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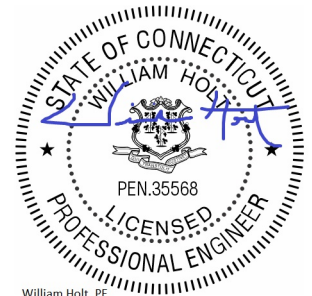
## Structural Analysis Report

**Structure** : 142 ft Monopole  
**ATC Site Name** : WSPT - South, CT  
**ATC Site Number** : 302511  
**Engineering Number** : 13958510\_C3\_03  
**Proposed Carrier** : AT&T MOBILITY  
**Carrier Site Name** : MRCTB051010  
**Carrier Site Number** : CTCN002103  
**Site Location** : 20 Post Office Lane  
Westport, CT 06880-6226  
41.1235, -73.3131  
**County** : Fairfield  
**Date** : March 14, 2022  
**Max Usage** : 83%  
**Result** : Pass

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Director of Engineering  
License No. 35568 Expires: 01/31/2023

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## **Introduction**

The purpose of this report is to summarize results of a structural analysis performed on the 142 ft Monopole to reflect the change in loading by AT&T MOBILITY.

## **Supporting Documents**

<b>Tower Drawings</b>	EEl Drawing #GS50841, dated March 2, 1998
<b>Foundation Drawing</b>	Mapping by TEP Project #65218-72422, dated December 28, 2015
<b>Geotechnical Report</b>	MB&A Project #011105, dated July 17, 2001
<b>Modifications</b>	EEl Drawing #GS54696, dated July 24, 2003 ATC Job #42046633, dated October 16, 2008

## **Analysis**

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

<b>Basic Wind Speed:</b>	118 mph (3-second gust)
<b>Basic Wind Speed w/ Ice:</b>	50 mph (3-second gust) w/ 1.00" radial ice concurrent
<b>Code:</b>	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State 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>	$S_s = 0.23$ , $S_i = 0.06$
<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 and Reserved Equipment**

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
131.0	2	Raycap DC6-48-60-18-8F ("Squid")	Triangular Platform with Handrails	(6) 1 1/4" Coax	AT&T MOBILITY
	3	CCI OPA65R-BU6D			
	3	Ericsson RRUS 32 B30			
	1	Raycap DC6-48-60-0-8C			
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 4478 B14			
	3	Ericsson RRUS 8843 B2, B66A			
120.0	3	Ericsson Radio 4449 B71 B85A	Square Platform with Handrails	(3) 1.99" (50.7mm) Hybrid	T-MOBILE
	3	Commscope VV-65A-R1			
	1	Ericsson AIR 21, 1.3 M, B2A B4P			
	3	Ericsson AIR 6419 B41			
	1	Ericsson AIR 32 B2A/B66A			
	3	RFS APXVAALL24 43-U-NA20			
	3	Ericsson 4460 BAND 2/25			
111.0	-	-	Empty Triangular Platform with Handrails	-	SPRINT NEXTEL
100.0	3	Antel BXA-70080/6CF__	Triangular Platform with Handrails	(12) 7/8" Coax (6) 1 5/8" Coax (1) 1 5/8" Hybriflex (1) 1/2" Coax	VERIZON WIRELESS
	6	Quintel QS6656-5D			
	3	Samsung B2/B66A RRH-BR049			
	3	Samsung B5/B13 RRH-BR04C			
	1	Commscope RC2DC-3315-PF-48			
	1	Generic GPS			
	3	Ryma MGD3-800TX			
78.1	2	Diamond X50A	Stand-Off	(2) 0.405" (10.3mm) Coax	SENET, INC.
69.7	1	PCTEL GPS-TMG-HR-26N	Stand-Off	(1) 1/2" Coax	SPRINT NEXTEL
53.0	1	Raycap RDIDC-9181-PF-48	Triangular Platform with Handrails	(1) 1.75" (44.5mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B604			
	3	Fujitsu TA08025-B605			
	3	JMA Wireless MX08FRO665-21			

**Equipment to be Removed**

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
131.0	3	Powerwave Allgon 7770.00	-	(2) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6 (2) 2" conduit	AT&T MOBILITY
	3	Kathrein Scala 80010965			
	3	Quintel QS66512-2			

**Proposed Equipment**

Elev. <sup>1</sup> (ft)	Qty	Equipment	Mount Type	Lines	Carrier
133.0	3	Ericsson Air 6449 B77D	Triangular Platform with Handrails	(2) 0.40" (10.3mm) Fiber (2) 0.88" (22.4mm) 8 AWG 6 (4) 0.92" (23.4mm) Cable	AT&T MOBILITY
131.0	3	CCI DMP65R-BU6E			
129.0	3	Ericsson AIR 6419 B77G			

<sup>1</sup> Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.

### Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	53%	Pass
Shaft	82%	Pass
Base Plate	83%	Pass
Flanges	62%	Pass
Reinforcement	65%	Pass
Interface	61%	Pass

### Foundation

Reaction Component	Analysis Reactions	% of Usage
Moment (Kips-Ft)	3133.8	37%
Shear (Kips)	33.5	22%
Axial (Kips)	54.3	11%

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

### Deflection and Sway\*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
133.0	Ericsson Air 6449 B77D	AT&T MOBILITY	1.616	1.380
131.0	CCI DMP65R-BU6E		1.568	1.380
129.0	Ericsson AIR 6419 B77G		1.520	1.380

\*Deflection 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 A.T. Engineering Service, PLLC 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 A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

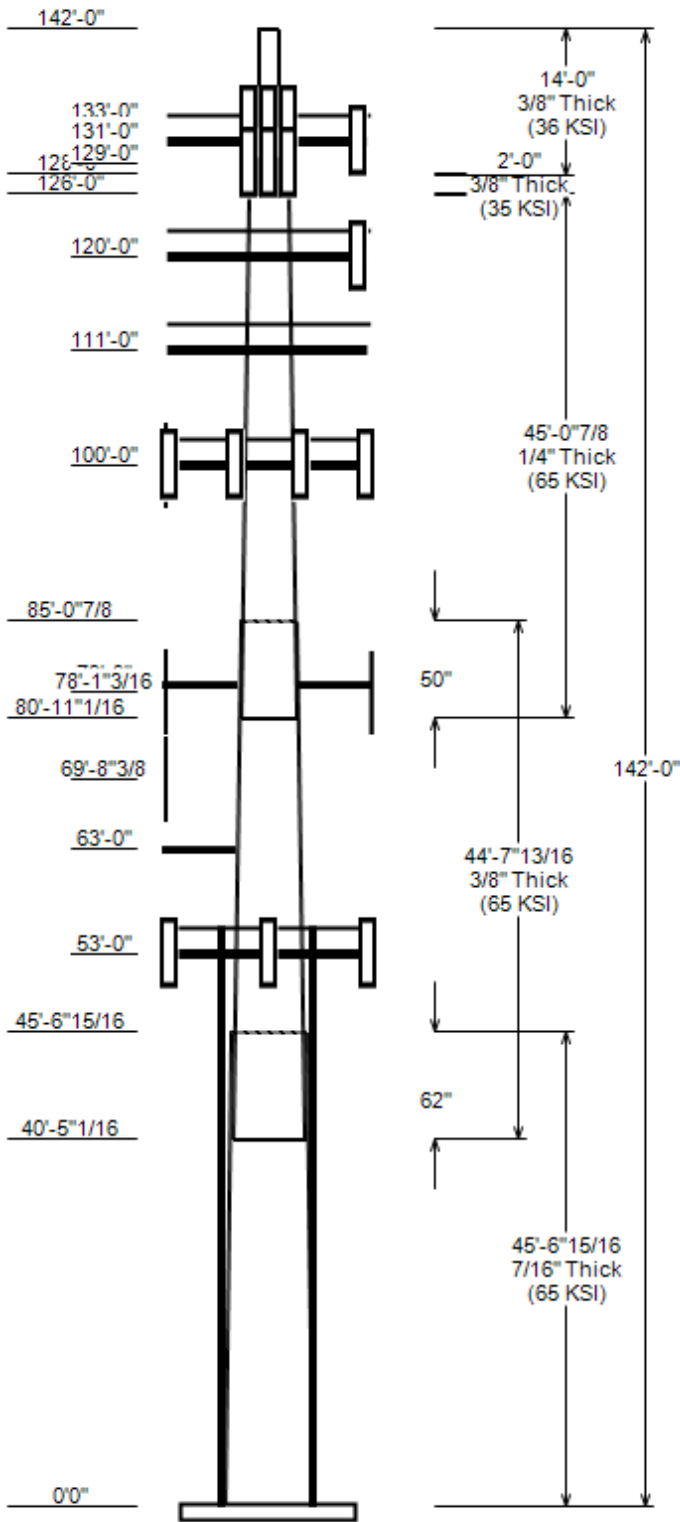
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with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

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, 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. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

Asset : 302511, WSPT - South  
 Client : AT&T MOBILITY  
 Code : ANSI/TIA-222-H

Height : 142 ft  
 Base Width : 45  
 Shape : 12 Sides



**SITE PARAMETERS**

Nominal Wind: 118 mph wind with no ice      Topo Category: 1  
 Ice Wind: 50 mph wind with 1" radial      Topo Method: Method 1  
 Base Elev (ft): 0.00      Taper : 0.21200 (in/ft)      Topo Feature:  
 Structure Class: II      Exposure : C      S<sub>s</sub> : 0.226      S<sub>1</sub> : 0.055

**SECTION PROPERTIES**

Shaft Section	Length (ft)	Diameter (in)		Thick Joint (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
		Across Flats Top	Across Flats Bottom					
1	45.578	35.32	45.00	0.438		0.000	12 Sides	65
2	44.654	27.69	37.17	0.375	Slip Joint	61.880	12 Sides	65
3	45.076	19.50	29.07	0.250	Slip Joint	49.810	12 Sides	65
4	2.000	10.75	10.75	0.375	Butt Joint	0.000	Round	35
5	14.000	10.75	10.75	0.375	Butt Joint	0.000	Round	36

**DISCRETE APPURTENANCE**

Attach Elev (ft)	Force Elev (ft)	Qty	Description
133.0	133.0	3	Ericsson Air 6449 B77D
131.0	131.0	2	Raycap DC6-48-60-18-8F ("Squid
131.0	131.0	3	Ericsson RRUS 8843 B2, B66A
131.0	131.0	3	Ericsson RRUS 4478 B14
131.0	131.0	3	Ericsson RRUS 4449 B5, B12
131.0	131.0	1	Raycap DC6-48-60-0-8C
131.0	131.0	3	Ericsson RRUS 32 B30
131.0	131.0	3	CCI DMP65R-BU6E
131.0	131.0	3	CCI OPA65R-BU6D
131.0	131.0	1	Generic Flat Platform with Han
129.0	129.0	3	Ericsson AIR 6419 B77G
120.0	120.0	3	Ericsson Radio 4449 B71 B85A
120.0	120.0	3	Ericsson 4460 BAND 2/25
120.0	120.0	3	Commscope VV-65A-R1
120.0	120.0	1	Ericsson AIR 21, 1.3 M, B2A B4
120.0	120.0	3	Ericsson AIR 6419 B41
120.0	120.0	1	Ericsson AIR 32 B2A/B66A
120.0	120.0	3	RFS APXVAALL24 43-U-NA20
120.0	120.0	1	Generic Square Platform with H
111.0	111.0	1	Generic Flat Platform with Han
100.0	100.0	1	Generic GPS
100.0	100.0	3	Samsung B2/B66A RRH-BR049
100.0	100.0	3	Samsung B5/B13 RRH-BR04C
100.0	100.0	3	Ryma MGD3-800TX
100.0	100.0	1	Commscope RC2DC-3315-PF-48
100.0	100.0	3	Antel BXA-70080/6CF__
100.0	100.0	6	Quintel QS6656-5D
100.0	100.0	1	Generic Flat Platform with Han
79.0	79.0	2	Round Side Arm
78.1	78.1	2	Diamond X50A
69.7	69.7	1	PCTEL GPS-TMG-HR-26N
63.0	63.0	1	Stand-Off
53.0	53.0	1	Raycap RDIDC-9181-PF-48
53.0	53.0	3	Fujitsu TA08025-B604
53.0	53.0	3	Fujitsu TA08025-B605
53.0	53.0	3	JMA Wireless MX08FRO665-21
53.0	53.0	1	Generic Flat Platform with Han

**LINEAR APPURTENANCE**

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
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**JOB INFORMATION**

Asset : 302511, WSPT - South  
 Client : AT&T MOBILITY  
 Code : ANSI/TIA-222-H

Height : 142 ft  
 Base Width : 45  
 Shape : 12 Sides

**LINEAR APPURTENANCE**

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	131.0	1 1/4" Coax	No
0.0	131.0	0.92" (23.4mm) Cable	No
0.0	131.0	0.88" (22.4mm) 8 AWG 6	No
0.0	131.0	0.40" (10.3mm) Fiber	No
0.0	120.0	1.99" (50.7mm) Hybrid	No
0.0	101.0	7/8" Coax	No
0.0	100.0	7/8" Coax	No
0.0	100.0	1/2" Coax	No
0.0	100.0	1 5/8" Hybriflex	No
0.0	100.0	1 5/8" Coax	No
0.0	78.0	0.405" (10.3mm) Coax	No
0.0	70.0	1/2" Coax	No
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	63.0	#20 w/ Angle Brackets	Yes
0.0	53.0	1.75" (44.5mm) Hybrid	No

**LOAD CASES**

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Nor	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh Nor	Seismic
0.9D - 1.0Ev + 1.0Eh Nor	Seismic (Reduced DL)
1.0D + 1.0W Service Norm	60 mph Wind with No Ice

**REACTIONS**

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W Normal	3133.75	33.49	54.32
0.9D + 1.0W Normal	3094.65	33.46	40.73
1.2D + 1.0Di + 1.0Wi Normal	802.42	8.26	71.34
1.2D + 1.0Ev + 1.0Eh Normal	153.86	1.36	54.54
0.9D - 1.0Ev + 1.0Eh Normal	151.19	1.36	37.22
1.0D + 1.0W Service Normal	723.19	7.77	45.32

**DISH DEFLECTIONS**

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
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ASSET: 302511, WSPT - South  
CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H  
ENG NO: 13958510\_C3\_03

