



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 75 ft Monopole
ATC Asset Name : Elsmere CO 1
ATC Asset Number : 302459
Engineering Number : 14885421_C3_03
Proposed Carrier : AT&T MOBILITY
Carrier Site Name : CONSTITUTION & HWY 24
Carrier Site Number : WSUTH0051541
Site Location : 2865 Akers Drive
COLORADO SPRINGS, CO 80922-1520
38.8749° N, 104.6862° W
County : El Paso
Date : December 12, 2024
Max Usage : 91%
Analysis Result : Pass





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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 75 ft Monopole tower to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower:	Rohn, Drawing # A962146, dated June 13, 1996
Foundation:	Rohn, Drawing # A962147-1, dated June 13, 1996
Geotechnical:	Terracon, Project # 23965030, dated June 4, 1996

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:	106 mph (3-second gust)
Basic Wind Speed w/ Ice:	58 mph (3-second gust) w/ 0.21" radial ice concurrent
Code(s):	ANSI/TIA-222-I / 2015 IBC
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Feature:	Flat
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	$S_{05} = 0.15, S_{01} = 0.07$
Site Class:	Default

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 reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact Engineering@americantower.com. Please include the American Tower asset name, asset number, and engineering number in the subject line for any questions.

Structure Usages

Structural Component	Usage	Control	Result
Pole Shaft	36.2%	1.2D + 1.0W	Pass
Serviceability Usage	9.4%	1.0D + 1.0W	Pass
Upper Flange Plate @ 60.0 ft	4.2%	Bolts	Pass
Upper Flange Plate @ 30.0 ft	24.7%	Plate	Pass
Base Plate @ 0.0 ft	25.7%	Rods	Pass
Foundation	39.6%	Shear	Pass
Foundation	91.1%	Axial	Pass
Foundation	35.7%	Moment	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	331.2	16.0	6.5

**Reactions shown reflect the results from the Load Case with maximum Moment excluding Overstrength Load Cases*

Foundation usages were calculated by comparing the maximum reactions from this analysis to the reactions from the original design drawings, factored by 1.35 per ANSI/TIA-222-I, Section 15.6.2

AT&T MOBILITY Final Loading

Elev (ft)	Qty	Equipment	Lines
49.0	3	Raycap DC6-48-60-18-8C-EV (Enclosure)	(3) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6
48.0	3	Ericsson AIR 6472 B77G B77M (92.6lbs)	-
45.0	3	Ericsson Radio 4490HP 44B5 44B12A C	(1) 3/8" (0.38" - 9.5mm) RET Control Cable (6) 7/8" Coax
	3	Ericsson Radio 4494 44B14 20B29 M01	
	3	Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3lbs)	
	3	T-Arm	
	6	Commscope NNH4-65C-R6-V3 (102.5 lbs)	

Install proposed lines outside the pole shaft. Stacking not to exceed 2 rows.

Other Existing/Reserved Loading

Elev (ft)	Qty	Equipment	Lines
72.0	-	-	(9) 7/8" Coax
	1	Platform with Handrails	-
70.0	1	Commscope RDIDC-9181-PF-48	(1) 1.41" (35.8mm) Hybrid
	3	Fujitsu TA08025-B604	
	3	Fujitsu TA08025-B605	
	3	JMA Wireless MX08FRO665-21	

(If table breaks across pages, please see previous page for data in merged cells)



Standard Conditions

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

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

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

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

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

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

ANALYSIS PARAMETERS

Design Wind: 106 mph	Ice Wind: 58 mph w/ 0.2" ice	Service Wind: 60 mph
Risk Category: II	Exposure: C	S_{D1}: 0.069 S_{DS}: 0.150
Topo Factor: Method 1	Topo Feature: Flat	
Structure Height: 75.0 ft	Base Elevation: 0.00 ft	Structure Type: Stepped
Base Diameter: 30.00 in	Base Rotation: 0.00°	Taper: 0.0000 (in/ft)

POLE SECTION PROPERTIES

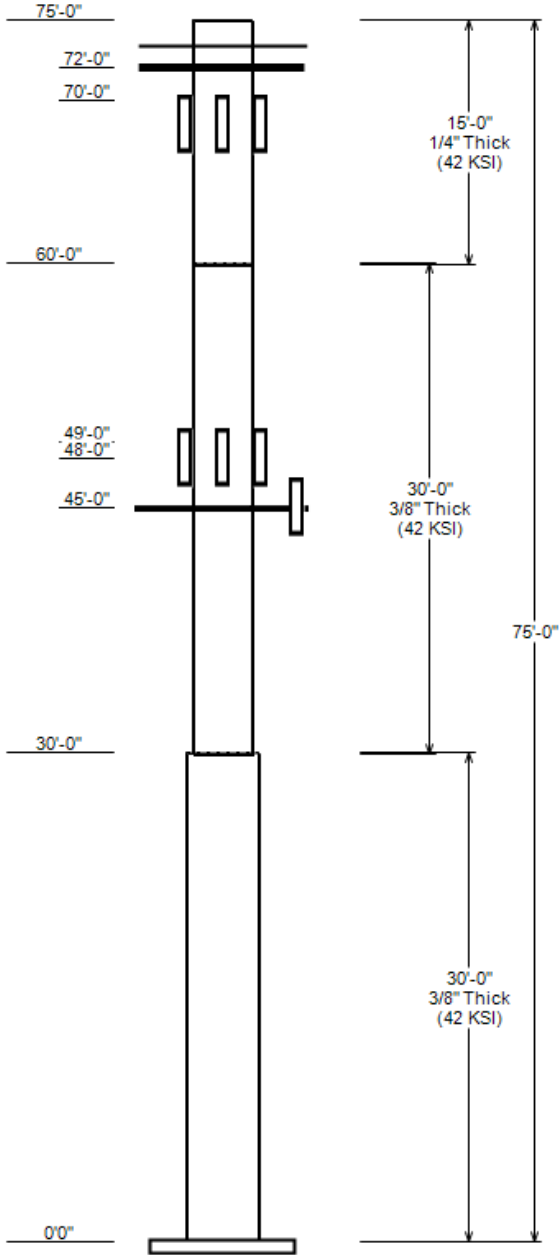
Section	Length (ft)	Flat Diameter (in)		Thick (in)	Joint Type	Joint Length (in)	Pole Shape	Yield Strength (ksi)
		Top	Bottom					
1	30.000	30.00	30.00	0.375		0.00	Round	42
2	30.000	24.00	24.00	0.375	Butt Joint	0.00	Round	42
3	15.000	24.00	24.00	0.250	Butt Joint	0.00	Round	42

