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Inspections Division
Approved with Conditions
Date: 12/28/17

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**275 ft Guyed Tower**
ATC Site Name	:	**Portland ME, ME**
ATC Site Number	:	**10047**
Engineering Number	:	**OAA685516_C3_08**
Proposed Carrier	:	**Verizon**
Carrier Site Name	:	**Portland_N_ME**
Carrier Site Number	:	**20130840731**
Site Location	:	**225 Riverside Industrial Parkway** **Portland, ME 04103-1438** **43.706000,-70.310700**
County	:	**Cumberland**
Date	:	**November 8, 2017**
Max Usage	:	**101%**
Result	:	**Pass**

Prepared By:
Hamid Kazem, PhD, E.I.
Structural Engineer I

Hamid Kazem

Reviewed By:

STATE OF MAINE
JOSHUA WALTON
No. 13932
LICENSED
PROFESSIONAL ENGINEER

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Calculations ..... Attached

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 275 ft guyed tower to reflect the change in loading by Verizon.

Supporting Documents

Tower Drawings	PiRod Drawing # 110412-B dated September 29, 1987
Foundation Drawing	PiRod Drawing # 110412-B dated September 29, 1987
Geotechnical Report	GEOServices, LLC Project # 21-07254 dated April 27, 2008

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:	98 mph (3-Second Gust)
Basic Wind Speed w/ Ice:	40 mph (3-Second Gust) w/ 1" radial ice concurrent
Code:	ANSI/TIA-222-G / 2009 IBC / Maine Model Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	1
Spectral Response:	Ss = 0.25, S_1 = 0.08
Site Class:	D - Stiff Soil

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

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Existing and Reserved Equipment

Elevation[1] (ft) Mount	Elevation[1] (ft) RAD	Qty	Antenna	Mount Type	Lines	Carrier
272.0	-	-	-	Sector Frames	(17) 1 5/8" Coax	Verizon
260.0	260.0	3	RFS APXVAA24_43-U-A20	Sector Frames	(12) 1 5/8" Coax (1) 1/2" Coax (1) 1 1/4" Fiber	T-Mobile
		3	Ericsson Radio 4478 B71			
		3	RFS ATMA4P4DBP-1A20			
		3	RFS APX16DWV-16DWV-S-E-ACU			
		1	Radio Waves G3-2.4			
239.0	239.0	1	RAC 8' Ice Shield	Leg	-	US Dept. Of Homeland Security
230.0	230.0	1	Radio Waves HPD6-4.7NS	Leg	(1) 1/2" Coax (1) 1 5/8" Coax	
		1	Motorola PTP 45600			
206.0	206.0	3	KMW HB-X-WM-17-65-00T	Stand-Offs	(6) 1 5/8" Coax	Clearwire
		3	KMW HB-X-WM-17-65-00T-TTLNA (w/BKT)			
195.0	195.0	1	10' Omni	Stand-Off	(1) 1 1/4" Coax	City Of Portland
188.0	188.0	3	Ericsson RRUS-11 (50 lbs.)	Sector Frames	(6) 1 5/8" Coax (1) 1 1/4" Fiber	US Cellular
		6	KMW AM-X-CD-17-65-00T-RET			
		1	Raycap RUSDC-6267-PF-48			
175.0	175.0	1	10' Omni	Stand-Off	(1) 7/8" Coax	City Of Portland
171.0	171.0	1	TX RX Systems 421-83A-01261	Stand-Off	(1) 1/2" Coax (1) 7/8" Coax	
		1	Bird BA40-41-DIN			US Dept. Of Homeland Security
153.0	153.0	1	6' Ice Shield	Leg	-	
142.0	142.0	1	Radio Waves HPD4-4.7	Leg	(2) 1/4" Coax (1) 1 5/8" Coax	
		1	Motorola PTP 45600			
131.0	131.0	1	Bird BA40-41-DIN	Stand-Off	(1) 7/8" Coax	
125.0	125.0	2	2' Omni	Stand-Off	(1) 1/2" Coax (1) 7/8" Coax	City Of Portland
100.0	100.0	1	2' Omni	Stand-Off	(1) 1/2" Coax	
38.0	38.0	1	2" X 8" GPS	Stand-Off	(1) 1/4" Coax	

Equipment to be Removed

Elevation[1] (ft) Mount	Elevation[1] (ft) RAD	Qty	Antenna	Mount Type	Lines	Carrier
272.0	272.0	3	Swedcom SACP 2x5516	-	(1) 1 5/8" Coax (1) 1 5/8" Fiber	Verizon
		3	CSS X7C-665-0			
		3	CSS AXP18-60			
		3	Swedcom SWCP 2x5515			
		3	Alcatel-Lucent RRH2x40-AWS			
		1	Raycap RDC-4276-PF-48			

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Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
272.0	272.0	12	Commscope SBNHH-1D65B (72.9")	Sector Frames	(2) 1 5/8" Hybriflex	Verizon
		2	Raycap RVZDC-6624-PF-48			
		3	Alcatel-Lucent B66a RRH4x45 (AWS-3)			
		3	Alcatel-Lucent B25 RRH4x30-4R			
		3	Alcatel-Lucent B13 RRH4x30-4R			

[1]Mount elevation is defined as height above bottom of steel structure to the bottom of mount, RAD elevation is defined as center of antenna above ground level (AGL).

Install proposed coax stacked on top of existing Verizon coax.

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Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	80%	Pass
Diagonals	98%	Pass
Horizontals	87%	Pass
Guys	62%	Pass
Leg Bolts	65%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Base Axial (kips)	353.9	101%
Anchor 1 Uplift (kips)	97.1	39%
Anchor 1 Shear (kips)	64.0	41%

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

Deflection, Twist and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Twist (°)	Sway (Rotation) (°)
272.0	Raycap RVZDC-6624-PF-48	Verizon	0.161	0.024	0.067
	Commscope SBNHH-1D65B (72.9")				
260.0	Radio Waves G3-2.4	T-Mobile	0.168		0.035
230.0	Radio Waves HPD6-4.7NS	US Dept. of Homeland	0.157		0.041
142.0	Radio Waves HPD4-4.7		0.109		0.044

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

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Standard Conditions

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessary limited, to:

-- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.

-- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements of the structure.

It is the responsibility of the client to ensure that the information provided to ATC Tower Services LLC and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and that their capacity has not significantly changed from the "as new" condition.

Unless explicitly agreed by both the client and American Tower Corporation, all services will be performed in accordance with the current revision of ANSI/TIA -222. The design basic wind speed will be determined based on the minimum basic wind speed as prescribed in ANSI/TIA-222. Although every effort is taken to ensure that the loading considered is adequate to meet the requirements of all applicable regulatory entities, we can provide no assurance to meet any other local and state codes or requirements. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement.

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

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Loads: 98 mph no ice
40 mph w/ 1" radial ice
Site Class: D Ss: 0.25 S1: 0.08
60 mph Serviceability

Job Information

Tower : 10047 Location : PORTLAND ME, ME
Code : ANSI/TIA-222-G Shape : Triangle Base
Client : VERIZON WIRELESS

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Sections Properties

Section	Leg Members		Diagonal Members	Horizontal Members
1 - 2	SOL 50 ksi	2 1/4" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 3/4" SOLID
3 - 10	SOL 50 ksi	2 1/4" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID
11 - 14	SOL 50 ksi	2" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID
15	SOL 50 ksi	2" SOLID	SOL 50 ksi 3/4" SOLID	PL 50 ksi PL 3 x 0.375
16	SOL 50 ksi	2" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID
17	SOL 50 ksi	2" SOLID	SOL 50 ksi 3/4" SOLID	PL 50 ksi PL 3 x 0.375
18 - 20	SOL 50 ksi	2" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID
21 - 23	SOL 50 ksi	1 3/4" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID
24	SOL 50 ksi	1 3/4" SOLID	SOL 50 ksi 3/4" SOLID	PL 50 ksi PL 3 x 0.375
25	SOL 50 ksi	1 3/4" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID
26	SOL 50 ksi	1 3/4" SOLID	SOL 50 ksi 3/4" SOLID	PL 50 ksi PL 3 x 0.375
27	SOL 50 ksi	1 3/4" SOLID	SOL 50 ksi 3/4" SOLID	SOL 50 ksi 7/8" SOLID

Discrete Appurtenance

Elev (ft)	Type	Qty	Description
272.00	Panel	12	Commscope SBNHH-1D65B (72.9")
272.00	Panel	2	Raycap RVZDC-6624-PF-48
272.00	Panel	3	Alcatel-Lucent B66a RRH4x45 (A
272.00	Panel	3	Alcatel-Lucent B25 RRH4x30-4R
272.00	Panel	3	Alcatel-Lucent B13 RRH4x30-4R
272.00	Mounting Frame	3	Flat Light Sector Frame
270.00	Other	1	Torque Arms
260.00	Panel	3	RFS APXVAA24_43-U-A20
260.00	Panel	3	Ericsson Radio 4478 B71
260.00	Panel	3	RFS ATMA4P4DBP-1A20
260.00	Panel	3	RFS APX16DWV-16DWV-S-E-ACU
260.00	Dish	1	Radio Waves G3-2.4
260.00	Mounting Frame	3	Round Sector Frame
239.00	Panel	1	RAC 8' Ice Shield
230.00	Dish	1	Radio Waves HPD6-4.7NS
230.00	Panel	1	Motorola PTP 45600
215.00	Other	1	Torque Arms
206.00	Straight Arm	3	Stand-Off
206.00	Panel	3	KMW HB-X-WM-17-65-00T
206.00	Panel	3	KMW HB-X-WM-17-65-00T-TTLNA (w
195.00	Straight Arm	1	Stand-Off
195.00	Whip	1	10' Omni
188.00	Panel	3	Ericsson RRUS-11 (50 lbs.)
188.00	Panel	6	KMW AM-X-CD-17-65-00T-RET
188.00	Panel	1	Raycap RUSDC-6267-PF-48
188.00	Mounting Frame	3	Round Sector Frame
175.00	Straight Arm	1	Stand-Off
175.00	Whip	1	10' Omni
171.00	Whip	1	Bird BA40-41-DIN
171.00	Panel	1	TX RX Systems 421-83A-01261
171.00	Straight Arm	1	Stand-Off
153.00	Panel	1	6' Ice Shield
142.00	Dish	1	Radio Waves HPD4-4.7
142.00	Panel	1	Motorola PTP 45600
131.00	Whip	1	Bird BA40-41-DIN
131.00	Straight Arm	1	Stand-Off
125.00	Straight Arm	1	Stand-Off
125.00	Whip	2	2' Omni
100.00	Straight Arm	1	Stand-Off
100.00	Whip	1	2' Omni
38.00	Whip	1	2" X 8" GPS
38.00	Straight Arm	1	Stand-Off

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Job Information

Tower : 10047 Location : PORTLAND ME, ME
Code : ANSI/TIA-222-G Shape : Triangle Base
Client : VERIZON WIRELESS

