

March 21, 2022

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Subject: Structural Analysis Report

Carrier Designation:

Duke Reconfiguration

Carrier Site Number:

FL-1030

Carrier Site Name:

Fort White MW

Engineering Firm Designation:

TEP Project Number:

26455.664933

Site Data:

Hwy 27, Fort White, Columbia County, FL 32038

Latitude 29° 57' 08.76", Longitude -82° 46' 45.24"

325 ± Foot - Self-Support Tower

Dear Garry Ganey,

Tower Engineering Professionals is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the stress level for the tower and foundation structure, under the following load case, to be:

LC1: Existing + Proposed + Reserved Loading

Note: See Table 1 for the existing, proposed, and reserved loading

Sufficient Capacity

Structure Capacity	Foundation Capacity
82.4%	35.3%

The analysis has been performed in accordance with the ANSI/TIA-222-H Structural Standard for Antenna Supporting Structures, Antennas, and Small Wind Turbine Support Structures and the 2020 Florida Building Code, 7th Edition.

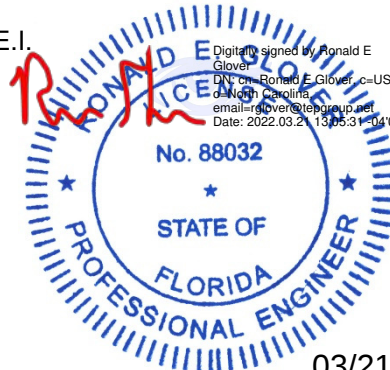
All modifications and equipment proposed in this report shall be installed in accordance with the appurtenances listed in Table 1 for the determined available structural capacity to be effective.

We at *Tower Engineering Professionals* appreciate the opportunity of providing our continuing professional services to you and *PeakNet*. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: Daniel Cisneros, E.I.

Respectfully submitted by:

Ronald E. Glover, P.E., S.E.



This item has been electronically signed and sealed by Ronald E. Glover, P.E., S.E. on 3/21/2022 using a Digital Signature.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

03/21/2022

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1) INTRODUCTION

This tower is a 325-ft Self Supporting tower located in Columbia County, FL. The original design criteria were unavailable for review. The tower has been modified per reinforcement drawings by TEP in December of 2011. All information provided to TEP was assumed to be accurate and complete.

2) ANALYSIS CRITERIA

TIA-222 Revision:	ANSI/TIA-222-H
Type of Analysis:	Comprehensive
Risk Category:	II
Wind Speed:	120 mph (Ultimate)
Exposure Category:	C
Topographic Procedure:	Method 2 ($K_{zt} = 1.0$)
Ice Thickness:	0.25 in
Wind Speed with Ice:	30 mph
Seismic Design Category:	B
Seismic Ss:	0.079
Seismic S1:	0.048
Service Wind Speed:	60 mph

Table 1 - Existing, Proposed, and Reserved Antenna and Cable Information

Existing/ Proposed/ Reserved	Mount Level (ft)	Ant CL (ft)	Qty	Antenna Model	Mount Type	Qty Coax	Coax Size	Coax Location	Owner/ Tenant
Existing	323	330	2	Commscope DB810K-Y	(2) Sidearms	1	1 5/8	CA Face	Duke Energy
			1	TTA 424-93C-03C		2	7/8		
Existing	317	317	1	RFS PADX8-U57A (B-Leg)	Dish Mount	2	EU63	B Leg	Duke Energy
Existing	305	313	1	dBSpectra DS8A10P36U-D	Sidearm Mount	1	7/8	CA Face	Duke Energy
		305	1	dBSpectra DS7TMD17C		1	1/2		
Existing	285	293	1	dBSpectra DS8A10P36U-D	Sidearm Mount	1	1 5/8	CA Face	Duke Energy
Existing	280	280	1	RFS PADX6-U57A (B-Leg)	Dish Mount	2	EU63	B Leg	Duke Energy
Reserved	252	252	3	Commscope TMA1921B78-21A	(3) Sabre C1085700 1C Sector Mounts	5	1 5/8	BC Face	T-Mobile
			3	Raycap RNSNDC-7771-PF-48					
			2	3'Ø Grid Dish					
Proposed	252	252	3	Ericsson AIR6449		3	2" Hybrid	BC Face	T-Mobile
			3	Ericsson RRUS 4480					
			3	Ericsson RRUS 4460					
Existing	252	252	3	Commscope FFHH-65C-R3		2	1 5/8	BC Face	T-Mobile
<i>To Be Removed</i>	252	252	3	Nokia FXFC	(3) Sector Mounts	3	1 5/8	BC Face	T-Mobile
			3	Nokia AHLOA					
			3	Commscope SBNH-1D65C					
Existing	240	240	4	Cambium C050045A102A	(2) Sidearm Mounts	4	3/8	CA Face	Duke Energy

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Source
Foundation Mapping Report	Tower Engineering Professionals, Inc., dated November 1, 2011 TEP No. 100740	TEP
Geotechnical Report	Tower Engineering Professionals, Inc., dated October 19, 2011 TEP No. 100740	TEP
Tower Mapping Report	Tower Engineering Professionals, Inc., dated July 2, 2018 TEP No. 26455.208108	TEP
Previous Modification Design	Tower Engineering Professionals, Inc., dated December 1, 2011 TEP No. 100740	TEP
Previous Structural Analysis	Tower Engineering Professionals, Inc., dated December 4, 2019 TEP No. 26455.332357	TEP
Correspondence	Correspondence from PeakNet in reference to the existing, proposed, and reserved loading.	PeakNet

3.1) Analysis Method

tnxTower (version 8.1.1.0), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Analysis Assumptions

- 1) The tower and foundation were built and maintained in accordance with the manufacturer's specification.
- 2) The configuration of existing antennas, transmission cables, mounts and other appurtenances are as specified in the tower mapping report by TEP.
- 3) Unless specified by the client or tower mapping, the location of the existing and proposed coax is assumed by TEP and listed in Table 1.
- 4) All tower components are in sufficient condition to carry their full design capacity.
- 5) Serviceability with respect to antenna twist, tilt, roll, or lateral translation, is not checked and is left to the carrier or tower owner to ensure conformance.
- 6) All antenna mounts and mounting hardware are structurally sufficient to carry the full design capacity requirements of appurtenance wind area and weight as provided by the original manufacturer specifications. It is the carrier's responsibility to ensure compliance to the structural limitations of the existing and/or proposed antenna mounts. TEP did not perform a site visit to verify the size, condition or capacity of the antenna mounts and did not analyze antennas supporting mounts as part of this structural analysis report.
- 7) The following material grades were assumed:
 - a) Connection bolts: A325N up to 1.5"Ø, ASTM A307 larger than 1.5"Ø
 - b) Leg grade: A572-50
 - c) Tower Pipe Bracing: ASTM A53B-35
 - d) Tower Angle Bracing/Other Steel: ASTM A36
 - e) Anchor Rods: ASTM A36

This analysis may be affected if any assumptions are not valid or have been made in error. Tower Engineering.

4) ANALYSIS RESULTS

Table 3 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ϕP_{allow} (lb)	% Capacity	Pass / Fail
T1	325 - 300	Leg	Pipe 3.5 EH	2	-11644.20	66208.27	17.6	Pass
T2	300 - 287.5	Leg	Pipe 4 EH	22	-20719.30	97668.06	21.2	Pass
T3	287.5 - 281.25	Leg	Pipe 4 EH	34	-26335.10	97668.06	27.0	Pass
T4	281.25 - 275	Leg	Pipe 4 EH	40	-30306.10	97668.06	31.0	Pass
T5	275 - 250	Leg	Pipe 5 EH	46	-54438.50	177209.54	30.7	Pass
T6	250 - 225	Leg	Pipe 5 EH	64	-73042.90	177209.54	41.2	Pass
T7	225 - 212.5	Leg	Pipe 5 EH	85	-87979.90	177209.54	49.6	Pass
T8	212.5 - 200	Leg	Pipe 5 EH	97	-102257.00	255580.49	40.0	Pass
T9	200 - 175	Leg	Pipe 6 EH	121	-132812.00	364524.28	36.4	Pass
T10	175 - 162.5	Leg	Pipe 6 EH	166	-149006.00	364524.28	40.9	Pass
T11	162.5 - 150	Leg	Pipe 6 EH	190	-165475.00	364524.28	45.4	Pass
T12	150 - 137.5	Leg	PIPE 8 X-STR (SCH80)	214	-183499.00	494485.93	37.1	Pass
T13	137.5 - 125	Leg	PIPE 8 X-STR (SCH80)	226	-200674.00	494485.93	40.6	Pass
T14	125 - 112.5	Leg	PIPE 8 X-STR (SCH80)	238	-218328.00	494485.93	44.2	Pass
T15	112.5 - 100	Leg	PIPE 8 X-STR (SCH80)	250	-235881.00	494485.93	47.7	Pass
T16	100 - 87.5	Leg	PIPE 8 X-STR (SCH80)	265	-254007.00	494485.93	51.4	Pass
T17	87.5 - 75	Leg	PIPE 8 X-STR (SCH80)	277	-271296.00	574113.72	47.3 69.8 (b)	Pass
T18	75 - 50	Leg	PIPE 8 SCH 100	301	-309741.00	672968.07	46.0 59.5 (b)	Pass
T19	50 - 25	Leg	PIPE 8 SCH 120	346	-330378.00	684253.47	48.3 62.5 (b)	Pass
T20	25 - 0	Leg	PIPE 10 SCH 100	379	-369594.00	939523.16	39.3 44.6 (b)	Pass
T1	325 - 300	Diagonal	PIPE 2.5 STD (SCH 40)	10	-6576.78	19016.44	34.6 47.6 (b)	Pass
T2	300 - 287.5	Diagonal	PIPE 2.5 STD (SCH 40)	28	-5577.29	16630.53	33.5	Pass
T3	287.5 - 281.25	Diagonal	PIPE 2.5 STD (SCH 40)	37	-5833.05	15185.41	38.4	Pass
T4	281.25 - 275	Diagonal	PIPE 3 STD (SCH40)	44	-6837.63	27281.83	25.1 34.4 (b)	Pass
T5	275 - 250	Diagonal	PIPE 3 STD (SCH40)	53	-9124.02	19982.97	45.7 45.9 (b)	Pass
T6	250 - 225	Diagonal	PIPE 3 STD (SCH40)	71	-10469.50	22113.21	47.3 54.1 (b)	Pass
T7	225 - 212.5	Diagonal	PIPE 3 STD (SCH40)	92	-10688.10	20969.02	51.0 55.1 (b)	Pass
T8	212.5 - 200	Diagonal	PIPE 3 STD (SCH40)	108	-11143.00	19875.76	56.1 56.8 (b)	Pass
T9	200 - 175	Diagonal	Pipe 3 EH	132	-12389.80	23215.71	53.4 62.4 (b)	Pass
T10	175 - 162.5	Diagonal	PIPE 3 STD (SCH40)	177	-12725.80	17035.93	74.7	Pass
T11	162.5 - 150	Diagonal	Pipe 3 EH	201	-13375.50	20830.63	64.2 67.3 (b)	Pass
T12	150 - 137.5	Diagonal	Pipe 3 EH	221	-13459.80	19991.05	67.3	Pass
T13	137.5 - 125	Diagonal	Pipe 3 EH	233	-14130.60	18939.90	74.6	Pass
T14	125 - 112.5	Diagonal	PIPE 3.5 STD	245	-14397.90	22071.63	65.2	Pass
T15	112.5 - 100	Diagonal	Pipe 3.5 EH	257	-15176.90	27458.55	55.3 55.7 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ϕP_{allow} (lb)	% Capacity	Pass / Fail
T16	100 - 87.5	Diagonal	2L4x4x1/4x3/8	276	-15556.30	32964.64	47.2 57.9 (b)	Pass
T17	87.5 - 75	Diagonal	3.5 STD w/ 4 STD Half Sleeve	298	-17080.70	32977.66	51.8 61.1 (b)	Pass
T18	75 - 50	Diagonal	3.5 STD w/ 4 STD Half Sleeve	322	-18552.90	29799.21	62.3 65.9 (b)	Pass
T19	50 - 25	Diagonal	Pipe 3.5 EH	369	-25755.90	41413.26	62.2	Pass
T20	25 - 0	Diagonal	Pipe 3.5 EH	402	-25797.10	39374.05	65.5	Pass
T6	250 - 225	Horizontal	L2 1/2x3 1/2x1/4	76	-9043.12	16659.82	54.3 82.4 (b)	Pass
T7	225 - 212.5	Horizontal	L2 1/2x3 1/2x1/4	91	-6355.99	12020.71	52.9 53.9 (b)	Pass
T8	212.5 - 200	Horizontal	L3x4x1/4	107	-6806.92	17473.05	39.0 54.1 (b)	Pass
T9	200 - 175	Horizontal	L3x4x1/4	131	-7914.32	13557.91	58.4 63.1 (b)	Pass
T10	175 - 162.5	Horizontal	L3 1/2x5x1/4	176	-8424.01	20512.17	41.1 67.5 (b)	Pass
T11	162.5 - 150	Horizontal	L3 1/2x5x1/4	200	-9088.65	18321.76	49.6 72.3 (b)	Pass
T12	150 - 137.5	Horizontal	L3 1/2x5x1/4	220	-9512.14	16772.28	56.7 60.0 (b)	Pass
T13	137.5 - 125	Horizontal	L4x6x5/16	232	-10151.50	29218.35	34.7 51.3 (b)	Pass
T14	125 - 112.5	Horizontal	L4x6x5/16	244	-10539.10	26506.72	39.8 53.5 (b)	Pass
T15	112.5 - 100	Horizontal	L4x6x5/16	256	-11124.60	24155.56	46.1 56.5 (b)	Pass
T16	100 - 87.5	Horizontal	L4x6x5/16	274	-11542.80	22104.07	52.2 60.2 (b)	Pass
T17	87.5 - 75	Horizontal	2L3 1/2x5x5/16x3/8	294	-12542.10	99582.63	12.6 50.2 (b)	Pass
T18	75 - 50	Horizontal	2L3 1/2x5x5/16x3/8	318	-13753.50	86739.23	15.9 56.3 (b)	Pass
T19	50 - 25	Horizontal	Pipe 3.5 EH	365	-14573.60	33112.69	44.0 44.7 (b)	Pass
T20	25 - 0	Horizontal	Pipe 3.5 EH	398	-15426.20	29016.12	53.2	Pass
T1	325 - 300	Top Girt	L3 1/2x3 1/2x1/4	6	-697.35	18577.33	3.8 4.1 (b)	Pass
T2	300 - 287.5	Top Girt	L3 1/2x3 1/2x1/4	26	-467.94	18740.29	2.5 3.2 (b)	Pass
T5	275 - 250	Top Girt	L4x4x1/4	51	-944.17	17703.63	5.3 7.5 (b)	Pass
T1	325 - 300	Mid Girt	L3 1/2x3 1/2x1/4	9	-1182.67	18577.33	6.4 8.0 (b)	Pass
T8	212.5 - 200	Redund Horz 1 Bracing	L2x2x3/16	102	-1773.51	11060.49	16.0	Pass
T9	200 - 175	Redund Horz 1 Bracing	L2x2x3/16	126	-2303.45	8634.05	26.7	Pass
T10	175 - 162.5	Redund Horz 1 Bracing	L2x2x3/16	171	-2584.31	7648.00	33.8	Pass
T11	162.5 - 150	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	195	-2869.95	13583.53	21.1	Pass
T17	87.5 - 75	Redund Horz 1 Bracing	L3x3x3/16	282	-4705.28	13677.19	34.4	Pass
T18	75 - 50	Redund Horz 1 Bracing	L3x3x3/16	306	-5372.07	11633.58	46.2	Pass
T19	50 - 25	Redund Horz 1 Bracing	Pipe 2 EH	370	-5729.98	19206.07	29.8	Pass
T20	25 - 0	Redund Horz 1 Bracing	Pipe 2 EH	384	-6410.13	16945.84	37.8	Pass
T8	212.5 - 200	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	103	-1419.10	8662.02	16.4	Pass
T9	200 - 175	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	144	-1707.65	7872.75	21.7	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	ϕP_{allow} (lb)	% Capacity	Pass / Fail
T10	175 - 162.5	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	172	-1855.30	7430.68	25.0	Pass
T11	162.5 - 150	Redund Diag 1 Bracing	L3x3x3/16	196	-2001.93	12291.09	16.3	Pass
T17	87.5 - 75	Redund Diag 1 Bracing	L3x3x3/16	283	-2905.36	9003.28	32.3	Pass
T18	75 - 50	Redund Diag 1 Bracing	L3x3x3/16	307	-3227.95	8082.12	39.9	Pass
T19	50 - 25	Redund Diag 1 Bracing	Pipe 3 EH	352	-4781.05	30925.54	15.5	Pass
T20	25 - 0	Redund Diag 1 Bracing	Pipe 3 EH	385	-5112.75	29879.95	17.1	Pass
T19	50 - 25	Redund Hip 1 Bracing	PIPE 1.5 SCH 80	363	-30.76	7925.24	0.4	Pass
T20	25 - 0	Redund Hip 1 Bracing	PIPE 1.5 SCH 80	396	-27.87	6898.84	0.4	Pass
T19	50 - 25	Redund Hip Diagonal 1 Bracing	PIPE 1.5 SCH 80	373	-53.83	1562.53	3.4	Pass
T20	25 - 0	Redund Hip Diagonal 1 Bracing	PIPE 1.5 SCH 80	406	-50.98	1433.46	3.6	Pass
T15	112.5 - 100	Inner Bracing	L5x3x3/8	264	-21.04	11660.14	0.3	Pass
T19	50 - 25	Inner Bracing	Pipe 3 EH	376	-18.42	19723.20	0.4	Pass
T20	25 - 0	Inner Bracing	Pipe 3 EH	409	-19.27	17168.86	0.4	Pass
							Summary	
						Leg (T17)	69.8	Pass
						Diagonal (T10)	74.7	Pass
						Horizontal (T6)	82.4	Pass
						Top Girt (T5)	7.5	Pass
						Mid Girt (T1)	8.0	Pass
						Redund Horz 1 Bracing (T18)	46.2	Pass
						Redund Diag 1 Bracing (T18)	39.9	Pass
						Redund Hip 1 Bracing (T20)	0.4	Pass
						Redund Hip Diagonal 1 Bracing (T20)	3.6	Pass
						Inner Bracing (T20)	0.4	Pass
						Bolt Checks	78.5	Pass
						RATING =	82.4	Pass

Table 4 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1,2	Anchor Rods	-	63.3	Pass
1,2	Base Foundation Soil Interaction	-	35.3	Pass
Structure Rating (max from all components) =				82.4%

Notes:

- 1) Rating per TIA-222-H, Section 15.5
- 2) See additional documentation in "Appendix B - Additional Calculations" for calculations supporting the % capacity listed.

