STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

VIA ELECTRONIC MAIL

November 21, 2019

Mark Roberts
QC Development
P.O. Box 916
Storrs, CT 06268

RE: **EM-CING-057-191021** – New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 36 Ritch Avenue, Greenwich, Connecticut.

Dear Mr. Roberts:

The Connecticut Siting Council (Council) is in receipt of your correspondence of November 19, 2019 submitted in response to the Council's October 29, 2019 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

Mark Roberts

To: Robidoux, Evan
Cc: CSC-DL Siting Council
Subject: RE: Council Incomplete Letter for EM-CING-057-191021 (36 Ritch Avenue, Greenwich, Connecticut)
Attachments: CT5004_PASSING SA_REV.pdf

Importance: High

Hello – Please find attached a revised tower structural analysis per your incomplete letter referenced below. A hard copy will follow via US Mail.

Thanks

Mark Roberts
QC Development
860-670-9068

From: Robidoux, Evan <Evan.Robidoux@ct.gov>
Sent: Thursday, October 31, 2019 3:48 PM
To: Mark Roberts <mark.roberts@qcdevelopment.net>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>
Subject: Council Incomplete Letter for EM-CING-057-191021 (36 Ritch Avenue, Greenwich, Connecticut)

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**82.7 ft Monopole**
ATC Site Name	:	**Byram Park CT, CT**
ATC Asset Number	:	**414240**
Engineering Number	:	**OAA754187_C3_01**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**GREENWICH SW**
Carrier Site Number	:	**CT5004**
Site Location	:	**48 RITCH AVENUE WEST** **GREENWICH, CT 06830-9992** **41.005100,-73.648300**
County	:	**Fairfield**
Date	:	**November 12, 2019**
Max Usage	:	**59%**
Result	:	**Pass**

Prepared By:
Thomas Pham
Structural Engineer I

Reviewed By:

COA: PEC.0001553

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 82.7 ft monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	EEI Project #16733 Rev. 3, dated December 9, 2011
Foundation Drawing	Centek Engineering Job #09129 Rev. 0, dated February 14, 2012
Geotechnical Report	DET Job #2010.14, dated October 4, 2010
Modifications	ATC Project #OAA711130_C6_09, dated October 26, 2018

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:	93 mph (3-Second Gust, V_{asd}) / 120 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2015 IBC / 2018 Connecticut State Building Code
Structure Class:	II
Exposure Category:	C
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	Ss = 0.26, 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	Antenna	Mount Type	Lines	Carrier
89.0	2	dbSpectra DS7C09P36U-D	Pole Mount	(2) 1/2" Coax (2) 7/8" Coax	TOWN OF GREENWICH, CT
	1	Bird 428D-83I-01-T			
77.0	3	RFS APX16DWV-16DWVS-E-A20 (60" Height)	T-Arm	(4) 1 1/4" Hybriflex Cable (3) 1 5/8" (1.63"-41.3mm) Fiber	T-MOBILE
	3	Ericsson AIR-32 B2A/B66Aa			
	3	Ericsson RRUS 32 B66			
	3	Ericsson Radio 4449 B12,B71			
	3	RFS APXVAARR24_43-U-NA20			
67.0	3	Ericsson RRUS 4478 B14	-	(2) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6 (12) 1 5/8" Coax (1) 2" conduit	AT&T MOBILITY
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 4426 B66			
	2	Raycap DC6-48-60-18-8F(32.8 lbs)			
	1	Raycap DC6-48-60-0-8C-EV			
	6	CCI DTMABP7819VG12A			
	3	Ericsson RRUS 32 B2			
	3	CCI OPA-65R-LCUU-H6			
	6	CCI DMP65R-BU4D			
	3	Powerwave Allgon P65-16-XLH-RR			
	3	Ericsson RRUS-32 (77 lbs)			
56.0	3	Alcatel-Lucent RRH2x60 700	T-Arm	(18) 1 5/8" Coax (1) 1 5/8" (1.63"-41.3mm) Fiber (1) 1 5/8" Hybriflex	VERIZON WIRELESS
	3	Alcatel-Lucent B66 RRH4x45			
	2	Commscope RC2DC-4750-PF-48			
	4	Commscope SBNHH-1D45A			
	2	Commscope SBNHH-1D65A			
	3	Amphenol Antel BXA-171063-12CF			
	3	Alcatel-Lucent RRH 2X60-1900			
	6	Amphenol Antel LPA-80063-6CF-EDIN-X			

Equipment to be Removed

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
67.0	-	-	Sector Frame	-	AT&T MOBILITY

Proposed Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
67.0	-	-	Site PRO1 RMV12-496	-	AT&T MOBILITY

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

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	39%	Pass
Shaft	46%	Pass
Base Plate	19%	Pass
Flange	2%	Pass

Foundations

Reaction Component	Original Design Reactions	Analysis Reactions	% of Design
Moment (Kips-Ft)	4,555.2	2,332.0	51%
Shear (Kips)	74.4	44.3	59%

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
67.0	CCI DTMABP7819VG12A	AT&T MOBILITY	0.192	0.287
	Raycap DC6-48-60-0-8C-EV			
	Raycap DC6-48-60-18-8F(32.8 lbs)			
	Ericsson RRUS 4426 B66			
	Ericsson RRUS 4449 B5, B12			
	Ericsson RRUS 4478 B14			
	Ericsson RRUS 32 B2			
	Ericsson RRUS-32 (77 lbs)			
	Powerwave Allgon P65-16-XLH-RR			
	CCI DMP65R-BU4D			
	CCI OPA-65R-LCUU-H6			

***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 A.T. Engineering Service, PLLC 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 A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

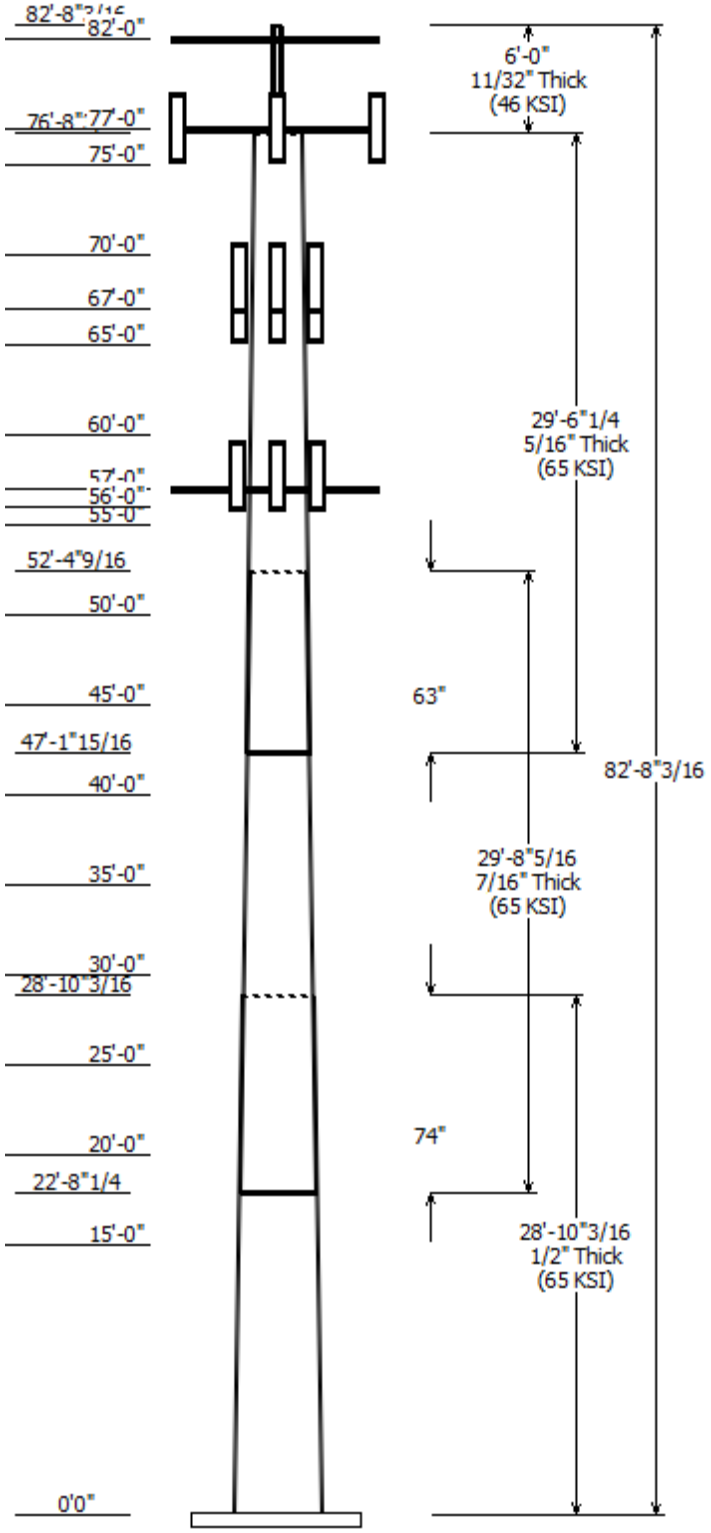
All assets of American Tower Corporation, its affiliates and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with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

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, 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. A.T. Engineering Service, PLLC 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 :	414240	Code:	ANSI/TIA-222-G
Location :	Byram Park CT, CT		
Description :	77 ft monopine	Struct Class :	II
Shape :	18 Sides	Exposure :	C
Height :	82.68 (ft)	Topo :	1
Base Elev (ft):	0.00		
Taper:	0.335790 (in/ft)		

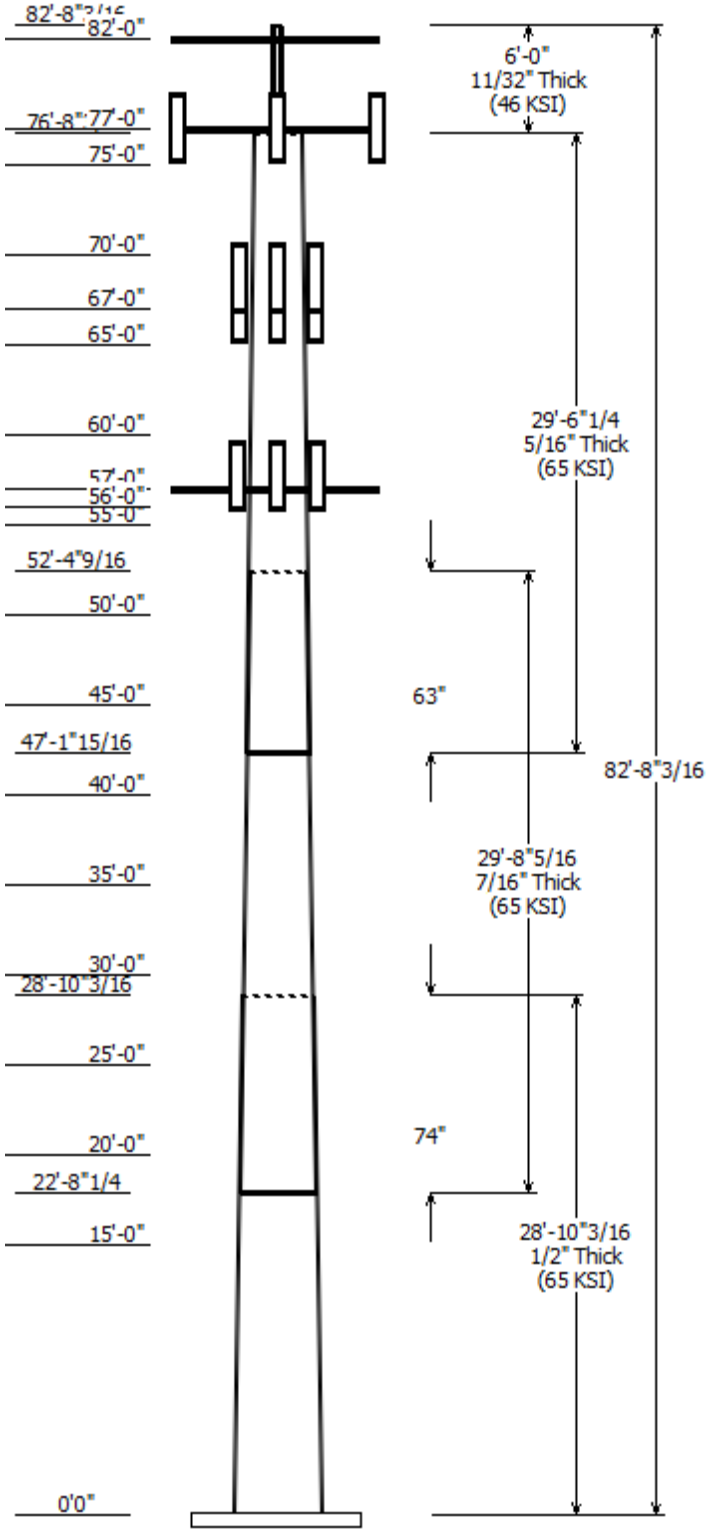


Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	28.852	42.31	52.00	0.500		0.000	18 Sides	65
2	29.693	35.28	45.25	0.438	Slip Joint	73.969	18 Sides	65
3	29.521	27.75	37.66	0.313	Slip Joint	62.656	18 Sides	65
4	6.000	4.500	4.500	0.337	Butt Joint	0.000	Round	46

