



Structural Analysis Report

Structure : 139 ft Monopole
ATC Asset Name : RL- Lussier Farm VT
ATC Asset Number : 201722
Engineering Number : 15400761_C3_02
Proposed Carrier : VERIZON WIRELESS
Carrier Site Name : SHELDON VT - A
Carrier Site Number : 5000233467
Site Location : 567 E. Sheldon Road
Sheldon, VT 05450
44.8956° N, 72.9251° W
County : Franklin
Date : October 10, 2025
Max Usage : 58%
Analysis Result : Pass



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Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 139 ft Monopole tower to reflect the change in loading by VERIZON WIRELESS.

Supporting Documents

Tower:	Ehresmann Job #93740, dated March 27, 2015
Foundation:	Ehresmann Job #93740, dated March 27, 2015
Geotechnical:	Advanced Engineering Froup, P.C Site #4BV0388C, dated September 17, 2014

Analysis

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

Basic Wind Speed:	106 mph (3-second gust)
Basic Wind Speed w/ Ice:	48 mph (3-second gust) w/ 2.30" radial ice concurrent
Code(s):	ANSI/TIA-222-I / 2015 IBC / 2015 Vermont Fire '&' Building Code
Exposure Category:	C
Risk Category:	II
Topographic Factor Procedure:	Method 1
Feature:	Flat
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	$S_{DS} = 0.25$, $S_{D1} = 0.10$
Site Class:	Default

Conclusion

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

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

Structure Usages

Structural Component	Usage	Control	Result
Pole Shaft	30.7%	1.2D + 1.0W	Pass
Serviceability Usage	19.1%	1.0D + 1.0W	Pass
Base Plate @ 0.0 ft	58.2%	Stiffener	Pass
Mat & Pier	42.3%	Flexure [Steel (Mat)]	Pass

Maximum Reactions

Foundation	Moment (k-ft)	Axial (k)	Shear (k)
Monopole Base	1,430.0	32.4	16.2

**Reactions shown reflect the results from the Load Case with maximum Moment excluding Overstrength Load Cases*

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

VERIZON WIRELESS Final Loading

Elev (ft)	Qty	Equipment	Lines
112.0	1	Raycap RVZDC-6627-PF-48	(1) 2.02 (51.2mm) Hybrid
110.0	3	Commscope CBC78T-DS-43-2X	-
	3	Samsung B2/B66A RRH ORAN (RF 4439d-25A)	
	3	Samsung B5/B13 RRH-BR04C	
	3	Samsung MT6413-77A	
	6	Commscope JAHH-65B-R3B	

Install proposed lines inside the pole shaft.

Other Existing/Reserved Loading

Elev (ft)	Qty	Equipment	Lines
135.0	1	Platform with Handrails	(2) 2.00" (50.8mm) Hybrid
	3	Ericsson Radio 4460 B25+B66	
	3	Ericsson Radio 4478 B71	
	3	RFS APXVAA24_43-U-A20	
	3	RFS APXVLL19P_43-C-A20	
110.0	3	Light Sector Frame	-

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



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.

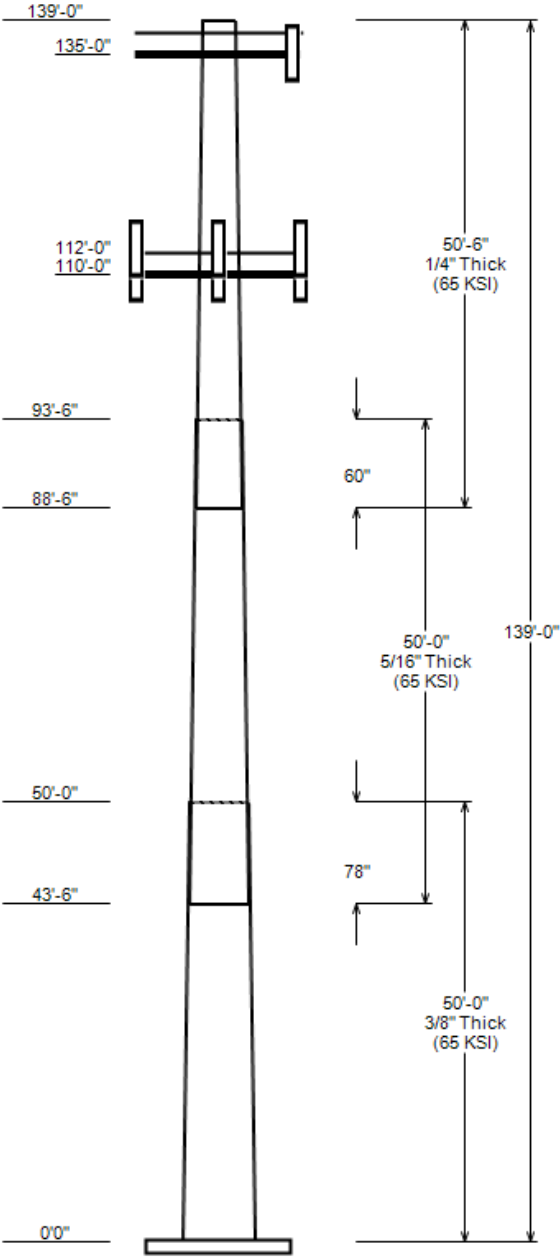
Unless explicitly agreed by both the client and ATC Tower Services, LLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

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					
Design Wind:	106 mph	Ice Wind:	48 mph w/ 2.3" ice	Service Wind:	60 mph
Risk Category:	II	Exposure:	C	S _{D1} : 0.100	S _{DS} : 0.250
Topo Factor:	Method 1	Topo Feature:	Flat		
Structure Height:	139.0 ft	Base Elevation:	0.00 ft	Structure Type:	Taper
Base Diameter:	55.00 in	Base Rotation:	0.00°	Taper:	0.2460 (in/ft)

POLE SECTION PROPERTIES								
Section	Length (ft)	Flat Diameter (in)		Thick (in)	Joint Type	Joint Length (in)	Pole Shape	Yield Strength (ksi)
		Top	Bottom					
1	50.000	42.72	55.00	0.375	Slip Joint	0.00	18 Sides	65
2	50.000	32.67	44.95	0.312		78.00	18 Sides	65
3	50.500	22.00	34.40	0.250	Slip Joint	60.00	18 Sides	65

DISCRETE APPURTENANCE		LINEAR APPURTENANCE	
Elev (ft)	Description	Elev To (ft)	Description
135.0	(3) Ericsson Radio 4460 B25+B66	135.0	(2) 2.00" (50.8mm) Hybrid
135.0	(1) Generic Round Platform with Handrail	112.0	(1) 2.02 (51.2mm) Hybrid
135.0	(3) Ericsson Radio 4478 B71		
135.0	(3) RFS APXVAA24_43-U-A20		
135.0	(3) RFS APXVLL19P_43-C-A20		
112.0	(1) Raycap RVZDC-6627-PF-48		
110.0	(3) Commscope CBC78T-DS-43-2X		
110.0	(3) Samsung B5/B13 RRH-BR04C		
110.0	(3) Flat Light Sector Frame		
110.0	(3) Samsung B2/B66A RRH ORAN (RF 4		
110.0	(3) Samsung MT6413-77A		
110.0	(6) Commscope JAHH-65B-R3B		



GLOBAL BASE REACTIONS

Load Case	Moment (kip-ft)	Axial (kip)	Shear (kip)
1.2D + 1.0W	1429.96	32.39	16.19
0.9D + 1.0W	1421.48	24.29	16.18
1.2D + 1.0Di + 1.0Wi	552.62	58.01	6.08
1.2D + 1.0Ev + 1.0Eh	114.66	32.32	1.07
0.9D - 1.0Ev + 1.0Eh	113.75	21.98	1.07
1.0D + 1.0W	408.31	27.00	4.64

ASSET: 201722, RL- Lussier Farm VT
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-I
PROJECT: 15400761_C3_02

ANALYSIS PARAMETERS

Location:	Franklin County,VT	Height:	139 ft
Type and Shape:	Taper, 18 Sides	Base Diameter:	55.00 in
Manufacturer:	Ehresmann	Top Diameter:	22.00 in
K _d (non-service):	0.95	Taper:	0.2460 in/ft
K _e :	0.98	Rotation:	0.000°

ICE & WIND PARAMETERS

Risk Category:	II	Design Wind Speed:	106 mph
Exposure Category:	C	Design Wind Speed w/ Ice:	48 mph
Design Ice Thickness:	2.30 in		
Topo Factor Procedure:	Method 1		
Crest Height(H):	0 ft	Service Wind Speed:	60 mph
Crest Length(L):	0 ft	HMSL:	518.00 ft
Feature:	Flat	Distance from Apex (x):	0 ft
		Upwind/Downwind:	

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method		
Site Class:	Default	Period Based on Rayleigh Method (sec):	1.68
T _L (sec):	6	P:	1
S _{ds} :	0.250	S _{d1} :	0.100
		C _s :	0.040
		C _s Max:	0.040
		C _s Min:	0.030

LOAD CASES

1.2D + 1.0W	106 mph Wind with No Ice
0.9D + 1.0W	106 mph Wind with No Ice (Reduced DL)
1.2D + 1.0Di + 1.0Wi	48 mph Wind with 2.3" Radial Ice
1.2D + 1.0Ev + 1.0Eh	Seismic
0.9D - 1.0Ev + 1.0Eh	Seismic (Reduced DL)
1.0D + 1.0W	60 mph Wind with No Ice
1.2D + 1.0Ev + 1.5Eh	Seismic Overstrength
0.9D - 1.0Ev + 1.5Eh	Seismic Overstrength (Reduced DL)

