(REVISED)
COMPREHENSIVE STRUCTURAL ANALYSIS REPORT

For

SITE NUMBER: CT2037
SITE NAME: NEW HAVEN WHEELER ST

69 Wheeler Street
New Haven, CT 06512

Antennas Mounted on the Monopole

Prepared for:

smartlink at&t

Dated: March 15, 2022 (Rev. 1)
February 11, 2022

Prepared by:

HDG HUDSON Design Group LLC

STATE OF CONNECTICUT
DANIEL HAMM
24178
LICENSED
PROFESSIONAL ENGINEER

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

HUDSON Design Group LLC

SCOPE OF WORK:

Hudson Design Group, LLC (HDG) has been authorized by AT&T to conduct a structural evaluation of the 98' monopole supporting the proposed AT&T's antennas located at elevation 90' above the ground level.

This report represents this office's findings, conclusions and recommendations pertaining to the support of AT&T's existing and proposed antennas listed below.

The following documents were used for our reference:

- Structural Analysis prepared by URS Corporation, dated July 17, 2006.
- Structural Analysis prepared by Structural Components dated April 26, 2012.
- Monopole Design Drawings prepared by Engineered Endeavors inc. dated April 20, 2015.
- Previous HDG Geotechnical Evaluation dated June 2, 2015.
- Mount Modification Drawings prepared by Bennett & Pless, dated August 26, 2016.
- Structural Analysis prepared by Malouf Engineering Intl., Inc. dated June 9, 2020.

CONCLUSION SUMMARY:

Based on our evaluation, we have determined that the existing monopole **is in conformance** with the ANSI/TIA-222-H Standard for the loading considered under the criteria listed in this report. The monopole is rated at **98.0 %** - (Base Plate at EL.0' Controlling).

FOUNDATION SUMMARY:

Based on our evaluation, we have determined that the existing foundation **is in conformance** with the ANSI/TIA-222-H Standard for the loading considered under the criteria listed in this report. The foundation is rated at **80.5 %** - (Overturning Controlling).

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APPURTENANCES CONFIGURATION (BASED ON RFDS V5.0 DATED: 3/8/2022):

Tenant	Appurtenances	Elev.	Mount
	(3) AIR32 Antennas	101'-1"	Platform
	(3) APXVAALL24_43 Antennas	101'-1"	Platform
	(3) AIR6449 B41 Antennas	101'-1"	Platform
	(3) 4449 B71 B85A RRH's	101'-1"	Platform
	(3) 4415 B2 B25 RRH's	101'-1"	Platform
	(1) E14FO6P66 02 Diplexer	101'-1"	Platform
	(1) RNSDC-7771-PF-48 OVP	101'-1"	Platform
	(1) 8ft Whip Antenna	96'	Sector Frame
AT&T	(1) OPA65R-BU4DA Antenna	91'	Sector Frame
AT&T	(2) OPA65R-BU6DA Antennas	91'	Sector Frame
AT&T	(4) Squid Surge Arrestors	91'	Sector Frame
AT&T	(3) B14 4478 RRH's	91'	Sector Frame
AT&T	(3) 4426 B66 RRH's	91'	Sector Frame
AT&T	(3) RRUS-E2 B29 RRH's	91'	Sector Frame
AT&T	**(1) QD4616-7 Antenna**	91'	Sector Frame
AT&T	**(2) QD6616-7 Antennas**	91'	Sector Frame
AT&T	**(3) AIR 6419 Antennas**	91'	Sector Frame
AT&T	**(3) AIR 6449 Antenna**	91'	Sector Frame
AT&T	**(3) 4415 B25 RRH's**	91'	Sector Frame
AT&T	**(3) B5/B12 4449 RRH's**	91'	Sector Frame
	(1) 2ft HP Dish	84'-6"	T-Frame
	(1) 1ft HP Dish	84'-6"	T-Frame
	(3) APXVTM14 Antennas	82'	T-Frame
	(3) LLPX310R-V1 Antennas	82'	T-Frame
	(3) NNVV-65B-R4 Antennas	82'	T-Frame
	(3) 2x50-800 RRH's	82'	T-Frame
	(3) Sprint RRH's	82'	T-Frame
	(3) 2x50-800 RRH's	82'	T-Frame
	(3) 4x45-1900 RRH's	82'	T-Frame
	(3) SPI-22132825WB	82'	T-Frame

Proposed AT&T Appurtenances shown in Bold.

AT&T EXISTING/PROPOSED COAX CABLES:

Tenant	Coax Cables	Elev.	Mount
AT&T	(8) DC Power Cables	91'	Tower Face
AT&T	(3) Fiber Cables	91'	Tower Face

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ANALYSIS RESULTS SUMMARY:

Component	Max. Stress Ratio	Elev. of Component (ft)	Pass/Fail	Comments
Pole Section-L1	51.9 %	88 – 99.42	PASS	
Pole Section-L2	94.7 %	80 – 88	PASS	
Pole Section-L3	45.5 %	75 – 80	PASS	
Pole Section-L4	62.8 %	70 – 75	PASS	
Pole Section-L5	71.6 %	65 – 70	PASS	
Pole Section-L6	79.2 %	60 – 65	PASS	
Pole Section-L7	86.0 %	55 – 60	PASS	
Pole Section-L8	68.2 %	45.67 - 55	PASS	
Pole Section-L9	67.6 %	45 – 45.67	PASS	
Pole Section-L10	70.2 %	40 – 45	PASS	
Pole Section-L11	73.1 %	35 – 40	PASS	
Pole Section-L12	75.7 %	30 – 35	PASS	
Pole Section-L13	78.0 %	25 -30	PASS	
Pole Section-L14	80.1 %	20 – 25	PASS	
Pole Section-L15	81.9 %	15 – 20	PASS	
Pole Section-L16	83.6 %	10 – 15	PASS	
Pole Section-L17	85.1 %	5 – 10	PASS	
Pole Section-L18	91.3 %	0 – 5	PASS	
Anchor Bolts & Base Plate	**98.0 %**	0	PASS	**Controlling**

FOUNDATION COMPARISON SUMMARY:

	Stress Ratio	Pass/Fail	Comments
Overturning	**80.5 %**	PASS	**Controlling**

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DESIGN CRITERIA:

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

   County: New Haven
   Ultimate Wind Speed: 125 mph (3 second gust)
   Structural Class: II
   Exposure Category: C
   Topographic Category: 1
   Nominal Ice Thickness: 1 inch

2. Approximate height above grade to proposed antennas: 9**1**'

***Calculations and referenced documents are attached.**

ASSUMPTIONS:

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

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

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

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

SUPPORT RECOMMENDATIONS:

HDG recommends that the proposed antennas and RRH's be mounted on the existing sector frames supported by the existing monopole.

Photo 1: Photo illustrating the Tower with Appurtenances shown.

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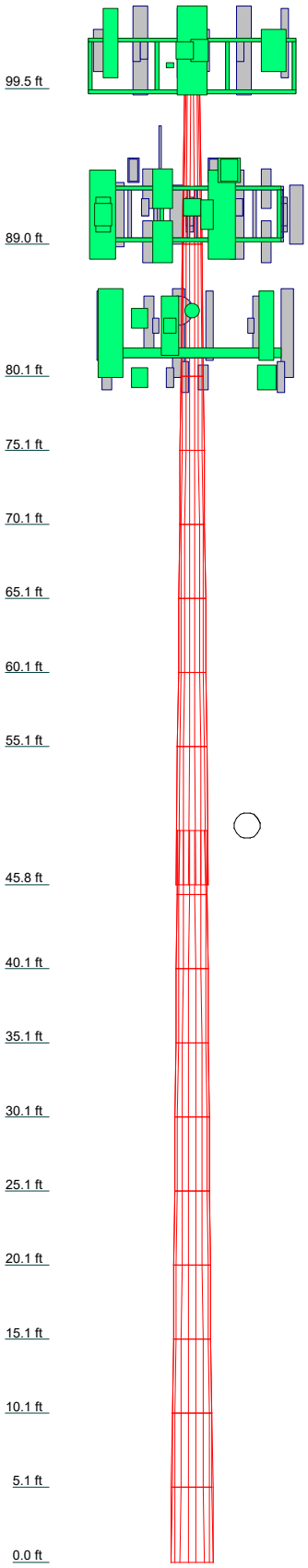
CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	10.52	18	0.1875		12.7500	16.5000	A572-65	307.6
2	8.90	18	0.1875		16.5000	18.1367		308.8
3	5.00	18	0.5010		18.1367	19.1596		491.0
4	5.00	18	0.4840		19.1596	20.1825		501.5
5	5.00	18	0.4680		20.1825	21.2054		511.2
6	5.00	18	0.4540		21.2054	22.2283		521.3
7	5.00	18	0.4410		22.2283	23.2512		531.0
8	9.33	18	0.5930	3.67	23.2512	25.1600		1411.0
9	4.34	18	0.6440		23.2232	24.9108		707.1
10	5.00	18	0.6300		24.9108	25.9207	A572-55	843.2
11	5.00	18	0.6140		25.9207	26.9306		855.8
12	5.00	18	0.6000		26.9306	27.9405		869.5
13	5.00	18	0.5870		27.9405	28.9504		883.1
14	5.00	18	0.5750		28.9504	29.9604		896.8
15	5.00	18	0.5640		29.9604	30.9703		910.7
16	5.00	18	0.5530		30.9703	31.9802		923.4
17	5.00	18	0.5430		31.9802	32.9901		936.6
18	5.08	18	0.5340		32.9901	34.0000	A139-52	965.7
								13375.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
PiROD 13' Platform w/handrail (T-Mobile)	101.083	RRUS-32 B30 RRH (ATI)	91
		B5/B12 4449 RRH (ATI)	91
AIR6449 B41 Antenna w/ Mount Pipe (T-Mobile)	101.083	Squid Surge Arrestor (ATI)	91
APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe (T-Mobile)	101.083	Pirod 12' T-Frame Sector Mount (1) (ATI)	91
AIR32 B66A/B2A Antenna w/ Mount Pipe (T-Mobile)	101.083	QD6616-7 Antenna w/ Mounting Pipe (ATI)	91
4449 B71+B85 RRH (T-Mobile)	101.083	AIR6419 Antenna w/ Mounting Pipe (ATI)	91
4415 B25 RRH (T-Mobile)	101.083	AIR6449 Antenna (ATI)	91
AIR6449 B41 Antenna w/ Mount Pipe (T-Mobile)	101.083	OPA65R-BU6DA Antenna w/ Mounting Pipe (ATI)	91
APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe (T-Mobile)	101.083	RRUS-E2 B29 RRH w/ Mounting Pipe (ATI)	91
AIR32 B66A/B2A Antenna w/ Mount Pipe (T-Mobile)	101.083	B14 4478 RRH (ATI)	91
		4426 B66 RRH (ATI)	91
4449 B71+B85 RRH (T-Mobile)	101.083	4415 B25 RRH w/ Mounting Pipe (ATI)	91
4415 B25 RRH (T-Mobile)	101.083	RRUS-32 B30 RRH (ATI)	91
AIR6449 B41 Antenna w/ Mount Pipe (T-Mobile)	101.083	B5/B12 4449 RRH (ATI)	91
APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe (T-Mobile)	101.083	Squid Surge Arrestor (ATI)	91
		8' Whip Antenna	91
AIR32 B66A/B2A Antenna w/ Mount Pipe (T-Mobile)	101.083	2' HP Dish	84.5
		1' HP Dish	84.5
4449 B71+B85 RRH (T-Mobile)	101.083	LLPX310R-V1 Antenna w/ Mounting Pipe (Sprint)	82
4415 B25 RRH (T-Mobile)	101.083		
SDX1926Q-43 Diplexer (T-Mobile)	101.083	NNVV-65B-R4 Antenna w/ Mounting Pipe (Sprint)	82
Pirod 12' T-Frame Sector Mount (1) (ATI)	91	700 RRH (Sprint)	82
QD4616-7 Antenna w/ Mounting Pipe (ATI)	91	SPI-22132825WB (CT2037) (Sprint)	82
		RRH-800 w/ Mount Pipe (Sprint)	82
AIR6419 Antenna w/ Mounting Pipe (ATI)	91	RRH-800 (Sprint)	82
		RRH-1900 (Sprint)	82
AIR6449 Antenna (ATI)	91	PiROD 12' T-Frame (Sprint)	82
OPA65R-BU4DA Antenna w/ Mounting Pipe (ATI)	91	APXVTM14 Antenna w/ Mount Pipe (Sprint)	82
RRUS-E2 B29 RRH w/ Mounting Pipe (ATI)	91	LLPX310R-V1 Antenna w/ Mounting Pipe (Sprint)	82
B14 4478 RRH (ATI)	91	NNVV-65B-R4 Antenna w/ Mounting Pipe (Sprint)	82
4426 B66 RRH (ATI)	91		
4415 B25 RRH w/ Mounting Pipe (ATI)	91	700 RRH (Sprint)	82
RRUS-32 B30 RRH (ATI)	91	SPI-22132825WB (CT2037) (Sprint)	82
B5/B12 4449 RRH (ATI)	91	RRH-800 w/ Mount Pipe (Sprint)	82
Squid Surge Arrestor (ATI)	91	RRH-800 (Sprint)	82
Squid Surge Arrestor (ATI)	91	RRH-1900 (Sprint)	82
Pirod 12' T-Frame Sector Mount (1) (ATI)	91	PiROD 12' T-Frame (Sprint)	82
QD6616-7 Antenna w/ Mounting Pipe (ATI)	91	APXVTM14 Antenna w/ Mount Pipe (Sprint)	82
AIR6419 Antenna w/ Mounting Pipe (ATI)	91	LLPX310R-V1 Antenna w/ Mounting Pipe (Sprint)	82
		NNVV-65B-R4 Antenna w/ Mounting Pipe (Sprint)	82
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		SPI-22132825WB (CT2037) (Sprint)	82
RRUS-E2 B29 RRH w/ Mounting Pipe (ATI)	91	RRH-800 w/ Mount Pipe (Sprint)	82
		RRH-800 (Sprint)	82
B14 4478 RRH (ATI)	91	PiROD 12' T-Frame (Sprint)	82
4426 B66 RRH (ATI)	91	APXVTM14 Antenna w/ Mount Pipe (Sprint)	82
4415 B25 RRH w/ Mounting Pipe (ATI)	91		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	A139-52	52 ksi	66 ksi
A572-55	55 ksi	70 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.

Hudson Design Group LLC
45 Beechwood Drive
North Andover, MA 01845
Phone: (978)-557-5553
FAX: (978)-336-5586

Job: ***CT2037***		
Project: ***NEW HAVEN WHEELER ST***		
Client: Smartlink / AT&T	Drawn by: LBW	App'd:
Code: TIA-222-H	Date: 03/14/22	Scale: NTS
Path: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\TnxTower\Tnx Projects\AT&T\CT\CT2037 - MPIC-Band\Rev 1\CT2037 (Rev 1).tri		Dwg No. E-1

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (lb)
1	10.52	18	0.1875		12.7500	16.5000	A572-65	307.6
2	8.90	18	0.1875		16.5000	18.1367	A572-65	308.8
3	5.00	18	0.5010		18.1367	19.1596	A572-65	491.0
4	5.00	18	0.4840		19.1596	20.1825	A572-65	501.5
5	5.00	18	0.4680		20.1825	21.2054	A572-65	511.2
6	5.00	18	0.4540		21.2054	22.2283	A572-65	521.3
7	5.00	18	0.4410		22.2283	23.2512	A572-65	531.0
8	9.33	18	0.5930	3.67	23.2512	25.1600	A572-65	1411.0
9	4.34	18	0.6440		23.2232	24.9108	A572-65	707.1
10	5.00	18	0.6300		24.9108	25.9207	A572-55	843.2
11	5.00	18	0.6140		25.9207	26.9306	A572-55	855.8
12	5.00	18	0.6000		26.9306	27.9405	A572-55	869.5
13	5.00	18	0.5870		27.9405	28.9504	A572-55	883.1
14	5.00	18	0.5750		28.9504	29.9604	A572-55	896.8
15	5.00	18	0.5640		29.9604	30.9703	A572-55	910.7
16	5.00	18	0.5530		30.9703	31.9802	A572-55	923.4
17	5.00	18	0.5430		31.9802	32.9901	A572-55	936.6
18	5.08	18	0.5340		32.9901	34.0000	A139-52	965.7
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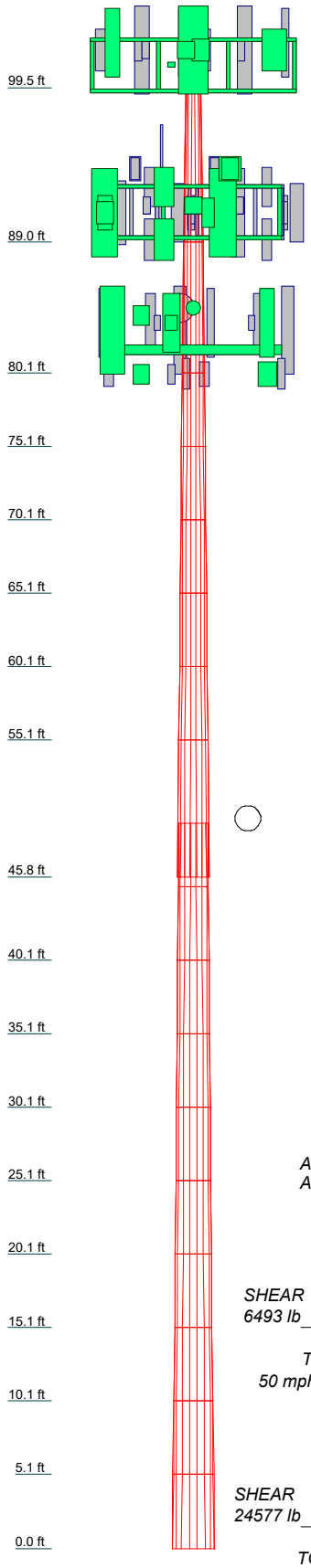

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi	A139-52	52 ksi	66 ksi
A572-55	55 ksi	70 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
8. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.

