



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

June 10, 2021

Victoria Masse
Northeast Site Solutions
420 Main Street
Sturbridge, MA 01566
Victoria@northeastsitesolutions.com

RE: **EM-T-MOBILE-043-210514** - T-Mobile notice of intent to modify an existing telecommunications facility located at 100 Sunset Ridge Drive, East Hartford, Connecticut.

Dear Ms. Masse:

The Connecticut Siting Council (Council) is in receipt of your correspondence of June 9, 2021 submitted in response to the Council's June 7, 2021 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

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

Thank you for your attention and cooperation.

Sincerely,

s/Melanie A. Bachman

Melanie A. Bachman
Executive Director

MAB/laf

From: Victoria Masse <victoria@northeastsitesolutions.com>
Sent: Wednesday, June 9, 2021 2:24 PM
To: Robidoux, Evan <Evan.Robidoux@ct.gov>
Cc: CSC-DL Siting Council <Siting.Council@ct.gov>; Deborah Chase <deborah@northeastsitesolutions.com>; Sheldon F <sheldon@northeastsitesolutions.com>
Subject: Re: Council Incomplete Letter for EM-T-MOBILE-043-210514 (100 Sunset Ridge Drive, East Hartford)

Good Afternoon,
Please see attached revised Structural Analysis for the site mentioned below that has been signed and stamped by a Professional Engineer licensed in the State of Connecticut.

EM-T-MOBILE-043-210514: 100 Sunset Ridge Drive, East Hartford

If you have any questions please let me know.

Thank you

On Mon, Jun 7, 2021 at 3:44 PM Robidoux, Evan <Evan.Robidoux@ct.gov> wrote:
Please see the attached correspondence.

--

Victoria Masse

Zoning & Permitting Specialist

Notary Public

Mobile: 860-306-2326

Office: 420 Main Street Unit 1 Box 2 Sturbridge, MA 01566

Email: victoria@northeastsitesolutions.com



Structural Analysis Report

Site Number: CT3438
Site Name: East Hartford Sunset Ridge
FA Number: 10578403
Address: 100 Sunset Ridge
East Hartford, CT 06108

Client:



at&t Mobility Corp.
500 Enterprise Drive
Rocky Hill, CT 06067

T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

Date: 5/3/2021

Scope of Work:

Centerline Communications was authorized by AT&T and T-Mobile to perform an analysis of the existing 140 ft. self-support tower to determine its capacity to support the proposed and existing AT&T and T-Mobile equipment listed in this report.

Existing and Proposed Appurtenances:

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	Number of Appurtenances	Antenna Manufacturer	Appurtenance Model	Feed Lines (in)
-	138.0	138.0	1	-	15' Lightning Rod	(7) 7/8
			3	-	7' Omni	
			3	-	3' Side Arm Mount	
-	135.0	135.0	1	-	1' Dish	
			1	-	3' Side Arm Mount	
-	120.0	130.0	3	-	20' Omni	
T-MOBILE	120.0	120.0	3	Ericsson	AIR6449 B41	
			3	Ericsson	AIR32 KRD901146-1_B66A_B2A	
			3	Ericsson	AIR21 KRC118023-1_B2A_B4P	
			3	RFS	APXVAARR24_43-UNA20	
			3	-	Generic Twin Style AB - AWS	
			3	Ericsson	Radio 4449 B71+B85	
			3	Ericsson	Radio 4415 B25	
			3	Site Pro 1	Heavy Duty Sector Mount P/N VFA12-WLL-30120	
AT&T	110.0	110.0	3	Kathrein	800 10799	(4) DC (5) DC (3) Fiber
			3	CCI	OPA65R-BU8DA	
			3	CCI	DMP65R-BU8DA	
			3	Ericsson	RRUS-32	
			3	Ericsson	RRUS-E2	
			3	Ericsson	RRUS 8843 B2/B66A	
			3	Ericsson	RRUS 4478 B14	
			3	Ericsson	RRUS 4449 B5/B12	
			3	Ericsson	RRUS 4415 B25	
			3	Raycap	DC9-48-60-24-8C-EV	
			3	Sabre	12' V-Boom	

-	100.0	100.0	3	-	NNVV-65B-R4	(3) 3" Conduit
			3	-	MAA-AAHC	
			3	-	RRH4x45-1900	
			6	-	RRH2x50-800	
			1	-	2' Dish	
			3	Site Pro 1	R5-216	
-	105.0	105.0	1	-	4' Dish	
-	95.0	95.0	2	-	1' Dish	

Note: Proposed equipment shown in **bold**.

Design Criteria:

Design Codes:

2018 Connecticut State Building Code
 2015 International Building Code
 ASCE 7-10
 TIA-222-G Standards

Basic Wind Speed	105 mph
Wind Speed with Ice	50 mph
Ice Thickness	1.00 in.
Exposure Category	B
Topographic Category	1
Structure Class	III
Site Soil Class (Assumed)	D – Stiff Soil
Seismic Design Category	B

*Refer to calculations for additional design criteria.

Conclusion:

**Passing with Modifications
Section Capacity (Summary)**

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	140 - 120	Leg	2 1/4	1	-5554.16	77870.40	7.1	Pass
T2	120 - 115	Leg	2 1/4	31	-14724.50	77870.40	18.9	Pass
T3	115 - 110	Leg	2 1/4	40	-19156.60	77870.40	24.6	Pass
T4	110 - 105	Leg	2 1/4	49	-30027.20	77870.40	38.6	Pass
T5	105 - 100	Leg	2 1/4	60	-43550.40	77870.40	55.9	Pass
T6	100 - 80	Leg	2 3/4	69	-	153147.00	71.3	Pass
					109206.00			
T7	80 - 60	Leg	3	96	-	198902.00	78.7	Pass
					156512.00			
T8	60 - 40	Leg	3 1/4	123	-	250223.00	77.6	Pass
					194178.00			
T9	40 - 20	Leg	Pirod 105218	150	-	300681.00	73.9	Pass
					222106.00			
T10	20 - 0	Leg	Pirod 105219	165	-	399868.00	63.3	Pass
					253020.00		65.4 (b)	
T1	140 - 120	Diagonal	L1 3/4x1 3/4x1/8	11	-1521.30	4232.90	35.9	Pass
T2	120 - 115	Diagonal	L1 3/4x1 3/4x1/4	38	-3528.45	7945.36	44.4	Pass
T3	115 - 110	Diagonal	L1 3/4x1 3/4x1/4	48	-3985.14	7945.36	50.2	Pass
T4	110 - 105	Diagonal	L2x2x1/4	56	-6572.42	11254.40	58.4	Pass
							65.9 (b)	
T5	105 - 100	Diagonal	L2x2x1/4	66	-7291.56	11254.40	64.8	Pass
							72.9 (b)	
T6	100 - 80	Diagonal	L2 1/2x2 1/2x5/16	75	-10066.00	23771.20	42.3	Pass
T7	80 - 60	Diagonal	L2 1/2x2 1/2x5/16	107	-6753.48	20250.00	33.4	Pass
T8	60 - 40	Diagonal	L2 1/2x2 1/2x5/16	134	-7096.32	16013.10	44.3	Pass
T9	40 - 20	Diagonal	L3x3x5/16	155	-8597.07	16911.90	50.8	Pass
T10	20 - 0	Diagonal	L3x3x5/16	170	-10266.90	14387.30	71.4	Pass
T1	140 - 120	Top Girt	L3x3x3/8	6	-274.08	22853.70	1.2	Pass
							Summary	
							Leg (T7)	78.7 Pass
							Diagonal (T5)	72.9 Pass
							Top Girt (T1)	1.2 Pass
							Bolt Checks	72.9 Pass
							RATING =	78.7 Pass

Structure Rating (max from all components) =	78.7%
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Foundation Capacity

	Previous Design Reactions*	Current Reaction (TIA-222-G)	% Capacity	Overall Result
Moment (Kip-ft)	5314.0	3467.257	64.7	Pass
Shear (Kips)	100.5	42.738	40.5	Pass
Axial (Kips)	473.0	43.943	32.3	Pass

*Per the previous Structural Analysis by EFI Global, dated July 15, 2020 referencing the Structural Analysis by Maser Consulting, dated April 20, 2018

Foundation Rating (max from all components) =	64.7%
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Recommendations:

The results of the analysis concluded that the existing tower and its foundation have sufficient capacity to support the existing and proposed loading for the final loading configuration upon completion of the following modifications. Centerline Communications recommends the following:

- Replace the existing L1-3/4x1-3/4x1/4 diagonals from 100-110' with proposed L2x2x1/4 angles using 5/8" A325 bolts with 1-1/8" edge distance and 1-1/8" gage distance.


Reference Documents:

- AT&T RFDS 3546088, dated April 28, 2020
- Structural Analysis by EFI Global, dated July 15, 2020
- Structural Analysis by Advanced Engineering Group, dated May 4, 2017
- Construction Drawings by Advanced Engineering Group, dated May 4, 2017

Assumptions and Limitations:

- The tower and structures were built and maintained with the manufacturer's specifications.
- The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in this report and the referenced drawings.
- Existing appurtenance information obtained from the previous Structural Analysis by EFI Global, dated July 15, 2020.
- All connections of the members are assumed to have been designed to meet or exceed the load carrying capacity of the connected members unless otherwise noted in this report.

Design Calculations

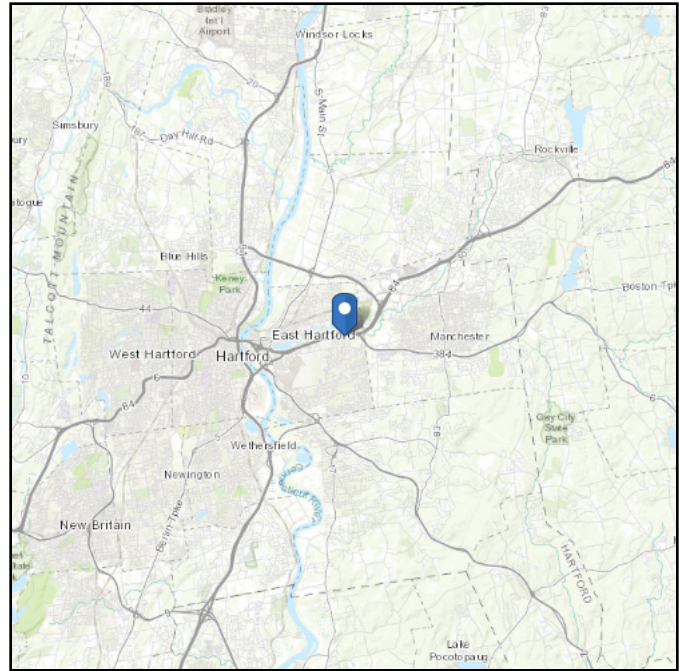
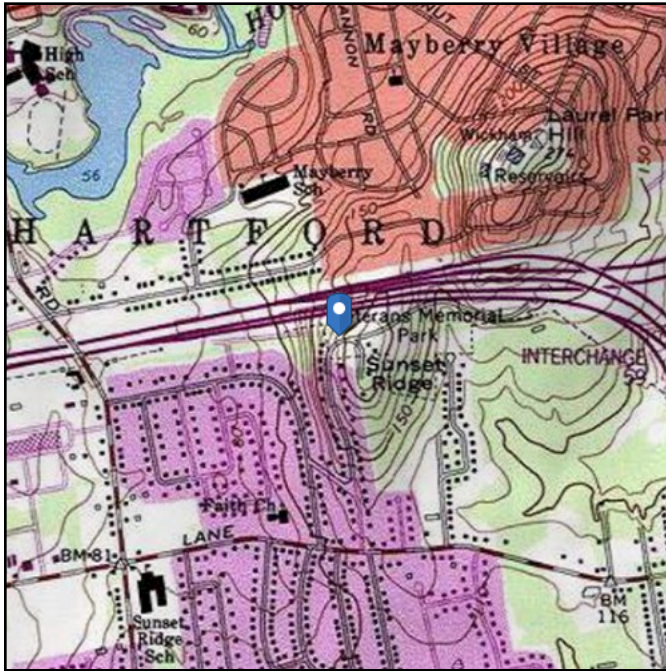


ASCE 7 Hazards Report

Address:
100 Sunset Ridge Dr
East Hartford, Connecticut
06118

Standard: ASCE/SEI 7-10
Risk Category: III
Soil Class: D - Stiff Soil

Elevation: 191.52 ft (NAVD 88)
Latitude: 41.771605
Longitude: -72.592504



Wind

Results:

Wind Speed:	133 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	93 Vmph
100-year MRI	100 Vmph

Data Source: ASCE/SEI 7-10, Fig. 26.5-1B and Figs. CC-1–CC-4, incorporating errata of March 12, 2014

Date Accessed: Tue Dec 29 2020

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 3% probability of exceedance in 50 years (annual exceedance probability = 0.000588, MRI = 1,700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2. Glazed openings need not be protected against wind-borne debris.

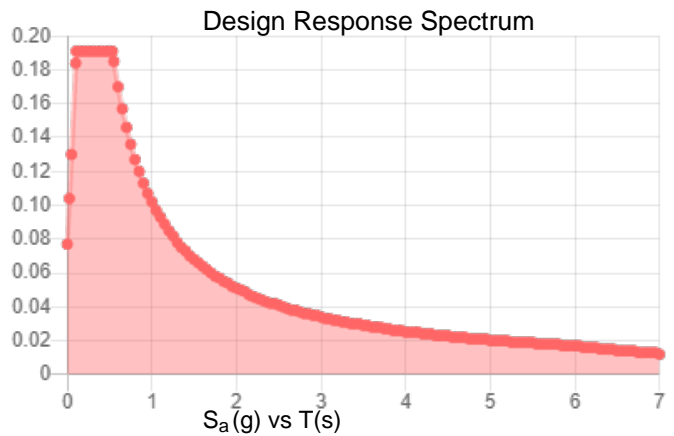
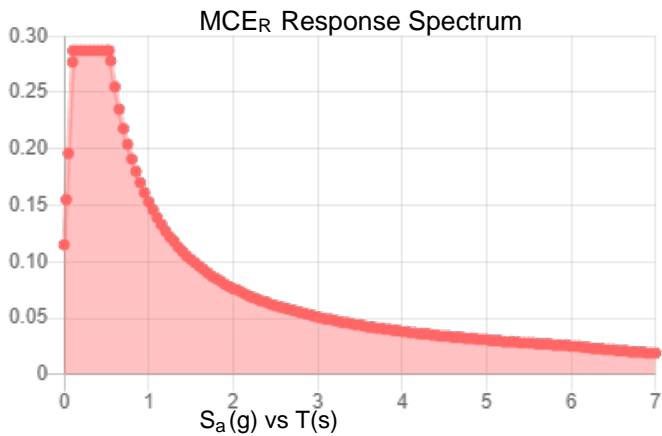
Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

Site Soil Class: D - Stiff Soil

Results:

S_S :	0.179	S_{DS} :	0.191
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.6	T_L :	6
F_v :	2.4	PGA :	0.09
S_{MS} :	0.287	PGA _M :	0.144
S_{M1} :	0.153	F _{PGA} :	1.6
		I_e :	1.25

Seismic Design Category B



Data Accessed:

Tue Dec 29 2020

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness: 1.00 in.
Concurrent Temperature: 5 F
Gust Speed: 50 mph

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

Date Accessed: Tue Dec 29 2020

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 50-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: 191.5 ft

Data Source: ASCE/SEI 7-10, Fig. 7-1.

Date Accessed: Tue Dec 29 2020

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.

