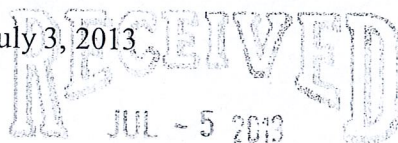


280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

July 3, 2013



CONNECTICUT
SITING COUNCIL

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

Re: **EM-VER-098-120306- 399 Greenwood Road, Norfolk, Connecticut**
EM-VER-100-120416- 38 Lower Road, North Canaan, Connecticut
EM-VER-098-120229- 10 Asphtag Road, Norfolk, Connecticut
EM-VER-120-120214- 35 Lower County Road, Roxbury, Connecticut
EM-VER-122-120430- 52 Library Street, Salisbury, Connecticut
EM-VER-141-121206- 61 Lowell Davis Road, Thompson, Connecticut
EM-VER-143-120214- Burr Mountain Road, Torrington, Connecticut
EM-VER-162-120430- 15 Oakdale Avenue, Winchester, Connecticut
EM-VER-168-120216- 186 Minortown Road, Woodbury, Connecticut

Completion of Construction Activity

Dear Ms. Bachman:

The purpose of this letter is to notify the Siting Council that construction activity associated with the above-referenced Cellco Partnership d/b/a Verizon Wireless telecommunications facilities has been completed.

If you have any questions or need any additional information regarding this facility please do not hesitate to contact me.

Sincerely,

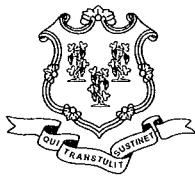
Kenneth C. Baldwin

Copy to:
Sandy M. Carter



Law Offices

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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

December 28, 2012

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

RE: **EM-VER-141-121206**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 61 Lowell Davis Drive, Thompson, Connecticut.

Dear Mr. 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 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;
- Not more than 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 December 5, 2012. 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,

Linda Roberts
Executive Director

LR/CDM/jbw

c: The Honorable Larry Groh, First Selectman, Town of Thompson
John E. Mahon, Jr., Zoning Enforcement Officer, Town of Thompson
Central State Tower





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

December 10, 2012

The Honorable Larry Groh
First Selectman
Town of Thompson
Town Office Building
815 Riverside Drive
P. O. Box 899
North Grosvenordale, CT 06255

RE: **EM-VER-141-121206**- Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 61 Lowell Davis Drive, Thompson, Connecticut.

Dear First Selectman Groh:

The Connecticut Siting Council (Council) received a request to modify an existing telecommunications facility, pursuant to Regulations of Connecticut State Agencies Section 16-50j-72, a copy of which has already been provided to you.

If you have any questions or comments regarding the proposal, please call me or inform the Council by December 24, 2012.

Thank you for your cooperation and consideration.

Very truly yours,

Linda Roberts
Executive Director

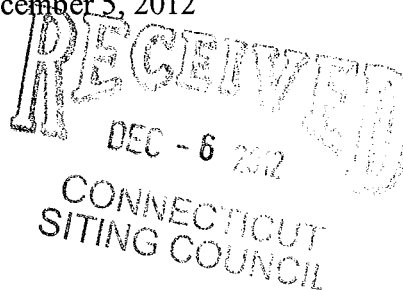
LR/jbw

c: John E. Mahon, Jr., Zoning Enforcement Officer, Town of Thompson

280 Trumbull Street
Hartford, CT 06103-3597
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Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts

December 5, 2012



Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap
61 Lowell Davis Drive, Thompson, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless (“Cellco”) currently maintains four (4) wireless telecommunications antennas (three (3) antennas at the 237-foot level and one (1) antenna at the 230-foot level) on an existing 250-foot guyed-lattice tower at the above-referenced address. The tower is owned by the Central State Tower. Cellco’s use of the tower was approved by the Council in 1991. Cellco now intends to remove all of its existing antennas and antenna cables and install nine (9) new antennas (three (3) model BXA-80063-6CF cellular antennas; three (3) model BXA-171063-12CF PCS antennas; and three (3) model BXA-70063-6CF LTE antennas), on T-Arms at the 243-foot level on the tower and twelve (12) new antenna cables. Cellco also intends to install six (6) coax cable diplexers behind its antennas. Attached behind Tab 1 are the specifications for Cellco’s replacement antennas and cable diplexers.

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 Lawrence K. Groh, Jr., First Selectman of the Town of Thompson. A copy of this letter is also being sent to NUMA Tool Company, the owner of the property on which the tower is located.

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



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Linda Roberts
December 5, 2012
Page 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 243-foot level on the existing 250-foot tower.
2. The proposed modifications do not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundaries.
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 replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative power density table for Cellco's modified facility is included behind Tab 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 Structural Analysis Report attached behind Tab 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:

Lawrence K. Groh, Jr., Thompson First Selectman
NUMA Tool Company
Sandy M. Carter



BXA-80063-6CF-EDIN-X

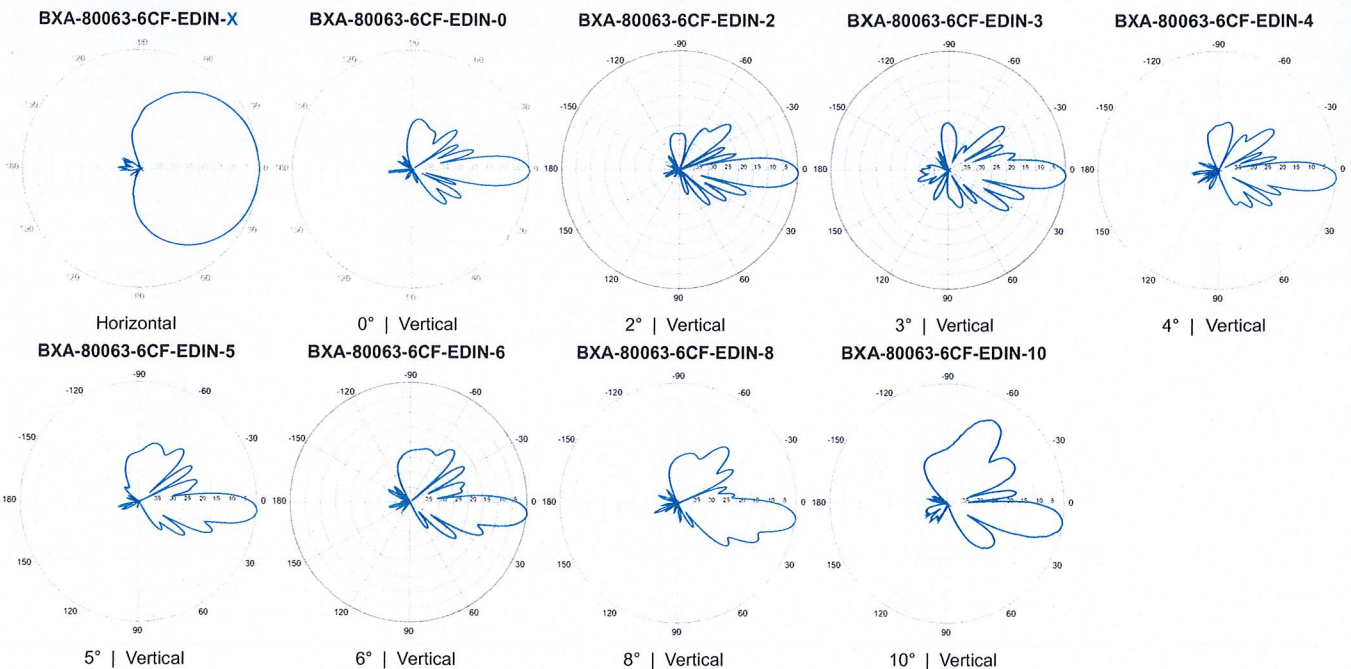
X-Pol | FET Panel | 63° | 14.5 dBd

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		
Frequency bands	806-900 MHz*	
*Optional frequency band for iDEN	806-941 MHz (specify when ordering)	
Polarization	±45°	
Horizontal beamwidth	63°	
Vertical beamwidth	11°	
Gain	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10	
Impedance	50Ω	
VSWR	≤1.4:1	
Upper sidelobe suppression (0°)	-18.2 dB	
Front-to-back ratio (+/-30°)	-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-80063-6CF-EDIN-X-FP	



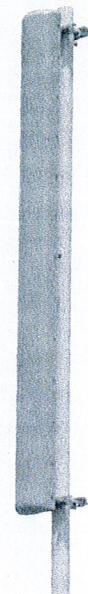
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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

BXA-171063-12CF-EDIN-X

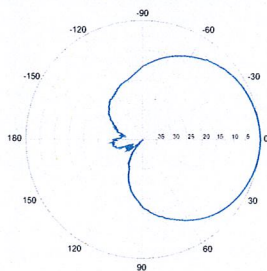
Replace "X" with desired electrical downtilt

X-Pol | FET Panel | 63° | 19.0 dBi

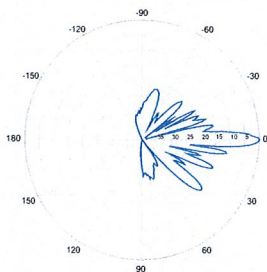
Electrical Characteristics	1710-2170 MHz		
Frequency bands	1710-1880 MHz	1850-1990 MHz	1920-2170 MHz
Polarization	±45°	±45°	±45°
Horizontal beamwidth	68°	65°	60°
Vertical beamwidth	4.5°	4.5°	4.5°
Gain	16.1 dBd / 18.2 dBi	16.5 dBd / 18.6 dBi	16.9 dBd / 19.0 dBi
Electrical downtilt (X)	0, 2, 5		
Impedance	50Ω		
VSWR	≤1.5:1		
First upper sidelobe	< -17 dB		
Front-to-back ratio	> 30 dB		
In-band isolation	> 28 dB		
IM3 (20W carrier)	< -150 dBc		
Input power	300 W		
Lightning protection	Direct Ground		
Connector(s)	2 Ports / EDIN / Female / Center (Back)		
Operating temperature	-40° to +60° C / -40° to +140° F		
Mechanical Characteristics			
Dimensions Length x Width x Depth	1840 x 154 x 105 mm	72.4 x 6.1 x 4.1 in	
Depth with z-brackets	133 mm	5.2 in	
Weight without mounting brackets	6.8 kg	15 lbs	
Survival wind speed	> 201 km/hr		> 125 mph
Wind area	Front: 0.28 m ² Side: 0.19 m ²	Front: 3.1 ft ² Side: 2.1 ft ²	
Wind load @ 161 km/hr (100 mph)	Front: 460 N Side: 304 N	Front: 103 lbf Side: 68 lbf	
Mounting Options	Part Number	Fits Pipe Diameter	Weight
2-Point Mounting Bracket Kit	26799997	50-102 mm 2.0-4.0 in	2.3 kg 5 lbs
2-Point Mounting & Downtilt Bracket Kit	26799999	50-102 mm 2.0-4.0 in	3.6 kg 8 lbs
Concealment Configurations	For concealment configurations, order BXA-171063-12CF-EDIN-X-FP		



BXA-171063-12CF-EDIN-X

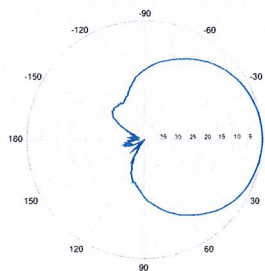


Horizontal | 1710-1880 MHz
BXA-171063-12CF-EDIN-0

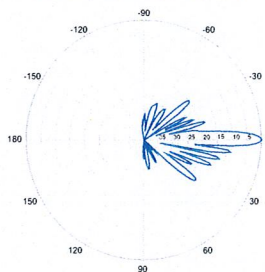


0° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-X

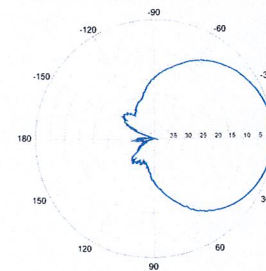


Horizontal | 1850-1990 MHz
BXA-171063-12CF-EDIN-0

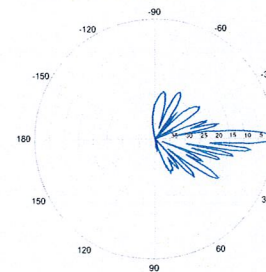


0° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-X



Horizontal | 1920-2170 MHz
BXA-171063-12CF-EDIN-0



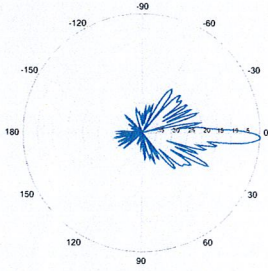
0° | Vertical | 1920-2170 MHz

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-171063-12CF-EDIN-X

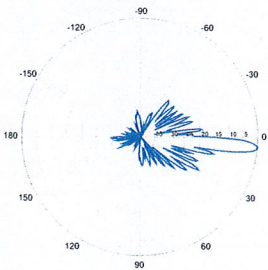
X-Pol | FET Panel | 63° | 19.0 dBi

BXA-171063-12CF-EDIN-2



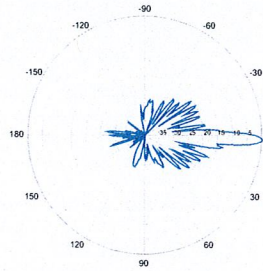
2° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-5



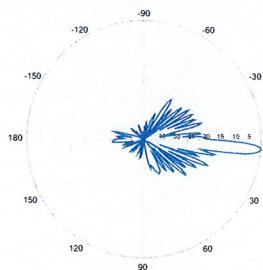
5° | Vertical | 1710-1880 MHz

BXA-171063-12CF-EDIN-2



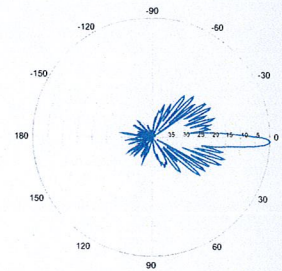
2° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-5



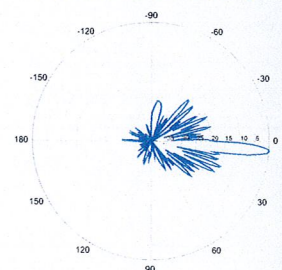
5° | Vertical | 1850-1990 MHz

BXA-171063-12CF-EDIN-2



2° | Vertical | 1920-2170 MHz

BXA-171063-12CF-EDIN-5



5° | Vertical | 1920-2170 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

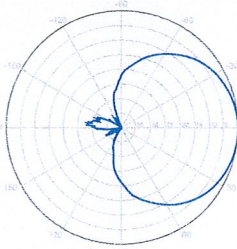
Replace "X" with desired electrical downtilt.