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Linear Appurtenance

Elev (ft) From	To	Qty	Description
10.00	272.00	2	1 5/8" Hybriflex
10.00	272.00	2	1 5/8" Coax
10.00	272.00	5	1 5/8" Coax
10.00	272.00	3	1 5/8" Coax
10.00	272.00	6	1 5/8" Coax
10.00	260.00	1	1/2" Coax
10.00	260.00	12	1 5/8" Coax
10.00	260.00	1	1 1/4" Fiber
0.00	230.00	1	1/2" Coax
0.00	230.00	1	1 5/8" Coax
10.00	206.00	1	Waveguide
10.00	206.00	6	1 5/8" Coax
10.00	195.00	1	1 1/4" Coax
10.00	188.00	6	1 5/8" Coax
10.00	188.00	1	1 1/4" Fiber
10.00	175.00	1	7/8" Coax
10.00	171.00	1	7/8" Coax
10.00	171.00	1	1/2" Coax
10.00	142.00	2	1/4" Coax
10.00	142.00	1	1 5/8" Coax
10.00	131.00	1	7/8" Coax
10.00	125.00	1	7/8" Coax
10.00	125.00	1	1/2" Coax
10.00	100.00	1	1/2" Coax
10.00	38.00	1	1/4" Coax

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Job Information

Tower :	10047	Location :	PORTLAND ME, ME
Code :	ANSI/TIA-222-G	Shape :	Triangle
Client :	VERIZON WIRELESS		

Base

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Guy Anchor Design Loads

Radius (ft)	Drop (ft)	Azimuth (°)	Uplift (kip)	Shear (kip)
115.00	0.00	0	97.13	64.01
115.00	0.00	240	97.13	64.01
115.00	0.00	120	97.13	64.01

Global Base Foundation Design Loads

Vertical (kip)	Horizontal (kip)
353.90	0.61

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Analysis Parameters

Location:	CUMBERLAND County, ME	Height (ft):	275
Code:	ANSI/TIA-222-G	Base Elevation (ft):	0.00
Shape:	Triangle	Bottom Face Width (ft):	3.50
Tower Manufacturer:	Pirod	Top Face Width (ft):	3.50
Tower Type:	Guyed		

Ice & Wind Parameters

Structure Class:	II	Design Windspeed Without Ice:	98 mph
Exposure Category:	B	Design Windspeed With Ice:	40 mph
Topographic Category:	1	Operational Windspeed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	1.00 in

Seismic Parameters

Analysis Method: Equivalent Modal Analysis & Equivalent Lateral Force Methods

Site Class: D - Stiff Soil

Period Based on Rayleigh Method (sec): 0.87

T_L(sec):	6	p:	1.3	C_S:	0.058
S_S :	0.245	S_1 :	0.079	C_S, Max:	0.058
F_a :	1.600	F_V :	2.400	C_S, Min:	0.030
S_{ds} :	0.261	S_{d1} :	0.126		

Load Cases

1.2D + 1.6W Normal	98 mph Normal to Face with No Ice
1.2D + 1.6W 60 deg	98 mph 60 degree with No Ice
1.2D + 1.6W 90 deg	98 mph 90 degree with No Ice
1.2D + 1.6W 120 deg	98 mph 120 degree with No Ice
1.2D + 1.6W 180 deg	98 mph 180 degree with No Ice
1.2D + 1.6W 210 deg	98 mph 210 degree with No Ice
1.2D + 1.6W 240 deg	98 mph 240 degree with No Ice
1.2D + 1.6W 300 deg	98 mph 300 degree with No Ice
1.2D + 1.6W 330 deg	98 mph 330 degree with No Ice
1.2D + 1.0Di + 1.0Wi Normal	40 mph Normal with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 60 deg	40 mph 60 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 90 deg	40 mph 90 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 120 deg	40 mph 120 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 180 deg	40 mph 180 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 210 deg	40 mph 210 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 240 deg	40 mph 240 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 300 deg	40 mph 300 deg with 1 in Radial Ice
1.2D + 1.0Di + 1.0Wi 330 deg	40 mph 330 deg with 1 in Radial Ice
(1.2 + 0.2Sds) * DL + E Normal	Seismic Normal
(1.2 + 0.2Sds) * DL + E 60 deg	Seismic 60 deg
(1.2 + 0.2Sds) * DL + E 90 deg	Seismic 90 deg

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Analysis Parameters

(1.2 + 0.2Sds) * DL + E 120 deg	Seismic 120 deg
(1.2 + 0.2Sds) * DL + E 180 deg	Seismic 180 deg
(1.2 + 0.2Sds) * DL + E 210 deg	Seismic 210 deg
(1.2 + 0.2Sds) * DL + E 240 deg	Seismic 240 deg
(1.2 + 0.2Sds) * DL + E 300 deg	Seismic 300 deg
(1.2 + 0.2Sds) * DL + E 330 deg	Seismic 330 deg
(0.9 - 0.2Sds) * DL + E Normal	Seismic (Reduced DL) Normal
(0.9 - 0.2Sds) * DL + E 60 deg	Seismic (Reduced DL) 60 deg
(0.9 - 0.2Sds) * DL + E 90 deg	Seismic (Reduced DL) 90 deg
(0.9 - 0.2Sds) * DL + E 120 deg	Seismic (Reduced DL) 120 deg
(0.9 - 0.2Sds) * DL + E 180 deg	Seismic (Reduced DL) 180 deg
(0.9 - 0.2Sds) * DL + E 210 deg	Seismic (Reduced DL) 210 deg
(0.9 - 0.2Sds) * DL + E 240 deg	Seismic (Reduced DL) 240 deg
(0.9 - 0.2Sds) * DL + E 300 deg	Seismic (Reduced DL) 300 deg
(0.9 - 0.2Sds) * DL + E 330 deg	Seismic (Reduced DL) 330 deg
1.0D + 1.0W Service Normal	Serviceability - 60 mph Wind Normal
1.0D + 1.0W Service 60 deg	Serviceability - 60 mph Wind 60 deg
1.0D + 1.0W Service 90 deg	Serviceability - 60 mph Wind 90 deg
1.0D + 1.0W Service 120 deg	Serviceability - 60 mph Wind 120 deg
1.0D + 1.0W Service 180 deg	Serviceability - 60 mph Wind 180 deg
1.0D + 1.0W Service 210 deg	Serviceability - 60 mph Wind 210 deg
1.0D + 1.0W Service 240 deg	Serviceability - 60 mph Wind 240 deg
1.0D + 1.0W Service 300 deg	Serviceability - 60 mph Wind 300 deg
1.0D + 1.0W Service 330 deg	Serviceability - 60 mph Wind 330 deg

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Tower Loading

Discrete Appurtenance Properties 1.2D + 1.6W

Elevation (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
272.0	Alcatel-Lucent B13	3	58	2.1	1.8	12.0	8.9	0.80	0.67	0.0	0.0	27.49	129	250
272.0	Alcatel-Lucent B25	3	51	2.1	1.8	12.0	7.2	0.80	0.67	0.0	0.0	27.49	129	220
272.0	Raycap RVZDC-6624-	2	32	2.5	2.4	15.7	10.3	0.80	0.67	0.0	0.0	27.49	99	92
272.0	Alcatel-Lucent B66a	3	67	2.7	2.2	12.0	6.8	0.80	0.67	0.0	0.0	27.49	160	289
272.0	Commscope SBNHH-	12	41	8.2	6.1	11.9	7.1	0.80	0.69	0.0	0.0	27.49	2031	702
272.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	27.49	1009	1728
270.0	Torque Arms	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	27.43	560	720
260.0	RFS ATMA4P4DBP-	3	16	0.9	0.9	8.0	4.9	0.80	0.50	0.0	0.0	27.14	39	69
260.0	Ericsson Radio 4478	3	60	1.6	1.3	13.2	7.4	0.80	0.50	0.0	0.0	27.14	73	259
260.0	Radio Waves G3-2.4	1	25	4.2	3.0	36.0	0.0	0.80	1.00	0.0	0.0	27.14	124	36
260.0	RFS APX16DWV-	3	40	6.1	4.4	13.0	3.1	0.80	0.60	0.0	0.0	27.14	323	171
260.0	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.0	27.14	801	1296
260.0	RFS APXVAA24_43-	3	101	20.3	8.0	24.0	8.5	0.80	0.63	0.0	0.0	27.14	1131	438
239.0	RAC 8' Ice Shield	1	600	6.0	8.0	60.0	24.0	1.00	1.00	0.0	0.0	26.49	216	864
230.0	Motorola PTP 45600	1	12	1.8	1.2	14.5	3.7	1.00	0.50	0.0	0.0	26.20	31	17
230.0	Radio Waves HPD6-	1	405	44.0	6.0	0.0	0.0	1.00	1.00	0.0	0.0	26.20	1568	583
215.0	Torque Arms	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	25.70	524	720
206.0	KMW HB-X-WM-17-	3	16	1.0	1.3	7.3	3.7	0.80	0.50	0.0	0.0	25.39	40	69
206.0	KMW HB-X-WM-17-	3	30	1.9	4.0	7.3	7.3	0.80	1.00	0.0	0.0	25.39	159	130
206.0	Stand-Off	3	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	25.39	311	432
195.0	10' Omni	1	25	3.0	10.0	3.0	3.0	1.00	1.00	0.0	0.0	24.99	102	36
195.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	24.99	102	144
188.0	Raycap RUSDC-6267-	1	16	2.5	1.6	16.1	5.6	0.80	0.67	0.0	0.0	24.73	46	23
188.0	Ericsson RRUS-11	3	50	2.6	1.5	17.3	7.2	0.80	0.67	0.0	0.0	24.73	139	216
188.0	KMW AM-X-CD-17-	6	31	5.0	4.0	11.8	6.0	0.80	0.66	0.0	0.0	24.73	532	266
188.0	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.0	24.73	730	1296
175.0	10' Omni	1	25	3.0	10.0	3.0	3.0	1.00	1.00	0.0	0.0	24.23	99	36
175.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	24.23	99	144
171.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	24.07	98	144
171.0	TX RX Systems 421-	1	20	3.1	1.7	16.0	6.0	1.00	0.50	0.0	0.0	24.07	51	29
171.0	Bird BA40-41-DIN	1	32	5.1	11.5	0.0	0.0	1.00	1.00	0.0	0.0	24.07	165	46
153.0	6' Ice Shield	1	450	3.9	1.2	100.0	48.0	1.00	1.00	0.0	0.0	23.32	123	648
142.0	Motorola PTP 45600	1	12	2.0	1.2	14.5	3.7	1.00	1.00	0.0	0.0	22.83	63	17
142.0	Radio Waves HPD4-	1	85	15.9	4.0	0.0	0.0	1.00	1.00	0.0	0.0	22.83	492	122
131.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	22.31	91	144
131.0	Bird BA40-41-DIN	1	32	5.1	11.5	0.0	0.0	1.00	1.00	0.0	0.0	22.31	153	46
125.0	2' Omni	2	5	0.3	2.0	2.0	2.0	1.00	1.00	0.0	0.0	22.01	18	14
125.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	22.01	90	144
100.0	2' Omni	1	5	0.3	2.0	2.0	2.0	1.00	1.00	0.0	0.0	20.65	8	7
100.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	20.65	84	144
38.00	2" X 8" GPS	1	10	0.2	0.7	2.0	2.0	1.00	1.00	0.0	0.0	15.66	3	14
38.00	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	15.66	64	144
	Totals	88	8966	557.8										

