



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

November 3, 2022

Michael Jones
President
M+K Development
140 Beach 137th Street
Rockaway Beach, NY 11694
mjones@mandkdevelopment.com

RE: **TS-DISH-138-220908** - Dish Wireless, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 623-627 Honeyspot Road, Stratford, Connecticut.

Dear Michael Jones:

The Connecticut Siting Council (Council) is in receipt of your correspondence dated October 28, 2022 submitted in response to the Council's October 6, 2022 notification of an incomplete request for tower sharing with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/IN/emr

From: Michael Jones <mjones@mandkdevelopment.com>
Sent: Saturday, October 29, 2022 2:13 PM
To: CSC-DL Siting Council <Siting.Council@ct.gov>
Cc: Michael Mosser <mmosser@mandkdevelopment.com>
Subject: Request of DISH Wireless LLC for an Order to Approve the Shared Use of an Existing Tower 627 Honeyspot Road- Stratford, CT 06615 Fairfield County- NJJER02049C- TS-DISH-138-220908

EXTERNAL EMAIL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Dear Ms. Bachman:

Good afternoon. Based on our recent incomplete letter on application # TS-DISH-138-220908 dated October 6th, due to an incorrect structural analysis in the submission package, we are resubmitting the attached shared use application. The only modification from the original package is the updated structural analysis.

Pursuant to Connecticut General Statutes (“C.G.S.”) §16-50aa, as amended, DISH Wireless LLC (“DISH”) hereby requests an order from the Connecticut Siting Council (“Council”) to approve the shared use by DISH of an existing telecommunication tower at 627 Honeyspot Road- Stratford, CT (the “Property”).

The existing 102’ 9” ft – Monopole is owned by Becker LLC. The underlying property is owned by Becker LLC. DISH requests that the Council find that the proposed shared use of the Becker LLC monopole satisfies the criteria of C.G.S. §16-50aa and issue an order approving the proposed shared use.

This modification/proposal includes hardware that is both 4G(LTE) and 5G capable through remote software configuration and either or both services may be turned on or off at various times.

A copy of this filing has been sent to your office.

Thanks and have a great weekend.

Michael Jones
President
M + K Development
m: 732.677.8881
e: mjones@mandkdevelopment.com





10/28/2022

Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: **TS-DISH-138-220908** - Dish Wireless, LLC request for an order to approve tower sharing at an existing telecommunications facility located at 623-627 Honeyspot Road, Stratford, Connecticut. 06615
Latitude: 41.176965° N / Longitude: -73.146356° W

Dear Ms. Bachman:

In response to your letter dated 10/6/22 related to the incomplete application submitted and pursuant to Connecticut General Statutes ("C.G.S.") §16-50aa, as amended, DISH Wireless LLC ("DISH") hereby requests an approval from the Connecticut Siting Council ("Council") to approve the shared use by DISH of an existing telecommunication tower at 627 Honeyspot Road in Stratford. We have attached the following updated document as requested to amend our original application:

- An updated structural analysis for the proposed equipment that includes proposed and approved equipment by owned/operated by AT&T and other entities that are located at this facility and is stamped and signed by a professional engineer duly licensed in the State of Connecticut, on or before November 7, 2022

Please review and advise if there is any other required documentation required to deem this application complete.

Sincerely,

A handwritten signature in black ink, appearing to read 'Michael Jones', is written over a light green background.

Michael Jones
President, M+K Development
140 Beach 137th St
Rockaway Beach, NY 11694
732-677-8881



EXHIBIT D

Structural Analysis



October 18, 2022

PASS

RE: Structural Analysis for Tower
Location: 627 Honeyspot Road Stratford, CT 06615
Site ID: NJJER02049C

Dish Wireless LLC,

Per your request, we have performed a structural analysis of the existing tower. This site consists of an existing monopole that has multiple carriers co-located on the tower. This review determines if the tower can support the existing and proposed loads.

1.0 Assumptions:

CATEGORY	DATA	CODE
Structure Type	Monopole	
RAD Center	62-2"	
Structure Class	II	ASCE 7-16
Exposure Class	B	ASCE 7-16
Kzt Factor	1.0	ASCE 7-16
Basic Wind Speed	125	ASCE 7-16
Ice Thickness	1"	ASCE 7-16
Ice Windspeed	50 MPH	ASCE 7-16
Seismic Design Category	B	ASCE 7-16
S _{DS}	.221	ASCE 7-16

2.0 Existing Documents:

DOCUMENT	COMPANY	DATE
Proposed Drawings	M&K Development	3/02/2022
Site Visit Photos	M&K Development	1/26/2022
Existing Structural Analysis	Hudson Design Group	4/27/2022



3.0 Proposed Equipment:

MANUFACTURER	EQUIPMENT	WEIGHTS
CommScope	(1) MC-PK8-DSH	1802 lbs
JMA Wireless	(3) MX08FR0665	64.5 lbs
Fujitsu	(3) TA08025-B604	63.9 lbs
Fujitsu	(3) TA08025-B605	74.9 lbs
RayCap	(1) OVP RDIDC-9181-PF-48	32 lbs

Bold represents equipment to be added

It is assumed that all information from the previous analysis performed by Centerline on October 27, 2021 is still accurate and correct. We have been informed that the top empty mounts will be removed from the tower and we have excluded them from our analysis. If these assumptions are not true, please contact our office for an amended report.

We are installing (1) proposed MC-PK8-DSH mount on the existing monopole that will support all the proposed equipment. After performing an analysis on the tower in TNxTower, it has been determined that the tower is **ADEQUATE** for the existing and proposed loads on the structure which passes at 83.4% of its capacity.

This report does not address the structural stability of any other mounts, or portion of the structure, nor does it provide any warranty either express or implied, for any portion of the proposed mount or structure.

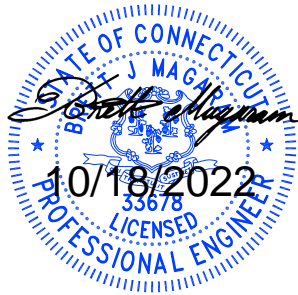
Please note that we have not had a professional engineer perform an independent visit to confirm existing structural conditions and the outcome of this analysis is based solely on the information provided in the previous structural analysis, photos and drawing details. If the existing conditions are modified, in disrepair or not properly represented, contact our office immediately for an amended report since this analysis may be inaccurate.



If you have any questions, feel free to contact us at any time.

Sincerely,

Magaram Engineering



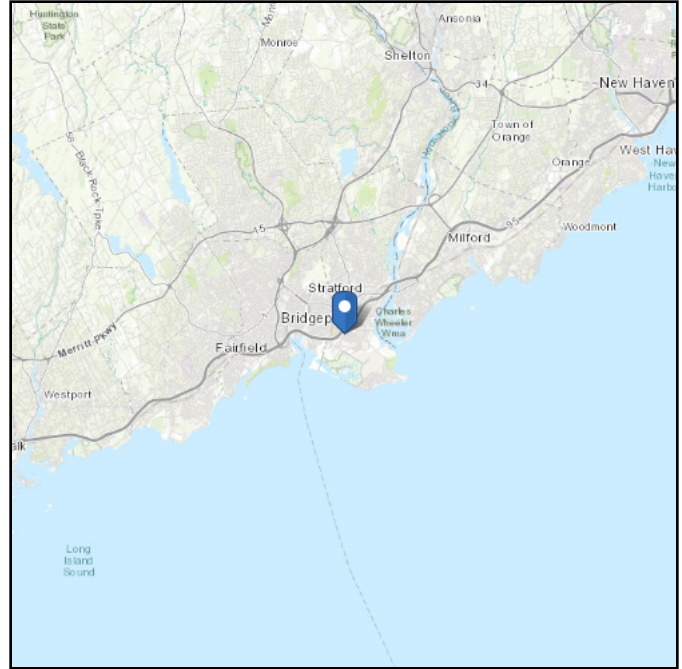
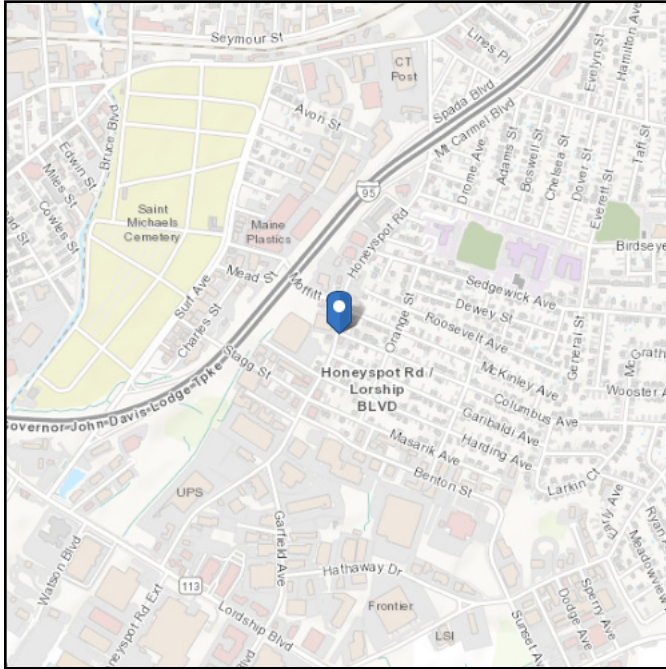
Brett Magaram
Connecticut License # 33678
Brett@MagaramEngineering.com
Phone: 914-450-8416

ASCE 7 Hazards Report

Address:
627 Honeyspot Rd
Stratford, Connecticut
06615

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

Elevation: 11.56 ft (NAVD 88)
Latitude: 41.177042
Longitude: -73.146241

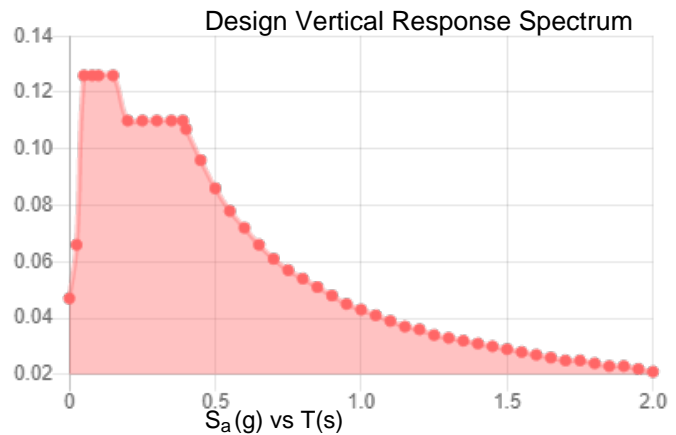
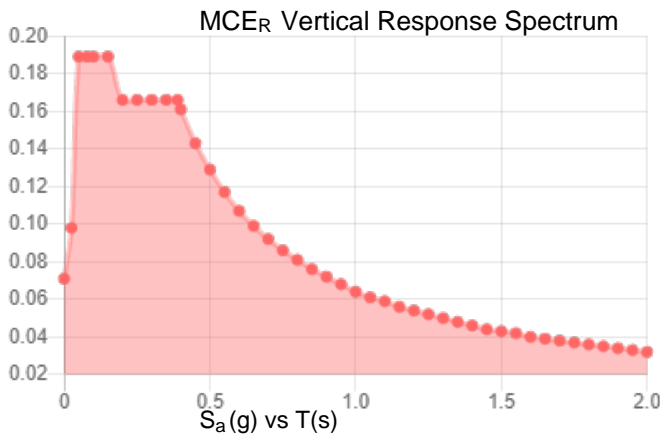
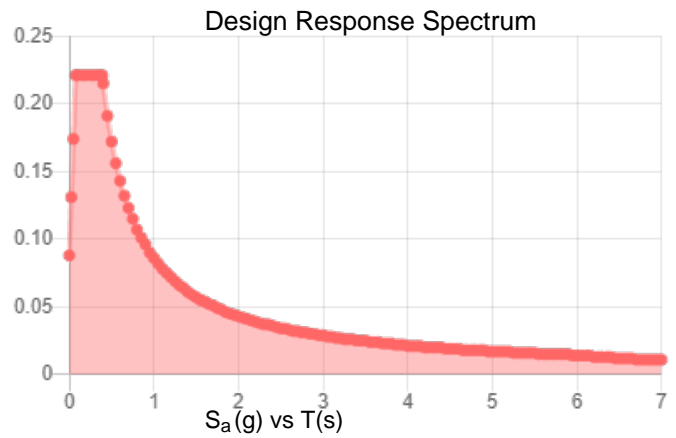
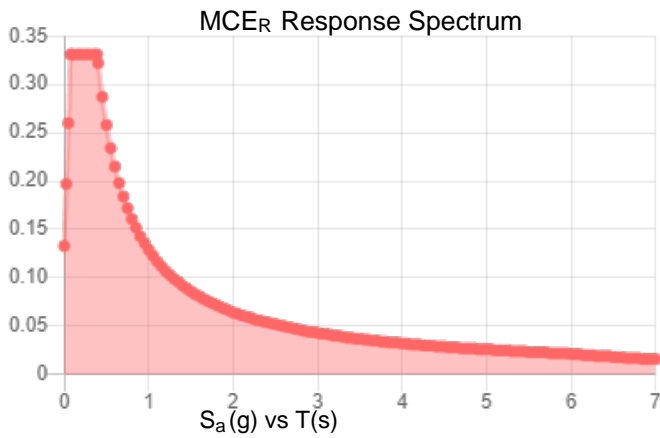


Site Soil Class: D - Default (see Section 11.4.3)

Results:

S_s :	0.207	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.117
F_v :	2.4	PGA _M :	0.184
S_{MS} :	0.331	F_{PGA} :	1.565
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.221	C_v :	0.714

Seismic Design Category B



Data Accessed: Tue May 17 2022

Date Source:

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

Ice

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 15 F
Gust Speed 50 mph

Data Source: Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8

Date Accessed: Tue May 17 2022

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Snow

Results:

Ground Snow Load, p_g : 30 lb/ft²
Elevation: 11.6 ft

Data Source: ASCE/SEI 7-16, Table 7.2-8

Date Accessed: Tue May 17 2022

Values provided are ground snow loads. In areas designated "case study required," extreme local variations in ground snow loads preclude mapping at this scale. Site-specific case studies are required to establish ground snow loads at elevations not covered.

The ASCE 7 Hazard Tool is provided for your convenience, for informational purposes only, and is provided “as is” and without warranties of any kind. The location data included herein has been obtained from information developed, produced, and maintained by third party providers; or has been extrapolated from maps incorporated in the ASCE 7 standard. While ASCE has made every effort to use data obtained from reliable sources or methodologies, ASCE does not make any representations or warranties as to the accuracy, completeness, reliability, currency, or quality of any data provided herein. Any third-party links provided by this Tool should not be construed as an endorsement, affiliation, relationship, or sponsorship of such third-party content by or from ASCE.

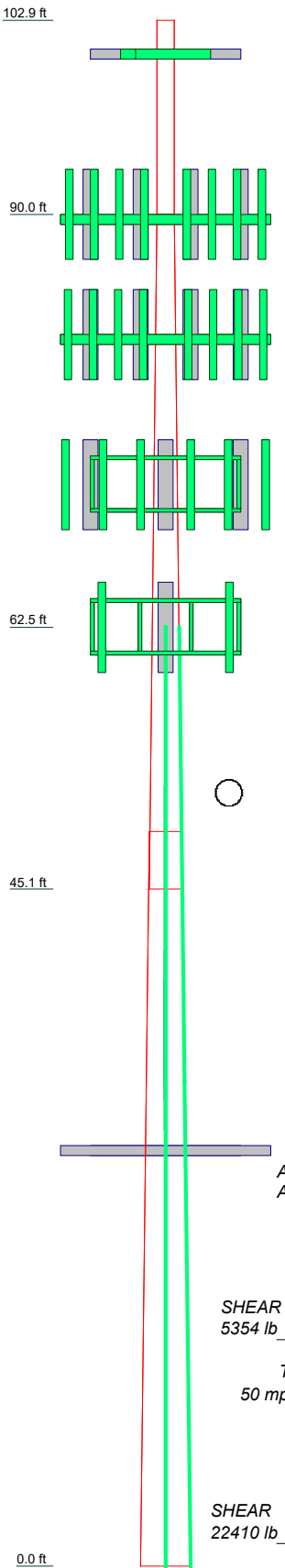
ASCE does not intend, nor should anyone interpret, the results provided by this Tool to replace the sound judgment of a competent professional, having knowledge and experience in the appropriate field(s) of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the contents of this Tool or the ASCE 7 standard.

In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from or related to your use of, or reliance on, the Tool or any information obtained therein. To the fullest extent permitted by law, you agree to release and hold harmless ASCE from any and all liability of any nature arising out of or resulting from any use of data provided by the ASCE 7 Hazard Tool.