Table 5 - Dish Twist/Sway Results for 60 mph Service Wind Speed

Elevation (ft)	Dish Model	Beam Deflection		
		Deflection (in)	Tilt (deg)	Twist (deg)
317.0	RFS PADX8-U57A	5.6777	0.1636	0.0239
280.0	RFS PADX6-U57A	4.4262	0.1526	0.0168
252.0	(2) 3'Ø Grid Dish	3.5199	0.1397	0.0118

4.1) Recommendations

- 1) If the load differs from that described in Table 1 of this report or the provisions of this analysis are found to be invalid, another structural analysis should be performed.
- 2) The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNX TOWER OUTPUT

Section	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36	A36
Leg Grade	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Diagonals	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Diagonal Grade	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Top Girts	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Mid Girts	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Horizontals	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Red. Horizontals	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Red. Horizontals	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Red. Hips	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Inner Bracing	PIPE 10 SCH 100	PIPE 8 SCH 120	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100	PIPE 8 SCH 100
Face Width (ft)	41.25	38.6597	36.0695	33.4792	32.184	30.8889	29.5938	28.2986	27.0035	25.7084	24.4132	23.1181	20.5278	19.2327	17.9375	15.3473	12.7571	10.1667	7.5763	5.0859
# Panels @ (ft)	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25	2 @ 25
Weight (lb)	84803.8	11802.5	10988.3	12018.4	5506.5	4202.4	4472.3	3697.7	3630.5	3306.3	2994.0	2692.9	5398.8	2001.0	1762.7	3416.3	3214.9	598.3	514.2	2121.5

325.0 ft
300.0 ft
287.5 ft
281.3 ft
275.0 ft

250.0 ft

225.0 ft

212.5 ft

200.0 ft

175.0 ft

162.5 ft

150.0 ft

137.5 ft

125.0 ft

112.5 ft

100.0 ft

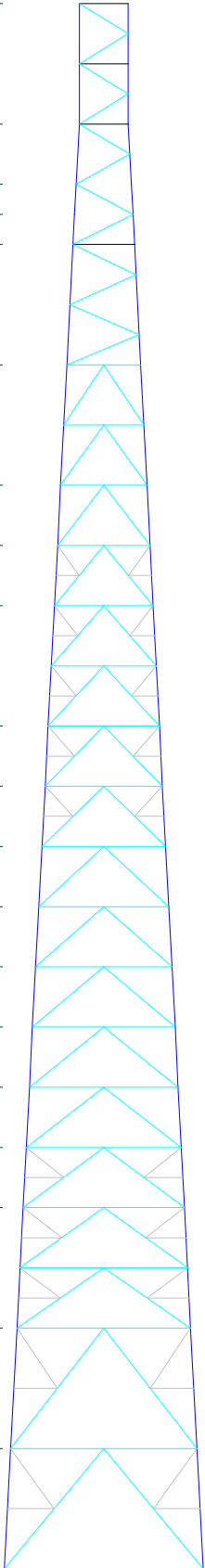
87.5 ft

75.0 ft

50.0 ft

25.0 ft

0.0 ft



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
2.9" x 20-ft Pipe Mount	325	FFHH-65C-R3 w/ Mount Pipe	252
5/8"x8-ft L Rod	325	4480	252
15" Dia. x 15" Beacon	325	4480	252
6' Sidearm Mount (TEP#100740)	323	4480	252
6' Sidearm Mount (TEP#100740)	323	4460	252
1" Dia x 10' Pipe	323	4460	252
1" Dia x 10' Pipe	323	4460	252
15-ft x 3" Omni	323	RNSNDC-7771-PF-48	252
15-ft x 3" Omni	323	RNSNDC-7771-PF-48	252
TTA 24"x6"x6"	323	RNSNDC-7771-PF-48	252
4.5" dia x 6"	317	TMAT1921B78-21A	252
PADX8-U57AC	317	TMAT1921B78-21A	252
16-ft x 3" Omni Antenna	305	TMAT1921B78-21A	252
DS7TM	305	Sabre 12' HD V-Boom Mounts (3) (C10857001C)	252
Side Arm Mount [SO 308-1]	305	2.4" x 8-ft Pipe	252
16-ft x 3" Omni Antenna	285	3-FT Grid	252
Side Arm Mount [SO 308-1]	285	3-FT Grid	252
4.5" dia x 6"	280	1.9" x 9-ft pipe	250
PADX6-U57AC	280	1.9" x 9-ft pipe	250
2.4" x 8-ft Pipe	252	1.9" x 9-ft pipe	250
2.4" x 8-ft Pipe	252	Side Arm Mount [SO 310-1]	240
AIR 6449 w/ Mount Pipe	252	(2) C050045A102A	240
AIR 6449 w/ Mount Pipe	252	(2) C050045A102A	240
AIR 6449 w/ Mount Pipe	252	Side Arm Mount [SO 310-1]	240
FFHH-65C-R3 w/ Mount Pipe	252		
FFHH-65C-R3 w/ Mount Pipe	252		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	PIPE 3 STD (SCH40)	E	3.5 STD w/ 4 STD Half Sleeve
B	PIPE 3.5 STD	F	L2 1/2x2 1/2x3/16
C	Pipe 3.5 EH	G	L3x3x3/16
D	2L4x4x1/4x3/8		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi
A53-B-35	35 ksi	60 ksi			

TOWER DESIGN NOTES

1. Tower is located in Columbia County, Florida.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 120 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 30 mph basic wind with 0.25 in ice. Ice is considered to

ALL REACIncrease in thickness with height.

ARE F/45. Deflections are based upon a 60 mph wind.

6. Tower Risk Category II.

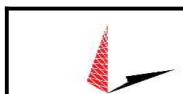
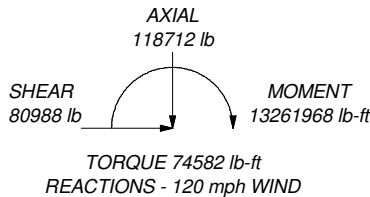
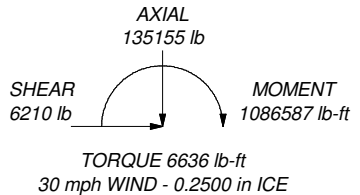
MAX. C7. Topographic Category 1 with Crest Height of 0.00 ft

DOWN: 404933 lb

SHEAR: 48040 lb

UPLIFT: -340935 lb

SHEAR: 42204 lb



Tower Engineering Professionals, Inc.

Tower Engineering Professionals, Inc.

326 Tryon Road
Raleigh, NC 27603
Phone: (919) 661-6351
FAX: (919) 661-6350

Job: **Fort White**

Project: **TEP No. 26455.664933**

Client: **Duke Energy**

Drawn by: **dcisneros**

App'd:

Code: **TIA-222-H**

Date: **03/21/22**

Scale: **NTS**

Path:

C:\Users\dcisneros\TOWER\Custom\2-319205-1-664933-Fort White-Structural Analysis\For Fort White MW.dwg

Dwg No. **E-1**

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350	Job	Fort White	Page	1 of 43
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	Client	Duke Energy	Designed by	dcisneros

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350	Job	Fort White	Page	2 of 43
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Tower Input Data

The main tower is a 3x free standing tower with an overall height of 325.00 ft above the ground line.

The base of the tower is set at an elevation of 0.00 ft above the ground line.

The face width of the tower is 10.17 ft at the top and 41.25 ft at the base.

This tower is designed using the TIA-222-H standard.

The following design criteria apply:

Tower is located in Columbia County, Florida.

Tower base elevation above sea level: 43.56 ft.

Basic wind speed of 120 mph.

Risk Category II.

Exposure Category C.

Simplified Topographic Factor Procedure for wind speed-up calculations is used.

Topographic Category: 1.

Crest Height: 0.00 ft.

Nominal ice thickness of 0.2500 in.

Ice thickness is considered to increase with height.

Ice density of 56.00 pcf.

A wind speed of 30 mph is used in combination with ice.

Temperature drop of 50.0000 °F.

Deflections calculated using a wind speed of 60 mph.

Pressures are calculated at each section.

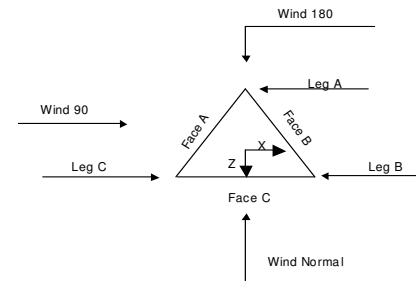
Stress ratio used in tower member design is 1.

Tower analysis based on target reliabilities in accordance with Annex S.

Load Modification Factors used: $K_{es}(F_w) = 0.95$, $K_{es}(t_i) = 0.85$.

Maximum demand-capacity ratio is: 1.05.

Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	325.00-300.00			10.17	1	25.00
T2	300.00-287.50			10.17	1	12.50
T3	287.50-281.25			11.46	1	6.25
T4	281.25-275.00			12.11	1	6.25
T5	275.00-250.00			12.76	1	25.00
T6	250.00-225.00			15.35	1	25.00
T7	225.00-212.50			17.94	1	12.50
T8	212.50-200.00			19.23	1	12.50
T9	200.00-175.00			20.53	1	25.00
T10	175.00-162.50			23.12	1	12.50
T11	162.50-150.00			24.41	1	12.50
T12	150.00-137.50			25.71	1	12.50
T13	137.50-125.00			27.00	1	12.50
T14	125.00-112.50			28.30	1	12.50
T15	112.50-100.00			29.59	1	12.50
T16	100.00-87.50			30.89	1	12.50
T17	87.50-75.00			32.18	1	12.50
T18	75.00-50.00			33.48	1	25.00
T19	50.00-25.00			36.07	1	25.00
T20	25.00-0.00			38.66	1	25.00

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
Use Code Stress Ratios	Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
Use Code Safety Factors - Guys	Retention Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist. Exemption
Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known

Tower Section Geometry (cont'd)

<i>tnxTower</i> <i>Tower Engineering Professionals, Inc.</i> <i>326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350</i>	Job Fort White	Page 3 of 43
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<i>Tower Section</i>	<i>Tower Elevation</i>	<i>Diagonal Spacing</i>	<i>Bracing Type</i>	<i>Has K Brace End Panels</i>	<i>Has Horizontals</i>	<i>Top Girt Offset</i>	<i>Bottom Girt Offset</i>
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	325.00-300.00	6.25	K Brace Left	No	No	0.0000	0.0000
T2	300.00-287.50	6.25	K Brace Left	No	No	0.0000	0.0000
T3	287.50-281.25	6.25	K Brace Right	No	No	0.0000	0.0000
T4	281.25-275.00	6.25	K Brace Left	No	No	0.0000	0.0000
T5	275.00-250.00	6.25	K Brace Left	No	No	0.0000	0.0000
T6	250.00-225.00	12.50	K Brace Down	No	Yes	0.0000	0.0000
T7	225.00-212.50	12.50	K Brace Down	No	Yes	0.0000	0.0000
T8	212.50-200.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T9	200.00-175.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T10	175.00-162.50	12.50	K1 Down	No	Yes	0.0000	0.0000
T11	162.50-150.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T12	150.00-137.50	12.50	K Brace Down	No	Yes	0.0000	0.0000
T13	137.50-125.00	12.50	K Brace Down	No	Yes	0.0000	0.0000
T14	125.00-112.50	12.50	K Brace Down	No	Yes	0.0000	0.0000
T15	112.50-100.00	12.50	K Brace Down	No	Yes	0.0000	0.0000
T16	100.00-87.50	12.50	K Brace Down	No	Yes	0.0000	0.0000
T17	87.50-75.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T18	75.00-50.00	12.50	K1 Down	No	Yes	0.0000	0.0000
T19	50.00-25.00	25.00	K1 Down	No	Yes	0.0000	0.0000
T20	25.00-0.00	25.00	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T1 325.00-300.00	Pipe	Pipe 3.5 EH	A572-50 (50 ksi)	Pipe	PIPE 2.5 STD (SCH 40)	A53-B-35 (35 ksi)
T2 300.00-287.50	Pipe	Pipe 4 EH	A572-50 (50 ksi)	Pipe	PIPE 2.5 STD (SCH 40)	A53-B-35 (35 ksi)
T3 287.50-281.25	Pipe	Pipe 4 EH	A572-50 (50 ksi)	Pipe	PIPE 2.5 STD (SCH 40)	A53-B-35 (35 ksi)
T4 281.25-275.00	Pipe	Pipe 4 EH	A572-50 (50 ksi)	Pipe	PIPE 3 STD (SCH40)	A53-B-35 (35 ksi)
T5 275.00-250.00	Pipe	Pipe 5 EH	A572-50 (50 ksi)	Pipe	PIPE 3 STD (SCH40)	A53-B-35 (35 ksi)
T6 250.00-225.00	Pipe	Pipe 5 EH	A572-50 (50 ksi)	Pipe	PIPE 3 STD (SCH40)	A53-B-35 (35 ksi)
T7 225.00-212.50	Pipe	Pipe 5 EH	A572-50 (50 ksi)	Pipe	PIPE 3 STD (SCH40)	A53-B-35 (35 ksi)
T8 212.50-200.00	Pipe	Pipe 5 EH	A572-50 (50 ksi)	Pipe	PIPE 3 STD (SCH40)	A53-B-35 (35 ksi)
T9 200.00-175.00	Pipe	Pipe 6 EH	A572-50 (50 ksi)	Pipe	Pipe 3 EH	A53-B-35 (35 ksi)
T10 175.00-162.50	Pipe	Pipe 6 EH	A572-50 (50 ksi)	Pipe	PIPE 3 STD (SCH40)	A53-B-35 (35 ksi)
T11 162.50-150.00	Pipe	Pipe 6 EH	A572-50 (50 ksi)	Pipe	Pipe 3 EH	A53-B-35 (35 ksi)
T12 150.00-137.50	Pipe	PIPE 8 X-STR (SCH80)	A572-50 (50 ksi)	Pipe	Pipe 3 EH	A53-B-35 (35 ksi)
T13 137.50-125.00	Pipe	PIPE 8 X-STR (SCH80)	A572-50 (50 ksi)	Pipe	Pipe 3 EH	A53-B-35 (35 ksi)
T14 125.00-112.50	Pipe	PIPE 8 X-STR (SCH80)	A572-50 (50 ksi)	Pipe	PIPE 3.5 STD	A53-B-35 (35 ksi)
T15 112.50-100.00	Pipe	PIPE 8 X-STR (SCH80)	A572-50 (50 ksi)	Pipe	Pipe 3.5 EH	A53-B-35 (35 ksi)

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<i>Tower Elevation</i>	<i>Leg Type</i>	<i>Leg Size</i>	<i>Leg Grade</i>	<i>Diagonal Type</i>	<i>Diagonal Size</i>	<i>Diagonal Grade</i>
<i>ft</i>						
T16 100.00-87.50	Pipe	PIPE 8 X-STR (SCH80)	A572-50 (50 ksi)	Double Angle	2L4x4x1/4x3/8	A36 (36 ksi)
T17 87.50-75.00	Pipe	PIPE 8 X-STR (SCH80)	A572-50 (50 ksi)	Arbitrary Shape	3.5 STD w/ 4 STD Half Sleeve	A53-B-35 (35 ksi)
T18 75.00-50.00	Pipe	PIPE 8 SCH 100	A572-50 (50 ksi)	Arbitrary Shape	3.5 STD w/ 4 STD Half Sleeve	A53-B-35 (35 ksi)
T19 50.00-25.00	Pipe	PIPE 8 SCH 120	A572-50 (50 ksi)	Pipe	Pipe 3.5 EH	A53-B-35 (35 ksi)
T20 25.00-0.00	Pipe	PIPE 10 SCH 100	A572-50 (50 ksi)	Pipe	Pipe 3.5 EH	A53-B-35 (35 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>Top Girt Type</i>	<i>Top Girt Size</i>	<i>Top Girt Grade</i>	<i>Bottom Girt Type</i>	<i>Bottom Girt Size</i>	<i>Bottom Girt Grade</i>
<i>ft</i>						
T1 325.00-300.00	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 300.00-287.50	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 275.00-250.00	Single Angle	L4x4x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

<i>Tower Elevation</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
<i>ft</i>							
T1 325.00-300.00	1	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T6 250.00-225.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x3 1/2x1/4	A36 (36 ksi)
T7 225.00-212.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x3 1/2x1/4	A36 (36 ksi)
T8 212.50-200.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x4x1/4	A36 (36 ksi)
T9 200.00-175.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3x4x1/4	A36 (36 ksi)
T10 175.00-162.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L3 1/2x5x1/4	A36 (36 ksi)
T11 162.50-150.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L3 1/2x5x1/4	A36 (36 ksi)
T12 150.00-137.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L3 1/2x5x1/4	A36 (36 ksi)
T13 137.50-125.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x6x5/16	A36 (36 ksi)
T14 125.00-112.50	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x6x5/16	A36 (36 ksi)
T15 112.50-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L4x6x5/16	A36 (36 ksi)

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<i>Tower Elevation</i> <i>ft</i>	<i>No. of Mid Girts</i>	<i>Mid Girt Type</i>	<i>Mid Girt Size</i>	<i>Mid Girt Grade</i>	<i>Horizontal Type</i>	<i>Horizontal Size</i>	<i>Horizontal Grade</i>
T16 100.00-87.50	None	Flat Bar	A36 (36 ksi)	Single Angle		L4x6x5/16	A36 (36 ksi)
T17 87.50-75.00	None	Flat Bar	A36 (36 ksi)	Double Angle	2L3	1/2x5x5/16x3/8	A36 (36 ksi)
T18 75.00-50.00	None	Flat Bar	A36 (36 ksi)	Double Angle	2L3	1/2x5x5/16x3/8	A36 (36 ksi)
T19 50.00-25.00	None	Flat Bar	A36 (36 ksi)	Pipe	Pipe 3.5	EH	A53-B-35 (35 ksi)
T20 25.00-0.00	None	Flat Bar	A36 (36 ksi)	Pipe	Pipe 3.5	EH	A53-B-35 (35 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
f_1						
T15	Solid Round		A36	Single Angle	L5x3x3/8	A36
112.50-100.00			(36 ksi)			(36 ksi)
T19 50.00-25.00	Solid Round		A36	Pipe	Pipe 3 EH	A53-B-35
			(36 ksi)			(35 ksi)
T20 25.00-0.00	Solid Round		A36	Pipe	Pipe 3 EH	A53-B-35
			(36 ksi)			(35 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
f_t					
T8	A36	Horizontal (1)	Single Angle	L2x2x3/16	1
212.50-200.00	(36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T9	A36	Horizontal (1)	Single Angle	L2x2x3/16	1
200.00-175.00	(36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T10	A36	Horizontal (1)	Single Angle	L2x2x3/16	1
175.00-162.50	(36 ksi)	Diagonal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
T11	A36	Horizontal (1)	Single Angle	L2 1/2x2 1/2x3/16	1
162.50-150.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x3/16	1
T17	A36	Horizontal (1)	Single Angle	L3x3x3/16	1
87.50-75.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x3/16	1
T18	A36	Horizontal (1)	Single Angle	L3x3x3/16	1
75.00-50.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x3/16	1
T19	A53-B-35	Horizontal (1)	Pipe	Pipe 2 EH	1
50.00-25.00	(35 ksi)	Diagonal (1)	Pipe	Pipe 3 EH	1
		Hip (1)	Pipe	PIPE 1.5 SCH 80	1
		Hip Diagonal (1)	Pipe	PIPE 1.5 SCH 80	1
T20	A53-B-35	Horizontal (1)	Pipe	Pipe 2 EH	1
25.00-0.00	(35 ksi)	Diagonal (1)	Pipe	Pipe 3 EH	1
		Hip (1)	Pipe	PIPE 1.5 SCH 80	1
		Hip Diagonal (1)	Pipe	PIPE 1.5 SCH 80	1

