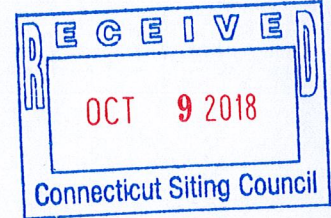




4 Davis Road West, Suite 5 Old Lyme, CT 06371

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



Re: Notice of Exempt Modification Application
179 Shunpike Road, Cromwell, CT 06416

December 6, 2017

Dear Ms. Bachman:

Sprint Spectrum Realty Company received an EM approval for the Fire Department Tower at the above location on December 26, 2017 (#EM-Sprint-033-171207). Subsequent to that approval, the Fire Department's engineer provided Sprint with a 3rd party review of our analysis, and required that Sprint have the analysis rerun with the tower as a structure class III because it is considered essential communications, is located at the top of a hill and open terrain (exposure class C). I am resubmitting the hard copies of the essential documents to the CSC for its records.

If you have any questions, please feel free to contact me.

Thank you,

By: Paul F. Sagristano

Paul F. Sagristano
Cherundolo Consulting
917.841.0247
psagrystano@lrivassoc.com



August 24, 2018

Mr. Michael Dagostino
Cromwell Tower Commission
One West Street
Cromwell, CT 06413

Reference: Sprint – CT60XC931-A
Third Party Review of a Structural Analysis of a tower located at
179 Shunpike Road (Cromwell Fire District Tower)
Cromwell, Connecticut 06413
AECOM Project Number: 60563810 / CFD-013

Dear Mr. Dagostino,

AECOM has been retained by the Cromwell Fire District to perform an independent structural review of the calculations prepared by Ramaker & Associates, Inc., signed and sealed on November 21, 2017. The above noted calculations are included with Ramaker's Structural Analysis of an existing 170' Self-Supporting Tower located at 179 Shunpike Road in Cromwell, CT for a proposed Sprint antenna arrangement.

The proposed Sprint antenna arrangement based on the Ramaker & Associates Engineering analysis is the following:

- Install: three (3) Commscope DT465B-2XR Panel Antennas, three (3) Alcatel-Lucent TD-RRH8x20-25 Remote Radio Head (RRH) units and three (3) Alcatel-Lucent 2x50W (800MHz) Remote Radio Head (RRH) units mounted on existing 9 foot, 9-arm Candleabra / Halo Antenna Mount assembly at an elevation of 170 feet above grade, along with two (2) Alcatel-Lucent 1-1/4" (1.54 inch Outer Diameter) Hybrid Fiber Optic cables connecting to existing and proposed antenna units at an elevation of 170 feet above grade. The coaxial cables are intended to run along the face of the existing tower structure nearby existing Sprint coaxial cables.

The independent structural analysis was conducted using TNX Tower (version) 7.0.8.5. Three load conditions were evaluated as shown below which were compared to design stresses according to the 2010 American Institute of Steel Construction (AISC) Load Resistance Factored Design (LRFD) and 2005 American National Standards Institute Telecommunications Industry Association Standard (TIA-222-G) with Addendum 2 (2009).

Load Condition 1 = (Basic) Wind Speed of 97 mph (3-second gust) Wind Load (without ice) + Guy Assembly dead load + Tower Dead Load (**governing**):

- (TIA-222-G Strength Combination 1 – (1.2 * Tower Dead Load) + (1.0 * Guy Assembly Dead Load) + (1.6 * Wind without ice build-up Load)

Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Guy Assembly dead load + 0.75" Ice Load (considered to increase in thickness with height of structure) + Tower Dead Load

- (TIA-222-G Strength Combination 3 – (1.2 * Tower Dead Load) + (1.0 * Guy Assembly Dead Load) + (1.0 * Dead Load Ice Build-up) + (1.0 Wind load applied to Ice Built-up surfaces)

Load Condition 3 = Tower Dead Load + Guy Assembly dead load + Seismic Shear

- (TIA-222-G Strength Combination 5 – (0.9 * Tower Dead Load) + (1.0 * Guy Assembly Dead Load) + (1.0 * Earthquake Load)

- NOTE: "Basic" Wind Load Applies 2016 CT Building Code Ultimate Wind Speed (Appendix N) to the 2012 International Building Code Section 1609.1.1 – Exception 5 to obtain "Basic" wind speed when applying the TIA-222-G Load Combinations.

Mr. Michael Dagostino
Cromwell Tower Commission
3rd Party Review – Cromwell, CT
One West Street
Cromwell, CT 06413

The independent structural analysis stated above has also considered the following site conditions (following the TIA-222-G Standard):

- Structure Class 3 – Essential Communications
- Topographic Category 3 – Tower location on top of hill – rolling (accelerated) wind conditions considered – Design crest height of 55 feet.
- Exposure Class C – Open Terrain with scattered obstructions

This review was conducted as stipulated in Section 107.7 of the October 1, 2016 Connecticut State Building Code Amendments to the 2012 International Building Code and Section 29-276b of the Connecticut General Statute for independent structural review. The structural review was performed in accordance with the ANSI/TIA-222-G-2005 Standard with 2009 Addendum 2 and the 2016 Connecticut State Building Code Amendments to the 2012 International Building Code.

The results of our independent structural analysis has determined that this 3rd party review letter will accept the Sprint analysis based on the following conditions to be in compliance with the requirements of the TIA-222-G and the 2016 Connecticut State Building Code Amendments to the 2012 International Building Code:

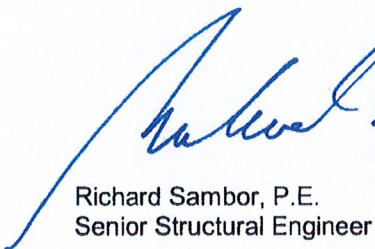
1. Structure Class is designated as Class 3 for the tower analysis, considering the structure as an Essential communications structure.
2. Tower topographic category is 3 with consideration of a calculated hill height "H".
3. The re-issue of the analysis signed and sealed incorporating these conditions.

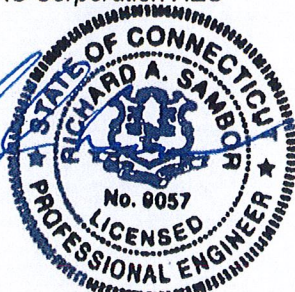
This determination is based on the original site having been designed, fabricated and installed in compliance with construction documents and State Building Codes.

Should there be any questions, please do not hesitate to contact me at (860)990-6767.

Sincerely,

AECOM, contracting as URS Corporation AES


Richard Sambor, P.E.
Senior Structural Engineer



cc: ICA, MJE, CF/Book – AECOM



September 25, 2018

Tom Jupin
Charles Cherundolo Consulting, Inc.
1280 Rt. 46 West
Parsippany, NJ 07054

Ramaker & Associates, Inc.
855 Community Drive
Sauk City, WI 53583

**SUBJECT: STRUCTURAL ASSESSMENT
 170-FOOT SELF-SUPPORT TOWER**

CARRIER: SPRINT

**SITE: CROMWELL – RT. 372 (CT60XC931-A)
 179 SHUNPIKE ROAD
 CROMWELL, MIDDLESEX COUNTY, CONNECTICUT 06416
 RAMAKER & ASSOCIATES PROJECT NUMBER: 29431**

**RESULTS: TOWER: 95.1% PASS
 FOUNDATION: 59.8% PASS**

Dear Tom Jupin:

Ramaker & Associates, Inc. (RAMAKER) respectfully submits this structural assessment for the above mentioned site. The purpose of this report is to determine the structural integrity of the existing structure with the existing and proposed loading. Engineering recommendations regarding the analysis results are provided in the following pages.

RAMAKER developed a finite element model of the tower using tnxTower analysis software. All information contained herein is valid only for the described structure configuration and loading conditions. RAMAKER reserves the right to modify our recommendations should alterations to the tower loading occur.

If you have any questions or comments, please do not hesitate to contact our office.

Sincerely,

RAMAKER & ASSOCIATES, INC.

Kali L. Phillips
Kali L. Phillips
Structural Designer

James R. Skowronski
James R. Skowronski, P.E.
Supervising Engineer



ANALYSIS CRITERIA

State Building Code	2016 CT State Building Code
Adopted Building Code	2012 IBC
Referenced Standard	TIA-222-G
Risk Category	III
Ultimate Design Wind Speed, V_{ult}	125 mph (3 sec. gust)
Nominal Design Wind Speed, V_{asd}	97 mph (3 sec. gust)
Design Wind Speed w/ Ice	50 mph (3 sec. gust)
Ice Thickness	3/4 inch
Exposure Category	C
Topographic Category	3
Crest Height	55 ft

SUPPORTING DOCUMENTATION

- Structural analysis by URS Corporation, job number 36931260.00000, dated September 23, 2014
- Construction drawings by RAMAKER, project number 29431
- Site visit(s) conducted by RAMAKER
- Other pertinent data procured or assumed by RAMAKER during site due diligence activities

TOWER LOADING

RAMAKER understands that the loading to be used for this analysis will consist of the antenna equipment, mount, and cable configurations as shown in the following chart:

Elevation	Appurtenance	Mount	Coax	Owner	Status
170	(1) 15' Omni	Leg Mount	(1) 1-5/8	Town	Existing
	(1) 2' Omni	Halo-Mount	(7) 1-1/2 (11) 7/8		
	(1) 20' Omni				
	(3) 15' Omni				
	(1) 20' Dipole				
	(2) 10' Omni				
	(1) 10' Omni on 15' Mount Pipe				
	(1) 2.5' Omni			(3) Hybrid (2) Hybrid	Sprint
	(1) Security Camera and Mount				
	(3) RFS APXVSP18-C				
	(3) ALU 1900MHz 4x45W				
	(3) ALU 800MHz 2x50W				
	(3) Commscope DT465B-2XR				
	(3) ALU TD-RRH8x20-25	Proposed			
(3) ALU 800MHz 2x50W					
133	(2) 20' Omni	Platform w/Handrail	(4) 1-5/8 (3) 7/8 (1) 1/2	Town	Existing
	(1) 10' Omni				
	(1) 10' Omni				
	(2) 5' Omni				
	(1) 6' Yagi				
	(1) 5' Whip		(5) 1-5/8	Clearwire	Existing
	(2) Andrew 2' Dish				
	(1) Andrew VHLP2.5				
	(1) Andrew VHLP2				
	(3) Argus LLPX310R				
	(3) Samsung RRU U-RAS				
125	(2) Ericsson AIR21 B2A/B4P	(3) T-Frame	(12) 1-5/8	T-Mobile	Existing
	(3) Twin PCS TMA				
	(3) Andrew LNX-6514DS-VTM				
	(3) Ericsson RRUS-11				

Elevation	Appearance	Mount	Coax	Owner	Status
115	(6) Powerwave RA21.7770.00	(3) T-Frame	(12) 1-5/8	AT&T	Existing
	(3) Quintel QS6658-3				
	(6) 10"x9"x3" TMA				
	(6) 4"x8"x4" TMA				
	(3) Ericsson RRUS-12 w/A2				
	(3) Ericsson RRUS-32				
	(3) Ericsson RRUS-12	(3) 2' Standoff			
	(1) Raycap DC6-48-60-18-8F				
101	(3) Andrew HBX-6517DS-VTM	(3) T-Frame	(12) 1-5/8	Verizon	Existing
	(3) Antel BXA-70063-6CF				
	(3) Antel BXA-171063-12CF				
	(3) Andrew LNX-6514DS-T4M				
	(3) ALU RRH 2x40				
	(6) Diplexer				
92	(1) 1' Dish	Pipe Mount	(1) 7/8	Unknown	Existing
30	(1) Security Camera	Leg Mount	(1) 1-5/8	Town	Existing

TOWER RESULTS

The maximum tower member stress capacities under the loading conditions previously described are as follows:

Component/Type	Percent Capacity	Pass/Fail
Leg	84.5	Pass
Diagonal	95.1	Pass
Horizontal	25.0	Pass
Bolt	94.4	Pass
Anchor Rods	68.4	Pass
RATING	95.1	PASS

Results of the analysis show that the existing tower will be stressed to a maximum of 95.1 percent of capacity. Therefore, the existing tower will pass the TIA-222-G analysis requirements under proposed loading conditions.

DISH TWIST/SWAY RESULTS

The twist/sway results for a 60 mph service wind speed are as follows:

Elevation	Dish	Deflection (in)	Tilt (deg)	Twist (deg)
137	Andrew VHLP2.5	3.109	0.2313	0.0428
136	2' Dish	3.060	0.2292	0.0421
133	Andrew VHLP2	2.916	0.2224	0.0399
92	1' Dish	1.325	0.1341	0.0196

FOUNDATION RESULTS

The maximum foundation stress capacities are as follows:

Component Type	Percent Capacity	Pass/Fail
Soil Interaction	59.8	Pass
Structural	46.5	Pass
RATING	59.8	PASS

The foundations were analyzed utilizing the previous structural analysis referenced above. Results of the analysis show that the existing foundation will be stressed to a maximum of 59.8 percent of capacity. Therefore, the existing foundation will pass the TIA-222-G analysis requirements under proposed loading conditions.

LIMITATIONS

The recommendations contained within this report were developed using the supporting documentation as previously described. All recommendations pertain only to the proposed antenna installation activities as described in this report. RAMAKER assumes no responsibility for failures caused by factors beyond our control. These include but are not limited to the following:

- Missing, corroding, and/or deteriorating members
- Improper manufacturing and/or construction
- Improper maintenance

RAMAKER assumes no responsibility for modifications completed prior to or hereafter in which RAMAKER was not directly involved. These modifications include but are not limited to the following:

- Replacing or strengthening bracing members
- Reinforcing or extending vertical members
- Installing or removing antenna mounting gates or side arms
- Changing loading configurations

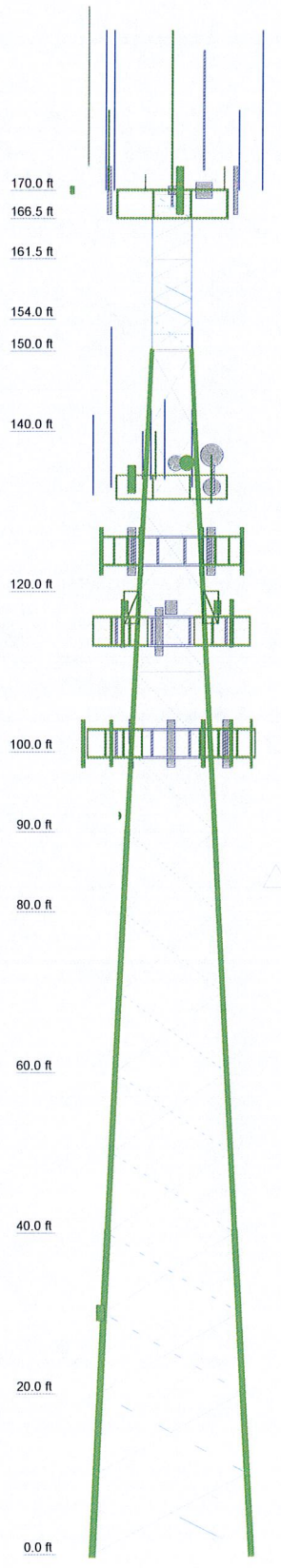
The tower owner is responsible for verifying that the existing loading on the structure is consistent with the loading applied to the structure within this report. If there is any information contrary to that contained herein, or if there are any defects arising from the original design, material, fabrication and erection deficiencies, this report should be disregarded and RAMAKER should be contacted immediately. RAMAKER is not liable for any representation, recommendation, or conclusion not expressly stated herein.

This analysis pertains only to the tower structure, and no analyses or conclusions were made regarding the antenna and equipment mounting structure(s). Analysis and certification of the antenna and equipment mounting structure(s) is performed and submitted separately.

ATTACHMENTS

- Analysis Figures
- Analysis Calculations

Section	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	E	D		C	B		Pirrod 105217	Pirrod 105216	A				SR 1 3/4
Leg Grade					A572-50				F				SR 7/8
Diagonals	L4x4x5/16	L3 1/2x3 1/2x3/8	L3 1/2x3 1/2x5/16	L3x3x3/8	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16	L3x3x3/16	N.A.			A572-50
Diagonal Grade				A36									
Top Girts				N.A.									L6x4x3/8
Mid Girts													
Bottom Girts				N.A.									
Sec. Horizontals				N.A.									
Face Width (ft)	20												
# Panels @ (ft)	18	16	14	15 @ 10	12	11	10	8	6				5
Weight (lb)	9100.9	5579.4	4685.9	3997.0	1625.5	1378.8	1020.3	3462.4	1071.2	229.3	390.0	475.9	1373.0



