STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

August 27, 2013

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-047-130809** – Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 236 South Main Street, East Windsor, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with the Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated August 8, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/jb

c: The Honorable Denise Sabotka Menard, First Selectman, Town of East Windsor
Laurie Whitten, Town Planner, Town of East Windsor
Balch Bridge Street Corporation

ROBINSON & COLE LLP

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
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kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

August 8, 2013

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

Re: **Notice of Exempt Modification – Facility Modification**
236 South Main Street, East Windsor, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 144-foot level on an existing 188-foot tower at the above-referenced address. The tower and underlying property are owned by Balch Bridge Street Corporation. Cellco's use of the tower was approved by the Council in 1997. Cellco now intends to replace three (3) of its existing antennas with three (3) model BXA-70063-6CF LTE antennas, at the same 144-foot level. Included in Attachment 1 are the specifications for Cellco's replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Denise Menard, First Selectwoman of the Town of East Windsor. A copy of this letter is also being sent to Balch Bridge Street Corporation, the owner of the property on which the tower is located.

The planned modifications to the Cellco facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 144-foot level on the existing 188-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the modified facility will not increase radio frequency (RF) emissions to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table for Cellco's modified facility is included in Attachment 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Detailed Structural Analysis included in Attachment 3).

For the foregoing reasons, Cellco respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Denise Menard, East Windsor First Selectwoman
Balch Bridge Street Corporation
Sandy M. Carter

ATTACHMENT 1

BXA-70063-6CF-EDIN-X

X-Pol | FET Panel | 63° | 14.5 dBd

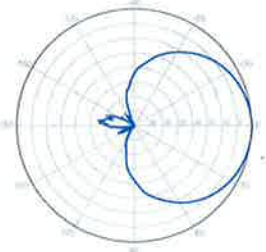
Replace "X" with desired electrical downtilt.

Antenna is also available with NE connector(s). Replace "EDIN" with "NE" in the model number when ordering.

Electrical Characteristics	696-900 MHz	
Frequency bands	696-806 MHz	806-900 MHz
Polarization	±45°	
Horizontal beamwidth	65°	63°
Vertical beamwidth	13°	11°
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.35:1	
Upper sidelobe suppression (0°)	-18.3 dB	-18.2 dB
Front-to-back ratio (+/-30°)	-33.4 dB	-36.3 dB
Null fill	5% (-26.02 dB)	
Isolation between ports	< -25 dB	
Input power with EDIN connectors	500 W	
Input power with NE connectors	300 W	
Lightning protection	Direct Ground	
Connector(s)	2 Ports / EDIN or NE / Female / Center (Back)	
Mechanical Characteristics		
Dimensions Length x Width x Depth	1804 x 285 x 132 mm	71.0 x 11.2 x 5.2 in
Depth with z-brackets	172 mm	6.8 in
Weight without mounting brackets	7.9 kg	17 lbs
Survival wind speed	> 201 km/hr	> 125 mph
Wind area	Front: 0.51 m^2 Side: 0.24 m^2	Front: 5.5 ft^2 Side: 2.6 ft^2
Wind load @ 161 km/hr (100 mph)	Front: 759 N Side: 391 N	Front: 169 lbf Side: 89 lbf

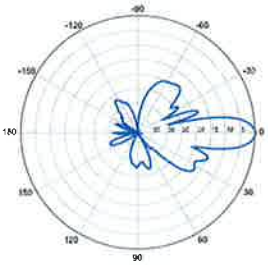
Mounting Options	Part Number	Fits Pipe Diameter	Weight
3-Point Mounting & Downtilt Bracket Kit	36210008	40-115 mm 1.57-4.5 in	6.9 kg 15.2 lbs
Concealment Configurations	For concealment configurations, order BXA-70063-6CF-EDIN-X-FP		

BXA-70063-6CF-EDIN-X



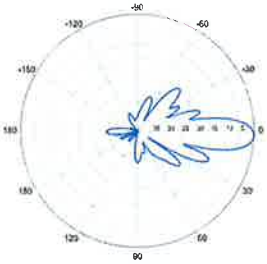
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

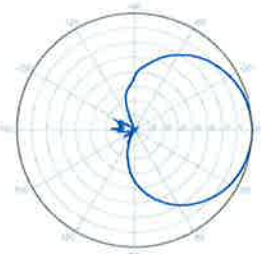


0° | Vertical | 750 MHz

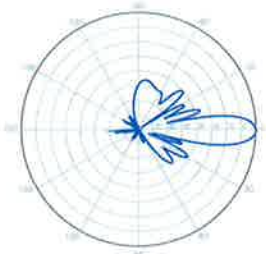
BXA-70063-6CF-EDIN-2



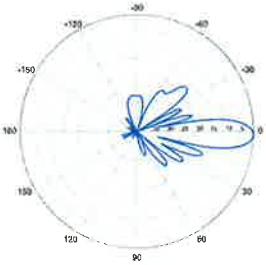
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



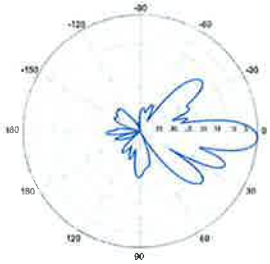
2° | Vertical | 850 MHz

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

BXA-70063-6CF-EDIN-X

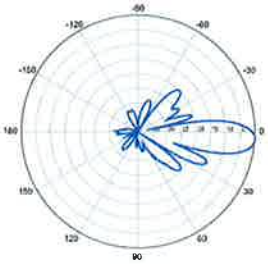
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



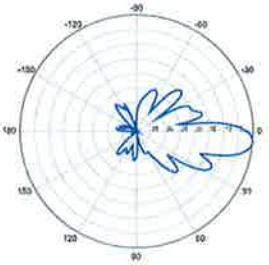
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

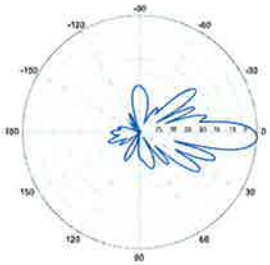


4° | Vertical | 750 MHz

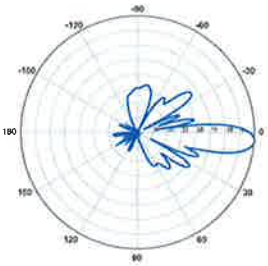
BXA-70063-6CF-EDIN-5



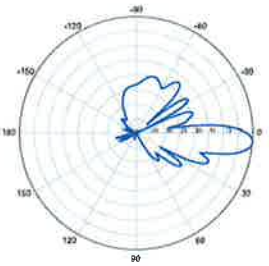
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

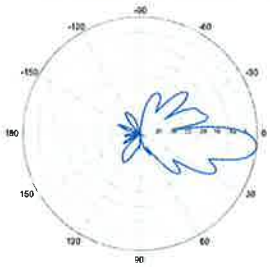


4° | Vertical | 850 MHz



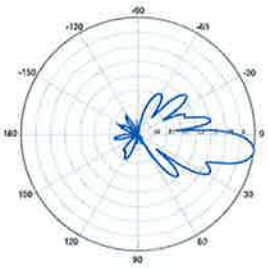
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



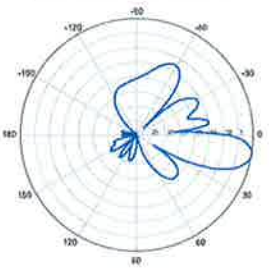
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

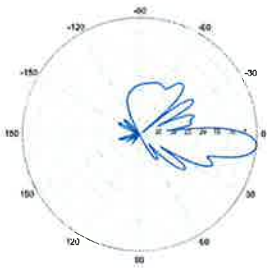


8° | Vertical | 750 MHz

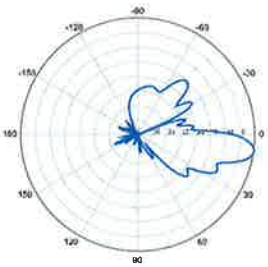
BXA-70063-6CF-EDIN-10



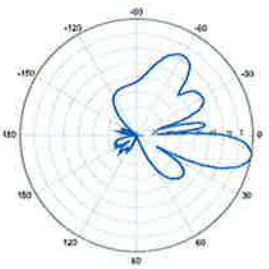
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

ATTACHMENT 2

	General	Power	Density					
Site Name: East Windsor								
Tower Height: Verizon @ 144ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*AT&T UMTS	2	565	170	0.0141	880	0.5867	2.40%	
*AT&T UMTS	2	1077	170	0.0268	1900	1.0000	2.68%	
*AT&T GSM	4	934	170	0.0465	1900	1.0000	4.65%	
*AT&T GSM	1	647	170	0.0080	880	0.5867	1.37%	
*AT&T LTE	1	1615	170	0.0201	734	0.4893	4.11%	
*MetroPCS CDMA	3	727	177	0.0250	2135	1.0000	2.50%	
*MetroPCS LTE	1	1200	177	0.0138	2130	1.0000	1.38%	
*Town	1	400	207	0.0034	33	0.2000	1.68%	
*T-Mobile GSM	8	123	153	0.0151	1945	1.0000	1.51%	
*T-Mobile UMTS	2	694	153	0.0213	2100	1.0000	2.13%	
*Nextel	12	100	183	0.0129	851	0.5673	2.27%	
*Sprint CDMA/LTE	3	693	120	0.0519	1900	1.0000	5.19%	
*Sprint CDMA/LTE	1	390	120	0.0097	850	0.5667	1.72%	
Verizon PCS	**11**	**234**	**144**	**0.0446**	**1970**	**1.0000**	**4.46%**	
Verizon Cellular	**9**	**220**	**144**	**0.0343**	**869**	**0.5793**	**5.93%**	
Verizon AWS	**1**	**1750**	**144**	**0.0303**	**2145**	**1.0000**	**3.03%**	
Verizon 700	**1**	**811**	**144**	**0.0141**	**698**	**0.4653**	**3.02%**	
								50.03%
* Source: Siting Council								

ATTACHMENT 3

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 188' ROHN SSV LATTICE TOWER FOR PROPOSED ANTENNA ARRANGEMENT

232 S. Main St.
East Windsor, Connecticut

prepared for

Verizon Wireless
99 East River Drive
East Hartford, Connecticut 06108

prepared by

URS CORPORATION
500 ENTERPRISE DRIVE, SUITE 3B
ROCKY HILL, CT 06067
TEL. 860-529-8882

36917407.00000
VZ5-158 (Rev.1)

July 31, 2013

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis and evaluation of the existing 188' self-supporting lattice tower structure located at 232 S. Main St in East Windsor, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code which requires a three second gust wind speed of 95 mph which converts to a 77.5 mph fastest mile per 2003 IBC (Table 1609.3.1) and the TIA/EIA-222-F standard for a wind velocity of 80 mph (fastest mile). The wind speed from the TIA/EIA-222-F governs the design at 80 mph (fastest mile) and 69 mph (fastest mile) concurrent with ½" ice. The antenna loading considered in this analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report. The proposed Verizon Wireless modification is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Remove: **(3) RFS P65-15-XL-2 Panel Antennas**	**Verizon Wireless (Existing)**	**@ 144'**
Install: **(3) Amphenol BXA-70063-6CF-2 Panel Antennas**	**Verizon Wireless (Proposed)**	

The results of the analysis indicate that the tower superstructure steel stresses are within the allowable limits. The tower foundation meets the minimum safety factor of two required to resist overturning as stipulated by Chapter 31, Section 3108.4.2 of the 2003 International Building Code (IBC). **Therefore, the overall tower structure is deemed structurally adequate with the wind load classification specified above and the proposed antenna loading.**

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Tower geometry and structural member sizes obtained from manufacturer's erection drawing prepared by ROHN Industries, dated September 30, 1996.
3) Foundation geometry obtained from manufacturer's foundation design drawings prepared by ROHN Industries, dated September 30, 1996.
4) Previous structural evaluation prepared by Malouf Engineering Intl., INC., on behalf of AT&T, dated September 21, 2007.
5) Previous structural analysis performed by URS Corporation on behalf of Pocket Wireless, project number PWS-004 / 36923534, signed and sealed September 30. 2008.
6) Previous structural assessment prepared by Velocitel on behalf of T-Mobile, project number 206AEATLCT11402, signed and sealed April 17, 2009.
7) Previous structural analysis performed by URS Coproration on behalf of Verizon Wireless, project number VZ5-049 (Rev 4) / 36931196, signed and sealed November 18, 2010.
8) Structural analysis report and calculations for AT&T proposed upgrades, prepared by Hudson Design Group, LLC., signed and sealed March 19, 2012.
9) Proposed telecommunications facility modification plans for AT&T proposed upgrades, prepared by Hudson Design Group, LLC., signed and sealed April 10, 2012.

1. EXECUTIVE SUMMARY *(continued)*

10) Proposed equipment upgrade for MetroPCS prepared by Chappell Engineering Associates, LLC., signed and sealed November 21, 2012.

11) Structural assessment report for Sprint proposed upgrades, prepared by Ramaker & Associates, INC., signed and sealed March 26, 2013.

12) Proposed telecommunications facility modification plans for Sprint proposed upgrades, prepared by Ramaker & Associates, INC., signed and sealed April 3, 2013.

13) Antenna and mount configuration as specified within Section 2 and 6 of this report.

14) Coax cable orientation as specified in section 6 of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mcd

cc: MJE, ICA – URS
CF/Book

1. INTRODUCTION

The subject tower is located at 232 S. Main St, East Windsor, Connecticut. The structure is an existing 188' self supporting steel tapered lattice tower, designed and manufactured by ROHN Industries.

The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(9) Decibel DB844H90E-XY (1) Amphenol BCD-87010 10' Omni Antenna	Sprint (existing)	13' Platform	188'	(10) 1 5/8"
(3) RFS APXV18-206517S-C	Metro PCS (existing)	Leg Mount	177'	(6) 1-5/8"
(3) Kathrein 800-10121 panels (6) Kathrein 860-10025 Remote Control Units (3) Powerwave TT19-08BP111-001 TMA's (6) LGP 21900 Diplexers (3) Powerwave 1001940 units (4) Powerwave P65-17-XLH-RR Panels (Alpha and Gamma Sectors) (2) SBNH-1D6565C Panels (Gamma Sector) (6) Ericsson RRU units (3) DTMABP7819VG12A units (1) Raycap DC6-48-60-18-8F surge arrestor	AT&T (existing)	(3) T-Frames	168'	(6) 1 5/8" (6) 1 1/4" (3) FB-L98B-002 Fiber Cables (6) WR-VG122ST DC Power Cables
(3) RFS APX16DWV-16DWVS Panel (3) RFS ATMAP1412D-1-A20 Amplifiers (6) RFS RR90-17-00DP panels (6) TMA units (6) Powerwave 7250.03 Panels	T-Mobile (existing)	(3) T-Frames	155	(9) 1 5/8"
(3) RFS P65-15-XL-2 Panels (to be removed) (6) RFS APL868013-42T0 Panels (3) Decibel-Andrew 948F85T2E-M Panels (3) Diplex with Cables attachments	Verizon (existing)	(3) T-Frames	144'	(15) 1 5/8"
(3) Amphenol BXA-70063-6CF-2 Panels	**Verizon (Proposed)**	**Same as Above**	**144'**	**Same as Above**

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(2) RFS APX9ERR18-C panels (Alpha and Gamma Sector) (1) RFS APXVSPP18-C panel (Beta Sector) (3) ALU 1900 MHz RRH (3) ALU 800 MHz RRH	Sprint (existing)	(3) T-Frames	123'	(3) 1 1/4" Hybrid Cables

This structural analysis of the communications tower was performed by URS Corporation (URS) for Verizon Wireless. The purpose of this analysis was to investigate the structural integrity of the tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

2. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F - Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, and the American Institute of Steel Construction (AISC) Manual of Steel Construction - Allowable Stress Design (ASD).

The Connecticut State Building Code requires a three second gust wind speed of 95 mph which converts to a 77.5 mph fastest mile per 2003 IBC (Table 1609.3.1). The TIA/EIA-222-F requires a basic wind speed of 80 mph fastest mile. In this case the wind speed from the TIA/EIA-222-F governs the design.

The analysis was conducted using TNX Tower 6.0.0.8. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 80 mph (fastest mile) Wind Load + Tower Dead Load
Load Condition 2 = 69 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

3. FINDINGS AND EVALUATION

Stresses on the tower structure were evaluated to compare with allowable stresses in accordance with AISC. The results of the analysis indicate that the calculated stresses under the proposed loading were below the allowable stresses for the tower superstructure (see table below). In addition, the tower foundation meets the minimum safety factor of two required to resist overturning as stipulated by Chapter 31, Section 3108.4.2 of the 2003 International Building Code (IBC). Detailed analysis and calculations for the proposed load condition are provided in section 6 of this report. The tower anchor bolts were found to be structurally adequate.

Tower Base reactions:
For detailed proposed tower reactions, see drawing no. E-1 in section 6 of this report.

Tower Component Stress vs. Capacity Summary:

Component / (Section No.)	Controlling Component/ Elevation	Stress (% capacity)	Pass/Fail	Comments:
Tower Leg (T7)	Compression/60'-80'	69.5 %	**Pass**	
Diagonal (T10)	Compression/0'-20'	97.0 %	**Pass**	
Top Girt (T1)	Compression/180'-188'	0.7%	**Pass**	
Anchor Bolts	Tension	51.0%	**Pass**	

Foundation Summary:

Foundation	Component	Stress (% capacity/FOS)	Pass/Fail	Comments:
Reinf. Concrete Pad	OTM	93.0%/2.15	**Pass**	Min. F.O.S of 2.0 req'd per IBC 2003 Section 3108.4.2

4. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that the tower superstructure steel stresses are within the allowable limits. Also, the tower foundation meets the minimum safety factor of two required to resist overturning as stipulated by Chapter 31, Section 3108.4.2 of the 2003 International Building Code (IBC). Therefore, the overall tower structure is deemed structurally adequate with the wind load classification specified above and the proposed antenna loading.

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

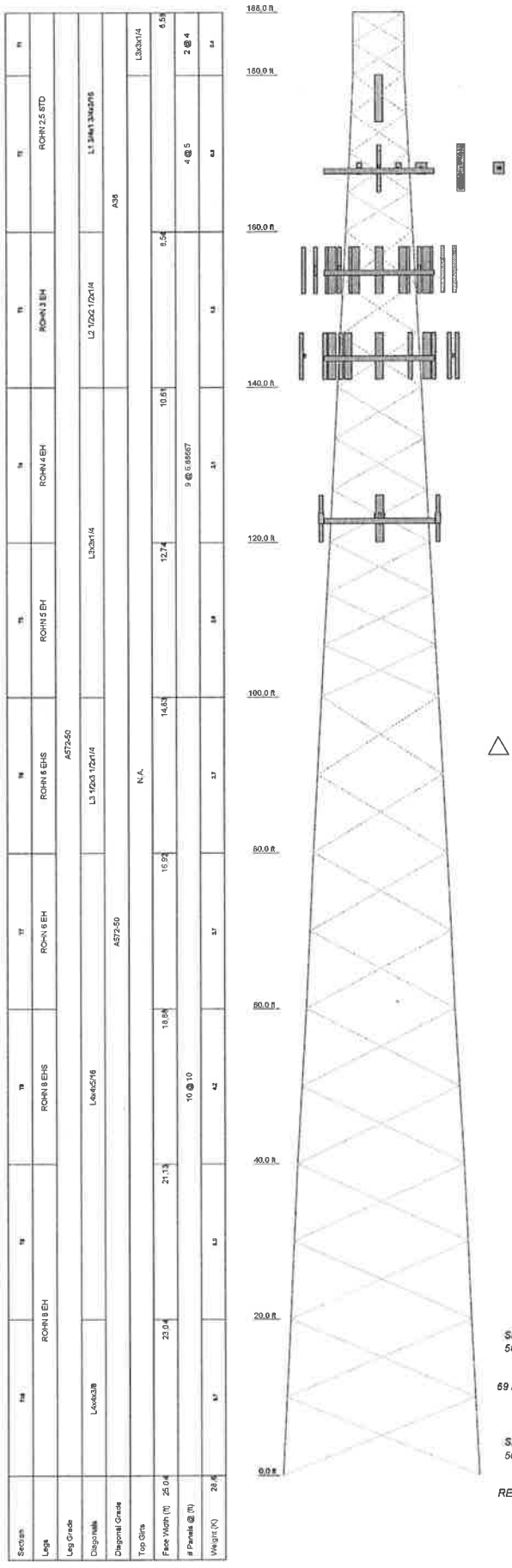
URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading condition.

