



Tower Engineering Solutions, LLC
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Structural Analysis Report

<u>Structure Information</u>	Tower Type	Existing 250 ft World Tower Guyed Tower
<u>Customer Information</u>	Name	SBA Communications Corp
	Site Number	FL09636-S
	Site Name	Lulu
<u>Carrier Information</u>	Name	AT&T
	Site ID / Name	10579357 / LULU
	App #	256371-1,
<u>Site Information</u>	Address:	120 Se Community Dr. Lulu, Florida 32061, Columbia County
	Latitude:	30.114211°
	Longitude:	-82.502236°

Analysis Result:

Max Structural Usage: **67.8% [Pass]**
Max Foundation Usage: **53.0% [Pass]**
Additional Usage Caused by New Mount/Mount Modification: N/A

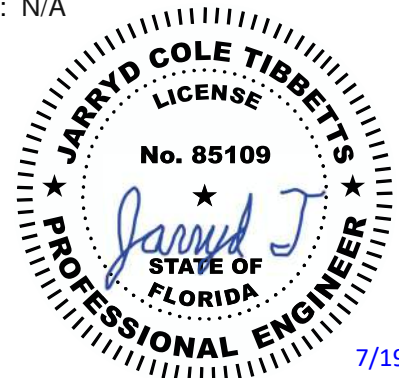
Report Prepared By: Tawfeeq Alajaj

Jarryd
Tibbetts

Digitally signed by
Jarryd Tibbetts
Date: 2024.07.19
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This item has been digitally signed and sealed by Jarryd Tibbetts on the date adjacent to the seal.

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TOWER ENGINEERING
SOLUTIONS, LLC
1320 Greenway Drive Ste 600
Irving, TX 75038
CA# 30690

Introduction

The purpose of this report is to summarize the analysis results on the 250 ft World Tower Guyed Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Document Type	Remarks
Tower Drawings	World Tower, Dwg # Q0889, dated 11/18/2008:
Foundation Drawing	World Tower, Dwg # Q0889, dated 11/18/2008:
Geotechnical Report	TEP, Project #082678.01, dated 10/20/2008:
Modification Drawings	N/A
Mount Analysis	AT&T MA by APX Engineering Group. Dated 07/09/2024.

Analysis Criteria

The comprehensive analysis was performed in accordance with the requirements and stipulations of the TIA-222-H. In accordance with this standard, the structure was analyzed using TESTowers, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Codes and Standards	ANSI/TIA-222-H / 2021 IBC / Florida Building Code, 8th Edition (2023)	
Wind Parameters	Basic Wind Speed (Ultimate 3-sec. Gust), V_{ULT} :	119.0 mph
	Ice Wind Speed (3-sec. Gust):	30.0
	Design Ice Thickness:	0.25"
	Service Load Wind Speed:	60 mph + 0" Radial ice
	Exposure Category:	C
	Risk Category:	II
	Ground Elevation Factor (K_e):	0.995
Topographic Parameters	Method:	Method 1
	Feature Type:	
	Crest Height (H):	0 ft
	Length of Feature (L):	0.0 ft
	Distance to crest (x):	0.0 ft
Seismic Parameters:	S_s	0.086 g
	S_1	0.05 g

This structural analysis is based upon the tower being classified as a Risk Category II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	246.0	3	Ericsson AIR6419 - Panel	(3) Sector Frames w/ (3) V-Bracing Kit & (3) Stabilizer Kit & (3) Tieback Assembly (3) Cross Over Plate	(12) 1 5/8" (2) 1 5/8" Hybrid	Verizon
2		6	JMA Wireless MX06FHG865-HG - Panel			
3		3	CommScope TD-850B-LTE-43 Diplexer			
4		3	Ericsson 4890 -			
5		3	Ericsson 4490 -			
6		1	Raycap RCMD-6627-PF-48 - OVP			

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
8	225.0	8	Ericsson - KRE 101 2526/1K - Panel	(3) SFG23RDXL-12-B	(4) 2" Conduit [housing (1) 0.30" Fiber Trunk and (2) 0.957" DC Power Cables each] Comment: Each of the (4) 2" Conduits will house (1) 0.30" Fiber Trunks and (2) 0.957" DC Power Cables for a combined total count of (4) 0.30 Fiber Trunks and (8) 0.957" DC Power Cables	AT&T
9		4	Ericsson Radio 4890			
10		4	Ericsson 4478 B14			
11		4	Ericsson 4490 B5/B12A			
12		4	Raycap DC9-48-60-24-8C-EV - OVP			

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

Tower Component	Utilization %	Pass / Fail
Max Leg	67.8%	Pass
Max Diagonal	60.7%	Pass
Max Horizontal	38.3%	Pass
Max Cable	60.9%	Pass
Structure Rating – (Controlling Utilization of all Components)		67.8%

Foundations

	Base Reactions		Inner Anchors	
Reactions (kips)	Axial	Shear	Uplift	Shear
Analysis Reactions	92.4	1.7	37.4	44.8

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Service Load Condition (Rigidity)

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.0692 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.
3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a comprehensive structural analysis.

Structure: FL09636-S-SBA

Site Name: Lulu **Code:** TIA-222-H 7/19/2024
Type: Guyed **Base Shape:** Triangle **Basic WS:** 119.00
Height: 250.00 (ft) **Base Width:** 0.00 **Basic Ice WS:** 30.00
Base Elev: 0.00 (ft) **Top Width:** 3.00 **Operational WS:** 60.00 Page: 1



Section Properties

Sect	Leg Members	Diagonal Members	Horizontal Members
1-3	SOL 2" SOLID	SOL 7/8" SOLID	SOL 3/4" SOLID
4	SOL 2" SOLID	SOL 1" SOLID	SOL 3/4" SOLID
5-6	SOL 1 3/4" SOLID	SOL 1" SOLID	SOL 3/4" SOLID
7-8	SOL 1 3/4" SOLID	SOL 7/8" SOLID	SOL 3/4" SOLID
9	SOL 2" SOLID	SOL 1" SOLID	SOL 3/4" SOLID
10	SOL 1 3/4" SOLID	SOL 7/8" SOLID	SOL 3/4" SOLID
11	SOL 2" SOLID	SOL 1" SOLID	SOL 3/4" SOLID
12	SOL 2" SOLID	SOL 1 1/8" SOLID	SOL 3/4" SOLID
13	SOL 1 3/4" SOLID	SOL 1" SOLID	SOL 3/4" SOLID
14	SOL 1 1/2" SOLID	SOL 7/8" SOLID	SOL 3/4" SOLID
15	SOL 1 1/2" SOLID	SOL 1" SOLID	SOL 3/4" SOLID

Discrete Appurtenances

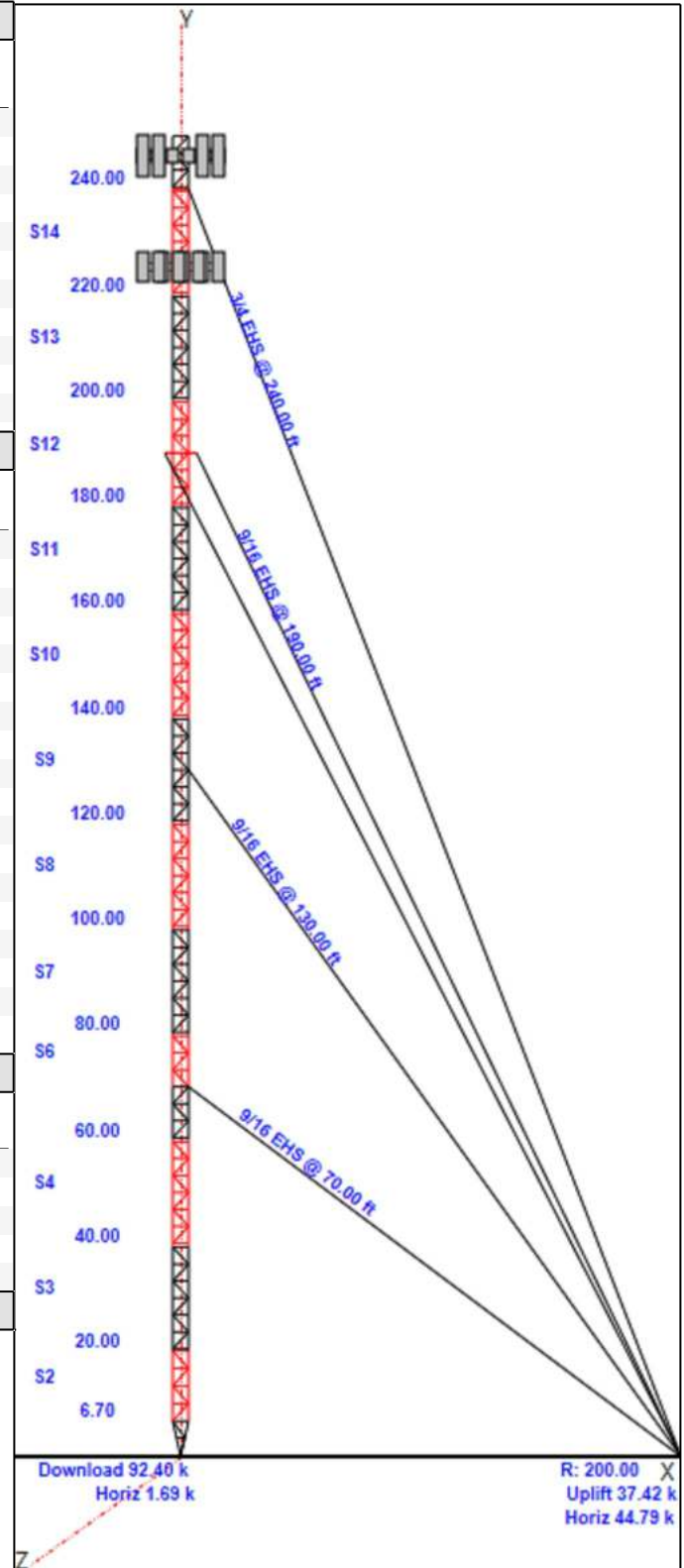
Attach Elev (ft)	Force Elev (ft)	Qty	Description
250.00	250.00	1	Beacon
250.00	250.00	1	Lightning rod
246.00	246.00	3	T-Frames
246.00	246.00	1	(3) V-bracing Kit & Stabilizer Kit
246.00	246.00	1	(3) Tieback Assembly & Cross over Plate
246.00	246.00	3	AIR6419
246.00	246.00	6	MX06FHG865-HG
246.00	246.00	3	Commscope TD-850B-LTE-43 Diplexer
246.00	246.00	3	Ericsson 4890
246.00	246.00	3	Ericsson 4490
246.00	246.00	1	Raycap RCMD-6627-PF-48
225.00	225.00	8	KRE 101 2526/1K
225.00	225.00	4	Radio 4890
225.00	225.00	4	4478 B14
225.00	225.00	4	4490 B5/B12A
225.00	225.00	4	Raycap DC9-48-60-24-8C-EV
225.00	225.00	1	(3) SFG23RDXL-12-B
125.00	125.00	3	Dual lights

