Prepared for:
Ericsson

Water Tower Threshold Analysis Report

August 2, 2024

**SGS Towers Project Number:**   2406204

Supporting Structure Information: Fluted Column Water Tank

Carrier: AT&T
Carrier Site Name: SOH3567
Carrier Site ID: AVERY PARK WT
FA ID Number: 10070814

Site Information: 7699 Avery Road
Dublin, OH 43017 (Franklin County)
40.127833, -83.163056

Overall Analysis Result: Sufficient
Refer to Appendix A for calculations supporting the capacity ratings
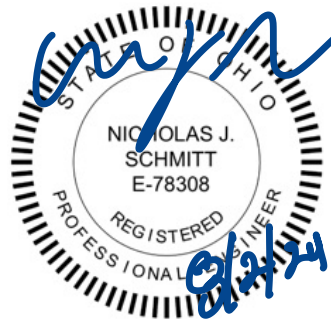
Prepared by: Tim Wordekemper, EI   DS

Executive Summary

This is a fluted column water tank. The water tank manufacturer drawings were not available at the time of this analysis. Due to this, drone photogrammetry and point cloud data was utilized to determine approximate dimension detailing for the water tank structure.

Analysis Criteria

Applicable Codes: AWWA D100-21
Risk Category: IV
Ultimate Wind Speed: 119 mph
Exposure Category: C
Topographic Category   1.0
Seismic Parameters: S_S: 0.123 / S_1 0.06

Final Loading Configuration

Elevations (ft)		Sector Position	Equipment Quantity	Equipment Manufacturer | Model	Notes
Mount	Equipment				
128	130	A2/B2/C2	3	ERICSSON | AIR 6419 B77D	1
	128	A1/B1/C1	3	COMMSCOPE | NNH4-65C-R6	
		A3/B3/C3	3	COMMSCOPE | NNH4-65C-R6	
	126	A2/B2/C2	3	ERICSSON | AIR 6419 B77G	
-	128	A1/B1/C1	3	ERICSSON | 4490 B5/B12A	2
		A1/B1/C1	3	ERICSSON | 4415 B30	
		A3/B3/C3	3	ERICSSON | 4478 B14	
		A3/B3/C3	3	ERICSSON | 4890 B25/B66	
		A1/B1	2	RAYCAP | DC6-48-60-18-8F	
		C1	1	RAYCAP | DC9-48-60-24-8C-EV	

Notes:
1) A = Alpha (0°) / B = Beta (120°) / C = Gamma (240°)
2) Equipment located on the interior of the water tank.
3) Refer to Appendix A for additional loading considered

Supporting Documentation

Document Type	Document Details
Mount Analysis Report	SGS Towers / Project No. 2405260, dated 06/13/2024
Previous Structural Assessment Letter	Jacobs Telecommunications, Inc. / Project No. EUAT0212, dated 03/30/2021
RFDS	WOID: RFDS-10361 / Last Modified Date: 03/25/2024
Scoping Document	LTE.CBAND.10070814.DE130.05142024.AVERY PARK WT.OHL03567

Assumptions

1) Structure was built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the Final Loading Configuration table and the supporting documents.
3) The analysis will be required to be revised if the existing conditions in the field differ from those shown in the referenced supporting documents or assumed in this analysis. No allowance was made for any damaged, missing, or rusted members.

The results of this analysis may be affected if any of the above-mentioned assumptions are not valid or have been made in error. SGS Towers shall be notified to determine the effect on the structural integrity of the supporting structure.

