



Structural Analysis Report

Structure : 129 ft Monopole
ATC Asset Name : Cotopaxi II
ATC Asset Number : 370593
Engineering Number : 15312118_C3_03
Proposed Carrier : AT&T MOBILITY
Carrier Site Name : COTOPAXI
Carrier Site Number : WSUTH0060835
Site Location : 345 Fremont County Road 012
COTOPAXI, CO 81223-0010
38.3742° N, 105.691° W
County : Fremont
Date : May 27, 2025
Max Usage : 87%
Analysis Result : Pass





Table of Contents

Introduction	3
Supporting Documents	3
Analysis	3
Conclusion	3
Structure Usages	4
Maximum Reactions	4
Tower Loading	5
Standard Conditions	Attached
Calculations	Attached

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 129 ft Monopole tower to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower:	Sabre Job #63640, dated July 26, 2012
Foundation:	Sabre Job #63640, dated July 26, 2012
Geotechnical:	TEP Project #093003, dated July 17, 2012

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:	105 mph (3-second gust)
Basic Wind Speed w/ Ice:	55 mph (3-second gust) w/ 0.18" radial ice concurrent
Code(s):	ANSI/TIA-222-I / 2018 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:	$S_{05} = 0.25$, $S_{01} = 0.12$
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	56.0%	1.2D + 1.0W	Pass
Serviceability Usage	43.2%	1.0D + 1.0W	Pass
Base Plate @ 0.0 ft	50.3%	Rods	Pass
Foundation	59.1%	Shear	Pass
Foundation	86.6%	Axial	Pass
Foundation	56.8%	Moment	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	1,416.9	29.6	14.7

**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.

AT&T MOBILITY Final Loading

Elev (ft)	Qty	Equipment	Lines
110.0	1	Low Profile Platform	(1) 0.41" (10.3mm) Fiber (2) 0.88" (22.4mm) 8 AWG 6 (1) 0.96" (24.3mm) Cable (3) 2" Carflex Non-Metallic Conduit
	1	Raycap DC9-48-60-24-8C-EV (Enclosure)	
	3	Ericsson Radio 4490HP 44B5 44B12A C	
	3	Ericsson Radio 4494 44B14 20B29 M01	
	3	Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3lbs)	
	6	Commscope NNH4-65C-R6-V3 (102.5 lbs)	

Install proposed lines inside the pole shaft.

Other Existing/Reserved Loading

Elev (ft)	Qty	Equipment	Lines
130.0	1	Platform with Handrails	(2) 2.00" (50.8mm) Hybrid
	3	Commscope FFVV-65C-R3-V1	
	3	Nokia AEHC	
	3	Nokia AHFII Airscale RRH 4T4R B25/66 480W	
	3	Nokia AHLOB AIRSCALE-4T4R-B71/85 320W	
100.0	1	Platform with Handrails	-
	3	Ericsson AIR 6419 B77D	
98.0	2	Raycap RVZDC-6627-PF-48 (29.5")	(2) 1.75" (44.5mm) Hybrid
	3	Ericsson 8843 Rev 2	
	3	Ericsson Radio 4449 - B13&B5	
	6	Commscope NHH-45C-R2B	

(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.

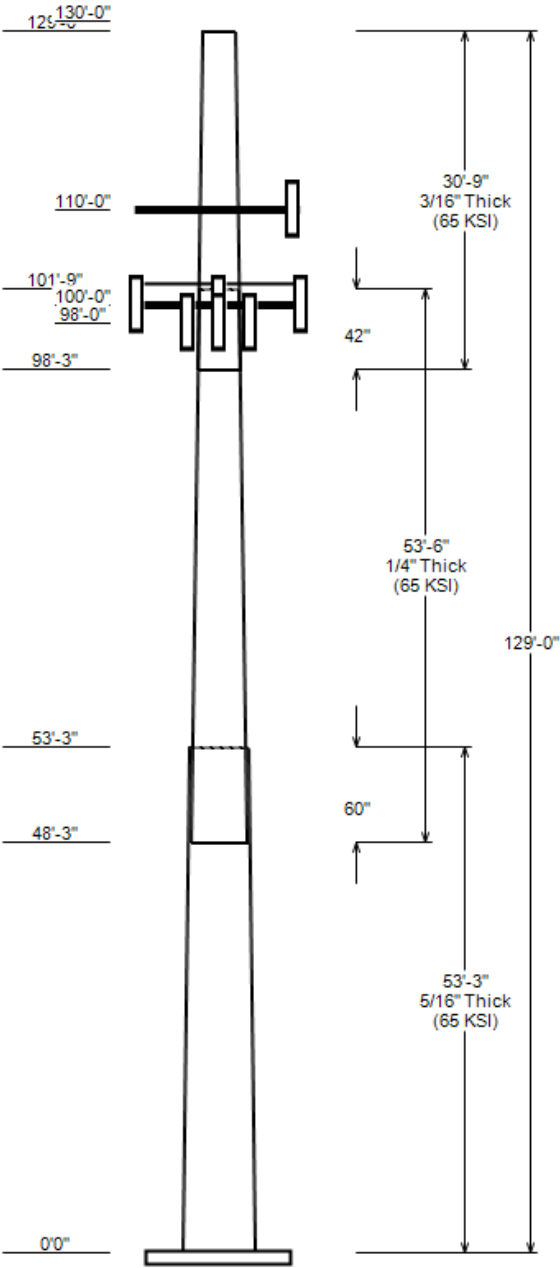
Unless explicitly agreed by both the client and ATC Tower Services LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

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:	105 mph	Ice Wind:	55 mph w/ 0.2" ice	Service Wind:	60 mph
Risk Category:	II	Exposure:	C	S _{DI} : 0.120	S _{DS} : 0.250
Topo Factor:	Method 1	Topo Feature:	Flat		
Structure Height:	129.0 ft	Base Elevation:	0.00 ft	Structure Type:	Taper
Base Diameter:	43.92 in	Base Rotation:	0.00°	Taper:	0.1980 (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	53.250	33.38	43.92	0.312	Slip Joint	0.00	18 Sides	65
2	53.500	24.27	34.86	0.250		60.00	18 Sides	65
3	30.750	19.25	25.34	0.188	Slip Joint	42.00	18 Sides	65

DISCRETE APPURTENANCE		LINEAR APPURTENANCE	
Elev (ft)	Description	Elev To (ft)	Description
130.0	(3) Nokia AHFII Airscale RRH 4T4R B25/	130.0	(2) 2.00" (50.8mm) Hybrid
130.0	(1) Generic Flat Platform with Handrails	110.0	(2) 0.88" (22.4mm) 8 AWG 6
130.0	(3) Nokia AEHC	110.0	(1) 0.96" (24.3mm) Cable
130.0	(3) Nokia AHLOB AIRSCALE-4T4R-B71/	110.0	(1) 0.41" (10.3mm) Fiber
130.0	(3) Commscope FFVV-65C-R3-V1	110.0	(3) 2" Carflex Non-Metallic Conduit
110.0	(3) Ericsson Radio 4890HP 48B2/B25 48	98.0	(2) 1.75" (44.5mm) Hybrid
110.0	(6) Commscope NNH4-65C-R6-V3 (102.		
110.0	(1) Generic Round Low Profile Platform		
110.0	(3) Ericsson Radio 4490HP 44B5 44B12		
110.0	(3) Ericsson Radio 4494 44B14 20B29 M		
110.0	(1) Raycap DC9-48-60-24-8C-EV (Encl		
100.0	(3) Ericsson AIR 6419 B77D		
100.0	(1) Generic Flat Platform with Handrails		
98.0	(6) Commscope NNH-45C-R2B		
98.0	(3) Ericsson Radio 4449 - B13&B5		
98.0	(2) Raycap RVZDC-6627-PF-48 (29.5")		
98.0	(3) Ericsson 8843 Rev 2		



