STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

November 3, 2021

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-034-210909** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 48 Newtown Road, Danbury, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) is in receipt of your correspondence of November 3, 2021 submitted in response to the Council's October 28, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/MP

From: Dandeneau, Kathleen <KDANDENEAU@RC.com>
Sent: Wednesday, November 3, 2021 8:10 AM
To: Bachman, Melanie <Melanie.Bachman@ct.gov>; CSC-DL Siting Council <Siting.Council@ct.gov>
Cc: Baldwin, Kenneth <KBALDWIN@RC.com>; Mayo, Rachel <rmayo@RC.com>
Subject: EM-VER-034-210909 - 48 Newtown Road, Danbury, CT - Updated SA

Per the Siting Council's October 29, 2021 Exempt Modification Incomplete letter, attached is the updated SA that the Siting Council requested. A hard copy is also being sent via U.S. Mail.

Kathleen M. Dandeneau
Legal Administrative Assistant

Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103
Direct 860.541.2689 | Fax 860.275.8299
kdandeneau@rc.com

(REVISED)
STRUCTURAL ANALYSIS REPORT

For

GERMANTOWN CT

50 Newtown Road
Danbury, CT 06810

Antennas Mounted to the Monopole

Prepared for:

verizon

20 Alexander Drive
Wallingford CT 06492

Dated: October 29, 2021 (Rev.1)
April 27, 2021

Prepared by:

HUDSON
Design Group LLC

45 Beechwood Drive
North Andover, MA 01845
(P) 978.557.5553 (F) 978.336.5586
www.hudsondesigngroupllc.com

SCOPE OF WORK:

Hudson Design Group LLC (HDG) has been authorized by Verizon to conduct a structural evaluation of the 110' monopole supporting the existing and proposed Verizon's antennas located at elevation 90' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of Verizon's existing and proposed antennas listed below.

The following documents were used for our reference:

- Tower Mapping Report prepared by ProVertic LLC dated November 19, 2019.
- Previous HDG Structural Analysis dated February 20, 2020.
- Mount Structural Analysis prepared by Maser Consulting dated March 31, 2021.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole and foundation **are in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The monopole structure is rated at **79.5%** - (Pole Section L6 from El.1' to El.21' Controlling).

FOUNDATION SUMMARY:

Based on our evaluation, we have determined that the existing foundation **is in conformance** with the ANSI/TIA-222-G Standard for the loading considered under the criteria listed in this report. The foundation is rated at **83.3 %** - (Moment Controlling).

HUDSON Design Group LLC

APPURTENANCES CONFIGURATION

Tenant	Appurtenances	Elev.	Mount
	(3) Powerwave 7770 Antennas	100'	V - Frame
	(1) OPA-65R-LCUU-H6 Antenna	100'	V - Frame
	(2) OPA-65R-LCUU-H4 Antennas	100'	V - Frame
	(1) HPA-65R-BUU-H6 Antenna	100'	V - Frame
	(2) SBNHH-1D65A Antennas	100'	V - Frame
	(1) 800-10965 Antenna	100'	V - Frame
	(2) 800-10964 Antennas	100'	V - Frame
	(6) LGP21401 TMA's	100'	V - Frame
	(6) TPX-070821 Triplexers	100'	V - Frame
	(3) RRUS-11 RRH's	100'	V - Frame
	(9) RRUS-32 RRH's	100'	V - Frame
	(3) B14 4478 RRH's	100'	V - Frame
	(3) Squid Surge Arrestor	100'	V - Frame
Verizon	(1) BXA-80063-6BF Antenna	90'	Platform
Verizon	(2) BXA-80080-6CF Antennas	90'	Platform
Verizon	(6) JAHH-65B-R3B Antennas	90'	Platform
Verizon	(3) XXDWMM Antennas w/ CBRS RRH-RT4401	90'	Platform
Verizon	(3) B5/B13 RRH-BR04C RRH's	90'	Platform
Verizon	(3) B2/B66A RRH-BR049 RRH's	90'	Platform
Verizon	(3) CBC78T-DS-43-2X Diplexers	90'	Platform
Verizon	(2) Junction Boxes	90'	Platform
Verizon	**(3) MT6407-77A Antennas**	90'	Platform

Proposed Verizon Appurtenances shown in Bold.

VERIZON EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
VERIZON	(6) 1 5/8" Cables	90'	Inside Monopole
VERIZON	**(2) 6x12 Hybrid Cables**	90'	Inside Monopole

Proposed Verizon Coax Cables shown in Bold.

HUDSON Design Group LLC

ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	10.1 %	97.5 – 111	PASS	
Pole Section-L2	10.1 %	97 – 97.5	PASS	
Pole Section-L3	66.4 %	72 – 97	PASS	
Pole Section-L4	79.4 %	47 – 72	PASS	
Pole Section-L5	78.9 %	21 – 47	PASS	
Pole Section-L6	**79.5 %**	1 – 21	PASS	**Controlling**

FOUNDATION RESULTS SUMMARY:

Component	Stress Ratio	Pass/Fail	Comments
Bearing	4.4 %	PASS	
Moment	**83.3 %**	PASS	**Controlling**

HUDSON Design Group LLC

DESIGN CRITERIA:

1. EIA/TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures

   County: Fairfield
   Wind Load: 110 mph (3 second gust)
   Structural Class: II
   Exposure Category: B
   Topographic Category: 1
   Nominal Ice Thickness: 0.75 inch

2. Approximate height above grade to proposed antennas: 90'

ASSUMPTIONS:

1. The appurtenances configuration is as stated in this report. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.

2. The monopole and foundation are properly constructed and maintained. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.

3. The support mounts and platforms are not analyzed and are considered adequate to support the loading. The analysis is limited to the primary support structure itself.

4. All prior structural modification, if any, are assumed to be as per the data supplied (if available), and installed properly.

SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas, RRUs and quadplexers be mounted on the existing platform supported by the monopole.

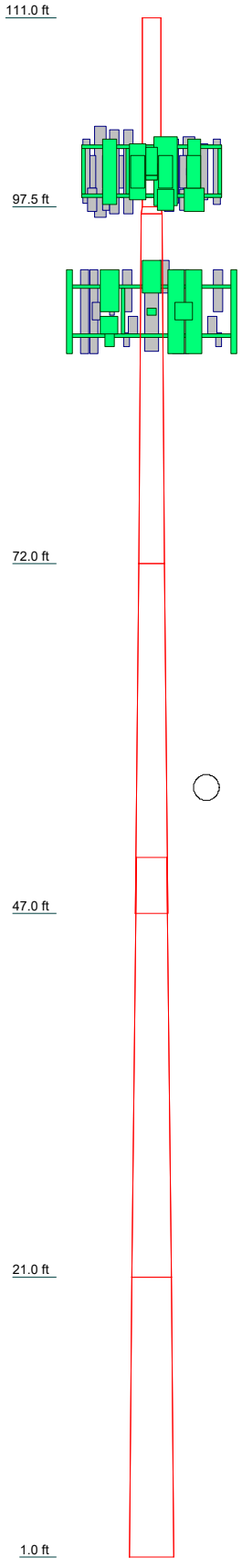
Photo 1: Photo illustrating the monopole with Appurtenances shown.

