

From: [Ryan Burgdorfer](#)
To: [Fontaine, Lisa](#)
Cc: [Christine Killion](#); [CSC-DL Siting Council](#); [Rob Brule](#)
Subject: RE: TS-DISH-152-220711 DISH WIRELESS L.L.C. @ 85 Miner Ln, Waterford / Customer #BOBOS00066B (14100509)
Date: Wednesday, December 6, 2023 2:02:03 PM
Attachments: [image001.png](#)
[STAMPED PDF. DISH WIRELESS L.L.C. @ 310972 WATERFORD REBUILD CT, CT \(14538894 C3 01\). Structural Analysis \(78%\) \(2\).pdf](#)
[\(231075\) Dish Wireless BOBOS00066B \(CSC\) RF Emissions Analysis Report 120523.pdf](#)

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EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Hi Lisa,

Please see attached revised Structural Analysis and MPE Report per your request.

Thank you!

Centerline has a new look. For more information about our rebrand, click [here](#).



Ryan Burgdorfer | Site Acquisition - Project Manager
[750 W Center St, Suite 301 | West Bridgewater, MA 02379](#)
Mobile: 508-665-8005
rburgdorfer@clinellc.com | www.centerlinecommunications.com

Building a better network.

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From: Ryan Burgdorfer
Sent: Thursday, September 21, 2023 11:59 AM
To: 'Fontaine, Lisa' <Lisa.Fontaine@ct.gov>
Cc: [Christine Killion <ckillion@clinellc.com>](mailto:ckillion@clinellc.com); [CSC-DL Siting Council <Siting.Council@ct.gov>](mailto:Siting.Council@ct.gov); [Rob Brule <firstsel@waterfordct.org>](mailto:Rob.Brule@waterfordct.org)
Subject: RE: TS-DISH-152-220711 DISH WIRELESS L.L.C. @ 85 Miner Ln, Waterford / Customer #BOBOS00066B (14100509)

Thank you Lisa, revised SA and MPE will be provided asap.

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From: Fontaine, Lisa <Lisa.Fontaine@ct.gov>
Sent: Thursday, September 21, 2023 11:32 AM
To: Ryan Burgdorfer <rburgdorfer@clinellc.com>
Cc: Christine Killion <ckillion@clinellc.com>; CSC-DL Siting Council <Siting.Council@ct.gov>; Rob Brule <firstsel@waterfordct.org>
Subject: RE: TS-DISH-152-220711 DISH WIRELESS L.L.C. @ 85 Miner Ln, Waterford / Customer #BOBOS00066B (14100509)

Good Morning,

Please see the attached correspondence.

Thank you.

From: Ryan Burgdorfer <rburgdorfer@clinellc.com>
Sent: Monday, September 18, 2023 4:27 PM
To: Walsh, Christina <Christina.Walsh@ct.gov>
Cc: Fontaine, Lisa <Lisa.Fontaine@ct.gov>; Mathews, Lisa A <Lisa.A.Mathews@ct.gov>; Bachman, Melanie <Melanie.Bachman@ct.gov>; Morrone, Adam N <Adam.N.Morrone@ct.gov>; Christine Killion <ckillion@clinellc.com>
Subject: TS-DISH-152-220711 DISH WIRELESS L.L.C. @ 85 Miner Ln, Waterford / Customer #BOBOS00066B (14100509)

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Hi Christina,

Per the attached Decision, Dish was to install its antennas at 177' and remove the omni antennas at that level that ATC believed were decommissioned. Last week, they found out that the omnis are part of Waterford's E-911 system, so they had to replace them and move Dish down to 174'.

Can you let me know what is needed in order to update the Council's decision?

Thanks

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FOX HILL TELECOM

Radio Frequency Emissions Analysis Report



Site ID: BOBOS00066B

15 Miner Lane
Waterford, CT 06385

December 5, 2023

Fox Hill Telecom Project Number: 231075

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	17.69 %



December 5, 2023

Dish Wireless
5701 South Santa Fe Drive
Littleton, CO 80120

Emissions Analysis for Site: **BOBOS00066B**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed radio installation for Dish Wireless, LLC (Dish) facility located at **15 Miner Lane, Waterford, CT**, for the purpose of determining whether the emissions from the Proposed Dish radio and antenna installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for the 600 MHz band is approximately $400 \mu\text{W}/\text{cm}^2$. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS / AWS-4) bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report the percentage of MPE rather than power density.



Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.



CALCULATIONS

Calculations were performed for the proposed upgrades to the Dish Wireless antenna facility located at **15 Miner Lane, Waterford, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4 \text{ ERP}}{R^2}$$

S = Power Density (in $\mu\text{w}/\text{cm}^2$)

ERP = Effective Radiated Power from antenna (watts)

R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.



For each Dish sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
5G	n71 (600 MHz)	4	61.5
5G	n70 (AWS-4 / 1995-2020)	4	40
5G	n66 (AWS-4 / 2180-2200)	4	40

Table 1: Channel Data Table



The following **Dish** antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz (n71) frequency band and the 2100 MHz (AWS 4) frequency bands at 1995-2020 MHz (n70) and 2180-2200 MHz (n66). This is based on feedback from Dish regarding anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	JMA MX08FRO665-21	174
B	1	JMA MX08FRO665-21	174
C	1	JMA MX08FRO665-21	174

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.



RESULTS

Per the calculations completed for the proposed **Dish** configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	1.20
Sector A Composite MPE%							1.20
Antenna B1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	1.20
Sector B Composite MPE%							1.20
Antenna C1	JMA MX08FRO665-21	n71 (600 MHz) / n70 (AWS-4 / 1995-2020) / n66 (AWS-4 / 2180-2200)	11.45 / 16.15 / 16.65	12	566	17,426.72	1.20
Sector C Composite MPE%							1.20

Table 3: Dish Emissions Levels



The Following table (*Table 4*) shows all additional carriers on site and their emissions contribution estimates, along with the newly calculated **Dish** far field emissions contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas, the highest recorded sector value be used for composite site emissions values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results for all three sectors. *Table 5* below shows a summary for each **Dish** Sector as well as the composite emissions value for the site.

Site Composite MPE%	
Carrier	MPE%
Dish – Max Per Sector Value	1.20 %
Verizon Wireless	4.32 %
AT&T	5.76 %
T-Mobile	6.37 %
Town of Waterford	0.04 %
Site Total MPE %:	17.69 %

Table 4: All Carrier MPE Contributions

Dish Sector A Total:	1.20 %
Dish Sector B Total:	1.20 %
Dish Sector C Total:	1.20 %
Site Total:	17.69 %

Table 5: Site MPE Summary



Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated **Dish** sector(s). For this site, all three sectors have the same configuration yielding the same results for all three sectors.

Dish _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
Dish n71 (600 MHz) 5G	4	858.77	174	3.20	n71 (600 MHz)	400	0.80%
Dish n70 (AWS-4 / 1995-2020) 5G	4	1,648.39	174	2.00	n70 (AWS-4 / 1995-2020)	1000	0.20%
Dish n66 (AWS-4 / 2180-2200) 5G	4	1,849.52	174	2.00	n66 (AWS-4 / 2180-2200)	1000	0.20%
						Total:	1.20 %

Table 6: Dish Maximum Sector MPE Power Values



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Dish facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Dish Sector	Power Density Value (%)
Sector A:	1.20 %
Sector B:	1.20 %
Sector C:	1.20 %
Dish Maximum Total (per sector):	1.20 %
Site Total:	17.69 %
Site Compliance Status:	COMPLIANT

The anticipated composite emissions value for this site, assuming all carriers present, is **17.69 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01609
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AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 180 ft Monopole
ATC Asset Name : WATERFORD REBUILD CT
ATC Asset Number : 310972
Engineering Number : 14538894_C3_01
Proposed Carrier : DISH WIRELESS L.L.C.
Carrier Site Name : BOBOS00066B
Carrier Site Number : BOBOS00066B
Site Location : 15 Miner Lane
Waterford, CT 06385-3016
41.329° N, 72.1246° W
County : New London
Date : September 28, 2023
Max Usage : 78%
Analysis Result : Pass

Created By:

Nathan Lyle
Structural Engineer I

Nathan Lyle



COA: PEC.0001553



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Standard Conditions Attached

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 180 ft Monopole tower to reflect the change in loading by DISH WIRELESS L.L.C..

Supporting Documents

Tower:	FWT Job #23766000, dated July 18, 2001
Foundation:	ATC Job #42693971, dated December 8, 2008
Geotechnical:	Tower Engineering Professionals Project #082973.01, dated November 7, 2008
Modification:	ATC Job #442108F2, dated November 9, 2009

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:	127 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.00" radial ice concurrent
Code(s):	ANSI/TIA-222-H / 2021 IBC / 2022 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Feature:	Flat
Spectral Response:	$S_s = 0.19$, $S_1 = 0.05$
Site Class:	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 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	77.5%	1.2D + 1.0W	Pass
Serviceability Usage	41.1%	1.0D + 1.0W	Pass
Lower Flange Plate @ 148.7 ft	33.1%	Bolts	Pass
Base Plate @ 0.0 ft	71.3%	Rods	Pass
Pier	72.9%	Moment [Soil]	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	5,561.8	76.9	41.8

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

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

DISH WIRELESS L.L.C. Final Loading

Elev (ft)	Qty	Equipment	Lines
174.0	1	Platform with Handrails	(1) 1.75" (44.5mm) Hybrid
	1	Raycap RDIDC-9181-PF-48	
	3	JMA Wireless MX08FRO665-21	
	3	Samsung SFG-ARR3J601DI	
	3	Samsung SFG-ARR3KM01DI	

Install proposed lines inside the pole shaft.

Other Existing/Reserved Loading

Elev (ft)	Qty	Equipment	Lines	Carrier
186.3	2	15' Omni	-	SPOK HOLDINGS, INC.
179.6	1	TTA	-	SPOK HOLDINGS, INC.
167.2	3	Samsung B2/B66A RRH-BR049	-	VERIZON WIRELESS
167.1	3	Samsung B5/B13 RRH-BR04C	-	VERIZON WIRELESS
167.0	3	Alcatel-Lucent B66a RRH4x45 (AWS-3)	-	VERIZON WIRELESS
164.8	6	Commscope HBXX-6517DS-A2M	-	VERIZON WIRELESS
164.1	3	Amphenol Antel QUAD656C0000X	-	VERIZON WIRELESS
161.6	3	72" x 14" Panel	-	VERIZON WIRELESS
160.0	1	Platform with Handrails	(12) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
	2	Kaelus KA-6030		
	2	Raycap RRFDC-3315-PF-48		
	3	Commscope CBC78T-DS-43-2X		
	3	Samsung B2/B66A RRH ORAN (RF 4439d-25A)		
	3	Samsung B5/B13 RRH ORAN (RF4440d-13A)		
	3	Samsung MT6407-77A		
156.7	3	Ericsson RRUS 32 B30 (60 lbs)	-	AT&T MOBILITY
156.0	3	Ericsson RRUS 11 (Band 12)	-	AT&T MOBILITY
155.0	3	Ericsson AIR 6449 B77D/ C-Band	(2) 0.39" (10mm) Fiber Trunk (4) 0.78" (19.7mm) 8 AWG 6 (1) 2" Carflex Non-Metallic Conduit	AT&T MOBILITY
154.9	1	Raycap DC6-48-60-18-8F	-	AT&T MOBILITY
154.5	1	Raycap DC6-48-60-18-8C	-	AT&T MOBILITY
154.3	3	Ericsson RRUS 32 B2	-	AT&T MOBILITY
154.2	1	Raycap DC6-48-60-18-8F ("Squid")	-	AT&T MOBILITY
	3	Ericsson RRUS 32 B66A		
154.0	3	Ericsson RRUS 4478 B14 (15")	(2) 2" conduit	AT&T MOBILITY
153.7	3	Kathrein Scala 80010965	-	AT&T MOBILITY
153.3	6	Commscope SBNHH-1D65A	-	AT&T MOBILITY
	6	Powerwave Allgon LGP17201		
153.0	1	Platform w/ Handrails	(2) 0.41" (10.3mm) Fiber (4) 0.78" (19.7mm) 8 AWG 6 (1) 0.92" (23.4mm) Cable (2) 0.96" (24.3mm) Cable (18) 1 1/4" Coax	AT&T MOBILITY
	1	Raycap DC6-48-60-18-8F		
	1	Raycap DC6-48-60-18-8F ("Squid")		
	1	Raycap DC9-48-60-24-8C-EV		
	3	Ericsson RRUS 32 B2		
	3	Ericsson RRUS 32 B30 (60 lbs)		
	3	Ericsson RRUS 32 B66A		
	3	Ericsson RRUS 4449 B5, B12		
3	Ericsson RRUS 4478 B14 (15")			



Elev (ft)	Qty	Equipment	Lines	Carrier
	3	Ericsson RRUS E2 B29		
	3	Mount Reinforcement		
	3	Kathrein Scala 80010965		
	3	Quintel QD6616-7		
	6	Andrew APTDC-BDFDM-DBW		
	6	Powerwave Allgon 7020.00 Dual Band RET		
152.9	3	Powerwave Allgon 7770.00	-	AT&T MOBILITY
151.0	3	Ericsson AIR 6419 B77G	-	AT&T MOBILITY
150.6	3	Powerwave Allgon 7020.00 Dual Band RET	-	AT&T MOBILITY
130.0	1	Platform with Handrails	(4) 1 5/8" Hybriflex	T-MOBILE
	3	Ericsson 4424 B25		
	3	Ericsson Air6449 B41		
	3	Ericsson RRUS 4415 B66		
	3	Ericsson Radio 2212 B13		
	3	Ericsson Radio 4449 B71 B85A		
	3	Mount Reinforcement		
	3	RFS APX16DWV-16DWVS-E-A20		
	3	RFS APXVAARR24_43-U-NA20		

(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.