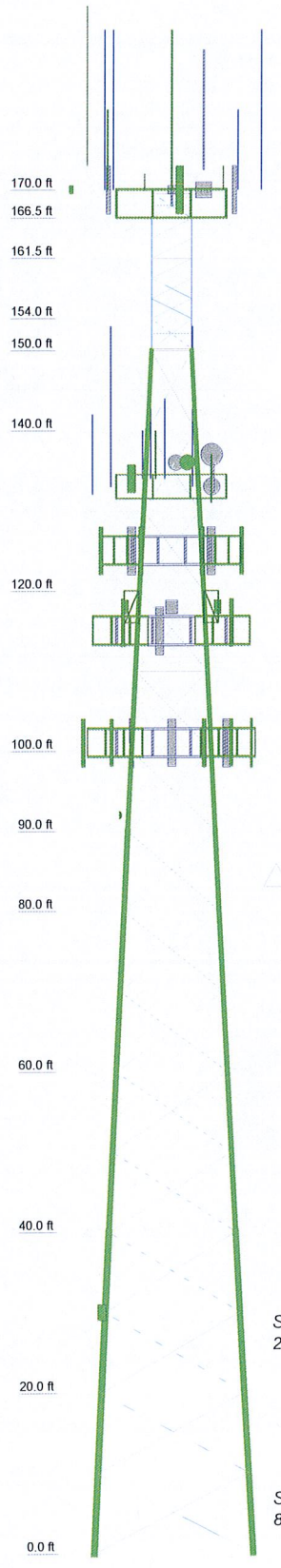
DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
15' Omni (Municipal)	170	ETW190VS12UB (T-Mobile)	125
2' Omni (Municipal)	170	2' Standoff (ATT)	118
15' Omni (Municipal)	170	2' Standoff (ATT)	118
20' Omni (Municipal)	170	2' Standoff (ATT)	118
SU-RA (Municipal)	170	RRUS-12 (ATT)	118
20' Dipole (Municipal)	170	RRUS-12 (ATT)	118
3' Omni (Municipal)	170	RRUS-12 (ATT)	118
10' Omni (Municipal)	170	DC6-48-60-18-8F (ATT)	118
15' Omni (Municipal)	170	QS6658-3 w/Mount Pipe (ATT)	115
15'x2-1/2" Pipe Mount	170	QS6658-3 w/Mount Pipe (ATT)	115
10' Omni (Municipal)	170	TMA 10"x9"x3" (ATT)	115
15' Omni (Municipal)	170	TMA 10"x9"x3" (ATT)	115
10' Omni (Municipal)	170	TMA 4"x8"x4" (ATT)	115
SU-RA (Municipal)	170	TMA 4"x8"x4" (ATT)	115
Camera and Mount	170	TMA 10"x9"x3" (ATT)	115
APXVSP18-C w/Mount Pipe (Sprint)	170	TMA 10"x9"x3" (ATT)	115
APXVSP18-C w/Mount Pipe (Sprint)	170	TMA 4"x8"x4" (ATT)	115
APXVSP18-C w/Mount Pipe (Sprint)	170	TMA 4"x8"x4" (ATT)	115
1900MHz 4x45W RRH (Sprint)	170	TMA 10"x9"x3" (ATT)	115
1900MHz 4x45W RRH (Sprint)	170	TMA 10"x9"x3" (ATT)	115
1900MHz 4x45W RRH (Sprint)	170	TMA 4"x8"x4" (ATT)	115
800MHz 2x50W RRH (Sprint)	170	TMA 4"x8"x4" (ATT)	115
800MHz 2x50W RRH (Sprint)	170	RRUS-12 w/ A2 Box (ATT)	115
800MHz 2x50W RRH (Sprint)	170	RRUS-12 w/ A2 Box (ATT)	115
DT465B-2XR w/Mount Pipe (Sprint)	170	RRUS-12 w/ A2 Box (ATT)	115
DT465B-2XR w/Mount Pipe (Sprint)	170	RRUS-32 (ATT)	115
DT465B-2XR w/Mount Pipe (Sprint)	170	RRUS-32 (ATT)	115
TD-RRH 8x20 (Sprint)	170	RRUS-32 (ATT)	115
TD-RRH 8x20 (Sprint)	170	Sector Mount [SM 408-1] (ATT)	115
TD-RRH 8x20 (Sprint)	170	Sector Mount [SM 408-1] (ATT)	115
800MHz 2x50W RRH (Sprint)	170	Sector Mount [SM 408-1] (ATT)	115
800MHz 2x50W RRH (Sprint)	170	(2) RA21.7770.00 w/Mount Pipe (ATT)	115
800MHz 2x50W RRH (Sprint)	170	(2) RA21.7770.00 w/Mount Pipe (ATT)	115
Sector Mount [SM 412-1] (Halo Mount)	168.25	(2) RA21.7770.00 w/Mount Pipe (ATT)	115
20' Omni (Municipal)	133	QS6658-3 w/Mount Pipe (ATT)	115
5' Omni (Municipal)	133	BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	101
10' Omni (Municipal)	133	BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	101
20' Omni (Municipal)	133	BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	101
5' Omni (Municipal)	133	BXA-171063-12CF w/Mount Pipe (Verizon)	101
5' Omni (Municipal)	133	BXA-171063-12CF w/Mount Pipe (Verizon)	101
10' Omni (Municipal)	133	BXA-171063-12CF w/Mount Pipe (Verizon)	101
6' Yagi (Municipal)	133	BXA-171063-12CF w/Mount Pipe (Verizon)	101
LLPX310R w/Mount Pipe (Clearwire)	133	BXA-171063-12CF w/Mount Pipe (Verizon)	101
LLPX310R w/Mount Pipe (Clearwire)	133	LNx-6514DS-T4M w/Mount Pipe (Verizon)	101
LLPX310R w/Mount Pipe (Clearwire)	133	LNx-6514DS-T4M w/Mount Pipe (Verizon)	101
RRH U-RAS (Clearwire)	133	LNx-6514DS-T4M w/Mount Pipe (Verizon)	101
RRH U-RAS (Clearwire)	133	LNx-6514DS-T4M w/Mount Pipe (Verizon)	101
RRH U-RAS (Clearwire)	133	RRH 2x40 AWS (Verizon)	101
6' x 2" Pipe Mount (Clearwire dish)	133	RRH 2x40 AWS (Verizon)	101
6' x 2" Pipe Mount (Clearwire dish)	133	RRH 2x40 AWS (Verizon)	101
6' x 2" Pipe Mount (Clearwire dish)	133	PIROD 20' Universal Platform	101
PIROD 20' Universal Platform	133	VHLP2.5 (Clearwire dish)	101
VHLP2.5 (Clearwire dish)	133	VHLP2 (Clearwire dish)	101
VHLP2 (Clearwire dish)	133	2 FT DISH (Clearwire dish)	101
2 FT DISH (Clearwire dish)	133	2 FT DISH (Clearwire dish)	101
ETW190VS12UB (T-Mobile)	125	ETW190VS12UB (T-Mobile)	101
ETW190VS12UB (T-Mobile)	125	RRUS-11 (T-Mobile)	101
RRUS-11 (T-Mobile)	125	RRUS-11 (T-Mobile)	101
RRUS-11 (T-Mobile)	125	RRUS-11 (T-Mobile)	101
RRUS-11 (T-Mobile)	125	LNx-6515DS-A1M w/Mount Pipe (T-Mobile)	101
LNx-6515DS-A1M w/Mount Pipe (T-Mobile)	125	LNx-6515DS-A1M w/Mount Pipe (T-Mobile)	101
LNx-6515DS-A1M w/Mount Pipe (T-Mobile)	125	LNx-6515DS-A1M w/Mount Pipe (T-Mobile)	101
LNx-6515DS-A1M w/Mount Pipe (T-Mobile)	125	Sector Mount [SM 405-1] (T-Mobile)	92
Sector Mount [SM 405-1] (T-Mobile)	125	Sector Mount [SM 405-1] (T-Mobile)	92
Sector Mount [SM 405-1] (T-Mobile)	125	Sector Mount [SM 405-1] (T-Mobile)	92
(2) AIR B2A/B4P w/ Mount Pipe (T-Mobile)	125	Camera and Mount (Unk.)	30
(2) AIR B2A/B4P w/ Mount Pipe (T-Mobile)	125		
(2) AIR B2A/B4P w/ Mount Pipe (T-Mobile)	125		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999		Job: Cromwell - RT. 372 (CT60xc931) Project: 29431 Client: Sprint Code: TIA-222-G Path: I:\29400\29431\Structural\Rev 4\29431 Original_Rev4.dwg	
		Drawn by: kphillips Date: 09/25/18	App'd: Scale: NTS Dwg No. E-1

Section	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	E	D	Pirod 105219	C	B	Pirod 105217	Pirod 105216	A	SR 1 3/4				
Leg Grade					A572-50								
Diagonals	L4x4x5/16	L3 1/2x3 1/2x3/8	L3 1/2x3 1/2x5/16	L3x3x3/8	L3x3x5/16	L3x3x3/16	L3x3x3/16	F	SR 7/8				
Diagonal Grade				A36					A572-50				
Top Girts													
Mid Girts													
Bottom Girts													
Sec. Horizontals													
Face Width (ft)	20	18	16	14	12	10	8	6					5
# Panels @ (ft)				15 @ 10									
Weight (lb) 30305.6	9190.3	5379.4	4685.9	3967.0	1626.6	1378.6	2402.4	1020.3	1071.2	206.3	380.0	475.0	1373.0



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244	F	L2 1/2x2 1/2x3/16
B	Pirod 105217 w/ 1" Reinf Rod	G	SR 7/8
C	Pirod 105218 w/ 1" Reinf Rod	H	1 @ 3.08333
D	Pirod 105219 w/ 1" Reinf Rod	I	1 @ 3.75
E	Pirod 105220 w/ 1" Reinf Rod		

MATERIAL STRENGTH

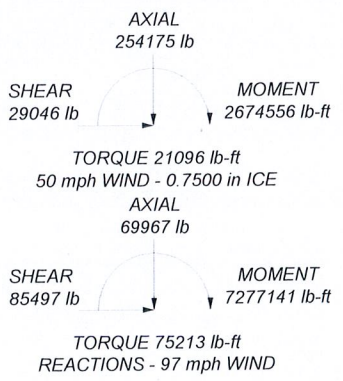
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

- ### TOWER DESIGN NOTES
1. Tower designed for Exposure C to the TIA-222-G Standard.
 2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
 3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
 4. Deflections are based upon a 60 mph wind.
 5. Tower Structure Class III.
 6. Topographic Category 3 with Crest Height of 55.00 ft
 7. TOWER RATING: 95.1%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 443466 lb
SHEAR: 52908 lb

UPLIFT: -388704 lb
SHEAR: 48474 lb

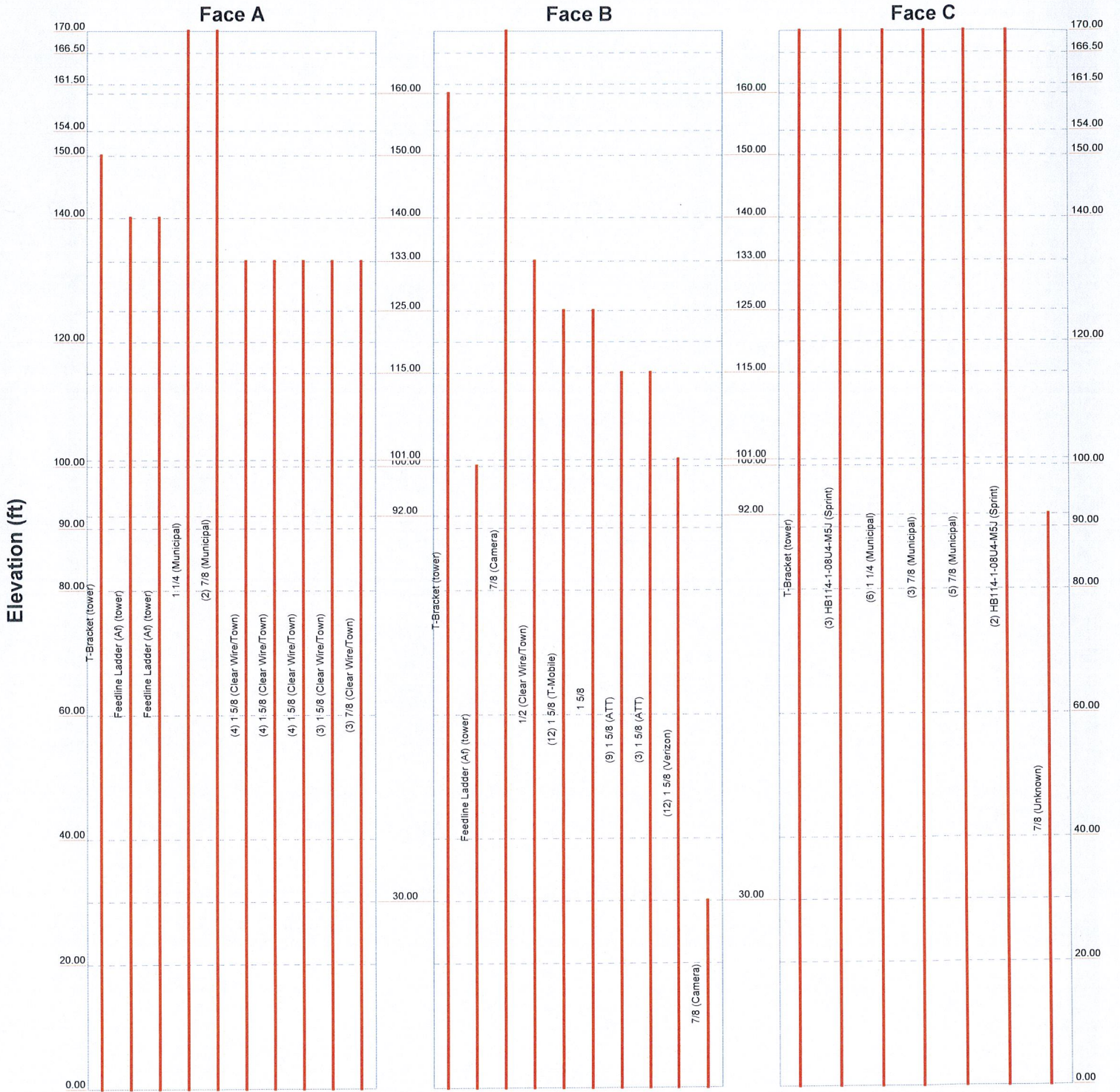


Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999		Job: Cromwell - RT. 372 (CT60xc931)	
		Project: 29431	Client: Sprint
Code: TIA-222-G	Drawn by: kphillips	App'd:	Scale: N.T.S.
Path: <small>1\29400\29431\Structural\Rev 4\29431 Original_Rev4.et</small>	Date: 09/25/18	Dwg No. E-1	

Feed Line Distribution Chart

0' - 170'

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



Ramaker & Associates, Inc.

855 Community Dr.
 Sauk City, Wisconsin 53583
 Phone: (608)-643-4100
 FAX: (608)-643-7999

Job: **Cromwell - RT. 372 (CT60xc931)**

Project: 29431	Drawn by: kphillips	App'd:
Client: Sprint	Date: 09/25/18	Scale: NTS
Code: TIA-222-G	Path: 1\29400\29431\Structural\Rev 4\29431_Original_Rev4.et	Dwg No. E-7

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 1 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 170.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 20.00 ft at the base.
This tower is designed using the TIA-222-G standard.

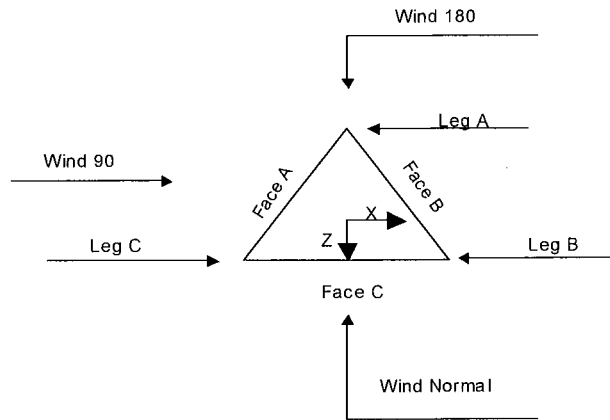
The following design criteria apply:

- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 97 mph.
- Structure Class III.
- Exposure Category C.
- Topographic Category 3.
- Crest Height 55.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 2 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	<i>ft</i>			<i>ft</i>		<i>ft</i>
T1	170.00-166.50			5.00	1	3.50
T2	166.50-161.50			5.00	1	5.00
T3	161.50-154.00			5.00	1	7.50
T4	154.00-150.00			5.00	1	4.00
T5	150.00-140.00			5.00	1	10.00
T6	140.00-120.00			6.00	1	20.00
T7	120.00-100.00			8.00	1	20.00
T8	100.00-90.00			10.00	1	10.00
T9	90.00-80.00			11.00	1	10.00
T10	80.00-60.00			12.00	1	20.00
T11	60.00-40.00			14.00	1	20.00
T12	40.00-20.00			16.00	1	20.00
T13	20.00-0.00			18.00	1	20.00

Tower Section Geometry (cont'd)

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	<i>ft</i>	<i>ft</i>				<i>in</i>	<i>in</i>
T1	170.00-166.50	3.08	X Brace	No	Yes	5.0000	0.0000
T2	166.50-161.50	2.50	X Brace	No	No	0.0000	0.0000

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 3 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T3	161.50-154.00	2.50	X Brace	No	No	0.0000	0.0000
T4	154.00-150.00	3.75	X Brace	No	Yes	0.0000	3.0000
T5	150.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T6	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T7	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T8	100.00-90.00	10.00	X Brace	No	No	0.0000	0.0000
T9	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T10	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T11	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T12	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T13	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry (cont'd)

Tower Elevation	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
ft						
T1 170.00-166.50	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 166.50-161.50	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 161.50-154.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 154.00-150.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 150.00-140.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 140.00-120.00	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 120.00-100.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 100.00-90.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T9 90.00-80.00	Truss Leg	Pirod 105217 w/ 1" Reinf Rod	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T10 80.00-60.00	Truss Leg	Pirod 105218 w/ 1" Reinf Rod	A572-50 (50 ksi)	Equal Angle	L3x3x3/8	A36 (36 ksi)
T11 60.00-40.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T12 40.00-20.00	Truss Leg	Pirod 105219 w/ 1" Reinf Rod	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x3/8	A36 (36 ksi)
T13 20.00-0.00	Truss Leg	Pirod 105220 w/ 1" Reinf Rod	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
ft						
T1 170.00-166.50	Single Angle	L6x4x3/8	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T2 166.50-161.50	Single Angle	L6x4x3/8	A36	Solid Round	7/8	A572-50

inxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 4 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Elevation <i>ft</i>	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T4 154.00-150.00	Solid Round		(36 ksi) A36	Solid Round	7/8	(50 ksi) A572-50
T5 150.00-140.00	Equal Angle	L3x3x3/16	(36 ksi) A36	Solid Round		(50 ksi) A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T7 120.00-100.00	1	Equal Angle	L3x3x3/16	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 170.00-166.50	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T4 154.00-150.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry (cont'd)

Tower Elevation <i>ft</i>	Gusset Area (per face) <i>ft²</i>	Gusset Thickness <i>in</i>	Gusset Grade	Adjust. Factor <i>A_t</i>	Adjust. Factor <i>A_r</i>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals <i>in</i>	Double Angle Stitch Bolt Spacing Horizontal <i>in</i>	Double Angle Stitch Bolt Spacing Redundants <i>in</i>
T1 170.00-166.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 166.50-161.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 161.50-154.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 154.00-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 5 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft ²	in							
T8 100.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T11 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T12 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T13 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors ¹							
			Legs	X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace
				X Y	X Y	X Y	X Y	X Y	X Y	X Y
T1 170.00-166.50	Yes	Yes								
T2 166.50-161.50	Yes	Yes								
T3 161.50-154.00	Yes	Yes								
T4 154.00-150.00	Yes	Yes								
T5 150.00-140.00	Yes	Yes								
T6 140.00-120.00	Yes	Yes								
T7 120.00-100.00	Yes	Yes								
T8 100.00-90.00	Yes	Yes								
T9 90.00-80.00	Yes	Yes								
T10 80.00-60.00	Yes	Yes								
T11 60.00-40.00	Yes	Yes								
T12 40.00-20.00	Yes	Yes								
T13 20.00-0.00	Yes	Yes								

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

Tower Section Geometry (cont'd)

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 7 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section Geometry (cont'd)

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 170.00-166.50	Sleeve DS	0.5000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T2 166.50-161.50	Sleeve DS	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.0000 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T3 161.50-154.00	Sleeve DS	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T4 154.00-150.00	Flange	0.7500 A325N	6	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T5 150.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T6 140.00-120.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.6250 A325X	0	1.0000 A325X	1	0.6250 A325X	0	0.6250 A325X	0
T7 120.00-100.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T8 100.00-90.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T9 90.00-80.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T10 80.00-60.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T11 60.00-40.00	Flange	1.2500 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T12 40.00-20.00	Flange	1.2500 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0
T13 20.00-0.00	Flange	1.5000 A325N	6	1.2500 A325N	1	1.0000 A325N	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
T-Bracket (tower)	A	No	Af (CaAa)	150.00 - 0.00	0.0000	0.07	1	1	0.7500	1.0000		1.50
T-Bracket (tower)	B	No	Af (CaAa)	160.00 - 0.00	0.0000	0.07	1	1	0.7500	1.0000		1.50
T-Bracket (tower)	C	No	Af (CaAa)	170.00 - 0.00	0.0000	0.07	1	1	0.7500	1.0000		1.50
Feedline Ladder (Af) (tower)	A	No	Af (CaAa)	140.00 - 0.00	0.0000	-0.05	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af) (tower)	A	No	Af (CaAa)	140.00 - 0.00	0.0000	0.35	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af) (tower)	B	No	Af (CaAa)	100.00 - 0.00	0.0000	-0.4	1	1	3.0000	3.0000		8.40

HB114-1-08U4-M5J (Sprint)	C	No	Ar (CaAa)	170.00 - 0.00	0.0000	0.1	3	3	1.5400	1.5400		1.08
1 1/4	C	No	Ar (CaAa)	170.00 - 0.00	0.0000	0.04	6	3	1.5500	1.5500		0.66

