Request for Waiver of Tolling Standard to Extend Construction Permit

West Virginia Educational Broadcasting Authority ("WVEBA"), licensee of low-power television translator station W17EF-D, Wheeling, West Virginia ("W17EF," Facility ID No. 167354), respectfully submits the instant application to request a waiver of the tolling standard set forth at Section 73.3598(b) of the Rules of the Federal Communications Commission ("FCC" or "Commission") to extend W17EF's construction permit, LMS File No. 0000054635 (the "Channel 17 Displacement CP"). The Channel 17 Displacement CP is presently scheduled to expire on December 15, 2022. Based upon the special, rare, and exceptional circumstances delineated below, WVEBA respectfully requests a waiver of the FCC's tolling standard to extend the Channel 17 Displacement CP for an additional 120 days, until **April 14, 2023.**

I. Legal Authority

Pursuant to FCC regulations, a station that requires additional time to complete construction beyond its initial construction permit may seek a waiver of the tolling standard set forth in Section 73.3598(b) of the FCC's Rules upon a showing of rare and exceptional circumstances.[1] The Commission may waive a rule where the particular facts make strict compliance inconsistent with the public interest, special circumstances warrant a deviation from the general rule, and such deviation will serve the public interest.[2] As explained below, such special, rare, and exceptional circumstances are present in the case of W17EF.

II. Background

W17EF is affiliated with the PBS Television Network and is licensed to WVEBA, a public benefit corporation established by the State of West Virginia (the "State") to provide non-commercial educational radio and television broadcasting services to residents of West Virginia.[3] W17EF operates as part of the WVEBA television network, which includes full-power television stations WSWP-TV, WVPB-TV, and WNPB-TV (collectively referred to herein as the "Full-Power Stations"), as well as six television translator stations, including W17EF. In addition, WVEBA holds the licenses for twelve full-power non-commercial educational radio stations and associated FM translator and FM booster stations.

In 2017, WVEBA learned that it would be required to transition the three Full-Power Stations to new channels as part of the repacking process, in addition to five of its TV translator stations that were displaced as a result of the incentive auction, including W17EF (these stations collectively referred to herein as the "Displaced Translator Stations," and together with the Full-Power Stations, the "Stations"). Thus, over the last several years, WVEBA has been tasked with balancing the transition of three full-power television stations and simultaneously addressing the

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[1] *See* Incentive Auction Task Force and Media Bureau Remind Repacked Stations of Certain Post-Auction Transition Requirements and Deadlines, Public Notice, DA 18-884 (rel. Aug. 27, 2018) at ¶ 13 and n. 34. ("Stations may also seek a waiver of the tolling rule to receive additional time to construct in the case where 'rare or exceptional circumstances' prevent construction." (citing 1998 Regulatory Review - Streamlining of Mass Media Applications, Rules and Processes, Memorandum Opinion and Order, 14 FCC Rcd 17525, 17536, ¶ 42 (1999)).

[2] *See Northeast Cellular Telephone Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990).

[3] *See* W. Va. Code § 10-5-1.

need to find displacement channels for five translator stations, all while continuing to manage the day-to-day operations of its television and radio network with limited engineering staff.

As the Commission is already aware, WVEBA is a state-funded governmental entity with limited resources, and is required to comply with the State's laws and procedures regarding the procurement of goods and services.[4] These laws require, *inter alia*, that equipment purchases in excess of $25,000 be put out for competitive bidding, a process that is time and resource intensive, and is managed by the State procurement office.[5] Under rules established by the State of West Virginia Purchasing Division, WVEBA could not start the lengthy procurement process for the Stations until it had adequate funds on hand to pay the winning vendor.[6] For WVEBA, this did not occur until March 14, 2019, when the Governor of West Virginia signed into law an appropriations bill providing WVEBA with $7.36 million to implement the repack for the Stations.[7]

When the funding for the post-auction transition for the Stations was finally made available, WVEBA was necessarily forced to prioritize construction on the three Full-Power Stations first, all of which had earlier construction deadlines, before it could initiate work on the Displaced Translator Stations. WVEBA started with WNPB-TV, which was assigned to transition to its post-auction channel at the end of Phase 4 on August 2, 2019. With a staff of only three engineers for the entire WVEBA television and radio network, WVEBA simply did not have the resources to initiate the complicated State procurement process for the equipment required for the two other full-power stations until such time as the WNPB-TV facility was fully constructed – much less to begin that process for the five displaced translator stations.[8] As a result, construction on W17EF and the other Displaced Translator Stations could not begin until after the three Full-Power Stations were fully constructed, and was thus delayed from the start.

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[4] *See* W. Va. Code § 5A-1-10 (2019) (requiring that all spending units use competitive bidding process to purchase commodities wherever possible).

[5] *See* W. Va. Code § 5A-3-11.

[6] *See* West Virginia Purchasing Division Procedures Handbook, § 6.6 ("Requisitions submitted to the Purchasing Division are to include proper encumbrance information for purchase orders to be encumbered by the Purchasing Division's Communication and Technical Services Unit. Agencies must designate the appropriate account(s) from which funds to pay for a contract will be taken prior to a contract being awarded"), *available at* http://www.state.wv.us/admin/purchase/handbook/2020/handbook.pdf (last visited June 23, 2020).

[7] *See* S.B. 681, 84th Leg., Reg. Sess. (W. Va. 2019)*; see also* Phil Kabler, Public Broadcasting Tech Upgrades Get Boost with $7.36 Million Appropriation, *Charleston Gazette-Mail*, *available at* https://www.wvgazettemail.com/news/public-broadcasting-tech-upgrades-get-boost-with-million-appropriation/article_c136c53b-6938-5278-8d54-5f65f0640546.html.

[8] In most cases, the State's procurement office required WVEBA to submit separate technical specifications for the various equipment required for WNPB-TV, WSWP-TV, and WVPB's post-auction facilities. Drafting the necessary technical specifications as required by the procurement office was a resource-intensive project, such that WVEBA could not dedicate staff to writing multiple specifications concurrently while still managing its day-to-day engineering needs and implementing the WNPB-TV repack. Indeed, WVEBA's small engineering team was tasked with balancing the repack schedule for all three WVEBA full-power television stations while concurrently managing the day-to-day engineering tasks for WVEBA's statewide network of television and radio stations, addressing unforeseen repairs (e.g., replacing two failed radio transmitters), and finding vacant channels for its five television translator stations that were displaced by the repack.

This initial setback was compounded by additional delays beyond WVEBA's control that arose during the construction process for the three Full-Power Stations, which, consequently, delayed WVEBA's ability to begin work on W17EF. As an initial matter, the WNPB-TV construction project was quite challenging, as it involved installing the station's new post-auction main antenna via a gin pole in the midst of a West Virginia winter, including heavy ice that stalled installation efforts more than once. Despite these challenges, WVEBA successfully completed construction of WNPB-TV's post-auction facility in February 2020.[9]

Once construction of the WNPB-TV post-auction facility was completed, WVEBA turned its focus to completing the post-auction facilities for its two other Full-Power Stations – WVPB and WSWP-TV – both of which were scheduled to transition in Phase 10. To this end, WVEBA had to work with the State procurement office on requisition requests that met the office's requirements for competitive bidding and complete the bidding processes required to obtain the equipment needed to complete construction on these stations – a process that, in some instances, took the procurement office much longer than WVEBA expected.[10] Even once procurement was complete, WVEBA encountered further delays beyond its control, including delayed equipment deliveries and setbacks due to severe winter weather. For instance, GatesAir ("Gates"), the vendor from whom WVEBA purchased WSWP's channel 8 transmitter, had initially told WVEBA that the transmitter would be delivered in August 2020 but subsequently notified WVEBA that transmitter delivery would be further delayed because the necessary mask filter was not yet available. Despite WVEBA's efforts to expedite delivery of the transmitter, Gates did not deliver it to WVEBA until early October 2020.

Similarly, although WVEBA had been working diligently to complete construction on WVPB's post auction facility, it was significantly delayed by the onset of three significant winter weather events, including a snowstorm in mid-February 2021, an ice storm just a few days later, and a rain storm thereafter that flooded the roads leading to the site and temporarily rendered it inaccessible to the crew. Construction on the Full-Power Stations was further complicated due to the COVID-19 pandemic, which made it more difficult to secure the work crews needed to complete installation and construction. As a result of these delays, WVEBA ultimately did not complete construction on the last of its three Full-Power Stations until July 15, 2021, and, consequently, could not begin work on the Displaced Translator Stations until late last summer.[11] WVEBA is now balancing construction activities for the five remaining Displaced Translator Stations, including W17EF, with a limited engineering staff.

III. Status of Construction on W17EF

W17EF historically operated on channel 30. After channel 30 was reallocated as part of the incentive auction, WVEBA submitted an application for authority to construct displacement facilities for W17EF on channel 17 during the FCC's Special Displacement Window.[12] The FCC

[9] *See* WNPB-TV License to Cover (LMS File No. 0000106559).

[10] For a full account of the delays encountered by WVEBA in completing the procurement process for WSWP-TV, please see LMS File No. 000151301.

[11] *See* WSWP-TV License to Cover (LMS File No. 0000152886).

[12] *See* LMS File No. 0000054635.

granted this application on January 29, 2019 and specified a three-year period for W17EF to construct the channel 17 displacement facility.

Since completing construction on the three Full-Power Stations, WVEBA has put forth its best efforts to complete work on the Displaced Translator Stations, including W17EF, but has encountered a number of unforeseen circumstances that delayed construction over the last year-and-a-half. These circumstances, which are described and documented more fully in WVEBA's prior filings,[13] included: (1) massive staff turnover, including the loss of key engineering staff; (2) unexpected expenditures that caused WVEBA to hit the spending limit specified in its contract with the outside vendor handling construction on the Displaced Translator Stations, Pillar Innovations, which required WVEBA conduct a new competitive bidding process before it could continue work on W17EF; and (3) several emergency incidents that temporarily diverted WVEBA's engineering resources away from its construction projects.

Despite these unforeseen delays, WVEBA has made significant progress toward completing work on all five of its Displaced Translator Stations since the construction permits for these stations were last extended. In an effort to use its resources most efficiently, WVEBA decided to prioritize construction on the two translator stations that were closest to completion: W34FE-D, Facility ID No. 167359 ("Parkersburg"); and W08EE-D, Facility ID No. 167357 ("Martinsburg"). As a result of these efforts, WVEBA was able to complete construction on its Parkersburg station on September 19, and formally filed a license to cover application on September 29.[14] WVEBA also completed construction on its Martinsburg station on November 17, and filed a license to cover application on November 22.[15] As a result of this progress, only three of the five Displaced Translator Stations – including W17EF – remain under construction at this point.

With regard to W17EF specifically, WVEBA is working hard to complete construction as soon as possible. As described in WVEBA's last request to extend the Channel 17 CP, WVEBA experienced difficulties obtaining background documentation needed from Nexstar, which owns the tower from which W17EF operates.[16] This prevented WVEBA from moving forward with performing a structural analysis, which is typically a necessary step before a work crew can climb the tower to install equipment. Unfortunately, and despite repeated attempts by WVEBA's staff to contact Nexstar, WVEBA was never able to obtain this documentation. To work around this issue, since WVEBA's last waiver request, WVEBA decided conduct a more abbreviated feasibility study, which is nearly identical to a structural analysis but without a ground study component.

Although WVEBA had fully expected the tower site to receive a passing result, WVEBA learned on the date of this filing – December 15, 2022 – that the site has failed the feasibility study.[17] As a result, WVEBA will now need to perform a further structural studies in order to determine what modifications need to be made to the tower in order to move forward – including

[13] *See, e.g.,* LMS File No. 0000195232.

[14] *See* LMS File No. 0000201163.

[15] *See* LMS File No. 0000204148.

[16] *See* LMS File No. 0000195232.

[17] A copy of the feasibility study, dated December 15, 2022, is attached hereto as **Exhibit A.**

potentially adding structural support to the tower.[18] As an alternative, WVEBA is also investigating the possibility of moving W17EF's operations to another tower nearby that is owned by the West Virginia State Interoperable Network ("SIRN"), a state-owned entity with which WVEBA already shares many of its other tower sites.

All of the necessary equipment for the Channel 17 facilities has now been delivered to its final destination as of the date of this filing.[19] Accordingly, as soon as the tower-site-related issues discussed above have been remedied, WVEBA will be in a position to complete construction on W17EF once it is able to schedule a work crew to install the new equipment. WVEBA anticipates being able to resolve all issues and complete installation within the next 120 days.

Grant of this Request Will Serve the Public Interest

In light of the special, rare, and exceptional circumstances described herein, waiver of the tolling standard to provide WVEBA with additional time to complete construction of the Channel 17 facilities for W17EF is warranted. Grant of this request to extend the Channel 17 Displacement CP to April 14, 2023 will not harm the public interest because W17EF has not yet received notice of displacement, and will affirmatively advance the public interest because it will enable W17EF to serve viewers with important non-commercial educational programming in the future.

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[18] Correspondence from WVEBA's engineering director outlining the next steps for resolving the issues identified in the feasibility analysis is attached hereto as **Exhibit B.**

[19] A copy of correspondence confirming the delivery of the equipment needed to complete installation for W17EF is attached hereto as **Exhibit C.**

Exhibit A

Feasibility Study

Reese
TOWER SERVICES
(570) 359-3293 (570) 401-4711 reesetowerservices.com
1044 St. John's Road, Drums, PA 18222

December 15, 2022

Todd Hetrick
Pillar Innovations, LLC
104 Corporate Drive
Morgantown, WV 26501

Re: Reese Tower Services – Tower Feasibility Structural Analysis Report
WNPB Wheeling Site
305’ Self-Support Tower
40.06123°, -80.75228°

Mr. Hetrick:

Please find enclosed the **FAILING** feasibility analysis for the self-support tower referenced above. We recommend a tower/foundation mapping and geotechnical evaluation be performed for this site.

We appreciate the opportunity to provide you with our services. Do not hesitate to call with any questions.

Regards,

Brian Reese
President

ENGINEERED
TOWER SOLUTIONS

Date: **December 15, 2022**

Brian Reese
Reese Tower Services
(570) 401-4711
breese@reesetowerservices.com

Engineered Tower Solutions, PLLC
3227 Wellington Court
Raleigh, NC 27615
(919) 782-2710

Subject:	**Feasibility Structural Analysis Report**	
Carrier Designation:	**WNPB Co-Locate:** **Carrier Site Name:**	 Wheeling WNPB
Engineering Firm Designation:	**ETS, PLLC Job Number:**	22114072.STR.4666
Site Data:	**Bridgeport, Belmont County, OH 43912** **Latitude *N 40.06123*°, Longitude *W -80.75228*°** **305.0 Foot – Self Support Tower**	

Dear Brian Reese,

Engineered Tower Solutions, PLLC is pleased to submit this **"Feasibility Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

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

Existing + Proposed Equipment Configuration	**Tower:**	**>200%**	**Insufficient Capacity**
*See Recommendations section for feasibility conditions.	**Foundations:**		**Not Analyzed**

This analysis has been performed in accordance with the 2017 Ohio Building Code (2015 IBC) based upon an ultimate 3-second gust wind speed of 115 mph. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by:

Bhumi D Mistry, EI
Structural Engineer II

Respectfully submitted by:

Jeffrey A. Arthur, PE
Division Manager – Construction Engineering

STATE OF OHIO
JEFFREY A. ARTHUR
E-79258
REGISTERED
PROFESSIONAL ENGINEER

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1) INTRODUCTION

The tower is a 310.0 ft Self Support tower located in Belmont County, Ohio. The original design standard and wind speed are unavailable.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	115 mph
Exposure Category:	C
Topographic Factor:	5
Crest Height:	601 ft
Ice Thickness:	1.5 in
Wind Speed With Ice:	40 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
210.0 (WNPB)	210.0	1	Propagation Systems, Inc.	PSILP120IM-17-EP	1	1-5/8
		1	Tower Mounts	Pipe Mount		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
310.0 (Unknown)	310.0	9	Andrew	4’ Panels	18	1-5/8
		3	Tower Mounts	T-Arms w/ Working Platforms		
294.0 (Unknown)	294.0	1	Unknown	Omni	1	7/8
		1	Tower Mount	Pipe Mount		
283.0 (Unknown)	283.0	1	Unknown	20’ Omni	1	1-1/4
		1	Tower Mount	Pipe Mount		
280.0 (Unknown)	280.0	1	Decibel	DB420	1	1/2
		1	Tower Mount	Pipe Mount		
278.0 (Unknown)	278.0	1	Andrew	6’ HP Dish	1	EW63
		1	Tower Mount	Pipe Mount		
260.0 (Unknown)	260.0	1	Unknown	Broadcast	1	1/2
		1	Tower Mount	Pipe Mount		
233.0 (Unknown)	233.0	6	Unknown	Broadcast	1	3”
		3	Tower Mount	Pipe Mounts		
229.0 (Unknown)	229.0	1	Unknown	4’ HP Dish	1	7/8
		1	Tower Mount	Pipe Mount		
222.0 (Unknown)	222.0	1	Mark Antenna	P948 GRN	1	7/8
		1	Tower Mount	Pipe Mount		

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
209.0 (Unknown)	209.0	2	Unknown	2 Bay Yagi	1	1/2
		2	Tower Mount	Pipe Mounts		
185.0 (Unknown)	185.0	3	Unknown	3 Bay Yagi	3	7/8
		3	Tower Mount	Pipe Mounts		
160.0 (Unknown)	171.0	1	Unknown	4’ Omni	1	1/2
		1	Tower Mount	Pipe Mount		
	160.0	1	Unknown	4’ Omni	1	7/8
		1	Tower Mount	Pipe Mount		
147.0 (Unknown)	149.0	1	Andrew	4’ HP Dish	1	EW90
		1	Tower Mount	Pipe Mount		
	146.0	1	Andrew	4’ HP Dish	2	EW90
		1	Tower Mount	Pipe Mount		
134.0 (Unknown)	134.0	1	Andrew	HPX8107P3A	1	EW90
		1	Tower Mount	Pipe Mount		
119.0 (Unknown)	131.0	1	Decibel	DB 420	2	7/8
		1	Tower Mount	Pipe Mount		
118.0 (Unknown)	118.0	1	Andrew	8’ HP Dish	1	EW63
		1	Tower Mount	Pipe Mount		
113.0 (Unknown)	113.0	1	Unknown	Yagi	1	1/2
		1	Tower Mount	Pipe Mount		
	118.0	1	Unknown	Omni	1	1/2
		1	Tower Mount	Pipe Mount		
109.0 (Unknown)	109.0	1	Amer mark	P-948 6RN	1	7/8
		1	Unknown	3’ Grid Dish	1	1/2
		1	Andrew	3’ Grid Dish	1	EW90
		1	Andrew	4’ Parabolic	1	EW63
		4	Tower Mount	Pipe Mounts	-	-
99.0 (Unknown)	99.0	1	Andrew	SD6 6103	1	EW90
		1	Tower Mount	Pipe Mount		
		1	Unknown	3’ Grid Dish	1	7/8
		1	Tower Mount	Pipe Mount		
98.0 (Unknown)	98.0	1	Commscope	DB222-A Dipole	1	7/8
		1	Tower Mount	Pipe Mount		
89.0 (Unknown)	89.0	1	Andrew	8’ HP Dish	1	EW63
		1	Andrew	SD6-103	1	EW90
		2	Tower Mount	Pipe Mounts	-	-
87.0 (Unknown)	88.0	1	Unknown	2’ Parabolic Dish	1	CAT 5
		1	Tower Mount	Pipe Mount		
75.0 (Unknown)	84.0	1	Unknown	Channel Master	1	CAT 5
		1	Tower Mount	Pipe Mount		
	80.0	1	Unknown	1’ Dish	1	LMR4
		1	Tower Mount	Pipe Mount		
58.0	58.0	1	Unknown	Bed Spring Dish	1	CAT 5

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
(Unknown)		1	Tower Mount	Pipe Mount		
45.0 (Unknown)	45.0	1	Radiation System	P-9A48GN	1	7/8
		1	Tower Mount	Pipe Mount		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Previous Analysis Report	SpectraSite Network Services (Job No. 18100232)	05/06/2002	Reese Tower Services
Tower Design Drawing	SpectraSite Network Services (Job No. 18100232)	05/06/2002	Reese Tower Services
Equipment Mapping Report	Pillar Innovations (Job No. 223871-02)	05/17/2022	Reese Tower Services
Proposed Antenna Layout	Propagation Systems, Inc. (Job No. PR2534-001)	06/14/2022	Reese Tower Services

