AMERICAN TOWER®
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Structural Analysis Report

Structure	:	**160 ft Monopole**
ATC Site Name	:	**Bridgewater CT, CT**
ATC Site Number	:	**281862**
Engineering Number	:	**OAA693298_C3_01**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**Bridgewater - LSE8**
Carrier Site Number	:	**CT1252**
Site Location	:	**111 Second Hill Rd** **Bridgewater, CT 06752-1017** **41.55497,-73.37088**
County	:	**Litchfield**
Date	:	**January 27, 2017**
Max Usage	:	**72%**
Result	:	**Pass**

Prepared By:
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Structural Engineer II

Reviewed By:

STATE OF CONNECTICUT
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Calculations ..... Attached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 160 ft monopole to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	TransAmerican Job #23513-0649, dated November 12, 2013
Foundation Drawing	TransAmerican Job #23513-0649, dated November 12, 2013
Geotechnical Report	Clarence Welti Associates Project - AT&T Tower Site #1252, dated September 10, 2013

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:	40 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	C
Topographic Category:	3
Crest Height:	145 ft
Spectral Response:	Ss = 0.20, 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

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
156.0	156.0	4	Raycap DC6-48-60-18-8F	Platform w/ Handrails	-	AT&T Mobility
		3	Ericsson RRUS			

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
156.0	156.0	12	Ericsson RRUS	-	(15) 1 5/8" Coax	AT&T Mobility
		12	Andrew SBNH-1D6565C			

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
156.0	156.0	3	Ericsson RRUS A2 B2	Platform w/ Handrails	(3) 3/8" RET Control Cable (6) 2" Conduit (8) 0.78" 8 AWG 6 (2) 0.39" Fiber Trunk	AT&T Mobility
		6	Ericsson RRUS 11 (Band 12) (55 lb)			
		3	Ericsson RRUS 32 B2			
		3	Ericsson RRUS-12 B2			
		12	CCI HPA-65R-BUU-H8			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	58%	Pass
Shaft	53%	Pass
Base Plate	37%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	3,550.0	4,792.5	2694.7	56%
Shear (Kips)	30.0	40.5	29.1	72%

*** The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1**

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) (°)
156.0	Ericsson RRUS A2 B2	AT&T Mobility	1.674	1.281
	Ericsson RRUS 11 (Band 12) (55 lb)			
	Ericsson RRUS 32 B2			
	Ericsson RRUS-12 B2			
	CCI HPA-65R-BUU-H8			

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

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Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

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. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

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 we supply.

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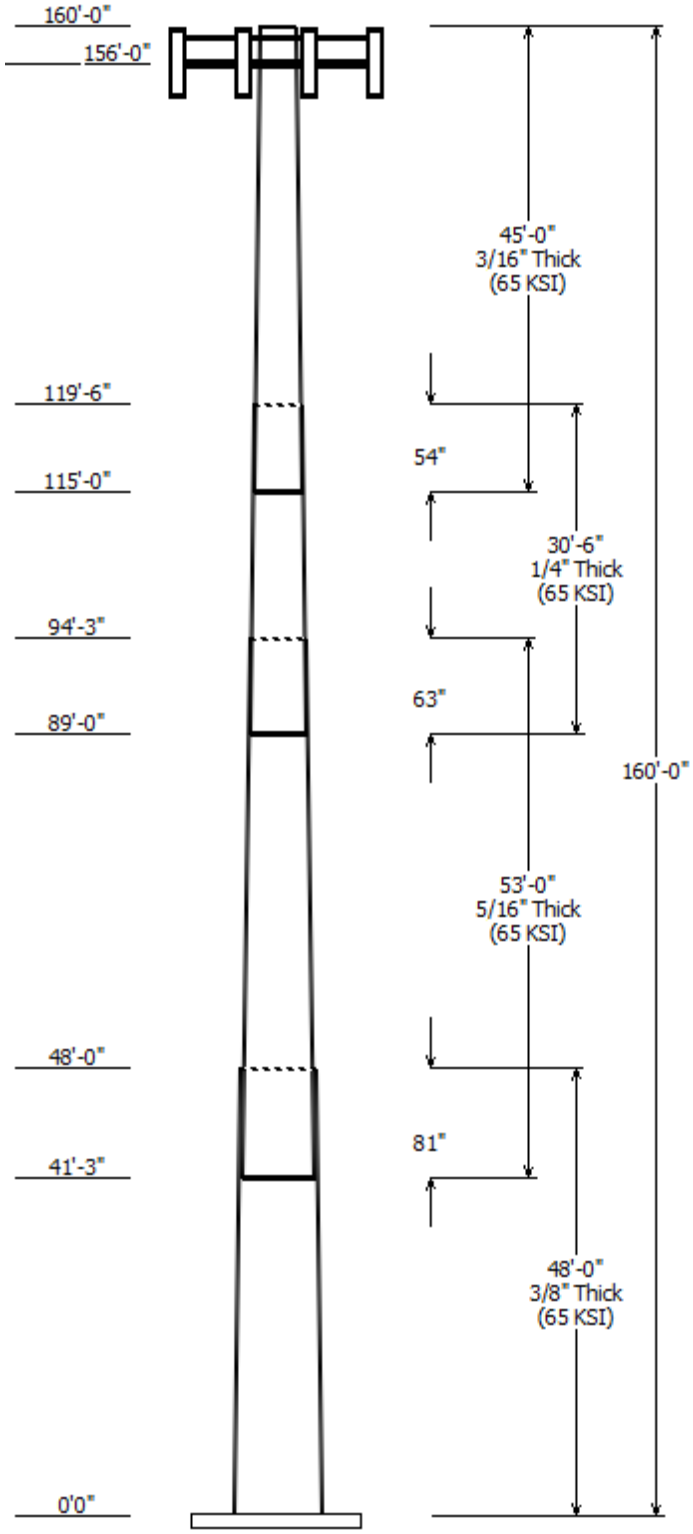


Job Information

Pole :	281862	Code:	ANSI/TIA-222-G
Description :	160 ft monopole		
Client :	AT&T Mobility	Struct Class :	II
Location :	Bridgewater CT, CT		
Shape :	18 Sides	Exposure :	C
Height :	160.00 (ft)	Topo :	3
Base Elev (ft):	0.00		
Taper:	0.250000 (in/ft)		

Sections Properties

Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
1	48.000	46.50	58.50	0.375		0.000	0.250000	65
2	53.000	35.56	48.81	0.313	Slip Joint	81.000	0.250000	65
3	30.500	29.75	37.37	0.250	Slip Joint	63.000	0.250000	65
4	45.000	20.00	31.25	0.188	Slip Joint	54.000	0.250000	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
156.000	156.000	3	Ericsson RRUS A2 B2
156.000	156.000	6	Ericsson RRUS 11 (Band 12) (55
156.000	156.000	3	Ericsson RRUS 32 B2
156.000	156.000	3	Ericsson RRUS-12 B2
156.000	156.000	3	Ericsson RRUS
156.000	156.000	1	Round Platform w/ Handrails
156.000	156.000	12	CCI HPA-65R-BUU-H8
156.000	156.000	4	Raycap DC6-48-60-18-8F

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
0.000	156.0	0.39" Fiber Trunk	No
0.000	156.0	0.78" 8 AWG 6	No
0.000	156.0	2" Conduit	No
0.000	156.0	3/8" RET Control	No

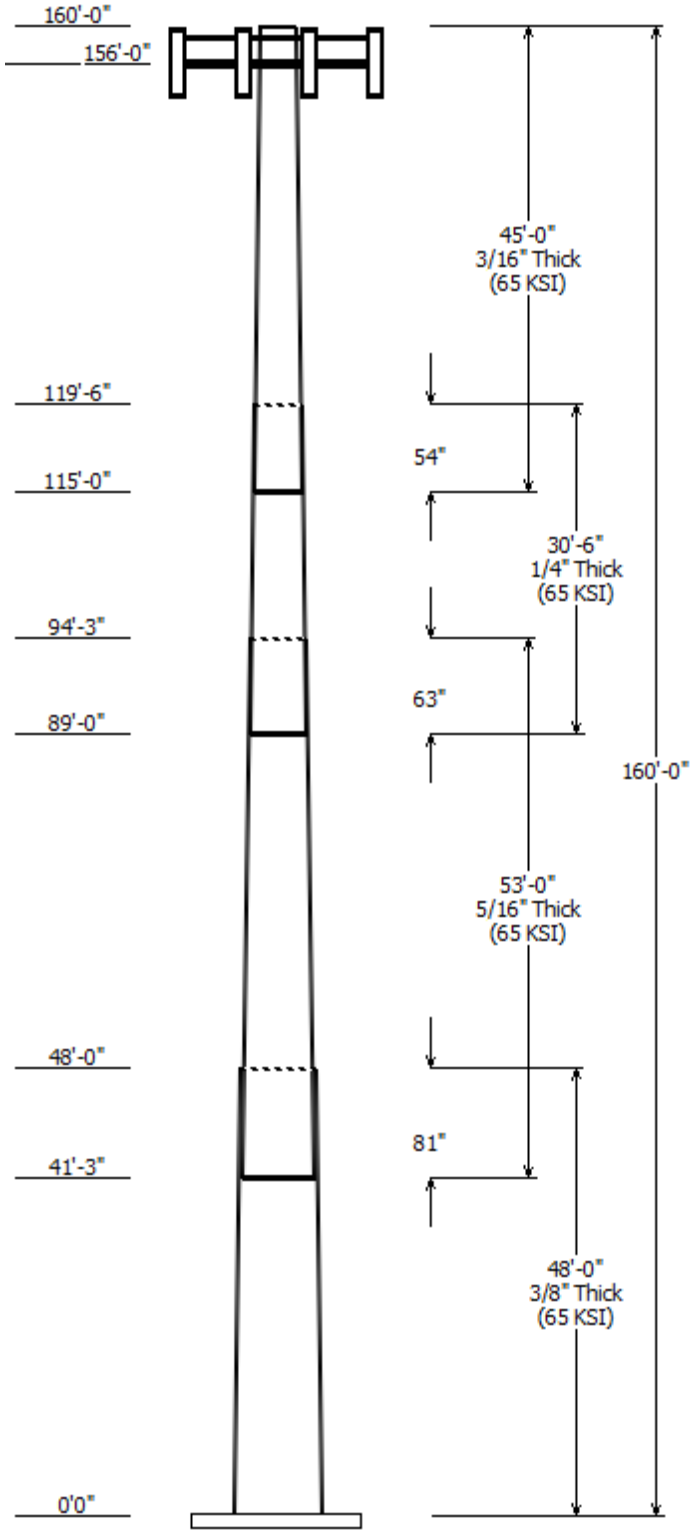
Load Cases

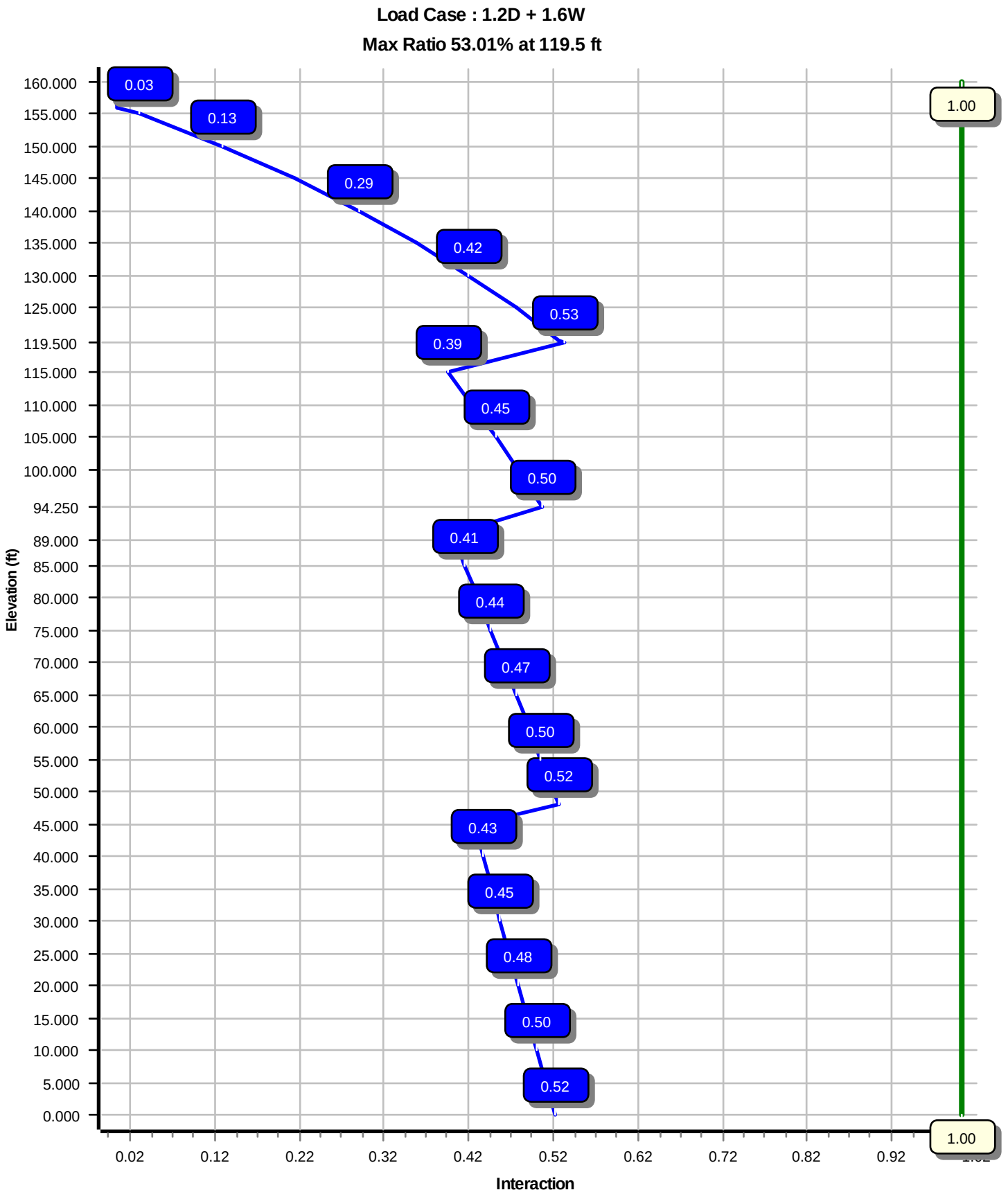
1.2D + 1.6W	93 mph with No Ice
0.9D + 1.6W	93 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	40 mph with 1.00 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) 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	2694.66	29.09	36.83
0.9D + 1.6W	2675.13	29.08	27.62
1.2D + 1.0Di + 1.0Wi	586.75	6.43	66.11
(1.2 + 0.2Sds) * DL + E ELFM	174.54	1.41	36.55
(1.2 + 0.2Sds) * DL + E EMAM	248.72	2.05	36.55
(0.9 - 0.2Sds) * DL + E ELFM	172.90	1.41	25.23
(0.9 - 0.2Sds) * DL + E EMAM	246.18	2.05	25.23
1.0D + 1.0W	698.10	7.56	30.72

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 53.01% at 119.5 ft
Elevation (ft)
Interaction
160.000
155.000
150.000
145.000
140.000
135.000
130.000
125.000
119.500
115.000
110.000
105.000
100.000
94.250
89.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
15.000
10.000
5.000
0.000
0.02
0.12
0.22
0.32
0.42
0.52
0.62
0.72
0.82
0.92
0.03
0.13
0.29
0.42
0.53
0.39
0.45
0.50
0.41
0.44
0.47
0.50
0.52
0.43
0.45
0.48
0.50
0.52
1.00
1.00

Site Number:	281862	Code: ANSI/TIA-222-G	© 2007 - 2017 by ATC IP LLC. All rights reserved.
Site Name:	Bridgewater CT, CT	Engineering Number:OAA693298_C3_01	1/27/2017 9:12:03 AM
Customer:	AT&T Mobility		