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



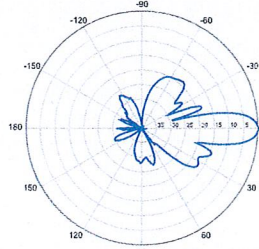
Electrical Characteristics	696-900 MHz		
Frequency bands	696-806 MHz	806-900 MHz	
Polarization	±45°		
Horizontal beamwidth	65°	63°	
Vertical beamwidth	13°	11°	
Gain	14.0 dBd (16.1 dBi)	14.5 dBd (16.6 dBi)	
Electrical downtilt (X)	0, 2, 3, 4, 5, 6, 8, 10		
Impedance	50Ω		
VSWR	≤1.35:1		
Upper sidelobe 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



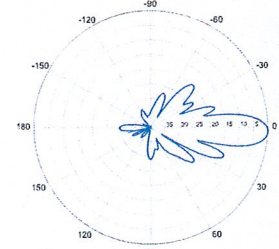
Horizontal | 750 MHz

BXA-70063-6CF-EDIN-0

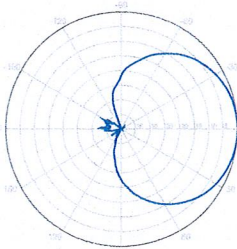


0° | Vertical | 750 MHz

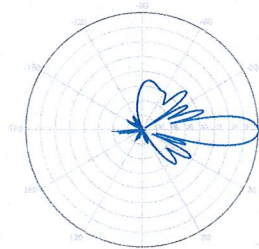
BXA-70063-6CF-EDIN-2



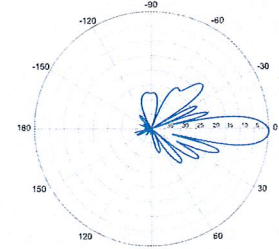
2° | Vertical | 750 MHz



Horizontal | 850 MHz



0° | Vertical | 850 MHz



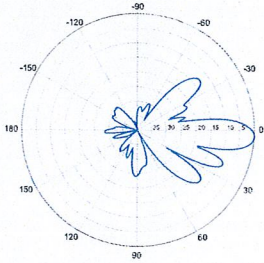
2° | Vertical | 850 MHz

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

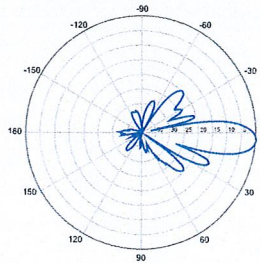
X-Pol | FET Panel | 63° | 14.5 dBd

BXA-70063-6CF-EDIN-3



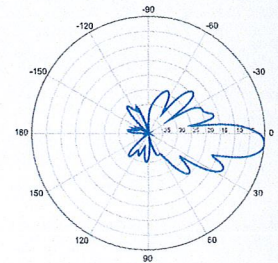
3° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-4

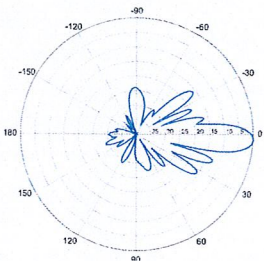


4° | Vertical | 750 MHz

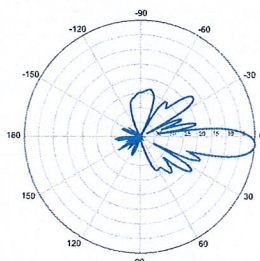
BXA-70063-6CF-EDIN-5



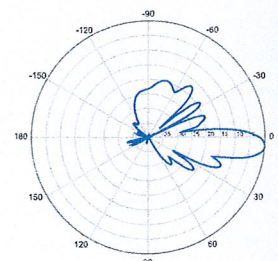
5° | Vertical | 750 MHz



3° | Vertical | 850 MHz

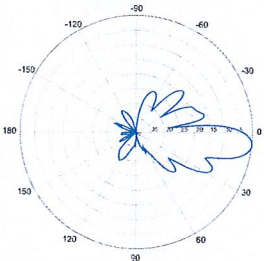


4° | Vertical | 850 MHz



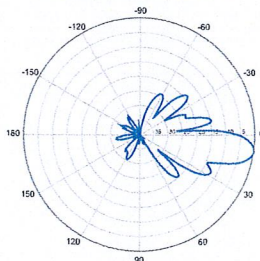
5° | Vertical | 850 MHz

BXA-70063-6CF-EDIN-6



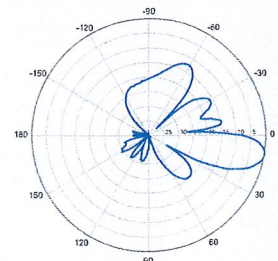
6° | Vertical | 750 MHz

BXA-70063-6CF-EDIN-8

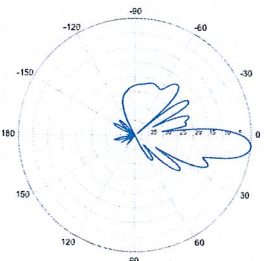


8° | Vertical | 750 MHz

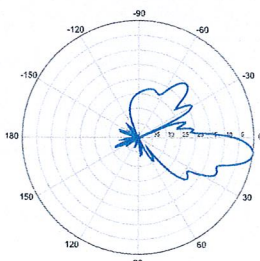
BXA-70063-6CF-EDIN-10



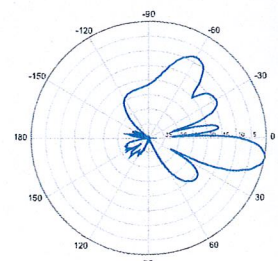
10° | Vertical | 750 MHz



6° | Vertical | 850 MHz



8° | Vertical | 850 MHz



10° | Vertical | 850 MHz

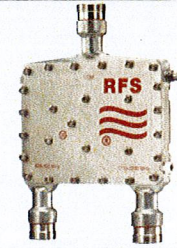
Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product.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



ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



Features/Benefits

- LTE ready design
- Extremely Low Insertion Loss
- High level of Rejection between bands – Protection against interferences
- Extremely High Power Handling Capability
- Integrated DC block/bypass versions available
- Very compact & small size design – Easy installation and reduced tower load
- In-line long-neck connectors for easy connection & waterproofing
- Exceptional reliability & environmental protection (IP 67)
- Equipped with 1 * Breathable Vent – Prevent any humidity inside the product
- Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)
- Grounding already provided through the mounting bracket
- Kit available for easy dual mount

Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
Power Handling Continuous, Max, W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max, W	15000 in low frequency path & 8000 in high frequency path
Impedance, Ohms	50
Insertion Loss, Path 1, dB	0.07 typ.
Insertion Loss, Path 2, dB	0.13 typ.
Rejection Between Bands Min/Typ, dB	58/64@698-960MHz; 57/70@1710-2200MHz
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
Temperature Range, °C (°F)	-40 to +60 (-40 to +140)
Environmental	ETSI 300-019-2-4 Class 4.1E
Ingress Protection	IP 67
Lightning Protection	EN/IEC61000-4-5 Level 4
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

Notes

All information contained in the present datasheet is subject to confirmation at time of ordering

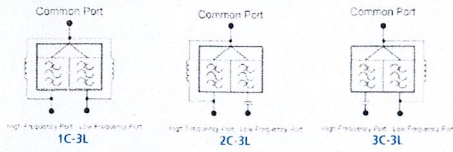


ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

FD9R6004/2C-3L Installation Instructions: [Wideband_Diplexer_Installation_Rev5.pdf](#)

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 2m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

All information contained in the present datasheet is subject to confirmation at time of ordering

Site Name: Thompson		General		Power		Density							
Tower Height: Verizon @ 243Ft.													
CARRIER	# OF CHAN.	WATTS ERP	HEIGHT	CALC. POWER DENS	FREQ.	MAX. PERMISS. EXP.	FRACTION MPE	Total					
*AT&T UMTS	1	500	212	0.0040	880	0.5867	0.68%						
*AT&T GSM	4	296	212	0.0095	880	0.5867	1.61%						
*AT&T GSM	2	427	212	0.0068	1900	1.0000	0.68%						
*MetroPCS	3	443.61	215	0.0104	2140	1.0000	1.04%						
*CONN-2 (Metro Mobile)	1	5130	235	0.0334	875	0.5833	5.73%						
*Nextel	9	100	190	0.0090	851	0.5673	1.58%						
*Paging	1	500	188	0.0051	928	0.6187	0.82%						
*EMS/Town	3	500	172	0.0182	450	0.3000	6.08%						
*Town	1	500	160	0.0070	66	0.2000	3.51%						
Verizon PCS	11	194	243	0.0130	1970	1.0000	1.30%						
Verizon Cellular	9	219	243	0.0120	869	0.5793	2.07%						
Verizon AWS	1	1750	243	0.0107	2145	1.0000	1.07%						
Verizon 700	1	733	243	0.0045	698	0.4653	0.96%						
									27.13%				
* Source: Siting Council													

250' Guyed Tower

61 Lowell Davis Road,
Thompson, CT 06277

Central States Tower Site Name: Thompson
Central States Tower Number: CT-00-3701

AT&T & Verizon Wireless Co-Location

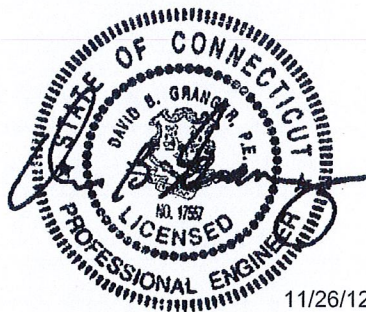
GPD Project Number: 2012816.10

Analysis Results

Tower Components	90.8%	Sufficient
Foundation	93.8%	Sufficient

November 26, 2012

Respectfully submitted by:



David B. Granger, P.E.
Connecticut #: 17557

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APPENDICES

1. TNXTOWER OUTPUT

Executive Summary

The purpose of this analysis is to verify whether the existing self support tower is structurally capable of carrying the proposed antenna and coax loads identified by AT&T and Verizon Wireless to Central States Tower. This report was commissioned by Yuri Dobrowolsky of Central States Tower.

The existing structure and its foundations have been analyzed per the following requirements:

Governing Code/s	TIA-222-F & ASCE7-05 & 2005 CT Building Code
Wind Speed	85 MPH Fastest Mile
Wind Speed w/ Ice	38 MPH Fastest Mile
Radial Ice Thickness	1-1/4"

Conclusions & Recommendations

The designs of the tower and foundations are sufficient for the proposed loading in accordance with the above loading criteria and will not require modification.

Tower Description

The existing Guyed Tower is located in Thompson, CT. The original design loading was not provided. All loading and structural information was provided by the Structural & Equipment Mapping Report by the GPD Group.

Documents Provided:

Document Type	Remarks	Source
Previous Structural Analysis	GPD Group Job #: 2008147.23 dated 12/05/2008	GPD
Mapping Report	GPD Group Job #: 2012816.10 dated 10/19/2012	GPD
Proposed Loading Configuration	Central States Tower Email Correspondence 11/16/2012	CST
Foundation NDT Mapping Report	GPD Group Job #: 2012816.10 dated 11/16/2012	GPD
Geotechnical Report	GPD Group Job #: 2012816.10 dated 11/16/2012	GPD

Tower Materials: (Assumed)

Structural Components	Material Strength
Legs	ASTM 572 (50 KSI Yield Strength)
Diagonals	ASTM A36 (36 KSI Yield Strength)
Horizontals	ASTM A36 (36 KSI Yield Strength)
Bolts	A325
Guy Wires	EHS

Tower Loading

The following data shows the major loading that the tower supports. All loading information was provided by GPD Group.