HUDSON
Design Group LLC

CALCULATIONS

Section	1	2	3	4	5	6
Length (ft)	13.50	0.50	25.00	25.00	30.00	20.00
Number of Sides	1	1	18	18	18	18
Thickness (in)	0.3750	0.3750	0.2500	0.3000	0.3650	0.3890
Socket Length (ft)				4.00		
Top Dia (in)	16.0000	16.0000	17.4900	22.7350	26.5408	33.3920
Bot Dia (in)	16.0000	17.4900	22.7350	27.9800	33.3920	37.0000
Grade	A36	A36	A36	A572-65	A572-65	A572-65
Weight (lb)	845.6	32.8	1340.8	2029.7	3500.8	2924.7

Total Weight (lb): 10674.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) Sabre 12' V-Boom (ATI)	100	TPX-070821 Triplexer (ATI)	100
7770 Antenna w/ Mounting Pipe (ATI)	100	TPX-070821 Triplexer (ATI)	100
7770 Antenna w/ Mounting Pipe (ATI)	100	TPX-070821 Triplexer (ATI)	100
7770 Antenna w/ Mounting Pipe (ATI)	100	Squid Surge Arrestor (ATI)	100
800-10965 Antenna w/ Mounting Pipe (ATI)	100	Squid Surge Arrestor (ATI)	100
800-10964 Antenna w/ Mounting Pipe (ATI)	100	Squid Surge Arrestor (ATI)	100
800-10964 Antenna w/ Mounting Pipe (ATI)	100	PiROD 13' Platform w/handrail (Verizon)	90
OPA-65R-LCUU-H6 Antenna w/ Mounting Pipe (ATI)	100	BXA-80063-6BF-EDIN Antenna w/ Mounting Pipe (Verizon)	90
OPA-65R-LCUU-H4 Antenna w/ Mounting Pipe (ATI)	100	BXA-80080-6CF Antenna w/ Mounting Pipe (Verizon)	90
OPA-65R-LCUU-H4 Antenna w/ Mounting Pipe (ATI)	100	BXA-80080-6CF Antenna w/ Mounting Pipe (Verizon)	90
HPA-65R-BUU-H6 Antenna w/ Mounting Pipe (ATI)	100	JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	90
SBNHH-1D65A Antenna w/ Mounting Pipe (ATI)	100	JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	90
SBNHH-1D65A Antenna w/ Mounting Pipe (ATI)	100	JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	90
RRUS-11 RRH (ATI)	100	JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	90
RRUS-11 RRH (ATI)	100	JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	90
RRUS-11 RRH (ATI)	100	JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	90
RRUS-32 RRH (ATI)	100	XXDWMM-12.5-65 Antenna (Verizon)	90
RRUS-32 RRH (ATI)	100	XXDWMM-12.5-65 Antenna (Verizon)	90
RRUS-32 RRH (ATI)	100	XXDWMM-12.5-65 Antenna (Verizon)	90
RRUS-32 RRH (ATI)	100	B2/B66A RRH-BR049 RRH (Verizon)	90
RRUS-32 RRH (ATI)	100	B2/B66A RRH-BR049 RRH (Verizon)	90
RRUS-32 RRH (ATI)	100	B2/B66A RRH-BR049 RRH (Verizon)	90
RRUS-32 RRH (ATI)	100	B5/13 RRH-BR04C RRH (Verizon)	90
RRUS-32 RRH (ATI)	100	B5/13 RRH-BR04C RRH (Verizon)	90
B14 4478 RRH (ATI)	100	B5/13 RRH-BR04C RRH (Verizon)	90
B14 4478 RRH (ATI)	100	CBC78T-DS-43-2X Diplexer (Verizon)	90
B14 4478 RRH (ATI)	100	CBC78T-DS-43-2X Diplexer (Verizon)	90
LGP21401 TMA (ATI)	100	CBC78T-DS-43-2X Diplexer (Verizon)	90
LGP21401 TMA (ATI)	100	Junction Box (Verizon)	90
LGP21401 TMA (ATI)	100	Junction Box (Verizon)	90
LGP21401 TMA (ATI)	100	MT6407-77A Antenna w/ Mounting Pipe (Verizon)	90
LGP21401 TMA (ATI)	100	MT6407-77A Antenna w/ Mounting Pipe (Verizon)	90
LGP21401 TMA (ATI)	100	MT6407-77A Antenna w/ Mounting Pipe (Verizon)	90
TPX-070821 Triplexer (ATI)	100		
TPX-070821 Triplexer (ATI)	100		
TPX-070821 Triplexer (ATI)	100		

MATERIAL STRENGTH

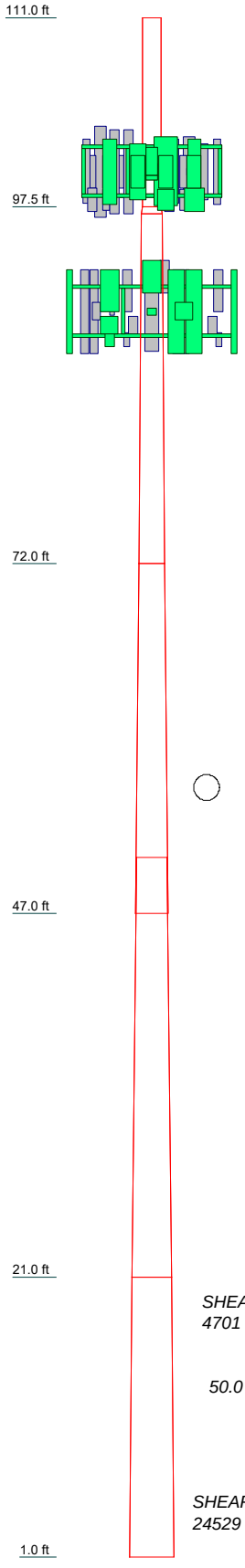
GRADE	Fy	Fu	GRADE	Fy	Fu
A36	36 ksi	58 ksi	A572-65	65 ksi	80 ksi

Hudson Design Group
45 Beechwood Drive
North Andover, MA
Phone: 978.557.5553
FAX: 978.336.5586

Job: ***GERMANTOWN CT***
Project: ***110 ft Monopole***
Client: VERIZON | Drawn by: ID | App'd:
Code: TIA-222-G | Date: 04/27/21 | Scale: NTS
Path: | Dwg No. E-1

Section	1	2	3	4	5	6
Length (ft)	13.50	0.50	25.00	25.00	30.00	20.00
Number of Sides	1	1	18	18	18	18
Thickness (in)	0.3750	0.3750	0.2500	0.3000	0.3650	0.3890
Socket Length (ft)				4.00		
Top Dia (in)	16.0000	16.0000	17.4900	22.7350	26.5408	33.3920
Bot Dia (in)	16.0000	17.4900	22.7350	27.9800	33.3920	37.0000
Grade	A36				A572-65	
Weight (lb)	845.6	32.8	1340.8	2029.7	3500.8	2924.7