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Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals $\frac{in}{in}$	Double Angle Stitch Bolt Spacing Horizontal $\frac{in}{in}$	Double Angle Stitch Bolt Spacing Redundant $\frac{in}{in}$
T1	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
325.00-300.00			(36 ksi)						
T2	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
300.00-287.50			(36 ksi)						
T3	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
287.50-281.25			(36 ksi)						
T4	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
281.25-275.00			(36 ksi)						
T5	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
275.00-250.00			(36 ksi)						
T6	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
250.00-225.00			(36 ksi)						
T7	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
225.00-212.50			(36 ksi)						
T8	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
212.50-200.00			(36 ksi)						
T9	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
200.00-175.00			(36 ksi)						
T10	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
175.00-162.50			(36 ksi)						
T11	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
162.50-150.00			(36 ksi)						
T12	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
150.00-137.50			(36 ksi)						
T13	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
137.50-125.00			(36 ksi)						
T14	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
125.00-112.50			(36 ksi)						
T15	0.00	0.3750	A36	1	1	1	0.0000	0.0000	36.0000
112.50-100.00			(36 ksi)						
T16	0.00	0.3750	A36	1	1	1	72.0000	0.0000	36.0000
100.00-87.50			(36 ksi)						
T17	0.00	0.3750	A36	1.05	1	1	0.0000	24.0000	36.0000
87.50-75.00			(36 ksi)						
T18	0.00	0.3750	A36	1.05	1	1	0.0000	24.0000	36.0000
75.00-50.00			(36 ksi)						
T19	0.00	0.5000	A36	1	1	1	0.0000	0.0000	36.0000
50.00-25.00			(36 ksi)						
T20 25.00-0.00	0.00	0.5000	A36	1	1	1	0.0000	0.0000	36.0000
			(36 ksi)						

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
ft			X	X	X	X	X	X	X	
			Y	Y	Y	Y	Y	Y	Y	

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Tower Elevation <i>ft</i>	Calc K Single Angles	Calc K Solid Rounds	<i>K Factors¹</i>									
			<i>Legs</i>	<i>X Brace Diags</i>	<i>K Brace Diags</i>	<i>Single Diags</i>	<i>Girts</i>	<i>Horiz.</i>	<i>Sec. Horiz.</i>	<i>Inner Brace</i>		
				<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>	<i>X Y</i>
T1 325.00-300.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T2 300.00-287.50	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T3 287.50-281.25	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T4 281.25-275.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T5 275.00-250.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T6 250.00-225.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T7 225.00-212.50	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T8 212.50-200.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T9 200.00-175.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T10 175.00-162.50	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T11 162.50-150.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T12 150.00-137.50	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T13 137.50-125.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T14 125.00-112.50	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T15 112.50-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T16 100.00-87.50	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T17 87.50-75.00	Yes	Yes	1	1	1	1	1	0.5	1	1	1	1
T18 75.00-50.00	Yes	Yes	1	1	1	1	1	0.5	1	1	1	1
T19 50.00-25.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1
T20 25.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1

¹Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	<i>Leg</i>		<i>Diagonal</i>		<i>Top Girt</i>		<i>Bottom Girt</i>		<i>Mid Girt</i>		<i>Long Horizontal</i>		<i>Short Horizontal</i>	
	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>
T1 325.00-300.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation <i>ft</i>	<i>Leg</i>		<i>Diagonal</i>		<i>Top Girt</i>		<i>Bottom Girt</i>		<i>Mid Girt</i>		<i>Long Horizontal</i>		<i>Short Horizontal</i>	
	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>
T2 300.00-287.50	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 287.50-281.25	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 281.25-275.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 275.00-250.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 250.00-225.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 225.00-212.50	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 212.50-200.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 200.00-175.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 175.00-162.50	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 162.50-150.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 150.00-137.50	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 137.50-125.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 125.00-112.50	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 112.50-100.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 100.00-87.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 87.50-75.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 75.00-50.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T19 50.00-25.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75
T20 25.00-0.00	0.0000	1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	1	0.0000	0.75

Tower Elevation <i>ft</i>	<i>Redundant Horizontal</i>		<i>Redundant Diagonal</i>		<i>Redundant Sub-Diagonal</i>		<i>Redundant Sub-Horizontal</i>		<i>Redundant Vertical</i>	<i>Redundant Hip</i>		<i>Redundant Hip Diagonal</i>	
	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>Net Width Deduct in</i>	<i>U</i>	<i>Net Width Deduct in</i>	<i>U</i>
T1 325.00-300.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.75	0.0000	0.75
T2 300.00-287.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.75	0.0000	0.75
T3 287.50-281.25	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.75	0.0000	0.75
T4 281.25-275.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.75	0.0000	0.75
T5 275.00-250.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.75	0.0000	0.75

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Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T6 250.00-225.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 225.00-212.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 212.50-200.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 200.00-175.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 175.00-162.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 162.50-150.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 150.00-137.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 137.50-125.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 125.00-112.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 112.50-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 100.00-87.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 87.50-75.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 75.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T19 50.00-25.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T20 25.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T8 212.50-200.00	Flange	1.3750	4	A325N	A325N	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
T9 200.00-175.00	Flange	1.3750	4	A325N	A325N	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
T10 175.00-162.50	Flange	0.7500	0	A325N	A325N	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
T11 162.50-150.00	Flange	1.5000	4	A325N	A325N	0.6250	0	0.6250	0	0.6250	0	0.7500	1	0.6250	0
T12 150.00-137.50	Flange	0.7500	0	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T13 137.50-125.00	Flange	1.5000	4	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T14 125.00-112.50	Flange	0.7500	0	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T15 112.50-100.00	Flange	1.5000	4	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T16 100.00-87.50	Flange	0.7500	0	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T17 87.50-75.00	Flange	1.7500	4	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T18 75.00-50.00	Flange	2.0000	4	A325N	A325N	1.0000	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T19 50.00-25.00	Flange	2.0000	4	A325N	A325N	1.2500	1	0.6250	0	0.6250	0	1.0000	1	0.6250	0
T20 25.00-0.00	Flange	2.5000	4	A325N	A325N	1.2500	1	0.6250	0	0.6250	0	1.1250	1	0.6250	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 325.00-300.00	Flange	0.8750	4	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0
T2 300.00-287.50	Flange	0.7500	0	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0
T3 287.50-281.25	Flange	0.7500	0	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0
T4 281.25-275.00	Flange	1.0000	4	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0
T5 275.00-250.00	Flange	1.1250	4	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0
T6 250.00-225.00	Flange	1.2500	4	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0
T7 225.00-212.50	Flange	0.7500	0	A325N	A325N	0.7500	1	A325N	A325N	0.6250	0	A325N	A325N	0.6250	0

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	# Per Row	# Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Ladder 2 Rail (L2x3x1/4)	A	No	No	Af (CaAa)	325.00 - 250.00	0.0000	0.4	1	1	0.5000	1.9000	4.09
Ladder Rail 2 (L2x3x1/4) - Weight Only ****	B	No	No	Af (CaAa)	325.00 - 250.00	0.0000	-0.4	1	1	0.5000	0.0000	4.09
Ladder Rung - Weight Only ****	A	No	No	Ar (CaAa)	325.00 - 0.00	0.0000	0.5	1	1	0.5000	0.0000	2.08
Ladder Mount Rung - Weight Only ****	A	No	No	Af (CaAa)	325.00 - 0.00	0.0000	0.5	1	1	0.5000	0.0000	3.37
Rail L1 1/2 x 1 1/2 x 1/8	A	No	No	Ar (CaAa)	312.50 - 9.00	0.0000	0.44	2	2	35.0000	1.4500	1.23
WG2 Rung	A	No	No	Af (CaAa)	312.50 - 9.00	0.0000	0.44	1	1	0.5000	1.4500	1.05
**** Rail L2x2x3/16	C	No	No	Af (CaAa)	250.00 - 1.50	0.0000	0.4	2	2	21.0000	1.9000	2.46
WG1 Rung	C	No	No	Af (CaAa)	250.00 - 0.0000	0.0000	0.4	1	1	0.5000	0.0000	1.06

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
****					1.50								

Ladder 1 Rail (PL1.5x3/8)	A	No	No	Af (CaAa)	250.00 - 0.00	0.0000	0.4	1	1	0.5000	1.5000		1.91
Ladder Rail 1 (PL1.5x3/8) - Weight Only	A	No	No	Af (CaAa)	250.00 - 0.00	0.0000	-0.4	1	1	0.5000	0.0000		1.91

5/8" dia. coax	B	No	No	Ar (CaAa)	325.00 - 8.00	0.0000	-0.5	1	1	0.5000	0.6250		0.15

9/16" EHS Cable	B	No	No	Ar (CaAa)	325.00 - 0.00	0.0000	-0.5	1	1	0.5000	0.5625		0.67

Safety Line 3/8	B	No	No	Ar (CaAa)	325.00 - 0.00	0.0000	-0.5	1	1	0.5000	0.3750		0.22

LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	322.50 - 8.00	0.0000	0.44	2	2	0.5000	1.0900		0.33

LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	322.50 - 8.00	0.0000	0.45	1	1	0.5000	1.9800		0.82

EU63	B	No	No	Ar (CaAa)	317.00 - 279.00	0.0000	0.5	2	2	0.5000	2.0300		0.56

LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	305.00 - 8.00	0.0000	0.44	1	1	1.0900	1.0900		0.33
LDF4P-50A (1/2 FOAM)	A	No	No	Ar (CaAa)	305.00 - 8.00	0.0000	0.44	1	1	0.6300	0.6300		0.15

LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	285.00 - 8.00	0.0000	0.45	1	1	1.9800	1.9800		0.82

EU63	B	No	No	Ar (CaAa)	279.00 - 8.00	0.0000	0.5	4	2	0.5000	2.0300		0.56

LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	252.00 - 1.00	0.0000	0.4	10	5	0.5000	1.9800		0.82

LDF2-50A (3/8 FOAM)	A	No	No	Ar (CaAa)	240.00 - 0.00	0.0000	0.4	4	4	0.5000	0.4400		0.08

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C _A A _A ft ² /ft	Weight plf

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
T1	325.00-300.00	A	0.000	0.000	24.782	0.000	318.16
		B	0.000	0.000	10.808	0.000	147.32
		C	0.000	0.000	0.000	0.000	0.00
T2	300.00-287.50	A	0.000	0.000	17.954	0.000	187.65
		B	0.000	0.000	7.028	0.000	78.14
		C	0.000	0.000	0.000	0.000	0.00
T3	287.50-281.25	A	0.000	0.000	9.720	0.000	96.90
		B	0.000	0.000	3.514	0.000	39.07
		C	0.000	0.000	0.000	0.000	0.00
T4	281.25-275.00	A	0.000	0.000	10.215	0.000	98.95
		B	0.000	0.000	5.138	0.000	43.55
		C	0.000	0.000	0.000	0.000	0.00
T5	275.00-250.00	A	0.000	0.000	40.858	0.000	395.80
		B	0.000	0.000	24.206	0.000	184.28
		C	0.000	0.000	3.960	0.000	16.40
T6	250.00-225.00	A	0.000	0.000	41.832	0.000	393.85
		B	0.000	0.000	24.206	0.000	82.03
		C	0.000	0.000	65.333	0.000	354.60
T7	225.00-212.50	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T8	212.50-200.00	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T9	200.00-175.00	A	0.000	0.000	43.592	0.000	397.05
		B	0.000	0.000	24.206	0.000	82.03
		C	0.000	0.000	65.333	0.000	354.60
T10	175.00-162.50	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T11	162.50-150.00	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T12	150.00-137.50	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T13	137.50-125.00	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T14	125.00-112.50	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T15	112.50-100.00	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T16	100.00-87.50	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T17	87.50-75.00	A	0.000	0.000	21.796	0.000	198.53
		B	0.000	0.000	12.103	0.000	41.01
		C	0.000	0.000	32.667	0.000	177.30
T18	75.00-50.00	A	0.000	0.000	43.592	0.000	397.05
		B	0.000	0.000	24.206	0.000	82.03
		C	0.000	0.000	65.333	0.000	354.60
T19	50.00-25.00	A	0.000	0.000	43.592	0.000	397.05

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
T20	25.00-0.00	B	0.000	0.000	24.206	0.000	82.03
		C	0.000	0.000	65.333	0.000	354.60
		A	0.000	0.000	32.519	0.000	343.25
		B	0.000	0.000	17.210	0.000	62.91
		C	0.000	0.000	62.403	0.000	337.42

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
T1	325.00-300.00	A	0.266	0.000	0.000	37.714	0.000	418.51
		B		0.000	0.000	21.341	0.000	229.12
		C		0.000	0.000	0.000	0.00	0.00
T2	300.00-287.50	A	0.264	0.000	0.000	26.795	0.000	256.76
		B		0.000	0.000	13.497	0.000	126.79
		C		0.000	0.000	0.000	0.000	0.00
T3	287.50-281.25	A	0.264	0.000	0.000	14.326	0.000	134.04
		B		0.000	0.000	6.743	0.000	63.32
		C		0.000	0.000	0.000	0.000	0.00
T4	281.25-275.00	A	0.263	0.000	0.000	14.944	0.000	137.80
		B		0.000	0.000	7.489	0.000	77.70
		C		0.000	0.000	0.000	0.000	0.00
T5	275.00-250.00	A	0.261	0.000	0.000	59.688	0.000	550.20
		B		0.000	0.000	31.599	0.000	342.68
		C		0.000	0.000	3.346	0.000	39.55
T6	250.00-225.00	A	0.259	0.000	0.000	66.471	0.000	572.98
		B		0.000	0.000	30.230	0.000	211.78
		C		0.000	0.000	61.523	0.000	699.56
T7	225.00-212.50	A	0.257	0.000	0.000	35.596	0.000	292.73
		B		0.000	0.000	15.090	0.000	105.60
		C		0.000	0.000	30.737	0.000	349.19
T8	212.50-200.00	A	0.255	0.000	0.000	35.543	0.000	292.14
		B		0.000	0.000	15.072	0.000	105.40
		C		0.000	0.000	30.720	0.000	348.76
T9	200.00-175.00	A	0.253	0.000	0.000	70.914	0.000	582.39
		B		0.000	0.000	30.086	0.000	210.15
		C		0.000	0.000	61.384	0.000	696.16
T10	175.00-162.50	A	0.250	0.000	0.000	35.363	0.000	290.17
		B		0.000	0.000	15.011	0.000	104.72
		C		0.000	0.000	30.661	0.000	347.34
T11	162.50-150.00	A	0.248	0.000	0.000	32.346	0.000	283.98
		B		0.000	0.000	16.448	0.000	84.31
		C		0.000	0.000	40.735	0.000	288.67
T12	150.00-137.50	A	0.246	0.000	0.000	32.259	0.000	283.13
		B		0.000	0.000	16.411	0.000	83.90
		C		0.000	0.000	40.668	0.000	287.64
T13	137.50-125.00	A	0.244	0.000	0.000	32.164	0.000	282.22
		B		0.000	0.000	16.372	0.000	83.45
		C		0.000	0.000	40.595	0.000	286.53
T14	125.00-112.50	A	0.242	0.000	0.000	32.061	0.000	281.22
		B		0.000	0.000	16.330	0.000	82.96
		C		0.000	0.000	40.516	0.000	285.32
T15	112.50-100.00	A	0.239	0.000	0.000	31.947	0.000	280.13
		B		0.000	0.000	16.283	0.000	82.43
		C		0.000	0.000	40.430	0.000	283.99
T16	100.00-87.50	A	0.236	0.000	0.000	31.821	0.000	278.93
		B		0.000	0.000	16.231	0.000	81.84

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Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight lb
T17	87.50-75.00	C		0.000	0.000	40.333	0.000	282.52
		A	0.233	0.000	0.000	31.679	0.000	277.57
		B		0.000	0.000	16.173	0.000	81.18
T18	75.00-50.00	C		0.000	0.000	40.224	0.000	280.86
		A	0.227	0.000	0.000	62.845	0.000	550.31
		B		0.000	0.000	32.134	0.000	159.98
T19	50.00-25.00	C		0.000	0.000	80.057	0.000	555.79
		A	0.215	0.000	0.000	61.887	0.000	541.36
		B		0.000	0.000	31.739	0.000	155.58
T20	25.00-0.00	C		0.000	0.000	79.324	0.000	544.76
		A	0.193	0.000	0.000	46.018	0.000	443.44
		B		0.000	0.000	22.417	0.000	109.59
		C		0.000	0.000	74.379	0.000	498.45

Feed Line Center of Pressure

Section	Elevation ft	CP _x in	CP _z in	CP _x Ice in	CP _z Ice in
T1	325.00-300.00	2.2534	-10.6278	2.1093	-14.6695
T2	300.00-287.50	3.1057	-13.8432	2.7983	-17.9044
T3	287.50-281.25	3.8349	-18.7343	3.3121	-22.9017
T4	281.25-275.00	5.8326	-18.4234	4.8516	-23.3052
T5	275.00-250.00	5.1002	-16.6568	4.2522	-21.6579
T6	250.00-225.00	-13.0143	-8.4293	-12.0941	-14.2656
T7	225.00-212.50	-14.0718	-9.9076	-13.1133	-16.6766
T8	212.50-200.00	-12.3051	-8.7591	-11.8101	-15.1999
T9	200.00-175.00	-12.9621	-9.2208	-12.2276	-15.6762
T10	175.00-162.50	-13.2716	-9.4606	-12.6245	-16.1889
T11	162.50-150.00	-13.2487	-9.4634	-12.7105	-15.9751
T12	150.00-137.50	-15.7613	-11.0799	-14.6295	-18.0372
T13	137.50-125.00	-15.7015	-11.0644	-14.7095	-18.1304
T14	125.00-112.50	-15.8767	-11.1717	-14.8522	-18.2232
T15	112.50-100.00	-16.2524	-11.4391	-15.2329	-18.6244
T16	100.00-87.50	-14.1404	-10.3472	-13.7627	-17.3661
T17	87.50-75.00	-13.8699	-9.8620	-13.3611	-16.3756
T18	75.00-50.00	-14.1972	-10.0985	-13.7155	-16.6656
T19	50.00-25.00	-22.5933	-15.3152	-20.5447	-23.4288
T20	25.00-0.00	-25.3977	-9.3812	-22.8560	-16.1650

