



**AMERICAN TOWER®**  
CORPORATION

## Structural Analysis Report

**Structure** : 250 ft Self Support Tower  
**ATC Asset Name** : Columbia (Charles) FL  
**ATC Asset Number** : 417139  
**Engineering Number** : 14192636\_C3\_02  
**Proposed Carrier** : T-MOBILE  
**Carrier Site Name** : 9JK2817A (UsA)  
**Carrier Site Number** : 9JK2817A  
**Site Location** : Charles Terrace  
Lake City, FL 32024-4402  
30.1063, -82.7601  
**County** : Columbia  
**Date** : January 5, 2023  
**Max Usage** : 75%  
**Analysis Result** : Pass

Prepared By:

Jordan Clark  
Structural Engineer

Reviewed



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: 2023.01.09  
14:57:09 -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 250 ft Self Support tower to reflect the change in loading by T-MOBILE.

## Supporting Documents

<b>Tower Drawing:</b>	CellXion File #TALT02291, dated December 6, 2005
<b>Foundation Drawing:</b>	CellXion File #TALT02291, dated December 21, 2005
<b>Geotechnical Report:</b>	SDII Project #30111111, dated April 1, 2005

## 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.

<b>Basic Wind Speed:</b>	118 mph (3-second gust)
<b>Basic Wind Speed w/ Ice:</b>	30 mph (3-second gust) w/ 0.25" radial ice concurrent
<b>Code(s):</b>	ANSI/TIA-222-H / 2018 IBC / 7th ED (2020) Florida Building Code
<b>Exposure Category:</b>	C
<b>Risk Category:</b>	II
<b>Topographic Factor Procedure:</b>	Method 1
<b>Topographic Category:</b>	1
<b>Spectral Response:</b>	$S_s = 0.08, S_i = 0.05$
<b>Site Class:</b>	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 contact American Tower via email at [Engineering@americantower.com](mailto:Engineering@americantower.com) Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

**Existing/Reserved Loading**

Elev.*	Qty	Equipment	Lines	Carrier
253.0'	1	Raycap RCMDC-3315-PF-48	(1) 1 5/8" (1.63"-41.3mm) Fiber (17) 1 5/8" Coax	ALLETEL COMMUNICATIONS, LLC
	1	VZW Unused Reserve (12986.62 sqin)		
	2	Commscope E15Z01P19		
	2	JMA Wireless DBC-67-C-1SF		
	6	CSS X7CAP-865		
	6	Commscope NHH-65C-R2B		
	6	Ericsson RRUS-32 (77 lbs)		
250.0'	1	Low Profile Platform	-	ALLETEL COMMUNICATIONS, LLC

*(If table breaks across pages, please see previous page for data in merged cells)*

*\*Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.*

**Proposed Carrier Final Loading**

Elev.*	Qty	Equipment	Lines	Carrier
240.0'	3	Light Sector Frame	(4) 1.99" (50.7mm) Hybrid	T-MOBILE
	4	Commscope FFVV-65C-R3-V1		
	4	Ericsson AIR 6419 B41		
	4	Ericsson Radio 4460 B25+B66		
	4	Ericsson Radio 4480 B71+B85A		

*(If table breaks across pages, please see previous page for data in merged cells)*

*\*Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.*

Install proposed lines on any empty face.

### Structure Usages

Structural Component	Usage	Pass/Fail
Legs	68%	Pass
Diagonals	63%	Pass
Horizontals	36%	Pass
Anchor Rods	57%	Pass
Leg Bolts	49%	Pass

### Foundation Reactions & Usages

Reaction Component	Original Design Reactions	Analysis Reactions	Usage
Uplift (k)	565.0	395.8	70%
Download (k)	652.1	474.3	73%
Shear (k)	54.1	40.4	75%

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.

### Antenna Deflection, Twist, and Sway

Elev.	Antenna	Carrier	Deflection	Twist	Sway [Rotation]
240.0'	Commscope FFVV-65C-R3-V1	T-MOBILE	0.540'	0.003°	0.332°
	Ericsson AIR 6419 B41				
	Ericsson Radio 4460 B25+B66				
	Ericsson Radio 4480 B71+B85A				
	Generic Flat Light Sector Frame				

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

## **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.

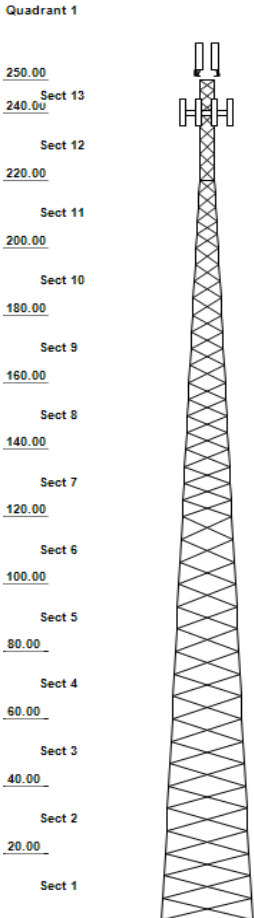
Unless explicitly agreed by both the client and ATC Tower Services, LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

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**

<b>Nominal Wind:</b> 118 mph	<b>Ice Wind:</b> 30 mph w/ 0.25" ice	<b>Service Wind:</b> 60 mph
<b>Risk Category:</b> II	<b>Exposure:</b> C	<b>S<sub>s</sub>:</b> 0.082 <b>S<sub>t</sub>:</b> 0.049
<b>Topo Category:</b> 1	<b>Topo Factor:</b> Method 1	<b>Topo Feature:</b>
<b>Structure Height:</b> 250 ft	<b>Base Elevation:</b> 0 ft	<b>Shape:</b> Triangle
<b>Base Width:</b> 24.3 ft	<b>Top Width:</b> 4.5 ft	

**Tower Elevation View**



**TOWER SECTION PROPERTIES**

Section	Leg Members	Diagonal Members	Horizontal Members
1	SOL 50 ksi 5 1/4" SOL	SAE 36 ksi 4X4X0.375	
2	SOL 50 ksi 5 1/4" SOL	SAE 36 ksi 4X4X0.25	
3	SOL 50 ksi 5" SOLID	SAE 36 ksi 4X4X0.25	
4	SOL 50 ksi 5" SOLID	SAE 36 ksi 3.5X3.5X0.25	
5	SOL 50 ksi 4 3/4" SOL	SAE 36 ksi 3.5X3.5X0.25	
6	SOL 50 ksi 4 1/2" SOL	SAE 36 ksi 3X3X0.25	
7	SOL 50 ksi 4 1/4" SOL	SAE 36 ksi 3X3X0.1875	
8	SOL 50 ksi 4" SOLID	SAE 36 ksi 2.5X2.5X0.1875	
9	SOL 50 ksi 3 3/4" SOL	SAE 36 ksi 2.5X2.5X0.1875	
10	SOL 50 ksi 3 1/2" SOL	SAE 36 ksi 2X2X0.1875	
11	SOL 50 ksi 3" SOLID	SAE 36 ksi 2X2X0.1875	SAE 36 ksi 2X2X0.1875
12	SOL 50 ksi 2 1/2" SOL	SAE 36 ksi 2.5X2.5X0.25	
13	SOL 50 ksi 1 3/4" SOL	SAE 36 ksi 2X2X0.1875	SAE 36 ksi 2X2X0.1875

**SECONDARY BRACING MEMBERS**

Section	Sub Diagonal 1	Sub Diagonal 2	Sub Diagonal 3
1 - 13	-	-	-

Section	Sub Horizontal 1	Sub Horizontal 2	Sub Horizontal 3
1 - 13	-	-	-

**DISCRETE APPURTENANCE**

**LINEAR APPURTENANCE**

Elev (ft)	Description	Elev To (ft)	Description
253.0	(6) CSS X7CAP-865	253.0	(17) 1 5/8" Coax
253.0	(6) Commscope NHH-65C-R2B	253.0	(1) 1 5/8" (1.63"-41.3mm) Fiber
253.0	(6) Ericsson RRUS-32 (77 lbs)	250.0	(1) Waveguide
253.0	(2) Commscope E15Z01P19	250.0	(1) Climbing Ladder
253.0	(2) JMA Wireless DBC-67-C-1SF	240.0	(4) 1.99" (50.7mm) Hybrid
253.0	(1) VZW Unused Reserve (12986.62 s		
253.0	(1) Raycap RCMDC-3315-PF-48		
250.0	(1) Generic Flat Low Profile Platf		
240.0	(4) Commscope FFVV-65C-R3-V1		
240.0	(4) Ericsson AIR 6419 B41		
240.0	(4) Ericsson Radio 4480 B71+B85A		
240.0	(4) Ericsson Radio 4460 B25+B66		
240.0	(3) Generic Flat Light Sector Fram		

**GLOBAL BASE REACTIONS**

	DL+W/L	DL+W/L+IL
<b>Moment (k-ft):</b>	9377.47	675.83
<b>Axial (k):</b>	86.22	98.66
<b>Shear (k):</b>	66.09	4.77

**INDIVIDUAL BASE REACTIONS**

<b>Comp (k):</b>	474.31
<b>Uplift (k):</b>	395.84
<b>Shear (k):</b>	40.41

ASSET: 417139, Columbia (Charles) FL  
CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
PROJECT: 14192636\_C3\_02

ANALYSIS PARAMETERS

<b>Location:</b>	Columbia County, FL	<b>Height:</b>	250 ft
<b>Type and Shape:</b>	Self Support, Triangle	<b>Base Elevation:</b>	0.00 ft
<b>Manufacturer:</b>	Undetermined	<b>Bottom Face Width:</b>	24.30 ft
<b>Kd</b>	0.85	<b>Top Face Width:</b>	4.50 ft
<b>Ke:</b>	1.00	<b>Anchor Bolt Detail Type:</b>	d