Total Weight (lb): 10674.5



TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 110.0 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.0 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.0 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 79.5%

ALL REACTIONS ARE FACTORED

AXIAL 47410 lb

SHEAR 4701 lb *MOMENT 405025 lb-ft*

TORQUE 153 lb-ft
50.0 mph WIND - 0.7500 in ICE

AXIAL 24775 lb

SHEAR 24529 lb *MOMENT 1985250 lb-ft*

TORQUE 1065 lb-ft
REACTIONS - 110.0 mph WIND

Hudson Design Group
45 Beechwood Drive
North Andover, MA
Phone: 978.557.5553
FAX: 978.336.5586

Job: ***GERMANTOWN CT***			
Project: ***110 ft Monopole***			
Client: VERIZON	Drawn by: ID	App'd:	
Code: TIA-222-G	Date: 04/27/21	Scale: NTS	
Path:		Dwg No. E-1	

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Fairfield County, Connecticut.
Basic wind speed of 110.0 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56.0 pcf.
A wind speed of 50.0 mph is used in combination with ice.
Temperature drop of 50.0 °F.
Deflections calculated using a wind speed of 60.0 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	111.00-97.50	13.50	0.00	Round	16.0000	16.0000	0.3750		A36 (36 ksi)
L2	97.50-97.00	0.50	0.00	Round	16.0000	17.4900	0.3750		A36 (36 ksi)
L3	97.00-72.00	25.00	0.00	18	17.4900	22.7350	0.2500	1.0000	A572-65 (65 ksi)
L4	72.00-47.00	25.00	4.00	18	22.7350	27.9800	0.3000	1.2000	A572-65 (65 ksi)
L5	47.00-21.00	30.00	0.00	18	26.5408	33.3920	0.3650	1.4600	A572-65 (65 ksi)
L6	21.00-1.00	20.00		18	33.3920	37.0000	0.3890	1.5560	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
L2	16.0000	18.4078	562.0841	5.5259	8.0000	70.2605	1124.1682	9.1984	0.0000	0
	17.4900	20.1631	738.6357	6.0525	8.7450	84.4638	1477.2714	10.0755	0.0000	0
L3	17.7212	13.6799	513.6842	6.1202	8.8849	57.8153	1028.0442	6.8413	2.6382	10.553
	23.0472	17.8418	1139.6279	7.9822	11.5494	98.6744	2280.7553	8.9226	3.5614	14.245
L4	23.0394	21.3626	1358.4506	7.9644	11.5494	117.6211	2718.6887	10.6833	3.4734	11.578

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	28.3654	26.3569	2551.3138	9.8264	14.2138	179.4950	5105.9848	13.1810	4.3965	14.655
L5	27.8215	30.3249	2625.0473	9.2924	13.4827	194.6971	5253.5486	15.1653	4.0288	11.038
	33.8508	38.2621	5272.8403	11.7246	16.9631	310.8411	10552.6187	19.1347	5.2346	14.341
L6	33.8471	40.7483	5607.3057	11.7161	16.9631	330.5583	11221.9896	20.3780	5.1924	13.348
	37.5108	45.2031	7654.7101	12.9969	18.7960	407.2521	15319.4925	22.6058	5.8274	14.98

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 111.00-97.50				1	1	1			
L2 97.50-97.00				1	1	1			
L3 97.00-72.00				1	1	1			
L4 72.00-47.00				1	1	1			
L5 47.00-21.00				1	1	1			
L6 21.00-1.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (AT&T) *****	B	Yes	Surface Ar (CaAa)	100.00 - 16.00	12	6	0.000 0.000	1.9100		1.04
6X12 HYBRID FIBER CABLES (Verizon)	C	Yes	Surface Ar (CaAa)	90.00 - 16.00	2	2	0.000 0.000	1.8100		2.18

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
2 1/2 (AT&T) *****	B	No	Yes	Inside Pole	100.00 - 16.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.16 1.16 1.16
1 5/8 (Verizon) *****	C	No	Yes	Inside Pole	90.00 - 16.00	6	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	1.04 1.04 1.04
WR-VG122ST-BRD	B	No	Yes	Inside Pole	100.00 - 16.00	4	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.25 0.25 0.25
FB-L98B-002	B	No	Yes	Inside Pole	100.00 - 16.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.25 0.25 0.25
WR-VG122ST-BRD	B	No	Yes	Inside Pole	100.00 - 16.00	2	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.25 0.25 0.25

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
*** AT&T ***									
(3) Sabre 12' V-Boom (AT&T)	C	None		0.0000	100.00	No Ice	33.64	33.64	1692.00
						1/2" Ice	48.17	48.17	2256.00
						1" Ice	62.70	62.70	2820.00
7770 Antenna w/ Mounting Pipe (AT&T)	A	From Face	3.00 -3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.84 6.32 6.77	4.35 5.20 5.92	56.90 105.42 160.42
7770 Antenna w/ Mounting Pipe (AT&T)	B	From Face	3.00 -3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.84 6.32 6.77	4.35 5.20 5.92	56.90 105.42 160.42
7770 Antenna w/ Mounting Pipe (AT&T)	C	From Face	3.00 -3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	5.84 6.32 6.77	4.35 5.20 5.92	56.90 105.42 160.42
800-10965 Antenna w/ Mounting Pipe (AT&T)	A	From Face	3.00 -1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	13.81 14.35 14.89	7.26 8.25 9.12	130.90 223.32 324.46
800-10964 Antenna w/ Mounting Pipe (AT&T)	B	From Face	3.00 -1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	10.25 10.77 11.27	5.53 6.41 7.16	116.90 191.51 273.56
800-10964 Antenna w/ Mounting Pipe (AT&T)	C	From Face	3.00 -1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	10.25 10.77 11.27	5.53 6.41 7.16	116.90 191.51 273.56
OPA-65R-LCUU-H6 Antenna w/ Mounting Pipe (AT&T)	A	From Face	3.00 1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	6.94 7.90 8.73	109.90 184.22 266.52
OPA-65R-LCUU-H4 Antenna w/ Mounting Pipe (AT&T)	B	From Face	3.00 1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.41 6.92 7.39	4.79 5.59 6.27	78.90 134.24 195.97
OPA-65R-LCUU-H4 Antenna w/ Mounting Pipe (AT&T)	C	From Face	3.00 1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.41 6.92 7.39	4.79 5.59 6.27	78.90 134.24 195.97
HPA-65R-BUU-H6 Antenna w/ Mounting Pipe (AT&T)	A	From Face	3.00 3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	9.66 10.13 10.61	6.94 7.90 8.73	72.90 147.22 229.52
SBNHH-1D65A Antenna w/ Mounting Pipe (AT&T)	B	From Face	3.00 3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.28 6.76 7.22	5.34 6.20 6.93	55.90 111.21 173.23
SBNHH-1D65A Antenna w/ Mounting Pipe (AT&T)	C	From Face	3.00 3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	6.28 6.76 7.22	5.34 6.20 6.93	55.90 111.21 173.23
RRUS-11 RRH (AT&T)	A	From Face	2.50 -3.00 -2.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51.00 71.87 95.78
RRUS-11 RRH (AT&T)	B	From Face	2.50 -3.00 -2.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51.00 71.87 95.78
RRUS-11 RRH (AT&T)	C	From Face	2.50 -3.00 -2.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21	1.19 1.34 1.50	51.00 71.87 95.78
RRUS-32 RRH (AT&T)	A	From Face	2.50 -3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	B	From Face	2.50 -3.00	0.0000	100.00	No Ice 1/2" Ice	2.74 2.96	1.67 1.86	60.00 81.11

