August 19, 2016

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

Re:	**Notice of Exempt Modification – Antenna Swap**
Property Address:	**3114 Albany Ave. West Hartford, CT 06117**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application 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).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 115-feet on an existing 346 foot–guyed tower, owned by EDUCATIONAL MEDIA FOUNDATION at 5700 WEST OAKS BOULEVARD ROCKLIN, CA 95765. AT&T now intends to remove (2)SBNH1D6565C Powerwave panel antennas on position (3), sectors A and C, (1) AM-X-CD-16-65-00T-RET Andrew sector B and replacing with (3) HPA-65R-BUU-H8 CCI panel antennas all on position (2) while retaining six 800-10121 Kathrein panel antennas on positions (1 and 4), all sectors at the 115-foot level. AT&T also intends to install 3 RRU-12's with A-2 modules on the existing antenna masts.

At a public meeting held July 5 , 2000, the West Hartford Town Plan and Zoning Commission Conditionally approved, by unanimous vote, a new 360'FM broadcasting tower, a 70' fiber glass AM broadcasting tower and a new 20' x 40' equipment building after demolishing the existing equipment building.

The Special Use Permit (SUP #903) cpomplies with the finding requirements of Section 177-42A (5a & 5b) of the West Hartford Code of Ordinances with the following conditions:

1. At the request of the applicant the new tower I reduce to 347' and the 70' FM antenna is withdrawn.

. 2. The applicant shall protect the existing tree screen along Route 44 all the way to the ridge line between the Tower and Route 44. This area shall not be materially altered without first receiving TPZ approval.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Ron Van Winkle, City Manager, West Hartford Town Hall 50 South Main Street, Room 310 West Hartford, CT 06107. A copy of this letter is also being sent to the property owner EDUCATIONAL MEDIA FOUNDATION at 5700 WEST OAKS BOULEVARD ROCKLIN, CA 95765 and to the tower company, SBA Communications Corporation 8051 Congress Avenue Boca Raton, Florida 33487-1307.

The planned modifications to AT&T's 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. AT&T's replacement antennas will be installed at the 115-foot level of the 346-foot guyed tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

For the foregoing reasons, AT&T 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,

David Barbagallo

CC w/enclosures:
Ron Van Winkle, City Manager, West Hartford Town
EDUCATIONAL MEDIA FOUNDATION- property owner
SBA Communications Corporation- Tower Company


smartlink

FULLERTON
ENGINEERING · DESIGN

Fullerton Engineering Consultants, Inc.
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

June 21, 2016

RE:	**AT&T LTE 2C**
Prepared For:	Smartlink / AT&T
Site Number:	CTL01154
FA Location:	10041811
Site Name:	WEST HARTFORD
Site Address:	3114 Albany Avenue West Hartford, CT 06117

To Whom It May Concern,

This structural assessment is in regards to the adequacy of the existing antenna frames w/ 1 stiff arm for the AT&T LTE 2C project. The purpose was to determine conformance of existing antenna mounting structure under 2003 International Building Code and the industry standard ANSI/TIA-222-F (Structural Standards for Steel Antenna Towers and Antenna Supporting Structures).

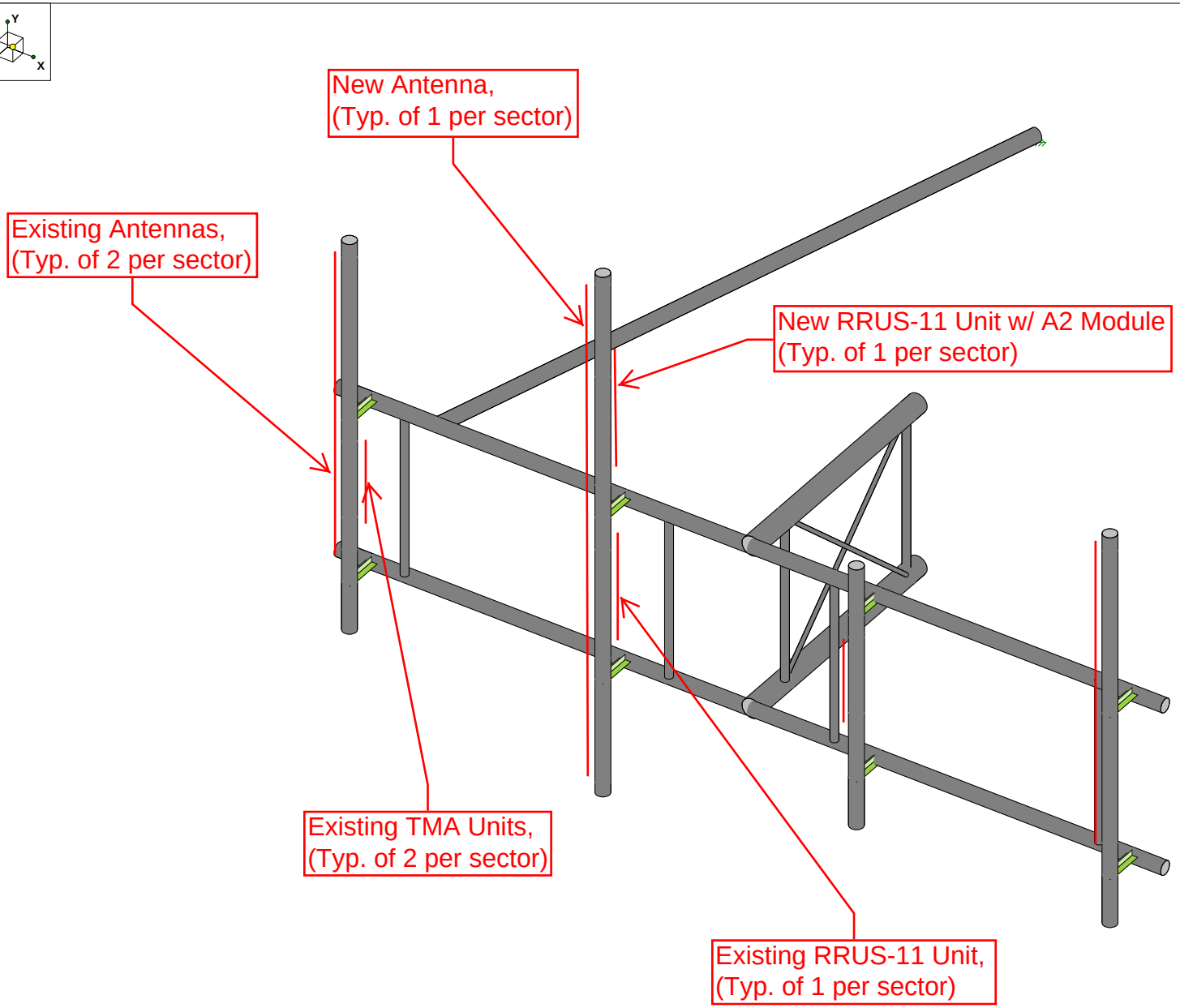
Based on collected information via a site visit dated 05/12/2016, technical data of the proposed equipment, structural calculations and engineering judgment, the existing antenna frames w/ 1 stiff arm are **adequate** to support the proposed installation for the above-referenced program. For installation details, see latest construction drawings prepared by Fullerton Engineering.

This PE certification completed by Fullerton Engineering Consultants is inclusive of the existing antenna mounting structure that will support the existing and proposed loading provided by the client.

This certification assumes that all the existing structural members of the existing antenna mounting structure are in good condition and have not been altered from the manufacturer's original design. Prior to installation of new equipment, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction.

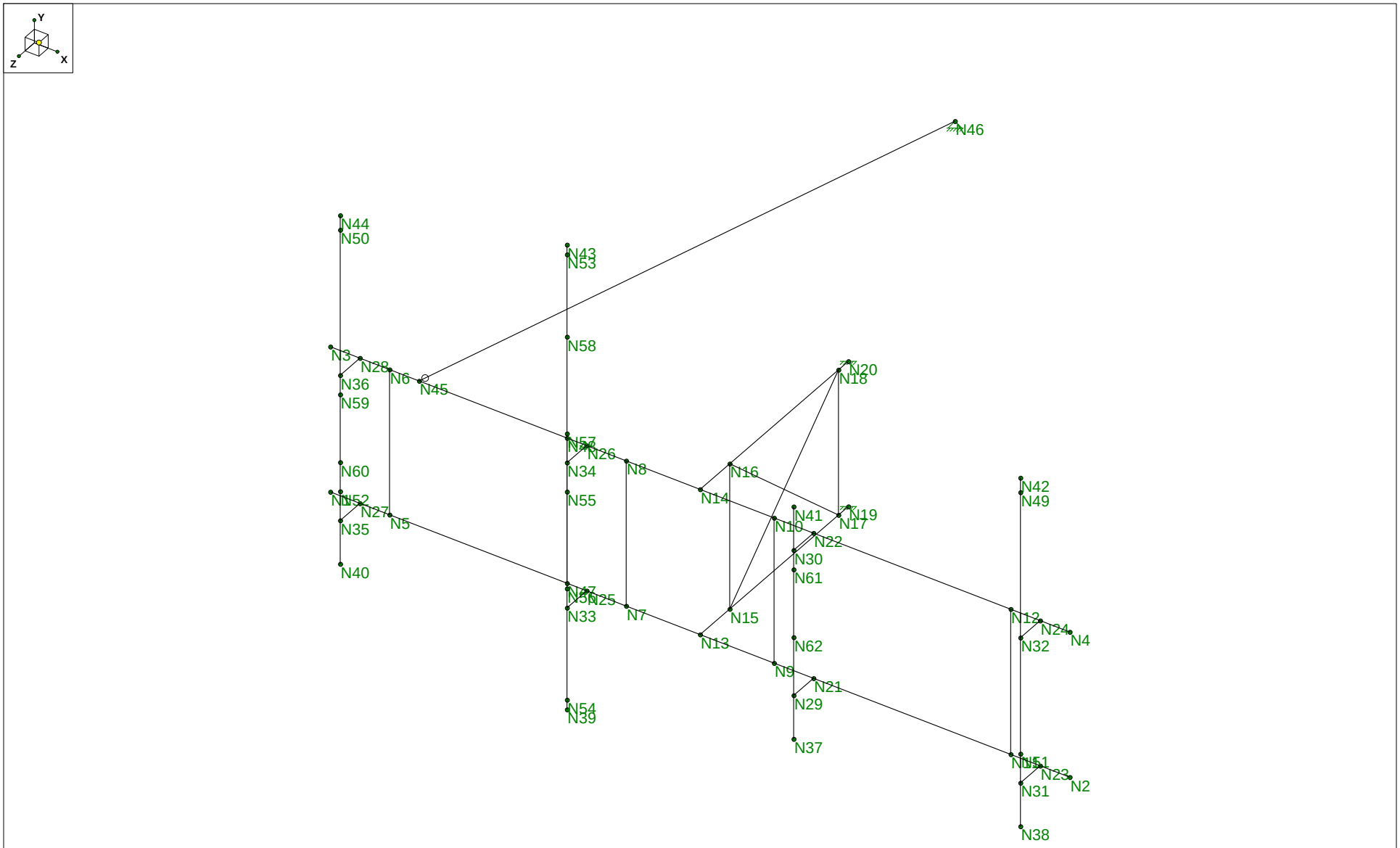
Respectfully,

Henry M. Bellagamba, P.E.



Envelope Only Solution

Fullerton Engineering Consultants, ...	T-Frame	SK - 1
THC		June 21, 2016 at 9:42 AM
CTL01154		CTL010154 - Mount Analysis.r3d



Envelope Only Solution

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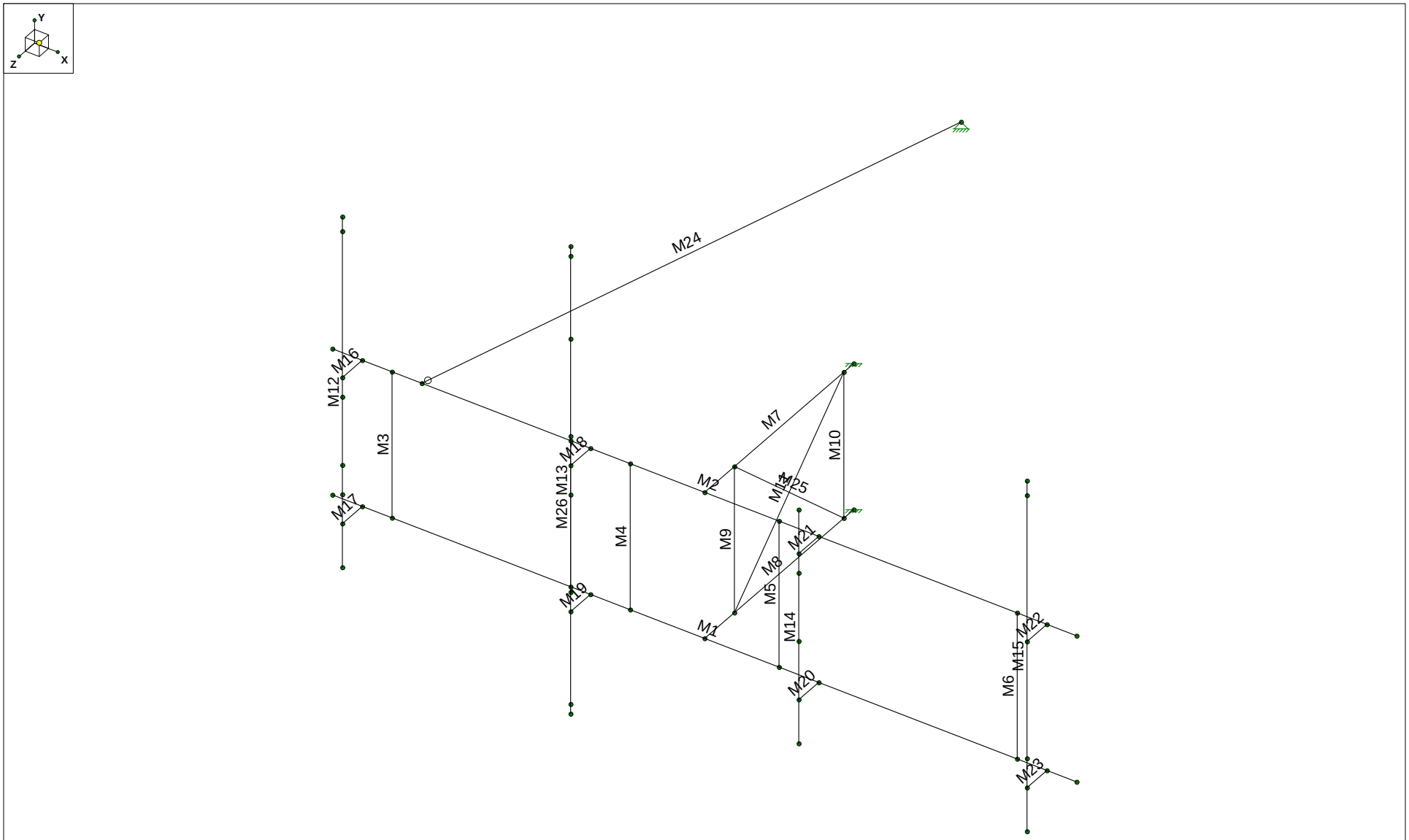
THC		June 21, 2016 at 9:48 AM
CTL01154		CTL010154 - Mount Analysis.r3d



Envelope Only Solution

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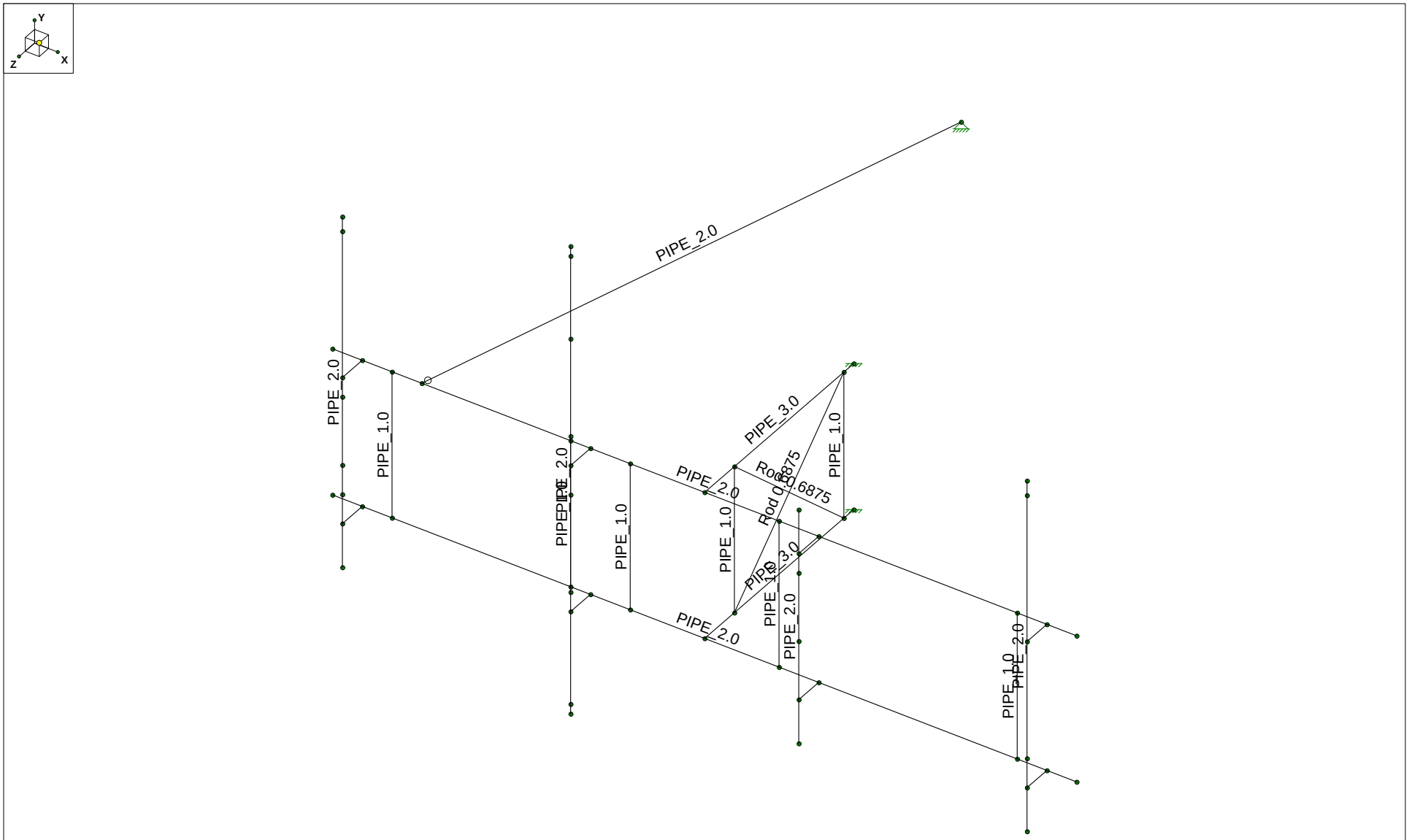

Envelope Only Solution

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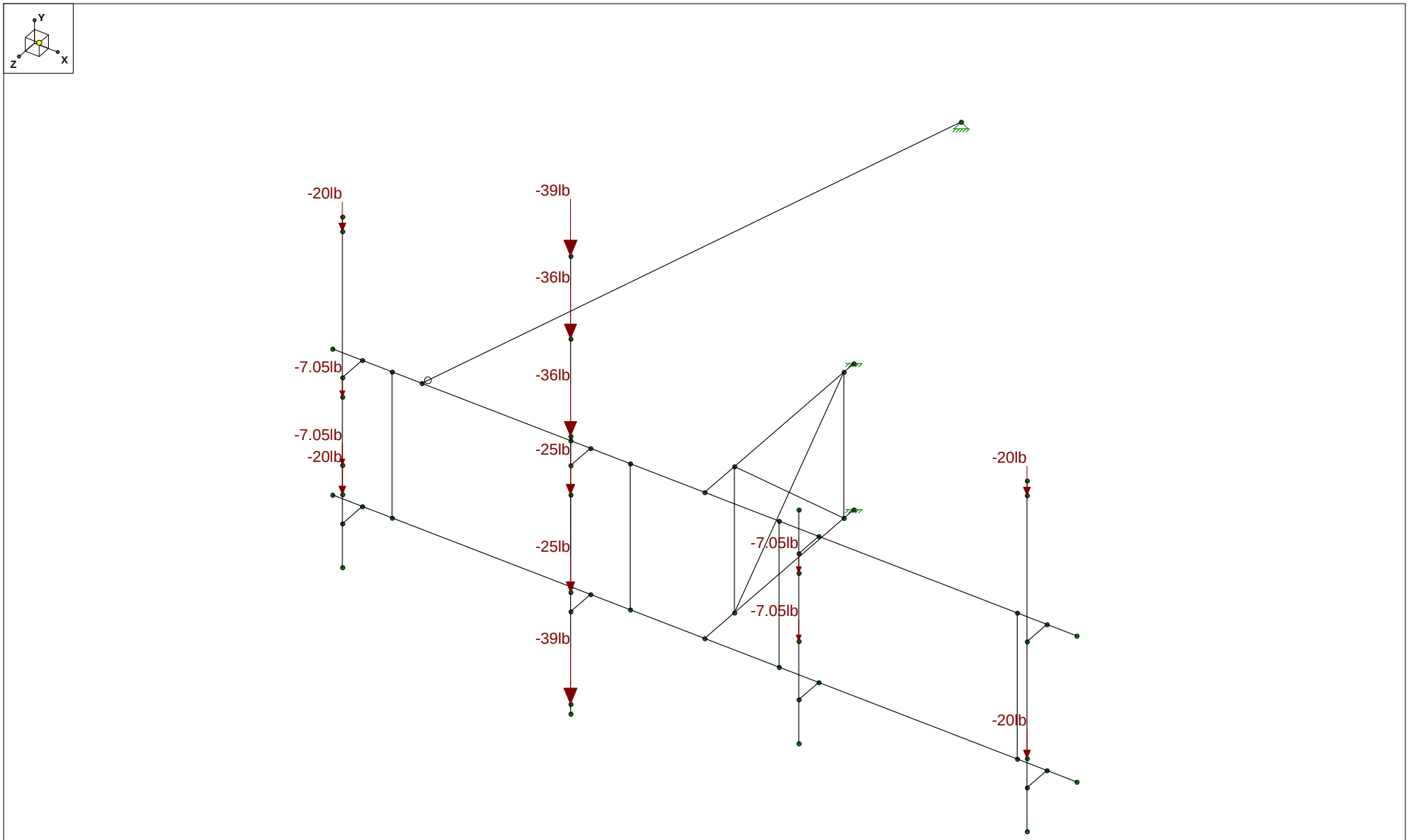

Loads: BLC 1, DL
Envelope Only Solution

Fullerton Engineering Consultants, ...	T-Frame	SK - 5
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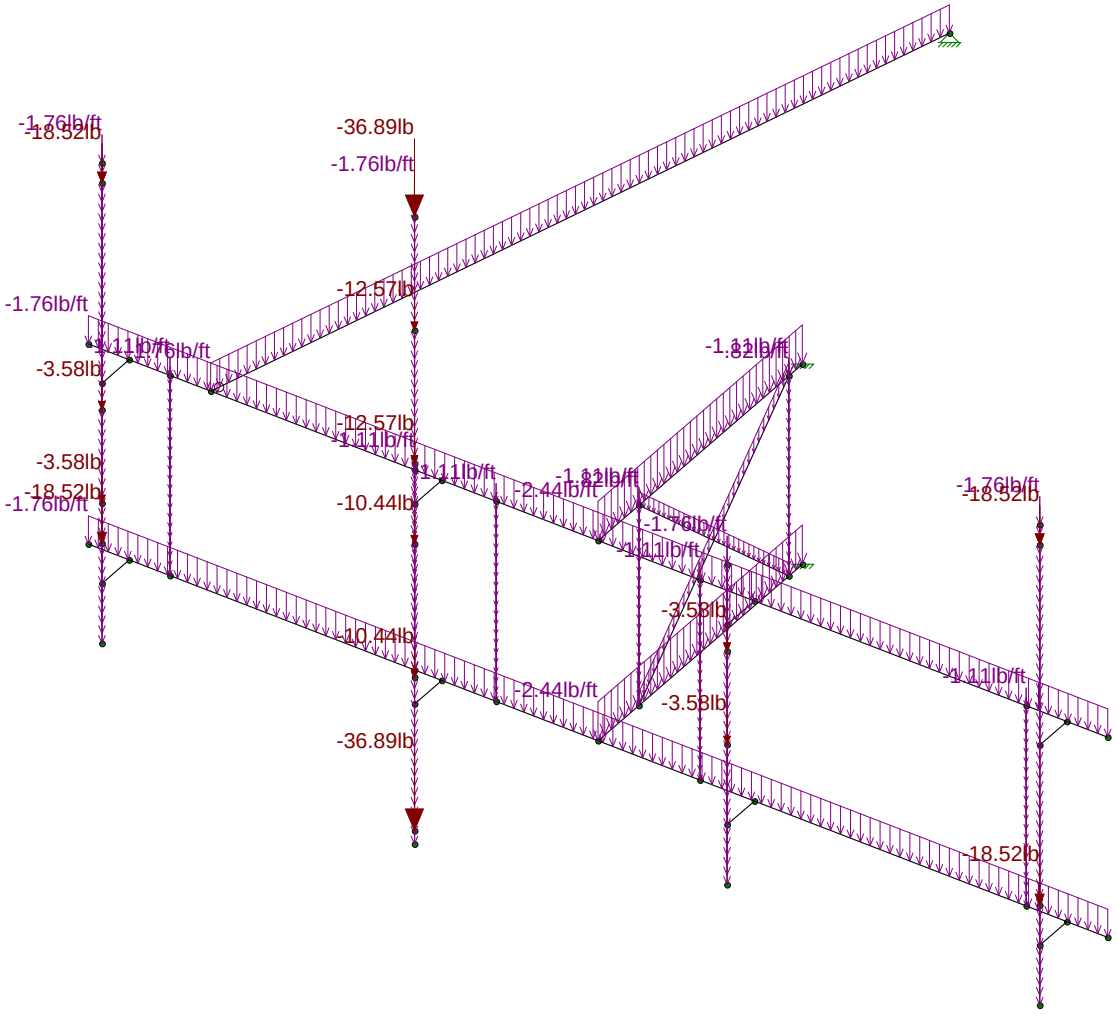

Loads: BLC 2, DLi
Envelope Only Solution

Fullerton Engineering Consultants, ...	T-Frame	SK - 6
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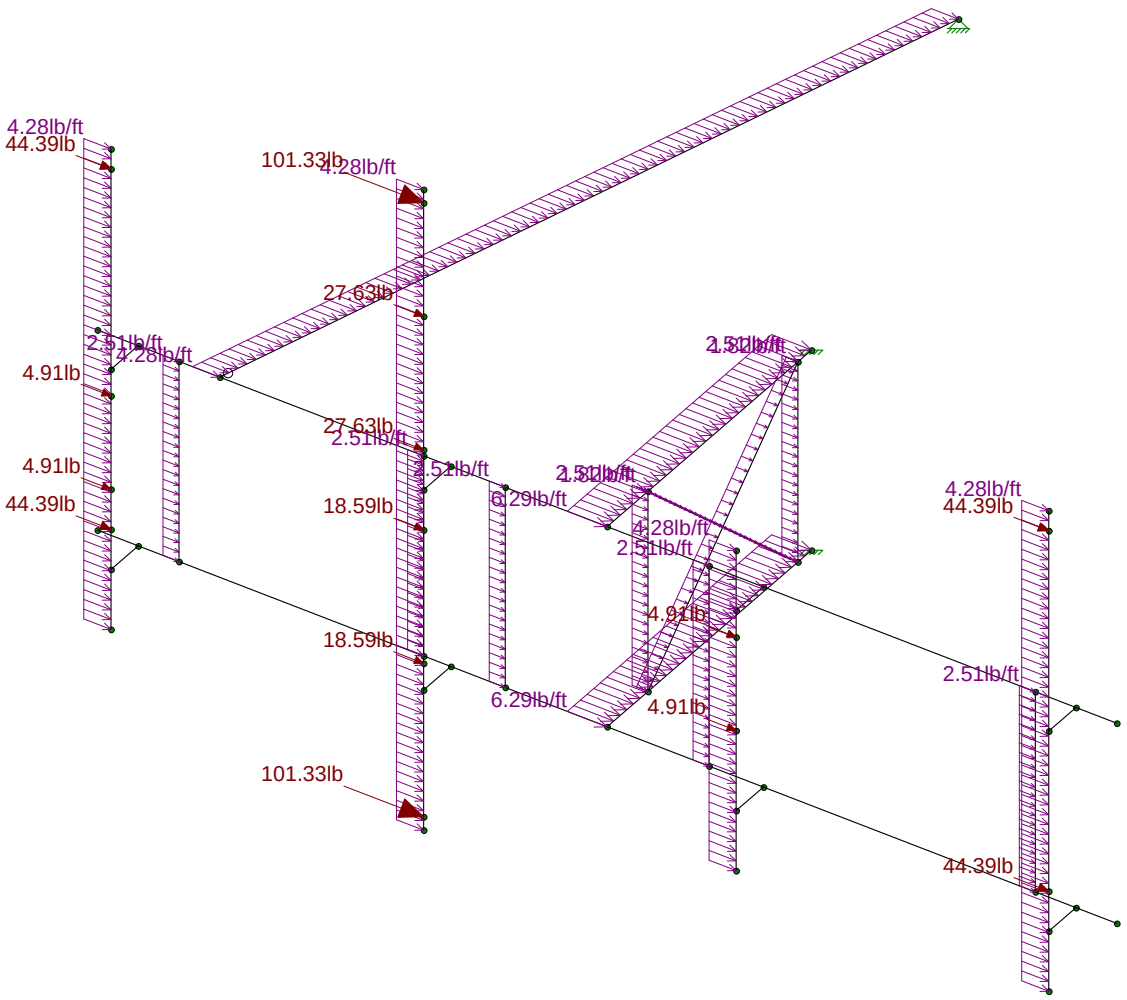
CTL01154		CTL010154 - Mount Analysis.r3d