6. DRAWINGS AND DATA

TNX TOWER INPUT / OUTPUT SUMMARY



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXV18-206517S-C (MetroPCS)	177	RR90-17-DP (T-Mobile)	155
DC6-48-60-18-8F (ATI)	168	RR90-17-DP (T-Mobile)	155
(2) RRUS-11 (ATI)	168	RR90-17-DP (T-Mobile)	155
(2) RRUS-11 (ATI)	168	RR90-17-DP (T-Mobile)	155
(2) RRUS-11 (ATI)	168	ATMAP1412D-1-A20 Amplifier (T-Mobile)	155
(2) 36NH-10X565C (ATI)	168	ATMAP1412D-1-A20 Amplifier (T-Mobile)	155
(2) P65-17-XLH-RR (ATI)	168	ATMAP1412D-1-A20 Amplifier (T-Mobile)	155
(2) P65-17-XLH-RR (ATI)	168	APX16DWV-16WVS (T-Mobile)	155
(2) LGP21900 (ATI)	168	APX16DWV-16WVS (T-Mobile)	155
(2) LGP21900 (ATI)	168	APX16DWV-16WVS (T-Mobile)	155
(2) LGP21900 (ATI)	168	Prod 15' T-Frame Sector Mount (1) (T-Mobile)	155
TT19-08BP111-001 (ATI)	168	Prod 15' T-Frame Sector Mount (1) (T-Mobile)	155
TT19-08BP111-001 (ATI)	168	Prod 15' T-Frame Sector Mount (1) (T-Mobile)	155
TT19-08BP111-001 (ATI)	168	Prod 15' T-Frame Sector Mount (1) (Verizon)	144
(2) 800-10025 RCU (ATI)	168	BXA-70063-6CF (Verizon)	144
(2) 800-10025 RCU (ATI)	168	BXA-70063-6CF (Verizon)	144
(2) 800-10025 RCU (ATI)	168	BXA-70063-6CF (Verizon)	144
800-10121 (ATI)	168	948F65T4E-M (Verizon)	144
800-10121 (ATI)	168	948F65T4E-M (Verizon)	144
800-10121 (ATI)	168	948F65T4E-M (Verizon)	144
Prod 15' T-Frame Sector Mount (1) (ATI)	168	APL868013-4ZTO (Verizon)	144
Prod 15' T-Frame Sector Mount (1) (ATI)	168	APL868013-4ZTO (Verizon)	144
Prod 15' T-Frame Sector Mount (1) (ATI)	168	APL868013-4ZTO (Verizon)	144
DTMA6P7811VG12A (ATI)	168	APL868013-4ZTO (Verizon)	144
DTMA6P7811VG12A (ATI)	168	APL868013-4ZTO (Verizon)	144
Powerwave 7001940 (ATI)	168	FD9R6002/2C-3L Diplexer (Verizon)	144
Powerwave 7001940 (ATI)	168	FD9R6002/2C-3L Diplexer (Verizon)	144
Powerwave 7001940 (ATI)	168	FD9R6002/2C-3L Diplexer (Verizon)	144
7250.03 (T-Mobile)	155	Prod 15' T-Frame Sector Mount (1) (Verizon)	144
7250.03 (T-Mobile)	155	Prod 15' T-Frame Sector Mount (1) (Verizon)	144
7250.03 (T-Mobile)	155	APXV9R206-C (Sprint)	123
7250.03 (T-Mobile)	155	APXV9R206-C (Sprint)	123
7250.03 (T-Mobile)	155	Prod 15' T-Frame Sector Mount (1) (Sprint)	123
7250.03 (T-Mobile)	155	Prod 15' T-Frame Sector Mount (1) (Sprint)	123
TMA (T-Mobile)	155	Prod 15' T-Frame Sector Mount (1) (Sprint)	123
TMA (T-Mobile)	155	800 MHz Filter (Sprint)	123
TMA (T-Mobile)	155	800 MHz Filter (Sprint)	123
TMA (T-Mobile)	155	PCS 1900 MHz 4x45W-65MHz (Sprint)	123
TMA (T-Mobile)	155	PCS 1900 MHz 4x45W-65MHz (Sprint)	123
TMA (T-Mobile)	155	PCS 1900 MHz 4x45W-65MHz (Sprint)	123
RR90-17-DP (T-Mobile)	155	APXV8PP18-C-A20 (Sprint)	123
RR90-17-DP (T-Mobile)	155	800 MHz Filter (Sprint)	123

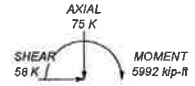
MATERIAL STRENGTH

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

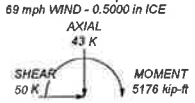
TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 60 mph wind.
4. Weld together tower sections have flange connections.
5. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
6. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
7. Welds are fabricated with ER-70S-6 electrodes.
8. TOWER RATING: 97%

MAX. CORNER REACTIONS AT BASE:
DOWN: 301 K
UPLIFT: -218 K
SHEAR: 34 K



TORQUE 73 kip-ft
69 mph WIND - 0.5000 in ICE



TORQUE 66 kip-ft
REACTIONS - 80 mph WIND

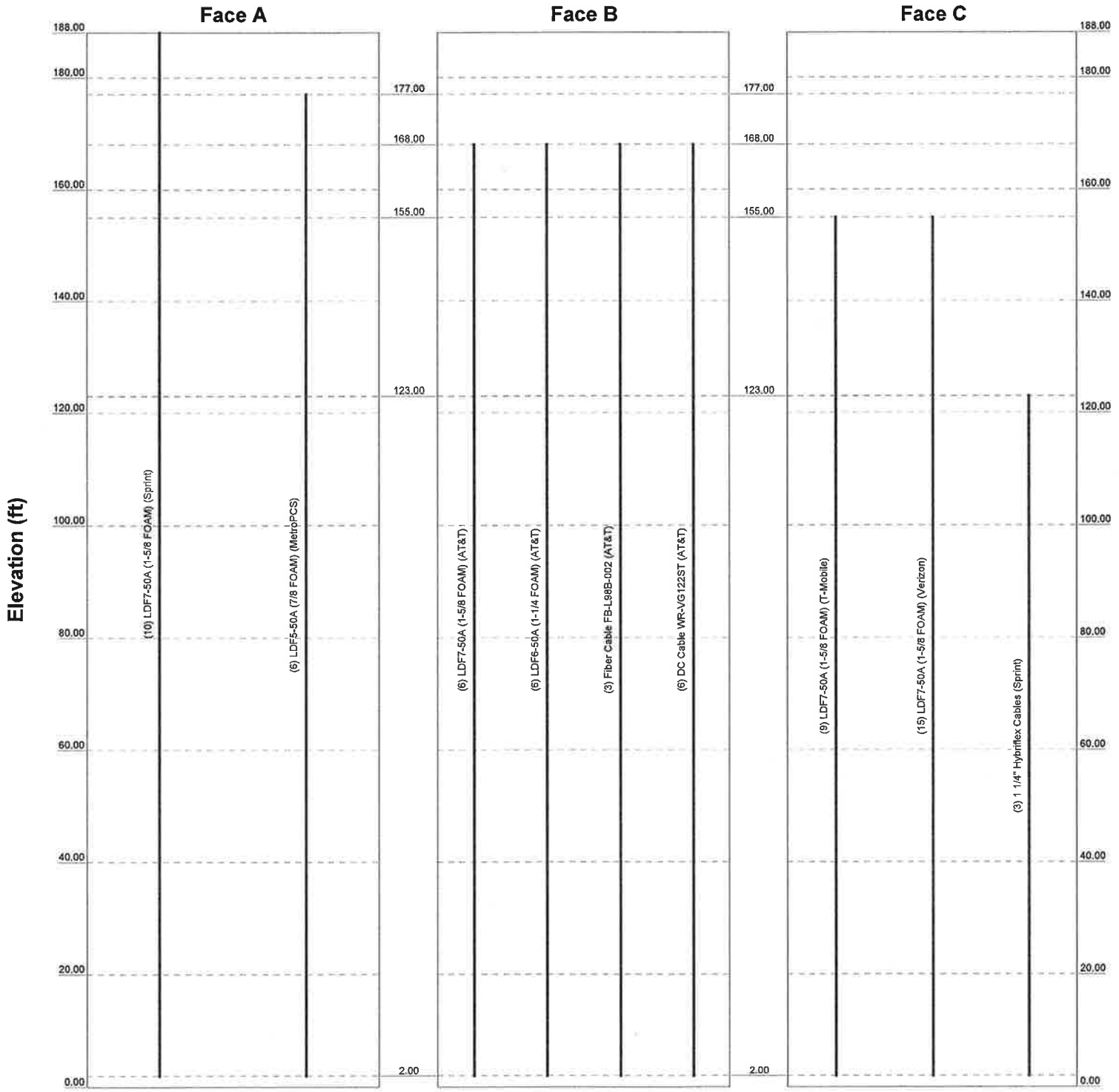
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job:	*188' SSV Rohn Tower*
Project:	*232 S. Main St, East Windsor, CT*
Client: Verizon Wireless	Drawn by: Michael_Dalickas Appvd
Code: TIA/EIA-222-F	Date: 07/31/13 Scale: NTS
Path:	Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION CHART

Feedline Distribution Chart
0' - 188'

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



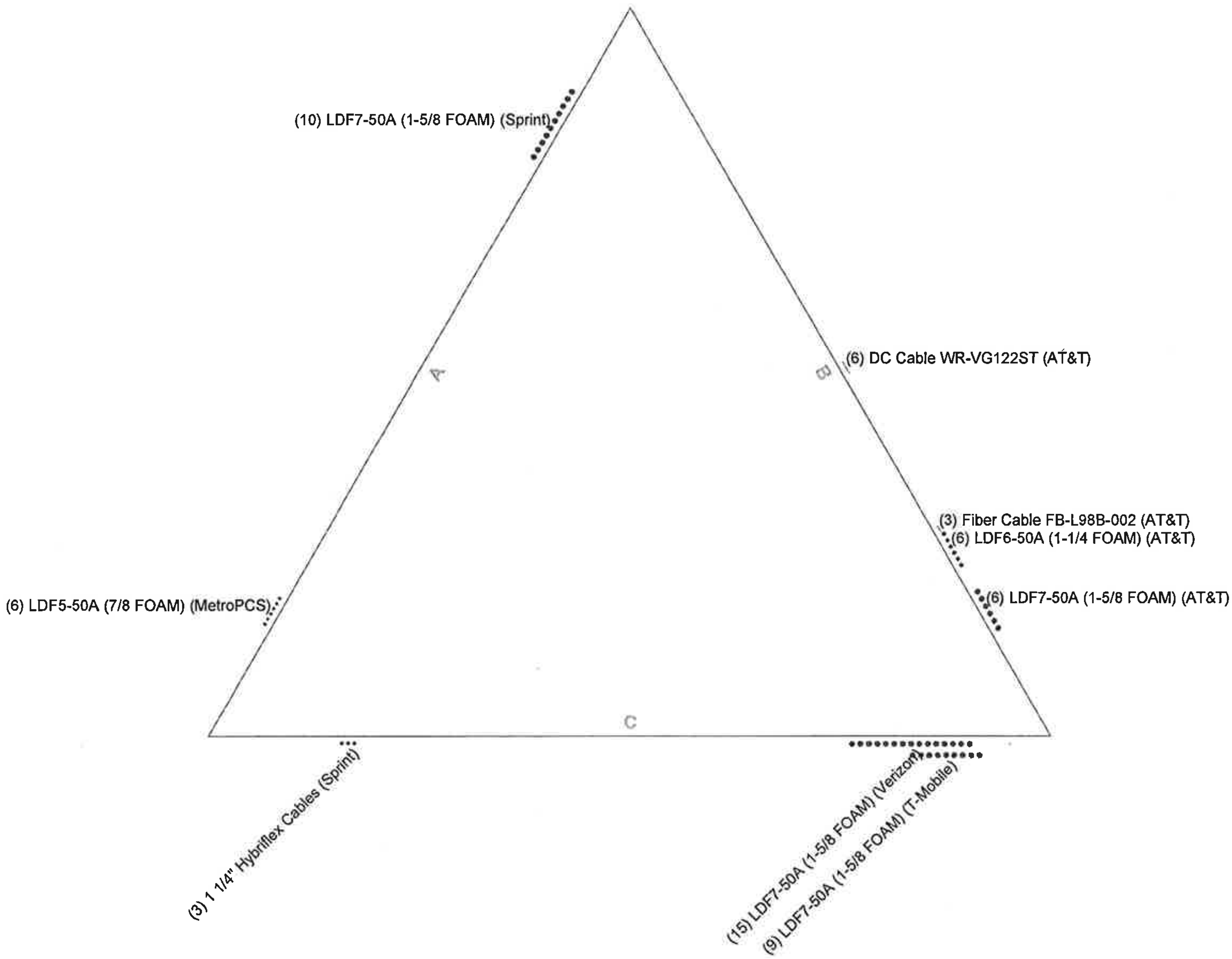
URS Corporation
500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: 860-529-8882
FAX: 860-529-3991

Job: ***188' SSV Rohn Tower***			
Project: ***232 S. Main St, East Windsor, CT***			
Client: Verizon Wireless	Drawn by: Michael_Dalickas	App'd:	
Code: TIA/EIA-222-F	Date: 07/31/13	Scale: NTS	
Path: W:\Verizon-VZ\36917407-VZ5156\08\Revision 1\ERI Files\188 SSV Rohn Tower.en		Dwg No. E-7	

TNX TOWER FEEDLINE PLAN

Feedline Plan

Round Flat App In Face App Out Face



URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: 860-529-8882 FAX: 860-529-3991	Job: **188' SSV Rohn Tower**		
	Project: **232 S. Main St, East Windsor, CT**		
	Client: Verizon Wireless	Drawn by: Michael_Dalickas	App'd:
	Code: TIA/EIA-222-F	Date: 07/31/13	Scale: NTS
	Path:		Dwg No. E-7

TNX TOWER DETAILED OUTPUT

tnxTower	Job	Page
	188' SSV Rohn Tower	1 of 42
URS Corporation 500 Enterprise Drive, Suite 3B Rocky Hill, CT 06067 Phone: 860-529-8882 FAX: 860-529-3991	Project 232 S. Main St, East Windsor, CT	Date 09:50:51 07/31/13
	Client Verizon Wireless	Designed by Michael_Dalickas

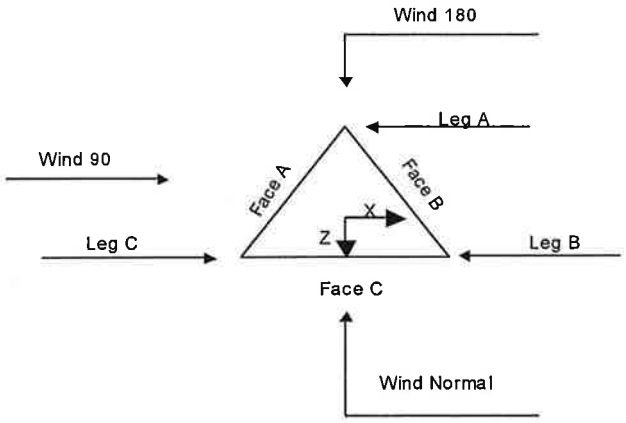
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 188.00 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 6.58 ft at the top and 25.04 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
Use Code Safety Factors - Guys	Retension Guys To Initial Tension	√ All Leg Panels Have Same Allowable
Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
√ Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	188.00-180.00			6.58	1	8.00
T2	180.00-160.00			6.58	1	20.00
T3	160.00-140.00			8.54	1	20.00
T4	140.00-120.00			10.61	1	20.00
T5	120.00-100.00			12.74	1	20.00
T6	100.00-80.00			14.83	1	20.00
T7	80.00-60.00			16.92	1	20.00
T8	60.00-40.00			18.88	1	20.00
T9	40.00-20.00			21.13	1	20.00
T10	20.00-0.00			23.04	1	20.00

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	188.00-180.00	4.00	X Brace	No	No	0.0000	0.0000
T2	180.00-160.00	5.00	X Brace	No	No	0.0000	0.0000
T3	160.00-140.00	6.67	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T5	120.00-100.00	6.67	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
T6	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T7	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T8	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 188.00-180.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 180.00-160.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 160.00-140.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x1/4	A36 (36 ksi)
T4 140.00-120.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T5 120.00-100.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)
T6 100.00-80.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T7 80.00-60.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A572-50 (50 ksi)
T8 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A572-50 (50 ksi)
T9 40.00-20.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Single Angle	L4x4x5/16	A572-50 (50 ksi)
T10 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Single Angle	L4x4x3/8	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft²	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
T1 188.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	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
T8 60.00-40.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	(36 ksi) A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	Y	K Brace Diags X	Y	Single Diags X	Y	Girts X	Y	Horiz. X	Y	Sec. Horiz. X	Y	Inner Brace X	Y
T1 188.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	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 Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 188.00-180.00	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	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
T2 180.00-160.00	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 160.00-140.00	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 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 188.00-180.00	Flange	0.6250 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 160.00-140.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 140.00-120.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 120.00-100.00	Flange	1.0000 A325N	6	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 100.00-80.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	1.0000 A325N	8	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-0.00	Flange	1.0000 A325N	10	0.7500 A325X	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

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

Description	Face or Leg	Allow Shield	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) (Sprint)	A	No	Ar (CfAe)	188.00 - 2.00	2.0000	0.3333	10	10	1.0000	1.9800		0.82
LDF5-50A (7/8 FOAM) (MetroPCS)	A	No	Ar (CfAe)	177.00 - 2.00	2.0000	-0.3333	6	6	1.0000	1.0900		0.33
LDF7-50A (1-5/8 FOAM) (AT&T)	B	No	Ar (CfAe)	168.00 - 2.00	2.0000	0.333	6	6	1.0000	1.9800		0.82
LDF6-50A (1-1/4 FOAM) (AT&T)	B	No	Ar (CfAe)	168.00 - 2.00	2.0000	0.25	6	6	1.0000	1.5500		0.66
Fiber Cable FB-L98B-002 (AT&T)	B	No	Ar (CfAe)	168.00 - 2.00	2.0000	0.22	3	3	0.4000	0.4000		0.25
DC Cable WR-VG122ST (AT&T)	B	No	Ar (CfAe)	168.00 - 2.00	2.0000	0	6	6	0.4000	0.4000		0.25
LDF7-50A (1-5/8 FOAM) (T-Mobile)	C	No	Ar (CfAe)	155.00 - 2.00	6.0000	-0.375	9	9	1.0000	1.9800		0.82
LDF7-50A (1-5/8 FOAM) (Verizon)	C	No	Ar (CfAe)	155.00 - 2.00	2.0000	-0.33333	15	15	1.0000	1.9800		0.82
1 1/4" Hybriflex Cables (Sprint)	C	No	Ar (CfAe)	123.00 - 2.00	2.0000	0.3333	3	3	1.0000	1.2500		0.42

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
T1	188.00-180.00	A	13.200	0.000	0.000	0.000	0.07
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	180.00-160.00	A	42.265	0.000	0.000	0.000	0.20
		B	16.520	0.000	0.000	0.000	0.09
		C	0.000	0.000	0.000	0.000	0.00
T3	160.00-140.00	A	43.900	0.000	0.000	0.000	0.20
		B	41.300	0.000	0.000	0.000	0.22
		C	59.400	0.000	0.000	0.000	0.30
T4	140.00-120.00	A	43.900	0.000	0.000	0.000	0.20
		B	41.300	0.000	0.000	0.000	0.22
		C	80.138	0.000	0.000	0.000	0.40
T5	120.00-100.00	A	43.900	0.000	0.000	0.000	0.20
		B	41.300	0.000	0.000	0.000	0.22
		C	85.450	0.000	0.000	0.000	0.42
T6	100.00-80.00	A	43.900	0.000	0.000	0.000	0.20
		B	41.300	0.000	0.000	0.000	0.22
		C	85.450	0.000	0.000	0.000	0.42
T7	80.00-60.00	A	43.900	0.000	0.000	0.000	0.20
		B	41.300	0.000	0.000	0.000	0.22
		C	85.450	0.000	0.000	0.000	0.42
T8	60.00-40.00	A	43.900	0.000	0.000	0.000	0.20

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
		B	41.300	0.000	0.000	0.000	0.22
		C	85.450	0.000	0.000	0.000	0.42
T9	40.00-20.00	A	43.900	0.000	0.000	0.000	0.20
		B	41.300	0.000	0.000	0.000	0.22
		C	85.450	0.000	0.000	0.000	0.42
T10	20.00-0.00	A	39.510	0.000	0.000	0.000	0.18
		B	37.170	0.000	0.000	0.000	0.20
		C	76.905	0.000	0.000	0.000	0.38

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
T1	188.00-180.00	A	0.500	1.987	17.880	0.000	0.000	0.24
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	180.00-160.00	A	0.500	7.927	59.504	0.000	0.000	0.76
		B		5.553	22.167	0.000	0.000	0.30
		C		0.000	0.000	0.000	0.000	0.00
T3	160.00-140.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		7.450	81.950	0.000	0.000	1.09
T4	140.00-120.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		10.496	110.392	0.000	0.000	1.46
T5	120.00-100.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		13.683	116.767	0.000	0.000	1.55
T6	100.00-80.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		13.683	116.767	0.000	0.000	1.55
T7	80.00-60.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		13.683	116.767	0.000	0.000	1.55
T8	60.00-40.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		13.683	116.767	0.000	0.000	1.55
T9	40.00-20.00	A	0.500	8.450	62.117	0.000	0.000	0.79
		B		13.883	55.417	0.000	0.000	0.76
		C		13.683	116.767	0.000	0.000	1.55
T10	20.00-0.00	A	0.500	7.605	55.905	0.000	0.000	0.71
		B		12.495	49.875	0.000	0.000	0.68
		C		12.315	105.090	0.000	0.000	1.40

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	188.00-180.00	-2.8523	-11.0984	-2.6399	-10.2720
T2	180.00-160.00	-0.4674	-9.4700	-1.0131	-8.2714
T3	160.00-140.00	15.3579	4.9912	13.4593	4.6306
T4	140.00-120.00	18.5986	8.1319	16.8807	7.6890

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T5	120.00-100.00	19.1825	9.5708	17.6748	9.0269
T6	100.00-80.00	21.5478	10.6218	20.2019	10.1937
T7	80.00-60.00	23.0725	11.2703	21.8797	10.9401
T8	60.00-40.00	23.7605	11.5188	22.9764	11.4018
T9	40.00-20.00	25.6859	12.3764	24.8894	12.2760
T10	20.00-0.00	25.7840	12.3670	25.2232	12.3839