SHAFT SECTION PROPERTIES																			
Section	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Joint Len (in)	Weight (lb)	Bottom						Top						Taper (in/ft)
							Dia (in)	Elev (ft)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	Dia (in)	Elev (ft)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	
1-18	50.00	0.3750	65		0.00	9,819	55.00	0.000	65.02	24,510.4	24.45	146.67	42.72	50.00	50.41	11,421.	18.68	113.93	0.2455
2-18	50.00	0.3125	65	Slip	78.00	6,496	44.95	43.500	44.27	11,142.2	23.95	143.83	32.67	93.50	32.09	4,245.7	17.02	104.55	0.2455
3-18	50.50	0.2500	65	Slip	60.00	3,811	34.40	88.500	27.10	3,992.0	22.85	137.59	22.00	139.00	17.26	1,031.6	14.11	88.00	0.2455
Total Shaft Weight						20,126													

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
135.00	RFS APXVAA24_43-U-A20	3	0.75	0.000	101.40	20.267	0.63	693.04	25.902	0.63
135.00	RFS APXVLL19P_43-C-A20	3	0.75	0.000	40.90	8.250	0.65	272.15	12.733	0.65
135.00	Ericsson Radio 4460 B25+B66	3	0.75	0.000	109.00	2.564	0.67	243.13	4.163	0.67
135.00	Ericsson Radio 4478 B71	3	0.80	-0.800	60.00	1.650	0.50	135.93	2.936	0.50
135.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4957.99	64.295	1.00
112.00	Raycap RVZDC-6627-PF-48	1	0.90	0.000	32.00	3.781	1.00	195.49	5.752	1.00
110.00	Commscope JAHH-65B-R3B	6	0.80	0.400	60.60	9.113	0.69	361.25	13.236	0.69
110.00	Samsung MT6413-77A	3	0.80	0.000	57.30	3.805	0.61	183.48	5.779	0.61
110.00	Samsung B2/B66A RRH ORAN (RF 4	3	0.80	0.000	74.70	1.875	0.50	169.67	3.213	0.50
110.00	Samsung B5/B13 RRH-BR04C	3	0.80	0.000	70.30	1.875	0.50	155.31	3.216	0.50
110.00	Commscope CBC78T-DS-43-2X	3	0.80	0.000	20.70	0.552	0.50	53.53	1.307	0.50
110.00	Flat Light Sector Frame	3	0.75	0.000	400.00	17.900	0.75	847.26	40.324	0.75
Totals	Row Count: 12	35			5,698.50			15,581.48		

LINEAR APPURTENANCE PROPERTIES													
Load Case Azimuth (deg): 0.00													
Elev From (ft)	Elev To (ft)	Qty	Description	Diameter (in)	Weight (lb/ft)	Flat	Max/ Row	Distance Between Rows(in)	Distance Between Cols(in)	Azimuth (deg)	Distance From Face (in)	Exposed To Wind	Carrier
0.00	135.00	2	2.00" (50.8mm) Hybrid	2	3.09	N	0	0	0	0	0	N	T-MOBILE
0.00	112.00	1	2.02 (51.2mm) Hybrid	2.02	3.04	N	0	0	0	0	0	N	VERIZON WIRELESS

ASSET: 201722, RL- Lussier Farm VT
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SEGMENT PROPERTIES											
Seg Top Elev (ft)	Description (Max Length: 5 ft)	Thick (in)	Flat Dia (in)	Area (in²)	Ix (in⁴)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in³)	Z (in³)	Weight (lb)
0.00		0.3750	55.000	65.015	24,510.40	24.45	146.67	72.6	877.7	0.0	0.0
5.00		0.3750	53.773	63.554	22,894.90	23.87	143.39	73.3	838.6	0.0	1,093.7
10.00		0.3750	52.545	62.093	21,352.00	23.30	140.12	74	800.4	0.0	1,068.9
15.00		0.3750	51.318	60.632	19,880.00	22.72	136.85	74.7	763.0	0.0	1,044.0
20.00		0.3750	50.090	59.171	18,477.30	22.14	133.57	75.4	726.6	0.0	1,019.2
25.00		0.3750	48.863	57.710	17,142.10	21.56	130.30	76	691.0	0.0	994.3
30.00		0.3750	47.635	56.249	15,872.90	20.99	127.03	76.7	656.3	0.0	969.4
35.00		0.3750	46.408	54.788	14,667.90	20.41	123.75	77.4	622.5	0.0	944.6
40.00		0.3750	45.180	53.327	13,525.60	19.83	120.48	78.1	589.6	0.0	919.7
43.50	Bot - Section 2	0.3750	44.321	52.305	12,762.20	19.43	118.19	78.5	567.2	0.0	629.0
45.00		0.3750	43.953	51.866	12,444.10	19.26	117.21	78.8	557.6	0.0	490.9
50.00	Top - Section 1	0.3125	43.350	42.686	9,989.30	23.05	138.72	74.3	453.9	0.0	1,606.6
55.00		0.3125	42.123	41.469	9,158.70	22.36	134.79	75.1	428.3	0.0	715.9
60.00		0.3125	40.895	40.251	8,375.50	21.66	130.86	75.9	403.4	0.0	695.2
65.00		0.3125	39.668	39.034	7,638.30	20.97	126.94	76.7	379.3	0.0	674.5
70.00		0.3125	38.440	37.816	6,945.60	20.28	123.01	77.5	355.9	0.0	653.8
75.00		0.3125	37.213	36.599	6,296.10	19.59	119.08	78.4	333.2	0.0	633.0
80.00		0.3125	35.985	35.381	5,688.50	18.89	115.15	79.2	311.4	0.0	612.3
85.00		0.3125	34.758	34.164	5,121.20	18.20	111.22	80	290.2	0.0	591.6
88.50	Bot - Section 3	0.3125	33.898	33.312	4,747.40	17.72	108.47	80.6	275.8	0.0	401.8
90.00		0.3125	33.530	32.946	4,593.00	17.51	107.30	80.8	269.8	0.0	306.7
93.50	Top - Section 2	0.2500	33.171	26.122	3,576.80	21.98	132.68	75.5	212.4	0.0	702.5
95.00		0.2500	32.803	25.829	3,458.10	21.73	131.21	75.8	207.6	0.0	132.6
100.00		0.2500	31.575	24.855	3,081.50	20.86	126.30	76.9	192.2	0.0	431.2
105.00		0.2500	30.348	23.882	2,733.20	19.99	121.39	77.9	177.4	0.0	414.6
110.00		0.2500	29.120	22.908	2,412.30	19.13	116.48	78.9	163.2	0.0	398.0
112.00		0.2500	28.629	22.518	2,291.30	18.78	114.52	79.3	157.6	0.0	154.6
115.00		0.2500	27.893	21.934	2,117.50	18.26	111.57	79.9	149.5	0.0	226.9
120.00		0.2500	26.665	20.960	1,847.70	17.40	106.66	80.9	136.5	0.0	364.9
125.00		0.2500	25.438	19.986	1,601.90	16.53	101.75	82	124.0	0.0	348.3
130.00		0.2500	24.210	19.012	1,378.90	15.66	96.84	82.6	112.2	0.0	331.7
135.00		0.2500	22.983	18.038	1,177.70	14.80	91.93	82.6	100.9	0.0	315.2
139.00		0.2500	22.001	17.258	1,031.60	14.11	88.00	82.6	92.4	0.0	240.2

Total: 20,125.8

CALCULATED FORCES													
Load Case: 1.2D + 1.0W			106 mph Wind with No Ice									21 Iterations	
Gust Response Factor:		1.10											
Dead load Factor:		1.20											
Wind Load Factor:		1.00											
Seg	Pu	Vu	Tu	Mu	Mu	Resultant	Phi	Phi	Phi	Phi	Total	Rotation	
Elev	FY (-)	FX (-)	MY	MZ	MX	Moment	Pn	Vn	Tn	Mn	Deflect	(deg)	Ratio
(ft)	(kips)	(kips)	(ft-kips)	(ft-kips)	(ft-kips)	(ft-kips)	(kips)	(kips)	(ft-kips)	(ft-kips)	(in)		
0.00	-32.39	-16.19	0.00	-1,430.0	0.00	1,429.96	4,250.57	1,141.01	5,629.45	4,782.12	0	0	0.307
5.00	-31.00	-15.81	0.00	-1,349.0	0.00	1,349.04	4,193.88	1,115.37	5,379.31	4,611.59	0.04	-0.08	0.300
10.00	-29.64	-15.44	0.00	-1,270.0	0.00	1,269.98	4,135.41	1,089.73	5,134.86	4,442.03	0.17	-0.16	0.293
15.00	-28.31	-15.08	0.00	-1,192.8	0.00	1,192.76	4,075.15	1,064.09	4,896.10	4,273.58	0.39	-0.24	0.286
20.00	-27.01	-14.70	0.00	-1,117.4	0.00	1,117.37	4,013.11	1,038.45	4,663.02	4,106.37	0.69	-0.33	0.279
25.00	-25.75	-14.31	0.00	-1,043.9	0.00	1,043.89	3,949.28	1,012.81	4,435.62	3,940.53	1.07	-0.41	0.272
30.00	-24.51	-13.91	0.00	-972.4	0.00	972.35	3,883.66	987.17	4,213.90	3,776.21	1.55	-0.49	0.264
35.00	-23.31	-13.50	0.00	-902.8	0.00	902.81	3,816.27	961.53	3,997.87	3,613.54	2.11	-0.58	0.256
40.00	-22.13	-13.16	0.00	-835.3	0.00	835.29	3,747.08	935.89	3,787.53	3,452.66	2.76	-0.66	0.248
43.50	-21.33	-12.95	0.00	-789.2	0.00	789.25	3,697.59	917.94	3,643.67	3,341.17	3.27	-0.72	0.242
45.00	-20.72	-12.68	0.00	-769.8	0.00	769.83	3,676.11	910.25	3,582.87	3,293.69	3.5	-0.75	0.240
50.00	-18.72	-12.25	0.00	-706.4	0.00	706.44	2,854.06	749.14	2,912.06	2,528.84	4.33	-0.83	0.286
55.00	-17.80	-11.84	0.00	-645.2	0.00	645.19	2,803.06	727.78	2,748.34	2,412.31	5.25	-0.92	0.274
60.00	-16.90	-11.43	0.00	-586.0	0.00	586.00	2,750.28	706.41	2,589.35	2,296.88	6.26	-1.01	0.262
65.00	-16.02	-11.03	0.00	-528.8	0.00	528.85	2,695.71	685.04	2,435.09	2,182.69	7.37	-1.11	0.248
70.00	-15.17	-10.63	0.00	-473.7	0.00	473.72	2,639.35	663.68	2,285.58	2,069.88	8.58	-1.2	0.235
75.00	-14.35	-10.23	0.00	-420.6	0.00	420.60	2,581.21	642.31	2,140.80	1,958.58	9.88	-1.29	0.221