GLOBAL BASE REACTIONS

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	1416.95	29.60	14.68
0.9D + 1.0W	1395.41	22.20	14.66
1.2D + 1.0Di + 1.0Wi	475.91	30.32	5.26
1.2D + 1.0Ev + 1.0Eh	87.91	29.85	0.78
0.9D - 1.0Ev + 1.0Eh	86.10	20.30	0.78
1.0D + 1.0W	410.07	24.69	4.28

ANALYSIS PARAMETERS

Location:	Fremont County,CO	Height:	129 ft
Type and Shape:	Taper, 18 Sides	Base Diameter:	43.92 in
Manufacturer:	Sabre	Top Diameter:	19.25 in
K _d (non-service):	0.95	Taper:	0.1980 in/ft
K _e :	0.79	Rotation:	0.000°

ICE & WIND PARAMETERS

Risk Category:	II	Design Wind Speed:	105 mph
Exposure Category:	C	Design Wind Speed w/ Ice:	55 mph
Design Ice Thickness:	0.18 in		
Topo Factor Procedure:	Method 1		
Crest Height(H):	0 ft	Service Wind Speed:	60 mph
Crest Length(L):	0 ft	HMSL:	6423.00 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):	2.55
T _L (sec):	6	P:	1
S _{ds} :	0.250	S _{d1} :	0.120
		C _s :	0.031
		C _s Max:	0.031
		C _s Min:	0.030

LOAD CASES

1.2D + 1.0W	105 mph Wind with No Ice
0.9D + 1.0W	105 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	55 mph Wind with 0.18" 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)	Weight (lb)	Bottom						Top						Taper (in/ft)
							Dia (in)	Elev (ft)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	
1-18	53.25	0.3125	65		0.00	6,890	43.92	0.000	43.25	10,391.5	23.37	140.54	33.38	53.25	32.79	4,529.1	17.42	106.80	0.1980
2-18	53.50	0.2500	65	Slip	60.00	4,235	34.86	48.250	27.47	4,158.1	23.18	139.46	24.27	101.75	19.06	1,389.5	15.71	97.08	0.1980
3-18	30.75	0.1875	65	Slip	42.00	1,377	25.34	98.250	14.97	1,196.3	22.42	135.14	19.25	129.00	11.34	520.8	16.69	102.67	0.1980
Total Shaft Weight						12,502													

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
130.00	Nokia AHLOB AIRSCALE-4T4R-B71/	3	0.75	0.000	70.60	3.214	0.63	79.83	3.358	0.63
130.00	Nokia AHFII Aircscale RRH 4T4R	3	0.75	0.000	70.60	2.835	0.67	78.08	2.972	0.67
130.00	Commscope FFFVV-65C-R3-V1	3	0.75	0.000	124.60	21.113	0.63	173.48	21.553	0.63
130.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	2710.09	44.880	1.00
130.00	Nokia AEHC	3	0.75	0.000	103.60	6.844	0.62	121.88	7.053	0.62
110.00	Generic Round Low Profile Plat	1	1.00	0.000	1875.00	21.700	1.00	1969.19	23.933	1.00
110.00	Commscope NNH4-65C-R6-V3 (102.	6	0.80	0.000	102.50	17.073	0.64	140.68	17.502	0.64
110.00	Ericsson Radio 4890HP 48B2/B25	3	0.80	0.000	68.30	2.202	0.67	75.27	2.315	0.67
110.00	Ericsson Radio 4490HP 44B5 44B	3	0.80	0.000	68.30	2.202	0.67	75.20	2.262	0.67
110.00	Ericsson Radio 4494 44B14 20B2	3	0.80	0.000	57.30	2.202	0.67	63.69	2.315	0.67
110.00	Raycap DC9-48-60-24-8C-EV (Enc	1	0.80	0.000	18.50	2.676	1.00	28.24	2.808	1.00
100.00	Ericsson AIR 6419 B77D	3	0.75	0.000	63.10	4.186	0.67	75.97	4.348	0.67
100.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	2704.95	44.819	1.00
98.00	Ericsson 8843 Rev 2	3	0.75	0.000	75.00	1.650	0.50	82.14	1.748	0.50
98.00	Ericsson Radio 4449 - B13&B5	3	0.75	0.000	70.00	1.650	0.50	76.48	1.747	0.50
98.00	Raycap RVZDC-6627-PF-48 (29.5"	2	0.75	0.000	32.00	4.056	0.79	46.62	4.213	0.79
98.00	Commscope NHH-45C-R2B	6	0.75	0.000	81.60	15.892	0.64	115.96	16.316	0.64
Totals		Row Count: 17		48	10,376.30			11,751.61		

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	130.00	2	2.00" (50.8mm) Hybrid	2	3.09	N	0	0	0	0	0	N	T-MOBILE
0.00	110.00	3	2" Carflex Non-Metall	2.36	0.68	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	110.00	2	0.88" (22.4mm) 8 AWG	0.88	0.68	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	110.00	1	0.41" (10.3mm) Fiber	0.41	0.09	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	110.00	1	0.96" (24.3mm) Cable	0.96	0.88	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	98.00	2	1.75" (44.5mm) Hybrid	1.75	2.72	N	2	1.38	1.38	90	1.38	Y	VERIZON WIRELESS

SEGMENT PROPERTIES												
Seg Top Elev (ft)	Description	(Max Length: 5 ft)	Thick (in)	Flat Dia (in)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in³)	Z (in³)	Weight (lb)
0.00			0.3125	43.920	43.252	10,391.50	23.37	140.54	73.9	466.0	0.0	0.0
5.00			0.3125	42.930	42.270	9,699.60	22.81	137.38	74.6	445.0	0.0	727.5
10.00			0.3125	41.940	41.288	9,039.20	22.25	134.21	75.2	424.5	0.0	710.8
15.00			0.3125	40.950	40.306	8,409.40	21.70	131.04	75.9	404.5	0.0	694.1
20.00			0.3125	39.960	39.323	7,809.60	21.14	127.87	76.5	384.9	0.0	677.4
25.00			0.3125	38.969	38.341	7,239.00	20.58	124.70	77.2	365.9	0.0	660.7
30.00			0.3125	37.979	37.359	6,696.90	20.02	121.53	77.9	347.3	0.0	644.0
35.00			0.3125	36.989	36.377	6,182.50	19.46	118.37	78.5	329.2	0.0	627.3
40.00			0.3125	35.999	35.395	5,695.20	18.90	115.20	79.2	311.6	0.0	610.6
45.00			0.3125	35.009	34.413	5,234.20	18.34	112.03	79.8	294.5	0.0	593.9
48.25	Bot - Section 2		0.3125	34.365	33.775	4,948.30	17.98	109.97	80.3	283.6	0.0	377.0
50.00			0.3125	34.019	33.431	4,798.80	17.78	108.86	80.5	277.8	0.0	362.8
53.25	Top - Section 1		0.2500	33.875	26.681	3,811.40	22.48	135.50	75	221.6	0.0	664.1
55.00			0.2500	33.529	26.406	3,694.70	22.24	134.11	75.2	217.0	0.0	158.1
60.00			0.2500	32.539	25.620	3,374.70	21.54	130.15	76.1	204.3	0.0	442.6
65.00			0.2500	31.548	24.834	3,073.70	20.84	126.19	76.9	191.9	0.0	429.2
70.00			0.2500	30.558	24.049	2,791.10	20.14	122.23	77.7	179.9	0.0	415.8
75.00			0.2500	29.568	23.263	2,526.40	19.44	118.27	78.5	168.3	0.0	402.5
80.00			0.2500	28.578	22.478	2,279.00	18.75	114.31	79.4	157.1	0.0	389.1
85.00			0.2500	27.588	21.692	2,048.30	18.05	110.35	80.2	146.2	0.0	375.7
90.00			0.2500	26.598	20.906	1,833.70	17.35	106.39	81	135.8	0.0	362.4
95.00			0.2500	25.608	20.121	1,634.60	16.65	102.43	81.8	125.7	0.0	349.0
98.00			0.2500	25.014	19.649	1,522.40	16.23	100.05	82.3	119.9	0.0	203.0
98.25	Bot - Section 3		0.2500	24.964	19.610	1,513.30	16.20	99.86	82.4	119.4	0.0	16.7
100.00			0.2500	24.618	19.335	1,450.50	15.95	98.47	82.6	116.1	0.0	204.5
101.75	Top - Section 2		0.1875	24.646	14.555	1,100.10	21.77	131.45	75.8	87.9	0.0	201.6
105.00			0.1875	24.003	14.172	1,015.50	21.16	128.01	76.5	83.3	0.0	158.9
110.00			0.1875	23.012	13.583	894.10	20.23	122.73	77.6	76.5	0.0	236.1
115.00			0.1875	22.022	12.994	782.70	19.30	117.45	78.7	70.0	0.0	226.1
120.00			0.1875	21.032	12.405	681.00	18.37	112.17	79.8	63.8	0.0	216.1
125.00			0.1875	20.042	11.816	588.50	17.44	106.89	80.9	57.8	0.0	206.0
129.00			0.1875	19.250	11.344	520.80	16.69	102.67	81.8	53.3	0.0	157.6
Total:											12,501.2	

