



APPLICATION FOR ZONING PERMIT
RACINE COUNTY, WISCONSIN (Rev. 11/20)

PERMIT NO.
DATE PERMIT ISSUED

OWNER Ellertson Trust Harold W. Sr

APPLICANT FULLERTON ENGINEERING o.b.o. DISH WIRELESS (JOE GOLDSHLACK)

Mailing Address 8330 Raynor Ave

Mailing Address 1100 E WOODFIELD RD., STE. 500

City State Zip FRANKSVILLE WI 53120

City State Zip SCHAUMBURG, IL 60173

Phone (H) (W)

Phone (H) (W) 517-648-0023

Parcel Id. # 010-04-20-01-017-000 Site Address 8330 RAYNOR AVE.

Municipality NORWAY Section(s) 1 Town 4 North, Range 20 East

Lot Block Subdivision Name CSM #

Proposed Construction/Use class 2 co-location to install 3 antennas at 185-feet for an additional carrier on an existing mobile service support structure & associated ground equipment

New Principal Bldg. Size ( - x - ) ( - x - ) ( - x - )
Addition x Accessory Area (sq ft) ( see attached plans ) ( - )
Alteration Deck # of Units/Stories / Building Ht.-Avg. (ft.) prop@185'
Conversion Sign Peak Ht. (ft.) prop@185' 100-Yr. Floodplain Elev. -
Temporary Other CELL TOWER COLLOCATION Eave Ht. (ft.) - Flood Protection Elev. -

Contractor KEY TOWER LLC Est. Value w/Labor \$ 30,000 ZONING DISTRICT M-3

Table with 7 columns: Question, Yes, No, Yard Setbacks, Proposed, OK?
Existing Nonconforming? N/A \* Yes No x Yard Setbacks Proposed OK?
\*Structure's Fair Mrkt Value \$ N/A Cumulative % Street-1st yes
\*>50% of Fair Market Value? N/A x Yes No Street-2nd
Structure in Shoreland? (per map) Yes No x Side-1st W/i
Structure in Floodplain? (per map) Yes No x Side-2nd Exist.
Structure in Wetland? (per map) Yes No x Rear cell tower
Substandard Lot? Yes No x Shore lease area
Abutting Lot-Same Owner/Closely Related? Yes No x Total Acc. Structures -
BOA Variance Needed? Yes No x Date of Approval -
Conditional Use (Site Plan) Needed? Yes x No Date of Approval -
Shoreland Contract Needed? Yes No x Date of Approval -

Additional Zoning Permit Stipulations Listed on Back of this Form? Yes No x (If "Yes," see back)

The applicant hereby acknowledges receipt of notice contained herein and certifies that submitted information/ attachments are true and correct to the best of the knowledge and belief of the signer, and that all construction/ use will be done in accordance with the Zoning Ordinance, applicable stipulations, and Wisconsin laws.

BOA/Conditional Use (Site Plan) Pd: \$ 200.00

Signature of Owner /Applicant Joe Goldshlack Date June 3, 2022

CC Date (Check/Cash # 53820

Signature of Owner /Applicant JOE GOLDSHLACK FULLERTON ENGINEERING o.b.o. DISH WIRELESS JGOLDSHLACK@FULLERTONENGINEERING.COM (517) 648-0023

Shoreland Contract Fee Pd: \$

Print Name(s)

Zoning Permit Fee Pd: \$ 500.00

Notes (revisions, extensions, etc.)

CC Date/Check/Cash #

Other: Pd: \$

if shoreland erosion review fee is included above Zoning Administrator (Staff Initials)


Make checks payable to "Racine County Development Services" - Note: ALL FEES ARE NONREFUNDABLE (OVER)



Vertical stamp: PIN 0100420 - 01 - 017000



If a private onsite wastewater treatment system (POWTS) serves the property, check here  and complete # 1-6 below:

- 1) Sanitary Permit # \_\_\_\_\_ Date issued \_\_\_\_\_ Year installed \_\_\_\_\_ Failing? \_\_\_\_\_
  - 2) **If zoning permit is for an accessory structure without plumbing, check here \_\_\_\_\_ and go to #4 below.**
  - 3a) If a commercial facility, public building, or place of employment, will there be a change in occupancy of the structure; or will the proposed modification affect either the type or number of plumbing appliances, fixtures or devices discharging to the system? Yes\* \_\_\_\_\_ No \_\_\_\_\_ N/A \_\_\_\_\_
  - 3b) If a dwelling, will the addition/alteration change the number of bedrooms? Yes\* \_\_\_\_\_ No \_\_\_\_\_ N/A \_\_\_\_\_  
\*If "Yes" above, documentation must be submitted per SPS 383.25 (2) (d) to verify system can be used.
  - 4) Will construction interfere with the setback requirements to the POWTS per SPS 383.43 (8) (i)? Yes \_\_\_\_\_ No \_\_\_\_\_  
If "Yes," provide variance approval date: \_\_\_\_\_
  - 5) Has a new sanitary permit been issued to accommodate the structure or proposed modification in wastewater flow or contaminant load and/or County sanitary approval granted? Yes \_\_\_\_\_ No \_\_\_\_\_
  - 6) Comments unmanned cell tower will not impact POWTS
- POWTS Inspector's Signature:  1495714 Date: 10/8/22

**ZONING PERMIT REQUIREMENTS**

A Plat of Survey shall be prepared by a Land Surveyor registered in Wisconsin for all new principal structures located on lots less than five (5) acres in size. All zoning permit applications shall be accompanied by plans drawn to scale, showing the location, actual shape and dimensions of the lot to be built upon and any primary and accessory buildings, the lines within which the building shall be erected, altered or moved, the existing and/or intended use of each building or part of a building and the number of families and/or employees the building is intended to accommodate. Include floodplain, wetlands, environmental corridors, easements and such other information with regard to the lot and neighboring lots or buildings as may be necessary to determine and provide for ordinance enforcement. Adequate driveway access and off-street parking stalls must be provided in accordance with Sec. 20-1088, Racine County Code of Ordinances. In addition, if a private sewage system exists, the location of the tank(s), system and vent shall be shown on the plan with setback distances to the closest part of the proposed construction.

All dimensions shown relating to the location and size of the lot shall be based upon an actual survey. Lot area shall not contain road right-of-way. The lot and location of the building thereon shall be staked out on the ground before construction is started. NOTE: All street yard, side yard, and rear yard setbacks shall be measured from the closest property lines. Shore yard setbacks shall be measured from the closest point of the ordinary highwater mark of a navigable body of water. All elevations shall be provided in mean sea level datum.

All zoning permits issued pursuant to this ordinance are valid for nine (9) months unless substantial construction has commenced and is continuing, otherwise such zoning permits shall become null and void and a new zoning permit is required. It is the responsibility of the applicant to secure all other necessary permits required by any federal, state or local agency. The issuance of a zoning permit is not a guaranty or warranty that the requirements have been met for other necessary permits, or that the site is otherwise suitable for construction.

**NOTICE:** YOU ARE RESPONSIBLE FOR COMPLYING WITH STATE AND FEDERAL LAWS CONCERNING CONSTRUCTION NEAR OR ON WETLANDS, LAKES, AND STREAMS. WETLANDS THAT ARE NOT ASSOCIATED WITH OPEN WATER CAN BE DIFFICULT TO IDENTIFY. FAILURE TO COMPLY MAY RESULT IN REMOVAL OR MODIFICATION OF CONSTRUCTION THAT VIOLATES THE LAW OR OTHER PENALTIES OR COSTS. FOR MORE INFORMATION, VISIT THE DEPARTMENT OF NATURAL RESOURCES WETLANDS IDENTIFICATION WEB PAGE OR CONTACT A DEPARTMENT OF NATURAL RESOURCES SERVICE CENTER. See DNR web site <http://dnr.wi.gov/wetlands/locating.html> for more information.