### ANALYSIS PARAMETERS

<b>Location:</b>	Fairfield County,CT	<b>Height:</b>	142 ft
<b>Type and Shape:</b>	Custom, Round	<b>Base Diameter:</b>	45.00 in
<b>Manufacturer:</b>	EEI	<b>Top Diameter:</b>	19.50 in
<b>K<sub>d</sub> (non-service):</b>	0.95	<b>Taper:</b>	0.2120 in/ft
<b>K<sub>e</sub>:</b>	1.00	<b>Rotation:</b>	0.000°

### ICE & WIND PARAMETERS

<b>Exposure Category:</b>	C	<b>Design Wind Speed w/o Ice:</b>	118 mph
<b>Risk Category:</b>	II	<b>Design Wind Speed w/Ice:</b>	50 mph
<b>Topo Factor Procedure:</b>	Method 1	<b>Operational Wind Speed:</b>	60 mph
<b>Topographic Category:</b>	1	<b>Design Ice Thickness:</b>	1.00 in
<b>Crest Height:</b>	0 ft	<b>HMSL:</b>	15.00 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>	2.38
<b>T<sub>L</sub> (sec):</b>	6	<b>P:</b>	1
<b>S<sub>s</sub>:</b>	0.226	<b>S<sub>1</sub>:</b>	0.055
<b>F<sub>a</sub>:</b>	1.600	<b>F<sub>v</sub>:</b>	2.400
<b>S<sub>ds</sub>:</b>	0.241	<b>S<sub>dt</sub>:</b>	0.088
		<b>C<sub>s</sub>:</b>	0.030
		<b>C<sub>s</sub> Max:</b>	0.030
		<b>C<sub>s</sub> Min:</b>	0.030

### LOAD CASES

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Normal	50 mph wind with 1" radial ice
1.2D + 1.0Ev + 1.0Eh Normal	Seismic
0.9D - 1.0Ev + 1.0Eh Normal	Seismic (Reduced DL)
1.0D + 1.0W Service Normal	60 mph Wind with No Ice

**SHAFT SECTION PROPERTIES**

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Weight (lb)	Bottom						Top							
							Dia (in)	Elev (ft)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Dia (in)	Elev (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	Taper (in/ft)	
1-12	45.58	0.4375	65		0.00	8,679	45.00	0.002	62.78	15,912.1	24.88	102.86	35.32	45.58	49.15	7,634.6	18.95	80.74	0.2123	
2-12	44.65	0.3750	65	Slip	61.88	5,881	37.17	40.426	44.43	7,676.9	23.88	99.11	27.69	85.08	32.98	3,140.5	17.10	73.84	0.2123	
3-12	45.08	0.2500	65	Slip	49.81	2,968	29.07	80.924	23.20	2,459.5	28.48	116.28	19.50	126.00	15.50	733.0	18.22	78.00	0.2123	
4-R	2.00	0.3750	35	Butt	0.00	83	10.75	0	12.22	164.6	0.00	28.67	10.75	128.00	12.22	164.6	0.00	28.67	0.0000	
5-R	14.00	0.3750	36	Butt	0.00	582	10.75	0	12.22	164.6	0.00	28.67	10.75	142.00	12.22	164.6	0.00	28.67	0.0000	
Shaft Weight						18,193														

**DISCRETE APPURTENANCE PROPERTIES**

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice			Ice		
					Weight (lb)	EPAA (sf)	Orientation Factor	Weight (lb)	EPAA (sf)	Orientation Factor
133.00	Ericsson Air 6449 B77D	3	0.75	0.000	81.60	4.028	0.65	149.43	4.935	0.65
131.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	113.46	2.584	0.50
131.00	CCI DMP65R-BU6E	3	0.75	0.000	103.80	12.709	0.65	287.31	14.546	0.65
131.00	CCI OPA65R-BU6D	3	0.75	0.000	63.20	12.871	0.63	235.38	14.714	0.63
131.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3670.33	56.216	1.00
131.00	Raycap DC6-48-60-0-8C	1	0.75	0.000	16.00	2.030	0.50	48.30	2.530	0.50
131.00	Ericsson RRUS 32 B30	3	0.75	0.000	60.00	2.743	0.50	108.47	3.513	0.50
131.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.90	1.842	0.50	96.33	2.433	0.50
131.00	Ericsson RRUS 8843 B2, B66A	3	0.75	0.000	72.00	1.639	0.50	112.38	2.196	0.50
131.00	Raycap DC6-48-60-18-8F ("Squid	2	0.75	0.000	31.80	1.470	1.00	72.45	1.930	1.00
129.00	Ericsson AIR 6419 B77G	3	0.75	0.000	66.10	3.797	0.65	129.92	4.664	0.65
120.00	RFS APXVAALL24 43-U-NA20	3	0.75	0.000	122.80	20.243	0.63	376.73	22.661	0.63
120.00	Generic Square Platform with H	1	1.00	0.000	3790.00	49.300	1.00	6681.75	104.828	1.00
120.00	Ericsson AIR 32 B2A/B66A	1	0.75	0.000	143.30	6.870	0.75	262.33	8.365	0.75
120.00	Ericsson AIR 6419 B41	3	0.75	0.000	83.30	6.322	0.63	181.97	7.425	0.63
120.00	Ericsson AIR 21, 1.3 M, B2A B4	1	0.75	0.000	83.00	6.049	0.71	178.14	7.458	0.71
120.00	Commscope VV-65A-R1	3	0.75	0.000	23.80	5.928	0.63	100.35	7.309	0.63
120.00	Ericsson 4460 BAND 2/25	3	0.75	0.000	109.00	2.564	0.50	166.62	3.251	0.50
120.00	Ericsson Radio 4449 B71 B85A	3	0.75	0.000	75.00	1.650	0.50	114.21	2.204	0.50
111.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3651.03	55.988	1.00
100.00	Antel BXA-70080/6CF__	3	0.75	0.000	18.00	5.836	0.72	98.41	7.358	0.72
100.00	Quintel QS6656-5D	6	0.75	0.000	88.00	8.133	0.74	215.49	9.917	0.74
100.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3636.71	55.819	1.00
100.00	Commscope RC2DC-3315-PF-48	1	0.75	0.000	32.00	3.781	0.50	102.14	4.627	0.50
100.00	Ryma MGD3-800TX	3	0.75	0.000	15.40	3.340	0.69	59.02	4.480	0.69
100.00	Generic GPS	1	0.75	0.000	10.00	0.900	0.50	28.72	1.309	0.50
100.00	Samsung B5/B13 RRH-BR04C	3	0.75	0.000	70.30	1.875	0.50	106.90	2.453	0.50
100.00	Samsung B2/B66A RRH-BR049	3	0.75	0.000	84.40	1.875	0.50	125.22	2.453	0.50
79.00	Round Side Arm	2	0.90	0.000	150.00	5.200	0.90	195.80	6.901	0.90
78.10	Diamond X50A	2	1.00	0.000	2.30	1.120	1.00	3.21	2.237	1.00
69.70	PCTEL GPS-TMG-HR-26N	1	1.00	0.000	0.60	0.090	1.00	3.59	0.201	1.00
63.00	Stand-Off	1	1.00	0.000	30.00	1.000	1.00	38.94	1.319	1.00
53.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	3566.42	54.990	1.00
53.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	218.79	14.176	0.64
53.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	112.61	2.514	0.50
53.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	98.91	2.514	0.50
53.00	Raycap RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	0.50	56.06	2.407	0.50
<b>Totals</b>	<b>Num Loadings: 37</b>	<b>85</b>			<b>19,172.00</b>			<b>32,737.58</b>		

**LINEAR APPURTENANCE PROPERTIES**

Load Case Azimuth (deg) : 0.00\_

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Max Flat	Coax/Row	Dist Between Rows (in)	Dist Between Cols (in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	131.00	6	1 1/4" Coax	1.55	0.63	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	131.00	4	0.92" (23.4mm) Cable	0.92	0.89	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	131.00	2	0.40" (10.3mm) Fiber	0.4	0.09	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	131.00	2	0.88" (22.4mm) 8 AWG	0.88	0.68	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	120.00	3	1.99" (50.7mm) Hybrid	1.99	1.9	N	0	0	0	0	0	N	T-MOBILE

ASSET: 302511, WSPT - South  
 CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H  
 ENG NO: 13958510\_C3\_03

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	101.00	6	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	VERIZON WIREL
0.00	100.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIREL
0.00	100.00	6	7/8" Coax	1.09	0.33	N	0	0	0	0	0	N	VERIZON WIREL
0.00	100.00	1	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIREL
0.00	100.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	VERIZON WIREL
0.00	78.00	2	0.405" (10.3mm) Coax	0.41	0.11	N	0	0	0	0	0	N	SENET, INC.
0.00	70.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	SPRINT NEXTEL
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	130	0	Y	
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	40	0	Y	
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	310	0	Y	
0.00	63.00	1	#20 w/ Angle Brackets	4	4.68	N	1	0	0	220	0	Y	
0.00	53.00	1	1.75" (44.5mm) Hybrid	1.75	2.72	N	0	0	0	0	0	N	DISH WIRELESS

**ADDITIONAL STEEL**

Intermediate Connectors

Elev From (ft)	Elev To (ft)	Qty	Description	Fy (ksi)	Offset (in)	Description	Spacing (in)	Len (in)	Connectors	Continuation?
0.00	55.68	4	SOL #20 All Thread Bar	80	2.19	6" Angle Bracket	30.00	3.31	5/8" A36 U-Bolt	Y

SEGMENT PROPERTIES

(Max Len: 5.ft)

Additional Reinforcing

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	W/t Ratio	D/t Ratio	F'y (ksi)	S (in <sup>3</sup> )	Z (in <sup>3</sup> )	Weight (lb)	Area (in <sup>2</sup> )	Ix (in <sup>4</sup> )	Weight (lb)	
0.00		0.4375	45.000	62.777	15,912.10	24.88	102.86	77.6	683.1	0.0	0.0	19.640	6,615.40	0.0	
5.00		0.4375	43.939	61.282	14,801.90	24.23	100.43	78.3	650.8	0.0	1,055.4	19.640	6,347.80	334.0	
10.00		0.4375	42.877	59.787	13,744.60	23.58	98.00	79	619.3	0.0	1,029.9	19.640	6,085.70	334.0	
15.00		0.4375	41.816	58.291	12,738.80	22.93	95.58	79.7	588.5	0.0	1,004.5	19.640	5,829.10	334.0	
20.00		0.4375	40.754	56.796	11,783.30	22.28	93.15	80.4	558.6	0.0	979.0	19.640	5,578.10	334.0	
25.00		0.4375	39.693	55.300	10,876.90	21.63	90.73	81.1	529.4	0.0	953.6	19.640	5,332.60	334.0	
30.00		0.4375	38.631	53.805	10,018.20	20.98	88.30	81.8	501.0	0.0	928.2	19.640	5,092.60	334.0	
35.00		0.4375	37.570	52.310	9,205.90	20.33	85.87	81.9	473.4	0.0	902.7	19.640	4,858.20	334.0	
40.00		0.4375	36.508	50.814	8,438.70	19.68	83.45	81.9	446.5	0.0	877.3	19.640	4,629.30	334.0	
40.42	Bot - Section 2	0.4375	36.418	50.688	8,376.00	19.63	83.24	81.9	444.3	0.0	72.9	19.640	4,610.20	28.2	
45.00		0.4375	35.447	49.319	7,715.40	19.03	81.02	81.9	420.5	0.0	1,462.0	19.640	4,563.10	305.8	
45.58	Top - Section 1	0.3750	36.074	43.106	7,011.90	23.10	96.20	79.5	375.5	0.0	181.8	19.640	4,537.20	38.6	
50.00		0.3750	35.135	41.973	6,473.10	22.43	93.69	80.3	355.9	0.0	640.1	19.640	4,341.40	295.4	
53.00		0.3750	34.498	41.204	6,123.80	21.97	91.99	80.8	342.9	0.0	424.5	19.640	4,211.00	200.4	
55.00		0.3750	34.074	40.691	5,898.00	21.67	90.86	81.1	334.4	0.0	278.7	19.640	4,125.20	133.6	
55.68	Reinf. Top	0.3750	33.929	40.517	5,822.50	21.56	90.48	81.2	331.5	0.0	94.0	19.640	4,096.20	45.4	
60.00		0.3750	33.012	39.409	5,358.00	20.91	88.03	81.9	313.5	0.0	587.5				
63.00		0.3750	32.375	38.640	5,050.40	20.45	86.33	81.9	301.4	0.0	398.4				
65.00		0.3750	31.951	38.127	4,852.00	20.15	85.20	81.9	293.4	0.0	261.2				
69.70		0.3750	30.953	36.923	4,406.40	19.44	82.54	81.9	275.0	0.0	600.1				
70.00		0.3750	30.889	36.846	4,379.00	19.39	82.37	81.9	273.9	0.0	37.7				
75.00		0.3750	29.828	35.564	3,937.70	18.63	79.54	81.9	255.0	0.0	616.0				
78.10		0.3750	29.169	34.769	3,679.60	18.16	77.78	81.9	243.7	0.0	371.0				
79.00		0.3750	28.978	34.538	3,606.80	18.03	77.28	81.9	240.4	0.0	106.1				
80.00		0.3750	28.766	34.282	3,527.10	17.87	76.71	81.9	236.9	0.0	117.1				
80.92	Bot - Section 3	0.3750	28.570	34.045	3,454.40	17.73	76.19	81.9	233.6	0.0	107.5				
85.00		0.3750	27.705	33.000	3,146.10	17.12	73.88	81.9	219.4	0.0	781.8				
85.08	Top - Section 2	0.2500	28.188	22.490	2,240.70	27.53	112.75	74.7	153.6	0.0	14.2				
90.00		0.2500	27.143	21.649	1,998.50	26.41	108.57	75.9	142.2	0.0	369.8				
95.00		0.2500	26.082	20.794	1,771.00	25.27	104.33	77.1	131.2	0.0	361.1				
100.00		0.2500	25.020	19.940	1,561.60	24.14	100.08	78.4	120.6	0.0	346.5				
105.00		0.2500	23.959	19.085	1,369.30	23.00	95.83	79.6	110.4	0.0	332.0				
110.00		0.2500	22.897	18.231	1,193.50	21.86	91.59	80.9	100.7	0.0	317.4				
111.00		0.2500	22.685	18.060	1,160.20	21.63	90.74	81.1	98.8	0.0	61.7				
115.00		0.2500	21.836	17.376	1,033.40	20.72	87.34	81.9	91.4	0.0	241.2				
120.00		0.2500	20.774	16.522	888.30	19.59	83.10	81.9	82.6	0.0	288.4				
125.00		0.2500	19.713	15.667	757.50	18.45	78.85	81.9	74.2	0.0	273.8				
126.00	Top - Section 3	0.2500	19.500	15.496	733.00	18.22	78.00	81.9	72.6	0.0	53.0				
126.00	Bot - Section 4	0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4					
128.00	Top - Section 4	0.3750	10.750	12.223	164.60	0.00	28.67	35	30.6	40.4	83.2				
128.00	Bot - Section 5	0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4					
129.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	41.6				
130.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	41.6				
131.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	41.6				
133.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	83.2				
135.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	83.2				
140.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	208.0				
142.00		0.3750	10.750	12.223	164.60	0.00	28.67	36	30.6	40.4	83.2				
Totals:											18,193.7				3,719.4

