



AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure : 118.5 ft Monopole
ATC Site Name : **Huntsville - Clawson, UT**
ATC Site Number : **310318**
Engineering Number : **OAA680338_C3_01**
Proposed Carrier : **Verizon**
Carrier Site Name : **N/A**
Carrier Site Number : **N/A**
Site Location : **676 N. 7100 East St.**
Huntsville, UT 84317-9655
41.271106,-111.771300
County : **Weber**
Date : **June 28, 2016**
Max Usage : **65%**
Result : **Pass**

Reviewed by:
Neil Kuplic, PE
Director of Structural
Engineering

Prepared By:
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Engineer Intern

Nupur S. Khadilkar



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Table of Contents

Introduction	1
Supporting Documents	1
Analysis	1
Conclusion.....	1
Existing and Reserved Equipment	2
Equipment to be Removed.....	2
Proposed Equipment	2
Structure Usages	3
Foundations	3
Deflection, Twist, and Sway.....	3
Standard Conditions	4
Calculations	Attached



Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 118.5 ft monopole to reflect the change in loading by Verizon.

Supporting Documents

Tower Drawings	FWT Design #M98-1052-A.R1, dated May 27, 1998
Foundation Drawing	FWT Design #M98-1052-A.R1, dated May 28, 1998
Geotechnical Report	Simon-Bymaster Project #2-103-98, dated March 25, 1998

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:	90 mph (3-Second Gust, V_{asd}) / 115 mph (3-Second Gust, V_{ult})
Basic Wind Speed w/ Ice:	50 mph (3-Second Gust) w/ 1/4" radial ice concurrent
Code:	ANSI/TIA-222-G / 2012 IBC
Structure Class:	II
Exposure Category:	D
Topographic Category:	1
Crest Height:	0 ft
Spectral Response:	$S_s = 0.82, S_1 = 0.28$
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					
118.0	125.0	3	TX RX Systems 101-90-08-X-03	Low Profile Platform	(3) 7/8" Coax	Sprint Nextel
111.0	111.0	1	RFS DB-B1-6C-12AB-OZ	Low Profile Platforms	(6) 7/8" Coax (1) 1 5/8" Hybriflex Cable	Verizon
		6	Antel LPA-80090/4CF			
		6	Andrew SBNHH-1D65C			
100.0	100.0	6	Ericsson KRY 112 144/1	Low Profile Platforms	(12) 7/8" Coax	T-Mobile
		6	CellMax CMA-B/6521/E0-6			

Equipment to be Removed

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
111.0	111.0	3	Antel BXA-185090/8CF	-	(9) 7/8" Coax	Verizon
		3	Andrew DBXNH-6565B-VTM			
		3	ClearComm CCDP-565-1W			
		3	Alcatel-Lucent RRH2x40-07-L			

Proposed Equipment

Elevation ¹ (ft)		Qty	Antenna	Mount Type	Lines	Carrier
Mount	RAD					
111.0	111.0	3	Alcatel-Lucent B25 RRH4x30	Low Profile Platforms	(1) 1 5/8" Hybriflex Cable	Verizon
		3	Alcatel-Lucent B13 RRH4x30-4R			
		1	RFS DB-B1-6C-12AB-OZ			
		3	Alcatel-Lucent B66A RRH 4x45			

¹Mount 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 inside the pole shaft.



Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	58%	Pass
Shaft	65%	Pass
Base Plate	24%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	2,449.0	3,306.2	2,012.9	61%
Shear (Kips)	28.7	38.7	22.1	57%

* The design reactions are factored by 1.35 per ANSI/TIA-222-G, Sec. 15.5.1

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
111.0	Alcatel-Lucent B25 RRH4x30	Verizon	1.499	1.661
	Alcatel-Lucent B13 RRH4x30-4R			
	RFS DB-B1-6C-12AB-OZ			
	Alcatel-Lucent B66A RRH 4x45			
	Antel LPA-80090/4CF			

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



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:

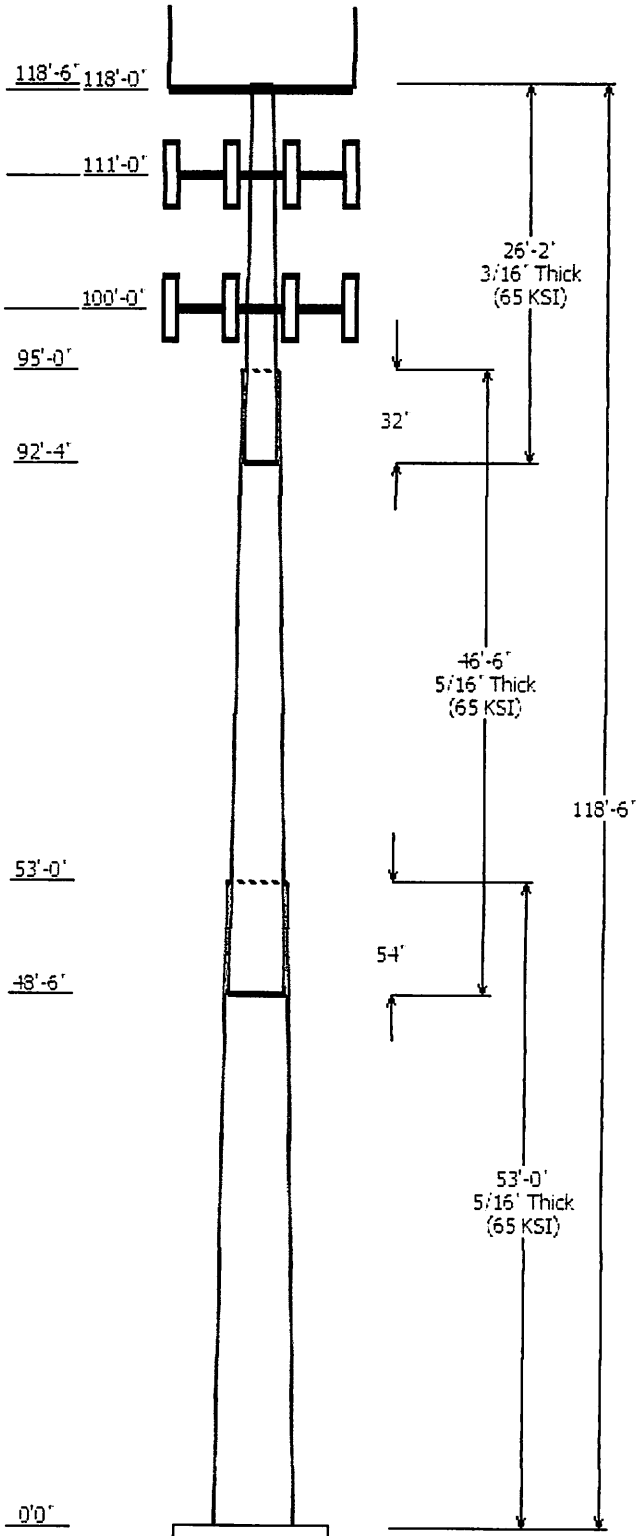
- Information supplied by the client regarding the structure itself, antenna, mounts and feed line loading on the structure and its components, or other relevant information.
- Information from drawings in the possession of American Tower Corporation, or generated by field inspections or measurements 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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Job Information	
Pole :	310318
Code:	ANSI/TIA-222-G
Description :	119 ft FWT Monopole
Client :	Verizon Wireless
Struct Class :	II
Location :	Huntsville - Clawson, UT
Shape :	18 Sides
Exposure :	D
Height :	118.50 (ft)
Topo :	1
Base Elev (ft):	0.00
Taper:	0.32319(in/ft)

Sections Properties							
Shaft Section	Length (ft)	Diameter (in)		Thick Joint Type	Overlap Length (in)	Taper (in/ft)	Steel Grade (ksi)
		Across Flats Top	Across Flats Bottom				
1	53.000	32.37	49.50	0.313	0.000	0.323200	65
2	46.500	19.42	34.45	0.313 Slip Joint	54.000	0.323200	65
3	26.167	12.20	20.65	0.188 Slip Joint	32.000	0.323200	65

Discrete Appurtenance			
Attach Elev (ft)	Force Elev (ft)	Qty	Description
118.000	118.000	1	Flat Low Profile Platform
118.000	125.000	3	TX RX Systems 101-90-08-X-03
111.000	111.000	6	Andrew SBNHH-1D65C
111.000	111.000	3	Alcatel-Lucent B66A RRH 4x45
111.000	111.000	3	Alcatel-Lucent B13 RRH4x30-4R
111.000	111.000	3	Alcatel-Lucent B25 RRH4x30
111.000	111.000	1	RFS DB-B1-6C-12AB-0Z
111.000	111.000	6	Antel LPA-80090/4CF
111.000	111.000	1	RFS DB-B1-6C-12AB-0Z
111.000	111.000	3	Round Low Profile Platform
100.000	100.000	6	CellMax CMA-B/6521/E0-6
100.000	100.000	3	Flat Low Profile Platform
100.000	100.000	6	Ericsson KRY 112 144/1

Linear Appurtenance			
Elev (ft)		Description	Exposed To Wind
From	To		
0.000	100.0	7/8" Coax	No
0.000	111.0	1 5/8" Hybriflex	No
0.000	111.0	1 5/8" Hybriflex	No
0.000	111.0	7/8" Coax	No
0.000	118.0	7/8" Coax	No

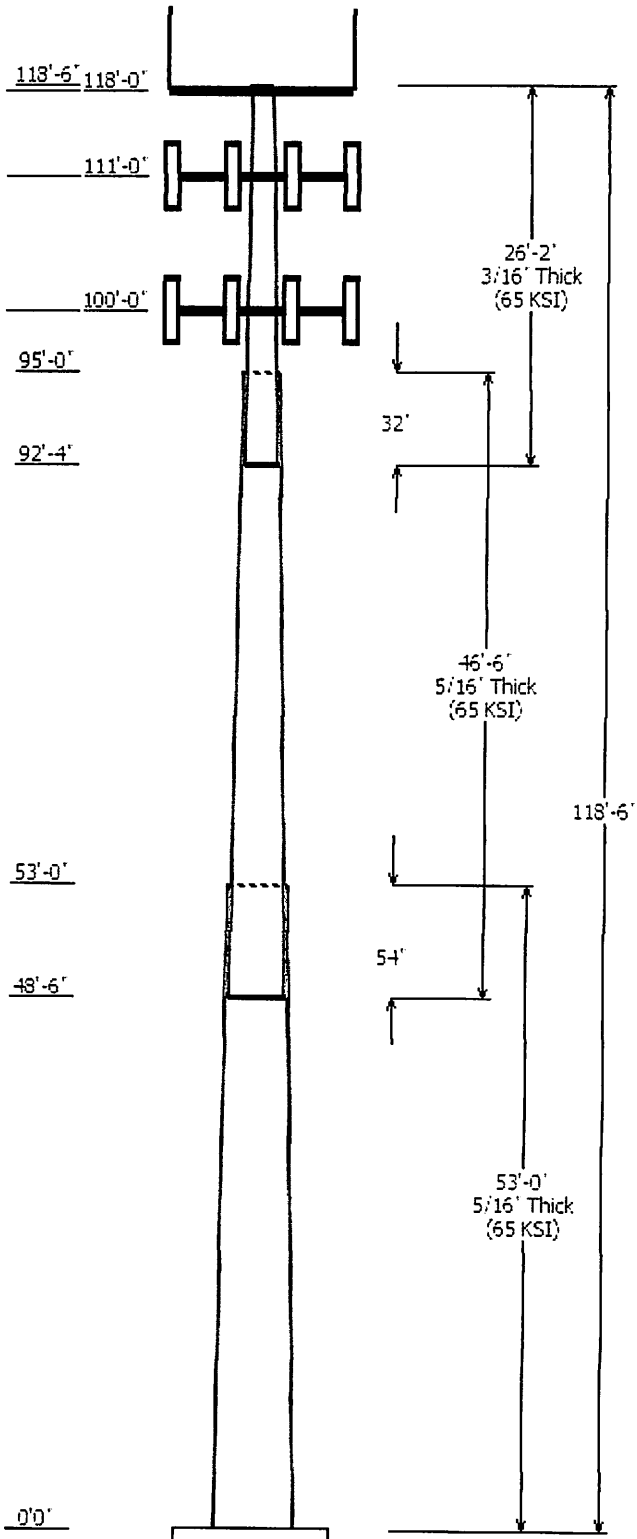
Load Cases	
1.2D + 1.6W	90 mph with No Ice
0.9D + 1.6W	90 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.25 in Radial Ice
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Lateral
(0.9 - 0.2Sds) * DL + E	Seismic (Reduced DL) Equivalent Modal
1.0D + 1.0W	Serviceability 60 mph

