



**AMERICAN TOWER®**  
CORPORATION

## Structural Analysis Report

**Structure** : 140 ft Monopole  
**ATC Asset Name** : WSPT-WESTPORT REBUILD CT  
**ATC Asset Number** : 310968  
**Engineering Number** : 13764586\_C3\_06  
**Proposed Carrier** : T-MOBILE  
**Carrier Site Name** : CT323/SS Tower Rebuilic  
**Carrier Site Number** : CT11323A  
**Site Location** : 180A Bayberry Lane  
Westport, CT 06880-2844  
41.1716, -73.3286  
**County** : Fairfield  
**Date** : November 18, 2022  
**Max Usage** : 69%  
**Analysis Result** : Pass

Prepared By:

Taylor Kellner  
Structural Engineer I

Reviewed



**COA: PEC.0001553**



**Table of Contents**

Introduction.....3

Supporting Documents.....3

Analysis.....3

Conclusion .....3

Existing/Reserved Loading.....4

Proposed Carrier Final Loading.....5

Structure Usages.....6

Foundation Reactions & Usages .....6

Antenna Deflection, Twist, and Sway .....6

Standard Conditions .....7

Calculations.....Attached

## Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 140 ft Monopole tower to reflect the change in loading by T-MOBILE.

## Supporting Documents

<b>Tower Drawing:</b>	PJF, Penn Summit Job #29204-0171, dated July 1, 2004
<b>Foundation Drawing:</b>	PJF, Penn Summit Job #29204-0171, dated June 10, 2004
<b>Geotechnical Report:</b>	GeoTechnologies Project #1-02-1190-EA, dated September 23, 2002

## 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.

<b>Basic Wind Speed:</b>	118 mph (3-second gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-second gust) w/ 1.00" radial ice concurrent
<b>Code(s):</b>	ANSI/TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
<b>Exposure Category:</b>	B
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 1
<b>Topographic Category:</b>	1
<b>Spectral Response:</b>	$S_s = 0.23$ , $S_i = 0.06$
<b>Site Class:</b>	D - Stiff Soil - 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 contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com) Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing/Reserved Loading**

Elev.*	Qty	Equipment	Lines	Carrier
147.0'	3	dbSpectra DS7C09P36U-D	(3) 1 5/8" Coax (3) 1 5/8" Coax (2) 3/8" Coax (4) 7/8" Coax (1) 1/2" Coax (1) EW90	TOWN OF WESTPORT
143.4'	1	12' Omni		
142.8'	2	8' Omni		
142.6'	1	6' FM antenna		
141.0'	1	12' Dipole		
140.0'	1	RFS SC3-W100AB		
	1	TX RX Systems 432F-83W-01-C-110/110R/48/48R		
138.0'	1	Platform with Handrails		
	1	6' Omni		
125.4'	1	9' Omni		
121.0'	1	Andrew DB586		
120.0'	1	Low Profile Platform		
115.5'	2	Diamond X50A		
114.9'	1	RFS DB-C1-12C-24AB-0Z	(2) 1/2" Coax	SENET, INC.
111.3'	3	Alcatel-Lucent B13 RRH4x30-4R		
110.1'	3	Alcatel-Lucent B25 RRH4x30		
110.0'	2	RFS DB-T1-6Z-8AB-0Z		
	3	Alcatel-Lucent B66a RRH4x45 (AWS-3)		
	3	Alcatel-Lucent RRH 2X60-1900		
	3	Amphenol Antel BXA-171063/8CF		
	3	Antel BXA-70080/6CF__		
	3	Commscope CBC78T-DS-43-2X		
	3	Nokia AirScale RRH 4T4R B5 160W AHCA		
	6	Commscope JAHH-65B-R3B		
1	Platform with Handrails			
103.8'	3	Ericsson RRUS 32 B2	(1) 1 1/4" Hybriflex Cable (1) 1 1/4" Hybriflex Cable (12) 1 5/8" Coax (1) 1 5/8" Hybriflex	VERIZON WIRELESS
103.6'	1	Raycap DC6-48-60-18-8F ("Squid")		
102.2'	3	Ericsson RRUS-11 (50 lbs.)		
102.0'	3	Ericsson Air 6449 B77D		
100.1'	3	CCI HPA-65R-BUU-H6		
100.0'	1	Low Profile Platform		
	1	Raycap DC6-48-60-18-8F ("Squid")		
	2	Raycap DC9-48-60-24-8C-EV		
	3	CCI DMP65R-BU8D		
	3	CCI TPA-65R-BU6DA-K		
	3	Ericsson RRUS 32 B2		
	3	Ericsson RRUS 4426 B66		
	3	Ericsson RRUS 4449 B5, B12		
	3	Ericsson RRUS 4478 B14		
99.7'	6	Powerwave Allgon 7770.00		
98.6'	12	Powerwave Allgon LGP21401		
98.0'	3	Ericsson AIR 6419 B77G		
77.0'	1	Platform with Handrails		
	1	Raycap RDIDC-9181-PF-48		
	3	Fujitsu TA08025-B604		
	3	Fujitsu TA08025-B605		
	3	JMA Wireless MX08FRO665-21		



Elev.*	Qty	Equipment	Lines	Carrier
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*(If table breaks across pages, please see previous page for data in merged cells)*

**\*Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.**

**Proposed Carrier Final Loading**

Elev.*	Qty	Equipment	Lines	Carrier
132.0'	3	Commscope VV-65A-R1	(4) 1.99" (50.7mm) Hybrid	T-MOBILE
	3	Ericsson 4460 BAND 2/25		
	3	Ericsson 4480 BAND 71		
	1	Site Pro 1 RMQP-496-HK		
	3	Ericsson AIR 6419 B41		
	3	RFS APXVAALL24 43-U-NA20		

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

**\*Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.**

Install proposed lines inside the pole shaft.

**Structure Usages**

Structural Component	Usage	Pass/Fail
Anchor Rods	65%	Pass
Base Plate	25%	Pass
Shaft	69%	Pass

**Foundation Reactions & Usages**

Reaction Component	Analysis Reactions	Usage
Moment (k-ft)	2925.9	52%
Axial (k)	59.8	17%
Shear (k)	28.1	17%

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

**Antenna Deflection, Twist, and Sway**

Elev.	Antenna	Carrier	Deflection	Twist	Sway [Rotation]
140.0'	RFS SC3-W100AB	TOWN OF WESTPORT	1.590'	N/A	1.200°
132.0'	Commscope VV-65A-R1	T-MOBILE	1.423'	N/A	1.190°
	RFS APXVAALL24 43-U-NA20				
	Ericsson 4460 BAND 2/25				
	Ericsson 4480 BAND 71				
	Ericsson AIR 6419 B41				

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

## **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.

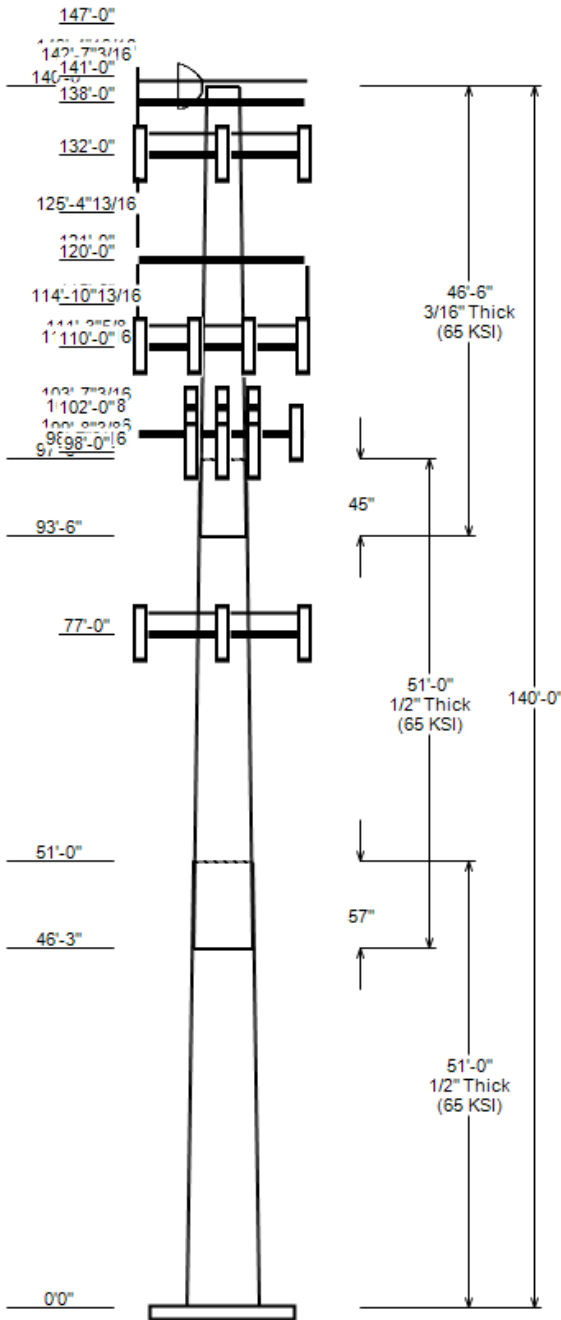
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

**ANALYSIS PARAMETERS**

Nominal Wind: 118 mph	Ice Wind: 50 mph w/ 1" ice	Service Wind: 60 mph
Risk Category: II	Exposure: B	S <sub>z</sub> : 0.227 S <sub>r</sub> : 0.056
Topo Category: 1	Topo Factor: Method 1	Topo Feature:
Structure Height: 140 ft	Base Elevation: 0.00 ft	Structure Type: Taper
Base Diameter: 47.13 in	Base Rotation: 0°	Taper: 0.2000 (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	51.000	36.93	47.13	0.500		0.000	18 Sides	65
2	51.000	28.68	38.88	0.500	Slip Joint	57.000	18 Sides	65
3	46.500	20.50	29.80	0.188	Slip Joint	45.000	18 Sides	65



**DISCRETE APPURTENANCE**

Elev (ft)	Description
147.0	(3) dbSpectra DS7C09P36U-D
143.4	(1) Generic 12' Omni
143.4	(1) Generic 12' Omni
142.8	(2) Generic 8' Omni
142.6	(1) Generic 6' FM antenna
141.0	(1) Generic 12' Dipole
140.0	(1) TX RX Systems 432F-83W-01-C-11
140.0	(1) RFS SC3-W100AB
138.0	(1) Generic 6' Omni
138.0	(1) Generic Flat Platform with Han
132.0	(3) Ericsson 4460 BAND 2/25
132.0	(3) Ericsson 4480 BAND 71
132.0	(3) Commscope VV-65A-R1
132.0	(3) Ericsson AIR 6419 B41
132.0	(3) RFS APXVAALL24 43-U-NA20
132.0	(1) Site Pro 1 RMQP-496-HK
125.4	(1) Generic 9' Omni
121.0	(1) Andrew DB586
120.0	(1) Generic Round Low Profile Plat
115.5	(2) Diamond X50A
114.9	(1) RFS DB-C1-12C-24AB-0Z
111.3	(3) Alcatel-Lucent B13 RRH4x30-4R
110.1	(3) Alcatel-Lucent B25 RRH4x30
110.0	(3) Commscope CBC78T-DS-43-2X
110.0	(3) Nokia AirScale RRH 4T4R B5 160
110.0	(3) Alcatel-Lucent RRH 2X60-1900
110.0	(3) Alcatel-Lucent B66a RRH4x45 (A
110.0	(3) Amphenol Antel BXA-171063/8CF
110.0	(2) RFS DB-T1-6Z-8AB-0Z
110.0	(3) Antel BXA-70080/6CF
110.0	(6) Commscope JAHH-65B-R3B
110.0	(1) Generic Round Platform with Ha
103.8	(3) Ericsson RRUS 32 B2
103.6	(1) Raycap DC6-48-60-18-8F ("Squid
102.2	(3) Ericsson RRUS-11 (50 lbs.)
102.0	(3) Ericsson Air 6449 B77D
100.1	(3) CCI HPA-65R-BUU-H6
100.0	(1) Raycap DC6-48-60-18-8F ("Squid
100.0	(3) Ericsson RRUS 4426 B66
100.0	(3) Ericsson RRUS 4449 B5, B12
100.0	(3) Ericsson RRUS 4478 B14
100.0	(3) Ericsson RRUS 32 B2
100.0	(2) Raycap DC9-48-60-24-8C-EV
100.0	(3) CCI TPA-65R-BU6DA-K
100.0	(3) CCI DMP65R-BU8D
100.0	(1) Generic Flat Low Profile Platf
99.7	(6) Powerwave Allgon 7770.00
98.6	(12) Powerwave Allgon LGP21401
98.0	(3) Ericsson AIR 6419 B77G
77.0	(1) Raycap RDIDC-9181-PF-48
77.0	(3) Fujitsu TA08025-B604
77.0	(3) Fujitsu TA08025-B605
77.0	(3) JMA Wireless MX08FRO665-21
77.0	(1) Generic Flat Platform with Han

