



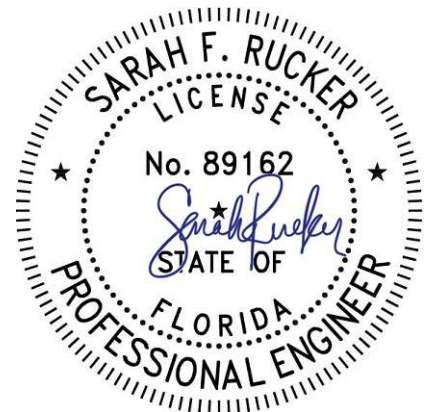
Structural Analysis Report

Structure : 190 ft Self Support Tower
ATC Asset Name : I-75 Exit 81
ATC Asset Number : 302825
Engineering Number : 14538915_C3_04
Proposed Carrier : VERIZON WIRELESS
Carrier Site Name : I75 HWY47
Carrier Site Number : 5000165925
Site Location : Route 10, Box 1010
Lake City, FL 32024-4356
30.1177° N, 82.6552° W
County : Columbia
Date : January 18, 2024
Max Usage : 37%
Analysis Result : Pass

Created By:

Daniel K. Sheek
Structural Engineer I

A handwritten signature in black ink, reading 'Daniel K. Sheek'.



This item has been electronically signed and sealed by Sarah F. Rucker, PE on the date shown using a digital signature.

Printed copies are not considered signed and sealed and the signature must be verified on any electronic copies.

Sarah
Rucker

Digitally signed by
Sarah Rucker
Date: 2024.01.22
07:57:14 -05'00'

COA: 9053

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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 190 ft Self Support tower to reflect the change in loading by VERIZON WIRELESS.

Supporting Documents

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:	119 mph (3-second gust)
Basic Wind Speed w/ Ice:	No Ice Considered
Code(s):	ANSI/TIA-222-H / 2021 IBC / 8th ED (2023) Florida Building Code
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Spectral Response:	$S_s = 0.12$, $S_i = 0.06$
Site Class:	D - Stiff Soil - Default

Conclusion

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

If you have any questions or require additional information, please reach out to your American Tower contact. If you do not have an American Tower contact and have an Engineering question, please contact **Engineering@americantower.com**. Please include the American Tower asset name, asset number, and engineering number in the subject line for any questions.

Structure Usages

Structural Component	Usage	Control	Location	Result
Leg	28.0%	Member X	Section 7	Pass
Diagonal	28.0%	Bolt Bear	Section 9	Pass
Horizontal	15.0%	Member Z	Section 10	Pass
Bolt	36.8%	-	Section 1	Pass
Serviceability Usage	2.7%	Deflection	Elevation 190 ft	Pass
Pier	29.2%	Axial [Soil]	Node 1	Pass
Pier	29.2%	Axial [Soil]	Node 1a	Pass
Pier	29.2%	Axial [Soil]	Node 1b	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Uplift (k)	Shear (k)
Self Support Base (Global)	3,417.5	58.8	-	33.5
Self Support Base (Local)	-	202.0	149.6	20.6

**Reactions shown are maximum overall and not limited by Load Case*

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

VERIZON WIRELESS Final Loading

Elev (ft)	Qty	Equipment	Lines
190.0	2	Raycap RVZDC-6627-PF-48	(2) 1 5/8" Hybriflex
	3	Light Sector Frame	
	4	Ericsson AIR 6419 N77G	
	4	Ericsson RRUS 4490	
	4	Ericsson RRUS 4890	
	8	JMA Wireless MX06FIT865-02	

Install proposed lines anywhere on tower.

Other Existing/Reserved Loading

No loading was considered in addition to the VERIZON WIRELESS Final Loading.



Standard Conditions

All engineering services performed by ATC Tower Services, LLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts, and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of ATC Tower Services, LLC

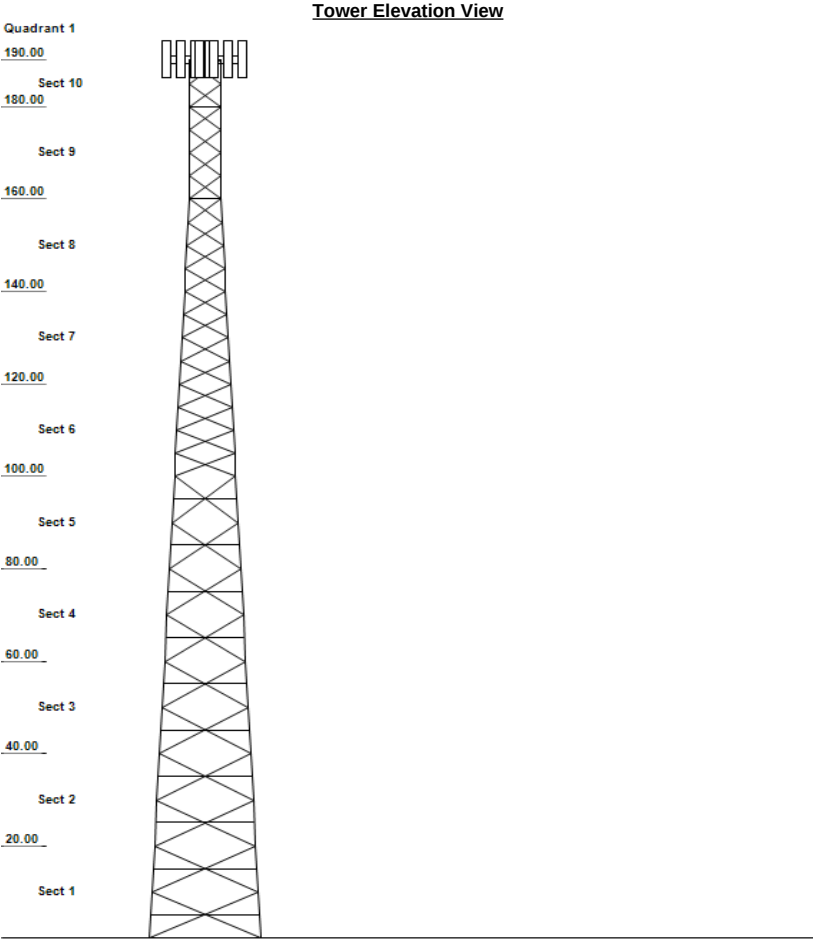
It is the responsibility of the client to ensure that the information provided to ATC Tower Services, LLC and used in the performance of our engineering services is correct and complete.

All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and ATC Tower Services, LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

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

ANALYSIS PARAMETERS			
Nominal Wind:	119 mph	Ice Wind:	0 mph w/ 0" ice
Risk Category:	II	Exposure:	C
Topo Category:	1	Topo Factor:	Method 1
Structure Height:	190 ft	Base Elevation:	0 ft
Base Width:	21.63 ft	Top Width:	6.3 ft
		Service Wind:	60 mph
		S _s :	0.120
		S ₁ :	0.058
		Topo Feature:	
		Shape:	Triangle



TOWER SECTION PROPERTIES			
Section	Leg Members	Diagonal Members	Horizontal Members
1	SOL 50 ksi 5" SOLID	SAE 44 ksi 4X4X0.5	
2	SOL 50 ksi 4 3/4" SOL	SAE 44 ksi 4X4X0.375	
3	SOL 50 ksi 4 1/2" SOL	SAE 44 ksi 4X4X0.375	
4	SOL 50 ksi 4 1/4" SOL	SAE 44 ksi 3.5X3.5X0.375	
5	SOL 50 ksi 4" SOLID	SAE 44 ksi 3.5X3.5X0.3125	
6	SOL 50 ksi 3 3/4" SOL	SAE 44 ksi 3X3X0.375	
7	SOL 50 ksi 3 1/4" SOL	SAE 44 ksi 2.5X2.5X0.25	
8	SOL 50 ksi 3" SOLID	SAE 44 ksi 2.5X2.5X0.25	SAE 44 ksi 2.5X2.5X0.25
9	SOL 50 ksi 2 1/2" SOL	SAE 44 ksi 2X2X0.25	SAE 44 ksi 2X2X0.25
10	SOL 50 ksi 2" SOLID	SAE 44 ksi 2X2X0.1875	SAE 44 ksi 2X2X0.1875

SECONDARY BRACING MEMBERS			
Section	Sub Horizontal 1	Sub Horizontal 2	Sub Horizontal 3
1 - 2	S3.5x3.5x0.25	-	-
3 - 4	S3X3X0.25	-	-
5	S2.5X2.5X0.25	-	-

DISCRETE APPURTENANCE		LINEAR APPURTENANCE	
Elev (ft)	Description	Elev To (ft)	Description
190.0	(8) JMA Wireless MX06FIT865-02	190.0	(2) 1 5/8" Hybriflex
190.0	(4) Ericsson RRUS 4490	190.0	(1) Waveguide
190.0	(4) Ericsson RRUS 4890	190.0	(1) Climbing Ladder
190.0	(4) Ericsson AIR 6419 N77G		
190.0	(3) Generic Flat Light Sector Fram		
190.0	(2) Raycap RVZDC-6627-PF-48		

GLOBAL BASE REACTIONS		
	DL+WL	DL+WL+IL
Moment (k-ft):	3417.53	0.11
Axial (k):	58.76	58.75
Shear (k):	33.48	0.00

INDIVIDUAL BASE REACTIONS	
Comp (k):	202.03
Uplift (k):	149.65
Shear (k):	20.59

ANALYSIS PARAMETERS					
Location:	Columbia County, FL	Height:	190 ft		
Type and Shape:	Self Support, Triangle	Base Elevation:	0.00 ft		
Manufacturer:	LeBlanc	Bottom Face Width:	21.63 ft		
Kd	0.85	Top Face Width:	6.30 ft		
Ke:	1.00				
ICE & WIND PARAMETERS					
Exposure Category:	C	Design Wind Speed Without Ice:	119 mph		
Risk Category:	II	Design Wind Speed with Ice:	0 mph		
Topographic Factor Procedure:	Method 1	Operational Windspeed:	60 mph		
Topographic Category:	Flat	Design Ice Thickness:	0.00 in		
Crest Height:	0 ft	HMSL:	68 ft		
SEISMIC PARAMETERS					
Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil	Period Based on Rayleigh Method (sec):	0.68		
T _L (sec):	8	P:	1.3	C _s :	0.043
S _s :	0.120	S ₁ :	0.058	C _{s, Max} :	0.045
F _a :	1.600	F _v :	2.400	C _{s, Min} :	0.030
S _{ds} :	0.128	S _{d1} :	0.093		
LOAD CASES					
1.2D + 1.0W Normal	1.2D + 1.0W Normal - 119 mph Wind with No Ice				
1.2D + 1.0W 60°	1.2D + 1.0W 60° - 119 mph Wind with No Ice				
1.2D + 1.0W 90°	1.2D + 1.0W 90° - 119 mph Wind with No Ice				
1.2D + 1.0W 120°	1.2D + 1.0W 120° - 119 mph Wind with No Ice				
1.2D + 1.0W 180°	1.2D + 1.0W 180° - 119 mph Wind with No Ice				
1.2D + 1.0W 210°	1.2D + 1.0W 210° - 119 mph Wind with No Ice				
1.2D + 1.0W 240°	1.2D + 1.0W 240° - 119 mph Wind with No Ice				
1.2D + 1.0W 300°	1.2D + 1.0W 300° - 119 mph Wind with No Ice				
1.2D + 1.0W 330°	1.2D + 1.0W 330° - 119 mph Wind with No Ice				
0.9D + 1.0W Normal	0.9D + 1.0W Normal - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 60°	0.9D + 1.0W 60° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 90°	0.9D + 1.0W 90° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 120°	0.9D + 1.0W 120° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 180°	0.9D + 1.0W 180° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 210°	0.9D + 1.0W 210° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 240°	0.9D + 1.0W 240° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 300°	0.9D + 1.0W 300° - 119 mph Wind with No Ice (Reduced DL)				
0.9D + 1.0W 330°	0.9D + 1.0W 330° - 119 mph Wind with No Ice (Reduced DL)				
1.2D + 1.0Di + 1.0Wi Normal	1.2D + 1.0Di + 1.0Wi Normal - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 60°	1.2D + 1.0Di + 1.0Wi 60° - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 90°	1.2D + 1.0Di + 1.0Wi 90° - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 120°	1.2D + 1.0Di + 1.0Wi 120° - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 180°	1.2D + 1.0Di + 1.0Wi 180° - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 210°	1.2D + 1.0Di + 1.0Wi 210° - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 240°	1.2D + 1.0Di + 1.0Wi 240° - 0 mph Wind with 0" Radial Ice				
1.2D + 1.0Di + 1.0Wi 300°	1.2D + 1.0Di + 1.0Wi 300° - 0 mph Wind with 0" Radial Ice				