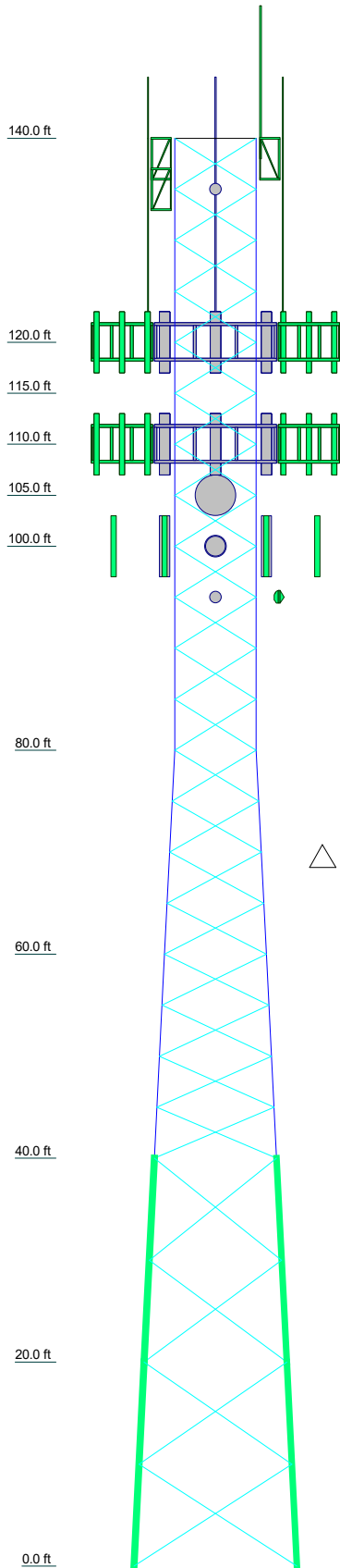
In using this Tool, you expressly assume all risks associated with your use. Under no circumstances shall ASCE or its officers, directors, employees, members, affiliates, or agents be liable to you or any other person for any direct, indirect, special, incidental, or consequential damages arising from 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.

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightening Rod 2"x15'	138	RRUS 4415 B25 (ATI)	110
Omni 2"x7'	138	RRUS 4415 B25 (ATI)	110
Omni 2"x7'	138	RRUS 4415 B25 (ATI)	110
Omni 2"x7'	138	RRUS 32 (ATI)	110
3' Side Mount Standoff	138	RRUS 32 (ATI)	110
3' Side Mount Standoff	138	RRUS 32 (ATI)	110
3' Side Mount Standoff	138	OPA65R-BU8DA w/ Mount Pipe (ATI)	110
3' Side Mount Standoff	135	OPA65R-BU8DA w/ Mount Pipe (ATI)	110
VHLP1	135	OPA65R-BU8DA w/ Mount Pipe (ATI)	110
Omni 3"x20'	120	DMP65R-BU8DA w/ Mount Pipe (ATI)	110
Omni 3"x20'	120	DMP65R-BU8DA w/ Mount Pipe (ATI)	110
AIR 6449 B41 W/ MOUNT PIPE (T-MOBILE)	120	DMP65R-BU8DA w/ Mount Pipe (ATI)	110
RRUS E2 B92 (ATI)		RRUS E2 B92 (ATI)	110
AIR 6449 B41 W/ MOUNT PIPE (T-MOBILE)	120	RRUS E2 B92 (ATI)	110
RRUS E2 B92 (ATI)		RRUS E2 B92 (ATI)	110
AIR 6449 B41 W/ MOUNT PIPE (T-MOBILE)	120	RRUS 8843 B2/B66A (ATI)	110
RRUS 8843 B2/B66A (ATI)		RRUS 8843 B2/B66A (ATI)	110
AIR32 B2A/B66A W/ MOUNT PIPE (T-MOBILE)	120	RRUS 8843 B2/B66A (ATI)	110
RRUS 4478 B14 (ATI)		RRUS 4478 B14 (ATI)	110
AIR32 B2A/B66A W/ MOUNT PIPE (T-MOBILE)	120	RRUS 4478 B14 (ATI)	110
RRUS 4478 B14 (ATI)		RRUS 4478 B14 (ATI)	110
AIR32 B2A/B66A W/ MOUNT PIPE (T-MOBILE)	120	RRUS 4449 B5/12 (ATI)	110
RRUS 4449 B5/12 (ATI)		RRUS 4449 B5/12 (ATI)	110
AIR32 B2A/B66A (T-MOBILE)	120	RRUS 4449 B5/12 (ATI)	110
RRUS 4449 B5/12 (ATI)		DC9-48-60-24-8C-EV (ATI)	110
AIR32 B2A/B66A (T-MOBILE)	120	DC9-48-60-24-8C-EV (ATI)	110
APXVAARR24_43-U-NA20 W/ MOUNT PIPE (T-MOBILE)	120	DC9-48-60-24-8C-EV (ATI)	110
DC9-48-60-24-8C-EV (ATI)		DC9-48-60-24-8C-EV (ATI)	110
APXVAARR24_43-U-NA20 W/ MOUNT PIPE (T-MOBILE)	120	SABRE 12' V-BOOM (ATI)	110
SABRE 12' V-BOOM (ATI)		SABRE 12' V-BOOM (ATI)	110
APXVAARR24_43-U-NA20 W/ MOUNT PIPE (T-MOBILE)	120	SABRE 12' V-BOOM (ATI)	110
SABRE 12' V-BOOM (ATI)		SABRE 12' V-BOOM (ATI)	110
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	120	HP4-102	105
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	120	Nokia AAHC w/pipe	100
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	120	Nokia AAHC w/pipe	100
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	120	Andrew-Commscope NNV-65B-R4 w/pipe	100
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	120	Andrew-Commscope NNV-65B-R4 w/pipe	100
RADIO 4449 B71+B85 (T-MOBILE)	120	Andrew-Commscope NNV-65B-R4 w/pipe	100
RADIO 4449 B71+B85 (T-MOBILE)	120	Andrew-Commscope NNV-65B-R4 w/pipe	100
RADIO 4449 B71+B85 (T-MOBILE)	120	Andrew-Commscope NNV-65B-R4 w/pipe	100
RADIO 4415 B25 (T-MOBILE)	120	RRH4x45-19	100
RADIO 4415 B25 (T-MOBILE)	120	RRH4x45-19	100
RADIO 4415 B25 (T-MOBILE)	120	RRH4x45-19	100
VFA12-WLL-30120 (T-MOBILE)	120	(2) FD-RRH-2x50-800	100
VFA12-WLL-30120 (T-MOBILE)	120	(2) FD-RRH-2x50-800	100
VFA12-WLL-30120 (T-MOBILE)	120	(2) FD-RRH-2x50-800	100
10'-P2.5x0.276 (T-MOBILE)	120	6'-P4x0.237	100
10'-P2.5x0.276 (T-MOBILE)	120	6'-P4x0.237	100
10'-P2.5x0.276 (T-MOBILE)	120	6'-P4x0.237	100
(2) 10.5'-P2x0.154 (T-MOBILE)	120	5'xP3x0.216 H	100
(2) 10.5'-P2x0.154 (T-MOBILE)	120	5'xP3x0.216 H	100
(2) 10.5'-P2x0.154 (T-MOBILE)	120	5'xP3x0.216 H	100
Omni 3"x20'	120	Nokia AAHC w/pipe	100
VHLP2-11	110	VHLP2-11	100
80010799 w/ Mount Pipe (ATI)	110	VHLP2-11	100
80010799 w/ Mount Pipe (ATI)	110	5'xP3x0.216 H	100
80010799 w/ Mount Pipe (ATI)	110	VHLP1	95
		VHLP1	95

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x1/4		



Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P1rod 105219	P1rod 105218	SR 3 1/4	SR 3	SR 2 3/4	SR 2 3/4	SR 2 1/4	SR 2 1/4	SR 2 1/4	SR 2 1/4
Leg Grade				A572-50						
Diagonals	L3x3x5/16			L2 1/2x2 1/2x5/16		L2x2x1/4	L1 3/4x1 3/4x1/8			
Diagonal Grade				A36						
Top Girts				N.A.						L3x3x3/8
Face Width (ft)	16	12	10	10	10	10	10	10	10	8
# Panels @ (ft)	4 @ 10				20 @ 5					
Weight (lb) 19224.4	4213.7	3519.4	3219.5	2807.4	2454.4	402.8	402.8	377.4	377.4	1374.6

Centerline Communications
 750 West Center Street, Suite 301
 West Bridgewater, MA 02379
 Phone: (781) 713-4725
 FAX:

Job: **CT3438**
 Project: **140ft Self Support Tower**
 Client: AT&T
 Code: TIA-222-G
 Path:
 Drawn by: Joshua Gildert
 Date: 12/29/20
 App'd:
 Scale: NTS
 Dwg No. E-1

SYMBOL LIST

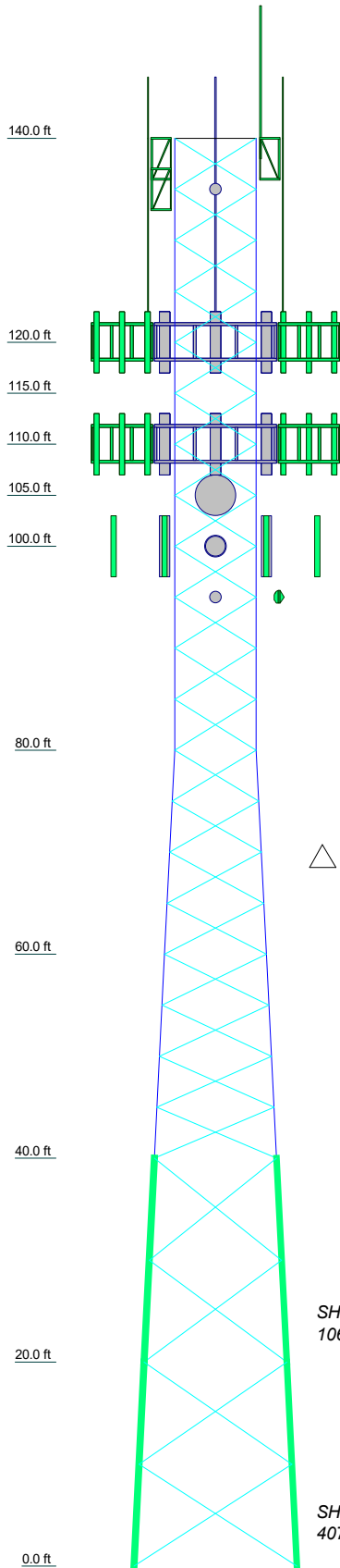
MARK	SIZE	MARK	SIZE
A	L1 3/4x1 3/4x1/4		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 78.7%

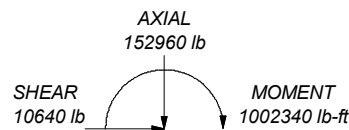


ALL REACTIONS
ARE FACTORED

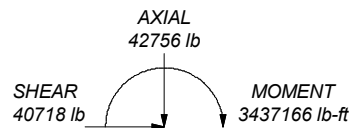
MAX. CORNER REACTIONS AT BASE:

DOWN: 262304 lb
SHEAR: 27176 lb

UPLIFT: -227261 lb
SHEAR: 24094 lb



TORQUE 8334 lb-ft
50 mph WIND - 1.0000 in ICE



TORQUE 33001 lb-ft
REACTIONS - 105 mph WIND

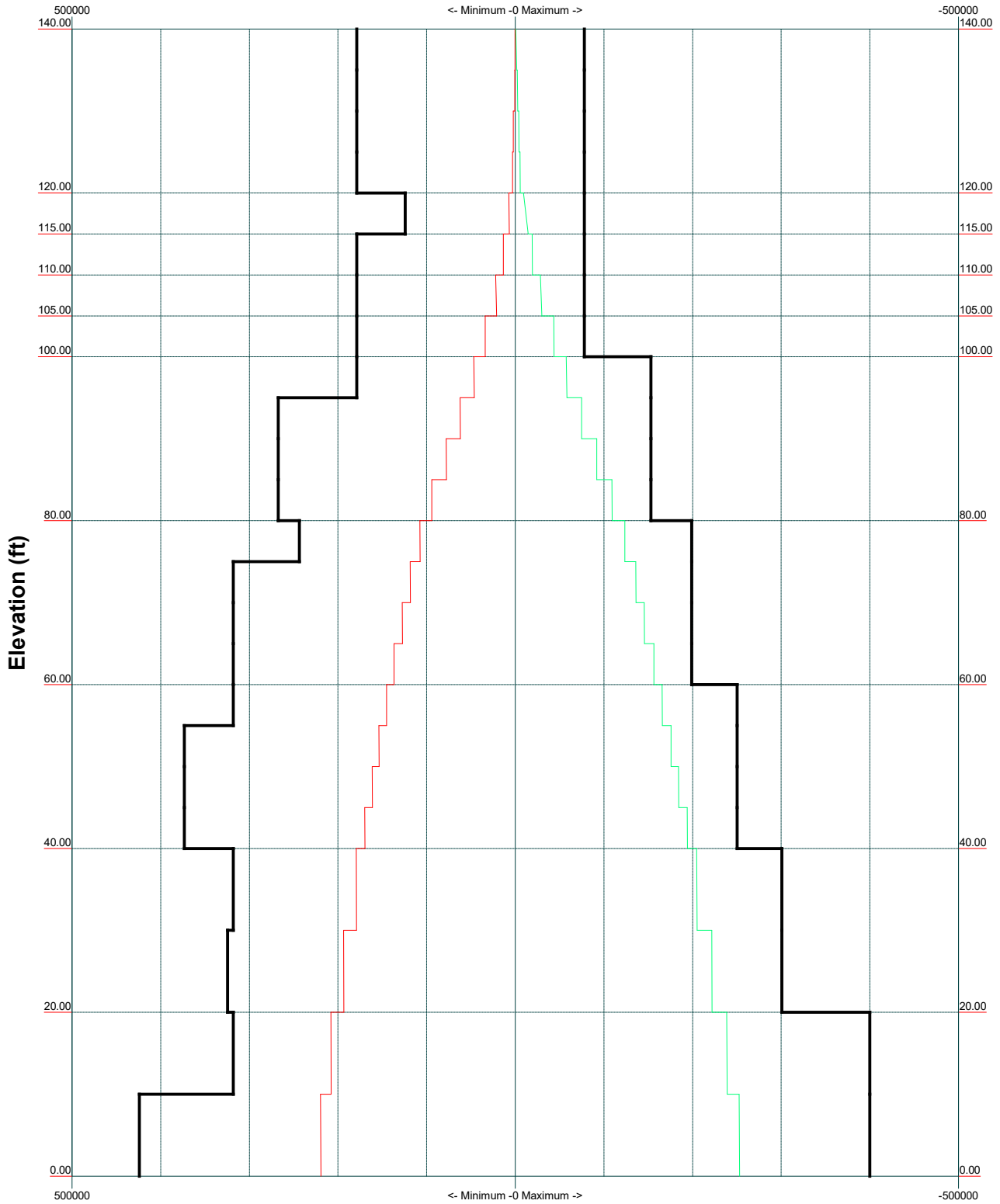
Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	P1rod 105219	P1rod 105218	SR 3 1/4	SR 3	SR 2 3/4			SR 2 1/4		
Leg Grade				A572-50						
Diagonals				L2 1/2x2 1/2x5/16				L2x2x1/4		L1 3/4x1 3/4x1/8
Diagonal Grade				A36						
Top Girts				N.A.						L3x3x3/8
Face Width (ft)	16	12	10							8
# Panels @ (ft)	4 @ 10				20 @ 5					
Weight (lb) 19224.4	4213.7	3519.4	3294.5	2807.4	2494.4	402.8	402.8	377.4	377.4	1374.6