3.1) Analysis Method

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

3.2) Assumptions

1) Tower and structures were built and have been maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Engineered Tower Solutions, PLLC should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	305 - 281	Pole	TP14x14x0.5	1	-2.99	667.98	59.9	Pass
L2	281 - 280	Pole	TP14x14x0.375	2	-3.06	505.63	82.1	Pass
T1	280 - 276	Leg	L4x4x3/8	4	27.47	92.66	29.6	Pass
T2	276 - 272	Leg	L4x4x3/8	20	30.62	92.66	33.0	Pass
T3	272 - 268	Leg	L4x4x3/8	32	34.75	92.66	37.5	Pass
T4	268 - 264	Leg	L4x4x3/8	48	39.28	92.66	42.4	Pass
T5	264 - 260	Leg	L4x4x3/8	60	43.41	92.66	46.8	Pass
T6	260 - 255	Leg	L4x4x3/8	78	-49.46	84.19	58.7	Pass
T7	255 - 250	Leg	L4x4x3/8	94	-59.30	84.19	70.4	Pass
T8	250 - 245	Leg	L4x4x7/16	106	-67.80	97.17	69.8	Pass
T9	245 - 240	Leg	L4x4x7/16	122	-75.28	97.17	77.5	Pass
T10	240 - 235	Leg	L4x4x7/16	131	-80.07	113.26	70.7 71.9 (b)	Pass
T11	235 - 230	Leg	L4x4x7/16	147	-87.02	97.17	89.6	Pass
T12	230 - 225	Leg	L4x4x7/16	159	-92.16	97.17	94.8	Pass
T13	225 - 200	Leg	L5x5x3/8	171	-121.90	106.40	114.6	Fail
T14	200 - 191.667	Leg	L6x6x3/8	211	-129.50	118.96	108.9	Fail
T15	191.667 - 183.333	Leg	L6x6x3/8	227	-142.54	142.90	99.7 105.0 (b)[1]	Pass
T16	183.333 - 175	Leg	L6x6x3/8	243	-151.36	118.96	127.2	Fail
T17	175 - 150	Leg	L6x6x7/16	255	-179.17	157.37	113.9	Fail
T18	150 - 125	Leg	L6x6x1/2	291	-215.82	178.67	120.8	Fail
T19	125 - 112.5	Leg	L6x6x9/16	327	-236.42	199.91	118.3	Fail
T20	112.5 - 100	Leg	L6x6x9/16	347	-257.84	200.10	128.9	Fail
T21	100 - 77.0001	Leg	L8x8x9/16	367	-282.33	230.08	122.7	Fail
T22	77.0001 - 50.0001	Leg	L8x8x3/4	389	-331.65	258.57	128.3	Fail
T23	50.0001 - 25.0001	Leg	L8x8x3/4	409	-382.30	282.45	135.4	Fail
T24	25.0001 - 0	Leg	L8x8x5/8	429	-419.48	321.33	130.5	Fail
T1	280 - 276	Diagonal	L1 3/4x1 3/4x3/16	13	-2.58	12.76	20.2 44.4 (b)	Pass
T2	276 - 272	Diagonal	L1 3/4x1 3/4x3/16	25	-3.34	12.76	26.2 57.3 (b)	Pass
T3	272 - 268	Diagonal	L1 3/4x1 3/4x3/16	41	-3.48	12.76	27.3 59.5 (b)	Pass
T4	268 - 264	Diagonal	L1 3/4x1 3/4x3/16	54	-3.87	12.76	30.3 66.4 (b)	Pass
T5	264 - 260	Diagonal	L1 3/4x1 3/4x3/16	72	-4.98	12.76	39.0 70.6 (b)	Pass
T6	260 - 255	Diagonal	L1 3/4x1 3/4x3/16	88	-4.86	11.07	43.9 83.1 (b)	Pass
T7	255 - 250	Diagonal	L1 3/4x1 3/4x3/16	99	-5.43	11.07	49.1 92.2 (b)	Pass
T8	250 - 245	Diagonal	L1 3/4x1 3/4x3/16	113	-3.60	9.66	37.2 46.3 (b)	Pass
T9	245 - 240	Diagonal	L1 3/4x1 3/4x3/16	127	-2.91	8.81	33.0 59.0 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T10	240 - 235	Diagonal	L1 3/4x1 3/4x3/16	137	-3.43	8.04	42.7 50.9 (b)	Pass
T11	235 - 230	Diagonal	L1 3/4x1 3/4x3/16	155	-3.08	7.35	41.9 56.0 (b)	Pass
T12	230 - 225	Diagonal	L1 3/4x1 3/4x3/16	168	-3.63	6.73	54.0 58.5 (b)	Pass
T13	225 - 200	Diagonal	L1 3/4x1 3/4x3/16	182	-4.97	5.09	97.8	Pass
T14	200 - 191.667	Diagonal	L2x2 1/2x3/16	224	-5.94	7.42	80.0	Pass
T15	191.667 - 183.333	Diagonal	L2x2 1/2x3/16	233	-6.26	6.88	91.0	Pass
T16	183.333 - 175	Diagonal	L2x2 1/2x3/16	250	-6.86	6.38	107.5	Fail
T17	175 - 150	Diagonal	L1 3/4x1 3/4x3/16	268	-9.87	2.09	471.6	Fail
T18	150 - 125	Diagonal	L1 3/4x1 3/4x3/16	305	-12.22	1.78	688.1	Fail
T19	125 - 112.5	Diagonal	L1 3/4x1 3/4x3/16	341	-13.48	1.67	807.2	Fail
T20	112.5 - 100	Diagonal	L1 3/4x1 3/4x3/16	361	-14.54	1.54	942.4	Fail
T21	100 - 77.0001	Diagonal	L2 1/2x2x1/4	379	-22.39	2.12	1055.1	Fail
T22	77.0001 - 50.0001	Diagonal	L2 1/2x2x1/4	402	-25.13	1.63	1542.2	Fail
T23	50.0001 - 25.0001	Diagonal	L2 1/2x2x1/4	418	-25.02	1.63	1536.0	Fail
T24	25.0001 - 0	Diagonal	L4x6x3/8	479	-35.43	25.93	136.7	Fail
T17	175 - 150	Horizontal	L2 1/2x3x1/4	273	-6.22	6.31	98.5	Pass
T18	150 - 125	Horizontal	L2 1/2x3 1/2x1/4	309	-5.57	5.61	99.2	Pass
T24	25.0001 - 0	Horizontal	L4x4x1/4	478	-19.38	14.10	137.4	Fail
T10	240 - 235	Secondary Horizontal	L2 1/2x2x3/16	146	-1.20	12.53	9.6	Pass
T15	191.667 - 183.333	Secondary Horizontal	L4x4x1/4	242	-2.14	39.88	5.4	Pass
T17	175 - 150	Secondary Horizontal	L2x2x3/16	278	-2.69	2.50	107.7	Fail
T18	150 - 125	Secondary Horizontal	L2x2 1/2x3/16	314	-3.24	3.44	94.3	Pass
T19	125 - 112.5	Secondary Horizontal	L2x2 1/2x3/16	346	-3.55	2.99	118.7	Fail
T20	112.5 - 100	Secondary Horizontal	L2 1/2x2 1/2x3/16	366	-3.87	2.82	137.2	Fail
T21	100 - 77.0001	Secondary Horizontal	L2 1/2x3 1/2x1/4	386	-4.24	7.89	53.8	Pass
T22	77.0001 - 50.0001	Secondary Horizontal	L3x3 1/2x1/4	404	-5.50	6.74	81.5	Pass
T23	50.0001 - 25.0001	Secondary Horizontal	L3x4x1/4	424	-5.98	7.97	75.0	Pass
T1	280 - 276	Top Girt	L2 1/2x2x3/16	9	-0.24	10.27	2.3 3.0 (b)	Pass
T3	272 - 268	Top Girt	L2 1/2x2x3/16	37	-0.39	10.27	3.8 4.9 (b)	Pass
T5	264 - 260	Top Girt	L2 1/2x2x3/16	65	-1.24	10.27	12.1 17.1 (b)	Pass
T6	260 - 255	Top Girt	L2 1/2x2x3/16	79	-1.08	10.27	10.5 14.4 (b)	Pass
T8	250 - 245	Top Girt	L2 1/2x2x3/16	109	-1.02	10.27	9.9 13.0 (b)	Pass
T13	225 - 200	Top Girt	L2 1/2x2x3/16	178	-1.83	7.30	25.1	Pass
T14	200 - 191.667	Top Girt	L2 1/2x2x3/16	217	-2.04	4.77	42.8	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T17	175 - 150	Top Girt	L2 1/2x2 1/2x1/4	261	-4.61	6.21	74.3	Pass
T18	150 - 125	Top Girt	L3x2 1/2x1/4	297	-5.78	5.76	100.4[1]	Pass
T19	125 - 112.5	Top Girt	L3 1/2x3x1/4	333	-5.31	7.33	72.4	Pass
T20	112.5 - 100	Top Girt	L3x4x1/4	353	-5.12	7.46	68.6	Pass
T21	100 - 77.0001	Top Girt	L4x4x1/4	373	-8.48	10.68	79.4	Pass
T22	77.0001 - 50.0001	Top Girt	L4x3x1/4	391	-11.56	5.61	206.2	Fail
T23	50.0001 - 25.0001	Top Girt	L5x3 1/2x5/16	411	-11.65	9.03	129.0	Fail
T24	25.0001 - 0	Redund Horz 1 Bracing	L3 1/2x2 1/2x1/4	464	-6.30	17.84	35.3	Pass
T24	25.0001 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	465	-6.40	5.54	115.7	Fail
T24	25.0001 - 0	Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	477	-0.16	4.63	3.5	Pass
T24	25.0001 - 0	Redund Sub Horz Bracing	L2 1/2x2 1/2x3/16	488	-4.61	21.90	21.0	Pass
T24	25.0001 - 0	Redund Sub Diagonal Bracing	L2 1/2x2 1/2x3/16	469	-2.66	8.25	32.2	Pass
							Summary	
						Pole (L2)	82.1	Pass
						Leg (T23)	135.4	Fail
						Diagonal (T22)	1542.2	Fail
						Horizontal (T24)	137.4	Fail
						Secondary Horizontal (T20)	137.2	Fail
						Top Girt (T22)	206.2	Fail
						Redund Horz 1 Bracing (T24)	35.3	Pass
						Redund Diag 1 Bracing (T24)	115.7	Fail
						Redund Hip 1 Bracing (T24)	3.5	Pass
						Redund Sub Horz Bracing (T24)	21.0	Pass
						Redund Sub Diagonal Bracing (T24)	32.2	Pass
						Bolt Checks	120.9	Fail
						RATING =	**1542.2**	**Fail**

Structure Rating (max from all components) =	**>200%**

Notes:
1) Capacities up to 105% are considered acceptable based on analysis methods used.

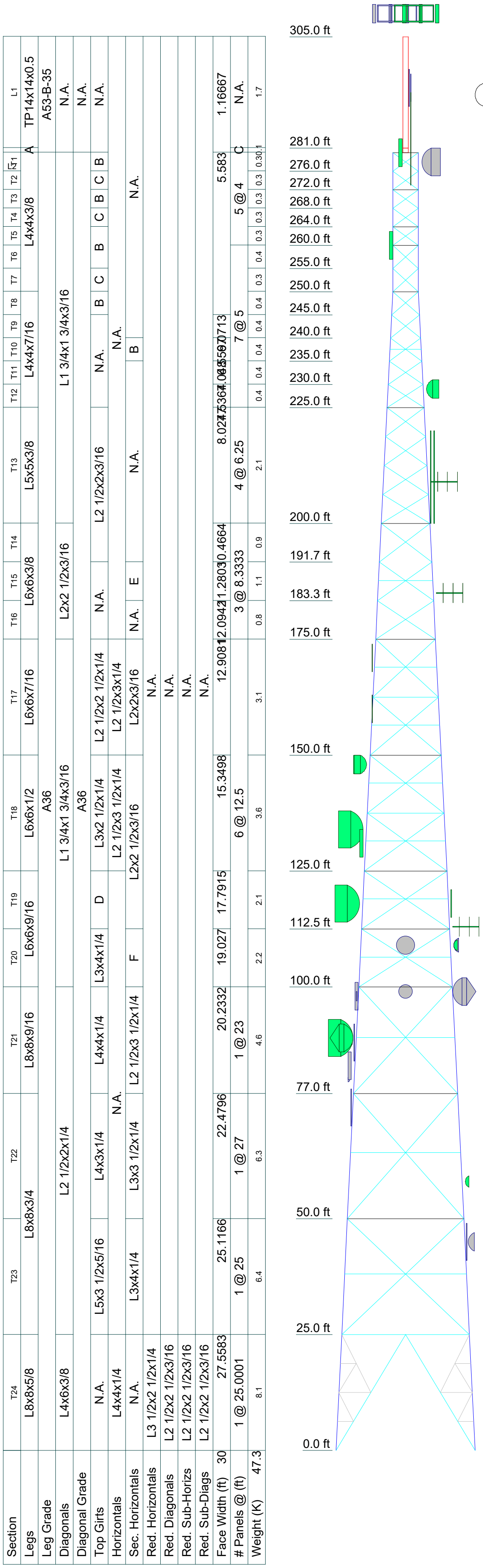
4.1) Recommendations

The tower feasibly has sufficient capacity to carry the proposed load configuration. However, the following conditions are required per TIA-222-H Section 15.6.3 prior to the implementation of a loading change:

1) Obtain original design drawings or a tower mapping.
2) Obtain a geotechnical report.
3) Obtain a comprehensive (rigorous) structural analysis.

APPENDIX A

TNXTOWER OUTPUT



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	TP14x14x0.375	D	L3 1/2x3x1/4
B	L2 1/2x2x3/16	E	L4x4x1/4
C	N.A.	F	L2 1/2x2 1/2x3/16

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 Belmont County, Ohio.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 5 with Crest Height of 601.00 ft
8. TOWER RATING: 1542.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 460 K
SHEAR: 51 K

UPLIFT: -457 K
SHEAR: 54 K

AXIAL 225 K
SHEAR 27 K
MOMENT 3887 kip-ft
TORQUE 13 kip-ft
40 mph WIND - 1.5000 in ICE

AXIAL 71 K
SHEAR 145 K
MOMENT 19356 kip-ft
TORQUE 29 kip-ft
REACTIONS - 115 mph WIND

Engineered Tower Solutions 3227 Wellington Court Raleigh, NC 27603 Phone: (919) 782-2710 FAX:	Job: ***Wheeling WNPB***		
	Project: ***ETS Project# 22114072.STR.4666***		
	Client: Reese Tower Services	Drawn by: bhumi.mistry	App'd:
	Code: TIA-222-H	Date: 12/15/22	Scale: NTS
	Path: C:\Users\bhumi.mistry\Documents\12-15\Wheeling WNPB_Feasibility Tower Analysis_12-12-2022.eri		Dwg No. E-1

Tower Input Data

The main tower is a 4x free standing tower with an overall height of 305.00 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 5.58 ft at the top and 30.00 ft at the base.
An index plate is provided at the 4x free standing -tower connection.
There is a pole section.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

- Tower is located in Belmont County, Ohio.
- Tower base elevation above sea level: 1286.80 ft.
- Basic wind speed of 115 mph.
- Risk Category II.
- Exposure Category C.
- Crest Height: 601.00 ft.
- Rigorous Topographic Factor Procedure for wind speed-up calculations is used.
  - Topographic Feature: Hill.
  - Slope Distance L: 3998.00 ft.
  - Distance from Crest x: 0.00 ft.
  - Horizontal Distance Downwind: No.
- Nominal ice thickness of 1.5000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 40 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 pole design is 1.
- 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

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

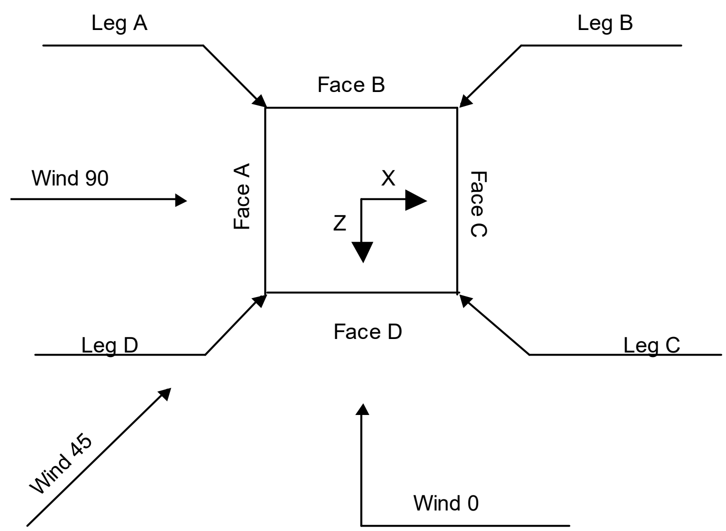
Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

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

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



Square Tower

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	305.00-281.00	24.00	0.00	Round	14.0000	14.0000	0.5000		A53-B-35 (35 ksi)
L2	281.00-280.00	1.00		Round	14.0000	14.0000	0.3750		A53-B-35 (35 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	14.0000	21.2058	483.7562	4.7762	7.0000	69.1080	967.5124	10.5965	0.0000	0
	14.0000	21.2058	483.7562	4.7762	7.0000	69.1080	967.5124	10.5965	0.0000	0
L2	14.0000	16.0516	372.7602	4.8190	7.0000	53.2515	745.5204	8.0210	0.0000	0
	14.0000	16.0516	372.7602	4.8190	7.0000	53.2515	745.5204	8.0210	0.0000	0

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 305.00-281.00				1	1	1			
L2				1	1	1			

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
281.00-280.00									

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	280.00-276.00			5.58	1	4.00
T2	276.00-272.00			5.58	1	4.00
T3	272.00-268.00			5.58	1	4.00
T4	268.00-264.00			5.58	1	4.00
T5	264.00-260.00			5.58	1	4.00
T6	260.00-255.00			5.58	1	5.00
T7	255.00-250.00			5.58	1	5.00
T8	250.00-245.00			5.58	1	5.00
T9	245.00-240.00			6.07	1	5.00
T10	240.00-235.00			6.56	1	5.00
T11	235.00-230.00			7.05	1	5.00
T12	230.00-225.00			7.54	1	5.00
T13	225.00-200.00			8.02	1	25.00
T14	200.00-191.67			10.47	1	8.33
T15	191.67-183.33			11.28	1	8.33
T16	183.33-175.00			12.09	1	8.33
T17	175.00-150.00			12.91	1	25.00
T18	150.00-125.00			15.35	1	25.00
T19	125.00-112.50			17.79	1	12.50
T20	112.50-100.00			19.03	1	12.50
T21	100.00-77.00			20.23	1	23.00
T22	77.00-50.00			22.48	1	27.00
T23	50.00-25.00			25.12	1	25.00
T24	25.00-0.00			27.56	1	25.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	280.00-276.00	4.00	X Brace	No	No	0.0000	0.0000
T2	276.00-272.00	4.00	X Brace	No	No	0.0000	0.0000
T3	272.00-268.00	4.00	X Brace	No	No	0.0000	0.0000
T4	268.00-264.00	4.00	X Brace	No	No	0.0000	0.0000
T5	264.00-260.00	4.00	X Brace	No	No	0.0000	0.0000
T6	260.00-255.00	5.00	X Brace	No	No	0.0000	0.0000
T7	255.00-250.00	5.00	X Brace	No	No	0.0000	0.0000
T8	250.00-245.00	5.00	X Brace	No	No	0.0000	0.0000
T9	245.00-240.00	5.00	X Brace	No	No	0.0000	0.0000
T10	240.00-235.00	5.00	X Brace	No	Yes	0.0000	0.0000
T11	235.00-230.00	5.00	X Brace	No	No	0.0000	0.0000
T12	230.00-225.00	5.00	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T13	225.00-200.00	6.25	X Brace	No	No	0.0000	0.0000
T14	200.00-191.67	8.33	X Brace	No	No	0.0000	0.0000
T15	191.67-183.33	8.33	X Brace	No	Yes	0.0000	0.0000
T16	183.33-175.00	8.33	X Brace	No	No	0.0000	0.0000
T17	175.00-150.00	12.50	X Brace	No	Yes	0.0000	0.0000
T18	150.00-125.00	12.50	X Brace	No	Yes	0.0000	0.0000
T19	125.00-112.50	12.50	X Brace	No	Yes	0.0000	0.0000
T20	112.50-100.00	12.50	X Brace	No	Yes	0.0000	0.0000
T21	100.00-77.00	23.00	X Brace	No	Yes	0.0000	0.0000
T22	77.00-50.00	27.00	X Brace	No	Yes	0.0000	0.0000
T23	50.00-25.00	25.00	X Brace	No	Yes	0.0000	0.0000
T24	25.00-0.00	25.00	K1B Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 280.00-276.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 276.00-272.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 272.00-268.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T4 268.00-264.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T5 264.00-260.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T6 260.00-255.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T7 255.00-250.00	Equal Angle	L4x4x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T8 250.00-245.00	Equal Angle	L4x4x7/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T9 245.00-240.00	Equal Angle	L4x4x7/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T10 240.00-235.00	Equal Angle	L4x4x7/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T11 235.00-230.00	Equal Angle	L4x4x7/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T12 230.00-225.00	Equal Angle	L4x4x7/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T13 225.00-200.00	Equal Angle	L5x5x3/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T14 200.00-191.67	Equal Angle	L6x6x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T15 191.67-183.33	Equal Angle	L6x6x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T16 183.33-175.00	Equal Angle	L6x6x3/8	A36 (36 ksi)	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)
T17 175.00-150.00	Equal Angle	L6x6x7/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T18 150.00-125.00	Equal Angle	L6x6x1/2	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T19 125.00-112.50	Equal Angle	L6x6x9/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T20	Equal Angle	L6x6x9/16	A36	Equal Angle	L1 3/4x1 3/4x3/16	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
112.50-100.00			(36 ksi)			(36 ksi)
T21 100.00-77.00	Equal Angle	L8x8x9/16	A36 (36 ksi)	Single Angle	L2 1/2x2x1/4	A36 (36 ksi)
T22 77.00-50.00	Equal Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L2 1/2x2x1/4	A36 (36 ksi)
T23 50.00-25.00	Equal Angle	L8x8x3/4	A36 (36 ksi)	Single Angle	L2 1/2x2x1/4	A36 (36 ksi)
T24 25.00-0.00	Equal Angle	L8x8x5/8	A36 (36 ksi)	Single Angle	L4x6x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 280.00-276.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T3 272.00-268.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 264.00-260.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 260.00-255.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T8 250.00-245.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T13 225.00-200.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T14 200.00-191.67	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T17 175.00-150.00	Equal Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T18 150.00-125.00	Single Angle	L3x2 1/2x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T19 125.00-112.50	Single Angle	L3 1/2x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T20 112.50-100.00	Single Angle	L3x4x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T21 100.00-77.00	Equal Angle	L4x4x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T22 77.00-50.00	Single Angle	L4x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T23 50.00-25.00	Single Angle	L5x3 1/2x5/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T17	None	Flat Bar		A36	Single Angle	L2 1/2x3x1/4	A36

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Tower Elevation *ft*	*No. of Mid Girts*	*Mid Girt Type*	*Mid Girt Size*	*Mid Girt Grade*	*Horizontal Type*	*Horizontal Size*	*Horizontal Grade*
175.00-150.00				(36 ksi)			(36 ksi)
T18 150.00-125.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2 1/2x3 1/2x1/4	A36 (36 ksi)
T24 25.00-0.00	None	Flat Bar		A36 (36 ksi)	Equal Angle	L4x4x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation *ft*	*Secondary Horizontal Type*	*Secondary Horizontal Size*	*Secondary Horizontal Grade*	*Inner Bracing Type*	*Inner Bracing Size*	*Inner Bracing Grade*
T10 240.00-235.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T15 191.67-183.33	Equal Angle	L4x4x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T17 175.00-150.00	Equal Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T18 150.00-125.00	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T19 125.00-112.50	Single Angle	L2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T20 112.50-100.00	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T21 100.00-77.00	Single Angle	L2 1/2x3 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T22 77.00-50.00	Single Angle	L3x3 1/2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T23 50.00-25.00	Single Angle	L3x4x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation *ft*	*Redundant Bracing Grade*		*Redundant Type*	*Redundant Size*	*K Factor*
T24 25.00-0.00	A36 (36 ksi)	Horizontal (1)	Single Angle	L3 1/2x2 1/2x1/4	1
		Diagonal (1)	Equal Angle	L2 1/2x2 1/2x3/16	1
		Sub-Diagonal	Equal Angle	L2 1/2x2 1/2x3/16	1
		Sub-Horizontal	Equal Angle	L2 1/2x2 1/2x3/16	1
		Hip (1)	Equal Angle	L2 1/2x2 1/2x3/16	1