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

Municipality	Ground Snow Load (psf)	MCE Spectral Accelerations (%g)		Wind Design Parameters								
		S _s	S ₁	Ultimate Design Wind Speeds, V _{ult} (mph)			Nominal Design Wind Speeds, V _{asd} (mph)			Wind-Borne Debris Regions ¹		Hurricane-Prone Regions
				Risk Cat. I	Risk Cat. II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV	Risk Cat. II & III except Occup I-2	Risk Cat III Occup I-2 & Risk Cat. IV	
Rocky Hill	30	0.181	0.063	115	125	135	89	97	105			Yes
Roxbury	35	0.197	0.065	110	120	125	85	93	97			Yes
Salem	30	0.170	0.060	120	135	140	93	105	108		Type A	Yes
Salisbury	40	0.173	0.065	105	115	120	81	89	93			
Scotland	30	0.172	0.061	120	130	140	93	101	108			Yes
Seymour	30	0.194	0.064	115	125	135	89	97	105			Yes
Sharon	40	0.179	0.065	105	115	120	81	89	93			
Shelton	30	0.199	0.064	115	125	135	89	97	105			Yes
Sherman	35	0.202	0.066	105	115	120	81	89	93			
Simsbury	35	0.179	0.064	110	120	130	85	93	101			Yes
Somers	35	0.174	0.064	115	125	135	89	97	105			Yes
Southbury	35	0.198	0.065	110	120	130	85	93	101			Yes
Southington	30	0.185	0.064	115	125	135	89	97	105			Yes
South Windsor	30	0.178	0.064	115	125	135	89	97	105			Yes
Sprague	30	0.171	0.061	120	130	140	93	101	108		Type A	Yes
Stafford	35	0.173	0.064	115	125	135	89	97	105			Yes
Stamford	30	0.249	0.069	110	120	130	85	93	101			Yes
Sterling	35	0.170	0.061	125	135	145	97	105	112		Type A	Yes
Stonington	30	0.159	0.058	125	140	150	97	108	116	Type B	Type A	Yes
Stratford	30	0.201	0.064	115	125	135	89	97	105		Type B	Yes
Suffield	35	0.176	0.065	110	120	130	85	93	101			Yes
Thomaston	35	0.186	0.064	110	120	130	85	93	101			Yes
Thompson	40	0.172	0.063	120	130	140	93	101	108			Yes
Tolland	35	0.175	0.064	115	125	135	89	97	105			Yes
Torrington	40	0.182	0.065	110	120	125	85	93	97			Yes
Trumbull	30	0.207	0.065	115	125	135	89	97	105			Yes
Union	40	0.172	0.064	115	125	135	89	97	105			Yes
Vernon	30	0.177	0.064	115	125	135	89	97	105			Yes
Voluntown	30	0.168	0.060	125	135	145	97	105	112		Type A	Yes
Wallingford	30	0.183	0.063	115	125	135	89	97	105			Yes
Warren	40	0.186	0.065	105	115	125	81	89	97			
Washington	35	0.192	0.065	105	120	125	81	93	97			Yes
Waterbury	35	0.189	0.064	110	125	130	85	97	101			Yes
Waterford	30	0.161	0.058	125	135	145	97	105	112	Type B	Type A	Yes
Watertown	35	0.189	0.064	110	120	130	85	93	101			Yes
Westbrook	30	0.167	0.059	120	135	145	93	105	112	Type B	Type A	Yes
West Hartford	30	0.181	0.064	115	125	135	89	97	105			Yes
West Haven	30	0.188	0.062	115	125	135	89	97	105		Type B	Yes
Weston	30	0.224	0.067	110	120	130	85	93	101			Yes

Section	1	2	3
Length (ft)	12.920	44.920	48.920
Number of Sides	1	18	18
Thickness (in)	0.250	0.250	0.313
Socket Length (ft)		3.840	25.113
Top Dia (in)	13.000	13.000	40.000
Bot Dia (in)	13.000	26.793	
Grade		A53-B-35	A572-65
Tube Length (ft)		30.250	32.250
Reinf Size		4x1 1/4	4.25 x 1.25
Reinf Grade		A572-65	A572-65
Weight (lb)	440.2	2382.9	5323.9



DESIGNED APPURTENANCE LOADING

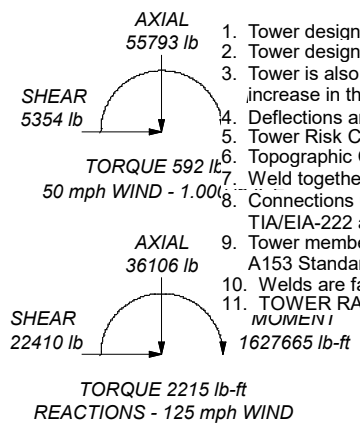
TYPE	ELEVATION	TYPE	ELEVATION
Gen 5' T-Arm (Abandoned)	101	B2/B66a RRH-BR049 (VZW)	82
Gen 5' T-Arm (Abandoned)	101	B5/B13 RRH-BR04C (VZW)	82
Gen 5' T-Arm (Abandoned)	101	(2) MX06FRO660-03 (VZW)	82
QD6616-7 (ATT)	90	BXA-70063-6CF-EDIN-X (VZW)	82
AIR6419 (ATT)	90	VZS01 (VZW)	82
AIR6449 (ATT)	90	B2/B66a RRH-BR049 (VZW)	82
DMP65R-BU6D (ATT)	90	B5/B13 RRH-BR04C (VZW)	82
RRUS32 (ATT)	90	Platform (VZW)	82
RRUS4478 B14 (ATT)	90	Ladder (VZW)	82
RRUS32 B2 (ATT)	90	APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	72
RRUS 4426 B66 (ATT)	90	AIR 6449 B41 [P2.0][96"] (TMO)	72
Radio 4415 (ATT)	90	VV-65A-R1 [P2.0][96"] (TMO)	72
DC6-48-60-18-8F (ATT)	90	RRU 4480 B71+B85 (TMO)	72
Radio 4449 (ATT)	90	RRU 4460 B25+B66 (TMO)	72
QD6616-7 (ATT)	90	APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	72
AIR6419 (ATT)	90	AIR 6449 B41 [P2.0][96"] (TMO)	72
DMP65R-BU6D (ATT)	90	VV-65A-R1 [P2.0][96"] (TMO)	72
RRUS32 (ATT)	90	RRU 4480 B71+B85 (TMO)	72
RRUS4478 B14 (ATT)	90	RRU 4460 B25+B66 (TMO)	72
RRUS32 B2 (ATT)	90	APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	72
RRUS 4426 B66 (ATT)	90	AIR 6449 B41 [P2.0][96"] (TMO)	72
Radio 4415 (ATT)	90	VV-65A-R1 [P2.0][96"] (TMO)	72
DC6-48-60-18-8F (ATT)	90	RRU 4480 B71+B85 (TMO)	72
Radio 4449 (ATT)	90	RRU 4460 B25+B66 (TMO)	72
QD6616-7 (ATT)	90	F4P-HRK8 (TMO)	72
AIR6419 (ATT)	90	F4P-8W (TMO)	72
AIR6449 (ATT)	90	MX08FRO665-21 [P3.0][96"] (DISH)	62.5
DMP65R-BU6D (ATT)	90	RRUS32 (ATT)	90
RRUS32 (ATT)	90	RRUS4478 B14 (ATT)	90
RRUS4478 B14 (ATT)	90	RRUS32 B2 (ATT)	90
RRUS32 B2 (ATT)	90	RRUS 4426 B66 (ATT)	90
RRUS 4426 B66 (ATT)	90	Radio 4415 (ATT)	90
Radio 4415 (ATT)	90	DC9-48-60-24-8C-EV (ATT)	90
DC9-48-60-24-8C-EV (ATT)	90	Radio 4449 (ATT)	90
Radio 4449 (ATT)	90	Platform (ATT)	90
Platform (ATT)	90	Ladder (ATT)	90
Ladder (ATT)	90	(2) MX06FRO660-03 (VZW)	82
(2) MX06FRO660-03 (VZW)	82	BXA-70063-6CF-EDIN-X (VZW)	82
BXA-70063-6CF-EDIN-X (VZW)	82	VZS01 (VZW)	82
VZS01 (VZW)	82	B2/B66a RRH-BR049 (VZW)	82
B2/B66a RRH-BR049 (VZW)	82	B5/B13 RRH-BR04C (VZW)	82
B5/B13 RRH-BR04C (VZW)	82	(2) DB-B1-6C-12AB-0Z (VZW)	82
(2) DB-B1-6C-12AB-0Z (VZW)	82	(2) MX06FRO660-03 (VZW)	82
(2) MX06FRO660-03 (VZW)	82	BXA-70063-6CF-EDIN-X (VZW)	82
BXA-70063-6CF-EDIN-X (VZW)	82	VZS01 (VZW)	82
VZS01 (VZW)	82		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A572-65	65 ksi	80 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure B 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 0.000 ft.
7. Weld together tower sections have flange connections.
8. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
9. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
10. Welds are fabricated with ER-70S-6 electrodes.
11. TOWER RATING: 83.4%
MOMENT

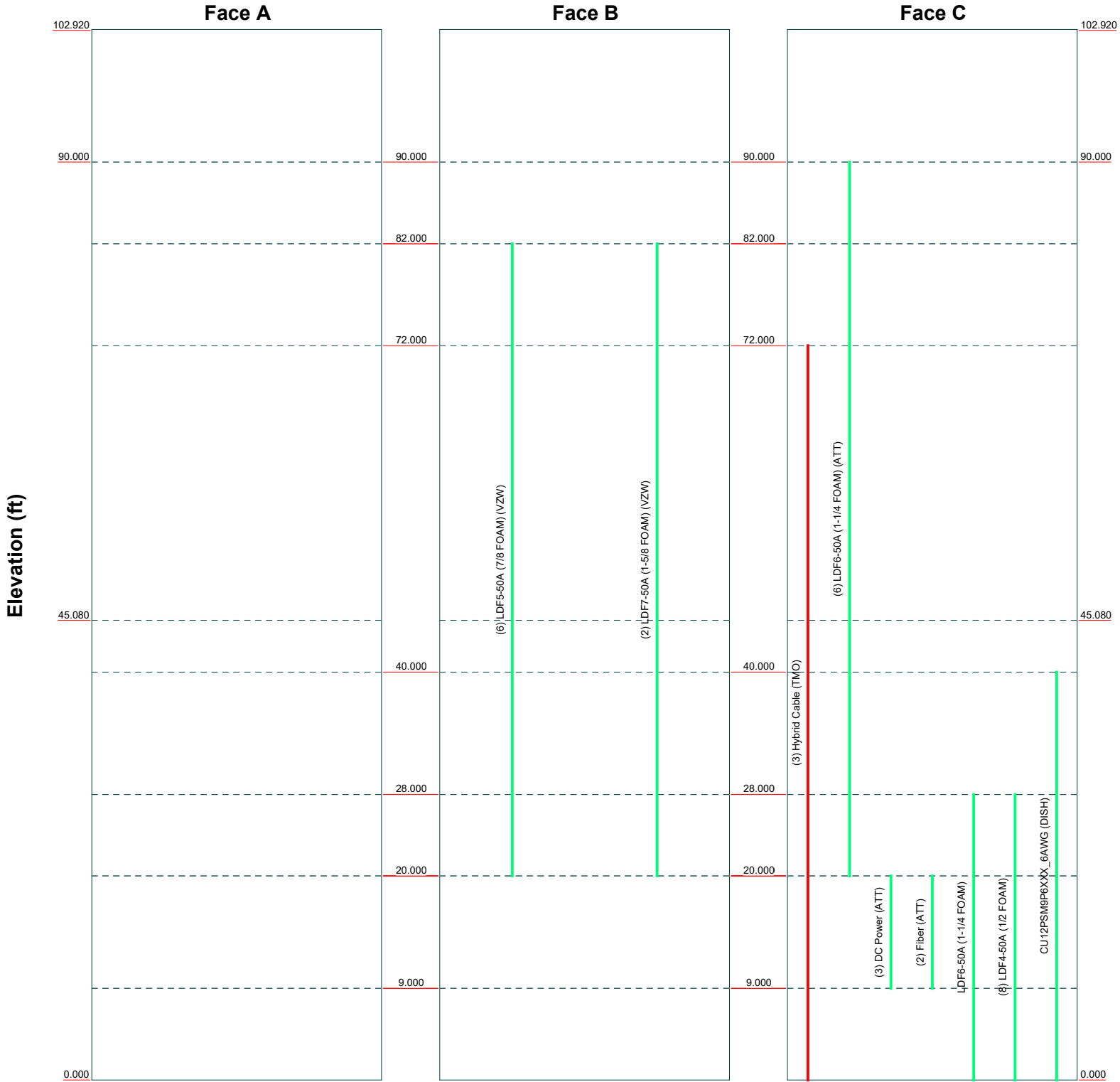


Magaram Engineering		Job: NJER02049C	
13705 Stone Shadow		Project:	
Clifton VA		Client:	Drawn by:
Phone: 914-450-8416		Code: TIA-222-H	Date: 10/18/22
FAX:		Path:	App'd:
		Scale: NTS	
		Dwg No. E-1	

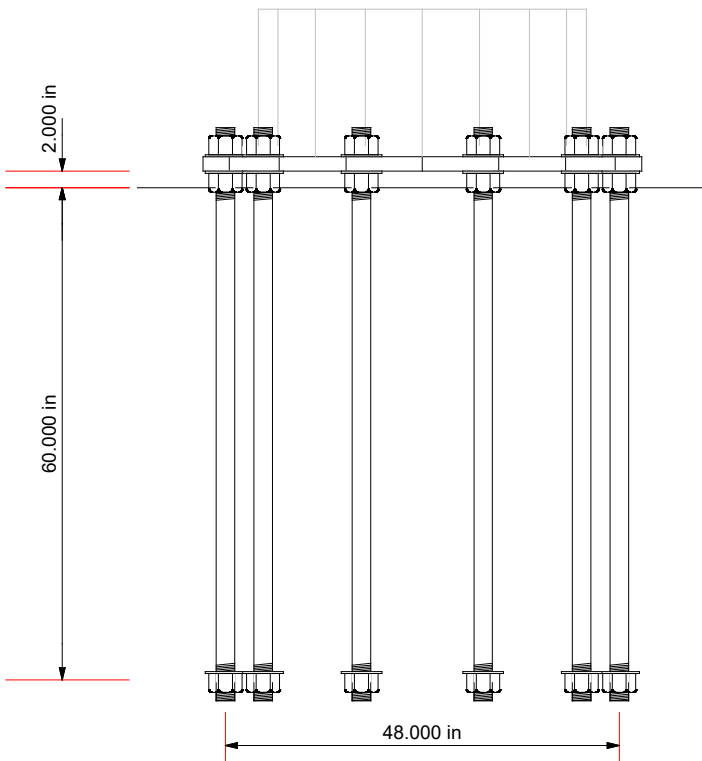
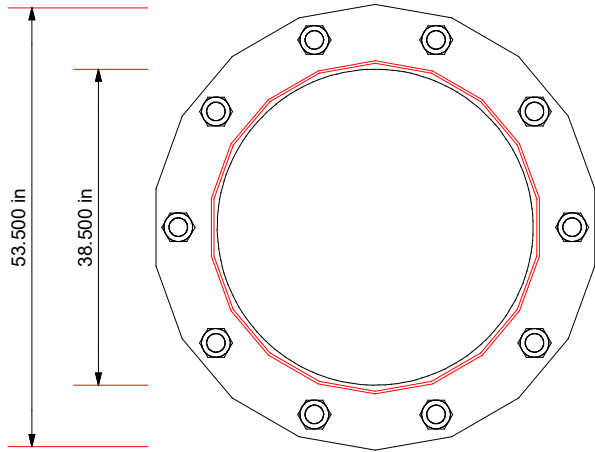
Feed Line Distribution Chart

0' - 102'11-1/32"

— Round
 — Flat
 — App In Face
 — App Out Face
 — Truss Leg



Magaram Engineering			Job: NJJER02049C		
13705 Stone Shadow			Project:		
Clifton VA			Client:		
Phone: 914-450-8416			Drawn by:		App'd:
FAX:			Date: 10/18/22		Scale: NTS
C:\Users\Brett Laptop 2019\Desktop\NJJER02049C Updated.et			Path:		Dwg No. E-7



FOUNDATION NOTES

1. Plate thickness is 1.750 in.
2. Plate grade is A572-60.
3. Anchor bolt grade is A615-75.
4. f_c is 4 ksi.

Magaram Engineering
 4491 Holly Avenue
 Fairfax, VA
 Phone: 914-450-8416
 FAX:

Job:		
Project:		
Client:	Drawn by:	App'd:
Code: TIA-222-H	Date: 05/25/22	Scale: NTS
Path:	Dwg No. F-1	

tnxTower Magaram Engineering 13705 Stone Shadow Clifton VA Phone: 914-450-8416 FAX:	Job	NJJER02049C	Page	1 of 25
	Project		Date	11:51:17 10/18/22
	Client		Designed by	

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: 0.000 ft.

Basic wind speed of 125 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.000 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.

Weld together tower sections have flange connections..

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..

Welds are fabricated with ER-70S-6 electrodes..

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.

Options

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="background-color: #e0e0e0; text-align: center; padding: 2px;">Poles</div> <ul style="list-style-type: none"> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|--|

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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	102.920-90.000	12.920	0.000	Round	13.000	13.000	0.250		A53-B-35 (35 ksi)
L2	90.000-45.080	44.920	3.840	18	13.000	26.793	0.250	1.000	A572-65 (65 ksi)
L3	45.080-0.000	48.920		18	25.113	40.000	0.313	1.250	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	13.000	10.014	203.562	4.509	6.500	31.317	407.125	5.004	0.000	0
L2	13.162	10.117	207.785	4.526	6.604	31.464	415.844	5.060	1.848	7.392
L3	26.639	24.599	1911.609	8.804	12.758	149.840	3825.733	12.302	3.870	12.384
	40.569	39.365	7833.496	14.089	20.320	385.507	15677.299	19.686	6.490	20.768

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 102.920-90.000 0				1	1	1			
L2 90.000-45.080 0				1	1	1			
L3 45.080-0.000				1	1	1			

Pole Reinforcing Data

Height Above Base ft	Segment Length ft	No. of Segments	Offset in	Grade	Type	Size	Unbraced Length ft	K	Bolt Hole Dia. in	Bolts per Row	Shear Lag Factor U
32.250	30.250	4	0.000	A572-65 (65 ksi)	Flat Bar	4x1 1/4	2.000	1.00	0.750	1	1.000
0.000	32.250	4	0.000	A572-65 (65 ksi)	Flat Bar	4.25 x 1.25	2.000	1.00	0.750	1	1.000

Monopole Base Plate Data

Base Plate Data

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Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.250 in
Number of bolts	10
Embedment length	60.000 in
f _c	4.000 ksi
Grout space	2.000 in
Base plate grade	A572-60
Base plate thickness	1.750 in
Bolt circle diameter	48.000 in
Outer diameter	53.500 in
Inner diameter	38.500 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Hybrid Cable (TMO)	C	Yes	Surface Ar (CaAa)	72.000 - 0.000	3	3	0.000 - 0.000	1.980		0.820

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} ft ² /ft	Weight plf
*									
LDF6-50A (1-1/4 FOAM) (ATT)	C	No	Yes	Inside Pole	90.000 - 20.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.660 0.660 0.660
DC Power (ATT)	C	No	Yes	Inside Pole	9.000 - 20.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.000 1.000 1.000
Fiber (ATT)	C	No	Yes	Inside Pole	9.000 - 20.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.000 1.000 1.000
LDF5-50A (7/8 FOAM) (VZW)	B	No	Yes	Inside Pole	82.000 - 20.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.330 0.330 0.330
LDF7-50A (1-5/8 FOAM) (VZW)	B	No	Yes	Inside Pole	82.000 - 20.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.820 0.820 0.820
LDF6-50A (1-1/4 FOAM)	C	No	Yes	Inside Pole	28.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.660 0.660 0.660
LDF4-50A (1/2 FOAM)	C	No	Yes	Inside Pole	28.000 - 0.000	8	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.150 0.150 0.150
*									
CU12PSM9P6XXX _6AWG (DISH)	C	No	Yes	Inside Pole	40.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	2.346 2.346 2.346

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	102.920-90.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	90.000-45.080	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	133.650
		C	0.000	0.000	15.990	0.000	244.106
L3	45.080-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	90.790
		C	0.000	0.000	26.778	0.000	411.134