ICE & WIND PARAMETERS

<b>Exposure Category:</b>	C	<b>Design Wind Speed Without Ice:</b>	118 mph
<b>Risk Category:</b>	II	<b>Design Wind Speed with Ice:</b>	30 mph
<b>Topographic Factor Procedure:</b>	Method 1	<b>Operational Windspeed:</b>	60 mph
<b>Topographic Category:</b>	Flat	<b>Design Ice Thickness:</b>	0.25 in
<b>Crest Height:</b>	0 ft	<b>HMSL:</b>	104 ft

SEISMIC PARAMETERS

<b>Analysis Method:</b>	Equivalent Lateral Force Method		
<b>Site Class:</b>	D - Stiff Soil	<b>Period Based on Rayleigh Method (sec):</b>	1.15
<b>T<sub>L</sub> (sec):</b>	8	<b>P:</b>	1.3
<b>S<sub>s</sub>:</b>	0.082	<b>S<sub>1</sub>:</b>	0.049
<b>F<sub>a</sub>:</b>	1.600	<b>F<sub>v</sub>:</b>	2.400
<b>S<sub>ds</sub>:</b>	0.087	<b>S<sub>d1</sub>:</b>	0.078
		<b>C<sub>s</sub>:</b>	0.030
		<b>C<sub>s, Max</sub>:</b>	0.030
		<b>C<sub>s, Min</sub>:</b>	0.030

LOAD CASES

1.2D + 1.0W Normal	1.2D + 1.0W Normal118 mph Wind with No Ice
1.2D + 1.0W 60°	1.2D + 1.0W 60°118 mph Wind with No Ice
1.2D + 1.0W 90°	1.2D + 1.0W 90°118 mph Wind with No Ice
0.9D + 1.0W Normal	0.9D + 1.0W Normal118 mph Wind with No Ice (Reduced DL)
0.9D + 1.0W 60°	0.9D + 1.0W 60°118 mph Wind with No Ice (Reduced DL)
0.9D + 1.0W 90°	0.9D + 1.0W 90°118 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi Normal	1.2D + 1.0Di + 1.0Wi Normal30 mph Wind with 0.25" Radial Ice
1.2D + 1.0Di + 1.0Wi 60°	1.2D + 1.0Di + 1.0Wi 60°30 mph Wind with 0.25" Radial Ice
1.2D + 1.0Di + 1.0Wi 90°	1.2D + 1.0Di + 1.0Wi 90°30 mph Wind with 0.25" Radial Ice
1.2D + 1.0Ev + 1.0Eh Normal	1.2D + 1.0Ev + 1.0Eh NormalSeismic
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
0.9D - 1.0Ev + 1.0Eh Normal	0.9D - 1.0Ev + 1.0Eh NormalSeismic (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)
1.0D + 1.0W Service Normal	1.0D + 1.0W Service Normal60 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

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 <sub>a</sub>	Orient. Factor	Vert. Ecc. (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
253.0	JMA Wireless DBC-67-C-1SF	2	7	0.4	0.6	6.2	3.4	0.80	0.50	3.0	33.34	46.56	11	16
253.0	Commscope E15Z01P19	2	11	0.8	1.1	7.2	2.9	0.80	0.50	0.3	7.39	46.46	25	26
253.0	Raycap RCMDC-3315-PF-48	1	21	2.5	1.6	15.7	10.3	0.80	1.00	-0.6	47.58	46.42	79	26
253.0	Ericsson RRUS-32 (77 lbs)	6	77	3.3	2.5	13.3	9.5	0.80	0.50	3.0	944.37	46.56	315	554
253.0	Commscope NHH-65C-R2B	6	52	11.4	8.0	11.9	7.1	0.80	0.70	3.0	4,543.61	46.56	1515	372
253.0	CSS X7CAP-865	6	56	11.8	8.0	12.5	7.1	0.80	0.69	3.0	4,659.99	46.56	1553	403
253.0	VZW Unused Reserve (12986.62 s	1	1336	90.2	0.0	0.0	0.0	0.80	0.90	0.0	0.00	46.45	2564	1603
250.0	Generic Flat Low Profile Platf	1	1875	26.1	0.0	0.0	0.0	1.00	1.00	0.0	0.00	46.33	1028	2250
240.0	Ericsson Radio 4460 B25+B66	4	109	2.6	1.6	15.7	12.1	0.80	0.50	0.0	0.00	45.93	160	523
240.0	Ericsson Radio 4480 B71+B85A	4	84	2.9	1.8	15.7	7.5	0.80	0.50	0.0	0.00	45.93	178	403
240.0	Ericsson AIR 6419 B41	4	83	6.3	3.0	20.9	9.0	0.80	0.63	0.0	0.00	45.93	498	400
240.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	45.93	2097	1440
240.0	Commscope FFFV-65C-R3-V1	4	125	21.1	8.0	25.2	9.3	0.80	0.63	0.0	0.00	45.93	1662	598
<b>Totals</b>		<b>44</b>	<b>7,179</b>	<b>465.5</b>									<b>11,684</b>	<b>8,614</b>

Discrete Appurtenance Properties for LC: 0.9D + 1.0W

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient. Factor	Vert. Ecc. (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
253.0	JMA Wireless DBC-67-C-1SF	2	7	0.4	0.6	6.2	3.4	0.80	0.50	3.0	33.34	46.56	11	12
253.0	Commscope E15Z01P19	2	11	0.8	1.1	7.2	2.9	0.80	0.50	0.3	7.39	46.46	25	20
253.0	Raycap RCMDC-3315-PF-48	1	21	2.5	1.6	15.7	10.3	0.80	1.00	-0.6	47.58	46.42	79	19
253.0	Ericsson RRUS-32 (77 lbs)	6	77	3.3	2.5	13.3	9.5	0.80	0.50	3.0	944.37	46.56	315	416
253.0	Commscope NHH-65C-R2B	6	52	11.4	8.0	11.9	7.1	0.80	0.70	3.0	4,543.61	46.56	1515	279
253.0	CSS X7CAP-865	6	56	11.8	8.0	12.5	7.1	0.80	0.69	3.0	4,659.99	46.56	1553	302
253.0	VZW Unused Reserve (12986.62 s	1	1336	90.2	0.0	0.0	0.0	0.80	0.90	0.0	0.00	46.45	2564	1202
250.0	Generic Flat Low Profile Platf	1	1875	26.1	0.0	0.0	0.0	1.00	1.00	0.0	0.00	46.33	1028	1688
240.0	Ericsson Radio 4460 B25+B66	4	109	2.6	1.6	15.7	12.1	0.80	0.50	0.0	0.00	45.93	160	392
240.0	Ericsson Radio 4480 B71+B85A	4	84	2.9	1.8	15.7	7.5	0.80	0.50	0.0	0.00	45.93	178	302
240.0	Ericsson AIR 6419 B41	4	83	6.3	3.0	20.9	9.0	0.80	0.63	0.0	0.00	45.93	498	300
240.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	45.93	2097	1080
240.0	Commscope FFFV-65C-R3-V1	4	125	21.1	8.0	25.2	9.3	0.80	0.63	0.0	0.00	45.93	1662	449
<b>Totals</b>		<b>44</b>	<b>7,179</b>	<b>465.5</b>									<b>11,684</b>	<b>6,461</b>

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 <sub>a</sub>	Orient. Factor	Vert. Ecc. (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
253.0	JMA Wireless DBC-67-C-1SF	2	9	0.4	0.6	6.2	3.4	0.80	0.50	3.0	2.59	3.01	1	20
253.0	Commscope E15Z01P19	2	14	0.9	1.1	7.2	2.9	0.80	0.50	0.3	0.54	3.00	2	33
253.0	Raycap RCMDC-3315-PF-48	1	35	2.7	1.6	15.7	10.3	0.80	1.00	-0.6	3.30	3.00	5	40
253.0	Ericsson RRUS-32 (77 lbs)	6	94	3.5	2.5	13.3	9.5	0.80	0.50	3.0	65.19	3.01	22	657
253.0	Commscope NHH-65C-R2B	6	92	12.0	8.0	11.9	7.1	0.80	0.70	3.0	308.29	3.01	103	612
253.0	CSS X7CAP-865	6	97	12.4	8.0	12.5	7.1	0.80	0.69	3.0	315.67	3.01	105	651
253.0	VZW Unused Reserve (12986.62 s	1	1499	101.2	0.0	0.0	0.0	0.80	0.90	0.0	0.00	3.00	186	1766
250.0	Generic Flat Low Profile Platf	1	2017	29.4	0.0	0.0	0.0	1.00	1.00	0.0	0.00	2.99	75	2392
240.0	Ericsson Radio 4460 B25+B66	4	124	2.7	1.6	15.7	12.1	0.80	0.50	0.0	0.00	2.97	11	585
240.0	Ericsson Radio 4480 B71+B85A	4	97	3.0	1.8	15.7	7.5	0.80	0.50	0.0	0.00	2.97	12	456
240.0	Ericsson AIR 6419 B41	4	110	6.6	3.0	20.9	9.0	0.80	0.63	0.0	0.00	2.97	34	505
240.0	Generic Flat Light Sector Fram	3	452	20.5	0.0	0.0	0.0	1.00	1.00	0.0	0.00	2.97	155	1597
240.0	Commscope FFFV-65C-R3-V1	4	197	21.8	8.0	25.2	9.3	0.80	0.63	0.0	0.00	2.97	111	886
<b>Totals</b>		<b>44</b>	<b>8,765</b>	<b>501.7</b>									<b>822</b>	<b>10,201</b>