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 8 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

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
(Municipal) 7/8	C	No	Ar (CaAa)	170.00 - 0.00	0.0000	0.08	3	3	0.7500	1.1100		0.54
(Municipal) 7/8	C	No	Ar (CaAa)	170.00 - 0.00	-6.0000	0.4	5	3	1.1100	1.1100		0.54
(Municipal) 1 1/4	A	No	Ar (CaAa)	170.00 - 0.00	-6.0000	-0.4	1	1	1.5500	1.5500		0.66
(Municipal) 7/8	A	No	Ar (CaAa)	170.00 - 0.00	-4.0000	-0.4	2	2	1.1100	1.1100		0.54
(Municipal) 7/8 (Camera) ***	B	No	Ar (CaAa)	170.00 - 0.00	0.0000	0.01	1	1	1.1100	1.1100		0.54
HB114-1-08U4-M5J (Sprint) ***** *****	C	No	Ar (CaAa)	170.00 - 0.00	0.0000	0.13	2	2	1.5400	1.5400		1.08
1 5/8 (Clear Wire/Town)	A	No	Ar (CaAa)	133.00 - 0.00	0.0000	0.05	4	2	0.7500 3.0000	1.9800		1.04
1 5/8 (Clear Wire/Town)	A	No	Ar (CaAa)	133.00 - 0.00	0.0000	0.07	4	2	0.7500 8.0000	1.9800		1.04
1 5/8 (Clear Wire/Town)	A	No	Ar (CaAa)	133.00 - 0.00	0.0000	0.09	4	2	0.7500 3.0000	1.9800		1.04
1 5/8 (Clear Wire/Town)	A	No	Ar (CaAa)	133.00 - 0.00	0.0000	-0.07	3	3	1.9800	1.9800		1.04
7/8 (Clear Wire/Town)	A	No	Ar (CaAa)	133.00 - 0.00	0.0000	-0.04	3	3	1.1100	1.1100		0.54
1/2 (Clear Wire/Town) *****	B	No	Ar (CaAa)	133.00 - 0.00	0.0000	0.02	1	1	0.5800	0.5800		0.25
1 5/8 (T-Mobile)	B	No	Ar (CaAa)	125.00 - 0.00	0.0000	-0.4	12	6	1.0000	1.9800		1.04
1 5/8 *****	B	No	Ar (CaAa)	125.00 - 0.00	0.0000	-0.358	1	1	1.9800	1.9800		1.04
1 5/8 (ATT)	B	No	Ar (CaAa)	115.00 - 0.00	0.0000	0.115	9	1	0.7500	1.9800		1.04
1 5/8 (ATT) *****	B	No	Ar (CaAa)	115.00 - 0.00	0.0000	0.13	3	1	0.7500	1.9800		1.04
1 5/8 (Verizon) *****	B	No	Ar (CaAa)	101.00 - 0.00	0.0000	0.07	12	7	0.7500	1.9800		1.04
7/8 (Unknown) *****	C	No	Ar (CaAa)	92.00 - 0.00	0.0000	0.08	1	1	5.0000	1.1100		0.54
7/8 (Camera)	B	No	Ar (CaAa)	30.00 - 0.00	0.0000	0.01	1	1	1.1100	1.1100		0.54

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C ₁ A ₁ In Face ft ²	C ₂ A ₁ Out Face ft ²	Weight lb
T1	170.00-166.50	A	0.000	0.000	1.319	0.000	6.09
		B	0.000	0.000	0.389	0.000	1.89
		C	0.000	0.000	9.641	0.000	53.13
T2	166.50-161.50	A	0.000	0.000	1.885	0.000	8.70
		B	0.000	0.000	0.555	0.000	2.70

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 9 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Tower Elevation ft	Face	A_R ft ²	A_F ft ²	$C_i A_i$ In Face ft ²	$C_o A_o$ Out Face ft ²	Weight lb
T3	161.50-154.00	C	0.000	0.000	13.773	0.000	75.90
		A	0.000	0.000	2.828	0.000	13.05
		B	0.000	0.000	1.833	0.000	13.05
T4	154.00-150.00	C	0.000	0.000	20.660	0.000	113.85
		A	0.000	0.000	1.508	0.000	6.96
		B	0.000	0.000	1.111	0.000	8.16
T5	150.00-140.00	C	0.000	0.000	11.019	0.000	60.72
		A	0.000	0.000	5.437	0.000	32.40
		B	0.000	0.000	2.777	0.000	20.40
T6	140.00-120.00	C	0.000	0.000	27.547	0.000	151.80
		A	0.000	0.000	73.812	0.000	624.66
		B	0.000	0.000	19.177	0.000	111.65
T7	120.00-100.00	C	0.000	0.000	55.093	0.000	303.60
		A	0.000	0.000	96.933	0.000	745.20
		B	0.000	0.000	96.209	0.000	515.88
T8	100.00-90.00	C	0.000	0.000	55.093	0.000	303.60
		A	0.000	0.000	48.467	0.000	372.60
		B	0.000	0.000	81.617	0.000	491.70
T9	90.00-80.00	C	0.000	0.000	27.769	0.000	152.88
		A	0.000	0.000	48.467	0.000	372.60
		B	0.000	0.000	81.617	0.000	491.70
T10	80.00-60.00	C	0.000	0.000	28.657	0.000	157.20
		A	0.000	0.000	96.933	0.000	745.20
		B	0.000	0.000	163.233	0.000	983.40
T11	60.00-40.00	C	0.000	0.000	57.313	0.000	314.40
		A	0.000	0.000	96.933	0.000	745.20
		B	0.000	0.000	163.233	0.000	983.40
T12	40.00-20.00	C	0.000	0.000	57.313	0.000	314.40
		A	0.000	0.000	96.933	0.000	745.20
		B	0.000	0.000	164.343	0.000	988.80
T13	20.00-0.00	C	0.000	0.000	57.313	0.000	314.40
		A	0.000	0.000	96.933	0.000	745.20
		B	0.000	0.000	165.453	0.000	994.20
		C	0.000	0.000	57.313	0.000	314.40

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	$C_i A_i$ In Face ft ²	$C_o A_o$ Out Face ft ²	Weight lb
T1	170.00-166.50	A	2.209	0.000	0.000	6.252	0.000	88.31
		B		0.000	0.000	1.934	0.000	33.23
		C		0.000	0.000	29.646	0.000	487.09
T2	166.50-161.50	A	2.203	0.000	0.000	8.917	0.000	125.73
		B		0.000	0.000	2.758	0.000	47.29
		C		0.000	0.000	42.301	0.000	694.11
T3	161.50-154.00	A	2.195	0.000	0.000	13.342	0.000	187.65
		B		0.000	0.000	7.759	0.000	137.46
		C		0.000	0.000	63.335	0.000	1037.26
T4	154.00-150.00	A	2.188	0.000	0.000	7.099	0.000	99.61
		B		0.000	0.000	4.611	0.000	81.80
		C		0.000	0.000	33.721	0.000	551.25
T5	150.00-140.00	A	2.178	0.000	0.000	23.720	0.000	357.82
		B		0.000	0.000	11.490	0.000	203.17
		C		0.000	0.000	84.122	0.000	1372.08
T6	140.00-120.00	A	2.158	0.000	0.000	205.128	0.000	3774.07
		B		0.000	0.000	46.785	0.000	913.53
		C		0.000	0.000	167.449	0.000	2717.49

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 10 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft ²	A_F ft ²	C_{A_1} In Face ft ²	C_{A_1} Out Face ft ²	Weight lb
T7	120.00-100.00	A	2.129	0.000	0.000	268.520	0.000	4815.16
		B		0.000	0.000	184.225	0.000	4364.40
		C		0.000	0.000	166.359	0.000	2681.17
T8	100.00-90.00	A	2.108	0.000	0.000	133.667	0.000	2383.73
		B		0.000	0.000	142.921	0.000	3386.16
		C		0.000	0.000	83.846	0.000	1345.02
T9	90.00-80.00	A	2.096	0.000	0.000	133.301	0.000	2369.09
		B		0.000	0.000	142.629	0.000	3364.15
		C		0.000	0.000	87.836	0.000	1406.72
T10	80.00-60.00	A	2.080	0.000	0.000	265.698	0.000	4702.14
		B		0.000	0.000	284.534	0.000	6674.09
		C		0.000	0.000	175.001	0.000	2791.41
T11	60.00-40.00	A	2.071	0.000	0.000	265.177	0.000	4681.44
		B		0.000	0.000	284.117	0.000	6642.97
		C		0.000	0.000	174.615	0.000	2778.75
T12	40.00-20.00	A	2.083	0.000	0.000	265.871	0.000	4709.02
		B		0.000	0.000	289.948	0.000	6771.08
		C		0.000	0.000	175.129	0.000	2795.61
T13	20.00-0.00	A	2.073	0.000	0.000	265.278	0.000	4685.43
		B		0.000	0.000	294.707	0.000	6820.94
		C		0.000	0.000	174.689	0.000	2781.19

Feed Line Center of Pressure

Section	Elevation ft	CP_x in	CP_z in	CP_x Ice in	CP_z Ice in
T1	170.00-166.50	-3.9059	5.3201	-2.0391	2.7583
T2	166.50-161.50	-4.2494	5.7985	-2.1933	2.9595
T3	161.50-154.00	-5.7253	8.1559	-4.0825	6.3202
T4	154.00-150.00	-5.4463	7.7065	-3.2199	4.9706
T5	150.00-140.00	-3.8292	4.6856	-1.8590	2.2567
T6	140.00-120.00	-8.3251	-3.0898	-6.6541	-0.6620
T7	120.00-100.00	-4.0415	-9.6933	-4.8734	-5.2970
T8	100.00-90.00	-0.7912	-12.1937	-2.9624	-8.0514
T9	90.00-80.00	-0.9748	-12.6959	-3.3494	-8.1546
T10	80.00-60.00	-1.1828	-13.8792	-3.8663	-9.1710
T11	60.00-40.00	-1.4133	-15.0974	-4.4422	-10.2534
T12	40.00-20.00	-1.5064	-16.4781	-4.6415	-11.3364
T13	20.00-0.00	-1.5237	-17.3056	-4.7182	-12.3256

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_n No Ice	K_n Ice
T1	3	T-Bracket	166.50 - 170.00	0.6000	0.2237
T1	8	11B114-1-08U4-M5J	166.50 - 170.00	0.6000	0.2237
T1	9	1 1/4	166.50 - 170.00	0.6000	0.2237
T1	10	7/8	166.50 - 170.00	0.6000	0.2237
T1	11	7/8	166.50 - 170.00	0.6000	0.2237
T1	12	1 1/4	166.50 - 170.00	0.6000	0.2237

inxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 11 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T1	13	7/8	166.50 - 170.00	0.6000	0.2237
T1	14	7/8	166.50 - 170.00	0.6000	0.2237
T1	16	HB114-1-08U4-M5J	166.50 - 170.00	0.6000	0.2237
T2	3	T-Bracket	161.50 - 166.50	0.6000	0.2371
T2	8	HB114-1-08U4-M5J	161.50 - 166.50	0.6000	0.2371
T2	9	1 1/4	161.50 - 166.50	0.6000	0.2371
T2	10	7/8	161.50 - 166.50	0.6000	0.2371
T2	11	7/8	161.50 - 166.50	0.6000	0.2371
T2	12	1 1/4	161.50 - 166.50	0.6000	0.2371
T2	13	7/8	161.50 - 166.50	0.6000	0.2371
T2	14	7/8	161.50 - 166.50	0.6000	0.2371
T2	16	HB114-1-08U4-M5J	161.50 - 166.50	0.6000	0.2371
T3	2	T-Bracket	154.00 - 160.00	0.6000	0.4687
T3	3	T-Bracket	154.00 - 161.50	0.6000	0.4687
T3	8	HB114-1-08U4-M5J	154.00 - 161.50	0.6000	0.4687
T3	9	1 1/4	154.00 - 161.50	0.6000	0.4687
T3	10	7/8	154.00 - 161.50	0.6000	0.4687
T3	11	7/8	154.00 - 161.50	0.6000	0.4687
T3	12	1 1/4	154.00 - 161.50	0.6000	0.4687
T3	13	7/8	154.00 - 161.50	0.6000	0.4687
T3	14	7/8	154.00 - 161.50	0.6000	0.4687
T3	16	HB114-1-08U4-M5J	154.00 - 161.50	0.6000	0.4687
T4	2	T-Bracket	150.00 - 154.00	0.6000	0.3811
T4	3	T-Bracket	150.00 - 154.00	0.6000	0.3811
T4	8	HB114-1-08U4-M5J	150.00 - 154.00	0.6000	0.3811
T4	9	1 1/4	150.00 - 154.00	0.6000	0.3811
T4	10	7/8	150.00 - 154.00	0.6000	0.3811
T4	11	7/8	150.00 - 154.00	0.6000	0.3811
T4	12	1 1/4	150.00 - 154.00	0.6000	0.3811
T4	13	7/8	150.00 - 154.00	0.6000	0.3811
T4	14	7/8	150.00 - 154.00	0.6000	0.3811
T4	16	HB114-1-08U4-M5J	150.00 - 154.00	0.6000	0.3811
T5	1	T-Bracket	140.00 - 150.00	0.6000	0.2322
T5	2	T-Bracket	140.00 - 150.00	0.6000	0.2322
T5	3	T-Bracket	140.00 - 150.00	0.6000	0.2322
T5	8	HB114-1-08U4-M5J	140.00 - 150.00	0.6000	0.2322
T5	9	1 1/4	140.00 - 150.00	0.6000	0.2322
T5	10	7/8	140.00 - 150.00	0.6000	0.2322
T5	11	7/8	140.00 - 150.00	0.6000	0.2322
T5	12	1 1/4	140.00 - 150.00	0.6000	0.2322
T5	13	7/8	140.00 - 150.00	0.6000	0.2322
T5	14	7/8	140.00 - 150.00	0.6000	0.2322
T5	16	HB114-1-08U4-M5J	140.00 - 150.00	0.6000	0.2322
T6	1	T-Bracket	120.00 - 140.00	0.6000	0.4080
T6	2	T-Bracket	120.00 - 140.00	0.6000	0.4080
T6	3	T-Bracket	120.00 - 140.00	0.6000	0.4080
T6	4	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.4080
T6	5	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.4080
T6	8	HB114-1-08U4-M5J	120.00 - 140.00	0.6000	0.4080
T6	9	1 1/4	120.00 - 140.00	0.6000	0.4080
T6	10	7/8	120.00 - 140.00	0.6000	0.4080
T6	11	7/8	120.00 - 140.00	0.6000	0.4080
T6	12	1 1/4	120.00 - 140.00	0.6000	0.4080
T6	13	7/8	120.00 - 140.00	0.6000	0.4080
T6	14	7/8	120.00 - 140.00	0.6000	0.4080
T6	16	HB114-1-08U4-M5J	120.00 - 140.00	0.6000	0.4080
T6	20	1 5/8	120.00 - 133.00	0.6000	0.4080
T6	21	1 5/8	120.00 - 133.00	0.6000	0.4080
T6	22	1 5/8	120.00 - 133.00	0.6000	0.4080
T6	23	1 5/8	120.00 - 133.00	0.6000	0.4080
T6	24	7/8	120.00 - 133.00	0.6000	0.4080
T6	25	1/2	120.00 - 133.00	0.6000	0.4080

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 12 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T6	27	1 5/8	120.00 - 125.00	0.6000	0.4080
T6	28	1 5/8	120.00 - 125.00	0.6000	0.4080
T7	1	T-Bracket	100.00 - 120.00	0.6000	0.4796
T7	2	T-Bracket	100.00 - 120.00	0.6000	0.4796
T7	3	T-Bracket	100.00 - 120.00	0.6000	0.4796
T7	4	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4796
T7	5	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.4796
T7	8	HB114-1-08U4-M5J	100.00 - 120.00	0.6000	0.4796
T7	9	1 1/4	100.00 - 120.00	0.6000	0.4796
T7	10	7/8	100.00 - 120.00	0.6000	0.4796
T7	11	7/8	100.00 - 120.00	0.6000	0.4796
T7	12	1 1/4	100.00 - 120.00	0.6000	0.4796
T7	13	7/8	100.00 - 120.00	0.6000	0.4796
T7	14	7/8	100.00 - 120.00	0.6000	0.4796
T7	16	HB114-1-08U4-M5J	100.00 - 120.00	0.6000	0.4796
T7	20	1 5/8	100.00 - 120.00	0.6000	0.4796
T7	21	1 5/8	100.00 - 120.00	0.6000	0.4796
T7	22	1 5/8	100.00 - 120.00	0.6000	0.4796
T7	23	1 5/8	100.00 - 120.00	0.6000	0.4796
T7	24	7/8	100.00 - 120.00	0.6000	0.4796
T7	25	1/2	100.00 - 120.00	0.6000	0.4796
T7	27	1 5/8	100.00 - 120.00	0.6000	0.4796
T7	28	1 5/8	100.00 - 120.00	0.6000	0.4796
T7	30	1 5/8	100.00 - 115.00	0.6000	0.4796
T7	31	1 5/8	100.00 - 115.00	0.6000	0.4796
T7	33	1 5/8	100.00 - 101.00	0.6000	0.4796
T8	1	T-Bracket	90.00 - 100.00	0.6000	0.5546
T8	2	T-Bracket	90.00 - 100.00	0.6000	0.5546
T8	3	T-Bracket	90.00 - 100.00	0.6000	0.5546
T8	4	Feedline Ladder (Af)	90.00 - 100.00	0.6000	0.5546
T8	5	Feedline Ladder (Af)	90.00 - 100.00	0.6000	0.5546
T8	6	Feedline Ladder (Af)	90.00 - 100.00	0.6000	0.5546
T8	8	HB114-1-08U4-M5J	90.00 - 100.00	0.6000	0.5546
T8	9	1 1/4	90.00 - 100.00	0.6000	0.5546
T8	10	7/8	90.00 - 100.00	0.6000	0.5546
T8	11	7/8	90.00 - 100.00	0.6000	0.5546
T8	12	1 1/4	90.00 - 100.00	0.6000	0.5546
T8	13	7/8	90.00 - 100.00	0.6000	0.5546
T8	14	7/8	90.00 - 100.00	0.6000	0.5546
T8	16	HB114-1-08U4-M5J	90.00 - 100.00	0.6000	0.5546
T8	20	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	21	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	22	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	23	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	24	7/8	90.00 - 100.00	0.6000	0.5546
T8	25	1/2	90.00 - 100.00	0.6000	0.5546
T8	27	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	28	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	30	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	31	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	33	1 5/8	90.00 - 100.00	0.6000	0.5546
T8	35	7/8	90.00 - 92.00	0.6000	0.5546
T9	1	T-Bracket	80.00 - 90.00	0.6000	0.5711
T9	2	T-Bracket	80.00 - 90.00	0.6000	0.5711
T9	3	T-Bracket	80.00 - 90.00	0.6000	0.5711
T9	4	Feedline Ladder (Af)	80.00 - 90.00	0.6000	0.5711
T9	5	Feedline Ladder (Af)	80.00 - 90.00	0.6000	0.5711
T9	6	Feedline Ladder (Af)	80.00 - 90.00	0.6000	0.5711
T9	8	HB114-1-08U4-M5J	80.00 - 90.00	0.6000	0.5711
T9	9	1 1/4	80.00 - 90.00	0.6000	0.5711
T9	10	7/8	80.00 - 90.00	0.6000	0.5711
T9	11	7/8	80.00 - 90.00	0.6000	0.5711

inxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 13 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _a No Ice	K _a Ice
T9	12	1 1/4	80.00 - 90.00	0.6000	0.5711
T9	13	7/8	80.00 - 90.00	0.6000	0.5711
T9	14	7/8	80.00 - 90.00	0.6000	0.5711
T9	16	HB114-1-08U4-M5J	80.00 - 90.00	0.6000	0.5711
T9	20	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	21	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	22	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	23	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	24	7/8	80.00 - 90.00	0.6000	0.5711
T9	25	1/2	80.00 - 90.00	0.6000	0.5711
T9	27	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	28	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	30	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	31	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	33	1 5/8	80.00 - 90.00	0.6000	0.5711
T9	35	7/8	80.00 - 90.00	0.6000	0.5711
T10	1	T-Bracket	60.00 - 80.00	0.6000	0.6000
T10	2	T-Bracket	60.00 - 80.00	0.6000	0.6000
T10	3	T-Bracket	60.00 - 80.00	0.6000	0.6000
T10	4	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T10	5	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T10	8	HB114-1-08U4-M5J	60.00 - 80.00	0.6000	0.6000
T10	9	1 1/4	60.00 - 80.00	0.6000	0.6000
T10	10	7/8	60.00 - 80.00	0.6000	0.6000
T10	11	7/8	60.00 - 80.00	0.6000	0.6000
T10	12	1 1/4	60.00 - 80.00	0.6000	0.6000
T10	13	7/8	60.00 - 80.00	0.6000	0.6000
T10	14	7/8	60.00 - 80.00	0.6000	0.6000
T10	16	HB114-1-08U4-M5J	60.00 - 80.00	0.6000	0.6000
T10	20	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	21	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	22	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	23	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	24	7/8	60.00 - 80.00	0.6000	0.6000
T10	25	1/2	60.00 - 80.00	0.6000	0.6000
T10	27	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	28	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	30	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	31	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	33	1 5/8	60.00 - 80.00	0.6000	0.6000
T10	35	7/8	60.00 - 80.00	0.6000	0.6000
T11	1	T-Bracket	40.00 - 60.00	0.6000	0.6000
T11	2	T-Bracket	40.00 - 60.00	0.6000	0.6000
T11	3	T-Bracket	40.00 - 60.00	0.6000	0.6000
T11	4	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T11	5	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T11	6	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T11	8	HB114-1-08U4-M5J	40.00 - 60.00	0.6000	0.6000
T11	9	1 1/4	40.00 - 60.00	0.6000	0.6000
T11	10	7/8	40.00 - 60.00	0.6000	0.6000
T11	11	7/8	40.00 - 60.00	0.6000	0.6000
T11	12	1 1/4	40.00 - 60.00	0.6000	0.6000
T11	13	7/8	40.00 - 60.00	0.6000	0.6000
T11	14	7/8	40.00 - 60.00	0.6000	0.6000
T11	16	HB114-1-08U4-M5J	40.00 - 60.00	0.6000	0.6000
T11	20	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	21	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	22	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	23	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	24	7/8	40.00 - 60.00	0.6000	0.6000
T11	25	1/2	40.00 - 60.00	0.6000	0.6000

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 14 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K _n No Ice	K _n Ice
T11	27	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	28	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	30	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	31	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	33	1 5/8	40.00 - 60.00	0.6000	0.6000
T11	35	7/8	40.00 - 60.00	0.6000	0.6000
T12	1	T-Bracket	20.00 - 40.00	0.6000	0.6000
T12	2	T-Bracket	20.00 - 40.00	0.6000	0.6000
T12	3	T-Bracket	20.00 - 40.00	0.6000	0.6000
T12	4	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	5	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	6	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T12	8	HB114-1-08U4-M5J	20.00 - 40.00	0.6000	0.6000
T12	9	1 1/4	20.00 - 40.00	0.6000	0.6000
T12	10	7/8	20.00 - 40.00	0.6000	0.6000
T12	11	7/8	20.00 - 40.00	0.6000	0.6000
T12	12	1 1/4	20.00 - 40.00	0.6000	0.6000
T12	13	7/8	20.00 - 40.00	0.6000	0.6000
T12	14	7/8	20.00 - 40.00	0.6000	0.6000
T12	16	HB114-1-08U4-M5J	20.00 - 40.00	0.6000	0.6000
T12	20	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	21	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	22	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	23	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	24	7/8	20.00 - 40.00	0.6000	0.6000
T12	25	1/2	20.00 - 40.00	0.6000	0.6000
T12	27	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	28	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	30	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	31	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	33	1 5/8	20.00 - 40.00	0.6000	0.6000
T12	35	7/8	20.00 - 40.00	0.6000	0.6000
T12	37	7/8	20.00 - 30.00	0.6000	0.6000
T13	1	T-Bracket	0.00 - 20.00	0.6000	0.6000
T13	2	T-Bracket	0.00 - 20.00	0.6000	0.6000
T13	3	T-Bracket	0.00 - 20.00	0.6000	0.6000
T13	4	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	5	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	6	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T13	8	HB114-1-08U4-M5J	0.00 - 20.00	0.6000	0.6000
T13	9	1 1/4	0.00 - 20.00	0.6000	0.6000
T13	10	7/8	0.00 - 20.00	0.6000	0.6000
T13	11	7/8	0.00 - 20.00	0.6000	0.6000
T13	12	1 1/4	0.00 - 20.00	0.6000	0.6000
T13	13	7/8	0.00 - 20.00	0.6000	0.6000
T13	14	7/8	0.00 - 20.00	0.6000	0.6000
T13	16	HB114-1-08U4-M5J	0.00 - 20.00	0.6000	0.6000
T13	20	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	21	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	22	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	23	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	24	7/8	0.00 - 20.00	0.6000	0.6000
T13	25	1/2	0.00 - 20.00	0.6000	0.6000
T13	27	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	28	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	30	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	31	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	33	1 5/8	0.00 - 20.00	0.6000	0.6000
T13	35	7/8	0.00 - 20.00	0.6000	0.6000
T13	37	7/8	0.00 - 20.00	0.6000	0.6000

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 15 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _A A ₁		Weight	
			Horz	Lateral			Front	Side		
			ft	ft	°	ft	ft ²	ft ²	lb	
15' Omni (Municipal)	A	From Leg	0.00	0.00	0.0000	170.00	No Ice	4.13	4.13	40.00
			0.00	0.00			1/2" Ice	5.66	5.66	70.14
			8.00	0.00			1" Ice	7.20	7.20	109.87
2' Omni (Municipal)	C	From Leg	1.00	0.00	0.0000	170.00	No Ice	0.36	0.36	10.00
			0.00	0.00			1/2" Ice	0.49	0.49	13.98
			1.00	0.00			1" Ice	0.63	0.63	19.58
15' Omni (Municipal)	A	From Leg	7.00	0.00	0.0000	170.00	No Ice	4.13	4.13	40.00
			4.00	0.00			1/2" Ice	5.66	5.66	70.14
			10.00	0.00			1" Ice	7.20	7.20	109.87
20' Omni (Municipal)	A	From Face	8.25	0.00	0.0000	170.00	No Ice	5.50	5.50	55.00
			0.00	0.00			1/2" Ice	7.53	7.53	95.06
			10.00	0.00			1" Ice	9.58	9.58	147.78
SU-RA (Municipal)	A	From Leg	7.00	0.00	0.0000	170.00	No Ice	1.21	0.30	5.50
			0.00	0.00			1/2" Ice	1.35	0.38	13.29
			0.00	0.00			1" Ice	1.49	0.47	23.01
20' Dipole (Municipal)	A	From Face	7.00	0.00	0.0000	170.00	No Ice	6.00	6.00	55.00
			0.00	0.00			1/2" Ice	8.03	8.03	98.17
			10.00	0.00			1" Ice	10.08	10.08	154.01
3' Omni (Municipal)	B	From Leg	7.00	0.00	0.0000	170.00	No Ice	0.60	0.60	10.00
			4.00	0.00			1/2" Ice	0.79	0.79	15.81
			1.50	0.00			1" Ice	0.99	0.99	23.86
10' Omni (Municipal)	B	From Face	8.25	0.00	0.0000	170.00	No Ice	2.75	2.75	30.00
			0.00	0.00			1/2" Ice	3.78	3.78	50.21
			5.00	0.00			1" Ice	4.83	4.83	76.96
15' Omni (Municipal)	B	From Face	7.00	0.00	0.0000	170.00	No Ice	4.13	4.13	40.00
			8.00	0.00			1/2" Ice	5.66	5.66	70.14
			10.00	0.00			1" Ice	7.20	7.20	109.87
15'x2-1/2" Pipe Mount	C	From Leg	7.00	0.00	0.0000	170.00	No Ice	4.32	4.32	87.00
			4.00	0.00			1/2" Ice	5.85	5.85	118.35
			8.00	0.00			1" Ice	7.40	7.40	159.32
10' Omni (Municipal)	C	From Leg	7.00	0.00	0.0000	170.00	No Ice	2.75	2.75	30.00
			4.00	0.00			1/2" Ice	3.78	3.78	50.21
			13.00	0.00			1" Ice	4.83	4.83	76.96
15' Omni (Municipal)	C	From Face	8.25	0.00	0.0000	170.00	No Ice	4.13	4.13	40.00
			0.00	0.00			1/2" Ice	5.66	5.66	70.14
			10.00	0.00			1" Ice	7.20	7.20	109.87
10' Omni (Municipal)	C	From Face	7.00	0.00	0.0000	170.00	No Ice	2.75	2.75	30.00
			8.00	0.00			1/2" Ice	3.78	3.78	50.21
			5.00	0.00			1" Ice	4.83	4.83	76.96
SU-RA (Municipal)	C	From Leg	7.00	0.00	0.0000	170.00	No Ice	1.21	0.30	5.50
			8.00	0.00			1/2" Ice	1.35	0.38	13.29
			0.00	0.00			1" Ice	1.49	0.47	23.01
Camera and Mount	A	From Leg	7.00	0.00	0.0000	170.00	No Ice	4.80	4.80	150.00
			4.00	0.00			1/2" Ice	5.07	5.07	208.37
			0.00	0.00			1" Ice	5.35	5.35	271.59
Sector Mount [SM 412-1] (Halo Mount)	C	None		0.00	0.0000	168.25	No Ice	70.47	70.47	3080.00
				0.00			1/2" Ice	100.14	100.14	4498.00
				0.00			1" Ice	129.81	129.81	5916.00

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tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job	Cromwell - RT. 372 (CT60xc931)	Page	17 of 41
	Project	29431	Date	09:09:34 09/25/18
	Client	Sprint	Designed by	kphillips

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C ₁ A ₁		Weight	
			Horz	Vert	Lateral			Front	Side		
			ft	ft	ft	°	ft	ft ²	ft ²	lb	
20' Omni (Municipal)	A	From Face	4.00			0.0000	133.00	No Ice	5.50	5.50	55.00
			-5.00					1/2" Ice	7.53	7.53	95.06
			10.00					1" Ice	9.58	9.58	147.78
5' Omni (Municipal)	A	From Face	4.00			0.0000	133.00	No Ice	1.23	1.23	25.00
			3.00					1/2" Ice	1.53	1.53	34.47
			4.00					1" Ice	1.84	1.84	47.41
10' Omni (Municipal)	A	From Face	4.00			0.0000	133.00	No Ice	2.75	2.75	30.00
			5.00					1/2" Ice	3.78	3.78	50.21
			6.00					1" Ice	4.83	4.83	76.96
20' Omni (Municipal)	B	From Face	4.00			0.0000	133.00	No Ice	5.50	5.50	55.00
			-5.00					1/2" Ice	7.53	7.53	95.06
			10.00					1" Ice	9.58	9.58	147.78
5' Omni (Municipal)	C	From Face	4.00			0.0000	133.00	No Ice	1.23	1.23	25.00
			-5.00					1/2" Ice	1.53	1.53	34.47
			1.00					1" Ice	1.84	1.84	47.41
5' Omni (Municipal)	C	From Face	4.00			0.0000	133.00	No Ice	1.23	1.23	25.00
			2.00					1/2" Ice	1.53	1.53	34.47
			4.00					1" Ice	1.84	1.84	47.41
10' Omni (Municipal)	A	From Face	4.00			0.0000	133.00	No Ice	2.75	2.75	30.00
			8.50					1/2" Ice	3.78	3.78	50.21
			6.00					1" Ice	4.83	4.83	76.96
6' Yagi (Municipal)	A	From Face	4.00			0.0000	133.00	No Ice	3.13	3.13	30.00
			-9.50					1/2" Ice	8.14	8.14	64.43
			4.00					1" Ice	13.17	13.17	129.62
**											
LLPX310R w/Mount Pipe (Clearwire)	A	From Face	4.00			0.0000	133.00	No Ice	4.69	3.16	45.81
			0.00					1/2" Ice	5.07	3.74	85.21
			1.00					1" Ice	5.47	4.33	130.09
LLPX310R w/Mount Pipe (Clearwire)	B	From Face	4.00			0.0000	133.00	No Ice	4.69	3.16	45.81
			0.00					1/2" Ice	5.07	3.74	85.21
			1.00					1" Ice	5.47	4.33	130.09
LLPX310R w/Mount Pipe (Clearwire)	C	From Face	4.00			0.0000	133.00	No Ice	4.69	3.16	45.81
			5.00					1/2" Ice	5.07	3.74	85.21
			1.00					1" Ice	5.47	4.33	130.09
RRH U-RAS (Clearwire)	A	From Face	4.00			0.0000	133.00	No Ice	1.82	0.83	33.00
			0.00					1/2" Ice	2.00	0.97	44.91
			-2.00					1" Ice	2.19	1.12	59.16
RRH U-RAS (Clearwire)	B	From Face	4.00			0.0000	133.00	No Ice	1.82	0.83	33.00
			0.00					1/2" Ice	2.00	0.97	44.91
			-2.00					1" Ice	2.19	1.12	59.16
RRH U-RAS (Clearwire)	C	From Face	4.00			0.0000	133.00	No Ice	1.82	0.83	33.00
			5.00					1/2" Ice	2.00	0.97	44.91
			-2.00					1" Ice	2.19	1.12	59.16
6' x 2" Pipe Mount (Clearwire dish)	B	From Face	4.00			0.0000	133.00	No Ice	1.43	1.43	21.90
			-9.00					1/2" Ice	1.92	1.92	32.73
			0.00					1" Ice	2.29	2.29	47.61
6' x 2" Pipe Mount (Clearwire dish)	B	From Face	4.00			0.0000	133.00	No Ice	1.43	1.43	21.90
			-2.00					1/2" Ice	1.92	1.92	32.73
			0.00					1" Ice	2.29	2.29	47.61
6' x 2" Pipe Mount (Clearwire dish)	B	From Face	4.00			0.0000	133.00	No Ice	1.43	1.43	21.90
			6.00					1/2" Ice	1.92	1.92	32.73
			0.00					1" Ice	2.29	2.29	47.61
6' x 2" Pipe Mount (Clearwire dish)	C	From Face	4.00			0.0000	133.00	No Ice	1.43	1.43	21.90
			-2.00					1/2" Ice	1.92	1.92	32.73
			0.00					1" Ice	2.29	2.29	47.61
PiROD 20' Universal Platform	C	None				0.0000	133.00	No Ice	33.10	33.10	2270.00
								1/2" Ice	47.10	47.10	2701.00

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job		Cromwell - RT. 372 (CT60xc931)		Page		18 of 41	
	Project		29431		Date		09:09:34 09/25/18	
	Client		Sprint		Designed by		kphillips	

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{A,A}		Weight	
			Horz Lateral	Vert			Front	Side		
							ft	ft	ft	
							1" Ice	61.10	61.10	3132.00

(2) AIR B2A/B4P w/ Mount Pipe (T-Mobile)	A	From Leg	3.00	0.0000	125.00	No Ice	7.23	6.12	112.20	
			0.00			1/2" Ice	8.02	7.36	174.30	
			0.00			1" Ice	8.75	8.46	243.53	
(2) AIR B2A/B4P w/ Mount Pipe (T-Mobile)	B	From Leg	3.00	0.0000	125.00	No Ice	7.23	6.12	112.20	
			0.00			1/2" Ice	8.02	7.36	174.30	
			0.00			1" Ice	8.75	8.46	243.53	
(2) AIR B2A/B4P w/ Mount Pipe (T-Mobile)	C	From Leg	3.00	0.0000	125.00	No Ice	7.23	6.12	112.20	
			0.00			1/2" Ice	8.02	7.36	174.30	
			0.00			1" Ice	8.75	8.46	243.53	
ETW190VS12UB (T-Mobile)	A	From Leg	3.00	0.0000	125.00	No Ice	0.57	0.32	14.60	
			5.00			1/2" Ice	0.67	0.40	19.55	
			0.00			1" Ice	0.77	0.49	26.03	
ETW190VS12UB (T-Mobile)	B	From Leg	3.00	0.0000	125.00	No Ice	0.57	0.32	14.60	
			5.00			1/2" Ice	0.67	0.40	19.55	
			0.00			1" Ice	0.77	0.49	26.03	
ETW190VS12UB (T-Mobile)	C	From Leg	3.00	0.0000	125.00	No Ice	0.57	0.32	14.60	
			5.00			1/2" Ice	0.67	0.40	19.55	
			0.00			1" Ice	0.77	0.49	26.03	
RRUS-11 (T-Mobile)	A	From Leg	3.00	0.0000	125.00	No Ice	2.78	1.19	50.71	
			-1.50			1/2" Ice	2.99	1.33	71.49	
			-3.00			1" Ice	3.21	1.49	95.32	
RRUS-11 (T-Mobile)	B	From Leg	3.00	0.0000	125.00	No Ice	2.78	1.19	50.71	
			-1.50			1/2" Ice	2.99	1.33	71.49	
			-3.00			1" Ice	3.21	1.49	95.32	
RRUS-11 (T-Mobile)	C	From Leg	3.00	0.0000	125.00	No Ice	2.78	1.19	50.71	
			-1.50			1/2" Ice	2.99	1.33	71.49	
			-3.00			1" Ice	3.21	1.49	95.32	
LNX-6515DS-A1M w/Mount Pipe (T-Mobile)	A	From Leg	3.00	0.0000	125.00	No Ice	11.43	9.59	92.20	
			-1.50			1/2" Ice	12.05	11.01	179.10	
			0.00			1" Ice	12.67	12.28	275.75	
LNX-6515DS-A1M w/Mount Pipe (T-Mobile)	B	From Leg	3.00	0.0000	125.00	No Ice	11.43	9.59	92.20	
			-1.50			1/2" Ice	12.05	11.01	179.10	
			0.00			1" Ice	12.67	12.28	275.75	
LNX-6515DS-A1M w/Mount Pipe (T-Mobile)	C	From Leg	3.00	0.0000	125.00	No Ice	11.43	9.59	92.20	
			-1.50			1/2" Ice	12.05	11.01	179.10	
			0.00			1" Ice	12.67	12.28	275.75	
Sector Mount [SM 405-1] (T-Mobile)	A	From Leg	3.00	0.0000	125.00	No Ice	8.27	8.37	286.93	
			0.00			1/2" Ice	12.24	11.93	420.81	
			0.00			1" Ice	16.21	15.49	554.68	
Sector Mount [SM 405-1] (T-Mobile)	B	From Leg	3.00	0.0000	125.00	No Ice	8.27	8.37	286.93	
			0.00			1/2" Ice	12.24	11.93	420.81	
			0.00			1" Ice	16.21	15.49	554.68	
Sector Mount [SM 405-1] (T-Mobile)	C	From Leg	3.00	0.0000	125.00	No Ice	8.27	8.37	286.93	
			0.00			1/2" Ice	12.24	11.93	420.81	
			0.00			1" Ice	16.21	15.49	554.68	