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} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	102.920-90.000	A	1.113	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	90.000-45.080	A	1.071	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	133.650
		C		0.000	0.000	27.195	0.000	457.968
L3	45.080-0.000	A	0.957	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	90.790
		C		0.000	0.000	45.541	0.000	769.264

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L2	1	Hybrid Cable	45.08 - 72.00	1.0000	1.0000
L3	1	Hybrid Cable	0.00 - 45.08	1.0000	1.0000

Discrete Tower Loads

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						ft
			Lateral		°	ft	ft ²	ft ²	lb	
Gen 5' T-Arm (Abandoned)	A	From Leg	0.000	0.000	0.000	101.000	No Ice	2.720	2.720	50.000
			0.000	0.000			1/2" Ice	4.910	4.910	90.000
			0.000	0.000			1" Ice	7.100	7.100	130.000
Gen 5' T-Arm (Abandoned)	B	From Leg	0.000	0.000	0.000	101.000	No Ice	2.720	2.720	50.000
			0.000	0.000			1/2" Ice	4.910	4.910	90.000
			0.000	0.000			1" Ice	7.100	7.100	130.000
Gen 5' T-Arm (Abandoned)	C	From Leg	0.000	0.000	0.000	101.000	No Ice	2.720	2.720	50.000
			0.000	0.000			1/2" Ice	4.910	4.910	90.000
			0.000	0.000			1" Ice	7.100	7.100	130.000

QD6616-7 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	14.050	8.700	88.200
			0.000	0.000			1/2" Ice	14.770	9.990	193.270
			0.000	0.000			1" Ice	15.450	11.120	307.320
AIR6419 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	3.800	1.940	77.000
			0.000	0.000			1/2" Ice	4.050	2.140	104.860
			0.000	0.000			1" Ice	4.310	2.340	136.300
AIR6449 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	5.650	2.420	100.000
			0.000	0.000			1/2" Ice	5.960	2.640	140.000
			0.000	0.000			1" Ice	6.260	2.870	180.000
DMP65R-BU6D (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	13.200	7.515	125.200
			0.000	0.000			1/2" Ice	13.910	8.795	220.255
			0.000	0.000			1" Ice	14.587	9.927	324.041
RRUS32 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	2.860	1.780	60.000
			0.000	0.000			1/2" Ice	3.080	1.970	80.000
			0.000	0.000			1" Ice	3.320	2.170	100.000
RRUS4478 B14 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	2.020	1.250	60.000
			0.000	0.000			1/2" Ice	2.200	1.400	80.000
			0.000	0.000			1" Ice	2.390	1.550	100.000
RRUS32 B2 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	2.740	1.670	50.000
			0.000	0.000			1/2" Ice	2.960	1.860	70.000
			0.000	0.000			1" Ice	3.190	2.050	100.000
RRUS 4426 B66 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	1.640	0.730	50.000
			0.000	0.000			1/2" Ice	1.800	0.840	60.000
			0.000	0.000			1" Ice	1.970	0.980	80.000
Radio 4415 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	1.840	0.820	50.000
			0.000	0.000			1/2" Ice	2.010	0.940	60.000
			0.000	0.000			1" Ice	2.190	1.070	80.000
DC6-48-60-18-8F (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	1.210	1.210	30.000
			0.000	0.000			1/2" Ice	1.890	1.890	50.000
			0.000	0.000			1" Ice	2.110	2.110	80.000
Radio 4449 (ATT)	A	From Leg	4.000	0.000	0.000	90.000	No Ice	1.640	1.290	70.000
			0.000	0.000			1/2" Ice	1.800	1.440	90.000
			0.000	0.000			1" Ice	1.970	1.590	110.000
*										
QD6616-7 (ATT)	B	From Leg	4.000	0.000	0.000	90.000	No Ice	14.050	8.700	88.200
			0.000	0.000			1/2" Ice	14.770	9.990	193.270
			0.000	0.000			1" Ice	15.450	11.120	307.320
AIR6419 (ATT)	B	From Leg	4.000	0.000	0.000	90.000	No Ice	3.800	1.940	77.000
			0.000	0.000			1/2" Ice	4.050	2.140	104.860
			0.000	0.000			1" Ice	4.310	2.340	136.300
AIR6449 (ATT)	B	From Leg	4.000	0.000	0.000	90.000	No Ice	5.650	2.420	100.000
			0.000	0.000			1/2" Ice	5.960	2.640	140.000
			0.000	0.000			1" Ice	6.260	2.870	180.000
DMP65R-BU6D (ATT)	B	From Leg	4.000	0.000	0.000	90.000	No Ice	13.200	7.515	125.200
			0.000	0.000			1/2" Ice	13.910	8.795	220.255
			0.000	0.000			1" Ice	14.587	9.927	324.041
RRUS32	B	From Leg	4.000	0.000	0.000	90.000	No Ice	2.860	1.780	60.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight lb
			Horz ft	Lateral Vert ft					
(ATT)			0.000			1/2" Ice	3.080	1.970	80.000
			0.000			1" Ice	3.320	2.170	100.000
RRUS4478 B14	B	From Leg	4.000	0.000	90.000	No Ice	2.020	1.250	60.000
(ATT)			0.000			1/2" Ice	2.200	1.400	80.000
			0.000			1" Ice	2.390	1.550	100.000
RRUS32 B2	B	From Leg	4.000	0.000	90.000	No Ice	2.740	1.670	50.000
(ATT)			0.000			1/2" Ice	2.960	1.860	70.000
			0.000			1" Ice	3.190	2.050	100.000
RRUS 4426 B66	B	From Leg	4.000	0.000	90.000	No Ice	1.640	0.730	50.000
(ATT)			0.000			1/2" Ice	1.800	0.840	60.000
			0.000			1" Ice	1.970	0.980	80.000
Radio 4415	B	From Leg	4.000	0.000	90.000	No Ice	1.840	0.820	50.000
(ATT)			0.000			1/2" Ice	2.010	0.940	60.000
			0.000			1" Ice	2.190	1.070	80.000
DC6-48-60-18-8F	B	From Leg	4.000	0.000	90.000	No Ice	1.210	1.210	30.000
(ATT)			0.000			1/2" Ice	1.890	1.890	50.000
			0.000			1" Ice	2.110	2.110	80.000
Radio 4449	B	From Leg	4.000	0.000	90.000	No Ice	1.640	1.290	70.000
(ATT)			0.000			1/2" Ice	1.800	1.440	90.000
			0.000			1" Ice	1.970	1.590	110.000
*									
QD6616-7	C	From Leg	4.000	0.000	90.000	No Ice	14.050	8.700	88.200
(ATT)			0.000			1/2" Ice	14.770	9.990	193.270
			0.000			1" Ice	15.450	11.120	307.320
AIR6419	C	From Leg	4.000	0.000	90.000	No Ice	3.800	1.940	77.000
(ATT)			0.000			1/2" Ice	4.050	2.140	104.860
			0.000			1" Ice	4.310	2.340	136.300
AIR6449	C	From Leg	4.000	0.000	90.000	No Ice	5.650	2.420	100.000
(ATT)			0.000			1/2" Ice	5.960	2.640	140.000
			0.000			1" Ice	6.260	2.870	180.000
DMP65R-BU6D	C	From Leg	4.000	0.000	90.000	No Ice	13.200	7.515	125.200
(ATT)			0.000			1/2" Ice	13.910	8.795	220.255
			0.000			1" Ice	14.587	9.927	324.041
RRUS32	C	From Leg	4.000	0.000	90.000	No Ice	2.860	1.780	60.000
(ATT)			0.000			1/2" Ice	3.080	1.970	80.000
			0.000			1" Ice	3.320	2.170	100.000
RRUS4478 B14	C	From Leg	4.000	0.000	90.000	No Ice	2.020	1.250	60.000
(ATT)			0.000			1/2" Ice	2.200	1.400	80.000
			0.000			1" Ice	2.390	1.550	100.000
RRUS32 B2	C	From Leg	4.000	0.000	90.000	No Ice	2.740	1.670	50.000
(ATT)			0.000			1/2" Ice	2.960	1.860	70.000
			0.000			1" Ice	3.190	2.050	100.000
RRUS 4426 B66	C	From Leg	4.000	0.000	90.000	No Ice	1.640	0.730	50.000
(ATT)			0.000			1/2" Ice	1.800	0.840	60.000
			0.000			1" Ice	1.970	0.980	80.000
Radio 4415	C	From Leg	4.000	0.000	90.000	No Ice	1.840	0.820	50.000
(ATT)			0.000			1/2" Ice	2.010	0.940	60.000
			0.000			1" Ice	2.190	1.070	80.000
DC9-48-60-24-8C-EV	C	From Leg	4.000	0.000	90.000	No Ice	4.788	4.788	16.000
(ATT)			0.000			1/2" Ice	6.729	6.729	186.360
			0.000			1" Ice	8.670	8.670	356.720
Radio 4449	C	From Leg	4.000	0.000	90.000	No Ice	1.640	1.290	70.000
(ATT)			0.000			1/2" Ice	1.800	1.440	90.000
			0.000			1" Ice	1.970	1.590	110.000
*									
Platform	C	None		0.000	90.000	No Ice	41.000	41.000	2500.000
(ATT)						1/2" Ice	56.000	56.000	3000.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			Lateral		°	ft	ft ²	ft ²	lb
Ladder (ATT)	C	None			0.000	90.000	1" Ice 71.000 No Ice 7.070 1/2" Ice 9.730 1" Ice 11.190	71.000 7.070 9.730 11.190	3500.000 40.000 70.000 80.000

(2) MX06FRO660-03 (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 10.110 1/2" Ice 10.680 1" Ice 11.220	8.990 10.150 11.030	100.000 190.000 290.000
BXA-70063-6CF-EDIN-X (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 7.810 1/2" Ice 8.360 1" Ice 8.870	5.800 6.950 7.820	60.000 120.000 190.000
VZS01 (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 5.910 1/2" Ice 6.720 1" Ice 7.440	3.740 4.790 5.700	120.000 170.000 220.000
B2/B66a RRH-BR049 (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
B5/B13 RRH-BR04C (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
(2) DB-B1-6C-12AB-OZ (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 3.360 1/2" Ice 3.600 1" Ice 3.840	2.190 2.400 2.610	30.000 60.000 90.000
*									
(2) MX06FRO660-03 (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 10.110 1/2" Ice 10.680 1" Ice 11.220	8.990 10.150 11.030	100.000 190.000 290.000
BXA-70063-6CF-EDIN-X (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 7.810 1/2" Ice 8.360 1" Ice 8.870	5.800 6.950 7.820	60.000 120.000 190.000
VZS01 (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 5.910 1/2" Ice 6.720 1" Ice 7.440	3.740 4.790 5.700	120.000 170.000 220.000
B2/B66a RRH-BR049 (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
B5/B13 RRH-BR04C (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
*									
(2) MX06FRO660-03 (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 10.110 1/2" Ice 10.680 1" Ice 11.220	8.990 10.150 11.030	100.000 190.000 290.000
BXA-70063-6CF-EDIN-X (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 7.810 1/2" Ice 8.360 1" Ice 8.870	5.800 6.950 7.820	60.000 120.000 190.000
VZS01 (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 5.910 1/2" Ice 6.720 1" Ice 7.440	3.740 4.790 5.700	120.000 170.000 220.000
B2/B66a RRH-BR049 (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
B5/B13 RRH-BR04C (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
*									
Platform	C	None			0.000	82.000	No Ice 41.000	41.000	2500.000

<p>tnxTower</p> <p>Magaram Engineering 13705 Stone Shadow Clifton VA Phone: 914-450-8416 FAX:</p>	Job	NJJER02049C	Page	8 of 25
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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight	
			Horz	Vert						ft
(VZW)										
Ladder (VZW)	C	None			0.000	82.000				

APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	A	From Leg	4.000	0.000	0.000	72.000	No Ice	20.267	10.644	179.100
AIR 6449 B41 [P2.0][96"] (TMO)	A	From Leg	4.000	0.000	0.000	72.000	No Ice	6.927	4.316	132.200
VV-65A-R1 [P2.0][96"] (TMO)	A	From Leg	4.000	0.000	0.000	72.000	No Ice	6.704	4.631	53.000
RRU 4480 B71+B85 (TMO)	A	From Leg	4.000	0.000	0.000	72.000	No Ice	2.878	1.397	81.000
RRU 4460 B25+B66 (TMO)	A	From Leg	4.000	0.000	0.000	72.000	No Ice	2.564	1.976	109.000
*										
APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	B	From Leg	4.000	0.000	0.000	72.000	No Ice	20.267	10.644	179.100
AIR 6449 B41 [P2.0][96"] (TMO)	B	From Leg	4.000	0.000	0.000	72.000	No Ice	6.927	4.316	132.200
VV-65A-R1 [P2.0][96"] (TMO)	B	From Leg	4.000	0.000	0.000	72.000	No Ice	6.704	4.631	53.000
RRU 4480 B71+B85 (TMO)	B	From Leg	4.000	0.000	0.000	72.000	No Ice	2.878	1.397	81.000
RRU 4460 B25+B66 (TMO)	B	From Leg	4.000	0.000	0.000	72.000	No Ice	2.564	1.976	109.000
*										
APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	C	From Leg	4.000	0.000	0.000	72.000	No Ice	20.267	10.644	179.100
AIR 6449 B41 [P2.0][96"] (TMO)	C	From Leg	4.000	0.000	0.000	72.000	No Ice	6.927	4.316	132.200
VV-65A-R1 [P2.0][96"] (TMO)	C	From Leg	4.000	0.000	0.000	72.000	No Ice	6.704	4.631	53.000
RRU 4480 B71+B85 (TMO)	C	From Leg	4.000	0.000	0.000	72.000	No Ice	2.878	1.397	81.000
RRU 4460 B25+B66 (TMO)	C	From Leg	4.000	0.000	0.000	72.000	No Ice	2.564	1.976	109.000
*										
F4P-HRK8 (TMO)	C	None			0.000	72.000	No Ice	7.250	7.250	465.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			Lateral		°	ft	ft ²	ft ²	lb
			ft	ft					
F4P-8W (TMO)	C	None			0.000	72.000	No Ice 42.430 1/2" Ice 52.000 1" Ice 64.650	42.430 52.000 64.650	2283.000 2912.000 3796.000

(2) Gen 5' T-Arm	A	From Leg	1.000 0.000 0.000		0.000	28.000	No Ice 2.720 1/2" Ice 4.910 1" Ice 7.100	2.720 4.910 7.100	50.000 90.000 130.000
Gen 14' T-Arm	A	From Leg	1.000 0.000 0.000		0.000	28.000	No Ice 3.500 1/2" Ice 5.250 1" Ice 7.880	1.600 2.400 3.600	340.000 410.000 490.000
20' x 3" Omni	A	From Leg	1.000 0.000 14.000		0.000	28.000	No Ice 6.000 1/2" Ice 8.033 1" Ice 10.083	6.000 8.033 10.083	100.000 143.168 199.011
(2) 10' x 3" Omni	A	From Leg	1.000 0.000 8.000		0.000	28.000	No Ice 3.000 1/2" Ice 4.033 1" Ice 5.027	3.000 4.033 5.027	15.000 36.788 65.142
(3) 10' x 3" Omni	A	From Leg	1.000 0.000 6.000		0.000	28.000	No Ice 3.000 1/2" Ice 4.033 1" Ice 5.027	3.000 4.033 5.027	15.000 36.788 65.142
GPS	A	From Leg	1.000 0.000 2.000		0.000	28.000	No Ice 0.260 1/2" Ice 0.320 1" Ice 0.390	0.260 0.320 0.390	5.000 10.000 15.000

MX08FRO665-21 [P3.0][96"] (DISH)	A	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 13.189 1/2" Ice 13.837 1" Ice 14.463	8.667 9.730 10.684	125.140 229.115 343.808
TA08025-B604 (DISH)	A	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	0.981 1.112 1.250	60.000 80.000 100.000
TA08025-B605 (DISH)	A	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	1.129 1.267 1.411	80.000 90.000 100.000
*									
MX08FRO665-21 [P3.0][96"] (DISH)	B	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 13.189 1/2" Ice 13.837 1" Ice 14.463	8.667 9.730 10.684	125.140 229.115 343.808
TA08025-B604 (DISH)	B	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	0.981 1.112 1.250	60.000 80.000 100.000
TA08025-B605 (DISH)	B	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	1.129 1.267 1.411	80.000 90.000 100.000
*									
MX08FRO665-21 [P3.0][96"] (DISH)	C	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 13.189 1/2" Ice 13.837 1" Ice 14.463	8.667 9.730 10.684	125.140 229.115 343.808
TA08025-B604 (DISH)	C	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	0.981 1.112 1.250	60.000 80.000 100.000
TA08025-B605 (DISH)	C	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	1.129 1.267 1.411	80.000 90.000 100.000
*									
MC-PK8-DSH (8ft Snub Nose Platform) (DISH)	C	None			0.000	62.500	No Ice 37.590 1/2" Ice 41.460 1" Ice 53.080	37.590 41.460 53.080	1727.000 1766.500 2280.600

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Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K_Z	q_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 102.920-90.000	96.460	0.978	37.168	13.997	A	0.000	13.997	13.997	100.00	0.000	0.000
					B	0.000	13.997		100.00	0.000	0.000
					C	0.000	13.997		100.00	0.000	0.000
L2 90.000-45.080	65.461	0.876	33.101	75.483	A	0.000	75.483	75.483	100.00	0.000	0.000
					B	0.000	75.483		100.00	0.000	0.000
					C	0.000	75.483		100.00	15.990	0.000
L3 45.080-0.000	21.157	0.7	26.979	126.239	A	0.000	126.239	126.239	100.00	0.000	0.000
					B	0.000	126.239		100.00	0.000	0.000
					C	0.000	126.239		100.00	26.778	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation	z	K_Z	q_z	t_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	in	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 102.920-90.000	96.460	0.978	5.947	1.113	16.394	A	0.000	16.394	16.394	100.00	0.000	0.000
						B	0.000	16.394		100.00	0.000	0.000
						C	0.000	16.394		100.00	0.000	0.000
L2 90.000-45.080	65.461	0.876	5.296	1.071	83.500	A	0.000	83.500	83.500	100.00	0.000	0.000
						B	0.000	83.500		100.00	0.000	0.000
						C	0.000	83.500		100.00	27.195	0.000
L3 45.080-0.000	21.157	0.7	4.317	0.957	134.285	A	0.000	134.285	134.285	100.00	0.000	0.000
						B	0.000	134.285		100.00	0.000	0.000
						C	0.000	134.285		100.00	45.541	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation	z	K_Z	q_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 102.920-90.000	96.460	0.978	7.662	13.997	A	0.000	13.997	13.997	100.00	0.000	0.000
					B	0.000	13.997		100.00	0.000	0.000
					C	0.000	13.997		100.00	0.000	0.000
L2 90.000-45.080	65.461	0.876	6.824	75.483	A	0.000	75.483	75.483	100.00	0.000	0.000
					B	0.000	75.483		100.00	0.000	0.000