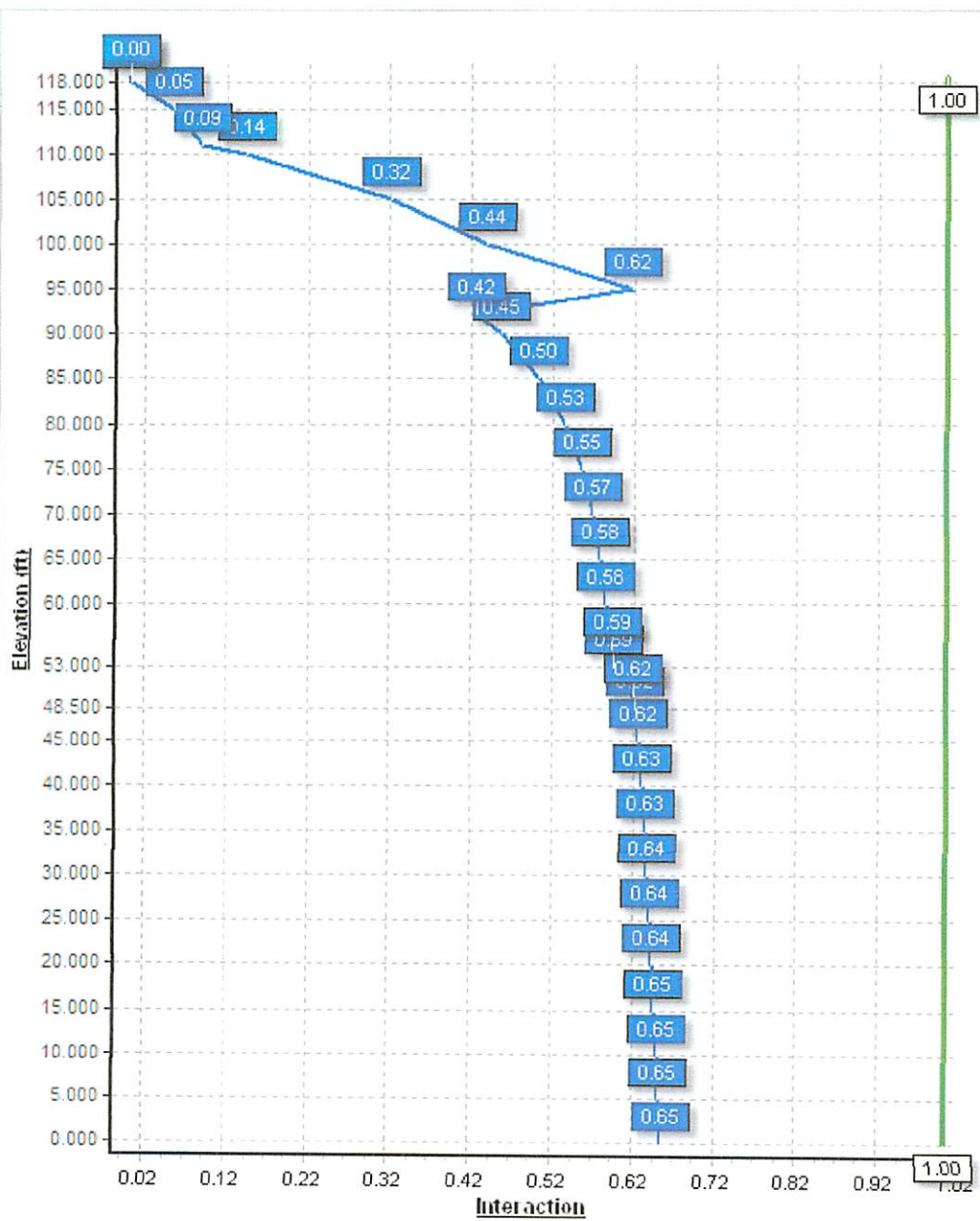
Reactions			
Load Case	Moment (kip-ft)	Shear (kip)	Axial (kip)
1.2D + 1.6W	2012.85	22.14	30.24
0.9D + 1.6W	1988.27	22.12	22.67
1.2D + 1.0Di + 1.0Wi	530.53	6.25	33.47

$(1.2 + 0.2Sds) * DL + E$ E LFM	351.24	3.33	32.37
$(1.2 + 0.2Sds) * DL + E$ EMAM	810.93	7.63	32.37
$(0.9 - 0.2Sds) * DL + E$ E LFM	343.13	3.33	18.80
$(0.9 - 0.2Sds) * DL + E$ EMAM	791.42	7.62	18.79
1.0D + 1.0W	555.26	6.15	25.23

Dish Deflections

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
	0.00	0.000	0.000





Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

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Customer: Verizon Wireless

Analysis Parameters

Location:	Weber County, UT		
Code:	ANSI/TIA-222-G	Height (ft):	118.
Shape:	18 Sides	Base Diameter (in):	49.50
Pole Type:	Taper	Top Diameter (in):	12.20
Pole Manufacturer:	FWT Inc	Taper (in/ft) :	0.323

Ice & Wind Parameters

Structure Class:	II	Design Wind Speed Without Ice:	90 mph
Exposure Category:	D	Design Wind Speed With Ice:	50 mph
Topographic Category:	1	Operational Wind Speed:	60 mph
Crest Height:	0.0 ft	Design Ice Thickness:	0.25 in

Seismic Parameters

Analysis Method:	Equivalent Modal Analysis & Equivalent Lateral Force Methods		
Site Class:	D - Stiff Soil		
Period Based on Rayleigh Method (sec):	2.24		
T _L (sec):	8	p:	1.3
S _s :	0.823	S _r :	0.276
F _a :	1.171	F _v :	1.848
S _{ds} :	0.642	S _{d1} :	0.340
		C _s :	0.101
		C _s Max:	0.101
		C _s Min:	0.030

Load Cases

1.2D + 1.6W	90 mph with No Ice
0.9D + 1.6W	90 mph with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	50 mph with 0.25 in Radial Ice
(1.2 + 0.2Sds) * DL + E ELM	Seismic Equivalent Lateral Forces Method
(1.2 + 0.2Sds) * DL + E EMAM	Seismic Equivalent Modal Analysis Method
(0.9 - 0.2Sds) * DL + E ELM	Seismic (Reduced DL) Equivalent Lateral Forces Method
(0.9 - 0.2Sds) * DL + E EMAM	Seismic (Reduced DL) Equivalent Modal Analysis Method
1.0D + 1.0W	Serviceability 60 mph

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

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Customer: Verizon Wireless

Shaft Section Properties

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom						Top						
							Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Taper (in/ft)
1-18	53.000	0.3125	65		0.00	7,266	49.50	0.00	48.79	14912.8	26.52	158.40	32.37	53.00	31.80	4128.6	16.85	103.59	0.323198
2-18	46.500	0.3125	65	Slip	54.00	4,178	34.45	48.50	33.86	4985.2	18.03	110.24	19.42	95.00	18.95	874.3	9.55	62.15	0.323198
3-18	26.167	0.1875	65	Slip	32.00	861	20.65	92.33	12.18	645.0	18.02	110.18	12.20	118.50	7.15	130.4	10.06	65.07	0.323198
Shaft Weight						12,305													

Discrete Appurtenance Properties

Attach Elev (ft)	Description	Qty	No Ice			Ice			Distance From Face (ft)	Vert Ecc (ft)
			Weight (lb)	EPAa (sf)	Orientation Factor	Weight (lb)	EPAa (sf)	Orientation Factor		
118.00	Flat Low Profile Platform	1	1500.00	26.100	1.00	1,711.00	32.318	1.00	0.000	0.000
118.00	TX RX Systems 101-90-08-X-	3	38.00	3.460	0.67	74.32	4.632	0.67	0.000	7.000
111.00	Alcatel-Lucent B13 RRH4x30-	3	57.80	2.140	0.67	79.82	2.325	0.67	0.000	0.000
111.00	Alcatel-Lucent B25 RRH4x30	3	53.00	2.120	0.67	72.79	2.313	0.67	0.000	0.000
111.00	Alcatel-Lucent B66A RRH	3	67.00	2.580	0.67	88.43	2.773	0.67	0.000	0.000
111.00	Andrew SBNHH-1D65C	6	66.10	11.390	0.84	139.90	12.439	0.84	0.000	0.000
111.00	Antel LPA-80090/4CF	6	11.00	4.040	0.82	41.20	4.317	0.82	0.000	0.000
111.00	RFS DB-B1-6C-12AB-0Z	1	21.40	2.510	0.67	47.48	2.710	0.67	0.000	0.000
111.00	RFS DB-B1-6C-12AB-0Z	1	21.40	2.510	0.67	47.48	2.710	0.67	0.000	0.000
111.00	Round Low Profile Platform	3	1500.00	21.700	1.00	1,709.89	27.920	1.00	0.000	0.000
100.00	CellMax CMA-B/6521/E0-6	6	31.00	6.570	0.86	72.71	6.990	0.86	0.000	0.000
100.00	Ericsson KRY 112 144/1	6	11.00	0.410	0.50	14.49	0.431	0.50	0.000	0.000
100.00	Flat Low Profile Platform	3	1500.00	26.100	1.00	1,707.28	32.208	1.00	0.000	0.000
Totals		45	11904.80			14,613.31			Number of Loadings : 13	

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Diameter (in)	Coax Weight (lb/ft)	Flat	Projected Width (in)	Exposed To Wind	Carrier
0.00	118.00	3	7/8" Coax	1.09	0.33	N	0.00	N	Sprint Nextel
0.00	111.00	1	1 5/8" Hybriflex	1.98	1.30	N	0.00	N	Verizon
0.00	111.00	1	1 5/8" Hybriflex	1.98	1.30	N	0.00	N	Verizon
0.00	111.00	6	7/8" Coax	1.09	0.33	N	0.00	N	Verizon
0.00	100.00	12	7/8" Coax	1.09	0.33	N	0.00	N	T-Mobile

