AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	159 ft Monopole
ATC Asset Name	:	WILLINGTON CT
ATC Asset Number	:	281416
Engineering Number	:	15445313_C3_06
Proposed Carrier	:	VERIZON WIRELESS
Carrier Site Name	:	WILLINGTON HILL CT
Carrier Site Number	:	5000992841
Site Location	:	196 Tolland Turnpike WILLINGTON, CT 06279-1318 41.8757° N, 72.2694° W
County	:	Tolland
Date	:	May 20, 2026
Max Usage	:	81%
Analysis Result	:	Pass

Created By:

Stella Vanne
Structural Engineer I

STATE OF CONNECTICUT
ESHA KAUSHAL MODI
32593
LICENSED
PROFESSIONAL ENGINEER

Esha Modi

Digitally signed by Esha Modi
Date: 2026.05.20 16:44:43 -04'00'

COA: PEC.0001553

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 159 ft Monopole tower to reflect the change in loading by VERIZON WIRELESS.

Supporting Documents

Tower:	Valmont Dwg #226782, dated August 5, 2013
Foundation:	ATC project# 54066971, dated August 7, 2013
Geotechnical:	Clarence Welti Association, Inc., dated May 7, 2013

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	116 mph (3-second gust)
Basic Wind Speed w/ Ice:	48 mph (3-second gust) w/ 1.19" radial ice concurrent
Code(s):	ANSI/TIA-222-I / 2021 IBC / 2022 Connecticut State Building Code
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_{DS} = 0.16, S_{D1} = 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	80.9%	1.2D + 1.0W	Pass
Serviceability Usage	57.9%	1.0D + 1.0W	Pass
Base Plate @ 0.0 ft	65.5%	Rods	Pass
Mat & Pier	54.5%	Flexure [Steel (Pier)]	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	3,532.1	47.0	28.9

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

Structure base reactions were analyzed using available geotechnical and foundation information.

Existing/Reserved Loading

Elev (ft)	Qty	Equipment
160.1	6	Raycap DC6-48-60-18-8F ("Squid")
156.0	6	Kathrein Scala 80010966
	3	Ericsson RRUS 4449 B5, B12
	6	Ericsson RRUS-11
	3	Ericsson RRUS 8843 B2, B66A
	1	Platform with Handrails
	3	Ericsson RRUS 4415 B25
	3	Andrew SBNH-1D6565C (60.8 lbs)
	3	Andrew SBNH-1D6565C (60.8 lbs)
	3	CCI HPA65R-BU8A
147.0	3	Samsung RF4461d-13A
	6	Commscope NHH-65B-HG-R2B
	1	Platform with Handrails
	3	Samsung MF3208d-25A
	1	Raycap RVZDC-6600-PF-48
	3	Samsung MT6413-77A
135.0	3	Fujitsu TA08025-B605
	3	Fujitsu TA08025-B604
	3	JMA Wireless MX08FRO665-21
	1	Raycap RDIDC-9181-PF-48
	1	Platform with Handrails

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

Elev (ft)	Lines
156.0	(3) 0.39" (10mm) Fiber Trunk
	(8) 0.78" (19.7mm) 8 AWG 6
	(18) 1 5/8" Coax
147.0	(3) 1 1/4" Hybriflex Cable
135.0	(1) 1.60" (40.6mm) Hybrid

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

Standard Conditions

All engineering services performed by A.T. Engineering 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 A.T. Engineering Services LLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering 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 A.T. Engineering Services LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

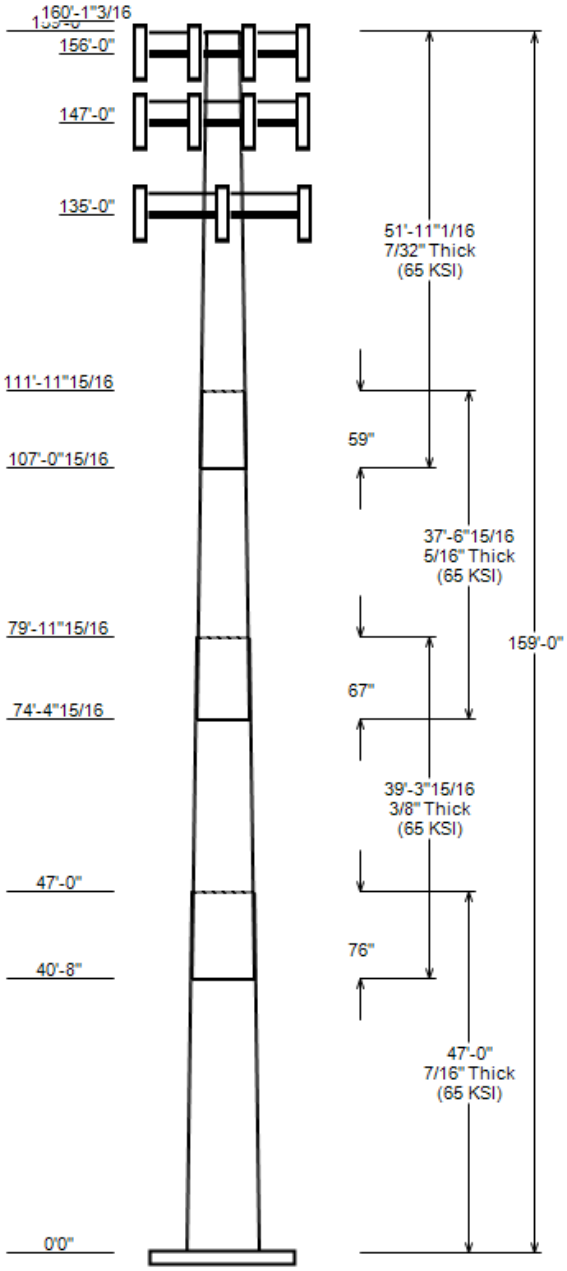
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

ANALYSIS PARAMETERS

Design Wind:	116 mph	**Ice Wind:**	48 mph w/ 1.2" ice	**Service Wind:**	60 mph
Risk Category:	II	**Exposure:**	C	**S_{D1}:** 0.068	**S_{DS}:** 0.160
Topo Factor:	Method 1	**Topo Feature:**	**Flat**		
Structure Height:	159.0 ft	**Base Elevation:**	0.00 ft	**Structure Type:**	Taper
Base Diameter:	50.25 in	**Base Rotation:**	0.00°	**Taper:**	0.1880 (in/ft)

POLE SECTION PROPERTIES

Section	Length (ft)	Flat Diameter (in) Top	Flat Diameter (in) Bottom	Thick (in)	Joint Type	Joint Length (in)	Pole Shape	Yield Strength (ksi)
1	47.000	41.44	50.25	0.438		0.00	18 Sides	65
2	39.330	36.00	43.38	0.375	Slip Joint	76.00	18 Sides	65
3	37.580	30.63	37.67	0.312	Slip Joint	67.00	18 Sides	65
4	51.923	22.25	31.99	0.219	Slip Joint	59.00	18 Sides	65



DISCRETE APPURTENANCE

Elev (ft)	Description
160.1	(6) Raycap DC6-48-60-18-8F ("Squid")
156.0	(3) Ericsson RRUS 4415 B25
156.0	(1) Generic Flat Platform with Handrails
156.0	(3) Ericsson RRUS 4449 B5, B12
156.0	(6) Ericsson RRUS-11
156.0	(3) Andrew SBNH-1D6565C (60.8 lbs)
156.0	(6) Kathrein Scala 80010966
156.0	(3) Ericsson RRUS 8843 B2, B66A
156.0	(3) CCI HPA65R-BU8A
147.0	(3) Samsung MT6413-77A
147.0	(1) Raycap RVZDC-6600-PF-48
147.0	(3) Samsung RF4461d-13A
147.0	(6) Commscope NHH-65B-HG-R2B
147.0	(3) Samsung MF3208d-25A
147.0	(1) Generic Platform with Handrails
135.0	(3) Fujitsu TA08025-B605
135.0	(3) Fujitsu TA08025-B604
135.0	(1) Generic Round Platform with Handrail
135.0	(1) Raycap RDIDC-9181-PF-48
135.0	(3) JMA Wireless MX08FRO665-21

LINEAR APPURTENANCE

Elev To (ft)	Description
156.0	(3) 0.39" (10mm) Fiber Trunk
156.0	(18) 1 5/8" Coax
156.0	(8) 0.78" (19.7mm) 8 AWG 6
147.0	(3) 1 1/4" Hybriflex Cable
135.0	(1) 1.60" (40.6mm) Hybrid

GLOBAL BASE REACTIONS

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	3532.05	47.00	28.90
0.9D + 1.0W	3472.57	35.23	28.88
1.2D + 1.0Di + 1.0Wi	934.67	65.57	7.66
1.2D + 1.0Ev + 1.0Eh	165.29	46.72	1.18
0.9D - 1.0Ev + 1.0Eh	161.94	32.92	1.18
1.0D + 1.0W	838.16	39.21	6.91

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ANALYSIS PARAMETERS

Location:	Tolland County,CT	**Height:**	159 ft
Type and Shape:	Taper, 18 Sides	**Base Diameter:**	50.25 in
Manufacturer:	Valmont	**Top Diameter:**	22.25 in
K_d (non-service):	0.95	**Taper:**	0.1880 in/ft
K_e:	0.97	**Rotation:**	0.000º

ICE & WIND PARAMETERS

Risk Category:	II	**Design Wind Speed:**	116 mph
Exposure Category:	C	**Design Wind Speed w/ Ice:**	48 mph
Design Ice Thickness:	1.19 in		
Topo Factor Procedure:	1		
Crest Height(H):	0 ft	**Service Wind Speed:**	60 mph
Crest Length(L):	0 ft	**HMSL:**	768.00 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):**		2.94
T_L (sec):	6	**P:**	1	**C_s:**	0.030
S_{ds}:	0.160	**S_{d1}:**	0.068	**C_s Max:**	0.030
				C_s Min:	0.030

LOAD CASES

1.2D + 1.0W	116 mph Wind with No Ice
0.9D + 1.0W	116 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	48 mph Wind with 1.19" 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)