Load Case: 1.2D + 1.0W Normal	118 mph wind with no ice	26 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 1.20		
Wind Load Factor: 1.00		

**CALCULATED FORCES**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-54.32	-33.49	0.00	-3,133.8	0.00	3,133.75	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.567
5.00	-52.27	-33.09	0.00	-2,966.3	0.00	2,966.32	4,317.85	1,075.50	4,413.87	3,821.19	0.1	-0.19	0.553
10.00	-50.24	-32.69	0.00	-2,800.9	0.00	2,800.88	4,250.64	1,049.26	4,201.16	3,669.01	0.41	-0.39	0.539
15.00	-48.25	-32.29	0.00	-2,637.4	0.00	2,637.41	4,181.52	1,023.01	3,993.70	3,518.15	0.92	-0.58	0.524
20.00	-46.29	-31.87	0.00	-2,476.0	0.00	2,475.95	4,110.49	996.77	3,791.49	3,368.74	1.64	-0.78	0.508
25.00	-44.37	-31.42	0.00	-2,316.6	0.00	2,316.60	4,037.56	970.52	3,594.54	3,220.91	2.56	-0.97	0.492
30.00	-42.48	-30.96	0.00	-2,159.5	0.00	2,159.49	3,962.71	944.28	3,402.84	3,074.78	3.68	-1.17	0.475
35.00	-40.62	-30.47	0.00	-2,004.7	0.00	2,004.72	3,855.75	918.04	3,216.39	2,907.69	5.01	-1.37	0.460
40.00	-38.84	-30.19	0.00	-1,852.4	0.00	1,852.35	3,745.52	891.79	3,035.19	2,742.88	6.55	-1.56	0.445
40.42	-38.65	-29.95	0.00	-1,839.6	0.00	1,839.61	3,736.22	889.58	3,020.15	2,729.20	6.69	-1.58	0.443
45.00	-36.24	-29.64	0.00	-1,702.5	0.00	1,702.49	3,635.30	865.55	2,859.25	2,582.88	8.29	-1.76	0.422
45.58	-35.90	-29.40	0.00	-1,685.4	0.00	1,685.35	3,085.21	756.51	2,547.97	2,239.64	8.5	-1.78	0.466
50.00	-34.47	-29.00	0.00	-1,555.4	0.00	1,555.36	3,031.72	736.62	2,415.77	2,142.33	10.23	-1.95	0.444
53.00	-29.86	-25.90	0.00	-1,468.4	0.00	1,468.35	2,994.57	723.12	2,328.08	2,076.90	11.49	-2.07	0.427
55.00	-29.24	-25.75	0.00	-1,416.5	0.00	1,416.54	2,969.43	714.13	2,270.53	2,033.56	12.38	-2.14	0.418
55.68	-29.00	-25.51	0.00	-1,399.0	0.00	1,399.03	2,960.81	711.07	2,251.12	2,018.87	12.68	-2.17	0.415
55.68	-29.00	-25.51	0.00	-1,399.0	0.00	1,399.03	2,960.81	711.07	2,251.12	2,018.87	12.68	-2.17	0.704
60.00	-28.01	-25.14	0.00	-1,288.8	0.00	1,288.85	2,904.85	691.63	2,129.79	1,925.98	14.73	-2.34	0.680
63.00	-27.28	-24.86	0.00	-1,213.4	0.00	1,213.44	2,848.16	678.13	2,047.51	1,851.12	16.26	-2.54	0.666
65.00	-26.83	-24.57	0.00	-1,163.7	0.00	1,163.71	2,810.37	669.14	1,993.56	1,802.04	17.35	-2.67	0.657
69.70	-25.91	-24.32	0.00	-1,048.2	0.00	1,048.21	2,721.56	647.99	1,869.60	1,689.30	20.14	-2.98	0.631
70.00	-25.80	-24.11	0.00	-1,040.9	0.00	1,040.92	2,715.89	646.64	1,861.82	1,682.23	20.33	-3	0.630
75.00	-24.83	-23.73	0.00	-920.4	0.00	920.39	2,621.41	624.15	1,734.59	1,566.54	23.63	-3.32	0.598
78.10	-24.25	-23.44	0.00	-846.8	0.00	846.83	2,562.84	610.20	1,657.97	1,496.88	25.85	-3.51	0.577
79.00	-23.74	-22.95	0.00	-825.7	0.00	825.74	2,545.83	606.15	1,636.05	1,476.96	26.52	-3.57	0.570
80.00	-23.56	-22.86	0.00	-802.8	0.00	802.79	2,526.94	601.65	1,611.87	1,454.97	27.27	-3.64	0.563
80.92	-23.35	-22.65	0.00	-781.7	0.00	781.66	2,509.47	597.49	1,589.67	1,434.80	27.98	-3.69	0.556
85.00	-22.26	-22.41	0.00	-689.3	0.00	689.34	2,432.46	579.16	1,493.64	1,347.52	31.25	-3.94	0.522
85.08	-22.21	-22.21	0.00	-687.6	0.00	687.65	1,511.75	394.71	1,040.29	860.19	31.31	-3.95	0.817
90.00	-21.53	-21.78	0.00	-578.3	0.00	578.30	1,478.99	379.94	963.92	809.78	35.53	-4.23	0.732
95.00	-20.85	-21.37	0.00	-469.4	0.00	469.39	1,443.84	364.94	889.35	759.04	40.16	-4.6	0.636
100.00	-16.25	-16.34	0.00	-362.6	0.00	362.55	1,406.77	349.94	817.78	708.87	45.16	-4.94	0.525
105.00	-15.73	-15.90	0.00	-280.9	0.00	280.88	1,367.80	334.95	749.21	659.40	50.48	-5.23	0.440
110.00	-15.25	-15.62	0.00	-201.4	0.00	201.37	1,326.92	319.95	683.65	610.75	56.09	-5.48	0.344
111.00	-12.36	-13.10	0.00	-185.8	0.00	185.75	1,318.52	316.95	670.90	601.13	57.24	-5.53	0.320
115.00	-12.01	-12.70	0.00	-133.4	0.00	133.37	1,280.81	304.95	621.09	561.60	61.93	-5.68	0.249
120.00	-5.86	-6.40	0.00	-69.8	0.00	69.85	1,217.82	289.96	561.53	507.42	67.96	-5.82	0.143
125.00	-5.50	-6.13	0.00	-37.8	0.00	37.83	1,154.84	274.96	504.97	455.99	74.09	-5.91	0.088
126.00	-5.43	-6.05	0.00	-31.7	0.00	31.71	1,142.24	271.96	494.02	446.03	75.33	-5.92	0.076
126.00	-5.43	-6.05	0.00	-31.7	0.00	31.71	385.02	115.51	105.36	106.00	75.33	-5.92	0.316
128.00	-5.31	-6.00	0.00	-19.6	0.00	19.60	396.02	118.81	108.37	109.03	77.81	-5.94	0.196
128.00	-5.31	-6.00	0.00	-19.6	0.00	19.60	385.02	115.51	105.36	106.00	77.81	-5.94	0.201
129.00	-5.04	-5.67	0.00	-13.6	0.00	13.60	396.02	118.81	108.37	109.03	79.06	-5.97	0.140
130.00	-4.98	-5.64	0.00	-7.9	0.00	7.92	396.02	118.81	108.37	109.03	80.31	-5.99	0.088
131.00	-0.79	-0.58	0.00	-2.3	0.00	2.28	396.02	118.81	108.37	109.03	81.56	-6	0.023
133.00	-0.43	-0.21	0.00	-1.1	0.00	1.12	396.02	118.81	108.37	109.03	84.07	-6	0.011
135.00	-0.34	-0.13	0.00	-0.7	0.00	0.70	396.02	118.81	108.37	109.03	86.58	-6.01	0.007
140.00	-0.10	-0.03	0.00	-0.1	0.00	0.06	396.02	118.81	108.37	109.03	92.86	-6.01	0.001
142.00	0.00	-0.02	0.00	0.0	0.00	0.00	396.02	118.81	108.37	109.03	95.37	-6.01	0.000

Load Case: 0.9D + 1.0W Normal	118 mph wind with no ice	25 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 0.90		
Wind Load Factor: 1.00		

**CALCULATED FORCES**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-40.73	-33.46	0.00	-3,094.6	0.00	3,094.65	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.558
5.00	-39.16	-33.02	0.00	-2,927.4	0.00	2,927.35	4,317.85	1,075.50	4,413.87	3,821.19	0.1	-0.19	0.544
10.00	-37.62	-32.58	0.00	-2,762.2	0.00	2,762.25	4,250.64	1,049.26	4,201.16	3,669.01	0.41	-0.38	0.529
15.00	-36.10	-32.14	0.00	-2,599.3	0.00	2,599.34	4,181.52	1,023.01	3,993.70	3,518.15	0.91	-0.57	0.514
20.00	-34.61	-31.68	0.00	-2,438.6	0.00	2,438.64	4,110.49	996.77	3,791.49	3,368.74	1.61	-0.77	0.499
25.00	-33.14	-31.20	0.00	-2,280.2	0.00	2,280.23	4,037.56	970.52	3,594.54	3,220.91	2.52	-0.96	0.482
30.00	-31.70	-30.71	0.00	-2,124.2	0.00	2,124.22	3,962.71	944.28	3,402.84	3,074.78	3.63	-1.15	0.465
35.00	-30.29	-30.20	0.00	-1,970.7	0.00	1,970.70	3,855.75	918.04	3,216.39	2,907.69	4.94	-1.35	0.450
40.00	-28.94	-29.90	0.00	-1,819.7	0.00	1,819.71	3,745.52	891.79	3,035.19	2,742.88	6.46	-1.54	0.435
40.42	-28.79	-29.65	0.00	-1,807.1	0.00	1,807.10	3,736.22	889.58	3,020.15	2,729.20	6.59	-1.55	0.434
45.00	-26.97	-29.34	0.00	-1,671.4	0.00	1,671.35	3,635.30	865.55	2,859.25	2,582.88	8.17	-1.73	0.413
45.58	-26.71	-29.08	0.00	-1,654.4	0.00	1,654.39	3,085.21	756.51	2,547.97	2,239.64	8.38	-1.75	0.456
50.00	-25.63	-28.68	0.00	-1,525.8	0.00	1,525.79	3,031.72	736.62	2,415.77	2,142.33	10.08	-1.92	0.434
53.00	-22.18	-25.61	0.00	-1,439.8	0.00	1,439.75	2,994.57	723.12	2,328.08	2,076.90	11.32	-2.03	0.417
55.00	-21.71	-25.45	0.00	-1,388.5	0.00	1,388.54	2,969.43	714.13	2,270.53	2,033.56	12.19	-2.11	0.408
55.68	-21.53	-25.20	0.00	-1,371.2	0.00	1,371.23	2,960.81	711.07	2,251.12	2,018.87	12.5	-2.14	0.405
55.68	-21.53	-25.20	0.00	-1,371.2	0.00	1,371.23	2,960.81	711.07	2,251.12	2,018.87	12.5	-2.14	0.688
60.00	-20.77	-24.81	0.00	-1,262.4	0.00	1,262.39	2,904.85	691.63	2,129.79	1,925.98	14.51	-2.3	0.664
63.00	-20.21	-24.52	0.00	-1,188.0	0.00	1,187.95	2,848.16	678.13	2,047.51	1,851.12	16.01	-2.5	0.650
65.00	-19.85	-24.21	0.00	-1,138.9	0.00	1,138.90	2,810.37	669.14	1,993.56	1,802.04	17.09	-2.63	0.640
69.70	-19.16	-23.95	0.00	-1,025.1	0.00	1,025.11	2,721.56	647.99	1,869.60	1,689.30	19.82	-2.92	0.615
70.00	-19.06	-23.71	0.00	-1,017.9	0.00	1,017.93	2,715.89	646.64	1,861.82	1,682.23	20.01	-2.94	0.613
75.00	-18.32	-23.32	0.00	-899.4	0.00	899.36	2,621.41	624.15	1,734.59	1,566.54	23.26	-3.26	0.582
78.10	-17.88	-23.02	0.00	-827.1	0.00	827.08	2,562.84	610.20	1,657.97	1,496.88	25.44	-3.45	0.561
79.00	-17.50	-22.53	0.00	-806.4	0.00	806.37	2,545.83	606.15	1,636.05	1,476.96	26.09	-3.51	0.554
80.00	-17.35	-22.44	0.00	-783.8	0.00	783.83	2,526.94	601.65	1,611.87	1,454.97	26.83	-3.57	0.547
80.92	-17.19	-22.22	0.00	-763.1	0.00	763.08	2,509.47	597.49	1,589.67	1,434.80	27.53	-3.63	0.540
85.00	-16.37	-21.98	0.00	-672.5	0.00	672.54	2,432.46	579.16	1,493.64	1,347.52	30.73	-3.87	0.507
85.08	-16.32	-21.76	0.00	-670.9	0.00	670.88	1,511.75	394.71	1,040.29	860.19	30.79	-3.87	0.794
90.00	-15.79	-21.31	0.00	-563.7	0.00	563.73	1,478.99	379.94	963.92	809.78	34.93	-4.15	0.710
95.00	-15.27	-20.87	0.00	-457.2	0.00	457.18	1,443.84	364.94	889.35	759.04	39.47	-4.51	0.616
100.00	-11.89	-15.92	0.00	-352.8	0.00	352.82	1,406.77	349.94	817.78	708.87	44.37	-4.84	0.508
105.00	-11.49	-15.48	0.00	-273.2	0.00	273.21	1,367.80	334.95	749.21	659.40	49.59	-5.12	0.425
110.00	-11.13	-15.20	0.00	-195.8	0.00	195.82	1,326.92	319.95	683.65	610.75	55.08	-5.36	0.331
111.00	-9.01	-12.74	0.00	-180.6	0.00	180.62	1,318.52	316.95	670.90	601.13	56.21	-5.41	0.309
115.00	-8.75	-12.35	0.00	-129.6	0.00	129.64	1,280.81	304.95	621.09	561.60	60.8	-5.56	0.239
120.00	-4.26	-6.23	0.00	-67.9	0.00	67.88	1,217.82	289.96	561.53	507.42	66.7	-5.7	0.138
125.00	-3.99	-5.96	0.00	-36.7	0.00	36.74	1,154.84	274.96	504.97	455.99	72.7	-5.78	0.085
126.00	-3.94	-5.89	0.00	-30.8	0.00	30.78	1,142.24	271.96	494.02	446.03	73.91	-5.79	0.073
126.00	-3.94	-5.89	0.00	-30.8	0.00	30.78	385.02	115.51	105.36	106.00	73.91	-5.79	0.303
128.00	-3.86	-5.84	0.00	-19.0	0.00	19.01	396.02	118.81	108.37	109.03	76.34	-5.81	0.186
128.00	-3.86	-5.84	0.00	-19.0	0.00	19.01	385.02	115.51	105.36	106.00	76.34	-5.81	0.192
129.00	-3.66	-5.52	0.00	-13.2	0.00	13.16	396.02	118.81	108.37	109.03	77.56	-5.84	0.132
130.00	-3.62	-5.49	0.00	-7.6	0.00	7.64	396.02	118.81	108.37	109.03	78.78	-5.86	0.081
131.00	-0.58	-0.56	0.00	-2.2	0.00	2.16	396.02	118.81	108.37	109.03	80.01	-5.87	0.021
133.00	-0.32	-0.20	0.00	-1.0	0.00	1.04	396.02	118.81	108.37	109.03	82.47	-5.87	0.010
135.00	-0.25	-0.12	0.00	-0.6	0.00	0.64	396.02	118.81	108.37	109.03	84.92	-5.88	0.007
140.00	-0.07	-0.03	0.00	-0.1	0.00	0.06	396.02	118.81	108.37	109.03	91.07	-5.88	0.001
142.00	0.00	-0.02	0.00	0.0	0.00	0.00	396.02	118.81	108.37	109.03	93.53	-5.88	0.000