Site Number: 310318

Code: ANSI/MIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

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Customer: Verizon Wireless

Segment Properties (Max Len : 5. ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in ²)	Ix (in ⁴)	W/t Ratio	D/t Ratio	Fy (ksi)	S (in ³)	Z (in ³)	Weight (lb)
0.00		0.3125	49.500	48.786	14,912.8	26.52	158.40	70.2	593.4	0.0	0.0
5.00		0.3125	47.884	47.183	13,490.7	25.61	153.23	71.3	554.9	0.0	816.4
10.00		0.3125	46.268	45.580	12,162.1	24.70	148.06	72.4	517.7	0.0	789.1
15.00		0.3125	44.652	43.978	10,923.6	23.78	142.89	73.4	481.8	0.0	761.9
20.00		0.3125	43.036	42.375	9,772.3	22.87	137.72	74.5	447.2	0.0	734.6
25.00		0.3125	41.420	40.772	8,704.8	21.96	132.54	75.6	413.9	0.0	707.3
30.00		0.3125	39.804	39.169	7,718.0	21.05	127.37	76.6	381.9	0.0	680.1
35.00		0.3125	38.188	37.566	6,808.8	20.14	122.20	77.7	351.2	0.0	652.8
40.00		0.3125	36.572	35.964	5,974.0	19.23	117.03	78.8	321.7	0.0	625.5
45.00		0.3125	34.956	34.361	5,210.3	18.31	111.86	79.9	293.6	0.0	598.2
48.50	Bot - Section 2	0.3125	33.825	33.239	4,716.4	17.67	108.24	80.6	274.6	0.0	402.5
50.00		0.3125	33.340	32.758	4,514.7	17.40	106.69	80.9	266.7	0.0	340.0
53.00	Top - Section 1	0.3125	32.995	32.416	4,374.8	17.21	105.59	81.2	261.1	0.0	665.3
55.00		0.3125	32.349	31.775	4,120.3	16.84	103.52	81.6	250.9	0.0	218.4
60.00		0.3125	30.733	30.172	3,527.7	15.93	98.35	82.6	226.1	0.0	527.0
65.00		0.3125	29.117	28.570	2,994.9	15.02	93.17	82.6	202.6	0.0	499.7
70.00		0.3125	27.501	26.967	2,518.6	14.11	88.00	82.6	180.4	0.0	472.4
75.00		0.3125	25.885	25.364	2,095.7	13.19	82.83	82.6	159.5	0.0	445.2
80.00		0.3125	24.269	23.761	1,722.9	12.28	77.66	82.6	139.8	0.0	417.9
85.00		0.3125	22.653	22.158	1,397.3	11.37	72.49	82.6	121.5	0.0	390.6
90.00		0.3125	21.037	20.556	1,115.5	10.46	67.32	82.6	104.4	0.0	363.4
92.33	Bot - Section 3	0.3125	20.283	19.808	998.1	10.03	64.91	82.6	96.9	0.0	160.2
95.00	Top - Section 2	0.1875	19.796	11.669	566.9	17.21	105.58	81.2	56.4	0.0	284.1
100.0		0.1875	18.180	10.707	438.0	15.69	96.96	82.6	47.4	0.0	190.4
105.0		0.1875	16.564	9.746	330.2	14.17	88.34	82.6	39.3	0.0	174.0
110.0		0.1875	14.948	8.784	241.8	12.65	79.72	82.6	31.9	0.0	157.6
111.0		0.1875	14.625	8.592	226.3	12.34	78.00	82.6	30.5	0.0	29.6
115.0		0.1875	13.332	7.822	170.8	11.13	71.10	82.6	25.2	0.0	111.7
118.0		0.1875	12.363	7.245	135.7	10.22	65.93	82.6	21.6	0.0	76.9
118.5		0.1875	12.201	7.149	130.4	10.06	65.07	82.6	21.0	0.0	12.2
12,305.2											

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

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Customer: Verizon Wireless

Load Case: 1.2D + 1.6W

90 mph with No Ice

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		239.1	0.0					0.0	0.0	239.1	0.0	0.0	0.0
5.00		470.3	979.7					0.0	57.2	470.3	1,036.9	0.0	0.0
10.00		454.4	947.0					0.0	57.2	454.4	1,004.1	0.0	0.0
15.00		444.4	914.2					0.0	57.2	444.4	971.4	0.0	0.0
20.00		443.7	881.5					0.0	57.2	443.7	938.7	0.0	0.0
25.00		444.2	848.8					0.0	57.2	444.2	906.0	0.0	0.0
30.00		440.7	816.1					0.0	57.2	440.7	873.2	0.0	0.0
35.00		434.4	783.3					0.0	57.2	434.4	840.5	0.0	0.0
40.00		425.8	750.6					0.0	57.2	425.8	807.8	0.0	0.0
45.00		354.6	717.9					0.0	57.2	354.6	775.1	0.0	0.0
48.50	Bot - Section 2	206.1	483.1					0.0	40.0	206.1	523.1	0.0	0.0
50.00		184.3	408.0					0.0	17.2	184.3	425.2	0.0	0.0
53.00	Top - Section 1	202.5	798.4					0.0	34.3	202.5	832.7	0.0	0.0
55.00		275.9	262.1					0.0	22.9	275.9	285.0	0.0	0.0
60.00		384.1	632.4					0.0	57.2	384.1	689.6	0.0	0.0
65.00		369.0	599.7					0.0	57.2	369.0	656.8	0.0	0.0
70.00		353.0	566.9					0.0	57.2	353.0	624.1	0.0	0.0
75.00		336.3	534.2					0.0	57.2	336.3	591.4	0.0	0.0
80.00		318.9	501.5					0.0	57.2	318.9	558.7	0.0	0.0
85.00		300.8	468.8					0.0	57.2	300.8	525.9	0.0	0.0
90.00		210.6	436.0					0.0	57.2	210.6	493.2	0.0	0.0
92.33	Bot - Section 3	137.7	192.3					0.0	26.7	137.7	219.0	0.0	0.0
95.00	Top - Section 2	202.0	340.9					0.0	30.5	202.0	371.4	0.0	0.0
100.00	Appertunance(s)	248.3	228.4	5,286.2	0.0	0.0	5,702.4	0.0	57.2	5,534.6	5,988.0	0.0	0.0
105.00		228.2	208.8					0.0	33.4	228.2	242.2	0.0	0.0
110.00		129.6	189.2					0.0	33.4	129.6	222.6	0.0	0.0
111.00	Appertunance(s)	98.6	35.5	6,875.0	0.0	0.0	6,646.6	0.0	6.7	6,973.6	6,688.7	0.0	0.0
115.00		132.1	134.0					0.0	4.8	132.1	138.8	0.0	0.0
118.00	Appertunance(s)	62.7	92.3	1,621.9	0.0	2,011.4	1,936.8	0.0	3.6	1,684.6	2,032.7	0.0	0.0
118.50		8.6	14.7					0.0	0.0	8.6	14.7	0.0	0.0
Totals:										22,324.0	30,277.4	0.00	0.00

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:45 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.6W

90 mph with No Ice

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Wind Load Factor : 1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-30.24	-22.14	0.00	-2,012.85	0.00	2,012.85	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.654
5.00	-29.13	-21.76	0.00	-1,902.18	0.00	1,902.18	3,026.97	1,513.48	5,924.46	2,966.64	0.10	-0.19	0.651
10.00	-28.06	-21.40	0.00	-1,793.38	0.00	1,793.38	2,968.13	1,484.07	5,610.69	2,809.51	0.40	-0.38	0.648
15.00	-27.01	-21.04	0.00	-1,686.39	0.00	1,686.39	2,906.21	1,453.10	5,299.15	2,653.51	0.91	-0.59	0.645
20.00	-26.00	-20.69	0.00	-1,581.17	0.00	1,581.17	2,841.19	1,420.59	4,990.46	2,498.94	1.64	-0.80	0.642
25.00	-25.02	-20.33	0.00	-1,477.73	0.00	1,477.73	2,773.08	1,386.54	4,685.25	2,346.11	2.59	-1.02	0.639
30.00	-24.07	-19.97	0.00	-1,376.09	0.00	1,376.09	2,701.87	1,350.93	4,384.13	2,195.32	3.79	-1.25	0.636
35.00	-23.16	-19.62	0.00	-1,276.23	0.00	1,276.23	2,627.57	1,313.78	4,087.73	2,046.90	5.23	-1.50	0.633
40.00	-22.27	-19.27	0.00	-1,178.14	0.00	1,178.14	2,550.17	1,275.09	3,796.67	1,901.16	6.94	-1.75	0.629
45.00	-21.43	-18.98	0.00	-1,081.77	0.00	1,081.77	2,469.68	1,234.84	3,511.57	1,758.40	8.92	-2.02	0.624
48.50	-20.87	-18.81	0.00	-1,015.34	0.00	1,015.34	2,411.50	1,205.75	3,315.88	1,660.41	10.48	-2.22	0.620
50.00	-20.41	-18.66	0.00	-987.13	0.00	987.13	2,386.10	1,193.05	3,233.06	1,618.93	11.19	-2.31	0.619
53.00	-19.54	-18.47	0.00	-931.17	0.00	931.17	2,367.87	1,183.94	3,174.58	1,589.65	12.70	-2.50	0.594
55.00	-19.20	-18.25	0.00	-894.23	0.00	894.23	2,333.31	1,166.65	3,065.78	1,535.17	13.78	-2.62	0.591
60.00	-18.43	-17.93	0.00	-802.96	0.00	802.96	2,241.65	1,120.83	2,795.35	1,399.75	16.68	-2.91	0.582
65.00	-17.70	-17.63	0.00	-713.30	0.00	713.30	2,122.57	1,061.29	2,504.82	1,254.27	19.90	-3.22	0.577
70.00	-17.00	-17.33	0.00	-625.17	0.00	625.17	2,003.49	1,001.75	2,230.23	1,116.77	23.44	-3.54	0.569
75.00	-16.33	-17.05	0.00	-538.50	0.00	538.50	1,884.41	942.21	1,971.58	987.26	27.32	-3.87	0.554
80.00	-15.70	-16.79	0.00	-453.23	0.00	453.23	1,765.33	882.67	1,728.87	865.72	31.55	-4.20	0.533
85.00	-15.10	-16.54	0.00	-369.28	0.00	369.28	1,646.25	823.13	1,502.09	752.16	36.13	-4.54	0.501
90.00	-14.56	-16.35	0.00	-286.58	0.00	286.58	1,527.17	763.59	1,291.26	646.59	41.07	-4.88	0.453
92.33	-14.31	-16.24	0.00	-248.43	0.00	248.43	1,471.60	735.80	1,198.32	600.05	43.49	-5.04	0.424
95.00	-13.89	-16.06	0.00	-205.14	0.00	205.14	852.40	426.20	685.64	343.33	46.35	-5.21	0.615
100.00	-8.39	-10.03	0.00	-124.85	0.00	124.85	795.51	397.76	586.65	293.76	51.95	-5.48	0.436
105.00	-8.13	-9.82	0.00	-74.69	0.00	74.69	724.06	362.03	485.51	243.11	57.87	-5.80	0.319
110.00	-7.90	-9.68	0.00	-25.59	0.00	25.59	652.62	326.31	393.93	197.26	64.07	-6.02	0.143
111.00	-1.98	-2.05	0.00	-15.91	0.00	15.91	638.33	319.16	376.76	188.66	65.33	-6.04	0.087
115.00	-1.86	-1.90	0.00	-7.72	0.00	7.72	581.17	290.58	311.92	156.19	70.41	-6.10	0.053
118.00	-0.01	-0.01	0.00	-0.01	0.00	0.01	538.30	269.15	267.30	133.85	74.24	-6.13	0.000
118.50	0.00	-0.01	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	74.88	-6.13	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:45 PM

Customer: Verizon Wireless

Load Case: 0.9D + 1.6W

90 mph with No Ice (Reduced DL)