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
800 MHz Filter (Sprint)	A	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	0.52 0.65	0.38 0.50	0.01 0.01
800 MHz Filter (Sprint)	B	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	0.52 0.65	0.38 0.50	0.01 0.01
800 MHz Filter (Sprint)	C	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	0.52 0.65	0.38 0.50	0.01 0.01
PCS 1900 MHz 4x45W-65MHz (Sprint)	A	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	2.73 2.95	2.61 2.83	0.06 0.09
PCS 1900 MHz 4x45W-65MHz (Sprint)	B	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	2.73 2.95	2.61 2.83	0.06 0.09
PCS 1900 MHz 4x45W-65MHz (Sprint)	C	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	2.73 2.95	2.61 2.83	0.06 0.09
APXVSPP18-C-A20 (Sprint)	B	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	8.40 8.95	5.28 5.74	0.06 0.11
APXV9R20B-C (Sprint)	A	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	9.93 10.50	6.09 6.62	0.06 0.12
APXV9R20B-C (Sprint)	C	From Face	5.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	9.93 10.50	6.09 6.62	0.06 0.12
Pirod 15' T-Frame Sector Mount (1) (Sprint)	A	None		0.0000	123.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (Sprint)	B	None		0.0000	123.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (Sprint)	C	None		0.0000	123.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
BXA-70063-6CF (Verizon)	A	From Face	5.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	7.73 8.27	4.16 4.60	0.02 0.06
BXA-70063-6CF	B	From Face	5.00	0.0000	144.00	No Ice	7.73	4.16	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Verizon)			0.00 0.00			1/2" Ice	8.27	4.60	0.06
BXA-70063-6CF (Verizon)	C	From Face	5.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	7.73 8.27	4.16 4.60	0.02 0.06
948F85T4E-M (Verizon)	A	From Face	5.00 4.00 0.00	0.0000	144.00	No Ice 1/2" Ice	1.82 2.11	3.27 3.63	0.01 0.03
948F85T4E-M (Verizon)	B	From Face	5.00 4.00 0.00	0.0000	144.00	No Ice 1/2" Ice	1.82 2.11	3.27 3.63	0.01 0.03
948F85T4E-M (Verizon)	C	From Face	5.00 4.00 0.00	0.0000	144.00	No Ice 1/2" Ice	1.82 2.11	3.27 3.63	0.01 0.03
APL868013-42TO (Verizon)	A	From Face	5.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	0.01 0.03
APL868013-42TO (Verizon)	A	From Face	5.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	0.01 0.03
APL868013-42TO (Verizon)	B	From Face	5.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	0.01 0.03
APL868013-42TO (Verizon)	B	From Face	5.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	0.01 0.03
APL868013-42TO (Verizon)	C	From Face	5.00 6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	0.01 0.03
APL868013-42TO (Verizon)	C	From Face	5.00 -6.00 0.00	0.0000	144.00	No Ice 1/2" Ice	2.87 3.18	3.73 4.10	0.01 0.03
FD9R600/2C-3L Diplexer (Verizon)	A	From Leg	5.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.36 0.45	0.08 0.13	0.00 0.00
FD9R600/2C-3L Diplexer (Verizon)	B	From Leg	5.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.36 0.45	0.08 0.13	0.00 0.00
FD9R600/2C-3L Diplexer (Verizon)	C	From Leg	5.00 0.00 0.00	0.0000	144.00	No Ice 1/2" Ice	0.36 0.45	0.08 0.13	0.00 0.00
Pirod 15' T-Frame Sector Mount (1) (Verizon)	A	None		0.0000	144.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (Verizon)	B	None		0.0000	144.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (Verizon)	C	None		0.0000	144.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
7250.03 (T-Mobile)	A	From Face	5.00 -6.00 0.00	0.0000	155.00	No Ice 1/2" Ice	4.00 4.39	1.87 2.33	0.02 0.04
7250.03 (T-Mobile)	A	From Face	5.00 6.00 0.00	0.0000	155.00	No Ice 1/2" Ice	4.00 4.39	1.87 2.33	0.02 0.04
7250.03	B	From Face	5.00	0.0000	155.00	No Ice	4.00	1.87	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile)			-6.00			1/2" Ice	4.39	2.33	0.04
			0.00						
7250.03	B	From Face	5.00	0.0000	155.00	No Ice	4.00	1.87	0.02
(T-Mobile)			6.00			1/2" Ice	4.39	2.33	0.04
			0.00						
7250.03	C	From Face	5.00	0.0000	155.00	No Ice	4.00	1.87	0.02
(T-Mobile)			-6.00			1/2" Ice	4.39	2.33	0.04
			0.00						
7250.03	C	From Face	5.00	0.0000	155.00	No Ice	4.00	1.87	0.02
(T-Mobile)			6.00			1/2" Ice	4.39	2.33	0.04
			0.00						
TMA	A	From Face	5.00	0.0000	155.00	No Ice	1.06	0.45	0.02
(T-Mobile)			3.00			1/2" Ice	1.21	0.57	0.03
			0.00						
TMA	A	From Face	5.00	0.0000	155.00	No Ice	1.06	0.45	0.02
(T-Mobile)			-3.00			1/2" Ice	1.21	0.57	0.03
			0.00						
TMA	B	From Face	5.00	0.0000	155.00	No Ice	1.06	0.45	0.02
(T-Mobile)			3.00			1/2" Ice	1.21	0.57	0.03
			0.00						
TMA	B	From Face	5.00	0.0000	155.00	No Ice	1.06	0.45	0.02
(T-Mobile)			-3.00			1/2" Ice	1.21	0.57	0.03
			0.00						
TMA	C	From Face	5.00	0.0000	155.00	No Ice	1.06	0.45	0.02
(T-Mobile)			3.00			1/2" Ice	1.21	0.57	0.03
			0.00						
TMA	C	From Face	5.00	0.0000	155.00	No Ice	1.06	0.45	0.02
(T-Mobile)			-3.00			1/2" Ice	1.21	0.57	0.03
			0.00						
RR90-17-DP	A	From Face	5.00	0.0000	155.00	No Ice	4.36	1.97	0.02
(T-Mobile)			3.00			1/2" Ice	4.77	2.31	0.04
			0.00						
RR90-17-DP	A	From Face	5.00	0.0000	155.00	No Ice	4.36	1.97	0.02
(T-Mobile)			-3.00			1/2" Ice	4.77	2.31	0.04
			0.00						
RR90-17-DP	B	From Face	5.00	0.0000	155.00	No Ice	4.36	1.97	0.02
(T-Mobile)			3.00			1/2" Ice	4.77	2.31	0.04
			0.00						
RR90-17-DP	B	From Face	5.00	0.0000	155.00	No Ice	4.36	1.97	0.02
(T-Mobile)			-3.00			1/2" Ice	4.77	2.31	0.04
			0.00						
RR90-17-DP	C	From Face	5.00	0.0000	155.00	No Ice	4.36	1.97	0.02
(T-Mobile)			3.00			1/2" Ice	4.77	2.31	0.04
			0.00						
RR90-17-DP	C	From Face	5.00	0.0000	155.00	No Ice	4.36	1.97	0.02
(T-Mobile)			-3.00			1/2" Ice	4.77	2.31	0.04
			0.00						
ATMAP1412D-1-A20	A	From Face	5.00	0.0000	155.00	No Ice	1.17	0.47	0.01
Amplifier			0.00			1/2" Ice	1.31	0.57	0.02
(T-Mobile)			0.00						
ATMAP1412D-1-A20	B	From Face	5.00	0.0000	155.00	No Ice	1.17	0.47	0.01
Amplifier			0.00			1/2" Ice	1.31	0.57	0.02
(T-Mobile)			0.00						
ATMAP1412D-1-A20	C	From Face	5.00	0.0000	155.00	No Ice	1.17	0.47	0.01
Amplifier			0.00			1/2" Ice	1.31	0.57	0.02
(T-Mobile)			0.00						
APX16DWV-16WVS	A	From Face	5.00	0.0000	155.00	No Ice	7.07	2.15	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile)			0.00 0.00			1/2" Ice	7.52	2.49	0.07
APX16DWV-16WVS (T-Mobile)	B	From Face	5.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice	7.07 7.52	2.15 2.49	0.04 0.07
APX16DWV-16WVS (T-Mobile)	C	From Face	5.00 0.00 0.00	0.0000	155.00	No Ice 1/2" Ice	7.07 7.52	2.15 2.49	0.04 0.07
Pirod 15' T-Frame Sector Mount (1) (T-Mobile)	A	None		0.0000	155.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (T-Mobile)	B	None		0.0000	155.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
Pirod 15' T-Frame Sector Mount (1) (T-Mobile)	C	None		0.0000	155.00	No Ice 1/2" Ice	15.00 20.60	15.00 20.60	0.50 0.65
DC6-48-60-18-8F (AT&T)	C	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	1.27 1.46	1.27 1.46	0.02 0.04
(2) RRUS-11 (AT&T)	A	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	0.06 0.07
(2) RRUS-11 (AT&T)	B	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	0.06 0.07
(2) RRUS-11 (AT&T)	C	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	2.94 3.17	1.25 1.41	0.06 0.07
(2) SBNH-1D6565C (AT&T)	C	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	11.45 12.06	7.70 8.29	0.06 0.13
(2) P65-17-XLH-RR (AT&T)	A	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	11.47 12.08	6.80 7.38	0.02 0.08
(2) P65-17-XLH-RR (AT&T)	B	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	11.47 12.08	6.80 7.38	0.02 0.08
(2) LGP21900 (AT&T)	A	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	0.00 0.00
(2) LGP21900 (AT&T)	B	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	0.00 0.00
(2) LGP21900 (AT&T)	C	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	0.00 0.00
TT19-08BP111-001 (AT&T)	A	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	0.64 0.76	0.52 0.62	0.02 0.02
TT19-08BP111-001 (AT&T)	B	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	0.64 0.76	0.52 0.62	0.02 0.02
TT19-08BP111-001 (AT&T)	C	Stand-Off Left	6.50 3.75 0.00	0.0000	168.00	No Ice 1/2" Ice	0.64 0.76	0.52 0.62	0.02 0.02
(2) 860-10025 RCU	A	Stand-Off	6.50	30.0000	168.00	No Ice	0.04	0.05	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T)		Left	3.75 0.00			1/2" Ice	0.07	0.08	0.00
(2) 860-10025 RCU	B	Stand-Off	6.50	30.0000	168.00	No Ice	0.04	0.05	0.00
(AT&T)		Left	3.75 0.00			1/2" Ice	0.07	0.08	0.00
(2) 860-10025 RCU	C	Stand-Off	6.50	30.0000	168.00	No Ice	0.04	0.05	0.00
(AT&T)		Left	3.75 0.00			1/2" Ice	0.07	0.08	0.00
800-10121	A	Stand-Off	6.50	30.0000	168.00	No Ice	5.62	3.29	0.05
(AT&T)		Left	3.75 0.00			1/2" Ice	6.04	3.64	0.08
800-10121	B	Stand-Off	6.50	30.0000	168.00	No Ice	5.62	3.29	0.05
(AT&T)		Left	3.75 0.00			1/2" Ice	6.04	3.64	0.08
800-10121	C	Stand-Off	6.50	30.0000	168.00	No Ice	5.62	3.29	0.05
(AT&T)		Left	3.75 0.00			1/2" Ice	6.04	3.64	0.08
Pirod 15' T-Frame Sector Mount (1)	A	None		0.0000	168.00	No Ice	15.00	15.00	0.50
(AT&T)						1/2" Ice	20.60	20.60	0.65
Pirod 15' T-Frame Sector Mount (1)	B	None		0.0000	168.00	No Ice	15.00	15.00	0.50
(AT&T)						1/2" Ice	20.60	20.60	0.65
Pirod 15' T-Frame Sector Mount (1)	C	None		0.0000	168.00	No Ice	15.00	15.00	0.50
(AT&T)						1/2" Ice	20.60	20.60	0.65
DTMABP7811VG12A	A	Stand-Off	6.50	0.0000	168.00	No Ice	1.14	0.38	0.02
(AT&T)		Left	3.75 0.00			1/2" Ice	1.28	0.49	0.03
DTMABP7811VG12A	B	Stand-Off	6.50	0.0000	168.00	No Ice	1.14	0.38	0.02
(AT&T)		Left	3.75 0.00			1/2" Ice	1.28	0.49	0.03
DTMABP7811VG12A	C	Stand-Off	6.50	0.0000	168.00	No Ice	1.14	0.38	0.02
(AT&T)		Left	3.75 0.00			1/2" Ice	1.28	0.49	0.03
Powerwave 1001940	A	Stand-Off	6.50	0.0000	168.00	No Ice	0.08	0.21	0.00
(AT&T)		Left	3.75 0.00			1/2" Ice	0.12	0.30	0.01
Powerwave 1001940	B	Stand-Off	6.50	0.0000	168.00	No Ice	0.08	0.21	0.00
(AT&T)		Left	3.75 0.00			1/2" Ice	0.12	0.30	0.01
Powerwave 1001940	C	Stand-Off	6.50	0.0000	168.00	No Ice	0.08	0.21	0.00
(AT&T)		Left	3.75 0.00			1/2" Ice	0.12	0.30	0.01
APXV18-206517S-C	A	From Leg	0.00	0.0000	177.00	No Ice	5.17	3.04	0.03
(MetroPCS)			0.00 0.00			1/2" Ice	5.62	3.47	0.05

Tower Pressures - No Ice

$G_H = 1.118$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	184.00	1.634	27	54.557	A	5.913	17.033	3.833	16.71	0.000	0.000
188.00-180.00					B	5.913	3.833		39.33	0.000	0.000
					C	5.913	3.833		39.33	0.000	0.000
T2	170.00	1.597	26	155.997	A	10.246	51.864	9.599	15.45	0.000	0.000
180.00-160.00					B	10.246	26.119		26.40	0.000	0.000
					C	10.246	9.599		48.37	0.000	0.000
T3	150.00	1.541	25	197.341	A	14.160	55.587	11.687	16.76	0.000	0.000
160.00-140.00					B	14.160	52.987		17.41	0.000	0.000
					C	14.160	71.087		13.71	0.000	0.000
T4	130.00	1.48	24	241.011	A	19.550	58.928	15.028	19.15	0.000	0.000
140.00-120.00					B	19.550	56.328		19.81	0.000	0.000
					C	19.550	95.166		13.10	0.000	0.000
T5	110.00	1.411	23	284.984	A	22.226	62.477	18.577	21.93	0.000	0.000
120.00-100.00					B	22.226	59.877		22.63	0.000	0.000
					C	22.226	104.027		14.71	0.000	0.000
T6	90.00	1.332	22	328.557	A	21.164	66.023	22.123	25.37	0.000	0.000
100.00-80.00					B	21.164	63.423		26.15	0.000	0.000
					C	21.164	107.573		17.19	0.000	0.000
T7 80.00-60.00	70.00	1.24	20	369.055	A	26.500	66.019	22.119	23.91	0.000	0.000
					B	26.500	63.419		24.60	0.000	0.000
					C	26.500	107.569		16.50	0.000	0.000
T8 60.00-40.00	50.00	1.126	18	414.498	A	28.816	72.711	28.811	28.38	0.000	0.000
					B	28.816	70.111		29.12	0.000	0.000
					C	28.816	114.261		20.14	0.000	0.000
T9 40.00-20.00	30.00	1	16	456.091	A	31.276	72.694	28.794	27.69	0.000	0.000
					B	31.276	70.094		28.40	0.000	0.000
					C	31.276	114.244		19.79	0.000	0.000
T10 20.00-0.00	10.00	1	16	495.193	A	33.681	68.308	28.798	28.24	0.000	0.000
					B	33.681	65.968		28.90	0.000	0.000
					C	33.681	105.703		20.66	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.118$

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	184.00	1.634	20	0.5000	55.223	A	23.793	10.155	5.167	15.22	0.000	0.000
188.00-180.00						B	5.913	8.168		36.69	0.000	0.000
						C	5.913	8.168		36.69	0.000	0.000
T2	170.00	1.597	20	0.5000	157.666	A	69.750	26.720	12.937	13.41	0.000	0.000
180.00-160.00						B	32.413	24.345		22.79	0.000	0.000
						C	10.246	18.792		44.55	0.000	0.000
T3	150.00	1.541	19	0.5000	199.010	A	76.277	29.141	15.027	14.25	0.000	0.000
160.00-140.00						B	69.577	34.574		14.43	0.000	0.000
						C	96.110	28.141		12.09	0.000	0.000
T4	130.00	1.48	18	0.5000	242.680	A	81.666	33.334	18.368	15.97	0.000	0.000
140.00-120.00						B	74.966	38.768		16.15	0.000	0.000
						C	129.941	35.380		11.11	0.000	0.000
T5	110.00	1.411	17	0.5000	286.653	A	84.342	37.775	21.916	17.95	0.000	0.000
120.00-100.00						B	77.642	43.208		18.14	0.000	0.000
						C	138.992	43.008		12.04	0.000	0.000
T6 100.00-80.00	90.00	1.332	16	0.5000	330.226	A	83.280	39.960	25.463	20.66	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	76.580	45.393		20.88	0.000	0.000
						C	137.930	45.193		13.90	0.000	0.000
T7 80.00-60.00	70.00	1.24	15	0.5000	370.724	A	88.616	40.532	25.457	19.71	0.000	0.000
						B	81.916	45.966		19.91	0.000	0.000
						C	143.266	45.766		13.47	0.000	0.000
T8 60.00-40.00	50.00	1.126	14	0.5000	416.167	A	90.933	47.805	32.151	23.17	0.000	0.000
						B	84.233	53.238		23.39	0.000	0.000
						C	145.583	53.038		16.19	0.000	0.000
T9 40.00-20.00	30.00	1	12	0.5000	457.760	A	93.392	48.401	32.132	22.66	0.000	0.000
						B	86.692	53.834		22.87	0.000	0.000
						C	148.042	53.634		15.93	0.000	0.000
T10 20.00-0.00	10.00	1	12	0.5000	496.862	A	89.586	48.162	32.137	23.33	0.000	0.000
						B	83.556	53.052		23.52	0.000	0.000
						C	138.771	52.872		16.77	0.000	0.000