CALCULATED FORCES													
Load Case: 1.2D + 1.0W			105 mph Wind with No Ice									24 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	-29.60	-14.68	0.00	-1,417.0	0.00	1,416.95	2,877.14	759.07	2,989.70	2,583.30	0	0	0.559
5.00	-28.58	-14.51	0.00	-1,343.6	0.00	1,343.57	2,836.81	741.83	2,855.50	2,488.84	0.1	-0.19	0.550
10.00	-27.59	-14.34	0.00	-1,271.0	0.00	1,271.04	2,795.32	724.60	2,724.37	2,395.05	0.4	-0.38	0.541
15.00	-26.61	-14.16	0.00	-1,199.4	0.00	1,199.36	2,752.67	707.36	2,596.33	2,301.99	0.9	-0.58	0.531
20.00	-25.66	-13.98	0.00	-1,128.5	0.00	1,128.54	2,708.85	690.13	2,471.36	2,209.73	1.61	-0.77	0.521
25.00	-24.73	-13.79	0.00	-1,058.6	0.00	1,058.63	2,663.88	672.89	2,349.48	2,118.35	2.53	-0.97	0.509
30.00	-23.82	-13.59	0.00	-989.7	0.00	989.68	2,617.74	655.66	2,230.68	2,027.92	3.65	-1.17	0.498
35.00	-22.93	-13.38	0.00	-921.7	0.00	921.73	2,570.45	638.42	2,114.97	1,938.51	4.99	-1.38	0.485
40.00	-22.06	-13.17	0.00	-854.8	0.00	854.82	2,521.99	621.19	2,002.33	1,850.18	6.54	-1.58	0.471
45.00	-21.22	-12.99	0.00	-789.0	0.00	788.97	2,472.36	603.95	1,892.78	1,763.02	8.3	-1.79	0.457
48.25	-20.68	-12.87	0.00	-746.8	0.00	746.77	2,439.49	592.75	1,823.22	1,707.02	9.57	-1.92	0.446
50.00	-20.20	-12.76	0.00	-724.2	0.00	724.24	2,421.58	586.72	1,786.31	1,677.09	10.28	-1.99	0.441
53.25	-19.32	-12.63	0.00	-682.8	0.00	682.77	1,799.94	468.25	1,422.10	1,245.83	11.69	-2.13	0.560
55.00	-19.07	-12.49	0.00	-660.7	0.00	660.67	1,788.22	463.42	1,392.94	1,224.87	12.48	-2.2	0.551
60.00	-18.40	-12.28	0.00	-598.2	0.00	598.21	1,753.95	449.63	1,311.30	1,165.39	14.92	-2.45	0.525
65.00	-17.75	-12.06	0.00	-536.8	0.00	536.82	1,718.53	435.84	1,232.12	1,106.57	17.61	-2.69	0.496
70.00	-17.12	-11.85	0.00	-476.5	0.00	476.49	1,681.94	422.06	1,155.41	1,048.48	20.55	-2.92	0.465
75.00	-16.51	-11.63	0.00	-417.3	0.00	417.26	1,644.19	408.27	1,081.16	991.19	23.73	-3.15	0.432

ASSET: 370593, Cotopaxi II
CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-I
PROJECT: 15312118_C3_03

CALCULATED FORCES

80.00	-15.92	-11.41	0.00	-359.1	0.00	359.11	1,605.28	394.48	1,009.38	934.77	27.15	-3.37	0.395
85.00	-15.35	-11.19	0.00	-302.1	0.00	302.06	1,565.21	380.69	940.06	879.30	30.78	-3.57	0.354
90.00	-14.81	-10.97	0.00	-246.1	0.00	246.11	1,523.97	366.91	873.21	824.85	34.63	-3.76	0.309
95.00	-14.28	-10.78	0.00	-191.3	0.00	191.28	1,481.58	353.12	808.82	771.49	38.66	-3.93	0.259
98.00	-12.90	-9.03	0.00	-158.9	0.00	158.93	1,455.58	344.85	771.38	740.02	41.16	-4.02	0.224
98.25	-12.88	-8.99	0.00	-156.7	0.00	156.68	1,453.40	344.16	768.30	737.42	41.37	-4.03	0.222
100.00	-9.49	-7.25	0.00	-140.9	0.00	140.94	1,436.50	339.33	746.90	718.52	42.86	-4.08	0.203
101.75	-9.23	-7.13	0.00	-128.2	0.00	128.25	992.96	255.45	564.32	499.80	44.36	-4.13	0.267
105.00	-9.00	-6.95	0.00	-105.1	0.00	105.07	975.91	248.73	535.02	478.20	47.19	-4.2	0.230
110.00	-5.16	-3.86	0.00	-70.3	0.00	70.32	948.72	238.39	491.46	445.40	51.66	-4.33	0.164
115.00	-4.86	-3.64	0.00	-51.0	0.00	51.03	920.38	228.04	449.75	413.19	56.24	-4.42	0.129
120.00	-4.58	-3.42	0.00	-32.8	0.00	32.84	890.87	217.70	409.90	381.66	60.92	-4.5	0.091
125.00	-4.31	-3.23	0.00	-15.7	0.00	15.73	860.20	207.36	371.89	350.86	65.65	-4.55	0.050
129.00	0.00	-2.88	0.00	-2.8	0.00	2.80	834.82	199.09	342.81	326.80	69.47	-4.57	0.009

