AMERICAN TOWER®
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Structural Analysis Report

Structure	:	**65 ft Self Supported Tower**
ATC Site Name	:	**Cornwall CT, CT**
ATC Site Number	:	**88009**
Engineering Number	:	**OAA700092_C3_01**
Proposed Carrier	:	**AT&T Mobility**
Carrier Site Name	:	**Cornwall**
Carrier Site Number	:	**CTL01025 / 10035044**
Site Location	:	**Mohawk Mtn.** **LItchfield, CT 06759-4232** **41.821300,-73.296400**
County	:	**Litchfield**
Date	:	**April 11, 2017**
Max Usage	:	**100%**
Result	:	**Pass**

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 65 ft self supported tower to reflect the change in loading by AT&T Mobility.

Supporting Documents

Tower Drawings	CSEI ATC Engineering #26472221, dated September 19, 2006
Foundation Drawing	TEP Project #74252-101870, dated November 22, 2016
Geotechnical Report	FDH Project #16PWAQ1600, dated November 30, 2016

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:	93 mph (3-Second Gust, Vasd) / 120 mph (3-Second Gust, Vult)
Basic Wind Speed w/ Ice:	40 mph (3-Second Gust) w/ 3/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC / 2016 Connecticut State Building Code
Structure Class:	II
Exposure Category:	B
Topographic Category:	3
Crest Height:	214 ft
Spectral Response:	Ss = 0.18, S_1 = 0.06
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.

Existing and Reserved Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
69.0	75.0	1	12' Dipole	Leg	-	--
	72.0	1	6' Omni			
	69.0	3	RFS APXVSPP18-C-A20		(3) 1 1/4" Hybriflex (1) 1 1/4" Fiber	Sprint Nextel
		3	Alcatel-Lucent TD-RRH8x20-25 w/ Solar Shield			
		3	Alcatel-Lucent 800MHz RRH			
		3	Alcatel-Lucent RRH2x40 (700)			
65.0	65.0	1	Andrew ABT-DFDM-ADB	Sector Frames	(12) 1 1/4" Coax (2) 0.78" 8 AWG 6 (1) 0.39" Fiber Trunk	AT&T Mobility
		1	Andrew SBNHH-1D65A (33.5 lbs)			
		2	CCI HPA-65R-BUU-H6			
		1	Raycap DC6-48-60-18-8F			
		6	Powerwave 7770.00A			
		6	Powerwave TT19-08BP111-001			
		3	Ericsson RRUS 11 (Band 12)			
63.0	72.0	1	18' Omni	Leg	(2) 7/8" Coax	US Dept Of Homeland Security
	63.0	1	Sinclair SV228-HF2SNM			
57.0	57.0	3	RFS RFS APXV9TM14-ALU-I20	Stand-Offs	(3) 1 1/4" Hybriflex	Sprint Nextel
		3	RFS APXVSPP18-C-A20			
56.0	56.0	3	Commscope LNX-6515DS-A1M (50.3 lb)	T-Arms	(2) 1 5/8" Hybriflex (1) 1/2" Coax	T-Mobile
		3	RFS APX16DWV-16DWVS-E-A20			
		3	Ericsson RRUS 11 B2			
		3	Ericsson RRUS 11 B4			
		3	Ericsson RRUS 11 B12			
		1	Symmetricom 58532A			
55.0	55.0	1	10' Std. Dish	Leg	(1) 7/8" Coax	--
		3	10' HP Dish			
50.0	50.0	-	-	Empty Platfrom w/ Handrails	-	
48.0	48.0	3	Decibel 776QNB120EXM	Leg	(12) 7/8" Coax (3) 1/2" Coax	Alltel
46.0	46.0	3	Antel BXA-70063-6CF-EDIN-X	Leg	(12) 1 5/8" Coax	
		6	Antel LPA-80063/6CF			
		3	Antel BXA-171063/12CF__2 FP			
		6	RFS FD9R6004/2C-3L (3.1 lbs)			
37.5	37.5	-	-	Access Platform	-	-

Equipment to be Removed

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
65.0	65.0	3	Ericsson RRUS 11 w/ RRUS A2	-	-	AT&T Mobility

Proposed Equipment

Elevation[1] (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
65.0	65.0	3	Ericsson RRUS 32 (50.8 lbs)	Sector Frames	-	AT&T Mobility

[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).

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Legs	59%	Pass
Diagonals	100%	Pass
Horizontals	31%	Pass

Foundations

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-ft)	95.0	35%
Axial (Kips)	116.9	4%
Shear (Kips)	26.0	24%

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) (°)
65.0	Ericsson RRUS 32 (50.8 lbs)	AT&T Mobility	0.170	0.024	0.575
63.0	Sinclair SV228-HF2SNM	US Dept of Homeland			
55.0	10' HP Dish	--	0.092	0.026	0.915
	10' Std. Dish				

***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 A.T. Engineering Service, PLLC 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. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

Job Information

Tower :	88009	Location :	CORNWALL CT, CT		
Code :	ANSI/TIA-222-G	Shape :	Square	Base Width :	20.00 ft
Client :	AT&T MOBILITY			Top Width :	7.00 ft

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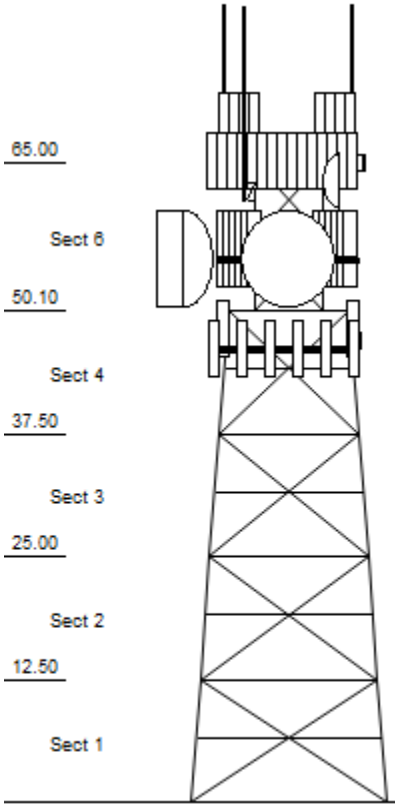
Loads: 93 mph no ice
40 mph w/ 3/4" radial ice
Site Class: D Ss: 0.18 S1: 0.06
60 mph Serviceability

Sections Properties

Section	Leg Members		Diagonal Members	Horizontal Members
1 - 2	SAE 33 ksi	6X6X0.625	SAU 36 ksi 4X3X0.25	DAL 36 ksi 3X2.5X0.25
3	SAE 33 ksi	6X6X0.5	SAU 36 ksi 3.5X3X0.25	DAL 36 ksi 3.5X3X0.3125
4	SAE 33 ksi	6X6X0.5	SAE 36 ksi 3.5x3.5x0.25	DAL 36 ksi 3.5X3X0.3125
5	SAE 33 ksi	6X6X0.5		
6	SAE 33 ksi	6X6X0.5	SAU 36 ksi 3X2X0.25	DAL 36 ksi 2.5X2X0.25