Centerline Communications
750 West Center Street, Suite 301
West Bridgewater, MA 02379
Phone: (781) 713-4725
FAX:

Job: CT3438		
Project: 140ft Self Support Tower		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 12/29/20	Scale: NTS
Path:		Dwg No. E-1

TIA-222-G - 105 mph/50 mph 1.0000 in Ice Exposure B

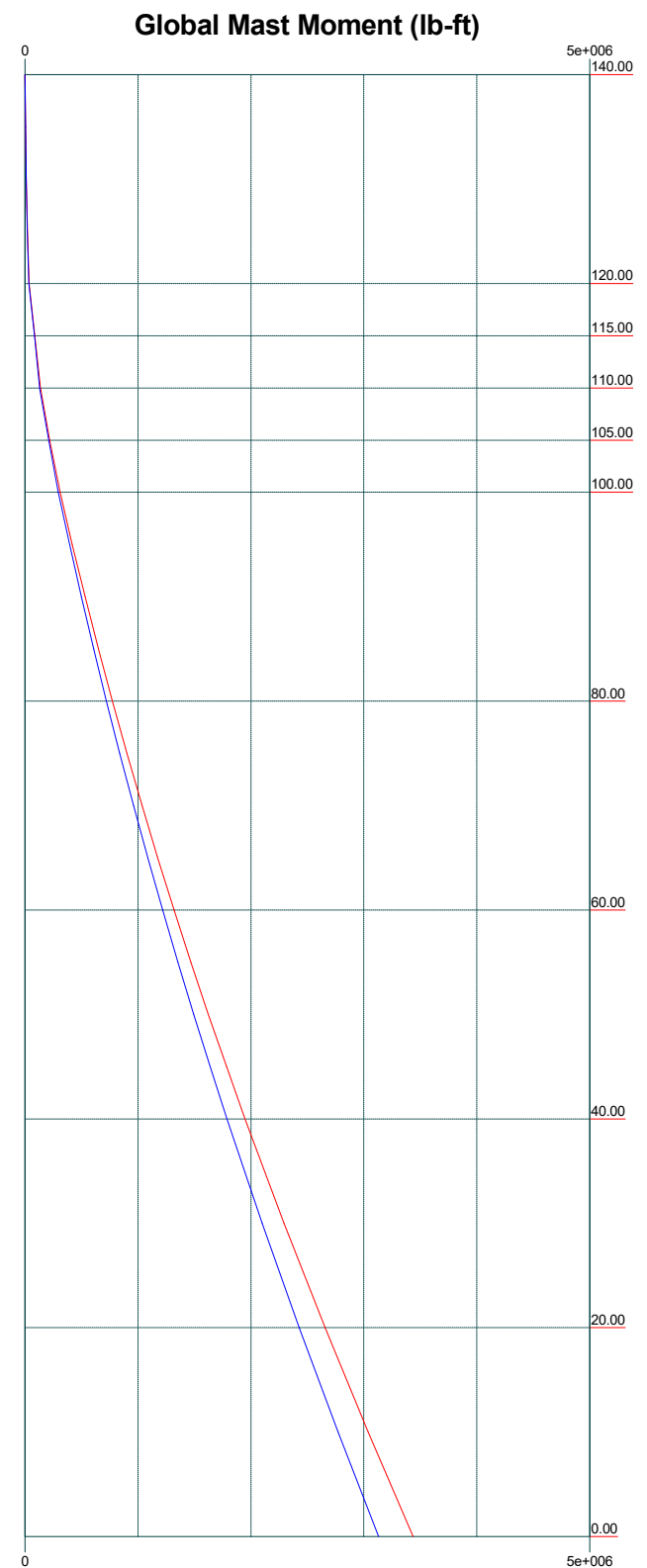
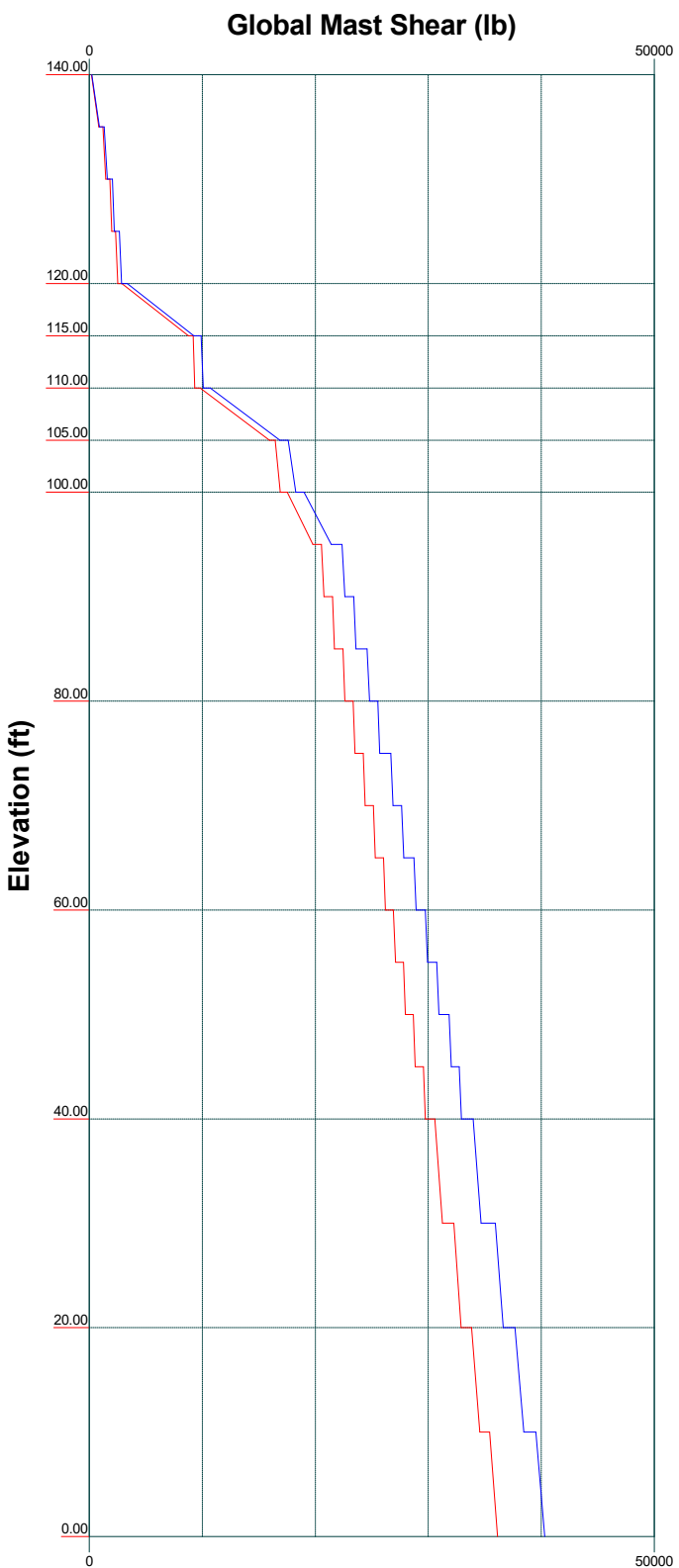
Leg Capacity ——— Leg Compression (lb)



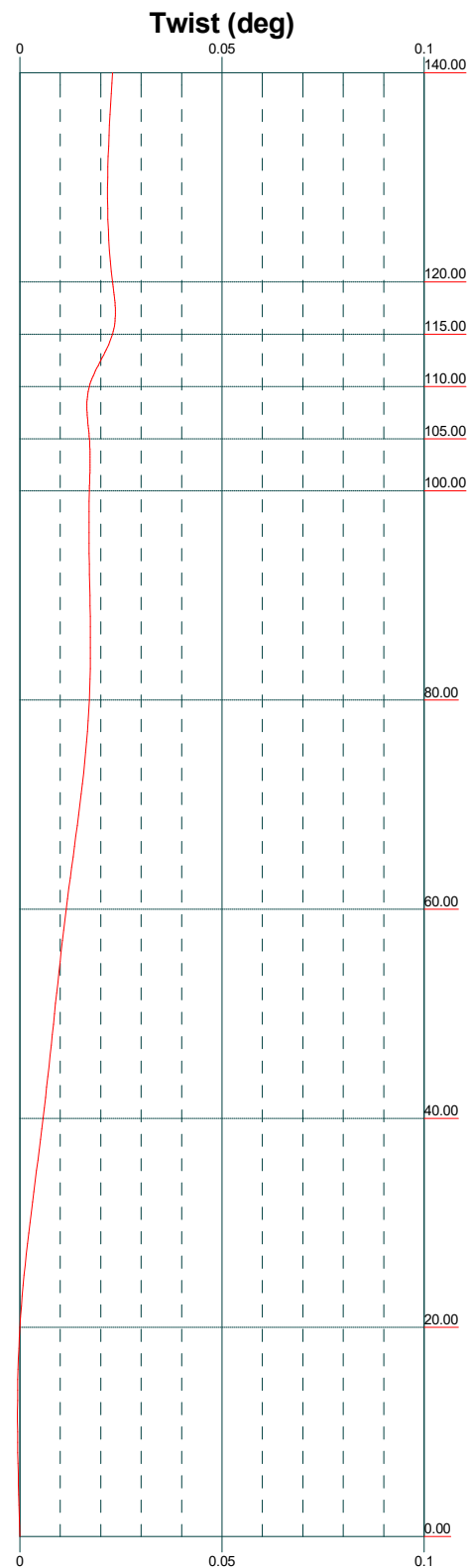
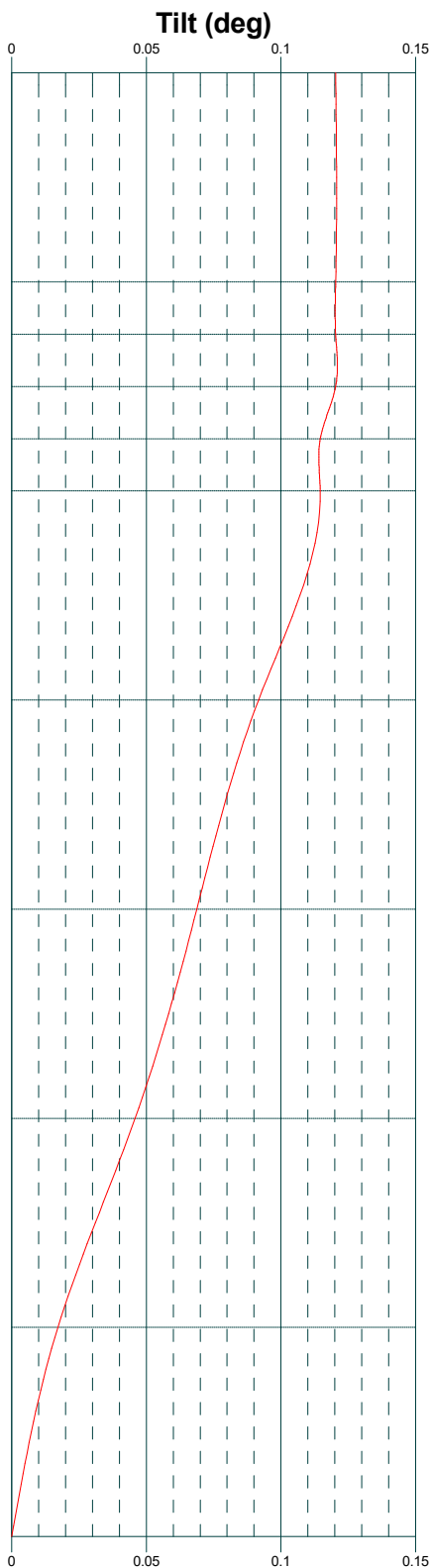
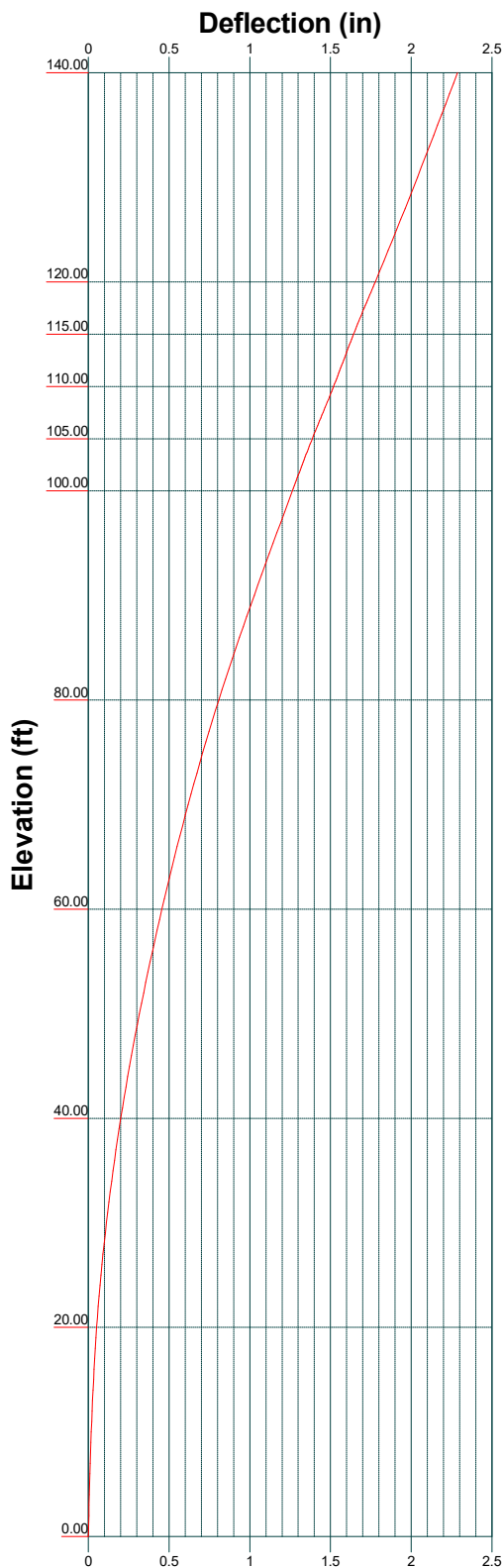
Centerline Communications		Job: CT3438	
750 West Center Street, Suite 301		Project: 140ft Self Support Tower	
West Bridgewater, MA 02379		Client: AT&T	Drawn by: Joshua Gildert
Phone: (781) 713-4725		Code: TIA-222-G	Date: 12/29/20
FAX:		Path:	App'd:
			Scale: NTS
			Dwg No. E-3

Vx Vz

Mx Mz



Centerline Communications		Job: CT3438	
750 West Center Street, Suite 301		Project: 140ft Self Support Tower	
West Bridgewater, MA 02379		Client: AT&T	Drawn by: Joshua Gildert
Phone: (781) 713-4725		Code: TIA-222-G	Date: 12/29/20
FAX:		Path:	App'd:
			Scale: NTS
			Dwg No. E-4