RRUS-12 (ATT)	A	From Leg	2.00	0.0000	118.00	No Ice	3.14	1.26	57.98	
			0.00			1/2" Ice	3.36	1.42	81.02	
			0.00			1" Ice	3.59	1.57	107.26	
RRUS-12 (ATT)	B	From Leg	2.00	0.0000	118.00	No Ice	3.14	1.26	57.98	
			0.00			1/2" Ice	3.36	1.42	81.02	
			0.00			1" Ice	3.59	1.57	107.26	
RRUS-12 (ATT)	C	From Leg	2.00	0.0000	118.00	No Ice	3.14	1.26	57.98	
			0.00			1/2" Ice	3.36	1.42	81.02	
			0.00			1" Ice	3.59	1.57	107.26	

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job		Cromwell - RT. 372 (CT60xc931)		Page		19 of 41	
	Project		29431		Date		09:09:34 09/25/18	
	Client		Sprint		Designed by		kphillips	

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{A,1}		Weight	
			Horz	Vert	Lateral			Front	Side		
			ft	ft	ft	°	ft	ft ²	ft ²	lb	
DC6-48-60-18-8F (ATT)	B	From Leg	1.00			0.0000	118.00	No Ice	0.92	0.92	32.80
			0.00					1/2" Ice	1.46	1.46	50.52
			0.00					1" Ice	1.64	1.64	70.72
2' Standoff (ATT)	A	From Leg	1.00			0.0000	118.00	No Ice	1.80	1.80	33.00
			0.00					1/2" Ice	3.30	3.30	59.00
			0.00					1" Ice	4.80	4.80	85.00
2' Standoff (ATT)	B	From Leg	1.00			0.0000	118.00	No Ice	1.80	1.80	33.00
			0.00					1/2" Ice	3.30	3.30	59.00
			0.00					1" Ice	4.80	4.80	85.00
2' Standoff (ATT)	C	From Leg	1.00			0.0000	118.00	No Ice	1.80	1.80	33.00
			0.00					1/2" Ice	3.30	3.30	59.00
			0.00					1" Ice	4.80	4.80	85.00

(2) RA21.7770.00 w/Mount Pipe (ATT)	A	From Leg	3.00			0.0000	115.00	No Ice	7.17	5.41	66.40
			0.00					1/2" Ice	7.86	6.63	124.83
			0.00					1" Ice	8.50	7.70	190.68
(2) RA21.7770.00 w/Mount Pipe (ATT)	B	From Leg	3.00			0.0000	115.00	No Ice	7.17	5.41	66.40
			0.00					1/2" Ice	7.86	6.63	124.83
			0.00					1" Ice	8.50	7.70	190.68
(2) RA21.7770.00 w/Mount Pipe (ATT)	C	From Leg	3.00			0.0000	115.00	No Ice	7.17	5.41	66.40
			0.00					1/2" Ice	7.86	6.63	124.83
			0.00					1" Ice	8.50	7.70	190.68
QS6658-3 w/Mount Pipe (ATT)	A	From Leg	3.00			0.0000	115.00	No Ice	8.37	8.11	102.55
			-1.50					1/2" Ice	8.93	9.30	176.59
			0.00					1" Ice	9.46	10.21	258.73
QS6658-3 w/Mount Pipe (ATT)	B	From Leg	3.00			0.0000	115.00	No Ice	8.37	8.11	102.55
			-1.50					1/2" Ice	8.93	9.30	176.59
			1.00					1" Ice	9.46	10.21	258.73
QS6658-3 w/Mount Pipe (ATT)	C	From Leg	3.00			0.0000	115.00	No Ice	8.37	8.11	102.55
			-1.50					1/2" Ice	8.93	9.30	176.59
			1.00					1" Ice	9.46	10.21	258.73
TMA 10"x9"x3" (ATT)	A	From Leg	3.00			0.0000	115.00	No Ice	0.75	0.26	25.00
			-7.50					1/2" Ice	0.86	0.33	30.51
			0.00					1" Ice	0.98	0.41	37.64
TMA 10"x9"x3" (ATT)	A	From Leg	3.00			0.0000	115.00	No Ice	0.75	0.26	25.00
			-7.50					1/2" Ice	0.86	0.33	30.51
			0.00					1" Ice	0.98	0.41	37.64
TMA 4"x8"x4" (ATT)	A	From Leg	3.00			0.0000	115.00	No Ice	0.27	0.13	5.00
			0.00					1/2" Ice	0.34	0.18	8.14
			0.00					1" Ice	0.41	0.24	12.52
TMA 4"x8"x4" (ATT)	A	From Leg	3.00			0.0000	115.00	No Ice	0.27	0.13	5.00
			0.00					1/2" Ice	0.34	0.18	8.14
			0.00					1" Ice	0.41	0.24	12.52
TMA 10"x9"x3" (ATT)	B	From Leg	3.00			0.0000	115.00	No Ice	0.75	0.26	25.00
			-7.50					1/2" Ice	0.86	0.33	30.51
			0.00					1" Ice	0.98	0.41	37.64
TMA 10"x9"x3" (ATT)	B	From Leg	3.00			0.0000	115.00	No Ice	0.75	0.26	25.00
			-7.50					1/2" Ice	0.86	0.33	30.51
			0.00					1" Ice	0.98	0.41	37.64
TMA 4"x8"x4" (ATT)	B	From Leg	3.00			0.0000	115.00	No Ice	0.27	0.13	5.00
			0.00					1/2" Ice	0.34	0.18	8.14
			0.00					1" Ice	0.41	0.24	12.52
TMA 4"x8"x4" (ATT)	B	From Leg	3.00			0.0000	115.00	No Ice	0.27	0.13	5.00
			0.00					1/2" Ice	0.34	0.18	8.14
			0.00					1" Ice	0.41	0.24	12.52
TMA 10"x9"x3" (ATT)	C	From Leg	3.00			0.0000	115.00	No Ice	0.75	0.26	25.00
			-7.50					1/2" Ice	0.86	0.33	30.51

inxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 20 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C ₁ A ₁		Weight
			Horz	Lateral			Front	Side	
			Vert		°	ft	ft ²	ft ²	lb
			0.00						
TMA 10"x9"x3" (ATT)	C	From Leg	3.00		0.0000	115.00	1" Ice 0.98	0.41	37.64
			-7.50				No Ice 0.75	0.26	25.00
			0.00				1/2" Ice 0.86	0.33	30.51
TMA 4"x8"x4" (ATT)	C	From Leg	3.00		0.0000	115.00	1" Ice 0.98	0.41	37.64
			0.00				No Ice 0.27	0.13	5.00
			0.00				1/2" Ice 0.34	0.18	8.14
TMA 4"x8"x4" (ATT)	C	From Leg	3.00		0.0000	115.00	1" Ice 0.41	0.24	12.52
			0.00				No Ice 0.27	0.13	5.00
			0.00				1/2" Ice 0.34	0.18	8.14
			0.00				1" Ice 0.41	0.24	12.52
RRUS-12 w/ A2 Box (ATT)	A	From Leg	3.00		0.0000	115.00	No Ice 3.15	1.82	80.00
			-1.50				1/2" Ice 3.36	2.00	107.36
			0.00				1" Ice 3.59	2.18	138.13
RRUS-12 w/ A2 Box (ATT)	B	From Leg	3.00		0.0000	115.00	No Ice 3.15	1.82	80.00
			-1.50				1/2" Ice 3.36	2.00	107.36
			0.00				1" Ice 3.59	2.18	138.13
RRUS-12 w/ A2 Box (ATT)	C	From Leg	3.00		0.0000	115.00	No Ice 3.15	1.82	80.00
			-1.50				1/2" Ice 3.36	2.00	107.36
			0.00				1" Ice 3.59	2.18	138.13
RRUS-32 (ATT)	A	From Leg	3.00		0.0000	115.00	No Ice 2.69	1.59	50.80
			-1.50				1/2" Ice 2.91	1.78	71.33
			-3.00				1" Ice 3.14	1.97	95.01
RRUS-32 (ATT)	B	From Leg	3.00		0.0000	115.00	No Ice 2.69	1.59	50.80
			-1.50				1/2" Ice 2.91	1.78	71.33
			-3.00				1" Ice 3.14	1.97	95.01
RRUS-32 (ATT)	C	From Leg	3.00		0.0000	115.00	No Ice 2.69	1.59	50.80
			-1.50				1/2" Ice 2.91	1.78	71.33
			-3.00				1" Ice 3.14	1.97	95.01
Sector Mount [SM 408-1] (ATT)	A	From Leg	2.50		0.0000	115.00	No Ice 11.70	8.25	339.80
			0.00				1/2" Ice 17.51	12.27	491.56
			0.00				1" Ice 23.32	16.29	643.31
Sector Mount [SM 408-1] (ATT)	B	From Leg	2.50		0.0000	115.00	No Ice 11.70	8.25	339.80
			0.00				1/2" Ice 17.51	12.27	491.56
			0.00				1" Ice 23.32	16.29	643.31
Sector Mount [SM 408-1] (ATT)	C	From Leg	2.50		0.0000	115.00	No Ice 11.70	8.25	339.80
			0.00				1/2" Ice 17.51	12.27	491.56
			0.00				1" Ice 23.32	16.29	643.31

HBX-6517DS-VTM w/Mount Pipe (Verizon)	A	From Leg	3.00		0.0000	101.00	No Ice 5.42	4.96	44.25
			-5.00				1/2" Ice 5.97	6.14	90.00
			0.00				1" Ice 6.49	7.03	143.32
HBX-6517DS-VTM w/Mount Pipe (Verizon)	B	From Leg	3.00		0.0000	101.00	No Ice 5.42	4.96	44.25
			-5.00				1/2" Ice 5.97	6.14	90.00
			0.00				1" Ice 6.49	7.03	143.32
HBX-6517DS-VTM w/Mount Pipe (Verizon)	C	From Leg	3.00		0.0000	101.00	No Ice 5.42	4.96	44.25
			-5.00				1/2" Ice 5.97	6.14	90.00
			0.00				1" Ice 6.49	7.03	143.32
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	A	From Leg	3.00		0.0000	101.00	No Ice 7.83	5.82	42.55
			0.00				1/2" Ice 8.39	6.99	103.53
			0.00				1" Ice 8.91	7.87	172.25
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	B	From Leg	3.00		0.0000	101.00	No Ice 7.83	5.82	42.55
			0.00				1/2" Ice 8.39	6.99	103.53
			0.00				1" Ice 8.91	7.87	172.25
BXA-70063-6CF-EDIN-X w/Mount Pipe (Verizon)	C	From Leg	3.00		0.0000	101.00	No Ice 7.83	5.82	42.55
			0.00				1/2" Ice 8.39	6.99	103.53
			0.00				1" Ice 8.91	7.87	172.25
BXA-171063-12CF w/Mount	A	From Leg	3.00		0.0000	101.00	No Ice 5.03	5.29	38.35

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 21 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{1A1}		Weight
			Horz	Vert	Lateral			Front	Side	
			ft	ft	ft	°	ft	ft ²	ft ²	lb
Pipe			5.00				1/2" Ice	5.58	6.46	84.33
(Verizon)			0.00				1" Ice	6.10	7.34	137.75
BXA-171063-12CF w/Mount	B	From Leg	3.00			0.0000	No Ice	5.03	5.29	38.35
Pipe			5.00				1/2" Ice	5.58	6.46	84.33
(Verizon)			0.00				1" Ice	6.10	7.34	137.75
BXA-171063-12CF w/Mount	C	From Leg	3.00			0.0000	No Ice	5.03	5.29	38.35
Pipe			5.00				1/2" Ice	5.58	6.46	84.33
(Verizon)			0.00				1" Ice	6.10	7.34	137.75
LNx-6514DS-T4M w/Mount	A	From Leg	3.00			0.0000	No Ice	8.41	7.08	64.16
Pipe			7.00				1/2" Ice	8.97	8.27	133.31
(Verizon)			0.00				1" Ice	9.50	9.18	210.50
LNx-6514DS-T4M w/Mount	B	From Leg	3.00			0.0000	No Ice	8.41	7.08	64.16
Pipe			7.00				1/2" Ice	8.97	8.27	133.31
(Verizon)			0.00				1" Ice	9.50	9.18	210.50
LNx-6514DS-T4M w/Mount	C	From Leg	3.00			0.0000	No Ice	8.41	7.08	64.16
Pipe			7.00				1/2" Ice	8.97	8.27	133.31
(Verizon)			0.00				1" Ice	9.50	9.18	210.50
RRH 2x40 AWS	A	From Leg	3.00			0.0000	No Ice	2.16	1.42	44.00
(Verizon)			-5.00				1/2" Ice	2.36	1.59	61.40
			-1.00				1" Ice	2.57	1.77	81.69
RRH 2x40 AWS	B	From Leg	3.00			0.0000	No Ice	2.16	1.42	44.00
(Verizon)			-5.00				1/2" Ice	2.36	1.59	61.40
			-1.00				1" Ice	2.57	1.77	81.69
RRH 2x40 AWS	C	From Leg	3.00			0.0000	No Ice	2.16	1.42	44.00
(Verizon)			-5.00				1/2" Ice	2.36	1.59	61.40
			-1.00				1" Ice	2.57	1.77	81.69
FD9R6004/2C-3L	A	From Leg	3.00			0.0000	No Ice	0.37	0.08	2.60
(Verizon)			0.00				1/2" Ice	0.45	0.14	4.90
			2.00				1" Ice	0.54	0.20	8.29
FD9R6004/2C-3L	A	From Leg	3.00			0.0000	No Ice	0.37	0.08	2.60
(Verizon)			0.00				1/2" Ice	0.45	0.14	4.90
			2.00				1" Ice	0.54	0.20	8.29
FD9R6004/2C-3L	B	From Leg	3.00			0.0000	No Ice	0.37	0.08	2.60
(Verizon)			0.00				1/2" Ice	0.45	0.14	4.90
			2.00				1" Ice	0.54	0.20	8.29
FD9R6004/2C-3L	B	From Leg	3.00			0.0000	No Ice	0.37	0.08	2.60
(Verizon)			0.00				1/2" Ice	0.45	0.14	4.90
			2.00				1" Ice	0.54	0.20	8.29
FD9R6004/2C-3L	C	From Leg	3.00			0.0000	No Ice	0.37	0.08	2.60
(Verizon)			0.00				1/2" Ice	0.45	0.14	4.90
			2.00				1" Ice	0.54	0.20	8.29
FD9R6004/2C-3L	C	From Leg	3.00			0.0000	No Ice	0.37	0.08	2.60
(Verizon)			0.00				1/2" Ice	0.45	0.14	4.90
			2.00				1" Ice	0.54	0.20	8.29
Sector Mount [SM 408-1]	A	From Leg	2.50			0.0000	No Ice	11.70	8.25	339.80
(Verizon)			0.00				1/2" Ice	17.51	12.27	491.56
			0.00				1" Ice	23.32	16.29	643.31
Sector Mount [SM 408-1]	B	From Leg	2.50			0.0000	No Ice	11.70	8.25	339.80
(Verizon)			0.00				1/2" Ice	17.51	12.27	491.56
			0.00				1" Ice	23.32	16.29	643.31
Sector Mount [SM 408-1]	C	From Leg	2.50			0.0000	No Ice	11.70	8.25	339.80
(Verizon)			0.00				1/2" Ice	17.51	12.27	491.56
			0.00				1" Ice	23.32	16.29	643.31

5' x 2" Pipe Mount	C	From Leg	1.00			0.0000	No Ice	1.19	1.19	29.00
(ATT)			0.00				1/2" Ice	1.50	1.50	38.07
			0.00				1" Ice	1.81	1.81	50.59

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job	Cromwell - RT. 372 (CT60xc931)	Page	22 of 41
	Project	29431	Date	09:09:34 09/25/18
	Client	Sprint	Designed by	kphillips

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C ₁ A ₁ Front	C ₁ A ₁ Side	Weight
			ft	°	ft	ft ²	ft ²	lb

Camera and Mount (Unk.)	C	From Leg	0.50 0.00 0.00	0.0000	30.00	No Ice 4.80 1/2" Ice 5.07 1" Ice 5.35	4.80 5.07 5.35	150.00 208.37 271.59

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft	°	°	ft	ft	ft ²	lb
VHLP2.5 (Clearwire dish)	B	Paraboloid w/Shroud (HP)	From Face	4.00 0.00 4.00	0.0000		133.00	2.92	No Ice 6.68 1/2" Ice 7.07 1" Ice 7.46	48.00 76.00 104.00
VHLP2 (Clearwire dish)	B	Paraboloid w/Shroud (HP)	From Face	4.00 0.00 0.00	0.0000		133.00	2.18	No Ice 3.72 1/2" Ice 4.01 1" Ice 4.30	27.00 54.00 81.00
2 FT DISH (Clearwire dish)	B	Paraboloid w/o Radome	From Face	4.00 -9.00 3.00	0.0000		133.00	2.00	No Ice 3.14 1/2" Ice 3.41 1" Ice 3.68	70.00 87.50 105.01
2 FT DISH (Clearwire dish)	C	Paraboloid w/o Radome	From Face	4.00 -2.00 3.00	0.0000		133.00	2.00	No Ice 3.14 1/2" Ice 3.41 1" Ice 3.68	70.00 87.50 105.01

1' Dish	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		92.00	1.00	No Ice 0.79 1/2" Ice 0.92 1" Ice 1.06	25.00 29.72 34.45

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in ²	in ²	lb	lb	in	in	in ²
Pirod 105244	1026.8606	3350.4195	535.96	880.51	7.1310	23.2668	3.6816
Pirod 105216	2185.5952	6444.0037	458.09	1662.43	7.5889	22.3750	3.6816
Pirod 105217	2312.6169	6495.8492	566.74	1650.74	8.0299	22.5550	5.3014
Pirod 105217	2312.6169	6481.0853	566.74	1624.21	8.0299	22.5038	5.3014
Pirod 105217 w/ 1" Reinf Rod	2481.3473	6794.5014	719.91	1538.92	8.6158	23.5920	7.6341
Pirod 105218 w/ 1" Reinf Rod	2589.5550	6808.6560	849.73	1539.16	8.9915	23.6412	9.5686
Pirod 105219	2620.2715	6598.2673	1047.25	1687.73	9.0982	22.9107	9.4248
Pirod 105219 w/ 1" Reinf Rod	2744.1041	6852.7131	1191.91	1620.48	9.5281	23.7941	11.7171
Pirod 105220 w/ 1" Reinf Rod	2867.7293	6891.4699	1359.89	1630.16	9.9574	23.9287	14.2124

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 23 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Force Totals