Existing/Leased Loading

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufacture	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Verizon	237	237	3	EMS Wireless	RS901200DA2	9	1-5/8	
			3		Standoff Mount			
Unknown	230	230	1	Unknown	24" x 6" x 6" Panel	1	1-5/8	
			1		Standoff Mount			
AT&T	205	205	6	Powerwave	7770.00	12	1-5/8	
			6	Powerwave	LGP 21901			
			6	Unknown	8" x 5" x 2" TMA			
			3		T-Frame			
Unknown	200	205	1	Unknown	120" x 3" Omni	1	1-5/8	
			1		Standoff Mount			
Unknown	190	195	2	Unknown	120" x 3" Omni	N/A	N/A	
			3		Standoff Mount			

Final Configuration Loading

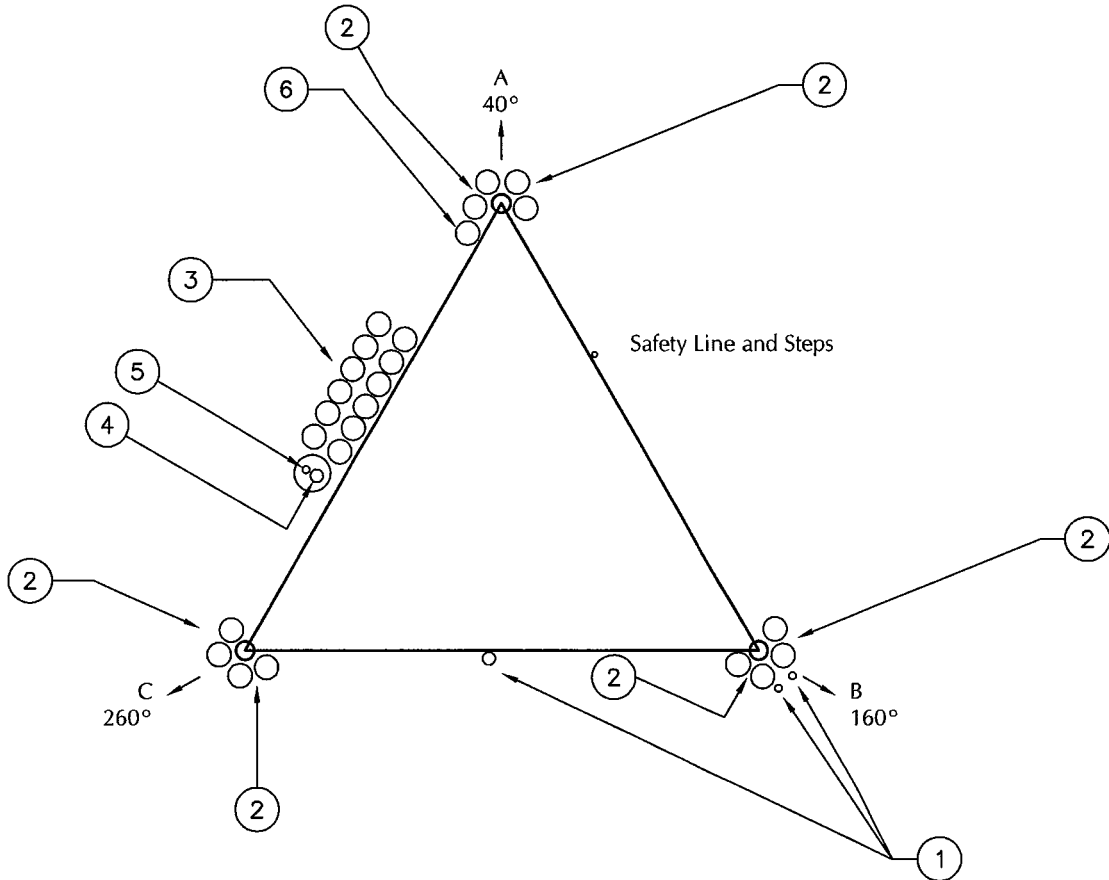
Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufacture	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Verizon	243	243	3	Antel	BXA 70063/6CF	12	1-5/8	
			3	Antel	BXA 80063/6CF			
			3	Antel	BXA 171063/12CF			
			6	RFS	FD9R6004/2C-3L			
			3		T-Frame			
AT&T	205	205	3	KMW	AM-X-CD-17-65-00T	12	1-5/8 7/8 Power Cable 1/2 Fiber Cable	1
			6	Powerwave	7770.0			
			6	Powerwave	LGP 21401			
			6	Powerwave	LGP 21901			
			6	Ericsson	RRUS-11			
			1	Raycap	DC6-48-60-18-8F			
			3		T-Frame			
Unknown	200	205	1	Unknown	120" x 3" Omni	1	1-5/8	
			1		Standoff Mount			

BOLD type indicates the carriers' final proposed loading.

Notes:

- 1) The 7/8" and 1/2" power and fiber cables run inside one 3" flex conduit.

Proposed Coax Configuration



#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Tower Lighting	1/2" & 1"	2 & 1	124' & 250'	(1) 1/2" to 124'
2	Verizon	1-5/8"	12	243'	Proposed
3	AT&T	1-5/8"	12	205'	
4	AT&T	7/8"	1	205'	Proposed Within Flex Conduit
5	AT&T	1/2"	1	205'	Proposed Within Flex Conduit
6	Unknown	1-5/8"	1	200'	

Assumptions

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the Existing/Reserved Loading and Proposed Loading Tables, and the specified documents.
- 4) All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
- 5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
- 6) Coax has been modeled based on the Tower Mapping.
- 7) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
- 8) The tower's structural material grades were assumed based on prior experience with similar guyed towers.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

Tower Section Results

Capacity Summary of Structural Components

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF x P _{allow} K	% Capacity	Pass/Fail
T1	250 - 240	Leg	Pipe 2.875" x 0.203" (2.5 STD)	2	-4.8	58.2	16.3	Pass
T2	240 - 220	Leg	Pipe 2.875" x 0.203" (2.5 STD)	37	-35.1	57.5	61.0	Pass
T3	220 - 200	Leg	Pipe 2.875" x 0.203" (2.5 STD)	103	-40.9	57.6	71.1	Pass
T4	200 - 180	Leg	Pipe 2.875" x 0.203" (2.5 STD)	169	-37.4	57.4	65.1	Pass
T5	180 - 160	Leg	Pipe 2.875" x 0.203" (2.5 STD)	236	-22.7	41.5	54.7	Pass
T6	160 - 140	Leg	Pipe 2.875" x 0.203" (2.5 STD)	302	-23.7	41.5	57.3	Pass
T7	140 - 120	Leg	Pipe 2.875" x 0.203" (2.5 STD)	367	-28.0	41.5	67.5	Pass
T8	120 - 100	Leg	Pipe 2.875" x 0.203" (2.5 STD)	433	-29.2	41.5	70.5	Pass
T9	100 - 80	Leg	Pipe 2.875" x 0.203" (2.5 STD)	499	-30.5	41.5	73.5	Pass
T10	80 - 60	Leg	Pipe 2.875" x 0.203" (2.5 STD)	565	-33.1	41.5	79.8	Pass
T11	60 - 40	Leg	Pipe 2.875" x 0.203" (2.5 STD)	631	-34.3	41.4	82.8	Pass
T12	40 - 20	Leg	Pipe 2.875" x 0.203" (2.5 STD)	697	-35.5	41.4	85.8	Pass
T13	20 - 6.75	Leg	Pipe 2.875" x 0.203" (2.5 STD)	763	-36.3	41.4	87.6	Pass
T14	6.75 - 0	Leg	Pipe 2.875" x 0.203" (2.5 STD)	809	-37.6	41.4	90.8	Pass
T1	250 - 240	Diagonal	1 1/4	13	-1.3	23.9	5.4	Pass
T2	240 - 220	Diagonal	3/4	96	-3.2	6.2	52.0	Pass
T3	220 - 200	Diagonal	3/4	116	-3.1	6.2	50.3	Pass
T4	200 - 180	Diagonal	3/4	230	-3.5	6.2	55.7	Pass
T5	180 - 160	Diagonal	3/4	245	-1.9	4.7	40.7	Pass
T6	160 - 140	Diagonal	3/4	311	-2.0	4.7	42.6	Pass
T7	140 - 120	Diagonal	3/4	376	-3.1	6.2	50.4	Pass
T8	120 - 100	Diagonal	3/4	443	-2.4	4.7	52.5	Pass
T9	100 - 80	Diagonal	3/4	509	-2.5	4.7	54.7	Pass
T10	80 - 60	Diagonal	3/4	625	-2.6	4.7	55.1	Pass
T11	60 - 40	Diagonal	3/4	641	-2.9	4.7	61.6	Pass
T12	40 - 20	Diagonal	3/4	707	-3.0	4.7	63.7	Pass
T13	20 - 6.75	Diagonal	3/4	804	-2.9	4.7	62.7	Pass
T14	6.75 - 0	Diagonal	3/4	822	-4.7	5.7	83.4	Pass
T1	250 - 240	Horizontal	1 1/4	17	-0.7	23.4	3.1	Pass
T2	240 - 220	Horizontal	5/8	94	-0.8	2.1	40.8	Pass
T3	220 - 200	Horizontal	5/8	130	-1.0	2.8	34.7	Pass
T4	200 - 180	Horizontal	5/8	225	2.4	8.8	27.3	Pass
T5	180 - 160	Horizontal	5/8	252	2.2	6.6	33.6	Pass
T6	160 - 140	Horizontal	5/8	318	2.3	6.6	35.3	Pass
T7	140 - 120	Horizontal	5/8	385	2.4	6.6	36.1	Pass
T8	120 - 100	Horizontal	5/8	451	2.9	6.6	43.6	Pass
T9	100 - 80	Horizontal	5/8	517	3.0	6.6	45.5	Pass
T10	80 - 60	Horizontal	5/8	583	3.1	6.6	46.5	Pass
T11	60 - 40	Horizontal	5/8	649	3.4	6.6	51.3	Pass
T12	40 - 20	Horizontal	5/8	715	3.5	6.6	53.1	Pass
T13	20 - 6.75	Horizontal	5/8	801	3.5	6.6	53.2	Pass
T14	6.75 - 0	Horizontal	2 x 1/4	814	4.3	10.8	39.9	Pass
T1	250 - 240	Secondary Horizontal	5/8	26	0.0	8.8	0.4	Pass
T2	240 - 220	Secondary Horizontal	5/8	102	0.0	8.8	0.4	Pass
T3	220 - 200	Secondary Horizontal	5/8	168	0.0	8.8	0.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF x P _{allow} K	% Capacity	Pass/Fail
T4	200 - 180	Secondary Horizontal	5/8	234	0.0	8.8	0.2	Pass
T5	180 - 160	Secondary Horizontal	5/8	300	0.0	8.8	0.1	Pass
T6	160 - 140	Secondary Horizontal	5/8	316	0.0	8.8	0.1	Pass
T7	140 - 120	Secondary Horizontal	5/8	432	0.0	8.8	0.1	Pass
T8	120 - 100	Secondary Horizontal	5/8	448	0.0	8.8	0.3	Pass
T9	100 - 80	Secondary Horizontal	5/8	514	0.0	8.8	0.5	Pass
T10	80 - 60	Secondary Horizontal	5/8	630	0.0	8.8	0.5	Pass
T11	60 - 40	Secondary Horizontal	5/8	646	0.0	8.8	0.7	Pass
T12	40 - 20	Secondary Horizontal	5/8	712	0.0	8.8	0.7	Pass
T13	20 - 6.75	Secondary Horizontal	5/8	808	0.0	8.8	0.7	Pass
T1	250 - 240	Top Girt	L2x1 1/2x3/16	4	-0.0	9.5	0.2	Pass
T2	240 - 220	Top Girt	L2x1 1/2x3/16	41	3.3	17.9	18.3	Pass
T3	220 - 200	Top Girt	L2x1 1/2x3/16	108	1.2	17.9	6.9	Pass
T4	200 - 180	Top Girt	L2x1 1/2x3/16	173	1.4	17.9	7.8	Pass
T5	180 - 160	Top Girt	L2x1 1/2x3/16	239	1.9	13.4	14.1	Pass
T6	160 - 140	Top Girt	L2x1 1/2x3/16	305	1.3	13.4	9.5	Pass
T7	140 - 120	Top Girt	L2x1 1/2x3/16	371	1.3	13.4	9.9	Pass
T8	120 - 100	Top Girt	L2x1 1/2x3/16	438	2.3	13.4	17.1	Pass
T9	100 - 80	Top Girt	L2x1 1/2x3/16	504	1.6	13.4	12.3	Pass
T10	80 - 60	Top Girt	L2x1 1/2x3/16	570	1.7	13.4	12.8	Pass
T11	60 - 40	Top Girt	L2x1 1/2x3/16	636	2.5	13.4	18.3	Pass
T12	40 - 20	Top Girt	L2x1 1/2x3/16	702	1.9	13.4	14.4	Pass
T13	20 - 6.75	Top Girt	L2x1 1/2x3/16	768	2.0	13.4	14.9	Pass
T2	240 - 220	Bottom Girt	L2x1 1/2x3/16	44	1.4	17.9	7.7	Pass
T3	220 - 200	Bottom Girt	L2x1 1/2x3/16	109	1.3	17.9	7.4	Pass
T5	180 - 160	Bottom Girt	L2x1 1/2x3/16	242	1.3	13.4	9.5	Pass
T6	160 - 140	Bottom Girt	L2x1 1/2x3/16	308	1.3	13.4	10.0	Pass
T8	120 - 100	Bottom Girt	L2x1 1/2x3/16	441	1.6	13.4	12.3	Pass
T9	100 - 80	Bottom Girt	L2x1 1/2x3/16	507	1.7	13.4	12.8	Pass
T11	60 - 40	Bottom Girt	L2x1 1/2x3/16	639	1.9	13.4	14.4	Pass
T12	40 - 20	Bottom Girt	L2x1 1/2x3/16	705	2.0	13.4	14.8	Pass
T13	20 - 6.75	Bottom Girt	2 x 1/4	771	4.1	10.8	38.4	Pass
T1	250 - 240	Guy A@240.083	9/16	846	9.8	17.5	55.7	Pass
T4	200 - 180	Guy A@180.083	9/16	853	12.9	17.5	73.5	Pass
T7	140 - 120	Guy A@120.083	1/2	856	8.9	13.4	66.4	Pass
T10	80 - 60	Guy A@60.0833	3/8	859	5.1	7.7	66.1	Pass
T1	250 - 240	Guy B@240.083	9/16	839	9.7	17.5	55.4	Pass
T4	200 - 180	Guy B@180.083	9/16	852	12.8	17.5	73.1	Pass
T7	140 - 120	Guy B@120.083	1/2	855	8.9	13.4	66.3	Pass
T10	80 - 60	Guy B@60.0833	3/8	858	5.1	7.7	65.8	Pass
T1	250 - 240	Guy C@240.083	9/16	834	9.8	17.5	56.0	Pass
T4	200 - 180	Guy C@180.083	9/16	851	12.9	17.5	73.9	Pass
T7	140 - 120	Guy C@120.083	1/2	854	9.0	13.4	66.7	Pass
T10	80 - 60	Guy C@60.0833	3/8	857	5.1	7.7	66.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF x P _{allow} K	% Capacity	Pass/Fail
T1	250 - 240	Top Guy Pull-Off@240.083	L2x1 1/2x3/16	8	4.4	17.9	24.4	Pass
T4	200 - 180	Top Guy Pull-Off@180.083	L2x1 1/2x3/16	176	3.4	17.9	18.9	Pass
T7	140 - 120	Top Guy Pull-Off@120.083	L2x1 1/2x3/16	373	2.9	13.4	21.3	Pass
T10	80 - 60	Top Guy Pull-Off@60.0833	L2x1 1/2x3/16	571	2.9	13.4	21.8	Pass
T1	250 - 240	Torque Arm Top@240.083	L2x2x1/4	835	9.0	20.3	44.7	Pass
T1	250 - 240	Torque Arm Bottom@240.083	L2x2x1/4	844	-13.3	17.3	76.9	Pass
							Summary	
							Leg (T14)	90.8 Pass
							Diagonal (T14)	83.4 Pass
							Horizontal (T13)	53.2 Pass
							Secondary Horizontal (T12)	0.7 Pass
							Top Girt (T11)	18.3 Pass
							Bottom Girt (T13)	38.4 Pass
							Guy A (T4)	73.5 Pass
							Guy B (T4)	73.1 Pass
							Guy C (T4)	73.9 Pass
							Top Guy Pull-Off (T1)	24.4 Pass
							Torque Arm Top (T1)	44.7 Pass
							Torque Arm Bottom (T1)	76.9 Pass
							Bolt Checks	25.8 Pass
							RATING =	90.8 Pass