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		239.1	0.0					0.0	0.0	239.1	0.0	0.0	0.0
5.00		470.3	734.8					0.0	42.9	470.3	777.7	0.0	0.0
10.00		454.4	710.2					0.0	42.9	454.4	753.1	0.0	0.0
15.00		444.4	685.7					0.0	42.9	444.4	728.6	0.0	0.0
20.00		443.7	661.1					0.0	42.9	443.7	704.0	0.0	0.0
25.00		444.2	636.6					0.0	42.9	444.2	679.5	0.0	0.0
30.00		440.7	612.1					0.0	42.9	440.7	654.9	0.0	0.0
35.00		434.4	587.5					0.0	42.9	434.4	630.4	0.0	0.0
40.00		425.8	563.0					0.0	42.9	425.8	605.8	0.0	0.0
45.00		354.6	538.4					0.0	42.9	354.6	581.3	0.0	0.0
48.50	Bot - Section 2	206.1	362.3					0.0	30.0	206.1	392.3	0.0	0.0
50.00		184.3	306.0					0.0	12.9	184.3	318.9	0.0	0.0
53.00	Top - Section 1	202.5	598.8					0.0	25.7	202.5	624.5	0.0	0.0
55.00		275.9	196.6					0.0	17.2	275.9	213.7	0.0	0.0
60.00		384.1	474.3					0.0	42.9	384.1	517.2	0.0	0.0
65.00		369.0	449.7					0.0	42.9	369.0	492.6	0.0	0.0
70.00		353.0	425.2					0.0	42.9	353.0	468.1	0.0	0.0
75.00		336.3	400.7					0.0	42.9	336.3	443.5	0.0	0.0
80.00		318.9	376.1					0.0	42.9	318.9	419.0	0.0	0.0
85.00		300.8	351.6					0.0	42.9	300.8	394.5	0.0	0.0
90.00		210.6	327.0					0.0	42.9	210.6	369.9	0.0	0.0
92.33	Bot - Section 3	137.7	144.2					0.0	20.0	137.7	164.2	0.0	0.0
95.00	Top - Section 2	202.0	255.7					0.0	22.9	202.0	278.5	0.0	0.0
100.00	Appertunance(s)	248.3	171.3	5,286.2	0.0	0.0	4,276.8	0.0	42.9	5,534.6	4,491.0	0.0	0.0
105.00		228.2	156.6					0.0	25.1	228.2	181.7	0.0	0.0
110.00		129.6	141.9					0.0	25.1	129.6	166.9	0.0	0.0
111.00	Appertunance(s)	98.6	26.6	6,875.0	0.0	0.0	4,984.9	0.0	5.0	6,973.6	5,016.5	0.0	0.0
115.00		132.1	100.5					0.0	3.6	132.1	104.1	0.0	0.0
118.00	Appertunance(s)	62.7	69.2	1,621.9	0.0	2,011.4	1,452.6	0.0	2.7	1,684.6	1,524.5	0.0	0.0
118.50		8.6	11.0					0.0	0.0	8.6	11.0	0.0	0.0
Totals:										22,324.0	22,708.0	0.00	0.00

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:46 PM

Customer: Verizon Wireless

Load Case: 0.9D + 1.6W

90 mph with No Ice (Reduced DL)

23 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 0.90

Wind Load Factor : 1.60

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-22.67	-22.12	0.00	-1,988.27	0.00	1,988.27	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.644
5.00	-21.82	-21.72	0.00	-1,877.66	0.00	1,877.66	3,026.97	1,513.48	5,924.46	2,966.64	0.10	-0.18	0.640
10.00	-21.00	-21.34	0.00	-1,769.05	0.00	1,769.05	2,968.13	1,484.07	5,610.69	2,809.51	0.40	-0.38	0.637
15.00	-20.20	-20.96	0.00	-1,662.37	0.00	1,662.37	2,906.21	1,453.10	5,299.15	2,653.51	0.90	-0.58	0.634
20.00	-19.42	-20.58	0.00	-1,557.57	0.00	1,557.57	2,841.19	1,420.59	4,990.46	2,498.94	1.62	-0.79	0.630
25.00	-18.67	-20.20	0.00	-1,454.68	0.00	1,454.68	2,773.08	1,386.54	4,685.25	2,346.11	2.56	-1.01	0.627
30.00	-17.95	-19.82	0.00	-1,353.69	0.00	1,353.69	2,701.87	1,350.93	4,384.13	2,195.32	3.74	-1.24	0.623
35.00	-17.24	-19.44	0.00	-1,254.60	0.00	1,254.60	2,627.57	1,313.78	4,087.73	2,046.90	5.16	-1.48	0.620
40.00	-16.56	-19.08	0.00	-1,157.39	0.00	1,157.39	2,550.17	1,275.09	3,796.67	1,901.16	6.84	-1.73	0.615
45.00	-15.92	-18.77	0.00	-1,062.01	0.00	1,062.01	2,469.68	1,234.84	3,511.57	1,758.40	8.79	-1.99	0.611
48.50	-15.49	-18.58	0.00	-996.33	0.00	996.33	2,411.50	1,205.75	3,315.88	1,660.41	10.33	-2.19	0.607
50.00	-15.13	-18.42	0.00	-968.46	0.00	968.46	2,386.10	1,193.05	3,233.06	1,618.93	11.03	-2.28	0.605
53.00	-14.47	-18.23	0.00	-913.19	0.00	913.19	2,367.87	1,183.94	3,174.58	1,589.65	12.52	-2.46	0.581
55.00	-14.20	-18.00	0.00	-876.72	0.00	876.72	2,333.31	1,166.65	3,065.78	1,535.17	13.57	-2.58	0.577
60.00	-13.61	-17.66	0.00	-786.73	0.00	786.73	2,241.65	1,120.83	2,795.35	1,399.75	16.43	-2.87	0.568
65.00	-13.05	-17.34	0.00	-698.42	0.00	698.42	2,122.57	1,061.29	2,504.82	1,254.27	19.59	-3.17	0.563
70.00	-12.51	-17.03	0.00	-611.74	0.00	611.74	2,003.49	1,001.75	2,230.23	1,116.77	23.07	-3.48	0.554
75.00	-11.99	-16.73	0.00	-526.61	0.00	526.61	1,884.41	942.21	1,971.58	987.26	26.89	-3.80	0.540
80.00	-11.50	-16.45	0.00	-442.95	0.00	442.95	1,765.33	882.67	1,728.87	865.72	31.04	-4.13	0.519
85.00	-11.04	-16.19	0.00	-360.70	0.00	360.70	1,646.25	823.13	1,502.09	752.16	35.54	-4.46	0.487
90.00	-10.62	-15.99	0.00	-279.78	0.00	279.78	1,527.17	763.59	1,291.26	646.59	40.38	-4.79	0.440
92.33	-10.42	-15.87	0.00	-242.47	0.00	242.47	1,471.60	735.80	1,198.32	600.05	42.76	-4.94	0.412
95.00	-10.10	-15.68	0.00	-200.15	0.00	200.15	852.40	426.20	685.64	343.33	45.57	-5.11	0.596
100.00	-6.09	-9.79	0.00	-121.75	0.00	121.75	795.51	397.76	586.65	293.76	51.06	-5.37	0.423
105.00	-5.88	-9.57	0.00	-72.79	0.00	72.79	724.06	362.03	485.51	243.11	56.86	-5.69	0.308
110.00	-5.71	-9.44	0.00	-24.93	0.00	24.93	652.62	326.31	393.93	197.26	62.93	-5.90	0.136
111.00	-1.44	-1.99	0.00	-15.49	0.00	15.49	638.33	319.16	376.76	188.66	64.17	-5.92	0.084
115.00	-1.35	-1.84	0.00	-7.55	0.00	7.55	581.17	290.58	311.92	156.19	69.15	-5.98	0.051
118.00	-0.01	-0.01	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	72.91	-6.00	0.000
118.50	0.00	-0.01	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	73.54	-6.00	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:46 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 0.25 in Radial Ice

22 Iterations

Gust Response Factor : 1.10

Ice Dead Load Factor : 1.00

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces			Linear Forces		Sum of Forces				
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion Moment MY (lb-ft)	MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		86.5	0.0					0.0	0.0	86.5	0.0	0.0	0.0
5.00		170.3	1,096.5					0.0	57.2	170.3	1,153.7	0.0	0.0
10.00		164.9	1,073.1					0.0	57.2	164.9	1,130.3	0.0	0.0
15.00		161.5	1,042.5					0.0	57.2	161.5	1,099.7	0.0	0.0
20.00		161.5	1,009.4					0.0	57.2	161.5	1,066.6	0.0	0.0
25.00		161.8	975.1					0.0	57.2	161.8	1,032.3	0.0	0.0
30.00		160.8	940.0					0.0	57.2	160.8	997.2	0.0	0.0
35.00		158.7	904.4					0.0	57.2	158.7	961.5	0.0	0.0
40.00		155.8	868.3					0.0	57.2	155.8	925.4	0.0	0.0
45.00		129.9	831.9					0.0	57.2	129.9	889.0	0.0	0.0
48.50	Bot - Section 2	75.6	561.0					0.0	40.0	75.6	601.1	0.0	0.0
50.00		67.6	441.8					0.0	17.2	67.6	458.9	0.0	0.0
53.00	Top - Section 1	74.4	864.3					0.0	34.3	74.4	898.6	0.0	0.0
55.00		101.5	305.4					0.0	22.9	101.5	328.3	0.0	0.0
60.00		141.4	735.9					0.0	57.2	141.4	793.1	0.0	0.0
65.00		136.2	698.7					0.0	57.2	136.2	755.8	0.0	0.0
70.00		130.6	661.3					0.0	57.2	130.6	718.5	0.0	0.0
75.00		124.7	623.8					0.0	57.2	124.7	680.9	0.0	0.0
80.00		118.6	586.1					0.0	57.2	118.6	643.3	0.0	0.0
85.00		112.2	548.4					0.0	57.2	112.2	605.6	0.0	0.0
90.00		78.8	510.6					0.0	57.2	78.8	567.8	0.0	0.0
92.33	Bot - Section 3	51.6	226.0					0.0	26.7	51.6	252.7	0.0	0.0
95.00	Top - Section 2	76.0	378.6					0.0	30.5	76.0	409.1	0.0	0.0
100.00	Appertunance(s)	93.8	293.8	1,212.4	0.0	0.0	5,995.4	0.0	57.2	1,306.2	6,346.4	0.0	0.0
105.00		86.7	268.9					0.0	33.4	86.7	302.3	0.0	0.0
110.00		49.4	243.8					0.0	33.4	49.4	277.2	0.0	0.0
111.00	Appertunance(s)	37.9	46.2	1,567.3	0.0	0.0	7,149.7	0.0	6.7	1,605.2	7,202.6	0.0	0.0
115.00		50.9	173.4					0.0	4.8	50.9	178.2	0.0	0.0
118.00	Appertunance(s)	24.3	119.8	393.0	0.0	519.4	2,056.8	0.0	3.6	417.3	2,180.2	0.0	0.0
118.50		3.4	19.2					0.0	0.0	3.4	19.2	0.0	0.0
Totals:										6,319.94	33,475.4	0.00	0.00