**LINEAR APPURTENANCE**

Elev To (ft)	Description
147.0	(3) 1 5/8" Coax
142.6	(4) 7/8" Coax
142.6	(2) 3/8" Coax
142.6	(3) 1 5/8" Coax
140.0	(1) EW90
140.0	(1) 1/2" Coax
132.0	(4) 1.99" (50.7mm) Hybrid
121.0	(1) 1/2" Coax
121.0	(2) 1 1/4" Coax
115.6	(2) 1/2" Coax
110.0	(1) 1 5/8" Hybriflex
110.0	(6) 1 5/8" Coax
110.0	(6) 1 5/8" Coax
110.0	(1) 1 1/4" Hybriflex Cable
103.6	(1) 2" conduit
103.6	(2) 0.78" (19.7mm) 8 AWG 6
103.6	(1) 0.39" (10mm) Fiber Trunk
100.0	(1) 3/8" (0.38"- 9.5mm) RET Control Cabl
100.0	(1) 3/8" (0.38"- 9.5mm) RET Control Cabl
100.0	(3) 2" conduit
100.0	(12) 1 5/8" Coax
100.0	(6) 1 5/8" Coax
100.0	(4) 0.92" (23.4mm) Cable
100.0	(2) 0.78" (19.7mm) 8 AWG 6
100.0	(3) 0.40" (10.3mm) Fiber
77.0	(1) 1.75" (44.5mm) Hybrid

**GLOBAL BASE REACTIONS**

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	2925.94	59.79	28.10
0.9D + 1.0W	2883.40	44.83	28.07
1.2D + 1.0Di + 1.0Wi	772.12	77.42	7.39
1.2D + 1.0Ev + 1.0Eh	170.14	60.28	1.50
0.9D - 1.0Ev + 1.0Eh	166.93	41.12	1.50
1.0D + 1.0W	670.86	49.87	6.49

**DISH SERVICEABILITY**

Load Case	Elevation (ft)	Deflection (in)	Rotation (°)
1.0D + 1.0W	140.00	19.078	1.201

**LOAD CASE KEY**

<b>1.2D + 1.0W</b>	118 mph Wind with No Ice
<b>0.9D + 1.0W</b>	118 mph Wind with No Ice (Reduced)
<b>1.2D + 1.0Di + 1.0Wi</b>	50 mph Wind with 1" Radial Ice
<b>1.2D + 1.0Ev + 1.0Eh</b>	Seismic



ASSET: 310968, WSPT-WESTPORT REBUILD CT  
CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
PROJECT: 13764586

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**0.9D - 1.0Ev + 1.0Eh**  
**1.0D + 1.0W**

Seismic (Reduced DL)  
60 mph Wind with No Ice

ANALYSIS PARAMETERS

<b>Location:</b>	Fairfield County,CT	<b>Height:</b>	140 ft
<b>Type and Shape:</b>	Taper, 18 Sides	<b>Base Diameter:</b>	47.13 in
<b>Manufacturer:</b>	PennSummit	<b>Top Diameter:</b>	20.50 in
<b>K<sub>d</sub> (non-service):</b>	0.95	<b>Taper:</b>	0.2000 in/ft
<b>K<sub>e</sub>:</b>	0.99	<b>Rotation:</b>	0.000°

ICE & WIND PARAMETERS

<b>Risk Category:</b>	II	<b>Design Wind Speed:</b>	118 mph
<b>Exposure Category:</b>	B	<b>Design Wind Speed w/ Ice:</b>	50 mph
<b>Topo Factor Procedure:</b>	Method 1	<b>Design Ice Thickness:</b>	1.00 in
<b>Topographic Category:</b>	1	<b>Service Wind Speed:</b>	60 mph
<b>Crest Height:</b>	0 ft	<b>HMSL:</b>	250.00 ft

SEISMIC PARAMETERS

<b>Analysis Method:</b>	Equivalent Lateral Force Method		
<b>Site Class:</b>	D - Stiff Soil	<b>Period Based on Rayleigh Method (sec):</b>	2.46
<b>T<sub>L</sub> (sec):</b>	6	<b>P:</b>	1
<b>S<sub>s</sub>:</b>	0.227	<b>S<sub>1</sub>:</b>	0.056
<b>F<sub>a</sub>:</b>	1.600	<b>F<sub>v</sub>:</b>	2.400
<b>S<sub>ds</sub>:</b>	0.242	<b>S<sub>d1</sub>:</b>	0.090
		<b>C<sub>s</sub>:</b>	0.030
		<b>C<sub>s</sub> Max:</b>	0.030
		<b>C<sub>s</sub> Min:</b>	0.030

LOAD CASES

1.2D + 1.0W	118 mph Wind with No Ice
0.9D + 1.0W	118 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph Wind with 1" 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

SHAFT SECTION PROPERTIES

Section	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom						Top							
							Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)	
1-18	51.00	0.5000	65		0.00	11,437	47.13	0.000	74.00	20,328.7	14.86	94.26	36.93	51.00	57.81	9,692.3	11.26	73.86	0.2000	
2-18	51.00	0.5000	65	Slip	57.00	9,165	38.88	46.250	60.90	11,333.7	11.95	77.76	28.68	97.25	44.71	4,485.1	8.35	57.35	0.2000	
3-18	46.50	0.1875	65	Slip	45.00	2,351	29.80	93.500	17.62	1,952.7	26.26	158.94	20.50	140.00	12.09	630.1	17.52	109.33	0.2000	
<b>Total Shaft Weight</b>						<b>22,953</b>														

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Vert Ecc (ft)	No Ice			Ice			
				Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor	
147.00	dbSpectra DS7C09P36U-D	3	0.75	0.000	70.00	3.550	1.00	130.81	6.896	1.00
143.40	Generic 12' Omni	1	0.75	0.000	40.00	3.600	1.00	100.19	6.448	1.00
143.40	Generic 12' Omni	1	0.75	0.000	40.00	3.600	1.00	100.19	6.448	1.00
142.80	Generic 8' Omni	2	0.75	0.000	25.00	2.400	1.00	65.44	4.221	1.00
142.60	Generic 6' FM antenna	1	0.75	0.000	30.00	13.450	1.00	481.31	16.500	1.00
141.00	Generic 12' Dipole	1	0.75	0.000	40.00	4.510	1.00	128.40	9.255	1.00
140.00	TX RX Systems 432F-83W-01-C-11	1	0.75	0.000	18.00	1.500	1.00	49.28	2.039	1.00
140.00	RFS SC3-W100AB	1	0.75	0.000	40.00	10.737	1.00	223.95	12.007	1.00
138.00	Generic 6' Omni	1	1.00	0.000	25.00	1.760	1.00	55.51	2.592	1.00
138.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3675.61	56.279	1.00
132.00	Site Pro 1 RMQP-496-HK	1	1.00	0.000	1799.00	35.860	1.00	2707.57	51.830	1.00
132.00	Commscope VV-65A-R1	3	0.75	0.000	23.80	5.928	0.63	101.19	7.324	0.63
132.00	Ericsson AIR 6419 B41	3	0.75	0.000	83.30	6.322	0.63	183.04	7.437	0.63
132.00	RFS APXVAALL24 43-U-NA20	3	0.75	0.000	122.80	20.243	0.63	379.50	22.687	0.63
132.00	Ericsson 4480 BAND 71	3	0.75	0.000	81.00	2.878	0.67	131.17	3.618	0.67
132.00	Ericsson 4460 BAND 2/25	3	0.75	0.000	109.00	2.564	0.67	167.25	3.259	0.67
125.40	Generic 9' Omni	1	0.80	0.000	25.00	2.700	1.00	69.91	4.832	1.00
121.00	Andrew DB586	1	1.00	2.000	8.30	0.740	1.00	12.08	1.077	1.00
120.00	Generic Round Low Profile Plat	1	1.00	0.000	1875.00	21.700	1.00	2403.08	34.219	1.00
115.50	Diamond X50A	2	1.00	0.000	2.30	1.120	1.00	3.24	2.284	1.00
114.90	RFS DB-C1-12C-24AB-0Z	1	0.75	0.000	32.00	4.056	1.00	114.54	4.942	1.00
111.30	Alcatel-Lucent B13 RRH4x30-4R	3	0.75	0.000	57.80	2.140	0.67	102.50	2.787	0.67
110.10	Alcatel-Lucent B25 RRH4x30	3	0.75	0.000	53.00	2.120	0.67	92.10	2.763	0.67
110.00	Antel BXA-70080/6CF__	3	0.75	0.000	18.00	5.836	0.72	99.20	7.373	0.72
110.00	RFS DB-T1-6Z-8AB-0Z	2	0.75	0.000	44.00	4.800	0.50	125.32	5.718	0.50
110.00	Amphenol Antel BXA-171063/8CF	3	0.75	0.000	10.50	2.900	0.67	53.99	3.963	0.67
110.00	Alcatel-Lucent RRH 2X60-1900	3	0.75	0.000	39.60	1.876	0.50	75.07	2.481	0.50
110.00	Nokia AirScale RRH 4T4R B5 160	3	0.75	0.000	35.30	1.286	0.50	60.71	1.772	0.50
110.00	Commscope CBC78T-DS-43-2X	3	0.75	0.000	20.70	0.552	0.50	34.98	0.880	0.50
110.00	Commscope JAHH-65B-R3B	6	0.75	0.000	60.60	9.113	0.69	191.32	10.906	0.69
110.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3546.58	42.995	1.00
110.00	Alcatel-Lucent B66a RRH4x45 (A	3	0.75	0.000	67.00	2.660	0.50	112.81	3.402	0.50
103.80	Ericsson RRUS 32 B2	3	0.80	0.000	53.00	2.743	0.50	100.35	3.496	0.50
103.60	Raycap DC6-48-60-18-8F ("Squid	1	0.80	0.000	31.80	1.470	1.00	71.49	1.919	1.00
102.20	Ericsson RRUS-11 (50 lbs.)	3	0.80	0.000	50.00	2.566	0.50	93.82	3.239	0.50
102.00	Ericsson Air 6449 B77D	3	0.80	0.000	81.60	4.028	0.65	147.64	4.911	0.65
100.10	CCI HPA-65R-BUU-H6	3	0.80	0.000	51.00	9.658	0.69	191.75	11.436	0.69
100.00	CCI TPA-65R-BU6DA-K	3	0.80	0.000	79.60	15.270	0.60	271.63	17.105	0.60
100.00	Raycap DC9-48-60-24-8C-EV	2	0.80	0.000	16.00	4.788	0.50	98.80	5.731	0.50
100.00	Ericsson RRUS 32 B2	3	0.80	0.000	53.00	2.743	0.50	100.17	3.493	0.50
100.00	Ericsson RRUS 4449 B5, B12	3	0.80	0.000	71.00	1.969	0.50	112.34	2.567	0.50
100.00	Ericsson RRUS 4426 B66	3	0.80	0.000	48.40	1.650	0.50	77.03	2.195	0.50
100.00	Raycap DC6-48-60-18-8F ("Squid	1	0.80	0.000	31.80	1.470	1.00	71.37	1.918	1.00
100.00	CCI DMP65R-BU8D	3	0.80	0.000	95.70	17.871	0.63	313.70	20.235	0.63
100.00	Generic Flat Low Profile Platf	1	1.00	0.000	1875.00	26.100	1.00	2394.44	38.345	1.00
100.00	Ericsson RRUS 4478 B14	3	0.80	0.000	59.40	2.021	0.50	98.76	2.626	0.50
99.70	Powerwave Allgon 7770.00	6	0.80	0.000	35.00	5.508	0.65	107.86	6.871	0.65
98.60	Powerwave Allgon LGP21401	12	0.80	0.000	14.10	1.104	0.50	30.08	1.561	0.50
98.00	Ericsson AIR 6419 B77G	3	0.80	0.000	66.10	3.797	0.65	128.19	4.640	0.65
77.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	114.10	2.536	0.50

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
77.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	100.30	2.536	0.50
77.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	57.42	2.429	1.00
77.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	224.92	14.243	0.64
77.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3608.74	55.489	1.00
<b>Totals</b>		<b>Row Count: 54</b>	<b>135</b>		<b>19,462.20</b>			<b>34,010.36</b>		

LINEAR APPURTENANCE PROPERTIES

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	147.00	3	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	TOWN OF WESTPORT
0.00	142.60	4	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	TOWN OF WESTPORT
0.00	142.60	3	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	TOWN OF WESTPORT
0.00	142.60	2	3/8" Coax	0.44	0.08	N	0	0	0	0	0	N	TOWN OF WESTPORT
0.00	140.00	1	EW90	1.32	0.32	N	0	0	0	0	0	N	TOWN OF WESTPORT
0.00	140.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	TOWN OF WESTPORT
0.00	132.00	4	1.99" (50.7mm) Hybrid	1.99	1.9	N	0	0	0	0	0	N	T-MOBILE
0.00	121.00	2	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	EVERSOURCE ENERGY
0.00	121.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	EVERSOURCE ENERGY
0.00	115.60	2	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	SENET, INC.
0.00	114.70	1	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	110.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	110.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	110.00	1	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	110.00	1	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	103.60	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	103.60	1	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	103.60	1	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	12	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	4	0.92" (23.4mm) Cable	0.92	0.89	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	3	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	3	0.40" (10.3mm) Fiber	0.4	0.09	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	1	3/8" (0.38"- 9.5mm) R	0.38	0.23	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	100.00	1	3/8" (0.38"- 9.5mm) R	0.38	0.23	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	77.00	1	1.75" (44.5mm) Hybrid	1.75	2.72	N	0	0	0	0	0	N	DISH WIRELESS L.L.C.