Tower Section Geometry *(cont'd)*

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
T1 280.00-276.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 276.00-272.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 272.00-268.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 268.00-264.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 264.00-260.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 260.00-255.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 255.00-250.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 250.00-245.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 245.00-240.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 240.00-235.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 235.00-230.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 230.00-225.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 225.00-200.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T14 200.00-191.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T15 191.67-183.33	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T16 183.33-175.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T17 175.00-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T18 150.00-125.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T19 125.00-112.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T20 112.50-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T21 100.00-77.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T22 77.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T23 50.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T24 25.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation	*Calc K Single Angles*	*Calc K Solid Rounds*	*Legs*	*X Brace Diags*	*K Brace Diags*	*Single Diags*	*Girts*	*Horiz.*	*Sec. Horiz.*	*Inner Brace*
				X	*X*	*X*	*X*	*X*	*X*	*X*
ft				*Y*	*Y*	*Y*	*Y*	*Y*	*Y*	*Y*
T1	Yes	No	1	1	1	1	1	1	1	1
280.00-276.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
276.00-272.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
272.00-268.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
268.00-264.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
264.00-260.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
260.00-255.00				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
255.00-250.00				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
250.00-245.00				1	1	1	1	1	1	1
T9	Yes	No	1	1	1	1	1	1	1	1
245.00-240.00				1	1	1	1	1	1	1
T10	Yes	No	1	1	1	1	1	1	1	1
240.00-235.00				1	1	1	1	1	1	1
T11	Yes	No	1	1	1	1	1	1	1	1
235.00-230.00				1	1	1	1	1	1	1
T12	Yes	No	1	1	1	1	1	1	1	1
230.00-225.00				1	1	1	1	1	1	1
T13	Yes	No	1	1	1	1	1	1	1	1
225.00-200.00				1	1	1	1	1	1	1
T14	Yes	No	1	1	1	1	1	1	1	1
200.00-191.67				1	1	1	1	1	1	1
T15	Yes	No	1	1	1	1	1	1	1	1
191.67-183.33				1	1	1	1	1	1	1
T16	Yes	No	1	1	1	1	1	1	1	1
183.33-175.00				1	1	1	1	1	1	1
T17	Yes	No	1	1	1	1	1	1	1	1
175.00-150.00				1	1	1	1	1	1	1
T18	Yes	No	1	1	1	1	1	1	1	1
150.00-125.00				1	1	1	1	1	1	1
T19	Yes	No	1	1	1	1	1	1	1	1
125.00-112.50				1	1	1	1	1	1	1
T20	Yes	No	1	1	1	1	1	1	1	1
112.50-100.00				1	1	1	1	1	1	1
T21	Yes	No	1	1	1	1	1	1	1	1
100.00-77.00				1	1	1	1	1	1	1
T22	Yes	No	1	1	1	1	1	1	1	1
77.00-50.00				1	1	1	1	1	1	1
T23	Yes	No	1	1	1	1	1	1	1	1
50.00-25.00				1	1	1	1	1	1	1
T24	Yes	No	1	1	1	1	1	1	1	1
25.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation 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 280.00-276.00	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 276.00-272.00	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 272.00-268.00	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 268.00-264.00	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 264.00-260.00	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 260.00-255.00	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 255.00-250.00	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 250.00-245.00	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 245.00-240.00	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 240.00-235.00	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
T11 235.00-230.00	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
T12 230.00-225.00	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
T13 225.00-200.00	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
T14 200.00-191.67	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
T15 191.67-183.33	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
T16 183.33-175.00	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
T17 175.00-150.00	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
T18 150.00-125.00	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
T19 125.00-112.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T20 112.50-100.00	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
T21 100.00-77.00	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
T22 77.00-50.00	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
T23 50.00-25.00	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
T24 25.00-0.00	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 Elevation ft	*Redundant Horizontal*		*Redundant Diagonal*		*Redundant Sub-Diagonal*		*Redundant Sub-Horizontal*		*Redundant Vertical*		*Redundant Hip*		*Redundant Hip Diagonal*	
	Net Width Deduct in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*	*Net Width Deduct* in	*U*
T1 280.00-276.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 276.00-272.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 272.00-268.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 268.00-264.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 264.00-260.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 260.00-255.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 255.00-250.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 250.00-245.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 245.00-240.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 240.00-235.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 235.00-230.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 230.00-225.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 225.00-200.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 200.00-191.67	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 191.67-183.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 183.33-175.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T17 175.00-150.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T18 150.00-125.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T19 125.00-112.50	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T20 112.50-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T21 100.00-77.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T22 77.00-50.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T23 50.00-25.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T24 25.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower 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 280.00-276.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T2 276.00-272.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T3 272.00-268.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T4 268.00-264.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T5 264.00-260.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T6 260.00-255.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T7 255.00-250.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T8 250.00-245.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	1	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T9 245.00-240.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T10 240.00-235.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T11 235.00-230.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T12 230.00-225.00	Flange	0.6250 A307	10	0.6250 A307	1	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T13 225.00-200.00	Flange	0.6250 A307	12	0.6250 A307	2	0.6250 A307	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T14 200.00-191.67	Flange	0.6250 A307	12	0.6250 A307	2	0.6250 A307	2	0.0000 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T15 191.67-183.33	Flange	0.6250 A307	12	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T16 183.33-175.00	Flange	0.6250 A307	12	0.6250 A307	2	0.6250 A307	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T17 175.00-150.00	Flange	0.6250 A307	16	0.6250 A307	2	0.6250 A307	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T18 150.00-125.00	Flange	0.6250 A307	18	0.6250 A307	2	0.6250 A307	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A307	0	0.6250 A325N	0
T19 125.00-112.50	Flange	0.6250 A307	20	0.7500 A307	3	0.7500 A307	3	0.0000 A325N	0	0.6250 A325N	0	0.7500 A307	0	0.6250 A325N	0
T20 112.50-100.00	Flange	0.6250 A307	20	0.7500 A307	3	0.7500 A307	3	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	0	0.6250 A325N	0
T21 100.00-77.00	Flange	0.7500 A307	22	0.7500 A307	3	0.7500 A307	3	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	0	0.6250 A325N	0
T22 77.00-50.00	Flange	0.7500 A307	20	0.7500 A307	3	0.7500 A307	3	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	0	0.6250 A325N	0
T23 50.00-25.00	Flange	0.7500 A307	24	0.7500 A307	3	0.7500 A307	3	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	0	0.6250 A325N	0
T24 25.00-0.00	Flange	0.7500 A307	30	0.7500 A307	3	0.7500 A307	3	0.6250 A325N	0	0.6250 A325N	0	0.7500 A307	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
*****													
LDF7-50A (1-5/8 FOAM)	B	No	No	Ar (CaAa)	280.00 - 6.00	0.0000	-0.45	18	6	0.5000	1.9800		0.82
*****													
*****													
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	280.00 - 229.00	0.0000	0	1	1	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	229.00 - 222.00	0.0000	0.45	2	2	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	222.00 - 185.00	0.0000	0.45	3	3	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	185.00 - 160.00	0.0000	0.45	6	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	160.00 - 119.00	0.0000	0.45	7	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	119.00 - 106.00	0.0000	0.45	9	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	109.00 - 99.00	0.0000	0.45	10	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	99.00 - 98.00	0.0000	0.45	11	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	98.00 - 45.00	0.0000	0.45	12	6	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	45.00 - 6.00	0.0000	0.45	13	6	0.5000	1.0900		0.33
*****													
LDF6-50A (1-1/4 FOAM)	B	No	No	Ar (CaAa)	280.00 - 6.00	0.0000	0.4	1	1	1.5500	1.5500		0.66
*****													
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	280.00 - 260.00	0.0000	0.45	1	1	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	260.00 - 209.00	0.0000	0.45	2	2	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	209.00 - 160.00	0.0000	0.45	3	3	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	160.00 - 113.00	0.0000	0.45	4	4	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	113.00 - 109.00	0.0000	0.45	6	6	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	109.00 - 6.00	0.0000	0.45	7	6	0.6300	0.6300		0.15
*****													
EW63	C	No	No	Ar (CaAa)	278.00 - 118.00	0.0000	-0.45	1	1	1.5742	1.5742		0.51
EW63	C	No	No	Ar (CaAa)	118.00 - 109.00	0.0000	-0.45	2	2	1.5742	1.5742		0.51
EW63	C	No	No	Ar (CaAa)	109.00 - 89.00	0.0000	-0.45	3	3	1.5742	1.5742		0.51
EW63	C	No	No	Ar (CaAa)	89.00 - 6.00	0.0000	-0.45	4	4	1.5742	1.5742		0.51
*****													
EW90	D	No	No	Ar (CaAa)	147.00 - 134.00	0.0000	-0.45	6	6	0.9869	0.9869		0.32
EW90	D	No	No	Ar (CaAa)	134.00 - 109.00	0.0000	-0.45	4	4	0.9869	0.9869		0.32
EW90	D	No	No	Ar (CaAa)	109.00 - 99.00	0.0000	-0.45	5	5	0.9869	0.9869		0.32
EW90	D	No	No	Ar (CaAa)	99.00 - 89.00	0.0000	-0.45	6	6	0.9869	0.9869		0.32
EW90	D	No	No	Ar (CaAa)	89.00 - 6.00	0.0000	-0.45	7	6	0.9869	0.9869		0.32
*****													

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"	D	No	No	Ar (CaAa)	233.00 - 6.00	0.0000	-0.4	1	1	2.0000	3.0000		2.80
*****													
CAT-5e Cable	D	No	No	Ar (CaAa)	118.00 - 117.00	0.0000	0.45	1	1	0.2500	0.2000		0.02
CAT-5e Cable	D	No	No	Ar (CaAa)	117.00 - 87.00	0.0000	0.45	2	2	0.2500	0.2000		0.02
CAT-5e Cable	D	No	No	Ar (CaAa)	87.00 - 75.00	0.0000	0.45	3	3	0.2500	0.2000		0.02
CAT-5e Cable	D	No	No	Ar (CaAa)	75.00 - 58.00	0.0000	0.45	4	4	0.2500	0.2000		0.02
CAT-5e Cable	D	No	No	Ar (CaAa)	58.00 - 6.00	0.0000	0.45	5	5	0.2500	0.2000		0.02
*****													
LMR-400(3/8)	D	No	No	Ar (CaAa)	75.00 - 6.00	0.0000	0.4	1	1	0.4050	0.4050		0.07

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight plf
*****								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	305.00-281.00	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	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
L2	281.00-280.00	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	0.000	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T1	280.00-276.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	15.312	0.000	0.06
		C	0.000	0.000	0.567	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T2	276.00-272.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	15.312	0.000	0.06
		C	0.000	0.000	0.882	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T3	272.00-268.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	15.312	0.000	0.06
		C	0.000	0.000	0.882	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T4	268.00-264.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	15.312	0.000	0.06

Tower Section	*Tower Elevation ft*	*Face*	A_R *ft²*	A_F *ft²*	C_AA_A *In Face ft²*	C_AA_A *Out Face ft²*	*Weight K*
		C	0.000	0.000	0.882	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T5	264.00-260.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	15.312	0.000	0.06
		C	0.000	0.000	0.882	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T6	260.00-255.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.140	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T7	255.00-250.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.140	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T8	250.00-245.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.140	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T9	245.00-240.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.140	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T10	240.00-235.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.140	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	0.000	0.000	0.00
T11	235.00-230.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.140	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	0.847	0.000	0.01
T12	230.00-225.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	19.576	0.000	0.08
		C	0.000	0.000	1.417	0.000	0.00
		D	0.000	0.000	1.412	0.000	0.01
T13	225.00-200.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	100.823	0.000	0.41
		C	0.000	0.000	7.653	0.000	0.02
		D	0.000	0.000	7.076	0.000	0.07
T14	200.00-191.67	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	33.717	0.000	0.14
		C	0.000	0.000	2.887	0.000	0.01
		D	0.000	0.000	2.365	0.000	0.02
T15	191.67-183.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	34.262	0.000	0.14
		C	0.000	0.000	2.887	0.000	0.01
		D	0.000	0.000	2.369	0.000	0.02
T16	183.33-175.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	36.442	0.000	0.14
		C	0.000	0.000	2.887	0.000	0.01
		D	0.000	0.000	2.373	0.000	0.02
T17	175.00-150.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	110.415	0.000	0.44
		C	0.000	0.000	9.291	0.000	0.03
		D	0.000	0.000	7.149	0.000	0.07
T18	150.00-125.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	112.050	0.000	0.44
		C	0.000	0.000	10.236	0.000	0.03
		D	0.000	0.000	18.458	0.000	0.11
T19	125.00-112.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	57.442	0.000	0.23
		C	0.000	0.000	6.047	0.000	0.02

Tower Section	*Tower Elevation ft*	*Face*	A_R ft^2	A_F ft^2	C_AA_A *In Face* ft^2	C_AA_A *Out Face* ft^2	*Weight K*
		D	0.000	0.000	8.767	0.000	0.05
T20	112.50-100.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	62.674	0.000	0.24
		C	0.000	0.000	10.644	0.000	0.03
		D	0.000	0.000	9.980	0.000	0.05
T21	100.00-77.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	115.294	0.000	0.44
		C	0.000	0.000	22.894	0.000	0.07
		D	0.000	0.000	22.634	0.000	0.11
T22	77.00-50.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	135.729	0.000	0.52
		C	0.000	0.000	28.908	0.000	0.08
		D	0.000	0.000	30.046	0.000	0.14
T23	50.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	127.855	0.000	0.49
		C	0.000	0.000	26.767	0.000	0.08
		D	0.000	0.000	28.284	0.000	0.13
T24	25.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	97.585	0.000	0.37
		C	0.000	0.000	20.343	0.000	0.06
		D	0.000	0.000	21.496	0.000	0.10

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	*Tower Elevation ft*	*Face or Leg*	*Ice Thickness in*	A_R ft^2	A_F ft^2	C_AA_A *In Face* ft^2	C_AA_A *Out Face* ft^2	*Weight K*
L1	305.00-281.00	A	2.092	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	0.000	0.000	0.00
		D		0.000	0.000	0.000	0.000	0.00
L2	281.00-280.00	A	2.088	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	0.000	0.000	0.00
		D		0.000	0.000	0.000	0.000	0.00
T1	280.00-276.00	A	2.088	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	15.211	0.000	0.35
		C		0.000	0.000	3.072	0.000	0.05
		D		0.000	0.000	0.000	0.000	0.00
T2	276.00-272.00	A	2.086	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	15.208	0.000	0.35
		C		0.000	0.000	4.220	0.000	0.07
		D		0.000	0.000	0.000	0.000	0.00
T3	272.00-268.00	A	2.085	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	15.204	0.000	0.35
		C		0.000	0.000	4.218	0.000	0.07
		D		0.000	0.000	0.000	0.000	0.00
T4	268.00-264.00	A	2.084	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	15.200	0.000	0.35
		C		0.000	0.000	4.216	0.000	0.07
		D		0.000	0.000	0.000	0.000	0.00
T5	264.00-260.00	A	2.083	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	15.196	0.000	0.35
		C		0.000	0.000	4.214	0.000	0.07
		D		0.000	0.000	0.000	0.000	0.00
T6	260.00-255.00	A	2.081	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	18.990	0.000	0.44
		C		0.000	0.000	7.693	0.000	0.10

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		D		0.000	0.000	0.000	0.000	0.00
T7	255.00-250.00	A	2.079	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	18.983	0.000	0.44
		C		0.000	0.000	7.688	0.000	0.10
		D		0.000	0.000	0.000	0.000	0.00
T8	250.00-245.00	A	2.078	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	18.976	0.000	0.44
		C		0.000	0.000	7.683	0.000	0.10
		D		0.000	0.000	0.000	0.000	0.00
T9	245.00-240.00	A	2.076	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	18.970	0.000	0.44
		C		0.000	0.000	7.678	0.000	0.10
		D		0.000	0.000	0.000	0.000	0.00
T10	240.00-235.00	A	2.074	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	18.962	0.000	0.44
		C		0.000	0.000	7.673	0.000	0.10
		D		0.000	0.000	0.000	0.000	0.00
T11	235.00-230.00	A	2.072	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	18.955	0.000	0.44
		C		0.000	0.000	7.667	0.000	0.10
		D		0.000	0.000	2.143	0.000	0.05
T12	230.00-225.00	A	2.070	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	21.152	0.000	0.45
		C		0.000	0.000	7.662	0.000	0.10
		D		0.000	0.000	3.570	0.000	0.08
T13	225.00-200.00	A	2.063	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	111.969	0.000	2.34
		C		0.000	0.000	39.367	0.000	0.50
		D		0.000	0.000	17.815	0.000	0.39
T14	200.00-191.67	A	2.055	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	37.424	0.000	0.78
		C		0.000	0.000	13.767	0.000	0.18
		D		0.000	0.000	5.924	0.000	0.13
T15	191.67-183.33	A	2.050	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	38.282	0.000	0.80
		C		0.000	0.000	13.745	0.000	0.18
		D		0.000	0.000	5.917	0.000	0.13
T16	183.33-175.00	A	2.045	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	41.812	0.000	0.86
		C		0.000	0.000	13.723	0.000	0.18
		D		0.000	0.000	5.908	0.000	0.13
T17	175.00-150.00	A	2.034	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	126.015	0.000	2.59
		C		0.000	0.000	42.367	0.000	0.55
		D		0.000	0.000	17.669	0.000	0.38
T18	150.00-125.00	A	2.014	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	126.801	0.000	2.61
		C		0.000	0.000	44.119	0.000	0.57
		D		0.000	0.000	56.623	0.000	0.90
T19	125.00-112.50	A	1.995	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	63.192	0.000	1.31
		C		0.000	0.000	26.120	0.000	0.32
		D		0.000	0.000	31.226	0.000	0.46
T20	112.50-100.00	A	1.980	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	68.500	0.000	1.40
		C		0.000	0.000	38.272	0.000	0.49
		D		0.000	0.000	39.104	0.000	0.53
T21	100.00-77.00	A	1.954	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	115.448	0.000	2.46
		C		0.000	0.000	77.052	0.000	1.03
		D		0.000	0.000	79.532	0.000	1.12

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T22	77.00-50.00	A	1.904	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	134.351	0.000	2.84
		C		0.000	0.000	94.269	0.000	1.26
		D		0.000	0.000	106.291	0.000	1.49
T23	50.00-25.00	A	1.821	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	124.522	0.000	2.59
		C		0.000	0.000	85.923	0.000	1.11
		D		0.000	0.000	97.847	0.000	1.33
T24	25.00-0.00	A	1.645	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	92.041	0.000	1.85
		C		0.000	0.000	63.110	0.000	0.76
		D		0.000	0.000	70.758	0.000	0.90

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	305.00-281.00	0.0000	0.0000	0.0000	0.0000
L2	281.00-280.00	0.0000	0.0000	0.0000	0.0000
T1	280.00-276.00	-5.0669	-5.2007	-1.3840	-4.2292
T2	276.00-272.00	-5.2734	-6.1615	-1.2800	-6.7300
T3	272.00-268.00	-4.7227	-5.4440	-0.8953	-4.6075
T4	268.00-264.00	-5.2734	-6.1615	-1.2832	-6.7327
T5	264.00-260.00	-4.7227	-5.4440	-0.8981	-4.6121
T6	260.00-255.00	-4.8573	-5.4180	-0.8417	-5.0061
T7	255.00-250.00	-5.3476	-6.0340	-1.0846	-6.5250
T8	250.00-245.00	-4.9964	-5.5453	-0.8973	-5.2945
T9	245.00-240.00	-5.8208	-6.4763	-1.2376	-7.3200
T10	240.00-235.00	-5.4431	-5.9302	-1.0456	-6.0474
T11	235.00-230.00	-5.0802	-5.1579	-0.3023	-6.5052
T12	230.00-225.00	-3.6156	-4.2756	2.3007	-5.9549
T13	225.00-200.00	-3.1135	-4.2930	3.4940	-6.2798
T14	200.00-191.67	-3.0422	-3.9518	3.6856	-6.0980
T15	191.67-183.33	-2.6809	-3.8615	4.0884	-6.1373
T16	183.33-175.00	-1.7666	-4.7583	6.3485	-7.1840
T17	175.00-150.00	-1.5259	-5.1257	6.3968	-7.2278
T18	150.00-125.00	1.4596	-5.2181	11.9962	-5.1065
T19	125.00-112.50	1.9068	-5.5448	11.3906	-4.7943
T20	112.50-100.00	5.6901	-6.2610	12.9772	-5.3167
T21	100.00-77.00	6.2173	-5.4369	13.9742	-5.5512
T22	77.00-50.00	6.7148	-5.0902	12.9100	-4.0897
T23	50.00-25.00	5.5789	-8.3255	12.9110	-5.1118
T24	25.00-0.00	4.1570	-6.2953	9.7647	-4.3449

