Robinson+Cole

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February 1, 2019

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
14-20 Isham Road, West Hartford, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) antennas at the 106-foot level of the existing 125-foot roof-top tower at 14-20 Isham Road in West Hartford, Connecticut (the "Property").[1] The roof-top tower and underlying property are owned by M&R Gassner Family II, LLC. Cellco's use of this tower was approved by the Council in 2008. Cellco now intends to modify its facility by removing nine (9) remote radio heads ("RRHs") and installing six (6) new RRHs behind its antennas. Included in Attachment 1 are specifications for Cellco's new RRHs.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Matthew W. Hart, West Hartford Town Manager; West Hartford's Town Planner, Todd Dumais; and M&R Gassner Family II, LLC, the owner of the Property and the tower.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement RRHs will be attached to Cellco's antenna mounting

[1] The existing facility consists of a 100-foot guyed-lattice tower on top of a 25-foot tall building at the Property.

structure behind its antennas at the 106-foot level.

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

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

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

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

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

A copy of the parcel map and owner information for the Property is included in Attachment 4. A Certificate of Mailing verifying that this filing was sent to municipal officials and the owner of the Property is included in Attachment 5.

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Matthew W. Hart, West Hartford Town Manager
Todd Dumais, West Hartford Town Planner
M&R Gassner Family II, LLC
Tim Parks

ATTACHMENT 1

SAMSUNG

Ultra-Compact Radio Unit 700MHz (B13)

RFD01P-13A

Samsung's RFD01P-13 is a compact remote Radio Unit (RU) designed for deployments that require extreme flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFD01P-13 RU targets support for Band 13 (700MHz) over a near-zero footprint, which makes it ideal for extending broad baseline LTE coverage in virtually any environment.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Ultra-minimal footprint reduces site acquisition and deployment costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability minimizes site maintenance visits
- Convection cooled, silent operation

Key Technical Specifications

Duplex Type: FDD
Operating Frequency:
B13: DL(746-756MHz)/UL(777-787MHz)
Instantaneous Bandwidth: 10MHz
RF Chain: 4T4R/2T4R/2T2R changeable
Output Power: Total 160W
DU-RU Interface: CPRI (10Gbps)
Dimensions(WHD): 320 x 320 x 151mm (15.4L)
Weight: 17kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

ATTACHMENT 2

	General	Power	Density					
Site Name: West Hartford Center								
Tower Height: 100ft (roof-top tower)								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Nextel	12	100	123	851	0.0315	0.5673	0.56%	
*Clearwire	2	724	114	2495	0.0447	1.0000	0.45%	
*Clearwire	1	1239	110	23000	0.0412	1.0000	0.41%	
*Clearwire	1	1239	110	23000	0.0412	1.0000	0.41%	
*Clearwire	1	2060	119	18000	0.0580	1.0000	0.58%	
*MetroPCS AWS	3	727	132	2130	0.0494	1.0000	0.49%	
*MetroPCS LTE	1	866	107	2130	0.0305	1.0000	0.31%	
VZW PCS	**1**	**6100**	**106**	**0.1952**	**1970**	**1.0000**	**19.52%**	
VZW 850 LTE	**1**	**1900**	**106**	**0.0608**	**869**	**0.5793**	**10.50%**	
VZW 850 Cellular	**3**	**422**	**106**	**0.0135**	**869**	**0.5793**	**2.33%**	
VZW AWS	**1**	**6200**	**106**	**0.1984**	**2145**	**1.0000**	**19.84%**	
VZW 700	**1**	**2200**	**106**	**0.0704**	**746**	**0.4973**	**14.16%**	
								69.56%
* Source: Siting Council								

ATTACHMENT 3

Dewberry

Dewberry Engineers Inc.
600 Parsippany Road, Suite 301
Parsippany, NJ 07054

973.739.9400
973.739.9710 fax
www.dewberry.com

Structural Analysis Report For a 100-ft Guyed Tower

Site Name: West Hartford Center CT
Site No.: 467475
Site Address: 14-20 Isham Road
West Hartford, CT 06107

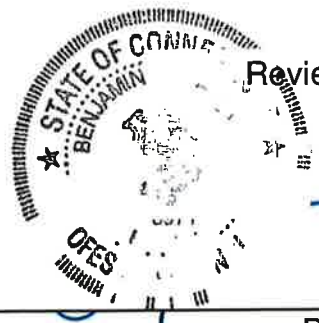
Prepared for:
Verizon Wireless
99 East River Drive
East Hartford, CT 06108

September 5, 2018

Prepared by:
Dewberry Engineers Inc.
600 Parsippany Road, Suite 301
Parsippany, NJ 07054
Dewberry Project Number: 50104156

Tower Controlling Member	% Capacity	Pass/Fail
Tower Components	65.7	Pass
Foundation	73.0	Pass

Tower/Foundation Previously Reinforced?	YES ☐ / NO ☒
Previous Reinforcement Verified?	YES ☐ / NO ☐ Date: **N/A**
Reinforcement Required?	YES ☐ / NO ☒



Reviewed by: Benjamin

Brandon Kelsey, E.I.T
Structural Engineer

Benjamin Revette, P.E.
Connecticut Professional Engineer
License No.: 28971

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1.0 INTRODUCTION AND PROJECT SUMMARY

The objective of this report is to provide the structural analysis for the existing 100-ft Guyed tower on top of the existing 25-ft tall building located in West Hartford, CT to determine the structural integrity for the structure and foundation with the existing + proposed equipment. The telecommunication upgrade is proposed by Verizon Wireless.

Please refer to appendices for the structural analysis package regarding the structural analysis.

2.0 CODES, STANDARDS, AND REFERENCES

The structural analysis was completed according to the provisions of the following Codes and standards:

- TIA/EIA-222-G-2005, Structural Standard for Steel Antenna Supporting Structures and Antennas.
- International Building Code, 2012
- 2016 Connecticut State Building Code – Amendments to IBC 2012
- American Institute of Steel Construction *AISC 360-05, Specifications for Structural Steel Buildings*

The analysis was in compliance with the minimum requirements as specified by TIA-222-G for Hartford County, CT under the following load parameters:

- 97 mph basic wind velocity without ice
- 1" radial ice
- 50 mph basic wind velocity with ice
- 60 mph under service loads

The tower geometry, member sizes, existing antenna loading, and foundation design loading were referenced from the following reports, all of which can be found in Appendix B:

- Original Tower Design Drawings by Cianci & Cianci dated October 22, 1997.
- Tower Mapping Report by GPD Group dated July 9, 2012.
- Structural Tower Analysis by Centek dated July 22, 2016.
- RFDS by Verizon Wireless dated June 25, 2018.
- Site Visit notes by Dewberry Engineers Inc. dated July 23, 2018.

3.0 EXISTING AND PROPOSED TOWER LOADING

3.1 EXISTING (includes Reserved, if applicable) Antenna and Cable information:

Mounting Elevation (ft)	Center Line Elevation (ft)	QTY.	APPURTENANCES DESCRIPTION	COAX
125	141	1	12' Omni	(2) 1-5/8" (1) 7/8"
	130	1	4 Bay Dipole	
		1	10' Omni	
	128	1	6' Omni	
122	123.5	3	LLPX310R-V1	(12) 1-1/4" (1) 2" Flex Conduit (3) 7/8"
	122	3	Samsung SP1-22132825WB RRH	
		1	2'x2'x1' Junction Box	
		1	VHLP1-23	
		3	13' Standoff Mount	
119	119	1	VHLP1-23	(2) 1/2"
118	118	1	VHLP1-23	
106	115	3*	AWS RRH 4x45 (B66a)	(12) 1-5/8" (2) Hybrids
	114	2	DB-T1-6Z-12AB-OZ OVP	
	111	3*	1900 RRH 4x30 (B25)	
	111	3*	700 RRH 4x30 (B13)	
	107	1	BXA-171063-12CF	
		6	SBNHH-1D65B	
		1	BXA-171085-8CF	
		1	BXA-80063/4CF	
		4	SACP 2x5516	
		2	SWCP 2x5514	
	106	3	Valmont 12' Lightweight T-Frame	
69	69	1	4' Yagi	(1) 1/2"
55	55	1	4' Yagi	(1) 1/2" (1) 1-5/8"
32	32	1	2'x2'x1' Junction Box	

*(9) RRHs to be removed and replaced

3.2 PROPOSED Antenna Loading and Cable information:

Mounting Elevation (ft)	Center Line Elevation (ft)	QTY.	APPURTENANCES DESCRIPTION	COAX
106	111	3	B5/B13 RRH	-
		3	B2/B66a RRH	

3.3 Method:

tnxTower, a commercially available engineering software program, was used to create a theoretical mathematical model of the tower members and calculate primary member stresses under various loading conditions. Selected output from the analysis is included in Appendix A.

4.0 TOWER ANALYSIS RESULTS SUMMARY

4.1 Tower Structure Results

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	125 - 105	Leg	2	2	-16241.10	74093.50	21.9	Pass
		Diagonal	7/8	40	-2357.90	9631.38	24.5	Pass
		Horizontal	L2x2x3/16	17	1814.74	23166.00	7.8	Pass
		Top Girt	L2x2x3/16	5	157.38	18739.00	0.8	Pass
		Bottom Girt	L2x2x3/16	8	847.40	23166.00	3.7	Pass
		Guy A@116.958	3/4	258	18436.30	34980.00	52.7	Pass
		Guy B@116.958	3/4	257	20039.50	34980.00	57.3	Pass
		Guy C@116.958	3/4	256	19577.70	34980.00	56.0	Pass
		Top Guy Pull-Off@116.958	3" x 1/4" Plate	35	2484.12	24300.00	21.2	Pass
T2	105 - 85	Leg	2	54	-45727.90	74093.50	61.7	Pass
		Diagonal	7/8	64	-5634.81	9631.38	58.5	Pass
		Horizontal	L2x2x3/16	68	2253.60	23166.00	9.7	Pass
		Top Girt	L2x2x3/16	55	1459.91	18739.00	7.8	Pass
		Bottom Girt	L2x2x3/16	59	2094.34	23166.00	9.0	Pass
T3	85 - 65	Leg	2 1/4	105	-70546.00	107392.00	65.7	Pass
		Diagonal	7/8	151	-5967.60	9729.92	61.3	Pass
		Horizontal	L2x2x3/16	119	2965.63	23166.00	12.8	Pass
		Top Girt	L2x2x3/16	107	804.15	18739.00	4.3	Pass
		Bottom Girt	L2x2x3/16	110	1311.36	23166.00	5.7	Pass
		Guy A@76.9583	7/8	261	22898.10	47820.00	47.9	Pass
		Guy B@76.9583	7/8	260	26011.30	47820.00	54.4	Pass
		Guy C@76.9583	7/8	259	24582.70	47820.00	51.4	Pass
		Top Guy Pull-Off@76.9583	3" x 1/4" Plate	136	7254.38	24300.00	29.9	Pass
T4	65 - 45	Leg	2	156	-46576.10	74093.50	62.9	Pass
		Diagonal	7/8	204	-4839.71	9631.38	50.2	Pass
		Horizontal	L2x2x1/8	197	2947.56	15693.80	18.8	Pass
		Top Girt	L2x2x1/8	158	1842.66	15693.80	11.7	Pass
		Bottom Girt	L2x2x1/8	160	1537.32	15693.80	9.8	Pass
T5	45 - 29	Leg	2	207	-31415.50	74603.20	42.1	Pass
		Diagonal	7/8	246	-2921.46	9676.41	30.2	Pass
		Horizontal	L2x2x1/8	239	2869.30	15693.80	18.3	Pass
		Top Girt	L2x2x1/8	209	1592.61	15693.80	10.1	Pass
		Bottom Girt	L2x2x1/8	211	5132.28	15693.80	32.7	Pass
T6	29 - 25	Leg	2	248	-38021.90	95668.20	39.7	Pass
		Top Girt	L3x3x1/8	250	4929.85	23793.80	20.7	Pass
		Bottom Girt	12" x 3/8" Plate	254	-253.69	116106.00	0.2	Pass
							Summary	
						Leg (T3)	65.7	Pass
						Diagonal (T3)	61.3	Pass
						Horizontal (T4)	18.8	Pass
						Top Girt (T6)	20.7	Pass
						Bottom Girt (T5)	32.7	Pass
						Guy A (T1)	52.7	Pass
						Guy B (T1)	57.3	Pass
						Guy C (T1)	56.0	Pass
						Top Guy Pull-Off (T3)	29.9	Pass
						Bolt Checks	24.8	Pass
						RATING =	**65.7**	**Pass**

The above (tower Structural results" table displays the calculated stress ratio capacity of the tower member.

**Note: Capacities up to 105% are considered acceptable (where applicable)*

4.2 Foundation results

Guy forces are transferred to the existing building structure via three (3) 7/8" ø and three (3) 3/4" ø galvanized steel guy wires with turnbuckles. All guy anchorage posts are positively attached to the existing building structure. Connections to the existing building were originally designed by Cianci & Cianci Structural Engineers job no: 97-113-01 dated October 22, 1997.

Review of the guy anchor and tower base connections consisted of a comparison of the proposed reactions and the design reactions obtained from the aforementioned design documents:

Calculated Proposed + Existing Equipment Loading Reactions Compared To Previous Reactions:

CONDITION	CALCULATED TOWER REACTIONS (Rev G) (kips)	Original DESIGN REACTIONS (Rev F) (kips)	Original DESIGN REACTIONS X 1.35 (Rev G) (kips)	Capacity	PASS/ FAIL
Tower Base Vert.	104.46	106	143.1	73.0%	PASS
Tower Base Horiz.	0.86	1.6	2.16	39.8%	PASS
Guy Anchor A @ 45' Vert.	33.61	45.1	60.89	55.2%	PASS
Guy Anchor A @ 45' Horiz.	22.38	31.7	42.80	52.3%	PASS
Guy Anchor B @ 39' Vert.	39.11	51.6	69.66	56.1%	PASS
Guy Anchor B @ 39' Horiz.	22.73	32.0	43.2	52.6%	PASS
Guy Anchor C @ 37.5' Vert.	36.90	47.8	64.53	57.2%	PASS
Guy Anchor C @ 37.5' Horiz.	22.83	31.6	42.66	53.5%	PASS

5.0 CONCLUSIONS AND COMMENTARY

After analysis, it was determined that the existing tower structure **is adequate** to support the proposed forces as a result of the telecommunication upgrade.

This analysis is limited to the tower structure only. No building analysis or condition assessment was considered and is not part of the scope of this project. This analysis demonstrates a reduction of overall loading from the original design but does not evaluate the imposed tower and guy loads on the building structure. Our analysis assumes the building and the tower have been properly maintained and are in good condition. Any discovery of damage of disrepair should immediately be brought to the attention of the tower owner, building owner, and Dewberry Engineers.

This engineering analysis is based upon the theoretical capacity of the structure. It is not a condition assessment of the tower and its foundation. It is the responsibility of Verizon Wireless to verify that the tower modeled and analyzed is the correct structure modeled. Dewberry Engineers Inc. reserves the right to add to or modify this report if more information becomes available. The conclusions reached by Dewberry Engineers Inc. in this report are only applicable to the previously mentioned existing structural elements supporting the proposed wireless telecommunications installation. The results of this report are based on the assumption that existing structural elements have been installed per the original design documents, have been well maintained and are uncompromised. This report does not imply that a thorough inspection of the existing structure has been performed. Any deviation of the support condition, loading, location, placement, equipment configuration, etc, will require Dewberry Engineers Inc. to generate an additional structural analysis.

6.0 ASSUMPTIONS

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

1. The tower member sizes and shapes are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and as stated in the materials section.
2. The antenna configuration is as supplied and/or as modeled in the analysis. It is assumed to be complete and accurate. All antennas, mounts, coax and waveguides are assumed to be properly installed and supported as per manufacturer requirements.
3. Some assumptions are made regarding antennas and mount sizes and their projected areas based on best interpretation of data supplied and of best knowledge of antenna type and industry practice.
4. All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5. Foundations are properly designed and constructed to resist the original design loads indicated in the documents provided.
6. The tower and structures have been properly maintained in accordance with TIA Standards and/or with manufacturer's specifications.

7. All welds and connections are assumed to develop at least the member capacity unless determined otherwise and explicitly stated in this report.
8. All prior structural modifications are assumed to be as per data supplied/ available and to have been properly installed.
9. All existing loading was obtained from the structural analysis found in Appendix B, prepared by Black & Veatch, and is assumed to be accurate.

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

7.0 DISCLAIMER OF WARRANTIES

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

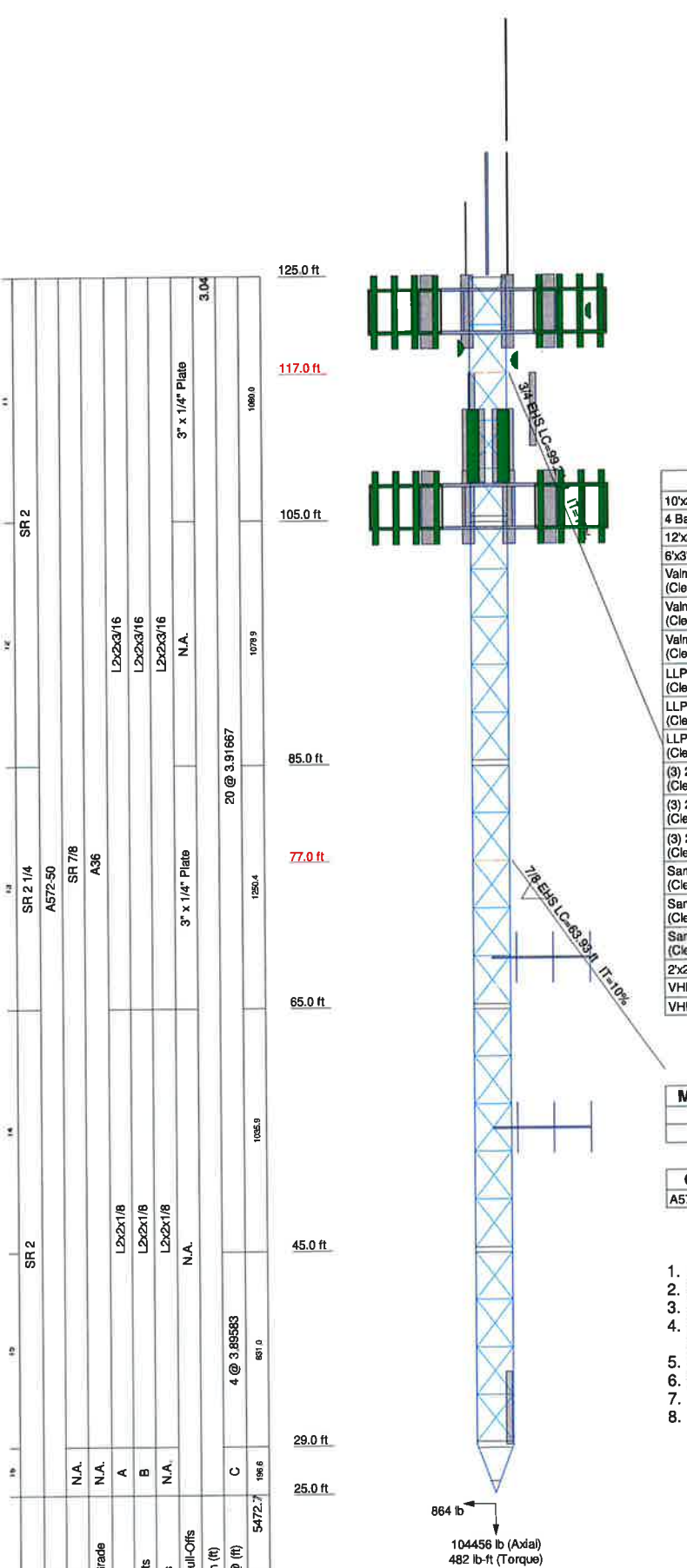
Dewberry Engineers Inc. does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. Dewberry Engineers Inc. provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to calculate the structural integrity for the existing tower under existing and proposed loadings.

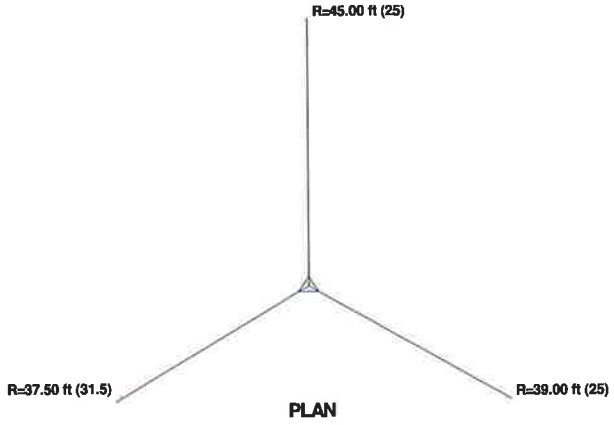
If the amount of ice accumulation is in excess of the specified code recommended amount, that should be considered in the structural analysis.

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

APPENDIX A

tnxTOWER OUTPUT FOR PROPOSED LOADING





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10'x3" Dia Omni	125	VHLP1-23	118
4 Bay DIPole	125	BXA-171063-12CF w/ Mast Pipe (Verizon)	106
12'x3" Dia Omni	125	(2) SBNHH-1D65B w/ Mast Pipe (Verizon)	106
6'x3" Dia Omni	125	BXA-171085-8CF w/ Mast Pipe (Verizon)	106
Valmont 13' standoff Mounting Frame (Clearwire)	122	BXA-80063/4CF w/ Mast Pipe (Verizon)	106
Valmont 13' standoff Mounting Frame (Clearwire)	122	SACP 2x5516 w/ Mast Pipe (Verizon)	106
Valmont 13' standoff Mounting Frame (Clearwire)	122	(2) SBNHH-1D65B w/ Mast Pipe (Verizon)	106
LLPX310R-V1 W/ Mast Pipe (Clearwire)	122	SACP 2x5516 w/ Mast Pipe (Verizon)	106
LLPX310R-V1 W/ Mast Pipe (Clearwire)	122	SWCP 2x5514 w/ Mast Pipe (Verizon)	106
LLPX310R-V1 W/ Mast Pipe (Clearwire)	122	SACP 2x5516 w/ Mast Pipe (Verizon)	106
(3) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	122	(2) SBNHH-1D65B w/ Mast Pipe (Verizon)	106
(3) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	122	SACP 2x5516 w/ Mast Pipe (Verizon)	106
(3) 2-3/8" OD Mast Pipe (6' Long) (Clearwire)	122	SWCP 2x5514 w/ Mast Pipe (Verizon)	106
Samsung SP1-22132825WB RRH (Clearwire)	122	B5/B13 RRH (Verizon)	106
Samsung SP1-22132825WB RRH (Clearwire)	122	B5/B13 RRH (Verizon)	106
Samsung SP1-22132825WB RRH (Clearwire)	122	B5/B13 RRH (Verizon)	106
2'x2'x1' junction box (Clearwire)	122	B2/B66A RRH (Verizon)	106
VHLP1-23	122	B2/B66A RRH (Verizon)	106
VHLP1-23	119	B2/B66A RRH (Verizon)	106
		(2) DB-T1-6Z-12AB-0Z OVP (Verizon)	106
		valmont 12' T-Frame (Verizon)	106
		valmont 12' T-Frame (Verizon)	106
		valmont 12' T-Frame (Verizon)	106
		4' Yagi	69
		4' Yagi	55
		2'x2'x1' junction box	32

SYMBOL LIST

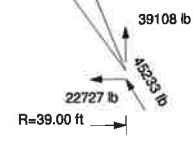
MARK	SIZE	MARK	SIZE
A	L3x3x1/8	C	1 @ 2.78842
B	12" x 3/8" Plate		

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 Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 99 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 65.7%



ALL REACTIONS ARE FACTORED

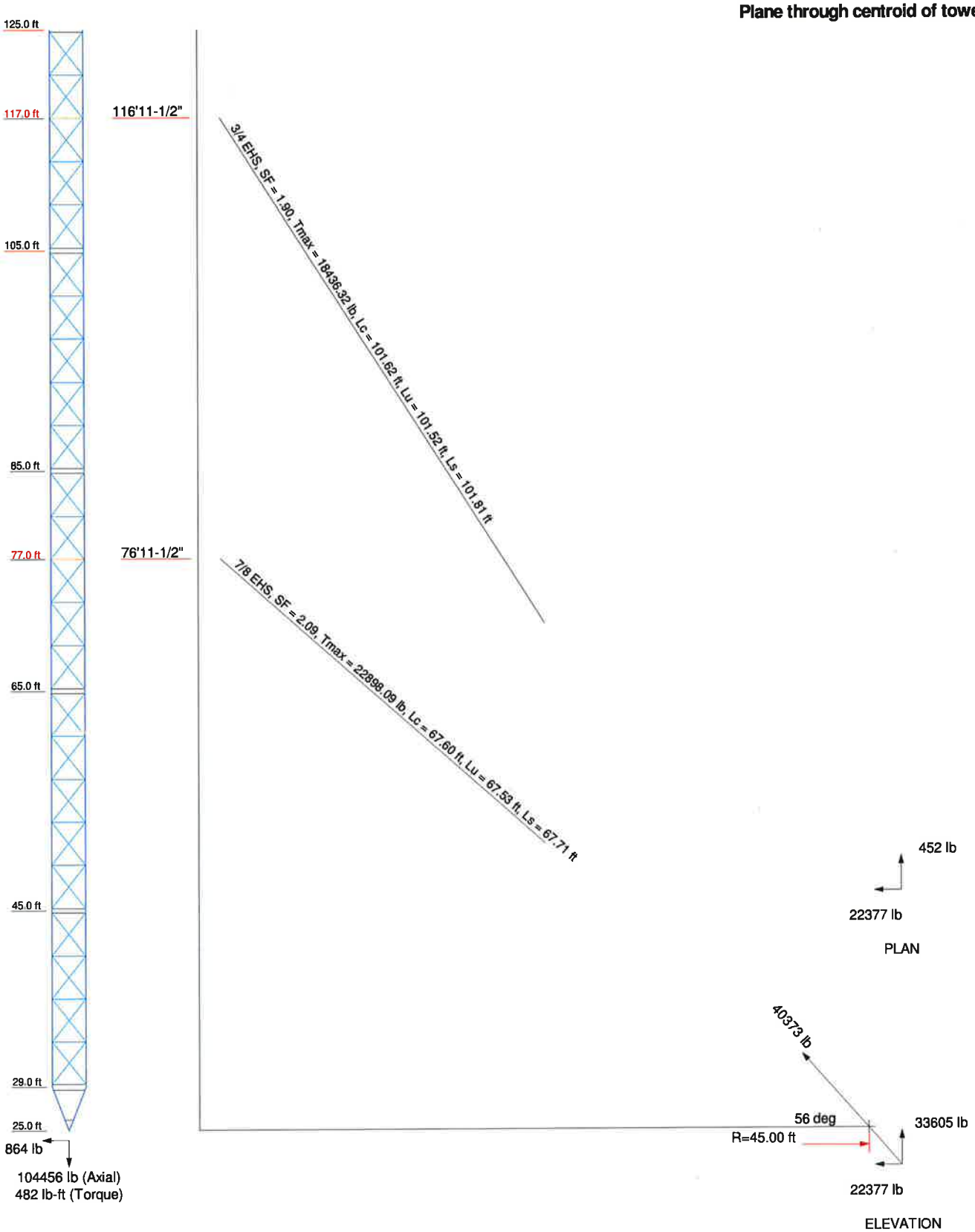
Dewberry Engineers Inc.
600 Parsippany Road, Suite 301
Parsippany, NJ 07054
Phone: (973) 739-9400
FAX: (973) 739-9710

Job: **West Hartford Center CT**			
Project: **50002925 / 50104156**			
Client: Verizon Wireless	Drawn by: Bkelsey	App'd:	
Code: TIA-222-G	Date: 09/05/18	Scale: N	
Path:		Dwg No.	

Guy Tensions and Tower Reactions

TIA-222-G - 99 mph/50 mph 1.0000 in Ice Exposure C

Maximum Values
Anchor 'A'@45 ft Azimuth 0 deg Elev 25 ft
Plane through centroid of tower



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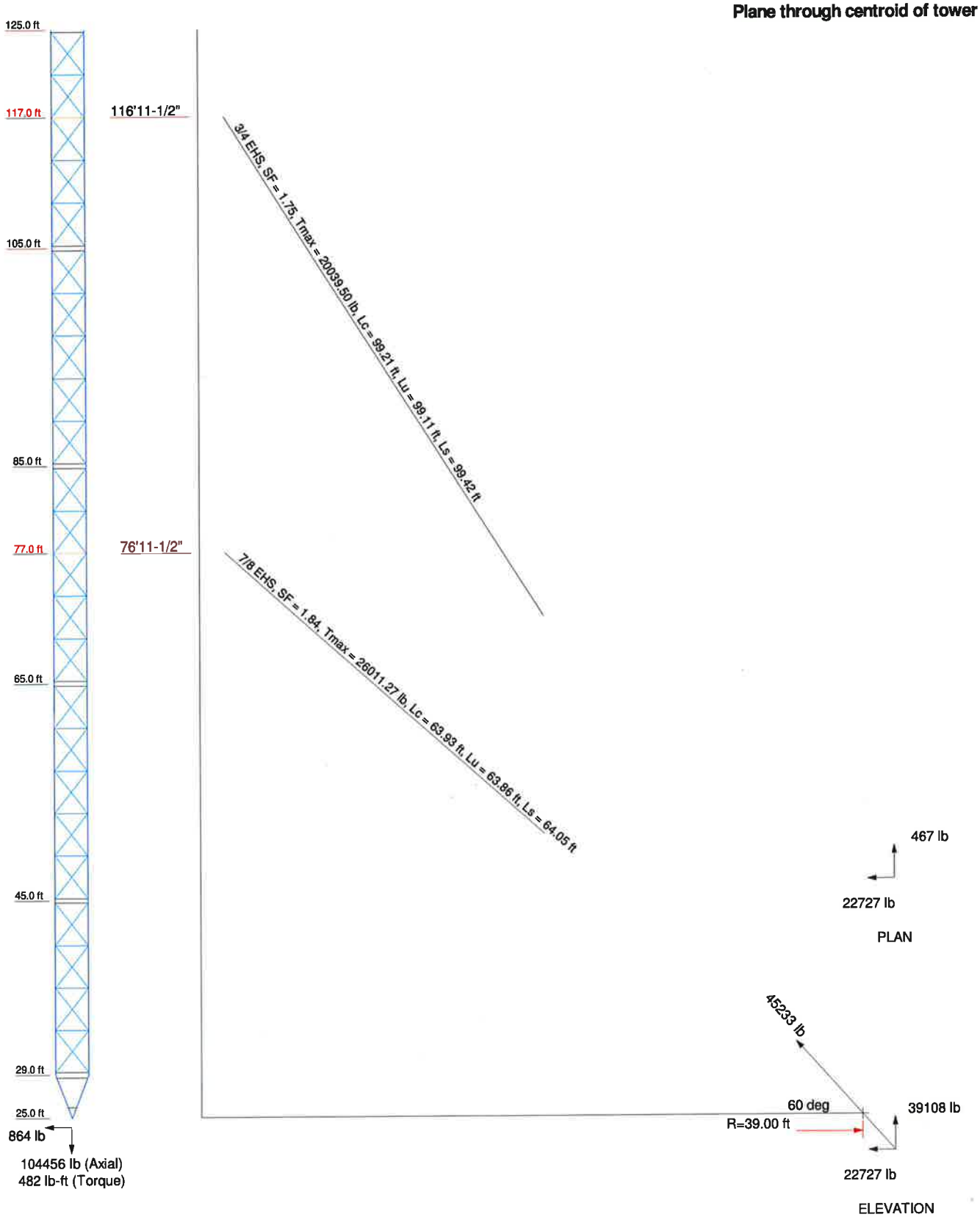
Code: TIA-222-G	Date: 09/05/18		Scale: N
Path:			Dwg No.

Guy Tensions and Tower Reactions

TIA-222-G - 99 mph/50 mph 1.0000 in Ice Exposure C

Maximum Values
Anchor 'B'@39 ft Azimuth 120 deg Elev 25 ft
Plane through centroid of tower



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Client: Verizon Wireless	Drawn by: Bkelsey	App'd:	
Code: TIA-222-G	Date: 09/05/18	Scale: N	
Path:		Dwg No.	

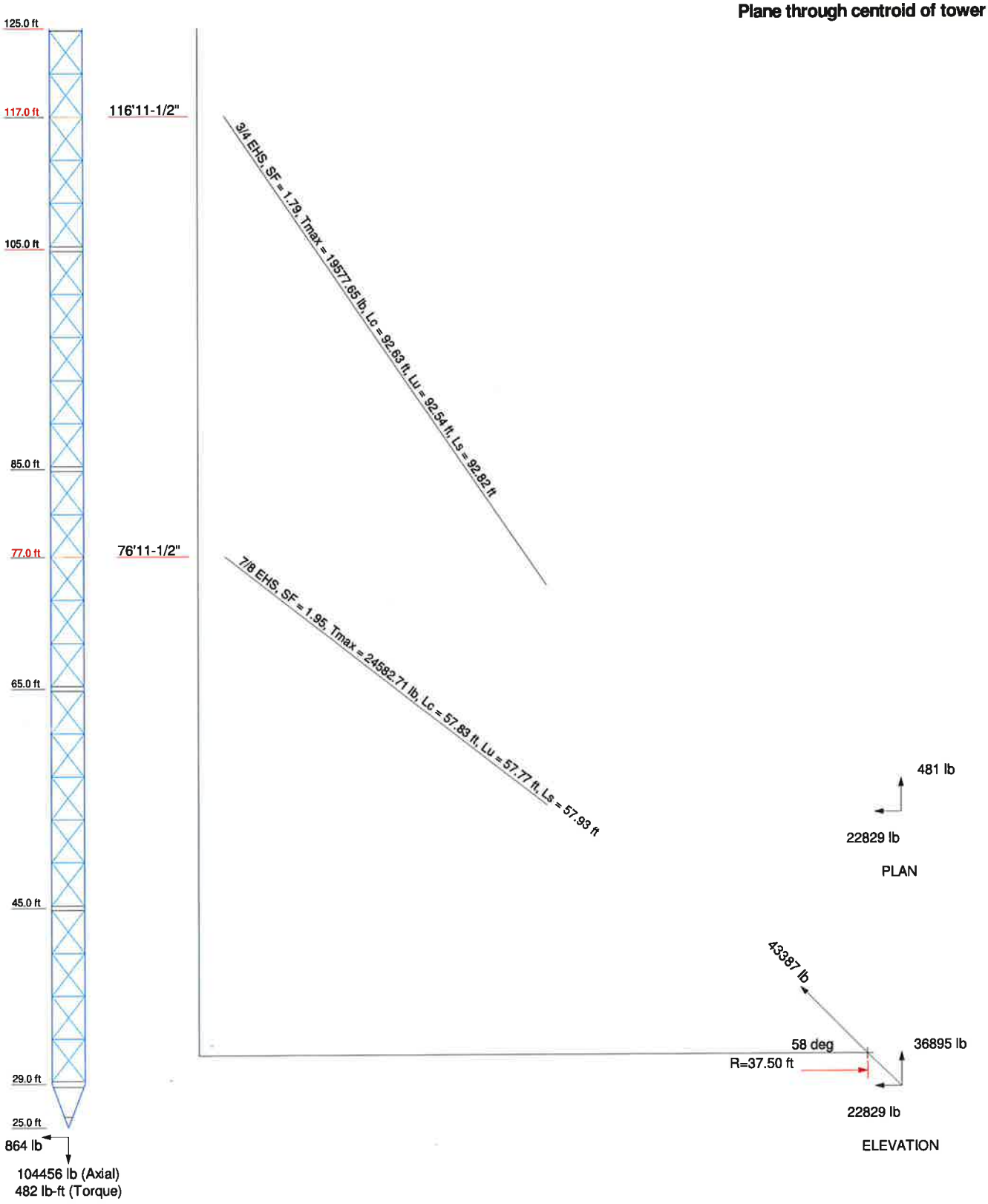
Guy Tensions and Tower Reactions

TIA-222-G - 99 mph/50 mph 1.0000 in Ice Exposure C

Maximum Values

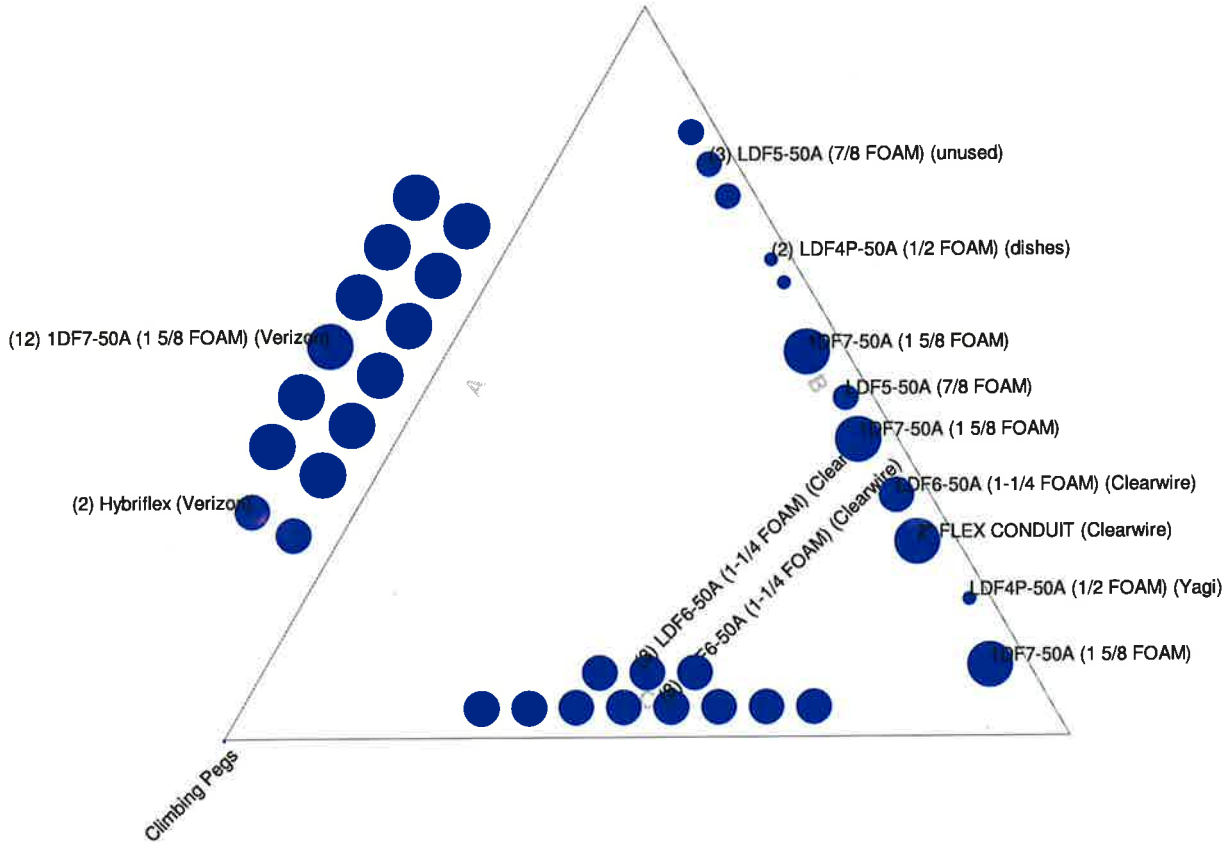
Anchor 'C'@37.5 ft Azimuth 240 deg Elev 31.5 ft

Plane through centroid of tower



Dewberry Engineers Inc. 600 Parsippany Road, Suite 301 Parsippany, NJ 07054 Phone: (973) 739-9400 FAX: (973) 739-9710	Job: ***West Hartford Center CT***		
	Project: ***50002925 / 50104156***		
	Client: Verizon Wireless	Drawn by: Bkelsey	App'd:
	Code: TIA-222-G	Date: 09/05/18	Scale: N
	Path:		Dwg No.

Round Flat App In Face App Out Face



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Code: TIA-222-G	Date: 09/05/18	Scale: N	
Path:		Dwg No.	