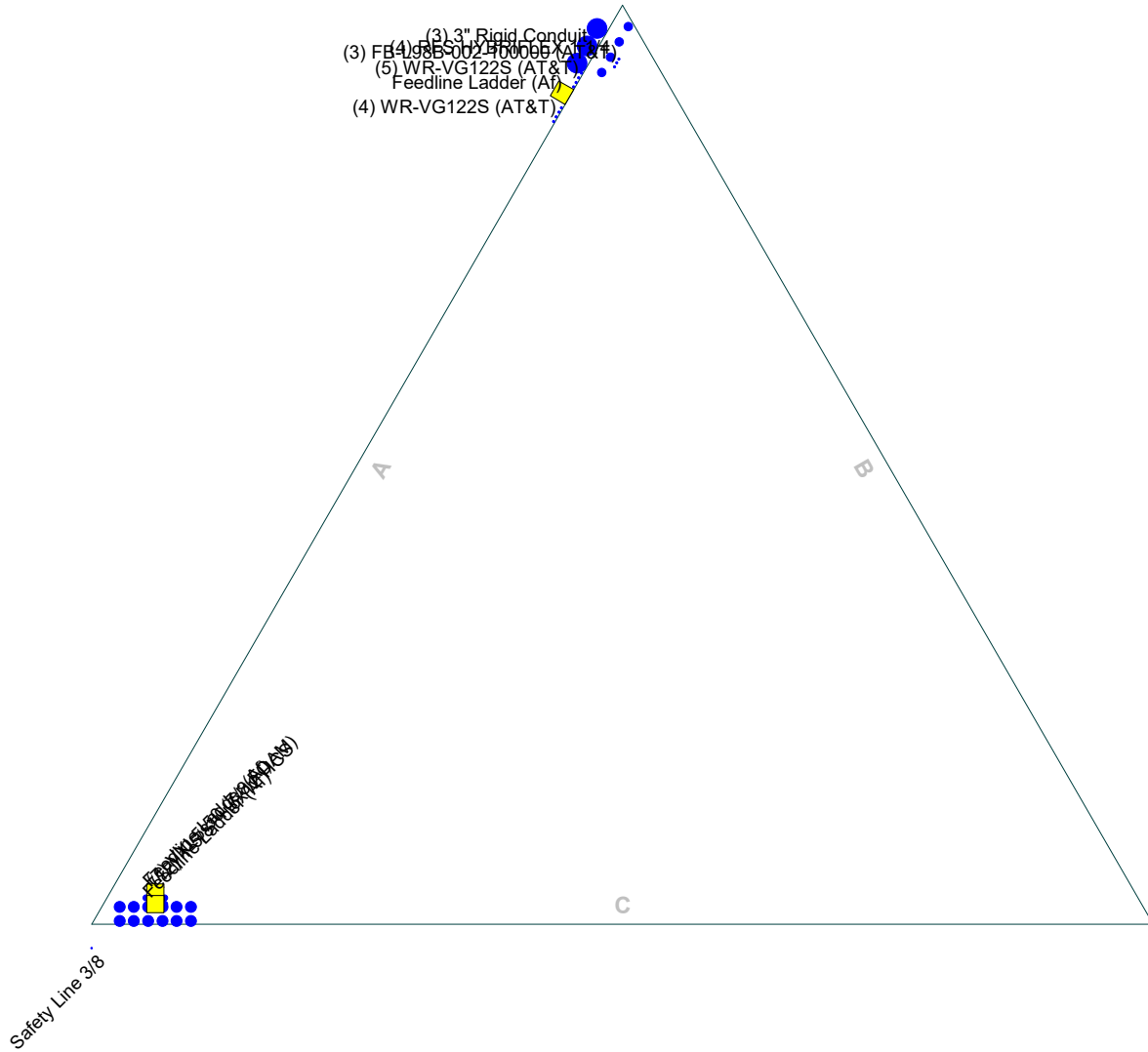


Centerline Communications
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 West Bridgewater, MA 02379
 Phone: (781) 713-4725
 FAX:

Job: CT3438		
Project: 140ft Self Support Tower		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 12/29/20	Scale: NTS
Path:		Dwg No. E-5

Feed Line Plan

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



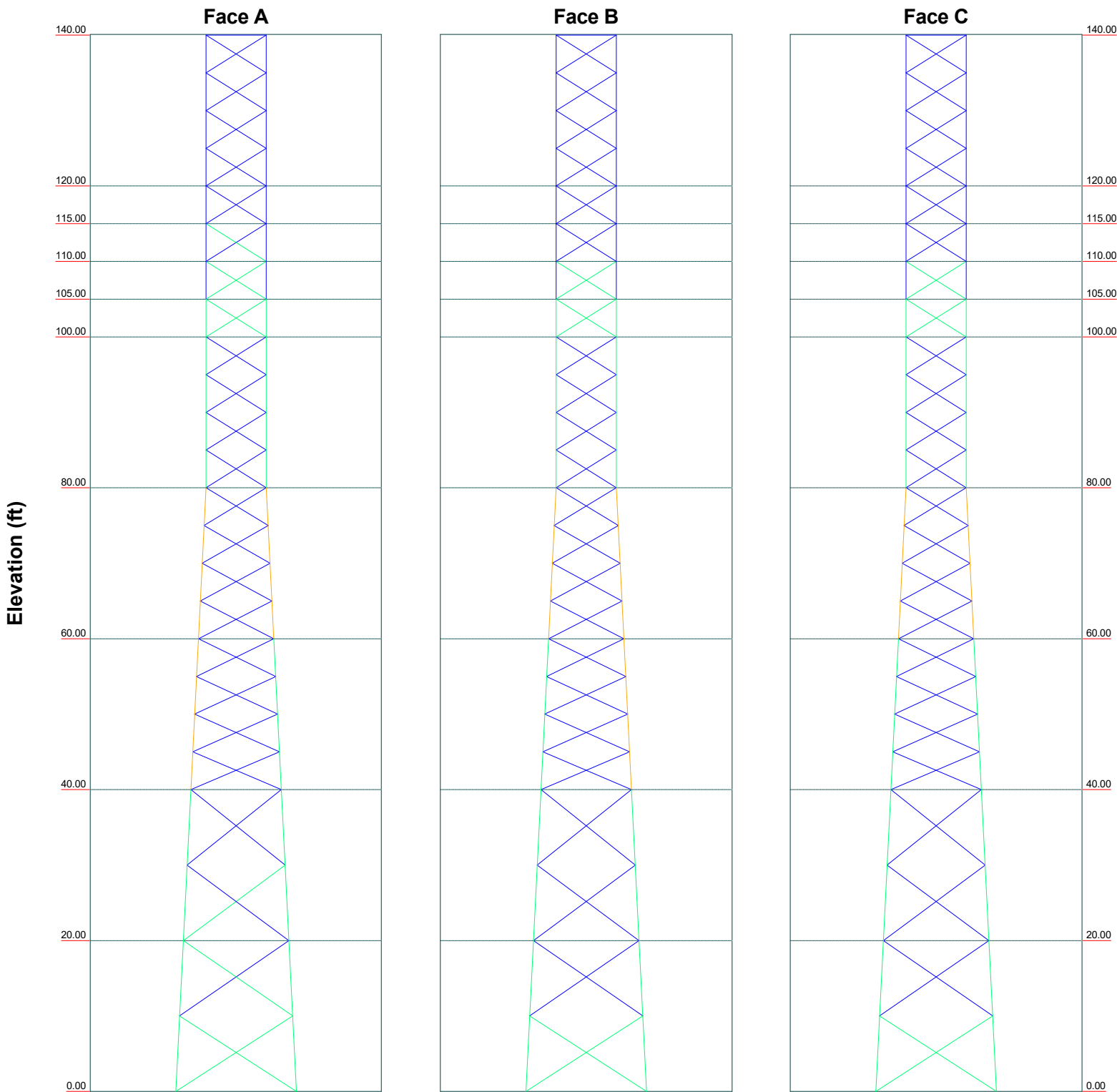
Centerline Communications
 750 West Center Street, Suite 301
 West Bridgewater, MA 02379
 Phone: (781) 713-4725
 FAX:

Job: CT3438		
Project: 140ft Self Support Tower		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 12/29/20	Scale: NTS
Path:		Dwg No. E-7

Stress Distribution Chart

0' - 140'

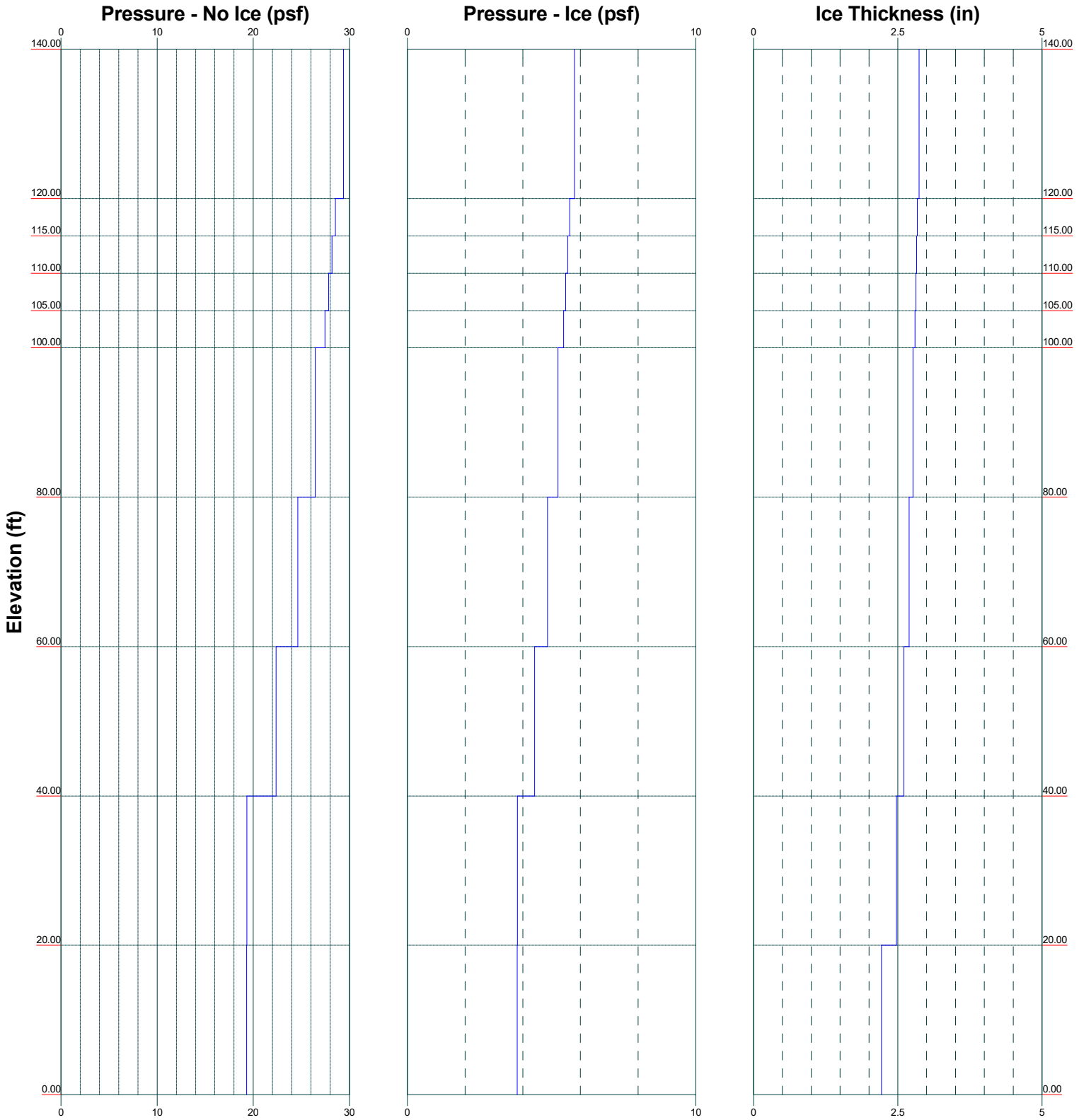
■ > 100%
 ■ 90%-100%
 ■ 75%-90%
 ■ 50%-75%
 ■ < 50% Overstress



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 Phone: (781) 713-4725
 FAX:

Job: CT3438		
Project: 140ft Self Support Tower		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 12/29/20	Scale: NTS
Path:		Dwg No. E-8

Wind Pressures and Ice Thickness
TIA-222-G - 105 mph/50 mph 1.0000 in Ice Exposure B



Centerline Communications
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 Phone: (781) 713-4725
 FAX:

Job: CT3438		
Project: 140ft Self Support Tower		
Client: AT&T	Drawn by: Joshua Gildert	App'd:
Code: TIA-222-G	Date: 12/29/20	Scale: NTS
Path:		Dwg No. E-9

tnxTower Centerline Communications 750 West Center Street, Suite 301 West Bridgewater, MA 02379 Phone: (781) 713-4725 FAX:	Job	CT3438	Page	1 of 27
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	Client	AT&T	Designed by	Joshua Gildert

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 140.00 ft above the ground line.

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

The face width of the tower is 8.00 ft at the top and 16.00 ft at the base.

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

The following design criteria apply:

Tower is located in Hartford County, Connecticut.

Basic wind speed of 105 mph.

Structure Class III.

Exposure Category B.

Topographic Category 1.

Crest Height 0.00 ft.

Nominal ice thickness of 1.0000 in.

Ice thickness is considered to increase with height.

Ice density of 56 pcf.

A wind speed of 50 mph is used in combination with ice.

Temperature drop of 50 °F.

Deflections calculated using a wind speed of 60 mph.

A non-linear (P-delta) analysis was used.

Pressures are calculated at each section.

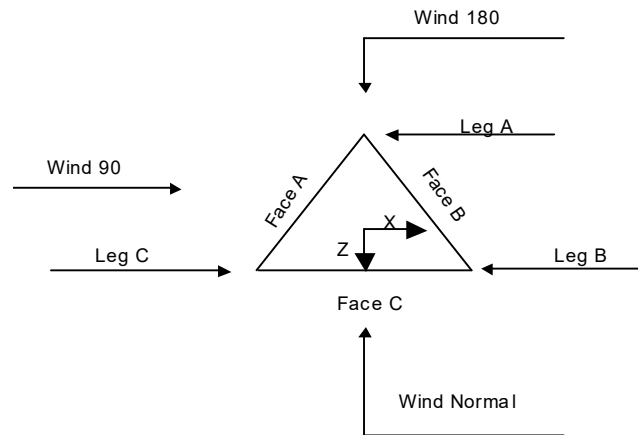
Stress ratio used in tower member design is 1.