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	3	LDF7-50A (1-5/8 FOAM)	276.00 - 280.00	0.6000	0.3734
T1	6	LDF5-50A (7/8 FOAM)	276.00 - 280.00	0.6000	0.3734
T1	17	LDF6-50A (1-1/4 FOAM)	276.00 - 280.00	0.6000	0.3734
T1	19	LDF4-50A (1/2 FOAM)	276.00 - 280.00	0.6000	0.3734
T1	26	EW63	276.00 - 278.00	0.6000	0.3734
T2	3	LDF7-50A (1-5/8 FOAM)	272.00 - 276.00	0.6000	0.5004
T2	6	LDF5-50A (7/8 FOAM)	272.00 - 276.00	0.6000	0.5004
T2	17	LDF6-50A (1-1/4 FOAM)	272.00 - 276.00	0.6000	0.5004
T2	19	LDF4-50A (1/2 FOAM)	272.00 - 276.00	0.6000	0.5004
T2	26	EW63	272.00 - 276.00	0.6000	0.5004
T3	3	LDF7-50A (1-5/8 FOAM)	268.00 - 272.00	0.6000	0.3738
T3	6	LDF5-50A (7/8 FOAM)	268.00 - 272.00	0.6000	0.3738
T3	17	LDF6-50A (1-1/4 FOAM)	268.00 - 272.00	0.6000	0.3738
T3	19	LDF4-50A (1/2 FOAM)	268.00 - 272.00	0.6000	0.3738
T3	26	EW63	268.00 - 272.00	0.6000	0.3738
T4	3	LDF7-50A (1-5/8 FOAM)	264.00 - 268.00	0.6000	0.5008
T4	6	LDF5-50A (7/8 FOAM)	264.00 - 268.00	0.6000	0.5008
T4	17	LDF6-50A (1-1/4 FOAM)	264.00 - 268.00	0.6000	0.5008
T4	19	LDF4-50A (1/2 FOAM)	264.00 - 268.00	0.6000	0.5008
T4	26	EW63	264.00 - 268.00	0.6000	0.5008
T5	3	LDF7-50A (1-5/8 FOAM)	260.00 - 264.00	0.6000	0.3742
T5	6	LDF5-50A (7/8 FOAM)	260.00 - 264.00	0.6000	0.3742
T5	17	LDF6-50A (1-1/4 FOAM)	260.00 - 264.00	0.6000	0.3742
T5	19	LDF4-50A (1/2 FOAM)	260.00 - 264.00	0.6000	0.3742
T5	26	EW63	260.00 - 264.00	0.6000	0.3742
T6	3	LDF7-50A (1-5/8 FOAM)	255.00 - 260.00	0.6000	0.4349
T6	6	LDF5-50A (7/8 FOAM)	255.00 - 260.00	0.6000	0.4349
T6	17	LDF6-50A (1-1/4 FOAM)	255.00 - 260.00	0.6000	0.4349
T6	20	LDF4-50A (1/2 FOAM)	255.00 - 260.00	0.6000	0.4349
T6	26	EW63	255.00 - 260.00	0.6000	0.4349
T7	3	LDF7-50A (1-5/8 FOAM)	250.00 - 255.00	0.6000	0.5365

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T7	6	LDF5-50A (7/8 FOAM)	250.00 - 255.00	0.6000	0.5365
T7	17	LDF6-50A (1-1/4 FOAM)	250.00 - 255.00	0.6000	0.5365
T7	20	LDF4-50A (1/2 FOAM)	250.00 - 255.00	0.6000	0.5365
T7	26	EW63	250.00 - 255.00	0.6000	0.5365
T8	3	LDF7-50A (1-5/8 FOAM)	245.00 - 250.00	0.6000	0.4513
T8	6	LDF5-50A (7/8 FOAM)	245.00 - 250.00	0.6000	0.4513
T8	17	LDF6-50A (1-1/4 FOAM)	245.00 - 250.00	0.6000	0.4513
T8	20	LDF4-50A (1/2 FOAM)	245.00 - 250.00	0.6000	0.4513
T8	26	EW63	245.00 - 250.00	0.6000	0.4513
T9	3	LDF7-50A (1-5/8 FOAM)	240.00 - 245.00	0.6000	0.5701
T9	6	LDF5-50A (7/8 FOAM)	240.00 - 245.00	0.6000	0.5701
T9	17	LDF6-50A (1-1/4 FOAM)	240.00 - 245.00	0.6000	0.5701
T9	20	LDF4-50A (1/2 FOAM)	240.00 - 245.00	0.6000	0.5701
T9	26	EW63	240.00 - 245.00	0.6000	0.5701
T10	3	LDF7-50A (1-5/8 FOAM)	235.00 - 240.00	0.6000	0.4860
T10	6	LDF5-50A (7/8 FOAM)	235.00 - 240.00	0.6000	0.4860
T10	17	LDF6-50A (1-1/4 FOAM)	235.00 - 240.00	0.6000	0.4860
T10	20	LDF4-50A (1/2 FOAM)	235.00 - 240.00	0.6000	0.4860
T10	26	EW63	235.00 - 240.00	0.6000	0.4860
T11	3	LDF7-50A (1-5/8 FOAM)	230.00 - 235.00	0.6000	0.6000
T11	6	LDF5-50A (7/8 FOAM)	230.00 - 235.00	0.6000	0.6000
T11	17	LDF6-50A (1-1/4 FOAM)	230.00 - 235.00	0.6000	0.6000
T11	20	LDF4-50A (1/2 FOAM)	230.00 - 235.00	0.6000	0.6000
T11	26	EW63	230.00 - 235.00	0.6000	0.6000
T11	37	3"	230.00 - 233.00	1.0000	0.6000
T12	3	LDF7-50A (1-5/8 FOAM)	225.00 - 230.00	0.6000	0.6000
T12	6	LDF5-50A (7/8 FOAM)	229.00 - 230.00	0.6000	0.6000
T12	7	LDF5-50A (7/8 FOAM)	225.00 - 229.00	0.6000	0.6000
T12	17	LDF6-50A (1-1/4 FOAM)	225.00 - 230.00	0.6000	0.6000
T12	20	LDF4-50A (1/2 FOAM)	225.00 - 230.00	0.6000	0.6000
T12	26	EW63	225.00 - 230.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	37	3"	225.00 - 230.00	1.0000	0.6000
T13	3	LDF7-50A (1-5/8 FOAM)	200.00 - 225.00	0.6000	0.6000
T13	7	LDF5-50A (7/8 FOAM)	222.00 - 225.00	0.6000	0.6000
T13	8	LDF5-50A (7/8 FOAM)	200.00 - 222.00	0.6000	0.6000
T13	17	LDF6-50A (1-1/4 FOAM)	200.00 - 225.00	0.6000	0.6000
T13	20	LDF4-50A (1/2 FOAM)	209.00 - 225.00	0.6000	0.6000
T13	21	LDF4-50A (1/2 FOAM)	200.00 - 209.00	0.6000	0.6000
T13	26	EW63	200.00 - 225.00	0.6000	0.6000
T13	37	3"	200.00 - 225.00	1.0000	0.6000
T14	3	LDF7-50A (1-5/8 FOAM)	191.67 - 200.00	0.6000	0.6000
T14	8	LDF5-50A (7/8 FOAM)	191.67 - 200.00	0.6000	0.6000
T14	17	LDF6-50A (1-1/4 FOAM)	191.67 - 200.00	0.6000	0.6000
T14	21	LDF4-50A (1/2 FOAM)	191.67 - 200.00	0.6000	0.6000
T14	26	EW63	191.67 - 200.00	0.6000	0.6000
T14	37	3"	191.67 - 200.00	1.0000	0.6000
T15	3	LDF7-50A (1-5/8 FOAM)	183.33 - 191.67	0.6000	0.6000
T15	8	LDF5-50A (7/8 FOAM)	185.00 - 191.67	0.6000	0.6000
T15	9	LDF5-50A (7/8 FOAM)	183.33 - 185.00	0.6000	0.6000
T15	17	LDF6-50A (1-1/4 FOAM)	183.33 - 191.67	0.6000	0.6000
T15	21	LDF4-50A (1/2 FOAM)	183.33 - 191.67	0.6000	0.6000
T15	26	EW63	183.33 - 191.67	0.6000	0.6000
T15	37	3"	183.33 - 191.67	1.0000	0.6000
T16	3	LDF7-50A (1-5/8 FOAM)	175.00 - 183.33	0.6000	0.6000
T16	9	LDF5-50A (7/8 FOAM)	175.00 - 183.33	0.6000	0.6000
T16	17	LDF6-50A (1-1/4 FOAM)	175.00 - 183.33	0.6000	0.6000
T16	21	LDF4-50A (1/2 FOAM)	175.00 - 183.33	0.6000	0.6000
T16	26	EW63	175.00 - 183.33	0.6000	0.6000
T16	37	3"	175.00 - 183.33	1.0000	0.6000
T17	3	LDF7-50A (1-5/8 FOAM)	150.00 - 175.00	0.6000	0.6000
T17	9	LDF5-50A (7/8 FOAM)	160.00 - 175.00	0.6000	0.6000
T17	10	LDF5-50A (7/8 FOAM)	150.00 - 160.00	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
T17	17	LDF6-50A (1-1/4 FOAM)	150.00 - 175.00	0.6000	0.6000
T17	21	LDF4-50A (1/2 FOAM)	160.00 - 175.00	0.6000	0.6000
T17	22	LDF4-50A (1/2 FOAM)	150.00 - 160.00	0.6000	0.6000
T17	26	EW63	150.00 - 175.00	0.6000	0.6000
T17	37	3"	150.00 - 175.00	1.0000	0.6000
T18	3	LDF7-50A (1-5/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T18	10	LDF5-50A (7/8 FOAM)	125.00 - 150.00	0.6000	0.6000
T18	17	LDF6-50A (1-1/4 FOAM)	125.00 - 150.00	0.6000	0.6000
T18	22	LDF4-50A (1/2 FOAM)	125.00 - 150.00	0.6000	0.6000
T18	26	EW63	125.00 - 150.00	0.6000	0.6000
T18	31	EW90	134.00 - 147.00	0.6000	0.6000
T18	32	EW90	125.00 - 134.00	0.6000	0.6000
T18	37	3"	125.00 - 150.00	1.0000	0.6000
T19	3	LDF7-50A (1-5/8 FOAM)	112.50 - 125.00	0.6000	0.6000
T19	10	LDF5-50A (7/8 FOAM)	119.00 - 125.00	0.6000	0.6000
T19	11	LDF5-50A (7/8 FOAM)	112.50 - 119.00	0.6000	0.6000
T19	17	LDF6-50A (1-1/4 FOAM)	112.50 - 125.00	0.6000	0.6000
T19	22	LDF4-50A (1/2 FOAM)	113.00 - 125.00	0.6000	0.6000
T19	23	LDF4-50A (1/2 FOAM)	112.50 - 113.00	0.6000	0.6000
T19	26	EW63	118.00 - 125.00	0.6000	0.6000
T19	27	EW63	112.50 - 118.00	0.6000	0.6000
T19	32	EW90	112.50 - 125.00	0.6000	0.6000
T19	37	3"	112.50 - 125.00	1.0000	0.6000
T19	39	CAT-5e Cable	117.00 - 118.00	0.6000	0.6000
T19	40	CAT-5e Cable	112.50 - 117.00	0.6000	0.6000
T20	3	LDF7-50A (1-5/8 FOAM)	100.00 - 112.50	0.6000	0.6000
T20	11	LDF5-50A (7/8 FOAM)	106.00 - 112.50	0.6000	0.6000
T20	12	LDF5-50A (7/8 FOAM)	100.00 - 109.00	0.6000	0.6000
T20	17	LDF6-50A (1-1/4 FOAM)	100.00 - 112.50	0.6000	0.6000
T20	23	LDF4-50A (1/2 FOAM)	109.00 - 112.50	0.6000	0.6000
T20	24	LDF4-50A (1/2 FOAM)	100.00 - 109.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T20	27	EW63	109.00 - 112.50	0.6000	0.6000
T20	28	EW63	100.00 - 109.00	0.6000	0.6000
T20	32	EW90	109.00 - 112.50	0.6000	0.6000
T20	33	EW90	100.00 - 109.00	0.6000	0.6000
T20	37	3"	100.00 - 112.50	1.0000	0.6000
T20	40	CAT-5e Cable	100.00 - 112.50	0.6000	0.6000
T21	3	LDF7-50A (1-5/8 FOAM)	77.00 - 100.00	0.6000	0.6000
T21	12	LDF5-50A (7/8 FOAM)	99.00 - 100.00	0.6000	0.6000
T21	13	LDF5-50A (7/8 FOAM)	98.00 - 99.00	0.6000	0.6000
T21	14	LDF5-50A (7/8 FOAM)	77.00 - 98.00	0.6000	0.6000
T21	17	LDF6-50A (1-1/4 FOAM)	77.00 - 100.00	0.6000	0.6000
T21	24	LDF4-50A (1/2 FOAM)	77.00 - 100.00	0.6000	0.6000
T21	28	EW63	89.00 - 100.00	0.6000	0.6000
T21	29	EW63	77.00 - 89.00	0.6000	0.6000
T21	33	EW90	99.00 - 100.00	0.6000	0.6000
T21	34	EW90	89.00 - 99.00	0.6000	0.6000
T21	35	EW90	77.00 - 89.00	0.6000	0.6000
T21	37	3"	77.00 - 100.00	1.0000	0.6000
T21	40	CAT-5e Cable	87.00 - 100.00	0.6000	0.6000
T21	41	CAT-5e Cable	77.00 - 87.00	0.6000	0.6000
T22	3	LDF7-50A (1-5/8 FOAM)	50.00 - 77.00	0.6000	0.6000
T22	14	LDF5-50A (7/8 FOAM)	50.00 - 77.00	0.6000	0.6000
T22	17	LDF6-50A (1-1/4 FOAM)	50.00 - 77.00	0.6000	0.6000
T22	24	LDF4-50A (1/2 FOAM)	50.00 - 77.00	0.6000	0.6000
T22	29	EW63	50.00 - 77.00	0.6000	0.6000
T22	35	EW90	50.00 - 77.00	0.6000	0.6000
T22	37	3"	50.00 - 77.00	1.0000	0.6000
T22	41	CAT-5e Cable	75.00 - 77.00	0.6000	0.6000
T22	42	CAT-5e Cable	58.00 - 75.00	0.6000	0.6000
T22	43	CAT-5e Cable	50.00 - 58.00	0.6000	0.6000
T22	45	LMR-400(3/8)	50.00 - 75.00	0.6000	0.6000
T23	3	LDF7-50A (1-5/8 FOAM)	25.00 - 50.00	0.6000	0.6000
T23	14	LDF5-50A (7/8 FOAM)	45.00 - 50.00	0.6000	0.6000
T23	15	LDF5-50A (7/8 FOAM)	25.00 - 45.00	0.6000	0.6000
T23	17	LDF6-50A (1-1/4 FOAM)	25.00 - 50.00	0.6000	0.6000
T23	24	LDF4-50A (1/2 FOAM)	25.00 - 50.00	0.6000	0.6000
T23	29	EW63	25.00 - 50.00	0.6000	0.6000
T23	35	EW90	25.00 - 50.00	0.6000	0.6000
T23	37	3"	25.00 - 50.00	0.6000	0.6000
T23	43	CAT-5e Cable	25.00 - 50.00	0.6000	0.6000
T23	45	LMR-400(3/8)	25.00 - 50.00	0.6000	0.6000
T24	3	LDF7-50A (1-5/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T24	15	LDF5-50A (7/8 FOAM)	6.00 - 25.00	0.6000	0.6000
T24	17	LDF6-50A (1-1/4 FOAM)	6.00 - 25.00	0.6000	0.6000
T24	24	LDF4-50A (1/2 FOAM)	6.00 - 25.00	0.6000	0.6000
T24	29	EW63	6.00 - 25.00	0.6000	0.6000
T24	35	EW90	6.00 - 25.00	0.6000	0.6000
T24	37	3"	6.00 - 25.00	0.6000	0.6000
T24	43	CAT-5e Cable	6.00 - 25.00	0.6000	0.6000
T24	45	LMR-400(3/8)	6.00 - 25.00	0.6000	0.6000

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
*****									
*****									
(3) 4' x 1' Panel	A	From Leg	4.00	0.0000	310.00	No Ice	5.07	2.87	0.04
			0.00			1/2" Ice	5.39	3.18	0.07
			0.00			1" Ice	5.73	3.49	0.11
						2" Ice	6.41	4.11	0.20
(3) 4' x 1' Panel	B	From Leg	4.00	0.0000	310.00	No Ice	5.07	2.87	0.04
			0.00			1/2" Ice	5.39	3.18	0.07
			0.00			1" Ice	5.73	3.49	0.11
						2" Ice	6.41	4.11	0.20
(3) 4' x 1' Panel	C	From Leg	4.00	0.0000	310.00	No Ice	5.07	2.87	0.04
			0.00			1/2" Ice	5.39	3.18	0.07
			0.00			1" Ice	5.73	3.49	0.11
						2" Ice	6.41	4.11	0.20
T-Arm Mount [TA 703-1]	A	From Leg	2.00	0.0000	310.00	No Ice	3.35	4.81	0.15
			0.00			1/2" Ice	4.29	5.67	0.21
			0.00			1" Ice	5.31	6.63	0.28
						2" Ice	7.59	8.80	0.47
T-Arm Mount [TA 703-1]	B	From Leg	2.00	0.0000	310.00	No Ice	3.35	4.81	0.15
			0.00			1/2" Ice	4.29	5.67	0.21
			0.00			1" Ice	5.31	6.63	0.28
						2" Ice	7.59	8.80	0.47
T-Arm Mount [TA 703-1]	C	From Leg	2.00	0.0000	310.00	No Ice	3.35	4.81	0.15
			0.00			1/2" Ice	4.29	5.67	0.21
			0.00			1" Ice	5.31	6.63	0.28
						2" Ice	7.59	8.80	0.47
*****									
1.5" dia x 2.75-ft Omni Antenna	B	From Leg	1.00	0.0000	294.00	No Ice	0.39	0.39	0.01
			0.00			1/2" Ice	0.56	0.56	0.01
			0.00			1" Ice	0.74	0.74	0.02
						2" Ice	1.12	1.12	0.03
2.4"x8' Mount Pipe	B	From Leg	0.50	0.0000	294.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			0.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
2.9" dia x 20-ft Omni Antenna	C	From Leg	1.00	0.0000	283.00	No Ice	5.62	5.62	0.04
			0.00			1/2" Ice	7.83	7.83	0.08
			0.00			1" Ice	9.88	9.88	0.14
						2" Ice	14.03	14.03	0.28
2.4"x8' Mount Pipe	C	From Leg	0.50	0.0000	283.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			0.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
DB420	D	From Leg	1.00	0.0000	280.00	No Ice	3.33	3.33	0.03
			0.00			1/2" Ice	5.99	5.99	0.04
			0.00			1" Ice	8.66	8.66	0.05
						2" Ice	13.99	13.99	0.07
2.4" x 2' Pipe Mount	D	From Leg	0.50	0.0000	280.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			0.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
Broadcast	D	From Leg	0.50	0.0000	260.00	No Ice	0.85	0.18	0.01