Load Case: 1.2D + 1.0Di + 1.0Wi Normal		50 mph wind with 1" radial ice		25 Iterations
Gust Response Factor:	1.10	Ice Dead Load Factor	1.00	
Dead load Factor:	1.20			Ice Importance Factor 1.00
Wind Load Factor:	1.00			

**CALCULATED FORCES**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-71.34	-8.26	0.00	-802.4	0.00	802.42	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.155
5.00	-69.12	-8.18	0.00	-761.1	0.00	761.14	4,317.85	1,075.50	4,413.87	3,821.19	0.03	-0.05	0.152
10.00	-66.91	-8.11	0.00	-720.2	0.00	720.23	4,250.64	1,049.26	4,201.16	3,669.01	0.11	-0.1	0.148
15.00	-64.71	-8.03	0.00	-679.7	0.00	679.70	4,181.52	1,023.01	3,993.70	3,518.15	0.24	-0.15	0.144
20.00	-62.55	-7.94	0.00	-639.6	0.00	639.56	4,110.49	996.77	3,791.49	3,368.74	0.42	-0.2	0.140
25.00	-60.41	-7.85	0.00	-599.8	0.00	599.84	4,037.56	970.52	3,594.54	3,220.91	0.66	-0.25	0.136
30.00	-58.30	-7.76	0.00	-560.6	0.00	560.57	3,962.71	944.28	3,402.84	3,074.78	0.95	-0.3	0.132
35.00	-56.23	-7.66	0.00	-521.8	0.00	521.78	3,855.75	918.04	3,216.39	2,907.69	1.29	-0.35	0.128
40.00	-54.19	-7.59	0.00	-483.5	0.00	483.49	3,745.52	891.79	3,035.19	2,742.88	1.69	-0.4	0.124
40.42	-54.01	-7.55	0.00	-480.3	0.00	480.29	3,736.22	889.58	3,020.15	2,729.20	1.72	-0.41	0.124
45.00	-51.35	-7.48	0.00	-445.7	0.00	445.74	3,635.30	865.55	2,859.25	2,582.88	2.14	-0.45	0.119
45.58	-51.02	-7.43	0.00	-441.4	0.00	441.42	3,085.21	756.51	2,547.97	2,239.64	2.19	-0.46	0.131
50.00	-49.38	-7.34	0.00	-408.6	0.00	408.58	3,031.72	736.62	2,415.77	2,142.33	2.64	-0.5	0.125
53.00	-43.17	-6.63	0.00	-386.6	0.00	386.56	2,994.57	723.12	2,328.08	2,076.90	2.97	-0.54	0.120
55.00	-42.45	-6.59	0.00	-373.3	0.00	373.30	2,969.43	714.13	2,270.53	2,033.56	3.2	-0.56	0.118
55.68	-42.21	-6.54	0.00	-368.8	0.00	368.82	2,960.81	711.07	2,251.12	2,018.87	3.28	-0.56	0.117
55.68	-42.21	-6.54	0.00	-368.8	0.00	368.82	2,960.81	711.07	2,251.12	2,018.87	3.28	-0.56	0.197
60.00	-41.02	-6.46	0.00	-340.6	0.00	340.57	2,904.85	691.63	2,129.79	1,925.98	3.81	-0.61	0.191
63.00	-40.16	-6.40	0.00	-321.2	0.00	321.18	2,848.16	678.13	2,047.51	1,851.12	4.21	-0.66	0.188
65.00	-39.69	-6.35	0.00	-308.4	0.00	308.37	2,810.37	669.14	1,993.56	1,802.04	4.49	-0.7	0.185
69.70	-38.61	-6.29	0.00	-278.5	0.00	278.53	2,721.56	647.99	1,869.60	1,689.30	5.22	-0.78	0.179
70.00	-38.54	-6.25	0.00	-276.6	0.00	276.65	2,715.89	646.64	1,861.82	1,682.23	5.26	-0.78	0.179
75.00	-37.43	-6.18	0.00	-245.4	0.00	245.38	2,621.41	624.15	1,734.59	1,566.54	6.13	-0.87	0.171
78.10	-36.75	-6.10	0.00	-226.2	0.00	226.23	2,562.84	610.20	1,657.97	1,496.88	6.71	-0.92	0.166
79.00	-36.12	-5.98	0.00	-220.7	0.00	220.74	2,545.83	606.15	1,636.05	1,476.96	6.88	-0.94	0.164
80.00	-35.91	-5.97	0.00	-214.8	0.00	214.76	2,526.94	601.65	1,611.87	1,454.97	7.08	-0.95	0.162
80.92	-35.71	-5.92	0.00	-209.2	0.00	209.24	2,509.47	597.49	1,589.67	1,434.80	7.27	-0.97	0.160
85.00	-34.48	-5.87	0.00	-185.1	0.00	185.10	2,432.46	579.16	1,493.64	1,347.52	8.12	-1.03	0.152
85.08	-34.45	-5.83	0.00	-184.6	0.00	184.65	1,511.75	394.71	1,040.29	860.19	8.14	-1.04	0.238
90.00	-33.66	-5.74	0.00	-156.0	0.00	155.95	1,478.99	379.94	963.92	809.78	9.25	-1.11	0.216
95.00	-32.87	-5.66	0.00	-127.2	0.00	127.24	1,443.84	364.94	889.35	759.04	10.47	-1.21	0.191
100.00	-25.76	-4.45	0.00	-98.9	0.00	98.94	1,406.77	349.94	817.78	708.87	11.79	-1.3	0.158
105.00	-25.09	-4.35	0.00	-76.7	0.00	76.71	1,367.80	334.95	749.21	659.40	13.2	-1.38	0.135
110.00	-24.45	-4.28	0.00	-55.0	0.00	54.98	1,326.92	319.95	683.65	610.75	14.69	-1.45	0.109
111.00	-20.44	-3.65	0.00	-50.7	0.00	50.70	1,318.52	316.95	670.90	601.13	14.99	-1.46	0.100
115.00	-19.94	-3.55	0.00	-36.1	0.00	36.11	1,280.81	304.95	621.09	561.60	16.24	-1.51	0.080
120.00	-9.43	-1.65	0.00	-18.3	0.00	18.34	1,217.82	289.96	561.53	507.42	17.84	-1.54	0.044
125.00	-8.90	-1.58	0.00	-10.1	0.00	10.07	1,154.84	274.96	504.97	455.99	19.47	-1.57	0.030
126.00	-8.80	-1.56	0.00	-8.5	0.00	8.49	1,142.24	271.96	494.02	446.03	19.8	-1.57	0.027
126.00	-8.80	-1.56	0.00	-8.5	0.00	8.49	385.02	115.51	105.36	106.00	19.8	-1.57	0.103
128.00	-8.64	-1.54	0.00	-5.4	0.00	5.38	396.02	118.81	108.37	109.03	20.45	-1.58	0.071
128.00	-8.64	-1.54	0.00	-5.4	0.00	5.38	385.02	115.51	105.36	106.00	20.45	-1.58	0.073
129.00	-8.18	-1.45	0.00	-3.8	0.00	3.85	396.02	118.81	108.37	109.03	20.79	-1.58	0.056
130.00	-8.10	-1.44	0.00	-2.4	0.00	2.39	396.02	118.81	108.37	109.03	21.12	-1.59	0.043
131.00	-1.18	-0.21	0.00	-1.0	0.00	0.96	396.02	118.81	108.37	109.03	21.45	-1.59	0.012
133.00	-0.60	-0.10	0.00	-0.5	0.00	0.54	396.02	118.81	108.37	109.03	22.12	-1.59	0.007
135.00	-0.47	-0.06	0.00	-0.3	0.00	0.34	396.02	118.81	108.37	109.03	22.79	-1.6	0.004
140.00	-0.13	-0.01	0.00	-0.0	0.00	0.03	396.02	118.81	108.37	109.03	24.46	-1.6	0.001
142.00	0.00	-0.01	0.00	0.0	0.00	0.00	396.02	118.81	108.37	109.03	25.13	-1.6	0.000



ASSET: 302511, WSPT - South  
 CUSTOMER: AT&T MOBILITY

CODE: ANSI/TIA-222-H  
 ENG NO: 13958510\_C3\_03

Load Case: 1.0D + 1.0W Service Normal	60 mph Wind with No Ice	24 Iterations
Gust Response Factor: 1.10		
Dead load Factor: 1.00		
Wind Load Factor: 1.00		

**CALCULATED FORCES**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-45.32	-7.77	0.00	-723.2	0.00	723.19	4,383.15	1,101.74	4,631.83	3,974.58	0	0	0.136
5.00	-43.69	-7.67	0.00	-684.4	0.00	684.36	4,317.85	1,075.50	4,413.87	3,821.19	0.02	-0.04	0.133
10.00	-42.08	-7.57	0.00	-646.0	0.00	646.01	4,250.64	1,049.26	4,201.16	3,669.01	0.09	-0.09	0.130
15.00	-40.51	-7.47	0.00	-608.2	0.00	608.16	4,181.52	1,023.01	3,993.70	3,518.15	0.21	-0.13	0.126
20.00	-38.95	-7.37	0.00	-570.8	0.00	570.80	4,110.49	996.77	3,791.49	3,368.74	0.38	-0.18	0.122
25.00	-37.43	-7.26	0.00	-534.0	0.00	533.95	4,037.56	970.52	3,594.54	3,220.91	0.59	-0.22	0.118
30.00	-35.93	-7.15	0.00	-497.6	0.00	497.65	3,962.71	944.28	3,402.84	3,074.78	0.85	-0.27	0.114
35.00	-34.45	-7.03	0.00	-461.9	0.00	461.90	3,855.75	918.04	3,216.39	2,907.69	1.16	-0.32	0.111
40.00	-33.00	-6.97	0.00	-426.7	0.00	426.73	3,745.52	891.79	3,035.19	2,742.88	1.51	-0.36	0.107
40.42	-32.88	-6.91	0.00	-423.8	0.00	423.79	3,736.22	889.58	3,020.15	2,729.20	1.54	-0.36	0.107
45.00	-30.90	-6.84	0.00	-392.2	0.00	392.15	3,635.30	865.55	2,859.25	2,582.88	1.91	-0.4	0.102
45.58	-30.65	-6.78	0.00	-388.2	0.00	388.20	3,085.21	756.51	2,547.97	2,239.64	1.96	-0.41	0.112
50.00	-29.50	-6.69	0.00	-358.2	0.00	358.21	3,031.72	736.62	2,415.77	2,142.33	2.36	-0.45	0.107
53.00	-25.61	-5.98	0.00	-338.2	0.00	338.15	2,994.57	723.12	2,328.08	2,076.90	2.65	-0.48	0.102
55.00	-25.11	-5.94	0.00	-326.2	0.00	326.20	2,969.43	714.13	2,270.53	2,033.56	2.85	-0.49	0.100
55.68	-24.94	-5.88	0.00	-322.2	0.00	322.16	2,960.81	711.07	2,251.12	2,018.87	2.93	-0.5	0.099
55.68	-24.94	-5.88	0.00	-322.2	0.00	322.16	2,960.81	711.07	2,251.12	2,018.87	2.93	-0.5	0.168
60.00	-24.15	-5.80	0.00	-296.8	0.00	296.75	2,904.85	691.63	2,129.79	1,925.98	3.4	-0.54	0.162
63.00	-23.59	-5.73	0.00	-279.4	0.00	279.36	2,848.16	678.13	2,047.51	1,851.12	3.75	-0.58	0.159
65.00	-23.28	-5.66	0.00	-267.9	0.00	267.90	2,810.37	669.14	1,993.56	1,802.04	4	-0.62	0.157
69.70	-22.55	-5.60	0.00	-241.3	0.00	241.29	2,721.56	647.99	1,869.60	1,689.30	4.64	-0.69	0.151
70.00	-22.50	-5.55	0.00	-239.6	0.00	239.61	2,715.89	646.64	1,861.82	1,682.23	4.69	-0.69	0.151
75.00	-21.76	-5.46	0.00	-211.9	0.00	211.86	2,621.41	624.15	1,734.59	1,566.54	5.45	-0.76	0.144
78.10	-21.30	-5.39	0.00	-194.9	0.00	194.94	2,562.84	610.20	1,657.97	1,496.88	5.96	-0.81	0.139
79.00	-20.88	-5.28	0.00	-190.1	0.00	190.08	2,545.83	606.15	1,636.05	1,476.96	6.11	-0.82	0.137
80.00	-20.73	-5.26	0.00	-184.8	0.00	184.80	2,526.94	601.65	1,611.87	1,454.97	6.29	-0.84	0.135
80.92	-20.60	-5.21	0.00	-179.9	0.00	179.94	2,509.47	597.49	1,589.67	1,434.80	6.45	-0.85	0.134
85.00	-19.71	-5.16	0.00	-158.7	0.00	158.71	2,432.46	579.16	1,493.64	1,347.52	7.2	-0.91	0.126
85.08	-19.70	-5.11	0.00	-158.3	0.00	158.32	1,511.75	394.71	1,040.29	860.19	7.22	-0.91	0.197
90.00	-19.20	-5.01	0.00	-133.2	0.00	133.17	1,478.99	379.94	963.92	809.78	8.19	-0.97	0.178
95.00	-18.71	-4.91	0.00	-108.1	0.00	108.14	1,443.84	364.94	889.35	759.04	9.26	-1.06	0.156
100.00	-14.62	-3.75	0.00	-83.6	0.00	83.60	1,406.77	349.94	817.78	708.87	10.41	-1.14	0.128
105.00	-14.21	-3.65	0.00	-64.8	0.00	64.82	1,367.80	334.95	749.21	659.40	11.64	-1.2	0.109
110.00	-13.82	-3.59	0.00	-46.6	0.00	46.55	1,326.92	319.95	683.65	610.75	12.93	-1.26	0.087
111.00	-11.26	-3.01	0.00	-43.0	0.00	42.96	1,318.52	316.95	670.90	601.13	13.2	-1.27	0.080
115.00	-10.96	-2.92	0.00	-30.9	0.00	30.91	1,280.81	304.95	621.09	561.60	14.28	-1.31	0.064
120.00	-5.37	-1.49	0.00	-16.3	0.00	16.28	1,217.82	289.96	561.53	507.42	15.67	-1.34	0.037
125.00	-5.05	-1.42	0.00	-8.8	0.00	8.85	1,154.84	274.96	504.97	455.99	17.09	-1.36	0.024
126.00	-4.99	-1.41	0.00	-7.4	0.00	7.43	1,142.24	271.96	494.02	446.03	17.37	-1.36	0.021
126.00	-4.99	-1.41	0.00	-7.4	0.00	7.43	385.02	115.51	105.36	106.00	17.37	-1.36	0.083
128.00	-4.89	-1.39	0.00	-4.6	0.00	4.62	396.02	118.81	108.37	109.03	17.95	-1.37	0.055
128.00	-4.89	-1.39	0.00	-4.6	0.00	4.62	385.02	115.51	105.36	106.00	17.95	-1.37	0.056
129.00	-4.64	-1.32	0.00	-3.2	0.00	3.23	396.02	118.81	108.37	109.03	18.24	-1.38	0.041
130.00	-4.59	-1.31	0.00	-1.9	0.00	1.91	396.02	118.81	108.37	109.03	18.52	-1.38	0.029
131.00	-0.70	-0.15	0.00	-0.6	0.00	0.60	396.02	118.81	108.37	109.03	18.81	-1.38	0.007
133.00	-0.37	-0.06	0.00	-0.3	0.00	0.31	396.02	118.81	108.37	109.03	19.39	-1.38	0.004
135.00	-0.29	-0.04	0.00	-0.2	0.00	0.19	396.02	118.81	108.37	109.03	19.97	-1.39	0.002
140.00	-0.08	-0.01	0.00	-0.0	0.00	0.02	396.02	118.81	108.37	109.03	21.43	-1.39	0.000
142.00	0.00	-0.01	0.00	0.0	0.00	0.00	396.02	118.81	108.37	109.03	22.01	-1.39	0.000