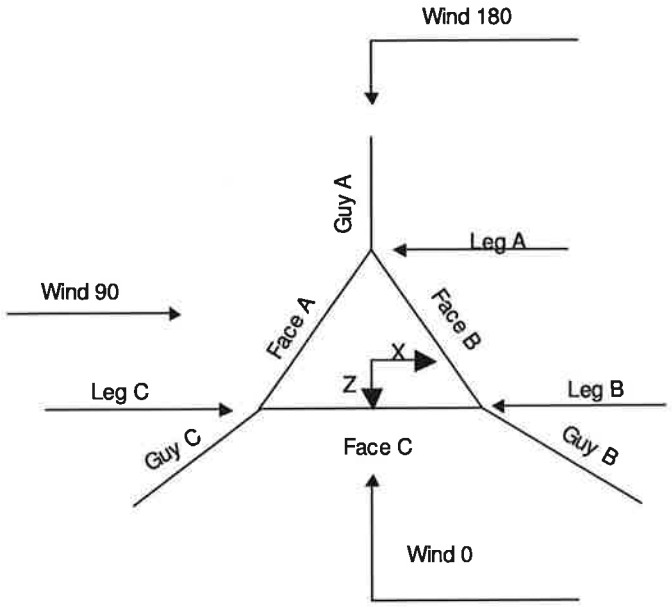
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 125.00 ft above the ground line.
The base of the tower is set at an elevation of 25.00 ft above the ground line.
The face width of the tower is 3.04 ft at the top and tapered at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 99 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 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.
Pressures are calculated at each section.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	125.00-105.00			3.04	1	20.00
T2	105.00-85.00			3.04	1	20.00
T3	85.00-65.00			3.04	1	20.00
T4	65.00-45.00			3.04	1	20.00
T5	45.00-29.00			3.04	1	16.00
T6	29.00-25.00			3.04	1	4.00

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
	ft	ft				in	in
T1	125.00-105.00	3.92	X Brace	No	Yes	2.5000	2.5000
T2	105.00-85.00	3.92	X Brace	No	Yes	2.5000	2.5000
T3	85.00-65.00	3.92	X Brace	No	Yes	2.5000	2.5000
T4	65.00-45.00	3.92	X Brace	No	Yes	2.5000	2.5000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	45.00-29.00	3.90	X Brace	No	Yes	2.5000	2.5000
T6	29.00-25.00	2.79	X Brace	No	Yes	2.5390	12.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 125.00-105.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 105.00-85.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 85.00-65.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 65.00-45.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T5 45.00-29.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T6 29.00-25.00	Solid Round	2	A572-50 (50 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 125.00-105.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 105.00-85.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 85.00-65.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 65.00-45.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 45.00-29.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 29.00-25.00	Single Angle	L3x3x1/8	A36 (36 ksi)	Flat Bar	12" x 3/8" Plate	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 125.00-105.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 105.00-85.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 85.00-65.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 65.00-45.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 45.00-29.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 29.00-25.00	1	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 125.00-105.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 105.00-85.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 85.00-65.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 65.00-45.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 45.00-29.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 29.00-25.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
125.00-105.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
105.00-85.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
85.00-65.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
65.00-45.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
45.00-29.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
29.00-25.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 125.00-105.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 105.00-85.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 85.00-65.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 65.00-45.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 45.00-29.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 29.00-25.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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 125.00-105.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 105.00-85.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 85.00-65.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 65.00-45.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 45.00-29.00	Flange	0.7500 A325N	3	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 29.00-25.00	Flange	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
116.958	EHS	A	3/4	5830.00	10%	19000	1.155	101.53	45.00	0.0000	25.00	100%
		B	3/4	5830.00	10%	19000	1.155	99.12	39.00	0.0000	25.00	100%
		C	3/4	5830.00	10%	19000	1.155	92.55	37.50	0.0000	31.50	100%

76.9583	EHS	A	7/8	7970.00	10%	19000	1.581	67.54	45.00	0.0000	25.00	100%
		B	7/8	7970.00	10%	19000	1.581	63.87	39.00	0.0000	25.00	100%
		C	7/8	7970.00	10%	19000	1.581	57.78	37.50	0.0000	31.50	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
116.958	Corner						
76.9583	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
116.96	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	3" x 1/4" Plate
76.96	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	3" x 1/4" Plate

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
116.958	117.26	114.49	106.89		1.01 1.7 sec/pulse	0.97 1.7 sec/pulse	0.84 1.6 sec/pulse	
76.9583	106.78	100.98	91.34		0.45 1.2 sec/pulse	0.40 1.1 sec/pulse	0.33 1.0 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
116.958	No	No			1	1	1	1
76.9583	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
116.958	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
76.9583	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
116.958	A	70.98	25	6	2.1592
	B	70.98	25	6	2.1592
	C	74.23	25	6	2.1689
76.9583	A	50.98	23	6	2.0889
	B	50.98	23	6	2.0889
	C	54.23	24	6	2.1019

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
116.958	A	64.8140	5936.11 5830.00	0.00	5382.38	-2503.49	-9446.85	0.00	0.00
	B	67.9511	5936.11 5830.00	1912.54	5510.03	1104.20	4835.45	0.00	-8375.24
	C	67.3018	5928.61 5830.00	-1964.69	5477.39	1134.31	4806.81	-0.00	8325.63
			Sum:	**-52.15**	16369.79	**-264.98**	**195.40**	-0.00	**-49.60**
76.9583	A	50.2294	8052.07 7970.00	0.00	6210.75	-5124.69	-10900.77	0.00	0.00
	B	54.3662	8052.07 7970.00	4041.89	6561.50	2333.59	5758.19	0.00	-9973.49
	C	51.8213	8041.80 7970.00	-4285.54	6338.99	2474.26	5562.92	-0.00	9635.26
			Sum:	**-243.65**	19111.24	**-316.84**	**420.35**	-0.00	**-338.22**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
116.958	A	64.8140	8886.57 8075.46	0.00	8122.28	-3605.51	-14255.78	0.00	0.00
	B	67.9511	8763.74 7952.61	2714.62	8183.98	1567.29	7182.04	0.00	-12439.66
	C	67.3018	8710.02 7951.09	-2781.48	8096.23	1605.89	7105.03	-0.00	12306.28
			Sum:	-66.86	24402.50	-432.34	31.29	-0.00	-133.38
76.9583	A	50.2294	11508.15 11033.45	0.00	8971.25	-7207.94	-15745.84	0.00	0.00
	B	54.3662	11405.37 10930.66	5633.30	9368.58	3252.39	8221.61	0.00	-14240.24
	C	51.8213	11353.89 10934.92	-5964.31	9026.64	3443.49	7921.53	-0.00	13720.49
			Sum:	-331.00	27366.46	-512.05	397.30	-0.00	-519.75

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
116.958	A	64.8140	5936.11 5830.00	0.00	5382.38	-2503.49	-9446.85	0.00	0.00
	B	67.9511	5936.11 5830.00	1912.54	5510.03	1104.20	4835.45	0.00	-8375.24
	C	67.3018	5928.61 5830.00	-1964.69	5477.39	1134.31	4806.81	-0.00	8325.63
			Sum:	-52.15	16369.79	-264.98	195.40	-0.00	-49.60
76.9583	A	50.2294	8052.07 7970.00	0.00	6210.75	-5124.69	-10900.77	0.00	0.00
	B	54.3662	8052.07 7970.00	4041.89	6561.50	2333.59	5758.19	0.00	-9973.49
	C	51.8213	8041.80 7970.00	-4285.54	6338.99	2474.26	5562.92	-0.00	9635.26
			Sum:	-243.65	19111.24	-316.84	420.35	-0.00	-338.22

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
				Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept	Initial Tension	Intercept
ft		ft	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft	lb	ft
116.958	A	43.24	91.96	6279	0.94	6129	0.96	5979	0.99	5830	1.01	5681	1.04	5531	1.07	5382	1.10
	B	37.24	91.96	6180	0.91	6063	0.93	5946	0.95	5830	0.97	5714	0.99	5597	1.01	5481	1.03
	C	35.74	85.46	6200	0.79	6076	0.81	5953	0.82	5830	0.84	5707	0.86	5584	0.88	5461	0.90
76.9583	A	43.24	51.96	9357	0.38	8894	0.40	8432	0.43	7970	0.45	7509	0.48	7049	0.51	6590	0.54
	B	37.24	51.96	9122	0.35	8737	0.37	8353	0.38	7970	0.40	7587	0.42	7204	0.45	6822	0.47
	C	35.74	45.46	9267	0.28	8834	0.30	8402	0.31	7970	0.33	7539	0.35	7108	0.37	6678	0.39

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
Climbing Pegs	C	No	Ar (CaAa)	125.00 - 29.00	0.0000	0.5	1	1	0.2500 0.0000	0.1500		0.31
1DF7-50A (1 5/8 FOAM) (Verizon)	A	No	Ar (CaAa)	106.00 - 29.00	1.0000	0	12	6	0.5000	1.9800		0.82
Hybriflex (Verizon)	A	No	Ar (CaAa)	106.00 - 29.00	1.0000	-0.25	2	1	0.5000	1.5400		1.08
LDF6-50A (1-1/4 FOAM) (Clearwire)	C	No	Ar (CaAa)	122.00 - 29.00	-0.5000	0	8	8	0.5000	1.5500		0.66
LDF6-50A (1-1/4 FOAM) (Clearwire)	C	No	Ar (CaAa)	122.00 - 29.00	-2.0000	0	3	3	0.5000	1.5500		0.66
1DF7-50A (1 5/8 FOAM)	B	No	Ar (CaAa)	125.00 - 29.00	-0.5000	-0.05	1	1	0.5000	1.9800		0.82
1DF7-50A (1 5/8 FOAM)	B	No	Ar (CaAa)	125.00 - 29.00	-0.5000	0.07	1	1	0.5000	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	No	Ar (CaAa)	125.00 - 29.00	-0.5000	0.02	1	1	0.5000	1.0900		0.33
LDF4P-50A (1/2 FOAM) (dishes)	B	No	Ar (CaAa)	122.00 - 29.00	-0.5000	-0.15	2	2	0.5000	0.6300		0.15
LDF5-50A (7/8 FOAM) (unused)	B	No	Ar (CaAa)	122.00 - 29.00	-0.5000	-0.3	3	3	0.5000	1.0900		0.33
LDF6-50A (1-1/4 FOAM) (Clearwire)	B	No	Ar (CaAa)	122.00 - 29.00	-0.5000	0.15	1	1	0.5000	1.5500		0.66
2" FLEX CONDUIT (Clearwire)	B	No	Ar (CaAa)	122.00 - 29.00	-0.5000	0.21	1	1	0.5000	2.0000		0.32
LDF4P-50A (1/2 FOAM) (Yagi)	B	No	Ar (CaAa)	69.00 - 55.00	-0.5000	0.3	2	2	0.5000	0.6300		0.15
LDF4P-50A (1/2 FOAM) (Yagi)	B	No	Ar (CaAa)	55.00 - 29.00	-0.5000	0.3	1	1	0.5000	0.6300		0.15
1DF7-50A (1 5/8 FOAM)	B	No	Ar (CaAa)	69.00 - 29.00	-0.5000	0.38	1	1	0.5000	1.9800		0.82

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	125.00-105.00	A	0.000	0.000	2.684	0.000	12.00
		B	0.000	0.000	23.836	0.000	77.99
		C	0.000	0.000	29.285	0.000	129.62
T2	105.00-85.00	A	0.000	0.000	53.680	0.000	240.00
		B	0.000	0.000	26.260	0.000	84.80
		C	0.000	0.000	34.400	0.000	151.40

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T3	85.00-65.00	A	0.000	0.000	53.680	0.000	240.00
		B	0.000	0.000	27.556	0.000	89.28
		C	0.000	0.000	34.400	0.000	151.40
T4	65.00-45.00	A	0.000	0.000	53.680	0.000	240.00
		B	0.000	0.000	32.110	0.000	105.70
		C	0.000	0.000	34.400	0.000	151.40
T5	45.00-29.00	A	0.000	0.000	42.944	0.000	192.00
		B	0.000	0.000	25.184	0.000	83.36
		C	0.000	0.000	27.520	0.000	121.12
T6	29.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	125.00-105.00	A	2.266	0.000	0.000	3.884	0.000	81.30
		B		0.000	0.000	98.222	0.000	1550.91
		C		0.000	0.000	79.867	0.000	1252.12
T2	105.00-85.00	A	2.223	0.000	0.000	77.098	0.000	1596.59
		B		0.000	0.000	107.519	0.000	1655.27
		C		0.000	0.000	91.577	0.000	1418.56
T3	85.00-65.00	A	2.171	0.000	0.000	76.389	0.000	1561.42
		B		0.000	0.000	112.222	0.000	1686.16
		C		0.000	0.000	90.691	0.000	1382.81
T4	65.00-45.00	A	2.105	0.000	0.000	75.484	0.000	1517.09
		B		0.000	0.000	130.333	0.000	1921.69
		C		0.000	0.000	89.561	0.000	1337.73
T5	45.00-29.00	A	2.023	0.000	0.000	59.495	0.000	1170.63
		B		0.000	0.000	97.710	0.000	1435.64
		C		0.000	0.000	70.536	0.000	1026.40
T6	29.00-25.00	A	1.960	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	125.00-105.00	1.6411	1.7831	1.3182	0.8902
T2	105.00-85.00	-1.6745	0.1590	0.4840	0.7254
T3	85.00-65.00	-1.5256	0.2137	0.5185	0.7476
T4	65.00-45.00	-1.0413	0.3980	0.9432	0.9073
T5	45.00-29.00	-1.1261	0.3724	1.0973	0.9843
T6	29.00-25.00	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Climbing Pegs	105.00 - 125.00	0.6000	0.2767
T1	2	1DF7-50A (1 5/8 FOAM)	105.00 - 106.00	0.6000	0.2767
T1	3	Hybriflex	105.00 - 106.00	0.6000	0.2767
T1	4	LDF6-50A (1-1/4 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	5	LDF6-50A (1-1/4 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	6	1DF7-50A (1 5/8 FOAM)	105.00 - 125.00	0.6000	0.2767
T1	7	1DF7-50A (1 5/8 FOAM)	105.00 - 125.00	0.6000	0.2767
T1	8	LDF5-50A (7/8 FOAM)	105.00 - 125.00	1.0000	1.0000
T1	9	LDF4P-50A (1/2 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	10	LDF5-50A (7/8 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	11	LDF6-50A (1-1/4 FOAM)	105.00 - 122.00	1.0000	1.0000
T1	12	2" FLEX CONDUIT	105.00 - 122.00	0.6000	0.2767
T2	1	Climbing Pegs	85.00 - 105.00	0.6000	0.2798
T2	2	1DF7-50A (1 5/8 FOAM)	85.00 - 105.00	0.6000	0.2798
T2	3	Hybriflex	85.00 - 105.00	0.6000	0.2798
T2	4	LDF6-50A (1-1/4 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	5	LDF6-50A (1-1/4 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	6	1DF7-50A (1 5/8 FOAM)	85.00 - 105.00	0.6000	0.2798
T2	7	1DF7-50A (1 5/8 FOAM)	85.00 - 105.00	0.6000	0.2798
T2	8	LDF5-50A (7/8 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	9	LDF4P-50A (1/2 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	10	LDF5-50A (7/8 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	11	LDF6-50A (1-1/4 FOAM)	85.00 - 105.00	1.0000	1.0000
T2	12	2" FLEX CONDUIT	85.00 - 105.00	0.6000	0.2798
T3	1	Climbing Pegs	65.00 - 85.00	0.6000	0.2919
T3	2	1DF7-50A (1 5/8 FOAM)	65.00 - 85.00	0.6000	0.2919
T3	3	Hybriflex	65.00 - 85.00	0.6000	0.2919
T3	4	LDF6-50A (1-1/4 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	5	LDF6-50A (1-1/4 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	6	1DF7-50A (1 5/8 FOAM)	65.00 - 85.00	0.6000	0.2919
T3	7	1DF7-50A (1 5/8 FOAM)	65.00 - 85.00	0.6000	0.2919
T3	8	LDF5-50A (7/8 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	9	LDF4P-50A (1/2 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	10	LDF5-50A (7/8 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	11	LDF6-50A (1-1/4 FOAM)	65.00 - 85.00	1.0000	1.0000
T3	12	2" FLEX CONDUIT	65.00 - 85.00	0.6000	0.2919
T3	13	LDF4P-50A (1/2 FOAM)	65.00 - 69.00	1.0000	1.0000
T3	15	1DF7-50A (1 5/8 FOAM)	65.00 - 69.00	0.6000	0.2919
T4	1	Climbing Pegs	45.00 - 65.00	0.6000	0.3046
T4	2	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.3046
T4	3	Hybriflex	45.00 - 65.00	0.6000	0.3046
T4	4	LDF6-50A (1-1/4 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	5	LDF6-50A (1-1/4 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	6	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.3046
T4	7	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.3046
T4	8	LDF5-50A (7/8 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	9	LDF4P-50A (1/2 FOAM)	45.00 - 65.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	10	LDF5-50A (7/8 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	11	LDF6-50A (1-1/4 FOAM)	45.00 - 65.00	1.0000	1.0000
T4	12	2" FLEX CONDUIT	45.00 - 65.00	0.6000	0.3046
T4	13	LDF4P-50A (1/2 FOAM)	55.00 - 65.00	1.0000	1.0000
T4	14	LDF4P-50A (1/2 FOAM)	45.00 - 55.00	1.0000	1.0000
T4	15	1DF7-50A (1 5/8 FOAM)	45.00 - 65.00	0.6000	0.3046
T5	1	Climbing Pegs	29.00 - 45.00	0.6000	0.3178
T5	2	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.3178
T5	3	Hybriflex	29.00 - 45.00	0.6000	0.3178
T5	4	LDF6-50A (1-1/4 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	5	LDF6-50A (1-1/4 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	6	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.3178
T5	7	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.3178
T5	8	LDF5-50A (7/8 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	9	LDF4P-50A (1/2 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	10	LDF5-50A (7/8 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	11	LDF6-50A (1-1/4 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	12	2" FLEX CONDUIT	29.00 - 45.00	0.6000	0.3178
T5	14	LDF4P-50A (1/2 FOAM)	29.00 - 45.00	1.0000	1.0000
T5	15	1DF7-50A (1 5/8 FOAM)	29.00 - 45.00	0.6000	0.3178

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
10'x3" Dia Omni	A	From Leg	0.25	0.0000	125.00	No Ice	3.00	3.00	35.00
			0.00			1/2" Ice	4.03	4.03	56.79
			5.00			1" Ice	5.03	5.03	85.14
4 Bay DiPole	B	From Leg	0.25	0.0000	125.00	No Ice	3.15	3.15	32.00
			0.00			1/2" Ice	5.67	5.67	42.00
			5.00			1" Ice	8.19	8.19	52.00
12'x3" Dia Omni	B	From Leg	0.25	0.0000	125.00	No Ice	3.60	3.60	36.00
			0.00			1/2" Ice	4.83	4.83	62.06
			16.00			1" Ice	6.08	6.08	95.92
6'x3" Dia Omni	C	From Leg	0.25	0.0000	125.00	No Ice	1.77	1.77	20.00
			0.00			1/2" Ice	2.13	2.13	33.24
			3.00			1" Ice	2.50	2.50	50.59
Valmont 13' standoff Mounting Frame (Clearwire)	A	From Leg	2.25	0.0000	122.00	No Ice	20.60	12.90	517.00
			0.00			1/2" Ice	28.80	19.40	784.00
			0.00			1" Ice	37.00	25.90	1051.00
Valmont 13' standoff Mounting Frame (Clearwire)	B	From Leg	2.25	0.0000	122.00	No Ice	20.60	12.90	517.00
			0.00			1/2" Ice	28.80	19.40	784.00
			0.00			1" Ice	37.00	25.90	1051.00
Valmont 13' standoff Mounting Frame (Clearwire)	C	From Leg	2.25	0.0000	122.00	No Ice	20.60	12.90	517.00
			0.00			1/2" Ice	28.80	19.40	784.00
			0.00			1" Ice	37.00	25.90	1051.00
LLPX310R-V1 W/ Mast Pipe (Clearwire)	A	From Leg	4.50	0.0000	122.00	No Ice	4.95	3.36	64.50
			-6.00			1/2" Ice	5.45	4.13	106.52
			1.50			1" Ice	5.90	4.78	154.21
LLPX310R-V1 W/ Mast Pipe	B	From Leg	4.50	0.0000	122.00	No Ice	4.95	3.36	64.50

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Clearwire)			-6.00			1/2" Ice	5.45	4.13	106.52
			1.50			1" Ice	5.90	4.78	154.21
LLPX310R-V1 W/ Mast Pipe	C	From Leg	4.50	0.0000	122.00	No Ice	4.95	3.36	64.50
(Clearwire)			-6.00			1/2" Ice	5.45	4.13	106.52
			1.50			1" Ice	5.90	4.78	154.21
(3) 2-3/8" OD Mast Pipe (6'	A	From Leg	4.50	0.0000	122.00	No Ice	1.43	1.43	21.96
Long)			2.00			1/2" Ice	1.92	1.92	32.79
(Clearwire)			0.00			1" Ice	2.29	2.29	47.67
(3) 2-3/8" OD Mast Pipe (6'	B	From Leg	4.50	0.0000	122.00	No Ice	1.43	1.43	21.96
Long)			2.00			1/2" Ice	1.92	1.92	32.79
(Clearwire)			0.00			1" Ice	2.29	2.29	47.67
(3) 2-3/8" OD Mast Pipe (6'	C	From Leg	4.50	0.0000	122.00	No Ice	1.43	1.43	21.96
Long)			2.00			1/2" Ice	1.92	1.92	32.79
(Clearwire)			0.00			1" Ice	2.29	2.29	47.67
Samsung SP1-22132825WB	A	From Leg	1.00	0.0000	122.00	No Ice	2.00	0.50	30.00
RRH			0.00			1/2" Ice	2.18	0.60	44.19
(Clearwire)			0.00			1" Ice	2.37	0.70	60.98
Samsung SP1-22132825WB	B	From Leg	1.00	0.0000	122.00	No Ice	2.00	0.50	30.00
RRH			0.00			1/2" Ice	2.18	0.60	44.19
(Clearwire)			0.00			1" Ice	2.37	0.70	60.98
Samsung SP1-22132825WB	C	From Leg	1.00	0.0000	122.00	No Ice	2.00	0.50	30.00
RRH			0.00			1/2" Ice	2.18	0.60	44.19
(Clearwire)			0.00			1" Ice	2.37	0.70	60.98
2'x2'x1' junction box	B	From Face	1.00	0.0000	122.00	No Ice	4.80	2.40	30.00
(Clearwire)			0.00			1/2" Ice	5.07	2.60	69.31
			0.00			1" Ice	5.35	2.81	112.70
valmont 12' T-Frame	A	From Leg	1.50	0.0000	106.00	No Ice	10.60	10.60	540.00
(Verizon)			0.00			1/2" Ice	18.40	18.40	702.00
			0.00			1" Ice	26.20	26.20	864.00
valmont 12' T-Frame	B	From Leg	1.50	0.0000	106.00	No Ice	10.60	10.60	540.00
(Verizon)			0.00			1/2" Ice	18.40	18.40	702.00
			0.00			1" Ice	26.20	26.20	864.00
valmont 12' T-Frame	C	From Leg	1.50	0.0000	106.00	No Ice	10.60	10.60	540.00
(Verizon)			0.00			1/2" Ice	18.40	18.40	702.00
			0.00			1" Ice	26.20	26.20	864.00
BXA-171063-12CF w/ Mast	A	From Leg	3.00	0.0000	106.00	No Ice	5.26	5.53	50.00
Pipe			-6.00			1/2" Ice	5.92	6.79	98.59
(Verizon)			1.00			1" Ice	6.54	7.91	154.81
(2) SBNHH-1D65B w/ Mast	A	From Leg	3.00	0.0000	106.00	No Ice	8.62	7.30	84.80
Pipe			-0.50			1/2" Ice	9.28	8.58	156.34
(Verizon)			1.00			1" Ice	9.91	9.72	236.09
BXA-171085-8CF w/ Mast	A	From Leg	3.00	0.0000	106.00	No Ice	3.87	4.04	46.40
Pipe			2.50			1/2" Ice	4.59	5.17	86.17
(Verizon)			1.00			1" Ice	5.23	6.15	132.00
BXA-80063/4CF w/ Mast	A	From Leg	3.00	0.0000	106.00	No Ice	5.67	4.34	54.10
Pipe			5.00			1/2" Ice	6.41	5.47	103.99
(Verizon)			1.00			1" Ice	7.07	6.45	160.28
SACP 2x5516 w/ Mast Pipe	B	From Leg	3.00	0.0000	106.00	No Ice	5.87	5.12	60.20
(Verizon)			-6.00			1/2" Ice	6.57	6.30	112.95
			1.00			1" Ice	7.21	7.34	172.60
(2) SBNHH-1D65B w/ Mast	B	From Leg	3.00	0.0000	106.00	No Ice	8.62	7.30	84.80
Pipe			-0.50			1/2" Ice	9.28	8.58	156.34
(Verizon)			1.00			1" Ice	9.91	9.72	236.09
SACP 2x5516 w/ Mast Pipe	B	From Leg	3.00	0.0000	106.00	No Ice	5.87	5.12	60.20
(Verizon)			2.50			1/2" Ice	6.57	6.30	112.95
			1.00			1" Ice	7.21	7.34	172.60
SWCP 2x5514 w/ Mast Pipe	B	From Leg	3.00	0.0000	106.00	No Ice	7.16	7.17	64.20

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon)			5.00			1/2" Ice	7.90	8.34	135.30
			1.00			1" Ice	8.57	9.36	213.68
SACP 2x5516 w/ Mast Pipe	C	From Leg	3.00	0.0000	106.00	No Ice	5.87	5.12	60.20
(Verizon)			-6.00			1/2" Ice	6.57	6.30	112.95
			1.00			1" Ice	7.21	7.34	172.60
(2) SBNHH-1D65B w/ Mast Pipe	C	From Leg	3.00	0.0000	106.00	No Ice	8.62	7.30	84.80
			-0.50			1/2" Ice	9.28	8.58	156.34
(Verizon)			1.00			1" Ice	9.91	9.72	236.09
SACP 2x5516 w/ Mast Pipe	C	From Leg	3.00	0.0000	106.00	No Ice	5.87	5.12	60.20
(Verizon)			2.50			1/2" Ice	6.57	6.30	112.95
			1.00			1" Ice	7.21	7.34	172.60
SWCP 2x5514 w/ Mast Pipe	C	From Leg	3.00	0.0000	106.00	No Ice	7.16	7.17	64.20
(Verizon)			5.00			1/2" Ice	7.90	8.34	135.30
			1.00			1" Ice	8.57	9.36	213.68
B5/B13 RRH	A	From Face	0.50	0.0000	106.00	No Ice	1.88	1.01	82.00
(Verizon)			-1.25			1/2" Ice	2.05	1.14	98.43
			5.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH	B	From Face	0.50	0.0000	106.00	No Ice	1.88	1.01	82.00
(Verizon)			-1.25			1/2" Ice	2.05	1.14	98.43
			5.00			1" Ice	2.22	1.28	117.53
B5/B13 RRH	C	From Face	0.50	0.0000	106.00	No Ice	1.88	1.01	82.00
(Verizon)			-1.25			1/2" Ice	2.05	1.14	98.43
			5.00			1" Ice	2.22	1.28	117.53
B2/B66A RRH	A	From Face	0.50	0.0000	106.00	No Ice	1.88	1.25	97.50
(Verizon)			1.25			1/2" Ice	2.05	1.39	115.84
			5.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH	B	From Face	0.50	0.0000	106.00	No Ice	1.88	1.25	97.50
(Verizon)			1.25			1/2" Ice	2.05	1.39	115.84
			5.00			1" Ice	2.22	1.54	136.97
B2/B66A RRH	C	From Face	0.50	0.0000	106.00	No Ice	1.88	1.25	97.50
(Verizon)			1.25			1/2" Ice	2.05	1.39	115.84
			5.00			1" Ice	2.22	1.54	136.97
(2) DB-T1-6Z-12AB-OZ	B	From Face	0.50	0.0000	106.00	No Ice	2.82	1.85	26.00
OVP			0.00			1/2" Ice	3.04	2.03	51.02
(Verizon)			8.00			1" Ice	3.25	2.22	79.31
4' Yagi	A	From Leg	2.00	0.0000	69.00	No Ice	1.20	1.20	20.00
			0.00			1/2" Ice	1.80	1.80	30.00
			0.00			1" Ice	2.40	2.40	40.00
4' Yagi	A	From Leg	2.00	0.0000	55.00	No Ice	1.20	1.20	20.00
			0.00			1/2" Ice	1.80	1.80	30.00
			0.00			1" Ice	2.40	2.40	40.00
2'x2'x1' junction box	B	From Face	0.50	0.0000	32.00	No Ice	4.80	2.40	30.00
			0.00			1/2" Ice	5.07	2.60	69.31
			0.00			1" Ice	5.35	2.81	112.70

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral / Vert (ft)	Azimuth Adjustment (°)	3 dB Beam Width (°)	Elevation (ft)	Outside Diameter (ft)		Aperture Area (ft^2)	Weight (lb)
VHLP1-23	B	Paraboloid w/o Radome	From Leg	4.00 -6.00 0.00	0.0000		122.00	1.27	No Ice 1/2" Ice 1" Ice	1.27 1.44 1.61	15.00 22.39 29.78
VHLP1-23	C	Paraboloid w/o Radome	From Leg	0.50 0.00 0.00	0.0000		119.00	1.27	No Ice 1/2" Ice 1" Ice	1.27 1.44 1.61	15.00 22.39 29.78
VHLP1-23	B	Paraboloid w/o Radome	From Leg	0.50 0.00 0.00	0.0000		118.00	1.27	No Ice 1/2" Ice 1" Ice	1.27 1.44 1.61	15.00 22.39 29.78

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	A_G (ft^2)	Face	A_F (ft^2)	A_R (ft^2)	A_{leg} (ft^2)	Leg %	C_AA_A In Face (ft^2)	C_AA_A Out Face (ft^2)
T1 125.00-105.00	115.00	1.303	28	64.133	A	2.454	10.084	6.667	53.17	2.684	0.000
					B	2.454	10.084		53.17	23.836	0.000
					C	2.454	10.084		53.17	29.285	0.000
T2 105.00-85.00	95.00	1.252	27	64.133	A	2.873	10.084	6.667	51.45	53.680	0.000
					B	2.873	10.084		51.45	26.260	0.000
					C	2.873	10.084		51.45	34.400	0.000
T3 85.00-65.00	75.00	1.191	25	64.550	A	2.437	10.892	7.500	56.27	53.680	0.000
					B	2.437	10.892		56.27	27.556	0.000
					C	2.437	10.892		56.27	34.400	0.000
T4 65.00-45.00	55.00	1.116	24	64.133	A	2.873	10.084	6.667	51.45	53.680	0.000
					B	2.873	10.084		51.45	32.110	0.000
					C	2.873	10.084		51.45	34.400	0.000
T5 45.00-29.00	37.00	1.027	22	51.307	A	2.394	8.058	5.333	51.03	42.944	0.000
					B	2.394	8.058		51.03	25.184	0.000
					C	2.394	8.058		51.03	27.520	0.000
T6 29.00-25.00	27.00	0.961	20	6.793	A	0.697	1.456	1.456	67.64	0.000	0.000
					B	0.697	1.456		67.64	0.000	0.000
					C	0.697	1.456		67.64	0.000	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation (ft)	z (ft)	K_Z	q_z (psf)	t_Z (in)	A_G (ft^2)	Face	A_F (ft^2)	A_R (ft^2)	A_{leg} (ft^2)	Leg %	C_AA_A In Face (ft^2)	C_AA_A Out Face (ft^2)
T1 125.00-105.00	115.00	1.303	7	2.2659	71.686	A	2.454	49.398	21.773	41.99	3.884	0.000
						B	2.454	49.398		41.99	98.222	0.000
						C	2.454	49.398		41.99	79.867	0.000
T2 105.00-85.00	95.00	1.252	7	2.2231	71.544	A	2.873	48.654	21.487	41.70	77.098	0.000
						B	2.873	48.654		41.70	107.519	0.000
						C	2.873	48.654		41.70	91.577	0.000
T3 85.00-65.00	75.00	1.191	6	2.1711	71.787	A	2.437	48.394	21.974	43.23	76.389	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	2.437	48.394		43.23	112.222	0.000
						C	2.437	48.394		43.23	90.691	0.000
T4 65.00-45.00	55.00	1.116	6	2.1048	71.149	A	2.873	46.603	20.699	41.84	75.484	0.000
						B	2.873	46.603		41.84	130.333	0.000
						C	2.873	46.603		41.84	89.561	0.000
T5 45.00-29.00	37.00	1.027	6	2.0230	56.701	A	2.394	36.290	16.123	41.68	59.495	0.000
						B	2.394	36.290		41.68	97.710	0.000
						C	2.394	36.290		41.68	70.536	0.000
T6 29.00-25.00	27.00	0.961	5	1.9603	8.191	A	0.697	5.390	4.310	70.81	0.000	0.000
						B	0.697	5.390		70.81	0.000	0.000
						C	0.697	5.390		70.81	0.000	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	115.00	1.303	10	64.133	A	2.454	10.084	6.667	53.17	2.684	0.000
125.00-105.00					B	2.454	10.084		53.17	23.836	0.000
					C	2.454	10.084		53.17	29.285	0.000
T2	95.00	1.252	10	64.133	A	2.873	10.084	6.667	51.45	53.680	0.000
105.00-85.00					B	2.873	10.084		51.45	26.260	0.000
					C	2.873	10.084		51.45	34.400	0.000
T3 85.00-65.00	75.00	1.191	9	64.550	A	2.437	10.892	7.500	56.27	53.680	0.000
					B	2.437	10.892		56.27	27.556	0.000
					C	2.437	10.892		56.27	34.400	0.000
T4 65.00-45.00	55.00	1.116	9	64.133	A	2.873	10.084	6.667	51.45	53.680	0.000
					B	2.873	10.084		51.45	32.110	0.000
					C	2.873	10.084		51.45	34.400	0.000
T5 45.00-29.00	37.00	1.027	8	51.307	A	2.394	8.058	5.333	51.03	42.944	0.000
					B	2.394	8.058		51.03	25.184	0.000
					C	2.394	8.058		51.03	27.520	0.000
T6 29.00-25.00	27.00	0.961	8	6.793	A	0.697	1.456	1.456	67.64	0.000	0.000
					B	0.697	1.456		67.64	0.000	0.000
					C	0.697	1.456		67.64	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	219.61	1079.98	A	0.195	2.611	28	1	1	8.239	1628.83	81.44	C
125.00-105.00			B	0.195	2.611		1	1	8.239			
			C	0.195	2.611		1	1	8.239			
T2	476.20	1078.89	A	0.202	2.589	27	1	1	8.670	2048.60	102.43	C
105.00-85.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T3	480.68	1250.35	A	0.206	2.574	25	1	1	8.707	1968.54	98.43	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
85.00-65.00			B	0.206	2.574		1	1	8.707			
			C	0.206	2.574		1	1	8.707			
T4	497.10	1035.95	A	0.202	2.589	24	1	1	8.670	1909.82	95.49	C
65.00-45.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T5	396.48	830.96	A	0.204	2.584	22	1	1	7.029	1401.67	87.60	C
45.00-29.00			B	0.204	2.584		1	1	7.029			
			C	0.204	2.584		1	1	7.029			
T6	0.00	196.59	A	0.317	2.252	20	1	1	1.577	61.84	15.46	C
29.00-25.00			B	0.317	2.252		1	1	1.577			
			C	0.317	2.252		1	1	1.577			
Sum Weight:	2070.07	5472.71								9019.28		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	219.61	1079.98	A	0.195	2.611	28	0.8	1	7.749	1598.54	79.93	C
125.00-105.00			B	0.195	2.611		0.8	1	7.749			
			C	0.195	2.611		0.8	1	7.749			
T2	476.20	1078.89	A	0.202	2.589	27	0.8	1	8.095	2014.82	100.74	C
105.00-85.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T3	480.68	1250.35	A	0.206	2.574	25	0.8	1	8.219	1941.45	97.07	C
85.00-65.00			B	0.206	2.574		0.8	1	8.219			
			C	0.206	2.574		0.8	1	8.219			
T4	497.10	1035.95	A	0.202	2.589	24	0.8	1	8.095	1879.72	93.99	C
65.00-45.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T5	396.48	830.96	A	0.204	2.584	22	0.8	1	6.550	1378.64	86.17	C
45.00-29.00			B	0.204	2.584		0.8	1	6.550			
			C	0.204	2.584		0.8	1	6.550			
T6	0.00	196.59	A	0.317	2.252	20	0.8	1	1.437	56.37	14.09	C
29.00-25.00			B	0.317	2.252		0.8	1	1.437			
			C	0.317	2.252		0.8	1	1.437			
Sum Weight:	2070.07	5472.71								8869.55		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	219.61	1079.98	A	0.195	2.611	28	0.85	1	7.871	1643.22	82.16	C
125.00-105.00			B	0.195	2.611		0.85	1	7.871			
			C	0.195	2.611		0.85	1	7.871			
T2	476.20	1078.89	A	0.202	2.589	27	0.85	1	8.239	2116.90	105.84	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
105.00-85.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T3	480.68	1250.35	A	0.206	2.574	25	0.85	1	8.341	2034.25	101.71	C
85.00-65.00			B	0.206	2.574		0.85	1	8.341			
			C	0.206	2.574		0.85	1	8.341			
T4	497.10	1035.95	A	0.202	2.589	24	0.85	1	8.239	1963.55	98.18	C
65.00-45.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T5	396.48	830.96	A	0.204	2.584	22	0.85	1	6.670	1445.82	90.36	C
45.00-29.00			B	0.204	2.584		0.85	1	6.670			
			C	0.204	2.584		0.85	1	6.670			
T6	0.00	196.59	A	0.317	2.252	20	0.85	1	1.472	57.74	14.43	C
29.00-25.00			B	0.317	2.252		0.85	1	1.472			
			C	0.317	2.252		0.85	1	1.472			
Sum Weight:	2070.07	5472.71								9261.47		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	2884.32	3858.21	A	0.723	1.779	7	1	1	43.349	907.31*	45.37	C
125.00-105.00			B	0.723	1.779		1	1	43.349			
			C	0.723	1.779		1	1	43.349			
T2	4670.42	3769.36	A	0.72	1.779	7	1	1	43.043	869.80*	43.49	C
105.00-85.00			B	0.72	1.779		1	1	43.043			
			C	0.72	1.779		1	1	43.043			
T3	4630.38	3885.86	A	0.708	1.777	6	1	1	41.967	830.39*	41.52	C
85.00-65.00			B	0.708	1.777		1	1	41.967			
			C	0.708	1.777		1	1	41.967			
T4	4776.51	3503.21	A	0.695	1.776	6	1	1	40.520	770.99*	38.55	C
65.00-45.00			B	0.695	1.776		1	1	40.520			
			C	0.695	1.776		1	1	40.520			
T5	3632.67	2704.48	A	0.682	1.776	6	1	1	31.374	565.23*	35.33	C
45.00-29.00			B	0.682	1.776		1	1	31.374			
			C	0.682	1.776		1	1	31.374			
T6	0.00	525.45	A	0.743	1.785	5	1	1	5.237	41.53	10.38	C
29.00-25.00			B	0.743	1.785		1	1	5.237			
			C	0.743	1.785		1	1	5.237			
Sum Weight:	20594.30	18246.58			*2.1A_g limit					3985.26		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	2884.32	3858.21	A	0.723	1.779	7	0.8	1	42.858	907.31*	45.37	C
125.00-105.00			B	0.723	1.779		0.8	1	42.858			
			C	0.723	1.779		0.8	1	42.858			
T2	4670.42	3769.36	A	0.72	1.779	7	0.8	1	42.468	869.80*	43.49	C
105.00-85.00			B	0.72	1.779		0.8	1	42.468			
			C	0.72	1.779		0.8	1	42.468			
T3	4630.38	3885.86	A	0.708	1.777	6	0.8	1	41.479	830.39*	41.52	C
85.00-65.00			B	0.708	1.777		0.8	1	41.479			
			C	0.708	1.777		0.8	1	41.479			
T4	4776.51	3503.21	A	0.695	1.776	6	0.8	1	39.945	770.99*	38.55	C
65.00-45.00			B	0.695	1.776		0.8	1	39.945			
			C	0.695	1.776		0.8	1	39.945			
T5	3632.67	2704.48	A	0.682	1.776	6	0.8	1	30.895	565.23*	35.33	C
45.00-29.00			B	0.682	1.776		0.8	1	30.895			
			C	0.682	1.776		0.8	1	30.895			
T6	0.00	525.45	A	0.743	1.785	5	0.8	1	5.098	40.42	10.11	C
29.00-25.00			B	0.743	1.785		0.8	1	5.098			
			C	0.743	1.785		0.8	1	5.098			
Sum Weight:	20594.30	18246.58			*2.1A_g limit					3984.16		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	2884.32	3858.21	A	0.723	1.779	7	0.85	1	42.981	907.31*	45.37	C
125.00-105.00			B	0.723	1.779		0.85	1	42.981			
			C	0.723	1.779		0.85	1	42.981			
T2	4670.42	3769.36	A	0.72	1.779	7	0.85	1	42.612	869.80*	43.49	C
105.00-85.00			B	0.72	1.779		0.85	1	42.612			
			C	0.72	1.779		0.85	1	42.612			
T3	4630.38	3885.86	A	0.708	1.777	6	0.85	1	41.601	830.39*	41.52	C
85.00-65.00			B	0.708	1.777		0.85	1	41.601			
			C	0.708	1.777		0.85	1	41.601			
T4	4776.51	3503.21	A	0.695	1.776	6	0.85	1	40.089	770.99*	38.55	C
65.00-45.00			B	0.695	1.776		0.85	1	40.089			
			C	0.695	1.776		0.85	1	40.089			
T5	3632.67	2704.48	A	0.682	1.776	6	0.85	1	31.015	565.23*	35.33	C
45.00-29.00			B	0.682	1.776		0.85	1	31.015			
			C	0.682	1.776		0.85	1	31.015			
T6	0.00	525.45	A	0.743	1.785	5	0.85	1	5.133	40.70	10.17	C
29.00-25.00			B	0.743	1.785		0.85	1	5.133			
			C	0.743	1.785		0.85	1	5.133			
Sum Weight:	20594.30	18246.58			*2.1A_g limit					3984.43		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	219.61	1079.98	A	0.195	2.611	10	1	1	8.239	598.28	29.91	C
125.00-105.00			B	0.195	2.611		1	1	8.239			
			C	0.195	2.611		1	1	8.239			
T2	476.20	1078.89	A	0.202	2.589	10	1	1	8.670	752.47	37.62	C
105.00-85.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T3	480.68	1250.35	A	0.206	2.574	9	1	1	8.707	723.06	36.15	C
85.00-65.00			B	0.206	2.574		1	1	8.707			
			C	0.206	2.574		1	1	8.707			
T4	497.10	1035.95	A	0.202	2.589	9	1	1	8.670	701.50	35.07	C
65.00-45.00			B	0.202	2.589		1	1	8.670			
			C	0.202	2.589		1	1	8.670			
T5	396.48	830.96	A	0.204	2.584	8	1	1	7.029	514.85	32.18	C
45.00-29.00			B	0.204	2.584		1	1	7.029			
			C	0.204	2.584		1	1	7.029			
T6	0.00	196.59	A	0.317	2.252	8	1	1	1.577	22.71	5.68	C
29.00-25.00			B	0.317	2.252		1	1	1.577			
			C	0.317	2.252		1	1	1.577			
Sum Weight:	2070.07	5472.71								3312.87		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	219.61	1079.98	A	0.195	2.611	10	0.8	1	7.749	587.16	29.36	C
125.00-105.00			B	0.195	2.611		0.8	1	7.749			
			C	0.195	2.611		0.8	1	7.749			
T2	476.20	1078.89	A	0.202	2.589	10	0.8	1	8.095	740.06	37.00	C
105.00-85.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T3	480.68	1250.35	A	0.206	2.574	9	0.8	1	8.219	713.11	35.66	C
85.00-65.00			B	0.206	2.574		0.8	1	8.219			
			C	0.206	2.574		0.8	1	8.219			
T4	497.10	1035.95	A	0.202	2.589	9	0.8	1	8.095	690.44	34.52	C
65.00-45.00			B	0.202	2.589		0.8	1	8.095			
			C	0.202	2.589		0.8	1	8.095			
T5	396.48	830.96	A	0.204	2.584	8	0.8	1	6.550	506.39	31.65	C
45.00-29.00			B	0.204	2.584		0.8	1	6.550			
			C	0.204	2.584		0.8	1	6.550			
T6	0.00	196.59	A	0.317	2.252	8	0.8	1	1.437	20.71	5.18	C
29.00-25.00			B	0.317	2.252		0.8	1	1.437			
			C	0.317	2.252		0.8	1	1.437			
Sum Weight:	2070.07	5472.71								3257.87		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	219.61	1079.98	A	0.195	2.611	10	0.85	1	7.871	603.57	30.18	C
125.00-105.00			B	0.195	2.611		0.85	1	7.871			
			C	0.195	2.611		0.85	1	7.871			
T2	476.20	1078.89	A	0.202	2.589	10	0.85	1	8.239	777.56	38.88	C
105.00-85.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T3	480.68	1250.35	A	0.206	2.574	9	0.85	1	8.341	747.20	37.36	C
85.00-65.00			B	0.206	2.574		0.85	1	8.341			
			C	0.206	2.574		0.85	1	8.341			
T4	497.10	1035.95	A	0.202	2.589	9	0.85	1	8.239	721.23	36.06	C
65.00-45.00			B	0.202	2.589		0.85	1	8.239			
			C	0.202	2.589		0.85	1	8.239			
T5	396.48	830.96	A	0.204	2.584	8	0.85	1	6.670	531.06	33.19	C
45.00-29.00			B	0.204	2.584		0.85	1	6.670			
			C	0.204	2.584		0.85	1	6.670			
T6	0.00	196.59	A	0.317	2.252	8	0.85	1	1.472	21.21	5.30	C
29.00-25.00			B	0.317	2.252		0.85	1	1.472			
			C	0.317	2.252		0.85	1	1.472			
Sum Weight:	2070.07	5472.71								3401.83		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3389.24			
Bracing Weight	2083.48			
Total Member Self-Weight	5472.71			
Guy Weight	637.74			
Total Weight	13719.66			
Wind 0 deg - No Ice		23.88	-13773.30	26.21
Wind 30 deg - No Ice		6887.50	-11742.97	71.92
Wind 60 deg - No Ice		10804.38	-6220.74	259.91
Wind 90 deg - No Ice		11880.95	-84.88	303.40
Wind 120 deg - No Ice		11395.42	6454.75	321.95
Wind 150 deg - No Ice		6940.00	12005.80	310.90
Wind 180 deg - No Ice		-58.43	13586.37	135.79
Wind 210 deg - No Ice		-6859.45	11742.91	-41.65
Wind 240 deg - No Ice		-10977.05	6240.77	25.37
Wind 270 deg - No Ice		-11895.07	16.25	-81.45
Wind 300 deg - No Ice		-11263.82	-6418.53	-244.41
Wind 330 deg - No Ice		-6994.36	-12006.97	-282.55
Member Ice	12773.86			
Guy Ice	3691.28			
Total Weight Ice	63669.55			
Wind 0 deg - Ice		1.96	-6802.75	684.68
Wind 30 deg - Ice		3431.04	-5882.95	630.73
Wind 60 deg - Ice		5919.34	-3411.13	495.44
Wind 90 deg - Ice		6825.66	-27.02	221.92
Wind 120 deg - Ice		5911.80	3371.80	-139.22
Wind 150 deg - Ice		3391.83	5869.94	-441.29
Wind 180 deg - Ice		-16.16	6786.38	-614.48
Wind 210 deg - Ice		-3419.52	5882.92	-618.30