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

Elev (ft)	Description	Qty	Wt. (lb)	EPA (sf)	Length (ft)	Width (in)	Depth (in)	K <sub>a</sub>	Orient. Factor	Vert. Ecc. (ft)	M <sub>u</sub> (lb-ft)	Q <sub>z</sub> (psf)	F <sub>a</sub> (WL) (lb)	P <sub>a</sub> (DL) (lb)
253.0	JMA Wireless DBC-67-C-1SF	2	7	0.4	0.6	6.2	3.4	0.80	0.50	3.0	8.62	12.04	3	13
253.0	Commscope E15Z01P19	2	11	0.8	1.1	7.2	2.9	0.80	0.50	0.3	1.91	12.01	6	22
253.0	Raycap RCMDC-3315-PF-48	1	21	2.5	1.6	15.7	10.3	0.80	1.00	-0.6	12.30	12.00	21	21
253.0	Ericsson RRUS-32 (77 lbs)	6	77	3.3	2.5	13.3	9.5	0.80	0.50	3.0	244.16	12.04	81	462
253.0	Commscope NHH-65C-R2B	6	52	11.4	8.0	11.9	7.1	0.80	0.70	3.0	1,174.73	12.04	392	310
253.0	CSS X7CAP-865	6	56	11.8	8.0	12.5	7.1	0.80	0.69	3.0	1,204.82	12.04	402	336
253.0	VZW Unused Reserve (12986.62 s	1	1336	90.2	0.0	0.0	0.0	0.80	0.90	0.0	0.00	12.01	663	1336
250.0	Generic Flat Low Profile Platf	1	1875	26.1	0.0	0.0	0.0	1.00	1.00	0.0	0.00	11.98	266	1875
240.0	Ericsson Radio 4460 B25+B66	4	109	2.6	1.6	15.7	12.1	0.80	0.50	0.0	0.00	11.88	41	436
240.0	Ericsson Radio 4480 B71+B85A	4	84	2.9	1.8	15.7	7.5	0.80	0.50	0.0	0.00	11.88	46	336
240.0	Ericsson AIR 6419 B41	4	83	6.3	3.0	20.9	9.0	0.80	0.63	0.0	0.00	11.88	129	333
240.0	Generic Flat Light Sector Fram	3	400	17.9	0.0	0.0	0.0	1.00	1.00	0.0	0.00	11.88	542	1200
240.0	Commscope FFFV-65C-R3-V1	4	125	21.1	8.0	25.2	9.3	0.80	0.63	0.0	0.00	11.88	430	498
<b>Totals</b>		<b>44</b>	<b>7,179</b>	<b>465.5</b>									<b>3,021</b>	<b>7,179</b>

ASSET: 417139, Columbia (Charles) FL

CODE: ANSI/TIA-222-H

CUSTOMER: T-MOBILE

PROJECT: 14192636\_C3\_02

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 <sub>a</sub> Override
0.0	253.0	1 5/8" (1.63"-41.3mm) Fiber	1	1.63	1.61	100	1	Individual	0.00	N	1.00	1.00	0.01
0.0	253.0	1 5/8" Coax	17	1.98	0.82	35	1	Block	0.00	N	1.00	1.00	0.00
0.0	250.0	Waveguide	1	2.00	6.00	100	1	Individual	0.00	N	1.00	1.00	0.00
0.0	250.0	Climbing Ladder	1	2.00	6.90	100	2	Individual	0.00	N	1.00	1.00	0.00
0.0	240.0	1.99" (50.7mm) Hybrid	4	1.99	1.90	100	2	Individual	0.00	N	1.00	1.00	0.00

SECTION FORCES

1.2D + 1.0W Normal  
118 mph Wind with No Ice

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

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	46.13	6.172	2.917	0.00	0.196	2.61	1.00	1.00	0.0	7.84	20.48	0.00	971	0	803	742	1545	
12	230	45.52	12.104	8.333	0.00	0.217	2.54	1.00	1.00	0.0	16.92	42.98	0.00	2957	0	1663	1833	3496	
11	210	44.66	11.501	10.014	0.00	0.190	2.63	1.00	1.00	0.0	17.24	45.31	0.00	3230	0	1720	1798	3518	
10	190	43.73	11.305	11.682	0.00	0.153	2.76	1.00	1.00	0.0	17.85	49.26	0.00	3842	0	1831	1761	3592	
9	170	42.72	16.644	12.517	0.00	0.156	2.75	1.00	1.00	0.0	23.55	64.72	0.00	4485	0	2350	1720	4070	
8	150	41.61	19.283	13.351	0.00	0.146	2.78	1.00	1.00	0.0	26.52	73.85	0.00	5001	0	2612	1675	4287	
7	130	40.37	26.406	14.186	0.00	0.157	2.75	1.00	1.00	0.0	34.02	93.45	0.00	5794	0	3207	1626	4832	
6	110	38.98	23.241	15.020	0.00	0.130	2.85	1.00	1.00	0.0	31.12	88.64	0.00	6447	0	2937	1570	4506	
5	90	37.36	29.965	15.855	0.00	0.138	2.82	1.00	1.00	0.0	38.22	107.63	0.00	7408	0	3418	1505	4923	
4	70	35.44	32.868	16.689	0.00	0.134	2.83	1.00	1.00	0.0	41.49	117.39	0.00	8087	0	3536	1427	4963	
3	50	33.02	40.951	16.689	0.00	0.142	2.80	1.00	1.00	0.0	49.78	139.34	0.00	8661	0	3910	1329	5240	
2	30	29.65	44.342	17.524	0.00	0.140	2.81	1.00	1.00	0.0	53.68	150.70	0.00	9399	0	3798	1194	4992	
1	10	25.66	47.794	17.524	0.00	0.137	2.82	1.00	1.00	0.0	55.99	157.89	0.00	11327	0	3443	1033	4476	
														<b>Totals</b>	<b>77,609</b>	<b>0</b>			<b>54,442</b>

1.2D + 1.0W 60°  
118 mph Wind with No Ice

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

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	46.13	6.172	2.917	0.00	0.196	2.61	0.80	1.00	0.0	6.61	17.26	0.00	971	0	677	742	1418	
12	230	45.52	12.104	8.333	0.00	0.217	2.54	0.80	1.00	0.0	14.50	36.83	0.00	2957	0	1425	1833	3258	
11	210	44.66	11.501	10.014	0.00	0.190	2.63	0.80	1.00	0.0	14.94	39.26	0.00	3230	0	1491	1798	3289	
10	190	43.73	11.305	11.682	0.00	0.153	2.76	0.80	1.00	0.0	15.59	43.02	0.00	3842	0	1599	1761	3360	
9	170	42.72	16.644	12.517	0.00	0.156	2.75	0.80	1.00	0.0	20.23	55.57	0.00	4485	0	2018	1720	3738	
8	150	41.61	19.283	13.351	0.00	0.146	2.78	0.80	1.00	0.0	22.67	63.11	0.00	5001	0	2232	1675	3907	
7	130	40.37	26.406	14.186	0.00	0.157	2.75	0.80	1.00	0.0	28.73	78.94	0.00	5794	0	2709	1626	4335	
6	110	38.98	23.241	15.020	0.00	0.130	2.85	0.80	1.00	0.0	26.47	75.40	0.00	6447	0	2498	1570	4068	
5	90	37.36	29.965	15.855	0.00	0.138	2.82	0.80	1.00	0.0	32.23	90.75	0.00	7408	0	2882	1505	4387	
4	70	35.44	32.868	16.689	0.00	0.134	2.83	0.80	1.00	0.0	34.92	98.79	0.00	8087	0	2976	1427	4403	
3	50	33.02	40.951	16.689	0.00	0.142	2.80	0.80	1.00	0.0	41.59	116.41	0.00	8661	0	3267	1329	4596	
2	30	29.65	44.342	17.524	0.00	0.140	2.81	0.80	1.00	0.0	44.81	125.81	0.00	9399	0	3171	1194	4364	
1	10	25.66	47.794	17.524	0.00	0.137	2.82	0.80	1.00	0.0	46.45	130.99	0.00	11327	0	2857	1033	3890	
														<b>Totals</b>	<b>77,609</b>	<b>0</b>			<b>49,014</b>

1.2D + 1.0W 90°  
118 mph Wind with No Ice

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

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	46.13	6.172	2.917	0.00	0.196	2.61	0.85	1.00	0.0	6.92	18.07	0.00	971	0	708	742	1450	
12	230	45.52	12.104	8.333	0.00	0.217	2.54	0.85	1.00	0.0	15.10	38.37	0.00	2957	0	1485	1833	3318	
11	210	44.66	11.501	10.014	0.00	0.190	2.63	0.85	1.00	0.0	15.51	40.78	0.00	3230	0	1548	1798	3346	
10	190	43.73	11.305	11.682	0.00	0.153	2.76	0.85	1.00	0.0	16.16	44.58	0.00	3842	0	1657	1761	3418	
9	170	42.72	16.644	12.517	0.00	0.156	2.75	0.85	1.00	0.0	21.06	57.86	0.00	4485	0	2101	1720	3821	
8	150	41.61	19.283	13.351	0.00	0.146	2.78	0.85	1.00	0.0	23.63	65.79	0.00	5001	0	2327	1675	4002	
7	130	40.37	26.406	14.186	0.00	0.157	2.75	0.85	1.00	0.0	30.05	82.57	0.00	5794	0	2833	1626	4459	
6	110	38.98	23.241	15.020	0.00	0.130	2.85	0.85	1.00	0.0	27.63	78.71	0.00	6447	0	2608	1570	4177	
5	90	37.36	29.965	15.855	0.00	0.138	2.82	0.85	1.00	0.0	33.73	94.97	0.00	7408	0	3016	1505	4521	
4	70	35.44	32.868	16.689	0.00	0.134	2.83	0.85	1.00	0.0	36.56	103.44	0.00	8087	0	3116	1427	4543	
3	50	33.02	40.951	16.689	0.00	0.142	2.80	0.85	1.00	0.0	43.64	122.14	0.00	8661	0	3428	1329	4757	
2	30	29.65	44.342	17.524	0.00	0.140	2.81	0.85	1.00	0.0	47.03	132.03	0.00	9399	0	3327	1194	4521	
1	10	25.66	47.794	17.524	0.00	0.137	2.82	0.85	1.00	0.0	48.84	137.72	0.00	11327	0	3004	1033	4037	
														<b>Totals</b>	<b>77,609</b>	<b>0</b>			<b>50,371</b>

0.9D + 1.0W Normal  
118 mph Wind with No Ice (Reduced DL)