Additional Capacities

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Block	0	93.8	Pass
	Tower Base Foundation	0	28.7	Pass

Disclaimer of Warranties

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

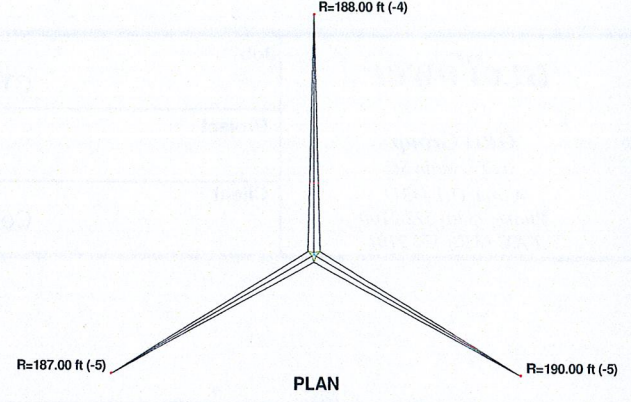
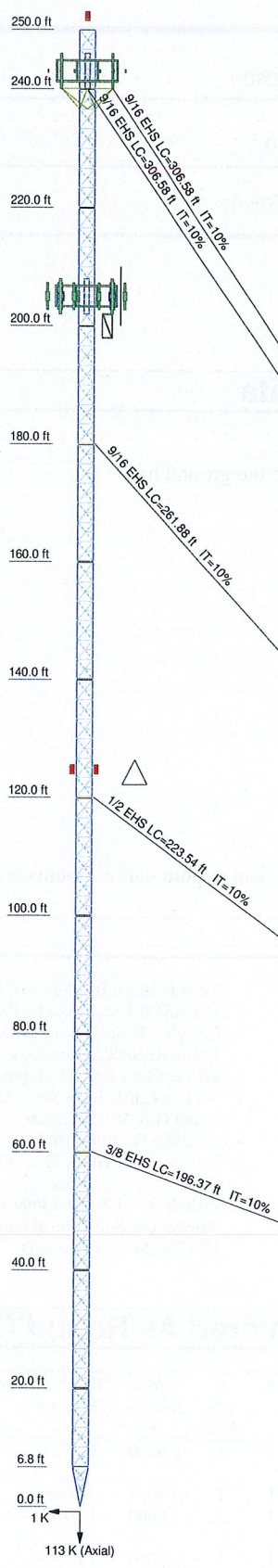
The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

TNX TOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14
Legs	SR 1 1/4													
Leg Grade	A572-50													
Diagonals	SR 3/4													
Diagonal Grade	A36													
Top Girts	L2x1 1/2x3/16													
Bottom Girts	N.A.													
Horizontals	2 x 1/4													
Sec. Horizontals	N.A.													
Top Guy Pull-Offs	SR 5/8													
Face Width (ft)	L2x1 1/2x3/16													
# Panels @ (ft)	66 @ 3.30556													
Weight (K)	B 4 @ 3.27083													



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon	250	(2) 7770.00 w/Mount Pipe	205
BXA-70063/6CF w/ Mount Pipe	243	(2) 7770.00 w/Mount Pipe	205
BXA-70063/6CF w/ Mount Pipe	243	(2) LGP21401	205
BXA-70063/6CF w/ Mount Pipe	243	(2) LGP21401	205
BXA-80063/6CF w/ Mount Pipe	243	(2) LGP21401	205
BXA-80063/6CF w/ Mount Pipe	243	(2) LGP21901	205
BXA-80063/6CF w/ Mount Pipe	243	(2) LGP21901	205
(2) FD9R6004/2C-3L	243	(2) LGP21901	205
(2) FD9R6004/2C-3L	243	(2) RRU5-11	205
(2) FD9R6004/2C-3L	243	(2) RRU5-11	205
BXA-171063/12CF w/ Mount Pipe	243	(2) RRU5-11	205
BXA-171063/12CF w/ Mount Pipe	243	DC6-48-60-18-8F	205
BXA-171063/12CF w/ Mount Pipe	243	(3) 12' T-Frame	205
(3) 12' Lightweight T-Frame	243	3" Dia 10' Omni w/mount pipe	200
AM-X-CD-17-65-00T w/ Mount Pipe	205	72" Standoff	200
AM-X-CD-17-65-00T w/ Mount Pipe	205	Side Light	124
(2) 7770.00 w/Mount Pipe	205	Side Light	124

SYMBOL LIST

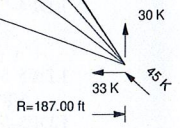
MARK	SIZE	MARK	SIZE
A	L2x1 1/2x3/16	B	3 @ 2.25

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Windham County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.25 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 90.8%



<p>GPD Group 520 S. Main St AKRON, OH 44311 Phone: (330) 572 2100 FAX: (330) 572 2101</p>	Job: CT1052 Thompson
	Project: 2012816.10
	Client: Central State Tower
	Code: TIA/EIA-222-F
	Path: O:\2012\2012816\10 Thompson, CT\SA Report\In\CT Thompson.eri
Drawn by: B. Franczkowski	App'd:
Date: 11/26/12	Scale: NTS
	Dwg No. E-1

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	Client	Central State Tower	Designed by	B. Franczkowski

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 250.00 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 3.00 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- Tower is located in Windham County, Connecticut.
- Basic wind speed of 85 mph.
- Nominal ice thickness of 1.2500 in.
- Ice density of 56 pcf.
- A wind speed of 38 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 50 mph.
- Pressures are calculated at each section.
- Safety factor used in guy design is 2.
- 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

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification √ Use Code Stress Ratios √ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile √ Include Bolts In Member Capacity Leg Bolts Are At Top Of Section √ Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination | <ul style="list-style-type: none"> Distribute Leg Loads As Uniform Assume Legs Pinned √ Assume Rigid Index Plate √ Use Clear Spans For Wind Area √ Use Clear Spans For KL/r √ Retension Guys To Initial Tension Bypass Mast Stability Checks √ Use Azimuth Dish Coefficients √ Project Wind Area of Appurt. √ Autocalc Torque Arm Areas SR Members Have Cut Ends √ Sort Capacity Reports By Component Triangulate Diamond Inner Bracing | <ul style="list-style-type: none"> Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules √ Calculate Redundant Bracing Forces Ignore Redundant Members in FEA SR Leg Bolts Resist Compression √ All Leg Panels Have Same Allowable Offset Girt At Foundation √ Consider Feedline Torque √ Include Angle Block Shear Check <li style="padding-left: 20px;">Poles Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets |
|--|--|---|

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
LDF4-50A(1/2")	B	Yes	Ar (CfAe)	124.00 - 8.00	1.0000	0.5	1	1	0.6300	0.6300		0.15
1" Coax	C	Yes	Ar (CfAe)	250.00 - 8.00	0.0000	0	1	1	1.0000	1.0000		0.60
LDF5-50A(1-5/8")	A	No	Ar (Leg)	243.00 - 8.00	0.0000	0	4	2	1.0000	1.0900		0.33
LDF5-50A(1-5/8")	B	No	Ar (Leg)	243.00 - 8.00	0.0000	0	4	2	1.0000	1.0900		0.33
LDF5-50A(1-5/8")	C	No	Ar (Leg)	243.00 - 8.00	0.0000	0	4	2	1.0000	1.0900		0.33
LDF5-50A(1-5/8")	A	Yes	Ar (CfAe)	205.00 - 8.00	0.0000	0	12	6	1.0000	1.0900		0.33

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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
LDF5-50A(1-5/8")	A	Yes	Ar (CfAe)	200.00 - 8.00	0.0000	0.49	1	1	1.0000	1.0900		0.33
Safety Line 3/8	B	Yes	Ar (CfAe)	250.00 - 8.00	0.0000	-0.2	1	1	0.3750	0.3750		0.22
LDF4-50A(1/2")	B	Yes	Ar (CfAe)	250.00 - 8.00	1.0000	0.5	1	1	0.6300	0.6300		0.15
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	205.00 - 8.00	0.0000	-0.2	1	1	1.0000	0.0000		0.33
LDF4P-50A(1/2")	A	Yes	Ar (CfAe)	205.00 - 8.00	0.0000	-0.2	1	1	0.6300	0.0000		0.15
3" Flex Conduit	A	Yes	Ar (CfAe)	205.00 - 8.00	0.0000	-0.2	1	1	1.0000	3.0000		0.48

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _{AA} In Face ft ²	C _{AA} Out Face ft ²	Weight K
T1	250.00-240.00	A	1.090	0.000	0.000	0.000	0.0
		B	1.928	0.000	0.000	0.000	0.0
		C	1.923	0.000	0.000	0.000	0.0
T2	240.00-220.00	A	7.267	0.000	0.000	0.000	0.0
		B	8.942	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T3	220.00-200.00	A	11.242	0.000	0.000	0.000	0.1
		B	8.942	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T4	200.00-180.00	A	24.983	0.000	0.000	0.000	0.1
		B	8.942	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T5	180.00-160.00	A	24.983	0.000	0.000	0.000	0.1
		B	8.942	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T6	160.00-140.00	A	24.983	0.000	0.000	0.000	0.1
		B	8.942	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T7	140.00-120.00	A	24.983	0.000	0.000	0.000	0.1
		B	9.152	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T8	120.00-100.00	A	24.983	0.000	0.000	0.000	0.1
		B	9.992	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T9	100.00-80.00	A	24.983	0.000	0.000	0.000	0.1
		B	9.992	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T10	80.00-60.00	A	24.983	0.000	0.000	0.000	0.1
		B	9.992	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T11	60.00-40.00	A	24.983	0.000	0.000	0.000	0.1
		B	9.992	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T12	40.00-20.00	A	24.983	0.000	0.000	0.000	0.1
		B	9.992	0.000	0.000	0.000	0.0
		C	8.933	0.000	0.000	0.000	0.0
T13	20.00-6.75	A	14.990	0.000	0.000	0.000	0.1
		B	5.995	0.000	0.000	0.000	0.0
		C	5.360	0.000	0.000	0.000	0.0