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SHAFT SECTION PROPERTIES

							Bottom						Top						
Section	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	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)
1-18	47.00	0.4375	65		0.00	10,084	50.25	0.000	69.17	21,683.9	18.49	114.86	41.44	47.00	56.93	12,091.	14.94	94.72	0.1875
2-18	39.33	0.3750	65	Slip	76.00	6,262	43.38	40.670	51.18	11,955.9	18.63	115.67	36.00	80.00	42.40	6,799.3	15.16	96.00	0.1875
3-18	37.58	0.3125	65	Slip	67.00	4,292	37.67	74.410	37.06	6,534.5	19.49	120.55	30.63	111.99	30.07	3,490.7	15.52	98.00	0.1875
4-18	51.92	0.2188	65	Slip	59.00	3,300	31.99	107.077	22.06	2,812.7	24.01	146.19	22.25	159.00	15.30	938.2	16.17	101.69	0.1875
			Total Shaft Weight			**23,938**													

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
160.10	Raycap DC6-48-60-18-8F ("Squid	6	0.75	0.000	18.90	1.470	1.00	68.20	2.028	1.00
156.00	Kathrein Scala 80010966	6	0.75	0.000	114.60	17.363	0.63	370.79	20.306	0.63
156.00	Andrew SBNH-1D6565C (60.8 lbs)	3	0.75	0.000	60.80	11.440	0.70	243.86	14.022	0.70
156.00	Andrew SBNH-1D6565C (60.8 lbs)	3	0.75	0.000	60.80	11.440	0.70	243.86	14.022	0.70
156.00	Ericsson RRUS-11	6	0.75	0.000	55.00	3.792	0.50	126.62	4.816	0.50
156.00	Ericsson RRUS 8843 B2, B66A	3	0.75	0.000	72.00	1.639	0.50	120.90	2.313	0.50
156.00	Ericsson RRUS 4415 B25	3	0.75	0.000	46.00	1.842	0.50	85.12	2.558	0.50
156.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	122.42	2.713	0.50
156.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3917.32	59.132	1.00
156.00	CCI HPA65R-BU8A	3	0.75	0.000	54.00	11.230	0.71	239.34	13.802	0.71
147.00	Generic Platform with Handrail	1	1.00	0.000	2500.00	50.000	1.00	4156.96	77.616	1.00
147.00	Samsung MF3208d-25A	3	0.75	0.000	127.20	8.288	0.60	271.57	9.794	0.60
147.00	Commscope NHH-65B-HG-R2B	6	0.75	0.000	45.20	8.079	0.69	183.43	10.288	0.69
147.00	Raycap RVZDC-6600-PF-48	1	0.75	0.000	31.50	4.056	1.00	132.27	5.138	1.00
147.00	Samsung RF4461d-13A	3	0.75	0.000	79.10	1.875	0.50	130.22	2.591	0.50
147.00	Samsung MT6413-77A	3	0.75	0.000	57.30	3.805	0.61	124.62	4.858	0.61
135.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	66.49	2.574	1.00
135.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	124.19	2.684	0.50
135.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	109.69	2.684	0.50
135.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	266.31	14.696	0.64
135.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3771.75	46.393	1.00
Totals	**Row Count: 21**	**65**			**11,450.40**			**22,785.33**		

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	156.00	18	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	156.00	8	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	156.00	3	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	147.00	3	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	VERIZON
0.00	135.00	1	1.60" (40.6mm) Hybrid	1.6	2.34	N	0	0	0	0	0	N	DISH WIRELESS L.L.C.

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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	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.4375	50.250	69.168	21,683.90	18.49	114.86	79.7	849.9	0.0	0.0
5.00		0.4375	49.312	67.867	20,482.50	18.11	112.71	80.1	818.1	0.0	1,165.7
10.00		0.4375	48.375	66.565	19,326.30	17.73	110.57	80.5	786.9	0.0	1,143.6
15.00		0.4375	47.437	65.263	18,214.40	17.36	108.43	81	756.3	0.0	1,121.5
20.00		0.4375	46.500	63.961	17,146.10	16.98	106.29	81.4	726.3	0.0	1,099.3
25.00		0.4375	45.562	62.659	16,120.30	16.60	104.14	81.9	696.9	0.0	1,077.2
30.00		0.4375	44.625	61.358	15,136.30	16.22	102.00	82.3	668.1	0.0	1,055.0
35.00		0.4375	43.687	60.056	14,193.20	15.84	99.86	82.6	639.9	0.0	1,032.9
40.00		0.4375	42.750	58.754	13,290.10	15.47	97.71	82.6	612.3	0.0	1,010.7
40.67	Bot - Section 2	0.4375	42.625	58.581	13,172.70	15.42	97.43	82.6	608.7	0.0	133.1
45.00		0.4375	41.812	57.452	12,426.10	15.09	95.57	82.6	585.3	0.0	1,603.0
47.00	Top - Section 1	0.3750	42.187	49.766	10,992.40	18.07	112.50	80.1	513.2	0.0	729.4
50.00		0.3750	41.625	49.096	10,554.70	17.81	111.00	80.5	499.4	0.0	504.6
55.00		0.3750	40.687	47.980	9,851.30	17.37	108.50	81	476.9	0.0	825.8
60.00		0.3750	39.750	46.864	9,179.90	16.93	106.00	81.5	454.9	0.0	806.8
65.00		0.3750	38.812	45.749	8,539.70	16.49	103.50	82	433.4	0.0	787.9
70.00		0.3750	37.875	44.633	7,929.90	16.05	101.00	82.5	412.4	0.0	768.9
74.41	Bot - Section 3	0.3750	37.047	43.648	7,416.50	15.66	98.79	82.6	394.3	0.0	662.9
75.00		0.3750	36.937	43.517	7,349.90	15.60	98.50	82.6	391.9	0.0	160.9
80.00	Top - Section 2	0.3125	36.626	36.017	6,000.50	18.90	117.20	79.2	322.7	0.0	1,350.7
80.00		0.3125	36.625	36.016	6,000.20	18.90	117.20	79.2	322.7	0.0	0.4
85.00		0.3125	35.687	35.086	5,547.30	18.37	114.20	79.8	306.2	0.0	604.9
90.00		0.3125	34.750	34.156	5,117.90	17.84	111.20	80.4	290.1	0.0	589.0
95.00		0.3125	33.812	33.227	4,711.20	17.32	108.20	81	274.4	0.0	573.2
100.00		0.3125	32.875	32.297	4,326.60	16.79	105.20	81.7	259.2	0.0	557.4
105.00		0.3125	31.937	31.367	3,963.60	16.26	102.20	82.3	244.4	0.0	541.6
107.08	Bot - Section 4	0.3125	31.548	30.981	3,819.00	16.04	100.95	82.5	238.4	0.0	220.3
110.00		0.3125	31.000	30.437	3,621.40	15.73	99.20	82.6	230.1	0.0	523.0
111.99	Top - Section 3	0.2188	31.064	21.420	2,574.80	23.27	141.97	74	163.3	0.0	351.4
115.00		0.2188	30.500	21.029	2,436.20	22.82	139.40	74.6	157.3	0.0	217.1
120.00		0.2188	29.563	20.378	2,216.90	22.06	135.11	75.5	147.7	0.0	352.2
125.00		0.2188	28.625	19.727	2,011.10	21.31	130.83	76.3	138.4	0.0	341.2
130.00		0.2188	27.688	19.076	1,818.50	20.55	126.54	77.2	129.4	0.0	330.1
135.00		0.2188	26.750	18.425	1,638.60	19.79	122.26	78.1	120.6	0.0	319.0
140.00		0.2188	25.813	17.774	1,470.90	19.04	117.97	79	112.2	0.0	307.9
145.00		0.2188	24.875	17.122	1,315.20	18.28	113.69	79.9	104.1	0.0	296.9
147.00		0.2188	24.500	16.862	1,256.10	17.98	111.97	80.3	101.0	0.0	115.6
150.00		0.2188	23.938	16.471	1,170.80	17.53	109.40	80.8	96.3	0.0	170.1
155.00		0.2188	23.000	15.820	1,037.40	16.77	105.12	81.7	88.8	0.0	274.7
156.00		0.2188	22.813	15.690	1,012.00	16.62	104.26	81.9	87.4	0.0	53.6
159.00		0.2188	22.250	15.300	938.20	16.17	101.69	82.4	83.1	0.0	158.2
										Total:	**23,937.7**

CALCULATED FORCES

Load Case: 1.2D + 1.0W — 116 mph Wind with No Ice — 26 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	-47.00	-28.90	0.00	-3,532.0	0.00	3,532.05	4,958.59	1,213.91	5,461.75	5,077.52	0	0	0.706
5.00	-45.33	-28.63	0.00	-3,387.5	0.00	3,387.54	4,892.41	1,191.06	5,258.12	4,914.65	0.12	-0.23	0.699
10.00	-43.70	-28.35	0.00	-3,244.4	0.00	3,244.40	4,825.19	1,168.21	5,058.37	4,753.32	0.48	-0.46	0.692
15.00	-42.09	-28.07	0.00	-3,102.6	0.00	3,102.65	4,756.93	1,145.37	4,862.48	4,593.60	1.09	-0.69	0.685
20.00	-40.52	-27.76	0.00	-2,962.3	0.00	2,962.32	4,687.62	1,122.52	4,670.46	4,435.55	1.94	-0.93	0.677
25.00	-38.97	-27.43	0.00	-2,823.5	0.00	2,823.52	4,617.28	1,099.67	4,482.31	4,279.23	3.04	-1.17	0.669
30.00	-37.45	-27.09	0.00	-2,686.4	0.00	2,686.35	4,545.89	1,076.83	4,298.02	4,124.71	4.39	-1.41	0.660