Discrete Appurtenance Properties 1.2D + 1.0Di + 1.0Wi

Elevation (ft)	Description	Qty	Ice Wt (lb)	Ice EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a (DL) (lb)
272.0	Alcatel-Lucent B13	3	184	3.1	1.8	12.0	8.9	0.80	0.67	0.0	0.0	4.58	19	703
272.0	Alcatel-Lucent B25	3	166	3.1	1.8	12.0	7.2	0.80	0.67	0.0	0.0	4.58	19	636
272.0	Raycap RVZDC-6624-	2	226	5.0	2.4	15.7	10.3	0.80	0.67	0.0	0.0	4.58	21	557
272.0	Alcatel-Lucent B66a	3	200	3.7	2.2	12.0	6.8	0.80	0.67	0.0	0.0	4.58	23	769

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272.0	Commscope SBNHH-	12	353	10.1	6.1	11.9	7.1	0.80	0.69	0.0	0.0	4.58	261	5196
272.0	Flat Light Sector	3	827	39.3	0.0	0.0	0.0	0.75	0.67	0.0	0.0	4.58	231	3265
270.0	Torque Arms	1	993	29.8	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.57	116	1312
260.0	RFS ATMA4P4DBP-	3	68	1.3	0.9	8.0	4.9	0.80	0.50	0.0	0.0	4.52	6	255
260.0	Ericsson Radio 4478	3	156	2.4	1.3	13.2	7.4	0.80	0.50	0.0	0.0	4.52	11	606
260.0	Radio Waves G3-2.4	1	148	41.3	3.0	36.0	0.0	0.80	1.00	0.0	0.0	4.52	127	183
260.0	RFS APX16DWV-	3	240	7.6	4.4	13.0	3.1	0.80	0.60	0.0	0.0	4.52	42	891
260.0	Round Sector Frame	3	818	37.7	0.0	0.0	0.0	0.75	0.67	0.0	0.0	4.52	219	3162
260.0	RFS APXVAA24_43-	3	734	23.0	8.0	24.0	8.5	0.80	0.63	0.0	0.0	4.52	134	2716
239.0	RAC 8' Ice Shield	1	2154	14.8	8.0	60.0	24.0	1.00	1.00	0.0	0.0	4.41	56	2729
230.0	Motorola PTP 45600	1	91	2.6	1.2	14.5	3.7	1.00	0.50	0.0	0.0	4.37	5	112
230.0	Radio Waves HPD6-	1	1832	50.0	6.0	0.0	0.0	1.00	1.00	0.0	0.0	4.37	186	2296
215.0	Torque Arms	1	982	29.5	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.28	107	1299
206.0	KMW HB-X-WM-17-	3	71	1.6	1.3	7.3	3.7	0.80	0.50	0.0	0.0	4.23	7	267
206.0	KMW HB-X-WM-17-	3	198	4.6	4.0	7.3	7.3	0.80	1.00	0.0	0.0	4.23	40	734
206.0	Stand-Off	3	167	5.2	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.23	56	674
195.0	10' Omni	1	234	6.7	10.0	3.0	3.0	1.00	1.00	0.0	0.0	4.16	24	287
195.0	Stand-Off	1	167	5.1	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.16	18	224
188.0	Raycap RUSDC-6267-	1	127	3.5	1.6	16.1	5.6	0.80	0.67	0.0	0.0	4.12	7	156
188.0	Ericsson RRUS-11	3	171	3.5	1.5	17.3	7.2	0.80	0.67	0.0	0.0	4.12	20	652
188.0	KMW AM-X-CD-17-	6	226	6.4	4.0	11.8	6.0	0.80	0.66	0.0	0.0	4.12	71	1669
188.0	Round Sector Frame	3	803	37.0	0.0	0.0	0.0	0.75	0.67	0.0	0.0	4.12	196	3108
175.0	10' Omni	1	230	6.7	10.0	3.0	3.0	1.00	1.00	0.0	0.0	4.04	23	282
175.0	Stand-Off	1	166	5.1	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.04	18	223
171.0	Stand-Off	1	166	5.1	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.01	17	223
171.0	TX RX Systems 421-	1	135	3.6	1.7	16.0	6.0	1.00	0.50	0.0	0.0	4.01	6	167
171.0	Bird BA40-41-DIN	1	121	18.3	11.5	0.0	0.0	1.00	1.00	0.0	0.0	4.01	63	153
153.0	6' Ice Shield	1	1565	9.4	1.2	100.0	48.0	1.00	1.00	0.0	0.0	3.89	31	1985
142.0	Motorola PTP 45600	1	86	2.5	1.2	14.5	3.7	1.00	1.00	0.0	0.0	3.80	8	106
142.0	Radio Waves HPD4-	1	298	19.0	4.0	0.0	0.0	1.00	1.00	0.0	0.0	3.80	61	378
131.0	Stand-Off	1	164	5.1	0.0	0.0	0.0	1.00	1.00	0.0	0.0	3.72	16	221
131.0	Bird BA40-41-DIN	1	118	18.0	11.5	0.0	0.0	1.00	1.00	0.0	0.0	3.72	57	150
125.0	2' Omni	2	42	1.0	2.0	2.0	2.0	1.00	1.00	0.0	0.0	3.67	6	103
125.0	Stand-Off	1	164	5.1	0.0	0.0	0.0	1.00	1.00	0.0	0.0	3.67	16	221
100.0	2' Omni	1	40	0.9	2.0	2.0	2.0	1.00	1.00	0.0	0.0	3.44	3	49
100.0	Stand-Off	1	162	5.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	3.44	15	218
38.00	2" X 8" GPS	1	23	0.3	0.7	2.0	2.0	1.00	1.00	0.0	0.0	2.61	1	30
38.00	Stand-Off	1	155	4.8	0.0	0.0	0.0	1.00	1.00	0.0	0.0	2.61	11	211
	Totals	88	30856	983.0										

Discrete Appurtenance Properties 1.0D + 1.0W Service

Elevation (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K_a	Orient. Factor	Vert. Ecc.(ft)	M_u (lb-ft)	Q_z (psf)	F_a (WL) (lb)	P_a(DL) (lb)
272.0	Alcatel-Lucent B13	3	58	2.1	1.8	12.0	8.9	0.80	0.67	0.0	0.0	10.30	30	173
272.0	Alcatel-Lucent B25	3	51	2.1	1.8	12.0	7.2	0.80	0.67	0.0	0.0	10.30	30	153
272.0	Raycap RVZDC-6624-	2	32	2.5	2.4	15.7	10.3	0.80	0.67	0.0	0.0	10.30	23	64
272.0	Alcatel-Lucent B66a	3	67	2.7	2.2	12.0	6.8	0.80	0.67	0.0	0.0	10.30	37	201
272.0	Commscope SBNHH-	12	41	8.2	6.1	11.9	7.1	0.80	0.69	0.0	0.0	10.30	476	487
272.0	Flat Light Sector	3	400	17.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	10.30	236	1200
270.0	Torque Arms	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	10.28	131	500
260.0	RFS ATMA4P4DBP-	3	16	0.9	0.9	8.0	4.9	0.80	0.50	0.0	0.0	10.17	9	48
260.0	Ericsson Radio 4478	3	60	1.6	1.3	13.2	7.4	0.80	0.50	0.0	0.0	10.17	17	180
260.0	Radio Waves G3-2.4	1	25	4.2	3.0	36.0	0.0	0.80	1.00	0.0	0.0	10.17	29	25
260.0	RFS APX16DWV-	3	40	6.1	4.4	13.0	3.1	0.80	0.60	0.0	0.0	10.17	76	119
260.0	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.0	10.17	188	900

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260.0	RFS APXVAA24_43-	3	101	20.3	8.0	24.0	8.5	0.80	0.63	0.0	0.0	10.17	265	304
239.0	RAC 8' Ice Shield	1	600	6.0	8.0	60.0	24.0	1.00	1.00	0.0	0.0	9.93	51	600
230.0	Motorola PTP 45600	1	12	1.8	1.2	14.5	3.7	1.00	0.50	0.0	0.0	9.82	7	12
230.0	Radio Waves HPD6-	1	405	44.0	6.0	0.0	0.0	1.00	1.00	0.0	0.0	9.82	367	405
215.0	Torque Arms	1	500	15.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	9.63	123	500
206.0	KMW HB-X-WM-17-	3	16	1.0	1.3	7.3	3.7	0.80	0.50	0.0	0.0	9.52	9	48
206.0	KMW HB-X-WM-17-	3	30	1.9	4.0	7.3	7.3	0.80	1.00	0.0	0.0	9.52	37	90
206.0	Stand-Off	3	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	9.52	73	300
195.0	10' Omni	1	25	3.0	10.0	3.0	3.0	1.00	1.00	0.0	0.0	9.37	24	25
195.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	9.37	24	100
188.0	Raycap RUSDC-6267-	1	16	2.5	1.6	16.1	5.6	0.80	0.67	0.0	0.0	9.27	11	16
188.0	Ericsson RRUS-11	3	50	2.6	1.5	17.3	7.2	0.80	0.67	0.0	0.0	9.27	33	150
188.0	KMW AM-X-CD-17-	6	31	5.0	4.0	11.8	6.0	0.80	0.66	0.0	0.0	9.27	125	185
188.0	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.67	0.0	0.0	9.27	171	900
175.0	10' Omni	1	25	3.0	10.0	3.0	3.0	1.00	1.00	0.0	0.0	9.08	23	25
175.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	9.08	23	100
171.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	9.02	23	100
171.0	TX RX Systems 421-	1	20	3.1	1.7	16.0	6.0	1.00	0.50	0.0	0.0	9.02	12	20
171.0	Bird BA40-41-DIN	1	32	5.1	11.5	0.0	0.0	1.00	1.00	0.0	0.0	9.02	39	32
153.0	6' Ice Shield	1	450	3.9	1.2	100.0	48.0	1.00	1.00	0.0	0.0	8.74	29	450
142.0	Motorola PTP 45600	1	12	2.0	1.2	14.5	3.7	1.00	1.00	0.0	0.0	8.56	15	12
142.0	Radio Waves HPD4-	1	85	15.9	4.0	0.0	0.0	1.00	1.00	0.0	0.0	8.56	115	85
131.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	8.36	21	100
131.0	Bird BA40-41-DIN	1	32	5.1	11.5	0.0	0.0	1.00	1.00	0.0	0.0	8.36	36	32
125.0	2' Omni	2	5	0.3	2.0	2.0	2.0	1.00	1.00	0.0	0.0	8.25	4	10
125.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	8.25	21	100
100.0	2' Omni	1	5	0.3	2.0	2.0	2.0	1.00	1.00	0.0	0.0	7.74	2	5
100.0	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	7.74	20	100
38.00	2" X 8" GPS	1	10	0.2	0.7	2.0	2.0	1.00	1.00	0.0	0.0	5.87	1	10
38.00	Stand-Off	1	100	3.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	5.87	15	100
	Totals	88	8966	557.8										

