AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**181.9 ft Monopole**
ATC Site Name	:	**Harwinton, CT**
ATC Asset Number	:	**302502**
Engineering Number	:	**OAA752282_C3_01**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**Harwinton**
Carrier Site Number	:	**CTL01057**
Site Location	:	**159 Weingart Road** **Harwinton, CT 06791-1109** **41.787800,-73.092500**
County	:	**Litchfield**
Date	:	**September 26, 2019**
Max Usage	:	**98%**
Result	:	**Pass**

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32593
LICENSED
PROFESSIONAL ENGINEER

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 181.9 ft monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	Mapping by Smith Cullum Site #CT-0038, dated February 13, 2002
Foundation Drawing	Girard & Co. Engineers Job #3C237, dated April 24, 1990
Geotechnical Report	Johnson Soils Engineering Co. Report #14974-H, dated January 28, 2002
Modifications	Hutter Trunkina Engineering Project #03320B, dated August 4, 2003 ATC Project #42504234, dated February 27, 2009 ATC Job #OAA684307_C6_06, dated November 16, 2016
Inspection	Inspection by ATC for ATC Site #302502, dtaed July 10, 2013 No structural deficiencies were found.

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:	115 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Spectral Response:	Ss = 0.18, S_1 = 0.05
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
185.0	6	Powerwave Allgon LGP21401	Platform with Handrails w/ Side Arms	(5) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (12) 1 1/4" Coax (1) 3" conduit	AT&T MOBILITY
	3	Kaelus DBC0061F1V51-2			
	1	Raycap DC6-48-60-0-8F			
	1	Raycap DC6-48-60-18-8F ("Squid")			
	3	Ericsson RRUS 32 (50.8 lbs)			
	3	Powerwave Allgon 7770.00			
	3	Quintel QS66512-2			
175.0	3	Alcatel-Lucent B25 RRH4x30	Platform with Handrails	(6) 1 5/8" Coax (1) 1 5/8" Hybriflex	VERIZON WIRELESS
	3	Nokia B5 RRH4x40-850			
	3	Alcatel-Lucent B13 RRH4x30-4R			
	6	Antel LPA-80063/6CF			
	6	Commscope JAHH-65B-R3B			
	3	Nokia B66a RRH4x45 (UHIE)			
	1	RFS DB-B1-6C-12AB-0Z			
163.0	3	Ericsson AIR 21, 1.3 M, B2A B4P	Low Profile Platform	(1) 1 5/8" (1.63"-41.3mm) Fiber (6) 1 5/8" Coax (2) 0.26" (6.6mm) Cat 5e (1) 0.32" x 0.17" (8.1mm x 4.4mm) SST Drop Cable	METRO PCS INC
	3	Andrew LNX-6515DS-A1M			
	3	Ericsson AIR 21, 1.3M, B4A B2P (90.4 lbs)			
	1	Fastback Networks Intelligent Backhaul Radio 1300 Series			
145.0	3	KMW TTA (HB-X-WM-17-65-00T)	Flush	(6) 1 5/8" Coax	CLEARWIRE CORPORATION
	3	KMW HB-X-WM-17-65-00T			

Equipment to be Removed

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
185.0	6	Ericsson RRUS 11 (Band 12)	-	-	AT&T MOBILITY
	3	KMW AM-X-CD-16-65-00T-RET			
	3	Ericsson RRUS 12			

Proposed Equipment

Elev.[1] (ft)	Qty	Antenna	Mount Type	Lines	Carrier
185.0	1	Raycap DC6-48-60-0-8F	Platform with Handrails w/ Side Arms	(2) 0.78" (19.7mm) 8 AWG 6	AT&T MOBILITY
	3	Ericsson Radio 8843 - B2 + B66A			
	3	Ericsson RRUS 4449 B5, B12			
	1	Andrew SBNHH-1D65A			
	2	CCI HPA65R-BU6A			
	3	CCI DMP65R-BU6DA			

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

Install proposed coax inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	81%	Pass
Shaft	83%	Pass
Base Plate	24%	Pass
Reinforcement	98%	Pass
Flange	37%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3,772.8	80%
Axial (Kips)	65.6	90%
Shear (Kips)	29.6	94%

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

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
181.9	Raycap DC6-48-60-0-8F	AT&T MOBILITY	2.952	1.991
	Ericsson Radio 8843 - B2 + B66A			
	Ericsson RRUS 4449 B5, B12			
	Andrew SBNHH-1D65A			
	CCI HPA65R-BU6A			
	CCI DMP65R-BU6DA			

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

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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.

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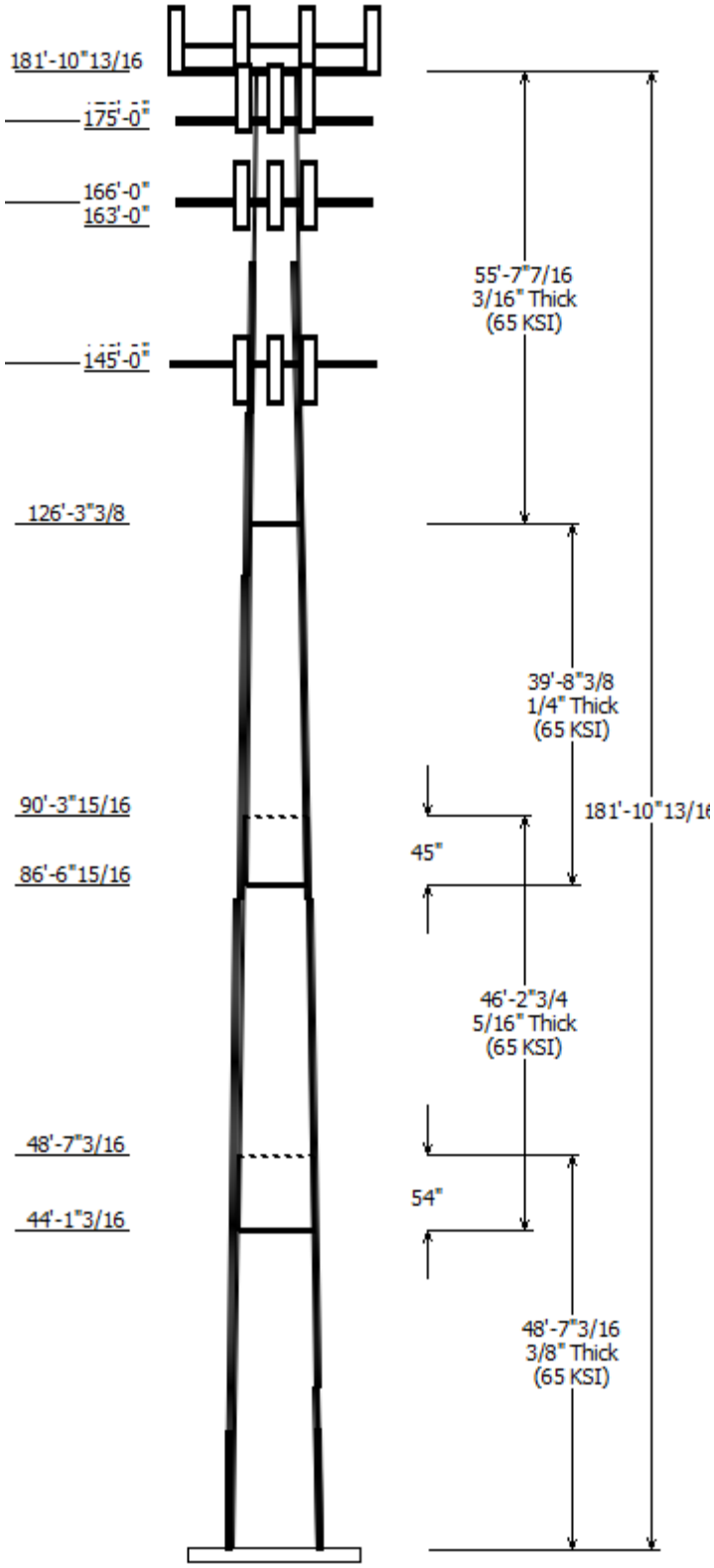


Job Information

Client : AT&T MOBILITY
Pole : 302502
Code: ANSI/TIA-222-H
Location : Harwinton, CT
Description : 182 ft Monopole
Risk Category : II
Shape : 12 Sides
Exposure : B
Height : 181.90 (ft)
Topo Method : Method 1
Base Elev (ft): 0.00
Topographic Category : 1
Taper: 0.162864 (in/ft)

Sections Properties

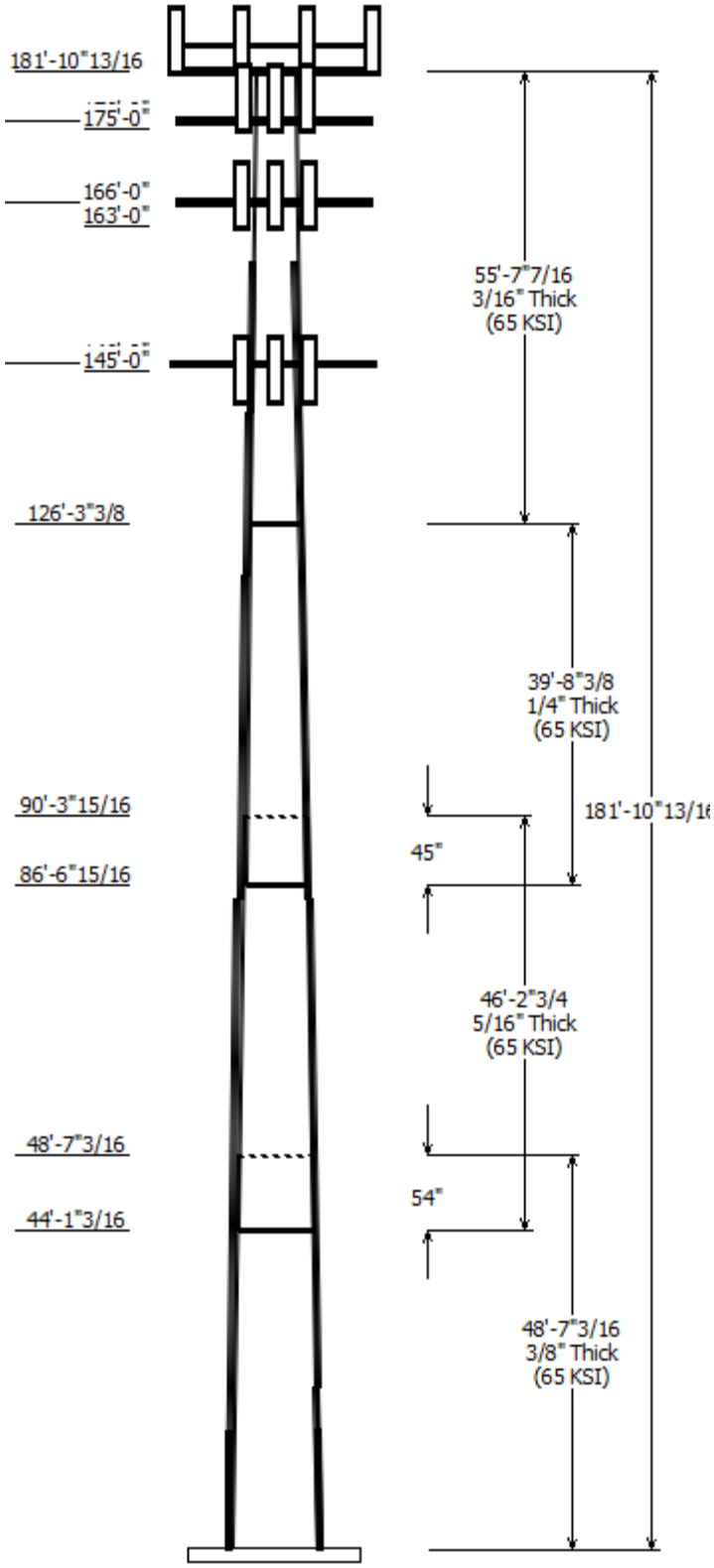
Shaft Section	Length (ft)	Diameter (in) Accross Flats Top	Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	48.600	35.08	43.00	0.375		0.000	12 Sides	65
2	46.230	28.91	36.44	0.313	Slip Joint	54.000	12 Sides	65
3	39.700	23.55	30.02	0.250	Slip Joint	45.000	12 Sides	65
4	55.620	14.50	23.55	0.188	Butt Joint	0.000	12 Sides	65

Discrete Appurtenance

Attach Elev (ft)	Force Elev (ft)	Qty	Description
181.900	185.000	1	Round Platform w/ Handrails
181.900	185.000	3	CCI DMP65R-BU6DA
181.900	185.000	3	Quintel QS66512-2
181.900	185.000	2	CCI HPA65R-BU6A
181.900	185.000	1	Andrew SBNHH-1D65A
181.900	185.000	3	Powerwave Allgon 7770.00
181.900	185.000	3	Ericsson RRUS 32 (50.8 lbs)
181.900	185.000	3	Ericsson RRUS 4449 B5, B12
181.900	185.000	3	Ericsson Radio 8843 - B2 + B66
181.900	185.000	1	Raycap DC6-48-60-18-8F
181.900	185.000	1	Raycap DC6-48-60-0-8F
181.900	185.000	1	Raycap DC6-48-60-0-8F
181.900	185.000	6	Powerwave Allgon LGP21401
181.900	185.000	3	Kaelus DBC0061F1V51-2
176.000	176.000	1	Flat Platform w/ Round Handrai
175.000	176.000	6	Antel LPA-80063/6CF
175.000	176.000	6	Commscope JAHH-65B-R3B
175.000	176.000	3	Nokia B66a RRH4x45 (UHIE)
175.000	176.000	1	RFS DB-B1-6C-12AB-0Z
175.000	176.000	3	Alcatel-Lucent B13 RRH4x30-4R
175.000	176.000	3	Alcatel-Lucent B25 RRH4x30
175.000	176.000	3	Nokia B5 RRH4x40-850
166.000	166.000	1	Round Low Profile Platform
163.000	163.000	1	Fastback Networks Intelligent
163.000	166.000	3	Andrew LNX-6515DS-A1M
163.000	166.000	3	Ericsson AIR 21, 1.3M, B4A B2P
163.000	166.000	3	Ericsson AIR 21, 1.3 M, B2A B4
146.000	146.000	3	Pipe
145.000	145.000	3	KMW HB-X-WM-17-65-00T
145.000	145.000	3	KMW TTA (HB-X-WM-17-65-00T)

Linear Appurtenance

Elev (ft) From	To	Description	Exposed To Wind
140.0	163.0	1 5/8" Coax	Yes
140.0	163.0	1 5/8" Coax	Yes
140.0	160.0	3" Solid Rod	Yes
140.0	160.0	3" Solid Rod	Yes
140.0	160.0	3" Solid Rod	Yes
120.0	140.0	3.5" Solid Rod	Yes
120.0	140.0	3.5" Solid Rod	Yes



120.0	140.0	3.5" Solid Rod	Yes
80.000	120.0	4.0" Solid Rod	Yes
80.000	120.0	4.0" Solid Rod	Yes
80.000	120.0	4.0" Solid Rod	Yes
5.000	145.0	1 5/8" Coax	No
0.000	19.500	#20Dywidag	Yes
0.000	19.500	#20Dywidag	Yes
0.000	19.500	#20Dywidag	Yes
0.000	80.000	4.25" Solid Rod	Yes
0.000	80.000	4.25" Solid Rod	Yes
0.000	80.000	4.25" Solid Rod	Yes
0.000	175.0	1 5/8" Coax	No
0.000	175.0	1 5/8" Hybriflex	No
0.000	185.0	0.39" (10mm)	No
0.000	185.0	0.78" (19.7mm) 8	No
0.000	185.0	0.78" (19.7mm) 8	No
0.000	185.0	1 1/4" Coax	No
0.000	185.0	3" conduit	No
0.000	163.0	0.26" (6.6mm) Cat	No
0.000	163.0	0.32" x 0.17"	No
0.000	163.0	1 5/8" (1.63"-	No
0.000	163.0	1 5/8" Coax	No

Load Cases

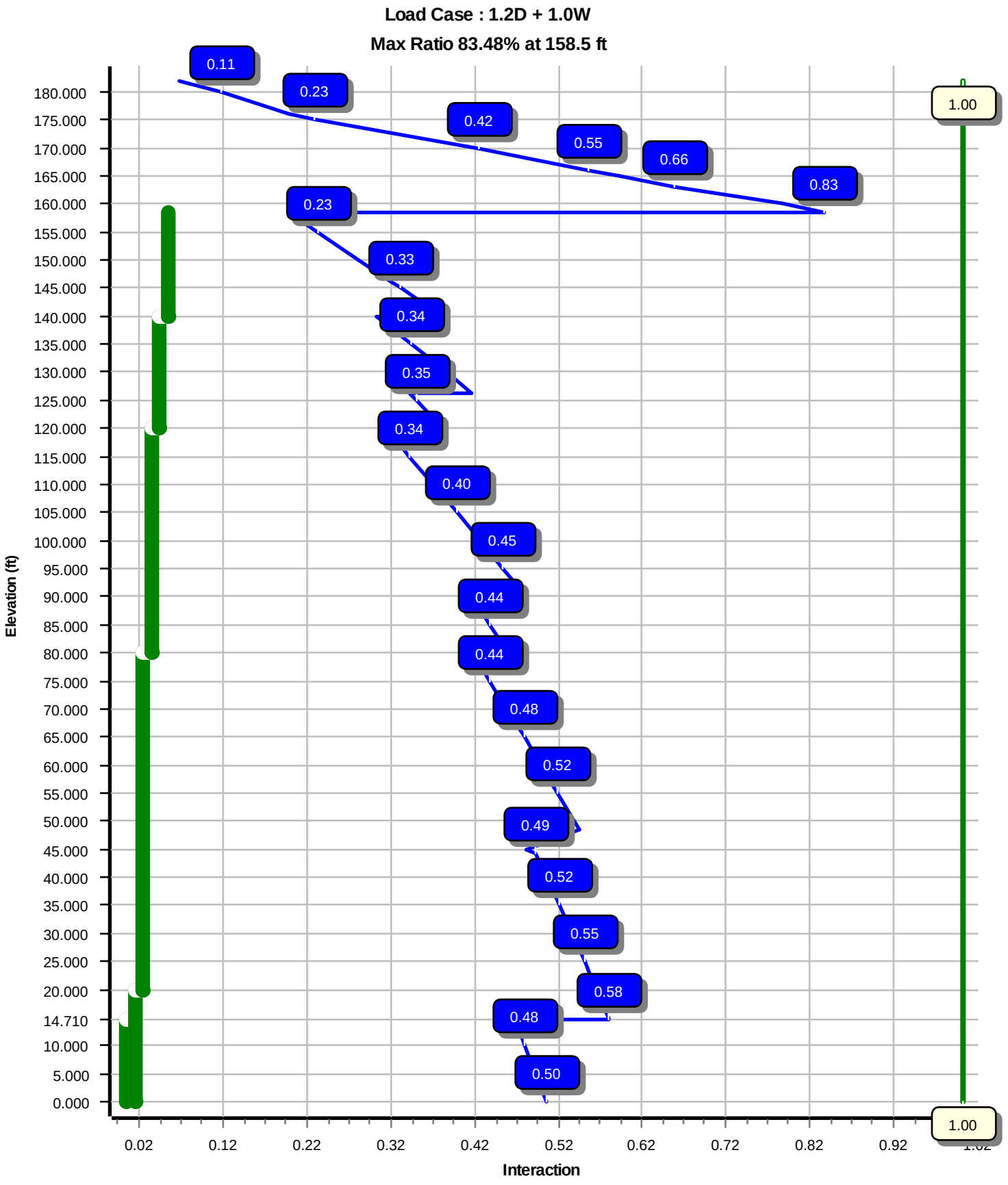
1.2D + 1.0W	115 mph with No Ice
0.9D + 1.0W	115 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 1.00 in Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	Serviceability 60 mph