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Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F _{a c e}	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L3 45.080-0.000	21.157	0.7	5.562	126.239	C	0.000	75.483		100.00	15.990	0.000
					A	0.000	126.239	126.239	100.00	0.000	0.000
					B	0.000	126.239		100.00	0.000	0.000
					C	0.000	126.239		100.00	26.778	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F _{a c e}	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	440.249	A	1	0.6	37.16	1	1	13.997	343.351	26.575	C
			B	1	0.6	8	1	1	13.997			
			C	1	0.6		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	33.10	1	1	75.483	2006.347	44.665	C
			B	1	0.73	1	1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	26.97	1	1	126.239	2734.880	60.667	C
			B	1	0.73	9	1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	222318.08 0 lb-ft	5084.578		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F _{a c e}	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	440.249	A	1	0.6	37.16	1	1	13.997	343.351	26.575	C
			B	1	0.6	8	1	1	13.997			
			C	1	0.6		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	33.10	1	1	75.483	2006.347	44.665	C
			B	1	0.73	1	1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	26.97	1	1	126.239	2734.880	60.667	C
			B	1	0.73	9	1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	222318.08 0 lb-ft	5084.578		

Tower Forces - No Ice - Wind 90 To Face

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.6	37.16	1	1	13.997	343.351	26.575	C
0			B	1	0.6	8	1	1	13.997			
L2 90.000-45.080	377.757	2382.878	C	1	0.6		1	1	13.997			
A			A	1	0.73	33.10	1	1	75.483	2006.347	44.665	C
B			B	1	0.73	1	1	1	75.483			
C			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	26.97	1	1	126.239	2734.880	60.667	C
B			B	1	0.73	9	1	1	126.239			
C			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	222318.08 0 lb-ft	5084.578		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	688.246	A	1	1.2	5.947	1	1	16.394	128.690	9.961	C
0			B	1	1.2		1	1	16.394			
L2 90.000-45.080	591.618	3627.845	C	1	1.2		1	1	16.394			
A			A	1	1.2	5.296	1	1	83.500	583.746	12.995	C
B			B	1	1.2		1	1	83.500			
C			C	1	1.2		1	1	83.500			
L3 45.080-0.000	860.054	13069.704	A	1	1.2	4.317	1	1	133.426	760.260	16.865	C
B			B	1	1.2		1	1	133.426			
C			C	1	1.2		1	1	133.426			
Sum Weight:	1451.672	17385.796						OTM	66710.585 lb-ft	1472.696		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	688.246	A	1	1.2	5.947	1	1	16.394	128.690	9.961	C
0			B	1	1.2		1	1	16.394			
L2 90.000-45.080	591.618	3627.845	C	1	1.2		1	1	16.394			
A			A	1	1.2	5.296	1	1	83.500	583.746	12.995	C
B			B	1	1.2		1	1	83.500			
C			C	1	1.2		1	1	83.500			
L3 45.080-0.000	860.054	13069.704	A	1	1.2	4.317	1	1	133.426	760.260	16.865	C
B			B	1	1.2		1	1	133.426			
C			C	1	1.2		1	1	133.426			
Sum Weight:	1451.672	17385.796						OTM	66710.585 lb-ft	1472.696		

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Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	688.246	A	1	1.2	5.947	1	1	16.394	128.690	9.961	C
			B	1	1.2		1	1	16.394			
			C	1	1.2		1	1	16.394			
L2 90.000-45.080	591.618	3627.845	A	1	1.2	5.296	1	1	83.500	583.746	12.995	C
			B	1	1.2		1	1	83.500			
			C	1	1.2		1	1	83.500			
L3 45.080-0.000	860.054	13069.704	A	1	1.2	4.317	1	1	133.426	760.260	16.865	C
			B	1	1.2		1	1	133.426			
			C	1	1.2		1	1	133.426			
Sum Weight:	1451.672	17385.796						OTM	66710.585 lb-ft	1472.696		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.728	7.662	1	1	13.997	85.882	6.647	C
			B	1	0.728		1	1	13.997			
			C	1	0.728		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	6.824	1	1	75.483	413.603	9.208	C
			B	1	0.73		1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	5.562	1	1	126.239	563.788	12.506	C
			B	1	0.73		1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	47286.978 lb-ft	1063.274		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.728	7.662	1	1	13.997	85.882	6.647	C
			B	1	0.728		1	1	13.997			
			C	1	0.728		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	6.824	1	1	75.483	413.603	9.208	C
			B	1	0.73		1	1	75.483			
			C	1	0.73		1	1	75.483			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L3 45.080-0.000	501.923	9714.912	A	1	0.73	5.562	1	1	126.239	563.788	12.506	C
			B	1	0.73		1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	47286.978 lb-ft	1063.274		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.728	7.662	1	1	13.997	85.882	6.647	C
			B	1	0.728		1	1	13.997			
			C	1	0.728		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	6.824	1	1	75.483	413.603	9.208	C
			B	1	0.73		1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	5.562	1	1	126.239	563.788	12.506	C
			B	1	0.73		1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	47286.978 lb-ft	1063.274		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Leg Weight	8147.036					
Bracing Weight	4391.002					
Total Member Self-Weight	12538.038			-1743.653	-55.065	
Total Weight	30088.238			-1743.653	-55.065	
Wind 0 deg - No Ice		0.000	-22410.247	-1567573.618	-55.065	-451.271
Wind 30 deg - No Ice		11140.794	-19407.843	-1357792.181	-779196.021	-1502.044
Wind 60 deg - No Ice		19296.421	-11205.124	-784658.635	-1349566.786	-2150.346
Wind 90 deg - No Ice		22281.587	0.000	-1743.653	-1558336.976	-2222.464
Wind 120 deg - No Ice		19296.421	11205.124	781171.330	-1349566.786	-1699.075
Wind 150 deg - No Ice		11140.794	19407.843	1354304.876	-779196.021	-720.420
Wind 180 deg - No Ice		0.000	22410.247	1564086.313	-55.065	451.271
Wind 210 deg - No Ice		-11140.794	19407.843	1354304.876	779085.891	1502.044
Wind 240 deg - No Ice		-19296.421	11205.124	781171.330	1349456.657	2150.346
Wind 270 deg - No Ice		-22281.587	0.000	-1743.653	1558226.847	2222.464
Wind 300 deg - No Ice		-19296.421	-11205.124	-784658.635	1349456.657	1699.075
Wind 330 deg - No Ice		-11140.794	-19407.843	-1357792.181	779085.891	720.420
Member Ice	4847.758					
Total Weight Ice	49656.797			-3175.659	1204.920	
Wind 0 deg - Ice		0.000	-5354.054	-369497.872	1204.920	-139.710

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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
Wind 30 deg - Ice		2660.944	-4636.747	-320420.002	-181172.484	-421.993
Wind 60 deg - Ice		4608.890	-2677.027	-186336.766	-314682.009	-591.204
Wind 90 deg - Ice		5321.888	0.000	-3175.659	-363549.887	-602.002
Wind 120 deg - Ice		4608.890	2677.027	179985.447	-314682.009	-451.494
Wind 150 deg - Ice		2660.944	4636.747	314068.683	-181172.484	-180.009
Wind 180 deg - Ice		0.000	5354.054	363146.554	1204.920	139.710
Wind 210 deg - Ice		-2660.944	4636.747	314068.683	183582.323	421.993
Wind 240 deg - Ice		-4608.890	2677.027	179985.447	317091.849	591.204
Wind 270 deg - Ice		-5321.888	0.000	-3175.659	365959.727	602.002
Wind 300 deg - Ice		-4608.890	-2677.027	-186336.766	317091.849	451.494
Wind 330 deg - Ice		-2660.944	-4636.747	-320420.002	183582.323	180.009
Total Weight	30088.238			-1743.653	-55.065	
Wind 0 deg - Service		0.000	-4634.915	-325992.070	-55.065	-93.028
Wind 30 deg - Service		2304.196	-4013.954	-282551.020	-161401.268	-309.642
Wind 60 deg - Service		3990.985	-2317.458	-163867.862	-279514.886	-443.288
Wind 90 deg - Service		4608.392	0.000	-1743.653	-322747.471	-458.155
Wind 120 deg - Service		3990.985	2317.458	160380.556	-279514.886	-350.260
Wind 150 deg - Service		2304.196	4013.954	279063.714	-161401.268	-148.513
Wind 180 deg - Service		0.000	4634.915	322504.765	-55.065	93.028
Wind 210 deg - Service		-2304.196	4013.954	279063.714	161291.138	309.642
Wind 240 deg - Service		-3990.985	2317.458	160380.556	279404.757	443.288
Wind 270 deg - Service		-4608.392	0.000	-1743.653	322637.342	458.155
Wind 300 deg - Service		-3990.985	-2317.458	-163867.862	279404.757	350.260
Wind 330 deg - Service		-2304.196	-4013.954	-282551.020	161291.138	148.513

Load Combinations

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

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Comb. No.	Description
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum 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	102.92 - 90	Pole	Max Tension	8	0.023	0.001	-0.457
			Max. Compression	26	-1224.699	-0.128	-1.602
			Max. Mx	8	-657.389	-5602.288	1.826
			Max. My	2	-657.283	1.805	5603.135
			Max. Vy	8	667.542	-5602.288	1.826
			Max. Vx	2	-667.657	1.805	5603.135
			Max. Torque	33			0.006
L2	90 - 45.08	Pole	Max Tension	36	87406.808	28686.962	173.306
			Max. Compression	26	-31610.388	1282.040	294.114
			Max. Mx	8	-17756.649	-331330.40	418.965
							0
			Max. My	2	-17752.808	-72.465	333090.208
			Max. Vy	8	16610.854	-331330.40	418.965
							0
L3	45.08 - 0	Pole	Max. Vx	2	-16684.105	-72.465	333090.208
			Max. Torque	17			-585.359
			Max Tension	38	97313.515	62577.121	105258.153
			Max. Compression	1	-18753.582	-30.554	1077.705
			Max. Mx	8	-13723.096	-1071191.7	1340.663
							77
			Max. My	2	-13671.262	-42.376	1079316.48
	32.25 - 62.5	Reinforcing	Max. Vy	21	-18398.051	1061757.70	997.098
							3
			Max. Vx	15	18726.134	-30.843	-1067586.1
							31
			Max. Torque	21			-2214.535
			Max Tension	8	121789.530	-1.180	-110.859
			Max. Compression	8	-131009.76	0.074	-99.691

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	2	120936.365	1232.841	-0.039
			Max. My	8	121172.597	-0.650	-137.140
			Max. Vy	14	24.128	-1232.448	-0.039
			Max. Vx	8	15.760	-0.650	-137.140
	0 - 32.25	Reinforcing	Max Tension	2	159632.038	1833.760	0.020
			Max. Compression	2	-170122.07	0.000	-0.000
				8			
			Max. Mx	2	159632.038	1833.760	0.020
			Max. My	8	159175.327	-2.049	-191.242
			Max. Vy	2	65.351	1833.760	0.020
			Max. Vx	8	-14.405	-2.049	-191.242

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	1	18753.582	0.190	-4.836
	Max. H _x	21	8318.760	18391.325	-5.135
	Max. H _z	3	8273.213	-0.047	18711.487
	Max. M _x	2	1079316.489	0.015	18704.270
	Max. M _z	8	1071191.778	-18382.159	-6.543
	Max. Torsion	9	2213.559	-18391.004	-5.135
	Min. Vert	38	-89350.504	2360.228	4158.160
	Min. H _x	9	8317.275	-18391.004	-5.135
	Min. H _z	15	8317.615	-0.046	-18719.374
	Min. M _x	14	-1076635.500	0.016	-18714.756
	Min. M _z	20	-1071111.306	18382.592	-6.543
	Min. Torsion	21	-2213.570	18391.325	-5.135
	Reinf @ Azimuth 90 deg	Max. Vert	8	169638.465	-187.181
Max. H _x		20	-158410.727	3841.290	3.249
Max. H _z		12	87602.388	-601.161	922.937
Min. Vert		20	-158410.727	3841.290	3.249
Min. H _x		30	75364.501	-744.184	-2.431
Min. H _z		4	87616.342	-601.214	-926.186
Reinf @ Azimuth 0 deg	Max. Vert	2	170122.039	0.246	127.319
	Max. H _x	6	87970.728	882.478	574.969
	Max. H _z	27	75984.104	-0.833	734.282
	Min. Vert	14	-158405.906	-0.005	-3793.584
	Min. H _x	22	87971.024	-882.309	574.959
	Min. H _z	14	-158405.906	-0.005	-3793.584
Reinf @ Azimuth 270 deg	Max. Vert	20	169618.856	187.357	-2.618
	Max. H _x	36	75733.719	746.151	-2.443
	Max. H _z	16	87581.776	601.142	922.841
	Min. Vert	8	-158429.307	-3841.925	3.249
	Min. H _x	8	-158429.307	-3841.925	3.249
	Min. H _z	24	87595.727	601.195	-926.090
Reinf @ Azimuth 180 deg	Max. Vert	14	169610.663	0.245	-133.165
	Max. H _x	10	87468.688	876.950	-574.818
	Max. H _z	2	-158886.905	-0.005	3810.963
	Min. Vert	2	-158886.905	-0.005	3810.963
	Min. H _x	18	87468.981	-876.783	-574.809
	Min. H _z	33	75151.322	-0.824	-731.010

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
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Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overtuning Moment, M _x lb-ft	Overtuning Moment, M _z lb-ft	Torque lb-ft
Dead Only	30088.238	-0.005	0.022	-1743.350	-55.001	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	36105.847	-0.002	-22409.349	-1627664.695	-77.077	-441.868
0.9 Dead+1.0 Wind 0 deg - No Ice	27079.389	-0.002	-22409.655	-1611355.101	-56.451	-443.375
1.2 Dead+1.0 Wind 30 deg - No Ice	36105.873	11140.646	-19407.586	-1409937.653	-809054.019	-1417.421
0.9 Dead+1.0 Wind 30 deg - No Ice	27079.406	11140.699	-19407.679	-1395721.443	-801153.408	-1421.016
1.2 Dead+1.0 Wind 60 deg - No Ice	36105.873	19296.159	-11204.979	-814943.924	-1401265.222	-2067.959
0.9 Dead+1.0 Wind 60 deg - No Ice	27079.406	19296.253	-11205.031	-806500.640	-1387596.534	-2071.110
1.2 Dead+1.0 Wind 90 deg - No Ice	36105.847	22280.675	-0.002	-2163.251	-1617971.363	-2214.762
0.9 Dead+1.0 Wind 90 deg - No Ice	27079.389	22280.986	-0.002	-1607.106	-1602211.853	-2215.317
1.2 Dead+1.0 Wind 120 deg - No Ice	36105.873	19296.159	11204.978	810615.365	-1401261.472	-1768.095
0.9 Dead+1.0 Wind 120 deg - No Ice	27079.406	19296.253	11205.031	803284.953	-1387593.756	-1765.910
1.2 Dead+1.0 Wind 150 deg - No Ice	36105.873	11140.647	19407.586	1405604.751	-809050.257	-797.300
0.9 Dead+1.0 Wind 150 deg - No Ice	27079.406	11140.700	19407.679	1392502.533	-801150.621	-794.270
1.2 Dead+1.0 Wind 180 deg - No Ice	36105.847	-0.002	22409.351	1623329.746	-77.065	441.912
0.9 Dead+1.0 Wind 180 deg - No Ice	27079.390	-0.002	22409.656	1608134.637	-56.444	443.403
1.2 Dead+1.0 Wind 210 deg - No Ice	36105.873	-11140.648	19407.586	1405609.184	808898.453	1562.704
0.9 Dead+1.0 Wind 210 deg - No Ice	27079.406	-11140.701	19407.678	1392505.750	801039.411	1562.261
1.2 Dead+1.0 Wind 240 deg - No Ice	36105.873	-19296.160	11204.978	810619.802	1401114.786	2210.011
0.9 Dead+1.0 Wind 240 deg - No Ice	27079.406	-19296.254	11205.030	803288.174	1387486.262	2209.317
1.2 Dead+1.0 Wind 270 deg - No Ice	36105.847	-22280.676	-0.002	-2163.254	1617827.242	2214.782
0.9 Dead+1.0 Wind 270 deg - No Ice	27079.389	-22280.986	-0.002	-1607.107	1602106.216	2215.328
1.2 Dead+1.0 Wind 300 deg - No Ice	36105.873	-19296.159	-11204.978	-814948.368	1401118.526	1626.093
0.9 Dead+1.0 Wind 300 deg - No Ice	27079.406	-19296.253	-11205.031	-806503.866	1387489.035	1627.734
1.2 Dead+1.0 Wind 330 deg - No Ice	36105.873	-11140.647	-19407.586	-1409942.093	808902.195	652.092
0.9 Dead+1.0 Wind 330 deg - No Ice	27079.406	-11140.700	-19407.678	-1395724.665	801042.187	653.075
1.2 Dead+1.0 Ice+1.0 Temp	55792.959	1.235	0.451	-3531.738	1201.527	-0.353
1.2 Dead+1.0 Wind 0 deg+1.0	55792.959	0.005	-5353.562	-394285.122	1393.679	-163.579

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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
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 30 deg+1.0	55792.959	2660.701	-4636.320	-341957.097	-193114.805	-429.796
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 60 deg+1.0	55792.959	4608.465	-2676.780	-198994.634	-335504.721	-584.135
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90 deg+1.0	55792.959	5321.396	0.003	-3704.426	-387622.893	-585.224
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120 deg+1.0	55792.959	4608.465	2676.786	191585.618	-335504.427	-429.617
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 150 deg+1.0	55792.959	2660.701	4636.326	334547.755	-193114.507	-155.858
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180 deg+1.0	55792.959	0.005	5353.568	386875.623	1393.691	162.716
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210 deg+1.0	55792.959	-2660.690	4636.326	334548.070	195902.059	437.573
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240 deg+1.0	55792.959	-4608.454	2676.785	191585.942	338292.320	591.898
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270 deg+1.0	55792.959	-5321.385	0.003	-3704.402	390410.951	584.356
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300 deg+1.0	55792.959	-4608.454	-2676.780	-198994.917	338292.601	420.121
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330 deg+1.0	55792.959	-2660.690	-4636.320	-341957.389	195902.336	146.353
Ice+1.0 Temp						
Dead+Wind 0 deg - Service	30088.234	-0.000	-4634.480	-336437.183	-59.543	-92.083
Dead+Wind 30 deg - Service	30088.234	2303.976	-4013.577	-291604.014	-166596.008	-305.519
Dead+Wind 60 deg - Service	30088.234	3990.604	-2317.239	-169117.672	-288509.050	-439.403
Dead+Wind 90 deg - Service	30088.234	4607.953	0.002	-1798.253	-333132.243	-457.853
Dead+Wind 120 deg - Service	30088.234	3990.605	2317.243	165521.097	-288508.929	-353.620
Dead+Wind 150 deg - Service	30088.234	2303.977	4013.582	288007.302	-166595.886	-152.328
Dead+Wind 180 deg - Service	30088.234	-0.000	4634.484	332840.401	-59.541	92.096
Dead+Wind 210 deg - Service	30088.234	-2303.978	4013.581	288007.444	166476.886	311.845
Dead+Wind 240 deg - Service	30088.234	-3990.605	2317.243	165521.239	288390.093	445.723
Dead+Wind 270 deg - Service	30088.234	-4607.954	0.002	-1798.253	333013.488	457.865
Dead+Wind 300 deg - Service	30088.234	-3990.605	-2317.239	-169117.815	288390.212	347.325
Dead+Wind 330 deg - Service	30088.234	-2303.977	-4013.577	-291604.157	166477.005	146.027