Loads: BLC 3, WL(0)
Envelope Only Solution

Fullerton Engineering Consultants, ...	T-Frame	SK - 7
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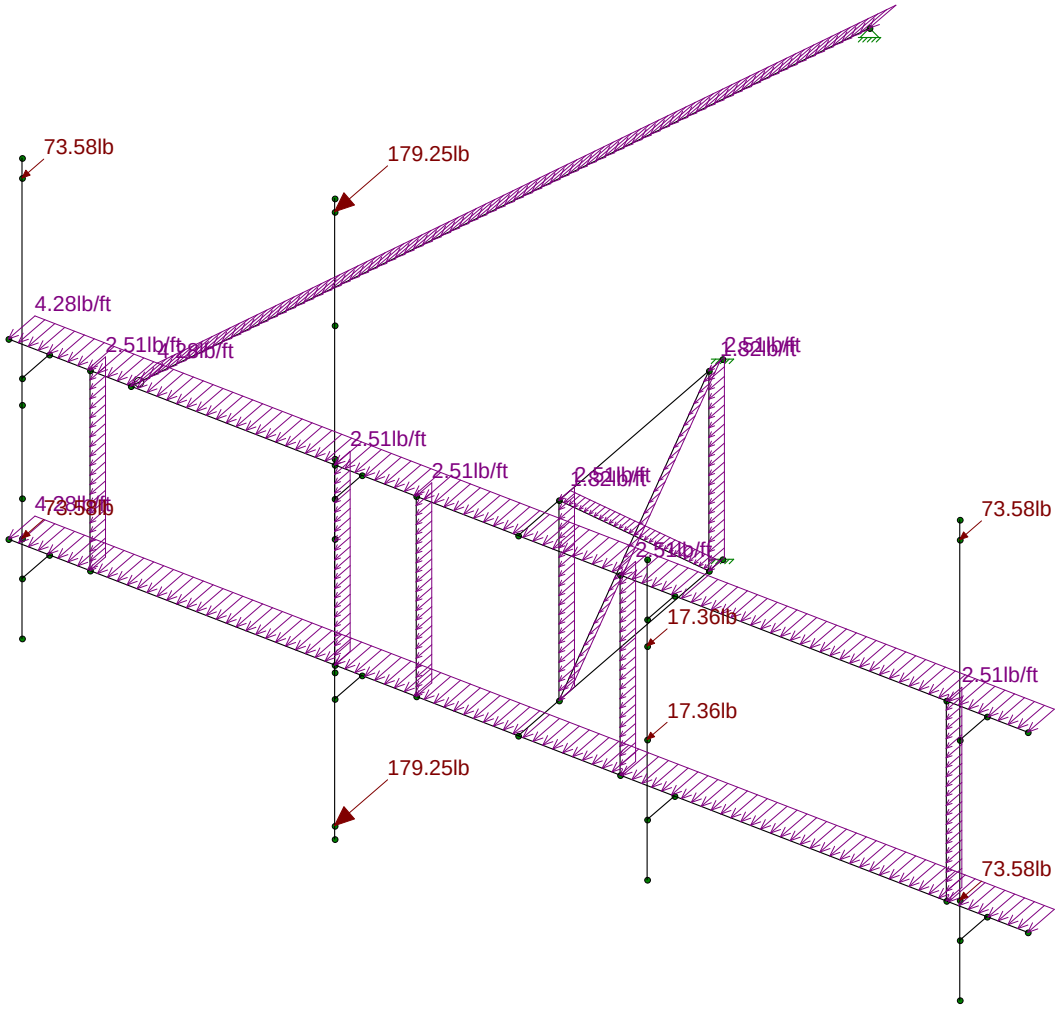

Loads: BLC 4, WL(90)
Envelope Only Solution

Fullerton Engineering Consultants, ...	T-Frame	SK - 8
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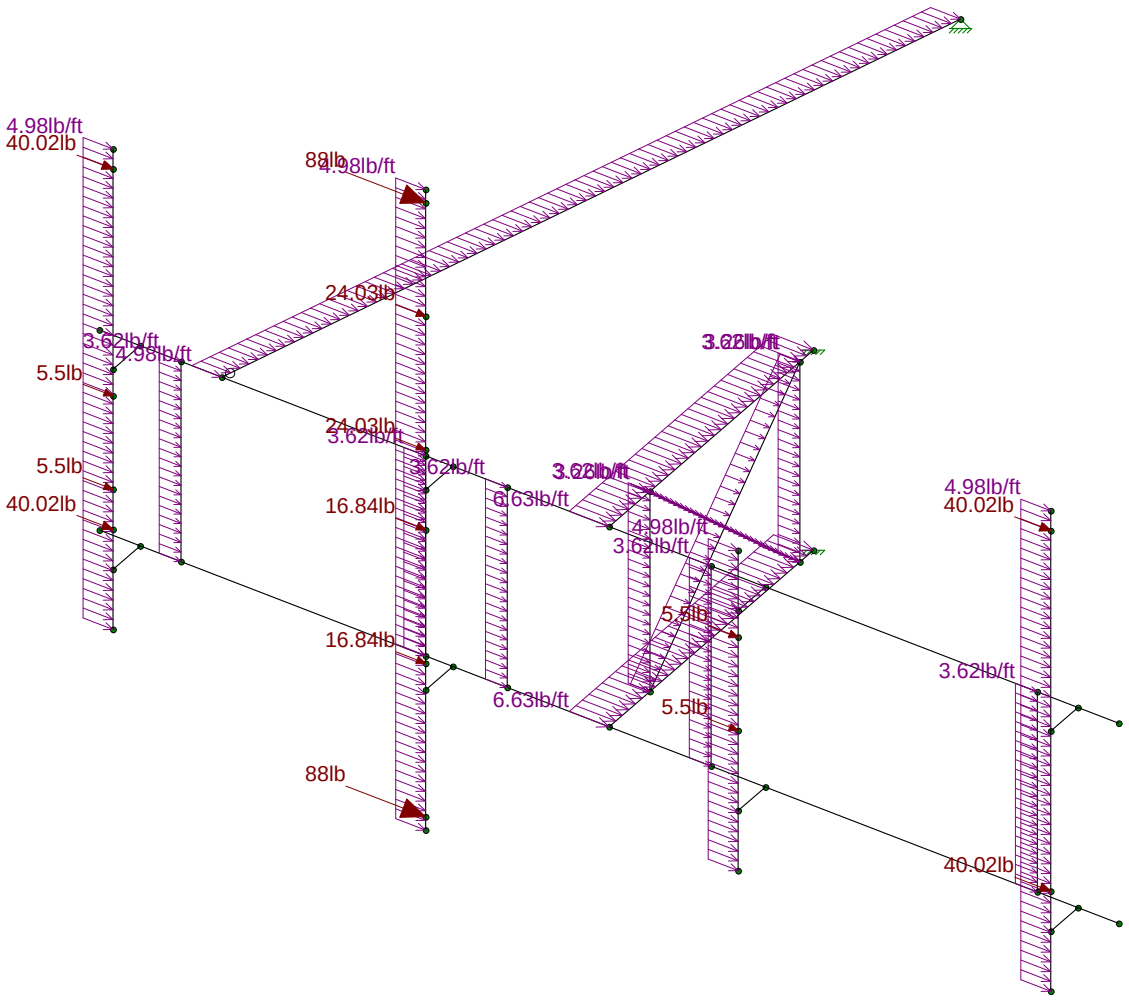

Loads: BLC 5, WL.i(0)
Envelope Only Solution

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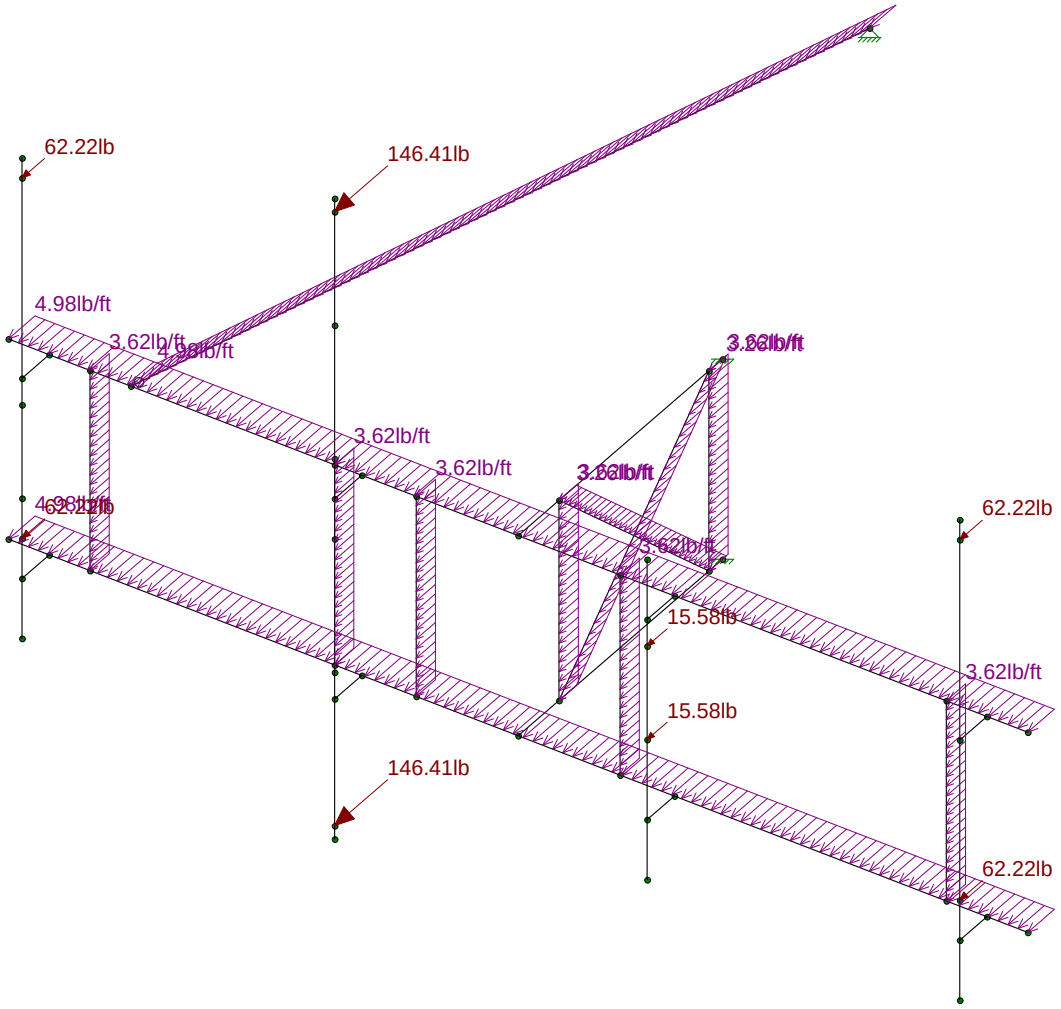

Loads: BLC 6, WL.i(90)
Envelope Only Solution

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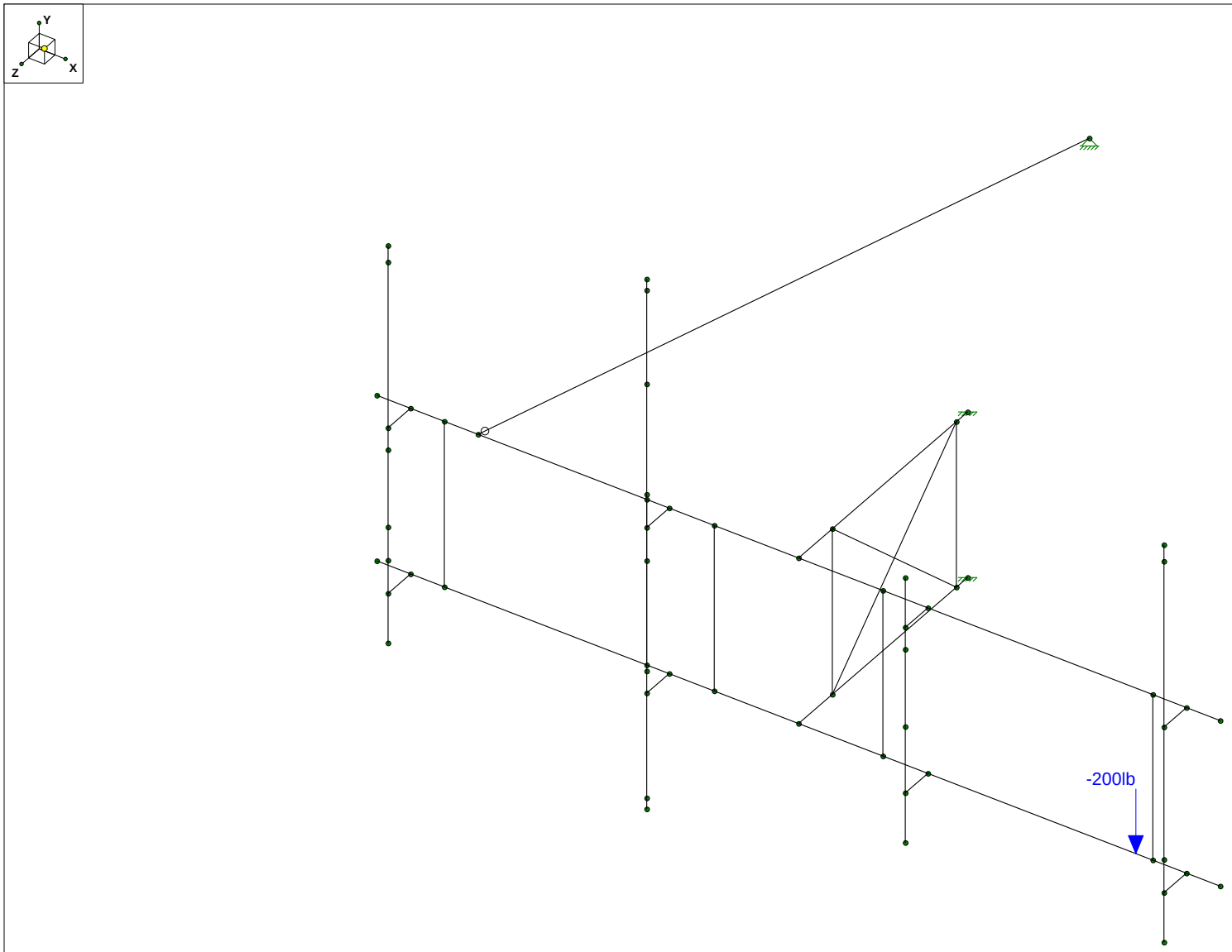


Loads: BLC 7, LL
Envelope Only Solution

Fullerton Engineering Consultants, ...	T-Frame	SK - 11
THC		June 21, 2016 at 9:52 AM
CTL01154		CTL010154 - Mount Analysis.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 13th(360-05): ASD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 13th(360-05): ASD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Om Z	1
Om X	1
Rho Z	1
Rho X	1

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M1	PIPE_2.0	150	50	50	50	50					Lateral
2	M2	PIPE_2.0	150	50	50	50	50					Lateral
3	M3	PIPE_1.0	30			Lbyy						Lateral
4	M4	PIPE_1.0	30			Lbyy						Lateral
5	M5	PIPE_1.0	30			Lbyy						Lateral
6	M6	PIPE_1.0	30			Lbyy						Lateral
7	M7	PIPE_3.0	45			Lbyy						Lateral
8	M8	PIPE_3.0	45			Lbyy						Lateral
9	M9	PIPE_1.0	30			Lbyy						Lateral
10	M10	PIPE_1.0	30			Lbyy						Lateral
11	M11	Rod 0.6875	44.598			Lbyy						Lateral
12	M12	PIPE_2.0	72			Lbyy						Lateral
13	M13	PIPE_2.0	96			Lbyy						Lateral
14	M14	PIPE_2.0	48			Lbyy						Lateral
15	M15	PIPE_2.0	72			Lbyy						Lateral
16	M24	PIPE_2.0	118.008			Lbyy						Lateral
17	M25	Rod 0.6875	44.598			Lbyy						Lateral
18	M26	PIPE_1.0	30			Lbyy						Lateral

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(...
1	DL	None		-1		14				
2	DLi	None				14		18		
3	WL(0)	None				14		16		
4	WL(90)	None				8		12		
5	WL.i(0)	None				14		16		
6	WL.i(90)	None				8		12		
7	LL	None					1			

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2*DL+1.6*WL(0)		Y		1	1.2	3	1.6																
2	1.2*DL+1.6*WL(90)		Y		1	1.2	4	1.6																
3	1.2*DL+1.6*WL(270)		Y		1	1.2	5	1.6																
4	1.2*DL+1.0*DLi+1.0*WL.i(0)+1.0*T		Y		1	1.2	2	1	6	1	9	1												
5	1.2*DL+1.0*DLi+1.0*WL.i(90)+1....		Y		1	1.2	2	1	7	1	9	1												
6	1.2*DL+1.0*DLi+1.0*WL.i(270)+1...		Y		1	1.2	2	1	8	1	9	1												
7	0.9*DL+1.6*WL(0)		Y		1	.9	3	1.6																
8	0.9*DL+1.6*WL(90)		Y		1	.9	4	1.6																
9	0.9*DL+1.6*WL(270)		Y		1	.9	5	1.6																
10	1.2*DL+1.5*LL		Y		1	1.2	9	1.5																
11			Y																					
12			Y																					
13	DL+WL(0)	Yes	Y		1	1	3	1																
14	DL+WL(0-)	Yes	Y		1	1	3	-1																
15	DL + WL(90)	Yes	Y		1	1	4	1																
16	DL + WL(90-)	Yes	Y		1	1	4	-1																
17	DL + DLi + 0.75*WLi(0)	Yes	Y		1	1	2	1	5	.75														
18	DL + DLi + 0.75*WLi(0-)	Yes	Y		1	1	2	1	5	-.75														
19	DL + DLi + 0.75*WLi(90)	Yes	Y		1	1	2	1	6	.75														
20	DL + DLi + 0.75*WLi(90-)	Yes	Y		1	1	2	1	6	-.75														
21	DL+LL	Yes	Y		1	1	7	1																

Envelope Joint Reactions

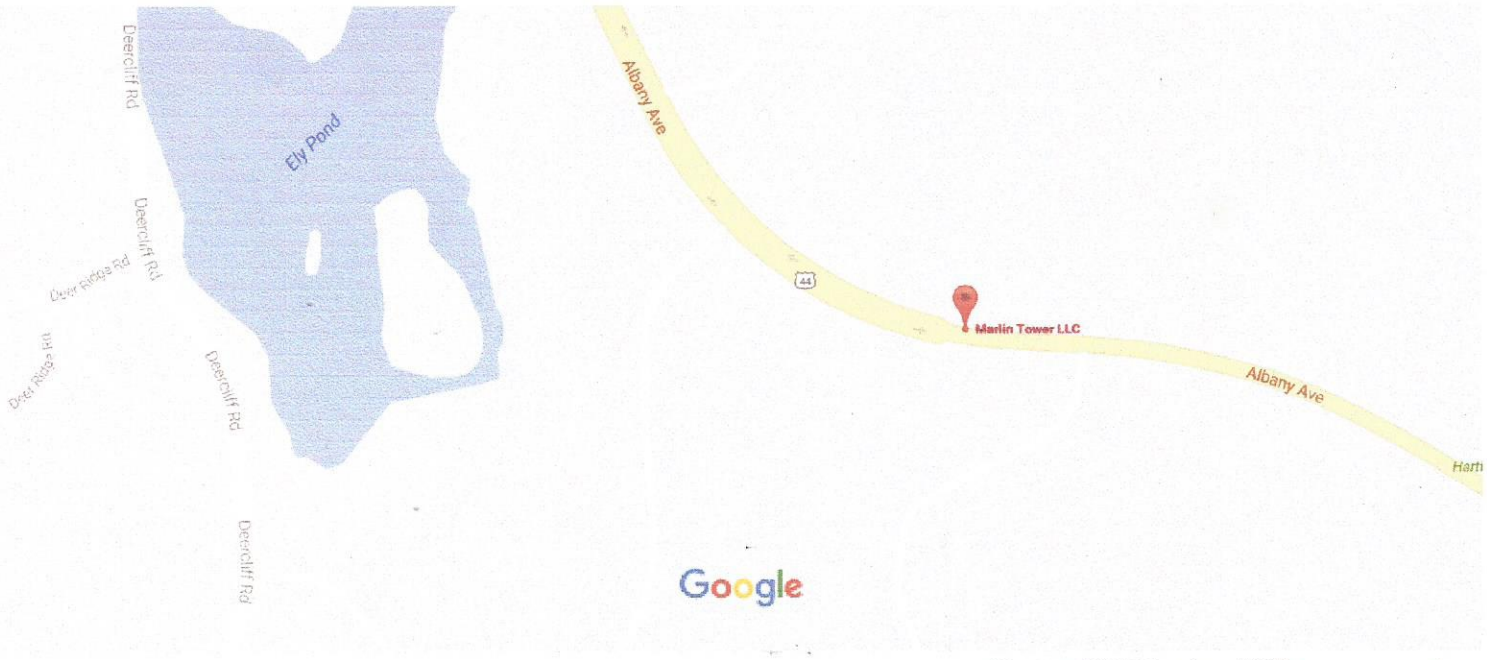
	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N20	max	651.719	14	858.59	19	-310.068	16	-.15	15	1.874	14	.115	21
2		min	-454.74	13	511.677	16	-1632.38	19	-.284	20	-1.368	13	-.36	18
3	N19	max	106.378	14	97.84	20	1390.381	20	-.044	15	.514	14	.114	21
4		min	-316.913	17	37.041	15	723.106	15	-.09	20	-.997	13	-.366	18
5	N46	max	84.485	15	26.436	19	303.248	16	0	13	0	13	0	13
6		min	-82.167	16	16.334	16	-310.254	15	0	13	0	13	0	13
7	Totals:	max	741.737	14	958.118	17	894.008	16						
8		min	-741.737	13	602.547	14	-894.007	15						

Envelope AISC 13th(360-05): ASD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[...	Dir	LC	Pnc/o...	Pnt/om...	Mnyy/o...	Mnzz/o...	Cb	Eqn
1	M13	PIPE_2.0	.566	45	15	.055	45		18	9986.4...	21988....	1.281	1.281	1...	H1-1b
2	M2	PIPE_2.0	.564	75	16	.142	59.3...		16	17750....	21988....	1.281	1.281	1	H1-1b
3	M7	PIPE_3.0	.489	45	14	.179	45		18	41298....	44622....	3.934	3.934	2...	H1-1b
4	M1	PIPE_2.0	.405	75	15	.106	75		20	17750....	21988....	1.281	1.281	1	H1-1b
5	M8	PIPE_3.0	.264	45	13	.130	8.906		18	41298....	44622....	3.934	3.934	1...	H1-1b
6	M14	PIPE_2.0	.215	39	21	.071	13		15	18050....	21988....	1.281	1.281	1...	H1-1b
7	M4	PIPE_1.0	.207	30	17	.031	0		21	7735.4...	10110....	.318	.318	2...	H1-1b
8	M26	PIPE_1.0	.197	0	19	.030	0		18	7735.4...	10110....	.318	.318	2...	H1-1b
9	M6	PIPE_1.0	.170	0	21	.037	0		16	7735.4...	10110....	.318	.318	2...	H1-1b
10	M12	PIPE_2.0	.166	33	16	.041	33		16	14105....	21988....	1.281	1.281	2...	H1-1b
11	M9	PIPE_1.0	.161	30	18	.081	30		18	7735.4...	10110....	.318	.318	2...	H1-1b
12	M15	PIPE_2.0	.158	33	16	.058	33		16	14105....	21988....	1.281	1.281	2...	H1-1b
13	M11	Rod 0.6875	.154	44.598	20	.018	0		14	828.718	8002.42	.092	.092	3	H1-1b
14	M3	PIPE_1.0	.144	0	18	.020	0		15	7735.4...	10110....	.318	.318	2...	H1-1b
15	M5	PIPE_1.0	.137	30	18	.042	0		19	7735.4...	10110....	.318	.318	2...	H1-1b
16	M24	PIPE_2.0	.067	59.004	18	.005	118....		17	6767.4...	21988....	1.281	1.281	1...	H1-1b
17	M10	PIPE_1.0	.030	0	18	.016	0		18	7735.4...	10110....	.318	.318	2...	H1-1b
18	M25	Rod 0.6875	.000	0	13	.000	0		13	828.718	8002.42	.092	.092	1	H1-1a

< 1.0 => Members are adequate

Google Maps Marlin Tower LLC



Marlin Tower LLC

Professional Services

3114 Albany Ave, West Hartford, CT 06117

(860) 236-5240

Add missing information

SITESAFE
RF COMPLIANCE EXPERTS
A BUSINESS OF FDH VELOCITEL

200 North Glebe Road, Suite 1000, Arlington, VA 22203-3728
703.276.1100 ● 703.276.1169 fax
info@sitesafe.com ● www.sitesafe.com

Smartlink LLC on behalf of AT&T Mobility, LLC
Site FA – 10041811
Site ID – CTV1154 (2C)
USID – 88240
Site Name – West Hartford
Site Compliance Report

3114 Albany Avenue
West Hartford, CT 06117

Latitude: N41-47-48.49
Longitude: W72-47-48.60
Structure Type: Monopole

Report generated date: September 12, 2016
Report by: Sam Cosgrove
Customer Contact: Kristen Smith

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

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Table of Contents

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1 General Site Summary

1.1 Report Summary

AT&T Mobility, LLC	Summary
Access to Antennas Locked?	Yes
RF Sign(s) @ access point(s)	None
RF Sign(s) @ antennas	None
Barrier(s) @ sectors	None
Max cumulative simulated RFE level on the Ground Level	<1% General Public Limit
FCC & AT&T Compliant?	Will Be Compliant

The following documents were provided by the client and were utilized to create this report:

RFDS: NEW-ENGLAND_CONNECTICUT_CTV1154_2017-LTE-Next-Carrier_LTE-2C_om636a_PTN_10041811_88240_03-16-2016_Preliminary-Approved_v2.00

CD's: 10041811_AE201_160816_CTL01154_REV1

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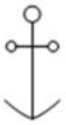
2 Scale Maps of Site

The following diagrams are included:

- Site Scale Map
- RF Exposure Diagram
- AT&T Mobility, LLC Contribution
- Detail View
- Elevation View

Scale Map Key		
 Existing Sign	Proposed Barrier	GPS Reading
 PROPOSED Proposed Sign	Existing Barrier	 Anchor Point

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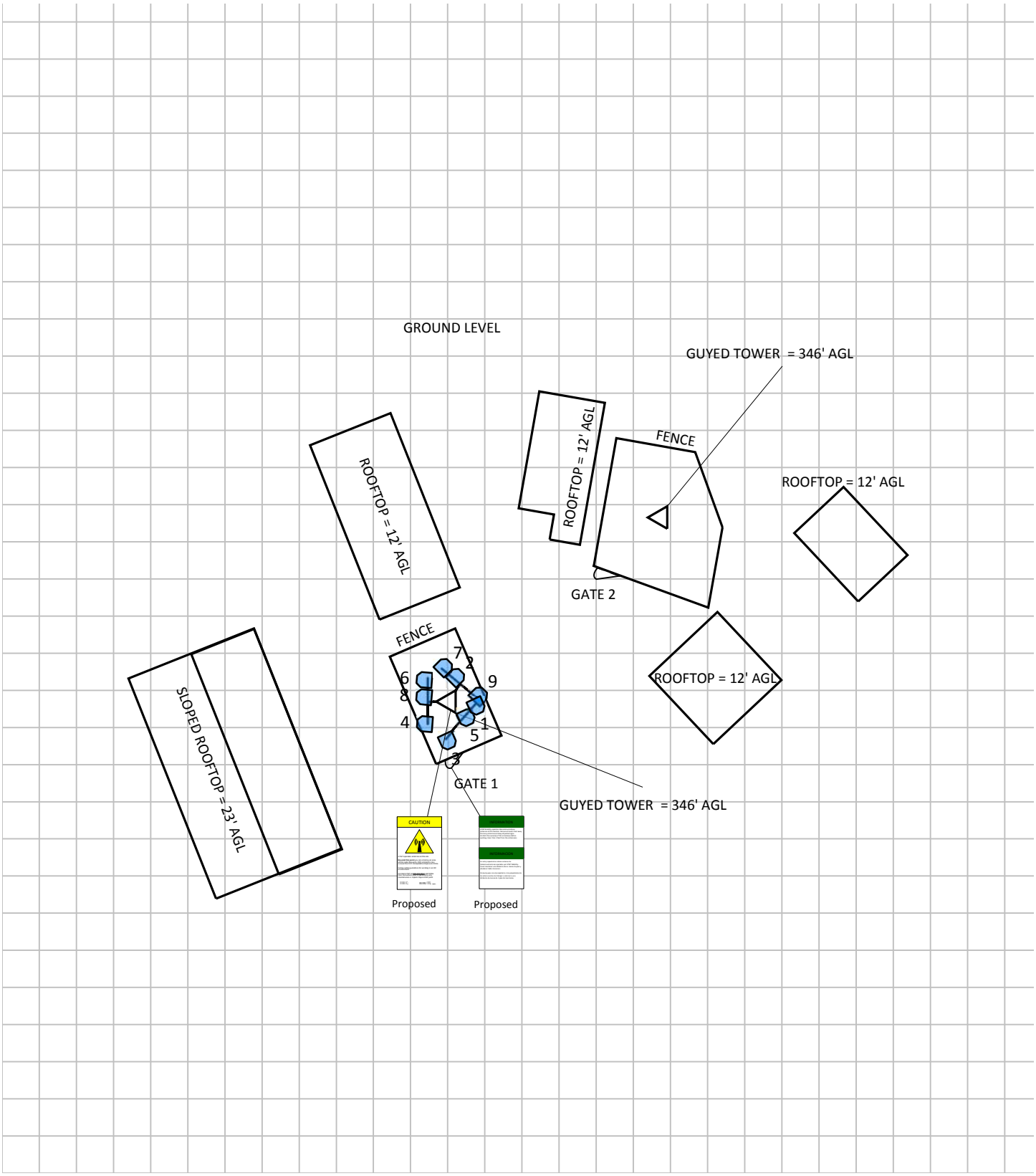
Site Scale Map For: West Hartford



(Feet)

0 11.6 23.2

www.sitesafe.com
Site Name:West Hartford
9/12/2016 10:48:21 AM

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

3 Antenna Inventory

The following antenna inventory on this and the following page, were obtained by the customer and were utilized to create the site model diagrams:

Ant ID	Operator	Antenna Make & Model	Type	TX Freq (MHz)	Az (Deg)	Hor BW (Deg)	Ant Len (ft)	Ant Gain (dBd)	2G GSM Radio(s)	3G UMTS Radio(s)	4G Radio(s)	Total ERP (Watts)	X	Y	Z (AGL)
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	155	87.6	4.5	11.35	0	1	0	264.2	98.5'	149.1'	112.7'
1	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	155	85.7	4.5	14.32	0	1	0	407.4	98.5'	149.1'	112.7'
2	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	737	45	64.9	7.7	13.26	0	0	1	1044.7	95.1'	154'	111.2'
2	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	45	63.1	7.7	14.76	0	0	1	3380.6	95.1'	154'	111.2'
3	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	155	87.6	4.5	11.35	1	0	0	50.4	93.7'	143.3'	112.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	275	87.6	4.5	11.35	0	1	0	264.2	89.8'	146.1'	112.7'
4	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	275	85.7	4.5	14.32	0	1	0	407.4	89.8'	146.1'	112.7'
5	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H6	Panel	737	155	66.2	6	11.68	0	0	1	827.9	96.8'	147.2'	112'
5	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H6	Panel	1900	155	61.1	6	14.53	0	0	1	3258.4	96.8'	147.2'	112'
6	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	275	87.6	4.5	11.35	1	0	0	31.8	89.7'	153.5'	112.7'
7	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	45	87.6	4.5	11.35	0	1	0	264.2	93.1'	155.7'	112.7'
7	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	1900	45	85.7	4.5	14.32	0	1	0	407.4	93.1'	155.7'	112.7'
8	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	737	275	64.9	7.7	13.26	0	0	1	1044.7	89.7'	150.7'	111.2'
8	AT&T MOBILITY LLC (PROPOSED)	CCI Antennas HPA-65R-BUU-H8	Panel	1900	275	63.1	7.7	14.76	0	0	1	3380.6	89.7'	150.7'	111.2'
9	AT&T MOBILITY LLC	Kathrein-Scala 800-10121	Panel	850	45	87.6	4.5	11.35	1	0	0	31.8	98.9'	150.9'	112.7'

NOTE: X, Y and Z indicate relative position of the bottom of the antenna to the origin location on the site, displayed in the model results diagram. Specifically, the Z reference indicates the bottom of the antenna height above the main site level unless otherwise indicated. The distance to the bottom of the antenna is calculated by subtracting half of the length of the antenna from the antenna centerline. Effective Radiated Power (ERP) is provided by the operator or based on Sitesafe experience. The values used in the modeling may be greater than are currently deployed. For other operators at this site the use of "Generic" as an antenna model or "Unknown" for a wireless operator means the information with regard to operator, their FCC license and/or antenna information was not available nor could it be secured while on site. Other operator's equipment, antenna models and powers used for modeling are based on obtained information or Sitesafe experience.