Reactions

Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.0W	3772.77	29.55	65.56
0.9D + 1.0W	3699.67	29.52	49.16
1.2D + 1.0Di + 1.0Wi	944.13	6.67	81.09
1.2D + 1.0Ev + 1.0Eh	256.86	1.65	65.18
0.9D - 1.0Ev + 1.0Eh	250.49	1.64	45.42
1.0D + 1.0W	911.59	7.22	54.67

Dish Deflections

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


Load Case : 1.2D + 1.0W
Max Ratio 83.48% at 158.5 ft
Elevation (ft)
Interaction
0.11
0.23
0.42
0.55
0.66
0.83
0.23
0.33
0.34
0.35
0.34
0.40
0.45
0.44
0.44
0.48
0.52
0.49
0.52
0.55
0.58
0.48
0.50
1.00
1.00
180.000
175.000
170.000
165.000
160.000
155.000
150.000
145.000
140.000
135.000
130.000
125.000
120.000
115.000
110.000
105.000
100.000
95.000
90.000
85.000
80.000
75.000
70.000
65.000
60.000
55.000
50.000
45.000
40.000
35.000
30.000
25.000
20.000
14.710
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

Site Number: 302502	**Code: ANSI/TIA-222-H**	© 2007 - 2019 by ATC IP LLC. All rights reserved.
Site Name: Harwinton, CT	**Engineering Number:OAA752282_C3_01**	**9/26/2019 3:59:18 PM**
Customer: AT&T MOBILITY		

Analysis Parameters

Location :	**Litchfield County, CT**	**Height (ft) :**	**181.9**
Code :	**ANSI/TIA-222-H**	**Base Diameter (in) :**	**43.00**
Shape :	**12 Sides**	**Top Diameter (in) :**	**14.50**
Pole Type :	**Taper**	**Taper (in/ft) :**	**0.163**
Pole Manfacturer :	**Mapped**	**Rotation (deg) :**	**0.00**
Kd (non-service) :	**0.95**	**Ke :**	**0.96**

Ice & Wind Parameters

Exposure Category:	**B**	**Design Wind Speed Without Ice:**	**115 mph**
Risk Category:	**II**	**Design Wind Speed With Ice:**	**50 mph**
Topographic Factor Procedure:	**Method 1**	**Operational Wind Speed:**	**60 mph**
Topographic Category:	**1**	**Design Ice Thickness:**	**1.00 in**
Crest Height:	**0 ft**	**HMSL:**	**1049.00 ft**

Seismic Parameters

Analysis Method:	**Equivalent Lateral Force Method**
Site Class:	**D - Stiff Soil**
Period Based on Rayleigh Method (sec):	**3.32**

T_L (sec):	**6**	**p:**	**1**	**C_s:**	**0.030**
S_s:	**0.176**	**S_1:**	**0.054**	**C_s Max:**	**0.030**
F_a:	**1.600**	**F_v:**	**2.400**	**C_s Min:**	**0.030**
S_{ds}:	**0.188**	**S_{d1}:**	**0.086**		

Load Cases

1.2D + 1.0W	**115 mph with No Ice**
0.9D + 1.0W	**115 mph with No Ice (Reduced DL)**
1.2D + 1.0Di + 1.0Wi	**50 mph with 1.00 in Radial Ice**
1.2D + 1.0Ev + 1.0Eh	**Seismic**
0.9D - 1.0Ev + 1.0Eh	**Seismic (Reduced DL)**
1.0D + 1.0W	**Serviceability 60 mph**

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Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint Len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (ft)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-12	48.600	0.3750	65		0.00	7,722	43.00	0.00	51.47	11936.2	28.05	114.67	35.08	48.60	41.91	6445.1	22.39	93.56	0.162864
2-12	46.230	0.3125	65	Slip	54.00	5,123	36.44	44.10	36.36	6057.6	28.57	116.62	28.91	90.33	28.78	3004.9	22.11	92.52	0.162864
3-12	39.700	0.2500	65	Slip	45.00	2,886	30.02	86.58	23.97	2712.1	29.50	120.10	23.55	126.28	18.76	1301.1	22.57	94.23	0.162864
4-12	55.620	0.1875	65	Butt	0.00	2,153	23.55	126.28	14.11	983.7	30.99	125.65	14.50	181.90	8.64	225.9	18.04	77.33	0.162864
				Shaft Weight		17,884													

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
181.90	Kaelus DBC0061F1V51-2	3	0.75	3.100	25.50	0.430	0.50	38.08	0.734	0.50
181.90	Powerwave Allgon LGP21401	6	0.75	3.100	14.10	1.100	0.50	31.08	1.584	0.50
181.90	Raycap DC6-48-60-0-8F	1	0.75	3.100	32.80	1.360	0.50	72.37	1.811	0.50
181.90	Raycap DC6-48-60-0-8F	1	0.75	3.100	32.80	1.360	0.50	72.37	1.811	0.50
181.90	Raycap DC6-48-60-18-8F	1	0.75	3.100	31.80	1.470	0.50	73.80	1.945	0.50
181.90	Ericsson Radio 8843 - B2 + B66A	3	0.75	3.100	71.90	1.650	0.50	113.84	2.227	0.50
181.90	Ericsson RRUS 4449 B5, B12	3	0.75	3.100	71.00	1.970	0.50	114.87	2.605	0.50
181.90	Ericsson RRUS 32 (50.8 lbs)	3	0.75	3.100	50.80	2.690	0.50	99.48	3.476	0.50
181.90	Powerwave Allgon 7770.00	3	0.75	3.100	35.00	5.510	0.65	120.21	6.209	0.65
181.90	Andrew SBNHH-1D65A	1	0.75	3.100	40.90	5.880	0.69	133.16	7.333	0.69
181.90	CCI HPA65R-BU6A	2	0.75	3.100	41.90	7.860	0.70	161.19	9.739	0.70
181.90	Quintel QS66512-2	3	0.75	3.100	111.00	8.130	0.74	246.64	10.027	0.74
181.90	CCI DMP65R-BU6DA	3	0.75	3.100	79.40	12.710	0.63	254.74	14.609	0.63
181.90	Round Platform w/ Handrails	1	1.00	3.100	2,450.00	33.200	1.00	3,530.47	53.509	1.00
176.00	Flat Platform w/ Round Handrails	1	1.00	0.000	2,000.00	34.800	1.00	2,964.41	46.481	1.00
175.00	Nokia B5 RRH4x40-850	3	0.75	1.000	48.50	1.320	0.50	76.45	1.835	0.50
175.00	Alcatel-Lucent B25 RRH4x30	3	0.75	1.000	53.00	2.120	0.50	93.90	2.792	0.50
175.00	Alcatel-Lucent B13 RRH4x30-4R	3	0.75	1.000	57.80	2.140	0.50	104.53	2.817	0.50
175.00	RFS DB-B1-6C-12AB-0Z	1	0.75	1.000	21.40	2.510	0.50	75.47	3.215	0.50
175.00	Nokia B66a RRH4x45 (UHIE)	3	0.75	1.000	56.80	2.540	0.50	104.27	3.300	0.50
175.00	Commscope JAHH-65B-R3B	6	0.75	1.000	60.60	9.110	0.69	197.65	10.989	0.69
175.00	Antel LPA-80063/6CF	6	0.75	1.000	27.00	9.590	0.76	212.67	10.495	0.76
166.00	Round Low Profile Platform	1	1.00	0.000	1,500.00	21.700	1.00	1,937.09	34.652	1.00
163.00	Fastback Networks Intelligent	1	0.80	0.000	8.80	0.670	1.00	21.49	1.042	1.00
163.00	Ericsson AIR 21, 1.3 M, B2A B4P	3	0.80	3.000	83.00	6.050	0.71	181.22	7.505	0.71
163.00	Ericsson AIR 21, 1.3M, B4A B2P	3	0.80	3.000	90.40	6.090	0.70	188.39	7.546	0.70
163.00	Andrew LNX-6515DS-A1M	3	0.80	3.000	49.80	11.410	0.70	203.97	13.593	0.70
146.00	Pipe	3	1.00	0.000	40.00	1.630	0.67	71.42	2.386	0.67
145.00	KMW TTA (HB-X-WM-17-65-00T)	3	0.80	0.000	15.90	0.650	0.50	29.50	0.963	0.50
145.00	KMW HB-X-WM-17-65-00T	3	0.80	0.000	30.00	1.950	0.50	78.31	2.673	0.50
Totals	Num Loadings:30	80			9,721.90			18,210.91		

Linear Appurtenance Properties

Load Case Azimuth (deg) : 30

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	185.00	5	0.39" (10mm) Fiber	0.39	0.06	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	185.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	185.00	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	185.00	12	1 1/4" Coax	1.55	0.63	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	185.00	1	3" conduit	3.50	7.58	N	0	0.00	0.00	0	0.00	N	AT&T MOBILITY
0.00	175.00	6	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS

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0.00	175.00	1	1 5/8" Hybriflex	1.98	1.30	N	0	0.00	0.00	0	0.00	N	VERIZON WIRELESS
0.00	163.00	2	0.26" (6.6mm) Cat 5e	0.26	0.04	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	163.00	1	0.32" x 0.17" (8.1mm	0.32	0.02	N	0	0.00	0.00	0	0.00	N	T-MOBILE
0.00	163.00	1	1 5/8" (1.63"-41.3mm)	1.63	1.61	N	0	0.00	0.00	0	0.00	N	METRO PCS INC
0.00	163.00	6	1 5/8" Coax	1.98	0.82	N	0	0.00	0.00	0	0.00	N	METRO PCS INC
140.00	163.00	3	1 5/8" Coax	1.98	0.00	N	3	1.00	1.00	10	1.00	Y	
140.00	163.00	3	1 5/8" Coax	1.98	0.00	N	3	1.00	1.00	130	1.00	Y	
140.00	160.00	1	3" Solid Rod	4.30	0.00	N	1	0.00	0.00	0	0.00	Y	--
140.00	160.00	1	3" Solid Rod	4.30	0.00	N	1	0.00	0.00	120	0.00	Y	--
140.00	160.00	1	3" Solid Rod	4.30	0.00	N	1	0.00	0.00	240	0.00	Y	--
5.00	145.00	6	1 5/8" Coax	1.98	0.82	N	3	0.00	0.00	90	0.00	N	CLEARWIRE
120.00	140.00	1	3.5" Solid Rod	4.80	0.00	N	1	0.00	0.00	0	0.00	Y	--
120.00	140.00	1	3.5" Solid Rod	4.80	0.00	N	1	0.00	0.00	120	0.00	Y	--
120.00	140.00	1	3.5" Solid Rod	4.80	0.00	N	1	0.00	0.00	240	0.00	Y	--
80.00	120.00	1	4.0" Solid Rod	5.30	0.00	N	1	0.00	0.00	0	0.00	Y	--
80.00	120.00	1	4.0" Solid Rod	5.30	0.00	N	1	0.00	0.00	120	0.00	Y	--
80.00	120.00	1	4.0" Solid Rod	5.30	0.00	N	1	0.00	0.00	240	0.00	Y	--
0.00	80.00	1	4.25" Solid Rod	5.50	0.00	N	1	0.00	0.00	60	0.00	Y	--
0.00	80.00	1	4.25" Solid Rod	5.50	0.00	N	1	0.00	0.00	180	0.00	Y	--
0.00	80.00	1	4.25" Solid Rod	5.50	0.00	N	1	0.00	0.00	300	0.00	Y	--
0.00	19.50	1	#20Dywidag	4.00	0.00	N	1	0.00	0.00	0	0.00	Y	--
0.00	19.50	1	#20Dywidag	4.00	0.00	N	1	0.00	0.00	120	0.00	Y	--
0.00	19.50	1	#20Dywidag	4.00	0.00	N	1	0.00	0.00	240	0.00	Y	--

Additional Steel

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Intermediate Connections Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	14.71	3	SOL #20 All Thread	80	5.15	6" T Bracket	30.0	3.31	5/8" Hollo Bolt	No
0.00	20.00	3	SOL 4 1/4" SOLID	50	1.00	AJAX M20 Class	16.5	3.50	5/8" A36 U-Bolt	Yes
20.00	80.00	3	SOL 4 1/4" SOLID	50	1.00	AJAX M20 Class	22.0	3.50	5/8" Hollo Bolt	Yes
80.00	120.0	3	SOL 4" SOLID	50	0.88	AJAX M20 Class	22.0	3.50	5/8" Hollo Bolt	Yes
120.0	140.0	3	SOL 3 1/2" SOLID	50	1.13	AJAX M20 Class	22.0	3.50	5/8" Hollo Bolt	Yes
140.0	158.5	3	SOL 3" SOLID	50	1.38	AJAX M20 Class	22.0	3.50	5/8" Hollo Bolt	Yes