**EQUIVALENT LATERAL FORCES METHOD ANALYSIS**

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period ( $S_S$ ):	0.226
Spectral Response Acceleration at 1.0 Second Period ( $S_1$ ):	0.055
Long-Period Transition Period ( $T_L$ – Seconds):	6
Importance Factor ( $I_a$ ):	1.000
Site Coefficient $F_a$ :	1.600
Site Coefficient $F_v$ :	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period ( $S_{ds}$ ):	0.241
Design Spectral Response Acceleration at 1.0 Second Period ( $S_{d1}$ ):	0.088
Seismic Response Coefficient ( $C_s$ ):	0.030
Upper Limit $C_S$ :	0.030
Lower Limit $C_S$ :	0.030
Period based on Rayleigh Method (sec):	2.380
Redundancy Factor ( $\rho$ ):	1.000
Seismic Force Distribution Exponent ( $k$ ):	1.940
Total Unfactored Dead Load:	45.320 k
Seismic Base Shear (E):	1.360 k

**1.2D + 1.0Ev + 1.0Eh Normal Seismic**

Segment	Height Above Base (ft)	Weight (lb)	$W_z$ (lb-ft)	$C_{vx}$	Horizontal Force (lb)	Vertical Force (lb)
45	141	83	1,243	0.005	7	104
44	137.5	208	2,960	0.012	16	260
43	134	83	1,126	0.005	6	104
42	132	83	1,094	0.004	6	104
41	130.5	50	649	0.003	4	63
40	129.5	50	639	0.003	4	63
39	128.5	50	630	0.003	4	63
38	126.9999	101	1,231	0.005	7	126
37	125.5	62	738	0.003	4	77
36	122.5	318	3,619	0.015	20	397
35	117.5	361	3,789	0.016	21	451
34	113	299	2,911	0.012	16	374
33	110.5	76	710	0.003	4	95
32	107.5	390	3,444	0.014	19	487
31	102.5	407	3,273	0.013	18	508
30	97.5	471	3,438	0.014	19	588
29	92.5	486	3,200	0.013	18	606
28	87.5377	492	2,916	0.012	16	615
27	85.0377	16	90	0.000	1	20
26	82.9622	883	4,712	0.019	26	1,103
25	80.4622	130	656	0.003	4	163
24	79.5	142	697	0.003	4	177
23	78.55	129	617	0.002	3	160
22	76.55	449	2,048	0.008	11	560
21	72.5	742	3,045	0.012	17	926
20	69.85	45	173	0.001	1	56
19	67.35	719	2,558	0.010	14	897
18	64	312	1,005	0.004	6	389
17	61.5	530	1,582	0.006	9	662
16	57.84	778	2,058	0.008	11	971
15	55.34	169	411	0.002	2	211
14	54	500	1,159	0.005	6	624
13	51.5	765	1,617	0.007	9	955
12	47.7891	1,142	2,087	0.009	12	1,426

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
11	45.2891	247	407	0.002	2	309
10	42.7109	1,982	2,911	0.012	16	2,474
9	40.2109	121	158	0.001	1	151
8	37.5	1,445	1,648	0.007	9	1,804
7	32.5	1,470	1,270	0.005	7	1,835
6	27.5	1,496	934	0.004	5	1,867
5	22.5	1,521	643	0.003	4	1,899
4	17.5	1,547	402	0.002	2	1,931
3	12.5	1,572	212	0.001	1	1,962
2	7.5	1,598	80	0.000	0	1,994
1	2.5	1,623	10	0.000	0	2,026
Ericsson Air 6449 B77D	133	245	3,266	0.013	18	306
Raycap DC6-48-60-18-8F ("Squid")	131	64	824	0.003	5	79
Ericsson RRUS 8843 B2, B66A	131	216	2,798	0.012	16	270
Ericsson RRUS 4478 B14	131	180	2,328	0.010	13	224
Ericsson RRUS 4449 B5, B12	131	213	2,759	0.011	15	266
Raycap DC6-48-60-0-8C	131	16	207	0.001	1	20
Ericsson RRUS 32 B30	131	180	2,332	0.010	13	225
CCI DMP65R-BU6E	131	311	4,034	0.016	22	389
CCI OPA65R-BU6D	131	190	2,456	0.010	14	237
Generic Flat Platform with Handrails	131	2,500	32,385	0.133	180	3,121
Generic Flat Platform with Handrails	111	2,500	23,474	0.096	131	3,121
Generic Flat Platform with Handrails	100	2,500	19,167	0.078	107	3,121
Generic Flat Platform with Handrails	53	2,500	5,585	0.023	31	3,121
Ericsson AIR 6419 B77G	129	198	2,493	0.010	14	248
Ericsson Radio 4449 B71 B85A	120	225	2,458	0.010	14	281
Ericsson 4460 BAND 2/25	120	327	3,572	0.015	20	408
Commscope VV-65A-R1	120	71	780	0.003	4	89
Ericsson AIR 21, 1.3 M, B2A B4P	120	83	907	0.004	5	104
Ericsson AIR 6419 B41	120	250	2,730	0.011	15	312
Ericsson AIR 32 B2A/B66A	120	143	1,566	0.006	9	179
RFS APXVAALL24 43-U-NA20	120	368	4,025	0.016	22	460
Generic Square Platform with Handrails	120	3,790	41,406	0.170	231	4,731
Generic GPS	100	10	77	0.000	0	12
Samsung B5/B13 RRH-BR04C	100	211	1,617	0.007	9	263
Samsung B2/B66A RRH-BR049	100	253	1,941	0.008	11	316
Ryma MGD3-800TX	100	46	354	0.002	2	58
Commscope RC2DC-3315-PF-48	100	32	245	0.001	1	40
Antel BXA-70080/6CF__	100	54	414	0.002	2	67
Quintel QS6656-5D	100	528	4,048	0.017	23	659
Round Side Arm	79	300	1,455	0.006	8	374
Diamond X50A	78.1	5	22	0.000	0	6
PCTEL GPS-TMG-HR-26N	69.7	1	2	0.000	0	1
Stand-Off	63	30	94	0.000	1	37
Raycap RDIDC-9181-PF-48	53	22	49	0.000	0	27
Fujitsu TA08025-B604	53	192	428	0.002	2	239
Fujitsu TA08025-B605	53	225	503	0.002	3	281
JMA Wireless MX08FRO665-21	53	194	432	0.002	2	242
		45,318	244,033	1.000	1,360	56,567

**0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)**

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
45	141	83	1,243	0.005	7	71
44	137.5	208	2,960	0.012	16	177
43	134	83	1,126	0.005	6	71
42	132	83	1,094	0.004	6	71
41	130.5	50	649	0.003	4	43
40	129.5	50	639	0.003	4	43
39	128.5	50	630	0.003	4	43
38	126.9999	101	1,231	0.005	7	86
37	125.5	62	738	0.003	4	53

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
36	122.5	318	3,619	0.015	20	271
35	117.5	361	3,789	0.016	21	308
34	113	299	2,911	0.012	16	255
33	110.5	76	710	0.003	4	65
32	107.5	390	3,444	0.014	19	332
31	102.5	407	3,273	0.013	18	347
30	97.5	471	3,438	0.014	19	401
29	92.5	486	3,200	0.013	18	414
28	87.5377	492	2,916	0.012	16	420
27	85.0377	16	90	0.000	1	14
26	82.9622	883	4,712	0.019	26	752
25	80.4622	130	656	0.003	4	111
24	79.5	142	697	0.003	4	121
23	78.55	129	617	0.002	3	109
22	76.55	449	2,048	0.008	11	382
21	72.5	742	3,045	0.012	17	632
20	69.85	45	173	0.001	1	39
19	67.35	719	2,558	0.010	14	612
18	64	312	1,005	0.004	6	266
17	61.5	530	1,582	0.006	9	452
16	57.84	778	2,058	0.008	11	662
15	55.34	169	411	0.002	2	144
14	54	500	1,159	0.005	6	426
13	51.5	765	1,617	0.007	9	652
12	47.7891	1,142	2,087	0.009	12	973
11	45.2891	247	407	0.002	2	211
10	42.7109	1,982	2,911	0.012	16	1,688
9	40.2109	121	158	0.001	1	103
8	37.5	1,445	1,648	0.007	9	1,231
7	32.5	1,470	1,270	0.005	7	1,252
6	27.5	1,496	934	0.004	5	1,274
5	22.5	1,521	643	0.003	4	1,296
4	17.5	1,547	402	0.002	2	1,317
3	12.5	1,572	212	0.001	1	1,339
2	7.5	1,598	80	0.000	0	1,361
1	2.5	1,623	10	0.000	0	1,382
Ericsson Air 6449 B77D	133	245	3,266	0.013	18	209
Raycap DC6-48-60-18-8F ("Squid")	131	64	824	0.003	5	54
Ericsson RRUS 8843 B2, B66A	131	216	2,798	0.012	16	184
Ericsson RRUS 4478 B14	131	180	2,328	0.010	13	153
Ericsson RRUS 4449 B5, B12	131	213	2,759	0.011	15	181
Raycap DC6-48-60-0-8C	131	16	207	0.001	1	14
Ericsson RRUS 32 B30	131	180	2,332	0.010	13	153
CCI DMP65R-BU6E	131	311	4,034	0.016	22	265
CCI OPA65R-BU6D	131	190	2,456	0.010	14	161
Generic Flat Platform with Handrails	131	2,500	32,385	0.133	180	2,129
Generic Flat Platform with Handrails	111	2,500	23,474	0.096	131	2,129
Generic Flat Platform with Handrails	100	2,500	19,167	0.078	107	2,129
Generic Flat Platform with Handrails	53	2,500	5,585	0.023	31	2,129
Ericsson AIR 6419 B77G	129	198	2,493	0.010	14	169
Ericsson Radio 4449 B71 B85A	120	225	2,458	0.010	14	192
Ericsson 4460 BAND 2/25	120	327	3,572	0.015	20	279
Commscope VV-65A-R1	120	71	780	0.003	4	61
Ericsson AIR 21, 1.3 M, B2A B4P	120	83	907	0.004	5	71
Ericsson AIR 6419 B41	120	250	2,730	0.011	15	213
Ericsson AIR 32 B2A/B66A	120	143	1,566	0.006	9	122
RFS APXVAALL24 43-U-NA20	120	368	4,025	0.016	22	314
Generic Square Platform with Handrails	120	3,790	41,406	0.170	231	3,228
Generic GPS	100	10	77	0.000	0	9
Samsung B5/B13 RRH-BR04C	100	211	1,617	0.007	9	180
Samsung B2/B66A RRH-BR049	100	253	1,941	0.008	11	216
Rymasa MGD3-800TX	100	46	354	0.002	2	39
Commscope RC2DC-3315-PF-48	100	32	245	0.001	1	27
Antel BXA-70080/6CF__	100	54	414	0.002	2	46
Quintel QS6656-5D	100	528	4,048	0.017	23	450
Round Side Arm	79	300	1,455	0.006	8	256
Diamond X50A	78.1	5	22	0.000	0	4
PCTEL GPS-TMG-HR-26N	69.7	1	2	0.000	0	1
Stand-Off	63	30	94	0.000	1	26
Raycap RDIDC-9181-PF-48	53	22	49	0.000	0	19