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Tower Loading

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out Of Zone	Spacing (in)	Orientation Factor	Ka Override
10.00	272.0	1 5/8" Coax	6	1.98	0.82	33	2	Block	0.00	N	0.67	1.00	0.86
10.00	272.0	1 5/8" Coax	3	1.98	0.82	0	3	Individual	0.00	N	1.00	1.00	0.01
10.00	272.0	1 5/8" Coax	5	1.98	0.82	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	272.0	1 5/8" Coax	2	1.98	0.82	0	2	Individual	0.00	N	1.00	1.00	0.52
10.00	272.0	1 5/8" Hybriflex	2	1.98	1.30	0	Lin App	Individual	0.00	N	1.00	1.00	0.01
10.00	260.0	1 1/4" Fiber	1	1.25	1.05	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	260.0	1 5/8" Coax	12	1.98	0.82	0	3	Cluster	7.92	N	0.50	1.00	0.00
10.00	260.0	1/2" Coax	1	0.63	0.15	0	Lin App	Individual	0.00	N	1.00	1.00	0.01
0.00	230.0	1 5/8" Coax	1	1.98	0.82	0	3	Individual	0.00	N	1.00	1.00	0.43
0.00	230.0	1/2" Coax	1	0.63	0.15	0	Lin App	Individual	0.00	N	1.00	1.00	0.40
10.00	206.0	1 5/8" Coax	6	1.98	0.82	50	1	Block	0.00	N	1.00	1.00	0.00
10.00	206.0	Waveguide	1	1.00	6.00	0	1	Individual	0.00	N	1.00	1.00	0.00
10.00	195.0	1 1/4" Coax	1	1.55	0.66	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	188.0	1 1/4" Fiber	1	1.25	1.05	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	188.0	1 5/8" Coax	6	1.98	1.04	33	Lin App	Block	0.00	N	0.67	1.00	0.86
10.00	175.0	7/8" Coax	1	1.09	0.33	0	Lin App	Individual	0.00	N	1.00	1.00	0.01
10.00	171.0	1/2" Coax	1	0.63	0.15	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	171.0	7/8" Coax	1	1.09	0.33	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	142.0	1 5/8" Coax	1	1.98	0.82	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	142.0	1/4" Coax	2	0.34	0.06	0	Lin App	Individual	0.00	N	1.00	1.00	0.01
10.00	131.0	7/8" Coax	1	1.09	0.33	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	125.0	1/2" Coax	1	0.63	0.15	0	Lin App	Individual	0.00	N	1.00	1.00	0.01
10.00	125.0	7/8" Coax	1	1.09	0.33	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
10.00	100.0	1/2" Coax	1	0.63	0.15	0	3	Individual	0.00	N	1.00	1.00	0.59
10.00	38.00	1/4" Coax	1	0.34	0.06	0	3	Individual	0.00	N	1.00	1.00	0.00

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Equivalent Lateral Force Method

(Based on ASCE7-10 Chapters 11, 12 & 15)

Spectral Response Acceleration for Short Period (S_s):	0.25
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.08
Long-Period Transition Period (T_L - Seconds):	6
Importance Factor (I_e):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v:	2.40
Response Modification Coefficient (R):	2.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.26
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.13
Seismic Response Coefficient (C_s):	0.06
Upper Limit C_s:	0.06
Lower Limit C_s:	0.03
Period based on Rayleigh Method (sec):	0.87
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.18
Total Unfactored Dead Load:	35.10 k
Seismic Base Shear (E):	2.67 k

LoadCase (1.2 + 0.2Sds) * DL + E Seismic

Section	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
27	272.50	250	189,791	0.014	36	313
26	269.42	106	79,552	0.006	15	133
25	268.25	82	60,933	0.004	12	102
24	267.08	106	78,704	0.006	15	133
23	265.75	99	73,253	0.005	14	124
22	255.00	1,318	924,912	0.066	176	1,650
21	235.00	1,379	879,081	0.063	167	1,727
20	222.50	416	248,668	0.018	47	521
19	219.25	129	75,544	0.005	14	161
18	217.33	177	103,107	0.007	20	222
17	215.58	129	74,230	0.005	14	162
16	214.42	137	78,210	0.006	15	171
15	213.25	129	73,243	0.005	14	161
14	212.08	121	68,295	0.005	13	151
13	206.50	802	438,838	0.031	83	1,005
12	200.75	145	76,729	0.005	15	182
11	190.00	1,829	906,614	0.065	172	2,290
10	170.00	2,116	919,666	0.066	175	2,650
9	150.00	2,108	790,146	0.056	150	2,640
8	130.00	2,131	674,378	0.048	128	2,669
7	110.00	2,157	560,209	0.040	106	2,701
6	90.00	2,144	439,230	0.031	83	2,685
5	70.00	2,144	326,288	0.023	62	2,685
4	50.00	2,160	220,776	0.016	42	2,705

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Equivalent Lateral Force Method

3	30.00	2,145	119,838	0.009	23	2,687
2	12.50	1,368	27,135	0.002	5	1,713
1	2.50	308	910	0.000	0	385
Alcatel-Lucent B13 RRH4x30-4R	272.00	173	131,385	0.009	25	217
Alcatel-Lucent B25 RRH4x30-4R	272.00	153	115,928	0.008	22	192
Raycap RVZDC-6624-PF-48	272.00	64	48,493	0.003	9	80
Alcatel-Lucent B66a RRH4x45 (AWS-3)	272.00	201	152,297	0.011	29	252
Commscope SBNHH-1D65B (72.9")	272.00	487	369,150	0.026	70	610
Flat Light Sector Frame	272.00	1,200	909,236	0.065	173	1,503
Torque Arms	270.00	500	375,556	0.027	71	626
RFS ATMA4P4DBP-1A20	260.00	48	34,264	0.002	7	60
Ericsson Radio 4478 B71	260.00	180	129,298	0.009	25	225
Radio Waves G3-2.4	260.00	25	17,958	0.001	3	31
RFS APX16DWV-16DWV-S-E-ACU	260.00	119	85,337	0.006	16	149
Round Sector Frame	260.00	900	646,489	0.046	123	1,127
RFS APXVAA24_43-U-A20	260.00	304	218,513	0.016	42	381
RAC 8' Ice Shield	239.00	600	390,131	0.028	74	751
Motorola PTP 45600	230.00	12	7,518	0.001	1	15
Radio Waves HPD6-4.7NS	230.00	405	251,650	0.018	48	507
Torque Arms	215.00	500	286,860	0.020	55	626
KMW HB-X-WM-17-65-00T-TTLNA	206.00	48	26,017	0.002	5	60
KMW HB-X-WM-17-65-00T	206.00	90	49,088	0.003	9	113
Stand-Off	206.00	300	163,627	0.012	31	376
10' Omni	195.00	25	12,779	0.001	2	31
Stand-Off	195.00	100	51,115	0.004	10	125
Raycap RUSDC-6267-PF-48	188.00	16	7,734	0.001	1	20
Ericsson RRUS-11 (50 lbs.)	188.00	150	73,428	0.005	14	188
KMW AM-X-CD-17-65-00T-RET	188.00	185	90,463	0.006	17	231
Round Sector Frame	188.00	900	440,566	0.031	84	1,127
10' Omni	175.00	25	11,244	0.001	2	31
Stand-Off	175.00	100	44,974	0.003	9	125
Stand-Off	171.00	100	43,761	0.003	8	125
TX RX Systems 421-83A-01261	171.00	20	8,752	0.001	2	25
Bird BA40-41-DIN	171.00	32	14,003	0.001	3	40
6' Ice Shield	153.00	450	172,649	0.012	33	564
Motorola PTP 45600	142.00	12	4,250	0.000	1	15
Radio Waves HPD4-4.7	142.00	85	29,857	0.002	6	106
Stand-Off	131.00	100	31,931	0.002	6	125
Bird BA40-41-DIN	131.00	32	10,218	0.001	2	40
2' Omni	125.00	10	3,021	0.000	1	13
Stand-Off	125.00	100	30,208	0.002	6	125
2' Omni	100.00	5	1,160	0.000	0	6
Stand-Off	100.00	100	23,201	0.002	4	125
2" X 8" GPS	38.00	10	739	0.000	0	13
Stand-Off	38.00	100	7,387	0.001	1	125
		35,103	14,030,513	1.000	2,666	43,959

LoadCase (0.9 - 0.2Sds) * DL + E Seismic (Reduced DL)

Section	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
27	272.50	250	189,791	0.014	36	212
26	269.42	106	79,552	0.006	15	90
25	268.25	82	60,933	0.004	12	69

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24	267.08	106	78,704	0.006	15	90
23	265.75	99	73,253	0.005	14	84
22	255.00	1,318	924,912	0.066	176	1,117
21	235.00	1,379	879,080	0.063	167	1,169
20	222.50	416	248,668	0.018	47	353
19	219.25	129	75,544	0.005	14	109
18	217.33	177	103,107	0.007	20	150
17	215.58	129	74,230	0.005	14	109
16	214.42	137	78,210	0.006	15	116
15	213.25	129	73,243	0.005	14	109
14	212.08	121	68,295	0.005	13	103
13	206.50	802	438,838	0.031	83	680
12	200.75	145	76,729	0.005	15	123
11	190.00	1,829	906,614	0.065	172	1,551
10	170.00	2,116	919,666	0.066	175	1,794
9	150.00	2,108	790,146	0.056	150	1,787
8	130.00	2,131	674,378	0.048	128	1,807
7	110.00	2,157	560,209	0.040	106	1,829
6	90.00	2,144	439,230	0.031	83	1,818
5	70.00	2,144	326,288	0.023	62	1,818
4	50.00	2,160	220,776	0.016	42	1,831
3	30.00	2,145	119,838	0.009	23	1,819
2	12.50	1,368	27,135	0.002	5	1,160
1	2.50	308	910	0.000	0	261
Alcatel-Lucent B13 RRH4x30-4R	272.00	173	131,385	0.009	25	147
Alcatel-Lucent B25 RRH4x30-4R	272.00	153	115,928	0.008	22	130
Raycap RVZDC-6624-PF-48	272.00	64	48,493	0.003	9	54
Alcatel-Lucent B66a RRH4x45 (AWS-3)	272.00	201	152,297	0.011	29	170
Commscope SBNHH-1D65B (72.9")	272.00	487	369,150	0.026	70	413
Flat Light Sector Frame	272.00	1,200	909,236	0.065	173	1,017
Torque Arms	270.00	500	375,556	0.027	71	424
RFS ATMA4P4DBP-1A20	260.00	48	34,264	0.002	7	40
Ericsson Radio 4478 B71	260.00	180	129,298	0.009	25	153
Radio Waves G3-2.4	260.00	25	17,958	0.001	3	21
RFS APX16DWV-16DWV-S-E-ACU	260.00	119	85,337	0.006	16	101
Round Sector Frame	260.00	900	646,489	0.046	123	763
RFS APXVAA24_43-U-A20	260.00	304	218,513	0.016	42	258
RAC 8' Ice Shield	239.00	600	390,131	0.028	74	509
Motorola PTP 45600	230.00	12	7,518	0.001	1	10
Radio Waves HPD6-4.7NS	230.00	405	251,650	0.018	48	343
Torque Arms	215.00	500	286,860	0.020	55	424
KMW HB-X-WM-17-65-00T-TTLNA	206.00	48	26,017	0.002	5	40
KMW HB-X-WM-17-65-00T	206.00	90	49,088	0.003	9	76
Stand-Off	206.00	300	163,627	0.012	31	254
10' Omni	195.00	25	12,779	0.001	2	21
Stand-Off	195.00	100	51,115	0.004	10	85
Raycap RUSDC-6267-PF-48	188.00	16	7,734	0.001	1	13
Ericsson RRUS-11 (50 lbs.)	188.00	150	73,428	0.005	14	127
KMW AM-X-CD-17-65-00T-RET	188.00	185	90,463	0.006	17	157
Round Sector Frame	188.00	900	440,566	0.031	84	763
10' Omni	175.00	25	11,244	0.001	2	21
Stand-Off	175.00	100	44,974	0.003	9	85
Stand-Off	171.00	100	43,761	0.003	8	85
TX RX Systems 421-83A-01261	171.00	20	8,752	0.001	2	17
Bird BA40-41-DIN	171.00	32	14,003	0.001	3	27