ASSET: 201722, RL- Lussier Farm VT
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-I
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CALCULATED FORCES

80.00	-13.56	-9.84	0.00	-369.4	0.00	369.45	2,521.29	620.94	2,000.75	1,848.93	11.29	-1.38	0.205
85.00	-12.79	-9.51	0.00	-320.3	0.00	320.26	2,459.58	599.58	1,865.45	1,741.08	12.78	-1.47	0.189
88.50	-12.26	-9.31	0.00	-287.0	0.00	286.97	2,415.32	584.62	1,773.55	1,666.71	13.88	-1.53	0.178
90.00	-11.88	-9.12	0.00	-273.0	0.00	273.00	2,396.08	578.21	1,734.88	1,635.14	14.36	-1.55	0.172
93.50	-11.00	-8.92	0.00	-241.1	0.00	241.07	1,775.97	458.44	1,363.14	1,203.29	15.52	-1.61	0.207
95.00	-10.82	-8.69	0.00	-227.7	0.00	227.70	1,763.20	453.31	1,332.82	1,181.18	16.03	-1.63	0.199
100.00	-10.24	-8.32	0.00	-184.3	0.00	184.27	1,719.49	436.21	1,234.21	1,108.13	17.78	-1.72	0.173
105.00	-9.69	-7.97	0.00	-142.7	0.00	142.66	1,674.00	419.12	1,139.39	1,036.21	19.62	-1.79	0.144
110.00	-6.57	-4.95	0.00	-102.4	0.00	102.37	1,626.72	402.03	1,048.36	965.53	21.53	-1.85	0.110
112.00	-6.33	-4.65	0.00	-92.5	0.00	92.47	1,607.31	395.19	1,013.00	937.65	22.31	-1.88	0.103
115.00	-6.04	-4.38	0.00	-78.5	0.00	78.52	1,577.65	384.93	961.11	896.26	23.5	-1.91	0.092
120.00	-5.58	-4.06	0.00	-56.6	0.00	56.61	1,526.80	367.84	877.66	828.51	25.53	-1.95	0.072
125.00	-5.13	-3.74	0.00	-36.3	0.00	36.33	1,474.17	350.75	798.00	762.42	27.6	-1.99	0.051
130.00	-4.71	-3.43	0.00	-17.6	0.00	17.64	1,412.46	333.65	722.13	694.56	29.7	-2.01	0.029
135.00	-0.28	-0.12	0.00	-0.5	0.00	0.48	1,340.10	316.56	650.04	624.87	31.81	-2.02	0.001
139.00	0.00	-0.11	0.00	0.0	0.00	0.00	1,282.21	302.88	595.10	571.77	33.51	-2.02	0.000

CALCULATED FORCES

Load Case: 0.9D + 1.0W

106 mph Wind with No Ice (Reduced DL)

21 Iterations

Gust Response Factor: 1.10
 Dead load Factor: 0.90
 Wind Load Factor: 1.00

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	-24.29	-16.18	0.00	-1,421.5	0.00	1,421.48	4,250.57	1,141.01	5,629.45	4,782.12	0	0	0.303
5.00	-23.24	-15.80	0.00	-1,340.6	0.00	1,340.58	4,193.88	1,115.37	5,379.31	4,611.59	0.04	-0.08	0.296
10.00	-22.22	-15.42	0.00	-1,261.6	0.00	1,261.61	4,135.41	1,089.73	5,134.86	4,442.03	0.17	-0.16	0.290
15.00	-21.21	-15.04	0.00	-1,184.5	0.00	1,184.52	4,075.15	1,064.09	4,896.10	4,273.58	0.38	-0.24	0.283
20.00	-20.24	-14.65	0.00	-1,109.3	0.00	1,109.32	4,013.11	1,038.45	4,663.02	4,106.37	0.68	-0.32	0.275
25.00	-19.28	-14.26	0.00	-1,036.1	0.00	1,036.06	3,949.28	1,012.81	4,435.62	3,940.53	1.07	-0.41	0.268
30.00	-18.35	-13.85	0.00	-964.8	0.00	964.78	3,883.66	987.17	4,213.90	3,776.21	1.54	-0.49	0.260
35.00	-17.44	-13.44	0.00	-895.5	0.00	895.54	3,816.27	961.53	3,997.87	3,613.54	2.1	-0.57	0.253
40.00	-16.56	-13.09	0.00	-828.3	0.00	828.34	3,747.08	935.89	3,787.53	3,452.66	2.74	-0.66	0.245
43.50	-15.96	-12.88	0.00	-782.5	0.00	782.54	3,697.59	917.94	3,643.67	3,341.17	3.25	-0.72	0.239
45.00	-15.50	-12.61	0.00	-763.2	0.00	763.23	3,676.11	910.25	3,582.87	3,293.69	3.48	-0.74	0.236
50.00	-14.00	-12.18	0.00	-700.2	0.00	700.20	2,854.06	749.14	2,912.06	2,528.84	4.3	-0.83	0.282
55.00	-13.30	-11.76	0.00	-639.3	0.00	639.32	2,803.06	727.78	2,748.34	2,412.31	5.21	-0.91	0.270
60.00	-12.62	-11.35	0.00	-580.5	0.00	580.52	2,750.28	706.41	2,589.35	2,296.88	6.21	-1	0.258
65.00	-11.96	-10.94	0.00	-523.8	0.00	523.78	2,695.71	685.04	2,435.09	2,182.69	7.32	-1.1	0.245
70.00	-11.33	-10.54	0.00	-469.1	0.00	469.07	2,639.35	663.68	2,285.58	2,069.88	8.52	-1.19	0.231
75.00	-10.71	-10.14	0.00	-416.4	0.00	416.37	2,581.21	642.31	2,140.80	1,958.58	9.81	-1.28	0.217
80.00	-10.11	-9.75	0.00	-365.7	0.00	365.66	2,521.29	620.94	2,000.75	1,848.93	11.2	-1.37	0.202
85.00	-9.53	-9.42	0.00	-316.9	0.00	316.90	2,459.58	599.58	1,865.45	1,741.08	12.68	-1.45	0.186
88.50	-9.14	-9.23	0.00	-283.9	0.00	283.93	2,415.32	584.62	1,773.55	1,666.71	13.77	-1.51	0.174
90.00	-8.85	-9.04	0.00	-270.1	0.00	270.09	2,396.08	578.21	1,734.88	1,635.14	14.25	-1.54	0.169
93.50	-8.19	-8.84	0.00	-238.5	0.00	238.46	1,775.97	458.44	1,363.14	1,203.29	15.4	-1.59	0.203
95.00	-8.05	-8.60	0.00	-225.2	0.00	225.20	1,763.20	453.31	1,332.82	1,181.18	15.9	-1.62	0.196
100.00	-7.62	-8.24	0.00	-182.2	0.00	182.19	1,719.49	436.21	1,234.21	1,108.13	17.64	-1.7	0.169
105.00	-7.21	-7.89	0.00	-141.0	0.00	140.99	1,674.00	419.12	1,139.39	1,036.21	19.46	-1.77	0.141
110.00	-4.89	-4.89	0.00	-101.1	0.00	101.11	1,626.72	402.03	1,048.36	965.53	21.36	-1.84	0.108
112.00	-4.71	-4.59	0.00	-91.3	0.00	91.32	1,607.31	395.19	1,013.00	937.65	22.13	-1.86	0.100
115.00	-4.50	-4.33	0.00	-77.5	0.00	77.54	1,577.65	384.93	961.11	896.26	23.31	-1.89	0.089
120.00	-4.15	-4.00	0.00	-55.9	0.00	55.89	1,526.80	367.84	877.66	828.51	25.32	-1.94	0.070
125.00	-3.82	-3.69	0.00	-35.9	0.00	35.87	1,474.17	350.75	798.00	762.42	27.37	-1.97	0.050
130.00	-3.50	-3.39	0.00	-17.4	0.00	17.41	1,412.46	333.65	722.13	694.56	29.45	-2	0.028
135.00	-0.21	-0.12	0.00	-0.5	0.00	0.47	1,340.10	316.56	650.04	624.87	31.54	-2.01	0.001
139.00	0.00	-0.11	0.00	0.0	0.00	0.00	1,282.21	302.88	595.10	571.77	33.22	-2.01	0.000