Load Case	Vertical Forces <i>lb</i>	Sum of Forces <i>X</i> <i>lb</i>	Sum of Forces <i>Z</i> <i>lb</i>	Sum of Overturning Moments, <i>M_x</i> <i>lb-ft</i>	Sum of Overturning Moments, <i>M_z</i> <i>lb-ft</i>	Sum of Torques <i>lb-ft</i>
Leg Weight	19677.75					
Bracing Weight	10627.83					
Total Member Self-Weight	30305.58			-29982.48	4737.67	
Total Weight	58306.14			-29982.48	4737.67	
Wind 0 deg - No Ice		143.01	-53435.66	-4532592.80	-13980.15	-10983.84
Wind 30 deg - No Ice		26058.07	-45057.17	-3841871.17	-2201320.58	-26161.82
Wind 60 deg - No Ice		44417.83	-25768.01	-2214456.81	-3749167.91	-46478.73
Wind 90 deg - No Ice		50227.87	-107.01	-44203.22	-4230436.86	-44788.43
Wind 120 deg - No Ice		44502.66	25554.06	2124145.68	-3757078.58	-21415.09
Wind 150 deg - No Ice		25233.81	43677.69	3704766.61	-2153380.78	1651.75
Wind 180 deg - No Ice		-266.09	51733.07	4367308.22	41059.08	12188.84
Wind 210 deg - No Ice		-26186.58	45044.25	3780150.25	2228944.92	26847.23
Wind 240 deg - No Ice		-45985.19	26575.13	2201481.98	3863068.68	46860.20
Wind 270 deg - No Ice		-50315.55	170.29	-6572.70	4252173.95	45055.32
Wind 300 deg - No Ice		-43105.69	-24703.19	-2130759.38	3686317.86	22182.90
Wind 330 deg - No Ice		-25154.68	-43763.35	-3776379.00	2152098.06	-1345.45
Member Ice	65463.73					
Total Weight Ice	242513.34			-121445.50	20082.49	
Wind 0 deg - Ice		49.03	-29045.57	-2618173.49	13746.61	-11199.79
Wind 30 deg - Ice		14205.19	-24578.62	-2245526.71	-1207936.61	-17532.32
Wind 60 deg - Ice		23973.37	-13883.43	-1328072.05	-2059643.22	-20659.61
Wind 90 deg - Ice		27566.85	-36.29	-126215.15	-2370293.55	-15851.41
Wind 120 deg - Ice		24464.90	14076.87	1090947.77	-2090249.09	-5244.13
Wind 150 deg - Ice		14281.75	24727.66	2009609.00	-1210862.90	4344.02
Wind 180 deg - Ice		-88.89	28697.88	2354373.71	32201.58	11614.36
Wind 210 deg - Ice		-14247.47	24573.30	2001913.43	1254133.49	17773.02
Wind 240 deg - Ice		-24304.27	14040.75	1093528.86	2122212.89	20791.19
Wind 270 deg - Ice		-27595.32	56.78	-113645.62	2414472.88	15939.19
Wind 300 deg - Ice		-24189.23	-13905.42	-1323395.98	2115947.19	5510.05
Wind 330 deg - Ice		-14255.37	-24756.68	-2256446.24	1247440.60	-4238.37
Total Weight	58306.14			-29982.48	4737.67	
Wind 0 deg - Service		54.72	-20445.14	-1726252.67	-5470.32	-4202.55
Wind 30 deg - Service		9970.14	-17239.43	-1461974.02	-842373.87	-10009.84
Wind 60 deg - Service		16994.81	-9859.16	-839305.11	-1434599.44	-17783.34
Wind 90 deg - Service		19217.81	-40.94	-8939.19	-1618738.91	-17136.61
Wind 120 deg - Service		17027.27	9777.30	820697.96	-1437626.16	-8193.68
Wind 150 deg - Service		9654.77	16711.63	1425463.12	-824031.51	631.98
Wind 180 deg - Service		-101.81	19793.72	1678959.75	15588.37	4663.60
Wind 210 deg - Service		-10019.31	17234.49	1454305.84	852700.61	10272.08
Wind 240 deg - Service		-17594.50	10167.97	850287.79	1477936.61	17929.29
Wind 270 deg - Service		-19251.35	65.16	5458.71	1626813.11	17238.72
Wind 300 deg - Service		-16492.77	-9451.74	-807281.44	1410309.56	8487.45
Wind 330 deg - Service		-9624.49	-16744.40	-1436915.90	823298.05	-514.79

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 24 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Comb. No.	Description
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	170 - 166.5	Leg	Max Tension	7	5227.47	-327.88	569.22
			Max. Compression	27	-11594.07	10.77	-17.97
			Max. Mx	20	-1611.86	962.39	-2.85
			Max. My	16	-5010.92	202.49	-742.79
			Max. Vy	20	-2309.69	962.39	-2.85

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 25 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft		
T2	166.5 - 161.5	Diagonal	Max. Vx	16	1783.98	202.49	-742.79		
			Max Tension	7	3444.18	0.00	0.00		
			Max. Compression	18	-3609.71	-1.82	1.52		
			Max. Mx	28	846.28	-10.38	-0.14		
			Max. My	20	-2249.01	-2.70	1.70		
			Max. Vy	28	17.07	-10.38	-0.14		
		Secondary Horizontal	Max. Vx	20	0.59	0.00	0.00		
			Max Tension	6	675.32	0.00	0.00		
			Max. Compression	18	-711.31	-2.17	0.12		
			Max. Mx	29	-71.09	-8.66	-0.18		
			Max. My	6	96.77	-1.38	-1.25		
			Max. Vy	29	16.93	-8.66	-0.18		
		Top Girt	Max. Vx	6	-0.50	-1.38	-1.25		
			Max Tension	18	1077.13	0.00	0.00		
			Max. Compression	15	-1000.05	0.00	0.00		
			Max. Mx	27	450.62	-125.49	0.00		
			Max. My	20	120.62	0.00	0.00		
			Max. Vy	27	-100.39	0.00	0.00		
		Leg		Max. Vx	Max. Vx	20	0.00	0.00	0.00
					Max Tension	7	13676.90	-4.12	-1.64
					Max. Compression	2	-18390.73	-3.29	27.52
					Max. Mx	12	-14940.67	-26.33	-0.86
					Max. My	27	-16295.38	-1.49	28.01
				Diagonal	Max. Vy	10	24.74	-24.84	-9.45
					Max. Vx	24	35.04	10.77	26.76
					Max Tension	4	3730.62	0.00	0.00
					Max. Compression	4	-3748.64	0.00	0.00
					Max. Mx	27	1179.22	-10.47	-0.25
				Top Girt	Max. My	6	-3454.11	-1.87	-1.90
					Max. Vy	27	17.22	-10.47	-0.25
					Max. Vx	6	-0.68	0.00	0.00
					Max Tension	37	350.49	0.00	0.00
					Max. Compression	3	-39.24	0.00	0.00
Bottom Girt	Max. Mx	27	145.22	-125.25	0.00				
	Max. My	20	55.89	0.00	0.00				
	Max. Vy	27	100.20	0.00	0.00				
	Max. Vx	20	0.00	0.00	0.00				
	Max Tension	15	2.46	0.00	0.00				
	Max. Compression	33	-45.15	0.00	0.00				
T3	161.5 - 154	Leg	Max. Mx	37	-37.04	33.57	0.00		
			Max. My	20	-6.12	0.00	-0.00		
			Max. Vy	37	-26.85	0.00	0.00		
			Max. Vx	20	0.00	0.00	0.00		
			Max Tension	7	28627.07	-34.29	15.25		
			Max. Compression	2	-34253.39	-2.65	-45.45		
		Diagonal	Max. Mx	20	-3410.11	74.26	-11.26		
			Max. My	24	-2142.10	33.37	77.74		
			Max. Vy	12	-52.52	-52.94	0.21		
			Max. Vx	24	-64.75	33.37	77.74		
			Max Tension	16	4096.42	0.00	0.00		
			Max. Compression	4	-4020.12	0.00	0.00		
			Max. Mx	38	525.67	-11.00	-0.35		
			Max. My	6	-3854.97	-1.81	-3.14		
			Max. Vy	27	17.34	-10.99	-0.23		
T4	154 - 150	Leg	Max. Vx	6	-1.12	0.00	0.00		
			Max Tension	7	39201.78	116.65	-82.43		
			Max. Compression	2	-45444.99	-67.81	1118.90		
			Max. Mx	10	-43511.61	-893.04	-626.88		
			Max. My	2	-45444.99	-67.81	1118.90		
			Max. Vy	10	4051.52	-893.04	-626.88		
		Max. Vx	2	-5083.51	-67.81	1118.90			

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 26 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft		
T5	150 - 140	Diagonal	Max Tension	16	4722.64	-3.78	0.15		
			Max. Compression	4	-4888.96	0.00	0.00		
			Max. Mx	27	1290.81	-12.51	0.06		
			Max. My	8	-2938.70	-0.49	-2.17		
			Max. Vy	27	17.37	-12.51	0.06		
			Max. Vx	8	0.70	-0.49	-2.17		
		Secondary Horizontal	Max Tension	2	704.39	0.00	0.00		
			Max. Compression	2	-704.39	-1.83	1.52		
			Max. Mx	35	69.91	-9.27	0.31		
			Max. My	18	676.89	-1.86	1.82		
			Max. Vy	35	-17.01	-9.27	0.31		
			Max. Vx	18	0.73	-1.86	1.82		
		Bottom Girt	Max Tension	15	388.58	0.00	0.00		
			Max. Compression	2	-405.19	0.00	0.00		
			Max. Mx	37	137.16	33.25	0.00		
			Max. My	20	-0.86	0.00	-0.00		
			Max. Vy	37	26.60	0.00	0.00		
			Max. Vx	20	0.00	0.00	0.00		
		T5	150 - 140	Leg	Max Tension	15	43343.44	-1055.04	-67.16
					Max. Compression	2	-49604.28	2998.27	165.16
					Max. Mx	14	42471.95	-3280.84	-270.91
					Max. My	20	-3485.72	-225.69	-4892.78
					Max. Vy	6	357.69	-3277.55	348.72
					Max. Vx	24	-622.21	-231.62	4784.71
Diagonal	Max Tension			7	5402.02	47.71	9.60		
	Max. Compression			18	-5967.74	0.00	0.00		
	Max. Mx			37	995.45	51.75	-7.86		
	Max. My			18	-5947.49	-36.23	-29.04		
	Max. Vy			37	36.93	51.75	-7.86		
	Max. Vx			18	5.78	0.00	0.00		
Top Girt	Max Tension			6	608.84	0.00	0.00		
	Max. Compression			3	-533.29	0.00	0.00		
	Max. Mx			37	443.57	-67.28	0.00		
	Max. My			35	265.57	0.00	1.94		
	Max. Vy			37	53.82	0.00	0.00		
	Max. Vx			35	-1.55	0.00	0.00		
T6	140 - 120	Leg	Max Tension	15	75367.36	-4362.17	-307.00		
			Max. Compression	2	-87664.62	3522.28	87.02		
			Max. Mx	2	-68798.80	4529.34	156.67		
			Max. My	24	-5703.51	-394.97	6264.91		
			Max. Vy	14	1000.32	-4351.62	-308.88		
			Max. Vx	20	1028.99	26.91	-3659.84		
		Diagonal	Max Tension	16	8796.20	0.00	0.00		
			Max. Compression	16	-9134.39	0.00	0.00		
			Max. Mx	27	1398.70	114.07	15.45		
			Max. My	18	-8792.24	-74.30	-21.58		
			Max. Vy	27	-57.13	114.07	15.45		
			Max. Vx	27	-5.27	0.00	0.00		
		T7	120 - 100	Leg	Max Tension	15	120133.11	-5339.41	-11.08
					Max. Compression	2	-138835.16	4212.36	233.50
					Max. Mx	2	-112041.32	6135.47	15.05
					Max. My	24	-8329.62	-388.26	7577.38
					Max. Vy	14	1106.27	-4800.51	-340.59
					Max. Vx	20	1835.70	-400.20	-7561.74
Diagonal	Max Tension			17	11025.33	0.00	0.00		
	Max. Compression			18	-11880.48	0.00	0.00		
	Max. Mx			27	2598.59	123.55	-12.97		
	Max. My			16	-11662.88	-42.15	-44.15		
	Max. Vy			37	66.69	101.24	-13.17		
	Max. Vx			16	7.16	0.00	0.00		
T7	120 - 100	Mid Girt	Max Tension	14	3379.29	0.00	0.00		

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 27 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T8	100 - 90	Leg	Max. Compression	3	-2914.80	0.00	0.00
			Max. Mx	27	-144.10	-212.80	0.00
			Max. My	35	1651.06	0.00	6.14
			Max. Vy	27	94.58	0.00	0.00
			Max. Vx	35	-2.73	0.00	0.00
			Max Tension	15	147127.30	-4696.07	-336.00
			Max. Compression	2	-169101.17	4504.44	-14.09
		Diagonal	Max. Mx	14	144827.60	-4800.51	-340.58
			Max. My	24	-9216.28	-388.30	7577.38
			Max. Vy	33	-298.03	-3023.40	-259.05
			Max. Vx	20	-585.28	-400.25	-7561.73
			Max Tension	16	13345.48	0.00	0.00
			Max. Compression	16	-13693.39	0.00	0.00
			Max. Mx	27	4128.82	190.72	-15.03
T9	90 - 80	Leg	Max. My	28	2011.42	134.62	22.94
			Max. Vy	27	-86.89	190.72	-15.03
			Max. Vx	28	-5.78	0.00	0.00
			Max Tension	15	174606.89	-4250.23	-22.41
			Max. Compression	2	-199239.37	6542.82	100.49
			Max. Mx	2	-199239.37	6542.82	100.49
			Max. My	20	-11374.40	6.44	-4868.14
		Diagonal	Max. Vy	14	379.03	-6314.04	-147.31
			Max. Vx	20	320.77	6.44	-4868.14
			Max Tension	16	13108.71	0.00	0.00
			Max. Compression	16	-13416.16	0.00	0.00
			Max. Mx	27	3868.29	178.92	-18.41
			Max. My	28	1664.60	135.73	25.26
			Max. Vy	37	90.16	155.33	22.48
T10	80 - 60	Leg	Max. Vx	28	-6.01	0.00	0.00
			Max Tension	15	225902.08	-5339.88	-69.32
			Max. Compression	2	-256440.55	5838.64	30.99
			Max. Mx	2	-226998.15	6542.82	100.49
			Max. My	4	-11732.06	-71.23	-5776.17
			Max. Vy	19	277.89	6408.00	-225.65
			Max. Vx	20	341.93	-75.99	-5633.54
		Diagonal	Max Tension	16	13996.99	0.00	0.00
			Max. Compression	16	-14334.10	0.00	0.00
			Max. Mx	27	3217.35	211.21	25.23
			Max. My	29	-4051.65	151.91	29.80
			Max. Vy	37	109.54	200.95	25.82
			Max. Vx	35	6.62	0.00	0.00
			Max Tension	15	275703.45	-5003.79	-61.82
T11	60 - 40	Leg	Max. Compression	2	-312662.12	6610.79	85.47
			Max. Mx	2	-312662.12	6610.79	85.47
			Max. My	20	-16472.13	39.18	-6028.65
			Max. Vy	18	-334.27	6509.47	-228.34
			Max. Vx	8	-323.87	-72.69	5558.60
			Max Tension	16	14849.66	0.00	0.00
			Max. Compression	16	-15339.63	0.00	0.00
		Diagonal	Max. Mx	27	3466.94	288.29	33.53
			Max. My	35	-67.54	222.20	-37.12
			Max. Vy	37	133.41	268.33	33.10
			Max. Vx	35	-7.58	0.00	0.00
			Max Tension	15	324968.72	-6137.95	-26.62
			Max. Compression	2	-369249.99	6417.89	12.87
			Max. Mx	37	51571.45	-7773.03	-72.07
T12	40 - 20	Leg	Max. My	4	-17167.98	-169.48	-6260.36
			Max. Vy	33	898.07	-7662.47	-37.05
			Max. Vx	8	477.29	-108.76	6055.51
			Max Tension	16	16599.14	0.00	0.00
			Max. Compression	16	-17111.00	0.00	0.00
		Diagonal	Max. Mx	37	133.41	268.33	33.10
			Max. My	35	-7.58	0.00	0.00
			Max. Vy	37	133.41	268.33	33.10
			Max. Vx	35	-7.58	0.00	0.00
			Max Tension	15	324968.72	-6137.95	-26.62

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 28 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T13	20 - 0	Leg	Max. Mx	27	4792.66	341.45	39.85
			Max. My	29	-3682.33	269.13	43.35
			Max. Vy	37	158.00	330.65	38.54
			Max. Vx	29	8.41	0.00	0.00
			Max Tension	15	374922.67	-6470.83	-98.73
			Max. Compression	2	-427166.23	-0.00	-0.06
			Max. Mx	27	-215570.00	11446.31	-22.15
			Max. My	4	-20443.42	-447.94	-10342.83
		Diagonal	Max. Vy	33	-1597.64	-7662.47	-37.05
			Max. Vx	20	-1362.28	-448.30	-10010.22
			Max Tension	17	19513.28	0.00	0.00
			Max. Compression	18	-20685.57	0.00	0.00
			Max. Mx	37	1558.73	433.02	-55.47
			Max. My	29	-7057.87	357.95	61.00
			Max. Vy	37	179.56	433.02	-55.47
			Max. Vx	29	-10.28	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	436395.74	44390.11	-28124.13
	Max. H _x	18	436395.74	44390.11	-28124.13
	Max. H _y	7	-385818.94	-40573.00	25927.07
	Min. Vert	7	-385818.94	-40573.00	25927.07
	Min. H _x	7	-385818.94	-40573.00	25927.07
	Min. H _y	18	436395.74	44390.11	-28124.13
Leg B	Max. Vert	10	424480.42	-43536.00	-26295.14
	Max. H _x	23	-376566.77	39817.16	24169.13
	Max. H _y	23	-376566.77	39817.16	24169.13
	Min. Vert	23	-376566.77	39817.16	24169.13
	Min. H _x	10	424480.42	-43536.00	-26295.14
	Min. H _y	10	424480.42	-43536.00	-26295.14
Leg A	Max. Vert	2	443466.02	-504.65	52905.67
	Max. H _x	21	16891.88	7504.14	1211.51
	Max. H _y	2	443466.02	-504.65	52905.67
	Min. Vert	15	-388703.84	572.91	-48470.48
	Min. H _x	9	20384.64	-7500.58	1507.07
	Min. H _y	15	-388703.84	572.91	-48470.48

Tower Mast Reaction Summary

Load Combination	Vertical lb	Shear _x lb	Shear _y lb	Overturing Moment, M _x lb-ft	Overturing Moment, M _y lb-ft	Torque lb-ft
Dead Only	58306.14	0.00	0.00	-30005.17	4742.06	-0.06
1.2 Dead+1.6 Wind 0 deg - No Ice	69967.36	228.81	-85497.05	-7277100.07	-24361.84	-17630.38
0.9 Dead+1.6 Wind 0 deg - No Ice	52475.52	228.81	-85497.05	-7258702.01	-25752.37	-17616.31
1.2 Dead+1.6 Wind 30 deg - No Ice	69967.36	41692.92	-72091.47	-6166451.00	-3541987.23	-41995.67
0.9 Dead+1.6 Wind 30 deg - No Ice	52475.52	41692.92	-72091.47	-6149460.96	-3538838.11	-41953.31
1.2 Dead+1.6 Wind 60 deg - No Ice	69967.36	71068.53	-41228.81	-3549383.49	-6031194.01	-74592.50
0.9 Dead+1.6 Wind 60 deg - No Ice	52475.52	71068.53	-41228.81	-3535761.70	-6024842.55	-74533.17