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	250.00	1	1/2"
0.00	250.00	1	Safety Cable
0.00	246.00	12	1 5/8" Coax
0.00	246.00	2	1 5/8" Hybrid
0.00	225.00	4	2" Conduit

Max Guy Wire

60.86% @ 240 ft - 3/4 EHS

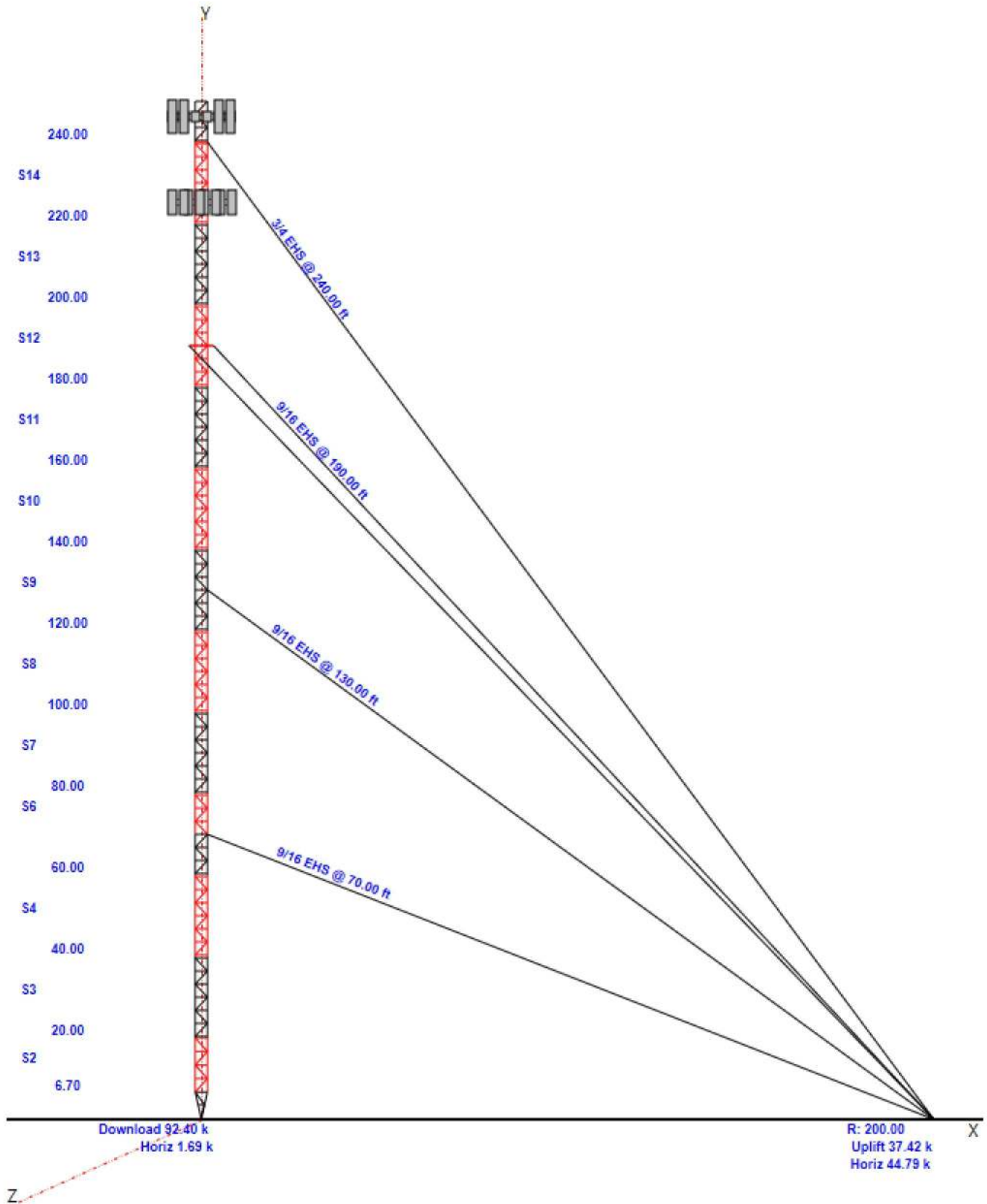


Structure: FL09636-S-SBA

Site Name: Lulu	Code: TIA-222-H	7/19/2024
Type: Guyed	Base Shape: Triangle	Basic WS: 119.00
Height: 250.00 (ft)	Base Width: 0.00	Basic Ice WS: 30.00
Base Elev: 0.00 (ft)	Top Width: 3.00	Operational WS: 60.00

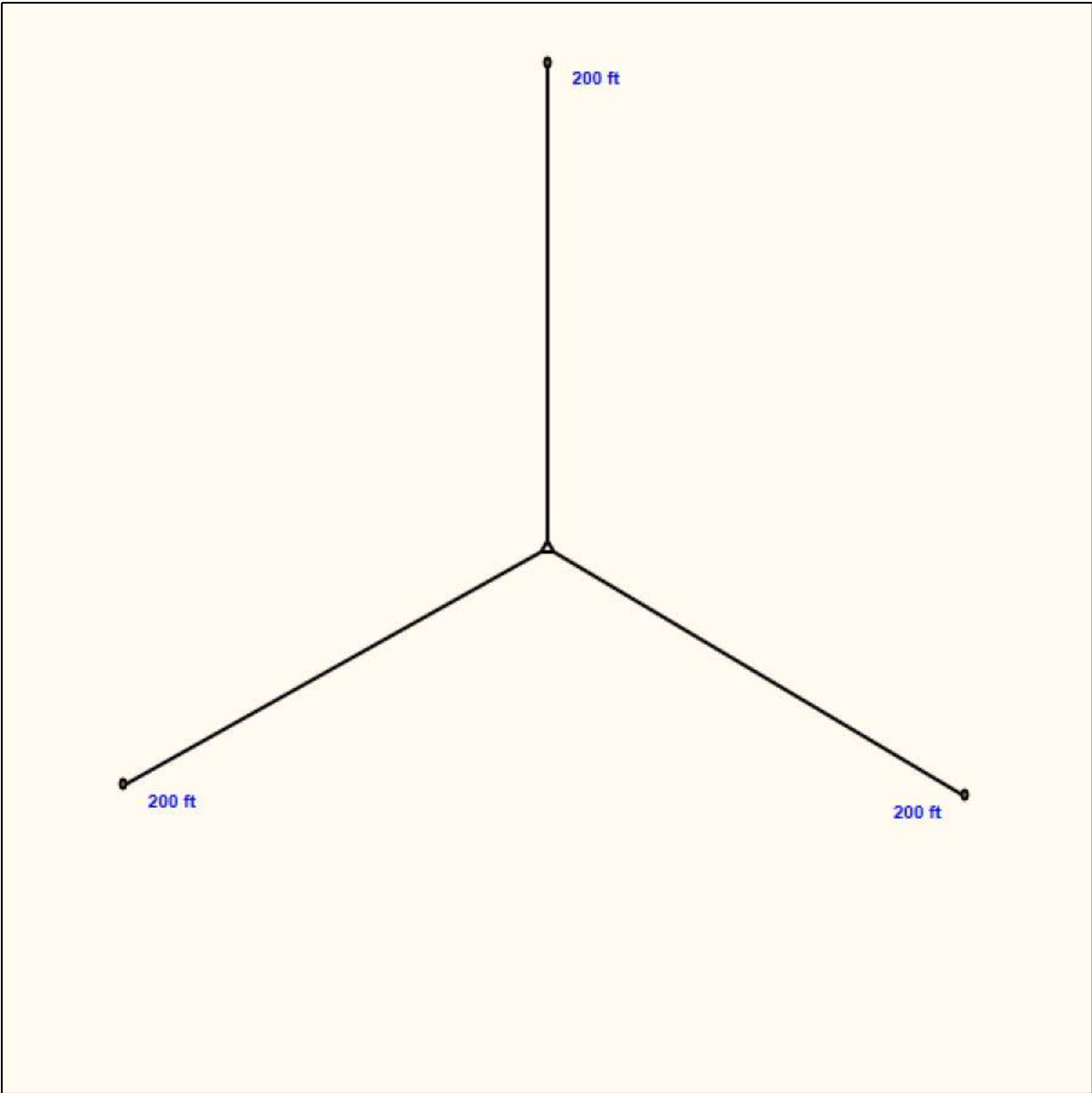


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Anchor Drops with Guy Radius - Structure: FL09636-S-SBA

Site Name:	Lulu	Code:	EIA_H	7/19/2024	
Type:	Guyed	Base Shape:	Triangle	Basic WS:	
Height:	250.00 (ft)	Base Width:	0.00	Basic Ice WS:	
Base Elev:	0.00 (ft)	Top Width:	3.00	Operational WS:	
				60.00	Page: 3

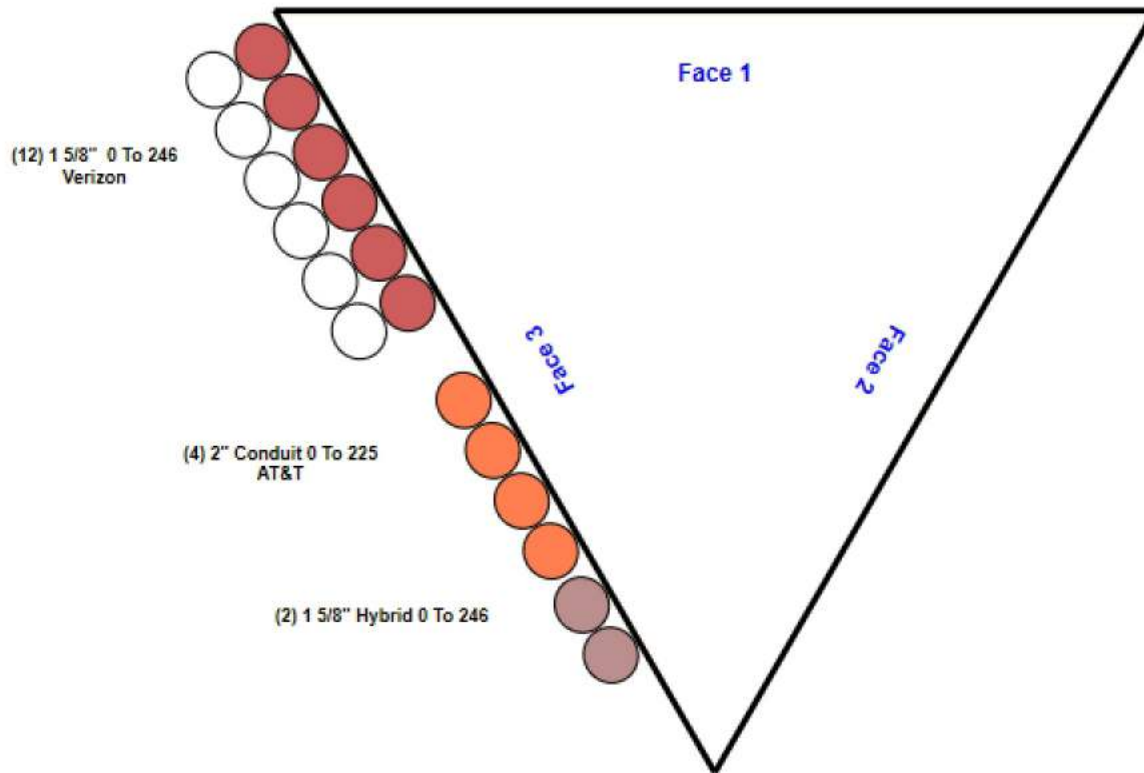


Structure: FL09636-S-SBA - Coax Line Placement

Type: Guyed
Site Name: Lulu
Height: 250.00 (ft)