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4 Emission Predictions

In the RF Exposure Simulations below all heights are reflected with respect to main site level. In most rooftop cases this is the height of the main rooftop and in other cases this can be ground level. Each different height area, rooftop, or platform level is labeled with its height relative to the main site level. Emissions are calculated appropriately based on the relative height and location of that area to all antennas.

The Antenna Inventory heights are referenced to the same level.

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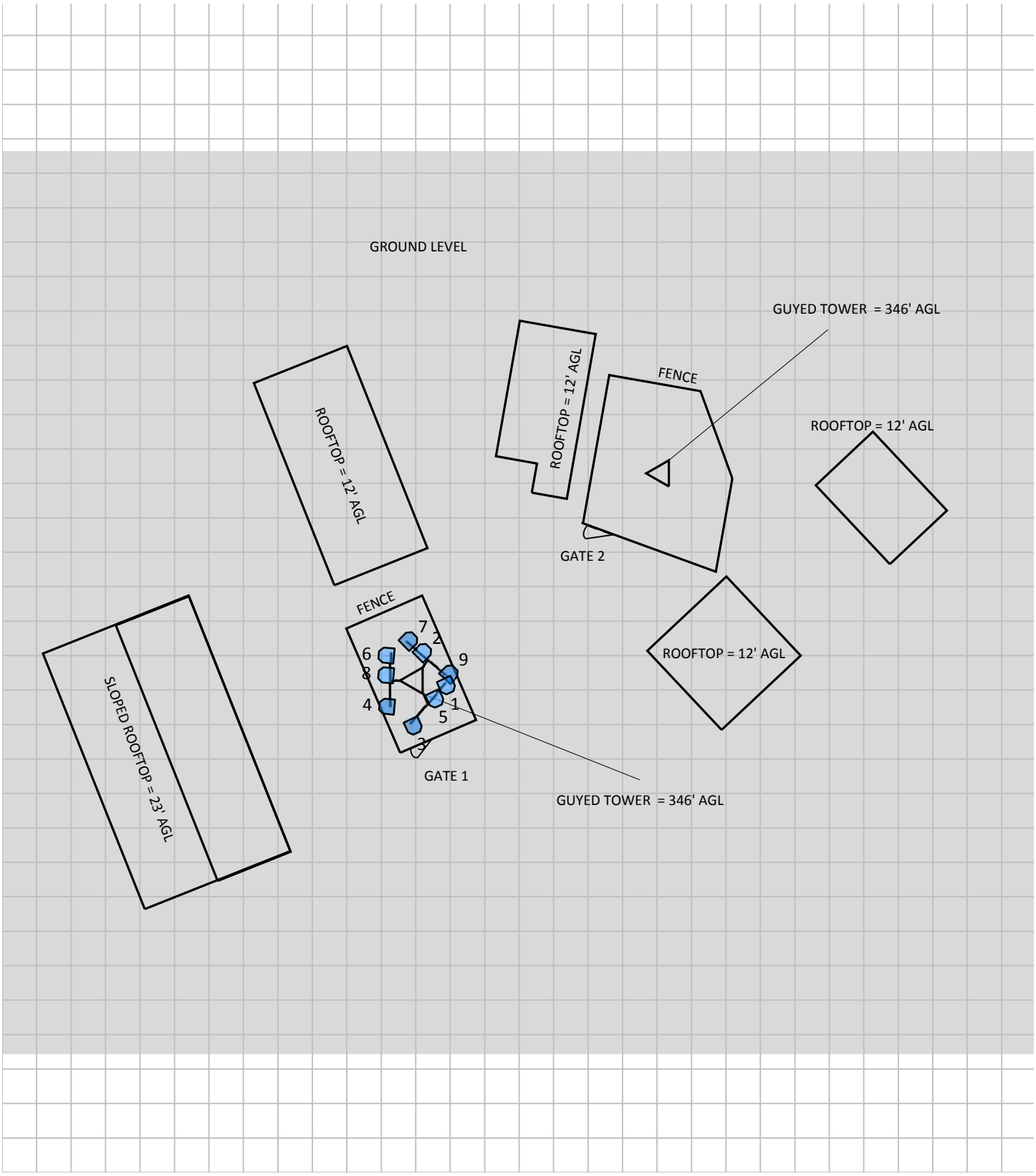
RF Exposure Simulation For: West Hartford



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)
0 10 20

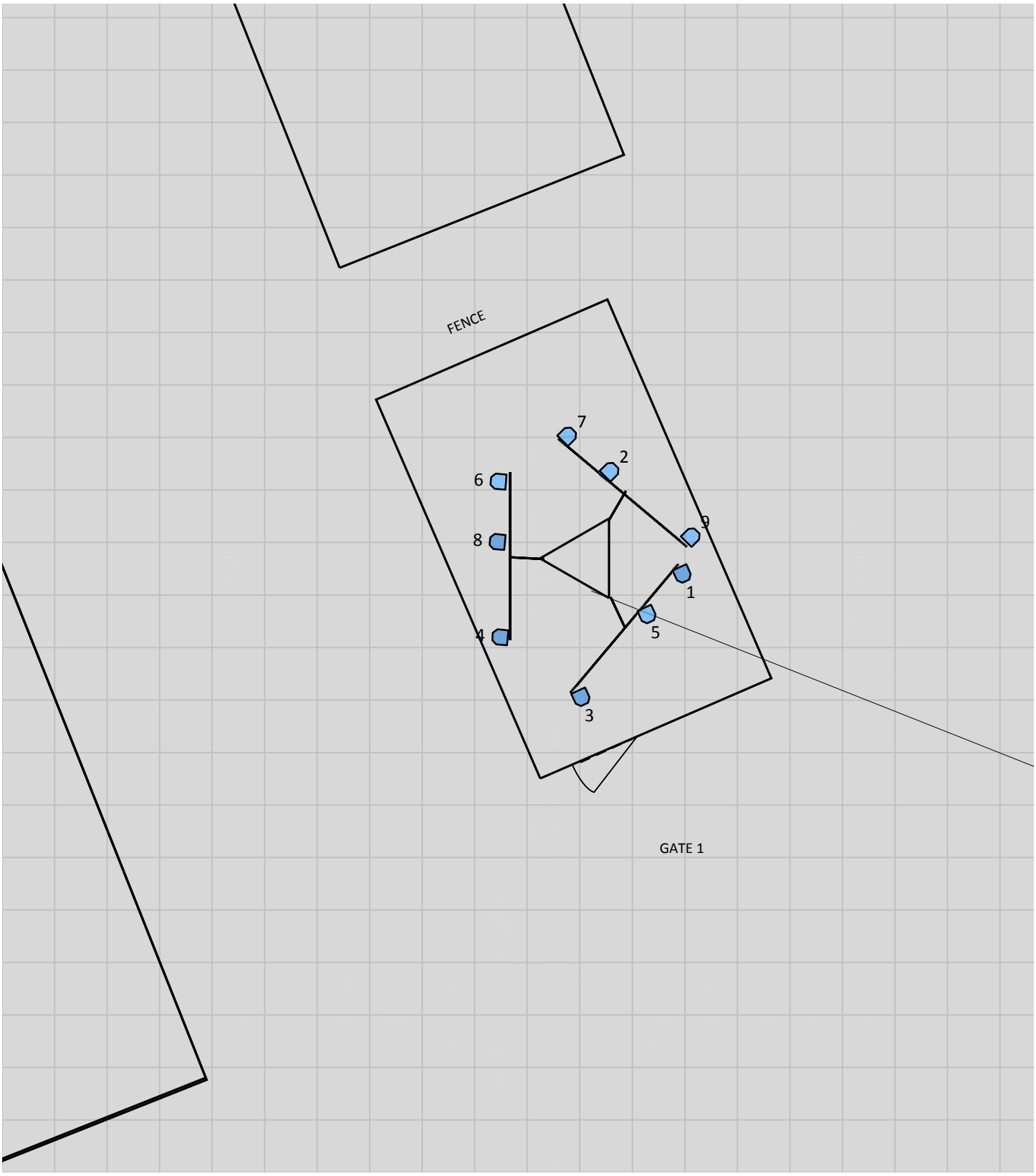
>= 5000 >= 500 >= 100 >= 5 < 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

www.sitesafe.com
Site Name:West Hartford
9/12/2016 10:42:43 AM

SitesafeTC Version:1.0.0.0 - 0.0.0.249
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: West Hartford
Detail View



% of FCC Public Exposure Limit
Spatial average 0' - 6'

(Feet)

0 3.3 6.5

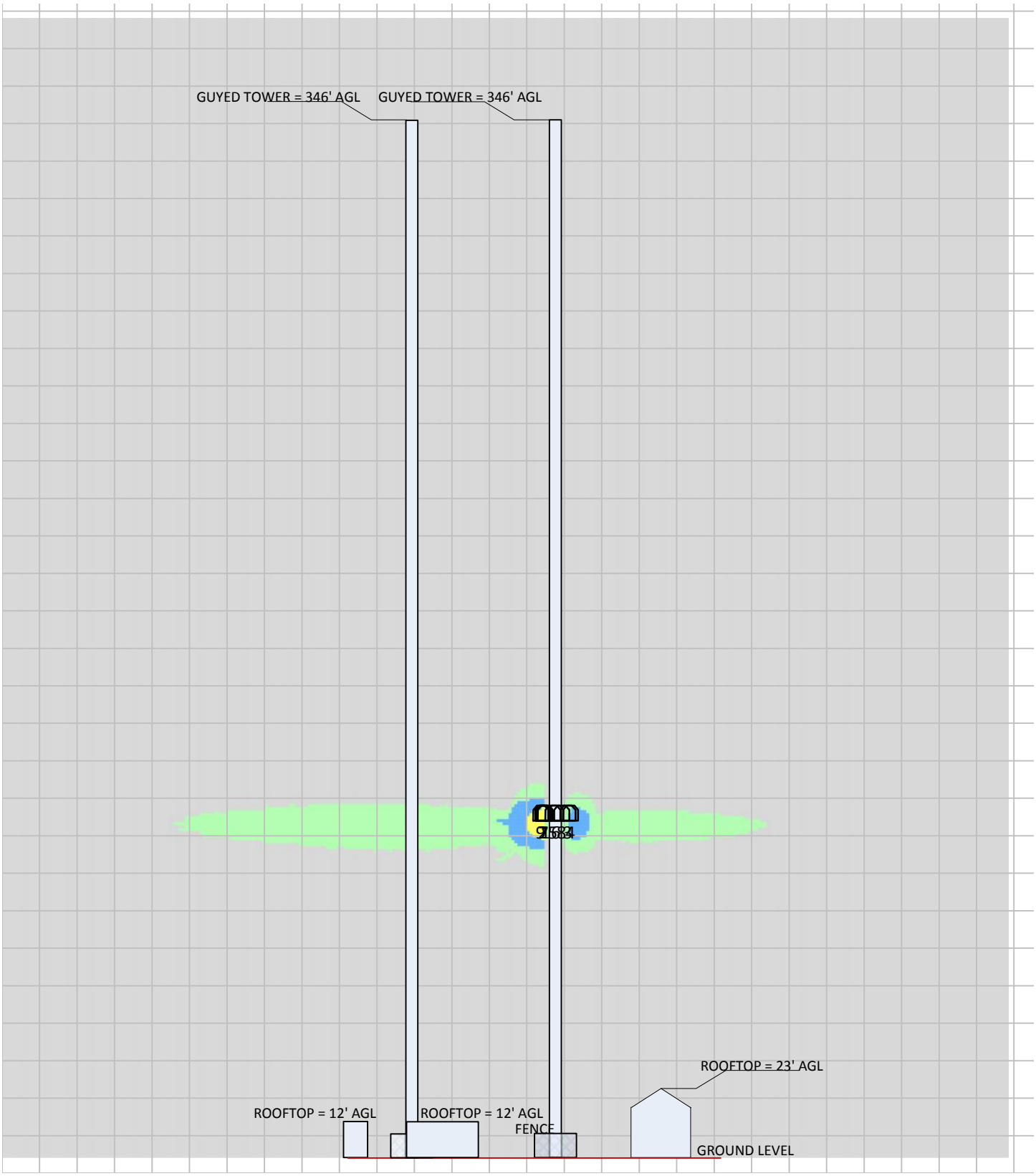
www.sitesafe.com
Site Name:West Hartford
9/12/2016 10:43:04 AM

>= 5000	>= 500	>= 100	>= 5	< 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.249
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

RF Exposure Simulation For: West Hartford
Elevation View



(Feet)

0 22.9 45.9

www.sitesafe.com
Site Name:West Hartford
9/12/2016 10:47:39 AM

>= 5000	>= 500	>= 100	>= 5	< 5

AT&T MOBILITY LLC	VERIZON WIRELESS	T-MOBILE	METROPCS	CRICKET COMMUNICATIONS	CLEARWIRE	SPRINT

SitesafeTC Version:1.0.0.0 - 0.0.0.249
Sitesafe OET-65 Model
Near Field Boundary: 1.5 * Aperture
Reflection Factor: 1
Spatially Averaged

5 Site Compliance

5.1 Site Compliance Statement

Upon evaluation of the cumulative RF emission levels from all operators at this site, RF hazard signage and antenna locations, Sitesafe has determined that:

AT&T Mobility, LLC will be compliant when the remediation recommended in Section 5.2 or other appropriate remediation is implemented.

The compliance determination is based on General Public RFE levels derived from theoretical modeling, RF signage placement, proposed antenna inventory and the level of restricted access to the antennas at the site. Any deviation from the AT&T Mobility, LLC's proposed deployment plan could result in the site being rendered non-compliant.

Modeling is used for determining compliance and the percentage of MPE contribution.

5.2 Actions for Site Compliance

Based on FCC regulations, common industry practice, and our understanding of AT&T Mobility, LLC RF Safety Policy requirements, this section provides a statement of recommendations for site compliance. Recommendations have been proposed based on our understanding of existing access restrictions, signage, and an analysis of predicted RFE levels.

AT&T Mobility, LLC will be made compliant if the following changes are implemented:

Site Access Location

Information Sign 1 required at Gate 1.
Yellow Caution 2 sign required at the base of the Guyed Tower.

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6 Engineer Certification

The professional engineer whose seal appears on the cover of this document hereby certifies and affirms that:

I am registered as a Professional Engineer in the jurisdiction indicated in the professional engineering stamp on the cover of this document; and

That I am an employee of Sitesafe, Inc., in Arlington, Virginia, at which place the staff and I provide RF compliance services to clients in the wireless communications industry; and

That I am thoroughly familiar with the Rules and Regulations of the Federal Communications Commission (FCC) as well as the regulations of the Occupational Safety and Health Administration (OSHA), both in general and specifically as they apply to the FCC Guidelines for Human Exposure to Radio-frequency Radiation; and

That I have thoroughly reviewed this Site Compliance Report and believe it to be true and accurate to the best of my knowledge as assembled by and attested to by Sam Cosgrove.

September 12, 2016

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Appendix A – Statement of Limiting Conditions

Sitesafe has provided computer generated model(s) in this Site Compliance Report to show approximate dimensions of the site, and the model is included to assist the reader of the compliance report to visualize the site area, and to provide supporting documentation for Sitesafe's recommendations.

Sitesafe may note in the Site Compliance Report any adverse physical conditions, such as needed repairs, that Sitesafe became aware of during the normal research involved in creating this report. Sitesafe will not be responsible for any such conditions that do exist or for any engineering or testing that might be required to discover whether such conditions exist. Because Sitesafe is not an expert in the field of mechanical engineering or building maintenance, the Site Compliance Report must not be considered a structural or physical engineering report.

Sitesafe obtained information used in this Site Compliance Report from sources that Sitesafe considers reliable and believes them to be true and correct. Sitesafe does not assume any responsibility for the accuracy of such items that were furnished by other parties. When conflicts in information occur between data collected by Sitesafe provided by a second party and data collected by Sitesafe, the data will be used.

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Appendix B – Regulatory Background Information

FCC Rules and Regulations

In 1996, the Federal Communication Commission (FCC) adopted regulations for the evaluating of the effects of RF emissions in 47 CFR § 1.1307 and 1.1310. The guideline from the FCC Office of Engineering and Technology is Bulletin 65 ("OET Bulletin 65"), *Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*, Edition 97-01, published August 1997. Since 1996 the FCC periodically reviews these rules and regulations as per their congressional mandate.

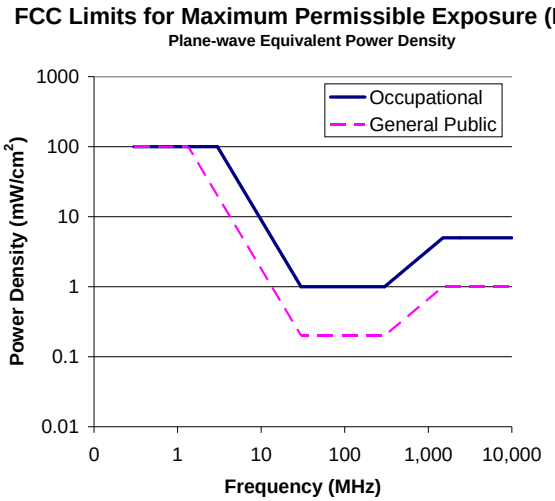
FCC regulations define two separate tiers of exposure limits: Occupational or "Controlled environment" and General Public or "Uncontrolled environment". The General Public limits are generally five times more conservative or restrictive than the Occupational limit. These limits apply to *accessible* areas where workers or the general public may be exposed to Radio Frequency (RF) electromagnetic fields.

Occupational or Controlled limits apply in situations in which persons are exposed as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure.

An area is considered a Controlled environment when access is limited to these aware personnel. Typical criteria are restricted access (i.e. locked or alarmed doors, barriers, etc.) to the areas where antennas are located coupled with proper RF warning signage. A site with Controlled environments is evaluated with Occupational limits.

All other areas are considered Uncontrolled environments. If a site has no access controls or no RF warning signage it is evaluated with General Public limits.

The theoretical modeling of the RF electromagnetic fields has been performed in accordance with OET Bulletin 65. The Maximum Permissible Exposure (MPE) limits utilized in this analysis are outlined in the following diagram:



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Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6

Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

OSHA Statement

The General Duty clause of the OSHA Act (Section 5) outlines the occupational safety and health responsibilities of the employer and employee. The General Duty clause in Section 5 states:

(a) Each employer –

(1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;

(2) shall comply with occupational safety and health standards promulgated under this Act.

(b) Each employee shall comply with occupational safety and health standards and all rules, regulations, and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA has defined Radiofrequency and Microwave Radiation safety standards for workers who may enter hazardous RF areas. Regulation Standards 29 CFR § 1910.147 identify a generic Lock Out Tag Out procedure aimed to control the unexpected energization or start up of machines when maintenance or service is being performed.

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Appendix C – Safety Plan and Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.

Training and Qualification Verification: All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).

Physical Access Control: Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:

- Locked door or gate
- Alarmed door
- Locked ladder access
- Restrictive Barrier at antenna (e.g. Chain link with posted RF Sign)

RF Signage: Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.

Assume all antennas are active: Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.

Maintain a 3 foot clearance from all antennas: There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.

Site RF Emissions Diagram: Section 4 of this report contains an RF Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas at the site. The modeling is a worst case scenario assuming a duty cycle of 100% for each transmitting antenna at full power. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.

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Appendix D – RF Emissions

The RF Emissions Simulation(s) in this report display theoretical spatially averaged percentage of the Maximum Permissible Exposure for all systems at the site unless otherwise noted. These diagrams use modeling as prescribed in OET Bulletin 65 and assumptions detailed in Appendix E.

The key at the bottom of each RF Emissions Simulation indicates percentages displayed referenced to FCC General Public Maximum Permissible Exposure (MPE) limits. Color coding on the diagram is as follows:

- Areas indicated as Gray are predicted to be below 5% of the MPE limits. **Gray represents areas more than 20 times below the most conservative exposure limit**.
- Green represents areas are predicted to be between 5% and 100% of the MPE limits. **Green areas are accessible to anyone**.
- Blue represents areas predicted to exceed the General Public MPE limits but are less than Occupational limits. **Blue areas should be accessible only to RF trained workers**.
- Yellow represents areas predicted to exceed Occupational MPE limits. **Yellow areas should be accessible only to RF trained workers able to assess current exposure levels**.
- Red represents areas predicted to have exposure more than 10 times the Occupational MPE limits. **Red indicates that the RF levels must be reduced prior to access.** An RF Safety Plan is required which outlines how to reduce the RF energy in these areas prior to access.

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Appendix E – Assumptions and Definitions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at **full power at all times**. Software modeling was performed for all transmitting antennas located on the site. Sitesafe has further assumed a 100% duty cycle and maximum radiated power.

The modeling is based on recommendations from the FCC's OET-65 bulletin with the following variances per AT&T guidance. Reflection has not been considered in the modeling, i.e. the reflection factor is 1.0. The near / far field boundary has been set to 1.5 times the aperture height of the antenna and modeling beyond that point is the lesser of the near field cylindrical model and the far field model taking into account the gain of the antenna.

The site has been modeled with these assumptions to show the maximum RF energy density. Areas modeled with exposure greater than 100% of the General Public MPE level may not actually occur, but are shown as a prediction that could be realized. Sitesafe believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor).

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Unknown" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, Sitesafe recommends remodeling of the site utilizing the more complete and accurate data. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, Sitesafe uses the closest frequency in the antenna's range that corresponds to the highest Maximum Permissible Exposure (MPE), resulting in a conservative analysis.

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Definitions

5% Rule – The rules adopted by the FCC specify that, in general, at multiple transmitter sites actions necessary to bring the area into compliance with the guidelines are the shared responsibility of all licensees whose transmitters produce field strengths or power density levels at the area in question in excess of 5% of the exposure limits. In other words, any wireless operator that contributes 5% or greater of the MPE limit in an area that is identified to be greater than 100% of the MPE limit is responsible taking corrective actions to bring the site into compliance.

Compliance – The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.

Decibel (dB) – A unit for measuring power or strength of a signal.

Duty Cycle – The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 100% corresponds to continuous operation.

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna.

Effective Radiated Power (ERP) – In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.

Gain (of an antenna) – The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from an isotropic radiator. Gain is a measure of the relative efficiency of a directional antennas as compared to an omni directional antenna.

General Population/Uncontrolled Environment – Defined by the FCC, as an area where exposure to RF energy may occur to persons who are **unaware** of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.

Generic Antenna – For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, Sitesafe will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.

Isotropic Antenna – An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.

Maximum Measurement – This measurement represents the single largest measurement recorded when performing a spatial average measurement.

Maximum Permissible Exposure (MPE) – The maximum levels of RF exposure a person may be exposed to without harmful effect and with acceptable safety factor.

Occupational/Controlled Environment – Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are **aware** of the

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potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.

OET Bulletin 65 – Technical guideline developed by the FCC's Office of Engineering and Technology to determine the impact of Radio Frequency radiation on Humans. The guideline was published in August 1997.

OSHA (Occupational Safety and Health Administration) – Under the Occupational Safety and Health Act of 1970, employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to promote the safety and health of America's working men and women by setting and enforcing standards; providing training, outreach and education; establishing partnerships; and encouraging continual process improvement in workplace safety and health. For more information, visit www.osha.gov.

Radio Frequency (RF) – The frequencies of electromagnetic waves which are used for radio communications. Approximately 3 kHz to 300 GHz.

Radio Frequency Exposure (RFE) – The amount of RF power density that a person is or might be exposed to.

Spatial Average Measurement – A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average power density an average sized human will be exposed to at a location.

Transmitter Power Output (TPO) – The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.

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Appendix F – References

The following references can be followed for further information about RF Health and Safety.

Sitesafe, Inc.
http://www.sitesafe.com
FCC Radio Frequency Safety
http://www.fcc.gov/encyclopedia/radio-frequency-safety
National Council on Radiation Protection and Measurements (NCRP)
http://www.ncrponline.org
Institute of Electrical and Electronics Engineers, Inc., (IEEE)
http://www.ieee.org
American National Standards Institute (ANSI)
http://www.ansi.org
Environmental Protection Agency (EPA)
http://www.epa.gov/radtown/wireless-tech.html
National Institutes of Health (NIH)
http://www.niehs.nih.gov/health/topics/agents/emf/
Occupational Safety and Health Agency (OSHA)
http://www.osha.gov/SLTC/radiofrequencyradiation/
International Commission on Non-Ionizing Radiation Protection (ICNIRP)
http://www.icnirp.org
World Health Organization (WHO)
http://www.who.int/peh-emf/en/
National Cancer Institute
http://www.cancer.gov/cancertopics/factsheet/Risk/cellphones
American Cancer Society (ACS)
http://www.cancer.org/docroot/PED/content/PED_1_3X_Cellular_Phone_Towers.asp?siteareа=PED
European Commission Scientific Committee on Emerging and Newly Identified Health Risks
http://ec.europa.eu/health/ph_risk/committees/04_scenihr/docs/scenihr_o_022.pdf
Fairfax County, Virginia Public School Survey
http://www.fcps.edu/fts/safety-security/RFEESurvey/
UK Health Protection Agency Advisory Group on Non-ionising Radiation
http://www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317133826368
Norwegian Institute of Public Health
http://www.fhi.no/dokumenter/545eea7147.pdf

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TOWN PLAN AND ZONING COMMISSION

CERTIFIED MAIL

July 11, 2000

John Ramsey
Marlin Broadcasting, Inc.
1039 Asylum Avenue
Hartford, CT 06105

SUBJECT: 3114 Albany Avenue – Radio Tower – Marlin Broadcasting, Inc.

Dear Mr. Ramsey:

At its regular meeting of July 5, 2000 the West Hartford Town Plan and Zoning Commission gave consideration to the following item:

> **3114 Albany Avenue** – Application (SUP #903) of Marlin Broadcasting, Inc. (Paul J. Aparo, Attorney) requesting Special Use Permit approval to authorize a new 360' FM broadcasting tower, construct a new 70' fiber glass AM broadcasting tower and a new 20' x 40' equipment building and demolish the existing equipment building. (Submitted for TPZ receipt on June 5, 2000. Suggest required public hearing be scheduled for Wednesday, July 5, 2000.)
> R-10 ZONE

After a review of the application and its related exhibits and after consideration of staff technical comments on the public hearing record, the TPZ acted by **unanimous vote** (Motion/Wirth; Second/Davidoff) (Meck seated for Kearns; Begley seated for Kappes) to **CONDITIONALLY APPROVE** the subject application. During its discussions and deliberations on this matter, the Commission made the following findings:

The proposed Special Use Permit will comply with the finding requirements of Section 177-42A(5a & 5b) of the West Hartford Code of Ordinances with the following conditions:

1. **At the request of the applicant the new tower is reduced to 347 feet, and the 70 foot FM antenna is withdrawn.**
2. **The applicant shall protect the existing tree screen along Route 44 all the way to the ridge line between the Tower and Route 44. This area shall not be materially altered without first receiving a TPZ approval.**

You should now contact the Planning Staff to discuss the submission requirements for your plans. A ten dollar ($10) filing fee is required to file a notice of approval on the West Hartford Land Records. My staff will happy to assist you in completing these requirements. The TPZ approval is not final until the legal requirements for filing are completed. The effective date of approval is July 28, 2000.

If you have questions, please feel free to call the Planning Staff at 523-3123.

Very truly yours,

Donald R. Foster
Town Planner

C: Ronald Van Winkle, Director of Community
Kevin O'Connor, Corporation Counsel
Norma Cronin, Town Clerk
William Farrell, Town Engineer
Subject TPZ File

3114Albany-Jully00

StartAntennaData It is advisable to provide an ID (ant 1) for all antennas

ID	Name	(MHz) Freq	Trans Power	Trans Count	Coax Len	Coax Type	Other Losses	Input Power
1	AT&T MOB	850	19.36416	1	0			19.36416
1	AT&T MOB	1900	15.06606	1	0			15.06606
2	AT&T MOB	737	49.31738	1	0			49.31738
2	AT&T MOB	1900	112.9796	1	0			112.9796
3	AT&T MOB	850	3.689772	1	0			3.689772
4	AT&T MOB	850	19.36416	1	0			19.36416
4	AT&T MOB	1900	15.06606	1	0			15.06606
5	AT&T MOB	737	56.23413	1	0			56.23413
5	AT&T MOB	1900	114.8154	1	0			114.8154
6	AT&T MOB	850	2.327451	1	0			2.327451
7	AT&T MOB	850	19.36416	1	0			19.36416
7	AT&T MOB	1900	15.06606	1	0			15.06606
8	AT&T MOB	737	49.31738	1	0			49.31738
8	AT&T MOB	1900	112.9796	1	0			112.9796
9	AT&T MOB	850	2.327451	1	0			2.327451

StartSymbolData

Calc Power	Mfg	Model	(ft) X	(ft) Y	(ft) Z	Type	(ft) Aper	dBd Gain
	Kathrein-Sc	800-10121	98.50181	149.1227	112.729	Panel	4.542	11.35
	Kathrein-Sc	800-10121	98.50181	149.1227	112.729	Panel	4.542	14.32
	CCI Antenn	HPA-65R-B	95.06315	154.0431	111.15	Panel	7.7	13.26
	CCI Antenn	HPA-65R-B	95.06315	154.0431	111.15	Panel	7.7	14.76
	Kathrein-Sc	800-10121	93.68151	143.2506	112.729	Panel	4.542	11.35
	Kathrein-Sc	800-10121	89.81334	146.1283	112.729	Panel	4.542	11.35
	Kathrein-Sc	800-10121	89.81334	146.1283	112.729	Panel	4.542	14.32
	CCI Antenn	HPA-65R-B	96.82681	147.1915	112	Panel	6	11.68
	CCI Antenn	HPA-65R-B	96.82681	147.1915	112	Panel	6	14.53
	Kathrein-Sc	800-10121	89.7353	153.5415	112.729	Panel	4.542	11.35
	Kathrein-Sc	800-10121	93.04636	155.733	112.729	Panel	4.542	11.35
	Kathrein-Sc	800-10121	93.04636	155.733	112.729	Panel	4.542	14.32
	CCI Antenn	HPA-65R-B	89.68834	150.6691	111.15	Panel	7.7	13.26
	CCI Antenn	HPA-65R-B	89.68834	150.6691	111.15	Panel	7.7	14.76
	Kathrein-Sc	800-10121	98.9253	150.9315	112.729	Panel	4.542	11.35

BWdth Pt Dir	Uptime Profile	ON flag
87.6;155	100%	ON•
85.7;155	100%	ON•
64.9;45	100%	ON•
63.1;45	100%	ON•
87.6;155	100%	ON•
87.6;275	100%	ON•
85.7;275	100%	ON•
66.2;155	100%	ON•
61.1;155	100%	ON•
87.6;275	100%	ON•
87.6;45	100%	ON•
85.7;45	100%	ON•
64.9;275	100%	ON•
63.1;275	100%	ON•
87.6;45	100%	ON•

PROJECT:	LTE 2C
SITE NUMBER:	CTL01154
FA NUMBER:	10041811
PTN NUMBER:	2051A066KZ
PACE NUMBER:	MRCTB018154
SBA#:	CT15879
SITE NAME:	WEST HARTFORD
SITE ADDRESS:	3114 ALBANY AVENUE WEST HARTFORD, CT 06117

PROJECT INFORMATION

SITE NAME:	WEST HARTFORD
SITE NUMBER:	CTL01154
SITE ADDRESS:	3114 ALBANY AVENUE WEST HARTFORD, CT 06117
FA NUMBER:	10041811
PTN NUMBER:	2051A066KZ
PACE NUMBER:	MRCTB018154
USID NUMBER:	88240
SBA NUMBER:	CT15879
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
TOWER OWNER:	SBA COMMUNICATIONS CORPORATION 8051 CONGRESS AVENUE BOCA RATON, FL 33487
JURISDICTION:	HARTFORD COUNTY
COUNTY:	HARTFORD
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.796803°
LONGITUDE:	-72.796832°
GROUND ELEV.:	681'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	CAMERON SYME
PHONE:	(508) 596-7146
EMAIL:	cs6970@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	RYAN BURGDORFER (508) 665-8005
EMAIL:	Ryan.Burgdorfer@Smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@Smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	MILEN DIMITROV (847) 908-8439
EMAIL:	MDimitrov@fullertonengineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	MARK DONNELLY (617) 515-2080
EMAIL:	mark.donnelly@smartlinkllc.com

SCOPE OF WORK

LTE 1900 WILL BE 2C AT THE SITE WITH BRONZE CONFIGURATION.
PROPOSED 2C PROJECT SCOPE HEREIN BASED ON RFDS ID # 1123242, VERSION 2.00 LAST UPDATED 05/18/16.