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	3	Ladder 2 Rail (L2x3x1/4)	300.00 - 325.00	0.6000	0.6000
		Ladder Rail 2 (L2x3x1/4) - Weight Only	300.00 - 325.00	0.6000	0.6000
T1	6	Ladder Rung - Weight Only	300.00 - 325.00	0.6000	0.6000
		Ladder Mount Rung - Weight	300.00 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
		Only	325.00		
T1	10	Rail L1 1/2 x 1 1/2 x 1/8	300.00 - 312.50	0.6000	0.6000
T1	12	WG2 Rung	300.00 - 312.50	0.6000	0.6000
T1	22	5/8" dia. coax	300.00 - 325.00	0.6000	0.6000
T1	24	9/16" EHS Cable	300.00 - 325.00	0.6000	0.6000
T1	26	Safety Line 3/8	300.00 - 325.00	0.6000	0.6000
T1	28	LDF5-50A (7/8 FOAM)	300.00 - 322.50	0.6000	0.6000
T1	30	LDF7-50A (1-5/8 FOAM)	300.00 - 322.50	0.6000	0.6000
T1	32	EU63	300.00 - 317.00	0.6000	0.6000
T1	34	LDF5-50A (7/8 FOAM)	300.00 - 305.00	0.6000	0.6000
T1	35	LDF4P-50A (1/2 FOAM)	300.00 - 305.00	0.6000	0.6000
T2	3	Ladder 2 Rail (L2x3x1/4)	287.50 - 300.00	0.6000	0.6000
T2	4	Ladder Rail 2 (L2x3x1/4) - Weight Only	287.50 - 300.00	0.6000	0.6000
T2	6	Ladder Rung - Weight Only	287.50 - 300.00	0.6000	0.6000
T2	8	Ladder Mount Rung - Weight Only	287.50 - 300.00	0.6000	0.6000
T2	10	Rail L1 1/2 x 1 1/2 x 1/8	287.50 - 300.00	0.6000	0.6000
T2	12	WG2 Rung	287.50 - 300.00	0.6000	0.6000
T2	22	5/8" dia. coax	287.50 - 300.00	0.6000	0.6000
T2	24	9/16" EHS Cable	287.50 - 300.00	0.6000	0.6000
T2	26	Safety Line 3/8	287.50 - 300.00	0.6000	0.6000
T2	28	LDF5-50A (7/8 FOAM)	287.50 - 300.00	0.6000	0.6000
T2	30	LDF7-50A (1-5/8 FOAM)	287.50 - 300.00	0.6000	0.6000
T2	32	EU63	287.50 - 300.00	0.6000	0.6000
T2	34	LDF5-50A (7/8 FOAM)	287.50 - 300.00	0.6000	0.6000
T2	35	LDF4P-50A (1/2 FOAM)	287.50 - 300.00	0.6000	0.6000
T3	3	Ladder 2 Rail (L2x3x1/4)	281.25 - 287.50	0.6000	0.6000
T3	4	Ladder Rail 2 (L2x3x1/4) - Weight Only	281.25 - 287.50	0.6000	0.6000
T3	6	Ladder Rung - Weight Only	281.25 - 287.50	0.6000	0.6000
T3	8	Ladder Mount Rung - Weight Only	281.25 - 287.50	0.6000	0.6000
T3	10	Rail L1 1/2 x 1 1/2 x 1/8	281.25 - 287.50	0.6000	0.6000
T3	12	WG2 Rung	281.25 - 287.50	0.6000	0.6000
T3	22	5/8" dia. coax	281.25 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
			287.50		
T3	24	9/16" EHS Cable	281.25 - 287.50	0.6000	0.6000
T3	26	Safety Line 3/8	281.25 - 287.50	0.6000	0.6000
T3	28	LDF5-50A (7/8 FOAM)	281.25 - 287.50	0.6000	0.6000
T3	30	LDF7-50A (1-5/8 FOAM)	281.25 - 287.50	0.6000	0.6000
T3	32	EU63	281.25 - 287.50	0.6000	0.6000
T3	34	LDF5-50A (7/8 FOAM)	281.25 - 287.50	0.6000	0.6000
T3	35	LDF4P-50A (1/2 FOAM)	281.25 - 287.50	0.6000	0.6000
T3	37	LDF7-50A (1-5/8 FOAM)	281.25 - 285.00	0.6000	0.6000
T4	3	Ladder 2 Rail (L2x3x1/4)	275.00 - 281.25	0.6000	0.6000
T4	4	Ladder Rail 2 (L2x3x1/4) - Weight Only	275.00 - 281.25	0.6000	0.6000
T4	6	Ladder Rung - Weight Only	275.00 - 281.25	0.6000	0.6000
T4	8	Ladder Mount Rung - Weight Only	275.00 - 281.25	0.6000	0.6000
T4	10	Rail L1 1/2 x 1 1/2 x 1/8	275.00 - 281.25	0.6000	0.6000
T4	12	WG2 Rung	275.00 - 281.25	0.6000	0.6000
T4	22	5/8" dia. coax	275.00 - 281.25	0.6000	0.6000
T4	24	9/16" EHS Cable	275.00 - 281.25	0.6000	0.6000
T4	26	Safety Line 3/8	275.00 - 281.25	0.6000	0.6000
T4	28	LDF5-50A (7/8 FOAM)	275.00 - 281.25	0.6000	0.6000
T4	30	LDF7-50A (1-5/8 FOAM)	275.00 - 281.25	0.6000	0.6000
T4	32	EU63	279.00 - 281.25	0.6000	0.6000
T4	34	LDF5-50A (7/8 FOAM)	275.00 - 281.25	0.6000	0.6000
T4	35	LDF4P-50A (1/2 FOAM)	275.00 - 281.25	0.6000	0.6000
T4	37	LDF7-50A (1-5/8 FOAM)	275.00 - 281.25	0.6000	0.6000
T4	39	EU63	275.00 - 279.00	0.6000	0.6000
T5	3	Ladder 2 Rail (L2x3x1/4)	250.00 - 275.00	0.6000	0.6000
T5	4	Ladder Rail 2 (L2x3x1/4) - Weight Only	250.00 - 275.00	0.6000	0.6000
T5	6	Ladder Rung - Weight Only	250.00 - 275.00	0.6000	0.6000
T5	8	Ladder Mount Rung - Weight Only	250.00 - 275.00	0.6000	0.6000
T5	10	Rail L1 1/2 x 1 1/2 x 1/8	250.00 - 275.00	0.6000	0.6000
T5	12	WG2 Rung	250.00 - 275.00	0.6000	0.6000
T5	22	5/8" dia. coax	250.00 -	0.6000	0.6000

tnxTower Tower Engineering Professionals, Inc. 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350	Job	Fort White	Page	17 of 43
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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T5	24	9/16" EHS Cable	275.00 - 250.00 - 275.00	0.6000	0.6000
T5	26	Safety Line 3/8	250.00 - 275.00	0.6000	0.6000
T5	28	LDF5-50A (7/8 FOAM)	250.00 - 275.00	0.6000	0.6000
T5	30	LDF7-50A (1-5/8 FOAM)	250.00 - 275.00	0.6000	0.6000
T5	34	LDF5-50A (7/8 FOAM)	250.00 - 275.00	0.6000	0.6000
T5	35	LDF4P-50A (1/2 FOAM)	250.00 - 275.00	0.6000	0.6000
T5	37	LDF7-50A (1-5/8 FOAM)	250.00 - 275.00	0.6000	0.6000
T5	39	EU63	250.00 - 275.00	0.6000	0.6000
T5	41	LDF7-50A (1-5/8 FOAM)	250.00 - 252.00	0.6000	0.6000
T6	6	Ladder Rung - Weight Only	225.00 - 250.00	0.6000	0.6000
T6	8	Ladder Mount Rung - Weight Only	225.00 - 250.00	0.6000	0.6000
T6	10	Rail L1 1/2 x 1 1/2 x 1/8	225.00 - 250.00	0.6000	0.6000
T6	12	WG2 Rung	225.00 - 250.00	0.6000	0.6000
T6	14	Rail L2x2x3/16	225.00 - 250.00	0.6000	0.6000
T6	16	WG1 Rung	225.00 - 250.00	0.6000	0.6000
T6	19	Ladder 1 Rail (PL1.5x3/8)	225.00 - 250.00	0.6000	0.6000
T6	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	225.00 - 250.00	0.6000	0.6000
T6	22	5/8" dia. coax	225.00 - 250.00	0.6000	0.6000
T6	24	9/16" EHS Cable	225.00 - 250.00	0.6000	0.6000
T6	26	Safety Line 3/8	225.00 - 250.00	0.6000	0.6000
T6	28	LDF5-50A (7/8 FOAM)	225.00 - 250.00	0.6000	0.6000
T6	30	LDF7-50A (1-5/8 FOAM)	225.00 - 250.00	0.6000	0.6000
T6	34	LDF5-50A (7/8 FOAM)	225.00 - 250.00	0.6000	0.6000
T6	35	LDF4P-50A (1/2 FOAM)	225.00 - 250.00	0.6000	0.6000
T6	37	LDF7-50A (1-5/8 FOAM)	225.00 - 250.00	0.6000	0.6000
T6	39	EU63	225.00 - 250.00	0.6000	0.6000
T6	41	LDF7-50A (1-5/8 FOAM)	225.00 - 250.00	0.6000	0.6000
T6	45	LDF2-50A (3/8 FOAM)	225.00 - 240.00	0.6000	0.6000
T7	6	Ladder Rung - Weight Only	212.50 - 225.00	0.6000	0.6000
T7	8	Ladder Mount Rung - Weight Only	212.50 - 225.00	0.6000	0.6000
T7	10	Rail L1 1/2 x 1 1/2 x 1/8	212.50 - 225.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T7	12	WG2 Rung	225.00 - 212.50 - 225.00	0.6000	0.6000
T7	14	Rail L2x2x3/16	212.50 - 225.00	0.6000	0.6000
T7	16	WG1 Rung	212.50 - 225.00	0.6000	0.6000
T7	19	Ladder 1 Rail (PL1.5x3/8)	212.50 - 225.00	0.6000	0.6000
T7	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	212.50 - 225.00	0.6000	0.6000
T7	22	5/8" dia. coax	212.50 - 225.00	0.6000	0.6000
T7	24	9/16" EHS Cable	212.50 - 225.00	0.6000	0.6000
T7	26	Safety Line 3/8	212.50 - 225.00	0.6000	0.6000
T7	28	LDF5-50A (7/8 FOAM)	212.50 - 225.00	0.6000	0.6000
T7	30	LDF7-50A (1-5/8 FOAM)	212.50 - 225.00	0.6000	0.6000
T7	34	LDF5-50A (7/8 FOAM)	212.50 - 225.00	0.6000	0.6000
T7	35	LDF4P-50A (1/2 FOAM)	212.50 - 225.00	0.6000	0.6000
T7	37	LDF7-50A (1-5/8 FOAM)	212.50 - 225.00	0.6000	0.6000
T7	39	EU63	212.50 - 225.00	0.6000	0.6000
T7	41	LDF7-50A (1-5/8 FOAM)	212.50 - 225.00	0.6000	0.6000
T7	45	LDF2-50A (3/8 FOAM)	212.50 - 225.00	0.6000	0.6000
T8	6	Ladder Rung - Weight Only	200.00 - 212.50	0.6000	0.6000
T8	8	Ladder Mount Rung - Weight Only	200.00 - 212.50	0.6000	0.6000
T8	10	Rail L1 1/2 x 1 1/2 x 1/8	200.00 - 212.50	0.6000	0.6000
T8	12	WG2 Rung	200.00 - 212.50	0.6000	0.6000
T8	14	Rail L2x2x3/16	200.00 - 212.50	0.6000	0.6000
T8	16	WG1 Rung	200.00 - 212.50	0.6000	0.6000
T8	19	Ladder 1 Rail (PL1.5x3/8)	200.00 - 212.50	0.6000	0.6000
T8	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	200.00 - 212.50	0.6000	0.6000
T8	22	5/8" dia. coax	200.00 - 212.50	0.6000	0.6000
T8	24	9/16" EHS Cable	200.00 - 212.50	0.6000	0.6000
T8	26	Safety Line 3/8	200.00 - 212.50	0.6000	0.6000
T8	28	LDF5-50A (7/8 FOAM)	200.00 - 212.50	0.6000	0.6000
T8	30	LDF7-50A (1-5/8 FOAM)	200.00 - 212.50	0.6000	0.6000
T8	34	LDF5-50A (7/8 FOAM)	200.00 - 212.50	0.6000	0.6000
T8	35	LDF4P-50A (1/2 FOAM)	200.00 - 212.50	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T8	37	LDF7-50A (1-5/8 FOAM)	212.50	0.6000	0.6000
			200.00 -		
			212.50		
T8	39	EU63	200.00 -	0.6000	0.6000
			212.50		
T8	41	LDF7-50A (1-5/8 FOAM)	200.00 -	0.6000	0.6000
			212.50		
T8	45	LDF2-50A (3/8 FOAM)	200.00 -	0.6000	0.6000
			212.50		
T9	6	Ladder Rung - Weight Only	175.00 -	0.6000	0.6000
			200.00		
T9	8	Ladder Mount Rung - Weight Only	175.00 -	0.6000	0.6000
			200.00		
T9	10	Rail L1 1/2 x 1 1/2 x 1/8	175.00 -	0.6000	0.6000
			200.00		
T9	12	WG2 Rung	175.00 -	0.6000	0.6000
			200.00		
T9	14	Rail L2x2x3/16	175.00 -	0.6000	0.6000
			200.00		
T9	16	WG1 Rung	175.00 -	0.6000	0.6000
			200.00		
T9	19	Ladder 1 Rail (PL1.5x3/8)	175.00 -	0.6000	0.6000
			200.00		
T9	20	Ladder Rail 1 (PL1.5x3/8) -	175.00 -	0.6000	0.6000
		Weight Only	200.00		
T9	22	5/8" dia. coax	175.00 -	0.6000	0.6000
			200.00		
T9	24	9/16" EHS Cable	175.00 -	0.6000	0.6000
			200.00		
T9	26	Safety Line 3/8	175.00 -	0.6000	0.6000
			200.00		
T9	28	LDF5-50A (7/8 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T9	30	LDF7-50A (1-5/8 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T9	34	LDF5-50A (7/8 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T9	35	LDF4P-50A (1/2 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T9	37	LDF7-50A (1-5/8 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T9	39	EU63	175.00 -	0.6000	0.6000
			200.00		
T9	41	LDF7-50A (1-5/8 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T9	45	LDF2-50A (3/8 FOAM)	175.00 -	0.6000	0.6000
			200.00		
T10	6	Ladder Rung - Weight Only	162.50 -	0.6000	0.6000
			175.00		
T10	8	Ladder Mount Rung - Weight Only	162.50 -	0.6000	0.6000
			175.00		
T10	10	Rail L1 1/2 x 1 1/2 x 1/8	162.50 -	0.6000	0.6000
			175.00		
T10	12	WG2 Rung	162.50 -	0.6000	0.6000
			175.00		
T10	14	Rail L2x2x3/16	162.50 -	0.6000	0.6000
			175.00		
T10	16	WG1 Rung	162.50 -	0.6000	0.6000
			175.00		
T10	19	Ladder 1 Rail (PL1.5x3/8)	162.50 -	0.6000	0.6000
			175.00		
T10	20	Ladder Rail 1 (PL1.5x3/8) -	162.50 -	0.6000	0.6000
		Weight Only	175.00		
T10	22	5/8" dia. coax	162.50 -	0.6000	0.6000
			175.00		
T10	24	9/16" EHS Cable	162.50 -	0.6000	0.6000
			175.00		
T10	26	Safety Line 3/8	162.50 -	0.6000	0.6000
			175.00		
T10	28	LDF5-50A (7/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	30	LDF7-50A (1-5/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	34	LDF5-50A (7/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	35	LDF4P-50A (1/2 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	37	LDF7-50A (1-5/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	39	EU63	162.50 -	0.6000	0.6000
			175.00		
T10	41	LDF7-50A (1-5/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	45	LDF2-50A (3/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	20	Ladder Rail 1 (PL1.5x3/8) -	162.50 -	0.6000	0.6000

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
		Weight Only	175.00		
		5/8" dia. coax	162.50 -	0.6000	0.6000
			175.00		
T10	24	9/16" EHS Cable	162.50 -	0.6000	0.6000
			175.00		
T10	26	Safety Line 3/8	162.50 -	0.6000	0.6000
			175.00		
T10	28	LDF5-50A (7/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	30	LDF7-50A (1-5/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	34	LDF5-50A (7/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	35	LDF4P-50A (1/2 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	37	LDF7-50A (1-5/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	39	EU63	162.50 -	0.6000	0.6000
			175.00		
T10	41	LDF7-50A (1-5/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T10	45	LDF2-50A (3/8 FOAM)	162.50 -	0.6000	0.6000
			175.00		
T11	6	Ladder Rung - Weight Only	150.00 -	0.6000	0.6000
			162.50		
T11	8	Ladder Mount Rung - Weight Only	150.00 -	0.6000	0.6000
			162.50		
T11	10	Rail L1 1/2 x 1 1/2 x 1/8	150.00 -	0.6000	0.6000
			162.50		
T11	12	WG2 Rung	150.00 -	0.6000	0.6000
			162.50		
T11	14	Rail L2x2x3/16	150.00 -	0.6000	0.6000
			162.50		
T11	16	WG1 Rung	150.00 -	0.6000	0.6000
			162.50		
T11	19	Ladder 1 Rail (PL1.5x3/8)	150.00 -	0.6000	0.6000
			162.50		
T11	20	Ladder Rail 1 (PL1.5x3/8) -	150.00 -	0.6000	0.6000
		Weight Only	162.50		
T11	22	5/8" dia. coax	150.00 -	0.6000	0.6000
			162.50		
T11	24	9/16" EHS Cable	150.00 -	0.6000	0.6000
			162.50		
T11	26	Safety Line 3/8	150.00 -	0.6000	0.6000
			162.50		
T11	28	LDF5-50A (7/8 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T11	30	LDF7-50A (1-5/8 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T11	34	LDF5-50A (7/8 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T11	35	LDF4P-50A (1/2 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T11	37	LDF7-50A (1-5/8 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T11	39	EU63	150.00 -	0.6000	0.6000
			162.50		
T11	41	LDF7-50A (1-5/8 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T11	45	LDF2-50A (3/8 FOAM)	150.00 -	0.6000	0.6000
			162.50		
T12	6	Ladder Rung - Weight Only	137.50 -	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_s Ice</i>
T12	8	Ladder Mount Rung - Weight Only	150.00 - 137.50 - 150.00	0.6000	0.6000
T12	10	Rail L1 1/2 x 1 1/2 x 1/8	137.50 - 150.00	0.6000	0.6000
T12	12	WG2 Rung	137.50 - 150.00	0.6000	0.6000
T12	14	Rail L2x2x3/16	137.50 - 150.00	0.6000	0.6000
T12	16	WG1 Rung	137.50 - 150.00	0.6000	0.6000
T12	19	Ladder 1 Rail (PL1.5x3/8)	137.50 - 150.00	0.6000	0.6000
T12	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	137.50 - 150.00	0.6000	0.6000
T12	22	5/8" dia. coax	137.50 - 150.00	0.6000	0.6000
T12	24	9/16" EHS Cable	137.50 - 150.00	0.6000	0.6000
T12	26	Safety Line 3/8	137.50 - 150.00	0.6000	0.6000
T12	28	LDF5-50A (7/8 FOAM)	137.50 - 150.00	0.6000	0.6000
T12	30	LDF7-50A (1-5/8 FOAM)	137.50 - 150.00	0.6000	0.6000
T12	34	LDF5-50A (7/8 FOAM)	137.50 - 150.00	0.6000	0.6000
T12	35	LDF4P-50A (1/2 FOAM)	137.50 - 150.00	0.6000	0.6000
T12	37	LDF7-50A (1-5/8 FOAM)	137.50 - 150.00	0.6000	0.6000
T12	39	EU63	137.50 - 150.00	0.6000	0.6000
T12	41	LDF7-50A (1-5/8 FOAM)	137.50 - 150.00	0.6000	0.6000
T12	45	LDF2-50A (3/8 FOAM)	137.50 - 150.00	0.6000	0.6000
T13	6	Ladder Rung - Weight Only	125.00 - 137.50	0.6000	0.6000
T13	8	Ladder Mount Rung - Weight Only	125.00 - 137.50	0.6000	0.6000
T13	10	Rail L1 1/2 x 1 1/2 x 1/8	125.00 - 137.50	0.6000	0.6000
T13	12	WG2 Rung	125.00 - 137.50	0.6000	0.6000
T13	14	Rail L2x2x3/16	125.00 - 137.50	0.6000	0.6000
T13	16	WG1 Rung	125.00 - 137.50	0.6000	0.6000
T13	19	Ladder 1 Rail (PL1.5x3/8)	125.00 - 137.50	0.6000	0.6000
T13	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	125.00 - 137.50	0.6000	0.6000
T13	22	5/8" dia. coax	125.00 - 137.50	0.6000	0.6000
T13	24	9/16" EHS Cable	125.00 - 137.50	0.6000	0.6000
T13	26	Safety Line 3/8	125.00 - 137.50	0.6000	0.6000
T13	28	LDF5-50A (7/8 FOAM)	125.00 - 137.50	0.6000	0.6000
T13	30	LDF7-50A (1-5/8 FOAM)	125.00 - 137.50	0.6000	0.6000