ALL REACTIONS ARE FACTORED

AXIAL 43217 lb

SHEAR 6493 lb — *MOMENT 554113 lb-ft*

TORQUE 156 lb-ft
50 mph WIND - 1.0000 in ICE

AXIAL 29752 lb

SHEAR 24577 lb — *MOMENT 2043845 lb-ft*

TORQUE 2942 lb-ft
REACTIONS - 125 mph WIND

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Path: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\TnxTower\Tnx Projects\AT&T\CT\CT2037 - MPIC-Band\Rev 1\CT2037 (Rev 1).tri		Dwg No. E-1	

Tower Input Data

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

Tower base elevation above sea level: 0.00 ft.
Basic wind speed of 125 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 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Tapered Pole Section Geometry

Section	*Elevation* *ft*	*Section Length* *ft*	*Splice Length* *ft*	*Number of Sides*	*Top Diameter* *in*	*Bottom Diameter* *in*	*Wall Thickness* *in*	*Bend Radius* *in*	*Pole Grade*
L1	99.50-88.98	10.52	0.00	18	12.7500	16.5000	0.1875	0.7500	A572-65 (65 ksi)
L2	88.98-80.08	8.90	0.00	18	16.5000	18.1367	0.1875	0.7500	A572-65 (65 ksi)
L3	80.08-75.08	5.00	0.00	18	18.1367	19.1596	0.5010	2.0040	A572-65 (65 ksi)
L4	75.08-70.08	5.00	0.00	18	19.1596	20.1825	0.4840	1.9360	A572-55 (55 ksi)
L5	70.08-65.08	5.00	0.00	18	20.1825	21.2054	0.4680	1.8720	A572-55 (55 ksi)
L6	65.08-60.08	5.00	0.00	18	21.2054	22.2283	0.4540	1.8160	A572-55 (55 ksi)
L7	60.08-55.08	5.00	0.00	18	22.2283	23.2512	0.4410	1.7640	A572-55 (55 ksi)
L8	55.08-45.75	9.33	3.67	18	23.2512	25.1600	0.5930	2.3720	A572-55 (55 ksi)
L9	45.75-45.08	4.34	0.00	18	23.2232	24.9108	0.6440	2.5760	A572-55 (55 ksi)
L10	45.08-40.08	5.00	0.00	18	24.9108	25.9207	0.6300	2.5200	A572-55 (55 ksi)
L11	40.08-35.08	5.00	0.00	18	25.9207	26.9306	0.6140	2.4560	A572-55 (55 ksi)
L12	35.08-30.08	5.00	0.00	18	26.9306	27.9405	0.6000	2.4000	A572-55

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
									(55 ksi)
L13	30.08-25.08	5.00	0.00	18	27.9405	28.9504	0.5870	2.3480	A572-55 (55 ksi)
L14	25.08-20.08	5.00	0.00	18	28.9504	29.9604	0.5750	2.3000	A572-55 (55 ksi)
L15	20.08-15.08	5.00	0.00	18	29.9604	30.9703	0.5640	2.2560	A572-55 (55 ksi)
L16	15.08-10.08	5.00	0.00	18	30.9703	31.9802	0.5530	2.2120	A572-55 (55 ksi)
L17	10.08-5.08	5.00	0.00	18	31.9802	32.9901	0.5430	2.1720	A572-55 (55 ksi)
L18	5.08-0.00	5.08		18	32.9901	34.0000	0.5340	2.1360	A139-52 (52 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	12.9178	7.4763	149.0644	4.4597	6.4770	23.0144	298.3249	3.7388	1.9140	10.208
	16.7256	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
L2	16.7256	9.7080	326.3677	5.7909	8.3820	38.9367	653.1649	4.8549	2.5740	13.728
	18.3876	10.6820	434.7914	6.3720	9.2134	47.1910	870.1549	5.3420	2.8621	15.264
L3	18.3392	28.0438	1101.9457	6.2607	9.2134	119.6019	2205.3414	14.0246	2.3103	4.611
	19.3779	29.6704	1305.0263	6.6238	9.7331	134.0816	2611.7698	14.8380	2.4903	4.971
L4	19.3805	28.6898	1264.1931	6.6298	9.7331	129.8863	2530.0497	14.3476	2.5202	5.207
	20.4192	30.2612	1483.5056	6.9930	10.2527	144.6940	2968.9633	15.1335	2.7003	5.579
L5	20.4217	29.2845	1437.9624	6.9986	10.2527	140.2519	2877.8169	14.6451	2.7284	5.83
	21.4603	30.8040	1673.6057	7.3618	10.7723	155.3613	3349.4135	15.4049	2.9085	6.215
L6	21.4625	29.9027	1626.8310	7.3667	10.7723	151.0192	3255.8026	14.9542	2.9331	6.461
	22.5012	31.3767	1879.4589	7.7299	11.2920	166.4420	3761.3908	15.6913	3.1131	6.857
L7	22.5032	30.4964	1828.9137	7.7345	11.2920	161.9658	3660.2338	15.2511	3.1360	7.111
	23.5419	31.9282	2098.7961	8.0976	11.8116	177.6893	4200.3538	15.9671	3.3161	7.519
L8	23.5184	42.6469	2766.1472	8.0437	11.8116	234.1888	5535.9341	21.3275	3.0485	5.141
	25.4567	46.2396	3525.7819	8.7213	12.7813	275.8551	7056.2031	23.1242	3.3845	5.707
L9	24.9312	46.1531	2972.7187	8.0156	11.7974	251.9815	5949.3490	23.0809	2.9538	4.587
	25.1957	49.6027	3690.3518	8.6147	12.6547	291.6194	7385.5595	24.8061	3.2509	5.048
L10	25.1979	48.5524	3616.3787	8.6197	12.6547	285.7739	7237.5158	24.2808	3.2755	5.199
	26.2234	50.5718	4086.6503	8.9782	13.1677	310.3538	8178.6778	25.2907	3.4532	5.481
L11	26.2258	49.3186	3990.4263	8.9839	13.1677	303.0462	7986.1033	24.6640	3.4814	5.67
	27.2513	51.2867	4487.4754	9.3424	13.6807	328.0140	8980.8556	25.6482	3.6591	5.96
L12	27.2535	50.1440	4392.1573	9.3474	13.6807	321.0467	8790.0940	25.0768	3.6838	6.14
	28.2790	52.0672	4917.1673	9.7059	14.1938	346.4313	9840.8046	26.0386	3.8615	6.436
L13	28.2810	50.9633	4817.4940	9.7105	14.1938	339.4090	9641.3271	25.4865	3.8844	6.617
	29.3065	52.8449	5371.0271	10.0690	14.7068	365.2070	10749.1215	26.4275	4.0622	6.92
L14	29.3083	51.7865	5267.9082	10.0733	14.7068	358.1953	10542.7480	25.8982	4.0833	7.101
	30.3339	53.6298	5850.6893	10.4318	15.2199	384.4109	11709.0771	26.8200	4.2610	7.41
L15	30.3356	52.6236	5745.2102	10.4357	15.2199	377.4806	11497.9801	26.3168	4.2804	7.589
	31.3611	54.4314	6357.9075	10.7942	15.7329	404.1151	12724.1809	27.2209	4.4581	7.904
L16	31.3628	53.3891	6240.6739	10.7981	15.7329	396.6636	12489.5594	26.6996	4.4775	8.097
	32.3882	55.1617	6883.1395	11.1567	16.2459	423.6836	13775.3360	27.5861	4.6552	8.418
L17	32.3898	54.1814	6765.1242	11.1602	16.2459	416.4193	13539.1502	27.0959	4.6728	8.606
	33.4153	55.9220	7438.2687	11.5187	16.7590	443.8380	14886.3249	27.9663	4.8506	8.933
L18	33.4166	55.0104	7321.0712	11.5219	16.7590	436.8449	14651.7756	27.5104	4.8664	9.113
	34.4421	56.7221	8025.9611	11.8804	17.2720	464.6805	16062.4829	28.3664	5.0442	9.446

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 99.50-88.98				1	1	1			
L2 88.98-80.08				1	1	1			
L3 80.08-75.08				1	1	1			
L4 75.08-70.08				1	1	1			
L5 70.08-65.08				1	1	1			
L6 65.08-60.08				1	1	1			
L7 60.08-55.08				1	1	1			
L8 55.08-45.75				1	1	1			
L9 45.75-45.08				1	1	1			
L10 45.08-40.08				1	1	1			
L11 40.08-35.08				1	1	1			
L12 35.08-30.08				1	1	1			
L13 30.08-25.08				1	1	1			
L14 25.08-20.08				1	1	1			
L15 20.08-15.08				1	1	1			
L16 15.08-10.08				1	1	1			
L17 10.08-5.08				1	1	1			
L18 5.08-0.00				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
DC Cables (In Face) (AT&T)	A	No	Yes	Inside Pole	91.00 - 0.00	8	No Ice	0.00	0.88
							1/2" Ice	0.00	0.88
							1" Ice	0.00	0.88
Fiber Cable (AT&T)	A	No	Yes	Inside Pole	91.00 - 0.00	3	No Ice	0.00	0.35
							1/2" Ice	0.00	0.35
							1" Ice	0.00	0.35
1-1/4 Hybrid (T-Mobile)	A	No	Yes	Inside Pole	99.42 - 0.00	6	No Ice	0.00	0.48
							1/2" Ice	0.00	0.48
							1" Ice	0.00	0.48
1" Hybrid (T-Mobile)	A	No	Yes	Inside Pole	99.42 - 0.00	1	No Ice	0.00	0.48
							1/2" Ice	0.00	0.48
							1" Ice	0.00	0.48
1-1/2" Hybrid Cables (In Face) (T-Mobile)	A	No	Yes	Inside Pole	99.42 - 0.00	2	No Ice	0.00	1.50
							1/2" Ice	0.00	1.50
							1" Ice	0.00	1.50
DC Cables (In Face) (T-Mobile)	A	No	Yes	Inside Pole	99.42 - 0.00	1	No Ice	0.00	0.88
							1/2" Ice	0.00	0.88
							1" Ice	0.00	0.88
1/2" Cable (Sprint)	A	No	Yes	Inside Pole	82.00 - 0.00	4	No Ice	0.00	0.35
							1/2" Ice	0.00	0.35
							1" Ice	0.00	0.35
1-1/4" Fiber Cable (In Face) (Sprint)	A	No	Yes	Inside Pole	82.00 - 0.00	3	No Ice	0.00	0.48
							1/2" Ice	0.00	0.48
							1" Ice	0.00	0.48
7/8 Cable (In Face)	A	No	Yes	Inside Pole	82.00 - 0.00	1	No Ice	0.00	0.54

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
(Sprint)							1/2" Ice	0.00	0.54
							1" Ice	0.00	0.54
2" Cable	A	No	Yes	Inside Pole	82.00 - 0.00	2	No Ice	0.00	0.71
(Sprint)							1/2" Ice	0.00	0.71
							1" Ice	0.00	0.71

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	99.50-88.98	A	0.000	0.000	0.000	0.000	92.14
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	88.98-80.08	A	0.000	0.000	0.000	0.000	145.68
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	80.08-75.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L4	75.08-70.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L5	70.08-65.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L6	65.08-60.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L7	60.08-55.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L8	55.08-45.75	A	0.000	0.000	0.000	0.000	187.93
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L9	45.75-45.08	A	0.000	0.000	0.000	0.000	13.50
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L10	45.08-40.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L11	40.08-35.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L12	35.08-30.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L13	30.08-25.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L14	25.08-20.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L15	20.08-15.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L16	15.08-10.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	0.000	0.00
L17	10.08-5.08	A	0.000	0.000	0.000	0.000	100.72
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L18	5.08-0.00	A	0.000	0.000	0.000	0.000	102.33
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

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_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	99.50-88.98	A	1.110	0.000	0.000	0.000	0.000	92.14
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	88.98-80.08	A	1.099	0.000	0.000	0.000	0.000	145.68
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	80.08-75.08	A	1.089	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L4	75.08-70.08	A	1.082	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L5	70.08-65.08	A	1.074	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L6	65.08-60.08	A	1.066	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L7	60.08-55.08	A	1.057	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L8	55.08-45.75	A	1.043	0.000	0.000	0.000	0.000	187.93
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L9	45.75-45.08	A	1.032	0.000	0.000	0.000	0.000	13.50
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L10	45.08-40.08	A	1.026	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L11	40.08-35.08	A	1.013	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L12	35.08-30.08	A	0.999	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L13	30.08-25.08	A	0.982	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L14	25.08-20.08	A	0.963	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L15	20.08-15.08	A	0.939	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L16	15.08-10.08	A	0.908	0.000	0.000	0.000	0.000	100.72

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L17	10.08-5.08	A	0.863	0.000	0.000	0.000	0.000	100.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L18	5.08-0.00	A	0.773	0.000	0.000	0.000	0.000	102.33
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
PiROD 13' Platform w/handrail (T-Mobile)	C	None		0.0000	101.08	No Ice	31.30	31.30	1822.00
						1/2" Ice	40.20	40.20	2452.00
						1" Ice	49.10	49.10	3082.00
AIR6449 B41 Antenna w/ Mount Pipe (T-Mobile)	A	From Face	3.50	0.0000	101.08	No Ice	6.45	3.92	124.90
			-5.50			1/2" Ice	7.02	4.64	179.90
			1.00			1" Ice	7.53	5.25	240.81
APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe (T-Mobile)	A	From Face	3.50	0.0000	101.08	No Ice	14.67	7.58	75.90
			0.00			1/2" Ice	15.18	8.54	177.65
			1.00			1" Ice	15.71	9.38	288.05
AIR32 B66A/B2A Antenna w/ Mount Pipe (T-Mobile)	A	From Face	3.50	0.0000	101.08	No Ice	6.81	6.14	153.90
			5.50			1/2" Ice	7.30	6.99	215.61
			1.50			1" Ice	7.76	7.73	284.26
4449 B71+B85 RRH (T-Mobile)	A	From Face	3.50	0.0000	101.08	No Ice	1.97	1.42	71.00
			-0.50			1/2" Ice	2.15	1.57	89.58
			1.00			1" Ice	2.33	1.74	110.99
4415 B25 RRH (T-Mobile)	A	From Face	3.50	0.0000	101.08	No Ice	1.64	0.68	44.00
			0.50			1/2" Ice	1.80	0.79	56.41
			1.00			1" Ice	1.97	0.91	71.18
AIR6449 B41 Antenna w/ Mount Pipe (T-Mobile)	B	From Face	3.50	0.0000	101.08	No Ice	6.45	3.92	124.90
			-5.50			1/2" Ice	7.02	4.64	179.90
			1.00			1" Ice	7.53	5.25	240.81
APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe (T-Mobile)	B	From Face	3.50	0.0000	101.08	No Ice	14.67	7.58	75.90
			0.00			1/2" Ice	15.18	8.54	177.65
			1.00			1" Ice	15.71	9.38	288.05
AIR32 B66A/B2A Antenna w/ Mount Pipe (T-Mobile)	B	From Face	3.50	0.0000	101.08	No Ice	6.81	6.14	153.90
			5.50			1/2" Ice	7.30	6.99	215.61
			1.50			1" Ice	7.76	7.73	284.26
4449 B71+B85 RRH (T-Mobile)	B	From Face	3.50	0.0000	101.08	No Ice	1.97	1.42	71.00
			-0.50			1/2" Ice	2.15	1.57	89.58
			1.00			1" Ice	2.33	1.74	110.99
4415 B25 RRH (T-Mobile)	B	From Face	3.50	0.0000	101.08	No Ice	1.64	0.68	44.00
			0.50			1/2" Ice	1.80	0.79	56.41
			1.00			1" Ice	1.97	0.91	71.18
AIR6449 B41 Antenna w/ Mount Pipe (T-Mobile)	C	From Face	3.50	0.0000	101.08	No Ice	6.45	3.92	124.90
			-5.50			1/2" Ice	7.02	4.64	179.90
			1.00			1" Ice	7.53	5.25	240.81
APXVAALL18_43-U-NA20 Antenna w/ Mounting Pipe (T-Mobile)	C	From Face	3.50	0.0000	101.08	No Ice	14.67	7.58	75.90
			0.00			1/2" Ice	15.18	8.54	177.65
			1.00			1" Ice	15.71	9.38	288.05
AIR32 B66A/B2A Antenna w/ Mount Pipe	C	From Face	3.50	0.0000	101.08	No Ice	6.81	6.14	153.90
			5.50			1/2" Ice	7.30	6.99	215.61