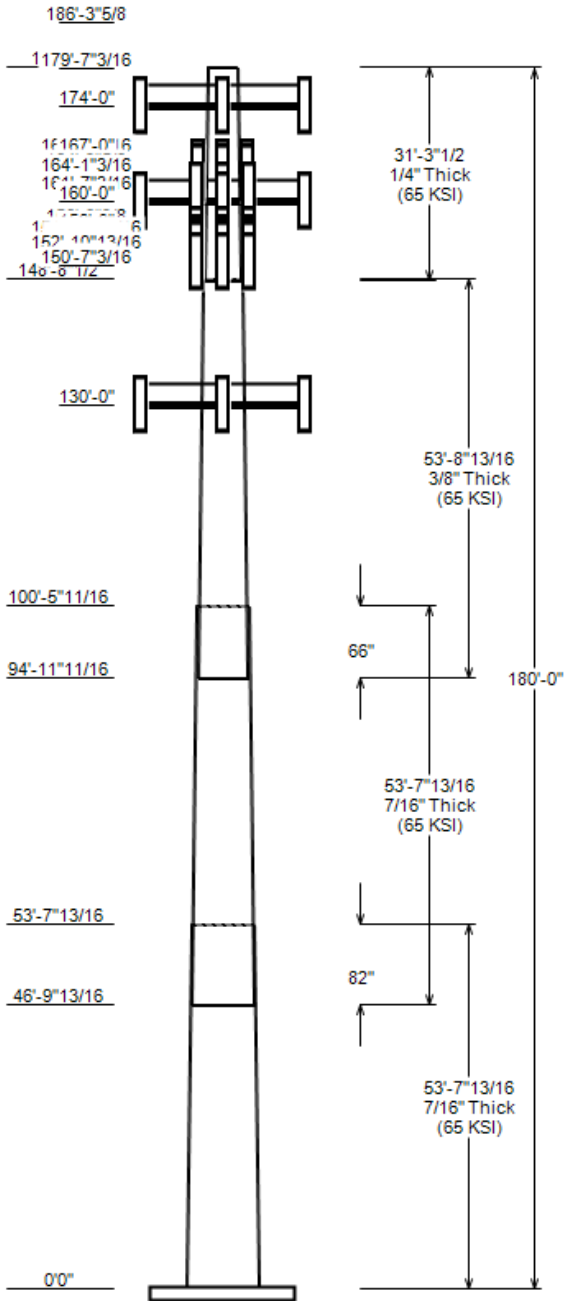
All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Services LLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

ANALYSIS PARAMETERS

Nominal Wind: 127 mph	Ice Wind: 50 mph w/ 1" ice	Service Wind: 60 mph
Risk Category: II	Exposure: B	S _s : 0.191 S _i : 0.052
Topo Category: 1	Topo Factor: Method 1	Topo Feature:
Structure Height: 180 ft	Base Elevation: 0.00 ft	Structure Type: Custom
Base Diameter: 62.45 in	Base Rotation: 0°	Taper: 0.2290 (in/ft)

POLE SECTION PROPERTIES

Section	Length (ft)	Flat Diameter (in)		Thick (in)	Joint Type	Joint Length (in)	Pole Shape	Yield Strength (ksi)
		Top	Bottom					
1	53.653	50.18	62.45	0.438		0.000	18 Sides	65
2	53.653	40.36	52.62	0.438	Slip Joint	82.000	18 Sides	65
3	53.736	30.08	42.36	0.375	Slip Joint	66.000	18 Sides	65
4	31.292	23.40	30.44	0.250	Butt Joint	0.000	18 Sides	65



DISCRETE APPURTENANCE

LINEAR APPURTENANCE

Elev (ft)	Description	Elev To (ft)	Description
186.3	(2) Generic 15' Omni	186.0	(2) 1 5/8" Coax
179.6	(1) Generic TTA	174.0	(1) 1.75" (44.5mm) Hybrid
174.0	(1) Raycap RDIDC-9181-PF-48	160.0	(2) 1 5/8" Hybriflex
174.0	(3) Samsung SFG-ARR3KM01DI	160.0	(12) 1 5/8" Coax
174.0	(3) Samsung SFG-ARR3J601DI	157.0	(1) 2" conduit
174.0	(3) JMA Wireless MX08FRO665-21	157.0	(2) 0.78" (19.7mm) 8 AWG 6
174.0	(1) Generic Flat Platform with Han	155.0	(1) 2" Carflex Non-Metallic Conduit
167.2	(3) Samsung B2/B66A RRH-BR049	155.0	(4) 0.78" (19.7mm) 8 AWG 6
167.1	(3) Samsung B5/B13 RRH-BR04C	155.0	(2) 0.39" (10mm) Fiber Trunk
167.0	(3) Alcatel-Lucent B66a RRH4x45 (A	154.0	(2) 2" conduit
164.8	(6) Commscope HBXX-6517DS-A2M	153.0	(12) 1 1/4" Coax
164.1	(3) Amphenol Antel QUAD656C0000X	153.0	(6) 1 1/4" Coax
161.6	(3) Generic 72" x 14" Panel	153.0	(2) 0.96" (24.3mm) Cable
160.0	(3) Commscope CBC78T-DS-43-2X	153.0	(1) 0.92" (23.4mm) Cable
160.0	(2) Kaelus KA-6030	153.0	(4) 0.78" (19.7mm) 8 AWG 6
160.0	(3) Samsung B2/B66A RRH ORAN (RF 4	153.0	(2) 0.41" (10.3mm) Fiber
160.0	(2) Raycap RRFDC-3315-PF-48	130.0	(4) 1 5/8" Hybriflex
160.0	(3) Samsung MT6407-77A		
160.0	(6) Commscope JAHH-65B-R3B		
160.0	(1) Generic Round Platform with Ha		
156.7	(3) Ericsson RRUS 32 B30 (60 lbs)		
156.0	(3) Ericsson RRUS 11 (Band 12)		
155.0	(3) Ericsson AIR 6449 B77D/ C-Band		
154.9	(1) Raycap DC6-48-60-18-8F		
154.5	(1) Raycap DC6-48-60-18-8C		
154.3	(3) Ericsson RRUS 32 B2		
154.2	(1) Raycap DC6-48-60-18-8F ("Squid		
154.2	(3) Ericsson RRUS 32 B66A		
154.0	(3) Ericsson RRUS 4478 B14 (15")		
153.7	(3) Kathrein Scala 80010965		
153.3	(6) Powerwave Allgon LGP17201		
153.3	(6) Commscope SBNHH-1D65A		
153.0	(6) Andrew APTDC-BDFDM-DBW		
153.0	(6) Powerwave Allgon 7020.00 Dual		
153.0	(1) Raycap DC9-48-60-24-8C-EV		
153.0	(1) Raycap DC6-48-60-18-8F		
153.0	(1) Raycap DC6-48-60-18-8F ("Squid		
153.0	(3) Ericsson RRUS 4478 B14 (15")		
153.0	(3) Ericsson RRUS 4449 B5, B12		
153.0	(3) Ericsson RRUS 32 B30 (60 lbs)		
153.0	(3) Ericsson RRUS 32 B66A		
153.0	(3) Ericsson RRUS 32 B2		
153.0	(3) Ericsson RRUS E2 B29		
153.0	(3) Generic Mount Reinforcement		
153.0	(3) Quintel QD6616-7		
153.0	(3) Kathrein Scala 80010965		
153.0	(1) Flat Platform w/ Round Handrai		
152.9	(3) Powerwave Allgon 7770.00		
151.0	(3) Ericsson AIR 6419 B77G		
150.6	(3) Powerwave Allgon 7020.00 Dual		
130.0	(3) Ericsson RRUS 4415 B66		
130.0	(3) Ericsson Radio 4449 B71 B85A		
130.0	(3) Ericsson Radio 2212 B13		
130.0	(3) Ericsson 4424 B25		
130.0	(3) Generic Mount Reinforcement		
130.0	(3) Ericsson Air6449 B41		
130.0	(3) RFS APX16DWV-16DWVS-E-A20		
130.0	(3) RFS APXVAARR24_43-U-NA20		
130.0	(1) Generic Round Platform with Ha		

GLOBAL BASE REACTIONS

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	5561.82	76.85	41.78
0.9D + 1.0W	5471.71	57.62	41.75
1.2D + 1.0Di + 1.0Wi	1279.00	100.09	9.67
1.2D + 1.0Ev + 1.0Eh	286.53	77.40	1.93
0.9D + 1.0Ev + 1.0Eh	280.49	53.60	1.92
1.0D + 1.0W	1100.39	64.10	8.34

ANALYSIS PARAMETERS

Location:	New London County,CT	Height:	180 ft
Type and Shape:	Custom, 18 Sides	Base Diameter:	62.45 in
Manufacturer:	FWT	Top Diameter:	23.40 in
K_d (non-service):	0.95	Taper:	0.2290 in/ft
K_e:	1.00	Rotation:	0.000°

ICE & WIND PARAMETERS

Risk Category:	II	Design Wind Speed:	127 mph
Exposure Category:	B	Design Wind Speed w/ Ice:	50 mph
Topo Factor Procedure:	Method 1	Design Ice Thickness:	1.00 in
Topographic Category:	1	Service Wind Speed:	60 mph
Crest Height:	0 ft	HMSL:	94.00 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	2.96
T_L (sec):	6	P:	1
S_s:	0.191	S₁:	0.052
F_a:	1.600	F_v:	2.400
S_{ds}:	0.204	S_{d1}:	0.083
		C_s:	0.030
		C_s Max:	0.030
		C_s Min:	0.030

LOAD CASES

1.2D + 1.0W	127 mph Wind with No Ice
0.9D + 1.0W	127 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 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	53.65	0.4375	65		0.00	14,166	62.45	-0.003	86.11	41,837.0	23.41	142.74	50.18	53.65	69.08	21,599.	18.46	114.71	0.2286	
2-18	53.65	0.4375	65	Slip	82.00	11,675	52.62	46.817	72.46	24,931.5	19.45	120.28	40.36	100.47	55.43	11,160.	14.50	92.24	0.2286	
3-18	53.74	0.3750	65	Slip	66.00	7,802	42.36	94.974	49.98	11,132.5	18.16	112.97	30.08	148.71	35.36	3,941.6	12.38	80.21	0.2286	
4-18	31.29	0.2500	65	Butt	0.00	2,253	30.44	148.708	23.95	2,757.8	19.70	121.75	23.40	180.00	18.37	1,243.8	14.74	93.60	0.2249	
Total Shaft Weight						35,896														

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
186.30	Generic 15' Omni	2	1.00	0.000	40.00	4.500	1.00	116.96	8.134	1.00
179.60	Generic TTA	1	0.80	0.000	10.00	1.200	1.00	34.46	1.693	1.00
174.00	Samsung SFG-ARR3J601DI	3	0.75	0.000	94.60	2.063	0.67	143.34	2.702	0.67
174.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	238.57	14.392	0.64
174.00	Samsung SFG-ARR3KM01DI	3	0.75	0.000	61.30	1.875	0.50	101.96	2.485	0.50
174.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	60.36	2.477	1.00
174.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3703.10	56.603	1.00
167.20	Samsung B2/B66A RRH-BR049	3	1.00	0.000	84.40	1.875	0.50	127.48	2.485	0.50
167.10	Samsung B5/B13 RRH-BR04C	3	1.00	0.000	70.30	1.875	0.50	108.93	2.484	0.50
167.00	Alcatel-Lucent B66a RRH4x45 (A	3	1.00	0.000	67.00	2.660	0.67	114.85	3.435	0.67
164.80	Commscope HBXX-6517DS-A2M	6	0.75	0.000	40.80	8.528	0.68	159.38	10.487	0.68
164.10	Amphenol Antel QUAD656C0000X	3	0.75	0.000	54.00	13.242	0.62	229.75	15.193	0.62
161.60	Generic 72" x 14" Panel	3	0.75	0.000	45.00	9.222	0.67	174.40	11.089	0.67
160.00	Commscope CBC78T-DS-43-2X	3	0.75	0.000	20.70	0.552	0.50	35.54	0.893	0.50
160.00	Kaelus KA-6030	2	0.75	0.000	17.60	0.963	0.50	33.44	1.402	0.50
160.00	Samsung B5/B13 RRH ORAN (RF444	3	0.75	0.000	70.30	1.875	0.50	111.88	2.481	0.50
160.00	Samsung B2/B66A RRH ORAN (RF 4	3	0.75	0.000	74.70	1.875	0.50	117.62	2.479	0.50
160.00	Raycap RRFDC-3315-PF-48	2	0.75	0.000	26.90	2.512	0.67	80.41	3.211	0.67
160.00	Commscope JAHH-65B-R3B	6	0.75	0.000	60.60	9.113	0.69	196.48	10.976	0.69
160.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3587.91	43.618	1.00
160.00	Samsung MT6407-77A	3	0.75	0.000	81.60	4.709	0.61	150.06	5.729	0.61
156.70	Ericsson RRUS 32 B30 (60 lbs)	3	0.75	3.000	60.00	2.692	0.50	107.67	3.467	0.50
156.00	Ericsson RRUS 11 (Band 12)	3	0.75	0.000	50.00	2.566	0.67	95.70	3.268	0.67
155.00	Ericsson AIR 6449 B77D/ C-Band	3	0.75	0.000	81.60	4.028	0.70	159.67	4.948	0.70
154.90	Raycap DC6-48-60-18-8F	1	0.75	3.000	20.00	1.260	0.50	55.28	1.701	0.50
154.50	Raycap DC6-48-60-18-8C	1	0.75	0.000	16.00	2.030	1.00	55.00	2.539	1.00
154.30	Ericsson RRUS 32 B2	3	0.75	3.000	53.00	2.743	0.50	102.27	3.526	0.50
154.20	Raycap DC6-48-60-18-8F ("Squid	1	0.75	0.000	18.90	1.470	0.50	60.24	1.938	0.50
154.20	Ericsson RRUS 32 B66A	3	0.75	3.000	50.70	2.720	0.50	99.79	3.499	0.50
154.00	Ericsson RRUS 4478 B14 (15")	3	0.75	3.000	59.40	1.650	0.50	92.68	2.217	0.50
153.70	Kathrein Scala 80010965	3	0.75	0.000	97.60	13.814	0.62	276.11	15.857	0.62
153.30	Commscope SBNHH-1D65A	6	0.75	0.000	33.50	5.883	0.69	124.11	7.307	0.69
153.30	Powerwave Allgon LGP17201	6	0.75	0.000	31.00	1.668	0.50	56.53	2.237	0.50
153.00	Generic Mount Reinforcement	3	0.75	0.000	200.00	4.980	0.67	329.54	8.308	0.67
153.00	Ericsson RRUS E2 B29	3	0.75	0.000	60.00	3.145	0.62	114.14	3.921	0.62
153.00	Ericsson RRUS 32 B2	3	0.75	0.000	53.00	2.743	0.67	102.23	3.526	0.67
153.00	Ericsson RRUS 32 B66A	3	0.75	0.000	50.70	2.720	0.67	99.76	3.499	0.67
153.00	Ericsson RRUS 32 B30 (60 lbs)	3	0.75	0.000	60.00	2.692	0.67	107.56	3.465	0.67
153.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	114.14	2.593	0.50
153.00	Ericsson RRUS 4478 B14 (15")	3	0.75	0.000	59.40	1.650	0.50	92.67	2.217	0.50
153.00	Raycap DC6-48-60-18-8F ("Squid	1	0.75	0.000	18.90	1.470	1.00	60.21	1.937	1.00
153.00	Raycap DC6-48-60-18-8F	1	0.75	0.000	20.00	1.260	1.00	55.24	1.701	1.00
153.00	Raycap DC9-48-60-24-8C-EV	1	0.75	0.000	16.00	1.010	1.00	46.18	1.385	1.00
153.00	Powerwave Allgon 7020.00 Dual	6	0.75	0.000	2.20	0.339	0.50	9.04	0.613	0.50
153.00	Andrew APTDC-BDFDM-DBW	6	0.75	0.000	1.30	0.102	0.50	3.75	0.259	0.50
153.00	Quintel QD6616-7	3	0.75	0.000	130.00	13.578	0.64	325.80	15.477	0.64
153.00	Kathrein Scala 80010965	3	0.75	0.000	97.60	13.814	0.62	276.05	15.856	0.62
153.00	Flat Platform w/ Round Handrai	1	1.00	0.000	2500.00	34.800	1.00	3665.74	51.027	1.00
152.90	Powerwave Allgon 7770.00	3	0.75	0.000	35.00	5.508	0.65	111.04	6.930	0.65

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
151.00	Ericsson AIR 6419 B77G	3	0.75	0.000	66.10	3.797	0.65	130.95	4.677	0.65
150.60	Powerwave Allgon 7020.00 Dual	3	0.75	0.000	2.20	0.339	0.50	9.03	0.612	0.50
130.00	Generic Mount Reinforcement	3	0.75	0.000	200.00	4.980	0.67	327.20	8.248	0.67
130.00	Ericsson 4424 B25	3	0.75	0.000	86.00	2.052	0.50	133.92	2.672	0.50
130.00	Ericsson Radio 2212 B13	3	0.75	1.400	42.80	1.856	0.50	76.14	2.447	0.50
130.00	Ericsson Radio 4449 B71 B85A	3	0.75	0.000	75.00	1.650	0.50	114.53	2.208	0.50
130.00	Ericsson RRUS 4415 B66	3	0.75	0.000	46.00	1.650	0.50	74.46	2.208	0.50
130.00	RFS APX16DWV-16DWVS-E-A20	3	0.75	0.000	40.70	6.586	0.60	117.48	8.009	0.60
130.00	RFS APXVAARR24_43-U-NA20	3	0.75	0.000	127.90	20.243	0.63	385.93	22.681	0.63
130.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	3564.59	43.266	1.00
130.00	Ericsson Air6449 B41	3	0.75	0.000	104.00	5.682	0.63	193.57	6.725	0.63
Totals	Row Count: 60	171			19,871.40			36,178.90		