CALCULATED FORCES

Load Case: 0.9D + 1.0W		105 mph Wind with No Ice (Reduced DL)										24 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	-22.20	-14.66	0.00	-1,395.4	0.00	1,395.41	2,877.14	759.07	2,989.70	2,583.30	0	0	0.548	
5.00	-21.42	-14.47	0.00	-1,322.1	0.00	1,322.10	2,836.81	741.83	2,855.50	2,488.84	0.1	-0.19	0.539	
10.00	-20.66	-14.28	0.00	-1,249.8	0.00	1,249.76	2,795.32	724.60	2,724.37	2,395.05	0.4	-0.37	0.530	
15.00	-19.92	-14.08	0.00	-1,178.4	0.00	1,178.38	2,752.67	707.36	2,596.33	2,301.99	0.89	-0.57	0.520	
20.00	-19.20	-13.88	0.00	-1,108.0	0.00	1,107.97	2,708.85	690.13	2,471.36	2,209.73	1.59	-0.76	0.509	
25.00	-18.49	-13.67	0.00	-1,038.6	0.00	1,038.58	2,663.88	672.89	2,349.48	2,118.35	2.49	-0.95	0.498	
30.00	-17.79	-13.45	0.00	-970.2	0.00	970.24	2,617.74	655.66	2,230.68	2,027.92	3.59	-1.15	0.486	
35.00	-17.12	-13.22	0.00	-903.0	0.00	903.00	2,570.45	638.42	2,114.97	1,938.51	4.9	-1.35	0.473	
40.00	-16.46	-13.00	0.00	-836.9	0.00	836.88	2,521.99	621.19	2,002.33	1,850.18	6.43	-1.55	0.459	
45.00	-15.82	-12.80	0.00	-771.9	0.00	771.90	2,472.36	603.95	1,892.78	1,763.02	8.16	-1.75	0.445	
48.25	-15.42	-12.68	0.00	-730.3	0.00	730.30	2,439.49	592.75	1,823.22	1,707.02	9.4	-1.88	0.435	
50.00	-15.05	-12.56	0.00	-708.1	0.00	708.10	2,421.58	586.72	1,786.31	1,677.09	10.1	-1.96	0.429	
53.25	-14.39	-12.43	0.00	-667.3	0.00	667.27	1,799.94	468.25	1,422.10	1,245.83	11.48	-2.09	0.544	
55.00	-14.19	-12.28	0.00	-645.5	0.00	645.52	1,788.22	463.42	1,392.94	1,224.87	12.26	-2.16	0.536	
60.00	-13.68	-12.06	0.00	-584.1	0.00	584.11	1,753.95	449.63	1,311.30	1,165.39	14.65	-2.4	0.510	
65.00	-13.19	-11.83	0.00	-523.8	0.00	523.83	1,718.53	435.84	1,232.12	1,106.57	17.29	-2.63	0.482	
70.00	-12.71	-11.60	0.00	-464.7	0.00	464.69	1,681.94	422.06	1,155.41	1,048.48	20.17	-2.86	0.452	
75.00	-12.25	-11.37	0.00	-406.7	0.00	406.70	1,644.19	408.27	1,081.16	991.19	23.28	-3.08	0.419	
80.00	-11.80	-11.14	0.00	-349.8	0.00	349.84	1,605.28	394.48	1,009.38	934.77	26.62	-3.3	0.382	
85.00	-11.37	-10.92	0.00	-294.1	0.00	294.12	1,565.21	380.69	940.06	879.30	30.18	-3.5	0.343	
90.00	-10.95	-10.69	0.00	-239.5	0.00	239.54	1,523.97	366.91	873.21	824.85	33.95	-3.68	0.298	
95.00	-10.56	-10.50	0.00	-186.1	0.00	186.09	1,481.58	353.12	808.82	771.49	37.89	-3.85	0.249	
98.00	-9.55	-8.78	0.00	-154.6	0.00	154.57	1,455.58	344.85	771.38	740.02	40.34	-3.94	0.216	
98.25	-9.53	-8.74	0.00	-152.4	0.00	152.38	1,453.40	344.16	768.30	737.42	40.54	-3.94	0.214	
100.00	-7.01	-7.06	0.00	-137.1	0.00	137.08	1,436.50	339.33	746.90	718.52	42	-3.99	0.196	
101.75	-6.82	-6.94	0.00	-124.7	0.00	124.73	992.96	255.45	564.32	499.80	43.47	-4.04	0.257	
105.00	-6.64	-6.76	0.00	-102.2	0.00	102.16	975.91	248.73	535.02	478.20	46.24	-4.11	0.221	
110.00	-3.81	-3.75	0.00	-68.3	0.00	68.34	948.72	238.39	491.46	445.40	50.61	-4.23	0.158	
115.00	-3.59	-3.53	0.00	-49.6	0.00	49.60	920.38	228.04	449.75	413.19	55.09	-4.32	0.124	
120.00	-3.38	-3.32	0.00	-32.0	0.00	31.95	890.87	217.70	409.90	381.66	59.65	-4.4	0.088	
125.00	-3.18	-3.14	0.00	-15.4	0.00	15.35	860.20	207.36	371.89	350.86	64.29	-4.45	0.048	
129.00	0.00	-2.88	0.00	-2.8	0.00	2.80	834.82	199.09	342.81	326.80	68.02	-4.47	0.009	

CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi				55 mph Wind with 0.18" Radial Ice								23 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													
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio		
0.00	-30.32	-5.26	0.00	-475.9	0.00	475.91	2,877.14	759.07	2,989.70	2,583.30	0	0	0.195		
5.00	-29.31	-5.17	0.00	-449.6	0.00	449.59	2,836.81	741.83	2,855.50	2,488.84	0.03	-0.06	0.191		
10.00	-28.31	-5.09	0.00	-423.7	0.00	423.72	2,795.32	724.60	2,724.37	2,395.05	0.13	-0.13	0.187		
15.00	-27.33	-5.00	0.00	-398.3	0.00	398.28	2,752.67	707.36	2,596.33	2,301.99	0.3	-0.19	0.183		
20.00	-26.37	-4.91	0.00	-373.3	0.00	373.28	2,708.85	690.13	2,471.36	2,209.73	0.54	-0.26	0.179		
25.00	-25.43	-4.81	0.00	-348.7	0.00	348.74	2,663.88	672.89	2,349.48	2,118.35	0.84	-0.32	0.174		
30.00	-24.51	-4.71	0.00	-324.7	0.00	324.68	2,617.74	655.66	2,230.68	2,027.92	1.22	-0.39	0.170		
35.00	-23.61	-4.61	0.00	-301.1	0.00	301.12	2,570.45	638.42	2,114.97	1,938.51	1.66	-0.46	0.165		
40.00	-22.73	-4.51	0.00	-278.1	0.00	278.07	2,521.99	621.19	2,002.33	1,850.18	2.17	-0.52	0.159		
45.00	-21.87	-4.42	0.00	-255.5	0.00	255.54	2,472.36	603.95	1,892.78	1,763.02	2.76	-0.59	0.154		
48.25	-21.33	-4.36	0.00	-241.2	0.00	241.18	2,439.49	592.75	1,823.22	1,707.02	3.17	-0.63	0.150		
50.00	-20.84	-4.31	0.00	-233.6	0.00	233.55	2,421.58	586.72	1,786.31	1,677.09	3.41	-0.66	0.148		
53.25	-19.95	-4.25	0.00	-219.5	0.00	219.54	1,799.94	468.25	1,422.10	1,245.83	3.87	-0.7	0.187		
55.00	-19.71	-4.18	0.00	-212.1	0.00	212.11	1,788.22	463.42	1,392.94	1,224.87	4.13	-0.72	0.184		
60.00	-19.03	-4.08	0.00	-191.2	0.00	191.21	1,753.95	449.63	1,311.30	1,165.39	4.93	-0.8	0.175		
65.00	-18.38	-3.97	0.00	-170.8	0.00	170.83	1,718.53	435.84	1,232.12	1,106.57	5.81	-0.88	0.165		
70.00	-17.74	-3.87	0.00	-151.0	0.00	150.98	1,681.94	422.06	1,155.41	1,048.48	6.77	-0.95	0.155		
75.00	-17.11	-3.76	0.00	-131.6	0.00	131.65	1,644.19	408.27	1,081.16	991.19	7.81	-1.02	0.143		
80.00	-16.51	-3.66	0.00	-112.8	0.00	112.84	1,605.28	394.48	1,009.38	934.77	8.92	-1.09	0.131		
85.00	-15.92	-3.55	0.00	-94.6	0.00	94.56	1,565.21	380.69	940.06	879.30	10.1	-1.16	0.118		
90.00	-15.35	-3.45	0.00	-76.8	0.00	76.80	1,523.97	366.91	873.21	824.85	11.35	-1.22	0.103		
95.00	-14.80	-3.36	0.00	-59.6	0.00	59.56	1,481.58	353.12	808.82	771.49	12.65	-1.27	0.087		
98.00	-13.37	-2.85	0.00	-49.5	0.00	49.48	1,455.58	344.85	771.38	740.02	13.46	-1.3	0.076		
98.25	-13.34	-2.83	0.00	-48.8	0.00	48.77	1,453.40	344.16	768.30	737.42	13.53	-1.3	0.075		
100.00	-9.91	-2.31	0.00	-43.8	0.00	43.81	1,436.50	339.33	746.90	718.52	14.01	-1.32	0.068		
101.75	-9.63	-2.25	0.00	-39.8	0.00	39.78	992.96	255.45	564.32	499.80	14.49	-1.33	0.089		
105.00	-9.38	-2.17	0.00	-32.5	0.00	32.46	975.91	248.73	535.02	478.20	15.41	-1.35	0.078		
110.00	-5.41	-1.23	0.00	-21.6	0.00	21.61	948.72	238.39	491.46	445.40	16.85	-1.39	0.054		
115.00	-5.08	-1.13	0.00	-15.4	0.00	15.45	920.38	228.04	449.75	413.19	18.32	-1.42	0.043		
120.00	-4.76	-1.04	0.00	-9.8	0.00	9.78	890.87	217.70	409.90	381.66	19.83	-1.45	0.031		
125.00	-4.45	-0.95	0.00	-4.6	0.00	4.60	860.20	207.36	371.89	350.86	21.35	-1.46	0.018		
129.00	0.00	-0.84	0.00	-0.8	0.00	0.80	834.82	199.09	342.81	326.80	22.57	-1.47	0.002		