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			1.50			1" Ice	7.76	7.73	284.26
4449 B71+B85 RRH	C	From Face	3.50	0.0000	101.08	No Ice	1.97	1.42	71.00
(T-Mobile)			-0.50			1/2" Ice	2.15	1.57	89.58
			1.00			1" Ice	2.33	1.74	110.99
4415 B25 RRH	C	From Face	3.50	0.0000	101.08	No Ice	1.64	0.68	44.00
(T-Mobile)			0.50			1/2" Ice	1.80	0.79	56.41
			1.00			1" Ice	1.97	0.91	71.18
SDX1926Q-43 Diplexer	C	From Face	3.00	0.0000	101.08	No Ice	0.24	0.10	7.00
(T-Mobile)			1.50			1/2" Ice	0.31	0.14	9.47
			0.00			1" Ice	0.38	0.20	13.04
*****									
Pirod 12' T-Frame Sector	A	From Face	3.00	0.0000	91.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
QD4616-7 Antenna w/	A	From Face	4.00	0.0000	91.00	No Ice	9.93	6.28	84.74
Mounting Pipe			-2.00			1/2" Ice	10.45	6.98	165.78
(AT&T)			0.00			1" Ice	10.97	7.69	254.88
AIR6419 Antenna w/	A	From Face	4.00	0.0000	91.00	No Ice	5.46	3.92	95.20
Mounting Pipe			2.00			1/2" Ice	6.28	4.95	145.49
(AT&T)			1.75			1" Ice	7.01	5.84	201.59
AIR6449 Antenna	A	From Face	4.00	0.0000	91.00	No Ice	4.39	2.37	82.00
(AT&T)			2.00			1/2" Ice	4.66	2.59	113.80
			-1.83			1" Ice	4.95	2.82	149.50
OPA65R-BU4DA Antenna	A	From Face	4.00	0.0000	91.00	No Ice	8.88	4.97	74.90
w/ Mounting Pipe			6.00			1/2" Ice	9.43	5.77	143.42
(AT&T)			0.00			1" Ice	9.95	6.45	218.78
RRUS-E2 B29 RRH w/	A	From Face	2.50	0.0000	91.00	No Ice	3.93	2.47	71.25
Mounting Pipe			-2.50			1/2" Ice	4.35	2.93	107.75
(AT&T)			3.00			1" Ice	4.78	3.41	148.93
B14 4478 RRH	A	From Face	2.50	0.0000	91.00	No Ice	2.02	1.25	60.00
(AT&T)			-2.50			1/2" Ice	2.20	1.40	77.66
			3.00			1" Ice	2.39	1.56	98.08
4426 B66 RRH	A	From Face	3.00	0.0000	91.00	No Ice	1.64	0.72	49.00
(AT&T)			0.00			1/2" Ice	1.80	0.84	61.79
			0.50			1" Ice	1.97	0.96	76.97
4415 B25 RRH w/ Mounting	A	From Face	3.00	0.0000	91.00	No Ice	2.77	2.10	65.90
Pipe			0.00			1/2" Ice	3.33	2.71	94.20
(AT&T)			0.50			1" Ice	3.79	3.20	126.54
RRUS-32 B30 RRH	A	From Face	3.00	0.0000	91.00	No Ice	2.74	1.67	60.00
(AT&T)			6.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
B5/B12 4449 RRH	A	From Face	3.00	0.0000	91.00	No Ice	1.97	1.40	73.00
(AT&T)			6.00			1/2" Ice	2.15	1.56	91.48
			0.00			1" Ice	2.33	1.72	112.77
Squid Surge Arrestor	A	From Face	1.50	0.0000	91.00	No Ice	1.88	1.88	33.00
(AT&T)			-1.00			1/2" Ice	2.07	2.07	51.91
			0.00			1" Ice	2.27	2.27	73.78
Squid Surge Arrestor	A	From Face	1.50	0.0000	91.00	No Ice	1.88	1.88	33.00
(AT&T)			-1.00			1/2" Ice	2.07	2.07	51.91
			0.00			1" Ice	2.27	2.27	73.78
Pirod 12' T-Frame Sector	B	From Face	3.00	0.0000	91.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
QD6616-7 Antenna w/	B	From Face	4.00	0.0000	91.00	No Ice	14.05	8.70	88.20
Mounting Pipe			-2.00			1/2" Ice	14.77	9.99	193.27
(AT&T)			0.00			1" Ice	15.45	11.12	307.32
AIR6419 Antenna w/	B	From Face	4.00	0.0000	91.00	No Ice	5.46	3.92	95.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Mounting Pipe			2.00			1/2" Ice	6.28	4.95	145.49
(AT&T)			1.75			1" Ice	7.01	5.84	201.59
AIR6449 Antenna	B	From Face	4.00	0.0000	91.00	No Ice	4.39	2.37	82.00
(AT&T)			2.00			1/2" Ice	4.66	2.59	113.80
			-1.83			1" Ice	4.95	2.82	149.50
OPA65R-BU4DA Antenna	B	From Face	4.00	0.0000	91.00	No Ice	8.88	4.97	74.90
w/ Mounting Pipe			6.00			1/2" Ice	9.43	5.77	143.42
(AT&T)			0.00			1" Ice	9.95	6.45	218.78
RRUS-E2 B29 RRH w/	B	From Face	2.50	0.0000	91.00	No Ice	3.93	2.47	71.25
Mounting Pipe			-2.50			1/2" Ice	4.35	2.93	107.75
(AT&T)			3.00			1" Ice	4.78	3.41	148.93
B14 4478 RRH	B	From Face	2.50	0.0000	91.00	No Ice	2.02	1.25	60.00
(AT&T)			-2.50			1/2" Ice	2.20	1.40	77.66
			3.00			1" Ice	2.39	1.56	98.08
4426 B66 RRH	B	From Face	3.00	0.0000	91.00	No Ice	1.64	0.72	49.00
(AT&T)			0.00			1/2" Ice	1.80	0.84	61.79
			0.50			1" Ice	1.97	0.96	76.97
4415 B25 RRH w/ Mounting	B	From Face	3.00	0.0000	91.00	No Ice	2.77	2.10	65.90
Pipe			0.00			1/2" Ice	3.33	2.71	94.20
(AT&T)			0.50			1" Ice	3.79	3.20	126.54
RRUS-32 B30 RRH	B	From Face	3.00	0.0000	91.00	No Ice	2.74	1.67	60.00
(AT&T)			6.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
B5/B12 4449 RRH	B	From Face	3.00	0.0000	91.00	No Ice	1.97	1.40	73.00
(AT&T)			6.00			1/2" Ice	2.15	1.56	91.48
			0.00			1" Ice	2.33	1.72	112.77
Squid Surge Arrestor	B	From Face	1.50	0.0000	91.00	No Ice	1.88	1.88	33.00
(AT&T)			-1.00			1/2" Ice	2.07	2.07	51.91
			0.00			1" Ice	2.27	2.27	73.78
Pirod 12' T-Frame Sector	C	From Face	3.00	0.0000	91.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
QD6616-7 Antenna w/	C	From Face	4.00	0.0000	91.00	No Ice	14.05	8.70	88.20
Mounting Pipe			-2.00			1/2" Ice	14.77	9.99	193.27
(AT&T)			0.00			1" Ice	15.45	11.12	307.32
AIR6419 Antenna w/	C	From Face	4.00	0.0000	91.00	No Ice	5.46	3.92	95.20
Mounting Pipe			2.00			1/2" Ice	6.28	4.95	145.49
(AT&T)			1.75			1" Ice	7.01	5.84	201.59
AIR6449 Antenna	C	From Face	4.00	0.0000	91.00	No Ice	4.39	2.37	82.00
(AT&T)			2.00			1/2" Ice	4.66	2.59	113.80
			-1.83			1" Ice	4.95	2.82	149.50
OPA65R-BU6DA Antenna	C	From Face	4.00	0.0000	91.00	No Ice	12.89	7.10	85.90
w/ Mounting Pipe			6.00			1/2" Ice	13.39	8.05	176.82
(AT&T)			0.00			1" Ice	13.90	8.88	276.10
RRUS-E2 B29 RRH w/	C	From Face	2.50	0.0000	91.00	No Ice	3.93	2.47	71.25
Mounting Pipe			-2.50			1/2" Ice	4.35	2.93	107.75
(AT&T)			3.00			1" Ice	4.78	3.41	148.93
B14 4478 RRH	C	From Face	2.50	0.0000	91.00	No Ice	2.02	1.25	60.00
(AT&T)			-2.50			1/2" Ice	2.20	1.40	77.66
			3.00			1" Ice	2.39	1.56	98.08
4426 B66 RRH	C	From Face	3.00	0.0000	91.00	No Ice	1.64	0.72	49.00
(AT&T)			0.00			1/2" Ice	1.80	0.84	61.79
			0.50			1" Ice	1.97	0.96	76.97
4415 B25 RRH w/ Mounting	C	From Face	3.00	0.0000	91.00	No Ice	2.77	2.10	65.90
Pipe			0.00			1/2" Ice	3.33	2.71	94.20
(AT&T)			0.50			1" Ice	3.79	3.20	126.54
RRUS-32 B30 RRH	C	From Face	3.00	0.0000	91.00	No Ice	2.74	1.67	60.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			6.00			1/2" Ice	2.96	1.86	81.11
			0.00			1" Ice	3.19	2.05	105.42
B5/B12 4449 RRH	C	From Face	3.00	0.0000	91.00	No Ice	1.97	1.40	73.00
(AT&T)			6.00			1/2" Ice	2.15	1.56	91.48
			0.00			1" Ice	2.33	1.72	112.77
Squid Surge Arrestor	C	From Face	1.50	0.0000	91.00	No Ice	1.88	1.88	33.00
(AT&T)			-1.00			1/2" Ice	2.07	2.07	51.91
			0.00			1" Ice	2.27	2.27	73.78
8' Whip Antenna	A	From Face	3.00	0.0000	91.00	No Ice	4.00	4.00	10.00
			2.00			1/2" Ice	4.92	4.92	32.30
			2.00			1" Ice	5.61	5.61	61.40
*****									
PiROD 12' T-Frame	A	From Face	1.50	0.0000	82.00	No Ice	12.20	12.20	360.00
(Sprint)			0.00			1/2" Ice	17.60	17.60	490.00
			0.00			1" Ice	23.00	23.00	620.00
APXVTM14 Antenna w/	A	From Face	3.50	0.0000	82.00	No Ice	6.65	5.03	52.90
Mount Pipe			-5.00			1/2" Ice	7.14	5.89	108.31
(Sprint)			1.50			1" Ice	7.60	6.63	170.47
LLPX310R-V1 Antenna w/	A	From Face	3.50	0.0000	82.00	No Ice	6.34	5.13	49.90
Mounting Pipe			1.50			1/2" Ice	6.85	5.93	107.04
(Sprint)			1.50			1" Ice	7.31	6.61	170.60
NNVV-65B-R4 Antenna w/	A	From Face	3.50	0.0000	82.00	No Ice	12.27	7.17	98.90
Mounting Pipe			5.50			1/2" Ice	12.77	8.13	186.93
(Sprint)			1.00			1" Ice	13.27	8.97	283.27
700 RRH	A	From Face	3.00	0.0000	82.00	No Ice	2.50	0.88	50.00
(Sprint)			-5.00			1/2" Ice	2.70	1.02	66.72
			-2.00			1" Ice	2.90	1.16	86.23
SPI-22132825WB (CT2037)	A	From Face	3.00	0.0000	82.00	No Ice	1.00	0.80	50.00
(Sprint)			1.50			1/2" Ice	1.13	0.91	60.60
			1.50			1" Ice	1.26	1.04	73.33
RRH-800 w/ Mount Pipe	A	From Face	3.00	0.0000	82.00	No Ice	2.82	3.27	85.90
(Sprint)			3.50			1/2" Ice	3.38	3.94	122.93
			-2.00			1" Ice	3.84	4.48	164.61
RRH-800	A	From Face	3.00	0.0000	82.00	No Ice	1.71	1.84	64.00
(Sprint)			3.50			1/2" Ice	1.88	2.01	85.14
			2.00			1" Ice	2.05	2.19	109.25
RRH-1900	A	From Face	3.00	0.0000	82.00	No Ice	2.31	2.38	60.00
(Sprint)			5.50			1/2" Ice	2.52	2.58	83.90
			-2.00			1" Ice	2.73	2.79	111.08
PiROD 12' T-Frame	B	From Face	1.50	0.0000	82.00	No Ice	12.20	12.20	360.00
(Sprint)			0.00			1/2" Ice	17.60	17.60	490.00
			0.00			1" Ice	23.00	23.00	620.00
APXVTM14 Antenna w/	B	From Face	3.50	0.0000	82.00	No Ice	6.65	5.03	52.90
Mount Pipe			-5.00			1/2" Ice	7.14	5.89	108.31
(Sprint)			1.50			1" Ice	7.60	6.63	170.47
LLPX310R-V1 Antenna w/	B	From Face	3.50	0.0000	82.00	No Ice	6.34	5.13	49.90
Mounting Pipe			1.50			1/2" Ice	6.85	5.93	107.04
(Sprint)			1.50			1" Ice	7.31	6.61	170.60
NNVV-65B-R4 Antenna w/	B	From Face	3.50	0.0000	82.00	No Ice	12.27	7.17	98.90
Mounting Pipe			5.50			1/2" Ice	12.77	8.13	186.93
(Sprint)			1.00			1" Ice	13.27	8.97	283.27
700 RRH	B	From Face	3.00	0.0000	82.00	No Ice	2.50	0.88	50.00
(Sprint)			-5.00			1/2" Ice	2.70	1.02	66.72
			-2.00			1" Ice	2.90	1.16	86.23
SPI-22132825WB (CT2037)	B	From Face	3.00	0.0000	82.00	No Ice	1.00	0.80	50.00
(Sprint)			1.50			1/2" Ice	1.13	0.91	60.60
			1.50			1" Ice	1.26	1.04	73.33

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
RRH-800 w/ Mount Pipe	B	From Face	3.00	0.0000	82.00	No Ice	2.82	3.27	85.90
(Sprint)			3.50			1/2" Ice	3.38	3.94	122.93
			-2.00			1" Ice	3.84	4.48	164.61
RRH-800	B	From Face	3.00	0.0000	82.00	No Ice	1.71	1.84	64.00
(Sprint)			3.50			1/2" Ice	1.88	2.01	85.14
			2.00			1" Ice	2.05	2.19	109.25
RRH-1900	B	From Face	3.00	0.0000	82.00	No Ice	2.31	2.38	60.00
(Sprint)			5.50			1/2" Ice	2.52	2.58	83.90
			-2.00			1" Ice	2.73	2.79	111.08
PiROD 12' T-Frame	C	From Face	1.50	0.0000	82.00	No Ice	12.20	12.20	360.00
(Sprint)			0.00			1/2" Ice	17.60	17.60	490.00
			0.00			1" Ice	23.00	23.00	620.00
APXVTM14 Antenna w/	C	From Face	3.50	0.0000	82.00	No Ice	6.65	5.03	52.90
Mount Pipe			-5.00			1/2" Ice	7.14	5.89	108.31
(Sprint)			1.50			1" Ice	7.60	6.63	170.47
LLPX310R-V1 Antenna w/	C	From Face	3.50	0.0000	82.00	No Ice	6.34	5.13	49.90
Mounting Pipe			1.50			1/2" Ice	6.85	5.93	107.04
(Sprint)			1.50			1" Ice	7.31	6.61	170.60
NNVV-65B-R4 Antenna w/	C	From Face	3.50	0.0000	82.00	No Ice	12.27	7.17	98.90
Mounting Pipe			5.50			1/2" Ice	12.77	8.13	186.93
(Sprint)			1.00			1" Ice	13.27	8.97	283.27
700 RRH	C	From Face	3.00	0.0000	82.00	No Ice	2.50	0.88	50.00
(Sprint)			-5.00			1/2" Ice	2.70	1.02	66.72
			-2.00			1" Ice	2.90	1.16	86.23
SPI-22132825WB (CT2037)	C	From Face	3.00	0.0000	82.00	No Ice	1.00	0.80	50.00
(Sprint)			1.50			1/2" Ice	1.13	0.91	60.60
			1.50			1" Ice	1.26	1.04	73.33
RRH-800 w/ Mount Pipe	C	From Face	3.00	0.0000	82.00	No Ice	2.82	3.27	85.90
(Sprint)			3.50			1/2" Ice	3.38	3.94	122.93
			-2.00			1" Ice	3.84	4.48	164.61
RRH-800	C	From Face	3.00	0.0000	82.00	No Ice	1.71	1.84	64.00
(Sprint)			3.50			1/2" Ice	1.88	2.01	85.14
			2.00			1" Ice	2.05	2.19	109.25