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
89.000	89.000	2	dbSpectra DS7C09P36U-D
89.000	89.000	1	Bird 428D-83I-01-T
82.000	82.000	2	Round Side Arm
82.000	82.000	2	Pole Mount
77.000	77.000	3	Flat T-Arms
77.000	77.000	3	RFS APXVAARR24_43-U-NA20
77.000	77.000	3	RFS APX16DWV-16DWVS-E-A20
77.000	77.000	3	Ericsson AIR-32 B2A/B66Aa
77.000	77.000	3	Ericsson RRUS 32 B66
77.000	77.000	3	Ericsson Radio 4449 B12,B71
75.000	75.400	1	Pine Branches
70.000	70.000	1	Pine Branches
67.000	68.000	3	CCI OPA-65R-LCUU-H6
67.000	67.000	6	CCI DMP65R-BU4D
67.000	68.000	3	Powerwave Allgon P65-16-
67.000	68.000	3	Ericsson RRUS-32 (77 lbs)
67.000	68.000	3	Ericsson RRUS 32 B2
67.000	67.000	3	Ericsson RRUS 4478 B14
67.000	67.000	3	Ericsson RRUS 4449 B5, B12
67.000	68.000	3	Ericsson RRUS 4426 B66
67.000	68.000	2	Raycap DC6-48-60-18-8F(32.8 lb
67.000	67.000	1	Raycap DC6-48-60-0-8C-EV
67.000	68.000	6	CCI DTMABP7819VG12A
67.000	67.000	3	Site PRO1, RMV12-496
65.000	65.000	1	Pine Branches
60.000	60.000	1	Pine Branches
57.000	57.000	3	Flat T-Arm
56.000	56.000	1	VZW Unused Reserve: 14138
56.000	57.000	6	Amphenol Antel LPA-80063-
56.000	57.000	4	Commscope SBNHH-1D45A
56.000	57.000	2	Commscope SBNHH-1D65A
56.000	57.000	3	Amphenol Antel BXA-171063-
56.000	57.000	2	Commscope RC2DC-4750-PF-
56.000	57.000	3	Alcatel-Lucent B66 RRH4x45
56.000	57.000	3	Alcatel-Lucent RRH2x60 700
56.000	57.000	3	Alcatel-Lucent RRH 2X60-1900
55.000	55.000	1	Pine Branches
50.000	50.000	1	Pine Branches
45.000	45.000	1	Pine Branches
40.000	40.000	1	Pine Branches
35.000	35.000	1	Pine Branches
30.000	30.000	1	Pine Branches
25.000	25.000	1	Pine Branches
20.000	20.000	1	Pine Branches



15.000	15.000	1	Pine Branches

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	56.000	1 5/8" (1.63"-	No
0.000	56.000	1 5/8" Coax	No
0.000	56.000	1 5/8" Hybriflex	No
0.000	57.000	1 5/8" Coax	No
0.000	67.000	0.39" (10mm)	No
0.000	67.000	0.78" (19.7mm) 8	No
0.000	67.000	1 5/8" Coax	No
0.000	67.000	2" conduit	No
0.000	77.000	1 1/4" Hybriflex	No
0.000	77.000	1 5/8" (1.63"-	No
0.000	89.000	1/2" Coax	No
0.000	89.000	7/8" Coax	No

Load Cases

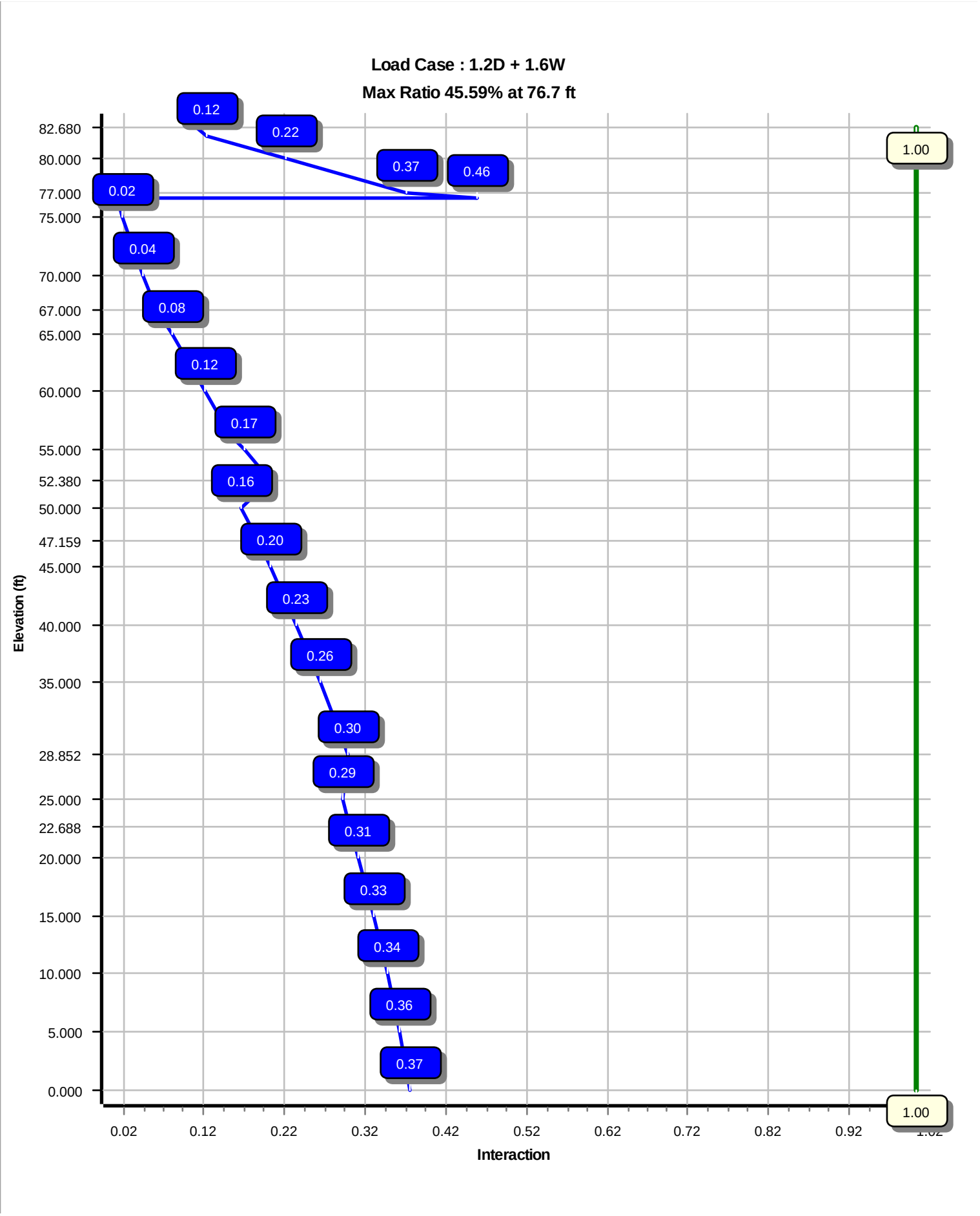
1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) 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	2332.02	44.26	43.10
0.9D + 1.6W	2327.05	44.25	32.31
1.2D + 1.0Di + 1.0Wi	669.65	12.83	60.56
(1.2 + 0.2Sds) * DL + E ELFM	200.88	3.59	43.14
(1.2 + 0.2Sds) * DL + E EMAM	150.28	2.51	43.14
(0.9 - 0.2Sds) * DL + E ELFM	200.30	3.59	29.03
(0.9 - 0.2Sds) * DL + E EMAM	149.83	2.50	29.03
1.0D + 1.0W	542.45	10.31	35.95

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000


Load Case : 1.2D + 1.6W
Max Ratio 45.59% at 76.7 ft
0.12
0.22
0.37
0.46
0.02
0.04
0.08
0.12
0.17
0.16
0.20
0.23
0.26
0.30
0.29
0.31
0.33
0.34
0.36
0.37
1.00
1.00
82.680
80.000
77.000
75.000
70.000
67.000
65.000
60.000
55.000
52.380
50.000
47.159
45.000
40.000
35.000
28.852
25.000
22.688
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: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA754187_C3_01 11/12/2019 2:45:49 PM

Customer: AT&T MOBILITY

Analysis Parameters

Location :	Fairfield County, CT	Height (ft) :	82.68
Code :	ANSI/TIA-222-G	Base Diameter (in) :	52.00
Shape :	18 Sides. Sect 4: Round	Top Diameter (in) :	4.50
Pole Type :	Custom	Taper (in/ft) :	0.336
Pole Manfacturer :	EEI	Rotation (deg) :	0.00

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	93 mph
Exposure Category:	C	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0 ft	Design Ice Thickness:	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods				
Site Class:	D - Stiff Soil				
Period Based on Rayleigh Method (sec):	0.75				
T_L (sec):	6	p:	1	C_s:	0.100
S_s:	0.260	S_1:	0.070	C_s Max:	0.100
F_a:	1.592	F_v:	2.400	C_s Min:	0.030
S_{ds}:	0.276	S_{d1}:	0.112		

Load Cases

1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.75 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)
1-18	28.852	0.5000	65		0.00	7,269	52.00	0.00	81.73	27386.5	16.57	104.00	42.31	28.85	66.35	14656.0	13.16	84.62	0.335790
2-18	29.693	0.4375	65	Slip	73.97	5,589	45.25	22.69	62.23	15794.9	16.48	103.44	35.28	52.38	48.39	7424.8	12.46	80.65	0.335790
3-18	29.521	0.3125	65	Slip	62.66	3,228	37.66	47.16	37.05	6530.4	19.49	120.53	27.75	76.68	27.22	2588.8	13.90	88.81	0.335790
4-R	6.000	0.3370	46	Butt	0.00	90	4.500	76.68	4.41	9.6	0.00	13.35	4.500	82.68	4.41	9.6	0.00	13.35	0.000000
					Shaft Weight	16,175													

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
89.00	Bird 428D-83I-01-T	1	1.00	0.000	8.90	0.470	1.00	25.42	0.922	1.00
89.00	dbSpectra DS7C09P36U-D	2	1.00	0.000	70.00	3.550	1.00	156.57	8.314	1.00
82.00	Pole Mount	2	1.00	0.000	40.00	1.630	1.00	84.45	2.699	1.00
82.00	Round Side Arm	2	1.00	0.000	150.00	5.200	0.90	218.92	7.760	0.90
77.00	Ericsson Radio 4449 B12,B71	3	0.80	0.000	74.00	1.640	0.50	126.47	2.431	0.50
77.00	Ericsson RRUS 32 B66	3	0.80	0.000	53.00	2.740	0.67	121.93	3.835	0.67
77.00	Ericsson AIR-32 B2A/B66Aa	3	0.80	0.000	132.20	6.510	0.71	281.79	8.563	0.71
77.00	RFS APX16DWV-16DWVS-E-A20	3	0.80	0.000	41.90	7.010	0.60	156.91	9.179	0.60
77.00	Flat T-Arms	3	0.75	0.000	250.00	12.900	0.67	445.88	20.565	0.67
77.00	RFS APXVAARR24_43-U-NA20	3	0.80	0.000	127.90	20.240	0.63	495.84	23.716	0.63
75.00	Pine Branches	1	1.00	0.400	600.00	45.000	1.00	989.48	74.211	1.00
70.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	987.28	74.046	1.00
67.00	CCI DTMABP7819VG12A	6	0.80	1.000	19.20	0.970	0.50	42.71	1.573	0.50
67.00	Raycap DC6-48-60-0-8C-EV	1	0.80	0.000	16.00	1.020	1.00	57.80	1.541	1.00
67.00	Raycap DC6-48-60-18-8F(32.8	2	0.80	1.000	32.80	1.470	1.00	89.75	2.115	1.00
67.00	Ericsson RRUS 4426 B66	3	0.80	1.000	48.40	1.650	0.50	89.61	2.434	0.50
67.00	Ericsson RRUS 4449 B5, B12	3	0.80	0.000	71.00	1.970	0.50	130.49	2.831	0.50
67.00	Ericsson RRUS 4478 B14	3	0.80	0.000	59.40	2.020	0.67	116.05	2.890	0.67
67.00	Ericsson RRUS 32 B2	3	0.80	1.000	53.00	2.740	0.67	120.89	3.818	0.67
67.00	Ericsson RRUS-32 (77 lbs)	3	0.80	1.000	77.00	3.310	0.71	166.77	4.493	0.71
67.00	Powerwave Allgon P65-16-XLH-	3	0.80	1.000	53.00	8.130	0.67	205.04	10.702	0.67
67.00	CCI DMP65R-BU4D	6	0.80	0.000	67.90	8.280	0.62	234.61	10.149	0.62
67.00	CCI OPA-65R-LCUU-H6	3	0.80	1.000	73.00	9.660	0.66	260.87	12.219	0.66
67.00	Site PRO1, RMV12-496	3	0.75	0.000	452.60	9.700	0.67	743.65	15.938	0.67
65.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	983.74	73.781	1.00
60.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	981.21	73.591	1.00
57.00	Flat T-Arm	3	0.75	0.000	250.00	12.900	0.67	439.94	20.333	0.67
56.00	Alcatel-Lucent RRH 2X60-1900	3	0.80	1.000	39.60	1.880	0.50	89.41	2.732	0.50
56.00	Alcatel-Lucent RRH2x60 700	3	0.80	1.000	56.70	2.150	0.67	118.44	3.059	0.67
56.00	Alcatel-Lucent B66 RRH4x45	3	0.80	1.000	67.00	2.580	0.67	131.28	3.602	0.67
56.00	Commscope RC2DC-4750-PF-48	2	0.80	1.000	26.00	3.780	0.77	125.45	4.979	0.77
56.00	Amphenol Antel BXA-171063-	3	0.80	1.000	12.80	4.790	0.72	99.67	6.930	0.72
56.00	Commscope SBNHH-1D65A	2	0.80	1.000	33.50	5.880	0.77	156.30	7.809	0.77
56.00	Commscope SBNHH-1D45A	4	0.80	1.000	50.50	7.240	0.63	193.87	9.015	0.63
56.00	Amphenol Antel LPA-80063-6CF-	6	0.80	1.000	27.00	9.730	0.75	263.74	12.214	0.75
56.00	VZW Unused Reserve: 14138 sq	1	0.80	0.000	1,488.70	98.180	0.90	2,429.58	160.231	0.90
55.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	977.96	73.347	1.00
50.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	974.19	73.065	1.00
45.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	969.22	72.692	1.00
40.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	964.63	72.347	1.00
35.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	959.45	71.959	1.00
30.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	955.90	71.692	1.00
25.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	948.49	71.137	1.00
20.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	937.87	70.341	1.00
15.00	Pine Branches	1	1.00	0.000	600.00	45.000	1.00	926.69	69.502	1.00

Totals Num Loadings:45 107 16,882.30 33,776.38

Linear Appurtenance Properties

Load Case Azimuth (deg) :