Analysis Parameters

Location:	Litchfield County, CT	Height (ft):	160
Code:	ANSI/TIA-222-G	Base Diameter (in):	58.50
Shape:	18 Sides	Top Diameter (in):	20.00
Pole Type:	Taper	Taper (in/ft) :	0.250
Pole Manfacturer:		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:	40 mph
Topographic Category:	3	Operational Wind Speed:	60 mph
Crest Height:	145.0 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):	1.99

T_L (sec):	8	p:	1.3	C_s:	0.035
S_s:	0.199	S_1:	0.066	C_s Max:	0.035
F_a:	1.600	F_v :	2.400	C_s Min:	0.030
S_{ds}:	0.212	S_{d1}:	0.106		

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	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

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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 (in 2)	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	48.000	0.3750	65		0.00	10,133	58.50	0.00	69.18	29530.1	26.10	156.00	46.50	48.00	54.90	14756.5	20.45	124.00	0.250000
2-18	53.000	0.3125	65	Slip	81.00	7,490	48.81	41.25	48.10	14296.2	26.13	156.20	35.56	94.25	34.96	5488.7	18.66	113.80	0.250000
3-18	30.500	0.2500	65	Slip	63.00	2,743	37.37	89.00	29.46	5129.6	24.95	149.50	29.75	119.50	23.41	2573.7	19.57	119.00	0.250000
4-18	45.000	0.1875	65	Slip	54.00	2,318	31.25	115.00	18.49	2253.5	27.98	166.67	20.00	160.00	11.79	584.7	17.40	106.67	0.250000
				Shaft Weight		22,685													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor	Distance From Face (ft)	Vert Ecc (ft)
156.00	CCI HPA-65R-BUU-H8	12	68.00	12.980	0.67	501.05	15.288	0.67	0.000	0.000
156.00	Ericsson RRUS	3	44.10	3.130	0.67	185.85	4.210	0.67	0.000	0.000
156.00	Ericsson RRUS 11 (Band 12)	6	55.00	2.520	0.67	178.20	3.455	0.67	0.000	0.000
156.00	Ericsson RRUS 32 B2	3	53.00	2.740	0.67	187.91	3.794	0.67	0.000	0.000
156.00	Ericsson RRUS A2 B2	3	22.00	2.060	0.67	108.75	2.931	0.67	0.000	0.000
156.00	Ericsson RRUS-12 B2	3	58.00	3.150	0.67	203.08	4.182	0.67	0.000	0.000
156.00	Raycap DC6-48-60-18-8F	4	20.00	1.110	1.00	143.56	2.801	1.00	0.000	0.000
156.00	Round Platform w/ Handrails	1	2000.00	27.200	1.00	3,812.31	61.388	1.00	0.000	0.000
	Totals	35	3757.30		13,525.07			Number of Loadings :		8

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	156.00	2	0.39" Fiber Trunk	0.39	0.06	N	0.00	N	AT&T Mobility
0.00	156.00	8	0.78" 8 AWG 6	0.78	0.59	N	0.00	N	AT&T Mobility
0.00	156.00	6	2" Conduit	2.38	3.65	N	0.00	N	AT&T Mobility
0.00	156.00	3	3/8" RET Control Cable	0.38	0.23	N	0.00	N	AT&T Mobility

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Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.3750	58.500	69.181	29,530.1	26.10	156.00	70.7	994.2	0.0	0.0
5.00		0.3750	57.250	67.693	27,665.6	25.51	152.67	71.4	951.8	0.0	1,164.4
10.00		0.3750	56.000	66.205	25,881.3	24.92	149.33	72.1	910.3	0.0	1,139.1
15.00		0.3750	54.750	64.718	24,175.4	24.33	146.00	72.8	869.7	0.0	1,113.8
20.00		0.3750	53.500	63.230	22,546.2	23.75	142.67	73.5	830.0	0.0	1,088.4
25.00		0.3750	52.250	61.742	20,991.8	23.16	139.33	74.2	791.3	0.0	1,063.1
30.00		0.3750	51.000	60.254	19,510.6	22.57	136.00	74.9	753.5	0.0	1,037.8
35.00		0.3750	49.750	58.766	18,100.8	21.98	132.67	75.5	716.6	0.0	1,012.5
40.00		0.3750	48.500	57.279	16,760.5	21.39	129.33	76.2	680.7	0.0	987.2
41.25	Bot - Section 2	0.3750	48.188	56.907	16,436.1	21.25	128.50	76.4	671.8	0.0	242.8
45.00		0.3750	47.250	55.791	15,488.1	20.81	126.00	76.9	645.6	0.0	1,326.9
48.00	Top - Section 1	0.3125	47.125	46.430	12,855.2	25.18	150.80	71.8	537.3	0.0	1,042.8
50.00		0.3125	46.625	45.935	12,447.7	24.90	149.20	72.1	525.8	0.0	314.3
55.00		0.3125	45.375	44.695	11,466.7	24.19	145.20	72.9	497.7	0.0	771.0
60.00		0.3125	44.125	43.455	10,538.7	23.49	141.20	73.8	470.4	0.0	749.9
65.00		0.3125	42.875	42.215	9,662.2	22.78	137.20	74.6	443.9	0.0	728.8
70.00		0.3125	41.625	40.975	8,835.7	22.08	133.20	75.4	418.1	0.0	707.7
75.00		0.3125	40.375	39.736	8,057.7	21.37	129.20	76.3	393.1	0.0	686.6
80.00		0.3125	39.125	38.496	7,326.7	20.67	125.20	77.1	368.8	0.0	665.5
85.00		0.3125	37.875	37.256	6,641.4	19.96	121.20	77.9	345.4	0.0	644.4
89.00	Bot - Section 3	0.3125	36.875	36.264	6,124.9	19.40	118.00	78.6	327.2	0.0	500.3
90.00		0.3125	36.625	36.016	6,000.2	19.25	117.20	78.8	322.7	0.0	222.9
94.25	Top - Section 2	0.2500	36.063	28.416	4,604.6	24.02	144.25	73.1	251.5	0.0	930.3
95.00		0.2500	35.875	28.267	4,532.6	23.89	143.50	73.3	248.9	0.0	72.3
100.0		0.2500	34.625	27.276	4,072.0	23.01	138.50	74.3	231.6	0.0	472.5
105.0		0.2500	33.375	26.284	3,643.8	22.13	133.50	75.4	215.0	0.0	455.6
110.0		0.2500	32.125	25.292	3,246.6	21.25	128.50	76.4	199.1	0.0	438.8
115.0	Bot - Section 4	0.2500	30.875	24.300	2,879.5	20.37	123.50	77.4	183.7	0.0	421.9
119.5	Top - Section 3	0.1875	30.125	17.816	2,017.4	26.92	160.67	69.7	131.9	0.0	643.2
120.0		0.1875	30.000	17.742	1,992.2	26.80	160.00	69.9	130.8	0.0	30.2
125.0		0.1875	28.750	16.998	1,752.0	25.63	153.33	71.3	120.0	0.0	295.5
130.0		0.1875	27.500	16.254	1,531.9	24.45	146.67	72.6	109.7	0.0	282.9
135.0		0.1875	26.250	15.510	1,331.0	23.28	140.00	74.0	99.9	0.0	270.2
140.0		0.1875	25.000	14.766	1,148.6	22.10	133.33	75.4	90.5	0.0	257.6
145.0		0.1875	23.750	14.022	983.6	20.92	126.67	76.8	81.6	0.0	244.9
150.0		0.1875	22.500	13.278	835.2	19.75	120.00	78.2	73.1	0.0	232.2
155.0		0.1875	21.250	12.534	702.5	18.57	113.33	79.6	65.1	0.0	219.6
156.0		0.1875	21.000	12.386	677.8	18.34	112.00	79.8	63.6	0.0	42.4
160.0		0.1875	20.000	11.790	584.7	17.40	106.67	80.9	57.6	0.0	164.5
											22,684.8

Site Number: 281862 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Bridgewater CT, CT Engineering Number:OAA693298_C3_01 1/27/2017 9:12:03 AM

Customer: AT&T Mobility

Load Case: 1.2D + 1.6W 93 mph with No Ice 24 Iterations

Gust Response Factor :1.10 Wind Importance Factor 1.00

Dead Load Factor :1.20

Wind Load Factor :1.60

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		2.34	0.85	41.853	46.03	649.39	0.650	0.000	0.00	0.000	0.00	572.5	0.0	0.0
5.00		2.28	0.85	40.876	44.96	634.91	0.650	0.000	5.00	24.487	15.92	1,107.7	0.0	1,397.3
10.00		2.18	0.85	39.053	42.95	607.18	0.650	0.000	5.00	23.958	15.57	1,036.2	0.0	1,366.9
15.00		2.09	0.85	37.388	41.12	580.98	0.650	0.000	5.00	23.429	15.23	985.7	0.0	1,336.5
20.00		2.00	0.87	37.001	40.70	564.92	0.650	0.000	5.00	22.900	14.88	964.5	0.0	1,306.1
25.00		1.92	0.92	37.498	41.24	555.57	0.650	0.000	5.00	22.371	14.54	950.5	0.0	1,275.8
30.00		1.85	0.96	37.671	41.43	543.68	0.650	0.000	5.00	21.842	14.20	929.6	0.0	1,245.4
35.00		1.79	0.99	37.647	41.41	530.35	0.650	0.000	5.00	21.313	13.85	904.8	0.0	1,215.0
40.00		1.73	1.02	37.502	41.25	516.19	0.650	0.000	5.00	20.785	13.51	555.2	0.0	1,184.6
41.25	Bot - Section 2	1.69	1.04	37.371	41.10	507.09	0.650	0.000	1.25	5.113	3.32	436.2	0.0	291.4
45.00		1.67	1.06	37.250	40.97	499.73	0.650	0.000	3.75	15.340	9.97	582.5	0.0	1,592.3
48.00	Top - Section 1	1.63	1.07	37.071	40.77	489.71	0.650	0.000	3.00	12.058	7.84	423.3	0.0	1,251.3
50.00		1.61	1.08	36.929	40.62	488.77	0.650	0.000	2.00	7.933	5.16	576.4	0.0	377.2
55.00		1.58	1.10	36.723	40.39	478.31	0.650	0.000	5.00	19.462	12.65	803.3	0.0	925.2
60.00		1.53	1.12	36.421	40.06	463.39	0.650	0.000	5.00	18.933	12.31	774.6	0.0	899.9
65.00		1.49	1.14	36.116	39.72	448.56	0.650	0.000	5.00	18.405	11.96	746.4	0.0	874.5
70.00		1.46	1.16	35.817	39.39	433.86	0.650	0.000	5.00	17.876	11.62	718.7	0.0	849.2
75.00		1.42	1.18	35.527	39.08	419.32	0.650	0.000	5.00	17.347	11.28	691.6	0.0	823.9
80.00		1.39	1.19	35.250	38.77	404.95	0.650	0.000	5.00	16.818	10.93	665.1	0.0	798.6
85.00		1.36	1.21	34.988	38.48	390.75	0.650	0.000	5.00	16.289	10.59	577.6	0.0	773.3
89.00	Bot - Section 3	1.34	1.22	34.766	38.24	378.13	0.650	0.000	4.00	12.651	8.22	314.0	0.0	600.4
90.00		1.33	1.23	34.648	38.11	371.18	0.650	0.000	1.00	3.152	2.05	322.4	0.0	267.5
94.25	Top - Section 2	1.32	1.24	34.529	37.98	363.92	0.650	0.000	4.25	13.160	8.55	304.9	0.0	1,116.3
95.00		1.30	1.25	34.421	37.86	362.09	0.650	0.000	0.75	2.283	1.48	337.6	0.0	86.8
100.0		1.29	1.25	34.301	37.73	354.23	0.650	0.000	5.00	14.914	9.69	573.2	0.0	567.0
105.0		1.27	1.27	34.105	37.51	340.70	0.650	0.000	5.00	14.385	9.35	549.5	0.0	546.8
110.0		1.25	1.28	33.927	37.31	327.31	0.650	0.000	5.00	13.856	9.01	526.3	0.0	526.5
115.0	Bot - Section 4	1.23	1.29	33.764	37.14	314.06	0.650	0.000	5.00	13.327	8.66	482.1	0.0	506.3
119.5	Top - Section 3	1.22	1.30	33.625	36.98	301.60	0.650	0.000	4.50	11.685	7.60	249.2	0.0	771.8
120.0		1.21	1.31	33.557	36.91	298.81	0.650	0.000	0.50	1.272	0.83	262.5	0.0	36.3
125.0		1.20	1.32	33.487	36.83	291.67	0.650	0.000	5.00	12.428	8.08	465.2	0.0	354.6
130.0		1.19	1.33	33.370	36.70	278.77	0.650	0.000	5.00	11.900	7.73	443.5	0.0	339.4
135.0		1.17	1.34	33.267	36.59	265.97	0.650	0.000	5.00	11.371	7.39	422.1	0.0	324.3
140.0		1.16	1.35	33.177	36.49	253.26	0.650	0.000	5.00	10.842	7.05	401.0	0.0	309.1
145.0		1.15	1.36	33.100	36.41	240.62	0.650	0.000	5.00	10.313	6.70	380.1	0.0	293.9
150.0		1.14	1.37	33.035	36.33	228.06	0.650	0.000	5.00	9.784	6.36	359.5	0.0	278.7
155.0		1.13	1.38	32.981	36.27	215.55	0.650	0.000	5.00	9.255	6.02	208.3	0.0	263.5
156.0	Appertunance(s)	1.12	1.38	32.954	36.24	208.08	0.650	0.000	1.00	1.788	1.16	164.4	0.0	50.9
160.0		1.12	1.39	32.934	36.22	201.86	0.650	0.000	4.00	6.939	4.51	130.7	0.0	197.4
							Totals:		160.00			21,899.0	0.0	27,221.8

Site Number: 281862 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Bridgewater CT, CT Engineering Number:OAA693298_C3_01 1/27/2017 9:12:04 AM

Customer: AT&T Mobility

Load Case: 1.2D + 1.6W 93 mph with No Ice 24 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		572.5	0.0					0.0	0.0	572.5	0.0	0.0	0.0
5.00		1,107.7	1,397.3					0.0	164.6	1,107.7	1,561.8	0.0	0.0
10.00		1,036.2	1,366.9					0.0	164.6	1,036.2	1,531.5	0.0	0.0
15.00		985.7	1,336.5					0.0	164.6	985.7	1,501.1	0.0	0.0
20.00		964.5	1,306.1					0.0	164.6	964.5	1,470.7	0.0	0.0
25.00		950.5	1,275.8					0.0	164.6	950.5	1,440.3	0.0	0.0
30.00		929.6	1,245.4					0.0	164.6	929.6	1,410.0	0.0	0.0
35.00		904.8	1,215.0					0.0	164.6	904.8	1,379.6	0.0	0.0
40.00		555.2	1,184.6					0.0	164.6	555.2	1,349.2	0.0	0.0
41.25	Bot - Section 2	436.2	291.4					0.0	41.1	436.2	332.6	0.0	0.0
45.00		582.5	1,592.3					0.0	123.4	582.5	1,715.8	0.0	0.0
48.00	Top - Section 1	423.3	1,251.3					0.0	98.7	423.3	1,350.0	0.0	0.0
50.00		576.4	377.2					0.0	65.8	576.4	443.0	0.0	0.0
55.00		803.3	925.2					0.0	164.6	803.3	1,089.8	0.0	0.0
60.00		774.6	899.9					0.0	164.6	774.6	1,064.4	0.0	0.0
65.00		746.4	874.5					0.0	164.6	746.4	1,039.1	0.0	0.0
70.00		718.7	849.2					0.0	164.6	718.7	1,013.8	0.0	0.0
75.00		691.6	823.9					0.0	164.6	691.6	988.5	0.0	0.0
80.00		665.1	798.6					0.0	164.6	665.1	963.2	0.0	0.0
85.00		577.6	773.3					0.0	164.6	577.6	937.9	0.0	0.0
89.00	Bot - Section 3	314.0	600.4					0.0	131.7	314.0	732.1	0.0	0.0
90.00		322.4	267.5					0.0	32.9	322.4	300.4	0.0	0.0
94.25	Top - Section 2	304.9	1,116.3					0.0	139.9	304.9	1,256.2	0.0	0.0
95.00		337.6	86.8					0.0	24.7	337.6	111.5	0.0	0.0
100.00		573.2	567.0					0.0	164.6	573.2	731.6	0.0	0.0
105.00		549.5	546.8					0.0	164.6	549.5	711.3	0.0	0.0
110.00		526.3	526.5					0.0	164.6	526.3	691.1	0.0	0.0
115.00	Bot - Section 4	482.1	506.3					0.0	164.6	482.1	670.8	0.0	0.0
119.50	Top - Section 3	249.2	771.8					0.0	148.1	249.2	920.0	0.0	0.0
120.00		262.5	36.3					0.0	16.5	262.5	52.8	0.0	0.0
125.00		465.2	354.6					0.0	164.6	465.2	519.2	0.0	0.0
130.00		443.5	339.4					0.0	164.6	443.5	504.0	0.0	0.0
135.00		422.1	324.3					0.0	164.6	422.1	488.8	0.0	0.0
140.00		401.0	309.1					0.0	164.6	401.0	473.6	0.0	0.0
145.00		380.1	293.9					0.0	164.6	380.1	458.5	0.0	0.0
150.00		359.5	278.7					0.0	164.6	359.5	443.3	0.0	0.0
155.00		208.3	263.5					0.0	164.6	208.3	428.1	0.0	0.0
156.00	Appertunance(s)	164.4	50.9	7,718.6	0.0	0.0	4,508.8	0.0	32.9	7,883.0	4,592.6	0.0	0.0
160.00		130.7	197.4					0.0	0.0	130.7	197.4	0.0	0.0
									Totals:	29,617.6	36,865.4	0.00	0.00