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CALCULATED FORCES

35.00	-35.96	-26.73	0.00	-2,550.9	0.00	2,550.90	4,461.85	1,053.98	4,117.61	3,961.72	6	-1.66	0.653
40.00	-34.54	-26.50	0.00	-2,417.2	0.00	2,417.25	4,365.13	1,031.13	3,941.06	3,790.99	7.87	-1.91	0.646
40.67	-34.31	-26.33	0.00	-2,399.6	0.00	2,399.59	4,352.24	1,028.09	3,917.81	3,768.51	8.13	-1.94	0.645
45.00	-32.19	-26.03	0.00	-2,285.5	0.00	2,285.50	4,268.42	1,008.29	3,768.38	3,624.02	10	-2.16	0.639
47.00	-31.21	-25.82	0.00	-2,233.4	0.00	2,233.44	3,589.52	873.39	3,298.55	3,084.74	10.92	-2.26	0.734
50.00	-30.43	-25.52	0.00	-2,156.0	0.00	2,155.96	3,554.97	861.64	3,210.41	3,013.58	12.4	-2.42	0.725
55.00	-29.19	-25.13	0.00	-2,028.4	0.00	2,028.36	3,496.57	842.05	3,066.16	2,896.10	15.08	-2.7	0.710
60.00	-27.98	-24.73	0.00	-1,902.7	0.00	1,902.73	3,437.12	822.47	2,925.22	2,780.05	18.06	-2.98	0.693
65.00	-26.79	-24.32	0.00	-1,779.1	0.00	1,779.10	3,376.63	802.89	2,787.61	2,665.48	21.33	-3.27	0.676
70.00	-25.63	-23.93	0.00	-1,657.5	0.00	1,657.51	3,315.10	783.31	2,653.30	2,552.47	24.91	-3.56	0.658
74.41	-24.66	-23.69	0.00	-1,551.9	0.00	1,551.91	3,242.82	766.02	2,537.51	2,441.17	28.31	-3.81	0.644
75.00	-24.40	-23.48	0.00	-1,538.0	0.00	1,538.01	3,233.09	763.72	2,522.32	2,426.47	28.78	-3.84	0.642
80.00	-22.55	-23.01	0.00	-1,420.6	0.00	1,420.61	2,566.20	632.08	2,073.18	1,915.92	32.96	-4.13	0.752
80.00	-22.60	-23.18	0.00	-1,420.7	0.00	1,420.69	2,566.23	632.09	2,073.25	1,915.98	32.95	-4.13	0.752
85.00	-21.58	-22.59	0.00	-1,305.6	0.00	1,305.59	2,519.59	615.76	1,967.53	1,832.15	37.45	-4.45	0.723
90.00	-20.64	-22.18	0.00	-1,192.6	0.00	1,192.61	2,471.95	599.45	1,864.64	1,749.45	42.28	-4.77	0.691
95.00	-19.73	-21.77	0.00	-1,081.7	0.00	1,081.71	2,423.26	583.13	1,764.51	1,667.88	47.45	-5.09	0.658
100.00	-18.84	-21.35	0.00	-972.9	0.00	972.89	2,373.53	566.81	1,667.14	1,587.51	52.94	-5.4	0.622
105.00	-17.99	-21.03	0.00	-866.2	0.00	866.15	2,322.75	550.49	1,572.54	1,508.40	58.75	-5.7	0.583
107.08	-17.64	-20.82	0.00	-822.5	0.00	822.48	2,301.36	543.71	1,534.06	1,475.93	61.25	-5.83	0.566
110.00	-16.90	-20.58	0.00	-761.6	0.00	761.61	2,261.32	534.17	1,480.70	1,424.55	64.87	-6	0.544
111.99	-16.39	-20.36	0.00	-720.6	0.00	720.59	1,427.17	375.92	1,047.30	906.45	67.4	-6.12	0.809
115.00	-15.98	-20.06	0.00	-659.4	0.00	659.39	1,411.20	369.05	1,009.38	879.81	71.3	-6.29	0.764
120.00	-15.34	-19.67	0.00	-559.1	0.00	559.11	1,383.81	357.63	947.85	835.83	78.06	-6.64	0.683
125.00	-14.73	-19.28	0.00	-460.8	0.00	460.76	1,355.37	346.20	888.26	792.31	85.18	-6.97	0.596
130.00	-14.15	-18.89	0.00	-364.4	0.00	364.36	1,325.90	334.78	830.60	749.30	92.62	-7.26	0.500
135.00	-10.19	-15.63	0.00	-269.9	0.00	269.93	1,295.38	323.35	774.88	706.87	100.34	-7.51	0.392
140.00	-9.69	-15.22	0.00	-191.8	0.00	191.77	1,263.82	311.93	721.09	665.08	108.29	-7.71	0.298
145.00	-9.22	-14.92	0.00	-115.7	0.00	115.66	1,231.22	300.50	669.24	623.99	116.43	-7.86	0.195
147.00	-5.40	-9.58	0.00	-85.8	0.00	85.83	1,217.89	295.93	649.04	607.77	119.72	-7.9	0.147
150.00	-5.16	-9.27	0.00	-57.1	0.00	57.09	1,197.58	289.07	619.32	583.66	124.69	-7.95	0.103
155.00	-4.74	-9.00	0.00	-10.7	0.00	10.74	1,162.90	277.65	571.34	544.15	133.02	-7.99	0.025
156.00	-0.26	-0.46	0.00	-1.7	0.00	1.74	1,155.83	275.36	561.97	536.36	134.68	-7.99	0.003
159.00	0.00	-0.42	0.00	-0.4	0.00	0.35	1,134.40	268.51	534.34	513.18	139.69	-7.99	0.001

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CALCULATED FORCES

Load Case: 0.9D + 1.0W — 116 mph Wind with No Ice (Reduced DL) — 26 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	-35.23	-28.88	0.00	-3,472.6	0.00	3,472.57	4,958.59	1,213.91	5,461.75	5,077.52	0	0	0.692
5.00	-33.96	-28.56	0.00	-3,328.2	0.00	3,328.18	4,892.41	1,191.06	5,258.12	4,914.65	0.12	-0.22	0.685
10.00	-32.71	-28.23	0.00	-3,185.4	0.00	3,185.41	4,825.19	1,168.21	5,058.37	4,753.32	0.47	-0.45	0.678
15.00	-31.48	-27.91	0.00	-3,044.2	0.00	3,044.23	4,756.93	1,145.37	4,862.48	4,593.60	1.07	-0.68	0.670
20.00	-30.27	-27.56	0.00	-2,904.7	0.00	2,904.70	4,687.62	1,122.52	4,670.46	4,435.55	1.9	-0.91	0.662
25.00	-29.09	-27.20	0.00	-2,766.9	0.00	2,766.88	4,617.28	1,099.67	4,482.31	4,279.23	2.98	-1.15	0.653
30.00	-27.92	-26.82	0.00	-2,630.9	0.00	2,630.89	4,545.89	1,076.83	4,298.02	4,124.71	4.31	-1.38	0.645
35.00	-26.78	-26.43	0.00	-2,496.8	0.00	2,496.79	4,461.85	1,053.98	4,117.61	3,961.72	5.89	-1.63	0.637
40.00	-25.71	-26.19	0.00	-2,364.6	0.00	2,364.65	4,365.13	1,031.13	3,941.06	3,790.99	7.72	-1.87	0.630
40.67	-25.52	-25.99	0.00	-2,347.2	0.00	2,347.20	4,352.24	1,028.09	3,917.81	3,768.51	7.98	-1.9	0.629
45.00	-23.92	-25.70	0.00	-2,234.6	0.00	2,234.55	4,268.42	1,008.29	3,768.38	3,624.02	9.81	-2.12	0.623
47.00	-23.18	-25.48	0.00	-2,183.2	0.00	2,183.16	3,589.52	873.39	3,298.55	3,084.74	10.72	-2.22	0.715
50.00	-22.58	-25.15	0.00	-2,106.7	0.00	2,106.74	3,554.97	861.64	3,210.41	3,013.58	12.16	-2.37	0.706
55.00	-21.62	-24.73	0.00	-1,981.0	0.00	1,981.00	3,496.57	842.05	3,066.16	2,896.10	14.79	-2.64	0.691
60.00	-20.69	-24.30	0.00	-1,857.4	0.00	1,857.36	3,437.12	822.47	2,925.22	2,780.05	17.71	-2.92	0.675
65.00	-19.78	-23.87	0.00	-1,735.8	0.00	1,735.85	3,376.63	802.89	2,787.61	2,665.48	20.91	-3.2	0.658
70.00	-18.90	-23.47	0.00	-1,616.5	0.00	1,616.48	3,315.10	783.31	2,653.30	2,552.47	24.41	-3.48	0.640
74.41	-18.16	-23.23	0.00	-1,512.9	0.00	1,512.92	3,242.82	766.02	2,537.51	2,441.17	27.74	-3.73	0.626
75.00	-17.96	-23.00	0.00	-1,499.3	0.00	1,499.29	3,233.09	763.72	2,522.32	2,426.47	28.2	-3.76	0.624
80.00	-16.60	-22.71	0.00	-1,384.4	0.00	1,384.36	2,566.23	632.09	2,073.25	1,915.98	32.29	-4.04	0.730
80.00	-16.55	-22.52	0.00	-1,384.3	0.00	1,384.28	2,566.20	632.08	2,073.18	1,915.92	32.29	-4.04	0.730
85.00	-15.81	-22.10	0.00	-1,271.7	0.00	1,271.66	2,519.59	615.76	1,967.53	1,832.15	36.69	-4.36	0.702
90.00	-15.09	-21.67	0.00	-1,161.2	0.00	1,161.18	2,471.95	599.45	1,864.64	1,749.45	41.41	-4.67	0.671
95.00	-14.38	-21.24	0.00	-1,052.8	0.00	1,052.84	2,423.26	583.13	1,764.51	1,667.88	46.46	-4.97	0.639
100.00	-13.70	-20.81	0.00	-946.6	0.00	946.63	2,373.53	566.81	1,667.14	1,587.51	51.82	-5.28	0.603
105.00	-13.06	-20.49	0.00	-842.6	0.00	842.57	2,322.75	550.49	1,572.54	1,508.40	57.5	-5.57	0.566
107.08	-12.79	-20.29	0.00	-800.0	0.00	800.01	2,301.36	543.71	1,534.06	1,475.93	59.95	-5.69	0.549
110.00	-12.23	-20.05	0.00	-740.7	0.00	740.71	2,261.32	534.17	1,480.70	1,424.55	63.48	-5.86	0.527
111.99	-11.84	-19.83	0.00	-700.8	0.00	700.75	1,427.17	375.92	1,047.30	906.45	65.95	-5.97	0.784
115.00	-11.53	-19.51	0.00	-641.1	0.00	641.14	1,411.20	369.05	1,009.38	879.81	69.76	-6.14	0.740
120.00	-11.04	-19.12	0.00	-543.6	0.00	543.57	1,383.81	357.63	947.85	835.83	76.36	-6.48	0.661
125.00	-10.57	-18.72	0.00	-448.0	0.00	447.98	1,355.37	346.20	888.26	792.31	83.31	-6.8	0.576
130.00	-10.13	-18.33	0.00	-354.4	0.00	354.38	1,325.90	334.78	830.60	749.30	90.58	-7.09	0.484
135.00	-7.22	-15.21	0.00	-262.8	0.00	262.75	1,295.38	323.35	774.88	706.87	98.11	-7.33	0.379
140.00	-6.85	-14.81	0.00	-186.7	0.00	186.72	1,263.82	311.93	721.09	665.08	105.88	-7.52	0.288
145.00	-6.50	-14.51	0.00	-112.7	0.00	112.70	1,231.22	300.50	669.24	623.99	113.82	-7.67	0.188
147.00	-3.78	-9.34	0.00	-83.7	0.00	83.67	1,217.89	295.93	649.04	607.77	117.03	-7.71	0.142
150.00	-3.61	-9.04	0.00	-55.7	0.00	55.66	1,197.58	289.07	619.32	583.66	121.87	-7.76	0.099
155.00	-3.30	-8.79	0.00	-10.5	0.00	10.49	1,162.90	277.65	571.34	544.15	130	-7.8	0.023
156.00	-0.19	-0.45	0.00	-1.7	0.00	1.70	1,155.83	275.36	561.97	536.36	131.63	-7.8	0.003
159.00	0.00	-0.42	0.00	-0.4	0.00	0.35	1,134.40	268.51	534.34	513.18	136.51	-7.8	0.001