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

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	46.13	6.172	2.917	0.00	0.196	2.61	1.00	1.00	0.0	7.84	20.48	0.00	728	0	803	742	1545	
12	230	45.52	12.104	8.333	0.00	0.217	2.54	1.00	1.00	0.0	16.92	42.98	0.00	2218	0	1663	1833	3496	
11	210	44.66	11.501	10.014	0.00	0.190	2.63	1.00	1.00	0.0	17.24	45.31	0.00	2422	0	1720	1798	3518	
10	190	43.73	11.305	11.682	0.00	0.153	2.76	1.00	1.00	0.0	17.85	49.26	0.00	2882	0	1831	1761	3592	
9	170	42.72	16.644	12.517	0.00	0.156	2.75	1.00	1.00	0.0	23.55	64.72	0.00	3364	0	2350	1720	4070	
8	150	41.61	19.283	13.351	0.00	0.146	2.78	1.00	1.00	0.0	26.52	73.85	0.00	3751	0	2612	1675	4287	
7	130	40.37	26.406	14.186	0.00	0.157	2.75	1.00	1.00	0.0	34.02	93.45	0.00	4346	0	3207	1626	4832	
6	110	38.98	23.241	15.020	0.00	0.130	2.85	1.00	1.00	0.0	31.12	88.64	0.00	4835	0	2937	1570	4506	
5	90	37.36	29.965	15.855	0.00	0.138	2.82	1.00	1.00	0.0	38.22	107.63	0.00	5556	0	3418	1505	4923	
4	70	35.44	32.868	16.689	0.00	0.134	2.83	1.00	1.00	0.0	41.49	117.39	0.00	6065	0	3536	1427	4963	
3	50	33.02	40.951	16.689	0.00	0.142	2.80	1.00	1.00	0.0	49.78	139.34	0.00	6496	0	3910	1329	5240	
2	30	29.65	44.342	17.524	0.00	0.140	2.81	1.00	1.00	0.0	53.68	150.70	0.00	7049	0	3798	1194	4992	
1	10	25.66	47.794	17.524	0.00	0.137	2.82	1.00	1.00	0.0	56.01	157.94	0.00	8495	0	3444	1033	4478	
														<b>Totals</b>	<b>58,207</b>	<b>0</b>			<b>54,443</b>

SECTION FORCES

0.9D + 1.0W 60°

Gust Response Factor (Gh): 0.85

118 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>r</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	46.13	6.172	2.917	0.00	0.196	2.61	0.80	1.00	0.0	6.61	17.26	0.00	728	0	677	742	1418	
12	230	45.52	12.104	8.333	0.00	0.217	2.54	0.80	1.00	0.0	14.50	36.83	0.00	2218	0	1425	1833	3258	
11	210	44.66	11.501	10.014	0.00	0.190	2.63	0.80	1.00	0.0	14.94	39.26	0.00	2422	0	1491	1798	3289	
10	190	43.73	11.305	11.682	0.00	0.153	2.76	0.80	1.00	0.0	15.59	43.02	0.00	2882	0	1599	1761	3360	
9	170	42.72	16.644	12.517	0.00	0.156	2.75	0.80	1.00	0.0	20.23	55.57	0.00	3364	0	2018	1720	3738	
8	150	41.61	19.283	13.351	0.00	0.146	2.78	0.80	1.00	0.0	22.67	63.11	0.00	3751	0	2232	1675	3907	
7	130	40.37	26.406	14.186	0.00	0.157	2.75	0.80	1.00	0.0	28.73	78.94	0.00	4346	0	2709	1626	4335	
6	110	38.98	23.241	15.020	0.00	0.130	2.85	0.80	1.00	0.0	26.47	75.40	0.00	4835	0	2498	1570	4068	
5	90	37.36	29.965	15.855	0.00	0.138	2.82	0.80	1.00	0.0	32.23	90.75	0.00	5556	0	2882	1505	4387	
4	70	35.44	32.868	16.689	0.00	0.134	2.83	0.80	1.00	0.0	34.92	98.79	0.00	6065	0	2976	1427	4403	
3	50	33.02	40.951	16.689	0.00	0.142	2.80	0.80	1.00	0.0	41.59	116.41	0.00	6496	0	3267	1329	4596	
2	30	29.65	44.342	17.524	0.00	0.140	2.81	0.80	1.00	0.0	44.81	125.81	0.00	7049	0	3171	1194	4364	
1	10	25.66	47.794	17.524	0.00	0.137	2.82	0.80	1.00	0.0	46.45	130.99	0.00	8495	0	2857	1033	3890	
														<b>Totals</b>	<b>58,207</b>	<b>0</b>			<b>49,014</b>

0.9D + 1.0W 90°

Gust Response Factor (Gh): 0.85

118 mph Wind with No Ice (Reduced DL)

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>r</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	46.13	6.172	2.917	0.00	0.196	2.61	0.85	1.00	0.0	6.92	18.07	0.00	728	0	708	742	1450	
12	230	45.52	12.104	8.333	0.00	0.217	2.54	0.85	1.00	0.0	15.10	38.37	0.00	2218	0	1485	1833	3318	
11	210	44.66	11.501	10.014	0.00	0.190	2.63	0.85	1.00	0.0	15.51	40.78	0.00	2422	0	1548	1798	3346	
10	190	43.73	11.305	11.682	0.00	0.153	2.76	0.85	1.00	0.0	16.16	44.58	0.00	2882	0	1657	1761	3418	
9	170	42.72	16.644	12.517	0.00	0.156	2.75	0.85	1.00	0.0	21.06	57.86	0.00	3364	0	2101	1720	3821	
8	150	41.61	19.283	13.351	0.00	0.146	2.78	0.85	1.00	0.0	23.63	65.79	0.00	3751	0	2327	1675	4002	
7	130	40.37	26.406	14.186	0.00	0.157	2.75	0.85	1.00	0.0	30.05	82.57	0.00	4346	0	2833	1626	4459	
6	110	38.98	23.241	15.020	0.00	0.130	2.85	0.85	1.00	0.0	27.63	78.71	0.00	4835	0	2608	1570	4177	
5	90	37.36	29.965	15.855	0.00	0.138	2.82	0.85	1.00	0.0	33.73	94.97	0.00	5556	0	3016	1505	4521	
4	70	35.44	32.868	16.689	0.00	0.134	2.83	0.85	1.00	0.0	36.56	103.44	0.00	6065	0	3116	1427	4543	
3	50	33.02	40.951	16.689	0.00	0.142	2.80	0.85	1.00	0.0	43.64	122.14	0.00	6496	0	3428	1329	4757	
2	30	29.65	44.342	17.524	0.00	0.140	2.81	0.85	1.00	0.0	47.03	132.03	0.00	7049	0	3327	1194	4521	
1	10	25.66	47.794	17.524	0.00	0.137	2.82	0.85	1.00	0.0	48.84	137.72	0.00	8495	0	3004	1033	4037	
														<b>Totals</b>	<b>58,207</b>	<b>0</b>			<b>50,371</b>

1.2D + 1.0Di + 1.0Wi Normal

Gust Response Factor (Gh): 0.85

30 mph Wind with 0.25" Radial Ice

Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00

Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>r</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	2.98	6.172	5.876	2.96	0.256	2.42	1.00	1.00	0.3	9.62	23.26	2.96	1280	309	59	52	111	
12	230	2.94	12.104	13.404	5.07	0.268	2.38	1.00	1.00	0.3	20.01	47.72	5.07	3650	693	119	141	260	
11	210	2.89	11.501	15.621	5.61	0.238	2.47	1.00	1.00	0.3	20.59	50.96	5.61	3920	690	125	140	265	
10	190	2.83	11.305	17.154	5.47	0.189	2.63	1.00	1.00	0.3	21.13	55.66	5.47	4531	689	134	139	273	
9	170	2.76	16.644	18.528	6.01	0.188	2.64	1.00	1.00	0.3	27.25	71.86	6.01	5264	778	169	136	304	
8	150	2.69	19.283	19.910	6.56	0.175	2.68	1.00	1.00	0.3	30.64	82.15	6.56	5820	819	188	133	320	
7	130	2.61	26.406	21.284	7.10	0.183	2.65	1.00	1.00	0.3	38.58	102.32	7.10	6725	931	227	128	355	
6	110	2.52	23.241	21.378	6.36	0.150	2.77	1.00	1.00	0.3	35.38	97.98	6.36	7312	865	210	125	335	
5	90	2.42	29.965	22.542	6.69	0.158	2.74	1.00	1.00	0.3	42.78	117.35	6.69	8367	959	241	119	360	
4	70	2.29	32.868	23.663	6.97	0.153	2.76	1.00	1.00	0.3	46.31	127.81	6.97	9072	985	249	113	362	
3	50	2.13	40.951	23.874	7.19	0.160	2.74	1.00	1.00	0.3	54.53	149.14	7.19	9732	1071	271	104	375	
2	30	1.92	44.342	24.775	7.25	0.156	2.75	1.00	1.00	0.2	58.42	160.52	7.25	10467	1068	261	93	355	
1	10	1.66	47.794	24.404	6.88	0.151	2.77	1.00	1.00	0.2	61.65	170.58	6.88	12323	996	240	80	321	
														<b>Totals</b>	<b>88,462</b>	<b>10,853</b>			<b>3,996</b>