CALCULATED FORCES

Load Case: 1.0D + 1.0W

60 mph Wind with No Ice

23 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	-24.69	-4.28	0.00	-410.1	0.00	410.07	2,877.14	759.07	2,989.70	2,583.30	0	0	0.167
5.00	-23.87	-4.23	0.00	-388.6	0.00	388.65	2,836.81	741.83	2,855.50	2,488.84	0.03	-0.05	0.165
10.00	-23.08	-4.18	0.00	-367.5	0.00	367.50	2,795.32	724.60	2,724.37	2,395.05	0.12	-0.11	0.162
15.00	-22.30	-4.12	0.00	-346.6	0.00	346.62	2,752.67	707.36	2,596.33	2,301.99	0.26	-0.17	0.159
20.00	-21.54	-4.06	0.00	-326.0	0.00	326.01	2,708.85	690.13	2,471.36	2,209.73	0.47	-0.22	0.156
25.00	-20.80	-4.01	0.00	-305.7	0.00	305.68	2,663.88	672.89	2,349.48	2,118.35	0.73	-0.28	0.152
30.00	-20.07	-3.94	0.00	-285.7	0.00	285.66	2,617.74	655.66	2,230.68	2,027.92	1.06	-0.34	0.149
35.00	-19.36	-3.88	0.00	-265.9	0.00	265.94	2,570.45	638.42	2,114.97	1,938.51	1.44	-0.4	0.145
40.00	-18.66	-3.81	0.00	-246.5	0.00	246.54	2,521.99	621.19	2,002.33	1,850.18	1.89	-0.46	0.141
45.00	-17.99	-3.76	0.00	-227.5	0.00	227.47	2,472.36	603.95	1,892.78	1,763.02	2.4	-0.52	0.136
48.25	-17.56	-3.73	0.00	-215.2	0.00	215.25	2,439.49	592.75	1,823.22	1,707.02	2.76	-0.55	0.133
50.00	-17.17	-3.69	0.00	-208.7	0.00	208.73	2,421.58	586.72	1,786.31	1,677.09	2.97	-0.58	0.132
53.25	-16.45	-3.65	0.00	-196.7	0.00	196.74	1,799.94	468.25	1,422.10	1,245.83	3.38	-0.62	0.167
55.00	-16.26	-3.61	0.00	-190.3	0.00	190.34	1,788.22	463.42	1,392.94	1,224.87	3.61	-0.64	0.165
60.00	-15.73	-3.55	0.00	-172.3	0.00	172.29	1,753.95	449.63	1,311.30	1,165.39	4.31	-0.71	0.157
65.00	-15.22	-3.48	0.00	-154.6	0.00	154.56	1,718.53	435.84	1,232.12	1,106.57	5.09	-0.78	0.149
70.00	-14.72	-3.42	0.00	-137.2	0.00	137.15	1,681.94	422.06	1,155.41	1,048.48	5.94	-0.84	0.140
75.00	-14.24	-3.35	0.00	-120.1	0.00	120.07	1,644.19	408.27	1,081.16	991.19	6.85	-0.91	0.130
80.00	-13.77	-3.29	0.00	-103.3	0.00	103.31	1,605.28	394.48	1,009.38	934.77	7.84	-0.97	0.119
85.00	-13.31	-3.22	0.00	-86.9	0.00	86.88	1,565.21	380.69	940.06	879.30	8.89	-1.03	0.107
90.00	-12.87	-3.16	0.00	-70.8	0.00	70.77	1,523.97	366.91	873.21	824.85	10	-1.09	0.094
95.00	-12.44	-3.10	0.00	-55.0	0.00	54.99	1,481.58	353.12	808.82	771.49	11.16	-1.13	0.080
98.00	-11.20	-2.60	0.00	-45.7	0.00	45.69	1,455.58	344.85	771.38	740.02	11.88	-1.16	0.069
98.25	-11.19	-2.58	0.00	-45.0	0.00	45.04	1,453.40	344.16	768.30	737.42	11.94	-1.16	0.069
100.00	-8.28	-2.09	0.00	-40.5	0.00	40.52	1,436.50	339.33	746.90	718.52	12.37	-1.18	0.062
101.75	-8.06	-2.05	0.00	-36.9	0.00	36.87	992.96	255.45	564.32	499.80	12.81	-1.19	0.082
105.00	-7.87	-2.00	0.00	-30.2	0.00	30.20	975.91	248.73	535.02	478.20	13.62	-1.21	0.071
110.00	-4.51	-1.11	0.00	-20.2	0.00	20.21	948.72	238.39	491.46	445.40	14.91	-1.25	0.050
115.00	-4.25	-1.04	0.00	-14.7	0.00	14.67	920.38	228.04	449.75	413.19	16.23	-1.27	0.040
120.00	-4.01	-0.98	0.00	-9.4	0.00	9.44	890.87	217.70	409.90	381.66	17.58	-1.3	0.029
125.00	-3.77	-0.93	0.00	-4.5	0.00	4.53	860.20	207.36	371.89	350.86	18.95	-1.31	0.017
129.00	0.00	-0.84	0.00	-0.8	0.00	0.82	834.82	199.09	342.81	326.80	20.05	-1.32	0.003

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

Design Spectral Response Acceleration at Short Period (S_{ds}):	0.250
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.120
Long-Period Transition Period (T_L - Seconds):	6
Importance Factor (I_e):	1.000
Response Modification Coefficient (R):	1.500
Seismic Response Coefficient (C_s):	0.031
Upper Limit C_s :	0.031
Lower Limit C_s :	0.030
Period based on Rayleigh Method (sec):	2.550
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	2.000
Total Unfactored Dead Load:	24.690 k
Seismic Base Shear (E):	0.770 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							
31		127	182	2,941	0.016	12	228
30		122.5	237	3,556	0.019	15	296
29		117.5	247	3,410	0.018	14	309
28		112.5	257	3,253	0.017	13	321
27		107.5	289	3,338	0.018	14	361
26		103.375	193	2,064	0.011	8	241
25		100.875	220	2,239	0.012	9	275
24		99.125	223	2,191	0.012	9	279
23		98.125	19	186	0.001	1	24
22		96.5	251	2,337	0.012	10	314
21		92.5	429	3,670	0.019	15	536
20		87.5	442	3,387	0.018	14	553
19		82.5	456	3,102	0.016	13	570
18		77.5	469	2,817	0.015	12	586
17		72.5	482	2,536	0.013	10	603
16		67.5	496	2,259	0.012	9	620
15		62.5	509	1,989	0.010	8	636
14		57.5	523	1,728	0.009	7	653
13		54.125	186	545	0.003	2	233
12		51.625	716	1,908	0.010	8	895
11		49.125	391	943	0.005	4	489
10		46.625	429	933	0.005	4	536
9		42.5	674	1,217	0.006	5	842
8		37.5	691	971	0.005	4	863
7		32.5	707	747	0.004	3	884
6		27.5	724	547	0.003	2	905
5		22.5	741	375	0.002	2	926
4		17.5	757	232	0.001	1	947
3		12.5	774	121	0.001	0	968
2		7.5	791	44	0.000	0	988
1		2.5	807	5	0.000	0	1,009
Nokia AHFII Aircscale RRH 4T4R B25/66 480W		129	212	3,525	0.019	14	265
Nokia AHLOB AIRSCALE-4T4R-B71/85 320W		129	212	3,525	0.019	14	265
Nokia AEHC		129	311	5,172	0.027	21	388
Commscope FFVV-65C-R3-V1		129	374	6,220	0.033	25	467
Generic Flat Platform with Handrails		129	2,500	41,602	0.220	170	3,125
Generic Flat Platform with Handrails		100	2,500	25,000	0.132	102	3,125
Ericsson Radio 4494 44B14 20B29 M01		110	172	2,080	0.011	8	215
Ericsson Radio 4490HP 44B5 44B12A C		110	205	2,479	0.013	10	256
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)		110	205	2,479	0.013	10	256
Raycap DC9-48-60-24-8C-EV (Enclosure)		110	18	224	0.001	1	23
Commscope NNH4-65C-R6-V3 (102.5 lbs)		110	615	7,442	0.039	30	769