LOAD CASES	
1.2D + 1.0Di + 1.0Wi 330°	1.2D + 1.0Di + 1.0Wi 330° - 0 mph Wind with 0" Radial Ice
1.2D + 1.0Ev + 1.0Eh Normal	1.2D + 1.0Ev + 1.0Eh Normal - Seismic
1.2D + 1.0Ev + 1.0Eh 60°	1.2D + 1.0Ev + 1.0Eh 60° - Seismic
1.2D + 1.0Ev + 1.0Eh 90°	1.2D + 1.0Ev + 1.0Eh 90° - Seismic
1.2D + 1.0Ev + 1.0Eh 120°	1.2D + 1.0Ev + 1.0Eh 120° - Seismic
1.2D + 1.0Ev + 1.0Eh 180°	1.2D + 1.0Ev + 1.0Eh 180° - Seismic
1.2D + 1.0Ev + 1.0Eh 210°	1.2D + 1.0Ev + 1.0Eh 210° - Seismic
1.2D + 1.0Ev + 1.0Eh 240°	1.2D + 1.0Ev + 1.0Eh 240° - Seismic
1.2D + 1.0Ev + 1.0Eh 300°	1.2D + 1.0Ev + 1.0Eh 300° - Seismic
1.2D + 1.0Ev + 1.0Eh 330°	1.2D + 1.0Ev + 1.0Eh 330° - Seismic
0.9D - 1.0Ev + 1.0Eh Normal	0.9D - 1.0Ev + 1.0Eh Normal - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 60°	0.9D - 1.0Ev + 1.0Eh 60° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 90°	0.9D - 1.0Ev + 1.0Eh 90° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 120°	0.9D - 1.0Ev + 1.0Eh 120° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 180°	0.9D - 1.0Ev + 1.0Eh 180° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 210°	0.9D - 1.0Ev + 1.0Eh 210° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 240°	0.9D - 1.0Ev + 1.0Eh 240° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 300°	0.9D - 1.0Ev + 1.0Eh 300° - Seismic (Reduced DL)
0.9D - 1.0Ev + 1.0Eh 330°	0.9D - 1.0Ev + 1.0Eh 330° - Seismic (Reduced DL)
1.0D + 1.0W Service Normal	1.0D + 1.0W Service Normal - 60 mph Wind with No Ice
1.0D + 1.0W Service 60°	1.0D + 1.0W Service 60° - 60 mph Wind with No Ice
1.0D + 1.0W Service 90°	1.0D + 1.0W Service 90° - 60 mph Wind with No Ice
1.0D + 1.0W Service 120°	1.0D + 1.0W Service 120° - 60 mph Wind with No Ice
1.0D + 1.0W Service 180°	1.0D + 1.0W Service 180° - 60 mph Wind with No Ice
1.0D + 1.0W Service 210°	1.0D + 1.0W Service 210° - 60 mph Wind with No Ice
1.0D + 1.0W Service 240°	1.0D + 1.0W Service 240° - 60 mph Wind with No Ice
1.0D + 1.0W Service 300°	1.0D + 1.0W Service 300° - 60 mph Wind with No Ice
1.0D + 1.0W Service 330°	1.0D + 1.0W Service 330° - 60 mph Wind with No Ice

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

TOWER LOADING – DISCRETE APPURTENANCE

Discrete Appurtenance Properties for LC: 1.2D + 1.0W

Elev (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)
190.0	Ericsson RRUS 4490	4	68	2.7	1.7	15.7	7.0	0.80	0.67	0.0	0.00	44.53	219	328
190.0	Ericsson RRUS 4890	4	70	2.7	1.7	15.7	7.2	0.80	0.67	0.0	0.00	44.53	219	334
190.0	Raycap RVZDC-6627-PF-48	2	32	3.8	2.4	15.7	10.3	0.80	0.77	0.0	0.00	44.53	176	77
190.0	Ericsson AIR 6419 N77G	4	70	3.9	2.5	15.7	6.7	0.80	0.63	0.0	0.00	44.53	300	336
190.0	JMA Wireless MX06FIT865-02	8	50	11.4	8.0	11.9	10.7	0.80	0.76	0.0	0.00	44.53	2093	480
190.0	Generic Flat Light Sector Fram	3	800	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	44.53	1143	2880
Totals		25	3,696	189.5									4,150	4,435

Discrete Appurtenance Properties for LC: 0.9D + 1.0W

Elev (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)
190.0	Ericsson RRUS 4490	4	68	2.7	1.7	15.7	7.0	0.80	0.67	0.0	0.00	44.53	219	246
190.0	Ericsson RRUS 4890	4	70	2.7	1.7	15.7	7.2	0.80	0.67	0.0	0.00	44.53	219	250
190.0	Raycap RVZDC-6627-PF-48	2	32	3.8	2.4	15.7	10.3	0.80	0.77	0.0	0.00	44.53	176	58
190.0	Ericsson AIR 6419 N77G	4	70	3.9	2.5	15.7	6.7	0.80	0.63	0.0	0.00	44.53	300	252
190.0	JMA Wireless MX06FIT865-02	8	50	11.4	8.0	11.9	10.7	0.80	0.76	0.0	0.00	44.53	2093	360
190.0	Generic Flat Light Sector Fram	3	800	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	44.53	1143	2160
Totals		25	3,696	189.5									4,150	3,326

Discrete Appurtenance Properties for LC: 1.2D + 1.0Di + 1.0Wi

Elev (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)
190.0	Ericsson RRUS 4490	4	68	2.7	1.7	15.7	7.0	0.80	0.67	0.0	0.00	0.00	0	328
190.0	Ericsson RRUS 4890	4	70	2.7	1.7	15.7	7.2	0.80	0.67	0.0	0.00	0.00	0	334
190.0	Raycap RVZDC-6627-PF-48	2	32	3.8	2.4	15.7	10.3	0.80	0.77	0.0	0.00	0.00	0	77
190.0	Ericsson AIR 6419 N77G	4	70	3.9	2.5	15.7	6.7	0.80	0.63	0.0	0.00	0.00	0	336
190.0	JMA Wireless MX06FIT865-02	8	50	11.4	8.0	11.9	10.7	0.80	0.76	0.0	0.00	0.00	0	480
190.0	Generic Flat Light Sector Fram	3	800	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	0.00	0	2880
Totals		25	3,696	189.5									0	4,435

Discrete Appurtenance Properties for LC: 1.0D + 1.0Wi Service

Elev (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)
190.0	Ericsson RRUS 4490	4	68	2.7	1.7	15.7	7.0	0.80	0.67	0.0	0.00	11.32	56	274
190.0	Ericsson RRUS 4890	4	70	2.7	1.7	15.7	7.2	0.80	0.67	0.0	0.00	11.32	56	278
190.0	Raycap RVZDC-6627-PF-48	2	32	3.8	2.4	15.7	10.3	0.80	0.77	0.0	0.00	11.32	45	64
190.0	Ericsson AIR 6419 N77G	4	70	3.9	2.5	15.7	6.7	0.80	0.63	0.0	0.00	11.32	76	280
190.0	JMA Wireless MX06FIT865-02	8	50	11.4	8.0	11.9	10.7	0.80	0.76	0.0	0.00	11.32	532	400
190.0	Generic Flat Light Sector Fram	3	800	17.9	0.0	0.0	0.0	0.75	0.75	0.0	0.00	11.32	291	2400
Totals		25	3,696	189.5									1,055	3,696

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

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TOWER LOADING – LINEAR APPURTENANCE

Linear Appurtenance Properties

Elev From (ft)	Elev To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	% In Wind	Spread On Faces	Bundling	Cluster Dia (in)	Out of Zone	Spacing (in)	Orient. Factor	K _a Override
0.0	190.0	1 5/8" Hybriflex	2	1.98	1.30	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	190.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	190.0	Climbing Ladder	1	2.00	6.90	100	1	Individual	0.00	N	1.00	1.00	0.00

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SECTION FORCES

1.2D + 1.0W 180°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.80	1.00	0.0	41.80	117.48	0.00	10286	0	2609	283	2892
Totals														54,322	0			25,370

1.2D + 1.0W 210°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	909	0	755	240	994
9	170	43.50	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	2386	0	1479	472	1950
8	150	42.37	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	3241	0	1838	459	2298
7	130	41.11	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	3642	0	2000	446	2445
6	110	39.69	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.16	74.29	0.00	5605	0	2510	430	2940
5	90	38.05	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	27.90	78.29	0.00	5540	0	2532	412	2945
4	70	36.09	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.55	88.84	0.00	6578	0	2725	391	3116
3	50	33.62	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.13	103.94	0.00	7632	0	2970	364	3335
2	30	30.19	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.65	116.57	0.00	8503	0	2992	327	3319
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	43.90	123.40	0.00	10286	0	2740	283	3024
Totals														54,322	0			26,366

1.2D + 1.0W 240°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	1.00	1.00	0.0	8.16	22.66	0.00	909	0	853	240	1093
9	170	43.50	11.455	8.333	0.00	0.152	2.76	1.00	1.00	0.0	16.19	44.74	0.00	2386	0	1654	472	2126
8	150	42.37	15.540	10.015	0.00	0.170	2.70	1.00	1.00	0.0	21.25	57.34	0.00	3241	0	2065	459	2524
7	130	41.11	16.961	10.850	0.00	0.147	2.78	1.00	1.00	0.0	23.12	64.30	0.00	3642	0	2247	446	2693
6	110	39.69	23.707	12.519	0.00	0.159	2.74	1.00	1.00	0.0	30.71	84.13	0.00	5605	0	2838	430	3269
5	90	38.05	24.164	13.354	0.00	0.141	2.81	1.00	1.00	0.0	31.52	88.46	0.00	5540	0	2861	412	3274
4	70	36.09	27.997	14.188	0.00	0.138	2.82	1.00	1.00	0.0	35.75	100.67	0.00	6578	0	3088	391	3479
3	50	33.62	34.023	15.023	0.00	0.142	2.80	1.00	1.00	0.0	42.23	118.23	0.00	7632	0	3379	364	3743
2	30	30.19	38.742	15.858	0.00	0.142	2.80	1.00	1.00	0.0	47.46	132.84	0.00	8503	0	3409	327	3736
1	10	26.13	42.118	16.692	0.00	0.139	2.81	1.00	1.00	0.0	50.22	141.15	0.00	10286	0	3135	283	3418
Totals														54,322	0			29,355