Segment	Height Above Base (ft)	Weight (lb)	W <sub>z</sub> (lb-ft)	C <sub>vx</sub>	Horizontal Force (lb)	Vertical Force (lb)
Fujitsu TA08025-B604	53	192	428	0.002	2	163
Fujitsu TA08025-B605	53	225	503	0.002	3	192
JMA Wireless MX08FRO665-21	53	194	432	0.002	2	165
		45,318	244,033	1.000	1,360	38,601

**1.2D + 1.0Ev + 1.0Eh Normal Seismic**

**CALCULATED FORCES**

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-54.54	-1.36	0.00	-153.86	0.00	153.86	4,383.15	1,101.74	4,632	3,974.58	0.00	0.00	0.04
5.00	-52.55	-1.37	0.00	-147.04	0.00	147.04	4,317.85	1,075.50	4,414	3,821.19	0.01	-0.01	0.04
10.00	-50.58	-1.38	0.00	-140.18	0.00	140.18	4,250.64	1,049.26	4,201	3,669.01	0.02	-0.02	0.04
15.00	-48.65	-1.38	0.00	-133.29	0.00	133.29	4,181.52	1,023.01	3,994	3,518.15	0.05	-0.03	0.04
20.00	-46.75	-1.39	0.00	-126.37	0.00	126.37	4,110.49	996.77	3,791	3,368.74	0.08	-0.04	0.03
25.00	-44.89	-1.39	0.00	-119.43	0.00	119.43	4,037.56	970.52	3,595	3,220.91	0.13	-0.05	0.03
30.00	-43.05	-1.39	0.00	-112.49	0.00	112.49	3,962.71	944.28	3,403	3,074.78	0.18	-0.06	0.03
35.00	-41.25	-1.38	0.00	-105.55	0.00	105.55	3,855.75	918.04	3,216	2,907.69	0.25	-0.07	0.03
40.00	-41.10	-1.39	0.00	-98.63	0.00	98.63	3,745.52	891.79	3,035	2,742.88	0.33	-0.08	0.03
40.42	-38.62	-1.37	0.00	-98.05	0.00	98.05	3,736.22	889.58	3,020	2,729.20	0.34	-0.08	0.03
45.00	-38.31	-1.37	0.00	-91.77	0.00	91.77	3,635.30	865.55	2,859	2,582.88	0.42	-0.09	0.03
45.58	-36.89	-1.36	0.00	-90.98	0.00	90.98	3,085.21	756.51	2,548	2,239.64	0.43	-0.09	0.03
50.00	-35.93	-1.36	0.00	-84.96	0.00	84.96	3,031.72	736.62	2,416	2,142.33	0.52	-0.10	0.03
53.00	-31.40	-1.30	0.00	-80.90	0.00	80.90	2,994.57	723.12	2,328	2,076.90	0.58	-0.11	0.03
55.00	-31.19	-1.30	0.00	-78.29	0.00	78.29	2,969.43	714.13	2,271	2,033.56	0.63	-0.11	0.03
55.68	-30.22	-1.29	0.00	-77.40	0.00	77.40	2,960.81	711.07	2,251	2,018.87	0.65	-0.11	0.03
55.68	-30.22	-1.29	0.00	-77.40	0.00	77.40	2,960.81	711.07	2,251	2,018.87	0.65	-0.11	0.05
60.00	-29.56	-1.29	0.00	-71.82	0.00	71.82	2,904.85	691.63	2,130	1,925.98	0.75	-0.12	0.05
63.00	-29.13	-1.29	0.00	-67.95	0.00	67.95	2,848.16	678.13	2,048	1,851.12	0.83	-0.13	0.05
65.00	-28.23	-1.28	0.00	-65.38	0.00	65.38	2,810.37	669.14	1,994	1,802.04	0.89	-0.14	0.05
69.70	-28.17	-1.28	0.00	-59.39	0.00	59.39	2,721.56	647.99	1,870	1,689.30	1.04	-0.16	0.05
70.00	-27.25	-1.26	0.00	-59.01	0.00	59.01	2,715.89	646.64	1,862	1,682.23	1.05	-0.16	0.05
75.00	-26.69	-1.26	0.00	-52.69	0.00	52.69	2,621.41	624.15	1,735	1,566.54	1.22	-0.18	0.04
78.10	-26.52	-1.26	0.00	-48.79	0.00	48.79	2,562.84	610.20	1,658	1,496.88	1.34	-0.19	0.04
79.00	-25.97	-1.24	0.00	-47.66	0.00	47.66	2,545.83	606.15	1,636	1,476.96	1.38	-0.19	0.04
80.00	-25.81	-1.24	0.00	-46.41	0.00	46.41	2,526.94	601.65	1,612	1,454.97	1.42	-0.20	0.04
80.92	-24.70	-1.22	0.00	-45.26	0.00	45.26	2,509.47	597.49	1,590	1,434.80	1.46	-0.20	0.04
85.00	-24.68	-1.22	0.00	-40.31	0.00	40.31	2,432.46	579.16	1,494	1,347.52	1.63	-0.21	0.04
85.08	-24.07	-1.20	0.00	-40.22	0.00	40.22	1,511.75	394.71	1,040	860.19	1.64	-0.21	0.06
90.00	-23.46	-1.19	0.00	-34.29	0.00	34.29	1,478.99	379.94	964	809.78	1.87	-0.23	0.06
95.00	-22.87	-1.18	0.00	-28.33	0.00	28.33	1,443.84	364.94	889	759.04	2.12	-0.25	0.05
100.00	-17.83	-0.99	0.00	-22.44	0.00	22.44	1,406.77	349.94	818	708.87	2.40	-0.27	0.04
105.00	-17.34	-0.97	0.00	-17.50	0.00	17.50	1,367.80	334.95	749	659.40	2.69	-0.29	0.04
110.00	-17.25	-0.97	0.00	-12.64	0.00	12.64	1,326.92	319.95	684	610.75	3.01	-0.31	0.03
111.00	-13.75	-0.81	0.00	-11.68	0.00	11.68	1,318.52	316.95	671	601.13	3.07	-0.31	0.03
115.00	-13.30	-0.78	0.00	-8.45	0.00	8.45	1,280.81	304.95	621	561.60	3.34	-0.32	0.03
120.00	-6.34	-0.41	0.00	-4.53	0.00	4.53	1,217.82	289.96	562	507.42	3.68	-0.33	0.01
125.00	-6.27	-0.40	0.00	-2.51	0.00	2.51	1,154.84	274.96	505	455.99	4.02	-0.33	0.01
126.00	-6.14	-0.39	0.00	-2.11	0.00	2.11	1,142.24	271.96	494	446.03	4.09	-0.34	0.01
126.00	-6.14	-0.39	0.00	-2.11	0.00	2.11	385.02	115.51	105	106.00	4.09	-0.34	0.04
128.00	-6.08	-0.39	0.00	-1.32	0.00	1.32	385.02	115.51	105	106.00	4.23	-0.34	0.03
128.00	-6.08	-0.39	0.00	-1.32	0.00	1.32	396.02	118.81	108	109.03	4.23	-0.34	0.03
129.00	-5.77	-0.37	0.00	-0.93	0.00	0.93	396.02	118.81	108	109.03	4.30	-0.34	0.02
130.00	-5.70	-0.37	0.00	-0.56	0.00	0.56	396.02	118.81	108	109.03	4.38	-0.34	0.02
131.00	-0.77	-0.05	0.00	-0.19	0.00	0.19	396.02	118.81	108	109.03	4.45	-0.34	0.00
133.00	-0.36	-0.03	0.00	-0.09	0.00	0.09	396.02	118.81	108	109.03	4.59	-0.34	0.00
135.00	-0.10	-0.01	0.00	-0.04	0.00	0.04	396.02	118.81	108	109.03	4.73	-0.34	0.00
140.00	0.00	0.00	0.00	0.00	0.00	0.00	396.02	118.81	108	109.03	5.09	-0.34	0.00
142.00	0.00	0.00	0.00	0.00	0.00	0.00	396.02	118.81	108	109.03	5.23	-0.34	0.00

**0.9D - 1.0Ev + 1.0Eh Normal Seismic (Reduced DL)**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-37.22	-1.36	0.00	-151.19	0.00	151.19	4,383.15	1,101.74	4,632	3,974.58	0.00	0.00	0.03
5.00	-35.86	-1.37	0.00	-144.38	0.00	144.38	4,317.85	1,075.50	4,414	3,821.19	0.01	-0.01	0.03
10.00	-34.52	-1.37	0.00	-137.55	0.00	137.55	4,250.64	1,049.26	4,201	3,669.01	0.02	-0.02	0.03
15.00	-33.20	-1.37	0.00	-130.69	0.00	130.69	4,181.52	1,023.01	3,994	3,518.15	0.04	-0.03	0.03
20.00	-31.90	-1.38	0.00	-123.82	0.00	123.82	4,110.49	996.77	3,791	3,368.74	0.08	-0.04	0.03
25.00	-30.63	-1.37	0.00	-116.94	0.00	116.94	4,037.56	970.52	3,595	3,220.91	0.13	-0.05	0.03
30.00	-29.38	-1.37	0.00	-110.06	0.00	110.06	3,962.71	944.28	3,403	3,074.78	0.18	-0.06	0.03
35.00	-28.15	-1.37	0.00	-103.21	0.00	103.21	3,855.75	918.04	3,216	2,907.69	0.25	-0.07	0.03
40.00	-28.04	-1.37	0.00	-96.38	0.00	96.38	3,745.52	891.79	3,035	2,742.88	0.32	-0.08	0.03
40.42	-26.36	-1.35	0.00	-95.80	0.00	95.80	3,736.22	889.58	3,020	2,729.20	0.33	-0.08	0.03
45.00	-26.15	-1.35	0.00	-89.61	0.00	89.61	3,635.30	865.55	2,859	2,582.88	0.41	-0.09	0.03
45.58	-25.17	-1.34	0.00	-88.83	0.00	88.83	3,085.21	756.51	2,548	2,239.64	0.42	-0.09	0.03
50.00	-24.52	-1.33	0.00	-82.90	0.00	82.90	3,031.72	736.62	2,416	2,142.33	0.51	-0.10	0.03
53.00	-21.43	-1.28	0.00	-78.90	0.00	78.90	2,994.57	723.12	2,328	2,076.90	0.57	-0.10	0.03
55.00	-21.28	-1.28	0.00	-76.33	0.00	76.33	2,969.43	714.13	2,271	2,033.56	0.62	-0.11	0.03
55.68	-20.62	-1.27	0.00	-75.46	0.00	75.46	2,960.81	711.07	2,251	2,018.87	0.63	-0.11	0.03
55.68	-20.62	-1.27	0.00	-75.46	0.00	75.46	2,960.81	711.07	2,251	2,018.87	0.63	-0.11	0.04
60.00	-20.17	-1.27	0.00	-69.97	0.00	69.97	2,904.85	691.63	2,130	1,925.98	0.74	-0.12	0.04
63.00	-19.88	-1.26	0.00	-66.17	0.00	66.17	2,848.16	678.13	2,048	1,851.12	0.82	-0.13	0.04
65.00	-19.26	-1.25	0.00	-63.64	0.00	63.64	2,810.37	669.14	1,994	1,802.04	0.87	-0.14	0.04
69.70	-19.22	-1.25	0.00	-57.76	0.00	57.76	2,721.56	647.99	1,870	1,689.30	1.02	-0.15	0.04
70.00	-18.59	-1.24	0.00	-57.39	0.00	57.39	2,715.89	646.64	1,862	1,682.23	1.03	-0.16	0.04
75.00	-18.21	-1.23	0.00	-51.20	0.00	51.20	2,621.41	624.15	1,735	1,566.54	1.20	-0.17	0.04
78.10	-18.10	-1.23	0.00	-47.39	0.00	47.39	2,562.84	610.20	1,658	1,496.88	1.31	-0.18	0.04
79.00	-17.72	-1.22	0.00	-46.29	0.00	46.29	2,545.83	606.15	1,636	1,476.96	1.35	-0.19	0.04
80.00	-17.61	-1.21	0.00	-45.07	0.00	45.07	2,526.94	601.65	1,612	1,454.97	1.39	-0.19	0.04
80.92	-16.86	-1.19	0.00	-43.95	0.00	43.95	2,509.47	597.49	1,590	1,434.80	1.43	-0.19	0.04
85.00	-16.84	-1.19	0.00	-39.11	0.00	39.11	2,432.46	579.16	1,494	1,347.52	1.60	-0.21	0.04
85.08	-16.42	-1.17	0.00	-39.03	0.00	39.03	1,511.75	394.71	1,040	860.19	1.60	-0.21	0.06
90.00	-16.01	-1.16	0.00	-33.25	0.00	33.25	1,478.99	379.94	964	809.78	1.83	-0.22	0.05
95.00	-15.61	-1.14	0.00	-27.46	0.00	27.46	1,443.84	364.94	889	759.04	2.07	-0.25	0.05
100.00	-12.17	-0.96	0.00	-21.74	0.00	21.74	1,406.77	349.94	818	708.87	2.34	-0.27	0.04
105.00	-11.83	-0.94	0.00	-16.95	0.00	16.95	1,367.80	334.95	749	659.40	2.63	-0.28	0.03
110.00	-11.77	-0.94	0.00	-12.25	0.00	12.25	1,326.92	319.95	684	610.75	2.94	-0.30	0.03
111.00	-9.38	-0.78	0.00	-11.31	0.00	11.31	1,318.52	316.95	671	601.13	3.00	-0.30	0.03
115.00	-9.08	-0.76	0.00	-8.19	0.00	8.19	1,280.81	304.95	621	561.60	3.26	-0.31	0.02
120.00	-4.33	-0.39	0.00	-4.40	0.00	4.40	1,217.82	289.96	562	507.42	3.59	-0.32	0.01
125.00	-4.28	-0.39	0.00	-2.43	0.00	2.43	1,154.84	274.96	505	455.99	3.93	-0.33	0.01
126.00	-4.19	-0.38	0.00	-2.04	0.00	2.04	1,142.24	271.96	494	446.03	3.99	-0.33	0.01
126.00	-4.19	-0.38	0.00	-2.04	0.00	2.04	385.02	115.51	105	106.00	3.99	-0.33	0.03
128.00	-4.15	-0.38	0.00	-1.28	0.00	1.28	385.02	115.51	105	106.00	4.13	-0.33	0.02
128.00	-4.15	-0.38	0.00	-1.28	0.00	1.28	396.02	118.81	108	109.03	4.13	-0.33	0.02
129.00	-3.93	-0.36	0.00	-0.90	0.00	0.90	396.02	118.81	108	109.03	4.20	-0.33	0.02
130.00	-3.89	-0.36	0.00	-0.54	0.00	0.54	396.02	118.81	108	109.03	4.27	-0.33	0.02
131.00	-0.53	-0.05	0.00	-0.19	0.00	0.19	396.02	118.81	108	109.03	4.34	-0.33	0.00
133.00	-0.25	-0.02	0.00	-0.09	0.00	0.09	396.02	118.81	108	109.03	4.48	-0.33	0.00
135.00	-0.07	-0.01	0.00	-0.04	0.00	0.04	396.02	118.81	108	109.03	4.62	-0.33	0.00
140.00	0.00	0.00	0.00	0.00	0.00	0.00	396.02	118.81	108	109.03	4.96	-0.33	0.00
142.00	0.00	0.00	0.00	0.00	0.00	0.00	396.02	118.81	108	109.03	5.10	-0.33	0.00