ASSET: 370593, Cotopaxi II
CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-I
PROJECT: 15312118_C3_03

SEISMIC FORCES

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)
Generic Round Low Profile Platform	110	1,875	22,688	0.120	93	2,344
Ericsson AIR 6419 B77D	100	189	1,893	0.010	8	237
Ericsson 8843 Rev 2	98	225	2,161	0.011	9	281
Ericsson Radio 4449 - B13&B5	98	210	2,017	0.011	8	262
Raycap RVZDC-6627-PF-48 (29.5")	98	64	615	0.003	3	80
Commscope NHH-45C-R2B	98	490	4,702	0.025	19	612
Totals:		24,689	189,413	1.000	774	30,861

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)
31	127	182	2,941	0.016	12	155
30	122.5	237	3,556	0.019	15	201
29	117.5	247	3,410	0.018	14	210
28	112.5	257	3,253	0.017	13	218
27	107.5	289	3,338	0.018	14	246
26	103.375	193	2,064	0.011	8	164
25	100.875	220	2,239	0.012	9	187
24	99.125	223	2,191	0.012	9	189
23	98.125	19	186	0.001	1	16
22	96.5	251	2,337	0.012	10	213
21	92.5	429	3,670	0.019	15	365
20	87.5	442	3,387	0.018	14	376
19	82.5	456	3,102	0.016	13	387
18	77.5	469	2,817	0.015	12	399
17	72.5	482	2,536	0.013	10	410
16	67.5	496	2,259	0.012	9	421
15	62.5	509	1,989	0.010	8	433
14	57.5	523	1,728	0.009	7	444
13	54.125	186	545	0.003	2	158
12	51.625	716	1,908	0.010	8	609
11	49.125	391	943	0.005	4	332
10	46.625	429	933	0.005	4	365
9	42.5	674	1,217	0.006	5	573
8	37.5	691	971	0.005	4	587
7	32.5	707	747	0.004	3	601
6	27.5	724	547	0.003	2	615
5	22.5	741	375	0.002	2	630
4	17.5	757	232	0.001	1	644
3	12.5	774	121	0.001	0	658
2	7.5	791	44	0.000	0	672
1	2.5	807	5	0.000	0	686
Nokia AHFII Airscale RRH 4T4R B25/66 480W	129	212	3,525	0.019	14	180
Nokia AHLOB AIRSCALE-4T4R-B71/85 320W	129	212	3,525	0.019	14	180
Nokia AEHC	129	311	5,172	0.027	21	264
Commscope FFVV-65C-R3-V1	129	374	6,220	0.033	25	318
Generic Flat Platform with Handrails	129	2,500	41,602	0.220	170	2,125
Generic Flat Platform with Handrails	100	2,500	25,000	0.132	102	2,125
Ericsson Radio 4494 44B14 20B29 M01	110	172	2,080	0.011	8	146
Ericsson Radio 4490HP 44B5 44B12A C	110	205	2,479	0.013	10	174
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)	110	205	2,479	0.013	10	174
Raycap DC9-48-60-24-8C-EV (Enclosure)	110	18	224	0.001	1	16
Commscope NNH4-65C-R6-V3 (102.5 lbs)	110	615	7,442	0.039	30	523
Generic Round Low Profile Platform	110	1,875	22,688	0.120	93	1,594
Ericsson AIR 6419 B77D	100	189	1,893	0.010	8	161
Ericsson 8843 Rev 2	98	225	2,161	0.011	9	191
Ericsson Radio 4449 - B13&B5	98	210	2,017	0.011	8	178
Raycap RVZDC-6627-PF-48 (29.5")	98	64	615	0.003	3	54
Commscope NHH-45C-R2B	98	490	4,702	0.025	19	416

ASSET: 370593, Cotopaxi II
CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-I
PROJECT: 15312118_C3_03

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)
Totals:		24,689	189,413	1.000	774	20,985

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)
31	127	182	2,941	0.016	18	228
30	122.5	237	3,556	0.019	22	296
29	117.5	247	3,410	0.018	21	309
28	112.5	257	3,253	0.017	20	321
27	107.5	289	3,338	0.018	20	361
26	103.375	193	2,064	0.011	13	241
25	100.875	220	2,239	0.012	14	275
24	99.125	223	2,191	0.012	13	279
23	98.125	19	186	0.001	1	24
22	96.5	251	2,337	0.012	14	314
21	92.5	429	3,670	0.019	22	536
20	87.5	442	3,387	0.018	21	553
19	82.5	456	3,102	0.016	19	570
18	77.5	469	2,817	0.015	17	586
17	72.5	482	2,536	0.013	16	603
16	67.5	496	2,259	0.012	14	620
15	62.5	509	1,989	0.010	12	636
14	57.5	523	1,728	0.009	11	653
13	54.125	186	545	0.003	3	233
12	51.625	716	1,908	0.010	12	895
11	49.125	391	943	0.005	6	489
10	46.625	429	933	0.005	6	536
9	42.5	674	1,217	0.006	7	842
8	37.5	691	971	0.005	6	863
7	32.5	707	747	0.004	5	884
6	27.5	724	547	0.003	3	905
5	22.5	741	375	0.002	2	926
4	17.5	757	232	0.001	1	947
3	12.5	774	121	0.001	1	968
2	7.5	791	44	0.000	0	988
1	2.5	807	5	0.000	0	1,009
Nokia AHFII Airscale RRH 4T4R B25/66 480W	129	212	3,525	0.019	22	265
Nokia AHLOB AIRSCALE-4T4R-B71/85 320W	129	212	3,525	0.019	22	265
Nokia AEHC	129	311	5,172	0.027	32	388
Commscope FFVV-65C-R3-V1	129	374	6,220	0.033	38	467
Generic Flat Platform with Handrails	129	2,500	41,602	0.220	255	3,125
Generic Flat Platform with Handrails	100	2,500	25,000	0.132	153	3,125
Ericsson Radio 4494 44B14 20B29 M01	110	172	2,080	0.011	13	215
Ericsson Radio 4490HP 44B5 44B12A C	110	205	2,479	0.013	15	256
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)	110	205	2,479	0.013	15	256
Raycap DC9-48-60-24-8C-EV (Enclosure)	110	18	224	0.001	1	23
Commscope NNH4-65C-R6-V3 (102.5 lbs)	110	615	7,442	0.039	46	769
Generic Round Low Profile Platform	110	1,875	22,688	0.120	139	2,344
Ericsson AIR 6419 B77D	100	189	1,893	0.010	12	237
Ericsson 8843 Rev 2	98	225	2,161	0.011	13	281
Ericsson Radio 4449 - B13&B5	98	210	2,017	0.011	12	262
Raycap RVZDC-6627-PF-48 (29.5")	98	64	615	0.003	4	80
Commscope NHH-45C-R2B	98	490	4,702	0.025	29	612
Totals:		24,689	189,413	1.000	1,160	30,861