SEGMENT PROPERTIES

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	F'y (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)
0.00		0.5000	47.130	73.999	20,328.70	14.86	94.26	82.6	849.6	0.0	0.0
5.00		0.5000	46.130	72.412	19,048.50	14.50	92.26	82.6	813.3	0.0	1,245.5
10.00		0.5000	45.130	70.825	17,823.20	14.15	90.26	82.6	777.9	0.0	1,218.5
15.00		0.5000	44.129	69.237	16,651.50	13.80	88.26	82.6	743.2	0.0	1,191.5
20.00		0.5000	43.129	67.650	15,532.40	13.45	86.26	82.6	709.3	0.0	1,164.5
25.00		0.5000	42.129	66.063	14,464.60	13.09	84.26	82.6	676.2	0.0	1,137.5
30.00		0.5000	41.129	64.476	13,446.80	12.74	82.26	82.6	644.0	0.0	1,110.5
35.00		0.5000	40.129	62.889	12,478.00	12.39	80.26	82.6	612.5	0.0	1,083.5
40.00		0.5000	39.129	61.301	11,556.90	12.04	78.26	82.6	581.7	0.0	1,056.5
45.00		0.5000	38.128	59.714	10,682.20	11.68	76.26	82.6	551.8	0.0	1,029.5
46.25	Bot - Section 2	0.5000	37.878	59.317	10,470.70	11.59	75.76	82.6	544.5	0.0	253.1
50.00		0.5000	37.128	58.127	9,852.80	11.33	74.26	82.6	522.7	0.0	1,518.9
51.00	Top - Section 1	0.5000	37.928	59.396	10,512.60	11.61	75.86	82.6	545.9	0.0	399.9
55.00		0.5000	37.128	58.127	9,852.70	11.33	74.26	82.6	522.7	0.0	799.8
60.00		0.5000	36.128	56.539	9,067.40	10.98	72.26	82.6	494.3	0.0	975.5
65.00		0.5000	35.128	54.952	8,325.00	10.62	70.26	82.6	466.8	0.0	948.5
70.00		0.5000	34.127	53.365	7,624.30	10.27	68.25	82.6	440.0	0.0	921.4

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	Fy (ksi)	S (in³)	Z (in³)	Weight (lb)
75.00			0.5000	33.127	51.778	6,964.00	9.92	66.25	82.6	414.1	0.0	894.4
77.00			0.5000	32.727	51.143	6,711.00	9.78	65.45	82.6	403.9	0.0	350.2
80.00			0.5000	32.127	50.190	6,343.00	9.57	64.25	82.6	388.9	0.0	517.2
85.00			0.5000	31.127	48.603	5,760.00	9.21	62.25	82.6	364.5	0.0	840.4
90.00			0.5000	30.127	47.016	5,214.00	8.86	60.25	82.6	340.9	0.0	813.4
93.50	Bot - Section 3		0.5000	29.427	45.905	4,853.00	8.61	58.85	82.6	324.8	0.0	553.3
95.00			0.5000	29.127	45.429	4,703.50	8.51	58.25	82.6	318.1	0.0	322.6
97.25	Top - Section 2		0.1875	29.052	17.177	1,808.10	25.56	154.94	71.3	122.6	0.0	477.6
98.00			0.1875	28.901	17.088	1,780.00	25.42	154.14	71.5	121.3	0.0	43.7
98.60			0.1875	28.781	17.016	1,757.80	25.30	153.50	71.6	120.3	0.0	34.8
99.70			0.1875	28.561	16.885	1,717.50	25.10	152.33	71.9	118.4	0.0	63.4
100.00			0.1875	28.501	16.850	1,706.70	25.04	152.01	71.9	117.9	0.0	17.2
100.10			0.1875	28.481	16.838	1,703.00	25.02	151.90	72	117.8	0.0	5.7
102.00			0.1875	28.101	16.612	1,635.30	24.66	149.87	72.4	114.6	0.0	108.1
102.20			0.1875	28.061	16.588	1,628.30	24.63	149.66	72.4	114.3	0.0	11.3
103.60			0.1875	27.781	16.421	1,579.70	24.36	148.17	72.7	112.0	0.0	78.6
103.80			0.1875	27.741	16.397	1,572.90	24.32	147.95	72.8	111.7	0.0	11.2
105.00			0.1875	27.501	16.255	1,532.10	24.10	146.67	73.1	109.7	0.0	66.7
110.00			0.1875	26.501	15.659	1,369.90	23.16	141.34	74.2	101.8	0.0	271.5
110.10			0.1875	26.481	15.647	1,366.80	23.14	141.23	74.2	101.7	0.0	5.3
111.30			0.1875	26.241	15.505	1,329.70	22.91	139.95	74.4	99.8	0.0	63.6
114.90			0.1875	25.521	15.076	1,222.40	22.24	136.11	75.2	94.3	0.0	187.3
115.00			0.1875	25.501	15.064	1,219.50	22.22	136.00	75.3	94.2	0.0	5.1
115.50			0.1875	25.401	15.005	1,205.10	22.12	135.47	75.4	93.4	0.0	25.6
120.00			0.1875	24.501	14.469	1,080.60	21.28	130.67	76.4	86.9	0.0	225.7
121.00			0.1875	24.301	14.350	1,054.20	21.09	129.60	76.6	85.4	0.0	49.0
125.00			0.1875	23.501	13.874	952.70	20.34	125.34	77.5	79.8	0.0	192.1
125.40			0.1875	23.421	13.826	942.90	20.26	124.91	77.6	79.3	0.0	18.9
130.00			0.1875	22.500	13.278	835.20	19.40	120.00	78.6	73.1	0.0	212.1
132.00			0.1875	22.100	13.040	791.10	19.02	117.87	79	70.5	0.0	89.6
135.00			0.1875	21.500	12.683	727.90	18.46	114.67	79.7	66.7	0.0	131.3
138.00			0.1875	20.900	12.326	668.10	17.89	111.47	80.4	63.0	0.0	127.7
140.00			0.1875	20.500	12.088	630.10	17.52	109.33	80.8	60.5	0.0	83.1
<b>Total:</b>												<b>22,952.3</b>

CALCULATED FORCES

Load Case: 1.2D + 1.0W 118 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	-59.79	-28.10	-0.09	-2,925.9	0.00	2,925.94	5,497.77	1,298.68	5,470.20	5,259.85	0	0	0.568
5.00	-57.79	-27.93	-0.09	-2,785.4	0.00	2,785.45	5,379.84	1,270.83	5,238.09	5,035.45	0.11	-0.2	0.564
10.00	-55.82	-27.76	-0.09	-2,645.8	0.00	2,645.80	5,261.92	1,242.97	5,011.02	4,815.96	0.42	-0.4	0.560
15.00	-53.89	-27.59	-0.09	-2,507.0	0.00	2,507.01	5,144.00	1,215.12	4,788.97	4,601.35	0.96	-0.61	0.556
20.00	-51.99	-27.41	-0.09	-2,369.1	0.00	2,369.09	5,026.07	1,187.26	4,571.96	4,391.63	1.71	-0.82	0.550
25.00	-50.12	-27.23	-0.09	-2,232.0	0.00	2,232.04	4,908.15	1,159.41	4,359.97	4,186.81	2.67	-1.03	0.544
30.00	-48.29	-27.04	-0.09	-2,095.9	0.00	2,095.90	4,790.23	1,131.55	4,153.02	3,986.88	3.86	-1.24	0.536
35.00	-46.48	-26.84	-0.09	-1,960.7	0.00	1,960.68	4,672.31	1,103.69	3,951.10	3,791.84	5.28	-1.45	0.528
40.00	-44.72	-26.63	-0.09	-1,826.5	0.00	1,826.47	4,554.38	1,075.84	3,754.22	3,601.69	6.92	-1.67	0.518
45.00	-43.02	-26.47	-0.09	-1,693.3	0.00	1,693.33	4,436.46	1,047.98	3,562.36	3,416.43	8.78	-1.89	0.506
46.25	-42.57	-26.36	-0.09	-1,660.2	0.00	1,660.25	4,406.98	1,041.02	3,515.18	3,370.88	9.28	-1.94	0.503
50.00	-40.40	-26.19	-0.09	-1,561.4	0.00	1,561.40	4,318.54	1,020.13	3,375.54	3,236.07	10.88	-2.11	0.493
51.00	-39.79	-26.07	-0.09	-1,535.2	0.00	1,535.22	4,412.85	1,042.41	3,524.56	3,379.93	11.32	-2.15	0.464
55.00	-38.44	-25.83	-0.09	-1,430.9	0.00	1,430.94	4,318.52	1,020.12	3,375.50	3,236.03	13.2	-2.33	0.452
60.00	-36.79	-25.54	-0.09	-1,301.8	0.00	1,301.81	4,200.59	992.27	3,193.71	3,060.56	15.74	-2.52	0.435
65.00	-35.17	-25.23	-0.09	-1,174.1	0.00	1,174.13	4,082.67	964.41	3,016.95	2,889.98	18.49	-2.72	0.416
70.00	-33.60	-24.92	-0.09	-1,048.0	0.00	1,047.97	3,964.75	936.55	2,845.22	2,724.29	21.44	-2.91	0.394
75.00	-32.07	-24.67	-0.09	-923.4	0.00	923.37	3,846.82	908.70	2,678.53	2,563.49	24.58	-3.09	0.369
77.00	-27.84	-22.07	-0.09	-874.0	0.00	874.02	3,799.65	897.56	2,613.26	2,500.54	25.89	-3.16	0.357

CALCULATED FORCES

80.00	-26.94	-21.82	-0.09	-807.8	0.00	807.80	3,728.90	880.84	2,516.86	2,407.59	27.91	-3.27	0.343
85.00	-25.50	-21.48	-0.09	-698.7	0.00	698.71	3,610.98	852.99	2,360.23	2,256.57	31.43	-3.44	0.317
90.00	-24.11	-21.17	-0.09	-591.3	0.00	591.33	3,493.05	825.13	2,208.63	2,110.45	35.12	-3.6	0.288
93.50	-23.15	-20.97	-0.09	-517.2	0.00	517.24	3,410.51	805.63	2,105.50	2,011.07	37.79	-3.71	0.265
95.00	-22.64	-20.84	-0.09	-485.8	0.00	485.78	3,375.13	797.28	2,062.06	1,969.22	38.96	-3.75	0.254
97.25	-21.88	-20.71	-0.09	-438.9	0.00	438.89	1,102.89	301.46	785.89	655.89	40.75	-3.81	0.694
98.00	-21.54	-20.44	-0.09	-423.4	0.00	423.36	1,099.71	299.89	777.74	650.58	41.35	-3.83	0.675
98.60	-21.24	-20.19	-0.09	-411.1	0.00	411.10	1,097.14	298.64	771.26	646.33	41.83	-3.87	0.660
99.70	-20.86	-19.51	-0.09	-388.9	0.00	388.88	1,092.40	296.34	759.43	638.55	42.73	-3.94	0.632
100.00	-17.26	-15.96	-0.09	-383.0	0.00	383.03	1,091.10	295.71	756.22	636.43	42.98	-3.96	0.621
100.10	-17.09	-15.32	-0.09	-381.4	-0.01	381.44	1,090.66	295.50	755.16	635.72	43.06	-3.97	0.618
102.00	-16.60	-15.00	-0.09	-352.3	-0.01	352.34	1,082.30	291.53	735.01	622.32	44.67	-4.09	0.584
102.20	-16.39	-14.84	-0.09	-349.3	-0.01	349.34	1,081.40	291.12	732.90	620.91	44.84	-4.1	0.580
103.60	-16.20	-14.74	-0.09	-328.6	-0.01	328.56	1,075.12	288.19	718.25	611.05	46.05	-4.18	0.555
103.80	-15.99	-14.57	-0.09	-325.6	-0.01	325.61	1,074.21	287.77	716.17	609.65	46.23	-4.19	0.552
105.00	-15.84	-14.42	-0.09	-308.1	-0.01	308.13	1,068.74	285.27	703.75	601.22	47.29	-4.26	0.530
110.00	-11.34	-10.93	-0.09	-236.0	-0.01	236.03	1,045.19	274.82	653.15	566.30	51.89	-4.51	0.429
110.10	-11.15	-10.76	-0.09	-234.9	-0.01	234.94	1,044.71	274.61	652.16	565.60	51.98	-4.52	0.428
111.30	-10.84	-10.49	-0.09	-222.0	-0.01	222.03	1,038.88	272.10	640.31	557.28	53.13	-4.58	0.410
114.90	-10.51	-10.25	-0.09	-184.3	-0.01	184.26	1,020.97	264.58	605.41	532.42	56.64	-4.73	0.358
115.00	-10.50	-10.23	-0.09	-183.2	-0.01	183.24	1,020.46	264.37	604.45	531.74	56.74	-4.74	0.356
115.50	-10.46	-10.02	-0.09	-178.1	-0.01	178.12	1,017.93	263.33	599.68	528.30	57.23	-4.76	0.349
120.00	-7.93	-8.82	-0.09	-133.0	-0.01	133.04	994.55	253.93	557.63	497.61	61.8	-4.92	0.277
121.00	-7.85	-8.65	0.00	-124.2	0.00	124.17	989.22	251.84	548.50	490.84	62.83	-4.96	0.262
125.00	-7.55	-8.51	0.00	-89.6	0.00	89.57	967.45	243.48	512.70	463.98	67.03	-5.07	0.202
125.40	-7.50	-8.29	0.00	-86.2	0.00	86.17	965.23	242.65	509.19	461.32	67.46	-5.08	0.196
130.00	-7.18	-8.08	0.00	-48.0	0.00	48.05	939.16	233.04	469.66	430.94	72.4	-5.18	0.120
132.00	-3.71	-4.06	0.00	-31.9	0.00	31.88	927.52	228.86	452.97	417.90	74.57	-5.2	0.081
135.00	-3.55	-3.89	0.00	-19.7	0.00	19.70	909.69	222.59	428.50	398.55	77.85	-5.23	0.054
138.00	-0.52	-1.71	0.00	-8.0	0.00	8.04	891.44	216.32	404.72	379.46	81.14	-5.25	0.022
140.00	0.00	-1.65	0.00	-4.6	0.00	4.62	879.04	212.15	389.23	366.89	83.33	-5.25	0.013