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Load Case: 1.2D + 1.6W 93 mph with No Ice 24 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	-36.83	-29.09	0.00	-2,694.66	0.00	2,694.66	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.520
5.00	-35.21	-28.06	0.00	-2,549.23	0.00	2,549.23	4,349.84	2,174.92	10,178.3	5,096.75	0.07	-0.13	0.508
10.00	-33.62	-27.09	0.00	-2,408.96	0.00	2,408.96	4,295.43	2,147.71	9,828.71	4,921.66	0.27	-0.25	0.497
15.00	-32.07	-26.17	0.00	-2,273.52	0.00	2,273.52	4,239.17	2,119.58	9,480.54	4,747.32	0.61	-0.38	0.487
20.00	-30.55	-25.26	0.00	-2,142.68	0.00	2,142.68	4,181.05	2,090.53	9,134.15	4,573.86	1.08	-0.51	0.476
25.00	-29.06	-24.36	0.00	-2,016.38	0.00	2,016.38	4,121.09	2,060.54	8,789.82	4,401.44	1.68	-0.64	0.465
30.00	-27.61	-23.48	0.00	-1,894.57	0.00	1,894.57	4,059.27	2,029.64	8,447.85	4,230.20	2.43	-0.78	0.455
35.00	-26.19	-22.62	0.00	-1,777.17	0.00	1,777.17	3,995.60	1,997.80	8,108.53	4,060.29	3.31	-0.91	0.444
40.00	-24.82	-22.08	0.00	-1,664.08	0.00	1,664.08	3,930.09	1,965.04	7,772.13	3,891.84	4.34	-1.05	0.434
41.25	-24.46	-21.66	0.00	-1,636.49	0.00	1,636.49	3,913.42	1,956.71	7,688.52	3,849.98	4.62	-1.08	0.431
45.00	-22.73	-21.08	0.00	-1,555.26	0.00	1,555.26	3,862.72	1,931.36	7,438.96	3,725.01	5.51	-1.18	0.424
48.00	-21.36	-20.66	0.00	-1,492.01	0.00	1,492.01	2,999.72	1,499.86	5,776.85	2,892.72	6.28	-1.27	0.523
50.00	-20.89	-20.11	0.00	-1,450.69	0.00	1,450.69	2,981.40	1,490.70	5,679.83	2,844.14	6.82	-1.32	0.517
55.00	-19.77	-19.34	0.00	-1,350.14	0.00	1,350.14	2,934.30	1,467.15	5,438.21	2,723.15	8.30	-1.48	0.503
60.00	-18.67	-18.59	0.00	-1,253.46	0.00	1,253.46	2,885.34	1,442.67	5,198.13	2,602.93	9.94	-1.65	0.488
65.00	-17.61	-17.86	0.00	-1,160.53	0.00	1,160.53	2,834.54	1,417.27	4,959.88	2,483.63	11.75	-1.81	0.474
70.00	-16.57	-17.16	0.00	-1,071.23	0.00	1,071.23	2,781.89	1,390.94	4,723.74	2,365.38	13.73	-1.97	0.459
75.00	-15.56	-16.47	0.00	-985.46	0.00	985.46	2,727.38	1,363.69	4,490.01	2,248.34	15.89	-2.14	0.444
80.00	-14.57	-15.81	0.00	-903.09	0.00	903.09	2,671.02	1,335.51	4,258.97	2,132.65	18.22	-2.31	0.429
85.00	-13.62	-15.23	0.00	-824.02	0.00	824.02	2,612.82	1,306.41	4,030.91	2,018.45	20.72	-2.47	0.414
89.00	-12.88	-14.91	0.00	-763.08	0.00	763.08	2,564.92	1,282.46	3,850.80	1,928.26	22.85	-2.61	0.401
90.00	-12.57	-14.59	0.00	-748.18	0.00	748.18	2,552.76	1,276.38	3,806.12	1,905.89	23.40	-2.64	0.398
94.25	-11.31	-14.24	0.00	-686.16	0.00	686.16	1,870.62	935.31	2,755.09	1,379.59	25.82	-2.79	0.504
95.00	-11.19	-13.92	0.00	-675.48	0.00	675.48	1,864.78	932.39	2,732.02	1,368.04	26.26	-2.82	0.500
100.00	-10.44	-13.35	0.00	-605.86	0.00	605.86	1,824.80	912.40	2,578.99	1,291.41	29.32	-3.02	0.475
105.00	-9.72	-12.80	0.00	-539.11	0.00	539.11	1,782.98	891.49	2,427.58	1,215.60	32.59	-3.22	0.449
110.00	-9.01	-12.26	0.00	-475.13	0.00	475.13	1,739.30	869.65	2,278.08	1,140.73	36.06	-3.41	0.422
115.00	-8.34	-11.77	0.00	-413.81	0.00	413.81	1,693.77	846.88	2,130.77	1,066.97	39.74	-3.61	0.393
119.50	-7.42	-11.47	0.00	-360.86	0.00	360.86	1,118.22	559.11	1,377.74	689.90	43.22	-3.78	0.530
120.00	-7.35	-11.22	0.00	-355.13	0.00	355.13	1,115.76	557.88	1,368.94	685.49	43.62	-3.80	0.525
125.00	-6.83	-10.75	0.00	-299.01	0.00	299.01	1,090.12	545.06	1,281.06	641.48	47.72	-4.03	0.473
130.00	-6.32	-10.30	0.00	-245.26	0.00	245.26	1,062.64	531.32	1,193.75	597.76	52.07	-4.26	0.417
135.00	-5.83	-9.86	0.00	-193.79	0.00	193.79	1,033.31	516.65	1,107.31	554.48	56.63	-4.46	0.356
140.00	-5.36	-9.43	0.00	-144.51	0.00	144.51	1,002.12	501.06	1,022.02	511.77	61.40	-4.64	0.288
145.00	-4.92	-9.03	0.00	-97.33	0.00	97.33	969.08	484.54	938.16	469.78	66.34	-4.79	0.213
150.00	-4.49	-8.64	0.00	-52.19	0.00	52.19	934.20	467.10	856.03	428.65	71.41	-4.90	0.127
155.00	-4.08	-8.40	0.00	-8.99	0.00	8.99	897.46	448.73	775.91	388.53	76.57	-4.95	0.028
156.00	-0.19	-0.15	0.00	-0.59	0.00	0.59	889.89	444.94	760.16	380.64	77.61	-4.95	0.002
160.00	0.00	-0.13	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	81.75	-4.95	0.000

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Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 24 Iterations

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

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		2.34	0.85	41.853	46.03	649.39	0.650	0.000	0.00	0.000	0.00	572.5	0.0	0.0
5.00		2.28	0.85	40.876	44.96	634.91	0.650	0.000	5.00	24.487	15.92	1,107.7	0.0	1,047.9
10.00		2.18	0.85	39.053	42.95	607.18	0.650	0.000	5.00	23.958	15.57	1,036.2	0.0	1,025.2
15.00		2.09	0.85	37.388	41.12	580.98	0.650	0.000	5.00	23.429	15.23	985.7	0.0	1,002.4
20.00		2.00	0.87	37.001	40.70	564.92	0.650	0.000	5.00	22.900	14.88	964.5	0.0	979.6
25.00		1.92	0.92	37.498	41.24	555.57	0.650	0.000	5.00	22.371	14.54	950.5	0.0	956.8
30.00		1.85	0.96	37.671	41.43	543.68	0.650	0.000	5.00	21.842	14.20	929.6	0.0	934.0
35.00		1.79	0.99	37.647	41.41	530.35	0.650	0.000	5.00	21.313	13.85	904.8	0.0	911.3
40.00		1.73	1.02	37.502	41.25	516.19	0.650	0.000	5.00	20.785	13.51	555.2	0.0	888.5
41.25	Bot - Section 2	1.69	1.04	37.371	41.10	507.09	0.650	0.000	1.25	5.113	3.32	436.2	0.0	218.6
45.00		1.67	1.06	37.250	40.97	499.73	0.650	0.000	3.75	15.340	9.97	582.5	0.0	1,194.2
48.00	Top - Section 1	1.63	1.07	37.071	40.77	489.71	0.650	0.000	3.00	12.058	7.84	423.3	0.0	938.5
50.00		1.61	1.08	36.929	40.62	488.77	0.650	0.000	2.00	7.933	5.16	576.4	0.0	282.9
55.00		1.58	1.10	36.723	40.39	478.31	0.650	0.000	5.00	19.462	12.65	803.3	0.0	693.9
60.00		1.53	1.12	36.421	40.06	463.39	0.650	0.000	5.00	18.933	12.31	774.6	0.0	674.9
65.00		1.49	1.14	36.116	39.72	448.56	0.650	0.000	5.00	18.405	11.96	746.4	0.0	655.9
70.00		1.46	1.16	35.817	39.39	433.86	0.650	0.000	5.00	17.876	11.62	718.7	0.0	636.9
75.00		1.42	1.18	35.527	39.08	419.32	0.650	0.000	5.00	17.347	11.28	691.6	0.0	617.9
80.00		1.39	1.19	35.250	38.77	404.95	0.650	0.000	5.00	16.818	10.93	665.1	0.0	599.0
85.00		1.36	1.21	34.988	38.48	390.75	0.650	0.000	5.00	16.289	10.59	577.6	0.0	580.0
89.00	Bot - Section 3	1.34	1.22	34.766	38.24	378.13	0.650	0.000	4.00	12.651	8.22	314.0	0.0	450.3
90.00		1.33	1.23	34.648	38.11	371.18	0.650	0.000	1.00	3.152	2.05	322.4	0.0	200.6
94.25	Top - Section 2	1.32	1.24	34.529	37.98	363.92	0.650	0.000	4.25	13.160	8.55	304.9	0.0	837.3
95.00		1.30	1.25	34.421	37.86	362.09	0.650	0.000	0.75	2.283	1.48	337.6	0.0	65.1
100.0		1.29	1.25	34.301	37.73	354.23	0.650	0.000	5.00	14.914	9.69	573.2	0.0	425.3
105.0		1.27	1.27	34.105	37.51	340.70	0.650	0.000	5.00	14.385	9.35	549.5	0.0	410.1
110.0		1.25	1.28	33.927	37.31	327.31	0.650	0.000	5.00	13.856	9.01	526.3	0.0	394.9
115.0	Bot - Section 4	1.23	1.29	33.764	37.14	314.06	0.650	0.000	5.00	13.327	8.66	482.1	0.0	379.7
119.5	Top - Section 3	1.22	1.30	33.625	36.98	301.60	0.650	0.000	4.50	11.685	7.60	249.2	0.0	578.9
120.0		1.21	1.31	33.557	36.91	298.81	0.650	0.000	0.50	1.272	0.83	262.5	0.0	27.2
125.0		1.20	1.32	33.487	36.83	291.67	0.650	0.000	5.00	12.428	8.08	465.2	0.0	266.0
130.0		1.19	1.33	33.370	36.70	278.77	0.650	0.000	5.00	11.900	7.73	443.5	0.0	254.6
135.0		1.17	1.34	33.267	36.59	265.97	0.650	0.000	5.00	11.371	7.39	422.1	0.0	243.2
140.0		1.16	1.35	33.177	36.49	253.26	0.650	0.000	5.00	10.842	7.05	401.0	0.0	231.8
145.0		1.15	1.36	33.100	36.41	240.62	0.650	0.000	5.00	10.313	6.70	380.1	0.0	220.4
150.0		1.14	1.37	33.035	36.33	228.06	0.650	0.000	5.00	9.784	6.36	359.5	0.0	209.0
155.0		1.13	1.38	32.981	36.27	215.55	0.650	0.000	5.00	9.255	6.02	208.3	0.0	197.6
156.0	Appertunance(s)	1.12	1.38	32.954	36.24	208.08	0.650	0.000	1.00	1.788	1.16	164.4	0.0	38.2
160.0		1.12	1.39	32.934	36.22	201.86	0.650	0.000	4.00	6.939	4.51	130.7	0.0	148.1
							Totals:		160.00			21,899.0	0.0	20,416.3

Site Number: 281862 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Bridgewater CT, CT Engineering Number:OAA693298_C3_01 1/27/2017 9:12:05 AM

Customer: AT&T Mobility

Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 24 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

		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		572.5	0.0					0.0	0.0	572.5	0.0	0.0	0.0
5.00		1,107.7	1,047.9					0.0	123.4	1,107.7	1,171.4	0.0	0.0
10.00		1,036.2	1,025.2					0.0	123.4	1,036.2	1,148.6	0.0	0.0
15.00		985.7	1,002.4					0.0	123.4	985.7	1,125.8	0.0	0.0
20.00		964.5	979.6					0.0	123.4	964.5	1,103.0	0.0	0.0
25.00		950.5	956.8					0.0	123.4	950.5	1,080.2	0.0	0.0
30.00		929.6	934.0					0.0	123.4	929.6	1,057.5	0.0	0.0
35.00		904.8	911.3					0.0	123.4	904.8	1,034.7	0.0	0.0
40.00		555.2	888.5					0.0	123.4	555.2	1,011.9	0.0	0.0
41.25	Bot - Section 2	436.2	218.6					0.0	30.9	436.2	249.4	0.0	0.0
45.00		582.5	1,194.2					0.0	92.6	582.5	1,286.8	0.0	0.0
48.00	Top - Section 1	423.3	938.5					0.0	74.1	423.3	1,012.5	0.0	0.0
50.00		576.4	282.9					0.0	49.4	576.4	332.2	0.0	0.0
55.00		803.3	693.9					0.0	123.4	803.3	817.3	0.0	0.0
60.00		774.6	674.9					0.0	123.4	774.6	798.3	0.0	0.0
65.00		746.4	655.9					0.0	123.4	746.4	779.3	0.0	0.0
70.00		718.7	636.9					0.0	123.4	718.7	760.4	0.0	0.0
75.00		691.6	617.9					0.0	123.4	691.6	741.4	0.0	0.0
80.00		665.1	599.0					0.0	123.4	665.1	722.4	0.0	0.0
85.00		577.6	580.0					0.0	123.4	577.6	703.4	0.0	0.0
89.00	Bot - Section 3	314.0	450.3					0.0	98.7	314.0	549.1	0.0	0.0
90.00		322.4	200.6					0.0	24.7	322.4	225.3	0.0	0.0
94.25	Top - Section 2	304.9	837.3					0.0	104.9	304.9	942.2	0.0	0.0
95.00		337.6	65.1					0.0	18.5	337.6	83.6	0.0	0.0
100.00		573.2	425.3					0.0	123.4	573.2	548.7	0.0	0.0
105.00		549.5	410.1					0.0	123.4	549.5	533.5	0.0	0.0
110.00		526.3	394.9					0.0	123.4	526.3	518.3	0.0	0.0
115.00	Bot - Section 4	482.1	379.7					0.0	123.4	482.1	503.1	0.0	0.0
119.50	Top - Section 3	249.2	578.9					0.0	111.1	249.2	690.0	0.0	0.0
120.00		262.5	27.2					0.0	12.3	262.5	39.6	0.0	0.0
125.00		465.2	266.0					0.0	123.4	465.2	389.4	0.0	0.0
130.00		443.5	254.6					0.0	123.4	443.5	378.0	0.0	0.0
135.00		422.1	243.2					0.0	123.4	422.1	366.6	0.0	0.0
140.00		401.0	231.8					0.0	123.4	401.0	355.2	0.0	0.0
145.00		380.1	220.4					0.0	123.4	380.1	343.8	0.0	0.0
150.00		359.5	209.0					0.0	123.4	359.5	332.5	0.0	0.0
155.00		208.3	197.6					0.0	123.4	208.3	321.1	0.0	0.0
156.00	Appertunance(s)	164.4	38.2	7,718.6	0.0	0.0	3,381.6	0.0	24.7	7,883.0	3,444.4	0.0	0.0
160.00		130.7	148.1					0.0	0.0	130.7	148.1	0.0	0.0
									Totals:	29,617.6	27,649.0	0.00	0.00