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	89.00	2	1/2" Coax	0.63	0.15	N	0	0.00	0.00	0	0.00	N	TOWN OF
0.00	89.00	2	7/8" Coax	1.09	0.33	N	0	0.00	0.00	0	0.00	N	TOWN OF
0.00	77.00	4	1 1/4" Hybriflex Cable	1.54	1.00	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	77.00	3	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	67.00	2	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	67.00	6	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	67.00	12	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	67.00	1	2" conduit	2.38	3.65	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	57.00	2	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	56.00	1	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	56.00	16	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	56.00	1	1 5/8" Hybriflex	1.98	1.30	N	0	0.00	0.00	0	0.00	N	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		0.5000	52.000	81.728	27,386.5	16.57	104.00	81.9	1037.	0.0	0.0
5.00		0.5000	50.321	79.063	24,794.4	15.98	100.64	82.6	970.5	0.0	1,367.8
10.00		0.5000	48.642	76.399	22,371.2	15.39	97.28	82.6	905.9	0.0	1,322.5
15.00		0.5000	46.963	73.734	20,111.3	14.80	93.93	82.6	843.5	0.0	1,277.2
20.00		0.5000	45.284	71.070	18,009.0	14.21	90.57	82.6	783.3	0.0	1,231.8
22.69	Bot - Section 2	0.5000	44.382	69.638	16,942.1	13.89	88.76	82.6	751.9	0.0	643.4
25.00		0.5000	43.605	68.406	16,058.5	13.61	87.21	82.6	725.4	0.0	1,028.6
28.85	Top - Section 1	0.4375	43.187	59.361	13,706.1	15.64	98.71	82.6	625.1	0.0	1,672.8
30.00		0.4375	42.801	58.825	13,338.5	15.49	97.83	82.6	613.8	0.0	230.9
35.00		0.4375	41.122	56.494	11,814.7	14.81	93.99	82.6	565.9	0.0	981.0
40.00		0.4375	39.443	54.163	10,411.5	14.13	90.16	82.6	519.9	0.0	941.3
45.00		0.4375	37.764	51.831	9,124.1	13.46	86.32	82.6	475.9	0.0	901.7
47.16	Bot - Section 3	0.4375	37.040	50.825	8,602.8	13.16	84.66	82.6	457.5	0.0	377.1
50.00		0.4375	36.086	49.500	7,947.5	12.78	82.48	82.6	433.8	0.0	838.5
52.38	Top - Section 2	0.3125	35.911	35.308	5,653.3	18.50	114.92	79.6	310.1	0.0	685.6
55.00		0.3125	35.032	34.436	5,244.4	18.00	112.10	80.2	294.9	0.0	310.9
56.00		0.3125	34.696	34.103	5,093.7	17.81	111.03	80.4	289.2	0.0	116.6
57.00		0.3125	34.360	33.770	4,945.9	17.62	109.95	80.7	283.5	0.0	115.5
60.00		0.3125	33.353	32.770	4,519.8	17.06	106.73	81.3	266.9	0.0	339.6
65.00		0.3125	31.674	31.105	3,865.2	16.11	101.36	82.5	240.4	0.0	543.4
67.00		0.3125	31.002	30.439	3,622.2	15.73	99.21	82.6	230.1	0.0	209.4
70.00		0.3125	29.995	29.440	3,277.1	15.16	95.98	82.6	215.2	0.0	305.6
75.00		0.3125	28.316	27.775	2,751.8	14.21	90.61	82.6	191.4	0.0	486.7
76.68	Top - Section 3	0.3125	27.752	27.215	2,588.8	13.90	88.81	82.6	183.7	0.0	157.2
76.68	Bot - Section 4	0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	
77.00		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	4.8
80.00		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	45.0
82.00		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	30.0
82.68		0.3370	4.500	4.407	9.6	0.00	13.35	46.0	4.2	5.9	10.2
											16,175.3

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA754187_C3_01 11/12/2019 2:45:49 PM

Customer: AT&T MOBILITY

Load Case: 1.2D + 1.6W 93 mph with No Ice 15 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		221.4	0.0					0.0	0.0	221.4	0.0	0.0	0.0
5.00		435.5	1,641.4					0.0	267.7	435.5	1,909.1	0.0	0.0
10.00		420.9	1,587.0					0.0	267.7	420.9	1,854.7	0.0	0.0
15.00	Appurtenance(s)	412.7	1,532.6	1,416.0	0.0	0.0	720.0	0.0	267.7	1,828.8	2,520.3	0.0	0.0
20.00	Appurtenance(s)	318.0	1,478.2	1,502.5	0.0	0.0	720.0	0.0	267.7	1,820.5	2,465.9	0.0	0.0
22.69	Bot - Section 2	211.0	772.1					0.0	143.9	211.0	915.9	0.0	0.0
25.00	Appurtenance(s)	263.9	1,234.3	1,574.7	0.0	0.0	720.0	0.0	123.8	1,838.6	2,078.1	0.0	0.0
28.85	Top - Section 1	214.2	2,007.4					0.0	206.2	214.2	2,213.6	0.0	0.0
30.00	Appurtenance(s)	262.6	277.1	1,636.4	0.0	0.0	720.0	0.0	61.5	1,898.9	1,058.6	0.0	0.0
35.00	Appurtenance(s)	424.5	1,177.2	1,690.3	0.0	0.0	720.0	0.0	267.7	2,114.8	2,164.9	0.0	0.0
40.00	Appurtenance(s)	418.8	1,129.6	1,738.5	0.0	0.0	720.0	0.0	267.7	2,157.3	2,117.3	0.0	0.0
45.00	Appurtenance(s)	296.1	1,082.0	1,782.2	0.0	0.0	720.0	0.0	267.7	2,078.3	2,069.7	0.0	0.0
47.16	Bot - Section 3	205.3	452.5					0.0	115.6	205.3	568.0	0.0	0.0
50.00	Appurtenance(s)	213.7	1,006.3	1,822.1	0.0	0.0	720.0	0.0	152.1	2,035.8	1,878.3	0.0	0.0
52.38	Top - Section 2	201.8	822.7					0.0	127.4	201.8	950.1	0.0	0.0
55.00	Appurtenance(s)	144.7	373.0	1,859.1	0.0	0.0	720.0	0.0	140.2	2,003.8	1,233.3	0.0	0.0
56.00	Appurtenance(s)	79.1	139.9	6,247.5	0.0	3,316.0	3,000.0	0.0	53.5	6,326.6	3,193.5	0.0	0.0
57.00	Appurtenance(s)	156.4	138.6	809.5	0.0	0.0	900.0	0.0	34.3	965.8	1,072.9	0.0	0.0
60.00	Appurtenance(s)	306.6	407.6	1,893.4	0.0	0.0	720.0	0.0	97.0	2,200.1	1,224.5	0.0	0.0
65.00	Appurtenance(s)	263.7	652.1	1,925.6	0.0	0.0	720.0	0.0	161.6	2,189.4	1,533.7	0.0	0.0
67.00	Appurtenance(s)	182.9	251.3	3,915.2	0.0	1,947.5	3,919.7	0.0	64.7	4,098.1	4,235.6	0.0	0.0
70.00	Appurtenance(s)	284.4	366.8	1,955.9	0.0	0.0	720.0	0.0	35.2	2,240.3	1,122.0	0.0	0.0
75.00	Appurtenance(s)	232.8	584.1	1,986.7	0.0	794.7	720.0	0.0	58.7	2,219.5	1,362.8	0.0	0.0
76.68	Top - Section 3	59.9	188.6					0.0	19.7	59.9	208.4	0.0	0.0
77.00	Appurtenance(s)	27.8	5.8	3,441.7	0.0	0.0	2,444.4	0.0	3.8	3,469.5	2,453.9	0.0	0.0
80.00		42.0	54.0					0.0	3.5	42.0	57.4	0.0	0.0
82.00	Appurtenance(s)	22.5	36.0	567.1	0.0	0.0	456.0	0.0	2.3	589.6	494.3	0.0	0.0
82.68		5.7	12.2					0.0	0.8	5.7	13.0	0.0	0.0
								Totals:		44,093.6	42,969.8	0.00	0.00

Load Case: 1.2D + 1.6W 93 mph with No Ice 15 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	-43.10	-44.26	0.00	-2,332.02	0.00	2,332.02	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.373
5.00	-41.10	-43.91	0.00	-2,110.71	0.00	2,110.71	5,874.00	2,937.00	11,999.0	6,008.46	0.06	-0.12	0.359
10.00	-39.16	-43.56	0.00	-1,891.18	0.00	1,891.18	5,676.05	2,838.02	11,200.1	5,608.37	0.25	-0.23	0.344
15.00	-36.57	-41.79	0.00	-1,673.38	0.00	1,673.38	5,478.10	2,739.05	10,428.6	5,222.07	0.55	-0.34	0.327
20.00	-34.06	-40.00	0.00	-1,464.43	0.00	1,464.43	5,280.14	2,640.07	9,684.72	4,849.56	0.97	-0.45	0.309
22.69	-33.11	-39.82	0.00	-1,356.93	0.00	1,356.93	5,173.75	2,586.87	9,296.23	4,655.02	1.25	-0.51	0.298
25.00	-31.00	-37.99	0.00	-1,264.86	0.00	1,264.86	5,082.19	2,541.10	8,968.32	4,490.82	1.51	-0.57	0.288
28.85	-28.76	-37.78	0.00	-1,118.52	0.00	1,118.52	4,410.21	2,205.11	7,728.69	3,870.09	2.00	-0.65	0.296
30.00	-27.68	-35.90	0.00	-1,075.13	0.00	1,075.13	4,370.43	2,185.21	7,589.18	3,800.23	2.16	-0.67	0.290
35.00	-25.48	-33.81	0.00	-895.62	0.00	895.62	4,197.22	2,098.61	6,996.61	3,503.50	2.92	-0.78	0.262
40.00	-23.34	-31.66	0.00	-726.59	0.00	726.59	4,024.01	2,012.01	6,428.12	3,218.84	3.79	-0.87	0.232
45.00	-21.28	-29.57	0.00	-568.31	0.00	568.31	3,850.81	1,925.40	5,883.72	2,946.23	4.76	-0.96	0.199
47.16	-20.69	-29.37	0.00	-504.48	0.00	504.48	3,776.02	1,888.01	5,656.10	2,832.26	5.20	-1.00	0.184
50.00	-18.83	-27.31	0.00	-421.04	0.00	421.04	3,677.60	1,838.80	5,363.40	2,685.69	5.81	-1.04	0.162
52.38	-17.87	-27.10	0.00	-356.04	0.00	356.04	2,530.81	1,265.41	3,698.60	1,852.05	6.34	-1.07	0.200
55.00	-16.66	-25.08	0.00	-285.04	0.00	285.04	2,486.37	1,243.18	3,543.07	1,774.17	6.94	-1.11	0.168
56.00	-13.59	-18.70	0.00	-256.64	0.00	256.64	2,469.16	1,234.58	3,484.21	1,744.70	7.17	-1.12	0.153
57.00	-12.53	-17.72	0.00	-237.94	0.00	237.94	2,451.82	1,225.91	3,425.65	1,715.37	7.41	-1.14	0.144
60.00	-11.34	-15.50	0.00	-184.80	0.00	184.80	2,398.99	1,199.50	3,251.77	1,628.30	8.14	-1.17	0.118
65.00	-9.84	-13.28	0.00	-107.30	0.00	107.30	2,308.28	1,154.14	2,968.33	1,486.37	9.39	-1.22	0.077
67.00	-5.69	-9.10	0.00	-78.78	0.00	78.78	2,261.48	1,130.74	2,845.26	1,424.74	9.91	-1.23	0.058
70.00	-4.62	-6.83	0.00	-51.49	0.00	51.49	2,187.24	1,093.62	2,660.62	1,332.29	10.69	-1.25	0.041
75.00	-3.31	-4.59	0.00	-16.52	0.00	16.52	2,063.52	1,031.76	2,366.67	1,185.09	12.00	-1.26	0.016
76.68	-3.10	-4.52	0.00	-8.81	0.00	8.81	2,021.95	1,010.98	2,271.76	1,137.57	12.45	-1.26	0.009
76.68	-3.10	-4.52	0.00	-8.81	0.00	8.81	182.47	91.23	29.26	20.19	12.45	-1.26	0.456
77.00	-0.72	-1.00	0.00	-7.37	0.00	7.37	182.47	91.23	29.26	20.19	12.53	-1.26	0.369
80.00	-0.65	-0.96	0.00	-4.36	0.00	4.36	182.47	91.23	29.26	20.19	13.50	-1.79	0.219
82.00	-0.18	-0.36	0.00	-2.43	0.00	2.43	182.47	91.23	29.26	20.19	14.30	-1.99	0.121
82.68	0.00	-0.35	0.00	-2.19	0.00	2.19	182.47	91.23	29.26	20.19	14.59	-2.04	0.108

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA754187_C3_01 11/12/2019 2:45:52 PM