DISCRETE APPURTENANCE

Elev (ft)	Description
72.0	(1) Generic Flat Platform with Handrails
70.0	(3) Fujitsu TA08025-B604
70.0	(3) JMA Wireless MX08FRO665-21
70.0	(3) Fujitsu TA08025-B605
70.0	(1) Commscope RDIDC-9181-PF-48
49.0	(3) Raycap DC6-48-60-18-8C-EV (Encl)
48.0	(3) Ericsson AIR 6472 B77G B77M (92.6)
45.0	(3) Round T-Arm
45.0	(3) Ericsson Radio 4490HP 44B5 44B12
45.0	(3) Ericsson Radio 4890HP 48B2/B25 48
45.0	(6) Commscope NNH4-65C-R6-V3 (102.
45.0	(3) Ericsson Radio 4494 44B14 20B29 M

LINEAR APPURTENANCE

Elev To (ft)	Description
72.0	(9) 7/8" Coax
70.0	(1) 1.41" (35.8mm) Hybrid
49.0	(3) 0.39" (10mm) Fiber Trunk
49.0	(6) 0.78" (19.7mm) 8 AWG 6
45.0	(1) 3/8" (0.38"- 9.5mm) RET Control Cabl
45.0	(6) 7/8" Coax



GLOBAL BASE REACTIONS

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	331.20	16.04	6.47
0.9D + 1.0W	329.70	12.03	6.46
1.2D + 1.0Di + 1.0Wi	130.06	16.61	2.68
1.2D + 1.0Ev + 1.0Eh	32.77	15.65	0.57
0.9D - 1.0Ev + 1.0Eh	32.60	11.07	0.57
1.0D + 1.0W	94.63	13.37	1.85

ANALYSIS PARAMETERS

Location:	El Paso County,CO	Height:	75 ft
Type and Shape:	Stepped, Round	Base Diameter:	30.00 in
Manufacturer:	Rohn	Top Diameter:	24.00 in
K_d (non-service):	0.95	Taper:	0.0000 in/ft
K_e:	0.79	Rotation:	0.000°

ICE & WIND PARAMETERS

Risk Category:	II	Design Wind Speed:	106 mph
Exposure Category:	C	Design Wind Speed w/ Ice:	58 mph
Design Ice Thickness:	0.21 in		
Topo Factor Procedure:	Method 1		
Crest Height(H):	0 ft	Service Wind Speed:	60 mph
Crest Length(L):	0 ft	HMSL:	6542.00 ft
Feature:	Flat	Distance from Apex (x):	0 ft
		Upwind/Downwind:	

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	Default	Period Based on Rayleigh Method (sec):	1.08
T_L (sec):	4	P:	1
S_{ds}:	0.150	S_{d1}:	0.069
		C_s:	0.043
		C_s Max:	0.043
		C_s Min:	0.030

LOAD CASES

1.2D + 1.0W	106 mph Wind with No Ice
0.9D + 1.0W	106 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	58 mph Wind with 0.21" Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice
1.2D + 1.0Ev + 1.5Eh	Seismic Overstrength
0.9D - 1.0Ev + 1.5Eh	Seismic Overstrength (Reduced DL)

SHAFT SECTION PROPERTIES

Section	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Bottom						Top							
						Weight (lb)	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)
1-R	30.00	0.3750	42		0.00	3,563	30.00	0.000	34.90	3,831.8	0.00	80.00	30.00	30.00	34.90	3,831.8	0.00	80.00	0.0000
2-R	30.00	0.3750	42	Butt	0.00	2,841	24.00	30.000	27.83	1,943.3	0.00	64.00	24.00	60.00	27.83	1,943.3	0.00	64.00	0.0000
3-R	15.00	0.2500	42	Butt	0.00	952	24.00	60.000	18.65	1,316.2	0.00	96.00	24.00	75.00	18.65	1,316.2	0.00	96.00	0.0000
Total Shaft Weight						7,356													

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice			Ice		
					Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor
72.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	2731.26	45.130	1.00
70.00	JMA Wireless MX08FRO665-21	3	0.75	-2.000	64.50	12.489	0.64	97.79	12.853	0.64
70.00	Fujitsu TA08025-B605	3	0.75	-2.000	75.00	1.962	0.50	83.11	2.081	0.50
70.00	Fujitsu TA08025-B604	3	0.75	-2.000	63.90	1.962	0.50	71.45	2.081	0.50
70.00	Commscope RDIDC-9181-PF-48	1	0.75	-2.000	21.90	1.867	1.00	29.27	1.984	1.00
49.00	Raycap DC6-48-60-18-8C-EV (Enc	3	0.80	0.000	16.00	2.687	0.67	26.51	2.830	0.67
48.00	Ericsson AIR 6472 B77G B77M (9	3	0.80	0.000	92.60	4.884	0.65	107.28	5.078	0.65
45.00	Round T-Arm	3	0.75	0.000	250.00	9.700	0.67	275.85	10.720	0.67
45.00	Ericsson Radio 4890HP 48B2/B25	3	0.80	0.000	68.30	2.202	0.67	75.71	2.323	0.67
45.00	Ericsson Radio 4490HP 44B5 44B	3	0.80	0.000	68.30	2.202	0.67	75.63	2.266	0.67
45.00	Ericsson Radio 4494 44B14 20B2	3	0.80	0.000	57.30	2.202	0.67	64.10	2.323	0.67
45.00	Commscope NNH4-65C-R6-V3 (102.	6	0.80	0.000	102.50	17.073	0.64	143.09	17.529	0.64
Totals		Row Count: 12	35		5,404.60			6,251.36		