CALCULATED FORCES

Load Case: 0.9D + 1.0W

118 mph Wind with No Ice (Reduced DL)

25 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	-44.83	-28.07	-0.09	-2,883.4	0.00	2,883.40	5,497.77	1,298.68	5,470.20	5,259.85	0	0	0.557
5.00	-43.31	-27.85	-0.09	-2,743.0	0.00	2,743.05	5,379.84	1,270.83	5,238.09	5,035.45	0.11	-0.2	0.553
10.00	-41.81	-27.63	-0.09	-2,603.8	0.00	2,603.81	5,261.92	1,242.97	5,011.02	4,815.96	0.42	-0.4	0.549
15.00	-40.34	-27.41	-0.09	-2,465.7	0.00	2,465.67	5,144.00	1,215.12	4,788.97	4,601.35	0.94	-0.6	0.544
20.00	-38.89	-27.19	-0.09	-2,328.6	0.00	2,328.64	5,026.07	1,187.26	4,571.96	4,391.63	1.68	-0.8	0.539
25.00	-37.47	-26.97	-0.09	-2,192.7	0.00	2,192.71	4,908.15	1,159.41	4,359.97	4,186.81	2.63	-1.01	0.532
30.00	-36.07	-26.74	-0.09	-2,057.9	0.00	2,057.88	4,790.23	1,131.55	4,153.02	3,986.88	3.8	-1.22	0.524
35.00	-34.70	-26.50	-0.09	-1,924.2	0.00	1,924.18	4,672.31	1,103.69	3,951.10	3,791.84	5.19	-1.43	0.515
40.00	-33.36	-26.26	-0.09	-1,791.7	0.00	1,791.66	4,554.38	1,075.84	3,754.22	3,601.69	6.8	-1.64	0.505
45.00	-32.07	-26.08	-0.09	-1,660.4	0.00	1,660.39	4,436.46	1,047.98	3,562.36	3,416.43	8.64	-1.85	0.494
46.25	-31.72	-25.95	-0.09	-1,627.8	0.00	1,627.79	4,406.98	1,041.02	3,515.18	3,370.88	9.13	-1.91	0.491
50.00	-30.09	-25.79	-0.09	-1,530.5	0.00	1,530.47	4,318.54	1,020.13	3,375.54	3,236.07	10.7	-2.07	0.481
51.00	-29.62	-25.65	-0.09	-1,504.7	0.00	1,504.68	4,412.85	1,042.41	3,524.56	3,379.93	11.13	-2.11	0.453
55.00	-28.59	-25.39	-0.09	-1,402.1	0.00	1,402.09	4,318.52	1,020.12	3,375.50	3,236.03	12.98	-2.28	0.441
60.00	-27.34	-25.08	-0.09	-1,275.2	0.00	1,275.16	4,200.59	992.27	3,193.71	3,060.56	15.47	-2.48	0.424
65.00	-26.11	-24.76	-0.09	-1,149.8	0.00	1,149.77	4,082.67	964.41	3,016.95	2,889.98	18.17	-2.67	0.405
70.00	-24.92	-24.44	-0.09	-1,026.0	0.00	1,025.96	3,964.75	936.55	2,845.22	2,724.29	21.07	-2.85	0.384
75.00	-23.77	-24.19	-0.09	-903.8	0.00	903.76	3,846.82	908.70	2,678.53	2,563.49	24.15	-3.03	0.359
77.00	-20.61	-21.64	-0.09	-855.4	0.00	855.38	3,799.65	897.56	2,613.26	2,500.54	25.44	-3.11	0.348
80.00	-19.94	-21.38	-0.09	-790.4	0.00	790.45	3,728.90	880.84	2,516.86	2,407.59	27.42	-3.21	0.334
85.00	-18.85	-21.04	-0.09	-683.5	0.00	683.53	3,610.98	852.99	2,360.23	2,256.57	30.87	-3.38	0.309
90.00	-17.79	-20.74	-0.09	-578.3	0.00	578.33	3,493.05	825.13	2,208.63	2,110.45	34.49	-3.53	0.280
93.50	-17.07	-20.55	-0.09	-505.7	0.00	505.74	3,410.51	805.63	2,105.50	2,011.07	37.12	-3.64	0.257
95.00	-16.69	-20.42	-0.09	-474.9	0.00	474.90	3,375.13	797.28	2,062.06	1,969.22	38.27	-3.68	0.247
97.25	-16.12	-20.30	-0.09	-429.0	0.00	428.95	1,102.89	301.46	785.89	655.89	40.01	-3.74	0.673
98.00	-15.86	-20.03	-0.09	-413.7	0.00	413.73	1,099.71	299.89	777.74	650.58	40.6	-3.76	0.655
98.60	-15.64	-19.79	-0.09	-401.7	0.00	401.71	1,097.14	298.64	771.26	646.33	41.08	-3.8	0.640
99.70	-15.36	-19.11	-0.09	-379.9	0.00	379.94	1,092.40	296.34	759.43	638.55	41.96	-3.87	0.613
100.00	-12.71	-15.62	-0.09	-374.2	0.00	374.21	1,091.10	295.71	756.22	636.43	42.21	-3.89	0.602
100.10	-12.59	-14.98	-0.09	-372.6	0.00	372.65	1,090.66	295.50	755.16	635.72	42.29	-3.89	0.600
102.00	-12.22	-14.67	-0.09	-344.2	0.00	344.19	1,082.30	291.53	735.01	622.32	43.86	-4.01	0.567
102.20	-12.07	-14.51	-0.09	-341.2	0.00	341.25	1,081.40	291.12	732.90	620.91	44.03	-4.02	0.563
103.60	-11.92	-14.41	-0.09	-320.9	0.00	320.94	1,075.12	288.19	718.25	611.05	45.22	-4.1	0.539
103.80	-11.77	-14.24	-0.09	-318.1	0.00	318.06	1,074.21	287.77	716.17	609.65	45.39	-4.11	0.535
105.00	-11.65	-14.08	-0.09	-301.0	-0.01	300.97	1,068.74	285.27	703.75	601.22	46.43	-4.18	0.514
110.00	-8.33	-10.68	-0.09	-230.6	-0.01	230.59	1,045.19	274.82	653.15	566.30	50.94	-4.43	0.417
110.10	-8.18	-10.51	-0.09	-229.5	-0.01	229.52	1,044.71	274.61	652.16	565.60	51.04	-4.43	0.415
111.30	-7.95	-10.24	-0.09	-216.9	-0.01	216.91	1,038.88	272.10	640.31	557.28	52.16	-4.49	0.398
114.90	-7.71	-10.00	-0.09	-180.0	-0.01	180.04	1,020.97	264.58	605.41	532.42	55.6	-4.64	0.347
115.00	-7.70	-9.99	-0.09	-179.0	-0.01	179.04	1,020.46	264.37	604.45	531.74	55.69	-4.64	0.346
115.50	-7.67	-9.77	-0.09	-174.0	-0.01	174.05	1,017.93	263.33	599.68	528.30	56.18	-4.66	0.338
120.00	-5.79	-8.62	-0.09	-130.1	-0.01	130.10	994.55	253.93	557.63	497.61	60.65	-4.83	0.268
121.00	-5.73	-8.45	0.00	-121.4	0.00	121.43	989.22	251.84	548.50	490.84	61.67	-4.86	0.254
125.00	-5.51	-8.31	0.00	-87.6	0.00	87.62	967.45	243.48	512.70	463.98	65.78	-4.97	0.196
125.40	-5.47	-8.09	0.00	-84.3	0.00	84.29	965.23	242.65	509.19	461.32	66.2	-4.98	0.190
130.00	-5.23	-7.89	0.00	-47.1	0.00	47.07	939.16	233.04	469.66	430.94	71.04	-5.07	0.116
132.00	-2.71	-3.96	0.00	-31.3	0.00	31.28	927.52	228.86	452.97	417.90	73.17	-5.1	0.078
135.00	-2.58	-3.79	0.00	-19.4	0.00	19.39	909.69	222.59	428.50	398.55	76.38	-5.13	0.052
138.00	-0.36	-1.69	0.00	-8.0	0.00	8.00	891.44	216.32	404.72	379.46	79.6	-5.14	0.022
140.00	0.00	-1.65	0.00	-4.6	0.00	4.62	879.04	212.15	389.23	366.89	81.76	-5.15	0.013

CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi													50 mph Wind with 1" Radial Ice		25 Iterations	
Gust Response Factor:		1.10		Ice Dead Load Factor				1.00		Ice Importance Factor				1.00		
Dead Load Factor:		1.20														
Wind Load Factor:		1.00														
Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio			
0.00	-77.42	-7.39	-0.02	-772.1	0.00	772.12	5,497.77	1,298.68	5,470.20	5,259.85	0	0	0.161			
5.00	-75.28	-7.35	-0.02	-735.2	0.00	735.17	5,379.84	1,270.83	5,238.09	5,035.45	0.03	-0.05	0.160			
10.00	-73.16	-7.30	-0.02	-698.4	0.00	698.43	5,261.92	1,242.97	5,011.02	4,815.96	0.11	-0.11	0.159			
15.00	-71.06	-7.26	-0.02	-661.9	0.00	661.92	5,144.00	1,215.12	4,788.97	4,601.35	0.25	-0.16	0.158			
20.00	-68.99	-7.21	-0.02	-625.6	0.00	625.64	5,026.07	1,187.26	4,571.96	4,391.63	0.45	-0.22	0.156			
25.00	-66.95	-7.16	-0.02	-589.6	0.00	589.59	4,908.15	1,159.41	4,359.97	4,186.81	0.71	-0.27	0.154			
30.00	-64.94	-7.11	-0.02	-553.8	0.00	553.77	4,790.23	1,131.55	4,153.02	3,986.88	1.02	-0.33	0.152			
35.00	-62.97	-7.06	-0.02	-518.2	0.00	518.20	4,672.31	1,103.69	3,951.10	3,791.84	1.39	-0.38	0.150			
40.00	-61.03	-7.00	-0.02	-482.9	0.00	482.89	4,554.38	1,075.84	3,754.22	3,601.69	1.83	-0.44	0.148			
45.00	-59.13	-6.96	-0.02	-447.9	0.00	447.87	4,436.46	1,047.98	3,562.36	3,416.43	2.32	-0.5	0.144			
46.25	-58.66	-6.93	-0.02	-439.2	0.00	439.18	4,406.98	1,041.02	3,515.18	3,370.88	2.45	-0.51	0.144			
50.00	-56.34	-6.88	-0.02	-413.2	0.00	413.19	4,318.54	1,020.13	3,375.54	3,236.07	2.87	-0.56	0.141			
51.00	-55.72	-6.85	-0.02	-406.3	0.00	406.31	4,412.85	1,042.41	3,524.56	3,379.93	2.99	-0.57	0.133			
55.00	-54.23	-6.78	-0.02	-378.9	0.00	378.91	4,318.52	1,020.12	3,375.50	3,236.03	3.49	-0.61	0.130			
60.00	-52.40	-6.70	-0.02	-345.0	0.00	344.99	4,200.59	992.27	3,193.71	3,060.56	4.16	-0.67	0.125			
65.00	-50.60	-6.61	-0.02	-311.5	0.00	311.49	4,082.67	964.41	3,016.95	2,889.98	4.88	-0.72	0.120			
70.00	-48.85	-6.53	-0.02	-278.4	0.00	278.42	3,964.75	936.55	2,845.22	2,724.29	5.66	-0.77	0.115			
75.00	-47.13	-6.45	-0.02	-245.8	0.00	245.80	3,846.82	908.70	2,678.53	2,563.49	6.5	-0.82	0.108			
77.00	-41.28	-5.82	-0.02	-232.9	0.00	232.89	3,799.65	897.56	2,613.26	2,500.54	6.84	-0.84	0.104			
80.00	-40.28	-5.75	-0.02	-215.4	0.00	215.42	3,728.90	880.84	2,516.86	2,407.59	7.38	-0.87	0.100			
85.00	-38.66	-5.65	-0.02	-186.7	0.00	186.67	3,610.98	852.99	2,360.23	2,256.57	8.31	-0.91	0.093			
90.00	-37.07	-5.56	-0.02	-158.4	0.00	158.42	3,493.05	825.13	2,208.63	2,110.45	9.29	-0.95	0.086			
93.50	-35.99	-5.50	-0.02	-139.0	0.00	138.97	3,410.51	805.63	2,105.50	2,011.07	10	-0.98	0.080			
95.00	-35.42	-5.46	-0.02	-130.7	0.00	130.72	3,375.13	797.28	2,062.06	1,969.22	10.31	-0.99	0.077			
97.25	-34.57	-5.42	-0.02	-118.4	0.00	118.43	1,102.89	301.46	785.89	655.89	10.78	-1.01	0.212			
98.00	-34.05	-5.36	-0.02	-114.4	0.00	114.37	1,099.71	299.89	777.74	650.58	10.94	-1.02	0.207			
98.60	-33.58	-5.29	-0.02	-111.2	0.00	111.16	1,097.14	298.64	771.26	646.33	11.07	-1.03	0.203			
99.70	-32.78	-5.13	-0.02	-105.3	0.00	105.34	1,092.40	296.34	759.43	638.55	11.31	-1.05	0.195			
100.00	-27.07	-4.28	-0.02	-103.8	0.00	103.80	1,091.10	295.71	756.22	636.43	11.37	-1.05	0.188			
100.10	-26.54	-4.14	-0.02	-103.4	0.00	103.37	1,090.66	295.50	755.16	635.72	11.39	-1.05	0.187			
102.00	-25.81	-4.06	-0.02	-95.5	0.00	95.51	1,082.30	291.53	735.01	622.32	11.82	-1.08	0.178			
102.20	-25.50	-4.02	-0.02	-94.7	0.00	94.70	1,081.40	291.12	732.90	620.91	11.86	-1.09	0.176			
103.60	-25.22	-3.99	-0.02	-89.1	0.00	89.08	1,075.12	288.19	718.25	611.05	12.19	-1.11	0.169			
103.80	-24.89	-3.95	-0.02	-88.3	0.00	88.28	1,074.21	287.77	716.17	609.65	12.23	-1.11	0.168			
105.00	-24.72	-3.90	-0.02	-83.5	0.00	83.54	1,068.74	285.27	703.75	601.22	12.52	-1.13	0.162			
110.00	-17.68	-2.99	-0.02	-64.0	0.00	64.04	1,045.19	274.82	653.15	566.30	13.74	-1.2	0.130			
110.10	-17.39	-2.94	-0.02	-63.7	0.00	63.74	1,044.71	274.61	652.16	565.60	13.77	-1.2	0.129			
111.30	-16.93	-2.87	-0.02	-60.2	0.00	60.21	1,038.88	272.10	640.31	557.28	14.07	-1.22	0.124			
114.90	-16.39	-2.80	-0.02	-49.9	0.00	49.89	1,020.97	264.58	605.41	532.42	15.01	-1.26	0.110			
115.00	-16.38	-2.79	-0.02	-49.6	0.00	49.61	1,020.46	264.37	604.45	531.74	15.03	-1.26	0.109			
115.50	-16.32	-2.72	-0.02	-48.2	0.00	48.21	1,017.93	263.33	599.68	528.30	15.16	-1.27	0.107			
120.00	-13.14	-2.37	-0.02	-36.0	0.00	35.97	994.55	253.93	557.63	497.61	16.38	-1.31	0.086			
121.00	-13.01	-2.32	0.00	-33.6	0.00	33.59	989.22	251.84	548.50	490.84	16.66	-1.32	0.082			
125.00	-12.57	-2.27	0.00	-24.3	0.00	24.32	967.45	243.48	512.70	463.98	17.78	-1.35	0.066			
125.40	-12.46	-2.20	0.00	-23.4	0.00	23.41	965.23	242.65	509.19	461.32	17.89	-1.35	0.064			
130.00	-11.98	-2.13	0.00	-13.3	0.00	13.31	939.16	233.04	469.66	430.94	19.21	-1.38	0.044			
132.00	-6.13	-1.13	0.00	-9.0	0.00	9.05	927.52	228.86	452.97	417.90	19.79	-1.39	0.028			
135.00	-5.86	-1.07	0.00	-5.7	0.00	5.66	909.69	222.59	428.50	398.55	20.66	-1.4	0.021			
138.00	-1.62	-0.50	0.00	-2.4	0.00	2.45	891.44	216.32	404.72	379.46	21.54	-1.4	0.008			
140.00	0.00	-0.46	0.00	-1.4	0.00	1.44	879.04	212.15	389.23	366.89	22.13	-1.4	0.004			



CALCULATED FORCES

Load Case: 1.0D + 1.0W

60 mph Wind with No Ice

24 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	-49.87	-6.49	-0.02	-670.9	0.00	670.86	5,497.77	1,298.68	5,470.20	5,259.85	0	0	0.137
5.00	-48.28	-6.45	-0.02	-638.4	0.00	638.39	5,379.84	1,270.83	5,238.09	5,035.45	0.02	-0.05	0.136
10.00	-46.71	-6.40	-0.02	-606.2	0.00	606.15	5,261.92	1,242.97	5,011.02	4,815.96	0.1	-0.09	0.135
15.00	-45.17	-6.35	-0.02	-574.2	0.00	574.15	5,144.00	1,215.12	4,788.97	4,601.35	0.22	-0.14	0.134
20.00	-43.66	-6.31	-0.02	-542.4	0.00	542.38	5,026.07	1,187.26	4,571.96	4,391.63	0.39	-0.19	0.132
25.00	-42.18	-6.26	-0.02	-510.8	0.00	510.85	4,908.15	1,159.41	4,359.97	4,186.81	0.61	-0.24	0.131
30.00	-40.72	-6.21	-0.02	-479.6	0.00	479.56	4,790.23	1,131.55	4,153.02	3,986.88	0.89	-0.28	0.129
35.00	-39.30	-6.16	-0.02	-448.5	0.00	448.51	4,672.31	1,103.69	3,951.10	3,791.84	1.21	-0.33	0.127
40.00	-37.89	-6.10	-0.02	-417.7	0.00	417.72	4,554.38	1,075.84	3,754.22	3,601.69	1.58	-0.38	0.124
45.00	-36.52	-6.06	-0.02	-387.2	0.00	387.20	4,436.46	1,047.98	3,562.36	3,416.43	2.01	-0.43	0.122
46.25	-36.18	-6.04	-0.02	-379.6	0.00	379.62	4,406.98	1,041.02	3,515.18	3,370.88	2.13	-0.44	0.121
50.00	-34.40	-6.00	-0.02	-357.0	0.00	356.98	4,318.54	1,020.13	3,375.54	3,236.07	2.49	-0.48	0.118
51.00	-33.93	-5.97	-0.02	-351.0	0.00	350.98	4,412.85	1,042.41	3,524.56	3,379.93	2.59	-0.49	0.112
55.00	-32.86	-5.91	-0.02	-327.1	0.00	327.10	4,318.52	1,020.12	3,375.50	3,236.03	3.02	-0.53	0.109
60.00	-31.54	-5.84	-0.02	-297.6	0.00	297.55	4,200.59	992.27	3,193.71	3,060.56	3.6	-0.58	0.105
65.00	-30.25	-5.77	-0.02	-268.4	0.00	268.35	4,082.67	964.41	3,016.95	2,889.98	4.23	-0.62	0.100
70.00	-28.98	-5.70	-0.02	-239.5	0.00	239.50	3,964.75	936.55	2,845.22	2,724.29	4.91	-0.67	0.095
75.00	-27.74	-5.64	-0.02	-211.0	0.00	211.01	3,846.82	908.70	2,678.53	2,563.49	5.63	-0.71	0.090
77.00	-24.13	-5.05	-0.02	-199.7	0.00	199.73	3,799.65	897.56	2,613.26	2,500.54	5.93	-0.72	0.086
80.00	-23.42	-4.99	-0.02	-184.6	0.00	184.59	3,728.90	880.84	2,516.86	2,407.59	6.39	-0.75	0.083
85.00	-22.25	-4.91	-0.02	-159.7	0.00	159.66	3,610.98	852.99	2,360.23	2,256.57	7.2	-0.79	0.077
90.00	-21.10	-4.84	-0.02	-135.1	0.00	135.12	3,493.05	825.13	2,208.63	2,110.45	8.04	-0.82	0.070
93.50	-20.32	-4.80	-0.02	-118.2	0.00	118.18	3,410.51	805.63	2,105.50	2,011.07	8.65	-0.85	0.065
95.00	-19.90	-4.77	-0.02	-111.0	0.00	110.99	3,375.13	797.28	2,062.06	1,969.22	8.92	-0.86	0.062
97.25	-19.27	-4.74	-0.02	-100.3	0.00	100.27	1,102.89	301.46	785.89	655.89	9.33	-0.87	0.171
98.00	-18.98	-4.67	-0.02	-96.7	0.00	96.71	1,099.71	299.89	777.74	650.58	9.47	-0.88	0.166
98.60	-18.74	-4.62	-0.02	-93.9	0.00	93.91	1,097.14	298.64	771.26	646.33	9.58	-0.89	0.163
99.70	-18.40	-4.46	-0.02	-88.8	0.00	88.83	1,092.40	296.34	759.43	638.55	9.78	-0.9	0.156
100.00	-15.21	-3.65	-0.02	-87.5	0.00	87.49	1,091.10	295.71	756.22	636.43	9.84	-0.91	0.152
100.10	-15.05	-3.50	-0.02	-87.1	0.00	87.13	1,090.66	295.50	755.16	635.72	9.86	-0.91	0.151
102.00	-14.63	-3.43	-0.02	-80.5	0.00	80.48	1,082.30	291.53	735.01	622.32	10.23	-0.93	0.143
102.20	-14.47	-3.39	-0.02	-79.8	0.00	79.79	1,081.40	291.12	732.90	620.91	10.26	-0.94	0.142
103.60	-14.31	-3.37	-0.02	-75.0	0.00	75.05	1,075.12	288.19	718.25	611.05	10.54	-0.96	0.136
103.80	-14.13	-3.33	-0.02	-74.4	0.00	74.38	1,074.21	287.77	716.17	609.65	10.58	-0.96	0.135
105.00	-14.03	-3.29	-0.02	-70.4	0.00	70.38	1,068.74	285.27	703.75	601.22	10.83	-0.97	0.130
110.00	-10.10	-2.50	-0.02	-53.9	0.00	53.93	1,045.19	274.82	653.15	566.30	11.88	-1.03	0.105
110.10	-9.93	-2.46	-0.02	-53.7	0.00	53.68	1,044.71	274.61	652.16	565.60	11.9	-1.03	0.104
111.30	-9.67	-2.39	-0.02	-50.7	0.00	50.73	1,038.88	272.10	640.31	557.28	12.16	-1.05	0.100
114.90	-9.39	-2.34	-0.02	-42.1	0.00	42.11	1,020.97	264.58	605.41	532.42	12.97	-1.08	0.088
115.00	-9.39	-2.34	-0.02	-41.9	0.00	41.88	1,020.46	264.37	604.45	531.74	12.99	-1.08	0.088
115.50	-9.35	-2.29	-0.02	-40.7	0.00	40.71	1,017.93	263.33	599.68	528.30	13.1	-1.09	0.086
120.00	-7.18	-2.02	-0.02	-30.4	0.00	30.42	994.55	253.93	557.63	497.61	14.15	-1.13	0.068
121.00	-7.11	-1.98	0.00	-28.4	0.00	28.40	989.22	251.84	548.50	490.84	14.38	-1.13	0.065
125.00	-6.86	-1.94	0.00	-20.5	0.00	20.49	967.45	243.48	512.70	463.98	15.35	-1.16	0.051
125.40	-6.81	-1.89	0.00	-19.7	0.00	19.71	965.23	242.65	509.19	461.32	15.44	-1.16	0.050
130.00	-6.53	-1.85	0.00	-11.0	0.00	11.00	939.16	233.04	469.66	430.94	16.57	-1.18	0.033
132.00	-3.37	-0.93	0.00	-7.3	0.00	7.30	927.52	228.86	452.97	417.90	17.07	-1.19	0.021
135.00	-3.22	-0.89	0.00	-4.5	0.00	4.52	909.69	222.59	428.50	398.55	17.82	-1.2	0.015
138.00	-0.56	-0.39	0.00	-1.9	0.00	1.86	891.44	216.32	404.72	379.46	18.58	-1.2	0.006
140.00	0.00	-0.38	0.00	-1.1	0.00	1.07	879.04	212.15	389.23	366.89	19.08	-1.2	0.003