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6' Ice Shield	153.00	450	172,649	0.012	33	381
Motorola PTP 45600	142.00	12	4,250	0.000	1	10
Radio Waves HPD4-4.7	142.00	85	29,857	0.002	6	72
Stand-Off	131.00	100	31,931	0.002	6	85
Bird BA40-41-DIN	131.00	32	10,218	0.001	2	27
2' Omni	125.00	10	3,021	0.000	1	8
Stand-Off	125.00	100	30,208	0.002	6	85
2' Omni	100.00	5	1,160	0.000	0	4
Stand-Off	100.00	100	23,201	0.002	4	85
2" X 8" GPS	38.00	10	739	0.000	0	8
Stand-Off	38.00	100	7,387	0.001	1	85
		35,103	14,030,512	1.000	2,666	29,758

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Equivalent Modal Analysis Method

(Based on ASCE7-10 Chapters 11, 12 & 15 and ANSI/TIA-G, section 2.7)

Spectral Response Acceleration for Short Period (S_s):	0.25
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.08
Importance Factor (I_e):	1.00
Site Coefficient F_a:	1.60
Site Coefficient F_v:	2.40
Response Modification Coefficient (R):	2.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.26
Desing Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.13
Period Based on Rayleigh Method (sec):	0.87
Redundancy Factor (p):	1.30

LoadCase (1.2 + 0.2Sds) * DL + E Seismic

Section	Height Above Base (ft)	Weight (lb)	a	b	c	S_{az}	Horizontal Force (lb)	Vertical Force (lb)
27	272.50	250	1.856	1.804	1.076	0.529	69	313
26	269.42	106	1.814	1.603	1.002	0.495	27	133
25	268.25	82	1.798	1.531	0.974	0.482	20	102
24	267.08	106	1.783	1.461	0.948	0.470	26	133
23	265.75	99	1.765	1.384	0.918	0.456	24	124
22	255.00	1,318	1.625	0.858	0.705	0.354	242	1,650
21	235.00	1,379	1.380	0.247	0.412	0.208	149	1,727
20	222.50	416	1.237	0.043	0.283	0.145	31	521
19	219.25	129	1.201	0.006	0.256	0.132	9	161
18	217.33	177	1.180	-0.013	0.240	0.125	12	222
17	215.58	129	1.162	-0.029	0.227	0.119	8	162
16	214.42	137	1.149	-0.038	0.219	0.115	8	171
15	213.25	129	1.137	-0.047	0.210	0.111	7	161
14	212.08	121	1.124	-0.055	0.202	0.108	7	151
13	206.50	802	1.066	-0.087	0.166	0.093	39	1,005
12	200.75	145	1.007	-0.108	0.135	0.081	6	182
11	190.00	1,829	0.902	-0.122	0.088	0.066	63	2,290
10	170.00	2,116	0.722	-0.093	0.034	0.059	65	2,650
9	150.00	2,108	0.562	-0.039	0.011	0.063	69	2,640
8	130.00	2,131	0.422	0.011	0.006	0.066	73	2,669
7	110.00	2,157	0.302	0.045	0.012	0.064	72	2,701
6	90.00	2,144	0.202	0.062	0.023	0.057	63	2,685
5	70.00	2,144	0.122	0.070	0.034	0.048	54	2,685
4	50.00	2,160	0.062	0.072	0.041	0.040	45	2,705
3	30.00	2,145	0.022	0.065	0.039	0.032	36	2,687
2	12.50	1,368	0.004	0.041	0.023	0.019	14	1,713
1	2.50	308	0.000	0.010	0.006	0.005	1	385
Alcatel-Lucent B13 RRH4x30-4R	272.00	173	1.849	1.771	1.064	0.523	47	217
Alcatel-Lucent B25 RRH4x30-4R	272.00	153	1.849	1.771	1.064	0.523	42	192
Raycap RVZDC-6624-PF-48	272.00	64	1.849	1.771	1.064	0.523	17	80
Alcatel-Lucent B66a RRH4x45	272.00	201	1.849	1.771	1.064	0.523	55	252
Commscope SBNHH-1D65B	272.00	487	1.849	1.771	1.064	0.523	133	610
Flat Light Sector Frame	272.00	1,200	1.849	1.771	1.064	0.523	326	1,503
Torque Arms	270.00	500	1.822	1.640	1.015	0.501	130	626
RFS ATMA4P4DBP-1A20	260.00	48	1.689	1.083	0.798	0.399	10	60
Ericsson Radio 4478 B71	260.00	180	1.689	1.083	0.798	0.399	37	225
Radio Waves G3-2.4	260.00	25	1.689	1.083	0.798	0.399	5	31
RFS APX16DWV-16DWV-S-E-ACU	260.00	119	1.689	1.083	0.798	0.399	25	149
Round Sector Frame	260.00	900	1.689	1.083	0.798	0.399	187	1,127

CITY OF PORTLAND, MAINE RESURGAM
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Equivalent Modal Analysis Method

RFS APXVAA24_43-U-A20	260.00	304	1.689	1.083	0.798	0.399	63	381
RAC 8' Ice Shield	239.00	600	1.428	0.338	0.461	0.233	73	751
Motorola PTP 45600	230.00	12	1.322	0.152	0.356	0.181	1	15
Radio Waves HPD6-4.7NS	230.00	405	1.322	0.152	0.356	0.181	38	507
Torque Arms	215.00	500	1.155	-0.033	0.223	0.117	30	626
KMW HB-X-WM-17-65-00T-TTLNA	206.00	48	1.061	-0.089	0.164	0.092	2	60
KMW HB-X-WM-17-65-00T	206.00	90	1.061	-0.089	0.164	0.092	4	113
Stand-Off	206.00	300	1.061	-0.089	0.164	0.092	14	376
10' Omni	195.00	25	0.950	-0.119	0.108	0.072	1	31
Stand-Off	195.00	100	0.950	-0.119	0.108	0.072	4	125
Raycap RUSDC-6267-PF-48	188.00	16	0.883	-0.121	0.081	0.064	1	20
Ericsson RRUS-11 (50 lbs.)	188.00	150	0.883	-0.121	0.081	0.064	5	188
KMW AM-X-CD-17-65-00T-RET	188.00	185	0.883	-0.121	0.081	0.064	6	231
Round Sector Frame	188.00	900	0.883	-0.121	0.081	0.064	30	1,127
10' Omni	175.00	25	0.765	-0.105	0.044	0.059	1	31
Stand-Off	175.00	100	0.765	-0.105	0.044	0.059	3	125
Stand-Off	171.00	100	0.731	-0.096	0.036	0.059	3	125
TX RX Systems 421-83A-01261	171.00	20	0.731	-0.096	0.036	0.059	1	25
Bird BA40-41-DIN	171.00	32	0.731	-0.096	0.036	0.059	1	40
6' Ice Shield	153.00	450	0.585	-0.047	0.013	0.062	14	564
Motorola PTP 45600	142.00	12	0.504	-0.018	0.007	0.065	0	15
Radio Waves HPD4-4.7	142.00	85	0.504	-0.018	0.007	0.065	3	106
Stand-Off	131.00	100	0.429	0.009	0.006	0.066	3	125
Bird BA40-41-DIN	131.00	32	0.429	0.009	0.006	0.066	1	40
2' Omni	125.00	10	0.390	0.021	0.007	0.066	0	13
Stand-Off	125.00	100	0.390	0.021	0.007	0.066	3	125
2' Omni	100.00	5	0.250	0.055	0.017	0.061	0	6
Stand-Off	100.00	100	0.250	0.055	0.017	0.061	3	125
2" X 8" GPS	38.00	10	0.036	0.069	0.041	0.035	0	13
Stand-Off	38.00	100	0.036	0.069	0.041	0.035	2	125
		35,103	70.031	26.790	23.274	12.904	2,565	43,959

LoadCase (0.9 - 0.2Sds) * DL + E Seismic (Reduced DL)

Section	Height Above Base (ft)	Weight (lb)	a	b	c	S_{az}	Horizontal Force (lb)	Vertical Force (lb)
27	272.50	250	1.856	1.804	1.076	0.529	69	212
26	269.42	106	1.814	1.603	1.002	0.495	27	90
25	268.25	82	1.798	1.531	0.974	0.482	20	69
24	267.08	106	1.783	1.461	0.948	0.470	26	90
23	265.75	99	1.765	1.384	0.918	0.456	24	84
22	255.00	1,318	1.625	0.858	0.705	0.354	242	1,117
21	235.00	1,379	1.380	0.247	0.412	0.208	149	1,169
20	222.50	416	1.237	0.043	0.283	0.145	31	353
19	219.25	129	1.201	0.006	0.256	0.132	9	109
18	217.33	177	1.180	-0.013	0.240	0.125	12	150
17	215.58	129	1.162	-0.029	0.227	0.119	8	109
16	214.42	137	1.149	-0.038	0.219	0.115	8	116
15	213.25	129	1.137	-0.047	0.210	0.111	7	109
14	212.08	121	1.124	-0.055	0.202	0.108	7	103
13	206.50	802	1.066	-0.087	0.166	0.093	39	680
12	200.75	145	1.007	-0.108	0.135	0.081	6	123
11	190.00	1,829	0.902	-0.122	0.088	0.066	63	1,551
10	170.00	2,116	0.722	-0.093	0.034	0.059	65	1,794
9	150.00	2,108	0.562	-0.039	0.011	0.063	69	1,787
8	130.00	2,131	0.422	0.011	0.006	0.066	73	1,807
7	110.00	2,157	0.302	0.045	0.012	0.064	72	1,829
6	90.00	2,144	0.202	0.062	0.023	0.057	63	1,818
5	70.00	2,144	0.122	0.070	0.034	0.048	54	1,818
4	50.00	2,160	0.062	0.072	0.041	0.040	45	1,831
3	30.00	2,145	0.022	0.065	0.039	0.032	36	1,819
2	12.50	1,368	0.004	0.041	0.023	0.019	14	1,160
1	2.50	308	0.000	0.010	0.006	0.005	1	261

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Equivalent Modal Analysis Method

