS
0.00	126.00	6	1 5/8" Coax	1.98	0.82	N	6	0.00	0.00	180	0.50	Y	T-MOBILE
0.00	126.00	1	1.46" (37.1mm) Hybrid	1.46	1.70	N	1	0.00	0.00	90	0.50	Y	T-MOBILE
0.00	126.00	6	7/8" Coax	1.09	0.33	N	6	0.00	0.00	90	0.50	Y	T-MOBILE
0.00	122.00	9	1 1/4" Coax	1.55	0.63	N	0	0.00	0.00	0	0.00	N	SPRINT NEXTEL
0.00	115.00	2	1/2" Coax	0.63	0.15	N	0	0.00	0.00	0	0.00	N	CLEARWIRE
5.00	115.00	1	2" conduit	2.38	3.65	N	1	0.00	0.00	90	0.50	Y	CLEARWIRE

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		0.5000	60.500	96.600	44,388.0	29.74	121.00	72.3	1417.	0.0	0.0
5.00		0.5000	59.260	94.604	41,692.6	29.08	118.52	73.0	1359.	0.0	1,626.6
10.00		0.5000	58.020	92.608	39,108.7	28.41	116.04	73.7	1302.	0.0	1,592.6
15.00		0.5000	56.780	90.611	36,633.7	27.75	113.56	74.5	1246.	0.0	1,558.6
20.00		0.5000	55.540	88.615	34,265.5	27.08	111.08	75.2	1191.	0.0	1,524.7
25.00		0.5000	54.300	86.619	32,001.5	26.42	108.60	75.9	1138.	0.0	1,490.7
30.00		0.5000	53.061	84.623	29,839.6	25.76	106.12	76.6	1086.	0.0	1,456.7
35.00		0.5000	51.821	82.626	27,777.3	25.09	103.64	77.3	1035.	0.0	1,422.8
40.00		0.5000	50.581	80.630	25,812.2	24.43	101.16	78.1	985.9	0.0	1,388.8
45.00		0.5000	49.341	78.634	23,942.1	23.76	98.68	78.8	937.4	0.0	1,354.8
47.08	Bot - Section 2	0.5000	48.824	77.802	23,190.4	23.49	97.65	79.1	917.6	0.0	554.5
50.00		0.5000	48.101	76.638	22,164.6	23.10	96.20	79.5	890.2	0.0	1,400.5
54.00	Top - Section 1	0.4060	47.921	62.117	17,900.4	28.95	118.03	73.1	721.6	0.0	1,886.6
55.00		0.4060	47.673	61.793	17,621.6	28.78	117.42	73.3	714.1	0.0	210.8
60.00		0.4060	46.433	60.172	16,270.9	27.97	114.37	74.2	676.9	0.0	1,037.6
65.00		0.4060	45.193	58.551	14,991.1	27.15	111.31	75.1	640.8	0.0	1,010.0
70.00		0.4060	43.953	56.930	13,780.2	26.33	108.26	76.0	605.7	0.0	982.4
75.00		0.4060	42.713	55.309	12,636.3	25.51	105.21	76.9	571.5	0.0	954.8
80.00		0.4060	41.474	53.688	11,557.5	24.69	102.15	77.8	538.4	0.0	927.2
85.00		0.4060	40.234	52.068	10,542.0	23.87	99.10	78.7	506.2	0.0	899.7
90.00		0.4060	38.994	50.447	9,587.8	23.06	96.04	79.6	475.0	0.0	872.1
95.00		0.4060	37.754	48.826	8,692.9	22.24	92.99	80.5	444.8	0.0	844.5
95.50	Bot - Section 3	0.4060	37.630	48.664	8,606.6	22.16	92.68	80.6	441.8	0.0	82.9
100.0		0.4060	36.514	47.205	7,855.6	21.42	89.94	81.4	415.6	0.0	1,310.0
101.0	Top - Section 2	0.3125	36.891	36.807	6,285.9	28.95	118.05	73.1	329.2	0.0	285.7
105.0		0.3125	35.899	35.809	5,788.3	28.10	114.88	74.1	311.5	0.0	494.2
110.0		0.3125	34.659	34.561	5,204.1	27.04	110.91	75.2	290.1	0.0	598.6
115.0		0.3125	33.419	33.314	4,660.6	25.98	106.94	76.4	269.4	0.0	577.4
120.0		0.3125	32.179	32.066	4,156.3	24.91	102.97	77.5	249.5	0.0	556.2
122.0		0.3125	31.683	31.567	3,965.3	24.49	101.39	78.0	241.8	0.0	216.5
125.0		0.3125	30.939	30.818	3,689.8	23.85	99.01	78.7	230.4	0.0	318.4
126.0		0.3125	30.692	30.569	3,600.9	23.64	98.21	78.9	226.7	0.0	104.4
130.0		0.3125	29.700	29.571	3,259.6	22.79	95.04	79.9	212.0	0.0	409.3
132.0		0.3125	29.204	29.072	3,097.3	22.36	93.45	80.3	204.9	0.0	199.5
135.0		0.3125	28.460	28.323	2,864.2	21.72	91.07	81.0	194.4	0.0	293.0
136.0		0.3125	28.212	28.074	2,789.1	21.51	90.28	81.3	191.0	0.0	96.0
140.0		0.3125	27.220	27.075	2,502.1	20.66	87.10	81.9	177.6	0.0	375.3
145.0		0.3125	25.980	25.828	2,171.9	19.60	83.14	81.9	161.5	0.0	450.0
150.0		0.3125	24.740	24.580	1,872.1	18.53	79.17	81.9	146.2	0.0	428.8
											31,793.3

Site Number: 306042 | Code: ANSI/TIA-222-G |

Site Name: Woods Chapel, MO | Engineering Number:13618801_C3_02 | 5/10/2021 2:32:53 PM

Customer: AT&T MOBILITY

Load Case: 1.2D + 1.6W | 90 mph with No Ice | 21 Iterations

Gust Response Factor :1.10 | Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		380.6	0.0					0.0	0.0	380.6	0.0	0.0	0.0
5.00		753.3	1,951.9					0.0	89.2	753.3	2,041.0	0.0	0.0
10.00		737.6	1,911.1					0.0	306.5	737.6	2,217.7	0.0	0.0
15.00		733.1	1,870.4					0.0	306.5	733.1	2,176.9	0.0	0.0
20.00		747.9	1,829.6					0.0	306.5	747.9	2,136.1	0.0	0.0
25.00		766.8	1,788.8					0.0	306.5	766.8	2,095.4	0.0	0.0
30.00		778.9	1,748.1					0.0	306.5	778.9	2,054.6	0.0	0.0
35.00		785.9	1,707.3					0.0	306.5	785.9	2,013.9	0.0	0.0
40.00		789.1	1,666.6					0.0	306.5	789.1	1,973.1	0.0	0.0
45.00		559.3	1,625.8					0.0	306.5	559.3	1,932.4	0.0	0.0
47.08	Bot - Section 2	398.0	665.4					0.0	127.7	398.0	793.1	0.0	0.0
50.00		553.1	1,680.5					0.0	178.8	553.1	1,859.4	0.0	0.0
54.00	Top - Section 1	399.1	2,263.9					0.0	245.2	399.1	2,509.1	0.0	0.0
55.00		476.0	253.0					0.0	61.3	476.0	314.3	0.0	0.0
60.00		789.1	1,245.1					0.0	306.5	789.1	1,551.6	0.0	0.0
65.00		781.1	1,212.0					0.0	306.5	781.1	1,518.5	0.0	0.0
70.00		771.6	1,178.9					0.0	306.5	771.6	1,485.4	0.0	0.0
75.00		760.8	1,145.8					0.0	306.5	760.8	1,452.3	0.0	0.0
80.00		748.9	1,112.7					0.0	306.5	748.9	1,419.2	0.0	0.0
85.00		735.8	1,079.6					0.0	306.5	735.8	1,386.1	0.0	0.0
90.00		721.8	1,046.5					0.0	306.5	721.8	1,353.0	0.0	0.0
95.00		392.6	1,013.4					0.0	306.5	392.6	1,319.9	0.0	0.0
95.50	Bot - Section 3	354.9	99.5					0.0	30.6	354.9	130.2	0.0	0.0
100.00		389.7	1,572.0					0.0	275.9	389.7	1,847.9	0.0	0.0
101.00	Top - Section 2	347.4	342.9					0.0	61.3	347.4	404.2	0.0	0.0
105.00		616.3	593.0					0.0	245.2	616.3	838.3	0.0	0.0
110.00		669.2	718.4					0.0	306.5	669.2	1,024.9	0.0	0.0
115.00	Appurtenance(s)	651.4	692.9	1,635.1	0.0	0.0	1,088.5	0.0	306.5	2,286.5	2,088.0	0.0	0.0
120.00		447.0	667.4					0.0	282.8	447.0	950.3	0.0	0.0
122.00	Appurtenance(s)	311.7	259.8	2,972.9	0.0	0.0	2,724.0	0.0	113.1	3,284.6	3,097.0	0.0	0.0
125.00		247.1	382.1					0.0	149.3	247.1	531.4	0.0	0.0
126.00	Appurtenance(s)	302.0	125.3	2,778.8	0.0	0.0	1,429.8	0.0	49.8	3,080.8	1,604.9	0.0	0.0
130.00		358.8	491.1					0.0	157.8	358.8	648.9	0.0	0.0
132.00	Appurtenance(s)	292.0	239.5	1,265.4	0.0	0.0	2,400.0	0.0	78.9	1,557.4	2,718.3	0.0	0.0
135.00		231.2	351.5					0.0	118.3	231.2	469.9	0.0	0.0
136.00	Appurtenance(s)	281.7	115.1	1,015.9	0.0	0.0	1,800.0	0.0	39.4	1,297.6	1,954.6	0.0	0.0
140.00	Appurtenance(s)	495.8	450.4	2,980.1	0.0	-11,920.6	1,346.6	0.0	157.8	3,475.9	1,954.8	0.0	0.0
145.00		531.7	540.1					0.0	126.2	531.7	666.2	0.0	0.0
150.00	Appurtenance(s)	260.5	514.6	2,026.3	0.0	0.0	2,400.0	0.0	126.2	2,286.8	3,040.8	0.0	0.0
								Totals:		36,023.0	59,573.6	0.00	0.00

Load Case: 1.2D + 1.6W — 90 mph with No Ice — 21 Iterations

Gust Response Factor :1.10 — Wind Importance Factor 1.00
Dead Load Factor :1.20
Wind Load Factor :1.60