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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)	Additional Reinforcing Area (in^2)	Additional Reinforcing Ix (in^4)	Additional Reinforcing Weight (lb)
0.00		0.3750	43.000	51.470	11,936.2	28.05	114.67	74.1	536.3	0.0	0.0	57.28	18,69	0.0
5.00		0.3750	42.186	50.486	11,265.1	27.46	112.50	74.8	515.9	0.0	867.3	57.28	18,10	974.5
10.00		0.3750	41.371	49.503	10,619.6	26.88	110.32	75.4	495.9	0.0	850.6	57.28	17,52	974.5
14.71	Reinf. Top	0.3750	40.604	48.577	10,034.6	26.33	108.28	76.0	477.4	0.0	786.0	57.28	16,98	918.0
15.00		0.3750	40.557	48.520	9,999.3	26.30	108.15	76.0	476.3	0.0	47.9	42.55	11,70	42.0
20.00	Reinf. Top Reinf	0.3750	39.743	47.537	9,403.6	25.72	105.98	76.7	457.1	0.0	817.1	42.55	11,30	724.0
25.00		0.3750	38.928	46.553	8,832.0	25.14	103.81	77.3	438.3	0.0	800.4	42.55	10,90	724.0
30.00		0.3750	38.114	45.570	8,284.1	24.55	101.64	77.9	419.9	0.0	783.7	42.55	10,51	724.0
35.00		0.3750	37.300	44.587	7,759.4	23.97	99.47	78.6	401.9	0.0	767.0	42.55	10,13	724.0
40.00		0.3750	36.485	43.603	7,257.2	23.39	97.29	79.2	384.3	0.0	750.2	42.55	9,763	724.0
44.10	Bot - Section 2	0.3750	35.818	42.797	6,862.0	22.91	95.51	79.7	370.1	0.0	602.7	42.55	9,462	593.7
45.00		0.3750	35.671	42.620	6,777.3	22.81	95.12	79.8	367.0	0.0	241.9	42.55	9,677	130.3
48.60	Top - Section 1	0.3125	35.710	35.619	5,696.4	27.94	114.27	74.2	308.2	0.0	957.7	42.55	9,414	521.3
50.00		0.3125	35.482	35.389	5,587.1	27.74	113.54	74.5	304.2	0.0	169.1	42.55	9,312	202.7
55.00		0.3125	34.667	34.570	5,207.9	27.05	110.94	75.2	290.2	0.0	595.1	42.55	8,954	724.0
60.00		0.3125	33.853	33.750	4,846.3	26.35	108.33	76.0	276.6	0.0	581.2	42.55	8,603	724.0
65.00		0.3125	33.039	32.931	4,501.8	25.65	105.72	76.7	263.2	0.0	567.3	42.55	8,259	724.0
70.00		0.3125	32.225	32.111	4,174.0	24.95	103.12	77.5	250.2	0.0	553.3	42.55	7,922	724.0
75.00		0.3125	31.410	31.292	3,862.6	24.25	100.51	78.3	237.6	0.0	539.4	42.55	7,593	724.0
80.00	Reinf. Top Reinf	0.3125	30.596	30.473	3,567.0	23.55	97.91	79.0	225.2	0.0	525.4	42.55	7,270	724.0
85.00		0.3125	29.782	29.653	3,286.9	22.86	95.30	79.8	213.2	0.0	511.5	37.69	5,986	641.4
86.58	Bot - Section 3	0.3125	29.524	29.394	3,201.6	22.64	94.48	80.0	209.5	0.0	158.7	37.69	5,901	202.7
90.00		0.3125	28.967	28.834	3,021.9	22.16	92.70	80.5	201.5	0.0	615.1	37.69	5,882	438.7
90.33	Top - Section 2	0.2500	29.413	23.477	2,548.6	28.85	117.65	73.3	167.4	0.0	58.7	37.69	5,864	42.3
95.00		0.2500	28.653	22.864	2,354.3	28.03	114.61	74.1	158.7	0.0	368.2	37.69	5,614	599.1
100.0		0.2500	27.839	22.209	2,157.6	27.16	111.35	75.1	149.7	0.0	383.4	37.69	5,354	641.4
105.0		0.2500	27.024	21.553	1,972.1	26.29	108.10	76.0	141.0	0.0	372.3	37.69	5,099	641.4
110.0		0.2500	26.210	20.898	1,797.6	25.41	104.84	77.0	132.5	0.0	361.1	37.69	4,851	641.4
115.0		0.2500	25.396	20.242	1,633.7	24.54	101.58	78.0	124.3	0.0	350.0	37.69	4,608	641.4
120.0	Reinf. Top Reinf	0.2500	24.581	19.587	1,480.1	23.67	98.33	78.9	116.3	0.0	338.8	37.69	4,372	641.4
125.0		0.2500	23.767	18.931	1,336.4	22.79	95.07	79.9	108.6	0.0	327.7	28.86	3,165	491.1
126.2	Top - Section 3	0.2500	23.559	18.763	1,301.1	22.57	94.23	80.1	106.7	0.0	82.1	28.86	3,121	125.7
126.2	Bot - Section 4	0.1875	23.559	14.110	983.7	30.99	125.65	70.9	80.7	0.0		28.86	3,121	
130.0		0.1875	22.953	13.744	909.2	30.12	122.41	71.9	76.5	0.0	176.3	28.86	2,994	365.4
135.0		0.1875	22.138	13.253	815.1	28.96	118.07	73.1	71.1	0.0	229.7	28.86	2,828	491.1
140.0	Reinf. Top Reinf	0.1875	21.324	12.761	727.7	27.79	113.73	74.4	65.9	0.0	221.3	28.86	2,666	491.1
145.0		0.1875	20.510	12.270	646.8	26.63	109.39	75.7	60.9	0.0	212.9	21.20	1,839	360.8
146.0		0.1875	20.347	12.171	631.4	26.40	108.52	75.9	59.9	0.0	41.6	21.20	1,817	72.1
150.0		0.1875	19.695	11.778	572.1	25.47	105.04	76.9	56.1	0.0	163.0	21.20	1,728	288.6
155.0		0.1875	18.881	11.286	503.4	24.30	100.70	78.2	51.5	0.0	196.2	21.20	1,620	360.8
158.5	Reinf. Top	0.1875	18.311	10.942	458.7	23.49	97.66	79.1	48.4	0.0	132.4	21.20	1,546	252.5
160.0		0.1875	18.067	10.795	440.4	23.14	96.36	79.5	47.1	0.0	55.5			
163.0		0.1875	17.578	10.500	405.3	22.44	93.75	80.2	44.5	0.0	108.7			
165.0		0.1875	17.252	10.303	383.0	21.98	92.01	80.7	42.9	0.0	70.8			
166.0		0.1875	17.090	10.205	372.1	21.74	91.14	81.0	42.1	0.0	34.9			
170.0		0.1875	16.438	9.811	330.7	20.81	87.67	81.9	38.9	0.0	136.2			
175.0		0.1875	15.624	9.320	283.4	19.65	83.33	81.9	35.0	0.0	162.7			
176.0		0.1875	15.461	9.221	274.6	19.42	82.46	81.9	34.3	0.0	31.5			
180.0		0.1875	14.809	8.828	240.9	18.48	78.98	81.9	31.4	0.0	122.8			
181.9		0.1875	14.500	8.641	225.9	18.04	77.33	81.9	30.1	0.0	56.5			
											17,884.1			20,752.

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Load Case: 1.2D + 1.0W 115 mph with No Ice 28 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg 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		262.8	0.0					0.0	0.0	262.8	0.0	0.0	0.0
5.00		520.7	1,040.8					106.8	1,360.4	627.4	2,401.2	0.0	0.0
10.00		496.1	1,020.7					106.8	1,390.0	602.9	2,410.7	0.0	0.0
14.71	Reinf. Top	252.8	943.2					100.6	1,309.3	353.4	2,252.5	0.0	0.0
15.00		262.3	57.5					6.2	63.2	268.5	120.7	0.0	0.0
20.00	Reinf. Top Reinf	482.5	980.6					106.8	1,089.4	589.3	2,069.9	0.0	0.0
25.00		468.2	960.5					0.0	1,089.4	468.2	2,049.9	0.0	0.0
30.00		471.2	940.4					0.0	1,089.4	471.2	2,029.8	0.0	0.0
35.00		484.1	920.3					0.0	1,089.4	484.1	2,009.7	0.0	0.0
40.00		454.1	900.3					0.0	1,089.4	454.1	1,989.6	0.0	0.0
44.10	Bot - Section 2	254.8	723.2					0.0	893.3	254.8	1,616.5	0.0	0.0
45.00		237.6	290.3					0.0	196.1	237.6	486.4	0.0	0.0
48.60	Top - Section 1	264.5	1,149.2					0.0	784.3	264.5	1,933.6	0.0	0.0
50.00		342.2	203.0					0.0	305.0	342.2	508.0	0.0	0.0
55.00		542.1	714.2					0.0	1,089.4	542.1	1,803.5	0.0	0.0
60.00		553.1	697.4					0.0	1,089.4	553.1	1,786.8	0.0	0.0
65.00		563.3	680.7					0.0	1,089.4	563.3	1,770.1	0.0	0.0
70.00		572.8	664.0					0.0	1,089.4	572.8	1,753.3	0.0	0.0
75.00		581.7	647.2					0.0	1,089.4	581.7	1,736.6	0.0	0.0
80.00	Reinf. Top Reinf	581.0	630.5					0.0	1,089.4	581.0	1,719.9	0.0	0.0
85.00		379.7	613.8					0.0	990.2	379.7	1,604.0	0.0	0.0
86.58	Bot - Section 3	295.0	190.5					0.0	312.9	295.0	503.4	0.0	0.0
90.00		223.0	738.2					0.0	677.3	223.0	1,415.4	0.0	0.0
90.33	Top - Section 2	296.1	70.5					0.0	65.4	296.1	135.8	0.0	0.0
95.00		575.6	441.8					0.0	924.8	575.6	1,366.7	0.0	0.0
100.00		601.6	460.1					0.0	990.2	601.6	1,450.3	0.0	0.0
105.00		604.7	446.7					0.0	990.2	604.7	1,436.9	0.0	0.0
110.00		603.4	433.4					0.0	990.2	603.4	1,423.5	0.0	0.0
115.00		597.5	420.0					0.0	990.2	597.5	1,410.2	0.0	0.0
120.00	Reinf. Top Reinf	581.0	406.6					71.9	990.2	652.8	1,396.8	0.0	0.0
125.00		357.2	393.2					0.0	809.8	357.2	1,203.0	0.0	0.0
126.28	Top - Section 3	282.6	98.5					0.0	207.3	282.6	305.8	0.0	0.0
130.00		486.8	211.6					0.0	602.5	486.8	814.1	0.0	0.0
135.00		546.3	275.6					73.1	809.8	619.4	1,085.4	0.0	0.0
140.00	Reinf. Top Reinf	471.2	265.6					73.5	809.8	544.7	1,075.4	0.0	0.0
145.00	Appurtenance(s)	241.3	255.5	116.8	0.0	0.0	165.2	82.1	653.4	440.1	1,074.2	0.0	0.0
146.00	Appurtenance(s)	195.7	49.9	122.9	0.0	0.0	144.0	16.8	124.8	335.4	318.7	0.0	0.0
150.00		345.6	195.6					68.4	499.1	414.1	694.7	0.0	0.0
155.00		318.5	235.4					88.3	623.9	406.9	859.3	0.0	0.0
158.50	Reinf. Top	183.2	158.8					63.7	436.7	247.0	595.6	0.0	0.0
160.00		138.9	66.6					27.8	57.3	166.7	123.9	0.0	0.0
163.00	Appurtenance(s)	139.9	130.4	1,565.6	0.0	4,634.7	814.1	0.0	114.6	1,705.6	1,059.1	0.0	0.0
165.00		82.7	84.9					0.0	60.5	82.7	145.4	0.0	0.0
166.00	Appurtenance(s)	134.6	41.9	844.2	0.0	0.0	1,800.0	0.0	30.2	978.9	1,872.1	0.0	0.0
170.00		236.5	163.5					0.0	121.0	236.5	284.4	0.0	0.0
175.00	Appurtenance(s)	154.4	195.3	2,815.2	0.0	2,815.2	1,434.4	0.0	151.2	2,969.5	1,780.9	0.0	0.0
176.00	Appurtenance(s)	123.6	37.9	1,376.7	0.0	0.0	2,400.0	0.0	22.8	1,500.4	2,460.6	0.0	0.0
180.00		144.0	147.4					0.0	91.1	144.0	238.5	0.0	0.0

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Load Case: 1.2D + 1.0W 115 mph with No Ice 28 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.00

181.90	45.5	67.8	0.0	43.3	45.5	111.0	0.0	0.0
			Totals:		25,867.7	60,693.6	0.00	0.00

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Load Case: 1.2D + 1.0W 115 mph with No Ice 28 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-65.56	-29.55	0.00	-3,772.77	0.00	3,772.77	3,433.77	903.29	3,632.17	2,981.33	0.00	0.00	0.503
5.00	-63.07	-29.11	0.00	-3,625.03	0.00	3,625.03	3,397.00	886.04	3,494.75	2,892.57	0.09	-0.17	0.491
10.00	-60.58	-28.67	0.00	-3,479.51	0.00	3,479.51	3,359.11	868.78	3,359.99	2,804.10	0.37	-0.34	0.478
14.71	-58.29	-28.39	0.00	-3,344.48	0.00	3,344.48	3,322.40	852.52	3,235.46	2,721.09	0.79	-0.51	0.466
14.71	-58.29	-28.39	0.00	-3,344.48	0.00	3,344.48	3,322.40	852.52	3,235.46	2,721.09	0.79	-0.51	0.577
15.00	-58.11	-28.23	0.00	-3,336.25	0.00	3,336.25	3,320.10	851.52	3,227.87	2,715.99	0.82	-0.52	0.576
20.00	-55.94	-27.83	0.00	-3,195.10	0.00	3,195.10	3,279.97	834.27	3,098.41	2,628.28	1.48	-0.73	0.562
20.00	-55.94	-27.83	0.00	-3,195.10	0.00	3,195.10	3,279.97	834.27	3,098.41	2,628.28	1.48	-0.73	0.562
25.00	-53.80	-27.53	0.00	-3,055.96	0.00	3,055.96	3,238.71	817.01	2,971.60	2,541.03	2.36	-0.95	0.548
30.00	-51.68	-27.22	0.00	-2,918.30	0.00	2,918.30	3,196.33	799.75	2,847.43	2,454.30	3.46	-1.16	0.533
35.00	-49.58	-26.88	0.00	-2,782.22	0.00	2,782.22	3,152.83	782.50	2,725.91	2,368.14	4.79	-1.38	0.519
40.00	-47.51	-26.53	0.00	-2,647.83	0.00	2,647.83	3,108.20	765.24	2,607.05	2,282.62	6.35	-1.59	0.504
44.10	-45.85	-26.32	0.00	-2,539.05	0.00	2,539.05	3,070.77	751.09	2,511.56	2,213.00	7.80	-1.77	0.491
45.00	-45.33	-26.14	0.00	-2,515.36	0.00	2,515.36	3,062.45	747.98	2,490.83	2,197.78	8.13	-1.81	0.480
48.60	-43.36	-25.90	0.00	-2,421.25	0.00	2,421.25	2,379.97	625.11	2,087.36	1,715.94	9.56	-1.96	0.542
50.00	-42.80	-25.64	0.00	-2,384.99	0.00	2,384.99	2,371.43	621.08	2,060.56	1,698.68	10.14	-2.02	0.536
55.00	-40.92	-25.19	0.00	-2,256.79	0.00	2,256.79	2,340.22	606.70	1,966.27	1,637.16	12.38	-2.25	0.516
60.00	-39.06	-24.72	0.00	-2,130.83	0.00	2,130.83	2,307.88	592.32	1,874.19	1,575.92	14.85	-2.47	0.496
65.00	-37.23	-24.21	0.00	-2,007.26	0.00	2,007.26	2,274.42	577.94	1,784.32	1,515.02	17.55	-2.68	0.476
70.00	-35.41	-23.69	0.00	-1,886.19	0.00	1,886.19	2,239.83	563.56	1,696.65	1,454.51	20.48	-2.90	0.456
75.00	-33.62	-23.14	0.00	-1,767.74	0.00	1,767.74	2,204.12	549.18	1,611.20	1,394.44	23.63	-3.12	0.436
80.00	-31.86	-22.58	0.00	-1,652.02	0.00	1,652.02	2,167.29	534.79	1,527.95	1,334.88	27.01	-3.33	0.415
80.00	-31.86	-22.58	0.00	-1,652.02	0.00	1,652.02	2,167.29	534.79	1,527.95	1,334.88	27.01	-3.33	0.457
85.00	-30.22	-22.18	0.00	-1,539.10	0.00	1,539.10	2,129.34	520.41	1,446.91	1,275.87	30.61	-3.54	0.436
86.58	-29.70	-21.92	0.00	-1,504.05	0.00	1,504.05	2,117.11	515.87	1,421.76	1,257.35	31.79	-3.61	0.429
90.00	-28.27	-21.65	0.00	-1,429.10	0.00	1,429.10	2,090.26	506.03	1,368.08	1,217.49	34.43	-3.77	0.406
90.33	-28.11	-21.40	0.00	-1,421.95	0.00	1,421.95	1,547.78	412.01	1,133.49	919.64	34.69	-3.78	0.478
95.00	-26.70	-20.83	0.00	-1,322.03	0.00	1,322.03	1,525.71	401.27	1,075.16	882.69	38.50	-3.99	0.452
100.00	-25.22	-20.23	0.00	-1,217.88	0.00	1,217.88	1,500.99	389.76	1,014.41	843.28	42.79	-4.22	0.424
105.00	-23.76	-19.60	0.00	-1,116.75	0.00	1,116.75	1,475.16	378.26	955.42	804.08	47.33	-4.44	0.396
110.00	-22.32	-18.97	0.00	-1,018.73	0.00	1,018.73	1,448.19	366.76	898.21	765.15	52.08	-4.65	0.368
115.00	-20.90	-18.33	0.00	-923.87	0.00	923.87	1,420.11	355.25	842.76	726.55	57.06	-4.86	0.341
120.00	-19.50	-17.63	0.00	-832.20	0.00	832.20	1,390.90	343.75	789.08	688.34	62.26	-5.06	0.313
120.00	-19.50	-17.63	0.00	-832.20	0.00	832.20	1,390.90	343.75	789.08	688.34	62.26	-5.06	0.379
125.00	-18.30	-17.21	0.00	-744.05	0.00	744.05	1,360.57	332.24	737.16	650.56	67.65	-5.25	0.348
126.28	-17.99	-16.93	0.00	-722.03	0.00	722.03	1,352.62	329.30	724.16	640.97	69.07	-5.31	0.339
126.28	-17.99	-16.93	0.00	-722.03	0.00	722.03	900.61	247.63	545.93	429.06	69.07	-5.31	0.415
130.00	-17.17	-16.43	0.00	-659.04	0.00	659.04	888.95	241.22	518.00	412.44	73.27	-5.48	0.383
135.00	-16.09	-15.77	0.00	-576.89	0.00	576.89	872.29	232.59	481.62	390.12	79.12	-5.70	0.341
140.00	-15.02	-15.17	0.00	-498.04	0.00	498.04	854.50	223.96	446.56	367.87	85.19	-5.91	0.300
140.00	-15.02	-15.17	0.00	-498.04	0.00	498.04	854.50	223.96	446.56	367.87	85.19	-5.91	0.378
145.00	-13.97	-14.65	0.00	-422.19	0.00	422.19	835.60	215.33	412.82	345.75	91.48	-6.10	0.328
146.00	-13.66	-14.31	0.00	-407.54	0.00	407.54	831.68	213.60	406.23	341.34	92.76	-6.15	0.318

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Load Case: 1.2D + 1.0W 115 mph with No Ice 28 Iterations

Gust Response Factor :1.10
Dead Load Factor :1.20
Wind Load Factor :1.00

150.00	-12.97	-13.86	0.00	-350.30	0.00	350.30	815.57	206.70	380.41	323.81	97.98	-6.33	0.279
155.00	-12.12	-13.40	0.00	-280.98	0.00	280.98	794.42	198.07	349.32	302.12	104.71	-6.52	0.230
158.50	-11.54	-13.10	0.00	-234.09	0.00	234.09	778.94	192.03	328.35	287.12	109.52	-6.64	0.196
158.50	-11.54	-13.10	0.00	-234.09	0.00	234.09	778.94	192.03	328.35	287.12	109.52	-6.64	0.835
160.00	-11.39	-12.96	0.00	-214.44	0.00	214.44	772.14	189.44	319.56	280.73	111.62	-6.69	0.783
163.00	-10.48	-11.20	0.00	-170.91	0.00	170.91	758.24	184.27	302.34	268.07	115.93	-7.07	0.655
165.00	-10.32	-11.13	0.00	-148.52	0.00	148.52	748.74	180.82	291.13	259.70	118.94	-7.29	0.589
166.00	-8.54	-9.95	0.00	-137.39	0.00	137.39	743.93	179.09	285.60	255.54	120.47	-7.40	0.552
170.00	-8.23	-9.73	0.00	-97.58	0.00	97.58	723.19	172.19	264.01	238.74	126.81	-7.76	0.423
175.00	-6.86	-6.56	0.00	-46.11	0.00	46.11	686.95	163.56	238.23	215.28	135.10	-8.07	0.226
176.00	-4.63	-4.74	0.00	-39.54	0.00	39.54	679.70	161.83	233.23	210.73	136.79	-8.12	0.195
180.00	-4.41	-4.57	0.00	-20.59	0.00	20.59	650.71	154.93	213.76	193.04	143.62	-8.24	0.114
181.90	0.00	-3.89	0.00	-11.91	0.00	11.91	636.94	151.65	204.82	184.90	146.90	-8.28	0.065