7/19/2024

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Loading Summary

Structure: FL09636-S-SBA	Code: TIA-222-H	7/19/2024
Site Name: Lulu	Exposure: C	
Height: 250.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II
		Page: 5



Discrete Appurtenances Properties

Attach Elev (ft)	Description	No Ice			Ice					Orientation Factor	Vert Ecc (ft)	
		Qty	Weight (lb)	CaAa (sf)	Weight (lb)	CaAa (sf)	Len (in)	Width (in)	Depth (in)			
250.00	Beacon	1	36.00	2.720	59.32	2.886	28.000	17.500	17.500	1.00	1.00	0.000
250.00	Lightning rod	1	12.00	1.250	16.40	2.014	120.000	1.000	1.000	1.00	1.00	0.000
246.00	T-Frames	3	500.00	17.500	622.20	19.938	0.000	0.000	0.000	0.75	0.75	0.000
246.00	(3) V-bracing Kit & Stabilizer Kit	1	280.00	10.500	341.59	12.425	0.000	0.000	0.000	0.75	1.00	0.000
246.00	(3) Tieback Assembly & Cross over	1	160.00	5.700	195.19	6.745	0.000	0.000	0.000	0.75	1.00	0.000
246.00	AIR6419	3	66.10	3.800	82.94	3.939	28.300	16.100	7.900	0.80	0.76	0.000
246.00	MX06FHG865-HG	6	50.00	11.610	97.51	11.894	95.900	12.200	10.700	0.80	0.95	0.000
246.00	Commscope TD-850B-LTE-43	3	52.90	1.250	64.85	1.348	15.400	15.200	6.400	0.80	0.74	0.000
246.00	Ericsson 4890	3	69.50	2.700	81.61	2.805	20.600	15.700	7.200	0.80	0.67	0.000
246.00	Ericsson 4490	3	69.50	2.700	81.61	2.805	20.600	15.700	7.200	0.80	0.67	0.000
246.00	Raycap RCMDC-6627-PF-48	1	32.00	4.060	51.94	4.204	29.500	16.500	12.600	0.80	1.00	0.000
225.00	KRE 101 2526/1K	8	77.40	12.270	120.42	12.518	72.000	19.600	7.800	0.80	0.74	0.000
225.00	Radio 4890	4	69.50	2.700	81.53	2.804	20.600	15.700	7.200	0.80	0.67	0.000
225.00	4478 B14	4	59.90	1.840	68.08	1.932	16.500	13.400	7.700	0.80	0.67	0.000
225.00	4490 B5/B12A	4	93.00	2.850	105.51	2.967	21.800	15.700	7.500	0.80	0.67	0.000
225.00	Raycap DC9-48-60-24-8C-EV	4	26.20	1.140	44.64	1.416	31.400	10.200	18.200	0.80	1.00	0.000
225.00	(3) SFG23RHDXL-12-B	1	2448.0	49.240	2864.16	60.002	0.000	0.000	0.000	0.75	1.00	0.000
125.00	Dual lights	3	12.00	0.400	14.75	0.457	15.000	4.000	4.000	0.75	0.75	0.000
Totals:		54	7,191.60		9,119.98		Number of Appurtenances :					18

Loading Summary

Structure: FL09636-S-SBA **Code:** TIA-222-H 7/19/2024
Site Name: Lulu **Exposure:** C
Height: 250.00 (ft) **Crest Height:** 0.00
Base Elev: 0.000 (ft) **Site Class:** D - Stiff Soil
Gh: 0.85 **Topography:** 1 **Struct Class:** II Page: 6



Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	250.00	1/2"	1	0.65	0.16		2	Individual NR		N	1.00	1.00	
0.00	250.00	Safety Cable	1	0.38	0.27		2	Individual NR		N	1.00	1.00	
0.00	246.00	1 5/8" Coax	12	1.98	1.04	50.00	3	Block		N	1.00	1.00	
0.00	246.00	1 5/8" Hybrid	2	2.00	1.10		3	Individual NR		N	1.00	1.00	
0.00	225.00	2" Conduit	4	2.00	1.61		3	Individual NR		N	1.00	1.00	

Section Forces

Structure: FL09636-S-SBA

Code: EIA_H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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Wind Loads

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 0.00

Wind Importance Factor: 1.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.4	26.05	0.000	3.07	0.00	0.28	2.36	1.00	1.00	0.00	1.85	16.70	0.00	518.4	0.0	96.91	303.75	400.67
								0.85	1.00	0.00	1.85	16.70	0.00	518.4	0.0	96.91	303.75	400.67
								0.80	1.00	0.00	1.85	16.70	0.00	518.4	0.0	96.91	303.75	400.67
2	13.4	26.05	0.000	6.40	0.00	0.15	2.76	1.00	1.00	0.00	3.68	33.14	0.00	1,052.7	0.0	225.52	602.97	828.49
								0.85	1.00	0.00	3.68	33.14	0.00	1,052.7	0.0	225.52	602.97	828.49
								0.80	1.00	0.00	3.68	33.14	0.00	1,052.7	0.0	225.52	602.97	828.49
3	30.0	30.10	0.000	9.76	0.00	0.15	2.76	1.00	1.00	0.00	5.62	49.84	0.00	1,594.7	0.0	396.66	1047.81	1,444.46
								0.85	1.00	0.00	5.62	49.84	0.00	1,594.7	0.0	396.66	1047.81	1,444.46
								0.80	1.00	0.00	5.62	49.84	0.00	1,594.7	0.0	396.66	1047.81	1,444.46
4	50.0	33.52	0.000	10.02	0.00	0.16	2.74	1.00	1.00	0.00	5.78	49.84	0.00	1,654.2	0.0	451.81	1166.77	1,618.58
								0.85	1.00	0.00	5.78	49.84	0.00	1,654.2	0.0	451.81	1166.77	1,618.58
								0.80	1.00	0.00	5.78	49.84	0.00	1,654.2	0.0	451.81	1166.77	1,618.58
5	65.0	35.42	1.000	4.51	0.00	0.18	2.68	1.00	1.00	0.00	3.61	24.92	0.00	783.9	0.0	291.53	616.52	908.05
								0.85	1.00	0.00	3.46	24.92	0.00	783.9	0.0	279.42	616.52	895.94
								0.80	1.00	0.00	3.41	24.92	0.00	783.9	0.0	275.39	616.52	891.90
6	75.0	36.51	0.000	4.51	0.00	0.14	2.80	1.00	1.00	0.00	2.59	24.92	0.00	728.8	0.0	225.12	635.37	860.49
								0.85	1.00	0.00	2.59	24.92	0.00	728.8	0.0	225.12	635.37	860.49
								0.80	1.00	0.00	2.59	24.92	0.00	728.8	0.0	225.12	635.37	860.49
7	90.0	37.94	0.000	8.94	0.00	0.14	2.80	1.00	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	464.15	1320.47	1,784.62
								0.85	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	464.15	1320.47	1,784.62
								0.80	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	464.15	1320.47	1,784.62
8	110.0	39.57	0.000	8.94	0.00	0.14	2.80	1.00	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	484.18	1377.45	1,861.63
								0.85	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	484.18	1377.45	1,861.63
								0.80	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	484.18	1377.45	1,861.63
9	130.0	40.99	1.000	9.84	0.00	0.17	2.70	1.00	1.00	0.00	6.69	49.84	0.00	1,693.0	0.0	628.51	1426.75	2,055.26
								0.85	1.00	0.00	6.54	49.84	0.00	1,693.0	0.0	614.42	1426.75	2,041.17
								0.80	1.00	0.00	6.49	49.84	0.00	1,693.0	0.0	609.73	1426.75	2,036.48
10	150.0	42.24	0.000	8.94	0.00	0.14	2.80	1.00	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	516.85	1470.39	1,987.24
								0.85	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	516.85	1470.39	1,987.24
								0.80	1.00	0.00	5.14	49.84	0.00	1,414.3	0.0	516.85	1470.39	1,987.24
11	170.0	43.37	0.000	10.02	0.00	0.16	2.74	1.00	1.00	0.00	5.78	49.84	0.00	1,654.2	0.0	584.58	1509.65	2,094.23
								0.85	1.00	0.00	5.78	49.84	0.00	1,654.2	0.0	584.58	1509.65	2,094.23
								0.80	1.00	0.00	5.78	49.84	0.00	1,654.2	0.0	584.58	1509.65	2,094.23
12	190.0	44.40	0.000	10.11	0.00	0.16	2.74	1.00	1.00	0.00	5.84	49.84	0.00	1,705.2	0.0	602.62	1545.42	2,148.04
								0.85	1.00	0.00	5.84	49.84	0.00	1,705.2	0.0	602.62	1545.42	2,148.04
								0.80	1.00	0.00	5.84	49.84	0.00	1,705.2	0.0	602.62	1545.42	2,148.04
13	210.0	45.34	0.000	9.21	0.00	0.15	2.79	1.00	1.00	0.00	5.30	49.84	0.00	1,473.8	0.0	568.78	1578.32	2,147.11
								0.85	1.00	0.00	5.30	49.84	0.00	1,473.8	0.0	568.78	1578.32	2,147.11
								0.80	1.00	0.00	5.30	49.84	0.00	1,473.8	0.0	568.78	1578.32	2,147.11
14	230.0	46.22	1.000	8.12	0.00	0.15	2.79	1.00	1.00	0.00	5.67	39.84	0.00	1,197.1	0.0	620.68	1325.97	1,946.65
								0.85	1.00	0.00	5.52	39.84	0.00	1,197.1	0.0	604.26	1325.97	1,930.23
								0.80	1.00	0.00	5.47	39.84	0.00	1,197.1	0.0	598.78	1325.97	1,924.76
15	245.0	46.84	0.000	4.29	0.00	0.14	2.82	1.00	1.00	0.00	2.46	11.29	0.00	519.1	0.0	276.43	384.25	660.67
								0.85	1.00	0.00	2.46	11.29	0.00	519.1	0.0	276.43	384.25	660.67
								0.80	1.00	0.00	2.46	11.29	0.00	519.1	0.0	276.43	384.25	660.67