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	-61.99	-40.25	0.00	-4,267.67	0.00	4,267.67	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.565
5.00	-59.86	-39.63	0.00	-4,066.43	0.00	4,066.43	6,215.54	3,107.77	15,067.9	7,441.50	0.07	-0.13	0.556
10.00	-57.55	-39.03	0.00	-3,868.26	0.00	3,868.26	6,144.79	3,072.40	14,579.4	7,200.24	0.29	-0.27	0.547
15.00	-55.29	-38.41	0.00	-3,673.14	0.00	3,673.14	6,071.43	3,035.72	14,092.2	6,959.61	0.64	-0.41	0.537
20.00	-53.06	-37.78	0.00	-3,481.08	0.00	3,481.08	5,995.47	2,997.74	13,606.6	6,719.80	1.14	-0.54	0.527
25.00	-50.88	-37.11	0.00	-3,292.20	0.00	3,292.20	5,916.91	2,958.45	13,123.0	6,481.00	1.79	-0.69	0.517
30.00	-48.75	-36.43	0.00	-3,106.64	0.00	3,106.64	5,835.74	2,917.87	12,642.0	6,243.42	2.58	-0.83	0.506
35.00	-46.66	-35.73	0.00	-2,924.49	0.00	2,924.49	5,751.96	2,875.98	12,163.8	6,007.26	3.53	-0.97	0.495
40.00	-44.61	-35.02	0.00	-2,745.85	0.00	2,745.85	5,665.59	2,832.79	11,688.9	5,772.72	4.62	-1.12	0.484
45.00	-42.63	-34.50	0.00	-2,570.76	0.00	2,570.76	5,576.61	2,788.30	11,217.6	5,539.99	5.87	-1.26	0.472
47.08	-41.80	-34.14	0.00	-2,498.90	0.00	2,498.90	5,538.76	2,769.38	11,022.5	5,443.60	6.44	-1.33	0.467
50.00	-39.89	-33.61	0.00	-2,399.34	0.00	2,399.34	5,485.02	2,742.51	10,750.5	5,309.27	7.28	-1.41	0.459
54.00	-37.35	-33.20	0.00	-2,264.90	0.00	2,264.90	4,089.14	2,044.57	8,015.68	3,958.64	8.51	-1.53	0.582
55.00	-36.99	-32.78	0.00	-2,231.70	0.00	2,231.70	4,077.72	2,038.86	7,951.24	3,926.82	8.84	-1.56	0.578
60.00	-35.37	-32.05	0.00	-2,067.82	0.00	2,067.82	4,019.09	2,009.54	7,629.58	3,767.96	10.57	-1.74	0.558
65.00	-33.78	-31.33	0.00	-1,907.56	0.00	1,907.56	3,957.85	1,978.93	7,309.16	3,609.72	12.48	-1.91	0.537
70.00	-32.23	-30.60	0.00	-1,750.94	0.00	1,750.94	3,894.01	1,947.01	6,990.39	3,452.29	14.58	-2.08	0.516
75.00	-30.72	-29.88	0.00	-1,597.94	0.00	1,597.94	3,827.57	1,913.78	6,673.67	3,295.87	16.85	-2.26	0.493
80.00	-29.24	-29.16	0.00	-1,448.55	0.00	1,448.55	3,758.52	1,879.26	6,359.40	3,140.67	19.31	-2.43	0.469
85.00	-27.81	-28.44	0.00	-1,302.77	0.00	1,302.77	3,686.86	1,843.43	6,047.97	2,986.87	21.95	-2.60	0.444
90.00	-26.41	-27.74	0.00	-1,160.55	0.00	1,160.55	3,612.61	1,806.30	5,739.81	2,834.68	24.76	-2.76	0.417
95.00	-25.07	-27.32	0.00	-1,021.88	0.00	1,021.88	3,535.74	1,767.87	5,435.30	2,684.29	27.74	-2.93	0.388
95.50	-24.92	-26.99	0.00	-1,008.22	0.00	1,008.22	3,527.92	1,763.96	5,405.07	2,669.36	28.05	-2.94	0.385
100.00	-23.06	-26.54	0.00	-886.77	0.00	886.77	3,456.28	1,728.14	5,134.86	2,535.91	30.89	-3.08	0.357
101.00	-22.64	-26.20	0.00	-860.23	0.00	860.23	2,422.80	1,211.40	3,656.13	1,805.62	31.54	-3.12	0.486
105.00	-21.77	-25.59	0.00	-755.44	0.00	755.44	2,386.99	1,193.50	3,503.59	1,730.29	34.20	-3.24	0.446
110.00	-20.71	-24.92	0.00	-627.47	0.00	627.47	2,339.89	1,169.95	3,313.75	1,636.54	37.68	-3.41	0.393
115.00	-18.71	-22.56	0.00	-502.86	0.00	502.86	2,290.19	1,145.09	3,125.22	1,543.43	41.33	-3.56	0.334
120.00	-17.76	-22.08	0.00	-390.04	0.00	390.04	2,237.88	1,118.94	2,938.40	1,451.17	45.14	-3.70	0.277
122.00	-14.86	-18.62	0.00	-345.88	0.00	345.88	2,216.23	1,108.11	2,864.24	1,414.54	46.70	-3.75	0.252
125.00	-14.33	-18.35	0.00	-290.01	0.00	290.01	2,182.97	1,091.48	2,753.69	1,359.95	49.07	-3.81	0.220
126.00	-12.92	-15.18	0.00	-271.66	0.00	271.66	2,171.67	1,085.84	2,717.04	1,341.84	49.87	-3.84	0.209
130.00	-12.28	-14.79	0.00	-210.94	0.00	210.94	2,125.45	1,062.73	2,571.50	1,269.97	53.12	-3.91	0.172
132.00	-9.67	-13.06	0.00	-181.36	0.00	181.36	2,101.72	1,050.86	2,499.42	1,234.37	54.76	-3.95	0.152
135.00	-9.21	-12.80	0.00	-142.19	0.00	142.19	2,065.33	1,032.67	2,392.23	1,181.43	57.26	-3.99	0.125
136.00	-7.35	-11.37	0.00	-129.39	0.00	129.39	2,053.00	1,026.50	2,356.76	1,163.91	58.10	-4.01	0.115
140.00	-5.64	-7.77	0.00	-83.90	0.00	83.90	1,995.73	997.87	2,208.66	1,090.78	61.47	-4.05	0.080
145.00	-5.01	-7.20	0.00	-45.05	0.00	45.05	1,903.77	951.88	2,008.69	992.02	65.73	-4.09	0.048
150.00	0.00	-6.82	0.00	-9.07	0.00	9.07	1,811.80	905.90	1,818.20	897.94	70.01	-4.10	0.010

Load Case: 0.9D + 1.6W — 90 mph with No Ice (Reduced DL) — 21 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		380.6	0.0					0.0	0.0	380.6	0.0	0.0	0.0
5.00		753.3	1,463.9					0.0	66.9	753.3	1,530.8	0.0	0.0
10.00		737.6	1,433.3					0.0	229.9	737.6	1,663.2	0.0	0.0
15.00		733.1	1,402.8					0.0	229.9	733.1	1,632.7	0.0	0.0
20.00		747.9	1,372.2					0.0	229.9	747.9	1,602.1	0.0	0.0
25.00		766.8	1,341.6					0.0	229.9	766.8	1,571.5	0.0	0.0
30.00		778.9	1,311.1					0.0	229.9	778.9	1,541.0	0.0	0.0
35.00		785.9	1,280.5					0.0	229.9	785.9	1,510.4	0.0	0.0
40.00		789.1	1,249.9					0.0	229.9	789.1	1,479.8	0.0	0.0
45.00		559.3	1,219.4					0.0	229.9	559.3	1,449.3	0.0	0.0
47.08	Bot - Section 2	398.0	499.0					0.0	95.8	398.0	594.8	0.0	0.0
50.00		553.1	1,260.4					0.0	134.1	553.1	1,394.5	0.0	0.0
54.00	Top - Section 1	399.1	1,697.9					0.0	183.9	399.1	1,881.8	0.0	0.0
55.00		476.0	189.7					0.0	46.0	476.0	235.7	0.0	0.0
60.00		789.1	933.8					0.0	229.9	789.1	1,163.7	0.0	0.0
65.00		781.1	909.0					0.0	229.9	781.1	1,138.9	0.0	0.0
70.00		771.6	884.2					0.0	229.9	771.6	1,114.1	0.0	0.0
75.00		760.8	859.3					0.0	229.9	760.8	1,089.2	0.0	0.0
80.00		748.9	834.5					0.0	229.9	748.9	1,064.4	0.0	0.0
85.00		735.8	809.7					0.0	229.9	735.8	1,039.6	0.0	0.0
90.00		721.8	784.9					0.0	229.9	721.8	1,014.8	0.0	0.0
95.00		392.6	760.1					0.0	229.9	392.6	990.0	0.0	0.0
95.50	Bot - Section 3	354.9	74.6					0.0	23.0	354.9	97.6	0.0	0.0
100.00		389.7	1,179.0					0.0	206.9	389.7	1,386.0	0.0	0.0
101.00	Top - Section 2	347.4	257.2					0.0	46.0	347.4	303.1	0.0	0.0
105.00		616.3	444.8					0.0	183.9	616.3	628.7	0.0	0.0
110.00		669.2	538.8					0.0	229.9	669.2	768.7	0.0	0.0
115.00	Appurtenance(s)	651.4	519.7	1,635.1	0.0	0.0	816.4	0.0	229.9	2,286.5	1,566.0	0.0	0.0
120.00		447.0	500.6					0.0	212.1	447.0	712.7	0.0	0.0
122.00	Appurtenance(s)	311.7	194.9	2,972.9	0.0	0.0	2,043.0	0.0	84.9	3,284.6	2,322.7	0.0	0.0
125.00		247.1	286.6					0.0	112.0	247.1	398.6	0.0	0.0
126.00	Appurtenance(s)	302.0	94.0	2,778.8	0.0	0.0	1,072.3	0.0	37.3	3,080.8	1,203.7	0.0	0.0
130.00		358.8	368.4					0.0	118.3	358.8	486.7	0.0	0.0
132.00	Appurtenance(s)	292.0	179.6	1,265.4	0.0	0.0	1,800.0	0.0	59.2	1,557.4	2,038.8	0.0	0.0
135.00		231.2	263.7					0.0	88.7	231.2	352.4	0.0	0.0
136.00	Appurtenance(s)	281.7	86.4	1,015.9	0.0	0.0	1,350.0	0.0	29.6	1,297.6	1,465.9	0.0	0.0
140.00	Appurtenance(s)	495.8	337.8	2,980.1	0.0	-11,920.6	1,010.0	0.0	118.3	3,475.9	1,466.1	0.0	0.0
145.00		531.7	405.0					0.0	94.6	531.7	499.7	0.0	0.0
150.00	Appurtenance(s)	260.5	385.9	2,026.3	0.0	0.0	1,800.0	0.0	94.6	2,286.8	2,280.6	0.0	0.0
								Totals:		36,023.0	44,680.2	0.00	0.00

Load Case: 0.9D + 1.6W — 90 mph with No Ice (Reduced DL) — 21 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :0.90
Wind Load Factor :1.60

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	-46.48	-40.23	0.00	-4,231.44	0.00	4,231.44	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.558
5.00	-44.86	-39.58	0.00	-4,030.29	0.00	4,030.29	6,215.54	3,107.77	15,067.9	7,441.50	0.07	-0.13	0.549
10.00	-43.11	-38.94	0.00	-3,832.39	0.00	3,832.39	6,144.79	3,072.40	14,579.4	7,200.24	0.28	-0.27	0.539
15.00	-41.39	-38.29	0.00	-3,637.71	0.00	3,637.71	6,071.43	3,035.72	14,092.2	6,959.61	0.64	-0.40	0.530
20.00	-39.70	-37.63	0.00	-3,446.24	0.00	3,446.24	5,995.47	2,997.74	13,606.6	6,719.80	1.13	-0.54	0.520
25.00	-38.05	-36.94	0.00	-3,258.10	0.00	3,258.10	5,916.91	2,958.45	13,123.0	6,481.00	1.77	-0.68	0.509
30.00	-36.43	-36.23	0.00	-3,073.41	0.00	3,073.41	5,835.74	2,917.87	12,642.0	6,243.42	2.56	-0.82	0.499
35.00	-34.84	-35.51	0.00	-2,892.26	0.00	2,892.26	5,751.96	2,875.98	12,163.8	6,007.26	3.49	-0.96	0.488
40.00	-33.29	-34.78	0.00	-2,714.73	0.00	2,714.73	5,665.59	2,832.79	11,688.9	5,772.72	4.58	-1.11	0.476
45.00	-31.79	-34.24	0.00	-2,540.86	0.00	2,540.86	5,576.61	2,788.30	11,217.6	5,539.99	5.82	-1.25	0.464
47.08	-31.16	-33.87	0.00	-2,469.52	0.00	2,469.52	5,538.76	2,769.38	11,022.5	5,443.60	6.38	-1.31	0.459
50.00	-29.72	-33.34	0.00	-2,370.72	0.00	2,370.72	5,485.02	2,742.51	10,750.5	5,309.27	7.20	-1.40	0.452
54.00	-27.81	-32.93	0.00	-2,237.36	0.00	2,237.36	4,089.14	2,044.57	8,015.68	3,958.64	8.43	-1.52	0.572
55.00	-27.52	-32.50	0.00	-2,204.44	0.00	2,204.44	4,077.72	2,038.86	7,951.24	3,926.82	8.75	-1.55	0.568
60.00	-26.29	-31.75	0.00	-2,041.96	0.00	2,041.96	4,019.09	2,009.54	7,629.58	3,767.96	10.46	-1.72	0.549
65.00	-25.08	-31.01	0.00	-1,883.19	0.00	1,883.19	3,957.85	1,978.93	7,309.16	3,609.72	12.36	-1.89	0.528
70.00	-23.91	-30.27	0.00	-1,728.14	0.00	1,728.14	3,894.01	1,947.01	6,990.39	3,452.29	14.43	-2.06	0.507
75.00	-22.76	-29.54	0.00	-1,576.77	0.00	1,576.77	3,827.57	1,913.78	6,673.67	3,295.87	16.68	-2.23	0.485
80.00	-21.64	-28.81	0.00	-1,429.07	0.00	1,429.07	3,758.52	1,879.26	6,359.40	3,140.67	19.11	-2.40	0.461
85.00	-20.55	-28.09	0.00	-1,285.01	0.00	1,285.01	3,686.86	1,843.43	6,047.97	2,986.87	21.72	-2.57	0.436
90.00	-19.50	-27.38	0.00	-1,144.56	0.00	1,144.56	3,612.61	1,806.30	5,739.81	2,834.68	24.49	-2.73	0.409
95.00	-18.49	-26.97	0.00	-1,007.67	0.00	1,007.67	3,535.74	1,767.87	5,435.30	2,684.29	27.44	-2.89	0.381
95.50	-18.37	-26.63	0.00	-994.18	0.00	994.18	3,527.92	1,763.96	5,405.07	2,669.36	27.75	-2.91	0.378
100.00	-16.97	-26.20	0.00	-874.34	0.00	874.34	3,456.28	1,728.14	5,134.86	2,535.91	30.55	-3.05	0.350
101.00	-16.65	-25.85	0.00	-848.15	0.00	848.15	2,422.80	1,211.40	3,656.13	1,805.62	31.20	-3.08	0.477
105.00	-15.99	-25.25	0.00	-744.73	0.00	744.73	2,386.99	1,193.50	3,503.59	1,730.29	33.83	-3.20	0.438
110.00	-15.19	-24.58	0.00	-618.50	0.00	618.50	2,339.89	1,169.95	3,313.75	1,636.54	37.27	-3.36	0.385
115.00	-13.71	-22.23	0.00	-495.63	0.00	495.63	2,290.19	1,145.09	3,125.22	1,543.43	40.87	-3.52	0.327
120.00	-12.99	-21.76	0.00	-384.46	0.00	384.46	2,237.88	1,118.94	2,938.40	1,451.17	44.63	-3.65	0.271
122.00	-10.87	-18.35	0.00	-340.93	0.00	340.93	2,216.23	1,108.11	2,864.24	1,414.54	46.17	-3.70	0.246
125.00	-10.47	-18.08	0.00	-285.89	0.00	285.89	2,182.97	1,091.48	2,753.69	1,359.95	48.51	-3.77	0.215
126.00	-9.46	-14.94	0.00	-267.81	0.00	267.81	2,171.67	1,085.84	2,717.04	1,341.84	49.31	-3.79	0.204
130.00	-8.99	-14.56	0.00	-208.06	0.00	208.06	2,125.45	1,062.73	2,571.50	1,269.97	52.51	-3.86	0.168
132.00	-7.05	-12.87	0.00	-178.95	0.00	178.95	2,101.72	1,050.86	2,499.42	1,234.37	54.14	-3.90	0.148
135.00	-6.71	-12.62	0.00	-140.34	0.00	140.34	2,065.33	1,032.67	2,392.23	1,181.43	56.60	-3.94	0.122
136.00	-5.33	-11.22	0.00	-127.73	0.00	127.73	2,053.00	1,026.50	2,356.76	1,163.91	57.43	-3.96	0.112
140.00	-4.10	-7.66	0.00	-82.83	0.00	82.83	1,995.73	997.87	2,208.66	1,090.78	60.76	-4.00	0.078
145.00	-3.64	-7.09	0.00	-44.54	0.00	44.54	1,903.77	951.88	2,008.69	992.02	64.97	-4.03	0.047
150.00	0.00	-6.82	0.00	-9.07	0.00	9.07	1,811.80	905.90	1,818.20	897.94	69.20	-4.05	0.010