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg): 0.00

Elev From (ft)	Elev To (ft)	Qty	Description	Diameter (in)	Weight (lb/ft)	Flat	Max/Row	Distance Between Rows(in)	Distance Between Cols(in)	Azimuth (deg)	Distance From Face (in)	Exposed To Wind	Carrier
0.00	72.00	9	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	SPRINT NEXTEL
0.00	70.00	1	1.41" (35.8mm) Hybrid	1.41	1.66	N	0	0	0	0	0	N	DISH WIRELESS L.L.C.
0.00	49.00	6	0.78" (19.7mm) 8 AWG	0.78	0.59	N	6	0.89	0.89	270	0.89	Y	AT&T MOBILITY
0.00	49.00	3	0.39" (10mm) Fiber Tr	0.39	0.06	N	3	0.7	0.7	270	0.7	Y	AT&T MOBILITY
0.00	45.00	6	7/8" Coax	1.09	0.33	N	6	1.05	1.05	90	1.05	Y	AT&T MOBILITY
5.00	45.00	1	3/8" (0.38"- 9.5mm) R	0.38	0.23	N	1	0.69	0.69	65	0.69	Y	AT&T MOBILITY

SEGMENT PROPERTIES

Seg Top Elev (ft)	Description	(Max Length: 5 ft)	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in ³)	Z (in ³)	Weight (lb)
0.00			0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	0.0
5.00			0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	593.8
10.00			0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	593.8
15.00			0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	593.8
20.00			0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	593.8
25.00			0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	593.8
30.00	Top - Section 1		0.3750	30.000	34.901	3,831.80	0.00	80.00	41.7	255.5	329.1	593.8
30.00	Bot - Section 2		0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	
35.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	473.5
40.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	473.5
45.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	473.5
48.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	284.1
49.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	94.7
50.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	94.7
55.00			0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	473.5
60.00	Top - Section 2		0.3750	24.000	27.833	1,943.30	0.00	64.00	42	161.9	209.3	473.5
60.00	Bot - Section 3		0.2500	24.000	18.653	1,316.20	0.00	96.00	39.4	109.7	141.0	
65.00			0.2500	24.000	18.653	1,316.20	0.00	96.00	39.4	109.7	141.0	317.4
70.00			0.2500	24.000	18.653	1,316.20	0.00	96.00	39.4	109.7	141.0	317.4
72.00			0.2500	24.000	18.653	1,316.20	0.00	96.00	39.4	109.7	141.0	126.9
75.00			0.2500	24.000	18.653	1,316.20	0.00	96.00	39.4	109.7	141.0	190.4
Total:												7,355.9

CALCULATED FORCES

Load Case: 1.2D + 1.0W 106 mph Wind with No Ice 17 Iterations

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

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	-16.04	-6.47	0.00	-331.2	0.00	331.20	1,311.06	395.78	1,030.84	948.43	0	0	0.362
5.00	-15.25	-6.34	0.00	-298.9	0.00	298.87	1,311.06	395.78	1,030.84	948.43	0.06	-0.12	0.327
10.00	-14.47	-6.21	0.00	-267.2	0.00	267.16	1,311.06	395.78	1,030.84	948.43	0.24	-0.22	0.293
15.00	-13.68	-6.07	0.00	-236.1	0.00	236.12	1,311.06	395.78	1,030.84	948.43	0.53	-0.32	0.260
20.00	-12.90	-5.92	0.00	-205.8	0.00	205.77	1,311.06	395.78	1,030.84	948.43	0.9	-0.4	0.227
25.00	-12.12	-5.76	0.00	-176.2	0.00	176.18	1,311.06	395.78	1,030.84	948.43	1.36	-0.47	0.195
30.00	-11.34	-5.59	0.00	-147.4	0.00	147.40	1,311.06	395.78	1,030.84	948.43	1.88	-0.53	0.164
30.00	-11.34	-5.59	0.00	-147.4	0.00	147.40	1,052.07	315.62	655.57	624.04	1.88	-0.53	0.247
35.00	-10.70	-5.43	0.00	-119.4	0.00	119.44	1,052.07	315.62	655.57	624.04	2.46	-0.58	0.202
40.00	-10.07	-5.27	0.00	-92.3	0.00	92.28	1,052.07	315.62	655.57	624.04	3.11	-0.66	0.158
45.00	-7.12	-3.15	0.00	-65.9	0.00	65.92	1,052.07	315.62	655.57	624.04	3.83	-0.71	0.113
48.00	-6.42	-2.88	0.00	-56.5	0.00	56.48	1,052.07	315.62	655.57	624.04	4.28	-0.74	0.097
49.00	-6.24	-2.74	0.00	-53.6	0.00	53.60	1,052.07	315.62	655.57	624.04	4.44	-0.75	0.092
50.00	-6.12	-2.65	0.00	-50.9	0.00	50.86	1,052.07	315.62	655.57	624.04	4.6	-0.76	0.087
55.00	-5.53	-2.48	0.00	-37.6	0.00	37.63	1,052.07	315.62	655.57	624.04	5.41	-0.79	0.066
60.00	-4.93	-2.32	0.00	-25.2	0.00	25.21	1,052.07	315.62	655.57	624.04	6.25	-0.81	0.045
60.00	-4.93	-2.32	0.00	-25.2	0.00	25.21	662.26	211.53	441.68	396.94	6.25	-0.81	0.071
65.00	-4.52	-2.15	0.00	-13.6	0.00	13.63	662.26	211.53	441.68	396.94	7.1	-0.83	0.041
70.00	-3.37	-1.36	0.00	-2.9	0.00	2.88	662.26	211.53	441.68	396.94	7.98	-0.83	0.012
72.00	-0.23	-0.05	0.00	-0.2	0.00	0.16	662.26	211.53	441.68	396.94	8.32	-0.84	0.001
75.00	0.00	-0.05	0.00	0.0	0.00	0.00	662.26	211.53	441.68	396.94	8.85	-0.84	0.000

CALCULATED FORCES

Load Case: 0.9D + 1.0W 106 mph Wind with No Ice (Reduced DL) 17 Iterations
 Gust Response Factor: 1.10
 Dead load Factor: 0.90
 Wind Load Factor: 1.00