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft ft ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
			0.00			1/2" Ice	0.97	0.25	0.01
			0.00			1" Ice	1.09	0.31	0.02
						2" Ice	1.36	0.48	0.04
2.4" x 2' Pipe Mount	D	From Leg	0.50	0.0000	260.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			0.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
*****									
(2) Broadcast	D	From Leg	0.50	0.0000	233.00	No Ice	0.85	0.18	0.01
			0.00			1/2" Ice	0.97	0.25	0.01
			0.00			1" Ice	1.09	0.31	0.02
						2" Ice	1.36	0.48	0.04
(2) Broadcast	D	From Leg	0.50	0.0000	233.00	No Ice	0.85	0.18	0.01
			0.00			1/2" Ice	0.97	0.25	0.01
			0.00			1" Ice	1.09	0.31	0.02
						2" Ice	1.36	0.48	0.04
(2) Broadcast	D	From Leg	0.50	0.0000	233.00	No Ice	0.85	0.18	0.01
			0.00			1/2" Ice	0.97	0.25	0.01
			0.00			1" Ice	1.09	0.31	0.02
						2" Ice	1.36	0.48	0.04
2.4" x 2' Pipe Mount	D	From Leg	0.50	0.0000	233.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			0.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
2.4" x 2' Pipe Mount	D	From Leg	0.50	0.0000	233.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			0.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
2.4" x 2' Pipe Mount	D	From Leg	0.50	0.0000	233.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			0.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
*****									
4-ft Yagi Antennas	C	From Leg	1.00	0.0000	209.00	No Ice	0.50	0.25	0.00
			0.00			1/2" Ice	1.00	0.50	0.01
			0.00			1" Ice	1.50	0.75	0.03
						2" Ice	2.50	1.25	0.05
4-ft Yagi Antennas	C	From Leg	1.00	0.0000	209.00	No Ice	0.50	0.25	0.00
			0.00			1/2" Ice	1.00	0.50	0.01
			0.00			1" Ice	1.50	0.75	0.03
						2" Ice	2.50	1.25	0.05
2.4" x 3.5' Pipe Mount	C	From Leg	0.50	0.0000	209.00	No Ice	0.72	0.72	0.01
			0.00			1/2" Ice	0.94	0.94	0.02
			0.00			1" Ice	1.17	1.17	0.03
						2" Ice	1.64	1.64	0.05
2.4" x 3.5' Pipe Mount	C	From Leg	0.50	0.0000	209.00	No Ice	0.72	0.72	0.01
			0.00			1/2" Ice	0.94	0.94	0.02
			0.00			1" Ice	1.17	1.17	0.03
						2" Ice	1.64	1.64	0.05
*****									
4-ft Yagi Antennas	C	From Leg	1.00	0.0000	185.00	No Ice	0.50	0.25	0.00
			0.00			1/2" Ice	1.00	0.50	0.01
			0.00			1" Ice	1.50	0.75	0.03
						2" Ice	2.50	1.25	0.05
4-ft Yagi Antennas	C	From Leg	1.00	0.0000	185.00	No Ice	0.50	0.25	0.00
			0.00			1/2" Ice	1.00	0.50	0.01
			0.00			1" Ice	1.50	0.75	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.50	1.25	0.05
4-ft Yagi Antennas	C	From Leg	1.00	0.0000	185.00	No Ice	0.50	0.25	0.00
			0.00			1/2" Ice	1.00	0.50	0.01
			0.00			1" Ice	1.50	0.75	0.03
						2" Ice	2.50	1.25	0.05
2.4" x 3.5' Pipe Mount	C	From Leg	0.50	0.0000	185.00	No Ice	0.72	0.72	0.01
			0.00			1/2" Ice	0.94	0.94	0.02
			0.00			1" Ice	1.17	1.17	0.03
						2" Ice	1.64	1.64	0.05
2.4" x 3.5' Pipe Mount	C	From Leg	0.50	0.0000	185.00	No Ice	0.72	0.72	0.01
			0.00			1/2" Ice	0.94	0.94	0.02
			0.00			1" Ice	1.17	1.17	0.03
						2" Ice	1.64	1.64	0.05
2.4" x 3.5' Pipe Mount	C	From Leg	0.50	0.0000	185.00	No Ice	0.72	0.72	0.01
			0.00			1/2" Ice	0.94	0.94	0.02
			0.00			1" Ice	1.17	1.17	0.03
						2" Ice	1.64	1.64	0.05
*****									
1.5" dia x 4-ft Omni Antenna	D	From Leg	0.00	0.0000	160.00	No Ice	0.60	0.60	0.01
			0.00			1/2" Ice	0.92	0.92	0.02
			11.00			1" Ice	1.17	1.17	0.02
						2" Ice	1.70	1.70	0.05
2.4"x8' Mount Pipe	D	From Leg	0.50	0.0000	160.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			11.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
1.5" dia x 4-ft Omni Antenna	D	From Leg	0.00	0.0000	160.00	No Ice	0.60	0.60	0.01
			0.00			1/2" Ice	0.92	0.92	0.02
			0.00			1" Ice	1.17	1.17	0.02
						2" Ice	1.70	1.70	0.05
2.4"x8' Mount Pipe	D	From Leg	0.50	0.0000	160.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			0.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
*****									
DB420	D	From Leg	0.50	0.0000	119.00	No Ice	3.33	3.33	0.03
			0.00			1/2" Ice	5.99	5.99	0.04
			12.00			1" Ice	8.66	8.66	0.05
						2" Ice	13.99	13.99	0.07
2.4" x 2' Pipe Mount	D	From Leg	0.50	0.0000	119.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			12.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
*****									
4-ft Yagi Antennas	C	From Leg	1.00	0.0000	113.00	No Ice	0.50	0.25	0.00
			0.00			1/2" Ice	1.00	0.50	0.01
			0.00			1" Ice	1.50	0.75	0.03
						2" Ice	2.50	1.25	0.05
2.4" x 3.5' Pipe Mount	C	From Leg	0.50	0.0000	113.00	No Ice	0.72	0.72	0.01
			0.00			1/2" Ice	0.94	0.94	0.02
			0.00			1" Ice	1.17	1.17	0.03
						2" Ice	1.64	1.64	0.05
1.5" dia x 4-ft Omni Antenna	C	From Leg	1.00	0.0000	113.00	No Ice	0.60	0.60	0.01
			0.00			1/2" Ice	0.92	0.92	0.02
			5.00			1" Ice	1.17	1.17	0.02
						2" Ice	1.70	1.70	0.05
2.4"x8' Mount Pipe	C	From Leg	0.50	0.0000	113.00	No Ice	1.90	1.90	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert (ft ft ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
			0.00			1/2" Ice	2.73	2.73	0.05
			5.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
*****									
DB222-A	A	From Leg	0.50	0.0000	98.00	No Ice	1.60	1.60	0.02
			0.00			1/2" Ice	2.88	2.88	0.02
			0.00			1" Ice	4.16	4.16	0.03
						2" Ice	6.72	6.72	0.04
2.4" x 2' Pipe Mount	A	From Leg	0.50	0.0000	98.00	No Ice	0.34	0.34	0.01
			0.00			1/2" Ice	0.47	0.47	0.01
			0.00			1" Ice	0.61	0.61	0.02
						2" Ice	0.92	0.92	0.03
*****									
Channel Master	A	From Leg	1.00	0.0000	74.00	No Ice	2.09	0.67	0.03
			0.00			1/2" Ice	2.39	1.13	0.04
			9.00			1" Ice	2.70	1.50	0.05
						2" Ice	3.33	2.10	0.09
2.4"x8' Mount Pipe	A	From Leg	0.50	0.0000	74.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			0.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
***									
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	278.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	C	From Leg	0.50	0.0000	229.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	D	From Leg	0.50	0.0000	147.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	D	From Leg	0.50	0.0000	134.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	D	From Leg	0.50	0.0000	118.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	C	From Leg	0.50	0.0000	109.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	109.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	109.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	B	From Face	0.50	0.0000	109.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert (ft ft ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	99.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	B	From Leg	0.50	0.0000	99.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	D	From Leg	0.50	0.0000	89.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	D	From Leg	0.50	0.0000	89.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
2.4"x8' Mount Pipe	A	From Leg	0.50	0.0000	87.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			1.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
Pipe Mount [PM 601-1]	A	From Leg	0.50	0.0000	75.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			5.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
Pipe Mount [PM 601-1]	C	From Leg	0.50	0.0000	58.00	No Ice	1.32	1.32	0.07
			0.00			1/2" Ice	1.58	1.58	0.08
			0.00			1" Ice	1.84	1.84	0.09
						2" Ice	2.40	2.40	0.13
2.4"x8' Mount Pipe	B	From Leg	0.50	0.0000	45.00	No Ice	1.90	1.90	0.03
			0.00			1/2" Ice	2.73	2.73	0.05
			0.00			1" Ice	3.40	3.40	0.07
						2" Ice	4.40	4.40	0.12
***									
PSILP120IM-17-EP	C	From Leg	2.00	0.0000	223.00 - 197.00	No Ice	11.97	11.97	0.15
			0.00			1/2" Ice	26.63	26.63	0.31
			0.00			1" Ice	29.33	29.33	0.48
						2" Ice	34.11	34.11	0.88
3" dia x 20' Pipe Mount	C	From Leg	1.00	0.0000	223.00 - 197.00	No Ice	5.66	5.66	0.12
			0.00			1/2" Ice	8.03	8.03	0.16
			0.00			1" Ice	10.08	10.08	0.22
						2" Ice	14.23	14.23	0.37
***									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert (ft)	Azimuth Adjustment (°)	3 dB Beam Width (°)	Elevation (ft)	Outside Diameter (ft)	Aperture Area (ft^2)	Weight (K)

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 K
6 FT DISH	B	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		278.00	6.00	No Ice	28.27	0.14
				0.00					1/2" Ice	29.05	0.29
				0.00					1" Ice	29.83	0.44
									2" Ice	31.39	0.74
4 FT DISH	C	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		229.00	4.00	No Ice	12.56	0.17
				0.00					1/2" Ice	13.09	0.24
				0.00					1" Ice	13.62	0.30
									2" Ice	14.68	0.44
4 FT DISH	D	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		146.00	4.00	No Ice	12.56	0.17
				0.00					1/2" Ice	13.09	0.24
				2.00					1" Ice	13.62	0.30
									2" Ice	14.68	0.44
4 FT DISH	D	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		149.00	4.00	No Ice	12.56	0.17
				0.00					1/2" Ice	13.09	0.24
				-1.00					1" Ice	13.62	0.30
									2" Ice	14.68	0.44
Andrew HPX8107P3A	D	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		134.00	8.00	No Ice	50.26	0.25
				0.00					1/2" Ice	51.29	0.51
				0.00					1" Ice	52.32	0.78
									2" Ice	54.39	1.30
8 FT DISH	D	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		118.00	8.00	No Ice	50.30	0.25
				0.00					1/2" Ice	51.29	0.51
				0.00					1" Ice	52.28	0.78
									2" Ice	54.27	1.30
6' x 3' Grid Dish	C	Grid	From Leg	1.00	0.0000		109.00	2.39	No Ice	4.50	0.04
				0.00					1/2" Ice	4.82	0.06
				0.00					1" Ice	5.14	0.09
									2" Ice	5.78	0.14
3' Dish	B	Grid	From Leg	1.00	0.0000		109.00	3.00	No Ice	7.07	0.02
				0.00					1/2" Ice	7.47	0.05
				0.00					1" Ice	7.86	0.09
									2" Ice	8.66	0.17
3' Dish	B	Grid	From Leg	1.00	0.0000		109.00	3.00	No Ice	7.07	0.02
				0.00					1/2" Ice	7.47	0.05
				0.00					1" Ice	7.86	0.09
									2" Ice	8.66	0.17
Andrew 4' w/Radome	B	Paraboloid w/Radome	From Face	0.00	0.0000		109.00	4.00	No Ice	12.57	0.14
				0.00					1/2" Ice	13.10	0.28
				0.00					1" Ice	13.62	0.42
									2" Ice	14.68	0.71
Andrew SD6 6103	B	Paraboloid w/Radome	From Leg	0.00	0.0000		99.00	6.00	No Ice	28.27	0.38
				0.00					1/2" Ice	29.07	0.45
				0.00					1" Ice	29.86	0.52
									2" Ice	31.44	0.66
3' Dish	B	Grid	From Face	1.00	0.0000		99.00	3.00	No Ice	7.07	0.02
				0.00					1/2" Ice	7.47	0.05
				0.00					1" Ice	7.86	0.09
									2" Ice	8.66	0.17
Andrew 8' HP Dish	D	Paraboloid w/Shroud (HP)	From Leg	1.00	0.0000		89.00	8.00	No Ice	50.27	0.47
				0.00					1/2" Ice	51.32	1.01
				0.00					1" Ice	52.37	1.55
									2" Ice	54.48	2.63
Andrew SD6 103	D	Paraboloid w/Radome	From Leg	1.00	0.0000		89.00	6.00	No Ice	28.27	0.38
				0.00					1/2" Ice	29.07	0.45
				0.00					1" Ice	29.86	0.52
									2" Ice	31.44	0.66
2' Parabolic Dish	A	Paraboloid w/o Radome	From Leg	1.00	0.0000		87.00	2.00	No Ice	3.14	0.07
				0.00					1/2" Ice	3.41	0.28
				1.00					1" Ice	3.68	0.49

Description	*Face or Leg*	*Dish Type*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft*	*Azimuth Adjustment* °	*3 dB Beam Width* °	*Elevation* *ft*	*Outside Diameter* *ft*		*Aperture Area* *ft²*	*Weight* *K*
									2" Ice	4.21	0.92
12" Dish	A	Paraboloid w/o Radome	From Leg	1.00 0.00 5.00	0.0000		75.00	1.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.39 1.57 1.75 2.11	0.02 0.02 0.03 0.05
Bed Spring Dish	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		58.00	2.50	No Ice 1/2" Ice 1" Ice 2" Ice	4.91 5.24 5.57 6.24	0.03 0.06 0.08 0.14
mWave P-9A48GN	B	Grid	From Leg	1.00 0.00 0.00	0.0000		45.00	4.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.57 13.10 13.62 14.68	0.08 0.15 0.22 0.35

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 45 deg - No Ice
5	0.9 Dead+1.0 Wind 45 deg - No Ice
6	1.2 Dead+1.0 Wind 90 deg - No Ice
7	0.9 Dead+1.0 Wind 90 deg - No Ice
8	1.2 Dead+1.0 Wind 135 deg - No Ice
9	0.9 Dead+1.0 Wind 135 deg - No Ice
10	1.2 Dead+1.0 Wind 180 deg - No Ice
11	0.9 Dead+1.0 Wind 180 deg - No Ice
12	1.2 Dead+1.0 Wind 225 deg - No Ice
13	0.9 Dead+1.0 Wind 225 deg - No Ice
14	1.2 Dead+1.0 Wind 270 deg - No Ice
15	0.9 Dead+1.0 Wind 270 deg - No Ice
16	1.2 Dead+1.0 Wind 315 deg - No Ice
17	0.9 Dead+1.0 Wind 315 deg - No Ice
18	1.2 Dead+1.0 Ice+1.0 Temp
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
20	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
21	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
22	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
23	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
24	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
25	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
26	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 45 deg - Service
29	Dead+Wind 90 deg - Service
30	Dead+Wind 135 deg - Service
31	Dead+Wind 180 deg - Service
32	Dead+Wind 225 deg - Service
33	Dead+Wind 270 deg - Service
34	Dead+Wind 315 deg - Service

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FAX:

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	305 - 281	14.491	28	0.7546	0.0522
L2	281 - 280	11.351	32	0.4584	0.0304
T1	280 - 276	11.258	32	0.4284	0.0301
T2	276 - 272	10.899	32	0.4245	0.0291
T3	272 - 268	10.541	32	0.4197	0.0276
T4	268 - 264	10.187	32	0.4140	0.0261
T5	264 - 260	9.838	32	0.4071	0.0246
T6	260 - 255	9.494	32	0.3997	0.0231
T7	255 - 250	9.072	32	0.3881	0.0210
T8	250 - 245	8.663	32	0.3744	0.0189
T9	245 - 240	8.273	32	0.3614	0.0170
T10	240 - 235	7.895	32	0.3490	0.0153
T11	235 - 230	7.531	32	0.3366	0.0138
T12	230 - 225	7.179	32	0.3239	0.0125
T13	225 - 200	6.839	32	0.3118	0.0114
T14	200 - 191.667	5.311	32	0.2549	0.0067
T15	191.667 - 183.333	4.866	32	0.2389	0.0057
T16	183.333 - 175	4.447	32	0.2228	0.0048
T17	175 - 150	4.057	28	0.2069	0.0039
T18	150 - 125	3.006	28	0.1663	0.0038
T19	125 - 112.5	2.131	28	0.1293	0.0031
T20	112.5 - 100	1.752	28	0.1124	0.0023
T21	100 - 77.0001	1.407	28	0.0950	0.0017
T22	77.0001 - 50.0001	0.903	28	0.0711	0.0011
T23	50.0001 - 25.0001	0.418	28	0.0493	0.0006
T24	25.0001 - 0	0.084	28	0.0278	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
310.00	(3) 4' x 1' Panel	28	14.491	0.7546	0.0539	11427
294.00	1.5" dia x 2.75-ft Omni Antenna	32	12.875	0.7062	0.0492	5194
283.00	2.9" dia x 20-ft Omni Antenna	32	11.547	0.5184	0.0361	2944
280.00	DB420	32	11.258	0.4284	0.0301	5030
278.00	6 FT DISH	32	11.078	0.4120	0.0295	11794
260.00	Broadcast	32	9.494	0.3997	0.0231	28795
233.00	(2) Broadcast	32	7.389	0.3315	0.0133	24125
229.00	4 FT DISH	32	7.110	0.3215	0.0123	25174
223.00	PSILP120IM-17-EP	32	6.706	0.3070	0.0109	26513
217.80	PSILP120IM-17-EP	32	6.369	0.2946	0.0098	26172
212.60	PSILP120IM-17-EP	32	6.045	0.2824	0.0088	25748
209.00	4-ft Yagi Antennas	32	5.827	0.2741	0.0081	25461
207.40	PSILP120IM-17-EP	32	5.733	0.2706	0.0078	25336
202.20	PSILP120IM-17-EP	32	5.434	0.2594	0.0070	25083
197.00	PSILP120IM-17-EP	32	5.148	0.2490	0.0063	27856
185.00	4-ft Yagi Antennas	32	4.529	0.2260	0.0049	30605
160.00	1.5" dia x 4-ft Omni Antenna	28	3.405	0.1817	0.0037	41468
148.00	4 FT DISH	28	2.929	0.1633	0.0038	39699
147.00	Pipe Mount [PM 601-1]	28	2.892	0.1618	0.0038	39881
134.00	Andrew HPX8107P3A	28	2.427	0.1422	0.0035	43282
119.00	DB420	28	1.945	0.1212	0.0027	54708
118.00	8 FT DISH	28	1.915	0.1199	0.0026	56485

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
113.00	4-ft Yagi Antennas	28	1.767	0.1131	0.0023	62005
109.00	6' x 3' Grid Dish	28	1.651	0.1075	0.0021	49847
99.00	Andrew SD6 6103	28	1.382	0.0937	0.0016	30741
98.00	DB222-A	28	1.357	0.0925	0.0016	31133
89.00	Andrew 8' HP Dish	28	1.148	0.0823	0.0014	44011
88.00	2' Parabolic Dish	28	1.127	0.0813	0.0014	46188
87.00	2.4"x8' Mount Pipe	28	1.105	0.0803	0.0014	48592
80.00	12" Dish	28	0.962	0.0737	0.0012	76127
75.00	Pipe Mount [PM 601-1]	28	0.865	0.0694	0.0011	100949
74.00	Channel Master	28	0.846	0.0685	0.0011	103011
58.00	Bed Spring Dish	28	0.554	0.0556	0.0006	117561
45.00	mWave P-9A48GN	28	0.337	0.0454	0.0006	62278

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	305 - 281	53.439	12	2.7746	0.1844
L2	281 - 280	41.891	12	1.6854	0.1044
T1	280 - 276	41.549	12	1.5831	0.1108
T2	276 - 272	40.216	12	1.5699	0.1070
T3	272 - 268	38.890	12	1.5537	0.1015
T4	268 - 264	37.578	12	1.5336	0.0961
T5	264 - 260	36.282	12	1.5094	0.0905
T6	260 - 255	35.006	12	1.4814	0.0848
T7	255 - 250	33.444	12	1.4380	0.0774
T8	250 - 245	31.928	12	1.3867	0.0696
T9	245 - 240	30.484	12	1.3382	0.0625
T10	240 - 235	29.086	12	1.2916	0.0563
T11	235 - 230	27.737	12	1.2450	0.0508
T12	230 - 225	26.435	12	1.1979	0.0461
T13	225 - 200	25.178	12	1.1527	0.0419
T14	200 - 191.667	19.537	12	0.9405	0.0247
T15	191.667 - 183.333	17.905	4	0.8809	0.0210
T16	183.333 - 175	16.372	4	0.8211	0.0175
T17	175 - 150	14.934	4	0.7622	0.0165
T18	150 - 125	11.060	4	0.6116	0.0148
T19	125 - 112.5	7.839	4	0.4754	0.0119
T20	112.5 - 100	6.443	4	0.4132	0.0089
T21	100 - 77.0001	5.173	4	0.3496	0.0067
T22	77.0001 - 50.0001	3.320	4	0.2618	0.0044
T23	50.0001 - 25.0001	1.538	4	0.1816	0.0022
T24	25.0001 - 0	0.309	5	0.1022	0.0014

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
310.00	(3) 4’ x 1’ Panel	12	53.439	2.7746	0.2058	3121
294.00	1.5" dia x 2.75-ft Omni Antenna	12	47.569	2.5977	0.2251	1418

Elevation *ft*	*Appurtenance*	*Gov. Load Comb.*	*Deflection* *in*	*Tilt* *°*	*Twist* *°*	*Radius of Curvature* *ft*
283.00	2.9" dia x 20-ft Omni Antenna	12	42.620	1.9065	0.1552	803
280.00	DB420	12	41.549	1.5831	0.1108	1373
278.00	6 FT DISH	12	40.879	1.5283	0.1127	3220
260.00	Broadcast	12	35.006	1.4814	0.0848	7889
233.00	(2) Broadcast	12	27.211	1.2261	0.0489	6525
229.00	4 FT DISH	12	26.180	1.1887	0.0452	6743
223.00	PSILP120IM-17-EP	12	24.687	1.1348	0.0403	7092
217.80	PSILP120IM-17-EP	12	23.442	1.0884	0.0362	7007
212.60	PSILP120IM-17-EP	12	22.244	1.0428	0.0324	6901
209.00	4-ft Yagi Antennas	12	21.442	1.0121	0.0299	6829
207.40	PSILP120IM-17-EP	12	21.093	0.9988	0.0289	6798
202.20	PSILP120IM-17-EP	12	19.989	0.9572	0.0258	6736
197.00	PSILP120IM-17-EP	4	18.936	0.9186	0.0233	7486
185.00	4-ft Yagi Antennas	4	16.671	0.8331	0.0182	8242
160.00	1.5" dia x 4-ft Omni Antenna	4	12.531	0.6686	0.0148	11245
148.00	4 FT DISH	4	10.778	0.6003	0.0147	10790
147.00	Pipe Mount [PM 601-1]	4	10.639	0.5947	0.0147	10841
134.00	Andrew HPX8107P3A	4	8.927	0.5226	0.0135	11799
119.00	DB420	4	7.154	0.4456	0.0105	14946
118.00	8 FT DISH	4	7.043	0.4407	0.0102	15431
113.00	4-ft Yagi Antennas	4	6.497	0.4157	0.0090	16934
109.00	6' x 3' Grid Dish	4	6.072	0.3951	0.0082	13608
99.00	Andrew SD6 6103	4	5.080	0.3449	0.0065	8369
98.00	DB222-A	4	4.988	0.3403	0.0064	8475
89.00	Andrew 8' HP Dish	4	4.222	0.3031	0.0055	11969
88.00	2' Parabolic Dish	4	4.142	0.2994	0.0054	12569
87.00	2.4"x8' Mount Pipe	4	4.064	0.2957	0.0053	13223
80.00	12" Dish	4	3.537	0.2716	0.0047	20712
75.00	Pipe Mount [PM 601-1]	4	3.178	0.2555	0.0042	27458
74.00	Channel Master	4	3.108	0.2524	0.0041	28017
58.00	Bed Spring Dish	4	2.037	0.2047	0.0026	31933
45.00	mWave P-9A48GN	4	1.239	0.1669	0.0022	16947