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Load Case: 0.9D + 1.6W 93 mph with No Ice (Reduced DL) 24 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	-27.62	-29.08	0.00	-2,675.13	0.00	2,675.13	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.514
5.00	-26.38	-28.02	0.00	-2,529.75	0.00	2,529.75	4,349.84	2,174.92	10,178.3	5,096.75	0.07	-0.13	0.503
10.00	-25.18	-27.04	0.00	-2,389.63	0.00	2,389.63	4,295.43	2,147.71	9,828.71	4,921.66	0.27	-0.25	0.492
15.00	-24.00	-26.10	0.00	-2,254.42	0.00	2,254.42	4,239.17	2,119.58	9,480.54	4,747.32	0.60	-0.38	0.481
20.00	-22.85	-25.18	0.00	-2,123.91	0.00	2,123.91	4,181.05	2,090.53	9,134.15	4,573.86	1.07	-0.51	0.470
25.00	-21.72	-24.27	0.00	-1,998.01	0.00	1,998.01	4,121.09	2,060.54	8,789.82	4,401.44	1.67	-0.64	0.459
30.00	-20.62	-23.37	0.00	-1,876.66	0.00	1,876.66	4,059.27	2,029.64	8,447.85	4,230.20	2.41	-0.77	0.449
35.00	-19.55	-22.50	0.00	-1,759.79	0.00	1,759.79	3,995.60	1,997.80	8,108.53	4,060.29	3.29	-0.90	0.438
40.00	-18.51	-21.96	0.00	-1,647.29	0.00	1,647.29	3,930.09	1,965.04	7,772.13	3,891.84	4.30	-1.04	0.428
41.25	-18.25	-21.54	0.00	-1,619.85	0.00	1,619.85	3,913.42	1,956.71	7,688.52	3,849.98	4.58	-1.07	0.426
45.00	-16.94	-20.96	0.00	-1,539.09	0.00	1,539.09	3,862.72	1,931.36	7,438.96	3,725.01	5.46	-1.17	0.418
48.00	-15.91	-20.53	0.00	-1,476.22	0.00	1,476.22	2,999.72	1,499.86	5,776.85	2,892.72	6.23	-1.26	0.516
50.00	-15.55	-19.98	0.00	-1,435.16	0.00	1,435.16	2,981.40	1,490.70	5,679.83	2,844.14	6.77	-1.31	0.510
55.00	-14.70	-19.19	0.00	-1,335.28	0.00	1,335.28	2,934.30	1,467.15	5,438.21	2,723.15	8.23	-1.47	0.496
60.00	-13.87	-18.44	0.00	-1,239.31	0.00	1,239.31	2,885.34	1,442.67	5,198.13	2,602.93	9.85	-1.63	0.481
65.00	-13.07	-17.70	0.00	-1,147.12	0.00	1,147.12	2,834.54	1,417.27	4,959.88	2,483.63	11.65	-1.79	0.467
70.00	-12.28	-17.00	0.00	-1,058.60	0.00	1,058.60	2,781.89	1,390.94	4,723.74	2,365.38	13.61	-1.95	0.452
75.00	-11.52	-16.31	0.00	-973.62	0.00	973.62	2,727.38	1,363.69	4,490.01	2,248.34	15.74	-2.12	0.437
80.00	-10.78	-15.65	0.00	-892.06	0.00	892.06	2,671.02	1,335.51	4,258.97	2,132.65	18.05	-2.28	0.422
85.00	-10.06	-15.07	0.00	-813.80	0.00	813.80	2,612.82	1,306.41	4,030.91	2,018.45	20.53	-2.45	0.407
89.00	-9.50	-14.75	0.00	-753.52	0.00	753.52	2,564.92	1,282.46	3,850.80	1,928.26	22.64	-2.58	0.395
90.00	-9.27	-14.43	0.00	-738.77	0.00	738.77	2,552.76	1,276.38	3,806.12	1,905.89	23.18	-2.62	0.391
94.25	-8.32	-14.09	0.00	-677.45	0.00	677.45	1,870.62	935.31	2,755.09	1,379.59	25.58	-2.76	0.496
95.00	-8.23	-13.77	0.00	-666.88	0.00	666.88	1,864.78	932.39	2,732.02	1,368.04	26.01	-2.79	0.492
100.00	-7.66	-13.19	0.00	-598.04	0.00	598.04	1,824.80	912.40	2,578.99	1,291.41	29.04	-2.98	0.467
105.00	-7.12	-12.64	0.00	-532.07	0.00	532.07	1,782.98	891.49	2,427.58	1,215.60	32.27	-3.18	0.442
110.00	-6.59	-12.11	0.00	-468.86	0.00	468.86	1,739.30	869.65	2,278.08	1,140.73	35.70	-3.38	0.415
115.00	-6.08	-11.62	0.00	-408.31	0.00	408.31	1,693.77	846.88	2,130.77	1,066.97	39.34	-3.57	0.386
119.50	-5.39	-11.33	0.00	-356.04	0.00	356.04	1,118.22	559.11	1,377.74	689.90	42.79	-3.74	0.521
120.00	-5.34	-11.08	0.00	-350.38	0.00	350.38	1,115.76	557.88	1,368.94	685.49	43.18	-3.76	0.516
125.00	-4.94	-10.61	0.00	-294.98	0.00	294.98	1,090.12	545.06	1,281.06	641.48	47.24	-3.99	0.465
130.00	-4.56	-10.16	0.00	-241.93	0.00	241.93	1,062.64	531.32	1,193.75	597.76	51.53	-4.21	0.409
135.00	-4.19	-9.72	0.00	-191.15	0.00	191.15	1,033.31	516.65	1,107.31	554.48	56.04	-4.41	0.349
140.00	-3.85	-9.31	0.00	-142.54	0.00	142.54	1,002.12	501.06	1,022.02	511.77	60.76	-4.59	0.283
145.00	-3.51	-8.91	0.00	-96.02	0.00	96.02	969.08	484.54	938.16	469.78	65.64	-4.73	0.208
150.00	-3.20	-8.52	0.00	-51.49	0.00	51.49	934.20	467.10	856.03	428.65	70.65	-4.84	0.124
155.00	-2.90	-8.29	0.00	-8.86	0.00	8.86	897.46	448.73	775.91	388.53	75.75	-4.89	0.026
156.00	-0.14	-0.14	0.00	-0.57	0.00	0.57	889.89	444.94	760.16	380.64	76.78	-4.89	0.002
160.00	0.00	-0.13	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	80.87	-4.89	0.000

Site Number: 281862 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Bridgewater CT, CT Engineering Number:OAA693298_C3_01 1/27/2017 9:12:05 AM

Customer: AT&T Mobility

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 23 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

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		2.34	0.85	7.743	8.517	0.000	1.200	0.000	0.00	0.000	0.00	130.8	0.0	0.0
5.00		2.28	0.85	7.562	8.318	0.000	1.200	2.064	5.00	26.206	31.45	254.0	766.7	2,164.0
10.00		2.18	0.85	7.224	7.947	0.000	1.200	2.267	5.00	25.847	31.02	239.1	827.3	2,194.1
15.00		2.09	0.85	6.916	7.608	0.000	1.200	2.350	5.00	25.387	30.46	228.4	840.2	2,176.7
20.00		2.00	0.87	6.845	7.529	0.000	1.200	2.395	5.00	24.896	29.87	224.1	838.4	2,144.5
25.00		1.92	0.92	6.937	7.631	0.000	1.200	2.422	5.00	24.390	29.27	221.5	829.3	2,105.1
30.00		1.85	0.96	6.969	7.666	0.000	1.200	2.439	5.00	23.875	28.65	217.2	816.2	2,061.6
35.00		1.79	0.99	6.964	7.661	0.000	1.200	2.449	5.00	23.354	28.03	211.9	800.6	2,015.6
40.00		1.73	1.02	6.938	7.631	0.000	1.200	2.455	5.00	22.830	27.40	130.2	783.4	1,968.0
41.25	Bot - Section 2	1.69	1.04	6.913	7.605	0.000	1.200	2.457	1.25	5.625	6.75	102.4	194.8	486.2
45.00		1.67	1.06	6.891	7.580	0.000	1.200	2.458	3.75	16.877	20.25	136.9	581.1	2,173.4
48.00	Top - Section 1	1.63	1.07	6.858	7.544	0.000	1.200	2.459	3.00	13.288	15.95	99.6	458.1	1,709.4
50.00		1.61	1.08	6.832	7.515	0.000	1.200	2.459	2.00	8.753	10.50	135.9	302.3	679.5
55.00		1.58	1.10	6.794	7.473	0.000	1.200	2.459	5.00	21.511	25.81	189.8	736.5	1,661.6
60.00		1.53	1.12	6.738	7.411	0.000	1.200	2.458	5.00	20.981	25.18	183.5	716.8	1,616.7
65.00		1.49	1.14	6.681	7.349	0.000	1.200	2.456	5.00	20.451	24.54	177.3	697.0	1,571.6
70.00		1.46	1.16	6.626	7.288	0.000	1.200	2.454	5.00	19.920	23.90	171.2	677.1	1,526.4
75.00		1.42	1.18	6.572	7.230	0.000	1.200	2.451	5.00	19.389	23.27	165.3	657.3	1,481.2
80.00		1.39	1.19	6.521	7.173	0.000	1.200	2.449	5.00	18.859	22.63	159.5	637.4	1,436.0
85.00		1.36	1.21	6.473	7.120	0.000	1.200	2.446	5.00	18.328	21.99	138.9	617.6	1,390.9
89.00	Bot - Section 3	1.34	1.22	6.431	7.075	0.000	1.200	2.444	4.00	14.280	17.14	75.7	481.4	1,081.8
90.00		1.33	1.23	6.410	7.051	0.000	1.200	2.443	1.00	3.559	4.27	77.8	121.1	388.5
94.25	Top - Section 2	1.32	1.24	6.388	7.026	0.000	1.200	2.442	4.25	14.890	17.87	73.7	500.4	1,616.8
95.00		1.30	1.25	6.368	7.004	0.000	1.200	2.441	0.75	2.588	3.11	81.9	87.8	174.6
100.0		1.29	1.25	6.345	6.980	0.000	1.200	2.440	5.00	16.948	20.34	139.3	566.2	1,133.2
105.0		1.27	1.27	6.309	6.940	0.000	1.200	2.438	5.00	16.417	19.70	134.2	546.7	1,093.5
110.0		1.25	1.28	6.276	6.904	0.000	1.200	2.437	5.00	15.887	19.06	129.1	527.3	1,053.8
115.0	Bot - Section 4	1.23	1.29	6.246	6.871	0.000	1.200	2.436	5.00	15.357	18.43	118.8	507.9	1,014.2
119.5	Top - Section 3	1.22	1.30	6.220	6.842	0.000	1.200	2.435	4.50	13.512	16.21	61.5	446.6	1,218.5
120.0		1.21	1.31	6.208	6.829	0.000	1.200	2.435	0.50	1.475	1.77	65.2	49.4	85.7
125.0		1.20	1.32	6.195	6.814	0.000	1.200	2.434	5.00	14.457	17.35	115.9	475.1	829.8
130.0		1.19	1.33	6.173	6.790	0.000	1.200	2.434	5.00	13.928	16.71	111.2	456.0	795.4
135.0		1.17	1.34	6.154	6.770	0.000	1.200	2.434	5.00	13.399	16.08	106.6	436.9	761.2
140.0		1.16	1.35	6.138	6.751	0.000	1.200	2.434	5.00	12.870	15.44	102.0	417.8	726.9
145.0		1.15	1.36	6.123	6.736	0.000	1.200	2.434	5.00	12.341	14.81	97.5	398.8	692.7
150.0		1.14	1.37	6.111	6.722	0.000	1.200	2.435	5.00	11.813	14.18	93.1	379.9	658.6
155.0		1.13	1.38	6.101	6.711	0.000	1.200	2.435	5.00	11.285	13.54	54.3	360.9	624.4
156.0	Appertunance(s)	1.12	1.38	6.096	6.706	0.000	1.200	2.436	1.00	2.194	2.63	43.3	71.4	122.3
160.0		1.12	1.39	6.092	6.702	0.000	1.200	2.436	4.00	8.563	10.28	34.4	273.6	471.0
							Totals:		160.00			5,232.6	19,883.3	47,105.1

Site Number: 281862 Code: ANSI/TIA-222-G © 2007 - 2017 by ATC IP LLC. All rights reserved.