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Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T14	6.75-0.00	A	0.000	0.000	0.000	0.000	0.0
		B	0.000	0.000	0.000	0.000	0.0
		C	0.000	0.000	0.000	0.000	0.0

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 _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
T1	250.00-240.00	A	1.250	1.795	1.045	0.000	0.000	0.0
		B		6.799	1.045	0.000	0.000	0.1
		C		4.712	1.045	0.000	0.000	0.1
T2	240.00-220.00	A	1.250	11.967	6.967	0.000	0.000	0.2
		B		21.975	6.967	0.000	0.000	0.3
		C		17.800	6.967	0.000	0.000	0.3
T3	220.00-200.00	A	1.250	17.837	11.321	0.000	0.000	0.4
		B		21.975	6.967	0.000	0.000	0.3
		C		17.800	6.967	0.000	0.000	0.3
T4	200.00-180.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		21.975	6.967	0.000	0.000	0.3
		C		17.800	6.967	0.000	0.000	0.3
T5	180.00-160.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		21.975	6.967	0.000	0.000	0.3
		C		17.800	6.967	0.000	0.000	0.3
T6	160.00-140.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		21.975	6.967	0.000	0.000	0.3
		C		17.800	6.967	0.000	0.000	0.3
T7	140.00-120.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		23.018	6.967	0.000	0.000	0.4
		C		17.800	6.967	0.000	0.000	0.3
T8	120.00-100.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		27.192	6.967	0.000	0.000	0.4
		C		17.800	6.967	0.000	0.000	0.3
T9	100.00-80.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		27.192	6.967	0.000	0.000	0.4
		C		17.800	6.967	0.000	0.000	0.3
T10	80.00-60.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		27.192	6.967	0.000	0.000	0.4
		C		17.800	6.967	0.000	0.000	0.3
T11	60.00-40.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		27.192	6.967	0.000	0.000	0.4
		C		17.800	6.967	0.000	0.000	0.3
T12	40.00-20.00	A	1.250	41.433	24.383	0.000	0.000	1.1
		B		27.192	6.967	0.000	0.000	0.4
		C		17.800	6.967	0.000	0.000	0.3
T13	20.00-6.75	A	1.250	24.860	14.630	0.000	0.000	0.7
		B		16.315	4.180	0.000	0.000	0.2
		C		10.680	4.180	0.000	0.000	0.2
T14	6.75-0.00	A	1.250	0.000	0.000	0.000	0.000	0.0
		B		0.000	0.000	0.000	0.000	0.0
		C		0.000	0.000	0.000	0.000	0.0

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Feed Line Shielding

Section	Elevation ft	Face	A_R	A_R	A_F	A_F
			ft^2	Ice ft^2	ft^2	Ice ft^2
T1	250.00-240.00	A	0.000	0.000	0.000	0.000
		B	0.095	1.911	0.028	0.167
		C	0.101	1.228	0.028	0.097
T2	240.00-220.00	A	0.000	0.000	0.000	0.000
		B	0.115	3.280	0.028	0.167
		C	0.128	2.140	0.028	0.097
T3	220.00-200.00	A	0.274	3.351	0.066	0.170
		B	0.115	3.280	0.028	0.167
		C	0.128	2.140	0.028	0.097
T4	200.00-180.00	A	1.219	15.365	0.295	0.781
		B	0.115	3.280	0.028	0.167
		C	0.128	2.140	0.028	0.097
T5	180.00-160.00	A	1.219	15.365	0.295	0.781
		B	0.115	3.280	0.028	0.167
		C	0.128	2.140	0.028	0.097
T6	160.00-140.00	A	1.219	15.365	0.295	0.781
		B	0.115	3.280	0.028	0.167
		C	0.128	2.140	0.028	0.097
T7	140.00-120.00	A	1.219	15.365	0.295	0.781
		B	0.130	3.622	0.031	0.184
		C	0.128	2.140	0.028	0.097
T8	120.00-100.00	A	1.219	15.365	0.295	0.781
		B	0.188	4.990	0.045	0.254
		C	0.128	2.140	0.028	0.097
T9	100.00-80.00	A	1.219	15.365	0.295	0.781
		B	0.188	4.990	0.045	0.254
		C	0.128	2.140	0.028	0.097
T10	80.00-60.00	A	1.219	15.365	0.295	0.781
		B	0.188	4.990	0.045	0.254
		C	0.128	2.140	0.028	0.097
T11	60.00-40.00	A	1.219	15.365	0.295	0.781
		B	0.188	4.990	0.045	0.254
		C	0.128	2.140	0.028	0.097
T12	40.00-20.00	A	1.219	15.365	0.295	0.781
		B	0.188	4.990	0.045	0.254
		C	0.128	2.140	0.028	0.097
T13	20.00-6.75	A	0.719	9.348	0.150	0.398
		B	0.111	3.036	0.023	0.129
		C	0.075	1.301	0.014	0.050
T14	6.75-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_x	CP_z	CP_x	CP_z
		in	in	Ice in	Ice in
T1	250.00-240.00	0.3200	0.2851	0.4907	0.2128
T2	240.00-220.00	0.3162	0.2819	0.4610	0.2016
T3	220.00-200.00	-0.2811	0.0643	0.1102	0.1291
T4	200.00-180.00	-1.7363	-0.8727	-0.8028	-0.4451
T5	180.00-160.00	-1.7363	-0.8727	-0.8028	-0.4451
T6	160.00-140.00	-1.7363	-0.8727	-0.8028	-0.4451

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Section	Elevation	CP _X	CP _Z	CP _X	CP _Z
	ft	in	in	Ice in	Ice in
T7	140.00-120.00	-1.6889	-0.8486	-0.7382	-0.4122
T8	120.00-100.00	-1.5015	-0.7534	-0.4842	-0.2825
T9	100.00-80.00	-1.5015	-0.7534	-0.4842	-0.2825
T10	80.00-60.00	-1.5015	-0.7534	-0.4842	-0.2825
T11	60.00-40.00	-1.5015	-0.7534	-0.4842	-0.2825
T12	40.00-20.00	-1.5015	-0.7534	-0.4842	-0.2825
T13	20.00-6.75	-1.4414	-0.7232	-0.4561	-0.2662
T14	6.75-0.00	0.0000	0.0000	0.0000	0.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A		Weight	
			Horz Lateral	Vert			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	K	
Flash Beacon	A	From Leg	0.00	0.00	0.0000	250.00	No Ice	3.00	3.00	0.1
			0.00	0.00			1/2" Ice	4.50	4.50	0.1
			1.50	0.00			1" Ice	6.00	6.00	0.2
			0.00	0.00			2" Ice	9.00	9.00	0.3
Side Light	B	From Leg	1.00	0.00	0.0000	124.00	No Ice	0.33	0.33	0.0
			0.00	0.00			1/2" Ice	0.47	0.47	0.0
			0.00	0.00			1" Ice	0.60	0.60	0.0
			0.00	0.00			2" Ice	0.87	0.87	0.0
Side Light	C	From Leg	1.00	0.00	0.0000	124.00	No Ice	0.33	0.33	0.0
			0.00	0.00			1/2" Ice	0.47	0.47	0.0
			0.00	0.00			1" Ice	0.60	0.60	0.0
			0.00	0.00			2" Ice	0.87	0.87	0.0
BXA-70063/6CF w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	243.00	No Ice	8.00	5.42	0.0
			0.00	0.00			1/2" Ice	8.65	6.59	0.1
			0.00	0.00			1" Ice	9.26	7.46	0.2
			0.00	0.00			2" Ice	10.51	9.25	0.3
BXA-70063/6CF w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	243.00	No Ice	8.00	5.42	0.0
			0.00	0.00			1/2" Ice	8.65	6.59	0.1
			0.00	0.00			1" Ice	9.26	7.46	0.2
			0.00	0.00			2" Ice	10.51	9.25	0.3
BXA-70063/6CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	243.00	No Ice	8.00	5.42	0.0
			0.00	0.00			1/2" Ice	8.65	6.59	0.1
			0.00	0.00			1" Ice	9.26	7.46	0.2
			0.00	0.00			2" Ice	10.51	9.25	0.3
BXA-80063/6CF w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	243.00	No Ice	7.76	5.19	0.0
			0.00	0.00			1/2" Ice	8.30	6.12	0.1
			0.00	0.00			1" Ice	8.85	6.93	0.2
			0.00	0.00			2" Ice	9.98	8.60	0.3
BXA-80063/6CF w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	243.00	No Ice	7.76	5.19	0.0
			0.00	0.00			1/2" Ice	8.30	6.12	0.1
			0.00	0.00			1" Ice	8.85	6.93	0.2
			0.00	0.00			2" Ice	9.98	8.60	0.3
BXA-80063/6CF w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	243.00	No Ice	7.76	5.19	0.0
			0.00	0.00			1/2" Ice	8.30	6.12	0.1
			0.00	0.00			1" Ice	8.85	6.93	0.2
			0.00	0.00			2" Ice	9.98	8.60	0.3
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.00	0.0000	243.00	No Ice	0.37	0.08	0.0
			0.00	0.00			1/2" Ice	0.45	0.14	0.0

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A _A Front	C _A A _A Side	Weight
			Horz	Lateral					
				0.00					
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	243.00	1" Ice	0.54	0.20	0.0
			0.00			2" Ice	0.75	0.34	0.0
			0.00			No Ice	0.37	0.08	0.0
			0.00			1/2" Ice	0.45	0.14	0.0
			0.00			1" Ice	0.54	0.20	0.0
			0.00			2" Ice	0.75	0.34	0.0
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.0000	243.00	No Ice	0.37	0.08	0.0
			0.00			1/2" Ice	0.45	0.14	0.0
			0.00			1" Ice	0.54	0.20	0.0
			0.00			2" Ice	0.75	0.34	0.0
BXA-171063/12CF w/ Mount Pipe	A	From Leg	4.00	0.0000	243.00	No Ice	4.79	5.34	0.0
			0.00			1/2" Ice	5.24	6.15	0.1
			0.00			1" Ice	5.70	6.96	0.1
			0.00			2" Ice	6.64	8.65	0.3
BXA-171063/12CF w/ Mount Pipe	B	From Leg	4.00	0.0000	243.00	No Ice	4.79	5.34	0.0
			0.00			1/2" Ice	5.24	6.15	0.1
			0.00			1" Ice	5.70	6.96	0.1
			0.00			2" Ice	6.64	8.65	0.3
BXA-171063/12CF w/ Mount Pipe	C	From Leg	4.00	0.0000	243.00	No Ice	4.79	5.34	0.0
			0.00			1/2" Ice	5.24	6.15	0.1
			0.00			1" Ice	5.70	6.96	0.1
			0.00			2" Ice	6.64	8.65	0.3
(3) 12' Lightweight T-Frame	C	None		0.0000	243.00	No Ice	19.83	19.83	0.9
						1/2" Ice	29.41	29.41	1.3
						1" Ice	38.99	38.99	1.7
						2" Ice	58.15	58.15	2.5
AM-X-CD-17-65-00T w/ Mount Pipe	A	From Leg	4.00	0.0000	205.00	No Ice	11.31	9.10	0.1
			0.00			1/2" Ice	11.93	10.52	0.2
			0.00			1" Ice	12.55	11.60	0.3
			0.00			2" Ice	13.88	13.80	0.5
AM-X-CD-17-65-00T w/ Mount Pipe	B	From Leg	4.00	0.0000	205.00	No Ice	11.31	9.10	0.1
			0.00			1/2" Ice	11.93	10.52	0.2
			0.00			1" Ice	12.55	11.60	0.3
			0.00			2" Ice	13.88	13.80	0.5
AM-X-CD-17-65-00T w/ Mount Pipe	C	From Leg	4.00	0.0000	205.00	No Ice	11.31	9.10	0.1
			0.00			1/2" Ice	11.93	10.52	0.2
			0.00			1" Ice	12.55	11.60	0.3
			0.00			2" Ice	13.88	13.80	0.5
(2) 7770.00 w/Mount Pipe	A	From Leg	4.00	0.0000	205.00	No Ice	5.88	4.10	0.1
			0.00			1/2" Ice	6.31	4.73	0.1
			0.00			1" Ice	6.75	5.37	0.2
			0.00			2" Ice	7.66	6.70	0.3
(2) 7770.00 w/Mount Pipe	B	From Leg	4.00	0.0000	205.00	No Ice	5.88	4.10	0.1
			0.00			1/2" Ice	6.31	4.73	0.1
			0.00			1" Ice	6.75	5.37	0.2
			0.00			2" Ice	7.66	6.70	0.3
(2) 7770.00 w/Mount Pipe	C	From Leg	4.00	0.0000	205.00	No Ice	5.88	4.10	0.1
			0.00			1/2" Ice	6.31	4.73	0.1
			0.00			1" Ice	6.75	5.37	0.2
			0.00			2" Ice	7.66	6.70	0.3
(2) LGP21401	A	From Leg	4.00	0.0000	205.00	No Ice	1.29	0.23	0.0
			0.00			1/2" Ice	1.45	0.31	0.0
			0.00			1" Ice	1.61	0.40	0.0
			0.00			2" Ice	1.97	0.61	0.1
(2) LGP21401	B	From Leg	4.00	0.0000	205.00	No Ice	1.29	0.23	0.0
			0.00			1/2" Ice	1.45	0.31	0.0
			0.00			1" Ice	1.61	0.40	0.0