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 29 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturning Moment, M _x lb-ft	Overturning Moment, M _z lb-ft	Torque lb-ft
1.2 Dead+1.6 Wind 90 deg - No Ice	69967.36	80364.60	-171.22	-59229.95	-6805190.23	-71915.62
0.9 Dead+1.6 Wind 90 deg - No Ice	52475.52	80364.60	-171.21	-50104.83	-6797856.43	-71855.98
1.2 Dead+1.6 Wind 120 deg - No Ice	69967.36	71204.26	40886.49	3427991.21	-6044007.66	-34444.06
0.9 Dead+1.6 Wind 120 deg - No Ice	52475.52	71204.26	40886.49	3432610.78	-6037642.11	-34397.79
1.2 Dead+1.6 Wind 150 deg - No Ice	69967.36	40374.09	69884.31	5970224.20	-3464995.90	2595.23
0.9 Dead+1.6 Wind 150 deg - No Ice	52475.52	40374.10	69884.31	5971503.11	-3461937.10	2613.92
1.2 Dead+1.6 Wind 180 deg - No Ice	69967.36	-425.75	82772.92	7035581.38	64280.32	19548.32
0.9 Dead+1.6 Wind 180 deg - No Ice	52475.52	-425.75	82772.92	7035515.47	62744.80	19534.05
1.2 Dead+1.6 Wind 210 deg - No Ice	69967.36	-41898.52	72070.80	6091190.50	3582802.24	43090.23
0.9 Dead+1.6 Wind 210 deg - No Ice	52475.52	-41898.52	72070.80	6092363.01	3576736.00	43047.26
1.2 Dead+1.6 Wind 240 deg - No Ice	69967.36	-73576.30	42520.19	3552218.45	6210591.35	75213.12
0.9 Dead+1.6 Wind 240 deg - No Ice	52475.52	-73576.30	42520.20	3556689.91	6201178.87	75152.24
1.2 Dead+1.6 Wind 270 deg - No Ice	69967.36	-80504.89	272.45	1364.91	6836369.87	72349.32
0.9 Dead+1.6 Wind 270 deg - No Ice	52475.52	-80504.89	272.46	10391.60	6826142.40	72289.97
1.2 Dead+1.6 Wind 300 deg - No Ice	69967.36	-68969.10	-39525.10	-3414738.45	5926568.94	35673.89
0.9 Dead+1.6 Wind 300 deg - No Ice	52475.52	-68969.10	-39525.10	-3401281.25	5917441.56	35628.43
1.2 Dead+1.6 Wind 330 deg - No Ice	69967.36	-40247.49	-70021.37	-6061280.87	3459209.58	-2109.41
0.9 Dead+1.6 Wind 330 deg - No Ice	52475.52	-40247.49	-70021.37	-6044373.06	3453286.59	-2127.78
1.2 Dead+1.0 Ice+1.0 Temp	254174.56	0.00	0.00	-129494.63	21962.82	0.89
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	254174.56	49.03	-29045.54	-2674510.77	15543.38	-11323.18
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	254174.56	14205.19	-24578.60	-2294859.21	-1229662.29	-17779.13
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	254174.55	23973.28	-13883.46	-1359832.22	-2097867.72	-20960.89
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	254174.56	27566.83	-36.29	-134760.96	-2414491.30	-16132.76
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	254174.56	24464.88	14076.86	1105850.49	-2128877.43	-5431.25
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	254174.56	14281.73	24727.64	2042181.68	-1232517.71	4304.33
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	254174.56	-88.89	28697.86	2393605.80	34484.02	11735.77
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	254174.56	-14247.45	24573.28	2034423.01	1279924.62	18020.27
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	254174.56	-24304.25	14040.73	1108565.39	2164735.64	21096.35
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	254174.56	-27595.30	56.78	-121872.97	2462686.76	16221.83
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	254174.56	-24189.21	-13905.41	-1354952.33	2158322.82	5695.84
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	254174.56	-14255.36	-24756.66	-2305899.29	1272967.22	-4201.54
Dead+Wind 0 deg - Service	58306.14	54.72	-20445.14	-1760236.87	-2430.00	-4214.17
Dead+Wind 30 deg - Service	58306.14	9970.14	-17239.43	-1494846.39	-842914.21	-10052.20

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 30 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Load Combination	Vertical lb	Shear _x lb	Shear _z lb	Overturing Moment, M _x lb-ft	Overturing Moment, M _z lb-ft	Torque lb-ft
Dead+Wind 60 deg - Service	58306.14	16994.81	-9859.16	-869518.68	-1437668.02	-17829.66
Dead+Wind 90 deg - Service	58306.14	19217.81	-40.94	-35601.62	-1622593.31	-17178.33
Dead+Wind 120 deg - Service	58306.14	17027.27	9777.30	797598.07	-1440718.15	-8230.66
Dead+Wind 150 deg - Service	58306.14	9654.77	16711.63	1405000.62	-824508.41	609.07
Dead+Wind 180 deg - Service	58306.14	-101.81	19793.72	1659555.36	18743.85	4674.12
Dead+Wind 210 deg - Service	58306.14	-10019.31	17234.49	1433924.10	859437.65	10314.57
Dead+Wind 240 deg - Service	58306.14	-17594.50	10167.97	827300.50	1487316.74	17978.96
Dead+Wind 270 deg - Service	58306.14	-19251.35	65.16	-21126.03	1636845.49	17281.04
Dead+Wind 300 deg - Service	58306.14	-16492.77	-9451.74	-837360.27	1419451.43	8523.27
Dead+Wind 330 deg - Service	58306.14	-9624.49	-16744.40	-1469719.56	829913.14	-492.43

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
1	0.00	-58306.14	0.00	-0.00	58306.14	-0.00	0.000%
2	228.81	-69967.36	-85497.05	-228.81	69967.36	85497.05	0.000%
3	228.81	-52475.52	-85497.05	-228.81	52475.52	85497.05	0.000%
4	41692.92	-69967.36	-72091.47	-41692.92	69967.36	72091.47	0.000%
5	41692.92	-52475.52	-72091.47	-41692.92	52475.52	72091.47	0.000%
6	71068.53	-69967.36	-41228.81	-71068.53	69967.36	41228.81	0.000%
7	71068.53	-52475.52	-41228.81	-71068.53	52475.52	41228.81	0.000%
8	80364.59	-69967.36	-171.21	-80364.60	69967.36	171.22	0.000%
9	80364.59	-52475.52	-171.21	-80364.60	52475.52	171.21	0.000%
10	71204.25	-69967.36	40886.49	-71204.26	69967.36	-40886.49	0.000%
11	71204.25	-52475.52	40886.49	-71204.26	52475.52	-40886.49	0.000%
12	40374.10	-69967.36	69884.31	-40374.09	69967.36	-69884.31	0.000%
13	40374.10	-52475.52	69884.31	-40374.10	52475.52	-69884.31	0.000%
14	-425.75	-69967.36	82772.92	425.75	69967.36	-82772.92	0.000%
15	-425.75	-52475.52	82772.92	425.75	52475.52	82772.92	0.000%
16	-41898.52	-69967.36	72070.80	41898.52	69967.36	-72070.80	0.000%
17	-41898.52	-52475.52	72070.80	41898.52	52475.52	-72070.80	0.000%
18	-73576.30	-69967.36	42520.20	73576.30	69967.36	-42520.19	0.000%
19	-73576.30	-52475.52	42520.20	73576.30	52475.52	-42520.20	0.000%
20	-80504.88	-69967.36	272.47	80504.89	69967.36	-272.45	0.000%
21	-80504.88	-52475.52	272.47	80504.89	52475.52	-272.46	0.000%
22	-68969.10	-69967.36	-39525.10	68969.10	69967.36	39525.10	0.000%
23	-68969.10	-52475.52	-39525.10	68969.10	52475.52	39525.10	0.000%
24	-40247.48	-69967.36	-70021.37	40247.49	69967.36	70021.37	0.000%
25	-40247.48	-52475.52	-70021.37	40247.49	52475.52	70021.37	0.000%
26	0.00	-254174.56	0.00	-0.00	254174.56	-0.00	0.000%
27	49.03	-254174.56	-29045.57	-49.03	254174.56	29045.54	0.000%
28	14205.19	-254174.56	-24578.62	-14205.19	254174.56	24578.60	0.000%
29	23973.37	-254174.56	-13883.43	-23973.28	254174.55	13883.46	0.000%
30	27566.85	-254174.56	-36.29	-27566.83	254174.56	36.29	0.000%
31	24464.90	-254174.56	14076.87	-24464.88	254174.56	-14076.86	0.000%
32	14281.75	-254174.56	24727.66	-14281.73	254174.56	-24727.64	0.000%
33	-88.89	-254174.56	28697.88	88.89	254174.56	-28697.86	0.000%
34	-14247.47	-254174.56	24573.30	14247.45	254174.56	-24573.28	0.000%
35	-24304.27	-254174.56	14040.75	24304.25	254174.56	-14040.73	0.000%
36	-27595.32	-254174.56	56.78	27595.30	254174.56	-56.78	0.000%
37	-24189.23	-254174.56	-13905.42	24189.21	254174.56	13905.41	0.000%
38	-14255.37	-254174.56	-24756.68	14255.36	254174.56	24756.66	0.000%
39	54.72	-58306.14	-20445.14	-54.72	58306.14	20445.14	0.000%
40	9970.14	-58306.14	-17239.43	-9970.14	58306.14	17239.43	0.000%
41	16994.81	-58306.14	-9859.16	-16994.81	58306.14	9859.16	0.000%
42	19217.81	-58306.14	-40.94	-19217.81	58306.14	40.94	0.000%

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 31 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	
43	17027.27	-58306.14	9777.30	-17027.27	58306.14	-9777.30	0.000%
44	9654.77	-58306.14	16711.63	-9654.77	58306.14	-16711.63	0.000%
45	-101.81	-58306.14	19793.72	101.81	58306.14	-19793.72	0.000%
46	-10019.31	-58306.14	17234.49	10019.31	58306.14	-17234.49	0.000%
47	-17594.50	-58306.14	10167.97	17594.50	58306.14	-10167.97	0.000%
48	-19251.35	-58306.14	65.16	19251.35	58306.14	-65.16	0.000%
49	-16492.77	-58306.14	-9451.74	16492.77	58306.14	9451.74	0.000%
50	-9624.49	-58306.14	-16744.40	9624.49	58306.14	16744.40	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000063
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000069
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000090
7	Yes	4	0.00000001	0.00000073
8	Yes	4	0.00000001	0.00000122
9	Yes	4	0.00000001	0.00000103
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000082
13	Yes	4	0.00000001	0.00000064
14	Yes	4	0.00000001	0.00000069
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000068
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000120
19	Yes	4	0.00000001	0.00000108
20	Yes	4	0.00000001	0.00000123
21	Yes	4	0.00000001	0.00000103
22	Yes	4	0.00000001	0.00000069
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000082
25	Yes	4	0.00000001	0.00000064
26	Yes	4	0.00000001	0.00000213
27	Yes	4	0.00000001	0.00002271
28	Yes	4	0.00000001	0.00002291
29	Yes	4	0.00000001	0.00002329
30	Yes	4	0.00000001	0.00002217
31	Yes	4	0.00000001	0.00002138
32	Yes	4	0.00000001	0.00002185
33	Yes	4	0.00000001	0.00002261
34	Yes	4	0.00000001	0.00002237
35	Yes	4	0.00000001	0.00002224
36	Yes	4	0.00000001	0.00002300
37	Yes	4	0.00000001	0.00002365
38	Yes	4	0.00000001	0.00002324
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001

inxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 32 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

44	Yes	4	0.0000001	0.0000001
45	Yes	4	0.0000001	0.0000001
46	Yes	4	0.0000001	0.0000001
47	Yes	4	0.0000001	0.0000001
48	Yes	4	0.0000001	0.0000001
49	Yes	4	0.0000001	0.0000001
50	Yes	4	0.0000001	0.0000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 166.5	4.980	39	0.2893	0.0824
T2	166.5 - 161.5	4.761	39	0.2874	0.0734
T3	161.5 - 154	4.456	39	0.2819	0.0676
T4	154 - 150	4.012	39	0.2675	0.0592
T5	150 - 140	3.788	39	0.2565	0.0551
T6	140 - 120	3.259	39	0.2373	0.0453
T7	120 - 100	2.335	39	0.1918	0.0322
T8	100 - 90	1.576	39	0.1529	0.0220
T9	90 - 80	1.267	39	0.1297	0.0191
T10	80 - 60	1.002	39	0.1125	0.0164
T11	60 - 40	0.568	39	0.0828	0.0120
T12	40 - 20	0.262	39	0.0504	0.0077
T13	20 - 0	0.081	39	0.0231	0.0040

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	15' Omni	39	4.980	0.2893	0.0824	33988
168.25	Sector Mount [SM 412-1]	39	4.870	0.2885	0.0775	33988
137.00	VHILP2.5	39	3.109	0.2313	0.0428	25922
136.00	2 FT DISH	39	3.060	0.2292	0.0421	26216
133.00	VHILP2	39	2.916	0.2224	0.0399	27232
125.00	(2) AIR B2A/B4P w/ Mount Pipe	39	2.550	0.2032	0.0350	30389
118.00	RRUS-12	39	2.252	0.1877	0.0310	31260
115.00	(2) RA21.7770.00 w/Mount Pipe	39	2.129	0.1818	0.0293	29683
101.00	HBX-6517DS-VTM w/Mount Pipe	39	1.609	0.1551	0.0224	23805
92.00	1' Dish	39	1.325	0.1341	0.0196	26378
30.00	Camera and Mount	39	0.156	0.0360	0.0058	39162

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 166.5	20.516	2	1.1792	0.3454
T2	166.5 - 161.5	19.622	2	1.1731	0.3076

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 33 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	161.5 - 154	18.377	2	1.1535	0.2831
T4	154 - 150	16.559	2	1.0973	0.2479
T5	150 - 140	15.636	2	1.0535	0.2310
T6	140 - 120	13.459	2	0.9761	0.1899
T7	120 - 100	9.653	2	0.7909	0.1348
T8	100 - 90	6.518	2	0.6307	0.0922
T9	90 - 80	5.244	2	0.5354	0.0799
T10	80 - 60	4.148	2	0.4645	0.0688
T11	60 - 40	2.354	2	0.3419	0.0504
T12	40 - 20	1.086	2	0.2082	0.0323
T13	20 - 0	0.336	2	0.0956	0.0168

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	15' Omni	2	20.516	1.1792	0.3454	8912
168.25	Sector Mount [SM 412-1]	2	20.068	1.1766	0.3248	8912
137.00	VHLP2.5	2	12.843	0.9520	0.1794	6380
136.00	2 FT DISH	2	12.642	0.9433	0.1762	6451
133.00	VHLP2	2	12.048	0.9157	0.1671	6698
125.00	(2) AIR B2A/B4P w/ Mount Pipe	2	10.541	0.8375	0.1465	7464
118.00	RRUS-12	2	9.308	0.7738	0.1301	7655
115.00	(2) RA21.7770.00 w/Mount Pipe	2	8.803	0.7498	0.1230	7251
101.00	HBX-6517DS-VTM w/Mount Pipe	2	6.656	0.6398	0.0938	5767
92.00	1' Dish	2	5.483	0.5534	0.0822	6401
30.00	Camera and Mount	2	0.648	0.1487	0.0244	9491

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T4	154	Leg	A325N	0.7500	6	6533.63	29820.60	0.219 ✓	1	Bolt Tension
T5	150	Leg	A325N	1.0000	6	7223.91	53014.40	0.136 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	5402.02	10662.90	0.507 ✓	1	Member Block Shear
		Top Girt	A325N	1.0000	1	608.84	10163.70	0.060 ✓	1	Member Block Shear
T6	140	Leg	A325N	1.0000	6	12561.20	53014.40	0.237 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8796.20	11682.40	0.753 ✓	1	Member Block Shear
T7	120	Leg	A325N	1.0000	6	20022.20	53014.40	0.378 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11025.30	11682.40	0.944 ✓	1	Member Block Shear
T8	100	Leg	A325N	1.0000	6	24521.20	53014.40	0.463 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	13345.50	19470.70	0.685 ✓	1	Member Block Shear

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 34 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load Allowable	Allowable Ratio	Criteria
T9	90	Leg	A325N	1.0000	6	29101.10	53014.40	0.549 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	13108.70	19470.70	0.673 ✓	1	Member Block Shear
T10	80	Leg	A325N	1.0000	6	37650.30	53014.40	0.710 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	13997.00	23364.80	0.599 ✓	1	Member Block Shear
T11	60	Leg	A325N	1.2500	6	45950.60	82835.00	0.555 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	14849.70	23701.20	0.627 ✓	1	Member Block Shear
T12	40	Leg	A325N	1.2500	6	54162.40	82835.00	0.654 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	16599.10	28441.40	0.584 ✓	1	Member Block Shear
T13	20	Leg	A325N	1.5000	6	62487.10	119282.00	0.524 ✓	1	Bolt Tension
		Diagonal	A325N	1.2500	1	19513.30	23701.20	0.823 ✓	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio P _n φP _n
T1	170 - 166.5	1 3/4	3.50	1.54	42.3 K=1.00	2.4053	-11594.10	94972.70	0.122 ¹ ✓
T2	166.5 - 161.5	1 3/4	5.00	2.50	68.6 K=1.00	2.4053	-18390.70	76748.10	0.240 ¹ ✓
T3	161.5 - 154	1 3/4	7.50	2.50	68.6 K=1.00	2.4053	-34253.40	76748.10	0.446 ¹ ✓
T4	154 - 150	1 3/4	4.00	1.88	51.4 K=1.00	2.4053	-45445.00	89205.40	0.509 ¹ ✓
T5	150 - 140	Pirod 105244	10.02	10.02	45.4 K=1.00	3.6816	-49604.30	142493.00	0.348 ¹ ✓
T6	140 - 120	Pirod 105216	20.03	10.02	45.4 K=1.00	3.6816	-87664.60	142493.00	0.615 ¹ ✓
T7	120 - 100	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-138835.00	214859.00	0.646 ¹ ✓
T8	100 - 90	Pirod 105217	10.02	10.02	37.8 K=1.00	5.3014	-169101.00	214859.00	0.787 ¹ ✓
T9	90 - 80	Pirod 105217 w/ 1" Reinf Rod	10.02	10.02	57.8 K=1.00	7.6341	-199239.00	269174.00	0.740 ¹ ✓
T10	80 - 60	Pirod 105218 w/ 1" Reinf Rod	20.03	10.02	53.4 K=1.00	9.5686	-256441.00	349569.00	0.734 ¹ ✓
T11	60 - 40	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-312662.00	399868.00	0.782 ¹ ✓
T12	40 - 20	Pirod 105219 w/ 1" Reinf Rod	20.03	10.02	50.6	11.7171	-369250.00	437196.00	0.845 ¹ ✓

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 35 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio P _n / φP _n
T13	20 - 0	Pirod 105220 w/ 1" Reinf Rod	20.03	10.02	K=1.00 47.7	14.2124	-427166.00	541394.00	0.789 ¹