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:47 PM

Customer: Verizon Wireless

Load Case: 1.2D + 1.0Di + 1.0Wi

50 mph with 0.25 in Radial Ice

22 Iterations

Gust Response Factor : 1.10

Ice Dead Load Factor : 1.00

Wind Importance Factor : 1.00

Dead Load Factor : 1.20

Ice Importance Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-33.47	-6.25	0.00	-530.53	0.00	530.53	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.181
5.00	-32.31	-6.11	0.00	-499.29	0.00	499.29	3,026.97	1,513.48	5,924.46	2,966.64	0.03	-0.05	0.179
10.00	-31.18	-5.97	0.00	-468.77	0.00	468.77	2,968.13	1,484.07	5,610.69	2,809.51	0.11	-0.10	0.177
15.00	-30.07	-5.83	0.00	-438.93	0.00	438.93	2,906.21	1,453.10	5,299.15	2,653.51	0.24	-0.15	0.176
20.00	-29.00	-5.70	0.00	-409.77	0.00	409.77	2,841.19	1,420.59	4,990.46	2,498.94	0.43	-0.21	0.174
25.00	-27.96	-5.56	0.00	-381.30	0.00	381.30	2,773.08	1,386.54	4,685.25	2,346.11	0.68	-0.27	0.173
30.00	-26.96	-5.42	0.00	-353.51	0.00	353.51	2,701.87	1,350.93	4,384.13	2,195.32	0.99	-0.33	0.171
35.00	-26.00	-5.29	0.00	-326.40	0.00	326.40	2,627.57	1,313.78	4,087.73	2,046.90	1.37	-0.39	0.169
40.00	-25.07	-5.15	0.00	-299.98	0.00	299.98	2,550.17	1,275.09	3,796.67	1,901.16	1.81	-0.45	0.168
45.00	-24.17	-5.04	0.00	-274.22	0.00	274.22	2,469.68	1,234.84	3,511.57	1,758.40	2.32	-0.52	0.166
48.50	-23.57	-4.97	0.00	-256.58	0.00	256.58	2,411.50	1,205.75	3,315.88	1,660.41	2.72	-0.57	0.164
50.00	-23.11	-4.91	0.00	-249.12	0.00	249.12	2,386.10	1,193.05	3,233.06	1,618.93	2.91	-0.60	0.164
53.00	-22.21	-4.85	0.00	-234.37	0.00	234.37	2,367.87	1,183.94	3,174.58	1,589.65	3.30	-0.64	0.157
55.00	-21.88	-4.76	0.00	-224.68	0.00	224.68	2,333.31	1,166.65	3,065.78	1,535.17	3.57	-0.67	0.156
60.00	-21.08	-4.64	0.00	-200.88	0.00	200.88	2,241.65	1,120.83	2,795.35	1,399.75	4.32	-0.75	0.153
65.00	-20.32	-4.52	0.00	-177.69	0.00	177.69	2,122.57	1,061.29	2,504.82	1,254.27	5.14	-0.82	0.151
70.00	-19.60	-4.40	0.00	-155.10	0.00	155.10	2,003.49	1,001.75	2,230.23	1,116.77	6.05	-0.90	0.149
75.00	-18.91	-4.30	0.00	-133.08	0.00	133.08	1,884.41	942.21	1,971.58	987.26	7.03	-0.98	0.145
80.00	-18.26	-4.19	0.00	-111.60	0.00	111.60	1,765.33	882.67	1,728.87	865.72	8.11	-1.07	0.139
85.00	-17.65	-4.09	0.00	-90.64	0.00	90.64	1,646.25	823.13	1,502.09	752.16	9.27	-1.15	0.131
90.00	-17.08	-4.02	0.00	-70.17	0.00	70.17	1,527.17	763.59	1,291.26	646.59	10.52	-1.23	0.120
92.33	-16.83	-3.98	0.00	-60.79	0.00	60.79	1,471.60	735.80	1,198.32	600.05	11.13	-1.27	0.113
95.00	-16.42	-3.91	0.00	-50.19	0.00	50.19	852.40	426.20	685.64	343.33	11.86	-1.31	0.166
100.00	-10.10	-2.46	0.00	-30.66	0.00	30.66	795.51	397.76	586.65	293.76	13.27	-1.38	0.117
105.00	-9.80	-2.38	0.00	-18.34	0.00	18.34	724.06	362.03	485.51	243.11	14.76	-1.46	0.089
110.00	-9.52	-2.33	0.00	-6.43	0.00	6.43	652.62	326.31	393.93	197.26	16.32	-1.51	0.047
111.00	-2.36	-0.53	0.00	-4.10	0.00	4.10	638.33	319.16	376.76	188.66	16.64	-1.52	0.025
115.00	-2.19	-0.48	0.00	-1.96	0.00	1.96	581.17	290.58	311.92	156.19	17.92	-1.53	0.016
118.00	-0.02	0.00	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	18.88	-1.54	0.000
118.50	0.00	0.00	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	19.04	-1.54	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:47 PM

Customer: Verizon Wireless

Load Case: 1.0D + 1.0W

Serviceability 60 mph

22 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Applied Segment Forces Summary

Seg Elev (ft)	Description	Shaft Forces		Discrete Forces				Linear Forces		Sum of Forces			
		Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Torsion MY (lb-ft)	Moment MZ (lb-ft)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Wind FX (lb)	Dead Load (lb)	Torsion MY (lb-ft)	Moment MZ (lb)
0.00		66.4	0.0					0.0	0.0	66.4	0.0	0.0	0.0
5.00		130.6	816.4					0.0	47.7	130.6	864.1	0.0	0.0
10.00		126.2	789.1					0.0	47.7	126.2	836.8	0.0	0.0
15.00		123.4	761.9					0.0	47.7	123.4	809.5	0.0	0.0
20.00		123.3	734.6					0.0	47.7	123.3	782.2	0.0	0.0
25.00		123.4	707.3					0.0	47.7	123.4	755.0	0.0	0.0
30.00		122.4	680.1					0.0	47.7	122.4	727.7	0.0	0.0
35.00		120.7	652.8					0.0	47.7	120.7	700.4	0.0	0.0
40.00		118.3	625.5					0.0	47.7	118.3	673.2	0.0	0.0
45.00		98.5	598.2					0.0	47.7	98.5	645.9	0.0	0.0
48.50	Bot - Section 2	57.2	402.5					0.0	33.4	57.2	435.9	0.0	0.0
50.00		51.2	340.0					0.0	14.3	51.2	354.3	0.0	0.0
53.00	Top - Section 1	56.2	665.3					0.0	28.6	56.2	693.9	0.0	0.0
55.00		76.6	218.4					0.0	19.1	76.6	237.5	0.0	0.0
60.00		106.7	527.0					0.0	47.7	106.7	574.6	0.0	0.0
65.00		102.5	499.7					0.0	47.7	102.5	547.4	0.0	0.0
70.00		98.1	472.4					0.0	47.7	98.1	520.1	0.0	0.0
75.00		93.4	445.2					0.0	47.7	93.4	492.8	0.0	0.0
80.00		88.6	417.9					0.0	47.7	88.6	465.6	0.0	0.0
85.00		83.6	390.6					0.0	47.7	83.6	438.3	0.0	0.0
90.00		58.5	363.4					0.0	47.7	58.5	411.0	0.0	0.0
92.33	Bot - Section 3	38.2	160.2					0.0	22.2	38.2	182.5	0.0	0.0
95.00	Top - Section 2	56.1	284.1					0.0	25.4	56.1	309.5	0.0	0.0
100.00	Appertunance(s)	69.0	190.4	1,468.4	0.0	0.0	4,752.0	0.0	47.7	1,537.4	4,990.0	0.0	0.0
105.00		63.4	174.0					0.0	27.9	63.4	201.8	0.0	0.0
110.00		36.0	157.6					0.0	27.9	36.0	185.5	0.0	0.0
111.00	Appertunance(s)	27.4	29.6	1,909.7	0.0	0.0	5,538.8	0.0	5.6	1,937.1	5,573.9	0.0	0.0
115.00		36.7	111.7					0.0	4.0	36.7	115.7	0.0	0.0
118.00	Appertunance(s)	17.4	76.9	450.5	0.0	558.7	1,614.0	0.0	3.0	467.9	1,693.9	0.0	0.0
118.50		2.4	12.2					0.0	0.0	2.4	12.2	0.0	0.0
Totals:										6,201.11	25,231.1	0.00	0.00

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Load Case: 1.0D + 1.0W

Serviceability 60 mph

22 Iterations

Gust Response Factor : 1.10

Wind Importance Factor : 1.00

Dead Load Factor : 1.00

Wind Load Factor : 1.00

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-25.23	-6.15	0.00	-555.26	0.00	555.26	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.186
5.00	-24.36	-6.04	0.00	-524.53	0.00	524.53	3,026.97	1,513.48	5,924.46	2,966.64	0.03	-0.05	0.185
10.00	-23.52	-5.93	0.00	-494.35	0.00	494.35	2,968.13	1,484.07	5,610.69	2,809.51	0.11	-0.11	0.184
15.00	-22.70	-5.83	0.00	-464.69	0.00	464.69	2,906.21	1,453.10	5,299.15	2,653.51	0.25	-0.16	0.183
20.00	-21.91	-5.73	0.00	-435.54	0.00	435.54	2,841.19	1,420.59	4,990.46	2,498.94	0.45	-0.22	0.182
25.00	-21.15	-5.62	0.00	-406.90	0.00	406.90	2,773.08	1,386.54	4,685.25	2,346.11	0.71	-0.28	0.181
30.00	-20.42	-5.52	0.00	-378.79	0.00	378.79	2,701.87	1,350.93	4,384.13	2,195.32	1.04	-0.35	0.180
35.00	-19.71	-5.42	0.00	-351.18	0.00	351.18	2,627.57	1,313.78	4,087.73	2,046.90	1.44	-0.41	0.179
40.00	-19.03	-5.32	0.00	-324.09	0.00	324.09	2,550.17	1,275.09	3,796.67	1,901.16	1.91	-0.48	0.178
45.00	-18.38	-5.24	0.00	-297.49	0.00	297.49	2,469.68	1,234.84	3,511.57	1,758.40	2.46	-0.56	0.177
48.50	-17.94	-5.19	0.00	-279.17	0.00	279.17	2,411.50	1,205.75	3,315.88	1,660.41	2.89	-0.61	0.176
50.00	-17.59	-5.14	0.00	-271.39	0.00	271.39	2,386.10	1,193.05	3,233.06	1,618.93	3.08	-0.64	0.175
53.00	-16.89	-5.09	0.00	-255.96	0.00	255.96	2,367.87	1,183.94	3,174.58	1,589.65	3.50	-0.69	0.168
55.00	-16.65	-5.03	0.00	-245.78	0.00	245.78	2,333.31	1,166.65	3,065.78	1,535.17	3.80	-0.72	0.167
60.00	-16.07	-4.94	0.00	-220.64	0.00	220.64	2,241.65	1,120.83	2,795.35	1,399.75	4.60	-0.80	0.165
65.00	-15.52	-4.85	0.00	-195.95	0.00	195.95	2,122.57	1,061.29	2,504.82	1,254.27	5.48	-0.89	0.164
70.00	-14.99	-4.77	0.00	-171.70	0.00	171.70	2,003.49	1,001.75	2,230.23	1,116.77	6.46	-0.97	0.161
75.00	-14.49	-4.69	0.00	-147.87	0.00	147.87	1,884.41	942.21	1,971.58	987.26	7.52	-1.06	0.157
80.00	-14.02	-4.61	0.00	-124.43	0.00	124.43	1,765.33	882.67	1,728.87	865.72	8.69	-1.16	0.152
85.00	-13.58	-4.54	0.00	-101.37	0.00	101.37	1,646.25	823.13	1,502.09	752.16	9.95	-1.25	0.143
90.00	-13.16	-4.49	0.00	-78.66	0.00	78.66	1,527.17	763.59	1,291.26	646.59	11.31	-1.34	0.130
92.33	-12.98	-4.46	0.00	-68.18	0.00	68.18	1,471.60	735.80	1,198.32	600.05	11.98	-1.38	0.122
95.00	-12.66	-4.41	0.00	-56.29	0.00	56.29	852.40	426.20	685.64	343.33	12.76	-1.43	0.179
100.00	-7.71	-2.75	0.00	-34.26	0.00	34.26	795.51	397.76	586.65	293.76	14.31	-1.51	0.126
105.00	-7.51	-2.69	0.00	-20.49	0.00	20.49	724.06	362.03	485.51	243.11	15.93	-1.59	0.095
110.00	-7.32	-2.66	0.00	-7.02	0.00	7.02	652.62	326.31	393.93	197.26	17.64	-1.65	0.047
111.00	-1.81	-0.56	0.00	-4.36	0.00	4.36	638.33	319.16	376.76	188.66	17.99	-1.66	0.026
115.00	-1.69	-0.52	0.00	-2.12	0.00	2.12	581.17	290.58	311.92	156.19	19.39	-1.68	0.016
118.00	-0.01	0.00	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	20.44	-1.68	0.000
118.50	0.00	0.00	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	20.62	-1.68	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Equivalent Lateral Forces Method Analysis