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 ft^2	Weight lb
2' HP Dish	A	Paraboloid	From	1.00	0.0000		84.50	2.00	No Ice	3.14	41.00
		w/Radome	Face	1.00					1/2" Ice	3.41	58.50
				0.00					1" Ice	3.68	76.01
1' HP Dish	C	Paraboloid	From	3.00	0.0000		84.50	1.00	No Ice	3.14	30.00
		w/Radome	Face	0.00					1/2" Ice	3.41	58.50
				0.00					1" Ice	3.68	76.01

Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 99.50-88.98	94.02	1.249	47	12.994	A	0.000	12.994	12.994	100.00	0.000	0.000
					B	0.000	12.994		100.00	0.000	0.000
					C	0.000	12.994		100.00	0.000	0.000
L2 88.98-80.08	84.46	1.221	46	13.021	A	0.000	13.021	13.021	100.00	0.000	0.000
					B	0.000	13.021		100.00	0.000	0.000
					C	0.000	13.021		100.00	0.000	0.000
L3 80.08-75.08	77.56	1.2	46	7.858	A	0.000	7.858	7.858	100.00	0.000	0.000
					B	0.000	7.858		100.00	0.000	0.000
					C	0.000	7.858		100.00	0.000	0.000
L4 75.08-70.08	72.56	1.183	45	8.292	A	0.000	8.292	8.292	100.00	0.000	0.000
					B	0.000	8.292		100.00	0.000	0.000
					C	0.000	8.292		100.00	0.000	0.000
L5 70.08-65.08	67.56	1.165	44	8.725	A	0.000	8.725	8.725	100.00	0.000	0.000
					B	0.000	8.725		100.00	0.000	0.000
					C	0.000	8.725		100.00	0.000	0.000
L6 65.08-60.08	62.56	1.147	44	9.159	A	0.000	9.159	9.159	100.00	0.000	0.000
					B	0.000	9.159		100.00	0.000	0.000
					C	0.000	9.159		100.00	0.000	0.000
L7 60.08-55.08	57.56	1.127	43	9.593	A	0.000	9.593	9.593	100.00	0.000	0.000
					B	0.000	9.593		100.00	0.000	0.000
					C	0.000	9.593		100.00	0.000	0.000
L8 55.08-45.75	50.35	1.095	42	19.039	A	0.000	19.039	19.039	100.00	0.000	0.000
					B	0.000	19.039		100.00	0.000	0.000
					C	0.000	19.039		100.00	0.000	0.000
L9 45.75-45.08	45.41	1.072	41	1.399	A	0.000	1.399	1.399	100.00	0.000	0.000
					B	0.000	1.399		100.00	0.000	0.000
					C	0.000	1.399		100.00	0.000	0.000
L10	42.56	1.057	40	10.713	A	0.000	10.713	10.713	100.00	0.000	0.000
45.08-40.08					B	0.000	10.713		100.00	0.000	0.000
					C	0.000	10.713		100.00	0.000	0.000
L11	37.56	1.03	39	11.141	A	0.000	11.141	11.141	100.00	0.000	0.000
40.08-35.08					B	0.000	11.141		100.00	0.000	0.000
					C	0.000	11.141		100.00	0.000	0.000
L12	32.56	0.999	38	11.569	A	0.000	11.569	11.569	100.00	0.000	0.000
35.08-30.08					B	0.000	11.569		100.00	0.000	0.000
					C	0.000	11.569		100.00	0.000	0.000
L13	27.57	0.965	37	11.997	A	0.000	11.997	11.997	100.00	0.000	0.000
30.08-25.08					B	0.000	11.997		100.00	0.000	0.000
					C	0.000	11.997		100.00	0.000	0.000
L14	22.57	0.925	35	12.425	A	0.000	12.425	12.425	100.00	0.000	0.000
25.08-20.08					B	0.000	12.425		100.00	0.000	0.000
					C	0.000	12.425		100.00	0.000	0.000
L15	17.57	0.878	33	12.853	A	0.000	12.853	12.853	100.00	0.000	0.000
20.08-15.08					B	0.000	12.853		100.00	0.000	0.000
					C	0.000	12.853		100.00	0.000	0.000
L16	12.57	0.85	32	13.281	A	0.000	13.281	13.281	100.00	0.000	0.000
15.08-10.08					B	0.000	13.281		100.00	0.000	0.000
					C	0.000	13.281		100.00	0.000	0.000
L17 10.08-5.08	7.57	0.85	32	13.709	A	0.000	13.709	13.709	100.00	0.000	0.000
					B	0.000	13.709		100.00	0.000	0.000
					C	0.000	13.709		100.00	0.000	0.000
L18 5.08-0.00	2.53	0.85	32	14.363	A	0.000	14.363	14.363	100.00	0.000	0.000
					B	0.000	14.363		100.00	0.000	0.000
					C	0.000	14.363		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 99.50-88.98	94.02	1.249	8	1.1104	14.941	A	0.000	14.941	14.941	100.00	0.000	0.000
						B	0.000	14.941		100.00	0.000	0.000
						C	0.000	14.941		100.00	0.000	0.000
L2 88.98-80.08	84.46	1.221	7	1.0985	14.651	A	0.000	14.651	14.651	100.00	0.000	0.000
						B	0.000	14.651		100.00	0.000	0.000
						C	0.000	14.651		100.00	0.000	0.000
L3 80.08-75.08	77.56	1.2	7	1.0892	8.765	A	0.000	8.765	8.765	100.00	0.000	0.000
						B	0.000	8.765		100.00	0.000	0.000
						C	0.000	8.765		100.00	0.000	0.000
L4 75.08-70.08	72.56	1.183	7	1.0820	9.193	A	0.000	9.193	9.193	100.00	0.000	0.000
						B	0.000	9.193		100.00	0.000	0.000
						C	0.000	9.193		100.00	0.000	0.000
L5 70.08-65.08	67.56	1.165	7	1.0743	9.621	A	0.000	9.621	9.621	100.00	0.000	0.000
						B	0.000	9.621		100.00	0.000	0.000
						C	0.000	9.621		100.00	0.000	0.000
L6 65.08-60.08	62.56	1.147	7	1.0661	10.047	A	0.000	10.047	10.047	100.00	0.000	0.000
						B	0.000	10.047		100.00	0.000	0.000
						C	0.000	10.047		100.00	0.000	0.000
L7 60.08-55.08	57.56	1.127	7	1.0572	10.474	A	0.000	10.474	10.474	100.00	0.000	0.000
						B	0.000	10.474		100.00	0.000	0.000
						C	0.000	10.474		100.00	0.000	0.000
L8 55.08-45.75	50.35	1.095	7	1.0432	20.661	A	0.000	20.661	20.661	100.00	0.000	0.000
						B	0.000	20.661		100.00	0.000	0.000
						C	0.000	20.661		100.00	0.000	0.000
L9 45.75-45.08	45.41	1.072	7	1.0324	1.516	A	0.000	1.516	1.516	100.00	0.000	0.000
						B	0.000	1.516		100.00	0.000	0.000
						C	0.000	1.516		100.00	0.000	0.000
L10 45.08-40.08	42.56	1.057	6	1.0258	11.568	A	0.000	11.568	11.568	100.00	0.000	0.000
						B	0.000	11.568		100.00	0.000	0.000
						C	0.000	11.568		100.00	0.000	0.000
L11 40.08-35.08	37.56	1.03	6	1.0130	11.985	A	0.000	11.985	11.985	100.00	0.000	0.000
						B	0.000	11.985		100.00	0.000	0.000
						C	0.000	11.985		100.00	0.000	0.000
L12 35.08-30.08	32.56	0.999	6	0.9987	12.401	A	0.000	12.401	12.401	100.00	0.000	0.000
						B	0.000	12.401		100.00	0.000	0.000
						C	0.000	12.401		100.00	0.000	0.000
L13 30.08-25.08	27.57	0.965	6	0.9822	12.816	A	0.000	12.816	12.816	100.00	0.000	0.000
						B	0.000	12.816		100.00	0.000	0.000
						C	0.000	12.816		100.00	0.000	0.000
L14 25.08-20.08	22.57	0.925	6	0.9627	13.228	A	0.000	13.228	13.228	100.00	0.000	0.000
						B	0.000	13.228		100.00	0.000	0.000
						C	0.000	13.228		100.00	0.000	0.000
L15 20.08-15.08	17.57	0.878	5	0.9389	13.636	A	0.000	13.636	13.636	100.00	0.000	0.000
						B	0.000	13.636		100.00	0.000	0.000
						C	0.000	13.636		100.00	0.000	0.000
L16 15.08-10.08	12.57	0.85	5	0.9080	14.038	A	0.000	14.038	14.038	100.00	0.000	0.000
						B	0.000	14.038		100.00	0.000	0.000
						C	0.000	14.038		100.00	0.000	0.000
L17 10.08-5.08	7.57	0.85	5	0.8631	14.429	A	0.000	14.429	14.429	100.00	0.000	0.000
						B	0.000	14.429		100.00	0.000	0.000
						C	0.000	14.429		100.00	0.000	0.000
L18 5.08-0.00	2.53	0.85	5	0.7734	15.018	A	0.000	15.018	15.018	100.00	0.000	0.000
						B	0.000	15.018		100.00	0.000	0.000
						C	0.000	15.018		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 99.50-88.98	94.02	1.249	10	12.994	A	0.000	12.994	12.994	100.00	0.000	0.000
					B	0.000	12.994		100.00	0.000	0.000
					C	0.000	12.994		100.00	0.000	0.000
L2 88.98-80.08	84.46	1.221	10	13.021	A	0.000	13.021	13.021	100.00	0.000	0.000
					B	0.000	13.021		100.00	0.000	0.000
					C	0.000	13.021		100.00	0.000	0.000
L3 80.08-75.08	77.56	1.2	9	7.858	A	0.000	7.858	7.858	100.00	0.000	0.000
					B	0.000	7.858		100.00	0.000	0.000
					C	0.000	7.858		100.00	0.000	0.000
L4 75.08-70.08	72.56	1.183	9	8.292	A	0.000	8.292	8.292	100.00	0.000	0.000
					B	0.000	8.292		100.00	0.000	0.000
					C	0.000	8.292		100.00	0.000	0.000
L5 70.08-65.08	67.56	1.165	9	8.725	A	0.000	8.725	8.725	100.00	0.000	0.000
					B	0.000	8.725		100.00	0.000	0.000
					C	0.000	8.725		100.00	0.000	0.000
L6 65.08-60.08	62.56	1.147	9	9.159	A	0.000	9.159	9.159	100.00	0.000	0.000
					B	0.000	9.159		100.00	0.000	0.000
					C	0.000	9.159		100.00	0.000	0.000
L7 60.08-55.08	57.56	1.127	9	9.593	A	0.000	9.593	9.593	100.00	0.000	0.000
					B	0.000	9.593		100.00	0.000	0.000
					C	0.000	9.593		100.00	0.000	0.000
L8 55.08-45.75	50.35	1.095	9	19.039	A	0.000	19.039	19.039	100.00	0.000	0.000
					B	0.000	19.039		100.00	0.000	0.000
					C	0.000	19.039		100.00	0.000	0.000
L9 45.75-45.08	45.41	1.072	8	1.399	A	0.000	1.399	1.399	100.00	0.000	0.000
					B	0.000	1.399		100.00	0.000	0.000
					C	0.000	1.399		100.00	0.000	0.000
L10	42.56	1.057	8	10.713	A	0.000	10.713	10.713	100.00	0.000	0.000
45.08-40.08					B	0.000	10.713		100.00	0.000	0.000
					C	0.000	10.713		100.00	0.000	0.000
L11	37.56	1.03	8	11.141	A	0.000	11.141	11.141	100.00	0.000	0.000
40.08-35.08					B	0.000	11.141		100.00	0.000	0.000
					C	0.000	11.141		100.00	0.000	0.000
L12	32.56	0.999	8	11.569	A	0.000	11.569	11.569	100.00	0.000	0.000
35.08-30.08					B	0.000	11.569		100.00	0.000	0.000
					C	0.000	11.569		100.00	0.000	0.000
L13	27.57	0.965	8	11.997	A	0.000	11.997	11.997	100.00	0.000	0.000
30.08-25.08					B	0.000	11.997		100.00	0.000	0.000
					C	0.000	11.997		100.00	0.000	0.000
L14	22.57	0.925	7	12.425	A	0.000	12.425	12.425	100.00	0.000	0.000
25.08-20.08					B	0.000	12.425		100.00	0.000	0.000
					C	0.000	12.425		100.00	0.000	0.000
L15	17.57	0.878	7	12.853	A	0.000	12.853	12.853	100.00	0.000	0.000
20.08-15.08					B	0.000	12.853		100.00	0.000	0.000
					C	0.000	12.853		100.00	0.000	0.000
L16	12.57	0.85	7	13.281	A	0.000	13.281	13.281	100.00	0.000	0.000
15.08-10.08					B	0.000	13.281		100.00	0.000	0.000
					C	0.000	13.281		100.00	0.000	0.000
L17 10.08-5.08	7.57	0.85	7	13.709	A	0.000	13.709	13.709	100.00	0.000	0.000
					B	0.000	13.709		100.00	0.000	0.000
					C	0.000	13.709		100.00	0.000	0.000
L18 5.08-0.00	2.53	0.85	7	14.363	A	0.000	14.363	14.363	100.00	0.000	0.000
					B	0.000	14.363		100.00	0.000	0.000
					C	0.000	14.363		100.00	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	92.14	307.58	A	1	0.73	47	1	1	12.994	495.33	47.08	C
99.50-88.98			B	1	0.73		1	1	12.994			
			C	1	0.73		1	1	12.994			
L2	145.68	308.75	A	1	0.73	46	1	1	13.021	485.30	54.53	C
88.98-80.08			B	1	0.73		1	1	13.021			
			C	1	0.73		1	1	13.021			
L3	100.72	490.97	A	1	0.73	46	1	1	7.858	287.65	57.53	C
80.08-75.08			B	1	0.73		1	1	7.858			
			C	1	0.73		1	1	7.858			
L4	100.72	501.49	A	1	0.73	45	1	1	8.292	299.30	59.86	C
75.08-70.08			B	1	0.73		1	1	8.292			
			C	1	0.73		1	1	8.292			
L5	100.72	511.17	A	1	0.73	44	1	1	8.725	310.26	62.05	C
70.08-65.08			B	1	0.73		1	1	8.725			
			C	1	0.73		1	1	8.725			
L6	100.72	521.30	A	1	0.73	44	1	1	9.159	320.46	64.09	C
65.08-60.08			B	1	0.73		1	1	9.159			
			C	1	0.73		1	1	9.159			
L7	100.72	531.05	A	1	0.73	43	1	1	9.593	329.80	65.96	C
60.08-55.08			B	1	0.73		1	1	9.593			
			C	1	0.73		1	1	9.593			
L8	187.93	1410.99	A	1	0.73	42	1	1	19.039	636.38	68.21	C
55.08-45.75			B	1	0.73		1	1	19.039			
			C	1	0.73		1	1	19.039			
L9	13.50	707.07	A	1	0.73	41	1	1	1.399	45.77	68.31	C
45.75-45.08			B	1	0.73		1	1	1.399			
			C	1	0.73		1	1	1.399			
L10	100.72	843.25	A	1	0.73	40	1	1	10.713	345.63	69.13	C
45.08-40.08			B	1	0.73		1	1	10.713			
			C	1	0.73		1	1	10.713			
L11	100.72	855.85	A	1	0.73	39	1	1	11.141	350.11	70.02	C
40.08-35.08			B	1	0.73		1	1	11.141			
			C	1	0.73		1	1	11.141			
L12	100.72	869.51	A	1	0.73	38	1	1	11.569	352.80	70.56	C
35.08-30.08			B	1	0.73		1	1	11.569			
			C	1	0.73		1	1	11.569			
L13	100.72	883.09	A	1	0.73	37	1	1	11.997	353.24	70.65	C
30.08-25.08			B	1	0.73		1	1	11.997			
			C	1	0.73		1	1	11.997			
L14	100.72	896.77	A	1	0.73	35	1	1	12.425	350.75	70.15	C
25.08-20.08			B	1	0.73		1	1	12.425			
			C	1	0.73		1	1	12.425			
L15	100.72	910.71	A	1	0.73	33	1	1	12.853	344.20	68.84	C
20.08-15.08			B	1	0.73		1	1	12.853			
			C	1	0.73		1	1	12.853			
L16	100.72	923.44	A	1	0.73	32	1	1	13.281	344.48	68.90	C
15.08-10.08			B	1	0.73		1	1	13.281			
			C	1	0.73		1	1	13.281			
L17	100.72	936.65	A	1	0.73	32	1	1	13.709	355.58	71.12	C
10.08-5.08			B	1	0.73		1	1	13.709			
			C	1	0.73		1	1	13.709			
L18 5.08-0.00	102.33	965.71	A	1	0.73	32	1	1	14.363	372.54	73.34	C
			B	1	0.73		1	1	14.363			
			C	1	0.73		1	1	14.363			
Sum Weight:	1850.88	13375.36						OTM	296708.89 lb-ft	6379.57		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	92.14	307.58	A	1	0.73	47	1	1	12.994	495.33	47.08	C
99.50-88.98			B	1	0.73		1	1	12.994			
			C	1	0.73		1	1	12.994			
L2	145.68	308.75	A	1	0.73	46	1	1	13.021	485.30	54.53	C
88.98-80.08			B	1	0.73		1	1	13.021			
			C	1	0.73		1	1	13.021			
L3	100.72	490.97	A	1	0.73	46	1	1	7.858	287.65	57.53	C
80.08-75.08			B	1	0.73		1	1	7.858			
			C	1	0.73		1	1	7.858			
L4	100.72	501.49	A	1	0.73	45	1	1	8.292	299.30	59.86	C
75.08-70.08			B	1	0.73		1	1	8.292			
			C	1	0.73		1	1	8.292			
L5	100.72	511.17	A	1	0.73	44	1	1	8.725	310.26	62.05	C
70.08-65.08			B	1	0.73		1	1	8.725			
			C	1	0.73		1	1	8.725			
L6	100.72	521.30	A	1	0.73	44	1	1	9.159	320.46	64.09	C
65.08-60.08			B	1	0.73		1	1	9.159			
			C	1	0.73		1	1	9.159			
L7	100.72	531.05	A	1	0.73	43	1	1	9.593	329.80	65.96	C
60.08-55.08			B	1	0.73		1	1	9.593			
			C	1	0.73		1	1	9.593			
L8	187.93	1410.99	A	1	0.73	42	1	1	19.039	636.38	68.21	C
55.08-45.75			B	1	0.73		1	1	19.039			
			C	1	0.73		1	1	19.039			
L9	13.50	707.07	A	1	0.73	41	1	1	1.399	45.77	68.31	C
45.75-45.08			B	1	0.73		1	1	1.399			
			C	1	0.73		1	1	1.399			
L10	100.72	843.25	A	1	0.73	40	1	1	10.713	345.63	69.13	C
45.08-40.08			B	1	0.73		1	1	10.713			
			C	1	0.73		1	1	10.713			
L11	100.72	855.85	A	1	0.73	39	1	1	11.141	350.11	70.02	C
40.08-35.08			B	1	0.73		1	1	11.141			
			C	1	0.73		1	1	11.141			
L12	100.72	869.51	A	1	0.73	38	1	1	11.569	352.80	70.56	C
35.08-30.08			B	1	0.73		1	1	11.569			
			C	1	0.73		1	1	11.569			
L13	100.72	883.09	A	1	0.73	37	1	1	11.997	353.24	70.65	C
30.08-25.08			B	1	0.73		1	1	11.997			
			C	1	0.73		1	1	11.997			
L14	100.72	896.77	A	1	0.73	35	1	1	12.425	350.75	70.15	C
25.08-20.08			B	1	0.73		1	1	12.425			
			C	1	0.73		1	1	12.425			
L15	100.72	910.71	A	1	0.73	33	1	1	12.853	344.20	68.84	C
20.08-15.08			B	1	0.73		1	1	12.853			
			C	1	0.73		1	1	12.853			
L16	100.72	923.44	A	1	0.73	32	1	1	13.281	344.48	68.90	C
15.08-10.08			B	1	0.73		1	1	13.281			
			C	1	0.73		1	1	13.281			
L17	100.72	936.65	A	1	0.73	32	1	1	13.709	355.58	71.12	C
10.08-5.08			B	1	0.73		1	1	13.709			
			C	1	0.73		1	1	13.709			
L18 5.08-0.00	102.33	965.71	A	1	0.73	32	1	1	14.363	372.54	73.34	C
			B	1	0.73		1	1	14.363			
			C	1	0.73		1	1	14.363			
Sum Weight:	1850.88	13375.36						OTM	296708.89 lb-ft	6379.57		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	92.14	307.58	A	1	0.73	47	1	1	12.994	495.33	47.08	C
99.50-88.98			B	1	0.73		1	1	12.994			
			C	1	0.73		1	1	12.994			
L2	145.68	308.75	A	1	0.73	46	1	1	13.021	485.30	54.53	C
88.98-80.08			B	1	0.73		1	1	13.021			
			C	1	0.73		1	1	13.021			
L3	100.72	490.97	A	1	0.73	46	1	1	7.858	287.65	57.53	C
80.08-75.08			B	1	0.73		1	1	7.858			
			C	1	0.73		1	1	7.858			
L4	100.72	501.49	A	1	0.73	45	1	1	8.292	299.30	59.86	C
75.08-70.08			B	1	0.73		1	1	8.292			
			C	1	0.73		1	1	8.292			
L5	100.72	511.17	A	1	0.73	44	1	1	8.725	310.26	62.05	C
70.08-65.08			B	1	0.73		1	1	8.725			
			C	1	0.73		1	1	8.725			
L6	100.72	521.30	A	1	0.73	44	1	1	9.159	320.46	64.09	C
65.08-60.08			B	1	0.73		1	1	9.159			
			C	1	0.73		1	1	9.159			
L7	100.72	531.05	A	1	0.73	43	1	1	9.593	329.80	65.96	C
60.08-55.08			B	1	0.73		1	1	9.593			
			C	1	0.73		1	1	9.593			
L8	187.93	1410.99	A	1	0.73	42	1	1	19.039	636.38	68.21	C
55.08-45.75			B	1	0.73		1	1	19.039			
			C	1	0.73		1	1	19.039			
L9	13.50	707.07	A	1	0.73	41	1	1	1.399	45.77	68.31	C
45.75-45.08			B	1	0.73		1	1	1.399			
			C	1	0.73		1	1	1.399			
L10	100.72	843.25	A	1	0.73	40	1	1	10.713	345.63	69.13	C
45.08-40.08			B	1	0.73		1	1	10.713			
			C	1	0.73		1	1	10.713			
L11	100.72	855.85	A	1	0.73	39	1	1	11.141	350.11	70.02	C
40.08-35.08			B	1	0.73		1	1	11.141			
			C	1	0.73		1	1	11.141			
L12	100.72	869.51	A	1	0.73	38	1	1	11.569	352.80	70.56	C
35.08-30.08			B	1	0.73		1	1	11.569			
			C	1	0.73		1	1	11.569			
L13	100.72	883.09	A	1	0.73	37	1	1	11.997	353.24	70.65	C
30.08-25.08			B	1	0.73		1	1	11.997			
			C	1	0.73		1	1	11.997			
L14	100.72	896.77	A	1	0.73	35	1	1	12.425	350.75	70.15	C
25.08-20.08			B	1	0.73		1	1	12.425			
			C	1	0.73		1	1	12.425			