**ADDITIONAL ZONING PERMIT STIPULATIONS (check all that apply)**

- Proposed structure is for personal use only and not to be used for human habitation or separate living quarters. No business, commercial or industrial use is allowed.
- All disturbed soils must be reseeded and mulched or sodded immediately upon completion of project.
- Must install the following within 14 days of completion of roof: gutters and downspouts which outlet onto splashblocks or into drain tiles; or a hard surface material that extends at least 16" beyond the dripline of the structure.
- All excess soil not used for backfilling project must be removed from the shoreland area within 10 days of excavation.
- A hard surface material must be placed beneath the deck to prevent soil erosion.
- All existing yard grade elevations will remain unchanged.
- Firmly anchor, no floor < \_\_\_\_\_'; Buoyant, flammable, explosive or injurious materials/utilities/electric & 1<sup>st</sup> floor ≥ \_\_\_\_\_'



Date: **June 22, 2021**

Matthew Brunozzi  
Pyramid Network Services, LLC  
6615 Towpath Rd  
East Syracuse, NY 13057

Sinnott Gering and Schmitt Towers, Inc.  
10834 Old Mill Rd Suite 8  
Omaha, NE 68154  
(402) 575-8885  
Engineering@sgstowers.com

**Subject: Structural Analysis Report**

**Carrier Designation:** *DISH Wireless L.L.C. Co-Locate*  
**Carrier Site Number:** *MWMKE00224*  
**Carrier Site Name:** *MWMKE00224*

**U.S. Cellular Site Designation:** **Site Number:** *783315*  
**Site Name:** *Union Church*

**Engineering Firm Designation:** **SGS Towers Project Number:** *2105204*

**Site Data:** **8330 N Raynor Ave, Franksville, WI 53126 (Waukesha County)**  
**Latitude 42.83420598, Longitude -88.07255784**  
**190 Foot – Self Support Tower**

Dear Matthew Brunozzi,

SGS Towers is pleased to submit this “**Structural Analysis Report**” to determine the structural integrity of the above-mentioned tower. The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

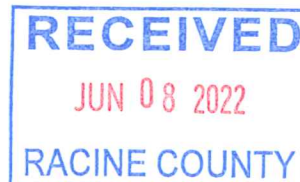
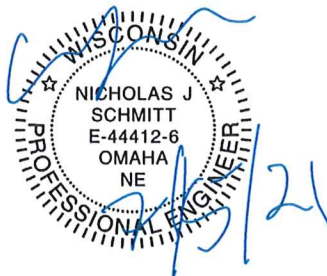
Proposed + Existing Equipment Configuration **Sufficient**

This analysis utilizes an ultimate 3-second gust wind speed of 115 mph as required by the 2015 International Building Code. Applicable Standard references and design criteria are listed in Section 2 - Analysis Criteria.

Structural analysis prepared by: Yamini Rajakumar

Respectfully submitted by:

Nicholas J. Schmitt, P.E., S.E.  
Vice President of Engineering



## 1) INTRODUCTION

This tower is an 190ft Self Support, designed by Cellxion in October of 1999.

## 2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	115 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	1.5 in
Wind Speed with Ice:	40 mph
*Seismic Ss:	0.094
*Seismic S1:	0.049
Service Wind Speed:	60 mph

**\*Note: A seismic analysis has been performed on this tower. It has been determined that seismic loading is not controlling the overall structural analysis.**

**Table 1 – Proposed Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Carrier
185.0	185.0	3	JMA	MX08FRO665-21	1	1.75 Hybrid	DISH
		3	Fujitsu	TA08025-B604			
		1	Raycap	RDIDC-9181-PF-48			
		3	Fujitsu	TA08025-B605			
		3	Commscope	MTSMTC3975HD083			

**Table 2 – Existing Equipment Configuration**

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Carrier
187.0	187.0	3	-	12.5' V-Sector Frame <sup>1</sup>	-	-	U.S. Cellular
150.0	150.0	6	Dengyo	OCT8-2LX2HX-BW65	6	1-5/8	
		6	Amphenol	WPA-70080-8CF-EDIN-X			
		3	-	Sabre C10857111			
142.0	142.0	3	Ericsson	RRU-11	2	1-1/4 Hybrid	
		2	Raycap	RUSDC-6267-PF-48			
		3	Ericsson	RRU-4449			
		3	Ericsson	RRU-4415			
	-	3	SitePro1	CWT8 Standoff Mount			

Note 1: Existing mount is assumed to be removed and not considered in this analysis.

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (lb)	SF*P_allow (lb)	% Capacity	Pass / Fail	
T5	120 - 100	Diagonal	L2 1/2x2 1/2x3/16	128	-3.65	16.84	21.7 31.4 (b)	Pass	
T6	100 - 80	Diagonal	L2 1/2x2 1/2x3/16	155	-3.91	12.65	31.0 33.5 (b)	Pass	
T7	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	182	-4.25	12.70	33.4	Pass	
T8	60 - 40	Diagonal	L3x3x1/4	209	-4.76	16.51	28.8 30.3 (b)	Pass	
T9	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	230	-5.21	21.90	23.8 33.5 (b)	Pass	
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	251	-5.67	18.23	31.1 36.1 (b)	Pass	
T1	190 - 180	Top Girt	L2x2x3/16	4	-0.12	13.68	0.9 1.2 (b)	Pass	
T3	160 - 140	Top Girt	L2x2x3/16	62	-0.88	13.80	6.3 10.6 (b)	Pass	
							Summary		
							Leg (T5)	47.9	Pass
							Diagonal (T4)	48.7	Pass
							Top Girt (T3)	10.6	Pass
							Bolt Checks	48.7	Pass
							<b>RATING =</b>	<b>48.7</b>	<b>Pass</b>

**Table 5 - Tower Component Stresses vs. Capacity**

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	49.4	Pass
1	Base Foundation (Soil Rating)	0	79.1	Pass
1	Base Foundation (Structural Rating)	0	7.2	Pass

<b>Structure Rating (max from all components) =</b>	<b>79.1%</b>
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity.

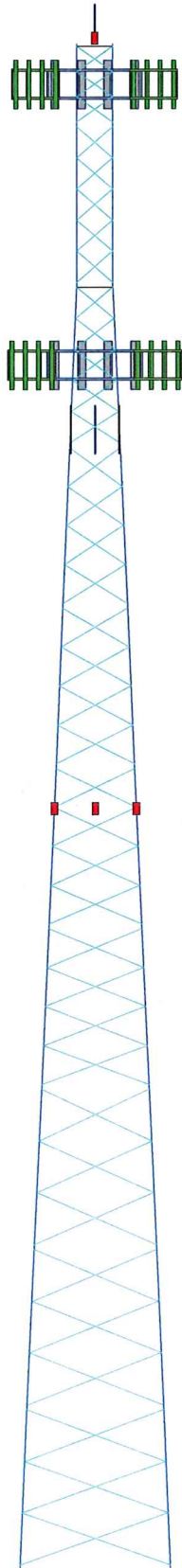
#### 4.1) Recommendations

The tower, anchor bolts and foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.



Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs	SR 1 3/4	SR 2	SR 2 1/4	SR 2 3/4	SR 3	SR 3 1/4	SR 3 1/2	SR 4	SR 4 1/4	SR 4 1/4
Leg Grade			L2x3x1/6	A572-50						
Diagonals						L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x1/4	L3x3x1/4	L3 1/2x3 1/2x1/4	L3 1/2x3 1/2x1/4
Diagonal Grade						A36				
Top Girts	L2x3x1/6	N.A.	L2x3x1/6	L2x3x1/6	L2x3x1/6	N.A.	N.A.	N.A.	N.A.	N.A.
Face Width (ft)	4.5		6.302	8.099	9.901	11.698	13.5	15.302	17.099	18.901
# Panels @ (ft)	3 @ 3.13889	10 @ 3.88333	16 @ 4.85417	23	27	34	42	49	51	51
Weight (K)	0.5	1.1	1.4	1.8	2.3	3.4	4.2	4.9	5.1	5.1

190.0 ft  
180.0 ft  
160.0 ft  
140.0 ft  
120.0 ft  
100.0 ft  
80.0 ft  
60.0 ft  
40.0 ft  
20.0 ft  
0.0 ft



### MATERIAL STRENGTH

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

### TOWER DESIGN NOTES

1. Tower is located in Waukesha County, Wisconsin.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 115 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 40 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 48.7%

ALL REACTIONS  
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:  
DOWN: 220 K  
SHEAR: 20 K