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 240 deg - Ice		-5937.95	3389.16	-377.46
Wind 270 deg - Ice		-6831.47	-1.17	-130.70
Wind 300 deg - Ice		-5910.05	-3387.12	166.75
Wind 330 deg - Ice		-3414.15	-5870.42	452.96
Total Weight	13719.66			
Wind 0 deg - Service		8.77	-5059.06	9.63
Wind 30 deg - Service		2529.84	-4313.30	26.42
Wind 60 deg - Service		3968.55	-2284.94	95.47
Wind 90 deg - Service		4363.98	-31.18	111.44
Wind 120 deg - Service		4185.64	2370.89	118.26
Wind 150 deg - Service		2549.13	4409.84	114.20
Wind 180 deg - Service		-21.46	4990.40	49.88
Wind 210 deg - Service		-2519.54	4313.28	-15.30
Wind 240 deg - Service		-4031.97	2292.29	9.32
Wind 270 deg - Service		-4369.17	5.97	-29.92
Wind 300 deg - Service		-4137.31	-2357.59	-89.77
Wind 330 deg - Service		-2569.09	-4410.27	-103.78

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy

Comb. No.	Description
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

Maximum 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	125 - 105	Leg	Max Tension	4	4898.10	-274.66	150.40
			Max. Compression	25	-17948.44	96.55	53.07
			Max. Mx	5	-5226.24	877.88	12.83
			Max. My	2	-5606.45	12.93	-878.91
			Max. Vy	5	1379.20	-327.28	-14.58
			Max. Vx	2	-1569.52	-2.37	310.76
		Diagonal	Max Tension	13	2602.46	0.00	0.00
			Max. Compression	2	-2357.90	0.00	0.00
			Max. Mx	15	-568.85	-6.17	0.07
			Max. My	2	-1939.39	-0.39	0.88
			Max. Vy	15	10.97	-6.17	0.07
			Max. Vx	2	0.37	-0.39	0.88
		Horizontal	Max Tension	10	1814.74	0.00	0.00
			Max. Compression	10	-204.71	0.00	0.00
			Max. Mx	14	1109.48	-19.66	0.00
			Max. My	16	113.80	0.00	0.00
			Max. Vy	14	25.87	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Top Girt	Max Tension	10	157.38	0.00	0.00
			Max. Compression	12	-112.17	0.00	0.00
			Max. Mx	15	105.40	-19.66	0.00
			Max. My	16	46.99	0.00	0.00
			Max. Vy	15	25.87	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Bottom Girt	Max Tension	10	847.40	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	614.21	-19.66	0.00
			Max. My	16	627.93	0.00	0.00
			Max. Vy	14	25.87	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Guy A	Bottom Tension	9	18331.72		
			Top Tension	9	18436.32		
			Top Cable Vert	9	16702.94		
			Top Cable Norm	9	7804.46		
			Top Cable Tan	9	20.13		
			Bot Cable Vert	9	-16505.07		
			Bot Cable Norm	9	7975.89		
			Bot Cable Tan	9	141.00		
		Guy B	Bottom Tension	11	19935.18		
			Top Tension	11	20039.50		
			Top Cable Vert	11	18578.81		
			Top Cable Norm	11	7510.56		
			Top Cable Tan	11	31.72		
			Bot Cable Vert	11	-18391.99		
			Bot Cable Norm	11	7689.18		
			Bot Cable Tan	11	151.76		
		Guy C	Bottom Tension	4	19480.23		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Tension	4	19577.65		
			Top Cable Vert	4	18072.28		
			Top Cable Norm	4	7528.43		
			Top Cable Tan	4	0.80		
			Bot Cable Vert	4	-17886.81		
			Bot Cable Norm	4	7716.31		
			Bot Cable Tan	4	0.80		
		Top Guy Pull-Off	Max Tension	10	4230.08	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	15	2444.89	20.41	0.00
			Max. My	16	1963.25	0.00	-0.00
			Max. Vy	15	26.86	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T2	105 - 85	Leg	Max Tension	4	22176.83	316.11	-151.95
			Max. Compression	2	-54180.53	2.20	177.07
			Max. Mx	5	-11279.13	-615.54	13.97
			Max. My	2	-16156.26	-12.05	636.35
			Max. Vy	10	-2488.44	153.31	-78.05
			Max. Vx	2	-2840.54	2.20	177.07
		Diagonal	Max Tension	4	2988.89	0.00	0.00
			Max. Compression	2	-5634.80	0.00	0.00
			Max. Mx	16	-338.35	-7.02	0.14
			Max. My	12	-2027.49	-0.13	-4.58
			Max. Vy	16	11.13	-7.02	0.14
			Max. Vx	12	1.87	-2.27	-4.57
		Horizontal	Max Tension	17	2253.60	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1696.55	-19.22	0.00
			Max. My	16	1552.45	0.00	0.00
			Max. Vy	14	-25.29	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Top Girt	Max Tension	2	1459.91	0.00	0.00
			Max. Compression	12	-264.31	0.00	0.00
			Max. Mx	14	788.58	-19.22	0.00
			Max. My	16	770.00	0.00	0.00
			Max. Vy	14	-25.29	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	2094.34	0.00	0.00
			Max. Compression	2	-1130.43	0.00	0.00
			Max. Mx	14	882.86	-19.22	0.00
			Max. My	16	925.51	0.00	0.00
			Max. Vy	14	-25.29	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T3	85 - 65	Leg	Max Tension	4	36395.77	121.90	-57.56
			Max. Compression	2	-70546.02	-8.66	65.25
			Max. Mx	10	-52124.90	670.44	-333.47
			Max. My	2	-54184.44	35.55	767.29
			Max. Vy	10	-2483.33	670.44	-333.47
			Max. Vx	2	-2834.45	35.55	767.29
		Diagonal	Max Tension	4	4135.04	0.00	0.00
			Max. Compression	2	-5967.60	0.00	0.00
			Max. Mx	16	-2430.55	-7.58	0.15
			Max. My	12	-2436.22	0.20	-7.83
			Max. Vy	16	11.09	-7.58	0.15
			Max. Vx	12	3.18	-2.72	-7.83
		Horizontal	Max Tension	2	2965.63	0.00	0.00
			Max. Compression	2	-1652.44	0.00	0.00
			Max. Mx	14	2165.30	-18.69	0.00
			Max. My	16	1293.80	0.00	0.00
			Max. Vy	14	24.60	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Top Girt	Max Tension	23	804.15	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	765.28	-18.69	0.00
			Max. My	16	766.03	0.00	0.00
			Max. Vy	14	24.60	0.00	0.00
			Max. Vx	16	-0.00	0.00	0.00
		Bottom Girt	Max Tension	17	1311.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1214.87	-18.69	0.00
			Max. My	15	1276.73	0.00	-0.00
			Max. Vy	14	24.60	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Guy A	Bottom Tension	10	22817.14		
			Top Tension	10	22898.09		
			Top Cable Vert	10	17612.85		
			Top Cable Norm	10	14632.43		
			Top Cable Tan	10	44.09		
			Bot Cable Vert	10	-17462.24		
			Bot Cable Norm	10	14685.11		
			Bot Cable Tan	10	198.53		
		Guy B	Bottom Tension	10	25930.35		
			Top Tension	10	26011.27		
			Top Cable Vert	10	21134.79		
			Top Cable Norm	10	15162.57		
			Top Cable Tan	10	61.64		
			Bot Cable Vert	10	-20993.50		
			Bot Cable Norm	10	15218.81		
			Bot Cable Tan	10	209.11		
		Guy C	Bottom Tension	6	24511.92		
			Top Tension	6	24582.71		
			Top Cable Vert	6	19323.48		
			Top Cable Norm	6	15195.68		
			Top Cable Tan	6	64.05		
			Bot Cable Vert	6	-19194.46		
			Bot Cable Norm	6	15243.61		
			Bot Cable Tan	6	198.41		
		Top Guy Pull-Off	Max Tension	2	7254.38	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	4443.33	19.42	0.00
			Max. My	16	4556.50	0.00	-0.00
			Max. Vy	14	25.55	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T4	65 - 45	Leg	Max Tension	4	2251.10	-73.75	48.29
			Max. Compression	2	-53949.20	12.86	-290.30
			Max. Mx	10	-44463.51	-247.01	143.53
			Max. My	2	-46523.89	12.86	-290.33
			Max. Vy	6	-1708.03	-108.77	-57.44
			Max. Vx	2	2000.21	-8.67	126.27
		Diagonal	Max Tension	4	924.84	0.00	0.00
			Max. Compression	2	-4839.71	0.00	0.00
			Max. Mx	16	-2736.83	-6.97	0.43
			Max. My	2	-4834.92	-0.90	7.09
			Max. Vy	16	10.52	-6.97	0.43
			Max. Vx	2	-2.87	-4.22	7.08
		Horizontal	Max Tension	17	2947.56	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2677.31	-16.94	0.00
			Max. My	15	2774.03	0.00	-0.00
			Max. Vy	14	22.29	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Top Girt	Max Tension	2	1842.66	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1240.47	-16.94	0.00
			Max. My	15	1474.36	0.00	-0.00
			Max. Vy	14	22.29	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Bottom Girt	Max Tension	2	1537.32	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1441.68	-16.94	0.00
			Max. My	15	1459.13	0.00	-0.00
			Max. Vy	14	22.29	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
T5	45 - 29	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	16	-34659.89	1240.91	657.76
			Max. Mx	15	-34648.15	1244.43	655.66
			Max. My	17	-34619.53	-44.17	-1400.31
			Max. Vy	15	5942.53	-1185.19	756.21
			Max. Vx	17	6815.91	-61.42	19.62
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-2921.46	0.00	0.00
			Max. Mx	16	-2537.09	-6.41	0.31
			Max. My	2	-2187.93	0.46	1.24
			Max. Vy	16	9.91	-6.41	0.31
			Max. Vx	2	0.51	0.46	1.24
		Horizontal	Max Tension	17	2869.30	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2533.42	-16.14	0.00
			Max. My	15	2851.58	0.00	-0.00
			Max. Vy	14	-21.23	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Top Girt	Max Tension	17	1592.61	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1429.86	-16.14	0.00
			Max. My	15	1530.14	0.00	-0.00
			Max. Vy	14	-21.23	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Bottom Girt	Max Tension	16	5132.28	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	5006.13	-16.14	0.00
			Max. My	15	5108.78	0.00	-0.00
			Max. Vy	14	-21.23	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
T6	29 - 25	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	16	-38021.92	51.18	171.52
			Max. Mx	16	-34423.26	1406.48	-52.80
			Max. My	15	-37962.53	48.82	185.97
			Max. Vy	16	7731.00	-379.62	-27.62
			Max. Vx	6	-165.10	-284.95	19.99
		Top Girt	Max Tension	16	4929.85	71.36	-71.49
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	15	4914.93	152.22	-8.42
			Max. My	15	4920.28	68.83	-73.94
			Max. Vy	15	54.23	152.22	-8.42
			Max. Vx	15	28.78	151.86	-7.01
		Bottom Girt	Max Tension	8	9.38	6.14	-133.06
			Max. Compression	2	-253.69	-6.13	-119.44
			Max. Mx	15	-206.04	-25.01	-221.21
			Max. My	16	-200.01	-23.98	-223.58
			Max. Vy	15	-76.12	-25.01	-221.21
			Max. Vx	8	-113.25	-9.22	-144.86

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	16	104455.97	33.51	-73.57
	Max. H_x	12	59599.38	547.17	310.32
	Max. H_z	4	60060.49	-560.20	327.31
	Max. M_x	1	0.00	9.76	-19.85
	Max. M_z	1	0.00	9.76	-19.85
	Max. Torsion	22	449.31	6.99	-80.51
	Min. Vert	35	48062.12	263.81	-189.22
	Min. H_x	4	60060.49	-560.20	327.31
	Min. H_z	8	56673.90	9.25	-863.70
	Min. M_x	1	0.00	9.76	-19.85
	Min. M_z	1	0.00	9.76	-19.85
	Min. Torsion	15	-481.59	0.18	-63.27
Guy C @ 37.5 ft Elev 31.5 ft Azimuth 240 deg	Max. Vert	10	-613.14	-152.81	88.75
	Max. H_x	10	-613.14	-152.81	88.75
	Max. H_z	3	-36684.28	-19543.30	11582.96
	Min. Vert	5	-36895.08	-19893.52	11201.25
	Min. H_x	5	-36895.08	-19893.52	11201.25
	Min. H_z	10	-613.14	-152.81	88.75
Guy B @ 39 ft Elev 25 ft Azimuth 120 deg	Max. Vert	6	-793.35	210.44	121.74
	Max. H_x	11	-39108.19	19814.49	11135.09
	Max. H_z	13	-38762.16	19400.89	11503.84
	Min. Vert	11	-39108.19	19814.49	11135.09
	Min. H_x	6	-793.35	210.44	121.74
	Min. H_z	6	-793.35	210.44	121.74
Guy A @ 45 ft Elev 25 ft Azimuth 0 deg	Max. Vert	2	-604.07	0.30	-203.14
	Max. H_x	10	-32899.82	452.01	-22107.60
	Max. H_z	2	-604.07	0.30	-203.14
	Min. Vert	9	-33604.69	239.17	-22376.61
	Min. H_x	6	-32688.36	-414.37	-21987.00
	Min. H_z	9	-33604.69	239.17	-22376.61

Tower Mast Reaction Summary

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
Dead Only	48489.68	-9.76	19.85	0.00	0.00	-2.80
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	90344.43	-1.09	-209.01	0.00	0.00	25.58
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	73878.09	348.37	-67.95	0.00	0.00	77.75
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	60060.49	560.20	-327.31	0.00	0.00	245.83
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	71763.73	252.62	-205.27	0.00	0.00	229.90

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	85705.86	270.77	328.40	0.00	0.00	243.59
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	69954.47	-70.88	556.54	0.00	0.00	320.77
1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy	56673.90	-9.25	863.70	0.00	0.00	166.00
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	71145.68	57.22	549.39	0.00	0.00	-31.35
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	88289.61	-234.00	311.95	0.00	0.00	40.12
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	73754.68	-226.10	-203.04	0.00	0.00	-47.23
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	59599.38	-547.17	-310.32	0.00	0.00	-256.06
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	74632.49	-353.51	-36.58	0.00	0.00	-283.02
1.2 Dead+1.0 Ice+1.0 Temp+Guy	102204.83	-7.13	66.06	0.00	0.00	-1.42
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	104348.57	-0.18	63.27	0.00	0.00	481.59
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	104455.97	-33.51	73.57	0.00	0.00	456.33
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	104289.62	-52.37	78.71	0.00	0.00	327.16
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	103823.21	-40.44	84.18	0.00	0.00	107.99
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	103063.13	5.93	104.20	0.00	0.00	-117.85
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	103031.17	-14.63	79.04	0.00	0.00	-297.21
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	102868.93	-13.65	69.88	0.00	0.00	-431.60
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	102641.36	-6.99	80.51	0.00	0.00	-449.31
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	102466.66	-12.44	107.69	0.00	0.00	-253.16
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	102991.03	36.20	92.97	0.00	0.00	-50.87
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	103508.75	48.14	93.64	0.00	0.00	137.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	104064.51	29.19	87.66	0.00	0.00	309.58
Dead+Wind 0 deg - Service+Guy	48655.28	-6.48	-307.08	0.00	0.00	5.68
Dead+Wind 30 deg - Service+Guy	48829.81	84.33	-171.10	0.00	0.00	21.43
Dead+Wind 60 deg - Service+Guy	48962.26	168.12	-96.80	0.00	0.00	62.05
Dead+Wind 90 deg - Service+Guy	48927.45	179.88	23.05	0.00	0.00	66.28
Dead+Wind 120 deg - Service+Guy	48837.79	245.81	186.77	0.00	0.00	78.41
Dead+Wind 150 deg - Service+Guy	48618.43	86.52	209.34	0.00	0.00	85.46
Dead+Wind 180 deg - Service+Guy	48408.74	-10.64	256.35	0.00	0.00	37.20
Dead+Wind 210 deg - Service+Guy	48231.26	-108.02	211.07	0.00	0.00	-12.45
Dead+Wind 240 deg - Service+Guy	48062.12	-263.81	189.22	0.00	0.00	10.86
Dead+Wind 270 deg -	48144.62	-198.42	26.26	0.00	0.00	-10.67

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Service+Guy Dead+Wind 300 deg - Service+Guy	48252.16	-185.36	-94.89	0.00	0.00	-60.01
Service+Guy Dead+Wind 330 deg - Service+Guy	48434.03	-99.45	-169.68	0.00	0.00	-78.20

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-13719.60	0.00	-3.43	13719.54	-5.25	0.046%
2	37.64	-16337.41	-23078.22	-39.89	16336.50	23045.77	0.115%
3	10134.30	-16316.15	-17235.90	-10135.09	16315.74	17218.62	0.067%
4	18216.00	-16300.41	-10476.51	-18209.99	16300.27	10470.54	0.032%
5	20085.69	-16328.12	-135.71	-20069.63	16327.70	144.54	0.071%
6	20113.34	-16357.85	11401.02	-20085.79	16356.99	-11385.12	0.112%
7	9929.28	-16347.96	17155.62	-9914.45	16347.56	-17146.61	0.068%
8	-92.92	-16334.56	20754.60	96.72	16334.32	-20739.40	0.059%
9	-10089.42	-16355.82	17235.81	10073.99	16355.44	-17227.91	0.067%
10	-20245.57	-16371.56	11520.83	20215.94	16370.66	-11506.35	0.116%
11	-20108.29	-16343.84	25.91	20089.26	16343.35	-17.05	0.081%
12	-18149.48	-16314.11	-10330.80	18139.82	16313.79	10313.02	0.076%
13	-10016.25	-16324.01	-17157.50	10014.37	16323.53	17137.52	0.078%
14	0.00	-66285.50	0.00	-1.13	66285.49	-5.62	0.009%
15	1.27	-66286.31	-7865.99	-2.06	66286.21	7858.63	0.011%
16	3974.01	-66266.06	-6805.05	-3973.92	66265.96	6796.52	0.013%
17	6867.03	-66251.22	-3945.44	-6862.14	66251.15	3940.34	0.011%
18	7923.50	-66278.38	-26.78	-7919.07	66278.34	27.94	0.007%
19	6859.94	-66307.37	3907.15	-6855.51	66307.32	-3904.78	0.008%
20	3935.75	-66297.82	6793.22	-3932.17	66297.79	-6790.31	0.007%
21	-15.47	-66284.69	7849.62	16.33	66284.66	-7844.36	0.008%
22	-3962.49	-66304.94	6805.03	3959.04	66304.91	-6802.58	0.006%
23	-6885.65	-66319.78	3923.47	6879.69	66319.72	-3921.25	0.010%
24	-7929.31	-66292.61	-1.41	7923.45	66292.57	1.87	0.009%
25	-6858.19	-66263.63	-3922.47	6854.70	66263.59	3918.34	0.008%
26	-3958.07	-66273.17	-6793.70	3956.92	66273.11	6788.05	0.009%
27	8.65	-13719.54	-5298.86	-9.65	13719.53	5294.58	0.030%
28	2326.52	-13715.05	-3956.82	-2325.14	13715.03	3953.72	0.023%
29	4181.82	-13711.43	-2405.08	-4178.49	13711.41	2403.34	0.026%
30	4611.04	-13717.79	-31.16	-4607.02	13717.78	31.24	0.028%
31	4617.39	-13724.62	2617.32	-4613.14	13724.60	-2615.30	0.032%
32	2279.45	-13722.35	3938.39	-2277.08	13722.34	-3935.63	0.025%
33	-21.33	-13719.27	4764.60	21.69	13719.26	-4761.54	0.021%
34	-2316.21	-13724.15	3956.80	2314.34	13724.15	-3954.68	0.020%
35	-4647.74	-13727.77	2644.82	4643.60	13727.76	-2644.07	0.029%
36	-4616.23	-13721.40	5.95	4611.59	13721.39	-7.16	0.033%
37	-4166.55	-13714.58	-2371.63	4161.96	13714.57	2368.70	0.037%
38	-2299.41	-13716.85	-3938.82	2296.38	13716.84	3935.05	0.033%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00041742
2	Yes	15	0.00082572	0.00081444
3	Yes	15	0.00064723	0.00051545
4	Yes	10	0.00041506	0.00048907
5	Yes	14	0.00069853	0.00057243
6	Yes	14	0.00087257	0.00086804
7	Yes	14	0.00067998	0.00057512
8	Yes	9	0.00070166	0.00087415
9	Yes	15	0.00066371	0.00051078
10	Yes	15	0.00083464	0.00079379
11	Yes	15	0.00071319	0.00058226
12	Yes	10	0.00086693	0.00083235
13	Yes	15	0.00068492	0.00059590
14	Yes	7	0.00000001	0.00027591
15	Yes	11	0.00076358	0.00032815
16	Yes	10	0.00090609	0.00039979
17	Yes	9	0.00075114	0.00037053
18	Yes	10	0.00000001	0.00022535
19	Yes	10	0.00000001	0.00023356
20	Yes	10	0.00000001	0.00021989
21	Yes	9	0.00000001	0.00025333
22	Yes	10	0.00000001	0.00021423
23	Yes	10	0.00078302	0.00030642
24	Yes	10	0.00064062	0.00028382
25	Yes	10	0.00054307	0.00022953
26	Yes	11	0.00057426	0.00024890
27	Yes	8	0.00000001	0.00040092
28	Yes	8	0.00000001	0.00034761
29	Yes	8	0.00000001	0.00040015
30	Yes	8	0.00000001	0.00041596
31	Yes	8	0.00000001	0.00045183
32	Yes	8	0.00000001	0.00034021
33	Yes	8	0.00000001	0.00029510
34	Yes	8	0.00000001	0.00030505
35	Yes	8	0.00000001	0.00044353
36	Yes	8	0.00000001	0.00047889
37	Yes	8	0.00000001	0.00051409
38	Yes	8	0.00000001	0.00044332

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 105	1.517	37	0.1003	0.0619
T2	105 - 85	1.102	27	0.1046	0.0557
T3	85 - 65	0.659	27	0.0899	0.0448
T4	65 - 45	0.378	27	0.0512	0.0445
T5	45 - 29	0.201	27	0.0443	0.0428
T6	29 - 25	0.042	27	0.0496	0.0388

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	10'x3" Dia Omni	37	1.517	0.1003	0.0619	176659
122.00	VHLP1-23	37	1.456	0.1014	0.0612	176659
119.00	VHLP1-23	37	1.395	0.1024	0.0604	147216
118.00	VHLP1-23	37	1.374	0.1027	0.0602	126185
116.96	Guy	27	1.353	0.1030	0.0599	109840
106.00	valmont 12' T-Frame	27	1.124	0.1047	0.0561	51384
76.96	Guy	27	0.524	0.0742	0.0443	23857
69.00	4' Yagi	27	0.421	0.0578	0.0445	30882
55.00	4' Yagi	27	0.286	0.0431	0.0441	91149
32.00	2'x2'x1' junction box	27	0.074	0.0486	0.0396	181524

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 105	12.879	2	0.8279	0.3396
T2	105 - 85	9.415	2	0.8336	0.3206
T3	85 - 65	5.981	10	0.7204	0.2973
T4	65 - 45	3.526	10	0.4868	0.2766
T5	45 - 29	1.751	10	0.4145	0.2562
T6	29 - 25	0.357	10	0.4234	0.2326

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
125.00	10'x3" Dia Omni	2	12.879	0.8279	0.3396	52730
122.00	VHLP1-23	2	12.368	0.8318	0.3369	52730
119.00	VHLP1-23	2	11.856	0.8353	0.3342	43942
118.00	VHLP1-23	2	11.684	0.8363	0.3333	37664
116.96	Guy	2	11.505	0.8372	0.3324	32785
106.00	valmont 12' T-Frame	2	9.593	0.8352	0.3216	15597
76.96	Guy	10	4.869	0.6253	0.2884	4269
69.00	4' Yagi	10	3.940	0.5276	0.2804	5444
55.00	4' Yagi	10	2.601	0.4291	0.2673	14208
32.00	2'x2'x1' junction box	10	0.623	0.4212	0.2371	56077

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	125	Leg	A325N	0.7500	3	1994.27	29820.60	0.067 ✔	1	Bolt Tension
		Top Girt	A325N	0.6250	1	157.38	6830.86	0.023 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	105	Leg	A325N	0.7500	3	7392.28	29820.60	0.248 ✔	1	Bolt Tension
		Top Girt	A325N	0.6250	1	1459.91	6830.86	0.214 ✔	1	Member Block Shear
T3	85	Leg	A325N	0.7500	3	5994.07	29820.60	0.201 ✔	1	Bolt Tension
		Top Girt	A325N	0.6250	1	804.15	6830.86	0.118 ✔	1	Member Block Shear
T4	65	Leg	A325N	0.7500	3	3769.49	29820.60	0.126 ✔	1	Bolt Tension
T5	45	Leg	A325N	0.7500	3	3851.10	29820.60	0.129 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	116.96 (A) (258)	3/4 EHS	5830.00	58299.91	18436.30	34980.00	1.000	1.897 ✔
	116.96 (B) (257)	3/4 EHS	5830.00	58299.91	20039.50	34980.00	1.000	1.746 ✔
	116.96 (C) (256)	3/4 EHS	5830.00	58299.91	19577.70	34980.00	1.000	1.787 ✔
T3	76.96 (A) (261)	7/8 EHS	7970.00	79699.84	22898.10	47820.00	1.000	2.088 ✔
	76.96 (B) (260)	7/8 EHS	7970.00	79699.84	26011.30	47820.00	1.000	1.838 ✔
	76.96 (C) (259)	7/8 EHS	7970.00	79699.84	24582.70	47820.00	1.000	1.945 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio P_u / ϕP_n
T1	125 - 105	2	20.00	3.92	94.0 K=1.00	3.1416	1.00	-16241.10	74093.50	0.219 [1] ✔
T2	105 - 85	2	20.00	3.92	94.0 K=1.00	3.1416	1.00	-45727.90	74093.50	0.617 [1] ✔
T3	85 - 65	2 1/4	20.00	3.92	83.6 K=1.00	3.9761	1.00	-70546.00	107392.00	0.657 [1] ✔
T4	65 - 45	2	20.00	3.92	94.0 K=1.00	3.1416	1.00	-46576.10	74093.50	0.629 [1] ✔
T5	45 - 29	2	16.00	3.90	93.5 K=1.00	3.1416	1.00	-31415.50	74603.20	0.421 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	29 - 25	2	4.37	3.05	73.1 K=1.00	3.1416	1.00	-38021.90	95668.20	0.397 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	7/8	4.96	2.34	115.7 K=0.90	0.6013	-2357.90	9631.38	0.245 [1] ✔
T2	105 - 85	7/8	4.96	2.34	115.7 K=0.90	0.6013	-5634.81	9631.38	0.585 [1] ✔
T3	85 - 65	7/8	4.96	2.33	114.8 K=0.90	0.6013	-5967.60	9729.92	0.613 [1] ✔
T4	65 - 45	7/8	4.96	2.34	115.7 K=0.90	0.6013	-4839.71	9631.38	0.502 [1] ✔
T5	45 - 29	7/8	4.94	2.34	115.3 K=0.90	0.6013	-2921.46	9676.41	0.302 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	103.8 K=1.19	0.7150	-204.71	13143.80	0.016 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	103.4 K=1.19	0.7150	-1652.44	13189.30	0.125 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.63	100.1 K=1.25	0.7150	-112.17	13668.70	0.008 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.63	100.1 K=1.25	0.7150	-264.31	13668.70	0.019 [1]

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

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	105 - 85	L2x2x3/16	3.04	2.87	103.8 K=1.19	0.7150	-1130.43	13143.80	0.086 [1]
T6	29 - 25	12" x 3/8" Plate	0.76	0.59	65.8 K=1.00	4.5000	-253.69	116106.00	0.002 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	2	20.00	3.92	94.0	3.1416	4898.10	141372.00	0.035 [1]
T2	105 - 85	2	20.00	0.21	5.0	3.1416	22176.80	141372.00	0.157 [1]
T3	85 - 65	2 1/4	20.00	3.92	83.6	3.9761	36395.80	178924.00	0.203 [1]
T4	65 - 45	2	20.00	0.21	5.0	3.1416	2251.10	141372.00	0.016 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	7/8	4.96	2.34	128.5	0.6013	2602.46	19482.80	0.134 [1]
T2	105 - 85	7/8	4.96	2.34	128.5	0.6013	2988.89	19482.80	0.153 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T3	85 - 65	7/8	4.96	2.33	127.6	0.6013	4135.04	19482.80	0.212 [1]
T4	65 - 45	7/8	4.96	2.34	128.5	0.6013	924.84	19482.80	0.047 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	55.9	0.7150	1814.74	23166.00	0.078 [1]
T2	105 - 85	L2x2x3/16	3.04	2.87	55.9	0.7150	2253.60	23166.00	0.097 [1]
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	0.7150	2965.63	23166.00	0.128 [1]
T4	65 - 45	L2x2x1/8	3.04	2.87	55.1	0.4844	2947.56	15693.80	0.188 [1]
T5	45 - 29	L2x2x1/8	3.04	2.87	55.1	0.4844	2869.30	15693.80	0.183 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.63	55.9	0.4308	157.38	18739.00	0.008 [1]
T2	105 - 85	L2x2x3/16	3.04	2.63	55.9	0.4308	1459.91	18739.00	0.078 [1]
T3	85 - 65	L2x2x3/16	3.04	2.61	55.5	0.4308	804.15	18739.00	0.043 [1]
T4	65 - 45	L2x2x1/8	3.04	2.87	55.1	0.4844	1842.66	15693.80	0.117 [1]
T5	45 - 29	L2x2x1/8	3.04	2.87	55.1	0.4844	1592.61	15693.80	0.101 [1]
T6	29 - 25	L3x3x1/8	2.88	2.71	34.3	0.7344	4929.85	23793.80	0.207 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	L2x2x3/16	3.04	2.87	55.9	0.7150	847.40	23166.00	0.037 [1] ✔
T2	105 - 85	L2x2x3/16	3.04	2.87	55.9	0.7150	2094.34	23166.00	0.090 [1] ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	0.7150	1311.36	23166.00	0.057 [1] ✔
T4	65 - 45	L2x2x1/8	3.04	2.87	55.1	0.4844	1537.32	15693.80	0.098 [1] ✔
T5	45 - 29	L2x2x1/8	3.04	2.87	55.1	0.4844	5132.28	15693.80	0.327 [1] ✔
T6	29 - 25	12" x 3/8" Plate	0.76	0.59	65.8	4.5000	9.38	145800.00	0.000 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	125 - 105	3" x 1/4" Plate	3.04	2.87	477.8	0.7500	2484.12	24300.00	0.102
T3	85 - 65	3" x 1/4" Plate	3.04	2.85	474.3	0.7500	7254.38	24300.00	0.299 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} lb-ft	ϕM_{nx} lb-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} lb-ft	ϕM_{ny} lb-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T1	125 - 105	3" x 1/4" Plate	20.41	126.56	0.161	-0.00	1518.75	0.000
T3	85 - 65	3" x 1/4" Plate	0.00	126.56	0.000	0.00	1518.75	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	125 - 105	3" x 1/4" Plate	0.102	0.161	0.000	0.212	1.000	4.8.1 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T3	85 - 65	3" x 1/4" Plate	0.299	0.000	0.000	0.299 [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

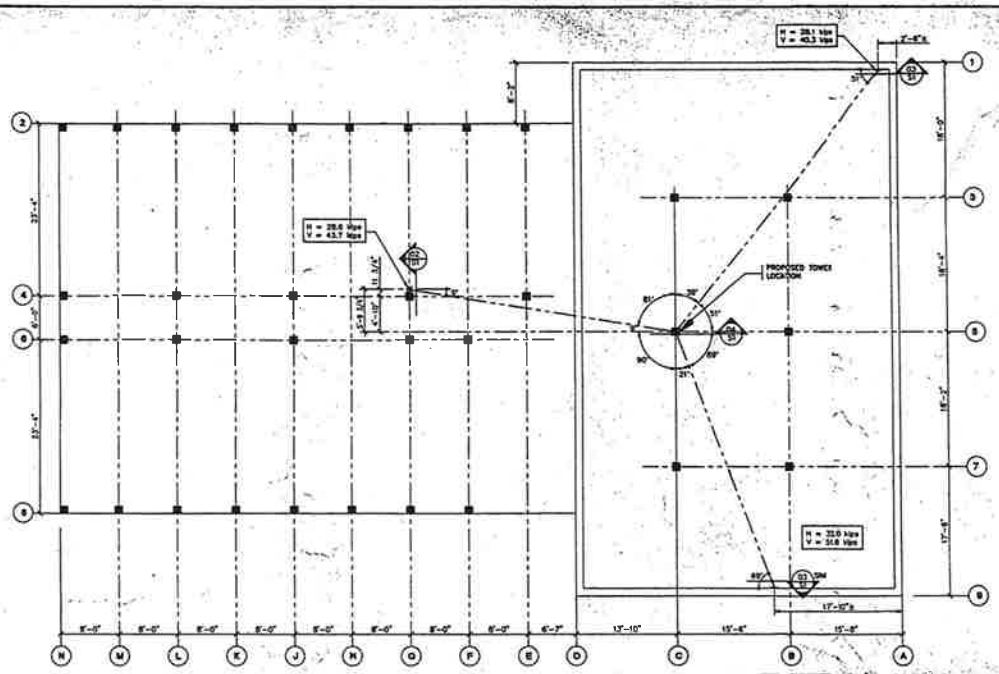
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	125 - 105	Leg	2	2	-16241.10	74093.50	21.9	Pass
		Diagonal	7/8	40	-2357.90	9631.38	24.5	Pass
		Horizontal	L2x2x3/16	17	1814.74	23166.00	7.8	Pass
		Top Girt	L2x2x3/16	5	157.38	18739.00	0.8	Pass
		Bottom Girt	L2x2x3/16	8	847.40	23166.00	3.7	Pass
		Guy A@116.958	3/4	258	18436.30	34980.00	52.7	Pass
		Guy B@116.958	3/4	257	20039.50	34980.00	57.3	Pass
		Guy C@116.958	3/4	256	19577.70	34980.00	56.0	Pass
		Top Guy Pull-Off@116.958	3" x 1/4" Plate	35	2484.12	24300.00	21.2	Pass
T2	105 - 85	Leg	2	54	-45727.90	74093.50	61.7	Pass
		Diagonal	7/8	64	-5634.81	9631.38	58.5	Pass
		Horizontal	L2x2x3/16	68	2253.60	23166.00	9.7	Pass
		Top Girt	L2x2x3/16	55	1459.91	18739.00	7.8	Pass
		Bottom Girt	L2x2x3/16	59	2094.34	23166.00	9.0	Pass
T3	85 - 65	Leg	2 1/4	105	-70546.00	107392.00	65.7	Pass
		Diagonal	7/8	151	-5967.60	9729.92	61.3	Pass
		Horizontal	L2x2x3/16	119	2965.63	23166.00	12.8	Pass
		Top Girt	L2x2x3/16	107	804.15	18739.00	4.3	Pass
		Bottom Girt	L2x2x3/16	110	1311.36	23166.00	5.7	Pass
		Guy A@76.9583	7/8	261	22898.10	47820.00	47.9	Pass
		Guy B@76.9583	7/8	260	26011.30	47820.00	54.4	Pass
		Guy C@76.9583	7/8	259	24582.70	47820.00	51.4	Pass
		Top Guy Pull-Off@76.9583	3" x 1/4" Plate	136	7254.38	24300.00	29.9	Pass
T4	65 - 45	Leg	2	156	-46576.10	74093.50	62.9	Pass
		Diagonal	7/8	204	-4839.71	9631.38	50.2	Pass
		Horizontal	L2x2x1/8	197	2947.56	15693.80	18.8	Pass
		Top Girt	L2x2x1/8	158	1842.66	15693.80	11.7	Pass
		Bottom Girt	L2x2x1/8	160	1537.32	15693.80	9.8	Pass
T5	45 - 29	Leg	2	207	-31415.50	74603.20	42.1	Pass
		Diagonal	7/8	246	-2921.46	9676.41	30.2	Pass
		Horizontal	L2x2x1/8	239	2869.30	15693.80	18.3	Pass
		Top Girt	L2x2x1/8	209	1592.61	15693.80	10.1	Pass
		Bottom Girt	L2x2x1/8	211	5132.28	15693.80	32.7	Pass
T6	29 - 25	Leg	2	248	-38021.90	95668.20	39.7	Pass
		Top Girt	L3x3x1/8	250	4929.85	23793.80	20.7	Pass
		Bottom Girt	12" x 3/8" Plate	254	-253.69	116106.00	0.2	Pass
							Summary	
						Leg (T3)	65.7	Pass
						Diagonal (T3)	61.3	Pass
						Horizontal (T4)	18.8	Pass
						Top Girt	20.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						(T6) Bottom Girt (T5)	32.7	Pass
						Guy A (T1)	52.7	Pass
						Guy B (T1)	57.3	Pass
						Guy C (T1)	56.0	Pass
						Top Guy Pull-Off (T3)	29.9	Pass
						Bolt Checks	24.8	Pass
						RATING =	**65.7**	**Pass**

APPENDIX B

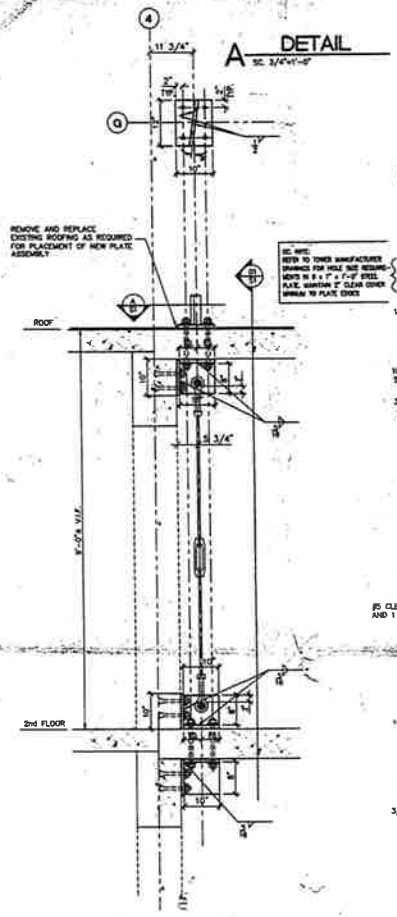
REFERENCED STRUCTURAL ANALYSIS REPORT

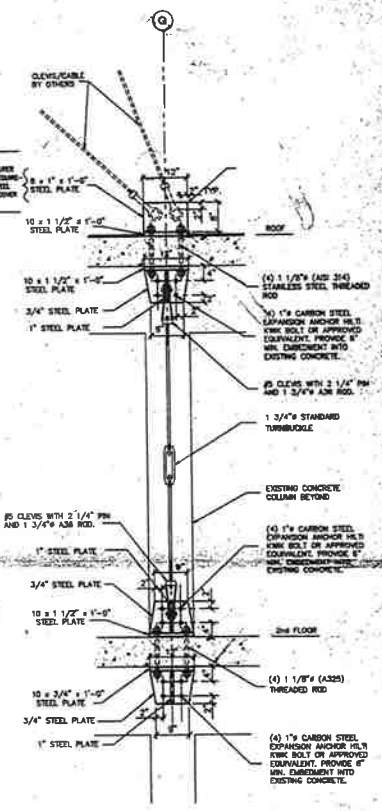


ROOF FRAMING PLAN

SC. 1/8"=1'-0"

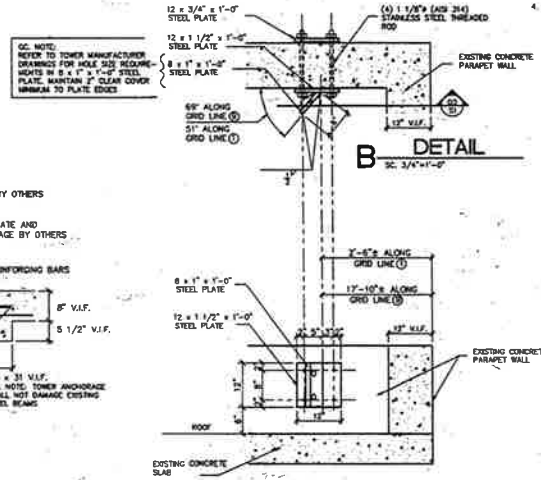
1. VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO START OF NEW WORK
2. FILL ALL VOIDS WHERE NEW PLATES COME IN CONTACT WITH EXISTING CONCRETE WITH NON SHRINK GROUT FOR FULL BEARING.
3. ALL REACTIONS ARE FURNISHED BY PAUL J. FORD AND CO., DATED 10/14/97. TOWER AND CABLE DESIGNS FURNISHED BY OTHERS
4. EXISTING DRAWING INFORMATION PER DRAWINGS PREPARED BY MYLCHREEST AND REYNOLDS CONSULTING ENGINEERS DATED MARCH 1946 AND DRAWINGS BY JOHN HUNTINGTON A.I.A DATED MAY 1952.