Section Forces

Structure: FL09636-S-SBA

Code: EIA_H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 8



Wind Loads with Ice

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00

Wind Importance Factor: 1.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.4	1.66	0.000	3.93	0.86	0.35	2.18	1.00	1.00	0.20	2.45	16.92	1.78	604.8	86.4	7.52	22.23	29.75
								0.85	1.00	0.20	2.45	16.92	1.78	604.8	86.4	7.52	22.23	29.75
								0.80	1.00	0.20	2.45	16.92	1.78	604.8	86.4	7.52	22.23	29.75
2	13.4	1.66	0.000	8.55	2.15	0.20	2.59	1.00	1.00	0.23	4.96	33.65	4.05	1,257.3	204.6	18.12	49.29	67.41
								0.85	1.00	0.23	4.96	33.65	4.05	1,257.3	204.6	18.12	49.29	67.41
								0.80	1.00	0.23	4.96	33.65	4.05	1,257.3	204.6	18.12	49.29	67.41
3	30.0	1.91	0.000	13.36	3.61	0.21	2.57	1.00	1.00	0.25	7.78	50.67	6.60	1,933.9	339.2	32.50	86.13	118.62
								0.85	1.00	0.25	7.78	50.67	6.60	1,933.9	339.2	32.50	86.13	118.62
								0.80	1.00	0.25	7.78	50.67	6.60	1,933.9	339.2	32.50	86.13	118.62
4	50.0	2.13	0.000	13.81	3.79	0.22	2.55	1.00	1.00	0.26	8.06	50.71	6.95	2,016.8	362.6	37.18	96.14	133.33
								0.85	1.00	0.26	8.06	50.71	6.95	2,016.8	362.6	37.18	96.14	133.33
								0.80	1.00	0.26	8.06	50.71	6.95	2,016.8	362.6	37.18	96.14	133.33
5	65.0	2.25	1.000	6.53	2.01	0.24	2.48	1.00	1.00	0.27	4.83	25.37	3.57	979.3	195.5	22.95	50.30	73.24
								0.85	1.00	0.27	4.68	25.37	3.57	979.3	195.5	22.23	50.30	72.53
								0.80	1.00	0.27	4.63	25.37	3.57	979.3	195.5	22.00	50.30	72.30
6	75.0	2.32	0.000	6.42	1.91	0.20	2.59	1.00	1.00	0.27	3.73	25.37	3.62	914.7	185.9	19.05	53.13	72.18
								0.85	1.00	0.27	3.73	25.37	3.62	914.7	185.9	19.05	53.13	72.18
								0.80	1.00	0.27	3.73	25.37	3.62	914.7	185.9	19.05	53.13	72.18
7	90.0	2.41	0.000	12.96	4.02	0.20	2.59	1.00	1.00	0.28	7.53	50.76	7.37	1,793.7	379.4	39.89	110.58	150.47
								0.85	1.00	0.28	7.53	50.76	7.37	1,793.7	379.4	39.89	110.58	150.47
								0.80	1.00	0.28	7.53	50.76	7.37	1,793.7	379.4	39.89	110.58	150.47
8	110.0	2.52	0.000	13.05	4.11	0.20	2.58	1.00	1.00	0.28	7.58	50.78	7.52	1,802.6	388.2	41.82	115.60	157.42
								0.85	1.00	0.28	7.58	50.78	7.52	1,802.6	388.2	41.82	115.60	157.42
								0.80	1.00	0.28	7.58	50.78	7.52	1,802.6	388.2	41.82	115.60	157.42
9	130.0	2.61	1.000	14.02	4.17	0.23	2.49	1.00	1.00	0.29	9.23	50.80	7.65	2,107.8	414.8	50.85	117.75	168.60
								0.85	1.00	0.29	9.08	50.80	7.65	2,107.8	414.8	50.02	117.75	167.77
								0.80	1.00	0.29	9.03	50.80	7.65	2,107.8	414.8	49.75	117.75	167.50
10	150.0	2.68	0.000	13.17	4.23	0.21	2.58	1.00	1.00	0.29	7.66	50.81	7.76	1,816.7	402.4	45.00	123.82	168.82
								0.85	1.00	0.29	7.66	50.81	7.76	1,816.7	402.4	45.00	123.82	168.82
								0.80	1.00	0.29	7.66	50.81	7.76	1,816.7	402.4	45.00	123.82	168.82
11	170.0	2.76	0.000	14.31	4.29	0.22	2.52	1.00	1.00	0.29	8.37	50.82	7.85	2,071.4	417.2	49.48	126.02	175.50
								0.85	1.00	0.29	8.37	50.82	7.85	2,071.4	417.2	49.48	126.02	175.50
								0.80	1.00	0.29	8.37	50.82	7.85	2,071.4	417.2	49.48	126.02	175.50
12	190.0	2.82	0.000	14.29	4.19	0.22	2.52	1.00	1.00	0.30	8.36	50.83	7.94	2,127.9	422.7	50.61	129.25	179.86
								0.85	1.00	0.30	8.36	50.83	7.94	2,127.9	422.7	50.61	129.25	179.86
								0.80	1.00	0.30	8.36	50.83	7.94	2,127.9	422.7	50.61	129.25	179.86
13	210.0	2.88	0.000	13.59	4.38	0.21	2.55	1.00	1.00	0.30	7.91	50.84	8.02	1,895.8	422.0	49.53	133.05	182.58
								0.85	1.00	0.30	7.91	50.84	8.02	1,895.8	422.0	49.53	133.05	182.58
								0.80	1.00	0.30	7.91	50.84	8.02	1,895.8	422.0	49.53	133.05	182.58
14	230.0	2.94	1.000	12.70	4.57	0.22	2.54	1.00	1.00	0.30	8.39	40.85	5.06	1,577.5	380.4	53.33	104.90	158.24
								0.85	1.00	0.30	8.24	40.85	5.06	1,577.5	380.4	52.38	104.90	157.28
								0.80	1.00	0.30	8.19	40.85	5.06	1,577.5	380.4	52.06	104.90	156.97
15	245.0	2.98	0.000	6.59	2.30	0.21	2.57	1.00	1.00	0.31	3.83	11.60	1.63	650.6	131.5	24.91	30.71	55.62
								0.85	1.00	0.31	3.83	11.60	1.63	650.6	131.5	24.91	30.71	55.62
								0.80	1.00	0.31	3.83	11.60	1.63	650.6	131.5	24.91	30.71	55.62

Section Forces

Structure: FL09636-S-SBA

Code: EIA_H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 9



Service Loads

Wind Load Factor: 1.00
Dead Load Factor: 1.00
Ice Dead Load Factor: 0.00

Wind Importance Factor: 1.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1	3.4	6.62	0.000	3.07	0.00	0.28	2.36	1.00	1.00	0.00	1.85	16.70	0.00	432.0	0.0	24.64	77.22	101.86
								0.85	1.00	0.00	1.85	16.70	0.00	432.0	0.0	24.64	77.22	101.86
								0.80	1.00	0.00	1.85	16.70	0.00	432.0	0.0	24.64	77.22	101.86
2	13.4	6.62	0.000	6.40	0.00	0.15	2.76	1.00	1.00	0.00	3.68	33.14	0.00	877.2	0.0	57.33	153.29	210.62
								0.85	1.00	0.00	3.68	33.14	0.00	877.2	0.0	57.33	153.29	210.62
								0.80	1.00	0.00	3.68	33.14	0.00	877.2	0.0	57.33	153.29	210.62
3	30.0	7.65	0.000	9.76	0.00	0.15	2.76	1.00	1.00	0.00	5.62	49.84	0.00	1,328.9	0.0	100.84	266.37	367.21
								0.85	1.00	0.00	5.62	49.84	0.00	1,328.9	0.0	100.84	266.37	367.21
								0.80	1.00	0.00	5.62	49.84	0.00	1,328.9	0.0	100.84	266.37	367.21
4	50.0	8.52	0.000	10.02	0.00	0.16	2.74	1.00	1.00	0.00	5.78	49.84	0.00	1,378.5	0.0	114.86	296.62	411.47
								0.85	1.00	0.00	5.78	49.84	0.00	1,378.5	0.0	114.86	296.62	411.47
								0.80	1.00	0.00	5.78	49.84	0.00	1,378.5	0.0	114.86	296.62	411.47
5	65.0	9.01	1.000	4.51	0.00	0.18	2.68	1.00	1.00	0.00	3.61	24.92	0.00	653.2	0.0	74.11	156.73	230.84
								0.85	1.00	0.00	3.46	24.92	0.00	653.2	0.0	71.03	156.73	227.77
								0.80	1.00	0.00	3.41	24.92	0.00	653.2	0.0	70.01	156.73	226.74
6	75.0	9.28	0.000	4.51	0.00	0.14	2.80	1.00	1.00	0.00	2.59	24.92	0.00	607.3	0.0	57.23	161.52	218.75
								0.85	1.00	0.00	2.59	24.92	0.00	607.3	0.0	57.23	161.52	218.75
								0.80	1.00	0.00	2.59	24.92	0.00	607.3	0.0	57.23	161.52	218.75
7	90.0	9.64	0.000	8.94	0.00	0.14	2.80	1.00	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	118.00	335.69	453.69
								0.85	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	118.00	335.69	453.69
								0.80	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	118.00	335.69	453.69
8	110.0	10.06	0.000	8.94	0.00	0.14	2.80	1.00	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	123.09	350.17	473.26
								0.85	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	123.09	350.17	473.26
								0.80	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	123.09	350.17	473.26
9	130.0	10.42	1.000	9.84	0.00	0.17	2.70	1.00	1.00	0.00	6.69	49.84	0.00	1,410.9	0.0	159.78	362.71	522.49
								0.85	1.00	0.00	6.54	49.84	0.00	1,410.9	0.0	156.20	362.71	518.91
								0.80	1.00	0.00	6.49	49.84	0.00	1,410.9	0.0	155.00	362.71	517.71
10	150.0	10.74	0.000	8.94	0.00	0.14	2.80	1.00	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	131.39	373.80	505.20
								0.85	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	131.39	373.80	505.20
								0.80	1.00	0.00	5.14	49.84	0.00	1,178.6	0.0	131.39	373.80	505.20
11	170.0	11.03	0.000	10.02	0.00	0.16	2.74	1.00	1.00	0.00	5.78	49.84	0.00	1,378.5	0.0	148.61	383.78	532.39
								0.85	1.00	0.00	5.78	49.84	0.00	1,378.5	0.0	148.61	383.78	532.39
								0.80	1.00	0.00	5.78	49.84	0.00	1,378.5	0.0	148.61	383.78	532.39
12	190.0	11.29	0.000	10.11	0.00	0.16	2.74	1.00	1.00	0.00	5.84	49.84	0.00	1,421.0	0.0	153.20	392.87	546.07
								0.85	1.00	0.00	5.84	49.84	0.00	1,421.0	0.0	153.20	392.87	546.07
								0.80	1.00	0.00	5.84	49.84	0.00	1,421.0	0.0	153.20	392.87	546.07
13	210.0	11.53	0.000	9.21	0.00	0.15	2.79	1.00	1.00	0.00	5.30	49.84	0.00	1,228.2	0.0	144.60	401.24	545.84
								0.85	1.00	0.00	5.30	49.84	0.00	1,228.2	0.0	144.60	401.24	545.84
								0.80	1.00	0.00	5.30	49.84	0.00	1,228.2	0.0	144.60	401.24	545.84
14	230.0	11.75	1.000	8.12	0.00	0.15	2.79	1.00	1.00	0.00	5.67	39.84	0.00	997.6	0.0	157.79	337.09	494.88
								0.85	1.00	0.00	5.52	39.84	0.00	997.6	0.0	153.61	337.09	490.70
								0.80	1.00	0.00	5.47	39.84	0.00	997.6	0.0	152.22	337.09	489.31
15	245.0	11.91	0.000	4.29	0.00	0.14	2.82	1.00	1.00	0.00	2.46	11.29	0.00	432.6	0.0	70.27	97.68	167.96
								0.85	1.00	0.00	2.46	11.29	0.00	432.6	0.0	70.27	97.68	167.96
								0.80	1.00	0.00	2.46	11.29	0.00	432.6	0.0	70.27	97.68	167.96