CALCULATED FORCES

Load Case: 1.2D + 1.0Di + 1.0Wi			48 mph Wind with 2.3" Radial Ice									20 Iterations		
Gust Response Factor:		1.10	Ice Dead Load Factor			1.00			Ice Importance Factor					1.00
Dead load Factor:		1.20												
Wind Load Factor:		1.00												
Seg	Pu	Vu	Tu	Mu	Mu	Resultant	Phi	Phi	Phi	Phi	Total	Rotation		
Elev	FY (-)	FX (-)	MY	MZ	MX	Moment	Pn	Vn	Tn	Mn	Deflect	(deg)	Ratio	
(ft)	(kips)	(kips)	(ft-kips)	(ft-kips)	(ft-kips)	(ft-kips)	(kips)	(kips)	(ft-kips)	(ft-kips)	(in)			
0.00	-58.01	-6.08	0.00	-552.6	0.00	552.62	4,250.57	1,141.01	5,629.45	4,782.12	0	0	0.129	
5.00	-56.02	-5.96	0.00	-522.2	0.00	522.21	4,193.88	1,115.37	5,379.31	4,611.59	0.02	-0.03	0.127	
10.00	-54.00	-5.84	0.00	-492.4	0.00	492.40	4,135.41	1,089.73	5,134.86	4,442.03	0.07	-0.06	0.124	
15.00	-51.99	-5.72	0.00	-463.2	0.00	463.18	4,075.15	1,064.09	4,896.10	4,273.58	0.15	-0.09	0.121	
20.00	-50.01	-5.60	0.00	-434.6	0.00	434.57	4,013.11	1,038.45	4,663.02	4,106.37	0.27	-0.13	0.118	
25.00	-48.05	-5.46	0.00	-406.6	0.00	406.59	3,949.28	1,012.81	4,435.62	3,940.53	0.42	-0.16	0.115	
30.00	-46.12	-5.33	0.00	-379.3	0.00	379.27	3,883.66	987.17	4,213.90	3,776.21	0.6	-0.19	0.112	
35.00	-44.23	-5.19	0.00	-352.6	0.00	352.63	3,816.27	961.53	3,997.87	3,613.54	0.82	-0.22	0.109	
40.00	-42.38	-5.07	0.00	-326.7	0.00	326.70	3,747.08	935.89	3,787.53	3,452.66	1.07	-0.26	0.106	
43.50	-41.10	-4.99	0.00	-309.0	0.00	308.97	3,697.59	917.94	3,643.67	3,341.17	1.27	-0.28	0.104	
45.00	-40.28	-4.90	0.00	-301.5	0.00	301.48	3,676.11	910.25	3,582.87	3,293.69	1.36	-0.29	0.103	
50.00	-37.61	-4.75	0.00	-277.0	0.00	276.99	2,854.06	749.14	2,912.06	2,528.84	1.68	-0.32	0.123	
55.00	-36.03	-4.60	0.00	-253.3	0.00	253.26	2,803.06	727.78	2,748.34	2,412.31	2.04	-0.36	0.118	
60.00	-34.48	-4.45	0.00	-230.3	0.00	230.27	2,750.28	706.41	2,589.35	2,296.88	2.43	-0.39	0.113	
65.00	-32.96	-4.31	0.00	-208.0	0.00	208.01	2,695.71	685.04	2,435.09	2,182.69	2.87	-0.43	0.108	
70.00	-31.49	-4.16	0.00	-186.5	0.00	186.48	2,639.35	663.68	2,285.58	2,069.88	3.34	-0.47	0.102	
75.00	-30.05	-4.01	0.00	-165.7	0.00	165.69	2,581.21	642.31	2,140.80	1,958.58	3.85	-0.5	0.096	
80.00	-28.66	-3.87	0.00	-145.6	0.00	145.62	2,521.29	620.94	2,000.75	1,848.93	4.4	-0.54	0.090	
85.00	-27.31	-3.74	0.00	-126.3	0.00	126.29	2,459.58	599.58	1,865.45	1,741.08	4.98	-0.57	0.084	
88.50	-26.38	-3.67	0.00	-113.2	0.00	113.20	2,415.32	584.62	1,773.55	1,666.71	5.41	-0.6	0.079	
90.00	-25.82	-3.59	0.00	-107.7	0.00	107.70	2,396.08	578.21	1,734.88	1,635.14	5.6	-0.61	0.077	
93.50	-24.54	-3.51	0.00	-95.1	0.00	95.12	1,775.97	458.44	1,363.14	1,203.29	6.05	-0.63	0.093	
95.00	-24.19	-3.43	0.00	-89.8	0.00	89.85	1,763.20	453.31	1,332.82	1,181.18	6.25	-0.64	0.090	
100.00	-23.07	-3.29	0.00	-72.7	0.00	72.72	1,719.49	436.21	1,234.21	1,108.13	6.94	-0.67	0.079	
105.00	-21.99	-3.15	0.00	-56.3	0.00	56.29	1,674.00	419.12	1,139.39	1,036.21	7.66	-0.7	0.068	
110.00	-14.52	-1.96	0.00	-40.4	0.00	40.43	1,626.72	402.03	1,048.36	965.53	8.41	-0.73	0.051	
112.00	-13.92	-1.85	0.00	-36.5	0.00	36.51	1,607.31	395.19	1,013.00	937.65	8.72	-0.74	0.048	
115.00	-13.33	-1.74	0.00	-31.0	0.00	30.97	1,577.65	384.93	961.11	896.26	9.18	-0.75	0.043	
120.00	-12.38	-1.60	0.00	-22.3	0.00	22.28	1,526.80	367.84	877.66	828.51	9.98	-0.77	0.035	
125.00	-11.46	-1.47	0.00	-14.3	0.00	14.26	1,474.17	350.75	798.00	762.42	10.79	-0.78	0.027	
130.00	-10.59	-1.34	0.00	-6.9	0.00	6.91	1,412.46	333.65	722.13	694.56	11.61	-0.79	0.017	
135.00	-0.61	-0.05	0.00	-0.2	0.00	0.22	1,340.10	316.56	650.04	624.87	12.44	-0.79	0.001	
139.00	0.00	-0.05	0.00	0.0	0.00	0.00	1,282.21	302.88	595.10	571.77	13.1	-0.79	0.000	

CALCULATED FORCES

Load Case: 1.0D + 1.0W

60 mph Wind with No Ice

20 Iterations

Gust Response Factor: 1.10
 Dead load Factor: 1.00
 Wind Load Factor: 1.00

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	-27.00	-4.64	0.00	-408.3	0.00	408.31	4,250.57	1,141.01	5,629.45	4,782.12	0	0	0.092
5.00	-25.86	-4.53	0.00	-385.1	0.00	385.12	4,193.88	1,115.37	5,379.31	4,611.59	0.01	-0.02	0.090
10.00	-24.74	-4.42	0.00	-362.5	0.00	362.48	4,135.41	1,089.73	5,134.86	4,442.03	0.05	-0.05	0.088
15.00	-23.65	-4.31	0.00	-340.4	0.00	340.37	4,075.15	1,064.09	4,896.10	4,273.58	0.11	-0.07	0.085
20.00	-22.58	-4.20	0.00	-318.8	0.00	318.80	4,013.11	1,038.45	4,663.02	4,106.37	0.2	-0.09	0.083
25.00	-21.54	-4.09	0.00	-297.8	0.00	297.77	3,949.28	1,012.81	4,435.62	3,940.53	0.31	-0.12	0.081
30.00	-20.52	-3.98	0.00	-277.3	0.00	277.32	3,883.66	987.17	4,213.90	3,776.21	0.44	-0.14	0.079
35.00	-19.53	-3.86	0.00	-257.4	0.00	257.44	3,816.27	961.53	3,997.87	3,613.54	0.6	-0.16	0.076
40.00	-18.56	-3.76	0.00	-238.2	0.00	238.15	3,747.08	935.89	3,787.53	3,452.66	0.79	-0.19	0.074
43.50	-17.90	-3.70	0.00	-225.0	0.00	225.00	3,697.59	917.94	3,643.67	3,341.17	0.93	-0.21	0.072
45.00	-17.40	-3.62	0.00	-219.4	0.00	219.45	3,676.11	910.25	3,582.87	3,293.69	1	-0.21	0.071
50.00	-15.74	-3.50	0.00	-201.4	0.00	201.35	2,854.06	749.14	2,912.06	2,528.84	1.24	-0.24	0.085
55.00	-14.98	-3.38	0.00	-183.9	0.00	183.86	2,803.06	727.78	2,748.34	2,412.31	1.5	-0.26	0.082
60.00	-14.24	-3.26	0.00	-167.0	0.00	166.97	2,750.28	706.41	2,589.35	2,296.88	1.79	-0.29	0.078
65.00	-13.52	-3.14	0.00	-150.7	0.00	150.66	2,695.71	685.04	2,435.09	2,182.69	2.1	-0.32	0.074
70.00	-12.82	-3.03	0.00	-134.9	0.00	134.94	2,639.35	663.68	2,285.58	2,069.88	2.45	-0.34	0.070
75.00	-12.14	-2.92	0.00	-119.8	0.00	119.79	2,581.21	642.31	2,140.80	1,958.58	2.82	-0.37	0.066
80.00	-11.48	-2.80	0.00	-105.2	0.00	105.21	2,521.29	620.94	2,000.75	1,848.93	3.22	-0.39	0.061
85.00	-10.84	-2.71	0.00	-91.2	0.00	91.19	2,459.58	599.58	1,865.45	1,741.08	3.65	-0.42	0.057
88.50	-10.40	-2.65	0.00	-81.7	0.00	81.71	2,415.32	584.62	1,773.55	1,666.71	3.96	-0.44	0.053
90.00	-10.08	-2.60	0.00	-77.7	0.00	77.73	2,396.08	578.21	1,734.88	1,635.14	4.1	-0.44	0.052
93.50	-9.35	-2.54	0.00	-68.6	0.00	68.63	1,775.97	458.44	1,363.14	1,203.29	4.43	-0.46	0.062
95.00	-9.20	-2.47	0.00	-64.8	0.00	64.82	1,763.20	453.31	1,332.82	1,181.18	4.57	-0.46	0.060
100.00	-8.73	-2.37	0.00	-52.4	0.00	52.44	1,719.49	436.21	1,234.21	1,108.13	5.07	-0.49	0.052
105.00	-8.26	-2.27	0.00	-40.6	0.00	40.59	1,674.00	419.12	1,139.39	1,036.21	5.6	-0.51	0.044
110.00	-5.60	-1.41	0.00	-29.1	0.00	29.11	1,626.72	402.03	1,048.36	965.53	6.14	-0.53	0.034
112.00	-5.39	-1.32	0.00	-26.3	0.00	26.30	1,607.31	395.19	1,013.00	937.65	6.36	-0.54	0.031
115.00	-5.15	-1.25	0.00	-22.3	0.00	22.33	1,577.65	384.93	961.11	896.26	6.7	-0.54	0.028
120.00	-4.75	-1.15	0.00	-16.1	0.00	16.10	1,526.80	367.84	877.66	828.51	7.28	-0.56	0.023
125.00	-4.37	-1.06	0.00	-10.3	0.00	10.33	1,474.17	350.75	798.00	762.42	7.87	-0.57	0.017
130.00	-4.01	-0.98	0.00	-5.0	0.00	5.02	1,412.46	333.65	722.13	694.56	8.47	-0.57	0.010
135.00	-0.24	-0.03	0.00	-0.1	0.00	0.14	1,340.10	316.56	650.04	624.87	9.07	-0.58	0.000
139.00	0.00	-0.03	0.00	0.0	0.00	0.00	1,282.21	302.88	595.10	571.77	9.55	-0.58	0.000