Site Number: 306042 | Code: ANSI/TIA-222-G |

Site Name: Woods Chapel, MO | Engineering Number:13618801_C3_02 | 5/10/2021 2:33:05 PM

Customer: AT&T MOBILITY

Load Case: 1.2D + 1.0Di + 1.0Wi | 40 mph with 1.00 in Radial Ice | 21 Iterations

Gust Response Factor :1.10 | Ice Dead Load Factor :1.00 | Wind Importance 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 Elev (ft)	Description	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		59.2	0.0					0.0	0.0	59.2	0.0	0.0	0.0
5.00		117.6	2,560.4					142.0	204.8	259.5	2,765.2	0.0	0.0
10.00		115.7	2,578.3					150.1	454.1	265.8	3,032.5	0.0	0.0
15.00		115.4	2,559.0					149.2	463.0	264.6	3,022.0	0.0	0.0
20.00		118.1	2,527.4					152.6	469.2	270.7	2,996.6	0.0	0.0
25.00		121.5	2,489.5					159.3	474.0	280.8	2,963.5	0.0	0.0
30.00		123.7	2,447.7					164.4	477.9	288.1	2,925.6	0.0	0.0
35.00		125.2	2,403.1					168.4	481.3	293.6	2,884.4	0.0	0.0
40.00		126.0	2,356.4					171.5	484.3	297.5	2,840.7	0.0	0.0
45.00		89.5	2,308.2					174.0	486.9	263.5	2,795.1	0.0	0.0
47.08	Bot - Section 2	63.8	949.2					73.1	203.6	136.9	1,152.8	0.0	0.0
50.00		88.7	2,080.8					102.8	285.7	191.5	2,366.5	0.0	0.0
54.00	Top - Section 1	64.1	2,805.9					141.8	393.0	205.9	3,199.0	0.0	0.0
55.00		76.6	388.5					35.9	98.5	112.5	487.0	0.0	0.0
60.00		127.2	1,909.4					180.2	493.5	307.4	2,402.9	0.0	0.0
65.00		126.3	1,864.9					181.0	495.4	307.3	2,360.3	0.0	0.0
70.00		125.1	1,819.9					181.5	497.1	306.6	2,317.0	0.0	0.0
75.00		123.8	1,774.2					181.7	498.8	305.5	2,272.9	0.0	0.0
80.00		122.2	1,728.0					181.7	500.3	304.0	2,228.3	0.0	0.0
85.00		120.5	1,681.3					181.5	501.8	302.0	2,183.1	0.0	0.0
90.00		118.6	1,634.2					181.1	503.1	299.8	2,137.4	0.0	0.0
95.00		64.7	1,586.8					180.6	504.5	245.2	2,091.2	0.0	0.0
95.50	Bot - Section 3	58.6	156.8					18.0	50.5	76.6	207.3	0.0	0.0
100.00		64.4	2,083.1					161.8	455.2	226.2	2,538.3	0.0	0.0
101.00	Top - Section 2	57.6	456.0					35.9	101.3	93.4	557.3	0.0	0.0
105.00		102.4	1,035.4					144.3	405.6	246.7	1,441.0	0.0	0.0
110.00		111.6	1,255.7					179.5	508.1	291.2	1,763.8	0.0	0.0
115.00	Appurtenance(s)	109.1	1,214.7	302.9	0.0	0.0	2,526.6	178.5	509.2	590.5	4,250.4	0.0	0.0
120.00		75.1	1,173.4					162.8	462.2	238.0	1,635.5	0.0	0.0
122.00	Appurtenance(s)	52.6	459.9	583.5	0.0	0.0	5,564.6	64.7	185.1	700.9	6,209.6	0.0	0.0
125.00		41.8	676.3					96.6	257.5	138.4	933.8	0.0	0.0
126.00	Appurtenance(s)	51.3	222.8	481.5	0.0	0.0	4,642.9	32.1	85.9	564.8	4,951.7	0.0	0.0
130.00		61.0	870.1					0.0	157.8	61.0	1,027.9	0.0	0.0
132.00	Appurtenance(s)	49.9	426.5	341.3	0.0	0.0	3,922.0	0.0	78.9	391.1	4,427.3	0.0	0.0
135.00		39.5	626.0					0.0	118.3	39.5	744.3	0.0	0.0
136.00	Appurtenance(s)	48.4	206.0	272.2	0.0	0.0	2,563.9	0.0	39.4	320.6	2,809.3	0.0	0.0
140.00	Appurtenance(s)	85.6	802.8	527.8	0.0	-2,111.2	4,523.8	0.0	157.8	613.4	5,484.4	0.0	0.0
145.00		92.4	963.5					0.0	126.2	92.4	1,089.6	0.0	0.0
150.00	Appurtenance(s)	45.4	920.9	415.2	0.0	0.0	4,091.6	0.0	126.2	460.6	5,138.7	0.0	0.0
								Totals:		10,713.3	96,634.4	0.00	0.00

Load Case: 1.2D + 1.0Di + 1.0Wi — 40 mph with 1.00 in Radial Ice — 21 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00 Wind Importance 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	-104.32	-11.44	0.00	-1,106.07	0.00	1,106.07	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.161
5.00	-101.55	-11.24	0.00	-1,048.87	0.00	1,048.87	6,215.54	3,107.77	15,067.9	7,441.50	0.02	-0.03	0.157
10.00	-98.51	-11.03	0.00	-992.65	0.00	992.65	6,144.79	3,072.40	14,579.4	7,200.24	0.07	-0.07	0.154
15.00	-95.49	-10.82	0.00	-937.48	0.00	937.48	6,071.43	3,035.72	14,092.2	6,959.61	0.17	-0.10	0.150
20.00	-92.48	-10.60	0.00	-883.36	0.00	883.36	5,995.47	2,997.74	13,606.6	6,719.80	0.29	-0.14	0.147
25.00	-89.51	-10.37	0.00	-830.34	0.00	830.34	5,916.91	2,958.45	13,123.0	6,481.00	0.46	-0.18	0.143
30.00	-86.58	-10.13	0.00	-778.48	0.00	778.48	5,835.74	2,917.87	12,642.0	6,243.42	0.66	-0.21	0.140
35.00	-83.69	-9.87	0.00	-727.85	0.00	727.85	5,751.96	2,875.98	12,163.8	6,007.26	0.90	-0.25	0.136
40.00	-80.85	-9.61	0.00	-678.48	0.00	678.48	5,665.59	2,832.79	11,688.9	5,772.72	1.18	-0.28	0.132
45.00	-78.05	-9.37	0.00	-630.40	0.00	630.40	5,576.61	2,788.30	11,217.6	5,539.99	1.50	-0.32	0.128
47.08	-76.90	-9.25	0.00	-610.88	0.00	610.88	5,538.76	2,769.38	11,022.5	5,443.60	1.64	-0.33	0.126
50.00	-74.53	-9.08	0.00	-583.89	0.00	583.89	5,485.02	2,742.51	10,750.5	5,309.27	1.85	-0.36	0.124
54.00	-71.33	-8.88	0.00	-547.58	0.00	547.58	4,089.14	2,044.57	8,015.68	3,958.64	2.16	-0.38	0.156
55.00	-70.84	-8.79	0.00	-538.70	0.00	538.70	4,077.72	2,038.86	7,951.24	3,926.82	2.24	-0.39	0.155
60.00	-68.43	-8.52	0.00	-494.75	0.00	494.75	4,019.09	2,009.54	7,629.58	3,767.96	2.68	-0.43	0.148
65.00	-66.07	-8.24	0.00	-452.17	0.00	452.17	3,957.85	1,978.93	7,309.16	3,609.72	3.15	-0.48	0.142
70.00	-63.75	-7.96	0.00	-410.99	0.00	410.99	3,894.01	1,947.01	6,990.39	3,452.29	3.67	-0.52	0.135
75.00	-61.47	-7.67	0.00	-371.21	0.00	371.21	3,827.57	1,913.78	6,673.67	3,295.87	4.24	-0.56	0.129
80.00	-59.24	-7.39	0.00	-332.85	0.00	332.85	3,758.52	1,879.26	6,359.40	3,140.67	4.84	-0.60	0.122
85.00	-57.06	-7.10	0.00	-295.92	0.00	295.92	3,686.86	1,843.43	6,047.97	2,986.87	5.49	-0.64	0.115
90.00	-54.92	-6.81	0.00	-260.43	0.00	260.43	3,612.61	1,806.30	5,739.81	2,834.68	6.17	-0.67	0.107
95.00	-52.83	-6.56	0.00	-226.39	0.00	226.39	3,535.74	1,767.87	5,435.30	2,684.29	6.90	-0.71	0.099
95.50	-52.62	-6.49	0.00	-223.11	0.00	223.11	3,527.92	1,763.96	5,405.07	2,669.36	6.97	-0.71	0.099
100.00	-50.08	-6.25	0.00	-193.89	0.00	193.89	3,456.28	1,728.14	5,134.86	2,535.91	7.66	-0.74	0.091
101.00	-49.52	-6.17	0.00	-187.63	0.00	187.63	2,422.80	1,211.40	3,656.13	1,805.62	7.82	-0.75	0.124
105.00	-48.08	-5.93	0.00	-162.97	0.00	162.97	2,386.99	1,193.50	3,503.59	1,730.29	8.46	-0.78	0.114
110.00	-46.32	-5.64	0.00	-133.34	0.00	133.34	2,339.89	1,169.95	3,313.75	1,636.54	9.29	-0.81	0.101
115.00	-42.08	-5.01	0.00	-105.15	0.00	105.15	2,290.19	1,145.09	3,125.22	1,543.43	10.16	-0.85	0.087
120.00	-40.44	-4.76	0.00	-80.11	0.00	80.11	2,237.88	1,118.94	2,938.40	1,451.17	11.06	-0.87	0.073
122.00	-34.24	-3.97	0.00	-70.59	0.00	70.59	2,216.23	1,108.11	2,864.24	1,414.54	11.43	-0.88	0.065
125.00	-33.31	-3.82	0.00	-58.68	0.00	58.68	2,182.97	1,091.48	2,753.69	1,359.95	11.99	-0.90	0.058
126.00	-28.37	-3.19	0.00	-54.85	0.00	54.85	2,171.67	1,085.84	2,717.04	1,341.84	12.18	-0.90	0.054
130.00	-27.34	-3.11	0.00	-42.11	0.00	42.11	2,125.45	1,062.73	2,571.50	1,269.97	12.94	-0.92	0.046
132.00	-22.92	-2.65	0.00	-35.88	0.00	35.88	2,101.72	1,050.86	2,499.42	1,234.37	13.33	-0.92	0.040
135.00	-22.18	-2.60	0.00	-27.92	0.00	27.92	2,065.33	1,032.67	2,392.23	1,181.43	13.91	-0.93	0.034
136.00	-19.37	-2.24	0.00	-25.32	0.00	25.32	2,053.00	1,026.50	2,356.76	1,163.91	14.11	-0.94	0.031
140.00	-13.90	-1.54	0.00	-16.36	0.00	16.36	1,995.73	997.87	2,208.66	1,090.78	14.89	-0.94	0.022
145.00	-12.81	-1.43	0.00	-8.66	0.00	8.66	1,903.77	951.88	2,008.69	992.02	15.89	-0.95	0.015
150.00	0.00	-1.22	0.00	-1.51	0.00	1.51	1,811.80	905.90	1,818.20	897.94	16.88	-0.95	0.002