Conclusion and Recommendations

The structure has sufficient capacity to carry the proposed load configuration. No modifications are required at this time.
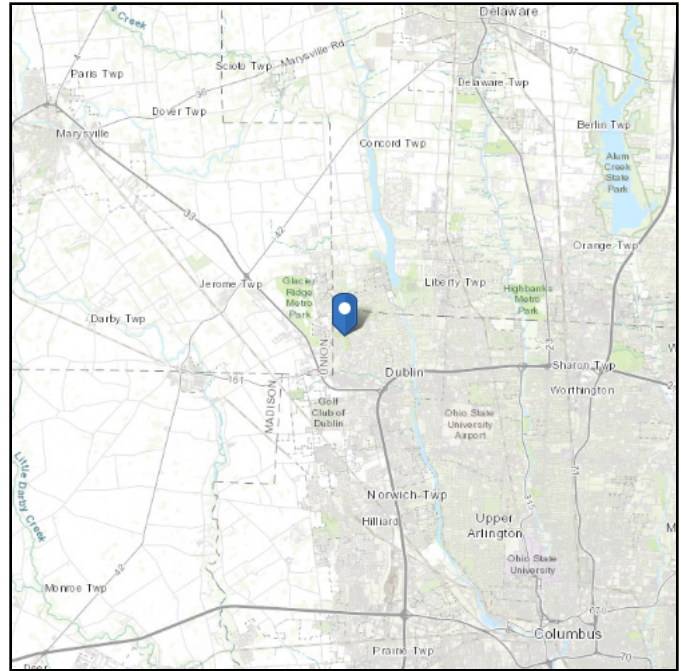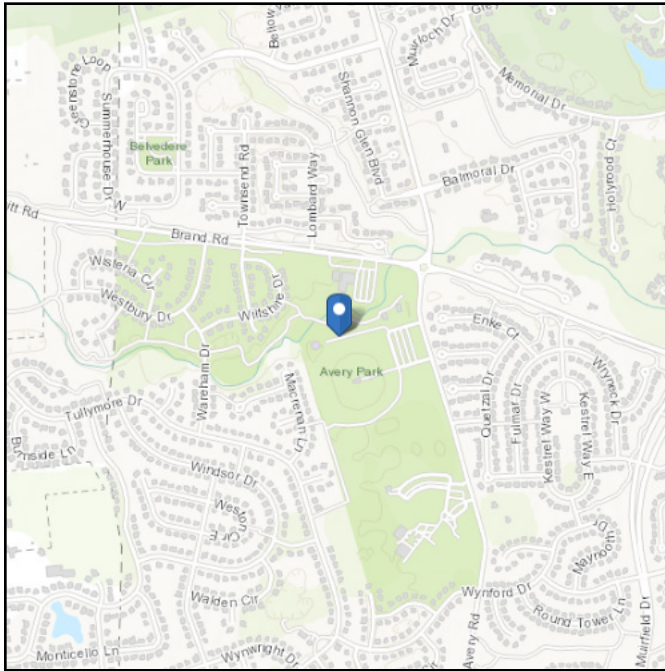
APPENDIX A

CALCULATIONS & ANALYSIS SUMMARY

ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: IV
Soil Class: D - Default (see Section 11.4.3)

Latitude: 40.128056
Longitude: -83.162222
Elevation: 919.5828669496167 ft (NAVD 88)

Wind

Results:

Wind Speed	119 Vmph
10-year MRI	75 Vmph
25-year MRI	81 Vmph
50-year MRI	85 Vmph
100-year MRI	93 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1D and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Tue Jul 30 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 1.6% probability of exceedance in 50 years (annual exceedance probability = 0.00033, MRI = 3,000 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2.

Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_S :	0.123	S_{D1} :	0.096
S_1 :	0.06	T_L :	12
F_a :	1.6	PGA :	0.062
F_v :	2.4	PGA_M :	0.1
S_{MS} :	0.196	F_{PGA} :	1.6
S_{M1} :	0.144	I_e :	1.5
S_{DS} :	0.131	C_v :	0.7

Seismic Design Category: C

MCE$_R$ Response Spectrum

S_a(g) vs T(s)

Design Response Spectrum

S_a(g) vs T(s)

MCE$_R$ Vertical Response Spectrum
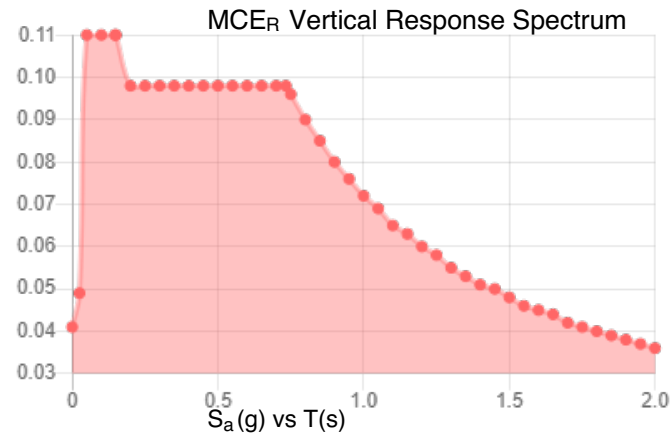

S_a(g) vs T(s)