<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_s Ice</i>
T13	34	LDF5-50A (7/8 FOAM)	137.50 - 125.00 - 137.50	0.6000	0.6000
T13	35	LDF4P-50A (1/2 FOAM)	125.00 - 137.50	0.6000	0.6000
T13	37	LDF7-50A (1-5/8 FOAM)	125.00 - 137.50	0.6000	0.6000
T13	39	EU63	125.00 - 137.50	0.6000	0.6000
T13	41	LDF7-50A (1-5/8 FOAM)	125.00 - 137.50	0.6000	0.6000
T13	45	LDF2-50A (3/8 FOAM)	125.00 - 137.50	0.6000	0.6000
T14	6	Ladder Rung - Weight Only	112.50 - 125.00	0.6000	0.6000
T14	8	Ladder Mount Rung - Weight Only	112.50 - 125.00	0.6000	0.6000
T14	10	Rail L1 1/2 x 1 1/2 x 1/8	112.50 - 125.00	0.6000	0.6000
T14	12	WG2 Rung	112.50 - 125.00	0.6000	0.6000
T14	14	Rail L2x2x3/16	112.50 - 125.00	0.6000	0.6000
T14	16	WG1 Rung	112.50 - 125.00	0.6000	0.6000
T14	19	Ladder 1 Rail (PL1.5x3/8)	112.50 - 125.00	0.6000	0.6000
T14	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	112.50 - 125.00	0.6000	0.6000
T14	22	5/8" dia. coax	112.50 - 125.00	0.6000	0.6000
T14	24	9/16" EHS Cable	112.50 - 125.00	0.6000	0.6000
T14	26	Safety Line 3/8	112.50 - 125.00	0.6000	0.6000
T14	28	LDF5-50A (7/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T14	30	LDF7-50A (1-5/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T14	34	LDF5-50A (7/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T14	35	LDF4P-50A (1/2 FOAM)	112.50 - 125.00	0.6000	0.6000
T14	37	LDF7-50A (1-5/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T14	39	EU63	112.50 - 125.00	0.6000	0.6000
T14	41	LDF7-50A (1-5/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T14	45	LDF2-50A (3/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T15	6	Ladder Rung - Weight Only	100.00 - 112.50	0.6000	0.6000
T15	8	Ladder Mount Rung - Weight Only	100.00 - 112.50	0.6000	0.6000
T15	10	Rail L1 1/2 x 1 1/2 x 1/8	100.00 - 112.50	0.6000	0.6000
T15	12	WG2 Rung	100.00 - 112.50	0.6000	0.6000
T15	14	Rail L2x2x3/16	100.00 - 112.50	0.6000	0.6000
T15	16	WG1 Rung	100.00 - 112.50	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_s Ice</i>
			112.50		
T15	19	Ladder 1 Rail (PL1.5x3/8)	100.00 - 112.50	0.6000	0.6000
T15	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	100.00 - 112.50	0.6000	0.6000
T15	22	5/8" dia. coax	100.00 - 112.50	0.6000	0.6000
T15	24	9/16" EHS Cable	100.00 - 112.50	0.6000	0.6000
T15	26	Safety Line 3/8	100.00 - 112.50	0.6000	0.6000
T15	28	LDF5-50A (7/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T15	30	LDF7-50A (1-5/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T15	34	LDF5-50A (7/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T15	35	LDF4P-50A (1/2 FOAM)	100.00 - 112.50	0.6000	0.6000
T15	37	LDF7-50A (1-5/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T15	39	EU63	100.00 - 112.50	0.6000	0.6000
T15	41	LDF7-50A (1-5/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T15	45	LDF2-50A (3/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T16	6	Ladder Rung - Weight Only	87.50 - 100.00	0.6000	0.6000
T16	8	Ladder Mount Rung - Weight Only	87.50 - 100.00	0.6000	0.6000
T16	10	Rail L1 1/2 x 1 1/2 x 1/8	87.50 - 100.00	0.6000	0.6000
T16	12	WG2 Rung	87.50 - 100.00	0.6000	0.6000
T16	14	Rail L2x2x3/16	87.50 - 100.00	0.6000	0.6000
T16	16	WG1 Rung	87.50 - 100.00	0.6000	0.6000
T16	19	Ladder 1 Rail (PL1.5x3/8)	87.50 - 100.00	0.6000	0.6000
T16	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	87.50 - 100.00	0.6000	0.6000
T16	22	5/8" dia. coax	87.50 - 100.00	0.6000	0.6000
T16	24	9/16" EHS Cable	87.50 - 100.00	0.6000	0.6000
T16	26	Safety Line 3/8	87.50 - 100.00	0.6000	0.6000
T16	28	LDF5-50A (7/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T16	30	LDF7-50A (1-5/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T16	34	LDF5-50A (7/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T16	35	LDF4P-50A (1/2 FOAM)	87.50 - 100.00	0.6000	0.6000
T16	37	LDF7-50A (1-5/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T16	39	EU63	87.50 - 100.00	0.6000	0.6000
T16	41	LDF7-50A (1-5/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T16	45	LDF2-50A (3/8 FOAM)	87.50 - 100.00	0.6000	0.6000
T17	6	Ladder Rung - Weight Only	75.00 - 87.50	0.6000	0.6000
T17	8	Ladder Mount Rung - Weight Only	75.00 - 87.50	0.6000	0.6000
T17	10	Rail L1 1/2 x 1 1/2 x 1/8	75.00 - 87.50	0.6000	0.6000
T17	12	WG2 Rung	75.00 - 87.50	0.6000	0.6000
T17	14	Rail L2x2x3/16	75.00 - 87.50	0.6000	0.6000
T17	16	WG1 Rung	75.00 - 87.50	0.6000	0.6000
T17	19	Ladder 1 Rail (PL1.5x3/8)	75.00 - 87.50	0.6000	0.6000
T17	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	75.00 - 87.50	0.6000	0.6000
T17	22	5/8" dia. coax	75.00 - 87.50	0.6000	0.6000
T17	24	9/16" EHS Cable	75.00 - 87.50	0.6000	0.6000
T17	26	Safety Line 3/8	75.00 - 87.50	0.6000	0.6000
T17	28	LDF5-50A (7/8 FOAM)	75.00 - 87.50	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_s Ice</i>
T17	30	LDF7-50A (1-5/8 FOAM)	75.00 - 87.50	0.6000	0.6000
T17	34	LDF5-50A (7/8 FOAM)	75.00 - 87.50	0.6000	0.6000
T17	35	LDF4P-50A (1/2 FOAM)	75.00 - 87.50	0.6000	0.6000
T17	37	LDF7-50A (1-5/8 FOAM)	75.00 - 87.50	0.6000	0.6000
T17	39	EU63	75.00 - 87.50	0.6000	0.6000
T17	41	LDF7-50A (1-5/8 FOAM)	75.00 - 87.50	0.6000	0.6000
T17	45	LDF2-50A (3/8 FOAM)	75.00 - 87.50	0.6000	0.6000
T18	6	Ladder Rung - Weight Only	50.00 - 75.00	0.6000	0.6000
T18	8	Ladder Mount Rung - Weight Only	50.00 - 75.00	0.6000	0.6000
T18	10	Rail L1 1/2 x 1 1/2 x 1/8	50.00 - 75.00	0.6000	0.6000
T18	12	WG2 Rung	50.00 - 75.00	0.6000	0.6000
T18	14	Rail L2x2x3/16	50.00 - 75.00	0.6000	0.6000
T18	16	WG1 Rung	50.00 - 75.00	0.6000	0.6000
T18	19	Ladder 1 Rail (PL1.5x3/8)	50.00 - 75.00	0.6000	0.6000
T18	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	50.00 - 75.00	0.6000	0.6000
T18	22	5/8" dia. coax	50.00 - 75.00	0.6000	0.6000
T18	24	9/16" EHS Cable	50.00 - 75.00	0.6000	0.6000
T18	26	Safety Line 3/8	50.00 - 75.00	0.6000	0.6000
T18	28	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T18	30	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T18	34	LDF5-50A (7/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T18	35	LDF4P-50A (1/2 FOAM)	50.00 - 75.00	0.6000	0.6000
T18	37	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T18	39	EU63	50.00 - 75.00	0.6000	0.6000
T18	41	LDF7-50A (1-5/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T18	45	LDF2-50A (3/8 FOAM)	50.00 - 75.00	0.6000	0.6000
T19	6	Ladder Rung - Weight Only	25.00 - 50.00	0.6000	0.6000
T19	8	Ladder Mount Rung - Weight Only	25.00 - 50.00	0.6000	0.6000
T19	10	Rail L1 1/2 x 1 1/2 x 1/8	25.00 - 50.00	0.6000	0.6000
T19	12	WG2 Rung	25.00 - 50.00	0.6000	0.6000
T19	14	Rail L2x2x3/16	25.00 - 50.00	0.6000	0.6000
T19	16	WG1 Rung	25.00 - 50.00	0.6000	0.6000
T19	19	Ladder 1 Rail (PL1.5x3/8)	25.00 - 50.00	0.6000	0.6000
T19	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	25.00 - 50.00	0.6000	0.6000
T19	22	5/8" dia. coax	25.00 - 50.00	0.6000	0.6000
T19	24	9/16" EHS Cable	25.00 - 50.00	0.6000	0.6000
T19	26	Safety Line 3/8	25.00 - 50.00	0.6000	0.6000
T19	28	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T19	30	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T19	34	LDF5-50A (7/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T19	35	LDF4P-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T19	37	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T19	39	EU63	25.00 - 50.00	0.6000	0.6000
T19	41	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T19	45	LDF2-50A (3/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T20	6	Ladder Rung - Weight Only	0.00 - 25.00	0.6000	0.6000
T20	8	Ladder Mount Rung - Weight Only	0.00 - 25.00	0.6000	0.6000
T20	10	Rail L1 1/2 x 1 1/2 x 1/8	9.00 - 25.00	0.6000	0.6000
T20	12	WG2 Rung	9.00 - 25.00	0.6000	0.6000
T20	14	Rail L2x2x3/16	1.50 - 25.00	0.6000	0.6000
T20	16	WG1 Rung	1.50 - 25.00	0.6000	0.6000
T20	19	Ladder 1 Rail (PL1.5x3/8)	0.00 - 25.00	0.6000	0.6000
T20	20	Ladder Rail 1 (PL1.5x3/8) - Weight Only	0.00 - 25.00	0.6000	0.6000
T20	22	5/8" dia. coax	8.00 - 25.00	0.6000	0.6000
T20	24	9/16" EHS Cable	0.00 - 25.00	0.6000	0.6000
T20	26	Safety Line 3/8	0.00 - 25.00	0.6000	0.6000

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<i>Tower Section</i>	<i>Feed Line Record No.</i>	<i>Description</i>	<i>Feed Line Segment Elev.</i>	<i>K_a No Ice</i>	<i>K_a Ice</i>
T20	28	LDF5-50A (7/8 FOAM)	8.00 - 25.00	0.6000	0.6000
T20	30	LDF7-50A (1-5/8 FOAM)	8.00 - 25.00	0.6000	0.6000
T20	34	LDF5-50A (7/8 FOAM)	8.00 - 25.00	0.6000	0.6000
T20	35	LDF4P-50A (1/2 FOAM)	8.00 - 25.00	0.6000	0.6000
T20	37	LDF7-50A (1-5/8 FOAM)	8.00 - 25.00	0.6000	0.6000
T20	39	EU63	8.00 - 25.00	0.6000	0.6000
T20	41	LDF7-50A (1-5/8 FOAM)	1.00 - 25.00	0.6000	0.6000
T20	45	LDF2-50A (3/8 FOAM)	0.00 - 25.00	0.6000	0.6000

Discrete Tower Loads

<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_mA_A Front ft²</i>	<i>C_pA_A Side ft²</i>	<i>Weight lb</i>
2.9" x 20-ft Pipe Mount	B	From Leg	0.00 0.00 12.50	0.0000	325.00	No Ice 1/2" Ice	5.80 7.83	116.00 157.93
5/8"x8-ft L Rod	B	From Leg	0.00 0.00 27.00	0.0000	325.00	No Ice 1/2" Ice	0.50 1.31	8.35 13.91
**** 15" Dia. x 15" Beacon	C	From Leg	0.63 0.00 0.00	0.0000	325.00	No Ice 1/2" Ice	0.78 1.24	30.00 48.35
**** 6' Sidearm Mount (TEP#100740)	A	From Leg	3.00 0.00 0.00	10.0000	323.00	No Ice 1/2" Ice	1.79 2.93	67.75 103.22
6' Sidearm Mount (TEP#100740)	C	From Leg	3.00 0.00 0.00	-10.0000	323.00	No Ice 1/2" Ice	1.79 2.93	67.75 103.22
1" Dia x 10' Pipe	A	From Leg	0.00 -2.00 0.00	0.0000	323.00	No Ice 1/2" Ice	0.00 2.02	16.80 26.06
1" Dia x 10' Pipe	C	From Leg	0.00 -2.00 0.00	0.0000	323.00	No Ice 1/2" Ice	0.00 2.02	16.80 26.06
15-ft x 3" Omni	A	From Leg	6.00 0.00 7.50	0.0000	323.00	No Ice 1/2" Ice	4.50 6.03	19.40 51.88
15-ft x 3" Omni	C	From Leg	6.00 0.00 7.50	0.0000	323.00	No Ice 1/2" Ice	4.50 6.03	19.40 51.88
TTA 24"x6"x6"	C	From Leg	0.25 0.00 0.00	0.0000	323.00	No Ice 1/2" Ice	1.27 1.43	25.00 36.70
**** 4.5" dia x 6'	B	From Leg	0.83 0.00 0.00	0.0000	317.00	No Ice 1/2" Ice	1.69 2.62	64.80 83.90

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	Project	TEP No. 26455.664933	Date	09:14:16 03/21/22
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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert ft ft ft</i>	<i>Azimuth Adjustment °</i>	<i>Placement ft</i>	<i>C_mA_A Front ft²</i>	<i>C_pA_A Side ft²</i>	<i>Weight lb</i>
Side Arm Mount [SO 308-1]	C	From Leg	3.00 0.00 0.00	0.0000	305.00	No Ice 1/2" Ice	0.98 1.70	53.00 78.75
16-ft x 3" Omni Antenna	C	From Leg	6.00 0.00 8.00	0.0000	305.00	No Ice 1/2" Ice	3.20 4.83	30.00 54.66
DS7TM	C	From Leg	6.00 0.00 0.00	0.0000	305.00	No Ice 1/2" Ice	0.58 0.68	10.00 15.22
**** Side Arm Mount [SO 308-1]	A	From Leg	3.00 0.00 0.00	0.0000	285.00	No Ice 1/2" Ice	0.98 1.70	53.00 78.75
16-ft x 3" Omni Antenna	A	From Leg	6.00 0.00 8.00	0.0000	285.00	No Ice 1/2" Ice	3.20 4.83	30.00 54.66
**** 4.5" dia x 6'	B	From Leg	0.83 0.00 0.00	0.0000	280.00	No Ice 1/2" Ice	1.71 2.62	64.80 83.90
**** Sabre 12' HD V-Boom Mounts (3) (C10857001C)	C	None		0.0000	252.00	No Ice 1/2" Ice	15.85 23.23	1335.00 1602.00
2.4" x 8-ft Pipe	A	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	1.90 2.73	29.28 43.65
2.4" x 8-ft Pipe	B	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	1.90 2.73	29.28 43.65
2.4" x 8-ft Pipe	C	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	1.90 2.73	29.28 43.65
AIR 6449 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	5.89 6.26	117.72 166.88
AIR 6449 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	5.89 6.26	117.72 166.88
AIR 6449 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	5.89 6.26	117.72 166.88
FFHH-65C-R3 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	21.38 22.13	158.55 301.44
FFHH-65C-R3 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	21.38 22.13	158.55 301.44
FFHH-65C-R3 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	21.38 22.13	158.55 301.44
4480	A	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	2.85 3.06	84.00 105.70
4480	B	From Leg	3.00 0.00 0.00	0.0000	252.00	No Ice 1/2" Ice	2.85 3.06	84.00 105.70
4480	C	From Leg	3.00	0.0000	252.00	No Ice	2.85	84.00

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	Project	TEP No. 26455.664933	Date	09:14:16 03/21/22
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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _A A _A Front ft ²	C _B A _A Side ft ²	Weight lb	
			0.00			1/2" Ice	3.06	1.54	105.70
			0.00						
4460	A	From Leg	3.00	0.0000	252.00	No Ice	2.56	1.98	109.00
			0.00			1/2" Ice	2.76	2.16	134.38
			0.00						
4460	B	From Leg	3.00	0.0000	252.00	No Ice	2.56	1.98	109.00
			0.00			1/2" Ice	2.76	2.16	134.38
			0.00						
4460	C	From Leg	3.00	0.0000	252.00	No Ice	2.56	1.98	109.00
			0.00			1/2" Ice	2.76	2.16	134.38
			0.00						
RNSNDC-7771-PF-48	A	From Leg	3.00	0.0000	252.00	No Ice	3.20	1.03	19.00
			0.00			1/2" Ice	3.42	1.17	40.36
			0.00						
RNSNDC-7771-PF-48	B	From Leg	3.00	0.0000	252.00	No Ice	3.20	1.03	19.00
			0.00			1/2" Ice	3.42	1.17	40.36
			0.00						
RNSNDC-7771-PF-48	C	From Leg	3.00	0.0000	252.00	No Ice	3.20	1.03	19.00
			0.00			1/2" Ice	3.42	1.17	40.36
			0.00						
TMAT1921B78-21A	A	From Leg	3.00	0.0000	252.00	No Ice	0.66	0.31	17.60
			0.00			1/2" Ice	0.76	0.39	23.27
			0.00						
TMAT1921B78-21A	B	From Leg	3.00	0.0000	252.00	No Ice	0.66	0.31	17.60
			0.00			1/2" Ice	0.76	0.39	23.27
			0.00						
TMAT1921B78-21A	C	From Leg	3.00	0.0000	252.00	No Ice	0.66	0.31	17.60
			0.00			1/2" Ice	0.76	0.39	23.27
			0.00						