Force/Stress Compression Summary

Structure: FL09636-S-SBA

Code: EIA/TIA-222-H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
						X	Y	Z					
1	6.7	SOL - 2" SOLID	-35.70	1.2D + 1.0W 90° Wind	3.20	100	100	100	76.85	50.00	91.80	38.9	Member X
2	20	SOL - 2" SOLID	-40.48	1.2D + 1.0W 60° Wind	3.32	100	100	100	79.80	50.00	88.75	45.6	Member X
3	40	SOL - 2" SOLID	-43.01	1.2D + 1.0W 60° Wind	3.21	100	100	100	77.00	50.00	91.64	46.9	Member X
4	60	SOL - 2" SOLID	-41.56	1.2D + 1.0W 60° Wind	3.21	100	100	100	77.00	50.00	91.64	45.4	Member X
5	70	SOL - 1 3/4" SOLID	-33.25	1.2D + 1.0W Normal Wind	3.21	100	100	100	88.00	50.00	61.44	54.1	Member X
6	80	SOL - 1 3/4" SOLID	-33.57	1.2D + 1.0W Normal Wind	3.21	100	100	100	88.00	50.00	61.44	54.6	Member X
7	100	SOL - 1 3/4" SOLID	-30.48	1.2D + 1.0W 60° Wind	3.21	100	100	100	88.00	50.00	61.44	49.6	Member X
8	120	SOL - 1 3/4" SOLID	-32.76	1.2D + 1.0W Normal Wind	3.21	100	100	100	88.00	50.00	61.44	53.3	Member X
9	140	SOL - 2" SOLID	-43.73	1.2D + 1.0W Normal Wind	3.21	100	100	100	77.00	50.00	91.64	47.7	Member X
10	160	SOL - 1 3/4" SOLID	-37.02	1.2D + 1.0W Normal Wind	3.21	100	100	100	88.00	50.00	61.44	60.3	Member X
11	180	SOL - 2" SOLID	-45.19	1.2D + 1.0W Normal Wind	3.21	100	100	100	77.00	50.00	91.64	49.3	Member X
12	200	SOL - 2" SOLID	-56.63	1.2D + 1.0W Normal Wind	3.21	100	100	100	77.00	50.00	91.64	61.8	Member X
13	220	SOL - 1 3/4" SOLID	-32.23	1.2D + 1.0W Normal Wind	3.21	100	100	100	88.00	50.00	61.44	52.4	Member X
14	240	SOL - 1 1/2" SOLID	-24.96	1.2D + 1.0W 60° Wind	3.21	100	100	100	102.67	50.00	36.79	67.8	Member X
15	250	SOL - 1 1/2" SOLID	-11.46	1.2D + 1.0W Normal Wind	3.21	100	100	100	102.67	50.00	36.79	31.1	Member X

HORIZONTAL MEMBERS

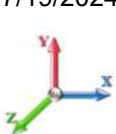
Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
						X	Y	Z									
1	6.7										0.00	0	0				
2	20	SOL - 3/4" SOLID	-0.25	1.2D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			4.6	Member X
3	40	SOL - 3/4" SOLID	-0.06	0.9D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			1.2	Member X
4	60	SOL - 3/4" SOLID	-0.75	1.2D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			13.6	Member X
5	70	SOL - 3/4" SOLID	-0.93	1.2D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			16.7	Member X
6	80	SOL - 3/4" SOLID	-0.62	0.9D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			11.3	Member X
7	100	SOL - 3/4" SOLID	-0.52	1.2D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			9.5	Member X
8	120	SOL - 3/4" SOLID	-0.57	1.2D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			10.3	Member X
9	140	SOL - 3/4" SOLID	-1.02	1.2D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			18.4	Member X
10	160	SOL - 3/4" SOLID	-0.33	0.9D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			6.0	Member X
11	180	SOL - 3/4" SOLID	-0.72	0.9D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			13.0	Member X
12	200	SOL - 3/4" SOLID	-2.12	1.2D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			38.3	Member X
13	220	SOL - 3/4" SOLID	-1.52	1.2D + 1.0W 60° Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			27.5	Member X
14	240	SOL - 3/4" SOLID	-1.99	1.2D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			35.9	Member X
15	250	SOL - 3/4" SOLID	-1.82	1.2D + 1.0W Normal Wind	3.00	100	100	100	134.40	36.00	5.53	0	0			32.9	Member X

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	Use %	Controls
						X	Y	Z									
1	6.7	SOL - 7/8" SOLID	-4.09	1.2D + 1.0W 90° Wind	3.26	95	95	95	118.82	36.00	9.27	0	0			44.1	Member X
2	20	SOL - 7/8" SOLID	-1.79	1.2D + 1.0W 90° Wind	4.48	95	95	95	163.33	36.00	5.09	0	0			35.2	Member X
3	40	SOL - 7/8" SOLID	-1.01	1.2D + 1.0W Normal Wind	4.39	95	95	95	160.20	36.00	5.29	0	0			19.0	Member X
4	60	SOL - 1" SOLID	-2.25	1.2D + 1.0W 60° Wind	4.39	95	95	95	140.21	36.00	9.03	0	0			24.9	Member X
5	70	SOL - 1" SOLID	-3.23	1.2D + 1.0W 90° Wind	4.39	95	95	95	140.21	36.00	9.03	0	0			35.8	Member X
6	80	SOL - 1" SOLID	-2.47	1.2D + 1.0W 90° Wind	4.39	95	95	95	140.21	36.00	9.03	0	0			27.4	Member X
7	100	SOL - 7/8" SOLID	-1.55	1.2D + 1.0W 60° Wind	4.39	95	95	95	160.20	36.00	5.29	0	0			29.4	Member X
8	120	SOL - 7/8" SOLID	-2.08	1.2D + 1.0W Normal Wind	4.39	95	95	95	160.20	36.00	5.29	0	0			39.4	Member X
9	140	SOL - 1" SOLID	-3.08	1.2D + 1.0W 90° Wind	4.39	95	95	95	140.21	36.00	9.03	0	0			34.1	Member X
10	160	SOL - 7/8" SOLID	-1.13	1.2D + 1.0W 60° Wind	4.39	95	95	95	160.20	36.00	5.29	0	0			21.3	Member X
11	180	SOL - 1" SOLID	-2.38	1.2D + 1.0W Normal Wind	4.39	95	95	95	140.21	36.00	9.03	0	0			26.4	Member X

Force/Stress Compression Summary

Structure: FL09636-S-SBA	Code: EIA/TIA-222-H	7/19/2024
Site Name: Lulu	Exposure: C	
Height: 250.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II



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DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Len (ft)	Bracing %			KL/R	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Bear		Controls
						X	Y	Z						Cap (kips)	%	
12	200	SOL - 1 1/8" SOLID	-6.11	1.2D + 1.0W 90° Wind	4.39	95	95	95	124.61	36.00	14.22	0	0		42.9	Member X
13	220	SOL - 1" SOLID	-4.55	1.2D + 1.0W Normal Wind	4.39	95	95	95	140.21	36.00	9.03	0	0		50.4	Member X
14	240	SOL - 7/8" SOLID	-3.21	1.2D + 1.0W 90° Wind	4.39	95	95	95	160.20	36.00	5.29	0	0		60.7	Member X
15	250	SOL - 1" SOLID	-4.96	1.2D + 1.0W 90° Wind	4.39	95	95	95	140.21	36.00	9.03	0	0		54.9	Member X

Force/Stress Tension Summary

Structure: FL09636-S-SBA

Code: EIA/TIA-222-H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

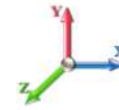
Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	6.7				0	0.00		
2	20				0	0.00		
3	40				0	0.00		
4	60				0	0.00		
5	70				0	0.00		
6	80				0	0.00		
7	100				0	0.00		
8	120				0	0.00		
9	140				0	0.00		
10	160				0	0.00		
11	180				0	0.00		
12	200	SOL - 2" SOLID	20.82	0.9D + 1.0W 60° Wind	50	141.37	14.7	Member
13	220	SOL - 1 3/4" SOLID	4.22	0.9D + 1.0W 60° Wind	50	108.24	3.9	Member
14	240	SOL - 1 1/2" SOLID	0.10	0.9D + 1.0W Normal Wind	50	79.52	0.1	Member
15	250	SOL - 1 1/2" SOLID	12.39	0.9D + 1.0W 60° Wind	50	79.52	15.6	Member

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	6.7	SOL - 3/4" SOLID	5.23	1.2D + 1.0W 90° Wind	36	14.31	0	0				36.6	Member
2	20	SOL - 3/4" SOLID	0.38	1.2D + 1.0W 60° Wind	36	14.31	0	0				2.6	Member
3	40	SOL - 3/4" SOLID	0.29	1.2D + 1.0W 60° Wind	36	14.31	0	0				2.1	Member
4	60	SOL - 3/4" SOLID	0.85	1.2D + 1.0W Normal Wi	36	14.31	0	0				5.9	Member
5	70	SOL - 3/4" SOLID	1.06	1.2D + 1.0W 60° Wind	36	14.31	0	0				7.4	Member
6	80	SOL - 3/4" SOLID	0.87	1.2D + 1.0W 60° Wind	36	14.31	0	0				6.1	Member
7	100	SOL - 3/4" SOLID	0.46	1.2D + 1.0W Normal Wi	36	14.31	0	0				3.2	Member
8	120	SOL - 3/4" SOLID	0.81	1.2D + 1.0W Normal Wi	36	14.31	0	0				5.7	Member
9	140	SOL - 3/4" SOLID	1.00	1.2D + 1.0W 60° Wind	36	14.31	0	0				7.0	Member
10	160	SOL - 3/4" SOLID	0.39	0.9D + 1.0W Normal Wi	36	14.31	0	0				2.7	Member
11	180	SOL - 3/4" SOLID	0.93	1.2D + 1.0W Normal Wi	36	14.31	0	0				6.5	Member
12	200	SOL - 3/4" SOLID	1.99	1.2D + 1.0W 60° Wind	36	14.31	0	0				13.9	Member
13	220	SOL - 3/4" SOLID	1.80	1.2D + 1.0W Normal Wi	36	14.31	0	0				12.6	Member
14	240	SOL - 3/4" SOLID	2.00	1.2D + 1.0W 60° Wind	36	14.31	0	0				13.9	Member
15	250	SOL - 3/4" SOLID	1.82	1.2D + 1.0W 60° Wind	36	14.31	0	0				12.7	Member