Tower Pressure - Service

$G_H = 1.118$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	184.00	1.634	15	54.557	A	5.913	17.033	3.833	16.71	0.000	0.000
188.00-180.00					B	5.913	3.833		39.33	0.000	0.000
					C	5.913	3.833		39.33	0.000	0.000
T2	170.00	1.597	15	155.997	A	10.246	51.864	9.599	15.45	0.000	0.000
180.00-160.00					B	10.246	26.119		26.40	0.000	0.000
					C	10.246	9.599		48.37	0.000	0.000
T3	150.00	1.541	14	197.341	A	14.160	55.587	11.687	16.76	0.000	0.000
160.00-140.00					B	14.160	52.987		17.41	0.000	0.000
					C	14.160	71.087		13.71	0.000	0.000
T4	130.00	1.48	14	241.011	A	19.550	58.928	15.028	19.15	0.000	0.000
140.00-120.00					B	19.550	56.328		19.81	0.000	0.000
					C	19.550	95.166		13.10	0.000	0.000
T5	110.00	1.411	13	284.984	A	22.226	62.477	18.577	21.93	0.000	0.000
120.00-100.00					B	22.226	59.877		22.63	0.000	0.000
					C	22.226	104.027		14.71	0.000	0.000
T6	90.00	1.332	12	328.557	A	21.164	66.023	22.123	25.37	0.000	0.000
100.00-80.00					B	21.164	63.423		26.15	0.000	0.000
					C	21.164	107.573		17.19	0.000	0.000
T7 80.00-60.00	70.00	1.24	11	369.055	A	26.500	66.019	22.119	23.91	0.000	0.000
					B	26.500	63.419		24.60	0.000	0.000
					C	26.500	107.569		16.50	0.000	0.000
T8 60.00-40.00	50.00	1.126	10	414.498	A	28.816	72.711	28.811	28.38	0.000	0.000
					B	28.816	70.111		29.12	0.000	0.000
					C	28.816	114.261		20.14	0.000	0.000
T9 40.00-20.00	30.00	1	9	456.091	A	31.276	72.694	28.794	27.69	0.000	0.000
					B	31.276	70.094		28.40	0.000	0.000
					C	31.276	114.244		19.79	0.000	0.000
T10 20.00-0.00	10.00	1	9	495.193	A	33.681	68.308	28.798	28.24	0.000	0.000
					B	33.681	65.968		28.90	0.000	0.000
					C	33.681	105.703		20.66	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	1	1	17.159	1.04	129.97	A
188.00-180.00			B	0.179	2.669	0.586	1	1	8.161			
			C	0.179	2.669	0.586	1	1	8.161			
T2	0.29	0.81	A	0.398	2.068	0.651	1	1	44.001	2.66	133.10	A
180.00-160.00			B	0.233	2.489	0.598	1	1	25.857			
			C	0.127	2.857	0.578	1	1	15.796			
T3	0.72	1.47	A	0.353	2.164	0.634	1	1	49.387	3.48	173.83	C
160.00-140.00			B	0.34	2.194	0.629	1	1	47.492			
			C	0.432	2.004	0.665	1	1	61.446			
T4	0.82	2.09	A	0.326	2.23	0.624	1	1	56.325	4.44	222.10	C
140.00-120.00			B	0.315	2.257	0.621	1	1	54.504			
			C	0.476	1.933	0.686	1	1	84.790			
T5	0.85	2.60	A	0.297	2.303	0.615	1	1	60.652	4.72	235.76	C
120.00-100.00			B	0.288	2.328	0.612	1	1	58.890			
			C	0.443	1.985	0.67	1	1	91.934			
T6	0.85	2.67	A	0.265	2.392	0.606	1	1	61.168	4.61	230.69	C
100.00-80.00			B	0.257	2.415	0.604	1	1	59.459			
			C	0.392	2.08	0.648	1	1	90.903			
T7	0.85	3.73	A	0.251	2.435	0.602	1	1	66.246	4.62	231.08	C
80.00-60.00			B	0.244	2.457	0.6	1	1	64.568			
			C	0.363	2.141	0.637	1	1	95.054			
T8	0.85	4.18	A	0.245	2.453	0.601	1	1	72.486	4.54	227.10	C
60.00-40.00			B	0.239	2.472	0.599	1	1	70.816			
			C	0.345	2.183	0.631	1	1	100.888			
T9	0.85	4.99	A	0.228	2.505	0.597	1	1	74.638	4.21	210.53	C
40.00-20.00			B	0.222	2.523	0.595	1	1	72.995			
			C	0.319	2.247	0.622	1	1	102.326			
T10	0.76	5.65	A	0.206	2.576	0.592	1	1	74.094	4.22	211.03	C
20.00-0.00			B	0.201	2.592	0.591	1	1	72.645			
			C	0.281	2.346	0.61	1	1	98.203			
Sum Weight:	6.88	28.61						OTM	3395.85 kip-ft	38.54		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	0.825	1	16.124	0.98	122.13	A
188.00-180.00			B	0.179	2.669	0.586	0.825	1	7.126			
			C	0.179	2.669	0.586	0.825	1	7.126			
T2	0.29	0.81	A	0.398	2.068	0.651	0.825	1	42.208	2.55	127.67	A
180.00-160.00			B	0.233	2.489	0.598	0.825	1	24.064			
			C	0.127	2.857	0.578	0.825	1	14.003			
T3	0.72	1.47	A	0.353	2.164	0.634	0.825	1	46.909	3.34	166.82	C
160.00-140.00			B	0.34	2.194	0.629	0.825	1	45.014			
			C	0.432	2.004	0.665	0.825	1	58.968			
T4	0.82	2.09	A	0.326	2.23	0.624	0.825	1	52.904	4.26	213.14	C
140.00-120.00			B	0.315	2.257	0.621	0.825	1	51.083			
			C	0.476	1.933	0.686	0.825	1	81.369			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T5	0.85	2.60	A	0.297	2.303	0.615	0.825	1	56.763	4.52	225.78	C
120.00-100.00			B	0.288	2.328	0.612	0.825	1	55.001			
			C	0.443	1.985	0.67	0.825	1	88.044			
T6	0.85	2.67	A	0.265	2.392	0.606	0.825	1	57.464	4.43	221.30	C
100.00-80.00			B	0.257	2.415	0.604	0.825	1	55.755			
			C	0.392	2.08	0.648	0.825	1	87.200			
T7	0.85	3.73	A	0.251	2.435	0.602	0.825	1	61.609	4.40	219.81	C
80.00-60.00			B	0.244	2.457	0.6	0.825	1	59.931			
			C	0.363	2.141	0.637	0.825	1	90.416			
T8	0.85	4.18	A	0.245	2.453	0.601	0.825	1	67.443	4.31	215.75	C
60.00-40.00			B	0.239	2.472	0.599	0.825	1	65.773			
			C	0.345	2.183	0.631	0.825	1	95.845			
T9	0.85	4.99	A	0.228	2.505	0.597	0.825	1	69.164	3.99	199.27	C
40.00-20.00			B	0.222	2.523	0.595	0.825	1	67.522			
			C	0.319	2.247	0.622	0.825	1	96.853			
T10	0.76	5.65	A	0.206	2.576	0.592	0.825	1	68.200	3.97	198.37	C
20.00-0.00			B	0.201	2.592	0.591	0.825	1	66.751			
			C	0.281	2.346	0.61	0.825	1	92.308			
Sum Weight:	6.88	28.61						OTM	3246.25 kip-ft	36.74		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	0.8	1	15.977	0.97	121.01	A
188.00-180.00			B	0.179	2.669	0.586	0.8	1	6.978			
			C	0.179	2.669	0.586	0.8	1	6.978			
T2	0.29	0.81	A	0.398	2.068	0.651	0.8	1	41.952	2.54	126.90	A
180.00-160.00			B	0.233	2.489	0.598	0.8	1	23.808			
			C	0.127	2.857	0.578	0.8	1	13.747			
T3	0.72	1.47	A	0.353	2.164	0.634	0.8	1	46.555	3.32	165.81	C
160.00-140.00			B	0.34	2.194	0.629	0.8	1	44.660			
			C	0.432	2.004	0.665	0.8	1	58.614			
T4	0.82	2.09	A	0.326	2.23	0.624	0.8	1	52.415	4.24	211.86	C
140.00-120.00			B	0.315	2.257	0.621	0.8	1	50.594			
			C	0.476	1.933	0.686	0.8	1	80.880			
T5	0.85	2.60	A	0.297	2.303	0.615	0.8	1	56.207	4.49	224.36	C
120.00-100.00			B	0.288	2.328	0.612	0.8	1	54.445			
			C	0.443	1.985	0.67	0.8	1	87.489			
T6	0.85	2.67	A	0.265	2.392	0.606	0.8	1	56.935	4.40	219.95	C
100.00-80.00			B	0.257	2.415	0.604	0.8	1	55.226			
			C	0.392	2.08	0.648	0.8	1	86.671			
T7	0.85	3.73	A	0.251	2.435	0.602	0.8	1	60.946	4.36	218.20	C
80.00-60.00			B	0.244	2.457	0.6	0.8	1	59.268			
			C	0.363	2.141	0.637	0.8	1	89.754			
T8	0.85	4.18	A	0.245	2.453	0.601	0.8	1	66.723	4.28	214.13	C
60.00-40.00			B	0.239	2.472	0.599	0.8	1	65.053			
			C	0.345	2.183	0.631	0.8	1	95.125			
T9	0.85	4.99	A	0.228	2.505	0.597	0.8	1	68.382	3.95	197.66	C
40.00-20.00			B	0.222	2.523	0.595	0.8	1	66.740			
			C	0.319	2.247	0.622	0.8	1	96.071			
T10	0.76	5.65	A	0.206	2.576	0.592	0.8	1	67.358	3.93	196.56	C
20.00-0.00			B	0.201	2.592	0.591	0.8	1	65.909			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	6.88	28.61	C	0.281	2.346	0.61	0.8	1 OTM	91.466 3224.88 kip-ft	36.48		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	0.85	1	16.272	0.99	123.25	A
188.00-180.00			B	0.179	2.669	0.586	0.85	1	7.274			
			C	0.179	2.669	0.586	0.85	1	7.274			
T2	0.29	0.81	A	0.398	2.068	0.651	0.85	1	42.464	2.57	128.45	A
180.00-160.00			B	0.233	2.489	0.598	0.85	1	24.320			
			C	0.127	2.857	0.578	0.85	1	14.259			
T3	0.72	1.47	A	0.353	2.164	0.634	0.85	1	47.263	3.36	167.82	C
160.00-140.00			B	0.34	2.194	0.629	0.85	1	45.368			
			C	0.432	2.004	0.665	0.85	1	59.322			
T4	0.82	2.09	A	0.326	2.23	0.624	0.85	1	53.393	4.29	214.42	C
140.00-120.00			B	0.315	2.257	0.621	0.85	1	51.572			
			C	0.476	1.933	0.686	0.85	1	81.857			
T5	0.85	2.60	A	0.297	2.303	0.615	0.85	1	57.319	4.54	227.21	C
120.00-100.00			B	0.288	2.328	0.612	0.85	1	55.556			
			C	0.443	1.985	0.67	0.85	1	88.600			
T6	0.85	2.67	A	0.265	2.392	0.606	0.85	1	57.994	4.45	222.64	C
100.00-80.00			B	0.257	2.415	0.604	0.85	1	56.284			
			C	0.392	2.08	0.648	0.85	1	87.729			
T7	0.85	3.73	A	0.251	2.435	0.602	0.85	1	62.271	4.43	221.42	C
80.00-60.00			B	0.244	2.457	0.6	0.85	1	60.593			
			C	0.363	2.141	0.637	0.85	1	91.079			
T8	0.85	4.18	A	0.245	2.453	0.601	0.85	1	68.163	4.35	217.37	C
60.00-40.00			B	0.239	2.472	0.599	0.85	1	66.493			
			C	0.345	2.183	0.631	0.85	1	96.565			
T9	0.85	4.99	A	0.228	2.505	0.597	0.85	1	69.946	4.02	200.88	C
40.00-20.00			B	0.222	2.523	0.595	0.85	1	68.304			
			C	0.319	2.247	0.622	0.85	1	97.634			
T10	0.76	5.65	A	0.206	2.576	0.592	0.85	1	69.042	4.00	200.17	C
20.00-0.00			B	0.201	2.592	0.591	0.85	1	67.593			
			C	0.281	2.346	0.61	0.85	1	93.150			
Sum Weight:	6.88	28.61						OTM	3267.63 kip-ft	36.99		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.24	0.70	A	0.615	1.796	0.763	1	1	31.539	1.27	158.89	A
188.00-180.00			B	0.255	2.423	0.603	1	1	10.840			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.255	2.423	0.603	1	1	10.840			
T2	1.07	1.31	A	0.612	1.797	0.761	1	1	90.082	3.55	177.62	A
180.00-160.00			B	0.36	2.149	0.636	1	1	47.898			
			C	0.184	2.65	0.587	1	1	21.282			
T3	2.64	2.10	A	0.53	1.864	0.713	1	1	97.058	4.46	223.24	C
160.00-140.00			B	0.523	1.872	0.71	1	1	94.114			
			C	0.624	1.791	0.769	1	1	117.745			
T4	3.02	2.93	A	0.474	1.936	0.685	1	1	104.485	5.72	286.05	C
140.00-120.00			B	0.469	1.944	0.682	1	1	101.407			
			C	0.681	1.776	0.807	1	1	158.482			
T5	3.11	3.57	A	0.426	2.015	0.663	1	1	109.371	5.97	298.32	C
120.00-100.00			B	0.422	2.023	0.661	1	1	106.188			
			C	0.635	1.786	0.776	1	1	172.349			
T6	3.11	3.63	A	0.373	2.12	0.641	1	1	108.896	5.75	287.36	C
100.00-80.00			B	0.369	2.128	0.64	1	1	105.613			
			C	0.555	1.839	0.727	1	1	170.778			
T7	3.11	4.85	A	0.348	2.175	0.632	1	1	114.228	5.64	281.93	C
80.00-60.00			B	0.345	2.183	0.631	1	1	110.906			
			C	0.51	1.887	0.703	1	1	175.421			
T8	3.11	5.45	A	0.333	2.211	0.627	1	1	120.891	5.44	271.83	C
60.00-40.00			B	0.33	2.218	0.626	1	1	117.541			
			C	0.477	1.931	0.686	1	1	181.976			
T9	3.11	6.34	A	0.31	2.27	0.619	1	1	123.349	5.03	251.31	C
40.00-20.00			B	0.307	2.278	0.618	1	1	119.965			
			C	0.441	1.989	0.669	1	1	183.923			
T10	2.79	7.08	A	0.277	2.358	0.609	1	1	118.926	4.97	248.59	C
20.00-0.00			B	0.275	2.365	0.609	1	1	115.841			
			C	0.386	2.093	0.646	1	1	172.920			
Sum Weight:	25.28	37.96						OTM	4291.84 kip-ft	47.80		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.24	0.70	A	0.615	1.796	0.763	0.825	1	27.375	1.10	137.91	A
188.00-180.00			B	0.255	2.423	0.603	0.825	1	9.805			
			C	0.255	2.423	0.603	0.825	1	9.805			
T2	1.07	1.31	A	0.612	1.797	0.761	0.825	1	77.876	3.07	153.55	A
180.00-160.00			B	0.36	2.149	0.636	0.825	1	42.226			
			C	0.184	2.65	0.587	0.825	1	19.489			
T3	2.64	2.10	A	0.53	1.864	0.713	0.825	1	83.709	3.83	191.35	C
160.00-140.00			B	0.523	1.872	0.71	0.825	1	81.938			
			C	0.624	1.791	0.769	0.825	1	100.926			
T4	3.02	2.93	A	0.474	1.936	0.685	0.825	1	90.193	4.90	245.00	C
140.00-120.00			B	0.469	1.944	0.682	0.825	1	88.287			
			C	0.681	1.776	0.807	0.825	1	135.742			
T5	3.11	3.57	A	0.426	2.015	0.663	0.825	1	94.611	5.12	256.22	C
120.00-100.00			B	0.422	2.023	0.661	0.825	1	92.600			
			C	0.635	1.786	0.776	0.825	1	148.026			
T6	3.11	3.63	A	0.373	2.12	0.641	0.825	1	94.322	4.93	246.75	C
100.00-80.00			B	0.369	2.128	0.64	0.825	1	92.211			
			C	0.555	1.839	0.727	0.825	1	146.640			
T7	3.11	4.85	A	0.348	2.175	0.632	0.825	1	98.721	4.83	241.64	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
80.00-60.00			B	0.345	2.183	0.631	0.825	1	96.571			
			C	0.51	1.887	0.703	0.825	1	150.350			
T8	3.11	5.45	A	0.333	2.211	0.627	0.825	1	104.978	4.68	233.77	C
60.00-40.00			B	0.33	2.218	0.626	0.825	1	102.801			
			C	0.477	1.931	0.686	0.825	1	156.499			
T9	3.11	6.34	A	0.31	2.27	0.619	0.825	1	107.006	4.32	215.91	C
40.00-20.00			B	0.307	2.278	0.618	0.825	1	104.794			
			C	0.441	1.989	0.669	0.825	1	158.016			
T10	2.79	7.08	A	0.277	2.358	0.609	0.825	1	103.249	4.27	213.68	C
20.00-0.00			B	0.275	2.365	0.609	0.825	1	101.219			
			C	0.386	2.093	0.646	0.825	1	148.635			
Sum Weight:	25.28	37.96						OTM	3688.33 kip-ft	41.06		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.24	0.70	A	0.615	1.796	0.763	0.8	1	26.780	1.08	134.92	A
188.00-180.00			B	0.255	2.423	0.603	0.8	1	9.658			
			C	0.255	2.423	0.603	0.8	1	9.658			
T2	1.07	1.31	A	0.612	1.797	0.761	0.8	1	76.132	3.00	150.12	A
180.00-160.00			B	0.36	2.149	0.636	0.8	1	41.416			
			C	0.184	2.65	0.587	0.8	1	19.233			
T3	2.64	2.10	A	0.53	1.864	0.713	0.8	1	81.802	3.74	186.80	C
160.00-140.00			B	0.523	1.872	0.71	0.8	1	80.199			
			C	0.624	1.791	0.769	0.8	1	98.523			
T4	3.02	2.93	A	0.474	1.936	0.685	0.8	1	88.151	4.78	239.14	C
140.00-120.00			B	0.469	1.944	0.682	0.8	1	86.413			
			C	0.681	1.776	0.807	0.8	1	132.494			
T5	3.11	3.57	A	0.426	2.015	0.663	0.8	1	92.502	5.00	250.20	C
120.00-100.00			B	0.422	2.023	0.661	0.8	1	90.659			
			C	0.635	1.786	0.776	0.8	1	144.551			
T6	3.11	3.63	A	0.373	2.12	0.641	0.8	1	92.240	4.82	240.95	C
100.00-80.00			B	0.369	2.128	0.64	0.8	1	90.297			
			C	0.555	1.839	0.727	0.8	1	143.192			
T7	3.11	4.85	A	0.348	2.175	0.632	0.8	1	96.505	4.72	235.88	C
80.00-60.00			B	0.345	2.183	0.631	0.8	1	94.523			
			C	0.51	1.887	0.703	0.8	1	146.768			
T8	3.11	5.45	A	0.333	2.211	0.627	0.8	1	102.705	4.57	228.34	C
60.00-40.00			B	0.33	2.218	0.626	0.8	1	100.695			
			C	0.477	1.931	0.686	0.8	1	152.859			
T9	3.11	6.34	A	0.31	2.27	0.619	0.8	1	104.671	4.22	210.85	C
40.00-20.00			B	0.307	2.278	0.618	0.8	1	102.627			
			C	0.441	1.989	0.669	0.8	1	154.315			
T10	2.79	7.08	A	0.277	2.358	0.609	0.8	1	101.009	4.17	208.69	C
20.00-0.00			B	0.275	2.365	0.609	0.8	1	99.130			
			C	0.386	2.093	0.646	0.8	1	145.165			
Sum Weight:	25.28	37.96						OTM	3602.12 kip-ft	40.10		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.24	0.70	A	0.615	1.796	0.763	0.85	1	27.970	1.13	140.91	A
188.00-180.00			B	0.255	2.423	0.603	0.85	1	9.953			
			C	0.255	2.423	0.603	0.85	1	9.953			
T2	1.07	1.31	A	0.612	1.797	0.761	0.85	1	79.619	3.14	156.99	A
180.00-160.00			B	0.36	2.149	0.636	0.85	1	43.037			
			C	0.184	2.65	0.587	0.85	1	19.746			
T3	2.64	2.10	A	0.53	1.864	0.713	0.85	1	85.616	3.92	195.91	C
160.00-140.00			B	0.523	1.872	0.71	0.85	1	83.677			
			C	0.624	1.791	0.769	0.85	1	103.329			
T4	3.02	2.93	A	0.474	1.936	0.685	0.85	1	92.235	5.02	250.87	C
140.00-120.00			B	0.469	1.944	0.682	0.85	1	90.162			
			C	0.681	1.776	0.807	0.85	1	138.991			
T5	3.11	3.57	A	0.426	2.015	0.663	0.85	1	96.719	5.24	262.23	C
120.00-100.00			B	0.422	2.023	0.661	0.85	1	94.542			
			C	0.635	1.786	0.776	0.85	1	151.500			
T6	3.11	3.63	A	0.373	2.12	0.641	0.85	1	96.404	5.05	252.55	C
100.00-80.00			B	0.369	2.128	0.64	0.85	1	94.126			
			C	0.555	1.839	0.727	0.85	1	150.088			
T7	3.11	4.85	A	0.348	2.175	0.632	0.85	1	100.936	4.95	247.39	C
80.00-60.00			B	0.345	2.183	0.631	0.85	1	98.619			
			C	0.51	1.887	0.703	0.85	1	153.931			
T8	3.11	5.45	A	0.333	2.211	0.627	0.85	1	107.251	4.78	239.21	C
60.00-40.00			B	0.33	2.218	0.626	0.85	1	104.906			
			C	0.477	1.931	0.686	0.85	1	160.139			
T9	3.11	6.34	A	0.31	2.27	0.619	0.85	1	109.341	4.42	220.96	C
40.00-20.00			B	0.307	2.278	0.618	0.85	1	106.962			
			C	0.441	1.989	0.669	0.85	1	161.717			
T10	2.79	7.08	A	0.277	2.358	0.609	0.85	1	105.488	4.37	218.67	C
20.00-0.00			B	0.275	2.365	0.609	0.85	1	103.307			
			C	0.386	2.093	0.646	0.85	1	152.104			
Sum Weight:	25.28	37.96						OTM	3774.55 kip-ft	42.02		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	1	1	17.159	0.58	73.11	A
188.00-180.00			B	0.179	2.669	0.586	1	1	8.161			
			C	0.179	2.669	0.586	1	1	8.161			
T2	0.29	0.81	A	0.398	2.068	0.651	1	1	44.001	1.50	74.87	A
180.00-160.00			B	0.233	2.489	0.598	1	1	25.857			
			C	0.127	2.857	0.578	1	1	15.796			
T3	0.72	1.47	A	0.353	2.164	0.634	1	1	49.387	1.96	97.78	C
160.00-140.00			B	0.34	2.194	0.629	1	1	47.492			
			C	0.432	2.004	0.665	1	1	61.446			
T4	0.82	2.09	A	0.326	2.23	0.624	1	1	56.325	2.50	124.93	C
140.00-120.00			B	0.315	2.257	0.621	1	1	54.504			
			C	0.476	1.933	0.686	1	1	84.790			
T5	0.85	2.60	A	0.297	2.303	0.615	1	1	60.652	2.65	132.61	C
120.00-100.00			B	0.288	2.328	0.612	1	1	58.890			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
			C	0.443	1.985	0.67	1	1	91.934			
T6	0.85	2.67	A	0.265	2.392	0.606	1	1	61.168	2.60	129.77	C
100.00-80.00			B	0.257	2.415	0.604	1	1	59.459			
			C	0.392	2.08	0.648	1	1	90.903			
T7	0.85	3.73	A	0.251	2.435	0.602	1	1	66.246	2.60	129.98	C
80.00-60.00			B	0.244	2.457	0.6	1	1	64.568			
			C	0.363	2.141	0.637	1	1	95.054			
T8	0.85	4.18	A	0.245	2.453	0.601	1	1	72.486	2.55	127.74	C
60.00-40.00			B	0.239	2.472	0.599	1	1	70.816			
			C	0.345	2.183	0.631	1	1	100.888			
T9	0.85	4.99	A	0.228	2.505	0.597	1	1	74.638	2.37	118.42	C
40.00-20.00			B	0.222	2.523	0.595	1	1	72.995			
			C	0.319	2.247	0.622	1	1	102.326			
T10	0.76	5.65	A	0.206	2.576	0.592	1	1	74.094	2.37	118.71	C
20.00-0.00			B	0.201	2.592	0.591	1	1	72.645			
			C	0.281	2.346	0.61	1	1	98.203			
Sum Weight:	6.88	28.61						OTM	1910.17 kip-ft	21.68		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	0.825	1	16.124	0.55	68.70	A
188.00-180.00			B	0.179	2.669	0.586	0.825	1	7.126			
			C	0.179	2.669	0.586	0.825	1	7.126			
T2	0.29	0.81	A	0.398	2.068	0.651	0.825	1	42.208	1.44	71.82	A
180.00-160.00			B	0.233	2.489	0.598	0.825	1	24.064			
			C	0.127	2.857	0.578	0.825	1	14.003			
T3	0.72	1.47	A	0.353	2.164	0.634	0.825	1	46.909	1.88	93.83	C
160.00-140.00			B	0.34	2.194	0.629	0.825	1	45.014			
			C	0.432	2.004	0.665	0.825	1	58.968			
T4	0.82	2.09	A	0.326	2.23	0.624	0.825	1	52.904	2.40	119.89	C
140.00-120.00			B	0.315	2.257	0.621	0.825	1	51.083			
			C	0.476	1.933	0.686	0.825	1	81.369			
T5	0.85	2.60	A	0.297	2.303	0.615	0.825	1	56.763	2.54	127.00	C
120.00-100.00			B	0.288	2.328	0.612	0.825	1	55.001			
			C	0.443	1.985	0.67	0.825	1	88.044			
T6	0.85	2.67	A	0.265	2.392	0.606	0.825	1	57.464	2.49	124.48	C
100.00-80.00			B	0.257	2.415	0.604	0.825	1	55.755			
			C	0.392	2.08	0.648	0.825	1	87.200			
T7	0.85	3.73	A	0.251	2.435	0.602	0.825	1	61.609	2.47	123.64	C
80.00-60.00			B	0.244	2.457	0.6	0.825	1	59.931			
			C	0.363	2.141	0.637	0.825	1	90.416			
T8	0.85	4.18	A	0.245	2.453	0.601	0.825	1	67.443	2.43	121.36	C
60.00-40.00			B	0.239	2.472	0.599	0.825	1	65.773			
			C	0.345	2.183	0.631	0.825	1	95.845			
T9	0.85	4.99	A	0.228	2.505	0.597	0.825	1	69.164	2.24	112.09	C
40.00-20.00			B	0.222	2.523	0.595	0.825	1	67.522			
			C	0.319	2.247	0.622	0.825	1	96.853			
T10	0.76	5.65	A	0.206	2.576	0.592	0.825	1	68.200	2.23	111.58	C
20.00-0.00			B	0.201	2.592	0.591	0.825	1	66.751			
			C	0.281	2.346	0.61	0.825	1	92.308			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	6.88	28.61						OTM	1826.02 kip-ft	20.66		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	0.8	1	15.977	0.54	68.07	A
188.00-180.00			B	0.179	2.669	0.586	0.8	1	6.978			
			C	0.179	2.669	0.586	0.8	1	6.978			
T2	0.29	0.81	A	0.398	2.068	0.651	0.8	1	41.952	1.43	71.38	A
180.00-160.00			B	0.233	2.489	0.598	0.8	1	23.808			
			C	0.127	2.857	0.578	0.8	1	13.747			
T3	0.72	1.47	A	0.353	2.164	0.634	0.8	1	46.555	1.87	93.27	C
160.00-140.00			B	0.34	2.194	0.629	0.8	1	44.660			
			C	0.432	2.004	0.665	0.8	1	58.614			
T4	0.82	2.09	A	0.326	2.23	0.624	0.8	1	52.415	2.38	119.17	C
140.00-120.00			B	0.315	2.257	0.621	0.8	1	50.594			
			C	0.476	1.933	0.686	0.8	1	80.880			
T5	0.85	2.60	A	0.297	2.303	0.615	0.8	1	56.207	2.52	126.20	C
120.00-100.00			B	0.288	2.328	0.612	0.8	1	54.445			
			C	0.443	1.985	0.67	0.8	1	87.489			
T6	0.85	2.67	A	0.265	2.392	0.606	0.8	1	56.935	2.47	123.72	C
100.00-80.00			B	0.257	2.415	0.604	0.8	1	55.226			
			C	0.392	2.08	0.648	0.8	1	86.671			
T7	0.85	3.73	A	0.251	2.435	0.602	0.8	1	60.946	2.45	122.74	C
80.00-60.00			B	0.244	2.457	0.6	0.8	1	59.268			
			C	0.363	2.141	0.637	0.8	1	89.754			
T8	0.85	4.18	A	0.245	2.453	0.601	0.8	1	66.723	2.41	120.45	C
60.00-40.00			B	0.239	2.472	0.599	0.8	1	65.053			
			C	0.345	2.183	0.631	0.8	1	95.125			
T9	0.85	4.99	A	0.228	2.505	0.597	0.8	1	68.382	2.22	111.18	C
40.00-20.00			B	0.222	2.523	0.595	0.8	1	66.740			
			C	0.319	2.247	0.622	0.8	1	96.071			
T10	0.76	5.65	A	0.206	2.576	0.592	0.8	1	67.358	2.21	110.56	C
20.00-0.00			B	0.201	2.592	0.591	0.8	1	65.909			
			C	0.281	2.346	0.61	0.8	1	91.466			
Sum Weight:	6.88	28.61						OTM	1814.00 kip-ft	20.52		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.07	0.43	A	0.421	2.025	0.66	0.85	1	16.272	0.55	69.33	A
188.00-180.00			B	0.179	2.669	0.586	0.85	1	7.274			
			C	0.179	2.669	0.586	0.85	1	7.274			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T2	0.29	0.81	A	0.398	2.068	0.651	0.85	1	42.464	1.45	72.25	A
180.00-160.00			B	0.233	2.489	0.598	0.85	1	24.320			
			C	0.127	2.857	0.578	0.85	1	14.259			
T3	0.72	1.47	A	0.353	2.164	0.634	0.85	1	47.263	1.89	94.40	C
160.00-140.00			B	0.34	2.194	0.629	0.85	1	45.368			
			C	0.432	2.004	0.665	0.85	1	59.322			
T4	0.82	2.09	A	0.326	2.23	0.624	0.85	1	53.393	2.41	120.61	C
140.00-120.00			B	0.315	2.257	0.621	0.85	1	51.572			
			C	0.476	1.933	0.686	0.85	1	81.857			
T5	0.85	2.60	A	0.297	2.303	0.615	0.85	1	57.319	2.56	127.81	C
120.00-100.00			B	0.288	2.328	0.612	0.85	1	55.556			
			C	0.443	1.985	0.67	0.85	1	88.600			
T6	0.85	2.67	A	0.265	2.392	0.606	0.85	1	57.994	2.50	125.23	C
100.00-80.00			B	0.257	2.415	0.604	0.85	1	56.284			
			C	0.392	2.08	0.648	0.85	1	87.729			
T7	0.85	3.73	A	0.251	2.435	0.602	0.85	1	62.271	2.49	124.55	C
80.00-60.00			B	0.244	2.457	0.6	0.85	1	60.593			
			C	0.363	2.141	0.637	0.85	1	91.079			
T8	0.85	4.18	A	0.245	2.453	0.601	0.85	1	68.163	2.45	122.27	C
60.00-40.00			B	0.239	2.472	0.599	0.85	1	66.493			
			C	0.345	2.183	0.631	0.85	1	96.565			
T9	0.85	4.99	A	0.228	2.505	0.597	0.85	1	69.946	2.26	112.99	C
40.00-20.00			B	0.222	2.523	0.595	0.85	1	68.304			
			C	0.319	2.247	0.622	0.85	1	97.634			
T10	0.76	5.65	A	0.206	2.576	0.592	0.85	1	69.042	2.25	112.60	C
20.00-0.00			B	0.201	2.592	0.591	0.85	1	67.593			
			C	0.281	2.346	0.61	0.85	1	93.150			
Sum Weight:	6.88	28.61						OTM	1838.04 kip-ft	20.81		