Load Case: 1.0D + 1.0W Serviceability 60 mph 20 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
Dead Load Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces Wind FX (lb)	Shaft Forces Dead Load (lb)	Discrete Forces Wind FX (lb)	Discrete Forces Torsion MY (lb-ft)	Discrete Forces Moment MZ (lb-ft)	Discrete Forces Dead Load (lb)	Linear Forces Wind FX (lb)	Linear Forces Dead Load (lb)	Sum of Forces Wind FX (lb)	Sum of Forces Dead Load (lb)	Sum of Forces Torsion MY (lb-ft)	Sum of Forces Moment MZ (lb)
0.00		94.6	0.0					0.0	0.0	94.6	0.0	0.0	0.0
5.00		187.2	1,626.6					0.0	74.3	187.2	1,700.9	0.0	0.0
10.00		183.3	1,592.6					0.0	255.5	183.3	1,848.0	0.0	0.0
15.00		182.2	1,558.6					0.0	255.5	182.2	1,814.1	0.0	0.0
20.00		185.9	1,524.7					0.0	255.5	185.9	1,780.1	0.0	0.0
25.00		190.6	1,490.7					0.0	255.5	190.6	1,746.2	0.0	0.0
30.00		193.6	1,456.7					0.0	255.5	193.6	1,712.2	0.0	0.0
35.00		195.3	1,422.8					0.0	255.5	195.3	1,678.2	0.0	0.0
40.00		196.1	1,388.8					0.0	255.5	196.1	1,644.3	0.0	0.0
45.00		139.0	1,354.8					0.0	255.5	139.0	1,610.3	0.0	0.0
47.08	Bot - Section 2	98.9	554.5					0.0	106.4	98.9	660.9	0.0	0.0
50.00		137.5	1,400.5					0.0	149.0	137.5	1,549.5	0.0	0.0
54.00	Top - Section 1	99.2	1,886.6					0.0	204.4	99.2	2,090.9	0.0	0.0
55.00		118.3	210.8					0.0	51.1	118.3	261.9	0.0	0.0
60.00		196.1	1,037.6					0.0	255.5	196.1	1,293.0	0.0	0.0
65.00		194.1	1,010.0					0.0	255.5	194.1	1,265.4	0.0	0.0
70.00		191.8	982.4					0.0	255.5	191.8	1,237.8	0.0	0.0
75.00		189.1	954.8					0.0	255.5	189.1	1,210.3	0.0	0.0
80.00		186.1	927.2					0.0	255.5	186.1	1,182.7	0.0	0.0
85.00		182.9	899.7					0.0	255.5	182.9	1,155.1	0.0	0.0
90.00		179.4	872.1					0.0	255.5	179.4	1,127.5	0.0	0.0
95.00		97.6	844.5					0.0	255.5	97.6	1,100.0	0.0	0.0
95.50	Bot - Section 3	88.2	82.9					0.0	25.5	88.2	108.5	0.0	0.0
100.00		96.9	1,310.0					0.0	229.9	96.9	1,539.9	0.0	0.0
101.00	Top - Section 2	86.3	285.7					0.0	51.1	86.3	336.8	0.0	0.0
105.00		153.2	494.2					0.0	204.4	153.2	698.6	0.0	0.0
110.00		166.3	598.6					0.0	255.5	166.3	854.1	0.0	0.0
115.00	Appurtenance(s)	161.9	577.4	406.4	0.0	0.0	907.1	0.0	255.5	568.3	1,740.0	0.0	0.0
120.00		111.1	556.2					0.0	235.7	111.1	791.9	0.0	0.0
122.00	Appurtenance(s)	77.5	216.5	738.9	0.0	0.0	2,270.0	0.0	94.3	816.4	2,580.8	0.0	0.0
125.00		61.4	318.4					0.0	124.4	61.4	442.8	0.0	0.0
126.00	Appurtenance(s)	75.1	104.4	690.6	0.0	0.0	1,191.5	0.0	41.5	765.7	1,337.4	0.0	0.0
130.00		89.2	409.3					0.0	131.5	89.2	540.8	0.0	0.0
132.00	Appurtenance(s)	72.6	199.5	314.5	0.0	0.0	2,000.0	0.0	65.7	387.1	2,265.3	0.0	0.0
135.00		57.5	293.0					0.0	98.6	57.5	391.6	0.0	0.0
136.00	Appurtenance(s)	70.0	96.0	252.5	0.0	0.0	1,500.0	0.0	32.9	322.5	1,628.8	0.0	0.0
140.00	Appurtenance(s)	123.2	375.3	740.7	0.0	-2,962.7	1,122.2	0.0	131.5	863.9	1,629.0	0.0	0.0
145.00		132.1	450.0					0.0	105.1	132.1	555.2	0.0	0.0
150.00	Appurtenance(s)	64.7	428.8	503.6	0.0	0.0	2,000.0	0.0	105.1	568.3	2,534.0	0.0	0.0
								Totals:		8,953.10	49,644.6	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 20 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00
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	-51.70	-10.00	0.00	-1,055.29	0.00	1,055.29	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.146
5.00	-49.99	-9.84	0.00	-1,005.29	0.00	1,005.29	6,215.54	3,107.77	15,067.9	7,441.50	0.02	-0.03	0.143
10.00	-48.14	-9.68	0.00	-956.09	0.00	956.09	6,144.79	3,072.40	14,579.4	7,200.24	0.07	-0.07	0.141
15.00	-46.32	-9.53	0.00	-907.67	0.00	907.67	6,071.43	3,035.72	14,092.2	6,959.61	0.16	-0.10	0.138
20.00	-44.53	-9.36	0.00	-860.03	0.00	860.03	5,995.47	2,997.74	13,606.6	6,719.80	0.28	-0.13	0.135
25.00	-42.78	-9.20	0.00	-813.21	0.00	813.21	5,916.91	2,958.45	13,123.0	6,481.00	0.44	-0.17	0.133
30.00	-41.06	-9.02	0.00	-767.24	0.00	767.24	5,835.74	2,917.87	12,642.0	6,243.42	0.64	-0.20	0.130
35.00	-39.38	-8.84	0.00	-722.13	0.00	722.13	5,751.96	2,875.98	12,163.8	6,007.26	0.87	-0.24	0.127
40.00	-37.73	-8.66	0.00	-677.92	0.00	677.92	5,665.59	2,832.79	11,688.9	5,772.72	1.14	-0.28	0.124
45.00	-36.12	-8.53	0.00	-634.60	0.00	634.60	5,576.61	2,788.30	11,217.6	5,539.99	1.45	-0.31	0.121
47.08	-35.45	-8.44	0.00	-616.82	0.00	616.82	5,538.76	2,769.38	11,022.5	5,443.60	1.59	-0.33	0.120
50.00	-33.90	-8.31	0.00	-592.20	0.00	592.20	5,485.02	2,742.51	10,750.5	5,309.27	1.80	-0.35	0.118
54.00	-31.81	-8.21	0.00	-558.96	0.00	558.96	4,089.14	2,044.57	8,015.68	3,958.64	2.10	-0.38	0.149
55.00	-31.54	-8.10	0.00	-550.75	0.00	550.75	4,077.72	2,038.86	7,951.24	3,926.82	2.18	-0.39	0.148
60.00	-30.25	-7.92	0.00	-510.24	0.00	510.24	4,019.09	2,009.54	7,629.58	3,767.96	2.61	-0.43	0.143
65.00	-28.98	-7.74	0.00	-470.64	0.00	470.64	3,957.85	1,978.93	7,309.16	3,609.72	3.08	-0.47	0.138
70.00	-27.74	-7.56	0.00	-431.95	0.00	431.95	3,894.01	1,947.01	6,990.39	3,452.29	3.60	-0.51	0.132
75.00	-26.52	-7.37	0.00	-394.18	0.00	394.18	3,827.57	1,913.78	6,673.67	3,295.87	4.16	-0.56	0.127
80.00	-25.34	-7.20	0.00	-357.30	0.00	357.30	3,758.52	1,879.26	6,359.40	3,140.67	4.77	-0.60	0.121
85.00	-24.18	-7.02	0.00	-321.33	0.00	321.33	3,686.86	1,843.43	6,047.97	2,986.87	5.42	-0.64	0.114
90.00	-23.05	-6.84	0.00	-286.24	0.00	286.24	3,612.61	1,806.30	5,739.81	2,834.68	6.12	-0.68	0.107
95.00	-21.95	-6.74	0.00	-252.04	0.00	252.04	3,535.74	1,767.87	5,435.30	2,684.29	6.85	-0.72	0.100
95.50	-21.84	-6.66	0.00	-248.67	0.00	248.67	3,527.92	1,763.96	5,405.07	2,669.36	6.93	-0.73	0.099
100.00	-20.30	-6.55	0.00	-218.71	0.00	218.71	3,456.28	1,728.14	5,134.86	2,535.91	7.63	-0.76	0.092
101.00	-19.96	-6.46	0.00	-212.17	0.00	212.17	2,422.80	1,211.40	3,656.13	1,805.62	7.79	-0.77	0.126
105.00	-19.26	-6.31	0.00	-186.32	0.00	186.32	2,386.99	1,193.50	3,503.59	1,730.29	8.45	-0.80	0.116
110.00	-18.40	-6.15	0.00	-154.75	0.00	154.75	2,339.89	1,169.95	3,313.75	1,636.54	9.31	-0.84	0.102
115.00	-16.67	-5.56	0.00	-124.02	0.00	124.02	2,290.19	1,145.09	3,125.22	1,543.43	10.21	-0.88	0.088
120.00	-15.88	-5.45	0.00	-96.21	0.00	96.21	2,237.88	1,118.94	2,938.40	1,451.17	11.15	-0.91	0.073
122.00	-13.31	-4.59	0.00	-85.32	0.00	85.32	2,216.23	1,108.11	2,864.24	1,414.54	11.53	-0.92	0.066
125.00	-12.86	-4.53	0.00	-71.54	0.00	71.54	2,182.97	1,091.48	2,753.69	1,359.95	12.12	-0.94	0.059
126.00	-11.54	-3.74	0.00	-67.02	0.00	67.02	2,171.67	1,085.84	2,717.04	1,341.84	12.32	-0.95	0.055
130.00	-11.00	-3.64	0.00	-52.06	0.00	52.06	2,125.45	1,062.73	2,571.50	1,269.97	13.12	-0.97	0.046
132.00	-8.74	-3.22	0.00	-44.77	0.00	44.77	2,101.72	1,050.86	2,499.42	1,234.37	13.53	-0.97	0.040
135.00	-8.35	-3.16	0.00	-35.11	0.00	35.11	2,065.33	1,032.67	2,392.23	1,181.43	14.14	-0.99	0.034
136.00	-6.73	-2.81	0.00	-31.95	0.00	31.95	2,053.00	1,026.50	2,356.76	1,163.91	14.35	-0.99	0.031
140.00	-5.11	-1.92	0.00	-20.72	0.00	20.72	1,995.73	997.87	2,208.66	1,090.78	15.18	-1.00	0.022
145.00	-4.56	-1.78	0.00	-11.13	0.00	11.13	1,903.77	951.88	2,008.69	992.02	16.23	-1.01	0.014
150.00	0.00	-1.69	0.00	-2.25	0.00	2.25	1,811.80	905.90	1,818.20	897.94	17.29	-1.01	0.003

Equivalent Lateral Forces Method Analysis

(Based on ASCE7-10 Chapters 11, 12, 15)

Spectral Response Acceleration for Short Period (S_s):	0.11	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.11	
Long-Period Transition Period (T_L):	12	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.60	
Site Coeffiecient F_v:	2.36	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.12	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.17	
Seismic Response Coefficient (C_s):	0.06	
Upper Limit C_s	0.06	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	2.05	
Redundancy Factor (p):	1.00	
Seismic Force Distribution Exponent (k):	1.78	
Total Unfactored Dead Load:	51.70	k
Seismic Base Shear (E):	2.91	k

Load Case (1.2 + 0.2Sds) * DL + E ELFM **Seismic Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
38	147.50	534	3,798	0.025	72	654
37	142.50	555	3,714	0.024	70	680
36	138.00	507	3,203	0.021	61	620
35	135.50	129	788	0.005	15	158
34	133.50	392	2,333	0.015	44	479
33	131.00	265	1,528	0.010	29	325
32	128.00	541	2,990	0.020	57	662
31	125.50	146	779	0.005	15	179
30	123.50	443	2,298	0.015	44	542
29	121.00	311	1,555	0.010	29	380
28	117.50	792	3,761	0.025	71	969
27	112.50	833	3,662	0.024	69	1,020
26	107.50	854	3,464	0.023	66	1,045
25	103.00	699	2,626	0.017	50	855
24	100.50	337	1,212	0.008	23	412
23	97.75	1,540	5,275	0.034	100	1,885
22	95.25	108	355	0.002	7	133
21	92.50	1,100	3,416	0.022	65	1,346
20	87.50	1,128	3,172	0.021	60	1,380
19	82.50	1,155	2,927	0.019	56	1,414
18	77.50	1,183	2,682	0.017	51	1,448
17	72.50	1,210	2,438	0.016	46	1,481
16	67.50	1,238	2,197	0.014	42	1,515