Discrete Appurtenance

Elev (ft)	Type	Qty	Description
69.00	Panel	3	RFS APXVSPP18-C-A20
69.00	Panel	3	Alcatel-Lucent TD-RRH8x20-25 w
69.00	Panel	3	Alcatel-Lucent 800 MHz RRH
69.00	Panel	3	Alcatel-Lucent RRH2x40 (700)
69.00	Whip	1	6' Omni
69.00	Whip	1	12' Dipole
65.01	Other	1	Fire Warden Cab
65.00	Panel	3	Ericsson RRUS 32 (50.8 lbs)
65.00	Mounting Frame	3	Round Sector Frame
65.00	Panel	1	Andrew ABT-DFDM-ADB
65.00	Panel	1	Andrew SBNHH-1D65A (33.5 lbs)
65.00	Panel	2	CCI HPA-65R-BUU-H6
65.00	Panel	1	Raycap DC6-48-60-18-8F
65.00	Panel	6	Powerwave Allgon 7770.00A
65.00	Panel	6	Powerwave Allgon TT19-08BP111-
65.00	Panel	3	Ericsson RRUS 11 (Band 12)
63.00	Whip	1	18' Omni
63.00	Dish	1	Sinclair SV228-HF2SNM
57.00	Panel	3	RFS RFS APXV9TM14-ALU-I20
57.00	Panel	3	RFS APXVSPP18-C-A20
57.00	Straight Arm	6	Stand-Off
56.00	Panel	3	Commscope LNX-6515DS-A1M
56.00	Panel	3	RFS APX16DWV-16DWVS-E-A20
56.00	Panel	3	Ericsson RRUS 11 B2
56.00	Panel	3	Ericsson RRUS 11 B4
56.00	Panel	3	Ericsson RRUS 11 B12
56.00	Panel	1	Symmetricom 58532A
56.00	Straight Arm	3	Flat T-Arm
55.00	Dish	1	10' Std. Dish
55.00	Dish	3	10' HP Dish
50.00	Platform	1	Platfrom w/ Handrails
48.00	Panel	3	Decibel 776QNB120EXM
46.00	Panel	3	Amphenol Antel BXA-70063-6CF-E
46.00	Panel	6	Antel LPA-80063/6CF
46.00	Panel	3	Antel BXA-171063/12CF__2 FP
46.00	Panel	6	RFS FD9R6004/2C-3L (3.1 lbs)
37.50	Platform	1	Access Platform

Linear Appurtenance

Elev (ft) From	To	Qty	Description
0.00	69.00	3	1 1/4" Hybriflex Cab
0.00	69.00	1	1 1/4" Fiber
0.00	65.00	1	Waveguide
0.00	65.00	1	Climbing Ladder
0.00	65.00	12	1 1/4" Coax
0.00	65.00	2	0.78" (19.7mm) 8 AWG
0.00	65.00	1	0.39" (10mm) Fiber T
0.00	63.00	1	7/8" Coax
0.00	63.00	1	7/8" Coax
0.00	57.00	3	1 1/4" Hybriflex Cab

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Job Information

Tower :	88009	Location :	CORNWALL CT, CT		
Code :	ANSI/TIA-222-G	Shape :	Square	Base Width :	20.00 ft
Client :	AT&T MOBILITY			Top Width :	7.00 ft

0.00	56.00	1	Waveguide
0.00	56.00	1	1/2" Coax
0.00	56.00	2	1 5/8" Hybriflex Cab
0.00	55.00	1	7/8" Coax
0.00	48.00	12	7/8" Coax
0.00	48.00	3	1/2" Coax
0.00	46.00	12	1 5/8" Coax

Global Base Foundation Design Loads

Load Case	Moment (k-ft)	Vertical (kip)	Horizontal (kip)
DL + WL	2,953.44	49.79	63.30
DL + WL + IL	718.60	144.96	14.83

Individual Base Foundation Design Loads

Vertical (kip)	Uplift (kip)	Horizontal (kip)
116.85	95.04	26.04

Site Number:	88009	Code:	ANSI/TIA-222-G	© 2007 - 2017 by ATC IP LLC. All rights reserved.
Site Name:	CORNWALL CT, CT	Engineering Number:	OAA700092_C3_01	4/11/2017 12:43:13 PM
Customer:	AT&T MOBILITY			

Analysis Parameters

Location:	LITCHFIELD County, CT	Height (ft):	65
Code:	ANSI/TIA-222-G	Base Elevation (ft):	0.00
Shape:	Square	Bottom Face Width (ft):	20.00
Tower Manufacturer:	CSEI	Top Face Width (ft):	7.00
Tower Type:	Self Support	Anchor Bolt Detail Type	c

Ice & Wind Parameters

Structure Class:	II	Design Windspeed Without Ice:	93 mph
Exposure Category:	B	Design Windspeed With Ice:	40 mph
Topographic Category:	3	Operational Windspeed:	60 mph
Crest Height:	214.2 ft	Design Ice Thickness:	0.75 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods
Site Class:	D - Stiff Soil
Period Based on Rayleigh Method (sec):	0.50

T_L (sec):	6	p:	1.3	C_S:	0.064
S_S :	0.181	S_1 :	0.065	C_S, Max:	0.070
F_a :	1.600	F_V :	2.400	C_S, Min:	0.030
S_{ds} :	0.193	S_{d1} :	0.104		

Load Cases

1.2D + 1.6W Normal	93 mph Normal to Face with No Ice
1.2D + 1.6W 45 deg	93 mph 45 degree with No Ice
1.2D + 1.6W 90 deg	93 mph 90 degree with No Ice
1.2D + 1.6W 135 deg	93 mph 135 degree with No Ice
1.2D + 1.6W 180 deg	93 mph 180 degree with No Ice
1.2D + 1.6W 225 deg	93 mph 225 degree with No Ice
1.2D + 1.6W 270 deg	93 mph 270 degree with No Ice
1.2D + 1.6W 315 deg	93 mph 315 degree with No Ice
0.9D + 1.6W Normal	93 mph Normal to Face with No Ice (Reduced DL)
0.9D + 1.6W 45 deg	93 mph 45 deg with No Ice (Reduced DL)
0.9D + 1.6W 90 deg	93 mph 90 deg with No Ice (Reduced DL)
0.9D + 1.6W 135 deg	93 mph 135 deg with No Ice (Reduced DL)
0.9D + 1.6W 180 deg	93 mph 180 deg with No Ice (Reduced DL)
0.9D + 1.6W 225 deg	93 mph 225 deg with No Ice (Reduced DL)
0.9D + 1.6W 270 deg	93 mph 270 deg with No Ice (Reduced DL)
0.9D + 1.6W 315 deg	93 mph 315 deg with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi Normal	40 mph Normal with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 45 deg	40 mph 45 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 90 deg	40 mph 90 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 135 deg	40 mph 135 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 180 deg	40 mph 180 deg with 0.75 in Radial Ice