Alcatel-Lucent B13 RRH4x30-4R	272.00	173	1.849	1.771	1.064	0.523	47	147
Alcatel-Lucent B25 RRH4x30-4R	272.00	153	1.849	1.771	1.064	0.523	42	130
Raycap RVZDC-6624-PF-48	272.00	64	1.849	1.771	1.064	0.523	17	54
Alcatel-Lucent B66a RRH4x45	272.00	201	1.849	1.771	1.064	0.523	55	170
Commscope SBNHH-1D65B	272.00	487	1.849	1.771	1.064	0.523	133	413
Flat Light Sector Frame	272.00	1,200	1.849	1.771	1.064	0.523	326	1,017
Torque Arms	270.00	500	1.822	1.640	1.015	0.501	130	424
RFS ATMA4P4DBP-1A20	260.00	48	1.689	1.083	0.798	0.399	10	40
Ericsson Radio 4478 B71	260.00	180	1.689	1.083	0.798	0.399	37	153
Radio Waves G3-2.4	260.00	25	1.689	1.083	0.798	0.399	5	21
RFS APX16DWV-16DWV-S-E-ACU	260.00	119	1.689	1.083	0.798	0.399	25	101
Round Sector Frame	260.00	900	1.689	1.083	0.798	0.399	187	763
RFS APXVAA24_43-U-A20	260.00	304	1.689	1.083	0.798	0.399	63	258
RAC 8' Ice Shield	239.00	600	1.428	0.338	0.461	0.233	73	509
Motorola PTP 45600	230.00	12	1.322	0.152	0.356	0.181	1	10
Radio Waves HPD6-4.7NS	230.00	405	1.322	0.152	0.356	0.181	38	343
Torque Arms	215.00	500	1.155	-0.033	0.223	0.117	30	424
KMW HB-X-WM-17-65-00T-TTLNA	206.00	48	1.061	-0.089	0.164	0.092	2	40
KMW HB-X-WM-17-65-00T	206.00	90	1.061	-0.089	0.164	0.092	4	76
Stand-Off	206.00	300	1.061	-0.089	0.164	0.092	14	254
10' Omni	195.00	25	0.950	-0.119	0.108	0.072	1	21
Stand-Off	195.00	100	0.950	-0.119	0.108	0.072	4	85
Raycap RUSDC-6267-PF-48	188.00	16	0.883	-0.121	0.081	0.064	1	13
Ericsson RRUS-11 (50 lbs.)	188.00	150	0.883	-0.121	0.081	0.064	5	127
KMW AM-X-CD-17-65-00T-RET	188.00	185	0.883	-0.121	0.081	0.064	6	157
Round Sector Frame	188.00	900	0.883	-0.121	0.081	0.064	30	763
10' Omni	175.00	25	0.765	-0.105	0.044	0.059	1	21
Stand-Off	175.00	100	0.765	-0.105	0.044	0.059	3	85
Stand-Off	171.00	100	0.731	-0.096	0.036	0.059	3	85
TX RX Systems 421-83A-01261	171.00	20	0.731	-0.096	0.036	0.059	1	17
Bird BA40-41-DIN	171.00	32	0.731	-0.096	0.036	0.059	1	27
6' Ice Shield	153.00	450	0.585	-0.047	0.013	0.062	14	381
Motorola PTP 45600	142.00	12	0.504	-0.018	0.007	0.065	0	10
Radio Waves HPD4-4.7	142.00	85	0.504	-0.018	0.007	0.065	3	72
Stand-Off	131.00	100	0.429	0.009	0.006	0.066	3	85
Bird BA40-41-DIN	131.00	32	0.429	0.009	0.006	0.066	1	27
2' Omni	125.00	10	0.390	0.021	0.007	0.066	0	8
Stand-Off	125.00	100	0.390	0.021	0.007	0.066	3	85
2' Omni	100.00	5	0.250	0.055	0.017	0.061	0	4
Stand-Off	100.00	100	0.250	0.055	0.017	0.061	3	85
2" X 8" GPS	38.00	10	0.036	0.069	0.041	0.035	0	8
Stand-Off	38.00	100	0.036	0.069	0.041	0.035	2	85
		35,103	70.031	26.790	23.274	12.904	2,565	29,758

CITY OF PORTLAND, MAINE RESURGAM
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Force/Stress Summary

Section: 1 PIROD42B Bot Elev (ft): 0.00 Height (ft): 5.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-128.57	1.2D + 1.0Di +	1.80	100	100	100	38.3	50.0	160.68	0	0	0.00	0.00	80	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-5.71	1.2D + 1.0Di +	2.440	50	50	50	70.3	50.0	13.86	0	0	0.00	0.00	41	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 3/4" SOLID	17.30	1.2D + 1.0Di +	50	65	19.88	0	0	0.00	0.00	0.00	87	Member
DIAG SOL - 3/4" SOLID	2.75	1.2D + 1.0Di +	50	65	19.88	0	0	0.00	0.00	0.00	13	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	114.18	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	0.00		0.00	0		

Section: 2 PIROD42 Bot Elev (ft): 5.00 Height (ft): 15.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-117.11	1.2D + 1.0Di +	2.39	100	100	100	51.0	50.0	147.98	0	0	0.00	0.00	79	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-0.76	1.2D + 1.0Di +	4.238	50	50	50	122.0	50.0	6.70	0	0	0.00	0.00	11	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 3/4" SOLID	7.67	1.2D + 1.0Di +	50	65	19.88	0	0	0.00	0.00	0.00	38	Member
DIAG SOL - 3/4" SOLID	0.60	1.2D + 1.0Di +	50	65	19.88	0	0	0.00	0.00	0.00	3	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	116.77	1.2D + 1.0Di +	178.90	65		
Bot Tension	0.00		0.00	0		
Bot Compression	114.18	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 3 1 Bot Elev (ft): 20.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-115.02	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	77	Member X
HORIZ SOL - 7/8" SOLID	-0.19	1.2D + 1.6W	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	1	Member X
DIAG SOL - 3/4" SOLID	-1.58	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	23	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	0.54	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	2	Member
DIAG SOL - 3/4" SOLID	0.86	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	4	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	113.75	1.2D + 1.0Di +	178.90	64		
Bot Tension	0.00		0.00	0		
Bot Compression	116.77	1.2D + 1.0Di +	0.00	0		

Section: 4 1 Bot Elev (ft): 40.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-113.91	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	76	Member X
HORIZ SOL - 7/8" SOLID	-0.38	1.2D + 1.6W 60	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	3	Member X
DIAG SOL - 3/4" SOLID	-2.25	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	33	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.19	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	4	Member
DIAG SOL - 3/4" SOLID	1.41	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	7	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	108.86	1.2D + 1.0Di +	178.90	61		
Bot Tension	0.00		0.00	0		
Bot Compression	113.75	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 5 1 Bot Elev (ft): 60.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-107.04	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	71	Member X
HORIZ SOL - 7/8" SOLID	-0.37	1.2D + 1.6W	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	3	Member X
DIAG SOL - 3/4" SOLID	-1.96	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	28	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	0.94	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	3	Member
DIAG SOL - 3/4" SOLID	1.20	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	6	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	102.53	1.2D + 1.0Di +	178.90	57		
Bot Tension	0.00		0.00	0		
Bot Compression	108.86	1.2D + 1.0Di +	0.00	0		

Section: 6 1 Bot Elev (ft): 80.00 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-101.73	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	68	Member X
HORIZ SOL - 7/8" SOLID	-0.02	1.2D + 1.6W	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	0	Member X
DIAG SOL - 3/4" SOLID	-1.21	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	17	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	0.56	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	2	Member
DIAG SOL - 3/4" SOLID	0.70	1.2D + 1.6W 60	50	65	19.88	0	0	0.00	0.00	0.00	3	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	99.23	1.2D + 1.0Di +	178.90	55		
Bot Tension	0.00		0.00	0		
Bot Compression	102.53	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 7 1 Bot Elev (ft): 100.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-97.73	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	65	Member X
HORIZ SOL - 7/8" SOLID	-0.75	1.2D + 1.6W 60	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	7	Member X
DIAG SOL - 3/4" SOLID	-3.09	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	45	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.52	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	5	Member
DIAG SOL - 3/4" SOLID	2.39	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	12	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	90.40	1.2D + 1.0Di +	178.90	51		
Bot Tension	0.00		0.00	0		
Bot Compression	99.23	1.2D + 1.0Di +	0.00	0		

Section: 8 1 Bot Elev (ft): 120.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-89.80	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	60	Member X
HORIZ SOL - 7/8" SOLID	-0.76	1.2D + 1.6W	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	7	Member X
DIAG SOL - 3/4" SOLID	-2.75	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	40	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.23	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	4	Member
DIAG SOL - 3/4" SOLID	2.10	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	10	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	88.62	1.2D + 1.0Di +	178.90	50		
Bot Tension	0.00		0.00	0		
Bot Compression	90.40	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 9 1 Bot Elev (ft): 140.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-87.45	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	58	Member X
HORIZ SOL - 7/8" SOLID	-0.10	1.2D + 1.6W	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	0	Member X
DIAG SOL - 3/4" SOLID	-1.46	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	21	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	0.78	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	2	Member
DIAG SOL - 3/4" SOLID	0.82	1.2D + 1.6W 60	50	65	19.88	0	0	0.00	0.00	0.00	4	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	84.21	1.2D + 1.0Di +	178.90	47		
Bot Tension	0.00		0.00	0		
Bot Compression	88.62	1.2D + 1.0Di +	0.00	0		

Section: 10 1 Bot Elev (ft): 160.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2 1/4" SOLID	-82.83	1.2D + 1.0Di +	2.33	100	100	100	49.8	50.0	149.28	0	0	0.00	0.00	55	Member X
HORIZ SOL - 7/8" SOLID	-0.43	1.2D + 1.6W 60	3.500	95	95	95	118.6	50.0	9.66	0	0	0.00	0.00	4	Member X
DIAG SOL - 3/4" SOLID	-1.98	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	29	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.12	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	4	Member
DIAG SOL - 3/4" SOLID	1.92	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	9	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	74.20	1.2D + 1.0Di +	178.90	41		
Bot Tension	0.00		0.00	0		
Bot Compression	84.21	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 11 2 Bot Elev (ft): 180.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-73.27	1.2D + 1.0Di +	2.33	100	100	100	56.0	50.0	112.40	0	0	0.00	0.00	65	Member X
HORIZ SOL - 7/8" SOLID	-0.17	1.2D + 1.6W	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	1	Member X
DIAG SOL - 3/4" SOLID	-1.34	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	19	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	0.71	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	2	Member
DIAG SOL - 3/4" SOLID	0.86	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	4	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	69.60	1.2D + 1.0Di +	141.40	49		
Bot Tension	0.00		0.00	0		
Bot Compression	74.20	1.2D + 1.0Di +	0.00	0		