1.2D + 1.0W 300°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	0.80	1.00	0.0	6.90	19.18	0.00	909	0	722	240	962
9	170	43.50	11.455	8.333	0.00	0.152	2.76	0.80	1.00	0.0	13.90	38.41	0.00	2386	0	1420	472	1892
8	150	42.37	15.540	10.015	0.00	0.170	2.70	0.80	1.00	0.0	18.14	48.95	0.00	3241	0	1763	459	2222
7	130	41.11	16.961	10.850	0.00	0.147	2.78	0.80	1.00	0.0	19.72	54.87	0.00	3642	0	1917	446	2363
6	110	39.69	23.707	12.519	0.00	0.159	2.74	0.80	1.00	0.0	25.97	71.14	0.00	5605	0	2400	430	2830
5	90	38.05	24.164	13.354	0.00	0.141	2.81	0.80	1.00	0.0	26.69	74.90	0.00	5540	0	2422	412	2835
4	70	36.09	27.997	14.188	0.00	0.138	2.82	0.80	1.00	0.0	30.15	84.90	0.00	6578	0	2604	391	2996
3	50	33.62	34.023	15.023	0.00	0.142	2.80	0.80	1.00	0.0	35.43	99.18	0.00	7632	0	2834	364	3199
2	30	30.19	38.742	15.858	0.00	0.142	2.80	0.80	1.00	0.0	39.71	111.15	0.00	8503	0	2853	327	3180
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.80	1.00	0.0	41.80	117.48	0.00	10286	0	2609	283	2892
Totals														54,322	0			25,370

1.2D + 1.0W 330°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	909	0	755	240	994
9	170	43.50	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	2386	0	1479	472	1950
8	150	42.37	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	3241	0	1838	459	2298
7	130	41.11	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	3642	0	2000	446	2445
6	110	39.69	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.16	74.39	0.00	5605	0	2510	430	2940
5	90	38.05	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	27.90	78.29	0.00	5540	0	2532	412	2945
4	70	36.09	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.55	88.84	0.00	6578	0	2725	391	3116
3	50	33.62	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.13	103.94	0.00	7632	0	2970	364	3335
2	30	30.19	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.65	116.57	0.00	8503	0	2992	327	3319
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	43.90	123.40	0.00	10286	0	2740	283	3024
Totals														54,322	0			26,366

0.9D + 1.0W Normal

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	1.00	1.00	0.0	8.16	22.66	0.00	682	0	853	240	1093

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

SECTION FORCES

0.9D + 1.0W 180°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
Totals														40,741	0			25,370

0.9D + 1.0W 210°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	682	0	755	240	994
9	170	43.50	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	1789	0	1479	472	1950
8	150	42.37	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	2431	0	1838	459	2298
7	130	41.11	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	2731	0	2000	446	2445
6	110	39.69	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.16	74.39	0.00	4204	0	2510	430	2940
5	90	38.05	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	27.90	78.29	0.00	4155	0	2532	412	2945
4	70	36.09	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.55	88.84	0.00	4933	0	2725	391	3116
3	50	33.62	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.13	103.94	0.00	5724	0	2970	364	3335
2	30	30.19	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.65	116.57	0.00	6377	0	2992	327	3319
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	43.90	123.40	0.00	7714	0	2740	283	3024
Totals														40,741	0			26,366

0.9D + 1.0W 240°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	1.00	1.00	0.0	8.16	22.66	0.00	682	0	853	240	1093
9	170	43.50	11.455	8.333	0.00	0.152	2.76	1.00	1.00	0.0	16.19	44.74	0.00	1789	0	1654	472	2126
8	150	42.37	15.540	10.015	0.00	0.170	2.70	1.00	1.00	0.0	21.25	57.34	0.00	2431	0	2065	459	2524
7	130	41.11	16.961	10.850	0.00	0.147	2.78	1.00	1.00	0.0	23.12	64.30	0.00	2731	0	2247	446	2693
6	110	39.69	23.707	12.519	0.00	0.159	2.74	1.00	1.00	0.0	30.71	84.13	0.00	4204	0	2838	430	3269
5	90	38.05	24.164	13.354	0.00	0.141	2.81	1.00	1.00	0.0	31.52	88.46	0.00	4155	0	2861	412	3274
4	70	36.09	27.997	14.188	0.00	0.138	2.82	1.00	1.00	0.0	35.75	100.67	0.00	4933	0	3088	391	3479
3	50	33.62	34.023	15.023	0.00	0.142	2.80	1.00	1.00	0.0	42.23	118.23	0.00	5724	0	3379	364	3743
2	30	30.19	38.742	15.858	0.00	0.142	2.80	1.00	1.00	0.0	47.46	132.84	0.00	6377	0	3409	327	3736
1	10	26.13	42.118	16.692	0.00	0.139	2.81	1.00	1.00	0.0	50.22	141.15	0.00	7714	0	3135	283	3418
Totals														40,741	0			29,355

0.9D + 1.0W 300°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	0.80	1.00	0.0	6.90	19.18	0.00	682	0	722	240	962
9	170	43.50	11.455	8.333	0.00	0.152	2.76	0.80	1.00	0.0	13.90	38.41	0.00	1789	0	1420	472	1892
8	150	42.37	15.540	10.015	0.00	0.170	2.70	0.80	1.00	0.0	18.14	48.95	0.00	2431	0	1763	459	2222
7	130	41.11	16.961	10.850	0.00	0.147	2.78	0.80	1.00	0.0	19.72	54.87	0.00	2731	0	1917	446	2363
6	110	39.69	23.707	12.519	0.00	0.159	2.74	0.80	1.00	0.0	25.97	71.14	0.00	4204	0	2400	430	2830
5	90	38.05	24.164	13.354	0.00	0.141	2.81	0.80	1.00	0.0	26.69	74.90	0.00	4155	0	2422	412	2835
4	70	36.09	27.997	14.188	0.00	0.138	2.82	0.80	1.00	0.0	30.15	84.90	0.00	4933	0	2604	391	2996
3	50	33.62	34.023	15.023	0.00	0.142	2.80	0.80	1.00	0.0	35.43	99.18	0.00	5724	0	2834	364	3199
2	30	30.19	38.742	15.858	0.00	0.142	2.80	0.80	1.00	0.0	39.71	111.15	0.00	6377	0	2853	327	3180
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.80	1.00	0.0	41.80	117.48	0.00	7714	0	2609	283	2892
Totals														40,741	0			25,370

0.9D + 1.0W 330°

Gust Response Factor (Gh): 0.85

119 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	44.28	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	682	0	755	240	994
9	170	43.50	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	1789	0	1479	472	1950
8	150	42.37	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	2431	0	1838	459	2298
7	130	41.11	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	2731	0	2000	446	2445
6	110	39.69	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.16	74.39	0.00	4204	0	2510	430	2940
5	90	38.05	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	27.90	78.29	0.00	4155	0	2532	412	2945
4	70	36.09	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.55	88.84	0.00	4933	0	2725	391	3116
3	50	33.62	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.13	103.94	0.00	5724	0	2970	364	3335
2	30	30.19	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.65	116.57	0.00	6377	0	2992	327	3319
1	10	26.13	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	43.90	123.40	0.00	7714	0	2740	283	3024
Totals														40,741	0			26,366

1.2D + 1.0Di + 1.0Wi Normal

Gust Response Factor (Gh): 0.85

0 mph Wind with 0" Radial Ice

Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00

Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	0.00	6.266	3.333	0.00	0.148	2.78	1.00	1.00	0.0	8.16	22.66	0.00	909	0	0	0	0
9	170	0.00	11.455	8.333	0.00	0.152	2.76	1.00	1.00	0.0	16.19	44.74	0.00	2386	0	0	0	0

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

SECTION FORCES

1.2D + 1.0Di + 1.0Wi Normal
0 mph Wind with 0" Radial Ice

Gust Response Factor (Gh): 0.85
Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00
Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
8	150	0.00	15.540	10.015	0.00	0.170	2.70	1.00	1.00	0.0	21.25	57.34	0.00	3241	0	0	0	0
7	130	0.00	16.961	10.850	0.00	0.147	2.78	1.00	1.00	0.0	23.12	64.30	0.00	3642	0	0	0	0
6	110	0.00	23.707	12.519	0.00	0.159	2.74	1.00	1.00	0.0	30.82	84.43	0.00	5605	0	0	0	0
5	90	0.00	24.164	13.354	0.00	0.141	2.81	1.00	1.00	0.0	31.73	89.05	0.00	5540	0	0	0	0
4	70	0.00	27.997	14.188	0.00	0.138	2.82	1.00	1.00	0.0	36.03	101.47	0.00	6578	0	0	0	0
3	50	0.00	34.023	15.023	0.00	0.142	2.80	1.00	1.00	0.0	42.54	119.08	0.00	7632	0	0	0	0
2	30	0.00	38.742	15.858	0.00	0.142	2.80	1.00	1.00	0.0	47.73	133.60	0.00	8503	0	0	0	0
1	10	0.00	42.118	16.692	0.00	0.139	2.81	1.00	1.00	0.0	51.57	144.96	0.00	10286	0	0	0	0
Totals															54,322	0		0

1.2D + 1.0Di + 1.0Wi 60°
0 mph Wind with 0" Radial Ice

Gust Response Factor (Gh): 0.85
Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00
Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	0.00	6.266	3.333	0.00	0.148	2.78	0.80	1.00	0.0	6.90	19.18	0.00	909	0	0	0	0
9	170	0.00	11.455	8.333	0.00	0.152	2.76	0.80	1.00	0.0	13.90	38.41	0.00	2386	0	0	0	0
8	150	0.00	15.540	10.015	0.00	0.170	2.70	0.80	1.00	0.0	18.14	48.95	0.00	3241	0	0	0	0
7	130	0.00	16.961	10.850	0.00	0.147	2.78	0.80	1.00	0.0	19.72	54.87	0.00	3642	0	0	0	0
6	110	0.00	23.707	12.519	0.00	0.159	2.74	0.80	1.00	0.0	26.08	71.45	0.00	5605	0	0	0	0
5	90	0.00	24.164	13.354	0.00	0.141	2.81	0.80	1.00	0.0	26.90	75.48	0.00	5540	0	0	0	0
4	70	0.00	27.997	14.188	0.00	0.138	2.82	0.80	1.00	0.0	30.43	85.70	0.00	6578	0	0	0	0
3	50	0.00	34.023	15.023	0.00	0.142	2.80	0.80	1.00	0.0	35.73	100.04	0.00	7632	0	0	0	0
2	30	0.00	38.742	15.858	0.00	0.142	2.80	0.80	1.00	0.0	39.98	111.91	0.00	8503	0	0	0	0
1	10	0.00	42.118	16.692	0.00	0.139	2.81	0.80	1.00	0.0	43.15	121.29	0.00	10286	0	0	0	0
Totals															54,322	0		0

1.2D + 1.0Di + 1.0Wi 90°
0 mph Wind with 0" Radial Ice

Gust Response Factor (Gh): 0.85
Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00
Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	0.00	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	909	0	0	0	0
9	170	0.00	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	2386	0	0	0	0
8	150	0.00	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	3241	0	0	0	0
7	130	0.00	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	3642	0	0	0	0
6	110	0.00	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.27	74.69	0.00	5605	0	0	0	0
5	90	0.00	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	28.11	78.88	0.00	5540	0	0	0	0
4	70	0.00	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.83	89.64	0.00	6578	0	0	0	0
3	50	0.00	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.44	104.80	0.00	7632	0	0	0	0
2	30	0.00	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.92	117.34	0.00	8503	0	0	0	0
1	10	0.00	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	45.26	127.21	0.00	10286	0	0	0	0
Totals															54,322	0		0