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.000	-30088.238	0.000	0.005	30088.238	-0.022	0.000%
2	0.000	-36105.885	-22410.247	0.002	36105.847	22409.349	0.002%
3	0.000	-27079.414	-22410.247	0.002	27079.389	22409.655	0.002%
4	11140.794	-36105.885	-19407.843	-11140.646	36105.873	19407.586	0.001%
5	11140.794	-27079.414	-19407.843	-11140.699	27079.406	19407.679	0.001%
6	19296.421	-36105.885	-11205.124	-19296.159	36105.873	11204.979	0.001%
7	19296.421	-27079.414	-11205.124	-19296.253	27079.406	11205.031	0.001%
8	22281.587	-36105.885	0.000	-22280.675	36105.847	0.002	0.002%
9	22281.587	-27079.414	0.000	-22280.986	27079.389	0.002	0.002%
10	19296.421	-36105.885	11205.124	-19296.159	36105.873	-11204.978	0.001%
11	19296.421	-27079.414	11205.124	-19296.253	27079.406	-11205.031	0.001%
12	11140.794	-36105.885	19407.843	-11140.647	36105.873	-19407.586	0.001%
13	11140.794	-27079.414	19407.843	-11140.700	27079.406	-19407.679	0.001%
14	0.000	-36105.885	22410.247	0.002	36105.847	-22409.351	0.002%
15	0.000	-27079.414	22410.247	0.002	27079.390	-22409.656	0.002%
16	-11140.794	-36105.885	19407.843	11140.648	36105.873	-19407.586	0.001%
17	-11140.794	-27079.414	19407.843	11140.701	27079.406	-19407.678	0.001%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
18	-19296.421	-36105.885	11205.124	19296.160	36105.873	-11204.978	0.001%
19	-19296.421	-27079.414	11205.124	19296.254	27079.406	-11205.030	0.001%
20	-22281.587	-36105.885	0.000	22280.676	36105.847	0.002	0.002%
21	-22281.587	-27079.414	0.000	22280.986	27079.389	0.002	0.002%
22	-19296.421	-36105.885	-11205.124	19296.159	36105.873	11204.978	0.001%
23	-19296.421	-27079.414	-11205.124	19296.253	27079.406	11205.031	0.001%
24	-11140.794	-36105.885	-19407.843	11140.647	36105.873	19407.586	0.001%
25	-11140.794	-27079.414	-19407.843	11140.700	27079.406	19407.678	0.001%
26	0.000	-55792.964	0.000	-1.235	55792.959	-0.451	0.002%
27	0.000	-55792.964	-5354.054	-0.005	55792.959	5353.562	0.001%
28	2660.944	-55792.964	-4636.747	-2660.701	55792.959	4636.320	0.001%
29	4608.890	-55792.964	-2677.027	-4608.465	55792.959	2676.780	0.001%
30	5321.888	-55792.964	0.000	-5321.396	55792.959	-0.003	0.001%
31	4608.890	-55792.964	2677.027	-4608.465	55792.959	-2676.786	0.001%
32	2660.944	-55792.964	4636.747	-2660.701	55792.959	-4636.326	0.001%
33	0.000	-55792.964	5354.054	-0.005	55792.959	-5353.568	0.001%
34	-2660.944	-55792.964	4636.747	2660.690	55792.959	-4636.326	0.001%
35	-4608.890	-55792.964	2677.027	4608.454	55792.959	-2676.785	0.001%
36	-5321.888	-55792.964	0.000	5321.385	55792.959	-0.003	0.001%
37	-4608.890	-55792.964	-2677.027	4608.454	55792.959	2676.780	0.001%
38	-2660.944	-55792.964	-4636.747	2660.690	55792.959	4636.320	0.001%
39	0.000	-30088.238	-4634.915	0.000	30088.234	4634.480	0.001%
40	2304.196	-30088.238	-4013.954	-2303.976	30088.234	4013.577	0.001%
41	3990.985	-30088.238	-2317.458	-3990.604	30088.234	2317.239	0.001%
42	4608.392	-30088.238	0.000	-4607.953	30088.234	-0.002	0.001%
43	3990.985	-30088.238	2317.458	-3990.605	30088.234	-2317.243	0.001%
44	2304.196	-30088.238	4013.954	-2303.977	30088.234	-4013.582	0.001%
45	0.000	-30088.238	4634.915	0.000	30088.234	-4634.484	0.001%
46	-2304.196	-30088.238	4013.954	2303.978	30088.234	-4013.581	0.001%
47	-3990.985	-30088.238	2317.458	3990.605	30088.234	-2317.243	0.001%
48	-4608.392	-30088.238	0.000	4607.954	30088.234	-0.002	0.001%
49	-3990.985	-30088.238	-2317.458	3990.605	30088.234	2317.239	0.001%
50	-2304.196	-30088.238	-4013.954	2303.977	30088.234	4013.577	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	13	0.00000001	0.00011358
3	Yes	13	0.00000001	0.00007722
4	Yes	14	0.00000001	0.00012414
5	Yes	14	0.00000001	0.00008222
6	Yes	14	0.00000001	0.00013897
7	Yes	14	0.00000001	0.00009246
8	Yes	13	0.00000001	0.00011606
9	Yes	13	0.00000001	0.00007887
10	Yes	14	0.00000001	0.00012909
11	Yes	14	0.00000001	0.00008574
12	Yes	14	0.00000001	0.00012804
13	Yes	14	0.00000001	0.00008500
14	Yes	13	0.00000001	0.00011352
15	Yes	13	0.00000001	0.00007719
16	Yes	14	0.00000001	0.00013744
17	Yes	14	0.00000001	0.00009157
18	Yes	14	0.00000001	0.00012420

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19	Yes	14	0.0000001	0.00008239
20	Yes	13	0.0000001	0.00011604
21	Yes	13	0.0000001	0.00007886
22	Yes	14	0.0000001	0.00013304
23	Yes	14	0.0000001	0.00008835
24	Yes	14	0.0000001	0.00013251
25	Yes	14	0.0000001	0.00008803
26	Yes	6	0.0000001	0.00002490
27	Yes	13	0.0000001	0.00003667
28	Yes	13	0.0000001	0.00003824
29	Yes	13	0.0000001	0.00003878
30	Yes	13	0.0000001	0.00003657
31	Yes	13	0.0000001	0.00003829
32	Yes	13	0.0000001	0.00003786
33	Yes	13	0.0000001	0.00003623
34	Yes	13	0.0000001	0.00003896
35	Yes	13	0.0000001	0.00003894
36	Yes	13	0.0000001	0.00003738
37	Yes	13	0.0000001	0.00003931
38	Yes	13	0.0000001	0.00003922
39	Yes	12	0.0000001	0.00014602
40	Yes	12	0.0000001	0.00014548
41	Yes	12	0.0000001	0.00014756
42	Yes	12	0.0000001	0.00014767
43	Yes	12	0.0000001	0.00014602
44	Yes	12	0.0000001	0.00014467
45	Yes	12	0.0000001	0.00014491
46	Yes	12	0.0000001	0.00014563
47	Yes	12	0.0000001	0.00014572
48	Yes	12	0.0000001	0.00014753
49	Yes	12	0.0000001	0.00014671
50	Yes	12	0.0000001	0.00014592

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	102.92 - 90	10.804	39	0.952	0.003
L2	90 - 45.08	8.236	39	0.943	0.003
L3	48.92 - 0	2.207	39	0.436	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
101.000	Gen 5' T-Arm	39	10.416	0.953	0.003	17679
90.000	QD6616-7	39	8.236	0.943	0.003	7203
82.000	(2) MX06FRO660-03	39	6.765	0.889	0.003	6017
72.000	APXVAALL24_43-U-NA20 [P2.0][96"]	39	5.107	0.774	0.003	5230
62.500	MX08FRO665-21 [P3.0][96"]	39	3.744	0.636	0.002	4652
28.000	(2) Gen 5' T-Arm	39	0.804	0.205	0.001	7017

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	102.92 - 90	52.216	2	4.593	0.017
L2	90 - 45.08	39.830	2	4.554	0.017
L3	48.92 - 0	10.677	2	2.111	0.006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
101.000	Gen 5' T-Arm	2	50.342	4.602	0.017	3760
90.000	QD6616-7	2	39.830	4.554	0.017	1529
82.000	(2) MX06FRO660-03	2	32.727	4.297	0.015	1269
72.000	APXVAALL24_43-U-NA20 [P2.0][96"]	2	24.714	3.742	0.013	1095
62.500	MX08FRO665-21 [P3.0][96"]	2	18.120	3.079	0.009	968
28.000	(2) Gen 5' T-Arm	2	3.889	0.997	0.003	1449

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
1.750	10	2.250	101281.972	104016.224	43.245		Plate	0.80
			243576.145	404336.400	54.000			
			0.42	0.26	0.80			

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 P _u /φP _n
L1	102.92 - 90 (1)	TP13x13x0.25	12.920	102.920	273.9	10.014	-657.373	30149.199	0.022
L2	90 - 45.08 (2)	TP26.793x13x0.25	44.920	102.920	164.2	16.817	-17752.801	140996.000	0.126
L3	45.08 - 0 (3)	TP40x25.113x0.313	48.920	102.920	87.7	39.365	-13671.300	1109320.000	0.012

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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	102.92 - 90 (1)	TP13x13x0.25	5607.684	106695.000	0.053	0.000	106695.000	0.000
L2	90 - 45.08 (2)	TP26.793x13x0.25	333090.000	542403.333	0.614	0.000	542403.333	0.000
L3	45.08 - 0 (3)	TP40x25.113x0.313	1079316.667	2195616.667	0.492	0.000	2195616.667	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	102.92 - 90 (1)	TP13x13x0.25	672.145	94630.703	0.007	0.002	106077.500	0.000
L2	90 - 45.08 (2)	TP26.793x13x0.25	16684.100	295143.000	0.057	443.318	547797.500	0.001
L3	45.08 - 0 (3)	TP40x25.113x0.313	18715.500	690856.000	0.027	441.491	2401166.667	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	102.92 - 90 (1)	0.022	0.053	0.000	0.007	0.000	0.074	1.000	4.8.2 ✓
L2	90 - 45.08 (2)	0.126	0.614	0.000	0.057	0.001	0.743	1.000	4.8.2 ✓
L3	45.08 - 0 (3)	0.012	0.492	0.000	0.027	0.000	0.505	1.000	4.8.2 ✓

Reinforcing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L3	62.5 - 32.25	4x1 1/4	30.252	2.000	66.5 K=1.00	5.000	-131010.000	192094.000	0.682 ¹
L3	32.25 - 0	4.25 x 1.25	32.253	2.000	66.5 K=1.00	5.313	-170122.000	204100.000	0.834 ¹

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¹ $P_u / \phi P_n$ controls

Reinforcing 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 $\frac{M_{uy}}{\phi M_{ny}}$
L3	62.5 - 32.25	4x1 1/4	0.074	24375.000	0.000	-99.691	7617.191	0.013
L3	32.25 - 0	4.25 x 1.25	0.000	27517.083	0.000	-0.000	8093.258	0.000

Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	62.5 - 32.25	4x1 1/4	0.682	0.000	0.013	0.682 ¹	1.000	4.8.1 ✓
L3	32.25 - 0	4.25 x 1.25	0.834	0.000	0.000	0.834 ¹	1.000	4.8.1 ✓

¹ $P_u / \phi P_n$ controls

Tension Checks

Reinforcing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in ²	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L3	62.5 - 32.25	4x1 1/4	30.252	2.000	66.5	4.063	121790.000	243750.000	0.500 ¹
L3	32.25 - 0	4.25 x 1.25	32.253	2.000	66.5	4.375	159632.000	262500.000	0.608 ¹

¹ $P_u / \phi P_n$ controls

Reinforcing 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 $\frac{M_{uy}}{\phi M_{ny}}$
L3	62.5 - 32.25	4x1 1/4	-1.180	24375.000	0.000	-110.859	7617.191	0.015
L3	32.25 - 0	4.25 x 1.25	1833.758	27517.083	0.067	0.020	8093.258	0.000

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Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$			
L3	62.5 - 32.25	4x1 1/4	0.500	0.000	0.015	0.500 ¹	1.000	4.8.1 ✓
L3	32.25 - 0	4.25 x 1.25	0.608	0.067	0.000	0.608 ¹	1.000	4.8.1 ✓

¹ $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
L1	102.92 - 90	Pole	TP13x13x0.25	1	-657.373	30149.199	7.4	Pass	
L2	90 - 45.08	Pole	TP26.793x13x0.25	2	-17752.801	140996.000	74.3	Pass	
L3	45.08 - 0	Pole	TP40x25.113x0.313	3	89612.797	2302850.000	50.5	Pass	
	62.5 - 32.25	Reinforcing	4x1 1/4	8	-131010.000	192094.000	68.2	Pass	
	32.25 - 0	Reinforcing	4.25 x 1.25	5	-170122.000	204100.000	83.4	Pass	
							Summary		
							Pole (L2)	74.3	Pass
							Reinforcing (L3)	83.4	Pass
							Base Plate	80.1	Pass
							RATING =	83.4	Pass

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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: 0.000 ft.

Basic wind speed of 125 mph.

Risk Category II.

Exposure Category B.

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

Topographic Category: 1.

Crest Height: 0.000 ft.

Nominal ice thickness of 1.000 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.

Weld together tower sections have flange connections..

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..

Welds are fabricated with ER-70S-6 electrodes..

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.

Options

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity √ Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) SR Members Have Cut Ends SR Members Are Concentric | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas Add IBC .6D+W Combination Sort Capacity Reports By Component √ Triangulate Diamond Inner Bracing Treat Feed Line Bundles As Cylinder Ignore KL/ry For 60 Deg. Angle Legs | <ul style="list-style-type: none"> Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feed Line Torque Include Angle Block Shear Check Use TIA-222-H Bracing Resist. Exemption Use TIA-222-H Tension Splice Exemption <div style="background-color: #e0e0e0; text-align: center; padding: 2px;">Poles</div> <ul style="list-style-type: none"> Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets Pole Without Linear Attachments Pole With Shroud Or No Appurtenances Outside and Inside Corner Radii Are Known |
|--|---|--|

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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	102.920-90.000	12.920	0.000	Round	13.000	13.000	0.250		A53-B-35 (35 ksi)
L2	90.000-45.080	44.920	3.840	18	13.000	26.793	0.250	1.000	A572-65 (65 ksi)
L3	45.080-0.000	48.920		18	25.113	40.000	0.313	1.250	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in ²	I in ⁴	r in	C in	I/C in ³	J in ⁴	It/Q in ²	w in	w/t
L1	13.000	10.014	203.562	4.509	6.500	31.317	407.125	5.004	0.000	0
L2	13.162	10.117	207.785	4.526	6.604	31.464	415.844	5.060	1.848	7.392
L3	26.639	24.599	1911.609	8.804	12.758	149.840	3825.733	12.302	3.870	12.384
	40.569	39.365	7833.496	14.089	20.320	385.507	15677.299	19.686	6.490	20.768

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 102.920-90.000 0				1	1	1			
L2 90.000-45.080 0				1	1	1			
L3 45.080-0.000				1	1	1			

Pole Reinforcing Data

Height Above Base ft	Segment Length ft	No. of Segments	Offset in	Grade	Type	Size	Unbraced Length ft	K	Bolt Hole Dia. in	Bolts per Row	Shear Lag Factor U
32.250	30.250	4	0.000	A572-65 (65 ksi)	Flat Bar	4x1 1/4	2.000	1.00	0.750	1	1.000
0.000	32.250	4	0.000	A572-65 (65 ksi)	Flat Bar	4.25 x 1.25	2.000	1.00	0.750	1	1.000

Monopole Base Plate Data

Base Plate Data

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Base Plate Data	
Base plate is square	
Base plate is grouted	
Anchor bolt grade	A615-75
Anchor bolt size	2.250 in
Number of bolts	10
Embedment length	60.000 in
f _c	4.000 ksi
Grout space	2.000 in
Base plate grade	A572-60
Base plate thickness	1.750 in
Bolt circle diameter	48.000 in
Outer diameter	53.500 in
Inner diameter	38.500 in
Base plate type	Plain Plate

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Hybrid Cable (TMO)	C	Yes	Surface Ar (CaAa)	72.000 - 0.000	3	3	0.000 - 0.000	1.980		0.820

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} ft ² /ft	Weight plf
*									
LDF6-50A (1-1/4 FOAM) (ATT)	C	No	Yes	Inside Pole	90.000 - 20.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.660 0.660 0.660
DC Power (ATT)	C	No	Yes	Inside Pole	9.000 - 20.000	3	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.000 1.000 1.000
Fiber (ATT)	C	No	Yes	Inside Pole	9.000 - 20.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	1.000 1.000 1.000
LDF5-50A (7/8 FOAM) (VZW)	B	No	Yes	Inside Pole	82.000 - 20.000	6	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.330 0.330 0.330
LDF7-50A (1-5/8 FOAM) (VZW)	B	No	Yes	Inside Pole	82.000 - 20.000	2	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.820 0.820 0.820
LDF6-50A (1-1/4 FOAM)	C	No	Yes	Inside Pole	28.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.660 0.660 0.660
LDF4-50A (1/2 FOAM)	C	No	Yes	Inside Pole	28.000 - 0.000	8	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	0.150 0.150 0.150
*									
CU12PSM9P6XXX _6AWG (DISH)	C	No	Yes	Inside Pole	40.000 - 0.000	1	No Ice 1/2" Ice 1" Ice	0.000 0.000 0.000	2.346 2.346 2.346