15	62.50	1,265	1,959	0.013	37	1,549
14	57.50	1,293	1,726	0.011	33	1,583
13	54.50	262	318	0.002	6	321
12	52.00	2,091	2,334	0.015	44	2,560
11	48.54	1,549	1,531	0.010	29	1,897
10	46.04	661	594	0.004	11	809
9	42.50	1,610	1,256	0.008	24	1,971
8	37.50	1,644	1,027	0.007	19	2,013
7	32.50	1,678	813	0.005	15	2,054
6	27.50	1,712	617	0.004	12	2,096
5	22.50	1,746	440	0.003	8	2,137
4	17.50	1,780	287	0.002	5	2,179
3	12.50	1,814	161	0.001	3	2,221
2	7.50	1,848	66	0.000	1	2,262
1	2.50	1,701	9	0.000	0	2,082
Powerwave Allgon TT0	150.00	66	484	0.003	9	81
Nokia AirScale RRH 4	150.00	110	809	0.005	15	135
Raycap DC6-48-60-18-	150.00	33	240	0.002	5	40
Raycap DC6-48-60-18-	150.00	16	117	0.001	2	20
Raycap DC6-48-60-0-8	150.00	16	117	0.001	2	20
Nokia AHLBBA	150.00	284	2,084	0.014	40	348
Alcatel-Lucent RRH4X	150.00	210	1,539	0.010	29	257
Nokia AirScale Dual	150.00	265	1,939	0.013	37	324
Nokia AEQK AirScale	150.00	298	2,181	0.014	41	364
Commscope JAH4-65C-R	150.00	262	1,919	0.013	36	321
CCI TPA65R-BU8D	150.00	495	3,628	0.024	69	606
Flat Platform with H	150.00	2,000	14,657	0.096	278	2,448
Commscope CBC78-DF-2	140.00	40	257	0.002	5	48
Commscope TMA-T-DB78	140.00	116	749	0.005	14	141
RFS DB-B1-6C-12AB-0Z	140.00	43	277	0.002	5	52
Ericsson RRUS B13 w/	140.00	216	1,400	0.009	27	264
Ericsson AIR 32 (57"	140.00	297	1,926	0.013	37	364
Kathrein Scala 800 1	140.00	112	729	0.005	14	138
Andrew LNX-6515DS-A1	140.00	299	1,937	0.013	37	366
Round Low Profile Pl	136.00	1,500	9,237	0.060	175	1,836
Round Platform w/ Ha	132.00	2,000	11,680	0.076	221	2,448
Andrew ETW190VS12UB	126.00	33	177	0.001	3	40
Nokia AirScale Dual	126.00	251	1,352	0.009	26	308
Nokia FRIG w/o Solar	126.00	162	871	0.006	17	198
Nokia FHFB	126.00	146	782	0.005	15	178
Raycap ASU9338TYP01	126.00	15	80	0.001	2	18
Andrew TMBXX-6516-A2	126.00	208	1,116	0.007	21	254
Commscope FFHH-65C-R	126.00	377	2,028	0.013	38	462
Generic 48" x 12" Pa	122.00	270	1,371	0.009	26	331
Flat Platform with H	122.00	2,000	10,155	0.066	193	2,448
DragonWave Horizon D	115.00	14	64	0.000	1	17
Samsung 2.5GHz nRRHv	115.00	152	695	0.005	13	186
Argus LLPX310R	115.00	86	392	0.003	7	105
Andrew Microwaves VH	115.00	95	435	0.003	8	117
Side Arms	115.00	560	2,560	0.017	49	685
		51,699	153,296	1.000	2,907	63,286

Load Case (0.9 - 0.2Sds) * DL + E ELFM **Seismic (Reduced DL) Equivalent Lateral Forces Method**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
38	147.50	534	3,798	0.025	72	468
37	142.50	555	3,714	0.024	70	486
36	138.00	507	3,203	0.021	61	444
35	135.50	129	788	0.005	15	113

34	133.50	392	2,333	0.015	44	343
33	131.00	265	1,528	0.010	29	232
32	128.00	541	2,990	0.020	57	474
31	125.50	146	779	0.005	15	128
30	123.50	443	2,298	0.015	44	388
29	121.00	311	1,555	0.010	29	272
28	117.50	792	3,761	0.025	71	694
27	112.50	833	3,662	0.024	69	729
26	107.50	854	3,464	0.023	66	748
25	103.00	699	2,626	0.017	50	612
24	100.50	337	1,212	0.008	23	295
23	97.75	1,540	5,275	0.034	100	1,349
22	95.25	108	355	0.002	7	95
21	92.50	1,100	3,416	0.022	65	963
20	87.50	1,128	3,172	0.021	60	988
19	82.50	1,155	2,927	0.019	56	1,012
18	77.50	1,183	2,682	0.017	51	1,036
17	72.50	1,210	2,438	0.016	46	1,060
16	67.50	1,238	2,197	0.014	42	1,084
15	62.50	1,265	1,959	0.013	37	1,108
14	57.50	1,293	1,726	0.011	33	1,133
13	54.50	262	318	0.002	6	229
12	52.00	2,091	2,334	0.015	44	1,831
11	48.54	1,549	1,531	0.010	29	1,357
10	46.04	661	594	0.004	11	579
9	42.50	1,610	1,256	0.008	24	1,410
8	37.50	1,644	1,027	0.007	19	1,440
7	32.50	1,678	813	0.005	15	1,470
6	27.50	1,712	617	0.004	12	1,500
5	22.50	1,746	440	0.003	8	1,529
4	17.50	1,780	287	0.002	5	1,559
3	12.50	1,814	161	0.001	3	1,589
2	7.50	1,848	66	0.000	1	1,619
1	2.50	1,701	9	0.000	0	1,490
Powerwave Allgon TT0	150.00	66	484	0.003	9	58
Nokia AirScale RRH 4	150.00	110	809	0.005	15	97
Raycap DC6-48-60-18-	150.00	33	240	0.002	5	29
Raycap DC6-48-60-18-	150.00	16	117	0.001	2	14
Raycap DC6-48-60-0-8	150.00	16	117	0.001	2	14
Nokia AHLBBA	150.00	284	2,084	0.014	40	249
Alcatel-Lucent RRH4X	150.00	210	1,539	0.010	29	184
Nokia AirScale Dual	150.00	265	1,939	0.013	37	232
Nokia AEQK AirScale	150.00	298	2,181	0.014	41	261
Commscope JAH4-65C-R	150.00	262	1,919	0.013	36	229
CCI TPA65R-BU8D	150.00	495	3,628	0.024	69	434
Flat Platform with H	150.00	2,000	14,657	0.096	278	1,752
Commscope CBC78-DF-2	140.00	40	257	0.002	5	35
Commscope TMA-T-DB78	140.00	116	749	0.005	14	101
RFS DB-B1-6C-12AB-0Z	140.00	43	277	0.002	5	37
Ericsson RRUS B13 w/	140.00	216	1,400	0.009	27	189
Ericsson AIR 32 (57"	140.00	297	1,926	0.013	37	260
Kathrein Scala 800 1	140.00	112	729	0.005	14	99
Andrew LNX-6515DS-A1	140.00	299	1,937	0.013	37	262
Round Low Profile Pl	136.00	1,500	9,237	0.060	175	1,314
Round Platform w/ Ha	132.00	2,000	11,680	0.076	221	1,752
Andrew ETW190VS12UB	126.00	33	177	0.001	3	29
Nokia AirScale Dual	126.00	251	1,352	0.009	26	220
Nokia FRIG w/o Solar	126.00	162	871	0.006	17	142
Nokia FHFB	126.00	146	782	0.005	15	127
Raycap ASU9338TYP01	126.00	15	80	0.001	2	13
Andrew TMBXX-6516-A2	126.00	208	1,116	0.007	21	182
Commscope FFHH-65C-R	126.00	377	2,028	0.013	38	330
Generic 48" x 12" Pa	122.00	270	1,371	0.009	26	236
Flat Platform with H	122.00	2,000	10,155	0.066	193	1,752

DragonWave Horizon D	**115.00**	**14**	**64**	**0.000**	**1**	**12**
Samsung 2.5GHz nRRHv	**115.00**	**152**	**695**	**0.005**	**13**	**133**
Argus LLPX310R	**115.00**	**86**	**392**	**0.003**	**7**	**75**
Andrew Microwaves VH	**115.00**	**95**	**435**	**0.003**	**8**	**83**
Side Arms	**115.00**	**560**	**2,560**	**0.017**	**49**	**491**
		51,699	**153,296**	**1.000**	**2,907**	**45,283**

Load Case (1.2 + 0.2Sds) * DL + E ELFM **Seismic Equivalent Lateral Forces Method**

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	-61.20	-2.91	0.00	-353.98	0.00	353.98	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.056
5.00	-58.94	-2.92	0.00	-339.43	0.00	339.43	6,215.54	3,107.77	15,067.9	7,441.50	0.01	-0.01	0.055
10.00	-56.72	-2.93	0.00	-324.82	0.00	324.82	6,144.79	3,072.40	14,579.4	7,200.24	0.02	-0.02	0.054
15.00	-54.54	-2.93	0.00	-310.18	0.00	310.18	6,071.43	3,035.72	14,092.2	6,959.61	0.05	-0.03	0.054
20.00	-52.40	-2.93	0.00	-295.51	0.00	295.51	5,995.47	2,997.74	13,606.6	6,719.80	0.10	-0.05	0.053
25.00	-50.31	-2.93	0.00	-280.84	0.00	280.84	5,916.91	2,958.45	13,123.0	6,481.00	0.15	-0.06	0.052
30.00	-48.25	-2.92	0.00	-266.18	0.00	266.18	5,835.74	2,917.87	12,642.0	6,243.42	0.22	-0.07	0.051
35.00	-46.24	-2.91	0.00	-251.56	0.00	251.56	5,751.96	2,875.98	12,163.8	6,007.26	0.30	-0.08	0.050
40.00	-44.26	-2.89	0.00	-237.00	0.00	237.00	5,665.59	2,832.79	11,688.9	5,772.72	0.39	-0.09	0.049
45.00	-43.46	-2.89	0.00	-222.53	0.00	222.53	5,576.61	2,788.30	11,217.6	5,539.99	0.50	-0.11	0.048
47.08	-41.56	-2.86	0.00	-216.51	0.00	216.51	5,538.76	2,769.38	11,022.5	5,443.60	0.54	-0.11	0.047
50.00	-39.00	-2.82	0.00	-208.17	0.00	208.17	5,485.02	2,742.51	10,750.5	5,309.27	0.61	-0.12	0.046
54.00	-38.68	-2.82	0.00	-196.90	0.00	196.90	4,089.14	2,044.57	8,015.68	3,958.64	0.72	-0.13	0.059
55.00	-37.09	-2.78	0.00	-194.08	0.00	194.08	4,077.72	2,038.86	7,951.24	3,926.82	0.75	-0.13	0.059
60.00	-35.54	-2.75	0.00	-180.16	0.00	180.16	4,019.09	2,009.54	7,629.58	3,767.96	0.90	-0.15	0.057
65.00	-34.03	-2.72	0.00	-166.39	0.00	166.39	3,957.85	1,978.93	7,309.16	3,609.72	1.06	-0.16	0.055
70.00	-32.55	-2.67	0.00	-152.81	0.00	152.81	3,894.01	1,947.01	6,990.39	3,452.29	1.24	-0.18	0.053
75.00	-31.10	-2.63	0.00	-139.44	0.00	139.44	3,827.57	1,913.78	6,673.67	3,295.87	1.44	-0.19	0.050
80.00	-29.68	-2.57	0.00	-126.30	0.00	126.30	3,758.52	1,879.26	6,359.40	3,140.67	1.65	-0.21	0.048
85.00	-28.30	-2.52	0.00	-113.43	0.00	113.43	3,686.86	1,843.43	6,047.97	2,986.87	1.87	-0.22	0.046
90.00	-26.96	-2.45	0.00	-100.85	0.00	100.85	3,612.61	1,806.30	5,739.81	2,834.68	2.12	-0.24	0.043
95.00	-26.82	-2.45	0.00	-88.59	0.00	88.59	3,535.74	1,767.87	5,435.30	2,684.29	2.37	-0.25	0.041
95.50	-24.94	-2.34	0.00	-87.36	0.00	87.36	3,527.92	1,763.96	5,405.07	2,669.36	2.40	-0.25	0.040
100.00	-24.53	-2.32	0.00	-76.82	0.00	76.82	3,456.28	1,728.14	5,134.86	2,535.91	2.64	-0.27	0.037
101.00	-23.67	-2.27	0.00	-74.49	0.00	74.49	2,422.80	1,211.40	3,656.13	1,805.62	2.70	-0.27	0.051
105.00	-22.63	-2.21	0.00	-65.41	0.00	65.41	2,386.99	1,193.50	3,503.59	1,730.29	2.93	-0.28	0.047
110.00	-21.61	-2.14	0.00	-54.38	0.00	54.38	2,339.89	1,169.95	3,313.75	1,636.54	3.23	-0.29	0.042
115.00	-19.53	-1.98	0.00	-43.70	0.00	43.70	2,290.19	1,145.09	3,125.22	1,543.43	3.54	-0.31	0.037
120.00	-19.15	-1.95	0.00	-33.80	0.00	33.80	2,237.88	1,118.94	2,938.40	1,451.17	3.87	-0.32	0.032
122.00	-15.83	-1.67	0.00	-29.90	0.00	29.90	2,216.23	1,108.11	2,864.24	1,414.54	4.01	-0.32	0.028
125.00	-15.65	-1.66	0.00	-24.89	0.00	24.89	2,182.97	1,091.48	2,753.69	1,359.95	4.21	-0.33	0.025
126.00	-13.53	-1.47	0.00	-23.23	0.00	23.23	2,171.67	1,085.84	2,717.04	1,341.84	4.28	-0.33	0.024
130.00	-13.20	-1.44	0.00	-17.36	0.00	17.36	2,125.45	1,062.73	2,571.50	1,269.97	4.56	-0.34	0.020
132.00	-10.28	-1.16	0.00	-14.48	0.00	14.48	2,101.72	1,050.86	2,499.42	1,234.37	4.70	-0.34	0.017
135.00	-10.12	-1.14	0.00	-11.02	0.00	11.02	2,065.33	1,032.67	2,392.23	1,181.43	4.92	-0.34	0.014
136.00	-7.67	-0.89	0.00	-9.88	0.00	9.88	2,053.00	1,026.50	2,356.76	1,163.91	4.99	-0.34	0.012
140.00	-5.61	-0.67	0.00	-6.32	0.00	6.32	1,995.73	997.87	2,208.66	1,090.78	5.28	-0.35	0.009
145.00	-4.96	-0.59	0.00	-2.97	0.00	2.97	1,903.77	951.88	2,008.69	992.02	5.65	-0.35	0.006
150.00	0.00	-0.56	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.20	897.94	6.02	-0.35	0.000

Load Case (0.9 - 0.2Sds) * DL + E ELFM **Seismic (Reduced DL) Equivalent Lateral Forces Method**