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

Spectral Response Acceleration for Short Period (S_s):	0.82
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.28
Long-Period Transition Period (T_L):	8
Importance Factor (I_E):	1.00
Site Coefficient F_a :	1.17
Site Coefficient F_v :	1.85
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.64
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.34
Seismic Response Coefficient (C_s):	0.10
Upper Limit C_s	0.10
Lower Limit C_s	0.03
Period based on Rayleigh Method (sec):	2.24
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.87
Total Unfactored Dead Load:	25.23 k
Seismic Base Shear (E):	3.32 k

Load Case (1.2 + 0.2Sds) * DL + E ELM

Seismic Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
29	118.25	12	91	0.001	3	16
28	116.50	80	579	0.006	20	106
27	113.00	116	792	0.008	27	154
26	110.50	35	231	0.002	8	47
25	107.50	185	1,157	0.012	39	246
24	102.50	202	1,152	0.012	39	268
23	97.50	238	1,237	0.013	42	316
22	93.67	309	1,493	0.015	51	411
21	91.17	182	837	0.009	29	242
20	87.50	411	1,745	0.018	59	546
19	82.50	438	1,668	0.017	57	582
18	77.50	466	1,576	0.016	54	618
17	72.50	493	1,473	0.015	50	655
16	67.50	520	1,360	0.014	46	691
15	62.50	547	1,240	0.013	42	727
14	57.50	575	1,114	0.011	38	763
13	54.00	237	409	0.004	14	315
12	51.50	694	1,095	0.011	37	922
11	49.25	354	514	0.005	18	471
10	46.75	436	574	0.006	20	579
9	42.50	646	712	0.007	24	858
8	37.50	673	587	0.006	20	894
7	32.50	700	468	0.005	16	931

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

6	27.50	728	356	0.004	12	967
5	22.50	755	254	0.003	9	1,003
4	17.50	782	164	0.002	6	1,039
3	12.50	810	91	0.001	3	1,075
2	7.50	837	36	0.000	1	1,112
1	2.50	864	5	0.000	0	1,148
TX RX Systems 101-90	118.00	114	846	0.009	29	151
Flat Low Profile Pla	118.00	1,500	11,137	0.114	379	1,993
Alcatel-Lucent B25 R	111.00	159	1,053	0.011	36	211
Alcatel-Lucent B13 R	111.00	173	1,148	0.012	39	230
RFS DB-B1-6C-12AB-0Z	111.00	21	142	0.001	5	28
RFS DB-B1-6C-12AB-0Z	111.00	21	142	0.001	5	28
Alcatel-Lucent B66A	111.00	201	1,331	0.014	45	267
Antel LPA-80090/4CF	111.00	66	437	0.004	15	88
Andrew SBNHH-1D65C	111.00	397	2,627	0.027	90	527
Round Low Profile Pl	111.00	4,500	29,805	0.305	1,016	5,978
Ericsson KRY 112 144	100.00	66	360	0.004	12	88
CellMax CMA-B/6521/E	100.00	186	1,014	0.010	35	247
Flat Low Profile Pla	100.00	4,500	24,525	0.251	836	5,978
		25,231	97,576	1.000	3,325	33,519

Load Case (0.9 - 0.2Sds) * DL + E ELFM

Seismic (Reduced DL) Equivalent Lateral Forces Method

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
29	118.25	12	91	0.001	3	9
28	116.50	80	579	0.006	20	62
27	113.00	116	792	0.008	27	89
26	110.50	35	231	0.002	8	27
25	107.50	185	1,157	0.012	39	143
24	102.50	202	1,152	0.012	39	156
23	97.50	238	1,237	0.013	42	184
22	93.67	309	1,493	0.015	51	239
21	91.17	182	837	0.009	29	141
20	87.50	411	1,745	0.018	59	317
19	82.50	438	1,668	0.017	57	338
18	77.50	466	1,576	0.016	54	359
17	72.50	493	1,473	0.015	50	380
16	67.50	520	1,360	0.014	46	401
15	62.50	547	1,240	0.013	42	422
14	57.50	575	1,114	0.011	38	443
13	54.00	237	409	0.004	14	183
12	51.50	694	1,095	0.011	37	535
11	49.25	354	514	0.005	18	273
10	46.75	436	574	0.006	20	336
9	42.50	646	712	0.007	24	498
8	37.50	673	587	0.006	20	519
7	32.50	700	468	0.005	16	540
6	27.50	728	356	0.004	12	561
5	22.50	755	254	0.003	9	582
4	17.50	782	164	0.002	6	604
3	12.50	810	91	0.001	3	625
2	7.50	837	36	0.000	1	646
1	2.50	864	5	0.000	0	667
TX RX Systems 101-90	118.00	114	846	0.009	29	88
Flat Low Profile Pla	118.00	1,500	11,137	0.114	379	1,157
Alcatel-Lucent B25 R	111.00	159	1,053	0.011	36	123
Alcatel-Lucent B13 R	111.00	173	1,148	0.012	39	134
RFS DB-B1-6C-12AB-0Z	111.00	21	142	0.001	5	17
RFS DB-B1-6C-12AB-0Z	111.00	21	142	0.001	5	17

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Alcatel-Lucent B66A	111.00	201	1,331	0.014	45	155
Antel LPA-80090/4CF	111.00	66	437	0.004	15	51
Andrew SBNHH-1D65C	111.00	397	2,627	0.027	90	306
Round Low Profile PI	111.00	4,500	29,805	0.305	1,016	3,472
Ericsson KRY 112 144	100.00	66	360	0.004	12	51
CellMax CMA-B/6521/E	100.00	186	1,014	0.010	35	144
Flat Low Profile Pla	100.00	4,500	24,525	0.251	836	3,472
		25,231	97,576	1.000	3,325	19,466

Site Number: 310318

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Load Case (1.2 + 0.2Sds) * DL + E ELFM

Seismic Equivalent Lateral Forces Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-32.37	-3.33	0.00	-351.24	0.00	351.24	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.123
5.00	-31.26	-3.35	0.00	-334.57	0.00	334.57	3,026.97	1,513.48	5,924.46	2,966.64	0.02	-0.03	0.123
10.00	-30.18	-3.37	0.00	-317.82	0.00	317.82	2,968.13	1,484.07	5,610.69	2,809.51	0.07	-0.07	0.123
15.00	-29.14	-3.38	0.00	-300.99	0.00	300.99	2,906.21	1,453.10	5,299.15	2,653.51	0.16	-0.10	0.123
20.00	-28.13	-3.39	0.00	-284.11	0.00	284.11	2,841.19	1,420.59	4,990.46	2,498.94	0.29	-0.14	0.124
25.00	-27.16	-3.39	0.00	-267.18	0.00	267.18	2,773.08	1,386.54	4,685.25	2,346.11	0.46	-0.18	0.124
30.00	-26.23	-3.39	0.00	-250.23	0.00	250.23	2,701.87	1,350.93	4,384.13	2,195.32	0.67	-0.22	0.124
35.00	-25.33	-3.39	0.00	-233.28	0.00	233.28	2,627.57	1,313.78	4,087.73	2,046.90	0.93	-0.27	0.124
40.00	-24.47	-3.38	0.00	-216.34	0.00	216.34	2,550.17	1,275.09	3,796.67	1,901.16	1.24	-0.32	0.123
45.00	-23.89	-3.37	0.00	-199.45	0.00	199.45	2,469.68	1,234.84	3,511.57	1,758.40	1.59	-0.36	0.123
48.50	-23.42	-3.36	0.00	-187.64	0.00	187.64	2,411.50	1,205.75	3,315.88	1,660.41	1.87	-0.40	0.123
50.00	-22.50	-3.33	0.00	-182.59	0.00	182.59	2,386.10	1,193.05	3,233.06	1,618.93	2.00	-0.42	0.122
53.00	-22.18	-3.32	0.00	-172.60	0.00	172.60	2,367.87	1,183.94	3,174.58	1,589.65	2.28	-0.45	0.118
55.00	-21.41	-3.30	0.00	-165.95	0.00	165.95	2,333.31	1,166.65	3,065.78	1,535.17	2.47	-0.48	0.117
60.00	-20.68	-3.27	0.00	-149.48	0.00	149.48	2,241.65	1,120.83	2,795.35	1,399.75	3.00	-0.53	0.116
65.00	-19.99	-3.23	0.00	-133.14	0.00	133.14	2,122.57	1,061.29	2,504.82	1,254.27	3.58	-0.59	0.116
70.00	-19.33	-3.20	0.00	-116.97	0.00	116.97	2,003.49	1,001.75	2,230.23	1,116.77	4.23	-0.65	0.114
75.00	-18.71	-3.16	0.00	-100.98	0.00	100.98	1,884.41	942.21	1,971.58	987.26	4.94	-0.71	0.112
80.00	-18.13	-3.11	0.00	-85.20	0.00	85.20	1,765.33	882.67	1,728.87	865.72	5.72	-0.77	0.109
85.00	-17.58	-3.07	0.00	-69.63	0.00	69.63	1,646.25	823.13	1,502.09	752.16	6.56	-0.83	0.103
90.00	-17.33	-3.05	0.00	-54.31	0.00	54.31	1,527.17	763.59	1,291.26	646.59	7.47	-0.90	0.095
92.33	-16.92	-3.00	0.00	-47.20	0.00	47.20	1,471.60	735.80	1,198.32	600.05	7.92	-0.93	0.090
95.00	-16.60	-2.96	0.00	-39.20	0.00	39.20	852.40	426.20	685.64	343.33	8.44	-0.96	0.134
100.00	-10.04	-1.94	0.00	-24.38	0.00	24.38	795.51	397.76	586.65	293.76	9.48	-1.01	0.096
105.00	-9.79	-1.90	0.00	-14.69	0.00	14.69	724.06	362.03	485.51	243.11	10.58	-1.08	0.074
110.00	-9.74	-1.90	0.00	-5.16	0.00	5.16	652.62	326.31	393.93	197.26	11.73	-1.12	0.041
111.00	-2.26	-0.48	0.00	-3.27	0.00	3.27	638.33	319.16	376.76	188.66	11.97	-1.12	0.021
115.00	-2.15	-0.45	0.00	-1.36	0.00	1.36	581.17	290.58	311.92	156.19	12.91	-1.14	0.012
118.00	0.00	0.00	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	13.63	-1.14	0.000
118.50	0.00	0.00	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	13.75	-1.14	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