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

Design Spectral Response Acceleration at Short Period (S_{ds}):	0.250
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.100
Long-Period Transition Period (T_L - Seconds):	6
Importance Factor (I_e):	1.000
Response Modification Coefficient (R):	1.500
Seismic Response Coefficient (C_s):	0.040
Upper Limit C_s :	0.040
Lower Limit C_s :	0.030
Period based on Rayleigh Method (sec):	1.680
Redundancy Factor (ρ):	1.000
Seismic Force Distribution Exponent (k):	1.590
Total Unfactored Dead Load:	27.000 k
Seismic Base Shear (E):	1.070 k

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh	Seismic	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
Segment							
32		137	240	607	0.022	23	300
31		132.5	346	829	0.030	32	433
30		127.5	363	817	0.029	31	453
29		122.5	379	801	0.029	31	474
28		117.5	396	783	0.028	30	495
27		113.5	245	459	0.016	18	307
26		111	173	312	0.011	12	216
25		107.5	444	762	0.028	29	555
24		102.5	461	733	0.026	28	576
23		97.5	477	701	0.025	27	597
22		94.25	146	204	0.007	8	183
21		91.75	735	980	0.035	38	918
20		89.25	320	409	0.015	16	401
19		86.75	434	529	0.019	20	543
18		82.5	638	718	0.026	28	797
17		77.5	658	671	0.024	26	823
16		72.5	679	623	0.022	24	849
15		67.5	700	573	0.021	22	875
14		62.5	721	521	0.019	20	901
13		57.5	741	470	0.017	18	927
12		52.5	762	418	0.015	16	953
11		47.5	1,653	773	0.028	30	2,066
10		44.25	505	211	0.008	8	631
9		41.75	661	252	0.009	10	827
8		37.5	966	310	0.011	12	1,207
7		32.5	991	253	0.009	10	1,238
6		27.5	1,016	199	0.007	8	1,269
5		22.5	1,040	148	0.005	6	1,301
4		17.5	1,065	102	0.004	4	1,332
3		12.5	1,090	61	0.002	2	1,363
2		7.5	1,115	28	0.001	1	1,394
1		2.5	1,140	5	0.000	0	1,425
Ericsson Radio 4478 B71		135	180	444	0.016	17	225
Ericsson Radio 4460 B25+B66		135	327	807	0.029	31	409
RFS APXVLL19P_43-C-A20		135	123	303	0.011	12	153
RFS APXVAA24_43-U-A20		135	304	750	0.027	29	380
Generic Round Platform with Handrails		135	2,500	6,167	0.222	237	3,125
Raycap RVZDC-6627-PF-48		112	32	59	0.002	2	40
Commscope CBC78T-DS-43-2X		110	62	111	0.004	4	78
Samsung B5/B13 RRH-BR04C		110	211	375	0.014	14	264
Samsung B2/B66A RRH ORAN (RF 4439d-25A)		110	224	399	0.014	15	280
Samsung MT6413-77A		110	172	306	0.011	12	215

ASSET: 201722, RL- Lussier Farm VT
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-I
PROJECT: 15400761_C3_02

SEISMIC FORCES

1.2D + 1.0Ev + 1.0Eh

Seismic

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
Commscope JAHH-65B-R3B	110	364	647	0.023	25	454
Flat Light Sector Frame	110	1,200	2,136	0.077	82	1,500
Totals:		26,999	27,763	1.000	1,068	33,749

SEISMIC FORCES

0.9D - 1.0Ev + 1.0Eh

Seismic (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
32	137	240	607	0.022	23	204
31	132.5	346	829	0.030	32	294
30	127.5	363	817	0.029	31	308
29	122.5	379	801	0.029	31	322
28	117.5	396	783	0.028	30	336
27	113.5	245	459	0.016	18	209
26	111	173	312	0.011	12	147
25	107.5	444	762	0.028	29	378
24	102.5	461	733	0.026	28	392
23	97.5	477	701	0.025	27	406
22	94.25	146	204	0.007	8	124
21	91.75	735	980	0.035	38	625
20	89.25	320	409	0.015	16	272
19	86.75	434	529	0.019	20	369
18	82.5	638	718	0.026	28	542
17	77.5	658	671	0.024	26	560
16	72.5	679	623	0.022	24	577
15	67.5	700	573	0.021	22	595
14	62.5	721	521	0.019	20	612
13	57.5	741	470	0.017	18	630
12	52.5	762	418	0.015	16	648
11	47.5	1,653	773	0.028	30	1,405
10	44.25	505	211	0.008	8	429
9	41.75	661	252	0.009	10	562
8	37.5	966	310	0.011	12	821
7	32.5	991	253	0.009	10	842
6	27.5	1,016	199	0.007	8	863
5	22.5	1,040	148	0.005	6	884
4	17.5	1,065	102	0.004	4	905
3	12.5	1,090	61	0.002	2	927
2	7.5	1,115	28	0.001	1	948
1	2.5	1,140	5	0.000	0	969
Ericsson Radio 4478 B71	135	180	444	0.016	17	153
Ericsson Radio 4460 B25+B66	135	327	807	0.029	31	278
RFS APXVLL19P_43-C-A20	135	123	303	0.011	12	104
RFS APXVAA24_43-U-A20	135	304	750	0.027	29	259
Generic Round Platform with Handrails	135	2,500	6,167	0.222	237	2,125
Raycap RVZDC-6627-PF-48	112	32	59	0.002	2	27
Commscope CBC78T-DS-43-2X	110	62	111	0.004	4	53
Samsung B5/B13 RRH-BR04C	110	211	375	0.014	14	179
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	110	224	399	0.014	15	190
Samsung MT6413-77A	110	172	306	0.011	12	146
Commscope JAHH-65B-R3B	110	364	647	0.023	25	309
Flat Light Sector Frame	110	1,200	2,136	0.077	82	1,020
Totals:		26,999	27,763	1.000	1,068	22,949

SEISMIC FORCES

1.2D + 1.0Ev + 1.5Eh

Seismic Overstrength

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
32	137	240	607	0.022	35	300
31	132.5	346	829	0.030	48	433

ASSET: 201722, RL- Lussier Farm VT
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-I
PROJECT: 15400761_C3_02

SEISMIC FORCES

1.2D + 1.0Ev + 1.5Eh

Seismic Overstrength

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
30	127.5	363	817	0.029	47	453
29	122.5	379	801	0.029	46	474
28	117.5	396	783	0.028	45	495
27	113.5	245	459	0.016	27	307
26	111	173	312	0.011	18	216
25	107.5	444	762	0.028	44	555
24	102.5	461	733	0.026	42	576
23	97.5	477	701	0.025	40	597
22	94.25	146	204	0.007	12	183
21	91.75	735	980	0.035	57	918
20	89.25	320	409	0.015	24	401
19	86.75	434	529	0.019	31	543
18	82.5	638	718	0.026	41	797
17	77.5	658	671	0.024	39	823
16	72.5	679	623	0.022	36	849
15	67.5	700	573	0.021	33	875
14	62.5	721	521	0.019	30	901
13	57.5	741	470	0.017	27	927
12	52.5	762	418	0.015	24	953
11	47.5	1,653	773	0.028	45	2,066
10	44.25	505	211	0.008	12	631
9	41.75	661	252	0.009	15	827
8	37.5	966	310	0.011	18	1,207
7	32.5	991	253	0.009	15	1,238
6	27.5	1,016	199	0.007	11	1,269
5	22.5	1,040	148	0.005	9	1,301
4	17.5	1,065	102	0.004	6	1,332
3	12.5	1,090	61	0.002	4	1,363
2	7.5	1,115	28	0.001	2	1,394
1	2.5	1,140	5	0.000	0	1,425
Ericsson Radio 4478 B71	135	180	444	0.016	26	225
Ericsson Radio 4460 B25+B66	135	327	807	0.029	47	409
RFS APXVLL19P_43-C-A20	135	123	303	0.011	17	153
RFS APXVAA24_43-U-A20	135	304	750	0.027	43	380
Generic Round Platform with Handrails	135	2,500	6,167	0.222	356	3,125
Raycap RVZDC-6627-PF-48	112	32	59	0.002	3	40
Commscope CBC78T-DS-43-2X	110	62	111	0.004	6	78
Samsung B5/B13 RRH-BR04C	110	211	375	0.014	22	264
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	110	224	399	0.014	23	280
Samsung MT6413-77A	110	172	306	0.011	18	215
Commscope JAHH-65B-R3B	110	364	647	0.023	37	454
Flat Light Sector Frame	110	1,200	2,136	0.077	123	1,500
Totals:		26,999	27,763	1.000	1,603	33,749