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Load Case: 0.9D + 1.0W 115 mph with No Ice (Reduced DL) 28 Iterations

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

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg 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		262.8	0.0					0.0	0.0	262.8	0.0	0.0	0.0
5.00		520.7	780.6					106.8	1,020.3	627.4	1,800.9	0.0	0.0
10.00		496.1	765.5					106.8	1,042.5	602.9	1,808.0	0.0	0.0
14.71	Reinf. Top	252.8	707.4					100.6	982.0	353.4	1,689.4	0.0	0.0
15.00		262.3	43.1					6.2	47.4	268.5	90.5	0.0	0.0
20.00	Reinf. Top Reinf	482.5	735.4					106.8	817.0	589.3	1,552.5	0.0	0.0
25.00		468.2	720.4					0.0	817.0	468.2	1,537.4	0.0	0.0
30.00		471.2	705.3					0.0	817.0	471.2	1,522.3	0.0	0.0
35.00		484.1	690.3					0.0	817.0	484.1	1,507.3	0.0	0.0
40.00		454.1	675.2					0.0	817.0	454.1	1,492.2	0.0	0.0
44.10	Bot - Section 2	254.8	542.4					0.0	670.0	254.8	1,212.4	0.0	0.0
45.00		237.6	217.7					0.0	147.1	237.6	364.8	0.0	0.0
48.60	Top - Section 1	264.5	861.9					0.0	588.3	264.5	1,450.2	0.0	0.0
50.00		342.2	152.2					0.0	228.8	342.2	381.0	0.0	0.0
55.00		542.1	535.6					0.0	817.0	542.1	1,352.6	0.0	0.0
60.00		553.1	523.1					0.0	817.0	553.1	1,340.1	0.0	0.0
65.00		563.3	510.5					0.0	817.0	563.3	1,327.5	0.0	0.0
70.00		572.8	498.0					0.0	817.0	572.8	1,315.0	0.0	0.0
75.00		581.7	485.4					0.0	817.0	581.7	1,302.5	0.0	0.0
80.00	Reinf. Top Reinf	581.0	472.9					0.0	817.0	581.0	1,289.9	0.0	0.0
85.00		379.7	460.3					0.0	742.6	379.7	1,203.0	0.0	0.0
86.58	Bot - Section 3	295.0	142.9					0.0	234.7	295.0	377.5	0.0	0.0
90.00		223.0	553.6					0.0	508.0	223.0	1,061.6	0.0	0.0
90.33	Top - Section 2	296.1	52.9					0.0	49.0	296.1	101.9	0.0	0.0
95.00		575.6	331.4					0.0	693.6	575.6	1,025.0	0.0	0.0
100.00		601.6	345.1					0.0	742.6	601.6	1,087.7	0.0	0.0
105.00		604.7	335.1					0.0	742.6	604.7	1,077.7	0.0	0.0
110.00		603.4	325.0					0.0	742.6	603.4	1,067.7	0.0	0.0
115.00		597.5	315.0					0.0	742.6	597.5	1,057.6	0.0	0.0
120.00	Reinf. Top Reinf	581.0	304.9					71.9	742.6	652.8	1,047.6	0.0	0.0
125.00		357.2	294.9					0.0	607.4	357.2	902.3	0.0	0.0
126.28	Top - Section 3	282.6	73.9					0.0	155.5	282.6	229.4	0.0	0.0
130.00		486.8	158.7					0.0	451.9	486.8	610.5	0.0	0.0
135.00		546.3	206.7					73.1	607.4	619.4	814.1	0.0	0.0
140.00	Reinf. Top Reinf	471.2	199.2					73.5	607.4	544.7	806.5	0.0	0.0
145.00	Appurtenance(s)	241.3	191.6	116.8	0.0	0.0	123.9	82.1	490.0	440.1	805.6	0.0	0.0
146.00	Appurtenance(s)	195.7	37.4	122.9	0.0	0.0	108.0	16.8	93.6	335.4	239.0	0.0	0.0
150.00		345.6	146.7					68.4	374.3	414.1	521.0	0.0	0.0
155.00		318.5	176.6					88.3	467.9	406.9	644.5	0.0	0.0
158.50	Reinf. Top	183.2	119.1					63.7	327.5	247.0	446.7	0.0	0.0
160.00		138.9	49.9					27.8	43.0	166.7	92.9	0.0	0.0
163.00	Appurtenance(s)	139.9	97.8	1,565.6	0.0	4,634.7	610.6	0.0	85.9	1,705.6	794.3	0.0	0.0
165.00		82.7	63.7					0.0	45.4	82.7	109.1	0.0	0.0
166.00	Appurtenance(s)	134.6	31.4	844.2	0.0	0.0	1,350.0	0.0	22.7	978.9	1,404.1	0.0	0.0
170.00		236.5	122.6					0.0	90.7	236.5	213.3	0.0	0.0
175.00	Appurtenance(s)	154.4	146.5	2,815.2	0.0	2,815.2	1,075.8	0.0	113.4	2,969.5	1,335.6	0.0	0.0
176.00	Appurtenance(s)	123.6	28.4	1,376.7	0.0	0.0	1,800.0	0.0	17.1	1,500.4	1,845.5	0.0	0.0
180.00		144.0	110.6					0.0	68.3	144.0	178.9	0.0	0.0

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Load Case: 0.9D + 1.0W 115 mph with No Ice (Reduced DL) 28 Iterations

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

181.90	45.5	50.8	0.0	32.5	45.5	83.3	0.0	0.0
			Totals:		25,867.7	45,520.2	0.00	0.00

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Load Case: 0.9D + 1.0W 115 mph with No Ice (Reduced DL) 28 Iterations

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-49.16	-29.52	0.00	-3,699.67	0.00	3,699.67	3,433.77	903.29	3,632.17	2,981.33	0.00	0.00	0.491
5.00	-47.27	-29.03	0.00	-3,552.07	0.00	3,552.07	3,397.00	886.04	3,494.75	2,892.57	0.09	-0.17	0.479
10.00	-45.39	-28.55	0.00	-3,406.92	0.00	3,406.92	3,359.11	868.78	3,359.99	2,804.10	0.36	-0.34	0.466
14.71	-43.66	-28.25	0.00	-3,272.46	0.00	3,272.46	3,322.40	852.52	3,235.46	2,721.09	0.77	-0.50	0.454
14.71	-43.66	-28.25	0.00	-3,272.46	0.00	3,272.46	3,322.40	852.52	3,235.46	2,721.09	0.77	-0.50	0.563
15.00	-43.51	-28.06	0.00	-3,264.27	0.00	3,264.27	3,320.10	851.52	3,227.87	2,715.99	0.80	-0.51	0.562
20.00	-41.87	-27.61	0.00	-3,123.97	0.00	3,123.97	3,279.97	834.27	3,098.41	2,628.28	1.45	-0.72	0.548
20.00	-41.87	-27.61	0.00	-3,123.97	0.00	3,123.97	3,279.97	834.27	3,098.41	2,628.28	1.45	-0.72	0.548
25.00	-40.24	-27.27	0.00	-2,985.93	0.00	2,985.93	3,238.71	817.01	2,971.60	2,541.03	2.31	-0.93	0.533
30.00	-38.63	-26.91	0.00	-2,849.60	0.00	2,849.60	3,196.33	799.75	2,847.43	2,454.30	3.39	-1.14	0.519
35.00	-37.03	-26.53	0.00	-2,715.05	0.00	2,715.05	3,152.83	782.50	2,725.91	2,368.14	4.69	-1.35	0.504
40.00	-35.46	-26.16	0.00	-2,582.40	0.00	2,582.40	3,108.20	765.24	2,607.05	2,282.62	6.22	-1.56	0.489
44.10	-34.21	-25.93	0.00	-2,475.16	0.00	2,475.16	3,070.77	751.09	2,511.56	2,213.00	7.63	-1.73	0.477
45.00	-33.81	-25.74	0.00	-2,451.83	0.00	2,451.83	3,062.45	747.98	2,490.83	2,197.78	7.96	-1.77	0.466
48.60	-32.33	-25.48	0.00	-2,359.17	0.00	2,359.17	2,379.97	625.11	2,087.36	1,715.94	9.35	-1.92	0.526
50.00	-31.90	-25.21	0.00	-2,323.50	0.00	2,323.50	2,371.43	621.08	2,060.56	1,698.68	9.92	-1.98	0.521
55.00	-30.47	-24.73	0.00	-2,197.46	0.00	2,197.46	2,340.22	606.70	1,966.27	1,637.16	12.11	-2.19	0.501
60.00	-29.06	-24.23	0.00	-2,073.81	0.00	2,073.81	2,307.88	592.32	1,874.19	1,575.92	14.52	-2.41	0.481
65.00	-27.67	-23.71	0.00	-1,952.65	0.00	1,952.65	2,274.42	577.94	1,784.32	1,515.02	17.16	-2.62	0.462
70.00	-26.30	-23.18	0.00	-1,834.08	0.00	1,834.08	2,239.83	563.56	1,696.65	1,454.51	20.01	-2.83	0.442
75.00	-24.95	-22.62	0.00	-1,718.20	0.00	1,718.20	2,204.12	549.18	1,611.20	1,394.44	23.09	-3.04	0.422
80.00	-23.62	-22.05	0.00	-1,605.11	0.00	1,605.11	2,167.29	534.79	1,527.95	1,334.88	26.39	-3.25	0.402
80.00	-23.62	-22.05	0.00	-1,605.11	0.00	1,605.11	2,167.29	534.79	1,527.95	1,334.88	26.39	-3.25	0.443
85.00	-22.39	-21.66	0.00	-1,494.84	0.00	1,494.84	2,129.34	520.41	1,446.91	1,275.87	29.89	-3.45	0.422
86.58	-21.99	-21.38	0.00	-1,460.63	0.00	1,460.63	2,117.11	515.87	1,421.76	1,257.35	31.05	-3.52	0.415
90.00	-20.91	-21.12	0.00	-1,387.50	0.00	1,387.50	2,090.26	506.03	1,368.08	1,217.49	33.63	-3.67	0.393
90.33	-20.79	-20.86	0.00	-1,380.53	0.00	1,380.53	1,547.78	412.01	1,133.49	919.64	33.88	-3.69	0.462
95.00	-19.73	-20.29	0.00	-1,283.11	0.00	1,283.11	1,525.71	401.27	1,075.16	882.69	37.59	-3.89	0.437
100.00	-18.61	-19.69	0.00	-1,181.66	0.00	1,181.66	1,500.99	389.76	1,014.41	843.28	41.77	-4.11	0.410
105.00	-17.51	-19.07	0.00	-1,083.23	0.00	1,083.23	1,475.16	378.26	955.42	804.08	46.19	-4.32	0.383
110.00	-16.43	-18.44	0.00	-987.89	0.00	987.89	1,448.19	366.76	898.21	765.15	50.83	-4.53	0.356
115.00	-15.36	-17.82	0.00	-895.67	0.00	895.67	1,420.11	355.25	842.76	726.55	55.68	-4.73	0.329
120.00	-14.31	-17.12	0.00	-806.60	0.00	806.60	1,390.90	343.75	789.08	688.34	60.73	-4.93	0.302
120.00	-14.31	-17.12	0.00	-806.60	0.00	806.60	1,390.90	343.75	789.08	688.34	60.73	-4.93	0.366
125.00	-13.41	-16.72	0.00	-720.98	0.00	720.98	1,360.57	332.24	737.16	650.56	65.99	-5.11	0.335
126.28	-13.18	-16.44	0.00	-699.58	0.00	699.58	1,352.62	329.30	724.16	640.97	67.36	-5.17	0.327
126.28	-13.18	-16.44	0.00	-699.58	0.00	699.58	900.61	247.63	545.93	429.06	67.36	-5.17	0.400
130.00	-12.56	-15.94	0.00	-638.42	0.00	638.42	888.95	241.22	518.00	412.44	71.45	-5.33	0.369
135.00	-11.75	-15.29	0.00	-558.71	0.00	558.71	872.29	232.59	481.62	390.12	77.15	-5.55	0.329
140.00	-10.95	-14.71	0.00	-482.26	0.00	482.26	854.50	223.96	446.56	367.87	83.06	-5.75	0.289
140.00	-10.95	-14.71	0.00	-482.26	0.00	482.26	854.50	223.96	446.56	367.87	83.06	-5.75	0.365
145.00	-10.17	-14.21	0.00	-408.72	0.00	408.72	835.60	215.33	412.82	345.75	89.18	-5.94	0.316
146.00	-9.94	-13.87	0.00	-394.51	0.00	394.51	831.68	213.60	406.23	341.34	90.42	-5.98	0.307

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Load Case: 0.9D + 1.0W 115 mph with No Ice (Reduced DL) 28 Iterations

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

150.00	-9.42	-13.43	0.00	-339.04	0.00	339.04	815.57	206.70	380.41	323.81	95.50	-6.15	0.269
155.00	-8.79	-12.98	0.00	-271.88	0.00	271.88	794.42	198.07	349.32	302.12	102.04	-6.34	0.221
158.50	-8.36	-12.70	0.00	-226.45	0.00	226.45	778.94	192.03	328.35	287.12	106.73	-6.46	0.188
158.50	-8.36	-12.70	0.00	-226.45	0.00	226.45	778.94	192.03	328.35	287.12	106.73	-6.46	0.804
160.00	-8.24	-12.55	0.00	-207.41	0.00	207.41	772.14	189.44	319.56	280.73	108.76	-6.51	0.754
163.00	-7.59	-10.80	0.00	-165.12	0.00	165.12	758.24	184.27	302.34	268.07	112.96	-6.87	0.629
165.00	-7.47	-10.73	0.00	-143.52	0.00	143.52	748.74	180.82	291.13	259.70	115.88	-7.09	0.566
166.00	-6.16	-9.61	0.00	-132.79	0.00	132.79	743.93	179.09	285.60	255.54	117.37	-7.19	0.531
170.00	-5.92	-9.38	0.00	-94.36	0.00	94.36	723.19	172.19	264.01	238.74	123.54	-7.54	0.406
175.00	-4.98	-6.27	0.00	-44.64	0.00	44.64	686.95	163.56	238.23	215.28	131.59	-7.84	0.216
176.00	-3.35	-4.54	0.00	-38.37	0.00	38.37	679.70	161.83	233.23	210.73	133.23	-7.88	0.188
180.00	-3.19	-4.37	0.00	-20.22	0.00	20.22	650.71	154.93	213.76	193.04	139.87	-8.01	0.110
181.90	0.00	-3.89	0.00	-11.91	0.00	11.91	636.94	151.65	204.82	184.90	143.05	-8.04	0.065

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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 1.00 in Radial Ice 27 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg 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		52.2	0.0					0.0	0.0	52.2	0.0	0.0	0.0
5.00		103.9	1,255.8					0.0	1,433.2	103.9	2,689.0	0.0	0.0
10.00		99.8	1,256.6					0.0	1,471.8	99.8	2,728.5	0.0	0.0
14.71	Reinf. Top	51.0	1,172.7					0.0	1,390.8	51.0	2,563.5	0.0	0.0
15.00		53.3	71.9					0.0	68.3	53.3	140.2	0.0	0.0
20.00	Reinf. Top Reinf	98.4	1,227.9					0.0	1,175.3	98.4	2,403.2	0.0	0.0
25.00		95.2	1,209.2					0.0	1,142.1	95.2	2,351.3	0.0	0.0
30.00		94.5	1,189.1					0.0	1,143.3	94.5	2,332.3	0.0	0.0
35.00		95.7	1,168.0					0.0	1,144.2	95.7	2,312.2	0.0	0.0
40.00		88.5	1,146.2					0.0	1,145.1	88.5	2,291.3	0.0	0.0
44.10	Bot - Section 2	49.2	923.7					0.0	939.6	49.2	1,863.2	0.0	0.0
45.00		45.3	335.1					0.0	206.3	45.3	541.4	0.0	0.0
48.60	Top - Section 1	50.4	1,326.7					0.0	825.5	50.4	2,152.1	0.0	0.0
50.00		65.0	271.9					0.0	321.1	65.0	593.0	0.0	0.0
55.00		101.9	956.4					0.0	1,147.2	101.9	2,103.6	0.0	0.0
60.00		102.2	936.4					0.0	1,147.8	102.2	2,084.1	0.0	0.0
65.00		102.2	916.1					0.0	1,148.3	102.2	2,064.4	0.0	0.0
70.00		102.0	895.6					0.0	1,148.8	102.0	2,044.4	0.0	0.0
75.00		101.6	874.8					0.0	1,149.2	101.6	2,024.1	0.0	0.0
80.00	Reinf. Top Reinf	101.1	853.9					12.6	1,149.7	113.7	2,003.6	0.0	0.0
85.00		66.2	832.9					11.8	1,048.9	78.0	1,881.8	0.0	0.0
86.58	Bot - Section 3	50.5	259.4					5.0	331.5	55.5	590.9	0.0	0.0
90.00		38.0	887.5					12.5	717.8	50.5	1,605.3	0.0	0.0
90.33	Top - Section 2	50.3	84.9					1.3	69.3	51.6	154.2	0.0	0.0
95.00		96.6	641.4					18.5	980.4	115.1	1,621.7	0.0	0.0
100.00		98.8	669.0					23.6	1,050.0	122.4	1,719.0	0.0	0.0
105.00		97.5	650.8					27.0	1,050.3	124.5	1,701.1	0.0	0.0
110.00		96.1	632.5					30.0	1,050.6	126.0	1,683.1	0.0	0.0
115.00		94.5	614.1					32.6	1,050.9	127.1	1,665.0	0.0	0.0
120.00	Reinf. Top Reinf	92.9	595.6					35.0	1,051.2	127.9	1,646.8	0.0	0.0
125.00		57.7	577.0					30.3	865.9	87.9	1,442.9	0.0	0.0
126.28	Top - Section 3	45.1	145.3					8.2	221.7	53.3	367.0	0.0	0.0
130.00		77.7	344.4					24.6	644.5	102.3	988.9	0.0	0.0
135.00		87.4	448.8					35.0	866.4	122.4	1,315.2	0.0	0.0
140.00	Reinf. Top Reinf	86.2	433.3					37.0	866.6	123.2	1,300.0	0.0	0.0
145.00	Appurtenance(s)	51.5	417.8	30.9	0.0	0.0	249.1	32.6	794.4	115.0	1,461.3	0.0	0.0
146.00	Appurtenance(s)	42.3	82.2	34.0	0.0	0.0	197.6	6.8	153.0	83.1	432.8	0.0	0.0
150.00		75.2	321.0					27.9	612.3	103.2	933.3	0.0	0.0
155.00		70.0	386.6					104.7	765.7	174.7	1,152.3	0.0	0.0
158.50	Reinf. Top	40.6	261.9					74.9	536.3	115.5	798.2	0.0	0.0
160.00		34.9	110.3					32.5	100.0	67.3	210.3	0.0	0.0
163.00	Appurtenance(s)	37.7	215.7	361.3	0.0	1,065.7	1,423.5	42.0	168.7	441.1	1,807.9	0.0	0.0
165.00		22.3	140.9					0.0	60.5	22.3	201.4	0.0	0.0
166.00	Appurtenance(s)	36.5	69.6	254.9	0.0	0.0	1,937.1	0.0	30.2	291.3	2,037.0	0.0	0.0
170.00		64.3	270.7					0.0	121.0	64.3	391.7	0.0	0.0
175.00	Appurtenance(s)	42.1	323.5	623.0	0.0	623.0	3,336.5	0.0	151.2	665.1	3,811.2	0.0	0.0
176.00	Appurtenance(s)	34.0	63.3	347.6	0.0	0.0	2,914.4	0.0	22.8	381.6	3,000.5	0.0	0.0
180.00		39.6	245.3					0.0	91.1	39.6	336.4	0.0	0.0