**ANALYSIS SUMMARY**

Load Case	Reactions						Max Usage	
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
	1.2D + 1.0W Normal	33.49	0.00	54.32	0.00	0.00	3133.75	85.08
0.9D + 1.0W Normal	33.46	0.00	40.73	0.00	0.00	3094.65	85.08	0.79
1.2D + 1.0Di + 1.0Wi Normal	8.26	0.00	71.34	0.00	0.00	802.42	85.08	0.24
1.2D + 1.0Ev + 1.0Eh Normal	1.39	0.00	54.54	0.00	0.00	153.86	85.08	0.06
0.9D - 1.0Ev + 1.0Eh Normal	1.38	0.00	37.22	0.00	0.00	151.19	85.08	0.06
1.0D + 1.0W Service Normal	7.77	0.00	45.32	0.00	0.00	723.19	85.08	0.2

**ADDITIONAL STEEL SUMMARY**

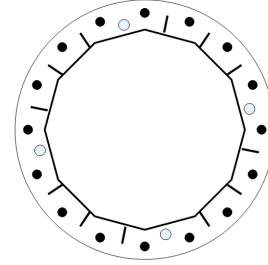
Elev From (ft)	Elev To (ft)	Member	Intermediate Connectors			Max member			
			VQ/I	Shear Applied (kips)	Shear (phiVn) (kips)	Ratio	Pu (kip)	PhiPn (kip)	Ratio
0.00	55.68	SOL #20 All Thread Bar	276.6	8.3	16.8	0.4937	215.8	330.5	0.6531

Elev From (ft)	Elev To (ft)	Member	Upper Termination Connectors				Lower Termination Connectors					
			MQ/I	phiVn (kips)	Num Reqd	Num Actual	Ratio	MQ/I (kips)	phiVn (kip)	Num Reqd	Num Actual	Ratio
0.00	55.68	SOL #20 All Thread Bar	169.5752	12	15	22	0.6423	0	12	0	0	0.0000

**BASE PLATE ANALYSIS @ 0 FT**

**PLATE PARAMETERS (ID# 15669)**

Diameter: 60 in  
 Shape: Round  
 Thickness: 2 in  
 Grade: A871-60  
 Yield Strength: 60 ksi  
 Tensile Strength: 75 ksi  
 Rod Detail Type: c  
 Clear Distance: - in  
 Base Weld Size: 0.125 in  
 Orientation Offset: - °  
 Analysis Type: Elastic  
 Neutral Axis: 90 °



**ANCHOR ROD PARAMETERS**

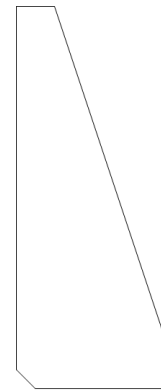
Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 16040]	Radial	16	2.25	54	A615-75	75	100	-	-

**DYWIDAG BAR PARAMETERS**

Quantity	Bar Size	Bar Diameter (in)	Fy (ksi)	Fu (ksi)	Bracket Type	Bracket Offset (in)	Circle (in)	Offset (°)
4 [ID# 954]	#20	2.5	80	100	Angle	2.19	51.88	11.25

**STIFFENER PARAMETERS**

Arrangement: Radial  
 Quantity: 12  
 Height: 10 in  
 Width: 4 in  
 Thickness: 0.5 in  
 Notch: 0.5 in  
 Grade: A36  
 Yield Strength: 36 ksi  
 Tensile Strength: 58 ksi  
 Horizontal Weld Type: Fillet  
 Horizontal Weld Fillet Size: 0.313 in  
 Vertical Weld Fillet Size: 0.313 in  
 Weld Strength: 70 ksi  
 Orientation Offset: - °





**ANCHOR ROD GEOMETRY AND APPLIED LOADS --- ORIGINAL (16) 2.25"Ø [ID 16040]**

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in <sup>4</sup> )	Axial Load (k)	Shear Load (k)
1	0.393	24.94	10.33	-23.732	1829.987	-114.96	1.28
2	0.785	19.09	19.09	-18.164	1072.330	-87.44	2.36
3	1.178	10.33	24.94	-9.830	314.672	-46.24	3.08
4	1.571	0.00	27.00	0.000	0.839	2.36	3.33
5	1.963	-10.33	24.94	9.830	314.672	50.95	3.08
6	2.356	-19.09	19.09	18.164	1072.330	92.15	2.36
7	2.749	-24.94	10.33	23.732	1829.987	119.68	1.28
8	3.142	-27.00	0.00	25.688	2143.820	129.34	0.00
9	3.534	-24.94	-10.33	23.732	1829.987	119.68	1.28
10	3.927	-19.09	-19.09	18.164	1072.330	92.15	2.36
11	4.320	-10.33	-24.94	9.830	314.672	50.95	3.08
12	4.712	0.00	-27.00	0.000	0.839	2.36	3.33
13	5.105	10.33	-24.94	-9.830	314.672	-46.24	3.08
14	5.498	19.09	-19.09	-18.164	1072.330	-87.44	2.36
15	5.890	24.94	-10.33	-23.732	1829.987	-114.96	1.28
16	6.283	27.00	0.00	-25.688	2143.820	-124.63	0.00

**DYWIDAG BAR GEOMETRY AND APPLIED LOADS --- (4) #20 [ID 954]**

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in <sup>4</sup> )	Axial Load (k)
1	1.767	-5.06	25.44	5.061	127.631	47.30
2	3.338	-25.44	-5.06	25.442	3179.214	221.09
3	4.909	5.06	-25.44	-5.061	127.631	-39.00
4	0.196	25.44	5.06	-25.442	3179.214	-212.79

**STIFFENER GEOMETRY AND APPLIED LOADS**

Position	Radians	Moment Arm (in)	Inertia (in <sup>4</sup> )	Axial Load (k)	Shear Load (k)
1	0.589	-20.371	654.442	-39.57	0.65
2	0.982	-13.611	293.660	-26.16	0.97
3	1.374	-4.780	38.549	-8.62	1.14
4	2.160	13.611	293.660	27.88	0.97
5	2.553	20.371	654.442	41.30	0.65
6	2.945	24.029	909.553	48.56	0.23
7	3.731	20.371	654.442	41.30	0.65
8	4.123	13.611	293.660	27.88	0.97
9	4.516	4.780	38.549	10.35	1.14
10	5.301	-13.611	293.660	-26.16	0.97
11	5.694	-20.371	654.442	-39.57	0.65
12	6.087	-24.029	909.553	-46.83	0.23

ASSET: 302511, WSPT - South  
 CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
 ENG NO: 13769201

**REACTION DISTRIBUTION**

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	45"Ø x 0.4375" (12 Sides)	2176.4	54.32	33.49	0.694
Bolt Group	Original (16) 2.25"Ø	2176.4	-	33.49	0.694
Dywidag Group	(4) #20	957.4	-	-	0.306
Stiffeners	(12) 10"H x 4"W x 0.5"T	597.4	-	9.19	0.191
<b>TOTALS</b>		<b>3133.75</b>	<b>54.32</b>	<b>33.49</b>	

**COMPONENT PROPERTIES**

Component	ID	Gross Area (in <sup>2</sup> )	Net Area (in <sup>2</sup> )	Individual Inertia (in <sup>4</sup> )	Moment of Inertia (in <sup>4</sup> )	Threads/in
Pole	45"Ø x 0.4375" (12 Sides)	60.5515	-	-	15034.41	-
Bolt Group	Original (16) 2.25"Ø	3.9761	3.2477	0.8393	17157.27	4.5
Dywidag Group	(4) #20	4.9087	4.9087	1.9175	6613.69	-
Stiffeners	(12) 10"H x 4"W x 0.5"T	1.7500	1.5750	10.6667	5688.61	-

**EXTERNAL BASE PLATE BEND LINE ANALYSIS @ 0 FT**

**POLE PROPERTIES**

Flat-to-Flat Diameter: 45.12 in  
 Point-to-Point Diameter: 46.72 in  
 Flat Width: 12.091 in  
 Flat Radians: 0.524 rad

**PLATE PROPERTIES**

Neutral Axis: 90 °  
 Bend Line Lower Limit: 2.559 rad  
 Bend Line Upper Limit: 3.724 rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in <sup>3</sup> )	Applied Moment Mu (k-in)	Moment Capacity φMn (k-in)	Ratio
Flat	35.459	3.11	38.572	684.2	2082.9	0.328
Corner	33.334	1.70	35.029	390.7	1891.6	0.207
Circumferential	44.434	4.06	48.497	858.7	2618.9	0.328

**ELASTIC ANCHOR ROD ANALYSIS**

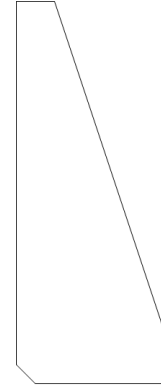
Class	Group Quantity	Rod Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity φPn (k)	Ratio	Interaction
Original	16	2.25	129.3	0.0	243.6	0.531	0.531

**DYWIDAG BAR ANALYSIS**

Group Quantity	Bar Size	Bar Circle (in)	Applied Axial Load Pu (k)	Compressive Capacity φPn (k)	Ratio
4	#20	51.88	221.1	368.2	0.601

**BASE PLATE STIFFENER ANALYSIS**

Quantity:	12	
Height:	10	in
Width:	4	in
Effective Width:	4.000	in
Thickness:	0.5	in
Notch:	0.5	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Horizontal Weld Type:	Fillet	
Horizontal Weld Fillet Size:	0.313	in
Horizontal Weld Bevel Size:		in
Vertical Weld Fillet Size:	0.313	in
Weld Strength:	70	ksi
Electrode Coefficient:	1.000	



**PLATE COMPRESSION**

Radius of Gyration:	0.144	in <sup>3</sup>
kl/r:	41.57	
4.71 √(E/Fy):	133.68	
Buckling Stress, Fe:	165.64	ksi
Crit. Buckling Stress, Fcr:	145.26	ksi
Applied Compression, Pu:	48.56	k
Compressive Capacity, φPn:	228.79	k
<b>Pu/φPn:</b>	<b>0.106</b>	

**PLATE TENSION**

Gross Cross Section:	1.7500	in <sup>2</sup>
Net Cross Section:	1.5750	in <sup>2</sup>
Applied Tension, Tu:	46.83	k
Tensile Capacity, φTn:	56.70	k
<b>Tu/φTn:</b>	<b>0.413</b>	

**VERTICAL WELD TO POLE**

Vertical Eccentricity Ratio, a=e <sub>x</sub> /l:	0.133	
Spacing Ratio, k:	0.050	
Weld Coefficient, C:	3.720	
Applied Compression, Pu:	48.56	k
Compressive Capacity, φPn:	139.72	k
Horizontal Eccentricity Ratio, a=e <sub>x</sub> /l:	0.333	
Weld Coefficient, C:	2.940	
Applied Shear, Vu:	0.23	k
Shear Capacity, φVn:	110.43	k
<b>Pu/φPn + Vu/φVn:</b>	<b>0.350</b>	

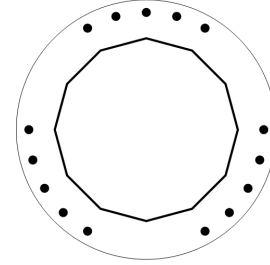
**HORIZONTAL WELD TO PLATE**

Horizontal Eccentricity Ratio, a=e <sub>x</sub> /l:	0.167	
Spacing Ratio, k:	0.125	
Weld Coefficient, C:	3.940	
Effective Fillet Size:	0.313	in
Applied Compression, Pu:	48.56	k
Compressive Capacity, φPn:	59.19	k
Vertical Eccentricity Ratio, a=e <sub>x</sub> /l:	0.417	
Weld Coefficient, C:	2.670	
Applied Shear, Vu:	0.23	k
Shear Capacity, φVn:	40.11	k
<b>Pu/φPn + Vu/φVn:</b>	<b>0.826</b>	

**LOWER FLANGE PLATE ANALYSIS @ 125.9999 FT**

**PLATE PARAMETERS (ID# 16078)**

Diameter:	28.5	in
Shape:	Round	
Thickness:	1.5	in
Grade:	A871-60	
Yield Strength:	60	ksi
Tensile Strength:	75	ksi
Pole Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	120	°



**FLANGE BOLT PARAMETERS**

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 16456]	Cluster	15	1	25.75	A325	92	120	6	-

**FLANGE BOLT GEOMETRY AND APPLIED LOADS --- ORIGINAL (15) 1"Ø [ID 16456]**

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in <sup>4</sup> )	Axial Load (k)	Shear Load (k)
1	1.047	6.44	11.15	-10.609	68.204	-2.61	0.32
2	1.309	3.33	12.44	-8.662	45.479	-2.61	0.46
3	1.571	0.00	12.88	-6.125	22.754	-2.61	0.56
4	1.833	-3.33	12.44	-3.171	6.118	-2.61	0.63
5	2.094	-6.44	11.15	0.000	0.029	4.05	0.65
6	3.142	-12.88	0.00	10.609	68.204	4.05	0.32
7	3.403	-12.44	-3.33	11.833	84.840	4.05	0.17
8	3.665	-11.15	-6.44	12.250	90.929	4.05	0.00
9	3.927	-9.10	-9.10	11.833	84.840	4.05	0.17
10	4.189	-6.44	-11.15	10.609	68.204	4.05	0.32
11	5.236	6.44	-11.15	0.000	0.029	-2.61	0.65
12	5.498	9.10	-9.10	-3.171	6.118	-2.61	0.63
13	5.760	11.15	-6.44	-6.125	22.754	-2.61	0.56
14	6.021	12.44	-3.33	-8.662	45.479	-2.61	0.46
15	6.283	12.88	0.00	-10.609	68.204	-2.61	0.32