Customer: AT&T MOBILITY

Load Case: 0.9D + 1.6W — 93 mph with No Ice (Reduced DL) — 15 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		221.4	0.0					0.0	0.0	221.4	0.0	0.0	0.0
5.00		435.5	1,231.1					0.0	200.7	435.5	1,431.8	0.0	0.0
10.00		420.9	1,190.3					0.0	200.7	420.9	1,391.0	0.0	0.0
15.00	Appurtenance(s)	412.7	1,149.5	1,416.0	0.0	0.0	540.0	0.0	200.7	1,828.8	1,890.2	0.0	0.0
20.00	Appurtenance(s)	318.0	1,108.7	1,502.5	0.0	0.0	540.0	0.0	200.7	1,820.5	1,849.4	0.0	0.0
22.69	Bot - Section 2	211.0	579.0					0.0	107.9	211.0	686.9	0.0	0.0
25.00	Appurtenance(s)	263.9	925.7	1,574.7	0.0	0.0	540.0	0.0	92.8	1,838.6	1,558.6	0.0	0.0
28.85	Top - Section 1	214.2	1,505.5					0.0	154.6	214.2	1,660.2	0.0	0.0
30.00	Appurtenance(s)	262.6	207.8	1,636.4	0.0	0.0	540.0	0.0	46.1	1,898.9	793.9	0.0	0.0
35.00	Appurtenance(s)	424.5	882.9	1,690.3	0.0	0.0	540.0	0.0	200.7	2,114.8	1,623.7	0.0	0.0
40.00	Appurtenance(s)	418.8	847.2	1,738.5	0.0	0.0	540.0	0.0	200.7	2,157.3	1,588.0	0.0	0.0
45.00	Appurtenance(s)	296.1	811.5	1,782.2	0.0	0.0	540.0	0.0	200.7	2,078.3	1,552.3	0.0	0.0
47.16	Bot - Section 3	205.3	339.4					0.0	86.7	205.3	426.0	0.0	0.0
50.00	Appurtenance(s)	213.7	754.7	1,822.1	0.0	0.0	540.0	0.0	114.1	2,035.8	1,408.8	0.0	0.0
52.38	Top - Section 2	201.8	617.0					0.0	95.6	201.8	712.6	0.0	0.0
55.00	Appurtenance(s)	144.7	279.8	1,859.1	0.0	0.0	540.0	0.0	105.2	2,003.8	925.0	0.0	0.0
56.00	Appurtenance(s)	79.1	104.9	6,247.5	0.0	3,316.0	2,250.0	0.0	40.1	6,326.6	2,395.1	0.0	0.0
57.00	Appurtenance(s)	156.4	103.9	809.5	0.0	0.0	675.0	0.0	25.7	965.8	804.7	0.0	0.0
60.00	Appurtenance(s)	306.6	305.7	1,893.4	0.0	0.0	540.0	0.0	72.7	2,200.1	918.4	0.0	0.0
65.00	Appurtenance(s)	263.7	489.0	1,925.6	0.0	0.0	540.0	0.0	121.2	2,189.4	1,150.3	0.0	0.0
67.00	Appurtenance(s)	182.9	188.5	3,915.2	0.0	1,947.5	2,939.8	0.0	48.5	4,098.1	3,176.7	0.0	0.0
70.00	Appurtenance(s)	284.4	275.1	1,955.9	0.0	0.0	540.0	0.0	26.4	2,240.3	841.5	0.0	0.0
75.00	Appurtenance(s)	232.8	438.1	1,986.7	0.0	794.7	540.0	0.0	44.1	2,219.5	1,022.1	0.0	0.0
76.68	Top - Section 3	59.9	141.5					0.0	14.8	59.9	156.3	0.0	0.0
77.00	Appurtenance(s)	27.8	4.3	3,441.7	0.0	0.0	1,833.3	0.0	2.8	3,469.5	1,840.4	0.0	0.0
80.00		42.0	40.5					0.0	2.6	42.0	43.1	0.0	0.0
82.00	Appurtenance(s)	22.5	27.0	567.1	0.0	0.0	342.0	0.0	1.7	589.6	370.7	0.0	0.0
82.68		5.7	9.2					0.0	0.6	5.7	9.8	0.0	0.0
								Totals:		44,093.6	32,227.3	0.00	0.00

Site Number: 414240 Code: ANSI/TIA-222-G

Site Name: Byram Park CT, CT Engineering Number:OAA754187_C3_01 11/12/2019 2:45:54 PM

Customer: AT&T MOBILITY

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 15 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	-32.31	-44.25	0.00	-2,327.05	0.00	2,327.05	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.371
5.00	-30.80	-43.88	0.00	-2,105.79	0.00	2,105.79	5,874.00	2,937.00	11,999.0	6,008.46	0.06	-0.12	0.356
10.00	-29.32	-43.51	0.00	-1,886.41	0.00	1,886.41	5,676.05	2,838.02	11,200.1	5,608.37	0.25	-0.23	0.342
15.00	-27.36	-41.72	0.00	-1,668.87	0.00	1,668.87	5,478.10	2,739.05	10,428.6	5,222.07	0.55	-0.34	0.325
20.00	-25.46	-39.93	0.00	-1,460.25	0.00	1,460.25	5,280.14	2,640.07	9,684.72	4,849.56	0.97	-0.45	0.306
22.69	-24.74	-39.74	0.00	-1,352.94	0.00	1,352.94	5,173.75	2,586.87	9,296.23	4,655.02	1.24	-0.51	0.296
25.00	-23.15	-37.91	0.00	-1,261.05	0.00	1,261.05	5,082.19	2,541.10	8,968.32	4,490.82	1.51	-0.56	0.286
28.85	-21.46	-37.70	0.00	-1,115.04	0.00	1,115.04	4,410.21	2,205.11	7,728.69	3,870.09	2.00	-0.64	0.293
30.00	-20.65	-35.81	0.00	-1,071.75	0.00	1,071.75	4,370.43	2,185.21	7,589.18	3,800.23	2.16	-0.67	0.287
35.00	-18.99	-33.71	0.00	-892.68	0.00	892.68	4,197.22	2,098.61	6,996.61	3,503.50	2.91	-0.77	0.260
40.00	-17.38	-31.56	0.00	-724.13	0.00	724.13	4,024.01	2,012.01	6,428.12	3,218.84	3.78	-0.87	0.230
45.00	-15.83	-29.47	0.00	-566.33	0.00	566.33	3,850.81	1,925.40	5,883.72	2,946.23	4.74	-0.96	0.197
47.16	-15.39	-29.27	0.00	-502.70	0.00	502.70	3,776.02	1,888.01	5,656.10	2,832.26	5.19	-1.00	0.182
50.00	-14.00	-27.22	0.00	-419.54	0.00	419.54	3,677.60	1,838.80	5,363.40	2,685.69	5.79	-1.04	0.160
52.38	-13.28	-27.01	0.00	-354.75	0.00	354.75	2,530.81	1,265.41	3,698.60	1,852.05	6.32	-1.07	0.197
55.00	-12.38	-25.00	0.00	-283.98	0.00	283.98	2,486.37	1,243.18	3,543.07	1,774.17	6.92	-1.10	0.165
56.00	-10.10	-18.63	0.00	-255.66	0.00	255.66	2,469.16	1,234.58	3,484.21	1,744.70	7.15	-1.12	0.151
57.00	-9.31	-17.65	0.00	-237.04	0.00	237.04	2,451.82	1,225.91	3,425.65	1,715.37	7.39	-1.13	0.142
60.00	-8.42	-15.44	0.00	-184.09	0.00	184.09	2,398.99	1,199.50	3,251.77	1,628.30	8.11	-1.17	0.117
65.00	-7.31	-13.23	0.00	-106.89	0.00	106.89	2,308.28	1,154.14	2,968.33	1,486.37	9.37	-1.21	0.075
67.00	-4.22	-9.07	0.00	-78.49	0.00	78.49	2,261.48	1,130.74	2,845.26	1,424.74	9.88	-1.23	0.057
70.00	-3.43	-6.81	0.00	-51.29	0.00	51.29	2,187.24	1,093.62	2,660.62	1,332.29	10.66	-1.24	0.040
75.00	-2.45	-4.57	0.00	-16.45	0.00	16.45	2,063.52	1,031.76	2,366.67	1,185.09	11.97	-1.26	0.015
76.68	-2.30	-4.50	0.00	-8.78	0.00	8.78	2,021.95	1,010.98	2,271.76	1,137.57	12.41	-1.26	0.009
76.68	-2.30	-4.50	0.00	-8.78	0.00	8.78	182.47	91.23	29.26	20.19	12.41	-1.26	0.450
77.00	-0.53	-1.00	0.00	-7.34	0.00	7.34	182.47	91.23	29.26	20.19	12.50	-1.26	0.366
80.00	-0.48	-0.96	0.00	-4.35	0.00	4.35	182.47	91.23	29.26	20.19	13.47	-1.78	0.218
82.00	-0.13	-0.36	0.00	-2.43	0.00	2.43	182.47	91.23	29.26	20.19	14.26	-1.98	0.121
82.68	0.00	-0.35	0.00	-2.19	0.00	2.19	182.47	91.23	29.26	20.19	14.55	-2.03	0.108

Load Case: 1.2D + 1.0Di + 1.0Wi — 50 mph with 0.75 in Radial Ice — 15 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		77.1	0.0					0.0	0.0	77.1	0.0	0.0	0.0
5.00		152.2	2,015.1					0.0	267.7	152.2	2,282.8	0.0	0.0
10.00		147.9	1,991.6					0.0	267.7	147.9	2,259.3	0.0	0.0
15.00	Appurtenance(s)	145.6	1,944.7	395.1	0.0	0.0	926.7	0.0	267.7	540.8	3,139.0	0.0	0.0
20.00	Appurtenance(s)	112.6	1,890.0	424.3	0.0	0.0	937.9	0.0	267.7	536.8	3,095.5	0.0	0.0
22.69	Bot - Section 2	74.8	993.6					0.0	143.9	74.8	1,137.4	0.0	0.0
25.00	Appurtenance(s)	93.8	1,427.5	449.7	0.0	0.0	948.5	0.0	123.8	543.5	2,499.8	0.0	0.0
28.85	Top - Section 1	76.2	2,324.1					0.0	206.2	76.2	2,530.3	0.0	0.0
30.00	Appurtenance(s)	93.7	371.6	471.0	0.0	0.0	955.9	0.0	61.5	564.7	1,389.0	0.0	0.0
35.00	Appurtenance(s)	151.8	1,577.0	488.3	0.0	0.0	959.5	0.0	267.7	640.1	2,804.1	0.0	0.0
40.00	Appurtenance(s)	150.4	1,519.4	504.9	0.0	0.0	964.6	0.0	267.7	655.3	2,751.7	0.0	0.0
45.00	Appurtenance(s)	106.6	1,460.7	520.1	0.0	0.0	969.2	0.0	267.7	626.7	2,697.6	0.0	0.0
47.16	Bot - Section 3	74.1	614.3					0.0	115.6	74.1	729.9	0.0	0.0
50.00	Appurtenance(s)	77.2	1,218.6	534.5	0.0	0.0	974.2	0.0	152.1	611.7	2,344.9	0.0	0.0
52.38	Top - Section 2	73.1	997.9					0.0	127.4	73.1	1,125.3	0.0	0.0
55.00	Appurtenance(s)	52.5	562.2	547.4	0.0	0.0	978.0	0.0	140.2	599.9	1,680.4	0.0	0.0
56.00	Appurtenance(s)	28.8	211.7	1,645.4	0.0	781.1	5,848.0	0.0	53.5	1,674.1	6,113.2	0.0	0.0
57.00	Appurtenance(s)	56.9	209.8	230.5	0.0	0.0	1,319.8	0.0	34.3	287.4	1,564.0	0.0	0.0
60.00	Appurtenance(s)	112.0	616.1	559.4	0.0	0.0	981.2	0.0	97.0	671.4	1,694.3	0.0	0.0
65.00	Appurtenance(s)	96.6	985.2	570.4	0.0	0.0	983.7	0.0	161.6	667.0	2,130.6	0.0	0.0
67.00	Appurtenance(s)	67.3	382.6	965.8	0.0	471.7	6,755.4	0.0	64.7	1,033.1	7,202.6	0.0	0.0
70.00	Appurtenance(s)	105.1	558.4	581.4	0.0	0.0	987.3	0.0	35.2	686.5	1,580.9	0.0	0.0
75.00	Appurtenance(s)	86.2	888.3	591.9	0.0	236.8	989.5	0.0	58.7	678.2	1,936.5	0.0	0.0
76.68	Top - Section 3	22.3	289.4					0.0	19.7	22.3	309.1	0.0	0.0
77.00	Appurtenance(s)	10.4	9.7	831.2	0.0	0.0	4,451.6	0.0	3.8	841.6	4,465.1	0.0	0.0
80.00		15.7	90.8					0.0	3.5	15.7	94.2	0.0	0.0
82.00	Appurtenance(s)	8.5	60.6	157.2	0.0	0.0	606.7	0.0	2.3	165.7	669.6	0.0	0.0
82.68		2.2	20.6					0.0	0.8	2.2	21.4	0.0	0.0
								Totals:		12,739.9	60,248.4	0.00	0.00

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 0.75 in Radial Ice 15 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	-60.56	-12.83	0.00	-669.65	0.00	669.65	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.115
5.00	-58.27	-12.71	0.00	-605.53	0.00	605.53	5,874.00	2,937.00	11,999.0	6,008.46	0.02	-0.03	0.111
10.00	-56.00	-12.59	0.00	-541.99	0.00	541.99	5,676.05	2,838.02	11,200.1	5,608.37	0.07	-0.07	0.107
15.00	-52.85	-12.07	0.00	-479.05	0.00	479.05	5,478.10	2,739.05	10,428.6	5,222.07	0.16	-0.10	0.101
20.00	-49.75	-11.55	0.00	-418.69	0.00	418.69	5,280.14	2,640.07	9,684.72	4,849.56	0.28	-0.13	0.096
22.69	-48.61	-11.49	0.00	-387.65	0.00	387.65	5,173.75	2,586.87	9,296.23	4,655.02	0.36	-0.15	0.093
25.00	-46.11	-10.95	0.00	-361.08	0.00	361.08	5,082.19	2,541.10	8,968.32	4,490.82	0.43	-0.16	0.089
28.85	-43.58	-10.88	0.00	-318.90	0.00	318.90	4,410.21	2,205.11	7,728.69	3,870.09	0.57	-0.19	0.092
30.00	-42.19	-10.32	0.00	-306.41	0.00	306.41	4,370.43	2,185.21	7,589.18	3,800.23	0.62	-0.19	0.090
35.00	-39.38	-9.69	0.00	-254.79	0.00	254.79	4,197.22	2,098.61	6,996.61	3,503.50	0.84	-0.22	0.082
40.00	-36.63	-9.04	0.00	-206.32	0.00	206.32	4,024.01	2,012.01	6,428.12	3,218.84	1.09	-0.25	0.073
45.00	-33.93	-8.41	0.00	-161.11	0.00	161.11	3,850.81	1,925.40	5,883.72	2,946.23	1.36	-0.27	0.064
47.16	-33.20	-8.34	0.00	-142.94	0.00	142.94	3,776.02	1,888.01	5,656.10	2,832.26	1.49	-0.29	0.059
50.00	-30.86	-7.73	0.00	-119.24	0.00	119.24	3,677.60	1,838.80	5,363.40	2,685.69	1.66	-0.30	0.053
52.38	-29.73	-7.65	0.00	-100.85	0.00	100.85	2,530.81	1,265.41	3,698.60	1,852.05	1.81	-0.31	0.066
55.00	-28.05	-7.05	0.00	-80.80	0.00	80.80	2,486.37	1,243.18	3,543.07	1,774.17	1.98	-0.32	0.057
56.00	-21.95	-5.34	0.00	-72.97	0.00	72.97	2,469.16	1,234.58	3,484.21	1,744.70	2.05	-0.32	0.051
57.00	-20.39	-5.05	0.00	-67.64	0.00	67.64	2,451.82	1,225.91	3,425.65	1,715.37	2.12	-0.32	0.048
60.00	-18.70	-4.37	0.00	-52.50	0.00	52.50	2,398.99	1,199.50	3,251.77	1,628.30	2.33	-0.33	0.040
65.00	-16.57	-3.69	0.00	-30.66	0.00	30.66	2,308.28	1,154.14	2,968.33	1,486.37	2.68	-0.35	0.028
67.00	-9.37	-2.61	0.00	-22.80	0.00	22.80	2,261.48	1,130.74	2,845.26	1,424.74	2.83	-0.35	0.020
70.00	-7.80	-1.92	0.00	-14.96	0.00	14.96	2,187.24	1,093.62	2,660.62	1,332.29	3.05	-0.36	0.015
75.00	-5.86	-1.23	0.00	-5.13	0.00	5.13	2,063.52	1,031.76	2,366.67	1,185.09	3.43	-0.36	0.007
76.68	-5.55	-1.20	0.00	-3.06	0.00	3.06	2,021.95	1,010.98	2,271.76	1,137.57	3.56	-0.36	0.005
76.68	-5.55	-1.20	0.00	-3.06	0.00	3.06	182.47	91.23	29.26	20.19	3.56	-0.36	0.182
77.00	-1.09	-0.34	0.00	-2.68	0.00	2.68	182.47	91.23	29.26	20.19	3.58	-0.36	0.139
80.00	-1.00	-0.32	0.00	-1.66	0.00	1.66	182.47	91.23	29.26	20.19	3.87	-0.56	0.088
82.00	-0.33	-0.15	0.00	-1.02	0.00	1.02	182.47	91.23	29.26	20.19	4.12	-0.63	0.052
82.68	0.00	-0.15	0.00	-0.92	0.00	0.92	182.47	91.23	29.26	20.19	4.22	-0.65	0.045