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	-43.79	-2.91	0.00	-350.55	0.00	350.55	6,283.69	3,141.85	15,557.3	7,683.17	0.00	0.00	0.053
5.00	-42.17	-2.92	0.00	-336.01	0.00	336.01	6,215.54	3,107.77	15,067.9	7,441.50	0.01	-0.01	0.052
10.00	-40.58	-2.92	0.00	-321.42	0.00	321.42	6,144.79	3,072.40	14,579.4	7,200.24	0.02	-0.02	0.051
15.00	-39.02	-2.92	0.00	-306.82	0.00	306.82	6,071.43	3,035.72	14,092.2	6,959.61	0.05	-0.03	0.051
20.00	-37.49	-2.92	0.00	-292.21	0.00	292.21	5,995.47	2,997.74	13,606.6	6,719.80	0.09	-0.05	0.050
25.00	-35.99	-2.92	0.00	-277.61	0.00	277.61	5,916.91	2,958.45	13,123.0	6,481.00	0.15	-0.06	0.049
30.00	-34.52	-2.91	0.00	-263.03	0.00	263.03	5,835.74	2,917.87	12,642.0	6,243.42	0.21	-0.07	0.048
35.00	-33.08	-2.89	0.00	-248.50	0.00	248.50	5,751.96	2,875.98	12,163.8	6,007.26	0.29	-0.08	0.047
40.00	-31.67	-2.87	0.00	-234.05	0.00	234.05	5,665.59	2,832.79	11,688.9	5,772.72	0.39	-0.09	0.046
45.00	-31.09	-2.86	0.00	-219.69	0.00	219.69	5,576.61	2,788.30	11,217.6	5,539.99	0.49	-0.11	0.045
47.08	-29.74	-2.84	0.00	-213.72	0.00	213.72	5,538.76	2,769.38	11,022.5	5,443.60	0.54	-0.11	0.045
50.00	-27.90	-2.79	0.00	-205.45	0.00	205.45	5,485.02	2,742.51	10,750.5	5,309.27	0.61	-0.12	0.044
54.00	-27.67	-2.79	0.00	-194.28	0.00	194.28	4,089.14	2,044.57	8,015.68	3,958.64	0.71	-0.13	0.056
55.00	-26.54	-2.76	0.00	-191.49	0.00	191.49	4,077.72	2,038.86	7,951.24	3,926.82	0.74	-0.13	0.055
60.00	-25.43	-2.72	0.00	-177.70	0.00	177.70	4,019.09	2,009.54	7,629.58	3,767.96	0.89	-0.15	0.053
65.00	-24.35	-2.69	0.00	-164.07	0.00	164.07	3,957.85	1,978.93	7,309.16	3,609.72	1.05	-0.16	0.052
70.00	-23.29	-2.64	0.00	-150.64	0.00	150.64	3,894.01	1,947.01	6,990.39	3,452.29	1.23	-0.18	0.050
75.00	-22.25	-2.60	0.00	-137.42	0.00	137.42	3,827.57	1,913.78	6,673.67	3,295.87	1.42	-0.19	0.048
80.00	-21.24	-2.54	0.00	-124.45	0.00	124.45	3,758.52	1,879.26	6,359.40	3,140.67	1.63	-0.21	0.045
85.00	-20.25	-2.48	0.00	-111.74	0.00	111.74	3,686.86	1,843.43	6,047.97	2,986.87	1.85	-0.22	0.043
90.00	-19.29	-2.42	0.00	-99.33	0.00	99.33	3,612.61	1,806.30	5,739.81	2,834.68	2.09	-0.24	0.040
95.00	-19.19	-2.41	0.00	-87.24	0.00	87.24	3,535.74	1,767.87	5,435.30	2,684.29	2.34	-0.25	0.038
95.50	-17.84	-2.31	0.00	-86.03	0.00	86.03	3,527.92	1,763.96	5,405.07	2,669.36	2.37	-0.25	0.037
100.00	-17.55	-2.29	0.00	-75.63	0.00	75.63	3,456.28	1,728.14	5,134.86	2,535.91	2.61	-0.26	0.035
101.00	-16.93	-2.24	0.00	-73.34	0.00	73.34	2,422.80	1,211.40	3,656.13	1,805.62	2.67	-0.27	0.048
105.00	-16.19	-2.17	0.00	-64.39	0.00	64.39	2,386.99	1,193.50	3,503.59	1,730.29	2.89	-0.28	0.044
110.00	-15.46	-2.10	0.00	-53.53	0.00	53.53	2,339.89	1,169.95	3,313.75	1,636.54	3.19	-0.29	0.039
115.00	-13.97	-1.95	0.00	-43.02	0.00	43.02	2,290.19	1,145.09	3,125.22	1,543.43	3.50	-0.30	0.034
120.00	-13.70	-1.92	0.00	-33.27	0.00	33.27	2,237.88	1,118.94	2,938.40	1,451.17	3.82	-0.31	0.029
122.00	-11.32	-1.65	0.00	-29.43	0.00	29.43	2,216.23	1,108.11	2,864.24	1,414.54	3.96	-0.32	0.026
125.00	-11.19	-1.63	0.00	-24.50	0.00	24.50	2,182.97	1,091.48	2,753.69	1,359.95	4.16	-0.32	0.023
126.00	-9.68	-1.44	0.00	-22.87	0.00	22.87	2,171.67	1,085.84	2,717.04	1,341.84	4.23	-0.33	0.022
130.00	-9.45	-1.41	0.00	-17.09	0.00	17.09	2,125.45	1,062.73	2,571.50	1,269.97	4.50	-0.33	0.018
132.00	-7.35	-1.14	0.00	-14.26	0.00	14.26	2,101.72	1,050.86	2,499.42	1,234.37	4.64	-0.34	0.015
135.00	-7.24	-1.12	0.00	-10.85	0.00	10.85	2,065.33	1,032.67	2,392.23	1,181.43	4.86	-0.34	0.013
136.00	-5.48	-0.88	0.00	-9.73	0.00	9.73	2,053.00	1,026.50	2,356.76	1,163.91	4.93	-0.34	0.011
140.00	-4.02	-0.66	0.00	-6.22	0.00	6.22	1,995.73	997.87	2,208.66	1,090.78	5.21	-0.34	0.008
145.00	-3.55	-0.58	0.00	-2.92	0.00	2.92	1,903.77	951.88	2,008.69	992.02	5.58	-0.35	0.005
150.00	0.00	-0.56	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.20	897.94	5.94	-0.35	0.000

Equivalent Modal Analysis Method

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.11
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.11
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.36
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.12
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.17
Period Based on Rayleigh Method (sec):	2.05
Redundancy Factor (p):	1.00

Load Case (1.2 + 0.2Sds) * DL + E EMAM **Seismic Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
38	147.50	534	1.828	1.667	1.025	0.251	89	654
37	142.50	555	1.706	1.144	0.823	0.208	77	680
36	138.00	507	1.600	0.778	0.670	0.175	59	620
35	135.50	129	1.542	0.611	0.595	0.158	14	158
34	133.50	392	1.497	0.494	0.539	0.146	38	479
33	131.00	265	1.442	0.367	0.476	0.132	23	325
32	128.00	541	1.376	0.240	0.408	0.116	42	662
31	125.50	146	1.323	0.154	0.357	0.105	10	179
30	123.50	443	1.281	0.095	0.320	0.097	29	542
29	121.00	311	1.230	0.035	0.278	0.088	18	380
28	117.50	792	1.160	-0.030	0.226	0.077	40	969
27	112.50	833	1.063	-0.088	0.165	0.064	36	1,020
26	107.50	854	0.971	-0.116	0.117	0.056	32	1,045
25	103.00	699	0.891	-0.122	0.084	0.050	23	855
24	100.50	337	0.848	-0.119	0.069	0.048	11	412
23	97.75	1,540	0.803	-0.112	0.055	0.046	47	1,885
22	95.25	108	0.762	-0.104	0.044	0.044	3	133
21	92.50	1,100	0.719	-0.092	0.034	0.043	32	1,346
20	87.50	1,128	0.643	-0.068	0.020	0.042	31	1,380
19	82.50	1,155	0.572	-0.043	0.012	0.040	31	1,414
18	77.50	1,183	0.505	-0.018	0.007	0.039	31	1,448
17	72.50	1,210	0.442	0.005	0.006	0.038	30	1,481
16	67.50	1,238	0.383	0.023	0.007	0.036	30	1,515
15	62.50	1,265	0.328	0.039	0.010	0.034	29	1,549
14	57.50	1,293	0.278	0.050	0.014	0.032	27	1,583
13	54.50	262	0.250	0.055	0.017	0.030	5	321
12	52.00	2,091	0.227	0.059	0.020	0.029	40	2,560
11	48.54	1,549	0.198	0.063	0.023	0.027	28	1,897
10	46.04	661	0.178	0.065	0.026	0.026	11	809
9	42.50	1,610	0.152	0.068	0.030	0.024	26	1,971
8	37.50	1,644	0.118	0.070	0.035	0.021	23	2,013
7	32.50	1,678	0.089	0.071	0.039	0.019	21	2,054
6	27.50	1,712	0.064	0.072	0.041	0.017	19	2,096
5	22.50	1,746	0.043	0.070	0.042	0.015	18	2,137

4	17.50	1,780	0.026	0.067	0.040	0.013	16	2,179
3	12.50	1,814	0.013	0.059	0.034	0.011	13	2,221
2	7.50	1,848	0.005	0.044	0.025	0.008	10	2,262
1	2.50	1,701	0.001	0.018	0.010	0.003	4	2,082
Powerwave Allgon TT0	150.00	66	1.890	1.980	1.140	0.274	12	81
Nokia AirScale RRH 4	150.00	110	1.890	1.980	1.140	0.274	20	135
Raycap DC6-48-60-18-	150.00	33	1.890	1.980	1.140	0.274	6	40
Raycap DC6-48-60-18-	150.00	16	1.890	1.980	1.140	0.274	3	20
Raycap DC6-48-60-0-8	150.00	16	1.890	1.980	1.140	0.274	3	20
Nokia AHLBBA	150.00	284	1.890	1.980	1.140	0.274	52	348
Alcatel-Lucent RRH4X	150.00	210	1.890	1.980	1.140	0.274	38	257
Nokia AirScale Dual	150.00	265	1.890	1.980	1.140	0.274	48	324
Nokia AEQK AirScale	150.00	298	1.890	1.980	1.140	0.274	54	364
Commscope JAH4-65C-	150.00	262	1.890	1.980	1.140	0.274	48	321
CCI TPA65R-BU8D	150.00	495	1.890	1.980	1.140	0.274	91	606
Flat Platform with H	150.00	2,000	1.890	1.980	1.140	0.274	366	2,448
Commscope CBC78-	140.00	40	1.646	0.929	0.735	0.189	5	48
Commscope TMA-T-	140.00	116	1.646	0.929	0.735	0.189	15	141
RFS DB-B1-6C-12AB-0Z	140.00	43	1.646	0.929	0.735	0.189	5	52
Ericsson RRUS B13 w/	140.00	216	1.646	0.929	0.735	0.189	27	264
Ericsson AIR 32 (57"	140.00	297	1.646	0.929	0.735	0.189	37	364
Kathrein Scala 800 1	140.00	112	1.646	0.929	0.735	0.189	14	138
Andrew LNX-6515DS-A1	140.00	299	1.646	0.929	0.735	0.189	38	366
Round Low Profile Pl	136.00	1,500	1.554	0.642	0.609	0.161	161	1,836
Round Platform w/ Ha	132.00	2,000	1.464	0.415	0.501	0.137	183	2,448
Andrew ETW190VS12UB	126.00	33	1.334	0.170	0.367	0.107	2	40
Nokia AirScale Dual	126.00	251	1.334	0.170	0.367	0.107	18	308
Nokia FRIG w/o Solar	126.00	162	1.334	0.170	0.367	0.107	12	198
Nokia FHFB	126.00	146	1.334	0.170	0.367	0.107	10	178
Raycap ASU9338TYP01	126.00	15	1.334	0.170	0.367	0.107	1	18
Andrew TMBXX-6516-	126.00	208	1.334	0.170	0.367	0.107	15	254
Commscope FFHH-65C-	126.00	377	1.334	0.170	0.367	0.107	27	462
Generic 48" x 12" Pa	122.00	270	1.250	0.057	0.294	0.091	16	331
Flat Platform with H	122.00	2,000	1.250	0.057	0.294	0.091	122	2,448
DragonWave Horizon D	115.00	14	1.111	-0.064	0.194	0.070	1	17
Samsung 2.5GHz nRRHv	115.00	152	1.111	-0.064	0.194	0.070	7	186
Argus LLPX310R	115.00	86	1.111	-0.064	0.194	0.070	4	105
Andrew Microwaves	115.00	95	1.111	-0.064	0.194	0.070	4	117
Side Arms	115.00	560	1.111	-0.064	0.194	0.070	26	685
		51,699	81.164	37.878	30.796	8.602	2,558	63,286

Load Case (0.9 - 0.2Sds) * DL + E EMAM **Seismic (Reduced DL) Equivalent Modal Analysis Method**

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
38	147.50	534	1.828	1.667	1.025	0.251	89	468
37	142.50	555	1.706	1.144	0.823	0.208	77	486
36	138.00	507	1.600	0.778	0.670	0.175	59	444
35	135.50	129	1.542	0.611	0.595	0.158	14	113
34	133.50	392	1.497	0.494	0.539	0.146	38	343
33	131.00	265	1.442	0.367	0.476	0.132	23	232
32	128.00	541	1.376	0.240	0.408	0.116	42	474
31	125.50	146	1.323	0.154	0.357	0.105	10	128
30	123.50	443	1.281	0.095	0.320	0.097	29	388
29	121.00	311	1.230	0.035	0.278	0.088	18	272
28	117.50	792	1.160	-0.030	0.226	0.077	40	694
27	112.50	833	1.063	-0.088	0.165	0.064	36	729
26	107.50	854	0.971	-0.116	0.117	0.056	32	748
25	103.00	699	0.891	-0.122	0.084	0.050	23	612