1.2D + 1.0Di + 1.0Wi 60°

Gust Response Factor (Gh): 0.85

30 mph Wind with 0.25" Radial Ice

Wind Importance Factor (Iw): 1.00

Ice Importance Factor: 1.00

Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>r</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>r</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)	
13	245	2.98	6.172	5.876	2.96	0.256	2.42	0.80	1.00	0.3	8.38	20.28	2.96	1280	309	51	52	104	
12	230	2.94	12.104	13.404	5.07	0.268	2.38	0.80	1.00	0.3	17.59	41.94	5.07	3650	693	105	141	246	
11	210	2.89	11.501	15.621	5.61	0.238	2.47	0.80	1.00	0.3	18.29	45.27	5.61	3920	690	111	140	251	
10	190	2.83	11.305	17.154	5.47	0.189	2.63	0.80	1.00	0.3	18.87	49.70	5.47	4531	689	119	139	259	
9	170	2.76	16.644	18.528	6.01	0.188	2.64	0.80	1.00	0.3	23.92	63.09	6.01	5264	778	148	136	284	
8	150	2.69	19.283	19.910	6.56	0.175	2.68	0.80	1.00	0.3	26.79	71.81	6.56	5820	819	164	133	297	
7	130	2.61	26.406	21.284	7.10	0.183	2.65	0.80	1.00	0.3	33.29	88.31	7.10	6725	931	196	128	324	
6	110	2.52	23.241	21.378	6.36	0.150	2.77	0.80	1.00	0.3	30.73	85.10	6.36	7312	865	182	125	307	
5	90	2.42	29.965	22.542	6.69	0.158	2.74	0.80	1.00	0.3	36.78	100.91	6.69	8367	959	207	119	326	
4	70	2.29	32.868	23.663	6.97	0.153	2.76	0.80	1.00	0.3	39.73	109.67	6.97	9072	985	214	113	326	
3	50	2.13	40.951	23.874	7.19	0.160	2.74	0.80	1.00	0.3	46.34	126.74	7.19	9732	1071	230	104	334	
2	30	1.92	44.342	24.775	7.25	0.156	2.75	0.80	1.00	0.2	49.55	136.15	7.25	10467	1068	222	93	315	
1	10	1.66	47.794	24.404	6.88	0.151	2.77	0.80	1.00	0.2	52.09	144.13	6.88	12323	996	203	80	283	
														<b>Totals</b>	<b>88,462</b>	<b>10,853</b>			<b>3,656</b>

SECTION FORCES

1.2D + 1.0Di + 1.0Wi 90°

Gust Response Factor (Gh): 0.85

Ice Importance Factor: 1.00

30 mph Wind with 0.25" Radial Ice

Wind Importance Factor (Iw): 1.00

Ice Dead Load Factor: 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>s</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)			
13	245	2.98	6.172	5.876	2.96	0.256	2.42	0.85	1.00	0.3	8.69	21.02	2.96	1280	309	53	52	105			
12	230	2.94	12.104	13.404	5.07	0.268	2.38	0.85	1.00	0.3	18.19	43.39	5.07	3650	693	109	141	250			
11	210	2.89	11.501	15.621	5.61	0.238	2.47	0.85	1.00	0.3	18.87	46.69	5.61	3920	690	115	140	254			
10	190	2.83	11.305	17.154	5.47	0.189	2.63	0.85	1.00	0.3	19.43	51.19	5.47	4531	689	123	139	262			
9	170	2.76	16.644	18.528	6.01	0.188	2.64	0.85	1.00	0.3	24.75	65.28	6.01	5264	778	153	136	289			
8	150	2.69	19.283	19.910	6.56	0.175	2.68	0.85	1.00	0.3	27.75	74.40	6.56	5820	819	170	133	303			
7	130	2.61	26.406	21.284	7.10	0.183	2.65	0.85	1.00	0.3	34.61	91.81	7.10	6725	931	204	128	332			
6	110	2.52	23.241	21.378	6.36	0.150	2.77	0.85	1.00	0.3	31.89	88.32	6.36	7312	865	189	125	314			
5	90	2.42	29.965	22.542	6.69	0.158	2.74	0.85	1.00	0.3	38.28	105.02	6.69	8367	959	216	119	335			
4	70	2.29	32.868	23.663	6.97	0.153	2.76	0.85	1.00	0.3	41.38	114.20	6.97	9072	985	222	113	335			
3	50	2.13	40.951	23.874	7.19	0.160	2.74	0.85	1.00	0.3	48.38	132.34	7.19	9732	1071	240	104	344			
2	30	1.92	44.342	24.775	7.25	0.156	2.75	0.85	1.00	0.2	51.77	142.25	7.25	10467	1068	232	93	325			
1	10	1.66	47.794	24.404	6.88	0.151	2.77	0.85	1.00	0.2	54.48	150.75	6.88	12323	996	212	80	293			
														<b>Totals</b>	<b>88,462</b>	<b>10,853</b>					<b>3,741</b>

1.0D + 1.0W Service Normal

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>s</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)			
13	245	11.93	6.172	2.917	0.00	0.196	2.61	1.00	1.00	0.0	7.84	20.48	0.00	809	0	208	192	399			
12	230	11.77	12.104	8.333	0.00	0.217	2.54	1.00	1.00	0.0	16.92	42.98	0.00	2464	0	430	474	904			
11	210	11.55	11.501	10.014	0.00	0.190	2.63	1.00	1.00	0.0	17.24	45.31	0.00	2692	0	445	465	910			
10	190	11.31	11.305	11.682	0.00	0.153	2.76	1.00	1.00	0.0	17.94	49.50	0.00	3202	0	476	455	931			
9	170	11.04	16.644	12.517	0.00	0.156	2.75	1.00	1.00	0.0	23.76	65.27	0.00	3738	0	613	445	1058			
8	150	10.76	19.283	13.351	0.00	0.146	2.78	1.00	1.00	0.0	26.86	74.77	0.00	4167	0	684	433	1117			
7	130	10.44	26.406	14.186	0.00	0.157	2.75	1.00	1.00	0.0	34.47	94.69	0.00	4828	0	840	420	1260			
6	110	10.08	23.241	15.020	0.00	0.130	2.85	1.00	1.00	0.0	31.74	90.41	0.00	5373	0	774	406	1180			
5	90	9.66	29.965	15.855	0.00	0.138	2.82	1.00	1.00	0.0	38.95	109.67	0.00	6173	0	901	389	1290			
4	70	9.16	32.868	16.689	0.00	0.134	2.83	1.00	1.00	0.0	42.32	119.72	0.00	6739	0	932	369	1301			
3	50	8.54	40.951	16.689	0.00	0.142	2.80	1.00	1.00	0.0	50.41	141.11	0.00	7217	0	1024	344	1368			
2	30	7.67	44.342	17.524	0.00	0.140	2.81	1.00	1.00	0.0	54.27	152.36	0.00	7832	0	993	309	1301			
1	10	6.63	47.794	17.524	0.00	0.137	2.82	1.00	1.00	0.0	57.72	162.76	0.00	9439	0	918	267	1185			
														<b>Totals</b>	<b>64,674</b>	<b>0</b>					<b>14,204</b>

1.0D + 1.0W Service 60°

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>s</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)			
13	245	11.93	6.172	2.917	0.00	0.196	2.61	0.80	1.00	0.0	6.61	17.26	0.00	809	0	175	192	367			
12	230	11.77	12.104	8.333	0.00	0.217	2.54	0.80	1.00	0.0	14.50	36.83	0.00	2464	0	368	474	842			
11	210	11.55	11.501	10.014	0.00	0.190	2.63	0.80	1.00	0.0	14.94	39.26	0.00	2692	0	385	465	850			
10	190	11.31	11.305	11.682	0.00	0.153	2.76	0.80	1.00	0.0	15.68	43.26	0.00	3202	0	416	455	871			
9	170	11.04	16.644	12.517	0.00	0.156	2.75	0.80	1.00	0.0	20.43	56.13	0.00	3738	0	527	445	972			
8	150	10.76	19.283	13.351	0.00	0.146	2.78	0.80	1.00	0.0	23.00	64.04	0.00	4167	0	586	433	1019			
7	130	10.44	26.406	14.186	0.00	0.157	2.75	0.80	1.00	0.0	29.19	80.18	0.00	4828	0	711	420	1132			
6	110	10.08	23.241	15.020	0.00	0.130	2.85	0.80	1.00	0.0	27.09	77.17	0.00	5373	0	661	406	1067			
5	90	9.66	29.965	15.855	0.00	0.138	2.82	0.80	1.00	0.0	32.95	92.80	0.00	6173	0	762	389	1151			
4	70	9.16	32.868	16.689	0.00	0.134	2.83	0.80	1.00	0.0	35.74	101.13	0.00	6739	0	788	369	1157			
3	50	8.54	40.951	16.689	0.00	0.142	2.80	0.80	1.00	0.0	42.22	118.18	0.00	7217	0	857	344	1201			
2	30	7.67	44.342	17.524	0.00	0.140	2.81	0.80	1.00	0.0	45.40	127.46	0.00	7832	0	831	309	1139			
1	10	6.63	47.794	17.524	0.00	0.137	2.82	0.80	1.00	0.0	48.16	135.81	0.00	9439	0	766	267	1033			
														<b>Totals</b>	<b>64,674</b>	<b>0</b>					<b>12,800</b>

1.0D + 1.0W Service 90°

Gust Response Factor (Gh): 0.85

60 mph Wind with No Ice

Wind Importance Factor (Iw): 1.00

Section #	Elev (ft)	Q <sub>Z</sub> (psf)	A <sub>r</sub> (sf)	A <sub>s</sub> (sf)	Ice A <sub>r</sub> (sf)	e	C <sub>r</sub>	D <sub>f</sub>	D <sub>r</sub>	T <sub>iz</sub> (in)	A <sub>e</sub> (sf)	EPA <sub>a</sub> (sf)	EPA <sub>ai</sub> (sf)	Wt (lb)	Ice Wt (lb)	F <sub>st</sub> (lb)	F <sub>a</sub> (lb)	Force (lb)			
13	245	11.93	6.172	2.917	0.00	0.196	2.61	0.85	1.00	0.0	6.92	18.07	0.00	809	0	183	192	375			
12	230	11.77	12.104	8.333	0.00	0.217	2.54	0.85	1.00	0.0	15.10	38.37	0.00	2464	0	384	474	858			
11	210	11.55	11.501	10.014	0.00	0.190	2.63	0.85	1.00	0.0	15.51	40.78	0.00	2692	0	400	465	865			
10	190	11.31	11.305	11.682	0.00	0.153	2.76	0.85	1.00	0.0	16.24	44.82	0.00	3202	0	431	455	886			
9	170	11.04	16.644	12.517	0.00	0.156	2.75	0.85	1.00	0.0	21.26	58.41	0.00	3738	0	548	445	993			
8	150	10.76	19.283	13.351	0.00	0.146	2.78	0.85	1.00	0.0	23.96	66.72	0.00	4167	0	610	433	1043			
7	130	10.44	26.406	14.186	0.00	0.157	2.75	0.85	1.00	0.0	30.51	83.81	0.00	4828	0	744	420	1164			
6	110	10.08	23.241	15.020	0.00	0.130	2.85	0.85	1.00	0.0	28.25	80.48	0.00	5373	0	689	406	1095			
5	90	9.66	29.965	15.855	0.00	0.138	2.82	0.85	1.00	0.0	34.45	97.01	0.00	6173	0	797	389	1186			
4	70	9.16	32.868	16.689	0.00	0.134	2.83	0.85	1.00	0.0	37.39	105.78	0.00	6739	0	824	369	1193			
3	50	8.54	40.951	16.689	0.00	0.142	2.80	0.85	1.00	0.0	44.27	123.91	0.00	7217	0	899	344	1243			
2	30	7.67	44.342	17.524	0.00	0.140	2.81	0.85	1.00	0.0	47.62	133.69	0.00	7832	0	871	309	1180			
1	10	6.63	47.794	17.524	0.00	0.137	2.82	0.85	1.00	0.0	50.55	142.54	0.00	9439	0	804	267	1071			
														<b>Totals</b>	<b>64,674</b>	<b>0</b>					<b>13,151</b>