L15	100.72	910.71	A	1	0.73	33	1	1	12.853	344.20	68.84	C
20.08-15.08			B	1	0.73		1	1	12.853			
			C	1	0.73		1	1	12.853			
L16	100.72	923.44	A	1	0.73	32	1	1	13.281	344.48	68.90	C
15.08-10.08			B	1	0.73		1	1	13.281			
			C	1	0.73		1	1	13.281			
L17	100.72	936.65	A	1	0.73	32	1	1	13.709	355.58	71.12	C
10.08-5.08			B	1	0.73		1	1	13.709			
			C	1	0.73		1	1	13.709			
L18 5.08-0.00	102.33	965.71	A	1	0.73	32	1	1	14.363	372.54	73.34	C
			B	1	0.73		1	1	14.363			
			C	1	0.73		1	1	14.363			
Sum Weight:	1850.88	13375.36						OTM	296708.89 lb-ft	6379.57		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	92.14	534.45	A	1	1.2	8	1	1	14.941	149.80	14.24	C
99.50-88.98			B	1	1.2		1	1	14.941			
			C	1	1.2		1	1	14.941			
L2	145.68	531.01	A	1	1.2	7	1	1	14.651	143.61	16.14	C
88.98-80.08			B	1	1.2		1	1	14.651			
			C	1	1.2		1	1	14.651			
L3	100.72	623.65	A	1	1.2	7	1	1	8.765	84.39	16.88	C
80.08-75.08			B	1	1.2		1	1	8.765			
			C	1	1.2		1	1	8.765			
L4	100.72	640.07	A	1	1.2	7	1	1	9.193	87.28	17.46	C
75.08-70.08			B	1	1.2		1	1	9.193			
			C	1	1.2		1	1	9.193			
L5	100.72	655.50	A	1	1.2	7	1	1	9.621	89.98	18.00	C
70.08-65.08			B	1	1.2		1	1	9.621			
			C	1	1.2		1	1	9.621			
L6	100.72	671.20	A	1	1.2	7	1	1	10.047	92.46	18.49	C
65.08-60.08			B	1	1.2		1	1	10.047			
			C	1	1.2		1	1	10.047			
L7	100.72	686.31	A	1	1.2	7	1	1	10.474	94.71	18.94	C
60.08-55.08			B	1	1.2		1	1	10.474			
			C	1	1.2		1	1	10.474			
L8	187.93	1714.31	A	1	1.2	7	1	1	20.661	181.64	19.47	C
55.08-45.75			B	1	1.2		1	1	20.661			
			C	1	1.2		1	1	20.661			
L9	13.50	729.11	A	1	1.2	7	1	1	1.515	13.03	19.45	C
45.75-45.08			B	1	1.2		1	1	1.515			
			C	1	1.2		1	1	1.515			
L10	100.72	1010.64	A	1	1.2	6	1	1	11.568	98.16	19.63	C
45.08-40.08			B	1	1.2		1	1	11.568			
			C	1	1.2		1	1	11.568			
L11	100.72	1027.40	A	1	1.2	6	1	1	11.985	99.06	19.81	C
40.08-35.08			B	1	1.2		1	1	11.985			
			C	1	1.2		1	1	11.985			
L12	100.72	1044.76	A	1	1.2	6	1	1	12.401	99.47	19.89	C
35.08-30.08			B	1	1.2		1	1	12.401			
			C	1	1.2		1	1	12.401			
L13	100.72	1061.47	A	1	1.2	6	1	1	12.816	99.25	19.85	C
30.08-25.08			B	1	1.2		1	1	12.816			
			C	1	1.2		1	1	12.816			
L14	100.72	1077.50	A	1	1.2	6	1	1	13.228	98.21	19.64	C
25.08-20.08			B	1	1.2		1	1	13.228			
			C	1	1.2		1	1	13.228			
L15	100.72	1092.69	A	1	1.2	5	1	1	13.636	96.04	19.21	C
20.08-15.08			B	1	1.2		1	1	13.636			
			C	1	1.2		1	1	13.636			
L16	100.72	1104.90	A	1	1.2	5	1	1	14.038	95.76	19.15	C
15.08-10.08			B	1	1.2		1	1	14.038			
			C	1	1.2		1	1	14.038			
L17	100.72	1114.28	A	1	1.2	5	1	1	14.429	98.43	19.69	C
10.08-5.08			B	1	1.2		1	1	14.429			
			C	1	1.2		1	1	14.429			
L18 5.08-0.00	102.33	1131.90	A	1	1.2	5	1	1	15.018	102.45	20.17	C
			B	1	1.2		1	1	15.018			
			C	1	1.2		1	1	15.018			
Sum Weight:	1850.88	16451.17						OTM	86127.80 lb-ft	1823.72		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	92.14	534.45	A	1	1.2	8	1	1	14.941	149.80	14.24	C
99.50-88.98			B	1	1.2		1	1	14.941			
			C	1	1.2		1	1	14.941			
L2	145.68	531.01	A	1	1.2	7	1	1	14.651	143.61	16.14	C
88.98-80.08			B	1	1.2		1	1	14.651			
			C	1	1.2		1	1	14.651			
L3	100.72	623.65	A	1	1.2	7	1	1	8.765	84.39	16.88	C
80.08-75.08			B	1	1.2		1	1	8.765			
			C	1	1.2		1	1	8.765			
L4	100.72	640.07	A	1	1.2	7	1	1	9.193	87.28	17.46	C
75.08-70.08			B	1	1.2		1	1	9.193			
			C	1	1.2		1	1	9.193			
L5	100.72	655.50	A	1	1.2	7	1	1	9.621	89.98	18.00	C
70.08-65.08			B	1	1.2		1	1	9.621			
			C	1	1.2		1	1	9.621			
L6	100.72	671.20	A	1	1.2	7	1	1	10.047	92.46	18.49	C
65.08-60.08			B	1	1.2		1	1	10.047			
			C	1	1.2		1	1	10.047			
L7	100.72	686.31	A	1	1.2	7	1	1	10.474	94.71	18.94	C
60.08-55.08			B	1	1.2		1	1	10.474			
			C	1	1.2		1	1	10.474			
L8	187.93	1714.31	A	1	1.2	7	1	1	20.661	181.64	19.47	C
55.08-45.75			B	1	1.2		1	1	20.661			
			C	1	1.2		1	1	20.661			
L9	13.50	729.11	A	1	1.2	7	1	1	1.515	13.03	19.45	C
45.75-45.08			B	1	1.2		1	1	1.515			
			C	1	1.2		1	1	1.515			
L10	100.72	1010.64	A	1	1.2	6	1	1	11.568	98.16	19.63	C
45.08-40.08			B	1	1.2		1	1	11.568			
			C	1	1.2		1	1	11.568			
L11	100.72	1027.40	A	1	1.2	6	1	1	11.985	99.06	19.81	C
40.08-35.08			B	1	1.2		1	1	11.985			
			C	1	1.2		1	1	11.985			
L12	100.72	1044.76	A	1	1.2	6	1	1	12.401	99.47	19.89	C
35.08-30.08			B	1	1.2		1	1	12.401			
			C	1	1.2		1	1	12.401			
L13	100.72	1061.47	A	1	1.2	6	1	1	12.816	99.25	19.85	C
30.08-25.08			B	1	1.2		1	1	12.816			
			C	1	1.2		1	1	12.816			
L14	100.72	1077.50	A	1	1.2	6	1	1	13.228	98.21	19.64	C
25.08-20.08			B	1	1.2		1	1	13.228			
			C	1	1.2		1	1	13.228			
L15	100.72	1092.69	A	1	1.2	5	1	1	13.636	96.04	19.21	C
20.08-15.08			B	1	1.2		1	1	13.636			
			C	1	1.2		1	1	13.636			
L16	100.72	1104.90	A	1	1.2	5	1	1	14.038	95.76	19.15	C
15.08-10.08			B	1	1.2		1	1	14.038			
			C	1	1.2		1	1	14.038			
L17	100.72	1114.28	A	1	1.2	5	1	1	14.429	98.43	19.69	C
10.08-5.08			B	1	1.2		1	1	14.429			
			C	1	1.2		1	1	14.429			
L18 5.08-0.00	102.33	1131.90	A	1	1.2	5	1	1	15.018	102.45	20.17	C
			B	1	1.2		1	1	15.018			
			C	1	1.2		1	1	15.018			
Sum Weight:	1850.88	16451.17						OTM	86127.80 lb-ft	1823.72		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1	92.14	534.45	A	1	1.2	8	1	1	14.941	149.80	14.24	C
99.50-88.98			B	1	1.2		1	1	14.941			
			C	1	1.2		1	1	14.941			
L2	145.68	531.01	A	1	1.2	7	1	1	14.651	143.61	16.14	C
88.98-80.08			B	1	1.2		1	1	14.651			
			C	1	1.2		1	1	14.651			
L3	100.72	623.65	A	1	1.2	7	1	1	8.765	84.39	16.88	C
80.08-75.08			B	1	1.2		1	1	8.765			
			C	1	1.2		1	1	8.765			
L4	100.72	640.07	A	1	1.2	7	1	1	9.193	87.28	17.46	C
75.08-70.08			B	1	1.2		1	1	9.193			
			C	1	1.2		1	1	9.193			
L5	100.72	655.50	A	1	1.2	7	1	1	9.621	89.98	18.00	C
70.08-65.08			B	1	1.2		1	1	9.621			
			C	1	1.2		1	1	9.621			
L6	100.72	671.20	A	1	1.2	7	1	1	10.047	92.46	18.49	C
65.08-60.08			B	1	1.2		1	1	10.047			
			C	1	1.2		1	1	10.047			
L7	100.72	686.31	A	1	1.2	7	1	1	10.474	94.71	18.94	C
60.08-55.08			B	1	1.2		1	1	10.474			
			C	1	1.2		1	1	10.474			
L8	187.93	1714.31	A	1	1.2	7	1	1	20.661	181.64	19.47	C
55.08-45.75			B	1	1.2		1	1	20.661			
			C	1	1.2		1	1	20.661			
L9	13.50	729.11	A	1	1.2	7	1	1	1.515	13.03	19.45	C
45.75-45.08			B	1	1.2		1	1	1.515			
			C	1	1.2		1	1	1.515			
L10	100.72	1010.64	A	1	1.2	6	1	1	11.568	98.16	19.63	C
45.08-40.08			B	1	1.2		1	1	11.568			
			C	1	1.2		1	1	11.568			
L11	100.72	1027.40	A	1	1.2	6	1	1	11.985	99.06	19.81	C
40.08-35.08			B	1	1.2		1	1	11.985			
			C	1	1.2		1	1	11.985			
L12	100.72	1044.76	A	1	1.2	6	1	1	12.401	99.47	19.89	C
35.08-30.08			B	1	1.2		1	1	12.401			
			C	1	1.2		1	1	12.401			
L13	100.72	1061.47	A	1	1.2	6	1	1	12.816	99.25	19.85	C
30.08-25.08			B	1	1.2		1	1	12.816			
			C	1	1.2		1	1	12.816			
L14	100.72	1077.50	A	1	1.2	6	1	1	13.228	98.21	19.64	C
25.08-20.08			B	1	1.2		1	1	13.228			
			C	1	1.2		1	1	13.228			
L15	100.72	1092.69	A	1	1.2	5	1	1	13.636	96.04	19.21	C
20.08-15.08			B	1	1.2		1	1	13.636			
			C	1	1.2		1	1	13.636			
L16	100.72	1104.90	A	1	1.2	5	1	1	14.038	95.76	19.15	C
15.08-10.08			B	1	1.2		1	1	14.038			
			C	1	1.2		1	1	14.038			
L17	100.72	1114.28	A	1	1.2	5	1	1	14.429	98.43	19.69	C
10.08-5.08			B	1	1.2		1	1	14.429			
			C	1	1.2		1	1	14.429			
L18 5.08-0.00	102.33	1131.90	A	1	1.2	5	1	1	15.018	102.45	20.17	C
			B	1	1.2		1	1	15.018			
			C	1	1.2		1	1	15.018			
Sum Weight:	1850.88	16451.17						OTM	86127.80 lb-ft	1823.72		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	92.14	307.58	A	1	0.73	10	1	1	12.994	102.11	9.71	C
99.50-88.98			B	1	0.73		1	1	12.994			
			C	1	0.73		1	1	12.994			
L2	145.68	308.75	A	1	0.73	10	1	1	13.021	100.04	11.24	C
88.98-80.08			B	1	0.73		1	1	13.021			
			C	1	0.73		1	1	13.021			
L3	100.72	490.97	A	1	0.73	9	1	1	7.858	59.30	11.86	C
80.08-75.08			B	1	0.73		1	1	7.858			
			C	1	0.73		1	1	7.858			
L4	100.72	501.49	A	1	0.73	9	1	1	8.292	61.70	12.34	C
75.08-70.08			B	1	0.73		1	1	8.292			
			C	1	0.73		1	1	8.292			
L5	100.72	511.17	A	1	0.73	9	1	1	8.725	63.96	12.79	C
70.08-65.08			B	1	0.73		1	1	8.725			
			C	1	0.73		1	1	8.725			
L6	100.72	521.30	A	1	0.73	9	1	1	9.159	66.06	13.21	C
65.08-60.08			B	1	0.73		1	1	9.159			
			C	1	0.73		1	1	9.159			
L7	100.72	531.05	A	1	0.73	9	1	1	9.593	67.99	13.60	C
60.08-55.08			B	1	0.73		1	1	9.593			
			C	1	0.73		1	1	9.593			
L8	187.93	1410.99	A	1	0.73	9	1	1	19.039	131.19	14.06	C
55.08-45.75			B	1	0.73		1	1	19.039			
			C	1	0.73		1	1	19.039			
L9	13.50	707.07	A	1	0.73	8	1	1	1.399	9.44	14.08	C
45.75-45.08			B	1	0.73		1	1	1.399			
			C	1	0.73		1	1	1.399			
L10	100.72	843.25	A	1	0.73	8	1	1	10.713	71.25	14.25	C
45.08-40.08			B	1	0.73		1	1	10.713			
			C	1	0.73		1	1	10.713			
L11	100.72	855.85	A	1	0.73	8	1	1	11.141	72.17	14.43	C
40.08-35.08			B	1	0.73		1	1	11.141			
			C	1	0.73		1	1	11.141			
L12	100.72	869.51	A	1	0.73	8	1	1	11.569	72.73	14.55	C
35.08-30.08			B	1	0.73		1	1	11.569			
			C	1	0.73		1	1	11.569			
L13	100.72	883.09	A	1	0.73	8	1	1	11.997	72.82	14.56	C
30.08-25.08			B	1	0.73		1	1	11.997			
			C	1	0.73		1	1	11.997			
L14	100.72	896.77	A	1	0.73	7	1	1	12.425	72.31	14.46	C
25.08-20.08			B	1	0.73		1	1	12.425			
			C	1	0.73		1	1	12.425			
L15	100.72	910.71	A	1	0.73	7	1	1	12.853	70.96	14.19	C
20.08-15.08			B	1	0.73		1	1	12.853			
			C	1	0.73		1	1	12.853			
L16	100.72	923.44	A	1	0.73	7	1	1	13.281	71.01	14.20	C
15.08-10.08			B	1	0.73		1	1	13.281			
			C	1	0.73		1	1	13.281			
L17	100.72	936.65	A	1	0.73	7	1	1	13.709	73.30	14.66	C
10.08-5.08			B	1	0.73		1	1	13.709			
			C	1	0.73		1	1	13.709			
L18 5.08-0.00	102.33	965.71	A	1	0.73	7	1	1	14.363	76.80	15.12	C
			B	1	0.73		1	1	14.363			
			C	1	0.73		1	1	14.363			
Sum Weight:	1850.88	13375.36						OTM	61165.76 lb-ft	1315.13		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	92.14	307.58	A	1	0.73	10	1	1	12.994	102.11	9.71	C
99.50-88.98			B	1	0.73		1	1	12.994			
			C	1	0.73		1	1	12.994			
L2	145.68	308.75	A	1	0.73	10	1	1	13.021	100.04	11.24	C
88.98-80.08			B	1	0.73		1	1	13.021			
			C	1	0.73		1	1	13.021			
L3	100.72	490.97	A	1	0.73	9	1	1	7.858	59.30	11.86	C
80.08-75.08			B	1	0.73		1	1	7.858			
			C	1	0.73		1	1	7.858			
L4	100.72	501.49	A	1	0.73	9	1	1	8.292	61.70	12.34	C
75.08-70.08			B	1	0.73		1	1	8.292			
			C	1	0.73		1	1	8.292			
L5	100.72	511.17	A	1	0.73	9	1	1	8.725	63.96	12.79	C
70.08-65.08			B	1	0.73		1	1	8.725			
			C	1	0.73		1	1	8.725			
L6	100.72	521.30	A	1	0.73	9	1	1	9.159	66.06	13.21	C
65.08-60.08			B	1	0.73		1	1	9.159			
			C	1	0.73		1	1	9.159			
L7	100.72	531.05	A	1	0.73	9	1	1	9.593	67.99	13.60	C
60.08-55.08			B	1	0.73		1	1	9.593			
			C	1	0.73		1	1	9.593			
L8	187.93	1410.99	A	1	0.73	9	1	1	19.039	131.19	14.06	C
55.08-45.75			B	1	0.73		1	1	19.039			
			C	1	0.73		1	1	19.039			
L9	13.50	707.07	A	1	0.73	8	1	1	1.399	9.44	14.08	C
45.75-45.08			B	1	0.73		1	1	1.399			
			C	1	0.73		1	1	1.399			
L10	100.72	843.25	A	1	0.73	8	1	1	10.713	71.25	14.25	C
45.08-40.08			B	1	0.73		1	1	10.713			
			C	1	0.73		1	1	10.713			
L11	100.72	855.85	A	1	0.73	8	1	1	11.141	72.17	14.43	C
40.08-35.08			B	1	0.73		1	1	11.141			
			C	1	0.73		1	1	11.141			
L12	100.72	869.51	A	1	0.73	8	1	1	11.569	72.73	14.55	C
35.08-30.08			B	1	0.73		1	1	11.569			
			C	1	0.73		1	1	11.569			
L13	100.72	883.09	A	1	0.73	8	1	1	11.997	72.82	14.56	C
30.08-25.08			B	1	0.73		1	1	11.997			
			C	1	0.73		1	1	11.997			
L14	100.72	896.77	A	1	0.73	7	1	1	12.425	72.31	14.46	C
25.08-20.08			B	1	0.73		1	1	12.425			
			C	1	0.73		1	1	12.425			
L15	100.72	910.71	A	1	0.73	7	1	1	12.853	70.96	14.19	C
20.08-15.08			B	1	0.73		1	1	12.853			
			C	1	0.73		1	1	12.853			
L16	100.72	923.44	A	1	0.73	7	1	1	13.281	71.01	14.20	C
15.08-10.08			B	1	0.73		1	1	13.281			
			C	1	0.73		1	1	13.281			
L17	100.72	936.65	A	1	0.73	7	1	1	13.709	73.30	14.66	C
10.08-5.08			B	1	0.73		1	1	13.709			
			C	1	0.73		1	1	13.709			
L18 5.08-0.00	102.33	965.71	A	1	0.73	7	1	1	14.363	76.80	15.12	C
			B	1	0.73		1	1	14.363			
			C	1	0.73		1	1	14.363			
Sum Weight:	1850.88	13375.36						OTM	61165.76 lb-ft	1315.13		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1	92.14	307.58	A	1	0.73	10	1	1	12.994	102.11	9.71	C
99.50-88.98			B	1	0.73		1	1	12.994			
			C	1	0.73		1	1	12.994			
L2	145.68	308.75	A	1	0.73	10	1	1	13.021	100.04	11.24	C
88.98-80.08			B	1	0.73		1	1	13.021			
			C	1	0.73		1	1	13.021			
L3	100.72	490.97	A	1	0.73	9	1	1	7.858	59.30	11.86	C
80.08-75.08			B	1	0.73		1	1	7.858			
			C	1	0.73		1	1	7.858			
L4	100.72	501.49	A	1	0.73	9	1	1	8.292	61.70	12.34	C
75.08-70.08			B	1	0.73		1	1	8.292			
			C	1	0.73		1	1	8.292			
L5	100.72	511.17	A	1	0.73	9	1	1	8.725	63.96	12.79	C
70.08-65.08			B	1	0.73		1	1	8.725			
			C	1	0.73		1	1	8.725			
L6	100.72	521.30	A	1	0.73	9	1	1	9.159	66.06	13.21	C
65.08-60.08			B	1	0.73		1	1	9.159			
			C	1	0.73		1	1	9.159			
L7	100.72	531.05	A	1	0.73	9	1	1	9.593	67.99	13.60	C
60.08-55.08			B	1	0.73		1	1	9.593			
			C	1	0.73		1	1	9.593			
L8	187.93	1410.99	A	1	0.73	9	1	1	19.039	131.19	14.06	C
55.08-45.75			B	1	0.73		1	1	19.039			
			C	1	0.73		1	1	19.039			
L9	13.50	707.07	A	1	0.73	8	1	1	1.399	9.44	14.08	C
45.75-45.08			B	1	0.73		1	1	1.399			
			C	1	0.73		1	1	1.399			
L10	100.72	843.25	A	1	0.73	8	1	1	10.713	71.25	14.25	C
45.08-40.08			B	1	0.73		1	1	10.713			
			C	1	0.73		1	1	10.713			
L11	100.72	855.85	A	1	0.73	8	1	1	11.141	72.17	14.43	C
40.08-35.08			B	1	0.73		1	1	11.141			
			C	1	0.73		1	1	11.141			
L12	100.72	869.51	A	1	0.73	8	1	1	11.569	72.73	14.55	C
35.08-30.08			B	1	0.73		1	1	11.569			
			C	1	0.73		1	1	11.569			
L13	100.72	883.09	A	1	0.73	8	1	1	11.997	72.82	14.56	C
30.08-25.08			B	1	0.73		1	1	11.997			
			C	1	0.73		1	1	11.997			
L14	100.72	896.77	A	1	0.73	7	1	1	12.425	72.31	14.46	C
25.08-20.08			B	1	0.73		1	1	12.425			
			C	1	0.73		1	1	12.425			
L15	100.72	910.71	A	1	0.73	7	1	1	12.853	70.96	14.19	C
20.08-15.08			B	1	0.73		1	1	12.853			
			C	1	0.73		1	1	12.853			
L16	100.72	923.44	A	1	0.73	7	1	1	13.281	71.01	14.20	C
15.08-10.08			B	1	0.73		1	1	13.281			
			C	1	0.73		1	1	13.281			
L17	100.72	936.65	A	1	0.73	7	1	1	13.709	73.30	14.66	C
10.08-5.08			B	1	0.73		1	1	13.709			
			C	1	0.73		1	1	13.709			
L18 5.08-0.00	102.33	965.71	A	1	0.73	7	1	1	14.363	76.80	15.12	C
			B	1	0.73		1	1	14.363			
			C	1	0.73		1	1	14.363			
Sum Weight:	1850.88	13375.36						OTM	61165.76 lb-ft	1315.13		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	13375.36					
Bracing Weight	0.00					
Total Member Self-Weight	13375.36			-148.22	-130.45	
Total Weight	24793.02			-148.22	-130.45	
Wind 0 deg - No Ice		35.67	-24577.74	-1957842.78	-3343.24	-2324.91
Wind 30 deg - No Ice		12107.45	-21295.07	-1696515.59	-962257.96	-925.60
Wind 60 deg - No Ice		20916.18	-12318.37	-981660.11	-1661776.33	616.77
Wind 90 deg - No Ice		24132.18	-47.76	-4382.69	-1917051.14	1943.32
Wind 120 deg - No Ice		20882.92	12257.98	975916.70	-1658767.48	2822.31
Wind 150 deg - No Ice		12054.44	21297.91	1696260.62	-957434.46	2975.68
Member Ice	3075.81					
Total Weight Ice	38137.40			-167.21	-121.47	
Wind 0 deg - Ice		7.63	-6491.66	-511852.04	-818.59	-34.91
Wind 30 deg - Ice		3243.70	-5624.29	-443523.80	-255746.67	-91.36
Wind 60 deg - Ice		5607.04	-3252.18	-256590.96	-441876.84	-143.29
Wind 90 deg - Ice		6470.21	-9.93	-1058.64	-509827.88	-166.44
Wind 120 deg - Ice		5599.87	3239.22	255071.48	-441218.50	-131.08
Wind 150 deg - Ice		3232.15	5623.99	443111.14	-254680.18	-54.78
Total Weight	24793.02			-148.22	-130.45	
Wind 0 deg - Service		7.35	-5066.64	-403721.80	-792.75	-479.27
Wind 30 deg - Service		2495.92	-4389.92	-349849.89	-198470.50	-190.81
Wind 60 deg - Service		4311.82	-2539.40	-202484.31	-342674.37	127.14
Wind 90 deg - Service		4974.79	-9.85	-1021.15	-395298.60	400.61
Wind 120 deg - Service		4304.96	2526.95	201064.99	-342054.11	581.81
Wind 150 deg - Service		2484.99	4390.51	349562.00	-197476.15	613.43