- (3) NEW ANTENNAS TO REPLACE (3) EXISTING ANTENNAS
- (3) NEW RRUS-12 W/A2 MODULES
- (3) NEW 25A BREAKERS
- (1) NEW XMU
- (1) NEW LTE DUS
- (1) NEW ARGUS CONVERTER MODULE

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP

DIRECTIONS

SCAN QR CODE FOR LINK
TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE:	2003 INTERNATIONAL BUILDING CODE
ELECTRICAL CODE:	2011 NATIONAL ELECTRIC CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON
ENGINEERING · DESIGN
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001444
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	6/23/16	90% REVIEW	KC
1	08/12/16	FOR PERMIT	VV

I HEREBY CERTIFY THAT THESE DRAWING WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
WEST HARTFORD

SITE NUMBER:
CTL01154

SITE ADDRESS
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

THESE DRAWINGS ARE THE PROPERTY OF FULLERTON ENGINEERING CONSULTANTS, INC. IT IS FOR THE EXCLUSIVE USE OF THIS PROJECT. ANY RE-USE OF THIS DRAWING WITHOUT THE EXPRESSED WRITTEN CONSENT OF FULLERTON ENGINEERING CONSULTANTS, INC. IS PROHIBITED.

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS

2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.

3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.

5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.

6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.

8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.

10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.

11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.

12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.

13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.

14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.

15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.

16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.

17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.

18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.

19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.

20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.

21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.

22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.

23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.

24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.

25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.

26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.

27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.

28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.

29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.

30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.

31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.

32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).

33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.

34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.

35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.

36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.

37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.

38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.

41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.

42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.

43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.

44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.

45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.

46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.

47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.

48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.

49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.

50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.

52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
   A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
   B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.

54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.

55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.

63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.

64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.

65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".

66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.

67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.

68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.

69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.

72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.

73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.

74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.

75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
   A. TEMPERATURE SHALL BE ABOVE 50° F.
   B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
   C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
   D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS

76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
   A. GROUNDING AT THE ANTENNA LEVEL.
   B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
   C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
   D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
   E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.

77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · PROFESSIONAL ENGINEER

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WEST HARTFORD

SITE NUMBER:
CTL01154

SITE ADDRESS
3114 ALBANY AVENUE
WEST HARTFORD, CT 06117

SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP1

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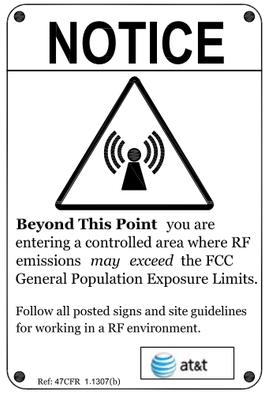
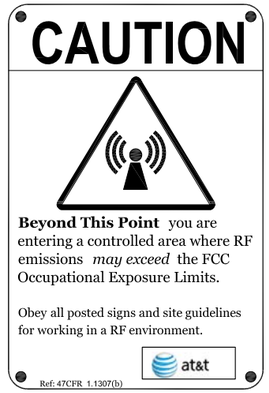
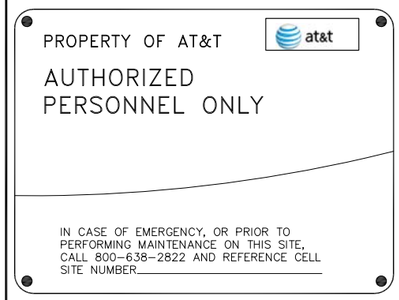




ALERTING SIGNS

ALERTING SIGN



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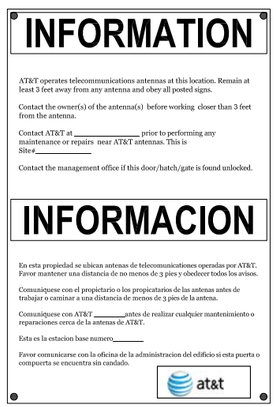

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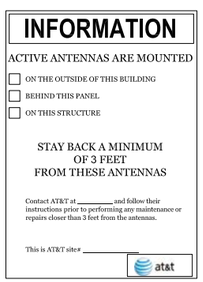

INFO SIGN #2

INFO SIGN #3

ALERTING SIGN (FOR CELL SITE BATTERIES)

ALERTING SIGN (FOR DIESEL FUEL)

ALERTING SIGN (FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

STRUCURE TYPLE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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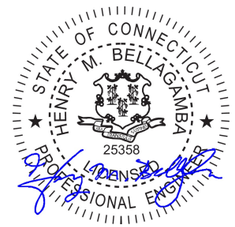

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NOTES AND SPECIFICATIONS

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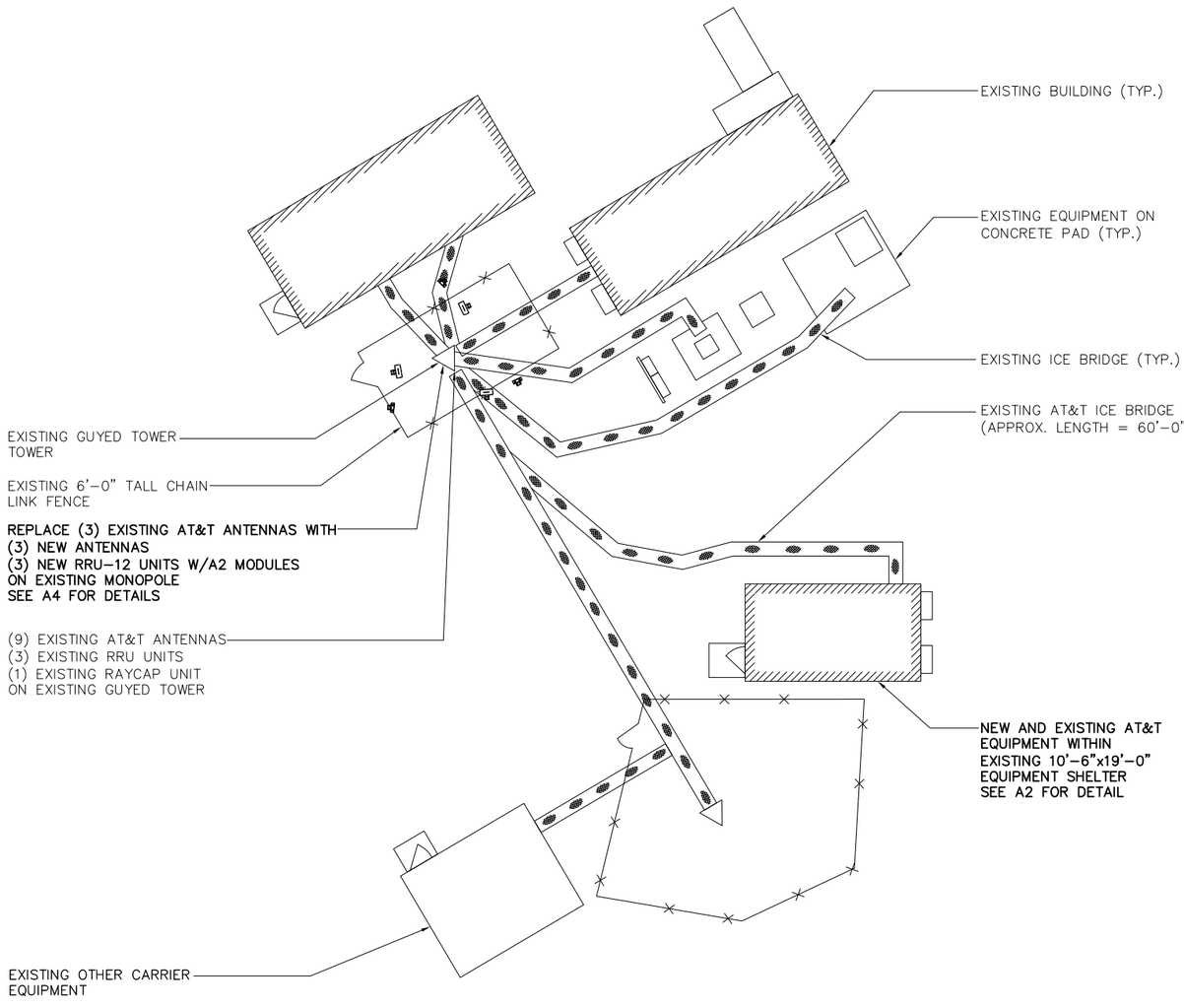
ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE (A / S-1)



COMPOUND PLAN — SCALE: 1/16" = 1'-0" — 1

SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 2 — SCALE: N.T.S. — 3

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SHEET NAME
COMPOUND PLAN

SHEET NUMBER
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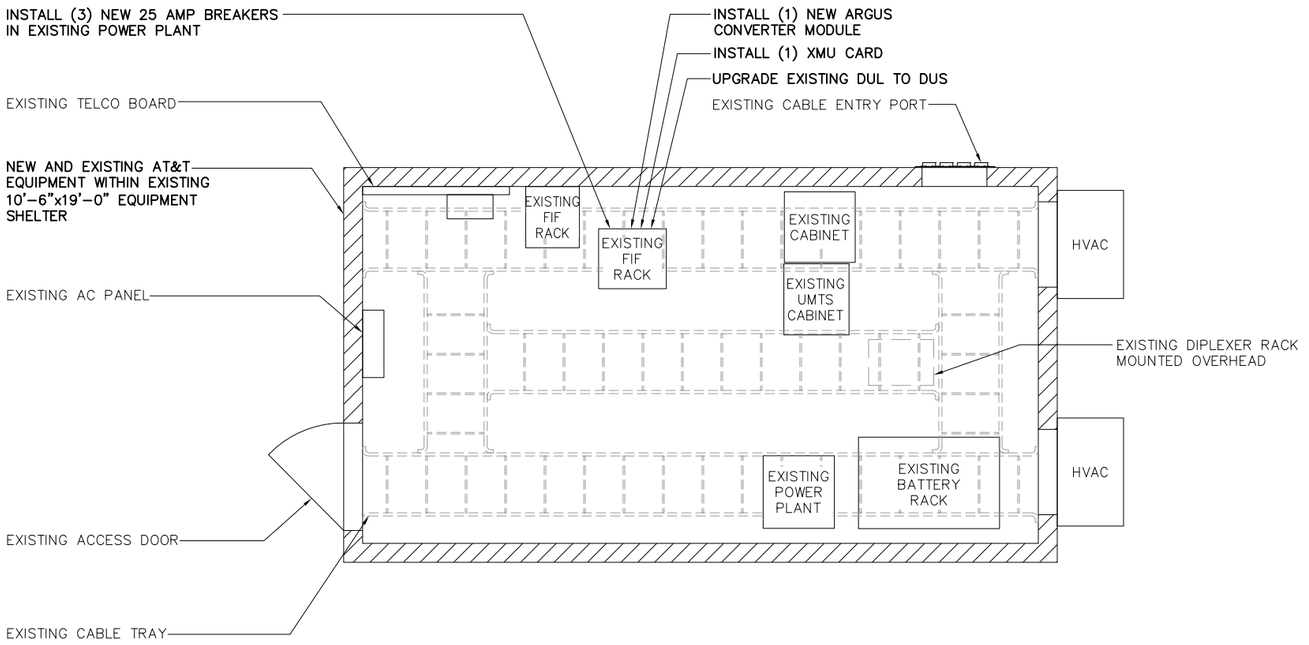

EQUIPMENT PLAN

SCALE: 1/4" = 1'-0"

1

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SHEET NAME

EQUIPMENT PLAN

SHEET NUMBER

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NOTES:

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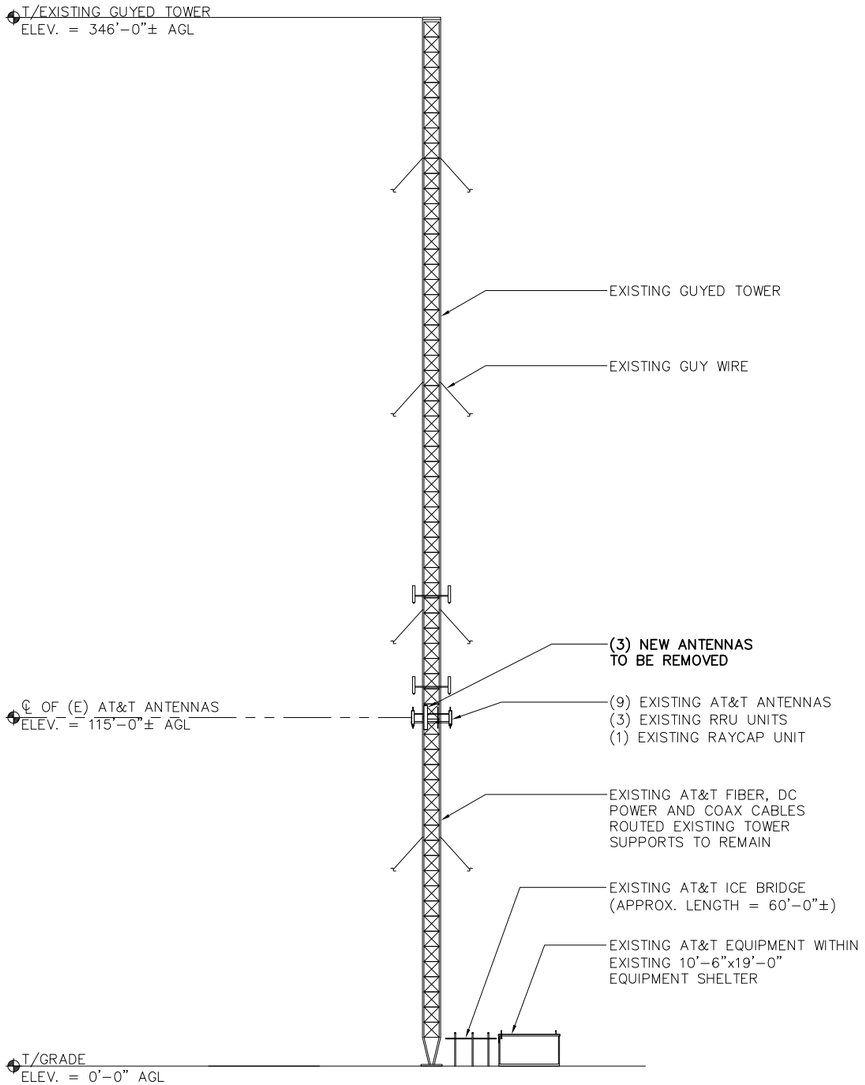
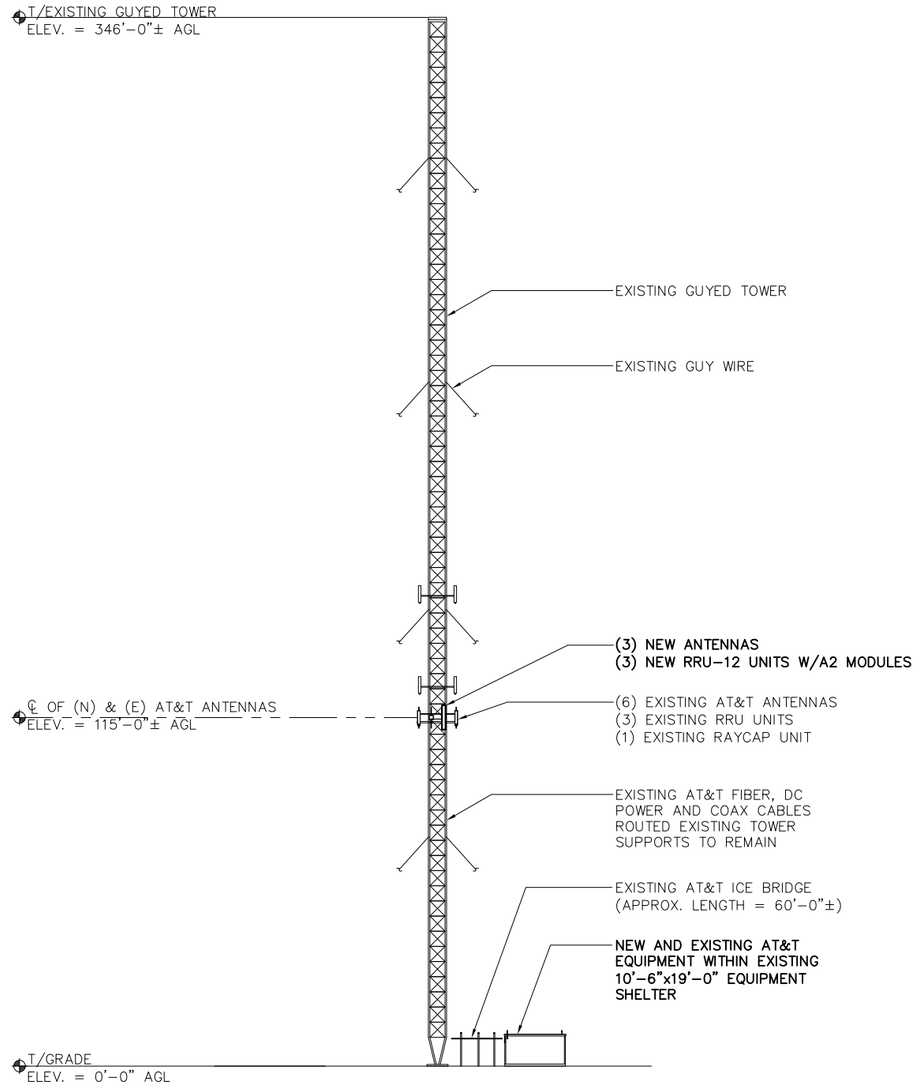
2. CALCULATIONS FOR THE ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
3. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION — SCALE: = 1" = 50'-0" — 1



NEW ELEVATION — SCALE: = 1" = 50'-0" — 2

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SHEET NAME
ELEVATIONS

SHEET NUMBER
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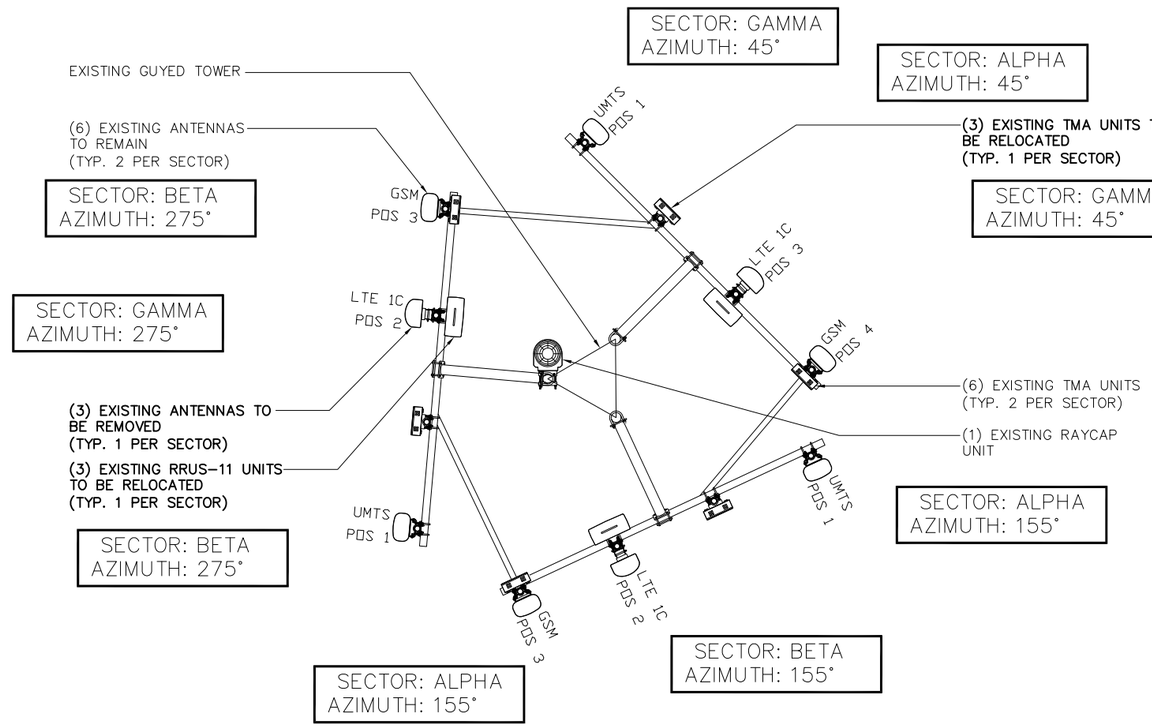
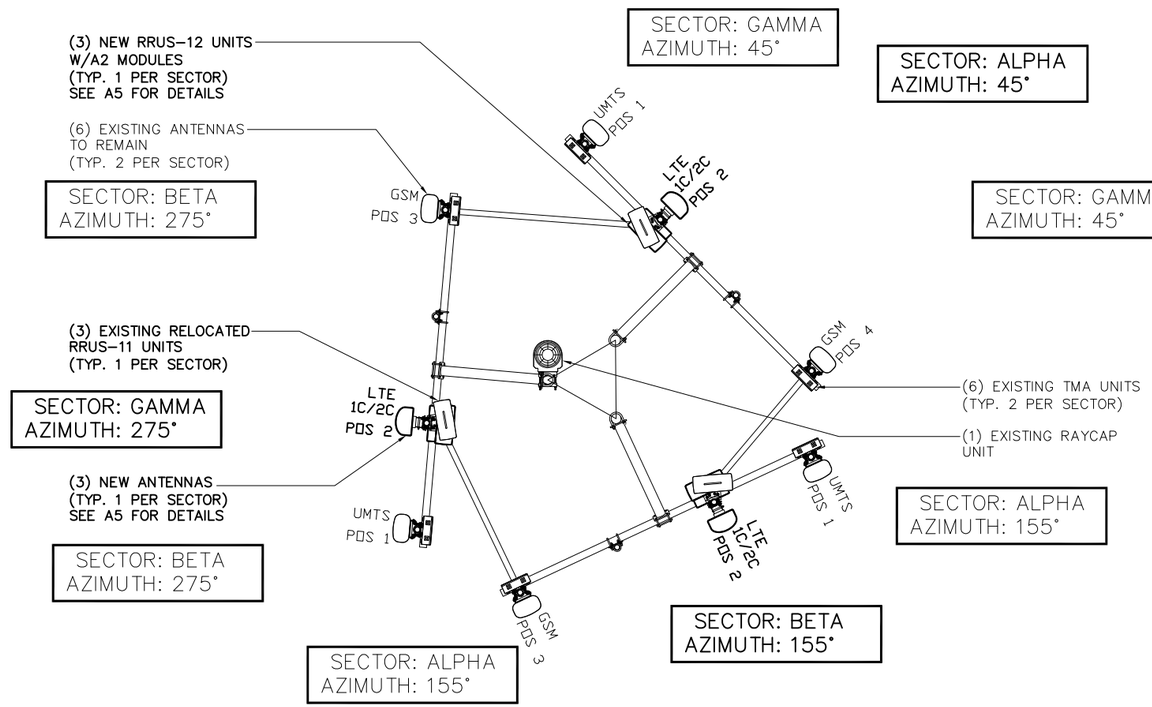


EXISTING ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 1



FINAL ANTENNA PLAN

SCALE: 3/16" = 1'-0" | 2

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SHEET NAME
ANTENNA PLANS

SHEET NUMBER
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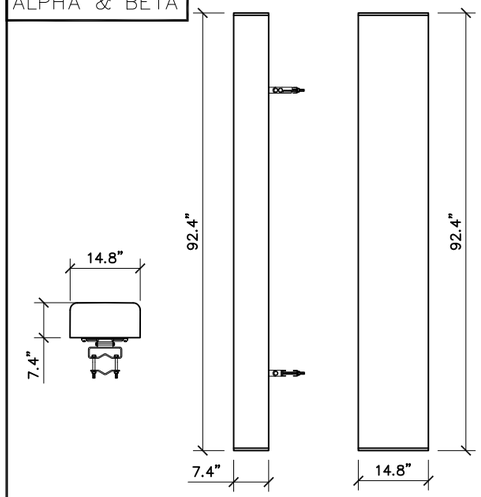
ALPHA & BETA



PLAN VIEW SIDE VIEW FRONT VIEW

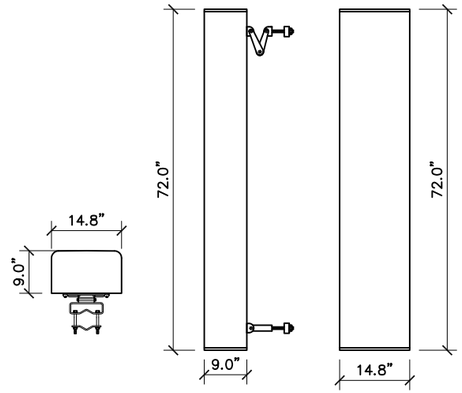
CCI – HPA–65R–BUU–H8

HEXPORT MULTI–BAND ANTENNA

FREQUENCY RANGE	698–806 MHz
	824–894 MHz
	1850–1990 MHz
	1710–1755/2110–2170 MHz
	2305–2360 MHz
ANTENNA	68 Lbs
WITH BRACKET	78 Lbs

ANTENNA SPEC SCALE: N.T.S. 1

GAMMA



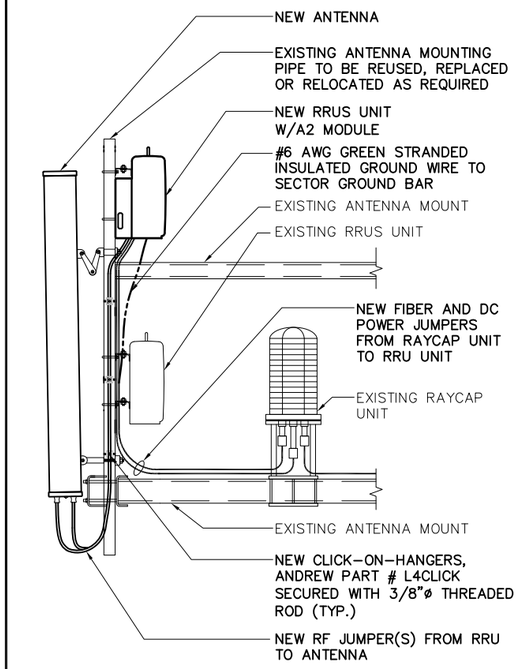
PLAN VIEW SIDE VIEW FRONT VIEW

CCI – HPA–65R–BUU–H6

HEXPORT MULTI–BAND ANTENNA

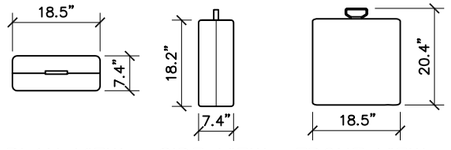
FREQUENCY RANGE	698–806 MHz
	824–894 MHz
	1850–1990 MHz
	1710–1755/2110–2170 MHz
	2305–2360 MHz
ANTENNA	51 Lbs
WITH BRACKET	61 Lbs

ANTENNA SPEC SCALE: N.T.S. 2



ANTENNA SCHEMATIC SCALE: N.T.S. 3

NOT USED SCALE: N.T.S. 4



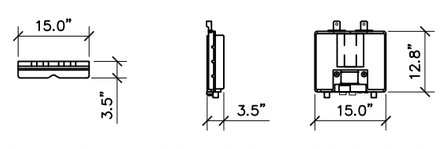
PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS 12

WITH SOLAR SHIELD

UNIT WEIGHT	52.2 Lbs

RRU SPEC SCALE: N.T.S. 5



PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – RRUS A2 MODULE

UNIT WEIGHT	22 Lbs

A2 BOX SPEC SCALE: N.T.S. 6

NOT USED SCALE: N.T.S. 7

NOT USED SCALE: N.T.S. 8

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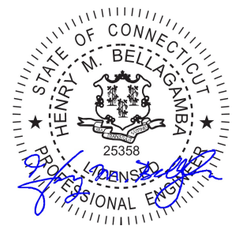

SITE NAME

WEST HARTFORD

SITE NUMBER:

CTL01154

SITE ADDRESS

3114 ALBANY AVENUE
WEST HARTFORD, CT 06117

SHEET NAME

EQUIPMENT DETAILS

SHEET NUMBER

A5

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FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (05/18/16)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	(E) UMTS ANTENNA	800-10121	KATHREIN	(1) EXISTING TMA UNIT(S)	155°	115'-0"	1-5/8"ø LDF7-50A	190'-0"	(1) (E) DC6-48-60-18-8F UNIT
								1-5/8"ø LDF7-50A	190'-0"	
	A-2	(N) LTE1C/2C ANTENNA	HPA-65R-BUU-H8	CCI	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-12 UNIT W/ A2 MODULE	45°	115'-0"	(1) EXISTING FIBER CABLE	190'-0"	
								(2) EXISTING DC POWER CABLES	190'-0"	
	A-3	-	-	-	-	-	-	-		
	A-4	(E) GSM ANTENNA	800-10121	KATHREIN	(1) EXISTING TMA UNIT(S)	155°	115'-0"	1-5/8"ø LDF7-50A	190'-0"	
BETA	B-1	(E) UMTS ANTENNA	800-10121	KATHREIN	(1) EXISTING TMA UNIT(S)	275°	115'-0"	1-5/8"ø LDF7-50A	190'-0"	
								1-5/8"ø LDF7-50A	190'-0"	
	B-2	(N) LTE1C/2C ANTENNA	HPA-65R-BUU-H6	CCI	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-12 UNIT W/ A2 MODULE	155°	115'-0"	SEE ANTENNA A-2 FOR CABLE TYPE AND LENGTH		
	B-3	-	-	-	-	-	-	-		
	B-4	(E) GSM ANTENNA	800-10121	KATHREIN	(1) EXISTING TMA UNIT(S)	275°	115'-0"	1-5/8"ø LDF7-50A	190'-0"	
GAMMA	C-1	(E) UMTS ANTENNA	800-10121	KATHREIN	(1) EXISTING TMA UNIT(S)	45°	115'-0"	1-5/8"ø LDF7-50A	190'-0"	
								1-5/8"ø LDF7-50A	190'-0"	
	C-2	(N) LTE1C/2C ANTENNA	HPA-65R-BUU-H8	CCI	(1) EXISTING RRUS-11 UNIT AND (1) NEW RRUS-12 UNIT W/ A2 MODULE	275°	115'-0"	SEE ANTENNA A-2 FOR CABLE TYPE AND LENGTH		
	C-3	-	-	-	-	-	-	-		
	C-4	(E) GSM ANTENNA	800-10121	KATHREIN	(1) EXISTING TMA UNIT(S)	45°	115'-0"	1-5/8"ø LDF7-50A	190'-0"	

ANTENNA & CABLE CONFIGURATION

SCALE: N.T.S.