ASSET: 417139, Columbia (Charles) FL  
 CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
 PROJECT: 14192636\_C3\_02

EQUIVALENT LATERAL FORCE METHOD

Spectral Response Acceleration for Short Period ( $S_s$ ):	0.08
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.05
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 ( $S_{ds}$ ):	0.09
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.08
Seismic Response Coefficient ( $C_s$ ):	0.03
Upper Limit $C_s$ :	0.03
Lower Limit $C_s$ :	0.03
Period based on Rayleigh Method (sec):	1.15
Redundancy Factor ( $p$ ):	1.30
Seismic Force Distribution Exponent ( $k$ ):	1.32
Total Unfactored Dead Load:	71.85 k
Seismic Base Shear (E):	2.80 k

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Section/Appurtenance	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
13	245.00	809	1,171,452	0.029	82	714
12	230.00	2,464	3,281,599	0.082	230	2,174
11	210.00	2,692	3,178,215	0.079	223	2,375
10	190.00	3,202	3,311,932	0.083	232	2,826
9	170.00	3,738	3,337,345	0.083	234	3,299
8	150.00	4,167	3,152,976	0.079	221	3,678
7	130.00	4,828	3,023,137	0.076	212	4,261
6	110.00	5,373	2,696,794	0.067	189	4,741
5	90.00	6,173	2,376,187	0.059	166	5,448
4	70.00	6,739	1,860,355	0.046	130	5,948
3	50.00	7,217	1,276,555	0.032	89	6,369
2	30.00	7,832	704,793	0.018	49	6,912
1	10.00	9,439	198,557	0.005	14	8,330
JMA Wireless DBC-67-C-1SF	250.00	13	19,928	0.000	1	12
Commscope E15Z01P19	250.00	22	32,718	0.001	2	19
Raycap RCMD-3315-PF-48	250.00	21	31,826	0.001	2	19
Ericsson RRUS-32 (77 lbs)	250.00	462	687,077	0.017	48	408
Commscope NHH-65C-R2B	250.00	310	460,431	0.012	32	273
CSS X7CAP-865	250.00	336	499,692	0.012	35	297
VZW Unused Reserve (12986.62 sqin)	250.00	1,336	1,986,277	0.050	139	1,179
Generic Flat Low Profile Platform	250.00	1,875	2,788,462	0.070	195	1,655
Ericsson Radio 4460 B25+B66	240.00	436	614,321	0.015	43	385
Ericsson Radio 4480 B71+B85A	240.00	336	473,422	0.012	33	297
Ericsson AIR 6419 B41	240.00	333	469,477	0.012	33	294
Generic Flat Light Sector Frame	240.00	1,200	1,690,793	0.042	118	1,059
Commscope FFVV-65C-R3-V1	240.00	498	702,243	0.018	49	440
<b>Totals</b>		<b>71,852</b>	<b>40,026,560</b>	<b>1.000</b>	<b>2,802</b>	<b>63,410</b>

1.2D + 1.0Ev + 1.0Eh

Section/Appurtenance	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	Cvx	Horizontal Force (lb)	Vertical Force (lb)
13	245.00	809	1,171,452	0.029	82	985
12	230.00	2,464	3,281,599	0.082	230	3,000
11	210.00	2,692	3,178,215	0.079	223	3,277
10	190.00	3,202	3,311,932	0.083	232	3,898
9	170.00	3,738	3,337,345	0.083	234	4,551
8	150.00	4,167	3,152,976	0.079	221	5,074
7	130.00	4,828	3,023,137	0.076	212	5,879
6	110.00	5,373	2,696,794	0.067	189	6,541
5	90.00	6,173	2,376,187	0.059	166	7,516
4	70.00	6,739	1,860,355	0.046	130	8,205



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FORCE/STRESS SUMMARY

Section 1 – 0.0' to 20.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5 1/4" SOLID	-469.01	1.2D + 1.0W N	6.676	100	100	100	61.04	61.04	741.88	0.00	0.00	0	0	63	Member X
D SAE - 4X4X0.375	-9.67	1.2D + 1.0W 90°	24.911	50	50	50	191.87	191.87	22.24	27.06	36.54	1	1	43	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5 1/4" SOLID	392.73	0.9D + 1.0W 60°	50.0	65	974.16	0.00	0.00				0	0	40	Member
D SAE - 4X4X0.375	9.70	1.2D + 1.0W 90°	36.0	58	81.84	27.06	22.18	24.26			1	1	43	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	397.82	0.9D + 1.0W 60°	974.31	41	8	2.0" GR50

Section 2 – 20.0' to 40.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5 1/4" SOLID	-436.11	1.2D + 1.0W N	6.676	100	100	100	61.04	61.04	741.88	0.00	0.00	0	0	58	Member X
D SAE - 4X4X0.25	-9.58	1.2D + 1.0W 90°	23.182	50	50	50	174.96	174.96	18.14	27.06	24.36	1	1	52	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5 1/4" SOLID	362.25	1.2D + 1.0W 60°	50.0	65	974.16	0.00	0.00				0	0	37	Member
D SAE - 4X4X0.25	9.42	1.2D + 1.0W 90°	36.0	58	55.65	27.06	14.79	16.18			1	1	63	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	371.03	0.9D + 1.0W 60°	758.83	49	6	1 1/2 A325

Section 3 – 40.0' to 60.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5" SOLID	-402.04	1.2D + 1.0W N	6.676	100	100	100	64.09	64.09	654.37	0.00	0.00	0	0	61	Member X
D SAE - 4X4X0.25	-8.93	1.2D + 1.0W 90°	21.464	50	50	50	162.00	162.00	21.16	27.06	24.36	1	1	42	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5" SOLID	337.51	1.2D + 1.0W 60°	50.0	65	883.58	0.00	0.00				0	0	38	Member
D SAE - 4X4X0.25	8.79	1.2D + 1.0W 90°	36.0	58	55.65	27.06	14.79	16.18			1	1	59	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	345.54	0.9D + 1.0W 60°	758.83	46	6	1 1/2 A325

Section 4 – 60.0' to 80.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5" SOLID	-368.57	1.2D + 1.0W N	6.676	100	100	100	64.09	64.09	654.37	0.00	0.00	0	0	56	Member X
D SAE - 3.5x3.5x0.25	-8.11	1.2D + 1.0W 90°	19.761	50	50	50	172.34	172.34	16.29	27.06	24.36	1	1	49	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 5" SOLID	312.66	1.2D + 1.0W 60°	50.0	65	883.58	0.00	0.00				0	0	35	Member
D SAE - 3.5x3.5x0.25	7.98	1.2D + 1.0W 90°	36.0	58	47.49	27.06	14.79	16.18			1	1	53	Bolt Bear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	320.02	0.9D + 1.0W 60°	758.83	42	6	1 1/2 A325

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FORCE/STRESS SUMMARY

Section 5 – 80.0' to 100.00'

Member Compression														
	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	F <sub>c</sub> P <sub>n</sub> (kip)	Shear $\Phi R_{nv}$ (kip)	Bear $\Phi R_n$ (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 4 3/4" SOLID	-335.71	1.2D + 1.0W N	6.676	100	100	100	67.46	67.46	571.73	0.00	0.00	0	0	58 Member X
D SAE - 3.5x3.5x0.25	-7.40	1.2D + 1.0W 90°	18.077	50	50	50	157.65	157.65	19.46	27.06	24.36	1	1	38 Member Z

Member Tension													
	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	$\Phi_c P_n$ (kip)	Shear $\Phi R_{nv}$ (kip)	Bear $\Phi R_n$ (kip)	Blk Shear $\Phi_t P_n$ (kip)	# Bolt	# Hole	Use %	Controls	
L SOL - 4 3/4" SOLID	287.82	1.2D + 1.0W 60°	50.0	65	797.44	0.00	0.00		0	0	36	Member	
D SAE - 3.5x3.5x0.25	7.27	1.2D + 1.0W 90°	36.0	58	47.49	27.06	14.79	16.18	1	1	49	Bolt Bear	

Max Splice Forces						
	Pu (kip)	Load Case	$\Phi R_{nt}$ (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	294.61	0.9D + 1.0W 60°	758.83	39	6	1 1/2 A325

FORCE/STRESS SUMMARY

Section 6 – 100.0' to 120.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 4 1/2" SOLID	-303.40	1.2D + 1.0W N	6.676	100	100	100	71.21	71.21	493.98	0.00	0.00	0	0	61	Member X
D SAE - 3X3X0.25	-6.67	1.2D + 1.0W 90°	16.418	50	50	50	166.39	166.39	14.89	27.06	24.36	1	1	44	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 4 1/2" SOLID	265.66	0.9D + 1.0W 60°	50.0	65	715.68	0.00	0.00				0	0	37	Member
D SAE - 3X3X0.25	6.51	1.2D + 1.0W 90°	36.0	58	39.33	27.06	14.79	13.46			1	1	48	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	269.15	0.9D + 1.0W 60°	758.83	35	6	1 1/2 A325