1.2D + 1.0Di + 1.0Wi 120°
0 mph Wind with 0" Radial Ice

Gust Response Factor (Gh): 0.85
Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00
Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	0.00	6.266	3.333	0.00	0.148	2.78	1.00	1.00	0.0	8.16	22.66	0.00	909	0	0	0	0
9	170	0.00	11.455	8.333	0.00	0.152	2.76	1.00	1.00	0.0	16.19	44.74	0.00	2386	0	0	0	0
8	150	0.00	15.540	10.015	0.00	0.170	2.70	1.00	1.00	0.0	21.25	57.34	0.00	3241	0	0	0	0
7	130	0.00	16.961	10.850	0.00	0.147	2.78	1.00	1.00	0.0	23.12	64.30	0.00	3642	0	0	0	0
6	110	0.00	23.707	12.519	0.00	0.159	2.74	1.00	1.00	0.0	30.82	84.43	0.00	5605	0	0	0	0
5	90	0.00	24.164	13.354	0.00	0.141	2.81	1.00	1.00	0.0	31.73	89.05	0.00	5540	0	0	0	0
4	70	0.00	27.997	14.188	0.00	0.138	2.82	1.00	1.00	0.0	36.03	101.47	0.00	6578	0	0	0	0
3	50	0.00	34.023	15.023	0.00	0.142	2.80	1.00	1.00	0.0	42.54	119.08	0.00	7632	0	0	0	0
2	30	0.00	38.742	15.858	0.00	0.142	2.80	1.00	1.00	0.0	47.73	133.60	0.00	8503	0	0	0	0
1	10	0.00	42.118	16.692	0.00	0.139	2.81	1.00	1.00	0.0	51.57	144.96	0.00	10286	0	0	0	0
Totals															54,322	0		0

1.2D + 1.0Di + 1.0Wi 180°
0 mph Wind with 0" Radial Ice

Gust Response Factor (Gh): 0.85
Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00
Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _r	D _r	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	0.00	6.266	3.333	0.00	0.148	2.78	0.80	1.00	0.0	6.90	19.18	0.00	909	0	0	0	0
9	170	0.00	11.455	8.333	0.00	0.152	2.76	0.80	1.00	0.0	13.90	38.41	0.00	2386	0	0	0	0
8	150	0.00	15.540	10.015	0.00	0.170	2.70	0.80	1.00	0.0	18.14	48.95	0.00	3241	0	0	0	0
7	130	0.00	16.961	10.850	0.00	0.147	2.78	0.80	1.00	0.0	19.72	54.87	0.00	3642	0	0	0	0
6	110	0.00	23.707	12.519	0.00	0.159	2.74	0.80	1.00	0.0	26.08	71.45	0.00	5605	0	0	0	0
5	90	0.00	24.164	13.354	0.00	0.141	2.81	0.80	1.00	0.0	26.90	75.48	0.00	5540	0	0	0	0
4	70	0.00	27.997	14.188	0.00	0.138	2.82	0.80	1.00	0.0	30.43	85.70	0.00	6578	0	0	0	0
3	50	0.00	34.023	15.023	0.00	0.142	2.80	0.80	1.00	0.0	35.73	100.04	0.00	7632	0	0	0	0
2	30	0.00	38.742	15.858	0.00	0.142	2.80	0.80	1.00	0.0	39.98	111.91	0.00	8503	0	0	0	0
1	10	0.00	42.118	16.692	0.00	0.139	2.81	0.80	1.00	0.0	43.15	121.29	0.00	10286	0	0	0	0
Totals															54,322	0		0

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

SECTION FORCES

1.0D + 1.0W Service 210°

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _f	D _f	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	11.26	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	757	0	192	61	253
9	170	11.06	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	1988	0	376	120	496
8	150	10.77	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	2701	0	467	117	584
7	130	10.45	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	3035	0	508	113	622
6	110	10.09	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.27	74.69	0.00	4671	0	641	109	750
5	90	9.67	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	28.11	78.88	0.00	4617	0	649	105	753
4	70	9.17	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.83	89.64	0.00	5482	0	699	99	799
3	50	8.55	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.44	104.80	0.00	6360	0	761	93	854
2	30	7.68	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.92	117.34	0.00	7086	0	766	83	849
1	10	6.64	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	45.26	127.21	0.00	8571	0	718	72	790
Totals															45,268	0		6,749

1.0D + 1.0W Service 240°

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _f	D _f	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	11.26	6.266	3.333	0.00	0.148	2.78	1.00	1.00	0.0	8.16	22.66	0.00	757	0	217	61	278
9	170	11.06	11.455	8.333	0.00	0.152	2.76	1.00	1.00	0.0	16.19	44.74	0.00	1988	0	421	120	540
8	150	10.77	15.540	10.015	0.00	0.170	2.70	1.00	1.00	0.0	21.25	57.34	0.00	2701	0	525	117	642
7	130	10.45	16.961	10.850	0.00	0.147	2.78	1.00	1.00	0.0	23.12	64.30	0.00	3035	0	571	113	685
6	110	10.09	23.707	12.519	0.00	0.159	2.74	1.00	1.00	0.0	30.82	84.43	0.00	4671	0	724	109	834
5	90	9.67	24.164	13.354	0.00	0.141	2.81	1.00	1.00	0.0	31.73	89.05	0.00	4617	0	732	105	837
4	70	9.17	27.997	14.188	0.00	0.138	2.82	1.00	1.00	0.0	36.03	101.47	0.00	5482	0	791	99	891
3	50	8.55	34.023	15.023	0.00	0.142	2.80	1.00	1.00	0.0	42.54	119.08	0.00	6360	0	865	93	958
2	30	7.68	38.742	15.858	0.00	0.142	2.80	1.00	1.00	0.0	47.73	133.60	0.00	7086	0	872	83	955
1	10	6.64	42.118	16.692	0.00	0.139	2.81	1.00	1.00	0.0	51.57	144.96	0.00	8571	0	818	72	890
Totals															45,268	0		7,509

1.0D + 1.0W Service 300°

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _f	D _f	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	11.26	6.266	3.333	0.00	0.148	2.78	0.80	1.00	0.0	6.90	19.18	0.00	757	0	183	61	244
9	170	11.06	11.455	8.333	0.00	0.152	2.76	0.80	1.00	0.0	13.90	38.41	0.00	1988	0	361	120	481
8	150	10.77	15.540	10.015	0.00	0.170	2.70	0.80	1.00	0.0	18.14	48.95	0.00	2701	0	448	117	565
7	130	10.45	16.961	10.850	0.00	0.147	2.78	0.80	1.00	0.0	19.72	54.87	0.00	3035	0	487	113	601
6	110	10.09	23.707	12.519	0.00	0.159	2.74	0.80	1.00	0.0	26.08	71.45	0.00	4671	0	613	109	722
5	90	9.67	24.164	13.354	0.00	0.141	2.81	0.80	1.00	0.0	26.90	75.48	0.00	4617	0	621	105	725
4	70	9.17	27.997	14.188	0.00	0.138	2.82	0.80	1.00	0.0	30.43	85.70	0.00	5482	0	668	99	768
3	50	8.55	34.023	15.023	0.00	0.142	2.80	0.80	1.00	0.0	35.73	100.04	0.00	6360	0	727	93	819
2	30	7.68	38.742	15.858	0.00	0.142	2.80	0.80	1.00	0.0	39.98	111.91	0.00	7086	0	730	83	813
1	10	6.64	42.118	16.692	0.00	0.139	2.81	0.80	1.00	0.0	43.15	121.29	0.00	8571	0	685	72	757
Totals															45,268	0		6,496

1.0D + 1.0W Service 330°

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q _Z (psf)	A _r (sf)	A _r (sf)	Ice A _r (sf)	e	C _f	D _f	D _r	T _{iz} (in)	A _e (sf)	EPA _a (sf)	EPA _{ai} (sf)	Wt (lb)	Ice Wt (lb)	F _{st} (lb)	F _a (lb)	Force (lb)
10	185	11.26	6.266	3.333	0.00	0.148	2.78	0.85	1.00	0.0	7.22	20.05	0.00	757	0	192	61	253
9	170	11.06	11.455	8.333	0.00	0.152	2.76	0.85	1.00	0.0	14.47	39.99	0.00	1988	0	376	120	496
8	150	10.77	15.540	10.015	0.00	0.170	2.70	0.85	1.00	0.0	18.92	51.05	0.00	2701	0	467	117	584
7	130	10.45	16.961	10.850	0.00	0.147	2.78	0.85	1.00	0.0	20.57	57.22	0.00	3035	0	508	113	622
6	110	10.09	23.707	12.519	0.00	0.159	2.74	0.85	1.00	0.0	27.27	74.69	0.00	4671	0	641	109	750
5	90	9.67	24.164	13.354	0.00	0.141	2.81	0.85	1.00	0.0	28.11	78.88	0.00	4617	0	649	105	753
4	70	9.17	27.997	14.188	0.00	0.138	2.82	0.85	1.00	0.0	31.83	89.64	0.00	5482	0	699	99	799
3	50	8.55	34.023	15.023	0.00	0.142	2.80	0.85	1.00	0.0	37.44	104.80	0.00	6360	0	761	93	854
2	30	7.68	38.742	15.858	0.00	0.142	2.80	0.85	1.00	0.0	41.92	117.34	0.00	7086	0	766	83	849
1	10	6.64	42.118	16.692	0.00	0.139	2.81	0.85	1.00	0.0	45.26	127.21	0.00	8571	0	718	72	790
Totals															45,268	0		6,749

EQUIVALENT LATERAL FORCE METHOD	
Spectral Response Acceleration for Short Period (S _S):	0.12
Spectral Response Acceleration at 1.0 Second Period (S ₁):	0.06
Long-Period Transition Period (T _L – Seconds):	8
Importance Factor (I _e):	1.00
Site Coefficient F _a :	1.60
Site Coefficient F _v :	2.40
Response Modification Coefficient (R):	3.00
Design Spectral Response Acceleration at Short Period (S _{ds}):	0.13
Design Spectral Response Acceleration at 1.0 Second Period (S _{d1}):	0.09
Seismic Response Coefficient (C _s):	0.04
Upper Limit C _s :	0.04
Lower Limit C _s :	0.03
Period based on Rayleigh Method (sec):	0.68
Redundancy Factor (p):	1.30
Seismic Force Distribution Exponent (k):	1.09
Total Unfactored Dead Load:	48.96 k
Seismic Base Shear (E):	2.72 k

SEISMIC FORCES						
0.9D - 1.0Ev + 1.0Eh						
Section/Appurtenance	Height Above Base (ft)	Weight (lb)	W ₂ (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
10	185.00	757	224,994	0.038	102	662
9	170.00	1,988	538,653	0.090	245	1,739
8	150.00	2,701	638,273	0.107	290	2,361
7	130.00	3,035	613,630	0.103	279	2,654
6	110.00	4,671	787,101	0.132	358	4,084
5	90.00	4,617	625,070	0.105	284	4,037
4	70.00	5,482	564,195	0.094	257	4,793
3	50.00	6,360	453,540	0.076	206	5,562
2	30.00	7,086	289,424	0.048	132	6,196
1	10.00	8,571	105,629	0.018	48	7,495
Ericsson RRUS 4490	190.00	274	83,683	0.014	38	239
Ericsson RRUS 4890	190.00	278	85,029	0.014	39	243
Raycap RVZDC-6627-PF-48	190.00	64	19,575	0.003	9	56
Ericsson AIR 6419 N77G	190.00	280	85,641	0.014	39	245
JMA Wireless MX06FIT865-02	190.00	400	122,344	0.020	56	350
Generic Flat Light Sector Frame	190.00	2,400	734,065	0.123	334	2,099
Totals		48,964	5,970,847	1.000	2,716	42,814