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	186.00	2	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	SPOK HOLDINGS, INC.
0.00	174.00	1	1.75" (44.5mm) Hybrid	1.75	2.72	N	0	0	0	0	0	N	DISH WIRELESS L.L.C.
0.00	160.00	12	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	160.00	2	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIRELESS
0.00	157.00	2	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	157.00	1	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	155.00	1	2" Carflex Non-Metall	2.36	0.68	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	154.00	2	2" conduit	2.38	3.65	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	153.00	12	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	153.00	6	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	153.00	4	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	153.00	2	0.96" (24.3mm) Cable	0.96	0.88	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	153.00	2	0.41" (10.3mm) Fiber	0.41	0.09	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	153.00	1	0.92" (23.4mm) Cable	0.92	0.89	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	130.00	4	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	T-MOBILE

SEGMENT PROPERTIES

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in ³)	Z (in ³)	Weight (lb)
0.00		0.4375	62.450	86.109	41,837.00	23.41	142.74	73.9	1319.5	0.0	0.0
5.00		0.4375	61.307	84.522	39,566.00	22.95	140.13	74.4	1271.1	0.0	1,451.5
10.00		0.4375	60.164	82.935	37,378.70	22.48	137.52	75	1223.7	0.0	1,424.5
15.00		0.4375	59.021	81.348	35,273.50	22.02	134.91	75.5	1177.1	0.0	1,397.5
20.00		0.4375	57.878	79.760	33,248.90	21.56	132.29	76	1131.5	0.0	1,370.5
25.00		0.4375	56.735	78.173	31,303.30	21.10	129.68	76.6	1086.7	0.0	1,343.5
30.00		0.4375	55.592	76.586	29,435.10	20.64	127.07	77.1	1042.9	0.0	1,316.5
35.00		0.4375	54.449	74.999	27,642.70	20.18	124.45	77.7	999.9	0.0	1,289.5
40.00		0.4375	53.306	73.412	25,924.70	19.72	121.84	78.2	957.9	0.0	1,262.5
45.00		0.4375	52.163	71.825	24,279.30	19.26	119.23	78.7	916.8	0.0	1,235.5
46.82	Bot - Section 2	0.4375	51.747	71.247	23,698.30	19.09	118.28	78.9	902.0	0.0	442.9
50.00		0.4375	51.020	70.238	22,705.10	18.80	116.62	79.3	876.5	0.0	1,544.4
53.65	Top - Section 1	0.4375	51.060	70.293	22,759.00	18.82	116.71	79.3	877.9	0.0	1,746.7
55.00		0.4375	50.752	69.865	22,346.10	18.69	116.00	79.4	867.2	0.0	321.3
60.00		0.4375	49.609	68.278	20,857.50	18.23	113.39	80	828.1	0.0	1,175.2
65.00		0.4375	48.466	66.691	19,436.60	17.77	110.78	80.5	789.9	0.0	1,148.2
70.00		0.4375	47.323	65.104	18,081.70	17.31	108.17	81	752.6	0.0	1,121.2
75.00		0.4375	46.180	63.517	16,791.20	16.85	105.55	81.6	716.2	0.0	1,094.2
80.00		0.4375	45.037	61.930	15,563.70	16.39	102.94	82.1	680.7	0.0	1,067.2
85.00		0.4375	43.894	60.343	14,397.50	15.93	100.33	82.6	646.0	0.0	1,040.2

SEGMENT PROPERTIES												
Seg Top Elev (ft)	Description	(Max Length: 5 ft)	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in ³)	Z (in ³)	Weight (lb)
90.00			0.4375	42.751	58.755	13,291.00	15.47	97.72	82.6	612.3	0.0	1,013.2
94.97	Bot - Section 3		0.4375	41.614	57.177	12,248.50	15.01	95.12	82.6	579.7	0.0	980.8
95.00			0.4375	41.608	57.168	12,242.80	15.01	95.10	82.6	579.5	0.0	10.1
100.00			0.4375	40.465	55.581	11,251.20	14.55	92.49	82.6	547.6	0.0	1,797.7
100.47	Top - Section 2		0.3750	41.107	48.480	10,162.10	17.57	109.62	80.7	486.9	0.0	167.2
105.00			0.3750	40.072	47.248	9,406.90	17.08	106.86	81.3	462.4	0.0	737.4
110.00			0.3750	38.929	45.887	8,617.60	16.54	103.81	81.9	436.0	0.0	792.3
115.00			0.3750	37.786	44.527	7,873.60	16.00	100.76	82.6	410.4	0.0	769.1
120.00			0.3750	36.643	43.166	7,173.80	15.47	97.71	82.6	385.6	0.0	746.0
125.00			0.3750	35.500	41.806	6,516.70	14.93	94.67	82.6	361.6	0.0	722.9
130.00			0.3750	34.357	40.446	5,901.00	14.39	91.62	82.6	338.3	0.0	699.7
135.00			0.3750	33.214	39.085	5,325.30	13.85	88.57	82.6	315.8	0.0	676.6
140.00			0.3750	32.071	37.725	4,788.40	13.32	85.52	82.6	294.1	0.0	653.4
145.00			0.3750	30.928	36.364	4,288.80	12.78	82.47	82.6	273.1	0.0	630.3
148.71	Top - Section 3		0.3750	30.080	35.355	3,941.60	12.38	80.21	82.6	258.1	0.0	452.5
148.71	Bot - Section 4		0.2500	30.438	23.953	2,757.80	19.70	121.75	78.2	178.5	0.0	
150.00			0.2500	30.147	23.722	2,679.00	19.50	120.59	78.5	175.0	0.0	104.8
150.60			0.2500	30.012	23.615	2,642.90	19.40	120.05	78.6	173.4	0.0	48.3
151.00			0.2500	29.922	23.544	2,619.00	19.34	119.69	78.7	172.4	0.0	32.1
152.90			0.2500	29.495	23.205	2,507.40	19.04	117.98	79	167.4	0.0	151.1
153.00			0.2500	29.472	23.187	2,501.70	19.02	117.89	79	167.2	0.0	7.9
153.30			0.2500	29.405	23.134	2,484.40	18.98	117.62	79.1	166.4	0.0	23.6
153.70			0.2500	29.315	23.062	2,461.40	18.91	117.26	79.2	165.4	0.0	31.4
154.00			0.2500	29.247	23.009	2,444.30	18.87	116.99	79.2	164.6	0.0	23.5
154.20			0.2500	29.202	22.973	2,433.00	18.83	116.81	79.2	164.1	0.0	15.6
154.30			0.2500	29.180	22.955	2,427.30	18.82	116.72	79.3	163.8	0.0	7.8
154.50			0.2500	29.135	22.919	2,416.00	18.79	116.54	79.3	163.3	0.0	15.6
154.90			0.2500	29.045	22.848	2,393.50	18.72	116.18	79.4	162.3	0.0	31.1
155.00			0.2500	29.023	22.830	2,387.90	18.71	116.09	79.4	162.1	0.0	7.8
156.00			0.2500	28.798	22.652	2,332.30	18.55	115.19	79.6	159.5	0.0	77.4
156.70			0.2500	28.640	22.527	2,294.00	18.44	114.56	79.7	157.8	0.0	53.8
160.00			0.2500	27.898	21.938	2,118.70	17.91	111.59	80.3	149.6	0.0	249.7
161.60			0.2500	27.538	21.652	2,037.10	17.66	110.15	80.6	145.7	0.0	118.7
164.10			0.2500	26.976	21.206	1,913.70	17.26	107.90	81.1	139.7	0.0	182.3
164.80			0.2500	26.818	21.081	1,880.10	17.15	107.27	81.2	138.1	0.0	50.4
165.00			0.2500	26.774	21.046	1,870.60	17.12	107.09	81.3	137.6	0.0	14.3
167.00			0.2500	26.324	20.689	1,777.00	16.80	105.29	81.6	133.0	0.0	142.0
167.10			0.2500	26.301	20.671	1,772.40	16.79	105.20	81.7	132.7	0.0	7.0
167.20			0.2500	26.279	20.653	1,767.80	16.77	105.11	81.7	132.5	0.0	7.0
170.00			0.2500	25.649	20.153	1,642.60	16.33	102.60	82.2	126.1	0.0	194.4
174.00			0.2500	24.749	19.440	1,474.20	15.69	99.00	82.6	117.3	0.0	269.5
175.00			0.2500	24.525	19.261	1,434.00	15.53	98.10	82.6	115.2	0.0	65.8
179.60			0.2500	23.490	18.440	1,258.30	14.80	93.96	82.6	105.5	0.0	295.1
180.00			0.2500	23.400	18.369	1,243.80	14.74	93.60	82.6	104.7	0.0	25.1
Total:											35,895.3	

CALCULATED FORCES													
Load Case: 1.2D + 1.0W			127 mph Wind with No Ice										29 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	-76.85	-41.78	0.00	-5,561.8	0.00	5,561.82	5,724.86	1,511.21	8,464.29	7,310.45	0	0	0.775
5.00	-74.66	-41.45	0.00	-5,352.9	0.00	5,352.93	5,660.55	1,483.36	8,155.18	7,094.17	0.1	-0.19	0.769
10.00	-72.49	-41.12	0.00	-5,145.7	0.00	5,145.68	5,594.70	1,455.50	7,851.81	6,879.04	0.4	-0.37	0.762
15.00	-70.36	-40.80	0.00	-4,940.1	0.00	4,940.07	5,527.30	1,427.65	7,554.20	6,665.16	0.89	-0.57	0.755
20.00	-68.26	-40.47	0.00	-4,736.1	0.00	4,736.10	5,458.35	1,399.80	7,262.33	6,452.65	1.59	-0.76	0.747
25.00	-66.19	-40.14	0.00	-4,533.8	0.00	4,533.75	5,387.86	1,371.94	6,976.22	6,241.61	2.49	-0.96	0.740
30.00	-64.16	-39.81	0.00	-4,333.0	0.00	4,333.04	5,315.82	1,344.09	6,695.85	6,032.16	3.61	-1.16	0.731
35.00	-62.16	-39.47	0.00	-4,134.0	0.00	4,133.98	5,242.22	1,316.23	6,421.23	5,824.40	4.93	-1.37	0.723

CALCULATED FORCES

40.00	-60.19	-39.10	0.00	-3,936.6	0.00	3,936.65	5,167.09	1,288.38	6,152.37	5,618.45	6.47	-1.57	0.713
45.00	-58.30	-38.83	0.00	-3,741.1	0.00	3,741.14	5,090.40	1,260.52	5,889.25	5,414.42	8.23	-1.78	0.703
46.82	-57.59	-38.64	0.00	-3,670.5	0.00	3,670.50	5,062.11	1,250.39	5,794.93	5,340.67	8.93	-1.86	0.700
50.00	-55.44	-38.33	0.00	-3,547.6	0.00	3,547.62	5,012.16	1,232.67	5,631.89	5,212.41	10.22	-2	0.693
53.65	-53.05	-38.07	0.00	-3,407.6	0.00	3,407.61	5,014.93	1,233.64	5,640.79	5,219.44	11.81	-2.16	0.664
55.00	-52.50	-37.82	0.00	-3,356.3	0.00	3,356.32	4,993.60	1,226.14	5,572.37	5,165.35	12.43	-2.22	0.661
60.00	-50.66	-37.37	0.00	-3,167.2	0.00	3,167.25	4,913.45	1,198.28	5,322.11	4,966.00	14.87	-2.43	0.649
65.00	-48.85	-36.91	0.00	-2,980.4	0.00	2,980.41	4,831.76	1,170.43	5,077.59	4,768.91	17.52	-2.64	0.636
70.00	-47.07	-36.45	0.00	-2,795.9	0.00	2,795.86	4,748.52	1,142.58	4,838.82	4,574.21	20.39	-2.85	0.622
75.00	-45.34	-35.97	0.00	-2,613.6	0.00	2,613.64	4,663.73	1,114.72	4,605.80	4,382.00	23.49	-3.06	0.607
80.00	-43.63	-35.49	0.00	-2,433.8	0.00	2,433.78	4,577.39	1,086.87	4,378.53	4,192.39	26.81	-3.28	0.591
85.00	-41.97	-35.01	0.00	-2,256.3	0.00	2,256.31	4,483.15	1,059.01	4,157.01	3,999.83	30.35	-3.49	0.575
90.00	-40.34	-34.52	0.00	-2,081.3	0.00	2,081.27	4,365.24	1,031.16	3,941.25	3,791.17	34.12	-3.7	0.559
94.97	-38.80	-34.22	0.00	-1,909.6	0.00	1,909.62	4,247.97	1,003.46	3,732.38	3,589.20	38.09	-3.92	0.542
95.00	-38.74	-34.02	0.00	-1,908.7	0.00	1,908.67	4,247.32	1,003.30	3,731.23	3,588.09	38.11	-3.92	0.542
100.00	-36.22	-33.62	0.00	-1,738.6	0.00	1,738.57	4,129.40	975.45	3,526.96	3,390.61	42.33	-4.13	0.523
100.47	-35.94	-33.41	0.00	-1,722.7	0.00	1,722.69	3,522.83	850.82	3,130.30	2,948.50	42.74	-4.15	0.596
105.00	-34.69	-32.94	0.00	-1,571.4	0.00	1,571.44	3,457.66	829.20	2,973.26	2,819.74	46.76	-4.34	0.569
110.00	-33.33	-32.45	0.00	-1,406.7	0.00	1,406.74	3,384.20	805.32	2,804.53	2,679.63	51.43	-4.57	0.536
115.00	-32.01	-31.95	0.00	-1,244.5	0.00	1,244.52	3,308.12	781.45	2,640.73	2,540.99	56.32	-4.78	0.501
120.00	-30.73	-31.45	0.00	-1,084.8	0.00	1,084.77	3,207.05	757.57	2,481.85	2,387.35	61.44	-4.99	0.466
125.00	-29.49	-30.95	0.00	-927.5	0.00	927.51	3,105.98	733.70	2,327.91	2,238.49	66.77	-5.19	0.426
130.00	-23.09	-25.88	0.00	-772.6	0.00	772.63	3,004.91	709.82	2,178.89	2,094.44	72.31	-5.38	0.378
135.00	-21.96	-25.37	0.00	-643.2	0.00	643.23	2,903.84	685.95	2,034.81	1,955.17	78.03	-5.55	0.338
140.00	-20.88	-24.85	0.00	-516.4	0.00	516.40	2,802.76	662.07	1,895.65	1,820.69	83.92	-5.71	0.292
145.00	-19.83	-24.39	0.00	-392.2	0.00	392.15	2,701.69	638.20	1,761.42	1,691.01	89.96	-5.84	0.241
148.71	-19.07	-24.11	0.00	-301.7	0.00	301.70	2,626.73	620.49	1,665.04	1,597.92	94.52	-5.93	0.198
148.71	-19.07	-24.11	0.00	-301.7	0.00	301.70	1,686.34	420.37	1,146.21	1,046.99	94.52	-5.93	0.303
150.00	-18.87	-24.01	0.00	-270.6	0.00	270.56	1,675.25	416.33	1,124.26	1,030.02	96.13	-5.95	0.277
150.60	-18.77	-23.94	0.00	-256.2	0.00	256.15	1,670.07	414.45	1,114.14	1,022.16	96.87	-5.97	0.265
151.00	-18.50	-23.56	0.00	-246.6	0.00	246.57	1,666.60	413.20	1,107.41	1,016.93	97.37	-5.98	0.257
152.90	-18.12	-23.05	0.00	-201.8	0.00	201.81	1,650.01	407.25	1,075.75	992.18	99.76	-6.03	0.218
153.00	-12.77	-17.37	0.00	-199.5	0.00	199.51	1,649.13	406.93	1,074.10	990.88	99.89	-6.03	0.211
153.30	-12.38	-16.24	0.00	-194.3	0.00	194.30	1,646.48	405.99	1,069.14	986.99	100.26	-6.04	0.206
153.70	-12.08	-15.24	0.00	-187.8	0.00	187.80	1,642.95	404.74	1,062.56	981.81	100.77	-6.04	0.200
154.00	-11.83	-15.11	0.00	-183.0	0.00	182.96	1,640.30	403.80	1,057.63	977.93	101.15	-6.05	0.196
154.20	-11.62	-14.90	0.00	-179.5	0.00	179.50	1,638.53	403.17	1,054.35	975.34	101.4	-6.05	0.192
154.30	-11.44	-14.71	0.00	-177.6	0.00	177.56	1,637.64	402.86	1,052.71	974.05	101.53	-6.06	0.191
154.50	-11.40	-14.61	0.00	-174.6	0.00	174.62	1,635.86	402.24	1,049.44	971.47	101.78	-6.06	0.188
154.90	-11.34	-14.56	0.00	-168.7	0.00	168.70	1,632.30	400.98	1,042.92	966.31	102.29	-6.07	0.183
155.00	-11.07	-14.18	0.00	-167.2	0.00	167.25	1,631.41	400.67	1,041.29	965.02	102.42	-6.07	0.181
156.00	-10.79	-13.89	0.00	-153.1	0.00	153.07	1,622.46	397.54	1,025.08	952.16	103.69	-6.09	0.169
156.70	-10.52	-13.55	0.00	-142.9	0.00	142.90	1,616.16	395.35	1,013.80	943.19	104.58	-6.1	0.159
160.00	-6.13	-9.45	0.00	-98.2	0.00	98.18	1,586.07	385.01	961.50	901.22	108.81	-6.15	0.113
161.60	-5.90	-8.58	0.00	-83.0	0.00	83.05	1,571.24	380.00	936.64	881.07	110.87	-6.17	0.099
164.10	-5.59	-7.51	0.00	-61.6	0.00	61.60	1,547.77	372.17	898.44	849.86	114.1	-6.2	0.077
164.80	-5.38	-6.16	0.00	-56.4	0.00	56.35	1,541.13	369.98	887.89	841.19	115.01	-6.2	0.071
165.00	-5.37	-6.07	0.00	-55.1	0.00	55.12	1,539.23	369.35	884.89	838.71	115.27	-6.2	0.069
167.00	-4.98	-5.68	0.00	-43.0	0.00	42.98	1,520.07	363.09	855.13	814.10	117.87	-6.22	0.056
167.10	-4.74	-5.51	0.00	-42.4	0.00	42.41	1,519.11	362.77	853.66	812.87	118	-6.22	0.056
167.20	-4.45	-5.22	0.00	-41.9	0.00	41.86	1,518.14	362.46	852.19	811.65	118.13	-6.22	0.055
170.00	-4.24	-4.93	0.00	-27.2	0.00	27.24	1,490.89	353.69	811.46	777.61	121.77	-6.24	0.038
174.00	-0.48	-0.97	0.00	-7.5	0.00	7.52	1,444.26	341.16	755.00	726.35	127	-6.25	0.011
175.00	-0.42	-0.76	0.00	-6.6	0.00	6.55	1,431.01	338.03	741.20	713.01	128.3	-6.25	0.009
179.60	-0.07	-0.48	0.00	-3.1	0.00	3.07	1,370.02	323.63	679.38	653.23	134.31	-6.25	0.005
180.00	0.00	-0.47	0.00	-2.9	0.00	2.88	1,364.72	322.37	674.13	648.16	134.84	-6.25	0.004