SEISMIC FORCES

0.9D - 1.0Ev + 1.5EhSeismic Overstrength (Reduced DL)						
Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
31	127	182	2,941	0.016	18	155
30	122.5	237	3,556	0.019	22	201
29	117.5	247	3,410	0.018	21	210
28	112.5	257	3,253	0.017	20	218
27	107.5	289	3,338	0.018	20	246
26	103.375	193	2,064	0.011	13	164
25	100.875	220	2,239	0.012	14	187
24	99.125	223	2,191	0.012	13	189
23	98.125	19	186	0.001	1	16
22	96.5	251	2,337	0.012	14	213
21	92.5	429	3,670	0.019	22	365
20	87.5	442	3,387	0.018	21	376
19	82.5	456	3,102	0.016	19	387
18	77.5	469	2,817	0.015	17	399
17	72.5	482	2,536	0.013	16	410
16	67.5	496	2,259	0.012	14	421
15	62.5	509	1,989	0.010	12	433
14	57.5	523	1,728	0.009	11	444
13	54.125	186	545	0.003	3	158
12	51.625	716	1,908	0.010	12	609
11	49.125	391	943	0.005	6	332
10	46.625	429	933	0.005	6	365
9	42.5	674	1,217	0.006	7	573
8	37.5	691	971	0.005	6	587
7	32.5	707	747	0.004	5	601
6	27.5	724	547	0.003	3	615
5	22.5	741	375	0.002	2	630
4	17.5	757	232	0.001	1	644
3	12.5	774	121	0.001	1	658
2	7.5	791	44	0.000	0	672
1	2.5	807	5	0.000	0	686
Nokia AHFII Aircscale RRH 4T4R B25/66 480W	129	212	3,525	0.019	22	180
Nokia AHLOB AIRSCALE-4T4R-B71/85 320W	129	212	3,525	0.019	22	180
Nokia AEHC	129	311	5,172	0.027	32	264
Commscope FFVV-65C-R3-V1	129	374	6,220	0.033	38	318
Generic Flat Platform with Handrails	129	2,500	41,602	0.220	255	2,125
Generic Flat Platform with Handrails	100	2,500	25,000	0.132	153	2,125
Ericsson Radio 4494 44B14 20B29 M01	110	172	2,080	0.011	13	146
Ericsson Radio 4490HP 44B5 44B12A C	110	205	2,479	0.013	15	174
Ericsson Radio 4890HP 48B2/B25 48B66 M01 (68.3 lbs)	110	205	2,479	0.013	15	174
Raycap DC9-48-60-24-8C-EV (Enclosure)	110	18	224	0.001	1	16
Commscope NNH4-65C-R6-V3 (102.5 lbs)	110	615	7,442	0.039	46	523
Generic Round Low Profile Platform	110	1,875	22,688	0.120	139	1,594
Ericsson AIR 6419 B77D	100	189	1,893	0.010	12	161
Ericsson 8843 Rev 2	98	225	2,161	0.011	13	191
Ericsson Radio 4449 - B13&B5	98	210	2,017	0.011	12	178
Raycap RVZDC-6627-PF-48 (29.5")	98	64	615	0.003	4	54
Commscope NHH-45C-R2B	98	490	4,702	0.025	29	416
Totals:		24,689	189,413	1.000	1,160	20,985

1.2D + 1.0Ev + 1.0EhSeismic

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	-29.85	-0.78	0.00	-87.91	0.00	87.91	2,877.14	759.07	2,990	2,583.30	0.00	0.00	0.04
5.00	-28.86	-0.78	0.00	-84.03	0.00	84.03	2,836.81	741.83	2,856	2,488.84	0.01	-0.01	0.04
10.00	-27.89	-0.79	0.00	-80.12	0.00	80.12	2,795.32	724.60	2,724	2,395.05	0.03	-0.02	0.04
15.00	-26.95	-0.79	0.00	-76.19	0.00	76.19	2,752.67	707.36	2,596	2,301.99	0.06	-0.04	0.04
20.00	-26.02	-0.79	0.00	-72.23	0.00	72.23	2,708.85	690.13	2,471	2,209.73	0.10	-0.05	0.04

ASSET: 370593, Cotopaxi II
CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-I
PROJECT: 15312118_C3_03