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	-12.03	-6.46	0.00	-329.7	0.00	329.70	1,311.06	395.78	1,030.84	948.43	0	0	0.357
5.00	-11.43	-6.33	0.00	-297.4	0.00	297.39	1,311.06	395.78	1,030.84	948.43	0.06	-0.12	0.323
10.00	-10.84	-6.19	0.00	-265.8	0.00	265.75	1,311.06	395.78	1,030.84	948.43	0.24	-0.22	0.289
15.00	-10.25	-6.05	0.00	-234.8	0.00	234.79	1,311.06	395.78	1,030.84	948.43	0.52	-0.31	0.256
20.00	-9.66	-5.89	0.00	-204.6	0.00	204.55	1,311.06	395.78	1,030.84	948.43	0.9	-0.4	0.223
25.00	-9.08	-5.73	0.00	-175.1	0.00	175.08	1,311.06	395.78	1,030.84	948.43	1.35	-0.47	0.192
30.00	-8.49	-5.56	0.00	-146.4	0.00	146.44	1,311.06	395.78	1,030.84	948.43	1.87	-0.53	0.161
30.00	-8.49	-5.56	0.00	-146.4	0.00	146.44	1,052.07	315.62	655.57	624.04	1.87	-0.53	0.243
35.00	-8.01	-5.40	0.00	-118.6	0.00	118.62	1,052.07	315.62	655.57	624.04	2.45	-0.57	0.198
40.00	-7.53	-5.24	0.00	-91.6	0.00	91.60	1,052.07	315.62	655.57	624.04	3.09	-0.65	0.154
45.00	-5.33	-3.12	0.00	-65.4	0.00	65.41	1,052.07	315.62	655.57	624.04	3.81	-0.71	0.110
48.00	-4.81	-2.86	0.00	-56.0	0.00	56.04	1,052.07	315.62	655.57	624.04	4.26	-0.74	0.094
49.00	-4.67	-2.72	0.00	-53.2	0.00	53.17	1,052.07	315.62	655.57	624.04	4.42	-0.74	0.090
50.00	-4.58	-2.63	0.00	-50.4	0.00	50.45	1,052.07	315.62	655.57	624.04	4.57	-0.75	0.085
55.00	-4.14	-2.46	0.00	-37.3	0.00	37.33	1,052.07	315.62	655.57	624.04	5.38	-0.78	0.064
60.00	-3.69	-2.30	0.00	-25.0	0.00	25.01	1,052.07	315.62	655.57	624.04	6.21	-0.81	0.044
60.00	-3.69	-2.30	0.00	-25.0	0.00	25.01	662.26	211.53	441.68	396.94	6.21	-0.81	0.069
65.00	-3.39	-2.13	0.00	-13.5	0.00	13.51	662.26	211.53	441.68	396.94	7.06	-0.82	0.039
70.00	-2.52	-1.35	0.00	-2.9	0.00	2.86	662.26	211.53	441.68	396.94	7.93	-0.83	0.011
72.00	-0.17	-0.05	0.00	-0.2	0.00	0.16	662.26	211.53	441.68	396.94	8.28	-0.83	0.001
75.00	0.00	-0.05	0.00	0.0	0.00	0.00	662.26	211.53	441.68	396.94	8.8	-0.83	0.000

CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi			58 mph Wind with 0.21" Radial Ice						17 Iterations				
Gust Response Factor:		1.10	Ice Dead Load Factor			1.00			Ice Importance Factor			1.00	
Dead Load Factor:		1.20											
Wind Load Factor:		1.00											
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	-16.61	-2.68	0.00	-130.1	0.00	130.06	1,311.06	395.78	1,030.84	948.43	0	0	0.150
5.00	-15.79	-2.60	0.00	-116.7	0.00	116.67	1,311.06	395.78	1,030.84	948.43	0.02	-0.05	0.135
10.00	-14.96	-2.51	0.00	-103.7	0.00	103.69	1,311.06	395.78	1,030.84	948.43	0.09	-0.09	0.121
15.00	-14.13	-2.43	0.00	-91.1	0.00	91.12	1,311.06	395.78	1,030.84	948.43	0.21	-0.12	0.107
20.00	-13.30	-2.33	0.00	-79.0	0.00	78.98	1,311.06	395.78	1,030.84	948.43	0.35	-0.15	0.093
25.00	-12.47	-2.24	0.00	-67.3	0.00	67.31	1,311.06	395.78	1,030.84	948.43	0.53	-0.18	0.081
30.00	-11.63	-2.14	0.00	-56.1	0.00	56.13	1,311.06	395.78	1,030.84	948.43	0.73	-0.2	0.068
30.00	-11.63	-2.14	0.00	-56.1	0.00	56.13	1,052.07	315.62	655.57	624.04	0.73	-0.2	0.101
35.00	-10.95	-2.06	0.00	-45.4	0.00	45.42	1,052.07	315.62	655.57	624.04	0.96	-0.22	0.083
40.00	-10.26	-1.97	0.00	-35.1	0.00	35.14	1,052.07	315.62	655.57	624.04	1.21	-0.25	0.066
45.00	-7.31	-1.27	0.00	-25.3	0.00	25.29	1,052.07	315.62	655.57	624.04	1.48	-0.27	0.047
48.00	-6.59	-1.17	0.00	-21.5	0.00	21.49	1,052.07	315.62	655.57	624.04	1.66	-0.29	0.041
49.00	-6.40	-1.11	0.00	-20.3	0.00	20.32	1,052.07	315.62	655.57	624.04	1.72	-0.29	0.039
50.00	-6.28	-1.06	0.00	-19.2	0.00	19.20	1,052.07	315.62	655.57	624.04	1.78	-0.29	0.037
55.00	-5.65	-0.96	0.00	-13.9	0.00	13.92	1,052.07	315.62	655.57	624.04	2.09	-0.3	0.028
60.00	-5.02	-0.86	0.00	-9.1	0.00	9.12	1,052.07	315.62	655.57	624.04	2.41	-0.31	0.019
60.00	-5.02	-0.86	0.00	-9.1	0.00	9.12	662.26	211.53	441.68	396.94	2.41	-0.31	0.031
65.00	-4.58	-0.76	0.00	-4.8	0.00	4.83	662.26	211.53	441.68	396.94	2.74	-0.32	0.019
70.00	-3.40	-0.48	0.00	-1.0	0.00	1.05	662.26	211.53	441.68	396.94	3.08	-0.32	0.008
72.00	-0.25	-0.03	0.00	-0.1	0.00	0.10	662.26	211.53	441.68	396.94	3.21	-0.32	0.001
75.00	0.00	-0.03	0.00	0.0	0.00	0.00	662.26	211.53	441.68	396.94	3.41	-0.32	0.000