Bolt Design Data

Section No.	*Elevation* *ft*	*Component Type*	*Bolt Grade*	*Bolt Size* *in*	*Number Of Bolts*	*Maximum Load per Bolt* *K*	*Allowable Load per Bolt* *K*	*Ratio Load / Allowable*	*Allowable Ratio*	*Criteria*
T1	280	Leg	A307	0.6250	10	2.75	10.17	0.270	1	Bolt Tension
		Diagonal	A307	0.6250	1	2.58	5.81	0.444	1	Member Block Shear
		Top Girt	A307	0.6250	1	0.24	7.83	0.030	1	Member Bearing
T2	276	Leg	A307	0.6250	10	3.06	10.17	0.301	1	Bolt Tension
		Diagonal	A307	0.6250	1	3.33	5.81	0.573	1	Member Block Shear
T3	272	Leg	A307	0.6250	10	3.48	10.17	0.342	1	Bolt Tension
		Diagonal	A307	0.6250	1	3.46	5.81	0.595	1	Member Block Shear
		Top Girt	A307	0.6250	1	0.39	7.83	0.049	1	Member Bearing
T4	268	Leg	A307	0.6250	10	3.93	10.17	0.386	1	Bolt Tension
		Diagonal	A307	0.6250	1	3.86	5.81	0.664	1	Member Block Shear
T5	264	Leg	A307	0.6250	10	4.34	10.17	0.427	1	Bolt Tension
		Diagonal	A307	0.6250	1	4.10	5.81	0.706	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Girt	A307	0.6250	1	1.34	7.83	0.171	1	Member Bearing
T6	260	Leg	A307	0.6250	10	5.15	10.17	0.506	1	Bolt Tension
		Diagonal	A307	0.6250	1	4.83	5.81	0.831	1	Member Block Shear
		Top Girt	A307	0.6250	1	1.12	7.83	0.144	1	Member Bearing
T7	255	Leg	A307	0.6250	10	5.88	10.17	0.578	1	Bolt Tension
		Diagonal	A307	0.6250	1	5.36	5.81	0.922	1	Member Block Shear
T8	250	Leg	A307	0.6250	10	6.48	10.17	0.638	1	Bolt Tension
		Diagonal	A307	0.6250	1	2.69	5.81	0.463	1	Member Block Shear
		Top Girt	A307	0.6250	1	1.02	7.83	0.130	1	Member Bearing
T9	245	Leg	A307	0.6250	10	7.02	10.17	0.690	1	Bolt Tension
		Diagonal	A307	0.6250	1	3.43	5.81	0.590	1	Member Block Shear
T10	240	Leg	A307	0.6250	10	7.32	10.17	0.719	1	Bolt Tension
		Diagonal	A307	0.6250	1	2.96	5.81	0.509	1	Member Block Shear
T11	235	Leg	A307	0.6250	10	7.85	10.17	0.772	1	Bolt Tension
		Diagonal	A307	0.6250	1	3.26	5.81	0.560	1	Member Block Shear
T12	230	Leg	A307	0.6250	10	8.25	10.17	0.811	1	Bolt Tension
		Diagonal	A307	0.6250	1	3.40	5.81	0.585	1	Member Block Shear
T13	225	Leg	A307	0.6250	12	9.05	10.17	0.890	1	Bolt Tension
		Diagonal	A307	0.6250	2	2.45	5.66	0.433	1	Member Block Shear
		Top Girt	A307	0.6250	2	0.92	7.19	0.127	1	Member Block Shear
T14	200	Leg	A307	0.6250	12	9.66	10.17	0.950	1	Bolt Tension
		Diagonal	A307	0.6250	2	2.92	6.17	0.473	1	Member Block Shear
		Top Girt	A307	0.6250	2	1.02	7.19	0.142	1	Member Block Shear
T15	191.667	Leg	A307	0.6250	12	10.68	10.17	**1.050**	1	Bolt Tension
		Diagonal	A307	0.6250	2	3.18	6.17	0.515	1	Member Block Shear
T16	183.333	Leg	A307	0.6250	12	11.44	10.17	**1.125**	1	Bolt Tension
		Diagonal	A307	0.6250	2	3.39	6.17	0.549	1	Member Block Shear
T17	175	Leg	A307	0.6250	16	10.31	10.17	**1.014**	1	Bolt Tension
		Diagonal	A307	0.6250	2	5.33	5.66	0.942	1	Member Block Shear
		Top Girt	A307	0.6250	2	2.31	8.63	0.267	1	Bolt Shear
T18	150	Leg	A307	0.6250	18	11.27	10.17	**1.108**	1	Bolt Tension
		Diagonal	A307	0.6250	2	6.05	5.66	**1.069**	1	Member Block Shear
		Top Girt	A307	0.6250	2	2.89	8.63	0.335	1	Bolt Shear
T19	125	Leg	A307	0.6250	20	11.19	10.17	**1.100**	1	Bolt Tension
		Diagonal	A307	0.7500	3	4.40	6.46	0.681	1	Member Block Shear
		Top Girt	A307	0.7500	3	1.71	11.33	0.151	1	Member Block Shear
T20	112.5	Leg	A307	0.6250	20	12.30	10.17	**1.209**	1	Bolt Tension
		Diagonal	A307	0.7500	3	4.76	6.46	0.737	1	Member Block Shear
		Top Girt	A307	0.7500	3	1.66	10.42	0.159	1	Member Block Shear
T21	100	Leg	A307	0.7500	22	12.30	15.05	0.817	1	Bolt Tension
		Diagonal	A307	0.7500	3	7.96	9.97	0.798	1	Member Block

Section No.	*Elevation* *ft*	*Component Type*	*Bolt Grade*	*Bolt Size* *in*	*Number Of Bolts*	*Maximum Load per Bolt* *K*	*Allowable Load per Bolt* *K*	*Ratio* $\frac{Load}{Allowable}$	*Allowable Ratio*	*Criteria*
										Shear
T22	77.0001	Top Girt	A307	0.7500	3	2.83	12.43	0.227	1	Bolt Shear
		Leg	A307	0.7500	20	16.07	15.05	**1.068**	1	Bolt Tension
		Diagonal	A307	0.7500	3	8.60	9.97	0.863	1	Member Block Shear
T23	50.0001	Top Girt	A307	0.7500	3	3.85	12.43	0.310	1	Bolt Shear
		Leg	A307	0.7500	24	15.62	15.05	**1.038**	1	Bolt Tension
		Diagonal	A307	0.7500	3	8.57	9.97	0.859	1	Member Block Shear
T24	25.0001	Top Girt	A307	0.7500	3	3.88	12.43	0.313	1	Bolt Shear
		Leg	A307	0.7500	30	13.23	15.05	0.879	1	Bolt Tension
		Diagonal	A307	0.7500	3	13.00	12.43	**1.046**	1	Bolt Shear

Compression Checks

Pole Design Data

Section No.	*Elevation* *ft*	*Size*	*L* *ft*	L_u *ft*	*Kl/r*	*A* in^2	P_u *K*	ϕP_n *K*	*Ratio* $\frac{P_u}{\phi P_n}$
L1	305 - 281 (1)	TP14x14x0.5	24.00	0.00	0.0	21.2057	-2.99	667.98	0.004
L2	281 - 280 (2)	TP14x14x0.375	1.00	0.00	0.0	16.0516	-3.06	505.63	0.006

Pole Bending Design Data

Section No.	*Elevation* *ft*	*Size*	M_{ux} *kip-ft*	ϕM_{nx} *kip-ft*	*Ratio* $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} *kip-ft*	ϕM_{ny} *kip-ft*	*Ratio* $\frac{M_{uy}}{\phi M_{ny}}$
L1	305 - 281 (1)	TP14x14x0.5	141.75	239.31	0.592	0.00	239.31	0.000
L2	281 - 280 (2)	TP14x14x0.375	148.16	182.79	0.811	0.00	182.79	0.000

Pole Shear Design Data

Section No.	*Elevation* *ft*	*Size*	*Actual* V_u *K*	ϕV_n *K*	*Ratio* $\frac{V_u}{\phi V_n}$	*Actual* T_u *kip-ft*	ϕT_n *kip-ft*	*Ratio* $\frac{T_u}{\phi T_n}$
L1	305 - 281 (1)	TP14x14x0.5	6.39	200.39	0.032	4.49	237.85	0.019
L2	281 - 280 (2)	TP14x14x0.375	6.44	151.69	0.042	4.49	181.70	0.025

Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	305 - 281 (1)	0.004	0.592	0.000	0.032	0.019	0.599	1.000	4.8.2
L2	281 - 280 (2)	0.006	0.811	0.000	0.042	0.025	0.821	1.000	4.8.2

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 276	L4x4x3/8	4.00	4.00	60.9 K=1.00	2.8600	-15.75	90.95	0.173 [1]
T2	276 - 272	L4x4x3/8	4.00	4.00	60.9 K=1.00	2.8600	-19.40	90.95	0.213 [1]
T3	272 - 268	L4x4x3/8	4.00	4.00	60.9 K=1.00	2.8600	-25.81	90.95	0.284 [1]
T4	268 - 264	L4x4x3/8	4.00	4.00	60.9 K=1.00	2.8600	-32.56	90.95	0.358 [1]
T5	264 - 260	L4x4x3/8	4.00	4.00	60.9 K=1.00	2.8600	-38.77	90.95	0.426 [1]
T6	260 - 255	L4x4x3/8	5.00	5.00	76.1 K=1.00	2.8600	-49.46	84.19	0.587 [1]
T7	255 - 250	L4x4x3/8	5.00	5.00	76.1 K=1.00	2.8600	-59.30	84.19	0.704 [1]
T8	250 - 245	L4x4x7/16	5.01	5.01	76.6 K=1.00	3.3100	-67.80	97.17	0.698 [1]
T9	245 - 240	L4x4x7/16	5.01	5.01	76.6 K=1.00	3.3100	-75.28	97.17	0.775 [1]
T10	240 - 235	L4x4x7/16	5.01	2.60	39.7 K=1.00	3.3100	-80.07	113.26	0.707 [1]
T11	235 - 230	L4x4x7/16	5.01	5.01	76.6 K=1.00	3.3100	-87.02	97.17	0.896 [1]
T12	230 - 225	L4x4x7/16	5.01	5.01	76.6 K=1.00	3.3100	-92.16	97.17	0.948 [1]
T13	225 - 200	L5x5x3/8	25.06	6.26	75.9 K=1.00	3.6100	-121.90	106.40	1.146 [1]
		4.8.1 (1.15 CR) - 171							
T14	200 - 191.667	L6x6x3/8	8.35	8.35	84.2 K=1.00	4.3600	-129.50	118.96	1.089 [1]
		4.8.1 (1.09 CR) - 211							
T15	191.667 - 183.333	L6x6x3/8	8.35	4.32	43.6 K=1.00	4.3600	-142.54	142.90	0.997 [1]
T16	183.333 - 175	L6x6x3/8	8.35	8.35	84.2 K=1.00	4.3600	-151.36	118.96	1.272 [1]
		4.8.1 (1.27 CR) - 243							
T17	175 - 150	L6x6x7/16	25.06	6.52	65.8 K=1.00	5.0600	-179.17	157.37	1.139 [1]
		4.8.1 (1.14 CR) - 255							
T18	150 - 125	L6x6x1/2	25.06	6.49	66.0 K=1.00	5.7500	-215.82	178.67	1.208 [1]
		4.8.1 (1.21 CR) - 291							
T19	125 - 112.5	L6x6x9/16	12.53	6.48	65.9	6.4300	-236.42	199.91	1.183 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				
		4.8.1 (1.18 CR) - 327							
T20	112.5 - 100	L6x6x9/16	12.53	6.46	65.7 K=1.00	6.4300	-257.84	200.10	1.289 [1]
		4.8.1 (1.29 CR) - 347							
T21	100 - 77.0001	L8x8x9/16	23.05	12.13	91.6 K=1.00	8.6800	-282.33	230.08	1.227 [1]
		4.8.1 (1.23 CR) - 367							
T22	77.0001 - 50.0001	L8x8x3/4	27.06	14.28	108.5 K=1.00	11.4000	-331.65	258.57	1.283 [1]
		4.8.1 (1.28 CR) - 389							
T23	50.0001 - 25.0001	L8x8x3/4	25.06	13.11	99.6 K=1.00	11.4000	-382.30	282.45	1.354 [1]
		4.8.1 (1.35 CR) - 409							
T24	25.0001 - 0	L8x8x5/8	25.06	6.26	47.6 K=1.00	9.6100	-419.48	321.33	1.305 [1]
		4.8.1 (1.31 CR) - 429							

[1] P_u / ϕP_n controls

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	280 - 276	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T2	276 - 272	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T3	272 - 268	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T4	268 - 264	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T5	264 - 260	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T6	260 - 255	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T7	255 - 250	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T8	250 - 245	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T9	245 - 240	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T10	240 - 235	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T11	235 - 230	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T12	230 - 225	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T13	225 - 200	L5x5x3/8	0.00	16.59	0.000	0.00	8.41	0.000
T14	200 - 191.667	L6x6x3/8	0.00	23.44	0.000	0.00	11.73	0.000
T15	191.667 - 183.333	L6x6x3/8	0.00	23.44	0.000	0.00	11.73	0.000
T16	183.333 - 175	L6x6x3/8	0.00	23.44	0.000	0.00	11.73	0.000
T17	175 - 150	L6x6x7/16	0.00	27.97	0.000	0.00	14.18	0.000
T18	150 - 125	L6x6x1/2	0.00	31.67	0.000	0.00	15.90	0.000
T19	125 - 112.5	L6x6x9/16	0.00	35.30	0.000	0.00	17.80	0.000
T20	112.5 - 100	L6x6x9/16	0.00	35.30	0.000	0.00	17.80	0.000
T21	100 - 77.0001	L8x8x9/16	0.00	64.00	0.000	0.00	32.51	0.000
T22	77.0001 - 50.0001	L8x8x3/4	0.00	83.33	0.000	0.00	42.63	0.000
T23	50.0001 - 25.0001	L8x8x3/4	0.00	83.33	0.000	0.00	42.63	0.000
T24	25.0001 - 0	L8x8x5/8	0.00	70.64	0.000	0.00	35.72	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	280 - 276	L4x4x3/8	0.173	0.000	0.000	0.173 [1]	1.000	4.8.1
T2	276 - 272	L4x4x3/8	0.213	0.000	0.000	0.213 [1]	1.000	4.8.1
T3	272 - 268	L4x4x3/8	0.284	0.000	0.000	0.284 [1]	1.000	4.8.1
T4	268 - 264	L4x4x3/8	0.358	0.000	0.000	0.358 [1]	1.000	4.8.1
T5	264 - 260	L4x4x3/8	0.426	0.000	0.000	0.426 [1]	1.000	4.8.1
T6	260 - 255	L4x4x3/8	0.587	0.000	0.000	0.587 [1]	1.000	4.8.1
T7	255 - 250	L4x4x3/8	0.704	0.000	0.000	0.704 [1]	1.000	4.8.1
T8	250 - 245	L4x4x7/16	0.698	0.000	0.000	0.698 [1]	1.000	4.8.1
T9	245 - 240	L4x4x7/16	0.775	0.000	0.000	0.775 [1]	1.000	4.8.1
T10	240 - 235	L4x4x7/16	0.707	0.000	0.000	0.707 [1]	1.000	4.8.1
T11	235 - 230	L4x4x7/16	0.896	0.000	0.000	0.896 [1]	1.000	4.8.1
T12	230 - 225	L4x4x7/16	0.948	0.000	0.000	0.948 [1]	1.000	4.8.1
T13	225 - 200	L5x5x3/8	1.146	0.000	0.000	**1.146** [1]	1.000	4.8.1
T14	200 - 191.667	L6x6x3/8	1.089	0.000	0.000	**1.089** [1]	1.000	4.8.1
T15	191.667 - 183.333	L6x6x3/8	0.997	0.000	0.000	0.997 [1]	1.000	4.8.1
T16	183.333 - 175	L6x6x3/8	1.272	0.000	0.000	**1.272** [1]	1.000	4.8.1
T17	175 - 150	L6x6x7/16	1.139	0.000	0.000	**1.139** [1]	1.000	4.8.1
T18	150 - 125	L6x6x1/2	1.208	0.000	0.000	**1.208** [1]	1.000	4.8.1
T19	125 - 112.5	L6x6x9/16	1.183	0.000	0.000	**1.183** [1]	1.000	4.8.1
T20	112.5 - 100	L6x6x9/16	1.289	0.000	0.000	**1.289** [1]	1.000	4.8.1
T21	100 - 77.0001	L8x8x9/16	1.227	0.000	0.000	**1.227** [1]	1.000	4.8.1
T22	77.0001 - 50.0001	L8x8x3/4	1.283	0.000	0.000	**1.283** [1]	1.000	4.8.1
T23	50.0001 - 25.0001	L8x8x3/4	1.354	0.000	0.000	**1.354** [1]	1.000	4.8.1
T24	25.0001 - 0	L8x8x5/8	1.305	0.000	0.000	**1.305** [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio P_u / ϕP_n
T1	280 - 276	L1 3/4x1 3/4x3/16	6.87	3.31	116.8 K=1.01	0.6211	-2.58	12.76	0.202 [1]
T2	276 - 272	L1 3/4x1 3/4x3/16	6.87	3.31	116.8 K=1.01	0.6211	-3.34	12.76	0.262 [1]
T3	272 - 268	L1 3/4x1 3/4x3/16	6.87	3.31	116.8 K=1.01	0.6211	-3.48	12.76	0.273 [1]
T4	268 - 264	L1 3/4x1 3/4x3/16	6.87	3.31	116.8 K=1.01	0.6211	-3.87	12.76	0.303 [1]
T5	264 - 260	L1 3/4x1 3/4x3/16	6.87	3.31	116.8 K=1.01	0.6211	-4.98	12.76	0.390 [1]
T6	260 - 255	L1 3/4x1 3/4x3/16	7.49	3.63	126.7 K=1.00	0.6211	-4.86	11.07	0.439 [1]
T7	255 - 250	L1 3/4x1 3/4x3/16	7.49	3.63	126.7 K=1.00	0.6211	-5.43	11.07	0.491 [1]
T8	250 - 245	L1 3/4x1 3/4x3/16	7.68	3.88	135.6 K=1.00	0.6211	-3.60	9.66	0.372 [1]
T9	245 - 240	L1 3/4x1 3/4x3/16	8.06	4.07	142.0 K=1.00	0.6211	-2.91	8.81	0.330 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	240 - 235	L1 3/4x1 3/4x3/16	8.45	4.26	148.7 K=1.00	0.6211	-3.43	8.04	0.427 [1]
T11	235 - 230	L1 3/4x1 3/4x3/16	8.85	4.45	155.5 K=1.00	0.6211	-3.08	7.35	0.419 [1]
T12	230 - 225	L1 3/4x1 3/4x3/16	9.25	4.65	162.5 K=1.00	0.6211	-3.63	6.73	0.540 [1]
T13	225 - 200	L1 3/4x1 3/4x3/16	11.93	5.95	187.0 K=0.90	0.6211	-4.97	5.09	0.978 [1]
T14	200 - 191.667	L2x2 1/2x3/16	13.71	6.91	176.6 K=0.91	0.8090	-5.94	7.42	0.800 [1]
T15	191.667 - 183.333	L2x2 1/2x3/16	14.36	7.23	183.5 K=0.90	0.8090	-6.26	6.88	0.910 [1]
T16	183.333 - 175	L2x2 1/2x3/16 4.8.1 (1.07 CR) - 250	15.03	7.56	190.5 K=0.90	0.8090	-6.86	6.38	**1.075** [1]
T17	175 - 150	L1 3/4x1 3/4x3/16 KL/R > 200 (C) - 268	19.34	9.87	291.4 K=0.84	0.6211	-9.87	2.09	**4.716** [1]
T18	150 - 125	L1 3/4x1 3/4x3/16 KL/R > 200 (C) - 305	21.26	10.81	316.3 K=0.84	0.6211	-12.22	1.78	**6.881** [1]
T19	125 - 112.5	L1 3/4x1 3/4x3/16 KL/R > 200 (C) - 341	22.26	11.18	326.3 K=0.84	0.6211	-13.48	1.67	**8.072** [1]
T20	112.5 - 100	L1 3/4x1 3/4x3/16 KL/R > 200 (C) - 361	23.28	11.67	339.4 K=0.83	0.6211	-14.54	1.54	**9.424** [1]
T21	100 - 77.0001	L2 1/2x2x1/4 KL/R > 200 (C) - 379	31.41	16.21	378.1 K=0.82	1.0600	-22.39	2.12	**10.551** [1]
T22	77.0001 - 50.0001	L2 1/2x2x1/4 KL/R > 200 (C) - 402	36.02	18.68	431.5 K=0.82	1.0600	-25.13	1.63	**15.422** [1]
T23	50.0001 - 25.0001	L2 1/2x2x1/4 KL/R > 200 (C) - 418	36.33	18.69	431.6 K=0.82	1.0600	-25.02	1.63	**15.360** [1]
T24	25.0001 - 0	L4x6x3/8 4.8.1 (1.37 CR) - 479	29.18	14.59	199.6 K=1.00	3.6100	-35.43	25.93	**1.367** [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T17	175 - 150	L2 1/2x3x1/4 KL/R > 200 (C) - 273	14.13	14.13	243.7 K=0.76	1.3100	-6.22	6.31	0.985 [1]
T18	150 - 125	L2 1/2x3 1/2x1/4 KL/R > 200 (C) - 309	16.57	16.57	271.0 K=0.74	1.4400	-5.57	5.61	0.992 [1]
T24	25.0001 - 0	L4x4x1/4 4.8.1 (1.37 CR) - 478	27.56	20.67	198.4 K=1.00	1.9400	-19.38	14.10	**1.374** [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	240 - 235	L2 1/2x2x3/16	6.80	6.80	136.0 K=1.00	0.8090	-1.20	12.53	0.096 [1]
T15	191.667 - 183.333	L4x4x1/4	11.67	11.67	116.0 K=1.04	1.9400	-2.14	39.88	0.054 [1]
T17	175 - 150	L2x2x3/16	14.71	14.71	286.2 K=1.00	0.7150	-2.69	2.50	**1.077** [1]
		KL/R > 250 (C) - 278							
T18	150 - 125	L2x2 1/2x3/16	17.16	17.16	259.6 K=1.00	0.8090	-3.24	3.44	0.943 [1]
		KL/R > 250 (C) - 314							
T19	125 - 112.5	L2x2 1/2x3/16	18.39	18.39	278.2 K=1.00	0.8090	-3.55	2.99	**1.187** [1]
		KL/R > 250 (C) - 346							
T20	112.5 - 100	L2 1/2x2 1/2x3/16	19.61	19.61	302.5 K=1.00	0.9020	-3.87	2.82	**1.372** [1]
		KL/R > 250 (C) - 366							
T21	100 - 77.0001	L2 1/2x3 1/2x1/4	21.30	21.30	228.6 K=1.00	1.4400	-4.24	7.89	0.538 [1]
T22	77.0001 - 50.0001	L3x3 1/2x1/4	23.73	23.73	257.3 K=1.00	1.5600	-5.50	6.74	0.815 [1]
		KL/R > 250 (C) - 404							
T23	50.0001 - 25.0001	L3x4x1/4	26.28	26.28	246.3 K=1.00	1.6900	-5.98	7.97	0.750 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 276	L2 1/2x2x3/16	5.58	5.34	150.2 K=1.00	0.8090	-0.24	10.27	0.023 [1]
T3	272 - 268	L2 1/2x2x3/16	5.58	5.34	150.2 K=1.00	0.8090	-0.39	10.27	0.038 [1]
T5	264 - 260	L2 1/2x2x3/16	5.58	5.34	150.2 K=1.00	0.8090	-1.24	10.27	0.121 [1]
T6	260 - 255	L2 1/2x2x3/16	5.58	5.34	150.2 K=1.00	0.8090	-1.08	10.27	0.105 [1]
T8	250 - 245	L2 1/2x2x3/16	5.58	5.34	150.2 K=1.00	0.8090	-1.02	10.27	0.099 [1]
T13	225 - 200	L2 1/2x2x3/16	8.02	7.63	178.1 K=0.83	0.8090	-1.83	7.30	0.251 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T14	200 - 191.667	L2 1/2x2x3/16	10.47	10.07	220.3 K=0.78	0.8090	-2.04	4.77	0.428 [1]
		KL/R > 200 (C) - 217							
T17	175 - 150	L2 1/2x2 1/2x1/4	12.91	12.51	234.3 K=0.77	1.1900	-4.61	6.21	0.743 [1]
		KL/R > 200 (C) - 261							
T18	150 - 125	L3x2 1/2x1/4	15.35	14.95	255.2 K=0.75	1.3100	-5.78	5.76	**1.004** [1]
		KL/R > 200 (C) - 297							
T19	125 - 112.5	L3 1/2x3x1/4	17.79	17.15	246.7 K=0.76	1.5600	-5.31	7.33	0.724 [1]
		KL/R > 200 (C) - 333							
T20	112.5 - 100	L3x4x1/4	19.03	18.38	254.6 K=0.75	1.6900	-5.12	7.46	0.686 [1]
		KL/R > 200 (C) - 353							
T21	100 - 77.0001	L4x4x1/4	20.23	19.59	228.0 K=0.77	1.9400	-8.48	10.68	0.794 [1]
		KL/R > 200 (C) - 373							
T22	77.0001 - 50.0001	L4x3x1/4	22.48	21.83	293.7 K=0.73	1.6900	-11.56	5.61	**2.062** [1]
		KL/R > 200 (C) - 391							
T23	50.0001 - 25.0001	L5x3 1/2x5/16	25.12	24.47	284.9 K=1.00	2.5600	-11.65	9.03	**1.290** [1]
		KL/R > 200 (C) - 411							