1.2D + 1.0Ev + 1.0Eh						
Section/Appurtenance	Height Above Base (ft)	Weight (lb)	W ₂ (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
10	185.00	757	224,994	0.038	102	928
9	170.00	1,988	538,653	0.090	245	2,437
8	150.00	2,701	638,273	0.107	290	3,310
7	130.00	3,035	613,630	0.103	279	3,720
6	110.00	4,671	787,101	0.132	358	5,725
5	90.00	4,617	625,070	0.105	284	5,659
4	70.00	5,482	564,195	0.094	257	6,718
3	50.00	6,360	453,540	0.076	206	7,795
2	30.00	7,086	289,424	0.048	132	8,684
1	10.00	8,571	105,629	0.018	48	10,505
Ericsson RRUS 4490	190.00	274	83,683	0.014	38	335
Ericsson RRUS 4890	190.00	278	85,029	0.014	39	341
Raycap RVZDC-6627-PF-48	190.00	64	19,575	0.003	9	78
Ericsson AIR 6419 N77G	190.00	280	85,641	0.014	39	343
JMA Wireless MX06FIT865-02	190.00	400	122,344	0.020	56	490
Generic Flat Light Sector Frame	190.00	2,400	734,065	0.123	334	2,941
Totals		48,964	5,970,847	1.000	2,716	60,010

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

FORCE/STRESS SUMMARY

Section 1 – 0.0' to 20.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F' _y (ksi)	Φ _c P _n (kip)	Shear			# Bolt	# Hole	Use %	Controls
	X			Y	Z	ΦR _{nv} (kip)				Bear ΦR _n (kip)						
L SOL - 5" SOLID	-196.11	1.2D + 1.0W N	10.015	50	50	50	48.07	50.00	746.20	0.00	0.00	0	0	26	Member X	
D SAE - 4X4X0.5	-5.95	1.2D + 1.0W N	23.397	50	50	50	179.52	44.00	33.31	27.06	50.40	1	1	21	Bolt Shear	
Member Tension	Pu (kip)	Load Case	F _y (ksi)	F _u (ksi)	Φ _c P _n (kip)	Shear ΦR _{nv} (kip)	Bear ΦR _n (kip)	Blk Shear			# Bolt	# Hole	Use %	Controls		
	Φ _t P _n (kip)															
L SOL - 5" SOLID	141.97	1.2D + 1.0W 60°	50.0	65	883.58	0.00	0.00			0	0	16	Member			
D SAE - 4X4X0.5	5.73	1.2D + 1.0W 90°	44.0	60	110.74	27.06	30.60	0.00		1	1	21	Bolt Shear			
Max Splice Forces	Pu (kip)	Load Case	ΦR _{nt} (kip)	Use %	Num Bolts	Bolt Type										
Bot Tension	151.17	0.9D + 1.0W 60°	411.04	37	6	1.5" A572-50										

Section 2 – 20.0' to 40.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F' _y (ksi)	Φ _c P _n (kip)	Shear			# Bolt	# Hole	Use %	Controls					
	X			Y	Z	ΦR _{nv} (kip)				Bear ΦR _n (kip)	Blk Shear Φ _t P _n (kip)										
L SOL - 4 3/4" SOLID	-174.05	1.2D + 1.0W N	10.015	50	50	50	50.60	50.00	661.28	0.00	0.00	0	0	26	Member X						
D SAE - 4X4X0.375	-5.79	1.2D + 1.0W N	21.68	50	50	50	166.99	44.00	29.36	27.06	37.80	1	1	21	Bolt Shear						
Member Tension	Pu (kip)	Load Case	F _y (ksi)	F _u (ksi)	Φ _c P _n (kip)	Shear ΦR _{nv} (kip)	Bear ΦR _n (kip)	Blk Shear Φ _t P _n (kip)	# Bolt	# Hole	Use %	Controls									
L SOL - 4 3/4" SOLID	131.02	0.9D + 1.0W 60°	50.0	65	797.44	0.00	0.00			0	0	16	Member								
D SAE - 4X4X0.375	5.69	1.2D + 1.0W 90°	44.0	60	84.66	27.06	22.95	0.00		1	1	24	Bolt Bear								
Max Splice Forces	Pu (kip)	Load Case	ΦR _{nt} (kip)	Use %	Num Bolts	Bolt Type															
Bot Tension	134.29	0.9D + 1.0W 60°	623.64	22	6	1.375" A325															

Section 3 – 40.0' to 60.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F'y (ksi)	Φc Pn (kip)	Shear					Controls
	X			Y	Z	ΦRnv (kip)				Bear ΦRn (kip)	# Bolt	# Hole	Use %		
L SOL - 4 1/2" SOLID	-151.03	1.2D + 1.0W N	10.015	50	50	50	53.41	50.00	580.92	0.00	0.00	0	0	25	Member X
D SAE - 4X4X0.375	-5.19	1.2D + 1.0W N	20	50	50	50	154.04	44.00	34.50	27.06	37.80	1	1	19	Bolt Shear
Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear			Use %	Controls			
	Φt Pn (kip)							# Bolt	# Hole						
L SOL - 4 1/2" SOLID	115.58	0.9D + 1.0W 60°	50.0	65	715.68	0.00	0.00			0	0	16	Member		
D SAE - 4X4X0.375	5.16	1.2D + 1.0W 90°	44.0	60	84.66	27.06	22.95	0.00		1	1	22	Bolt Bear		
Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type									
Bot Tension	118.59		0.9D + 1.0W 60°	623.64	19	6	1.375" A325								

Section 4 – 60.0' to 80.00'

										Shear					
Member Compression	Pu (kip)	Load Case	Len (ft)	X	Y	Z	KL/R	F'y (ksi)	Φc Pn (kip)	ΦRnv (kip)	Bear ΦRn (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4 1/4" SOLID	-128.87	1.2D + 1.0W N	10.015	50	50	50	56.56	50.00	505.24	0.00	0.00	0	0	25	Member X
D SAE - 3.5X3.5X0.375	-4.68	1.2D + 1.0W 90°	18.366	50	50	50	160.40	44.00	27.59	27.06	37.80	1	1	17	Bolt Shear
										Blk Shear					
Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	ΦRnv (kip)	ΦRn (kip)	Φt Pn (kip)	# Bolt	# Hole	Use %	Controls			
L SOL - 4 1/4" SOLID	97.74	1.2D + 1.0W 60°	50.0	65	638.37	0.00	0.00		0	0	15	Member			
D SAE - 3.5X3.5X0.375	4.60	1.2D + 1.0W 90°	44.0	60	71.83	27.06	22.95	0.00	1	1	20	Bolt Bear			
										Max Splice Forces					
Bot Tension	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type									
	103.33	0.9D + 1.0W 60°	623.64	17	6	1.375" A325									

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Section 5 – 80.0' to 100.00'

		Pu (kip)	Load Case	Len (ft)	Bracing %			F _y (ksi)	Φ _c P _n (kip)	Shear ΦR _{nv} (kip)	Bear ΦR _n (kip)	# Bolt	# Hole	Use %	Controls	
Member Compression					X	Y	Z	KL/R								
L SOL - 4" SOLID		-107.67	1.2D + 1.0W N	10.015	50	50	50	60.09	50.00	434.25	0.00	0.00	0	0	24	Member X
D SAE - 3.5X3.5X0.3125		-4.18	1.2D + 1.0W 90°	16.791	50	50	50	146.01	44.00	28.06	19.88	27.00	1	1	21	Bolt Shear
		Pu (kip)	Load Case	F _y (ksi)	F _u (ksi)	Φ _c P _n (kip)	Shear ΦR _{nv} (kip)	Bear ΦR _n (kip)	Blk Shear Φ _t P _n (kip)	# Bolt	# Hole	Use %	Controls			
Member Tension																
L SOL - 4" SOLID		85.21	0.9D + 1.0W 60°	50.0	65	565.47	0.00	0.00		0	0	15	Member			
D SAE - 3.5X3.5X0.3125		4.12	1.2D + 1.0W 90°	44.0	60	61.97	19.88	16.31	0.00	1	1	25	Bolt Bear			
Max Splice Forces		Pu (kip)	Load Case	ΦR _{nt} (kip)	Use %	Num Bolts	Bolt Type									
Bot Tension		88.29	0.9D + 1.0W 60°	412.17	21	6	1 1/8 A325									

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Section 6 – 100.0' to 120.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F' _y (ksi)	Φ _c P _n (kip)	Shear					Controls				
	X			Y	Z	ΦR _{nv} (kip)				Bear ΦR _n (kip)	# Bolt	# Hole	Use %						
L SOL - 3 3/4" SOLID	-89.68	1.2D + 1.0W N	5.008	100	100	100	64.10	50.00	368.06	0.00	0.00	0	0	24	Member X				
D SAE - 3X3X0.375	-3.00	1.2D + 1.0W 90°	12.825	50	50	50	131.09	44.00	35.14	19.88	32.40	1	1	15	Bolt Shear				
Member Tension	Pu (kip)	Load Case	F _y (ksi)	F _u (ksi)	Φ _c P _n (kip)	Shear ΦR _{nv} (kip)	Bear ΦR _n (kip)	Blk Shear Φ _t P _n (kip)	# Bolt	# Hole	Use %	Controls							
L SOL - 3 3/4" SOLID	70.65	1.2D + 1.0W 60°	50.0	65	497.02	0.00	0.00			0	0	14	Member						
D SAE - 3X3X0.375	2.98	1.2D + 1.0W 90°	44.0	60	60.93	19.88	19.58	0.00	1	1	15	Bolt Bear							
Max Splice Forces	Pu (kip)	Load Case	ΦR _{nt} (kip)	Use %	Num Bolts	Bolt Type													
Bot Tension	73.28	0.9D + 1.0W 60°	412.17	18	6	1 1/8 A325													

Section 7 – 120.0' to 140.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F' _y (ksi)	Φ _c P _n (kip)	Shear			# Bolt	# Hole	Use %	Controls						
	X			Y	Z	ΦR _{nv} (kip)				Bear ΦR _n (kip)												
L SOL - 3 1/4" SOLID	-70.50	1.2D + 1.0W N	5.008	100	100	100	73.96	50.00	250.26	0.00	0.00	0	0	28	Member X							
D SAE - 2.5X2.5X0.25	-2.48	1.2D + 1.0W 90°	11.086	50	50	50	135.47	44.00	18.56	19.88	21.60	1	1	13	Member Z							
Member Tension	Pu (kip)	Load Case	F _y (ksi)	F _u (ksi)	Φ _c P _n (kip)	Shear ΦR _{nv} (kip)	Bear ΦR _n (kip)	Blk Shear Φ _t P _n (kip)	# Bolt	# Hole	Use %	Controls										
L SOL - 3 1/4" SOLID	56.99	1.2D + 1.0W 60°	50.0	65	373.32	0.00	0.00			0	0	15	Member									
D SAE - 2.5X2.5X0.25	2.49	1.2D + 1.0W 330°	44.0	60	33.31	19.88	13.05	0.00	1	1	19	Bolt Bear										
Max Splice Forces	Pu (kip)	Load Case	ΦR _{nt} (kip)	Use %	Num Bolts	Bolt Type																
Bot Tension	59.50	0.9D + 1.0W 60°	412.17	14	6	1 1/8 A325																

Section 8 – 140.0' to 160.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F'y (ksi)	Φc Pn (kip)	Shear		# Bolt	# Hole	Use %	Controls	
	X			Y	Z	KL/R			ΦRnv (kip)	Bear ΦRn (kip)					
L SOL - 3" SOLID	-52.40	1.2D + 1.0W N	5.008	100	100	100	80.12	50.00	198.94	0.00	0.00	0	0	26	Member X
H SAE - 2.5X2.5X0.25	-0.14	1.2D + 1.0W N	6.3	100	100	100	153.98	44.00	14.37	19.88	21.60	1	1	1	Member Z
D SAE - 2.5X2.5X0.25	-2.21	1.2D + 1.0W 330°	9.415	50	50	50	116.29	44.00	25.19	19.88	21.60	1	1	11	Bolt Shear

Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear Φt Pn (kip)	# Bolt	# Hole	Use %	Controls	
L SOL - 3" SOLID	42.81	1.2D + 1.0W 60°	50.0	65	318.10	0.00	0.00			0	0	13	Member
H SAE - 2.5X2.5X0.25	0.14	1.2D + 1.0W N	44.0	60	33.31	19.88	13.05	0.00	1	1	1	Bolt Bear	
D SAE - 2.5X2.5X0.25	2.16	1.2D + 1.0W 90°	44.0	60	33.31	19.88	13.05	0.00	1	1	16	Bolt Bear	

Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	45.25	0.9D + 1.0W 60°	218.07	21	4	1" A325

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Section 9 – 160.0' to 180.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F'y (ksi)	Φc Pn (kip)	Shear	Bear ΦRn (kip)	# Bolt	# Hole	Use %	Controls
	X			Y	Z	ΦRnv (kip)									
L SOL - 2 1/2" SOLID	-32.37	1.2D + 1.0W N	5	100	100	100	96.00	50.00	112.63	0.00	0.00	0	0	28	Member X
H SAE - 2X2X0.25	-0.02	1.2D + 1.0W N	6.3	100	100	100	193.36	44.00	7.20	13.81	18.00	1	1	0	Member Z
D SAE - 2X2X0.25	-3.09	1.2D + 1.0W 330°	8.043	50	50	50	123.43	44.00	17.66	13.81	18.00	1	1	22	Bolt Shear
Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear	Bear	Blk Shear	# Bolt	# Hole	Use %	Controls			
	ΦRnv (kip)					Φt Pn (kip)	Φt Pn (kip)								
L SOL - 2 1/2" SOLID	26.86	0.9D + 1.0W 60°	50.0	65	220.95	0.00	0.00		0	0	12	Member			
H SAE - 2X2X0.25	0.05	1.2D + 1.0W N	44.0	60	25.92	13.81	10.80	0.00	1	1	0	Bolt Bear			
D SAE - 2X2X0.25	3.05	1.2D + 1.0W 330°	44.0	60	25.92	13.81	10.80	0.00	1	1	28	Bolt Bear			
Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type									
Bot Tension	29.94					0.9D + 1.0W 60°	218.07	14	4	1" A325					

Section 10 – 180.0' to 190.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			KL/R	F'y (ksi)	Φc Pn (kip)	Shear		# Bolt	# Hole	Use %	Controls
	X			Y	Z	ΦRnv (kip)				Bear ΦRn (kip)					
L SOL - 2" SOLID	-8.49	1.2D + 1.0W N	5	100	100	100	120.00	50.00	49.29	0.00	0.00	0	0	17	Member X
H SAE - 2X2X0.1875	-0.85	1.2D + 1.0W 60°	6.3	100	100	100	191.89	44.00	5.56	13.81	13.50	1	1	15	Member Z
D SAE - 2X2X0.1875	-2.19	1.2D + 1.0W 90°	8.043	50	50	50	122.49	44.00	13.64	13.81	13.50	1	1	16	Bolt Bear
Member Tension	Pu (kip)	Load Case	Fy (ksi)	Fu (ksi)	ΦcPn (kip)	Shear ΦRnv (kip)	Bear ΦRn (kip)	Blk Shear		# Bolt	# Hole	Use %	Controls		
	Φt Pn (kip)							Φt Pn (kip)							
L SOL - 2" SOLID	4.86	1.2D + 1.0W 60°	50.0	65	141.37	0.00	0.00			0	0	3	Member		
H SAE - 2X2X0.1875	0.82	1.2D + 1.0W N	44.0	60	19.78	13.81	8.10	0.00		1	1	10	Bolt Bear		
D SAE - 2X2X0.1875	2.23	1.2D + 1.0W 330°	44.0	60	19.78	13.81	8.10	0.00		1	1	27	Bolt Bear		
Max Splice Forces	Pu (kip)	Load Case	ΦRnt (kip)	Use %	Num Bolts	Bolt Type									
Bot Tension	7.51					0.9D + 1.0W 60°	218.07	3	4	1" A325					

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DEFLECTIONS AND ROTATIONS					
Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.0D + 1.0W Service 330° 60 mph Wind with No Ice	190.00	0.142	-0.0022	0.0927	0.0928
1.0D + 1.0W Service 300° 60 mph Wind with No Ice	190.00	0.1392	0.0019	0.0901	0.0901
1.0D + 1.0W Service 240° 60 mph Wind with No Ice	190.00	0.1505	0.0020	0.0972	0.0972
1.0D + 1.0W Service 210° 60 mph Wind with No Ice	190.00	0.142	-0.0022	0.0928	0.0929
1.0D + 1.0W Service 180° 60 mph Wind with No Ice	190.00	0.1392	0.0019	0.0901	0.0901
1.0D + 1.0W Service 120° 60 mph Wind with No Ice	190.00	0.1507	0.0020	0.0974	0.0975
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	190.00	0.1422	-0.0022	0.0931	0.0931
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	190.00	0.1392	0.0019	0.0902	0.0903
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	190.00	0.1514	-0.0024	0.0979	0.0979
0.9D - 1.0Ev + 1.0Eh 330° Seismic (Reduced DL)	190.00	0.064	-0.0008	0.0409	0.0409
0.9D - 1.0Ev + 1.0Eh 300° Seismic (Reduced DL)	190.00	0.064	0.0007	0.0411	0.0411
0.9D - 1.0Ev + 1.0Eh 240° Seismic (Reduced DL)	190.00	0.064	0.0007	0.0405	0.0405
0.9D - 1.0Ev + 1.0Eh 210° Seismic (Reduced DL)	190.00	0.064	-0.0008	0.0409	0.0409
0.9D - 1.0Ev + 1.0Eh 180° Seismic (Reduced DL)	190.00	0.064	0.0007	0.0411	0.0411
0.9D - 1.0Ev + 1.0Eh 120° Seismic (Reduced DL)	190.00	0.064	0.0007	0.0405	0.0405
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	190.00	0.064	-0.0008	0.0409	0.0409
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	190.00	0.064	0.0007	0.0411	0.0411
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	190.00	0.064	0.0007	0.0405	0.0405
1.2D + 1.0Ev + 1.0Eh 330° Seismic	190.00	0.0641	-0.0008	0.0414	0.0414
1.2D + 1.0Ev + 1.0Eh 300° Seismic	190.00	0.0641	0.0007	0.0416	0.0416
1.2D + 1.0Ev + 1.0Eh 240° Seismic	190.00	0.0641	0.0007	0.0407	0.0407
1.2D + 1.0Ev + 1.0Eh 210° Seismic	190.00	0.0641	-0.0008	0.0414	0.0414
1.2D + 1.0Ev + 1.0Eh 180° Seismic	190.00	0.0641	0.0007	0.0416	0.0416
1.2D + 1.0Ev + 1.0Eh 120° Seismic	190.00	0.0641	0.0007	0.0407	0.0407
1.2D + 1.0Ev + 1.0Eh 90° Seismic	190.00	0.0641	-0.0008	0.0414	0.0414
1.2D + 1.0Ev + 1.0Eh 60° Seismic	190.00	0.0641	0.0007	0.0416	0.0416
1.2D + 1.0Ev + 1.0Eh Normal Seismic	190.00	0.0641	0.0007	0.0407	0.0407
1.2D + 1.0Di + 1.0Wi 330° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 300° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 240° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 210° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 180° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 120° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 90° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi 60° 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
1.2D + 1.0Di + 1.0Wi Normal 0 mph Wind with 0" Radial Ice	190.00	0.0007	0.0000	0.0015	0.0015
0.9D + 1.0W 330° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5614	-0.0117	0.3666	0.3668
0.9D + 1.0W 300° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5502	-0.0101	0.3585	0.3587
0.9D + 1.0W 240° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5953	0.0105	0.3825	0.3826
0.9D + 1.0W 210° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5615	-0.0116	0.3675	0.3676
0.9D + 1.0W 180° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5502	0.0101	0.3585	0.3587
0.9D + 1.0W 120° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5957	0.0106	0.3828	0.383
0.9D + 1.0W 90° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5617	-0.0116	0.3677	0.3679
0.9D + 1.0W 60° 119 mph Wind with No Ice (Reduced DL)	190.00	0.5501	0.0100	0.3586	0.3587
0.9D + 1.0W Normal 119 mph Wind with No Ice (Reduced DL)	190.00	0.5957	-0.0106	0.3828	0.383
1.2D + 1.0W 330° 119 mph Wind with No Ice	190.00	0.562	-0.0118	0.3671	0.3673
1.2D + 1.0W 300° 119 mph Wind with No Ice	190.00	0.5508	-0.0101	0.3587	0.3589
1.2D + 1.0W 240° 119 mph Wind with No Ice	190.00	0.5959	0.0105	0.3831	0.3833
1.2D + 1.0W 210° 119 mph Wind with No Ice	190.00	0.5621	-0.0116	0.3679	0.3681
1.2D + 1.0W 180° 119 mph Wind with No Ice	190.00	0.5508	0.0101	0.3587	0.3589
1.2D + 1.0W 120° 119 mph Wind with No Ice	190.00	0.5963	0.0106	0.3836	0.3837
1.2D + 1.0W 90° 119 mph Wind with No Ice	190.00	0.5623	-0.0116	0.3682	0.3684
1.2D + 1.0W 60° 119 mph Wind with No Ice	190.00	0.5507	0.0100	0.3589	0.359
1.2D + 1.0W Normal 119 mph Wind with No Ice	190.00	0.5963	-0.0106	0.3836	0.3837