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Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	102.920-90.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000	0.000
L2	90.000-45.080	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	133.650
		C	0.000	0.000	15.990	0.000	244.106
L3	45.080-0.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	90.790
		C	0.000	0.000	26.778	0.000	411.134

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} In Face ft ²	C _{AA} Out Face ft ²	Weight lb
L1	102.920-90.000	A	1.113	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	0.000	0.000	0.000
L2	90.000-45.080	A	1.071	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	133.650
		C		0.000	0.000	27.195	0.000	457.968
L3	45.080-0.000	A	0.957	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	90.790
		C		0.000	0.000	45.541	0.000	769.264

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
L2	1	Hybrid Cable	45.08 - 72.00	1.0000	1.0000
L3	1	Hybrid Cable	0.00 - 45.08	1.0000	1.0000

Discrete Tower Loads

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<i>Description</i>	<i>Face or Leg</i>	<i>Offset Type</i>	<i>Offsets: Horz Lateral Vert</i> <i>ft ft ft</i>	<i>Azimuth Adjustment</i> <i>°</i>	<i>Placement</i> <i>ft</i>	<i>CAAA Front</i> <i>ft²</i>	<i>CAAA Side</i> <i>ft²</i>	<i>Weight</i> <i>lb</i>
Gen 5' T-Arm (Abandoned)	A	From Leg	0.000 0.000 0.000	0.000	101.000	No Ice 2.720 1/2" Ice 4.910 1" Ice 7.100	2.720 4.910 7.100	50.000 90.000 130.000
Gen 5' T-Arm (Abandoned)	B	From Leg	0.000 0.000 0.000	0.000	101.000	No Ice 2.720 1/2" Ice 4.910 1" Ice 7.100	2.720 4.910 7.100	50.000 90.000 130.000
Gen 5' T-Arm (Abandoned)	C	From Leg	0.000 0.000 0.000	0.000	101.000	No Ice 2.720 1/2" Ice 4.910 1" Ice 7.100	2.720 4.910 7.100	50.000 90.000 130.000

QD6616-7 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 14.050 1/2" Ice 14.770 1" Ice 15.450	8.700 9.990 11.120	88.200 193.270 307.320
AIR6419 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 3.800 1/2" Ice 4.050 1" Ice 4.310	1.940 2.140 2.340	77.000 104.860 136.300
AIR6449 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 5.650 1/2" Ice 5.960 1" Ice 6.260	2.420 2.640 2.870	100.000 140.000 180.000
DMP65R-BU6D (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 13.200 1/2" Ice 13.910 1" Ice 14.587	7.515 8.795 9.927	125.200 220.255 324.041
RRUS32 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 2.860 1/2" Ice 3.080 1" Ice 3.320	1.780 1.970 2.170	60.000 80.000 100.000
RRUS4478 B14 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 2.020 1/2" Ice 2.200 1" Ice 2.390	1.250 1.400 1.550	60.000 80.000 100.000
RRUS32 B2 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 2.740 1/2" Ice 2.960 1" Ice 3.190	1.670 1.860 2.050	50.000 70.000 100.000
RRUS 4426 B66 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 1.640 1/2" Ice 1.800 1" Ice 1.970	0.730 0.840 0.980	50.000 60.000 80.000
Radio 4415 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 1.840 1/2" Ice 2.010 1" Ice 2.190	0.820 0.940 1.070	50.000 60.000 80.000
DC6-48-60-18-8F (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 1.210 1/2" Ice 1.890 1" Ice 2.110	1.210 1.890 2.110	30.000 50.000 80.000
Radio 4449 (ATT)	A	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 1.640 1/2" Ice 1.800 1" Ice 1.970	1.290 1.440 1.590	70.000 90.000 110.000
*								
QD6616-7 (ATT)	B	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 14.050 1/2" Ice 14.770 1" Ice 15.450	8.700 9.990 11.120	88.200 193.270 307.320
AIR6419 (ATT)	B	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 3.800 1/2" Ice 4.050 1" Ice 4.310	1.940 2.140 2.340	77.000 104.860 136.300
AIR6449 (ATT)	B	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 5.650 1/2" Ice 5.960 1" Ice 6.260	2.420 2.640 2.870	100.000 140.000 180.000
DMP65R-BU6D (ATT)	B	From Leg	4.000 0.000 0.000	0.000	90.000	No Ice 13.200 1/2" Ice 13.910 1" Ice 14.587	7.515 8.795 9.927	125.200 220.255 324.041
RRUS32	B	From Leg	4.000	0.000	90.000	No Ice 2.860	1.780	60.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight lb
			Horz Lateral ft	Vert ft					
(ATT)			0.000			1/2" Ice	3.080	1.970	80.000
			0.000			1" Ice	3.320	2.170	100.000
RRUS4478 B14	B	From Leg	4.000		0.000	No Ice	2.020	1.250	60.000
(ATT)			0.000			1/2" Ice	2.200	1.400	80.000
			0.000			1" Ice	2.390	1.550	100.000
RRUS32 B2	B	From Leg	4.000		0.000	No Ice	2.740	1.670	50.000
(ATT)			0.000			1/2" Ice	2.960	1.860	70.000
			0.000			1" Ice	3.190	2.050	100.000
RRUS 4426 B66	B	From Leg	4.000		0.000	No Ice	1.640	0.730	50.000
(ATT)			0.000			1/2" Ice	1.800	0.840	60.000
			0.000			1" Ice	1.970	0.980	80.000
Radio 4415	B	From Leg	4.000		0.000	No Ice	1.840	0.820	50.000
(ATT)			0.000			1/2" Ice	2.010	0.940	60.000
			0.000			1" Ice	2.190	1.070	80.000
DC6-48-60-18-8F	B	From Leg	4.000		0.000	No Ice	1.210	1.210	30.000
(ATT)			0.000			1/2" Ice	1.890	1.890	50.000
			0.000			1" Ice	2.110	2.110	80.000
Radio 4449	B	From Leg	4.000		0.000	No Ice	1.640	1.290	70.000
(ATT)			0.000			1/2" Ice	1.800	1.440	90.000
			0.000			1" Ice	1.970	1.590	110.000
*									
QD6616-7	C	From Leg	4.000		0.000	No Ice	14.050	8.700	88.200
(ATT)			0.000			1/2" Ice	14.770	9.990	193.270
			0.000			1" Ice	15.450	11.120	307.320
AIR6419	C	From Leg	4.000		0.000	No Ice	3.800	1.940	77.000
(ATT)			0.000			1/2" Ice	4.050	2.140	104.860
			0.000			1" Ice	4.310	2.340	136.300
AIR6449	C	From Leg	4.000		0.000	No Ice	5.650	2.420	100.000
(ATT)			0.000			1/2" Ice	5.960	2.640	140.000
			0.000			1" Ice	6.260	2.870	180.000
DMP65R-BU6D	C	From Leg	4.000		0.000	No Ice	13.200	7.515	125.200
(ATT)			0.000			1/2" Ice	13.910	8.795	220.255
			0.000			1" Ice	14.587	9.927	324.041
RRUS32	C	From Leg	4.000		0.000	No Ice	2.860	1.780	60.000
(ATT)			0.000			1/2" Ice	3.080	1.970	80.000
			0.000			1" Ice	3.320	2.170	100.000
RRUS4478 B14	C	From Leg	4.000		0.000	No Ice	2.020	1.250	60.000
(ATT)			0.000			1/2" Ice	2.200	1.400	80.000
			0.000			1" Ice	2.390	1.550	100.000
RRUS32 B2	C	From Leg	4.000		0.000	No Ice	2.740	1.670	50.000
(ATT)			0.000			1/2" Ice	2.960	1.860	70.000
			0.000			1" Ice	3.190	2.050	100.000
RRUS 4426 B66	C	From Leg	4.000		0.000	No Ice	1.640	0.730	50.000
(ATT)			0.000			1/2" Ice	1.800	0.840	60.000
			0.000			1" Ice	1.970	0.980	80.000
Radio 4415	C	From Leg	4.000		0.000	No Ice	1.840	0.820	50.000
(ATT)			0.000			1/2" Ice	2.010	0.940	60.000
			0.000			1" Ice	2.190	1.070	80.000
DC9-48-60-24-8C-EV	C	From Leg	4.000		0.000	No Ice	4.788	4.788	16.000
(ATT)			0.000			1/2" Ice	6.729	6.729	186.360
			0.000			1" Ice	8.670	8.670	356.720
Radio 4449	C	From Leg	4.000		0.000	No Ice	1.640	1.290	70.000
(ATT)			0.000			1/2" Ice	1.800	1.440	90.000
			0.000			1" Ice	1.970	1.590	110.000
*									
Platform	C	None			0.000	No Ice	41.000	41.000	2500.000
(ATT)						1/2" Ice	56.000	56.000	3000.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment °	Placement ft	CAAA Front ft ²	CAAA Side ft ²	Weight lb
			Horz Lateral ft	Vert ft					
Ladder (ATT)	C	None			0.000	90.000	1" Ice 71.000 No Ice 7.070 1/2" Ice 9.730 1" Ice 11.190	71.000 7.070 9.730 11.190	3500.000 40.000 70.000 80.000

(2) MX06FRO660-03 (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 10.110 1/2" Ice 10.680 1" Ice 11.220	8.990 10.150 11.030	100.000 190.000 290.000
BXA-70063-6CF-EDIN-X (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 7.810 1/2" Ice 8.360 1" Ice 8.870	5.800 6.950 7.820	60.000 120.000 190.000
VZS01 (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 5.910 1/2" Ice 6.720 1" Ice 7.440	3.740 4.790 5.700	120.000 170.000 220.000
B2/B66a RRH-BR049 (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
B5/B13 RRH-BR04C (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
(2) DB-B1-6C-12AB-OZ (VZW)	A	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 3.360 1/2" Ice 3.600 1" Ice 3.840	2.190 2.400 2.610	30.000 60.000 90.000
*									
(2) MX06FRO660-03 (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 10.110 1/2" Ice 10.680 1" Ice 11.220	8.990 10.150 11.030	100.000 190.000 290.000
BXA-70063-6CF-EDIN-X (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 7.810 1/2" Ice 8.360 1" Ice 8.870	5.800 6.950 7.820	60.000 120.000 190.000
VZS01 (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 5.910 1/2" Ice 6.720 1" Ice 7.440	3.740 4.790 5.700	120.000 170.000 220.000
B2/B66a RRH-BR049 (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
B5/B13 RRH-BR04C (VZW)	B	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
*									
(2) MX06FRO660-03 (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 10.110 1/2" Ice 10.680 1" Ice 11.220	8.990 10.150 11.030	100.000 190.000 290.000
BXA-70063-6CF-EDIN-X (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 7.810 1/2" Ice 8.360 1" Ice 8.870	5.800 6.950 7.820	60.000 120.000 190.000
VZS01 (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 5.910 1/2" Ice 6.720 1" Ice 7.440	3.740 4.790 5.700	120.000 170.000 220.000
B2/B66a RRH-BR049 (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
B5/B13 RRH-BR04C (VZW)	C	From Leg	4.000 0.000 0.000		0.000	82.000	No Ice 1.880 1/2" Ice 2.050 1" Ice 2.220	1.010 1.140 1.280	70.000 90.000 110.000
*									
Platform	C	None			0.000	82.000	No Ice 41.000	41.000	2500.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
(VZW)						1/2" Ice	56.000	56.000	3000.000
						1" Ice	71.000	71.000	3500.000
Ladder (VZW)	C	None			0.000	No Ice	7.070	7.070	40.000
						1/2" Ice	9.730	9.730	70.000
						1" Ice	11.190	11.190	80.000

APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	A	From Leg	4.000	0.000	0.000	No Ice	20.267	10.644	179.100
			0.000			1/2" Ice	20.915	12.070	312.118
			0.000			1" Ice	21.570	13.348	455.740
AIR 6449 B41 [P2.0][96"] (TMO)	A	From Leg	4.000	0.000	0.000	No Ice	6.927	4.316	132.200
			0.000			1/2" Ice	7.772	5.370	191.882
			0.000			1" Ice	8.522	6.275	257.858
VV-65A-R1 [P2.0][96"] (TMO)	A	From Leg	4.000	0.000	0.000	No Ice	6.704	4.631	53.000
			0.000			1/2" Ice	7.423	5.800	107.657
			0.000			1" Ice	8.082	6.821	169.212
RRU 4480 B71+B85 (TMO)	A	From Leg	4.000	0.000	0.000	No Ice	2.878	1.397	81.000
			0.000			1/2" Ice	3.091	1.558	102.854
			0.000			1" Ice	3.312	1.727	127.832
RRU 4460 B25+B66 (TMO)	A	From Leg	4.000	0.000	0.000	No Ice	2.564	1.976	109.000
			0.000			1/2" Ice	2.764	2.156	134.383
			0.000			1" Ice	2.971	2.343	163.033
*									
APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	B	From Leg	4.000	0.000	0.000	No Ice	20.267	10.644	179.100
			0.000			1/2" Ice	20.915	12.070	312.118
			0.000			1" Ice	21.570	13.348	455.740
AIR 6449 B41 [P2.0][96"] (TMO)	B	From Leg	4.000	0.000	0.000	No Ice	6.927	4.316	132.200
			0.000			1/2" Ice	7.772	5.370	191.882
			0.000			1" Ice	8.522	6.275	257.858
VV-65A-R1 [P2.0][96"] (TMO)	B	From Leg	4.000	0.000	0.000	No Ice	6.704	4.631	53.000
			0.000			1/2" Ice	7.423	5.800	107.657
			0.000			1" Ice	8.082	6.821	169.212
RRU 4480 B71+B85 (TMO)	B	From Leg	4.000	0.000	0.000	No Ice	2.878	1.397	81.000
			0.000			1/2" Ice	3.091	1.558	102.854
			0.000			1" Ice	3.312	1.727	127.832
RRU 4460 B25+B66 (TMO)	B	From Leg	4.000	0.000	0.000	No Ice	2.564	1.976	109.000
			0.000			1/2" Ice	2.764	2.156	134.383
			0.000			1" Ice	2.971	2.343	163.033
*									
APXVAALL24_43-U-NA20 [P2.0][96"] (TMO)	C	From Leg	4.000	0.000	0.000	No Ice	20.267	10.644	179.100
			0.000			1/2" Ice	20.915	12.070	312.118
			0.000			1" Ice	21.570	13.348	455.740
AIR 6449 B41 [P2.0][96"] (TMO)	C	From Leg	4.000	0.000	0.000	No Ice	6.927	4.316	132.200
			0.000			1/2" Ice	7.772	5.370	191.882
			0.000			1" Ice	8.522	6.275	257.858
VV-65A-R1 [P2.0][96"] (TMO)	C	From Leg	4.000	0.000	0.000	No Ice	6.704	4.631	53.000
			0.000			1/2" Ice	7.423	5.800	107.657
			0.000			1" Ice	8.082	6.821	169.212
RRU 4480 B71+B85 (TMO)	C	From Leg	4.000	0.000	0.000	No Ice	2.878	1.397	81.000
			0.000			1/2" Ice	3.091	1.558	102.854
			0.000			1" Ice	3.312	1.727	127.832
RRU 4460 B25+B66 (TMO)	C	From Leg	4.000	0.000	0.000	No Ice	2.564	1.976	109.000
			0.000			1/2" Ice	2.764	2.156	134.383
			0.000			1" Ice	2.971	2.343	163.033
*									
F4P-HRK8 (TMO)	C	None			0.000	No Ice	7.250	7.250	465.000
						1/2" Ice	9.860	9.860	551.000
						1" Ice	11.760	11.760	670.000

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	CAAA Front	CAAA Side	Weight
			Horz	Vert					
			Lateral		°	ft	ft ²	ft ²	lb
			ft	ft					
F4P-8W (TMO)	C	None			0.000	72.000	No Ice 42.430 1/2" Ice 52.000 1" Ice 64.650	42.430 52.000 64.650	2283.000 2912.000 3796.000

(2) Gen 5' T-Arm	A	From Leg	1.000 0.000 0.000		0.000	28.000	No Ice 2.720 1/2" Ice 4.910 1" Ice 7.100	2.720 4.910 7.100	50.000 90.000 130.000
Gen 14' T-Arm	A	From Leg	1.000 0.000 0.000		0.000	28.000	No Ice 3.500 1/2" Ice 5.250 1" Ice 7.880	1.600 2.400 3.600	340.000 410.000 490.000
20' x 3" Omni	A	From Leg	1.000 0.000 14.000		0.000	28.000	No Ice 6.000 1/2" Ice 8.033 1" Ice 10.083	6.000 8.033 10.083	100.000 143.168 199.011
(2) 10' x 3" Omni	A	From Leg	1.000 0.000 8.000		0.000	28.000	No Ice 3.000 1/2" Ice 4.033 1" Ice 5.027	3.000 4.033 5.027	15.000 36.788 65.142
(3) 10' x 3" Omni	A	From Leg	1.000 0.000 6.000		0.000	28.000	No Ice 3.000 1/2" Ice 4.033 1" Ice 5.027	3.000 4.033 5.027	15.000 36.788 65.142
GPS	A	From Leg	1.000 0.000 2.000		0.000	28.000	No Ice 0.260 1/2" Ice 0.320 1" Ice 0.390	0.260 0.320 0.390	5.000 10.000 15.000

MX08FRO665-21 [P3.0][96"] (DISH)	A	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 13.189 1/2" Ice 13.837 1" Ice 14.463	8.667 9.730 10.684	125.140 229.115 343.808
TA08025-B604 (DISH)	A	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	0.981 1.112 1.250	60.000 80.000 100.000
TA08025-B605 (DISH)	A	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	1.129 1.267 1.411	80.000 90.000 100.000
*									
MX08FRO665-21 [P3.0][96"] (DISH)	B	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 13.189 1/2" Ice 13.837 1" Ice 14.463	8.667 9.730 10.684	125.140 229.115 343.808
TA08025-B604 (DISH)	B	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	0.981 1.112 1.250	60.000 80.000 100.000
TA08025-B605 (DISH)	B	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	1.129 1.267 1.411	80.000 90.000 100.000
*									
MX08FRO665-21 [P3.0][96"] (DISH)	C	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 13.189 1/2" Ice 13.837 1" Ice 14.463	8.667 9.730 10.684	125.140 229.115 343.808
TA08025-B604 (DISH)	C	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	0.981 1.112 1.250	60.000 80.000 100.000
TA08025-B605 (DISH)	C	From Leg	4.000 0.000 0.000		0.000	62.500	No Ice 1.964 1/2" Ice 2.138 1" Ice 2.320	1.129 1.267 1.411	80.000 90.000 100.000
*									
MC-PK8-DSH (8ft Snub Nose Platform) (DISH)	C	None			0.000	62.500	No Ice 37.590 1/2" Ice 41.460 1" Ice 53.080	37.590 41.460 53.080	1727.000 1766.500 2280.600