24	100.50	337	0.848	-0.119	0.069	0.048	11	295
23	97.75	1,540	0.803	-0.112	0.055	0.046	47	1,349
22	95.25	108	0.762	-0.104	0.044	0.044	3	95
21	92.50	1,100	0.719	-0.092	0.034	0.043	32	963
20	87.50	1,128	0.643	-0.068	0.020	0.042	31	988
19	82.50	1,155	0.572	-0.043	0.012	0.040	31	1,012
18	77.50	1,183	0.505	-0.018	0.007	0.039	31	1,036
17	72.50	1,210	0.442	0.005	0.006	0.038	30	1,060
16	67.50	1,238	0.383	0.023	0.007	0.036	30	1,084
15	62.50	1,265	0.328	0.039	0.010	0.034	29	1,108
14	57.50	1,293	0.278	0.050	0.014	0.032	27	1,133
13	54.50	262	0.250	0.055	0.017	0.030	5	229
12	52.00	2,091	0.227	0.059	0.020	0.029	40	1,831
11	48.54	1,549	0.198	0.063	0.023	0.027	28	1,357
10	46.04	661	0.178	0.065	0.026	0.026	11	579
9	42.50	1,610	0.152	0.068	0.030	0.024	26	1,410
8	37.50	1,644	0.118	0.070	0.035	0.021	23	1,440
7	32.50	1,678	0.089	0.071	0.039	0.019	21	1,470
6	27.50	1,712	0.064	0.072	0.041	0.017	19	1,500
5	22.50	1,746	0.043	0.070	0.042	0.015	18	1,529
4	17.50	1,780	0.026	0.067	0.040	0.013	16	1,559
3	12.50	1,814	0.013	0.059	0.034	0.011	13	1,589
2	7.50	1,848	0.005	0.044	0.025	0.008	10	1,619
1	2.50	1,701	0.001	0.018	0.010	0.003	4	1,490
Powerwave Allgon TT0	150.00	66	1.890	1.980	1.140	0.274	12	58
Nokia AirScale RRH 4	150.00	110	1.890	1.980	1.140	0.274	20	97
Raycap DC6-48-60-18-	150.00	33	1.890	1.980	1.140	0.274	6	29
Raycap DC6-48-60-18-	150.00	16	1.890	1.980	1.140	0.274	3	14
Raycap DC6-48-60-0-8	150.00	16	1.890	1.980	1.140	0.274	3	14
Nokia AHLBBA	150.00	284	1.890	1.980	1.140	0.274	52	249
Alcatel-Lucent RRH4X	150.00	210	1.890	1.980	1.140	0.274	38	184
Nokia AirScale Dual	150.00	265	1.890	1.980	1.140	0.274	48	232
Nokia AEQK AirScale	150.00	298	1.890	1.980	1.140	0.274	54	261
Commscope JAH4-65C-	150.00	262	1.890	1.980	1.140	0.274	48	229
CCI TPA65R-BU8D	150.00	495	1.890	1.980	1.140	0.274	91	434
Flat Platform with H	150.00	2,000	1.890	1.980	1.140	0.274	366	1,752
Commscope CBC78-	140.00	40	1.646	0.929	0.735	0.189	5	35
Commscope TMA-T-	140.00	116	1.646	0.929	0.735	0.189	15	101
RFS DB-B1-6C-12AB-0Z	140.00	43	1.646	0.929	0.735	0.189	5	37
Ericsson RRUS B13 w/	140.00	216	1.646	0.929	0.735	0.189	27	189
Ericsson AIR 32 (57"	140.00	297	1.646	0.929	0.735	0.189	37	260
Kathrein Scala 800 1	140.00	112	1.646	0.929	0.735	0.189	14	99
Andrew LNX-6515DS-A1	140.00	299	1.646	0.929	0.735	0.189	38	262
Round Low Profile Pl	136.00	1,500	1.554	0.642	0.609	0.161	161	1,314
Round Platform w/ Ha	132.00	2,000	1.464	0.415	0.501	0.137	183	1,752
Andrew ETW190VS12UB	126.00	33	1.334	0.170	0.367	0.107	2	29
Nokia AirScale Dual	126.00	251	1.334	0.170	0.367	0.107	18	220
Nokia FRIG w/o Solar	126.00	162	1.334	0.170	0.367	0.107	12	142
Nokia FHFB	126.00	146	1.334	0.170	0.367	0.107	10	127
Raycap ASU9338TYP01	126.00	15	1.334	0.170	0.367	0.107	1	13
Andrew TMBXX-6516-	126.00	208	1.334	0.170	0.367	0.107	15	182
Commscope FFHH-65C-	126.00	377	1.334	0.170	0.367	0.107	27	330
Generic 48" x 12" Pa	122.00	270	1.250	0.057	0.294	0.091	16	236
Flat Platform with H	122.00	2,000	1.250	0.057	0.294	0.091	122	1,752
DragonWave Horizon D	115.00	14	1.111	-0.064	0.194	0.070	1	12
Samsung 2.5GHz nRRHv	115.00	152	1.111	-0.064	0.194	0.070	7	133
Argus LLPX310R	115.00	86	1.111	-0.064	0.194	0.070	4	75
Andrew Microwaves	115.00	95	1.111	-0.064	0.194	0.070	4	83
Side Arms	115.00	560	1.111	-0.064	0.194	0.070	26	491
		51,699	81.164	37.878	30.796	8.602	2,558	45,283

Load Case **(1.2 + 0.2Sds) * DL + E EMAM** **Seismic Equivalent Modal Analysis Method**

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	-61.20	-2.56	0.00	-319.79	0.00	319.79	6,283.69	3,141.85	15,557.31	7,683.17	0.00	0.00	0.051
5.00	-58.94	-2.56	0.00	-307.00	0.00	307.00	6,215.54	3,107.77	15,067.96	7,441.50	0.01	-0.01	0.051
10.00	-56.72	-2.56	0.00	-294.20	0.00	294.20	6,144.79	3,072.40	14,579.45	7,200.24	0.02	-0.02	0.050
15.00	-54.54	-2.55	0.00	-281.42	0.00	281.42	6,071.43	3,035.72	14,092.20	6,959.61	0.05	-0.03	0.049
20.00	-52.40	-2.54	0.00	-268.67	0.00	268.67	5,995.47	2,997.74	13,606.61	6,719.80	0.09	-0.04	0.049
25.00	-50.31	-2.53	0.00	-255.97	0.00	255.97	5,916.91	2,958.45	13,123.09	6,481.00	0.14	-0.05	0.048
30.00	-48.25	-2.52	0.00	-243.32	0.00	243.32	5,835.74	2,917.87	12,642.03	6,243.42	0.20	-0.06	0.047
35.00	-46.24	-2.50	0.00	-230.75	0.00	230.75	5,751.96	2,875.98	12,163.84	6,007.26	0.27	-0.07	0.046
40.00	-44.27	-2.48	0.00	-218.25	0.00	218.25	5,665.59	2,832.79	11,688.92	5,772.72	0.35	-0.09	0.046
45.00	-43.46	-2.47	0.00	-205.86	0.00	205.86	5,576.61	2,788.30	11,217.67	5,539.99	0.45	-0.10	0.045
47.08	-41.56	-2.45	0.00	-200.71	0.00	200.71	5,538.76	2,769.38	11,022.50	5,443.60	0.49	-0.10	0.044
50.00	-39.00	-2.41	0.00	-193.57	0.00	193.57	5,485.02	2,742.51	10,750.50	5,309.27	0.56	-0.11	0.044
54.00	-38.68	-2.41	0.00	-183.94	0.00	183.94	4,089.14	2,044.57	8,015.68	3,958.64	0.66	-0.12	0.056
55.00	-37.10	-2.38	0.00	-181.54	0.00	181.54	4,077.72	2,038.86	7,951.24	3,926.82	0.68	-0.12	0.055
60.00	-35.55	-2.36	0.00	-169.64	0.00	169.64	4,019.09	2,009.54	7,629.58	3,767.96	0.82	-0.14	0.054
65.00	-34.03	-2.33	0.00	-157.85	0.00	157.85	3,957.85	1,978.93	7,309.16	3,609.72	0.97	-0.15	0.052
70.00	-32.55	-2.31	0.00	-146.19	0.00	146.19	3,894.01	1,947.01	6,990.39	3,452.29	1.13	-0.17	0.051
75.00	-31.10	-2.28	0.00	-134.66	0.00	134.66	3,827.57	1,913.78	6,673.67	3,295.87	1.31	-0.18	0.049
80.00	-29.69	-2.25	0.00	-123.27	0.00	123.27	3,758.52	1,879.26	6,359.40	3,140.67	1.51	-0.19	0.047
85.00	-28.31	-2.22	0.00	-112.02	0.00	112.02	3,686.86	1,843.43	6,047.97	2,986.87	1.72	-0.21	0.045
90.00	-26.96	-2.19	0.00	-100.92	0.00	100.92	3,612.61	1,806.30	5,739.81	2,834.68	1.95	-0.22	0.043
95.00	-26.83	-2.19	0.00	-89.96	0.00	89.96	3,535.74	1,767.87	5,435.30	2,684.29	2.19	-0.24	0.041
95.50	-24.94	-2.14	0.00	-88.87	0.00	88.87	3,527.92	1,763.96	5,405.07	2,669.36	2.21	-0.24	0.040
100.00	-24.53	-2.13	0.00	-79.24	0.00	79.24	3,456.28	1,728.14	5,134.86	2,535.91	2.44	-0.25	0.038
101.00	-23.67	-2.11	0.00	-77.11	0.00	77.11	2,422.80	1,211.40	3,656.13	1,805.62	2.50	-0.25	0.052
105.00	-22.63	-2.07	0.00	-68.69	0.00	68.69	2,386.99	1,193.50	3,503.59	1,730.29	2.71	-0.26	0.049
110.00	-21.61	-2.04	0.00	-58.31	0.00	58.31	2,339.89	1,169.95	3,313.75	1,636.54	3.00	-0.28	0.045
115.00	-19.53	-1.95	0.00	-48.11	0.00	48.11	2,290.19	1,145.09	3,125.22	1,543.43	3.30	-0.29	0.040
120.00	-19.15	-1.93	0.00	-38.36	0.00	38.36	2,237.88	1,118.94	2,938.40	1,451.17	3.62	-0.31	0.035
122.00	-15.83	-1.75	0.00	-34.49	0.00	34.49	2,216.23	1,108.11	2,864.24	1,414.54	3.75	-0.31	0.032
125.00	-15.65	-1.74	0.00	-29.23	0.00	29.23	2,182.97	1,091.48	2,753.69	1,359.95	3.95	-0.32	0.029
126.00	-13.53	-1.60	0.00	-27.49	0.00	27.49	2,171.67	1,085.84	2,717.04	1,341.84	4.01	-0.32	0.027
130.00	-13.20	-1.58	0.00	-21.08	0.00	21.08	2,125.45	1,062.73	2,571.50	1,269.97	4.29	-0.33	0.023
132.00	-10.28	-1.34	0.00	-17.92	0.00	17.92	2,101.72	1,050.86	2,499.42	1,234.37	4.43	-0.33	0.019
135.00	-10.12	-1.33	0.00	-13.89	0.00	13.89	2,065.33	1,032.67	2,392.23	1,181.43	4.64	-0.34	0.017
136.00	-7.66	-1.09	0.00	-12.56	0.00	12.56	2,053.00	1,026.50	2,356.76	1,163.91	4.71	-0.34	0.015
140.00	-5.61	-0.86	0.00	-8.18	0.00	8.18	1,995.73	997.87	2,208.66	1,090.78	4.99	-0.34	0.010
145.00	-4.96	-0.77	0.00	-3.86	0.00	3.86	1,903.77	951.88	2,008.69	992.02	5.36	-0.35	0.006
150.00	0.00	-0.74	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.20	897.94	5.72	-0.35	0.000

Load Case **(0.9 - 0.2Sds) * DL + E EMAM** **Seismic (Reduced DL) Equivalent Modal Analysis Method**