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-G Bracing Resist. Exemption Use TIA-222-G Tension Splice Exemption <li style="text-align: center;">Poles 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 |
|--|---|---|

tnxTower Centerline Communications 750 West Center Street, Suite 301 West Bridgewater, MA 02379 Phone: (781) 713-4725 FAX:	Job CT3438	Page 2 of 27
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Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	140.00-120.00			8.00	1	20.00
T2	120.00-115.00			8.00	1	5.00
T3	115.00-110.00			8.00	1	5.00
T4	110.00-105.00			8.00	1	5.00
T5	105.00-100.00			8.00	1	5.00
T6	100.00-80.00			8.00	1	20.00
T7	80.00-60.00			8.00	1	20.00
T8	60.00-40.00			10.00	1	20.00
T9	40.00-20.00			12.00	1	20.00
T10	20.00-0.00			14.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	140.00-120.00	5.00	X Brace	No	No	0.0000	0.0000
T2	120.00-115.00	5.00	X Brace	No	No	0.0000	0.0000
T3	115.00-110.00	5.00	X Brace	No	No	0.0000	0.0000
T4	110.00-105.00	5.00	X Brace	No	No	0.0000	0.0000
T5	105.00-100.00	5.00	X Brace	No	No	0.0000	0.0000

tnxTower Centerline Communications 750 West Center Street, Suite 301 West Bridgewater, MA 02379 Phone: (781) 713-4725 FAX:	Job	CT3438	Page	3 of 27
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Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T6	100.00-80.00	5.00	X Brace	No	No	0.0000	0.0000
T7	80.00-60.00	5.00	X Brace	No	No	0.0000	0.0000
T8	60.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 140.00-120.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/8	A36 (36 ksi)
T2 120.00-115.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T3 115.00-110.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T4 110.00-105.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T5 105.00-100.00	Solid Round	2 1/4	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T6 100.00-80.00	Solid Round	2 3/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T7 80.00-60.00	Solid Round	3	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T8 60.00-40.00	Solid Round	3 1/4	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T9 40.00-20.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T10 20.00-0.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 140.00-120.00	Equal Angle	L3x3x3/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft ²	in					in	in	in

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	Client	AT&T	Designed by	Joshua Gildert

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T1 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T2 120.00-115.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T3 115.00-110.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T4 110.00-105.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T5 105.00-100.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors ¹							
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
											X Y
T1 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T2 120.00-115.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T3 115.00-110.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T4 110.00-105.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T5 105.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T6 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T7 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T8 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T9 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T10 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1

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

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Tower Section Geometry (cont'd)

Tower Elevation ft	Truss-Leg K Factors					
	Truss-Legs Used As Leg Members			Truss-Legs Used As Inner Members		
	Leg Panels	X Brace Diagonals	Z Brace Diagonals	Leg Panels	X Brace Diagonals	Z Brace Diagonals
T9 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T10 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 120.00-115.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 115.00-110.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 110.00-105.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 105.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 140.00-120.00	Flange	0.0000	0	A325N		0.6250	0	A325N		0.6250	0	A325N		0.6250	0
T2 120.00-115.00	Flange	0.6250	6	A325N		0.6250	0	A325N		0.0000	0	A325N		0.6250	0
T3 115.00-110.00	Flange	0.6250	0	A325N		0.6250	0	A325N		0.0000	0	A325N		0.6250	0
T4 110.00-105.00	Flange	0.6250	0	A325N		0.6250	1	A325N		0.0000	0	A325N		0.6250	0

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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T5 105.00-100.00	Flange	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.00-80.00	Flange	0.7500 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	0.8750 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-0.00	Flange	1.0000 A325N	6	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*** 3" Rigid Conduit	A	No	No	Ar (CaAa)	100.00 - 6.00	0.0000	0.45	3	3	0.0000	3.5000		3.00
VXL5-50 (7/8 FOAM) RFS	C	No	No	Ar (CaAa)	140.00 - 6.00	-4.0000	0.44	7	4	0.0000	1.0800		0.29
HYBRIFLEX 1 1/4	A	No	No	Ar (CaAa)	100.00 - 6.00	-2.0000	0.46	4	4	1.5400	1.5400		1.30
*** 1-5/8" + 6x12 HCS	C	No	No	Ar (CaAa)	120.00 - 6.00	-2.0000	0.44	12	6	0.5000	1.9800		0.82
*** WR-VG122S (AT&T)	A	No	No	Ar (CaAa)	110.00 - 6.00	0.0000	0.38	4	4	0.4600	0.4600		0.14
WR-VG122S (AT&T)	A	No	No	Ar (CaAa)	110.00 - 6.00	0.0000	0.42	5	5	0.4600	0.4600		0.14
FB-L98B-002-100000 (AT&T)	A	No	No	Ar (CaAa)	110.00 - 6.00	-4.0000	0.45	3	3	0.3937	0.3937		0.06
*** Feedline Ladder (Af)	C	No	No	Af (CaAa)	120.00 - 6.00	-4.0000	0.44	1	1	0.0000	3.0000		8.40
Feedline Ladder (Af)	A	No	No	Af (CaAa)	100.00 - 6.00	0.0000	0.4	1	1	0.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	No	Af (CaAa)	140.00 - 6.00	-2.0000	0.44	1	1	0.0000	3.0000		8.40
Safety Line 3/8	C	No	No	Ar (CaAa)	140.00 - 6.00	4.0000	0.5	1	1	0.3750	0.3750		0.22

Feed Line/Linear Appurtenances Section Areas

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	Project	140ft Self Support Tower	Date	10:57:37 12/29/20
	Client	AT&T	Designed by	Joshua Gildert

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
T1	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	25.870	0.000	213.00
T2	120.00-115.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	20.848	0.000	144.45
T3	115.00-110.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	20.848	0.000	144.45
T4	110.00-105.00	A	0.000	0.000	2.661	0.000	7.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	20.848	0.000	144.45
T5	105.00-100.00	A	0.000	0.000	2.661	0.000	7.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	20.848	0.000	144.45
T6	100.00-80.00	A	0.000	0.000	53.962	0.000	480.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	83.390	0.000	577.80
T7	80.00-60.00	A	0.000	0.000	53.962	0.000	480.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	83.390	0.000	577.80
T8	60.00-40.00	A	0.000	0.000	53.962	0.000	480.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	83.390	0.000	577.80
T9	40.00-20.00	A	0.000	0.000	53.962	0.000	480.80
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	83.390	0.000	577.80
T10	20.00-0.00	A	0.000	0.000	37.774	0.000	336.56
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	58.373	0.000	404.46

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
T1	140.00-120.00	A	2.867	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	65.648	0.000	1416.61
T2	120.00-115.00	A	2.839	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.688	0.000	865.33
T3	115.00-110.00	A	2.826	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.609	0.000	861.29
T4	110.00-105.00	A	2.813	0.000	0.000	19.962	0.000	266.75
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.526	0.000	857.10
T5	105.00-100.00	A	2.800	0.000	0.000	19.892	0.000	264.85
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	35.440	0.000	852.73
T6	100.00-80.00	A	2.764	0.000	0.000	190.290	0.000	3493.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	140.830	0.000	3363.95
T7	80.00-60.00	A	2.695	0.000	0.000	187.668	0.000	3394.11
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	139.066	0.000	3275.82
T8	60.00-40.00	A	2.606	0.000	0.000	184.262	0.000	3266.62

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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
T9	40.00-20.00	B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	136.772	0.000	3163.09
		A	2.476	0.000	0.000	179.311	0.000	3085.39
		B		0.000	0.000	0.000	0.000	0.00
T10	20.00-0.00	C		0.000	0.000	133.437	0.000	3002.79
		A	2.219	0.000	0.000	118.657	0.000	1918.52
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	88.775	0.000	1888.41

Feed Line Center of Pressure

Section	Elevation ft	CP _X in	CP _Z in	CP _X Ice in	CP _Z Ice in
T1	140.00-120.00	-7.8731	3.7980	-9.6972	5.4913
T2	120.00-115.00	-19.2078	7.9545	-18.0930	9.2212
T3	115.00-110.00	-19.2078	7.9545	-18.1194	9.2328
T4	110.00-105.00	-17.5050	2.4302	-15.6483	-1.2179
T5	105.00-100.00	-17.5050	2.4302	-15.6725	-1.2167
T6	100.00-80.00	-13.9139	-10.5502	-12.9995	-11.4075
T7	80.00-60.00	-14.9279	-11.2259	-14.4351	-12.6168
T8	60.00-40.00	-16.7909	-12.4894	-16.8438	-14.6515
T9	40.00-20.00	-18.4557	-13.2635	-16.7113	-14.3588
T10	20.00-0.00	-15.5928	-11.0442	-14.9714	-12.9682

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	3	VXL5-50 (7/8 FOAM)	120.00 - 140.00	0.6000	0.5447
T1	14	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5447
T1	15	Safety Line 3/8	120.00 - 140.00	0.6000	0.5447
T2	3	VXL5-50 (7/8 FOAM)	115.00 - 120.00	0.6000	0.5810
T2	6	1-5/8" + 6x12 HCS	115.00 - 120.00	0.6000	0.5810
T2	12	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.5810
T2	14	Feedline Ladder (Af)	115.00 - 120.00	0.6000	0.5810
T2	15	Safety Line 3/8	115.00 - 120.00	0.6000	0.5810
T3	3	VXL5-50 (7/8 FOAM)	110.00 - 115.00	0.6000	0.5822
T3	6	1-5/8" + 6x12 HCS	110.00 - 115.00	0.6000	0.5822
T3	12	Feedline Ladder (Af)	110.00 - 115.00	0.6000	0.5822

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	14	Feedline Ladder (Af)	110.00 - 115.00	0.6000	0.5822
T3	15	Safety Line 3/8	110.00 - 115.00	0.6000	0.5822
T4	3	VXL5-50 (7/8 FOAM)	105.00 - 110.00	0.6000	0.5742
T4	6	1-5/8" + 6x12 HCS	105.00 - 110.00	0.6000	0.5742
T4	8	WR-VG122S	105.00 - 110.00	0.6000	0.5742
T4	9	WR-VG122S	105.00 - 110.00	0.6000	0.5742
T4	10	FB-L98B-002-100000	105.00 - 110.00	0.6000	0.5742
T4	12	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.5742
T4	14	Feedline Ladder (Af)	105.00 - 110.00	0.6000	0.5742
T4	15	Safety Line 3/8	105.00 - 110.00	0.6000	0.5742
T5	3	VXL5-50 (7/8 FOAM)	100.00 - 105.00	0.6000	0.5756
T5	6	1-5/8" + 6x12 HCS	100.00 - 105.00	0.6000	0.5756
T5	8	WR-VG122S	100.00 - 105.00	0.6000	0.5756
T5	9	WR-VG122S	100.00 - 105.00	0.6000	0.5756
T5	10	FB-L98B-002-100000	100.00 - 105.00	0.6000	0.5756
T5	12	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.5756
T5	14	Feedline Ladder (Af)	100.00 - 105.00	0.6000	0.5756
T5	15	Safety Line 3/8	100.00 - 105.00	0.6000	0.5756
T6	2	3" Rigid Conduit	80.00 - 100.00	0.6000	0.5547
T6	3	VXL5-50 (7/8 FOAM)	80.00 - 100.00	0.6000	0.5547
T6	4	RFS HYBRIFLEX 1 1/4	80.00 - 100.00	0.6000	0.5547
T6	6	1-5/8" + 6x12 HCS	80.00 - 100.00	0.6000	0.5547
T6	8	WR-VG122S	80.00 - 100.00	0.6000	0.5547
T6	9	WR-VG122S	80.00 - 100.00	0.6000	0.5547
T6	10	FB-L98B-002-100000	80.00 - 100.00	0.6000	0.5547
T6	12	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.5547
T6	13	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.5547
T6	14	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.5547
T6	15	Safety Line 3/8	80.00 - 100.00	0.6000	0.5547
T7	2	3" Rigid Conduit	60.00 - 80.00	0.6000	0.5798
T7	3	VXL5-50 (7/8 FOAM)	60.00 - 80.00	0.6000	0.5798
T7	4	RFS HYBRIFLEX 1 1/4	60.00 - 80.00	0.6000	0.5798
T7	6	1-5/8" + 6x12 HCS	60.00 - 80.00	0.6000	0.5798
T7	8	WR-VG122S	60.00 - 80.00	0.6000	0.5798
T7	9	WR-VG122S	60.00 - 80.00	0.6000	0.5798
T7	10	FB-L98B-002-100000	60.00 - 80.00	0.6000	0.5798
T7	12	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5798
T7	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5798
T7	14	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5798
T7	15	Safety Line 3/8	60.00 - 80.00	0.6000	0.5798
T8	2	3" Rigid Conduit	40.00 - 60.00	0.6000	0.6000
T8	3	VXL5-50 (7/8 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	4	RFS HYBRIFLEX 1 1/4	40.00 - 60.00	0.6000	0.6000
T8	6	1-5/8" + 6x12 HCS	40.00 - 60.00	0.6000	0.6000

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Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	8	WR-VG122S	40.00 - 60.00	0.6000	0.6000
T8	9	WR-VG122S	40.00 - 60.00	0.6000	0.6000
T8	10	FB-L98B-002-100000	40.00 - 60.00	0.6000	0.6000
T8	12	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	14	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	15	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T9	2	3" Rigid Conduit	20.00 - 40.00	0.6000	0.5692
T9	3	VXL5-50 (7/8 FOAM)	20.00 - 40.00	0.6000	0.5692
T9	4	RFS HYBRIFLEX 1 1/4	20.00 - 40.00	0.6000	0.5692
T9	6	1-5/8" + 6x12 HCS	20.00 - 40.00	0.6000	0.5692
T9	8	WR-VG122S	20.00 - 40.00	0.6000	0.5692
T9	9	WR-VG122S	20.00 - 40.00	0.6000	0.5692
T9	10	FB-L98B-002-100000	20.00 - 40.00	0.6000	0.5692
T9	12	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.5692
T9	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.5692
T9	14	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.5692
T9	15	Safety Line 3/8	20.00 - 40.00	0.6000	0.5692
T10	2	3" Rigid Conduit	6.00 - 20.00	0.6000	0.6000
T10	3	VXL5-50 (7/8 FOAM)	6.00 - 20.00	0.6000	0.6000
T10	4	RFS HYBRIFLEX 1 1/4	6.00 - 20.00	0.6000	0.6000
T10	6	1-5/8" + 6x12 HCS	6.00 - 20.00	0.6000	0.6000
T10	8	WR-VG122S	6.00 - 20.00	0.6000	0.6000
T10	9	WR-VG122S	6.00 - 20.00	0.6000	0.6000
T10	10	FB-L98B-002-100000	6.00 - 20.00	0.6000	0.6000
T10	12	Feedline Ladder (Af)	6.00 - 20.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	6.00 - 20.00	0.6000	0.6000
T10	14	Feedline Ladder (Af)	6.00 - 20.00	0.6000	0.6000
T10	15	Safety Line 3/8	6.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C_{AA} Front	C_{AA} Side	Weight	
			ft ft ft	°	ft	ft ²	ft ²	lb	
Lightening Rod 2"x15'	B	From Leg	0.50	0.0000	138.00	No Ice	3.00	3.00	80.00
			0.00			1/2" Ice	4.53	4.53	103.14
			7.50			1" Ice	6.07	6.07	135.79
*** Omni 2"x7'	A	From Leg	3.00	0.0000	138.00	No Ice	1.40	1.40	30.00
			0.00			1/2" Ice	2.13	2.13	40.00
			5.00			1" Ice	2.86	2.86	50.00
Omni 2"x7'	B	From Leg	3.00	0.0000	138.00	No Ice	1.40	1.40	30.00
			0.00			1/2" Ice	2.13	2.13	40.00
			5.00			1" Ice	2.86	2.86	50.00
Omni 2"x7'	C	From Leg	3.00	0.0000	138.00	No Ice	1.40	1.40	30.00
			0.00			1/2" Ice	2.13	2.13	40.00
			5.00			1" Ice	2.86	2.86	50.00
3' Side Mount Standoff	A	From Leg	1.50	0.0000	138.00	No Ice	1.50	1.50	40.00
			0.00			1/2" Ice	2.20	2.20	70.00
			0.00			1" Ice	2.90	2.90	100.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	CAA Front ft ²	CAA Side ft ²	Weight lb
3' Side Mount Standoff	B	From Leg	1.50 0.00 0.00	0.0000	138.00	No Ice 1.50 1/2" Ice 2.20 1" Ice 2.90	1.50 2.20 2.90	40.00 70.00 100.00
3' Side Mount Standoff	C	From Leg	1.50 0.00 0.00	0.0000	138.00	No Ice 1.50 1/2" Ice 2.20 1" Ice 2.90	1.50 2.20 2.90	40.00 70.00 100.00

3' Side Mount Standoff	C	From Leg	1.50 0.00 0.00	0.0000	135.00	No Ice 1.50 1/2" Ice 2.20 1" Ice 2.90	1.50 2.20 2.90	40.00 70.00 100.00

Omni 3"x20'	A	From Leg	3.00 0.00 10.00	0.0000	120.00	No Ice 6.00 1/2" Ice 8.03 1" Ice 10.06	6.00 8.03 10.06	50.00 90.00 140.00
Omni 3"x20'	B	From Leg	3.00 0.00 10.00	0.0000	120.00	No Ice 6.00 1/2" Ice 8.03 1" Ice 10.06	6.00 8.03 10.06	50.00 90.00 140.00
Omni 3"x20'	C	From Leg	3.00 0.00 10.00	0.0000	120.00	No Ice 6.00 1/2" Ice 8.03 1" Ice 10.06	6.00 8.03 10.06	50.00 90.00 140.00