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Analysis Parameters

1.2D + 1.0Di + 1.0Wi 225 deg	40 mph 225 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 270 deg	40 mph 270 deg with 0.75 in Radial Ice
1.2D + 1.0Di + 1.0Wi 315 deg	40 mph 315 deg with 0.75 in Radial Ice
(1.2 + 0.2Sds) * DL + E Normal	Seismic Normal
(1.2 + 0.2Sds) * DL + E 45 deg	Seismic 45 deg
(1.2 + 0.2Sds) * DL + E 90 deg	Seismic 90 deg
(1.2 + 0.2Sds) * DL + E 135 deg	Seismic 135 deg
(1.2 + 0.2Sds) * DL + E 180 deg	Seismic 180 deg
(1.2 + 0.2Sds) * DL + E 225 deg	Seismic 225 deg
(1.2 + 0.2Sds) * DL + E 270 deg	Seismic 270 deg
(1.2 + 0.2Sds) * DL + E 315 deg	Seismic 315 deg
(0.9 - 0.2Sds) * DL + E Normal	Seismic (Reduced DL) Normal
(0.9 - 0.2Sds) * DL + E 45 deg	Seismic (Reduced DL) 45 deg
(0.9 - 0.2Sds) * DL + E 90 deg	Seismic (Reduced DL) 90 deg
(0.9 - 0.2Sds) * DL + E 135 deg	Seismic (Reduced DL) 135 deg
(0.9 - 0.2Sds) * DL + E 180 deg	Seismic (Reduced DL) 180 deg
(0.9 - 0.2Sds) * DL + E 225 deg	Seismic (Reduced DL) 225 deg
(0.9 - 0.2Sds) * DL + E 270 deg	Seismic (Reduced DL) 270 deg
(0.9 - 0.2Sds) * DL + E 315 deg	Seismic (Reduced DL) 315 deg
1.0D + 1.0W Service Normal	Serviceability - 60 mph Wind Normal
1.0D + 1.0W Service 45 deg	Serviceability - 60 mph Wind 45 deg
1.0D + 1.0W Service 90 deg	Serviceability - 60 mph Wind 90 deg
1.0D + 1.0W Service 135 deg	Serviceability - 60 mph Wind 135 deg
1.0D + 1.0W Service 180 deg	Serviceability - 60 mph Wind 180 deg
1.0D + 1.0W Service 225 deg	Serviceability - 60 mph Wind 225 deg
1.0D + 1.0W Service 270 deg	Serviceability - 60 mph Wind 270 deg
1.0D + 1.0W Service 315 deg	Serviceability - 60 mph Wind 315 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)
69.00	6' Omni	1	25	1.8	6.0	3.0	3.0	1.00	1.00	3.0	188.0	26.18	63	36
69.00	Alcatel-Lucent	3	50	2.1	1.7	12.2	10.6	0.80	0.50	0.0	0.0	26.16	90	216
69.00	Alcatel-Lucent 800	3	53	2.1	1.6	13.0	10.8	0.80	0.50	0.0	0.0	26.16	91	229
69.00	Alcatel-Lucent TD-	3	70	4.1	2.2	18.6	6.7	0.80	0.50	0.0	0.0	26.16	173	302
69.00	12' Dipole	1	40	4.5	12.0	3.0	3.0	1.00	1.00	6.0	964.4	26.21	161	58
69.00	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	26.16	472	246
65.01	Fire Warden Cab	1	2000	150.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	26.11	5326	2880
65.00	Andrew ABT-DFDM-	1	1	0.1	0.3	1.7	1.6	0.80	0.50	0.0	0.0	26.11	1	2
65.00	Powerwave Allgon	6	16	0.6	0.8	6.7	5.4	0.80	0.50	0.0	0.0	26.11	55	138
65.00	Raycap DC6-48-60-	1	20	1.1	2.0	9.7	9.7	0.80	1.00	0.0	0.0	26.11	32	29
65.00	Ericsson RRUS 11	3	50	2.6	1.5	17.3	7.2	0.80	0.50	0.0	0.0	26.11	110	216
65.00	Ericsson RRUS 32	3	51	2.7	2.2	12.1	6.7	0.80	0.50	0.0	0.0	26.11	115	219
65.00	Powerwave Allgon	6	27	5.6	4.6	11.0	4.9	0.80	0.76	0.0	0.0	26.11	720	233
65.00	Andrew SBNHH-	1	34	5.9	4.6	11.9	7.1	0.80	0.69	0.0	0.0	26.11	115	48
65.00	CCI HPA-65R-BUU-H6	2	51	9.7	6.0	14.8	9.0	0.80	0.69	0.0	0.0	26.11	379	147
65.00	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.0	26.11	863	1296
63.00	18' Omni	1	55	5.4	18.0	3.0	3.0	1.00	1.00	9.0	1730.7	26.18	192	79
63.00	Sinclair SV228-	1	93	15.8	6.0	116.0	62.0	1.00	1.00	0.0	0.0	26.08	561	134
57.00	Stand-Off	6	100	3.0	0.0	0.0	0.0	1.00	0.67	0.0	0.0	25.96	426	864
57.00	RFS RFS	3	55	6.3	4.7	12.6	6.3	0.80	0.66	0.0	0.0	25.96	355	238
57.00	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	25.96	469	246
56.00	Symmetricom	1	0	0.2	0.5	3.5	3.5	1.00	1.00	0.0	0.0	25.93	8	1
56.00	Ericsson RRUS 11	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	25.93	118	219
56.00	Ericsson RRUS 11 B4	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	25.93	118	219
56.00	Ericsson RRUS 11 B2	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	25.93	118	219
56.00	RFS APX16DWV-	3	41	6.6	4.7	13.3	3.1	0.80	0.60	0.0	0.0	25.93	335	176
56.00	Commscope LNX-	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.0	25.93	678	217
56.00	Flat T-Arm	3	250	12.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	25.93	686	1080
55.00	10' HP Dish	3	705	99.1	10.0	0.0	0.0	1.00	0.90	0.0	0.0	25.91	9427	3046
55.00	10' Std. Dish	1	512	130.7	10.0	0.0	0.0	1.00	1.00	0.0	0.0	25.91	4605	737
50.00	Platfrom w/	1	5000	70.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	25.75	2451	7200
48.00	Decibel	3	117	22.2	6.0	37.0	9.5	1.00	0.65	0.0	0.0	25.67	1511	505
46.00	RFS FD9R6004/2C-3L	6	3	0.4	0.5	6.5	1.5	1.00	0.50	0.0	0.0	25.58	38	27
46.00	Antel BXA-	3	15	4.8	6.0	6.1	4.1	1.00	0.88	0.0	0.0	25.58	440	65
46.00	Amphenol Antel BXA-	3	17	7.6	5.9	11.2	5.2	1.00	0.77	0.0	0.0	25.58	608	73
46.00	Antel LPA-80063/6CF	6	27	9.6	5.9	15.0	13.1	1.00	0.94	0.0	0.0	25.58	1882	233
37.50	Access Platform	1	5000	45.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	25.09	1535	7200
	Totals	101	20191	1234.6										

Discrete Appurtenance Properties 0.9D + 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)
69.00	6' Omni	1	25	1.8	6.0	3.0	3.0	1.00	1.00	3.0	188.0	26.18	63	20
69.00	Alcatel-Lucent	3	50	2.1	1.7	12.2	10.6	0.80	0.50	0.0	0.0	26.16	90	122
69.00	Alcatel-Lucent 800	3	53	2.1	1.6	13.0	10.8	0.80	0.50	0.0	0.0	26.16	91	129
69.00	Alcatel-Lucent TD-	3	70	4.1	2.2	18.6	6.7	0.80	0.50	0.0	0.0	26.16	173	170
69.00	12' Dipole	1	40	4.5	12.0	3.0	3.0	1.00	1.00	6.0	964.4	26.21	161	32
69.00	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	26.16	472	139
65.01	Fire Warden Cab	1	2000	150.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	26.11	5326	1620
65.00	Andrew ABT-DFDM-	1	1	0.1	0.3	1.7	1.6	0.80	0.50	0.0	0.0	26.11	1	1
65.00	Powerwave Allgon	6	16	0.6	0.8	6.7	5.4	0.80	0.50	0.0	0.0	26.11	55	78