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	6.7	SOL - 7/8" SOLID	0.00		36	0.00	0	0					
2	20	SOL - 7/8" SOLID	1.69	1.2D + 1.0W 90° Wind	36	19.48	0	0				8.7	Member
3	40	SOL - 7/8" SOLID	0.53	0.9D + 1.0W 90° Wind	36	19.48	0	0				2.7	Member
4	60	SOL - 1" SOLID	2.26	1.2D + 1.0W 90° Wind	36	25.45	0	0				8.9	Member
5	70	SOL - 1" SOLID	2.60	1.2D + 1.0W 90° Wind	36	25.45	0	0				10.2	Member
6	80	SOL - 1" SOLID	1.92	0.9D + 1.0W 60° Wind	36	25.45	0	0				7.5	Member
7	100	SOL - 7/8" SOLID	1.40	0.9D + 1.0W 90° Wind	36	19.48	0	0				7.2	Member
8	120	SOL - 7/8" SOLID	1.80	1.2D + 1.0W 90° Wind	36	19.48	0	0				9.2	Member
9	140	SOL - 1" SOLID	2.49	1.2D + 1.0W Normal Wi	36	25.45	0	0				9.8	Member
10	160	SOL - 7/8" SOLID	1.03	0.9D + 1.0W 90° Wind	36	19.48	0	0				5.3	Member
11	180	SOL - 1" SOLID	2.32	0.9D + 1.0W 90° Wind	36	25.45	0	0				9.1	Member
12	200	SOL - 1 1/8" SOLID	5.27	1.2D + 1.0W Normal Wi	36	32.21	0	0				16.4	Member

Force/Stress Tension Summary

Structure: FL09636-S-SBA

Site Name: Lulu

Height: 250.00 (ft)

Base Elev: 0.000 (ft)

Gh: 0.85

Code: EIA/TIA-222-H

Exposure: C

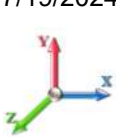
Crest Height: 0.00

Site Class: D - Stiff Soil

Struct Class: II

7/19/2024

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DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
13	220	SOL - 1" SOLID	4.85	1.2D + 1.0W 90° Wind	36	25.45	0	0				19.1	Member
14	240	SOL - 7/8" SOLID	3.29	1.2D + 1.0W 90° Wind	36	19.48	0	0				16.9	Member
15	250	SOL - 1" SOLID	5.37	1.2D + 1.0W 90° Wind	36	25.45	0	0				21.1	Member

Seismic Section Forces

Structure: FL09636-S-SBA

Code: TIA-222-H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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Load Case: 1.2D + 1.0Ev + 1.0Eh

Dead Load Factor	1.20	Sds	0.091	Ss	0.0860	Fa	1.6000	Ke	1.0077	TL	8.0000
Seismic Load Factor	1.00	Sd1	0.080	S1	0.0500	Fv	2.4000	Kg	0.0060	Cs	0.0306
Seismic Importance Factor	1.00	W1	0.000	R	3.0000	Vs	0.8080	T	0.5153	f1	1.9405

Sect #	Elev (ft)	Wz (lb)	Lateral Fsz (lbs)	Vertical Ev (lbs)
1	3.35	431.98	0.29	7.93
2	13.35	877.25	2.38	16.10
3	30.00	1328.9	8.17	24.39
4	50.00	1378.4	14.19	25.30
5	65.00	853.88	11.40	15.67
6	75.00	607.33	9.35	11.15
7	90.00	1178.6	21.90	21.63
8	110.00	1178.6	26.81	21.63
9	130.00	1673.3	45.17	30.72
10	150.00	1178.6	36.65	21.63
11	170.00	1378.4	48.69	25.30
12	190.00	1944.6	77.03	35.70
13	210.00	1228.1	53.63	22.54
14	230.00	5598.0	271.02	102.76
15	245.00	3526.5	181.32	64.73

Load Case: 0.9D + 1.0Ev + 1.0Eh

Dead Load Factor	0.90	Sds	0.091	Ss	0.0860	Fa	1.6000	Ke	1.0077	TL	8.0000
Seismic Load Factor	1.00	Sd1	0.080	S1	0.0500	Fv	2.4000	Kg	0.0060	Cs	0.0306
Seismic Importance Factor	1.00	W1	0.000	R	3.0000	Vs	0.8080	T	0.5153	f1	1.9405

Sect #	Elev (ft)	Wz (lb)	Lateral Fsz (lbs)	Vertical Ev (lbs)
1	3.35	431.98	0.29	7.93
2	13.35	877.25	2.38	16.10
3	30.00	1328.9	8.17	24.39
4	50.00	1378.4	14.19	25.30
5	65.00	853.88	11.40	15.67
6	75.00	607.33	9.35	11.15
7	90.00	1178.6	21.90	21.63
8	110.00	1178.6	26.81	21.63
9	130.00	1673.3	45.17	30.72
10	150.00	1178.6	36.65	21.63
11	170.00	1378.4	48.69	25.30
12	190.00	1944.6	77.03	35.70
13	210.00	1228.1	53.63	22.54
14	230.00	5598.0	271.02	102.76
15	245.00	3526.5	181.32	64.73

Support Forces Summary

Structure: FL09636-S-SBA

Code: TIA-222-H

7/19/2024

Site Name: Lulu

Exposure: C

Height: 250.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.0W Normal Wind	1	0.00	92.40	-1.66	
	A1	0.00	-1.90	1.83	
	A1b	29.89	-29.89	-18.69	
	A1a	-29.90	-29.89	-18.69	
1.2D + 1.0W 60° Wind	1	-1.44	86.37	-0.83	
	A1	-1.13	-9.47	11.23	
	A1b	9.15	-9.47	-6.59	
	A1a	-38.77	-37.39	-22.38	
1.2D + 1.0W 90° Wind	1	-1.63	90.42	-0.02	
	A1	-1.46	-20.02	23.48	
	A1b	3.40	-3.88	-2.56	
	A1a	-37.46	-36.13	-20.90	
0.9D + 1.0W Normal Wind	1	0.00	85.53	-1.69	
	A1	0.00	-1.91	1.85	
	A1b	29.88	-29.87	-18.68	
	A1a	-29.89	-29.87	-18.68	
0.9D + 1.0W 60° Wind	1	-1.46	79.64	-0.85	
	A1	-1.13	-9.52	11.28	
	A1b	9.20	-9.52	-6.61	
	A1a	-38.79	-37.42	-22.40	
0.9D + 1.0W 90° Wind	1	-1.65	83.60	-0.02	
	A1	-1.46	-20.03	23.50	
	A1b	3.43	-3.91	-2.58	
	A1a	-37.46	-36.13	-20.90	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	73.49	-0.15	
	A1	0.00	-10.79	14.27	
	A1b	14.68	-13.01	-8.63	
	A1a	-14.68	-13.01	-8.63	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.12	73.25	-0.07	
	A1	-0.13	-11.47	15.09	
	A1b	13.00	-11.47	-7.66	
	A1a	-15.46	-13.69	-8.92	
1.2D + 1.0Di + 1.0Wi 90° Wind	1	-0.14	73.37	0.00	
	A1	-0.17	-12.24	16.06	
	A1b	12.50	-10.96	-7.29	
	A1a	-15.32	-13.52	-8.77	
1.2D + 1.0Ev + 1.0Eh	1	0.00	72.90	0.00	
	A1	0.00	-12.91	17.05	
	A1b	15.44	-13.69	-8.92	
	A1a	-15.44	-13.69	-8.92	
0.9D + 1.0Ev + 1.0Eh	1	0.00	66.00	-0.01	
	A1	0.00	-13.04	17.19	
	A1b	15.56	-13.82	-8.98	
	A1a	-15.56	-13.82	-8.98	

1.0D + 1.0W Normal Wind	1	0.00	58.36	-0.48
	A1	0.00	-6.09	8.25
	A1b	14.35	-13.19	-8.61
	A1a	-14.35	-13.19	-8.61

1.0D + 1.0W 60° Wind	1	-0.40	58.78	-0.23
	A1	-0.28	-8.65	11.19
	A1b	9.55	-8.65	-5.84
	A1a	-17.04	-15.74	-9.84

1.0D + 1.0W 90° Wind	1	-0.47	58.55	0.01
	A1	-0.35	-10.91	13.95
	A1b	7.78	-6.82	-4.64
	A1a	-16.39	-15.00	-9.31

Max Reactions (kips)	Base	Anchor 1
Vertical	92.40	37.42
Horizontal	1.69	44.79

Cable Forces Summary

Structure: FL09636-S-SBA	Code: TIA-222-H	7/19/2024
Site Name: Lulu	Exposure: C	
Height: 250.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II
		Page: 17