AIR 6449 B41 W/ MOUNT PIPE (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 5.95 1/2" Ice 6.33 1" Ice 6.72	3.36 3.83 4.32	118.60 168.39 223.69
AIR 6449 B41 W/ MOUNT PIPE (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 5.95 1/2" Ice 6.33 1" Ice 6.72	3.36 3.83 4.32	118.60 168.39 223.69
AIR 6449 B41 W/ MOUNT PIPE (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 5.95 1/2" Ice 6.33 1" Ice 6.72	3.36 3.83 4.32	118.60 168.39 223.69
AIR32 B2A/B66A W/ MOUNT PIPE (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 6.58 1/2" Ice 6.97 1" Ice 7.37	5.90 6.56 7.24	150.45 209.55 275.40
AIR32 B2A/B66A W/ MOUNT PIPE (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 6.58 1/2" Ice 6.97 1" Ice 7.37	5.90 6.56 7.24	150.45 209.55 275.40
AIR32 B2A/B66A W/ MOUNT PIPE (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 6.58 1/2" Ice 6.97 1" Ice 7.37	5.90 6.56 7.24	150.45 209.55 275.40
AIR32 B2A/B66A (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 6.51 1/2" Ice 6.89 1" Ice 7.27	4.71 5.07 5.43	132.20 178.02 229.11
AIR32 B2A/B66A (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 6.51 1/2" Ice 6.89 1" Ice 7.27	4.71 5.07 5.43	132.20 178.02 229.11
AIR32 B2A/B66A (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 6.51 1/2" Ice 6.89 1" Ice 7.27	4.71 5.07 5.43	132.20 178.02 229.11
APXVAARR24_43-U-NA20 W/ MOUNT PIPE (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 20.24 1/2" Ice 20.89 1" Ice 21.55	10.79 12.21 13.49	157.20 290.89 435.20
APXVAARR24_43-U-NA20 W/ MOUNT PIPE (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 20.24 1/2" Ice 20.89 1" Ice 21.55	10.79 12.21 13.49	157.20 290.89 435.20
APXVAARR24_43-U-NA20 W/ MOUNT PIPE (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 20.24 1/2" Ice 20.89 1" Ice 21.55	10.79 12.21 13.49	157.20 290.89 435.20

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	Client	AT&T	Designed by	Joshua Gildert

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight lb
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 0.40 1/2" Ice 0.49 1" Ice 0.57	0.16 0.22 0.28	10.00 10.00 20.00
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 0.40 1/2" Ice 0.49 1" Ice 0.57	0.16 0.22 0.28	10.00 10.00 20.00
GENERIC TWIN STYLE 1B - TWIN AWS (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 0.40 1/2" Ice 0.49 1" Ice 0.57	0.16 0.22 0.28	10.00 10.00 20.00
RADIO 4449 B71+B85 (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95	1.00 1.13 1.27	74.00 89.91 108.43
RADIO 4449 B71+B85 (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95	1.00 1.13 1.27	74.00 89.91 108.43
RADIO 4449 B71+B85 (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1.63 1/2" Ice 1.79 1" Ice 1.95	1.00 1.13 1.27	74.00 89.91 108.43
RADIO 4415 B25 (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1.84 1/2" Ice 2.01 1" Ice 2.19	0.82 0.94 1.07	46.00 60.07 76.66
RADIO 4415 B25 (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1.84 1/2" Ice 2.01 1" Ice 2.19	0.82 0.94 1.07	46.00 60.07 76.66
RADIO 4415 B25 (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1.84 1/2" Ice 2.01 1" Ice 2.19	0.82 0.94 1.07	46.00 60.07 76.66
VFA12-WLL-30120 (T-MOBILE)	A	From Leg	0.00 0.00 0.00	0.0000	120.00	No Ice 13.20 1/2" Ice 19.50 1" Ice 25.80	9.20 14.60 19.50	660.00 800.00 1010.00
VFA12-WLL-30120 (T-MOBILE)	B	From Leg	0.00 0.00 0.00	0.0000	120.00	No Ice 13.20 1/2" Ice 19.50 1" Ice 25.80	9.20 14.60 19.50	660.00 800.00 1010.00
VFA12-WLL-30120 (T-MOBILE)	C	From Leg	0.00 0.00 0.00	0.0000	120.00	No Ice 13.20 1/2" Ice 19.50 1" Ice 25.80	9.20 14.60 19.50	660.00 800.00 1010.00
10'-P2.5x0.276 (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 2.88 1/2" Ice 3.91 1" Ice 4.96	2.88 3.91 4.96	60.00 80.00 110.00
10'-P2.5x0.276 (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 2.88 1/2" Ice 3.91 1" Ice 4.96	2.88 3.91 4.96	60.00 80.00 110.00
10'-P2.5x0.276 (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 2.88 1/2" Ice 3.91 1" Ice 4.96	2.88 3.91 4.96	60.00 80.00 110.00
(2) 10.5'-P2x0.154 (T-MOBILE)	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 2.49 1/2" Ice 3.57 1" Ice 4.67	2.49 3.57 4.67	40.00 60.00 80.00
(2) 10.5'-P2x0.154 (T-MOBILE)	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 2.49 1/2" Ice 3.57 1" Ice 4.67	2.49 3.57 4.67	40.00 60.00 80.00
(2) 10.5'-P2x0.154 (T-MOBILE)	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 2.49 1/2" Ice 3.57 1" Ice 4.67	2.49 3.57 4.67	40.00 60.00 80.00

Nokia AAHC w/pipe	A	From Leg	4.00 0.00	0.0000	100.00	No Ice 4.39 1/2" Ice 4.70	2.73 3.11	120.00 160.00

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	Client	AT&T	Designed by	Joshua Gildert

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft ²	ft ²	lb	
Nokia AAHC w/pipe	B	From Leg	0.00		0.0000	100.00	1" Ice	5.02	3.51	210.00
			4.00				No Ice	4.39	2.73	120.00
			0.00				1/2" Ice	4.70	3.11	160.00
Nokia AAHC w/pipe	C	From Leg	0.00		0.0000	100.00	1" Ice	5.02	3.51	210.00
			4.00				No Ice	4.39	2.73	120.00
			0.00				1/2" Ice	4.70	3.11	160.00
Andrew-Commscope NNV-65B-R4 w/pipe	A	From Leg	0.00		0.0000	100.00	1" Ice	5.02	3.51	210.00
			4.00				No Ice	12.56	7.76	130.00
			0.00				1/2" Ice	13.14	8.80	230.00
Andrew-Commscope NNV-65B-R4 w/pipe	B	From Leg	0.00		0.0000	100.00	1" Ice	13.70	9.69	330.00
			4.00				No Ice	12.56	7.76	130.00
			0.00				1/2" Ice	13.14	8.80	230.00
Andrew-Commscope NNV-65B-R4 w/pipe	C	From Leg	0.00		0.0000	100.00	1" Ice	13.70	9.69	330.00
			4.00				No Ice	12.56	7.76	130.00
			0.00				1/2" Ice	13.14	8.80	230.00
RRH4x45-19	A	From Leg	0.00		0.0000	100.00	1" Ice	13.70	9.69	330.00
			4.00				No Ice	2.31	2.38	60.00
			0.00				1/2" Ice	2.52	2.58	80.00
RRH4x45-19	B	From Leg	0.00		0.0000	100.00	1" Ice	2.73	2.79	110.00
			4.00				No Ice	2.31	2.38	60.00
			0.00				1/2" Ice	2.52	2.58	80.00
RRH4x45-19	C	From Leg	0.00		0.0000	100.00	1" Ice	2.73	2.79	110.00
			4.00				No Ice	2.31	2.38	60.00
			0.00				1/2" Ice	2.52	2.58	80.00
(2) FD-RRH-2x50-800	A	From Leg	0.00		0.0000	100.00	1" Ice	2.73	2.79	110.00
			4.00				No Ice	1.36	3.01	50.00
			0.00				1/2" Ice	1.52	3.22	80.00
(2) FD-RRH-2x50-800	B	From Leg	0.00		0.0000	100.00	1" Ice	1.68	3.45	100.00
			4.00				No Ice	1.36	3.01	50.00
			0.00				1/2" Ice	1.52	3.22	80.00
(2) FD-RRH-2x50-800	C	From Leg	0.00		0.0000	100.00	1" Ice	1.68	3.45	100.00
			4.00				No Ice	1.36	3.01	50.00
			0.00				1/2" Ice	1.52	3.22	80.00
6'-P4x0.237	A	From Leg	0.00		0.0000	100.00	1" Ice	1.68	3.45	100.00
			4.00				No Ice	1.77	0.03	60.00
			0.00				1/2" Ice	2.62	0.04	80.00
6'-P4x0.237	B	From Leg	0.00		0.0000	100.00	1" Ice	3.00	0.06	110.00
			4.00				No Ice	1.77	0.03	60.00
			0.00				1/2" Ice	2.62	0.04	80.00
6'-P4x0.237	C	From Leg	0.00		0.0000	100.00	1" Ice	3.00	0.06	110.00
			4.00				No Ice	1.77	0.03	60.00
			0.00				1/2" Ice	2.62	0.04	80.00
5'xP3x0.216 H	A	From Leg	0.00		0.0000	100.00	1" Ice	3.00	0.06	110.00
			4.00				No Ice	1.86	0.03	40.00
			0.00				1/2" Ice	2.28	0.04	60.00
5'xP3x0.216 H	B	From Leg	0.00		0.0000	100.00	1" Ice	2.71	0.06	70.00
			4.00				No Ice	1.86	0.03	40.00
			0.00				1/2" Ice	2.28	0.04	60.00
5'xP3x0.216 H	C	From Leg	0.00		0.0000	100.00	1" Ice	2.71	0.06	70.00
			4.00				No Ice	1.86	0.03	40.00
			0.00				1/2" Ice	2.28	0.04	60.00
***			0.00				1" Ice	2.71	0.06	70.00
80010799 w/ Mount Pipe (AT&T)	A	From Leg	4.00		0.0000	110.00	No Ice	9.91	6.15	140.00
			0.00				1/2" Ice	10.67	6.87	240.00
			0.00				1" Ice	11.44	7.60	360.00
80010799 w/ Mount Pipe	B	From Leg	4.00		0.0000	110.00	No Ice	9.91	6.15	140.00

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft ²	ft ²	lb
(AT&T)			0.00			1/2" Ice	10.67	6.87	240.00
			0.00			1" Ice	11.44	7.60	360.00
80010799 w/ Mount Pipe	C	From Leg	4.00		0.0000	No Ice	9.91	6.15	140.00
(AT&T)			0.00			1/2" Ice	10.67	6.87	240.00
			0.00			1" Ice	11.44	7.60	360.00
RRUS 4415 B25	A	From Leg	4.00		0.0000	No Ice	1.64	0.68	40.00
(AT&T)			0.00			1/2" Ice	1.80	0.79	60.00
			0.00			1" Ice	1.97	0.91	70.00
RRUS 4415 B25	B	From Leg	4.00		0.0000	No Ice	1.64	0.68	40.00
(AT&T)			0.00			1/2" Ice	1.80	0.79	60.00
			0.00			1" Ice	1.97	0.91	70.00
RRUS 4415 B25	C	From Leg	4.00		0.0000	No Ice	1.64	0.68	40.00
(AT&T)			0.00			1/2" Ice	1.80	0.79	60.00
			0.00			1" Ice	1.97	0.91	70.00
RRUS 32	A	From Leg	4.00		0.0000	No Ice	2.86	1.78	60.00
(AT&T)			0.00			1/2" Ice	3.08	1.97	80.00
			0.00			1" Ice	3.32	2.17	100.00
RRUS 32	B	From Leg	4.00		0.0000	No Ice	2.86	1.78	60.00
(AT&T)			0.00			1/2" Ice	3.08	1.97	80.00
			0.00			1" Ice	3.32	2.17	100.00
RRUS 32	C	From Leg	4.00		0.0000	No Ice	2.86	1.78	60.00
(AT&T)			0.00			1/2" Ice	3.08	1.97	80.00
			0.00			1" Ice	3.32	2.17	100.00
OPA65R-BU8DA w/ Mount Pipe	A	From Leg	4.00		0.0000	No Ice	18.09	10.10	110.00
(AT&T)			0.00			1/2" Ice	18.72	11.52	230.00
			0.00			1" Ice	19.36	12.80	360.00
OPA65R-BU8DA w/ Mount Pipe	B	From Leg	4.00		0.0000	No Ice	18.09	10.10	110.00
(AT&T)			0.00			1/2" Ice	18.72	11.52	230.00
			0.00			1" Ice	19.36	12.80	360.00
OPA65R-BU8DA w/ Mount Pipe	C	From Leg	4.00		0.0000	No Ice	18.09	10.10	110.00
(AT&T)			0.00			1/2" Ice	18.72	11.52	230.00
			0.00			1" Ice	19.36	12.80	360.00
DMP65R-BU8DA w/ Mount Pipe	A	From Leg	4.00		0.0000	No Ice	17.87	10.02	120.00
(AT&T)			0.00			1/2" Ice	18.50	11.44	240.00
			0.00			1" Ice	19.14	12.72	370.00
DMP65R-BU8DA w/ Mount Pipe	B	From Leg	4.00		0.0000	No Ice	17.87	10.02	120.00
(AT&T)			0.00			1/2" Ice	18.50	11.44	240.00
			0.00			1" Ice	19.14	12.72	370.00
DMP65R-BU8DA w/ Mount Pipe	C	From Leg	4.00		0.0000	No Ice	17.87	10.02	120.00
(AT&T)			0.00			1/2" Ice	18.50	11.44	240.00
			0.00			1" Ice	19.14	12.72	370.00
RRUS E2 B92	A	From Leg	4.00		0.0000	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	80.00
			0.00			1" Ice	3.59	1.60	110.00
RRUS E2 B92	B	From Leg	4.00		0.0000	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	80.00
			0.00			1" Ice	3.59	1.60	110.00
RRUS E2 B92	C	From Leg	4.00		0.0000	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	80.00
			0.00			1" Ice	3.59	1.60	110.00
RRUS 8843 B2/B66A	A	From Leg	4.00		0.0000	No Ice	1.64	1.35	70.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	90.00
			0.00			1" Ice	1.97	1.65	110.00
RRUS 8843 B2/B66A	B	From Leg	4.00		0.0000	No Ice	1.64	1.35	70.00
(AT&T)			0.00			1/2" Ice	1.80	1.50	90.00
			0.00			1" Ice	1.97	1.65	110.00
RRUS 8843 B2/B66A	C	From Leg	4.00		0.0000	No Ice	1.64	1.35	70.00