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

DETAILED REACTIONS

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*(-) Uplift and (+) Down		
					FX* (kip)	FY* (kip)	FZ* (kip)
1.2D + 1.0W Normal	12.49	0.00	0	1	0.01	202.03	-20.59
	12.49	0.00	120	1a	6.25	-71.63	-6.45
	12.49	0.00	240	1b	-6.26	-71.64	-6.44
1.2D + 1.0W 60°	12.49	0.00	0	1	-2.12	101.81	-9.72
	12.49	0.00	120	1a	-9.47	101.81	3.02
	12.49	0.00	240	1b	-13.96	-144.87	-8.06
1.2D + 1.0W 90°	12.49	0.00	0	1	-2.55	19.59	-1.10
	12.49	0.00	120	1a	-14.93	165.90	7.16
	12.49	0.00	240	1b	-13.02	-126.74	-6.06
1.2D + 1.0W 120°	12.49	0.00	0	1	-2.47	-71.63	8.65
	12.49	0.00	120	1a	-17.82	202.03	10.30
	12.49	0.00	240	1b	-8.71	-71.64	-2.20
1.2D + 1.0W 180°	12.49	0.00	0	1	-0.01	-144.86	16.12
	12.49	0.00	120	1a	-7.35	101.81	6.70
	12.49	0.00	240	1b	7.36	101.80	6.68
1.2D + 1.0W 210°	12.49	0.00	0	1	1.26	-126.72	14.31
	12.49	0.00	120	1a	0.32	19.59	2.75
	12.49	0.00	240	1b	13.66	165.89	9.35
1.2D + 1.0W 240°	12.49	0.00	0	1	2.46	-71.63	8.65
	12.49	0.00	120	1a	8.72	-71.63	-2.19
	12.49	0.00	240	1b	17.82	202.02	10.29
1.2D + 1.0W 300°	12.49	0.00	0	1	2.13	101.81	-9.72
	12.49	0.00	120	1a	13.95	-144.86	-8.06
	12.49	0.00	240	1b	9.47	101.80	3.03
1.2D + 1.0W 330°	12.49	0.00	0	1	1.28	165.90	-16.52
	12.49	0.00	120	1a	11.75	-126.72	-8.25
	12.49	0.00	240	1b	2.22	19.58	-1.64
0.9D + 1.0W Normal	12.49	0.00	0	1	0.01	197.01	-20.31
	12.49	0.00	120	1a	6.50	-76.47	-6.60
	12.49	0.00	240	1b	-6.50	-76.47	-6.58
0.9D + 1.0W 60°	12.49	0.00	0	1	-2.12	96.86	-9.44
	12.49	0.00	120	1a	-9.23	96.86	2.88
	12.49	0.00	240	1b	-14.20	-149.65	-8.20
0.9D + 1.0W 90°	12.49	0.00	0	1	-2.55	14.69	-0.82
	12.49	0.00	120	1a	-14.69	160.90	7.01
	12.49	0.00	240	1b	-13.26	-131.53	-6.20
0.9D + 1.0W 120°	12.49	0.00	0	1	-2.47	-76.47	8.93
	12.49	0.00	120	1a	-17.58	197.01	10.15
	12.49	0.00	240	1b	-8.96	-76.47	-2.34
0.9D + 1.0W 180°	12.49	0.00	0	1	-0.01	-149.64	16.41
	12.49	0.00	120	1a	-7.11	96.86	6.55
	12.49	0.00	240	1b	7.11	96.85	6.54
0.9D + 1.0W 210°	12.49	0.00	0	1	1.26	-131.52	14.59
	12.49	0.00	120	1a	0.57	14.69	2.61
	12.49	0.00	240	1b	13.42	160.89	9.21
0.9D + 1.0W 240°	12.49	0.00	0	1	2.46	-76.47	8.93
	12.49	0.00	120	1a	8.96	-76.47	-2.33
	12.49	0.00	240	1b	17.58	197.00	10.15
0.9D + 1.0W 300°	12.49	0.00	0	1	2.13	96.86	-9.44
	12.49	0.00	120	1a	14.20	-149.64	-8.20
	12.49	0.00	240	1b	9.22	96.85	2.89
0.9D + 1.0W 330°	12.49	0.00	0	1	1.28	160.90	-16.23
	12.49	0.00	120	1a	11.99	-131.52	-8.39
	12.49	0.00	240	1b	1.98	14.68	-1.78
1.2D + 1.0Di + 1.0Wi Normal	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
1.2D + 1.0Di + 1.0Wi 60°	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

DETAILED REACTIONS							
Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*(-) Uplift and (+) Down		
					FX* (kip)	FY* (kip)	FZ* (kip)
1.2D + 1.0Di + 1.0Wi 90°	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
1.2D + 1.0Di + 1.0Wi 120°	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	19.58	0.90
1.2D + 1.0Di + 1.0Wi 180°	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
1.2D + 1.0Di + 1.0Wi 210°	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
1.2D + 1.0Di + 1.0Wi 240°	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	19.58	0.90
1.2D + 1.0Di + 1.0Wi 300°	12.49	0.00	120	1a	0.78	19.58	-0.45
	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	19.58	0.90
	12.49	0.00	120	1a	0.78	19.58	-0.45
1.2D + 1.0Di + 1.0Wi 330°	12.49	0.00	240	1b	-0.77	19.59	-0.45
	12.49	0.00	0	1	0.00	36.88	-2.77
	12.49	0.00	120	1a	-0.37	9.81	0.05
	12.49	0.00	240	1b	0.37	9.81	0.05
1.2D + 1.0Ev + 1.0Eh Normal	12.49	0.00	0	1	-0.14	27.86	-1.96
	12.49	0.00	120	1a	-1.77	27.86	0.86
	12.49	0.00	240	1b	-0.40	0.79	-0.23
	12.49	0.00	0	1	-0.16	18.84	-1.15
1.2D + 1.0Ev + 1.0Eh 60°	12.49	0.00	120	1a	-2.25	34.46	1.21
	12.49	0.00	240	1b	-0.25	3.21	-0.05
	12.49	0.00	0	1	-0.14	9.81	-0.34
	12.49	0.00	120	1a	-2.40	36.88	1.39
1.2D + 1.0Ev + 1.0Eh 90°	12.49	0.00	240	1b	0.23	9.81	0.29
	12.49	0.00	0	1	0.00	0.79	0.47
	12.49	0.00	120	1a	-1.63	27.86	1.10
	12.49	0.00	240	1b	1.63	27.86	1.10
1.2D + 1.0Ev + 1.0Eh 120°	12.49	0.00	0	1	0.08	3.21	0.25
	12.49	0.00	120	1a	-0.92	18.84	0.71
	12.49	0.00	240	1b	2.17	34.46	1.35
	12.49	0.00	0	1	0.14	9.81	-0.34
1.2D + 1.0Ev + 1.0Eh 180°	12.49	0.00	120	1a	-0.23	9.81	0.29
	12.49	0.00	240	1b	2.40	36.88	1.39
	12.49	0.00	0	1	0.14	27.86	-1.96
	12.49	0.00	120	1a	0.40	0.79	-0.23
1.2D + 1.0Ev + 1.0Eh 210°	12.49	0.00	240	1b	1.77	27.86	0.86
	12.49	0.00	0	1	0.08	34.46	-2.56
	12.49	0.00	120	1a	0.17	3.21	-0.19
	12.49	0.00	240	1b	1.08	18.84	0.44
1.2D + 1.0Ev + 1.0Eh 240°	12.49	0.00	0	1	0.00	31.47	-2.44
	12.49	0.00	120	1a	-0.08	4.42	-0.11
	12.49	0.00	240	1b	0.08	4.42	-0.11
	12.49	0.00	0	1	-0.14	22.45	-1.63
0.9D - 1.0Ev + 1.0Eh Normal	12.49	0.00	120	1a	-1.48	22.45	0.70
	12.49	0.00	240	1b	-0.69	-4.59	-0.40
	12.49	0.00	0	1	-0.16	13.44	-0.82
	12.49	0.00	120	1a	-1.97	29.05	1.04
0.9D - 1.0Ev + 1.0Eh 60°	12.49	0.00	240	1b	-0.54	-2.18	-0.22
	12.49	0.00	0	1	-0.14	4.42	-0.01
	12.49	0.00	120	1a	-0.54	-2.18	-0.22
	12.49	0.00	240	1b	-0.14	4.42	-0.01

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915_C3_04

DETAILED REACTIONS

Load Case	Radius (ft)	Elevation (ft)	Azimuth (deg)	Node	*(-) Uplift and (+) Down		
					FX* (kip)	FY* (kip)	FZ* (kip)
0.9D - 1.0Ev + 1.0Eh 180°	12.49	0.00	120	1a	-2.11	31.47	1.22
	12.49	0.00	240	1b	-0.06	4.42	0.13
	12.49	0.00	0	1	0.00	-4.59	0.80
	12.49	0.00	120	1a	-1.34	22.45	0.94
	12.49	0.00	240	1b	1.34	22.45	0.94
0.9D - 1.0Ev + 1.0Eh 210°	12.49	0.00	0	1	0.08	-2.18	0.58
	12.49	0.00	120	1a	-0.63	13.44	0.55
	12.49	0.00	240	1b	1.89	29.05	1.18
0.9D - 1.0Ev + 1.0Eh 240°	12.49	0.00	0	1	0.14	4.42	-0.01
	12.49	0.00	120	1a	0.06	4.42	0.13
	12.49	0.00	240	1b	2.11	31.47	1.22
0.9D - 1.0Ev + 1.0Eh 300°	12.49	0.00	0	1	0.14	22.45	-1.63
	12.49	0.00	120	1a	0.69	-4.59	-0.40
	12.49	0.00	240	1b	1.48	22.45	0.70
0.9D - 1.0Ev + 1.0Eh 330°	12.49	0.00	0	1	0.08	29.05	-2.23
	12.49	0.00	120	1a	0.46	-2.18	-0.36
	12.49	0.00	240	1b	0.79	13.44	0.27
1.0D + 1.0W Service Normal	12.49	0.00	0	1	0.00	62.72	-5.91
	12.49	0.00	120	1a	1.02	-6.87	-1.32
	12.49	0.00	240	1b	-1.02	-6.88	-1.32
1.0D + 1.0W Service 60°	12.49	0.00	0	1	-0.54	37.16	-3.13
	12.49	0.00	120	1a	-2.98	37.16	1.10
	12.49	0.00	240	1b	-2.98	-25.36	-1.72
1.0D + 1.0W Service 90°	12.49	0.00	0	1	-0.65	16.32	-0.94
	12.49	0.00	120	1a	-4.37	53.40	2.15
	12.49	0.00	240	1b	-2.75	-20.76	-1.21
1.0D + 1.0W Service 120°	12.49	0.00	0	1	-0.63	-6.79	1.54
	12.49	0.00	120	1a	-5.11	62.55	2.95
	12.49	0.00	240	1b	-1.65	-6.80	-0.23
1.0D + 1.0W Service 180°	12.49	0.00	0	1	0.00	-25.35	3.45
	12.49	0.00	120	1a	-2.44	37.16	2.04
	12.49	0.00	240	1b	2.44	37.15	2.03
1.0D + 1.0W Service 210°	12.49	0.00	0	1	0.32	-20.75	2.98
	12.49	0.00	120	1a	-0.49	16.32	1.04
	12.49	0.00	240	1b	4.05	53.39	2.71
1.0D + 1.0W Service 240°	12.49	0.00	0	1	0.63	-6.79	1.54
	12.49	0.00	120	1a	1.65	-6.79	-0.22
	12.49	0.00	240	1b	5.11	62.54	2.95
1.0D + 1.0W Service 300°	12.49	0.00	0	1	0.54	37.16	-3.13
	12.49	0.00	120	1a	2.98	-25.35	-1.72
	12.49	0.00	240	1b	2.98	37.15	1.10
1.0D + 1.0W Service 330°	12.49	0.00	0	1	0.33	53.40	-4.86
	12.49	0.00	120	1a	2.42	-20.75	-1.77
	12.49	0.00	240	1b	1.14	16.32	-0.09

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

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PROJECT: 14538915_C3_04

MAXIMUM REACTIONS SUMMARY

<u>Individual</u>		<u>Global (DL+WL+IL)</u>		<u>Global (DL+WL)</u>	
Max Uplift:	149.65 (kip)	Moment Ice:	0.11 (kip-ft)	Moment:	3417.53 (kip-ft)
Max Down:	202.03 (kip)	Total Down Ice:	58.75 (kip)	Total Down:	58.76 (kip)
Max Shear:	20.59 (kip)	Total Shear Ice:	0 (kip)	Total Shear:	33.48 (kip)
1.2D + 1.0W Normal					

PIER FOUNDATION ANALYSIS (NODE 1)