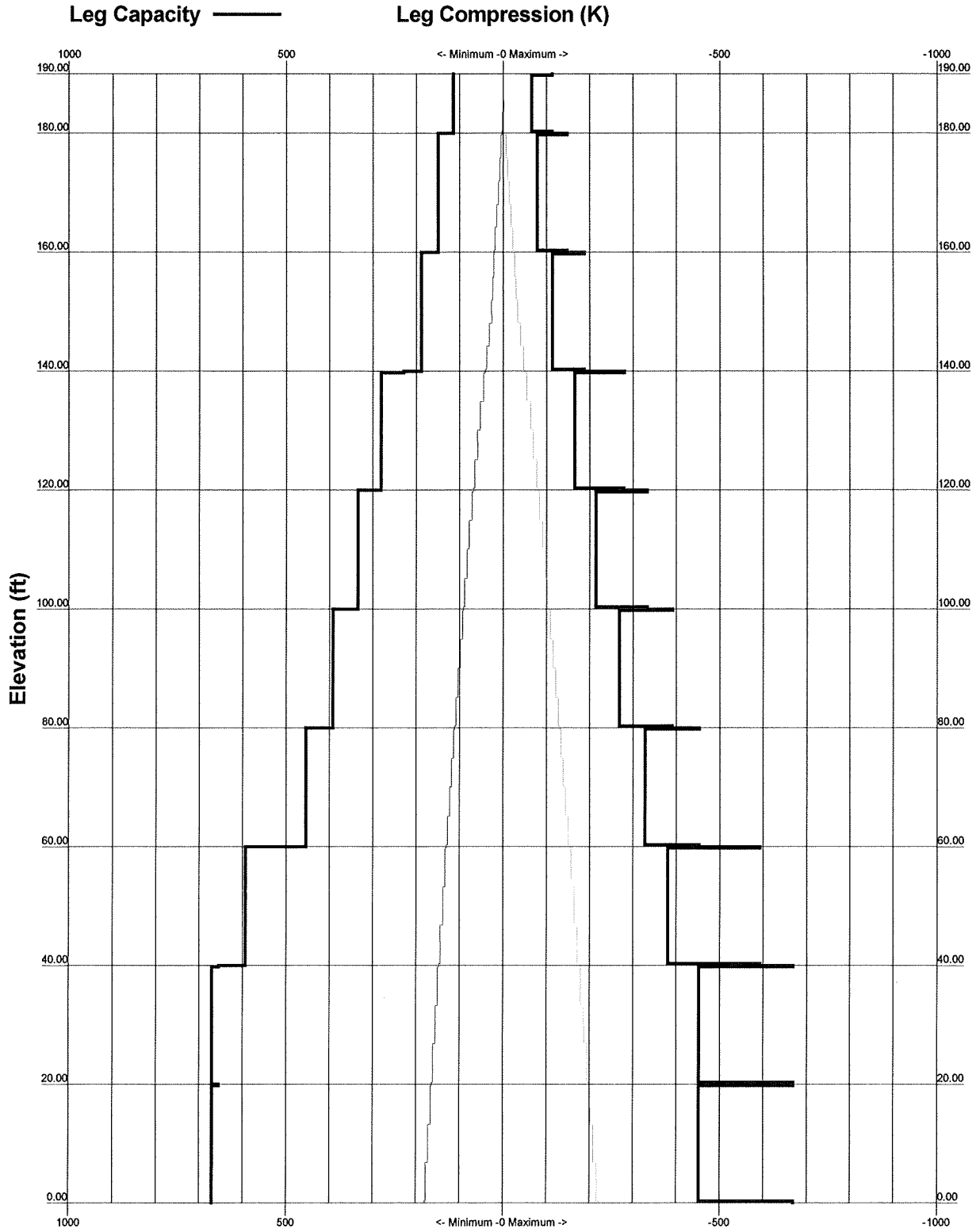
UPLIFT: -180 K  
SHEAR: 17 K

AXIAL  
98 K  
SHEAR  
6 K  
MOMENT  
711 kip-ft  
TORQUE 2 kip-ft  
40 mph WIND - 1.5000 in ICE

AXIAL  
48 K  
SHEAR  
32 K  
MOMENT  
3338 kip-ft  
TORQUE 10 kip-ft  
REACTIONS - 115 mph WIND

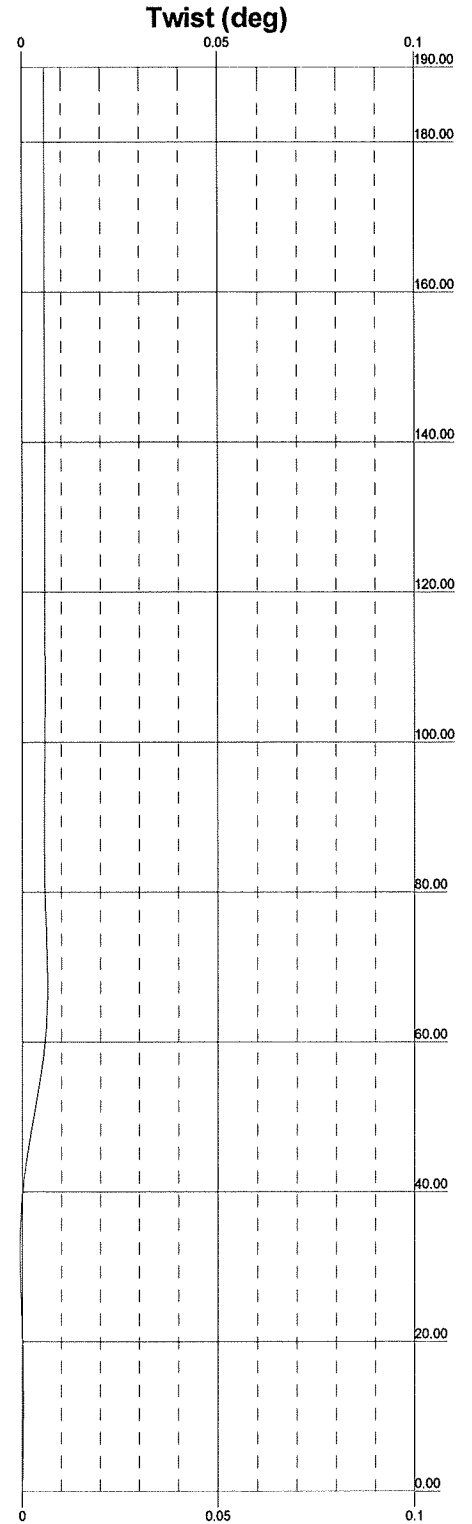
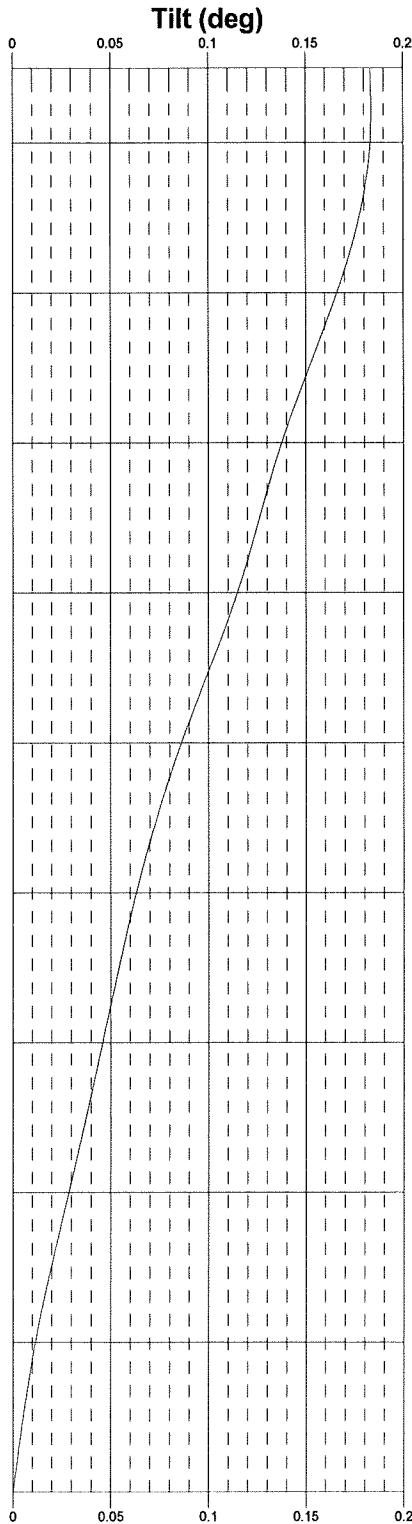
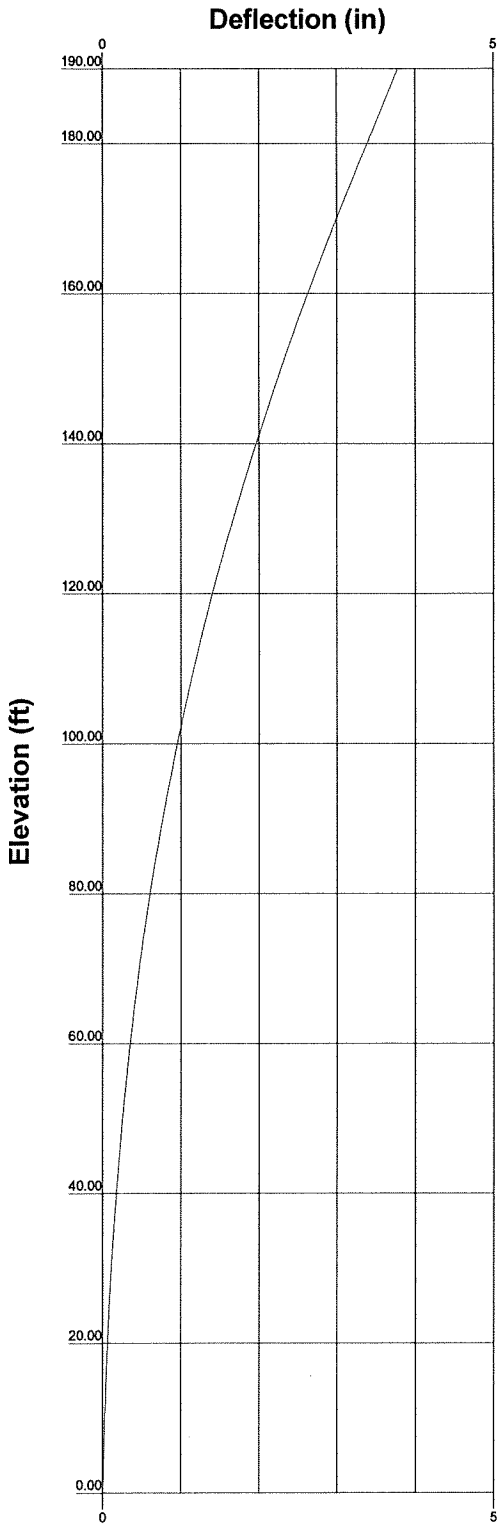
<b>Sinnott, Gering &amp; Schmitt, Inc.</b> Chapel Hill, NC Phone: engineering@sgstowers.com FAX:		Job: <b>SGS#2105204</b> Project: <b>Union Church (783315)</b>	
		Client: Pyramid Network Services Code: TIA-222-H Path:	Drawn by: Yamini Rajakumar Date: 07/02/21 Scale: NTS Dwg No. E-1