Site Name: Bridgewater CT, CT Engineering Number:OAA693298_C3_01 1/27/2017 9:12:06 AM

Customer: AT&T Mobility

Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 23 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		130.8	0.0					0.0	0.0	130.8	0.0	0.0	0.0
5.00		254.0	2,164.0					0.0	164.6	254.0	2,328.5	0.0	0.0
10.00		239.1	2,194.1					0.0	164.6	239.1	2,358.7	0.0	0.0
15.00		228.4	2,176.7					0.0	164.6	228.4	2,341.3	0.0	0.0
20.00		224.1	2,144.5					0.0	164.6	224.1	2,309.1	0.0	0.0
25.00		221.5	2,105.1					0.0	164.6	221.5	2,269.6	0.0	0.0
30.00		217.2	2,061.6					0.0	164.6	217.2	2,226.1	0.0	0.0
35.00		211.9	2,015.6					0.0	164.6	211.9	2,180.2	0.0	0.0
40.00		130.2	1,968.0					0.0	164.6	130.2	2,132.6	0.0	0.0
41.25	Bot - Section 2	102.4	486.2					0.0	41.1	102.4	527.4	0.0	0.0
45.00		136.9	2,173.4					0.0	123.4	136.9	2,296.9	0.0	0.0
48.00	Top - Section 1	99.6	1,709.4					0.0	98.7	99.6	1,808.1	0.0	0.0
50.00		135.9	679.5					0.0	65.8	135.9	745.3	0.0	0.0
55.00		189.8	1,661.6					0.0	164.6	189.8	1,826.2	0.0	0.0
60.00		183.5	1,616.7					0.0	164.6	183.5	1,781.3	0.0	0.0
65.00		177.3	1,571.6					0.0	164.6	177.3	1,736.1	0.0	0.0
70.00		171.2	1,526.4					0.0	164.6	171.2	1,691.0	0.0	0.0
75.00		165.3	1,481.2					0.0	164.6	165.3	1,645.8	0.0	0.0
80.00		159.5	1,436.0					0.0	164.6	159.5	1,600.6	0.0	0.0
85.00		138.9	1,390.9					0.0	164.6	138.9	1,555.5	0.0	0.0
89.00	Bot - Section 3	75.7	1,081.8					0.0	131.7	75.7	1,213.5	0.0	0.0
90.00		77.8	388.5					0.0	32.9	77.8	421.4	0.0	0.0
94.25	Top - Section 2	73.7	1,616.8					0.0	139.9	73.7	1,756.6	0.0	0.0
95.00		81.9	174.6					0.0	24.7	81.9	199.3	0.0	0.0
100.00		139.3	1,133.2					0.0	164.6	139.3	1,297.8	0.0	0.0
105.00		134.2	1,093.5					0.0	164.6	134.2	1,258.0	0.0	0.0
110.00		129.1	1,053.8					0.0	164.6	129.1	1,218.4	0.0	0.0
115.00	Bot - Section 4	118.8	1,014.2					0.0	164.6	118.8	1,178.7	0.0	0.0
119.50	Top - Section 3	61.5	1,218.5					0.0	148.1	61.5	1,366.6	0.0	0.0
120.00		65.2	85.7					0.0	16.5	65.2	102.2	0.0	0.0
125.00		115.9	829.8					0.0	164.6	115.9	994.4	0.0	0.0
130.00		111.2	795.4					0.0	164.6	111.2	960.0	0.0	0.0
135.00		106.6	761.2					0.0	164.6	106.6	925.7	0.0	0.0
140.00		102.0	726.9					0.0	164.6	102.0	891.5	0.0	0.0
145.00		97.5	692.7					0.0	164.6	97.5	857.3	0.0	0.0
150.00		93.1	658.6					0.0	164.6	93.1	823.1	0.0	0.0
155.00		54.3	624.4					0.0	164.6	54.3	789.0	0.0	0.0
156.00	Appertunance(s)	43.3	122.3	1,308.7	0.0	0.0	13,876.5	0.0	32.9	1,351.9	14,031.8	0.0	0.0
160.00		34.4	471.0					0.0	0.0	34.4	471.0	0.0	0.0
								Totals:		6,541.30	66,116.5	0.00	0.00

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Load Case: 1.2D + 1.0Di + 1.0Wi 40 mph with 1.00 in Radial Ice 23 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	-66.11	-6.43	0.00	-586.75	0.00	586.75	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.126
5.00	-63.78	-6.20	0.00	-554.62	0.00	554.62	4,349.84	2,174.92	10,178.3	5,096.75	0.01	-0.03	0.123
10.00	-61.42	-5.99	0.00	-523.61	0.00	523.61	4,295.43	2,147.71	9,828.71	4,921.66	0.06	-0.06	0.121
15.00	-59.08	-5.79	0.00	-493.66	0.00	493.66	4,239.17	2,119.58	9,480.54	4,747.32	0.13	-0.08	0.118
20.00	-56.77	-5.59	0.00	-464.71	0.00	464.71	4,181.05	2,090.53	9,134.15	4,573.86	0.23	-0.11	0.115
25.00	-54.49	-5.39	0.00	-436.77	0.00	436.77	4,121.09	2,060.54	8,789.82	4,401.44	0.37	-0.14	0.112
30.00	-52.27	-5.19	0.00	-409.82	0.00	409.82	4,059.27	2,029.64	8,447.85	4,230.20	0.53	-0.17	0.110
35.00	-50.08	-5.00	0.00	-383.85	0.00	383.85	3,995.60	1,997.80	8,108.53	4,060.29	0.72	-0.20	0.107
40.00	-47.95	-4.88	0.00	-358.86	0.00	358.86	3,930.09	1,965.04	7,772.13	3,891.84	0.94	-0.23	0.104
41.25	-47.42	-4.78	0.00	-352.76	0.00	352.76	3,913.42	1,956.71	7,688.52	3,849.98	1.00	-0.23	0.104
45.00	-45.13	-4.65	0.00	-334.82	0.00	334.82	3,862.72	1,931.36	7,438.96	3,725.01	1.20	-0.26	0.102
48.00	-43.32	-4.56	0.00	-320.86	0.00	320.86	2,999.72	1,499.86	5,776.85	2,892.72	1.36	-0.27	0.125
50.00	-42.57	-4.44	0.00	-311.74	0.00	311.74	2,981.40	1,490.70	5,679.83	2,844.14	1.48	-0.29	0.124
55.00	-40.74	-4.26	0.00	-289.57	0.00	289.57	2,934.30	1,467.15	5,438.21	2,723.15	1.80	-0.32	0.120
60.00	-38.96	-4.09	0.00	-268.27	0.00	268.27	2,885.34	1,442.67	5,198.13	2,602.93	2.15	-0.36	0.117
65.00	-37.22	-3.92	0.00	-247.82	0.00	247.82	2,834.54	1,417.27	4,959.88	2,483.63	2.55	-0.39	0.113
70.00	-35.53	-3.76	0.00	-228.20	0.00	228.20	2,781.89	1,390.94	4,723.74	2,365.38	2.97	-0.43	0.109
75.00	-33.88	-3.61	0.00	-209.39	0.00	209.39	2,727.38	1,363.69	4,490.01	2,248.34	3.44	-0.46	0.106
80.00	-32.28	-3.45	0.00	-191.37	0.00	191.37	2,671.02	1,335.51	4,258.97	2,132.65	3.94	-0.50	0.102
85.00	-30.73	-3.32	0.00	-174.11	0.00	174.11	2,612.82	1,306.41	4,030.91	2,018.45	4.48	-0.53	0.098
89.00	-29.51	-3.24	0.00	-160.84	0.00	160.84	2,564.92	1,282.46	3,850.80	1,928.26	4.94	-0.56	0.095
90.00	-29.09	-3.17	0.00	-157.60	0.00	157.60	2,552.76	1,276.38	3,806.12	1,905.89	5.06	-0.57	0.094
94.25	-27.33	-3.08	0.00	-144.15	0.00	144.15	1,870.62	935.31	2,755.09	1,379.59	5.57	-0.60	0.119
95.00	-27.13	-3.01	0.00	-141.83	0.00	141.83	1,864.78	932.39	2,732.02	1,368.04	5.67	-0.60	0.118
100.00	-25.84	-2.88	0.00	-126.78	0.00	126.78	1,824.80	912.40	2,578.99	1,291.41	6.32	-0.65	0.112
105.00	-24.58	-2.75	0.00	-112.40	0.00	112.40	1,782.98	891.49	2,427.58	1,215.60	7.02	-0.69	0.106
110.00	-23.36	-2.62	0.00	-98.67	0.00	98.67	1,739.30	869.65	2,278.08	1,140.73	7.77	-0.73	0.100
115.00	-22.18	-2.50	0.00	-85.58	0.00	85.58	1,693.77	846.88	2,130.77	1,066.97	8.55	-0.77	0.093
119.50	-20.81	-2.43	0.00	-74.34	0.00	74.34	1,118.22	559.11	1,377.74	689.90	9.29	-0.80	0.126
120.00	-20.71	-2.37	0.00	-73.13	0.00	73.13	1,115.76	557.88	1,368.94	685.49	9.38	-0.81	0.125
125.00	-19.72	-2.25	0.00	-61.29	0.00	61.29	1,090.12	545.06	1,281.06	641.48	10.25	-0.86	0.114
130.00	-18.76	-2.14	0.00	-50.02	0.00	50.02	1,062.64	531.32	1,193.75	597.76	11.17	-0.90	0.101
135.00	-17.83	-2.03	0.00	-39.31	0.00	39.31	1,033.31	516.65	1,107.31	554.48	12.14	-0.94	0.088
140.00	-16.94	-1.93	0.00	-29.14	0.00	29.14	1,002.12	501.06	1,022.02	511.77	13.15	-0.98	0.074
145.00	-16.08	-1.82	0.00	-19.51	0.00	19.51	969.08	484.54	938.16	469.78	14.19	-1.01	0.058
150.00	-15.26	-1.72	0.00	-10.41	0.00	10.41	934.20	467.10	856.03	428.65	15.26	-1.03	0.041
155.00	-14.48	-1.65	0.00	-1.82	0.00	1.82	897.46	448.73	775.91	388.53	16.35	-1.04	0.021
156.00	-0.47	-0.04	0.00	-0.17	0.00	0.17	889.89	444.94	760.16	380.64	16.57	-1.04	0.001
160.00	0.00	-0.03	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	17.44	-1.04	0.000

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Load Case: 1.0D + 1.0W Serviceability 60 mph 23 Iterations

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

Shaft Segment Forces (Factored)

Seg Top Elev (ft)	Description	Kzt	Kz	qz (psf)	qzGh (psf)	C (mph-ft)	Cf	Ice Thick (in)	Tributary (ft)	Ap (sf)	EPAs (sf)	Wind Force X (lb)	Dead Load Ice (lb)	Tot Dead Load (lb)
0.00		2.34	0.85	17.421	19.16	418.96	0.650	0.000	0.00	0.000	0.00	148.9	0.0	0.0
5.00		2.28	0.85	17.014	18.71	409.62	0.650	0.000	5.00	24.487	15.92	288.2	0.0	1,164.4
10.00		2.18	0.85	16.255	17.88	391.73	0.650	0.000	5.00	23.958	15.57	269.6	0.0	1,139.1
15.00		2.09	0.85	15.562	17.11	374.82	0.650	0.000	5.00	23.429	15.23	256.4	0.0	1,113.8
20.00		2.00	0.87	15.401	16.94	364.46	0.650	0.000	5.00	22.900	14.88	250.9	0.0	1,088.4
25.00		1.92	0.92	15.608	17.16	358.43	0.650	0.000	5.00	22.371	14.54	247.3	0.0	1,063.1
30.00		1.85	0.96	15.680	17.24	350.76	0.650	0.000	5.00	21.842	14.20	241.8	0.0	1,037.8
35.00		1.79	0.99	15.670	17.23	342.16	0.650	0.000	5.00	21.313	13.85	235.4	0.0	1,012.5
40.00		1.73	1.02	15.610	17.17	333.03	0.650	0.000	5.00	20.785	13.51	144.4	0.0	987.2
41.25	Bot - Section 2	1.69	1.04	15.555	17.11	327.16	0.650	0.000	1.25	5.113	3.32	113.5	0.0	242.8
45.00		1.67	1.06	15.505	17.05	322.40	0.650	0.000	3.75	15.340	9.97	151.5	0.0	1,326.9
48.00	Top - Section 1	1.63	1.07	15.430	16.97	315.94	0.650	0.000	3.00	12.058	7.84	110.1	0.0	1,042.8
50.00		1.61	1.08	15.371	16.90	315.34	0.650	0.000	2.00	7.933	5.16	149.9	0.0	314.3
55.00		1.58	1.10	15.285	16.81	308.59	0.650	0.000	5.00	19.462	12.65	209.0	0.0	771.0
60.00		1.53	1.12	15.159	16.67	298.96	0.650	0.000	5.00	18.933	12.31	201.5	0.0	749.9
65.00		1.49	1.14	15.033	16.53	289.39	0.650	0.000	5.00	18.405	11.96	194.2	0.0	728.8
70.00		1.46	1.16	14.908	16.39	279.91	0.650	0.000	5.00	17.876	11.62	187.0	0.0	707.7
75.00		1.42	1.18	14.788	16.26	270.53	0.650	0.000	5.00	17.347	11.28	179.9	0.0	686.6
80.00		1.39	1.19	14.672	16.14	261.26	0.650	0.000	5.00	16.818	10.93	173.0	0.0	665.5
85.00		1.36	1.21	14.563	16.02	252.10	0.650	0.000	5.00	16.289	10.59	150.3	0.0	644.4
89.00	Bot - Section 3	1.34	1.22	14.471	15.91	243.95	0.650	0.000	4.00	12.651	8.22	81.7	0.0	500.3
90.00		1.33	1.23	14.422	15.86	239.47	0.650	0.000	1.00	3.152	2.05	83.9	0.0	222.9
94.25	Top - Section 2	1.32	1.24	14.372	15.81	234.79	0.650	0.000	4.25	13.160	8.55	79.3	0.0	930.3
95.00		1.30	1.25	14.327	15.76	233.60	0.650	0.000	0.75	2.283	1.48	87.8	0.0	72.3
100.0		1.29	1.25	14.277	15.70	228.54	0.650	0.000	5.00	14.914	9.69	149.1	0.0	472.5
105.0		1.27	1.27	14.196	15.61	219.80	0.650	0.000	5.00	14.385	9.35	143.0	0.0	455.6
110.0		1.25	1.28	14.121	15.53	211.17	0.650	0.000	5.00	13.856	9.01	136.9	0.0	438.8
115.0	Bot - Section 4	1.23	1.29	14.054	15.45	202.62	0.650	0.000	5.00	13.327	8.66	125.4	0.0	421.9
119.5	Top - Section 3	1.22	1.30	13.996	15.39	194.58	0.650	0.000	4.50	11.685	7.60	64.8	0.0	643.2
120.0		1.21	1.31	13.967	15.36	192.78	0.650	0.000	0.50	1.272	0.83	68.3	0.0	30.2
125.0		1.20	1.32	13.938	15.33	188.17	0.650	0.000	5.00	12.428	8.08	121.0	0.0	295.5
130.0		1.19	1.33	13.890	15.27	179.85	0.650	0.000	5.00	11.900	7.73	115.4	0.0	282.9
135.0		1.17	1.34	13.847	15.23	171.59	0.650	0.000	5.00	11.371	7.39	109.8	0.0	270.2
140.0		1.16	1.35	13.810	15.19	163.39	0.650	0.000	5.00	10.842	7.05	104.3	0.0	257.6
145.0		1.15	1.36	13.777	15.15	155.24	0.650	0.000	5.00	10.313	6.70	98.9	0.0	244.9
150.0		1.14	1.37	13.750	15.12	147.13	0.650	0.000	5.00	9.784	6.36	93.5	0.0	232.2
155.0		1.13	1.38	13.728	15.10	139.07	0.650	0.000	5.00	9.255	6.02	54.2	0.0	219.6
156.0	Appertunance(s)	1.12	1.38	13.716	15.08	134.24	0.650	0.000	1.00	1.788	1.16	42.8	0.0	42.4
160.0		1.12	1.39	13.708	15.07	130.23	0.650	0.000	4.00	6.939	4.51	34.0	0.0	164.5
							Totals:		160.00			5,696.9	0.0	22,684.8