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C _{AA} Front	C _{AA} Side	Weight
			ft	°	ft	ft ²	ft ²	lb
(AT&T)			0.00			1/2" Ice	1.80	90.00
			0.00			1" Ice	1.97	110.00
RRUS 4478 B14 (AT&T)	A	From Leg	4.00	0.0000	110.00	No Ice	1.84	60.00
			0.00			1/2" Ice	2.01	80.00
			0.00			1" Ice	2.19	90.00
RRUS 4478 B14 (AT&T)	B	From Leg	4.00	0.0000	110.00	No Ice	1.84	60.00
			0.00			1/2" Ice	2.01	80.00
			0.00			1" Ice	2.19	90.00
RRUS 4478 B14 (AT&T)	C	From Leg	4.00	0.0000	110.00	No Ice	1.84	60.00
			0.00			1/2" Ice	2.01	80.00
			0.00			1" Ice	2.19	90.00
RRUS 4449 B5/12 (AT&T)	A	From Leg	4.00	0.0000	110.00	No Ice	1.97	70.00
			0.00			1/2" Ice	2.14	90.00
			0.00			1" Ice	2.33	110.00
RRUS 4449 B5/12 (AT&T)	B	From Leg	4.00	0.0000	110.00	No Ice	1.97	70.00
			0.00			1/2" Ice	2.14	90.00
			0.00			1" Ice	2.33	110.00
RRUS 4449 B5/12 (AT&T)	C	From Leg	4.00	0.0000	110.00	No Ice	1.97	70.00
			0.00			1/2" Ice	2.14	90.00
			0.00			1" Ice	2.33	110.00
DC9-48-60-24-8C-EV (AT&T)	A	From Leg	4.00	0.0000	110.00	No Ice	2.74	30.00
			0.00			1/2" Ice	2.96	60.00
			0.00			1" Ice	3.20	100.00
DC9-48-60-24-8C-EV (AT&T)	B	From Leg	4.00	0.0000	110.00	No Ice	2.74	30.00
			0.00			1/2" Ice	2.96	60.00
			0.00			1" Ice	3.20	100.00
DC9-48-60-24-8C-EV (AT&T)	C	From Leg	4.00	0.0000	110.00	No Ice	2.74	30.00
			0.00			1/2" Ice	2.96	60.00
			0.00			1" Ice	3.20	100.00
SABRE 12' V-BOOM (AT&T)	A	From Leg	0.00	0.0000	110.00	No Ice	15.40	560.00
			0.00			1/2" Ice	21.30	740.00
			0.00			1" Ice	27.20	920.00
SABRE 12' V-BOOM (AT&T)	B	From Leg	0.00	0.0000	110.00	No Ice	15.40	560.00
			0.00			1/2" Ice	21.30	740.00
			0.00			1" Ice	27.20	920.00
SABRE 12' V-BOOM (AT&T)	C	From Leg	0.00	0.0000	110.00	No Ice	15.40	560.00
			0.00			1/2" Ice	21.30	740.00
			0.00			1" Ice	27.20	920.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft	°	°	ft	ft	ft ²	lb
VHLP1	A	Paraboloid w/Radome	From Leg	2.00	0.0000		135.00	1.25	No Ice	10.00
				0.00					1/2" Ice	30.00
				0.00					1" Ice	40.00
VHLP2-11	A	Paraboloid	From	4.00	0.0000		100.00	2.00	No Ice	50.00

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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft ²	Weight lb
VHLP1	A	Paraboloid w/Radome	From Leg	0.00	0.0000		95.00	1.25	1/2" Ice	70.00
				0.00					1" Ice	90.00
				2.00					No Ice	10.00
				0.00					1/2" Ice	30.00
VHLP1	B	Paraboloid w/Radome	From Leg	0.00	0.0000		95.00	1.25	1" Ice	40.00
				2.00					No Ice	10.00
				0.00					1/2" Ice	30.00
				0.00					1" Ice	40.00
VHLP2-11	A	Paraboloid w/o Radome	From Leg	2.00	0.0000		100.00	2.17	No Ice	30.00
				0.00					1/2" Ice	50.00
				0.00					1" Ice	70.00
				0.00					No Ice	80.00
HP4-102	A	Paraboloid w/Shroud (HP)	From Leg	3.00	0.0000		105.00	4.00	No Ice	100.00
				0.00					1/2" Ice	100.00
				0.00					1" Ice	200.00
				0.00					1" Ice	200.00

Truss-Leg Properties

Section Designation	Area in ²	Area Ice in ²	Self Weight lb	Ice Weight lb	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in ²
Pirod 105218	2263.4687	7294.0816	754.52	2139.58	7.8593	25.3267	7.2158
Pirod 105219	2441.8688	7138.3308	944.27	1840.96	8.4787	24.7859	9.4248

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice

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Comb. No.	Description
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	249047.28	21758.84	-13336.59
	Max. H _x	18	249047.28	21758.84	-13336.59
	Max. H _z	7	-210172.29	-18833.02	11647.85
	Min. Vert	7	-210172.29	-18833.02	11647.85
	Min. H _x	7	-210172.29	-18833.02	11647.85
	Min. H _z	18	249047.28	21758.84	-13336.59
Leg B	Max. Vert	10	251298.12	-22599.33	-13118.17
	Max. H _x	23	-216923.43	19760.07	11525.57
	Max. H _z	23	-216923.43	19760.07	11525.57
	Min. Vert	23	-216923.43	19760.07	11525.57
	Min. H _x	10	251298.12	-22599.33	-13118.17
	Min. H _z	10	251298.12	-22599.33	-13118.17
Leg A	Max. Vert	2	262303.81	-1201.83	27149.29
	Max. H _x	21	11182.57	1589.02	889.82
	Max. H _z	2	262303.81	-1201.83	27149.29
	Min. Vert	15	-227261.21	1183.75	-24065.33
	Min. H _x	8	14831.20	-1642.41	1194.68
	Min. H _z	15	-227261.21	1183.75	-24065.33

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft

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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
Dead Only	35630.38	0.01	0.00	-4541.36	16576.72	0.02
1.2 Dead+1.6 Wind 0 deg - No Ice	42756.46	-5.03	-40718.04	-3437104.55	20563.10	-32965.40
0.9 Dead+1.6 Wind 0 deg - No Ice	32067.34	-5.03	-40718.24	-3431324.82	15544.00	-32937.98
1.2 Dead+1.6 Wind 30 deg - No Ice	42756.46	18269.78	-31987.69	-2759718.27	-1549263.42	-23500.30
0.9 Dead+1.6 Wind 30 deg - No Ice	32067.34	18269.87	-31987.86	-2754760.50	-1552238.61	-23472.61
1.2 Dead+1.6 Wind 60 deg - No Ice	42756.46	30910.22	-18083.20	-1561804.14	-2632468.86	-18881.11
0.9 Dead+1.6 Wind 60 deg - No Ice	32067.34	30910.38	-18083.29	-1558404.59	-2634037.19	-18862.34
1.2 Dead+1.6 Wind 90 deg - No Ice	42756.46	36536.30	-24.19	-8023.53	-3089904.07	-18253.83
0.9 Dead+1.6 Wind 90 deg - No Ice	32067.34	36536.48	-24.20	-6645.70	-3090902.57	-18248.89
1.2 Dead+1.6 Wind 120 deg - No Ice	42756.46	33668.78	20020.63	1692190.91	-2815748.62	-2078.80
0.9 Dead+1.6 Wind 120 deg - No Ice	32067.34	33668.94	20020.73	1691380.40	-2817127.21	-2088.66
1.2 Dead+1.6 Wind 150 deg - No Ice	42756.46	19537.49	34450.93	2903949.26	-1623053.02	20378.63
0.9 Dead+1.6 Wind 150 deg - No Ice	32067.34	19537.58	34451.10	2901581.50	-1625965.91	20356.71
1.2 Dead+1.6 Wind 180 deg - No Ice	42756.46	-1.42	38868.29	3300039.03	20226.07	33000.99
0.9 Dead+1.6 Wind 180 deg - No Ice	32067.34	-1.43	38868.48	3297136.40	15205.66	32971.29
1.2 Dead+1.6 Wind 210 deg - No Ice	42756.46	-18278.56	32260.55	2777157.66	1590527.08	23234.69
0.9 Dead+1.6 Wind 210 deg - No Ice	32067.34	-18278.66	32260.71	2774902.73	1583466.06	23206.78
1.2 Dead+1.6 Wind 240 deg - No Ice	42756.46	-32676.05	19441.67	1658832.03	2798994.98	18313.69
0.9 Dead+1.6 Wind 240 deg - No Ice	32067.34	-32676.22	19441.77	1658048.16	2790381.07	18287.48
1.2 Dead+1.6 Wind 270 deg - No Ice	42755.97	-36548.48	-26.13	-8212.17	3131089.52	18221.14
0.9 Dead+1.6 Wind 270 deg - No Ice	32067.34	-36548.97	-26.38	-6837.46	3122044.94	18217.09
1.2 Dead+1.6 Wind 300 deg - No Ice	42756.46	-31922.92	-18666.24	-1595474.29	2731155.70	2618.14
0.9 Dead+1.6 Wind 300 deg - No Ice	32067.34	-31923.08	-18666.33	-1592046.67	2722632.07	2627.66
1.2 Dead+1.6 Wind 330 deg - No Ice	42756.46	-19545.38	-34182.87	-2886849.85	1663566.67	-20079.54
0.9 Dead+1.6 Wind 330 deg - No Ice	32067.34	-19545.48	-34183.04	-2881778.16	1656439.89	-20058.04
1.2 Dead+1.0 Ice+1.0 Temp	152960.18	0.44	0.12	-40098.03	97107.12	0.29
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	152960.18	-0.98	-10474.32	-948587.76	97306.12	-8328.51
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	152960.18	5005.04	-8720.41	-803723.27	-340473.57	-7665.29
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	152960.18	8594.52	-4997.04	-477538.81	-653925.88	-6265.01
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	152960.18	10200.03	-2.46	-40398.46	-785882.91	-5300.94
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	152960.18	9175.20	5387.57	423761.09	-689805.75	-1476.26
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	152960.18	5251.05	9189.14	752878.62	-354893.05	4715.96

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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
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 180	152960.18	-0.26	10323.63	858658.27	97254.65	8334.07
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 210	152960.18	-5006.73	8764.08	728085.97	535133.99	7624.53
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 240	152960.18	-8752.10	5142.16	409461.06	859637.01	6183.51
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 270	152960.18	-10202.47	-2.90	-40413.41	980548.61	5294.97
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	152960.18	-9021.50	-5243.26	-491910.11	873332.41	1554.46
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	152960.18	-5252.58	-9146.42	-828599.11	549419.54	-4667.80
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	35630.38	-0.89	-7225.93	-613042.46	16737.79	-5848.27
Dead+Wind 30 deg - Service	35630.38	3242.22	-5676.62	-492906.94	-261603.09	-4170.26
Dead+Wind 60 deg - Service	35630.38	5485.43	-3209.10	-280505.04	-453668.32	-3348.74
Dead+Wind 90 deg - Service	35630.38	6483.84	-4.30	-4999.45	-534766.30	-3236.57
Dead+Wind 120 deg - Service	35630.38	5974.95	3552.91	296472.35	-486183.33	-369.97
Dead+Wind 150 deg - Service	35630.38	3467.18	6113.77	511322.41	-274695.43	3610.41
Dead+Wind 180 deg - Service	35630.38	-0.25	6897.69	581554.71	16675.60	5853.25
Dead+Wind 210 deg - Service	35630.38	-3243.76	5725.06	488834.89	295113.07	4122.96
Dead+Wind 240 deg - Service	35630.38	-5798.78	3450.17	290555.85	509404.97	3248.04
Dead+Wind 270 deg - Service	35630.38	-6486.05	-4.69	-5033.22	568273.70	3230.99
Dead+Wind 300 deg - Service	35630.38	-5665.14	-3312.57	-286482.66	497371.45	465.87
Dead+Wind 330 deg - Service	35630.38	-3468.58	-6066.19	-515468.75	308070.36	-3557.32

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	-0.00	-35630.38	0.00	-0.01	35630.38	-0.00	0.000%
2	-5.03	-42756.46	-40718.76	5.03	42756.46	40718.04	0.001%
3	-5.03	-32067.35	-40718.76	5.03	32067.34	40718.24	0.001%
4	18270.19	-42756.46	-31988.31	-18269.78	42756.46	31987.69	0.001%
5	18270.19	-32067.35	-31988.31	-18269.87	32067.34	31987.86	0.001%
6	30910.87	-42756.46	-18083.58	-30910.22	42756.46	18083.20	0.001%
7	30910.87	-32067.35	-18083.58	-30910.38	32067.34	18083.29	0.001%
8	36537.01	-42756.46	-24.25	-36536.30	42756.46	24.19	0.001%
9	36537.01	-32067.35	-24.25	-36536.48	32067.34	24.20	0.001%
10	33669.37	-42756.46	20020.99	-33668.78	42756.46	-20020.63	0.001%
11	33669.37	-32067.35	20020.99	-33668.94	32067.34	-20020.73	0.001%
12	19537.81	-42756.46	34451.62	-19537.49	42756.46	-34450.93	0.001%
13	19537.81	-32067.35	34451.62	-19537.58	32067.34	-34451.10	0.001%
14	-1.43	-42756.46	38869.10	1.42	42756.46	-38868.29	0.001%
15	-1.43	-32067.35	38869.10	1.43	32067.34	-38868.48	0.001%
16	-18278.88	-42756.46	32261.22	18278.56	42756.46	-32260.55	0.001%
17	-18278.88	-32067.35	32261.22	18278.66	32067.34	-32260.71	0.001%
18	-32676.65	-42756.46	19442.03	32676.05	42756.46	-19441.67	0.001%
19	-32676.65	-32067.35	19442.03	32676.22	32067.34	-19441.77	0.001%
20	-36549.50	-42756.46	-26.43	36548.48	42755.97	26.13	0.002%
21	-36549.50	-32067.35	-26.43	36548.97	32067.34	26.38	0.001%
22	-31923.59	-42756.46	-18666.63	31922.92	42756.46	18666.24	0.001%
23	-31923.59	-32067.35	-18666.63	31923.08	32067.34	18666.33	0.001%
24	-19545.81	-42756.46	-34183.50	19545.38	42756.46	34182.87	0.001%
25	-19545.81	-32067.35	-34183.50	19545.48	32067.34	34183.04	0.001%
26	-0.00	-152960.18	0.00	-0.44	152960.18	-0.12	0.000%
27	-1.00	-152960.18	-10474.52	0.98	152960.18	10474.32	0.000%

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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	
28	5005.11	-152960.18	-8720.58	-5005.04	152960.18	8720.41	0.000%
29	8594.66	-152960.18	-4997.14	-8594.52	152960.18	4997.04	0.000%
30	10200.19	-152960.18	-2.47	-10200.03	152960.18	2.46	0.000%
31	9175.34	-152960.18	5387.66	-9175.20	152960.18	-5387.57	0.000%
32	5251.12	-152960.18	9189.30	-5251.05	152960.18	-9189.14	0.000%
33	-0.28	-152960.18	10323.82	0.26	152960.18	-10323.63	0.000%
34	-5006.85	-152960.18	8764.24	5006.73	152960.18	-8764.08	0.000%
35	-8752.29	-152960.18	5142.25	8752.10	152960.18	-5142.16	0.000%
36	-10202.68	-152960.18	-2.91	10202.47	152960.18	2.90	0.000%
37	-9021.69	-152960.18	-5243.36	9021.50	152960.18	5243.26	0.000%
38	-5252.70	-152960.18	-9146.59	5252.58	152960.18	9146.42	0.000%
39	-0.89	-35630.38	-7226.04	0.89	35630.38	7225.93	0.000%
40	3242.27	-35630.38	-5676.72	-3242.22	35630.38	5676.62	0.000%
41	5485.51	-35630.38	-3209.15	-5485.43	35630.38	3209.10	0.000%
42	6483.94	-35630.38	-4.30	-6483.84	35630.38	4.30	0.000%
43	5975.04	-35630.38	3552.97	-5974.95	35630.38	-3552.91	0.000%
44	3467.22	-35630.38	6113.86	-3467.18	35630.38	-6113.77	0.000%
45	-0.25	-35630.38	6897.80	0.25	35630.38	-6897.69	0.000%
46	-3243.81	-35630.38	5725.15	3243.76	35630.38	-5725.06	0.000%
47	-5798.87	-35630.38	3450.23	5798.78	35630.38	-3450.17	0.000%
48	-6486.16	-35630.38	-4.69	6486.05	35630.38	4.69	0.000%
49	-5665.23	-35630.38	-3312.62	5665.14	35630.38	3312.57	0.000%
50	-3468.64	-35630.38	-6066.28	3468.58	35630.38	6066.19	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.0000001	0.0000001
2	Yes	9	0.0000001	0.00008504
3	Yes	9	0.0000001	0.00006144
4	Yes	9	0.0000001	0.00009268
5	Yes	9	0.0000001	0.00006902
6	Yes	9	0.0000001	0.00009950
7	Yes	9	0.0000001	0.00007557
8	Yes	9	0.0000001	0.00009285
9	Yes	9	0.0000001	0.00006918
10	Yes	9	0.0000001	0.00008522
11	Yes	9	0.0000001	0.00006165
12	Yes	9	0.0000001	0.00009317
13	Yes	9	0.0000001	0.00006945
14	Yes	9	0.0000001	0.00009999
15	Yes	9	0.0000001	0.00007602
16	Yes	9	0.0000001	0.00009302
17	Yes	9	0.0000001	0.00006934
18	Yes	9	0.0000001	0.00008534
19	Yes	9	0.0000001	0.00006176
20	Yes	9	0.0000001	0.00009286
21	Yes	9	0.0000001	0.00006918
22	Yes	9	0.0000001	0.00009960
23	Yes	9	0.0000001	0.00007566
24	Yes	9	0.0000001	0.00009284
25	Yes	9	0.0000001	0.00006913
26	Yes	8	0.0000001	0.00013899
27	Yes	10	0.0000001	0.00006770
28	Yes	10	0.0000001	0.00006464