APPLIED REACTIONS

Axial (k)	Uplift (k)	Shear (k)
202.03	149.64	20.59

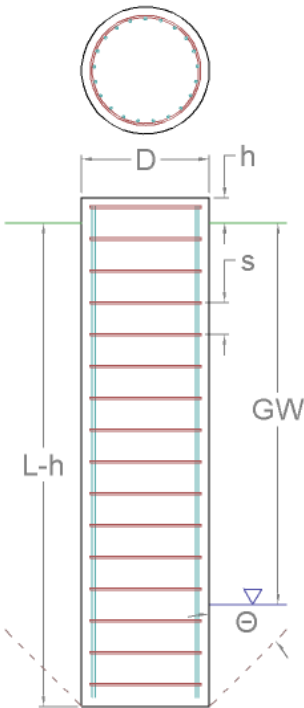
FOUNDATION PARAMETERS

Pier Diameter:	D	5.00	ft
Pier Embedment Depth:	L-h	52.0	ft
Pier Height above Grade:	h	1.00	ft
Concrete Compressive Strength:		4,000	psi
Vertical Rebar:		(24) #10 bars [60 ksi]	
Tie Rebar:	s	#5 bars @ 18.0" c/c [60 ksi]	
Rebar Clear Cover:		3.00	in

SOIL PARAMETERS

Water Table Depth [BGL]:	GW	11	ft
Uplift Pullout Angle:	θ	15	°
Uplift Skin Friction Factor:		0.860	

Layer Depth (ft)		Unit Weight pcf	Cohesion psf	Friction Angle °	Ultimate Skin Friction psf	Ultimate Net Bearing psf
Top	Bottom					
0	6	105	0	0	0	0
6	10	107	0	28	300	0
10	11	107	0	27	250	0
11	15	107	0	27	300	0
15	18	111	0	28	650	0
18	20	111	0	28	700	0
20	25	121	0	31	1,550	0
25	30	118	0	30	1,350	0
30	33	118	0	30	1,400	0
33	35	119	1,600	0	750	0
35	40	115	1,200	0	550	0
40	45	115	1,200	0	550	0
45	50	124	4,000	0	2,000	0
50	55	123	3,200	0	1,700	21,000



SOIL STRENGTH ANALYSIS

Volume of Concrete (ft³)	Buoyant Weight of Concrete (k)	Skin Friction Resistance (k)	Inflection Point [BGL] (ft)
1,040.65	105.86	708.43	36.15

SOIL MOMENT ANALYSIS

Total Lateral Resistance (k)	Moment at Inflection Point, M _u (k-ft)	Additional Resistance (k-ft)	Nominal Moment Capacity, ΦM _n (k-ft)	Soil Moment Usage, M _u / ΦM _n
3,715.81	764.84	0.00	30,800.03	2.5%

SOIL COMPRESSION ANALYSIS

Compressive Bearing Resistance (k)	Compressive Force, P _u (k)	Additional Resistance (k)	Nominal Compressive Capacity, ΦP _n (k)	Soil Compressive Usage, P _u / ΦP _n
412.33	245.60	0.00	840.57	29.2%

ASSET: 302825, I-75 Exit 81
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SOIL UPLIFT ANALYSIS				
Soil Pullout Weight (k)	Uplift Force, T_u (k)	Additional Resistance (k)	Nominal Uplift Capacity, ϕT_n (k)	Soil Uplift Usage, $T_u / \phi T_n$
1,060.98	54.36	0.00	456.94	11.9%



REINFORCING STEEL STRENGTH ANALYSIS

Rebar Cage Diameter (in)	Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, Φ_b	Strength Shear Reduction Factor, Φ_v	Strength Compression Reduction Factor, Φ_c
51.48	29,000	0.9	0.75	0.65

PIER REINFORCING MOMENT ANALYSIS

Design Moment, M_u (k-ft)	Nominal Moment Capacity, $\Phi_b M_n$ (k-ft)	Bending Reinforcement Ratio	Pier Rebar Flexure Usage, $M_u / \Phi_b M_n$
288.26	3,457.49	0.01	8.3%



PIER REINFORCING COMPRESSION ANALYSIS

Buoyant Weight of Concrete (k)	Design Compression, P_u (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, $P_u / \Phi_p P_n$
105.86	245.60	5,895.99	4.2%



PIER REINFORCING SHEAR ANALYSIS

Design Shear, V_u (k)	Nominal Shear Capacity, $\Phi_v V_n$ (k)	Pier Rebar Shear Usage, $V_u / \Phi_v V_n$
20.59	314.24	6.6%



PIER REINFORCING TENSION ANALYSIS

Design Tension, T_u (k)	Nominal Tension Capacity, $\Phi_t T_n$ (k)	Pier Rebar Tension Usage, $T_u / \Phi_t T_n$	Flexure & Tension Interaction, $M_u / \Phi_b M_n + T_u / \Phi_t T_n$
149.64	1,645.92	0.09	17.4%



PIER FOUNDATION ANALYSIS (NODE 1a)

APPLIED REACTIONS

Axial (k)	Uplift (k)	Shear (k)
202.03	149.64	20.58

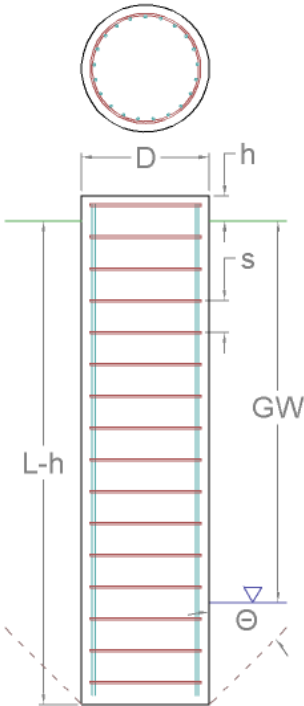
FOUNDATION PARAMETERS

Pier Diameter:	D	5.00	ft
Pier Embedment Depth:	L-h	52.0	ft
Pier Height above Grade:	h	1.00	ft
Concrete Compressive Strength:		4,000	psi
Vertical Rebar:		(24) #10 bars [60 ksi]	
Tie Rebar:	s	#5 bars @ 18.0" c/c [60 ksi]	
Rebar Clear Cover:		3.00	in

SOIL PARAMETERS

Water Table Depth [BGL]:	GW	11	ft
Uplift Pullout Angle:	θ	15	°
Uplift Skin Friction Factor:		0.860	

Layer Depth (ft)		Unit Weight pcf	Cohesion psf	Friction Angle °	Ultimate Skin Friction psf	Ultimate Net Bearing psf
Top	Bottom					
0	6	105	0	0	0	0
6	10	107	0	28	300	0
10	11	107	0	27	250	0
11	15	107	0	27	300	0
15	18	111	0	28	650	0
18	20	111	0	28	700	0
20	25	121	0	31	1,550	0
25	30	118	0	30	1,350	0
30	33	118	0	30	1,400	0
33	35	119	1,600	0	750	0
35	40	115	1,200	0	550	0
40	45	115	1,200	0	550	0
45	50	124	4,000	0	2,000	0
50	55	123	3,200	0	1,700	21,000



SOIL STRENGTH ANALYSIS

Volume of Concrete (ft³)	Buoyant Weight of Concrete (k)	Skin Friction Resistance (k)	Inflection Point [BGL] (ft)
1,040.65	105.86	708.43	36.15

SOIL MOMENT ANALYSIS

Total Lateral Resistance (k)	Moment at Inflection Point, M _u (k-ft)	Additional Resistance (k-ft)	Nominal Moment Capacity, ΦM _n (k-ft)	Soil Moment Usage, M _u / ΦM _n
3,715.81	764.47	0.00	30,800.03	2.5%

SOIL COMPRESSION ANALYSIS

Compressive Bearing Resistance (k)	Compressive Force, P _u (k)	Additional Resistance (k)	Nominal Compressive Capacity, ΦP _n (k)	Soil Compressive Usage, P _u / ΦP _n
412.33	245.60	0.00	840.57	29.2%

ASSET: 302825, I-75 Exit 81
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-H
PROJECT: 14538915

SOIL UPLIFT ANALYSIS				
Soil Pullout Weight (k)	Uplift Force, T_u (k)	Additional Resistance (k)	Nominal Uplift Capacity, ϕT_n (k)	Soil Uplift Usage, $T_u / \phi T_n$
1,060.98	54.36	0.00	456.94	11.9%



REINFORCING STEEL STRENGTH ANALYSIS

Rebar Cage Diameter (in)	Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, Φ_b	Strength Shear Reduction Factor, Φ_v	Strength Compression Reduction Factor, Φ_c
51.48	29,000	0.9	0.75	0.65

PIER REINFORCING MOMENT ANALYSIS

Design Moment, M_u (k-ft)	Nominal Moment Capacity, $\Phi_b M_n$ (k-ft)	Bending Reinforcement Ratio	Pier Rebar Flexure Usage, $M_u / \Phi_b M_n$
288.12	3,457.49	0.01	8.3%



PIER REINFORCING COMPRESSION ANALYSIS

Buoyant Weight of Concrete (k)	Design Compression, P_u (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, $P_u / \Phi_p P_n$
105.86	245.60	5,895.99	4.2%



PIER REINFORCING SHEAR ANALYSIS

Design Shear, V_u (k)	Nominal Shear Capacity, $\Phi_v V_n$ (k)	Pier Rebar Shear Usage, $V_u / \Phi_v V_n$
20.58	314.24	6.5%



PIER REINFORCING TENSION ANALYSIS

Design Tension, T_u (k)	Nominal Tension Capacity, $\Phi_t T_n$ (k)	Pier Rebar Tension Usage, $T_u / \Phi_t T_n$	Flexure & Tension Interaction, $M_u / \Phi_b M_n + T_u / \Phi_t T_n$
149.64	1,645.92	0.09	17.4%



PIER FOUNDATION ANALYSIS (NODE 1b)

APPLIED REACTIONS

Axial (k)	Uplift (k)	Shear (k)
202.02	149.65	20.58

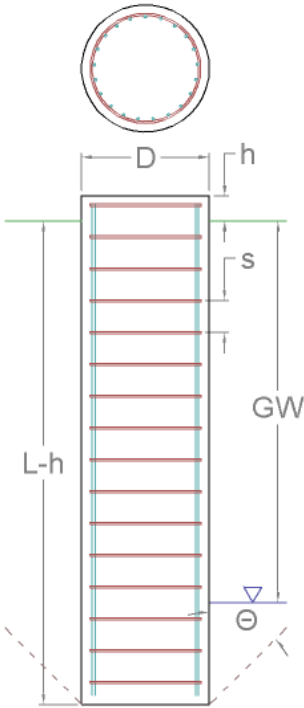
FOUNDATION PARAMETERS

Pier Diameter:	D	5.00	ft
Pier Embedment Depth:	L-h	52.0	ft
Pier Height above Grade:	h	1.00	ft
Concrete Compressive Strength:		4,000	psi
Vertical Rebar:		(24) #10 bars [60 ksi]	
Tie Rebar:	s	#5 bars @ 18.0" c/c [60 ksi]	
Rebar Clear Cover:		3.00	in

SOIL PARAMETERS

Water Table Depth [BGL]:	GW	11	ft
Uplift Pullout Angle:	θ	15	°
Uplift Skin Friction Factor:		0.860	

Layer Depth (ft)		Unit Weight pcf	Cohesion psf	Friction Angle °	Ultimate Skin Friction psf	Ultimate Net Bearing psf
Top	Bottom					
0	6	105	0	0	0	0
6	10	107	0	28	300	0
10	11	107	0	27	250	0
11	15	107	0	27	300	0
15	18	111	0	28	650	0
18	20	111	0	28	700	0
20	25	121	0	31	1,550	0
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SOIL UPLIFT ANALYSIS				
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Buoyant Weight of Concrete (k)	Design Compression, P_u (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, $P_u / \Phi_p P_n$
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PIER REINFORCING TENSION ANALYSIS

Design Tension, T_u (k)	Nominal Tension Capacity, $\Phi_t T_n$ (k)	Pier Rebar Tension Usage, $T_u / \Phi_t T_n$	Flexure & Tension Interaction, $M_u / \Phi_b M_n + T_u / \Phi_t T_n$
149.65	1,645.92	0.09	17.4%