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 Ice+1.0 Temp
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
21	Dead+Wind 0 deg - Service
22	Dead+Wind 30 deg - Service
23	Dead+Wind 60 deg - Service
24	Dead+Wind 90 deg - Service
25	Dead+Wind 120 deg - Service

Comb. No.	Description
26	Dead+Wind 150 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
L1	99.5 - 88.98	Pole	Max Tension	14	0.00	-0.00	0.00
			Max. Compression	14	-16210.65	475.56	-119.38
			Max. Mx	8	-7221.89	-87726.18	144.71
			Max. My	2	-7139.15	-102.44	89686.77
			Max. Vy	8	13255.41	-87726.18	144.71
			Max. Vx	2	-13628.75	-102.44	89686.77
			Max. Torque	12			-2558.96
L2	88.98 - 80.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-23222.83	-147.56	196.86
			Max. Mx	8	-10417.88	-223043.81	764.55
			Max. My	2	-10320.12	-713.39	228435.48
			Max. Vy	8	19969.34	-223043.81	764.55
			Max. Vx	2	-20437.56	-713.39	228435.48
			Max. Torque	12			-2974.26
L3	80.08 - 75.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24065.54	-147.56	196.86
			Max. Mx	8	-11222.94	-323564.03	992.35
			Max. My	2	-11130.51	-871.40	331297.50
			Max. Vy	8	20260.16	-323564.03	992.35
			Max. Vx	2	-20728.94	-871.40	331297.50
			Max. Torque	12			-2972.51
L4	75.08 - 70.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-24926.77	-147.56	196.86
			Max. Mx	8	-12048.89	-425553.15	1225.38
			Max. My	2	-11962.07	-1035.85	435630.71
			Max. Vy	8	20551.14	-425553.15	1225.38
			Max. Vx	2	-21020.20	-1035.85	435630.71
			Max. Torque	12			-2970.13
L5	70.08 - 65.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-25805.36	-147.56	196.87
			Max. Mx	8	-12908.04	-528964.99	1462.24
			Max. My	2	-12827.77	-1205.13	541386.83
			Max. Vy	8	20832.62	-528964.99	1462.24
			Max. Vx	2	-21301.54	-1205.13	541386.83
			Max. Torque	12			-2967.18
L6	65.08 - 60.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-26701.67	-147.56	196.87
			Max. Mx	8	-13796.91	-633752.78	1702.18
			Max. My	2	-13723.86	-1378.42	648516.90
			Max. Vy	8	21104.60	-633752.78	1702.18
			Max. Vx	2	-21572.93	-1378.42	648516.90
			Max. Torque	12			-2963.88
L7	60.08 - 55.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-27615.06	-147.56	196.87
			Max. Mx	8	-14712.00	-739868.66	1944.57
			Max. My	2	-14646.73	-1555.06	756970.83
			Max. Vy	8	21366.69	-739868.66	1944.57
			Max. Vx	2	-21833.98	-1555.06	756970.83
			Max. Torque	12			-2960.44
L8	55.08 - 45.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-28946.71	-147.57	196.88
			Max. Mx	8	-15996.76	-861686.90	2219.50
			Max. My	2	-15938.27	-1756.05	881431.10