Design Vertical Response Spectrum

S_a(g) vs T(s)
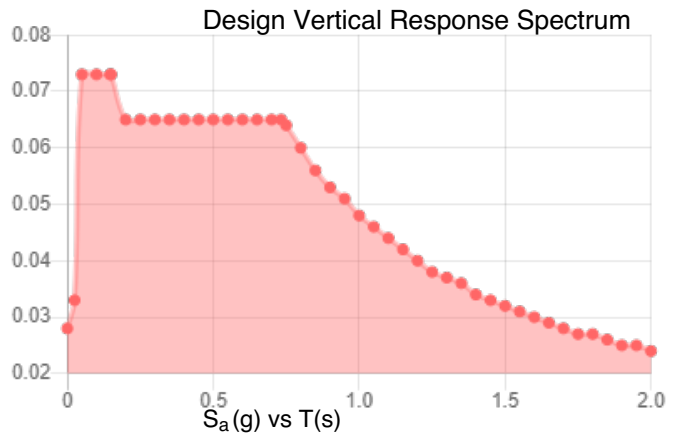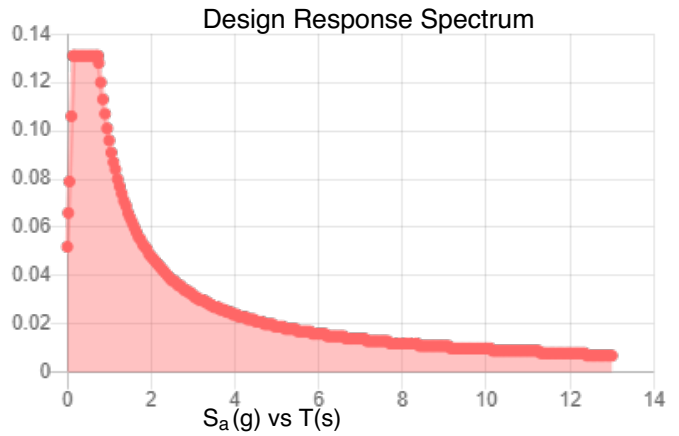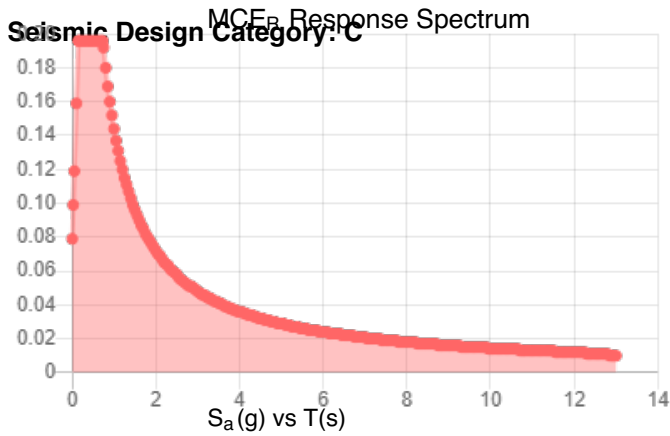
Data Accessed: **Tue Jul 30 2024**

Date Source:
USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

The ASCE Hazard Tool is provided for your convenience, for informational purposes only, and is provided "as is" and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

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Fluted Column Elevated Water Tank