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	3.19	2.05	105.42
RRUS-32 RRH (AT&T)	C	From Face	2.50 -3.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	A	From Face	2.50 -1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	B	From Face	2.50 -1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	C	From Face	2.50 -1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	A	From Face	2.50 1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	B	From Face	2.50 1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
RRUS-32 RRH (AT&T)	C	From Face	2.50 1.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.74 2.96 3.19	1.67 1.86 2.05	60.00 81.11 105.42
B14 4478 RRH (AT&T)	A	From Face	2.50 -1.00 -2.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.56	60.00 77.66 98.08
B14 4478 RRH (AT&T)	B	From Face	2.50 -1.00 -2.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.56	60.00 77.66 98.08
B14 4478 RRH (AT&T)	C	From Face	2.50 -1.00 -2.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	2.02 2.20 2.39	1.25 1.40 1.56	60.00 77.66 98.08
LGP21401 TMA (AT&T)	A	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	0.36 0.45 0.56	19.00 26.13 35.14
LGP21401 TMA (AT&T)	B	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	0.36 0.45 0.56	19.00 26.13 35.14
LGP21401 TMA (AT&T)	C	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	0.36 0.45 0.56	19.00 26.13 35.14
LGP21401 TMA (AT&T)	A	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	0.36 0.45 0.56	19.00 26.13 35.14
LGP21401 TMA (AT&T)	B	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	0.36 0.45 0.56	19.00 26.13 35.14
LGP21401 TMA (AT&T)	C	From Face	1.00 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	1.08 1.21 1.35	0.36 0.45 0.56	19.00 26.13 35.14
TPX-070821 Triplexer (AT&T)	A	From Face	2.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	7.50 10.95 15.73
TPX-070821 Triplexer (AT&T)	B	From Face	2.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	7.50 10.95 15.73
TPX-070821 Triplexer (AT&T)	C	From Face	2.50 0.00	0.0000	100.00	No Ice 1/2" Ice	0.47 0.56	0.10 0.15	7.50 10.95

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	0.66	0.20	15.73
TPX-070821 Triplexer (AT&T)	A	From Face	2.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	7.50 10.95 15.73
TPX-070821 Triplexer (AT&T)	B	From Face	2.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	7.50 10.95 15.73
TPX-070821 Triplexer (AT&T)	C	From Face	2.50 0.00 0.00	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	7.50 10.95 15.73
Squid Surge Arrestor (AT&T)	A	From Face	0.00 0.00 0.75	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.81 1.30 1.48	0.81 1.30 1.48	33.00 48.38 66.11
Squid Surge Arrestor (AT&T)	B	From Face	0.00 0.00 0.75	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.81 1.30 1.48	0.81 1.30 1.48	33.00 48.38 66.11
Squid Surge Arrestor (AT&T)	C	From Face	0.00 0.00 0.75	0.0000	100.00	No Ice 1/2" Ice 1" Ice	0.81 1.30 1.48	0.81 1.30 1.48	33.00 48.38 66.11
*** VERIZON ***									
PiROD 13' Platform w/handrail (Verizon)	A	None		0.0000	90.00	No Ice 1/2" Ice 1" Ice	31.30 40.20 49.10	31.30 40.20 49.10	1822.00 2452.00 3082.00
BXA-80063-6BF-EDIN Antenna w/ Mounting Pipe (Verizon)	A	From Leg	6.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	7.33 7.79 8.25	5.46 6.38 7.18	41.90 99.18 163.85
BXA-80080-6CF Antenna w/ Mounting Pipe (Verizon)	B	From Leg	6.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	7.78 8.23 8.69	5.35 6.29 7.11	43.90 101.53 166.76
BXA-80080-6CF Antenna w/ Mounting Pipe (Verizon)	C	From Leg	6.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	7.78 8.23 8.69	5.35 6.29 7.11	43.90 101.53 166.76
JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	A	From Face	3.00 -3.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	9.11 9.58 10.05	12.25 13.10 13.95	162.74 262.61 371.79
JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	B	From Face	3.00 -3.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	9.11 9.58 10.05	12.25 13.10 13.95	162.74 262.61 371.79
JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	C	From Face	3.00 -3.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	9.11 9.58 10.05	12.25 13.10 13.95	162.74 262.61 371.79
JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	A	From Face	3.00 -1.75 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	9.11 9.58 10.05	12.25 13.10 13.95	162.74 262.61 371.79
JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	B	From Face	3.00 -1.75 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	9.11 9.58 10.05	12.25 13.10 13.95	162.74 262.61 371.79
JAHH-65B-R3B Antenna w/ Mounting Pipe (Verizon)	C	From Face	3.00 -1.75 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	9.11 9.58 10.05	12.25 13.10 13.95	162.74 262.61 371.79
XXDWMM-12.5-65 Antenna (Verizon)	A	From Face	3.00 3.00 -2.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	2.07 2.61 3.04	1.60 2.18 2.63	25.90 46.97 71.36
XXDWMM-12.5-65 Antenna (Verizon)	B	From Face	3.00 3.00 -2.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	2.07 2.61 3.04	1.60 2.18 2.63	25.90 46.97 71.36
XXDWMM-12.5-65 Antenna	C	From Face	3.00	0.0000	90.00	No Ice	2.07	1.60	25.90