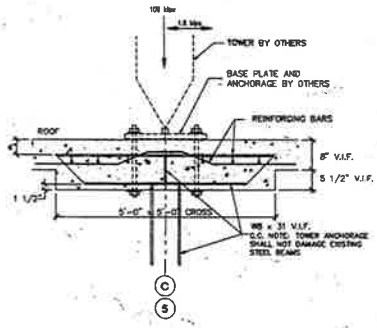


02 SECTION SC. 3/4"=1'-0"

01 SECTION SC. 3/4"=1'-0"



B DETAIL SC. 3/4"=1'-0"



04 SECTION SC. 3/4"=1'-0"

03 SECTION SC. 3/4"=1'-0"

STEEL NOTES:

1. ALL STEEL SHALL BE ASTM-A36 (UNLESS OTHERWISE NOTED ON DRAWINGS).
2. ALL STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS - ALLOWABLE STRESS DESIGN AND PLASTIC DESIGN" (AISC/ASD - 89).
3. ALL EXTERIOR STEEL SHALL BE HOT DIPPED GALVANIZED.
4. ALL WELDS SHALL BE MADE ONLY BY WELDERS WHO HAVE BEEN QUALIFIED AS PRESCRIBED IN THE "STANDARD CODE OF WELDING IN BUILDING CONSTRUCTION" OF THE AMERICAN WELDING SOCIETY (AWS D1.1-80).
5. SUBMIT SHOP DRAWINGS, FOR REVIEW PRIOR TO FABRICATION.

rev. no.	by	date	remarks

CELLULAR ANTENNA
14 - 20 ISHAM ROAD
WEST HARTFORD, CONNECTICUT

ROOF FRAMING PLAN

CIANCI & CIANCI
STRUCTURAL ENGINEERS
WEST HARTFORD, CT (860)521-6415

job no.	scale	date
97-119.01	AS NOTED	10/22/97

drawing no. S-1

P.O. BOX 8597 FORT WORTH, TX 76124-0597
(817) 457-3060 FAX (817) 429-6018

Tower 100 FT GUYED
Location HARTFORD COUNTY, CT
Client GENERAL TOWER CO.
Design 80 MPH + SIMULTANEOUS 1/2" ICE
According to ANSI/EIA 222-F 1996

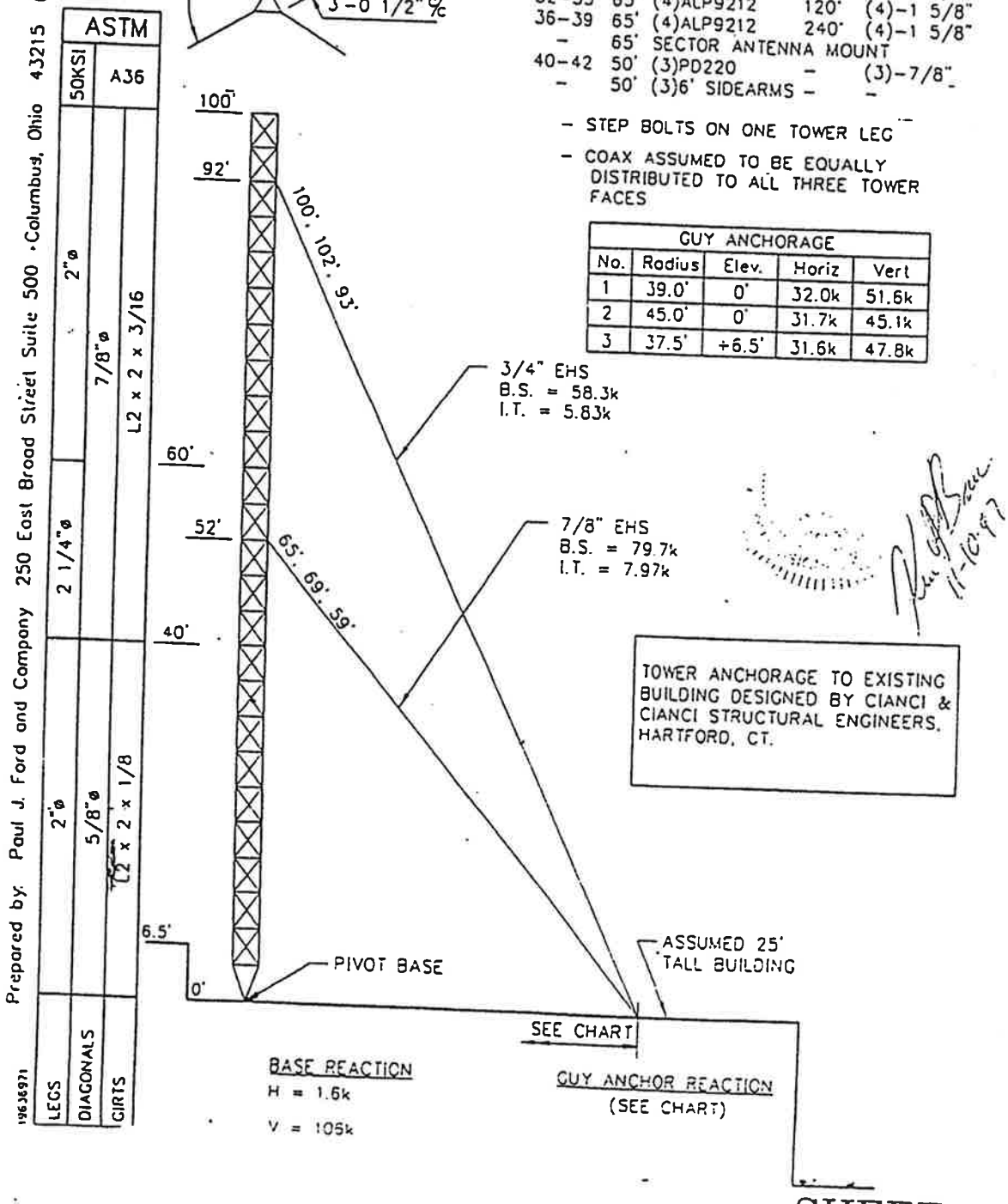
Page 1 Of 1
By KRH Date
FWT No. PJF No. 19-636-97R
Revision No. 1 Date 11-10-1997

ANTENNA LIST

NO	EL.	ANTENNA	AZ	COAX
1-4	98'	(4)ALP9212	0°	(4)-1 5/8"
5-8	98'	(4)ALP9212	120°	(4)-1 5/8"
9-12	98'	(4)ALP9212	240°	(4)-1 5/8"
-	98'	SECTOR ANTENNA MOUNT		
13-16	78'	(4)ALP9212	0°	(4)-1 5/8"
17-20	78'	(4)ALP9212	120°	(4)-1 5/8"
21-24	78'	(4)ALP9212	240°	(4)-1 5/8"
-	78'	SECTOR ANTENNA MOUNT		
25-27	72'	(3)PD220	-	(3)-7/8"
-	72'	(3)6' SIDEARMS	-	-
28-31	65'	(4)ALP9212	0°	(4)-1 5/8"
32-35	65'	(4)ALP9212	120°	(4)-1 5/8"
36-39	65'	(4)ALP9212	240°	(4)-1 5/8"
-	65'	SECTOR ANTENNA MOUNT		
40-42	50'	(3)PD220	-	(3)-7/8"
-	50'	(3)6' SIDEARMS	-	-

- STEP BOLTS ON ONE TOWER LEG
- COAX ASSUMED TO BE EQUALLY DISTRIBUTED TO ALL THREE TOWER FACES

GUY ANCHORAGE				
No.	Radius	Elev.	Horiz	Vert
1	39.0'	0'	32.0k	51.6k
2	45.0'	0'	31.7k	45.1k
3	37.5'	+6.5'	31.6k	47.8k

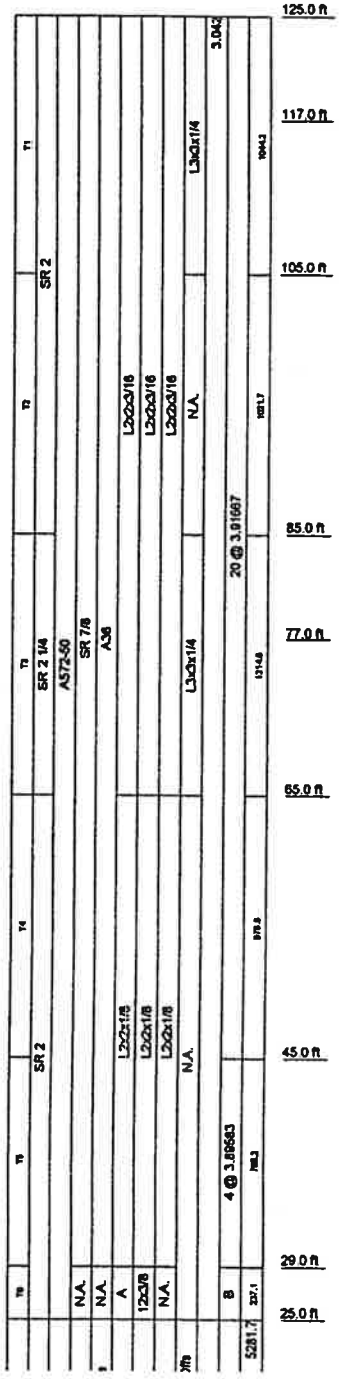


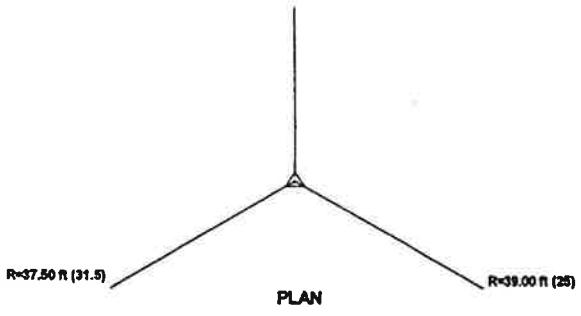
TOWER ANCHORAGE TO EXISTING BUILDING DESIGNED BY CIANCI & CIANCI STRUCTURAL ENGINEERS, HARTFORD, CT.

11-10-97

Prepared by: Paul J. Ford and Company 250 East Broad Street Suite 500 Columbus, Ohio 43215 (614)-221-6679 Fax (614)-221-0166

SHEET 1 OF 37





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12' x 3" Dia Omni (est)	143	SLCP 2x6015 (Verizon)	110
18' x 3" Dia Omni (est)	132	LPA-80063/4CF (Verizon)	110
4 Bay Dipole	132	LPA-80063/4CF (Verizon)	110
4 Bay Dipole	129	SC-E 6014 rev2 (Verizon)	110
6' x 3" Dia Omni	128	SC-E 6014 rev2 (Verizon)	110
4' x 3" DIA Omni (est)	127	SC-E 6014 rev2 (Verizon)	110
Dragonwave 2.5 (Clearwire)	127	SC-E 6014 rev2 (Verizon)	110
Boom Gate (1) (Sprint/Nextel)	123	BXA-171063-8BF (Verizon)	110
Boom Gate (1) (Sprint/Nextel)	123	SACP 2x5516 (Verizon)	110
(4) ALP 9212 (est) (Sprint/Nextel)	123	SACP 2x5516 (Verizon)	110
(4) ALP 9212 (est) (Sprint/Nextel)	123	(2) Diplexer (Verizon)	110
(4) ALP 9212 (est) (Sprint/Nextel)	123	(2) Diplexer (Verizon)	110
Boom Gate (1) (Sprint/Nextel)	123	(2) Diplexer (Verizon)	110
Argus LLPX310R (Clearwire)	123	PiROD 13' Lightweight T-Frame (Verizon)	110
Argus LLPX310R (Clearwire)	123	GPS - mount	35
Argus LLPX310R (Clearwire)	123	GPS	35
Dragonwave 2.5 (Clearwire)	119	GPS - mount	35
PiROD 13' Lightweight T-Frame (Verizon)	110	GPS	35
PiROD 13' Lightweight T-Frame (Verizon)	110	GPS - mount	35
(2) GPS (Verizon)	110	GPS	35
BXA-70063/6CF (Verizon)	110	GPS - mount	35
SLCP 2x6015 (Verizon)	110	GPS	35

SYMBOL LIST

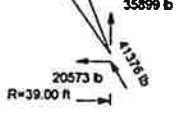
MARK	SIZE	MARK	SIZE
A	L3x3x3/8	B	1 @ 2.78842

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 Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Tower located is roof top mounted and located approx 25' above mean grade level.
6. TOWER RATING: 91.9%



GPD GROUP®

STRUCTURAL & EQUIPMENT MAPPING REPORT

SITE ID: HFC1539C
SITE NAME: Wireless Solutions – West Hartford

SITE ADDRESS: 14-20 Isham Road
West Hartford, CT 06091
Hartford County

COORDINATES: 41° 45' 41.57" N
72° 44' 25.57" W

ELEVATION: 145' ±

TOWER: 125' Guyed Tower

OWNER: General Tower Company

TOWER MANUFACTURER: FWT

TOWER TAG: Unknown

MAPPING COMPLETED BY: GPD & Northeast Towers, Inc.

WEATHER CONDITIONS: Sunny

MAPPING COMPLETED FOR:

Dewberry

July 9, 2012

GPD Project #: 2012707.13

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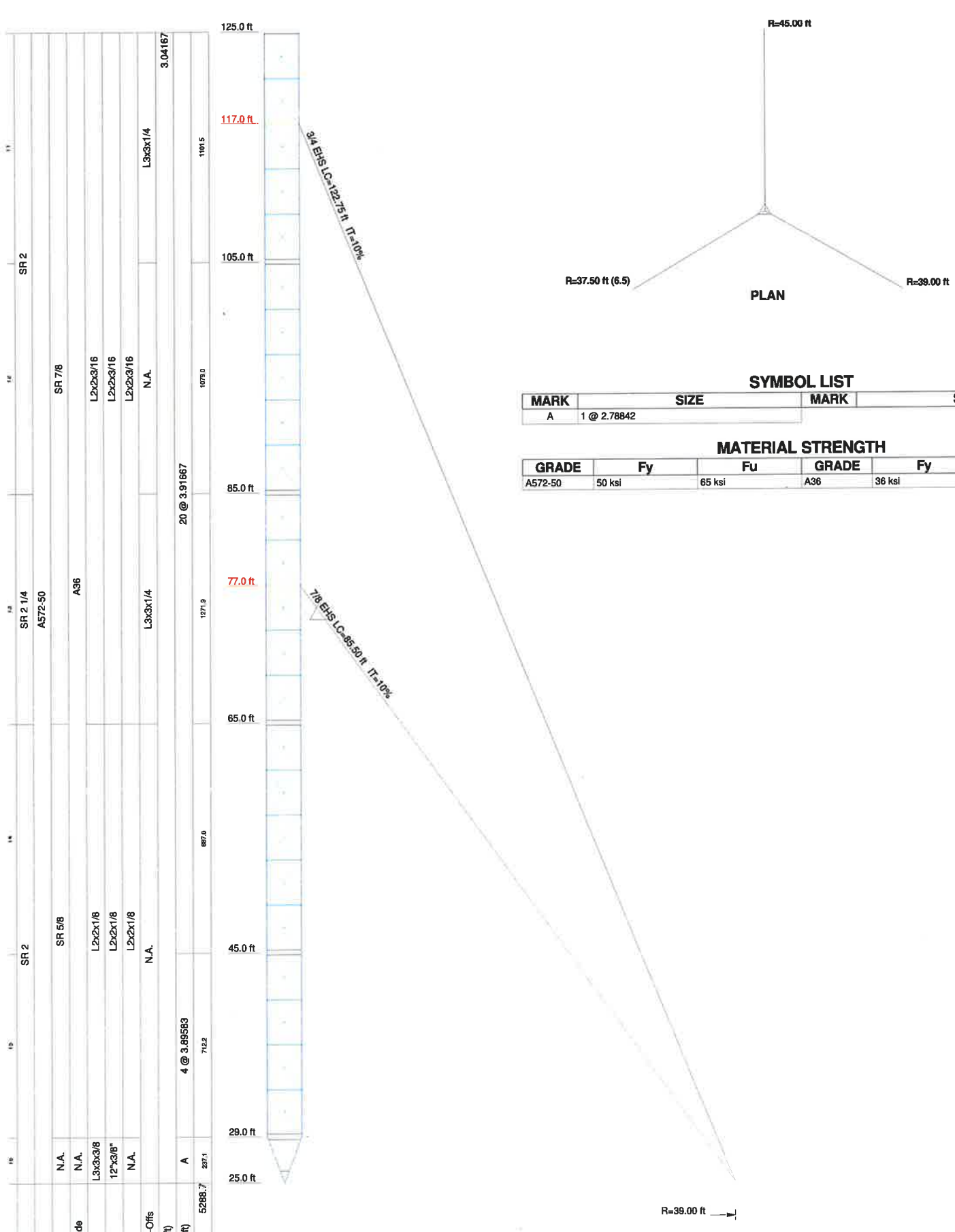
TOWER ELEVATION DRAWING AND STRUCTURAL INFORMATION



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	1 @ 2.78842		

MATERIAL STRENGTH

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

GPD GROUP
GPD Group
520 South Main Street, Suite 2531
Akron, OH 44311
Phone: (330) 572-2100
FAX: (330) 572-2101

Job: HFC1539C Wireless Solutions – West Hartfo			
Project: 2012707.13			
Client: Dewberry	Drawn by: jalexander	App'd:	
Code: TIA/EIA-222-F	Date: 07/09/12	Scale: NTS	
Path: O:\2012\2012707\13\tnx\Wireless Solutions-West Hartford.eri		Dwg No. E-1	

TOWER BOLT INFORMATION			
ELEVATION	QTY	SIZE	LOCATION
105′	3	3/4″	Leg
85′	3	3/4″	Leg
65′	3	3/4″	Leg
45′	3	3/4″	Leg
40′	3	3/4″	Leg
29′	3	3/4″	Leg

EQUIPMENT SUMMARY SHEETS

CARRIER: Unknown

MOUNT DESCRIPTION	CENTERLINE	FACE WIDTH	FACE HEIGHT	STANDOFF	MAIN FACE HORIZONTAL	ANTENNA PIPE
	122'	N/A	N/A	N/A	N/A	4'x2-3/8"

APPURTENANCE	CENTERLINE	MANUFACTURER	MODEL	QTY	DIMENSION LxWxD	POSITION	AZIMUTH
Omni	141'	Unknown	12' Omni	1	12'T	Leg B	N/A
Omni	130'	Unknown	10' 4-Bay Dipole	1	10'T	Leg B	N/A
Omni	130'	Unknown	10' Omni	1	10'T	Leg A	N/A
Omni	128'	Unknown	6' Omni	1	6'T	Leg C	N/A

FEEDLINE INFORMATION			
SIZE	QTY	LOCATION	NOTES
1-5/8	2	Face B	Coax for 10' Omni and 10' 4-Bay Dipole
1/2	1	Face B	Coax for 6' Whip

CARRIER: Clearwire & Nextel/Sprint

MOUNT DESCRIPTION	CENTERLINE	FACE WIDTH	FACE HEIGHT	STANDOFF	MAIN FACE HORIZONTAL	ANTENNA PIPE
	122'	13'	50"	52-3/4"	Tube	4'x2-3/8"

APPURTENANCE	CENTERLINE	MANUFACTURER	MODEL	QTY	DIMENSION LxWxD	POSITION	AZIMUTH
Panel	123.33'	Decibel	DB844H65E-XY	6	48"x6"X9"	Leg A/B	0/120
Panel	123.33'	Decibel	DB844H90E-XY	3	48"x6"x8"	Leg C	240
Panel	123.33'	Argus	LLPX310R-V1	3	42"x12"x4.5"	Leg A/B/C	0/120/240
RRH	123.33'	Samsung	SP1-22132825WB	3	12"x20"x5"	Leg A/B/C	0/120/240
Fiber Box	125'	Unknown	2'x2' Box	1	2'x2'x1'	Face B	N/A

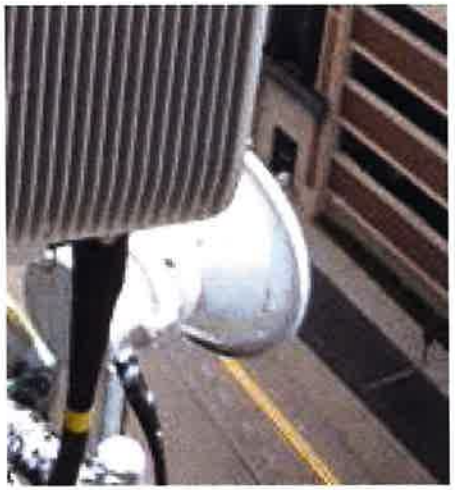
FEEDLINE INFORMATION			
SIZE	QTY	LOCATION	NOTES
1-1/4"	9	Face C	Coax for Decibel Antennas
2-1/4"	1	Face	Coax for Argus Antennas

CARRIER: Clearwire

MOUNT DESCRIPTION	CENTERLINE	FACE WIDTH	FACE HEIGHT	STANDOFF	MAIN FACE HORIZONTAL	ANTENNA PIPE
	118'	N/A	N/A	N/A	N/A	4'x2-3/8"

APPURTENANCE	CENTERLINE	MANUFACTURER	MODEL	QTY	DIMENSION LxWxD	POSITION	AZIMUTH
Dish	118'	Dragonwave	1' HP Dish	2	12"ø	Leg B/C	190

FEEDLINE INFORMATION			
SIZE	QTY	LOCATION	NOTES
1/2"	2	Face B	



CARRIER: Verizon

MOUNT DESCRIPTION	CENTERLINE	FACE WIDTH	FACE HEIGHT	STANDOFF	MAIN FACE HORIZONTAL	ANTENNA PIPE
	106'	13'	32"	40-1/2"	Pipe	4'x2-3/8"

APPURTENANCE	CENTERLINE	MANUFACTURER	MODEL	QTY	DIMENSION LxWxD	POSITION	AZIMUTH
Panel	107.5'	Antel	LPA 80063/4CF	6	47.44"x15.2"x13.19"	Leg A/B/C	30/150/270
Panel	107.5'	Antel	LPA 185063/8CF	6	48.75"x6.06"x3.15"	Leg A/B/C	30/150/270

FEEDLINE INFORMATION			
SIZE	QTY	LOCATION	NOTES
1-5/8"	12	Face A	

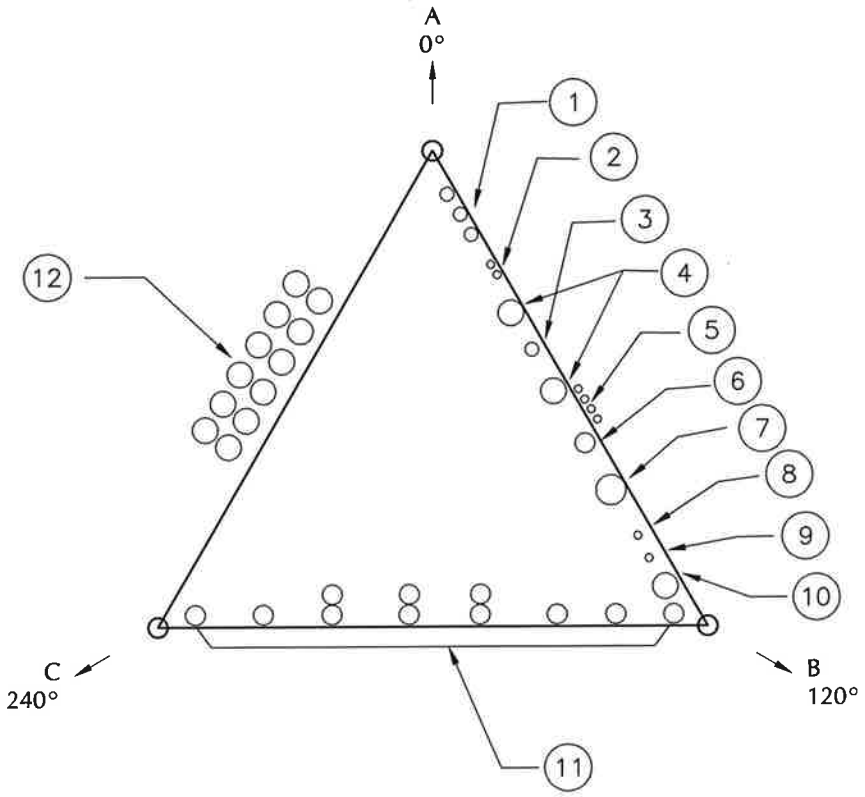
CARRIER: Miscellaneous

MOUNT DESCRIPTION	CENTERLINE	FACE WIDTH	FACE HEIGHT	STANDOFF	MAIN FACE HORIZONTAL	ANTENNA PIPE
	35'	N/A	N/A	6'	N/A	N/A

APPURTENANCE	CENTERLINE	MANUFACTURER	MODEL	QTY	DIMENSION LxWxD	POSITION	AZIMUTH
Yagi	68.83'	Unknown	4' Yagi	1	4'L	Leg A	N/A
Yagi	54.5'	Unknown	4' Yagi	1	4'L	Leg A	N/A
GPS	35'	Unknown	GPS	4	5"x6.12"x6.12"	Leg A/B	N/A
Fiber Box	32.5'	Unknown	2'x2' Box	1	2'x2'x1'	Face B	N/A

FEEDLINE INFORMATION			
SIZE	QTY	LOCATION	NOTES
1/2"	2	Face B	Coax for Yagi
1/2"	4	Face B	Coax for GPS

FEEDLINE PLAN



#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Unknown	7/8"	3	29' to 122'	Unused
2	Clearwire	1/2"	2	29' to 118'	
3	Unknown	7/8"	1	29' to 122'	
4	Unknown	1-5/8"	2	29' to 122'	
5	Unknown	1/2"	4	29' to 35'	
6	Unknown	1-1/4"	1	29' to 122'	
7	Clearwire	2-1/4"	1	29' to 122'	
8	Mike Gassner	1/2"	1	29' to 68.83'	
9	Mike Gassner	1/2"	1	29' to 54.5'	
10	Mike Gassner	1-5/8"	1	29' to 68.83'	
11	Nextel/Sprint	1-1/4"	11	29' to 122'	(2) Unused Coax
12	Verizon	1-5/8"	12	29' to 106'	

PHOTOS

Coax on Face A

Coax on Face B

Coax on Face C

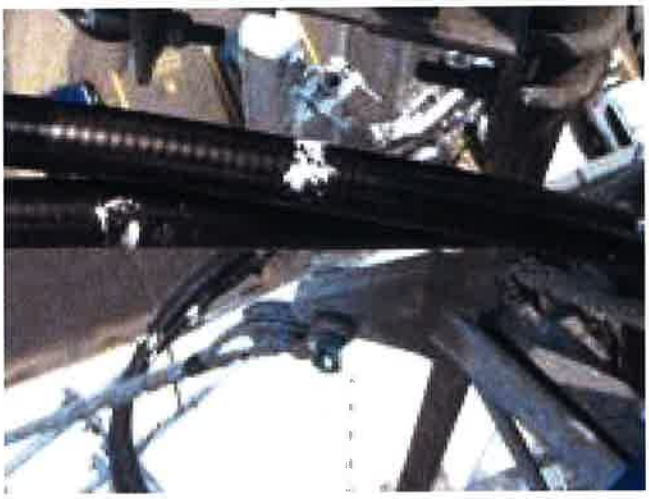
Guy Wire

Tower view from bottom

Overall Tower

Step Pegs and Safety Climb on Leg C

GPS



Guy Wire (Typical)

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

100-ft Existing Roof Top Mounted FWT
Guyed Lattice Tower

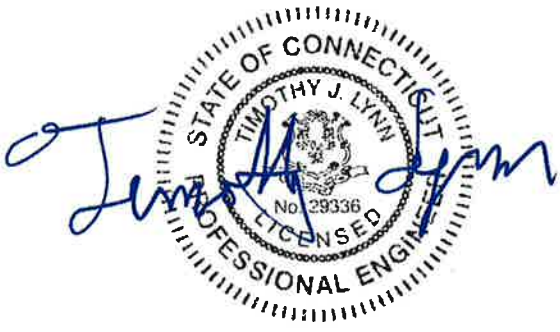
Proposed Verizon Wireless
Antenna Upgrade

Verizon Site Ref: West Hartford Center

14-20 Isham Road
West Hartford, CT

CENTEK Project No. 16001.17

Date: July 22, 2016



Prepared for:

Verizon Wireless
99 East River Road, 9th Floor
East Hartford, CT 06108

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna installation/modification proposed by Verizon Wireless on the existing roof top mounted guyed lattice tower located in West Hartford, CT.

The host tower is a 100-ft, six-section, three legged guyed lattice tower with pin base originally designed by Paul J Ford and Company job no; 19-636-97R dated November 10, 1997 and manufactured by FWT. The tower type, geometry and structure member sizes were taken from a previous structural report prepared by Centek Engineering job no; 12124.54 dated January 21, 2013. Guy anchorage to the existing host building roof top was taken from the original design documents prepared by Cianci & Cianci Structural Engineers job no; 97-113-01 dated October 22, 1997.

Antenna and appurtenance inventory were taken from the aforementioned Centek structural report and a Verizon RF data sheet.

The tower is made up of six (6) vertical sections consisting of A572-50 solid steel legs. Diagonal and horizontal bracing consists of A36 solid round and steel angle construction. The vertical tower legs are connected together with bolted flanges while bracing consists of fully welded connections. The width of the tower face is 3'-0-1/2".

Verizon proposes the removal of nine (9) panel antennas and six (6) remote radio heads and the installation of nine (9) panel antennas, nine (9) remote radio heads and one (1) main distribution boxes mounted to the existing three (3) T-frames. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing, proposed and future loads considered in this analysis consist of the following:

- UNKNOWN (Existing):
  Appurtenance: One (1) 18-ft Omni-directional whip antenna, one (1) 12-ft Omni-directional whip antenna, one (1) 6-ft Omni-directional whip antenna, one (1) 4-ft Omni-directional whip antenna and two (2) 4 Bay dipole antennas mounted to the top of the tower.
  Coax Cables: Three (3) 1-5/8" ∅ and four (4) 7/8" dia. coax cables running on the face of the existing tower as specified in Section 3 of this report.
- CLEARWIRE (Existing):
  Antennas: One (1) Andrew VHLP2-18 microwave dish pipe mounted with a RAD center elevation of 127-ft above existing grade (102-ft above tower base).
  Coax Cables: One (1) 1/2" ∅ coax cable running on the face of the existing tower as specified in Section 3 of this report.
- NEXTEL / CLEARWIRE (Existing):
  Antennas: Six (6) Decibel DB844H65E-XY panel antennas, three (3) Decibel DB844G65ZAXY panel antennas, three (3) Argus LLPX310R panel antennas and three (3) RRU's mounted to three (3) 12-ft boom gates with a RAD center elevation of 123-ft above existing grade (98-ft above tower base).
  Coax Cables: Twelve (12) 1-1/4" ∅ coax cables and one (1) 3" ∅ flex conduit running on the face of the existing tower as specified in Section 3 of this report.

- CLEARWIRE (Existing):
  Antennas: Two (2) Andrew VHLP1-23 microwave dishes pipe mounted with a RAD center elevation of 118-ft above existing grade (93-ft above tower base).
  Coax Cables: Two (2) 1/2" ∅ coax cables running on the face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antennas: One (1) ANT-150D6-9 yagi antenna leg mounted with an elevation of 69-ft above existing grade (44-ft above tower base).
  Coax Cables: One (1) 1/2" ∅ coax cables running on the face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antennas: One (1) ANT-150D6-9 yagi antenna leg mounted with an elevation of 55-ft above existing grade (30-ft above tower base).
  Coax Cables: One (1) 1/2" ∅ coax cables running on the face of the existing tower as specified in Section 3 of this report.
- UNKNOWN (Existing):
  Antennas: Four (4) GPS antennas mounted on standoff arms with an elevation of 31-ft above existing grade (6-ft above tower base).
  Coax Cables: Four (4) 1/2" ∅ coax cables running on the face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing to Remain):
  Antennas: One (1) Antel BXA-80063-4CF and two (2) Swedcom SLCP 2X6014 panel antennas mounted to three (3) existing 12-ft T-Frames with a RAD center elevation of 105-ft above existing grade (80-ft above tower base).
  Appurtenances: One (1) RFS DB-T1-6Z-8AB-0Z main distribution box flush mounted to a leg of the existing tower with a RAD center elevation of 109-ft above existing grade (84-ft above tower base).
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on the face of the existing tower as specified in Section 3 of this report.
- VERIZON (Existing to Remove):
  Antennas: One (1) Antel BXA-70063-6CF, two (2) Swedcom SLCP 2X6015, one (1) Antel BXA-171063-8BF, two (2) Swedcom SACP 2X5516, one (1) Antel BXA-171063-12CF panel antenna and two (2) Swedcom SACP 2X5516 panel antennas panel antennas mounted to three (3) existing 12-ft T-Frames with a RAD center elevation of 105-ft above existing grade (80-ft above tower base).
  Appurtenances: Three (3) Alcatel-Lucent RRH2x40-AWS Remote Radio Heads and three (3) Alcatel-Lucent RRH2x40-07-U Remote Radio Heads mounted to three (3) existing 12-ft T-Frames with a RAD center elevation of 105-ft above existing grade (80-ft above tower base).

- **VERIZON (PROPOSED):**
  Antennas: Nine (9) Andrew SBNHH-1D65B panel antennas mounted to three (3) existing 12-ft T-Frames with a RAD center elevation of 105-ft above existing grade (80-ft above tower base).
  Antennas: Three (3) Alcatel-Lucent RRH2x60-700 remote radio heads, three (3) Alcatel-Lucent RRH2x60-PCS remote radio heads, three (3) Alcatel-Lucent RRH4x45/2x90-AWS remote radio heads and one (1) RFS DB-T1-6Z-8AB-0Z main distribution mounted to three (3) existing 12-ft T-Frames with a RAD center elevation of 105-ft above existing grade (80-ft above tower base).
  Coax Cables: One (1) 1-5/8" ∅ fiber cable running on the face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables to be installed as indicated in this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower shaft, and the model assumes that the shaft members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (fastest mile) with no ice and a 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix K of the CSBC[1] and the wind speed data available in the TIA/EIA-222-F-96 Standard. The higher of the two wind speeds is utilized in preparation on the tower analysis.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the tower structure and its components, and the application of ½" radial ice on the tower structure and its components.

Basic Wind Speed:	Hartford; v = 80 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	West Hartford; v = 95 mph (3 second gust) equivalent to v = 77.5 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed controls.	
Load Cases:	Load Case 1; 80 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 2; 69 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 69 mph wind speed velocity represents 75% of the wind pressure generated by the 80 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	Load Case 3; Seismic – not checked	*[Section 1614.5 of State Bldg. Code 2005] does not control in the design of this structure type*

[1] The 2005 Connecticut State Building Code as amended by the 2009 CT State Supplement. (CSBC)

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

- Calculated stresses were found to be within allowable limits. In Load Case 1, per tnxTower "Section Capacity Table", this tower was found to be at **71.7%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T4)	45'-65' AGL (20'-40' ATB)	71.7%	**PASS**
Diagonal (T3)	65'-85' AGL (40'-60' ATB)	61.4%	**PASS**
Guy A (T1)	117' AGL (92' ATB)	50.7%	**PASS**
Guy B (T1)	117' AGL (92' ATB)	54.6%	**PASS**
Guy C (T1)	117' AGL (92' ATB)	53.7%	**PASS**

Existing Guy Anchors and Tower Base

Guy forces are transferred to the existing building structure via three (3) 7/8" ∅ and three (3) 3/4" ∅ galvanized steel guy wires with turnbuckles. All guy anchorage posts are positively attached to the existing building structure. Connections to the existing building were originally designed by Cianci & Cianci Structural Engineers job no; 97-113-01 dated October 22, 1997.

Review of the guy anchor and tower base connections consisted of comparison of the proposed reactions and the design reactions obtained from the aforementioned design documents:

- The guy anchor bolts and tower base **were found** to be within allowable limits.

Tower Component	Original Design Reaction (kips)	Proposed Reaction (kips)	Stress Ratio (percentage of capacity)	Result
Tower Base	106 (Vert)	89 (Vert)	84.0%	**PASS**
	1.6 (Horz)	1 (Horz)	62.5%	**PASS**
Guy Anchor A @ 45'	40.3 (Vert)	32 (Vert)	79.4%	**PASS**
	28.1 (Horz)	21 (Horz)	74.7%	**PASS**
Guy Anchor B @ 39'	51.6 (Vert)	37 (Vert)	71.7%	**PASS**
	32.0 (Horz)	21 (Horz)	65.6%	**PASS**
Guy Anchor C @ 37.5'	43.7 (Vert)	35 (Vert)	80.1%	**PASS**
	28.6 (Horz)	21 (Horz)	73.4%	**PASS**

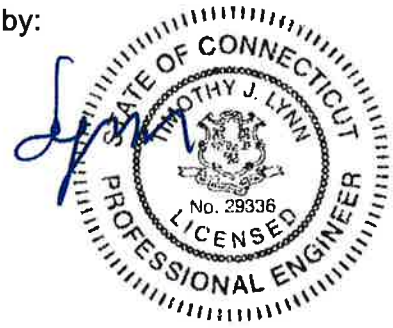
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Verizon Wireless. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

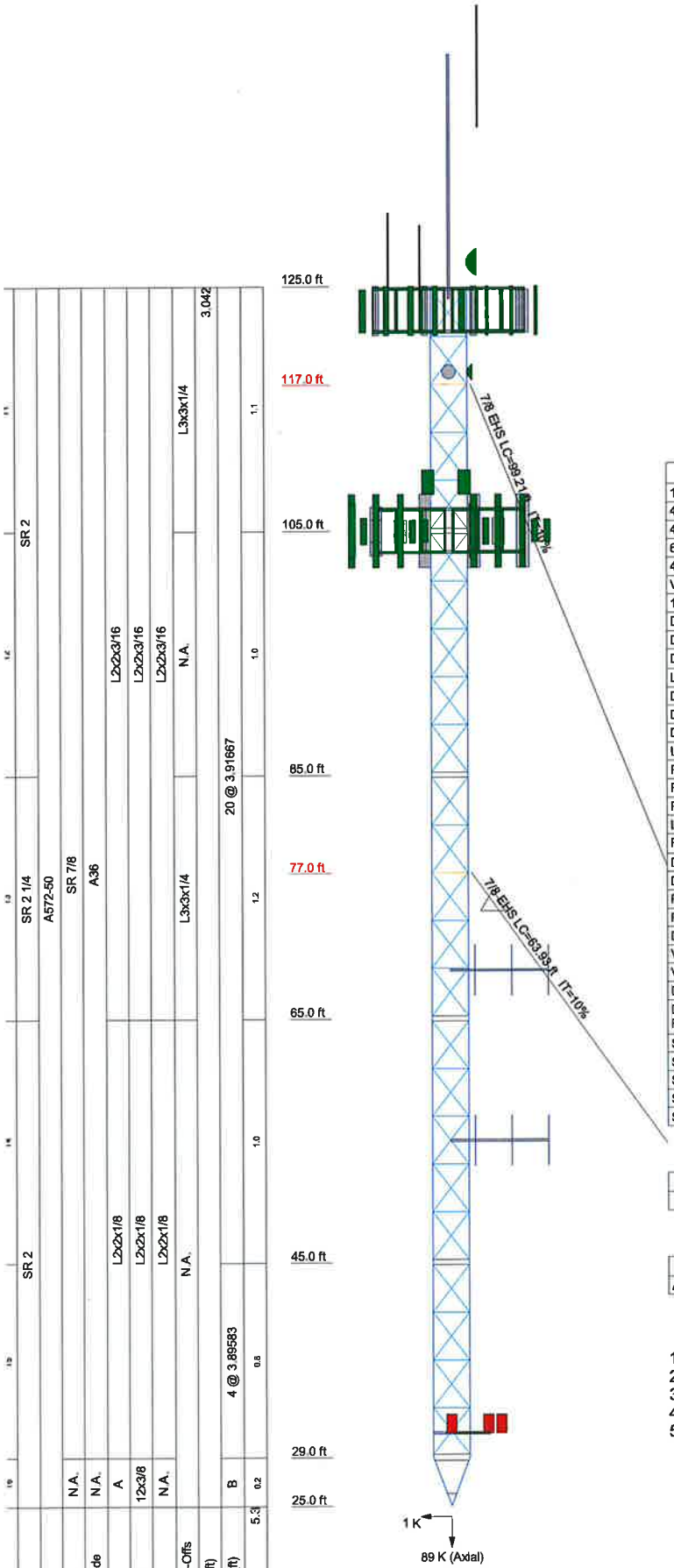
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