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Customer: Verizon Wireless

Load Case (0.9 - 0.2Sds) * DL + E ELFM

Seismic (Reduced DL) Equivalent Lateral Forces Method

Calculated Forces

Seg	Pu	Vu	Tu	Mu	Mu	Resultant	phi	phi	phi	phi	Total		
Elev	FY (-)	FX (-)	MY	MZ	MX	Moment	Pn	Vn	Tn	Mn	Deflect	Rotation	Ratio
(ft)	(kips)	(kips)	(ft-kips)	(ft-kips)	(ft-kips)	(ft-kips)	(kips)	(kips)	(ft-kips)	(ft-kips)	(in)	(deg)	
0.00	-18.80	-3.33	0.00	-343.13	0.00	343.13	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.116
5.00	-18.15	-3.34	0.00	-326.48	0.00	326.48	3,026.97	1,513.48	5,924.46	2,966.64	0.02	-0.03	0.116
10.00	-17.52	-3.35	0.00	-309.79	0.00	309.79	2,968.13	1,484.07	5,610.69	2,809.51	0.07	-0.07	0.116
15.00	-16.92	-3.35	0.00	-293.07	0.00	293.07	2,906.21	1,453.10	5,299.15	2,653.51	0.16	-0.10	0.116
20.00	-16.33	-3.35	0.00	-276.32	0.00	276.32	2,841.19	1,420.59	4,990.46	2,498.94	0.28	-0.14	0.116
25.00	-15.77	-3.35	0.00	-259.57	0.00	259.57	2,773.08	1,386.54	4,685.25	2,346.11	0.45	-0.18	0.116
30.00	-15.23	-3.34	0.00	-242.83	0.00	242.83	2,701.87	1,350.93	4,384.13	2,195.32	0.65	-0.22	0.116
35.00	-14.71	-3.33	0.00	-226.13	0.00	226.13	2,627.57	1,313.78	4,087.73	2,046.90	0.91	-0.26	0.116
40.00	-14.21	-3.32	0.00	-209.48	0.00	209.48	2,550.17	1,275.09	3,796.67	1,901.16	1.20	-0.31	0.116
45.00	-13.87	-3.30	0.00	-192.90	0.00	192.90	2,469.68	1,234.84	3,511.57	1,758.40	1.55	-0.35	0.115
48.50	-13.59	-3.29	0.00	-181.34	0.00	181.34	2,411.50	1,205.75	3,315.88	1,660.41	1.82	-0.39	0.115
50.00	-13.06	-3.26	0.00	-176.40	0.00	176.40	2,386.10	1,193.05	3,233.06	1,618.93	1.95	-0.41	0.114
53.00	-12.87	-3.25	0.00	-166.64	0.00	166.64	2,367.87	1,183.94	3,174.58	1,589.65	2.21	-0.44	0.110
55.00	-12.43	-3.21	0.00	-160.15	0.00	160.15	2,333.31	1,166.65	3,065.78	1,535.17	2.40	-0.46	0.110
60.00	-12.00	-3.18	0.00	-144.08	0.00	144.08	2,241.65	1,120.83	2,795.35	1,399.75	2.92	-0.51	0.108
65.00	-11.60	-3.14	0.00	-128.19	0.00	128.19	2,122.57	1,061.29	2,504.82	1,254.27	3.48	-0.57	0.108
70.00	-11.21	-3.10	0.00	-112.49	0.00	112.49	2,003.49	1,001.75	2,230.23	1,116.77	4.11	-0.63	0.106
75.00	-10.85	-3.05	0.00	-97.01	0.00	97.01	1,884.41	942.21	1,971.58	987.26	4.80	-0.69	0.104
80.00	-10.51	-3.00	0.00	-81.76	0.00	81.76	1,765.33	882.67	1,728.87	865.72	5.55	-0.75	0.100
85.00	-10.19	-2.95	0.00	-66.76	0.00	66.76	1,646.25	823.13	1,502.09	752.16	6.36	-0.81	0.095
90.00	-10.05	-2.92	0.00	-52.02	0.00	52.02	1,527.17	763.59	1,291.26	646.59	7.24	-0.87	0.087
92.33	-9.81	-2.88	0.00	-45.19	0.00	45.19	1,471.60	735.80	1,198.32	600.05	7.67	-0.90	0.082
95.00	-9.63	-2.84	0.00	-37.53	0.00	37.53	852.40	426.20	685.64	343.33	8.18	-0.93	0.121
100.00	-5.82	-1.86	0.00	-23.34	0.00	23.34	795.51	397.76	586.65	293.76	9.18	-0.98	0.087
105.00	-5.67	-1.82	0.00	-14.05	0.00	14.05	724.06	362.03	485.51	243.11	10.24	-1.04	0.066
110.00	-5.65	-1.81	0.00	-4.94	0.00	4.94	652.62	326.31	393.93	197.26	11.35	-1.08	0.034
111.00	-1.31	-0.46	0.00	-3.13	0.00	3.13	638.33	319.16	376.76	188.66	11.58	-1.08	0.019
115.00	-1.25	-0.44	0.00	-1.31	0.00	1.31	581.17	290.58	311.92	156.19	12.49	-1.09	0.011
118.00	0.00	0.00	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	13.18	-1.10	0.000
118.50	0.00	0.00	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	13.30	-1.10	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Equivalent Modal Forces Analysis

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

Spectral Response Acceleration for Short Period (S_g):	0.82
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.28
Importance Factor (I_E):	1.00
Site Coefficient F_a :	1.17
Site Coefficient F_v :	1.85
Response Modification Coefficient (R):	1.50
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.64
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.34
Period Based on Rayleigh Method (sec):	2.24
Redundancy Factor (ρ):	1.30

Load Case (1.2 + 0.2Sds) * DL + E EMAM

Seismic Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)					Horizontal Force (lb)	Vertical Force (lb)
			a	b	c	Saz		
29	118.25	12	1.882	1.938	1.125	1.208	13	16
28	116.50	80	1.827	1.663	1.024	1.091	76	106
27	113.00	116	1.719	1.194	0.843	0.874	88	154
26	110.50	35	1.643	0.919	0.731	0.732	22	47
25	107.50	185	1.555	0.647	0.611	0.577	93	246
24	102.50	202	1.414	0.311	0.446	0.354	62	268
23	97.50	238	1.279	0.093	0.318	0.173	36	316
22	93.67	309	1.181	-0.013	0.241	0.063	17	411
21	91.17	182	1.119	-0.059	0.199	0.005	1	242
20	87.50	411	1.030	-0.101	0.147	-0.062	-22	546
19	82.50	438	0.916	-0.121	0.094	-0.116	-44	582
18	77.50	466	0.808	-0.113	0.056	-0.131	-53	618
17	72.50	493	0.707	-0.089	0.031	-0.108	-46	655
16	67.50	520	0.613	-0.058	0.016	-0.056	-25	691
15	62.50	547	0.526	-0.026	0.008	0.010	5	727
14	57.50	575	0.445	0.003	0.006	0.073	36	763
13	54.00	237	0.392	0.020	0.007	0.109	22	315
12	51.50	694	0.357	0.031	0.008	0.129	77	922
11	49.25	354	0.326	0.039	0.010	0.143	44	471
10	46.75	436	0.294	0.047	0.013	0.154	58	579
9	42.50	646	0.243	0.056	0.018	0.166	93	858
8	37.50	673	0.189	0.064	0.025	0.169	99	894
7	32.50	700	0.142	0.069	0.031	0.166	101	931
6	27.50	728	0.102	0.071	0.037	0.161	102	967
5	22.50	755	0.068	0.072	0.041	0.156	102	1,003
4	17.50	782	0.041	0.070	0.042	0.149	101	1,039
3	12.50	810	0.021	0.065	0.038	0.138	97	1,075
2	7.50	837	0.008	0.051	0.029	0.113	82	1,112
1	2.50	864	0.001	0.022	0.012	0.055	41	1,148
TX RX Systems 101-90	118.00	114	1.874	1.897	1.110	1.191	118	151
Flat Low Profile Pla	118.00	1,500	1.874	1.897	1.110	1.191	1,548	1,993
Alcatel-Lucent B25 R	111.00	159	1.658	0.971	0.752	0.760	105	211
Alcatel-Lucent B13 R	111.00	173	1.658	0.971	0.752	0.760	114	230
RFS DB-B1-6C-12AB-0Z	111.00	21	1.658	0.971	0.752	0.760	14	28

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

RFS DB-B1-6C-12AB-0Z	111.00	21	1.658	0.971	0.752	0.760	14	28
Alcatel-Lucent B66A	111.00	201	1.658	0.971	0.752	0.760	132	267
Antel LPA-80090/4CF	111.00	66	1.658	0.971	0.752	0.760	43	88
Andrew SBNHH-1D65C	111.00	397	1.658	0.971	0.752	0.760	261	527
Round Low Profile PI	111.00	4,500	1.658	0.971	0.752	0.760	2,964	5,978
Ericsson KRY 112 144	100.00	66	1.346	0.189	0.378	0.258	15	88
CellMax CMA-B/6521/E	100.00	186	1.346	0.189	0.378	0.258	42	247
Flat Low Profile Pla	100.00	4,500	1.346	0.189	0.378	0.258	1,006	5,978
		25,231	41.904	18.992	15.579	15.731	7,652	33,519

Load Case (0.9 - 0.2Sds) * DL + E EMAM

Seismic (Reduced DL) Equivalent Modal Analysis Method

Segment	Height Above Base (ft)	Weight (lb)	a	b	c	Saz	Horizontal Force (lb)	Vertical Force (lb)
29	118.25	12	1.882	1.938	1.125	1.208	13	9
28	116.50	80	1.827	1.663	1.024	1.091	76	62
27	113.00	116	1.719	1.194	0.843	0.874	88	89
26	110.50	35	1.643	0.919	0.731	0.732	22	27
25	107.50	185	1.555	0.647	0.611	0.577	93	143
24	102.50	202	1.414	0.311	0.446	0.354	62	156
23	97.50	238	1.279	0.093	0.318	0.173	36	184
22	93.67	309	1.181	-0.013	0.241	0.063	17	239
21	91.17	182	1.119	-0.059	0.199	0.005	1	141
20	87.50	411	1.030	-0.101	0.147	-0.062	-22	317
19	82.50	438	0.916	-0.121	0.094	-0.116	-44	338
18	77.50	466	0.808	-0.113	0.056	-0.131	-53	359
17	72.50	493	0.707	-0.089	0.031	-0.108	-46	380
16	67.50	520	0.613	-0.058	0.016	-0.056	-25	401
15	62.50	547	0.526	-0.026	0.008	0.010	5	422
14	57.50	575	0.445	0.003	0.006	0.073	36	443
13	54.00	237	0.392	0.020	0.007	0.109	22	183
12	51.50	694	0.357	0.031	0.008	0.129	77	535
11	49.25	354	0.326	0.039	0.010	0.143	44	273
10	46.75	436	0.294	0.047	0.013	0.154	58	336
9	42.50	646	0.243	0.056	0.018	0.166	93	498
8	37.50	673	0.189	0.064	0.025	0.169	99	519
7	32.50	700	0.142	0.069	0.031	0.166	101	540
6	27.50	728	0.102	0.071	0.037	0.161	102	561
5	22.50	755	0.068	0.072	0.041	0.156	102	582
4	17.50	782	0.041	0.070	0.042	0.149	101	604
3	12.50	810	0.021	0.065	0.038	0.138	97	625
2	7.50	837	0.008	0.051	0.029	0.113	82	646
1	2.50	864	0.001	0.022	0.012	0.055	41	667
TX RX Systems 101-90	118.00	114	1.874	1.897	1.110	1.191	118	88
Flat Low Profile Pla	118.00	1,500	1.874	1.897	1.110	1.191	1,548	1,157
Alcatel-Lucent B25 R	111.00	159	1.658	0.971	0.752	0.760	105	123
Alcatel-Lucent B13 R	111.00	173	1.658	0.971	0.752	0.760	114	134
RFS DB-B1-6C-12AB-0Z	111.00	21	1.658	0.971	0.752	0.760	14	17
RFS DB-B1-6C-12AB-0Z	111.00	21	1.658	0.971	0.752	0.760	14	17
Alcatel-Lucent B66A	111.00	201	1.658	0.971	0.752	0.760	132	155
Antel LPA-80090/4CF	111.00	66	1.658	0.971	0.752	0.760	43	51
Andrew SBNHH-1D65C	111.00	397	1.658	0.971	0.752	0.760	261	306
Round Low Profile PI	111.00	4,500	1.658	0.971	0.752	0.760	2,964	3,472
Ericsson KRY 112 144	100.00	66	1.346	0.189	0.378	0.258	15	51
CellMax CMA-B/6521/E	100.00	186	1.346	0.189	0.378	0.258	42	144
Flat Low Profile Pla	100.00	4,500	1.346	0.189	0.378	0.258	1,006	3,472
		25,231	41.904	18.992	15.579	15.731	7,652	19,466

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Load Case (1.2 + 0.2Sds) * DL + E EMAM