Load Case: 1.0D + 1.0W Serviceability 60 mph 15 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

		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		51.5	0.0					0.0	0.0	51.5	0.0	0.0	0.0
5.00		101.4	1,367.8					0.0	223.0	101.4	1,590.9	0.0	0.0
10.00		98.0	1,322.5					0.0	223.0	98.0	1,545.6	0.0	0.0
15.00	Appurtenance(s)	96.1	1,277.2	329.6	0.0	0.0	600.0	0.0	223.0	425.7	2,100.2	0.0	0.0
20.00	Appurtenance(s)	74.0	1,231.8	349.7	0.0	0.0	600.0	0.0	223.0	423.7	2,054.9	0.0	0.0
22.69	Bot - Section 2	49.1	643.4					0.0	119.9	49.1	763.3	0.0	0.0
25.00	Appurtenance(s)	61.4	1,028.6	366.5	0.0	0.0	600.0	0.0	103.2	428.0	1,731.8	0.0	0.0
28.85	Top - Section 1	49.9	1,672.8					0.0	171.8	49.9	1,844.6	0.0	0.0
30.00	Appurtenance(s)	61.1	230.9	380.9	0.0	0.0	600.0	0.0	51.2	442.0	882.2	0.0	0.0
35.00	Appurtenance(s)	98.8	981.0	393.4	0.0	0.0	600.0	0.0	223.0	492.3	1,804.1	0.0	0.0
40.00	Appurtenance(s)	97.5	941.3	404.7	0.0	0.0	600.0	0.0	223.0	502.1	1,764.4	0.0	0.0
45.00	Appurtenance(s)	68.9	901.7	414.8	0.0	0.0	600.0	0.0	223.0	483.7	1,724.7	0.0	0.0
47.16	Bot - Section 3	47.8	377.1					0.0	96.3	47.8	473.4	0.0	0.0
50.00	Appurtenance(s)	49.7	838.5	424.1	0.0	0.0	600.0	0.0	126.7	473.9	1,565.3	0.0	0.0
52.38	Top - Section 2	47.0	685.6					0.0	106.2	47.0	791.8	0.0	0.0
55.00	Appurtenance(s)	33.7	310.9	432.7	0.0	0.0	600.0	0.0	116.9	466.4	1,027.7	0.0	0.0
56.00	Appurtenance(s)	18.4	116.6	1,454.2	0.0	771.8	2,500.0	0.0	44.6	1,472.6	2,661.2	0.0	0.0
57.00	Appurtenance(s)	36.4	115.5	188.4	0.0	0.0	750.0	0.0	28.6	224.8	894.1	0.0	0.0
60.00	Appurtenance(s)	71.4	339.6	440.7	0.0	0.0	600.0	0.0	80.8	512.1	1,020.5	0.0	0.0
65.00	Appurtenance(s)	61.4	543.4	448.2	0.0	0.0	600.0	0.0	134.7	509.6	1,278.1	0.0	0.0
67.00	Appurtenance(s)	42.6	209.4	911.3	0.0	453.3	3,266.4	0.0	53.9	953.9	3,529.7	0.0	0.0
70.00	Appurtenance(s)	66.2	305.6	455.3	0.0	0.0	600.0	0.0	29.4	521.5	935.0	0.0	0.0
75.00	Appurtenance(s)	54.2	486.7	462.4	0.0	185.0	600.0	0.0	48.9	516.6	1,135.7	0.0	0.0
76.68	Top - Section 3	14.1	157.2					0.0	16.4	14.1	173.6	0.0	0.0
77.00	Appurtenance(s)	7.7	4.8	801.1	0.0	0.0	2,037.0	0.0	3.1	808.8	2,044.9	0.0	0.0
80.00		11.7	45.0					0.0	2.9	11.7	47.9	0.0	0.0
82.00	Appurtenance(s)	6.3	30.0	132.0	0.0	0.0	380.0	0.0	1.9	138.3	411.9	0.0	0.0
82.68		1.6	10.2					0.0	0.7	1.6	10.9	0.0	0.0
									Totals:	10,267.9	35,808.1	0.00	0.00

Load Case: 1.0D + 1.0W Serviceability 60 mph 15 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	-35.95	-10.31	0.00	-542.45	0.00	542.45	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.091
5.00	-34.36	-10.22	0.00	-490.92	0.00	490.92	5,874.00	2,937.00	11,999.0	6,008.46	0.01	-0.03	0.088
10.00	-32.81	-10.14	0.00	-439.82	0.00	439.82	5,676.05	2,838.02	11,200.1	5,608.37	0.06	-0.05	0.084
15.00	-30.70	-9.72	0.00	-389.14	0.00	389.14	5,478.10	2,739.05	10,428.6	5,222.07	0.13	-0.08	0.080
20.00	-28.65	-9.30	0.00	-340.53	0.00	340.53	5,280.14	2,640.07	9,684.72	4,849.56	0.23	-0.11	0.076
22.69	-27.88	-9.26	0.00	-315.53	0.00	315.53	5,173.75	2,586.87	9,296.23	4,655.02	0.29	-0.12	0.073
25.00	-26.15	-8.84	0.00	-294.11	0.00	294.11	5,082.19	2,541.10	8,968.32	4,490.82	0.35	-0.13	0.071
28.85	-24.30	-8.79	0.00	-260.08	0.00	260.08	4,410.21	2,205.11	7,728.69	3,870.09	0.47	-0.15	0.073
30.00	-23.42	-8.35	0.00	-249.99	0.00	249.99	4,370.43	2,185.21	7,589.18	3,800.23	0.50	-0.16	0.071
35.00	-21.61	-7.86	0.00	-208.25	0.00	208.25	4,197.22	2,098.61	6,996.61	3,503.50	0.68	-0.18	0.065
40.00	-19.85	-7.36	0.00	-168.95	0.00	168.95	4,024.01	2,012.01	6,428.12	3,218.84	0.88	-0.20	0.057
45.00	-18.12	-6.87	0.00	-132.16	0.00	132.16	3,850.81	1,925.40	5,883.72	2,946.23	1.11	-0.22	0.050
47.16	-17.65	-6.83	0.00	-117.32	0.00	117.32	3,776.02	1,888.01	5,656.10	2,832.26	1.21	-0.23	0.046
50.00	-16.08	-6.35	0.00	-97.93	0.00	97.93	3,677.60	1,838.80	5,363.40	2,685.69	1.35	-0.24	0.041
52.38	-15.29	-6.30	0.00	-82.82	0.00	82.82	2,530.81	1,265.41	3,698.60	1,852.05	1.47	-0.25	0.051
55.00	-14.27	-5.83	0.00	-66.31	0.00	66.31	2,486.37	1,243.18	3,543.07	1,774.17	1.61	-0.26	0.043
56.00	-11.61	-4.35	0.00	-59.71	0.00	59.71	2,469.16	1,234.58	3,484.21	1,744.70	1.67	-0.26	0.039
57.00	-10.72	-4.12	0.00	-55.36	0.00	55.36	2,451.82	1,225.91	3,425.65	1,715.37	1.72	-0.26	0.037
60.00	-9.70	-3.60	0.00	-43.00	0.00	43.00	2,398.99	1,199.50	3,251.77	1,628.30	1.89	-0.27	0.030
65.00	-8.42	-3.09	0.00	-24.99	0.00	24.99	2,308.28	1,154.14	2,968.33	1,486.37	2.18	-0.28	0.020
67.00	-4.90	-2.12	0.00	-18.35	0.00	18.35	2,261.48	1,130.74	2,845.26	1,424.74	2.30	-0.29	0.015
70.00	-3.97	-1.59	0.00	-12.00	0.00	12.00	2,187.24	1,093.62	2,660.62	1,332.29	2.49	-0.29	0.011
75.00	-2.83	-1.07	0.00	-3.86	0.00	3.86	2,063.52	1,031.76	2,366.67	1,185.09	2.79	-0.29	0.005
76.68	-2.66	-1.05	0.00	-2.06	0.00	2.06	2,021.95	1,010.98	2,271.76	1,137.57	2.89	-0.29	0.003
76.68	-2.66	-1.05	0.00	-2.06	0.00	2.06	182.47	91.23	29.26	20.19	2.89	-0.29	0.117
77.00	-0.62	-0.24	0.00	-1.72	0.00	1.72	182.47	91.23	29.26	20.19	2.91	-0.29	0.089
80.00	-0.57	-0.22	0.00	-1.02	0.00	1.02	182.47	91.23	29.26	20.19	3.14	-0.42	0.053
82.00	-0.16	-0.08	0.00	-0.57	0.00	0.57	182.47	91.23	29.26	20.19	3.33	-0.46	0.029
82.68	0.00	-0.08	0.00	-0.51	0.00	0.51	182.47	91.23	29.26	20.19	3.39	-0.47	0.025

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.26	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07	
Long-Period Transition Period (T_L):	6	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.59	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.28	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11	
Seismic Response Coefficient (C_s):	0.10	
Upper Limit C_s	0.10	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	0.75	
Redundancy Factor (p):	1.00	
Seismic Force Distribution Exponent (k):	1.12	
Total Unfactored Dead Load:	35.96	k
Seismic Base Shear (E):	3.59	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)
27	82.34	11	2	0.001	2	14
26	81.00	32	4	0.002	6	40
25	78.50	48	6	0.003	9	60
24	76.84	8	1	0.000	1	10
23	75.84	174	23	0.009	32	218
22	72.50	536	66	0.026	93	672
21	68.50	335	39	0.015	55	420
20	66.00	263	29	0.011	41	330
19	62.50	678	71	0.028	100	851
18	58.50	420	41	0.016	57	528
17	56.50	144	13	0.005	19	181
16	55.50	161	15	0.006	21	202
15	53.69	428	38	0.015	53	537
14	51.19	792	66	0.026	93	994
13	48.58	965	76	0.030	107	1,212
12	46.08	473	35	0.014	49	594
11	42.50	1,125	76	0.030	107	1,412
10	37.50	1,164	68	0.027	97	1,462
9	32.50	1,204	60	0.024	85	1,511
8	29.43	282	13	0.005	18	354
7	26.93	1,845	75	0.029	105	2,315
6	23.84	1,132	40	0.016	56	1,421
5	21.34	763	24	0.009	34	958

4	17.50	1,455	36	0.014	51	1,826
3	12.50	1,500	26	0.010	36	1,883
2	7.50	1,546	15	0.006	21	1,940
1	2.50	1,591	4	0.002	6	1,997
Bird 428D-83I-01-T	82.68	9	1	0.000	2	11
dbSpectra DS7C09P36U	82.68	140	20	0.008	28	176
Pole Mount	82.00	80	11	0.004	16	100
Round Side Arm	82.00	300	42	0.017	60	377
Ericsson Radio 4449	77.00	222	29	0.012	41	279
Ericsson RRUS 32 B66	77.00	159	21	0.008	30	200
Ericsson AIR-32 B2A/	77.00	397	52	0.021	74	498
RFS APX16DWV-16DWVS-	77.00	126	17	0.007	23	158
Flat T-Arms	77.00	750	99	0.039	140	941
RFS APXVAARR24_43-U-	77.00	384	51	0.020	71	482
Pine Branches	75.00	600	77	0.030	108	753
Pine Branches	70.00	600	71	0.028	100	753
CCI DTMABP7819VG12A	67.00	115	13	0.005	18	145
Raycap DC6-48-60-0-8	67.00	16	2	0.001	3	20
Raycap DC6-48-60-18-	67.00	66	7	0.003	10	82
Ericsson RRUS 4426 B	67.00	145	16	0.006	23	182
Ericsson RRUS 4449 B	67.00	213	24	0.009	34	267
Ericsson RRUS 4478 B	67.00	178	20	0.008	28	224
Ericsson RRUS 32 B2	67.00	159	18	0.007	25	200
Ericsson RRUS-32 (77	67.00	231	26	0.010	37	290
Powerwave Allgon P65	67.00	159	18	0.007	25	200
CCI DMP65R-BU4D	67.00	407	46	0.018	65	511
CCI OPA-65R-LCUU-H6	67.00	219	25	0.010	35	275
Site PRO1, RMV12-496	67.00	1,358	153	0.060	216	1,704
Pine Branches	65.00	600	65	0.026	92	753
Pine Branches	60.00	600	60	0.024	84	753
Flat T-Arm	57.00	750	71	0.028	100	941
Alcatel-Lucent RRH 2	56.00	119	11	0.004	15	149
Alcatel-Lucent RRH2x	56.00	170	16	0.006	22	214
Alcatel-Lucent B66 R	56.00	201	19	0.007	26	252
Commscope RC2DC-4750	56.00	52	5	0.002	7	65
Amphenol Antel BXA-1	56.00	38	4	0.001	5	48
Commscope SBNHH-1D65	56.00	67	6	0.002	9	84
Commscope SBNHH-1D45	56.00	202	19	0.007	26	254
Amphenol Antel LPA-8	56.00	162	15	0.006	21	203
VZW Unused Reserve:	56.00	1,489	137	0.054	194	1,869
Pine Branches	55.00	600	54	0.021	77	753
Pine Branches	50.00	600	49	0.019	69	753
Pine Branches	45.00	600	43	0.017	61	753
Pine Branches	40.00	600	38	0.015	53	753
Pine Branches	35.00	600	33	0.013	46	753
Pine Branches	30.00	600	27	0.011	39	753
Pine Branches	25.00	600	22	0.009	32	753
Pine Branches	20.00	600	17	0.007	25	753
Pine Branches	15.00	600	13	0.005	18	753
		35,957	2,544	1.000	3,590	45,133