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65.00	Raycap DC6-48-60-	1	20	1.1	2.0	9.7	9.7	0.80	1.00	0.0	0.0	26.11	32	16
65.00	Ericsson RRUS 11	3	50	2.6	1.5	17.3	7.2	0.80	0.50	0.0	0.0	26.11	110	122
65.00	Ericsson RRUS 32	3	51	2.7	2.2	12.1	6.7	0.80	0.50	0.0	0.0	26.11	115	123
65.00	Powerwave Allgon	6	27	5.6	4.6	11.0	4.9	0.80	0.76	0.0	0.0	26.11	720	131
65.00	Andrew SBNHH-	1	34	5.9	4.6	11.9	7.1	0.80	0.69	0.0	0.0	26.11	115	27
65.00	CCI HPA-65R-BUU-H6	2	51	9.7	6.0	14.8	9.0	0.80	0.69	0.0	0.0	26.11	379	83
65.00	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.0	26.11	863	729
63.00	18' Omni	1	55	5.4	18.0	3.0	3.0	1.00	1.00	9.0	1730.7	26.18	192	45
63.00	Sinclair SV228-	1	93	15.8	6.0	116.0	62.0	1.00	1.00	0.0	0.0	26.08	561	75
57.00	Stand-Off	6	100	3.0	0.0	0.0	0.0	1.00	0.67	0.0	0.0	25.96	426	486
57.00	RFS RFS	3	55	6.3	4.7	12.6	6.3	0.80	0.66	0.0	0.0	25.96	355	134
57.00	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	25.96	469	139
56.00	Symmetricom	1	0	0.2	0.5	3.5	3.5	1.00	1.00	0.0	0.0	25.93	8	0
56.00	Ericsson RRUS 11	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	25.93	118	123
56.00	Ericsson RRUS 11 B4	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	25.93	118	123
56.00	Ericsson RRUS 11 B2	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	25.93	118	123
56.00	RFS APX16DWV-	3	41	6.6	4.7	13.3	3.1	0.80	0.60	0.0	0.0	25.93	335	99
56.00	Commscope LNX-	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.0	25.93	678	122
56.00	Flat T-Arm	3	250	12.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	25.93	686	608
55.00	10' HP Dish	3	705	99.1	10.0	0.0	0.0	1.00	0.90	0.0	0.0	25.91	9427	1713
55.00	10' Std. Dish	1	512	130.7	10.0	0.0	0.0	1.00	1.00	0.0	0.0	25.91	4605	415
50.00	Platfrom w/	1	5000	70.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	25.75	2451	4050
48.00	Decibel	3	117	22.2	6.0	37.0	9.5	1.00	0.65	0.0	0.0	25.67	1511	284
46.00	RFS FD9R6004/2C-3L	6	3	0.4	0.5	6.5	1.5	1.00	0.50	0.0	0.0	25.58	38	15
46.00	Antel BXA-	3	15	4.8	6.0	6.1	4.1	1.00	0.88	0.0	0.0	25.58	440	36
46.00	Amphenol Antel BXA-	3	17	7.6	5.9	11.2	5.2	1.00	0.77	0.0	0.0	25.58	608	41
46.00	Antel LPA-80063/6CF	6	27	9.6	5.9	15.0	13.1	1.00	0.94	0.0	0.0	25.58	1882	131
37.50	Access Platform	1	5000	45.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	25.09	1535	4050
	Totals	101	20191	1234.6										

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)
69.00	6' Omni	1	116	3.2	6.0	3.0	3.0	1.00	1.00	3.0	39.3	4.84	13	146
69.00	Alcatel-Lucent	3	146	2.8	1.7	12.2	10.6	0.80	0.50	0.0	0.0	4.84	14	561
69.00	Alcatel-Lucent 800	3	149	2.8	1.6	13.0	10.8	0.80	0.50	0.0	0.0	4.84	14	575
69.00	Alcatel-Lucent TD-	3	172	5.5	2.2	18.6	6.7	0.80	0.50	0.0	0.0	4.84	27	670
69.00	12' Dipole	1	217	7.8	12.0	3.0	3.0	1.00	1.00	6.0	194.0	4.85	32	270
69.00	RFS APXVSPP18-C-	3	276	9.4	6.0	11.8	7.0	0.80	0.69	0.0	0.0	4.84	64	1034
65.01	Fire Warden Cab	1	6521	771.6	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.83	3168	8305
65.00	Andrew ABT-DFDM-	1	4	0.3	0.3	1.7	1.6	0.80	0.50	0.0	0.0	4.83	0	4
65.00	Powerwave Allgon	6	38	1.3	0.8	6.7	5.4	0.80	0.50	0.0	0.0	4.83	13	296
65.00	Raycap DC6-48-60-	1	77	1.7	2.0	9.7	9.7	0.80	1.00	0.0	0.0	4.83	6	97
65.00	Ericsson RRUS 11	3	124	3.7	1.5	17.3	7.2	0.80	0.50	0.0	0.0	4.83	18	481
65.00	Ericsson RRUS 32	3	145	3.5	2.2	12.1	6.7	0.80	0.50	0.0	0.0	4.83	17	558
65.00	Powerwave Allgon	6	150	7.9	4.6	11.0	4.9	0.80	0.76	0.0	0.0	4.83	118	1121
65.00	Andrew SBNHH-	1	180	8.2	4.6	11.9	7.1	0.80	0.69	0.0	0.0	4.83	19	224
65.00	CCI HPA-65R-BUU-H6	2	288	12.7	6.0	14.8	9.0	0.80	0.69	0.0	0.0	4.83	57	716
65.00	Round Sector Frame	3	698	32.3	0.0	0.0	0.0	0.75	0.75	0.0	0.0	4.83	224	2728
63.00	18' Omni	1	318	12.4	18.0	3.0	3.0	1.00	1.00	9.0	459.3	4.84	51	395
63.00	Sinclair SV228-	1	610	64.1	6.0	116.0	62.0	1.00	1.00	0.0	0.0	4.82	263	755
57.00	Stand-Off	6	153	4.7	0.0	0.0	0.0	1.00	0.67	0.0	0.0	4.80	77	1244
57.00	RFS RFS	3	204	8.7	4.7	12.6	6.3	0.80	0.66	0.0	0.0	4.80	56	774
57.00	RFS APXVSPP18-C-	3	244	11.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	4.80	75	918
56.00	Symmetricom	1	9	0.6	0.5	3.5	3.5	1.00	1.00	0.0	0.0	4.80	3	11

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56.00	Ericsson RRUS 11	3	146	3.5	1.6	17.0	7.2	0.80	0.50	0.0	0.0	4.80	17	561
56.00	Ericsson RRUS 11 B4	3	146	3.5	1.6	17.0	7.2	0.80	0.50	0.0	0.0	4.80	17	561
56.00	Ericsson RRUS 11 B2	3	146	3.5	1.6	17.0	7.2	0.80	0.50	0.0	0.0	4.80	17	561
56.00	RFS APX16DWV-	3	193	7.8	4.7	13.3	3.1	0.80	0.60	0.0	0.0	4.80	46	723
56.00	Commscope LNX-	3	339	13.2	8.0	11.9	7.1	0.80	0.70	0.0	0.0	4.80	91	1256
56.00	Flat T-Arm	3	476	21.7	0.0	0.0	0.0	0.75	0.67	0.0	0.0	4.80	134	1894
55.00	10' HP Dish	3	2811	105.4	10.0	0.0	0.0	1.00	0.90	0.0	0.0	4.79	1159	10626
55.00	10' Std. Dish	1	2379	140.5	10.0	0.0	0.0	1.00	1.00	0.0	0.0	4.79	573	2978
50.00	Platfrom w/	1	18097	331.9	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.76	1344	22916
48.00	Decibel	3	621	24.3	6.0	37.0	9.5	1.00	0.65	0.0	0.0	4.75	191	2320
46.00	RFS FD9R6004/2C-3L	6	12	0.8	0.5	6.5	1.5	1.00	0.50	0.0	0.0	4.73	10	89
46.00	Antel BXA-	3	118	7.3	6.0	6.1	4.1	1.00	0.88	0.0	0.0	4.73	78	435
46.00	Amphenol Antel BXA-	3	176	10.5	5.9	11.2	5.2	1.00	0.77	0.0	0.0	4.73	98	646
46.00	Antel LPA-80063/6CF	6	339	11.1	5.9	15.0	13.1	1.00	0.94	0.0	0.0	4.73	251	2480
37.50	Access Platform	1	18296	211.2	0.0	0.0	0.0	1.00	1.00	0.0	0.0	4.64	833	23155
	Totals	101	73531	2575.0										