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon)			3.00			1/2" Ice	2.61	2.18	46.97
			-2.00			1" Ice	3.04	2.63	71.36
B2/B66A RRH-BR049 RRH	A	From Face	2.50	0.0000	90.00	No Ice	1.88	1.25	98.00
(Verizon)			3.00			1/2" Ice	2.05	1.39	116.34
			-1.00			1" Ice	2.22	1.54	137.47
B2/B66A RRH-BR049 RRH	B	From Face	2.50	0.0000	90.00	No Ice	1.88	1.25	98.00
(Verizon)			3.00			1/2" Ice	2.05	1.39	116.34
			-1.00			1" Ice	2.22	1.54	137.47
B2/B66A RRH-BR049 RRH	C	From Face	2.50	0.0000	90.00	No Ice	1.88	1.25	98.00
(Verizon)			3.00			1/2" Ice	2.05	1.39	116.34
			-1.00			1" Ice	2.22	1.54	137.47
B5/13 RRH-BR04C RRH	A	From Face	2.50	0.0000	90.00	No Ice	1.88	1.01	82.00
(Verizon)			-2.25			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/13 RRH-BR04C RRH	B	From Face	2.50	0.0000	90.00	No Ice	1.88	1.01	82.00
(Verizon)			-2.25			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
B5/13 RRH-BR04C RRH	C	From Face	2.50	0.0000	90.00	No Ice	1.88	1.01	82.00
(Verizon)			-2.25			1/2" Ice	2.05	1.14	98.43
			0.00			1" Ice	2.22	1.28	117.53
CBC78T-DS-43-2X Diplexer	A	From Face	2.50	0.0000	90.00	No Ice	0.37	0.52	9.50
(Verizon)			0.00			1/2" Ice	0.45	0.61	15.95
			0.00			1" Ice	0.54	0.71	24.08
CBC78T-DS-43-2X Diplexer	B	From Face	2.50	0.0000	90.00	No Ice	0.37	0.52	9.50
(Verizon)			0.00			1/2" Ice	0.45	0.61	15.95
			0.00			1" Ice	0.54	0.71	24.08
CBC78T-DS-43-2X Diplexer	C	From Face	2.50	0.0000	90.00	No Ice	0.37	0.52	9.50
(Verizon)			0.00			1/2" Ice	0.45	0.61	15.95
			0.00			1" Ice	0.54	0.71	24.08
Junction Box	B	From Face	0.25	0.0000	90.00	No Ice	3.78	2.51	32.00
(Verizon)			0.00			1/2" Ice	4.03	2.72	63.40
			2.50			1" Ice	4.29	2.94	98.56
Junction Box	C	From Face	0.25	0.0000	90.00	No Ice	3.78	2.51	32.00
(Verizon)			0.00			1/2" Ice	4.03	2.72	63.40
			2.50			1" Ice	4.29	2.94	98.56
**									
MT6407-77A Antenna w/	A	From Face	3.00	0.0000	90.00	No Ice	5.43	3.27	109.00
Mounting Pipe			3.00			1/2" Ice	5.97	3.99	154.17
(Verizon)			1.50			1" Ice	6.46	4.59	204.90
MT6407-77A Antenna w/	B	From Face	3.00	0.0000	90.00	No Ice	5.43	3.27	109.00
Mounting Pipe			3.00			1/2" Ice	5.97	3.99	154.17
(Verizon)			1.50			1" Ice	6.46	4.59	204.90
MT6407-77A Antenna w/	C	From Face	3.00	0.0000	90.00	No Ice	5.43	3.27	109.00
Mounting Pipe			3.00			1/2" Ice	5.97	3.99	154.17
(Verizon)			1.50			1" Ice	6.46	4.59	204.90
**									

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	111 - 97.5	Pole	TP16x16x0.375	1	-4753.73	596412.00	10.1	Pass
L2	97.5 - 97	Pole	TP17.49x16x0.375	2	-4754.77	596412.00	10.1	Pass
L3	97 - 72	Pole	TP22.735x17.49x0.25	3	-10904.80	1325560.00	66.4	Pass
L4	72 - 47	Pole	TP27.98x22.735x0.3	4	-14034.90	1898820.00	79.4	Pass
L5	47 - 21	Pole	TP33.392x26.5408x0.365	5	-20463.70	2842680.00	78.9	Pass
L6	21 - 1	Pole	TP37x33.392x0.389	6	-24759.60	3358360.00	79.5	Pass
							Summary	
							Pole (L6) 79.5	Pass
							RATING = **79.5**	**Pass**

Stiffened or Unstiffened, Ungrouted, Circular Base Plate - Any Rod Material

Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#:	*GERMANTOWN CT*
Site Name:	*0*
App #:	*0*
Pole Manufacturer:	*Other*

Reactions		
Mu:	1985	ft-kips
Axial, Pu:	25	kips
Shear, Vu:	25	kips
Eta Factor, ŋ	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria:	AISC LRFD	<-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	17	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	45	in

Anchor Rod Results

		Rigid
Max Rod (Cu+ Vu/ŋ):	128.9 Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0 Kips	φ*Tn
Anchor Rod Stress Ratio:	49.6% **Pass**	

Plate Data		
Diam:	51	in
Thick:	2	in
Grade:	60	ksi
Single-Rod B-eff:	6.91	in

Base Plate Results

	Flexural Check	Rigid
Base Plate Stress:	42.5 ksi	AISC LRFD
Allowable Plate Stress:	54.0 ksi	φ*Fy
Base Plate Stress Ratio:	78.6% **Pass**	Y.L. Length: 25.61

Stiffener Data (Welding at both sides)		
Config:	0	*
Weld Type:		
Groove Depth:		<-- Disregard
Groove Angle:		<-- Disregard
Fillet H. Weld:		in
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

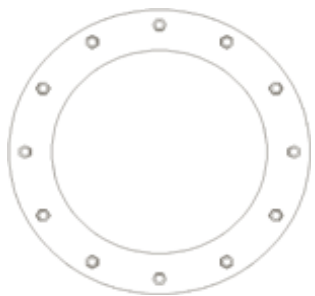
Stiffener Results

Horizontal Weld :	n/a
Vertical Weld:	n/a
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	n/a
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	n/a
Plate Comp. (AISC Bracket):	n/a

Pole Data		
Diam:	37	in
Thick:	0.389	in
Grade:	65	ksi
# of Sides:	18	"0" IF Round
Fu	80	ksi
Reinf. Fillet Weld	0	"0" if None

Pole Results

Pole Punching Shear Check:	n/a



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

tnxFoundation	Job:	GERMANTOWN CT	Date:
	Client:	VERIZON;	4/27/2021 12:59:21 PM

Foundation

Foundation name: **Tower Foundation**

Foundation type: **Caisson**

Geometry and Materials

Caisson:

Diameter	D	5.50 ft
Caisson length	L	21.00 ft
Base area		23.76 ft2

Levels:

Pier above ground	h	1.00 ft
Foundation level	hf	20.00 ft
Frost depth	fd	3.00 ft
Ground water level	hw	-

Concrete:

Strength	f'c	3.0 ksi
Unit weight		0.15 kcf

Parameters:

Caisson unit skin friction and unit end bearing stress are defined	No
End bearing capacity factors Nc and Nq are defined	No

Soils:

#	Name	Φ	Cu	Kp	γ.dry	γ.sat	fs	qb	Top level
1	Sand Custom 1	28.00	0.00 ksf	3	110.0 pcf	120.0 pcf	0.0 ksf	0.0 ksf	0.00 ft
2	Sand Custom 2	38.00	0.00 ksf	3	110.0 pcf	78.0 pcf	0.0 ksf	0.0 ksf	3.00 ft
3	Sand Custom 3	38.00	0.00 ksf	3	110.0 pcf	43.0 pcf	0.0 ksf	0.0 ksf	13.00 ft

Φ - internal friction angle

Cu - soil cohesion

Kp - coefficient of passive pressure

γ.dry - dry soil density

γ.sat - saturated soil density

fs - external skin friction (unit value)

qb - end bearing stress (unit value)

Soils:

#	Name	∈	Kt	Ξ	Nc	Nq
1	Sand Custom 1	30.00	0.50	0.50	9.00	1.00
2	Sand Custom 2	30.00	0.50	0.50	9.00	1.00
3	Sand Custom 3	30.00	0.50	0.50	9.00	1.00