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Load Case: 1.0D + 1.0W Serviceability 60 mph 23 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		148.9	0.0					0.0	0.0	148.9	0.0	0.0	0.0
5.00		288.2	1,164.4					0.0	137.1	288.2	1,301.5	0.0	0.0
10.00		269.6	1,139.1					0.0	137.1	269.6	1,276.2	0.0	0.0
15.00		256.4	1,113.8					0.0	137.1	256.4	1,250.9	0.0	0.0
20.00		250.9	1,088.4					0.0	137.1	250.9	1,225.6	0.0	0.0
25.00		247.3	1,063.1					0.0	137.1	247.3	1,200.3	0.0	0.0
30.00		241.8	1,037.8					0.0	137.1	241.8	1,175.0	0.0	0.0
35.00		235.4	1,012.5					0.0	137.1	235.4	1,149.7	0.0	0.0
40.00		144.4	987.2					0.0	137.1	144.4	1,124.3	0.0	0.0
41.25	Bot - Section 2	113.5	242.8					0.0	34.3	113.5	277.1	0.0	0.0
45.00		151.5	1,326.9					0.0	102.9	151.5	1,429.8	0.0	0.0
48.00	Top - Section 1	110.1	1,042.8					0.0	82.3	110.1	1,125.0	0.0	0.0
50.00		149.9	314.3					0.0	54.9	149.9	369.2	0.0	0.0
55.00		209.0	771.0					0.0	137.1	209.0	908.1	0.0	0.0
60.00		201.5	749.9					0.0	137.1	201.5	887.0	0.0	0.0
65.00		194.2	728.8					0.0	137.1	194.2	865.9	0.0	0.0
70.00		187.0	707.7					0.0	137.1	187.0	844.8	0.0	0.0
75.00		179.9	686.6					0.0	137.1	179.9	823.8	0.0	0.0
80.00		173.0	665.5					0.0	137.1	173.0	802.7	0.0	0.0
85.00		150.3	644.4					0.0	137.1	150.3	781.6	0.0	0.0
89.00	Bot - Section 3	81.7	500.3					0.0	109.7	81.7	610.1	0.0	0.0
90.00		83.9	222.9					0.0	27.4	83.9	250.3	0.0	0.0
94.25	Top - Section 2	79.3	930.3					0.0	116.6	79.3	1,046.9	0.0	0.0
95.00		87.8	72.3					0.0	20.6	87.8	92.9	0.0	0.0
100.00		149.1	472.5					0.0	137.1	149.1	609.7	0.0	0.0
105.00		143.0	455.6					0.0	137.1	143.0	592.8	0.0	0.0
110.00		136.9	438.8					0.0	137.1	136.9	575.9	0.0	0.0
115.00	Bot - Section 4	125.4	421.9					0.0	137.1	125.4	559.0	0.0	0.0
119.50	Top - Section 3	64.8	643.2					0.0	123.4	64.8	766.6	0.0	0.0
120.00		68.3	30.2					0.0	13.7	68.3	44.0	0.0	0.0
125.00		121.0	295.5					0.0	137.1	121.0	432.7	0.0	0.0
130.00		115.4	282.9					0.0	137.1	115.4	420.0	0.0	0.0
135.00		109.8	270.2					0.0	137.1	109.8	407.4	0.0	0.0
140.00		104.3	257.6					0.0	137.1	104.3	394.7	0.0	0.0
145.00		98.9	244.9					0.0	137.1	98.9	382.0	0.0	0.0
150.00		93.5	232.2					0.0	137.1	93.5	369.4	0.0	0.0
155.00		54.2	219.6					0.0	137.1	54.2	356.7	0.0	0.0
156.00	Appertunance(s)	42.8	42.4	2,008.0	0.0	0.0	3,757.3	0.0	27.4	2,050.7	3,827.1	0.0	0.0
160.00		34.0	164.5					0.0	0.0	34.0	164.5	0.0	0.0
									Totals:	7,704.90	30,721.2	0.00	0.00

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Load Case: 1.0D + 1.0W Serviceability 60 mph 23 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	-30.72	-7.56	0.00	-698.10	0.00	698.10	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.139
5.00	-29.41	-7.29	0.00	-660.28	0.00	660.28	4,349.84	2,174.92	10,178.3	5,096.75	0.02	-0.03	0.136
10.00	-28.13	-7.04	0.00	-623.81	0.00	623.81	4,295.43	2,147.71	9,828.71	4,921.66	0.07	-0.07	0.133
15.00	-26.88	-6.80	0.00	-588.62	0.00	588.62	4,239.17	2,119.58	9,480.54	4,747.32	0.16	-0.10	0.130
20.00	-25.65	-6.56	0.00	-554.64	0.00	554.64	4,181.05	2,090.53	9,134.15	4,573.86	0.28	-0.13	0.127
25.00	-24.45	-6.32	0.00	-521.85	0.00	521.85	4,121.09	2,060.54	8,789.82	4,401.44	0.44	-0.17	0.125
30.00	-23.27	-6.09	0.00	-490.24	0.00	490.24	4,059.27	2,029.64	8,447.85	4,230.20	0.63	-0.20	0.122
35.00	-22.12	-5.86	0.00	-459.79	0.00	459.79	3,995.60	1,997.80	8,108.53	4,060.29	0.86	-0.24	0.119
40.00	-20.99	-5.72	0.00	-430.47	0.00	430.47	3,930.09	1,965.04	7,772.13	3,891.84	1.12	-0.27	0.116
41.25	-20.71	-5.61	0.00	-423.32	0.00	423.32	3,913.42	1,956.71	7,688.52	3,849.98	1.20	-0.28	0.115
45.00	-19.28	-5.46	0.00	-402.27	0.00	402.27	3,862.72	1,931.36	7,438.96	3,725.01	1.43	-0.31	0.113
48.00	-18.15	-5.35	0.00	-385.88	0.00	385.88	2,999.72	1,499.86	5,776.85	2,892.72	1.63	-0.33	0.139
50.00	-17.78	-5.21	0.00	-375.17	0.00	375.17	2,981.40	1,490.70	5,679.83	2,844.14	1.77	-0.34	0.138
55.00	-16.87	-5.01	0.00	-349.13	0.00	349.13	2,934.30	1,467.15	5,438.21	2,723.15	2.15	-0.38	0.134
60.00	-15.98	-4.81	0.00	-324.09	0.00	324.09	2,885.34	1,442.67	5,198.13	2,602.93	2.57	-0.43	0.130
65.00	-15.12	-4.62	0.00	-300.04	0.00	300.04	2,834.54	1,417.27	4,959.88	2,483.63	3.04	-0.47	0.126
70.00	-14.27	-4.44	0.00	-276.93	0.00	276.93	2,781.89	1,390.94	4,723.74	2,365.38	3.56	-0.51	0.122
75.00	-13.44	-4.26	0.00	-254.74	0.00	254.74	2,727.38	1,363.69	4,490.01	2,248.34	4.11	-0.55	0.118
80.00	-12.64	-4.09	0.00	-233.44	0.00	233.44	2,671.02	1,335.51	4,258.97	2,132.65	4.72	-0.60	0.114
85.00	-11.86	-3.94	0.00	-213.00	0.00	213.00	2,612.82	1,306.41	4,030.91	2,018.45	5.36	-0.64	0.110
89.00	-11.25	-3.85	0.00	-197.25	0.00	197.25	2,564.92	1,282.46	3,850.80	1,928.26	5.91	-0.67	0.107
90.00	-11.00	-3.77	0.00	-193.39	0.00	193.39	2,552.76	1,276.38	3,806.12	1,905.89	6.06	-0.68	0.106
94.25	-9.95	-3.68	0.00	-177.36	0.00	177.36	1,870.62	935.31	2,755.09	1,379.59	6.68	-0.72	0.134
95.00	-9.86	-3.60	0.00	-174.60	0.00	174.60	1,864.78	932.39	2,732.02	1,368.04	6.80	-0.73	0.133
100.00	-9.25	-3.45	0.00	-156.61	0.00	156.61	1,824.80	912.40	2,578.99	1,291.41	7.59	-0.78	0.126
105.00	-8.65	-3.31	0.00	-139.35	0.00	139.35	1,782.98	891.49	2,427.58	1,215.60	8.43	-0.83	0.120
110.00	-8.07	-3.17	0.00	-122.82	0.00	122.82	1,739.30	869.65	2,278.08	1,140.73	9.33	-0.88	0.112
115.00	-7.52	-3.04	0.00	-106.98	0.00	106.98	1,693.77	846.88	2,130.77	1,066.97	10.28	-0.93	0.105
119.50	-6.75	-2.97	0.00	-93.29	0.00	93.29	1,118.22	559.11	1,377.74	689.90	11.19	-0.98	0.141
120.00	-6.70	-2.90	0.00	-91.81	0.00	91.81	1,115.76	557.88	1,368.94	685.49	11.29	-0.98	0.140
125.00	-6.27	-2.78	0.00	-77.31	0.00	77.31	1,090.12	545.06	1,281.06	641.48	12.35	-1.04	0.126
130.00	-5.85	-2.66	0.00	-63.42	0.00	63.42	1,062.64	531.32	1,193.75	597.76	13.48	-1.10	0.112
135.00	-5.44	-2.55	0.00	-50.11	0.00	50.11	1,033.31	516.65	1,107.31	554.48	14.66	-1.15	0.096
140.00	-5.05	-2.44	0.00	-37.37	0.00	37.37	1,002.12	501.06	1,022.02	511.77	15.89	-1.20	0.078
145.00	-4.67	-2.34	0.00	-25.17	0.00	25.17	969.08	484.54	938.16	469.78	17.17	-1.24	0.058
150.00	-4.30	-2.24	0.00	-13.50	0.00	13.50	934.20	467.10	856.03	428.65	18.48	-1.27	0.036
155.00	-3.94	-2.17	0.00	-2.32	0.00	2.32	897.46	448.73	775.91	388.53	19.82	-1.28	0.010
156.00	-0.16	-0.04	0.00	-0.15	0.00	0.15	889.89	444.94	760.16	380.64	20.09	-1.28	0.001
160.00	0.00	-0.03	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	21.16	-1.28	0.000

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Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.20	
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07	
Long-Period Transition Period (T_L):	8	
Importance Factor (I_E):	1.00	
Site Coefficient F_a:	1.60	
Site Coeffiecient F_v:	2.40	
Response Modification Coefficient (R):	1.50	
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.21	
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11	
Seismic Response Coefficient (C_s):	0.04	
Upper Limit C_s	0.04	
Lower Limit C_s	0.03	
Period based on Rayleigh Method (sec):	1.99	
Redundancy Factor (p):	1.30	
Seismic Force Distribution Exponent (k):	1.75	
Total Unfactored Dead Load:	30.72	k
Seismic Base Shear (E):	1.41	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	158.00	165	1,142	0.016	22	204
37	155.50	70	471	0.007	9	87
36	152.50	357	2,328	0.032	45	443
35	147.50	369	2,274	0.031	44	459
34	142.50	382	2,214	0.031	43	475
33	137.50	395	2,149	0.030	42	490
32	132.50	407	2,079	0.029	40	506
31	127.50	420	2,004	0.028	39	522
30	122.50	433	1,925	0.027	37	538
29	119.75	44	188	0.003	4	55
28	117.25	767	3,160	0.044	61	952
27	112.50	559	2,144	0.030	42	695
26	107.50	576	2,040	0.028	40	716
25	102.50	593	1,932	0.027	38	736
24	97.50	610	1,821	0.025	35	757
23	94.63	93	263	0.004	5	115
22	92.13	1,047	2,831	0.039	55	1,301
21	89.50	250	644	0.009	13	311
20	87.00	610	1,493	0.021	29	758
19	82.50	782	1,743	0.024	34	971
18	77.50	803	1,605	0.022	31	997
17	72.50	824	1,466	0.020	29	1,023
16	67.50	845	1,327	0.018	26	1,050

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15	62.50	866	1,189	0.016	23	1,076
14	57.50	887	1,053	0.015	20	1,102
13	52.50	908	920	0.013	18	1,128
12	49.00	369	331	0.005	6	459
11	46.50	1,125	922	0.013	18	1,398
10	43.13	1,430	1,027	0.014	20	1,776
9	40.63	277	179	0.002	3	344
8	37.50	1,124	632	0.009	12	1,397
7	32.50	1,150	504	0.007	10	1,428
6	27.50	1,175	384	0.005	7	1,460
5	22.50	1,200	277	0.004	5	1,491
4	17.50	1,226	182	0.003	4	1,523
3	12.50	1,251	103	0.001	2	1,554
2	7.50	1,276	43	0.001	1	1,586
1	2.50	1,302	6	0.000	0	1,617
Raycap DC6-48-60-18-	156.00	80	543	0.007	11	99
Ericsson RRUS A2 B2	156.00	66	448	0.006	9	82
Ericsson RRUS 11 (Ba	156.00	330	2,240	0.031	44	410
Ericsson RRUS 32 B2	156.00	159	1,079	0.015	21	198
Ericsson RRUS	156.00	132	898	0.012	17	164
Ericsson RRUS-12 B2	156.00	174	1,181	0.016	23	216
CCI HPA-65R-BUU-H8	156.00	816	5,539	0.076	108	1,014
Round Platform w/ Ha	156.00	2,000	13,577	0.187	264	2,485
		30,721	72,502	1.000	1,410	38,170

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	158.00	165	1,142	0.016	22	141
37	155.50	70	471	0.007	9	60
36	152.50	357	2,328	0.032	45	306
35	147.50	369	2,274	0.031	44	317
34	142.50	382	2,214	0.031	43	328
33	137.50	395	2,149	0.030	42	338
32	132.50	407	2,079	0.029	40	349
31	127.50	420	2,004	0.028	39	360
30	122.50	433	1,925	0.027	37	371
29	119.75	44	188	0.003	4	38
28	117.25	767	3,160	0.044	61	657
27	112.50	559	2,144	0.030	42	479
26	107.50	576	2,040	0.028	40	494
25	102.50	593	1,932	0.027	38	508
24	97.50	610	1,821	0.025	35	523
23	94.63	93	263	0.004	5	80
22	92.13	1,047	2,831	0.039	55	898
21	89.50	250	644	0.009	13	215
20	87.00	610	1,493	0.021	29	523
19	82.50	782	1,743	0.024	34	670
18	77.50	803	1,605	0.022	31	688
17	72.50	824	1,466	0.020	29	706
16	67.50	845	1,327	0.018	26	724
15	62.50	866	1,189	0.016	23	743
14	57.50	887	1,053	0.015	20	761
13	52.50	908	920	0.013	18	779
12	49.00	369	331	0.005	6	317
11	46.50	1,125	922	0.013	18	965
10	43.13	1,430	1,027	0.014	20	1,226
9	40.63	277	179	0.002	3	238
8	37.50	1,124	632	0.009	12	964

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7	32.50	1,150	504	0.007	10	986
6	27.50	1,175	384	0.005	7	1,008
5	22.50	1,200	277	0.004	5	1,029
4	17.50	1,226	182	0.003	4	1,051
3	12.50	1,251	103	0.001	2	1,073
2	7.50	1,276	43	0.001	1	1,094
1	2.50	1,302	6	0.000	0	1,116
Raycap DC6-48-60-18-	156.00	80	543	0.007	11	69
Ericsson RRUS A2 B2	156.00	66	448	0.006	9	57
Ericsson RRUS 11 (Ba	156.00	330	2,240	0.031	44	283
Ericsson RRUS 32 B2	156.00	159	1,079	0.015	21	136
Ericsson RRUS	156.00	132	898	0.012	17	113
Ericsson RRUS-12 B2	156.00	174	1,181	0.016	23	149
CCI HPA-65R-BUU-H8	156.00	816	5,539	0.076	108	700
Round Platform w/ Ha	156.00	2,000	13,577	0.187	264	1,715
		30,721	72,502	1.000	1,410	26,345