CALCULATED FORCES

Load Case: 1.0D + 1.0W		60 mph Wind with No Ice										16 Iterations	
Gust Response Factor:		1.10											
Dead load Factor:		1.00											
Wind Load Factor:		1.00											
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	-13.37	-1.85	0.00	-94.6	0.00	94.63	1,311.06	395.78	1,030.84	948.43	0	0	0.110
5.00	-12.72	-1.81	0.00	-85.4	0.00	85.37	1,311.06	395.78	1,030.84	948.43	0.02	-0.03	0.100
10.00	-12.08	-1.78	0.00	-76.3	0.00	76.29	1,311.06	395.78	1,030.84	948.43	0.07	-0.06	0.090
15.00	-11.43	-1.74	0.00	-67.4	0.00	67.41	1,311.06	395.78	1,030.84	948.43	0.15	-0.09	0.080
20.00	-10.78	-1.69	0.00	-58.7	0.00	58.73	1,311.06	395.78	1,030.84	948.43	0.26	-0.11	0.070
25.00	-10.14	-1.64	0.00	-50.3	0.00	50.28	1,311.06	395.78	1,030.84	948.43	0.39	-0.13	0.061
30.00	-9.49	-1.60	0.00	-42.1	0.00	42.06	1,311.06	395.78	1,030.84	948.43	0.54	-0.15	0.052
30.00	-9.49	-1.60	0.00	-42.1	0.00	42.06	1,052.07	315.62	655.57	624.04	0.54	-0.15	0.076
35.00	-8.96	-1.55	0.00	-34.1	0.00	34.07	1,052.07	315.62	655.57	624.04	0.7	-0.17	0.063
40.00	-8.44	-1.50	0.00	-26.3	0.00	26.31	1,052.07	315.62	655.57	624.04	0.89	-0.19	0.050
45.00	-5.96	-0.90	0.00	-18.8	0.00	18.79	1,052.07	315.62	655.57	624.04	1.09	-0.2	0.036
48.00	-5.38	-0.82	0.00	-16.1	0.00	16.10	1,052.07	315.62	655.57	624.04	1.22	-0.21	0.031
49.00	-5.23	-0.78	0.00	-15.3	0.00	15.28	1,052.07	315.62	655.57	624.04	1.27	-0.21	0.029
50.00	-5.13	-0.75	0.00	-14.5	0.00	14.50	1,052.07	315.62	655.57	624.04	1.31	-0.22	0.028
55.00	-4.63	-0.71	0.00	-10.7	0.00	10.72	1,052.07	315.62	655.57	624.04	1.54	-0.22	0.022
60.00	-4.13	-0.66	0.00	-7.2	0.00	7.19	1,052.07	315.62	655.57	624.04	1.78	-0.23	0.015
60.00	-4.13	-0.66	0.00	-7.2	0.00	7.19	662.26	211.53	441.68	396.94	1.78	-0.23	0.024
65.00	-3.79	-0.61	0.00	-3.9	0.00	3.88	662.26	211.53	441.68	396.94	2.03	-0.24	0.016
70.00	-2.82	-0.39	0.00	-0.8	0.00	0.82	662.26	211.53	441.68	396.94	2.28	-0.24	0.006
72.00	-0.19	-0.02	0.00	-0.0	0.00	0.05	662.26	211.53	441.68	396.94	2.38	-0.24	0.000
75.00	0.00	-0.01	0.00	0.0	0.00	0.00	662.26	211.53	441.68	396.94	2.53	-0.24	0.000

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

Design Spectral Response Acceleration at Short Period (S_{ds}):	0.150
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.069
Long-Period Transition Period (T_L - Seconds):	4
Importance Factor (I_e):	1.000
Response Modification Coefficient (R):	1.500
Seismic Response Coefficient (C_s):	0.043
Upper Limit C_s :	0.043
Lower Limit C_s :	0.030
Period based on Rayleigh Method (sec):	1.080
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	1.290
Total Unfactored Dead Load:	13.370 k
Seismic Base Shear (E):	0.570 k

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh	Seismic	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
Segment							
18		73.5	190	49	0.026	15	234
17		71	133	33	0.017	10	163
16		67.5	341	78	0.042	24	419
15		62.5	341	71	0.038	21	419
14		57.5	497	93	0.049	28	611
13		52.5	497	82	0.044	25	611
12		49.5	99	15	0.008	5	122
11		48.5	103	15	0.008	5	127
10		46.5	309	44	0.023	13	380
9		42.5	526	66	0.036	20	647
8		37.5	526	57	0.030	17	647
7		32.5	526	47	0.025	14	647
6		27.5	647	47	0.025	14	795
5		22.5	647	36	0.019	11	795
4		17.5	647	26	0.014	8	795
3		12.5	647	17	0.009	5	795
2		7.5	647	9	0.005	3	795
1		2.5	645	2	0.001	1	794
Generic Flat Platform with Handrails		72	2,500	624	0.333	189	3,075
Commscope RDIDC-9181-PF-48		70	22	5	0.003	2	27
Fujitsu TA08025-B604		70	192	46	0.025	14	236
Fujitsu TA08025-B605		70	225	54	0.029	16	277
JMA Wireless MX08FRO665-21		70	194	47	0.025	14	238
Raycap DC6-48-60-18-8C-EV (Enclosure)		49	48	7	0.004	2	59
Ericsson AIR 6472 B77G B77M (92.6lbs)		48	278	41	0.022	12	342
Ericsson Radio 4494 44B14 20B29 M01		45	172	23	0.012	7	211
Ericsson Radio 4490HP 44B5 44B12A C		45	205	28	0.015	8	252
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)		45	205	28	0.015	8	252
Round T-Arm		45	750	102	0.054	31	922
Commscope NNH4-65C-R6-V3 (102.5 lbs)		45	615	84	0.045	25	756
Totals:			13,371	1,875	1.000	569	16,447