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	-43.79	-2.56	0.00	-316.58	0.00	316.58	6,283.69	3,141.85	15,557.31	7,683.17	0.00	0.00	0.048
5.00	-42.17	-2.56	0.00	-303.79	0.00	303.79	6,215.54	3,107.77	15,067.96	7,441.50	0.01	-0.01	0.048
10.00	-40.58	-2.55	0.00	-291.02	0.00	291.02	6,144.79	3,072.40	14,579.45	7,200.24	0.02	-0.02	0.047
15.00	-39.02	-2.54	0.00	-278.27	0.00	278.27	6,071.43	3,035.72	14,092.20	6,959.61	0.05	-0.03	0.046
20.00	-37.50	-2.53	0.00	-265.57	0.00	265.57	5,995.47	2,997.74	13,606.61	6,719.80	0.09	-0.04	0.046
25.00	-35.99	-2.51	0.00	-252.93	0.00	252.93	5,916.91	2,958.45	13,123.09	6,481.00	0.13	-0.05	0.045
30.00	-34.52	-2.50	0.00	-240.36	0.00	240.36	5,835.74	2,917.87	12,642.03	6,243.42	0.19	-0.06	0.044
35.00	-33.08	-2.48	0.00	-227.87	0.00	227.87	5,751.96	2,875.98	12,163.84	6,007.26	0.27	-0.07	0.044
40.00	-31.67	-2.46	0.00	-215.47	0.00	215.47	5,665.59	2,832.79	11,688.92	5,772.72	0.35	-0.09	0.043
45.00	-31.09	-2.45	0.00	-203.18	0.00	203.18	5,576.61	2,788.30	11,217.67	5,539.99	0.44	-0.10	0.042
47.08	-29.74	-2.42	0.00	-198.07	0.00	198.07	5,538.76	2,769.38	11,022.50	5,443.60	0.49	-0.10	0.042
50.00	-27.90	-2.38	0.00	-191.01	0.00	191.01	5,485.02	2,742.51	10,750.50	5,309.27	0.55	-0.11	0.041
54.00	-27.67	-2.38	0.00	-181.47	0.00	181.47	4,089.14	2,044.57	8,015.68	3,958.64	0.65	-0.12	0.053
55.00	-26.54	-2.36	0.00	-179.09	0.00	179.09	4,077.72	2,038.86	7,951.24	3,926.82	0.67	-0.12	0.052
60.00	-25.43	-2.33	0.00	-167.31	0.00	167.31	4,019.09	2,009.54	7,629.58	3,767.96	0.81	-0.13	0.051
65.00	-24.35	-2.30	0.00	-155.65	0.00	155.65	3,957.85	1,978.93	7,309.16	3,609.72	0.96	-0.15	0.049
70.00	-23.29	-2.28	0.00	-144.13	0.00	144.13	3,894.01	1,947.01	6,990.39	3,452.29	1.12	-0.16	0.048
75.00	-22.25	-2.25	0.00	-132.75	0.00	132.75	3,827.57	1,913.78	6,673.67	3,295.87	1.30	-0.18	0.046
80.00	-21.24	-2.22	0.00	-121.50	0.00	121.50	3,758.52	1,879.26	6,359.40	3,140.67	1.49	-0.19	0.044
85.00	-20.25	-2.19	0.00	-110.41	0.00	110.41	3,686.86	1,843.43	6,047.97	2,986.87	1.70	-0.21	0.042
90.00	-19.29	-2.16	0.00	-99.46	0.00	99.46	3,612.61	1,806.30	5,739.81	2,834.68	1.92	-0.22	0.040
95.00	-19.19	-2.16	0.00	-88.66	0.00	88.66	3,535.74	1,767.87	5,435.30	2,684.29	2.16	-0.23	0.038
95.50	-17.84	-2.11	0.00	-87.58	0.00	87.58	3,527.92	1,763.96	5,405.07	2,669.36	2.19	-0.24	0.038
100.00	-17.55	-2.10	0.00	-78.10	0.00	78.10	3,456.28	1,728.14	5,134.86	2,535.91	2.41	-0.25	0.036
101.00	-16.94	-2.07	0.00	-76.00	0.00	76.00	2,422.80	1,211.40	3,656.13	1,805.62	2.47	-0.25	0.049
105.00	-16.19	-2.04	0.00	-67.70	0.00	67.70	2,386.99	1,193.50	3,503.59	1,730.29	2.68	-0.26	0.046
110.00	-15.46	-2.01	0.00	-57.48	0.00	57.48	2,339.89	1,169.95	3,313.75	1,636.54	2.96	-0.28	0.042
115.00	-13.97	-1.92	0.00	-47.44	0.00	47.44	2,290.19	1,145.09	3,125.22	1,543.43	3.26	-0.29	0.037
120.00	-13.70	-1.90	0.00	-37.84	0.00	37.84	2,237.88	1,118.94	2,938.40	1,451.17	3.57	-0.30	0.032
122.00	-11.32	-1.73	0.00	-34.03	0.00	34.03	2,216.23	1,108.11	2,864.24	1,414.54	3.70	-0.31	0.029
125.00	-11.19	-1.72	0.00	-28.85	0.00	28.85	2,182.97	1,091.48	2,753.69	1,359.95	3.90	-0.32	0.026
126.00	-9.68	-1.58	0.00	-27.14	0.00	27.14	2,171.67	1,085.84	2,717.04	1,341.84	3.96	-0.32	0.025
130.00	-9.44	-1.56	0.00	-20.81	0.00	20.81	2,125.45	1,062.73	2,571.50	1,269.97	4.23	-0.33	0.021
132.00	-7.35	-1.33	0.00	-17.70	0.00	17.70	2,101.72	1,050.86	2,499.42	1,234.37	4.37	-0.33	0.018
135.00	-7.24	-1.31	0.00	-13.72	0.00	13.72	2,065.33	1,032.67	2,392.23	1,181.43	4.58	-0.33	0.015
136.00	-5.48	-1.08	0.00	-12.41	0.00	12.41	2,053.00	1,026.50	2,356.76	1,163.91	4.65	-0.33	0.013
140.00	-4.01	-0.85	0.00	-8.09	0.00	8.09	1,995.73	997.87	2,208.66	1,090.78	4.93	-0.34	0.009
145.00	-3.55	-0.76	0.00	-3.81	0.00	3.81	1,903.77	951.88	2,008.69	992.02	5.29	-0.34	0.006
150.00	0.00	-0.74	0.00	0.00	0.00	0.00	1,811.80	905.90	1,818.20	897.94	5.65	-0.34	0.000

Analysis Summary

	Reactions						Max Usage	
Load Case	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 + 1.6W	40.25	0.00	61.99	0.00	0.00	4267.67	54.00	0.58
0.9D + 1.6W	40.23	0.00	46.48	0.00	0.00	4231.44	54.00	0.57
1.2D + 1.0Di + 1.0Wi	11.44	0.00	104.32	0.00	0.00	1106.07	0.00	0.16
(1.2 + 0.2Sds) * DL + E ELFM	2.91	0.00	61.20	0.00	0.00	353.98	54.00	0.06
(1.2 + 0.2Sds) * DL + E EMAM	2.56	0.00	61.20	0.00	0.00	319.79	54.00	0.06
(0.9 - 0.2Sds) * DL + E ELFM	2.91	0.00	43.79	0.00	0.00	350.55	54.00	0.06
(0.9 - 0.2Sds) * DL + E EMAM	2.56	0.00	43.79	0.00	0.00	316.58	54.00	0.05
1.0D + 1.0W	10.00	0.00	51.70	0.00	0.00	1055.29	54.00	0.15

Base Plate & Anchor Rod Analysis

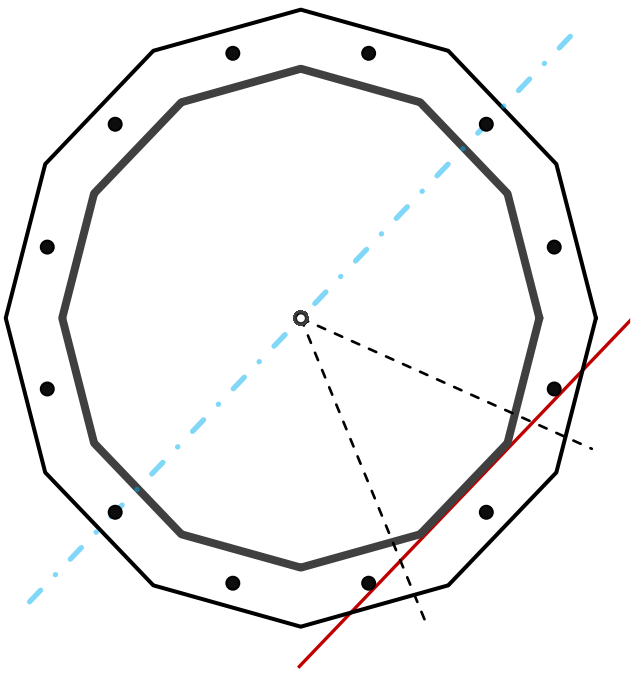
Pole Dimensions		
Number of Sides	12	-
Diameter	60.5	in
Thickness	1/2	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	4,267.7	k-ft
Axial, Pu	62.0	k
Shear, Vu	40.3	k
Neutral Axis	225	°

Report Capacities		
Component	Capacity	Result
Base Plate	28%	Pass
Anchor Rods	102%	Pass
Dwyidag	-	-

Base Plate		
Number of Sides	12	-
Diameter, ø	75.14	in
Thickness	2 5/8	in
Grade	A871-60	
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	784.1	k
Bending Stress, ϕMn	2765.2	k

Original Anchor Rods		
Arrangement	Radial	-
Quantity	12	-
Diameter, ø	2 1/4	in
Bolt Circle	69.14	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	18.1	in
Orientation Offset	15	°
Applied Force, Pu	260.7	k
Anchor Rods, ϕPn	259.8	k



Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	40.3	4267.7	1.00
Anchor Rod Forces	40.3	4267.7	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	93.1749	7.7646	0.6497		41936.48
Bolt	3.9761	3.2477	0.8393	4.5	21725.25
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	12	-
Width, W	75.14	in
Thickness, t	2.625	in
Yield Strength, Fy	60	ksi
Tensile Strength, Fu	75	ksi
Base Plate Chord	44.562	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

Anchor Rods		
Anchor Rod Quantity, N	12	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	69.14	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	260.7	k
Applied Shear, Vu	2.7	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	1.004	OK
Interaction Capacity	1.022	OK

External Base Plate		
Chord Length AA	45.514	in
Additional AA	5.250	in
Section Modulus, Z	87.449	in^3
Applied Moment, Mu	784.1	k-ft
Bending Capacity, ϕMn	4722.2	k-ft
Capacity, Mu/ϕMn	0.166	OK
Chord Length AB	43.371	in
Additional AB	5.250	in
Section Modulus, Z	83.757	in^3
Applied Moment, Mu	504.8	k-ft
Bending Capacity, ϕMn	4522.9	k-ft
Capacity, Mu/ϕMn	0.112	OK
Bend Line Length	29.726	in
Additional Bend Line	0.000	in
Section Modulus, Z	51.207	in^3
Applied Moment, Mu	784.1	k-ft
Bending Capacity, ϕMn	2765.2	k-ft
Capacity, Mu/ϕMn	0.284	OK

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, ϕMn	0.0	k-ft
Capacity, Mu/ϕMn		

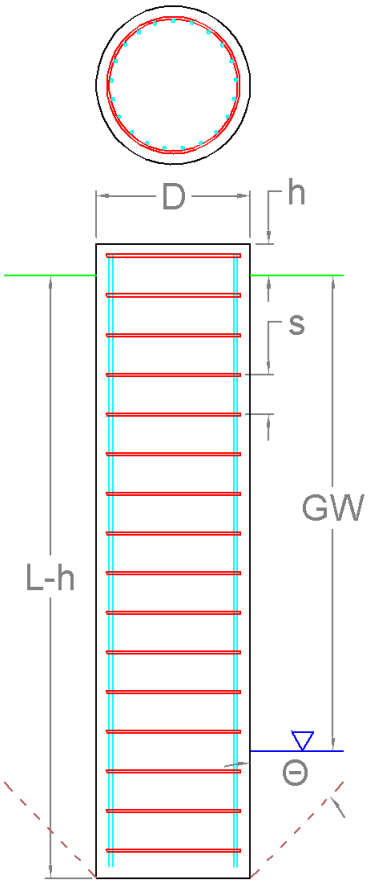
Pier Foundation Analysis (ANSI/TIA-222-G)

Foundation Analysis Parameters			
Pier Diameter	*D*	8.00	ft
Pier Embedment	*L-h*	33.0	ft
Pier Height above Ground	*H*	0.50	ft
Water Table Depth [BGL]	*GW*	18	ft
Pullout Angle	Θ	30	°
Unit Weight of Concrete		150	pcf
Uplift Skin Friction Factor		1.000	

Reactions		
Moment, M_u	4,267.7	k-ft
Shear, V_u	40.2	k
Axial, P_u	62.0	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	1.0	105	0	0	0	0
1.0	7.0	100	250	0	0	0
7.0	10.5	100	250	0	134	0
10.5	12.0	136	5,916	0	2,662	0
12.0	18.0	136	6,125	0	2,768	0
18.0	18.5	100	9,017	0	4,058	0
18.5	34.0	100	9,845	0	4,430	36,226



Soil Strength Capacities		
Volume of Concrete	1,683.9	ft^3
Weight of Concrete [Buoyancy Considered]	205.5	k
Average Soil Unit Weight	80.0	pcf
Skin Friction Resistance	2,194.9	k
Compressive Bearing Resistance	1,820.9	k
Pullout Weight [Minus Concrete Weight]	1,635.0	k
Compressive Force, P_u	144.9	k
Nominal Compressive Capacity, $\phi_s P_n$	3,011.9	k
$P_u / \phi_s P_n$	4.8%	
Total Lateral Resistance	11,556.2	k
Inflection Point [BGL]	23.2	ft
Moment at Inflection Point, M_D	5,220.2	k-ft
Nominal Moment Capacity, $\phi_s M_n$	46,789.3	k-ft
$M_D / \phi_s M_n$	11.2%	

Pier Strength Capacities			
Concrete Compressive Strength, f'_c		3,000	psi
Rebar Size #		9	
Rebar Area (Single)		1.00	in^2
Rebar Quantity		32	
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	*s*	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		4,289.1	k-ft
Moment Capacity, $\phi_B M_n$		6,190.9	k-ft
$M_u / \phi_B M_n$		**69.3%**	
Design Shear, V_u		395.9	k
Shear Capacity, $\phi_V V_n$		712.4	k
$V_u / \phi_V V_n$		**55.6%**	
Design Compression, P_u		144.9	k
Compression Capacity, $\phi_P P_n$		10,553.9	k
$P_u / \phi_P P_n$		**1.4%**	
Bending Reinforcement Ratio		0.004	