Analysis Criteria

AWWA Standard D100-	2021	
International Building Code (IBC):	2021	
Exposure Category:	C	- AWWA D100-21 Section 3.1.6.2
Risk Category:	IV	
Gust Effect Factor (G_h) :	0.85	- AWWA D100-21 Section 3.1.6.4
Ultimate Wind Speed (V):	119	mph. - From ASCE7 hazards report
Topographic Effects (K_{zt}):	1.00	- AWWA D100-21 Section 3.1.6.3
Ground Snow Load (p_g):	20	psf. - From ASCE7 hazards report
Ground Elevation (z_g):	919	ft - ASCE 7-16 Section 26.9
Exposure Factor (C_e):	0.9	- AWWA D100-21 Section 3.1.4.2
Thermal Factor (C_t):	1.2	- AWWA D100-21 Section 3.1.4.2
Importance Factor for Snow (I_s) :	1.2	- AWWA D100-21 Section 3.1.4.2
Tank Roof Slope (Θ_r):	14.9	deg.
Calculated Slope Factor (C_s):	1.0	- AWWA D100-21 Section 3.1.4.3 Formula 3-2
Between 0 and 1 Check (C_s):	-----	
Minimum Value Check (C_s):	-----	- Slope factor cannot be less than zero
Maximum Value Check (C_s):	1	- Slope factor cannot be greater than 1
Final Slope Factor (C_s):	1.0	
Flat Roof Snow Load (p_f):	18.1	psf. - AWWA D100-21 Section 3.1.4.3 - EQ. 3-1
Sloped Roof Snow Load (p_s):	18.1	psf. - AWWA D100-21 Section 3.1.4.3 - EQ. 3-3
Strength to Service Level Factor for Wind (λ_w):	0.6	- AWWA D100-21 Section 3.1.6.5
Directionality Factor (K_d):	1.0	- AWWA D100-21 Section 3.1.6.5
Velocity Pressure Coefficient ($K_{z\ top}$) :	1.43	- At top of tank AWWA D100-21 Section 3.1.6.5 - Table 2
Velocity Pressure Coefficient ($K_{z\ bott}$) :	0.85	- At bottom of shaft AWWA D100-21 Section 3.1.6.5 - table 2

Fluted Column Elevated Water Tank

Tank Geometry

Tank

Elevation of the top of structure (H_{tank}):	176.6	ft. (AGL)
Diameter of tank (D_{tank}):	101.4	ft.
Height of tank top dome (H_{top}):	13.5	ft.
Height of tank mid-section (H_{flat}):	23.4	ft.
Height of tank tapered section (H_t):	10.2	ft.
Water tank capacity (V_{tank}):	2000000	gal. (assumed)

Shaft

Outer Diameter of shaft (D_{shaft}):	79.4	ft
Elevation of the top of shaft (H_{shaft}):	129.5	ft. $H_{tank} - H_{top} - H_{fl}$
Total length of shaft Override (H_{shaft}):		ft.
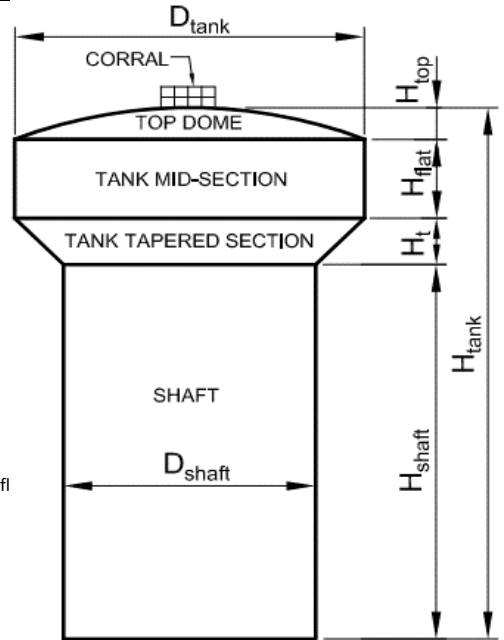
Corral

Corral Diameter:	29.8	ft.
Corral Height:	3.5	ft.
Number of Railing Panels:	16	
Number of Diagonals per Panel:	0	
Number of Railing Verticals:	16	
Number of Railing Horizontals:	2	

Corral Member Cross Sections / Projected Widths (in)

Toe Plate Cross Section:	Flat Plate	4
Railing Horizontal 1 Cross Section:	Open Shape	2.5
Railing Horizontal 2 Cross Section:	Open Shape	2.5
Railing Horizontal 3 Cross Section:	N/A	N/A
Railing Diagonal Cross Section:	N/A	N/A
Railing Vertical Cross Section:	Open Shape	2.5