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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 1.00 in Radial Ice 27 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

181.90	12.6	113.5	0.0	43.3	12.6	156.7	0.0	0.0
			Totals:		5,710.46	73,699.1	0.00	0.00

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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 1.00 in Radial Ice 27 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-81.09	-6.67	0.00	-944.13	0.00	944.13	3,433.77	903.29	3,632.17	2,981.33	0.00	0.00	0.135
5.00	-78.40	-6.63	0.00	-910.76	0.00	910.76	3,397.00	886.04	3,494.75	2,892.57	0.02	-0.04	0.132
10.00	-75.67	-6.58	0.00	-877.62	0.00	877.62	3,359.11	868.78	3,359.99	2,804.10	0.09	-0.09	0.129
14.71	-73.10	-6.55	0.00	-846.63	0.00	846.63	3,322.40	852.52	3,235.46	2,721.09	0.20	-0.13	0.126
14.71	-73.10	-6.55	0.00	-846.63	0.00	846.63	3,322.40	852.52	3,235.46	2,721.09	0.20	-0.13	0.155
15.00	-72.96	-6.54	0.00	-844.73	0.00	844.73	3,320.10	851.52	3,227.87	2,715.99	0.21	-0.13	0.155
20.00	-70.55	-6.50	0.00	-812.05	0.00	812.05	3,279.97	834.27	3,098.41	2,628.28	0.37	-0.18	0.152
20.00	-70.55	-6.50	0.00	-812.05	0.00	812.05	3,279.97	834.27	3,098.41	2,628.28	0.37	-0.18	0.152
25.00	-68.19	-6.46	0.00	-779.57	0.00	779.57	3,238.71	817.01	2,971.60	2,541.03	0.59	-0.24	0.148
30.00	-65.85	-6.42	0.00	-747.27	0.00	747.27	3,196.33	799.75	2,847.43	2,454.30	0.87	-0.29	0.145
35.00	-63.53	-6.37	0.00	-715.19	0.00	715.19	3,152.83	782.50	2,725.91	2,368.14	1.21	-0.35	0.141
40.00	-61.24	-6.32	0.00	-683.34	0.00	683.34	3,108.20	765.24	2,607.05	2,282.62	1.61	-0.40	0.138
44.10	-59.37	-6.29	0.00	-657.43	0.00	657.43	3,070.77	751.09	2,511.56	2,213.00	1.97	-0.45	0.135
45.00	-58.83	-6.26	0.00	-651.77	0.00	651.77	3,062.45	747.98	2,490.83	2,197.78	2.06	-0.46	0.132
48.60	-56.67	-6.22	0.00	-629.23	0.00	629.23	2,379.97	625.11	2,087.36	1,715.94	2.42	-0.50	0.149
50.00	-56.08	-6.19	0.00	-620.52	0.00	620.52	2,371.43	621.08	2,060.56	1,698.68	2.57	-0.52	0.148
55.00	-53.97	-6.12	0.00	-589.59	0.00	589.59	2,340.22	606.70	1,966.27	1,637.16	3.15	-0.57	0.143
60.00	-51.88	-6.05	0.00	-558.99	0.00	558.99	2,307.88	592.32	1,874.19	1,575.92	3.78	-0.63	0.138
65.00	-49.81	-5.97	0.00	-528.75	0.00	528.75	2,274.42	577.94	1,784.32	1,515.02	4.47	-0.69	0.133
70.00	-47.76	-5.89	0.00	-498.89	0.00	498.89	2,239.83	563.56	1,696.65	1,454.51	5.22	-0.75	0.128
75.00	-45.73	-5.81	0.00	-469.44	0.00	469.44	2,204.12	549.18	1,611.20	1,394.44	6.04	-0.80	0.122
80.00	-43.73	-5.71	0.00	-440.40	0.00	440.40	2,167.29	534.79	1,527.95	1,334.88	6.91	-0.86	0.117
80.00	-43.73	-5.71	0.00	-440.40	0.00	440.40	2,167.29	534.79	1,527.95	1,334.88	6.91	-0.86	0.129
85.00	-41.84	-5.63	0.00	-411.86	0.00	411.86	2,129.34	520.41	1,446.91	1,275.87	7.84	-0.92	0.123
86.58	-41.25	-5.59	0.00	-402.97	0.00	402.97	2,117.11	515.87	1,421.76	1,257.35	8.15	-0.94	0.121
90.00	-39.64	-5.52	0.00	-383.87	0.00	383.87	2,090.26	506.03	1,368.08	1,217.49	8.83	-0.98	0.115
90.33	-39.49	-5.49	0.00	-382.04	0.00	382.04	1,547.78	412.01	1,133.49	919.64	8.90	-0.98	0.136
95.00	-37.86	-5.39	0.00	-356.41	0.00	356.41	1,525.71	401.27	1,075.16	882.69	9.89	-1.04	0.129
100.00	-36.14	-5.27	0.00	-329.48	0.00	329.48	1,500.99	389.76	1,014.41	843.28	11.01	-1.10	0.121
105.00	-34.44	-5.15	0.00	-303.13	0.00	303.13	1,475.16	378.26	955.42	804.08	12.19	-1.16	0.114
110.00	-32.75	-5.02	0.00	-277.40	0.00	277.40	1,448.19	366.76	898.21	765.15	13.44	-1.22	0.106
115.00	-31.08	-4.89	0.00	-252.31	0.00	252.31	1,420.11	355.25	842.76	726.55	14.74	-1.27	0.099
120.00	-29.44	-4.75	0.00	-227.88	0.00	227.88	1,390.90	343.75	789.08	688.34	16.11	-1.33	0.091
120.00	-29.44	-4.75	0.00	-227.88	0.00	227.88	1,390.90	343.75	789.08	688.34	16.11	-1.33	0.110
125.00	-27.99	-4.64	0.00	-204.14	0.00	204.14	1,360.57	332.24	737.16	650.56	17.53	-1.38	0.101
126.28	-27.63	-4.60	0.00	-198.20	0.00	198.20	1,352.62	329.30	724.16	640.97	17.90	-1.40	0.099
126.28	-27.63	-4.60	0.00	-198.20	0.00	198.20	900.61	247.63	545.93	429.06	17.90	-1.40	0.121
130.00	-26.64	-4.49	0.00	-181.10	0.00	181.10	888.95	241.22	518.00	412.44	19.01	-1.44	0.112
135.00	-25.32	-4.36	0.00	-158.64	0.00	158.64	872.29	232.59	481.62	390.12	20.55	-1.50	0.100
140.00	-24.02	-4.23	0.00	-136.82	0.00	136.82	854.50	223.96	446.56	367.87	22.16	-1.56	0.089
140.00	-24.02	-4.23	0.00	-136.82	0.00	136.82	854.50	223.96	446.56	367.87	22.16	-1.56	0.112
145.00	-22.56	-4.09	0.00	-115.67	0.00	115.67	835.60	215.33	412.82	345.75	23.83	-1.61	0.097
146.00	-22.13	-4.00	0.00	-111.58	0.00	111.58	831.68	213.60	406.23	341.34	24.17	-1.63	0.094

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Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph with 1.00 in Radial Ice 27 Iterations

Gust Response Factor :1.10 Ice Dead Load Factor :1.00
Dead Load Factor :1.20 Ice Importance Factor :1.00
Wind Load Factor :1.00

150.00	-21.19	-3.89	0.00	-95.57	0.00	95.57	815.57	206.70	380.41	323.81	25.55	-1.68	0.083
155.00	-20.04	-3.70	0.00	-76.11	0.00	76.11	794.42	198.07	349.32	302.12	27.34	-1.73	0.069
158.50	-19.25	-3.57	0.00	-63.17	0.00	63.17	778.94	192.03	328.35	287.12	28.62	-1.76	0.059
158.50	-19.25	-3.57	0.00	-63.17	0.00	63.17	778.94	192.03	328.35	287.12	28.62	-1.76	0.245
160.00	-19.04	-3.51	0.00	-57.82	0.00	57.82	772.14	189.44	319.56	280.73	29.17	-1.77	0.231
163.00	-17.24	-3.04	0.00	-46.22	0.00	46.22	758.24	184.27	302.34	268.07	30.32	-1.88	0.195
165.00	-17.04	-3.02	0.00	-40.14	0.00	40.14	748.74	180.82	291.13	259.70	31.12	-1.94	0.178
166.00	-15.01	-2.68	0.00	-37.12	0.00	37.12	743.93	179.09	285.60	255.54	31.53	-1.97	0.166
170.00	-14.61	-2.62	0.00	-26.41	0.00	26.41	723.19	172.19	264.01	238.74	33.22	-2.06	0.131
175.00	-10.83	-1.83	0.00	-12.67	0.00	12.67	686.95	163.56	238.23	215.28	35.43	-2.15	0.075
176.00	-7.84	-1.34	0.00	-10.84	0.00	10.84	679.70	161.83	233.23	210.73	35.88	-2.16	0.063
180.00	-7.51	-1.29	0.00	-5.50	0.00	5.50	650.71	154.93	213.76	193.04	37.71	-2.19	0.040
181.90	0.00	-1.00	0.00	-3.05	0.00	3.05	636.94	151.65	204.82	184.90	38.58	-2.20	0.017

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Load Case: 1.0D + 1.0W Serviceability 60 mph 27 Iterations

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

Applied Segment Forces Summary

		Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
Seg 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		64.0	0.0					0.0	0.0	64.0	0.0	0.0	0.0
5.00		126.8	867.3					27.6	1,133.7	154.4	2,001.0	0.0	0.0
10.00		120.8	850.6					27.6	1,158.3	148.4	2,008.9	0.0	0.0
14.71	Reinf. Top	61.6	786.0					26.0	1,091.1	87.6	1,877.1	0.0	0.0
15.00		63.9	47.9					1.6	52.7	65.5	100.6	0.0	0.0
20.00	Reinf. Top Reinf	117.5	817.1					27.6	907.8	145.1	1,724.9	0.0	0.0
25.00		114.0	800.4					0.0	907.8	114.0	1,708.2	0.0	0.0
30.00		114.8	783.7					0.0	907.8	114.8	1,691.5	0.0	0.0
35.00		117.9	767.0					0.0	907.8	117.9	1,674.8	0.0	0.0
40.00		110.6	750.2					0.0	907.8	110.6	1,658.0	0.0	0.0
44.10	Bot - Section 2	62.1	602.7					0.0	744.4	62.1	1,347.1	0.0	0.0
45.00		57.9	241.9					0.0	163.4	57.9	405.3	0.0	0.0
48.60	Top - Section 1	64.4	957.7					0.0	653.6	64.4	1,611.3	0.0	0.0
50.00		83.3	169.1					0.0	254.2	83.3	423.3	0.0	0.0
55.00		132.0	595.1					0.0	907.8	132.0	1,502.9	0.0	0.0
60.00		134.7	581.2					0.0	907.8	134.7	1,489.0	0.0	0.0
65.00		137.2	567.3					0.0	907.8	137.2	1,475.1	0.0	0.0
70.00		139.5	553.3					0.0	907.8	139.5	1,461.1	0.0	0.0
75.00		141.7	539.4					0.0	907.8	141.7	1,447.2	0.0	0.0
80.00	Reinf. Top Reinf	141.5	525.4					0.0	907.8	141.5	1,433.2	0.0	0.0
85.00		92.5	511.5					0.0	825.1	92.5	1,336.6	0.0	0.0
86.58	Bot - Section 3	71.9	158.7					0.0	260.7	71.9	419.5	0.0	0.0
90.00		54.3	615.1					0.0	564.4	54.3	1,179.5	0.0	0.0
90.33	Top - Section 2	72.1	58.7					0.0	54.5	72.1	113.2	0.0	0.0
95.00		140.2	368.2					0.0	770.7	140.2	1,138.9	0.0	0.0
100.00		146.5	383.4					0.0	825.1	146.5	1,208.6	0.0	0.0
105.00		147.3	372.3					0.0	825.1	147.3	1,197.4	0.0	0.0
110.00		147.0	361.1					0.0	825.1	147.0	1,186.3	0.0	0.0
115.00		145.5	350.0					0.0	825.1	145.5	1,175.1	0.0	0.0
120.00	Reinf. Top Reinf	141.5	338.8					22.7	825.1	164.3	1,164.0	0.0	0.0
125.00		87.0	327.7					0.0	674.9	87.0	1,002.5	0.0	0.0
126.28	Top - Section 3	68.8	82.1					0.0	172.8	68.8	254.9	0.0	0.0
130.00		118.6	176.3					0.0	502.1	118.6	678.4	0.0	0.0
135.00		133.1	229.7					21.3	674.9	154.4	904.5	0.0	0.0
140.00	Reinf. Top Reinf	114.8	221.3					21.5	674.9	136.3	896.1	0.0	0.0
145.00	Appurtenance(s)	58.8	212.9	28.4	0.0	0.0	137.7	21.5	544.5	108.7	895.1	0.0	0.0
146.00	Appurtenance(s)	47.7	41.6	29.9	0.0	0.0	120.0	4.4	104.0	82.0	265.6	0.0	0.0
150.00		84.2	163.0					18.0	415.9	102.2	578.9	0.0	0.0
155.00		77.6	196.2					23.2	519.9	100.8	716.1	0.0	0.0
158.50	Reinf. Top	44.6	132.4					16.8	363.9	61.4	496.3	0.0	0.0
160.00		33.8	55.5					7.3	47.7	41.1	103.2	0.0	0.0
163.00	Appurtenance(s)	34.1	108.7	381.3	0.0	1,128.8	678.4	0.0	95.5	415.4	882.6	0.0	0.0
165.00		20.1	70.8					0.0	50.4	20.1	121.2	0.0	0.0
166.00	Appurtenance(s)	32.8	34.9	205.6	0.0	0.0	1,500.0	0.0	25.2	238.4	1,560.1	0.0	0.0
170.00		57.6	136.2					0.0	100.8	57.6	237.0	0.0	0.0
175.00	Appurtenance(s)	37.6	162.7	685.7	0.0	685.7	1,195.3	0.0	126.0	723.3	1,484.0	0.0	0.0
176.00	Appurtenance(s)	30.1	31.5	335.3	0.0	0.0	2,000.0	0.0	19.0	365.4	2,050.5	0.0	0.0
180.00		35.1	122.8					0.0	75.9	35.1	198.8	0.0	0.0

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Load Case: 1.0D + 1.0W Serviceability 60 mph 27 Iterations

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

181.90	11.1	56.5	0.0	36.1	11.1	92.5	0.0	0.0
			Totals:		6,325.69	50,578.0	0.00	0.00

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Load Case: 1.0D + 1.0W Serviceability 60 mph 27 Iterations