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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	-36.55	-1.41	0.00	-174.54	0.00	174.54	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.041
5.00	-34.97	-1.42	0.00	-167.48	0.00	167.48	4,349.84	2,174.92	10,178.3	5,096.75	0.00	-0.01	0.041
10.00	-33.41	-1.42	0.00	-160.40	0.00	160.40	4,295.43	2,147.71	9,828.71	4,921.66	0.02	-0.02	0.040
15.00	-31.89	-1.42	0.00	-153.31	0.00	153.31	4,239.17	2,119.58	9,480.54	4,747.32	0.04	-0.03	0.040
20.00	-30.40	-1.42	0.00	-146.21	0.00	146.21	4,181.05	2,090.53	9,134.15	4,573.86	0.07	-0.03	0.039
25.00	-28.94	-1.41	0.00	-139.12	0.00	139.12	4,121.09	2,060.54	8,789.82	4,401.44	0.11	-0.04	0.039
30.00	-27.51	-1.41	0.00	-132.05	0.00	132.05	4,059.27	2,029.64	8,447.85	4,230.20	0.16	-0.05	0.038
35.00	-26.11	-1.40	0.00	-125.01	0.00	125.01	3,995.60	1,997.80	8,108.53	4,060.29	0.22	-0.06	0.037
40.00	-25.77	-1.40	0.00	-118.02	0.00	118.02	3,930.09	1,965.04	7,772.13	3,891.84	0.29	-0.07	0.037
41.25	-23.99	-1.38	0.00	-116.28	0.00	116.28	3,913.42	1,956.71	7,688.52	3,849.98	0.31	-0.07	0.036
45.00	-22.59	-1.36	0.00	-111.11	0.00	111.11	3,862.72	1,931.36	7,438.96	3,725.01	0.37	-0.08	0.036
48.00	-22.13	-1.35	0.00	-107.03	0.00	107.03	2,999.72	1,499.86	5,776.85	2,892.72	0.42	-0.09	0.044
50.00	-21.01	-1.34	0.00	-104.32	0.00	104.32	2,981.40	1,490.70	5,679.83	2,844.14	0.46	-0.09	0.044
55.00	-19.90	-1.32	0.00	-97.64	0.00	97.64	2,934.30	1,467.15	5,438.21	2,723.15	0.56	-0.10	0.043
60.00	-18.83	-1.30	0.00	-91.04	0.00	91.04	2,885.34	1,442.67	5,198.13	2,602.93	0.68	-0.11	0.042
65.00	-17.78	-1.27	0.00	-84.55	0.00	84.55	2,834.54	1,417.27	4,959.88	2,483.63	0.80	-0.13	0.040
70.00	-16.75	-1.25	0.00	-78.18	0.00	78.18	2,781.89	1,390.94	4,723.74	2,365.38	0.94	-0.14	0.039
75.00	-15.76	-1.22	0.00	-71.95	0.00	71.95	2,727.38	1,363.69	4,490.01	2,248.34	1.09	-0.15	0.038
80.00	-14.79	-1.18	0.00	-65.86	0.00	65.86	2,671.02	1,335.51	4,258.97	2,132.65	1.26	-0.16	0.036
85.00	-14.03	-1.15	0.00	-59.95	0.00	59.95	2,612.82	1,306.41	4,030.91	2,018.45	1.43	-0.17	0.035
89.00	-13.72	-1.14	0.00	-55.33	0.00	55.33	2,564.92	1,282.46	3,850.80	1,928.26	1.58	-0.18	0.034
90.00	-12.42	-1.08	0.00	-54.19	0.00	54.19	2,552.76	1,276.38	3,806.12	1,905.89	1.62	-0.19	0.033
94.25	-12.30	-1.08	0.00	-49.58	0.00	49.58	1,870.62	935.31	2,755.09	1,379.59	1.79	-0.20	0.043
95.00	-11.54	-1.04	0.00	-48.77	0.00	48.77	1,864.78	932.39	2,732.02	1,368.04	1.83	-0.20	0.042
100.00	-10.81	-1.01	0.00	-43.55	0.00	43.55	1,824.80	912.40	2,578.99	1,291.41	2.04	-0.21	0.040
105.00	-10.09	-0.97	0.00	-38.52	0.00	38.52	1,782.98	891.49	2,427.58	1,215.60	2.27	-0.23	0.037
110.00	-9.40	-0.92	0.00	-33.69	0.00	33.69	1,739.30	869.65	2,278.08	1,140.73	2.52	-0.24	0.035
115.00	-8.44	-0.86	0.00	-29.07	0.00	29.07	1,693.77	846.88	2,130.77	1,066.97	2.78	-0.26	0.032
119.50	-8.39	-0.86	0.00	-25.20	0.00	25.20	1,118.22	559.11	1,377.74	689.90	3.03	-0.27	0.044
120.00	-7.85	-0.82	0.00	-24.77	0.00	24.77	1,115.76	557.88	1,368.94	685.49	3.06	-0.27	0.043
125.00	-7.33	-0.78	0.00	-20.67	0.00	20.67	1,090.12	545.06	1,281.06	641.48	3.35	-0.29	0.039
130.00	-6.82	-0.74	0.00	-16.78	0.00	16.78	1,062.64	531.32	1,193.75	597.76	3.66	-0.30	0.034
135.00	-6.33	-0.70	0.00	-13.09	0.00	13.09	1,033.31	516.65	1,107.31	554.48	3.98	-0.31	0.030
140.00	-5.86	-0.65	0.00	-9.61	0.00	9.61	1,002.12	501.06	1,022.02	511.77	4.32	-0.33	0.025
145.00	-5.40	-0.60	0.00	-6.36	0.00	6.36	969.08	484.54	938.16	469.78	4.67	-0.34	0.019
150.00	-4.96	-0.56	0.00	-3.33	0.00	3.33	934.20	467.10	856.03	428.65	5.02	-0.34	0.013
155.00	-4.87	-0.55	0.00	-0.55	0.00	0.55	897.46	448.73	775.91	388.53	5.38	-0.35	0.007
156.00	0.00	0.00	0.00	0.00	0.00	0.00	889.89	444.94	760.16	380.64	5.46	-0.35	0.000
160.00	0.00	0.00	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	5.75	-0.35	0.000

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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	-25.23	-1.41	0.00	-172.90	0.00	172.90	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.039
5.00	-24.13	-1.41	0.00	-165.85	0.00	165.85	4,349.84	2,174.92	10,178.3	5,096.75	0.00	-0.01	0.038
10.00	-23.06	-1.41	0.00	-158.78	0.00	158.78	4,295.43	2,147.71	9,828.71	4,921.66	0.02	-0.02	0.038
15.00	-22.01	-1.41	0.00	-151.71	0.00	151.71	4,239.17	2,119.58	9,480.54	4,747.32	0.04	-0.03	0.037
20.00	-20.98	-1.41	0.00	-144.64	0.00	144.64	4,181.05	2,090.53	9,134.15	4,573.86	0.07	-0.03	0.037
25.00	-19.97	-1.41	0.00	-137.58	0.00	137.58	4,121.09	2,060.54	8,789.82	4,401.44	0.11	-0.04	0.036
30.00	-18.99	-1.40	0.00	-130.55	0.00	130.55	4,059.27	2,029.64	8,447.85	4,230.20	0.16	-0.05	0.036
35.00	-18.02	-1.39	0.00	-123.55	0.00	123.55	3,995.60	1,997.80	8,108.53	4,060.29	0.22	-0.06	0.035
40.00	-17.78	-1.39	0.00	-116.61	0.00	116.61	3,930.09	1,965.04	7,772.13	3,891.84	0.29	-0.07	0.034
41.25	-16.56	-1.37	0.00	-114.87	0.00	114.87	3,913.42	1,956.71	7,688.52	3,849.98	0.31	-0.07	0.034
45.00	-15.59	-1.35	0.00	-109.75	0.00	109.75	3,862.72	1,931.36	7,438.96	3,725.01	0.37	-0.08	0.034
48.00	-15.28	-1.34	0.00	-105.70	0.00	105.70	2,999.72	1,499.86	5,776.85	2,892.72	0.42	-0.09	0.042
50.00	-14.50	-1.33	0.00	-103.02	0.00	103.02	2,981.40	1,490.70	5,679.83	2,844.14	0.46	-0.09	0.041
55.00	-13.74	-1.31	0.00	-96.38	0.00	96.38	2,934.30	1,467.15	5,438.21	2,723.15	0.56	-0.10	0.040
60.00	-12.99	-1.29	0.00	-89.85	0.00	89.85	2,885.34	1,442.67	5,198.13	2,602.93	0.67	-0.11	0.039
65.00	-12.27	-1.26	0.00	-83.42	0.00	83.42	2,834.54	1,417.27	4,959.88	2,483.63	0.79	-0.12	0.038
70.00	-11.56	-1.23	0.00	-77.11	0.00	77.11	2,781.89	1,390.94	4,723.74	2,365.38	0.93	-0.14	0.037
75.00	-10.87	-1.20	0.00	-70.95	0.00	70.95	2,727.38	1,363.69	4,490.01	2,248.34	1.08	-0.15	0.036
80.00	-10.20	-1.17	0.00	-64.93	0.00	64.93	2,671.02	1,335.51	4,258.97	2,132.65	1.24	-0.16	0.034
85.00	-9.68	-1.14	0.00	-59.09	0.00	59.09	2,612.82	1,306.41	4,030.91	2,018.45	1.42	-0.17	0.033
89.00	-9.47	-1.13	0.00	-54.53	0.00	54.53	2,564.92	1,282.46	3,850.80	1,928.26	1.57	-0.18	0.032
90.00	-8.57	-1.07	0.00	-53.40	0.00	53.40	2,552.76	1,276.38	3,806.12	1,905.89	1.60	-0.18	0.031
94.25	-8.49	-1.07	0.00	-48.85	0.00	48.85	1,870.62	935.31	2,755.09	1,379.59	1.77	-0.20	0.040
95.00	-7.97	-1.03	0.00	-48.05	0.00	48.05	1,864.78	932.39	2,732.02	1,368.04	1.80	-0.20	0.039
100.00	-7.46	-0.99	0.00	-42.90	0.00	42.90	1,824.80	912.40	2,578.99	1,291.41	2.02	-0.21	0.037
105.00	-6.96	-0.95	0.00	-37.93	0.00	37.93	1,782.98	891.49	2,427.58	1,215.60	2.25	-0.23	0.035
110.00	-6.48	-0.91	0.00	-33.16	0.00	33.16	1,739.30	869.65	2,278.08	1,140.73	2.49	-0.24	0.033
115.00	-5.83	-0.85	0.00	-28.61	0.00	28.61	1,693.77	846.88	2,130.77	1,066.97	2.75	-0.25	0.030
119.50	-5.79	-0.85	0.00	-24.79	0.00	24.79	1,118.22	559.11	1,377.74	689.90	2.99	-0.26	0.041
120.00	-5.42	-0.81	0.00	-24.37	0.00	24.37	1,115.76	557.88	1,368.94	685.49	3.02	-0.27	0.040
125.00	-5.06	-0.77	0.00	-20.34	0.00	20.34	1,090.12	545.06	1,281.06	641.48	3.31	-0.28	0.036
130.00	-4.71	-0.73	0.00	-16.50	0.00	16.50	1,062.64	531.32	1,193.75	597.76	3.61	-0.30	0.032
135.00	-4.37	-0.68	0.00	-12.87	0.00	12.87	1,033.31	516.65	1,107.31	554.48	3.93	-0.31	0.027
140.00	-4.04	-0.64	0.00	-9.45	0.00	9.45	1,002.12	501.06	1,022.02	511.77	4.26	-0.32	0.022
145.00	-3.73	-0.59	0.00	-6.25	0.00	6.25	969.08	484.54	938.16	469.78	4.61	-0.33	0.017
150.00	-3.42	-0.55	0.00	-3.28	0.00	3.28	934.20	467.10	856.03	428.65	4.96	-0.34	0.011
155.00	-3.36	-0.54	0.00	-0.54	0.00	0.54	897.46	448.73	775.91	388.53	5.32	-0.34	0.005
156.00	0.00	0.00	0.00	0.00	0.00	0.00	889.89	444.94	760.16	380.64	5.39	-0.34	0.000
160.00	0.00	0.00	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	5.67	-0.34	0.000

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Equivalent Modal Forces Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.20
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.07
Importance Factor (I_E):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v	2.40
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.21
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.11
Period Based on Rayleigh Method (sec):	1.99
Redundancy Factor (p):	1.30

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	158.00	165	1.843	1.741	1.053	0.373	53	204
37	155.50	70	1.785	1.472	0.952	0.334	20	87
36	152.50	357	1.717	1.188	0.841	0.289	89	443
35	147.50	369	1.606	0.798	0.679	0.221	71	459
34	142.50	382	1.499	0.499	0.542	0.162	54	475
33	137.50	395	1.396	0.276	0.427	0.110	38	490
32	132.50	407	1.296	0.115	0.333	0.066	23	506
31	127.50	420	1.200	0.005	0.255	0.030	11	522
30	122.50	433	1.108	-0.065	0.192	0.001	1	538
29	119.75	44	1.059	-0.090	0.162	-0.011	0	55
28	117.25	767	1.015	-0.106	0.139	-0.020	-13	952
27	112.50	559	0.934	-0.120	0.101	-0.033	-16	695
26	107.50	576	0.853	-0.119	0.070	-0.039	-19	716
25	102.50	593	0.776	-0.107	0.047	-0.038	-19	736
24	97.50	610	0.702	-0.087	0.030	-0.031	-16	757
23	94.63	93	0.661	-0.074	0.023	-0.024	-2	115
22	92.13	1,047	0.627	-0.062	0.018	-0.018	-16	1,301
21	89.50	250	0.591	-0.050	0.014	-0.010	-2	311
20	87.00	610	0.559	-0.038	0.011	-0.002	-1	758
19	82.50	782	0.502	-0.017	0.007	0.011	8	971
18	77.50	803	0.443	0.004	0.006	0.026	18	997
17	72.50	824	0.388	0.022	0.007	0.037	26	1,023
16	67.50	845	0.336	0.036	0.009	0.045	33	1,050
15	62.50	866	0.288	0.048	0.013	0.051	38	1,076
14	57.50	887	0.244	0.056	0.018	0.054	41	1,102
13	52.50	908	0.203	0.062	0.023	0.055	43	1,128
12	49.00	369	0.177	0.065	0.026	0.055	17	459
11	46.50	1,125	0.160	0.067	0.029	0.054	53	1,398
10	43.13	1,430	0.137	0.069	0.032	0.054	66	1,776
9	40.63	277	0.122	0.070	0.034	0.053	13	344
8	37.50	1,124	0.104	0.071	0.037	0.052	51	1,397
7	32.50	1,150	0.078	0.072	0.040	0.051	51	1,428
6	27.50	1,175	0.056	0.071	0.042	0.049	50	1,460
5	22.50	1,200	0.037	0.070	0.041	0.048	49	1,491

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4	17.50	1,226	0.023	0.065	0.039	0.045	47	1,523
3	12.50	1,251	0.012	0.057	0.033	0.040	43	1,554
2	7.50	1,276	0.004	0.042	0.024	0.031	34	1,586
1	2.50	1,302	0.000	0.017	0.009	0.014	15	1,617
Raycap DC6-48-60-18-	156.00	80	1.797	1.523	0.972	0.341	24	99
Ericsson RRUS A2 B2	156.00	66	1.797	1.523	0.972	0.341	20	82
Ericsson RRUS 11 (Ba	156.00	330	1.797	1.523	0.972	0.341	98	410
Ericsson RRUS 32 B2	156.00	159	1.797	1.523	0.972	0.341	47	198
Ericsson RRUS	156.00	132	1.797	1.523	0.972	0.341	39	164
Ericsson RRUS-12 B2	156.00	174	1.797	1.523	0.972	0.341	51	216
CCI HPA-65R-BUU-H8	156.00	816	1.797	1.523	0.972	0.341	241	1,014
Round Platform w/ Ha	156.00	2,000	1.797	1.523	0.972	0.341	592	2,485
		30,721	38.917	18.309	14.129	4.915	2,063	38,170