Fluted Column Elevated Water Tank

Discrete Appurtenances - Input Based on Dimensions

Description	Quantity (N_{app})	Elevation (ft.)	Flat / Round	Exposure Factor	Height or Length (in.)	Width (in.)	Depth (in.)	Weight per Item (lbs.)
ATT - COMMSCOPE | NNH4-65C-R6 (Sector)	6	128	Flat	0.90	96	19.6	7.8	99.2
ATT - ERICSSON | AIR 6419 B77D (Sector)	3	128	Flat	0.90	28.23	16.06	7.05	62.4
ATT - ERICSSON | AIR 6419 B77G (Sector)	3	128	Flat	0.90	31.1	16.1	7.3	55.4
ATT - ERICSSON | 4490 B5 B12A	3	128	Flat	0.00	15.1	17.5	6.8	68.0
ATT - ERICSSON | 4415 B30	3	128	Flat	0.00	14.96	13.18	5.04	42.9
ATT - ERICSSON | 4478 B14	3	128	Flat	0.00	18.1	13.4	8.26	59.4
ATT - ERICSSON | 4890 B25 B66	3	128	Flat	0.00	15.1	17.5	6.9	68
ATT - RAYCAP | DC9-48-60-24-8C-EV	1	128	Round	0.00	31.41	10.24	10.24	26.2
ATT - RAYCAP | DC6-48-60-18-8F	2	128	Round	0.00	31.5	11	11	33
Unknown | 8'x2' Panel (Sector)	3	128	Flat	0.90	96	24	8	100.0
Unknown | 3'x2' Panel (Sector)	3	128	Flat	0.90	36	24	6	80.0
Unknown | RRU 1	6	128	Flat	0.25	24	8	18	60
POD Shroud	1	189.7	Round	1.00	57.6	235.2	235.2	500
POD Shaft	1	183.15	Round	1.00	157.2	69.6	69.6	3000
POD Antenna 1 (Sector)	6	189.7	Flat	0.50	96	12	6	45
POD Antenna 2 (Sector)	6	189.7	Flat	0.50	48	12	6	25.0
POD RRU 1 (Sector)	6	189.7	Flat	0.25	24	18	8	60.0
POD P2P 1	1	192	Flat	1.00	36	18	10	30
POD Omni 1	1	198	Round	1.00	120	2	2	20
POD Omni 2	1	198	Round	1.00	60	2	2	10
POD Surge	1	189.7	Flat	0.00	28	14	8	30

Total Weight (lbs): 7025.7

SGS Project No.:						2406204	
Site Name:						SOH3567	
Site Number:						10070814	
Analysis Date:						TJW 07/30/2024	

Fluted Column Elevated Water Tank

Input - Feedlines and Linear Appurtenances

Description	Quantity	Elevation (ft.)	Projected Width of Cluster (in.)	Weight of Single Line (lb/lft.)	Shielding Factor	C_a	(EPA) C_aA_a (ft²)
ATT - 1-5/8" FH (Inside)	12	128	0.00	1.53	0.00	0.00	0.00
ATT - 18 Pair Fiber Trunk (Inside)	2	128	0.00	0.06	0.00	0.00	0.00
ATT - 24 Pair Fiber Trunk (Inside)	1	128	0.00	0.06	0.00	0.00	0.00
Other - 1-5/8" FH (Inside)	6	128	0.00	1.53	0.00	0.00	0.00
Other - 1-5/8" FH (Inside)	16	189.7	0.00	1.53	0.00	0.00	0.00