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

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-54.67	-7.22	0.00	-911.59	0.00	911.59	3,433.77	903.29	3,632.17	2,981.33	0.00	0.00	0.127
5.00	-52.66	-7.10	0.00	-875.51	0.00	875.51	3,397.00	886.04	3,494.75	2,892.57	0.02	-0.04	0.123
10.00	-50.65	-6.99	0.00	-840.01	0.00	840.01	3,359.11	868.78	3,359.99	2,804.10	0.09	-0.08	0.120
14.71	-48.77	-6.91	0.00	-807.11	0.00	807.11	3,322.40	852.52	3,235.46	2,721.09	0.19	-0.12	0.117
14.71	-48.77	-6.91	0.00	-807.11	0.00	807.11	3,322.40	852.52	3,235.46	2,721.09	0.19	-0.12	0.145
15.00	-48.66	-6.87	0.00	-805.10	0.00	805.10	3,320.10	851.52	3,227.87	2,715.99	0.20	-0.12	0.144
20.00	-46.93	-6.76	0.00	-770.76	0.00	770.76	3,279.97	834.27	3,098.41	2,628.28	0.36	-0.18	0.141
20.00	-46.93	-6.76	0.00	-770.76	0.00	770.76	3,279.97	834.27	3,098.41	2,628.28	0.36	-0.18	0.141
25.00	-45.22	-6.68	0.00	-736.95	0.00	736.95	3,238.71	817.01	2,971.60	2,541.03	0.57	-0.23	0.137
30.00	-43.52	-6.60	0.00	-703.53	0.00	703.53	3,196.33	799.75	2,847.43	2,454.30	0.84	-0.28	0.133
35.00	-41.84	-6.51	0.00	-670.53	0.00	670.53	3,152.83	782.50	2,725.91	2,368.14	1.16	-0.33	0.130
40.00	-40.18	-6.42	0.00	-637.98	0.00	637.98	3,108.20	765.24	2,607.05	2,282.62	1.53	-0.38	0.126
44.10	-38.83	-6.37	0.00	-611.64	0.00	611.64	3,070.77	751.09	2,511.56	2,213.00	1.88	-0.43	0.123
45.00	-38.42	-6.32	0.00	-605.91	0.00	605.91	3,062.45	747.98	2,490.83	2,197.78	1.96	-0.44	0.120
48.60	-36.81	-6.26	0.00	-583.14	0.00	583.14	2,379.97	625.11	2,087.36	1,715.94	2.31	-0.47	0.135
50.00	-36.38	-6.20	0.00	-574.37	0.00	574.37	2,371.43	621.08	2,060.56	1,698.68	2.45	-0.49	0.134
55.00	-34.87	-6.09	0.00	-543.38	0.00	543.38	2,340.22	606.70	1,966.27	1,637.16	2.99	-0.54	0.129
60.00	-33.38	-5.97	0.00	-512.95	0.00	512.95	2,307.88	592.32	1,874.19	1,575.92	3.58	-0.59	0.124
65.00	-31.90	-5.84	0.00	-483.12	0.00	483.12	2,274.42	577.94	1,784.32	1,515.02	4.23	-0.65	0.119
70.00	-30.44	-5.71	0.00	-453.91	0.00	453.91	2,239.83	563.56	1,696.65	1,454.51	4.94	-0.70	0.114
75.00	-28.99	-5.58	0.00	-425.34	0.00	425.34	2,204.12	549.18	1,611.20	1,394.44	5.70	-0.75	0.109
80.00	-27.55	-5.44	0.00	-397.44	0.00	397.44	2,167.29	534.79	1,527.95	1,334.88	6.51	-0.80	0.103
80.00	-27.55	-5.44	0.00	-397.44	0.00	397.44	2,167.29	534.79	1,527.95	1,334.88	6.51	-0.80	0.114
85.00	-26.21	-5.35	0.00	-370.23	0.00	370.23	2,129.34	520.41	1,446.91	1,275.87	7.38	-0.85	0.108
86.58	-25.79	-5.28	0.00	-361.78	0.00	361.78	2,117.11	515.87	1,421.76	1,257.35	7.67	-0.87	0.107
90.00	-24.61	-5.22	0.00	-343.72	0.00	343.72	2,090.26	506.03	1,368.08	1,217.49	8.30	-0.91	0.101
90.33	-24.50	-5.15	0.00	-342.00	0.00	342.00	1,547.78	412.01	1,133.49	919.64	8.37	-0.91	0.119
95.00	-23.36	-5.02	0.00	-317.92	0.00	317.92	1,525.71	401.27	1,075.16	882.69	9.28	-0.96	0.112
100.00	-22.15	-4.87	0.00	-292.84	0.00	292.84	1,500.99	389.76	1,014.41	843.28	10.32	-1.02	0.105
105.00	-20.95	-4.72	0.00	-268.48	0.00	268.48	1,475.16	378.26	955.42	804.08	11.41	-1.07	0.098
110.00	-19.76	-4.57	0.00	-244.88	0.00	244.88	1,448.19	366.76	898.21	765.15	12.56	-1.12	0.092
115.00	-18.58	-4.42	0.00	-222.03	0.00	222.03	1,420.11	355.25	842.76	726.55	13.76	-1.17	0.085
120.00	-17.42	-4.24	0.00	-199.95	0.00	199.95	1,390.90	343.75	789.08	688.34	15.01	-1.22	0.078
120.00	-17.42	-4.24	0.00	-199.95	0.00	199.95	1,390.90	343.75	789.08	688.34	15.01	-1.22	0.094
125.00	-16.42	-4.14	0.00	-178.75	0.00	178.75	1,360.57	332.24	737.16	650.56	16.31	-1.26	0.086
126.28	-16.16	-4.07	0.00	-173.44	0.00	173.44	1,352.62	329.30	724.16	640.97	16.65	-1.28	0.084
126.28	-16.16	-4.07	0.00	-173.44	0.00	173.44	900.61	247.63	545.93	429.06	16.65	-1.28	0.103
130.00	-15.48	-3.95	0.00	-158.29	0.00	158.29	888.95	241.22	518.00	412.44	17.67	-1.32	0.095
135.00	-14.58	-3.79	0.00	-138.52	0.00	138.52	872.29	232.59	481.62	390.12	19.08	-1.37	0.085
140.00	-13.68	-3.64	0.00	-119.56	0.00	119.56	854.50	223.96	446.56	367.87	20.54	-1.42	0.075
140.00	-13.68	-3.64	0.00	-119.56	0.00	119.56	854.50	223.96	446.56	367.87	20.54	-1.42	0.094
145.00	-12.79	-3.52	0.00	-101.34	0.00	101.34	835.60	215.33	412.82	345.75	22.06	-1.47	0.082
146.00	-12.53	-3.44	0.00	-97.82	0.00	97.82	831.68	213.60	406.23	341.34	22.37	-1.48	0.080

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Load Case: 1.0D + 1.0W Serviceability 60 mph 27 Iterations

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

150.00	-11.95	-3.33	0.00	-84.07	0.00	84.07	815.57	206.70	380.41	323.81	23.63	-1.52	0.070
155.00	-11.23	-3.22	0.00	-67.43	0.00	67.43	794.42	198.07	349.32	302.12	25.25	-1.57	0.058
158.50	-10.74	-3.14	0.00	-56.17	0.00	56.17	778.94	192.03	328.35	287.12	26.41	-1.60	0.050
158.50	-10.74	-3.14	0.00	-56.17	0.00	56.17	778.94	192.03	328.35	287.12	26.41	-1.60	0.210
160.00	-10.63	-3.11	0.00	-51.45	0.00	51.45	772.14	189.44	319.56	280.73	26.91	-1.61	0.197
163.00	-9.76	-2.68	0.00	-40.99	0.00	40.99	758.24	184.27	302.34	268.07	27.96	-1.70	0.166
165.00	-9.64	-2.66	0.00	-35.63	0.00	35.63	748.74	180.82	291.13	259.70	28.68	-1.75	0.150
166.00	-8.08	-2.39	0.00	-32.96	0.00	32.96	743.93	179.09	285.60	255.54	29.05	-1.78	0.140
170.00	-7.84	-2.33	0.00	-23.42	0.00	23.42	723.19	172.19	264.01	238.74	30.58	-1.87	0.109
175.00	-6.38	-1.56	0.00	-11.07	0.00	11.07	686.95	163.56	238.23	215.28	32.58	-1.94	0.061
176.00	-4.35	-1.13	0.00	-9.50	0.00	9.50	679.70	161.83	233.23	210.73	32.99	-1.95	0.052
180.00	-4.15	-1.09	0.00	-4.97	0.00	4.97	650.71	154.93	213.76	193.04	34.63	-1.98	0.032
181.90	0.00	-0.95	0.00	-2.90	0.00	2.90	636.94	151.65	204.82	184.90	35.43	-1.99	0.016

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Equivalent Lateral Forces Method Analysis

Spectral Response Acceleration for Short Period (S_S):	0.18
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.05
Long-Period Transition Period (T_L):	6
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}):	0.19
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.09
Seismic Response Coefficient (C_s):	0.03
Upper Limit C_s	0.03
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	3.32
Redundancy Factor (p):	1.00
Seismic Force Distribution Exponent (k):	2.00
Total Unfactored Dead Load:	54.67 k
Seismic Base Shear (E):	1.64 k

Load Case 1.2D + 1.0Ev + 1.0Eh **Seismic**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
48	180.95	93	3,030	0.005	8	115
47	178.00	199	6,297	0.010	17	246
46	175.50	51	1,556	0.003	4	63
45	172.50	289	8,592	0.014	23	357
44	168.00	237	6,690	0.011	18	293
43	165.50	60	1,646	0.003	4	74
42	164.00	121	3,259	0.005	9	150
41	161.50	204	5,325	0.009	14	253
40	159.25	103	2,618	0.004	7	128
39	156.75	496	12,194	0.020	33	614
38	152.50	716	16,654	0.027	44	886
37	148.00	579	12,680	0.021	34	716
36	145.50	146	3,082	0.005	8	180
35	142.50	757	15,381	0.025	41	937
34	137.50	896	16,943	0.028	45	1,109
33	132.50	905	15,880	0.026	42	1,119
32	128.14	678	11,139	0.018	30	840
31	125.64	255	4,023	0.007	11	315
30	122.50	1,003	15,044	0.024	40	1,241
29	117.50	1,164	16,070	0.026	43	1,440
28	112.50	1,175	14,873	0.024	40	1,454
27	107.50	1,186	13,709	0.022	37	1,468
26	102.50	1,197	12,581	0.020	34	1,482
25	97.50	1,209	11,489	0.019	31	1,496
24	92.67	1,139	9,779	0.016	26	1,409

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23	90.17	113	920	0.001	2	140
22	88.29	1,180	9,195	0.015	25	1,460
21	85.79	419	3,087	0.005	8	519
20	82.50	1,337	9,097	0.015	24	1,654
19	77.50	1,433	8,608	0.014	23	1,774
18	72.50	1,447	7,607	0.012	20	1,791
17	67.50	1,461	6,657	0.011	18	1,808
16	62.50	1,475	5,762	0.009	15	1,825
15	57.50	1,489	4,923	0.008	13	1,843
14	52.50	1,503	4,142	0.007	11	1,860
13	49.30	423	1,029	0.002	3	524
12	46.80	1,611	3,529	0.006	9	1,994
11	44.55	405	804	0.001	2	502
10	42.05	1,347	2,382	0.004	6	1,667
9	37.50	1,658	2,332	0.004	6	2,052
8	32.50	1,675	1,769	0.003	5	2,073
7	27.50	1,691	1,279	0.002	3	2,093
6	22.50	1,708	865	0.001	2	2,114
5	17.50	1,725	528	0.001	1	2,135
4	14.85	101	22	0.000	0	124
3	12.35	1,877	287	0.000	1	2,323
2	7.50	2,009	113	0.000	0	2,486
1	2.50	2,001	13	0.000	0	2,476
Kaelus DBC0061F1V51-	181.90	76	2,531	0.004	7	95
Powerwave Allgon LGP	181.90	85	2,799	0.005	7	105
Raycap DC6-48-60-0-8	181.90	33	1,085	0.002	3	41
Raycap DC6-48-60-0-8	181.90	33	1,085	0.002	3	41
Raycap DC6-48-60-18-	181.90	32	1,052	0.002	3	39
Ericsson Radio 8843	181.90	216	7,137	0.012	19	267
Ericsson RRUS 4449 B	181.90	213	7,048	0.011	19	264
Ericsson RRUS 32 (50	181.90	152	5,043	0.008	13	189
Powerwave Allgon 777	181.90	105	3,474	0.006	9	130
Andrew SBNHH-1D65A	181.90	41	1,353	0.002	4	51
CCI HPA65R-BU6A	181.90	84	2,773	0.005	7	104
Quintel QS66512-2	181.90	333	11,018	0.018	29	412
CCI DMP65R-BU6DA	181.90	238	7,881	0.013	21	295
Round Platform w/ Ha	181.90	2,450	81,065	0.132	216	3,032
Flat Platform w/ Rou	176.00	2,000	61,952	0.101	165	2,475
Nokia B5 RRH4x40-850	175.00	146	4,456	0.007	12	180
Alcatel-Lucent B25 R	175.00	159	4,869	0.008	13	197
Alcatel-Lucent B13 R	175.00	173	5,310	0.009	14	215
RFS DB-B1-6C-12AB-0Z	175.00	21	655	0.001	2	26
Nokia B66a RRH4x45 (	175.00	170	5,219	0.008	14	211
Commscope JAHH-65B-R	175.00	364	11,135	0.018	30	450
Antel LPA-80063/6CF	175.00	162	4,961	0.008	13	200
Round Low Profile Pl	166.00	1,500	41,334	0.067	110	1,856
Fastback Networks In	163.00	9	234	0.000	1	11
Ericsson AIR 21, 1.3	163.00	249	6,616	0.011	18	308
Ericsson AIR 21, 1.3	163.00	271	7,206	0.012	19	336
Andrew LNX-6515DS-A1	163.00	149	3,969	0.006	11	185
Pipe	146.00	120	2,558	0.004	7	149
KMW TTA (HB-X-WM-17-	145.00	48	1,003	0.002	3	59
KMW HB-X-WM-17-65-00	145.00	90	1,892	0.003	5	111
		54,669	614,199	1.000	1,640	67,655

Load Case 0.9D - 1.0Ev + 1.0Eh **Seismic (Reduced DL)**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
48	180.95	93	3,030	0.005	8	80
47	178.00	199	6,297	0.010	17	171

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46	175.50	51	1,556	0.003	4	44
45	172.50	289	8,592	0.014	23	249
44	168.00	237	6,690	0.011	18	204
43	165.50	60	1,646	0.003	4	52
42	164.00	121	3,259	0.005	9	105
41	161.50	204	5,325	0.009	14	176
40	159.25	103	2,618	0.004	7	89
39	156.75	496	12,194	0.020	33	428
38	152.50	716	16,654	0.027	44	618
37	148.00	579	12,680	0.021	34	499
36	145.50	146	3,082	0.005	8	126
35	142.50	757	15,381	0.025	41	653
34	137.50	896	16,943	0.028	45	773
33	132.50	905	15,880	0.026	42	780
32	128.14	678	11,139	0.018	30	585
31	125.64	255	4,023	0.007	11	220
30	122.50	1,003	15,044	0.024	40	865
29	117.50	1,164	16,070	0.026	43	1,004
28	112.50	1,175	14,873	0.024	40	1,013
27	107.50	1,186	13,709	0.022	37	1,023
26	102.50	1,197	12,581	0.020	34	1,033
25	97.50	1,209	11,489	0.019	31	1,042
24	92.67	1,139	9,779	0.016	26	982
23	90.17	113	920	0.001	2	98
22	88.29	1,180	9,195	0.015	25	1,017
21	85.79	419	3,087	0.005	8	362
20	82.50	1,337	9,097	0.015	24	1,153
19	77.50	1,433	8,608	0.014	23	1,236
18	72.50	1,447	7,607	0.012	20	1,248
17	67.50	1,461	6,657	0.011	18	1,260
16	62.50	1,475	5,762	0.009	15	1,272
15	57.50	1,489	4,923	0.008	13	1,284
14	52.50	1,503	4,142	0.007	11	1,296
13	49.30	423	1,029	0.002	3	365
12	46.80	1,611	3,529	0.006	9	1,390
11	44.55	405	804	0.001	2	350
10	42.05	1,347	2,382	0.004	6	1,162
9	37.50	1,658	2,332	0.004	6	1,430
8	32.50	1,675	1,769	0.003	5	1,444
7	27.50	1,691	1,279	0.002	3	1,459
6	22.50	1,708	865	0.001	2	1,473
5	17.50	1,725	528	0.001	1	1,488
4	14.85	101	22	0.000	0	87
3	12.35	1,877	287	0.000	1	1,619
2	7.50	2,009	113	0.000	0	1,733
1	2.50	2,001	13	0.000	0	1,726
Kaelus DBC0061F1V51-	181.90	76	2,531	0.004	7	66
Powerwave Allgon LGP	181.90	85	2,799	0.005	7	73
Raycap DC6-48-60-0-8	181.90	33	1,085	0.002	3	28
Raycap DC6-48-60-0-8	181.90	33	1,085	0.002	3	28
Raycap DC6-48-60-18-	181.90	32	1,052	0.002	3	27
Ericsson Radio 8843	181.90	216	7,137	0.012	19	186
Ericsson RRUS 4449 B	181.90	213	7,048	0.011	19	184
Ericsson RRUS 32 (50	181.90	152	5,043	0.008	13	131
Powerwave Allgon 777	181.90	105	3,474	0.006	9	91
Andrew SBNHH-1D65A	181.90	41	1,353	0.002	4	35
CCI HPA65R-BU6A	181.90	84	2,773	0.005	7	72
Quintel QS66512-2	181.90	333	11,018	0.018	29	287
CCI DMP65R-BU6DA	181.90	238	7,881	0.013	21	205
Round Platform w/ Ha	181.90	2,450	81,065	0.132	216	2,113
Flat Platform w/ Rou	176.00	2,000	61,952	0.101	165	1,725
Nokia B5 RRH4x40-850	175.00	146	4,456	0.007	12	125
Alcatel-Lucent B25 R	175.00	159	4,869	0.008	13	137
Alcatel-Lucent B13 R	175.00	173	5,310	0.009	14	150

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RFS DB-B1-6C-12AB-0Z	175.00	21	655	0.001	2	18
Nokia B66a RRH4x45 (	175.00	170	5,219	0.008	14	147
Commscope JAHH-65B-R	175.00	364	11,135	0.018	30	314
Antel LPA-80063/6CF	175.00	162	4,961	0.008	13	140
Round Low Profile Pl	166.00	1,500	41,334	0.067	110	1,294
Fastback Networks In	163.00	9	234	0.000	1	8
Ericsson AIR 21, 1.3	163.00	249	6,616	0.011	18	215
Ericsson AIR 21, 1.3	163.00	271	7,206	0.012	19	234
Andrew LNX-6515DS-A1	163.00	149	3,969	0.006	11	129
Pipe	146.00	120	2,558	0.004	7	103
KMW TTA (HB-X-WM-17-	145.00	48	1,003	0.002	3	41
KMW HB-X-WM-17-65-00	145.00	90	1,892	0.003	5	78
		54,669	614,199	1.000	1,640	47,149