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L3 1/2x2 1/2x1/4	6.89	6.89	152.0 K=1.00	1.4400	-6.30	17.84	0.353 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	14.00	14.00	216.0 K=1.00	0.9020	-6.40	5.54	**1.157** [1]
		4.8.1 (1.16 CR) - 452							

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	9.74	9.74	236.2 K=1.00	0.9020	-0.16	4.63	0.035 [1]

[1] P_u / ϕP_n controls

Redundant Sub-Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	3.44	3.44	101.8 K=1.22	0.9020	-4.61	21.90	0.210 [1]

[1] P_u / ϕP_n controls

Redundant Sub Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	7.30	7.30	176.9 K=1.00	0.9020	-2.66	8.25	0.322 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 276	L4x4x3/8	4.00	4.00	39.0	2.8600	27.47	92.66	0.296 [1]
T2	276 - 272	L4x4x3/8	4.00	4.00	39.0	2.8600	30.62	92.66	0.330 [1]
T3	272 - 268	L4x4x3/8	4.00	4.00	39.0	2.8600	34.75	92.66	0.375 [1]
T4	268 - 264	L4x4x3/8	4.00	4.00	39.0	2.8600	39.28	92.66	0.424 [1]
T5	264 - 260	L4x4x3/8	4.00	4.00	39.0	2.8600	43.41	92.66	0.468 [1]
T6	260 - 255	L4x4x3/8	5.00	5.00	48.8	2.8600	51.48	92.66	0.556 [1]
T7	255 - 250	L4x4x3/8	5.00	5.00	48.8	2.8600	58.82	92.66	0.635 [1]
T8	250 - 245	L4x4x7/16	5.01	5.01	48.9	3.3100	64.84	107.24	0.605 [1]
T9	245 - 240	L4x4x7/16	5.01	5.01	48.9	3.3100	70.15	107.24	0.654 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	240 - 235	L4x4x7/16	5.01	2.42	23.6	3.3100	73.21	107.24	0.683 [1]
T11	235 - 230	L4x4x7/16	5.01	5.01	48.9	3.3100	78.51	107.24	0.732 [1]
T12	230 - 225	L4x4x7/16	5.01	5.01	48.9	3.3100	82.48	107.24	0.769 [1]
T13	225 - 200	L5x5x3/8 4.8.1 (1.13 CR) - 173	25.06	6.26	48.2	3.6100	108.64	116.96	0.929 [1]
T14	200 - 191.667	L6x6x3/8 4.8.1 (1.08 CR) - 213	8.35	8.35	53.3	4.3600	115.97	141.26	0.821 [1]
T15	191.667 - 183.333	L6x6x3/8	8.35	4.03	25.7	4.3600	128.32	141.26	0.908 [1]
T16	183.333 - 175	L6x6x3/8 4.8.1 (1.26 CR) - 245	8.35	8.35	53.3	4.3600	137.31	141.26	0.972 [1]
T17	175 - 150	L6x6x7/16 4.8.1 (1.13 CR) - 257	25.06	6.01	38.5	5.0600	165.08	163.94	1.007 [1]
T18	150 - 125	L6x6x1/2 4.8.1 (1.19 CR) - 293	25.06	6.04	39.0	5.7500	202.99	186.30	1.090 [1]
T19	125 - 112.5	L6x6x9/16 4.8.1 (1.17 CR) - 329	12.53	6.06	39.3	6.4300	223.95	208.33	1.075 [1]
T20	112.5 - 100	L6x6x9/16 4.8.1 (1.28 CR) - 349	12.53	6.07	39.4	6.4300	246.42	208.33	1.183 [1]
T21	100 - 77.0001	L8x8x9/16 4.8.1 (1.22 CR) - 369	23.05	10.92	52.4	8.6800	271.44	281.23	0.965 [1]
T22	77.0001 - 50.0001	L8x8x3/4 4.8.1 (1.28 CR) - 387	27.06	12.78	62.1	11.4000	321.90	369.36	0.872 [1]
T23	50.0001 - 25.0001	L8x8x3/4 4.8.1 (1.35 CR) - 407	25.06	11.95	58.1	11.4000	375.44	369.36	1.016 [1]
T24	25.0001 - 0	L8x8x5/8 4.8.1 (1.30 CR) - 427	25.06	6.26	30.2	9.6100	397.57	311.36	1.277 [1]

[1] P_u / ϕP_n controls

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	280 - 276	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T2	276 - 272	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T3	272 - 268	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T4	268 - 264	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T5	264 - 260	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T6	260 - 255	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T7	255 - 250	L4x4x3/8	0.00	10.43	0.000	0.00	5.29	0.000
T8	250 - 245	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T9	245 - 240	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T10	240 - 235	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T11	235 - 230	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T12	230 - 225	L4x4x7/16	0.00	11.97	0.000	0.00	6.15	0.000
T13	225 - 200	L5x5x3/8	0.00	16.59	0.000	0.00	8.41	0.000
T14	200 - 191.667	L6x6x3/8	0.00	23.44	0.000	0.00	11.73	0.000
T15	191.667 - 183.333	L6x6x3/8	0.00	23.44	0.000	0.00	11.73	0.000
T16	183.333 - 175	L6x6x3/8	0.00	23.44	0.000	0.00	11.73	0.000
T17	175 - 150	L6x6x7/16	0.00	27.97	0.000	0.00	14.18	0.000
T18	150 - 125	L6x6x1/2	0.00	31.67	0.000	0.00	15.90	0.000

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T19	125 - 112.5	L6x6x9/16	0.00	35.30	0.000	0.00	17.80	0.000
T20	112.5 - 100	L6x6x9/16	0.00	35.30	0.000	0.00	17.80	0.000
T21	100 - 77.0001	L8x8x9/16	0.00	64.00	0.000	0.00	32.51	0.000
T22	77.0001 - 50.0001	L8x8x3/4	0.00	83.33	0.000	0.00	42.63	0.000
T23	50.0001 - 25.0001	L8x8x3/4	0.00	83.33	0.000	0.00	42.63	0.000
T24	25.0001 - 0	L8x8x5/8	0.00	70.64	0.000	0.00	35.72	0.000

Leg Interaction Design Data (Tension)

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
T1	280 - 276	L4x4x3/8	0.296	0.000	0.000	0.296 [1]	1.000	4.8.1
T2	276 - 272	L4x4x3/8	0.330	0.000	0.000	0.330 [1]	1.000	4.8.1
T3	272 - 268	L4x4x3/8	0.375	0.000	0.000	0.375 [1]	1.000	4.8.1
T4	268 - 264	L4x4x3/8	0.424	0.000	0.000	0.424 [1]	1.000	4.8.1
T5	264 - 260	L4x4x3/8	0.468	0.000	0.000	0.468 [1]	1.000	4.8.1
T6	260 - 255	L4x4x3/8	0.556	0.000	0.000	0.556 [1]	1.000	4.8.1
T7	255 - 250	L4x4x3/8	0.635	0.000	0.000	0.635 [1]	1.000	4.8.1
T8	250 - 245	L4x4x7/16	0.605	0.000	0.000	0.605 [1]	1.000	4.8.1
T9	245 - 240	L4x4x7/16	0.654	0.000	0.000	0.654 [1]	1.000	4.8.1
T10	240 - 235	L4x4x7/16	0.683	0.000	0.000	0.683 [1]	1.000	4.8.1
T11	235 - 230	L4x4x7/16	0.732	0.000	0.000	0.732 [1]	1.000	4.8.1
T12	230 - 225	L4x4x7/16	0.769	0.000	0.000	0.769 [1]	1.000	4.8.1
T13	225 - 200	L5x5x3/8	0.929	0.000	0.000	0.929 [1]	1.000	4.8.1
T14	200 - 191.667	L6x6x3/8	0.821	0.000	0.000	0.821 [1]	1.000	4.8.1
T15	191.667 - 183.333	L6x6x3/8	0.908	0.000	0.000	0.908 [1]	1.000	4.8.1
T16	183.333 - 175	L6x6x3/8	0.972	0.000	0.000	0.972 [1]	1.000	4.8.1
T17	175 - 150	L6x6x7/16	1.007	0.000	0.000	**1.007** [1]	1.000	4.8.1
T18	150 - 125	L6x6x1/2	1.090	0.000	0.000	**1.090** [1]	1.000	4.8.1
T19	125 - 112.5	L6x6x9/16	1.075	0.000	0.000	**1.075** [1]	1.000	4.8.1
T20	112.5 - 100	L6x6x9/16	1.183	0.000	0.000	**1.183** [1]	1.000	4.8.1
T21	100 - 77.0001	L8x8x9/16	0.965	0.000	0.000	0.965 [1]	1.000	4.8.1
T22	77.0001 - 50.0001	L8x8x3/4	0.872	0.000	0.000	0.872 [1]	1.000	4.8.1
T23	50.0001 - 25.0001	L8x8x3/4	1.016	0.000	0.000	**1.016** [1]	1.000	4.8.1
T24	25.0001 - 0	L8x8x5/8	1.277	0.000	0.000	**1.277** [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 276	L1 3/4x1 3/4x3/16	6.87	3.31	76.7	0.3604	2.58	15.68	0.165 [1]
T2	276 - 272	L1 3/4x1 3/4x3/16	6.87	3.31	76.7	0.3604	3.33	15.68	0.213 [1]
T3	272 - 268	L1 3/4x1 3/4x3/16	6.87	3.31	76.7	0.3604	3.46	15.68	0.221 [1]

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (K)	ϕP_n (K)	Ratio $\frac{P_u}{\phi P_n}$
T4	268 - 264	L1 3/4x1 3/4x3/16	6.87	3.31	76.7	0.3604	3.86	15.68	0.246 [1]
T5	264 - 260	L1 3/4x1 3/4x3/16	6.87	3.31	76.7	0.3604	4.10	15.68	0.262 [1]
T6	260 - 255	L1 3/4x1 3/4x3/16	7.49	3.63	83.7	0.3604	4.83	15.68	0.308 [1]
T7	255 - 250	L1 3/4x1 3/4x3/16	7.49	3.63	83.7	0.3604	5.36	15.68	0.342 [1]
T8	250 - 245	L1 3/4x1 3/4x3/16	7.68	3.88	89.4	0.3604	2.69	15.68	0.172 [1]
T9	245 - 240	L1 3/4x1 3/4x3/16	8.06	4.07	93.5	0.3604	3.43	15.68	0.219 [1]
T10	240 - 235	L1 3/4x1 3/4x3/16	8.45	4.26	97.8	0.3604	2.96	15.68	0.189 [1]
T11	235 - 230	L1 3/4x1 3/4x3/16	8.85	4.45	102.1	0.3604	3.26	15.68	0.208 [1]
T12	230 - 225	L1 3/4x1 3/4x3/16	9.25	4.65	106.6	0.3604	3.40	15.68	0.217 [1]
T13	225 - 200	L1 3/4x1 3/4x3/16	11.93	5.95	137.4	0.3604	4.90	15.68	0.313 [1]
T14	200 - 191.667	L2x2 1/2x3/16	13.71	6.91	142.2	0.5013	5.83	21.81	0.267 [1]
T15	191.667 - 183.333	L2x2 1/2x3/16	14.36	7.23	148.7	0.5013	6.35	21.81	0.291 [1]
T16	183.333 - 175	L2x2 1/2x3/16 4.8.1 (1.07 CR) - 250	15.03	7.56	155.3	0.5013	6.77	21.81	0.311 [1]
T17	175 - 150	L1 3/4x1 3/4x3/16	19.34	9.87	225.0	0.3604	10.66	15.68	0.680 [1]
T18	150 - 125	L1 3/4x1 3/4x3/16	21.26	10.81	246.0	0.3604	12.10	15.68	0.772 [1]
T19	125 - 112.5	L1 3/4x1 3/4x3/16	22.26	11.18	257.1	0.3428	13.19	14.91	0.884 [1]
T20	112.5 - 100	L1 3/4x1 3/4x3/16	23.28	11.67	268.1	0.3428	14.27	14.91	0.957 [1]
T21	100 - 77.0001	L2 1/2x2x1/4	31.41	16.21	334.8	0.6309	23.88	27.45	0.870 [1]
T22	77.0001 - 50.0001	L2 1/2x2x1/4	36.02	18.68	385.0	0.6309	25.81	27.45	0.940 [1]
T23	50.0001 - 25.0001	L2 1/2x2x1/4	36.33	18.69	385.1	0.6309	25.70	27.45	0.936 [1]
T24	25.0001 - 0	L4x6x3/8 4.8.1 (1.33 CR) - 482	29.18	14.27	181.1	2.4614	38.99	107.07	0.364 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (K)	ϕP_n (K)	Ratio $\frac{P_u}{\phi P_n}$
T17	175 - 150	L2 1/2x3x1/4	14.13	14.13	225.6	1.3100	4.93	42.44	0.116 [1]
T18	150 - 125	L2 1/2x3 1/2x1/4	16.57	16.57	270.2	1.4400	5.73	46.66	0.123 [1]
T24	25.0001 - 0	L4x4x1/4 4.8.1 (1.34 CR) - 446	27.56	20.67	198.4	1.9400	18.14	62.86	0.289 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation (ft)	Size	L (ft)	L_u (ft)	Kl/r	A (in^2)	P_u (K)	ϕP_n (K)	Ratio $\frac{P_u}{\phi P_n}$
T10	240 - 235	L2 1/2x2x3/16	6.80	6.80	136.0	0.8090	1.20	26.21	0.046 [1]
T15	191.667 - 183.333	L4x4x1/4	11.67	11.67	112.1	1.9400	2.14	62.86	0.034 [1]
T17	175 - 150	L2x2x3/16	13.49	13.49	262.4	0.7150	2.69	23.17	0.116 [1]
T18	150 - 125	L2x2 1/2x3/16	15.94	15.94	241.1	0.8090	3.24	26.21	0.124 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T19	125 - 112.5	L2x2 1/2x3/16	18.39	18.39	278.2	0.8090	3.55	26.21	0.135 [1]
T20	112.5 - 100	L2 1/2x2 1/2x3/16	19.61	19.61	302.5	0.9020	3.87	29.22	0.132 [1]
T21	100 - 77.0001	L2 1/2x3 1/2x1/4	21.30	21.30	228.6	1.4400	4.24	46.66	0.091 [1]
T22	77.0001 - 50.0001	L3x3 1/2x1/4	23.73	23.73	257.3	1.5600	5.50	50.54	0.109 [1]
T23	50.0001 - 25.0001	L3x4x1/4	26.28	26.28	246.3	1.6900	5.98	54.76	0.109 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 276	L2 1/2x2x3/16	5.58	5.34	111.7	0.5013	0.24	21.81	0.011 [1]
T3	272 - 268	L2 1/2x2x3/16	5.58	5.34	111.7	0.5013	0.39	21.81	0.018 [1]
T5	264 - 260	L2 1/2x2x3/16	5.58	5.34	111.7	0.5013	1.34	21.81	0.061 [1]
T6	260 - 255	L2 1/2x2x3/16	5.58	5.34	111.7	0.5013	1.12	21.81	0.052 [1]
T8	250 - 245	L2 1/2x2x3/16	5.58	5.34	111.7	0.5013	1.02	21.81	0.047 [1]
T13	225 - 200	L2 1/2x2x3/16	8.02	7.63	160.6	0.5013	1.83	21.81	0.084 [1]
T14	200 - 191.667	L2 1/2x2x3/16	10.47	10.07	209.4	0.5013	2.05	21.81	0.094 [1]
T17	175 - 150	L2 1/2x2 1/2x1/4	12.91	12.51	201.4	0.7519	4.13	32.71	0.126 [1]
T18	150 - 125	L3x2 1/2x1/4	15.35	14.95	245.1	0.8419	5.28	36.62	0.144 [1]
T19	125 - 112.5	L3 1/2x3x1/4	17.79	17.15	233.9	1.0059	5.14	43.76	0.117 [1]
T20	112.5 - 100	L3x4x1/4	19.03	18.38	254.5	1.1034	4.99	48.00	0.104 [1]
T21	100 - 77.0001	L4x4x1/4	20.23	19.59	194.2	1.2909	7.47	56.16	0.133 [1]
T22	77.0001 - 50.0001	L4x3x1/4	22.48	21.83	300.7	1.1034	9.44	48.00	0.197 [1]
T23	50.0001 - 25.0001	L5x3 1/2x5/16	25.12	24.47	292.4	1.7149	9.53	74.60	0.128 [1]

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L3 1/2x2 1/2x1/4	6.89	6.89	112.3	1.4400	6.30	46.66	0.135 [1]

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16 4.8.1 (1.15 CR) - 434	14.00	14.00	216.0	0.9020	7.01	29.22	0.240 [1]

[1] P_u / ϕP_n controls

Redundant Hip (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	9.74	9.74	150.3	0.9020	0.03	29.22	0.001 [1]

[1] P_u / ϕP_n controls

Redundant Sub-Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	3.44	3.44	53.1	0.9020	2.45	29.22	0.084 [1]

[1] P_u / ϕP_n controls

Redundant Sub Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T24	25.0001 - 0	L2 1/2x2 1/2x3/16	7.30	7.30	112.5	0.9020	4.93	29.22	0.169 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
L1	305 - 281	Pole	TP14x14x0.5	1	-2.99	667.98	59.9	Pass
L2	281 - 280	Pole	TP14x14x0.375	2	-3.06	505.63	82.1	Pass
T1	280 - 276	Leg	L4x4x3/8	4	27.47	92.66	29.6	Pass
T2	276 - 272	Leg	L4x4x3/8	20	30.62	92.66	33.0	Pass
T3	272 - 268	Leg	L4x4x3/8	32	34.75	92.66	37.5	Pass
T4	268 - 264	Leg	L4x4x3/8	48	39.28	92.66	42.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T5	264 - 260	Leg	L4x4x3/8	60	43.41	92.66	46.8	Pass
T6	260 - 255	Leg	L4x4x3/8	78	-49.46	84.19	58.7	Pass
T7	255 - 250	Leg	L4x4x3/8	94	-59.30	84.19	70.4	Pass
T8	250 - 245	Leg	L4x4x7/16	106	-67.80	97.17	69.8	Pass
T9	245 - 240	Leg	L4x4x7/16	122	-75.28	97.17	77.5	Pass
T10	240 - 235	Leg	L4x4x7/16	131	-80.07	113.26	70.7 71.9 (b)	Pass
T11	235 - 230	Leg	L4x4x7/16	147	-87.02	97.17	89.6	Pass
T12	230 - 225	Leg	L4x4x7/16	159	-92.16	97.17	94.8	Pass
T13	225 - 200	Leg	L5x5x3/8	171	-121.90	106.40	114.6	Fail
T14	200 - 191.667	Leg	L6x6x3/8	211	-129.50	118.96	108.9	Fail
T15	191.667 - 183.333	Leg	L6x6x3/8	227	-142.54	142.90	99.7 105.0 (b)	Fail
T16	183.333 - 175	Leg	L6x6x3/8	243	-151.36	118.96	127.2	Fail
T17	175 - 150	Leg	L6x6x7/16	255	-179.17	157.37	113.9	Fail
T18	150 - 125	Leg	L6x6x1/2	291	-215.82	178.67	120.8	Fail
T19	125 - 112.5	Leg	L6x6x9/16	327	-236.42	199.91	118.3	Fail
T20	112.5 - 100	Leg	L6x6x9/16	347	-257.84	200.10	128.9	Fail
T21	100 - 77.0001	Leg	L8x8x9/16	367	-282.33	230.08	122.7	Fail
T22	77.0001 - 50.0001	Leg	L8x8x3/4	389	-331.65	258.57	128.3	Fail
T23	50.0001 - 25.0001	Leg	L8x8x3/4	409	-382.30	282.45	135.4	Fail
T24	25.0001 - 0	Leg	L8x8x5/8	429	-419.48	321.33	130.5	Fail
T1	280 - 276	Diagonal	L1 3/4x1 3/4x3/16	13	-2.58	12.76	20.2 44.4 (b)	Pass
T2	276 - 272	Diagonal	L1 3/4x1 3/4x3/16	25	-3.34	12.76	26.2 57.3 (b)	Pass
T3	272 - 268	Diagonal	L1 3/4x1 3/4x3/16	41	-3.48	12.76	27.3 59.5 (b)	Pass
T4	268 - 264	Diagonal	L1 3/4x1 3/4x3/16	54	-3.87	12.76	30.3 66.4 (b)	Pass
T5	264 - 260	Diagonal	L1 3/4x1 3/4x3/16	72	-4.98	12.76	39.0 70.6 (b)	Pass
T6	260 - 255	Diagonal	L1 3/4x1 3/4x3/16	88	-4.86	11.07	43.9 83.1 (b)	Pass
T7	255 - 250	Diagonal	L1 3/4x1 3/4x3/16	99	-5.43	11.07	49.1 92.2 (b)	Pass
T8	250 - 245	Diagonal	L1 3/4x1 3/4x3/16	113	-3.60	9.66	37.2 46.3 (b)	Pass
T9	245 - 240	Diagonal	L1 3/4x1 3/4x3/16	127	-2.91	8.81	33.0 59.0 (b)	Pass
T10	240 - 235	Diagonal	L1 3/4x1 3/4x3/16	137	-3.43	8.04	42.7 50.9 (b)	Pass
T11	235 - 230	Diagonal	L1 3/4x1 3/4x3/16	155	-3.08	7.35	41.9 56.0 (b)	Pass
T12	230 - 225	Diagonal	L1 3/4x1 3/4x3/16	168	-3.63	6.73	54.0 58.5 (b)	Pass
T13	225 - 200	Diagonal	L1 3/4x1 3/4x3/16	182	-4.97	5.09	97.8	Pass
T14	200 - 191.667	Diagonal	L2x2 1/2x3/16	224	-5.94	7.42	80.0	Pass
T15	191.667 - 183.333	Diagonal	L2x2 1/2x3/16	233	-6.26	6.88	91.0	Pass
T16	183.333 - 175	Diagonal	L2x2 1/2x3/16	250	-6.86	6.38	107.5	Fail
T17	175 - 150	Diagonal	L1 3/4x1 3/4x3/16	268	-9.87	2.09	471.6	Fail
T18	150 - 125	Diagonal	L1 3/4x1 3/4x3/16	305	-12.22	1.78	688.1	Fail
T19	125 - 112.5	Diagonal	L1 3/4x1 3/4x3/16	341	-13.48	1.67	807.2	Fail
T20	112.5 - 100	Diagonal	L1 3/4x1 3/4x3/16	361	-14.54	1.54	942.4	Fail
T21	100 - 77.0001	Diagonal	L2 1/2x2x1/4	379	-22.39	2.12	1055.1	Fail
T22	77.0001 - 50.0001	Diagonal	L2 1/2x2x1/4	402	-25.13	1.63	1542.2	Fail
T23	50.0001 -	Diagonal	L2 1/2x2x1/4	418	-25.02	1.63	1536.0	Fail