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)
27	82.34	11	2	0.001	2	9
26	81.00	32	4	0.002	6	27
25	78.50	48	6	0.003	9	40
24	76.84	8	1	0.000	1	7
23	75.84	174	23	0.009	32	147

22	72.50	536	66	0.026	93	453
21	68.50	335	39	0.015	55	283
20	66.00	263	29	0.011	41	222
19	62.50	678	71	0.028	100	573
18	58.50	420	41	0.016	57	355
17	56.50	144	13	0.005	19	122
16	55.50	161	15	0.006	21	136
15	53.69	428	38	0.015	53	361
14	51.19	792	66	0.026	93	669
13	48.58	965	76	0.030	107	815
12	46.08	473	35	0.014	49	400
11	42.50	1,125	76	0.030	107	950
10	37.50	1,164	68	0.027	97	984
9	32.50	1,204	60	0.024	85	1,017
8	29.43	282	13	0.005	18	238
7	26.93	1,845	75	0.029	105	1,558
6	23.84	1,132	40	0.016	56	956
5	21.34	763	24	0.009	34	645
4	17.50	1,455	36	0.014	51	1,229
3	12.50	1,500	26	0.010	36	1,267
2	7.50	1,546	15	0.006	21	1,306
1	2.50	1,591	4	0.002	6	1,344
Bird 428D-83I-01-T	82.68	9	1	0.000	2	8
dbSpectra DS7C09P36U	82.68	140	20	0.008	28	118
Pole Mount	82.00	80	11	0.004	16	68
Round Side Arm	82.00	300	42	0.017	60	253
Ericsson Radio 4449	77.00	222	29	0.012	41	188
Ericsson RRUS 32 B66	77.00	159	21	0.008	30	134
Ericsson AIR-32 B2A/	77.00	397	52	0.021	74	335
RFS APX16DWV-16DWVS-	77.00	126	17	0.007	23	106
Flat T-Arms	77.00	750	99	0.039	140	634
RFS APXVAARR24_43-U-	77.00	384	51	0.020	71	324
Pine Branches	75.00	600	77	0.030	108	507
Pine Branches	70.00	600	71	0.028	100	507
CCI DTMABP7819VG12A	67.00	115	13	0.005	18	97
Raycap DC6-48-60-0-8	67.00	16	2	0.001	3	14
Raycap DC6-48-60-18-	67.00	66	7	0.003	10	55
Ericsson RRUS 4426 B	67.00	145	16	0.006	23	123
Ericsson RRUS 4449 B	67.00	213	24	0.009	34	180
Ericsson RRUS 4478 B	67.00	178	20	0.008	28	151
Ericsson RRUS 32 B2	67.00	159	18	0.007	25	134
Ericsson RRUS-32 (77	67.00	231	26	0.010	37	195
Powerwave Allgon P65	67.00	159	18	0.007	25	134
CCI DMP65R-BU4D	67.00	407	46	0.018	65	344
CCI OPA-65R-LCUU-H6	67.00	219	25	0.010	35	185
Site PRO1, RMV12-496	67.00	1,358	153	0.060	216	1,147
Pine Branches	65.00	600	65	0.026	92	507
Pine Branches	60.00	600	60	0.024	84	507
Flat T-Arm	57.00	750	71	0.028	100	634
Alcatel-Lucent RRH 2	56.00	119	11	0.004	15	100
Alcatel-Lucent RRH2x	56.00	170	16	0.006	22	144
Alcatel-Lucent B66 R	56.00	201	19	0.007	26	170
Commscope RC2DC-4750	56.00	52	5	0.002	7	44
Amphenol Antel BXA-1	56.00	38	4	0.001	5	32
Commscope SBNHH-1D65	56.00	67	6	0.002	9	57
Commscope SBNHH-1D45	56.00	202	19	0.007	26	171
Amphenol Antel LPA-8	56.00	162	15	0.006	21	137
VZW Unused Reserve:	56.00	1,489	137	0.054	194	1,258
Pine Branches	55.00	600	54	0.021	77	507
Pine Branches	50.00	600	49	0.019	69	507
Pine Branches	45.00	600	43	0.017	61	507
Pine Branches	40.00	600	38	0.015	53	507
Pine Branches	35.00	600	33	0.013	46	507
Pine Branches	30.00	600	27	0.011	39	507

Pine Branches	25.00	600	22	0.009	32	507
Pine Branches	20.00	600	17	0.007	25	507
Pine Branches	15.00	600	13	0.005	18	507
		35,957	2,544	1.000	3,590	30,377

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	-43.14	-3.59	0.00	-200.88	0.00	200.88	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.039
5.00	-41.20	-3.57	0.00	-182.94	0.00	182.94	5,874.00	2,937.00	11,999.0	6,008.46	0.01	-0.01	0.037
10.00	-39.31	-3.54	0.00	-165.07	0.00	165.07	5,676.05	2,838.02	11,200.1	5,608.37	0.02	-0.02	0.036
15.00	-36.73	-3.48	0.00	-147.35	0.00	147.35	5,478.10	2,739.05	10,428.6	5,222.07	0.05	-0.03	0.035
20.00	-35.02	-3.43	0.00	-129.95	0.00	129.95	5,280.14	2,640.07	9,684.72	4,849.56	0.08	-0.04	0.033
22.69	-33.60	-3.37	0.00	-120.75	0.00	120.75	5,173.75	2,586.87	9,296.23	4,655.02	0.11	-0.05	0.032
25.00	-30.53	-3.23	0.00	-112.95	0.00	112.95	5,082.19	2,541.10	8,968.32	4,490.82	0.13	-0.05	0.031
28.85	-30.18	-3.22	0.00	-100.50	0.00	100.50	4,410.21	2,205.11	7,728.69	3,870.09	0.17	-0.06	0.033
30.00	-27.91	-3.10	0.00	-96.80	0.00	96.80	4,370.43	2,185.21	7,589.18	3,800.23	0.19	-0.06	0.032
35.00	-25.70	-2.95	0.00	-81.32	0.00	81.32	4,197.22	2,098.61	6,996.61	3,503.50	0.26	-0.07	0.029
40.00	-23.53	-2.79	0.00	-66.55	0.00	66.55	4,024.01	2,012.01	6,428.12	3,218.84	0.33	-0.08	0.027
45.00	-22.18	-2.68	0.00	-52.58	0.00	52.58	3,850.81	1,925.40	5,883.72	2,946.23	0.42	-0.09	0.024
47.16	-20.97	-2.58	0.00	-46.78	0.00	46.78	3,776.02	1,888.01	5,656.10	2,832.26	0.46	-0.09	0.022
50.00	-19.23	-2.41	0.00	-39.46	0.00	39.46	3,677.60	1,838.80	5,363.40	2,685.69	0.51	-0.09	0.020
52.38	-18.69	-2.36	0.00	-33.72	0.00	33.72	2,530.81	1,265.41	3,698.60	1,852.05	0.56	-0.10	0.026
55.00	-17.73	-2.26	0.00	-27.53	0.00	27.53	2,486.37	1,243.18	3,543.07	1,774.17	0.61	-0.10	0.023
56.00	-14.42	-1.91	0.00	-25.27	0.00	25.27	2,469.16	1,234.58	3,484.21	1,744.70	0.63	-0.10	0.020
57.00	-12.95	-1.75	0.00	-23.36	0.00	23.36	2,451.82	1,225.91	3,425.65	1,715.37	0.66	-0.10	0.019
60.00	-11.34	-1.57	0.00	-18.10	0.00	18.10	2,398.99	1,199.50	3,251.77	1,628.30	0.72	-0.11	0.016
65.00	-10.26	-1.43	0.00	-10.26	0.00	10.26	2,308.28	1,154.14	2,968.33	1,486.37	0.83	-0.11	0.011
67.00	-5.74	-0.85	0.00	-7.40	0.00	7.40	2,261.48	1,130.74	2,845.26	1,424.74	0.88	-0.11	0.008
70.00	-4.31	-0.65	0.00	-4.85	0.00	4.85	2,187.24	1,093.62	2,660.62	1,332.29	0.95	-0.11	0.006
75.00	-3.34	-0.51	0.00	-1.59	0.00	1.59	2,063.52	1,031.76	2,366.67	1,185.09	1.07	-0.11	0.003
76.68	-3.33	-0.51	0.00	-0.73	0.00	0.73	2,021.95	1,010.98	2,271.76	1,137.57	1.11	-0.11	0.002
76.68	-3.33	-0.51	0.00	-0.73	0.00	0.73	182.47	91.23	29.26	20.19	1.11	-0.11	0.054
77.00	-0.72	-0.12	0.00	-0.57	0.00	0.57	182.47	91.23	29.26	20.19	1.12	-0.11	0.032
80.00	-0.68	-0.11	0.00	-0.22	0.00	0.22	182.47	91.23	29.26	20.19	1.20	-0.15	0.015
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.27	-0.16	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.29	-0.16	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	-29.03	-3.59	0.00	-200.30	0.00	200.30	6,024.56	3,012.28	12,725.4	6,372.20	0.00	0.00	0.036
5.00	-27.73	-3.57	0.00	-182.37	0.00	182.37	5,874.00	2,937.00	11,999.0	6,008.46	0.01	-0.01	0.035
10.00	-26.46	-3.54	0.00	-164.52	0.00	164.52	5,676.05	2,838.02	11,200.1	5,608.37	0.02	-0.02	0.034
15.00	-24.72	-3.47	0.00	-146.83	0.00	146.83	5,478.10	2,739.05	10,428.6	5,222.07	0.05	-0.03	0.033
20.00	-23.57	-3.42	0.00	-129.47	0.00	129.47	5,280.14	2,640.07	9,684.72	4,849.56	0.08	-0.04	0.031
22.69	-22.61	-3.36	0.00	-120.29	0.00	120.29	5,173.75	2,586.87	9,296.23	4,655.02	0.11	-0.04	0.030
25.00	-20.55	-3.23	0.00	-112.51	0.00	112.51	5,082.19	2,541.10	8,968.32	4,490.82	0.13	-0.05	0.029
28.85	-20.31	-3.21	0.00	-100.09	0.00	100.09	4,410.21	2,205.11	7,728.69	3,870.09	0.17	-0.06	0.030
30.00	-18.78	-3.09	0.00	-96.41	0.00	96.41	4,370.43	2,185.21	7,589.18	3,800.23	0.19	-0.06	0.030
35.00	-17.29	-2.94	0.00	-80.98	0.00	80.98	4,197.22	2,098.61	6,996.61	3,503.50	0.25	-0.07	0.027
40.00	-15.84	-2.78	0.00	-66.26	0.00	66.26	4,024.01	2,012.01	6,428.12	3,218.84	0.33	-0.08	0.025
45.00	-14.93	-2.67	0.00	-52.35	0.00	52.35	3,850.81	1,925.40	5,883.72	2,946.23	0.42	-0.09	0.022
47.16	-14.11	-2.57	0.00	-46.57	0.00	46.57	3,776.02	1,888.01	5,656.10	2,832.26	0.46	-0.09	0.020
50.00	-12.94	-2.40	0.00	-39.28	0.00	39.28	3,677.60	1,838.80	5,363.40	2,685.69	0.51	-0.09	0.018
52.38	-12.58	-2.35	0.00	-33.57	0.00	33.57	2,530.81	1,265.41	3,698.60	1,852.05	0.56	-0.10	0.023
55.00	-11.93	-2.25	0.00	-27.41	0.00	27.41	2,486.37	1,243.18	3,543.07	1,774.17	0.61	-0.10	0.020
56.00	-9.70	-1.90	0.00	-25.16	0.00	25.16	2,469.16	1,234.58	3,484.21	1,744.70	0.63	-0.10	0.018
57.00	-8.71	-1.75	0.00	-23.25	0.00	23.25	2,451.82	1,225.91	3,425.65	1,715.37	0.65	-0.10	0.017
60.00	-7.63	-1.56	0.00	-18.02	0.00	18.02	2,398.99	1,199.50	3,251.77	1,628.30	0.72	-0.11	0.014
65.00	-6.90	-1.43	0.00	-10.22	0.00	10.22	2,308.28	1,154.14	2,968.33	1,486.37	0.83	-0.11	0.010
67.00	-3.86	-0.85	0.00	-7.37	0.00	7.37	2,261.48	1,130.74	2,845.26	1,424.74	0.88	-0.11	0.007
70.00	-2.90	-0.65	0.00	-4.83	0.00	4.83	2,187.24	1,093.62	2,660.62	1,332.29	0.95	-0.11	0.005
75.00	-2.25	-0.51	0.00	-1.58	0.00	1.58	2,063.52	1,031.76	2,366.67	1,185.09	1.07	-0.11	0.002
76.68	-2.24	-0.51	0.00	-0.73	0.00	0.73	2,021.95	1,010.98	2,271.76	1,137.57	1.11	-0.11	0.002
76.68	-2.24	-0.51	0.00	-0.73	0.00	0.73	182.47	91.23	29.26	20.19	1.11	-0.11	0.048
77.00	-0.48	-0.12	0.00	-0.56	0.00	0.56	182.47	91.23	29.26	20.19	1.11	-0.11	0.031
80.00	-0.46	-0.11	0.00	-0.22	0.00	0.22	182.47	91.23	29.26	20.19	1.20	-0.15	0.013
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.26	-0.16	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.28	-0.16	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):	0.26
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.59
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.28
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11
Period Based on Rayleigh Method (sec):	0.75
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)
27	82.34	11	1.874	1.899	1.111	0.571	4	14
26	81.00	32	1.814	1.603	1.001	0.518	11	40
25	78.50	48	1.704	1.136	0.820	0.428	14	60
24	76.84	8	1.632	0.882	0.715	0.374	2	10
23	75.84	174	1.590	0.749	0.657	0.344	40	218
22	72.50	536	1.453	0.392	0.489	0.256	91	672
21	68.50	335	1.297	0.117	0.334	0.174	39	420
20	66.00	263	1.204	0.009	0.258	0.135	24	330
19	62.50	678	1.080	-0.080	0.175	0.096	43	851
18	58.50	420	0.946	-0.119	0.106	0.069	19	528
17	56.50	144	0.883	-0.121	0.081	0.062	6	181
16	55.50	161	0.852	-0.119	0.070	0.060	6	202
15	53.69	428	0.797	-0.111	0.053	0.058	16	537
14	51.19	792	0.724	-0.094	0.035	0.057	30	994
13	48.58	965	0.652	-0.071	0.022	0.059	38	1,212
12	46.08	473	0.587	-0.048	0.013	0.062	20	594
11	42.50	1,125	0.499	-0.016	0.007	0.066	49	1,412
10	37.50	1,164	0.389	0.022	0.007	0.068	53	1,462
9	32.50	1,204	0.292	0.047	0.013	0.066	53	1,511
8	29.43	282	0.239	0.057	0.018	0.063	12	354
7	26.93	1,845	0.200	0.063	0.023	0.060	73	2,315
6	23.84	1,132	0.157	0.067	0.029	0.055	42	1,421
5	21.34	763	0.126	0.070	0.034	0.051	26	958
4	17.50	1,455	0.085	0.071	0.039	0.046	45	1,826
3	12.50	1,500	0.043	0.071	0.042	0.040	40	1,883
2	7.50	1,546	0.016	0.061	0.036	0.031	32	1,940
1	2.50	1,591	0.002	0.030	0.017	0.015	16	1,997
Bird 428D-83I-01-T	82.68	9	1.890	1.980	1.140	0.584	3	11
dbSpectra DS7C09P36U	82.68	140	1.890	1.980	1.140	0.584	55	176
Pole Mount	82.00	80	1.859	1.821	1.082	0.557	30	100
Round Side Arm	82.00	300	1.859	1.821	1.082	0.557	111	377
Ericsson Radio 4449	77.00	222	1.639	0.905	0.725	0.379	56	279
Ericsson RRUS 32 B66	77.00	159	1.639	0.905	0.725	0.379	40	200
Ericsson AIR-32 B2A/	77.00	397	1.639	0.905	0.725	0.379	100	498