SEISMIC FORCES

0.9D - 1.0Ev + 1.5Eh

Seismic Overstrength (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
32	137	240	607	0.022	35	204
31	132.5	346	829	0.030	48	294
30	127.5	363	817	0.029	47	308
29	122.5	379	801	0.029	46	322
28	117.5	396	783	0.028	45	336
27	113.5	245	459	0.016	27	209
26	111	173	312	0.011	18	147
25	107.5	444	762	0.028	44	378
24	102.5	461	733	0.026	42	392
23	97.5	477	701	0.025	40	406
22	94.25	146	204	0.007	12	124
21	91.75	735	980	0.035	57	625
20	89.25	320	409	0.015	24	272

SEISMIC FORCES

0.9D - 1.0Ev + 1.5Eh

Seismic Overstrength (Reduced DL)

Segment	Height Above Base (ft)	Weight (lb)	W _z (lb-ft)	C _{vx}	Horizontal Force (lb)	Vertical Force (lb)
19	86.75	434	529	0.019	31	369
18	82.5	638	718	0.026	41	542
17	77.5	658	671	0.024	39	560
16	72.5	679	623	0.022	36	577
15	67.5	700	573	0.021	33	595
14	62.5	721	521	0.019	30	612
13	57.5	741	470	0.017	27	630
12	52.5	762	418	0.015	24	648
11	47.5	1,653	773	0.028	45	1,405
10	44.25	505	211	0.008	12	429
9	41.75	661	252	0.009	15	562
8	37.5	966	310	0.011	18	821
7	32.5	991	253	0.009	15	842
6	27.5	1,016	199	0.007	11	863
5	22.5	1,040	148	0.005	9	884
4	17.5	1,065	102	0.004	6	905
3	12.5	1,090	61	0.002	4	927
2	7.5	1,115	28	0.001	2	948
1	2.5	1,140	5	0.000	0	969
Ericsson Radio 4478 B71	135	180	444	0.016	26	153
Ericsson Radio 4460 B25+B66	135	327	807	0.029	47	278
RFS APXVLL19P_43-C-A20	135	123	303	0.011	17	104
RFS APXVAA24_43-U-A20	135	304	750	0.027	43	259
Generic Round Platform with Handrails	135	2,500	6,167	0.222	356	2,125
Raycap RVZDC-6627-PF-48	112	32	59	0.002	3	27
Commscope CBC78T-DS-43-2X	110	62	111	0.004	6	53
Samsung B5/B13 RRH-BR04C	110	211	375	0.014	22	179
Samsung B2/B66A RRH ORAN (RF 4439d-25A)	110	224	399	0.014	23	190
Samsung MT6413-77A	110	172	306	0.011	18	146
Commscope JAHH-65B-R3B	110	364	647	0.023	37	309
Flat Light Sector Frame	110	1,200	2,136	0.077	123	1,020
Totals:		26,999	27,763	1.000	1,603	22,949

1.2D + 1.0Ev + 1.0Eh

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	-32.32	-1.07	0.00	-114.66	0.00	114.66	4,250.57	1,141.01	5,629	4,782.12	0.00	0.00	0.03
5.00	-30.93	-1.07	0.00	-109.31	0.00	109.31	4,193.88	1,115.37	5,379	4,611.59	0.00	-0.01	0.03
10.00	-29.57	-1.07	0.00	-103.95	0.00	103.95	4,135.41	1,089.73	5,135	4,442.03	0.01	-0.01	0.03
15.00	-28.24	-1.07	0.00	-98.59	0.00	98.59	4,075.15	1,064.09	4,896	4,273.58	0.03	-0.02	0.03
20.00	-26.94	-1.07	0.00	-93.23	0.00	93.23	4,013.11	1,038.45	4,663	4,106.37	0.06	-0.03	0.03
25.00	-25.67	-1.06	0.00	-87.88	0.00	87.88	3,949.28	1,012.81	4,436	3,940.53	0.09	-0.03	0.03
30.00	-24.43	-1.06	0.00	-82.57	0.00	82.57	3,883.66	987.17	4,214	3,776.21	0.13	-0.04	0.03
35.00	-23.22	-1.05	0.00	-77.28	0.00	77.28	3,816.27	961.53	3,998	3,613.54	0.17	-0.05	0.03
40.00	-22.39	-1.04	0.00	-72.05	0.00	72.05	3,747.08	935.89	3,788	3,452.66	0.23	-0.06	0.03
43.50	-21.76	-1.03	0.00	-68.42	0.00	68.42	3,697.59	917.94	3,644	3,341.17	0.27	-0.06	0.03
45.00	-19.70	-1.00	0.00	-66.87	0.00	66.87	3,676.11	910.25	3,583	3,293.69	0.29	-0.06	0.03
50.00	-18.74	-0.99	0.00	-61.87	0.00	61.87	2,854.06	749.14	2,912	2,528.84	0.36	-0.07	0.03
55.00	-17.82	-0.97	0.00	-56.94	0.00	56.94	2,803.06	727.78	2,748	2,412.31	0.44	-0.08	0.03
60.00	-16.92	-0.95	0.00	-52.10	0.00	52.10	2,750.28	706.41	2,589	2,296.88	0.52	-0.09	0.03
65.00	-16.04	-0.93	0.00	-47.35	0.00	47.35	2,695.71	685.04	2,435	2,182.69	0.62	-0.09	0.03
70.00	-15.19	-0.91	0.00	-42.70	0.00	42.70	2,639.35	663.68	2,286	2,069.88	0.72	-0.10	0.03
75.00	-14.37	-0.88	0.00	-38.17	0.00	38.17	2,581.21	642.31	2,141	1,958.58	0.83	-0.11	0.03
80.00	-13.57	-0.85	0.00	-33.77	0.00	33.77	2,521.29	620.94	2,001	1,848.93	0.95	-0.12	0.02
85.00	-13.03	-0.83	0.00	-29.50	0.00	29.50	2,459.58	599.58	1,865	1,741.08	1.08	-0.13	0.02
88.50	-12.63	-0.82	0.00	-26.59	0.00	26.59	2,415.32	584.62	1,774	1,666.71	1.18	-0.13	0.02
90.00	-11.71	-0.78	0.00	-25.36	0.00	25.36	2,396.08	578.21	1,735	1,635.14	1.22	-0.13	0.02
93.50	-11.53	-0.77	0.00	-22.64	0.00	22.64	1,775.97	458.44	1,363	1,203.29	1.32	-0.14	0.03

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
95.00	-10.93	-0.74	0.00	-21.48	0.00	21.48	1,763.20	453.31	1,333	1,181.18	1.36	-0.14	0.02
100.00	-10.35	-0.72	0.00	-17.76	0.00	17.76	1,719.49	436.21	1,234	1,108.13	1.52	-0.15	0.02
105.00	-9.80	-0.69	0.00	-14.19	0.00	14.19	1,674.00	419.12	1,139	1,036.21	1.68	-0.16	0.02
110.00	-6.79	-0.51	0.00	-10.76	0.00	10.76	1,626.72	402.03	1,048	965.53	1.85	-0.16	0.02
112.00	-6.45	-0.49	0.00	-9.73	0.00	9.73	1,607.31	395.19	1,013	937.65	1.92	-0.17	0.01
115.00	-5.95	-0.46	0.00	-8.25	0.00	8.25	1,577.65	384.93	961	896.26	2.02	-0.17	0.01
120.00	-5.48	-0.43	0.00	-5.95	0.00	5.95	1,526.80	367.84	878	828.51	2.20	-0.17	0.01
125.00	-5.02	-0.40	0.00	-3.80	0.00	3.80	1,474.17	350.75	798	762.42	2.39	-0.18	0.01
130.00	-4.59	-0.36	0.00	-1.82	0.00	1.82	1,412.46	333.65	722	694.56	2.58	-0.18	0.01
135.00	0.00	0.00	0.00	0.00	0.00	0.00	1,340.10	316.56	650	624.87	2.77	-0.18	0.00
139.00	0.00	0.00	0.00	0.00	0.00	0.00	1,282.21	302.88	595	571.77	2.92	-0.18	0.00