TIA-222-H - 115 mph/40 mph 1.5000 in Ice Exposure C



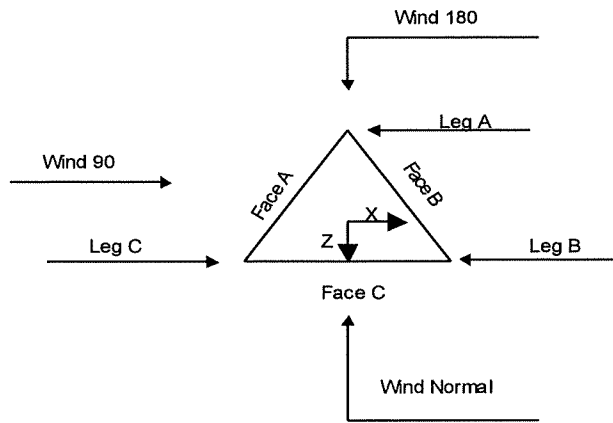
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		Project: <b>Union Church (783315)</b>	
Client: Pyramid Network Services		Drawn by: Yamini Rajakumar	App'd:
Code: TIA-222-H		Date: 07/02/21	Scale: NTS
Path:		Dwg No. E-3	





<b>Sinnott, Gering &amp; Schmitt, Inc.</b> Chapel Hill, NC Phone: engineering@sgstowers.com FAX:		Job: <b>SGS#2105204</b>		
		Project: <b>Union Church (783315)</b>		
		Client: <b>Pyramid Network Services</b>	Drawn by: <b>Yamini Rajakumar</b>	App'd:
		Code: <b>TIA-222-H</b>	Date: <b>07/02/21</b>	Scale: <b>NTS</b>
		Path:	Dwg No. <b>E-5</b>	

<b>tnxTower</b>  <b>Sinnott, Gering &amp; Schmitt, Inc.</b>  Chapel Hill, NC Phone: <a href="mailto:engineering@sgstowers.com">engineering@sgstowers.com</a> FAX:	<b>Job</b> SGS#2105204	<b>Page</b> 2 of 28
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	<b>Client</b> Pyramid Network Services	<b>Designed by</b> Yamini Rajakumar



**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	190.00-180.00			4.50	1	10.00
T2	180.00-160.00			4.50	1	20.00
T3	160.00-140.00			4.50	1	20.00
T4	140.00-120.00			6.30	1	20.00
T5	120.00-100.00			8.10	1	20.00
T6	100.00-80.00			9.90	1	20.00
T7	80.00-60.00			11.70	1	20.00
T8	60.00-40.00			13.50	1	20.00
T9	40.00-20.00			15.30	1	20.00
T10	20.00-0.00			17.10	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	190.00-180.00	3.14	X Brace	No	No	3.0000	4.0000
T2	180.00-160.00	3.88	X Brace	No	No	3.0000	4.0000
T3	160.00-140.00	3.88	X Brace	No	No	3.0000	4.0000

<b>tnxTower</b>  <b>Sinnott, Gering &amp; Schmitt, Inc.</b>  Chapel Hill, NC Phone: <a href="mailto:engineering@sgstowers.com">engineering@sgstowers.com</a> FAX:	<b>Job</b> SGS#2105204	<b>Page</b> 4 of 28
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Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor $A_f$	Adjust. Factor $A_r$	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
ft	ft <sup>2</sup>	in							
T1 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

### Tower Section Geometry (cont'd)

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors <sup>1</sup>							
				X Brace Diags	K Brace Diags	Single Diags	Girts	Horiz.	Sec. Horiz.	Inner Brace	
											X
ft				X	X	X	X	X	X	X	
T1 190.00-180.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T2 180.00-160.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T3 160.00-140.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T4 140.00-120.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T5 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T6 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T7 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T8 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T9 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1
T10 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1

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



<b>tnxTower</b> <b>Sinnott, Gering &amp; Schmitt, Inc.</b> Chapel Hill, NC Phone: <a href="mailto:engineering@sgstowers.com">engineering@sgstowers.com</a> FAX:	<b>Job</b> SGS#2105204	<b>Page</b> 6 of 28
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Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 190.00-180.00	Flange	0.7500	0	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T2 180.00-160.00	Flange	1.0000	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T3 160.00-140.00	Flange	1.0000	4	0.6250	1	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T4 140.00-120.00	Flange	1.0000	4	0.6250	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T5 120.00-100.00	Flange	1.3750	6	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T6 100.00-80.00	Flange	1.3750	6	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T7 80.00-60.00	Flange	1.3750	6	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T8 60.00-40.00	Flange	1.3750	6	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T9 40.00-20.00	Flange	1.3750	6	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
T10 20.00-0.00	Flange	1.3750	6	0.8750	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0

**Feed Line/Linear Appurtenances - Entered As Round Or Flat**

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*** 1-5/8" (U.S.Cellular) ***	C	No	No	Ar (CaAa)	150.00 - 0.00	0.0000	0.4	6	6	1.6300	1.6300		1.35
*** 1-1/4 Hybrid (U.S.Cellular) ***	B	No	No	Ar (CaAa)	142.00 - 0.00	0.0000	0.4	2	2	1.2500	1.2500		1.61
*** Feedline Ladder (Af) ***	B	No	No	Af (CaAa)	190.00 - 2.00	0.0000	0	1	1	3.0000	3.0000		8.40
*** Safety Line 3/8 ***	C	No	No	Ar (CaAa)	190.00 - 0.00	0.0000	0	1	1	0.3750	0.3750		0.22
*** 1.75" Hybrid (Dish Wireless) ***	B	No	No	Ar (CaAa)	185.00 - 0.00	0.0000	0	1	1	0.0000	1.7500		2.72
*** Feedline Ladder (Af) ***	C	No	No	Af (CaAa)	150.00 - 5.00	0.0000	0	1	1	3.0000	3.0000		8.40
*** Climbing Ladder ***	C	No	No	Af (CaAa)	190.00 - 0.00	0.0000	0	1	1	0.2500	3.0000		7.90

**Feed Line/Linear Appurtenances - Entered As Area**

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	<b>Project</b> Union Church (783315)	<b>Date</b> 16:07:38 07/02/21
	<b>Client</b> Pyramid Network Services	<b>Designed by</b> Yamini Rajakumar

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_A A_A$ In Face ft <sup>2</sup>	$C_A A_A$ Out Face ft <sup>2</sup>	Weight K
		B		0.000	0.000	27.350	0.000	0.57
		C		0.000	0.000	57.330	0.000	0.94
T4	140.00-120.00	A	1.462	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	44.881	0.000	0.77
		C		0.000	0.000	91.664	0.000	1.50
T5	120.00-100.00	A	1.438	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	44.520	0.000	0.76
		C		0.000	0.000	91.229	0.000	1.48
T6	100.00-80.00	A	1.410	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	44.095	0.000	0.75
		C		0.000	0.000	90.717	0.000	1.46
T7	80.00-60.00	A	1.375	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	43.574	0.000	0.73
		C		0.000	0.000	90.089	0.000	1.44
T8	60.00-40.00	A	1.329	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	42.898	0.000	0.71
		C		0.000	0.000	89.274	0.000	1.40
T9	40.00-20.00	A	1.263	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	41.914	0.000	0.69
		C		0.000	0.000	88.089	0.000	1.35
T10	20.00-0.00	A	1.132	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	38.510	0.000	0.60
		C		0.000	0.000	82.109	0.000	1.18

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
T1	190.00-180.00	1.6027	-0.8115	1.7093	0.4343
T2	180.00-160.00	2.0370	-1.0842	2.4091	0.2044
T3	160.00-140.00	-0.6549	0.5860	-1.3861	2.0917
T4	140.00-120.00	-1.8831	2.8445	-3.1468	5.0343
T5	120.00-100.00	-1.9742	2.8716	-3.5776	5.4904
T6	100.00-80.00	-2.1663	3.0833	-4.0559	5.9955
T7	80.00-60.00	-2.3229	3.2514	-4.4964	6.3957
T8	60.00-40.00	-2.5166	3.4738	-5.1371	7.0455
T9	40.00-20.00	-2.4429	3.3256	-5.3981	6.9905
T10	20.00-0.00	-2.7563	2.9911	-6.3377	6.5794

### Shielding Factor $K_a$

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
T1	6	Feedline Ladder (Af)	180.00 - 190.00	0.6000	0.5275
T1	8	Safety Line 3/8	180.00 - 190.00	0.6000	0.5275
T1	10	1.75" Hybrid	180.00 - 185.00	0.6000	0.5275
T1	14	Climbing Ladder	180.00 -	0.6000	0.5275

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	<b>Client</b> Pyramid Network Services	<b>Designed by</b> Yamini Rajakumar