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Tower Pressures - No Ice

$G_H = 1.100$

Section Elevation	z	K_Z	q_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 102.920-90.000	96.460	0.978	37.168	13.997	A	0.000	13.997	13.997	100.00	0.000	0.000
					B	0.000	13.997		100.00	0.000	0.000
					C	0.000	13.997		100.00	0.000	0.000
L2 90.000-45.080	65.461	0.876	33.101	75.483	A	0.000	75.483	75.483	100.00	0.000	0.000
					B	0.000	75.483		100.00	0.000	0.000
					C	0.000	75.483		100.00	0.000	0.000
L3 45.080-0.000	21.157	0.7	26.979	126.239	A	0.000	126.239	126.239	100.00	15.990	0.000
					B	0.000	126.239		100.00	0.000	0.000
					C	0.000	126.239		100.00	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.100$

Section Elevation	z	K_Z	q_z	t_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	in	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 102.920-90.000	96.460	0.978	5.947	1.113	16.394	A	0.000	16.394	16.394	100.00	0.000	0.000
						B	0.000	16.394		100.00	0.000	0.000
						C	0.000	16.394		100.00	0.000	0.000
L2 90.000-45.080	65.461	0.876	5.296	1.071	83.500	A	0.000	83.500	83.500	100.00	0.000	0.000
						B	0.000	83.500		100.00	0.000	0.000
						C	0.000	83.500		100.00	27.195	0.000
L3 45.080-0.000	21.157	0.7	4.317	0.957	134.285	A	0.000	134.285	134.285	100.00	0.000	0.000
						B	0.000	134.285		100.00	0.000	0.000
						C	0.000	134.285		100.00	45.541	0.000

Tower Pressure - Service

$G_H = 1.100$

Section Elevation	z	K_Z	q_z	A_G	F a c e	A_F	A_R	A_{leg}	Leg %	C_{AA} In Face	C_{AA} Out Face
ft	ft		psf	ft ²	e	ft ²	ft ²	ft ²		ft ²	ft ²
L1 102.920-90.000	96.460	0.978	7.662	13.997	A	0.000	13.997	13.997	100.00	0.000	0.000
					B	0.000	13.997		100.00	0.000	0.000
					C	0.000	13.997		100.00	0.000	0.000
L2 90.000-45.080	65.461	0.876	6.824	75.483	A	0.000	75.483	75.483	100.00	0.000	0.000
					B	0.000	75.483		100.00	0.000	0.000

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Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F _{a c e}	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _{AA} In Face ft ²	C _{AA} Out Face ft ²
L3 45.080-0.000	21.157	0.7	5.562	126.239	C	0.000	75.483			15.990	0.000
					A	0.000	126.239	126.239	100.00	0.000	0.000
					B	0.000	126.239		100.00	0.000	0.000
					C	0.000	126.239		100.00	26.778	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F _{a c e}	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	440.249	A	1	0.6	37.16	1	1	13.997	343.351	26.575	C
			B	1	0.6	8	1	1	13.997			
			C	1	0.6		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	33.10	1	1	75.483	2006.347	44.665	C
			B	1	0.73	1	1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	26.97	1	1	126.239	2734.880	60.667	C
			B	1	0.73	9	1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	222318.08 0 lb-ft	5084.578		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F _{a c e}	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	440.249	A	1	0.6	37.16	1	1	13.997	343.351	26.575	C
			B	1	0.6	8	1	1	13.997			
			C	1	0.6		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	33.10	1	1	75.483	2006.347	44.665	C
			B	1	0.73	1	1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	26.97	1	1	126.239	2734.880	60.667	C
			B	1	0.73	9	1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	222318.08 0 lb-ft	5084.578		

Tower Forces - No Ice - Wind 90 To Face

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Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	440.249	A	1	0.6	37.16	1	1	13.997	343.351	26.575	C
0			B	1	0.6	8	1	1	13.997			
L2 90.000-45.080	377.757	2382.878	C	1	0.6		1	1	13.997			
A			A	1	0.73	33.10	1	1	75.483	2006.347	44.665	C
B			B	1	0.73	1	1	1	75.483			
C			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	26.97	1	1	126.239	2734.880	60.667	C
B			B	1	0.73	9	1	1	126.239			
C			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	222318.08 0 lb-ft	5084.578		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	688.246	A	1	1.2	5.947	1	1	16.394	128.690	9.961	C
0			B	1	1.2		1	1	16.394			
L2 90.000-45.080	591.618	3627.845	C	1	1.2		1	1	16.394			
A			A	1	1.2	5.296	1	1	83.500	583.746	12.995	C
B			B	1	1.2		1	1	83.500			
C			C	1	1.2		1	1	83.500			
L3 45.080-0.000	860.054	13069.704	A	1	1.2	4.317	1	1	133.426	760.260	16.865	C
B			B	1	1.2		1	1	133.426			
C			C	1	1.2		1	1	133.426			
Sum Weight:	1451.672	17385.796						OTM	66710.585 lb-ft	1472.696		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	F a c e	e	C _F	q _z psf	D _F	D _R	A _E ft ²	F lb	w plf	Ctrl. Face
L1 102.920-90.000	0.000	688.246	A	1	1.2	5.947	1	1	16.394	128.690	9.961	C
0			B	1	1.2		1	1	16.394			
L2 90.000-45.080	591.618	3627.845	C	1	1.2		1	1	16.394			
A			A	1	1.2	5.296	1	1	83.500	583.746	12.995	C
B			B	1	1.2		1	1	83.500			
C			C	1	1.2		1	1	83.500			
L3 45.080-0.000	860.054	13069.704	A	1	1.2	4.317	1	1	133.426	760.260	16.865	C
B			B	1	1.2		1	1	133.426			
C			C	1	1.2		1	1	133.426			
Sum Weight:	1451.672	17385.796						OTM	66710.585 lb-ft	1472.696		

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Tower Forces - With Ice - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	688.246	A	1	1.2	5.947	1	1	16.394	128.690	9.961	C
0			B	1	1.2		1	1	16.394			
L2 90.000-45.080	591.618	3627.845	C	1	1.2		1	1	16.394			
A			A	1	1.2	5.296	1	1	83.500	583.746	12.995	C
B			B	1	1.2		1	1	83.500			
C			C	1	1.2		1	1	83.500			
L3 45.080-0.000	860.054	13069.704	A	1	1.2	4.317	1	1	133.426	760.260	16.865	C
B			B	1	1.2		1	1	133.426			
C			C	1	1.2		1	1	133.426			
Sum Weight:	1451.672	17385.796						OTM	66710.585 lb-ft	1472.696		

Tower Forces - Service - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.728	7.662	1	1	13.997	85.882	6.647	C
0			B	1	0.728		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	C	1	0.728		1	1	13.997			
A			A	1	0.73	6.824	1	1	75.483	413.603	9.208	C
B			B	1	0.73		1	1	75.483			
C			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	5.562	1	1	126.239	563.788	12.506	C
B			B	1	0.73		1	1	126.239			
C			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	47286.978 lb-ft	1063.274		

Tower Forces - Service - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.728	7.662	1	1	13.997	85.882	6.647	C
0			B	1	0.728		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	C	1	0.728		1	1	13.997			
A			A	1	0.73	6.824	1	1	75.483	413.603	9.208	C
B			B	1	0.73		1	1	75.483			
C			C	1	0.73		1	1	75.483			

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Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L3 45.080-0.000	501.923	9714.912	A	1	0.73	5.562	1	1	126.239	563.788	12.506	C
			B	1	0.73		1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	47286.978 lb-ft	1063.274		

Tower Forces - Service - Wind 90 To Face

Section Elevation	Add Weight	Self Weight	F a c e	e	C _F	q _z	D _F	D _R	A _E	F	w	Ctrl. Face
ft	lb	lb				psf			ft ²	lb	plf	
L1 102.920-90.000	0.000	440.249	A	1	0.728	7.662	1	1	13.997	85.882	6.647	C
			B	1	0.728		1	1	13.997			
			C	1	0.728		1	1	13.997			
L2 90.000-45.080	377.757	2382.878	A	1	0.73	6.824	1	1	75.483	413.603	9.208	C
			B	1	0.73		1	1	75.483			
			C	1	0.73		1	1	75.483			
L3 45.080-0.000	501.923	9714.912	A	1	0.73	5.562	1	1	126.239	563.788	12.506	C
			B	1	0.73		1	1	126.239			
			C	1	0.73		1	1	126.239			
Sum Weight:	879.680	12538.038						OTM	47286.978 lb-ft	1063.274		

Force Totals

Load Case	Vertical Forces	Sum of Forces X	Sum of Forces Z	Sum of Overturning Moments, M _x	Sum of Overturning Moments, M _z	Sum of Torques
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Leg Weight	8147.036					
Bracing Weight	4391.002					
Total Member Self-Weight	12538.038			-1743.653	-55.065	
Total Weight	30088.238			-1743.653	-55.065	
Wind 0 deg - No Ice		0.000	-22410.247	-1567573.618	-55.065	-451.271
Wind 30 deg - No Ice		11140.794	-19407.843	-1357792.181	-779196.021	-1502.044
Wind 60 deg - No Ice		19296.421	-11205.124	-784658.635	-1349566.786	-2150.346
Wind 90 deg - No Ice		22281.587	0.000	-1743.653	-1558336.976	-2222.464
Wind 120 deg - No Ice		19296.421	11205.124	781171.330	-1349566.786	-1699.075
Wind 150 deg - No Ice		11140.794	19407.843	1354304.876	-779196.021	-720.420
Wind 180 deg - No Ice		0.000	22410.247	1564086.313	-55.065	451.271
Wind 210 deg - No Ice		-11140.794	19407.843	1354304.876	779085.891	1502.044
Wind 240 deg - No Ice		-19296.421	11205.124	781171.330	1349456.657	2150.346
Wind 270 deg - No Ice		-22281.587	0.000	-1743.653	1558226.847	2222.464
Wind 300 deg - No Ice		-19296.421	-11205.124	-784658.635	1349456.657	1699.075
Wind 330 deg - No Ice		-11140.794	-19407.843	-1357792.181	779085.891	720.420
Member Ice	4847.758					
Total Weight Ice	49656.797			-3175.659	1204.920	
Wind 0 deg - Ice		0.000	-5354.054	-369497.872	1204.920	-139.710

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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
Wind 30 deg - Ice		2660.944	-4636.747	-320420.002	-181172.484	-421.993
Wind 60 deg - Ice		4608.890	-2677.027	-186336.766	-314682.009	-591.204
Wind 90 deg - Ice		5321.888	0.000	-3175.659	-363549.887	-602.002
Wind 120 deg - Ice		4608.890	2677.027	179985.447	-314682.009	-451.494
Wind 150 deg - Ice		2660.944	4636.747	314068.683	-181172.484	-180.009
Wind 180 deg - Ice		0.000	5354.054	363146.554	1204.920	139.710
Wind 210 deg - Ice		-2660.944	4636.747	314068.683	183582.323	421.993
Wind 240 deg - Ice		-4608.890	2677.027	179985.447	317091.849	591.204
Wind 270 deg - Ice		-5321.888	0.000	-3175.659	365959.727	602.002
Wind 300 deg - Ice		-4608.890	-2677.027	-186336.766	317091.849	451.494
Wind 330 deg - Ice		-2660.944	-4636.747	-320420.002	183582.323	180.009
Total Weight	30088.238			-1743.653	-55.065	
Wind 0 deg - Service		0.000	-4634.915	-325992.070	-55.065	-93.028
Wind 30 deg - Service		2304.196	-4013.954	-282551.020	-161401.268	-309.642
Wind 60 deg - Service		3990.985	-2317.458	-163867.862	-279514.886	-443.288
Wind 90 deg - Service		4608.392	0.000	-1743.653	-322747.471	-458.155
Wind 120 deg - Service		3990.985	2317.458	160380.556	-279514.886	-350.260
Wind 150 deg - Service		2304.196	4013.954	279063.714	-161401.268	-148.513
Wind 180 deg - Service		0.000	4634.915	322504.765	-55.065	93.028
Wind 210 deg - Service		-2304.196	4013.954	279063.714	161291.138	309.642
Wind 240 deg - Service		-3990.985	2317.458	160380.556	279404.757	443.288
Wind 270 deg - Service		-4608.392	0.000	-1743.653	322637.342	458.155
Wind 300 deg - Service		-3990.985	-2317.458	-163867.862	279404.757	350.260
Wind 330 deg - Service		-2304.196	-4013.954	-282551.020	161291.138	148.513

Load Combinations

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

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Comb. No.	Description
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum 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	102.92 - 90	Pole	Max Tension	8	0.023	0.001	-0.457
			Max. Compression	26	-1224.699	-0.128	-1.602
			Max. Mx	8	-657.389	-5602.288	1.826
			Max. My	2	-657.283	1.805	5603.135
			Max. Vy	8	667.542	-5602.288	1.826
			Max. Vx	2	-667.657	1.805	5603.135
			Max. Torque	33			0.006
L2	90 - 45.08	Pole	Max Tension	36	87406.808	28686.962	173.306
			Max. Compression	26	-31610.388	1282.040	294.114
			Max. Mx	8	-17756.649	-331330.40	418.965
							0
			Max. My	2	-17752.808	-72.465	333090.208
			Max. Vy	8	16610.854	-331330.40	418.965
							0
L3	45.08 - 0	Pole	Max. Vx	2	-16684.105	-72.465	333090.208
			Max. Torque	17			-585.359
			Max Tension	38	97313.515	62577.121	105258.153
			Max. Compression	1	-18753.582	-30.554	1077.705
			Max. Mx	8	-13723.096	-1071191.7	1340.663
							77
			Max. My	2	-13671.262	-42.376	1079316.48
	32.25 - 62.5	Reinforcing	Max. Vy	21	-18398.051	1061757.70	997.098
							3
			Max. Vx	15	18726.134	-30.843	-1067586.1
							31
			Max. Torque	21			-2214.535
			Max Tension	8	121789.530	-1.180	-110.859
			Max. Compression	8	-131009.76	0.074	-99.691

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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	2	120936.365	1232.841	-0.039
			Max. My	8	121172.597	-0.650	-137.140
			Max. Vy	14	24.128	-1232.448	-0.039
			Max. Vx	8	15.760	-0.650	-137.140
	0 - 32.25	Reinforcing	Max Tension	2	159632.038	1833.760	0.020
			Max. Compression	2	-170122.07	0.000	-0.000
				8			
			Max. Mx	2	159632.038	1833.760	0.020
			Max. My	8	159175.327	-2.049	-191.242
			Max. Vy	2	65.351	1833.760	0.020
			Max. Vx	8	-14.405	-2.049	-191.242

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Pole	Max. Vert	1	18753.582	0.190	-4.836
	Max. H _x	21	8318.760	18391.325	-5.135
	Max. H _z	3	8273.213	-0.047	18711.487
	Max. M _x	2	1079316.489	0.015	18704.270
	Max. M _z	8	1071191.778	-18382.159	-6.543
	Max. Torsion	9	2213.559	-18391.004	-5.135
	Min. Vert	38	-89350.504	2360.228	4158.160
	Min. H _x	9	8317.275	-18391.004	-5.135
	Min. H _z	15	8317.615	-0.046	-18719.374
	Min. M _x	14	-1076635.500	0.016	-18714.756
	Min. M _z	20	-1071111.306	18382.592	-6.543
	Min. Torsion	21	-2213.570	18391.325	-5.135
	Reinf @ Azimuth 90 deg	Max. Vert	8	169638.465	-187.181
Max. H _x		20	-158410.727	3841.290	3.249
Max. H _z		12	87602.388	-601.161	922.937
Min. Vert		20	-158410.727	3841.290	3.249
Min. H _x		30	75364.501	-744.184	-2.431
Min. H _z		4	87616.342	-601.214	-926.186
Reinf @ Azimuth 0 deg	Max. Vert	2	170122.039	0.246	127.319
	Max. H _x	6	87970.728	882.478	574.969
	Max. H _z	27	75984.104	-0.833	734.282
	Min. Vert	14	-158405.906	-0.005	-3793.584
	Min. H _x	22	87971.024	-882.309	574.959
	Min. H _z	14	-158405.906	-0.005	-3793.584
Reinf @ Azimuth 270 deg	Max. Vert	20	169618.856	187.357	-2.618
	Max. H _x	36	75733.719	746.151	-2.443
	Max. H _z	16	87581.776	601.142	922.841
	Min. Vert	8	-158429.307	-3841.925	3.249
	Min. H _x	8	-158429.307	-3841.925	3.249
	Min. H _z	24	87595.727	601.195	-926.090
Reinf @ Azimuth 180 deg	Max. Vert	14	169610.663	0.245	-133.165
	Max. H _x	10	87468.688	876.950	-574.818
	Max. H _z	2	-158886.905	-0.005	3810.963
	Min. Vert	2	-158886.905	-0.005	3810.963
	Min. H _x	18	87468.981	-876.783	-574.809
	Min. H _z	33	75151.322	-0.824	-731.010