0.9D - 1.0Ev + 1.0Eh 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	-21.98	-1.07	0.00	-113.75	0.00	113.75	4,250.57	1,141.01	5,629	4,782.12	0.00	0.00	0.03
5.00	-21.03	-1.07	0.00	-108.40	0.00	108.40	4,193.88	1,115.37	5,379	4,611.59	0.00	-0.01	0.03
10.00	-20.11	-1.07	0.00	-103.05	0.00	103.05	4,135.41	1,089.73	5,135	4,442.03	0.01	-0.01	0.03
15.00	-19.20	-1.07	0.00	-97.70	0.00	97.70	4,075.15	1,064.09	4,896	4,273.58	0.03	-0.02	0.03
20.00	-18.32	-1.06	0.00	-92.36	0.00	92.36	4,013.11	1,038.45	4,663	4,106.37	0.06	-0.03	0.03
25.00	-17.45	-1.06	0.00	-87.04	0.00	87.04	3,949.28	1,012.81	4,436	3,940.53	0.09	-0.03	0.03
30.00	-16.61	-1.05	0.00	-81.75	0.00	81.75	3,883.66	987.17	4,214	3,776.21	0.13	-0.04	0.03
35.00	-15.79	-1.04	0.00	-76.50	0.00	76.50	3,816.27	961.53	3,998	3,613.54	0.17	-0.05	0.03
40.00	-15.23	-1.03	0.00	-71.30	0.00	71.30	3,747.08	935.89	3,788	3,452.66	0.23	-0.05	0.03
43.50	-14.80	-1.02	0.00	-67.69	0.00	67.69	3,697.59	917.94	3,644	3,341.17	0.27	-0.06	0.02
45.00	-13.39	-0.99	0.00	-66.16	0.00	66.16	3,676.11	910.25	3,583	3,293.69	0.29	-0.06	0.02
50.00	-12.75	-0.98	0.00	-61.19	0.00	61.19	2,854.06	749.14	2,912	2,528.84	0.36	-0.07	0.03
55.00	-12.11	-0.96	0.00	-56.30	0.00	56.30	2,803.06	727.78	2,748	2,412.31	0.43	-0.08	0.03
60.00	-11.50	-0.94	0.00	-51.50	0.00	51.50	2,750.28	706.41	2,589	2,296.88	0.52	-0.08	0.03
65.00	-10.91	-0.92	0.00	-46.79	0.00	46.79	2,695.71	685.04	2,435	2,182.69	0.61	-0.09	0.03
70.00	-10.33	-0.90	0.00	-42.19	0.00	42.19	2,639.35	663.68	2,286	2,069.88	0.71	-0.10	0.02
75.00	-9.77	-0.87	0.00	-37.71	0.00	37.71	2,581.21	642.31	2,141	1,958.58	0.82	-0.11	0.02
80.00	-9.23	-0.84	0.00	-33.35	0.00	33.35	2,521.29	620.94	2,001	1,848.93	0.94	-0.12	0.02
85.00	-8.86	-0.82	0.00	-29.13	0.00	29.13	2,459.58	599.58	1,865	1,741.08	1.07	-0.13	0.02
88.50	-8.59	-0.81	0.00	-26.25	0.00	26.25	2,415.32	584.62	1,774	1,666.71	1.16	-0.13	0.02
90.00	-7.96	-0.77	0.00	-25.04	0.00	25.04	2,396.08	578.21	1,735	1,635.14	1.21	-0.13	0.02
93.50	-7.84	-0.76	0.00	-22.35	0.00	22.35	1,775.97	458.44	1,363	1,203.29	1.31	-0.14	0.02
95.00	-7.43	-0.73	0.00	-21.21	0.00	21.21	1,763.20	453.31	1,333	1,181.18	1.35	-0.14	0.02
100.00	-7.04	-0.71	0.00	-17.53	0.00	17.53	1,719.49	436.21	1,234	1,108.13	1.50	-0.15	0.02
105.00	-6.66	-0.68	0.00	-14.00	0.00	14.00	1,674.00	419.12	1,139	1,036.21	1.66	-0.16	0.02
110.00	-4.62	-0.51	0.00	-10.62	0.00	10.62	1,626.72	402.03	1,048	965.53	1.83	-0.16	0.01
112.00	-4.38	-0.49	0.00	-9.61	0.00	9.61	1,607.31	395.19	1,013	937.65	1.90	-0.16	0.01
115.00	-4.05	-0.46	0.00	-8.15	0.00	8.15	1,577.65	384.93	961	896.26	2.00	-0.17	0.01
120.00	-3.72	-0.42	0.00	-5.87	0.00	5.87	1,526.80	367.84	878	828.51	2.18	-0.17	0.01
125.00	-3.42	-0.39	0.00	-3.75	0.00	3.75	1,474.17	350.75	798	762.42	2.36	-0.18	0.01
130.00	-3.12	-0.36	0.00	-1.79	0.00	1.79	1,412.46	333.65	722	694.56	2.55	-0.18	0.01
135.00	0.00	0.00	0.00	0.00	0.00	0.00	1,340.10	316.56	650	624.87	2.74	-0.18	0.00
139.00	0.00	0.00	0.00	0.00	0.00	0.00	1,282.21	302.88	595	571.77	2.89	-0.18	0.00

ANALYSIS SUMMARY

Load Case	Base 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	16.19	0.00	32.39	0.00	0.00	1429.96	0.00	0.31
0.9D + 1.0W	16.18	0.00	24.29	0.00	0.00	1421.48	0.00	0.3
1.2D + 1.0Di + 1.0Wi	6.08	0.00	58.01	0.00	0.00	552.62	0.00	0.13
1.2D + 1.0Ev + 1.0Eh	1.07	0.00	32.32	0.00	0.00	114.66	0.00	0.03
0.9D - 1.0Ev + 1.0Eh	1.07	0.00	21.98	0.00	0.00	113.75	0.00	0.03
1.0D + 1.0W	4.64	0.00	27.00	0.00	0.00	408.31	0.00	0.09

ANALYSIS SUMMARY - OVERSTRENGTH LOAD CASES

Load Case	Base Reactions					
	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)
1.2D + 1.0Ev + 1.5Eh	1.60	0.00	32.32	0.00	0.00	171.98
0.9D - 1.0Ev + 1.5Eh	1.60	0.00	21.98	0.00	0.00	170.62

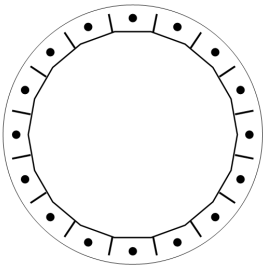
BASE PLATE ANALYSIS @ 0 FT

APPLIED REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
1429.96	32.39	16.19

PLATE PARAMETERS (ID# 31366)

Width:	69	in
Shape:	Round	
Thickness:	2	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Rod Detail Type:	d	
Clear Distance	3.438	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	10	°

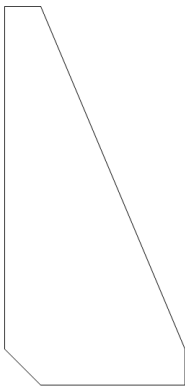


ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	F _y (ksi)	F _u (ksi)	Spacing (in)	Offset (°)
Original [ID#32188]	Radial	16	2.25	62	A615-75	75	100	-	-

STIFFENER PARAMETERS

Arrangement:	Radial	
Quantity:	16	
Height:	10.5	in
Width:	5	in
Thickness:	0.5	in
Notch:	1	in
Grade:	A572-50	
Yield Strength:	50	ksi
Tensile Strength:	65	ksi
Horizontal Weld Type:	Fillet	
Horizontal Weld Fillet Size:	0.188	in
Vertical Weld Fillet Size:	0.188	in
Weld Strength:	70	ksi
Orientation Offset:	-	°



COMPONENT PROPERTIES

Component	ID	Gross Area (in ²)	Net Area (in ²)	Individual Inertia (in ⁴)	Moment of Inertia (in ⁴)	Threads/in
Pole	55"Ø x 0.375" (18 Sides)	64.0273	-	-	23884.33	-
Bolt Group	Original (16) 2.25"Ø	3.9761	3.2477	0.8393	22912.18	4.5
Stiffeners	(16) 10.5"H x 5"W x 0.5"T	2.0000	1.8000	20.8333	13002.08	-

REACTION DISTRIBUTION					
Component	ID	Moment M _u (k-ft)	Axial Load P _u (k)	Shear V _u (k)	Moment Factor
Pole	55"ø x 0.375" (18 Sides)	1430.0	32.39	16.19	1.000
Bolt Group	Original (16) 2.25"ø	1430.0	-	16.19	1.000
Stiffeners	(16) 10.5"H x 5"W x 0.5"T	504.0	-	5.71	0.352

BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES					PLATE PROPERTIES		
Flat-to-Flat Diameter:	55.12	in	Flat Width:	9.720	in	Neutral Axis:	10°
Point-to-Point Diameter:	55.98	in	Flat Radians:	0.349	rad	Bend Line Limits:	1.306 to 2.228 rad
Orientation Offset:	-	°					
Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in³)	Applied Moment M _u (k-in)	Moment Capacity ΦM _n (k-in)	Flexure Result M _u /ΦM _n	
Flats	35.172	4.46	39.636	225.5	1783.6	12.6%	✓
Corners	33.802	2.96	36.758	163.6	1654.1	9.9%	✓
Circumferential	40.372	10.69	51.058	247.6	2297.6	10.8%	✓

PLASTIC ANCHOR ROD ANALYSIS

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load P _u (k)	Applied Shear Load V _u (k)	Compressive Capacity ΦP _n (k)	Interaction Result
Original	16	2.25	55.8	1.6	243.6	22.9% ✓

ASSET: 201722, RL- Lussier Farm VT
CUSTOMER: VERIZON WIRELESS

CODE: ANSI/TIA-222-I
PROJECT: 15400761

BASE PLATE STIFFENER ANALYSIS

Quantity: 16
Height: 10.5 in
Width: 5 in
Effective Width: 5.000 in
Thickness: 0.5 in
Notch: 1 in
Grade: A572-50
Yield Strength: 50 ksi
Tensile Strength: 65 ksi
Horizontal Weld Type: Fillet
Horizontal Weld Fillet Size: 0.188 in
Horizontal Weld Bevel Size: in
Vertical Weld Fillet Size: 0.188 in
Weld Strength: 70 ksi
Electrode Coefficient: 1.000