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	$K_a$ No Ice	$K_a$ Ice
T7	10	1.75" Hybrid	60.00 - 80.00	0.6000	0.6000
T7	13	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T7	14	Climbing Ladder	60.00 - 80.00	0.6000	0.6000
T8	2	1-5/8"	40.00 - 60.00	0.6000	0.6000
T8	4	1-1/4 Hybrid	40.00 - 60.00	0.6000	0.6000
T8	6	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	8	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T8	10	1.75" Hybrid	40.00 - 60.00	0.6000	0.6000
T8	13	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T8	14	Climbing Ladder	40.00 - 60.00	0.6000	0.6000
T9	2	1-5/8"	20.00 - 40.00	0.6000	0.6000
T9	4	1-1/4 Hybrid	20.00 - 40.00	0.6000	0.6000
T9	6	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	8	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	10	1.75" Hybrid	20.00 - 40.00	0.6000	0.6000
T9	13	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T9	14	Climbing Ladder	20.00 - 40.00	0.6000	0.6000
T10	2	1-5/8"	0.00 - 20.00	0.6000	0.6000
T10	4	1-1/4 Hybrid	0.00 - 20.00	0.6000	0.6000
T10	6	Feedline Ladder (Af)	2.00 - 20.00	0.6000	0.6000
T10	8	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T10	10	1.75" Hybrid	0.00 - 20.00	0.6000	0.6000
T10	13	Feedline Ladder (Af)	5.00 - 20.00	0.6000	0.6000
T10	14	Climbing Ladder	0.00 - 20.00	0.6000	0.6000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	$C_{A1}$ Front $ft^2$	$C_{A1}$ Side $ft^2$	Weight K	
***									
Flash Beacon Lighting	A	From Leg	0.00	0.0000	190.00	No Ice	2.70	2.70	0.05
			0.00			1/2" Ice	3.10	3.10	0.07
			0.00			1" Ice	3.50	3.50	0.09
						2" Ice	4.30	4.30	0.13
***									
Lighting Rod 3/4" x 7'	A	From Leg	0.00	0.0000	190.00	No Ice	0.53	0.53	0.03
			0.00			1/2" Ice	1.24	1.24	0.04
			3.00			1" Ice	1.97	1.97	0.05
						2" Ice	3.07	3.07	0.08
***									
Sabre C10857111 (12' HD V-Frame, No Pipes) (U.S.Cellular)	A	From Leg	0.00	0.0000	150.00	No Ice	21.79	8.22	0.47
			0.00			1/2" Ice	26.65	11.99	0.71
			0.00			1" Ice	31.51	15.76	0.96
						2" Ice	41.23	23.30	1.44
***									
Sabre C10857111 (12' HD V-Frame, No Pipes) (U.S.Cellular)	B	From Leg	0.00	0.0000	150.00	No Ice	21.79	8.22	0.47
			0.00			1/2" Ice	26.65	11.99	0.71
			0.00			1" Ice	31.51	15.76	0.96
						2" Ice	41.23	23.30	1.44
***									



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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A</sub> A <sub>A</sub> Front	C <sub>A</sub> A <sub>A</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
			0.00			1" Ice	1.94	1.95	0.12	
						2" Ice	2.20	2.51	0.16	
*** Site Pro CWT8 (U.S.Cellular)	B	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.68	1.39	0.08
			0.00			1/2" Ice	1.81	1.67	0.10	
			0.00			1" Ice	1.94	1.95	0.12	
						2" Ice	2.20	2.51	0.16	
*** Site Pro CWT8 (U.S.Cellular)	B	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.68	1.39	0.08
			0.00			1/2" Ice	1.81	1.67	0.10	
			0.00			1" Ice	1.94	1.95	0.12	
						2" Ice	2.20	2.51	0.16	
*** Site Pro CWT8 (U.S.Cellular)	C	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.68	1.39	0.08
			0.00			1/2" Ice	1.81	1.67	0.10	
			0.00			1" Ice	1.94	1.95	0.12	
						2" Ice	2.20	2.51	0.16	
*** Site Pro CWT8 (U.S.Cellular)	C	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.68	1.39	0.08
			0.00			1/2" Ice	1.81	1.67	0.10	
			0.00			1" Ice	1.94	1.95	0.12	
						2" Ice	2.20	2.51	0.16	
*** 6' x 2" Mount Pipe (U.S.Cellular)	A	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03	
			0.00			1" Ice	2.29	2.29	0.05	
						2" Ice	3.06	3.06	0.09	
*** 6' x 2" Mount Pipe (U.S.Cellular)	A	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03	
			0.00			1" Ice	2.29	2.29	0.05	
						2" Ice	3.06	3.06	0.09	
*** 6' x 2" Mount Pipe (U.S.Cellular)	B	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03	
			0.00			1" Ice	2.29	2.29	0.05	
						2" Ice	3.06	3.06	0.09	
*** 6' x 2" Mount Pipe (U.S.Cellular)	B	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03	
			0.00			1" Ice	2.29	2.29	0.05	
						2" Ice	3.06	3.06	0.09	
*** 6' x 2" Mount Pipe (U.S.Cellular)	C	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03	
			0.00			1" Ice	2.29	2.29	0.05	
						2" Ice	3.06	3.06	0.09	
*** 6' x 2" Mount Pipe (U.S.Cellular)	C	From Leg	0.00	0.00	0.0000	142.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03	
			0.00			1" Ice	2.29	2.29	0.05	
						2" Ice	3.06	3.06	0.09	
*** RRUS-11 (U.S.Cellular)	A	From Leg	1.00	0.00	0.0000	142.00	No Ice	3.26	1.38	0.05
			0.00			1/2" Ice	3.50	1.56	0.07	
			0.00			1" Ice	3.75	1.74	0.10	
						2" Ice	4.28	2.15	0.15	

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>A,A</sub> Front	C <sub>A,A</sub> Side	Weight
			Horz	Lateral					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
			0.00			1/2" Ice	0.68	0.68	0.04
			0.00			1" Ice	0.80	0.80	0.05
			0.00			2" Ice	1.09	1.09	0.09
***									
Mid Beacon	C	From Leg	0.00		0.0000	94.00	No Ice	0.40	0.03
			0.00			1/2" Ice	0.68	0.68	0.04
			0.00			1" Ice	0.80	0.80	0.05
			0.00			2" Ice	1.09	1.09	0.09
***									
MX08FRO0665-21 (Dish Wireless)	A	From Leg	3.00		0.0000	185.00	No Ice	14.00	0.06
			0.00			1/2" Ice	14.60	6.32	0.14
			0.00			1" Ice	15.21	6.79	0.22
			0.00			2" Ice	16.45	7.74	0.40
***									
MX08FRO0665-21 (Dish Wireless)	B	From Leg	3.00		0.0000	185.00	No Ice	14.00	0.06
			0.00			1/2" Ice	14.60	6.32	0.14
			0.00			1" Ice	15.21	6.79	0.22
			0.00			2" Ice	16.45	7.74	0.40
***									
MX08FRO0665-21 (Dish Wireless)	C	From Leg	3.00		0.0000	185.00	No Ice	14.00	0.06
			0.00			1/2" Ice	14.60	6.32	0.14
			0.00			1" Ice	15.21	6.79	0.22
			0.00			2" Ice	16.45	7.74	0.40
***									
TA08025-B604 (Dish Wireless)	A	From Leg	2.50		0.0000	185.00	No Ice	2.29	0.06
			0.00			1/2" Ice	2.49	1.36	0.08
			0.00			1" Ice	2.71	1.53	0.10
			0.00			2" Ice	3.16	1.89	0.15
***									
TA08025-B604 (Dish Wireless)	B	From Leg	2.50		0.0000	185.00	No Ice	2.29	0.06
			0.00			1/2" Ice	2.49	1.36	0.08
			0.00			1" Ice	2.71	1.53	0.10
			0.00			2" Ice	3.16	1.89	0.15
***									
TA08025-B604 (Dish Wireless)	C	From Leg	2.50		0.0000	185.00	No Ice	2.29	0.06
			0.00			1/2" Ice	2.49	1.36	0.08
			0.00			1" Ice	2.71	1.53	0.10
			0.00			2" Ice	3.16	1.89	0.15
***									
TA08025-B605 (Dish Wireless)	A	From Leg	2.50		0.0000	185.00	No Ice	2.29	0.07
			0.00			1/2" Ice	2.49	1.55	0.09
			0.00			1" Ice	2.71	1.73	0.11
			0.00			2" Ice	3.16	2.10	0.16
***									
TA08025-B605 (Dish Wireless)	B	From Leg	2.50		0.0000	185.00	No Ice	2.29	0.07
			0.00			1/2" Ice	2.49	1.55	0.09
			0.00			1" Ice	2.71	1.73	0.11
			0.00			2" Ice	3.16	2.10	0.16
***									
TA08025-B605 (Dish Wireless)	C	From Leg	2.50		0.0000	185.00	No Ice	2.29	0.07
			0.00			1/2" Ice	2.49	1.55	0.09
			0.00			1" Ice	2.71	1.73	0.11
			0.00			2" Ice	3.16	2.10	0.16
***									
RDIDC-9181-PF-48 (Dish Wireless)	A	From Leg	2.50		0.0000	185.00	No Ice	2.18	0.02
			0.00			1/2" Ice	2.38	1.40	0.04