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
Segment							
18		73.5	190	49	0.026	15	166
17		71	133	33	0.017	10	116
16		67.5	341	78	0.042	24	296
15		62.5	341	71	0.038	21	296
14		57.5	497	93	0.049	28	432

SEISMIC FORCES

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)
13	52.5	497	82	0.044	25	432
12	49.5	99	15	0.008	5	86
11	48.5	103	15	0.008	5	90
10	46.5	309	44	0.023	13	269
9	42.5	526	66	0.036	20	458
8	37.5	526	57	0.030	17	458
7	32.5	526	47	0.025	14	458
6	27.5	647	47	0.025	14	563
5	22.5	647	36	0.019	11	563
4	17.5	647	26	0.014	8	563
3	12.5	647	17	0.009	5	563
2	7.5	647	9	0.005	3	563
1	2.5	645	2	0.001	1	562
Generic Flat Platform with Handrails	72	2,500	624	0.333	189	2,175
Commscope RDIDC-9181-PF-48	70	22	5	0.003	2	19
Fujitsu TA08025-B604	70	192	46	0.025	14	167
Fujitsu TA08025-B605	70	225	54	0.029	16	196
JMA Wireless MX08FRO665-21	70	194	47	0.025	14	168
Raycap DC6-48-60-18-8C-EV (Enclosure)	49	48	7	0.004	2	42
Ericsson AIR 6472 B77G B77M (92.6lbs)	48	278	41	0.022	12	242
Ericsson Radio 4494 44B14 20B29 M01	45	172	23	0.012	7	150
Ericsson Radio 4490HP 44B5 44B12A C	45	205	28	0.015	8	178
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)	45	205	28	0.015	8	178
Round T-Arm	45	750	102	0.054	31	652
Commscope NNH4-65C-R6-V3 (102.5 lbs)	45	615	84	0.045	25	535
Totals:		13,371	1,875	1.000	569	11,633

SEISMIC FORCES

1.2D + 1.0Ev + 1.5Eh

Seismic Overstrength

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
18	73.5	190	49	0.026	22	234
17	71	133	33	0.017	15	163
16	67.5	341	78	0.042	36	419
15	62.5	341	71	0.038	32	419
14	57.5	497	93	0.049	42	611
13	52.5	497	82	0.044	38	611
12	49.5	99	15	0.008	7	122
11	48.5	103	15	0.008	7	127
10	46.5	309	44	0.023	20	380
9	42.5	526	66	0.036	30	647
8	37.5	526	57	0.030	26	647
7	32.5	526	47	0.025	21	647
6	27.5	647	47	0.025	21	795
5	22.5	647	36	0.019	16	795
4	17.5	647	26	0.014	12	795
3	12.5	647	17	0.009	8	795
2	7.5	647	9	0.005	4	795
1	2.5	645	2	0.001	1	794
Generic Flat Platform with Handrails	72	2,500	624	0.333	284	3,075
Commscope RDIDC-9181-PF-48	70	22	5	0.003	2	27
Fujitsu TA08025-B604	70	192	46	0.025	21	236
Fujitsu TA08025-B605	70	225	54	0.029	25	277
JMA Wireless MX08FRO665-21	70	194	47	0.025	21	238
Raycap DC6-48-60-18-8C-EV (Enclosure)	49	48	7	0.004	3	59
Ericsson AIR 6472 B77G B77M (92.6lbs)	48	278	41	0.022	19	342
Ericsson Radio 4494 44B14 20B29 M01	45	172	23	0.012	11	211
Ericsson Radio 4490HP 44B5 44B12A C	45	205	28	0.015	13	252
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)	45	205	28	0.015	13	252
Round T-Arm	45	750	102	0.054	46	922

SEISMIC FORCES

1.2D + 1.0Ev + 1.5Eh

Seismic Overstrength

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Commscope NNH4-65C-R6-V3 (102.5 lbs)	45	615	84	0.045	38	756
Totals:		13,371	1,875	1.000	853	16,447

SEISMIC FORCES

0.9D - 1.0Ev + 1.5Eh

Seismic Overstrength (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
18	73.5	190	49	0.026	22	166
17	71	133	33	0.017	15	116
16	67.5	341	78	0.042	36	296
15	62.5	341	71	0.038	32	296
14	57.5	497	93	0.049	42	432
13	52.5	497	82	0.044	38	432
12	49.5	99	15	0.008	7	86
11	48.5	103	15	0.008	7	90
10	46.5	309	44	0.023	20	269
9	42.5	526	66	0.036	30	458
8	37.5	526	57	0.030	26	458
7	32.5	526	47	0.025	21	458
6	27.5	647	47	0.025	21	563
5	22.5	647	36	0.019	16	563
4	17.5	647	26	0.014	12	563
3	12.5	647	17	0.009	8	563
2	7.5	647	9	0.005	4	563
1	2.5	645	2	0.001	1	562
Generic Flat Platform with Handrails	72	2,500	624	0.333	284	2,175
Commscope RDIDC-9181-PF-48	70	22	5	0.003	2	19
Fujitsu TA08025-B604	70	192	46	0.025	21	167
Fujitsu TA08025-B605	70	225	54	0.029	25	196
JMA Wireless MX08FRO665-21	70	194	47	0.025	21	168
Raycap DC6-48-60-18-8C-EV (Enclosure)	49	48	7	0.004	3	42
Ericsson AIR 6472 B77G B77M (92.6lbs)	48	278	41	0.022	19	242
Ericsson Radio 4494 44B14 20B29 M01	45	172	23	0.012	11	150
Ericsson Radio 4490HP 44B5 44B12A C	45	205	28	0.015	13	178
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)	45	205	28	0.015	13	178
Round T-Arm	45	750	102	0.054	46	652
Commscope NNH4-65C-R6-V3 (102.5 lbs)	45	615	84	0.045	38	535
Totals:		13,371	1,875	1.000	853	11,633