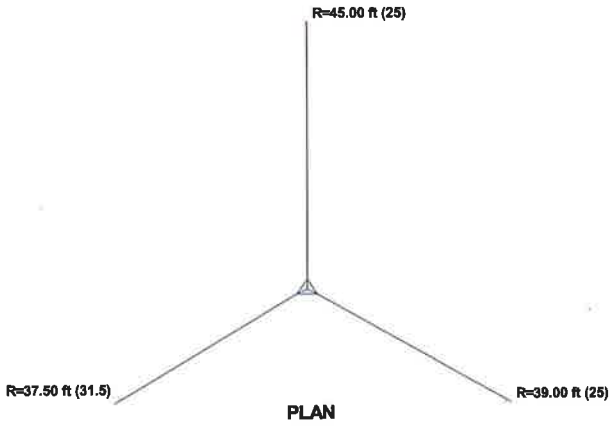
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
12' x 3" Dia Omni	137	SLCP 2x6014 (Verizon - Existing)	105
4-Bay Dipole	129	RRH4x30-B13 (Verizon - Proposed)	105
4-Bay Dipole	129	RRH4x30-B13 (Verizon - Proposed)	105
6' x 3" Dia Omni	128	RRH4x30-B13 (Verizon - Proposed)	105
4' x 3" DIA Omni	127	RRH4x45/2x90-AWS (Verizon - Proposed)	105
VHLP2-18 (Clearwire)	127	RRH4x45/2x90-AWS (Verizon - Proposed)	105
18' x 3" Dia Omni	125	RRH4x45/2x90-AWS (Verizon - Proposed)	105
DB844H65E-XY (Nextel)	123	RRH2x60-PCS (Verizon - Proposed)	105
DB844H65E-XY (Nextel)	123	RRH2x60-PCS (Verizon - Proposed)	105
DB844H65E-XY (Nextel)	123	RRH2x60-PCS (Verizon - Proposed)	105
LLPX310R (Clearwire)	123	Plrod 12' T-Frame Sector Mount (1) (Verizon - Existing)	105
DB844G65ZAXY (Nextel)	123	Plrod 12' T-Frame Sector Mount (1) (Verizon - Existing)	105
DB844G65ZAXY (Nextel)	123	Plrod 12' T-Frame Sector Mount (1) (Verizon - Existing)	105
DB844G65ZAXY (Nextel)	123	SBNHH-1D65B (Verizon - Proposed)	105
LLPX310R (Clearwire)	123	SBNHH-1D65B (Verizon - Proposed)	105
RRU (Clearwire)	123	SBNHH-1D65B (Verizon - Proposed)	105
RRU (Clearwire)	123	SBNHH-1D65B (Verizon - Proposed)	105
RRU (Clearwire)	123	SBNHH-1D65B (Verizon - Proposed)	105
LLPX310R (Clearwire)	123	BXA-80063-4CF (Verizon - Existing)	105
Rohn 6' x 12' Boom Gate (1) (Nextel)	123	ANT150D6-9	69
DB844H65E-XY (Nextel)	123	ANT150D6-9	55
DB844H65E-XY (Nextel)	123	GPS	31
Rohn 6' x 12' Boom Gate (1) (Nextel)	123	3' Pipe Mount Side Arm	31
Rohn 6' x 12' Boom Gate (1) (Nextel)	123	3' Pipe Mount Side Arm	31
DB844H65E-XY (Nextel)	123	3' Pipe Mount Side Arm	31
VHLP1-23 (Clearwire)	118	3' Pipe Mount Side Arm	31
VHLP1-23 (Clearwire)	118	GPS	31
DB-T1-6Z-8AB-0Z (Verizon - Existing)	109	GPS	31
DB-T1-6Z-8AB-0Z (Verizon - Proposed)	109	GPS	31
SBNHH-1D65B (Verizon - Proposed)	105		
SBNHH-1D65B (Verizon - Proposed)	105		
SBNHH-1D65B (Verizon - Proposed)	105		
SLCP 2x6014 (Verizon - Existing)	105		
SBNHH-1D65B (Verizon - Proposed)	105		

SYMBOL LIST

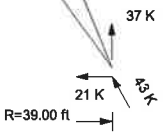
MARK	SIZE	MARK	SIZE
A	L3x3x1/8	B	1 @ 2.78842

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. Tower is located on the roof of a building approximately 25'-0" above grade level.
5. TOWER RATING: 71.7%



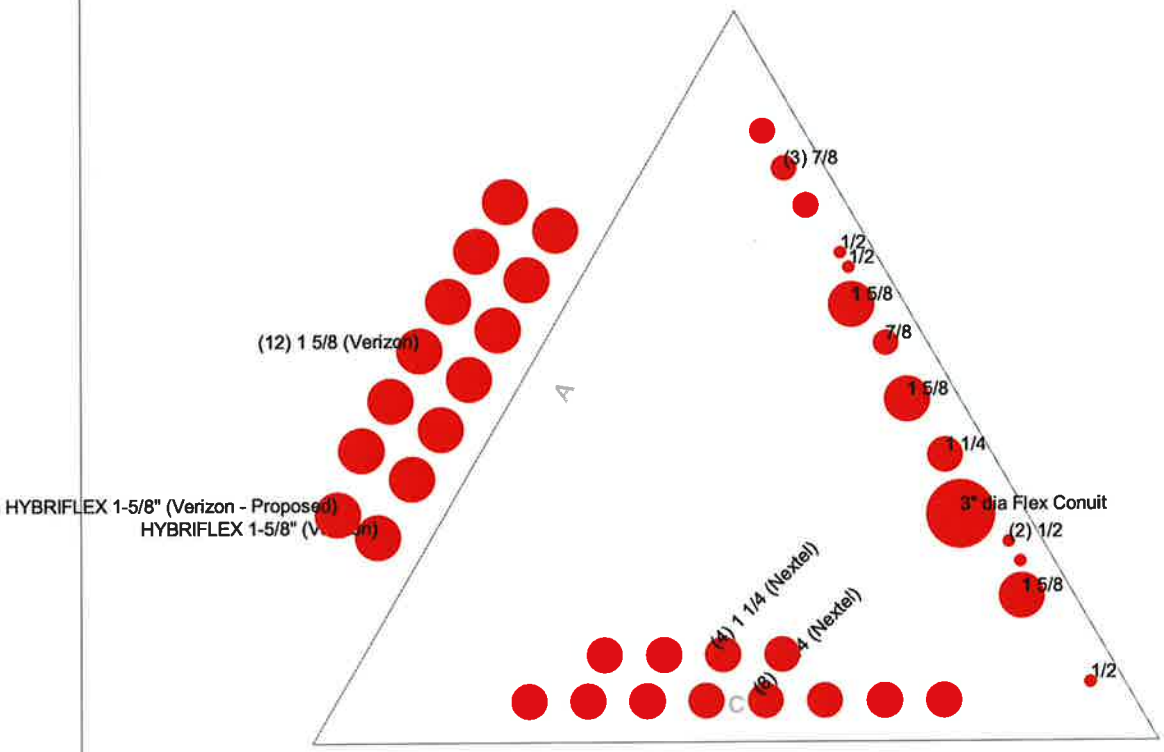
Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: 16001.17 - West Hartford Center			
Project: 100-ft FWT Guyed Tower - 20 Isham Rd., West Hartford,			
Client: Verizon Wireless	Drawn by: TJL	App'd:	
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS	
Path:		Dwg No. E-1	

45'

Round Flat App In Face App Out Face

Section @ 45'



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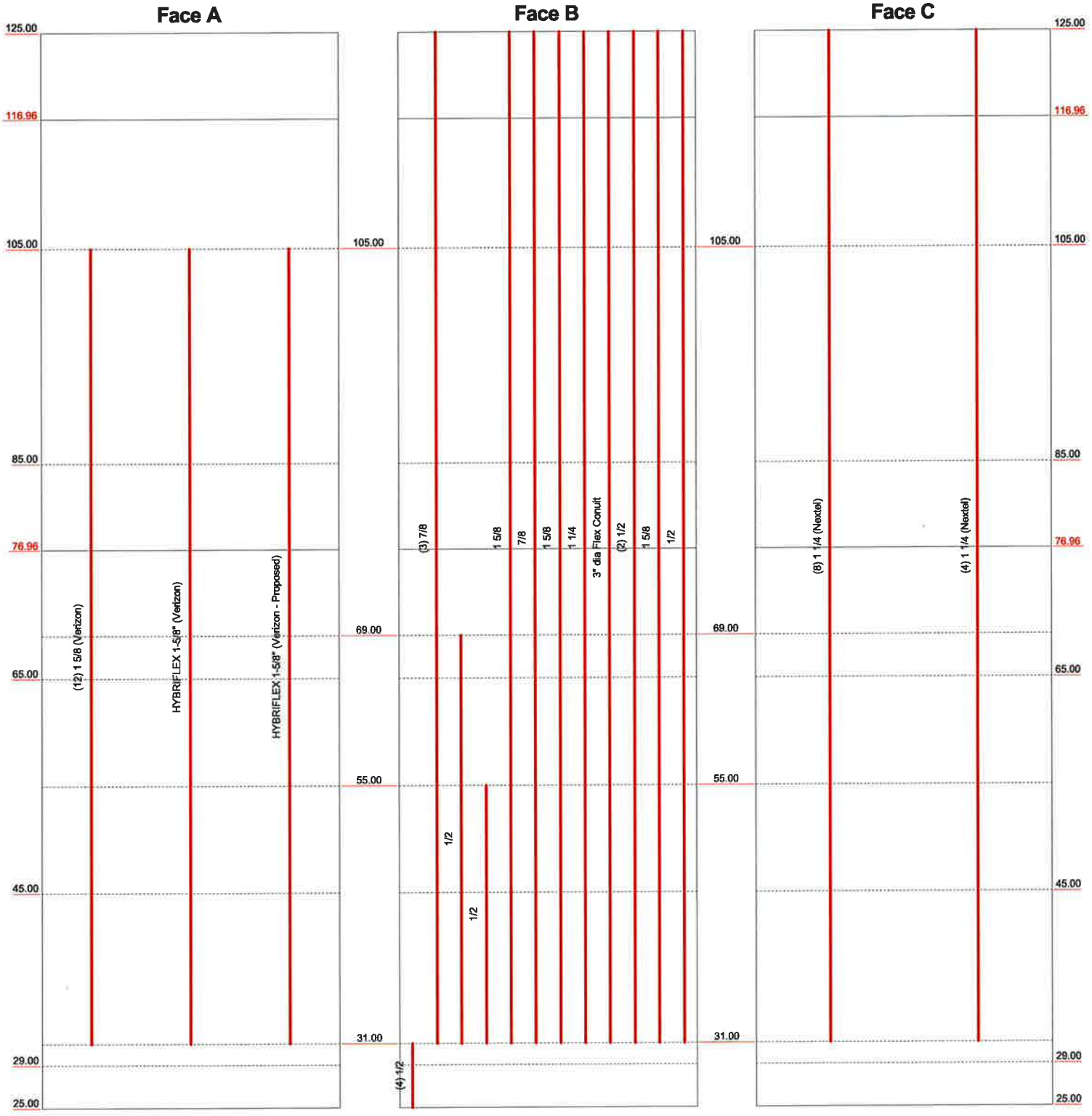
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS	
Path:		Dwg No. E-7	

25' - 125'

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



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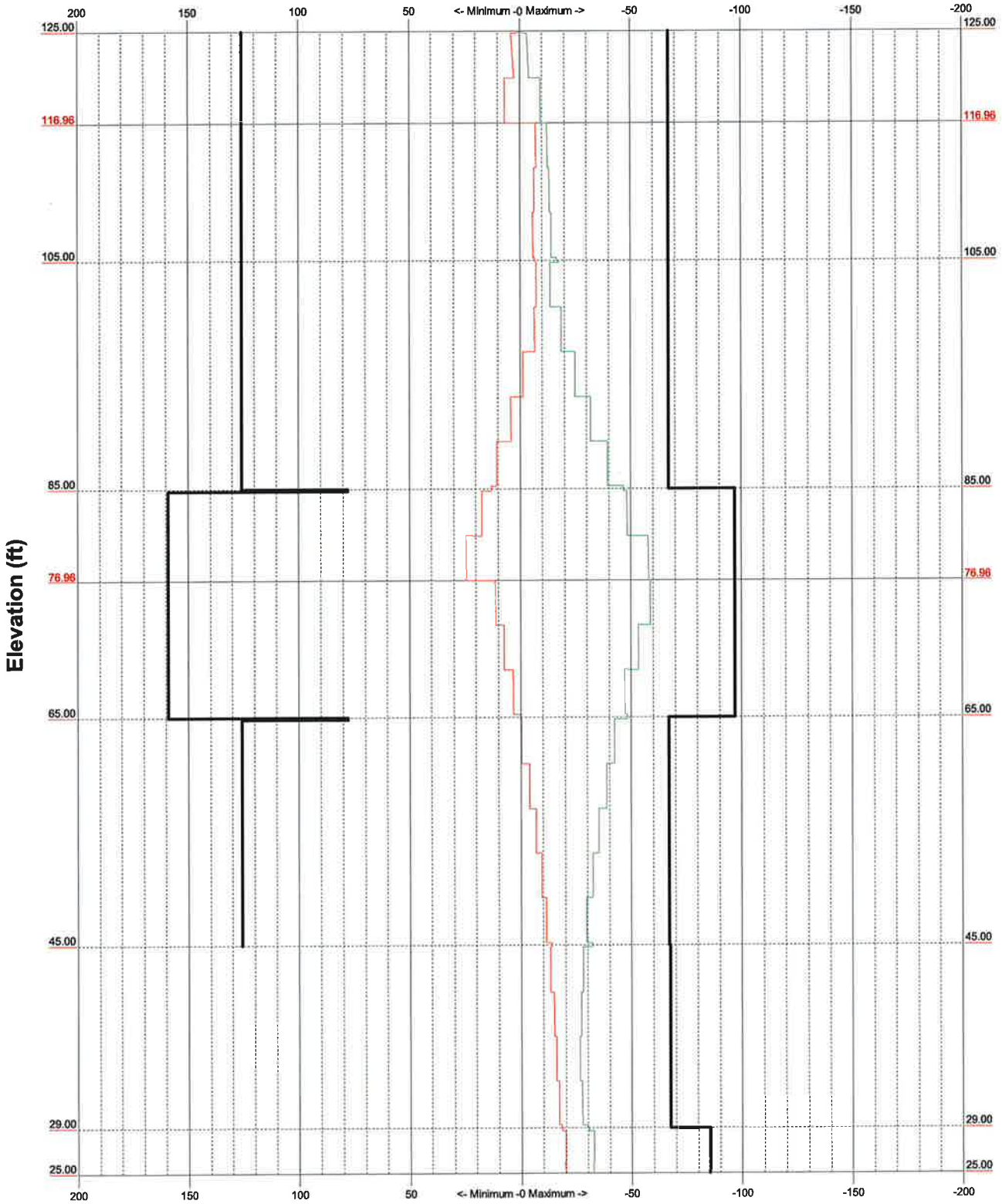
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS	
Path:		Dwg No. E-7	

TIA/EIA-222-F - 80 mph/69 mph 0.500 in Ice

Leg Capacity ——— **Leg Compression (K)**



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Project: ***100-ft FWT Guyed Tower - 20 Isham Rd., West Hartford,***			
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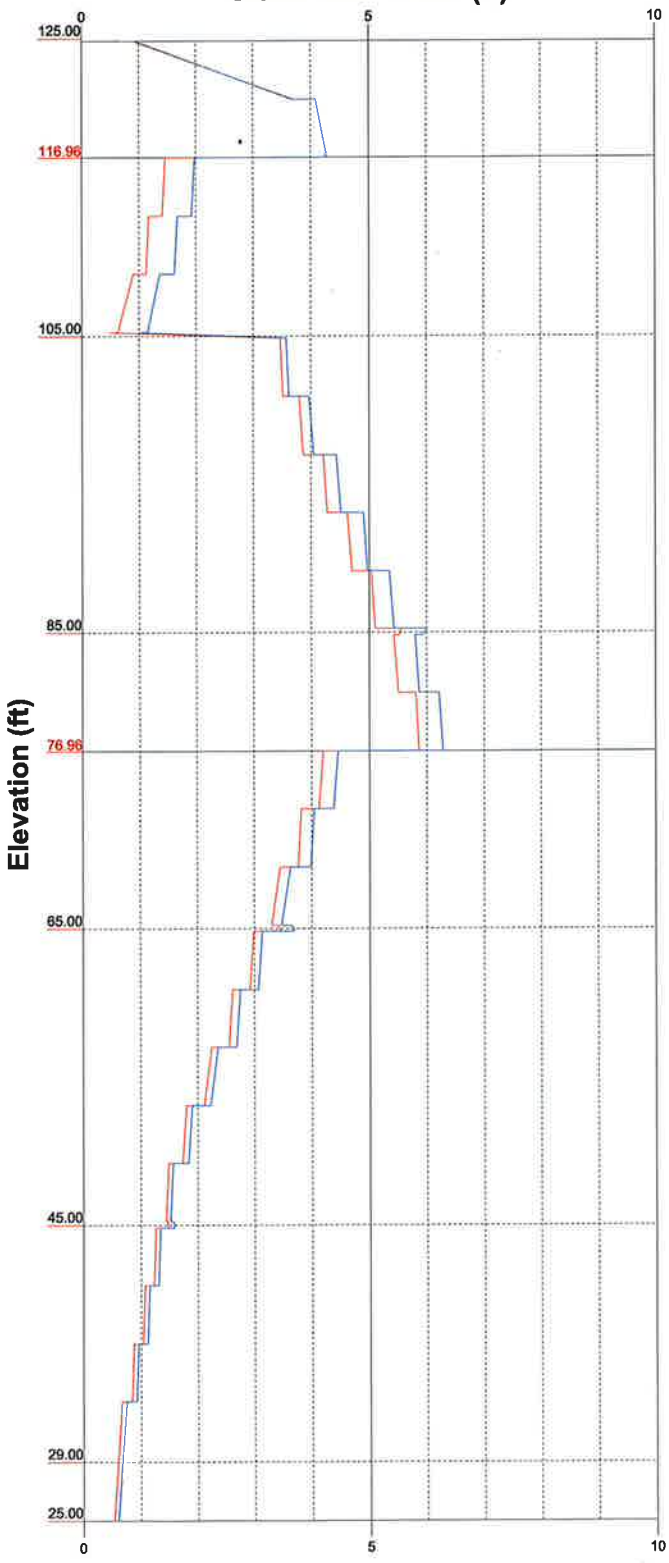
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS	
Path:		Dwg No. E-3	

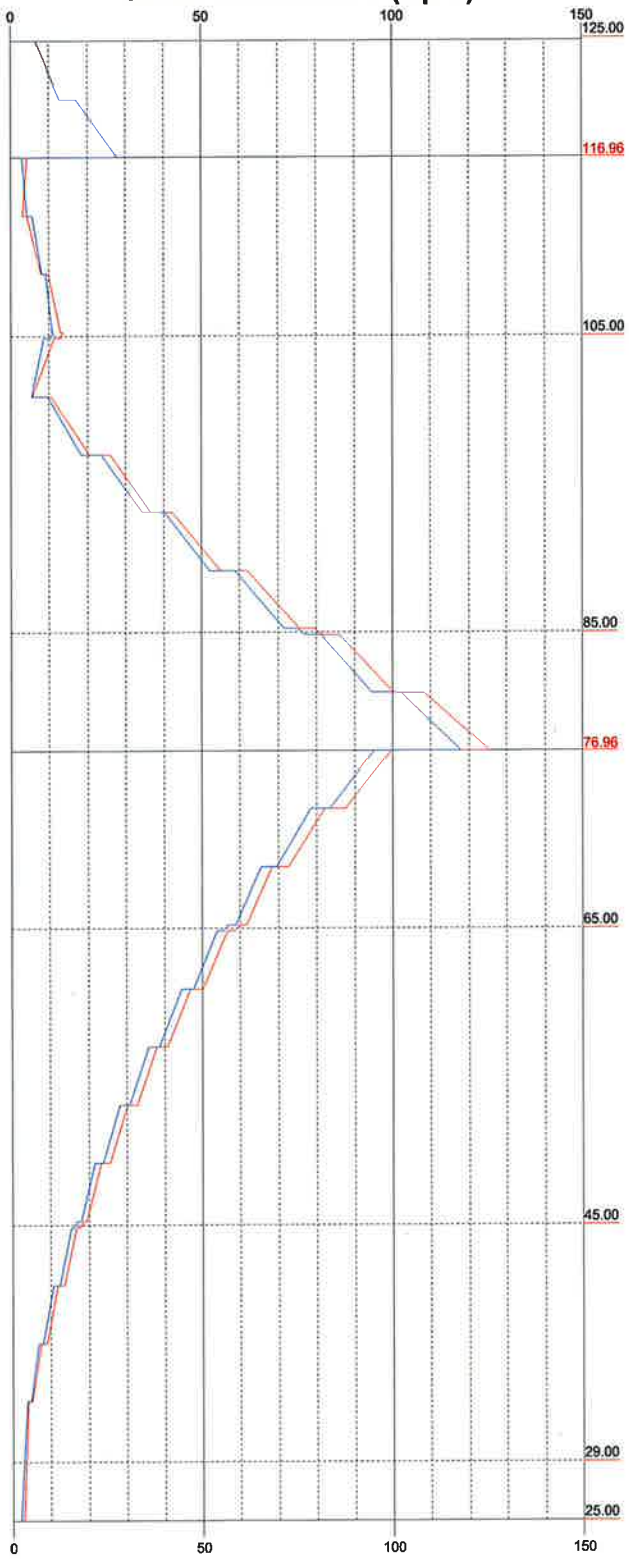
Vx Vz

Global Mast Shear (K)



Mx Mz

Global Mast Moment (kip-ft)



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Job: ***16001.17 - West Hartford Center***		
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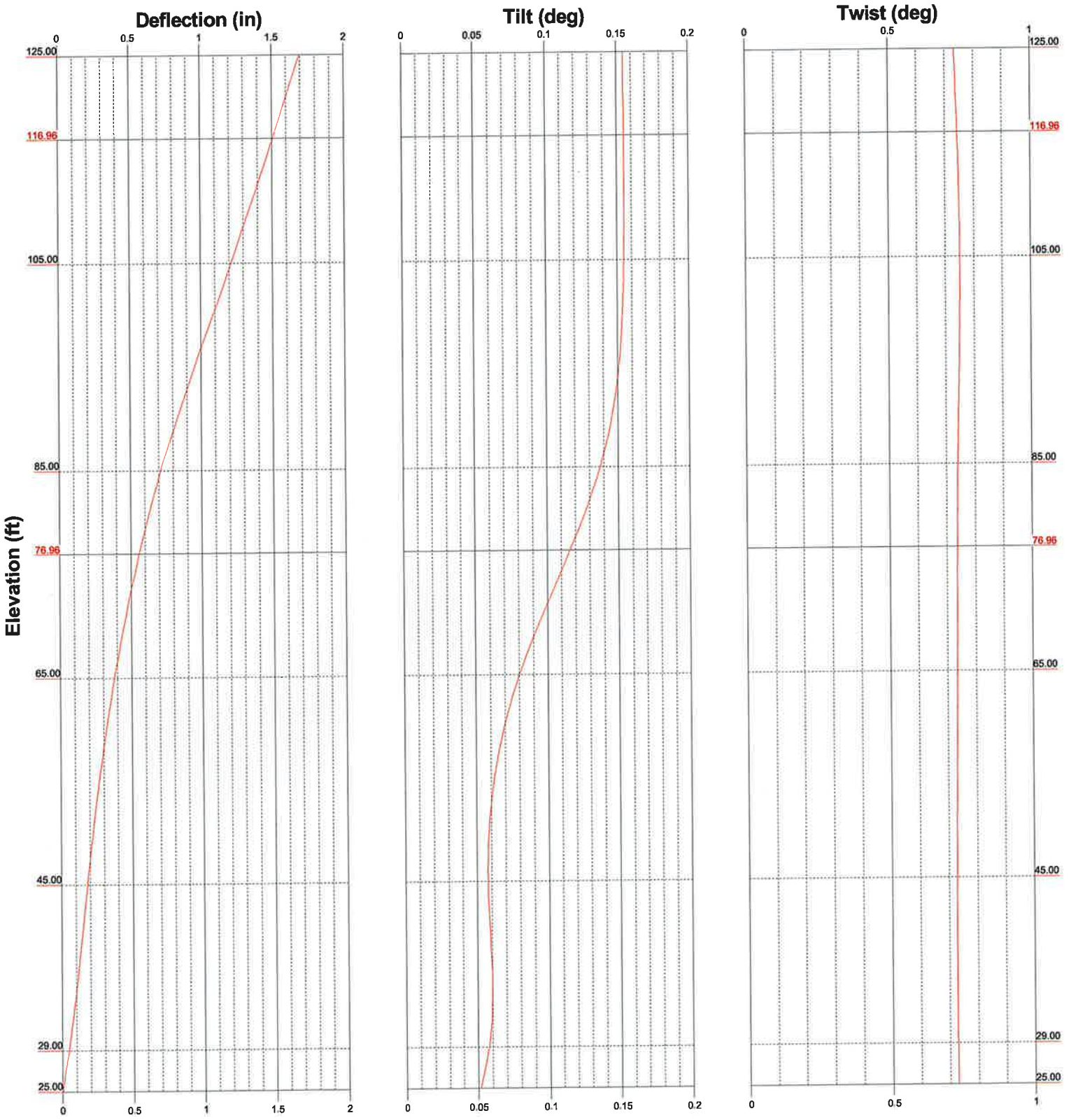
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS
Path:		Dwg No. E-4

TIA/EIA-222-F - Service - 50 mph

Maximum Values



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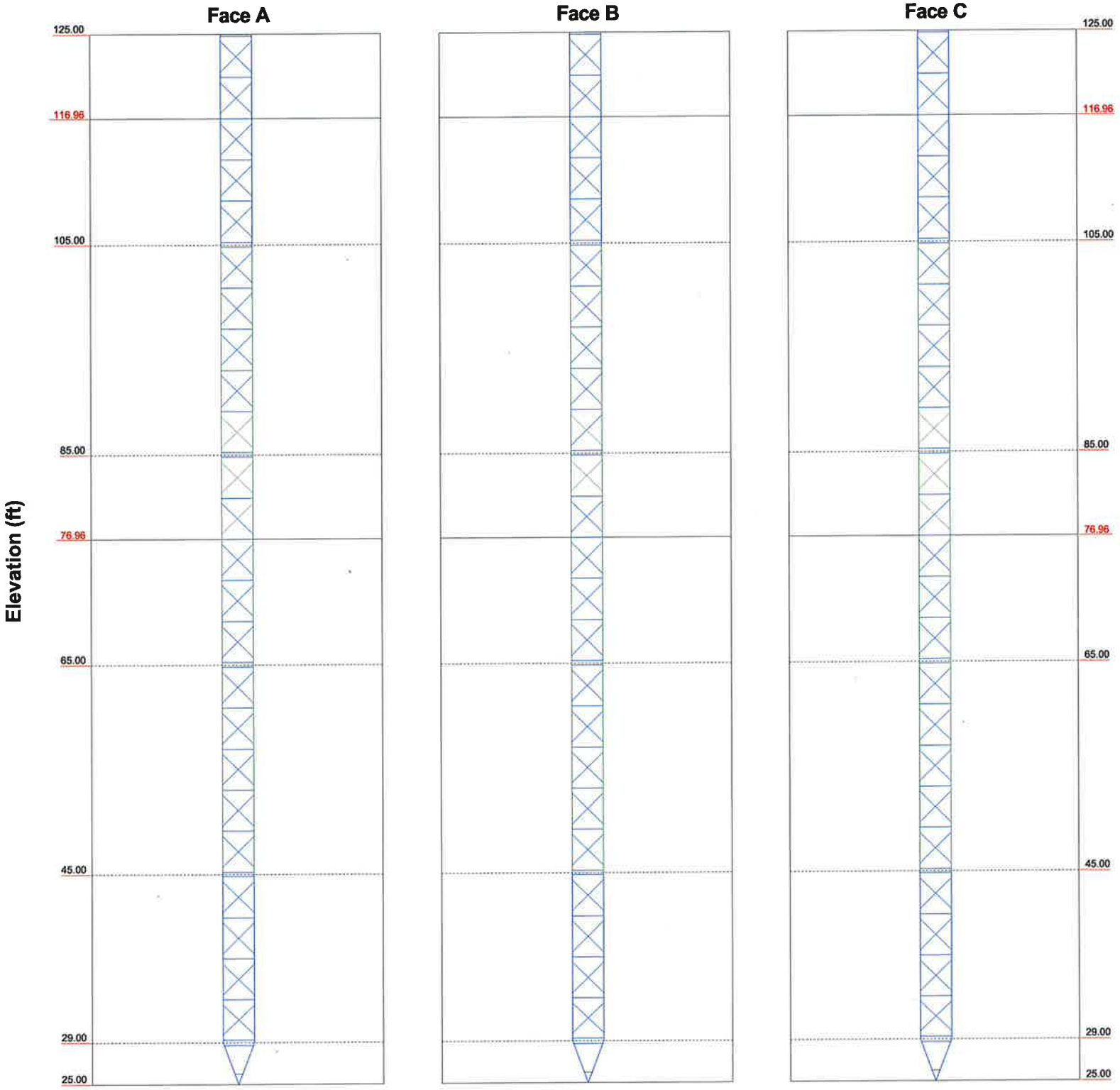
Job: ***16001.17 - West Hartford Center***		
Project: ***100-ft FWT Guyed Tower - 20 Isham Rd., West Hartford,***		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS
Path:		Dwg No. E-5

25' - 125'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



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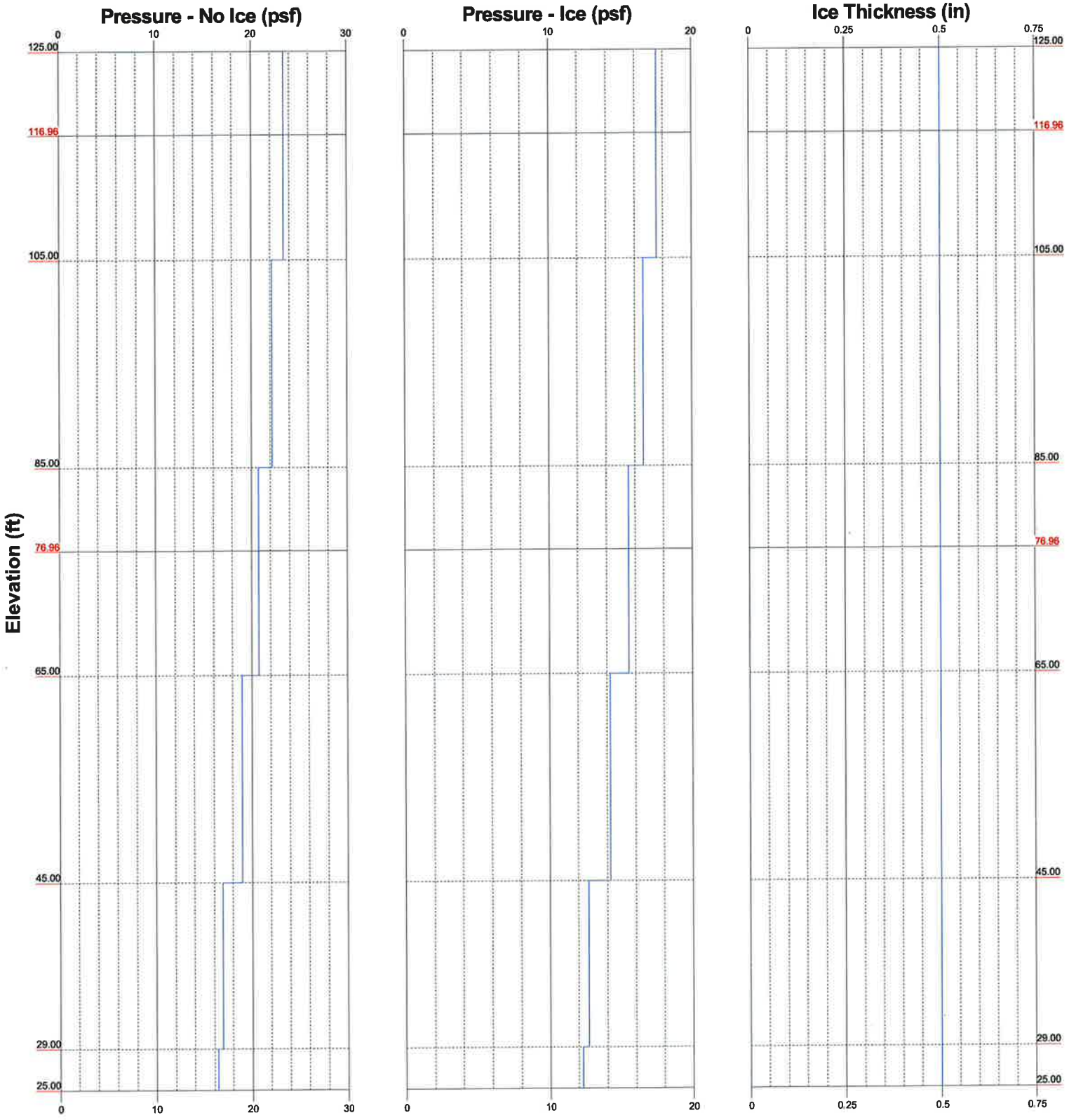
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS
Path:		Dwg No. E-8

Wind Pressures and Ice Thickness
TIA/EIA-222-F - 80 mph/69 mph 0.500 in Ice



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Job:	***16001.17 - West Hartford Center***		
Project:	***100-ft FWT Guyed Tower - 20 Isham Rd., West Hartford,***		
Client: Verizon Wireless		Drawn by: TJL	App'd:
Code: TIA/EIA-222-F		Date: 07/22/16	Scale: NTS
Path:			Dwg No. E-9

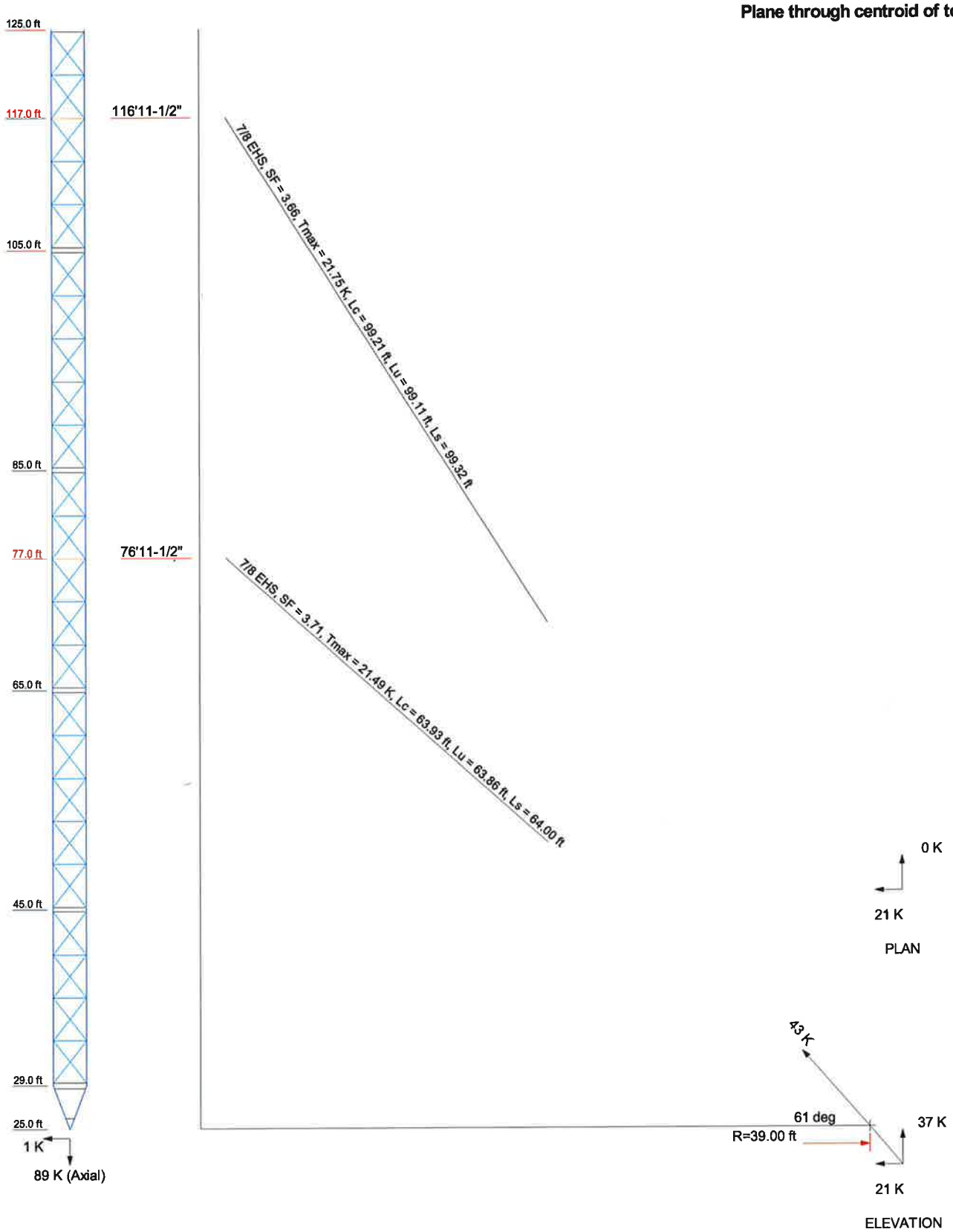
Guy Tensions and Tower Reactions

TIA/EIA-222-F - 80 mph/69 mph 0.500 in Ice

Maximum Values

Anchor 'B'@39 ft Azimuth 120 deg Elev 25 ft

Plane through centroid of tower



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: **16001.17 - West Hartford Center**		
	Project: ***100-ft FWT Guyed Tower - 20 Isham Rd., West Hartford,***		
	Client: Verizon Wireless	Drawn by: TJL	App'd:
	Code: TIA/EIA-222-F	Date: 07/22/16	Scale: NTS
	Path:		Dwg No. E-6

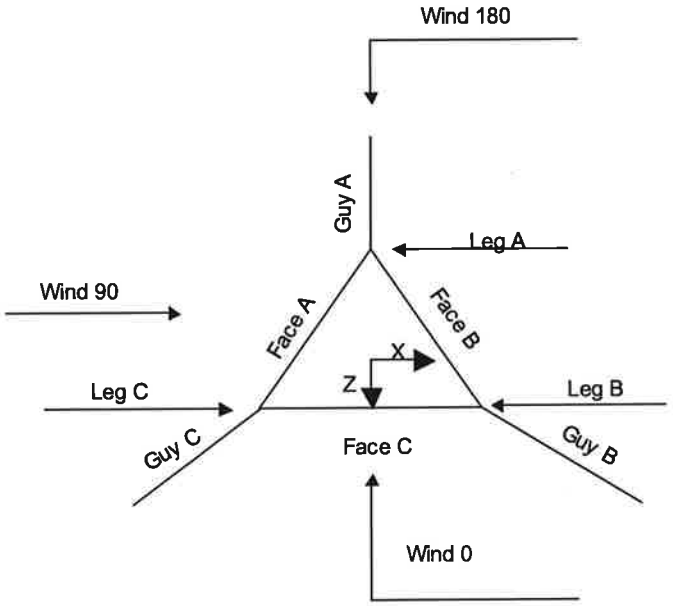
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 125.00 ft above the ground line.
The base of the tower is set at an elevation of 25.00 ft above the ground line.
The face width of the tower is 3.04 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 80 mph.
Nominal ice thickness of 0.500 in.
Ice density of 56 pcf.
A wind speed of 69 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Tower is located on the roof of a building approximately 25'-0" above grade level..
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-G Bracing Resist. Exemption
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-G Tension Splice Exemption
√ Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
√ SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric		



Corner & Starmount Guyed Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	125.00-105.00			3.04	1	20.00
T2	105.00-85.00			3.04	1	20.00
T3	85.00-65.00			3.04	1	20.00
T4	65.00-45.00			3.04	1	20.00
T5	45.00-29.00			3.04	1	16.00
T6	29.00-25.00			3.04	1	4.00

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
	ft	ft				in	in
T1	125.00-105.00	3.92	X Brace	No	Yes	2.500	2.500
T2	105.00-85.00	3.92	X Brace	No	Yes	2.500	2.500
T3	85.00-65.00	3.92	X Brace	No	Yes	2.500	2.500
T4	65.00-45.00	3.92	X Brace	No	Yes	2.500	2.500

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	45.00-29.00	3.90	X Brace	No	Yes	2.500	2.500
T6	29.00-25.00	2.79	X Brace	No	Yes	2.539	12.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 125.00-105.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 105.00-85.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 85.00-65.00	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 65.00-45.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T5 45.00-29.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)
T6 29.00-25.00	Solid Round	2	A572-50 (50 ksi)	Flat Bar		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 125.00-105.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 105.00-85.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 85.00-65.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 65.00-45.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 45.00-29.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 29.00-25.00	Single Angle	L3x3x1/8	A36 (36 ksi)	Flat Bar	12x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 125.00-105.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T2 105.00-85.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T3 85.00-65.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 65.00-45.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T5 45.00-29.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L2x2x1/8	A36 (36 ksi)
T6 29.00-25.00	1	Single Angle	L2x2x1/4	A36 (36 ksi)	Single Angle	L2x2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 125.00-105.00	0.00	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T2 105.00-85.00	0.00	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T3 85.00-65.00	0.00	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T4 65.00-45.00	0.00	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T5 45.00-29.00	0.00	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000
T6 29.00-25.00	0.00	0.000	A36 (36 ksi)	1	1	1	36.000	36.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
125.00-105.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
105.00-85.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
85.00-65.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
65.00-45.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
45.00-29.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
29.00-25.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 125.00-105.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 105.00-85.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 85.00-65.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 65.00-45.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 45.00-29.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 29.00-25.00	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation	Connection Offsets							
	Diagonal				K-Bracing			
	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.	Vert. Top	Horiz. Top	Vert. Bot.	Horiz. Bot.
ft	in	in	in	in	in	in	in	in
T1 125.00-105.00	6.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000
T2 105.00-85.00	6.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000
T3 85.00-65.00	6.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000
T4 65.00-45.00	6.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000
T5 45.00-29.00	6.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000
T6 29.00-25.00	6.000	0.000	6.000	0.000	0.000	0.000	0.000	0.000

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 125.00-105.00	Flange	0.750 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T2 105.00-85.00	Flange	0.750 A325N	0	0.000 A325N	0	0.000 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T3 85.00-65.00	Flange	0.750 A325N	3	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T4 65.00-45.00	Flange	0.750 A325N	3	0.000 A325N	0	0.500 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T5 45.00-29.00	Flange	0.750 A325N	3	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0
T6 29.00-25.00	Flange	0.750 A325N	3	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
116.958	EHS	A	7/8	7.97	10%	19000	1.581	101.53	45.00	0.0000	25.00	100%
		B	7/8	7.97	10%	19000	1.581	99.12	39.00	0.0000	25.00	100%
		C	7/8	7.97	10%	19000	1.581	92.55	37.50	0.0000	31.50	100%
76.9583	EHS	A	7/8	7.97	10%	19000	1.581	67.54	45.00	0.0000	25.00	100%
		B	7/8	7.97	10%	19000	1.581	63.87	39.00	0.0000	25.00	100%
		C	7/8	7.97	10%	19000	1.581	57.78	37.50	0.0000	31.50	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
116.958	Corner						
76.9583	Corner						

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
116.96	A36 (36 ksi)	Solid Round			No	A36 (36 ksi)	Single Angle	L3x3x1/4
76.96	A36 (36 ksi)	Solid Round			No	A36 (36 ksi)	Single Angle	L3x3x1/4

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
116.958	0.16	0.16	0.15		1.01 1.7 sec/pulse	0.97 1.7 sec/pulse	0.84 1.6 sec/pulse	
76.9583	0.11	0.10	0.09		0.45 1.2 sec/pulse	0.40 1.1 sec/pulse	0.33 1.0 sec/pulse	

Guy Data (cont'd)

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
116.958	Yes	Yes			1	1	1	1
76.9583	No	No			1	1	1	1

Guy Data (cont'd)

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
116.958	0.000 A325N	0	0.000	1	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75
76.9583	0.000 A325N	0	0.000	1	0.625 A325N	0	0.000	0.75	0.625 A325N	0	0.000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
116.958	A	70.98	20	15	0.500
	B	70.98	20	15	0.500
	C	74.23	21	15	0.500
76.9583	A	50.98	19	14	0.500
	B	50.98	19	14	0.500
	C	54.23	19	14	0.500

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
116.958	A	64.8146	8.12	0.00	7.36	-3.42	-12.92	0.00	0.00