Total Weight (lbs): 8192.02

Fluted Column Elevated Water Tank

Results - Discrete Appurtenances - Input Based on Dimensions

Description	Quantity (N$_{app}$)	Elev. (ft.) AGL	K$_z$	C	Aspect Ratio	C$_a$	A$_a$ ft^2	(EPA) C$_a$A$_a$ ft^2	F$_a$ lbs.	M$_{ovt}$ (ft-kip)
ATT - COMMSCOPE | NNH4-65C-R6 (Sector)	6	128.0	1.33	---	4.90	1.31	13.07	37.91	**1466.9**	**187.8**
ATT - ERICSSON | AIR 6419 B77D (Sector)	3	128.0	1.33	---	1.76	1.20	3.15	8.29	**160.5**	**20.5**
ATT - ERICSSON | AIR 6419 B77G (Sector)	3	128.0	1.33	---	1.93	1.20	3.48	9.28	**179.6**	**23.0**
ATT - ERICSSON | 4490 B5 B12A	3	128.0	1.33	---	1.16	1.20	1.84	2.20	**0.0**	**0.0**
ATT - ERICSSON | 4415 B30	3	128.0	1.33	---	1.14	1.20	1.37	1.64	**0.0**	**0.0**
ATT - ERICSSON | 4478 B14	3	128.0	1.33	---	1.35	1.20	1.68	2.02	**0.0**	**0.0**
ATT - ERICSSON | 4890 B25 B66	3	128.0	1.33	---	1.16	1.20	1.84	2.20	**0.0**	**0.0**
ATT - RAYCAP | DC9-48-60-24-8C-EV	1	128.0	1.33	109.5	3.07	0.51	2.23	1.14	**0.0**	**0.0**
ATT - RAYCAP | DC6-48-60-18-8F	2	128.0	1.33	117.6	2.86	0.51	2.41	1.22	**0.0**	**0.0**
Unknown | 8'x2' Panel (Sector)	3	128.0	1.33	---	4.00	1.27	16.00	42.93	**830.7**	**106.3**
Unknown | 3'x2' Panel (Sector)	3	128.0	1.33	---	1.50	1.20	6.00	13.85	**268.0**	**34.3**
Unknown | RRU 1	6	128.0	1.33	---	3.00	1.22	1.33	1.63	**52.5**	**6.7**
POD Shroud	1	189.7	1.45	2621.4	4.08	0.54	94.08	50.35	**1175.9**	**223.1**
POD Shaft	1	183.2	1.44	772.9	2.26	0.50	75.98	37.99	**880.7**	**161.3**
POD Antenna 1 (Sector)	6	189.7	1.45	---	8.00	1.43	8.00	27.40	**639.9**	**121.4**
POD Antenna 2 (Sector)	6	189.7	1.45	---	4.00	1.27	4.00	11.90	**277.9**	**52.7**
POD RRU 1 (Sector)	6	189.7	1.45	---	1.33	1.20	3.00	7.84	**91.6**	**17.4**
POD P2P 1	1	192.0	1.45	---	2.00	1.20	4.50	5.40	**126.4**	**24.3**
POD Omni 1	1	198.0	1.46	22.4	60.00	1.20	1.67	2.00	**47.1**	**9.3**
POD Omni 2	1	198.0	1.46	22.4	30.00	1.20	0.83	1.00	**23.6**	**4.7**
POD Surge	1	189.7	1.45	---	2.00	1.20	2.72	3.27	**0.0**	**0.0**
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							Sum:		6221.3	992.8

Fluted Column Elevated Water Tank

Results - Feedlines and Linear Appurtenances

$K_{z\ min.} = 0.85$ (EPA)

Description	Quantity	Elevation (ft.)	$K_{z\ max}$	$K_{z\ avg.}$	C_a	$C_a A_a$ (ft^2)	$q_{z\ avg.}$ psf.	F_a lbs.	M_{ovt} (ft-kip)
ATT - 1-5/8" FH (Inside)	12	128.0	1.33	1.09	0.00	0.00	20.70	**0.0**	0.0
ATT - 18 Pair Fiber Trunk (Inside)	2	128.0	1.33	1.09	0.00	0.00	20.70	**0.0**	0.0
ATT - 24 Pair Fiber Trunk (Inside)	1	128.0	1.33	1.09	0.00	0.00	20.70	**0.0**	0.0
Other - 1-5/8" FH (Inside)	6	128.0	1.33	1.09	0.00	0.00	20.70	**0.0**	0.0
Other - 1-5/8" FH (Inside)	16	189.7	1.45	1.15	0.00	0.00	21.79	**0.0**	0.0
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							Sum:	0.0	0.0

Fluted Column Elevated Water Tank

Results - Existing Structure Geometry & Analysis Parameters

Wind Load and Parameters from AWWA D100-21 Section 3 and Table 3

$P_w = q_z G C_f => 30 C_f$ - AWWA-D100-21 (Eq 3-5)

$q_z = \lambda_w (0.00256 K_z K_{zt} K_d V^2)$ - AWWA-D100-21 (Eq 3-4)

G: 0.85 - User input - AWWA D100-21 Section 3.1.6.6

C_f: 0.50 - Wind drag coefficient for top dome (double-curved)