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CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi — 48 mph Wind with 1.19" Radial Ice — 25 Iterations

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

Ice Dead Load Factor 1.00

Ice Importance 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	-65.57	-7.66	0.00	-934.7	0.00	934.67	4,958.59	1,213.91	5,461.75	5,077.52	0	0	0.197
5.00	-63.72	-7.59	0.00	-896.4	0.00	896.40	4,892.41	1,191.06	5,258.12	4,914.65	0.03	-0.06	0.195
10.00	-61.87	-7.52	0.00	-858.4	0.00	858.45	4,825.19	1,168.21	5,058.37	4,753.32	0.13	-0.12	0.193
15.00	-60.04	-7.45	0.00	-820.8	0.00	820.84	4,756.93	1,145.37	4,862.48	4,593.60	0.29	-0.18	0.191
20.00	-58.23	-7.38	0.00	-783.6	0.00	783.59	4,687.62	1,122.52	4,670.46	4,435.55	0.51	-0.25	0.189
25.00	-56.45	-7.29	0.00	-746.7	0.00	746.71	4,617.28	1,099.67	4,482.31	4,279.23	0.8	-0.31	0.187
30.00	-54.69	-7.20	0.00	-710.2	0.00	710.25	4,545.89	1,076.83	4,298.02	4,124.71	1.16	-0.37	0.184
35.00	-52.96	-7.11	0.00	-674.2	0.00	674.23	4,461.85	1,053.98	4,117.61	3,961.72	1.59	-0.44	0.182
40.00	-51.26	-7.05	0.00	-638.7	0.00	638.68	4,365.13	1,031.13	3,941.06	3,790.99	2.08	-0.5	0.180
40.67	-51.03	-7.00	0.00	-634.0	0.00	633.98	4,352.24	1,028.09	3,917.81	3,768.51	2.15	-0.51	0.180
45.00	-48.68	-6.93	0.00	-603.6	0.00	603.63	4,268.42	1,008.29	3,768.38	3,624.02	2.64	-0.57	0.178
47.00	-47.61	-6.87	0.00	-589.8	0.00	589.77	3,589.52	873.39	3,298.55	3,084.74	2.89	-0.6	0.205
50.00	-46.71	-6.79	0.00	-569.2	0.00	569.16	3,554.97	861.64	3,210.41	3,013.58	3.28	-0.64	0.202
55.00	-45.24	-6.69	0.00	-535.2	0.00	535.21	3,496.57	842.05	3,066.16	2,896.10	3.99	-0.71	0.198
60.00	-43.79	-6.58	0.00	-501.8	0.00	501.77	3,437.12	822.47	2,925.22	2,780.05	4.78	-0.79	0.193
65.00	-42.37	-6.47	0.00	-468.9	0.00	468.87	3,376.63	802.89	2,787.61	2,665.48	5.64	-0.86	0.189
70.00	-40.98	-6.37	0.00	-436.5	0.00	436.51	3,315.10	783.31	2,653.30	2,552.47	6.59	-0.94	0.183
74.41	-39.77	-6.30	0.00	-408.4	0.00	408.42	3,242.82	766.02	2,537.51	2,441.17	7.49	-1.01	0.180
75.00	-39.52	-6.24	0.00	-404.7	0.00	404.72	3,233.09	763.72	2,522.32	2,426.47	7.61	-1.02	0.179
80.00	-37.44	-6.16	0.00	-373.5	0.00	373.52	2,566.23	632.09	2,073.25	1,915.98	8.71	-1.09	0.210
80.00	-37.44	-6.12	0.00	-373.5	0.00	373.50	2,566.20	632.08	2,073.18	1,915.92	8.71	-1.09	0.210
85.00	-36.25	-6.01	0.00	-342.9	0.00	342.92	2,519.59	615.76	1,967.53	1,832.15	9.9	-1.18	0.202
90.00	-35.09	-5.89	0.00	-312.9	0.00	312.89	2,471.95	599.45	1,864.64	1,749.45	11.18	-1.26	0.193
95.00	-33.96	-5.78	0.00	-283.4	0.00	283.43	2,423.26	583.13	1,764.51	1,667.88	12.54	-1.34	0.184
100.00	-32.85	-5.66	0.00	-254.5	0.00	254.54	2,373.53	566.81	1,667.14	1,587.51	13.99	-1.42	0.174
105.00	-31.77	-5.57	0.00	-226.2	0.00	226.23	2,322.75	550.49	1,572.54	1,508.40	15.53	-1.5	0.164
107.08	-31.33	-5.51	0.00	-214.7	0.00	214.66	2,301.36	543.71	1,534.06	1,475.93	16.19	-1.54	0.159
110.00	-30.45	-5.44	0.00	-198.6	0.00	198.55	2,261.32	534.17	1,480.70	1,424.55	17.14	-1.58	0.153
111.99	-29.86	-5.38	0.00	-187.7	0.00	187.69	1,427.17	375.92	1,047.30	906.45	17.81	-1.61	0.228
115.00	-29.35	-5.30	0.00	-171.5	0.00	171.51	1,411.20	369.05	1,009.38	879.81	18.84	-1.65	0.216
120.00	-28.51	-5.19	0.00	-145.0	0.00	145.02	1,383.81	357.63	947.85	835.83	20.62	-1.75	0.194
125.00	-27.69	-5.08	0.00	-119.1	0.00	119.06	1,355.37	346.20	888.26	792.31	22.5	-1.83	0.171
130.00	-26.90	-4.96	0.00	-93.7	0.00	93.67	1,325.90	334.78	830.60	749.30	24.46	-1.91	0.146
135.00	-20.59	-4.05	0.00	-68.8	0.00	68.85	1,295.38	323.35	774.88	706.87	26.49	-1.97	0.113
140.00	-19.85	-3.92	0.00	-48.6	0.00	48.61	1,263.82	311.93	721.09	665.08	28.58	-2.02	0.089
145.00	-19.13	-3.82	0.00	-29.0	0.00	29.01	1,231.22	300.50	669.24	623.99	30.72	-2.06	0.062
147.00	-11.82	-2.40	0.00	-21.4	0.00	21.36	1,217.89	295.93	649.04	607.77	31.58	-2.07	0.045
150.00	-11.41	-2.30	0.00	-14.2	0.00	14.17	1,197.58	289.07	619.32	583.66	32.89	-2.08	0.034
155.00	-10.76	-2.21	0.00	-2.7	0.00	2.69	1,162.90	277.65	571.34	544.15	35.08	-2.09	0.014
156.00	-0.69	-0.13	0.00	-0.5	0.00	0.48	1,155.83	275.36	561.97	536.36	35.51	-2.09	0.001
159.00	0.00	-0.11	0.00	-0.1	0.00	0.08	1,134.40	268.51	534.34	513.18	36.83	-2.09	0.000