Section: 12 2 Bot Elev (ft): 200.0 Height (ft): 1.500

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-69.15	1.2D + 1.0Di +	0.83	100	100	100	20.0	50.0	137.30	0	0	0.00	0.00	50	Member X
HORIZ SOL - 7/8" SOLID	-1.70	1.2D + 1.6W 90	1.750	96	96	96	59.9	50.0	20.81	0	0	0.00	0.00	8	Member X
DIAG SOL - 3/4" SOLID	-1.88	1.2D + 1.6W 90	1.938	97	97	97	108.3	50.0	8.44	0	0	0.00	0.00	22	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.70	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	6	Member
DIAG SOL - 3/4" SOLID	1.92	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	9	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	68.80	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	69.60	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 13 2 Bot Elev (ft): 201.5 Height (ft): 10.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-68.36	1.2D + 1.0Di +	2.50	100	100	100	60.0	50.0	108.65	0	0	0.00	0.00	62	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-1.69	1.2D + 1.6W 90	4.301	50	50	50	123.9	50.0	6.51	0	0	0.00	0.00	26	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	1.49	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	7	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	64.81	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	68.80	1.2D + 1.0Di +	0.00	0		

Section: 14 2 Bot Elev (ft): 211.5 Height (ft): 1.167

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-61.74	1.2D + 1.0Di +	1.17	100	100	100	28.0	50.0	133.49	0	0	0.00	0.00	46	Member X
HORIZ SOL - 7/8" SOLID	-0.01	1.2D + 1.6W	1.750	96	96	96	59.9	50.0	20.81	0	0	0.00	0.00	0	Member X
DIAG SOL - 3/4" SOLID	-3.12	1.2D + 1.6W	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	43	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.43	1.2D + 1.0Di +	50	65	27.06	0	0	0.00	0.00	0.00	5	Member
DIAG SOL - 3/4" SOLID	0.69	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	3	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	62.06	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	64.81	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 15 2 Bot Elev (ft): 212.6 Height (ft): 1.166

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-54.32	1.2D + 1.0Di +	1.17	100	100	100	28.0	50.0	133.50	0	0	0.00	0.00	40	Member X
HORIZ PL - PL 3 x 0.375	-7.47	1.2D + 1.6W 90	1.750	96	96	96	121.3	50.0	17.27	0	0	0.00	0.00	43	Member Y
DIAG SOL - 3/4" SOLID	-7.09	1.2D + 1.6W 90	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	98	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	4.74	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	23	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	55.50	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	62.06	1.2D + 1.0Di +	0.00	0		

Section: 16 2 Bot Elev (ft): 213.8 Height (ft): 1.167

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-58.75	1.2D + 1.6W	1.17	100	100	100	28.0	50.0	133.49	0	0	0.00	0.00	44	Member X
HORIZ SOL - 7/8" SOLID	0.00	1.2D + 1.6W 90	1.750	96	96	96	59.9	50.0	20.81	0	0	0.00	0.00	0	Member X
DIAG SOL - 3/4" SOLID	-5.52	1.2D + 1.6W 60	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	76	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.61	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	5	Member
DIAG SOL - 3/4" SOLID	5.06	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	25	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	58.75	1.2D + 1.6W 240	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	55.50	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 17 2 Bot Elev (ft): 215.0 Height (ft): 1.167

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-52.71	1.2D + 1.6W	1.17	100	100	100	28.0	50.0	133.49	0	0	0.00	0.00	39	Member X
HORIZ PL - PL 3 x 0.375	-2.68	1.2D + 1.6W 60	1.750	96	96	96	121.3	50.0	17.27	0	0	0.00	0.00	15	Member Y
DIAG SOL - 3/4" SOLID	-2.03	1.2D + 1.6W 60	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	28	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG SOL - 2" SOLID	9.00	1.2D + 1.6W 60	50	65	141.37	0	0	0.00	0.00		6	Member
HORIZ PL - PL 3 x 0.375	11.99	1.2D + 1.6W	50	65	50.63	0	0	0.00	0.00	0.00	23	Member
DIAG SOL - 3/4" SOLID	1.90	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	9	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	6.75	1.2D + 1.6W 300	0.00	0	0	
Top Compression	50.60	1.2D + 1.6W 120	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	58.75	1.2D + 1.6W 240	0.00	0		

Section: 18 2 Bot Elev (ft): 216.1 Height (ft): 2.333

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-45.94	1.2D + 1.6W	2.33	100	100	100	56.0	50.0	112.41	0	0	0.00	0.00	40	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-4.40	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	64	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG SOL - 2" SOLID	2.19	1.2D + 1.6W 60	50	65	141.37	0	0	0.00	0.00		1	Member
HORIZ	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	4.19	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	21	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	42.37	1.2D + 1.6W	0.00	0		
Bot Tension	6.75	1.2D + 1.6W 300	0.00	0		
Bot Compression	50.60	1.2D + 1.6W 120	0.00	0		

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Force/Stress Summary

Section: 19 2 Bot Elev (ft): 218.5 Height (ft): 1.500

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-42.24	1.2D + 1.6W	0.83	100	100	100	20.0	50.0	137.30	0	0	0.00	0.00	30	Member X
HORIZ SOL - 7/8" SOLID	-1.31	1.2D + 1.6W 60	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	13	Member X
DIAG	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00		

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.22	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	4	Member
DIAG SOL - 3/4" SOLID	0.01	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	0	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	42.24	1.2D + 1.6W 120	141.40	30		
Bot Tension	0.00		0.00	0		
Bot Compression	42.37	1.2D + 1.6W	0.00	0		

Section: 20 2 - 5' Bot Elev (ft): 220.0 Height (ft): 5.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 2" SOLID	-38.65	1.2D + 1.6W	2.17	100	100	100	52.0	50.0	116.00	0	0	0.00	0.00	33	Member X
HORIZ SOL - 7/8" SOLID	-2.13	1.2D + 1.6W	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	22	Member X
DIAG SOL - 3/4" SOLID	-3.91	1.2D + 1.6W 90	4.117	50	50	50	118.5	50.0	7.10	0	0	0.00	0.00	54	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	2.24	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	8	Member
DIAG SOL - 3/4" SOLID	3.92	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	19	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	39.27	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	42.24	1.2D + 1.6W 120	0.00	0		

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Force/Stress Summary

Section: 21 3 Bot Elev (ft): 225.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-40.59	1.2D + 1.0Di +	2.38	100	100	100	65.1	50.0	79.36	0	0	0.00	0.00	51	Member X
HORIZ SOL - 7/8" SOLID	-0.98	1.2D + 1.6W	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	10	Member X
DIAG SOL - 3/4" SOLID	-2.81	1.2D + 1.6W 90	4.230	50	50	50	121.8	50.0	6.73	0	0	0.00	0.00	41	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	1.26	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	4	Member
DIAG SOL - 3/4" SOLID	2.58	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	12	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	41.06	1.2D + 1.0Di +	108.20	38		
Bot Tension	0.00		0.00	0		
Bot Compression	39.27	1.2D + 1.0Di +	0.00	0		

Section: 22 3 Bot Elev (ft): 245.0 Height (ft): 20.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-46.25	1.2D + 1.6W 60	2.33	100	100	100	64.0	50.0	80.23	0	0	0.00	0.00	57	Member X
HORIZ SOL - 7/8" SOLID	-0.34	1.2D + 1.6W	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	3	Member X
DIAG SOL - 3/4" SOLID	-1.35	1.2D + 1.6W 90	4.206	50	50	50	121.1	50.0	6.80	0	0	0.00	0.00	19	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	1.15	1.2D + 1.6W	50	65	108.24	0	0	0.00	0.00		1	Member
HORIZ SOL - 7/8" SOLID	0.71	1.2D + 1.6W 60	50	65	27.06	0	0	0.00	0.00	0.00	2	Member
DIAG SOL - 3/4" SOLID	1.04	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	5	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	42.62	1.2D + 1.6W 60	108.20	39		
Bot Tension	0.00		0.00	0		
Bot Compression	41.06	1.2D + 1.0Di +	0.00	0		

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Force/Stress Summary

Section: 23 4 Bot Elev (ft): 265.0 Height (ft): 1.500

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-42.56	1.2D + 1.6W 60	0.67	100	100	100	18.3	50.0	105.62	0	0	0.00	0.00	40	Member X
HORIZ SOL - 7/8" SOLID	-1.57	1.2D + 1.6W 60	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	16	Member X
DIAG SOL - 3/4" SOLID	-1.90	1.2D + 1.6W 90	1.938	97	97	97	108.3	50.0	8.44	0	0	0.00	0.00	22	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ SOL - 7/8" SOLID	0.34	1.2D + 1.6W	50	65	27.06	0	0	0.00	0.00	0.00	1	Member
DIAG SOL - 3/4" SOLID	2.37	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	11	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	41.33	1.2D + 1.6W 60	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	42.62	1.2D + 1.6W 60	0.00	0		

Section: 24 4 Bot Elev (ft): 266.5 Height (ft): 1.166

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-41.32	1.2D + 1.6W 60	1.17	100	100	100	32.0	50.0	100.44	0	0	0.00	0.00	41	Member X
HORIZ PL - PL 3 x 0.375	-0.88	1.2D + 1.6W 60	1.750	96	96	96	121.3	50.0	17.26	0	0	0.00	0.00	5	Member Y
DIAG SOL - 3/4" SOLID	-0.74	1.2D + 1.6W 90	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	10	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ PL - PL 3 x 0.375	1.57	1.2D + 1.6W	50	65	50.63	0	0	0.00	0.00	0.00	3	Member
DIAG SOL - 3/4" SOLID	1.20	1.2D + 1.6W	50	65	19.88	0	0	0.00	0.00	0.00	6	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	40.35	1.2D + 1.6W 60	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	41.33	1.2D + 1.6W 60	0.00	0		

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Force/Stress Summary

Section: 25 4 Bot Elev (ft): 267.6 Height (ft): 1.167

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-38.81	1.2D + 1.6W 60	1.17	100	100	100	32.0	50.0	100.43	0	0	0.00	0.00	38	Member X
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	-1.83	1.2D + 1.6W	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	25	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	0.74	1.2D + 1.6W 90	50	65	19.88	0	0	0.00	0.00	0.00	3	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	38.81	1.2D + 1.6W 60	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	40.35	1.2D + 1.6W 60	0.00	0		

Section: 26 4 Bot Elev (ft): 268.8 Height (ft): 1.167

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-18.16	1.2D + 1.6W 60	1.17	100	100	100	32.0	50.0	100.43	0	0	0.00	0.00	18	Member X
HORIZ PL - PL 3 x 0.375	-0.13	1.2D + 1.6W 60	1.750	96	96	96	121.3	50.0	17.27	0	0	0.00	0.00	0	Member Y
DIAG SOL - 3/4" SOLID	-2.12	1.2D + 1.6W	2.103	97	97	97	117.5	50.0	7.23	0	0	0.00	0.00	29	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ PL - PL 3 x 0.375	1.17	1.2D + 1.6W	50	65	50.63	0	0	0.00	0.00	0.00	2	Member
DIAG SOL - 3/4" SOLID	1.27	1.2D + 1.6W 60	50	65	19.88	0	0	0.00	0.00	0.00	6	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	17.35	1.2D + 1.0Di +	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	38.81	1.2D + 1.6W 60	0.00	0		