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
			7.97						
	B	67.9517	8.12	2.61	7.53	1.51	6.61	0.00	-11.46
			7.97						
	C	67.3025	8.10	-2.69	7.49	1.55	6.58	-0.00	11.39
			7.97						
			Sum:	**-0.07**	22.38	**-0.36**	**0.27**	0.00	**-0.07**
76.9583	A	50.2302	8.05	0.00	6.21	-5.12	-10.91	0.00	0.00
			7.97						
	B	54.3671	8.05	4.04	6.56	2.33	5.76	0.00	-9.98
			7.97						
	C	51.8222	8.04	-4.29	6.34	2.47	5.57	-0.00	9.64
			7.97						
			Sum:	**-0.24**	19.11	**-0.32**	**0.42**	0.00	**-0.34**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
116.958	A	64.8146	11.00	0.00	9.98	-4.63	-17.52	0.00	0.00
			10.78						
	B	67.9517	11.00	3.54	10.21	2.04	8.97	0.00	-15.53
			10.77						
	C	67.3025	10.98	-3.64	10.15	2.10	8.91	-0.00	15.44
			10.78						
			Sum:	**-0.10**	30.34	**-0.49**	**0.36**	0.00	**-0.09**
76.9583	A	50.2302	10.92	0.00	8.43	-6.94	-14.80	0.00	0.00
			10.79						
	B	54.3671	10.92	5.48	8.90	3.16	7.81	0.00	-13.53
			10.79						
	C	51.8222	10.90	-5.81	8.60	3.35	7.55	-0.00	13.08
			10.79						
			Sum:	**-0.33**	25.92	**-0.43**	**0.57**	0.00	**-0.46**

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
116.958	A	64.8146	8.12	0.00	7.36	-3.42	-12.92	0.00	0.00
			7.97						
	B	67.9517	8.12	2.61	7.53	1.51	6.61	0.00	-11.46
			7.97						
	C	67.3025	8.10	-2.69	7.49	1.55	6.58	-0.00	11.39
			7.97						

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
			Sum:	**-0.07**	22.38	**-0.36**	**0.27**	0.00	**-0.07**
76.9583	A	50.2302	8.05 7.97	0.00	6.21	-5.12	-10.91	0.00	0.00
	B	54.3671	8.05 7.97	4.04	6.56	2.33	5.76	0.00	-9.98
	C	51.8222	8.04 7.97	-4.29	6.34	2.47	5.57	-0.00	9.64
			Sum:	**-0.24**	19.11	**-0.32**	**0.42**	0.00	**-0.34**

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning: 0 F Initial Tension	0 F Intercept	20 F Initial Tension	20 F Intercept	40 F Initial Tension	40 F Intercept	60 F Initial Tension	60 F Intercept	80 F Initial Tension	80 F Intercept	100 F Initial Tension	100 F Intercept	120 F Initial Tension	120 F Intercept
ft		ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft
116.958	A	43.24	91.96	8.583	0.94	8.379	0.96	8.174	0.99	7.970	1.01	7.766	1.04	7.562	1.07	7.358	1.10
	B	37.24	91.96	8.448	0.91	8.288	0.93	8.129	0.95	7.970	0.97	7.811	0.99	7.652	1.01	7.493	1.03
	C	35.74	85.46	8.475	0.79	8.307	0.81	8.138	0.83	7.970	0.84	7.802	0.86	7.634	0.88	7.466	0.90
76.9583	A	43.24	51.96	9.357	0.38	8.894	0.40	8.432	0.43	7.970	0.45	7.509	0.48	7.049	0.51	6.590	0.54
	B	37.24	51.96	9.121	0.35	8.737	0.37	8.353	0.38	7.970	0.40	7.587	0.42	7.204	0.45	6.822	0.47
	C	35.74	45.46	9.267	0.28	8.834	0.30	8.402	0.31	7.970	0.33	7.539	0.35	7.108	0.37	6.678	0.39

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
1 5/8 (Verizon)	A	Yes	Ar (CfAe)	105.00 - 31.00	1.000	0	12	6	0.500	1.980		1.04
1 1/4 (Nextel)	C	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0	8	8	1.000	1.550		0.66
1 1/4 (Nextel)	C	Yes	Ar (CfAe)	125.00 - 31.00	-3.000	0.05	4	4	1.000	1.550		0.66
1/2	B	Yes	Ar (CfAe)	31.00 - 25.00	0.000	0	4	4	0.580	0.580		0.25
7/8	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	-0.31	3	3	0.750	1.110		0.54
1/2	B	Yes	Ar (CfAe)	69.00 - 31.00	-1.000	-0.19	1	1	0.580	0.580		0.25
1/2	B	Yes	Ar (CfAe)	55.00 - 31.00	-1.000	-0.17	1	1	0.580	0.580		0.25
1 5/8	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	-0.13	1	1	1.980	1.980		1.04
7/8	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	-0.07	1	1	1.110	1.110		0.54
1 5/8	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0	1	1	1.980	1.980		1.04
1 1/4	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0.08	1	1	1.550	1.550		0.66
3" dia Flex Conuit	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0.15	1	1	3.000	3.000		5.00
1/2	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0.22	2	2	0.400	0.580		0.25
1 5/8	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0.27	1	1	1.980	1.980		1.04
HYBRIFLEX 1-5/8" (Verizon)	A	Yes	Ar (CfAe)	105.00 - 31.00	1.000	-0.25	1	1	1.980	1.980		1.90
1/2	B	Yes	Ar (CfAe)	125.00 - 31.00	-1.000	0.4	1	1	0.580	0.580		0.25
HYBRIFLEX	A	Yes	Ar (CfAe)	105.00 - 31.00	3.000	-0.25	1	1	1.980	1.980		1.90

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
1-5/8" (Verizon - Proposed)												

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	125.00-105.00	A	0.000	0.000	0.000	0.000	0.00
		B	27.783	0.000	0.000	0.000	0.23
		C	31.000	0.000	0.000	0.000	0.16
T2	105.00-85.00	A	26.400	0.000	0.000	0.000	0.33
		B	27.783	0.000	0.000	0.000	0.23
		C	31.000	0.000	0.000	0.000	0.16
T3	85.00-65.00	A	26.400	0.000	0.000	0.000	0.33
		B	27.977	0.000	0.000	0.000	0.23
		C	31.000	0.000	0.000	0.000	0.16
T4	65.00-45.00	A	26.400	0.000	0.000	0.000	0.33
		B	29.233	0.000	0.000	0.000	0.24
		C	31.000	0.000	0.000	0.000	0.16
T5	45.00-29.00	A	18.480	0.000	0.000	0.000	0.23
		B	21.188	0.000	0.000	0.000	0.17
		C	21.700	0.000	0.000	0.000	0.11
T6	29.00-25.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.773	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	125.00-105.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		38.117	7.833	0.000	0.000	0.51
		C		8.500	42.500	0.000	0.000	0.57
T2	105.00-85.00	A	0.500	14.900	20.667	0.000	0.000	0.74
		B		38.117	7.833	0.000	0.000	0.51
		C		8.500	42.500	0.000	0.000	0.57
T3	85.00-65.00	A	0.500	14.900	20.667	0.000	0.000	0.74
		B		38.643	7.833	0.000	0.000	0.52
		C		8.500	42.500	0.000	0.000	0.57
T4	65.00-45.00	A	0.500	14.900	20.667	0.000	0.000	0.74
		B		42.067	7.833	0.000	0.000	0.54
		C		8.500	42.500	0.000	0.000	0.57
T5	45.00-29.00	A	0.500	10.430	14.467	0.000	0.000	0.52
		B		30.632	6.063	0.000	0.000	0.39
		C		5.950	29.750	0.000	0.000	0.40
T6	29.00-25.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.527	1.160	0.000	0.000	0.01
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T1	125.00-105.00	A	0.000	0.000	0.000	0.000
		B	1.651	7.001	1.505	2.489
		C	1.843	7.771	1.679	2.763
T2	105.00-85.00	A	1.569	5.419	1.320	1.778
		B	1.651	7.001	1.389	2.297
		C	1.843	7.771	1.550	2.550
T3	85.00-65.00	A	1.569	5.419	1.430	1.927
		B	1.663	7.081	1.515	2.517
		C	1.843	7.771	1.679	2.763
T4	65.00-45.00	A	1.569	5.419	1.320	1.778
		B	1.738	7.603	1.462	2.495
		C	1.843	7.771	1.550	2.550
T5	45.00-29.00	A	1.095	3.809	0.962	1.297
		B	1.255	5.614	1.104	1.911
		C	1.285	5.462	1.130	1.859
T6	29.00-25.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.066	0.149	0.356
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	125.00-105.00	1.922	1.395	1.643	1.183
T2	105.00-85.00	-1.151	0.109	-0.484	0.413
T3	85.00-65.00	-1.110	0.090	-0.461	0.378
T4	65.00-45.00	-1.086	-0.010	-0.390	0.214
T5	45.00-29.00	-0.970	-0.066	-0.306	0.126
T6	29.00-25.00	0.607	-0.350	0.507	-0.293

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral / Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft / ft / ft	°	ft		ft^2	ft^2	K
Rohn 6' x 12' Boom Gate (1) (Nextel)	A	From Leg	2.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	16.60 25.00	16.60 25.00	0.70 1.10
Rohn 6' x 12' Boom Gate (1) (Nextel)	B	From Leg	2.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	16.60 25.00	16.60 25.00	0.70 1.10
Rohn 6' x 12' Boom Gate (1) (Nextel)	C	From Leg	2.00 0.00	0.0000	123.00	No Ice 1/2" Ice	16.60 25.00	16.60 25.00	0.70 1.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DB844H65E-XY (Nextel)	A	From Leg	0.00 3.00 -6.00	0.0000	123.00	No Ice 1/2" Ice	2.87 3.18	4.20 4.57	0.01 0.04
DB844H65E-XY (Nextel)	A	From Leg	0.00 3.00 -2.00	0.0000	123.00	No Ice 1/2" Ice	2.87 3.18	4.20 4.57	0.01 0.04
DB844H65E-XY (Nextel)	A	From Leg	0.00 3.00 2.00	0.0000	123.00	No Ice 1/2" Ice	2.87 3.18	4.20 4.57	0.01 0.04
LLPX310R (Clearwire)	A	From Leg	0.00 3.00 6.00	0.0000	123.00	No Ice 1/2" Ice	4.83 5.18	1.95 2.21	0.03 0.05
DB844H65E-XY (Nextel)	B	From Leg	0.00 3.00 -6.00	0.0000	123.00	No Ice 1/2" Ice	2.87 3.18	4.20 4.57	0.01 0.04
DB844H65E-XY (Nextel)	B	From Leg	0.00 3.00 -2.00	0.0000	123.00	No Ice 1/2" Ice	2.87 3.18	4.20 4.57	0.01 0.04
DB844H65E-XY (Nextel)	B	From Leg	0.00 3.00 2.00	0.0000	123.00	No Ice 1/2" Ice	2.87 3.18	4.20 4.57	0.01 0.04
LLPX310R (Clearwire)	B	From Leg	0.00 3.00 6.00	0.0000	123.00	No Ice 1/2" Ice	4.83 5.18	1.95 2.21	0.03 0.05
DB844G65ZAXY (Nextel)	C	From Leg	0.00 3.00 -6.00	0.0000	123.00	No Ice 1/2" Ice	4.67 5.05	3.73 4.10	0.02 0.05
DB844G65ZAXY (Nextel)	C	From Leg	0.00 3.00 -2.00	0.0000	123.00	No Ice 1/2" Ice	4.67 5.05	3.73 4.10	0.02 0.05
DB844G65ZAXY (Nextel)	C	From Leg	0.00 3.00 2.00	0.0000	123.00	No Ice 1/2" Ice	4.67 5.05	3.73 4.10	0.02 0.05
LLPX310R (Clearwire)	C	From Leg	0.00 3.00 6.00	0.0000	123.00	No Ice 1/2" Ice	4.83 5.18	1.95 2.21	0.03 0.05
RRU (Clearwire)	A	From Leg	0.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	1.80 2.00	0.78 0.92	0.03 0.04
RRU (Clearwire)	B	From Leg	0.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	1.80 2.00	0.78 0.92	0.03 0.04
RRU (Clearwire)	C	From Leg	0.00 0.00 0.00	0.0000	123.00	No Ice 1/2" Ice	1.80 2.00	0.78 0.92	0.03 0.04
Pirod 12' T-Frame Sector Mount (1) (Verizon - Existing)	A	From Leg	2.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
Pirod 12' T-Frame Sector Mount (1) (Verizon - Existing)	B	From Leg	2.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
Pirod 12' T-Frame Sector Mount (1) (Verizon - Existing)	C	From Leg	2.00 0.00 0.00	0.0000	105.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	0.47 0.60
SBNHH-1D65B (Verizon - Proposed)	A	From Leg	4.00 6.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
SBNHH-1D65B (Verizon - Proposed)	A	From Leg	0.00 4.00 2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SBNHH-1D65B (Verizon - Proposed)	A	From Leg	4.00 -2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
BXA-80063-4CF (Verizon - Existing)	A	From Leg	4.00 -6.00 0.00	0.0000	105.00	No Ice 1/2" Ice	5.16 5.55	2.52 2.82	0.01 0.04
SBNHH-1D65B (Verizon - Proposed)	B	From Leg	4.00 6.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SBNHH-1D65B (Verizon - Proposed)	B	From Leg	4.00 2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SBNHH-1D65B (Verizon - Proposed)	B	From Leg	4.00 -2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SLCP 2x6014 (Verizon - Existing)	B	From Leg	4.00 6.00 0.00	0.0000	105.00	No Ice 1/2" Ice	7.21 7.65	5.67 6.09	0.02 0.07
SBNHH-1D65B (Verizon - Proposed)	C	From Leg	4.00 6.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SBNHH-1D65B (Verizon - Proposed)	C	From Leg	4.00 2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SBNHH-1D65B (Verizon - Proposed)	C	From Leg	4.00 -2.00 0.00	0.0000	105.00	No Ice 1/2" Ice	8.33 8.88	5.34 5.79	0.04 0.09
SLCP 2x6014 (Verizon - Existing)	C	From Leg	4.00 6.00 0.00	0.0000	105.00	No Ice 1/2" Ice	7.21 7.65	5.67 6.09	0.02 0.07
DB-T1-6Z-8AB-0Z (Verizon - Existing)	C	From Leg	0.00 0.50 0.00	0.0000	109.00	No Ice 1/2" Ice	5.60 5.92	2.33 2.56	0.04 0.08
DB-T1-6Z-8AB-0Z (Verizon - Proposed)	B	From Leg	0.00 0.50 0.00	0.0000	109.00	No Ice 1/2" Ice	5.60 5.92	2.33 2.56	0.04 0.08
RRH4x30-B13 (Verizon - Proposed)	A	From Leg	4.00 -4.00 0.00	0.0000	105.00	No Ice 1/2" Ice	2.52 2.74	1.89 2.09	0.06 0.08
RRH4x30-B13 (Verizon - Proposed)	B	From Leg	4.00 -4.00 0.00	0.0000	105.00	No Ice 1/2" Ice	2.52 2.74	1.89 2.09	0.06 0.08
RRH4x30-B13 (Verizon - Proposed)	C	From Leg	4.00 -4.00 0.00	0.0000	105.00	No Ice 1/2" Ice	2.52 2.74	1.89 2.09	0.06 0.08
RRH4x45/2x90-AWS (Verizon - Proposed)	A	From Leg	4.00 4.00 0.00	0.0000	105.00	No Ice 1/2" Ice	3.01 3.26	1.91 2.13	0.08 0.10
RRH4x45/2x90-AWS (Verizon - Proposed)	B	From Leg	4.00 4.00 0.00	0.0000	105.00	No Ice 1/2" Ice	3.01 3.26	1.91 2.13	0.08 0.10
RRH4x45/2x90-AWS (Verizon - Proposed)	C	From Leg	4.00 4.00	0.0000	105.00	No Ice 1/2" Ice	3.01 3.26	1.91 2.13	0.08 0.10

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RRH2x60-PCS (Verizon - Proposed)	A	From Leg	0.00 4.00 -6.00	0.0000	105.00	No Ice 1/2" Ice	2.51 2.73	1.55 1.74	0.06 0.07
RRH2x60-PCS (Verizon - Proposed)	B	From Leg	0.00 4.00 -6.00	0.0000	105.00	No Ice 1/2" Ice	2.51 2.73	1.55 1.74	0.06 0.07
RRH2x60-PCS (Verizon - Proposed)	C	From Leg	0.00 4.00 -6.00	0.0000	105.00	No Ice 1/2" Ice	2.51 2.73	1.55 1.74	0.06 0.07
18' x 3" Dia Omni	A	From Leg	0.00 1.00 0.00	0.0000	125.00	No Ice 1/2" Ice	5.40 7.23	5.40 7.23	0.05 0.09
12' x 3" Dia Omni	B	From Leg	9.00 1.00 0.00	0.0000	137.00	No Ice 1/2" Ice	3.60 4.83	3.60 4.83	0.04 0.06
6' x 3" Dia Omni	C	From Leg	6.00 4.00 0.00	0.0000	128.00	No Ice 1/2" Ice	1.77 2.13	1.77 2.13	0.02 0.03
4' x 3" DIA Omni	C	From Leg	0.00 1.00 0.00	0.0000	127.00	No Ice 1/2" Ice	1.00 1.25	1.00 1.25	0.02 0.02
4-Bay Dipole	A	From Leg	0.00 1.00 0.00	0.0000	129.00	No Ice 1/2" Ice	3.15 5.67	3.15 5.67	0.03 0.04
4-Bay Dipole	A	From Leg	0.00 1.00 0.00	0.0000	129.00	No Ice 1/2" Ice	3.15 5.67	3.15 5.67	0.03 0.04
ANT150D6-9	A	From Leg	0.00 1.00 0.00	0.0000	69.00	No Ice 1/2" Ice	4.00 4.60	4.00 4.60	0.03 0.03
ANT150D6-9	A	From Leg	0.00 1.00 0.00	0.0000	55.00	No Ice 1/2" Ice	4.00 4.60	4.00 4.60	0.03 0.03
GPS	A	From Leg	0.00 3.00 0.00	0.0000	31.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.01
GPS	A	From Leg	0.00 0.00 3.00	0.0000	31.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.01
GPS	B	From Leg	0.00 3.00 0.00	0.0000	31.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.01
GPS	B	From Leg	0.00 0.00 3.00	0.0000	31.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	0.01 0.01
3' Pipe Mount Side Arm	A	From Leg	0.00 1.00 0.00	0.0000	31.00	No Ice 1/2" Ice	0.47 0.69	0.47 0.69	0.01 0.05
3' Pipe Mount Side Arm	A	From Leg	0.00 0.00 1.00	0.0000	31.00	No Ice 1/2" Ice	0.47 0.69	0.47 0.69	0.01 0.05
3' Pipe Mount Side Arm	B	From Leg	0.00 1.00 0.00	0.0000	31.00	No Ice 1/2" Ice	0.47 0.69	0.47 0.69	0.01 0.05
3' Pipe Mount Side Arm	B	From Leg	0.00 0.00 1.00	0.0000	31.00	No Ice 1/2" Ice	0.47 0.69	0.47 0.69	0.01 0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft	C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00					

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP1-23 (Clearwire)	A	Paraboloid w/o Radome	From Leg	0.00 0.00 0.00	Worst		118.00	1.27	No Ice 1/2" Ice	1.28 1.45	0.01 0.01
VHLP1-23 (Clearwire)	B	Paraboloid w/o Radome	From Leg	0.00 0.00 0.00	Worst		118.00	1.27	No Ice 1/2" Ice	1.28 1.45	0.01 0.01
VHLP2-18 (Clearwire)	B	Paraboloid w/o Radome	From Leg	0.00 0.00 0.00	Worst		127.00	2.17	No Ice 1/2" Ice	3.72 4.01	0.03 0.04

Tower Pressures - No Ice

$G_H = 1.162$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	115.00	1.429	23	64.173	A	3.115	9.740	6.667	51.86	0.000	0.000
125.00-105.00					B	1.610	35.872		17.79	0.000	0.000
					C	1.436	38.897		16.53	0.000	0.000
T2	95.00	1.353	22	64.173	A	1.555	34.571	6.667	18.45	0.000	0.000
105.00-85.00					B	1.486	35.872		17.85	0.000	0.000
					C	1.325	38.897		16.57	0.000	0.000
T3 85.00-65.00	75.00	1.264	21	64.590	A	1.662	35.404	7.500	20.23	0.000	0.000
					B	1.577	36.887		19.50	0.000	0.000
					C	1.413	39.730		18.23	0.000	0.000
T4 65.00-45.00	55.00	1.157	19	64.173	A	1.555	34.571	6.667	18.45	0.000	0.000
					B	1.414	37.235		17.25	0.000	0.000
					C	1.325	38.897		16.57	0.000	0.000
T5 45.00-29.00	37.00	1.033	17	51.339	A	1.434	25.169	5.333	20.05	0.000	0.000
					B	1.293	27.716		18.39	0.000	0.000
					C	1.266	28.198		18.10	0.000	0.000
T6 29.00-25.00	27.00	1	16	6.797	A	1.272	1.456	1.456	53.37	0.000	0.000
					B	1.123	2.230		43.43	0.000	0.000
					C	1.272	1.456		53.37	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.162$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 125.00-105.00	115.00	1.429	18	0.500	65.840	A	3.115	18.023	10.000	47.31	0.000	0.000
						B	8.459	49.138		17.36	0.000	0.000
						C	42.852	18.752		16.23	0.000	0.000
T2 105.00-85.00	95.00	1.353	17	0.500	65.840	A	21.764	27.504	10.000	20.30	0.000	0.000
						B	8.411	49.138		17.38	0.000	0.000
						C	42.825	18.752		16.24	0.000	0.000
T3 85.00-65.00	75.00	1.264	16	0.500	66.257	A	21.833	28.326	10.833	21.60	0.000	0.000
						B	8.408	50.407		18.42	0.000	0.000
						C	42.830	19.575		17.36	0.000	0.000
T4 65.00-45.00	55.00	1.157	14	0.500	65.840	A	21.764	27.504	10.000	20.30	0.000	0.000
						B	8.214	52.486		16.47	0.000	0.000
						C	42.825	18.752		16.24	0.000	0.000
T5 45.00-29.00	37.00	1.033	13	0.500	52.672	A	15.566	21.069	8.000	21.84	0.000	0.000
						B	6.548	39.466		17.39	0.000	0.000
						C	30.287	14.936		17.69	0.000	0.000
T6 29.00-25.00	27.00	1	12	0.500	7.154	A	1.272	2.460	2.184	58.52	0.000	0.000
						B	2.077	2.921		43.71	0.000	0.000
						C	1.272	2.460		58.52	0.000	0.000

Tower Pressure - Service

$G_H = 1.162$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 125.00-105.00	115.00	1.429	9	64.173	A	3.115	9.740	6.667	51.86	0.000	0.000
					B	1.610	35.872		17.79	0.000	0.000
					C	1.436	38.897		16.53	0.000	0.000
T2 105.00-85.00	95.00	1.353	9	64.173	A	1.555	34.571	6.667	18.45	0.000	0.000
					B	1.486	35.872		17.85	0.000	0.000
					C	1.325	38.897		16.57	0.000	0.000
T3 85.00-65.00	75.00	1.264	8	64.590	A	1.662	35.404	7.500	20.23	0.000	0.000
					B	1.577	36.887		19.50	0.000	0.000
					C	1.413	39.730		18.23	0.000	0.000
T4 65.00-45.00	55.00	1.157	7	64.173	A	1.555	34.571	6.667	18.45	0.000	0.000
					B	1.414	37.235		17.25	0.000	0.000
					C	1.325	38.897		16.57	0.000	0.000
T5 45.00-29.00	37.00	1.033	7	51.339	A	1.434	25.169	5.333	20.05	0.000	0.000
					B	1.293	27.716		18.39	0.000	0.000
					C	1.266	28.198		18.10	0.000	0.000
T6 29.00-25.00	27.00	1	6	6.797	A	1.272	1.456	1.456	53.37	0.000	0.000
					B	1.123	2.230		43.43	0.000	0.000
					C	1.272	1.456		53.37	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	1	1	8.866	1.53	76.51	C
125.00-105.00			B	0.584	1.815	0.744	1	1	28.298			
			C	0.628	1.789	0.771	1	1	31.443			
T2	0.72	1.03	A	0.563	1.832	0.732	1	1	26.848	1.44	72.12	C
105.00-85.00			B	0.582	1.816	0.743	1	1	28.133			
			C	0.627	1.79	0.77	1	1	31.290			
T3	0.72	1.23	A	0.574	1.823	0.738	1	1	27.789	1.39	69.39	C
85.00-65.00			B	0.596	1.807	0.751	1	1	29.274			
			C	0.637	1.786	0.777	1	1	32.281			
T4	0.73	0.99	A	0.563	1.832	0.732	1	1	26.848	1.23	61.69	C
65.00-45.00			B	0.602	1.803	0.755	1	1	29.526			
			C	0.627	1.79	0.77	1	1	31.290			
T5	0.51	0.79	A	0.518	1.878	0.707	1	1	19.226	0.79	49.47	C
45.00-29.00			B	0.565	1.83	0.733	1	1	21.604			
			C	0.574	1.822	0.738	1	1	22.075			
T6	0.00	0.20	A	0.401	2.061	0.652	1	1	2.222	0.10	24.27	B
29.00-25.00			B	0.493	1.909	0.694	1	1	2.671			
			C	0.401	2.061	0.652	1	1	2.222			
Sum Weight:	3.07	5.30								6.48		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	0.825	1	8.321	1.52	75.90	C
125.00-105.00			B	0.584	1.815	0.744	0.825	1	28.016			
			C	0.628	1.789	0.771	0.825	1	31.192			
T2	0.72	1.03	A	0.563	1.832	0.732	0.825	1	26.576	1.43	71.59	C
105.00-85.00			B	0.582	1.816	0.743	0.825	1	27.873			
			C	0.627	1.79	0.77	0.825	1	31.058			
T3	0.72	1.23	A	0.574	1.823	0.738	0.825	1	27.498	1.38	68.85	C
85.00-65.00			B	0.596	1.807	0.751	0.825	1	28.998			
			C	0.637	1.786	0.777	0.825	1	32.034			
T4	0.73	0.99	A	0.563	1.832	0.732	0.825	1	26.576	1.22	61.24	C
65.00-45.00			B	0.602	1.803	0.755	0.825	1	29.279			
			C	0.627	1.79	0.77	0.825	1	31.058			
T5	0.51	0.79	A	0.518	1.878	0.707	0.825	1	18.975	0.78	48.97	C
45.00-29.00			B	0.565	1.83	0.733	0.825	1	21.378			
			C	0.574	1.822	0.738	0.825	1	21.854			
T6	0.00	0.20	A	0.401	2.061	0.652	0.825	1	1.999	0.09	22.48	B
29.00-25.00			B	0.493	1.909	0.694	0.825	1	2.474			
			C	0.401	2.061	0.652	0.825	1	1.999			
Sum Weight:	3.07	5.30								6.42		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	0.8	1	8.243	1.52	75.81	C
125.00-105.00			B	0.584	1.815	0.744	0.8	1	27.976			
			C	0.628	1.789	0.771	0.8	1	31.156			
T2	0.72	1.03	A	0.563	1.832	0.732	0.8	1	26.537	1.43	71.51	C
105.00-85.00			B	0.582	1.816	0.743	0.8	1	27.836			
			C	0.627	1.79	0.77	0.8	1	31.025			
T3	0.72	1.23	A	0.574	1.823	0.738	0.8	1	27.456	1.38	68.78	C
85.00-65.00			B	0.596	1.807	0.751	0.8	1	28.958			
			C	0.637	1.786	0.777	0.8	1	31.999			
T4	0.73	0.99	A	0.563	1.832	0.732	0.8	1	26.537	1.22	61.17	C
65.00-45.00			B	0.602	1.803	0.755	0.8	1	29.243			
			C	0.627	1.79	0.77	0.8	1	31.025			
T5	0.51	0.79	A	0.518	1.878	0.707	0.8	1	18.939	0.78	48.90	C
45.00-29.00			B	0.565	1.83	0.733	0.8	1	21.346			
			C	0.574	1.822	0.738	0.8	1	21.822			
T6	0.00	0.20	A	0.401	2.061	0.652	0.8	1	1.968	0.09	22.23	B
29.00-25.00			B	0.493	1.909	0.694	0.8	1	2.446			
			C	0.401	2.061	0.652	0.8	1	1.968			
Sum Weight:	3.07	5.30								6.42		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	0.85	1	8.399	1.52	75.98	C
125.00-105.00			B	0.584	1.815	0.744	0.85	1	28.056			
			C	0.628	1.789	0.771	0.85	1	31.228			
T2	0.72	1.03	A	0.563	1.832	0.732	0.85	1	26.615	1.43	71.66	C
105.00-85.00			B	0.582	1.816	0.743	0.85	1	27.910			
			C	0.627	1.79	0.77	0.85	1	31.091			
T3	0.72	1.23	A	0.574	1.823	0.738	0.85	1	27.540	1.38	68.93	C
85.00-65.00			B	0.596	1.807	0.751	0.85	1	29.037			
			C	0.637	1.786	0.777	0.85	1	32.069			
T4	0.73	0.99	A	0.563	1.832	0.732	0.85	1	26.615	1.23	61.30	C
65.00-45.00			B	0.602	1.803	0.755	0.85	1	29.314			
			C	0.627	1.79	0.77	0.85	1	31.091			
T5	0.51	0.79	A	0.518	1.878	0.707	0.85	1	19.011	0.78	49.04	C
45.00-29.00			B	0.565	1.83	0.733	0.85	1	21.410			
			C	0.574	1.822	0.738	0.85	1	21.885			
T6	0.00	0.20	A	0.401	2.061	0.652	0.85	1	2.031	0.09	22.74	B
29.00-25.00			B	0.493	1.909	0.694	0.85	1	2.502			
			C	0.401	2.061	0.652	0.85	1	2.031			
Sum Weight:	3.07	5.30								6.43		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.08	1.37	A	0.321	2.242	0.623	1	1	14.335	2.49	124.35	C
125.00-105.00			B	0.875	1.89	0.96	1	1	55.647			
			C	0.936	1.979	1	1	1	61.604			
T2	1.82	1.34	A	0.748	1.787	0.856	1	1	45.295	2.35	117.66	C
105.00-85.00			B	0.874	1.889	0.96	1	1	55.566			
			C	0.935	1.978	1	1	1	61.577			
T3	1.82	1.55	A	0.757	1.79	0.862	1	1	46.258	2.24	112.08	C
85.00-65.00			B	0.888	1.907	0.972	1	1	57.398			
			C	0.942	1.989	1	1	1	62.405			
T4	1.85	1.29	A	0.748	1.787	0.856	1	1	45.295	2.01	100.65	C
65.00-45.00			B	0.922	1.957	1	1	1	60.700			
			C	0.935	1.978	1	1	1	61.577			
T5	1.31	1.04	A	0.696	1.776	0.817	1	1	32.774	1.24	77.35	B
45.00-29.00			B	0.874	1.889	0.959	1	1	44.405			
			C	0.859	1.871	0.946	1	1	44.416			
T6	0.01	0.25	A	0.522	1.873	0.709	1	1	3.016	0.11	28.33	B
29.00-25.00			B	0.699	1.776	0.819	1	1	4.468			
			C	0.522	1.873	0.709	1	1	3.016			
Sum Weight:	7.89	6.84								10.45		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	1.08	1.37	A	0.321	2.242	0.623	0.825	1	13.790	2.18	109.22	C
125.00-105.00			B	0.875	1.89	0.96	0.825	1	54.166			
			C	0.936	1.979	1	0.825	1	54.105			
T2	1.82	1.34	A	0.748	1.787	0.856	0.825	1	41.486	2.07	103.34	C
105.00-85.00			B	0.874	1.889	0.96	0.825	1	54.094			
			C	0.935	1.978	1	0.825	1	54.083			
T3	1.82	1.55	A	0.757	1.79	0.862	0.825	1	42.437	1.97	98.61	C
85.00-65.00			B	0.888	1.907	0.972	0.825	1	55.927			
			C	0.942	1.989	1	0.825	1	54.910			
T4	1.85	1.29	A	0.748	1.787	0.856	0.825	1	41.486	1.92	95.81	B
65.00-45.00			B	0.922	1.957	1	0.825	1	59.263			
			C	0.935	1.978	1	0.825	1	54.083			
T5	1.31	1.04	A	0.696	1.776	0.817	0.825	1	30.050	1.21	75.35	B
45.00-29.00			B	0.874	1.889	0.959	0.825	1	43.259			
			C	0.859	1.871	0.946	0.825	1	39.116			
T6	0.01	0.25	A	0.522	1.873	0.709	0.825	1	2.793	0.10	26.03	B
29.00-25.00			B	0.699	1.776	0.819	0.825	1	4.105			
			C	0.522	1.873	0.709	0.825	1	2.793			
Sum Weight:	7.89	6.84								9.45		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	1.08	1.37	A	0.321	2.242	0.623	0.8	1	13.712	2.14	107.05	C
125.00-105.00			B	0.875	1.89	0.96	0.8	1	53.955			
			C	0.936	1.979	1	0.8	1	53.034			
T2	1.82	1.34	A	0.748	1.787	0.856	0.8	1	40.942	2.03	101.29	C
105.00-85.00			B	0.874	1.889	0.96	0.8	1	53.884			
			C	0.935	1.978	1	0.8	1	53.012			
T3	1.82	1.55	A	0.757	1.79	0.862	0.8	1	41.891	1.93	96.69	C
85.00-65.00			B	0.888	1.907	0.972	0.8	1	55.717			
			C	0.942	1.989	1	0.8	1	53.839			
T4	1.85	1.29	A	0.748	1.787	0.856	0.8	1	40.942	1.91	95.48	B
65.00-45.00			B	0.922	1.957	1	0.8	1	59.057			
			C	0.935	1.978	1	0.8	1	53.012			
T5	1.31	1.04	A	0.696	1.776	0.817	0.8	1	29.661	1.20	75.07	B
45.00-29.00			B	0.874	1.889	0.959	0.8	1	43.095			
			C	0.859	1.871	0.946	0.8	1	38.359			
T6	0.01	0.25	A	0.522	1.873	0.709	0.8	1	2.762	0.10	25.70	B
29.00-25.00			B	0.699	1.776	0.819	0.8	1	4.053			
			C	0.522	1.873	0.709	0.8	1	2.762			
Sum Weight:	7.89	6.84								9.31		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	1.08	1.37	A	0.321	2.242	0.623	0.85	1	13.868	2.23	111.38	C
125.00-105.00			B	0.875	1.89	0.96	0.85	1	54.378			
			C	0.936	1.979	1	0.85	1	55.177			
T2	1.82	1.34	A	0.748	1.787	0.856	0.85	1	42.030	2.11	105.38	C
105.00-85.00			B	0.874	1.889	0.96	0.85	1	54.305			
			C	0.935	1.978	1	0.85	1	55.154			
T3	1.82	1.55	A	0.757	1.79	0.862	0.85	1	42.983	2.01	100.54	C
85.00-65.00			B	0.888	1.907	0.972	0.85	1	56.137			
			C	0.942	1.989	1	0.85	1	55.980			
T4	1.85	1.29	A	0.748	1.787	0.856	0.85	1	42.030	1.92	96.14	B
65.00-45.00			B	0.922	1.957	1	0.85	1	59.468			
			C	0.935	1.978	1	0.85	1	55.154			
T5	1.31	1.04	A	0.696	1.776	0.817	0.85	1	30.439	1.21	75.64	B
45.00-29.00			B	0.874	1.889	0.959	0.85	1	43.422			
			C	0.859	1.871	0.946	0.85	1	39.873			
T6	0.01	0.25	A	0.522	1.873	0.709	0.85	1	2.825	0.11	26.35	B
29.00-25.00			B	0.699	1.776	0.819	0.85	1	4.157			
			C	0.522	1.873	0.709	0.85	1	2.825			
Sum Weight:	7.89	6.84								9.58		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	1	1	8.866	0.60	29.89	C
125.00-105.00			B	0.584	1.815	0.744	1	1	28.298			
			C	0.628	1.789	0.771	1	1	31.443			
T2	0.72	1.03	A	0.563	1.832	0.732	1	1	26.848	0.56	28.17	C
105.00-85.00			B	0.582	1.816	0.743	1	1	28.133			
			C	0.627	1.79	0.77	1	1	31.290			
T3	0.72	1.23	A	0.574	1.823	0.738	1	1	27.789	0.54	27.10	C
85.00-65.00			B	0.596	1.807	0.751	1	1	29.274			
			C	0.637	1.786	0.777	1	1	32.281			
T4	0.73	0.99	A	0.563	1.832	0.732	1	1	26.848	0.48	24.10	C
65.00-45.00			B	0.602	1.803	0.755	1	1	29.526			
			C	0.627	1.79	0.77	1	1	31.290			
T5	0.51	0.79	A	0.518	1.878	0.707	1	1	19.226	0.31	19.32	C
45.00-29.00			B	0.565	1.83	0.733	1	1	21.604			
			C	0.574	1.822	0.738	1	1	22.075			
T6	0.00	0.20	A	0.401	2.061	0.652	1	1	2.222	0.04	9.48	B
29.00-25.00			B	0.493	1.909	0.694	1	1	2.671			
			C	0.401	2.061	0.652	1	1	2.222			
Sum Weight:	3.07	5.30								2.53		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	0.825	1	8.321	0.59	29.65	C
125.00-105.00			B	0.584	1.815	0.744	0.825	1	28.016			
			C	0.628	1.789	0.771	0.825	1	31.192			
T2	0.72	1.03	A	0.563	1.832	0.732	0.825	1	26.576	0.56	27.96	C
105.00-85.00			B	0.582	1.816	0.743	0.825	1	27.873			
			C	0.627	1.79	0.77	0.825	1	31.058			
T3	0.72	1.23	A	0.574	1.823	0.738	0.825	1	27.498	0.54	26.90	C
85.00-65.00			B	0.596	1.807	0.751	0.825	1	28.998			
			C	0.637	1.786	0.777	0.825	1	32.034			
T4	0.73	0.99	A	0.563	1.832	0.732	0.825	1	26.576	0.48	23.92	C
65.00-45.00			B	0.602	1.803	0.755	0.825	1	29.279			
			C	0.627	1.79	0.77	0.825	1	31.058			
T5	0.51	0.79	A	0.518	1.878	0.707	0.825	1	18.975	0.31	19.13	C
45.00-29.00			B	0.565	1.83	0.733	0.825	1	21.378			
			C	0.574	1.822	0.738	0.825	1	21.854			
T6	0.00	0.20	A	0.401	2.061	0.652	0.825	1	1.999	0.04	8.78	B
29.00-25.00			B	0.493	1.909	0.694	0.825	1	2.474			
			C	0.401	2.061	0.652	0.825	1	1.999			
Sum Weight:	3.07	5.30								2.51		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	0.8	1	8.243	0.59	29.61	C
125.00-105.00			B	0.584	1.815	0.744	0.8	1	27.976			
			C	0.628	1.789	0.771	0.8	1	31.156			
T2	0.72	1.03	A	0.563	1.832	0.732	0.8	1	26.537	0.56	27.93	C
105.00-85.00			B	0.582	1.816	0.743	0.8	1	27.836			
			C	0.627	1.79	0.77	0.8	1	31.025			
T3	0.72	1.23	A	0.574	1.823	0.738	0.8	1	27.456	0.54	26.87	C
85.00-65.00			B	0.596	1.807	0.751	0.8	1	28.958			
			C	0.637	1.786	0.777	0.8	1	31.999			
T4	0.73	0.99	A	0.563	1.832	0.732	0.8	1	26.537	0.48	23.89	C
65.00-45.00			B	0.602	1.803	0.755	0.8	1	29.243			
			C	0.627	1.79	0.77	0.8	1	31.025			
T5	0.51	0.79	A	0.518	1.878	0.707	0.8	1	18.939	0.31	19.10	C
45.00-29.00			B	0.565	1.83	0.733	0.8	1	21.346			
			C	0.574	1.822	0.738	0.8	1	21.822			
T6	0.00	0.20	A	0.401	2.061	0.652	0.8	1	1.968	0.03	8.68	B
29.00-25.00			B	0.493	1.909	0.694	0.8	1	2.446			
			C	0.401	2.061	0.652	0.8	1	1.968			
Sum Weight:	3.07	5.30								2.51		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.39	1.06	A	0.2	2.595	0.59	0.85	1	8.399	0.59	29.68	C
125.00-105.00			B	0.584	1.815	0.744	0.85	1	28.056			
			C	0.628	1.789	0.771	0.85	1	31.228			
T2	0.72	1.03	A	0.563	1.832	0.732	0.85	1	26.615	0.56	27.99	C
105.00-85.00			B	0.582	1.816	0.743	0.85	1	27.910			
			C	0.627	1.79	0.77	0.85	1	31.091			
T3	0.72	1.23	A	0.574	1.823	0.738	0.85	1	27.540	0.54	26.93	C
85.00-65.00			B	0.596	1.807	0.751	0.85	1	29.037			
			C	0.637	1.786	0.777	0.85	1	32.069			
T4	0.73	0.99	A	0.563	1.832	0.732	0.85	1	26.615	0.48	23.95	C
65.00-45.00			B	0.602	1.803	0.755	0.85	1	29.314			
			C	0.627	1.79	0.77	0.85	1	31.091			
T5	0.51	0.79	A	0.518	1.878	0.707	0.85	1	19.011	0.31	19.16	C
45.00-29.00			B	0.565	1.83	0.733	0.85	1	21.410			
			C	0.574	1.822	0.738	0.85	1	21.885			
T6	0.00	0.20	A	0.401	2.061	0.652	0.85	1	2.031	0.04	8.88	B
29.00-25.00			B	0.493	1.909	0.694	0.85	1	2.502			
			C	0.401	2.061	0.652	0.85	1	2.031			
Sum Weight:	3.07	5.30								2.51		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	3.39			
Bracing Weight	1.91			
Total Member Self-Weight	5.30			
Guy Weight	0.76			
Total Weight	14.40			
Wind 0 deg - No Ice		0.08	-14.11	-1.46
Wind 30 deg - No Ice		7.18	-12.22	-1.30
Wind 45 deg - No Ice		10.10	-9.99	-1.08
Wind 60 deg - No Ice		12.34	-7.09	-0.79
Wind 90 deg - No Ice		14.21	-0.08	-0.06
Wind 120 deg - No Ice		12.31	6.98	0.68
Wind 135 deg - No Ice		9.99	9.88	0.99
Wind 150 deg - No Ice		7.04	12.14	1.23
Wind 180 deg - No Ice		-0.08	14.04	1.46
Wind 210 deg - No Ice		-7.18	12.22	1.30
Wind 225 deg - No Ice		-10.10	9.99	1.08
Wind 240 deg - No Ice		-12.39	7.13	0.78
Wind 270 deg - No Ice		-14.21	0.08	0.06
Wind 300 deg - No Ice		-12.25	-6.95	-0.68
Wind 315 deg - No Ice		-9.99	-9.88	-0.99
Wind 330 deg - No Ice		-7.04	-12.14	-1.23
Member Ice	1.54			
Guy Ice	0.41			
Total Weight Ice	24.24			
Wind 0 deg - Ice		0.06	-17.50	-0.88
Wind 30 deg - Ice		8.43	-14.44	-0.85
Wind 45 deg - Ice		11.80	-11.72	-0.75
Wind 60 deg - Ice		14.31	-8.24	-0.60
Wind 90 deg - Ice		16.76	-0.06	-0.16
Wind 120 deg - Ice		15.23	8.70	0.34
Wind 135 deg - Ice		11.71	11.63	0.51
Wind 150 deg - Ice		8.32	14.38	0.69
Wind 180 deg - Ice		-0.06	16.37	0.90
Wind 210 deg - Ice		-8.43	14.44	0.85
Wind 225 deg - Ice		-11.80	11.72	0.75
Wind 240 deg - Ice		-15.29	8.81	0.54
Wind 270 deg - Ice		-16.76	0.06	0.16
Wind 300 deg - Ice		-14.25	-8.13	-0.30
Wind 315 deg - Ice		-11.71	-11.63	-0.51
Wind 330 deg - Ice		-8.32	-14.38	-0.69
Total Weight	14.40			
Wind 0 deg - Service		0.03	-5.51	-0.57
Wind 30 deg - Service		2.80	-4.77	-0.51
Wind 45 deg - Service		3.95	-3.90	-0.42
Wind 60 deg - Service		4.82	-2.77	-0.31
Wind 90 deg - Service		5.55	-0.03	-0.02
Wind 120 deg - Service		4.81	2.73	0.26
Wind 135 deg - Service		3.90	3.86	0.39
Wind 150 deg - Service		2.75	4.74	0.48
Wind 180 deg - Service		-0.03	5.49	0.57
Wind 210 deg - Service		-2.80	4.77	0.51
Wind 225 deg - Service		-3.95	3.90	0.42
Wind 240 deg - Service		-4.84	2.78	0.31
Wind 270 deg - Service		-5.55	0.03	0.02
Wind 300 deg - Service		-4.79	-2.72	-0.26
Wind 315 deg - Service		-3.90	-3.86	-0.39
Wind 330 deg - Service		-2.75	-4.74	-0.48