CALCULATED FORCES

Load Case: 0.9D + 1.0W

127 mph Wind with No Ice (Reduced DL)

29 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	-57.62	-41.75	0.00	-5,471.7	0.00	5,471.71	5,724.86	1,511.21	8,464.29	7,310.45	0	0	0.759
5.00	-55.94	-41.35	0.00	-5,263.0	0.00	5,262.98	5,660.55	1,483.36	8,155.18	7,094.17	0.1	-0.18	0.753
10.00	-54.29	-40.97	0.00	-5,056.2	0.00	5,056.21	5,594.70	1,455.50	7,851.81	6,879.04	0.39	-0.37	0.746
15.00	-52.66	-40.58	0.00	-4,851.4	0.00	4,851.39	5,527.30	1,427.65	7,554.20	6,665.16	0.88	-0.56	0.738
20.00	-51.05	-40.20	0.00	-4,648.5	0.00	4,648.49	5,458.35	1,399.80	7,262.33	6,452.65	1.56	-0.75	0.731
25.00	-49.48	-39.82	0.00	-4,447.5	0.00	4,447.51	5,387.86	1,371.94	6,976.22	6,241.61	2.45	-0.94	0.723
30.00	-47.92	-39.44	0.00	-4,248.4	0.00	4,248.43	5,315.82	1,344.09	6,695.85	6,032.16	3.54	-1.14	0.714
35.00	-46.39	-39.04	0.00	-4,051.3	0.00	4,051.26	5,242.22	1,316.23	6,421.23	5,824.40	4.85	-1.34	0.705
40.00	-44.89	-38.63	0.00	-3,856.1	0.00	3,856.06	5,167.09	1,288.38	6,152.37	5,618.45	6.36	-1.54	0.696
45.00	-43.45	-38.33	0.00	-3,662.9	0.00	3,662.93	5,090.40	1,260.52	5,889.25	5,414.42	8.09	-1.75	0.686
46.82	-42.91	-38.11	0.00	-3,593.2	0.00	3,593.20	5,062.11	1,250.39	5,794.93	5,340.67	8.77	-1.83	0.682
50.00	-41.28	-37.79	0.00	-3,472.0	0.00	3,471.98	5,012.16	1,232.67	5,631.89	5,212.41	10.03	-1.96	0.675
53.65	-39.47	-37.52	0.00	-3,334.0	0.00	3,333.96	5,014.93	1,233.64	5,640.79	5,219.44	11.6	-2.12	0.648
55.00	-39.04	-37.24	0.00	-3,283.4	0.00	3,283.41	4,993.60	1,226.14	5,572.37	5,165.35	12.2	-2.18	0.644
60.00	-37.64	-36.76	0.00	-3,097.2	0.00	3,097.23	4,913.45	1,198.28	5,322.11	4,966.00	14.59	-2.38	0.632
65.00	-36.26	-36.27	0.00	-2,913.4	0.00	2,913.44	4,831.76	1,170.43	5,077.59	4,768.91	17.19	-2.59	0.619
70.00	-34.90	-35.78	0.00	-2,732.1	0.00	2,732.09	4,748.52	1,142.58	4,838.82	4,574.21	20.01	-2.79	0.606
75.00	-33.58	-35.28	0.00	-2,553.2	0.00	2,553.20	4,663.73	1,114.72	4,605.80	4,382.00	23.05	-3	0.591
80.00	-32.28	-34.78	0.00	-2,376.8	0.00	2,376.79	4,577.39	1,086.87	4,378.53	4,192.39	26.3	-3.21	0.575
85.00	-31.01	-34.28	0.00	-2,202.9	0.00	2,202.89	4,483.15	1,059.01	4,157.01	3,999.83	29.77	-3.42	0.559
90.00	-29.77	-33.77	0.00	-2,031.5	0.00	2,031.51	4,365.24	1,031.16	3,941.25	3,791.17	33.46	-3.63	0.544
94.97	-28.61	-33.48	0.00	-1,863.6	0.00	1,863.58	4,247.97	1,003.46	3,732.38	3,589.20	37.35	-3.83	0.527
95.00	-28.55	-33.26	0.00	-1,862.6	0.00	1,862.65	4,247.32	1,003.30	3,731.23	3,588.09	37.37	-3.84	0.527
100.00	-26.65	-32.89	0.00	-1,696.4	0.00	1,696.36	4,129.40	975.45	3,526.96	3,390.61	41.49	-4.04	0.508
100.47	-26.44	-32.66	0.00	-1,680.8	0.00	1,680.83	3,522.83	850.82	3,130.30	2,948.50	41.9	-4.06	0.579
105.00	-25.48	-32.18	0.00	-1,533.0	0.00	1,532.97	3,457.66	829.20	2,973.26	2,819.74	45.84	-4.25	0.553
110.00	-24.45	-31.67	0.00	-1,372.1	0.00	1,372.10	3,384.20	805.32	2,804.53	2,679.63	50.4	-4.47	0.521
115.00	-23.45	-31.17	0.00	-1,213.7	0.00	1,213.74	3,308.12	781.45	2,640.73	2,540.99	55.19	-4.68	0.486
120.00	-22.47	-30.67	0.00	-1,057.9	0.00	1,057.90	3,207.05	757.57	2,481.85	2,387.35	60.2	-4.89	0.452
125.00	-21.53	-30.17	0.00	-904.6	0.00	904.57	3,105.98	733.70	2,327.91	2,238.49	65.42	-5.08	0.413
130.00	-16.81	-25.24	0.00	-753.6	0.00	753.62	3,004.91	709.82	2,178.89	2,094.44	70.83	-5.26	0.367
135.00	-15.96	-24.73	0.00	-627.4	0.00	627.42	2,903.84	685.95	2,034.81	1,955.17	76.42	-5.43	0.328
140.00	-15.14	-24.23	0.00	-503.8	0.00	503.76	2,802.76	662.07	1,895.65	1,820.69	82.18	-5.58	0.283
145.00	-14.35	-23.79	0.00	-382.6	0.00	382.60	2,701.69	638.20	1,761.42	1,691.01	88.09	-5.71	0.233
148.71	-13.79	-23.52	0.00	-294.4	0.00	294.38	2,626.73	620.49	1,665.04	1,597.92	92.56	-5.79	0.191
148.71	-13.79	-23.52	0.00	-294.4	0.00	294.38	1,686.34	420.37	1,146.21	1,046.99	92.56	-5.79	0.292
150.00	-13.64	-23.43	0.00	-264.0	0.00	264.00	1,675.25	416.33	1,124.26	1,030.02	94.13	-5.82	0.268
150.60	-13.56	-23.36	0.00	-249.9	0.00	249.94	1,670.07	414.45	1,114.14	1,022.16	94.86	-5.84	0.256
151.00	-13.37	-22.98	0.00	-240.6	0.00	240.60	1,666.60	413.20	1,107.41	1,016.93	95.35	-5.85	0.248
152.90	-13.09	-22.48	0.00	-196.9	0.00	196.94	1,650.01	407.25	1,075.75	992.18	97.68	-5.89	0.209
153.00	-9.20	-16.97	0.00	-194.7	0.00	194.69	1,649.13	406.93	1,074.10	990.88	97.8	-5.89	0.204
153.30	-8.93	-15.85	0.00	-189.6	0.00	189.60	1,646.48	405.99	1,069.14	986.99	98.17	-5.9	0.199
153.70	-8.73	-14.86	0.00	-183.3	0.00	183.26	1,642.95	404.74	1,062.56	981.81	98.67	-5.91	0.193
154.00	-8.55	-14.73	0.00	-178.5	0.00	178.53	1,640.30	403.80	1,057.63	977.93	99.04	-5.92	0.189
154.20	-8.39	-14.53	0.00	-175.1	0.00	175.14	1,638.53	403.17	1,054.35	975.34	99.29	-5.92	0.186
154.30	-8.26	-14.35	0.00	-173.2	0.00	173.24	1,637.64	402.86	1,052.71	974.05	99.41	-5.92	0.184
154.50	-8.23	-14.25	0.00	-170.4	0.00	170.37	1,635.86	402.24	1,049.44	971.47	99.66	-5.93	0.182
154.90	-8.18	-14.20	0.00	-164.6	0.00	164.60	1,632.30	400.98	1,042.92	966.31	100.15	-5.93	0.177
155.00	-7.99	-13.83	0.00	-163.2	0.00	163.18	1,631.41	400.67	1,041.29	965.02	100.28	-5.94	0.175
156.00	-7.79	-13.55	0.00	-149.4	0.00	149.35	1,622.46	397.54	1,025.08	952.16	101.52	-5.95	0.163
156.70	-7.59	-13.22	0.00	-139.4	0.00	139.42	1,616.16	395.35	1,013.80	943.19	102.39	-5.97	0.154
160.00	-4.38	-9.25	0.00	-95.8	0.00	95.81	1,586.07	385.01	961.50	901.22	106.53	-6.02	0.110
161.60	-4.24	-8.39	0.00	-81.0	0.00	81.00	1,571.24	380.00	936.64	881.07	108.55	-6.03	0.095
164.10	-4.02	-7.32	0.00	-60.0	0.00	60.04	1,547.77	372.17	898.44	849.86	111.71	-6.06	0.074
164.80	-3.90	-5.99	0.00	-54.9	0.00	54.91	1,541.13	369.98	887.89	841.19	112.59	-6.06	0.068

CALCULATED FORCES

165.00	-3.89	-5.90	0.00	-53.7	0.00	53.71	1,539.23	369.35	884.89	838.71	112.85	-6.07	0.067
167.00	-3.61	-5.52	0.00	-41.9	0.00	41.92	1,520.07	363.09	855.13	814.10	115.39	-6.08	0.054
167.10	-3.43	-5.35	0.00	-41.4	0.00	41.36	1,519.11	362.77	853.66	812.87	115.51	-6.08	0.053
167.20	-3.23	-5.08	0.00	-40.8	0.00	40.83	1,518.14	362.46	852.19	811.65	115.64	-6.08	0.053
170.00	-3.07	-4.79	0.00	-26.6	0.00	26.61	1,490.89	353.69	811.46	777.61	119.21	-6.1	0.036
174.00	-0.34	-0.95	0.00	-7.4	0.00	7.43	1,444.26	341.16	755.00	726.35	124.31	-6.11	0.010
175.00	-0.30	-0.74	0.00	-6.5	0.00	6.48	1,431.01	338.03	741.20	713.01	125.59	-6.11	0.009
179.60	-0.04	-0.48	0.00	-3.1	0.00	3.07	1,370.02	323.63	679.38	653.23	131.47	-6.11	0.005
180.00	0.00	-0.47	0.00	-2.9	0.00	2.88	1,364.72	322.37	674.13	648.16	131.98	-6.12	0.004

CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi 50 mph Wind with 1" Radial Ice 28 Iterations
 Gust Response Factor: 1.10 Ice Dead Load Factor: 1.00
 Dead load Factor: 1.20
 Wind 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	-100.09	-9.67	0.00	-1,279.0	0.00	1,279.00	5,724.86	1,511.21	8,464.29	7,310.45	0	0	0.192
5.00	-97.72	-9.60	0.00	-1,230.6	0.00	1,230.63	5,660.55	1,483.36	8,155.18	7,094.17	0.02	-0.04	0.191
10.00	-95.35	-9.52	0.00	-1,182.6	0.00	1,182.64	5,594.70	1,455.50	7,851.81	6,879.04	0.09	-0.09	0.189
15.00	-93.00	-9.45	0.00	-1,135.0	0.00	1,135.03	5,527.30	1,427.65	7,554.20	6,665.16	0.2	-0.13	0.187
20.00	-90.68	-9.37	0.00	-1,087.8	0.00	1,087.81	5,458.35	1,399.80	7,262.33	6,452.65	0.37	-0.17	0.185
25.00	-88.39	-9.29	0.00	-1,041.0	0.00	1,040.96	5,387.86	1,371.94	6,976.22	6,241.61	0.57	-0.22	0.183
30.00	-86.13	-9.22	0.00	-994.5	0.00	994.50	5,315.82	1,344.09	6,695.85	6,032.16	0.83	-0.27	0.181
35.00	-83.91	-9.13	0.00	-948.4	0.00	948.42	5,242.22	1,316.23	6,421.23	5,824.40	1.13	-0.31	0.179
40.00	-81.72	-9.05	0.00	-902.8	0.00	902.75	5,167.09	1,288.38	6,152.37	5,618.45	1.49	-0.36	0.177
45.00	-79.57	-8.98	0.00	-857.5	0.00	857.52	5,090.40	1,260.52	5,889.25	5,414.42	1.89	-0.41	0.174
46.82	-78.79	-8.94	0.00	-841.2	0.00	841.18	5,062.11	1,250.39	5,794.93	5,340.67	2.05	-0.43	0.173
50.00	-76.51	-8.86	0.00	-812.8	0.00	812.76	5,012.16	1,232.67	5,631.89	5,212.41	2.35	-0.46	0.171
53.65	-73.92	-8.80	0.00	-780.4	0.00	780.38	5,014.93	1,233.64	5,640.79	5,219.44	2.71	-0.5	0.164
55.00	-73.36	-8.74	0.00	-768.5	0.00	768.53	4,993.60	1,226.14	5,572.37	5,165.35	2.86	-0.51	0.164
60.00	-71.28	-8.63	0.00	-724.8	0.00	724.83	4,913.45	1,198.28	5,322.11	4,966.00	3.41	-0.56	0.161
65.00	-69.25	-8.52	0.00	-681.7	0.00	681.69	4,831.76	1,170.43	5,077.59	4,768.91	4.02	-0.61	0.157
70.00	-67.25	-8.40	0.00	-639.1	0.00	639.10	4,748.52	1,142.58	4,838.82	4,574.21	4.68	-0.65	0.154
75.00	-65.28	-8.29	0.00	-597.1	0.00	597.08	4,663.73	1,114.72	4,605.80	4,382.00	5.39	-0.7	0.150
80.00	-63.36	-8.17	0.00	-555.6	0.00	555.64	4,577.39	1,086.87	4,378.53	4,192.39	6.16	-0.75	0.146
85.00	-61.48	-8.05	0.00	-514.8	0.00	514.80	4,483.15	1,059.01	4,157.01	3,999.83	6.97	-0.8	0.142
90.00	-59.63	-7.93	0.00	-474.6	0.00	474.56	4,365.24	1,031.16	3,941.25	3,791.17	7.83	-0.85	0.139
94.97	-57.84	-7.85	0.00	-435.1	0.00	435.14	4,247.97	1,003.46	3,732.38	3,589.20	8.74	-0.9	0.135
95.00	-57.82	-7.80	0.00	-434.9	0.00	434.92	4,247.32	1,003.30	3,731.23	3,588.09	8.75	-0.9	0.135
100.00	-55.04	-7.70	0.00	-395.9	0.00	395.90	4,129.40	975.45	3,526.96	3,390.61	9.71	-0.95	0.130
100.47	-54.78	-7.65	0.00	-392.3	0.00	392.27	3,522.83	850.82	3,130.30	2,948.50	9.81	-0.95	0.149
105.00	-53.34	-7.53	0.00	-357.6	0.00	357.63	3,457.66	829.20	2,973.26	2,819.74	10.73	-0.99	0.142
110.00	-51.78	-7.41	0.00	-320.0	0.00	319.96	3,384.20	805.32	2,804.53	2,679.63	11.8	-1.04	0.135
115.00	-50.25	-7.29	0.00	-282.9	0.00	282.90	3,308.12	781.45	2,640.73	2,540.99	12.92	-1.09	0.127
120.00	-48.76	-7.16	0.00	-246.5	0.00	246.48	3,207.05	757.57	2,481.85	2,387.35	14.09	-1.14	0.119
125.00	-47.31	-7.03	0.00	-210.7	0.00	210.68	3,105.98	733.70	2,327.91	2,238.49	15.31	-1.19	0.109
130.00	-37.83	-5.88	0.00	-175.5	0.00	175.49	3,004.91	709.82	2,178.89	2,094.44	16.58	-1.23	0.096
135.00	-36.48	-5.75	0.00	-146.1	0.00	146.09	2,903.84	685.95	2,034.81	1,955.17	17.89	-1.27	0.087
140.00	-35.17	-5.61	0.00	-117.4	0.00	117.35	2,802.76	662.07	1,895.65	1,820.69	19.24	-1.3	0.077
145.00	-33.89	-5.49	0.00	-89.3	0.00	89.30	2,701.69	638.20	1,761.42	1,691.01	20.62	-1.33	0.065
148.71	-32.96	-5.41	0.00	-69.0	0.00	68.95	2,626.73	620.49	1,665.04	1,597.92	21.66	-1.35	0.056
148.71	-32.96	-5.41	0.00	-69.0	0.00	68.95	1,686.34	420.37	1,146.21	1,046.99	21.66	-1.35	0.086
150.00	-32.70	-5.39	0.00	-62.0	0.00	61.96	1,675.25	416.33	1,124.26	1,030.02	22.03	-1.36	0.080
150.60	-32.55	-5.37	0.00	-58.7	0.00	58.72	1,670.07	414.45	1,114.14	1,022.16	22.2	-1.36	0.077
151.00	-32.08	-5.28	0.00	-56.6	0.00	56.58	1,666.60	413.20	1,107.41	1,016.93	22.32	-1.37	0.075
152.90	-31.40	-5.17	0.00	-46.5	0.00	46.54	1,650.01	407.25	1,075.75	992.18	22.86	-1.38	0.066
153.00	-22.63	-3.91	0.00	-46.0	0.00	46.03	1,649.13	406.93	1,074.10	990.88	22.89	-1.38	0.060
153.30	-21.57	-3.67	0.00	-44.8	0.00	44.85	1,646.48	405.99	1,069.14	986.99	22.98	-1.38	0.059
153.70	-20.73	-3.48	0.00	-43.4	0.00	43.39	1,642.95	404.74	1,062.56	981.81	23.09	-1.38	0.057
154.00	-20.38	-3.44	0.00	-42.3	0.00	42.29	1,640.30	403.80	1,057.63	977.93	23.18	-1.38	0.056
154.20	-20.00	-3.40	0.00	-41.5	0.00	41.51	1,638.53	403.17	1,054.35	975.34	23.24	-1.38	0.055
154.30	-19.67	-3.36	0.00	-41.1	0.00	41.08	1,637.64	402.86	1,052.71	974.05	23.27	-1.38	0.054
154.50	-19.59	-3.33	0.00	-40.4	0.00	40.41	1,635.86	402.24	1,049.44	971.47	23.33	-1.39	0.054
154.90	-19.47	-3.32	0.00	-39.1	0.00	39.06	1,632.30	400.98	1,042.92	966.31	23.44	-1.39	0.052
155.00	-18.98	-3.24	0.00	-38.7	0.00	38.73	1,631.41	400.67	1,041.29	965.02	23.47	-1.39	0.052
156.00	-18.53	-3.17	0.00	-35.5	0.00	35.49	1,622.46	397.54	1,025.08	952.16	23.76	-1.39	0.049
156.70	-18.09	-3.09	0.00	-33.2	0.00	33.19	1,616.16	395.35	1,013.80	943.19	23.97	-1.39	0.046
160.00	-11.17	-2.13	0.00	-23.0	0.00	23.00	1,586.07	385.01	961.50	901.22	24.93	-1.41	0.033
161.60	-10.49	-1.95	0.00	-19.6	0.00	19.59	1,571.24	380.00	936.64	881.07	25.41	-1.41	0.029
164.10	-9.55	-1.73	0.00	-14.7	0.00	14.72	1,547.77	372.17	898.44	849.86	26.15	-1.42	0.024
164.80	-8.61	-1.45	0.00	-13.5	0.00	13.52	1,541.13	369.98	887.89	841.19	26.35	-1.42	0.022

CALCULATED FORCES

165.00	-8.58	-1.42	0.00	-13.2	0.00	13.23	1,539.23	369.35	884.89	838.71	26.41	-1.42	0.021
167.00	-7.97	-1.33	0.00	-10.4	0.00	10.38	1,520.07	363.09	855.13	814.10	27.01	-1.42	0.018
167.10	-7.61	-1.29	0.00	-10.2	0.00	10.24	1,519.11	362.77	853.66	812.87	27.04	-1.42	0.018
167.20	-7.19	-1.22	0.00	-10.1	0.00	10.11	1,518.14	362.46	852.19	811.65	27.07	-1.42	0.017
170.00	-6.84	-1.14	0.00	-6.7	0.00	6.69	1,490.89	353.69	811.46	777.61	27.9	-1.43	0.013
174.00	-0.94	-0.28	0.00	-2.1	0.00	2.13	1,444.26	341.16	755.00	726.35	29.1	-1.43	0.004
175.00	-0.82	-0.21	0.00	-1.8	0.00	1.85	1,431.01	338.03	741.20	713.01	29.4	-1.43	0.003
179.60	-0.26	-0.14	0.00	-0.9	0.00	0.86	1,370.02	323.63	679.38	653.23	30.78	-1.43	0.002
180.00	0.00	-0.13	0.00	-0.8	0.00	0.81	1,364.72	322.37	674.13	648.16	30.9	-1.43	0.001

CALCULATED FORCES

Load Case: 1.0D + 1.0W

60 mph Wind with No Ice

27 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	-64.10	-8.34	0.00	-1,100.4	0.00	1,100.39	5,724.86	1,511.21	8,464.29	7,310.45	0	0	0.162
5.00	-62.37	-8.26	0.00	-1,058.7	0.00	1,058.70	5,660.55	1,483.36	8,155.18	7,094.17	0.02	-0.04	0.160
10.00	-60.68	-8.19	0.00	-1,017.4	0.00	1,017.38	5,594.70	1,455.50	7,851.81	6,879.04	0.08	-0.07	0.159
15.00	-59.00	-8.12	0.00	-976.4	0.00	976.43	5,527.30	1,427.65	7,554.20	6,665.16	0.18	-0.11	0.157
20.00	-57.36	-8.05	0.00	-935.8	0.00	935.85	5,458.35	1,399.80	7,262.33	6,452.65	0.31	-0.15	0.156
25.00	-55.74	-7.97	0.00	-895.6	0.00	895.62	5,387.86	1,371.94	6,976.22	6,241.61	0.49	-0.19	0.154
30.00	-54.15	-7.90	0.00	-855.8	0.00	855.76	5,315.82	1,344.09	6,695.85	6,032.16	0.71	-0.23	0.152
35.00	-52.59	-7.83	0.00	-816.2	0.00	816.25	5,242.22	1,316.23	6,421.23	5,824.40	0.98	-0.27	0.150
40.00	-51.05	-7.75	0.00	-777.1	0.00	777.12	5,167.09	1,288.38	6,152.37	5,618.45	1.28	-0.31	0.148
45.00	-49.54	-7.69	0.00	-738.4	0.00	738.39	5,090.40	1,260.52	5,889.25	5,414.42	1.63	-0.35	0.146
46.82	-49.00	-7.65	0.00	-724.4	0.00	724.40	5,062.11	1,250.39	5,794.93	5,340.67	1.77	-0.37	0.145
50.00	-47.28	-7.59	0.00	-700.1	0.00	700.07	5,012.16	1,232.67	5,631.89	5,212.41	2.02	-0.4	0.144
53.65	-45.33	-7.53	0.00	-672.4	0.00	672.36	5,014.93	1,233.64	5,640.79	5,219.44	2.33	-0.43	0.138
55.00	-44.94	-7.48	0.00	-662.2	0.00	662.21	4,993.60	1,226.14	5,572.37	5,165.35	2.46	-0.44	0.137
60.00	-43.49	-7.39	0.00	-624.8	0.00	624.82	4,913.45	1,198.28	5,322.11	4,966.00	2.94	-0.48	0.135
65.00	-42.07	-7.29	0.00	-587.9	0.00	587.88	4,831.76	1,170.43	5,077.59	4,768.91	3.46	-0.52	0.132
70.00	-40.67	-7.20	0.00	-551.4	0.00	551.42	4,748.52	1,142.58	4,838.82	4,574.21	4.03	-0.56	0.129
75.00	-39.31	-7.10	0.00	-515.4	0.00	515.44	4,663.73	1,114.72	4,605.80	4,382.00	4.64	-0.6	0.126
80.00	-37.97	-7.00	0.00	-479.9	0.00	479.93	4,577.39	1,086.87	4,378.53	4,192.39	5.3	-0.65	0.123
85.00	-36.65	-6.91	0.00	-444.9	0.00	444.92	4,483.15	1,059.01	4,157.01	3,999.83	6	-0.69	0.119
90.00	-35.37	-6.81	0.00	-410.4	0.00	410.39	4,365.24	1,031.16	3,941.25	3,791.17	6.74	-0.73	0.116
94.97	-34.12	-6.75	0.00	-376.5	0.00	376.54	4,247.97	1,003.46	3,732.38	3,589.20	7.53	-0.77	0.113
95.00	-34.10	-6.71	0.00	-376.4	0.00	376.36	4,247.32	1,003.30	3,731.23	3,588.09	7.53	-0.77	0.113
100.00	-32.03	-6.63	0.00	-342.8	0.00	342.82	4,129.40	975.45	3,526.96	3,390.61	8.36	-0.82	0.109
100.47	-31.84	-6.59	0.00	-339.7	0.00	339.69	3,522.83	850.82	3,130.30	2,948.50	8.44	-0.82	0.124
105.00	-30.86	-6.49	0.00	-309.9	0.00	309.87	3,457.66	829.20	2,973.26	2,819.74	9.24	-0.86	0.119
110.00	-29.79	-6.39	0.00	-277.4	0.00	277.41	3,384.20	805.32	2,804.53	2,679.63	10.16	-0.9	0.112
115.00	-28.75	-6.30	0.00	-245.4	0.00	245.43	3,308.12	781.45	2,640.73	2,540.99	11.13	-0.94	0.105
120.00	-27.73	-6.20	0.00	-214.0	0.00	213.95	3,207.05	757.57	2,481.85	2,387.35	12.14	-0.99	0.098
125.00	-26.74	-6.10	0.00	-183.0	0.00	182.96	3,105.98	733.70	2,327.91	2,238.49	13.19	-1.03	0.090
130.00	-21.12	-5.10	0.00	-152.4	0.00	152.44	3,004.91	709.82	2,178.89	2,094.44	14.29	-1.06	0.080
135.00	-20.20	-5.00	0.00	-126.9	0.00	126.93	2,903.84	685.95	2,034.81	1,955.17	15.42	-1.1	0.072
140.00	-19.30	-4.90	0.00	-101.9	0.00	101.92	2,802.76	662.07	1,895.65	1,820.69	16.58	-1.13	0.063
145.00	-18.43	-4.81	0.00	-77.4	0.00	77.41	2,701.69	638.20	1,761.42	1,691.01	17.78	-1.15	0.053
148.71	-17.79	-4.76	0.00	-59.6	0.00	59.56	2,626.73	620.49	1,665.04	1,597.92	18.68	-1.17	0.044
148.71	-17.79	-4.76	0.00	-59.6	0.00	59.56	1,686.34	420.37	1,146.21	1,046.99	18.68	-1.17	0.068
150.00	-17.63	-4.74	0.00	-53.4	0.00	53.42	1,675.25	416.33	1,124.26	1,030.02	18.99	-1.17	0.063
150.60	-17.54	-4.73	0.00	-50.6	0.00	50.57	1,670.07	414.45	1,114.14	1,022.16	19.14	-1.18	0.060
151.00	-17.29	-4.65	0.00	-48.7	0.00	48.68	1,666.60	413.20	1,107.41	1,016.93	19.24	-1.18	0.058
152.90	-16.95	-4.55	0.00	-39.8	0.00	39.85	1,650.01	407.25	1,075.75	992.18	19.71	-1.19	0.051
153.00	-12.03	-3.43	0.00	-39.4	0.00	39.39	1,649.13	406.93	1,074.10	990.88	19.74	-1.19	0.047
153.30	-11.62	-3.21	0.00	-38.4	0.00	38.36	1,646.48	405.99	1,069.14	986.99	19.81	-1.19	0.046
153.70	-11.29	-3.01	0.00	-37.1	0.00	37.08	1,642.95	404.74	1,062.56	981.81	19.91	-1.19	0.045
154.00	-11.08	-2.98	0.00	-36.1	0.00	36.12	1,640.30	403.80	1,057.63	977.93	19.99	-1.19	0.044
154.20	-10.88	-2.94	0.00	-35.4	0.00	35.44	1,638.53	403.17	1,054.35	975.34	20.04	-1.19	0.043
154.30	-10.72	-2.90	0.00	-35.1	0.00	35.06	1,637.64	402.86	1,052.71	974.05	20.06	-1.2	0.043
154.50	-10.68	-2.88	0.00	-34.5	0.00	34.48	1,635.86	402.24	1,049.44	971.47	20.11	-1.2	0.042
154.90	-10.62	-2.87	0.00	-33.3	0.00	33.31	1,632.30	400.98	1,042.92	966.31	20.21	-1.2	0.041
155.00	-10.37	-2.80	0.00	-33.0	0.00	33.02	1,631.41	400.67	1,041.29	965.02	20.24	-1.2	0.041
156.00	-10.12	-2.74	0.00	-30.2	0.00	30.22	1,622.46	397.54	1,025.08	952.16	20.49	-1.2	0.038
156.70	-9.87	-2.68	0.00	-28.2	0.00	28.21	1,616.16	395.35	1,013.80	943.19	20.67	-1.2	0.036
160.00	-5.88	-1.87	0.00	-19.4	0.00	19.39	1,586.07	385.01	961.50	901.22	21.5	-1.21	0.025
161.60	-5.63	-1.70	0.00	-16.4	0.00	16.39	1,571.24	380.00	936.64	881.07	21.91	-1.22	0.022
164.10	-5.28	-1.48	0.00	-12.2	0.00	12.15	1,547.77	372.17	898.44	849.86	22.55	-1.22	0.018
164.80	-4.98	-1.21	0.00	-11.1	0.00	11.12	1,541.13	369.98	887.89	841.19	22.73	-1.22	0.016