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CALCULATED FORCES

Load Case: 1.0D + 1.0W — 60 mph Wind with No Ice — 25 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	-39.21	-6.91	0.00	-838.2	0.00	838.16	4,958.59	1,213.91	5,461.75	5,077.52	0	0	0.173
5.00	-37.91	-6.84	0.00	-803.6	0.00	803.59	4,892.41	1,191.06	5,258.12	4,914.65	0.03	-0.05	0.171
10.00	-36.64	-6.77	0.00	-769.4	0.00	769.38	4,825.19	1,168.21	5,058.37	4,753.32	0.11	-0.11	0.169
15.00	-35.38	-6.69	0.00	-735.5	0.00	735.54	4,756.93	1,145.37	4,862.48	4,593.60	0.26	-0.16	0.168
20.00	-34.15	-6.61	0.00	-702.1	0.00	702.08	4,687.62	1,122.52	4,670.46	4,435.55	0.46	-0.22	0.166
25.00	-32.95	-6.53	0.00	-669.0	0.00	669.00	4,617.28	1,099.67	4,482.31	4,279.23	0.72	-0.28	0.164
30.00	-31.76	-6.44	0.00	-636.4	0.00	636.35	4,545.89	1,076.83	4,298.02	4,124.71	1.04	-0.33	0.161
35.00	-30.60	-6.35	0.00	-604.1	0.00	604.13	4,461.85	1,053.98	4,117.61	3,961.72	1.42	-0.39	0.159
40.00	-29.46	-6.30	0.00	-572.4	0.00	572.36	4,365.13	1,031.13	3,941.06	3,790.99	1.87	-0.45	0.158
40.67	-29.30	-6.25	0.00	-568.2	0.00	568.17	4,352.24	1,028.09	3,917.81	3,768.51	1.93	-0.46	0.158
45.00	-27.59	-6.18	0.00	-541.1	0.00	541.07	4,268.42	1,008.29	3,768.38	3,624.02	2.37	-0.51	0.156
47.00	-26.81	-6.13	0.00	-528.7	0.00	528.71	3,589.52	873.39	3,298.55	3,084.74	2.59	-0.54	0.179
50.00	-26.22	-6.06	0.00	-510.3	0.00	510.31	3,554.97	861.64	3,210.41	3,013.58	2.94	-0.57	0.177
55.00	-25.27	-5.96	0.00	-480.0	0.00	480.04	3,496.57	842.05	3,066.16	2,896.10	3.57	-0.64	0.173
60.00	-24.33	-5.86	0.00	-450.2	0.00	450.25	3,437.12	822.47	2,925.22	2,780.05	4.28	-0.71	0.169
65.00	-23.41	-5.76	0.00	-421.0	0.00	420.95	3,376.63	802.89	2,787.61	2,665.48	5.06	-0.77	0.165
70.00	-22.51	-5.66	0.00	-392.2	0.00	392.15	3,315.10	783.31	2,653.30	2,552.47	5.9	-0.84	0.160
74.41	-21.74	-5.61	0.00	-367.2	0.00	367.15	3,242.82	766.02	2,537.51	2,441.17	6.71	-0.9	0.157
75.00	-21.56	-5.56	0.00	-363.9	0.00	363.86	3,233.09	763.72	2,522.32	2,426.47	6.82	-0.91	0.157
80.00	-20.08	-5.44	0.00	-336.1	0.00	336.08	2,566.20	632.08	2,073.18	1,915.92	7.81	-0.98	0.183
80.00	-20.08	-5.49	0.00	-336.1	0.00	336.10	2,566.23	632.09	2,073.25	1,915.98	7.81	-0.98	0.183
85.00	-19.34	-5.35	0.00	-308.9	0.00	308.86	2,519.59	615.76	1,967.53	1,832.15	8.88	-1.05	0.176
90.00	-18.62	-5.25	0.00	-282.1	0.00	282.13	2,471.95	599.45	1,864.64	1,749.45	10.02	-1.13	0.169
95.00	-17.92	-5.15	0.00	-255.9	0.00	255.91	2,423.26	583.13	1,764.51	1,667.88	11.25	-1.21	0.161
100.00	-17.24	-5.05	0.00	-230.2	0.00	230.18	2,373.53	566.81	1,667.14	1,587.51	12.55	-1.28	0.152
105.00	-16.57	-4.97	0.00	-205.0	0.00	204.95	2,322.75	550.49	1,572.54	1,508.40	13.93	-1.35	0.143
107.08	-16.29	-4.92	0.00	-194.6	0.00	194.62	2,301.36	543.71	1,534.06	1,475.93	14.52	-1.38	0.139
110.00	-15.70	-4.87	0.00	-180.2	0.00	180.23	2,261.32	534.17	1,480.70	1,424.55	15.38	-1.42	0.134
111.99	-15.29	-4.81	0.00	-170.5	0.00	170.53	1,427.17	375.92	1,047.30	906.45	15.98	-1.45	0.199
115.00	-15.00	-4.74	0.00	-156.1	0.00	156.06	1,411.20	369.05	1,009.38	879.81	16.9	-1.49	0.188
120.00	-14.52	-4.65	0.00	-132.4	0.00	132.35	1,383.81	357.63	947.85	835.83	18.51	-1.57	0.169
125.00	-14.05	-4.56	0.00	-109.1	0.00	109.11	1,355.37	346.20	888.26	792.31	20.2	-1.65	0.148
130.00	-13.59	-4.46	0.00	-86.3	0.00	86.32	1,325.90	334.78	830.60	749.30	21.96	-1.72	0.126
135.00	-10.03	-3.70	0.00	-64.0	0.00	64.00	1,295.38	323.35	774.88	706.87	23.79	-1.78	0.098
140.00	-9.61	-3.61	0.00	-45.5	0.00	45.48	1,263.82	311.93	721.09	665.08	25.68	-1.83	0.076
145.00	-9.20	-3.54	0.00	-27.4	0.00	27.45	1,231.22	300.50	669.24	623.99	27.61	-1.86	0.052
147.00	-5.49	-2.27	0.00	-20.4	0.00	20.38	1,217.89	295.93	649.04	607.77	28.4	-1.87	0.038
150.00	-5.26	-2.20	0.00	-13.6	0.00	13.55	1,197.58	289.07	619.32	583.66	29.58	-1.88	0.028
155.00	-4.89	-2.14	0.00	-2.6	0.00	2.55	1,162.90	277.65	571.34	544.15	31.55	-1.89	0.009
156.00	-0.27	-0.11	0.00	-0.4	0.00	0.41	1,155.83	275.36	561.97	536.36	31.95	-1.89	0.001
159.00	0.00	-0.10	0.00	-0.1	0.00	0.08	1,134.40	268.51	534.34	513.18	33.14	-1.89	0.000

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EQUIVALENT LATERAL FORCES METHOD ANALYSIS

Design Spectral Response Acceleration at Short Period (S_{ds}):	0.160
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.068
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):	0.030
Upper Limit C_S:	0.030
Lower Limit C_S:	0.030
Period based on Rayleigh Method (sec):	2.940
Redundancy Factor (p):	1.000
Seismic Force Distribution Exponent (k):	2.000
Total Unfactored Dead Load:	39.210 k
Seismic Base Shear (E):	1.180 k

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)
40	157.5	158	3,924	0.010	11	195
39	155.5	73	1,772	0.004	5	90
38	152.5	373	8,675	0.021	25	460
37	148.5	229	5,053	0.012	15	282
36	146	161	3,431	0.008	10	198
35	142.5	410	8,329	0.021	24	505
34	137.5	421	7,964	0.020	23	519
33	132.5	444	7,795	0.019	23	547
32	127.5	455	7,398	0.018	21	561
31	122.5	466	6,995	0.017	20	574
30	117.5	477	6,589	0.016	19	588
29	113.4967	292	3,765	0.009	11	360
28	110.9967	401	4,943	0.012	14	494
27	108.5383	596	7,023	0.017	20	734
26	106.0383	272	3,061	0.008	9	335
25	102.5	667	7,003	0.017	20	821
24	97.5	682	6,487	0.016	19	841
23	92.5	698	5,974	0.015	17	860
22	87.5	714	5,467	0.014	16	880
21	82.5	730	4,968	0.012	14	899
20	79.9983	0	3	0.000	0	1
19	77.4983	1,476	8,863	0.022	26	1,818
18	74.7067	176	980	0.002	3	216
17	72.2067	773	4,031	0.010	12	953
16	67.5	894	4,073	0.010	12	1,101
15	62.5	913	3,566	0.009	10	1,125
14	57.5	932	3,081	0.008	9	1,148
13	52.5	951	2,621	0.006	8	1,171
12	48.5	580	1,363	0.003	4	714
11	46	779	1,649	0.004	5	960
10	42.8333	1,711	3,140	0.008	9	2,108
9	40.3333	150	244	0.001	1	184
8	37.5	1,136	1,597	0.004	5	1,399
7	32.5	1,158	1,223	0.003	4	1,426
6	27.5	1,180	892	0.002	3	1,454
5	22.5	1,202	609	0.002	2	1,481
4	17.5	1,224	375	0.001	1	1,508
3	12.5	1,246	195	0.000	1	1,536
2	7.5	1,269	71	0.000	0	1,563
1	2.5	1,291	8	0.000	0	1,590

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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)
Raycap DC6-48-60-18-8F ("Squid")	159	113	2,867	0.007	8	140
Ericsson RRUS 8843 B2, B66A	156	216	5,257	0.013	15	266
Ericsson RRUS 4415 B25	156	138	3,358	0.008	10	170
Ericsson RRUS 4449 B5, B12	156	213	5,184	0.013	15	262
Ericsson RRUS-11	156	330	8,031	0.020	23	407
CCI HPA65R-BU8A	156	162	3,942	0.010	11	200
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	13	225
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	13	225
Kathrein Scala 80010966	156	688	16,733	0.041	49	847
Generic Flat Platform with Handrails	156	2,500	60,840	0.150	177	3,080
Samsung RF4461d-13A	147	237	5,128	0.013	15	292
Samsung MT6413-77A	147	172	3,715	0.009	11	212
Raycap RVZDC-6600-PF-48	147	32	681	0.002	2	39
Commscope NHH-65B-HG-R2B	147	271	5,860	0.014	17	334
Samsung MF3208d-25A	147	382	8,246	0.020	24	470
Generic Platform with Handrails	147	2,500	54,022	0.133	157	3,080
Raycap RDIDC-9181-PF-48	135	22	399	0.001	1	27
Fujitsu TA08025-B605	135	225	4,101	0.010	12	277
Fujitsu TA08025-B604	135	192	3,494	0.009	10	236
JMA Wireless MX08FRO665-21	135	194	3,527	0.009	10	238
Generic Round Platform with Handrails	135	2,500	45,562	0.112	132	3,080
	Totals:	**39,212**	**405,022**	**1.001**	**1,176**	**48,309**

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)
40	157.5	158	3,924	0.010	11	137
39	155.5	73	1,772	0.004	5	64
38	152.5	373	8,675	0.021	25	324
37	148.5	229	5,053	0.012	15	199
36	146	161	3,431	0.008	10	140
35	142.5	410	8,329	0.021	24	356
34	137.5	421	7,964	0.020	23	366
33	132.5	444	7,795	0.019	23	385
32	127.5	455	7,398	0.018	21	395
31	122.5	466	6,995	0.017	20	405
30	117.5	477	6,589	0.016	19	414
29	113.4967	292	3,765	0.009	11	254
28	110.9967	401	4,943	0.012	14	348
27	108.5383	596	7,023	0.017	20	517
26	106.0383	272	3,061	0.008	9	236
25	102.5	667	7,003	0.017	20	579
24	97.5	682	6,487	0.016	19	592
23	92.5	698	5,974	0.015	17	606
22	87.5	714	5,467	0.014	16	620
21	82.5	730	4,968	0.012	14	634
20	79.9983	0	3	0.000	0	0
19	77.4983	1,476	8,863	0.022	26	1,281
18	74.7067	176	980	0.002	3	152
17	72.2067	773	4,031	0.010	12	671
16	67.5	894	4,073	0.010	12	776
15	62.5	913	3,566	0.009	10	792
14	57.5	932	3,081	0.008	9	809
13	52.5	951	2,621	0.006	8	825
12	48.5	580	1,363	0.003	4	503
11	46	779	1,649	0.004	5	677
10	42.8333	1,711	3,140	0.008	9	1,485
9	40.3333	150	244	0.001	1	130