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vy	8	21704.52	-861686.90	2219.50
			Max. Vx	2	-22171.23	-1756.05	881431.10
			Max. Torque	12			-2957.11
L9	45.75 - 45.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-30844.52	-147.57	196.88
			Max. Mx	8	-17691.29	-956607.53	2429.68
			Max. My	2	-17635.85	-1909.37	978379.14
			Max. Vy	8	22044.13	-956607.53	2429.68
			Max. Vx	2	-22511.82	-1909.37	978379.14
			Max. Torque	12			-2953.61
L10	45.08 - 40.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-32144.67	-147.57	196.88
			Max. Mx	8	-18943.09	-1067505.93	2675.34
			Max. My	2	-18893.34	-2090.43	1091612.71
			Max. Vy	8	22336.43	-1067505.93	2675.34
			Max. Vx	2	-22803.19	-2090.43	1091612.71
			Max. Torque	12			-2953.23
L11	40.08 - 35.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-33464.10	-147.57	196.89
			Max. Mx	8	-20220.22	-1179815.86	2921.26
			Max. My	2	-20176.50	-2272.18	1206251.78
			Max. Vy	8	22613.88	-1179815.86	2921.26
			Max. Vx	2	-23079.26	-2272.18	1206251.78
			Max. Torque	12			-2951.04
L12	35.08 - 30.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-34803.62	-147.58	196.89
			Max. Mx	8	-21518.48	-1293476.38	3167.51
			Max. My	2	-21480.87	-2454.79	1322233.59
			Max. Vy	8	22878.39	-1293476.38	3167.51
			Max. Vx	2	-23342.04	-2454.79	1322233.59
			Max. Torque	12			-2949.03
L13	30.08 - 25.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-36162.57	-147.58	196.90
			Max. Mx	8	-22837.12	-1408418.03	3413.81
			Max. My	2	-22805.67	-2638.00	1439486.86
			Max. Vy	8	23127.92	-1408418.03	3413.81
			Max. Vx	2	-23589.48	-2638.00	1439486.86
			Max. Torque	12			-2947.22
L14	25.08 - 20.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-37540.29	-147.58	196.90
			Max. Mx	8	-24175.63	-1524559.47	3659.90
			Max. My	2	-24150.38	-2821.57	1557928.49
			Max. Vy	8	23359.78	-1524559.47	3659.90
			Max. Vx	2	-23818.90	-2821.57	1557928.49
			Max. Torque	12			-2945.66
L15	20.08 - 15.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-38935.98	-147.58	196.90
			Max. Mx	8	-25533.74	-1641803.14	3905.54
			Max. My	2	-25514.67	-3005.27	1677459.20
			Max. Vy	8	23570.17	-1641803.1	3905.54

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
						4	
			Max. Vx	2	-24026.50	-3005.27	1677459.20
			Max. Torque	12			-2944.36
L16	15.08 - 10.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-40346.43	-147.59	196.91
			Max. Mx	8	-26909.40	-1760058.9	4150.50
						0	
			Max. My	2	-26896.51	-3188.92	1797987.16
			Max. Vy	8	23765.93	-1760058.9	4150.50
						0	
			Max. Vx	2	-24219.15	-3188.92	1797987.16
			Max. Torque	12			-2943.34
L17	10.08 - 5.08	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-41768.89	-147.59	196.91
			Max. Mx	8	-28302.63	-1879281.4	4394.56
						9	
			Max. My	2	-28295.86	-3372.30	1919465.46
			Max. Vy	8	23958.19	-1879281.4	4394.56
						9	
			Max. Vx	2	-24407.96	-3372.30	1919465.46
			Max. Torque	12			-2942.61
L18	5.08 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	14	-43216.73	-147.59	196.92
			Max. Mx	8	-29736.33	-2001384.5	4641.38
						7	
			Max. My	2	-29735.72	-3558.15	2043841.81
			Max. Vy	8	24150.39	-2001384.5	4641.38
						7	
			Max. Vx	2	-24596.34	-3558.15	2043841.81
			Max. Torque	12			-2942.17

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	14	43216.73	-0.00	0.00
	Max. H_x	1	24793.02	-0.00	0.00
	Max. H_z	3	22313.70	-35.66	24577.35
	Max. M_x	2	2043841.81	-35.66	24577.14
	Max. M_z	8	2001384.57	-24131.59	47.76
	Max. Torsion	2	2306.89	-35.66	24577.14
	Min. Vert	3	22313.70	-35.66	24577.35
	Min. H_x	9	22313.70	-24131.80	47.76
	Min. H_z	13	22313.72	-12054.44	-21297.90
	Min. M_x	12	-1770768.37	-12054.43	-21297.89
	Min. M_z	1	130.45	-0.00	0.00
	Min. Torsion	12	-2942.05	-12054.43	-21297.89

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	24793.02	0.00	-0.00	-148.22	-130.45	0.00

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
1.2 Dead+1.0 Wind 0 deg - No Ice	29751.59	35.66	-24577.14	-2043841.81	-3558.59	-2306.89
0.9 Dead+1.0 Wind 0 deg - No Ice	22313.70	35.66	-24577.35	-2020297.74	-3465.62	-2301.25
1.2 Dead+1.0 Wind 30 deg - No Ice	29751.63	12107.44	-21295.04	-1771113.95	-1004554.59	-920.21
0.9 Dead+1.0 Wind 30 deg - No Ice	22313.72	12107.45	-21295.05	-1750689.41	-992962.59	-916.66
1.2 Dead+1.0 Wind 60 deg - No Ice	29751.63	20916.16	-12318.36	-1024909.02	-1734864.33	610.13
0.9 Dead+1.0 Wind 60 deg - No Ice	22313.72	20916.17	-12318.36	-1013063.54	-1714878.88	610.58
1.2 Dead+1.0 Wind 90 deg - No Ice	29751.59	24131.59	-47.76	-4641.74	-2001384.57	1924.79
0.9 Dead+1.0 Wind 90 deg - No Ice	22313.70	24131.80	-47.76	-4532.08	-1978349.18	1921.98
1.2 Dead+1.0 Wind 120 deg - No Ice	29751.63	20882.90	12257.97	1018806.51	-1731769.26	2791.81
0.9 Dead+1.0 Wind 120 deg - No Ice	22313.72	20882.91	12257.97	1007140.12	-1711812.54	2786.62
1.2 Dead+1.0 Wind 150 deg - No Ice	29751.63	12054.43	21297.89	1770768.37	-999545.28	2942.05
0.9 Dead+1.0 Wind 150 deg - No Ice	22313.72	12054.44	21297.90	1750449.12	-988005.55	2935.89
1.2 Dead+1.0 Ice+1.0 Temp	43216.73	0.00	-0.00	-196.92	-147.59	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	43216.73	7.63	-6491.53	-553969.52	-918.07	-51.01
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	43216.73	3243.64	-5624.18	-480025.97	-276795.97	-99.85
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	43216.73	5606.92	-3252.11	-277727.57	-478222.17	-141.88
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	43216.73	6470.07	-9.93	-1189.54	-551756.02	-155.54
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	43216.73	5599.75	3239.16	275994.85	-477506.25	-113.68
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	43216.73	3232.09	5623.87	479490.74	-275635.67	-35.43
Dead+Wind 0 deg - Service	24793.01	7.35	-5065.88	-419121.67	-827.58	-483.72
Dead+Wind 30 deg - Service	24793.01	2495.55	-4389.27	-363196.05	-206034.99	-193.36
Dead+Wind 60 deg - Service	24793.01	4311.18	-2539.02	-210211.79	-355732.54	127.16
Dead+Wind 90 deg - Service	24793.01	4974.05	-9.84	-1065.74	-410361.92	403.05
Dead+Wind 120 deg - Service	24793.01	4304.32	2526.58	208727.27	-355088.88	585.87
Dead+Wind 150 deg - Service	24793.01	2484.62	4389.86	362886.83	-205002.15	618.11

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-24793.02	0.00	-0.00	24793.02	0.00	0.000%
2	35.67	-29751.63	-24577.74	-35.66	29751.59	24577.14	0.002%
3	35.67	-22313.72	-24577.74	-35.66	22313.70	24577.35	0.001%
4	12107.45	-29751.63	-21295.07	-12107.44	29751.63	21295.04	0.000%
5	12107.45	-22313.72	-21295.07	-12107.45	22313.72	21295.05	0.000%
6	20916.18	-29751.63	-12318.37	-20916.16	29751.63	12318.36	0.000%
7	20916.18	-22313.72	-12318.37	-20916.17	22313.72	12318.36	0.000%
8	24132.18	-29751.63	-47.76	-24131.59	29751.59	47.76	0.002%
9	24132.18	-22313.72	-47.76	-24131.80	22313.70	47.76	0.001%
10	20882.92	-29751.63	12257.98	-20882.90	29751.63	-12257.97	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
11	20882.92	-22313.72	12257.98	-20882.91	22313.72	-12257.97	0.000%
12	12054.44	-29751.63	21297.91	-12054.43	29751.63	-21297.89	0.000%
13	12054.44	-22313.72	21297.91	-12054.44	22313.72	-21297.90	0.000%
14	0.00	-43216.73	0.00	-0.00	43216.73	0.00	0.000%
15	7.63	-43216.73	-6491.66	-7.63	43216.73	6491.53	0.000%
16	3243.70	-43216.73	-5624.29	-3243.64	43216.73	5624.18	0.000%
17	5607.04	-43216.73	-3252.18	-5606.92	43216.73	3252.11	0.000%
18	6470.21	-43216.73	-9.93	-6470.07	43216.73	9.93	0.000%
19	5599.87	-43216.73	3239.22	-5599.75	43216.73	-3239.16	0.000%
20	3232.15	-43216.73	5623.99	-3232.09	43216.73	-5623.87	0.000%
21	7.35	-24793.02	-5066.64	-7.35	24793.01	5065.88	0.003%
22	2495.92	-24793.02	-4389.92	-2495.55	24793.01	4389.27	0.003%
23	4311.82	-24793.02	-2539.40	-4311.18	24793.01	2539.02	0.003%
24	4974.79	-24793.02	-9.85	-4974.05	24793.01	9.84	0.003%
25	4304.96	-24793.02	2526.95	-4304.32	24793.01	-2526.58	0.003%
26	2484.99	-24793.02	4390.51	-2484.62	24793.01	-4389.86	0.003%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	99.5 - 88.98	16.506	21	1.5931	0.0145
L2	88.98 - 80.08	13.098	21	1.4840	0.0111
L3	80.08 - 75.08	10.505	21	1.2774	0.0063
L4	75.08 - 70.08	9.202	21	1.2097	0.0053
L5	70.08 - 65.08	7.977	21	1.1282	0.0045
L6	65.08 - 60.08	6.843	21	1.0366	0.0037
L7	60.08 - 55.08	5.809	21	0.9376	0.0031
L8	55.08 - 45.75	4.882	21	0.8332	0.0025
L9	49.42 - 45.08	3.948	21	0.7427	0.0021
L10	45.08 - 40.08	3.289	21	0.7025	0.0019
L11	40.08 - 35.08	2.594	21	0.6242	0.0016
L12	35.08 - 30.08	1.982	21	0.5451	0.0013
L13	30.08 - 25.08	1.453	21	0.4659	0.0011
L14	25.08 - 20.08	1.007	21	0.3868	0.0009
L15	20.08 - 15.08	0.643	21	0.3082	0.0007
L16	15.08 - 10.08	0.361	21	0.2302	0.0005
L17	10.08 - 5.08	0.161	21	0.1530	0.0003
L18	5.08 - 0	0.041	21	0.0766	0.0002

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	99.5 - 88.98	80.420	2	7.7750	0.0693
L2	88.98 - 80.08	63.834	2	7.2411	0.0529
L3	80.08 - 75.08	51.212	2	6.2324	0.0298
L4	75.08 - 70.08	44.865	2	5.9021	0.0253
L5	70.08 - 65.08	38.898	2	5.5052	0.0213
L6	65.08 - 60.08	33.372	2	5.0584	0.0178
L7	60.08 - 55.08	28.332	2	4.5754	0.0147
L8	55.08 - 45.75	23.811	2	4.0660	0.0119
L9	49.42 - 45.08	19.256	2	3.6243	0.0099
L10	45.08 - 40.08	16.042	2	3.4284	0.0091

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L11	40.08 - 35.08	12.654	2	3.0458	0.0077
L12	35.08 - 30.08	9.669	2	2.6599	0.0064
L13	30.08 - 25.08	7.087	2	2.2732	0.0052
L14	25.08 - 20.08	4.910	2	1.8873	0.0042
L15	20.08 - 15.08	3.135	2	1.5036	0.0032
L16	15.08 - 10.08	1.761	2	1.1230	0.0023
L17	10.08 - 5.08	0.783	2	0.7460	0.0015
L18	5.08 - 0	0.198	2	0.3735	0.0007

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L1	99.5 - 88.98 (1)	TP16.5x12.75x0.1875	10.52	99.50	206.2	9.7080	-7139.15	51589.10	0.138
L2	88.98 - 80.08 (2)	TP18.1367x16.5x0.1875	8.90	99.50	187.4	10.6820	-10320.10	68727.60	0.150
L3	80.08 - 75.08 (3)	TP19.1596x18.1367x0.501	5.00	99.50	180.3	29.6704	-11130.50	206286.00	0.054
L4	75.08 - 70.08 (4)	TP20.1825x19.1596x0.484	5.00	99.50	170.7	30.2612	-11962.10	234498.00	0.051
L5	70.08 - 65.08 (5)	TP21.2054x20.1825x0.468	5.00	99.50	162.2	30.8040	-12827.80	264547.00	0.048
L6	65.08 - 60.08 (6)	TP22.2283x21.2054x0.454	5.00	99.50	154.5	31.3767	-13723.90	297087.00	0.046
L7	60.08 - 55.08 (7)	TP23.2512x22.2283x0.441	5.00	99.50	147.5	31.9282	-14646.70	331757.00	0.044
L8	55.08 - 45.75 (8)	TP25.16x23.2512x0.593	9.33	99.50	141.2	44.8264	-15938.30	507768.00	0.031
L9	45.75 - 45.08 (9)	TP24.9108x23.2232x0.644	4.34	99.50	140.1	49.0702	-17487.70	564748.00	0.031
L10	45.08 - 40.08 (10)	TP25.9207x24.9108x0.63	5.00	99.50	133.0	50.5718	-18893.30	645978.00	0.029
L11	40.08 - 35.08 (11)	TP26.9306x25.9207x0.614	5.00	99.50	127.8	51.2867	-20176.50	709337.00	0.028
L12	35.08 - 30.08 (12)	TP27.9405x26.9306x0.6	5.00	99.50	123.0	52.0672	-21480.90	777258.00	0.028
L13	30.08 - 25.08 (13)	TP28.9504x27.9405x0.587	5.00	99.50	118.6	52.8449	-22805.70	849000.00	0.027
L14	25.08 - 20.08 (14)	TP29.9604x28.9504x0.575	5.00	99.50	114.5	53.6298	-24150.40	924821.00	0.026
L15	20.08 - 15.08 (15)	TP30.9703x29.9604x0.564	5.00	99.50	110.6	54.4314	-25514.70	1005000.00	0.025
L16	15.08 - 10.08 (16)	TP31.9802x30.9703x0.553	5.00	99.50	107.0	55.1617	-26896.50	1086850.00	0.025
L17	10.08 - 5.08 (17)	TP32.9901x31.9802x0.543	5.00	99.50	104.3	55.5739	-28044.60	1146680.00	0.024
L18	5.08 - 0 (18)	TP34x32.9901x0.534	5.08	99.50	101.7	56.0374	-29187.30	1193870.00	0.024