δ - friction angle between soil and the pile

Kt - coefficient for lateral earth pressure

α - adhesion factor

Nc - pile Bearing capacity factor Nc

Nq - pile Bearing capacity factor Nq

Loads:

#	Name	Description	P	Vx	Vz	Mz	Mx
1	Dead Only	TIA-222-G load combination	20.6 kip	0.0 kip	0.0 kip	-0.1 kip-ft	0.1 kip-ft
2	1.2 Dead+1.6 Wind 0 deg - No Ice	TIA-222-G load combination	24.8 kip	0.1 kip	20.3 kip	-8.4 kip-ft	1687.3 kip-ft
3	0.9 Dead+1.6 Wind 0 deg - No Ice	TIA-222-G load combination	18.6 kip	0.1 kip	20.3 kip	-8.2 kip-ft	1666.7 kip-ft
4	1.2 Dead+1.6 Wind 30 deg - No Ice	TIA-222-G load combination	24.8 kip	-9.9 kip	17.2 kip	829.9 kip-ft	1432.3 kip-ft
5	0.9 Dead+1.6 Wind 30 deg - No Ice	TIA-222-G load combination	18.6 kip	-9.9 kip	17.2 kip	819.8 kip-ft	1414.8 kip-ft
6	1.2 Dead+1.6 Wind 60 deg - No Ice	TIA-222-G load combination	24.8 kip	-17.3 kip	9.9 kip	1445.7 kip-ft	822.3 kip-ft
7	0.9 Dead+1.6 Wind 60 deg - No Ice	TIA-222-G load combination	18.6 kip	-17.3 kip	9.9 kip	1428.1 kip-ft	812.2 kip-ft
8	1.2 Dead+1.6 Wind 90 deg - No Ice	TIA-222-G load combination	24.8 kip	-20.4 kip	-0.1 kip	1697.8 kip-ft	-8.0 kip-ft
9	0.9 Dead+1.6 Wind 90 deg - No Ice	TIA-222-G load combination	18.6 kip	-20.4 kip	-0.1 kip	1677.2 kip-ft	-7.9 kip-ft
10	1.2 Dead+1.6 Wind 120 deg - No Ice	TIA-222-G load combination	24.8 kip	-17.7 kip	-10.2 kip	1478.7 kip-ft	-850.4 kip-ft
11	0.9 Dead+1.6 Wind 120 deg - No Ice	TIA-222-G load combination	18.6 kip	-17.7 kip	-10.2 kip	1460.7 kip-ft	-840.1 kip-ft
12	1.2 Dead+1.6 Wind 150 deg - No Ice	TIA-222-G load combination	24.8 kip	-12.4 kip	-21.2 kip	1001.8 kip-ft	-1713.4 kip-ft
13	0.9 Dead+1.6 Wind 150 deg - No Ice	TIA-222-G load combination	18.6 kip	-12.4 kip	-21.2 kip	990.0 kip-ft	-1693.2 kip-ft
14	1.2 Dead+1.6 Wind 180 deg - No Ice	TIA-222-G load combination	24.8 kip	-0.1 kip	-20.3 kip	8.0 kip-ft	-1686.9 kip-ft
15	0.9 Dead+1.6 Wind 180 deg - No Ice	TIA-222-G load combination	18.6 kip	-0.1 kip	-20.3 kip	7.9 kip-ft	-1666.5 kip-ft
16	1.2 Dead+1.6 Wind 210 deg - No Ice	TIA-222-G load combination	24.8 kip	9.9 kip	-17.2 kip	-830.2 kip-ft	-1432.0 kip-ft
17	0.9 Dead+1.6 Wind 210 deg - No Ice	TIA-222-G load combination	18.6 kip	9.9 kip	-17.2 kip	-820.1 kip-ft	-1414.6 kip-ft
18	1.2 Dead+1.6 Wind 240 deg - No Ice	TIA-222-G load combination	24.8 kip	17.3 kip	-9.9 kip	-1446.0 kip-ft	-821.9 kip-ft
19	0.9 Dead+1.6 Wind 240 deg - No Ice	TIA-222-G load combination	18.6 kip	17.3 kip	-9.9 kip	-1428.4 kip-ft	-812.0 kip-ft
20	1.2 Dead+1.6 Wind 270 deg - No Ice	TIA-222-G load combination	24.8 kip	20.4 kip	0.1 kip	-1698.1 kip-ft	8.4 kip-ft
21	0.9 Dead+1.6 Wind 270 deg - No Ice	TIA-222-G load combination	18.6 kip	20.4 kip	0.1 kip	-1677.4 kip-ft	8.2 kip-ft
22	1.2 Dead+1.6 Wind 300 deg - No Ice	TIA-222-G load combination	24.8 kip	17.7 kip	10.2 kip	-1479.0 kip-ft	850.8 kip-ft
23	0.9 Dead+1.6 Wind 300 deg - No Ice	TIA-222-G load combination	18.6 kip	17.7 kip	10.2 kip	-1461.0 kip-ft	840.4 kip-ft
24	1.2 Dead+1.6 Wind 330 deg - No Ice	TIA-222-G load combination	24.8 kip	12.4 kip	21.2 kip	-1002.1 kip-ft	1713.7 kip-ft
25	0.9 Dead+1.6 Wind 330 deg - No Ice	TIA-222-G load combination	18.6 kip	12.4 kip	21.2 kip	-990.3 kip-ft	1693.5 kip-ft
26	1.2 Dead+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	0.0 kip	0.0 kip	-0.7 kip-ft	0.7 kip-ft