1.9" x 9-ft pipe	A	From Leg	0.00	0.0000	250.00	No Ice	1.71	1.71	25.00
			-3.00			1/2" Ice	2.63	2.63	38.41
			0.00						
1.9" x 9-ft pipe	B	From Leg	0.00	0.0000	250.00	No Ice	1.71	1.71	25.00
			-3.00			1/2" Ice	2.63	2.63	38.41
			0.00						
1.9" x 9-ft pipe	C	From Leg	0.00	0.0000	250.00	No Ice	1.71	1.71	25.00
			-3.00			1/2" Ice	2.63	2.63	38.41
			0.00						

Side Arm Mount [SO 310-1]	B	From Leg	1.00	0.0000	240.00	No Ice	2.97	2.99	55.00
			0.00			1/2" Ice	4.40	4.58	83.41
			0.00						
Side Arm Mount [SO 310-1]	C	From Leg	1.00	0.0000	240.00	No Ice	2.97	2.99	55.00
			0.00			1/2" Ice	4.40	4.58	83.41
			0.00						
(2) C050045A102A	B	From Leg	2.00	0.0000	240.00	No Ice	4.35	0.80	31.00
			0.00			1/2" Ice	4.61	0.94	56.13
			0.00						
(2) C050045A102A	C	From Leg	2.00	0.0000	240.00	No Ice	4.35	0.80	31.00
			0.00			1/2" Ice	4.61	0.94	56.13
			0.00						

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Dishes											
Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft²	Weight lb	

PADX8-U57AC	B	Paraboloid w/o Radome	From Leg	1.88 0.00 0.00	-12.9000		317.00	8.62	No Ice 1/2" Ice	58.31 59.45 130.00 440.00	

PADX6-U57AC	B	Paraboloid w/o Radome	From Leg	0.50 0.00 0.00	-12.9000		280.00	6.58	No Ice 1/2" Ice	34.04 34.91 141.00 320.00	

3-FT Grid	B	Grid	From Leg	5.00 0.00 0.00	-90.0000		252.00	3.00	No Ice 1/2" Ice	7.07 7.47 30.00 38.33	
3-FT Grid	C	Grid	From Leg	5.00 0.00 0.00	0.0000		252.00	3.00	No Ice 1/2" Ice	7.07 7.47 30.00 38.33	

Load Combinations	
Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp

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Comb. No.	Description
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	325 - 300	5.9576	49	0.1643	0.0241
T2	300 - 287.5	5.0881	49	0.1607	0.0196
T3	287.5 - 281.25	4.6703	49	0.1563	0.0197
T4	281.25 - 275	4.4688	49	0.1532	0.0174
T5	275 - 250	4.2500	49	0.1503	0.0148
T6	250 - 225	3.4609	49	0.1387	0.0118
T7	225 - 212.5	2.7562	49	0.1239	0.0103
T8	212.5 - 200	2.4369	49	0.1149	0.0099
T9	200 - 175	2.1429	49	0.1052	0.0095
T10	175 - 162.5	1.6198	49	0.0895	0.0087
T11	162.5 - 150	1.3864	49	0.0810	0.0080
T12	150 - 137.5	1.1793	49	0.0721	0.0074
T13	137.5 - 125	0.9871	49	0.0660	0.0067
T14	125 - 112.5	0.8125	49	0.0596	0.0061
T15	112.5 - 100	0.6528	50	0.0531	0.0054
T16	100 - 87.5	0.5147	50	0.0463	0.0048
T17	87.5 - 75	0.3941	50	0.0392	0.0042
T18	75 - 50	0.2950	50	0.0320	0.0037
T19	50 - 25	0.1448	39	0.0194	0.0027
T20	25 - 0	0.0510	39	0.0087	0.0013

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
325.00	2.9" x 20-ft Pipe Mount	49	5.9576	0.1643	0.0241	741537

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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
323.00	6' Sidearm Mount (TEP#100740)	49	5.8876	0.1642	0.0241	741537
317.00	PADX8-U57AC	49	5.6777	0.1636	0.0239	463464
305.00	Side Arm Mount [SO 308-1]	49	5.2603	0.1618	0.0218	185386
285.00	Side Arm Mount [SO 308-1]	49	4.5908	0.1551	0.0190	72236
280.00	PADX6-U57AC	49	4.4262	0.1526	0.0168	25047
252.00	3-FT Grid	49	3.5199	0.1397	0.0118	127651
250.00	1.9" x 9-ft pipe	49	3.4609	0.1387	0.0118	151732
240.00	Side Arm Mount [SO 310-1]	49	3.1708	0.1333	0.0114	115785

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	325 - 300	21.5591	22	0.5982	0.0939
T2	300 - 287.5	18.3930	22	0.5844	0.0756
T3	287.5 - 281.25	16.8734	22	0.5680	0.0765
T4	281.25 - 275	16.1409	22	0.5566	0.0683
T5	275 - 250	15.3443	22	0.5458	0.0567
T6	250 - 225	12.4790	22	0.5028	0.0451
T7	225 - 212.5	9.9257	22	0.4484	0.0394
T8	212.5 - 200	8.7704	22	0.4155	0.0379
T9	200 - 175	7.7083	22	0.3798	0.0365
T10	175 - 162.5	5.8205	22	0.3227	0.0330
T11	162.5 - 150	4.9793	22	0.2919	0.0305
T12	150 - 137.5	4.2336	22	0.2593	0.0282
T13	137.5 - 125	3.5419	22	0.2373	0.0257
T14	125 - 112.5	2.9143	22	0.2144	0.0233
T15	112.5 - 100	2.3414	24	0.1907	0.0205
T16	100 - 87.5	1.8454	24	0.1661	0.0182
T17	87.5 - 75	1.4128	24	0.1408	0.0159
T18	75 - 50	1.0572	24	0.1149	0.0141
T19	50 - 25	0.5188	3	0.0695	0.0102
T20	25 - 0	0.1825	3	0.0310	0.0051

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
325.00	2.9" x 20-ft Pipe Mount	22	21.5591	0.5982	0.0939	200142
323.00	6' Sidearm Mount (TEP#100740)	22	21.3040	0.5975	0.0938	200142
317.00	PADX8-U57AC	22	20.5395	0.5953	0.0928	125088
305.00	Side Arm Mount [SO 308-1]	22	19.0197	0.5887	0.0841	50035
285.00	Side Arm Mount [SO 308-1]	22	16.5843	0.5635	0.0743	19447
280.00	PADX6-U57AC	22	15.9856	0.5544	0.0660	6761
252.00	3-FT Grid	22	12.6927	0.5065	0.0451	34683
250.00	1.9" x 9-ft pipe	22	12.4790	0.5028	0.0451	41359
240.00	Side Arm Mount [SO 310-1]	22	11.4273	0.4828	0.0438	31500

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Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T1	325	Leg	A325N	0.8750	4	3090.74	41556.00	0.074	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	6576.78	13805.80	0.476	1.05	Bolt Shear
		Top Girt	A325N	0.7500	1	512.85	12615.00	0.041	1.05	Member Bearing
		Mid Girt	A325N	0.7500	1	1015.18	12615.00	0.080	1.05	Member Bearing
T2	300	Diagonal	A325N	0.7500	1	5886.38	18922.50	0.311	1.05	Gusset Bearing
		Top Girt	A325N	0.7500	1	409.60	12615.00	0.032	1.05	Member Bearing
T3	287.5	Diagonal	A325N	0.7500	1	6221.49	18922.50	0.329	1.05	Gusset Bearing
T4	281.25	Leg	A325N	1.0000	4	7772.68	54517.00	0.143	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	6837.63	19880.40	0.344	1.05	Bolt Shear
T5	275	Leg	A325N	1.1250	4	13328.80	68694.60	0.194	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	9124.02	19880.40	0.459	1.05	Bolt Shear
		Top Girt	A325N	0.7500	1	944.17	12615.00	0.075	1.05	Member Bearing
T6	250	Leg	A325N	1.2500	4	17231.80	87219.80	0.198	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	10231.10	18922.50	0.541	1.05	Gusset Bearing
		Horizontal	A325N	0.7500	1	9857.46	11962.50	0.824	1.05	Member Block Shear
T7	225	Diagonal	A325N	0.7500	1	10435.20	18922.50	0.551	1.05	Gusset Bearing
		Horizontal	A325N	0.7500	1	6451.80	11962.50	0.539	1.05	Member Block Shear
T8	212.5	Leg	A325N	1.3750	4	24000.50	103939.00	0.231	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	10740.50	18922.50	0.568	1.05	Gusset Bearing
		Horizontal	A325N	0.7500	1	6825.45	12615.00	0.541	1.05	Member Bearing
T9	200	Leg	A325N	1.3750	4	30815.90	103939.00	0.296	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	11809.40	18922.50	0.624	1.05	Gusset Bearing
		Horizontal	A325N	0.7500	1	7960.74	12615.00	0.631	1.05	Member Bearing
T10	175	Diagonal	A325N	0.7500	1	12159.70	18922.50	0.643	1.05	Gusset Bearing
		Horizontal	A325N	0.7500	1	8517.20	12615.00	0.675	1.05	Member Bearing
T11	162.5	Leg	A325N	1.5000	4	37954.50	126472.00	0.300	1.05	Bolt Tension
		Diagonal	A325N	0.7500	1	13375.50	19880.40	0.673	1.05	Bolt Shear
		Horizontal	A325N	0.7500	1	9121.39	12615.00	0.723	1.05	Member Bearing
T12	150	Diagonal	A325N	1.0000	1	12964.90	25447.50	0.509	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	9761.45	16270.30	0.600	1.05	Member Block Shear
T13	137.5	Leg	A325N	1.5000	4	45489.30	126472.00	0.360	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	13518.00	25447.50	0.531	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	10441.90	20337.90	0.513	1.05	Member Block Shear
T14	125	Diagonal	A325N	1.0000	1	13786.30	25447.50	0.542	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	10879.40	20337.90	0.535	1.05	Member Block Shear
T15	112.5	Leg	A325N	1.5000	4	52804.50	126472.00	0.418	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	14168.40	25447.50	0.557	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	11488.50	20337.90	0.565	1.05	Member Block Shear
T16	100	Diagonal	A325N	1.0000	1	14726.70	25447.50	0.579	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	12236.20	20337.90	0.602	1.05	Member Block Shear
T17	87.5	Leg	A307	1.7500	4	59685.10	85475.40	0.698	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	15552.90	25447.50	0.611	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	12762.80	25447.50	0.502	1.05	Gusset Bearing
T18	75	Leg	A307	2.0000	4	66897.20	112420.00	0.595	1.05	Bolt Tension
		Diagonal	A325N	1.0000	1	16775.70	25447.50	0.659	1.05	Gusset Bearing
		Horizontal	A325N	1.0000	1	14336.30	25447.50	0.563	1.05	Gusset Bearing
T19	50	Leg	A307	2.0000	4	70293.60	112420.00	0.625	1.05	Bolt Tension
		Diagonal	A325N	1.2500	1	24037.50	42630.00	0.564	1.05	Gusset Bearing

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T20	25	Horizontal	A325N	1.0000	1	15158.10	33930.00	0.447	1.05	Gusset Bearing
		Leg	A36	2.5000	4	77634.30	173949.00	0.446	1.05	Bolt Tension
		Diagonal	A325N	1.2500	1	24089.30	42630.00	0.565	1.05	Gusset Bearing
		Horizontal	A325N	1.1250	1	15543.80	38280.00	0.406	1.05	Gusset Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	K _L /r	A in ²	P _n lb	ΦP _n lb	Ratio P _n ΦP _n
T1	325 - 300	Pipe 3.5 EH	25.00	6.25	114.8 K=2.00	3.6784	-11644.20	63055.50	0.185 ¹
T2	300 - 287.5	Pipe 4 EH	12.52	6.26	101.8 K=2.00	4.4074	-20719.30	93017.20	0.223 ¹
T3	287.5 - 281.25	Pipe 4 EH	6.26	6.26	101.8 K=2.00	4.4074	-26335.10	93017.20	0.283 ¹
T4	281.25 - 275	Pipe 4 EH	6.26	6.26	101.8 K=2.00	4.4074	-30306.10	93017.20	0.326 ¹
T5	275 - 250	Pipe 5 EH	25.04	6.26	81.7 K=2.00	6.1114	-54438.50	168771.00	0.323 ¹
T6	250 - 225	Pipe 5 EH	25.04	12.52	81.7 K=1.00	6.1114	-73042.90	168771.00	0.433 ¹
T7	225 - 212.5	Pipe 5 EH	12.52	12.52	81.7 K=1.00	6.1114	-87979.90	168771.00	0.521 ¹
T8	212.5 - 200	Pipe 5 EH	12.52	6.26	40.9 K=1.00	6.1114	-102257.00	243410.00	0.420 ¹
T9	200 - 175	Pipe 6 EH	25.04	6.26	34.2 K=1.00	8.4049	-132812.00	347166.00	0.383 ¹
T10	175 - 162.5	Pipe 6 EH	12.52	6.26	34.2 K=1.00	8.4049	-149006.00	347166.00	0.429 ¹
T11	162.5 - 150	Pipe 6 EH	12.52	6.26	34.2 K=1.00	8.4049	-165475.00	347166.00	0.477 ¹
T12	150 - 137.5	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2 K=1.00	12.7706	-183499.00	470939.00	0.390 ¹
T13	137.5 - 125	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2 K=1.00	12.7706	-200674.00	470939.00	0.426 ¹
T14	125 - 112.5	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2 K=1.00	12.7706	-218328.00	470939.00	0.464 ¹
T15	112.5 - 100	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2 K=1.00	12.7706	-235881.00	470939.00	0.501 ¹
T16	100 - 87.5	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2 K=1.00	12.7706	-254007.00	470939.00	0.539 ¹
T17	87.5 - 75	PIPE 8 X-STR (SCH80)	12.52	6.26	26.1 K=1.00	12.7706	-271296.00	546775.00	0.496 ¹
T18	75 - 50	PIPE 8 SCH 100	25.04	6.26	26.4 K=1.00	14.9867	-309741.00	640922.00	0.483 ¹
T19	50 - 25	PIPE 8 SCH 120	25.04	12.52	53.5 K=1.00	17.8581	-330378.00	651670.00	0.507 ¹
T20	25 - 0	PIPE 10 SCH 100	25.04	12.52	42.3 K=1.00	22.6581	-369594.00	894784.00	0.413 ¹

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Section No.	Elevation	Size	L	L _u	KI/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	

¹ P_u / ΦP_u controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KI/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T1	325 - 300	PIPE 2.5 STD (SCH 40)	11.93	11.54	145.9 K=1.00	1.7072	-6576.78	18110.90	0.363 ¹
T2	300 - 287.5	PIPE 2.5 STD (SCH 40)	12.77	12.34	156.0 K=1.00	1.7072	-5577.29	15838.60	0.352 ¹
T3	287.5 - 281.25	PIPE 2.5 STD (SCH 40)	13.34	12.92	163.3 K=1.00	1.7072	-5833.05	14462.30	0.403 ¹
T4	281.25 - 275	PIPE 3 STD (SCH40)	13.92	13.50	139.2 K=1.00	2.2285	-6837.63	25982.70	0.263 ¹
T5	275 - 250	PIPE 3 STD (SCH40)	16.27	15.77	162.6 K=1.00	2.2285	-9124.02	19031.40	0.479 ¹
T6	250 - 225	PIPE 3 STD (SCH40)	15.39	14.99	154.6 K=1.00	2.2285	-10469.50	21060.20	0.497 ¹
T7	225 - 212.5	PIPE 3 STD (SCH40)	15.78	15.40	158.8 K=1.00	2.2285	-10688.10	19970.50	0.535 ¹
T8	212.5 - 200	PIPE 3 STD (SCH40)	16.18	15.81	163.1 K=1.00	2.2285	-11143.00	18929.30	0.589 ¹
T9	200 - 175	Pipe 3 EH	17.03	16.62	175.5 K=1.00	3.0159	-12389.80	22110.20	0.560 ¹
T10	175 - 162.5	PIPE 3 STD (SCH40)	17.48	17.08	176.2 K=1.00	2.2285	-12725.80	16224.70	0.784 ¹
T11	162.5 - 150	Pipe 3 EH	17.93	17.55	185.3 K=1.00	3.0159	-13375.50	19838.70	0.674 ¹
T12	150 - 137.5	Pipe 3 EH	18.40	17.91	189.2 K=1.00	3.0159	-13459.80	19039.10	0.707 ¹
T13	137.5 - 125	Pipe 3 EH	18.88	18.40	194.4 K=1.00	3.0159	-14130.60	18038.00	0.783 ¹
T14	125 - 112.5	PIPE 3.5 STD	19.37	18.90	169.7 K=1.00	2.6795	-14397.90	21020.60	0.685 ¹
T15	112.5 - 100	Pipe 3.5 EH	19.87	19.41	178.3 K=1.00	3.6784	-15176.90	26151.00	0.580 ¹
T16	100 - 87.5	2L4x4x1/4x3/8	20.38	19.59	188.1 K=1.00	3.8800	-15556.30	31394.90	0.496 ¹
T17	87.5 - 75	3.5 STD w/ 4 STD Half Sleeve	20.90	20.45	175.3 K=1.00	4.2700	-17080.70	31407.30	0.544 ¹
T18	75 - 50	3.5 STD w/ 4 STD Half Sleeve	21.95	21.51	184.4 K=1.00	4.2700	-18552.90	28380.20	0.654 ¹
T19	50 - 25	Pipe 3.5 EH	31.61	15.81	145.2 K=1.00	3.6784	-25755.90	39441.20	0.653 ¹
T20	25 - 0	Pipe 3.5 EH	32.42	16.21	148.9 K=1.00	3.6784	-25797.10	37499.10	0.688 ¹

¹ P_u / ΦP_u controls

Horizontal Design Data (Compression)

<i>tnxTower</i> <i>Tower Engineering Professionals, Inc.</i> 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350	Job	Fort White	Page	34 of 43
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	Client	Duke Energy	Designed by	dcisneros

Section No.	Elevation	Size	L	L _u	KI/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T6	250 - 225	L2 1/2x3 1/2x1/4	15.35	7.31	161.2 K=1.00	1.4400	-9043.12	15866.50	0.570 ¹
T7	225 - 212.5	L2 1/2x3 1/2x1/4	17.94	8.60	189.7 K=1.00	1.4400	-6355.99	11448.30	0.555 ¹
T8	212.5 - 200	L3x4x1/4	19.23	9.25	170.5 K=1.00	1.6900	-6806.92	16641.00	0.409 ¹
T9	200 - 175	L3x4x1/4	21.82	10.50	193.5 K=1.00	1.6900	-7914.32	12912.30	0.613 ¹
T10	175 - 162.5	L3 1/2x5x1/4	23.12	11.15	173.7 K=1.00	2.0600	-8424.01	19535.40	0.431 ¹
T11	162.5 - 150	L3 1/2x5x1/4	24.41	11.80	183.8 K=1.00	2.0600	-9088.65	17449.30	0.521 ¹
T12	150 - 137.5	L3 1/2x5x1/4	25.71	12.33	192.1 K=1.00	2.0600	-9512.14	15973.60	0.595 ¹
T13	137.5 - 125	L4x6x5/16	27.00	12.98	176.5 K=1.00	3.0300	-10151.50	27827.00	0.365 ¹
T14	125 - 112.5	L4x6x5/16	28.30	13.62	185.3 K=1.00	3.0300	-10539.10	25244.50	0.417 ¹
T15	112.5 - 100	L4x6x5/16	29.59	14.27	194.2 K=1.00	3.0300	-11124.60	23005.30	0.484 ¹
T16	100 - 87.5	L4x6x5/16	30.89	14.92	203.0 K=1.00	3.0300	-11542.80	21051.50	0.548 ¹
T17	87.5 - 75	KL/R > 200 (C) - 274 2L3 1/2x5x5/16x3/8	32.18	23.43	121.8 K=1.00	5.1200	-12542.10	94840.60	0.132 ¹
T18	75 - 50	2L3 1/2x5x5/16x3/8	34.77	25.38	131.2 K=1.00	5.1200	-13753.50	82608.80	0.166 ¹
T19	50 - 25	Pipe 3.5 EH	36.07	17.68	162.3 K=1.00	3.6784	-14573.60	31535.90	0.462 ¹
T20	25 - 0	Pipe 3.5 EH	38.66	18.88	173.4 K=1.00	3.6784	-15426.20	27634.40	0.558 ¹