C_f: See Below - Wind drag coefficient for tank mid-section, tapered, and shaft

C_f: 1.3 - Wind drag coefficient for flat shapes
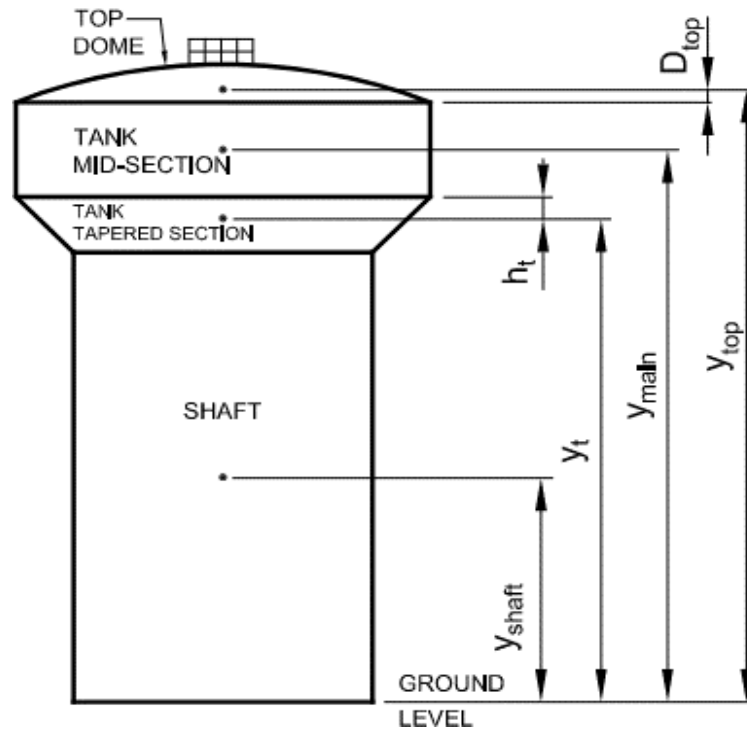
C_f: 1.8 - Wind drag coefficient for structural shapes.

K_{zt}: 1.00 - User Input - AWWA D100-21 Section 3.1.6.3

K_d: 1.0   - Directionality Factor - AWWA D100-21 - 3.1.6.5

λ_w: 0.6 - Strength to service factor for wind - AWWA D100-21 - 3.1.6.5

F_a : - Lateral load = P_w * (Projected Area)

M_{ovt} : - Overturning moment = F_a * (Centroid AGL)

Fluted Column Elevated Water Tank

Results - Existing Structure Geometry Parameters

Top Dome

(L_{top}) :	**88.45**	**ft.** $= (1/2H_{top}) * (D_{tank}/2) - (0.5*H_{top})$
Radius of curvature (R_{top}) :	**101.95**	**ft.** $= (1/2H_{top}) * (D_{tank}/2) + (0.5*H_{top})$
Arc angle (Θ_{top}):	**59.64**	**deg.** $= 2*\cos^{-1}(L_{top}/R_{top})$
Projected Area (A_{top}):	**925.41**	**ft^2** $=(\Theta_{top}R_{top}{}^2/2) - (0.5L_{top}D_{tank})$
Centroid of top dome (D_{top}):	**5.43**	**ft** $= (4R_{top}\sin(\Theta_{top})^3/2) / (3(\Theta_{top}-\sin(\Theta_{top}))) - L_{top}$
Elevation of top dome centroid: (y_{top}):	**168.53**	**ft.** $= (H_{tank}-H_{top})+D_{top}$
Wind pressure factor for top dome (K_z):	**1.41**	$= 2.01(y_{top}/z_g)^{2/\alpha}$
Wind pressure (q_z):	**30.7**	**psf.** - See formula above
Wind drag coefficient for top dome (C_f):	**0.5**	
Wind pressure on top dome (P_{wtd}):	**15.0**	**psf.** - See formulas above

Tank Mid-Section

Projected Area (A_{main}):	**2372.76**	**ft^2** $= H_{main} * D_{tank}$
Elevation of tank mid-section centroid (y_{main}):	**151.40**	**ft** $= H_{tank} - H_{top} - (H_{flat}/2)$
Wind pressure factor for tank mid-section (K_z):	**1.38**	$= 2.01(y_{main}/z_g)^{2/\alpha}$
Wind pressure (q_z):	**30.0**	**psf.**
Wind drag coefficient for tank mid-section (C_f):	**0.5**	
Wind pressure on tank mid-section (P_{wm}):	**15.0**	**psf.**

Tank Tapered Section

Projected Area (A_t):	**922.08**	**ft^2** - $H_t*(D_{tank}+D_{shaft})/2$
Centroid of tapered section (h_t):	**4.89**	**ft** - $(H_t/3)*(D_{tank}+2D_{shaft})/(D_{tank}+D_{shaft})$
Elevation of centroid of tapered section (y_t):	**134.81**	**ft** - $H_{tank} - H_{top} - H_{flat} - h_t$
Wind pressure factor for tank tapered section (K_z):	**1.35**	$= 2.01(y_t/z_g)^{2/\alpha}$
Wind pressure (q_z):	**29.32**	**psf.**
Wind drag coefficient for tank tapered section (C_f):	**0.5**	
Wind pressure on tank mid-section (P_{wm}):	**15.0**	**psf.**