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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)
8	37.5	1,136	1,597	0.004	5	986
7	32.5	1,158	1,223	0.003	4	1,005
6	27.5	1,180	892	0.002	3	1,024
5	22.5	1,202	609	0.002	2	1,043
4	17.5	1,224	375	0.001	1	1,063
3	12.5	1,246	195	0.000	1	1,082
2	7.5	1,269	71	0.000	0	1,101
1	2.5	1,291	8	0.000	0	1,120
Raycap DC6-48-60-18-8F ("Squid")	159	113	2,867	0.007	8	98
Ericsson RRUS 8843 B2, B66A	156	216	5,257	0.013	15	187
Ericsson RRUS 4415 B25	156	138	3,358	0.008	10	120
Ericsson RRUS 4449 B5, B12	156	213	5,184	0.013	15	185
Ericsson RRUS-11	156	330	8,031	0.020	23	286
CCI HPA65R-BU8A	156	162	3,942	0.010	11	141
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	13	158
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	13	158
Kathrein Scala 80010966	156	688	16,733	0.041	49	597
Generic Flat Platform with Handrails	156	2,500	60,840	0.150	177	2,170
Samsung RF4461d-13A	147	237	5,128	0.013	15	206
Samsung MT6413-77A	147	172	3,715	0.009	11	149
Raycap RVZDC-6600-PF-48	147	32	681	0.002	2	27
Commscope NHH-65B-HG-R2B	147	271	5,860	0.014	17	235
Samsung MF3208d-25A	147	382	8,246	0.020	24	331
Generic Platform with Handrails	147	2,500	54,022	0.133	157	2,170
Raycap RDIDC-9181-PF-48	135	22	399	0.001	1	19
Fujitsu TA08025-B605	135	225	4,101	0.010	12	195
Fujitsu TA08025-B604	135	192	3,494	0.009	10	166
JMA Wireless MX08FRO665-21	135	194	3,527	0.009	10	168
Generic Round Platform with Handrails	135	2,500	45,562	0.112	132	2,170
	Totals:	**39,212**	**405,022**	**1.001**	**1,176**	**34,036**

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)
40	157.5	158	3,924	0.010	17	195
39	155.5	73	1,772	0.004	8	90
38	152.5	373	8,675	0.021	38	460
37	148.5	229	5,053	0.012	22	282
36	146	161	3,431	0.008	15	198
35	142.5	410	8,329	0.021	36	505
34	137.5	421	7,964	0.020	35	519
33	132.5	444	7,795	0.019	34	547
32	127.5	455	7,398	0.018	32	561
31	122.5	466	6,995	0.017	30	574
30	117.5	477	6,589	0.016	29	588
29	113.4967	292	3,765	0.009	16	360
28	110.9967	401	4,943	0.012	22	494
27	108.5383	596	7,023	0.017	31	734
26	106.0383	272	3,061	0.008	13	335
25	102.5	667	7,003	0.017	31	821
24	97.5	682	6,487	0.016	28	841
23	92.5	698	5,974	0.015	26	860
22	87.5	714	5,467	0.014	24	880
21	82.5	730	4,968	0.012	22	899
20	79.9983	0	3	0.000	0	1
19	77.4983	1,476	8,863	0.022	39	1,818
18	74.7067	176	980	0.002	4	216
17	72.2067	773	4,031	0.010	18	953

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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)
16	67.5	894	4,073	0.010	18	1,101
15	62.5	913	3,566	0.009	16	1,125
14	57.5	932	3,081	0.008	13	1,148
13	52.5	951	2,621	0.006	11	1,171
12	48.5	580	1,363	0.003	6	714
11	46	779	1,649	0.004	7	960
10	42.8333	1,711	3,140	0.008	14	2,108
9	40.3333	150	244	0.001	1	184
8	37.5	1,136	1,597	0.004	7	1,399
7	32.5	1,158	1,223	0.003	5	1,426
6	27.5	1,180	892	0.002	4	1,454
5	22.5	1,202	609	0.002	3	1,481
4	17.5	1,224	375	0.001	2	1,508
3	12.5	1,246	195	0.000	1	1,536
2	7.5	1,269	71	0.000	0	1,563
1	2.5	1,291	8	0.000	0	1,590
Raycap DC6-48-60-18-8F ("Squid")	159	113	2,867	0.007	12	140
Ericsson RRUS 8843 B2, B66A	156	216	5,257	0.013	23	266
Ericsson RRUS 4415 B25	156	138	3,358	0.008	15	170
Ericsson RRUS 4449 B5, B12	156	213	5,184	0.013	23	262
Ericsson RRUS-11	156	330	8,031	0.020	35	407
CCI HPA65R-BU8A	156	162	3,942	0.010	17	200
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	19	225
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	19	225
Kathrein Scala 80010966	156	688	16,733	0.041	73	847
Generic Flat Platform with Handrails	156	2,500	60,840	0.150	265	3,080
Samsung RF4461d-13A	147	237	5,128	0.013	22	292
Samsung MT6413-77A	147	172	3,715	0.009	16	212
Raycap RVZDC-6600-PF-48	147	32	681	0.002	3	39
Commscope NHH-65B-HG-R2B	147	271	5,860	0.014	26	334
Samsung MF3208d-25A	147	382	8,246	0.020	36	470
Generic Platform with Handrails	147	2,500	54,022	0.133	235	3,080
Raycap RDIDC-9181-PF-48	135	22	399	0.001	2	27
Fujitsu TA08025-B605	135	225	4,101	0.010	18	277
Fujitsu TA08025-B604	135	192	3,494	0.009	15	236
JMA Wireless MX08FRO665-21	135	194	3,527	0.009	15	238
Generic Round Platform with Handrails	135	2,500	45,562	0.112	198	3,080
	Totals:	**39,212**	**405,022**	**1.001**	**1,765**	**48,309**

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)
40	157.5	158	3,924	0.010	17	137
39	155.5	73	1,772	0.004	8	64
38	152.5	373	8,675	0.021	38	324
37	148.5	229	5,053	0.012	22	199
36	146	161	3,431	0.008	15	140
35	142.5	410	8,329	0.021	36	356
34	137.5	421	7,964	0.020	35	366
33	132.5	444	7,795	0.019	34	385
32	127.5	455	7,398	0.018	32	395
31	122.5	466	6,995	0.017	30	405
30	117.5	477	6,589	0.016	29	414
29	113.4967	292	3,765	0.009	16	254
28	110.9967	401	4,943	0.012	22	348
27	108.5383	596	7,023	0.017	31	517
26	106.0383	272	3,061	0.008	13	236
25	102.5	667	7,003	0.017	31	579

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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)
24	97.5	682	6,487	0.016	28	592
23	92.5	698	5,974	0.015	26	606
22	87.5	714	5,467	0.014	24	620
21	82.5	730	4,968	0.012	22	634
20	79.9983	0	3	0.000	0	0
19	77.4983	1,476	8,863	0.022	39	1,281
18	74.7067	176	980	0.002	4	152
17	72.2067	773	4,031	0.010	18	671
16	67.5	894	4,073	0.010	18	776
15	62.5	913	3,566	0.009	16	792
14	57.5	932	3,081	0.008	13	809
13	52.5	951	2,621	0.006	11	825
12	48.5	580	1,363	0.003	6	503
11	46	779	1,649	0.004	7	677
10	42.8333	1,711	3,140	0.008	14	1,485
9	40.3333	150	244	0.001	1	130
8	37.5	1,136	1,597	0.004	7	986
7	32.5	1,158	1,223	0.003	5	1,005
6	27.5	1,180	892	0.002	4	1,024
5	22.5	1,202	609	0.002	3	1,043
4	17.5	1,224	375	0.001	2	1,063
3	12.5	1,246	195	0.000	1	1,082
2	7.5	1,269	71	0.000	0	1,101
1	2.5	1,291	8	0.000	0	1,120
Raycap DC6-48-60-18-8F ("Squid")	159	113	2,867	0.007	12	98
Ericsson RRUS 8843 B2, B66A	156	216	5,257	0.013	23	187
Ericsson RRUS 4415 B25	156	138	3,358	0.008	15	120
Ericsson RRUS 4449 B5, B12	156	213	5,184	0.013	23	185
Ericsson RRUS-11	156	330	8,031	0.020	35	286
CCI HPA65R-BU8A	156	162	3,942	0.010	17	141
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	19	158
Andrew SBNH-1D6565C (60.8 lbs)	156	182	4,439	0.011	19	158
Kathrein Scala 80010966	156	688	16,733	0.041	73	597
Generic Flat Platform with Handrails	156	2,500	60,840	0.150	265	2,170
Samsung RF4461d-13A	147	237	5,128	0.013	22	206
Samsung MT6413-77A	147	172	3,715	0.009	16	149
Raycap RVZDC-6600-PF-48	147	32	681	0.002	3	27
Commscope NHH-65B-HG-R2B	147	271	5,860	0.014	26	235
Samsung MF3208d-25A	147	382	8,246	0.020	36	331
Generic Platform with Handrails	147	2,500	54,022	0.133	235	2,170
Raycap RDIDC-9181-PF-48	135	22	399	0.001	2	19
Fujitsu TA08025-B605	135	225	4,101	0.010	18	195
Fujitsu TA08025-B604	135	192	3,494	0.009	15	166
JMA Wireless MX08FRO665-21	135	194	3,527	0.009	15	168
Generic Round Platform with Handrails	135	2,500	45,562	0.112	198	2,170
	Totals:	**39,212**	**405,022**	**1.001**	**1,765**	**34,036**

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	-46.72	-1.18	0.00	-165.29	0.00	165.29	4,958.59	1,213.91	5,462	5,077.52	0.00	0.00	0.04
5.00	-45.16	-1.19	0.00	-159.39	0.00	159.39	4,892.41	1,191.06	5,258	4,914.65	0.01	-0.01	0.04
10.00	-43.62	-1.20	0.00	-153.45	0.00	153.45	4,825.19	1,168.21	5,058	4,753.32	0.02	-0.02	0.04
15.00	-42.11	-1.20	0.00	-147.47	0.00	147.47	4,756.93	1,145.37	4,862	4,593.60	0.05	-0.03	0.04
20.00	-40.63	-1.21	0.00	-141.46	0.00	141.46	4,687.62	1,122.52	4,670	4,435.55	0.09	-0.04	0.04
25.00	-39.18	-1.21	0.00	-135.43	0.00	135.43	4,617.28	1,099.67	4,482	4,279.23	0.14	-0.06	0.04