Section 7 – 120.0' to 140.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 4 1/4" SOLID	-272.96	1.2D + 1.0W N	5.007	100	100	100	56.55	56.55	505.29	0.00	0.00	0	0	54	Member X
D SAE - 3X3X0.1875	-5.72	1.2D + 1.0W 90°	14.188	50	50	50	142.83	142.83	15.29	27.06	18.27	1	1	37	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 4 1/4" SOLID	238.78	1.2D + 1.0W 60°	50.0	65	638.37	0.00	0.00				0	0	37	Member
D SAE - 3X3X0.1875	5.60	1.2D + 1.0W 90°	36.0	58	29.83	27.06	11.09	10.09			1	1	55	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	243.45	0.9D + 1.0W 60°	623.64	39	6	1.375" A325

Section 8 – 140.0' to 160.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 4" SOLID	-241.79	1.2D + 1.0W N	5.007	100	100	100	60.08	60.08	434.30	0.00	0.00	0	0	55	Member X
D SAE - 2.5X2.5X0.1875	-5.04	1.2D + 1.0W 90°	12.52	50	50	50	151.75	151.75	11.21	27.06	18.27	1	1	44	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 4" SOLID	215.17	0.9D + 1.0W 60°	50.0	65	565.47	0.00	0.00				0	0	38	Member
D SAE - 2.5X2.5X0.1875	4.93	1.2D + 1.0W 90°	36.0	58	23.69	27.06	11.09	9.07			1	1	54	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	217.86	0.9D + 1.0W 60°	623.64	35	6	1.375" A325

Section 9 – 160.0' to 180.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls	
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 3 3/4" SOLID	-210.96	1.2D + 1.0W N	5.007	100	100	100	64.09	64.09	368.10	0.00	0.00	0	0	57	Member X
D SAE - 2.5X2.5X0.1875	-4.54	1.2D + 1.0W 90°	10.893	50	50	50	132.04	132.04	14.81	27.06	18.27	1	1	30	Member Z

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		Bear		Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
						Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)					
L SOL - 3 3/4" SOLID	187.43	1.2D + 1.0W 60°	50.0	65	497.02	0.00	0.00				0	0	37	Member
D SAE - 2.5X2.5X0.1875	4.43	1.2D + 1.0W 90°	36.0	58	23.69	27.06	11.09	9.07			1	1	48	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	191.75	0.9D + 1.0W 60°	623.64	31	6	1.375" A325

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FORCE/STRESS SUMMARY

Section 10 – 180.0' to 200.00'

Member Compression		Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	F <sub>c</sub> P <sub>n</sub> (kip)	Shear ΦR <sub>nv</sub> (kip)	Bear ΦR <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 1/2" SOLID	-179.21	1.2D + 1.0W N	5.007	100	100	100	68.66	68.66	306.71	0.00	0.00	0	0	58	Member X
D SAE - 2X2X0.1875	-4.17	1.2D + 1.0W 90°	9.331	50	50	50	142.09	142.09	10.14	13.81	13.05	1	1	41	Member Z

Member Tension		Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear ΦR <sub>nv</sub> (kip)	Bear ΦR <sub>n</sub> (kip)	Blk Shear Φ <sub>t</sub> P <sub>n</sub> (kip)	# Bolt	# Hole	Use %	Controls
L SOL - 3 1/2" SOLID	160.96	0.9D + 1.0W 60°	50.0	65	432.94	0.00	0.00	0.00	0	0	0	37	Member
D SAE - 2X2X0.1875	4.04	1.2D + 1.0W 90°	36.0	58	19.12	13.81	7.83	6.83	1	1	59	Blk Shear	

Max Splice Forces		Pu (kip)	Load Case	ΦR <sub>nt</sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	164.19	0.9D + 1.0W 60°	623.64	26	6	1.375" A325	

FORCE/STRESS SUMMARY

Section 11 – 200.0' to 220.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)				
L SOL - 3" SOLID	-145.40	1.2D + 1.0W N	4.005	100	100	100	64.09	64.09	235.59	0.00	0	0	61	Member X
H SAE - 2X2X0.1875	-0.14	1.2D + 1.0W N	4.502	100	100	100	137.12	137.12	10.88	13.81	1	1	1	Member Z
D SAE - 2X2X0.1875	-4.13	1.2D + 1.0W 90°	6.159	50	50	50	100.34	100.34	17.59	13.81	1	1	31	Bolt Bear

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Blk Shear		# Bolt	# Hole	Use %	Controls
								Φ <sub>t</sub> P <sub>n</sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)				
L SOL - 3" SOLID	129.41	1.2D + 1.0W 60°	50.0	65	318.10	0.00	0.00			0	0	40	Member
H SAE - 2X2X0.1875	0.05	1.2D + 1.0W N	36.0	58	19.12	13.81	7.83	6.83		1	1	0	Blk Shear
D SAE - 2X2X0.1875	3.97	1.2D + 1.0W 90°	36.0	58	19.12	13.81	7.83	6.83		1	1	58	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	133.29	0.9D + 1.0W 60°	623.64	21	6	1.375" A325

Section 12 – 220.0' to 240.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)				
L SOL - 2 1/2" SOLID	-98.08	1.2D + 1.0W N	4	100	100	100	76.80	76.80	143.55	0.00	0	0	68	Member X
D SAE - 2.5X2.5X0.25	-7.51	1.2D + 1.0W 90°	6.022	50	50	50	85.20	85.20	33.06	27.06	1	1	30	Bolt Bear

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Blk Shear		# Bolt	# Hole	Use %	Controls
								Φ <sub>t</sub> P <sub>n</sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)				
L SOL - 2 1/2" SOLID	84.69	1.2D + 1.0W 60°	50.0	65	220.95	0.00	0.00			0	0	38	Member
D SAE - 2.5X2.5X0.25	7.33	1.2D + 1.0W 90°	36.0	58	31.18	27.06	14.79	12.10		1	1	60	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	94.29	0.9D + 1.0W 60°	623.64	15	6	1.375" A325

Section 13 – 240.0' to 250.00'

Member Compression	Pu (kip)	Load Case	Len (ft)	Bracing %			F <sub>y</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Shear		# Bolt	# Hole	Use %	Controls
				X	Y	Z			Φ <sub>R<sub>nv</sub></sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)				
L SOL - 1 3/4" SOLID	-21.45	1.2D + 1.0W N	3.333	100	100	100	91.43	91.43	58.74	0.00	0	0	36	Member X
H SAE - 2X2X0.1875	-1.25	1.2D + 1.0W N	4.502	100	100	100	137.12	137.12	10.88	13.81	1	1	11	Member Z
D SAE - 2X2X0.1875	-3.68	1.2D + 1.0W N	5.602	50	50	50	93.98	93.98	18.59	13.81	1	1	28	Bolt Bear

Member Tension	Pu (kip)	Load Case	F <sub>y</sub> (ksi)	F <sub>u</sub> (ksi)	Φ <sub>c</sub> P <sub>n</sub> (kip)	Φ <sub>R<sub>nv</sub></sub> (kip)	Φ <sub>R<sub>n</sub></sub> (kip)	Blk Shear		# Bolt	# Hole	Use %	Controls
								Φ <sub>t</sub> P <sub>n</sub> (kip)	Bear Φ <sub>R<sub>n</sub></sub> (kip)				
L SOL - 1 3/4" SOLID	14.19	0.9D + 1.0W 60°	50.0	65	108.24	0.00	0.00			0	0	13	Member
H SAE - 2X2X0.1875	2.53	1.2D + 1.0W N	36.0	58	19.12	13.81	7.83	6.83		1	1	36	Blk Shear
D SAE - 2X2X0.1875	4.08	1.2D + 1.0W N	36.0	58	19.12	13.81	7.83	6.83		1	1	59	Blk Shear

Max Splice Forces	Pu (kip)	Load Case	Φ <sub>R<sub>nt</sub></sub> (kip)	Use %	Num Bolts	Bolt Type
Bot Tension	17.08	0.9D + 1.0W 60°	218.07	8	4	1 A325