1

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STATE OF CONNECTICUT
HENRY M. BELLAGAMBA
25358
LICENSED PROFESSIONAL ENGINEER

SITE NAME

WEST HARTFORD

SITE NUMBER:

CTL01154

SITE ADDRESS

3114 ALBANY AVENUE
WEST HARTFORD, CT 06117

SHEET NAME

ANTENNA & CABLE CONFIGURATION

SHEET NUMBER

A6

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1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

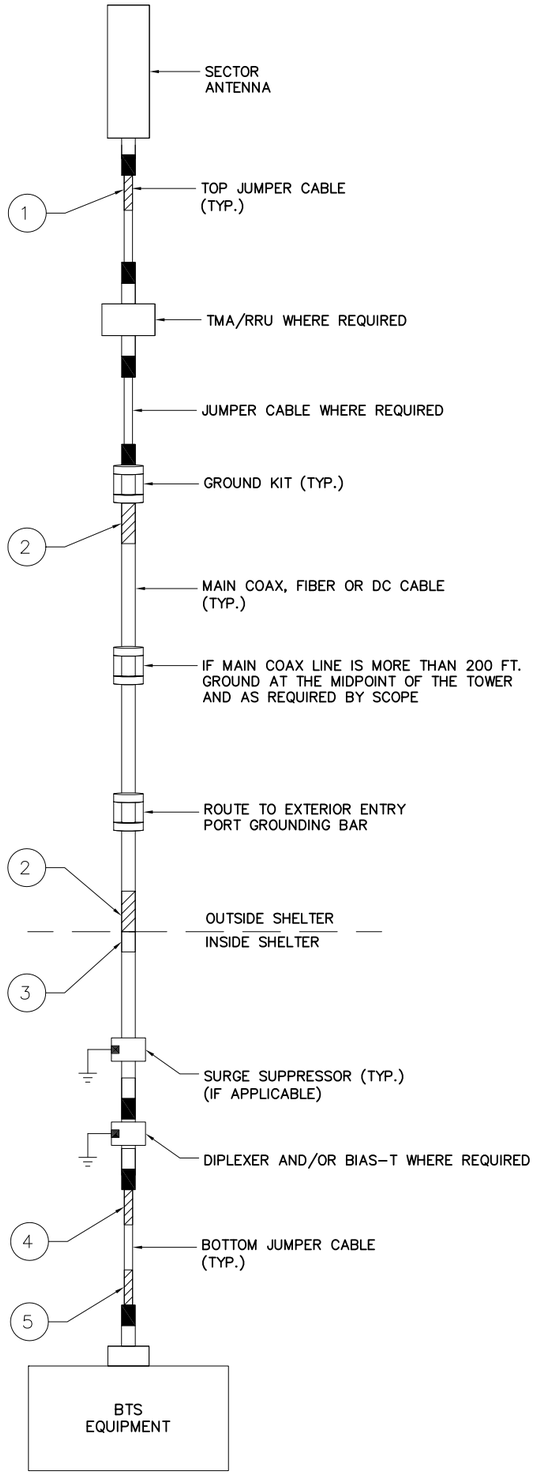
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
WEST HARTFORD

SITE NUMBER:
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SITE ADDRESS
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WEST HARTFORD, CT 06117

SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
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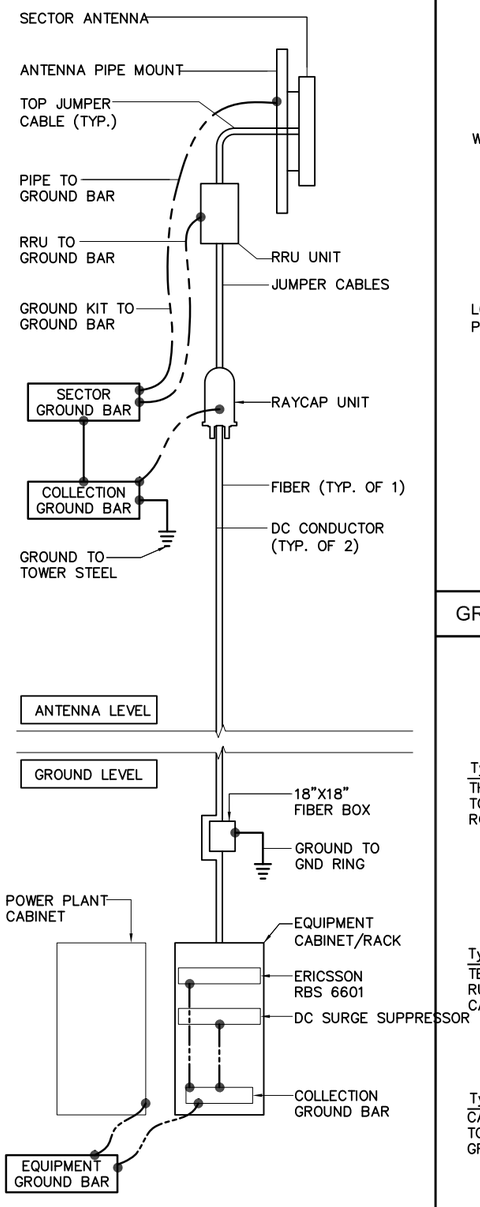
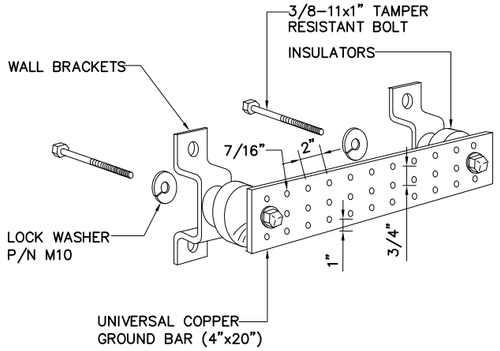
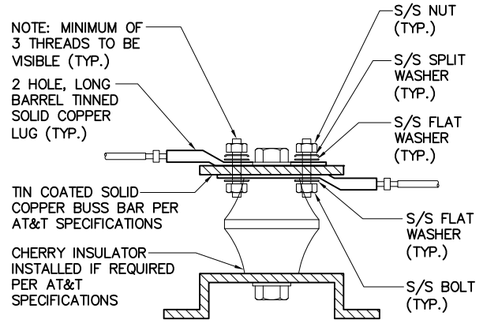


GROUNDING SCHEMATIC SCALE: N.T.S. 1



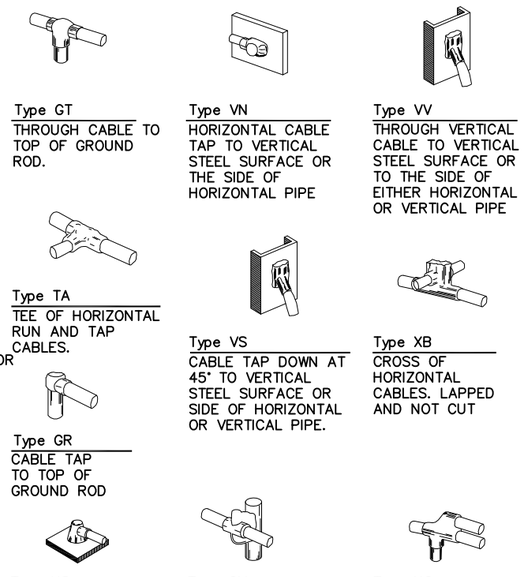
GROUND BAR DETAIL SCALE: N.T.S. 2



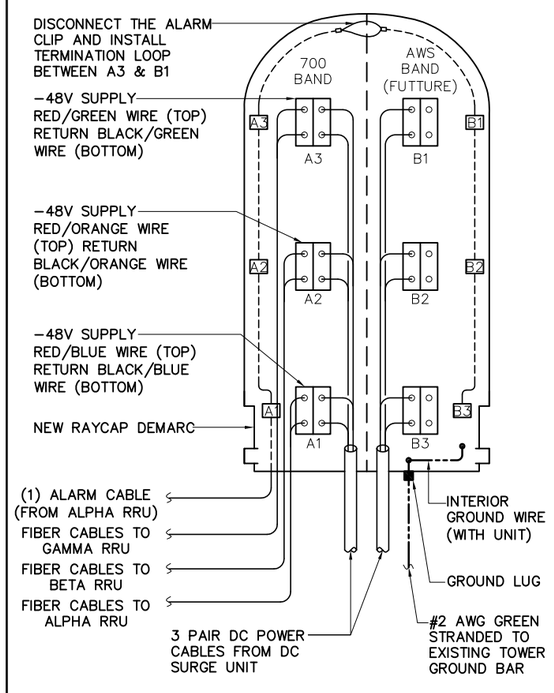
NOTES:

1. ALL HARDWARE 18-8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

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STATE OF CONNECTICUT · HENRY M. BELLAGAMBA · 25358 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
WEST HARTFORD

SITE NUMBER:
CTL01154

SITE ADDRESS
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WEST HARTFORD, CT 06117

SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
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FEC# 2016.0200. 0008

FDH VELOCITEL
ENGINEERING INNOVATION

Structural Analysis for
SBA Network Services, Inc.

345.2' Guyed Tower (346.4' AGL)

SBA Site Name: West Hartford
SBA Site ID: CT15879-A-05
AT&T Site ID: CTL01154
Site Address: 3114 Albany Avenue, West Hartford, CT 6117

FDH Velocitel Project Number 16PAIQ1400

Analysis Results

Tower Components	51.8%	Sufficient
Foundation	56.1%	Sufficient

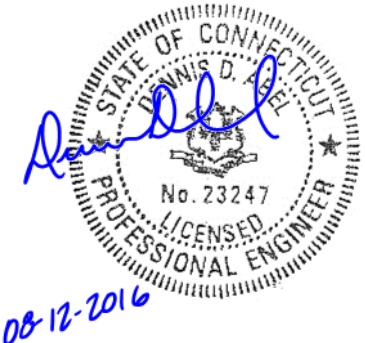
Prepared By:

Drew Alexander, EI
Project Engineer I

Reviewed By:

Dennis D. Abel, PE
Director of Structural Engineering
CT License No. 23247

Velocitel, Inc., d.b.a. FDH Velocitel
6521 Meridien Drive
Raleigh, NC, 27616
(919) 755-1012



08-12-2016

August 12, 2016

Prepared pursuant to the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code

TABLE OF CONTENTS

EXECUTIVE SUMMARY

At the request of SBA Network Services, Inc., FDH Velocitel performed a structural analysis of the existing Guyed Tower located in West Hartford, CT to determine whether the tower is structurally adequate to support the antenna configuration in place per **Table 1** pursuant to the *TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code*. Information pertaining to the antenna loading, current tower geometry, member sizes, and below grade parameters was obtained from:

Source	Document Type	Reference	Date
Tower Engineering Professionals	Tower Mapping	Project No. 112343	July 12, 2011
FDH, Inc.	Tower Mapping	Job No. 14629H1500	May 09, 2014
FDH Engineering, Inc.	Foundation Mapping	Project No. 1462OE1500	May 08, 2014
Clarence Welti Assoc., Inc.	Geotechnical Report	Site Location: West Hartford, CT	May 22, 2000
FDH, Inc.	TIA Inspection	Job No. 1308391800	December 04, 2013
SBA Network Services, Inc.	-	-	-

The *basic design wind speed* per *TIA/EIA-222-F* Standards is 80 mph without ice and 38 mph with 1" radial ice. Ice is considered to increase in thickness with height.

Conclusions

With the antenna configuration in place per **Table 1** we have determined the tower stress level to be sufficient and the foundations to be sufficient pursuant to the requirements stipulated by *TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2005 Connecticut Building Code* provided the **Recommendations** listed below are satisfied. For a more detailed description of the analysis of the tower, see the **Results** section of this report.

Our structural analysis has been performed assuming all information provided to FDH Velocitel is accurate (i.e., the structure member information, tower layout, existing antenna loading, and proposed antenna loading) and that the tower has been properly erected and maintained per the original design drawings.

Recommendations

To ensure the requirements of the current analysis standards are met with the antenna configuration in place per **Table 1**, we have the following recommendations:

1. Feed lines to be installed as shown in **Figure 1** in the **Appendix**.
2. RRU/RRH Stipulation: The equipment may be installed in any arrangement as determined by the client.

APPURTENANCE LISTING

The antennas and equipment, with their corresponding feed lines, considered for this analysis are shown in **Table 1**. *If the actual layout determined in the field deviates from the layout, FDH Velocitel should be contacted to perform a revised analysis.*

Table 1 - Appurtenance Loading

Existing Loading:

Antenna Elevation (ft.)	Description	Feed Lines	Carrier	Mount Elevation (ft.)	Mount Type
332	(1) ERI 3 Bay FM	(1) 3"	WCCC	332	Direct
308.3	(1) Scala SCA 4DR-8S	(1) 3"	ZGS Hartford	308.3	(1) Pipe Mount
261	(1) Decibel DB420-B	(1) 7/8"	Master Combiner	251	(1) Standoff
251.8	(1) Antenna Concepts ACB16A	(1) 1-5/8" (1) 3/8"	WRDM	251.8	(1) Pipe Mount
243	(1) Antel WPA-800120 (1) 18" x 6" x 6" TMA	(2) 7/8"	Town of West Hartford	243	Direct
235	(1) Scala 6-ft x 3-ft Grid Dish	(1) 7/8"	WCCC	235	Direct
232	(1) Radiowaves SP2-4.7NS (1) 12" x 2" x 2" TMA	(2) 1/4" (1) 3/8"	Town of West Hartford	232	Direct
225.5	(2) Unknown Panel 34" x 7" x 2"	(2) 3/8"	SNEW ISP	225.5	(2) Pipe Mount
220	(1) Antel WPA-800120	(1) 1-5/8"	Town of West Hartford	220	Direct
213	(1) Decibel DB420-B	(1) 1/2"	Master Combiner	203	(1) Standoff
196	(1) T.S. 3" x 3" x 6.5' (1) Cablewave PA6-112	(1) EW71	WRDM	196	(1) Standoff
191.5 (Tip) 180 168.5 (Base)	(1) Micronetixx LP-1900-B-12	(1) 1-5/8"	WRNT (R&C) Tyche Media	180	(1) Pipe Mount
165	(1) Antel BCD-80010	(1) 1-5/8"	Town of West Hartford	165	(1) Standoff
164.5	(1) 6810 1 Bay FM	(1) 1/2"	91.9 FM	164.5	(1) Pipe Mount
160	(4) RFS APX16DWV_16DWVS (4) Ericsson KRY 112 71	(12) 1-5/8"	T-Mobile	160	(3) T-Frames
146.5	(1) 12" x 4.5" x 6.25" TMA (1) 2-ft MW Dish	(1) 3/8"	SNEW ISP	146.5	(1) Pipe Mount
145	(1) 12-ft x 1" Omni	(1) 1-5/8"	Ham Radio	145	(1) Standoff
---	---	(1) 1-5/8"	---	142.5	---
---	---	(1) 1-5/8"	---	140.5	---
136.5	(1) 5' x 10" Detuner	(1) 1/4"	Ham Radio	136.5	Direct
130	(2) Andrew HBX-6517DS (2) Andrew LNX-6514DS (2) Swedcom SLCP 2x6015 (2) Swedcom SACP 2x5516 (4) RFS FD9R6004/2C (2) Alcatel Lucent RRH2x40-AWS (1) RFS DB-T1-6Z-8AB-0Z	(8) 1-5/8" (1) 1-5/8" Fiber	Verizon	129.5	(3) T-Frames
120.5	(3) RFS APXV18-206517S	(6) 1-5/8"	Metro PCS	120.5	(1) Pipe Mount
112	(3) Kathrein 800 10121 (4) Andrew SBNH-1D6565C (2) KMW AM-X-CD-16-65-00T-RET (6) CCI DTMABP7819VG12A (6) Ericsson RRUS 11	(12) 1-5/8" (4) 3/4" DC (2) 3/8" Fiber	AT&T	111.5	(3) T-Frames
48	(1) GPS	(1) 3/8"	Metro PCS	48	Direct
21	(1) 14-Element 4.5 ft Yagi	(1) 1/2"	Ham Radio	21	(1) Standoff

Proposed Carrier Final Loading:

Antenna Elevation (ft.)	Description	Feed Lines	Carrier	Mount Elevation (ft.)	Mount Type
112	(6) Kathrein 800 10121 (2) CCI HPA-65R-BUU-H8 (1) CCI HPA-65R-BUU-H6 (3) Ericsson RRUS-11 (3) Ericsson RRUS-12 (3) Ericsson RRUS A2 (6) CCI DTMABP7819VG12A (12) Kathrein 860 10025 (1) Raycap DC6-48-60-18-8F	(12) 1-5/8" (4) 3/4" DC (2) 3/8" Fiber	AT&T	111.5	(3) T-Frames

RESULTS

The following material grades for individual members were used for analysis:

Table 2 - Material Grade

Member Type	Material Grade
Legs	A572-50 (Assumed)
Bracing	A572-50 & A36 (Assumed)
Bolts	A325 (Assumed)

Table 3 and **Table 4** display the summary of capacities for the analyzed structure and its additional components. Values greater than 100% indicate locations where the maximum force in the member exceeds its capacity. **Table 5** displays the maximum dish rotations at service winds speeds.

If the assumptions outlined in this report differ from actual field conditions, FDH Velocitel should be contacted to perform a revised analysis. Furthermore, as no information pertaining to the allowable twist and sway requirements for the appurtenances was provided, deflection and rotation were not taken into consideration when performing this analysis.

See the **Appendix** for detailed modeling information.

Table 3 - Structure Member Capacities

Section No.	Elevation (ft.)	Component Type	Size	% Capacity[1]	Pass / Fail
L1	346.351 - 329.351	Pole	P10x.365 (10.75 OD)	10.6	Pass
L2	329.351 - 311.351	Pole	P10x.365 (10.75 OD)	38.3	Pass
T1	311.351 - 310.351	Leg	2 3/4	18.2	Pass
T2	310.351 - 299.182	Leg	2 3/4	5.8	Pass
T3	299.182 - 279.182	Leg	2 3/4	9.0	Pass
T4	279.182 - 259.182	Leg	2 3/4	9.5	Pass
T5	259.182 - 239.182	Leg	2 3/4	10.6	Pass
T6	239.182 - 219.182	Leg	2 3/4	17.0	Pass
T7	219.182 - 199.182	Leg	2 3/4	19.2 20.6 (b)	Pass
T8	199.182 - 179.182	Leg	2 3/4	21.6	Pass
T9	179.182 - 159.182	Leg	2 3/4	25.2	Pass
T10	159.182 - 139.182	Leg	3	25.8	Pass
T11	139.182 - 119.182	Leg	3	27.5 30.2 (b)	Pass
T12	119.182 - 99.1822	Leg	3	29.8	Pass
T13	99.1822 - 79.1822	Leg	3	34.0 36.0 (b)	Pass
T14	79.1822 - 59.1822	Leg	3	34.9	Pass
T15	59.1822 - 39.1822	Leg	3	35.7 37.9 (b)	Pass
T16	39.1822 - 19.1822	Leg	3	36.5	Pass
T17	19.1822 - 14.4112	Leg	3	36.5 38.7 (b)	Pass
T18	14.4112 - 11.8302	Leg	3	36.2	Pass
T19	11.8302 - 9.49947	Leg	3	36.7 38.9 (b)	Pass
T20	9.49947 - 7.16874	Leg	3	35.8 37.9 (b)	Pass
T21	7.16874 - 1.2	Leg	3	41.2	Pass
T2	310.351 - 299.182	Diagonal	7/8	21.1	Pass
T3	299.182 - 279.182	Diagonal	7/8	19.5	Pass
T4	279.182 - 259.182	Diagonal	7/8	15.5	Pass

Section No.	Elevation (ft.)	Component Type	Size	% Capacity[1]	Pass / Fail
T5	259.182 - 239.182	Diagonal	7/8	32.6	Pass
T6	239.182 - 219.182	Diagonal	7/8	38.5	Pass
T7	219.182 - 199.182	Diagonal	7/8	36.3	Pass
T8	199.182 - 179.182	Diagonal	7/8	29.7	Pass
T9	179.182 - 159.182	Diagonal	7/8	39.4	Pass
T10	159.182 - 139.182	Diagonal	1	30.1	Pass
T11	139.182 - 119.182	Diagonal	7/8	48.4	Pass
T12	119.182 - 99.1822	Diagonal	7/8	45.3	Pass
T13	99.1822 - 79.1822	Diagonal	7/8	47.2	Pass
T14	79.1822 - 59.1822	Diagonal	7/8	35.4	Pass
T15	59.1822 - 39.1822	Diagonal	7/8	23.1	Pass
T16	39.1822 - 19.1822	Diagonal	7/8	27.6	Pass
T17	19.1822 - 14.4112	Diagonal	1	19.4	Pass
T18	14.4112 - 11.8302	Diagonal	1	19.5	Pass
T19	11.8302 - 9.49947	Diagonal	1 1/4	8.0	Pass
T20	9.49947 - 7.16874	Diagonal	1 1/4	10.0	Pass
T21	7.16874 - 1.2	Diagonal	1 1/4	44.7	Pass
T1	311.351 - 310.351	Horizontal	6 x 1	1.6	Pass
T19	11.8302 - 9.49947	Horizontal	6 x 3/4	11.7	Pass
T20	9.49947 - 7.16874	Horizontal	6 x 3/4	13.9	Pass
T21	7.16874 - 1.2	Horizontal	6 x 3/4	7.2	Pass
T2	310.351 - 299.182	Top Girt	1 1/4	2.4	Pass
T3	299.182 - 279.182	Top Girt	1	2.2	Pass
T4	279.182 - 259.182	Top Girt	1	2.1	Pass
T5	259.182 - 239.182	Top Girt	1	1.1	Pass
T6	239.182 - 219.182	Top Girt	1	6.4	Pass
T7	219.182 - 199.182	Top Girt	1	9.5	Pass
T8	199.182 - 179.182	Top Girt	1	5.1	Pass
T9	179.182 - 159.182	Top Girt	1	5.9	Pass
T10	159.182 - 139.182	Top Girt	1 1/4	5.8	Pass
T11	139.182 - 119.182	Top Girt	1	10.3	Pass
T12	119.182 - 99.1822	Top Girt	1	0.7	Pass
T13	99.1822 - 79.1822	Top Girt	1	8.9	Pass
T14	79.1822 - 59.1822	Top Girt	1	4.7	Pass
T15	59.1822 - 39.1822	Top Girt	1	1.1	Pass
T16	39.1822 - 19.1822	Top Girt	1	1.3	Pass
T17	19.1822 - 14.4112	Top Girt	1 1/4	1.5	Pass
T18	14.4112 - 11.8302	Top Girt	7/8	5.2	Pass
T2	310.351 - 299.182	Bottom Girt	1 1/4	9.1	Pass
T3	299.182 - 279.182	Bottom Girt	1	1.8	Pass
T4	279.182 - 259.182	Bottom Girt	1	1.0	Pass
T5	259.182 - 239.182	Bottom Girt	1	7.8	Pass
T6	239.182 - 219.182	Bottom Girt	1	8.8	Pass
T7	219.182 - 199.182	Bottom Girt	1	4.8	Pass
T8	199.182 - 179.182	Bottom Girt	1	0.9	Pass
T9	179.182 - 159.182	Bottom Girt	1	7.9	Pass
T10	159.182 - 139.182	Bottom Girt	1 1/4	4.9	Pass
T11	139.182 - 119.182	Bottom Girt	1	1.7	Pass
T12	119.182 - 99.1822	Bottom Girt	1	7.8	Pass
T13	99.1822 - 79.1822	Bottom Girt	1	6.5	Pass
T14	79.1822 - 59.1822	Bottom Girt	1	2.0	Pass
T15	59.1822 - 39.1822	Bottom Girt	1	1.2	Pass
T16	39.1822 - 19.1822	Bottom Girt	1	1.5	Pass
T21	7.16874 - 1.2	Bottom Girt	6 x 3/4	6.3	Pass
T3	299.182 - 279.182	Mid Girt	1	0.5	Pass
T4	279.182 - 259.182	Mid Girt	1	0.4	Pass
T5	259.182 - 239.182	Mid Girt	1	0.5	Pass
T6	239.182 - 219.182	Mid Girt	1	17.2	Pass

Section No.	Elevation (ft.)	Component Type	Size	% Capacity[1]	Pass / Fail
T7	219.182 - 199.182	Mid Girt	1	0.9	Pass
T8	199.182 - 179.182	Mid Girt	1	1.0	Pass
T9	179.182 - 159.182	Mid Girt	1	1.0	Pass
T10	159.182 - 139.182	Mid Girt	1 1/4	14.5	Pass
T11	139.182 - 119.182	Mid Girt	1	2.2	Pass
T12	119.182 - 99.1822	Mid Girt	1	1.6	Pass
T13	99.1822 - 79.1822	Mid Girt	1	20.6	Pass
T14	79.1822 - 59.1822	Mid Girt	1	1.9	Pass
T15	59.1822 - 39.1822	Mid Girt	1	1.9	Pass
T16	39.1822 - 19.1822	Mid Girt	1	2.0	Pass
T17	19.1822 - 14.4112	Mid Girt	7/8	4.8	Pass
T19	11.8302 - 9.49947	Redund Horz 1 Bracing	7/8	8.8	Pass
T20	9.49947 - 7.16874	Redund Horz 1 Bracing	7/8	9.7	Pass
T20	9.49947 - 7.16874	Redund Diag 1 Bracing	7/8	11.8	Pass
T3	299.182 - 279.182	Guy A@299.182	13/16	37.7	Pass
T6	239.182 - 219.182	Guy A@229.182	7/8	40.9	Pass
T10	159.182 - 139.182	Guy A@149.182	13/16	47.3	Pass
T13	99.1822 - 79.1822	Guy A@89.1822	3/4	45.1	Pass
T3	299.182 - 279.182	Guy B@299.182	3/4	46.8	Pass
T6	239.182 - 219.182	Guy B@229.182	13/16	47.0	Pass
T10	159.182 - 139.182	Guy B@149.182	7/8	46.2	Pass
T13	99.1822 - 79.1822	Guy B@89.1822	13/16	41.5	Pass
T3	299.182 - 279.182	Guy C@299.182	3/4	44.1	Pass
T6	239.182 - 219.182	Guy C@229.182	13/16	43.8	Pass
T10	159.182 - 139.182	Guy C@149.182	7/8	43.1	Pass
T13	99.1822 - 79.1822	Guy C@89.1822	13/16	39.2	Pass

1. Capacities include 1/3 allowable stress increase for wind, per TIA/EIA-222-F standards.

Table 4 – Additional Structure Component Capacities

Elevation (ft.)	Component	% Capacity	Pass / Fail	Notes
0	Base Foundation (Structural)	56.1	Pass	1
0	Guy Foundation (Structural)	30.6	Pass	1
0	Base Foundation (Soil Interaction)	19.6	Pass	1
0	Guy Foundation (Soil Interaction)	35.5	Pass	1

1. Capacities include 1/3 allowable stress increase for wind, per TIA/EIA-222-F standards.

Table 5 - Maximum Dish Rotations at Service Wind Speeds

Centerline Elevation (ft.)	Dish	Tilt (deg)*	Twist (deg)*
235	(1) Scala 6-ft x 3-ft Grid Dish	0.0505	0.6406
232	(1) Radiowaves SP2-4.7NS	0.0506	0.6353
196	(1) Cablewave PA6-112	0.5723	0.5723
146.5	(1) 2-ft MW Dish	0.4423	0.4423

*Allowable tilt and twist to be reviewed by the carrier.

GENERAL COMMENTS

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 SBA Network Services, Inc. to verify that the tower modeled and analyzed is the correct structure (with accurate antenna loading information) modeled. If there are substantial modifications to be made or the assumptions made in this analysis are not accurate, FDH Velocitel should be notified immediately to perform a revised analysis.

LIMITATIONS

All opinions and conclusions are considered accurate to a reasonable degree of engineering certainty based upon the evidence available at the time of this report. All opinions and conclusions are subject to revision based upon receipt of new or additional/updated information. All services are provided exercising a level of care and diligence equivalent to the standard and care of our profession. No other warranty or guarantee, expressed or implied, is offered. Our services are confidential in nature and we will not release this report to any other party without the client's consent. The use of this engineering work is limited to the express purpose for which it was commissioned and it may not be reused, copied, or distributed for any other purpose without the written consent of FDH Velocitel.