¹ P_u / ΦP_u controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L _u	KI/r	A	P _u	ΦP _u	Ratio $\frac{P_u}{\Phi P_u}$
	ft		ft	ft		in ²	lb	lb	
T1	325 - 300	L3 1/2x3 1/2x1/4	10.17	9.56	165.3 K=1.00	1.6900	-697.35	17692.70	0.039 ¹
T2	300 - 287.5	L3 1/2x3 1/2x1/4	10.17	9.52	164.6 K=1.00	1.6900	-467.94	17847.90	0.026 ¹
T5	275 - 250	L4x4x1/4	12.76	12.02	181.5 K=1.00	1.9400	-944.17	16860.60	0.056 ¹

¹ P_u / ΦP_u controls

Mid Girt Design Data (Compression)

<i>tnxTower</i> <i>Tower Engineering Professionals, Inc.</i> 326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350	Job	Fort White	Page	35 of 43
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	Client	Duke Energy	Designed by	dcisneros

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _a	ΦP _a	Ratio $\frac{P_a}{\Phi P_a}$
	ft		ft	ft		in ²	lb	lb	$\frac{\Phi P_a}{\Phi P_a}$
T1	325 - 300	L3 1/2x3 1/2x1/4	10.17	9.56	165.3 K=1.00	1.6900	-1182.67	17692.70	0.067 ¹

¹ P_a / ΦP_a controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _a	ΦP _a	Ratio $\frac{P_a}{\Phi P_a}$
	ft		ft	ft		in ²	lb	lb	$\frac{\Phi P_a}{\Phi P_a}$
T8	212.5 - 200	L2x2x3/16	4.81	4.58	139.4 K=1.00	0.7150	-1773.51	10533.80	0.168 ¹
T9	200 - 175	L2x2x3/16	5.46	5.18	157.8 K=1.00	0.7150	-2303.45	8222.90	0.280 ¹
T10	175 - 162.5	L2x2x3/16	5.78	5.50	167.6 K=1.00	0.7150	-2584.31	7283.81	0.355 ¹
T11	162.5 - 150	L2 1/2x2 1/2x3/16	6.10	5.83	141.3 K=1.00	0.9020	-2869.95	12936.70	0.222 ¹
T17	87.5 - 75	L3x3x3/16	8.05	7.69	154.8 K=1.00	1.0900	-4705.28	13025.90	0.361 ¹
T18	75 - 50	L3x3x3/16	8.69	8.33	167.8 K=1.00	1.0900	-5372.07	11079.60	0.485 ¹
T19	50 - 25	Pipe 2 EH	9.02	8.66	135.2 K=1.00	1.4807	-5729.98	18291.50	0.313 ¹
T20	25 - 0	Pipe 2 EH	9.66	9.22	144.0 K=1.00	1.4807	-6410.13	16138.90	0.397 ¹

¹ P_a / ΦP_a controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _a	ΦP _a	Ratio $\frac{P_a}{\Phi P_a}$
	ft		ft	ft		in ²	lb	lb	$\frac{\Phi P_a}{\Phi P_a}$
T8	212.5 - 200	L2 1/2x2 1/2x3/16	7.69	7.30	176.9 K=1.00	0.9020	-1419.10	8249.54	0.172 ¹
T9	200 - 175	L2 1/2x2 1/2x3/16	8.09	7.65	185.6 K=1.00	0.9020	-1707.65	7497.86	0.228 ¹
T10	175 - 162.5	L2 1/2x2 1/2x3/16	8.30	7.88	191.0 K=1.00	0.9020	-1855.30	7076.84	0.262 ¹
T11	162.5 - 150	L3x3x3/16	8.51	8.11	163.3 K=1.00	1.0900	-2001.93	11705.80	0.171 ¹
T17	87.5 - 75	L3x3x3/16	9.94	9.47	190.7 K=1.00	1.0900	-2905.36	8574.55	0.339 ¹
T18	75 - 50	L3x3x3/16	10.45	10.00	201.3 K=1.00	1.0900	-3227.95	7697.25	0.419 ¹
T19	50 - 25	Pipe 3 EH	15.05	14.40	152.1 K=1.00	3.0159	-4781.05	29452.90	0.162 ¹
T20	25 - 0	Pipe 3 EH	15.42	14.65	154.7 K=1.00	3.0159	-5112.75	28457.10	0.180 ¹

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¹ P_a / ΦP_a controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _a	ΦP _a	Ratio $\frac{P_a}{\Phi P_a}$
	ft		ft	ft		in ²	lb	lb	$\frac{\Phi P_a}{\Phi P_a}$
T19	50 - 25	PIPE 1.5 SCH 80	9.02	9.02	178.8 K=1.00	1.0681	-30.76	7547.85	0.004 ¹
T20	25 - 0	PIPE 1.5 SCH 80	9.66	9.66	191.6 K=1.00	1.0681	-27.87	6570.32	0.004 ¹

¹ P_a / ΦP_a controls

Redundant Hip Diagonal (1) Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _a	ΦP _a	Ratio $\frac{P_a}{\Phi P_a}$
	ft		ft	ft		in ²	lb	lb	$\frac{\Phi P_a}{\Phi P_a}$
T19	50 - 25	PIPE 1.5 SCH 80	20.31	20.31	402.7 K=1.00	1.0681	-53.83	1488.12	0.036 ¹
T20	25 - 0	KL/R > 250 (C) - 373 PIPE 1.5 SCH 80 KL/R > 250 (C) - 406	21.20	21.20	420.4 K=1.00	1.0681	-50.98	1365.20	0.037 ¹

¹ P_a / ΦP_a controls

Inner Bracing Design Data (Compression)

Section No.	Elevation	Size	L	L _u	Kl/r	A	P _a	ΦP _a	Ratio $\frac{P_a}{\Phi P_a}$
	ft		ft	ft		in ²	lb	lb	$\frac{\Phi P_a}{\Phi P_a}$
T15	112.5 - 100	L5x3x3/8	14.80	14.80	271.5 K=1.00	2.8600	-21.45	11104.90	0.002 ¹
T19	50 - 25	KL/R > 250 (C) - 262 Pipe 3 EH	18.03	18.03	190.5 K=1.00	3.0159	-20.07	18784.00	0.001 ¹
T20	25 - 0	Pipe 3 EH	19.33	19.33	204.1 K=1.00	3.0159	-20.54	16351.30	0.001 ¹

¹ P_a / ΦP_a controls

Tension Checks

<i>tnxTower</i> <i>Tower Engineering Professionals, Inc.</i> <i>326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350</i>	Job Fort White	Page 37 of 43
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<i>tnxTower</i> <i>Tower Engineering Professionals, Inc.</i> <i>326 Tryon Road Raleigh, NC 27603 Phone: (919) 661-6351 FAX: (9195) 661-6350</i>	Job Fort White	Page 38 of 43
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Leg Design Data (Tension)

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>L</i>	<i>L_u</i>	<i>KI/r</i>	<i>A</i>	<i>P_u</i>	ΦP_u	<i>Ratio</i> $\frac{P_u}{\Phi P_u}$
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in²</i>	<i>lb</i>	<i>lb</i>	
T1	325 - 300	Pipe 3.5 EH	25.00	6.25	57.4	3.6784	12363.00	165529.00	0.075 ¹
T2	300 - 287.5	Pipe 4 EH	12.52	6.26	50.9	4.4074	21484.40	198335.00	0.108 ¹
T3	287.5 - 281.25	Pipe 4 EH	6.26	6.26	50.9	4.4074	25322.30	198335.00	0.128 ¹
T4	281.25 - 275	Pipe 4 EH	6.26	6.26	50.9	4.4074	31090.70	198335.00	0.157 ¹
T5	275 - 250	Pipe 5 EH	25.04	6.26	40.9	6.1114	53315.30	275012.00	0.194 ¹
T6	250 - 225	Pipe 5 EH	25.04	12.52	81.7	6.1114	68927.00	275012.00	0.251 ¹
T7	225 - 212.5	Pipe 5 EH	12.52	12.52	81.7	6.1114	82977.70	275012.00	0.302 ¹
T8	212.5 - 200	Pipe 5 EH	12.52	6.26	40.9	6.1114	96136.10	275012.00	0.350 ¹
T9	200 - 175	Pipe 6 EH	25.04	6.26	34.2	8.4049	123488.00	378222.00	0.326 ¹
T10	175 - 162.5	Pipe 6 EH	12.52	6.26	34.2	8.4049	137706.00	378222.00	0.364 ¹
T11	162.5 - 150	Pipe 6 EH	12.52	6.26	34.2	8.4049	152040.00	378222.00	0.402 ¹
T12	150 - 137.5	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2	12.7706	167577.00	574676.00	0.292 ¹
T13	137.5 - 125	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2	12.7706	181957.00	574676.00	0.317 ¹
T14	125 - 112.5	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2	12.7706	196635.00	574676.00	0.342 ¹
T15	112.5 - 100	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2	12.7706	211218.00	574676.00	0.368 ¹
T16	100 - 87.5	PIPE 8 X-STR (SCH80)	12.52	12.52	52.2	12.7706	225702.00	574676.00	0.393 ¹
T17	87.5 - 75	PIPE 8 X-STR (SCH80)	12.52	6.26	26.1	12.7706	239092.00	574676.00	0.416 ¹
T18	75 - 50	PIPE 8 SCH 100	25.04	6.26	26.4	14.9867	268015.00	674401.00	0.397 ¹
T19	50 - 25	PIPE 8 SCH 120	25.04	12.52	53.5	17.8581	281924.00	803615.00	0.351 ¹
T20	25 - 0	PIPE 10 SCH 100	25.04	12.52	42.3	22.6581	311470.00	1019610.00	0.305 ¹

¹ P_u / ΦP_u controls

Diagonal Design Data (Tension)

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>L</i>	<i>L_u</i>	<i>KI/r</i>	<i>A</i>	<i>P_u</i>	ΦP_u	<i>Ratio</i> $\frac{P_u}{\Phi P_u}$
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in²</i>	<i>lb</i>	<i>lb</i>	
T1	325 - 300	PIPE 2.5 STD (SCH 40)	11.93	11.54	145.9	1.7072	6333.03	53778.00	0.118 ¹
T2	300 - 287.5	PIPE 2.5 STD (SCH 40)	12.21	11.78	149.0	1.7072	5886.38	53778.00	0.109 ¹
T3	287.5 - 281.25	PIPE 2.5 STD (SCH 40)	13.34	12.92	163.3	1.7072	6221.49	53778.00	0.116 ¹
T4	281.25 - 275	PIPE 3 STD (SCH40)	13.92	13.50	139.2	2.2285	6394.87	70196.80	0.091 ¹
T5	275 - 250	PIPE 3 STD (SCH40)	15.68	15.17	156.5	2.2285	8640.71	70196.80	0.123 ¹
T6	250 - 225	PIPE 3 STD (SCH40)	15.39	14.99	154.6	2.2285	10231.10	70196.80	0.146 ¹
T7	225 - 212.5	PIPE 3 STD (SCH40)	15.78	15.40	158.8	2.2285	10435.20	70196.80	0.149 ¹
T8	212.5 - 200	PIPE 3 STD (SCH40)	16.18	15.81	163.1	2.2285	10740.50	70196.80	0.153 ¹
T9	200 - 175	Pipe 3 EH	17.03	16.62	175.5	3.0159	11809.40	95001.80	0.124 ¹
T10	175 - 162.5	PIPE 3 STD (SCH40)	17.48	17.08	176.2	2.2285	12159.70	70196.80	0.173 ¹
T11	162.5 - 150	Pipe 3 EH	17.93	17.55	185.3	3.0159	12730.50	95001.80	0.134 ¹
T12	150 - 137.5	Pipe 3 EH	18.40	17.91	189.2	3.0159	12964.90	95001.80	0.136 ¹
T13	137.5 - 125	Pipe 3 EH	18.88	18.40	194.4	3.0159	13518.00	95001.80	0.142 ¹
T14	125 - 112.5	PIPE 3.5 STD	19.37	18.90	169.7	2.6795	13786.30	84405.50	0.163 ¹
T15	112.5 - 100	Pipe 3.5 EH	19.87	19.41	178.3	3.6784	14168.40	115870.00	0.122 ¹
T16	100 - 87.5	2L4x4x1/4x3/8	20.38	19.59	191.3	2.4881	14726.70	108233.00	0.136 ¹
T17	87.5 - 75	3.5 STD w/ 4 STD Half Sleeve	20.90	20.45	175.3	4.2700	15552.90	134505.00	0.116 ¹
T18	75 - 50	3.5 STD w/ 4 STD Half Sleeve	21.95	21.51	184.4	4.2700	16775.70	134505.00	0.125 ¹
T19	50 - 25	Pipe 3.5 EH	31.61	15.81	145.2	3.6784	24037.50	115870.00	0.207 ¹
T20	25 - 0	Pipe 3.5 EH	32.42	16.21	148.9	3.6784	24089.30	115870.00	0.208 ¹

¹ P_u / ΦP_u controls

Horizontal Design Data (Tension)

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>L</i>	<i>L_u</i>	<i>KI/r</i>	<i>A</i>	<i>P_u</i>	ΦP_u	<i>Ratio</i> $\frac{P_u}{\Phi P_u}$
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in²</i>	<i>lb</i>	<i>lb</i>	
T6	250 - 225	L2 1/2x3 1/2x1/4	15.35	7.31	121.3	0.9159	9857.46	39843.30	0.247 ¹
T7	225 - 212.5	L2 1/2x3 1/2x1/4	17.94	8.60	142.5	0.9159	6451.80	39843.30	0.162 ¹
T8	212.5 - 200	L3x4x1/4	19.23	9.25	131.9	1.1034	6825.45	47999.50	0.142 ¹
T9	200 - 175	L3x4x1/4	21.82	10.50	149.5	1.1034	7960.74	47999.50	0.166 ¹
T10	175 - 162.5	L3 1/2x5x1/4	23.12	11.15	130.2	1.3809	8517.20	60070.80	0.142 ¹
T11	162.5 - 150	L3 1/2x5x1/4	24.41	11.80	137.7	1.3809	9121.39	60070.80	0.152 ¹
T12	150 - 137.5	L3 1/2x5x1/4	25.71	12.33	144.2	1.3341	9761.45	58031.70	0.168 ¹
T13	137.5 - 125	L4x6x5/16	27.00	12.98	134.3	2.0088	10441.90	87384.00	0.119 ¹
T14	125 - 112.5	L4x6x5/16	28.30	13.62	140.9	2.0088	10879.40	87384.00	0.125 ¹
T15	112.5 - 100	L4x6x5/16	29.59	14.27	147.5	2.0088	11488.50	87384.00	0.131 ¹
T16	100 - 87.5	L4x6x5/16	30.89	14.92	154.1	2.0088	12236.20	87384.00	0.140 ¹
T17	87.5 - 75	2L3 1/2x5x5/16x3/8	32.18	23.43	183.3	3.3127	12762.80	144101.00	0.089 ¹
T18	75 - 50	2L3 1/2x5x5/16x3/8	34.77	25.38	198.4	3.3127	14336.30	144101.00	0.099 ¹
T19	50 - 25	Pipe 3.5 EH	36.07	17.68	162.3	3.6784	15158.10	115870.00	0.131 ¹
T20	25 - 0	Pipe 3.5 EH	38.66	18.88	173.4	3.6784	15543.80	115870.00	0.134 ¹

¹ P_u / ΦP_u controls

Top Girt Design Data (Tension)

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>L</i>	<i>L_u</i>	<i>KI/r</i>	<i>A</i>	<i>P_u</i>	ΦP_u	<i>Ratio</i> $\frac{P_u}{\Phi P_u}$
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in²</i>	<i>lb</i>	<i>lb</i>	
T1	325 - 300	L3 1/2x3 1/2x1/4	10.17	9.56	108.3	1.1034	512.85	47999.50	0.011 ¹
T2	300 - 287.5	L3 1/2x3 1/2x1/4	10.17	9.52	107.8	1.1034	409.60	47999.50	0.009 ¹
T5	275 - 250	L4x4x1/4	12.76	12.02	118.0	1.2909	944.17	56155.80	0.017 ¹

¹ P_u / ΦP_u controls

Mid Girt Design Data (Tension)

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>L</i>	<i>L_u</i>	<i>KI/r</i>	<i>A</i>	<i>P_u</i>	ΦP_u	<i>Ratio</i> $\frac{P_u}{\Phi P_u}$
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in²</i>	<i>lb</i>	<i>lb</i>	
T1	325 - 300	L3 1/2x3 1/2x1/4	10.17	9.56	108.3	1.1034	1015.18	47999.50	0.021 ¹

¹ P_u / ΦP_u controls

Redundant Horizontal (1) Design Data (Tension)

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Section No.	Elevation	Size	L	L _n	Kl/r	A	P _n	ΦP _n	Ratio $\frac{P_n}{\Phi P_n}$
	ft		ft	ft		in ²	lb	lb	$\frac{P_n}{\Phi P_n}$
T8	212.5 - 200	L2x2x3/16	4.81	4.58	89.0	0.7150	1773.51	23166.00	0.077 ¹
T9	200 - 175	L2x2x3/16	5.46	5.18	100.7	0.7150	2303.45	23166.00	0.099 ¹
T10	175 - 162.5	L2x2x3/16	5.78	5.50	107.0	0.7150	2584.31	23166.00	0.112 ¹
T11	162.5 - 150	L2 1/2x2 1/2x3/16	6.10	5.83	89.9	0.9020	2869.95	29224.80	0.098 ¹
T17	87.5 - 75	L3x3x3/16	8.05	7.69	98.2	1.0900	4705.28	35316.00	0.133 ¹
T18	75 - 50	L3x3x3/16	8.69	8.33	106.5	1.0900	5372.07	35316.00	0.152 ¹
T19	50 - 25	Pipe 2 EH	9.02	8.66	135.2	1.4807	5729.98	46641.50	0.123 ¹
T20	25 - 0	Pipe 2 EH	9.66	9.22	144.0	1.4807	6410.13	46641.50	0.137 ¹