Discrete Appurtenance Pressures - No Ice $G_H = 1.118$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
800 MHz Filter	300.0000	0.01	-7.44	-4.29	123.00	1.456	24	0.52	0.38
800 MHz Filter	60.0000	0.01	7.44	-4.29	123.00	1.456	24	0.52	0.38
800 MHz Filter	180.0000	0.01	0.00	8.59	123.00	1.456	24	0.52	0.38
PCS 1900 MHz 4x45W-65MHz	300.0000	0.06	-7.44	-4.29	123.00	1.456	24	2.73	2.61
PCS 1900 MHz 4x45W-65MHz	60.0000	0.06	7.44	-4.29	123.00	1.456	24	2.73	2.61
PCS 1900 MHz 4x45W-65MHz	180.0000	0.06	0.00	8.59	123.00	1.456	24	2.73	2.61
APXVSPP18-C-A20	60.0000	0.06	7.44	-4.29	123.00	1.456	24	8.40	5.28
APXV9R20B-C	300.0000	0.06	-7.44	-4.29	123.00	1.456	24	9.93	6.09
APXV9R20B-C	180.0000	0.06	0.00	8.59	123.00	1.456	24	9.93	6.09
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	123.00	1.456	24	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	123.00	1.456	24	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	123.00	1.456	24	15.00	15.00
BXA-70063-6CF	300.0000	0.02	-6.88	-3.97	144.00	1.523	25	7.73	4.16
BXA-70063-6CF	60.0000	0.02	6.88	-3.97	144.00	1.523	25	7.73	4.16
BXA-70063-6CF	180.0000	0.02	0.00	7.94	144.00	1.523	25	7.73	4.16

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
948F85T4E-M	300.0000	0.01	-4.88	-7.44	144.00	1.523	25	1.82	3.27
948F85T4E-M	60.0000	0.01	8.88	-0.51	144.00	1.523	25	1.82	3.27
948F85T4E-M	180.0000	0.01	-4.00	7.94	144.00	1.523	25	1.82	3.27
APL868013-42TO	300.0000	0.01	-3.88	-9.17	144.00	1.523	25	2.87	3.73
APL868013-42TO	300.0000	0.01	-9.88	1.22	144.00	1.523	25	2.87	3.73
APL868013-42TO	60.0000	0.01	9.88	1.22	144.00	1.523	25	2.87	3.73
APL868013-42TO	60.0000	0.01	3.88	-9.17	144.00	1.523	25	2.87	3.73
APL868013-42TO	180.0000	0.01	-6.00	7.94	144.00	1.523	25	2.87	3.73
APL868013-42TO	180.0000	0.01	6.00	7.94	144.00	1.523	25	2.87	3.73
FD9R600/2C-3L Diplexer	0.0000	0.00	0.00	-10.89	144.00	1.523	25	0.36	0.08
FD9R600/2C-3L Diplexer	120.0000	0.00	9.43	5.44	144.00	1.523	25	0.36	0.08
FD9R600/2C-3L Diplexer	240.0000	0.00	-9.43	5.44	144.00	1.523	25	0.36	0.08
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	144.00	1.523	25	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	144.00	1.523	25	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	144.00	1.523	25	15.00	15.00
7250.03	300.0000	0.02	-9.59	1.39	155.00	1.556	25	4.00	1.87
7250.03	300.0000	0.02	-3.59	-9.00	155.00	1.556	25	4.00	1.87
7250.03	60.0000	0.02	3.59	-9.00	155.00	1.556	25	4.00	1.87
7250.03	60.0000	0.02	9.59	1.39	155.00	1.556	25	4.00	1.87
7250.03	180.0000	0.02	6.00	7.61	155.00	1.556	25	4.00	1.87
7250.03	180.0000	0.02	-6.00	7.61	155.00	1.556	25	4.00	1.87
TMA	300.0000	0.02	-5.09	-6.41	155.00	1.556	25	1.06	0.45
TMA	300.0000	0.02	-8.09	-1.21	155.00	1.556	25	1.06	0.45
TMA	60.0000	0.02	8.09	-1.21	155.00	1.556	25	1.06	0.45
TMA	60.0000	0.02	5.09	-6.41	155.00	1.556	25	1.06	0.45
TMA	180.0000	0.02	-3.00	7.61	155.00	1.556	25	1.06	0.45
TMA	180.0000	0.02	3.00	7.61	155.00	1.556	25	1.06	0.45
RR90-17-DP	300.0000	0.02	-5.09	-6.41	155.00	1.556	25	4.36	1.97
RR90-17-DP	300.0000	0.02	-8.09	-1.21	155.00	1.556	25	4.36	1.97
RR90-17-DP	60.0000	0.02	8.09	-1.21	155.00	1.556	25	4.36	1.97
RR90-17-DP	60.0000	0.02	5.09	-6.41	155.00	1.556	25	4.36	1.97
RR90-17-DP	180.0000	0.02	-3.00	7.61	155.00	1.556	25	4.36	1.97
RR90-17-DP	180.0000	0.02	3.00	7.61	155.00	1.556	25	4.36	1.97
ATMAP1412D-1-A20 Amplifier	300.0000	0.01	-6.59	-3.81	155.00	1.556	25	1.17	0.47
ATMAP1412D-1-A20 Amplifier	60.0000	0.01	6.59	-3.81	155.00	1.556	25	1.17	0.47
ATMAP1412D-1-A20 Amplifier	180.0000	0.01	0.00	7.61	155.00	1.556	25	1.17	0.47
APX16DWV-16WVS	300.0000	0.04	-6.59	-3.81	155.00	1.556	25	7.07	2.15
APX16DWV-16WVS	60.0000	0.04	6.59	-3.81	155.00	1.556	25	7.07	2.15
APX16DWV-16WVS	180.0000	0.04	0.00	7.61	155.00	1.556	25	7.07	2.15
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	155.00	1.556	25	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	155.00	1.556	25	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	155.00	1.556	25	15.00	15.00
DC6-48-60-18-8F	90.0000	0.02	10.38	5.99	168.00	1.592	26	1.27	1.27
RRUS-11	210.0000	0.12	-10.38	5.99	168.00	1.592	26	5.88	2.49
RRUS-11	330.0000	0.12	-0.00	-11.98	168.00	1.592	26	5.88	2.49
RRUS-11	90.0000	0.12	10.38	5.99	168.00	1.592	26	5.88	2.49
SBNH-1D6565C	90.0000	0.12	10.38	5.99	168.00	1.592	26	22.89	15.39
P65-17-XLH-RR	210.0000	0.04	-10.38	5.99	168.00	1.592	26	22.93	13.60
P65-17-XLH-RR	330.0000	0.04	-0.00	-11.98	168.00	1.592	26	22.93	13.60

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
LGP21900	210.0000	0.01	-10.38	5.99	168.00	1.592	26	0.47	0.23
LGP21900	330.0000	0.01	-0.00	-11.98	168.00	1.592	26	0.47	0.23
LGP21900	90.0000	0.01	10.38	5.99	168.00	1.592	26	0.47	0.23
TT19-08BP111-001	210.0000	0.02	-10.38	5.99	168.00	1.592	26	0.64	0.52
TT19-08BP111-001	330.0000	0.02	-0.00	-11.98	168.00	1.592	26	0.64	0.52
TT19-08BP111-001	90.0000	0.02	10.38	5.99	168.00	1.592	26	0.64	0.52
860-10025 RCU	240.0000	0.00	-10.38	5.99	168.00	1.592	26	0.08	0.09
860-10025 RCU	360.0000	0.00	-0.00	-11.98	168.00	1.592	26	0.08	0.09
860-10025 RCU	120.0000	0.00	10.38	5.99	168.00	1.592	26	0.08	0.09
800-10121	240.0000	0.05	-10.38	5.99	168.00	1.592	26	5.62	3.29
800-10121	360.0000	0.05	-0.00	-11.98	168.00	1.592	26	5.62	3.29
800-10121	120.0000	0.05	10.38	5.99	168.00	1.592	26	5.62	3.29
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	168.00	1.592	26	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	168.00	1.592	26	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	168.00	1.592	26	15.00	15.00
DTMABP7811VG12A	210.0000	0.02	-10.38	5.99	168.00	1.592	26	1.14	0.38
DTMABP7811VG12A	330.0000	0.02	-0.00	-11.98	168.00	1.592	26	1.14	0.38
DTMABP7811VG12A	90.0000	0.02	10.38	5.99	168.00	1.592	26	1.14	0.38
Powerwave 1001940	210.0000	0.00	-10.38	5.99	168.00	1.592	26	0.08	0.21
Powerwave 1001940	330.0000	0.00	-0.00	-11.98	168.00	1.592	26	0.08	0.21
Powerwave 1001940	90.0000	0.00	10.38	5.99	168.00	1.592	26	0.08	0.21
APXV18-206517S-C	0.0000	0.03	0.00	-3.97	177.00	1.616	26	5.17	3.04
	Sum Weight:	7.92							

Discrete Appurtenance Pressures - With Ice $G_H = 1.118$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
800 MHz Filter	300.0000	0.01	-7.44	-4.29	123.00	1.456	18	0.65	0.50	0.5000
800 MHz Filter	60.0000	0.01	7.44	-4.29	123.00	1.456	18	0.65	0.50	0.5000
800 MHz Filter	180.0000	0.01	0.00	8.59	123.00	1.456	18	0.65	0.50	0.5000
PCS 1900 MHz 4x45W-65MHz	300.0000	0.09	-7.44	-4.29	123.00	1.456	18	2.95	2.83	0.5000
PCS 1900 MHz 4x45W-65MHz	60.0000	0.09	7.44	-4.29	123.00	1.456	18	2.95	2.83	0.5000
PCS 1900 MHz 4x45W-65MHz	180.0000	0.09	0.00	8.59	123.00	1.456	18	2.95	2.83	0.5000
APXVSPP18-C-A20	60.0000	0.11	7.44	-4.29	123.00	1.456	18	8.95	5.74	0.5000
APXV9R20B-C	300.0000	0.12	-7.44	-4.29	123.00	1.456	18	10.50	6.62	0.5000
APXV9R20B-C	180.0000	0.12	0.00	8.59	123.00	1.456	18	10.50	6.62	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	123.00	1.456	18	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	123.00	1.456	18	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	123.00	1.456	18	20.60	20.60	0.5000
BXA-70063-6CF	300.0000	0.06	-6.88	-3.97	144.00	1.523	19	8.27	4.60	0.5000
BXA-70063-6CF	60.0000	0.06	6.88	-3.97	144.00	1.523	19	8.27	4.60	0.5000
BXA-70063-6CF	180.0000	0.06	0.00	7.94	144.00	1.523	19	8.27	4.60	0.5000
948F85T4E-M	300.0000	0.03	-4.88	-7.44	144.00	1.523	19	2.11	3.63	0.5000
948F85T4E-M	60.0000	0.03	8.88	-0.51	144.00	1.523	19	2.11	3.63	0.5000
948F85T4E-M	180.0000	0.03	-4.00	7.94	144.00	1.523	19	2.11	3.63	0.5000
APL868013-42TO	300.0000	0.03	-3.88	-9.17	144.00	1.523	19	3.18	4.10	0.5000

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
APL868013-42TO	300.0000	0.03	-9.88	1.22	144.00	1.523	19	3.18	4.10	0.5000
APL868013-42TO	60.0000	0.03	9.88	1.22	144.00	1.523	19	3.18	4.10	0.5000
APL868013-42TO	60.0000	0.03	3.88	-9.17	144.00	1.523	19	3.18	4.10	0.5000
APL868013-42TO	180.0000	0.03	-6.00	7.94	144.00	1.523	19	3.18	4.10	0.5000
APL868013-42TO	180.0000	0.03	6.00	7.94	144.00	1.523	19	3.18	4.10	0.5000
FD9R600/2C-3L Diplexer	0.0000	0.00	0.00	-10.89	144.00	1.523	19	0.45	0.13	0.5000
FD9R600/2C-3L Diplexer	120.0000	0.00	9.43	5.44	144.00	1.523	19	0.45	0.13	0.5000
FD9R600/2C-3L Diplexer	240.0000	0.00	-9.43	5.44	144.00	1.523	19	0.45	0.13	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	144.00	1.523	19	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	144.00	1.523	19	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	144.00	1.523	19	20.60	20.60	0.5000
7250.03	300.0000	0.04	-9.59	1.39	155.00	1.556	19	4.39	2.33	0.5000
7250.03	300.0000	0.04	-3.59	-9.00	155.00	1.556	19	4.39	2.33	0.5000
7250.03	60.0000	0.04	3.59	-9.00	155.00	1.556	19	4.39	2.33	0.5000
7250.03	60.0000	0.04	9.59	1.39	155.00	1.556	19	4.39	2.33	0.5000
7250.03	180.0000	0.04	6.00	7.61	155.00	1.556	19	4.39	2.33	0.5000
7250.03	180.0000	0.04	-6.00	7.61	155.00	1.556	19	4.39	2.33	0.5000
TMA	300.0000	0.03	-5.09	-6.41	155.00	1.556	19	1.21	0.57	0.5000
TMA	300.0000	0.03	-8.09	-1.21	155.00	1.556	19	1.21	0.57	0.5000
TMA	60.0000	0.03	8.09	-1.21	155.00	1.556	19	1.21	0.57	0.5000
TMA	60.0000	0.03	5.09	-6.41	155.00	1.556	19	1.21	0.57	0.5000
TMA	180.0000	0.03	-3.00	7.61	155.00	1.556	19	1.21	0.57	0.5000
TMA	180.0000	0.03	3.00	7.61	155.00	1.556	19	1.21	0.57	0.5000
RR90-17-DP	300.0000	0.04	-5.09	-6.41	155.00	1.556	19	4.77	2.31	0.5000
RR90-17-DP	300.0000	0.04	-8.09	-1.21	155.00	1.556	19	4.77	2.31	0.5000
RR90-17-DP	60.0000	0.04	8.09	-1.21	155.00	1.556	19	4.77	2.31	0.5000
RR90-17-DP	60.0000	0.04	5.09	-6.41	155.00	1.556	19	4.77	2.31	0.5000
RR90-17-DP	180.0000	0.04	-3.00	7.61	155.00	1.556	19	4.77	2.31	0.5000
RR90-17-DP	180.0000	0.04	3.00	7.61	155.00	1.556	19	4.77	2.31	0.5000
ATMAP1412D-1-A20 Amplifier	300.0000	0.02	-6.59	-3.81	155.00	1.556	19	1.31	0.57	0.5000
ATMAP1412D-1-A20 Amplifier	60.0000	0.02	6.59	-3.81	155.00	1.556	19	1.31	0.57	0.5000
ATMAP1412D-1-A20 Amplifier	180.0000	0.02	0.00	7.61	155.00	1.556	19	1.31	0.57	0.5000
APX16DWV-16WVS	300.0000	0.07	-6.59	-3.81	155.00	1.556	19	7.52	2.49	0.5000
APX16DWV-16WVS	60.0000	0.07	6.59	-3.81	155.00	1.556	19	7.52	2.49	0.5000
APX16DWV-16WVS	180.0000	0.07	0.00	7.61	155.00	1.556	19	7.52	2.49	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	155.00	1.556	19	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	155.00	1.556	19	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	155.00	1.556	19	20.60	20.60	0.5000
DC6-48-60-18-8F	90.0000	0.04	10.38	5.99	168.00	1.592	20	1.46	1.46	0.5000
RRUS-11	210.0000	0.15	-10.38	5.99	168.00	1.592	20	6.34	2.82	0.5000
RRUS-11	330.0000	0.15	-0.00	-11.98	168.00	1.592	20	6.34	2.82	0.5000
RRUS-11	90.0000	0.15	10.38	5.99	168.00	1.592	20	6.34	2.82	0.5000
SBNH-1D6565C	90.0000	0.25	10.38	5.99	168.00	1.592	20	24.13	16.58	0.5000
P65-17-XLH-RR	210.0000	0.17	-10.38	5.99	168.00	1.592	20	24.17	14.77	0.5000
P65-17-XLH-RR	330.0000	0.17	-0.00	-11.98	168.00	1.592	20	24.17	14.77	0.5000
LGP21900	210.0000	0.01	-10.38	5.99	168.00	1.592	20	0.60	0.33	0.5000
LGP21900	330.0000	0.01	-0.00	-11.98	168.00	1.592	20	0.60	0.33	0.5000
LGP21900	90.0000	0.01	10.38	5.99	168.00	1.592	20	0.60	0.33	0.5000
TT19-08BP111-001	210.0000	0.02	-10.38	5.99	168.00	1.592	20	0.76	0.62	0.5000