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 45 deg - No Ice+Guy
5	Dead+Wind 60 deg - No Ice+Guy
6	Dead+Wind 90 deg - No Ice+Guy
7	Dead+Wind 120 deg - No Ice+Guy
8	Dead+Wind 135 deg - No Ice+Guy
9	Dead+Wind 150 deg - No Ice+Guy
10	Dead+Wind 180 deg - No Ice+Guy
11	Dead+Wind 210 deg - No Ice+Guy
12	Dead+Wind 225 deg - No Ice+Guy
13	Dead+Wind 240 deg - No Ice+Guy
14	Dead+Wind 270 deg - No Ice+Guy
15	Dead+Wind 300 deg - No Ice+Guy
16	Dead+Wind 315 deg - No Ice+Guy
17	Dead+Wind 330 deg - No Ice+Guy
18	Dead+Ice+Temp+Guy
19	Dead+Wind 0 deg+Ice+Temp+Guy
20	Dead+Wind 30 deg+Ice+Temp+Guy
21	Dead+Wind 45 deg+Ice+Temp+Guy
22	Dead+Wind 60 deg+Ice+Temp+Guy
23	Dead+Wind 90 deg+Ice+Temp+Guy
24	Dead+Wind 120 deg+Ice+Temp+Guy
25	Dead+Wind 135 deg+Ice+Temp+Guy
26	Dead+Wind 150 deg+Ice+Temp+Guy
27	Dead+Wind 180 deg+Ice+Temp+Guy
28	Dead+Wind 210 deg+Ice+Temp+Guy
29	Dead+Wind 225 deg+Ice+Temp+Guy
30	Dead+Wind 240 deg+Ice+Temp+Guy
31	Dead+Wind 270 deg+Ice+Temp+Guy
32	Dead+Wind 300 deg+Ice+Temp+Guy
33	Dead+Wind 315 deg+Ice+Temp+Guy
34	Dead+Wind 330 deg+Ice+Temp+Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	125 - 105	Leg	Max Tension	22	6.89	-1.14	0.66
			Max. Compression	34	-16.48	-1.00	-0.58
			Max. Mx	30	-9.17	1.32	-0.75
			Max. My	19	-9.07	0.09	1.51
			Max. Vy	23	-0.85	-0.88	0.45
			Max. Vx	27	-0.93	-0.04	-1.11
		Diagonal	Max Tension	17	2.70	0.00	0.00
			Max. Compression	25	-3.11	0.00	0.00
			Max. Mx	10	0.22	-0.00	-0.00
			Max. My	10	-2.08	0.00	-0.00
			Max. Vy	27	0.00	-0.00	-0.00
			Max. Vx	10	-0.00	0.00	0.00
		Horizontal	Max Tension	30	2.40	0.00	0.00
			Max. Compression	13	-0.36	0.00	0.00
			Max. Mx	32	1.01	-0.01	0.00
			Max. My	20	2.03	0.00	-0.00
			Max. Vy	32	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Top Girt	Max Tension	19	0.70	0.00	0.00
			Max. Compression	15	-0.26	0.00	0.00
			Max. Mx	32	0.05	-0.01	0.00
			Max. My	20	0.38	0.00	-0.00
			Max. Vy	32	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Bottom Girt	Max Tension	24	1.19	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	32	0.90	-0.01	0.00
			Max. My	20	1.07	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Guy A	Bottom Tension	27	19.96		
			Top Tension	27	20.19		
			Top Cable Vert	27	18.32		
			Top Cable Norm	27	8.47		
			Top Cable Tan	27	0.00		
			Bot Cable Vert	27	-17.96		
			Bot Cable Norm	27	8.72		
			Bot Cable Tan	27	0.00		
		Guy B	Bottom Tension	31	21.53		
			Top Tension	31	21.75		
			Top Cable Vert	31	20.19		
			Top Cable Norm	31	8.08		
			Top Cable Tan	31	0.02		
			Bot Cable Vert	31	-19.86		
			Bot Cable Norm	31	8.31		
			Bot Cable Tan	31	0.13		
		Guy C	Bottom Tension	22	21.21		
			Top Tension	22	21.42		
			Top Cable Vert	22	19.80		
			Top Cable Norm	22	8.17		
			Top Cable Tan	22	0.01		
			Bot Cable Vert	22	-19.47		
			Bot Cable Norm	22	8.42		
			Bot Cable Tan	22	0.01		
		Top Guy Pull-Off	Max Tension	30	5.02	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	32	2.32	-0.01	0.00
			Max. My	2	2.22	0.00	0.00
			Max. Vy	32	-0.01	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
T2	105 - 85	Leg	Max Tension	5	13.23	0.16	-0.10

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	19	-46.47	-0.01	1.46
			Max. Mx	24	-37.90	1.71	0.85
			Max. My	19	-39.36	0.09	-1.95
			Max. Vy	23	2.41	0.07	0.85
			Max. Vx	19	-2.47	0.54	-0.34
		Diagonal	Max Tension	15	2.25	0.00	0.00
			Max. Compression	19	-5.27	0.00	0.00
			Max. Mx	19	0.66	-0.01	0.00
			Max. My	19	-5.25	-0.00	-0.00
			Max. Vy	19	0.00	-0.01	0.00
			Max. Vx	19	0.00	-0.00	-0.00
		Horizontal	Max Tension	23	2.96	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	2.04	-0.01	0.00
			Max. My	20	2.24	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Top Girt	Max Tension	19	2.03	0.00	0.00
			Max. Compression	15	-0.26	0.00	0.00
			Max. Mx	32	0.29	-0.01	0.00
			Max. My	20	1.11	0.00	-0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Bottom Girt	Max Tension	22	3.36	0.00	0.00
			Max. Compression	2	-1.55	0.00	0.00
			Max. Mx	18	1.07	-0.01	0.00
			Max. My	19	2.63	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T3	85 - 65	Leg	Max Tension	22	24.47	-1.17	0.68
			Max. Compression	19	-58.63	0.02	1.07
			Max. Mx	23	14.64	-2.26	0.41
			Max. My	19	-48.30	0.09	-2.49
			Max. Vy	23	2.41	-0.43	0.81
			Max. Vx	19	-2.47	0.62	0.18
		Diagonal	Max Tension	15	2.96	0.00	0.00
			Max. Compression	19	-5.97	0.00	0.00
			Max. Mx	19	0.81	-0.01	0.00
			Max. My	19	-5.95	-0.00	-0.00
			Max. Vy	19	0.01	-0.01	0.00
			Max. Vx	19	0.00	-0.00	-0.00
		Horizontal	Max Tension	20	3.86	0.00	0.00
			Max. Compression	2	-1.25	0.00	0.00
			Max. Mx	18	2.52	-0.01	0.00
			Max. My	19	3.10	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	19	2.15	0.00	0.00
			Max. Compression	15	-0.45	0.00	0.00
			Max. Mx	18	0.91	-0.01	0.00
			Max. My	19	0.42	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Bottom Girt	Max Tension	19	1.99	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	1.28	-0.01	0.00
			Max. My	19	1.31	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Guy A	Bottom Tension	26	18.81		
			Top Tension	26	18.94		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Top Cable Vert	26	14.61		
			Top Cable Norm	26	12.05		
			Top Cable Tan	26	0.02		
			Bot Cable Vert	26	-14.37		
			Bot Cable Norm	26	12.14		
			Bot Cable Tan	26	0.06		
		Guy B	Bottom Tension	31	21.37		
			Top Tension	31	21.49		
			Top Cable Vert	31	17.50		
			Top Cable Norm	31	12.47		
			Top Cable Tan	31	0.01		
			Bot Cable Vert	31	-17.28		
			Bot Cable Norm	31	12.57		
			Bot Cable Tan	31	0.07		
		Guy C	Bottom Tension	23	20.56		
			Top Tension	23	20.67		
			Top Cable Vert	23	16.28		
			Top Cable Norm	23	12.73		
			Top Cable Tan	23	0.01		
			Bot Cable Vert	23	-16.08		
			Bot Cable Norm	23	12.81		
			Bot Cable Tan	23	0.07		
		Top Guy Pull-Off	Max Tension	19	6.76	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	5.04	-0.01	0.00
			Max. My	2	4.47	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	2	0.00	0.00	0.00
T4	65 - 45	Leg	Max Tension	5	0.19	0.33	-0.18
			Max. Compression	19	-48.20	0.01	1.41
			Max. Mx	30	-46.78	1.36	-0.80
			Max. My	19	-48.20	0.01	1.61
			Max. Vy	23	-1.44	0.06	1.13
			Max. Vx	19	1.40	-0.94	-0.59
		Diagonal	Max Tension	5	0.41	0.00	0.00
			Max. Compression	19	-4.36	0.00	0.00
			Max. Mx	19	-3.65	-0.01	-0.00
			Max. My	34	-4.14	-0.01	-0.00
			Max. Vy	19	0.00	-0.01	-0.00
			Max. Vx	34	0.00	-0.01	-0.00
		Horizontal	Max Tension	19	3.47	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	2.86	-0.00	0.00
			Max. My	19	3.47	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	20	2.64	0.00	0.00
			Max. Compression	7	-0.15	0.00	0.00
			Max. Mx	18	1.32	-0.00	0.00
			Max. My	19	2.43	0.00	0.00
			Max. Vy	18	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Bottom Girt	Max Tension	19	2.00	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	1.91	-0.00	0.00
			Max. My	19	1.60	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T5	45 - 29	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-32.01	0.00	1.25
			Max. Mx	30	-26.02	-1.20	-0.56

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	19	-32.01	0.00	1.35
			Max. Vy	19	-6.51	0.69	0.34
			Max. Vx	19	7.45	0.00	0.67
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-3.17	0.00	0.00
			Max. Mx	19	-2.54	-0.00	-0.00
			Max. My	19	-2.07	-0.00	-0.00
			Max. Vy	19	0.00	-0.00	-0.00
			Max. Vx	19	0.00	-0.00	-0.00
		Horizontal	Max Tension	19	3.32	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	3.21	-0.00	0.00
			Max. My	19	3.28	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	24	1.89	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	1.28	-0.00	0.00
			Max. My	19	1.88	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Bottom Girt	Max Tension	19	5.45	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	5.21	-0.00	0.00
			Max. My	19	5.44	0.00	0.00
			Max. Vy	24	0.01	0.00	0.00
			Max. Vx	19	-0.00	0.00	0.00
T6	29 - 25	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-32.63	0.04	-0.01
			Max. Mx	19	-29.68	0.88	0.00
			Max. My	19	-30.09	0.76	0.08
			Max. Vy	19	5.06	-0.40	-0.05
			Max. Vx	27	-0.11	-0.30	0.02
		Top Girt	Max Tension	19	3.29	0.10	-0.04
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	19	3.14	0.15	-0.06
			Max. My	19	3.17	0.14	-0.06
			Max. Vy	2	0.05	0.14	-0.05
			Max. Vx	2	0.02	0.01	-0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-0.29	-0.13	0.00
			Max. Mx	10	-0.29	-0.16	-0.00
			Max. My	2	-0.25	-0.14	-0.00
			Max. Vy	2	-0.11	-0.14	-0.00
			Max. Vx	2	-0.01	-0.14	-0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	19	88.73	0.03	-0.13
	Max. H_x	7	65.67	0.49	0.14
	Max. H_z	13	67.28	-0.52	0.19
	Max. M_x	1	0.00	0.01	-0.03
	Max. M_z	1	0.00	0.01	-0.03
	Max. Torsion	1	0.00	0.01	-0.03

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. Vert	46	54.60	-0.04	-0.02
	Min. H_x	13	67.28	-0.52	0.19
	Min. H_z	2	68.47	0.03	-0.59
	Min. M_x	1	0.00	0.01	-0.03
	Min. M_z	1	0.00	0.01	-0.03
	Min. Torsion	1	0.00	0.01	-0.03
Guy C @ 37.5 ft Elev 31.5 ft Azimuth 240 deg	Max. Vert	13	-0.61	-0.18	0.10
	Max. H_x	13	-0.61	-0.18	0.10
	Max. H_z	20	-35.19	-18.10	10.71
	Min. Vert	21	-35.46	-18.26	10.68
	Min. H_x	23	-35.42	-18.41	10.41
	Min. H_z	13	-0.61	-0.18	0.10
Guy B @ 39 ft Elev 25 ft Azimuth 120 deg	Max. Vert	7	-0.87	0.27	0.16
	Max. H_x	31	-37.14	18.19	10.26
	Max. H_z	34	-36.90	17.89	10.57
	Min. Vert	31	-37.14	18.19	10.26
	Min. H_x	7	-0.87	0.27	0.16
	Min. H_z	7	-0.87	0.27	0.16
Guy A @ 45 ft Elev 25 ft Azimuth 0 deg	Max. Vert	2	-0.55	-0.00	-0.20
	Max. H_x	30	-28.67	0.37	-18.56
	Max. H_z	2	-0.55	-0.00	-0.20
	Min. Vert	27	-32.17	0.01	-20.73
	Min. H_x	24	-28.50	-0.34	-18.48
	Min. H_z	26	-32.14	-0.19	-20.75

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	55.07	-0.01	0.03	0.00	0.00	0.00
Dead+Wind 0 deg - No Ice+Guy	68.47	-0.03	0.59	0.00	0.00	0.00
Dead+Wind 30 deg - No Ice+Guy	63.49	-0.12	0.46	0.00	0.00	0.00
Dead+Wind 45 deg - No Ice+Guy	59.86	-0.17	0.30	0.00	0.00	0.00
Dead+Wind 60 deg - No Ice+Guy	58.52	-0.23	0.13	0.00	0.00	0.00
Dead+Wind 90 deg - No Ice+Guy	62.09	-0.45	-0.07	0.00	0.00	0.00
Dead+Wind 120 deg - No Ice+Guy	65.67	-0.49	-0.14	0.00	0.00	0.00
Dead+Wind 135 deg - No Ice+Guy	64.00	-0.42	-0.15	0.00	0.00	0.00
Dead+Wind 150 deg - No Ice+Guy	60.63	-0.30	-0.12	0.00	0.00	0.00
Dead+Wind 180 deg - No Ice+Guy	56.49	0.02	-0.05	0.00	0.00	0.00
Dead+Wind 210 deg - No Ice+Guy	61.14	0.35	-0.15	0.00	0.00	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 225 deg - No Ice+Guy	65.30	0.47	-0.19	0.00	0.00	0.00
Dead+Wind 240 deg - No Ice+Guy	67.28	0.52	-0.19	0.00	0.00	0.00
Dead+Wind 270 deg - No Ice+Guy	62.85	0.46	-0.13	0.00	0.00	0.00
Dead+Wind 300 deg - No Ice+Guy	56.64	0.20	0.08	0.00	0.00	0.00
Dead+Wind 315 deg - No Ice+Guy	58.92	0.12	0.27	0.00	0.00	0.00
Dead+Wind 330 deg - No Ice+Guy	63.57	0.08	0.43	0.00	0.00	0.00
Dead+Ice+Temp+Guy	67.55	-0.01	0.03	0.00	0.00	0.00
Dead+Wind 0 deg+Ice+Temp+Guy	88.73	-0.03	0.13	0.00	0.00	0.00
Dead+Wind 30 deg+Ice+Temp+Guy	80.48	0.16	0.05	0.00	0.00	0.00
Dead+Wind 45 deg+Ice+Temp+Guy	75.33	0.23	-0.03	0.00	0.00	0.00
Dead+Wind 60 deg+Ice+Temp+Guy	73.17	0.24	-0.12	0.00	0.00	0.00
Dead+Wind 90 deg+Ice+Temp+Guy	78.69	0.06	-0.09	0.00	0.00	0.00
Dead+Wind 120 deg+Ice+Temp+Guy	85.22	-0.07	0.13	0.00	0.00	0.00
Dead+Wind 135 deg+Ice+Temp+Guy	80.78	-0.08	0.24	0.00	0.00	0.00
Dead+Wind 150 deg+Ice+Temp+Guy	77.07	-0.07	0.36	0.00	0.00	0.00
Dead+Wind 180 deg+Ice+Temp+Guy	70.51	0.02	0.50	0.00	0.00	0.00
Dead+Wind 210 deg+Ice+Temp+Guy	77.69	0.12	0.33	0.00	0.00	0.00
Dead+Wind 225 deg+Ice+Temp+Guy	82.08	0.13	0.19	0.00	0.00	0.00
Dead+Wind 240 deg+Ice+Temp+Guy	87.05	0.11	0.07	0.00	0.00	0.00
Dead+Wind 270 deg+Ice+Temp+Guy	79.73	-0.05	-0.15	0.00	0.00	0.00
Dead+Wind 300 deg+Ice+Temp+Guy	71.44	-0.26	-0.17	0.00	0.00	0.00
Dead+Wind 315 deg+Ice+Temp+Guy	74.87	-0.27	-0.06	0.00	0.00	0.00
Dead+Wind 330 deg+Ice+Temp+Guy	80.81	-0.21	0.03	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	55.27	-0.02	0.03	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	55.54	-0.05	0.04	0.00	0.00	0.00
Dead+Wind 45 deg - Service+Guy	55.63	-0.06	0.05	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	55.69	-0.07	0.05	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	55.66	-0.08	0.04	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	55.51	-0.06	0.04	0.00	0.00	0.00
Dead+Wind 135 deg - Service+Guy	55.41	-0.05	0.03	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	55.30	-0.03	0.02	0.00	0.00	0.00

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 180 deg - Service+Guy	55.04	-0.00	0.02	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	54.78	0.03	0.02	0.00	0.00	0.00
Dead+Wind 225 deg - Service+Guy	54.67	0.04	0.02	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	54.60	0.04	0.02	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	54.61	0.05	0.02	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	54.77	0.04	0.03	0.00	0.00	0.00
Dead+Wind 315 deg - Service+Guy	54.88	0.03	0.03	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	55.01	0.02	0.03	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-14.40	0.00	-0.00	14.40	-0.00	0.001%
2	0.08	-14.40	-14.90	-0.08	14.40	14.90	0.002%
3	7.58	-14.38	-12.91	-7.58	14.38	12.91	0.001%
4	10.68	-14.37	-10.56	-10.68	14.37	10.56	0.001%
5	13.04	-14.37	-7.49	-13.04	14.37	7.49	0.003%
6	15.03	-14.39	-0.08	-15.03	14.39	0.08	0.001%
7	13.02	-14.41	7.38	-13.02	14.41	-7.38	0.001%
8	10.56	-14.41	10.44	-10.56	14.41	-10.44	0.001%
9	7.44	-14.41	12.82	-7.44	14.41	-12.82	0.000%
10	-0.08	-14.40	14.84	0.08	14.40	-14.84	0.001%
11	-7.58	-14.41	12.91	7.58	14.41	-12.91	0.001%
12	-10.68	-14.42	10.56	10.68	14.42	-10.56	0.001%
13	-13.10	-14.42	7.52	13.10	14.42	-7.52	0.001%
14	-15.03	-14.40	0.08	15.03	14.40	-0.08	0.002%
15	-12.96	-14.38	-7.35	12.96	14.38	7.35	0.003%
16	-10.56	-14.38	-10.44	10.56	14.38	10.44	0.002%
17	-7.44	-14.39	-12.82	7.44	14.39	12.82	0.001%
18	0.00	-24.24	0.00	-0.00	24.24	0.00	0.000%
19	0.06	-24.24	-18.78	-0.06	24.24	18.78	0.002%
20	9.08	-24.22	-15.55	-9.09	24.22	15.55	0.005%
21	12.72	-24.21	-12.62	-12.72	24.21	12.62	0.002%
22	15.45	-24.20	-8.88	-15.45	24.20	8.88	0.002%
23	18.07	-24.24	-0.06	-18.07	24.23	0.06	0.003%
24	16.36	-24.27	9.34	-16.36	24.27	-9.34	0.009%
25	12.63	-24.27	12.53	-12.63	24.27	-12.53	0.006%
26	8.98	-24.26	15.49	-8.98	24.26	-15.49	0.003%
27	-0.06	-24.24	17.65	0.06	24.24	-17.65	0.002%
28	-9.08	-24.27	15.55	9.08	24.27	-15.55	0.006%
29	-12.72	-24.28	12.62	12.72	24.28	-12.62	0.008%
30	-16.43	-24.28	9.45	16.42	24.28	-9.45	0.007%
31	-18.07	-24.25	0.06	18.07	24.25	-0.06	0.006%
32	-15.38	-24.22	-8.77	15.38	24.22	8.77	0.001%
33	-12.63	-24.22	-12.53	12.63	24.22	12.53	0.001%
34	-8.98	-24.23	-15.49	8.98	24.23	15.49	0.005%
35	0.03	-14.40	-5.82	-0.03	14.40	5.82	0.001%
36	2.96	-14.39	-5.04	-2.96	14.39	5.04	0.002%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
37	4.17	-14.39	-4.12	-4.17	14.39	4.12	0.003%
38	5.09	-14.39	-2.93	-5.09	14.39	2.93	0.002%
39	5.87	-14.40	-0.03	-5.87	14.39	0.03	0.001%
40	5.09	-14.40	2.88	-5.09	14.40	-2.88	0.001%
41	4.13	-14.40	4.08	-4.13	14.40	-4.08	0.002%
42	2.91	-14.40	5.01	-2.91	14.40	-5.01	0.003%
43	-0.03	-14.40	5.80	0.03	14.40	-5.80	0.004%
44	-2.96	-14.40	5.04	2.96	14.40	-5.04	0.003%
45	-4.17	-14.41	4.12	4.17	14.41	-4.12	0.003%
46	-5.12	-14.41	2.94	5.12	14.41	-2.94	0.000%
47	-5.87	-14.40	0.03	5.87	14.40	-0.03	0.001%
48	-5.06	-14.39	-2.87	5.06	14.39	2.87	0.002%
49	-4.13	-14.39	-4.08	4.13	14.39	4.08	0.002%
50	-2.91	-14.39	-5.01	2.91	14.39	5.01	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	17	0.00000001	0.00000000
2	Yes	37	0.00000001	0.00019064
3	Yes	38	0.00000001	0.00019435
4	Yes	37	0.00000001	0.00018316
5	Yes	32	0.00000001	0.00017717
6	Yes	26	0.00000001	0.00011481
7	Yes	36	0.00000001	0.00019745
8	Yes	37	0.00000001	0.00019535
9	Yes	38	0.00000001	0.00019815
10	Yes	40	0.00000001	0.00019117
11	Yes	38	0.00000001	0.00019944
12	Yes	37	0.00000001	0.00019816
13	Yes	39	0.00000001	0.00018595
14	Yes	27	0.00000001	0.00011369
15	Yes	34	0.00000001	0.00010554
16	Yes	35	0.00000001	0.00019171
17	Yes	38	0.00000001	0.00019108
18	Yes	15	0.00000001	0.00000000
19	Yes	33	0.00000001	0.00019451
20	Yes	28	0.00000001	0.00017196
21	Yes	28	0.00000001	0.00016991
22	Yes	28	0.00000001	0.00016169
23	Yes	24	0.00000001	0.00019544
24	Yes	25	0.00000001	0.00018887
25	Yes	26	0.00000001	0.00019248
26	Yes	27	0.00000001	0.00018792
27	Yes	29	0.00000001	0.00017072
28	Yes	28	0.00000001	0.00017793
29	Yes	28	0.00000001	0.00017657
30	Yes	29	0.00000001	0.00018563
31	Yes	25	0.00000001	0.00019093
32	Yes	28	0.00000001	0.00013340
33	Yes	29	0.00000001	0.00013909
34	Yes	28	0.00000001	0.00017190
35	Yes	41	0.00000001	0.00019439
36	Yes	36	0.00000001	0.00018480
37	Yes	33	0.00000001	0.00013425

38	Yes	33	0.00000001	0.00008611
39	Yes	27	0.00000001	0.00009498
40	Yes	37	0.00000001	0.00018803
41	Yes	33	0.00000001	0.00016887
42	Yes	33	0.00000001	0.00017520
43	Yes	33	0.00000001	0.00019506
44	Yes	34	0.00000001	0.00018312
45	Yes	34	0.00000001	0.00019033
46	Yes	41	0.00000001	0.00018882
47	Yes	28	0.00000001	0.00008975
48	Yes	33	0.00000001	0.00008055
49	Yes	34	0.00000001	0.00009880
50	Yes	34	0.00000001	0.00019659

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 105	1.694	48	0.1568	0.7326
T2	105 - 85	1.213	48	0.1567	0.7484
T3	85 - 65	0.714	49	0.1361	0.7373
T4	65 - 45	0.378	49	0.0822	0.7311
T5	45 - 29	0.181	49	0.0579	0.7299
T6	29 - 25	0.046	49	0.0548	0.7281

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.00	12' x 3" Dia Omni	48	1.694	0.1568	0.7326	205558
129.00	4-Bay Dipole	48	1.694	0.1568	0.7326	205558
128.00	6' x 3" Dia Omni	48	1.694	0.1568	0.7326	205558
127.00	VHLP2-18	48	1.694	0.1568	0.7326	205558
125.00	18' x 3" Dia Omni	48	1.694	0.1568	0.7326	205558
123.00	Rohn 6' x 12' Boom Gate (1)	48	1.647	0.1571	0.7349	205558
118.00	VHLP1-23	48	1.530	0.1576	0.7404	146827
116.96	Guy	48	1.506	0.1577	0.7415	127808
109.00	DB-T1-6Z-8AB-0Z	48	1.313	0.1575	0.7474	64356
105.00	Pirod 12' T-Frame Sector Mount (1)	48	1.213	0.1567	0.7484	63116
76.96	Guy	49	0.556	0.1153	0.7335	22878
69.00	ANT150D6-9	49	0.431	0.0923	0.7316	27227
55.00	ANT150D6-9	49	0.267	0.0654	0.7304	46092
31.00	GPS	49	0.066	0.0551	0.7283	30221

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	125 - 105	7.521	19	0.6591	1.7500
T2	105 - 85	5.488	19	0.6507	1.7917
T3	85 - 65	3.453	19	0.5654	1.7652
T4	65 - 45	1.996	19	0.3822	1.7501
T5	45 - 29	0.999	19	0.3071	1.7469
T6	29 - 25	0.254	19	0.3025	1.7424

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.00	12' x 3" Dia Omni	19	7.521	0.6591	1.7500	86452
129.00	4-Bay Dipole	19	7.521	0.6591	1.7500	86452
128.00	6' x 3" Dia Omni	19	7.521	0.6591	1.7500	86452
127.00	VHLP2-18	19	7.521	0.6591	1.7500	86452
125.00	18' x 3" Dia Omni	19	7.521	0.6591	1.7500	86452
123.00	Rohn 6' x 12' Boom Gate (1)	19	7.321	0.6594	1.7560	86452
118.00	VHLP1-23	19	6.820	0.6598	1.7704	61752
116.96	Guy	19	6.716	0.6597	1.7731	53753
109.00	DB-T1-6Z-8AB-0Z	19	5.905	0.6558	1.7888	27074
105.00	Pirod 12' T-Frame Sector Mount (1)	19	5.488	0.6507	1.7917	27386
76.96	Guy	19	2.791	0.4924	1.7559	7302
69.00	ANT150D6-9	19	2.241	0.4154	1.7513	9043
55.00	ANT150D6-9	19	1.455	0.3285	1.7484	13320
31.00	GPS	19	0.368	0.3028	1.7430	5474

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T3	85	Leg	A325N	0.750	3	4.41	19.43	0.227 ✔	1.333	Bolt Tension
T4	65	Leg	A325N	0.750	3	0.06	19.43	0.003 ✔	1.333	Bolt Tension
T5	45	Leg	A325N	0.750	3	0.00	19.44	0.000 ✔	1.333	Bolt Tension
T6	29	Leg	A325N	0.750	3	0.00	19.18	0.000 ✔	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.
T1	116.96 (A) (258)	7/8 EHS	7.97	79.70	20.19	39.85	2.000	3.948 ✔

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T K	Allowable T_a K	Required S.F.	Actual S.F.
T3	116.96 (B) (257)	7/8 EHS	7.97	79.70	21.75	39.85	2.000	3.665 ✔
	116.96 (C) (256)	7/8 EHS	7.97	79.70	21.42	39.85	2.000	3.721 ✔
	76.96 (A) (261)	7/8 EHS	7.97	79.70	18.94	39.85	2.000	4.208 ✔
	76.96 (B) (260)	7/8 EHS	7.97	79.70	21.49	39.85	2.000	3.708 ✔
	76.96 (C) (259)	7/8 EHS	7.97	79.70	20.67	39.85	2.000	3.856 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	2	20.00	3.92	94.0 K=1.00	1.00	16.065	3.142	-16.48	50.47	0.326 ✔
T2	105 - 85	2	20.00	3.92	94.0 K=1.00	1.00	16.065	3.142	-46.47	50.47	0.921 ✔
T3	85 - 65	2 1/4	20.00	3.92	83.6 K=1.00	1.00	18.292	3.976	-58.63	72.73	0.806 ✔
T4	65 - 45	2	20.00	3.92	94.0 K=1.00	1.00	16.065	3.142	-48.20	50.47	0.955 ✔
T5	45 - 29	2	16.00	3.90	93.5 K=1.00	1.00	16.175	3.142	-32.01	50.82	0.630 ✔
T6	29 - 25	2	4.37	3.05	73.1 K=1.00	1.00	20.359	3.142	-24.62	63.96	0.385* ✔

* DL controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	7/8	4.21	2.11	106.6 K=0.92	12.128	0.601	-3.11	7.29	0.426 ✔
T2	105 - 85	7/8	4.21	2.11	106.6 K=0.92	12.128	0.601	-5.27	7.29	0.723 ✔
T3	85 - 65	7/8	4.21	2.11	106.6 K=0.92	12.128	0.601	-5.97	7.29	0.818 ✔
T4	65 - 45	7/8	4.21	2.11	106.6 K=0.92	12.128	0.601	-4.36	7.29	0.597

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T5	45 - 29	7/8	4.20	2.10	106.4 K=0.92	12.146	0.601	-3.17	7.30	0.434 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	L2x2x3/16	3.04	2.88	103.8 K=1.19	12.493	0.715	-0.36	8.93	0.041 ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	103.5 K=1.19	12.534	0.715	-1.25	8.96	0.140 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	L2x2x3/16	3.04	2.88	103.8 K=1.19	12.493	0.715	-0.26	8.93	0.029 ✔
T2	105 - 85	L2x2x3/16	3.04	2.88	103.8 K=1.19	12.493	0.715	-0.26	8.93	0.029 ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	103.5 K=1.19	12.534	0.715	-0.45	8.96	0.050 ✔
T4	65 - 45	L2x2x1/8	3.04	2.88	103.4 K=1.19	12.338	0.484	-0.15	5.98	0.024 ✔

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	105 - 85	L2x2x3/16	3.04	2.88	103.8 K=1.19	12.493	0.715	-1.55	8.93	0.174 ✔
T6	29 - 25	12x3/8	0.76	0.59	65.8 K=1.00	16.857	4.500	-0.29	75.86	0.004 ✔

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	L3x3x1/4	3.04	2.88	37.1 K=1.53	21.600	1.440	0.00	20.60	0.000*
T3	85 - 65	L3x3x1/4	3.04	2.85	36.8 K=1.00	21.600	1.440	0.00	25.39	0.000*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	125 - 105	L3x3x1/4	-0.01	-0.077	21.600	0.004	-0.01	-0.152	21.600	0.007
T3	85 - 65	L3x3x1/4	-0.01	-0.077	21.600	0.004	-0.01	-0.152	21.600	0.007

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	125 - 105	L3x3x1/4	0.000	0.004	0.007	0.011* ✔	1.000	H1-3 ✔
T3	85 - 65	L3x3x1/4	0.000	0.004	0.007	0.011* ✔	1.000	H1-3 ✔

* DL controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	2	20.00	3.92	94.0	30.000	3.142	6.89	94.25	0.073 ✔
T2	105 - 85	2	20.00	3.92	94.0	30.000	3.142	13.23	94.25	0.140 ✔
T3	85 - 65	2 1/4	20.00	3.92	83.6	30.000	3.976	24.47	119.28	0.205 ✔
T4	65 - 45	2	20.00	3.92	94.0	30.000	3.142	0.19	94.25	0.002 ✔

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	125 - 105	7/8	4.21	2.11	115.6	21.600	0.601	2.70	12.99	0.208 ✔
T2	105 - 85	7/8	4.21	2.11	115.6	21.600	0.601	2.25	12.99	0.173 ✔
T3	85 - 65	7/8	4.21	2.11	115.6	21.600	0.601	2.96	12.99	0.228 ✔
T4	65 - 45	7/8	4.21	2.11	115.6	21.600	0.601	0.41	12.99	0.031 ✔

Horizontal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	125 - 105	L2x2x3/16	3.04	2.88	55.9	21.600	0.715	1.86	15.44	0.121* ✔
T2	105 - 85	L2x2x3/16	3.04	2.88	55.9	21.600	0.715	2.96	15.44	0.192 ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	21.600	0.715	3.86	15.44	0.250 ✔
T4	65 - 45	L2x2x1/8	3.04	2.88	55.1	21.600	0.484	2.65	10.46	0.254* ✔
T5	45 - 29	L2x2x1/8	3.04	2.88	55.1	21.600	0.484	2.66	10.46	0.254* ✔

* DL controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	F_a	A	Actual P	Allow. P_a	Ratio $\frac{P}{P_a}$
	ft		ft	ft		ksi	in^2	K	K	
T1	125 - 105	L2x2x3/16	3.04	2.88	55.9	21.600	0.715	0.70	15.44	0.045 ✔
T2	105 - 85	L2x2x3/16	3.04	2.88	55.9	21.600	0.715	2.03	15.44	0.131 ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	21.600	0.715	2.15	15.44	0.139 ✔
T4	65 - 45	L2x2x1/8	3.04	2.88	55.1	21.600	0.484	2.64	10.46	0.252 ✔
T5	45 - 29	L2x2x1/8	3.04	2.88	55.1	21.600	0.484	1.89	10.46	0.181 ✔
T6	29 - 25	L3x3x1/8	2.88	2.71	34.3	21.600	0.734	3.29	15.86	0.208

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

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	L2x2x3/16	3.04	2.88	55.9	21.600	0.715	0.91	15.44	0.059* ✔
T2	105 - 85	L2x2x3/16	3.04	2.88	55.9	21.600	0.715	3.36	15.44	0.217 ✔
T3	85 - 65	L2x2x3/16	3.04	2.85	55.5	21.600	0.715	1.99	15.44	0.129 ✔
T4	65 - 45	L2x2x1/8	3.04	2.88	55.1	21.600	0.484	2.00	10.46	0.191 ✔
T5	45 - 29	L2x2x1/8	3.04	2.88	55.1	21.600	0.484	4.26	10.46	0.408* ✔

* DL controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	125 - 105	L3x3x1/4	3.04	2.88	37.1	21.600	1.440	5.02	31.10	0.161
T3	85 - 65	L3x3x1/4	3.04	2.85	36.8	21.600	1.440	5.05	31.10	0.162*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	125 - 105	L3x3x1/4	-0.01	0.077	23.760	0.003	-0.01	0.149	23.760	0.006
T3	85 - 65	L3x3x1/4	-0.01	0.077	23.760	0.003	-0.01	0.149	23.760	0.006

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	125 - 105	L3x3x1/4	0.161	0.003	0.006	0.171	1.333	H2-1 ✔
T3	85 - 65	L3x3x1/4	0.162	0.003	0.006	0.172* ✔	1.000	H2-1 ✔

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	125 - 105	Leg	2	2	-16.48	67.27	24.5	Pass
T2	105 - 85	Leg	2	54	-46.47	67.27	69.1	Pass
T3	85 - 65	Leg	2 1/4	105	-58.63	96.95	60.5	Pass
T4	65 - 45	Leg	2	156	-48.20	67.27	71.7	Pass
T5	45 - 29	Leg	2	207	-32.01	67.74	47.3	Pass
T6	29 - 25	Leg	2	249	-24.62	63.96	38.5	Pass
T1	125 - 105	Diagonal	7/8	39	-3.11	9.72	32.0	Pass
T2	105 - 85	Diagonal	7/8	65	-5.27	9.72	54.2	Pass
T3	85 - 65	Diagonal	7/8	152	-5.97	9.72	61.4	Pass
T4	65 - 45	Diagonal	7/8	201	-4.36	9.72	44.8	Pass
T5	45 - 29	Diagonal	7/8	243	-3.17	9.74	32.6	Pass
T1	125 - 105	Horizontal	L2x2x3/16	16	1.86	15.44	12.1	Pass
T2	105 - 85	Horizontal	L2x2x3/16	68	2.96	20.59	14.4	Pass
T3	85 - 65	Horizontal	L2x2x3/16	119	3.86	20.59	18.7	Pass
T4	65 - 45	Horizontal	L2x2x1/8	170	2.65	10.46	25.4	Pass
T5	45 - 29	Horizontal	L2x2x1/8	239	2.66	10.46	25.4	Pass
T1	125 - 105	Top Girt	L2x2x3/16	4	0.70	20.59	3.4	Pass
T2	105 - 85	Top Girt	L2x2x3/16	55	2.03	20.59	9.9	Pass
T3	85 - 65	Top Girt	L2x2x3/16	106	2.15	20.59	10.4	Pass
T4	65 - 45	Top Girt	L2x2x1/8	158	2.64	13.95	18.9	Pass
T5	45 - 29	Top Girt	L2x2x1/8	209	1.89	13.95	13.5	Pass
T6	29 - 25	Top Girt	L3x3x1/8	250	3.29	21.14	15.6	Pass
T1	125 - 105	Bottom Girt	L2x2x3/16	8	0.91	15.44	5.9	Pass
T2	105 - 85	Bottom Girt	L2x2x3/16	59	3.36	20.59	16.3	Pass
T3	85 - 65	Bottom Girt	L2x2x3/16	109	1.99	20.59	9.7	Pass
T4	65 - 45	Bottom Girt	L2x2x1/8	160	2.00	13.95	14.4	Pass
T5	45 - 29	Bottom Girt	L2x2x1/8	213	4.26	10.46	40.8	Pass
T6	29 - 25	Bottom Girt	12x3/8	254	-0.29	101.12	0.3	Pass
T1	125 - 105	Guy A@116.958	7/8	258	20.19	39.85	50.7	Pass
T3	85 - 65	Guy A@76.9583	7/8	261	18.94	39.85	47.5	Pass
T1	125 - 105	Guy B@116.958	7/8	257	21.75	39.85	54.6	Pass
T3	85 - 65	Guy B@76.9583	7/8	260	21.49	39.85	53.9	Pass
T1	125 - 105	Guy C@116.958	7/8	256	21.42	39.85	53.7	Pass
T3	85 - 65	Guy C@76.9583	7/8	259	20.67	39.85	51.9	Pass
T1	125 - 105	Top Guy Pull-Off@116.958	L3x3x1/4	35	5.02	41.46	12.8	Pass
T3	85 - 65	Top Guy Pull-Off@76.9583	L3x3x1/4	137	5.05	31.10	17.2	Pass

Summary		
Leg (T4)	71.7	Pass
Diagonal (T3)	61.4	Pass
Horizontal (T5)	25.4	Pass
Top Girt	18.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						(T4)		
						Bottom Girt	40.8	Pass
						(T5)		
						Guy A (T1)	50.7	Pass
						Guy B (T1)	54.6	Pass
						Guy C (T1)	53.7	Pass
						Top Guy Pull-Off	17.2	Pass
						(T3)		
						Bolt Checks	17.0	Pass
						RATING =	**71.7**	**Pass**

SITE NAME	WEST HARTFORD CENTER CT	ECP - CELL #	AWS1	8	290
LATITUDE	41-45-41.60 N	LONGITUDE	72-44-25.35 W		
700 tilt change plus RET antenna swap outs and 40W to 60W RRH upgrades. The 60W 4 port 700 RRH will be connected to the low band ports on the 700 and AWS antenna.		SAVE BUTTON			
		STRUCTURE TYPE	LATTICE		