RFS APX16DWV-	77.00	126	1.639	0.905	0.725	0.379	32	158
Flat T-Arms	77.00	750	1.639	0.905	0.725	0.379	190	941
RFS APXVAARR24_43-U-	77.00	384	1.639	0.905	0.725	0.379	97	482
Pine Branches	75.00	600	1.555	0.646	0.611	0.320	128	753
Pine Branches	70.00	600	1.355	0.204	0.387	0.202	81	753
CCI DTMABP7819VG12A	67.00	115	1.241	0.047	0.287	0.149	11	145
Raycap DC6-48-60-0-8	67.00	16	1.241	0.047	0.287	0.149	2	20
Raycap DC6-48-60-18-	67.00	66	1.241	0.047	0.287	0.149	7	82
Ericsson RRUS 4426 B	67.00	145	1.241	0.047	0.287	0.149	14	182
Ericsson RRUS 4449 B	67.00	213	1.241	0.047	0.287	0.149	21	267
Ericsson RRUS 4478 B	67.00	178	1.241	0.047	0.287	0.149	18	224
Ericsson RRUS 32 B2	67.00	159	1.241	0.047	0.287	0.149	16	200
Ericsson RRUS-32 (77	67.00	231	1.241	0.047	0.287	0.149	23	290
Powerwave Allgon P65	67.00	159	1.241	0.047	0.287	0.149	16	200
CCI DMP65R-BU4D	67.00	407	1.241	0.047	0.287	0.149	41	511
CCI OPA-65R-LCUU-H6	67.00	219	1.241	0.047	0.287	0.149	22	275
Site PRO1, RMV12-496	67.00	1,358	1.241	0.047	0.287	0.149	135	1,704
Pine Branches	65.00	600	1.168	-0.023	0.232	0.122	49	753
Pine Branches	60.00	600	0.995	-0.111	0.129	0.077	31	753
Flat T-Arm	57.00	750	0.898	-0.122	0.087	0.064	32	941
Alcatel-Lucent RRH 2	56.00	119	0.867	-0.121	0.075	0.061	5	149
Alcatel-Lucent RRH2x	56.00	170	0.867	-0.121	0.075	0.061	7	214
Alcatel-Lucent B66 R	56.00	201	0.867	-0.121	0.075	0.061	8	252
Commscope RC2DC-	56.00	52	0.867	-0.121	0.075	0.061	2	65
Amphenol Antel BXA-1	56.00	38	0.867	-0.121	0.075	0.061	2	48
Commscope SBNHH-	56.00	67	0.867	-0.121	0.075	0.061	3	84
Commscope SBNHH-	56.00	202	0.867	-0.121	0.075	0.061	8	254
Amphenol Antel LPA-8	56.00	162	0.867	-0.121	0.075	0.061	7	203
VZW Unused Reserve:	56.00	1,489	0.867	-0.121	0.075	0.061	61	1,869
Pine Branches	55.00	600	0.836	-0.118	0.065	0.059	24	753
Pine Branches	50.00	600	0.691	-0.084	0.028	0.058	23	753
Pine Branches	45.00	600	0.560	-0.038	0.011	0.063	25	753
Pine Branches	40.00	600	0.442	0.004	0.006	0.068	27	753
Pine Branches	35.00	600	0.339	0.036	0.009	0.068	27	753
Pine Branches	30.00	600	0.249	0.056	0.017	0.064	25	753
Pine Branches	25.00	600	0.173	0.066	0.027	0.057	23	753
Pine Branches	20.00	600	0.111	0.070	0.036	0.049	20	753
Pine Branches	15.00	600	0.062	0.072	0.041	0.043	17	753
		35,957	70.604	19.732	20.795	12.103	2,519	45,133

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)
27	82.34	11	1.874	1.899	1.111	0.571	4	9
26	81.00	32	1.814	1.603	1.001	0.518	11	27
25	78.50	48	1.704	1.136	0.820	0.428	14	40
24	76.84	8	1.632	0.882	0.715	0.374	2	7
23	75.84	174	1.590	0.749	0.657	0.344	40	147
22	72.50	536	1.453	0.392	0.489	0.256	91	453
21	68.50	335	1.297	0.117	0.334	0.174	39	283
20	66.00	263	1.204	0.009	0.258	0.135	24	222
19	62.50	678	1.080	-0.080	0.175	0.096	43	573
18	58.50	420	0.946	-0.119	0.106	0.069	19	355
17	56.50	144	0.883	-0.121	0.081	0.062	6	122
16	55.50	161	0.852	-0.119	0.070	0.060	6	136
15	53.69	428	0.797	-0.111	0.053	0.058	16	361
14	51.19	792	0.724	-0.094	0.035	0.057	30	669
13	48.58	965	0.652	-0.071	0.022	0.059	38	815

12	46.08	473	0.587	-0.048	0.013	0.062	20	400
11	42.50	1,125	0.499	-0.016	0.007	0.066	49	950
10	37.50	1,164	0.389	0.022	0.007	0.068	53	984
9	32.50	1,204	0.292	0.047	0.013	0.066	53	1,017
8	29.43	282	0.239	0.057	0.018	0.063	12	238
7	26.93	1,845	0.200	0.063	0.023	0.060	73	1,558
6	23.84	1,132	0.157	0.067	0.029	0.055	42	956
5	21.34	763	0.126	0.070	0.034	0.051	26	645
4	17.50	1,455	0.085	0.071	0.039	0.046	45	1,229
3	12.50	1,500	0.043	0.071	0.042	0.040	40	1,267
2	7.50	1,546	0.016	0.061	0.036	0.031	32	1,306
1	2.50	1,591	0.002	0.030	0.017	0.015	16	1,344
Bird 428D-83I-01-T	82.68	9	1.890	1.980	1.140	0.584	3	8
dbSpectra DS7C09P36U	82.68	140	1.890	1.980	1.140	0.584	55	118
Pole Mount	82.00	80	1.859	1.821	1.082	0.557	30	68
Round Side Arm	82.00	300	1.859	1.821	1.082	0.557	111	253
Ericsson Radio 4449	77.00	222	1.639	0.905	0.725	0.379	56	188
Ericsson RRUS 32 B66	77.00	159	1.639	0.905	0.725	0.379	40	134
Ericsson AIR-32 B2A/	77.00	397	1.639	0.905	0.725	0.379	100	335
RFS APX16DWV-	77.00	126	1.639	0.905	0.725	0.379	32	106
Flat T-Arms	77.00	750	1.639	0.905	0.725	0.379	190	634
RFS APXVAARR24_43-U-	77.00	384	1.639	0.905	0.725	0.379	97	324
Pine Branches	75.00	600	1.555	0.646	0.611	0.320	128	507
Pine Branches	70.00	600	1.355	0.204	0.387	0.202	81	507
CCI DTMABP7819VG12A	67.00	115	1.241	0.047	0.287	0.149	11	97
Raycap DC6-48-60-0-8	67.00	16	1.241	0.047	0.287	0.149	2	14
Raycap DC6-48-60-18-	67.00	66	1.241	0.047	0.287	0.149	7	55
Ericsson RRUS 4426 B	67.00	145	1.241	0.047	0.287	0.149	14	123
Ericsson RRUS 4449 B	67.00	213	1.241	0.047	0.287	0.149	21	180
Ericsson RRUS 4478 B	67.00	178	1.241	0.047	0.287	0.149	18	151
Ericsson RRUS 32 B2	67.00	159	1.241	0.047	0.287	0.149	16	134
Ericsson RRUS-32 (77	67.00	231	1.241	0.047	0.287	0.149	23	195
Powerwave Allgon P65	67.00	159	1.241	0.047	0.287	0.149	16	134
CCI DMP65R-BU4D	67.00	407	1.241	0.047	0.287	0.149	41	344
CCI OPA-65R-LCUU-H6	67.00	219	1.241	0.047	0.287	0.149	22	185
Site PRO1, RMV12-496	67.00	1,358	1.241	0.047	0.287	0.149	135	1,147
Pine Branches	65.00	600	1.168	-0.023	0.232	0.122	49	507
Pine Branches	60.00	600	0.995	-0.111	0.129	0.077	31	507
Flat T-Arm	57.00	750	0.898	-0.122	0.087	0.064	32	634
Alcatel-Lucent RRH 2	56.00	119	0.867	-0.121	0.075	0.061	5	100
Alcatel-Lucent RRH2x	56.00	170	0.867	-0.121	0.075	0.061	7	144
Alcatel-Lucent B66 R	56.00	201	0.867	-0.121	0.075	0.061	8	170
Commscope RC2DC-	56.00	52	0.867	-0.121	0.075	0.061	2	44
Amphenol Antel BXA-1	56.00	38	0.867	-0.121	0.075	0.061	2	32
Commscope SBNHH-	56.00	67	0.867	-0.121	0.075	0.061	3	57
Commscope SBNHH-	56.00	202	0.867	-0.121	0.075	0.061	8	171
Amphenol Antel LPA-8	56.00	162	0.867	-0.121	0.075	0.061	7	137
VZW Unused Reserve:	56.00	1,489	0.867	-0.121	0.075	0.061	61	1,258
Pine Branches	55.00	600	0.836	-0.118	0.065	0.059	24	507
Pine Branches	50.00	600	0.691	-0.084	0.028	0.058	23	507
Pine Branches	45.00	600	0.560	-0.038	0.011	0.063	25	507
Pine Branches	40.00	600	0.442	0.004	0.006	0.068	27	507
Pine Branches	35.00	600	0.339	0.036	0.009	0.068	27	507
Pine Branches	30.00	600	0.249	0.056	0.017	0.064	25	507
Pine Branches	25.00	600	0.173	0.066	0.027	0.057	23	507
Pine Branches	20.00	600	0.111	0.070	0.036	0.049	20	507
Pine Branches	15.00	600	0.062	0.072	0.041	0.043	17	507
		35,957	70.604	19.732	20.795	12.103	2,519	30,377