¹ P_n / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	φP _n lb	A in ²	V _n lb	φV _n lb	Stress Ratio
T5	150 - 140	0.5	1.48	142.4	165670.00	0.1963	623.24	2448.25	0.255 ✓
T6	140 - 120	0.5	1.48	142.4	165670.00	0.1963	1145.04	2448.25	0.468 ✓
T7	120 - 100	0.5	1.47	141.2	238565.00	0.1963	1840.29	2490.00	0.739 ✓
T8	100 - 90	0.5	1.47	141.2	238565.00	0.1963	588.92	2490.00	0.237 ✓
T9	90 - 80	0.5	1.49	143.2	343533.00	0.1963	383.03	2502.27	0.153 ✓
T10	80 - 60	0.5	1.48	141.6	430586.00	0.1963	351.41	2545.74	0.138 ✓
T11	60 - 40	0.625	1.45	111.1	424115.00	0.3068	355.29	5809.85	0.061 ✓
T12	40 - 20	0.625	1.46	112.2	527270.00	0.3068	898.14	5877.70	0.153 ✓
T13	20 - 0	0.625	1.45	111.2	639559.00	0.3068	1598.07	5935.87	0.269 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio P _n / φP _n
T1	170 - 166.5	7/8	5.87	2.85	140.8 K=0.90	0.6013	-3609.71	6854.23	0.527 ¹
T2	166.5 - 161.5	7/8	5.59	2.71	134.0 K=0.90	0.6013	-3748.64	7568.59	0.495 ¹
T3	161.5 - 154	7/8	5.59	2.71	134.0 K=0.90	0.6013	-4020.12	7568.59	0.531 ¹
T4	154 - 150	7/8	6.25	3.03	149.8 K=0.90	0.6013	-4888.96	6054.87	0.807 ¹
T5	150 - 140	L2 1/2x2 1/2x3/16	11.42	4.98	120.8 K=1.00	0.9020	-5967.74	13558.30	0.440 ¹
T6	140 - 120	L3x3x3/16	12.50	5.63	115.0 K=1.01	1.0900	-9134.39	17418.80	0.524 ¹
T7	120 - 100	L3x3x3/16	13.80	6.33	127.4 K=1.00	1.0900	-11880.50	14946.80	0.795 ¹
T8	100 - 90	L3x3x5/16	14.50	6.70	136.5 K=1.00	1.7800	-13693.40	21593.90	0.634 ¹
T9	90 - 80	L3x3x5/16	15.24	7.04	143.5 K=1.00	1.7800	-13416.20	19532.90	0.687 ¹
T10	80 - 60	L3x3x3/8	16.80	7.85	160.5	2.1100	-14334.10	18505.20	0.775 ¹

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 36 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T11	60 - 40	L3 1/2x3 1/2x5/16	18.45	8.68	K=1.00 150.9	2.0900	-15339.60	20735.80	0.740 ¹
T12	40 - 20	L3 1/2x3 1/2x3/8	20.16	9.52	K=1.00 166.2	2.4800	-17111.00	20282.40	0.844 ¹
T13	20 - 0	L4x4x5/16	21.92	10.40	K=1.00 157.8	2.4000	-20685.60	21761.10	0.951 ¹

¹ P_n / φP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T1	170 - 166.5	7/8	5.00	4.85	K=0.70 186.4	0.6013	-711.31	3909.80	0.182 ¹
T4	154 - 150	7/8	5.00	4.85	K=0.70 186.4	0.6013	-704.39	3909.80	0.180 ¹

¹ P_n / φP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T1	170 - 166.5	L6x4x3/8	5.00	4.85	K=1.40 93.2	3.6100	-1000.05	72641.30	0.014 ¹
T2	166.5 - 161.5	L6x4x3/8	5.00	4.85	K=1.40 93.2	3.6100	-39.24	72641.30	0.001 ¹
T5	150 - 140	L3x3x3/16	5.00	4.52	K=1.16 105.5	1.0900	-533.29	19368.80	0.028 ¹

¹ P_n / φP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T2	166.5 - 161.5	7/8	5.00	4.85	K=0.70 186.4	0.6013	-45.15	3909.80	0.012 ¹

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 37 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Size	L ft	L _n ft	KL/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	154 - 150	7/8	5.00	4.85	186.4 K=0.70	0.6013	-405.19	3909.80	0.104 ¹ ✓

¹ P_u / φP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L _n ft	KL/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	120 - 100	L3x3x3/16	9.00	8.00	145.3 K=0.90	1.0900	-2914.80	11670.00	0.250 ¹ ✓

¹ P_u / φP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	KL/r	A in ²	P _u lb	φP _n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 166.5	1 3/4	3.50	1.54	42.3	2.4053	5227.47	108238.00	0.048 ¹ ✓
T2	166.5 - 161.5	1 3/4	5.00	2.50	68.6	2.4053	13676.90	108238.00	0.126 ¹ ✓
T3	161.5 - 154	1 3/4	7.50	2.50	68.6	2.4053	28627.10	108238.00	0.264 ¹ ✓
T4	154 - 150	1 3/4	4.00	1.88	51.4	2.4053	39201.80	108238.00	0.362 ¹ ✓
T5	150 - 140	Pirod 105244	10.02	10.02	45.4	3.6816	43343.40	165670.00	0.262 ¹ ✓
T6	140 - 120	Pirod 105216	20.03	10.02	45.4	3.6816	75367.40	165670.00	0.455 ¹ ✓
T7	120 - 100	Pirod 105217	20.03	10.02	37.8	5.3014	120133.00	238565.00	0.504 ¹ ✓
T8	100 - 90	Pirod 105217	10.02	10.02	37.8	5.3014	147127.00	238565.00	0.617 ¹ ✓
T9	90 - 80	Pirod 105217 w/ 1" Reinf Rod	10.02	10.02	57.8	7.6341	174607.00	343533.00	0.508 ¹ ✓
T10	80 - 60	Pirod 105218 w/ 1" Reinf Rod	20.03	10.02	53.4	9.5686	225902.00	430586.00	0.525 ¹ ✓
T11	60 - 40	Pirod 105219	20.03	10.02	28.4	9.4248	275703.00	424115.00	0.650 ¹ ✓
T12	40 - 20	Pirod 105219 w/ 1" Reinf Rod	20.03	10.02	50.6	11.7171	324975.00	527270.00	0.616 ¹ ✓

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 38 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T13	20 - 0	Pirod 105220 w/ 1" Reinf Rod	20.03	10.02	47.7	14.2124	374923.00	639559.00	0.586 ¹

¹ P_n / φP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L _d ft	Kl/r	φP _n lb	A in ²	V _n lb	φV _n lb	Stress Ratio
T5	150 - 140	0.5	1.48	142.4	165670.00	0.1963	623.24	2448.25	0.255 ✓
T6	140 - 120	0.5	1.48	142.4	165670.00	0.1963	1145.04	2448.25	0.468 ✓
T7	120 - 100	0.5	1.47	141.2	238565.00	0.1963	1840.29	2490.00	0.739 ✓
T8	100 - 90	0.5	1.47	141.2	238565.00	0.1963	588.92	2490.00	0.237 ✓
T9	90 - 80	0.5	1.49	143.2	343533.00	0.1963	383.03	2502.27	0.153 ✓
T10	80 - 60	0.5	1.48	141.6	430586.00	0.1963	351.41	2545.74	0.138 ✓
T11	60 - 40	0.625	1.45	111.1	424115.00	0.3068	355.29	5809.85	0.061 ✓
T12	40 - 20	0.625	1.46	112.2	527270.00	0.3068	898.14	5877.70	0.153 ✓
T13	20 - 0	0.625	1.45	111.2	639559.00	0.3068	1598.07	5935.87	0.269 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	Kl/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T1	170 - 166.5	7/8	5.87	2.85	156.4	0.6013	3444.18	27059.40	0.127 ¹ ✓
T2	166.5 - 161.5	7/8	5.59	2.71	148.9	0.6013	3730.62	27059.40	0.138 ¹ ✓
T3	161.5 - 154	7/8	5.59	2.71	148.9	0.6013	4096.42	27059.40	0.151 ¹ ✓
T4	154 - 150	7/8	6.25	3.03	166.4	0.6013	4722.64	27059.40	0.175 ¹ ✓
T5	150 - 140	L2 1/2x2 1/2x3/16	11.42	4.98	80.1	0.9020	5402.02	29224.80	0.185 ¹ ✓
T6	140 - 120	L3x3x3/16	12.50	5.63	74.6	1.0900	8796.20	35316.00	0.249 ¹ ✓
T7	120 - 100	L3x3x3/16	13.80	6.33	83.5	1.0900	11025.30	35316.00	0.312 ¹ ✓
T8	100 - 90	L3x3x5/16	14.50	6.70	89.9	1.7800	13345.50	57672.00	0.231 ¹ ✓
T9	90 - 80	L3x3x5/16	15.24	7.04	94.4	1.7800	13108.70	57672.00	0.227 ¹ ✓
T10	80 - 60	L3x3x3/8	16.80	7.85	105.9	2.1100	13997.00	68364.00	0.205 ¹ ✓

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 39 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Size	L ft	L _n ft	KI/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T11	60 - 40	L3 1/2x3 1/2x5/16	18.45	8.68	99.2	2.0900	14849.70	67716.00	0.219 ¹
T12	40 - 20	L3 1/2x3 1/2x3/8	20.16	9.52	109.5	2.4800	16599.10	80352.00	0.207 ¹
T13	20 - 0	L4x4x5/16	21.92	10.40	103.1	2.4000	19513.30	77760.00	0.251 ¹

¹ P_n / φP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	KI/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T1	170 - 166.5	7/8	5.00	4.85	266.3	0.6013	675.32	27059.40	0.025 ¹
T4	154 - 150	7/8	5.00	4.85	266.3	0.6013	704.39	27059.40	0.026 ¹

¹ P_n / φP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	KI/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T1	170 - 166.5	L6x4x3/8	5.00	4.85	50.0	3.6100	1077.13	116964.00	0.009 ¹
T2	166.5 - 161.5	L6x4x3/8	5.00	4.85	50.0	3.6100	350.49	116964.00	0.003 ¹
T5	150 - 140	L3x3x3/16	5.00	4.52	62.0	1.0900	608.84	35316.00	0.017 ¹

¹ P_n / φP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	KI/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T2	166.5 - 161.5	7/8	5.00	4.85	266.3	0.6013	2.46	27059.40	0.000 ¹

inxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 40 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Size	L ft	L _n ft	KI/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T4	154 - 150	7/8	5.00	4.85	266.3	0.6013	388.58	27059.40	0.014 ¹

¹ P_n / φP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L _n ft	KI/r	A in ²	P _n lb	φP _n lb	Ratio $\frac{P_n}{\phi P_n}$
T7	120 - 100	L3x3x3/16	9.00	8.00	102.2	1.0900	3379.29	49050.00	0.069 ¹

¹ P_n / φP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	φP _{allow} lb	% Capacity	Pass Fail
T1	170 - 166.5	Leg	1 3/4	3	-11594.10	94972.70	12.2	Pass
		Diagonal	7/8	12	-3609.71	6854.23	52.7	Pass
		Secondary Horizontal	7/8	13	-711.31	3909.80	18.2	Pass
T2	166.5 - 161.5	Top Girt	L6x4x3/8	4	-1000.05	72641.30	1.4	Pass
		Leg	1 3/4	18	-18390.70	76748.10	24.0	Pass
		Diagonal	7/8	29	-3748.64	7568.59	49.5	Pass
T3	161.5 - 154	Top Girt	L6x4x3/8	20	334.64	116964.00	0.3	Pass
		Bottom Girt	7/8	22	-45.15	3909.80	1.2	Pass
		Leg	1 3/4	39	-34253.40	76748.10	44.6	Pass
T4	154 - 150	Diagonal	7/8	44	-4020.12	7568.59	53.1	Pass
		Leg	1 3/4	60	-45445.00	89205.40	50.9	Pass
		Diagonal	7/8	68	-4888.96	6054.87	80.7	Pass
T5	150 - 140	Secondary Horizontal	7/8	72	-704.39	3909.80	18.0	Pass
		Bottom Girt	7/8	61	-405.19	3909.80	10.4	Pass
		Leg	Pirod 105244	75	-49604.30	142493.00	34.8	Pass
T6	140 - 120	Diagonal	L2 1/2x2 1/2x3/16	84	-5967.74	13558.30	44.0	Pass
		Top Girt	L3x3x3/16	76	-533.29	19368.80	2.8	Pass
		Leg	Pirod 105216	87	-87664.60	142493.00	61.5	Pass
T7	120 - 100	Diagonal	L3x3x3/16	93	-9134.39	17418.80	52.4	Pass
		Leg	Pirod 105217	102	-138835.00	214859.00	73.9	Pass
		Diagonal	L3x3x3/16	111	-11880.50	14946.80	79.5	Pass
T8	100 - 90	Mid Girt	L3x3x3/16	103	-2914.80	11670.00	25.0	Pass
		Leg	Pirod 105217	120	-169101.00	214859.00	78.7	Pass
		Diagonal	L3x3x5/16	126	-13693.40	21593.90	63.4	Pass
T9	90 - 80	Leg	Pirod 105217 w/ 1" Reinf Rod	129	-199239.00	269174.00	74.0	Pass
		Diagonal	L3x3x5/16	135	-13416.20	19532.90	68.7	Pass
		Leg	Pirod 105218 w/ 1" Reinf Rod	138	-256441.00	349569.00	73.4	Pass
T10	80 - 60	Diagonal	L3x3x3/8	144	-14334.10	18505.20	77.5	Pass
		Leg	Pirod 105219	153	-312662.00	399868.00	78.2	Pass
		Diagonal	L3 1/2x3 1/2x5/16	159	-15339.60	20735.80	74.0	Pass
T11	60 - 40	Leg	Pirod 105219	153	-312662.00	399868.00	78.2	Pass
		Diagonal	L3 1/2x3 1/2x5/16	159	-15339.60	20735.80	74.0	Pass
		Leg	Pirod 105219 w/ 1" Reinf Rod	168	-369250.00	437196.00	84.5	Pass
T12	40 - 20	Diagonal	L3 1/2x3 1/2x3/8	174	-17111.00	20282.40	84.4	Pass

tnxTower Ramaker & Associates, Inc. 855 Community Dr. Sauk City, Wisconsin 53583 Phone: (608)-643-4100 FAX: (608)-643-7999	Job Cromwell - RT. 372 (CT60xc931)	Page 41 of 41
	Project 29431	Date 09:09:34 09/25/18
	Client Sprint	Designed by kphillips

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail	
T13	20 - 0	Leg Diagonal	Pirod 105220 w/ 1" Reinf Rod L4x4x5/16	183	-427166.00	541394.00	78.9	Pass	
				189	-20685.60	21761.10	95.1	Pass	
							Summary		
						Leg (T12)	84.5	Pass	
						Diagonal (T13)	95.1	Pass	
						Secondary Horizontal (T1)	18.2	Pass	
						Top Girt (T5)	2.8	Pass	
						Bottom Girt (T4)	10.4	Pass	
						Mid Girt (T7)	25.0	Pass	
						Bolt Checks	94.4	Pass	
							RATING =	95.1	Pass



Ramaker & Associates, Inc.
 855 Community Drive
 Sauk City, WI 53583

Site: Cromwell - RT. 372 (CT60XC931-A)
 Project: 29431
 Date: 9/25/18

Self Support Tower Anchor Rod Check - TIA-222-G

Eta, η : 0.55
 Tension, Pu: 388.7 kip
 Shear, Vu: 48.5 kip

Quantity: 6
 Diameter: 1.25 in
 Grade: A687

Fy: 105 ksi
 Fu: 150 ksi

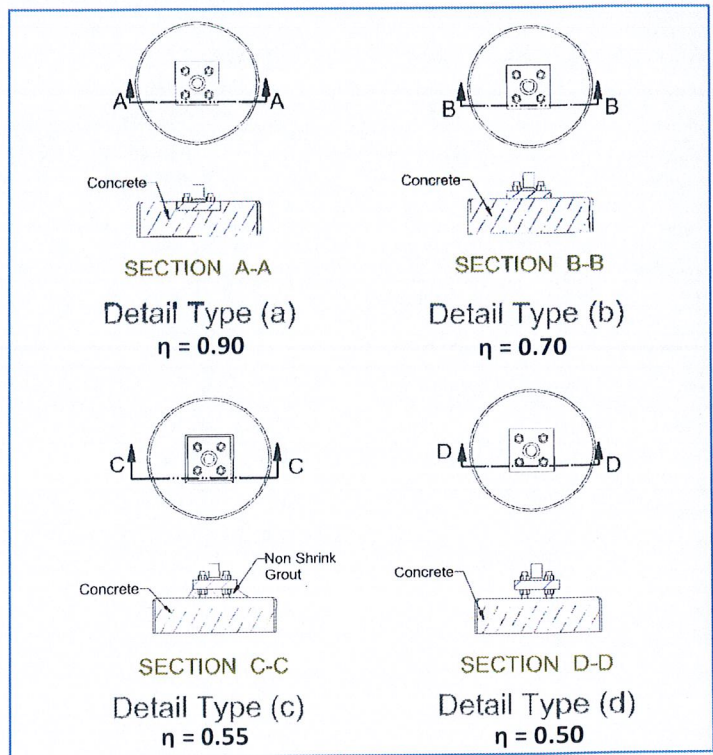
Anchor Force: 79.5 kip
 Design Capacity: 116.3 kip
 Stress Ratio: 68.4%

Length, lar: in
 Moment, Mu: kip-in
 Stress Ratio:

Maximum Acceptable: 105%

Governing Stress Ratio: 68.4% Pass

Anchor Rod Detail Types



Drilled Pier Foundation

Project #: 29431
 Site Name: CT60XC931-A

TIA-222 Revision: G
 Tower Type: Self Support

Applied Loads		
	Comp.	Uplift
Moment (kip-ft)	0	0
Axial Force (kips)	420.76	364.081
Shear Force (kips)	46.769	42.153

Material Properties		
Concrete Strength, f _c	3	ksi
Rebar Strength, F _y	60	ksi

Pier Design Data		
Depth	41	ft
Ext. Above Grade	0.5	ft
Pier Section 1		
<i>From 0.5' above grade to 41' below grade</i>		
Pier Diameter	5.5	ft
Rebar Quantity	22	
Rebar Size	8	
Clear Cover to Ties	3	in
Tie Size	4	

Analysis Results		
Soil Lateral Capacity		
	Compression	Uplift
D _{req} (ft from TOC)	21.31	21.31
Soil Safety Factor	22.07	24.49
Max Moment (kip-ft)	687.55	619.69
Rating	6.0%	5.4%
Soil Vertical Capacity		
	Compression	Uplift
Skin Friction (kips)	823.76	823.76
End Bearing (kips)	213.82	-
Weight of Concrete (kips)	177.47	133.11
Total Capacity (kips)	1037.58	956.86
Axial (kips)	598.23	364.08
Rating	57.7%	38.0%
Reinforced Concrete Capacity		
	Compression	Uplift
Critical Depth (ft from TOC)	22.20	19.48
Critical Moment (kip-ft)	685.68	612.87
Critical Moment Capacity	2591.50	1805.85
Rating	26.5%	33.9%
<i>Min. Steel is assumed</i>		
Soil Interaction Rating	57.7%	
Structural Foundation Rating	33.9%	

Soil Profile				
Groundwater Depth	n/a	ft	# of Layers	2

Layer	Top (ft)	Bottom (ft)	Thickness (ft)	γ _{soil} (pcf)	γ _{concrete} (pcf)	Cohesion (ksf)	Angle of Friction (degrees)	Calculated Ultimate Skin Friction Comp (ksf)	Calculated Ultimate Skin Friction Uplift (ksf)	Ultimate Skin Friction Comp Override (ksf)	Ultimate Skin Friction Uplift Override (ksf)	Ultimate Bearing Capacity (ksf)	SPT Blow Count	Soil Type
1	0	4	4	100	150	0	0	0.00	0.00					Cohesionless
2	4	41	37	100	150	0	30	0.00	0.00	1.72	1.72	12		Cohesionless