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
25.00	-25.12	-0.80	0.00	-68.26	0.00	68.26	2,663.88	672.89	2,349	2,118.35	0.16	-0.06	0.04
30.00	-24.23	-0.80	0.00	-64.27	0.00	64.27	2,617.74	655.66	2,231	2,027.92	0.23	-0.07	0.04
35.00	-23.37	-0.80	0.00	-60.28	0.00	60.28	2,570.45	638.42	2,115	1,938.51	0.32	-0.09	0.04
40.00	-22.53	-0.80	0.00	-56.28	0.00	56.28	2,521.99	621.19	2,002	1,850.18	0.41	-0.10	0.04
45.00	-21.99	-0.80	0.00	-52.29	0.00	52.29	2,472.36	603.95	1,893	1,763.02	0.53	-0.11	0.04
48.25	-21.50	-0.80	0.00	-49.70	0.00	49.70	2,439.49	592.75	1,823	1,707.02	0.61	-0.12	0.04
50.00	-20.61	-0.79	0.00	-48.30	0.00	48.30	2,421.58	586.72	1,786	1,677.09	0.65	-0.13	0.04
53.25	-20.37	-0.79	0.00	-45.74	0.00	45.74	1,799.94	468.25	1,422	1,245.83	0.75	-0.14	0.05
55.00	-19.72	-0.78	0.00	-44.36	0.00	44.36	1,788.22	463.42	1,393	1,224.87	0.80	-0.14	0.05
60.00	-19.08	-0.78	0.00	-40.45	0.00	40.45	1,753.95	449.63	1,311	1,165.39	0.96	-0.16	0.05
65.00	-18.46	-0.77	0.00	-36.56	0.00	36.56	1,718.53	435.84	1,232	1,106.57	1.13	-0.18	0.04
70.00	-17.86	-0.77	0.00	-32.69	0.00	32.69	1,681.94	422.06	1,155	1,048.48	1.32	-0.19	0.04
75.00	-17.27	-0.76	0.00	-28.87	0.00	28.87	1,644.19	408.27	1,081	991.19	1.53	-0.21	0.04
80.00	-16.70	-0.75	0.00	-25.08	0.00	25.08	1,605.28	394.48	1,009	934.77	1.76	-0.22	0.04
85.00	-16.15	-0.73	0.00	-21.35	0.00	21.35	1,565.21	380.69	940	879.30	2.00	-0.24	0.04
90.00	-15.62	-0.72	0.00	-17.68	0.00	17.68	1,523.97	366.91	873	824.85	2.25	-0.25	0.03
95.00	-15.30	-0.71	0.00	-14.08	0.00	14.08	1,481.58	353.12	809	771.49	2.52	-0.26	0.03
98.00	-14.04	-0.67	0.00	-11.95	0.00	11.95	1,455.58	344.85	771	740.02	2.69	-0.27	0.03
98.25	-13.76	-0.66	0.00	-11.78	0.00	11.78	1,453.40	344.16	768	737.42	2.70	-0.27	0.03
100.00	-10.13	-0.52	0.00	-10.63	0.00	10.63	1,436.50	339.33	747	718.52	2.80	-0.27	0.02
101.75	-9.89	-0.51	0.00	-9.71	0.00	9.71	992.96	255.45	564	499.80	2.90	-0.28	0.03
105.00	-9.52	-0.50	0.00	-8.05	0.00	8.05	975.91	248.73	535	478.20	3.09	-0.28	0.03
110.00	-5.34	-0.31	0.00	-5.55	0.00	5.55	948.72	238.39	491	445.40	3.39	-0.29	0.02
115.00	-5.03	-0.30	0.00	-3.98	0.00	3.98	920.38	228.04	450	413.19	3.71	-0.30	0.02
120.00	-4.74	-0.28	0.00	-2.49	0.00	2.49	890.87	217.70	410	381.66	4.02	-0.31	0.01
125.00	-4.51	-0.27	0.00	-1.08	0.00	1.08	860.20	207.36	372	350.86	4.35	-0.31	0.01
129.00	0.00	-0.25	0.00	0.00	0.00	0.00	834.82	199.09	343	326.80	4.61	-0.31	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	-20.30	-0.78	0.00	-86.10	0.00	86.10	2,877.14	759.07	2,990	2,583.30	0.00	0.00	0.04
5.00	-19.63	-0.78	0.00	-82.23	0.00	82.23	2,836.81	741.83	2,856	2,488.84	0.01	-0.01	0.04
10.00	-18.97	-0.78	0.00	-78.33	0.00	78.33	2,795.32	724.60	2,724	2,395.05	0.02	-0.02	0.04
15.00	-18.32	-0.78	0.00	-74.42	0.00	74.42	2,752.67	707.36	2,596	2,301.99	0.06	-0.04	0.04
20.00	-17.69	-0.79	0.00	-70.50	0.00	70.50	2,708.85	690.13	2,471	2,209.73	0.10	-0.05	0.04
25.00	-17.08	-0.79	0.00	-66.57	0.00	66.57	2,663.88	672.89	2,349	2,118.35	0.16	-0.06	0.04
30.00	-16.48	-0.79	0.00	-62.63	0.00	62.63	2,617.74	655.66	2,231	2,027.92	0.23	-0.07	0.04
35.00	-15.89	-0.79	0.00	-58.69	0.00	58.69	2,570.45	638.42	2,115	1,938.51	0.31	-0.09	0.04
40.00	-15.32	-0.78	0.00	-54.76	0.00	54.76	2,521.99	621.19	2,002	1,850.18	0.40	-0.10	0.04
45.00	-14.95	-0.78	0.00	-50.84	0.00	50.84	2,472.36	603.95	1,893	1,763.02	0.52	-0.11	0.04
48.25	-14.62	-0.78	0.00	-48.30	0.00	48.30	2,439.49	592.75	1,823	1,707.02	0.59	-0.12	0.03
50.00	-14.01	-0.77	0.00	-46.93	0.00	46.93	2,421.58	586.72	1,786	1,677.09	0.64	-0.13	0.03
53.25	-13.85	-0.77	0.00	-44.42	0.00	44.42	1,799.94	468.25	1,422	1,245.83	0.73	-0.13	0.04
55.00	-13.41	-0.77	0.00	-43.07	0.00	43.07	1,788.22	463.42	1,393	1,224.87	0.78	-0.14	0.04
60.00	-12.98	-0.76	0.00	-39.25	0.00	39.25	1,753.95	449.63	1,311	1,165.39	0.93	-0.15	0.04
65.00	-12.56	-0.75	0.00	-35.45	0.00	35.45	1,718.53	435.84	1,232	1,106.57	1.10	-0.17	0.04
70.00	-12.14	-0.74	0.00	-31.68	0.00	31.68	1,681.94	422.06	1,155	1,048.48	1.29	-0.19	0.04
75.00	-11.75	-0.73	0.00	-27.96	0.00	27.96	1,644.19	408.27	1,081	991.19	1.49	-0.20	0.04
80.00	-11.36	-0.72	0.00	-24.29	0.00	24.29	1,605.28	394.48	1,009	934.77	1.71	-0.22	0.03
85.00	-10.98	-0.71	0.00	-20.67	0.00	20.67	1,565.21	380.69	940	879.30	1.95	-0.23	0.03
90.00	-10.62	-0.70	0.00	-17.12	0.00	17.12	1,523.97	366.91	873	824.85	2.19	-0.24	0.03
95.00	-10.40	-0.69	0.00	-13.63	0.00	13.63	1,481.58	353.12	809	771.49	2.46	-0.26	0.03
98.00	-9.55	-0.65	0.00	-11.57	0.00	11.57	1,455.58	344.85	771	740.02	2.62	-0.26	0.02
98.25	-9.36	-0.64	0.00	-11.41	0.00	11.41	1,453.40	344.16	768	737.42	2.63	-0.26	0.02
100.00	-6.89	-0.51	0.00	-10.30	0.00	10.30	1,436.50	339.33	747	718.52	2.73	-0.27	0.02
101.75	-6.72	-0.50	0.00	-9.41	0.00	9.41	992.96	255.45	564	499.80	2.83	-0.27	0.03
105.00	-6.48	-0.48	0.00	-7.80	0.00	7.80	975.91	248.73	535	478.20	3.01	-0.27	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
110.00	-3.63	-0.30	0.00	-5.38	0.00	5.38	948.72	238.39	491	445.40	3.31	-0.28	0.02
115.00	-3.42	-0.29	0.00	-3.86	0.00	3.86	920.38	228.04	450	413.19	3.61	-0.29	0.01
120.00	-3.22	-0.27	0.00	-2.42	0.00	2.42	890.87	217.70	410	381.66	3.92	-0.30	0.01
125.00	-3.07	-0.26	0.00	-1.05	0.00	1.05	860.20	207.36	372	350.86	4.23	-0.30	0.01
129.00	0.00	-0.25	0.00	0.00	0.00	0.00	834.82	199.09	343	326.80	4.48	-0.30	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	14.68	0.00	29.60	0.00	0.00	1416.95	53.25	0.56
0.9D + 1.0W	14.66	0.00	22.20	0.00	0.00	1395.41	0.00	0.55
1.2D + 1.0Di + 1.0Wi	5.26	0.00	30.32	0.00	0.00	475.91	0.00	0.19
1.2D + 1.0Ev + 1.0Eh	0.78	0.00	29.85	0.00	0.00	87.91	53.25	0.05
0.9D - 1.0Ev + 1.0Eh	0.78	0.00	20.30	0.00	0.00	86.10	53.25	0.04
1.0D + 1.0W	4.28	0.00	24.69	0.00	0.00	410.07	0.00	0.17

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	1.16	0.00	29.85	0.00	0.00	131.87
0.9D - 1.0Ev + 1.5Eh	1.16	0.00	20.30	0.00	0.00	129.15

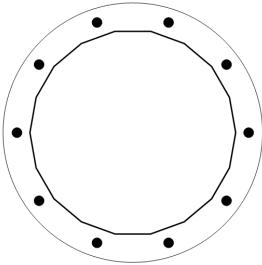
BASE PLATE ANALYSIS @ 0 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
1416.95	29.6	14.68

PLATE PARAMETERS (ID# 23503)

Width:	56	in
Shape:	Round	
Thickness:	2.5	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Rod Detail Type:	d	
Clear Distance	3	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	18	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#24119]	Radial	10	2.25	50	A615-75	75	100	-	-

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	43.92"Ø x 0.3125" (18 Sides)	42.5945	-	-	10126.19	-
Bolt Group	Original (10) 2.25"Ø	3.9761	3.2477	0.8393	9119.75	4.5

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	43.92"Ø x 0.3125" (18 Sides)	1417.0	29.60	14.68	1.000
Bolt Group	Original (10) 2.25"Ø	1417.0	-	14.68	1.000

BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES					PLATE PROPERTIES		
Flat-to-Flat Diameter:	44.04	in	Flat Width:	7.766	in	Neutral Axis:	18°
Point-to-Point Diameter:	44.72	in	Flat Radians:	0.349	rad	Bend Line Limits:	1.396 to 2.374 rad
Orientation Offset:	-	°					
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	30.175	0.00	47.148	243.7	2121.7	11.5%	✓
Corners	29.158	0.00	45.560	194.0	2050.2	9.5%	✓
Circumferential	35.152	0.00	54.925	194.0	2471.6	7.8%	✓

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		10	2.25	111.3	2.4	243.6	45.7% ✓