APPENDIX

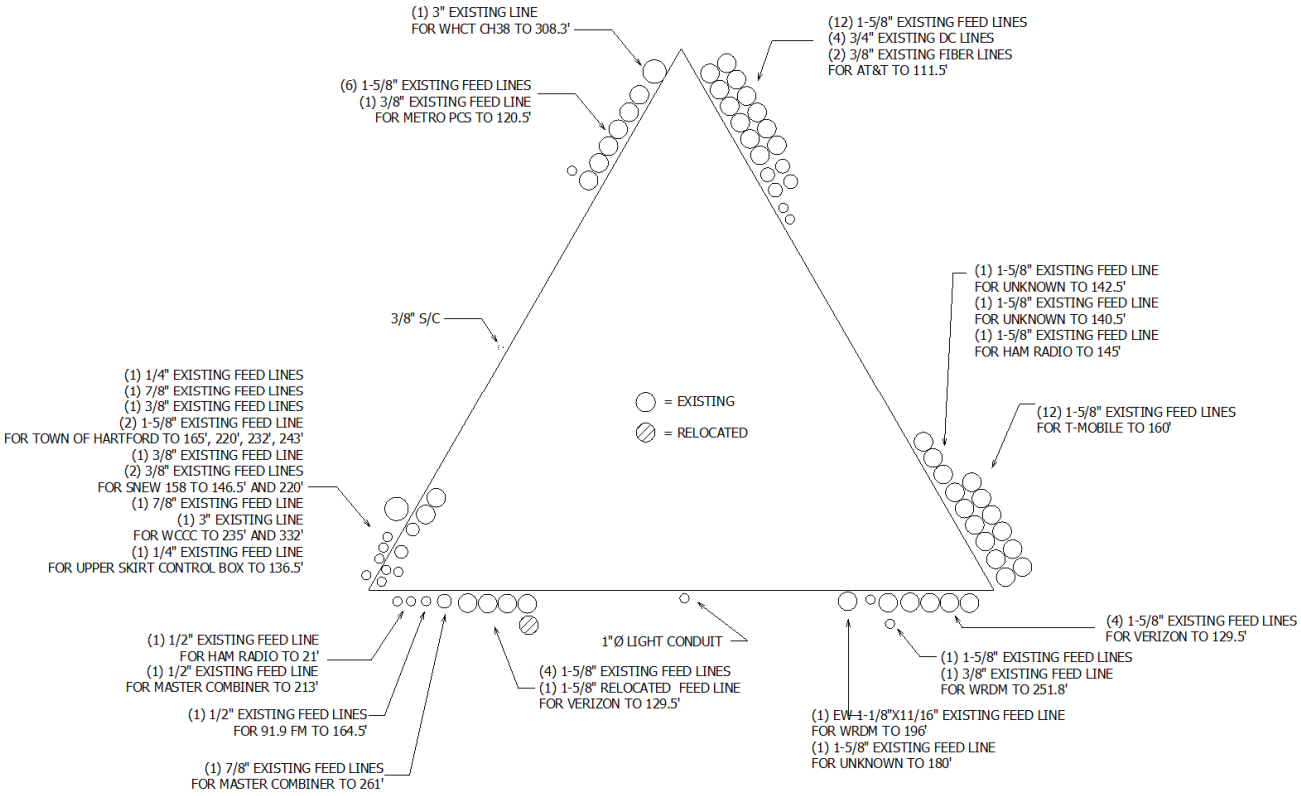
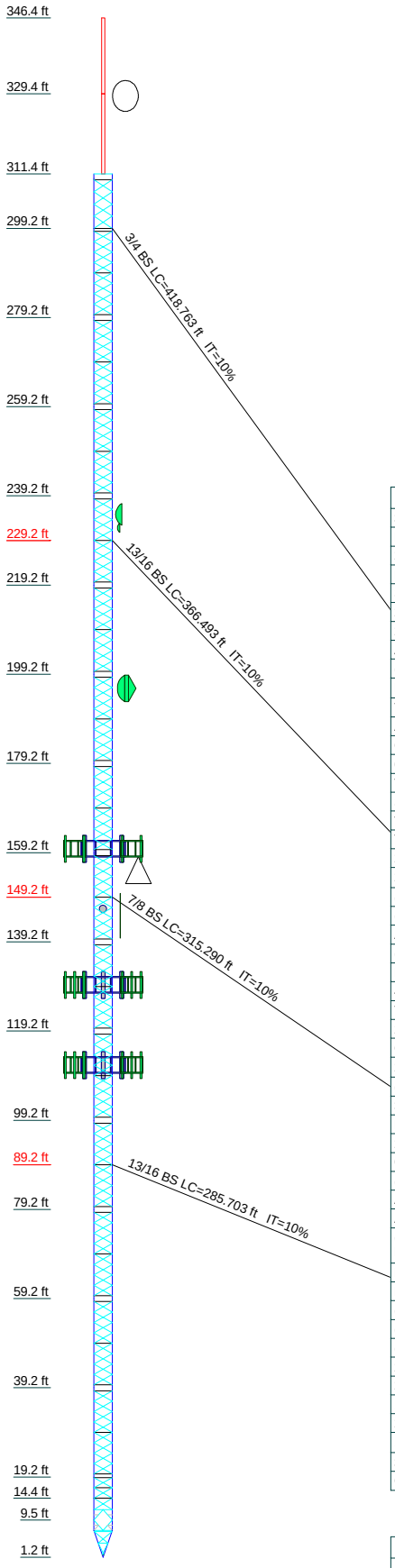
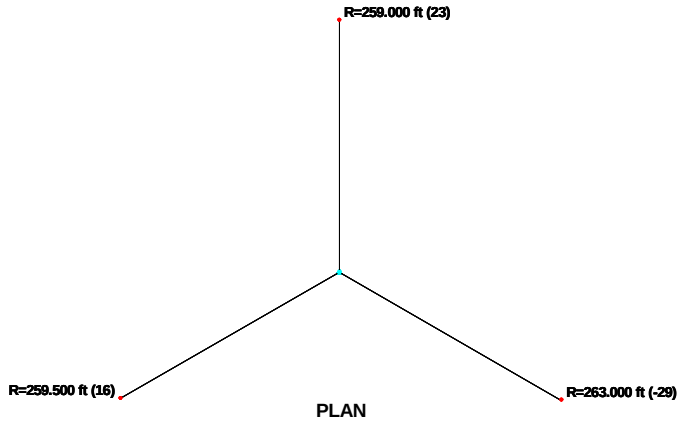


Figure 1 - Feed Line Layout

Section		L1	L2	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23
Legs		P10x.365 (10.75 OD)		SR 2 3/4												SR 3										
Leg Grade		A53-B-35		A572-50																						
Diagonals	A	N.A.		SR 7/8		SR 1										SR 7/8				SR 1						
Diagonal Grade		N.A.		A572-50																						
Top Girts	N.A. B	N.A.	A	SR 1		SR 1 1/4										SR 1										
Mid Girts	N.A. B	N.A.		SR 1		SR 1 1/4										SR 1										
Bottom Girts	C N.A.	N.A.	A	SR 1		SR 1 1/4										SR 1										
Horizontals	6 x 3/4	N.A.	D	N.A.																						
Red. Horizontals	N.A. B	N.A.										N.A.														
Red. Diagonals	N.A. B	N.A.										N.A.														
Face Width (ft)		0.895833	5																							
# Panels @ (ft)	J I H G	N.A.	E	F									126 @ 2.33333													
Weight (K)	33.9	0.7	0.4	1.1		1.9	1.9	1.9	1.9	1.9	1.9	1.9	2.3	2.1	2.1	2.1	2.1	2.1	2.1	0.6	0.3	0.3	1.0	0.3	0.3	0.7





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
30" x 18" Dia	346.3	Detuner	136.5
ERI 3 Bay FM	332	(3) T-Frames	129.5
2.4" Dia x 18" Pipe	332	SLCP 2x6015 w/ Mount Pipe	129.5
L2.5x2.5x0.25, 10-ft Length	309.5	SLCP 2x6015 w/ Mount Pipe	129.5
Scala SCA 4DR-8S	308.3	SACP 2x5516 w/ Mount Pipe	129.5
2.9" x 22-ft Mt. Pipe	297	SACP 2x5516 w/ Mount Pipe	129.5
2.4" x 25' Mount Pipe	251.8	(2) Andrew HBX-6517DS w/ Mount Pipe	129.5
Antenna Concepts ACB16A w/ Mount	251.8	(2) Andrew LNX-6514DS w/ Mount Pipe	129.5
(1) Side Arm Mount	251	FD9R6004/2C Diplexer	129.5
DB420-B	251	FD9R6004/2C Diplexer	129.5
TMA 18" x 6" x 6"	243	(2) FD9R6004/2C Diplexer	129.5
Antel WPA-800120	243	RRH2x40-AWS	129.5
CC806-12	236.5	RRH2x40-AWS	129.5
6-ft x 3-ft Grid	235	DB-T1-6Z-8AB-0Z	129.5
TMA 12" x 12" x 2"	232	APXV18-206517S w/Mount Pipe	120.5
SP2-4.7NS	232	APXV18-206517S w/Mount Pipe	120.5
TMA 6" x 6" x 2"	225.5	APXV18-206517S w/Mount Pipe	120.5
TMA 6" x 6" x 2"	225.5	(2) DTMABP7819VG12A	111.5
2'10" x 7" x 2" Panel w/ 48" Mount Pipe	225.5	2.4" Dia x 5-ft Pipe	111.5
2'10" x 7" x 2" Panel w/ 48" Mount Pipe	225.5	(3) T-Frames	111.5
(2) 1" x 8" Pipe	225.5	(2) 800 10121 w/ Mount Pipe	111.5
(2) 1" x 8" Pipe	225.5	(2) 800 10121 w/ Mount Pipe	111.5
Antel WPA-800120	220	2.4" Dia x 5-ft Pipe	111.5
(1) Side Arm Mount	203	2.4" Dia x 5-ft Pipe	111.5
DB420-B	203	DC6-48-60-18-8F	111.5
4.5" Dia x 6' Dish Mount	196	RRUS-12	111.5
T.S. 3" x 3" x 6.5'	196	(2) DTMABP7819VG12A	111.5
2.4" Dia x 6.5' Mount Pipe	196	HPA-65R-BUU-H8 w/ Mount Pipe	111.5
Cablewave PA6-112	196	RRUS A2	111.5
2.4" x 25' Mount Pipe	180	860 10025	111.5
(6) Micronetixx LP-1900-B-12 Antennas	180	860 10025	111.5
36" Standoff	165	RRUS A2	111.5
BCD-80010	165	RRUS A2	111.5
2.4" Dia x 10-ft Mount Pipe	164.5	RRUS-12	111.5
6810 1 Bay FM	164.5	HPA-65R-BUU-H8 w/ Mount Pipe	111.5
(3) T-Frames	160	RRUS-11	111.5
APX16DWV_16DWVS w/ Mount Pipe	160	RRUS-11	111.5
APX16DWV_16DWVS w/ Mount Pipe	160	RRUS-11	111.5
(2) APX16DWV_16DWVS w/ Mount Pipe	160	RRUS-12	111.5
KRY 112 71	160	(2) 800 10121 w/ Mount Pipe	111.5
KRY 112 71	160	860 10025	111.5
(2) KRY 112 71	160	HPA-65R-BUU-H6 w/ Mount Pipe	111.5
(2) 2.4" x 7-ft Pipe	160	(2) DTMABP7819VG12A	111.5
(2) 2.4" x 7-ft Pipe	160	1" dia x 16" Pipe	48
2.4" x 7-ft Pipe	160	GPS	48
2.4" Dia x 4-ft Mount Pipe	146.5	1-ft Side Arm	21
12" x 4.5" x 6.25" TMA	146.5	14-Element 4.5 ft Yagi	21
2-ft Dish w/o Radome	146.5	Detuning Box 29" x 24" x 12"	10.5
12-ft x 1" Omni	145	Control Box 12" x 13.5" x 6.5"	5.7
30" Sidearm Mount	145	36"x36"x12" TMA	1.2
Control Box 12" x 13.5" x 6.5"	141.5		

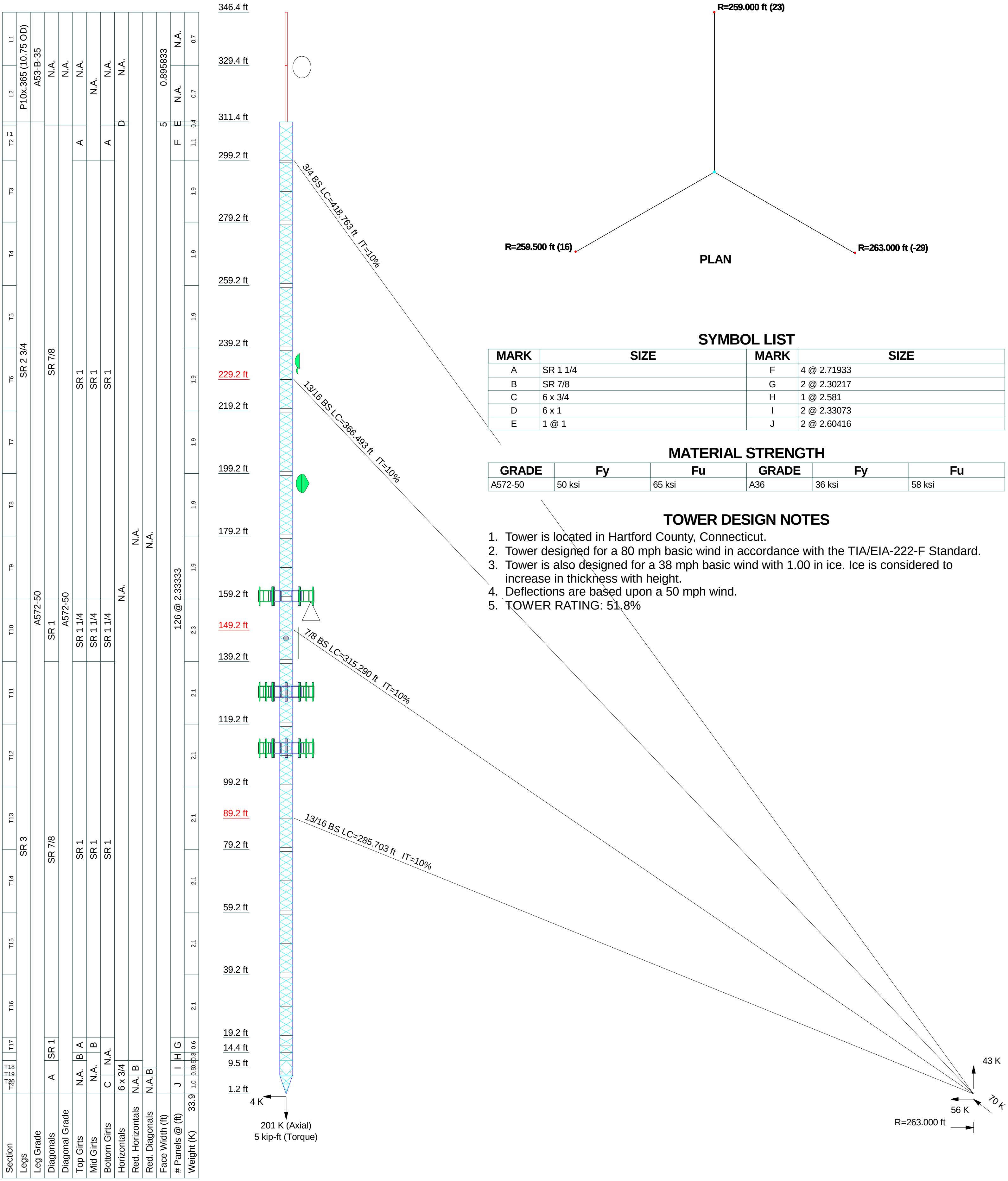
SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 1 1/4	F	4 @ 2.71933
B	SR 7/8	G	2 @ 2.30217
C	6 x 3/4	H	1 @ 2.581
D	6 x 1	I	2 @ 2.33073
E	1 @ 1	J	2 @ 2.60416

FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: (919) 755-1012
FAX: (919) 755-1031

Tower Analysis

Job: *West Hartford, CT15879-A-05*			
Project: *16PAIQ1400*			
Client: SBA Network Services, Inc.	Drawn by: DAlexander	App'd:	
Code: TIA/EIA-222-F	Date: 08/12/16	Scale: NTS	
Path:		Dwg No. E-1	



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C	6 x 3/4	H	1 @ 2.581
D	6 x 1	I	2 @ 2.33073
E	1 @ 1	J	2 @ 2.60416

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 38 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 51.8%

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Tower Analysis

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App'd:	
Code:	TIA/EIA-222-F
Date:	08/12/16
Scale:	NTS
Path:	
Dwg No.	E-1

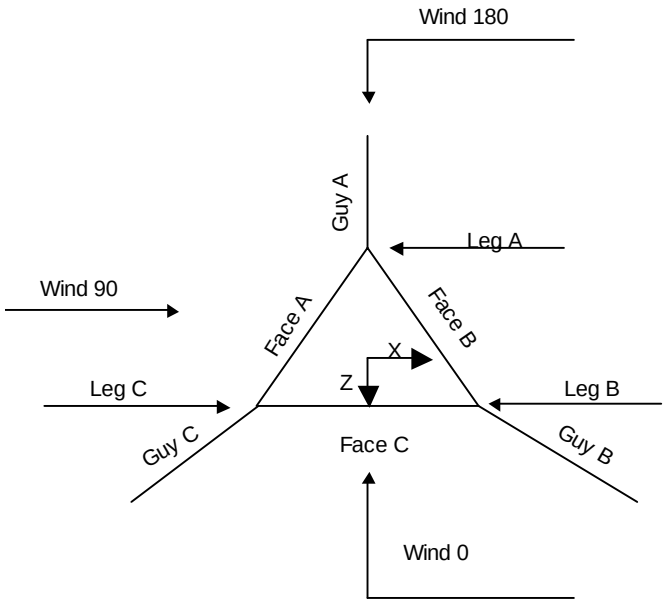
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 346.351 ft above the ground line.
The base of the tower is set at an elevation of 1.200 ft above the ground line.
The face width of the tower is 5.000 ft at the top and tapered at the base.
An index plate is provided at the 3x guyed -tower connection.
There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.0664.
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

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	346.351-329.351	17.000	P10x.365 (10.75 OD)	A53-B-35 (35 ksi)	
L2	329.351-311.351	18.000	P10x.365 (10.75 OD)	A53-B-35 (35 ksi)	

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
L1 346.351-329.351				1	1	1			
L2 329.351-311.351				1	1	1			

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	311.351-310.351			5.000	1	1.000
T2	310.351-299.182			5.000	1	11.169
T3	299.182-279.182			5.000	1	20.000
T4	279.182-259.182			5.000	1	20.000
T5	259.182-239.182			5.000	1	20.000
T6	239.182-219.182			5.000	1	20.000
T7	219.182-199.182			5.000	1	20.000
T8	199.182-179.182			5.000	1	20.000
T9	179.182-159.182			5.000	1	20.000
T10	159.182-139.182			5.000	1	20.000
T11	139.182-119.182			5.000	1	20.000
T12	119.182-99.182			5.000	1	20.000
T13	99.182-79.182			5.000	1	20.000
T14	79.182-59.182			5.000	1	20.000
T15	59.182-39.182			5.000	1	20.000
T16	39.182-19.182			5.000	1	20.000
T17	19.182-14.411			5.000	1	4.771
T18	14.411-11.830			5.000	1	2.581
T19	11.830-9.499			5.000	1	2.331
T20	9.499-7.169			5.000	1	2.331
T21	7.169-1.200			5.000	1	5.969

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	311.351-310.351	1.000	X Brace	No	Yes	0.0000	0.0000
T2	310.351-299.182	2.719	X Brace	No	No	3.5000	0.0000
T3	299.182-279.182	2.333	X Brace	No	No	8.0000	8.0000
T4	279.182-259.182	2.333	X Brace	No	No	8.0000	8.0000
T5	259.182-239.182	2.333	X Brace	No	No	8.0000	8.0000
T6	239.182-219.182	2.333	X Brace	No	No	8.0000	8.0000
T7	219.182-199.182	2.333	X Brace	No	No	8.0000	8.0000
T8	199.182-179.182	2.333	X Brace	No	No	8.0000	8.0000
T9	179.182-159.182	2.333	X Brace	No	No	8.0000	8.0000
T10	159.182-139.182	2.333	X Brace	No	No	8.0000	8.0000
T11	139.182-119.182	2.333	X Brace	No	No	8.0000	8.0000
T12	119.182-99.182	2.333	X Brace	No	No	8.0000	8.0000
T13	99.182-79.182	2.333	X Brace	No	No	8.0000	8.0000
T14	79.182-59.182	2.333	X Brace	No	No	8.0000	8.0000
T15	59.182-39.182	2.333	X Brace	No	No	8.0000	8.0000
T16	39.182-19.182	2.333	X Brace	No	No	8.0000	8.0000
T17	19.182-14.411	2.302	X Brace	No	No	2.0000	0.0000
T18	14.411-11.830	2.581	X Brace	No	No	0.0000	0.0000
T19	11.830-9.499	2.331	K1 Down	No	Yes	0.0000	0.0000
T20	9.499-7.169	2.331	K1 Up	No	Yes	0.0000	0.0000
T21	7.169-1.200	2.604	X Brace	No	Yes	3.0000	6.1250

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 311.351-310.351	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T2 310.351-299.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 299.182-279.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 279.182-259.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T5 259.182-239.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T6 239.182-219.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T7 219.182-199.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T8 199.182-179.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T9 179.182-159.182	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T10 159.182-139.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T11 139.182-119.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T12 119.182-99.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T13 99.182-79.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T14 79.182-59.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T15 59.182-39.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T16 39.182-19.182	Solid Round	3	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T17 19.182-14.411	Solid Round	3	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T18 14.411-11.830	Solid Round	3	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T19 11.830-9.499	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T20 9.499-7.169	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T21 7.169-1.200	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 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
T2 310.351-299.182	Solid Round	1 1/4	A570-50 (50 ksi)	Solid Round	1 1/4	A570-50 (50 ksi)
T3 299.182-279.182	Solid Round	1	A570-50 (50 ksi)	Solid Round	1	A570-50 (50 ksi)
T4	Solid Round	1	A570-50	Solid Round	1	A570-50

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
279.182-259.182			(50 ksi)			(50 ksi)
T5	Solid Round	1	A570-50	Solid Round	1	A570-50
259.182-239.182			(50 ksi)			(50 ksi)
T6	Solid Round	1	A570-50	Solid Round	1	A570-50
239.182-219.182			(50 ksi)			(50 ksi)
T7	Solid Round	1	A570-50	Solid Round	1	A570-50
219.182-199.182			(50 ksi)			(50 ksi)
T8	Solid Round	1	A570-50	Solid Round	1	A570-50
199.182-179.182			(50 ksi)			(50 ksi)
T9	Solid Round	1	A570-50	Solid Round	1	A570-50
179.182-159.182			(50 ksi)			(50 ksi)
T10	Solid Round	1 1/4	A570-50	Solid Round	1 1/4	A570-50
159.182-139.182			(50 ksi)			(50 ksi)
T11	Solid Round	1	A570-50	Solid Round	1	A570-50
139.182-119.182			(50 ksi)			(50 ksi)
T12	Solid Round	1	A570-50	Solid Round	1	A570-50
119.182-99.182			(50 ksi)			(50 ksi)
T13	Solid Round	1	A570-50	Solid Round	1	A570-50
99.182-79.182			(50 ksi)			(50 ksi)
T14	Solid Round	1	A570-50	Solid Round	1	A570-50
79.182-59.182			(50 ksi)			(50 ksi)
T15	Solid Round	1	A570-50	Solid Round	1	A570-50
59.182-39.182			(50 ksi)			(50 ksi)
T16	Solid Round	1	A570-50	Solid Round	1	A570-50
39.182-19.182			(50 ksi)			(50 ksi)
T17	Solid Round	1 1/4	A570-50	Solid Round		A570-50
19.182-14.411			(50 ksi)			(50 ksi)
T18	Solid Round	7/8	A570-50	Solid Round		A570-50
14.411-11.830			(50 ksi)			(50 ksi)
T21 7.169-1.200	Solid Round		A570-50	Flat Bar	6 x 3/4	A36
			(50 ksi)			(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	None	Flat Bar		A570-50	Flat Bar	6 x 1	A36
311.351-310.351				(50 ksi)			(36 ksi)
T3	1	Solid Round	1	A570-50	Solid Round		A572-50
299.182-279.182				(50 ksi)			(50 ksi)
T4	1	Solid Round	1	A570-50	Solid Round		A572-50
279.182-259.182				(50 ksi)			(50 ksi)
T5	1	Solid Round	1	A570-50	Solid Round		A572-50
259.182-239.182				(50 ksi)			(50 ksi)
T6	1	Solid Round	1	A570-50	Solid Round		A572-50
239.182-219.182				(50 ksi)			(50 ksi)
T7	1	Solid Round	1	A570-50	Solid Round		A572-50
219.182-199.182				(50 ksi)			(50 ksi)
T8	1	Solid Round	1	A570-50	Solid Round		A572-50
199.182-179.182				(50 ksi)			(50 ksi)
T9	1	Solid Round	1	A570-50	Solid Round		A572-50
179.182-159.182				(50 ksi)			(50 ksi)
T10	1	Solid Round	1 1/4	A570-50	Solid Round		A572-50
159.182-139.182				(50 ksi)			(50 ksi)

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T11 139.182-119.182	1	Solid Round	1	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T12 119.182-99.182	1	Solid Round	1	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T13 99.182-79.182	1	Solid Round	1	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T14 79.182-59.182	1	Solid Round	1	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T15 59.182-39.182	1	Solid Round	1	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T16 39.182-19.182	1	Solid Round	1	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T17 19.182-14.411	1	Solid Round	7/8	A570-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T19 11.830-9.499	None	Flat Bar		A570-50 (50 ksi)	Flat Bar	6 x 3/4	A36 (36 ksi)
T20 9.499-7.169	None	Flat Bar		A570-50 (50 ksi)	Flat Bar	6 x 3/4	A36 (36 ksi)
T21 7.169-1.200	None	Flat Bar		A570-50 (50 ksi)	Flat Bar	6 x 3/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T19 11.830-9.499	A572-50 (50 ksi)	Horizontal (1)	Solid Round	7/8	1
T20 9.499-7.169	A572-50 (50 ksi)	Horizontal (1)	Solid Round	7/8	1
		Diagonal (1)	Solid Round	7/8	1

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 311.351-310.351	0.000	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 310.351-299.182	0.000	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 299.182-279.182	0.000	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 279.182-259.182	0.000	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
259.182-239.182			(36 ksi)						
T6	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
239.182-219.182			(36 ksi)						
T7	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
219.182-199.182			(36 ksi)						
T8	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
199.182-179.182			(36 ksi)						
T9	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
179.182-159.182			(36 ksi)						
T10	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
159.182-139.182			(36 ksi)						
T11	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
139.182-119.182			(36 ksi)						
T12	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
119.182-99.182			(36 ksi)						
T13	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
99.182-79.182			(36 ksi)						
T14	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
79.182-59.182			(36 ksi)						
T15	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
59.182-39.182			(36 ksi)						
T16	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
39.182-19.182			(36 ksi)						
T17	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
19.182-14.411			(36 ksi)						
T18	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
14.411-11.830			(36 ksi)						
T19	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
11.830-9.499			(36 ksi)						
T20	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
9.499-7.169			(36 ksi)						
T21	0.000	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
7.169-1.200			(36 ksi)						

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	No	Yes	1	1	1	1	1	1	1	1
311.351-310.351				1	1	1	1	1	1	1
T2	No	Yes	1	1	1	1	1	1	1	1
310.351-299.1				1	1	1	1	1	1	1

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
82										
T3	No	Yes	1	1	1	1	1	1	1	1
299.182-279.1				1	1	1	1	1	1	1
82										
T4	No	Yes	1	1	1	1	1	1	1	1
279.182-259.1				1	1	1	1	1	1	1
82										
T5	No	Yes	1	1	1	1	1	1	1	1
259.182-239.1				1	1	1	1	1	1	1
82										
T6	No	Yes	1	1	1	1	1	1	1	1
239.182-219.1				1	1	1	1	1	1	1
82										
T7	No	Yes	1	1	1	1	1	1	1	1
219.182-199.1				1	1	1	1	1	1	1
82										
T8	No	Yes	1	1	1	1	1	1	1	1
199.182-179.1				1	1	1	1	1	1	1
82										
T9	No	Yes	1	1	1	1	1	1	1	1
179.182-159.1				1	1	1	1	1	1	1
82										
T10	No	Yes	1	1	1	1	1	1	1	1
159.182-139.1				1	1	1	1	1	1	1
82										
T11	No	Yes	1	1	1	1	1	1	1	1
139.182-119.1				1	1	1	1	1	1	1
82										
T12	No	Yes	1	1	1	1	1	1	1	1
119.182-99.18				1	1	1	1	1	1	1
2										
T13	No	Yes	1	1	1	1	1	1	1	1
99.182-79.182				1	1	1	1	1	1	1
T14	No	Yes	1	1	1	1	1	1	1	1
79.182-59.182				1	1	1	1	1	1	1
T15	No	Yes	1	1	1	1	1	1	1	1
59.182-39.182				1	1	1	1	1	1	1
T16	No	Yes	1	1	1	1	1	1	1	1
39.182-19.182				1	1	1	1	1	1	1
T17	No	Yes	1	1	1	1	1	1	1	1
19.182-14.411				1	1	1	1	1	1	1
T18	No	Yes	1	1	1	1	1	1	1	1
14.411-11.830				1	1	1	1	1	1	1
T19	No	Yes	1	1	1	1	1	1	1	1
11.830-9.499				1	1	1	1	1	1	1
T20	No	Yes	1	1	1	1	1	1	1	1
9.499-7.169				1	1	1	1	1	1	1
T21	No	Yes	1	1	1	1	1	1	1	1
7.169-1.200				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 311.351-310.351	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 310.351-299.182	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 299.182-279.182	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 279.182-259.182	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 259.182-239.182	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 239.182-219.182	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 219.182-199.182	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 199.182-179.182	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 179.182-159.182	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 159.182-139.182	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
T11 139.182-119.182	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
T12 119.182-99.182	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
T13 99.182-79.182	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
T14 79.182-59.182	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
T15 59.182-39.182	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
T16 39.182-19.182	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
T17 19.182-14.411	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
T18 14.411-11.830	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
T19 11.830-9.499	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
T20 9.499-7.169	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
T21 7.169-1.200	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 311.351-310.351	Flange	1.7500 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 310.351-299.182	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
T3 299.182-279.182	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 279.182-259.182	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
T5 259.182-239.182	Sleeve DS	0.8750 A325N	5	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 239.182-219.182	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
T7 219.182-199.182	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 199.182-179.182	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
T9 179.182-159.182	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 159.182-139.182	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
T11 139.182-119.182	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 119.182-99.182	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
T13 99.182-79.182	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 79.182-59.182	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
T15 59.182-39.182	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T16 39.182-19.182	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
T17 19.182-14.411	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T18 14.411-11.830	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
T19 11.830-9.499	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T20 9.499-7.169	Sleeve DS	0.8750 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T21 7.169-1.200	Sleeve DS	0.8750 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 K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
299.182	BS	A	13/16	8.00	10%	24000	1.390	376.362	259.000	0.0000	23.000	100%
		B	3/4	6.80	10%	24000	1.180	418.436	263.000	0.0000	-29.000	100%
		C	3/4	6.80	10%	24000	1.180	381.857	259.500	0.0000	16.000	100%
229.182	BS	A	7/8	9.20	10%	24000	1.610	328.541	259.000	0.0000	23.000	100%
		B	13/16	8.00	10%	24000	1.390	366.207	263.000	0.0000	-29.000	100%
		C	13/16	8.00	10%	24000	1.390	333.353	259.500	0.0000	16.000	100%
149.182	BS	A	13/16	8.00	10%	24000	1.390	285.290	259.000	0.0000	23.000	100%
		B	7/8	9.20	10%	24000	1.610	315.049	263.000	0.0000	-29.000	100%
		C	7/8	9.20	10%	24000	1.610	288.895	259.500	0.0000	16.000	100%
89.1822	BS	A	3/4	6.80	10%	24000	1.180	264.325	259.000	0.0000	23.000	100%
		B	13/16	8.00	10%	24000	1.390	285.484	263.000	0.0000	-29.000	100%
		C	13/16	8.00	10%	24000	1.390	266.640	259.500	0.0000	16.000	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
299.182	Corner						
229.182	Corner						
149.182	Corner						
89.1822	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
299.182	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
229.182	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
149.182	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	
89.182	A572-50 (50 ksi)	Solid Round				A572-50 (50 ksi)	Solid Round	

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
299.182	0.52	0.49	0.45		12.030 6.0 sec/pulse	14.786 6.6 sec/pulse	12.361 6.1 sec/pulse	
229.182	0.53	0.51	0.46		9.287 5.3 sec/pulse	11.407 5.8 sec/pulse	9.488 5.3 sec/pulse	
149.182	0.40	0.51	0.47		7.001 4.6 sec/pulse	8.560 5.1 sec/pulse	7.226 4.6 sec/pulse	
89.1822	0.31	0.40	0.37		6.034 4.2 sec/pulse	7.016 4.6 sec/pulse	6.144 4.3 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
299.182	No	No			1	1	1	1
229.182	No	No			1	1	1	1
149.182	No	No			1	1	1	1
89.1822	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
299.182	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
229.182	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
149.182	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
89.1822	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
299.182	A	161.091	26	6	1.2096
	B	135.091	25	5	1.1843
	C	157.591	26	6	1.2064
229.182	A	126.091	24	5	1.1745
	B	100.091	22	5	1.1424
	C	122.591	24	5	1.1706
149.182	A	86.091	22	5	1.1219

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
	B	60.091	19	4	1.0746
	C	82.591	21	5	1.1164
89.1822	A	56.091	19	4	1.0657
	B	30.091	16	4	1.0000
	C	52.591	19	4	1.0575