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)
69.00	6' Omni	1	25	1.8	6.0	3.0	3.0	1.00	1.00	3.0	48.9	10.90	16	25
69.00	Alcatel-Lucent	3	50	2.1	1.7	12.2	10.6	0.80	0.50	0.0	0.0	10.89	24	150
69.00	Alcatel-Lucent 800	3	53	2.1	1.6	13.0	10.8	0.80	0.50	0.0	0.0	10.89	24	159
69.00	Alcatel-Lucent TD-	3	70	4.1	2.2	18.6	6.7	0.80	0.50	0.0	0.0	10.89	45	210
69.00	12' Dipole	1	40	4.5	12.0	3.0	3.0	1.00	1.00	6.0	250.9	10.91	42	40
69.00	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	10.89	123	171
65.01	Fire Warden Cab	1	2000	150.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	10.87	1386	2000
65.00	Andrew ABT-DFDM-	1	1	0.1	0.3	1.7	1.6	0.80	0.50	0.0	0.0	10.87	0	1
65.00	Powerwave Allgon	6	16	0.6	0.8	6.7	5.4	0.80	0.50	0.0	0.0	10.87	14	96
65.00	Raycap DC6-48-60-	1	20	1.1	2.0	9.7	9.7	0.80	1.00	0.0	0.0	10.87	8	20
65.00	Ericsson RRUS 11	3	50	2.6	1.5	17.3	7.2	0.80	0.50	0.0	0.0	10.87	28	150
65.00	Ericsson RRUS 32	3	51	2.7	2.2	12.1	6.7	0.80	0.50	0.0	0.0	10.87	30	152
65.00	Powerwave Allgon	6	27	5.6	4.6	11.0	4.9	0.80	0.76	0.0	0.0	10.87	187	162
65.00	Andrew SBNHH-	1	34	5.9	4.6	11.9	7.1	0.80	0.69	0.0	0.0	10.87	30	34
65.00	CCI HPA-65R-BUU-H6	2	51	9.7	6.0	14.8	9.0	0.80	0.69	0.0	0.0	10.87	99	102
65.00	Round Sector Frame	3	300	14.4	0.0	0.0	0.0	0.75	0.75	0.0	0.0	10.87	224	900
63.00	18' Omni	1	55	5.4	18.0	3.0	3.0	1.00	1.00	9.0	450.2	10.90	50	55
63.00	Sinclair SV228-	1	93	15.8	6.0	116.0	62.0	1.00	1.00	0.0	0.0	10.85	146	93
57.00	Stand-Off	6	100	3.0	0.0	0.0	0.0	1.00	0.67	0.0	0.0	10.80	111	600
57.00	RFS RFS	3	55	6.3	4.7	12.6	6.3	0.80	0.66	0.0	0.0	10.80	92	165
57.00	RFS APXVSPP18-C-	3	57	8.0	6.0	11.8	7.0	0.80	0.69	0.0	0.0	10.80	122	171
56.00	Symmetricom	1	0	0.2	0.5	3.5	3.5	1.00	1.00	0.0	0.0	10.79	2	0
56.00	Ericsson RRUS 11	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	10.79	31	152
56.00	Ericsson RRUS 11 B4	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	10.79	31	152
56.00	Ericsson RRUS 11 B2	3	51	2.8	1.6	17.0	7.2	0.80	0.50	0.0	0.0	10.79	31	152
56.00	RFS APX16DWV-	3	41	6.6	4.7	13.3	3.1	0.80	0.60	0.0	0.0	10.79	87	122
56.00	Commscope LNX-	3	50	11.4	8.0	11.9	7.1	0.80	0.70	0.0	0.0	10.79	176	151
56.00	Flat T-Arm	3	250	12.9	0.0	0.0	0.0	0.75	0.67	0.0	0.0	10.79	178	750
55.00	10' HP Dish	3	705	99.1	10.0	0.0	0.0	1.00	0.90	0.0	0.0	10.78	2452	2115
55.00	10' Std. Dish	1	512	130.7	10.0	0.0	0.0	1.00	1.00	0.0	0.0	10.78	1198	512
50.00	Platfrom w/	1	5000	70.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	10.72	638	5000
48.00	Decibel	3	117	22.2	6.0	37.0	9.5	1.00	0.65	0.0	0.0	10.69	393	351
46.00	RFS FD9R6004/2C-3L	6	3	0.4	0.5	6.5	1.5	1.00	0.50	0.0	0.0	10.65	10	19
46.00	Antel BXA-	3	15	4.8	6.0	6.1	4.1	1.00	0.88	0.0	0.0	10.65	114	45
46.00	Amphenol Antel BXA-	3	17	7.6	5.9	11.2	5.2	1.00	0.77	0.0	0.0	10.65	158	51

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46.00	Antel LPA-80063/6CF	6	27	9.6	5.9	15.0	13.1	1.00	0.94	0.0	0.0	10.65	490	162
37.50	Access Platform	1	5000	45.0	0.0	0.0	0.0	1.00	1.00	0.0	0.0	10.44	399	5000
	Totals	101	20191	1234.6										

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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
0.00	69.00	1 1/4" Fiber	1	1.25	1.05	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	69.00	1 1/4" Hybriflex	3	1.54	1.00	0	1	Individual	0.00	N	0.00	1.00	0.00
0.00	65.00	0.39" (10mm) Fiber	1	0.39	0.06	0	1	Individual	0.00	N	1.00	1.00	0.01
0.00	65.00	0.78" (19.7mm) 8	2	0.78	0.59	0	1	Individual	0.00	N	1.00	1.00	0.01
0.00	65.00	1 1/4" Coax	12	1.55	0.63	33	1	Block	0.00	N	0.00	1.00	0.00
0.00	65.00	Climbing Ladder	1	2.00	6.90	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	65.00	Waveguide	1	2.00	6.00	0	1	Individual	0.00	N	1.00	1.00	0.00
0.00	63.00	7/8" Coax	1	1.09	0.33	0	1	Individual	0.00	N	1.00	1.00	0.00
0.00	63.00	7/8" Coax	1	1.09	0.33	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	57.00	1 1/4" Hybriflex	3	1.54	1.00	33	1	Block	0.00	N	0.00	1.00	0.00
0.00	56.00	1 5/8" Hybriflex	2	1.98	1.30	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	56.00	1/2" Coax	1	0.63	0.15	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	56.00	Waveguide	1	2.00	6.00	0	Lin App	Individual	0.00	N	1.00	1.00	0.00
0.00	55.00	7/8" Coax	1	1.09	0.33	0	1	Individual	0.00	N	1.00	1.00	0.00
0.00	48.00	1/2" Coax	3	0.63	0.15	0	1	Individual	0.00	N	1.00	1.00	0.00
0.00	48.00	7/8" Coax	12	1.09	0.33	33	1	Block	0.00	N	0.00	1.00	0.00
0.00	46.00	1 5/8" Coax	12	1.98	0.82	33	1	Block	0.00	N	0.00	1.00	0.00

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Force/Stress Summary

Section: 1 1 Bot Elev (ft): 0.00 Height (ft): 12.500

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 SAE - 6X6X0.625	-104.02	1.2D + 1.6W 45	12.57	50	50	50	63.9	33.0	173.38	0	0	0.00	0.00	59	Member Z
HORIZ DAL - 3X2.5X0.25	-4.63	0.9D + 1.6W	18.12	50	100	13	199.8	36.0	14.89	0	0	0.00	0.00	31	Member Y
DIAG SAU - 4X3X0.25	-11.97	1.2D + 1.6W	22.81	47	47	47	179.2	36.0	11.89	0	0	0.00	0.00	100	Member Z

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 SAE - 6X6X0.625	84.64	0.9D + 1.6W 45	33	45	211.17	0	0	0.00	0.00		40	Member
HORIZ DAL - 3X2.5X0.25	5.74	1.2D + 1.6W	36	58	85.21	0	0	0.00	0.00	0.00	6	Member
DIAG SAU - 4X3X0.25	10.64	1.2D + 1.6W	36	58	54.76	0	0	0.00	0.00	0.00	19	Member