700 Mhz - LTE Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	700 eNodeB		700 eNodeB		700 eNodeB	
ANTENNA TYPE	BXA-70063-6CF-2-750MHZ		SLCP 2X6015		SLCP 2X6015	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	0		4		4	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X40-700	1	ALU RH_2X40-700	1	ALU RH_2X40-700
700 Mhz - LTE Future Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	700 eNodeB		700 eNodeB		700 eNodeB	
ANTENNA TYPE	SBNHH-1D65B		SBNHH-1D65B		SBNHH-1D65B	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	3 electrical		5 electrical		5 electrical	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X60-700	1	ALU RH_2X60-700	1	ALU RH_2X60-700
850 Celluar - Current Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	Cellular Mod 4.0B		Cellular Mod 4.0B		Cellular Mod 4.0B	
ANTENNA TYPE	BXA-80063/4		SLCP 2X6014		SLCP 2X6014	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	0		4		4	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	0		0		0	
850 Celluar - Future Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	Cellular Mod 4.0B		Cellular Mod 4.0B		Cellular Mod 4.0B	
ANTENNA TYPE	BXA-80063/4		SLCP 2X6014		SLCP 2X6014	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	0		4		4	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	0		0		0	
DIPLEX WITH LTE CABLE						
1900 PCS - Current Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	BXA-171063-8BF-EDIN-2		SACP 2X5516		SACP 2X5516	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	0		2		2	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
1900 PCS - Future Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	SBNHH-1D65B		SBNHH-1D65B		SBNHH-1D65B	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	2 electrical		3 electrical		3 electrical	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEX WITH CELLULAR CABLE	REMOVE DIPLEXERS		REMOVE DIPLEXERS		REMOVE DIPLEXERS	
RRH - QTY/MODEL	1	ALU RH_2X60-PCS	1	ALU RH_2X60-PCS	1	ALU RH_2X60-PCS
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						

AWS - LTE Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	2100 MHz eNodeB		2100 MHz eNodeB		2100 MHz eNodeB	
ANTENNA TYPE	BXA-171063-12CF-EDIN-2		SACP 2X5516		SACP 2X5516	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	0		0		0	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X40-AWS	1	ALU RH_2X40-AWS	1	ALU RH_2X40-AWS
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX	1		DB-T1-6Z-8AB-0Z			
AWS - LTE Future Config	**ALPHA**		**BETA**		**GAMMA**	
EQUIPMENT TYPE	2100 MHz eNodeB		2100 MHz eNodeB		2100 MHz eNodeB	
ANTENNA TYPE	**SBNHH-1D65B**		**SBNHH-1D65B**		**SBNHH-1D65B**	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	60		180		290	
DOWN TILT (MECH/DEG)	**2 electrical**		**3 electrical**		**3 electrical**	
RAD CTR (FT AGL)	100		100		100	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	1	ALU RH_2X60-AWS	1	ALU RH_2X60-AWS	1	ALU RH_2X60-AWS
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX	1		DB-T1-6Z-8AB-0Z			

NUMBER OF CABLE'S NEEDED					Fiber Lines Model number			
TOTAL # FIBER LINES	2	TOTAL # OF MAINLINES		12	FIBER LINE MODEL #			HB158-1-08U8-S8J18
TOTAL # TOP JUMPERS	12	TOTAL # OF TOP JUMPERS		36	FIBER TOP JUMPER MODEL #			HB114-1-08U4-S4J18
Equipment Cable Ordering		**MAIN CABLE**	12 +	0	**TOP JUMPER #**	24	+	12

TX / RX FREQUENCIES			TX POWER OUTPUT	
Cellular A-Band	**PCS F / AWS-Band**	**700 Mhz C - E**	Cellular (Watts)	20
TX - 869-880,890-891.5 MHz	TX - 1970-1975 / 2145-21	TX - 746-757	PCS (Watts)	16
RX - 824-835,845-846.5 MHz	RX - 1890-1895 / 1745-17	RX - 776-787	LTE/ AWS (Watts)	40

ALPHA				BETA				GAMMA			
Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code
A1-A	800	Tx1/Rx0	RED	A5-A	800	Tx2/Rx0	BLUE	A9-A	800	Tx3/Rx0	GREEN
A1-B	1900	Tx1/Rx0	RED/ WHITE	A5-B	1900	Tx2/Rx0	BLUE/ WHITE	A9-B	1900	Tx3/Rx0	GREEN/WHITE
A2	700	Tx1/Rx0	RED/ ORANGE	A6	700	Tx2/Rx0	BLUE/ ORANGE	A10	700	Tx3/Rx0	GREEN/ORANGE
A3	700	Tx4/Rx1	RED/RED/ ORANGE	A7	700	Tx5/Rx1	BLUE/BLUE/OR ANGE	A11	700	Tx6/Rx1	GREEN/GREEN/ORANGE
A4-B	1900	Tx4/Rx1	RED/RED/ WHITE	A8-B	1900	Tx5/Rx1	BLUE/BLUE/WH ITE	A12-B	1900	Tx6/Rx1	GREEN/GREEN/WHITE
A4-A	800	Tx4/Rx1	RED/RED	A8-A	800	Tx5/Rx1	BLUE/BLUE	A12-A	800	Tx6/Rx1	GREEN/GREEN
F1-A	1700	Tx/Rx	RED/ BROWN	F1-B	1700	Tx/Rx	BLUE/BROWN	F1-C	1700	Tx/Rx	GREEN/BROWN
F1-D	1700	Tx/Rx	RED/RED/ BROWN	F1-E	1700	Tx/Rx	BLUE/BLUE/BR OWN	F1-F	1700	Tx/Rx	GREEN/GREEN/BROWN

RF ENGINEER	RF MANAGER	INITIALS	DATE
Prepared By: Mark Brauer	Alex Restrepo	MB	7/10/2015

EAST > North East > New England > New England West > WEST HARTFORD CENTER CT

- Brauer, Mark - mark.brauer2@verizonwireless.com - 06/25/2018 10:30:40

Project Detail		Location Information	
Site Type	Macro	**Siterra Site ID#**	325091
Carrier Aggregation	false	**Site Name**	WEST HARTFORD CENTER CT
MPT Id		**Siterra SR#**	
eCIP-0	false	**E-NodeB ID#**	068960
Project Name	850 ADD	**PSLC#**	467475
RFDS Project ID	1343985	**Switch Name**	Windsor 2
Project ID	15244807	**Tower Owner**	
Site Traker Project ID		**Tower Type**	Building Side-Mounted
RFDS Project Scope	850 LTE add Samsung Dual band RRHs Keep existing SBNHH antennas	**Street Address**	14-20 Isham Road
		City	West Hartford
		State	CT
		Zip Code	06107
		County	Hartford
		Latitude	41.761556 / 41 45' 41.6" N
		Longitude	-72.740375 / 72 44' 25.35" W

WEST HARTFORD CENTER CT - Brauer, Mark - mark.brauer2@verizonwireless.com - 06/25/2018 10:30:40

Antenna Summary

Added Antennas

700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY

Removed Antennas

700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY

Retained Antennas

700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	QTY
YES		YES		YES		ANDREW	SBNHH-1D65B_PORT 2 - 45_01DT_1950 (329413)	100	103	60(D1)	false	false	PHYSICAL	1
YES		YES			YES	ANDREW	SBNHH-1D65B_PORT 2 - 45_01DT_2130 (329414)	100	103	60(D1)	false	false	PHYSICAL	1
YES		YES		YES		ANDREW	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)	100	103	290(D3),180(D2)	false	false	PHYSICAL	2
YES		YES			YES	ANDREW	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)	100	103	290(D3),180(D2)	false	false	PHYSICAL	2
	YES					ANTEL INTERNATIONAL, INC.	BXA-80063/4 (97250)	100	102.1	60(D1)	false	false	PHYSICAL	2
	YES					SWEDCOM	SLCP 2X6014 (242852)	100	102.2	290(D3),180(D2)	false	false	PHYSICAL	4

WEST HARTFORD CENTER CT - Brauer, Mark - mark.brauer2@verizonwireless.com - 06/25/2018 10:30:40

Equipment Summary

Added Non Antennas

Equipment Type	700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Location	Make	Model	Cable Length	Cable Size	Inst. Type	Quantity
RRU	YES		YES				Tower	Samsung	B5/B13 RRH-BR04C			PHYSICAL	3
RRU					YES	YES	Tower	Samsung	B2/B66A RRH-BR049			PHYSICAL	3

Removed Non Antennas

Equipment Type	700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Location	Make	Model	Cable Length	Cable Size	Inst. Type	Quantity
RRU	YES						Tower	Nokia	UHBA B13 RRH 4x30			PHYSICAL	3
RRU						YES	Tower	Nokia	UHIE B66A RRH 4x45			PHYSICAL	3
RRU					YES		Tower	Nokia	UHFA B25 RRH 4x30			PHYSICAL	3

Retained Non Antennas

Equipment Type	700 LTE	850 CDMA	850 LTE	1900 CDMA	1900 LTE	2100 LTE	Location	Make	Model	Cable Length	Cable Size	Inst. Type	Quantity
Coaxial Cables							Tower					PHYSICAL	6
OVP Box							Tower					PHYSICAL	2
Hybrid Cable							Tower					PHYSICAL	2
Mount							Tower	Comscope	BSAMNT-SBS-1-2			PHYSICAL	3

WEST HARTFORD CENTER CT - Brauer, Mark - mark.brauer2@verizonwireless.com - 06/25/2018 10:30:40

Services

700 MHZ LTE						
	Current Version:			Proposed Version:		
	0001			0002		
Sector	D1	D2	D3	D1	D2	D3
Azimuth	60	180	290	60	180	290
Cell/ENode B ID	068960	068960	068960	068960	068960	068960
Antenna Model	SBNHH-1D65B_PORT 1 - 45_03DT_0725 (354020)	SBNHH-1D65B_PORT 1 - 45_05DT_0725 (354024)	SBNHH-1D65B_PORT 1 - 45_05DT_0725 (354024)	SBNHH-1D65B_PORT 1 - 45_03DT_0725 (354020)	SBNHH-1D65B_PORT 1 - 45_05DT_0725 (354024)	SBNHH-1D65B_PORT 1 - 45_05DT_0725 (354024)
Antenna Make	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Centerline(Ft)	100	100	100	100	100	100
Mechanical DT(Deg.)	0	0	0	0	0	0
Electrical DT	3	5	5	3	5	5
Tip Height	103	103	103	103	103	103
TMA make						
TMA model						
RRU make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU model	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	B5/B13 RRH-BR04C	B5/B13 RRH-BR04C	B5/B13 RRH-BR04C
# of Tx, Rx Lines	4,4	4,4	4,4	4,4	4,4	4,4
Position						

2100 MHZ LTE

	Current Version:			Proposed Version:		
	0001			0002		
Sector	D1	D2	D3	D1	D2	D3
Azimuth	60	180	290	60	180	290
Cell/ENode B ID	068960	068960	068960	068960	068960	068960
Antenna Model	SBNHH-1D65B_PORT 2 - 45_01DT_2130 (329414)	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)	SBNHH-1D65B_PORT 2 - 45_01DT_2130 (329414)	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)
Antenna Make	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Centerline(Ft)	100	100	100	100	100	100
Mechanical DT(Deg.)	0	0	0	0	0	0
Electrical DT	1	3	3	1	3	3
Tip Height	103	103	103	103	103	103
TMA make						
TMA model						
RRU make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU model	UHIE B66A RRH 4x45	UHIE B66A RRH 4x45	UHIE B66A RRH 4x45	B2/B66A RRH-BR049	B2/B66A RRH-BR049	B2/B66A RRH-BR049
# of Tx, Rx Lines	4,4	4,4	4,4	4,4	4,4	4,4
Position						

1900 MHZ LTE

	Current Version:			Proposed Version:		
	0001			0002		
Sector	D1	D2	D3	D1	D2	D3
Azimuth	60	180	290	60	180	290
Cell/ENode B ID	068960	068960	068960	068960	068960	068960
Antenna Model	SBNHH-1D65B_PORT 2 - 45_01DT_1950 (329413)	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)	SBNHH-1D65B_PORT 2 - 45_01DT_1950 (329413)	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)
Antenna Make	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW	ANDREW
Centerline(Ft)	100	100	100	100	100	100
Mechanical DT(Deg.)	0	0	0	0	0	0
Electrical DT	1	3	3	1	3	3
Tip Height	103	103	103	103	103	103
TMA make						
TMA model						
RRU make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU model	UHFA B25 RRH 4x30	UHFA B25 RRH 4x30	UHFA B25 RRH 4x30	B2/B66A RRH-BR049	B2/B66A RRH-BR049	B2/B66A RRH-BR049
# of Tx, Rx Lines	4,4	4,4	4,4	4,4	4,4	4,4
Position						

850 MHZ CDMA

	Current Version:			Proposed Version:		
	0001			0002		
Sector	D1	D2	D3	D1	D2	D3
Azimuth	60	180	290	60	180	290
Cell/ENode B ID						
Antenna Model	BXA-80063/4 (97250)	SLCP 2X6014 (242852)	SLCP 2X6014 (242852)	BXA-80063/4 (97250)	SLCP 2X6014 (242852)	SLCP 2X6014 (242852)
Antenna Make	ANTEL INTERNATIONAL, INC.	SWEDCOM	SWEDCOM	ANTEL INTERNATIONAL, INC.	SWEDCOM	SWEDCOM
Centerline(Ft)	100	100	100	100	100	100
Mechanical DT(Deg.)	0	4	4	0	4	4
Electrical DT	0	0	0	0	0	0
Tip Height	102.1	102.2	102.2	102.1	102.2	102.2
TMA make						
TMA model						
RRU make						
RRU model						
# of Tx, Rx Lines						
Position	,	,	,	,	,	,

850 MHZ LTE

	Current Version:	Proposed Version:		
		0002		
Sector		D1	D2	D3
Azimuth		60	180	290
Cell/ENode B ID		068960	068960	068960
Antenna Model		SBNHH-1D65B_PORT 1 - 45_03DT_0850 (354021)	SBNHH-1D65B_PORT 1 - 45_05DT_0850 (354025)	SBNHH-1D65B_PORT 1 - 45_05DT_0850 (354025)
Antenna Make		ANDREW	ANDREW	ANDREW
Centerline(Ft)		100	100	100
Mechanical DT(Deg.)		0	0	0
Electrical DT		3	5	5
Tip Height		103	103	103
TMA make				
TMA model				
RRU make		Samsung	Samsung	Samsung
RRU model		B5/B13 RRH-BR04C	B5/B13 RRH-BR04C	B5/B13 RRH-BR04C
# of Tx, Rx Lines		4,4	4,4	4,4
Position				

Service Comments

WEST HARTFORD CENTER CT - Brauer, Mark - mark.brauer2@verizonwireless.com - 06/25/2018 10:30:40

Callsigns Per Antenna - Proposed

Sector	Make	Model	Centerline	Tip Height	Azimuth(TN)	Elec. Tilt	Mech. Tilt	Gain	Horiz BW	Regulatory Power	700 Callsigns	850 Callsigns	1900 Callsigns	2100 Callsigns	28 GHz Callsigns	31 GHz Callsigns
D1	ANTEL INTERNATIONAL, INC.	BXA-80063/4 (97250)	100ft/30.48m	102.1ft/31.12m	60	0	0	13	63.75	431.52		KNKA404				
D1	ANDREW	SBNHH-1D65B_PORT 1 - 45_03DT_0725 (354020)	100ft/30.48m	103ft/31.39m	60	3	0	12.607	69	76.99	WQJQ689					
D1	ANDREW	SBNHH-1D65B_PORT 1 - 45_03DT_0850 (354021)	100ft/30.48m	103ft/31.39m	60	3	0	13.335	66	482.50		KNKA404				
D2	ANDREW	SBNHH-1D65B_PORT 1 - 45_05DT_0725 (354024)	100ft/30.48m	103ft/31.39m	180	5	0	12.632	69.25	77.44	WQJQ689					
D3	ANDREW	SBNHH-1D65B_PORT 1 - 45_05DT_0725 (354024)	100ft/30.48m	103ft/31.39m	290	5	0	12.632	69.25	77.44	WQJQ689					
D2	ANDREW	SBNHH-1D65B_PORT 1 - 45_05DT_0850 (354025)	100ft/30.48m	103ft/31.39m	180	5	0	13.351	64.5	484.28		KNKA404				
D3	ANDREW	SBNHH-1D65B_PORT 1 - 45_05DT_0850 (354025)	100ft/30.48m	103ft/31.39m	290	5	0	13.351	64.5	484.28		KNKA404				

D1	ANDREW	SBNHH-1D65B_PORT 2 - 45_01DT_1950 (329413)	100ft/30.48 m	103ft/31.39 m	60	1	0	16.205	52.75	289.24			KNLH251, WPOJ730			
D1	ANDREW	SBNHH-1D65B_PORT 2 - 45_01DT_2130 (329414)	100ft/30.48 m	103ft/31.39 m	60	1	0	16.163	61	143.23				WQGA906 ,WQGB276		
D2	ANDREW	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)	100ft/30.48 m	103ft/31.39 m	180	3	0	16.122	53	283.76			KNLH251, WPOJ730			
D3	ANDREW	SBNHH-1D65B_PORT 2 - 45_03DT_1950 (329417)	100ft/30.48 m	103ft/31.39 m	290	3	0	16.122	53	283.76			KNLH251, WPOJ730			
D2	ANDREW	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)	100ft/30.48 m	103ft/31.39 m	180	3	0	16.077	61.75	140.42				WQGA906 ,WQGB276		
D3	ANDREW	SBNHH-1D65B_PORT 2 - 45_03DT_2130 (329418)	100ft/30.48 m	103ft/31.39 m	290	3	0	16.077	61.75	140.42				WQGA906 ,WQGB276		
D2	SWEDCOM	SLCP 2X6014 (242852)	100ft/30.48 m	102.2ft/31.15m	180	0	4	14.08	55	496.59		KNKA404				
D3	SWEDCOM	SLCP 2X6014 (242852)	100ft/30.48 m	102.2ft/31.15m	290	0	4	14.08	55	496.59		KNKA404				

WEST HARTFORD CENTER CT - Brauer, Mark - mark.brauer2@verizonwireless.com - 06/25/2018 10:30:40

Callsigns

Callsigns	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs/ Sq Mi	Status	Project Action
KNKA404	*Hartford-New Britain-Bristol, CT*	*CL*	*CMA032*	*A*	*CT*	*Hartford*	*Cellco Partnership*	*Yes*	*25.000*	*824.000-835.000*	*869.000-880.000*	*845.000-846.500*	*890.000-891.500*	*496.59*	*500*	*1216.2*	*Active*	*Added*
KNLH251	*Hartford, CT*	*CW*	*BTA184*	*F*	*CT*	*Hartford*	*Cellco Partnership*	*Yes*	*10.000*	*1890.000-1895.000*	*1970.000-1975.000*	*.000-.000*	*.000-.000*	*289.24*	*1640*	*1216.2*	*Active*	*Retained*
WPLM398	Hartford, CT	LD	BTA184	B	CT	Hartford	Nextlink Wireless, LLC	Yes	150.000	31000.000-31075.000	31225.000-31300.000	.000-.000	.000-.000			1216.2	Active	
WPOH943	Hartford, CT	LD	BTA184	A	CT	Hartford	Nextlink Wireless, LLC	Yes	300.000	29100.000-29250.000	31075.000-31225.000	.000-.000	.000-.000			1216.2	Active	
WPOJ730	*Hartford, CT*	*CW*	*BTA184*	*C*	*CT*	*Hartford*	*Cellco Partnership*	*Yes*	*15.000*	*1895.000-1902.500*	*1975.000-1982.500*	*.000-.000*	*.000-.000*	*289.24*	*1640*	*1216.2*	*Active*	*Retained*
WQGA906	*New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-*	*AW*	*BEA010*	*B*	*CT*	*Hartford*	*Cellco Partnership*	*Yes*	*20.000*	*1720.000-1730.000*	*2120.000-2130.000*	*.000-.000*	*.000-.000*	*143.23*	*1640*	*1216.2*	*Active*	*Retained*
WQGB276	*Hartford-New Britain-Bristol, CT*	*AW*	*CMA032*	*A*	*CT*	*Hartford*	*Cellco Partnership*	*Yes*	*20.000*	*1710.000-1720.000*	*2110.000-2120.000*	*.000-.000*	*.000-.000*	*143.23*	*1640*	*1216.2*	*Active*	*Retained*
WQJQ689	*Northeast*	*WU*	*REA001*	*C*	*CT*	*Hartford*	*Cellco Partnership*	*Yes*	*22.000*	*746.000-757.000*	*776.000-787.000*	*.000-.000*	*.000-.000*	*77.44*	*1000*	*1216.2*	*Active*	*Retained*

Dewberry

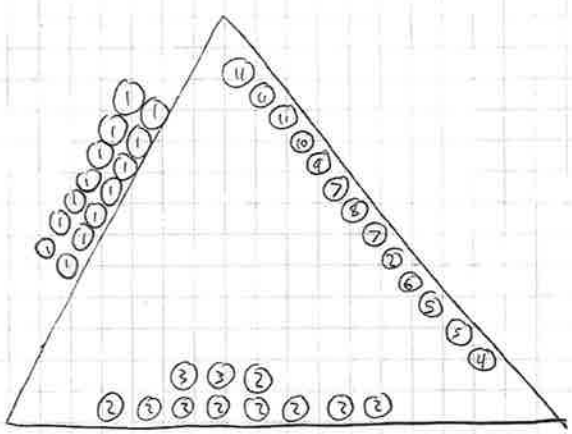
Calculation Sheet

Designer: West Hartford center CT   Date: SU   Checker: 7/23/18   Date:
Title: Bk   Job No.:
Subject: Sheet No. ___ of ___

upper guy wire .085" Ø
lower guy wire .089" Ø
antenna guys 1.51" Ø

Verizon Coax

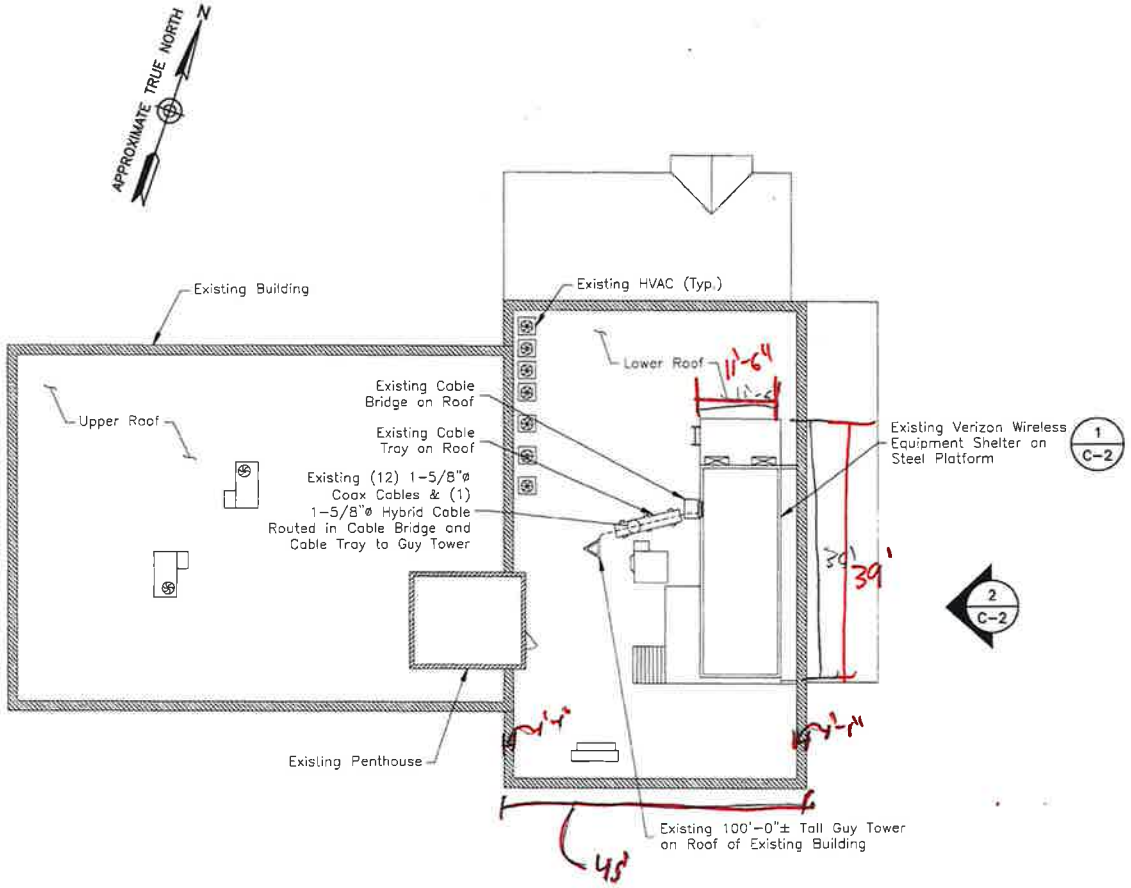
(12) 1-5/8" Coax
(2) 1-5/8" hybrid cables



(1) (12) 1-5/8" Coax + (2) -5/8" hybrids (Verizon)
(2) (10) 1-1/4" Coax (From dog house)
(3) (2) 1-1/4" Coax (From penthouse)
(4) (1) 1-5/8" Coax (From dog house)
(5) (2) 1/2" Coax (From dog house)
(6) (1) 1-5/8" flex conduit (From dog house)
(7) (2) 1-5/8" Coax (From penthouse)
(8) (1) 7/8" Coax (From penthouse)
(9) (1) 1/4" Coax (From dog house)
(10) (1) 1/2" Coax (From dog house)
(11) (3) 7/8" Coax (From dog house)

* These are some coax coming out of dog house that terminate @ base of tower

KEY MAP (1)
SCALE: N.T.S.



ROOF PLAN (2)
SCALE: 1"=20' FOR 11"x17"
1"=10' FOR 22"x34"
0' 10' 20'

20'-3" tall
3'-3" tall parapet

NOTES:

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING AND PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. ROOF PLAN & ELEVATION BASED A SITE VISIT BY DEWBERRY ENGINEERS INC. ON 06/07/17.
4. EXISTING ANTENNAS SHOWN AS APPROXIMATE. ELEVATION BASED ON EXISTING INFORMATION AND VISUAL INSPECTION AND HAVE NOT BEEN VERIFIED THROUGH AN ANTENNA MAPPING.
5. MOUNT ALL ANTENNAS, COAX, RRH'S, OVP BOXES, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS COMPLETED BY CENTEK ENGINEERING DATED JULY 22, 2016.
6. REUSE EXISTING ANTENNA MOUNTS AND COAX. INSPECT FOR DAMAGE OR DECAY AND REPLACE AS NEEDED PER STRUCTURAL ANALYSIS.
7. THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAINS. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.

CELLCO PARTNERSHIP
d/b/a verizon WIRELESS

99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

WEST HARTFORD CENTER CT

CONSTRUCTION DRAWINGS		
0	11/29/17	ISSUED AS FINAL
A	06/30/17	FOR COMMENT

Dewberry
Dewberry Engineers Inc.
800 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.8400
FAX: 973.739.8710

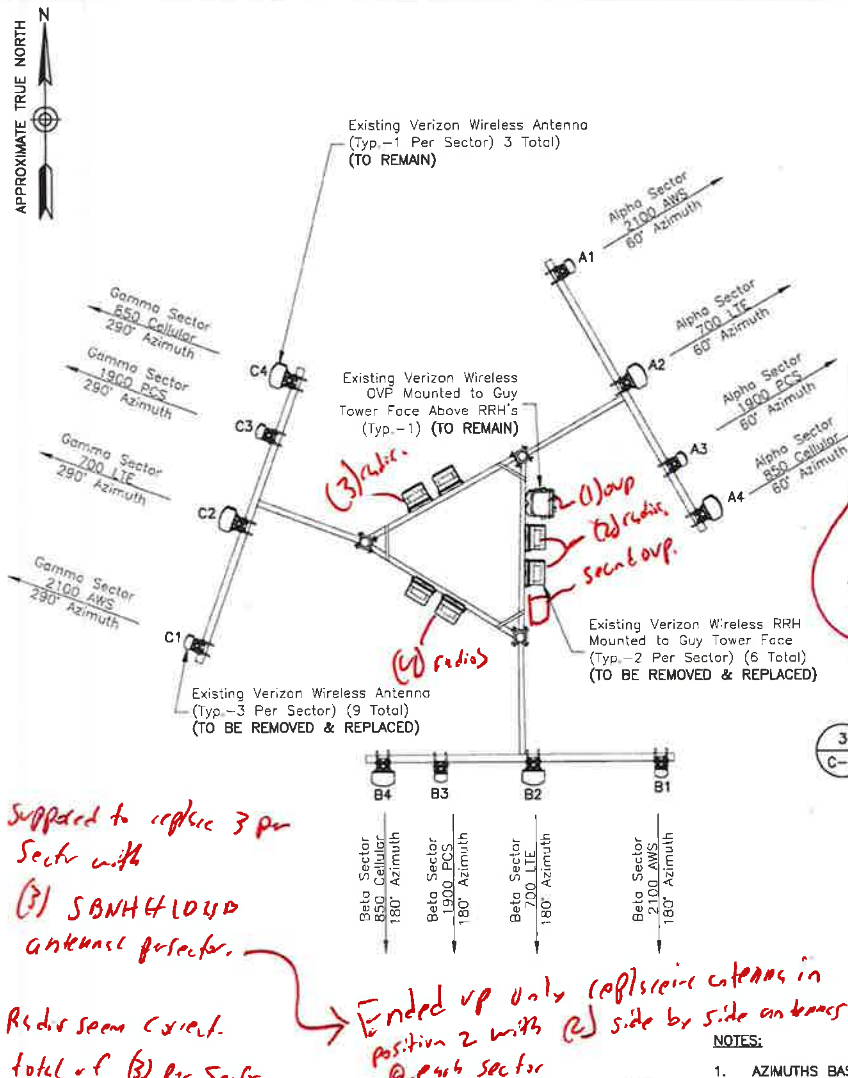
JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	NRS
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50067815
JOB NUMBER:	50091672

SITE ADDRESS:
14-20 ISHAM ROAD
WEST HARTFORD, CT 06107

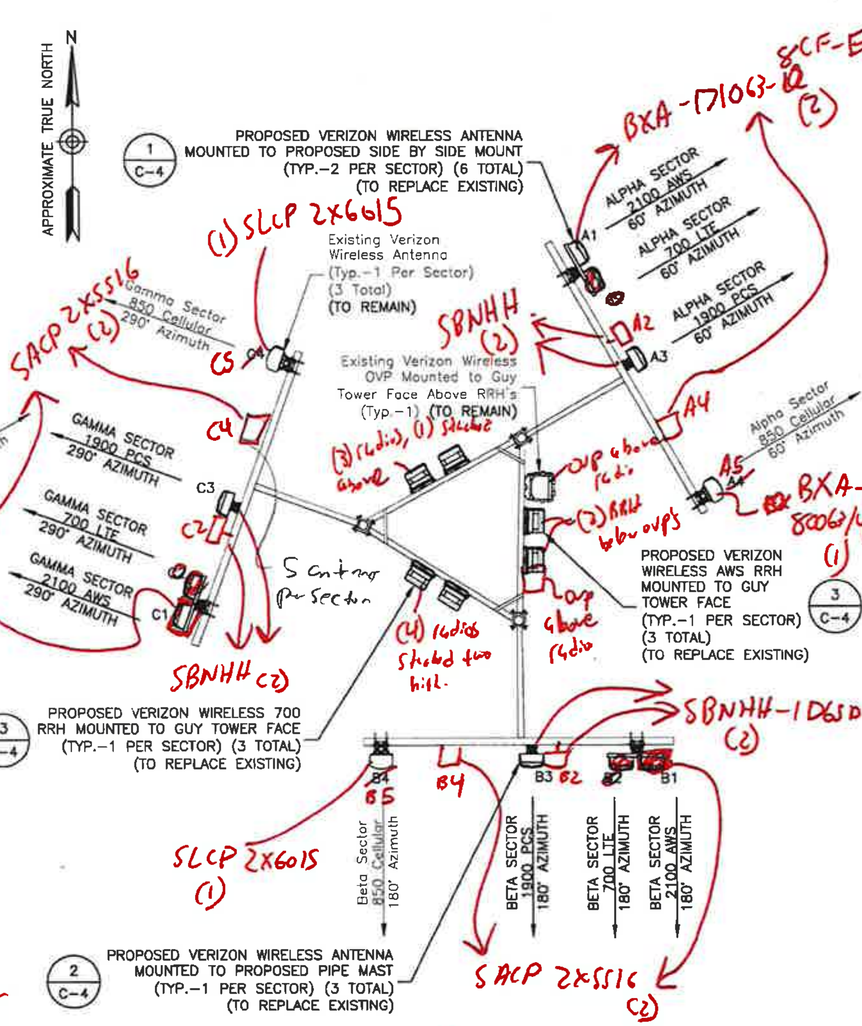
SHEET TITLE
KEY MAP & ROOF PLAN

SHEET NUMBER
C-1



EXISTING ANTENNA PLAN (1)

SCALE: N.T.S.



PROPOSED ANTENNA PLAN (2)

SCALE: N.T.S.

NOTES:

1. AZIMUTHS BASED ON TRUE NORTH.
2. MOUNT ALL ANTENNAS, COAX, RRH'S, OVP BOXES, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS COMPLETED BY CENTEK ENGINEERING DATED JULY 22, 2016.

CELLCO PARTNERSHIP d/b/a verizon WIRELESS
99 EAST RIVER DRIVE
EAST HARTFORD, CT 06108

WEST HARTFORD CENTER CT

CONSTRUCTION DRAWINGS

0	11/29/17	ISSUED AS FINAL
A	06/30/17	FOR COMMENT

Dewberry
Dewberry Engineers Inc.
600 PARSIPPANY ROAD
SUITE 301
PARSIPPANY, NJ 07054
PHONE: 973.739.9400
FAX: 973.739.9710

JIANG YU, P.E.
CONNECTICUT LICENSE NO. 0023222

DRAWN BY:	NRS
REVIEWED BY:	BSH
CHECKED BY:	GHN
PROJECT NUMBER:	50067815
JOB NUMBER:	50091672

SITE ADDRESS:

14–20 ISHAM ROAD
WEST HARTFORD, CT 06107

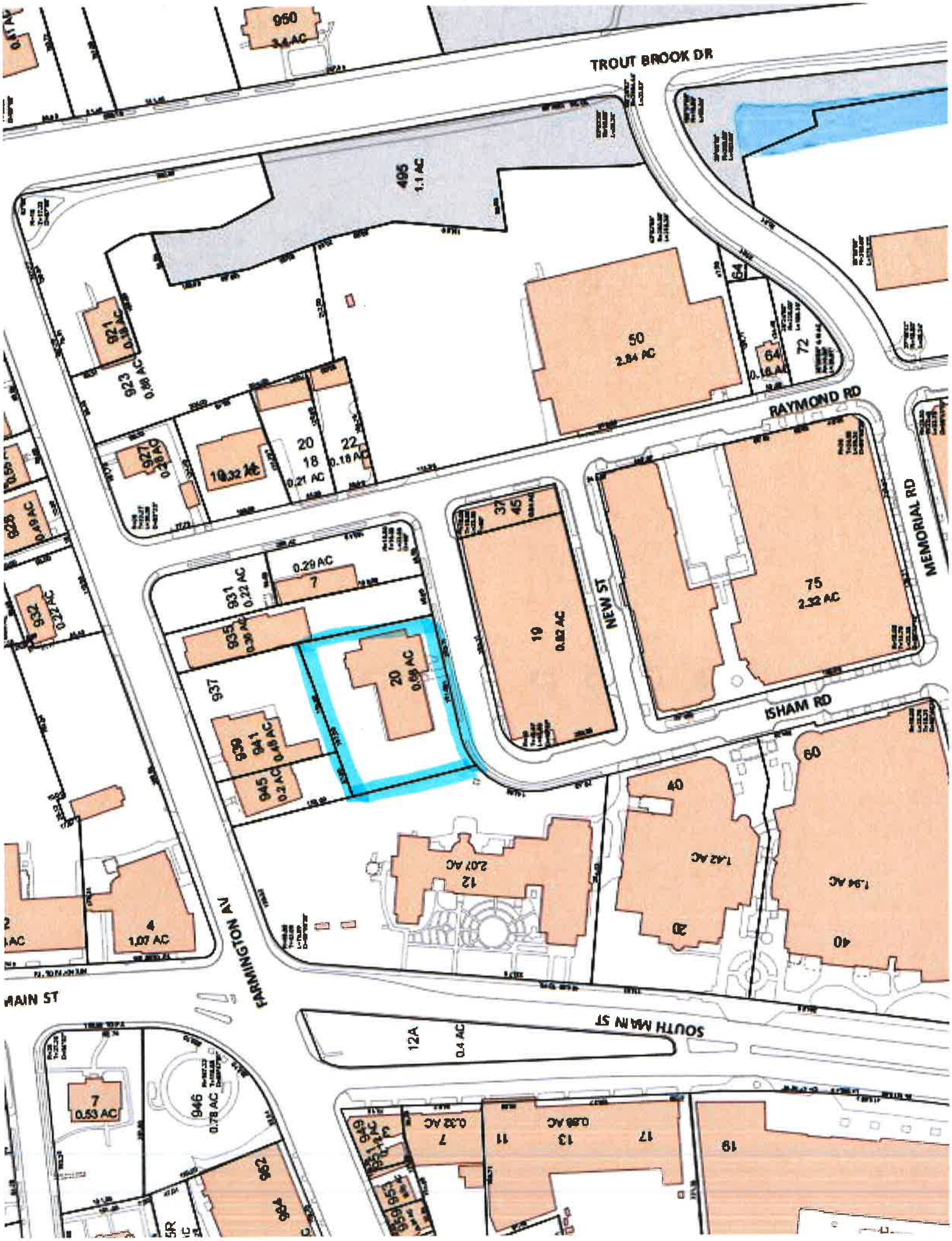
SHEET TITLE

EXISTING & PROPOSED ANTENNA PLANS

SHEET NUMBER

C–3

ATTACHMENT 4



TROUT BROOK DR
950
3.4 AC
495
1.1 AC
50
2.84 AC
64
0.18 AC
72
921
0.18 AC
923
0.88 AC
RAYMOND RD
927
0.28 AC
10
0.32 AC
20
18
0.21 AC
22
0.18 AC
37
45
MEMORIAL RD
0.29 AC
7
931
0.22 AC
932
0.22 AC
935
0.30 AC
NEW ST
19
0.82 AC
75
2.32 AC
20
0.88 AC
937
ISHAM RD
939
941
0.48 AC
945
0.2 AC
60
40
1.42 AC
20
12
2.07 AC
1.94 AC
40
4
1.07 AC
FARMINGTON AV
MAIN ST
SOUTH MAIN ST
12A
0.4 AC
7
0.53 AC
946
0.78 AC
962
949
0.32 AC
7
11
13
0.88 AC
17
19

20 ISHAM ROAD

Location	20 ISHAM ROAD	**Mblu**	F9/ 2901/ 20/ /
Parcel ID	2901 2 20 0001	**Owner**	M + R GASSNER FAMILY II LLC
Assessment	$1,526,910	**Appraisal**	$2,181,300
Vision Id #	10289	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$932,700	$1,248,600	$2,181,300

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$652,890	$874,020	$1,526,910

Owner of Record

Owner M + R GASSNER FAMILY II LLC
Co-Owner
Address 20 ISHAM ROAD
WEST HARTFORD, CT 06107

Sale Price $0
Certificate
Book & Page 2394/ 221
Sale Date 12/31/1998
Instrument U

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
M + R GASSNER FAMILY II LLC	$0		2394/ 221	U	12/31/1998
M & R GASSNER FAMILY LLC	$487,000		2194/ 310	Q	05/16/1998
NEW ENGLAND ACQUISITION CORPORATION	$1,067,000		2007/ 193	Q	05/10/1995
IMPRINT INC	$508,000		759/ 57	Q	01/31/1981
LARSEN CHRISTOPHER	$0		478/ 67	U	09/24/1970

Building Information

Building 1 : Section 1

Year Built: 1951
Living Area: 11,807
Replacement Cost: $1,556,464
Building Percent 58

Building Percent Good: 58

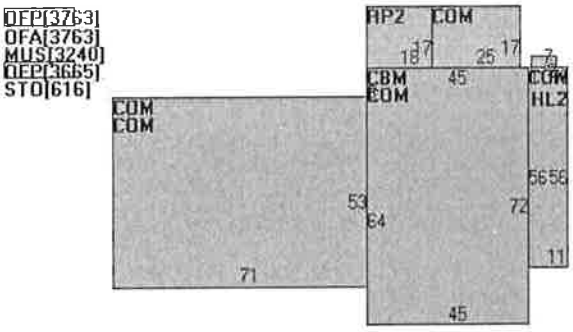
Replacement Cost Less Depreciation: $902,700

Building Attributes	
Field	**Description**
STYLE	Office Area
MODEL	Comm/Ind
Grade	C 0.90
Stories:	2
Occupancy	
Exterior Wall 1	Concrete Block
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Built Up
Interior Wall 1	Typical
Interior Wall 2	
Floor Type	Metal Deck
Floor Cover	Carpet
Heating Fuel	Typical
Heating Type	Hot Water
AC Type	Central - Zone
As Built Use	OFF
Bldg Use	Commercial
# of Bedrooms	
Total Baths	
Type	00
Wet Sprinkler	
Dry Sprinkler	
1st Floor Use:	
Class	Class C
Frame Type	Masonry
Plumbing	LIGHT
Ceiling	Acoustic Panel
Group	COM
Wall Height	20
Adjustment	

Building Photo

(http://images.vgsi.com/photos/WestHartfordCTPhotos//\00\00

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
OFP	LOW RISE PROF BLDG	7,428	7,428
OFA	OFFICE MIXED USE	3,763	3,763
STO	STORAGE AREA MIXED	616	616
CBM	BSMT COMM - NV	3,240	0
COM	COMMERCIAL - NV	11,807	0
HL2	LOAD LEVEL DOCK	21	0
MUS	MULTI USE STORAGE	3,240	0
RP2	COVERED PORCH	306	0
		30,421	11,807

Extra Features

Extra Features	Legend

No Data for Extra Features

Land

Land Use

Use Code	201
Description	Commercial
Zone	BC
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.68
Frontage	
Depth	
Assessed Value	$874,020
Appraised Value	$1,248,600

Outbuildings

Outbuildings — Legend

Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
CLP4	Paving, Asphalt			16000 SF	$25,600	1
CHL2	Loading Dock Leveler			1 UNITS	$2,300	1
CRP2	Covered Porch commercial			306 SF	$2,100	1

Valuation History

Appraisal

Valuation Year	Improvements	Land	Total
2017	$932,700	$1,248,600	$2,181,300
2016	$932,700	$1,248,600	$2,181,300
2015	$1,101,400	$1,187,800	$2,289,200

Assessment

Valuation Year	Improvements	Land	Total
2017	$652,890	$874,020	$1,526,910
2016	$652,890	$874,020	$1,526,910
2015	$770,980	$831,460	$1,602,440

ATTACHMENT 5

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103		3	neopost 02/01/2019 US POSTAGE $002.79 ZIP 06103 041L12203987
	Postmaster, per *(name of receiving employee)*		OLD STATE HOUSE STATION 06103 FEB 01 2019 USPS

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Matthew W. Hart, Town Manager Town of West Hartford West Hartford Town Hall 50 South Main Street, Room 310 West Hartford, CT 06107				
2.	Todd Dumais, Town Planner Town of West Hartford West Hartford Town Hall 50 South Main Street, Room 214 West Hartford, CT 06107				
3.	M&R Gassner Family II, LLC 20 Isham Road West Hartford, CT 06107				
4.					
5.					
6.					