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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
30.00	-37.75	-1.21	0.00	-129.37	0.00	129.37	4,545.89	1,076.83	4,298	4,124.71	0.21	-0.07	0.04
35.00	-36.35	-1.22	0.00	-123.30	0.00	123.30	4,461.85	1,053.98	4,118	3,961.72	0.28	-0.08	0.04
40.00	-36.17	-1.22	0.00	-117.23	0.00	117.23	4,365.13	1,031.13	3,941	3,790.99	0.37	-0.09	0.04
40.67	-34.06	-1.21	0.00	-116.41	0.00	116.41	4,352.24	1,028.09	3,918	3,768.51	0.39	-0.09	0.04
45.00	-33.10	-1.21	0.00	-111.17	0.00	111.17	4,268.42	1,008.29	3,768	3,624.02	0.47	-0.10	0.04
47.00	-32.38	-1.21	0.00	-108.76	0.00	108.76	3,589.52	873.39	3,299	3,084.74	0.52	-0.11	0.04
50.00	-31.21	-1.20	0.00	-105.14	0.00	105.14	3,554.97	861.64	3,210	3,013.58	0.59	-0.12	0.04
55.00	-30.06	-1.20	0.00	-99.13	0.00	99.13	3,496.57	842.05	3,066	2,896.10	0.72	-0.13	0.04
60.00	-28.94	-1.19	0.00	-93.14	0.00	93.14	3,437.12	822.47	2,925	2,780.05	0.86	-0.14	0.04
65.00	-27.84	-1.18	0.00	-87.18	0.00	87.18	3,376.63	802.89	2,788	2,665.48	1.02	-0.16	0.04
70.00	-26.88	-1.18	0.00	-81.26	0.00	81.26	3,315.10	783.31	2,653	2,552.47	1.19	-0.17	0.04
74.41	-26.67	-1.18	0.00	-76.08	0.00	76.08	3,242.82	766.02	2,538	2,441.17	1.36	-0.18	0.04
75.00	-24.85	-1.15	0.00	-75.39	0.00	75.39	3,233.09	763.72	2,522	2,426.47	1.38	-0.19	0.04
80.00	-24.85	-1.15	0.00	-69.65	0.00	69.65	2,566.23	632.09	2,073	1,915.98	1.58	-0.20	0.05
80.00	-23.95	-1.14	0.00	-69.65	0.00	69.65	2,566.20	632.08	2,073	1,915.92	1.58	-0.20	0.05
85.00	-23.07	-1.12	0.00	-63.97	0.00	63.97	2,519.59	615.76	1,968	1,832.15	1.80	-0.22	0.04
90.00	-22.21	-1.11	0.00	-58.35	0.00	58.35	2,471.95	599.45	1,865	1,749.45	2.03	-0.23	0.04
95.00	-21.37	-1.09	0.00	-52.81	0.00	52.81	2,423.26	583.13	1,765	1,667.88	2.28	-0.25	0.04
100.00	-20.55	-1.07	0.00	-47.35	0.00	47.35	2,373.53	566.81	1,667	1,587.51	2.55	-0.26	0.04
105.00	-20.21	-1.07	0.00	-41.98	0.00	41.98	2,322.75	550.49	1,573	1,508.40	2.83	-0.28	0.04
107.08	-19.48	-1.05	0.00	-39.77	0.00	39.77	2,301.36	543.71	1,534	1,475.93	2.95	-0.28	0.04
110.00	-18.98	-1.03	0.00	-36.71	0.00	36.71	2,261.32	534.17	1,481	1,424.55	3.13	-0.29	0.03
111.99	-18.62	-1.02	0.00	-34.66	0.00	34.66	1,427.17	375.92	1,047	906.45	3.25	-0.30	0.05
115.00	-18.03	-1.00	0.00	-31.59	0.00	31.59	1,411.20	369.05	1,009	879.81	3.44	-0.30	0.05
120.00	-17.46	-0.98	0.00	-26.58	0.00	26.58	1,383.81	357.63	948	835.83	3.77	-0.32	0.04
125.00	-16.90	-0.96	0.00	-21.67	0.00	21.67	1,355.37	346.20	888	792.31	4.12	-0.34	0.04
130.00	-16.35	-0.94	0.00	-16.85	0.00	16.85	1,325.90	334.78	831	749.30	4.48	-0.35	0.04
135.00	-11.97	-0.73	0.00	-12.15	0.00	12.15	1,295.38	323.35	775	706.87	4.85	-0.36	0.03
140.00	-11.47	-0.70	0.00	-8.51	0.00	8.51	1,263.82	311.93	721	665.08	5.23	-0.37	0.02
145.00	-11.27	-0.69	0.00	-5.01	0.00	5.01	1,231.22	300.50	669	623.99	5.63	-0.38	0.02
147.00	-6.56	-0.42	0.00	-3.63	0.00	3.63	1,217.89	295.93	649	607.77	5.78	-0.38	0.01
150.00	-6.10	-0.39	0.00	-2.37	0.00	2.37	1,197.58	289.07	619	583.66	6.02	-0.38	0.01
155.00	-6.01	-0.39	0.00	-0.41	0.00	0.41	1,162.90	277.65	571	544.15	6.42	-0.38	0.01
156.00	-0.14	-0.01	0.00	-0.03	0.00	0.03	1,155.83	275.36	562	536.36	6.50	-0.38	0.00
159.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,134.40	268.51	534	513.18	6.75	-0.38	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	-32.92	-1.18	0.00	-161.94	0.00	161.94	4,958.59	1,213.91	5,462	5,077.52	0.00	0.00	0.04
5.00	-31.81	-1.18	0.00	-156.04	0.00	156.04	4,892.41	1,191.06	5,258	4,914.65	0.01	-0.01	0.04
10.00	-30.73	-1.19	0.00	-150.12	0.00	150.12	4,825.19	1,168.21	5,058	4,753.32	0.02	-0.02	0.04
15.00	-29.67	-1.19	0.00	-144.18	0.00	144.18	4,756.93	1,145.37	4,862	4,593.60	0.05	-0.03	0.04
20.00	-28.63	-1.20	0.00	-138.21	0.00	138.21	4,687.62	1,122.52	4,670	4,435.55	0.09	-0.04	0.04
25.00	-27.60	-1.20	0.00	-132.23	0.00	132.23	4,617.28	1,099.67	4,482	4,279.23	0.14	-0.05	0.04
30.00	-26.60	-1.20	0.00	-126.24	0.00	126.24	4,545.89	1,076.83	4,298	4,124.71	0.20	-0.07	0.04
35.00	-25.61	-1.20	0.00	-120.24	0.00	120.24	4,461.85	1,053.98	4,118	3,961.72	0.28	-0.08	0.04
40.00	-25.48	-1.20	0.00	-114.25	0.00	114.25	4,365.13	1,031.13	3,941	3,790.99	0.36	-0.09	0.04
40.67	-23.99	-1.19	0.00	-113.45	0.00	113.45	4,352.24	1,028.09	3,918	3,768.51	0.38	-0.09	0.04
45.00	-23.32	-1.19	0.00	-108.29	0.00	108.29	4,268.42	1,008.29	3,768	3,624.02	0.46	-0.10	0.04
47.00	-22.81	-1.19	0.00	-105.91	0.00	105.91	3,589.52	873.39	3,299	3,084.74	0.51	-0.11	0.04
50.00	-21.99	-1.18	0.00	-102.35	0.00	102.35	3,554.97	861.64	3,210	3,013.58	0.58	-0.11	0.04
55.00	-21.18	-1.18	0.00	-96.45	0.00	96.45	3,496.57	842.05	3,066	2,896.10	0.70	-0.13	0.04
60.00	-20.39	-1.17	0.00	-90.57	0.00	90.57	3,437.12	822.47	2,925	2,780.05	0.84	-0.14	0.04
65.00	-19.61	-1.16	0.00	-84.73	0.00	84.73	3,376.63	802.89	2,788	2,665.48	1.00	-0.15	0.04
70.00	-18.94	-1.15	0.00	-78.94	0.00	78.94	3,315.10	783.31	2,653	2,552.47	1.16	-0.17	0.04
74.41	-18.79	-1.15	0.00	-73.86	0.00	73.86	3,242.82	766.02	2,538	2,441.17	1.32	-0.18	0.04

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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
75.00	-17.51	-1.12	0.00	-73.19	0.00	73.19	3,233.09	763.72	2,522	2,426.47	1.35	-0.18	0.04
80.00	-17.51	-1.12	0.00	-67.59	0.00	67.59	2,566.23	632.09	2,073	1,915.98	1.54	-0.19	0.04
80.00	-16.87	-1.11	0.00	-67.58	0.00	67.58	2,566.20	632.08	2,073	1,915.92	1.54	-0.19	0.04
85.00	-16.25	-1.10	0.00	-62.04	0.00	62.04	2,519.59	615.76	1,968	1,832.15	1.76	-0.21	0.04
90.00	-15.65	-1.08	0.00	-56.56	0.00	56.56	2,471.95	599.45	1,865	1,749.45	1.98	-0.23	0.04
95.00	-15.05	-1.06	0.00	-51.17	0.00	51.17	2,423.26	583.13	1,765	1,667.88	2.23	-0.24	0.04
100.00	-14.47	-1.04	0.00	-45.85	0.00	45.85	2,373.53	566.81	1,667	1,587.51	2.49	-0.25	0.04
105.00	-14.24	-1.04	0.00	-40.64	0.00	40.64	2,322.75	550.49	1,573	1,508.40	2.76	-0.27	0.03
107.08	-13.72	-1.01	0.00	-38.49	0.00	38.49	2,301.36	543.71	1,534	1,475.93	2.88	-0.27	0.03
110.00	-13.37	-1.00	0.00	-35.52	0.00	35.52	2,261.32	534.17	1,481	1,424.55	3.05	-0.28	0.03
111.99	-13.12	-0.99	0.00	-33.53	0.00	33.53	1,427.17	375.92	1,047	906.45	3.17	-0.29	0.05
115.00	-12.70	-0.97	0.00	-30.55	0.00	30.55	1,411.20	369.05	1,009	879.81	3.35	-0.30	0.04
120.00	-12.30	-0.95	0.00	-25.70	0.00	25.70	1,383.81	357.63	948	835.83	3.67	-0.31	0.04
125.00	-11.90	-0.93	0.00	-20.94	0.00	20.94	1,355.37	346.20	888	792.31	4.01	-0.33	0.04
130.00	-11.52	-0.91	0.00	-16.29	0.00	16.29	1,325.90	334.78	831	749.30	4.36	-0.34	0.03
135.00	-8.44	-0.70	0.00	-11.74	0.00	11.74	1,295.38	323.35	775	706.87	4.72	-0.35	0.02
140.00	-8.08	-0.68	0.00	-8.23	0.00	8.23	1,263.82	311.93	721	665.08	5.10	-0.36	0.02
145.00	-7.94	-0.67	0.00	-4.84	0.00	4.84	1,231.22	300.50	669	623.99	5.48	-0.37	0.01
147.00	-4.62	-0.41	0.00	-3.51	0.00	3.51	1,217.89	295.93	649	607.77	5.63	-0.37	0.01
150.00	-4.30	-0.38	0.00	-2.29	0.00	2.29	1,197.58	289.07	619	583.66	5.86	-0.37	0.01
155.00	-4.24	-0.37	0.00	-0.40	0.00	0.40	1,162.90	277.65	571	544.15	6.25	-0.37	0.00
156.00	-0.10	-0.01	0.00	-0.03	0.00	0.03	1,155.83	275.36	562	536.36	6.33	-0.37	0.00
159.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,134.40	268.51	534	513.18	6.56	-0.37	0.00