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period ( $S_S$ ):	0.227
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.056
Long-Period Transition Period ( $T_L$ – Seconds):	6
Importance Factor ( $I_e$ ):	1.000
Site Coefficient $F_a$ :	1.600
Site Coefficient $F_v$ :	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.242
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.090
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):	2.460
Redundancy Factor ( $\rho$ ):	1.000
Seismic Force Distribution Exponent (k):	1.980
Total Unfactored Dead Load:	49.870 k
Seismic Base Shear (E):	1.500 k

SEISMIC FORCES

Segment	Seismic	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
49		139	97	1,701	0.005	8	121
48		136.5	148	2,513	0.008	11	185
47		133.5	152	2,464	0.007	11	190
46		131	118	1,852	0.006	8	148
45		127.7	279	4,140	0.012	18	348
44		125.2	25	352	0.001	2	31
43		123	250	3,447	0.010	15	312
42		120.5	65	860	0.002	4	81
41		117.75	297	3,759	0.011	17	371
40		115.25	34	408	0.001	2	42
39		114.95	7	81	0.000	0	8
38		113.1	249	2,908	0.009	13	311
37		110.7	84	943	0.003	4	105
36		110.05	7	78	0.000	0	9
35		107.5	418	4,416	0.013	20	522
34		104.4	102	1,015	0.003	5	127
33		103.7	17	168	0.000	1	21
32		102.9	127	1,225	0.004	5	158
31		102.1	18	173	0.000	1	23
30		101.05	173	1,618	0.005	7	216
29		100.05	9	84	0.000	0	11
28		99.85	37	336	0.001	1	46
27		99.15	135	1,218	0.004	5	169
26		98.3	74	655	0.002	3	92
25		97.625	93	810	0.002	4	116
24		96.125	625	5,287	0.016	23	780
23		94.25	421	3,424	0.010	15	525
22		91.75	782	6,036	0.018	27	977
21		87.5	1,140	8,011	0.024	36	1,424
20		82.5	1,167	7,299	0.022	32	1,457
19		78.5	713	4,042	0.012	18	891
18		76	486	2,585	0.008	11	607
17		72.5	1,235	5,978	0.018	27	1,542
16		67.5	1,262	5,302	0.016	24	1,576
15		62.5	1,289	4,650	0.014	21	1,609
14		57.5	1,316	4,025	0.012	18	1,643
13		53	1,072	2,790	0.008	12	1,339
12		50.5	468	1,107	0.003	5	584

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh

Seismic

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
11	48.125	1,774	3,814	0.011	17	2,215
10	45.625	338	654	0.002	3	422
9	42.5	1,370	2,302	0.007	10	1,710
8	37.5	1,397	1,832	0.005	8	1,744
7	32.5	1,424	1,407	0.004	6	1,778
6	27.5	1,451	1,030	0.003	5	1,812
5	22.5	1,478	705	0.002	3	1,845
4	17.5	1,505	436	0.001	2	1,879
3	12.5	1,532	228	0.001	1	1,913
2	7.5	1,559	84	0.000	0	1,946
1	2.5	1,586	10	0.000	0	1,980
dbSpectra DS7C09P36U-D	140	210	3,743	0.011	17	262
Generic 12' Omni	140	40	713	0.002	3	50
Generic 12' Omni	140	40	713	0.002	3	50
Generic 8' Omni	140	50	891	0.003	4	62
Generic 6' FM antenna	140	30	535	0.002	2	37
Generic 12' Dipole	140	40	713	0.002	3	50
TX RX Systems 432F-83W-01-C-110/110R/48/48R	140	18	321	0.001	1	22
RFS SC3-W100AB	140	40	713	0.002	3	50
Generic 6' Omni	138	25	433	0.001	2	31
Generic Flat Platform with Handrails	138	2,500	43,305	0.128	192	3,121
Generic Flat Platform with Handrails	77	2,500	13,634	0.040	60	3,121
Ericsson 4460 BAND 2/25	132	327	5,187	0.015	23	408
Ericsson 4480 BAND 71	132	243	3,854	0.011	17	303
Commscope VV-65A-R1	132	71	1,133	0.003	5	89
Ericsson AIR 6419 B41	132	250	3,964	0.012	18	312
RFS APXVAALL24 43-U-NA20	132	368	5,844	0.017	26	460
Site Pro 1 RMQP-496-HK	132	1,799	28,536	0.085	127	2,246
Generic 9' Omni	125.4	25	358	0.001	2	31
Andrew DB586	121	8	111	0.000	0	10
Generic Round Low Profile Platform	120	1,875	24,625	0.073	109	2,341
Diamond X50A	115.5	5	56	0.000	0	6
RFS DB-C1-12C-24AB-0Z	114.9	32	386	0.001	2	40
Alcatel-Lucent B13 RRH4x30-4R	111.3	173	1,962	0.006	9	216
Alcatel-Lucent B25 RRH4x30	110.1	159	1,761	0.005	8	198
Commscope CBC78T-DS-43-2X	110	62	686	0.002	3	78
Nokia AirScale RRH 4T4R B5 160W AHCA	110	106	1,171	0.004	5	132
Alcatel-Lucent RRH 2X60-1900	110	119	1,313	0.004	6	148
Alcatel-Lucent B66a RRH4x45 (AWS-3)	110	201	2,222	0.007	10	251
Amphenol Antel BXA-171063/8CF	110	32	348	0.001	2	39
RFS DB-T1-6Z-8AB-0Z	110	88	973	0.003	4	110
Antel BXA-70080/6CF	110	54	597	0.002	3	67
Commscope JAHH-65B-R3B	110	364	4,019	0.012	18	454
Generic Round Platform with Handrails	110	2,500	27,635	0.082	123	3,121
Ericsson RRUS 32 B2	103.8	159	1,567	0.005	7	198
Ericsson RRUS 32 B2	100	159	1,455	0.004	6	198
Raycap DC6-48-60-18-8F ("Squid")	103.6	32	312	0.001	1	40
Raycap DC6-48-60-18-8F ("Squid")	100	32	291	0.001	1	40
Ericsson RRUS-11 (50 lbs.)	102.2	150	1,433	0.004	6	187
Ericsson Air 6449 B77D	102	245	2,330	0.007	10	306
CCI HPA-65R-BUU-H6	100.1	153	1,403	0.004	6	191
Ericsson RRUS 4426 B66	100	145	1,329	0.004	6	181
Ericsson RRUS 4449 B5, B12	100	213	1,949	0.006	9	266
Ericsson RRUS 4478 B14	100	178	1,631	0.005	7	222
Raycap DC9-48-60-24-8C-EV	100	32	293	0.001	1	40
CCI TPA-65R-BU6DA-K	100	239	2,186	0.006	10	298
CCI DMP65R-BU8D	100	287	2,628	0.008	12	358
Generic Flat Low Profile Platform	100	1,875	17,161	0.051	76	2,341
Powerwave Allgon 7770.00	99.7	210	1,911	0.006	8	262
Powerwave Allgon LGP21401	98.6	169	1,506	0.004	7	211
Ericsson AIR 6419 B77G	98	198	1,744	0.005	8	248

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh

Seismic

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
Raycap RDIDC-9181-PF-48	77	22	119	0.000	1	27
Fujitsu TA08025-B605	77	225	1,227	0.004	5	281
Fujitsu TA08025-B604	77	192	1,045	0.003	5	239
JMA Wireless MX08FRO665-21	77	194	1,055	0.003	5	242
<b>Totals:</b>		<b>49,869</b>	<b>337,292</b>	<b>1.000</b>	<b>1,496</b>	<b>62,258</b>

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
49	139	97	1,701	0.005	8	82
48	136.5	148	2,513	0.008	11	126
47	133.5	152	2,464	0.007	11	129
46	131	118	1,852	0.006	8	101
45	127.7	279	4,140	0.012	18	237
44	125.2	25	352	0.001	2	21
43	123	250	3,447	0.010	15	213
42	120.5	65	860	0.002	4	55
41	117.75	297	3,759	0.011	17	253
40	115.25	34	408	0.001	2	29
39	114.95	7	81	0.000	0	6
38	113.1	249	2,908	0.009	13	212
37	110.7	84	943	0.003	4	72
36	110.05	7	78	0.000	0	6
35	107.5	418	4,416	0.013	20	356
34	104.4	102	1,015	0.003	5	87
33	103.7	17	168	0.000	1	15
32	102.9	127	1,225	0.004	5	108
31	102.1	18	173	0.000	1	15
30	101.05	173	1,618	0.005	7	147
29	100.05	9	84	0.000	0	8
28	99.85	37	336	0.001	1	31
27	99.15	135	1,218	0.004	5	115
26	98.3	74	655	0.002	3	63
25	97.625	93	810	0.002	4	79
24	96.125	625	5,287	0.016	23	532
23	94.25	421	3,424	0.010	15	358
22	91.75	782	6,036	0.018	27	666
21	87.5	1,140	8,011	0.024	36	971
20	82.5	1,167	7,299	0.022	32	994
19	78.5	713	4,042	0.012	18	608
18	76	486	2,585	0.008	11	414
17	72.5	1,235	5,978	0.018	27	1,052
16	67.5	1,262	5,302	0.016	24	1,075
15	62.5	1,289	4,650	0.014	21	1,098
14	57.5	1,316	4,025	0.012	18	1,121
13	53	1,072	2,790	0.008	12	913
12	50.5	468	1,107	0.003	5	399
11	48.125	1,774	3,814	0.011	17	1,511
10	45.625	338	654	0.002	3	288
9	42.5	1,370	2,302	0.007	10	1,167
8	37.5	1,397	1,832	0.005	8	1,190
7	32.5	1,424	1,407	0.004	6	1,213
6	27.5	1,451	1,030	0.003	5	1,236
5	22.5	1,478	705	0.002	3	1,259
4	17.5	1,505	436	0.001	2	1,282
3	12.5	1,532	228	0.001	1	1,305
2	7.5	1,559	84	0.000	0	1,328
1	2.5	1,586	10	0.000	0	1,351
dbSpectra DS7C09P36U-D	140	210	3,743	0.011	17	179
Generic 12' Omni	140	40	713	0.002	3	34

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
Generic 12' Omni	140	40	713	0.002	3	34
Generic 8' Omni	140	50	891	0.003	4	43
Generic 6' FM antenna	140	30	535	0.002	2	26
Generic 12' Dipole	140	40	713	0.002	3	34
TX RX Systems 432F-83W-01-C-110/110R/48/48R	140	18	321	0.001	1	15
RFS SC3-W100AB	140	40	713	0.002	3	34
Generic 6' Omni	138	25	433	0.001	2	21
Generic Flat Platform with Handrails	138	2,500	43,305	0.128	192	2,129
Generic Flat Platform with Handrails	77	2,500	13,634	0.040	60	2,129
Ericsson 4460 BAND 2/25	132	327	5,187	0.015	23	278
Ericsson 4480 BAND 71	132	243	3,854	0.011	17	207
Commscope VV-65A-R1	132	71	1,133	0.003	5	61
Ericsson AIR 6419 B41	132	250	3,964	0.012	18	213
RFS APXVAALL24 43-U-NA20	132	368	5,844	0.017	26	314
Site Pro 1 RMQP-496-HK	132	1,799	28,536	0.085	127	1,532
Generic 9' Omni	125.4	25	358	0.001	2	21
Andrew DB586	121	8	111	0.000	0	7
Generic Round Low Profile Platform	120	1,875	24,625	0.073	109	1,597
Diamond X50A	115.5	5	56	0.000	0	4
RFS DB-C1-12C-24AB-0Z	114.9	32	386	0.001	2	27
Alcatel-Lucent B13 RRH4x30-4R	111.3	173	1,962	0.006	9	148
Alcatel-Lucent B25 RRH4x30	110.1	159	1,761	0.005	8	135
Commscope CBC78T-DS-43-2X	110	62	686	0.002	3	53
Nokia AirScale RRH 4T4R B5 160W AHCA	110	106	1,171	0.004	5	90
Alcatel-Lucent RRH 2X60-1900	110	119	1,313	0.004	6	101
Alcatel-Lucent B66a RRH4x45 (AWS-3)	110	201	2,222	0.007	10	171
Amphenol Antel BXA-171063/8CF	110	32	348	0.001	2	27
RFS DB-T1-6Z-8AB-0Z	110	88	973	0.003	4	75
Antel BXA-70080/6CF	110	54	597	0.002	3	46
Commscope JAHH-65B-R3B	110	364	4,019	0.012	18	310
Generic Round Platform with Handrails	110	2,500	27,635	0.082	123	2,129
Ericsson RRUS 32 B2	103.8	159	1,567	0.005	7	135
Ericsson RRUS 32 B2	100	159	1,455	0.004	6	135
Raycap DC6-48-60-18-8F ("Squid")	103.6	32	312	0.001	1	27
Raycap DC6-48-60-18-8F ("Squid")	100	32	291	0.001	1	27
Ericsson RRUS-11 (50 lbs.)	102.2	150	1,433	0.004	6	128
Ericsson Air 6449 B77D	102	245	2,330	0.007	10	208
CCI HPA-65R-BUU-H6	100.1	153	1,403	0.004	6	130
Ericsson RRUS 4426 B66	100	145	1,329	0.004	6	124
Ericsson RRUS 4449 B5, B12	100	213	1,949	0.006	9	181
Ericsson RRUS 4478 B14	100	178	1,631	0.005	7	152
Raycap DC9-48-60-24-8C-EV	100	32	293	0.001	1	27
CCI TPA-65R-BU6DA-K	100	239	2,186	0.006	10	203
CCI DMP65R-BU8D	100	287	2,628	0.008	12	244
Generic Flat Low Profile Platform	100	1,875	17,161	0.051	76	1,597
Powerwave Allgon 7770.00	99.7	210	1,911	0.006	8	179
Powerwave Allgon LGP21401	98.6	169	1,506	0.004	7	144
Ericsson AIR 6419 B77G	98	198	1,744	0.005	8	169
Raycap RDIDC-9181-PF-48	77	22	119	0.000	1	19
Fujitsu TA08025-B605	77	225	1,227	0.004	5	192
Fujitsu TA08025-B604	77	192	1,045	0.003	5	163
JMA Wireless MX08FRO665-21	77	194	1,055	0.003	5	165
<b>Totals:</b>		<b>49,869</b>	<b>337,292</b>	<b>1.000</b>	<b>1,496</b>	<b>42,467</b>