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
TT19-08BP111-001	330.0000	0.02	-0.00	-11.98	168.00	1.592	20	0.76	0.62	0.5000
TT19-08BP111-001	90.0000	0.02	10.38	5.99	168.00	1.592	20	0.76	0.62	0.5000
860-10025 RCU	240.0000	0.00	-10.38	5.99	168.00	1.592	20	0.14	0.16	0.5000
860-10025 RCU	360.0000	0.00	-0.00	-11.98	168.00	1.592	20	0.14	0.16	0.5000
860-10025 RCU	120.0000	0.00	10.38	5.99	168.00	1.592	20	0.14	0.16	0.5000
800-10121	240.0000	0.08	-10.38	5.99	168.00	1.592	20	6.04	3.64	0.5000
800-10121	360.0000	0.08	-0.00	-11.98	168.00	1.592	20	6.04	3.64	0.5000
800-10121	120.0000	0.08	10.38	5.99	168.00	1.592	20	6.04	3.64	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	168.00	1.592	20	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	168.00	1.592	20	20.60	20.60	0.5000
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.65	0.00	0.00	168.00	1.592	20	20.60	20.60	0.5000
DTMABP7811VG12A	210.0000	0.03	-10.38	5.99	168.00	1.592	20	1.28	0.49	0.5000
DTMABP7811VG12A	330.0000	0.03	-0.00	-11.98	168.00	1.592	20	1.28	0.49	0.5000
DTMABP7811VG12A	90.0000	0.03	10.38	5.99	168.00	1.592	20	1.28	0.49	0.5000
Powerwave 1001940	210.0000	0.01	-10.38	5.99	168.00	1.592	20	0.12	0.30	0.5000
Powerwave 1001940	330.0000	0.01	-0.00	-11.98	168.00	1.592	20	0.12	0.30	0.5000
Powerwave 1001940	90.0000	0.01	10.38	5.99	168.00	1.592	20	0.12	0.30	0.5000
APXV18-206517S-C	0.0000	0.05	0.00	-3.97	177.00	1.616	20	5.62	3.47	0.5000
	Sum Weight:	11.36								

Discrete Appurtenance Pressures - Service $G_H = 1.118$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
800 MHz Filter	300.0000	0.01	-7.44	-4.29	123.00	1.456	13	0.52	0.38
800 MHz Filter	60.0000	0.01	7.44	-4.29	123.00	1.456	13	0.52	0.38
800 MHz Filter	180.0000	0.01	0.00	8.59	123.00	1.456	13	0.52	0.38
PCS 1900 MHz 4x45W-65MHz	300.0000	0.06	-7.44	-4.29	123.00	1.456	13	2.73	2.61
PCS 1900 MHz 4x45W-65MHz	60.0000	0.06	7.44	-4.29	123.00	1.456	13	2.73	2.61
PCS 1900 MHz 4x45W-65MHz	180.0000	0.06	0.00	8.59	123.00	1.456	13	2.73	2.61
APXVSPP18-C-A20	60.0000	0.06	7.44	-4.29	123.00	1.456	13	8.40	5.28
APXV9R20B-C	300.0000	0.06	-7.44	-4.29	123.00	1.456	13	9.93	6.09
APXV9R20B-C	180.0000	0.06	0.00	8.59	123.00	1.456	13	9.93	6.09
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	123.00	1.456	13	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	123.00	1.456	13	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	123.00	1.456	13	15.00	15.00
BXA-70063-6CF	300.0000	0.02	-6.88	-3.97	144.00	1.523	14	7.73	4.16
BXA-70063-6CF	60.0000	0.02	6.88	-3.97	144.00	1.523	14	7.73	4.16
BXA-70063-6CF	180.0000	0.02	0.00	7.94	144.00	1.523	14	7.73	4.16
948F85T4E-M	300.0000	0.01	-4.88	-7.44	144.00	1.523	14	1.82	3.27
948F85T4E-M	60.0000	0.01	8.88	-0.51	144.00	1.523	14	1.82	3.27
948F85T4E-M	180.0000	0.01	-4.00	7.94	144.00	1.523	14	1.82	3.27
APL868013-42TO	300.0000	0.01	-3.88	-9.17	144.00	1.523	14	2.87	3.73
APL868013-42TO	300.0000	0.01	-9.88	1.22	144.00	1.523	14	2.87	3.73
APL868013-42TO	60.0000	0.01	9.88	1.22	144.00	1.523	14	2.87	3.73
APL868013-42TO	60.0000	0.01	3.88	-9.17	144.00	1.523	14	2.87	3.73
APL868013-42TO	180.0000	0.01	-6.00	7.94	144.00	1.523	14	2.87	3.73

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
APL868013-42TO	180.0000	0.01	6.00	7.94	144.00	1.523	14	2.87	3.73
FD9R600/2C-3L Diplexer	0.0000	0.00	0.00	-10.89	144.00	1.523	14	0.36	0.08
FD9R600/2C-3L Diplexer	120.0000	0.00	9.43	5.44	144.00	1.523	14	0.36	0.08
FD9R600/2C-3L Diplexer	240.0000	0.00	-9.43	5.44	144.00	1.523	14	0.36	0.08
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	144.00	1.523	14	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	144.00	1.523	14	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	144.00	1.523	14	15.00	15.00
7250.03	300.0000	0.02	-9.59	1.39	155.00	1.556	14	4.00	1.87
7250.03	300.0000	0.02	-3.59	-9.00	155.00	1.556	14	4.00	1.87
7250.03	60.0000	0.02	3.59	-9.00	155.00	1.556	14	4.00	1.87
7250.03	60.0000	0.02	9.59	1.39	155.00	1.556	14	4.00	1.87
7250.03	180.0000	0.02	6.00	7.61	155.00	1.556	14	4.00	1.87
7250.03	180.0000	0.02	-6.00	7.61	155.00	1.556	14	4.00	1.87
TMA	300.0000	0.02	-5.09	-6.41	155.00	1.556	14	1.06	0.45
TMA	300.0000	0.02	-8.09	-1.21	155.00	1.556	14	1.06	0.45
TMA	60.0000	0.02	8.09	-1.21	155.00	1.556	14	1.06	0.45
TMA	60.0000	0.02	5.09	-6.41	155.00	1.556	14	1.06	0.45
TMA	180.0000	0.02	-3.00	7.61	155.00	1.556	14	1.06	0.45
TMA	180.0000	0.02	3.00	7.61	155.00	1.556	14	1.06	0.45
RR90-17-DP	300.0000	0.02	-5.09	-6.41	155.00	1.556	14	4.36	1.97
RR90-17-DP	300.0000	0.02	-8.09	-1.21	155.00	1.556	14	4.36	1.97
RR90-17-DP	60.0000	0.02	8.09	-1.21	155.00	1.556	14	4.36	1.97
RR90-17-DP	60.0000	0.02	5.09	-6.41	155.00	1.556	14	4.36	1.97
RR90-17-DP	180.0000	0.02	-3.00	7.61	155.00	1.556	14	4.36	1.97
RR90-17-DP	180.0000	0.02	3.00	7.61	155.00	1.556	14	4.36	1.97
ATMAP1412D-1-A20 Amplifier	300.0000	0.01	-6.59	-3.81	155.00	1.556	14	1.17	0.47
ATMAP1412D-1-A20 Amplifier	60.0000	0.01	6.59	-3.81	155.00	1.556	14	1.17	0.47
ATMAP1412D-1-A20 Amplifier	180.0000	0.01	0.00	7.61	155.00	1.556	14	1.17	0.47
APX16DWV-16WVS	300.0000	0.04	-6.59	-3.81	155.00	1.556	14	7.07	2.15
APX16DWV-16WVS	60.0000	0.04	6.59	-3.81	155.00	1.556	14	7.07	2.15
APX16DWV-16WVS	180.0000	0.04	0.00	7.61	155.00	1.556	14	7.07	2.15
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	155.00	1.556	14	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	155.00	1.556	14	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	155.00	1.556	14	15.00	15.00
DC6-48-60-18-8F	90.0000	0.02	10.38	5.99	168.00	1.592	15	1.27	1.27
RRUS-11	210.0000	0.12	-10.38	5.99	168.00	1.592	15	5.88	2.49
RRUS-11	330.0000	0.12	-0.00	-11.98	168.00	1.592	15	5.88	2.49
RRUS-11	90.0000	0.12	10.38	5.99	168.00	1.592	15	5.88	2.49
SBNH-1D6565C	90.0000	0.12	10.38	5.99	168.00	1.592	15	22.89	15.39
P65-17-XLH-RR	210.0000	0.04	-10.38	5.99	168.00	1.592	15	22.93	13.60
P65-17-XLH-RR	330.0000	0.04	-0.00	-11.98	168.00	1.592	15	22.93	13.60
LGP21900	210.0000	0.01	-10.38	5.99	168.00	1.592	15	0.47	0.23
LGP21900	330.0000	0.01	-0.00	-11.98	168.00	1.592	15	0.47	0.23
LGP21900	90.0000	0.01	10.38	5.99	168.00	1.592	15	0.47	0.23
TT19-08BP111-001	210.0000	0.02	-10.38	5.99	168.00	1.592	15	0.64	0.52
TT19-08BP111-001	330.0000	0.02	-0.00	-11.98	168.00	1.592	15	0.64	0.52
TT19-08BP111-001	90.0000	0.02	10.38	5.99	168.00	1.592	15	0.64	0.52
860-10025 RCU	240.0000	0.00	-10.38	5.99	168.00	1.592	15	0.08	0.09
860-10025 RCU	360.0000	0.00	-0.00	-11.98	168.00	1.592	15	0.08	0.09

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
860-10025 RCU	120.0000	0.00	10.38	5.99	168.00	1.592	15	0.08	0.09
800-10121	240.0000	0.05	-10.38	5.99	168.00	1.592	15	5.62	3.29
800-10121	360.0000	0.05	-0.00	-11.98	168.00	1.592	15	5.62	3.29
800-10121	120.0000	0.05	10.38	5.99	168.00	1.592	15	5.62	3.29
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	168.00	1.592	15	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	168.00	1.592	15	15.00	15.00
Pirod 15' T-Frame Sector Mount (1)	0.0000	0.50	0.00	0.00	168.00	1.592	15	15.00	15.00
DTMABP7811VG12A	210.0000	0.02	-10.38	5.99	168.00	1.592	15	1.14	0.38
DTMABP7811VG12A	330.0000	0.02	-0.00	-11.98	168.00	1.592	15	1.14	0.38
DTMABP7811VG12A	90.0000	0.02	10.38	5.99	168.00	1.592	15	1.14	0.38
Powerwave 1001940	210.0000	0.00	-10.38	5.99	168.00	1.592	15	0.08	0.21
Powerwave 1001940	330.0000	0.00	-0.00	-11.98	168.00	1.592	15	0.08	0.21
Powerwave 1001940	90.0000	0.00	10.38	5.99	168.00	1.592	15	0.08	0.21
APXV18-206517S-C	0.0000	0.03	0.00	-3.97	177.00	1.616	15	5.17	3.04
	Sum Weight:	7.92							

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	13.56					
Bracing Weight	15.05					
Total Member Self-Weight	28.61			9.70	-25.04	
Total Weight	43.42			9.70	-25.04	
Wind 0 deg - No Ice		-0.01	-50.14	-5143.92	-24.02	63.53
Wind 30 deg - No Ice		24.22	-42.08	-4341.91	-2526.19	65.53
Wind 45 deg - No Ice		34.08	-34.17	-3527.96	-3547.62	60.69
Wind 60 deg - No Ice		41.52	-24.03	-2480.74	-4321.17	51.80
Wind 90 deg - No Ice		48.46	0.01	10.72	-5029.11	25.48
Wind 120 deg - No Ice		43.32	25.08	2587.40	-4470.25	-8.75
Wind 135 deg - No Ice		34.09	34.18	3548.81	-3549.07	-24.91
Wind 150 deg - No Ice		24.24	42.08	4362.33	-2527.96	-40.05
Wind 180 deg - No Ice		0.01	48.07	4992.36	-26.06	-60.10
Wind 210 deg - No Ice		-24.22	42.08	4361.31	2476.11	-65.53
Wind 225 deg - No Ice		-34.08	34.17	3547.36	3497.54	-60.69
Wind 240 deg - No Ice		-43.31	25.06	2585.63	4419.15	-54.79
Wind 270 deg - No Ice		-48.46	-0.01	8.68	4979.03	-25.48
Wind 300 deg - No Ice		-41.53	-24.04	-2482.51	4272.11	8.30
Wind 315 deg - No Ice		-34.09	-34.18	-3529.40	3498.98	24.91
Wind 330 deg - No Ice		-24.24	-42.08	-4342.93	2477.88	40.05
Member Ice	9.35					
Total Weight Ice	74.60			36.29	-83.52	
Wind 0 deg - Ice		-0.01	-58.39	-5857.39	-82.81	73.11
Wind 30 deg - Ice		26.26	-45.56	-4619.44	-2763.07	69.64
Wind 45 deg - Ice		36.45	-36.52	-3703.92	-3812.38	63.70
Wind 60 deg - Ice		43.81	-25.34	-2565.07	-4576.01	53.72
Wind 90 deg - Ice		52.52	0.01	37.00	-5443.85	27.88
Wind 120 deg - Ice		50.49	29.20	2983.75	-5174.05	-9.05
Wind 135 deg - Ice		36.46	36.53	3777.51	-3813.38	-25.19
Wind 150 deg - Ice		26.27	45.57	4692.73	-2764.30	-41.76
Wind 180 deg - Ice		0.01	50.69	5240.25	-84.23	-61.39
Wind 210 deg - Ice		-26.26	45.56	4692.02	2596.03	-69.64

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 225 deg - Ice		-36.45	36.52	3776.50	3645.34	-63.70
Wind 240 deg - Ice		-50.48	29.19	2982.52	5006.31	-64.06
Wind 270 deg - Ice		-52.52	-0.01	35.58	5276.82	-27.88
Wind 300 deg - Ice		-43.82	-25.35	-2566.30	4409.69	7.67
Wind 315 deg - Ice		-36.46	-36.53	-3704.93	3646.35	25.19
Wind 330 deg - Ice		-26.27	-45.57	-4620.15	2597.27	41.76
Total Weight	43.42			9.70	-25.04	
Wind 0 deg - Service		-0.00	-28.20	-2898.43	-0.46	35.74
Wind 30 deg - Service		13.63	-23.67	-2447.30	-1407.94	36.86
Wind 45 deg - Service		19.17	-19.22	-1989.45	-1982.49	34.14
Wind 60 deg - Service		23.35	-13.52	-1400.40	-2417.61	29.14
Wind 90 deg - Service		27.26	0.00	1.05	-2815.83	14.33
Wind 120 deg - Service		24.37	14.11	1450.43	-2501.47	-4.92
Wind 135 deg - Service		19.18	19.23	1991.22	-1983.30	-14.01
Wind 150 deg - Service		13.63	23.67	2448.84	-1408.93	-22.53
Wind 180 deg - Service		0.00	27.04	2803.22	-1.61	-33.81
Wind 210 deg - Service		-13.63	23.67	2448.26	1405.86	-36.86
Wind 225 deg - Service		-19.17	19.22	1990.41	1980.41	-34.14
Wind 240 deg - Service		-24.36	14.10	1449.44	2498.82	-30.82
Wind 270 deg - Service		-27.26	-0.00	-0.09	2813.75	-14.33
Wind 300 deg - Service		-23.36	-13.52	-1401.39	2416.11	4.67
Wind 315 deg - Service		-19.18	-19.23	-1990.27	1981.23	14.01
Wind 330 deg - Service		-13.63	-23.67	-2447.88	1406.85	22.53

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 45 deg - No Ice
5	Dead+Wind 60 deg - No Ice
6	Dead+Wind 90 deg - No Ice
7	Dead+Wind 120 deg - No Ice
8	Dead+Wind 135 deg - No Ice
9	Dead+Wind 150 deg - No Ice
10	Dead+Wind 180 deg - No Ice
11	Dead+Wind 210 deg - No Ice
12	Dead+Wind 225 deg - No Ice
13	Dead+Wind 240 deg - No Ice
14	Dead+Wind 270 deg - No Ice
15	Dead+Wind 300 deg - No Ice
16	Dead+Wind 315 deg - No Ice
17	Dead+Wind 330 deg - No Ice
18	Dead+Ice+Temp
19	Dead+Wind 0 deg+Ice+Temp
20	Dead+Wind 30 deg+Ice+Temp
21	Dead+Wind 45 deg+Ice+Temp
22	Dead+Wind 60 deg+Ice+Temp
23	Dead+Wind 90 deg+Ice+Temp
24	Dead+Wind 120 deg+Ice+Temp
25	Dead+Wind 135 deg+Ice+Temp
26	Dead+Wind 150 deg+Ice+Temp
27	Dead+Wind 180 deg+Ice+Temp
28	Dead+Wind 210 deg+Ice+Temp

Comb. No.	Description
29	Dead+Wind 225 deg+Ice+Temp
30	Dead+Wind 240 deg+Ice+Temp
31	Dead+Wind 270 deg+Ice+Temp
32	Dead+Wind 300 deg+Ice+Temp
33	Dead+Wind 315 deg+Ice+Temp
34	Dead+Wind 330 deg+Ice+Temp
35	Dead+Wind 0 deg - Service
36	Dead+Wind 30 deg - Service
37	Dead+Wind 45 deg - Service
38	Dead+Wind 60 deg - Service
39	Dead+Wind 90 deg - Service
40	Dead+Wind 120 deg - Service
41	Dead+Wind 135 deg - Service
42	Dead+Wind 150 deg - Service
43	Dead+Wind 180 deg - Service
44	Dead+Wind 210 deg - Service
45	Dead+Wind 225 deg - Service
46	Dead+Wind 240 deg - Service
47	Dead+Wind 270 deg - Service
48	Dead+Wind 300 deg - Service
49	Dead+Wind 315 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	188 - 180	Leg	Max Tension	15	0.21	-0.01	0.00
			Max. Compression	19	-0.81	0.01	0.08
			Max. Mx	13	-0.46	0.06	-0.06
			Max. My	10	0.14	-0.01	-0.09
			Max. Vy	30	-0.05	0.03	0.00
			Max. Vx	2	-0.04	0.01	0.09
		Diagonal	Max Tension	22	0.44	0.00	0.00
			Max. Compression	30	-0.53	0.00	0.00
			Max. Mx	22	-0.29	0.01	0.00
			Max. My	6	-0.22	0.00	0.00
			Max. Vy	22	0.01	0.01	0.00
			Max. Vx	6	0.00	0.00	0.00
		Top Girt	Max Tension	2	0.10	0.00	0.00
			Max. Compression	10	-0.12	0.00	0.00
			Max. Mx	18	-0.02	-0.04	0.00
			Max. My	19	-0.08	0.00	-0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	5	7.62	-0.41	0.00
			Max. Compression	19	-12.95	0.10	-0.01
			Max. Mx	15	3.96	1.12	-0.02
			Max. My	11	-0.35	-0.02	-1.17
			Max. Vy	15	-0.87	-0.60	-0.02
			Max. Vx	3	-0.86	-0.02	-0.55
		Diagonal	Max Tension	26	2.84	0.00	0.00
			Max. Compression	26	-2.82	0.00	0.00
			Max. Mx	20	1.16	0.01	0.00
			Max. My	32	-2.50	0.01	-0.00
			Max. Vy	20	0.01	0.01	0.00
			Max. Vx	32	0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	10	27.76	-0.32	0.04