Load Case	Elevation (ft)	Cable	Node 1	Node 2	Allow Tension (kips)	Applied Tension (kips)	Use %
1.2D + 1.0W Normal Wind	70.00	9/16 EHS	A1	28	21.00	0.65	3
			A1b	28a	21.00	6.57	31
			A1a	28b	21.00	6.58	31
			A1	52	21.00	0.09	0
	130.00		A1b	52a	21.00	7.10	34
			A1a	52b	21.00	7.10	34
			A1	T3	21.00	0.70	3
			A1a	T3b	21.00	8.11	39
	190.00		A1b	T3a	21.00	8.27	39
			A1b	T3	21.00	8.12	39
			A1a	T3a	21.00	8.27	39
			A1	T3b	21.00	0.70	3
		3/4 EHS	A1	96	34.98	1.26	4
			A1b	96a	34.98	17.58	50
			A1a	96b	34.98	17.58	50
			A1	96	34.98	17.58	50
1.2D + 1.0W 60° Wind	70.00	9/16 EHS	A1	28	21.00	2.50	12
			A1b	28a	21.00	2.50	12
			A1a	28b	21.00	8.83	42
			A1	52	21.00	2.69	13
	130.00		A1b	52a	21.00	2.69	13
			A1a	52b	21.00	9.55	45
			A1	T3	21.00	2.98	14
			A1a	T3b	21.00	10.14	48
	190.00		A1b	T3a	21.00	2.93	14
			A1b	T3	21.00	2.98	14
			A1a	T3a	21.00	10.14	48
			A1	T3b	21.00	2.93	14
		3/4 EHS	A1	96	34.98	4.55	13
			A1b	96a	34.98	4.56	13
			A1a	96b	34.98	21.28	61
			A1	96	34.98	21.28	61
1.2D + 1.0W 90° Wind	70.00	9/16 EHS	A1	28	21.00	4.42	21
			A1b	28a	21.00	0.99	5
			A1a	28b	21.00	8.13	39
			A1	52	21.00	4.92	23
	130.00		A1b	52a	21.00	1.02	5
			A1a	52b	21.00	8.89	42
			A1	T3	21.00	5.73	27
			A1a	T3b	21.00	9.91	47
	190.00		A1b	T3a	21.00	1.26	6
			A1b	T3	21.00	1.31	6
			A1a	T3a	21.00	9.71	46
			A1	T3b	21.00	5.75	27
		3/4 EHS	A1	96	34.98	11.23	32
			A1b	96a	34.98	1.98	6
			A1a	96b	34.98	21.01	60
			A1	96	34.98	21.01	60
0.9D + 1.0W Normal Wind	70.00	9/16 EHS	A1	28	21.00	0.65	3
			A1b	28a	21.00	6.57	31
			A1a	28b	21.00	6.57	31
			A1	52	21.00	0.09	0
	130.00		A1b	52a	21.00	7.11	34
			A1a	52b	21.00	7.11	34
			A1	T3	21.00	0.70	3
			A1a	T3b	21.00	8.12	39
	190.00		A1	T3	21.00	0.70	3
			A1a	T3b	21.00	8.12	39
			A1	T3	21.00	0.70	3
			A1a	T3b	21.00	8.12	39

0.9D + 1.0W Normal Wind	190.00	9/16 EHS	A1b	T3a	21.00	8.27	39
			A1b	T3	21.00	8.12	39
			A1a	T3a	21.00	8.27	39
			A1	T3b	21.00	0.70	3
0.9D + 1.0W 60° Wind	240.00	3/4 EHS	A1	96	34.98	1.27	4
			A1b	96a	34.98	17.55	50
			A1a	96b	34.98	17.54	50
			A1	28	21.00	2.51	12
	70.00	9/16 EHS	A1b	28a	21.00	2.50	12
			A1a	28b	21.00	8.83	42
			A1	52	21.00	2.70	13
			A1b	52a	21.00	2.70	13
	130.00		A1a	52b	21.00	9.56	46
			A1	T3	21.00	3.00	14
			A1a	T3b	21.00	10.15	48
			A1b	T3a	21.00	2.94	14
	190.00		A1b	T3	21.00	3.00	14
			A1a	T3a	21.00	10.15	48
			A1	T3b	21.00	2.94	14
			A1	96	34.98	4.58	13
0.9D + 1.0W 90° Wind	240.00	3/4 EHS	A1b	96a	34.98	4.58	13
			A1a	96b	34.98	21.29	61
			A1	28	21.00	4.43	21
			A1b	28a	21.00	1.00	5
	70.00	9/16 EHS	A1a	28b	21.00	8.13	39
			A1	52	21.00	4.93	23
			A1b	52a	21.00	1.02	5
			A1a	52b	21.00	8.90	42
	130.00		A1	T3	21.00	5.74	27
			A1a	T3b	21.00	9.92	47
			A1b	T3a	21.00	1.27	6
			A1b	T3	21.00	1.32	6
	190.00		A1a	T3a	21.00	9.71	46
			A1	T3b	21.00	5.75	27
			A1	96	34.98	11.22	32
			A1b	96a	34.98	2.00	6
1.2D + 1.0Di + 1.0Wi Normal Wind	70.00	9/16 EHS	A1a	96b	34.98	20.99	60
			A1	28	21.00	3.90	19
			A1b	28a	21.00	4.44	21
			A1a	28b	21.00	4.44	21
	130.00		A1	52	21.00	3.61	17
			A1b	52a	21.00	4.18	20
			A1a	52b	21.00	4.18	20
			A1	T3	21.00	3.20	15
	190.00		A1a	T3b	21.00	3.82	18
			A1b	T3a	21.00	3.81	18
			A1b	T3	21.00	3.83	18
			A1a	T3a	21.00	3.81	18
	240.00	3/4 EHS	A1	T3b	21.00	3.20	15
			A1	96	34.98	5.23	15
			A1b	96a	34.98	6.48	19
			A1a	96b	34.98	6.48	19
1.2D + 1.0Di + 1.0Wi 60° Wind	70.00	9/16 EHS	A1	28	21.00	4.06	19
			A1b	28a	21.00	4.06	19
			A1a	28b	21.00	4.60	22
			A1	52	21.00	3.77	18
	130.00		A1b	52a	21.00	3.77	18
			A1a	52b	21.00	4.35	21
			A1	T3	21.00	3.39	16
			A1a	T3b	21.00	3.99	19
	190.00		A1b	T3a	21.00	3.37	16
			A1b	T3	21.00	3.39	16
			A1a	T3a	21.00	4.00	19
			A1	T3b	21.00	3.38	16
	240.00	3/4 EHS	A1	96	34.98	5.62	16
			A1b	96a	34.98	5.62	16

1.2D + 1.0Di + 1.0Wi 60° Wind	240.00	3/4 EHS	A1a	96b	34.98	6.87	20
1.2D + 1.0Di + 1.0Wi 90° Wind	70.00	9/16 EHS	A1	28	21.00	4.25	20
			A1b	28a	21.00	3.94	19
			A1a	28b	21.00	4.56	22
	130.00		A1	52	21.00	3.97	19
			A1b	52a	21.00	3.65	17
			A1a	52b	21.00	4.31	21
	190.00		A1	T3	21.00	3.61	17
			A1a	T3b	21.00	3.95	19
			A1b	T3a	21.00	3.24	15
			A1b	T3	21.00	3.25	15
			A1a	T3a	21.00	3.95	19
			A1	T3b	21.00	3.59	17
	240.00	3/4 EHS	A1	96	34.98	6.04	17
			A1b	96a	34.98	5.33	15
			A1a	96b	34.98	6.77	19
1.2D + 1.0Ev + 1.0Eh	70.00	9/16 EHS	A1	28	21.00	4.87	23
			A1b	28a	21.00	4.93	23
			A1a	28b	21.00	4.93	23
	130.00		A1	52	21.00	4.34	21
			A1b	52a	21.00	4.44	21
			A1a	52b	21.00	4.44	21
	190.00		A1	T3	21.00	3.65	17
			A1a	T3b	21.00	3.84	18
			A1b	T3a	21.00	3.84	18
			A1b	T3	21.00	3.85	18
			A1a	T3a	21.00	3.85	18
			A1	T3b	21.00	3.66	17
	240.00	3/4 EHS	A1	96	34.98	5.93	17
			A1b	96a	34.98	6.51	19
			A1a	96b	34.98	6.51	19
0.9D + 1.0Ev + 1.0Eh	70.00	9/16 EHS	A1	28	21.00	4.88	23
			A1b	28a	21.00	4.94	24
			A1a	28b	21.00	4.94	24
	130.00		A1	52	21.00	4.37	21
			A1b	52a	21.00	4.47	21
			A1a	52b	21.00	4.47	21
	190.00		A1	T3	21.00	3.69	18
			A1a	T3b	21.00	3.88	18
			A1b	T3a	21.00	3.88	18
			A1b	T3	21.00	3.88	18
			A1a	T3a	21.00	3.89	19
			A1	T3b	21.00	3.70	18
	240.00	3/4 EHS	A1	96	34.98	6.01	17
			A1b	96a	34.98	6.59	19
			A1a	96b	34.98	6.59	19
1.0D + 1.0W Normal Wind	70.00	9/16 EHS	A1	28	21.00	2.43	12
			A1b	28a	21.00	4.04	19
			A1a	28b	21.00	4.04	19
	130.00		A1	52	21.00	2.25	11
			A1b	52a	21.00	3.94	19
			A1a	52b	21.00	3.94	19
	190.00		A1	T3	21.00	1.89	9
			A1a	T3b	21.00	3.78	18
			A1b	T3a	21.00	3.76	18
			A1b	T3	21.00	3.78	18
			A1a	T3a	21.00	3.76	18
			A1	T3b	21.00	1.89	9
	240.00	3/4 EHS	A1	96	34.98	2.64	8
			A1b	96a	34.98	6.83	20
			A1a	96b	34.98	6.83	20
1.0D + 1.0W 60° Wind	70.00	9/16 EHS	A1	28	21.00	2.95	14
			A1b	28a	21.00	2.95	14
			A1a	28b	21.00	4.55	22
	130.00		A1	52	21.00	2.80	13
			A1b	52a	21.00	2.80	13

1.0D + 1.0W 60° Wind	130.00	9/16 EHS	A1a	52b	21.00	4.52	22
	190.00		A1	T3	21.00	2.60	12
			A1a	T3b	21.00	4.42	21
			A1b	T3a	21.00	2.56	12
			A1b	T3	21.00	2.60	12
			A1a	T3a	21.00	4.42	21
			A1	T3b	21.00	2.56	12
	240.00		A1	96	34.98	4.17	12
			A1b	96a	34.98	4.17	12
			A1a	96b	34.98	8.39	24
1.0D + 1.0W 90° Wind	70.00	9/16 EHS	A1	28	21.00	3.49	17
			A1b	28a	21.00	2.56	12
			A1a	28b	21.00	4.41	21
	130.00		A1	52	21.00	3.36	16
			A1b	52a	21.00	2.39	11
			A1a	52b	21.00	4.36	21
	190.00		A1	T3	21.00	3.20	15
			A1a	T3b	21.00	4.24	20
			A1b	T3a	21.00	2.08	10
			A1b	T3	21.00	2.09	10
			A1a	T3a	21.00	4.23	20
			A1	T3b	21.00	3.16	15
	240.00		A1	96	34.98	5.49	16
			A1b	96a	34.98	3.09	9
			A1a	96b	34.98	7.94	23

Analysis Summary

Structure: FL09636-S-SBA	Code: TIA-222-H	7/19/2024
Site Name: Lulu	Exposure: C	
Height: 250.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II
		Page: 21



Max Reactions

Base:	92.40 (Vertical)	1.69 (Horizontal)
Anchor 1:	37.42 (Vertical)	44.79 (Horizontal)

Max Usages

Max Leg: 67.8% (1.2D + 1.0W 60° Wind - Sect 14)
 Max Diag: 60.7% (1.2D + 1.0W 90° Wind - Sect 14)
 Max Horiz: 38.3% (1.2D + 1.0W Normal Wind - Sect 12)
 Max Cable: 60.9% (0.9D + 1.0W 60° Wind) - Elev: 240 ft