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	-60.28	-1.50	0.00	-170.14	0.00	170.14	5,497.77	1,298.68	5,470	5,259.85	0.00	0.00	0.04

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
5.00	-58.33	-1.51	0.00	-162.64	0.00	162.64	5,379.84	1,270.83	5,238	5,035.45	0.01	-0.01	0.04
10.00	-56.42	-1.52	0.00	-155.07	0.00	155.07	5,261.92	1,242.97	5,011	4,815.96	0.02	-0.02	0.04
15.00	-54.54	-1.53	0.00	-147.46	0.00	147.46	5,144.00	1,215.12	4,789	4,601.35	0.06	-0.04	0.04
20.00	-52.69	-1.54	0.00	-139.80	0.00	139.80	5,026.07	1,187.26	4,572	4,391.63	0.10	-0.05	0.04
25.00	-50.88	-1.54	0.00	-132.11	0.00	132.11	4,908.15	1,159.41	4,360	4,186.81	0.16	-0.06	0.04
30.00	-49.10	-1.55	0.00	-124.39	0.00	124.39	4,790.23	1,131.55	4,153	3,986.88	0.23	-0.07	0.04
35.00	-47.36	-1.55	0.00	-116.66	0.00	116.66	4,672.31	1,103.69	3,951	3,791.84	0.31	-0.09	0.04
40.00	-45.65	-1.54	0.00	-108.93	0.00	108.93	4,554.38	1,075.84	3,754	3,601.69	0.41	-0.10	0.04
45.00	-45.23	-1.55	0.00	-101.22	0.00	101.22	4,436.46	1,047.98	3,562	3,416.43	0.52	-0.11	0.04
46.25	-43.01	-1.53	0.00	-99.29	0.00	99.29	4,406.98	1,041.02	3,515	3,370.88	0.55	-0.11	0.04
50.00	-42.43	-1.53	0.00	-93.55	0.00	93.55	4,318.54	1,020.13	3,376	3,236.07	0.64	-0.12	0.04
51.00	-41.09	-1.52	0.00	-92.02	0.00	92.02	4,412.85	1,042.41	3,525	3,379.93	0.67	-0.13	0.04
55.00	-39.44	-1.50	0.00	-85.95	0.00	85.95	4,318.52	1,020.12	3,376	3,236.03	0.78	-0.14	0.04
60.00	-37.83	-1.49	0.00	-78.43	0.00	78.43	4,200.59	992.27	3,194	3,060.56	0.93	-0.15	0.04
65.00	-36.26	-1.47	0.00	-71.00	0.00	71.00	4,082.67	964.41	3,017	2,889.98	1.09	-0.16	0.03
70.00	-34.72	-1.44	0.00	-63.67	0.00	63.67	3,964.75	936.55	2,845	2,724.29	1.27	-0.17	0.03
75.00	-34.11	-1.43	0.00	-56.46	0.00	56.46	3,846.82	908.70	2,679	2,563.49	1.45	-0.18	0.03
77.00	-29.31	-1.33	0.00	-53.59	0.00	53.59	3,799.65	897.56	2,613	2,500.54	1.53	-0.19	0.03
80.00	-27.85	-1.29	0.00	-49.61	0.00	49.61	3,728.90	880.84	2,517	2,407.59	1.65	-0.20	0.03
85.00	-26.43	-1.26	0.00	-43.14	0.00	43.14	3,610.98	852.99	2,360	2,256.57	1.86	-0.21	0.03
90.00	-25.45	-1.23	0.00	-36.85	0.00	36.85	3,493.05	825.13	2,209	2,110.45	2.08	-0.22	0.03
93.50	-24.93	-1.22	0.00	-32.54	0.00	32.54	3,410.51	805.63	2,106	2,011.07	2.24	-0.22	0.02
95.00	-24.15	-1.19	0.00	-30.72	0.00	30.72	3,375.13	797.28	2,062	1,969.22	2.31	-0.22	0.02
97.25	-24.03	-1.19	0.00	-28.04	0.00	28.04	1,102.89	301.46	786	655.89	2.42	-0.23	0.07
98.00	-23.69	-1.18	0.00	-27.14	0.00	27.14	1,099.71	299.89	778	650.58	2.46	-0.23	0.06
98.60	-23.31	-1.17	0.00	-26.44	0.00	26.44	1,097.14	298.64	771	646.33	2.49	-0.23	0.06
99.70	-23.00	-1.16	0.00	-25.16	0.00	25.16	1,092.40	296.34	759	638.55	2.54	-0.24	0.06
100.00	-19.05	-1.01	0.00	-24.81	0.00	24.81	1,091.10	295.71	756	636.43	2.55	-0.24	0.06
100.10	-18.64	-1.00	0.00	-24.71	0.00	24.71	1,090.66	295.50	755	635.72	2.56	-0.24	0.06
102.00	-18.31	-0.99	0.00	-22.82	0.00	22.82	1,082.30	291.53	735	622.32	2.66	-0.25	0.05
102.20	-17.96	-0.97	0.00	-22.62	0.00	22.62	1,081.40	291.12	733	620.91	2.67	-0.25	0.05
103.60	-17.90	-0.97	0.00	-21.26	0.00	21.26	1,075.12	288.19	718	611.05	2.74	-0.25	0.05
103.80	-17.58	-0.96	0.00	-21.06	0.00	21.06	1,074.21	287.77	716	609.65	2.75	-0.25	0.05
105.00	-17.06	-0.94	0.00	-19.91	0.00	19.91	1,068.74	285.27	704	601.22	2.82	-0.26	0.05
110.00	-12.65	-0.75	0.00	-15.21	0.00	15.21	1,045.19	274.82	653	566.30	3.09	-0.27	0.04
110.10	-12.34	-0.74	0.00	-15.13	0.00	15.13	1,044.71	274.61	652	565.60	3.10	-0.27	0.04
111.30	-11.82	-0.71	0.00	-14.25	0.00	14.25	1,038.88	272.10	640	557.28	3.17	-0.28	0.04
114.90	-11.77	-0.71	0.00	-11.68	0.00	11.68	1,020.97	264.58	605	532.42	3.38	-0.29	0.03
115.00	-11.73	-0.71	0.00	-11.61	0.00	11.61	1,020.46	264.37	604	531.74	3.39	-0.29	0.03
115.50	-11.35	-0.69	0.00	-11.26	0.00	11.26	1,017.93	263.33	600	528.30	3.42	-0.29	0.03
120.00	-8.93	-0.57	0.00	-8.14	0.00	8.14	994.55	253.93	558	497.61	3.70	-0.30	0.03
121.00	-8.61	-0.55	0.00	-7.57	0.00	7.57	989.22	251.84	548	490.84	3.76	-0.30	0.02
125.00	-8.57	-0.55	0.00	-5.37	0.00	5.37	967.45	243.48	513	463.98	4.02	-0.31	0.02
125.40	-8.20	-0.53	0.00	-5.15	0.00	5.15	965.23	242.65	509	461.32	4.04	-0.31	0.02
130.00	-8.05	-0.52	0.00	-2.72	0.00	2.72	939.16	233.04	470	430.94	4.34	-0.32	0.02
132.00	-4.04	-0.27	0.00	-1.68	0.00	1.68	927.52	228.86	453	417.90	4.48	-0.32	0.01
135.00	-3.86	-0.26	0.00	-0.86	0.00	0.86	909.69	222.59	428	398.55	4.68	-0.32	0.01
138.00	-0.58	-0.04	0.00	-0.08	0.00	0.08	891.44	216.32	405	379.46	4.88	-0.32	0.00
140.00	0.00	-0.04	0.00	0.00	0.00	0.00	879.04	212.15	389	366.89	5.01	-0.32	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	-41.12	-1.50	0.00	-166.93	0.00	166.93	5,497.77	1,298.68	5,470	5,259.85	0.00	0.00	0.04
5.00	-39.79	-1.51	0.00	-159.43	0.00	159.43	5,379.84	1,270.83	5,238	5,035.45	0.01	-0.01	0.04
10.00	-38.48	-1.51	0.00	-151.90	0.00	151.90	5,261.92	1,242.97	5,011	4,815.96	0.02	-0.02	0.04
15.00	-37.20	-1.52	0.00	-144.33	0.00	144.33	5,144.00	1,215.12	4,789	4,601.35	0.05	-0.03	0.04
20.00	-35.94	-1.52	0.00	-136.74	0.00	136.74	5,026.07	1,187.26	4,572	4,391.63	0.10	-0.05	0.04