27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	0.0 kip	4.4 kip	-1.5 kip-ft	381.9 kip-ft
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	-2.2 kip	3.8 kip	190.1 kip-ft	330.5 kip-ft
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	-3.8 kip	2.2 kip	330.5 kip-ft	190.7 kip-ft
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	-4.4 kip	0.0 kip	382.1 kip-ft	0.1 kip-ft
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	-3.8 kip	-2.2 kip	331.2 kip-ft	-190.4 kip-ft
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	-2.4 kip	-4.1 kip	202.2 kip-ft	-348.4 kip-ft
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	0.0 kip	-4.4 kip	0.0 kip-ft	-380.3 kip-ft
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	2.2 kip	-3.8 kip	-191.5 kip-ft	-328.8 kip-ft
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	3.8 kip	-2.2 kip	-332.0 kip-ft	-189.1 kip-ft
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	4.4 kip	0.0 kip	-383.6 kip-ft	1.6 kip-ft
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	3.8 kip	2.2 kip	-332.7 kip-ft	192.0 kip-ft
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	TIA-222-G load combination	47.4 kip	2.4 kip	4.1 kip	-203.7 kip-ft	350.1 kip-ft
39	Dead+Wind 0 deg - Service	TIA-222-G load combination	20.6 kip	0.0 kip	3.4 kip	-1.5 kip-ft	279.1 kip-ft
40	Dead+Wind 30 deg - Service	TIA-222-G load combination	20.6 kip	-1.7 kip	2.9 kip	137.1 kip-ft	237.0 kip-ft
41	Dead+Wind 60 deg - Service	TIA-222-G load combination	20.6 kip	-2.9 kip	1.6 kip	238.9 kip-ft	136.1 kip-ft
42	Dead+Wind 90 deg - Service	TIA-222-G load combination	20.6 kip	-3.4 kip	0.0 kip	280.6 kip-ft	-1.2 kip-ft
43	Dead+Wind 120 deg - Service	TIA-222-G load combination	20.6 kip	-2.9 kip	-1.7 kip	244.4 kip-ft	-140.5 kip-ft
44	Dead+Wind 150 deg - Service	TIA-222-G load combination	20.6 kip	-2.1 kip	-3.5 kip	165.7 kip-ft	-283.4 kip-ft
45	Dead+Wind 180 deg - Service	TIA-222-G load combination	20.6 kip	0.0 kip	-3.4 kip	1.2 kip-ft	-278.8 kip-ft
46	Dead+Wind 210 deg - Service	TIA-222-G load combination	20.6 kip	1.7 kip	-2.9 kip	-137.4 kip-ft	-236.7 kip-ft
47	Dead+Wind 240 deg - Service	TIA-222-G load combination	20.6 kip	2.9 kip	-1.6 kip	-239.2 kip-ft	-135.8 kip-ft
48	Dead+Wind 270 deg - Service	TIA-222-G load combination	20.6 kip	3.4 kip	0.0 kip	-280.9 kip-ft	1.5 kip-ft
49	Dead+Wind 300 deg - Service	TIA-222-G load combination	20.6 kip	2.9 kip	1.7 kip	-244.7 kip-ft	140.8 kip-ft
50	Dead+Wind 330 deg - Service	TIA-222-G load combination	20.6 kip	2.1 kip	3.5 kip	-166.0 kip-ft	283.7 kip-ft

Uplift capacity

Resistance factors

Resistance factor for shaft resistance of caisson - Uplift	0.35

Load factor for foundation weight	0.750
Load factor for soil weigth	0.750

Details for maximum uplift force:

Number of critical combination	1
Maximum uplift force from critical combination	0.00 kip
Shaft resistance of caisson due to skin friction	107.27 kip
Weight of caisson	77.02 kip
Weight of soil (for belled caissons)	0.00 kip
Allowable uplift resistance	95.31 kip
Ratio = Maximum uplift force / Uplift resistance	0

Bearing capacity

Resistance factors

Resistance factor for shaft resistance of caisson - Bearing	0.45
Resistance factor for base resistance of caisson - Bearing	0.4

Details for maximum compression force:

Number of critical combination	26
Maximum compression force from critical combination	47.41 kip
Shaft resistance of caisson due to skin friction	107.27 kip
Base resistance	2557.66 kip
Allowable bearing resistance	1071.33 kip
Ratio = Maximum compression / Compression resistance	0.044

Maximum moment along Caisson (P-Y)

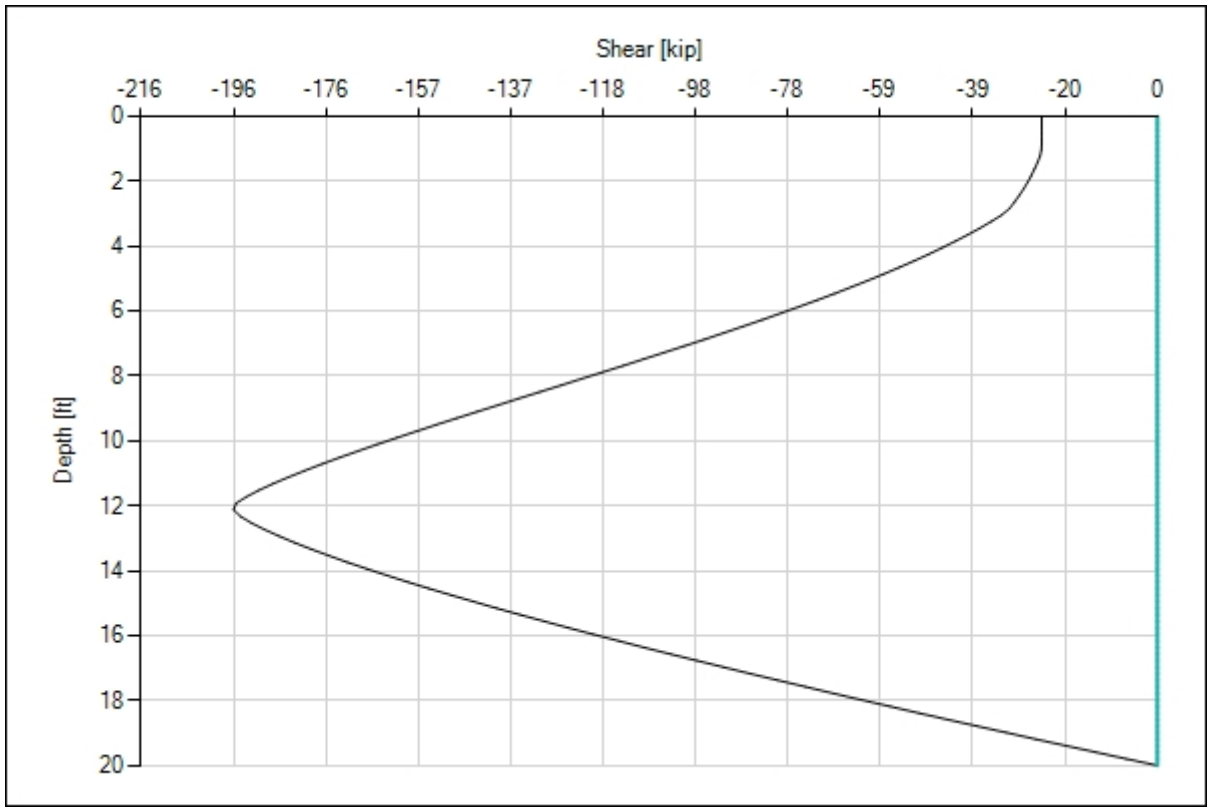
Results for the critical load:

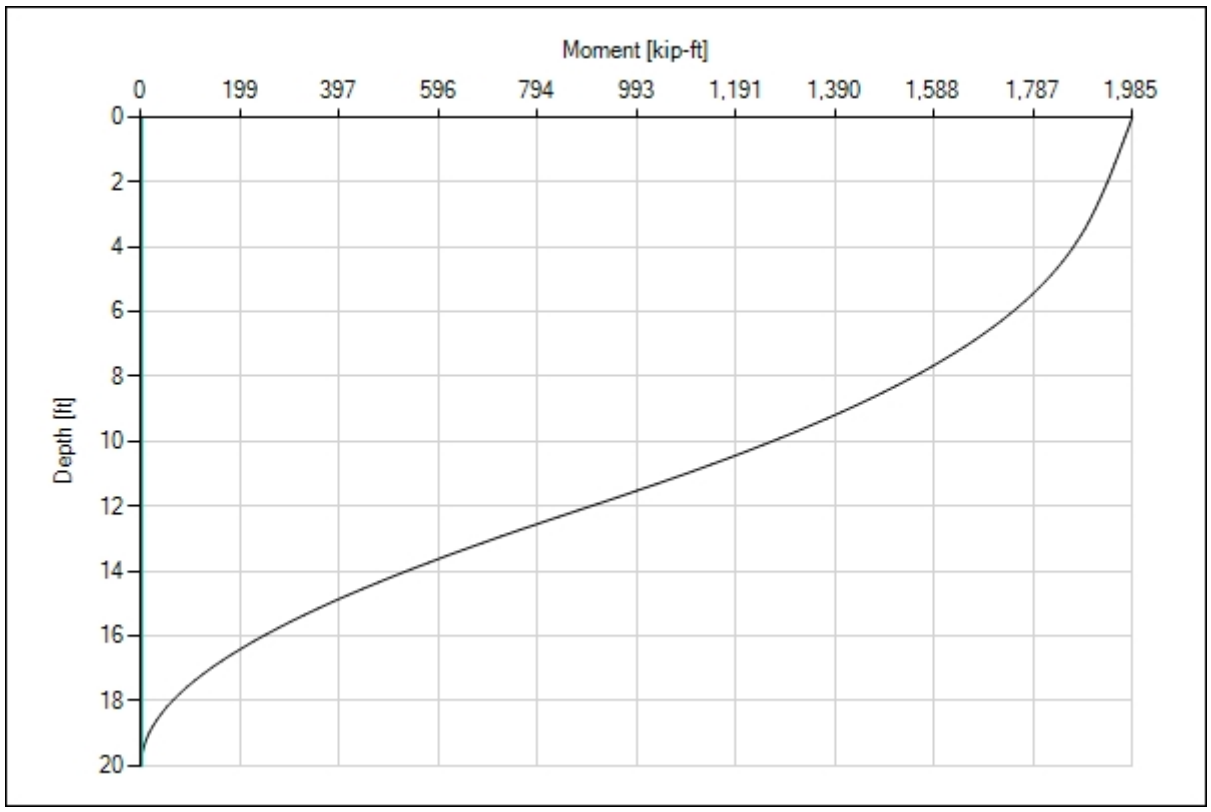
Number of critical combination		24
Max moment in caisson	Mmax	1985.25 kip-ft

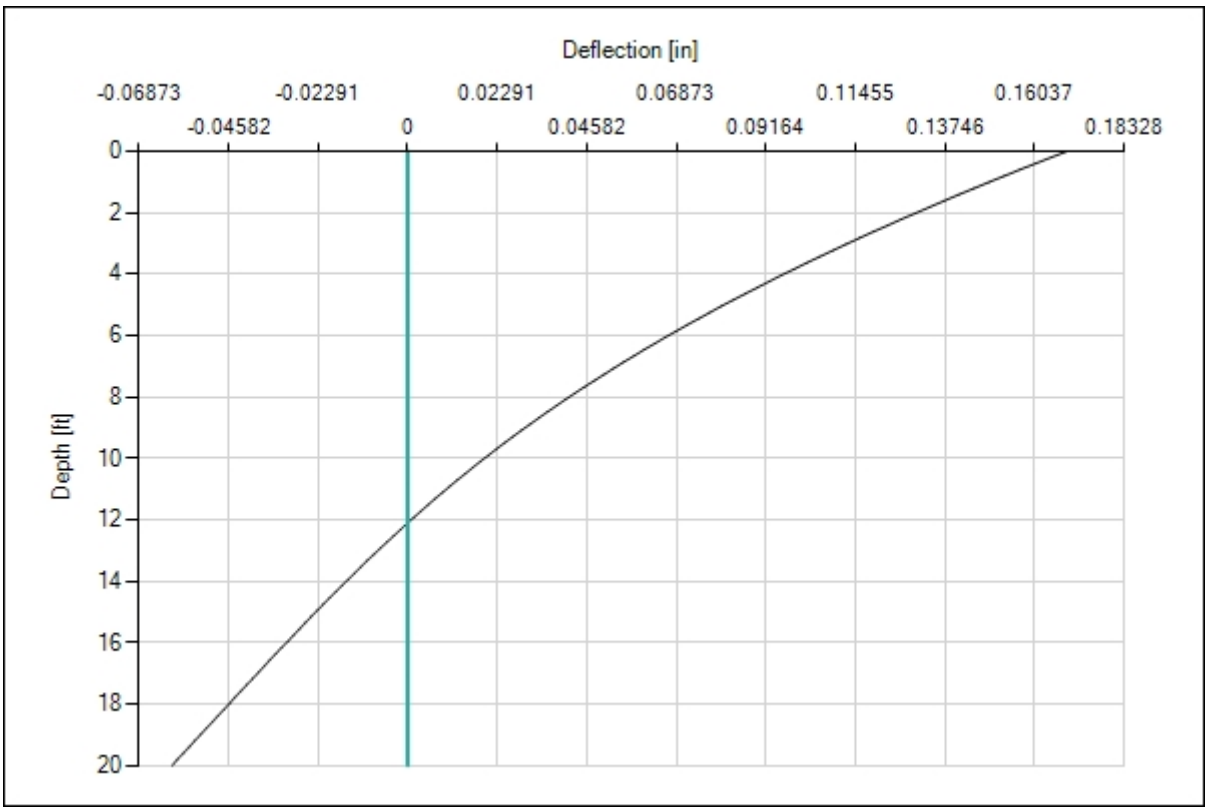
Shear and Moments along Caisson:

Level	Shear	Moment	Deflection
0.0 ft	-24.57 kip	1985.25 kip-ft	0.169 in
2.2 ft	-28.39 kip	1928.88 kip-ft	0.126 in
4.4 ft	-51.60 kip	1845.46 kip-ft	0.089 in
6.7 ft	-91.99 kip	1688.20 kip-ft	0.058 in
8.9 ft	-139.81 kip	1431.32 kip-ft	0.031 in
11.3 ft	-187.53 kip	1031.69 kip-ft	0.007 in
13.5 ft	-175.68 kip	610.94 kip-ft	-0.012 in
15.8 ft	-124.89 kip	274.22 kip-ft	-0.029 in
18.0 ft	-62.74 kip	64.19 kip-ft	-0.046 in

20.0 ft	-0.02 kip	0.00 kip-ft	-0.060 in







Caisson Flexure

Data:

Resistance factor for tension		0.9
Concrete cover		3.50 in
Steel strength of vertical bars	fy	60.00 ksi
Number of vertical bars		24
Diameter of vertical bars		1.00 in
Area of one bar		0.79 in2

Reinforcement ratio:

Reinforcement area		18.85 in2
Reinforcement ratio		0.006
Min reinforcement ratio		0.003
Verification: Reinforcement ratio > Min reinforcement ratio		OK

Results for the critical load:

Max moment in caisson	Mu	1985.25 kip-ft
Vertical load	Pu	24.78 kip
Caisson moment capacity	Mn	2384.26 kip-ft
Ratio = Mu / Mn		0.833