CALCULATED FORCES

165.00	-4.97	-1.20	0.00	-10.9	0.00	10.87	1,539.23	369.35	884.89	838.71	22.78	-1.22	0.016
167.00	-4.62	-1.12	0.00	-8.5	0.00	8.48	1,520.07	363.09	855.13	814.10	23.29	-1.23	0.013
167.10	-4.40	-1.08	0.00	-8.4	0.00	8.37	1,519.11	362.77	853.66	812.87	23.32	-1.23	0.013
167.20	-4.14	-1.03	0.00	-8.3	0.00	8.26	1,518.14	362.46	852.19	811.65	23.34	-1.23	0.013
170.00	-3.94	-0.97	0.00	-5.4	0.00	5.38	1,490.89	353.69	811.46	777.61	24.07	-1.23	0.010
174.00	-0.48	-0.19	0.00	-1.5	0.00	1.49	1,444.26	341.16	755.00	726.35	25.1	-1.23	0.002
175.00	-0.42	-0.15	0.00	-1.3	0.00	1.30	1,431.01	338.03	741.20	713.01	25.36	-1.23	0.002
179.60	-0.10	-0.10	0.00	-0.6	0.00	0.61	1,370.02	323.63	679.38	653.23	26.55	-1.23	0.001
180.00	0.00	-0.09	0.00	-0.6	0.00	0.57	1,364.72	322.37	674.13	648.16	26.65	-1.23	0.001

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

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

Spectral Response Acceleration for Short Period (S_s):	0.191
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.052
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}):	0.204
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.083
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):	2.960
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	2.000
Total Unfactored Dead Load:	64.100 k
Seismic Base Shear (E):	1.920 k

SEISMIC FORCES

Segment	Seismic	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
62		179.8	26	831	0.001	2	32
61		177.3	303	9,513	0.012	23	375
60		174.5	67	2,055	0.003	5	84
59		172	287	8,487	0.011	21	356
58		168.6	207	5,873	0.007	14	256
57		167.15	7	209	0.000	1	9
56		167.05	7	209	0.000	1	9
55		166	151	4,154	0.005	10	187
54		164.9	15	414	0.000	1	19
53		164.45	53	1,445	0.002	4	66
52		162.85	193	5,124	0.006	12	240
51		160.8	126	3,249	0.004	8	156
50		158.35	307	7,686	0.010	19	380
49		156.35	69	1,685	0.002	4	86
48		155.5	99	2,394	0.003	6	123
47		154.95	10	246	0.000	1	13
46		154.7	41	983	0.001	2	51
45		154.4	21	490	0.001	1	26
44		154.25	10	245	0.000	1	13
43		154.1	21	489	0.001	1	26
42		153.85	33	784	0.001	2	41
41		153.5	44	1,043	0.001	3	55
40		153.15	33	780	0.001	2	41
39		152.95	13	298	0.000	1	16
38		151.95	244	5,622	0.007	14	302
37		150.8	52	1,172	0.002	3	64
36		150.3	77	1,751	0.002	4	96
35		149.3542	168	3,738	0.005	9	208
34		146.8542	633	13,647	0.017	33	785
33		142.5	873	17,735	0.022	43	1,084
32		137.5	897	16,950	0.021	41	1,112
31		132.5	920	16,146	0.020	39	1,141
30		127.5	969	15,749	0.020	38	1,202
29		122.5	992	14,886	0.019	36	1,231
28		117.5	1,015	14,015	0.018	34	1,259
27		112.5	1,038	13,140	0.017	32	1,288
26		107.5	1,061	12,266	0.016	30	1,317
25		102.7361	981	10,355	0.013	25	1,217

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)
24	100.2361	193	1,935	0.002	5	239
23	97.5	2,067	19,648	0.025	48	2,564
22	94.9861	12	105	0.000	0	14
21	92.4861	1,248	10,678	0.014	26	1,549
20	87.5	1,282	9,817	0.012	24	1,591
19	82.5	1,309	8,911	0.011	22	1,624
18	77.5	1,336	8,026	0.010	20	1,658
17	72.5	1,363	7,166	0.009	17	1,691
16	67.5	1,390	6,334	0.008	15	1,725
15	62.5	1,417	5,536	0.007	13	1,758
14	57.5	1,444	4,775	0.006	12	1,792
13	54.3264	394	1,162	0.002	3	489
12	51.8264	1,943	5,220	0.007	13	2,411
11	48.4097	1,716	4,020	0.005	10	2,129
10	45.9097	541	1,140	0.001	3	671
9	42.5	1,505	2,718	0.003	7	1,867
8	37.5	1,532	2,154	0.003	5	1,900
7	32.5	1,559	1,646	0.002	4	1,934
6	27.5	1,586	1,199	0.002	3	1,967
5	22.5	1,613	816	0.001	2	2,001
4	17.5	1,640	502	0.001	1	2,034
3	12.5	1,667	260	0.000	1	2,068
2	7.5	1,694	95	0.000	0	2,101
1	2.5	1,721	11	0.000	0	2,135
Generic 15' Omni	180	80	2,592	0.003	6	99
Generic TTA	179.6	10	323	0.000	1	12
Raycap RDIDC-9181-PF-48	174	22	663	0.001	2	27
Samsung SFG-ARR3KM01DI	174	184	5,568	0.007	14	228
Samsung SFG-ARR3J601DI	174	284	8,592	0.011	21	352
JMA Wireless MX08FRO665-21	174	194	5,858	0.007	14	240
Generic Flat Platform with Handrails	174	2,500	75,690	0.096	184	3,102
Samsung B2/B66A RRH-BR049	167.2	253	7,078	0.009	17	314
Samsung B5/B13 RRH-BR04C	167.1	211	5,889	0.007	14	262
Alcatel-Lucent B66a RRH4x45 (AWS-3)	167	201	5,606	0.007	14	249
Commscope HBXX-6517DS-A2M	164.8	245	6,649	0.008	16	304
Amphenol Antel QUAD656C0000X	164.1	162	4,362	0.006	11	201
Generic 72" x 14" Panel	161.6	135	3,525	0.004	9	168
Commscope CBC78T-DS-43-2X	160	62	1,590	0.002	4	77
Kaelus KA-6030	160	35	901	0.001	2	44
Samsung B5/B13 RRH ORAN (RF4440d-13A)	160	211	5,399	0.007	13	262
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	160	224	5,737	0.007	14	278
Raycap RRFDC-3315-PF-48	160	54	1,377	0.002	3	67
Samsung MT6407-77A	160	245	6,267	0.008	15	304
Commscope JAHH-65B-R3B	160	364	9,308	0.012	23	451
Generic Round Platform with Handrails	160	2,500	64,000	0.081	156	3,102
Generic Round Platform with Handrails	130	2,500	42,250	0.053	103	3,102
Ericsson RRUS 32 B30 (60 lbs)	156.7	180	4,420	0.006	11	223
Ericsson RRUS 32 B30 (60 lbs)	153	180	4,214	0.005	10	223
Ericsson RRUS 11 (Band 12)	156	150	3,650	0.005	9	186
Ericsson AIR 6449 B77D/ C-Band	155	245	5,881	0.007	14	304
Raycap DC6-48-60-18-8F	154.9	20	480	0.001	1	25
Raycap DC6-48-60-18-8F	153	20	468	0.001	1	25
Raycap DC6-48-60-18-8C	154.5	16	382	0.000	1	20
Ericsson RRUS 32 B2	154.3	159	3,786	0.005	9	197
Ericsson RRUS 32 B2	153	159	3,722	0.005	9	197
Raycap DC6-48-60-18-8F ("Squid")	154.2	19	449	0.001	1	23
Raycap DC6-48-60-18-8F ("Squid")	153	19	442	0.001	1	23
Ericsson RRUS 32 B66A	154.2	152	3,617	0.005	9	189
Ericsson RRUS 32 B66A	153	152	3,561	0.004	9	189
Ericsson RRUS 4478 B14 (15")	154	178	4,226	0.005	10	221
Ericsson RRUS 4478 B14 (15")	153	178	4,171	0.005	10	221

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh	Seismic	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Segment							
Kathrein Scala 80010965		153.7	293	6,917	0.009	17	363
Kathrein Scala 80010965		153	293	6,854	0.009	17	363
Powerwave Allgon LGP17201		153.3	186	4,371	0.006	11	231
Commscope SBNHH-1D65A		153.3	201	4,724	0.006	11	249
Andrew APTDC-BDFDM-DBW		153	8	183	0.000	0	10
Powerwave Allgon 7020.00 Dual Band RET		153	13	309	0.000	1	16
Powerwave Allgon 7020.00 Dual Band RET		150.6	7	150	0.000	0	8
Raycap DC9-48-60-24-8C-EV		153	16	375	0.000	1	20
Ericsson RRUS 4449 B5, B12		153	213	4,986	0.006	12	264
Ericsson RRUS E2 B29		153	180	4,214	0.005	10	223
Generic Mount Reinforcement		153	600	14,045	0.018	34	744
Generic Mount Reinforcement		130	600	10,140	0.013	25	744
Quintel QD6616-7		153	390	9,130	0.012	22	484
Flat Platform w/ Round Handrails		153	2,500	58,522	0.074	142	3,102
Powerwave Allgon 7770.00		152.9	105	2,455	0.003	6	130
Ericsson AIR 6419 B77G		151	198	4,521	0.006	11	246
Ericsson RRUS 4415 B66		130	138	2,332	0.003	6	171
Ericsson Radio 4449 B71 B85A		130	225	3,802	0.005	9	279
Ericsson Radio 2212 B13		130	128	2,170	0.003	5	159
Ericsson 4424 B25		130	258	4,360	0.006	11	320
Ericsson Air6449 B41		130	312	5,273	0.007	13	387
RFS APX16DWV-16DWVS-E-A20		130	122	2,063	0.003	5	151
RFS APXVAARR24_43-U-NA20		130	384	6,485	0.008	16	476
Totals:			64,103	790,809	0.999	1,923	79,536

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Segment							
62		179.8	26	831	0.001	2	22
61		177.3	303	9,513	0.012	23	260
60		174.5	67	2,055	0.003	5	58
59		172	287	8,487	0.011	21	247
58		168.6	207	5,873	0.007	14	178
57		167.15	7	209	0.000	1	6
56		167.05	7	209	0.000	1	6
55		166	151	4,154	0.005	10	130
54		164.9	15	414	0.000	1	13
53		164.45	53	1,445	0.002	4	46
52		162.85	193	5,124	0.006	12	166
51		160.8	126	3,249	0.004	8	108
50		158.35	307	7,686	0.010	19	263
49		156.35	69	1,685	0.002	4	59
48		155.5	99	2,394	0.003	6	85
47		154.95	10	246	0.000	1	9
46		154.7	41	983	0.001	2	35
45		154.4	21	490	0.001	1	18
44		154.25	10	245	0.000	1	9
43		154.1	21	489	0.001	1	18
42		153.85	33	784	0.001	2	28
41		153.5	44	1,043	0.001	3	38
40		153.15	33	780	0.001	2	29
39		152.95	13	298	0.000	1	11
38		151.95	244	5,622	0.007	14	209
37		150.8	52	1,172	0.002	3	44
36		150.3	77	1,751	0.002	4	67
35		149.3542	168	3,738	0.005	9	144
34		146.8542	633	13,647	0.017	33	544
33		142.5	873	17,735	0.022	43	750
32		137.5	897	16,950	0.021	41	770
31		132.5	920	16,146	0.020	39	790

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)
30	127.5	969	15,749	0.020	38	832
29	122.5	992	14,886	0.019	36	852
28	117.5	1,015	14,015	0.018	34	872
27	112.5	1,038	13,140	0.017	32	892
26	107.5	1,061	12,266	0.016	30	912
25	102.7361	981	10,355	0.013	25	843
24	100.2361	193	1,935	0.002	5	166
23	97.5	2,067	19,648	0.025	48	1,776
22	94.9861	12	105	0.000	0	10
21	92.4861	1,248	10,678	0.014	26	1,073
20	87.5	1,282	9,817	0.012	24	1,102
19	82.5	1,309	8,911	0.011	22	1,125
18	77.5	1,336	8,026	0.010	20	1,148
17	72.5	1,363	7,166	0.009	17	1,171
16	67.5	1,390	6,334	0.008	15	1,195
15	62.5	1,417	5,536	0.007	13	1,218
14	57.5	1,444	4,775	0.006	12	1,241
13	54.3264	394	1,162	0.002	3	338
12	51.8264	1,943	5,220	0.007	13	1,670
11	48.4097	1,716	4,020	0.005	10	1,474
10	45.9097	541	1,140	0.001	3	465
9	42.5	1,505	2,718	0.003	7	1,293
8	37.5	1,532	2,154	0.003	5	1,316
7	32.5	1,559	1,646	0.002	4	1,339
6	27.5	1,586	1,199	0.002	3	1,362
5	22.5	1,613	816	0.001	2	1,386
4	17.5	1,640	502	0.001	1	1,409
3	12.5	1,667	260	0.000	1	1,432
2	7.5	1,694	95	0.000	0	1,455
1	2.5	1,721	11	0.000	0	1,478
Generic 15' Omni	180	80	2,592	0.003	6	69
Generic TTA	179.6	10	323	0.000	1	9
Raycap RDIDC-9181-PF-48	174	22	663	0.001	2	19
Samsung SFG-ARR3KM01DI	174	184	5,568	0.007	14	158
Samsung SFG-ARR3J601DI	174	284	8,592	0.011	21	244
JMA Wireless MX08FRO665-21	174	194	5,858	0.007	14	166
Generic Flat Platform with Handrails	174	2,500	75,690	0.096	184	2,148
Samsung B2/B66A RRH-BR049	167.2	253	7,078	0.009	17	218
Samsung B5/B13 RRH-BR04C	167.1	211	5,889	0.007	14	181
Alcatel-Lucent B66a RRH4x45 (AWS-3)	167	201	5,606	0.007	14	173
Commscope HBXX-6517DS-A2M	164.8	245	6,649	0.008	16	210
Amphenol Antel QUAD656C0000X	164.1	162	4,362	0.006	11	139
Generic 72" x 14" Panel	161.6	135	3,525	0.004	9	116
Commscope CBC78T-DS-43-2X	160	62	1,590	0.002	4	53
Kaelus KA-6030	160	35	901	0.001	2	30
Samsung B5/B13 RRH ORAN (RF4440d-13A)	160	211	5,399	0.007	13	181
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	160	224	5,737	0.007	14	193
Raycap RRFDC-3315-PF-48	160	54	1,377	0.002	3	46
Samsung MT6407-77A	160	245	6,267	0.008	15	210
Commscope JAHH-65B-R3B	160	364	9,308	0.012	23	312
Generic Round Platform with Handrails	160	2,500	64,000	0.081	156	2,148
Generic Round Platform with Handrails	130	2,500	42,250	0.053	103	2,148
Ericsson RRUS 32 B30 (60 lbs)	156.7	180	4,420	0.006	11	155
Ericsson RRUS 32 B30 (60 lbs)	153	180	4,214	0.005	10	155
Ericsson RRUS 11 (Band 12)	156	150	3,650	0.005	9	129
Ericsson AIR 6449 B77D/ C-Band	155	245	5,881	0.007	14	210
Raycap DC6-48-60-18-8F	154.9	20	480	0.001	1	17
Raycap DC6-48-60-18-8F	153	20	468	0.001	1	17
Raycap DC6-48-60-18-8C	154.5	16	382	0.000	1	14
Ericsson RRUS 32 B2	154.3	159	3,786	0.005	9	137
Ericsson RRUS 32 B2	153	159	3,722	0.005	9	137