**REACTION DISTRIBUTION**

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	19.5002"Ø x 0.25" (12 Sides)	31.7	5.43	6.05	1.000
Bolt Group	Original (15) 1"Ø	31.7	-	6.05	1.000
<b>TOTALS</b>		<b>31.71</b>	<b>5.43</b>	<b>6.05</b>	

ASSET: 302511, WSPT - South  
 CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
 ENG NO: 13769201

**COMPONENT PROPERTIES**

Component	ID	Gross Area (in <sup>2</sup> )	Net Area (in <sup>2</sup> )	Individual Inertia (in <sup>4</sup> )	Moment of Inertia (in <sup>4</sup> )	Threads/in
Pole	19.5002"Ø x 0.25" (12 Sides)	14.9470	-	-	692.68	-
Bolt Group	Original (15) 1"Ø	0.7854	0.6057	0.0292	682.19	8.0

**EXTERNAL LOWER FLANGE PLATE BEND LINE ANALYSIS @ 125.9999 FT**

**POLE PROPERTIES**

Flat-to-Flat Diameter: 19.62 in  
 Point-to-Point Diameter: 20.32 in  
 Flat Width: 5.259 in  
 Flat Radians: 0.524 rad

**PLATE PROPERTIES**

Neutral Axis: 120 °  
 Bend Line Lower Limit: rad  
 Bend Line Upper Limit: -0.332 rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in <sup>3</sup> )	Applied Moment Mu (k-in)	Moment Capacity φMn (k-in)	Ratio
Flat	19.013	0.00	10.695	34.9	577.5	0.060
Corner	18.272	0.00	10.278	27.6	555.0	0.050

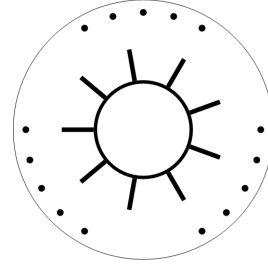
**PLASTIC FLANGE BOLT ANALYSIS**

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity φPn (k)	Ratio
Original	15	1	4.0	0.6	54.5	0.074

**UPPER FLANGE PLATE ANALYSIS @ 127.9999 FT**

**PLATE PARAMETERS (ID# 15670)**

Diameter: 28.5 in  
 Shape: Round  
 Thickness: 0.75 in  
 Grade: A36  
 Yield Strength: 36 ksi  
 Tensile Strength: 58 ksi  
 Pole Weld Size: 0.125 in  
 Orientation Offset: - °  
 Analysis Type: Plastic  
 Neutral Axis: 126 °

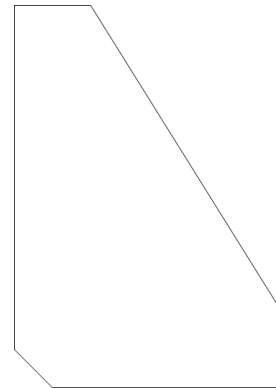


**FLANGE BOLT PARAMETERS**

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 16041]	Cluster	15	0.75	25.75	A325	92	120	6	-

**STIFFENER PARAMETERS**

Arrangement: Radial  
 Quantity: 9  
 Height: 5 in  
 Width: 3.5 in  
 Thickness: 0.375 in  
 Notch: 0.5 in  
 Grade: A36  
 Yield Strength: 36 ksi  
 Tensile Strength: 58 ksi  
 Horizontal Weld Type: Fillet  
 Horizontal Weld Fillet Size: 0.375 in  
 Vertical Weld Fillet Size: 0.375 in  
 Weld Strength: 70 ksi  
 Orientation Offset: - °



**FLANGE BOLT GEOMETRY AND APPLIED LOADS --- ORIGINAL (15) 0.75"Ø [ID 16041]**

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in <sup>4</sup> )	Axial Load (k)	Shear Load (k)
1	1.047	6.44	11.15	-11.334	42.971	-1.29	0.26
2	1.309	3.33	12.44	-9.641	31.100	-1.29	0.40
3	1.571	0.00	12.88	-7.292	17.794	-1.29	0.51
4	1.833	-3.33	12.44	-4.446	6.620	-1.29	0.59
5	2.094	-6.44	11.15	-1.297	0.571	-1.29	0.63
6	3.142	-12.88	0.00	10.037	33.702	2.71	0.37
7	3.403	-12.44	-3.33	11.582	44.876	2.71	0.23
8	3.665	-11.15	-6.44	12.338	50.925	2.71	0.07
9	3.927	-9.10	-9.10	12.254	50.228	2.71	0.10
10	4.189	-6.44	-11.15	11.334	42.971	2.71	0.26
11	5.236	6.44	-11.15	1.297	0.571	2.71	0.63
12	5.498	9.10	-9.10	-1.941	1.269	-1.29	0.62
13	5.760	11.15	-6.44	-5.046	8.525	-1.29	0.58
14	6.021	12.44	-3.33	-7.808	20.397	-1.29	0.49
15	6.283	12.88	0.00	-10.037	33.702	-1.29	0.37

**STIFFENER GEOMETRY AND APPLIED LOADS**

Position	Radians	Moment Arm (in)	Inertia (in <sup>4</sup> )	Axial Load (k)	Shear Load (k)
1	0.349	-6.849	47.611	-3.70	0.17
2	1.047	-6.509	43.131	-3.50	0.25
3	1.745	-3.123	10.963	-1.50	0.55
4	2.443	1.724	4.271	1.37	0.60
5	3.142	5.764	34.115	3.76	0.36
6	3.840	7.108	51.172	4.55	0.04
7	4.538	5.125	27.252	3.38	0.43
8	5.236	0.745	1.887	0.79	0.61
9	5.934	-3.984	16.998	-2.01	0.51

**REACTION DISTRIBUTION**

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	10.75"Ø x 0.375" (Round)	19.6	5.31	6.00	1.000
Bolt Group	Original (15) 0.75"Ø	19.6	-	6.00	1.000
Stiffeners	(9) 5"H x 3.5"W x 0.375"T	11.6	-	3.54	0.590
<b>TOTALS</b>		<b>19.6</b>	<b>5.31</b>	<b>6</b>	

**COMPONENT PROPERTIES**

Component	ID	Gross Area (in <sup>2</sup> )	Net Area (in <sup>2</sup> )	Individual Inertia (in <sup>4</sup> )	Moment of Inertia (in <sup>4</sup> )	Threads/in
Pole	10.75"Ø x 0.375" (Round)	12.2226	-	-	165.04	-
Bolt Group	Original (15) 0.75"Ø	0.4418	0.3345	0.0089	386.22	10.0
Stiffeners	(9) 5"H x 3.5"W x 0.375"T	1.1250	1.0125	5.3594	237.40	-

ASSET: 302511, WSPT - South  
 CUSTOMER: T-MOBILE

CODE: ANSI/TIA-222-H  
 ENG NO: 13769201

**EXTERNAL UPPER FLANGE PLATE BEND LINE ANALYSIS @ 127.9999 FT**

**POLE PROPERTIES**

Flat-to-Flat Diameter: 10.88 in  
 Point-to-Point Diameter: 10.88 in  
 Flat Width: 0.095 in  
 Flat Radians: 0.017 rad

**PLATE PROPERTIES**

Neutral Axis: 126 °  
 Bend Line Lower Limit: rad  
 Bend Line Upper Limit: -5.641 rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in <sup>3</sup> )	Applied Moment Mu (k-in)	Moment Capacity φMn (k-in)	Ratio
Flat	24.672	4.74	4.137	82.6	134.0	0.616
Corner	24.672	4.74	4.137	82.6	134.0	0.616

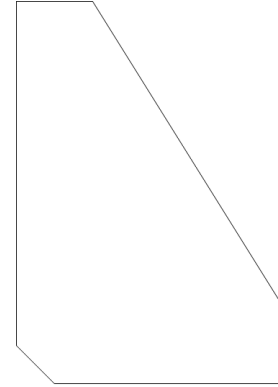
**PLASTIC FLANGE BOLT ANALYSIS**

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity φPn (k)	Ratio
Original	15	0.75	2.7	0.6	30.1	0.090



**UPPER FLANGE PLATE STIFFENER ANALYSIS**

Quantity:	9	
Height:	5	in
Width:	3.5	in
Effective Width:	3.500	in
Thickness:	0.375	in
Notch:	0.5	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Horizontal Weld Type:	Fillet	
Horizontal Weld Fillet Size:	0.375	in
Horizontal Weld Bevel Size:		in
Vertical Weld Fillet Size:	0.375	in
Weld Strength:	70	ksi
Electrode Coefficient:	1.000	



**PLATE COMPRESSION**

Radius of Gyration:	0.108	in <sup>3</sup>
kl/r:	27.71	
4.71 √(E/Fy):	133.68	
Buckling Stress, Fe:	372.68	ksi
Crit. Buckling Stress, Fcr:	326.84	ksi
Applied Compression, Pu:	4.55	k
Compressive Capacity, φPn:	330.93	k
<b>Pu/φPn:</b>	<b>0.007</b>	

**PLATE TENSION**

Gross Cross Section:	1.1250	in <sup>2</sup>
Net Cross Section:	1.0125	in <sup>2</sup>
Applied Tension, Tu:	3.70	k
Tensile Capacity, φTn:	36.45	k
<b>Tu/φTn:</b>	<b>0.051</b>	

**VERTICAL WELD TO POLE**

Vertical Eccentricity Ratio, a=e <sub>x</sub> /l:	0.233	
Spacing Ratio, k:	0.075	
Weld Coefficient, C:	3.510	
Applied Compression, Pu:	4.55	k
Compressive Capacity, φPn:	78.98	k
Horizontal Eccentricity Ratio, a=e <sub>y</sub> /l:	0.333	
Weld Coefficient, C:	2.940	
Applied Shear, Vu:	0.04	k
Shear Capacity, φVn:	66.15	k
<b>Pu/φPn + Vu/φVn:</b>	<b>0.058</b>	

**HORIZONTAL WELD TO PLATE**

Horizontal Eccentricity Ratio, a=e <sub>x</sub> /l:	0.167	
Spacing Ratio, k:	0.107	
Weld Coefficient, C:	3.940	
Effective Fillet Size:	0.375	in
Applied Compression, Pu:	4.55	k
Compressive Capacity, φPn:	62.06	k
Vertical Eccentricity Ratio, a=e <sub>y</sub> /l:	0.238	
Weld Coefficient, C:	3.510	
Applied Shear, Vu:	0.04	k
Shear Capacity, φVn:	55.28	k
<b>Pu/φPn + Vu/φVn:</b>	<b>0.074</b>	



## Monolithic Mat Foundation Analysis (ANSI/TIA-222-H)

### Foundation & Tower Parameters

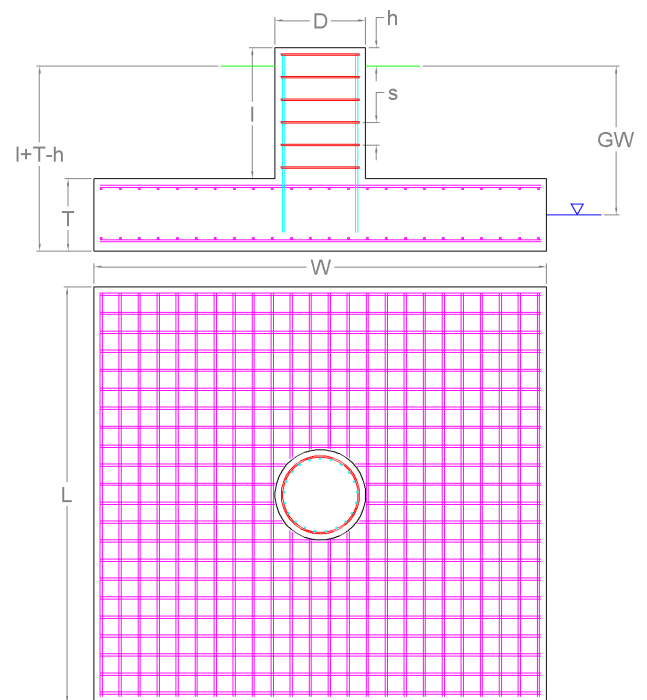
Ignore Mat Rebar?		Y	
Ignore Pier Rebar?		Y	
Foundation has Pier(s)?		Y	
Pier Shape		Square	
Pier Diameter	<i>D</i>	6.5	ft
Pier Height Above Ground	<i>h</i>	0.5	ft
Pier Length	<i>l</i>	4.5	ft
Mat Base Depth	<i>l+T-h</i>	7	ft
Mat Length	<i>L</i>	26.5	ft
Mat Width	<i>W</i>	26.5	ft
Mat Thickness	<i>T</i>	3	ft
Unit Weight of Concrete		150	pcf
Tower Eccentricity	<i>ecc</i>	0	ft
Tower Face Width	<i>FW</i>	3.75	ft
Tower Leg Count		1	

### Reactions

Moment, $M_u$	3,133.75	k-ft
Shear, $V_u$	33.49	k
Axial, $P_u$	54.32	k
Uplift, $T_u$	0	k
Tower Weight	54.32	k
Tower Dead Load Factor	0.9	

### Soil Parameters

Water Table Depth [BGL]	<i>GW</i>	10	ft
Unit Weight of Soil		125	pcf
Unit Weight of Soil [Submerged]		62.6	pcf
Shear Friction Coefficient		0.2	
Ultimate Bearing Pressure		18,255	psf
Bearing Pressure Type		Gross	
Conical Failure Angle		15	°
Capacity Increase (Transient Loads)		1.00	
Soil Strength Reduction Factor, $\phi_s$		0.75	
Dead Load Factor		1.2	



### Soil Capacities

Design Moment, $M_u$	3,384.92	k-ft
Nominal Moment Capacity, $\phi_m M_n$	9,087.47	k-ft
$M_u / \phi_s M_n$	37.2%	
Net Bearing Pressure	1,509	k
Nominal Bearing Capacity, $\phi_b P_n$	13,691	k
Bearing Pressure Controlling Load Direction	Diagonal to Pad Edge	
$P_u / \phi_s P_n$	11.0%	
Ultimate Friction Resistance	143.96	k
Ultimate Passive Pressure Resistance	54.66	k
Nominal Shear Capacity, $\phi_s V_n$	148.96	k
$V_u / \phi_s V_n$	22.0%	