1.2D + 1.0Ev + 1.0Eh

Seismic

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-15.65	-0.57	0.00	-32.77	0.00	32.77	1,311.06	395.78	1,031	948.43	0.00	0.00	0.05
5.00	-14.86	-0.57	0.00	-29.92	0.00	29.92	1,311.06	395.78	1,031	948.43	0.01	-0.01	0.04
10.00	-14.06	-0.57	0.00	-27.07	0.00	27.07	1,311.06	395.78	1,031	948.43	0.02	-0.02	0.04
15.00	-13.27	-0.56	0.00	-24.24	0.00	24.24	1,311.06	395.78	1,031	948.43	0.05	-0.03	0.04
20.00	-12.47	-0.55	0.00	-21.44	0.00	21.44	1,311.06	395.78	1,031	948.43	0.09	-0.04	0.03
25.00	-11.68	-0.54	0.00	-18.68	0.00	18.68	1,311.06	395.78	1,031	948.43	0.14	-0.05	0.03
30.00	-11.03	-0.52	0.00	-15.99	0.00	15.99	1,052.07	315.62	656	624.04	0.19	-0.05	0.04
30.00	-11.03	-0.52	0.00	-15.99	0.00	15.99	1,311.06	395.78	1,031	948.43	0.19	-0.05	0.03
35.00	-10.38	-0.51	0.00	-13.37	0.00	13.37	1,052.07	315.62	656	624.04	0.25	-0.06	0.03
40.00	-9.73	-0.49	0.00	-10.83	0.00	10.83	1,052.07	315.62	656	624.04	0.32	-0.07	0.03
45.00	-6.96	-0.39	0.00	-8.39	0.00	8.39	1,052.07	315.62	656	624.04	0.39	-0.08	0.02
48.00	-6.49	-0.37	0.00	-7.22	0.00	7.22	1,052.07	315.62	656	624.04	0.44	-0.08	0.02
49.00	-6.31	-0.37	0.00	-6.84	0.00	6.84	1,052.07	315.62	656	624.04	0.46	-0.08	0.02
50.00	-5.70	-0.34	0.00	-6.48	0.00	6.48	1,052.07	315.62	656	624.04	0.47	-0.08	0.02
55.00	-5.09	-0.31	0.00	-4.77	0.00	4.77	1,052.07	315.62	656	624.04	0.56	-0.08	0.01
60.00	-4.67	-0.29	0.00	-3.21	0.00	3.21	662.26	211.53	442	396.94	0.65	-0.09	0.02

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
60.00	-4.67	-0.29	0.00	-3.21	0.00	3.21	1,052.07	315.62	656	624.04	0.65	-0.09	0.01
65.00	-4.25	-0.27	0.00	-1.75	0.00	1.75	662.26	211.53	442	396.94	0.75	-0.09	0.01
70.00	-3.31	-0.21	0.00	-0.42	0.00	0.42	662.26	211.53	442	396.94	0.84	-0.09	0.01
72.00	0.00	0.00	0.00	0.00	0.00	0.00	662.26	211.53	442	396.94	0.88	-0.09	0.00
75.00	0.00	0.00	0.00	0.00	0.00	0.00	662.26	211.53	442	396.94	0.94	-0.09	0.00

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 (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-11.07	-0.57	0.00	-32.60	0.00	32.60	1,311.06	395.78	1,031	948.43	0.00	0.00	0.04
5.00	-10.51	-0.57	0.00	-29.75	0.00	29.75	1,311.06	395.78	1,031	948.43	0.01	-0.01	0.04
10.00	-9.95	-0.56	0.00	-26.91	0.00	26.91	1,311.06	395.78	1,031	948.43	0.02	-0.02	0.04
15.00	-9.38	-0.56	0.00	-24.08	0.00	24.08	1,311.06	395.78	1,031	948.43	0.05	-0.03	0.03
20.00	-8.82	-0.55	0.00	-21.29	0.00	21.29	1,311.06	395.78	1,031	948.43	0.09	-0.04	0.03
25.00	-8.26	-0.53	0.00	-18.55	0.00	18.55	1,311.06	395.78	1,031	948.43	0.14	-0.05	0.03
30.00	-7.80	-0.52	0.00	-15.88	0.00	15.88	1,052.07	315.62	656	624.04	0.19	-0.05	0.03
30.00	-7.80	-0.52	0.00	-15.88	0.00	15.88	1,311.06	395.78	1,031	948.43	0.19	-0.05	0.02
35.00	-7.34	-0.50	0.00	-13.27	0.00	13.27	1,052.07	315.62	656	624.04	0.25	-0.06	0.03
40.00	-6.88	-0.48	0.00	-10.75	0.00	10.75	1,052.07	315.62	656	624.04	0.31	-0.07	0.02
45.00	-4.92	-0.39	0.00	-8.33	0.00	8.33	1,052.07	315.62	656	624.04	0.39	-0.07	0.02
48.00	-4.59	-0.37	0.00	-7.17	0.00	7.17	1,052.07	315.62	656	624.04	0.44	-0.08	0.02
49.00	-4.46	-0.36	0.00	-6.79	0.00	6.79	1,052.07	315.62	656	624.04	0.45	-0.08	0.02
50.00	-4.03	-0.34	0.00	-6.43	0.00	6.43	1,052.07	315.62	656	624.04	0.47	-0.08	0.01
55.00	-3.60	-0.31	0.00	-4.73	0.00	4.73	1,052.07	315.62	656	624.04	0.56	-0.08	0.01
60.00	-3.30	-0.29	0.00	-3.18	0.00	3.18	662.26	211.53	442	396.94	0.65	-0.09	0.01
60.00	-3.30	-0.29	0.00	-3.18	0.00	3.18	1,052.07	315.62	656	624.04	0.65	-0.09	0.01
65.00	-3.01	-0.26	0.00	-1.74	0.00	1.74	662.26	211.53	442	396.94	0.74	-0.09	0.01
70.00	-2.34	-0.21	0.00	-0.42	0.00	0.42	662.26	211.53	442	396.94	0.83	-0.09	0.01
72.00	0.00	0.00	0.00	0.00	0.00	0.00	662.26	211.53	442	396.94	0.87	-0.09	0.00
75.00	0.00	0.00	0.00	0.00	0.00	0.00	662.26	211.53	442	396.94	0.93	-0.09	0.00