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	24	-39.78	0.66	0.01
			Max. Mx	15	26.65	0.96	-0.01
			Max. My	11	-3.60	-0.02	-0.93
			Max. Vy	15	0.86	-0.54	-0.01
			Max. Vx	3	0.85	-0.02	-0.47
		Diagonal	Max Tension	34	5.22	0.00	0.00
			Max. Compression	34	-5.31	0.00	0.00
			Max. Mx	24	4.07	0.05	0.00
			Max. My	26	-4.53	0.01	0.01
			Max. Vy	24	-0.02	0.05	0.00
			Max. Vx	26	-0.00	0.00	0.00
T4	140 - 120	Leg	Max Tension	10	54.38	-0.51	0.06
			Max. Compression	24	-74.49	0.61	0.00
			Max. Mx	15	35.72	-0.76	-0.01
			Max. My	3	-4.95	-0.03	-0.70
			Max. Vy	15	0.46	-0.69	-0.00
			Max. Vx	11	-0.50	-0.03	0.70
		Diagonal	Max Tension	34	6.66	0.00	0.00
			Max. Compression	19	-6.89	0.00	0.00
			Max. Mx	24	5.13	0.07	0.01
			Max. My	26	-5.89	0.02	0.01
			Max. Vy	22	0.03	0.07	-0.01
			Max. Vx	26	-0.00	0.00	0.00
T5	120 - 100	Leg	Max Tension	10	82.98	-0.26	0.03
			Max. Compression	24	-112.15	0.52	0.01
			Max. Mx	15	62.69	-0.69	-0.00
			Max. My	3	-5.19	-0.03	-0.70
			Max. Vy	15	-0.13	-0.69	-0.00
			Max. Vx	11	0.16	-0.03	0.70
		Diagonal	Max Tension	34	7.99	0.00	0.00
			Max. Compression	34	-7.96	0.00	0.00
			Max. Mx	21	5.66	0.08	0.01
			Max. My	27	-6.84	0.04	0.02
			Max. Vy	21	0.04	0.08	0.01
			Max. Vx	27	-0.00	0.00	0.00
T6	100 - 80	Leg	Max Tension	10	108.42	-0.42	0.11
			Max. Compression	24	-146.08	0.70	0.02
			Max. Mx	32	103.27	-0.80	-0.01
			Max. My	20	-13.26	-0.00	-0.81
			Max. Vy	32	0.12	-0.80	-0.01
			Max. Vx	20	0.17	-0.00	-0.81
		Diagonal	Max Tension	34	9.48	0.00	0.00
			Max. Compression	19	-9.68	0.00	0.00
			Max. Mx	24	7.77	0.14	0.01
			Max. My	19	-9.42	0.03	-0.03
			Max. Vy	21	0.05	0.13	-0.02
			Max. Vx	19	0.00	0.00	0.00
T7	80 - 60	Leg	Max Tension	10	135.62	-0.43	0.10
			Max. Compression	24	-183.68	0.49	0.01
			Max. Mx	32	130.26	-1.12	-0.01
			Max. My	20	-16.11	0.13	-0.75
			Max. Vy	32	0.16	-1.12	-0.01
			Max. Vx	3	0.15	-0.05	-0.73
		Diagonal	Max Tension	34	10.58	0.00	0.00
			Max. Compression	19	-10.92	0.00	0.00
			Max. Mx	24	8.63	0.22	0.02
			Max. My	19	-10.46	0.05	-0.03
			Max. Vy	21	0.07	0.20	-0.02
			Max. Vx	27	-0.00	0.00	0.00
T8	60 - 40	Leg	Max Tension	10	160.64	-1.03	0.09
			Max. Compression	24	-219.89	-0.93	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	32	154.85	-2.39	-0.01
			Max. My	20	-19.13	0.86	-1.13
			Max. Vy	30	0.36	2.00	0.07
			Max. Vx	3	0.19	-0.06	-1.11
		Diagonal	Max Tension	19	11.19	0.00	0.00
			Max. Compression	19	-11.04	0.00	0.00
			Max. Mx	24	7.79	0.23	0.02
			Max. My	19	-10.37	0.09	-0.04
			Max. Vy	22	0.08	0.22	-0.03
			Max. Vx	19	0.01	0.00	0.00
T9	40 - 20	Leg	Max Tension	10	185.83	-0.93	0.06
			Max. Compression	24	-257.34	-3.06	0.01
			Max. Mx	27	184.90	-5.84	0.13
			Max. My	20	-21.26	-1.70	-1.06
			Max. Vy	32	0.87	-5.84	-0.01
			Max. Vx	3	-0.15	-0.07	-0.97
		Diagonal	Max Tension	34	13.57	0.00	0.00
			Max. Compression	19	-12.93	0.00	0.00
			Max. Mx	24	9.24	0.26	0.02
			Max. My	19	-11.25	0.11	-0.04
			Max. Vy	21	0.09	0.26	-0.03
			Max. Vx	20	0.01	0.00	0.00
T10	20 - 0	Leg	Max Tension	10	210.39	-0.95	0.08
			Max. Compression	24	-295.12	0.00	-0.00
			Max. Mx	19	-267.74	6.06	-0.04
			Max. My	20	-24.42	5.05	-2.17
			Max. Vy	32	-1.08	-5.84	-0.01
			Max. Vx	20	-0.34	5.05	-2.17
		Diagonal	Max Tension	34	15.86	0.00	0.00
			Max. Compression	19	-15.17	0.00	0.00
			Max. Mx	21	5.75	0.40	0.04
			Max. My	19	-15.10	0.28	-0.06
			Max. Vy	21	0.11	0.40	0.04
			Max. Vx	19	0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	30	294.44	26.62	-13.61
	Max. H_x	13	251.06	26.93	-14.09
	Max. H_z	21	-213.57	-28.99	16.36
	Min. Vert	22	-217.82	-29.84	15.85
	Min. H_x	22	-217.82	-29.84	15.85
	Min. H_z	13	251.06	26.93	-14.09
Leg B	Max. Vert	24	301.20	-25.84	-15.17
	Max. H_x	32	-211.18	29.05	16.97
	Max. H_z	33	-206.94	27.89	18.05
	Min. Vert	15	-213.84	23.10	13.56
	Min. H_x	7	253.14	-26.23	-15.38
	Min. H_z	8	238.49	-23.83	-15.60
Leg A	Max. Vert	19	295.86	1.74	29.92
	Max. H_x	32	143.60	3.79	10.74
	Max. H_z	2	252.17	1.47	30.44
	Min. Vert	27	-217.58	-1.37	-33.80
	Min. H_x	24	-113.18	-4.36	-21.16

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	27	-217.58	-1.37	-33.80

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	43.42	0.00	-0.00	9.70	-25.04	-0.00
Dead+Wind 0 deg - No Ice	43.42	-0.01	-50.14	-5154.53	-24.19	63.62
Dead+Wind 30 deg - No Ice	43.42	24.22	-42.07	-4350.82	-2531.43	65.63
Dead+Wind 45 deg - No Ice	43.42	34.08	-34.17	-3535.15	-3554.91	60.77
Dead+Wind 60 deg - No Ice	43.42	41.51	-24.03	-2485.76	-4330.03	51.86
Dead+Wind 90 deg - No Ice	43.42	48.46	0.01	10.82	-5039.43	25.51
Dead+Wind 120 deg - No Ice	43.42	43.31	25.07	2592.71	-4479.46	-8.77
Dead+Wind 135 deg - No Ice	43.42	34.09	34.18	3556.06	-3556.44	-24.95
Dead+Wind 150 deg - No Ice	43.42	24.24	42.08	4371.23	-2533.25	-40.11
Dead+Wind 180 deg - No Ice	43.42	0.01	48.07	5002.57	-26.21	-60.18
Dead+Wind 210 deg - No Ice	43.42	-24.22	42.07	4370.31	2481.15	-65.63
Dead+Wind 225 deg - No Ice	43.42	-34.08	34.17	3554.72	3504.72	-60.77
Dead+Wind 240 deg - No Ice	43.42	-43.31	25.06	2591.04	4428.20	-54.86
Dead+Wind 270 deg - No Ice	43.42	-48.46	-0.01	8.78	4989.25	-25.51
Dead+Wind 300 deg - No Ice	43.42	-41.52	-24.04	-2487.61	4280.82	8.32
Dead+Wind 315 deg - No Ice	43.42	-34.09	-34.18	-3536.69	3506.07	24.95
Dead+Wind 330 deg - No Ice	43.42	-24.24	-42.08	-4351.92	2482.85	40.11
Dead+Ice+Temp	74.60	-0.00	-0.00	36.35	-83.67	0.00
Dead+Wind 0 deg+Ice+Temp	74.60	-0.01	-58.38	-5876.56	-83.21	73.40
Dead+Wind 30 deg+Ice+Temp	74.60	26.25	-45.55	-4634.60	-2772.16	69.92
Dead+Wind 45 deg+Ice+Temp	74.60	36.45	-36.51	-3716.05	-3824.88	63.95
Dead+Wind 60 deg+Ice+Temp	74.60	43.81	-25.34	-2573.44	-4591.01	53.93
Dead+Wind 90 deg+Ice+Temp	74.60	52.51	0.01	37.19	-5461.65	27.97
Dead+Wind 120 deg+Ice+Temp	74.60	50.48	29.19	2993.52	-5191.13	-9.11
Dead+Wind 135 deg+Ice+Temp	74.60	36.45	36.52	3789.86	-3825.95	-25.30
Dead+Wind 150 deg+Ice+Temp	74.60	26.26	45.56	4708.04	-2773.44	-41.94
Dead+Wind 180 deg+Ice+Temp	74.60	0.01	50.68	5257.41	-84.58	-61.64
Dead+Wind 210 deg+Ice+Temp	74.60	-26.25	45.55	4707.44	2604.51	-69.92
Dead+Wind 225 deg+Ice+Temp	74.60	-36.45	36.51	3788.97	3657.30	-63.96
Dead+Wind 240 deg+Ice+Temp	74.60	-50.47	29.18	2992.35	5022.59	-64.29
Dead+Wind 270 deg+Ice+Temp	74.60	-52.51	-0.01	35.78	5294.10	-27.98
Dead+Wind 300 deg+Ice+Temp	74.60	-43.81	-25.35	-2574.75	4424.12	7.71
Dead+Wind 315 deg+Ice+Temp	74.60	-36.45	-36.52	-3717.15	3658.22	25.30
Dead+Wind 330 deg+Ice+Temp	74.60	-26.26	-45.56	-4635.40	2605.65	41.94
Dead+Wind 0 deg - Service	43.42	-0.00	-28.20	-2895.17	-24.55	35.78
Dead+Wind 30 deg - Service	43.42	13.62	-23.67	-2443.10	-1434.90	36.91
Dead+Wind 45 deg - Service	43.42	19.17	-19.22	-1984.30	-2010.62	34.19
Dead+Wind 60 deg - Service	43.42	23.35	-13.51	-1394.02	-2446.63	29.17
Dead+Wind 90 deg - Service	43.42	27.26	0.00	10.32	-2845.67	14.34
Dead+Wind 120 deg - Service	43.42	24.36	14.10	1462.66	-2530.67	-4.92
Dead+Wind 135 deg - Service	43.42	19.17	19.22	2004.56	-2011.46	-14.03
Dead+Wind 150 deg - Service	43.42	13.63	23.67	2463.10	-1435.91	-22.56
Dead+Wind 180 deg - Service	43.42	0.00	27.04	2818.23	-25.70	-33.85
Dead+Wind 210 deg - Service	43.42	-13.62	23.66	2462.55	1384.68	-36.91
Dead+Wind 225 deg - Service	43.42	-19.17	19.22	2003.77	1960.43	-34.19
Dead+Wind 240 deg - Service	43.42	-24.36	14.10	1461.69	2479.90	-30.85
Dead+Wind 270 deg - Service	43.42	-27.26	-0.00	9.17	2795.49	-14.34
Dead+Wind 300 deg - Service	43.42	-23.36	-13.52	-1395.04	2397.01	4.68
Dead+Wind 315 deg - Service	43.42	-19.17	-19.22	-1985.14	1961.22	14.03
Dead+Wind 330 deg - Service	43.42	-13.63	-23.67	-2443.70	1385.66	22.56

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-43.42	0.00	-0.00	43.42	0.00	0.000%
2	-0.01	-43.42	-50.14	0.01	43.42	50.14	0.008%
3	24.22	-43.42	-42.08	-24.22	43.42	42.07	0.008%
4	34.08	-43.42	-34.17	-34.08	43.42	34.17	0.008%
5	41.52	-43.42	-24.03	-41.51	43.42	24.03	0.009%
6	48.46	-43.42	0.01	-48.46	43.42	-0.01	0.008%
7	43.32	-43.42	25.08	-43.31	43.42	-25.07	0.008%
8	34.09	-43.42	34.18	-34.09	43.42	-34.18	0.008%
9	24.24	-43.42	42.08	-24.24	43.42	-42.08	0.008%
10	0.01	-43.42	48.07	-0.01	43.42	-48.07	0.009%
11	-24.22	-43.42	42.08	24.22	43.42	-42.07	0.008%
12	-34.08	-43.42	34.17	34.08	43.42	-34.17	0.008%
13	-43.31	-43.42	25.06	43.31	43.42	-25.06	0.008%
14	-48.46	-43.42	-0.01	48.46	43.42	0.01	0.008%
15	-41.53	-43.42	-24.04	41.52	43.42	24.04	0.009%
16	-34.09	-43.42	-34.18	34.09	43.42	34.18	0.008%
17	-24.24	-43.42	-42.08	24.24	43.42	42.08	0.008%
18	0.00	-74.60	0.00	0.00	74.60	0.00	0.000%
19	-0.01	-74.60	-58.39	0.01	74.60	58.38	0.011%
20	26.26	-74.60	-45.56	-26.25	74.60	45.55	0.011%
21	36.45	-74.60	-36.52	-36.45	74.60	36.51	0.011%
22	43.81	-74.60	-25.34	-43.81	74.60	25.34	0.011%
23	52.52	-74.60	0.01	-52.51	74.60	-0.01	0.011%
24	50.49	-74.60	29.20	-50.48	74.60	-29.19	0.011%
25	36.46	-74.60	36.53	-36.45	74.60	-36.52	0.010%
26	26.27	-74.60	45.57	-26.26	74.60	-45.56	0.011%
27	0.01	-74.60	50.69	-0.01	74.60	-50.68	0.011%
28	-26.26	-74.60	45.56	26.25	74.60	-45.55	0.011%
29	-36.45	-74.60	36.52	36.45	74.60	-36.51	0.010%
30	-50.48	-74.60	29.19	50.47	74.60	-29.18	0.011%
31	-52.52	-74.60	-0.01	52.51	74.60	0.01	0.010%
32	-43.82	-74.60	-25.35	43.81	74.60	25.35	0.011%
33	-36.46	-74.60	-36.53	36.45	74.60	36.52	0.011%
34	-26.27	-74.60	-45.57	26.26	74.60	45.56	0.011%
35	-0.00	-43.42	-28.20	0.00	43.42	28.20	0.006%
36	13.63	-43.42	-23.67	-13.62	43.42	23.67	0.006%
37	19.17	-43.42	-19.22	-19.17	43.42	19.22	0.006%
38	23.35	-43.42	-13.52	-23.35	43.42	13.51	0.006%
39	27.26	-43.42	0.00	-27.26	43.42	-0.00	0.006%
40	24.37	-43.42	14.11	-24.36	43.42	-14.10	0.006%
41	19.18	-43.42	19.23	-19.17	43.42	-19.22	0.006%
42	13.63	-43.42	23.67	-13.63	43.42	-23.67	0.006%
43	0.00	-43.42	27.04	-0.00	43.42	-27.04	0.006%
44	-13.63	-43.42	23.67	13.62	43.42	-23.66	0.006%
45	-19.17	-43.42	19.22	19.17	43.42	-19.22	0.006%
46	-24.36	-43.42	14.10	24.36	43.42	-14.10	0.006%
47	-27.26	-43.42	-0.00	27.26	43.42	0.00	0.006%
48	-23.36	-43.42	-13.52	23.36	43.42	13.52	0.006%
49	-19.18	-43.42	-19.23	19.17	43.42	19.22	0.006%
50	-13.63	-43.42	-23.67	13.63	43.42	23.67	0.006%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00026513
3	Yes	4	0.00000001	0.00028614
4	Yes	4	0.00000001	0.00029934
5	Yes	4	0.00000001	0.00030440
6	Yes	4	0.00000001	0.00028524
7	Yes	4	0.00000001	0.00026463
8	Yes	4	0.00000001	0.00027162
9	Yes	4	0.00000001	0.00028567
10	Yes	4	0.00000001	0.00030472
11	Yes	4	0.00000001	0.00028640
12	Yes	4	0.00000001	0.00027220
13	Yes	4	0.00000001	0.00026487
14	Yes	4	0.00000001	0.00028513
15	Yes	4	0.00000001	0.00030405
16	Yes	4	0.00000001	0.00029870
17	Yes	4	0.00000001	0.00028533
18	Yes	4	0.00000001	0.00004224
19	Yes	4	0.00020877	0.00047035
20	Yes	4	0.00021982	0.00049490
21	Yes	4	0.00022607	0.00050856
22	Yes	4	0.00022827	0.00051336
23	Yes	4	0.00021888	0.00049240
24	Yes	4	0.00020853	0.00046920
25	Yes	4	0.00021245	0.00047834
26	Yes	4	0.00021907	0.00049273
27	Yes	4	0.00022849	0.00051355
28	Yes	4	0.00021991	0.00049460
29	Yes	4	0.00021304	0.00047971
30	Yes	4	0.00020856	0.00046935
31	Yes	4	0.00021849	0.00049177
32	Yes	4	0.00022753	0.00051197
33	Yes	4	0.00022501	0.00050645
34	Yes	4	0.00021862	0.00049245
35	Yes	4	0.00000001	0.00027283
36	Yes	4	0.00000001	0.00028448
37	Yes	4	0.00000001	0.00029188
38	Yes	4	0.00000001	0.00029468
39	Yes	4	0.00000001	0.00028371
40	Yes	4	0.00000001	0.00027239
41	Yes	4	0.00000001	0.00027619
42	Yes	4	0.00000001	0.00028398
43	Yes	4	0.00000001	0.00029489
44	Yes	4	0.00000001	0.00028449
45	Yes	4	0.00000001	0.00027653
46	Yes	4	0.00000001	0.00027242
47	Yes	4	0.00000001	0.00028340
48	Yes	4	0.00000001	0.00029416
49	Yes	4	0.00000001	0.00029115
50	Yes	4	0.00000001	0.00028369

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	188 - 180	6.177	40	0.2709	0.0417
T2	180 - 160	5.723	40	0.2706	0.0420
T3	160 - 140	4.579	40	0.2593	0.0419
T4	140 - 120	3.511	40	0.2311	0.0392
T5	120 - 100	2.572	40	0.1951	0.0342
T6	100 - 80	1.769	40	0.1600	0.0274
T7	80 - 60	1.131	40	0.1212	0.0211
T8	60 - 40	0.657	40	0.0861	0.0161
T9	40 - 20	0.323	40	0.0534	0.0107
T10	20 - 0	0.103	40	0.0275	0.0050

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	APXV18-206517S-C	40	5.551	0.2700	0.0421	169540
168.00	DC6-48-60-18-8F	40	5.033	0.2660	0.0422	132701
155.00	7250.03	40	4.302	0.2536	0.0415	46553
144.00	BXA-70063-6CF	40	3.715	0.2377	0.0399	37302
123.00	800 MHz Filter	40	2.705	0.2004	0.0351	37203

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	188 - 180	12.430	24	0.5422	0.0827
T2	180 - 160	11.520	24	0.5416	0.0831
T3	160 - 140	9.234	24	0.5182	0.0841
T4	140 - 120	7.102	24	0.4627	0.0795
T5	120 - 100	5.220	24	0.3923	0.0698
T6	100 - 80	3.604	24	0.3232	0.0556
T7	80 - 60	2.311	24	0.2459	0.0425
T8	60 - 40	1.347	24	0.1752	0.0323
T9	40 - 20	0.664	24	0.1091	0.0214
T10	20 - 0	0.212	24	0.0562	0.0100

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
177.00	APXV18-206517S-C	24	11.176	0.5403	0.0834	97359
168.00	DC6-48-60-18-8F	24	10.142	0.5318	0.0841	58910
155.00	7250.03	24	8.681	0.5069	0.0835	22934
144.00	BXA-70063-6CF	24	7.510	0.4757	0.0809	19072
123.00	800 MHz Filter	24	5.486	0.4028	0.0716	19205

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	188	Leg	A325N	0.6250	4	0.02	13.50	0.001 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	0.53	6.44	0.082 ✓	1.333	Bolt Shear
T2	180	Leg	A325N	0.7500	4	0.27	19.44	0.014 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	2.84	6.12	0.464 ✓	1.333	Member Bearing
T3	160	Leg	A325N	0.8750	4	3.19	26.45	0.121 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	5.31	6.44	0.824 ✓	1.333	Bolt Shear
T4	140	Leg	A325N	1.0000	4	9.08	34.56	0.263 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	6.89	6.44	1.069 ✓	1.333	Bolt Shear
T5	120	Leg	A325N	1.0000	6	10.61	34.56	0.307 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	7.99	9.28	0.861 ✓	1.333	Bolt Shear
T6	100	Leg	A325N	1.0000	8	11.82	34.56	0.342 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	9.68	9.28	1.044 ✓	1.333	Bolt Shear
T7	80	Leg	A325N	1.0000	8	15.27	34.56	0.442 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	10.92	9.28	1.178 ✓	1.333	Bolt Shear
T8	60	Leg	A325N	1.0000	8	18.59	34.56	0.538 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.7500	1	11.19	9.28	1.206 ✓	1.333	Bolt Shear
T9	40	Leg	A325N	1.0000	8	21.81	34.56	0.631 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	13.57	12.70	1.069 ✓	1.333	Member Bearing
T10	20	Leg	A325N	1.0000	10	20.19	34.56	0.584 ✓	1.333	Bolt Tension
		Diagonal	A325X	0.7500	1	15.86	13.25	1.197 ✓	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	188 - 180	ROHN 2.5 STD	8.00	4.00	50.7 K=1.00	24.247	1.7040	-0.81	41.32	0.020 ✓
T2	180 - 160	ROHN 2.5 STD	20.03	5.01	63.4 K=1.00	22.123	1.7040	-12.95	37.70	0.344 ✓
T3	160 - 140	ROHN 3 EH	20.04	6.68	70.5 K=1.00	20.840	3.0159	-39.78	62.85	0.633 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T4	140 - 120	ROHN 4 EH	20.04	6.68	54.3 K=1.00	23.670	4.4074	-74.49	104.32	0.714 ✓
T5	120 - 100	ROHN 5 EH	20.04	6.68	43.6 K=1.00	25.320	6.1120	-112.15	154.75	0.725 ✓
T6	100 - 80	ROHN 6 EHS	20.04	10.02	54.0 K=1.00	23.712	6.7133	-146.08	159.18	0.918 ✓
T7	80 - 60	ROHN 6 EH	20.03	10.02	54.8 K=1.00	23.592	8.4049	-183.68	198.29	0.926 ✓
T8	60 - 40	ROHN 8 EHS	20.04	10.02	41.2 K=1.00	25.665	9.7193	-219.89	249.44	0.882 ✓
T9	40 - 20	ROHN 8 EH	20.03	10.02	41.8 K=1.00	25.583	12.7627	-257.34	326.51	0.788 ✓
T10	20 - 0	ROHN 8 EH	20.03	10.02	41.8 K=1.00	25.582	12.7627	-295.12	326.50	0.904 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	188 - 180	L1 3/4x1 3/4x3/16	7.70	3.57	124.9 K=1.00	9.570	0.6211	-0.53	5.94	0.089 ✓
T2	180 - 160	L1 3/4x1 3/4x3/16	9.69	4.71	164.6 K=1.00	5.512	0.6211	-2.82	3.42	0.825 ✓
T3	160 - 140	L2 1/2x2 1/2x1/4	12.24	6.02	147.1 K=1.00	6.905	1.1900	-5.31	8.22	0.646 ✓
T4	140 - 120	L3x3x1/4	14.07	6.89	139.6 K=1.00	7.663	1.4400	-6.89	11.04	0.624 ✓
T5	120 - 100	L3x3x1/4	15.94	7.76	157.4 K=1.00	6.031	1.4400	-7.96	8.69	0.916 ✓
T6	100 - 80	L3 1/2x3 1/2x1/4	19.21	9.44	163.2 K=1.00	5.603	1.6900	-9.68	9.47	1.022 ✓
T7	80 - 60	L4x4x5/16	20.93	10.29	156.1 K=1.00	6.132	2.4000	-10.92	14.72	0.742 ✓
T8	60 - 40	L4x4x5/16	22.87	11.20	170.0 K=1.00	5.169	2.4000	-10.43	12.41	0.841 ✓
T9	40 - 20	L4x4x5/16	23.81	11.63	176.4 K=1.00	4.797	2.4000	-12.93	11.51	1.123 ✓
T10	20 - 0	L4x4x3/8	25.58	12.53	190.8 K=1.00	4.104	2.8600	-15.17	11.74	1.292 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	188 - 180	L3x3x1/4	6.58	6.34	125.2	9.519	1.4400	-0.12	13.71	0.009