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	99.5 - 88.98 (1)	TP16.5x12.75x0.1875	89686.67	241067.50	0.372	0.00	241067.50	0.000
L2	88.98 - 80.08 (2)	TP18.1367x16.5x0.1875	228436.67	291682.50	0.783	0.00	291682.50	0.000
L3	80.08 - 75.08 (3)	TP19.1596x18.1367x0.501	331298.33	830132.50	0.399	0.00	830132.50	0.000
L4	75.08 - 70.08 (4)	TP20.1825x19.1596x0.484	435631.67	758015.83	0.575	0.00	758015.83	0.000
L5	70.08 - 65.08 (5)	TP21.2054x20.1825x0.468	541388.33	813899.17	0.665	0.00	813899.17	0.000
L6	65.08 - 60.08 (6)	TP22.2283x21.2054x0.454	648518.33	871950.00	0.744	0.00	871950.00	0.000
L7	60.08 - 55.08 (7)	TP23.2512x22.2283x0.441	756972.50	930866.67	0.813	0.00	930866.67	0.000
L8	55.08 - 45.75 (8)	TP25.16x23.2512x0.593	881433.33	1357141.67	0.649	0.00	1357141.67	0.000
L9	45.75 - 45.08 (9)	TP24.9108x23.2232x0.644	963316.67	1494675.00	0.644	0.00	1494675.00	0.000
L10	45.08 - 40.08 (10)	TP25.9207x24.9108x0.63	1091616.67	1625866.67	0.671	0.00	1625866.67	0.000
L11	40.08 - 35.08 (11)	TP26.9306x25.9207x0.614	1206250.00	1718383.33	0.702	0.00	1718383.33	0.000
L12	35.08 - 30.08 (12)	TP27.9405x26.9306x0.6	1322233.33	1814866.67	0.729	0.00	1814866.67	0.000
L13	30.08 - 25.08 (13)	TP28.9504x27.9405x0.587	1439491.67	1913225.00	0.752	0.00	1913225.00	0.000
L14	25.08 - 20.08 (14)	TP29.9604x28.9504x0.575	1557933.33	2013833.33	0.774	0.00	2013833.33	0.000
L15	20.08 - 15.08 (15)	TP30.9703x29.9604x0.564	1677458.33	2117058.33	0.792	0.00	2117058.33	0.000
L16	15.08 - 10.08 (16)	TP31.9802x30.9703x0.553	1797991.67	2219575.00	0.810	0.00	2219575.00	0.000
L17	10.08 - 5.08 (17)	TP32.9901x31.9802x0.543	1895100.00	2296058.33	0.825	0.00	2296058.33	0.000
L18	5.08 - 0 (18)	TP34x32.9901x0.534	1993983.33	2245900.00	0.888	0.00	2245900.00	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	99.5 - 88.98 (1)	TP16.5x12.75x0.1875	13628.80	166458.00	0.082	2238.47	243391.67	0.009
L2	88.98 - 80.08 (2)	TP18.1367x16.5x0.1875	20437.60	185333.00	0.110	2331.79	294683.33	0.008
L3	80.08 - 75.08 (3)	TP19.1596x18.1367x0.501	20729.00	520716.00	0.040	2329.69	850866.67	0.003
L4	75.08 - 70.08 (4)	TP20.1825x19.1596x0.484	21020.20	449378.00	0.047	2327.42	775220.00	0.003
L5	70.08 - 65.08 (5)	TP21.2054x20.1825x0.468	21301.60	457439.00	0.047	2324.82	830745.00	0.003
L6	65.08 - 60.08 (6)	TP22.2283x21.2054x0.454	21573.00	465944.00	0.046	2322.08	888500.00	0.003
L7	60.08 - 55.08 (7)	TP23.2512x22.2283x0.441	21834.00	474134.00	0.046	2319.36	947133.33	0.002

Section No.	Elevation ft	Size	Actual V_u lb	ϕV_n lb	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u lb-ft	ϕT_n lb-ft	Ratio $\frac{T_u}{\phi T_n}$
L8	55.08 - 45.75 (8)	TP25.16x23.2512x0.593	22171.30	665671.00	0.033	2317.12	1388391.67	0.002
L9	45.75 - 45.08 (9)	TP24.9108x23.2232x0.644	22511.80	736600.00	0.031	2316.08	1531966.67	0.002
L10	45.08 - 40.08 (10)	TP25.9207x24.9108x0.63	22803.20	750991.00	0.030	2314.38	1663316.67	0.001
L11	40.08 - 35.08 (11)	TP26.9306x25.9207x0.614	23079.30	761608.00	0.030	2312.74	1755258.33	0.001
L12	35.08 - 30.08 (12)	TP27.9405x26.9306x0.6	23342.10	773199.00	0.030	2311.27	1851300.00	0.001
L13	30.08 - 25.08 (13)	TP28.9504x27.9405x0.587	23589.50	784747.00	0.030	2309.99	1949250.00	0.001
L14	25.08 - 20.08 (14)	TP29.9604x28.9504x0.575	23818.90	796403.00	0.030	2308.92	2049483.33	0.001
L15	20.08 - 15.08 (15)	TP30.9703x29.9604x0.564	24026.50	808307.00	0.030	2308.06	2152383.33	0.001
L16	15.08 - 10.08 (16)	TP31.9802x30.9703x0.553	24219.20	819151.00	0.030	2307.43	2254500.00	0.001
L17	10.08 - 5.08 (17)	TP32.9901x31.9802x0.543	24408.00	830442.00	0.029	2307.05	2330458.33	0.001
L18	5.08 - 0 (18)	TP34x32.9901x0.534	24558.90	791571.00	0.031	2306.91	2278008.33	0.001

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	99.5 - 88.98 (1)	0.138	0.372	0.000	0.082	0.009	0.519 ✔	1.000	4.8.2 ✔
L2	88.98 - 80.08 (2)	0.150	0.783	0.000	0.110	0.008	0.947 ✔	1.000	4.8.2 ✔
L3	80.08 - 75.08 (3)	0.054	0.399	0.000	0.040	0.003	0.455 ✔	1.000	4.8.2 ✔
L4	75.08 - 70.08 (4)	0.051	0.575	0.000	0.047	0.003	0.628 ✔	1.000	4.8.2 ✔
L5	70.08 - 65.08 (5)	0.048	0.665	0.000	0.047	0.003	0.716 ✔	1.000	4.8.2 ✔
L6	65.08 - 60.08 (6)	0.046	0.744	0.000	0.046	0.003	0.792 ✔	1.000	4.8.2 ✔
L7	60.08 - 55.08 (7)	0.044	0.813	0.000	0.046	0.002	0.860 ✔	1.000	4.8.2 ✔
L8	55.08 - 45.75 (8)	0.031	0.649	0.000	0.033	0.002	0.682 ✔	1.000	4.8.2 ✔
L9	45.75 - 45.08 (9)	0.031	0.644	0.000	0.031	0.002	0.676 ✔	1.000	4.8.2 ✔
L10	45.08 - 40.08 (10)	0.029	0.671	0.000	0.030	0.001	0.702 ✔	1.000	4.8.2 ✔
L11	40.08 - 35.08 (11)	0.028	0.702	0.000	0.030	0.001	0.731 ✔	1.000	4.8.2 ✔
L12	35.08 - 30.08 (12)	0.028	0.729	0.000	0.030	0.001	0.757 ✔	1.000	4.8.2 ✔
L13	30.08 - 25.08	0.027	0.752	0.000	0.030	0.001	0.780	1.000	4.8.2 ✔

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	(13)						✔		
L14	25.08 - 20.08	0.026	0.774	0.000	0.030	0.001	0.801	1.000	4.8.2 ✔
	(14)						✔		
L15	20.08 - 15.08	0.025	0.792	0.000	0.030	0.001	0.819	1.000	4.8.2 ✔
	(15)						✔		
L16	15.08 - 10.08	0.025	0.810	0.000	0.030	0.001	0.836	1.000	4.8.2 ✔
	(16)						✔		
L17	10.08 - 5.08	0.024	0.825	0.000	0.029	0.001	0.851	1.000	4.8.2 ✔
	(17)						✔		
L18	5.08 - 0 (18)	0.024	0.888	0.000	0.031	0.001	0.913	1.000	4.8.2 ✔
							✔		

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	99.5 - 88.98	Pole	TP16.5x12.75x0.1875	1	-7139.15	51589.10	51.9	Pass
L2	88.98 - 80.08	Pole	TP18.1367x16.5x0.1875	2	-10320.10	68727.60	94.7	Pass
L3	80.08 - 75.08	Pole	TP19.1596x18.1367x0.501	3	-11130.50	206286.00	45.5	Pass
L4	75.08 - 70.08	Pole	TP20.1825x19.1596x0.484	4	-11962.10	234498.00	62.8	Pass
L5	70.08 - 65.08	Pole	TP21.2054x20.1825x0.468	5	-12827.80	264547.00	71.6	Pass
L6	65.08 - 60.08	Pole	TP22.2283x21.2054x0.454	6	-13723.90	297087.00	79.2	Pass
L7	60.08 - 55.08	Pole	TP23.2512x22.2283x0.441	7	-14646.70	331757.00	86.0	Pass
L8	55.08 - 45.75	Pole	TP25.16x23.2512x0.593	8	-15938.30	507768.00	68.2	Pass
L9	45.75 - 45.08	Pole	TP24.9108x23.2232x0.644	9	-17487.70	564748.00	67.6	Pass
L10	45.08 - 40.08	Pole	TP25.9207x24.9108x0.63	10	-18893.30	645978.00	70.2	Pass
L11	40.08 - 35.08	Pole	TP26.9306x25.9207x0.614	11	-20176.50	709337.00	73.1	Pass
L12	35.08 - 30.08	Pole	TP27.9405x26.9306x0.6	12	-21480.90	777258.00	75.7	Pass
L13	30.08 - 25.08	Pole	TP28.9504x27.9405x0.587	13	-22805.70	849000.00	78.0	Pass
L14	25.08 - 20.08	Pole	TP29.9604x28.9504x0.575	14	-24150.40	924821.00	80.1	Pass
L15	20.08 - 15.08	Pole	TP30.9703x29.9604x0.564	15	-25514.70	1005000.00	81.9	Pass
L16	15.08 - 10.08	Pole	TP31.9802x30.9703x0.553	16	-26896.50	1086850.00	83.6	Pass
L17	10.08 - 5.08	Pole	TP32.9901x31.9802x0.543	17	-28044.60	1146680.00	85.1	Pass
L18	5.08 - 0	Pole	TP34x32.9901x0.534	18	-29187.30	1193870.00	91.3	Pass
							Summary	
						Pole (L2)	94.7	Pass
						RATING =	**94.7**	**Pass**

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

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

Site Data

BU#:	*CT2037*
Site Name:	*NEW HAVEN WHEELER ST*
App #:	*0*
Pole Manufacturer:	*Other*

Reactions		
Mu:	1100	ft-kips
Axial, Pu:	30	kips
Shear, Vu:	25	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

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

Anchor Rod Data		
Qty:	6	
Diam:	2.25	in
Rod Material:	A615-J	
Strength (Fu):	100	ksi
Yield (Fy):	75	ksi
Bolt Circle:	42	in

Plate Data		
Diam:	48	in
Thick:	1.5	in
Grade:	60	ksi
Single-Rod B-eff:	17.99	in

Stiffener Data (Welding at both sides)		
Config:	3	*
Weld Type:	Fillet	
Groove Depth:	0.25	<-- Disregard
Groove Angle:	45	<-- Disregard
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	6	in
Height:	18	in
Thick:	1.375	in
Notch:	0	in
Grade:	50	ksi
Weld str.:	70	ksi
Clear Space between	11	in

Pole Data		
Diam:	34	in
Thick:	0.534	in
Grade:	52	ksi
# of Sides:	18	"0" IF Round
Fu	66	ksi
Reinf. Fillet Weld	0	"0" if None

Anchor Rod Results

			Stiffened
Max Rod (Cu+ Vu/ń):	222.7	Kips	AISC LRFD
Allowable Axial, Φ*Fu*Anet:	260.0	Kips	φ*Tn
Anchor Rod Stress Ratio:	85.6%	**Pass**	

Base Plate Results

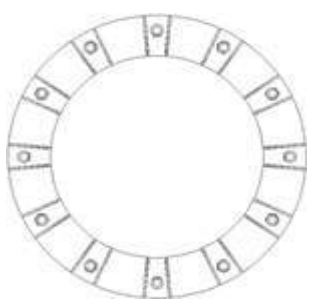
	Flexural Check		Stiffened
Base Plate Stress:	#NAME?	ksi	AISC LRFD
Allowable Plate Stress:	54.0	ksi	φ*Fy
Base Plate Stress Ratio:	#NAME?	#NAME?	Y.L. Length:
			N/A, Roark

Stiffener Results

Horizontal Weld :	98.0%	**Pass**
Vertical Weld:	35.4%	**Pass**
Plate Flex+Shear, fb/Fb+(fv/Fv)^2:	5.0%	**Pass**
Plate Tension+Shear, ft/Ft+(fv/Fv)^2:	22.2%	**Pass**
Plate Comp. (AISC Bracket):	27.1%	**Pass**

Pole Results

Pole Punching Shear Check:	7.4%	**Pass**



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

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

Date: 3/14/2022
Project Name: NEW HAVEN WHEELER ST
Project No.: CT2037
Designed By: LBW **Checked By:** MSC

HUDSON Design Group LLC

Outer Anchor Rod Epoxy Adhesive Check

Reference: Product Data Sheet prepared by Sika USA

Anchor Rod Properties:

Anchor Rod Diameter =	2.75	in
Epoxy Adhesive Area =	180.00	in^2

Epoxy Adhesive Properties:

Epoxy Type:	Sikadur - 32 Hi-Mod LPL	
Tensile Strength (F_T) =	5800	psi
F_T =	1044000	lbs
Shear Strength =	6400	psi
F_V =	1152000	lbs

Tensile Forces

Total Moment on Tower =	2043845	lb-ft
Moment on Inner Anchor Rods =	1100000	lb-ft
Remainder Moment =	943845	lb-ft
Distance to Outer Anchor Rods =	2.125	ft
Force Applied on Bolts =	444162	lbs
Number of Bolts in Tension	2	

Tension Design Load /Bolts =

f_t= 222081 lbs. < 1044000 lbs. Therefore, OK !

Date: 3/14/2022
Project Name: NEW HAVEN WHEELER ST
Project No.: CT2037
Designed By: LBW **Checked By:** MSC

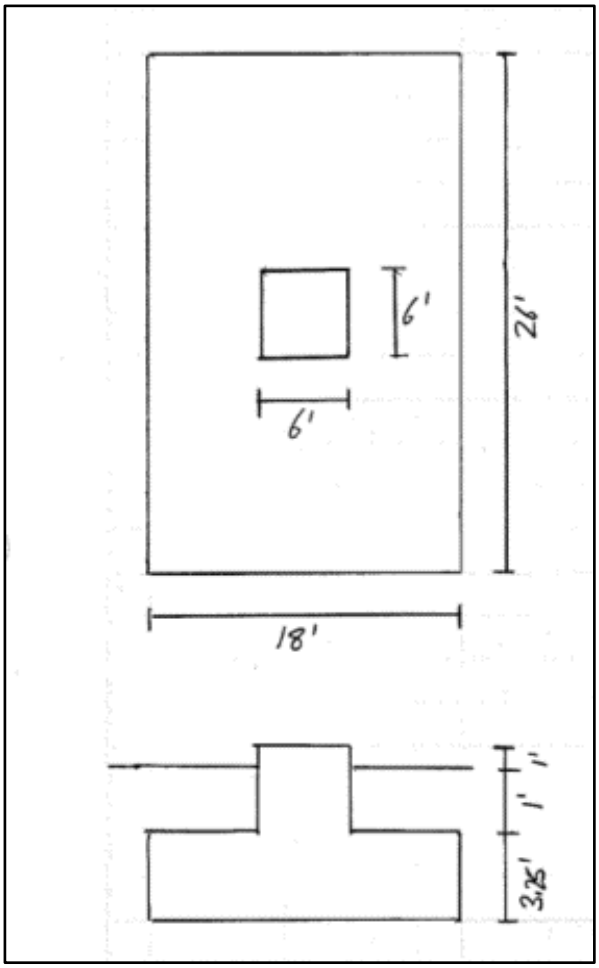
HUDSON Design Group LLC

Foundation Overturning Check

Reference: Structural Analysis prepared by URS Corporation, dated July 17, 2006

Overturning Moment (OTM) = 2043.845 ft-kips (See Tnx Tower Output)

Concrete Density = 0.15 kcf
Soil Density = 0.1 kcf



Pad Dimensions:

Width = 18 ft
Length = 26 ft
Depth = 3.25 ft

Weight of Pad = 228.15 kips

Pier Dimensions:

Width = 6 ft
Length = 6 ft
Depth = 2 ft

Weight of Pier = 10.8 kips

Overburden Dimensions:

Pad Area 468 ft
Pier Area 36 ft
Depth = 1 ft

Weight of Overburden = 43.2 kips

Total Weight = 282.15 kips

Resisting Moment:

Moment Arm = 9 ft
M_R = 2539.35 ft-kips

Foundation Stability (FS):

2043.845 lbs. < 2539.35 lbs. Therefore, OK !