Section: 2 1 Bot Elev (ft): 12.50 Height (ft): 12.500

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 SAE - 6X6X0.625	-84.32	1.2D + 1.6W 45	12.57	50	50	50	63.9	33.0	173.38	0	0	0.00	0.00	48	Member Z
HORIZ DAL - 3X2.5X0.25	-2.91	1.2D + 1.6W	16.25	50	50	17	106.7	36.0	46.79	0	0	0.00	0.00	6	Member Y
DIAG SAU - 4X3X0.25	-12.61	1.2D + 1.6W	21.27	47	47	47	169.0	36.0	13.36	0	0	0.00	0.00	94	Member Z

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 SAE - 6X6X0.625	66.22	0.9D + 1.6W 45	33	45	211.17	0	0	0.00	0.00		31	Member
HORIZ DAL - 3X2.5X0.25	3.83	1.2D + 1.6W	36	58	85.21	0	0	0.00	0.00	0.00	4	Member
DIAG SAU - 4X3X0.25	11.51	0.9D + 1.6W	36	58	54.76	0	0	0.00	0.00	0.00	21	Member

Section: 3 1 Bot Elev (ft): 25.00 Height (ft): 12.500

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 SAE - 6X6X0.5	-60.25	1.2D + 1.6W 45	12.57	50	50	50	63.9	33.0	140.22	0	0	0.00	0.00	42	Member Z
HORIZ DAL - 3.5X3X0.3125	-4.76	0.9D + 1.6W	14.37	50	100	17	136.1	36.0	47.22	0	0	0.00	0.00	10	Member Y
DIAG SAU - 3.5X3X0.25	-13.31	1.2D + 1.6W 90	19.78	47	47	47	163.4	36.0	13.20	0	0	0.00	0.00	100	Member Z

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 SAE - 6X6X0.5	45.04	0.9D + 1.6W 45	33	45	170.77	0	0	0.00	0.00		26	Member
HORIZ DAL - 3.5X3X0.3125	6.48	1.2D + 1.6W	36	58	125.39	0	0	0.00	0.00	0.00	5	Member
DIAG SAU - 3.5X3X0.25	11.80	1.2D + 1.6W 90	36	58	50.54	0	0	0.00	0.00	0.00	23	Member

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Force/Stress Summary

Section: 4 1 Bot Elev (ft): 37.50 Height (ft): 12.500

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Bracing % Y	Bracing % Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SAE - 6X6X0.5	-35.70	1.2D + 1.6W 45	12.57	50	50	50	63.9	33.0	140.22	0	0	0.00	0.00	25	Member Z
HORIZ DAL - 3.5X3X0.3125	-7.23	1.2D + 1.6W 90	12.50	100	100	17	136.4	36.0	47.01	0	0	0.00	0.00	15	Member X
DIAG SAE - 3.5x3.5x0.25	-12.59	1.2D + 1.6W	18.37	47	47	47	143.4	36.0	18.57	0	0	0.00	0.00	67	Member Z

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 SAE - 6X6X0.5	25.71	0.9D + 1.6W 45	33	45	170.77	0	0	0.00	0.00		15	Member
HORIZ DAL - 3.5X3X0.3125	5.11	1.2D + 1.6W	36	58	125.39	0	0	0.00	0.00	0.00	4	Member
DIAG SAE - 3.5x3.5x0.25	11.02	1.2D + 1.6W	36	58	54.76	0	0	0.00	0.00	0.00	20	Member

Section: 5 1 Bot Elev (ft): 50.00 Height (ft): 0.100

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Bracing % Y	Bracing % Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SAE - 6X6X0.5	-12.23	1.2D + 1.6W 45	0.39	50	50	50	2.0	33.0	170.74	0	0	0.00	0.00	7	Member Z
HORIZ	0.00		0.000	0	0	0	0.0	0.0	0.00	0	0	0.00	0.00	0	
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 SAE - 6X6X0.5	19.23	0.9D + 1.6W 45	33	45	170.77	0	0	0.00	0.00		11	Member
HORIZ	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	
DIAG	0.00		0	0	0.00	0	0	0.00	0.00	0.00	0	

Section: 6 1 Bot Elev (ft): 50.10 Height (ft): 14.900

Max Compression Member	Pu (kip)	Load Case	Len (ft)	Bracing % X	Bracing % Y	Bracing % Z	KL/R	F'y (ksi)	Phic Pn (kip)	Num Bolts	Num Holes	Shear phiRnv (kip)	Bear phiRn (kip)	Use %	Controls
LEG SAE - 6X6X0.5	-18.13	1.2D + 1.6W 45	7.45	100	100	100	75.8	33.0	129.46	0	0	0.00	0.00	14	Member Z
HORIZ DAL - 2.5X2X0.25	-5.06	1.2D + 1.6W 90	7.000	100	100	50	133.7	36.0	26.92	0	0	0.00	0.00	18	Member Y
DIAG SAU - 3X2X0.25	-6.42	1.2D + 1.6W	10.22	50	50	50	136.0	36.0	14.52	0	0	0.00	0.00	44	Member Z

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 SAE - 6X6X0.5	4.63	1.2D + 1.6W 45	33	45	170.77	0	0	0.00	0.00		2	Member
HORIZ DAL - 2.5X2X0.25	1.38	1.2D + 1.6W 45	36	58	69.01	0	0	0.00	0.00	0.00	2	Member
DIAG SAU - 3X2X0.25	10.88	0.9D + 1.6W 45	36	58	38.56	0	0	0.00	0.00	0.00	28	Member

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Detailed Reactions

Load Case	Node	FX (kip)	FY (kip)	FZ (kip)
1.2D + 1.6W Normal	1	-9.43	83.91	-16.49
	1a	6.66	-59.01	-13.78
	1b	-6.66	-59.01	-13.78
	1c	9.43	83.91	-16.49
1.2D + 1.6W 45 deg	1	-18.40	116.85	-18.43
	1a	-6.71	12.38	-3.91
	1b	-15.74	-91.99	-15.72
	1c	-3.91	12.54	-6.70
1.2D + 1.6W 90 deg	1	-16.49	83.79	-9.44
	1a	-16.49	83.79	9.44
	1b	-13.79	-58.89	-6.65
	1c	-13.79	-58.89	6.65
1.2D + 1.6W 135 deg	1	-6.71	12.38	3.91
	1a	-18.40	116.85	18.43
	1b	-3.91	12.54	6.70
	1c	-15.74	-91.99	15.72
1.2D + 1.6W 180 deg	1	6.66	-59.01	13.78
	1a	-9.43	83.91	16.49
	1b	9.43	83.91	16.49
	1c	-6.66	-59.01	13.78
1.2D + 1.6W 225 deg	1	15.74	-91.99	15.72
	1a	3.91	12.54	6.70
	1b	18.40	116.85	18.43
	1c	6.71	12.38	3.91
1.2D + 1.6W 270 deg	1	13.79	-58.89	6.65
	1a	13.79	-58.89	-6.65
	1b	16.49	83.79	9.44
	1c	16.49	83.79	-9.44
1.2D + 1.6W 315 deg	1	3.91	12.54	-6.70
	1a	15.74	-91.99	-15.72
	1b	6.71	12.38	-3.91
	1c	18.40	116.85	-18.43
0.9D + 1.6W Normal	1	-9.08	80.75	-16.14
	1a	7.00	-62.08	-14.13
	1b	-7.00	-62.08	-14.13
	1c	9.08	80.75	-16.14
0.9D + 1.6W 45 deg	1	-18.05	113.68	-18.07
	1a	-6.36	9.26	-4.27
	1b	-16.08	-95.04	-16.07
	1c	-4.26	9.44	-6.35
0.9D + 1.6W 90 deg	1	-16.14	80.63	-9.09
	1a	-16.14	80.63	9.09
	1b	-14.14	-61.96	-7.00
	1c	-14.14	-61.96	7.00
0.9D + 1.6W 135 deg	1	-6.36	9.26	4.27
	1a	-18.05	113.68	18.07
	1b	-4.26	9.44	6.35
	1c	-16.08	-95.04	16.07