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)
Raycap DC6-48-60-18-8F ("Squid")	154.2	19	449	0.001	1	16
Raycap DC6-48-60-18-8F ("Squid")	153	19	442	0.001	1	16
Ericsson RRUS 32 B66A	154.2	152	3,617	0.005	9	131
Ericsson RRUS 32 B66A	153	152	3,561	0.004	9	131
Ericsson RRUS 4478 B14 (15")	154	178	4,226	0.005	10	153
Ericsson RRUS 4478 B14 (15")	153	178	4,171	0.005	10	153
Kathrein Scala 80010965	153.7	293	6,917	0.009	17	252
Kathrein Scala 80010965	153	293	6,854	0.009	17	252
Powerwave Allgon LGP17201	153.3	186	4,371	0.006	11	160
Commscope SBNHH-1D65A	153.3	201	4,724	0.006	11	173
Andrew APTDC-BDFDM-DBW	153	8	183	0.000	0	7
Powerwave Allgon 7020.00 Dual Band RET	153	13	309	0.000	1	11
Powerwave Allgon 7020.00 Dual Band RET	150.6	7	150	0.000	0	6
Raycap DC9-48-60-24-8C-EV	153	16	375	0.000	1	14
Ericsson RRUS 4449 B5, B12	153	213	4,986	0.006	12	183
Ericsson RRUS E2 B29	153	180	4,214	0.005	10	155
Generic Mount Reinforcement	153	600	14,045	0.018	34	516
Generic Mount Reinforcement	130	600	10,140	0.013	25	516
Quintel QD6616-7	153	390	9,130	0.012	22	335
Flat Platform w/ Round Handrails	153	2,500	58,522	0.074	142	2,148
Powerwave Allgon 7770.00	152.9	105	2,455	0.003	6	90
Ericsson AIR 6419 B77G	151	198	4,521	0.006	11	170
Ericsson RRUS 4415 B66	130	138	2,332	0.003	6	119
Ericsson Radio 4449 B71 B85A	130	225	3,802	0.005	9	193
Ericsson Radio 2212 B13	130	128	2,170	0.003	5	110
Ericsson 4424 B25	130	258	4,360	0.006	11	222
Ericsson Air6449 B41	130	312	5,273	0.007	13	268
RFS APX16DWV-16DWVS-E-A20	130	122	2,063	0.003	5	105
RFS APXVAARR24_43-U-NA20	130	384	6,485	0.008	16	330
Totals:		64,103	790,809	0.999	1,923	55,081

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	-77.40	-1.93	0.00	-286.53	0.00	286.53	5,724.86	1,511.21	8,464	7,310.45	0.00	0.00	0.05
5.00	-75.30	-1.94	0.00	-276.89	0.00	276.89	5,660.55	1,483.36	8,155	7,094.17	0.01	-0.01	0.05
10.00	-73.23	-1.95	0.00	-267.19	0.00	267.19	5,594.70	1,455.50	7,852	6,879.04	0.02	-0.02	0.05
15.00	-71.20	-1.96	0.00	-257.43	0.00	257.43	5,527.30	1,427.65	7,554	6,665.16	0.05	-0.03	0.05
20.00	-69.19	-1.97	0.00	-247.62	0.00	247.62	5,458.35	1,399.80	7,262	6,452.65	0.08	-0.04	0.05
25.00	-67.23	-1.98	0.00	-237.76	0.00	237.76	5,387.86	1,371.94	6,976	6,241.61	0.13	-0.05	0.05
30.00	-65.29	-1.99	0.00	-227.86	0.00	227.86	5,315.82	1,344.09	6,696	6,032.16	0.19	-0.06	0.05
35.00	-63.39	-1.99	0.00	-217.93	0.00	217.93	5,242.22	1,316.23	6,421	5,824.40	0.26	-0.07	0.05
40.00	-61.52	-1.99	0.00	-207.97	0.00	207.97	5,167.09	1,288.38	6,152	5,618.45	0.34	-0.08	0.05
45.00	-60.85	-2.00	0.00	-198.01	0.00	198.01	5,090.40	1,260.52	5,889	5,414.42	0.43	-0.09	0.05
46.82	-58.72	-1.99	0.00	-194.37	0.00	194.37	5,062.11	1,250.39	5,795	5,340.67	0.47	-0.10	0.05
50.00	-56.31	-1.98	0.00	-188.04	0.00	188.04	5,012.16	1,232.67	5,632	5,212.41	0.53	-0.10	0.05
53.65	-55.82	-1.98	0.00	-180.81	0.00	180.81	5,014.93	1,233.64	5,641	5,219.44	0.62	-0.11	0.05
55.00	-54.03	-1.97	0.00	-178.14	0.00	178.14	4,993.60	1,226.14	5,572	5,165.35	0.65	-0.12	0.05
60.00	-52.27	-1.97	0.00	-168.26	0.00	168.26	4,913.45	1,198.28	5,322	4,966.00	0.78	-0.13	0.05
65.00	-50.55	-1.96	0.00	-158.43	0.00	158.43	4,831.76	1,170.43	5,078	4,768.91	0.92	-0.14	0.04
70.00	-48.86	-1.95	0.00	-148.64	0.00	148.64	4,748.52	1,142.58	4,839	4,574.21	1.07	-0.15	0.04
75.00	-47.20	-1.93	0.00	-138.91	0.00	138.91	4,663.73	1,114.72	4,606	4,382.00	1.23	-0.16	0.04
80.00	-45.57	-1.91	0.00	-129.25	0.00	129.25	4,577.39	1,086.87	4,379	4,192.39	1.41	-0.17	0.04
85.00	-43.98	-1.89	0.00	-119.68	0.00	119.68	4,483.15	1,059.01	4,157	3,999.83	1.59	-0.18	0.04
90.00	-42.43	-1.87	0.00	-110.22	0.00	110.22	4,365.24	1,031.16	3,941	3,791.17	1.79	-0.20	0.04
94.97	-42.42	-1.87	0.00	-100.91	0.00	100.91	4,247.97	1,003.46	3,732	3,589.20	2.00	-0.21	0.04
95.00	-39.85	-1.82	0.00	-100.86	0.00	100.86	4,247.32	1,003.30	3,731	3,588.09	2.00	-0.21	0.04
100.00	-39.61	-1.82	0.00	-91.75	0.00	91.75	4,129.40	975.45	3,527	3,390.61	2.22	-0.22	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
100.47	-38.40	-1.79	0.00	-90.89	0.00	90.89	3,522.83	850.82	3,130	2,948.50	2.25	-0.22	0.04
105.00	-37.08	-1.77	0.00	-82.77	0.00	82.77	3,457.66	829.20	2,973	2,819.74	2.46	-0.23	0.04
110.00	-35.79	-1.74	0.00	-73.94	0.00	73.94	3,384.20	805.32	2,805	2,679.63	2.70	-0.24	0.04
115.00	-34.53	-1.70	0.00	-65.25	0.00	65.25	3,308.12	781.45	2,641	2,540.99	2.96	-0.25	0.04
120.00	-33.30	-1.67	0.00	-56.73	0.00	56.73	3,207.05	757.57	2,482	2,387.35	3.23	-0.26	0.03
125.00	-32.10	-1.63	0.00	-48.39	0.00	48.39	3,105.98	733.70	2,328	2,238.49	3.51	-0.27	0.03
130.00	-25.17	-1.37	0.00	-40.24	0.00	40.24	3,004.91	709.82	2,179	2,094.44	3.81	-0.28	0.03
135.00	-24.06	-1.33	0.00	-33.40	0.00	33.40	2,903.84	685.95	2,035	1,955.17	4.11	-0.29	0.03
140.00	-22.97	-1.28	0.00	-26.76	0.00	26.76	2,802.76	662.07	1,896	1,820.69	4.42	-0.30	0.02
145.00	-22.19	-1.25	0.00	-20.36	0.00	20.36	2,701.69	638.20	1,761	1,691.01	4.74	-0.31	0.02
148.71	-21.98	-1.24	0.00	-15.74	0.00	15.74	2,626.73	620.49	1,665	1,597.92	4.98	-0.31	0.02
148.71	-21.98	-1.24	0.00	-15.74	0.00	15.74	1,686.34	420.37	1,146	1,046.99	4.98	-0.31	0.03
150.00	-21.88	-1.23	0.00	-14.15	0.00	14.15	1,675.25	416.33	1,124	1,030.02	5.06	-0.31	0.03
150.60	-21.81	-1.23	0.00	-13.41	0.00	13.41	1,670.07	414.45	1,114	1,022.16	5.10	-0.31	0.03
151.00	-21.26	-1.20	0.00	-12.92	0.00	12.92	1,666.60	413.20	1,107	1,016.93	5.13	-0.31	0.03
152.90	-21.12	-1.19	0.00	-10.63	0.00	10.63	1,650.01	407.25	1,076	992.18	5.25	-0.32	0.02
153.00	-14.97	-0.88	0.00	-10.51	0.00	10.51	1,649.13	406.93	1,074	990.88	5.26	-0.32	0.02
153.30	-14.44	-0.85	0.00	-10.25	0.00	10.25	1,646.48	405.99	1,069	986.99	5.28	-0.32	0.02
153.70	-14.03	-0.83	0.00	-9.91	0.00	9.91	1,642.95	404.74	1,063	981.81	5.31	-0.32	0.02
154.00	-13.79	-0.82	0.00	-9.66	0.00	9.66	1,640.30	403.80	1,058	977.93	5.33	-0.32	0.02
154.20	-13.56	-0.81	0.00	-9.50	0.00	9.50	1,638.53	403.17	1,054	975.34	5.34	-0.32	0.02
154.30	-13.34	-0.79	0.00	-9.42	0.00	9.42	1,637.64	402.86	1,053	974.05	5.35	-0.32	0.02
154.50	-13.27	-0.79	0.00	-9.26	0.00	9.26	1,635.86	402.24	1,049	971.47	5.36	-0.32	0.02
154.90	-13.23	-0.79	0.00	-8.94	0.00	8.94	1,632.30	400.98	1,043	966.31	5.39	-0.32	0.02
155.00	-12.80	-0.77	0.00	-8.86	0.00	8.86	1,631.41	400.67	1,041	965.02	5.39	-0.32	0.02
156.00	-12.53	-0.75	0.00	-8.10	0.00	8.10	1,622.46	397.54	1,025	952.16	5.46	-0.32	0.02
156.70	-11.93	-0.72	0.00	-7.57	0.00	7.57	1,616.16	395.35	1,014	943.19	5.51	-0.32	0.02
160.00	-7.19	-0.46	0.00	-5.20	0.00	5.20	1,586.07	385.01	962	901.22	5.73	-0.32	0.01
161.60	-6.78	-0.43	0.00	-4.47	0.00	4.47	1,571.24	380.00	937	881.07	5.84	-0.32	0.01
164.10	-6.52	-0.42	0.00	-3.39	0.00	3.39	1,547.77	372.17	898	849.86	6.01	-0.33	0.01
164.80	-6.19	-0.40	0.00	-3.09	0.00	3.09	1,541.13	369.98	888	841.19	6.06	-0.33	0.01
165.00	-6.01	-0.39	0.00	-3.02	0.00	3.02	1,539.23	369.35	885	838.71	6.07	-0.33	0.01
167.00	-5.75	-0.37	0.00	-2.24	0.00	2.24	1,520.07	363.09	855	814.10	6.21	-0.33	0.01
167.10	-5.48	-0.35	0.00	-2.20	0.00	2.20	1,519.11	362.77	854	812.87	6.21	-0.33	0.01
167.20	-4.91	-0.32	0.00	-2.17	0.00	2.17	1,518.14	362.46	852	811.65	6.22	-0.33	0.01
170.00	-4.55	-0.30	0.00	-1.27	0.00	1.27	1,490.89	353.69	811	777.61	6.41	-0.33	0.01
174.00	-0.52	-0.04	0.00	-0.08	0.00	0.08	1,444.26	341.16	755	726.35	6.69	-0.33	0.00
175.00	-0.14	-0.01	0.00	-0.05	0.00	0.05	1,431.01	338.03	741	713.01	6.76	-0.33	0.00
179.60	-0.10	-0.01	0.00	0.00	0.00	0.00	1,370.02	323.63	679	653.23	7.07	-0.33	0.00
180.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,364.72	322.37	674	648.16	7.10	-0.33	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	-53.60	-1.92	0.00	-280.49	0.00	280.49	5,724.86	1,511.21	8,464	7,310.45	0.00	0.00	0.05
5.00	-52.15	-1.93	0.00	-270.86	0.00	270.86	5,660.55	1,483.36	8,155	7,094.17	0.01	-0.01	0.05
10.00	-50.71	-1.94	0.00	-261.20	0.00	261.20	5,594.70	1,455.50	7,852	6,879.04	0.02	-0.02	0.05
15.00	-49.31	-1.95	0.00	-251.50	0.00	251.50	5,527.30	1,427.65	7,554	6,665.16	0.05	-0.03	0.05
20.00	-47.92	-1.95	0.00	-241.76	0.00	241.76	5,458.35	1,399.80	7,262	6,452.65	0.08	-0.04	0.05
25.00	-46.56	-1.96	0.00	-231.99	0.00	231.99	5,387.86	1,371.94	6,976	6,241.61	0.13	-0.05	0.05
30.00	-45.22	-1.96	0.00	-222.21	0.00	222.21	5,315.82	1,344.09	6,696	6,032.16	0.18	-0.06	0.05
35.00	-43.90	-1.96	0.00	-212.41	0.00	212.41	5,242.22	1,316.23	6,421	5,824.40	0.25	-0.07	0.05
40.00	-42.61	-1.96	0.00	-202.60	0.00	202.60	5,167.09	1,288.38	6,152	5,618.45	0.33	-0.08	0.04
45.00	-42.14	-1.96	0.00	-192.79	0.00	192.79	5,090.40	1,260.52	5,889	5,414.42	0.42	-0.09	0.04
46.82	-40.67	-1.96	0.00	-189.22	0.00	189.22	5,062.11	1,250.39	5,795	5,340.67	0.45	-0.10	0.04
50.00	-39.00	-1.94	0.00	-183.00	0.00	183.00	5,012.16	1,232.67	5,632	5,212.41	0.52	-0.10	0.04
53.65	-38.66	-1.95	0.00	-175.90	0.00	175.90	5,014.93	1,233.64	5,641	5,219.44	0.60	-0.11	0.04
55.00	-37.42	-1.94	0.00	-173.28	0.00	173.28	4,993.60	1,226.14	5,572	5,165.35	0.63	-0.11	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
60.00	-36.20	-1.93	0.00	-163.60	0.00	163.60	4,913.45	1,198.28	5,322	4,966.00	0.76	-0.12	0.04
65.00	-35.00	-1.92	0.00	-153.97	0.00	153.97	4,831.76	1,170.43	5,078	4,768.91	0.89	-0.14	0.04
70.00	-33.83	-1.90	0.00	-144.39	0.00	144.39	4,748.52	1,142.58	4,839	4,574.21	1.04	-0.15	0.04
75.00	-32.68	-1.89	0.00	-134.88	0.00	134.88	4,663.73	1,114.72	4,606	4,382.00	1.20	-0.16	0.04
80.00	-31.56	-1.87	0.00	-125.46	0.00	125.46	4,577.39	1,086.87	4,379	4,192.39	1.37	-0.17	0.04
85.00	-30.46	-1.84	0.00	-116.13	0.00	116.13	4,483.15	1,059.01	4,157	3,999.83	1.55	-0.18	0.04
90.00	-29.38	-1.82	0.00	-106.90	0.00	106.90	4,365.24	1,031.16	3,941	3,791.17	1.75	-0.19	0.04
94.97	-29.37	-1.82	0.00	-97.85	0.00	97.85	4,247.97	1,003.46	3,732	3,589.20	1.95	-0.20	0.03
95.00	-27.60	-1.77	0.00	-97.80	0.00	97.80	4,247.32	1,003.30	3,731	3,588.09	1.95	-0.20	0.03
100.00	-27.43	-1.77	0.00	-88.94	0.00	88.94	4,129.40	975.45	3,527	3,390.61	2.17	-0.21	0.03
100.47	-26.59	-1.74	0.00	-88.10	0.00	88.10	3,522.83	850.82	3,130	2,948.50	2.19	-0.21	0.04
105.00	-25.68	-1.72	0.00	-80.20	0.00	80.20	3,457.66	829.20	2,973	2,819.74	2.40	-0.22	0.04
110.00	-24.79	-1.69	0.00	-71.63	0.00	71.63	3,384.20	805.32	2,805	2,679.63	2.64	-0.23	0.03
115.00	-23.91	-1.65	0.00	-63.20	0.00	63.20	3,308.12	781.45	2,641	2,540.99	2.89	-0.25	0.03
120.00	-23.06	-1.62	0.00	-54.94	0.00	54.94	3,207.05	757.57	2,482	2,387.35	3.15	-0.26	0.03
125.00	-22.23	-1.58	0.00	-46.86	0.00	46.86	3,105.98	733.70	2,328	2,238.49	3.42	-0.27	0.03
130.00	-17.43	-1.33	0.00	-38.97	0.00	38.97	3,004.91	709.82	2,179	2,094.44	3.71	-0.28	0.02
135.00	-16.66	-1.28	0.00	-32.34	0.00	32.34	2,903.84	685.95	2,035	1,955.17	4.00	-0.28	0.02
140.00	-15.91	-1.24	0.00	-25.92	0.00	25.92	2,802.76	662.07	1,896	1,820.69	4.30	-0.29	0.02
145.00	-15.36	-1.21	0.00	-19.72	0.00	19.72	2,701.69	638.20	1,761	1,691.01	4.61	-0.30	0.02
148.71	-15.22	-1.20	0.00	-15.25	0.00	15.25	2,626.73	620.49	1,665	1,597.92	4.85	-0.30	0.02
148.71	-15.22	-1.20	0.00	-15.25	0.00	15.25	1,686.34	420.37	1,146	1,046.99	4.85	-0.30	0.02
150.00	-15.15	-1.19	0.00	-13.71	0.00	13.71	1,675.25	416.33	1,124	1,030.02	4.93	-0.30	0.02
150.60	-15.10	-1.19	0.00	-12.99	0.00	12.99	1,670.07	414.45	1,114	1,022.16	4.97	-0.31	0.02
151.00	-14.72	-1.16	0.00	-12.52	0.00	12.52	1,666.60	413.20	1,107	1,016.93	4.99	-0.31	0.02
152.90	-14.62	-1.16	0.00	-10.31	0.00	10.31	1,650.01	407.25	1,076	992.18	5.11	-0.31	0.02
153.00	-10.37	-0.85	0.00	-10.19	0.00	10.19	1,649.13	406.93	1,074	990.88	5.12	-0.31	0.02
153.30	-10.00	-0.82	0.00	-9.94	0.00	9.94	1,646.48	405.99	1,069	986.99	5.14	-0.31	0.02
153.70	-9.72	-0.80	0.00	-9.61	0.00	9.61	1,642.95	404.74	1,063	981.81	5.17	-0.31	0.02
154.00	-9.55	-0.79	0.00	-9.37	0.00	9.37	1,640.30	403.80	1,058	977.93	5.19	-0.31	0.02
154.20	-9.39	-0.78	0.00	-9.21	0.00	9.21	1,638.53	403.17	1,054	975.34	5.20	-0.31	0.02
154.30	-9.24	-0.77	0.00	-9.13	0.00	9.13	1,637.64	402.86	1,053	974.05	5.20	-0.31	0.02
154.50	-9.19	-0.77	0.00	-8.98	0.00	8.98	1,635.86	402.24	1,049	971.47	5.22	-0.31	0.02
154.90	-9.16	-0.76	0.00	-8.67	0.00	8.67	1,632.30	400.98	1,043	966.31	5.24	-0.31	0.02
155.00	-8.87	-0.74	0.00	-8.59	0.00	8.59	1,631.41	400.67	1,041	965.02	5.25	-0.31	0.01
156.00	-8.68	-0.73	0.00	-7.85	0.00	7.85	1,622.46	397.54	1,025	952.16	5.32	-0.31	0.01
156.70	-8.26	-0.70	0.00	-7.34	0.00	7.34	1,616.16	395.35	1,014	943.19	5.36	-0.31	0.01
160.00	-4.98	-0.44	0.00	-5.04	0.00	5.04	1,586.07	385.01	962	901.22	5.58	-0.31	0.01
161.60	-4.70	-0.42	0.00	-4.33	0.00	4.33	1,571.24	380.00	937	881.07	5.68	-0.32	0.01
164.10	-4.51	-0.40	0.00	-3.29	0.00	3.29	1,547.77	372.17	898	849.86	5.85	-0.32	0.01
164.80	-4.29	-0.39	0.00	-3.00	0.00	3.00	1,541.13	369.98	888	841.19	5.90	-0.32	0.01
165.00	-4.16	-0.38	0.00	-2.93	0.00	2.93	1,539.23	369.35	885	838.71	5.91	-0.32	0.01
167.00	-3.98	-0.36	0.00	-2.18	0.00	2.18	1,520.07	363.09	855	814.10	6.04	-0.32	0.01
167.10	-3.79	-0.34	0.00	-2.14	0.00	2.14	1,519.11	362.77	854	812.87	6.05	-0.32	0.01
167.20	-3.40	-0.31	0.00	-2.11	0.00	2.11	1,518.14	362.46	852	811.65	6.05	-0.32	0.01
170.00	-3.15	-0.29	0.00	-1.24	0.00	1.24	1,490.89	353.69	811	777.61	6.24	-0.32	0.00
174.00	-0.36	-0.03	0.00	-0.08	0.00	0.08	1,444.26	341.16	755	726.35	6.51	-0.32	0.00
175.00	-0.10	-0.01	0.00	-0.05	0.00	0.05	1,431.01	338.03	741	713.01	6.58	-0.32	0.00
179.60	-0.07	-0.01	0.00	0.00	0.00	0.00	1,370.02	323.63	679	653.23	6.88	-0.32	0.00
180.00	0.00	-0.01	0.00	0.00	0.00	0.00	1,364.72	322.37	674	648.16	6.91	-0.32	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	41.78	0.00	76.85	0.00	0.00	5561.82	0.00	0.77
0.9D + 1.0W	41.75	0.00	57.62	0.00	0.00	5471.71	0.00	0.76
1.2D + 1.0Di + 1.0Wi	9.67	0.00	100.09	0.00	0.00	1279.00	0.00	0.19
1.2D + 1.0Ev + 1.0Eh	2.00	0.00	77.40	0.00	0.00	286.53	0.00	0.05
0.9D - 1.0Ev + 1.0Eh	1.96	0.00	53.60	0.00	0.00	280.49	0.00	0.05
1.0D + 1.0W	8.34	0.00	64.10	0.00	0.00	1100.39	0.00	0.16