Shaft

Projected area (A_{shaft}):	**129.50**	**ft^2** $= H_{shaft}*D_{shaft}$
Elevation of the centroid of shaft (y_{shaft}):	**64.75**	**ft** $= H_{shaft} / 2$
Wind pressure factor for shaft (K_z):	**1.15**	$= 2.01(z/z_g)^{2/\alpha}$
Wind pressure on shaft (q_z):	**25.1**	psf. - (Eq 3-2)
Wind drag coefficient (C_f):	**0.82**	AWWA D100-11 Table 2
Wind load on shaft $(P_{w\ shaft})$:	**24.6**	psf. - (Eq 3-1)

SGS Project No.:	2406204
Site Name:	SOH3567
Site Number:	10070814
Analysis Date:	TJW 07/30/2024

Fluted Column Elevated Water Tank

Loading on Water Tank Structure

Description	Centroid (ft.) AGL	K_z	q_z (psf)	$d*\sqrt{q_z}$	l/d	C_f	P_w (psf)	Projected Area (ft^2)	F_a kip	M_{ovt} ft-kip
Tank Top Dome	168.53	1.41	30.7	Double Curved	0.2	0.5	15.0	925.4	**13.9**	**2339.4**
Tank Mid-Section	151.40	1.38	30.0	555.8	0.1	0.5	15.0	2372.8	**35.6**	**5388.5**
Tank Tapered Section	134.81	1.35	29.3	489.5	0.1	0.5	15.0	922.1	**13.8**	**1864.5**
Shaft	64.75	1.15	25.1	398.0	1.6	0.821	24.6	129.5	**3.2**	**206.5**
Corral										
Toe Plate	176.60	1.43	27.06	Structural	----	1.30	39.00	31.21	**1.2**	**214.9**
Railing Horizontal 1	180.10	1.43	27.18	Structural	----	1.80	54.00	19.50	**1.1**	**189.7**
Railing Horizontal 2	178.35	1.43	27.12	Structural	----	1.80	54.00	19.50	**1.1**	**187.8**
Railing Vertical	178.35	1.43	27.12	Structural	----	1.80	54.00	11.67	**0.6**	**112.4**
								Sum:	**70.4**	**10503.9**
								Override:		

Fluted Column Elevated Water Tank

Loading on Water Tank Structure

Vertical Loads

Full tank capacity (V_{tank}): 2000000 gal. (assumed)

Weight of only water at full tank capacity (W_{water}): 16683332 lbs. = (Gallons * 0.134 * 62.4 PCF.)

Detailed Structural Steel Weight available?: No

Weight of tank and support structure (no water) (W_{steel}): 834166.6 lbs. = 5% of maximum water weight (assumed)

Weight of tank, support structure, and water (W_{exist}): 17517499 lbs.

Total weight of discrete appurtenances: 7025.7 lbs.

Total weight of linear appurtenances: 8192.02 lbs.

Total weight of appurtenances (W_{app}): 15217.7 lbs.

Total weight of tank, support structure, water, and appurtenances (W_{total}): 17532716 lbs.

Fluted Column Elevated Water Tank

Load Increase Summary

	Vertical Load (lbs.)	Lateral Load (lbs.)	Overturning Moment (ft-kip)
Existing tank, tank support structure, and water with no appurtenances:	17517499	70447.0	10503.9
Discrete appurtenances:	7025.7	6221.3	992.8
Feedlines & linear appurtenances:	8192.0	0.0	0.0
Total appurtenance loading:	15217.7	6221.3	992.8
Total Load:	17532716	76668.3	11496.6

	Vertical Load	Lateral Load	Overturning Moment
Percent increase in loading from appurtenances:	0.09%	8.83%	9.45%

The water tank and its support structure have an increase of 8.83% of lateral load and an increase of 9.45% in overturning moment, at its base, as a result of all of the appurtenances. Based upon section 1103.1 and section 1103.2, of the 2021 International Existing Building Code (IEBC), the water tank support structure has acceptable capacity.