Max Deflection, Twist and Sway

Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0Ev + 1.0Eh - Normal To Face	123.58	0.0047	-0.0096	0.0054
	223.58	0.0235	0.0022	0.0168
	246.79	0.0300	0.0102	0.0184
	250.00	0.0309	0.0098	0.0178
0.9D + 1.0W 119 mph Wind at 60° From Face	123.58	0.4096	0.0038	0.1286
	223.58	0.9308	0.0098	0.3583
	246.79	1.0816	0.0215	0.4233
	250.00	1.1036	0.0215	0.3793
0.9D + 1.0W 119 mph Wind at 90° From Face	123.58	0.4348	0.1009	0.1843
	223.58	1.2040	0.0642	0.5921
	246.79	1.4566	0.0782	0.6754
	250.00	1.4923	0.0783	0.6352
0.9D + 1.0W 119 mph Wind at Normal To Face	123.58	0.4446	0.0036	0.1931
	223.58	1.3441	0.0099	0.7055
	246.79	1.6459	0.0218	0.7968
	250.00	1.6885	0.0217	0.7540
1.0D + 1.0W 60 mph Wind at 60° From Face	123.58	0.0813	-0.0036	0.0175
	223.58	0.1761	0.0044	0.0692
	246.79	0.2049	0.0115	0.0851
	250.00	0.2092	0.0114	0.0726
1.0D + 1.0W 60 mph Wind at 90° From Face	123.58	0.0760	0.0307	0.0120
	223.58	0.1582	0.0276	0.0637
	246.79	0.1864	0.0377	0.0817
	250.00	0.1904	0.0377	0.0707
1.0D + 1.0W 60 mph Wind at Normal To Face	123.58	0.0711	-0.0027	0.0042
	223.58	0.1389	0.0047	0.0557
	246.79	0.1638	0.0113	0.0756
	250.00	0.1675	0.0112	0.0646
1.2D + 1.0Di + 1.0Wi 30 mph Wind at 60° From Face	123.58	0.0256	-0.0115	0.0049
	223.58	0.0450	0.0019	0.0155
	246.79	0.0506	0.0091	0.0194
	250.00	0.0515	0.0089	0.0154

1.2D + 1.0Di + 1.0Wi 30 mph Wind at 90° From Face	123.58	0.0245	-0.0032	0.0038
	223.58	0.0420	0.0058	0.0142
	246.79	0.0477	0.0170	0.0196
	250.00	0.0485	0.0167	0.0149

1.2D + 1.0Di + 1.0Wi 30 mph Wind at Normal From Face	123.58	0.0240	-0.0115	0.0034
	223.58	0.0394	0.0019	0.0137
	246.79	0.0446	0.0090	0.0192
	250.00	0.0454	0.0088	0.0150

1.2D + 1.0Ev + 1.0Eh - Normal To Face	123.58	0.0048	-0.0109	0.0058
	223.58	0.0240	0.0028	0.0169
	246.79	0.0305	0.0122	0.0188
	250.00	0.0314	0.0118	0.0183

1.2D + 1.0W 119 mph Wind at 60° From Face	123.58	0.4105	0.0034	0.1292
	223.58	0.9350	0.0101	0.3614
	246.79	1.0870	0.0222	0.4263
	250.00	1.1092	0.0222	0.3819

1.2D + 1.0W 119 mph Wind at 90° From Face	123.58	0.4360	0.0998	0.1858
	223.58	1.2143	0.0636	0.5989
	246.79	1.4704	0.0778	0.6833
	250.00	1.5065	0.0778	0.6437

1.2D + 1.0W 119 mph Wind at Normal To Face	123.58	0.4464	0.0031	0.1949
	223.58	1.3567	0.0104	0.7134
	246.79	1.6622	0.0226	0.8063
	250.00	1.7053	0.0225	0.7637

	Guyed Tower Base Design		<i>Date</i>	
			7/7/2024	
	Customer Name:	SBA Communications Corp	TIA Standard:	TIA-222-H
	Site Name:		Structure Height (Ft.):	250
	Site Number:	FL09636-S-SBA	Engineer Name:	H. You
	Engr. Number:	149980	Engineer Login ID:	

Foundation Info Obtained from:

Structure Type:

Analysis or Design?

Base Reactions (Factored):

Axial Load (Kips):	92.4	Shear Force (Kips):	1.7
Uplift Force (Kips):	0.0	Moment (Kips-ft):	

Allowable over stress %: 5.0%

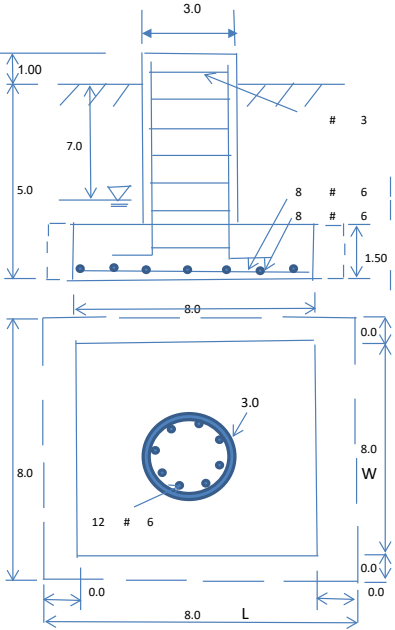
Foundation Geometries:

		Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	3.0	Depth of Base BG (ft.):	5.0
Pier Height A. G. (ft.):	1.00	Thickness of Pad (ft):	1.50
Length of Pad (ft.):	8	Width of Pad (ft.):	8

Final Length of pad (ft)	8.0	Final width of pad (ft):	8.0
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Material Properties and Reabr Info:

Concrete Strength (psi):	4000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi)	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	6	Tie / Stirrup Size #:	3	
Qty. of Vertical Rebars:	12	Tie Spacing (in):	6.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	6	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf
Rebar at the bottom of the concrete pad:				
Qty. of Rebar in Pad (L):	8	Qty. of Rebar in Pad (W):	8	



Soil Design Parameters:

Soil Unit Weight (pcf):	105.0	Soil Buoyant Weight:	50.0	Pcf	
Water Table B.G.S. (ft):	7.0	Unit Weight of Water:	62.4	pcf	Angle from Top of Pad:
Ultimate Bearing Pressure (psf):	5000	Ultimate Skin Friction:	0	Psf	Angle from Bottm of Pad:
					Angle from Bottm of Pad:

Foundation Analysis and Design:

Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.6
Total Dry Soil Volume (cu. Ft.):	199.26	Total Dry Soil Weight (Kips):	20.92
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00
Total Effective Soil Weight (Kips):	20.92	Weight from the Concrete Block at Top (K):	0.00
Total Dry Concrete Volume (cu. Ft.):	127.81	Total Dry Concrete Weight (Kips):	19.17
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00
Total Effective Concrete Weight (Kips):	19.17	Total Vertical Load on Base (Kips):	132.49

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	1601.3	<	Allowable Factored Soil Bearing (psf):	3000	0.53	OK!
Calculated Foundation Allowable Axail Capacity (Kips):	192.0	>	Design Factored Axial Load (Kips):	100	0.52	OK!

TES Engr. Number: 149980 Page 2/2 Date: 7/7/2024

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00

(1) Concrete Pier:

Vertical Steel Rebar Area (sq. in./each):	0.44	Tie / Stirrup Area (sq. in./each):	0.11			
Calculated Moment Capacity (Mn,Kips-Ft):	340.6	>	Design Factored Moment (Mu, Kips-Ft)	7.6	0.02	OK!
Calculated Shear Capacity (Kips):	159.9	>	Design Factored Shear (Kips):	1.7	0.01	OK!
Calculated Tension Capacity (Tn, Kips):	285.1	>	Design Factored Tension (Tu Kips):	0.0	0.00	OK!
Calculated Compression Capacity (Pn, Kips):	1790.3	>	Design Factored Axial Load (Pu Kips):	92.4	0.05	OK!
Moment & Axial Strength Combination(Pu/Pn+Mu/Mn):	0.07	OK!				
Pier Reinforcement Ratio:	0.005					

(2).Concrete Pad:

One-Way Design Shear Capacity (L-Dir. Kips):	133.2	>	One-Way Factored Shear (L-Dir Kips):	15.8	0.12	OK!
One-Way Design Shear Capacity (W-Dir. Kips):	133.2	>	One-Way Factored Shear (W-Dir Kips)	15.8	0.12	OK!
Two-Way Design Shear Capacity (Kips):	441.3	>	Two-Way Factored Shear (Kips):	71.1	0.16	OK!
Lower Steel Pad Reinforcement Ratio (L-Direct.):	0.0025	OK!	Lower Steel Pad Reinf. Ratio (W-Direc	0.0025		OK!
Lower Steel Pad Moment Capacity (L-Direction, Kips-ft):	226.5	>	Moment at Bottom (L-Direct. K-Ft):	38.6	0.17	OK!
Lower Steel Pad Moment Capacity (W-Dir. Kips-ft):	226.5	>	Moment at Bottom (W-Dir. Kips-Ft):	38.6	0.17	OK!

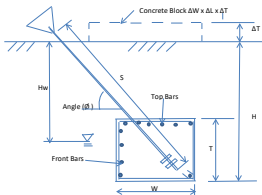
A. Inner Anchors:

Radius (ft.): 200

Pile Inner Anchors:		Radius (ft.):	200
H (ft.):	7.5	Height (ft.):	39.0
r (ft.):	25.0	W (ft.):	3.5
T (ft.):	4.0	Angle (deg):	39.9
S (ft.):	12.48		

Top bars:	5	#	6
Front bars:	5	#	6

Concrete Volume (Cu. Yd.)/Each:	12.96
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<u>Check Soil and Foundation Capacities</u>					
Nominal Factored Uplift Resistance:	126.75	Kips >	Design Uplift Force (Kips):	37.4	OK!
Ultimate Shear Friction Resistance at base:	24.57	Kips	Ultimate Resistance Pressure:	1577.5	OK!
Factored Shear Resistance:	143.04	Kips >	Design Shear Force (Kips):	44.8	OK!

Rebar Size (#):	6	Wind Load Factor on Concrete Design:	1.00
Qty. of the Rebar at top of the block:	5	Qty. of the Rebar in the front of the block:	5
Area of Single Rebar (sq. in.):	0.44	Factor for concrete compression zone:	0.85
One Way Shear due to Shear Force (Kips):	22.4	One Way Shear Capacity for shear (Kips):	140.9
One Way Shear due to Uplift (Kips):	140.0	One Way Shear Capacity for uplift (Kips):	151.8
Moment due to Shear Load (K-fts):	136.9	Flexural Capacity for Shear Load (K-fts):	376.1
Moment due to uplift Load (K-fts):	136.9	Flexural Capacity for uplift Load (K-fts):	376.1
Ratio of Design Moment/Moment capacity:	0.37	Minimum ratio of rebar (top & front):	0.17
Max. Ratio of Shear Force/Shear capacity:	0.15		

9.9