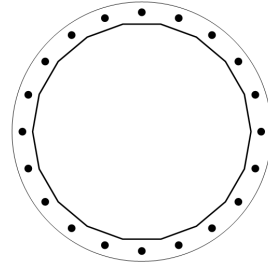
BASE PLATE ANALYSIS @ 0 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
5561.82	76.85	41.78

PLATE PARAMETERS (ID# 16631)

Width:	75	in
Shape:	Round	
Thickness:	2.75	in
Grade:	A633 Gr. E	
Yield Strength:	60	ksi
Tensile Strength:	80	ksi
Rod Detail Type:	d	
Clear Distance	3.5	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	36	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#17020]	Radial	20	2.25	69	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	62.45"ø x 0.4375" (18 Sides)	84.8008	-	-	40768.65	-
Bolt Group	Original (20) 2.25"ø	3.9761	3.2477	0.8393	35787.17	4.5

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	62.45"ø x 0.4375" (18 Sides)	5561.8	76.85	41.78	1.000
Bolt Group	Original (20) 2.25"ø	5561.8	-	41.78	1.000

BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	62.58	in	Flat Width:	11.034	in
Point-to-Point Diameter:	63.54	in	Flat Radians:	0.349	rad
Orientation Offset:	-	°			

PLATE PROPERTIES

Neutral Axis:	36	°
Bend Line Limits:	1.676 to 2.722	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n
Flats	36.396	0.00	68.812	496.7	3715.8	13.4%
Corners	34.683	0.00	65.573	290.3	3541.0	8.2%
Circumferential	47.124	0.00	89.093	843.2	4811.0	17.5%

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	20	2.25	166.9	3.3	243.6	71.3%

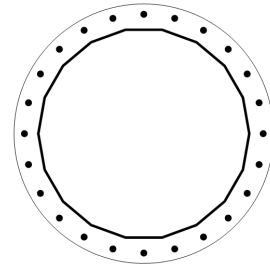
LOWER FLANGE PLATE ANALYSIS @ 148.7084 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
301.7	19.07	24.11

PLATE PARAMETERS (ID# 16630)

Width:	37.5	in
Shape:	Round	
Thickness:	2	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Base Weld Size:	0.313	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	23	°



FLANGE BOLT PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#17021]	Radial	24	1	34.5	A325	92	120	-	-

COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	30.0803"ø x 0.375" (18 Sides)	34.8183	-	-	3842.13	-
Bolt Group	Original (24) 1"ø	0.7854	0.6057	0.0292	2009.77	8.0

REACTION DISTRIBUTION

Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	30.0803"ø x 0.375" (18 Sides)	301.7	19.07	24.11	1.000
Bolt Group	Original (24) 1"ø	301.7	-	24.11	1.000

LOWER FLANGE PLATE BEND LINE ANALYSIS @ 148.7084 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	30.39	in
Point-to-Point Diameter:	30.86	in
Orientation Offset:	-	°

Flat Width:	5.359	in
Flat Radians:	0.349	rad

PLATE PROPERTIES

Neutral Axis:	23	°
Bend Line Limits:	1.457 to 2.470	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in ³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n
Flats	19.433	0.00	19.433	54.0	874.5	6.2%
Corners	18.680	0.00	18.680	39.5	840.6	4.7%
Circumferential	24.030	0.00	24.030	86.8	1081.4	8.0%

PLASTIC FLANGE BOLT ANALYSIS

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load P _u (k)	Applied Shear Load V _u (k)	Compressive Capacity ΦP _n (k)	Interaction Result
Original	24	1	15.8	1.6	54.5	33.1%

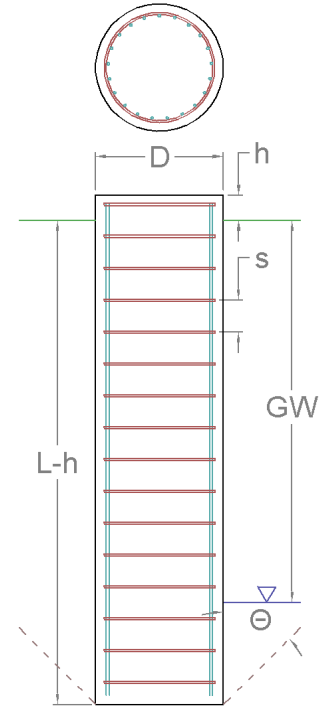
PIER FOUNDATION ANALYSIS

GLOBAL REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
5,561.82	76.85	41.78

FOUNDATION PARAMETERS

Pier Diameter:	D	8.00	ft
Pier Embedment Depth:	L-h	25.4	ft
Pier Height above Grade:	h	0.50	ft
Concrete Compressive Strength:		4,000	psi
Vertical Rebar:		(40) #10 bars [60 ksi]	
Tie Rebar:	s	#5 bars @ 6.0" c/c [40 ksi]	
Rebar Clear Cover:		3.00	in



SOIL PARAMETERS

Water Table Depth [BGL]: GW - ft

Layer Depth (ft)	Unit Weight	Cohesion	Friction Angle	Ultimate Skin Friction	Ultimate Net Bearing	
						Top
0	0.5	105	0	0	0	
0.5	4	110	0	33	0	
4	20	110	0	33	1,000	
20	26.42	110	0	33	1,400	

SOIL STRENGTH ANALYSIS

Volume of Concrete (ft³)	Buoyant Weight of Concrete (k)	Skin Friction Resistance (k)	Inflection Point [BGL] (ft)
1,302.88	195.43	592.83	17.69

SOIL MOMENT ANALYSIS

Total Lateral Resistance (k)	Moment at Inflection Point, M_u (k-ft)	Additional Resistance (k-ft)	Nominal Moment Capacity, ΦM_n (k-ft)	Soil Moment Usage, $M_u / \Phi M_n$
2,376.88	6,321.96	0.00	8,669.46	72.9% ✓


SOIL COMPRESSION ANALYSIS

Compressive Bearing Resistance (k)	Compressive Force, P_u (k)	Additional Resistance (k)	Nominal Compressive Capacity, ΦP_n (k)	Soil Compressive Usage, $P_u / \Phi P_n$
411.52	138.33	0.00	753.27	18.4% ✓


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
87.48	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, $M_u / \Phi_b M_n$
5,592.50	9,780.65	0.01	57.2% 

PIER REINFORCING COMPRESSION ANALYSIS

Buoyant Weight of Concrete (k)	Design Compression, P_u (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, $P_u / \Phi_p P_n$
195.43	138.33	14,292.34	1.0% 

PIER REINFORCING SHEAR ANALYSIS

Design Shear, V_u (k)	Nominal Shear Capacity, $\Phi_v V_n$ (k)	Pier Rebar Shear Usage, $V_u / \Phi_v V_n$
552.16	928.40	59.5% 