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA}		Weight
			Horz	Lateral			Front	Side	
			Vert ft	ft	°	ft	ft ²	ft ²	K
(2) LGP21401	C	From Leg	4.00	0.0000	205.00	2" Ice	1.97	0.61	0.1
			0.00			No Ice	1.29	0.23	0.0
			0.00			1/2" Ice	1.45	0.31	0.0
			0.00			1" Ice	1.61	0.40	0.0
(2) LGP21901	A	From Leg	4.00	0.0000	205.00	2" Ice	1.97	0.61	0.1
			0.00			No Ice	0.27	0.18	0.0
			0.00			1/2" Ice	0.34	0.25	0.0
			0.00			1" Ice	0.43	0.32	0.0
(2) LGP21901	B	From Leg	4.00	0.0000	205.00	2" Ice	0.62	0.49	0.0
			0.00			No Ice	0.27	0.18	0.0
			0.00			1/2" Ice	0.34	0.25	0.0
			0.00			1" Ice	0.43	0.32	0.0
(2) LGP21901	C	From Leg	4.00	0.0000	205.00	2" Ice	0.62	0.49	0.0
			0.00			No Ice	0.27	0.18	0.0
			0.00			1/2" Ice	0.34	0.25	0.0
			0.00			1" Ice	0.43	0.32	0.0
(2) RRUS-11	A	From Leg	4.00	0.0000	205.00	2" Ice	0.62	0.49	0.0
			0.00			No Ice	2.94	1.25	0.1
			0.00			1/2" Ice	3.17	1.41	0.1
			0.00			1" Ice	3.41	1.59	0.1
(2) RRUS-11	B	From Leg	4.00	0.0000	205.00	2" Ice	3.91	1.96	0.1
			0.00			No Ice	2.94	1.25	0.1
			0.00			1/2" Ice	3.17	1.41	0.1
			0.00			1" Ice	3.41	1.59	0.1
(2) RRUS-11	C	From Leg	4.00	0.0000	205.00	2" Ice	3.91	1.96	0.1
			0.00			No Ice	2.94	1.25	0.1
			0.00			1/2" Ice	3.17	1.41	0.1
			0.00			1" Ice	3.41	1.59	0.1
DC6-48-60-18-8F	C	From Leg	0.00	0.0000	205.00	2" Ice	3.91	1.96	0.1
			0.00			No Ice	2.22	2.22	0.0
			0.00			1/2" Ice	2.44	2.44	0.0
			0.00			1" Ice	2.66	2.66	0.1
(3) 12' T-Frame	C	None		0.0000	205.00	2" Ice	3.15	3.15	0.1
						No Ice	30.02	30.02	1.0
						1/2" Ice	40.48	40.48	1.4
						1" Ice	50.94	50.94	1.9
3" Dia 10' Omni w/mount pipe	B	From Leg	6.00	0.0000	200.00	2" Ice	71.86	71.86	2.8
			0.00			No Ice	4.11	4.11	0.1
			5.00			1/2" Ice	5.39	5.39	0.1
						1" Ice	6.64	6.64	0.2
72" Standoff	B	From Leg	3.00	0.0000	200.00	2" Ice	8.42	8.42	0.3
			0.00			No Ice	0.98	3.03	0.1
			0.00			1/2" Ice	1.70	5.22	0.1
			0.00			1" Ice	2.42	7.41	0.1
					2" Ice	3.86	11.79	0.2	

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Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy
5	Dead+Wind 90 deg - No Ice+Guy
6	Dead+Wind 120 deg - No Ice+Guy
7	Dead+Wind 150 deg - No Ice+Guy
8	Dead+Wind 180 deg - No Ice+Guy
9	Dead+Wind 210 deg - No Ice+Guy
10	Dead+Wind 240 deg - No Ice+Guy
11	Dead+Wind 270 deg - No Ice+Guy
12	Dead+Wind 300 deg - No Ice+Guy
13	Dead+Wind 330 deg - No Ice+Guy
14	Dead+Ice+Temp+Guy
15	Dead+Wind 0 deg+Ice+Temp+Guy
16	Dead+Wind 30 deg+Ice+Temp+Guy
17	Dead+Wind 60 deg+Ice+Temp+Guy
18	Dead+Wind 90 deg+Ice+Temp+Guy
19	Dead+Wind 120 deg+Ice+Temp+Guy
20	Dead+Wind 150 deg+Ice+Temp+Guy
21	Dead+Wind 180 deg+Ice+Temp+Guy
22	Dead+Wind 210 deg+Ice+Temp+Guy
23	Dead+Wind 240 deg+Ice+Temp+Guy
24	Dead+Wind 270 deg+Ice+Temp+Guy
25	Dead+Wind 300 deg+Ice+Temp+Guy
26	Dead+Wind 330 deg+Ice+Temp+Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum Tower Deflections - Service Wind

Section No.	Elevation <i>ft</i>	Horz. Deflection <i>in</i>	Gov. Load Comb.	Tilt <i>°</i>	Twist <i>°</i>
T1	250 - 240	2.249	29	0.1826	0.0243
T2	240 - 220	2.562	29	0.1851	0.0247
T3	220 - 200	3.127	29	0.1218	0.0289
T4	200 - 180	3.240	29	0.0392	0.0333
T5	180 - 160	2.912	29	0.0792	0.0499
T6	160 - 140	2.588	29	0.0839	0.0627
T7	140 - 120	2.202	29	0.0949	0.0724
T8	120 - 100	1.846	29	0.0566	0.0792
T9	100 - 80	1.726	31	0.0283	0.0849
T10	80 - 60	1.594	31	0.0455	0.0889
T11	60 - 40	1.360	31	0.0609	0.0895
T12	40 - 20	1.072	31	0.0865	0.0876
T13	20 - 6.75	0.616	31	0.1303	0.0827

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Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T14	6.75 - 0	0.220	31	0.1497	0.0771

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	Flash Beacon	29	2.249	0.1826	0.0243	126733
243.00	BXA-70063/6CF w/ Mount Pipe	29	2.467	0.1858	0.0244	94188
240.08	Guy	29	2.559	0.1852	0.0247	107942
205.00	AM-X-CD-17-65-00T w/ Mount Pipe	29	3.264	0.0423	0.0312	8331
200.00	3" Dia 10' Omni w/mount pipe	29	3.240	0.0392	0.0333	8678
180.08	Guy	29	2.913	0.0791	0.0498	34637
124.00	Side Light	29	1.901	0.0663	0.0781	17771
120.08	Guy	29	1.847	0.0568	0.0792	15555
60.08	Guy	31	1.361	0.0608	0.0895	595582

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	250 - 240	11.185	6	0.5952	0.1176
T2	240 - 220	12.408	6	0.6029	0.1181
T3	220 - 200	14.707	2	0.4043	0.1338
T4	200 - 180	15.552	2	0.2058	0.1533
T5	180 - 160	14.801	2	0.2868	0.1568
T6	160 - 140	13.647	2	0.3362	0.1874
T7	140 - 120	11.999	2	0.4261	0.2160
T8	120 - 100	10.268	2	0.3367	0.2427
T9	100 - 80	9.128	2	0.2597	0.2685
T10	80 - 60	7.952	2	0.3181	0.2888
T11	60 - 40	6.475	2	0.3684	0.3015
T12	40 - 20	4.826	2	0.4491	0.3044
T13	20 - 6.75	2.659	2	0.5837	0.2932
T14	6.75 - 0	0.935	2	0.6428	0.2735

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
250.00	Flash Beacon	6	11.185	0.5952	0.1176	16216
243.00	BXA-70063/6CF w/ Mount Pipe	6	12.038	0.6045	0.1176	11775
240.08	Guy	6	12.398	0.6030	0.1181	9869
205.00	AM-X-CD-17-65-00T w/ Mount Pipe	2	15.517	0.2503	0.1510	2504
200.00	3" Dia 10' Omni w/mount pipe	2	15.552	0.2058	0.1533	2551

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Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
180.08	Guy	2	14.805	0.2864	0.1566	13788
124.00	Side Light	2	10.573	0.3627	0.2374	5735
120.08	Guy	2	10.274	0.3372	0.2426	5034
60.08	Guy	2	6.482	0.3682	0.3015	20662

Bolt Design Data

Section No.	Elevation	Component Type	Bolt Grade	Bolt Size	Number Of Bolts	Maximum Load per Bolt	Allowable Load	Ratio Load Allowable	Allowable Ratio	Criteria
	ft			in		K	K			
T1	250	Leg	A325N	0.7500	3	1.1	19.4	0.058 ✓	1.333	Bolt Tension
T2	240	Leg	A325N	0.7500	3	5.6	19.4	0.288 ✓	1.333	Bolt Tension
T3	220	Leg	A325N	0.7500	3	6.7	19.4	0.344 ✓	1.333	Bolt Tension
T4	200	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T5	180	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T6	160	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T7	140	Leg	A325N	0.7500	3	0.0	19.3	0.000 ✓	1.333	Bolt Tension
T8	120	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T9	100	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T10	80	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T11	60	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T12	40	Leg	A325N	0.7500	3	0.0	19.4	0.000 ✓	1.333	Bolt Tension
T13	20	Leg	A325N	0.7500	3	0.0	19.1	0.000 ✓	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation	Size	Initial Tension	Breaking Load	Actual T	Allowable T _a	Required S.F.	Actual S.F.
	ft		K	K	K	K		
T1	240.08 (A) (845)	9/16 EHS	3.5	35.0	9.7	17.5	2.000	3.592 ✓
	240.08 (A) (846)	9/16 EHS	3.5	35.0	9.8	17.5	2.000	3.589 ✓
	240.08 (B) (839)	9/16 EHS	3.5	35.0	9.7	17.5	2.000	3.613 ✓
	240.08 (B) (840)	9/16 EHS	3.5	35.0	9.7	17.5	2.000	3.615 ✓
	240.08 (C) (833)	9/16 EHS	3.5	35.0	9.8	17.5	2.000	3.574 ✓
	240.08 (C) (834)	9/16 EHS	3.5	35.0	9.8	17.5	2.000	3.574 ✓
T4	180.08 (A) (853)	9/16 EHS	3.5	35.0	12.9	17.5	2.000	2.719 ✓

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Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T _a K	Required S.F.	Actual S.F.
T7	180.08 (B) (852)	9/16 EHS	3.5	35.0	12.8	17.5	2.000	2.736 ✓
	180.08 (C) (851)	9/16 EHS	3.5	35.0	12.9	17.5	2.000	2.708 ✓
	120.08 (A) (856)	1/2 EHS	2.7	26.9	8.9	13.4	2.000	3.012 ✓
	120.08 (B) (855)	1/2 EHS	2.7	26.9	8.9	13.4	2.000	3.016 ✓
	120.08 (C) (854)	1/2 EHS	2.7	26.9	9.0	13.4	2.000	2.998 ✓
T10	60.08 (A) (859)	3/8 EHS	1.5	15.4	5.1	7.7	2.000	3.024 ✓
	60.08 (B) (858)	3/8 EHS	1.5	15.4	5.1	7.7	2.000	3.042 ✓
	60.08 (C) (857)	3/8 EHS	1.5	15.4	5.1	7.7	2.000	3.023 ✓

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _a ft	Kl/r	Mast Stability Index	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P/P _a
T1	250 - 240	Pipe 2.875" x 0.203" (2.5 STD)	10.00	3.28	41.5 K=1.00	1.00	25.618	1.7040	-4.9	43.7	0.113 ✓
T2	240 - 220	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.99	25.309	1.7040	-35.1	43.1	0.813 ✓
T3	220 - 200	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.99	25.340	1.7040	-40.9	43.2	0.948 ✓
T4	200 - 180	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.99	25.291	1.7040	-37.4	43.1	0.868 ✓
T5	180 - 160	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.326	1.7040	-22.7	41.5	0.547° ✓
T6	160 - 140	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.326	1.7040	-23.7	41.5	0.573° ✓
T7	140 - 120	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.326	1.7040	-28.0	41.5	0.675° ✓
T8	120 - 100	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.326	1.7040	-29.2	41.5	0.705° ✓
T9	100 - 80	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.326	1.7040	-30.5	41.5	0.735° ✓
T10	80 - 60	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.326	1.7040	-33.1	41.5	0.798° ✓
T11	60 - 40	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.315	1.7040	-34.3	41.4	0.828° ✓
T12	40 - 20	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9 K=1.00	0.95	24.315	1.7040	-35.5	41.4	0.858° ✓
T13	20 - 6.75	Pipe 2.875" x 0.203" (2.5 STD)	13.25	3.27	41.4 K=1.00	0.95	24.315	1.7040	-36.3	41.4	0.876° ✓