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Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
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Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overtuning Moment, M _x lb-ft	Overtuning Moment, M _z lb-ft	Torque lb-ft
Dead Only	30088.238	-0.005	0.022	-1743.350	-55.001	-0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	36105.847	-0.002	-22409.349	-1627664.695	-77.077	-441.868
0.9 Dead+1.0 Wind 0 deg - No Ice	27079.389	-0.002	-22409.655	-1611355.101	-56.451	-443.375
1.2 Dead+1.0 Wind 30 deg - No Ice	36105.873	11140.646	-19407.586	-1409937.653	-809054.019	-1417.421
0.9 Dead+1.0 Wind 30 deg - No Ice	27079.406	11140.699	-19407.679	-1395721.443	-801153.408	-1421.016
1.2 Dead+1.0 Wind 60 deg - No Ice	36105.873	19296.159	-11204.979	-814943.924	-1401265.222	-2067.959
0.9 Dead+1.0 Wind 60 deg - No Ice	27079.406	19296.253	-11205.031	-806500.640	-1387596.534	-2071.110
1.2 Dead+1.0 Wind 90 deg - No Ice	36105.847	22280.675	-0.002	-2163.251	-1617971.363	-2214.762
0.9 Dead+1.0 Wind 90 deg - No Ice	27079.389	22280.986	-0.002	-1607.106	-1602211.853	-2215.317
1.2 Dead+1.0 Wind 120 deg - No Ice	36105.873	19296.159	11204.978	810615.365	-1401261.472	-1768.095
0.9 Dead+1.0 Wind 120 deg - No Ice	27079.406	19296.253	11205.031	803284.953	-1387593.756	-1765.910
1.2 Dead+1.0 Wind 150 deg - No Ice	36105.873	11140.647	19407.586	1405604.751	-809050.257	-797.300
0.9 Dead+1.0 Wind 150 deg - No Ice	27079.406	11140.700	19407.679	1392502.533	-801150.621	-794.270
1.2 Dead+1.0 Wind 180 deg - No Ice	36105.847	-0.002	22409.351	1623329.746	-77.065	441.912
0.9 Dead+1.0 Wind 180 deg - No Ice	27079.390	-0.002	22409.656	1608134.637	-56.444	443.403
1.2 Dead+1.0 Wind 210 deg - No Ice	36105.873	-11140.648	19407.586	1405609.184	808898.453	1562.704
0.9 Dead+1.0 Wind 210 deg - No Ice	27079.406	-11140.701	19407.678	1392505.750	801039.411	1562.261
1.2 Dead+1.0 Wind 240 deg - No Ice	36105.873	-19296.160	11204.978	810619.802	1401114.786	2210.011
0.9 Dead+1.0 Wind 240 deg - No Ice	27079.406	-19296.254	11205.030	803288.174	1387486.262	2209.317
1.2 Dead+1.0 Wind 270 deg - No Ice	36105.847	-22280.676	-0.002	-2163.254	1617827.242	2214.782
0.9 Dead+1.0 Wind 270 deg - No Ice	27079.389	-22280.986	-0.002	-1607.107	1602106.216	2215.328
1.2 Dead+1.0 Wind 300 deg - No Ice	36105.873	-19296.159	-11204.978	-814948.368	1401118.526	1626.093
0.9 Dead+1.0 Wind 300 deg - No Ice	27079.406	-19296.253	-11205.031	-806503.866	1387489.035	1627.734
1.2 Dead+1.0 Wind 330 deg - No Ice	36105.873	-11140.647	-19407.586	-1409942.093	808902.195	652.092
0.9 Dead+1.0 Wind 330 deg - No Ice	27079.406	-11140.700	-19407.678	-1395724.665	801042.187	653.075
1.2 Dead+1.0 Ice+1.0 Temp	55792.959	1.235	0.451	-3531.738	1201.527	-0.353
1.2 Dead+1.0 Wind 0 deg+1.0	55792.959	0.005	-5353.562	-394285.122	1393.679	-163.579

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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
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 30 deg+1.0	55792.959	2660.701	-4636.320	-341957.097	-193114.805	-429.796
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 60 deg+1.0	55792.959	4608.465	-2676.780	-198994.634	-335504.721	-584.135
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 90 deg+1.0	55792.959	5321.396	0.003	-3704.426	-387622.893	-585.224
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 120 deg+1.0	55792.959	4608.465	2676.786	191585.618	-335504.427	-429.617
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 150 deg+1.0	55792.959	2660.701	4636.326	334547.755	-193114.507	-155.858
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180 deg+1.0	55792.959	0.005	5353.568	386875.623	1393.691	162.716
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210 deg+1.0	55792.959	-2660.690	4636.326	334548.070	195902.059	437.573
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240 deg+1.0	55792.959	-4608.454	2676.785	191585.942	338292.320	591.898
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270 deg+1.0	55792.959	-5321.385	0.003	-3704.402	390410.951	584.356
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300 deg+1.0	55792.959	-4608.454	-2676.780	-198994.917	338292.601	420.121
Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330 deg+1.0	55792.959	-2660.690	-4636.320	-341957.389	195902.336	146.353
Ice+1.0 Temp						
Dead+Wind 0 deg - Service	30088.234	-0.000	-4634.480	-336437.183	-59.543	-92.083
Dead+Wind 30 deg - Service	30088.234	2303.976	-4013.577	-291604.014	-166596.008	-305.519
Dead+Wind 60 deg - Service	30088.234	3990.604	-2317.239	-169117.672	-288509.050	-439.403
Dead+Wind 90 deg - Service	30088.234	4607.953	0.002	-1798.253	-333132.243	-457.853
Dead+Wind 120 deg - Service	30088.234	3990.605	2317.243	165521.097	-288508.929	-353.620
Dead+Wind 150 deg - Service	30088.234	2303.977	4013.582	288007.302	-166595.886	-152.328
Dead+Wind 180 deg - Service	30088.234	-0.000	4634.484	332840.401	-59.541	92.096
Dead+Wind 210 deg - Service	30088.234	-2303.978	4013.581	288007.444	166476.886	311.845
Dead+Wind 240 deg - Service	30088.234	-3990.605	2317.243	165521.239	288390.093	445.723
Dead+Wind 270 deg - Service	30088.234	-4607.954	0.002	-1798.253	333013.488	457.865
Dead+Wind 300 deg - Service	30088.234	-3990.605	-2317.239	-169117.815	288390.212	347.325
Dead+Wind 330 deg - Service	30088.234	-2303.977	-4013.577	-291604.157	166477.005	146.027

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.000	-30088.238	0.000	0.005	30088.238	-0.022	0.000%
2	0.000	-36105.885	-22410.247	0.002	36105.847	22409.349	0.002%
3	0.000	-27079.414	-22410.247	0.002	27079.389	22409.655	0.002%
4	11140.794	-36105.885	-19407.843	-11140.646	36105.873	19407.586	0.001%
5	11140.794	-27079.414	-19407.843	-11140.699	27079.406	19407.679	0.001%
6	19296.421	-36105.885	-11205.124	-19296.159	36105.873	11204.979	0.001%
7	19296.421	-27079.414	-11205.124	-19296.253	27079.406	11205.031	0.001%
8	22281.587	-36105.885	0.000	-22280.675	36105.847	0.002	0.002%
9	22281.587	-27079.414	0.000	-22280.986	27079.389	0.002	0.002%
10	19296.421	-36105.885	11205.124	-19296.159	36105.873	-11204.978	0.001%
11	19296.421	-27079.414	11205.124	-19296.253	27079.406	-11205.031	0.001%
12	11140.794	-36105.885	19407.843	-11140.647	36105.873	-19407.586	0.001%
13	11140.794	-27079.414	19407.843	-11140.700	27079.406	-19407.679	0.001%
14	0.000	-36105.885	22410.247	0.002	36105.847	-22409.351	0.002%
15	0.000	-27079.414	22410.247	0.002	27079.390	-22409.656	0.002%
16	-11140.794	-36105.885	19407.843	11140.648	36105.873	-19407.586	0.001%
17	-11140.794	-27079.414	19407.843	11140.701	27079.406	-19407.678	0.001%

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Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
18	-19296.421	-36105.885	11205.124	19296.160	36105.873	-11204.978	0.001%
19	-19296.421	-27079.414	11205.124	19296.254	27079.406	-11205.030	0.001%
20	-22281.587	-36105.885	0.000	22280.676	36105.847	0.002	0.002%
21	-22281.587	-27079.414	0.000	22280.986	27079.389	0.002	0.002%
22	-19296.421	-36105.885	-11205.124	19296.159	36105.873	11204.978	0.001%
23	-19296.421	-27079.414	-11205.124	19296.253	27079.406	11205.031	0.001%
24	-11140.794	-36105.885	-19407.843	11140.647	36105.873	19407.586	0.001%
25	-11140.794	-27079.414	-19407.843	11140.700	27079.406	19407.678	0.001%
26	0.000	-55792.964	0.000	-1.235	55792.959	-0.451	0.002%
27	0.000	-55792.964	-5354.054	-0.005	55792.959	5353.562	0.001%
28	2660.944	-55792.964	-4636.747	-2660.701	55792.959	4636.320	0.001%
29	4608.890	-55792.964	-2677.027	-4608.465	55792.959	2676.780	0.001%
30	5321.888	-55792.964	0.000	-5321.396	55792.959	-0.003	0.001%
31	4608.890	-55792.964	2677.027	-4608.465	55792.959	-2676.786	0.001%
32	2660.944	-55792.964	4636.747	-2660.701	55792.959	-4636.326	0.001%
33	0.000	-55792.964	5354.054	-0.005	55792.959	-5353.568	0.001%
34	-2660.944	-55792.964	4636.747	2660.690	55792.959	-4636.326	0.001%
35	-4608.890	-55792.964	2677.027	4608.454	55792.959	-2676.785	0.001%
36	-5321.888	-55792.964	0.000	5321.385	55792.959	-0.003	0.001%
37	-4608.890	-55792.964	-2677.027	4608.454	55792.959	2676.780	0.001%
38	-2660.944	-55792.964	-4636.747	2660.690	55792.959	4636.320	0.001%
39	0.000	-30088.238	-4634.915	0.000	30088.234	4634.480	0.001%
40	2304.196	-30088.238	-4013.954	-2303.976	30088.234	4013.577	0.001%
41	3990.985	-30088.238	-2317.458	-3990.604	30088.234	2317.239	0.001%
42	4608.392	-30088.238	0.000	-4607.953	30088.234	-0.002	0.001%
43	3990.985	-30088.238	2317.458	-3990.605	30088.234	-2317.243	0.001%
44	2304.196	-30088.238	4013.954	-2303.977	30088.234	-4013.582	0.001%
45	0.000	-30088.238	4634.915	0.000	30088.234	-4634.484	0.001%
46	-2304.196	-30088.238	4013.954	2303.978	30088.234	-4013.581	0.001%
47	-3990.985	-30088.238	2317.458	3990.605	30088.234	-2317.243	0.001%
48	-4608.392	-30088.238	0.000	4607.954	30088.234	-0.002	0.001%
49	-3990.985	-30088.238	-2317.458	3990.605	30088.234	2317.239	0.001%
50	-2304.196	-30088.238	-4013.954	2303.977	30088.234	4013.577	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	13	0.00000001	0.00011358
3	Yes	13	0.00000001	0.00007722
4	Yes	14	0.00000001	0.00012414
5	Yes	14	0.00000001	0.00008222
6	Yes	14	0.00000001	0.00013897
7	Yes	14	0.00000001	0.00009246
8	Yes	13	0.00000001	0.00011606
9	Yes	13	0.00000001	0.00007887
10	Yes	14	0.00000001	0.00012909
11	Yes	14	0.00000001	0.00008574
12	Yes	14	0.00000001	0.00012804
13	Yes	14	0.00000001	0.00008500
14	Yes	13	0.00000001	0.00011352
15	Yes	13	0.00000001	0.00007719
16	Yes	14	0.00000001	0.00013744
17	Yes	14	0.00000001	0.00009157
18	Yes	14	0.00000001	0.00012420

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19	Yes	14	0.0000001	0.00008239
20	Yes	13	0.0000001	0.00011604
21	Yes	13	0.0000001	0.00007886
22	Yes	14	0.0000001	0.00013304
23	Yes	14	0.0000001	0.00008835
24	Yes	14	0.0000001	0.00013251
25	Yes	14	0.0000001	0.00008803
26	Yes	6	0.0000001	0.00002490
27	Yes	13	0.0000001	0.00003667
28	Yes	13	0.0000001	0.00003824
29	Yes	13	0.0000001	0.00003878
30	Yes	13	0.0000001	0.00003657
31	Yes	13	0.0000001	0.00003829
32	Yes	13	0.0000001	0.00003786
33	Yes	13	0.0000001	0.00003623
34	Yes	13	0.0000001	0.00003896
35	Yes	13	0.0000001	0.00003894
36	Yes	13	0.0000001	0.00003738
37	Yes	13	0.0000001	0.00003931
38	Yes	13	0.0000001	0.00003922
39	Yes	12	0.0000001	0.00014602
40	Yes	12	0.0000001	0.00014548
41	Yes	12	0.0000001	0.00014756
42	Yes	12	0.0000001	0.00014767
43	Yes	12	0.0000001	0.00014602
44	Yes	12	0.0000001	0.00014467
45	Yes	12	0.0000001	0.00014491
46	Yes	12	0.0000001	0.00014563
47	Yes	12	0.0000001	0.00014572
48	Yes	12	0.0000001	0.00014753
49	Yes	12	0.0000001	0.00014671
50	Yes	12	0.0000001	0.00014592

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	102.92 - 90	10.804	39	0.952	0.003
L2	90 - 45.08	8.236	39	0.943	0.003
L3	48.92 - 0	2.207	39	0.436	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
101.000	Gen 5' T-Arm	39	10.416	0.953	0.003	17679
90.000	QD6616-7	39	8.236	0.943	0.003	7203
82.000	(2) MX06FRO660-03	39	6.765	0.889	0.003	6017
72.000	APXVAALL24_43-U-NA20 [P2.0][96"]	39	5.107	0.774	0.003	5230
62.500	MX08FRO665-21 [P3.0][96"]	39	3.744	0.636	0.002	4652
28.000	(2) Gen 5' T-Arm	39	0.804	0.205	0.001	7017

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	102.92 - 90	52.216	2	4.593	0.017
L2	90 - 45.08	39.830	2	4.554	0.017
L3	48.92 - 0	10.677	2	2.111	0.006

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
101.000	Gen 5' T-Arm	2	50.342	4.602	0.017	3760
90.000	QD6616-7	2	39.830	4.554	0.017	1529
82.000	(2) MX06FRO660-03	2	32.727	4.297	0.015	1269
72.000	APXVAALL24_43-U-NA20 [P2.0][96"]	2	24.714	3.742	0.013	1095
62.500	MX08FRO665-21 [P3.0][96"]	2	18.120	3.079	0.009	968
28.000	(2) Gen 5' T-Arm	2	3.889	0.997	0.003	1449

Base Plate Design Data

Plate Thickness in	Number of Anchor Bolts	Anchor Bolt Size in	Actual Allowable Ratio Bolt Tension lb	Actual Allowable Ratio Bolt Compression lb	Actual Allowable Ratio Plate Stress ksi	Actual Allowable Ratio Stiffener Stress ksi	Controlling Condition	Ratio
1.750	10	2.250	101281.972	104016.224	43.245		Plate	0.80
			243576.145	404336.400	54.000			✓
			0.42	0.26	0.80			

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 P _u /φP _n
L1	102.92 - 90 (1)	TP13x13x0.25	12.920	102.920	273.9	10.014	-657.373	30149.199	0.022
L2	90 - 45.08 (2)	TP26.793x13x0.25	44.920	102.920	164.2	16.817	-17752.801	140996.000	0.126
L3	45.08 - 0 (3)	TP40x25.113x0.313	48.920	102.920	87.7	39.365	-13671.300	1109320.000	0.012

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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	102.92 - 90 (1)	TP13x13x0.25	5607.684	106695.000	0.053	0.000	106695.000	0.000
L2	90 - 45.08 (2)	TP26.793x13x0.25	333090.000	542403.333	0.614	0.000	542403.333	0.000
L3	45.08 - 0 (3)	TP40x25.113x0.313	1079316.667	2195616.667	0.492	0.000	2195616.667	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	102.92 - 90 (1)	TP13x13x0.25	672.145	94630.703	0.007	0.002	106077.500	0.000
L2	90 - 45.08 (2)	TP26.793x13x0.25	16684.100	295143.000	0.057	443.318	547797.500	0.001
L3	45.08 - 0 (3)	TP40x25.113x0.313	18715.500	690856.000	0.027	441.491	2401166.667	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Ratio P_u	Ratio M_{ux}	Ratio M_{uy}	Ratio V_u	Ratio T_u	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
		ϕP_n	ϕM_{nx}	ϕM_{ny}	ϕV_n	ϕT_n			
L1	102.92 - 90 (1)	0.022	0.053	0.000	0.007	0.000	0.074	1.000	4.8.2 ✓
L2	90 - 45.08 (2)	0.126	0.614	0.000	0.057	0.001	0.743	1.000	4.8.2 ✓
L3	45.08 - 0 (3)	0.012	0.492	0.000	0.027	0.000	0.505	1.000	4.8.2 ✓

Reinforcing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in ²	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L3	62.5 - 32.25	4x1 1/4	30.252	2.000	66.5 K=1.00	5.000	-131010.000	192094.000	0.682 ¹
L3	32.25 - 0	4.25 x 1.25	32.253	2.000	66.5 K=1.00	5.313	-170122.000	204100.000	0.834 ¹

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¹ $P_u / \phi P_n$ controls

Reinforcing 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 $\frac{M_{uy}}{\phi M_{ny}}$
L3	62.5 - 32.25	4x1 1/4	0.074	24375.000	0.000	-99.691	7617.191	0.013
L3	32.25 - 0	4.25 x 1.25	0.000	27517.083	0.000	-0.000	8093.258	0.000

Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L3	62.5 - 32.25	4x1 1/4	0.682	0.000	0.013	0.682 ¹	1.000	4.8.1 ✓
L3	32.25 - 0	4.25 x 1.25	0.834	0.000	0.000	0.834 ¹	1.000	4.8.1 ✓

¹ $P_u / \phi P_n$ controls

Tension Checks

Reinforcing Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in ²	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
L3	62.5 - 32.25	4x1 1/4	30.252	2.000	66.5	4.063	121790.000	243750.000	0.500 ¹
L3	32.25 - 0	4.25 x 1.25	32.253	2.000	66.5	4.375	159632.000	262500.000	0.608 ¹

¹ $P_u / \phi P_n$ controls

Reinforcing 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 $\frac{M_{uy}}{\phi M_{ny}}$
L3	62.5 - 32.25	4x1 1/4	-1.180	24375.000	0.000	-110.859	7617.191	0.015
L3	32.25 - 0	4.25 x 1.25	1833.758	27517.083	0.067	0.020	8093.258	0.000

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Reinforcing Interaction Design Data

Section No.	Elevation ft	Size	Ratio	Ratio	Ratio	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
			$\frac{P_u}{\phi P_n}$	$\frac{M_{ux}}{\phi M_{nx}}$	$\frac{M_{uy}}{\phi M_{ny}}$			
L3	62.5 - 32.25	4x1 1/4	0.500	0.000	0.015	0.500 ¹	1.000	4.8.1 ✓
L3	32.25 - 0	4.25 x 1.25	0.608	0.067	0.000	0.608 ¹	1.000	4.8.1 ✓

¹ $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
L1	102.92 - 90	Pole	TP13x13x0.25	1	-657.373	30149.199	7.4	Pass	
L2	90 - 45.08	Pole	TP26.793x13x0.25	2	-17752.801	140996.000	74.3	Pass	
L3	45.08 - 0	Pole	TP40x25.113x0.313	3	89612.797	2302850.000	50.5	Pass	
	62.5 - 32.25	Reinforcing	4x1 1/4	8	-131010.000	192094.000	68.2	Pass	
	32.25 - 0	Reinforcing	4.25 x 1.25	5	-170122.000	204100.000	83.4	Pass	
							Summary		
							Pole (L2)	74.3	Pass
							Reinforcing (L3)	83.4	Pass
							Base Plate	80.1	Pass
							RATING =	83.4	Pass