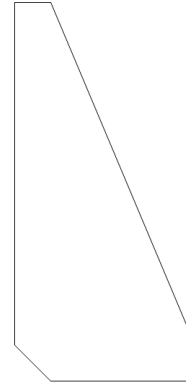


PLATE COMPRESSION

Radius of Gyration: 0.144 in³
kl/r: 43.65
4.71 $\sqrt{E/F_y}$: 113.43
Buckling Stress, F_e : 150.24 ksi
Crit. Buckling Stress, F_{cr} : 131.76 ksi
Applied Compression, P_u : 25.83 k
Compressive Capacity, ΦP_n : 237.16 k
Compressive Result, $P_u/\Phi P_n$: 5.4%

PLATE TENSION

Gross Cross Section: 2.0000 in²
Net Cross Section: 1.8000 in²
Applied Tension, T_u : 24.40 k
Tensile Capacity, ΦT_n : 87.75 k
Tension Result, $T_u/\Phi T_n$: 13.9%

VERTICAL WELD TO POLE

Vertical Eccentricity Ratio, $a=e_x/l$: 0.159
Spacing Ratio, k: 0.048
Weld Coefficient, C: 3.670
Applied Compression, P_u : 25.83 k
Compressive Capacity, ΦP_n : 86.93 k
Horizontal Eccentricity Ratio, $a=e_x/l$: 0.333
Weld Coefficient, C: 2.940
Applied Shear, V_u : 0.01 k
Shear Capacity, ΦV_n : 69.64 k
Weld Result, $P_u/\Phi P_n + V_u/\Phi V_n$: 29.7%

HORIZONTAL WELD TO PLATE

Horizontal Eccentricity Ratio, $a=e_x/l$: 0.167
Spacing Ratio, k: 0.100
Weld Coefficient, C: 3.940
Effective Fillet Size: 0.188 in
Applied Compression, P_u : 25.83 k
Compressive Capacity, ΦP_n : 44.44 k
Vertical Eccentricity Ratio, $a=e_x/l$: 0.350
Weld Coefficient, C: 3.090
Applied Shear, V_u : 0.01 k
Shear Capacity, ΦV_n : 34.86 k
Weld Result, $P_u/\Phi P_n + V_u/\Phi V_n$: 58.2%

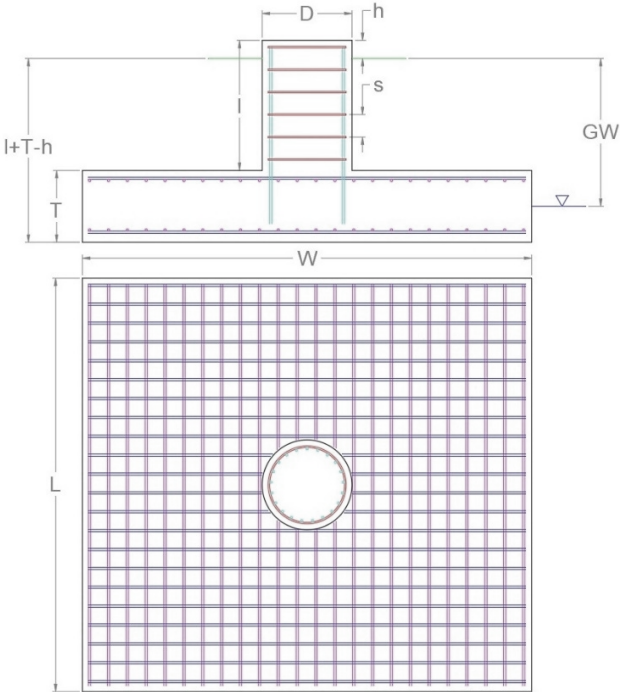
MONOLITHIC MAT & PIER FOUNDATION ANALYSIS

APPLIED GLOBAL REACTIONS

Moment (k-ft)	Axial (k)	Shear (k)
1,429.96	32.39	16.19

FOUNDATION PARAMETERS

Mat Length:	L	27	ft
Mat Width:	W	27	ft
Mat Thickness:	T	2	ft
Base Depth:	L+T-h	6	ft
Pier Shape:		Round	
Pier Diameter:	D	7	ft
Pier Height above Grade:	h	0.5	ft
Concrete Compressive Strength:		4,000	psi
Mat Top Rebar:		(38) #8 bars [60 ksi]	
Mat Bottom Rebar:		(38) #8 bars [60 ksi]	
Pier Vertical Rebar:		(44) #10 bars [60 ksi]	
Pier Rebar Ties:	s	#4 bars @ 6.0" c/c [40 ksi]	
Rebar Clear Cover:		3.0	in
Tower Eccentricity:	ecc	0	ft
Tower Leg Count		1	



SOIL PARAMETERS

Water Table Depth [BGL]:	GW	4	ft
Soil Unit Weight:		115	pcf
Ultimate Skin Friction:		0	psf
Ultimate Bearing Pressure:		8,000	psf
Bearing Pressure Type:		Net	
Coefficient of Shear Friction:		0.3	

SOIL STRENGTH ANALYSIS

Soil Strength Reduction Factor, Φ_s	Uplift Strength Reduction Factor, Φ_s	Asset Dead Load Factor	Dead Load Factor
0.75	0.75	0.9	1.2

SOIL OVERTURNING ANALYSIS

Design Moment, $M_{u,Design}$ (k-ft)	Nominal Overturning Capacity, $\Phi_m M_n$ (k-ft)	Soil Overturning Usage, $M_{u,Design} / \Phi_m M_n$
1,535.20	6,498.04	23.6%

SOIL BEARING ANALYSIS

Net Bearing Pressure, $P_{u,Net}$ (psf)	Nominal Bearing Capacity, $\Phi_b P_n$ (psf)	Bearing Pressure Controlling Load Direction	Soil Bearing Usage, $P_{u,net} / \Phi_b P_n$
818.00	6,518.00	Parallel to Pad Edge	12.6%

SOIL SLIDING SHEAR ANALYSIS

Applied Shear Force, V_u (k)	Friction Resistance (k)	Passive Pressure (psf)	Passive Pressure Resistance (k)	Nominal Shear Capacity, Φ_s V_n (k)	Soil Sliding Shear Usage, $V_u / \Phi_s V_n$
16.19	152.30	512.6	27.68	134.99	12.0%

MAT REINFORCING STEEL STRENGTH ANALYSIS

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

MAT REINFORCING ONE WAY SHEAR ANALYSIS

One Way Design Shear, V_u (k)	Nominal One Way Shear Capacity, $\Phi_c V_n$ (k)	One Way Shear Controlling Load Direction	Mat One Way Shear Usage, $V_u / \Phi_c V_n$	
47.18	634.11	Diagonal to Pad Edge	7.4%	

MAT REINFORCING PUNCHING SHEAR ANALYSIS

Punching Shear Design Stress, v_u (psi)	Nominal Punching Shear Capacity, $\Phi_c V_n$ (psi)	Mat Punching Shear Usage, $v_u / \Phi_c V_n$	
38.3	189.7	20.2%	

MAT REINFORCING MOMENT TRANSFER ANALYSIS

Moment Transfer Effective Flexural Width, w_f (in)	Neutral Axis Depth (in)	Pier Moment at Joint, M_{ut} (k-in)	Nominal Moment Transfer Capacity, $\Phi M_{sc,f}$ (k-in)	Mat Moment Transfer Usage, $0.6 M_{ut} / \Phi M_{sc,f}$	
13.00	1.71	0.00	15,768.0	0.0%	

MAT REINFORCING FLEXURE ANALYSIS - UPPER STEEL

Factored Moment, M_u (k-ft)	Nominal Flexural Capacity, ΦM_n (k-ft)	Flexural Steel Controlling Load Direction	Mat Upper Rebar Flexure Usage, $M_u / \Phi M_n$	
652.95	2,607.92	Parallel to Pad Edge	25.0%	

MAT REINFORCING FLEXURE ANALYSIS - LOWER STEEL

Factored Moment, M_u (k-ft)	Nominal Flexural Capacity, ΦM_n (k-ft)	Flexural Steel Controlling Load Direction	Mat Lower Rebar Flexure Usage, $M_u / \Phi M_n$	
1,104.20	2,607.92	Parallel to Pad Edge	42.3%	

PIER REINFORCING STEEL STRENGTH ANALYSIS

Rebar Cage Diameter (in)	Steel Elastic Modulus, E (ksi)	Strength Bending/Tension Reduction Factor, Φ_b	Strength Shear Reduction Factor, Φ_v	Strength Compression Reduction Factor, Φ_c
75.75	29,000	0.9	0.75	0.65

PIER REINFORCING MOMENT ANALYSIS

Design Moment, M_u (k-ft)	Nominal Moment Capacity, $\Phi_b M_n$ (k-ft)	Bending Reinforcement Ratio	Pier Rebar Flexure Usage, $M_u / \Phi_b M_n$	
1,502.82	9,314.15	0.010	16.1%	

PIER REINFORCING COMPRESSION ANALYSIS

Design Compression, P_u (k)	Nominal Compressive Capacity, $\Phi_p P_n$ (k)	Pier Rebar Compressive Usage, $P_u / \Phi_p P_n$	
32.39	9,738.68	0.3%	

PIER REINFORCING SHEAR ANALYSIS

Design Shear, V_u (k)	Nominal Shear Capacity, $\Phi_v V_n$ (k)	Pier Rebar Shear Usage, $V_u / \Phi_v V_n$	
16.19	661.67	2.4%	