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Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	Mast Stability Index	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
T14	6.75 - 0	Pipe 2.875" x 0.203" (2.5 STD)	6.97	2.32	29.4 K=1.00	0.89	24.315	1.7040	-37.6	41.4	0.908* ✓

* DL controls

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 P P _a
T1	250 - 240	1 1/4	4.44	2.04	86.4 K=1.10	14.633	1.2272	-1.3	18.0	0.073
T2	240 - 220	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-3.2	4.7	0.694
T3	220 - 200	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-3.1	4.7	0.671
T4	200 - 180	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-3.5	4.7	0.743
T5	180 - 160	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-1.9	4.7	0.407*
T6	160 - 140	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-2.0	4.7	0.426*
T7	140 - 120	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-3.1	4.7	0.672
T8	120 - 100	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-2.4	4.7	0.525*
T9	100 - 80	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-2.5	4.7	0.547*
T10	80 - 60	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-2.6	4.7	0.551*
T11	60 - 40	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-2.9	4.7	0.616*
T12	40 - 20	3/4	4.46	2.05	118.3 K=0.90	10.526	0.4418	-3.0	4.7	0.637*
T13	20 - 6.75	3/4	4.44	2.04	117.6 K=0.90	10.622	0.4418	-2.9	4.7	0.627*
T14	6.75 - 0	3/4	2.72	1.60	101.2 K=0.99	12.830	0.4418	-4.7	5.7	0.834*

* DL controls

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Horizontal 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 P P _a
T1	250 - 240	1 1/4	3.00	2.76	89.0 K=0.84	14.318	1.2272	-0.7	17.6	0.042
T2	240 - 220	5/8	3.00	2.76	148.4 K=0.70	6.781	0.3068	-0.8	2.1	0.408*
T3	220 - 200	5/8	3.00	2.76	148.4 K=0.70	6.781	0.3068	-1.0	2.1	0.463
T4	200 - 180	5/8	3.00	2.76	148.4 K=0.70	6.781	0.3068	-0.1	2.1	0.068

* DL controls

Secondary Horizontal 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 P P _a
T1	250 - 240	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T2	240 - 220	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T3	220 - 200	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T4	200 - 180	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T5	180 - 160	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T6	160 - 140	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T7	140 - 120	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T8	120 - 100	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T9	100 - 80	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T10	80 - 60	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T11	60 - 40	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T12	40 - 20	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000
T13	20 - 6.75	5/8	1.50	1.38	89.0 K=0.84	14.318	0.3068	-0.0	4.4	0.000

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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 P P _a
T1	250 - 240	L2x1 1/2x3/16	3.00	2.76	111.4 K=1.08	11.477	0.6211	-0.0	7.1	0.003
T2	240 - 220	L2x1 1/2x3/16	3.00	2.76	111.4 K=1.08	11.477	0.6211	-1.7	7.1	0.239
T3	220 - 200	L2x1 1/2x3/16	3.00	2.76	111.4 K=1.08	11.477	0.6211	-0.2	7.1	0.031
T4	200 - 180	L2x1 1/2x3/16	3.00	2.76	111.4 K=1.08	11.477	0.6211	-0.3	7.1	0.041

Bottom 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 P P _a
T2	240 - 220	L2x1 1/2x3/16	3.00	2.76	111.4 K=1.08	11.477	0.6211	-0.3	7.1	0.044
T3	220 - 200	L2x1 1/2x3/16	3.00	2.76	111.4 K=1.08	11.477	0.6211	-0.1	7.1	0.017

Top Guy Pull-Off 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 P P _a
T1	250 - 240	L2x1 1/2x3/16	3.00	2.76	102.9 K=1.00	12.610	0.6211	-1.7	7.8	0.217

Torque-Arm Bottom Design Data

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 P P _a
T1	250 - 240 (837)	L2x2x1/4	6.20	6.05	92.9 K=0.50	13.862	0.9380	-13.3	13.0	1.024
T1	250 - 240 (838)	L2x2x1/4	6.20	6.05	92.9 K=0.50	13.862	0.9380	-13.3	13.0	1.021
T1	250 - 240 (843)	L2x2x1/4	6.20	6.05	92.9 K=0.50	13.862	0.9380	-13.2	13.0	1.015
T1	250 - 240 (844)	L2x2x1/4	6.20	6.05	92.9 K=0.50	13.862	0.9380	-13.3	13.0	1.026
T1	250 - 240 (849)	L2x2x1/4	6.20	6.05	92.9 K=0.50	13.862	0.9380	-13.1	13.0	1.010

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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 P P _a
T1	250 - 240 (850)	L2x2x1/4	6.20	6.05	92.9 K=0.50	13.862	0.9380	-13.2	13.0	1.018 ✓

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 P P _a
T1	250 - 240	Pipe 2.875" x 0.203" (2.5 STD)	10.00	3.28	41.5	30.000	1.7040	3.4	51.1	0.066 ✓
T2	240 - 220	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9	30.000	1.7040	16.8	51.1	0.328 ✓
T3	220 - 200	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9	30.000	1.7040	25.7	51.1	0.503 ✓
T4	200 - 180	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9	30.000	1.7040	20.1	51.1	0.392 ✓
T7	140 - 120	Pipe 2.875" x 0.203" (2.5 STD)	20.00	3.31	41.9	30.000	1.7040	2.1	51.1	0.041 ✓

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 P P _a
T1	250 - 240	1 1/4	4.44	2.04	78.5	21.600	1.2272	1.7	26.5	0.066 ✓
T2	240 - 220	3/4	4.46	2.05	131.4	21.600	0.4418	2.9	9.5	0.302 ✓
T3	220 - 200	3/4	4.46	2.05	131.4	21.600	0.4418	1.2	9.5	0.128 ✓
T4	200 - 180	3/4	4.46	2.05	131.4	21.600	0.4418	2.1	9.5	0.221 ✓
T5	180 - 160	3/4	4.46	2.05	131.4	21.600	0.4418	0.1	9.5	0.007 ✓
T7	140 - 120	3/4	4.46	2.05	131.4	21.600	0.4418	0.6	9.5	0.061 ✓
T8	120 - 100	3/4	4.46	2.05	131.4	21.600	0.4418	0.2	9.5	0.020 ✓

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Horizontal 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 P/P _a
T1	250 - 240	1 1/4	3.00	2.76	106.0	21.600	1.2272	0.6	26.5	0.022
T2	240 - 220	5/8	3.00	2.76	212.0	21.600	0.3068	2.3	6.6	0.340
T3	220 - 200	5/8	3.00	2.76	212.0	21.600	0.3068	3.0	6.6	0.452
T4	200 - 180	5/8	3.00	2.76	212.0	21.600	0.3068	2.4	6.6	0.364
T5	180 - 160	5/8	3.00	2.76	212.0	21.600	0.3068	2.2	6.6	0.336*
T6	160 - 140	5/8	3.00	2.76	212.0	21.600	0.3068	2.3	6.6	0.353*
T7	140 - 120	5/8	3.00	2.76	212.0	21.600	0.3068	2.4	6.6	0.361*
T8	120 - 100	5/8	3.00	2.76	212.0	21.600	0.3068	2.9	6.6	0.436*
T9	100 - 80	5/8	3.00	2.76	212.0	21.600	0.3068	3.0	6.6	0.455*
T10	80 - 60	5/8	3.00	2.76	212.0	21.600	0.3068	3.1	6.6	0.465*
T11	60 - 40	5/8	3.00	2.76	212.0	21.600	0.3068	3.4	6.6	0.513*
T12	40 - 20	5/8	3.00	2.76	212.0	21.600	0.3068	3.5	6.6	0.531*
T13	20 - 6.75	5/8	3.00	2.76	212.0	21.600	0.3068	3.5	6.6	0.532*
T14	6.75 - 0	2 x 1/4	3.00	2.76	459.0	21.600	0.5000	4.3	10.8	0.399*

* DL controls

Secondary Horizontal 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 P/P _a
T1	250 - 240	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T2	240 - 220	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T3	220 - 200	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T4	200 - 180	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T5	180 - 160	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T6	160 - 140	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000

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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 P P _a
T7	140 - 120	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T8	120 - 100	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T9	100 - 80	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T10	80 - 60	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T11	60 - 40	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T12	40 - 20	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000
T13	20 - 6.75	5/8	1.50	1.38	106.0	21.600	0.3068	0.0	6.6	0.000

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 P P _a
T1	250 - 240	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	0.0	13.4	0.002
T2	240 - 220	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	3.3	13.4	0.244
T3	220 - 200	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.2	13.4	0.092
T4	200 - 180	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.4	13.4	0.104
T5	180 - 160	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.9	13.4	0.141°
T6	160 - 140	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.3	13.4	0.095°
T7	140 - 120	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.3	13.4	0.099°
T8	120 - 100	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	2.3	13.4	0.171°
T9	100 - 80	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.6	13.4	0.123°
T10	80 - 60	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.7	13.4	0.128°
T11	60 - 40	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	2.5	13.4	0.183°
T12	40 - 20	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.9	13.4	0.144°
T13	20 - 6.75	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	2.0	13.4	0.149°

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* DL controls

Bottom 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 P P _a
T2	240 - 220	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.4	13.4	0.102
T3	220 - 200	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.3	13.4	0.099
T5	180 - 160	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.3	13.4	0.095 ^o
T6	160 - 140	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.3	13.4	0.100 ^o
T8	120 - 100	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.6	13.4	0.123 ^o
T9	100 - 80	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.7	13.4	0.128 ^o
T11	60 - 40	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	1.9	13.4	0.144 ^o
T12	40 - 20	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	2.0	13.4	0.148 ^o
T13	20 - 6.75	2 x 1/4	3.00	2.76	459.0	21.600	0.5000	4.1	10.8	0.384 ^o

* DL controls

Top Guy Pull-Off 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 P P _a
T1	250 - 240	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	4.4	13.4	0.326
T4	200 - 180	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	3.4	13.4	0.252
T7	140 - 120	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	2.9	13.4	0.213 ^o
T10	80 - 60	L2x1 1/2x3/16	3.00	2.76	75.4	21.600	0.6211	2.9	13.4	0.218 ^o

* DL controls

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Torque-Arm Top Design Data

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 P P _a
T1	250 - 240 (835)	L2x2x1/4	5.13	5.01	98.8	21.600	0.9380	9.0	20.3	0.447 [*]
T1	250 - 240 (836)	L2x2x1/4	5.13	5.01	98.8	21.600	0.9380	9.0	20.3	0.446 [*]
T1	250 - 240 (841)	L2x2x1/4	5.13	5.01	98.8	21.600	0.9380	9.0	20.3	0.446 [*]
T1	250 - 240 (842)	L2x2x1/4	5.13	5.01	98.8	21.600	0.9380	9.0	20.3	0.444 [*]
T1	250 - 240 (847)	L2x2x1/4	5.13	5.01	98.8	21.600	0.9380	9.0	20.3	0.443 [*]
T1	250 - 240 (848)	L2x2x1/4	5.13	5.01	98.8	21.600	0.9380	9.0	20.3	0.444 [*]

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T1	250 - 240	Leg	Pipe 2.875" x 0.203" (2.5 STD)	2	-4.8	58.2	16.3	Pass
T2	240 - 220	Leg	Pipe 2.875" x 0.203" (2.5 STD)	37	-35.1	57.5	61.0	Pass
T3	220 - 200	Leg	Pipe 2.875" x 0.203" (2.5 STD)	103	-40.9	57.6	71.1	Pass
T4	200 - 180	Leg	Pipe 2.875" x 0.203" (2.5 STD)	169	-37.4	57.4	65.1	Pass
T5	180 - 160	Leg	Pipe 2.875" x 0.203" (2.5 STD)	236	-22.7	41.5	54.7	Pass
T6	160 - 140	Leg	Pipe 2.875" x 0.203" (2.5 STD)	302	-23.7	41.5	57.3	Pass
T7	140 - 120	Leg	Pipe 2.875" x 0.203" (2.5 STD)	367	-28.0	41.5	67.5	Pass
T8	120 - 100	Leg	Pipe 2.875" x 0.203" (2.5 STD)	433	-29.2	41.5	70.5	Pass
T9	100 - 80	Leg	Pipe 2.875" x 0.203" (2.5 STD)	499	-30.5	41.5	73.5	Pass
T10	80 - 60	Leg	Pipe 2.875" x 0.203" (2.5 STD)	565	-33.1	41.5	79.8	Pass
T11	60 - 40	Leg	Pipe 2.875" x 0.203" (2.5 STD)	631	-34.3	41.4	82.8	Pass
T12	40 - 20	Leg	Pipe 2.875" x 0.203" (2.5 STD)	697	-35.5	41.4	85.8	Pass
T13	20 - 6.75	Leg	Pipe 2.875" x 0.203" (2.5 STD)	763	-36.3	41.4	87.6	Pass
T14	6.75 - 0	Leg	Pipe 2.875" x 0.203" (2.5 STD)	809	-37.6	41.4	90.8	Pass
T1	250 - 240	Diagonal	1 1/4	13	-1.3	23.9	5.4	Pass
T2	240 - 220	Diagonal	3/4	96	-3.2	6.2	52.0	Pass
T3	220 - 200	Diagonal	3/4	116	-3.1	6.2	50.3	Pass
T4	200 - 180	Diagonal	3/4	230	-3.5	6.2	55.7	Pass
T5	180 - 160	Diagonal	3/4	245	-1.9	4.7	40.7	Pass
T6	160 - 140	Diagonal	3/4	311	-2.0	4.7	42.6	Pass
T7	140 - 120	Diagonal	3/4	376	-3.1	6.2	50.4	Pass
T8	120 - 100	Diagonal	3/4	443	-2.4	4.7	52.5	Pass
T9	100 - 80	Diagonal	3/4	509	-2.5	4.7	54.7	Pass
T10	80 - 60	Diagonal	3/4	625	-2.6	4.7	55.1	Pass
T11	60 - 40	Diagonal	3/4	641	-2.9	4.7	61.6	Pass
T12	40 - 20	Diagonal	3/4	707	-3.0	4.7	63.7	Pass
T13	20 - 6.75	Diagonal	3/4	804	-2.9	4.7	62.7	Pass
T14	6.75 - 0	Diagonal	3/4	822	-4.7	5.7	83.4	Pass
T1	250 - 240	Horizontal	1 1/4	17	-0.7	23.4	3.1	Pass
T2	240 - 220	Horizontal	5/8	94	-0.8	2.1	40.8	Pass
T3	220 - 200	Horizontal	5/8	130	-1.0	2.8	34.7	Pass
T4	200 - 180	Horizontal	5/8	225	2.4	8.8	27.3	Pass