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Load Case 1.2D + 1.0Ev + 1.0Eh **Seismic**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-65.18	-1.65	0.00	-256.86	0.00	256.86	3,433.77	903.29	3,632.17	2,981.33	0.00	0.00	0.043
5.00	-62.69	-1.66	0.00	-248.63	0.00	248.63	3,397.00	886.04	3,494.75	2,892.57	0.01	-0.01	0.042
10.00	-60.37	-1.67	0.00	-240.34	0.00	240.34	3,359.11	868.78	3,359.99	2,804.10	0.02	-0.02	0.041
14.71	-60.24	-1.68	0.00	-232.48	0.00	232.48	3,322.40	852.52	3,235.46	2,721.09	0.05	-0.03	0.040
14.71	-60.24	-1.68	0.00	-232.48	0.00	232.48	3,322.40	852.52	3,235.46	2,721.09	0.05	-0.03	0.049
15.00	-58.11	-1.68	0.00	-231.99	0.00	231.99	3,320.10	851.52	3,227.87	2,715.99	0.06	-0.04	0.049
20.00	-55.99	-1.69	0.00	-223.59	0.00	223.59	3,279.97	834.27	3,098.41	2,628.28	0.10	-0.05	0.048
20.00	-55.99	-1.69	0.00	-223.59	0.00	223.59	3,279.97	834.27	3,098.41	2,628.28	0.10	-0.05	0.048
25.00	-53.90	-1.70	0.00	-215.13	0.00	215.13	3,238.71	817.01	2,971.60	2,541.03	0.16	-0.07	0.047
30.00	-51.83	-1.71	0.00	-206.63	0.00	206.63	3,196.33	799.75	2,847.43	2,454.30	0.24	-0.08	0.045
35.00	-49.78	-1.71	0.00	-198.10	0.00	198.10	3,152.83	782.50	2,725.91	2,368.14	0.33	-0.10	0.044
40.00	-48.11	-1.71	0.00	-189.55	0.00	189.55	3,108.20	765.24	2,607.05	2,282.62	0.44	-0.11	0.043
44.10	-47.61	-1.72	0.00	-182.52	0.00	182.52	3,070.77	751.09	2,511.56	2,213.00	0.54	-0.12	0.042
45.00	-45.61	-1.71	0.00	-180.98	0.00	180.98	3,062.45	747.98	2,490.83	2,197.78	0.57	-0.13	0.041
48.60	-45.09	-1.71	0.00	-174.83	0.00	174.83	2,379.97	625.11	2,087.36	1,715.94	0.67	-0.14	0.047
50.00	-43.23	-1.70	0.00	-172.44	0.00	172.44	2,371.43	621.08	2,060.56	1,698.68	0.71	-0.14	0.046
55.00	-41.38	-1.70	0.00	-163.92	0.00	163.92	2,340.22	606.70	1,966.27	1,637.16	0.87	-0.16	0.045
60.00	-39.56	-1.69	0.00	-155.45	0.00	155.45	2,307.88	592.32	1,874.19	1,575.92	1.04	-0.17	0.043
65.00	-37.75	-1.67	0.00	-147.01	0.00	147.01	2,274.42	577.94	1,784.32	1,515.02	1.23	-0.19	0.041
70.00	-35.96	-1.66	0.00	-138.65	0.00	138.65	2,239.83	563.56	1,696.65	1,454.51	1.44	-0.21	0.040
75.00	-34.18	-1.64	0.00	-130.37	0.00	130.37	2,204.12	549.18	1,611.20	1,394.44	1.66	-0.22	0.038
80.00	-32.53	-1.61	0.00	-122.18	0.00	122.18	2,167.29	534.79	1,527.95	1,334.88	1.91	-0.24	0.036
80.00	-32.53	-1.61	0.00	-122.18	0.00	122.18	2,167.29	534.79	1,527.95	1,334.88	1.91	-0.24	0.040
85.00	-32.01	-1.61	0.00	-114.11	0.00	114.11	2,129.34	520.41	1,446.91	1,275.87	2.16	-0.25	0.038
86.58	-30.55	-1.58	0.00	-111.57	0.00	111.57	2,117.11	515.87	1,421.76	1,257.35	2.25	-0.26	0.038
90.00	-30.41	-1.58	0.00	-106.15	0.00	106.15	2,090.26	506.03	1,368.08	1,217.49	2.44	-0.27	0.036
90.33	-29.00	-1.55	0.00	-105.63	0.00	105.63	1,547.78	412.01	1,133.49	919.64	2.46	-0.27	0.042
95.00	-27.51	-1.52	0.00	-98.37	0.00	98.37	1,525.71	401.27	1,075.16	882.69	2.73	-0.29	0.040
100.00	-26.02	-1.49	0.00	-90.75	0.00	90.75	1,500.99	389.76	1,014.41	843.28	3.04	-0.30	0.037
105.00	-24.55	-1.45	0.00	-83.29	0.00	83.29	1,475.16	378.26	955.42	804.08	3.37	-0.32	0.035
110.00	-23.10	-1.41	0.00	-76.03	0.00	76.03	1,448.19	366.76	898.21	765.15	3.71	-0.34	0.033
115.00	-21.66	-1.37	0.00	-68.97	0.00	68.97	1,420.11	355.25	842.76	726.55	4.07	-0.35	0.030
120.00	-20.42	-1.32	0.00	-62.14	0.00	62.14	1,390.90	343.75	789.08	688.34	4.45	-0.37	0.028
120.00	-20.42	-1.32	0.00	-62.14	0.00	62.14	1,390.90	343.75	789.08	688.34	4.45	-0.37	0.034
125.00	-20.10	-1.31	0.00	-55.52	0.00	55.52	1,360.57	332.24	737.16	650.56	4.84	-0.38	0.031
126.28	-19.26	-1.28	0.00	-53.84	0.00	53.84	1,352.62	329.30	724.16	640.97	4.94	-0.39	0.030
126.28	-19.26	-1.28	0.00	-53.84	0.00	53.84	900.61	247.63	545.93	429.06	4.94	-0.39	0.037
130.00	-18.14	-1.24	0.00	-49.08	0.00	49.08	888.95	241.22	518.00	412.44	5.25	-0.40	0.034
135.00	-17.04	-1.19	0.00	-42.90	0.00	42.90	872.29	232.59	481.62	390.12	5.68	-0.41	0.031
140.00	-16.10	-1.14	0.00	-36.96	0.00	36.96	854.50	223.96	446.56	367.87	6.12	-0.43	0.027
140.00	-16.10	-1.14	0.00	-36.96	0.00	36.96	854.50	223.96	446.56	367.87	6.12	-0.43	0.034
145.00	-15.75	-1.13	0.00	-31.24	0.00	31.24	835.60	215.33	412.82	345.75	6.58	-0.44	0.030
146.00	-14.88	-1.08	0.00	-30.12	0.00	30.12	831.68	213.60	406.23	341.34	6.67	-0.45	0.029
150.00	-14.00	-1.03	0.00	-25.79	0.00	25.79	815.57	206.70	380.41	323.81	7.05	-0.46	0.026
155.00	-13.38	-1.00	0.00	-20.62	0.00	20.62	794.42	198.07	349.32	302.12	7.54	-0.48	0.022
158.50	-13.26	-0.99	0.00	-17.12	0.00	17.12	778.94	192.03	328.35	287.12	7.89	-0.48	0.019
158.50	-13.26	-0.99	0.00	-17.12	0.00	17.12	778.94	192.03	328.35	287.12	7.89	-0.48	0.077

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160.00	-13.00	-0.98	0.00	-15.63	0.00	15.63	772.14	189.44	319.56	280.73	8.05	-0.49	0.073
163.00	-12.01	-0.92	0.00	-12.69	0.00	12.69	758.24	184.27	302.34	268.07	8.36	-0.52	0.063
165.00	-11.94	-0.92	0.00	-10.85	0.00	10.85	748.74	180.82	291.13	259.70	8.58	-0.53	0.058
166.00	-9.79	-0.77	0.00	-9.94	0.00	9.94	743.93	179.09	285.60	255.54	8.69	-0.54	0.052
170.00	-9.43	-0.75	0.00	-6.85	0.00	6.85	723.19	172.19	264.01	238.74	9.16	-0.57	0.042
175.00	-7.89	-0.63	0.00	-3.11	0.00	3.11	686.95	163.56	238.23	215.28	9.76	-0.59	0.026
176.00	-5.17	-0.42	0.00	-2.48	0.00	2.48	679.70	161.83	233.23	210.73	9.89	-0.59	0.019
180.00	-5.06	-0.41	0.00	-0.79	0.00	0.79	650.71	154.93	213.76	193.04	10.38	-0.60	0.012
181.90	0.00	-0.36	0.00	0.00	0.00	0.00	636.94	151.65	204.82	184.90	10.62	-0.60	0.000

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Load Case 0.9D - 1.0Ev + 1.0Eh **Seismic (Reduced DL)**

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-45.42	-1.64	0.00	-250.49	0.00	250.49	3,433.77	903.29	3,632.17	2,981.33	0.00	0.00	0.039
5.00	-43.69	-1.65	0.00	-242.27	0.00	242.27	3,397.00	886.04	3,494.75	2,892.57	0.01	-0.01	0.038
10.00	-42.07	-1.66	0.00	-234.01	0.00	234.01	3,359.11	868.78	3,359.99	2,804.10	0.02	-0.02	0.037
14.71	-41.98	-1.66	0.00	-226.20	0.00	226.20	3,322.40	852.52	3,235.46	2,721.09	0.05	-0.03	0.037
14.71	-41.98	-1.66	0.00	-226.20	0.00	226.20	3,322.40	852.52	3,235.46	2,721.09	0.05	-0.03	0.045
15.00	-40.50	-1.67	0.00	-225.72	0.00	225.72	3,320.10	851.52	3,227.87	2,715.99	0.05	-0.03	0.045
20.00	-39.02	-1.67	0.00	-217.39	0.00	217.39	3,279.97	834.27	3,098.41	2,628.28	0.10	-0.05	0.044
20.00	-39.02	-1.67	0.00	-217.39	0.00	217.39	3,279.97	834.27	3,098.41	2,628.28	0.10	-0.05	0.044
25.00	-37.56	-1.68	0.00	-209.03	0.00	209.03	3,238.71	817.01	2,971.60	2,541.03	0.16	-0.06	0.043
30.00	-36.12	-1.68	0.00	-200.64	0.00	200.64	3,196.33	799.75	2,847.43	2,454.30	0.23	-0.08	0.042
35.00	-34.69	-1.68	0.00	-192.24	0.00	192.24	3,152.83	782.50	2,725.91	2,368.14	0.32	-0.09	0.041
40.00	-33.53	-1.68	0.00	-183.84	0.00	183.84	3,108.20	765.24	2,607.05	2,282.62	0.43	-0.11	0.040
44.10	-33.18	-1.68	0.00	-176.95	0.00	176.95	3,070.77	751.09	2,511.56	2,213.00	0.53	-0.12	0.039
45.00	-31.79	-1.67	0.00	-175.43	0.00	175.43	3,062.45	747.98	2,490.83	2,197.78	0.55	-0.12	0.038
48.60	-31.42	-1.67	0.00	-169.41	0.00	169.41	2,379.97	625.11	2,087.36	1,715.94	0.65	-0.13	0.043
50.00	-30.12	-1.66	0.00	-167.07	0.00	167.07	2,371.43	621.08	2,060.56	1,698.68	0.69	-0.14	0.043
55.00	-28.84	-1.66	0.00	-158.74	0.00	158.74	2,340.22	606.70	1,966.27	1,637.16	0.84	-0.15	0.041
60.00	-27.57	-1.64	0.00	-150.46	0.00	150.46	2,307.88	592.32	1,874.19	1,575.92	1.01	-0.17	0.040
65.00	-26.31	-1.63	0.00	-142.24	0.00	142.24	2,274.42	577.94	1,784.32	1,515.02	1.20	-0.19	0.038
70.00	-25.06	-1.61	0.00	-134.09	0.00	134.09	2,239.83	563.56	1,696.65	1,454.51	1.40	-0.20	0.037
75.00	-23.82	-1.59	0.00	-126.03	0.00	126.03	2,204.12	549.18	1,611.20	1,394.44	1.62	-0.22	0.035
80.00	-22.67	-1.57	0.00	-118.07	0.00	118.07	2,167.29	534.79	1,527.95	1,334.88	1.85	-0.23	0.033
80.00	-22.67	-1.57	0.00	-118.07	0.00	118.07	2,167.29	534.79	1,527.95	1,334.88	1.85	-0.23	0.037
85.00	-22.31	-1.56	0.00	-110.23	0.00	110.23	2,129.34	520.41	1,446.91	1,275.87	2.10	-0.25	0.035
86.58	-21.29	-1.54	0.00	-107.76	0.00	107.76	2,117.11	515.87	1,421.76	1,257.35	2.18	-0.25	0.035
90.00	-21.19	-1.54	0.00	-102.51	0.00	102.51	2,090.26	506.03	1,368.08	1,217.49	2.37	-0.26	0.033
90.33	-20.21	-1.51	0.00	-102.00	0.00	102.00	1,547.78	412.01	1,133.49	919.64	2.39	-0.26	0.039
95.00	-19.17	-1.48	0.00	-94.96	0.00	94.96	1,525.71	401.27	1,075.16	882.69	2.65	-0.28	0.037
100.00	-18.13	-1.44	0.00	-87.57	0.00	87.57	1,500.99	389.76	1,014.41	843.28	2.95	-0.29	0.034
105.00	-17.11	-1.41	0.00	-80.35	0.00	80.35	1,475.16	378.26	955.42	804.08	3.27	-0.31	0.032
110.00	-16.10	-1.37	0.00	-73.31	0.00	73.31	1,448.19	366.76	898.21	765.15	3.60	-0.33	0.030
115.00	-15.09	-1.32	0.00	-66.48	0.00	66.48	1,420.11	355.25	842.76	726.55	3.95	-0.34	0.028
120.00	-14.23	-1.28	0.00	-59.88	0.00	59.88	1,390.90	343.75	789.08	688.34	4.32	-0.36	0.026
120.00	-14.23	-1.28	0.00	-59.88	0.00	59.88	1,390.90	343.75	789.08	688.34	4.32	-0.36	0.031
125.00	-14.01	-1.27	0.00	-53.48	0.00	53.48	1,360.57	332.24	737.16	650.56	4.70	-0.37	0.028
126.28	-13.42	-1.24	0.00	-51.86	0.00	51.86	1,352.62	329.30	724.16	640.97	4.80	-0.37	0.028
126.28	-13.42	-1.24	0.00	-51.86	0.00	51.86	900.61	247.63	545.93	429.06	4.80	-0.37	0.034
130.00	-12.64	-1.19	0.00	-47.25	0.00	47.25	888.95	241.22	518.00	412.44	5.09	-0.39	0.031
135.00	-11.87	-1.15	0.00	-41.29	0.00	41.29	872.29	232.59	481.62	390.12	5.50	-0.40	0.028
140.00	-11.22	-1.10	0.00	-35.56	0.00	35.56	854.50	223.96	446.56	367.87	5.93	-0.42	0.025
140.00	-11.22	-1.10	0.00	-35.56	0.00	35.56	854.50	223.96	446.56	367.87	5.93	-0.42	0.031
145.00	-10.97	-1.09	0.00	-30.04	0.00	30.04	835.60	215.33	412.82	345.75	6.38	-0.43	0.027
146.00	-10.37	-1.04	0.00	-28.95	0.00	28.95	831.68	213.60	406.23	341.34	6.47	-0.43	0.026
150.00	-9.75	-1.00	0.00	-24.78	0.00	24.78	815.57	206.70	380.41	323.81	6.83	-0.45	0.023
155.00	-9.32	-0.96	0.00	-19.80	0.00	19.80	794.42	198.07	349.32	302.12	7.31	-0.46	0.020
158.50	-9.24	-0.96	0.00	-16.43	0.00	16.43	778.94	192.03	328.35	287.12	7.65	-0.47	0.017
158.50	-9.24	-0.96	0.00	-16.43	0.00	16.43	778.94	192.03	328.35	287.12	7.65	-0.47	0.069

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160.00	-9.06	-0.94	0.00	-15.00	0.00	15.00	772.14	189.44	319.56	280.73	7.80	-0.47	0.065
163.00	-8.37	-0.88	0.00	-12.17	0.00	12.17	758.24	184.27	302.34	268.07	8.10	-0.50	0.056
165.00	-8.32	-0.88	0.00	-10.41	0.00	10.41	748.74	180.82	291.13	259.70	8.31	-0.51	0.051
166.00	-6.82	-0.74	0.00	-9.53	0.00	9.53	743.93	179.09	285.60	255.54	8.42	-0.52	0.046
170.00	-6.57	-0.72	0.00	-6.57	0.00	6.57	723.19	172.19	264.01	238.74	8.87	-0.55	0.037
175.00	-5.50	-0.61	0.00	-2.98	0.00	2.98	686.95	163.56	238.23	215.28	9.45	-0.57	0.022
176.00	-3.60	-0.41	0.00	-2.38	0.00	2.38	679.70	161.83	233.23	210.73	9.57	-0.57	0.017
180.00	-3.52	-0.40	0.00	-0.75	0.00	0.75	650.71	154.93	213.76	193.04	10.05	-0.58	0.009
181.90	0.00	-0.36	0.00	0.00	0.00	0.00	636.94	151.65	204.82	184.90	10.28	-0.58	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 + 1.0W	29.55	0.00	65.56	0.00	0.00	3772.77	158.50	0.83
0.9D + 1.0W	29.52	0.00	49.16	0.00	0.00	3699.67	158.50	0.80
1.2D + 1.0Di + 1.0Wi	6.67	0.00	81.09	0.00	0.00	944.13	158.50	0.25
1.2D + 1.0Ev + 1.0Eh	1.65	0.00	65.18	0.00	0.00	256.86	158.50	0.08
0.9D - 1.0Ev + 1.0Eh	1.64	0.00	45.42	0.00	0.00	250.49	158.50	0.07
1.0D + 1.0W	7.22	0.00	54.67	0.00	0.00	911.59	158.50	0.21