(-) = Uplift (+) = Down

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0.9D + 1.6W 180 deg	1	7.00	-62.08	14.13
	1a	-9.08	80.75	16.14
	1b	9.08	80.75	16.14
	1c	-7.00	-62.08	14.13
0.9D + 1.6W 225 deg	1	16.08	-95.04	16.07
	1a	4.26	9.44	6.35
	1b	18.05	113.68	18.07
	1c	6.36	9.26	4.27
0.9D + 1.6W 270 deg	1	14.14	-61.96	7.00
	1a	14.14	-61.96	-7.00
	1b	16.14	80.63	9.09
	1c	16.14	80.63	-9.09
0.9D + 1.6W 315 deg	1	4.26	9.44	-6.35
	1a	16.08	-95.04	-16.07
	1b	6.36	9.26	-4.27
	1c	18.05	113.68	-18.07
1.2D + 1.0Di + 1.0Wi Normal	1	-3.96	53.70	-5.56
	1a	-0.02	18.77	-1.54
	1b	0.02	18.77	-1.54
	1c	3.96	53.70	-5.56
1.2D + 1.0Di + 1.0Wi 45 deg	1	-6.04	61.65	-6.06
	1a	-3.18	36.23	0.83
	1b	-2.06	10.83	-2.05
	1c	0.80	36.25	-3.20
1.2D + 1.0Di + 1.0Wi 90 deg	1	-5.54	53.69	-3.98
	1a	-5.54	53.69	3.98
	1b	-1.56	18.79	0.04
	1c	-1.56	18.79	-0.04
1.2D + 1.0Di + 1.0Wi 135 deg	1	-3.18	36.23	-0.83
	1a	-6.04	61.65	6.06
	1b	0.80	36.25	3.20
	1c	-2.06	10.83	2.05
1.2D + 1.0Di + 1.0Wi 180 deg	1	-0.02	18.77	1.54
	1a	-3.96	53.70	5.56
	1b	3.96	53.70	5.56
	1c	0.02	18.77	1.54
1.2D + 1.0Di + 1.0Wi 225 deg	1	2.06	10.83	2.05
	1a	-0.80	36.25	3.20
	1b	6.04	61.65	6.06
	1c	3.18	36.23	-0.83
1.2D + 1.0Di + 1.0Wi 270 deg	1	1.56	18.79	-0.04
	1a	1.56	18.79	0.04
	1b	5.54	53.69	3.98
	1c	5.54	53.69	-3.98
1.2D + 1.0Di + 1.0Wi 315 deg	1	-0.80	36.25	-3.20
	1a	2.06	10.83	-2.05
	1b	3.18	36.23	0.83
	1c	6.04	61.65	-6.06
(1.2 + 0.2Sds) * DL + E Normal M1	1	-1.89	16.10	-2.25
	1a	-0.93	7.66	0.58
	1b	0.93	7.66	0.58
	1c	1.89	16.10	-2.25

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(1.2 + 0.2Sds) * DL + E Normal M2	1	-1.87	15.98	-2.17
	1a	-0.95	7.78	0.66
	1b	0.95	7.78	0.66
	1c	1.87	15.98	-2.17
(1.2 + 0.2Sds) * DL + E 45 deg M1	1	-2.34	17.85	-2.34
	1a	-1.66	11.88	1.16
	1b	0.48	5.91	0.49
	1c	1.16	11.88	-1.67
(1.2 + 0.2Sds) * DL + E 45 deg M2	1	-2.27	17.68	-2.28
	1a	-1.62	11.88	1.21
	1b	0.55	6.08	0.55
	1c	1.20	11.88	-1.62
(1.2 + 0.2Sds) * DL + E 90 deg M1	1	-2.24	16.10	-1.89
	1a	-2.24	16.10	1.89
	1b	0.58	7.65	0.94
	1c	0.58	7.65	-0.94
(1.2 + 0.2Sds) * DL + E 90 deg M2	1	-2.17	15.98	-1.88
	1a	-2.17	15.98	1.88
	1b	0.65	7.78	0.95
	1c	0.65	7.78	-0.95
(1.2 + 0.2Sds) * DL + E 135 deg M1	1	-1.66	11.88	-1.16
	1a	-2.34	17.85	2.34
	1b	1.16	11.88	1.67
	1c	0.48	5.91	-0.49
(1.2 + 0.2Sds) * DL + E 135 deg M2	1	-1.62	11.88	-1.21
	1a	-2.27	17.68	2.28
	1b	1.20	11.88	1.62
	1c	0.55	6.08	-0.55
(1.2 + 0.2Sds) * DL + E 180 deg M1	1	-0.93	7.66	-0.58
	1a	-1.89	16.10	2.25
	1b	1.89	16.10	2.25
	1c	0.93	7.66	-0.58
(1.2 + 0.2Sds) * DL + E 180 deg M2	1	-0.95	7.78	-0.66
	1a	-1.87	15.98	2.17
	1b	1.87	15.98	2.17
	1c	0.95	7.78	-0.66
(1.2 + 0.2Sds) * DL + E 225 deg M1	1	-0.48	5.91	-0.49
	1a	-1.16	11.88	1.67
	1b	2.34	17.85	2.34
	1c	1.66	11.88	-1.16
(1.2 + 0.2Sds) * DL + E 225 deg M2	1	-0.55	6.08	-0.55
	1a	-1.20	11.88	1.62
	1b	2.27	17.68	2.28
	1c	1.62	11.88	-1.21
(1.2 + 0.2Sds) * DL + E 270 deg M1	1	-0.58	7.65	-0.94
	1a	-0.58	7.65	0.94
	1b	2.24	16.10	1.89
	1c	2.24	16.10	-1.89
(1.2 + 0.2Sds) * DL + E 270 deg M2	1	-0.65	7.78	-0.95
	1a	-0.65	7.78	0.95
	1b	2.17	15.98	1.88
	1c	2.17	15.98	-1.88
(1.2 + 0.2Sds) * DL + E 315 deg M1	1	-1.16	11.88	-1.67