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T5	180 - 160	Horizontal	5/8	252	2.2	6.6	33.6	Pass
T6	160 - 140	Horizontal	5/8	318	2.3	6.6	35.3	Pass
T7	140 - 120	Horizontal	5/8	385	2.4	6.6	36.1	Pass
T8	120 - 100	Horizontal	5/8	451	2.9	6.6	43.6	Pass
T9	100 - 80	Horizontal	5/8	517	3.0	6.6	45.5	Pass
T10	80 - 60	Horizontal	5/8	583	3.1	6.6	46.5	Pass
T11	60 - 40	Horizontal	5/8	649	3.4	6.6	51.3	Pass
T12	40 - 20	Horizontal	5/8	715	3.5	6.6	53.1	Pass
T13	20 - 6.75	Horizontal	5/8	801	3.5	6.6	53.2	Pass
T14	6.75 - 0	Horizontal	2 x 1/4	814	4.3	10.8	39.9	Pass
T1	250 - 240	Secondary Horizontal	5/8	26	0.0	8.8	0.4	Pass
T2	240 - 220	Secondary Horizontal	5/8	102	0.0	8.8	0.4	Pass
T3	220 - 200	Secondary Horizontal	5/8	168	0.0	8.8	0.3	Pass
T4	200 - 180	Secondary Horizontal	5/8	234	0.0	8.8	0.2	Pass
T5	180 - 160	Secondary Horizontal	5/8	300	0.0	8.8	0.1	Pass
T6	160 - 140	Secondary Horizontal	5/8	316	0.0	8.8	0.1	Pass
T7	140 - 120	Secondary Horizontal	5/8	432	0.0	8.8	0.1	Pass
T8	120 - 100	Secondary Horizontal	5/8	448	0.0	8.8	0.3	Pass
T9	100 - 80	Secondary Horizontal	5/8	514	0.0	8.8	0.5	Pass
T10	80 - 60	Secondary Horizontal	5/8	630	0.0	8.8	0.5	Pass
T11	60 - 40	Secondary Horizontal	5/8	646	0.0	8.8	0.7	Pass
T12	40 - 20	Secondary Horizontal	5/8	712	0.0	8.8	0.7	Pass
T13	20 - 6.75	Secondary Horizontal	5/8	808	0.0	8.8	0.7	Pass
T1	250 - 240	Top Girt	L2x1 1/2x3/16	4	-0.0	9.5	0.2	Pass
T2	240 - 220	Top Girt	L2x1 1/2x3/16	41	3.3	17.9	18.3	Pass
T3	220 - 200	Top Girt	L2x1 1/2x3/16	108	1.2	17.9	6.9	Pass
T4	200 - 180	Top Girt	L2x1 1/2x3/16	173	1.4	17.9	7.8	Pass
T5	180 - 160	Top Girt	L2x1 1/2x3/16	239	1.9	13.4	14.1	Pass
T6	160 - 140	Top Girt	L2x1 1/2x3/16	305	1.3	13.4	9.5	Pass
T7	140 - 120	Top Girt	L2x1 1/2x3/16	371	1.3	13.4	9.9	Pass
T8	120 - 100	Top Girt	L2x1 1/2x3/16	438	2.3	13.4	17.1	Pass
T9	100 - 80	Top Girt	L2x1 1/2x3/16	504	1.6	13.4	12.3	Pass
T10	80 - 60	Top Girt	L2x1 1/2x3/16	570	1.7	13.4	12.8	Pass
T11	60 - 40	Top Girt	L2x1 1/2x3/16	636	2.5	13.4	18.3	Pass
T12	40 - 20	Top Girt	L2x1 1/2x3/16	702	1.9	13.4	14.4	Pass
T13	20 - 6.75	Top Girt	L2x1 1/2x3/16	768	2.0	13.4	14.9	Pass
T2	240 - 220	Bottom Girt	L2x1 1/2x3/16	44	1.4	17.9	7.7	Pass
T3	220 - 200	Bottom Girt	L2x1 1/2x3/16	109	1.3	17.9	7.4	Pass
T5	180 - 160	Bottom Girt	L2x1 1/2x3/16	242	1.3	13.4	9.5	Pass
T6	160 - 140	Bottom Girt	L2x1 1/2x3/16	308	1.3	13.4	10.0	Pass
T8	120 - 100	Bottom Girt	L2x1 1/2x3/16	441	1.6	13.4	12.3	Pass
T9	100 - 80	Bottom Girt	L2x1 1/2x3/16	507	1.7	13.4	12.8	Pass
T11	60 - 40	Bottom Girt	L2x1 1/2x3/16	639	1.9	13.4	14.4	Pass
T12	40 - 20	Bottom Girt	L2x1 1/2x3/16	705	2.0	13.4	14.8	Pass
T13	20 - 6.75	Bottom Girt	2 x 1/4	771	4.1	10.8	38.4	Pass
T1	250 - 240	Guy A@240.083	9/16	846	9.8	17.5	55.7	Pass
T4	200 - 180	Guy A@180.083	9/16	853	12.9	17.5	73.5	Pass
T7	140 - 120	Guy A@120.083	1/2	856	8.9	13.4	66.4	Pass
T10	80 - 60	Guy A@60.0833	3/8	859	5.1	7.7	66.1	Pass
T1	250 - 240	Guy B@240.083	9/16	839	9.7	17.5	55.4	Pass
T4	200 - 180	Guy B@180.083	9/16	852	12.8	17.5	73.1	Pass
T7	140 - 120	Guy B@120.083	1/2	855	8.9	13.4	66.3	Pass
T10	80 - 60	Guy B@60.0833	3/8	858	5.1	7.7	65.8	Pass
T1	250 - 240	Guy C@240.083	9/16	834	9.8	17.5	56.0	Pass
T4	200 - 180	Guy C@180.083	9/16	851	12.9	17.5	73.9	Pass
T7	140 - 120	Guy C@120.083	1/2	854	9.0	13.4	66.7	Pass
T10	80 - 60	Guy C@60.0833	3/8	857	5.1	7.7	66.2	Pass
T1	250 - 240	Top Guy	L2x1 1/2x3/16	8	4.4	17.9	24.4	Pass
T4	200 - 180	Pull-Off@240.083						
		Top Guy	L2x1 1/2x3/16	176	3.4	17.9	18.9	Pass
		Pull-Off@180.083						

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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
T7	140 - 120	Top Guy Pull-Off@120.083	L2x1 1/2x3/16	373	2.9	13.4	21.3	Pass
T10	80 - 60	Top Guy Pull-Off@60.0833	L2x1 1/2x3/16	571	2.9	13.4	21.8	Pass
T1	250 - 240	Torque Arm Top@240.083	L2x2x1/4	835	9.0	20.3	44.7	Pass
T1	250 - 240	Torque Arm Bottom@240.083	L2x2x1/4	844	-13.3	17.3	76.9	Pass
						Summary		
						Leg (T14)	90.8	Pass
						Diagonal (T14)	83.4	Pass
						Horizontal (T13)	53.2	Pass
						Secondary Horizontal (T12)	0.7	Pass
						Top Girt (T11)	18.3	Pass
						Bottom Girt (T13)	38.4	Pass
						Guy A (T4)	73.5	Pass
						Guy B (T4)	73.1	Pass
						Guy C (T4)	73.9	Pass
						Top Guy Pull-Off (T1)	24.4	Pass
						Torque Arm Top (T1)	44.7	Pass
						Torque Arm Bottom (T1)	76.9	Pass
						Bolt Checks	25.8	Pass
						RATING =	90.8	Pass



Guyed Tower Base Foundation
Thompson, CT
2012816.10

Tower Reactions	
Axial	113 k
Shear	1 k
Pad & Pier Geometry	
Height	4 ft
Height above Grade	2 ft
Pad Width	8 ft
Pad Thickness	2 ft
Pier Shape	Round
Round Pier Diameter	2.5 ft

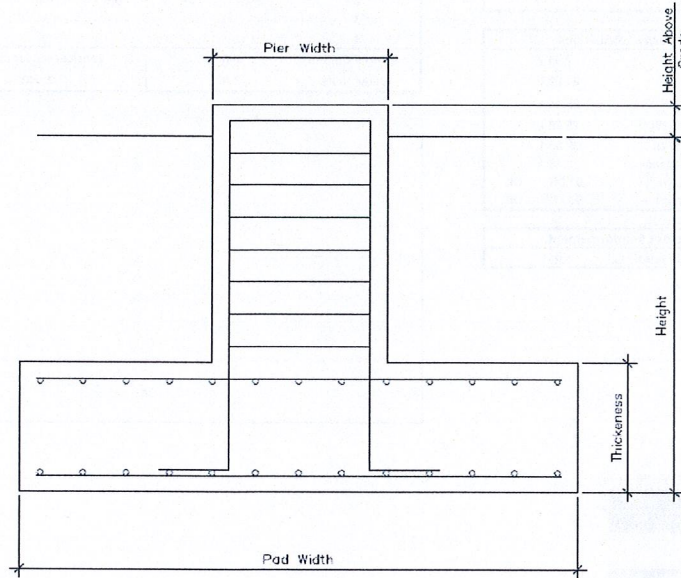
Pad & Pier Reinforcing	
F_c'	3 ksi
Clear Cover	3 in
Rebar F_y	60 ksi
Pad Rebar Size	# 6
Pad Rebar Quantity	9
Pier Rebar Size	# 6
Pier Rebar Quantity	8

Soil Properties	
Concrete Unit Weight	150 pcf
Soil Unit Weight	120 pcf
Bearing Type	Net
Allowable Bearing	9 ksf
Water Table Depth	3.5 ft

Bearing Capacity Calculations	
V_s	118.18 ft ³
V_c	147.63 ft ³
W_s	14.18 k
W_c	22.15 k
Q_{max}	2.40 ksf
$Q_{max} @ 45^\circ$	2.43 ksf

Reinforcing Calculations	
<i>Pad Moment Capacity</i>	
M_u	9.34 k-ft
ϕM_n	43.19 k-ft
Moment Capacity	21.6% OK
<i>Punching Shear</i>	
V_u	146.90 k
ϕV_c	511.71 k
Shear Capacity	28.7% OK
<i>Pier Compression</i>	
P_u	158.2 k
ϕP_n	1107.60 k
Compression Capacity	14.3% OK

Overall Capacities		
Bearing Capacity	21.7%	OK
Reinforcement Capacity	28.7%	OK
Controlling Capacity	28.7%	OK





Guyed Tower Anchor Foundation TIA/EIA-222-F
 Thompson, CT / 2012816.10
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Guy Anchor Location	
Azimuth/Leg	A, B, & C
Radius	180, 190', 187'
Tower Height (ft)	250

Tower Reactions	
Vertical	30 k
Horizontal	33 k

Anchor Block Geometry	
Width	5 ft
Height	4 ft
Length	12 ft
Depth	6 ft

Soil Capacity Calculations	
W_c	17.88 k
W_c	21.02 k
$(W_c + W_c)/1.5$	25.94 k
$(W_c/2) + (W_c/1.25)$	25.76 k
Uplift Resistance	32.96 k
Horizontal Resistance	35.18 k
Uplift Capacity=	91.0% OK
Horizontal Capacity=	93.8% OK

Anchor Block Reinforcement	
Is Reinforcement Known?	no

Capacity Summary		
Soil Capacity=	93.8%	OK
Controlling Capacity=	93.8%	OK

<-- Reinforcement capacity not verified

Soil Properties					
Layer	C, psf	ϕ , degrees	γ_{soil} pcf	$\gamma_{concrete}$ pcf	d, ft
1	0	34	110	150	2
2	0	34	120	150	4
3					
4					
Ignored Depth	2 ft			Consider soil for uplift	
Water Table	2 ft			Granular	