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Additional Steel Summary

Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors VQ/I (lb/in)	Shear Applied (kips)	Shear phiVn (kips)	Ratio	Max Member Pu (kip)	phiPn (kip)	Ratio
0.00	14.71	(3) SOL-#20 All Thread Bar	137.7	4.1	16.8	0.246	205.5	330.5	0.622
0.00	20.00	(3) SOL-4 1/4" SOLID	438.5	7.2	38.3	0.189	622.0	635.6	0.979
20.00	80.00	(3) SOL-4 1/4" SOLID	544.6	12.0	38.3	0.313	612.9	633.4	0.968
80.00	120.00	(3) SOL-4" SOLID	574.8	12.6	38.3	0.330	466.4	560.5	0.832
120.00	140.00	(3) SOL-3 1/2" SOLID	582.1	12.8	38.3	0.335	306.1	428.0	0.715
140.00	158.50	(3) SOL-3" SOLID	555.6	12.2	38.3	0.319	216.3	313.1	0.691

Elev From (ft)	Elev To (ft)	Member	Upper Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Ratio	Lower Termination Connectors MQ/I (kips)	phiVn (kips)	Num Reqd	Num Actual	Ratio
0.00	14.71	(3) SOL-#20 All Thread Bar	194.8	25.3	8	12	0.642	0.0	25.3	0	0	0.000
0.00	20.00	(3) SOL-4 1/4" SOLID	0.0	12.0	0	0	0.000	0.0	12.0	0	0	0.000
20.00	80.00	(3) SOL-4 1/4" SOLID	0.0	25.3	0	0	0.000	0.0	25.3	0	0	0.000
80.00	120.00	(3) SOL-4" SOLID	0.0	25.3	0	0	0.000	0.0	25.3	0	0	0.000
120.00	140.00	(3) SOL-3 1/2" SOLID	0.0	25.3	0	0	0.000	0.0	25.3	0	0	0.000
140.00	158.50	(3) SOL-3" SOLID	119.1	25.3	5	5	0.943	0.0	25.3	0	0	0.000

Site Name: Harwinton, CT
Site Number: 302502
Tower Type: MP
Design Loads (Factored) - Analysis per TIA-222-H Standards

Monolithic Mat & Pier Foundation Analysis

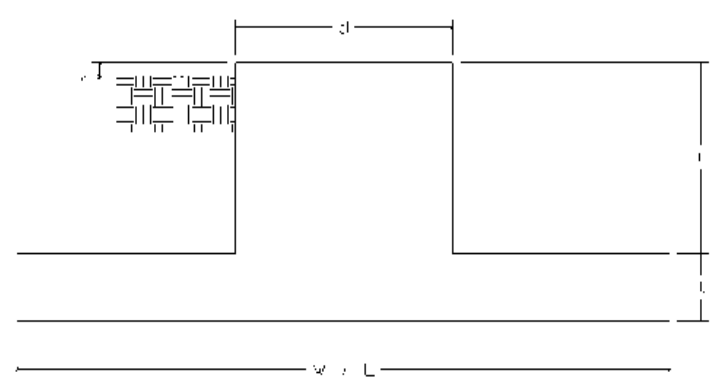
Foundation Analysis Parameters		
Design / Analysis / Mapping:	Analysis	-
Compression/Leg:	65.6	k
Uplift/Leg:	0.0	k
Total Shear:	29.6	k
Moment:	3,772.8	k-ft
Tower + Appurtenance Weight:	65.6	k
Depth to Base of Foundation (l + t - h):	8	ft
Diameter of Pier (d):	6.8	ft
Length of Pier (l):	5.5	ft
Height of Pier above Ground (h):	0.5	ft
Width of Pad (W):	20	ft
Length of Pad (L):	20	ft
Thickness of Pad (t):	3	ft
Tower Leg Center to Center:	0	ft
Number of Tower Legs:	1	-
Tower Center from Mat Center:	0	ft
Depth Below Ground Surface to Water Table:	99	ft
Unit Weight of Concrete:	150	pcf
Unit Weight of Soil Above Water Table:	136	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	73.6	pcf
Friction Angle of Uplift:	15	°
Coefficient of Shear Friction:	0.3	-
Ultimate Compressive Bearing Pressure:	22,642	psf
Ultimate Passive Pressure on Pad Face:	2,365	psf
$f_{Soil\ and\ Concrete\ Weight}$:	0.9	-
f_{Soil}:	0.75	-

Overturning Moment Usage		
Design OTM:	4023.9	k-ft
OTM Resistance:	5039.6	k-ft
Design OTM / OTM Resistance:	80%	Pass

Soil Bearing Pressure Usage		
Net Bearing Pressure:	15291	psf
Factored Nominal Bearing Pressure:	16982	psf
Factored Nominal (Net) Bearing Pressure:	90%	Pass
Load Direction Controling Design Bearing Pressure:	*Diagonal to Pad Edge*	

Sliding Factor of Safety		
Ultimate Friction Resistance:	153.6	k
Ultimate Passive Pressure Resistance:	106.4	k
Total Factored Sliding Resistance:	195.0	k
Sliding Design / Sliding Resistance:	15%	Pass

Foundation Steel Parameters		
Shear/Leg (Compression):	19.7	k
Shear/Leg (Uplift):	16.3	k
Concrete Strength (f'_c):	3,000	psi
Pad Tension Steel Depth:	32.38	in
Dead Load Factor:	0.9	-
f_{Shear}:	0.75	-
$f_{Flexure\ /\ Tension}$:	0.9	-
$f_{Compression:}$	0.65	-
b:	0.85	-
Bottom Pad Rebar Size #:	10	-
# of Bottom Pad Rebar:	40	-
Pad Bottom Steel Area:	50.80	in^2
Pad Steel F_y:	60,000	psi
Top Pad Rebar Size #:	5	-
# of Top Pad Rebar:	40	-
Pad Top Steel Area:	12.40	in^2
Pier Rebar Size #:	11	-
Pier Steel Area (Single Bar):	1.56	in^2
# of Pier Rebar:	52	-
Pier Steel F_y:	60,000	psi
Pier Cage Diameter:	72.9	in
Rebar Strain Limit:	0.008	-
Steel Elastic Modulus:	29,000	ksi
Tie Rebar Size #:	4	-
Tie Steel Area (Single Bar):	0.20	in^2
Tie Spacing:	12	in
Tie Steel F_y:	60,000	psi
Clear Cover:	3	in



Pad Strength Capacity			
Factored One Way Shear (V_u):	598.9	k	
One Way Shear Capacity (fV_c):	638.4	k	*ACI 318-14 25.5.5.1*
V_u / fV_c:	94%	Pass	
Load Direction Controling Shear Capacity:	*Parallel to Pad Edge*		
Lower Steel Pad Factored Moment (M_u):	2528.7	k-ft	
Lower Steel Pad Moment Capacity (fM_n):	6917.1	k-ft	*ACI 318-14 22.3.1.1*
M_u / fM_n:	37%	Pass	
Load Direction Controling Flexural Capacity:	*Parallel to Pad Edge*		
Upper Steel Pad Factored Moment (M_u):	494.4	k-ft	
Upper Steel Pad Moment Capacity (fM_n):	1777.7	k-ft	
M_u / fM_n:	28%	Pass	
Lower Pad Flexural Reinforcement Ratio:	0.0065		*OK - ACI 318-14 7.6.1.1 & 8.6.1.1*
Upper Pad Flexural Reinforcement Ratio:	0.0016		*OK - ACI 318-14 7.6.1.1 & 8.6.1.1*
Pad Shrinkage Reinforcement Ratio:	0.0081		*OK - ACI 318-14 24.4.3.2*
Lower Pad Reinforcement Spacing:	6.0	in	*OK - ACI 318-14 7.7.2.3, 8.7.2.2, & 24.4.3.3*
Ultimate Punching Shear Stress, v_u:	48.94	psi	*ACI 318-14 R8.4.4.2.3*
Nominal Punching Shear Capacity (f_cv_c):	164.3	psi	*ACI 318-14 22.6.5.2*
v_u / f_cv_c:	30%	Pass	
Pier Moment Pad Flexure Transfer Ratio, γ_f:	0.60		*TIA-222-H 9.4.2*
Moment Transfer Effective Flexural Width, B_{eff}:	15.77	ft	*TIA-222-H 9.4.2*
Moment Transfer Through Pad Flexure:	28334.12	k-in	*TIA-222-H 9.4.2*
Moment Transfer Flexural Capacity ($fM_{sc,f}$):	67537.88	k-in	
g_fM_{sc} / $fM_{sc,f}$:	0%	Pass	

Pier Strength Capacity			
Factored Moment in Pier (M_u):	3935.3	k-ft	
Pier Moment Capacity (fM_n):	13006.1	k-ft	
M_u / fM_n:	30%	Pass	
Factored Shear in Pier (V_u):	29.6	k	
Pier Shear Capacity (fV_n):	526.1	k	*ACI 318-14 22.5.1.1*
V_u / fV_c:	6%	Pass	
Pier Shear Reinforcement Ratio:	0.0004		*OK - No Ties Necessary for Shear - ACI11.5.6.1*
Factored Tension in Pier (T_u):	0.0	k	
Pier Tension Capacity (fT_n):	4380.5	k	
T_u / fT_n:	0%	Pass	
Factored Compression in Pier (P_u):	65.6	k	
Pier Compression Capacity (fP_n):	6815.1	k	*ACI 318-14 22.4.2.1*
P_u / fP_n:	1%	Pass	
Pier Compression Reinforcement Ratio:	0.016		*OK - TIA-222-H 9.4.1*
Minimum Depth to Develop Vertical Rebar:	63	in	*ACI 318-14 25.4.2.3*
Minimum Hook Development Length:	31	in	*ACI 318-14 25.4.3.1*
Minimum Mat Thickness / Edge Distance from Pier:	34.0	in	
Minimum Foundation Depth:	8.35	ft	
$M_u/f_BM_n + T_u/f_TT_n$:	30%	Pass	

AMERICAN TOWER CORPORATION

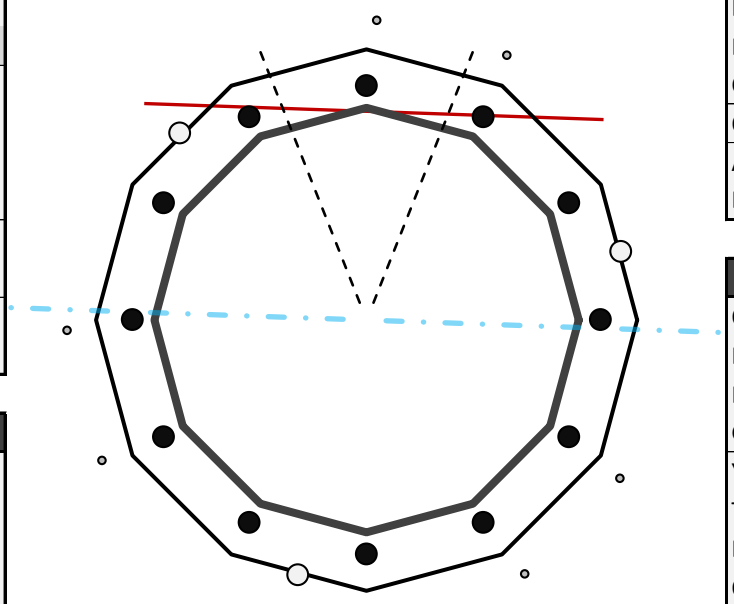
Base Plate & Anchor Rod Analysis

Pole Dimensions		
Number of Sides	12	-
Diameter	43	in
Thickness	0.375	in
Orientation Offset	0	°

Base Reactions		
Moment, Mu	3772.8	k-ft
Axial, Pu	65.6	k
Shear, Vu	29.6	k
Neutral Axis	358	°

Report Capacities		
Component	Capacity	Result
Base Plate	24%	Pass
Anchor Rods	81%	Pass
Dwyidag	57%	Pass

Base Plate		
Number of Sides	12	-
Diameter, ø	55	in
Thickness	2 1/2	in
Grade	A572-50	
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Clip	N/A	in
Orientation Offset	0	°
Anchor Rod Detail	c	η=0.55
Clear Distance	N/A	in
Applied Moment, Mu	355.6	k
Bending Stress, ϕMn	1481.5	k



Dywidag Reinforcement		
Quantity	3	-
Bar Size	#20	in
Diameter, ø	2.5	in
Bracket Type	Angle	-
Circle	55.50	in
Orientation Offset	15	°
Applied Force, Pu	224.5	k
Dywidag Bar, ϕPn	392.7	k

Original Anchor Rods		
Arrangement	Radial	-
Quantity	12	-
Diameter, ø	2 1/4	in
Bolt Circle	49.25	in
Grade	A615-75	
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Spacing	12.9	in
Orientation Offset	0	°
Applied Force, Pu	191.1	k
Anchor Rods, ϕPn	259.8	k

Additional Dywidag Reinforcement		
Quantity	6	-
Diameter, ø	1	in
Bolt Circle	63	in
Grade	Other	
Yield Strength, Fy	109	ksi
Tensile Strength, Fu	125	ksi
Bypass Base?	Yes (Dywidag)	
Orientation Offset	0	°
Applied Force, Pu	59.4	k
Additional Rod, ϕPn	78.5	k

Calculations for Monopole Base Plate & Anchor Rod Analysis

Reaction Distribution

Reaction	Shear Vu	Moment Mu	Factor
-	k	k-ft	-
Base Forces	29.6	2205.5	0.58
Anchor Rod Forces	29.6	2205.5	0.58
Additional Bolt (Grp1) Forces	0.0	457.3	0.12
Additional Bolt (Grp2) Forces	0.0	0.0	0.00
Dywidag Forces	0.0	1110.0	0.29
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	49.6447	4.1371	0.1948		11277.22
Bolt	3.9761	3.2477	0.8393	4.5	10714.13
Bolt1	0.7854	0.7854	0.0491	8	2338.23
Bolt2	0.0000	0.0000	0.0000	0	0.00
Dywidag	4.9087	4.9087	1.9175		5675.81
Stiffener	0.0000	0.0000	0.0000		0.00

Base Plate		
Shape	12	-
Width, W	55	in
Thickness, t	2.5	in
Yield Strength, Fy	50	ksi
Tensile Strength, Fu	65	ksi
Base Plate Chord	34.293	in
Detail Type	c	-
Detail Factor	0.55	-
Clear Distance	N/A	-

Anchor Rods		
Anchor Rod Quantity, N	12	-
Rod Diameter, d	2.25	in
Bolt Circle, BC	49.25	in
Yield Strength, Fy	75	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	191.1	k
Applied Shear, Vu	0.8	k
Compressive Capacity, ϕPn	259.8	k
Tensile Capacity, ϕRnt	0.736	OK
Interaction Capacity	0.741	OK

External Base Plate		
Chord Length AA	34.657	in
Additional AA	5.000	in
Section Modulus, Z	61.964	in^3
Applied Moment, Mu	355.6	k-ft
Bending Capacity, ϕMn	2788.4	k-ft
Capacity, Mu/ϕMn	0.128	OK
Chord Length AB	33.135	in
Additional AB	5.000	in
Section Modulus, Z	59.587	in^3
Applied Moment, Mu	210.2	k-ft
Bending Capacity, ϕMn	2681.4	k-ft
Capacity, Mu/ϕMn	0.078	OK
Bend Line Length	21.070	in
Additional Bend Line	0.000	in
Section Modulus, Z	32.921	in^3
Applied Moment, Mu	355.6	k-ft
Bending Capacity, ϕMn	1481.5	k-ft
Capacity, Mu/ϕMn	0.240	OK

Additional Bolt Group 1		
Bolt Quantity, N	6	-
Bolt Diameter, d	1	in
Bolt Circle, BC	63	in
Yield Strength, Fy	109	ksi
Tensile Strength, Fu	125	ksi
Applied Axial, Pu	59.4	k
Applied Shear, Vu	0.1	k
Compressive Capacity, ϕPn	78.5	k
Compressive Capacity, ϕPn	0.756	OK
Interaction Capacity	0.807	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		

Dywidag Reinforcement		
Dywidag Quantity, N	3	-
Dywidag Diameter, d	2.5	in
Bolt Circle, BC	55.5	in
Yield Strength, Fy	80	ksi
Tensile Strength, Fu	100	ksi
Applied Axial, Pu	224.5	k
Compressive Capacity, ϕPn	392.7	k
Capacity, Pu/ϕPn	0.572	OK

Flange Plate Analysis

Flange Plate			
	Plate Type	***Flange***	***@ 120 ft***
	Pole Diameter	23.55	in
	Pole Thickness	0.1875	in
	Plate Diameter	30	in
	Plate Thickness	1.25	in
	Plate Fy	36	ksi
	Weld Length	0.1875	in
	f_s Resistance	58.52	k-in
	Applied	19.60	k-in

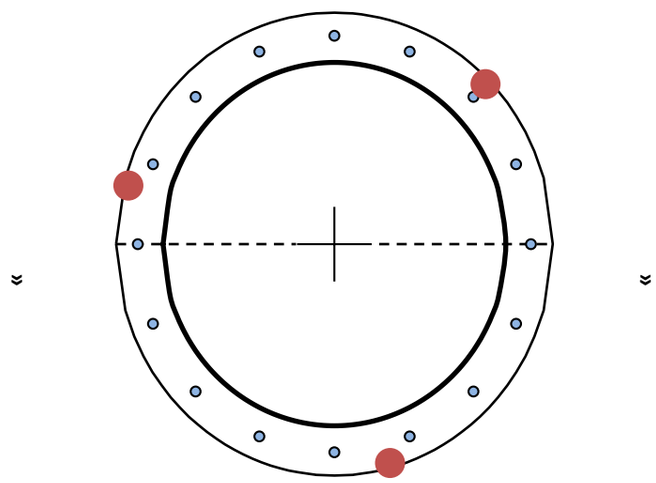
Code Rev.	***H***
Moment	832.2 k-ft
Axial	19.5 k

Required Flange Thickness:
0.72 in OK

Date	9/26/2019
Engineer	HAT
Site #	302502
Carrier	AT&T

Stiffeners		
#		

Bolts			
	#	***16***	
	Bolt Circle	27	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	20.11	k



Reinforcement			
	#	***3***	
•	DYW. Circle	29.35	in
	Offset Angle	45	°
	Type	Other	
	Diameter	3.5	in
	Fu	65	ksi
	f_s Resistance	500.30	k
	Applied	334.71	k

Plate Stress Ratio:
33% Pass

Bolt Stress Ratio:
37% Pass

Extra Bolts 0		
#		

Reinforcement Stress Ratio:
67% Pass