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ANALYSIS SUMMARY

	Base 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	28.90	0.00	47.00	0.00	0.00	3532.05	111.99	0.81
0.9D + 1.0W	28.88	0.00	35.23	0.00	0.00	3472.57	111.99	0.78
1.2D + 1.0Di + 1.0Wi	7.66	0.00	65.57	0.00	0.00	934.67	111.99	0.23
1.2D + 1.0Ev + 1.0Eh	1.18	0.00	46.72	0.00	0.00	165.29	111.99	0.05
0.9D - 1.0Ev + 1.0Eh	1.18	0.00	32.92	0.00	0.00	161.94	111.99	0.05
1.0D + 1.0W	6.91	0.00	39.21	0.00	0.00	838.16	111.99	0.2

ANALYSIS SUMMARY – OVERSTRENGTH LOAD CASES

	Base Reactions					
Load Case	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	1.77	0.00	46.72	0.00	0.00	248.03
0.9D - 1.0Ev + 1.5Eh	1.77	0.00	32.92	0.00	0.00	242.89

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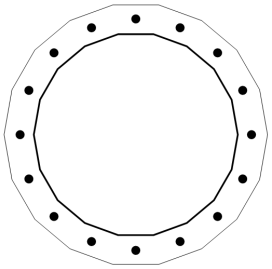
BASE PLATE ANALYSIS @ 0 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
3532.05	47	28.9

PLATE PARAMETERS (ID# 37647)

Width:	64.51	in
Shape:	18	
Thickness:	3.25	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Rod Detail Type:	d	
Clear Distance	3.625	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	0	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F_y (ksi)	F_u (ksi)	Spacing (in)	Offset (°)
Original [ID#38600]	Radial	16	2.25	57.53	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	50.25"ø x 0.4375" (18 Sides)	68.1176	-	-	21131.75	-
Bolt Group	Original (16) 2.25"ø	3.9761	3.2477	0.8393	19594.13	4.5

REACTION DISTRIBUTION

Component	ID	Moment M_u (k-ft)	Axial Load P_u (k)	Shear V_u (k)	Moment Factor
Pole	50.25"ø x 0.4375" (18 Sides)	3532.0	47.00	28.90	1.000
Bolt Group	Original (16) 2.25"ø	3532.0	-	28.90	1.000

BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	50.38	in
Point-to-Point Diameter:	51.15	in
Orientation Offset:	-	º

Flat Width:	8.882	in
Flat Radians:	0.349	rad

PLATE PROPERTIES

Neutral Axis:	0	°
Bend Line Limits:	0.931 to 2.210	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 $M_u/\Phi M_n$
Flats	34.258	0.00	90.462	507.0	4070.8	12.5% ✓
Corners	33.086	0.00	87.369	367.4	3931.6	9.3% ✓
Circumferential	47.636	0.00	125.788	1047.1	5660.5	18.5% ✓

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	16	2.25	144.9	2.9	243.6	59.5% ✓

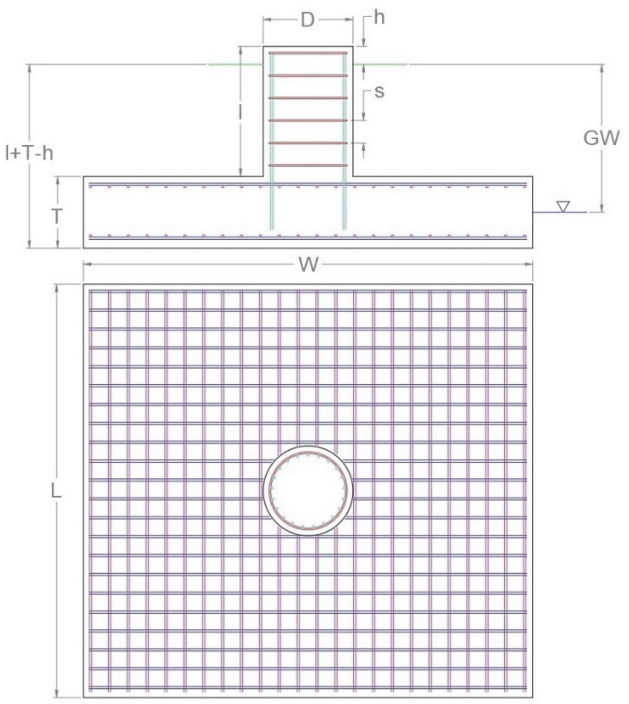
MONOLITHIC MAT & PIER FOUNDATION ANALYSIS

APPLIED GLOBAL REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
3,532.05	47.00	28.90

FOUNDATION PARAMETERS

Mat Length:	L	28	ft
Mat Width:	W	28	ft
Mat Thickness:	T	2.25	ft
Base Depth:	L+T-h	4.5	ft
Pier Shape:		Round	
Pier Diameter:	D	7	ft
Pier Height above Grade:	h	1	ft
Concrete Compressive Strength:		4,500	psi
Mat Top Rebar:		(36) #8 bars [60 ksi]	
Mat Bottom Rebar:		(36) #8 bars [60 ksi]	
Pier Vertical Rebar:		(40) #9 bars [60 ksi]	
Pier Rebar Ties:	s	#5 bars @ 6.0" c/c [60 ksi]	
Rebar Clear Cover:		3.0	in
Tower Eccentricity:	ecc	0	ft
Tower Leg Count		1	



SOIL PARAMETERS

Water Table Depth [BGL]:	GW		ft
Soil Unit Weight:		135	pcf
Ultimate Skin Friction:		0	psf
Ultimate Bearing Pressure:		12,000	psf
Bearing Pressure Type:		Gross	
Coefficient of Shear Friction:		0.35	

SOIL STRENGTH ANALYSIS

Soil Strength Reduction Factor, Φ_s	Uplift Strength Reduction Factor, Φ_s	Asset Dead Load Factor	Dead Load Factor
0.75	0.75	0.9	1.2

SOIL OVERTURNING ANALYSIS

Design Moment, $M_{u,Design}$ (k-ft)	Nominal Overturning Capacity, $\Phi_m M_n$ (k-ft)	Soil Overturning Usage, $M_{u,Design} / \Phi_m M_n$
3,691.00	7,159.79	**51.6%**

SOIL BEARING ANALYSIS

Net Bearing Pressure, $P_{u,Net}$ (psf)	Nominal Bearing Capacity, $\Phi_b P_n$ (psf)	Bearing Pressure Controlling Load Direction	Soil Bearing Usage, $P_{u,net} / \Phi_b P_n$
1,382.00	9,000.00	Diagonal to Pad Edge	**15.4%**

SOIL SLIDING SHEAR ANALYSIS

Applied Shear Force, V_u (k)	Friction Resistance (k)	Passive Pressure (psf)	Passive Pressure Resistance (k)	Nominal Shear Capacity, $\Phi_s V_n$ (k)	Soil Sliding Shear Usage, $V_u / \Phi_s V_n$
28.90	192.14	455.6	28.70	165.64	**17.0%**

MAT REINFORCING STEEL STRENGTH ANALYSIS

Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, Φ_b	Strength Shear Reduction Factor, Φ_v	Strength Compression Reduction Factor, Φ_c
29,000	0.9	0.75	0.65

MAT REINFORCING ONE WAY SHEAR ANALYSIS

One Way Design Shear, V_u (k)	Nominal One Way Shear Capacity, $\Phi_c V_n$ (k)	One Way Shear Controlling Load Direction	Mat One Way Shear Usage, V_u / $\Phi_c V_n$
160.28	798.85	Diagonal to Pad Edge	**20.1%**

MAT REINFORCING PUNCHING SHEAR ANALYSIS

Punching Shear Design Stress, v_u (psi)	Nominal Punching Shear Capacity, $\Phi_c v_n$ (psi)	Mat Punching Shear Usage, v_u / $\Phi_c v_n$
67.8	201.2	**33.7%**

MAT REINFORCING MOMENT TRANSFER ANALYSIS

Moment Transfer Effective Flexural Width, w_f (in)	Neutral Axis Depth (in)	Pier Moment at Joint, M_{ut} (k-in)	Nominal Moment Transfer Capacity, $\Phi M_{sc,f}$ (k-in)	Mat Moment Transfer Usage, 0.6 M_{ut} / $\Phi M_{sc,f}$
13.75	1.39	0.00	17,710.5	**0.0%**

MAT REINFORCING FLEXURE ANALYSIS – UPPER STEEL

Factored Moment, M_u (k-ft)	Nominal Flexural Capacity, ΦM_n (k-ft)	Flexural Steel Controlling Load Direction	Mat Upper Rebar Flexure Usage, M_u / ΦM_n
989.77	2,871.32	Parallel to Pad Edge	**34.5%**

MAT REINFORCING FLEXURE ANALYSIS – LOWER STEEL

Factored Moment, M_u (k-ft)	Nominal Flexural Capacity, ΦM_n (k-ft)	Flexural Steel Controlling Load Direction	Mat Lower Rebar Flexure Usage, M_u / ΦM_n
1,508.50	2,871.32	Parallel to Pad Edge	**52.5%**

PIER REINFORCING STEEL STRENGTH ANALYSIS

Rebar Cage Diameter (in)	Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, Φ_b	Strength Shear Reduction Factor, Φ_v	Strength Compression Reduction Factor, Φ_c
75.62	29,000	0.9	0.75	0.65

PIER REINFORCING MOMENT ANALYSIS

Design Moment, M_u (k-ft)	Nominal Moment Capacity, $\Phi_b M_n$ (k-ft)	Bending Reinforcement Ratio	Pier Rebar Flexure Usage, $M_u/\Phi_b M_n$
3,625.98	6,657.65	0.007	**54.5%**

PIER REINFORCING COMPRESSION ANALYSIS

Design Compression, P_u (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, P_u / $\Phi_p P_n$
47.00	10,974.22	**0.4%**

PIER REINFORCING SHEAR ANALYSIS

Design Shear, V_u (k)	Nominal Shear Capacity, $\Phi_v V_n$ (k)	Pier Rebar Shear Usage, V_u / $\Phi_v V_n$
28.90	872.47	**3.3%**