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Comb. No.	Description
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 K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	190 - 180	Leg	Max Tension	7	2.95	0.31	-0.19
			Max. Compression	2	-5.15	0.00	0.09
			Max. Mx	8	-1.08	0.37	0.00
			Max. My	2	-5.15	-0.00	-0.39
			Max. Vy	18	-1.19	0.07	-0.04
			Max. Vx	2	-1.43	0.00	0.09
		Diagonal	Max Tension	24	1.39	0.00	0.00
			Max. Compression	12	-1.37	0.00	0.00
			Max. Mx	2	-0.11	0.01	0.00
			Max. My	24	-1.36	-0.00	-0.01
			Max. Vy	31	-0.02	0.01	-0.00
			Max. Vx	24	-0.00	0.00	0.00
		Top Girt	Max Tension	3	0.10	0.00	0.00
			Max. Compression	14	-0.12	0.00	0.00
			Max. Mx	26	-0.04	-0.03	0.00
			Max. My	16	-0.01	0.00	0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
T2	180 - 160	Leg	Max Tension	15	20.61	0.01	0.34
			Max. Compression	2	-24.86	0.01	0.41
			Max. Mx	18	-4.90	0.37	-0.23
			Max. My	2	-5.15	0.01	0.45
			Max. Vy	18	-1.94	0.34	-0.20
			Max. Vx	2	-2.36	0.01	0.41
		Diagonal	Max Tension	12	2.02	0.00	0.00
			Max. Compression	24	-2.04	0.00	0.00
			Max. Mx	38	0.44	0.02	-0.00
			Max. My	12	-1.53	-0.00	0.00
			Max. Vy	38	-0.02	0.02	-0.00
			Max. Vx	12	0.00	0.00	0.00
T3	160 - 140	Leg	Max Tension	15	41.21	0.66	-0.00
			Max. Compression	2	-50.47	0.71	-0.01



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Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T8	60 - 40	Leg	Max. My	32	-0.36	0.08	-0.01
			Max. Vy	33	0.06	0.08	-0.01
			Max. Vx	32	-0.00	0.00	0.00
			Max Tension	15	147.14	1.37	0.02
			Max. Compression	2	-175.55	0.70	0.01
			Max. Mx	2	-152.87	2.29	0.03
			Max. My	24	-9.66	0.02	0.90
		Diagonal	Max. Vy	2	-7.13	0.70	0.01
			Max. Vx	24	-2.35	0.00	0.38
			Max Tension	4	4.71	0.00	0.00
			Max. Compression	4	-4.76	0.00	0.00
			Max. Mx	33	0.43	0.12	-0.01
			Max. My	29	-0.55	0.10	-0.01
			Max. Vy	33	0.07	0.12	-0.01
T9	40 - 20	Leg	Max. Vx	29	-0.00	0.00	0.00
			Max Tension	15	164.18	1.72	0.02
			Max. Compression	2	-198.27	0.48	0.01
			Max. Mx	2	-175.57	2.49	0.03
			Max. My	24	-11.71	0.03	0.97
			Max. Vy	2	-7.84	0.48	0.01
			Max. Vx	24	-2.66	-0.01	0.31
		Diagonal	Max Tension	4	5.20	0.00	0.00
			Max. Compression	4	-5.21	0.00	0.00
			Max. Mx	33	0.03	0.19	-0.02
			Max. My	29	-1.76	0.18	-0.02
			Max. Vy	33	0.09	0.19	-0.02
			Max. Vx	29	-0.00	0.00	0.00
			T10	20 - 0	Leg	Max Tension	15
Max. Compression	2	-220.72				0.00	0.00
Max. Mx	2	-220.70				-2.95	-0.04
Max. My	24	-14.03				0.02	0.98
Max. Vy	2	-8.83				0.00	0.00
Max. Vx	24	-2.66				0.02	0.98
Diagonal	Max Tension	4				5.61	0.00
	Max. Compression	2			-5.67	0.00	0.00
	Max. Mx	33			-0.80	0.23	-0.02
	Max. My	35			-1.63	0.23	0.02
	Max. Vy	33			0.10	0.23	-0.02
	Max. Vx	35			0.00	0.00	0.00

### Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	212.54	16.54	-9.29
	Max. H <sub>x</sub>	18	212.54	16.54	-9.29
	Max. H <sub>z</sub>	5	-154.73	-11.99	8.24
	Min. Vert	7	-170.78	-13.82	7.73
	Min. H <sub>x</sub>	7	-170.78	-13.82	7.73
	Min. H <sub>z</sub>	18	212.54	16.54	-9.29
Leg B	Max. Vert	10	213.00	-16.55	-9.29
	Max. H <sub>x</sub>	23	-170.69	13.83	7.72
	Max. H <sub>z</sub>	25	-154.01	12.03	8.01
	Min. Vert	23	-170.69	13.83	7.72
	Min. H <sub>x</sub>	10	213.00	-16.55	-9.29
	Min. H <sub>z</sub>	10	213.00	-16.55	-9.29

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Load Combination	Vertical	Shear <sub>x</sub>	Shear <sub>z</sub>	Overturing Moment, M <sub>x</sub>	Overturing Moment, M <sub>z</sub>	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 330 deg - No Ice	48.24	-14.87	-25.78	-2717.12	1571.14	-9.51
0.9 Dead+1.0 Wind 330 deg - No Ice	36.18	-14.87	-25.78	-2717.34	1570.10	-9.50
1.2 Dead+1.0 Ice+1.0 Temp	98.16	0.00	0.00	35.59	3.94	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	98.16	-0.00	-6.50	-660.55	4.34	-1.45
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	98.16	3.08	-5.34	-543.03	-329.51	1.23
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	98.16	4.98	-2.88	-281.15	-544.59	2.44
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	98.16	5.63	0.00	36.25	-618.17	1.66
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	98.16	5.17	2.99	361.66	-559.04	1.58
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	98.16	3.05	5.28	610.96	-327.79	2.41
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	98.16	0.00	6.23	711.21	3.55	1.45
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	98.16	-3.08	5.34	614.74	337.40	-1.23
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	98.16	-5.22	3.01	363.38	570.70	-2.44
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	98.16	-5.63	-0.00	35.46	626.06	-1.66
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	98.16	-4.93	-2.85	-279.42	548.70	-1.58
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	98.16	-3.05	-5.28	-539.25	335.68	-2.41
Dead+Wind 0 deg - Service	40.20	-0.01	-9.21	-948.63	-1.61	-0.97
Dead+Wind 30 deg - Service	40.20	4.28	-7.43	-773.94	-453.99	0.92
Dead+Wind 60 deg - Service	40.20	6.97	-4.03	-418.94	-745.92	2.03
Dead+Wind 90 deg - Service	40.20	7.82	0.01	11.79	-840.78	1.01
Dead+Wind 120 deg - Service	40.20	7.62	4.41	472.33	-798.80	2.13
Dead+Wind 150 deg - Service	40.20	4.26	7.39	792.74	-453.17	2.72
Dead+Wind 180 deg - Service	40.20	0.01	8.47	909.67	-3.29	0.97
Dead+Wind 210 deg - Service	40.20	-4.28	7.43	795.83	449.09	-0.92
Dead+Wind 240 deg - Service	40.20	-7.62	4.40	471.26	793.72	-2.03
Dead+Wind 270 deg - Service	40.20	-7.82	-0.01	10.11	835.88	-1.01
Dead+Wind 300 deg - Service	40.20	-6.97	-4.03	-420.02	741.20	-2.13
Dead+Wind 330 deg - Service	40.20	-4.26	-7.39	-770.84	448.27	-2.72

## Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-40.20	0.00	0.00	40.20	0.00	0.000%
2	-0.02	-48.24	-32.15	0.02	48.24	32.15	0.000%
3	-0.02	-36.18	-32.15	0.02	36.18	32.15	0.000%
4	14.94	-48.24	-25.94	-14.94	48.24	25.94	0.000%
5	14.94	-36.18	-25.94	-14.94	36.18	25.94	0.000%
6	24.33	-48.24	-14.06	-24.33	48.24	14.06	0.000%
7	24.33	-36.18	-14.06	-24.33	36.18	14.06	0.000%
8	27.30	-48.24	0.02	-27.30	48.24	-0.02	0.000%
9	27.30	-36.18	0.02	-27.30	36.18	-0.02	0.000%
10	26.58	-48.24	15.38	-26.58	48.24	-15.38	0.000%
11	26.58	-36.18	15.38	-26.58	36.18	-15.38	0.000%

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13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000111
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000441
28	Yes	4	0.00000001	0.00000436
29	Yes	4	0.00000001	0.00000433
30	Yes	4	0.00000001	0.00000436
31	Yes	4	0.00000001	0.00000446
32	Yes	4	0.00000001	0.00000451
33	Yes	4	0.00000001	0.00000453
34	Yes	4	0.00000001	0.00000450
35	Yes	4	0.00000001	0.00000444
36	Yes	4	0.00000001	0.00000432
37	Yes	4	0.00000001	0.00000430
38	Yes	4	0.00000001	0.00000434
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
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001

### Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	190 - 180	3.784	39	0.1860	0.0047
T2	180 - 160	3.389	39	0.1848	0.0052
T3	160 - 140	2.627	39	0.1665	0.0071
T4	140 - 120	1.962	39	0.1389	0.0085
T5	120 - 100	1.399	39	0.1129	0.0083
T6	100 - 80	0.951	39	0.0874	0.0072
T7	80 - 60	0.602	39	0.0645	0.0055
T8	60 - 40	0.346	39	0.0441	0.0038
T9	40 - 20	0.170	39	0.0283	0.0025
T10	20 - 0	0.057	39	0.0141	0.0013

### Critical Deflections and Radius of Curvature - Service Wind

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Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load Allowable	Allowable Ratio	Criteria
T3	160	Leg	A325N	1.0000	4	5.17	54.52	0.095 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	3.50	7.83	0.446 ✓	1.05	Member Bearing
		Top Girt	A325N	0.6250	1	0.88	7.83	0.112 ✓	1.05	Member Bearing
T4	140	Leg	A325N	1.0000	4	10.30	54.52	0.189 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.6250	1	4.00	7.83	0.511 ✓	1.05	Member Bearing
T5	120	Leg	A325N	1.3750	6	11.44	103.94	0.110 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.8750	1	3.65	11.09	0.329 ✓	1.05	Member Bearing
T6	100	Leg	A325N	1.3750	6	15.15	103.94	0.146 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.8750	1	3.90	11.09	0.351 ✓	1.05	Member Bearing
T7	80	Leg	A325N	1.3750	6	18.48	103.94	0.178 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.8750	1	4.25	14.79	0.287 ✓	1.05	Member Bearing
T8	60	Leg	A325N	1.3750	6	21.58	103.94	0.208 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.8750	1	4.71	14.79	0.318 ✓	1.05	Member Bearing
T9	40	Leg	A325N	1.3750	6	24.52	103.94	0.236 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.8750	1	5.20	14.79	0.351 ✓	1.05	Member Bearing
T10	20	Leg	A325N	1.3750	6	27.36	103.94	0.263 ✓	1.05	Bolt Tension
		Diagonal	A325N	0.8750	1	5.61	14.79	0.379 ✓	1.05	Member Bearing

### Compression Checks

### Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio P <sub>u</sub> / φP <sub>n</sub>
T1	190 - 180	1 3/4	10.00	3.14	86.1 K=1.00	2.4053	-4.15	62.95	0.066 <sup>1</sup> ✓
T2	180 - 160	2	20.00	3.88	93.2 K=1.00	3.1416	-22.48	74.91	0.300 <sup>1</sup> ✓
T3	160 - 140	2 1/4	20.03	3.89	83.0 K=1.00	3.9761	-46.98	108.18	0.434 <sup>1</sup> ✓
T4	140 - 120	2 3/4	20.03	4.86	84.8 K=1.00	5.9396	-76.96	157.91	0.487 <sup>1</sup> ✓
T5	120 - 100	3	20.03	4.86	77.8 K=1.00	7.0686	-102.79	204.40	0.503 <sup>1</sup> ✓
T6	100 - 80	3 1/4	20.03	4.86	71.8 K=1.00	8.2958	-126.66	256.11	0.495 <sup>1</sup> ✓
T7	80 - 60	3 1/2	20.03	4.86	66.7 K=1.00	9.6211	-149.71	312.85	0.479 <sup>1</sup> ✓
T8	60 - 40	4	20.03	6.48	77.8 K=1.00	12.5664	-171.43	363.38	0.472 <sup>1</sup> ✓

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<sup>1</sup>  $P_u / \phi P_n$  controls

### Tension Checks

### Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	1 3/4	10.00	0.33	9.1	2.4053	2.95	108.24	0.027 <sup>1</sup>
T2	180 - 160	2	20.00	0.33	8.0	3.1416	20.61	141.37	0.146 <sup>1</sup>
T3	160 - 140	2 1/4	20.03	0.33	7.1	3.9761	41.21	178.92	0.230 <sup>1</sup>
T4	140 - 120	2 3/4	20.03	0.33	5.8	5.9396	68.61	267.28	0.257 <sup>1</sup>
T5	120 - 100	3	20.03	0.33	5.3	7.0686	90.88	318.09	0.286 <sup>1</sup>
T6	100 - 80	3 1/4	20.03	0.33	4.9	8.2958	110.87	373.31	0.297 <sup>1</sup>
T7	80 - 60	3 1/2	20.03	0.33	4.6	9.6211	129.47	432.95	0.299 <sup>1</sup>
T8	60 - 40	4	20.03	0.33	4.0	12.5664	147.14	565.49	0.260 <sup>1</sup>
T9	40 - 20	4 1/4	20.03	0.33	3.8	14.1863	164.18	638.38	0.257 <sup>1</sup>
T10	20 - 0	4 1/4	20.03	0.33	3.8	14.1863	180.72	638.38	0.283 <sup>1</sup>

<sup>1</sup>  $P_u / \phi P_n$  controls

### Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L <sub>u</sub> ft	Kl/r	A in <sup>2</sup>	P <sub>u</sub> K	φP <sub>n</sub> K	Ratio $\frac{P_u}{\phi P_n}$
T1	190 - 180	L2x2x3/16	5.49	2.53	51.6	0.4308	1.39	18.74	0.074 <sup>1</sup>
T2	180 - 160	L2x2x3/16	5.94	2.74	55.7	0.4308	2.02	18.74	0.108 <sup>1</sup>
T3	160 - 140	L2x2x3/16	7.23	3.49	70.2	0.4308	3.50	18.74	0.187 <sup>1</sup>
T4	140 - 120	L2x2x3/16	8.15	3.96	79.3	0.4308	4.00	18.74	0.213 <sup>1</sup>
T5	120 - 100	L2 1/2x2 1/2x3/16	10.80	5.23	83.1	0.5359	3.65	23.31	0.157 <sup>1</sup>
T6	100 - 80	L2 1/2x2 1/2x3/16	12.44	6.04	95.5	0.5359	3.90	23.31	0.167 <sup>1</sup>

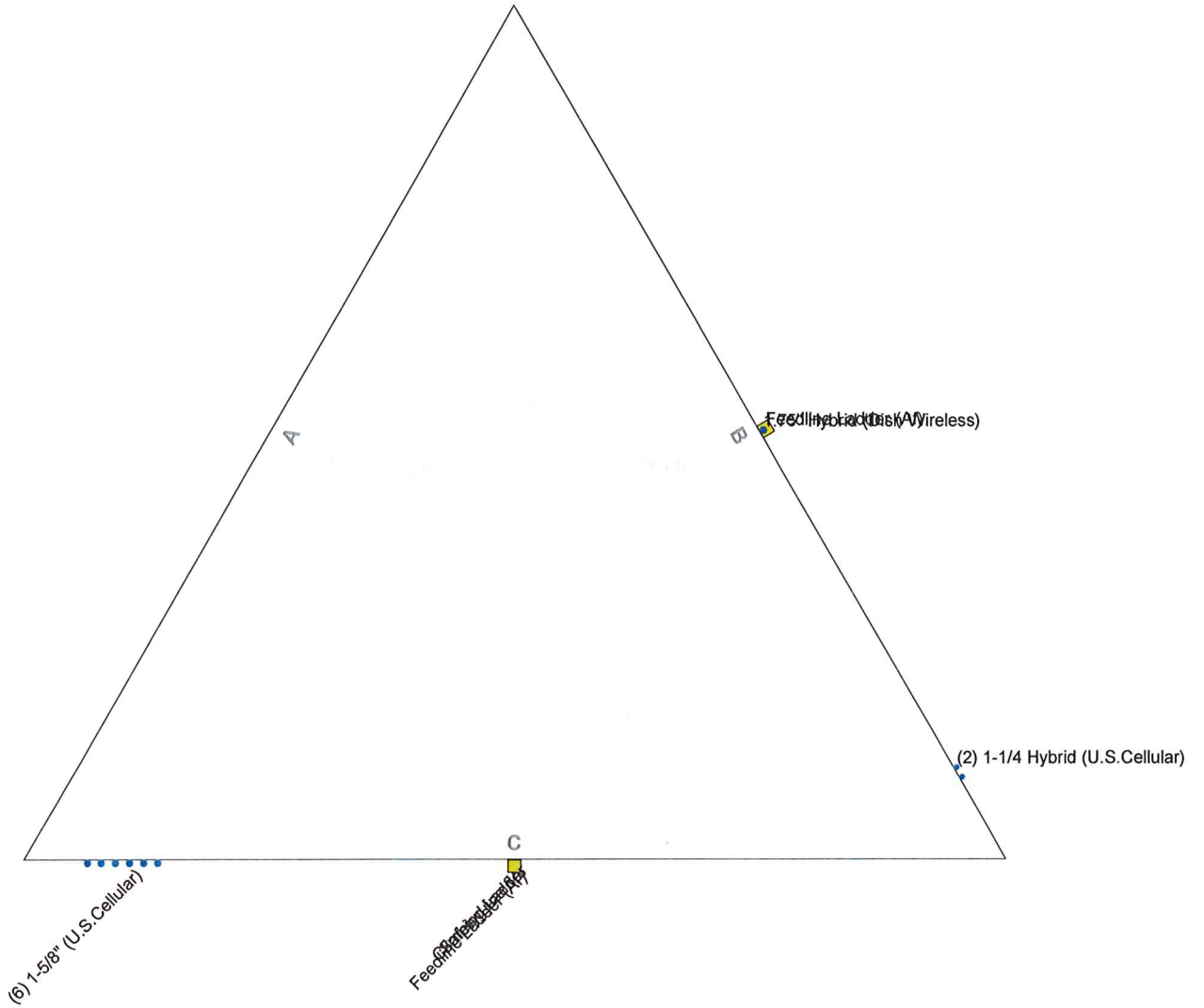
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Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\sigma P_{allow}$ K	% Capacity	Pass Fail	
T7	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	182	-4.25	12.70	33.4	Pass	
T8	60 - 40	Diagonal	L3x3x1/4	209	-4.76	16.51	28.8	Pass	
T9	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	230	-5.21	21.90	30.3 (b) 23.8	Pass	
T10	20 - 0	Diagonal	L3 1/2x3 1/2x1/4	251	-5.67	18.23	33.5 (b) 31.1	Pass	
T1	190 - 180	Top Girt	L2x2x3/16	4	-0.12	13.68	36.1 (b) 0.9	Pass	
T3	160 - 140	Top Girt	L2x2x3/16	62	-0.88	13.80	1.2 (b) 6.3	Pass	
							10.6 (b)		
							Summary		
							Leg (T5)	47.9	Pass
							Diagonal (T4)	48.7	Pass
							Top Girt (T3)	10.6	Pass
							Bolt Checks	48.7	Pass
							<b>RATING =</b>	<b>48.7</b>	<b>Pass</b>