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
					K=0.97					✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	188 - 180	ROHN 2.5 STD	8.00	4.00	50.7	30.000	1.7040	0.21	51.12	0.004 ✔
T2	180 - 160	ROHN 2.5 STD	20.03	5.01	63.4	30.000	1.7040	7.62	51.12	0.149 ✔
T3	160 - 140	ROHN 3 EH	20.04	6.68	70.5	30.000	3.0159	27.76	90.48	0.307 ✔
T4	140 - 120	ROHN 4 EH	20.04	6.68	54.3	30.000	4.4074	54.38	132.22	0.411 ✔
T5	120 - 100	ROHN 5 EH	20.04	6.68	43.6	30.000	6.1120	82.98	183.36	0.453 ✔
T6	100 - 80	ROHN 6 EHS	20.04	10.02	54.0	30.000	6.7133	108.42	201.40	0.538 ✔
T7	80 - 60	ROHN 6 EH	20.03	10.02	54.8	30.000	8.4049	135.62	252.15	0.538 ✔
T8	60 - 40	ROHN 8 EHS	20.04	10.02	41.2	30.000	9.7193	160.64	291.58	0.551 ✔
T9	40 - 20	ROHN 8 EH	20.03	10.02	41.8	30.000	12.7627	185.83	382.88	0.485 ✔
T10	20 - 0	ROHN 8 EH	20.03	10.02	41.8	30.000	12.7627	210.39	382.88	0.549 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	188 - 180	L1 3/4x1 3/4x3/16	7.70	3.57	82.9	29.000	0.3604	0.44	10.45	0.042 ✔
T2	180 - 160	L1 3/4x1 3/4x3/16	9.69	4.71	108.3	29.000	0.3604	2.84	10.45	0.271 ✔
T3	160 - 140	L2 1/2x2 1/2x1/4	12.24	6.02	96.0	29.000	0.7519	5.22	21.80	0.240 ✔
T4	140 - 120	L3x3x1/4	14.07	6.89	90.6	32.500	0.9394	6.66	30.53	0.218 ✔
T5	120 - 100	L3x3x1/4	15.94	7.76	102.0	32.500	0.9159	7.99	29.77	0.268 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T6	100 - 80	L3 1/2x3 1/2x1/4	19.21	9.44	105.5	32.500	1.1034	9.48	35.86	0.264 ✔
T7	80 - 60	L4x4x5/16	20.93	10.29	101.0	32.500	1.5949	10.58	51.84	0.204 ✔
T8	60 - 40	L4x4x5/16	22.87	11.20	109.8	32.500	1.5949	11.19	51.84	0.216 ✔
T9	40 - 20	L4x4x5/16	24.68	12.06	118.1	32.500	1.5949	13.57	51.84	0.262 ✔
T10	20 - 0	L4x4x3/8	26.50	12.99	128.1	32.500	1.8989	15.86	61.71	0.257 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	188 - 180	L3x3x1/4	6.58	6.34	81.8	21.600	1.4400	0.10	31.10	0.003 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	188 - 180	Leg	ROHN 2.5 STD	3	-0.81	55.08	1.5	Pass
T2	180 - 160	Leg	ROHN 2.5 STD	21	-12.95	50.25	25.8	Pass
T3	160 - 140	Leg	ROHN 3 EH	47	-39.78	83.78	47.5	Pass
T4	140 - 120	Leg	ROHN 4 EH	68	-74.49	139.06	53.6	Pass
T5	120 - 100	Leg	ROHN 5 EH	89	-112.15	206.28	54.4	Pass
T6	100 - 80	Leg	ROHN 6 EHS	110	-146.08	212.19	68.8	Pass
T7	80 - 60	Leg	ROHN 6 EH	125	-183.68	264.32	69.5	Pass
T8	60 - 40	Leg	ROHN 8 EHS	140	-219.89	332.51	66.1	Pass
T9	40 - 20	Leg	ROHN 8 EH	155	-257.34	435.24	59.1	Pass
T10	20 - 0	Leg	ROHN 8 EH	170	-295.12	435.22	67.8	Pass
T1	188 - 180	Diagonal	L1 3/4x1 3/4x3/16	12	-0.53	7.92	6.7	Pass
T2	180 - 160	Diagonal	L1 3/4x1 3/4x3/16	24	-2.82	4.56	61.9	Pass
T3	160 - 140	Diagonal	L2 1/2x2 1/2x1/4	52	-5.31	10.95	48.5 61.8 (b)	Pass
T4	140 - 120	Diagonal	L3x3x1/4	73	-6.89	14.71	46.8 80.2 (b)	Pass
T5	120 - 100	Diagonal	L3x3x1/4	94	-7.96	11.58	68.7	Pass
T6	100 - 80	Diagonal	L3 1/2x3 1/2x1/4	115	-9.68	12.62	76.7 78.3 (b)	Pass
T7	80 - 60	Diagonal	L4x4x5/16	130	-10.92	19.62	55.7 88.3 (b)	Pass
T8	60 - 40	Diagonal	L4x4x5/16	145	-10.43	16.54	63.1 90.5 (b)	Pass
T9	40 - 20	Diagonal	L4x4x5/16	166	-12.93	15.35	84.3	Pass
T10	20 - 0	Diagonal	L4x4x3/8	181	-15.17	15.64	97.0	Pass
T1	188 - 180	Top Girt	L3x3x1/4	4	-0.12	18.27	0.7 Summary	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Leg (T7)	69.5	Pass
						Diagonal (T10)	97.0	Pass
						Top Girt (T1)	0.7	Pass
						Bolt Checks	90.5	Pass
						RATING =	**97.0**	**Pass**

ANCHOR BOLT ANALYSIS

ANCHOR BOLT ANALYSIS

Input Data

Max Pier Reactions:

Uplift:	Uplift := 218 kips	*user input*
Shear:	Shear := 34 kips	*user input*
Compression:	Compression := 301 kips	*user input*

Anchor Bolt Data:

Use ASTM A354 Gr. BC

Number of Anchor Bolts = N	N := 10	*user input*	
Bolt Ultimate Strength:	F_u := 125 ksi	*user input*	
Bolt Yield Strength:	Fy := 93.75 ksi	*user input*	
Bolt Modulus:	E := 29000 ksi	*user input*	
Thickness of Anchor Bolts	D := 1in	*user input*	
Threads per Inch:	n := 8	*user input*	
Coefficient of Friction:	μ := 0.55	*user input*	(for baseplate with grout ASCE 10-97)

Anchor Bolt Area:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 0.785\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 0.606\cdot in^2$$

Check Tensile Forces:

Maximum Tensile Force (Gross Area):

$$AllowableTension := 1.333\cdot\left(0.33\cdot A_g\cdot F_u\right) \qquad AllowableTension = 43.2\cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Maximum Tensile Force (Net Area):

$$F_{net.area} := 1.333\cdot\left(0.60\cdot A_n\cdot Fy\right) \qquad F_{net.area} = 45.4\cdot kips$$

Note: 1.333 increase allowed per TIA/EIA

Applied Tension:

$$MaxTension := \frac{Uplift}{N} \qquad MaxTension = 21.8\cdot kips$$

Check Stresses:

$$\frac{MaxTension}{F_{net.area}} = 0.48$$

$$Condition1 := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed"\right)$$

Condition1 = "OK"

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area:

$$A_{s1} := \frac{Uplift}{Fy} + \frac{Shear}{\mu \cdot 0.85 \cdot Fy} \qquad A_{s1} = 3.1 \cdot in^2$$

$$A_{s2} := \left| \frac{Shear - (0.3 \cdot Compression)}{\mu \cdot 0.85 \cdot Fy} \right| \qquad A_{s2} = 1.3 \cdot in^2$$

Provided Area:

$$A_{sprovided} := A_n \cdot N \qquad A_{sprovided} = 6.1 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s1}}{A_{sprovided}} = 0.51$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed" \right) \qquad \frac{A_{s2}}{A_{sprovided}} = 0.21$$

Condition3 = "OK"

FOUNDATION ANALYSIS

DEFINE VARIABLES:

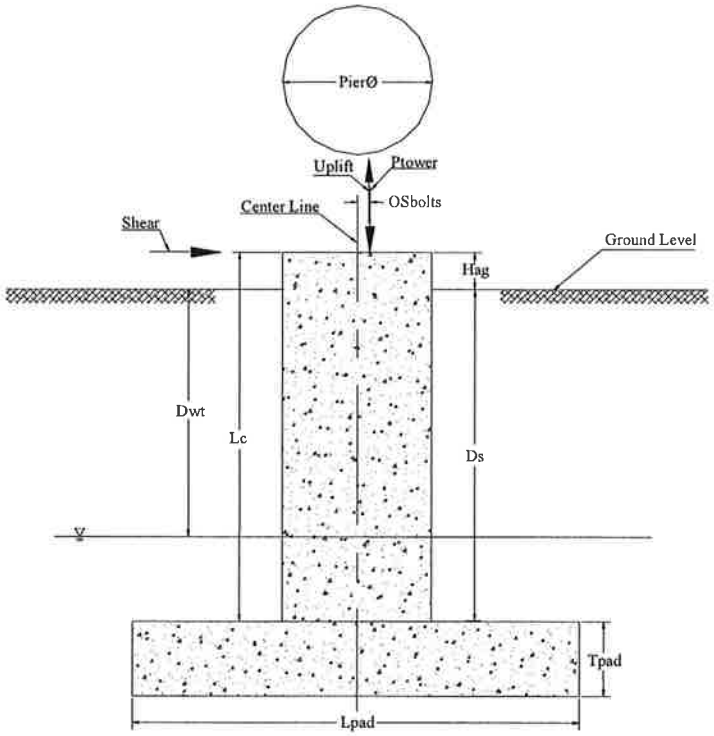
Steel Reinf. Yield Strength: $f_y := 60 \cdot ksi$

Concrete Compressive Strength: $f'_c := 4 \cdot ksi$

Max Uplift Force of Tower $Uplift := 218 \cdot kip$

Max Shear at Base of Tower $Shear := 34 \cdot kip$

Max Compressive Force of Tower $P_{Tower} := 301 \cdot kip$



Diameter of Pier $Pier\phi := 4.5 \cdot ft$

Length of Pier $L_c := 12.0 \cdot ft$

Height of Pier Above Grade $H_{ag} := 0.5 \cdot ft$

Length of Pad $L_{Pad} := 11.75 \cdot ft$

Thickness of Pad $T_{Pad} := 2.5 \cdot ft$

Distance to Water Table $D_{wt} := 20 \cdot ft$

NOTE: SET Dwt TO A VALUE GREATER THAN TOTAL DEPTH OF PAD IF WATER TABLE DOES NOT AFFECT FOOTING

Eccentricity of Anchor Bolts from Center Line of Pier $OS_{bolts} := 0 \cdot in$

Diameter of Reinforcing Bars in Pad $d_{bar} := 0.875 in$

$\gamma_s := 100 \frac{lb}{ft^3}$ $\gamma_c := 150 \frac{lb}{ft^3}$ $\gamma_w := 62.4 \frac{lb}{ft^3}$

Soil Internal Friction Angle $\phi := 30 \cdot deg$

Allowable Soil Pressure $q_u := 4 \cdot ksf$

Active Pressure of Soil Acting along Length of Pier $K_a := \frac{1 - \sin(\phi)}{1 + \sin(\phi)}$ $P_{Active} := \frac{1}{2} \cdot (L_c + T_{Pad})^2 \cdot Pier\phi \cdot \gamma_s \cdot K_a$ $P_{Active} = 15.77 \cdot kip$

Passive Pressure of Soil Acting along Length of Pier $K_p := \frac{1 + \sin(\phi)}{1 - \sin(\phi)}$ $P_{Passive} := \frac{1}{2} \cdot (L_c + T_{Pad})^2 \cdot Pier\phi \cdot \gamma_s \cdot K_p$ $P_{Passive} = 141.92 \cdot kip$

Distance from Grade to Bottom of Pier $D_s := L_c - H_{ag}$ $D_s = 11.5\,ft$

Area and Volume of Pier $A_c := \frac{\pi \cdot Pier\phi^2}{4}$ $V_c := A_c \cdot L_c$ $V_c = 190.85\,ft^3$

Area and Volume of Pad $A_p := L_{Pad}^2$ $V_p := T_{Pad} \cdot A_p$ $V_p = 345.16\,ft^3$

ALLOWABLE SOIL PRESSURE

Assume water table is below bottom of footing

$D_{wtp} := if\left[\left(D_s + T_{Pad}\right) > D_{wt}, T_{Pad}, 0\cdot ft\right]$ $D_{wtp} = 0\,ft$

$W_p := \left(V_p\cdot\gamma_c\right) - D_{wtp}\cdot A_p\cdot\gamma_w$ $W_p = 51.77\cdot kip$

$D_{wtc} := if\left[D_s < D_{wt}, 0\cdot ft, \left(D_s - D_{wt}\right)\right]$ $D_{wtc} = 0\,ft$

$W_c := \left(V_c\cdot\gamma_c\right) - D_{wtc}\cdot A_c\cdot\gamma_w$ $W_c = 28.63\cdot kip$

$W_s := \left[\left(D_s\right)\cdot\left(A_p - A_c\right)\cdot\gamma_s\right]$ $W_s = 140.48\cdot kip$

$P_{Total} := W_p + W_c + W_s + P_{Tower}$ $P_{Total} = 521.88\cdot kip$

$q_{gr} := \frac{P_{Total}}{A_p}$ $q_{gr} = 3.78\cdot ksf$

$q_n := q_{gr} - \left(D_s + T_{Pad}\right)\cdot\gamma_s$ $q_n = 2.38\cdot ksf$

$SoilPressure := if\left(q_n < q_u, \text{"Okay"}, \text{"No Good"}\right)$

SoilPressure = "Okay"

PUNCHING SHEAR:

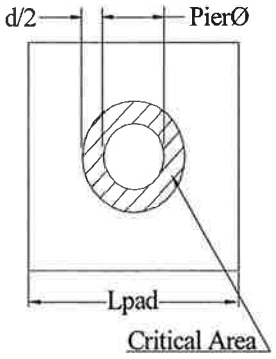
Critical section is located at a distance d/2 from the face of Pier

$$p_u := \left(\frac{1.3\cdot P_{Tower} + V_c\cdot\gamma_c}{L_{Pad}^{\,2}}\right) + \left[\frac{Shear\cdot\left(L_c + T_{Pad}\right) + P_{Tower}\cdot OS_{bolts} + \left(P_{Active} - P_{Passive}\right)\cdot\frac{L_c + T_{Pad}}{3}}{\frac{1}{6}\cdot L_{Pad}^{\,3}}\right]\cdot 1.333$$

$p_u = 2.47\cdot ksf$

$d := T_{Pad} - \left(3\cdot in + d_{bar}\right)$ $d = 2.18\,ft$

$b_o := (Pier\phi + d)\cdot\pi$ $b_o = 20.98\,ft$



$$Aout_{bo} := L_{Pad}^{\,2} - \frac{\pi\cdot(Pier\phi + d)^2}{4}$$

$Aout_{bo} = 103.05\,ft^2$

$V_u := Aout_{bo}\cdot p_u$ $V_u = 254.12\cdot kip$

$$\phi V_c := .85\cdot 4\cdot\sqrt{f'_c\cdot\frac{lb}{in^2}}\cdot b_o\cdot d$$ $\phi V_c = 1.41\times 10^3\cdot kip$

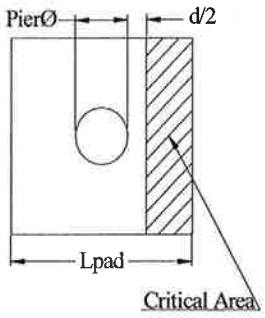
$PunchingShear := if\left(V_u < \phi V_c, \text{"Okay"}, \text{"No Good "}\right)$ PunchingShear = "Okay"

BEAM SHEAR:

Critical section is located at a distance d/2 from the face of the Pier

$V_u := p_u \cdot L_{Pad} \cdot \left(\frac{L_{Pad} - Pier\phi}{2} - \frac{d}{2} \right)$ $V_u = 73.5 \cdot kip$

$\phi V_c := .85 \cdot 2 \cdot \sqrt{f'_c \cdot \frac{lb}{in^2}} \cdot L_{Pad} \cdot d$ $\phi V_c = 396.05 \cdot kip$



$BeamShear := if(V_u < \phi V_c, "Okay", "No Good")$

BeamShear = "Okay"

BENDING:

Critical section extends across width of footing at the face of Pier

$A_{bar} := 0.875 \cdot in^2$ $NoOfBar := 13$ *user input*

$As_{provided} := NoOfBar \cdot A_{bar}$ $As_{provided} = 11.38 \cdot in^2$

$M_{Req} := p_u \cdot \frac{5}{6} \cdot L_{Pad} \cdot \left(\frac{L_{Pad} - Pier\phi}{2} \right)^2 \cdot \frac{1}{2}$

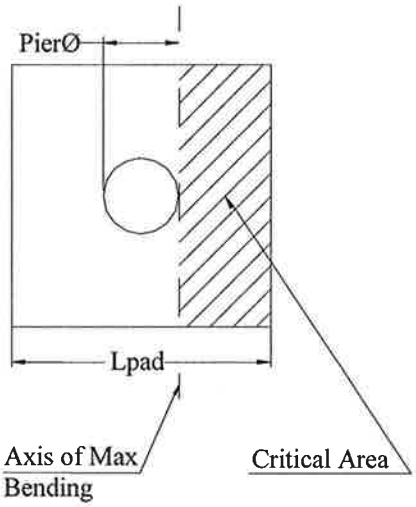
$M_{Req} = 158.65 \cdot kip \cdot ft$

$a := \frac{As_{provided} \cdot f_y}{.85 \cdot f'_c \cdot L_{Pad}}$

$a = 1.42 \cdot in$

$M_{Avail} := 0.9 \cdot As_{provided} \cdot f_y \cdot \left(d - \frac{a}{2} \right)$

$M_{Avail} = 1.3 \times 10^3 \cdot kip \cdot ft$



$Bending := if(M_{Avail} > M_{Req}, "Okay", "No Good")$

Bending = "Okay"

CHECK UPLIFT:

$Soil_1 := \left[(D_s)\cdot\left(L_{Pad}^2 - A_c\right)\cdot\gamma_s\right]$ $Soil_1 = 140.48\cdot kip$ Soil volume above footing

$Soil_2 := 4\cdot\left[(D_s)^2\cdot L_{Pad}\cdot\frac{\tan(\phi)}{2}\right]\cdot\gamma_s$ $Soil_2 = 179.43\cdot kip$ Soil wedge at back face of footing

$Soil_3 := 4\cdot\left[(D_s)^3\cdot\frac{\tan(\phi)^2}{3}\right]\cdot\gamma_s$ $Soil_3 = 67.59\cdot kip$

$WT_{soil} := Soil_1 + Soil_2 + Soil_3$ $WT_{soil} = 387.51\cdot kip$

$WT_{conc} := W_p + W_c$ $WT_{conc} = 80.4\cdot kip$

$Case_1 := \frac{WT_{soil}}{2.0} + \frac{WT_{conc}}{1.25}$ $Case_1 = 258.08\cdot kip$

$Case_2 := \frac{WT_{soil} + WT_{conc}}{2.0}$ $Case_2 = 233.96\cdot kip$

$UpliftCheck := \begin{cases} \text{"OK"} & \text{if } Case_1 \geq Uplift \wedge Case_2 \geq Uplift \\ \text{"No Good"} & \text{otherwise} \end{cases}$ $UpliftCheck = \text{"OK"}$

$UpLiftSafetyFactor_{prov} := \frac{WT_{soil} + WT_{conc}}{Uplift}$ $UpLiftSafetyFactor_{prov} = 2.15$

CHECK OVERTURNING MOMENT:

$SafetyFactor_{req} := 2.0$

$OTM := Shear\cdot\left(L_c + T_{Pad}\right) + Uplift\cdot\left(\frac{L_{Pad}}{2} - OS_{bolts}\right) + P_{Active}\cdot\frac{L_c + T_{Pad}}{3}$

$OTM = 1.85\times 10^3\cdot kip\cdot ft$

$RM := \left(P_{Tower}\right)\cdot\left(\frac{L_{Pad}}{2} - OS_{bolts}\right) + \left(WT_{conc} + Soil_1\right)\cdot\frac{L_{Pad}}{2} + P_{Passive}\cdot\left(\frac{L_c + T_{Pad}}{3}\right) + Soil_2\cdot\left(L_{Pad} + \frac{D_s\cdot\tan(\phi)}{3}\right)$

$RM = 6.26\times 10^3\cdot kip\cdot ft$

$OMSafetyFactor_{Prov} := \frac{RM}{OTM}$ $OMSafetyFactor_{Prov} = 3.38$

$OTMCheck := if\left(OMSafetyFactor_{Prov} < SafetyFactor_{req}, \text{"No Good"}, \text{"Okay"}\right)$ $OTMCheck = \text{"Okay"}$