Seismic Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-32.37	-7.63	0.00	-810.93	0.00	810.93	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.270
5.00	-31.24	-7.59	0.00	-772.77	0.00	772.77	3,026.97	1,513.48	5,924.46	2,966.64	0.04	-0.08	0.271
10.00	-30.16	-7.54	0.00	-734.81	0.00	734.81	2,968.13	1,484.07	5,610.69	2,809.51	0.16	-0.16	0.272
15.00	-29.11	-7.48	0.00	-697.13	0.00	697.13	2,906.21	1,453.10	5,299.15	2,653.51	0.37	-0.24	0.273
20.00	-28.09	-7.41	0.00	-659.76	0.00	659.76	2,841.19	1,420.59	4,990.46	2,498.94	0.67	-0.33	0.274
25.00	-27.12	-7.35	0.00	-622.69	0.00	622.69	2,773.08	1,386.54	4,685.25	2,346.11	1.06	-0.42	0.275
30.00	-26.17	-7.29	0.00	-585.94	0.00	585.94	2,701.87	1,350.93	4,384.13	2,195.32	1.55	-0.52	0.277
35.00	-25.27	-7.23	0.00	-549.50	0.00	549.50	2,627.57	1,313.78	4,087.73	2,046.90	2.15	-0.62	0.278
40.00	-24.40	-7.17	0.00	-513.36	0.00	513.36	2,550.17	1,275.09	3,796.67	1,901.16	2.87	-0.73	0.280
45.00	-23.80	-7.15	0.00	-477.49	0.00	477.49	2,469.68	1,234.84	3,511.57	1,758.40	3.70	-0.85	0.281
48.50	-23.33	-7.13	0.00	-452.47	0.00	452.47	2,411.50	1,205.75	3,315.88	1,660.41	4.36	-0.94	0.282
50.00	-22.40	-7.06	0.00	-441.78	0.00	441.78	2,386.10	1,193.05	3,233.06	1,618.93	4.66	-0.98	0.282
53.00	-22.07	-7.06	0.00	-420.61	0.00	420.61	2,367.87	1,183.94	3,174.58	1,589.65	5.30	-1.06	0.274
55.00	-21.30	-7.04	0.00	-406.50	0.00	406.50	2,333.31	1,166.65	3,065.78	1,535.17	5.76	-1.12	0.274
60.00	-20.56	-7.07	0.00	-371.30	0.00	371.30	2,241.65	1,120.83	2,795.35	1,399.75	7.01	-1.25	0.274
65.00	-19.85	-7.13	0.00	-335.95	0.00	335.95	2,122.57	1,061.29	2,504.82	1,254.27	8.40	-1.40	0.277
70.00	-19.17	-7.21	0.00	-300.30	0.00	300.30	2,003.49	1,001.75	2,230.23	1,116.77	9.94	-1.55	0.279
75.00	-18.53	-7.30	0.00	-264.24	0.00	264.24	1,884.41	942.21	1,971.58	987.26	11.65	-1.71	0.278
80.00	-17.93	-7.38	0.00	-227.74	0.00	227.74	1,765.33	882.67	1,728.87	865.72	13.53	-1.88	0.273
85.00	-17.36	-7.44	0.00	-190.85	0.00	190.85	1,646.25	823.13	1,502.09	752.16	15.59	-2.05	0.264
90.00	-17.10	-7.46	0.00	-153.67	0.00	153.67	1,527.17	763.59	1,291.26	646.59	17.83	-2.22	0.249
92.33	-16.68	-7.46	0.00	-136.26	0.00	136.26	1,471.60	735.80	1,198.32	600.05	18.94	-2.31	0.239
95.00	-16.34	-7.45	0.00	-116.37	0.00	116.37	852.40	426.20	685.64	343.33	20.25	-2.41	0.358
100.00	-9.80	-6.07	0.00	-79.14	0.00	79.14	795.51	397.76	586.65	293.76	22.86	-2.56	0.282
105.00	-9.54	-5.99	0.00	-48.80	0.00	48.80	724.06	362.03	485.51	243.11	25.67	-2.77	0.214
110.00	-9.48	-5.98	0.00	-18.82	0.00	18.82	652.62	326.31	393.93	197.26	28.66	-2.92	0.110
111.00	-2.17	-1.87	0.00	-12.84	0.00	12.84	638.33	319.16	376.76	188.66	29.27	-2.94	0.072
115.00	-2.07	-1.79	0.00	-5.37	0.00	5.37	581.17	290.58	311.92	156.19	31.75	-2.98	0.038
118.00	0.00	0.00	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	33.63	-3.00	0.000
118.50	0.00	0.00	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	33.95	-3.00	0.000

Site Number: 310318

Code: ANSI/TIA-222-G

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:48 PM

Customer: Verizon Wireless

Load Case (0.9 - 0.2Sds) * DL + E EMAM

Seismic (Reduced DL) Equivalent Modal Analysis Method

Calculated Forces

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	phi Pn (kips)	phi Vn (kips)	phi Tn (ft-kips)	phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-18.79	-7.62	0.00	-791.42	0.00	791.42	3,082.70	1,541.35	6,239.85	3,124.56	0.00	0.00	0.259
5.00	-18.14	-7.56	0.00	-753.30	0.00	753.30	3,026.97	1,513.48	5,924.46	2,966.64	0.04	-0.07	0.260
10.00	-17.50	-7.49	0.00	-715.48	0.00	715.48	2,968.13	1,484.07	5,610.69	2,809.51	0.16	-0.15	0.261
15.00	-16.89	-7.41	0.00	-678.02	0.00	678.02	2,906.21	1,453.10	5,299.15	2,653.51	0.36	-0.23	0.261
20.00	-16.30	-7.33	0.00	-640.96	0.00	640.96	2,841.19	1,420.59	4,990.46	2,498.94	0.65	-0.32	0.262
25.00	-15.72	-7.25	0.00	-604.30	0.00	604.30	2,773.08	1,386.54	4,685.25	2,346.11	1.03	-0.41	0.263
30.00	-15.17	-7.17	0.00	-568.03	0.00	568.03	2,701.87	1,350.93	4,384.13	2,195.32	1.51	-0.50	0.264
35.00	-14.64	-7.10	0.00	-532.16	0.00	532.16	2,627.57	1,313.78	4,087.73	2,046.90	2.10	-0.61	0.266
40.00	-14.13	-7.03	0.00	-496.68	0.00	496.68	2,550.17	1,275.09	3,796.67	1,901.16	2.79	-0.71	0.267
45.00	-13.78	-6.99	0.00	-461.55	0.00	461.55	2,469.68	1,234.84	3,511.57	1,758.40	3.60	-0.83	0.268
48.50	-13.50	-6.95	0.00	-437.09	0.00	437.09	2,411.50	1,205.75	3,315.88	1,660.41	4.24	-0.91	0.269
50.00	-12.96	-6.88	0.00	-426.66	0.00	426.66	2,386.10	1,193.05	3,233.06	1,618.93	4.53	-0.95	0.269
53.00	-12.77	-6.87	0.00	-406.02	0.00	406.02	2,367.87	1,183.94	3,174.58	1,589.65	5.15	-1.03	0.261
55.00	-12.32	-6.85	0.00	-392.28	0.00	392.28	2,333.31	1,166.65	3,065.78	1,535.17	5.60	-1.09	0.261
60.00	-11.88	-6.86	0.00	-358.05	0.00	358.05	2,241.65	1,120.83	2,795.35	1,399.75	6.80	-1.22	0.261
65.00	-11.46	-6.91	0.00	-323.75	0.00	323.75	2,122.57	1,061.29	2,504.82	1,254.27	8.15	-1.35	0.264
70.00	-11.06	-6.97	0.00	-289.22	0.00	289.22	2,003.49	1,001.75	2,230.23	1,116.77	9.65	-1.50	0.265
75.00	-10.68	-7.04	0.00	-254.37	0.00	254.37	1,884.41	942.21	1,971.58	987.26	11.30	-1.65	0.263
80.00	-10.32	-7.11	0.00	-219.16	0.00	219.16	1,765.33	882.67	1,728.87	865.72	13.12	-1.81	0.259
85.00	-9.98	-7.15	0.00	-183.63	0.00	183.63	1,646.25	823.13	1,502.09	752.16	15.11	-1.98	0.250
90.00	-9.83	-7.16	0.00	-147.89	0.00	147.89	1,527.17	763.59	1,291.26	646.59	17.27	-2.15	0.235
92.33	-9.58	-7.15	0.00	-131.18	0.00	131.18	1,471.60	735.80	1,198.32	600.05	18.34	-2.23	0.225
95.00	-9.38	-7.13	0.00	-112.11	0.00	112.11	852.40	426.20	685.64	343.33	19.62	-2.32	0.338
100.00	-5.59	-5.86	0.00	-76.47	0.00	76.47	795.51	397.76	586.65	293.76	22.14	-2.48	0.268
105.00	-5.43	-5.78	0.00	-47.15	0.00	47.15	724.06	362.03	485.51	243.11	24.85	-2.68	0.202
110.00	-5.40	-5.76	0.00	-18.25	0.00	18.25	652.62	326.31	393.93	197.26	27.74	-2.82	0.101
111.00	-1.23	-1.82	0.00	-12.49	0.00	12.49	638.33	319.16	376.76	188.66	28.33	-2.84	0.068
115.00	-1.17	-1.74	0.00	-5.22	0.00	5.22	581.17	290.58	311.92	156.19	30.73	-2.88	0.035
118.00	0.00	0.00	0.00	0.00	0.00	0.00	538.30	269.15	267.30	133.85	32.54	-2.89	0.000
118.50	0.00	0.00	0.00	0.00	0.00	0.00	531.15	265.58	260.20	130.29	32.85	-2.89	0.000

Site Number: 310318

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Site Name: Huntsville - Clawson, UT

Engineering Number: OAA680338_C3_01

6/29/2016 3:47:49 PM

Customer: Verizon Wireless

Analysis Summary

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.6W	22.14	0.00	30.24	0.00	0.00	2012.85	0.00	0.65
0.9D + 1.6W	22.12	0.00	22.67	0.00	0.00	1988.27	0.00	0.64
1.2D + 1.0Di + 1.0Wi	6.25	0.00	33.47	0.00	0.00	530.53	0.00	0.18
(1.2 + 0.2Sds) * DL + E ELFM	3.33	0.00	32.37	0.00	0.00	351.24	95.00	0.13
(1.2 + 0.2Sds) * DL + E EMAM	7.63	0.00	32.37	0.00	0.00	810.93	95.00	0.36
(0.9 - 0.2Sds) * DL + E ELFM	3.33	0.00	18.80	0.00	0.00	343.13	95.00	0.12
(0.9 - 0.2Sds) * DL + E EMAM	7.62	0.00	18.79	0.00	0.00	791.42	95.00	0.34
1.0D + 1.0W	6.15	0.00	25.23	0.00	0.00	555.26	0.00	0.19

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6/29/2016 3:47:49 PM

Customer: Verizon Wireless

Base Summary

Reactions

Original Design			Analysis			
Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment (kip-ft)	Axial (kip)	Shear (kip)	Moment Design %
2,449.00	19.50	28.70	2,012.85	33.47	22.14	60.88

Base Plate

Yield (ksi)	Thick (in)	Width (in)	Style	Poly Sides	Clip Len (in)	Effective Len (in)	Mu (kip-in)	Phi Mn (kip-in)	Ratio
60.0	2.500	62.000	Round	0	0.00	13.092	261.08	1104.66	0.24

Anchor Bolts

Bolt Circle	Num Bolts	Bolt Type	Bolt Dia (in)	Yield (ksi)	Ultimate (ksi)	Arrange	Cluster Dist (in)	Start Angle (deg)	Compression			Tension		
									Force (kip)	Allow (kip)	Ratio	Force (kip)	Allow (kip)	Ratio
56.00	12	2.25" 18J	2.25	75.00	100.00	Radial	0.00	0.0	146.56	260.00	0.58	140.99	260.00	0.56