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	158.00	165	1.843	1.741	1.053	0.373	53	141
37	155.50	70	1.785	1.472	0.952	0.334	20	60
36	152.50	357	1.717	1.188	0.841	0.289	89	306
35	147.50	369	1.606	0.798	0.679	0.221	71	317
34	142.50	382	1.499	0.499	0.542	0.162	54	328
33	137.50	395	1.396	0.276	0.427	0.110	38	338
32	132.50	407	1.296	0.115	0.333	0.066	23	349
31	127.50	420	1.200	0.005	0.255	0.030	11	360
30	122.50	433	1.108	-0.065	0.192	0.001	1	371
29	119.75	44	1.059	-0.090	0.162	-0.011	0	38
28	117.25	767	1.015	-0.106	0.139	-0.020	-13	657
27	112.50	559	0.934	-0.120	0.101	-0.033	-16	479
26	107.50	576	0.853	-0.119	0.070	-0.039	-19	494
25	102.50	593	0.776	-0.107	0.047	-0.038	-19	508
24	97.50	610	0.702	-0.087	0.030	-0.031	-16	523
23	94.63	93	0.661	-0.074	0.023	-0.024	-2	80
22	92.13	1,047	0.627	-0.062	0.018	-0.018	-16	898
21	89.50	250	0.591	-0.050	0.014	-0.010	-2	215
20	87.00	610	0.559	-0.038	0.011	-0.002	-1	523
19	82.50	782	0.502	-0.017	0.007	0.011	8	670
18	77.50	803	0.443	0.004	0.006	0.026	18	688
17	72.50	824	0.388	0.022	0.007	0.037	26	706
16	67.50	845	0.336	0.036	0.009	0.045	33	724
15	62.50	866	0.288	0.048	0.013	0.051	38	743
14	57.50	887	0.244	0.056	0.018	0.054	41	761
13	52.50	908	0.203	0.062	0.023	0.055	43	779
12	49.00	369	0.177	0.065	0.026	0.055	17	317
11	46.50	1,125	0.160	0.067	0.029	0.054	53	965
10	43.13	1,430	0.137	0.069	0.032	0.054	66	1,226
9	40.63	277	0.122	0.070	0.034	0.053	13	238
8	37.50	1,124	0.104	0.071	0.037	0.052	51	964
7	32.50	1,150	0.078	0.072	0.040	0.051	51	986
6	27.50	1,175	0.056	0.071	0.042	0.049	50	1,008
5	22.50	1,200	0.037	0.070	0.041	0.048	49	1,029
4	17.50	1,226	0.023	0.065	0.039	0.045	47	1,051
3	12.50	1,251	0.012	0.057	0.033	0.040	43	1,073
2	7.50	1,276	0.004	0.042	0.024	0.031	34	1,094
1	2.50	1,302	0.000	0.017	0.009	0.014	15	1,116
Raycap DC6-48-60-18-	156.00	80	1.797	1.523	0.972	0.341	24	69
Ericsson RRUS A2 B2	156.00	66	1.797	1.523	0.972	0.341	20	57
Ericsson RRUS 11 (Ba	156.00	330	1.797	1.523	0.972	0.341	98	283

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Ericsson RRUS 32 B2	156.00	159	1.797	1.523	0.972	0.341	47	136
Ericsson RRUS	156.00	132	1.797	1.523	0.972	0.341	39	113
Ericsson RRUS-12 B2	156.00	174	1.797	1.523	0.972	0.341	51	149
CCI HPA-65R-BUU-H8	156.00	816	1.797	1.523	0.972	0.341	241	700
Round Platform w/ Ha	156.00	2,000	1.797	1.523	0.972	0.341	592	1,715
		30,721	38.917	18.309	14.129	4.915	2,063	26,345

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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	-36.55	-2.05	0.00	-248.72	0.00	248.72	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.055
5.00	-34.97	-2.02	0.00	-238.47	0.00	238.47	4,349.84	2,174.92	10,178.3	5,096.75	0.01	-0.01	0.055
10.00	-33.41	-1.99	0.00	-228.35	0.00	228.35	4,295.43	2,147.71	9,828.71	4,921.66	0.03	-0.02	0.054
15.00	-31.89	-1.95	0.00	-218.41	0.00	218.41	4,239.17	2,119.58	9,480.54	4,747.32	0.06	-0.04	0.054
20.00	-30.40	-1.90	0.00	-208.68	0.00	208.68	4,181.05	2,090.53	9,134.15	4,573.86	0.10	-0.05	0.053
25.00	-28.94	-1.86	0.00	-199.16	0.00	199.16	4,121.09	2,060.54	8,789.82	4,401.44	0.16	-0.06	0.052
30.00	-27.51	-1.81	0.00	-189.88	0.00	189.88	4,059.27	2,029.64	8,447.85	4,230.20	0.23	-0.07	0.052
35.00	-26.11	-1.77	0.00	-180.82	0.00	180.82	3,995.60	1,997.80	8,108.53	4,060.29	0.32	-0.09	0.051
40.00	-25.77	-1.76	0.00	-171.99	0.00	171.99	3,930.09	1,965.04	7,772.13	3,891.84	0.42	-0.10	0.051
41.25	-23.99	-1.69	0.00	-169.80	0.00	169.80	3,913.42	1,956.71	7,688.52	3,849.98	0.44	-0.11	0.050
45.00	-22.59	-1.64	0.00	-163.46	0.00	163.46	3,862.72	1,931.36	7,438.96	3,725.01	0.53	-0.12	0.050
48.00	-22.13	-1.62	0.00	-158.55	0.00	158.55	2,999.72	1,499.86	5,776.85	2,892.72	0.61	-0.13	0.062
50.00	-21.00	-1.58	0.00	-155.30	0.00	155.30	2,981.40	1,490.70	5,679.83	2,844.14	0.66	-0.13	0.062
55.00	-19.90	-1.54	0.00	-147.40	0.00	147.40	2,934.30	1,467.15	5,438.21	2,723.15	0.81	-0.15	0.061
60.00	-18.83	-1.51	0.00	-139.68	0.00	139.68	2,885.34	1,442.67	5,198.13	2,602.93	0.97	-0.17	0.060
65.00	-17.78	-1.48	0.00	-132.15	0.00	132.15	2,834.54	1,417.27	4,959.88	2,483.63	1.16	-0.18	0.059
70.00	-16.75	-1.45	0.00	-124.76	0.00	124.76	2,781.89	1,390.94	4,723.74	2,365.38	1.36	-0.20	0.059
75.00	-15.75	-1.44	0.00	-117.50	0.00	117.50	2,727.38	1,363.69	4,490.01	2,248.34	1.58	-0.22	0.058
80.00	-14.78	-1.43	0.00	-110.31	0.00	110.31	2,671.02	1,335.51	4,258.97	2,132.65	1.83	-0.24	0.057
85.00	-14.02	-1.43	0.00	-103.16	0.00	103.16	2,612.82	1,306.41	4,030.91	2,018.45	2.09	-0.26	0.056
89.00	-13.71	-1.44	0.00	-97.43	0.00	97.43	2,564.92	1,282.46	3,850.80	1,928.26	2.32	-0.28	0.056
90.00	-12.41	-1.45	0.00	-95.99	0.00	95.99	2,552.76	1,276.38	3,806.12	1,905.89	2.38	-0.29	0.055
94.25	-12.30	-1.45	0.00	-89.84	0.00	89.84	1,870.62	935.31	2,755.09	1,379.59	2.64	-0.30	0.072
95.00	-11.54	-1.47	0.00	-88.75	0.00	88.75	1,864.78	932.39	2,732.02	1,368.04	2.69	-0.31	0.071
100.00	-10.80	-1.49	0.00	-81.41	0.00	81.41	1,824.80	912.40	2,578.99	1,291.41	3.03	-0.33	0.069
105.00	-10.08	-1.51	0.00	-73.97	0.00	73.97	1,782.98	891.49	2,427.58	1,215.60	3.39	-0.36	0.067
110.00	-9.39	-1.52	0.00	-66.44	0.00	66.44	1,739.30	869.65	2,278.08	1,140.73	3.79	-0.39	0.064
115.00	-8.44	-1.53	0.00	-58.82	0.00	58.82	1,693.77	846.88	2,130.77	1,066.97	4.21	-0.42	0.060
119.50	-8.38	-1.54	0.00	-51.92	0.00	51.92	1,118.22	559.11	1,377.74	689.90	4.62	-0.44	0.083
120.00	-7.84	-1.53	0.00	-51.15	0.00	51.15	1,115.76	557.88	1,368.94	685.49	4.66	-0.44	0.082
125.00	-7.32	-1.52	0.00	-43.48	0.00	43.48	1,090.12	545.06	1,281.06	641.48	5.15	-0.48	0.075
130.00	-6.81	-1.50	0.00	-35.87	0.00	35.87	1,062.64	531.32	1,193.75	597.76	5.66	-0.51	0.066
135.00	-6.32	-1.46	0.00	-28.38	0.00	28.38	1,033.31	516.65	1,107.31	554.48	6.21	-0.54	0.057
140.00	-5.85	-1.40	0.00	-21.08	0.00	21.08	1,002.12	501.06	1,022.02	511.77	6.80	-0.57	0.047
145.00	-5.39	-1.33	0.00	-14.06	0.00	14.06	969.08	484.54	938.16	469.78	7.40	-0.59	0.035
150.00	-4.95	-1.24	0.00	-7.40	0.00	7.40	934.20	467.10	856.03	428.65	8.03	-0.60	0.023
155.00	-4.86	-1.22	0.00	-1.22	0.00	1.22	897.46	448.73	775.91	388.53	8.66	-0.61	0.009
156.00	0.00	0.00	0.00	0.00	0.00	0.00	889.89	444.94	760.16	380.64	8.79	-0.61	0.000
160.00	0.00	0.00	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	9.30	-0.61	0.000

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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	-25.23	-2.05	0.00	-246.18	0.00	246.18	4,402.40	2,201.20	10,529.2	5,272.45	0.00	0.00	0.052
5.00	-24.13	-2.02	0.00	-235.93	0.00	235.93	4,349.84	2,174.92	10,178.3	5,096.75	0.01	-0.01	0.052
10.00	-23.06	-1.98	0.00	-225.83	0.00	225.83	4,295.43	2,147.71	9,828.71	4,921.66	0.02	-0.02	0.051
15.00	-22.01	-1.94	0.00	-215.92	0.00	215.92	4,239.17	2,119.58	9,480.54	4,747.32	0.06	-0.04	0.051
20.00	-20.98	-1.89	0.00	-206.22	0.00	206.22	4,181.05	2,090.53	9,134.15	4,573.86	0.10	-0.05	0.050
25.00	-19.97	-1.85	0.00	-196.76	0.00	196.76	4,121.09	2,060.54	8,789.82	4,401.44	0.16	-0.06	0.050
30.00	-18.99	-1.80	0.00	-187.52	0.00	187.52	4,059.27	2,029.64	8,447.85	4,230.20	0.23	-0.07	0.049
35.00	-18.02	-1.75	0.00	-178.52	0.00	178.52	3,995.60	1,997.80	8,108.53	4,060.29	0.31	-0.09	0.048
40.00	-17.78	-1.74	0.00	-169.77	0.00	169.77	3,930.09	1,965.04	7,772.13	3,891.84	0.41	-0.10	0.048
41.25	-16.56	-1.67	0.00	-167.59	0.00	167.59	3,913.42	1,956.71	7,688.52	3,849.98	0.44	-0.10	0.048
45.00	-15.59	-1.62	0.00	-161.31	0.00	161.31	3,862.72	1,931.36	7,438.96	3,725.01	0.52	-0.12	0.047
48.00	-15.28	-1.61	0.00	-156.44	0.00	156.44	2,999.72	1,499.86	5,776.85	2,892.72	0.60	-0.12	0.059
50.00	-14.50	-1.56	0.00	-153.23	0.00	153.23	2,981.40	1,490.70	5,679.83	2,844.14	0.65	-0.13	0.059
55.00	-13.74	-1.53	0.00	-145.41	0.00	145.41	2,934.30	1,467.15	5,438.21	2,723.15	0.80	-0.15	0.058
60.00	-12.99	-1.49	0.00	-137.78	0.00	137.78	2,885.34	1,442.67	5,198.13	2,602.93	0.96	-0.16	0.057
65.00	-12.27	-1.46	0.00	-130.33	0.00	130.33	2,834.54	1,417.27	4,959.88	2,483.63	1.14	-0.18	0.057
70.00	-11.56	-1.43	0.00	-123.04	0.00	123.04	2,781.89	1,390.94	4,723.74	2,365.38	1.34	-0.20	0.056
75.00	-10.87	-1.42	0.00	-115.88	0.00	115.88	2,727.38	1,363.69	4,490.01	2,248.34	1.56	-0.22	0.056
80.00	-10.20	-1.41	0.00	-108.80	0.00	108.80	2,671.02	1,335.51	4,258.97	2,132.65	1.81	-0.24	0.055
85.00	-9.68	-1.41	0.00	-101.75	0.00	101.75	2,612.82	1,306.41	4,030.91	2,018.45	2.07	-0.26	0.054
89.00	-9.46	-1.41	0.00	-96.10	0.00	96.10	2,564.92	1,282.46	3,850.80	1,928.26	2.29	-0.28	0.054
90.00	-8.56	-1.43	0.00	-94.69	0.00	94.69	2,552.76	1,276.38	3,806.12	1,905.89	2.35	-0.28	0.053
94.25	-8.48	-1.43	0.00	-88.62	0.00	88.62	1,870.62	935.31	2,755.09	1,379.59	2.61	-0.30	0.069
95.00	-7.96	-1.45	0.00	-87.55	0.00	87.55	1,864.78	932.39	2,732.02	1,368.04	2.66	-0.30	0.068
100.00	-7.45	-1.47	0.00	-80.31	0.00	80.31	1,824.80	912.40	2,578.99	1,291.41	2.99	-0.33	0.066
105.00	-6.96	-1.49	0.00	-72.98	0.00	72.98	1,782.98	891.49	2,427.58	1,215.60	3.35	-0.36	0.064
110.00	-6.48	-1.50	0.00	-65.55	0.00	65.55	1,739.30	869.65	2,278.08	1,140.73	3.74	-0.38	0.061
115.00	-5.82	-1.51	0.00	-58.04	0.00	58.04	1,693.77	846.88	2,130.77	1,066.97	4.16	-0.41	0.058
119.50	-5.78	-1.52	0.00	-51.23	0.00	51.23	1,118.22	559.11	1,377.74	689.90	4.56	-0.44	0.079
120.00	-5.41	-1.51	0.00	-50.47	0.00	50.47	1,115.76	557.88	1,368.94	685.49	4.60	-0.44	0.078
125.00	-5.05	-1.50	0.00	-42.90	0.00	42.90	1,090.12	545.06	1,281.06	641.48	5.08	-0.47	0.072
130.00	-4.70	-1.48	0.00	-35.39	0.00	35.39	1,062.64	531.32	1,193.75	597.76	5.59	-0.50	0.064
135.00	-4.36	-1.44	0.00	-27.99	0.00	27.99	1,033.31	516.65	1,107.31	554.48	6.14	-0.53	0.055
140.00	-4.03	-1.39	0.00	-20.79	0.00	20.79	1,002.12	501.06	1,022.02	511.77	6.71	-0.56	0.045
145.00	-3.72	-1.31	0.00	-13.87	0.00	13.87	969.08	484.54	938.16	469.78	7.31	-0.58	0.033
150.00	-3.41	-1.22	0.00	-7.30	0.00	7.30	934.20	467.10	856.03	428.65	7.92	-0.60	0.021
155.00	-3.35	-1.20	0.00	-1.20	0.00	1.20	897.46	448.73	775.91	388.53	8.55	-0.60	0.007
156.00	0.00	0.00	0.00	0.00	0.00	0.00	889.89	444.94	760.16	380.64	8.68	-0.60	0.000
160.00	0.00	0.00	0.00	0.00	0.00	0.00	858.87	429.43	698.09	349.56	9.18	-0.60	0.000

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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	29.09	0.00	36.83	0.00	0.00	2694.66	119.50	0.53
0.9D + 1.6W	29.08	0.00	27.62	0.00	0.00	2675.13	119.50	0.52
1.2D + 1.0Di + 1.0Wi	6.43	0.00	66.11	0.00	0.00	586.75	119.50	0.13
(1.2 + 0.2Sds) * DL + E ELFM	1.41	0.00	36.55	0.00	0.00	174.54	48.00	0.04
(1.2 + 0.2Sds) * DL + E EMAM	2.05	0.00	36.55	0.00	0.00	248.72	119.50	0.08
(0.9 - 0.2Sds) * DL + E ELFM	1.41	0.00	25.23	0.00	0.00	172.90	48.00	0.04
(0.9 - 0.2Sds) * DL + E EMAM	2.05	0.00	25.23	0.00	0.00	246.18	119.50	0.08
1.0D + 1.0W	7.56	0.00	30.72	0.00	0.00	698.10	119.50	0.14

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Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
3,550.00	40.00	30.00	2,694.66	66.11	29.09	56.23

Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
50.0	2.250	71.500	Round	0	0.00	13.262	280.61	755.33	0.37

Anchor Bolts

Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Start Angle (deg)	Compression Force (kip)	Compression Allow (kip)	Compression Ratio	Tension Force (kip)	Tension Allow (kip)	Tension Ratio
65.50	14	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	145.77	260.00	0.58	136.33	260.00	0.54