DEFLECTIONS AND ROTATIONS

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)	Resultant (deg)
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	240.00	0.5188	0.0027	0.3257	0.3257
1.0D + 1.0W Service 90° 60 mph Wind with No Ice	250.00	0.5748	0.0029	0.1352	0.1352
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	240.00	0.5145	0.0032	0.3232	0.3232
1.0D + 1.0W Service 60° 60 mph Wind with No Ice	250.00	0.5706	0.0026	0.4338	0.4339
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	240.00	0.5403	-0.0013	0.3319	0.3319
1.0D + 1.0W Service Normal 60 mph Wind with No Ice	250.00	0.6	-0.0018	0.7846	0.7846
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	240.00	0.1185	-0.0004	0.0719	0.0719
0.9D - 1.0Ev + 1.0Eh 90° Seismic (Reduced DL)	250.00	0.1311	0.0000	0.0722	0.0722
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	240.00	0.1185	0.0003	0.0714	0.0714
0.9D - 1.0Ev + 1.0Eh 60° Seismic (Reduced DL)	250.00	0.1311	0.0000	0.0722	0.0722
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	240.00	0.1185	0.0004	0.0722	0.0722
0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)	250.00	0.1311	0.0000	0.0721	0.0721
1.2D + 1.0Ev + 1.0Eh 90° Seismic	240.00	0.1188	-0.0004	0.0724	0.0724
1.2D + 1.0Ev + 1.0Eh 90° Seismic	250.00	0.1314	0.0000	0.0726	0.0726
1.2D + 1.0Ev + 1.0Eh 60° Seismic	240.00	0.1188	0.0003	0.0718	0.0718
1.2D + 1.0Ev + 1.0Eh 60° Seismic	250.00	0.1314	0.0000	0.0726	0.0726
1.2D + 1.0Ev + 1.0Eh Normal Seismic	240.00	0.1189	0.0004	0.0727	0.0727
1.2D + 1.0Ev + 1.0Eh Normal Seismic	250.00	0.1314	0.0000	0.0724	0.0724
1.2D + 1.0Di + 1.0Wi 90° 30 mph Wind with 0.25" Radial Ice	240.00	0.145	0.0008	0.0902	0.0902
1.2D + 1.0Di + 1.0Wi 90° 30 mph Wind with 0.25" Radial Ice	250.00	0.1606	0.0008	0.0309	0.0309
1.2D + 1.0Di + 1.0Wi 60° 30 mph Wind with 0.25" Radial Ice	240.00	0.1441	0.0008	0.0901	0.0901
1.2D + 1.0Di + 1.0Wi 60° 30 mph Wind with 0.25" Radial Ice	250.00	0.1598	0.0009	0.1167	0.1167
1.2D + 1.0Di + 1.0Wi Normal 30 mph Wind with 0.25" Radial Ice	240.00	0.1502	-0.0003	0.0925	0.0925
1.2D + 1.0Di + 1.0Wi Normal 30 mph Wind with 0.25" Radial Ice	250.00	0.1667	-0.0007	0.2115	0.2115
0.9D + 1.0W 90° 118 mph Wind with No Ice (Reduced DL)	240.00	2.0074	0.0121	1.2608	1.2608
0.9D + 1.0W 90° 118 mph Wind with No Ice (Reduced DL)	250.00	2.2242	0.0132	0.5209	0.521
0.9D + 1.0W 60° 118 mph Wind with No Ice (Reduced DL)	240.00	1.9907	0.0210	1.2502	1.2504
0.9D + 1.0W 60° 118 mph Wind with No Ice (Reduced DL)	250.00	2.2084	0.0230	1.6783	1.6783
0.9D + 1.0W Normal 118 mph Wind with No Ice (Reduced DL)	240.00	2.0903	-0.0067	1.2824	1.2824
0.9D + 1.0W Normal 118 mph Wind with No Ice (Reduced DL)	250.00	2.3214	-0.0047	3.0453	3.0453
1.2D + 1.0W 90° 118 mph Wind with No Ice	240.00	2.0123	0.0122	1.2646	1.2646
1.2D + 1.0W 90° 118 mph Wind with No Ice	250.00	2.2298	0.0133	0.5170	0.517
1.2D + 1.0W 60° 118 mph Wind with No Ice	240.00	1.9956	0.0210	1.2542	1.2544
1.2D + 1.0W 60° 118 mph Wind with No Ice	250.00	2.214	0.0229	1.6800	1.68
1.2D + 1.0W Normal 118 mph Wind with No Ice	240.00	2.0954	-0.0066	1.2866	1.2866
1.2D + 1.0W Normal 118 mph Wind with No Ice	250.00	2.3272	-0.0048	3.0498	3.0498

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	14.03	0.00	0	1	0.00	474.31	-40.41
	14.03	0.00	120	1a	13.42	-194.04	-12.84
	14.03	0.00	240	1b	-13.42	-194.04	-12.84
1.2D + 1.0W 60°	14.03	0.00	0	1	-3.81	238.12	-19.49
	14.03	0.00	120	1a	-18.77	237.38	6.46
	14.03	0.00	240	1b	-29.96	-389.27	-17.30
1.2D + 1.0W 90°	14.03	0.00	0	1	-4.61	28.75	-1.53
	14.03	0.00	120	1a	-29.91	396.34	14.69
	14.03	0.00	240	1b	-27.51	-338.86	-13.16
0.9D + 1.0W Normal	14.03	0.00	0	1	0.00	466.47	-40.01
	14.03	0.00	120	1a	13.75	-200.90	-13.04
	14.03	0.00	240	1b	-13.75	-200.90	-13.04
0.9D + 1.0W 60°	14.03	0.00	0	1	-3.82	230.62	-19.10
	14.03	0.00	120	1a	-18.43	229.89	6.26
	14.03	0.00	240	1b	-30.29	-395.84	-17.49
0.9D + 1.0W 90°	14.03	0.00	0	1	-4.62	21.56	-1.14
	14.03	0.00	120	1a	-29.56	388.62	14.49
	14.03	0.00	240	1b	-27.84	-345.51	-13.35
1.2D + 1.0Di + 1.0Wi Normal	14.03	0.00	0	1	0.00	65.00	0.76
	14.03	0.00	120	1a	4.18	16.83	-2.77
	14.03	0.00	240	1b	-4.18	16.83	-2.77
1.2D + 1.0Di + 1.0Wi 60°	14.03	0.00	0	1	-0.28	48.12	2.27
	14.03	0.00	120	1a	1.83	48.07	-1.37
	14.03	0.00	240	1b	-5.39	2.48	-3.11
1.2D + 1.0Di + 1.0Wi 90°	14.03	0.00	0	1	-0.33	32.89	3.59
	14.03	0.00	120	1a	1.02	59.56	-0.77
	14.03	0.00	240	1b	-5.21	6.21	-2.82
1.2D + 1.0Ev + 1.0Eh Normal	14.03	0.00	0	1	0.00	51.60	-3.29
	14.03	0.00	120	1a	-0.69	16.50	0.26
	14.03	0.00	240	1b	0.69	16.50	0.26
1.2D + 1.0Ev + 1.0Eh 60°	14.03	0.00	0	1	-0.11	39.90	-2.44
	14.03	0.00	120	1a	-2.17	39.90	1.12
	14.03	0.00	240	1b	-0.11	4.81	-0.06
1.2D + 1.0Ev + 1.0Eh 90°	14.03	0.00	0	1	-0.13	28.20	-1.58
	14.03	0.00	120	1a	-2.69	48.46	1.47
	14.03	0.00	240	1b	0.06	7.94	0.11
0.9D - 1.0Ev + 1.0Eh Normal	14.03	0.00	0	1	0.00	43.80	-2.86
	14.03	0.00	120	1a	-0.31	8.76	0.05
	14.03	0.00	240	1b	0.31	8.76	0.05
0.9D - 1.0Ev + 1.0Eh 60°	14.03	0.00	0	1	-0.12	32.12	-2.00
	14.03	0.00	120	1a	-1.79	32.12	0.90
	14.03	0.00	240	1b	-0.49	-2.92	-0.28
0.9D - 1.0Ev + 1.0Eh 90°	14.03	0.00	0	1	-0.13	20.44	-1.15
	14.03	0.00	120	1a	-2.31	40.67	1.26
	14.03	0.00	240	1b	-0.32	0.21	-0.11
1.0D + 1.0W Service Normal	14.03	0.00	0	1	0.00	139.20	-11.43
	14.03	0.00	120	1a	2.70	-33.67	-2.88
	14.03	0.00	240	1b	-2.70	-33.67	-2.88
1.0D + 1.0W Service 60°	14.03	0.00	0	1	-1.01	78.12	-5.97
	14.03	0.00	120	1a	-5.67	77.93	2.11
	14.03	0.00	240	1b	-6.98	-84.19	-4.03
1.0D + 1.0W Service 90°	14.03	0.00	0	1	-1.21	23.95	-1.30
	14.03	0.00	120	1a	-8.58	119.04	4.26
	14.03	0.00	240	1b	-6.35	-71.15	-2.96

ASSET: 417139, Columbia (Charles) FL  
CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
PROJECT: 14192636\_C3\_02

MAXIMUM REACTIONS SUMMARY

	<u>Individual</u>		<u>Global (DL+WL+IL)</u>		<u>Global (DL+WL)</u>
Max Uplift:	395.84 (kip)	Moment Ice:	675.83 (kip-ft)	Moment:	9377.47 (kip-ft)
Max Down:	474.31 (kip)	Total Down Ice:	98.66 (kip)	Total Down:	86.22 (kip)
Max Shear:	40.41 (kip)	Total Shear Ice:	4.77 (kip)	Total Shear:	66.09 (kip)
1.2D + 1.0W Normal					

Site Number  
 Site Name  
 TIA Revision  
 Date

Columbia (Charles) FL, FL  
 417139  
 ANSI/TIA-222-H  
 1/5/2023

## SST Anchor Rod Interaction Check

### Reactions & Layout

Uplift	Tu	395.8	k
Axial	Pu	474.3	k
Shear	Vu	40.4	k
Rod Quantity	n	8	
Rod Diameter	d	2	in
Rod Grade		Gr. 50	
Rod $F_y$	$F_y$	50	ksi
Rod $F_u$	$F_u$	65	ksi
Clear Distance		4.5	in
Grouted? (Type c)		No	

### Rod Properties

Threads per Inch	$n^b$	4.5	
Net Area	$A_n$	2.50	in <sup>2</sup>
Gross Area	$A_g$	3.14	in <sup>2</sup>

### Tension

Tension Reduction Factor	$\Phi_t$	0.75	
Nominal Tensile Strength	$R_{nt}$	162.38	k

[ANSI/TIA-222-H, 4.9.6.5]

### Shear

Shear Reduction Factor	$\Phi_v$	0.75	
Nominal Shear Strength	$R_{nv}$	102.10	k
Compression Reduction Factor	$\Phi_c$	0.90	
Nominal Shear Yielding Strength	$R_{nvc}$	70.69	k

[ANSI/TIA-222-H, 4.9.6.3]

### Flexure

Flexure Reduction Factor	$\Phi_f$	0.90	
Plastic Section Modulus	Z	1.33	in <sup>3</sup>
Nominal Flexural Strength	$M_n$	66.67	k-in

[ANSI/TIA-222-H, 4.7.1]

### Compression

Radius of Gyration	r	0.50	ksi
Effective Yield Strss	$F_y'$	50.00	ksi
$\lambda_c$		0.04	k-in
Critical Compression Stress	$F_{cr}$	49.96	k
Nominal Compression Yielding Strength	$R_{nc}$	157.08	k
Nominal Buckling Strength	$R_{nb}$	156.95	k
Anchor Rod Projection to Nut	lar	2.58	in

[ANSI/TIA-222-H, 4.5.4.2]

Tensile Interaction Result	30.4%	Pass
Compressive Interaction Result	56.7%	Pass