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
299.182	A	47.1592	8.38 / 8.00	0.00	6.27	-5.57	-18.09	0.00	0.00
	B	51.6001	7.19 / 6.80	3.76	5.73	2.17	8.27	0.00	-14.32
	C	47.8178	7.13 / 6.80	-4.05	5.39	2.34	7.78	-0.00	13.47
			Sum:	**-0.29**	17.38	**-1.06**	**-2.05**	0.00	**-0.85**
229.182	A	38.8356	9.53 / 9.20	0.00	6.14	-7.29	-17.72	0.00	0.00
	B	44.7865	8.36 / 8.00	5.03	6.02	2.90	8.68	0.00	-15.04
	C	39.7182	8.30 / 8.00	-5.43	5.44	3.13	7.85	-0.00	13.59
			Sum:	**-0.40**	17.59	**-1.26**	**-1.18**	0.00	**-1.45**
149.182	A	26.2286	8.18 / 8.00	0.00	3.77	-7.25	-10.89	0.00	0.00
	B	34.4118	9.49 / 9.20	6.67	5.53	3.85	7.99	0.00	-13.83
	C	27.4293	9.41 / 9.20	-7.15	4.52	4.13	6.52	-0.00	11.30
			Sum:	**-0.48**	13.83	**0.73**	**3.62**	0.00	**-2.53**
89.1822	A	14.4888	6.88 / 6.80	0.00	1.87	-6.62	-5.39	0.00	0.00
	B	24.4346	8.16 / 8.00	6.37	3.54	3.68	5.11	0.00	-8.85
	C	15.9173	8.10 / 8.00	-6.70	2.39	3.87	3.45	-0.00	5.98
			Sum:	**-0.33**	7.80	**0.93**	**3.18**	0.00	**-2.87**

Guy-Mast Forces (Excluding Wind) - 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
299.182	A	47.1592	13.94 / 12.73	0.00	10.60	-9.05	-30.59	0.00	0.00
	B	51.6001	12.31 / 11.01	6.26	9.97	3.61	14.38	0.00	-24.91

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	K	K	K	K	kip-ft	kip-ft	kip-ft
	C	47.8178	12.25	-6.78	9.42	3.91	13.60	-0.00	23.55
			11.10						
			Sum:	**-0.52**	29.99	**-1.53**	**-2.61**	0.00	**-1.36**
229.182	A	38.8356	15.35	0.00	10.08	-11.58	-29.10	0.00	0.00
			14.42						
	B	44.7865	13.68	8.07	10.01	4.66	14.45	0.00	-25.03
			12.61						
	C	39.7182	13.62	-8.77	9.12	5.06	13.16	-0.00	22.80
			12.72						
			Sum:	**-0.70**	29.21	**-1.86**	**-1.48**	0.00	**-2.23**
149.182	A	26.2286	13.20	0.00	6.30	-11.60	-18.18	0.00	0.00
			12.69						
	B	34.4118	14.93	10.39	8.88	6.00	12.82	0.00	-22.21
			14.19						
	C	27.4293	14.92	-11.24	7.36	6.49	10.63	-0.00	18.41
			14.35						
			Sum:	**-0.85**	22.54	**0.88**	**5.27**	0.00	**-3.80**
89.1822	A	14.4888	11.20	0.00	3.24	-10.72	-9.36	0.00	0.00
			10.97						
	B	24.4346	12.79	9.91	5.72	5.72	8.25	0.00	-14.29
			12.37						
	C	15.9173	12.84	-10.57	3.99	6.10	5.76	-0.00	9.98
			12.57						
			Sum:	**-0.66**	12.95	**1.10**	**4.66**	0.00	**-4.32**

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	K	K	K	K	kip-ft	kip-ft	kip-ft
299.182	A	47.1592	8.38	0.00	6.27	-5.57	-18.09	0.00	0.00
			8.00						
	B	51.6001	7.19	3.76	5.73	2.17	8.27	0.00	-14.32
			6.80						
	C	47.8178	7.13	-4.05	5.39	2.34	7.78	-0.00	13.47
			6.80						
			Sum:	**-0.29**	17.38	**-1.06**	**-2.05**	0.00	**-0.85**
229.182	A	38.8356	9.53	0.00	6.14	-7.29	-17.72	0.00	0.00
			9.20						
	B	44.7865	8.36	5.03	6.02	2.90	8.68	0.00	-15.04
			8.00						
	C	39.7182	8.30	-5.43	5.44	3.13	7.85	-0.00	13.59
			8.00						
			Sum:	**-0.40**	17.59	**-1.26**	**-1.18**	0.00	**-1.45**
149.182	A	26.2286	8.18	0.00	3.77	-7.25	-10.89	0.00	0.00
			8.00						
	B	34.4118	9.49	6.67	5.53	3.85	7.99	0.00	-13.83
			9.20						
	C	27.4293	9.41	-7.15	4.52	4.13	6.52	-0.00	11.30
			9.20						
			Sum:	**-0.48**	13.83	**0.73**	**3.62**	0.00	**-2.53**
89.1822	A	14.4888	6.88	0.00	1.87	-6.62	-5.39	0.00	0.00

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	K	K	K	K	kip-ft	kip-ft	kip-ft
			6.80						
	B	24.4346	8.16	6.37	3.54	3.68	5.11	0.00	-8.85
			8.00						
	C	15.9173	8.10	-6.70	2.39	3.87	3.45	-0.00	5.98
			8.00						
			Sum:	**-0.33**	7.80	**0.93**	**3.18**	0.00	**-2.87**

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
299.182	A	256.11	276.18	9.503	10.16	8.992	10.73	8.490	11.35	8.000	12.03	7.523	12.78	7.062	13.59	6.619	14.48
	B	260.11	328.18	7.862	12.83	7.502	13.43	7.147	14.08	6.800	14.79	6.461	15.54	6.131	16.36	5.811	17.23
	C	256.61	283.18	8.050	10.48	7.625	11.05	7.208	11.68	6.800	12.36	6.403	13.11	6.019	13.93	5.650	14.81
229.182	A	256.11	206.18	11.494	7.46	10.710	8.00	9.944	8.60	9.200	9.29	8.484	10.06	7.801	10.92	7.138	11.91
	B	260.11	258.18	9.636	9.50	9.078	10.08	8.532	10.71	8.000	11.41	7.484	12.18	6.987	13.02	6.513	13.95
	C	256.61	213.18	9.933	7.67	9.272	8.20	8.627	8.81	8.000	9.49	7.395	10.25	6.817	11.10	6.256	12.08
149.182	A	256.11	126.18	10.654	5.27	9.743	5.76	8.855	6.33	8.000	7.00	7.186	7.79	6.426	8.70	5.731	9.74
	B	260.11	178.18	11.772	6.71	10.891	7.25	10.031	7.86	9.200	8.56	8.404	9.36	7.652	10.26	6.952	11.28
	C	256.61	133.18	12.201	5.46	11.170	5.96	10.167	6.54	9.200	7.23	8.280	8.02	7.421	8.94	6.634	9.98
89.1822	A	256.11	66.18	9.452	4.35	8.539	4.81	7.652	5.36	6.800	6.03	5.998	6.84	5.261	7.79	4.605	8.89
	B	260.11	118.18	10.727	5.24	9.789	5.74	8.877	6.33	8.000	7.02	7.168	7.82	6.393	8.76	5.689	9.83
	C	256.61	73.18	11.063	4.45	10.009	4.92	8.984	5.47	8.000	6.14	7.072	6.95	6.218	7.89	5.455	8.99

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" ***	B	Yes	Ar (CfAe)	111.500 - 14.200	0.0000	-0.38	12	6	0.5000	1.9800		0.82
1-5/8"	B	Yes	Ar (CfAe)	145.000 - 14.200	0.0000	0.32	15	9	0.5000	1.9800		0.82
1-5/8" ***	B	Yes	Ar (CfAe)	160.000 - 145.000	0.0000	0.32	12	6	0.5000	1.9800		0.82
1-5/8"	C	Yes	Ar (CfAe)	128.049 - 14.200	0.0000	-0.4	4	4	0.5000	1.9800		0.82
3/8"	C	Yes	Ar (CfAe)	251.799 - 14.200	1.7000	-0.4	1	1	0.3750	0.3750		0.18
EW71	C	Yes	Ar (CfAe)	196.049 - 14.200	0.0000	-0.3	1	1	0.5000	1.1313		0.45
1-5/8"	C	Yes	Ar (CfAe)	180.049 - 14.200	0.0000	-0.25	1	1	0.5000	1.9800		0.82
1"	C	Yes	Ar (CfAe)	311.340 - 12.200	0.0000	0	1	1	1.2500	1.0000		1.13
1-5/8"	C	Yes	Ar (CfAe)	128.049 - 14.200	0.0000	0.25	5	4	0.5000	1.9800		0.82
7/8"	C	Yes	Ar (CfAe)	261.049 - 14.200	0.0000	0.35	1	1	1.1100	1.1100		0.54
1/2"	C	Yes	Ar (CfAe)	21.049 - 14.200	0.0000	0.45	3	3	0.5000 0.5800	0.5800		0.25
1/2"	C	Yes	Ar (CfAe)	164.549 - 21.049	0.0000	0.45	2	2	0.5000 0.5800	0.5800		0.25
1/2" ***	C	Yes	Ar (CfAe)	213.049 - 165.700	0.0000	0.45	1	1	0.5000 0.5800	0.5800		0.25
1/4"	A	Yes	Ar (CfAe)	136.549 - 14.200	0.0000	-0.47	1	1	0.2500	0.2500		0.25
7/8"	A	Yes	Ar (CfAe)	235.049 - 14.200	0.0000	-0.45	1	1	1.1100	1.1100		0.54

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
3/8"	A	Yes	Ar (CfAe)	146.549 - 14.200	0.0000	-0.42	3	3	0.3750	0.3750		0.18
3/8"	A	Yes	Ar (CfAe)	220.049 - 146.549	0.0000	-0.42	2	2	0.3750	0.3750		0.18
3"	A	No	Ar (CfAe)	311.340 - 14.200	0.0000	-0.35	1	1	3.0100	3.0100		1.78
***												
1-5/8"	A	Yes	Ar (CfAe)	120.549 - 14.200	0.0000	0.3	6	6	0.5000	1.9800		0.82
3/8"	A	Yes	Ar (CfAe)	48.049 - 14.200	2.0000	0.2	1	1	0.3750	0.3750		0.18
3"	A	Yes	Ar (CfAe)	308.049 - 14.200	0.0000	0.45	1	1	3.0100	3.0100		1.78
***												
7/8"	A	Yes	Ar (CfAe)	243.049 - 14.200	-1.5000	-0.35	2	2	0.5000	1.1100		0.54
1/4"	A	Yes	Ar (CfAe)	233.049 - 14.200	-1.5000	-0.4	2	2	0.2500	0.2500		0.25
3/8"	A	Yes	Ar (CfAe)	232.049 - 14.200	-1.5000	-0.45	1	1	0.3750	0.3750		0.18
1-5/8"	A	Yes	Ar (CfAe)	165.049 - 14.200	-1.5000	-0.3	2	2	0.5000	1.9800		0.82
***												
Safety Line 3/8	A	Yes	Ar (CfAe)	311.340 - 1.200	0.0000	0	1	1	0.3750	0.3750		0.22
***												
***												
3/4"	B	Yes	Ar (CfAe)	111.500 - 14.200	0.0000	-0.23	4	2	0.5000	0.9950		0.47
3/8"	B	Yes	Ar (CfAe)	111.500 - 14.200	0.0000	-0.19	2	2	0.5000	0.3750		0.18
***												

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
***								
3"	A	No	Inside Pole	346.351 - 311.360	1	No Ice	0.000	1.78
						1/2" Ice	0.000	1.78
						1" Ice	0.000	1.78
						2" Ice	0.000	1.78
						4" Ice	0.000	1.78
***								

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
L1	346.351-329.351	A	0.000	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	329.351-311.351	A	0.000	0.000	0.000	0.000	0.03
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	311.351-310.351	A	0.279	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.082	0.000	0.000	0.000	0.00
T2	310.351-299.182	A	5.375	0.000	0.000	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	0.931	0.000	0.000	0.000	0.01
T3	299.182-279.182	A	10.658	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	1.667	0.000	0.000	0.000	0.02

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
T4	279.182-259.182	A	10.658	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	1.839	0.000	0.000	0.000	0.02
T5	259.182-239.182	A	11.374	0.000	0.000	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	3.911	0.000	0.000	0.000	0.04
T6	239.182-219.182	A	16.860	0.000	0.000	0.000	0.12
		B	0.000	0.000	0.000	0.000	0.00
		C	4.142	0.000	0.000	0.000	0.04
T7	219.182-199.182	A	18.917	0.000	0.000	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.00
		C	4.812	0.000	0.000	0.000	0.04
T8	199.182-179.182	A	18.917	0.000	0.000	0.000	0.13
		B	0.000	0.000	0.000	0.000	0.00
		C	6.841	0.000	0.000	0.000	0.05
T9	179.182-159.182	A	20.853	0.000	0.000	0.000	0.14
		B	0.810	0.000	0.000	0.000	0.01
		C	10.498	0.000	0.000	0.000	0.07
T10	159.182-139.182	A	25.747	0.000	0.000	0.000	0.16
		B	22.680	0.000	0.000	0.000	0.21
		C	11.261	0.000	0.000	0.000	0.07
T11	139.182-119.182	A	27.856	0.000	0.000	0.000	0.18
		B	29.700	0.000	0.000	0.000	0.25
		C	22.964	0.000	0.000	0.000	0.14
T12	119.182-99.182	A	46.358	0.000	0.000	0.000	0.27
		B	44.707	0.000	0.000	0.000	0.39
		C	37.660	0.000	0.000	0.000	0.22
T13	99.182-79.182	A	46.358	0.000	0.000	0.000	0.27
		B	54.067	0.000	0.000	0.000	0.49
		C	37.660	0.000	0.000	0.000	0.22
T14	79.182-59.182	A	46.358	0.000	0.000	0.000	0.27
		B	54.067	0.000	0.000	0.000	0.49
		C	37.660	0.000	0.000	0.000	0.22
T15	59.182-39.182	A	46.635	0.000	0.000	0.000	0.27
		B	54.067	0.000	0.000	0.000	0.49
		C	37.660	0.000	0.000	0.000	0.22
T16	39.182-19.182	A	46.983	0.000	0.000	0.000	0.27
		B	54.067	0.000	0.000	0.000	0.49
		C	37.751	0.000	0.000	0.000	0.22
T17	19.182-14.411	A	11.208	0.000	0.000	0.000	0.06
		B	12.898	0.000	0.000	0.000	0.12
		C	9.215	0.000	0.000	0.000	0.05
T18	14.411-11.830	A	0.570	0.000	0.000	0.000	0.00
		B	0.571	0.000	0.000	0.000	0.01
		C	0.575	0.000	0.000	0.000	0.00
T19	11.830-9.499	A	0.073	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
T20	9.499-7.169	A	0.073	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
T21	7.169-1.200	A	0.187	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 K
L1	346.351-329.351	A	1.322	0.000	0.000	0.000	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	329.351-311.351	A	1.314	0.000	0.000	0.000	0.000	0.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	311.351-310.351	A	1.309	0.710	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.298	0.000	0.000	0.000	0.00
T2	310.351-299.182	A	1.306	12.165	0.000	0.000	0.000	0.21
		B		0.000	0.000	0.000	0.000	0.00
		C		3.361	0.000	0.000	0.000	0.05
T3	299.182-279.182	A	1.298	23.634	0.000	0.000	0.000	0.40
		B		0.000	0.000	0.000	0.000	0.00
		C		5.992	0.000	0.000	0.000	0.10
T4	279.182-259.182	A	1.286	23.523	0.000	0.000	0.000	0.40
		B		0.000	0.000	0.000	0.000	0.00
		C		6.528	0.000	0.000	0.000	0.10
T5	259.182-239.182	A	1.275	24.583	0.519	0.000	0.000	0.42
		B		0.000	0.000	0.000	0.000	0.00
		C		15.088	0.000	0.000	0.000	0.21
T6	239.182-219.182	A	1.262	40.660	3.315	0.000	0.000	0.67
		B		0.000	0.000	0.000	0.000	0.00
		C		16.760	0.000	0.000	0.000	0.23
T7	219.182-199.182	A	1.248	49.307	4.767	0.000	0.000	0.79
		B		0.000	0.000	0.000	0.000	0.00
		C		20.177	0.000	0.000	0.000	0.27
T8	199.182-179.182	A	1.233	48.908	4.767	0.000	0.000	0.78
		B		0.000	0.000	0.000	0.000	0.00
		C		26.927	0.000	0.000	0.000	0.36
T9	179.182-159.182	A	1.217	50.628	5.979	0.000	0.000	0.82
		B		0.301	0.845	0.000	0.000	0.03
		C		34.339	0.483	0.000	0.000	0.47
T10	159.182-139.182	A	1.198	55.279	9.360	0.000	0.000	0.95
		B		7.295	24.274	0.000	0.000	0.84
		C		34.263	1.800	0.000	0.000	0.49
T11	139.182-119.182	A	1.178	58.928	11.562	0.000	0.000	1.01
		B		7.226	33.067	0.000	0.000	0.99
		C		40.260	12.795	0.000	0.000	0.80
T12	119.182-99.182	A	1.154	65.370	30.817	0.000	0.000	1.44
		B		17.697	48.228	0.000	0.000	1.59
		C		47.678	26.600	0.000	0.000	1.19
T13	99.182-79.182	A	1.127	64.354	30.817	0.000	0.000	1.41
		B		23.906	57.683	0.000	0.000	1.95
		C		46.939	26.600	0.000	0.000	1.17
T14	79.182-59.182	A	1.093	63.114	30.817	0.000	0.000	1.37
		B		23.455	57.683	0.000	0.000	1.91
		C		46.038	26.600	0.000	0.000	1.13
T15	59.182-39.182	A	1.049	63.334	30.817	0.000	0.000	1.33
		B		22.871	57.683	0.000	0.000	1.87
		C		44.868	26.600	0.000	0.000	1.09
T16	39.182-19.182	A	1.000	63.667	30.817	0.000	0.000	1.30
		B		22.217	57.683	0.000	0.000	1.82
		C		43.560	26.768	0.000	0.000	1.05
T17	19.182-14.411	A	1.000	15.188	7.351	0.000	0.000	0.31
		B		5.300	13.760	0.000	0.000	0.44
		C		10.391	6.775	0.000	0.000	0.26
T18	14.411-11.830	A	1.000	1.141	0.325	0.000	0.000	0.02
		B		0.235	0.609	0.000	0.000	0.02
		C		0.960	0.300	0.000	0.000	0.02
T19	11.830-9.499	A	1.000	0.461	0.000	0.000	0.000	0.00

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
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T20	9.499-7.169	A	1.000	0.461	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
T21	7.169-1.200	A	1.000	1.181	0.000	0.000	0.000	0.01
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
L1	346.351-329.351		0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
L2	329.351-311.351		0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
T1	311.351-310.351	A	0.000	0.054	0.015	0.123
		B	0.000	0.000	0.000	0.000
		C	0.000	0.065	0.041	0.149
T2	310.351-299.182	A	0.201	2.042	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.073	0.990	0.000	0.000
T3	299.182-279.182	A	0.434	4.291	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.128	1.799	0.000	0.000
T4	279.182-259.182	A	0.434	4.241	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.141	1.947	0.000	0.000
T5	259.182-239.182	A	0.489	4.692	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.301	4.470	0.000	0.000
T6	239.182-219.182	A	0.910	10.220	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.318	4.929	0.000	0.000
T7	219.182-199.182	A	1.069	13.097	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.370	5.886	0.000	0.000
T8	199.182-179.182	A	1.069	12.880	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.526	7.786	0.000	0.000
T9	179.182-159.182	A	1.217	13.610	0.000	0.000
		B	0.062	0.328	0.000	0.000
		C	0.807	9.970	0.000	0.000
T10	159.182-139.182	A	1.849	16.438	0.000	0.000
		B	2.023	9.328	0.000	0.000
		C	1.004	10.656	0.000	0.000
T11	139.182-119.182	A	1.756	17.211	0.000	0.000
		B	2.283	11.268	0.000	0.000
		C	1.765	14.836	0.000	0.000
T12	119.182-99.182	A	3.178	24.065	0.000	0.000
		B	3.437	18.168	0.000	0.000
		C	2.895	20.470	0.000	0.000
T13	99.182-79.182	A	3.178	23.399	0.000	0.000

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
		B	4.156	22.096	0.000	0.000
		C	2.895	19.916	0.000	0.000
T14	79.182-59.182	A	3.178	22.597	0.000	0.000
		B	4.156	21.502	0.000	0.000
		C	2.895	19.249	0.000	0.000
T15	59.182-39.182	A	3.199	22.048	0.000	0.000
		B	4.156	20.739	0.000	0.000
		C	2.895	18.400	0.000	0.000
T16	39.182-19.182	A	3.226	21.448	0.000	0.000
		B	4.156	19.896	0.000	0.000
		C	2.902	17.512	0.000	0.000
T17	19.182-14.411	A	1.142	6.939	0.000	0.000
		B	1.471	6.437	0.000	0.000
		C	1.051	5.798	0.000	0.000
T18	14.411-11.830	A	0.052	0.429	0.000	0.000
		B	0.058	0.262	0.000	0.000
		C	0.058	0.392	0.000	0.000
T19	11.830-9.499	A	0.007	0.154	0.016	0.099
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T20	9.499-7.169	A	0.010	0.219	0.016	0.099
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T21	7.169-1.200	A	0.020	0.414	0.034	0.233
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	346.351-329.351	0.0000	0.0000	0.0000	0.0000
L2	329.351-311.351	0.0000	0.0000	0.0000	0.0000
T1	311.351-310.351	-0.7789	0.3141	-0.9929	0.3651
T2	310.351-299.182	-2.5304	-0.8911	-1.9906	-0.2804
T3	299.182-279.182	-2.5494	-1.3954	-1.9717	-0.5403
T4	279.182-259.182	-2.5972	-1.3454	-2.0212	-0.4986
T5	259.182-239.182	-3.1092	-0.6407	-2.1157	0.1780
T6	239.182-219.182	-4.6706	0.3618	-2.5811	0.7149
T7	219.182-199.182	-5.4704	0.8600	-3.0167	1.0263
T8	199.182-179.182	-5.0461	1.2927	-2.7602	1.4545
T9	179.182-159.182	-4.3655	2.2181	-2.0195	1.8284
T10	159.182-139.182	0.6038	3.2744	0.1347	1.8091
T11	139.182-119.182	2.0643	4.6852	0.4852	2.4594
T12	119.182-99.182	1.6975	0.2567	0.3648	0.7930
T13	99.182-79.182	1.9153	-1.0934	0.4607	0.2769
T14	79.182-59.182	1.9153	-1.0934	0.4873	0.2537
T15	59.182-39.182	1.8971	-1.1205	0.4733	0.1329
T16	39.182-19.182	1.8610	-1.1457	0.4438	-0.0045
T17	19.182-14.411	1.5838	-0.9793	0.3123	0.0689
T18	14.411-11.830	0.2390	0.0131	-0.1891	0.1735
T19	11.830-9.499	-0.0580	-0.0335	-0.1410	-0.0814
T20	9.499-7.169	-0.0518	-0.0299	-0.0887	-0.0512
T21	7.169-1.200	-0.0406	-0.0234	-0.0964	-0.0557

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
1-ft Side Arm	C	From Leg	5.000 0.000 0.000	-90.0000	21.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.080 0.120 0.160 0.240 0.400	0.350 0.530 0.710 1.070 1.790	0.01 0.01 0.02 0.02 0.04
14-Element 4.5 ft Yagi	C	From Leg	1.000 0.000 0.000	-90.0000	21.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.500 2.200 2.900 4.300 7.100	1.500 2.200 2.900 4.300 7.100	0.04 0.04 0.05 0.07 0.09
***									
1" dia x 16" Pipe	C	From Leg	1.000 0.000 0.000	30.0000	48.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.110 0.200 0.290 0.470 0.830	0.110 0.200 0.290 0.470 0.830	0.00 0.00 0.00 0.01 0.01
GPS	C	From Leg	1.000 0.000 0.000	0.0000	48.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.620 0.730 0.840 1.060 1.500	0.620 0.730 0.840 1.060 1.500	0.01 0.02 0.03 0.04 0.07
***									
2.4" Dia x 5-ft Pipe	A	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 1.500 1.800 2.400 3.600	1.200 1.500 1.800 2.400 3.600	0.02 0.03 0.04 0.06 0.09
2.4" Dia x 5-ft Pipe	B	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 1.500 1.800 2.400 3.600	1.200 1.500 1.800 2.400 3.600	0.02 0.03 0.04 0.06 0.09
2.4" Dia x 5-ft Pipe	C	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.200 1.500 1.800 2.400 3.600	1.200 1.500 1.800 2.400 3.600	0.02 0.03 0.04 0.06 0.09
(3) T-Frames	C	None		0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	22.470 31.990 41.510 60.550 98.630	22.470 31.990 41.510 60.550 98.630	1.03 1.50 1.97 2.90 4.76
(2) 800 10121 w/ Mount Pipe	A	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.07 0.11 0.17 0.30 0.68
(2) 800 10121 w/ Mount Pipe	B	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice	5.685 6.182 6.676 7.695	4.600 5.351 6.046 7.526	0.07 0.11 0.17 0.30

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 K
						4" Ice	9.858	10.832	0.68
(2) 800 10121 w/ Mount Pipe	C	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.685 6.182 6.676 7.695 9.858	4.600 5.351 6.046 7.526 10.832	0.07 0.11 0.17 0.30 0.68
(2) DTMABP7819VG12A	A	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.710 0.830 0.950 1.190 1.670	0.710 0.830 0.950 1.190 1.670	0.01 0.02 0.02 0.03 0.05
(2) DTMABP7819VG12A	B	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.710 0.830 0.950 1.190 1.670	0.710 0.830 0.950 1.190 1.670	0.01 0.02 0.02 0.03 0.05
(2) DTMABP7819VG12A	C	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.710 0.830 0.950 1.190 1.670	0.710 0.830 0.950 1.190 1.670	0.01 0.02 0.02 0.03 0.05
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.295 13.994 14.702 16.144 19.130	9.179 10.478 11.491 13.551 17.871	0.09 0.19 0.29 0.52 1.16
HPA-65R-BUU-H6 w/ Mount Pipe	B	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.398 14.094 14.758 16.113 18.942	8.113 9.304 10.209 12.175 16.354	0.08 0.17 0.27 0.50 1.11
HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	13.295 13.994 14.702 16.144 19.130	9.179 10.478 11.491 13.551 17.871	0.09 0.19 0.29 0.52 1.16
RRUS-11	A	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.06 0.07 0.10 0.15 0.30
RRUS-11	B	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.06 0.07 0.10 0.15 0.30
RRUS-11	C	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.942 3.172 3.410 3.913 5.023	1.246 1.412 1.587 1.963 2.819	0.06 0.07 0.10 0.15 0.30
RRUS-12	A	From Leg	4.000 0.000 0.500	0.0000	111.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.150 3.387 3.634 4.152 5.293	1.416 1.590 1.772 2.164 3.051	0.06 0.08 0.11 0.16 0.33
RRUS-12	B	From Leg	4.000	0.0000	111.500	No Ice	3.150	1.416	0.06

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
			0.000			1/2" Ice	3.387	1.590	0.08
			0.500			1" Ice	3.634	1.772	0.11
						2" Ice	4.152	2.164	0.16
						4" Ice	5.293	3.051	0.33
RRUS-12	C	From Leg	4.000	0.0000	111.500	No Ice	3.150	1.416	0.06
			0.000			1/2" Ice	3.387	1.590	0.08
			0.500			1" Ice	3.634	1.772	0.11
						2" Ice	4.152	2.164	0.16
						4" Ice	5.293	3.051	0.33
RRUS A2	A	From Leg	4.000	0.0000	111.500	No Ice	2.411	0.533	0.02
			0.000			1/2" Ice	2.619	0.665	0.03
			0.500			1" Ice	2.837	0.806	0.05
						2" Ice	3.297	1.114	0.09
						4" Ice	4.322	1.833	0.20
RRUS A2	B	From Leg	4.000	0.0000	111.500	No Ice	2.411	0.533	0.02
			0.000			1/2" Ice	2.619	0.665	0.03
			0.500			1" Ice	2.837	0.806	0.05
						2" Ice	3.297	1.114	0.09
						4" Ice	4.322	1.833	0.20
RRUS A2	C	From Leg	4.000	0.0000	111.500	No Ice	2.411	0.533	0.02
			0.000			1/2" Ice	2.619	0.665	0.03
			0.500			1" Ice	2.837	0.806	0.05
						2" Ice	3.297	1.114	0.09
						4" Ice	4.322	1.833	0.20
860 10025	A	From Leg	4.000	0.0000	111.500	No Ice	0.163	0.136	0.00
			0.000			1/2" Ice	0.229	0.199	0.00
			0.500			1" Ice	0.302	0.270	0.01
						2" Ice	0.476	0.439	0.01
						4" Ice	0.927	0.879	0.05
860 10025	B	From Leg	4.000	0.0000	111.500	No Ice	0.163	0.136	0.00
			0.000			1/2" Ice	0.229	0.199	0.00
			0.500			1" Ice	0.302	0.270	0.01
						2" Ice	0.476	0.439	0.01
						4" Ice	0.927	0.879	0.05
860 10025	C	From Leg	4.000	0.0000	111.500	No Ice	0.163	0.136	0.00
			0.000			1/2" Ice	0.229	0.199	0.00
			0.500			1" Ice	0.302	0.270	0.01
						2" Ice	0.476	0.439	0.01
						4" Ice	0.927	0.879	0.05
DC6-48-60-18-8F	C	From Leg	4.000	0.0000	111.500	No Ice	2.567	4.317	0.02
			0.000			1/2" Ice	2.798	4.596	0.05
			0.500			1" Ice	3.038	4.885	0.09
						2" Ice	3.543	5.488	0.17
						4" Ice	4.658	6.797	0.38
***									
APXV18-206517S w/Mount Pipe	A	From Leg	0.500	0.0000	120.500	No Ice	5.404	4.700	0.06
			0.000			1/2" Ice	5.960	5.860	0.10
			0.000			1" Ice	6.481	6.734	0.15
						2" Ice	7.547	8.515	0.28
						4" Ice	9.919	12.277	0.68
APXV18-206517S w/Mount Pipe	B	From Leg	0.500	0.0000	120.500	No Ice	5.404	4.700	0.06
			0.000			1/2" Ice	5.960	5.860	0.10
			0.000			1" Ice	6.481	6.734	0.15
						2" Ice	7.547	8.515	0.28
						4" Ice	9.919	12.277	0.68
APXV18-206517S w/Mount Pipe	C	From Leg	0.500	0.0000	120.500	No Ice	5.404	4.700	0.06
			0.000			1/2" Ice	5.960	5.860	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
			0.000			1" Ice	6.481	6.734	0.15
						2" Ice	7.547	8.515	0.28
						4" Ice	9.919	12.277	0.68
***									
30" Sidearm Mount	B	From Leg	1.250	0.0000	145.000	No Ice	0.350	0.350	0.02
			0.000			1/2" Ice	0.480	0.480	0.03
			0.000			1" Ice	0.610	0.610	0.04
						2" Ice	0.870	0.870	0.06
						4" Ice	1.390	1.390	0.10
12-ft x 1" Omni	B	From Leg	2.500	0.0000	145.000	No Ice	1.200	1.200	0.01
			0.000			1/2" Ice	2.420	2.420	0.03
			0.000			1" Ice	3.640	3.640	0.04
						2" Ice	6.080	6.080	0.06
						4" Ice	10.960	10.960	0.10
***									
2.4" Dia x 4-ft Mount Pipe	A	From Leg	0.500	0.0000	146.500	No Ice	0.870	0.870	0.01
			0.000			1/2" Ice	1.120	1.120	0.02
			0.000			1" Ice	1.370	1.370	0.03
						2" Ice	1.870	1.870	0.05
						4" Ice	2.870	2.870	0.08
12" x 4.5" x 6.25" TMA	A	From Leg	0.250	0.0000	146.500	No Ice	0.530	0.730	0.01
			0.000			1/2" Ice	0.640	0.850	0.02
			0.000			1" Ice	0.750	0.970	0.03
						2" Ice	0.970	1.210	0.04
						4" Ice	1.410	1.690	0.06
***									
(3) T-Frames	C	None		0.0000	160.000	No Ice	22.450	22.450	1.02
						1/2" Ice	33.500	33.500	1.47
						1" Ice	44.550	44.550	1.93
						2" Ice	66.650	66.650	2.84
						4" Ice	110.850	110.850	4.66
APX16DWV_16DWVS w/ Mount Pipe	A	From Leg	2.500	0.0000	160.000	No Ice	7.312	4.503	0.07
			0.000			1/2" Ice	8.013	5.565	0.12
			0.000			1" Ice	8.614	6.341	0.18
						2" Ice	9.846	7.926	0.33
						4" Ice	12.456	11.495	0.74
APX16DWV_16DWVS w/ Mount Pipe	A	From Leg	2.500	0.0000	160.000	No Ice	7.312	4.503	0.07
			0.000			1/2" Ice	8.013	5.565	0.12
			0.000			1" Ice	8.614	6.341	0.18
						2" Ice	9.846	7.926	0.33
						4" Ice	12.456	11.495	0.74
(2) APX16DWV_16DWVS w/ Mount Pipe	C	From Leg	2.500	0.0000	160.000	No Ice	7.312	4.503	0.07
			0.000			1/2" Ice	8.013	5.565	0.12
			0.000			1" Ice	8.614	6.341	0.18
						2" Ice	9.846	7.926	0.33
						4" Ice	12.456	11.495	0.74
KRY 112 71	A	From Leg	2.250	0.0000	160.000	No Ice	0.681	0.450	0.01
			0.000			1/2" Ice	0.802	0.559	0.02
			0.000			1" Ice	0.932	0.677	0.03
						2" Ice	1.219	0.939	0.04
						4" Ice	1.896	1.566	0.11
KRY 112 71	B	From Leg	2.250	0.0000	160.000	No Ice	0.681	0.450	0.01
			0.000			1/2" Ice	0.802	0.559	0.02
			0.000			1" Ice	0.932	0.677	0.03
						2" Ice	1.219	0.939	0.04
						4" Ice	1.896	1.566	0.11
(2) KRY 112 71	C	From Leg	2.250	0.0000	160.000	No Ice	0.681	0.450	0.01