# Feed Line Plan

Round \_\_\_\_\_ Flat \_\_\_\_\_ App In Face \_\_\_\_\_ App Out Face \_\_\_\_\_



<b>Sinnott, Gering &amp; Schmitt, Inc.</b>  Chapel Hill, NC Phone: engineering@sgstowers.com FAX:	Job: <b>SGS#2105204</b>		
	Project: <b>Union Church (783315)</b>		
	Client: <b>Pyramid Network Services</b>	Drawn by: <b>Yamini Rajakumar</b>	App'd:
	Code: <b>TIA-222-H</b>	Date: <b>07/02/21</b>	Scale: <b>NTS</b>
	Path:		Dwg No. <b>E-7</b>

## Self Support Anchor Rod Capacity

Site Info	
BU #	2105204
Site Name	Union Church
Order #	783315

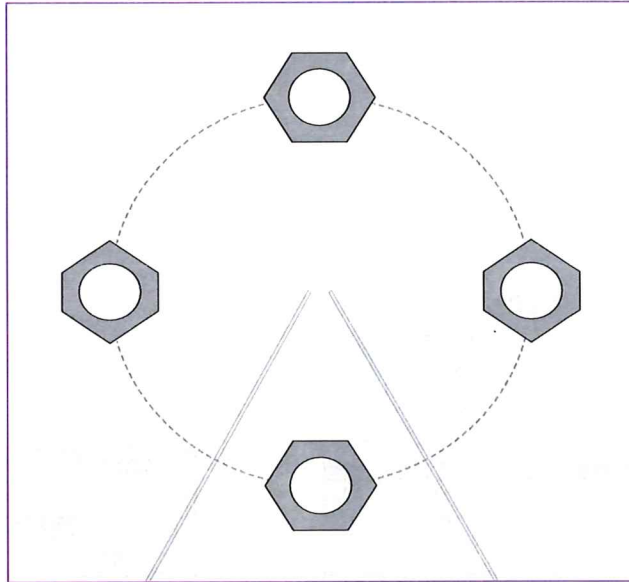
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	No
$I_{ar}$ (in)	0

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	220.00	180.00
Shear Force (kips)	20.00	17.00

\*TIA-222-H Section 15.5 Applied

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

\*Anchor Rod Eccentricity Applied



### Connection Properties

#### Anchor Rod Data

(4) 1-3/4"  $\phi$  bolts (A572-50 N;  $F_y=50$  ksi,  $F_u=65$  ksi)  
 $I_{ar}$  (in): 0

### Analysis Results

#### Anchor Rod Summary

(units of kips, kip-in)

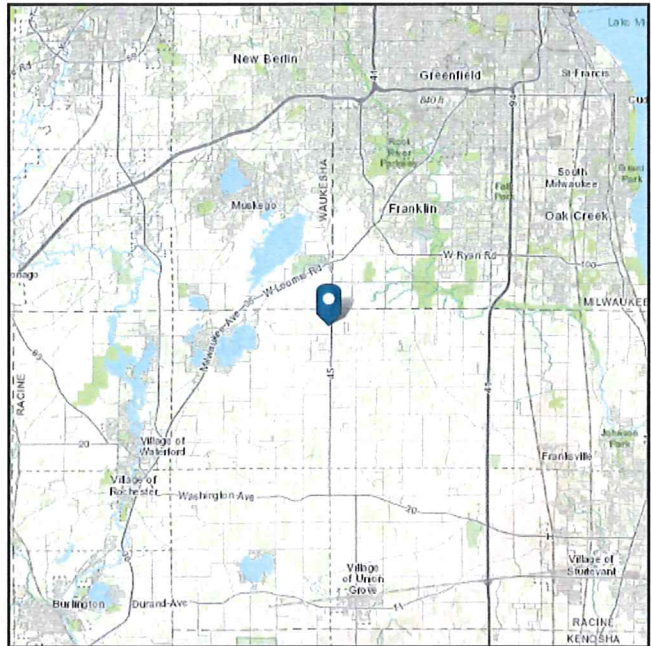
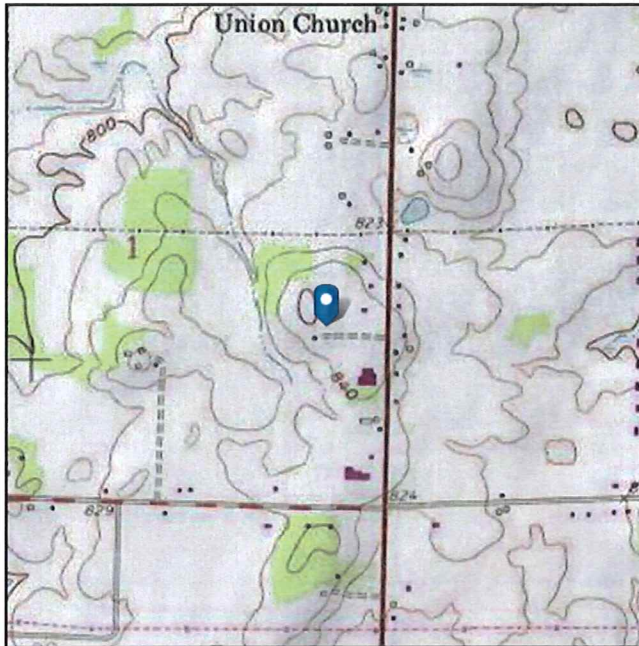
$P_u_c = 55$	$\phi P_n_c = 108.24$	Stress Rating
$V_u = 5$	$\phi V_n = 48.71$	49.4%
$M_u = n/a$	$\phi M_n = n/a$	Pass

# ASCE 7 Hazards Report

**Address:**  
No Address at This Location

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

**Elevation:** 847.89 ft (NAVD 88)  
**Latitude:** 42.8342  
**Longitude:** -88.07255



## Wind

### Results:

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

Data Source: ASCE 7-10, Fig. 26.5-1A and Figs. CC-1-CC-4, and Section 26.5.2, incorporating errata of March 12, 2014

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

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



## Ice

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**Results:**

Ice Thickness: 0.75 in.  
Concurrent Temperature: -5 F  
Gust Speed: 40 mph

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

**Date Accessed:** Tue Jun 22 2021

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

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SGS Project No.:	2105204
Site Name:	Union Church
Site Number:	783315
Analysis Date:	6/22/2021

**Square Inch Calculations**

**TOTAL SQUARE INCHES:** 5,952.05

**PROPOSED EQUIPMENT**

Centerlines (ft)		Quantity	Equipment	Weight (lb)	Length (in)	Width (in)	Depth (in)	Carrier
Mount	Equipment							
185	185	3	MX08FRO665-21	64.5	72	20	8	DISH
		3	TA08025-B604	63.9	15.75	14.9	7.87	DISH
		1	RDIDC-9181-PF-48	21.85	16	14	8	DISH
		3	TA08025-B605	74.9	15.75	14.9	9.06	DISH

**TOTAL SQUARE INCHES:** 0

**EXISTING EQUIPMENT**

Centerlines (ft)		Quantity	Equipment	Weight (lb)	Length (in)	Width (in)	Depth (in)	Carrier
Mount	Equipment							

<b>TOTAL SQUARE INCHES (EXISTING + PROPOSED)</b>	<b>5,952.05</b>
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