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29	Yes	10	0.00000001	0.00006207
30	Yes	10	0.00000001	0.00006032
31	Yes	10	0.00000001	0.00006104
32	Yes	10	0.00000001	0.00006335
33	Yes	10	0.00000001	0.00006587
34	Yes	10	0.00000001	0.00006730
35	Yes	10	0.00000001	0.00006873
36	Yes	10	0.00000001	0.00007010
37	Yes	10	0.00000001	0.00007099
38	Yes	10	0.00000001	0.00006999
39	Yes	9	0.00000001	0.00007030
40	Yes	9	0.00000001	0.00007063
41	Yes	9	0.00000001	0.00007128
42	Yes	9	0.00000001	0.00007015
43	Yes	9	0.00000001	0.00006962
44	Yes	9	0.00000001	0.00007111
45	Yes	9	0.00000001	0.00007233
46	Yes	9	0.00000001	0.00007102
47	Yes	9	0.00000001	0.00007004
48	Yes	9	0.00000001	0.00007089
49	Yes	9	0.00000001	0.00007208
50	Yes	9	0.00000001	0.00007136

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	140 - 120	2.287	39	0.1212	0.0216
T2	120 - 115	1.777	39	0.1205	0.0209
T3	115 - 110	1.643	39	0.1197	0.0205
T4	110 - 105	1.519	39	0.1183	0.0199
T5	105 - 100	1.387	39	0.1159	0.0192
T6	100 - 80	1.264	39	0.1123	0.0183
T7	80 - 60	0.808	39	0.0926	0.0148
T8	60 - 40	0.456	39	0.0679	0.0104
T9	40 - 20	0.201	39	0.0457	0.0059
T10	20 - 0	0.052	39	0.0197	0.0028

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightening Rod 2"x15'	39	2.237	0.1212	0.0215	203974
135.00	VHLP1	39	2.163	0.1212	0.0215	203974
120.00	Omni 3"x20'	39	1.777	0.1205	0.0209	255968
110.00	80010799 w/ Mount Pipe	39	1.519	0.1183	0.0199	37373
105.00	HP4-102	39	1.387	0.1159	0.0192	30658
100.00	VHLP2-11	39	1.264	0.1123	0.0183	80006
95.00	VHLP1	39	1.145	0.1081	0.0174	140072

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Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	140 - 120	12.847	2	0.6826	0.1218
T2	120 - 115	9.975	2	0.6784	0.1177
T3	115 - 110	9.223	2	0.6735	0.1157
T4	110 - 105	8.522	2	0.6649	0.1124
T5	105 - 100	7.780	2	0.6514	0.1084
T6	100 - 80	7.089	2	0.6306	0.1034
T7	80 - 60	4.533	2	0.5194	0.0836
T8	60 - 40	2.560	2	0.3804	0.0586
T9	40 - 20	1.129	2	0.2559	0.0333
T10	20 - 0	0.295	2	0.1103	0.0158

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
138.00	Lightening Rod 2"x15'	2	12.568	0.6827	0.1215	35395
135.00	VHLP1	2	12.149	0.6827	0.1210	35395
120.00	Omni 3"x20'	2	9.975	0.6784	0.1177	47372
110.00	80010799 w/ Mount Pipe	2	8.522	0.6649	0.1124	6430
105.00	HP4-102	2	7.780	0.6514	0.1084	5367
100.00	VHLP2-11	2	7.089	0.6306	0.1034	14391
95.00	VHLP1	2	6.420	0.6064	0.0984	23640

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T2	120	Leg	A325N	0.6250	6	1226.05	20708.70	0.059	✓	1 Bolt Tension
T4	110	Diagonal	A325N	0.6250	1	6588.15	9993.75	0.659	✓	1 Member Block Shear
T5	105	Diagonal	A325N	0.6250	1	7288.51	9993.75	0.729	✓	1 Member Block Shear
T6	100	Leg	A325N	0.7500	6	7814.40	29820.60	0.262	✓	1 Bolt Tension
T7	80	Leg	A325N	0.8750	6	17946.60	40589.10	0.442	✓	1 Bolt Tension
T8	60	Leg	A325N	1.0000	6	24206.20	53014.40	0.457	✓	1 Bolt Tension
T9	40	Leg	A325N	1.0000	6	29904.20	53014.40	0.564	✓	1 Bolt Tension
T10	20	Leg	A325N	1.0000	6	34669.60	53014.40	0.654	✓	1 Bolt Tension

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Compression Checks

Leg 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 $\frac{P_u}{\phi P_n}$
T1	140 - 120	2 1/4	20.00	5.00	106.7 K=1.00	3.9761	-5554.16	77870.40	0.071 ¹ ✓
T2	120 - 115	2 1/4	5.00	5.00	106.7 K=1.00	3.9761	-14724.50	77870.40	0.189 ¹ ✓
T3	115 - 110	2 1/4	5.00	5.00	106.7 K=1.00	3.9761	-19156.60	77870.40	0.246 ¹ ✓
T4	110 - 105	2 1/4	5.00	5.00	106.7 K=1.00	3.9761	-30027.20	77870.40	0.386 ¹ ✓
T5	105 - 100	2 1/4	5.00	5.00	106.7 K=1.00	3.9761	-43550.40	77870.40	0.559 ¹ ✓
T6	100 - 80	2 3/4	20.00	5.00	87.3 K=1.00	5.9396	-109206.00	153147.00	0.713 ¹ ✓
T7	80 - 60	3	20.03	5.01	80.1 K=1.00	7.0686	-156512.00	198902.00	0.787 ¹ ✓
T8	60 - 40	3 1/4	20.03	5.01	74.0 K=1.00	8.2958	-194178.00	250223.00	0.776 ¹ ✓
T9	40 - 20	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-222106.00	300681.00	0.739 ¹ ✓
T10	20 - 0	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-253020.00	399868.00	0.633 ¹ ✓

¹ P_u / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	φP _n lb	A in ²	V _u lb	φV _n lb	Stress Ratio
T9	40 - 20	0.5	1.46	119.0	324713.00	0.1963	778.00	3377.71	0.230 ✓
T10	20 - 0	0.625	1.45	94.4	424115.00	0.3068	940.72	6957.62	0.135 ✓

Diagonal 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 $\frac{P_u}{\phi P_n}$
T1	140 - 120	L1 3/4x1 3/4x1/8	9.43	4.61	150.1 K=0.94	0.4219	-1521.30	4232.90	0.359 ¹ ✓
T2	120 - 115	L1 3/4x1 3/4x1/4	9.43	4.61	152.0 K=0.94	0.8125	-3528.45	7945.36	0.444 ¹ ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	115 - 110	L1 3/4x1 3/4x1/4	9.43	4.61	152.0 K=0.94	0.8125	-3985.14	7945.36	0.502 ¹
T4	110 - 105	L2x2x1/4	9.43	4.47	137.2 K=1.00	0.9380	-6572.42	11254.40	0.584 ¹
T5	105 - 100	L2x2x1/4	9.43	4.47	137.2 K=1.00	0.9380	-7291.56	11254.40	0.648 ¹
T6	100 - 80	L2 1/2x2 1/2x5/16	9.43	4.58	114.3 K=1.02	1.4600	-10066.00	23771.20	0.423 ¹
T7	80 - 60	L2 1/2x2 1/2x5/16	10.52	5.26	127.0 K=0.98	1.4600	-6753.48	20250.00	0.334 ¹
T8	60 - 40	L2 1/2x2 1/2x5/16	12.31	6.15	143.5 K=0.95	1.4600	-7096.32	16013.10	0.443 ¹
T9	40 - 20	L3x3x5/16	16.80	8.09	154.2 K=0.94	1.7800	-8597.07	16911.90	0.508 ¹
T10	20 - 0	L3x3x5/16	18.45	8.93	167.2 K=0.92	1.7800	-10266.90	14387.30	0.714 ¹

¹ P_u / φP_n controls

Top Girt 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 $\frac{P_u}{\phi P_n}$
T1	140 - 120	L3x3x3/8	8.00	7.81	144.4 K=0.90	2.1100	-274.08	22853.70	0.012 ¹

¹ P_u / φP_n controls

Tension Checks

Leg 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 $\frac{P_u}{\phi P_n}$
T1	140 - 120	2 1/4	20.00	5.00	106.7	3.9761	3133.23	178924.00	0.018 ¹
T2	120 - 115	2 1/4	5.00	5.00	106.7	3.9761	7356.28	178924.00	0.041 ¹
T3	115 - 110	2 1/4	5.00	5.00	106.7	3.9761	13426.90	178924.00	0.075 ¹
T4	110 - 105	2 1/4	5.00	5.00	106.7	3.9761	22165.10	178924.00	0.124 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	105 - 100	2 1/4	5.00	5.00	106.7	3.9761	33924.20	178924.00	0.190 ¹
T6	100 - 80	2 3/4	20.00	5.00	87.3	5.9396	94235.30	267281.00	0.353 ¹
T7	80 - 60	3	20.03	5.01	80.1	7.0686	136859.00	318086.00	0.430 ¹
T8	60 - 40	3 1/4	20.03	5.01	74.0	8.2958	169766.00	373310.00	0.455 ¹
T9	40 - 20	Pirod 105218	20.03	10.02	32.4	7.2158	193740.00	324713.00	0.597 ¹
T10	20 - 0	Pirod 105219	20.03	10.02	28.4	9.4248	219729.00	424115.00	0.518 ¹

¹ P_u / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	φP _n lb	A in ²	V _u lb	φV _n lb	Stress Ratio
T9	40 - 20	0.5	1.46	119.0	324713.00	0.1963	778.00	3377.71	0.230
T10	20 - 0	0.625	1.45	94.4	424115.00	0.3068	940.72	6957.62	0.135

Diagonal 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 $\frac{P_u}{\phi P_n}$
T1	140 - 120	L1 3/4x1 3/4x1/8	9.43	4.61	101.3	0.4219	1407.79	13668.80	0.103 ¹
T2	120 - 115	L1 3/4x1 3/4x1/4	9.43	4.61	104.5	0.8125	3531.44	26325.00	0.134 ¹
T3	115 - 110	L1 3/4x1 3/4x1/4	9.43	4.61	104.5	0.8125	3968.87	26325.00	0.151 ¹
T4	110 - 105	L2x2x1/4	9.43	4.47	90.8	0.5629	6588.15	24485.10	0.269 ¹
T5	105 - 100	L2x2x1/4	9.43	4.47	90.8	0.5629	7288.51	24485.10	0.298 ¹
T6	100 - 80	L2 1/2x2 1/2x5/16	9.43	4.58	72.3	1.4600	9783.31	47304.00	0.207 ¹
T7	80 - 60	L2 1/2x2 1/2x5/16	10.08	5.04	79.5	1.4600	6799.64	47304.00	0.144 ¹
T8	60 - 40	L2 1/2x2 1/2x5/16	12.77	6.37	100.5	1.4600	6914.65	47304.00	0.146 ¹
T9	40 - 20	L3x3x5/16	16.80	8.09	105.3	1.7800	7986.81	57672.00	0.138 ¹

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	20 - 0	L3x3x5/16	18.45	8.93	116.2	1.7800	9281.67	57672.00	0.161 ¹ ✓

¹ P_u / φP_n controls

Top Girt 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 $\frac{P_u}{\phi P_n}$
T1	140 - 120	L3x3x3/8	8.00	7.81	102.7	2.1100	221.80	68364.00	0.003 ¹ ✓

¹ P_u / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	φP _{allow} lb	% Capacity	Pass Fail	
T1	140 - 120	Leg	2 1/4	1	-5554.16	77870.40	7.1	Pass	
T2	120 - 115	Leg	2 1/4	31	-14724.50	77870.40	18.9	Pass	
T3	115 - 110	Leg	2 1/4	40	-19156.60	77870.40	24.6	Pass	
T4	110 - 105	Leg	2 1/4	49	-30027.20	77870.40	38.6	Pass	
T5	105 - 100	Leg	2 1/4	60	-43550.40	77870.40	55.9	Pass	
T6	100 - 80	Leg	2 3/4	69	-109206.00	153147.00	71.3	Pass	
T7	80 - 60	Leg	3	96	-156512.00	198902.00	78.7	Pass	
T8	60 - 40	Leg	3 1/4	123	-194178.00	250223.00	77.6	Pass	
T9	40 - 20	Leg	Pirod 105218	150	-222106.00	300681.00	73.9	Pass	
T10	20 - 0	Leg	Pirod 105219	165	-253020.00	399868.00	63.3	Pass	
							65.4 (b)		
T1	140 - 120	Diagonal	L1 3/4x1 3/4x1/8	11	-1521.30	4232.90	35.9	Pass	
T2	120 - 115	Diagonal	L1 3/4x1 3/4x1/4	38	-3528.45	7945.36	44.4	Pass	
T3	115 - 110	Diagonal	L1 3/4x1 3/4x1/4	48	-3985.14	7945.36	50.2	Pass	
T4	110 - 105	Diagonal	L2x2x1/4	56	-6572.42	11254.40	58.4	Pass	
							65.9 (b)		
T5	105 - 100	Diagonal	L2x2x1/4	66	-7291.56	11254.40	64.8	Pass	
							72.9 (b)		
T6	100 - 80	Diagonal	L2 1/2x2 1/2x5/16	75	-10066.00	23771.20	42.3	Pass	
T7	80 - 60	Diagonal	L2 1/2x2 1/2x5/16	107	-6753.48	20250.00	33.4	Pass	
T8	60 - 40	Diagonal	L2 1/2x2 1/2x5/16	134	-7096.32	16013.10	44.3	Pass	
T9	40 - 20	Diagonal	L3x3x5/16	155	-8597.07	16911.90	50.8	Pass	
T10	20 - 0	Diagonal	L3x3x5/16	170	-10266.90	14387.30	71.4	Pass	
T1	140 - 120	Top Girt	L3x3x3/8	6	-274.08	22853.70	1.2	Pass	
							Summary		
							Leg (T7)	78.7	Pass
							Diagonal (T5)	72.9	Pass
							Top Girt (T1)	1.2	Pass
							Bolt Checks	72.9	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
RATING =							78.7	Pass

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