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	-43.14	-2.51	0.00	-150.28	0.00	150.28	6,024.56	3,012.28	12,725.49	6,372.20	0.00	0.00	0.031
5.00	-41.20	-2.48	0.00	-137.75	0.00	137.75	5,874.00	2,937.00	11,999.08	6,008.46	0.00	-0.01	0.030
10.00	-39.31	-2.44	0.00	-125.36	0.00	125.36	5,676.05	2,838.02	11,200.10	5,608.37	0.02	-0.02	0.029
15.00	-36.73	-2.39	0.00	-113.14	0.00	113.14	5,478.10	2,739.05	10,428.65	5,222.07	0.04	-0.02	0.028
20.00	-35.02	-2.34	0.00	-101.21	0.00	101.21	5,280.14	2,640.07	9,684.72	4,849.56	0.06	-0.03	0.028
22.69	-33.60	-2.30	0.00	-94.92	0.00	94.92	5,173.75	2,586.87	9,296.23	4,655.02	0.08	-0.03	0.027
25.00	-30.53	-2.21	0.00	-89.59	0.00	89.59	5,082.19	2,541.10	8,968.32	4,490.82	0.10	-0.04	0.026
28.85	-30.18	-2.20	0.00	-81.09	0.00	81.09	4,410.21	2,205.11	7,728.69	3,870.09	0.13	-0.04	0.028
30.00	-27.91	-2.12	0.00	-78.57	0.00	78.57	4,370.43	2,185.21	7,589.18	3,800.23	0.14	-0.05	0.027
35.00	-25.70	-2.04	0.00	-67.98	0.00	67.98	4,197.22	2,098.61	6,996.61	3,503.50	0.20	-0.05	0.026
40.00	-23.53	-1.96	0.00	-57.78	0.00	57.78	4,024.01	2,012.01	6,428.12	3,218.84	0.26	-0.06	0.024
45.00	-22.19	-1.92	0.00	-47.95	0.00	47.95	3,850.81	1,925.40	5,883.72	2,946.23	0.32	-0.07	0.022
47.16	-20.97	-1.88	0.00	-43.81	0.00	43.81	3,776.02	1,888.01	5,656.10	2,832.26	0.36	-0.07	0.021
50.00	-19.23	-1.83	0.00	-38.46	0.00	38.46	3,677.60	1,838.80	5,363.40	2,685.69	0.40	-0.08	0.020
52.38	-18.69	-1.81	0.00	-34.11	0.00	34.11	2,530.81	1,265.41	3,698.60	1,852.05	0.44	-0.08	0.026
55.00	-17.73	-1.78	0.00	-29.37	0.00	29.37	2,486.37	1,243.18	3,543.07	1,774.17	0.48	-0.08	0.024
56.00	-14.42	-1.67	0.00	-27.59	0.00	27.59	2,469.16	1,234.58	3,484.21	1,744.70	0.50	-0.08	0.022
57.00	-12.95	-1.62	0.00	-25.92	0.00	25.92	2,451.82	1,225.91	3,425.65	1,715.37	0.52	-0.08	0.020
60.00	-11.34	-1.54	0.00	-21.07	0.00	21.07	2,398.99	1,199.50	3,251.77	1,628.30	0.57	-0.09	0.018
65.00	-10.26	-1.47	0.00	-13.38	0.00	13.38	2,308.28	1,154.14	2,968.33	1,486.37	0.67	-0.09	0.013
67.00	-5.74	-1.09	0.00	-10.44	0.00	10.44	2,261.48	1,130.74	2,845.26	1,424.74	0.71	-0.10	0.010
70.00	-4.31	-0.92	0.00	-7.16	0.00	7.16	2,187.24	1,093.62	2,660.62	1,332.29	0.77	-0.10	0.007
75.00	-3.34	-0.75	0.00	-2.56	0.00	2.56	2,063.52	1,031.76	2,366.67	1,185.09	0.87	-0.10	0.004
76.68	-3.33	-0.75	0.00	-1.30	0.00	1.30	2,021.95	1,010.98	2,271.76	1,137.57	0.91	-0.10	0.003
76.68	-3.33	-0.75	0.00	-1.30	0.00	1.30	182.47	91.23	29.26	20.19	0.91	-0.10	0.083
77.00	-0.72	-0.22	0.00	-1.06	0.00	1.06	182.47	91.23	29.26	20.19	0.91	-0.10	0.056
80.00	-0.68	-0.21	0.00	-0.41	0.00	0.41	182.47	91.23	29.26	20.19	1.00	-0.17	0.024
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.07	-0.18	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.10	-0.18	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	-29.03	-2.50	0.00	-149.83	0.00	149.83	6,024.56	3,012.28	12,725.49	6,372.20	0.00	0.00	0.028
5.00	-27.73	-2.48	0.00	-137.30	0.00	137.30	5,874.00	2,937.00	11,999.08	6,008.46	0.00	-0.01	0.028
10.00	-26.46	-2.44	0.00	-124.92	0.00	124.92	5,676.05	2,838.02	11,200.10	5,608.37	0.02	-0.01	0.027
15.00	-24.72	-2.38	0.00	-112.73	0.00	112.73	5,478.10	2,739.05	10,428.65	5,222.07	0.04	-0.02	0.026
20.00	-23.57	-2.34	0.00	-100.83	0.00	100.83	5,280.14	2,640.07	9,684.72	4,849.56	0.06	-0.03	0.025
22.69	-22.61	-2.30	0.00	-94.55	0.00	94.55	5,173.75	2,586.87	9,296.23	4,655.02	0.08	-0.03	0.025
25.00	-20.55	-2.20	0.00	-89.24	0.00	89.24	5,082.19	2,541.10	8,968.32	4,490.82	0.10	-0.04	0.024
28.85	-20.31	-2.19	0.00	-80.77	0.00	80.77	4,410.21	2,205.11	7,728.69	3,870.09	0.13	-0.04	0.025
30.00	-18.79	-2.11	0.00	-78.25	0.00	78.25	4,370.43	2,185.21	7,589.18	3,800.23	0.14	-0.05	0.025
35.00	-17.30	-2.03	0.00	-67.70	0.00	67.70	4,197.22	2,098.61	6,996.61	3,503.50	0.19	-0.05	0.023
40.00	-15.84	-1.96	0.00	-57.54	0.00	57.54	4,024.01	2,012.01	6,428.12	3,218.84	0.25	-0.06	0.022
45.00	-14.93	-1.91	0.00	-47.76	0.00	47.76	3,850.81	1,925.40	5,883.72	2,946.23	0.32	-0.07	0.020
47.16	-14.12	-1.87	0.00	-43.63	0.00	43.63	3,776.02	1,888.01	5,656.10	2,832.26	0.35	-0.07	0.019
50.00	-12.94	-1.82	0.00	-38.31	0.00	38.31	3,677.60	1,838.80	5,363.40	2,685.69	0.40	-0.07	0.018
52.38	-12.58	-1.80	0.00	-33.98	0.00	33.98	2,530.81	1,265.41	3,698.60	1,852.05	0.44	-0.08	0.023
55.00	-11.94	-1.77	0.00	-29.26	0.00	29.26	2,486.37	1,243.18	3,543.07	1,774.17	0.48	-0.08	0.021
56.00	-9.70	-1.66	0.00	-27.49	0.00	27.49	2,469.16	1,234.58	3,484.21	1,744.70	0.50	-0.08	0.020
57.00	-8.71	-1.61	0.00	-25.83	0.00	25.83	2,451.82	1,225.91	3,425.65	1,715.37	0.51	-0.08	0.019
60.00	-7.63	-1.53	0.00	-21.00	0.00	21.00	2,398.99	1,199.50	3,251.77	1,628.30	0.57	-0.09	0.016
65.00	-6.90	-1.46	0.00	-13.34	0.00	13.34	2,308.28	1,154.14	2,968.33	1,486.37	0.66	-0.09	0.012
67.00	-3.86	-1.09	0.00	-10.42	0.00	10.42	2,261.48	1,130.74	2,845.26	1,424.74	0.70	-0.10	0.009
70.00	-2.90	-0.92	0.00	-7.14	0.00	7.14	2,187.24	1,093.62	2,660.62	1,332.29	0.76	-0.10	0.007
75.00	-2.25	-0.75	0.00	-2.55	0.00	2.55	2,063.52	1,031.76	2,366.67	1,185.09	0.87	-0.10	0.003
76.68	-2.24	-0.75	0.00	-1.29	0.00	1.29	2,021.95	1,010.98	2,271.76	1,137.57	0.90	-0.10	0.002
76.68	-2.24	-0.75	0.00	-1.29	0.00	1.29	182.47	91.23	29.26	20.19	0.90	-0.10	0.076
77.00	-0.48	-0.22	0.00	-1.05	0.00	1.05	182.47	91.23	29.26	20.19	0.91	-0.10	0.055
80.00	-0.46	-0.20	0.00	-0.41	0.00	0.41	182.47	91.23	29.26	20.19	1.00	-0.17	0.023
82.00	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.07	-0.18	0.000
82.68	0.00	0.00	0.00	0.00	0.00	0.00	182.47	91.23	29.26	20.19	1.09	-0.18	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	44.26	0.00	43.10	0.00	0.00	2332.02	76.68	0.46
0.9D + 1.6W	44.25	0.00	32.31	0.00	0.00	2327.05	76.68	0.45
1.2D + 1.0Di + 1.0Wi	12.83	0.00	60.56	0.00	0.00	669.65	76.68	0.18
(1.2 + 0.2Sds) * DL + E ELFM	3.59	0.00	43.14	0.00	0.00	200.88	76.68	0.05
(1.2 + 0.2Sds) * DL + E EMAM	2.51	0.00	43.14	0.00	0.00	150.28	76.68	0.08
(0.9 - 0.2Sds) * DL + E ELFM	3.59	0.00	29.03	0.00	0.00	200.30	76.68	0.05
(0.9 - 0.2Sds) * DL + E EMAM	2.50	0.00	29.03	0.00	0.00	149.83	76.68	0.08
1.0D + 1.0W	10.31	0.00	35.95	0.00	0.00	542.45	76.68	0.12

Base Plate & Anchor Rod Analysis

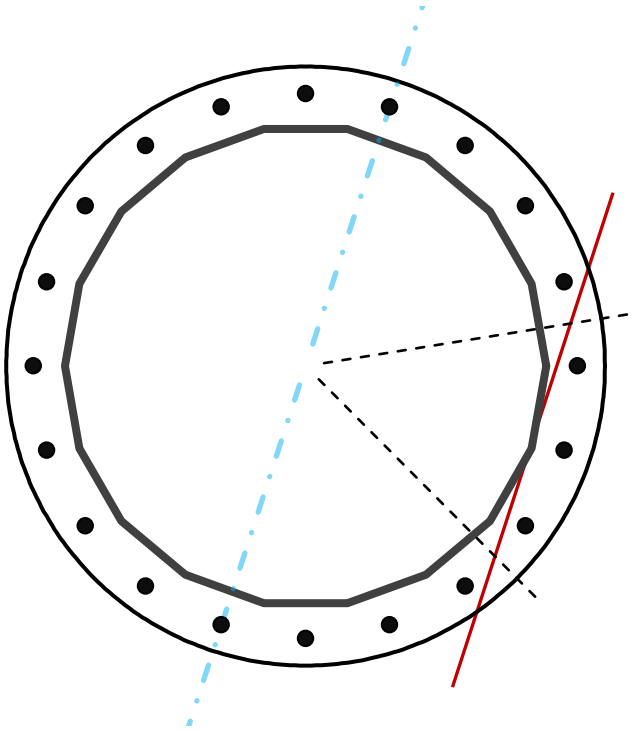
Pole Dimensions		
Number of Sides	18	-
Diameter	52	in
Thickness	0.5	in
Orientation Offset		°

Base Reactions		
Moment, Mu	2332.0	k-ft
Axial, Pu	43.1	k
Shear, Vu	44.3	k
Neutral Axis	252	°

Report Capacities		
Component	Capacity	Result
Base Plate	19%	Pass
Anchor Rods	39%	Pass
Dwyidag	-	-

Base Plate		
Shape	Round	-
Diameter, ø	66	in
Thickness	2 3/4	in
Grade	A572-50	
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Clip	N/A	in
Orientation Offset		°
Anchor Rod Detail	d	η=0.5
Clear Distance	3	in
Applied Moment, Mu	508.0	k
Bending Stress, ϕMn	2606.7	k

Original Anchor Rods		
Arrangement	Radial	-
Quantity	20	-
Diameter, ø	2 1/4	in
Bolt Circle	60	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	9.4	in
Orientation Offset		°
Applied Force, Pu	99.2	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	44.3	2332.0	1.00
Anchor Rod Forces	44.3	2332.0	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	80.4859	4.4714	0.3744		26690.34
Bolt	3.9761	3.2477	0.8393	4.5	26977.81
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	Round	-
Diameter, D	66	in
Thickness, t	2.75	in
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Base Plate Chord	40.645	in
Detail Type	d	-
Detail Factor	0.50	-
Clear Distance	3	-

Anchor Rods		
Anchor Rod Quantity, N	20	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	60	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	99.2	k
Applied Shear, Vu	1.1	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.382	OK
Interaction Capacity	0.390	OK

External Base Plate		
Chord Length AA	34.296	in
Additional AA	5.500	in
Section Modulus, Z	75.239	in^3
Applied Moment, Mu	508.0	k-ft
Bending Capacity, ϕMn	3385.7	k-ft
Capacity, Mu/ϕMn	0.150	OK
Chord Length AB	33.035	in
Additional AB	5.500	in
Section Modulus, Z	72.855	in^3
Applied Moment, Mu	391.9	k-ft
Bending Capacity, ϕMn	3278.5	k-ft
Capacity, Mu/ϕMn	0.120	OK
Bend Line Length	30.639	in
Additional Bend Line	0.000	in
Section Modulus, Z	57.927	in^3
Applied Moment, Mu	508.0	k-ft
Bending Capacity, ϕMn	2606.7	k-ft
Capacity, Mu/ϕMn	0.195	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		

Flange Plate Analysis

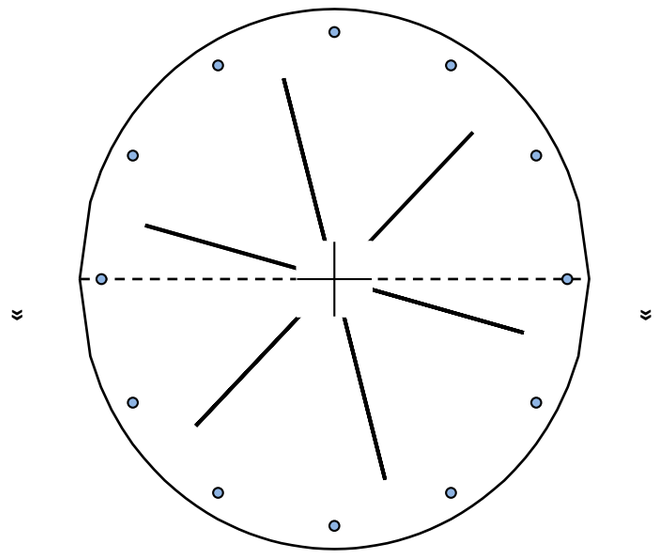
Flange Plate			
	Plate Type	***Flange***	***@ 77 ft***
	Pole Diameter	4.5	in
	Pole Thickness	0.337	in
	Plate Diameter	35	in
	Plate Thickness	1.5	in
	Plate Fy	50	ksi
	Weld Length	0.3125	in
	f_s Resistance	936.85	k-in
	Applied	10.85	k-in

Code Rev.	***G***		
Moment	8.8 k-ft		
Axial	3.1 k		

Date	11/12/2019
Engineer	T.Pham
Site #	414240
Carrier	AT&T MOBILITY

Stiffeners			
	#	***6***	***Show***
	Thickness	0.75	in
	Length	12	in
	Height	12	in
	Chamfer	1.25	in
	Offset Angle	0	°
	Fy	50	ksi

Bolts			
	#	***12***	
	Bolt Circle	32	in
	(R)adial / (S)quare	R	
	Bolt Gap	6	in
	Diameter	1	in
	Hole Diameter	1.125	in
	Type	A325	
	Fy	92	ksi
	Fu	120	ksi
	f_s Resistance	54.52	k
	Applied	0.84	k



Reinforcement		
#	***0***	

Plate Stress Ratio:

1%	Pass

Bolt Stress Ratio:

2%	Pass

Extra Bolts O		
#	***0***	