¹ P_n / ΦP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _n	Kl/r	A	P _n	ΦP _n	Ratio $\frac{P_n}{\Phi P_n}$
	ft		ft	ft		in ²	lb	lb	$\frac{P_n}{\Phi P_n}$
T8	212.5 - 200	L2 1/2x2 1/2x3/16	7.69	7.30	112.6	0.9020	1419.10	29224.80	0.049 ¹
T9	200 - 175	L2 1/2x2 1/2x3/16	7.89	7.45	115.0	0.9020	1770.18	29224.80	0.061 ¹
T10	175 - 162.5	L2 1/2x2 1/2x3/16	8.30	7.88	121.5	0.9020	1855.30	29224.80	0.063 ¹
T11	162.5 - 150	L3x3x3/16	8.51	8.11	103.6	1.0900	2001.93	35316.00	0.057 ¹
T17	87.5 - 75	L3x3x3/16	9.94	9.47	121.1	1.0900	2905.36	35316.00	0.082 ¹
T18	75 - 50	L3x3x3/16	10.19	9.74	124.5	1.0900	3270.17	35316.00	0.093 ¹
T19	50 - 25	Pipe 3 EH	15.05	14.40	152.1	3.0159	4781.05	95001.80	0.050 ¹
T20	25 - 0	Pipe 3 EH	15.42	14.65	154.7	3.0159	5112.75	95001.80	0.054 ¹

¹ P_n / ΦP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _n	Kl/r	A	P _n	ΦP _n	Ratio $\frac{P_n}{\Phi P_n}$
	ft		ft	ft		in ²	lb	lb	$\frac{P_n}{\Phi P_n}$
T19	50 - 25	PIPE 1.5 SCH 80	9.02	9.02	178.8	1.0681	6.19	33646.50	0.000 ¹
T20	25 - 0	PIPE 1.5 SCH 80	9.66	9.66	191.6	1.0681	2.61	33646.50	0.000 ¹

¹ P_n / ΦP_n controls

Redundant Hip Diagonal (1) Design Data (Tension)

Section No.	Elevation	Size	L	L _n	Kl/r	A	P _n	ΦP _n	Ratio $\frac{P_n}{\Phi P_n}$
	ft		ft	ft		in ²	lb	lb	$\frac{P_n}{\Phi P_n}$
T19	50 - 25	PIPE 1.5 SCH 80	20.31	20.31	402.7	1.0681	51.69	33646.50	0.002 ¹
T20	25 - 0	PIPE 1.5 SCH 80	21.20	21.20	420.4	1.0681	48.38	33646.50	0.001 ¹

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¹ P_n / ΦP_n controls

Inner Bracing Design Data (Tension)

Section No.	Elevation	Size	L	L _n	Kl/r	A	P _n	ΦP _n	Ratio $\frac{P_n}{\Phi P_n}$
	ft		ft	ft		in ²	lb	lb	$\frac{P_n}{\Phi P_n}$
T15	112.5 - 100	L5x3x3/8	14.80	14.80	210.2	2.8600	0.81	92664.00	0.000 ¹

¹ P_n / ΦP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ΦP _{allow} lb	% Capacity	Pass Fail
T1	325 - 300	Leg	Pipe 3.5 EH	2	-11644.20	66208.27	17.6	Pass
T2	300 - 287.5	Leg	Pipe 4 EH	22	-20719.30	97668.06	21.2	Pass
T3	287.5 - 281.25	Leg	Pipe 4 EH	34	-26335.10	97668.06	27.0	Pass
T4	281.25 - 275	Leg	Pipe 4 EH	40	-30306.10	97668.06	31.0	Pass
T5	275 - 250	Leg	Pipe 5 EH	46	-54438.50	177209.54	30.7	Pass
T6	250 - 225	Leg	Pipe 5 EH	64	-73042.90	177209.54	41.2	Pass
T7	225 - 212.5	Leg	Pipe 5 EH	85	-87979.90	177209.54	49.6	Pass
T8	212.5 - 200	Leg	Pipe 5 EH	97	-102257.00	255580.49	40.0	Pass
T9	200 - 175	Leg	Pipe 6 EH	121	-132812.00	364524.28	36.4	Pass
T10	175 - 162.5	Leg	Pipe 6 EH	166	-149006.00	364524.28	40.9	Pass
T11	162.5 - 150	Leg	Pipe 6 EH	190	-165475.00	364524.28	45.4	Pass
T12	150 - 137.5	Leg	PIPE 8 X-STR (SCH80)	214	-183499.00	494485.93	37.1	Pass
T13	137.5 - 125	Leg	PIPE 8 X-STR (SCH80)	226	-200674.00	494485.93	40.6	Pass
T14	125 - 112.5	Leg	PIPE 8 X-STR (SCH80)	238	-218328.00	494485.93	44.2	Pass
T15	112.5 - 100	Leg	PIPE 8 X-STR (SCH80)	250	-235881.00	494485.93	47.7	Pass
T16	100 - 87.5	Leg	PIPE 8 X-STR (SCH80)	265	-254007.00	494485.93	51.4	Pass
T17	87.5 - 75	Leg	PIPE 8 X-STR (SCH80)	277	-271296.00	574113.72	47.3	Pass
							69.8 (b)	
T18	75 - 50	Leg	PIPE 8 SCH 100	301	-309741.00	672968.07	46.0	Pass
							59.5 (b)	
T19	50 - 25	Leg	PIPE 8 SCH 120	346	-330378.00	684253.47	48.3	Pass
							62.5 (b)	
T20	25 - 0	Leg	PIPE 10 SCH 100	379	-369594.00	939523.16	39.3	Pass
							44.6 (b)	
T1	325 - 300	Diagonal	PIPE 2.5 STD (SCH 40)	10	-6576.78	19016.44	34.6	Pass
							47.6 (b)	
T2	300 - 287.5	Diagonal	PIPE 2.5 STD (SCH 40)	28	-5577.29	16630.53	33.5	Pass
T3	287.5 - 281.25	Diagonal	PIPE 2.5 STD (SCH 40)	37	-5833.05	15185.41	38.4	Pass
T4	281.25 - 275	Diagonal	PIPE 3 STD (SCH40)	44	-6837.63	27281.83	25.1	Pass
							34.4 (b)	
T5	275 - 250	Diagonal	PIPE 3 STD (SCH40)	53	-9124.02	19982.97	45.7	Pass
							45.9 (b)	
T6	250 - 225	Diagonal	PIPE 3 STD (SCH40)	71	-10469.50	22113.21	47.3	Pass
							54.1 (b)	
T7	225 - 212.5	Diagonal	PIPE 3 STD (SCH40)	92	-10688.10	20969.02	51.0	Pass
							55.1 (b)	
T8	212.5 - 200	Diagonal	PIPE 3 STD (SCH40)	108	-11143.00	19875.76	56.1	Pass
							56.8 (b)	
T9	200 - 175	Diagonal	Pipe 3 EH	132	-12389.80	23215.71	53.4	Pass
							62.4 (b)	
T10	175 - 162.5	Diagonal	PIPE 3 STD (SCH40)	177	-12725.80	17035.93	74.7	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T11	162.5 - 150	Diagonal	Pipe 3 EH	201	-13375.50	20830.63	64.2	Pass
T12	150 - 137.5	Diagonal	Pipe 3 EH	221	-13459.80	19991.05	67.3 (b)	Pass
T13	137.5 - 125	Diagonal	Pipe 3 EH	233	-14130.60	18939.90	74.6	Pass
T14	125 - 112.5	Diagonal	PIPE 3.5 STD	245	-14397.90	22071.63	65.2	Pass
T15	112.5 - 100	Diagonal	Pipe 3.5 EH	257	-15176.90	27458.55	55.3	Pass
							55.7 (b)	
T16	100 - 87.5	Diagonal	2L4x4x1/4x3/8	276	-15556.30	32964.64	47.2	Pass
							57.9 (b)	
T17	87.5 - 75	Diagonal	3.5 STD w/ 4 STD Half Sleeve	298	-17080.70	32977.66	51.8	Pass
							61.1 (b)	
T18	75 - 50	Diagonal	3.5 STD w/ 4 STD Half Sleeve	322	-18552.90	29799.21	62.3	Pass
							65.9 (b)	
T19	50 - 25	Diagonal	Pipe 3.5 EH	369	-25755.90	41413.26	62.2	Pass
T20	25 - 0	Diagonal	Pipe 3.5 EH	402	-25797.10	39374.05	65.5	Pass
T6	250 - 225	Horizontal	L2 1/2x3 1/2x1/4	76	-9043.12	16659.82	54.3	Pass
							82.4 (b)	
T7	225 - 212.5	Horizontal	L2 1/2x3 1/2x1/4	91	-6355.99	12020.71	52.9	Pass
							53.9 (b)	
T8	212.5 - 200	Horizontal	L3x4x1/4	107	-6806.92	17473.05	39.0	Pass
							54.1 (b)	
T9	200 - 175	Horizontal	L3x4x1/4	131	-7914.32	13557.91	58.4	Pass
							63.1 (b)	
T10	175 - 162.5	Horizontal	L3 1/2x5x1/4	176	-8424.01	20512.17	41.1	Pass
							67.5 (b)	
T11	162.5 - 150	Horizontal	L3 1/2x5x1/4	200	-9088.65	18321.76	49.6	Pass
							72.3 (b)	
T12	150 - 137.5	Horizontal	L3 1/2x5x1/4	220	-9512.14	16772.28	56.7	Pass
							60.0 (b)	
T13	137.5 - 125	Horizontal	L4x6x5/16	232	-10151.50	29218.35	34.7	Pass
							51.3 (b)	
T14	125 - 112.5	Horizontal	L4x6x5/16	244	-10539.10	26506.72	39.8	Pass
							53.5 (b)	
T15	112.5 - 100	Horizontal	L4x6x5/16	256	-11124.60	24155.56	46.1	Pass
							56.5 (b)	
T16	100 - 87.5	Horizontal	L4x6x5/16	274	-11542.80	22104.07	52.2	Pass
							60.2 (b)	
T17	87.5 - 75	Horizontal	2L3 1/2x5x5/16x3/8	294	-12542.10	99582.63	12.6	Pass
							50.2 (b)	
T18	75 - 50	Horizontal	2L3 1/2x5x5/16x3/8	318	-13753.50	86739.23	15.9	Pass
							56.3 (b)	
T19	50 - 25	Horizontal	Pipe 3.5 EH	365	-14573.60	33112.69	44.0	Pass
							44.7 (b)	
T20	25 - 0	Horizontal	Pipe 3.5 EH	398	-15426.20	29016.12	53.2	Pass
T1	325 - 300	Top Girt	L3 1/2x3 1/2x1/4	6	-697.35	18577.33	3.8	Pass
							4.1 (b)	
T2	300 - 287.5	Top Girt	L3 1/2x3 1/2x1/4	26	-467.94	18740.29	2.5	Pass
							3.2 (b)	
T5	275 - 250	Top Girt	L4x4x1/4	51	-944.17	17703.63	5.3	Pass
							7.5 (b)	
T1	325 - 300	Mid Girt	L3 1/2x3 1/2x1/4	9	-1182.67	18577.33	6.4	Pass
							8.0 (b)	
T8	212.5 - 200	Redund Horz 1 Bracing	L2x2x3/16	102	-1773.51	11060.49	16.0	Pass
T9	200 - 175	Redund Horz 1 Bracing	L2x2x3/16	126	-2303.45	8634.05	26.7	Pass
T10	175 - 162.5	Redund Horz 1 Bracing	L2x2x3/16	171	-2584.31	7648.00	33.8	Pass
T11	162.5 - 150	Redund Horz 1 Bracing	L2 1/2x2 1/2x3/16	195	-2869.95	13583.53	21.1	Pass
T17	87.5 - 75	Redund Horz 1	L3x3x3/16	282	-4705.28	13677.19	34.4	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Bracing						
T18	75 - 50	Redund Horz 1	L3x3x3/16	306	-5372.07	11633.58	46.2	Pass
		Bracing						
T19	50 - 25	Redund Horz 1	Pipe 2 EH	370	-5729.98	19206.07	29.8	Pass
		Bracing						
T20	25 - 0	Redund Horz 1	Pipe 2 EH	384	-6410.13	16945.84	37.8	Pass
		Bracing						
T8	212.5 - 200	Redund Diag 1	L2 1/2x2 1/2x3/16	103	-1419.10	8662.02	16.4	Pass
		Bracing						
T9	200 - 175	Redund Diag 1	L2 1/2x2 1/2x3/16	144	-1707.65	7872.75	21.7	Pass
		Bracing						
T10	175 - 162.5	Redund Diag 1	L2 1/2x2 1/2x3/16	172	-1855.30	7430.68	25.0	Pass
		Bracing						
T11	162.5 - 150	Redund Diag 1	L3x3x3/16	196	-2001.93	12291.09	16.3	Pass
		Bracing						
T17	87.5 - 75	Redund Diag 1	L3x3x3/16	283	-2905.36	9003.28	32.3	Pass
		Bracing						
T18	75 - 50	Redund Diag 1	L3x3x3/16	307	-3227.95	8082.12	39.9	Pass
		Bracing						
T19	50 - 25	Redund Diag 1	Pipe 3 EH	352	-4781.05	30925.54	15.5	Pass
		Bracing						
T20	25 - 0	Redund Diag 1	Pipe 3 EH	385	-5112.75	29879.95	17.1	Pass
		Bracing						
T19	50 - 25	Redund Hip 1	PIPE 1.5 SCH 80	363	-30.76	7925.24	0.4	Pass
		Bracing						
T20	25 - 0	Redund Hip 1	PIPE 1.5 SCH 80	396	-27.87	6898.84	0.4	Pass
		Bracing						
T19	50 - 25	Redund Hip Diagonal 1 Bracing	PIPE 1.5 SCH 80	373	-53.83	1562.53	3.4	Pass
		Bracing						
T20	25 - 0	Redund Hip Diagonal 1 Bracing	PIPE 1.5 SCH 80	406	-50.98	1433.46	3.6	Pass
		Bracing						
T15	112.5 - 100	Inner Bracing	L5x3x3/8	264	-21.04	11660.14	0.3	Pass
T19	50 - 25	Inner Bracing	Pipe 3 EH	376	-18.42	19723.20	0.4	Pass
T20	25 - 0	Inner Bracing	Pipe 3 EH	409	-19.27	17168.86	0.4	Pass
							Summary	
							Leg (T17)	69.8
							Diagonal (T10)	74.7
							Horizontal (T6)	82.4
							Top Girt (T5)	7.5
							Mid Girt (T1)	8.0
							Redund Horz 1 Bracing (T18)	46.2
							Redund Diag 1 Bracing (T18)	39.9
							Redund Hip 1 Bracing (T20)	0.4
							Redund Hip Diagonal 1 Bracing (T20)	3.6
							Inner Bracing	0.4

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						(T20)		
						Bolt Checks	78.5	Pass
						RATING =	82.4	Pass

APPENDIX B

ADDITIONAL CALCULATIONS

Self Support Anchor Rod Capacity



Site Info	
BU #	FL-1030
Site Name	Fort White
Order #	26455.664933

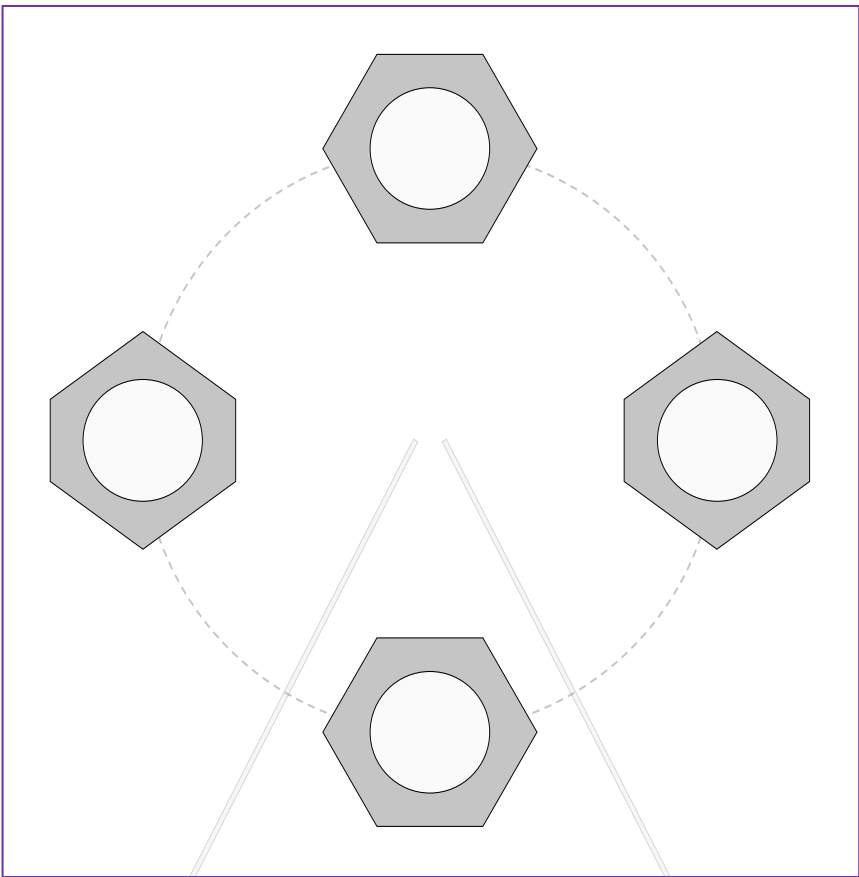
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
l_{ar} (in)	0

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	404.93	340.94
Shear Force (kips)	48.04	42.20

*TIA-222-H Section 15.5 Applied

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

*Anchor Rod Eccentricity Applied



Connection Properties		Analysis Results	
Anchor Rod Data		Anchor Rod Summary (units of kips, kip-in)	
(4) 2-1/2" ϕ bolts (A36 N; Fy=36 ksi, Fu=58 ksi)		$Pu_c = 101.23$	$\phi Pn_c = 159.04$ Stress Rating
l_{ar} (in): 0		$Vu = 12.01$	$\phi Vn = 71.57$ 63.3%
		$Mu = n/a$	$\phi Mn = n/a$ Pass

F	?	F	F
F	?	BHTAAwHHTV55	
F	F	?	F&L5L

?	?
?	L5vBxwBB

?

F	?
?	5vLL
?	x5vLL
?	Lv55
?	xUvLL
?	BvLL
γ?	xALvLL
γ?	HBvTL

?

?

?	TLTW5
?	5TLWT
?	TUvLT
φ?	LvθA
φ?	LvθA
φ?	LvθA
?	Lv
?	xvB

?

x?	TwH9
γx?	xxUvLL
φx?	5xvLL
B?	BvLL
γB?	xxUvLL
φB?	5BvLL
S?	BvLL
γS?	xxUvLL
φS?	5BvLL
T?	BvLL
γT?	xxUvLL
φT?	5BvLL
A?	BvLL
γA?	xxUvLL
φA?	5BvLL
?	B5vA5
?	BvLL
?	LvLL
μ?	LvLL
?	5HUvHL
?	ALvLL

F ?

F	F	F	F	UvA-
---	---	---	---	------

?

xvTV

?

xθvHA

F ?

F	F	F	F	55vU-
---	---	---	---	-------

?

5TLWT

?

xLLVvθx

F ?

F	F	F	F	5Av5-
---	---	---	---	-------

θ?

x5HvLA

?

TUvLT

?

x5HvLA