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Force/Stress Summary

Section: 27 Top Bot Elev (ft): 270.0 Height (ft): 5.000

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Y	Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SOL - 1 3/4" SOLID	-16.75	1.2D + 1.0Di +	2.17	100	100	100	59.4	50.0	83.61	0	0	0.00	0.00	20	Member X
HORIZ SOL - 7/8" SOLID	-3.32	1.2D + 1.0Di +	3.500	96	96	96	119.8	50.0	9.46	0	0	0.00	0.00	35	Member X
DIAG SOL - 3/4" SOLID	-1.27	1.2D + 1.6W 60	4.116	50	50	50	118.5	50.0	7.10	0	0	0.00	0.00	17	Member X

Max Tension Member	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	Phit Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Blk Shear phit Pn (kip)	Use %	Controls
LEG	0.00		0	0	0.00	0	0	0.00	0.00		0	
HORIZ	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	
DIAG SOL - 3/4" SOLID	3.98	1.2D + 1.0Di +	50	65	19.88	0	0	0.00	0.00	0.00	20	Member

Max Splice Forces	Pu (kip)	Load Case	phiRnt (kip)	Use %	Num Bolts	Bolt Type
Top Tension	0.00		0.00	0	0	
Top Compression	0.35	(1.2 + 0.2Sds) *	0.00	0		
Bot Tension	0.00		0.00	0		
Bot Compression	17.35	1.2D + 1.0Di +	0.00	0		

Maximum Reactions Summary

	Base	Anch1
Vertical (kip)	353.90	-97.13
Horizontal (kip)	0.61	64.01

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Force/Stress Summary

Guy Anchor Design Loads

Radius (ft)	Drop (ft)	Azimuth ( )	Uplift (kip)	Shear (kip)
115.00	0.00	0	97.13	64.01
115.00	0.00	240	97.13	64.01
115.00	0.00	120	97.13	64.01

Maximum Cable Forces Summary

Load Case	Elevation (ft)	Cable	Anchor Node	Tower Node	Allow Tension (kip)	Applied Tension (kip)	Use %
1.2D + 1.6W 90 deg	54.66	9/16 EHS	A1a	29b	21.00	9.59	46
1.2D + 1.6W 90 deg	110.00	5/8 EHS	A1a	57b	25.44	15.27	60
1.2D + 1.6W 90 deg	165.33	11/16 EHS	A1a	85b	30.00	18.51	62
1.2D + 1.6W 90 deg	213.83	5/8 EHS	A1a	T4a	25.44	13.41	53
1.2D + 1.6W 60 deg	215.00	5/8 EHS	A1a	111b	25.44	13.16	52
1.2D + 1.6W 60 deg	268.83	11/16 EHS	A1a	143b	30.00	14.21	47
1.2D + 1.6W 90 deg	269.99	5/8 EHS	A1a	T7a	25.44	11.94	47

Site Name:	Portland ME, ME	*Program Last Updated:*	*5/13/2014*
Site Number:	10047	*American Tower Corporation*	
Engineering Number:	OAA685516		
Engineer:	Hamid.Kazem		
Date:	11/08/17		

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Design Base Loads (Factored) per TIA-222-G

Foundation Mapped:	N				
Moment (M_u):	0.0	k-ft	Concrete Compressive Strength (f'_c):	3000	psi
Shear/Leg (V_u):	0.6	k	Vertical Steel Rebar Size #:	6	
Compression/Leg (P_u):	353.9	k	Vertical Steel Rebar Area:	0.44	in^2
Uplift/Leg (T_u):	0.0	k	# of Vertical Steel Rebars:	8	
Tower Type (GT / SST):	GT		Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Diameter of Prismatic Portion of Pier (d):	4.0	ft	Tie / Stirrup Size #:	4	
Depth to Base of Foundation:	4.0	ft	Tie / Stirrup Area:	0.20	in^2
Pier Height Above Ground (h):	0.50	ft	Tie / Stirrup Spacing:	18.0	in
Length / Width of Pad (w):	11.0	ft	Tie / Stirrup Steel Yield Strength (F_y):	60	ksi
Thickness of Pad (t):	1.5	ft	Rebar Cage Diameter:	40.0	in
Depth Below Ground Surface to Water Table (w):	99.0	ft	Bending/Tension Reduction Factor (ϕ_B):	0.90	
Unit Weight of Concrete:	150.0	pcf	Shear Reduction Factor (ϕ_V):	0.75	
Unit Weight of Water:	62.4	pcf	Compression Reduction Factor (ϕ_V):	0.65	
Unit Weight of Soil Above Water Table:	110.0	pcf	Steel Elastic Modulus:	29000	ksi
Unit Weight of Soil Below Water Table:	47.6	pcf	Pad Steel Rebar Size #:	8	
Friction Angle of Uplift from Top of Pad:	0	Degrees	Pad Steel Rebar Area:	0.79	in^2
Friction Angle of Uplift from Base of Pad:	0	Degrees	Pad Steel Rebar Yield Strength (F_y):	60	ksi
Uplift Angle Started at Top or Base of Pad (T/B):	T		# of Rebar in Top of Pad:	0	
Ultimate Skin Friction:	756	psf	# of Rebar in Base of Pad:	11	
Ultimate Compressive Bearing Pressure:	4964	psf	Pad Clear Cover:	3	in
Capacity Increase (Due to Transient Loads):	1.00				
Bearing Strength Reduction Factor (ϕ_s):	0.60				
Uplift Strength Reduction Factor (ϕ_s):	0.75				

Axial Capacities and Design Moment

Weight of Concrete (Bouyancy Considered):	32.9	k
Weight of Soil (Bouyancy Considered):	45.2	k
Ultimate Skin Friction Resistance:	49.9	k
Controlling Failure Mode (Top / Base):	Base	
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	58.5	k
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	360.4	k
P_u:	365.3	k
$T_u/\phi_s T_n$:	0.00	Result: OK
$P_u/\phi_s P_n$:	1.01	Result: Acceptable

Depth (ft) Top	Depth (ft) Bottom	Ultimate Lateral Bearing Pressure (psf)	Increment (psf/ft)	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)
0.0	2.0	0.0	110.0	110	0	0
2.0	2.5	1020.0	110.0	110	400	0

Inflection Point (Below Ground Surface):	1.7	ft
Factored Design Moment At Inflection Point (M_u):	0.5	k-ft

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Pad Strength Capacity

β:	0.85	ACI318-05 - 10.2.7.3
Upper Pad Flexural Reinforcement Spacing:	0	in - Pad Reinforcing Spacing OK - ACI7.12.2.2
One Way Design Shear (V_u):	75.7	k
One Way Shear Capacity (ϕV_c):	162.2	k - ACI318-05 - 11.3.1.1
V_u / ϕV_c:	0.47	Result: OK
Punching Design Shear (V_u):	289.9	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	467.8	k - ACI318-05 - 11.12.2.1
V_u / ϕV_c:	0.62	Result: OK
Flexural Loading Due to Soil Pressure (M_u):	202.3	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	536.7	k-ft - ACI318-05 - 10.3
M_u / ϕM_n:	0.38	Result: OK
Flexural Loading Due to Uplift (M_u):	0.0	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	0.0	k-ft - ACI318-05 - 10.3
M_u / ϕM_n:	0.00	Result: OK

Pier Strength Capacity

Design Moment (M_u):	0.5	k-ft
Nominal Moment Capacity ($\phi_B M_n$):	315.5	k-ft - ACI318-005 - 10.2
$M_u/\phi_B M_n$:	0.00	Result: OK
Design Shear (V_u):	0.6	k
Nominal Shear Capacity ($\phi_V V_n$):	199.9	k - ACI318-05 - 11.3.1.1 or 11.5.7.2
$V_u/\phi_V V_n$:	0.00	Result: OK
Design Tension (T_u):	0.0	k
Nominal Tension Capacity ($\phi_T T_n$):	190.1	k - ACI318-05 - 10.2
$T_u/\phi_T T_n$:	0.00	Result: OK
Design Compression (P_u):	353.9	k
Nominal Compression Capacity ($\phi_P P_n$):	2394.8	k - ACI318-05 - 10.3.6.2
$P_u/\phi_P P_n$:	0.15	Result: OK
$M_u/\phi_B M_n + T_u/\phi_T T_n$:	0.00	Result: OK

Site Name:	Portland ME, ME	*Program Last Updated:*	*5/13/2(*
Site Number:	10047	*American Tower Corporation*	
Engineering Number:	OAA685516		
Engineer:	Hamid.Kazem		
Date:	11/08/17		

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Design Standard per TIA-222-G

Anchor Radius:	230.0	ft
Uplift (Factored - P_u):	97.1	k
Shear (Factored - V_u):	64.0	k
Berm Present:	N	
Design Anchor Rod:	N	
Mapped Foundation:	N	
Anchor Base Depth (d):	12.5	ft
Width of Anchor (W):	12.0	ft
Length of Anchor (L):	12.0	ft
Thickness of Anchor (t):	3.0	ft
Depth Below Ground Surface to Water Table (w):	99.0	ft
Soil Uplift at Base / Top of Anchor (B/T):	T	
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	110.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	47.6	pcf
Internal Angle of Friction:	10	Degrees
Cohesion:	1232	psf
Ultimate Skin Friction of Pad Sides to Soil:	602	psf
Ultimate Coefficient of Shear Friction:	0.30	
Maximum Top Conical Failure Angle:	30	Degrees
Maximum Base Conical Failure Angle:	30	Degrees
Allowable Capacity Increase:	1.00	(Due to Transient Loads)
Uplift Strength Reduction Factor (ϕ_u):	0.75	
Shear Strength Reduction Factor (ϕ_v):	0.75	
Concrete Uplift Strength Reduction Factor (ϕ_u):	0.90	

Uplift

Weight of Concrete (Buoyancy Effect Considered):	64.8	k
Weight of Soil (Buoyancy Effect Considered):	250.3	k
Ultimate Uplift Resistance from Skin Friction:	65.0	k
Nominal Factored Uplift Resistance ($\phi_u P_n$):	246.0	k
P_u / $\phi_u P_n$:	0.39	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	42.7	k
Passive Pressure:	4655	psf
Ultimate Passure Pressure Resistance:	167.6	k
Nominal Shear Resistance ($\phi_v V_n$):	157.7	k
V_u / $\phi_v V_n$:	0.41	Result: OK

Strength Analysis of Reinforced Concrete

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Concrete Compressive Srength (f'_c):	3000	psi
Longitudinal Rebar Yield Strength:	60000	psi
# Longitudinal Rebar (Top):	10	
# Longitudinal Rebar (1 Side):	3	
Rebar Size:	5	
Strength Reduction Factor for Shear (ϕ_v):	0.75	
Strength Reduction Factor for Flexure (ϕ_b):	0.9	
Compression Zone Factor (β_1):	0.85	
Area of Single Rebar:	0.31	in^2
One Way Shear due to Shear Load (V_u):	0.9	k
Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$):	414.1	k
$V_u/\phi_v V_n$:	0.00	Result: OK
One Way Shear due to Uplift (V_u):	37.8	k
Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$):	378.6	k
$V_u/\phi_v V_n$:	0.10	Result: OK
Pad Flexure due to Shear Load (M_u):	96.0	k-ft
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	585.9	k-ft
Pad Flexure due to Uplift (M_u):	145.7	k-ft
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	446.3	k-ft
$M_u/\phi_b M_n$ (Max.):	0.33	Result: OK