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	1a	-0.48	5.91	0.49
	1b	1.66	11.88	1.16
	1c	2.34	17.85	-2.34
(1.2 + 0.2Sds) * DL + E 315 deg M2	1	-1.20	11.88	-1.62
	1a	-0.55	6.08	0.55
	1b	1.62	11.88	1.21
	1c	2.27	17.68	-2.28
(0.9 - 0.2Sds) * DL + E Normal M1	1	-1.46	12.48	-1.82
	1a	-0.50	4.04	0.15
	1b	0.50	4.04	0.15
	1c	1.46	12.48	-1.82
(0.9 - 0.2Sds) * DL + E Normal M2	1	-1.44	12.36	-1.74
	1a	-0.52	4.16	0.23
	1b	0.52	4.16	0.23
	1c	1.44	12.36	-1.74
(0.9 - 0.2Sds) * DL + E 45 deg M1	1	-1.91	14.23	-1.91
	1a	-1.23	8.26	0.73
	1b	0.05	2.29	0.06
	1c	0.73	8.26	-1.24
(0.9 - 0.2Sds) * DL + E 45 deg M2	1	-1.84	14.05	-1.85
	1a	-1.19	8.26	0.78
	1b	0.12	2.47	0.12
	1c	0.77	8.26	-1.19
(0.9 - 0.2Sds) * DL + E 90 deg M1	1	-1.81	12.48	-1.46
	1a	-1.81	12.48	1.46
	1b	0.15	4.04	0.51
	1c	0.15	4.04	-0.51
(0.9 - 0.2Sds) * DL + E 90 deg M2	1	-1.74	12.36	-1.45
	1a	-1.74	12.36	1.45
	1b	0.22	4.16	0.52
	1c	0.22	4.16	-0.52
(0.9 - 0.2Sds) * DL + E 135 deg M1	1	-1.23	8.26	-0.73
	1a	-1.91	14.23	1.91
	1b	0.73	8.26	1.24
	1c	0.05	2.29	-0.06
(0.9 - 0.2Sds) * DL + E 135 deg M2	1	-1.19	8.26	-0.78
	1a	-1.84	14.05	1.85
	1b	0.77	8.26	1.19
	1c	0.12	2.47	-0.12
(0.9 - 0.2Sds) * DL + E 180 deg M1	1	-0.50	4.04	-0.15
	1a	-1.46	12.48	1.82
	1b	1.46	12.48	1.82
	1c	0.50	4.04	-0.15
(0.9 - 0.2Sds) * DL + E 180 deg M2	1	-0.52	4.16	-0.23
	1a	-1.44	12.36	1.74
	1b	1.44	12.36	1.74
	1c	0.52	4.16	-0.23
(0.9 - 0.2Sds) * DL + E 225 deg M1	1	-0.05	2.29	-0.06
	1a	-0.73	8.26	1.24
	1b	1.91	14.23	1.91
	1c	1.23	8.26	-0.73
(0.9 - 0.2Sds) * DL + E 225 deg M2	1	-0.12	2.47	-0.12
	1a	-0.77	8.26	1.19

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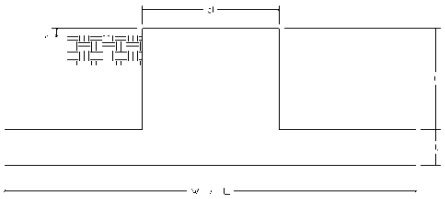
	1b	1.84	14.05	1.85
	1c	1.19	8.26	-0.78
(0.9 - 0.2Sds) * DL + E 270 deg M1	1	-0.15	4.04	-0.51
	1a	-0.15	4.04	0.51
	1b	1.81	12.48	1.46
	1c	1.81	12.48	-1.46
(0.9 - 0.2Sds) * DL + E 270 deg M2	1	-0.22	4.16	-0.52
	1a	-0.22	4.16	0.52
	1b	1.74	12.36	1.45
	1c	1.74	12.36	-1.45
(0.9 - 0.2Sds) * DL + E 315 deg M1	1	-0.73	8.26	-1.24
	1a	-0.05	2.29	0.06
	1b	1.23	8.26	0.73
	1c	1.91	14.23	-1.91
(0.9 - 0.2Sds) * DL + E 315 deg M2	1	-0.77	8.26	-1.19
	1a	-0.12	2.47	0.12
	1b	1.19	8.26	0.78
	1c	1.84	14.05	-1.85
1.0D + 1.0W Service Normal	1	-3.25	28.96	-5.10
	1a	0.93	-8.21	-2.78
	1b	-0.93	-8.21	-2.78
	1c	3.25	28.96	-5.10
1.0D + 1.0W Service 45 deg	1	-5.60	37.53	-5.60
	1a	-2.54	10.35	-0.22
	1b	-3.28	-16.79	-3.28
	1c	-0.22	10.40	-2.55
1.0D + 1.0W Service 90 deg	1	-5.09	28.93	-3.26
	1a	-5.09	28.93	3.26
	1b	-2.78	-8.18	-0.93
	1c	-2.78	-8.18	0.93
1.0D + 1.0W Service 135 deg	1	-2.54	10.35	0.22
	1a	-5.60	37.53	5.60
	1b	-0.22	10.40	2.55
	1c	-3.28	-16.79	3.28
1.0D + 1.0W Service 180 deg	1	0.93	-8.21	2.78
	1a	-3.25	28.96	5.10
	1b	3.25	28.96	5.10
	1c	-0.93	-8.21	2.78
1.0D + 1.0W Service 225 deg	1	3.28	-16.79	3.28
	1a	0.22	10.40	2.55
	1b	5.60	37.53	5.60
	1c	2.54	10.35	0.22
1.0D + 1.0W Service 270 deg	1	2.78	-8.18	0.93
	1a	2.78	-8.18	-0.93
	1b	5.09	28.93	3.26
	1c	5.09	28.93	-3.26
1.0D + 1.0W Service 315 deg	1	0.22	10.40	-2.55
	1a	3.28	-16.79	-3.28
	1b	2.54	10.35	-0.22
	1c	5.60	37.53	-5.60

Site Number:	88009	Code:	ANSI/TIA-222-G	© 2007 - 2017 by ATC IP LLC. All rights reserved.	
Site Name:	CORNWALL CT, CT	Engineering Number:	OAA700092_C3_01		4/11/2017 12:43:14 PM
Customer:	AT&T MOBILITY				

Max Uplift:	95.04 (kip)	Moment Ice:	718.60 (kip-ft)	Moment:	2,953.44 (kip-ft)	1.2D + 1.6W 315 deg
Max Down:	116.85 (kip)	Total Down Ice:	144.96 (kip)	Total Down:	49.79 (kip)	
Max Shear:	26.04 (kip)	Total Shear Ice:	14.83 (kip)	Total Shear:	63.30 (kip)	

Site Name:	Cornwall, CT	*Program Last Updated:*	*#REF!*
Site Number:	88009		
Engineering Number:	OAA700092		
Engineer:	Tsega.Melesse		
Date:	04/11/17		
Tower Type:	SST w/4 Legs		



Design Loads (Factored) - Analysis per TIA-222-G Standards

Design / Analysis / Mapping:	Mapping	
Compression/Leg:	116.9	k
Uplift/Leg:	95.0	k
Total Shear:	63.3	k
Moment:	2953.4	k-ft
Tower + Appurtenance Weight:	49.8	k
Depth to Base of Foundation (l + t - h):	4.92	ft
Diameter of Pier (d):	4.00	ft
Height of Pier above Ground (h):	0.50	
Width of Pad (W):	30.00	ft
Length of Pad (L):	30.00	ft
Thickness of Pad (t):	2.92	ft
Tower Leg Center to Center:	20.00	ft
Number of Tower Legs:	4.0	(1 if MP or GT)
Tower Center from Mat Center:	0.00	ft
Depth Below Ground Surface to Water Table:	99.00	ft
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	125.0	pcf
Unit Weight of Water:	62.4	pcf
Unit Weight of Soil Below Water Table:	67.0	pcf
Friction Angle of Uplift:	35.0	Degrees
Ultimate Coefficient of Shear Friction:	0.30	
Ultimate Compressive Bearing Pressure:	40000.0	psf
Ultimate Passive Pressure on Pad Face:	1914.0	psf
$\phi_{\text{Soil and Concrete Weight}}$:	0.9	
ϕ_{Soil}:	0.75	

Overturning Moment Usage

Design OTM:	3296.5	k-ft
OTM Resistance:	9535.6	k-ft
Design OTM / OTM Resistance:	0.35	Result: OK

Soil Bearing Pressure Usage

Net Bearing Pressure:	1198	psf
Factored Nominal Bearing Pressure:	30000	psf
Net Bearing Pressure/Factored Nominal Bearing Pressure:	0.04	Result: OK
Load Direction Controling Design Bearing Pressure:	Diagonal to Pad Edge	

Sliding Factor of Safety

Total Factored Sliding Resistance:	263.2	k
Sliding Design / Sliding Resistance:	0.24	Result: OK