ANALYSIS SUMMARY

Load Case	Base Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W	6.47	0.00	16.04	0.00	0.00	331.20	0.00	0.36
0.9D + 1.0W	6.46	0.00	12.03	0.00	0.00	329.70	0.00	0.36
1.2D + 1.0Di + 1.0Wi	2.68	0.00	16.61	0.00	0.00	130.06	0.00	0.15
1.2D + 1.0Ev + 1.0Eh	0.57	0.00	15.65	0.00	0.00	32.77	0.00	0.05
0.9D - 1.0Ev + 1.0Eh	0.57	0.00	11.07	0.00	0.00	32.60	0.00	0.04
1.0D + 1.0W	1.85	0.00	13.37	0.00	0.00	94.63	0.00	0.11

ANALYSIS SUMMARY - OVERSTRENGTH LOAD CASES

Load Case	Base Reactions					
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.0Ev + 1.5Eh	0.85	0.00	15.65	0.00	0.00	49.16
0.9D - 1.0Ev + 1.5Eh	0.85	0.00	11.07	0.00	0.00	48.90

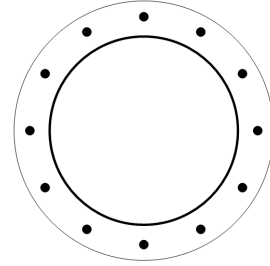
BASE PLATE ANALYSIS @ 0 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
331.2	16.04	6.47

PLATE PARAMETERS (ID# 6721)

Width:	41	in
Shape:	Round	
Thickness:	2	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Rod Detail Type:	c	
Clear Distance	-	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	15	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#3208]	Radial	12	1.5	36	Not Listed	109	125	-	-

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	30"ø x 0.375" (Round)	34.9007	-	-	3830.43	-
Bolt Group	Original (12) 1.5"ø	1.7671	1.4053	0.1571	2465.54	6.0

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	30"ø x 0.375" (Round)	331.2	16.04	6.47	1.000
Bolt Group	Original (12) 1.5"ø	331.2	-	6.47	1.000

BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	30.12	in
Point-to-Point Diameter:	30.12	in
Orientation Offset:	-	°

Flat Width:	0.263	in
Flat Radians:	0.017	rad

PLATE PROPERTIES

Neutral Axis:	15	°
Bend Line Limits:	1.250 to 2.415	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n
Flats	23.651	0.00	23.651	112.2	766.3	14.6%
Corners	23.651	0.00	23.651	112.2	766.3	14.6%
Circumferential	29.291	0.00	29.291	157.4	949.0	16.6%

PLASTIC ANCHOR ROD ANALYSIS

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load P _u (k)	Applied Shear Load V _u (k)	Compressive Capacity ΦP _n (k)	Interaction Result
Original	12	1.5	8.7	0.9	131.7	6.6%

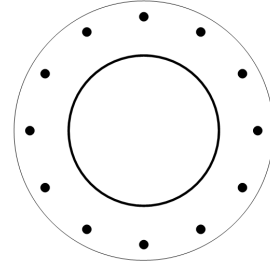
UPPER FLANGE PLATE ANALYSIS @ 30 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
147.4	11.34	5.59

PLATE PARAMETERS (ID# 11011)

Width:	41	in
Shape:	Round	
Thickness:	2	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	15	°



FLANGE BOLT PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#3209]	Radial	12	1.5	36	A325	92	120	-	-

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	24"ø x 0.375" (Round)	27.8322	-	-	1943.10	-
Bolt Group	Original (12) 1.5"ø	1.7671	1.4053	0.1571	2465.54	6.0

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	24"ø x 0.375" (Round)	147.4	11.34	5.59	1.000
Bolt Group	Original (12) 1.5"ø	147.4	-	5.59	1.000

UPPER FLANGE PLATE BEND LINE ANALYSIS @ 30 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	24.12	in
Point-to-Point Diameter:	24.12	in
Orientation Offset:	-	°

Flat Width:	0.211	in
Flat Radians:	0.017	rad

PLATE PROPERTIES

Neutral Axis:	15	°
Bend Line Limits:	1.070 to 2.595	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n
Flats	29.747	0.00	29.747	157.2	963.8	16.3%
Corners	29.747	0.00	29.747	157.2	963.8	16.3%
Circumferential	38.623	0.00	38.623	309.1	1251.4	24.7%

PLASTIC FLANGE BOLT ANALYSIS

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load P _u (k)	Applied Shear Load V _u (k)	Compressive Capacity ΦP _n (k)	Interaction Result
Original	12	1.5	1.9	0.7	126.5	1.5%

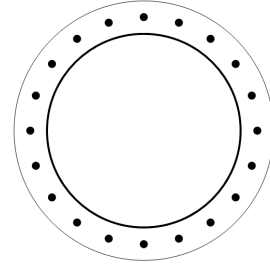
UPPER FLANGE PLATE ANALYSIS @ 60 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
25.21	4.93	2.32

PLATE PARAMETERS (ID# 3261)

Width:	32	in
Shape:	Round	
Thickness:	1.5	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	0	°



FLANGE BOLT PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#3210]	Radial	20	1	28	A325	92	120	-	-

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	24"ø x 0.25" (Round)	18.6530	-	-	1315.57	-
Bolt Group	Original (20) 1"ø	0.7854	0.6057	0.0292	1084.21	8.0

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	24"ø x 0.25" (Round)	25.2	4.93	2.32	1.000
Bolt Group	Original (20) 1"ø	25.2	-	2.32	1.000

UPPER FLANGE PLATE BEND LINE ANALYSIS @ 60 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	24.12	in
Point-to-Point Diameter:	24.12	in
Orientation Offset:	-	°

Flat Width:	0.211	in
Flat Radians:	0.017	rad

PLATE PROPERTIES

Neutral Axis:	0	°
Bend Line Limits:	1.111 to 2.031	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n
Flats	17.107	0.00	9.623	6.4	311.8	2.1%
Corners	17.107	0.00	9.623	6.4	311.8	2.1%
Circumferential	18.984	0.00	10.678	9.6	346.0	2.8%

PLASTIC FLANGE BOLT ANALYSIS

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load P _u (k)	Applied Shear Load V _u (k)	Compressive Capacity ΦP _n (k)	Interaction Result
Original	20	1	0.1	0.2	54.5	0.2%