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	-34.71	-1.52	0.00	-129.13	0.00	129.13	4,908.15	1,159.41	4,360	4,186.81	0.15	-0.06	0.04
30.00	-33.49	-1.52	0.00	-121.51	0.00	121.51	4,790.23	1,131.55	4,153	3,986.88	0.22	-0.07	0.04
35.00	-32.30	-1.52	0.00	-113.90	0.00	113.90	4,672.31	1,103.69	3,951	3,791.84	0.30	-0.08	0.04
40.00	-31.14	-1.52	0.00	-106.29	0.00	106.29	4,554.38	1,075.84	3,754	3,601.69	0.40	-0.10	0.04
45.00	-30.85	-1.52	0.00	-98.71	0.00	98.71	4,436.46	1,047.98	3,562	3,416.43	0.51	-0.11	0.04
46.25	-29.34	-1.50	0.00	-96.82	0.00	96.82	4,406.98	1,041.02	3,515	3,370.88	0.53	-0.11	0.04
50.00	-28.94	-1.50	0.00	-91.19	0.00	91.19	4,318.54	1,020.13	3,376	3,236.07	0.63	-0.12	0.04
51.00	-28.03	-1.49	0.00	-89.70	0.00	89.70	4,412.85	1,042.41	3,525	3,379.93	0.65	-0.12	0.03
55.00	-26.90	-1.47	0.00	-83.75	0.00	83.75	4,318.52	1,020.12	3,376	3,236.03	0.76	-0.13	0.03
60.00	-25.81	-1.45	0.00	-76.40	0.00	76.40	4,200.59	992.27	3,194	3,060.56	0.91	-0.15	0.03
65.00	-24.73	-1.43	0.00	-69.14	0.00	69.14	4,082.67	964.41	3,017	2,889.98	1.07	-0.16	0.03
70.00	-23.68	-1.41	0.00	-61.98	0.00	61.98	3,964.75	936.55	2,845	2,724.29	1.24	-0.17	0.03
75.00	-23.27	-1.40	0.00	-54.95	0.00	54.95	3,846.82	908.70	2,679	2,563.49	1.42	-0.18	0.03
77.00	-19.99	-1.29	0.00	-52.16	0.00	52.16	3,799.65	897.56	2,613	2,500.54	1.50	-0.18	0.03
80.00	-19.00	-1.26	0.00	-48.28	0.00	48.28	3,728.90	880.84	2,517	2,407.59	1.62	-0.19	0.03
85.00	-18.03	-1.23	0.00	-41.97	0.00	41.97	3,610.98	852.99	2,360	2,256.57	1.82	-0.20	0.02
90.00	-17.36	-1.20	0.00	-35.84	0.00	35.84	3,493.05	825.13	2,209	2,110.45	2.04	-0.21	0.02
93.50	-17.00	-1.18	0.00	-31.64	0.00	31.64	3,410.51	805.63	2,106	2,011.07	2.19	-0.22	0.02
95.00	-16.47	-1.16	0.00	-29.87	0.00	29.87	3,375.13	797.28	2,062	1,969.22	2.26	-0.22	0.02
97.25	-16.39	-1.16	0.00	-27.26	0.00	27.26	1,102.89	301.46	786	655.89	2.36	-0.22	0.06
98.00	-16.16	-1.15	0.00	-26.39	0.00	26.39	1,099.71	299.89	778	650.58	2.40	-0.22	0.06
98.60	-15.90	-1.13	0.00	-25.71	0.00	25.71	1,097.14	298.64	771	646.33	2.43	-0.23	0.05
99.70	-15.69	-1.12	0.00	-24.46	0.00	24.46	1,092.40	296.34	759	638.55	2.48	-0.23	0.05
100.00	-12.99	-0.98	0.00	-24.12	0.00	24.12	1,091.10	295.71	756	636.43	2.50	-0.23	0.05
100.10	-12.71	-0.97	0.00	-24.02	0.00	24.02	1,090.66	295.50	755	635.72	2.50	-0.23	0.05
102.00	-12.49	-0.96	0.00	-22.18	0.00	22.18	1,082.30	291.53	735	622.32	2.60	-0.24	0.05
102.20	-12.25	-0.95	0.00	-21.99	0.00	21.99	1,081.40	291.12	733	620.91	2.61	-0.24	0.05
103.60	-12.21	-0.95	0.00	-20.66	0.00	20.66	1,075.12	288.19	718	611.05	2.68	-0.25	0.05
103.80	-11.99	-0.93	0.00	-20.48	0.00	20.48	1,074.21	287.77	716	609.65	2.69	-0.25	0.05
105.00	-11.63	-0.91	0.00	-19.36	0.00	19.36	1,068.74	285.27	704	601.22	2.75	-0.25	0.04
110.00	-8.63	-0.73	0.00	-14.78	0.00	14.78	1,045.19	274.82	653	566.30	3.02	-0.27	0.03
110.10	-8.42	-0.72	0.00	-14.71	0.00	14.71	1,044.71	274.61	652	565.60	3.03	-0.27	0.03
111.30	-8.06	-0.69	0.00	-13.85	0.00	13.85	1,038.88	272.10	640	557.28	3.10	-0.27	0.03
114.90	-8.03	-0.69	0.00	-11.35	0.00	11.35	1,020.97	264.58	605	532.42	3.30	-0.28	0.03
115.00	-8.00	-0.69	0.00	-11.29	0.00	11.29	1,020.46	264.37	604	531.74	3.31	-0.28	0.03
115.50	-7.74	-0.67	0.00	-10.94	0.00	10.94	1,017.93	263.33	600	528.30	3.34	-0.28	0.03
120.00	-6.09	-0.55	0.00	-7.91	0.00	7.91	994.55	253.93	558	497.61	3.61	-0.29	0.02
121.00	-5.87	-0.54	0.00	-7.36	0.00	7.36	989.22	251.84	548	490.84	3.67	-0.29	0.02
125.00	-5.85	-0.53	0.00	-5.22	0.00	5.22	967.45	243.48	513	463.98	3.92	-0.30	0.02
125.40	-5.59	-0.51	0.00	-5.00	0.00	5.00	965.23	242.65	509	461.32	3.95	-0.30	0.02
130.00	-5.49	-0.51	0.00	-2.64	0.00	2.64	939.16	233.04	470	430.94	4.24	-0.31	0.01
132.00	-2.76	-0.26	0.00	-1.63	0.00	1.63	927.52	228.86	453	417.90	4.37	-0.31	0.01
135.00	-2.63	-0.25	0.00	-0.84	0.00	0.84	909.69	222.59	428	398.55	4.56	-0.31	0.01
138.00	-0.40	-0.04	0.00	-0.08	0.00	0.08	891.44	216.32	405	379.46	4.76	-0.31	0.00
140.00	0.00	-0.04	0.00	0.00	0.00	0.00	879.04	212.15	389	366.89	4.89	-0.31	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	28.10	0.00	59.79	0.01	0.09	2925.94	97.25	0.69
0.9D + 1.0W	28.07	0.00	44.83	0.01	0.09	2883.40	97.25	0.67
1.2D + 1.0Di + 1.0Wi	7.39	0.00	77.42	0.00	0.02	772.12	97.25	0.21
1.2D + 1.0Ev + 1.0Eh	1.55	0.00	60.28	0.00	0.00	170.14	97.25	0.06
0.9D - 1.0Ev + 1.0Eh	1.52	0.00	41.12	0.00	0.00	166.93	97.25	0.06
1.0D + 1.0W	6.49	0.00	49.87	0.00	0.02	670.86	97.25	0.17



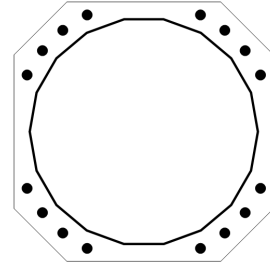
**BASE PLATE ANALYSIS @ 0 FT**

**APPLIED REACTIONS**

Moment (k-ft)	Axial (k)	Shear (k)
2925.94	59.79	28.1

**PLATE PARAMETERS (ID# 22465)**

Width:	54	in
Shape:	Square	
Thickness:	3.25	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Clip Length:	11	in
Rod Detail Type:	d	
Clear Distance:	3	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	225	°



**ANCHOR ROD PARAMETERS**

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Spacing (in)	Offset (°)
Original [ID#23059]	Cluster	16	2.25	54	A615-75	75	100	6	-

**COMPONENT PROPERTIES**

Component	ID	Gross Area (in <sup>2</sup> )	Net Area (in <sup>2</sup> )	Individual Inertia (in <sup>4</sup> )	Moment of Inertia (in <sup>4</sup> )	Threads/in
Pole	47.13"ø x 0.5" (18 Sides)	72.8749	-	-	19813.12	-
Bolt Group	Original (16) 2.25"ø	3.9761	3.2477	0.8393	17157.27	4.5

**REACTION DISTRIBUTION**

Component	ID	Moment M <sub>u</sub> (k-ft)	Axial Load P <sub>u</sub> (k)	Shear V <sub>u</sub> (k)	Moment Factor
Pole	47.13"ø x 0.5" (18 Sides)	2925.9	59.79	28.10	1.000
Bolt Group	Original (16) 2.25"ø	2925.9	-	28.10	1.000

**BASE PLATE BEND LINE ANALYSIS @ 0 FT**

**POLE PROPERTIES**

Flat-to-Flat Diameter:	47.26	in
Point-to-Point Diameter:	47.98	in
Orientation Offset:	-	°

Flat Width:	8.332	in
Flat Radians:	0.349	rad

**PLATE PROPERTIES**

Neutral Axis:	225	°
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Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in <sup>3</sup> )	Applied Moment M <sub>u</sub> (k-in)	Moment Capacity ΦM <sub>n</sub> (k-in)	Flexure Result M <sub>u</sub> /ΦM <sub>n</sub>
Flats	29.113	0.00	76.875	872.8	3459.4	25.2%
Corners	28.384	0.00	74.950	626.1	3372.8	18.6%

**PLASTIC ANCHOR ROD ANALYSIS**

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load P <sub>u</sub> (k)	Applied Shear Load V <sub>u</sub> (k)	Compressive Capacity ΦP <sub>n</sub> (k)	Interaction Result
Original	16	2.25	151.3	2.9	243.6	64.5%

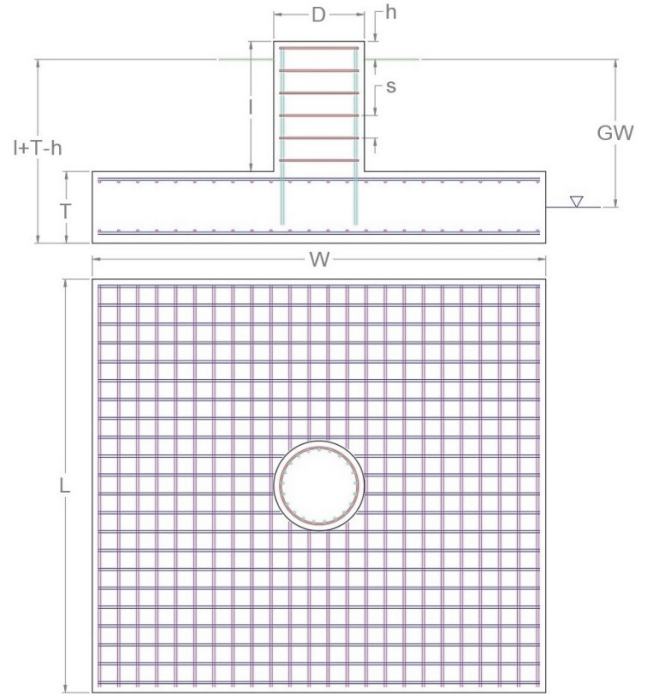
## MONOLITHIC MAT & PIER FOUNDATION ANALYSIS

### APPLIED GLOBAL REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
2,925.94	59.79	28.10

### FOUNDATION PARAMETERS

Mat Length:	L	23	ft
Mat Width:	W	23	ft
Mat Thickness:	T	3.5	ft
Base Depth:	L+T-h	7	ft
Pier Shape:		Square	
Pier Width:	D	6	ft
Pier Height above Grade:	h	0.5	ft
Concrete Compressive Strength:		3,000	psi
Mat Top Rebar:		(24) #9 bars [60 ksi]	
Mat Bottom Rebar:		(24) #9 bars [60 ksi]	
Pier Vertical Rebar:		(40) #11 bars [60 ksi]	
Pier Rebar Ties:	s	#4 bars @ 6.0" c/c [40 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:	115	pcf
Ultimate Skin Friction:	0	psf
Ultimate Bearing Pressure:	20,000	psf
Bearing Pressure Type:	Gross	
Coefficient of Shear Friction:	0.4	

### SOIL STRENGTH ANALYSIS

Soil Strength Reduction Factor, $\Phi_s$	Uplift Strength Reduction Factor, $\Phi_s$	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, $M_{u,Design} / \Phi_m M_n$
3,136.69	6,038.94	51.9% <span style="float: right; color: green;">✔</span>

### SOIL BEARING ANALYSIS

Net Bearing Pressure, $P_{u,Net}$ (psf)	Nominal Bearing Capacity, $\Phi_b P_n$ (k-ft)	Bearing Pressure Controlling Load Direction	Soil Bearing Usage, $P_{u,net} / \Phi_b P_n$
2,068.00	15,000.00	Diagonal to Pad Edge	13.8% <span style="float: right; color: green;">✔</span>

### 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, $V_u / \Phi_s V_n$
28.10	0.00	603.8	48.60	200.73	14.0% <span style="float: right; color: green;">✔</span>

**MAT REINFORCING STEEL STRENGTH ANALYSIS**

Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, $\Phi_b$	Strength Shear Reduction Factor, $\Phi_v$	Strength Compression Reduction Factor, $\Phi_c$
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, $V_u / \Phi_c V_n$
128.98	754.83	Diagonal to Pad Edge	17.1%

**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, $v_u / \Phi_c v_n$
28.3	164.3	17.2%

**MAT REINFORCING MOMENT TRANSFER ANALYSIS**

Moment Transfer Effective Flexural Width, $w_t$ (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, $0.6 M_{ut} / \Phi M_{sc,f}$
16.50	2.13	0.00	35,739.8	0.0%

**MAT REINFORCING FLEXURE ANALYSIS – UPPER STEEL**

Factored Moment, $M_u$ (k-ft)	Nominal Flexural Capacity, $\Phi M_n$ (k-ft)	Flexural Steel Controlling Load Direction	Mat Upper Rebar Flexure Usage, $M_u / \Phi M_n$
770.64	3,996.59	Parallel to Pad Edge	19.3%

**MAT REINFORCING FLEXURE ANALYSIS – LOWER STEEL**

Factored Moment, $M_u$ (k-ft)	Nominal Flexural Capacity, $\Phi M_n$ (k-ft)	Flexural Steel Controlling Load Direction	Mat Lower Rebar Flexure Usage, $M_u / \Phi M_n$
1,185.90	3,996.59	Parallel to Pad Edge	29.7%

**PIER REINFORCING STEEL STRENGTH ANALYSIS**

Rebar Cage Diameter (in)	Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, $\Phi_b$	Strength Shear Reduction Factor, $\Phi_v$	Strength Compression Reduction Factor, $\Phi_c$
63.62	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, $M_u / \Phi_b M_n$
3,038.34	8,737.91	0.012	34.8%

**PIER REINFORCING COMPRESSION ANALYSIS**

Design Compression, $P_u$ (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, $P_u / \Phi_p P_n$
59.79	6,839.91	0.9%

**PIER REINFORCING SHEAR ANALYSIS**

Design Shear, $V_u$ (k)	Nominal Shear Capacity, $\Phi_v V_n$ (k)	Pier Rebar Shear Usage, $V_u / \Phi_v V_n$
28.10	543.57	5.2%