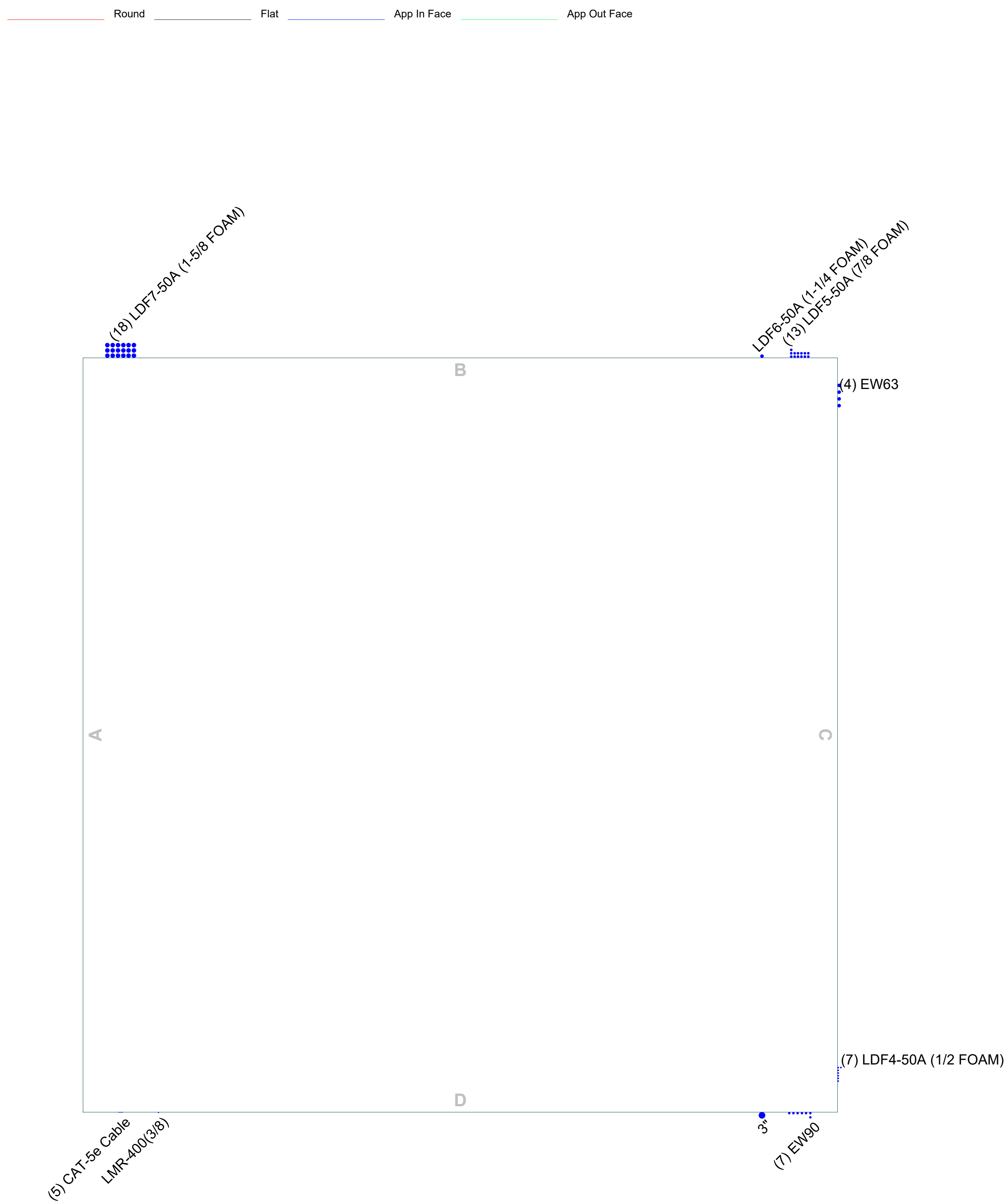
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
	25.0001							
T24	25.0001 - 0	Diagonal	L4x6x3/8	479	-35.43	25.93	136.7	Fail
T17	175 - 150	Horizontal	L2 1/2x3x1/4	273	-6.22	6.31	98.5	Pass
T18	150 - 125	Horizontal	L2 1/2x3 1/2x1/4	309	-5.57	5.61	99.2	Pass
T24	25.0001 - 0	Horizontal	L4x4x1/4	478	-19.38	14.10	137.4	Fail
T10	240 - 235	Secondary Horizontal	L2 1/2x2x3/16	146	-1.20	12.53	9.6	Pass
T15	191.667 - 183.333	Secondary Horizontal	L4x4x1/4	242	-2.14	39.88	5.4	Pass
T17	175 - 150	Secondary Horizontal	L2x2x3/16	278	-2.69	2.50	107.7	Fail
T18	150 - 125	Secondary Horizontal	L2x2 1/2x3/16	314	-3.24	3.44	94.3	Pass
T19	125 - 112.5	Secondary Horizontal	L2x2 1/2x3/16	346	-3.55	2.99	118.7	Fail
T20	112.5 - 100	Secondary Horizontal	L2 1/2x2 1/2x3/16	366	-3.87	2.82	137.2	Fail
T21	100 - 77.0001	Secondary Horizontal	L2 1/2x3 1/2x1/4	386	-4.24	7.89	53.8	Pass
T22	77.0001 - 50.0001	Secondary Horizontal	L3x3 1/2x1/4	404	-5.50	6.74	81.5	Pass
T23	50.0001 - 25.0001	Secondary Horizontal	L3x4x1/4	424	-5.98	7.97	75.0	Pass
T1	280 - 276	Top Girt	L2 1/2x2x3/16	9	-0.24	10.27	2.3 3.0 (b)	Pass
T3	272 - 268	Top Girt	L2 1/2x2x3/16	37	-0.39	10.27	3.8 4.9 (b)	Pass
T5	264 - 260	Top Girt	L2 1/2x2x3/16	65	-1.24	10.27	12.1 17.1 (b)	Pass
T6	260 - 255	Top Girt	L2 1/2x2x3/16	79	-1.08	10.27	10.5 14.4 (b)	Pass
T8	250 - 245	Top Girt	L2 1/2x2x3/16	109	-1.02	10.27	9.9 13.0 (b)	Pass
T13	225 - 200	Top Girt	L2 1/2x2x3/16	178	-1.83	7.30	25.1	Pass
T14	200 - 191.667	Top Girt	L2 1/2x2x3/16	217	-2.04	4.77	42.8	Pass
T17	175 - 150	Top Girt	L2 1/2x2 1/2x1/4	261	-4.61	6.21	74.3	Pass
T18	150 - 125	Top Girt	L3x2 1/2x1/4	297	-5.78	5.76	100.4	Fail
T19	125 - 112.5	Top Girt	L3 1/2x3x1/4	333	-5.31	7.33	72.4	Pass
T20	112.5 - 100	Top Girt	L3x4x1/4	353	-5.12	7.46	68.6	Pass
T21	100 - 77.0001	Top Girt	L4x4x1/4	373	-8.48	10.68	79.4	Pass
T22	77.0001 - 50.0001	Top Girt	L4x3x1/4	391	-11.56	5.61	206.2	Fail
T23	50.0001 - 25.0001	Top Girt	L5x3 1/2x5/16	411	-11.65	9.03	129.0	Fail
T24	25.0001 - 0	Redund Horz 1 Bracing	L3 1/2x2 1/2x1/4	464	-6.30	17.84	35.3	Pass
T24	25.0001 - 0	Redund Diag 1 Bracing	L2 1/2x2 1/2x3/16	465	-6.40	5.54	115.7	Fail
T24	25.0001 - 0	Redund Hip 1 Bracing	L2 1/2x2 1/2x3/16	477	-0.16	4.63	3.5	Pass
T24	25.0001 - 0	Redund Sub Horz Bracing	L2 1/2x2 1/2x3/16	488	-4.61	21.90	21.0	Pass
T24	25.0001 - 0	Redund Sub Diagonal Bracing	L2 1/2x2 1/2x3/16	469	-2.66	8.25	32.2	Pass
							Summary	
						Pole (L2)	82.1	Pass
						Leg (T23)	135.4	Fail
						Diagonal (T22)	1542.2	Fail
						Horizontal (T24)	137.4	Fail
						Secondary Horizontal (T20)	137.2	Fail
						Top Girt (T22)	206.2	Fail
						Redund	35.3	Pass

Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P K*	*øP$_{allow}$ K*	*% Capacity*	*Pass Fail*
						Horz 1 Bracing (T24)		
						Redund Diag 1 Bracing (T24)	115.7	Fail
						Redund Hip 1 Bracing (T24)	3.5	Pass
						Redund Sub Horz Bracing (T24)	21.0	Pass
						Redund Sub Diagonal Bracing (T24)	32.2	Pass
						Bolt Checks	120.9	Fail
						RATING =	**1542.2**	**Fail**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan



Engineered Tower Solutions 3227 Wellington Court Raleigh, NC 27603 Phone: (919) 782-2710 FAX:	Job: ***Wheeling WNPB***		
	Project: ***ETS Project# 22114072.STR.4666***		
	Client: Reese Tower Services	Drawn by: bhumi.mistry	App'd:
	Code: TIA-222-H	Date: 12/15/22	Scale: NTS
	Path: C:\Users\bhumi.mistry\Documents\12-15\Wheeling WNPB_Feasibility Tower Analysis_12-12-2022.er		Dwg No. E-7

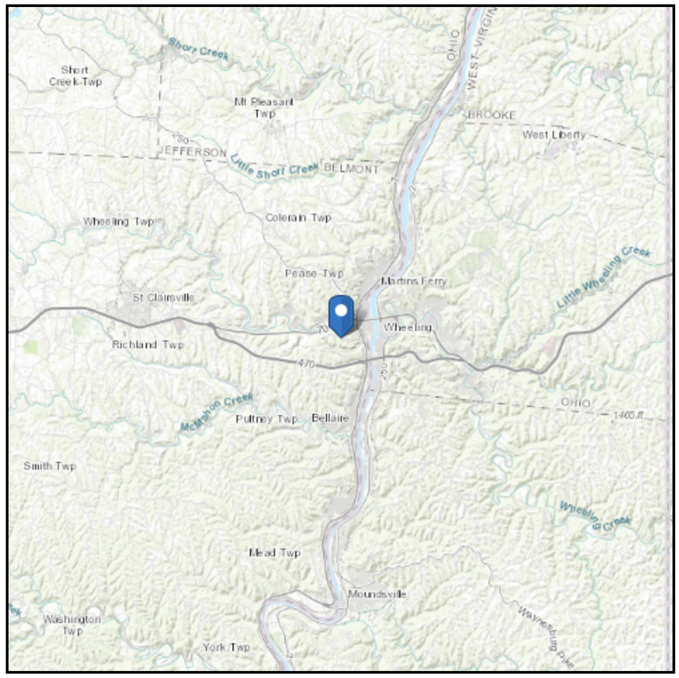
APPENDIX C

ADDITIONAL CALCULATIONS

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard:	ASCE/SEI 7-10	**Latitude:**	40.06123
Risk Category:	II	**Longitude:**	-80.75228
Soil Class:	D - Stiff Soil	**Elevation:**	1286.8 ft (NAVD 88)



Wind

Results:

Wind Speed	115 Vmph
10-year MRI	76 Vmph
25-year MRI	84 Vmph
50-year MRI	90 Vmph
100-year MRI	96 Vmph

Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, and Section 26.5.2, incorporating errata of March 12, 2014
Date Accessed:	Mon Dec 12 2022

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 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is not in a hurricane-prone region as defined in ASCE/SEI 7-10 Section 26.2.

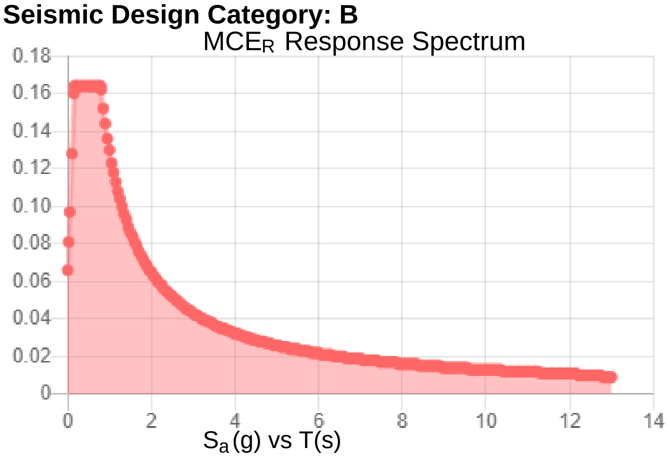
Seismic D - Stiff Soil

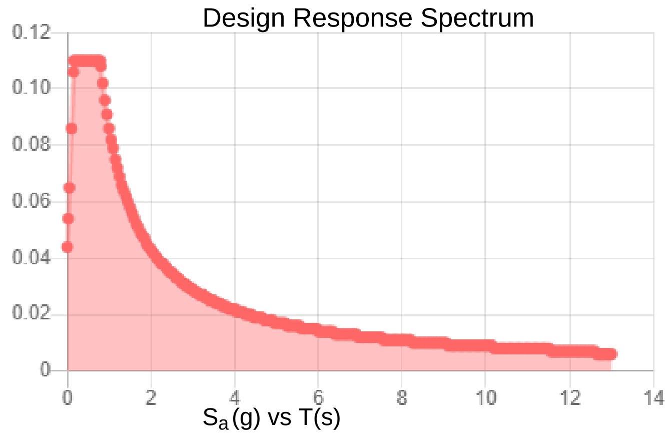
Site Soil Class:

Results:

S_S :	0.103	S_{D1} :	0.086
S_1 :	0.054	T_L :	12
F_a :	1.6	PGA :	0.046
F_v :	2.4	PGA_M :	0.074
S_{MS} :	0.164	F_{PGA} :	1.6
S_{M1} :	0.13	I_e :	1
S_{DS} :	0.11		

Seismic Design Category: B





Data Accessed: **Mon Dec 12 2022**

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:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed	40 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Mon Dec 12 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.

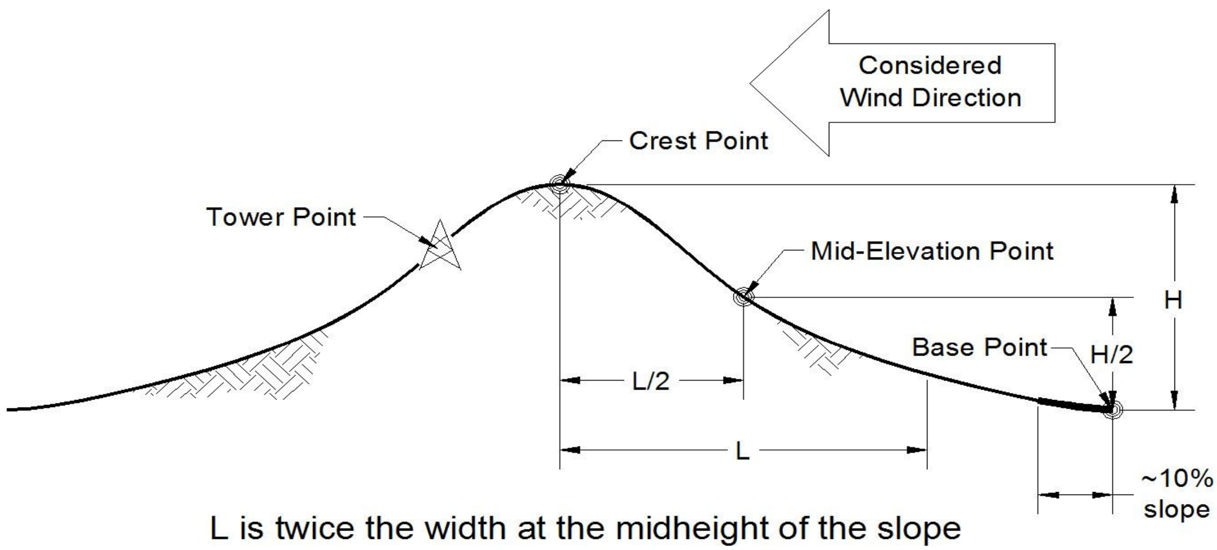
Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from 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.

Topographic Factors for use in tnxTower

(v. 3.1, effecitve 10.14.13)

per SEAW RSM-03 Figure 3-3

BU#:	
Site Name:	Wheeling WNPB
App#:	22114072.STR.4666



Topographic Feature

- ○ Continuous Ridge
- ○ Flat Topped Ridge
- ◉ Hill
- ○ Flat Topped Hill
- ○ Continuous Escarpment

Exposure Category

- ○ Exposure B
- ◉ Exposure C
- ○ Exposure D

Notes: 1) Feature is assumed to be isolated per section 1.8 of the Crown Castle standard for the Determination of Topographic Factors (ENG-PRC-10040).
2) Base Kzt may differ slightly from TNX value due to differences in where the base line is established. This does not effect the results in anyway.

Topographic Input

Crest Point Elevation (ft. AMSL)	1288
Base Point Elevation (ft. AMSL)	687
Mid-Height Elevation (ft. AMSL)	987.5
Crest to Mid-Height Distance (L/2) (ft.)	1999
Tower Point Elevation (ft. AMSL)	1288
Structure Upwind/Downwind Distance (x)(ft.)	0

tnxTower Input

		K_{ZT} (RSM-03)
Topographic Category	5	**At Base:**
Crest Height, H (ft.)	601	**1.739**[2]
Slope Distance, L (ft.)	3998	
Distance from Crest, x (ft.)	0	

Exhibit B

Correspondence from WVEBA's Engineering Director Regarding Next Steps to Remedy Issues Identified in Feasibility Analysis

Hiner, Virginia

From:	Tyler Garner <tgarner@wvpublic.org>
Sent:	Thursday, December 15, 2022 12:20 PM
To:	Hiner, Virginia
Subject:	FW: RTS Feasibility Study - Wheeling WNPB; WV; Report
Attachments:	Reese Tower Services Structural Analysis WNPB Wheeling_With Cover Letter (Sealed).pdf

EXTERNAL Email

Looks like Wheeling will be our problem site. We are going to have to have to do a full mapping and geotechnical investigation that will instruct us in our further action. This will require us to likely add structural support to the tower or look at other options. If we are able to request a 90 day extension for this site, that would be desirable.

Tyler Garner
Director of Engineering and IT
West Virginia Public Broadcasting

From: Brian Reese <breese@reesetowerservices.com>
Sent: Thursday, December 15, 2022 12:15 PM
To: Todd Hetrick - Pillar Innovations (toddhetrick@pillarinnovations.com) <toddhetrick@pillarinnovations.com>
Cc: Shelby Reese <sreese@reesetowerservices.com>; Arthur Austin <aaustin@wvpublic.org>; Tyler Garner <tgarner@wvpublic.org>
Subject: RTS Feasibility Study - Wheeling WNPB; WV; Report

Todd:

Failing feasibility study attached for Wheeling….substantial overstresses.

The tower photos from the L&A mapping do not match the tower documents we have. The tower and foundation should be mapped and a geotechnical investigation performed similar to Romney.

Regards,

Brian Reese, PW, CWI
President
Reese Tower Services
570-401-4711 cell

West Virginia Public Broadcasting
"Telling West Virginia's Story"
www.wvpublic.org

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Exhibit C

Correspondence Confirming Equipment Delivery

Hiner, Virginia

From: Tyler Garner <tgarner@wvpublic.org>
Sent: Thursday, December 15, 2022 11:20 AM
To: Hiner, Virginia
Subject: Equipment, Keyser, Romney

EXTERNAL Email

All the transmitters are at their respective transmitter sites. Romneys antenna is at the transmitter site for install on 12/16/22. Keyser and Wheeling antennas are ready to go at the staging area at Pillar to be brought to their sites on their install days.

On Saturday 12/17 Reese Tower Services will conduct their structural analysis on the Keyser site to either certify the welds or add certified clamps to the tower to allow us to pass the structural analysis. If we can pass the structural with certifying the welds or adding clamps, AT&T should not have to remove their antennas for us to replace our antenna.

Paul Frampton is the attorney for South Branch Inn and has been working with the land owner at Romney. He has given us permission to move forward with the install on the tower as we rework our lease on that site. We are expecting to finalize a lease shortly.

Tyler Garner
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