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
			0.000			1/2" Ice	0.802	0.559	0.02
			0.000			1" Ice	0.932	0.677	0.03
						2" Ice	1.219	0.939	0.04
						4" Ice	1.896	1.566	0.11
(2) 2.4" x 7-ft Pipe	A	From Leg	2.250	0.0000	160.000	No Ice	1.660	1.660	0.04
			0.000			1/2" Ice	2.390	2.390	0.06
			0.000			1" Ice	3.120	3.120	0.07
						2" Ice	4.580	4.580	0.09
						4" Ice	7.500	7.500	0.14
(2) 2.4" x 7-ft Pipe	B	From Leg	2.250	0.0000	160.000	No Ice	1.660	1.660	0.04
			0.000			1/2" Ice	2.390	2.390	0.06
			0.000			1" Ice	3.120	3.120	0.07
						2" Ice	4.580	4.580	0.09
						4" Ice	7.500	7.500	0.14
2.4" x 7-ft Pipe	C	From Leg	2.250	0.0000	160.000	No Ice	1.660	1.660	0.04
			0.000			1/2" Ice	2.390	2.390	0.06
			0.000			1" Ice	3.120	3.120	0.07
						2" Ice	4.580	4.580	0.09
						4" Ice	7.500	7.500	0.14
***									
2.4" Dia x 10-ft Mount Pipe	C	From Leg	0.500	0.0000	164.500	No Ice	2.380	2.380	0.04
			0.000			1/2" Ice	3.400	3.400	0.05
			0.000			1" Ice	4.420	4.420	0.07
						2" Ice	6.460	6.460	0.11
						4" Ice	10.540	10.540	0.18
6810 1 Bay FM	C	From Leg	1.000	0.0000	164.500	No Ice	0.200	0.200	0.00
			0.000			1/2" Ice	0.360	0.360	0.00
			0.000			1" Ice	0.520	0.520	0.00
						2" Ice	0.840	0.840	0.01
						4" Ice	1.480	1.480	0.01
***									
36" Standoff	A	From Leg	1.500	15.0000	165.000	No Ice	0.720	2.080	0.04
			0.000			1/2" Ice	0.940	2.880	0.06
			0.000			1" Ice	1.160	3.680	0.08
						2" Ice	1.600	5.280	0.12
						4" Ice	2.480	8.480	0.19
BCD-80010	A	From Leg	3.000	0.0000	165.000	No Ice	2.947	2.947	0.03
			0.000			1/2" Ice	4.110	4.110	0.05
			6.000			1" Ice	5.290	5.290	0.08
						2" Ice	7.160	7.160	0.16
						4" Ice	10.031	10.031	0.42
***									
2.4" x 25' Mount Pipe	B	From Leg	0.500	0.0000	180.000	No Ice	5.950	5.950	0.09
			0.000			1/2" Ice	8.480	8.480	0.14
			0.000			1" Ice	11.010	11.010	0.18
						2" Ice	16.070	16.070	0.27
						4" Ice	26.190	26.190	0.45
(6) Micronetixx LP-1900-B-12 Antennas	B	From Leg	1.000	35.0000	180.000	No Ice	7.300	2.650	0.05
			0.000			1/2" Ice	7.680	2.970	0.09
			0.000			1" Ice	8.060	3.290	0.13
						2" Ice	8.820	3.930	0.21
						4" Ice	10.340	5.210	0.37
***									
4.5" Dia x 6' Dish Mount	B	From Leg	1.000	0.0000	196.000	No Ice	2.250	2.250	0.06
			0.000			1/2" Ice	2.620	2.620	0.08
			0.000			1" Ice	2.990	2.990	0.10
						2" Ice	3.730	3.730	0.14

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
						4" Ice	5.210	5.210	0.22
T.S. 3" x 3" x 6.5'	B	From Face	0.000 0.000 0.000	0.0000	196.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.250 3.770 4.290 5.330 7.410	3.250 3.770 4.290 5.330 7.410	0.06 0.08 0.09 0.13 0.20
2.4" Dia x 6.5' Mount Pipe	B	From Face	0.000 0.000 0.000	0.0000	196.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.540 2.160 2.780 4.020 6.500	1.540 2.160 2.780 4.020 6.500	0.02 0.04 0.05 0.08 0.14
***									
(1) Side Arm Mount	C	From Leg	2.000 0.000 0.000	0.0000	203.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.980 1.700 2.420 3.860 6.740	2.180 3.800 5.420 8.660 15.140	0.04 0.06 0.08 0.12 0.20
DB420-B	C	From Leg	4.000 0.000 10.000	0.0000	203.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.330 5.994 8.658 13.986 24.642	3.330 5.994 8.658 13.986 24.642	0.03 0.04 0.05 0.07 0.12
***									
Antel WPA-800120	B	From Leg	0.000 0.000 0.000	30.0000	220.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.450 7.020 7.590 8.730 11.010	6.450 7.020 7.590 8.730 11.010	0.02 0.06 0.10 0.17 0.33
36"x36"x12" TMA	C	None		0.0000	1.200	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	12.600 13.071 13.551 14.536 16.610	4.200 4.515 4.840 5.514 6.965	0.10 0.17 0.25 0.43 0.85
***									
TMA 6" x 6" x 2"	A	From Leg	0.750 0.000 0.000	15.0000	225.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.350 0.430 0.510 0.670 0.990	0.120 0.170 0.220 0.320 0.520	0.02 0.02 0.02 0.03 0.04
TMA 6" x 6" x 2"	B	From Leg	0.750 0.000 0.000	15.0000	225.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.350 0.430 0.510 0.670 0.990	0.120 0.170 0.220 0.320 0.520	0.02 0.02 0.02 0.03 0.04
2'10" x 7" x 2" Panel w/ 48" Mount Pipe	A	From Leg	1.000 0.000 0.000	15.0000	225.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.600 2.940 3.280 3.960 5.320	1.790 2.250 2.710 3.630 5.470	0.04 0.07 0.09 0.14 0.23
2'10" x 7" x 2" Panel w/ 48" Mount Pipe	B	From Leg	1.000 0.000 0.000	15.0000	225.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.600 2.940 3.280 3.960 5.320	1.790 2.250 2.710 3.630 5.470	0.04 0.07 0.09 0.14 0.23
(2) 1" x 8" Pipe	A	From Leg	0.330 0.000 0.000	15.0000	225.500	No Ice 1/2" Ice 1" Ice	0.050 0.100 0.150	0.050 0.100 0.150	0.00 0.00 0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	0.250	0.250	0.00
						4" Ice	0.450	0.450	0.01
(2) 1" x 8" Pipe	B	From Leg	0.330 0.000 0.000	15.0000	225.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.050 0.100 0.150 0.250 0.450	0.050 0.100 0.150 0.250 0.450	0.00 0.00 0.00 0.00 0.01
***									
TMA 12" x 12" x 2"	B	From Leg	1.000 0.000 0.000	0.0000	232.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.400 1.560 1.720 2.040 2.680	0.230 0.330 0.430 0.630 1.030	0.01 0.02 0.03 0.04 0.07
***									
TMA 18" x 6" x 6"	B	From Leg	1.000 0.000 0.000	0.0000	243.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.050 1.210 1.370 1.690 2.330	1.050 1.210 1.370 1.690 2.330	0.00 0.02 0.03 0.00 0.00
Antel WPA-800120	B	From Leg	1.000 0.000 0.000	0.0000	243.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.450 7.020 7.590 8.730 11.010	6.450 7.020 7.590 8.730 11.010	0.02 0.06 0.10 0.17 0.33
***									
2.4" x 25' Mount Pipe	C	From Leg	0.500 0.000 0.000	0.0000	251.800	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.950 8.480 11.010 16.070 26.190	5.950 8.480 11.010 16.070 26.190	0.09 0.14 0.18 0.27 0.45
Antenna Concepts ACB16A w/ Mount	C	From Leg	2.500 0.000 0.000	0.0000	251.800	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	19.290 24.180 29.070 38.850 58.410	14.110 18.330 22.550 30.990 47.870	0.20 0.30 0.40 0.60 1.00
***									
(1) Side Arm Mount	C	From Leg	1.500 0.000 0.000	0.0000	251.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.940 1.480 2.020 3.100 5.260	1.410 2.170 2.930 4.450 7.490	0.03 0.04 0.06 0.08 0.14
DB420-B	C	From Leg	3.000 0.000 10.000	0.0000	251.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.330 5.994 8.658 13.986 24.642	3.330 5.994 8.658 13.986 24.642	0.03 0.04 0.05 0.07 0.12
***									
L2.5x2.5x0.25, 10-ft Length	B	Stand-Off Right	2.500 0.000 0.000	0.0000	309.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	4.170 5.310 6.450 8.730 13.290	4.170 5.310 6.450 8.730 13.290	0.04 0.06 0.09 0.14 0.23
2.9" x 22-ft Mt. Pipe	B	Stand-Off Right	7.500 0.000 0.000	0.0000	297.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.380 8.610 10.840 15.300 24.220	6.380 8.610 10.840 15.300 24.220	0.13 0.17 0.22 0.31 0.50

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 K
Scala SCA 4DR-8S	B	Stand-Off Right	8.000 0.000 0.000	0.0000	308.300	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	16.980 17.720 18.460 19.940 22.900	9.250 9.860 10.470 11.690 14.130	0.05 0.15 0.24 0.43 0.81
***									
Control Box 12" x 13.5" x 6.5"	C	From Face	0.250 0.000 0.000	0.0000	5.700	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.580 1.740 1.900 2.220 2.860	0.760 0.880 1.000 1.240 1.720	0.05 0.06 0.07 0.10 0.14
Detuning Box 29" x 24" x 12"	C	From Face	0.500 0.000 0.000	0.0000	10.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	6.770 7.110 7.450 8.130 9.490	3.380 3.650 3.920 4.460 5.540	0.05 0.10 0.14 0.23 0.41
Detuner	C	From Leg	0.000 0.000 0.000	30.0000	136.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.250 2.100 2.950 4.650 8.050	3.080 5.260 7.440 11.800 20.520	0.03 0.05 0.07 0.13 0.23
Control Box 12" x 13.5" x 6.5"	B	From Leg	0.250 0.000 0.000	0.0000	141.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	1.580 1.740 1.900 2.220 2.860	0.760 0.880 1.000 1.240 1.720	0.05 0.06 0.07 0.10 0.14
CC806-12	C	From Face	0.000 0.000 0.000	0.0000	236.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.220 7.000 8.780 12.340 19.460	5.220 7.000 8.780 12.340 19.460	0.05 0.09 0.12 0.20 0.35
***									
ACTIVE LEVEL (3) T-Frames	C	None		0.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	21.880 30.680 39.480 57.080 92.280	21.880 30.680 39.480 57.080 92.280	1.07 1.48 1.90 2.73 4.40
SLCP 2x6015 w/ Mount Pipe	A	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.718 11.416 12.090 13.447 16.279	9.996 11.341 12.452 14.573 19.030	0.06 0.15 0.25 0.47 1.09
SLCP 2x6015 w/ Mount Pipe	B	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	10.718 11.416 12.090 13.447 16.279	9.996 11.341 12.452 14.573 19.030	0.06 0.15 0.25 0.47 1.09
SACP 2x5516 w/ Mount Pipe	A	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.519 6.025 6.525 7.557 9.744	5.021 5.810 6.526 8.083 11.476	0.04 0.09 0.14 0.27 0.66
SACP 2x5516 w/ Mount Pipe	B	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice	5.519 6.025 6.525 7.557	5.021 5.810 6.526 8.083	0.04 0.09 0.14 0.27

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 K
						4" Ice	9.744	11.476	0.66
(2) Andrew HBX-6517DS w/ Mount Pipe	C	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.503 6.073 6.644 7.785 10.067	5.019 6.221 7.422 9.824 14.629	0.04 0.09 0.13 0.23 0.41
(2) Andrew LNX-6514DS w/ Mount Pipe	C	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	8.568 9.220 9.872 11.176 13.785	7.004 8.185 9.367 11.729 16.454	0.06 0.13 0.19 0.33 0.59
FD9R6004/2C Diplexer	A	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.00 0.01 0.01 0.02 0.06
FD9R6004/2C Diplexer	B	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.00 0.01 0.01 0.02 0.06
(2) FD9R6004/2C Diplexer	C	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.367 0.451 0.543 0.755 1.281	0.085 0.136 0.196 0.343 0.740	0.00 0.01 0.01 0.02 0.06
RRH2x40-AWS	A	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.04 0.06 0.08 0.13 0.28
RRH2x40-AWS	B	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	2.522 2.753 2.993 3.499 4.615	1.589 1.795 2.010 2.465 3.479	0.04 0.06 0.08 0.13 0.28
DB-T1-6Z-8AB-0Z	C	From Leg	2.250 0.000 2.000	40.0000	129.500	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	5.600 5.915 6.240 6.914 8.365	2.333 2.558 2.791 3.284 4.373	0.04 0.08 0.12 0.21 0.45
***									
30" x 18" Dia	C	None		0.0000	346.300	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.000 3.270 3.540 4.080 5.160	3.000 3.270 3.540 4.080 5.160	0.06 0.09 0.13 0.20 0.35
ERI 3 Bay FM	C	From Leg	1.500 0.000 0.000	0.0000	332.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	9.800 10.400 11.000 12.200 14.600	9.800 10.400 11.000 12.200 14.600	0.32 0.42 0.52 0.71 1.10
2.4" Dia x 18" Pipe	C	From Leg	0.750 0.000 0.000	0.0000	332.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	0.240 0.360 0.480 0.720 1.200	0.240 0.360 0.480 0.720 1.200	0.01 0.01 0.01 0.02 0.03

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
***								

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
2-ft Dish w/o Radome	A	Paraboloid w/o Radome	From Leg	1.500 0.000 0.000	70.0000		146.500	2.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.140 3.410 3.680 4.220 5.300	0.04 0.06 0.08 0.12 0.19
***											
Cablewave PA6-112	B	Paraboloid w/Radome	From Leg	1.500 0.000 0.000	0.0000		196.000	6.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	28.270 29.070 29.870 31.470 34.670	0.59 0.74 0.89 1.19 1.79
***											
SP2-4.7NS	B	Paraboloid w/o Radome	From Leg	1.500 0.000 0.000	60.0000		232.000	2.000	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	3.140 3.410 3.680 4.220 5.300	0.02 0.04 0.06 0.09 0.16
***											
6-ft x 3-ft Grid	B	Grid	From Leg	1.000 0.000 0.000	30.0000		235.000	4.790	No Ice 1/2" Ice 1" Ice 2" Ice 4" Ice	19.630 20.290 20.950 22.270 24.910	0.13 0.23 0.33 0.54 0.96
***											

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 60 deg - No Ice+Guy
5	Dead+Wind 90 deg - No Ice+Guy
6	Dead+Wind 120 deg - No Ice+Guy
7	Dead+Wind 150 deg - No Ice+Guy
8	Dead+Wind 180 deg - No Ice+Guy
9	Dead+Wind 210 deg - No Ice+Guy
10	Dead+Wind 240 deg - No Ice+Guy

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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	346.351 - 329.351	4.535	37	0.2369	0.7473
L2	329.351 - 311.351	3.726	37	0.2133	0.7473
T1	311.351 - 310.351	3.191	37	0.0470	0.7473
T2	310.351 - 299.182	3.182	37	0.0470	0.7478
T3	299.182 - 279.182	3.089	37	0.0464	0.7381
T4	279.182 - 259.182	2.952	37	0.0478	0.7095
T5	259.182 - 239.182	2.800	37	0.0494	0.6785
T6	239.182 - 219.182	2.625	37	0.0503	0.6478
T7	219.182 - 199.182	2.479	37	0.0528	0.6125
T8	199.182 - 179.182	2.349	37	0.0501	0.5785
T9	179.182 - 159.182	2.169	37	0.0522	0.5300
T10	159.182 - 139.182	1.944	37	0.0516	0.4672
T11	139.182 - 119.182	1.784	35	0.0419	0.4297
T12	119.182 - 99.1822	1.743	35	0.0460	0.3843
T13	99.1822 - 79.1822	1.589	33	0.0524	0.3351
T14	79.1822 - 59.1822	1.395	33	0.0515	0.2889
T15	59.1822 - 39.1822	1.163	33	0.0679	0.2459
T16	39.1822 - 19.1822	0.834	33	0.0880	0.2029
T17	19.1822 - 14.4112	0.415	33	0.1040	0.1620
T18	14.4112 - 11.8302	0.306	33	0.1064	0.1547
T19	11.8302 - 9.49947	0.246	33	0.1075	0.1515
T20	9.49947 - 7.16874	0.192	33	0.1084	0.1494
T21	7.16874 - 1.2	0.138	33	0.1089	0.1469

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
346.300	30" x 18" Dia	37	4.533	0.2370	0.7473	40522
332.000	ERI 3 Bay FM	37	3.843	0.2313	0.7475	14105
309.500	L2.5x2.5x0.25, 10-ft Length	37	3.175	0.0471	0.7479	15497
308.300	Scala SCA 4DR-8S	37	3.164	0.0473	0.7478	31502
299.182	Guy	37	3.089	0.0464	0.7381	59592
297.000	2.9" x 22-ft Mt. Pipe	37	3.072	0.0463	0.7350	61089
251.800	2.4" x 25' Mount Pipe	37	2.736	0.0498	0.6674	249694
251.000	(1) Side Arm Mount	37	2.728	0.0498	0.6662	214779
243.000	TMA 18" x 6" x 6"	37	2.658	0.0502	0.6540	88792
236.500	CC806-12	37	2.603	0.0504	0.6432	69299
235.000	6-ft x 3-ft Grid	37	2.591	0.0505	0.6406	70590
232.000	SP2-4.7NS	37	2.568	0.0506	0.6353	72911
229.182	Guy	37	2.547	0.0509	0.6302	74094
225.500	TMA 6" x 6" x 2"	37	2.521	0.0518	0.6236	75699
220.000	Antel WPA-800120	37	2.484	0.0527	0.6139	82073
203.000	(1) Side Arm Mount	37	2.376	0.0502	0.5855	75012
196.000	Cablewave PA6-112	37	2.325	0.0500	0.5723	50990
180.000	2.4" x 25' Mount Pipe	37	2.178	0.0520	0.5325	42511
165.000	36" Standoff	37	2.008	0.0532	0.4838	123118
164.500	2.4" Dia x 10-ft Mount Pipe	37	2.002	0.0531	0.4823	116446
160.000	(3) T-Frames	37	1.952	0.0520	0.4694	70039
149.182	Guy	37	1.847	0.0463	0.4468	68336
146.500	2-ft Dish w/o Radome	37	1.825	0.0448	0.4423	69094
145.000	30" Sidearm Mount	37	1.812	0.0440	0.4398	69525
141.500	Control Box 12" x 13.5" x 6.5"	36	1.792	0.0425	0.4338	71798
136.500	Detuner	35	1.782	0.0415	0.4245	116432
129.500	(3) T-Frames	35	1.774	0.0422	0.4093	51668
120.500	APXV18-206517S w/Mount Pipe	35	1.749	0.0454	0.3876	28719
111.500	2.4" Dia x 5-ft Pipe	35	1.695	0.0493	0.3653	38076
89.182	Guy	33	1.496	0.0517	0.3115	140074
48.000	1" dia x 16" Pipe	33	0.992	0.0793	0.2221	46005
21.000	1-ft Side Arm	33	0.456	0.1029	0.1651	88948
10.500	Detuning Box 29" x 24" x 12"	33	0.215	0.1080	0.1503	422586
5.700	Control Box 12" x 13.5" x 6.5"	33	0.104	0.1091	0.1452	881537
1.200	36"x36"x12" TMA	0	0.000	0.1101	0.1404	881537

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	346.351 - 329.351	12.288	12	0.6044	1.7733
L2	329.351 - 311.351	10.199	12	0.5470	1.7734
T1	311.351 - 310.351	8.788	12	0.1159	1.7736
T2	310.351 - 299.182	8.761	12	0.1153	1.7747
T3	299.182 - 279.182	8.490	12	0.1075	1.7500
T4	279.182 - 259.182	8.090	12	0.1089	1.6809
T5	259.182 - 239.182	7.660	12	0.1078	1.6060
T6	239.182 - 219.182	7.182	12	0.1050	1.5318
T7	219.182 - 199.182	6.795	12	0.0990	1.4474
T8	199.182 - 179.182	6.462	12	0.1017	1.3680

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T9	179.182 - 159.182	6.111	13	0.1240	1.2512
T10	159.182 - 139.182	5.590	13	0.1285	1.0979
T11	139.182 - 119.182	5.364	10	0.1099	1.0083
T12	119.182 - 99.1822	5.208	10	0.1261	0.9012
T13	99.1822 - 79.1822	4.725	10	0.1514	0.7842
T14	79.1822 - 59.1822	4.103	10	0.1594	0.6753
T15	59.1822 - 39.1822	3.379	10	0.2054	0.5748
T16	39.1822 - 19.1822	2.401	10	0.2581	0.4744
T17	19.1822 - 14.4112	1.188	10	0.2996	0.3787
T18	14.4112 - 11.8302	0.876	10	0.3060	0.3617
T19	11.8302 - 9.49947	0.705	10	0.3087	0.3542
T20	9.49947 - 7.16874	0.551	10	0.3110	0.3494
T21	7.16874 - 1.2	0.396	10	0.3123	0.3435

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
346.300	30" x 18" Dia	12	12.282	0.6047	1.7734	20258
332.000	ERI 3 Bay FM	12	10.502	0.5921	1.7740	6993
309.500	L2.5x2.5x0.25, 10-ft Length	12	8.740	0.1153	1.7751	6056
308.300	Scala SCA 4DR-8S	12	8.710	0.1150	1.7747	11588
299.182	Guy	12	8.490	0.1075	1.7500	8241
297.000	2.9" x 22-ft Mt. Pipe	12	8.442	0.1082	1.7422	8926
251.800	2.4" x 25' Mount Pipe	12	7.482	0.1086	1.5792	60228
251.000	(1) Side Arm Mount	12	7.462	0.1086	1.5763	59425
243.000	TMA 18" x 6" x 6"	12	7.270	0.1070	1.5467	32272
236.500	CC806-12	12	7.123	0.1031	1.5208	25410
235.000	6-ft x 3-ft Grid	12	7.091	0.1018	1.5145	25770
232.000	SP2-4.7NS	12	7.030	0.0991	1.5017	26871
229.182	Guy	12	6.974	0.0989	1.4895	28002
225.500	TMA 6" x 6" x 2"	12	6.905	0.0988	1.4737	29632
220.000	Antel WPA-800120	12	6.809	0.0988	1.4507	34073
203.000	(1) Side Arm Mount	12	6.530	0.0977	1.3844	26242
196.000	Cablewave PA6-112	13	6.419	0.1053	1.3532	19672
180.000	2.4" x 25' Mount Pipe	13	6.130	0.1232	1.2573	17412
165.000	36" Standoff	13	5.744	0.1307	1.1383	54892
164.500	2.4" Dia x 10-ft Mount Pipe	13	5.731	0.1306	1.1345	54910
160.000	(3) T-Frames	13	5.611	0.1291	1.1030	31555
149.182	Guy	10	5.399	0.1181	1.0487	30595
146.500	2-ft Dish w/o Radome	10	5.390	0.1152	1.0379	31706
145.000	30" Sidearm Mount	10	5.385	0.1136	1.0321	32363
141.500	Control Box 12" x 13.5" x 6.5"	10	5.372	0.1109	1.0181	34016
136.500	Detuner	10	5.354	0.1098	0.9961	63071
129.500	(3) T-Frames	10	5.318	0.1137	0.9603	20517
120.500	APXV18-206517S w/Mount Pipe	10	5.228	0.1243	0.9090	11292
111.500	2.4" Dia x 5-ft Pipe	10	5.056	0.1382	0.8559	15109
89.182	Guy	10	4.422	0.1525	0.7285	71486
48.000	1" dia x 16" Pipe	10	2.866	0.2354	0.5191	17738
21.000	1-ft Side Arm	10	1.306	0.2967	0.3860	34599
10.500	Detuning Box 29" x 24" x 12"	10	0.617	0.3101	0.3515	163827
5.700	Control Box 12" x 13.5" x 6.5"	10	0.298	0.3130	0.3396	340743
1.200	36"x36"x12" TMA	0	0.000	0.3156	0.3283	340743

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	311.351	Leg	A325N	1.7500	2	2.35	105.83	0.022 ✔	1.333	Bolt Tension
T3	299.182	Leg	A325N	0.8750	5	2.75	25.26	0.109 ✔	1	Bolt DS
T5	259.182	Leg	A325N	0.8750	5	3.24	25.26	0.128 ✔	1	Bolt DS
T7	219.182	Leg	A325N	0.8750	5	6.93	25.26	0.275 ✔	1.333	Bolt DS
T9	179.182	Leg	A325N	0.8750	5	7.71	25.26	0.305 ✔	1	Bolt DS
T11	139.182	Leg	A325N	0.8750	5	10.18	25.26	0.403 ✔	1	Bolt DS
T13	99.1822	Leg	A325N	0.8750	5	12.13	25.26	0.480 ✔	1	Bolt DS
T15	59.1822	Leg	A325N	0.8750	5	12.74	25.26	0.505 ✔	1	Bolt DS
T17	19.1822	Leg	A325N	0.8750	5	13.02	25.26	0.516 ✔	1	Bolt DS
T19	11.8302	Leg	A325N	0.8750	5	13.08	25.26	0.518 ✔	1	Bolt DS
T20	9.49947	Leg	A325N	0.8750	5	12.77	25.26	0.506 ✔	1	Bolt DS

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.
T3	299.182 (A) (983)	13/16 BS	8.00	80.00	15.10	40.00	2.000	5.299 ✔
	299.182 (B) (982)	3/4 BS	6.80	68.00	15.91	34.00	2.000	4.273 ✔
	299.182 (C) (981)	3/4 BS	6.80	68.00	15.00	34.00	2.000	4.533 ✔
T6	229.182 (A) (986)	7/8 BS	9.20	92.00	18.83	46.00	2.000	4.886 ✔
	229.182 (B) (985)	13/16 BS	8.00	80.00	18.79	40.00	2.000	4.258 ✔
	229.182 (C) (984)	13/16 BS	8.00	80.00	17.51	40.00	2.000	4.569 ✔
T10	149.182 (A) (989)	13/16 BS	8.00	80.00	18.91	40.00	2.000	4.231 ✔
	149.182 (B) (988)	7/8 BS	9.20	92.00	21.23	46.00	2.000	4.333 ✔
	149.182 (C) (987)	7/8 BS	9.20	92.00	19.81	46.00	2.000	4.644 ✔
T13	89.182 (A) (992)	3/4 BS	6.80	68.00	15.32	34.00	2.000	4.437 ✔
	89.182 (B) (991)	13/16 BS	8.00	80.00	16.59	40.00	2.000	4.821 ✔
	89.182 (C) (990)	13/16 BS	8.00	80.00	15.70	40.00	2.000	5.096 ✔

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
L1	346.351 - 329.351 (1)	P10x.365 (10.75 OD)	17.000	35.000	114.3	10.988	11.9083	-1.10	130.85	0.008
L2	329.351 - 311.351 (2)	P10x.365 (10.75 OD)	18.000	35.000	114.3	10.988	11.9083	-1.87	130.85	0.014

Pole 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 $\frac{f_{by}}{F_{by}}$
L1	346.351 - 329.351 (1)	P10x.365 (10.75 OD)	6.02	-2.417	23.100	0.105	0.00	0.000	23.100	0.000
L2	329.351 - 311.351 (2)	P10x.365 (10.75 OD)	22.72	-9.115	23.100	0.395	0.00	0.000	23.100	0.000

Pole 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
L1	346.351 - 329.351 (1)	P10x.365 (10.75 OD)	0.008	0.105	0.000	0.113 ✔	1.066	H1-3 ✔
L2	329.351 - 311.351 (2)	P10x.365 (10.75 OD)	0.014	0.395	0.000	0.409 ✔	1.066	H1-3 ✔

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	311.351 - 310.351	2 3/4	1.000	1.000	17.5 K=1.00	1.00	28.562	5.9396	-1.40	169.65	0.008*
T2	310.351 - 299.182	2 3/4	11.169	2.719	47.5 K=1.00	1.00	24.741	5.9396	-11.42	146.95	0.078
T3	299.182 - 279.182	2 3/4	20.000	2.333	40.7 K=1.00	1.00	25.730	5.9396	-13.75	152.82	0.090*
T4	279.182 - 259.182	2 3/4	20.000	2.333	40.7 K=1.00	1.00	25.730	5.9396	-14.54	152.82	0.095*
T5	259.182 -	2 3/4	20.000	2.333	40.7	1.00	25.730	5.9396	-16.22	152.82	0.106*

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 $\frac{P}{P_a}$
	239.182				K=1.00						
T6	239.182 - 219.182	2 3/4	20.000	2.333	40.7 K=1.00	1.00	25.730	5.9396	-25.96	152.82	0.170*
T7	219.182 - 199.182	2 3/4	20.000	2.333	40.7 K=1.00	1.00	25.730	5.9396	-29.28	152.82	0.192*
T8	199.182 - 179.182	2 3/4	20.000	2.333	40.7 K=1.00	1.00	25.730	5.9396	-32.97	152.82	0.216*
T9	179.182 - 159.182	2 3/4	20.000	2.333	40.7 K=1.00	1.00	25.730	5.9396	-38.53	152.82	0.252*
T10	159.182 - 139.182	3	20.000	2.333	37.3 K=1.00	1.00	26.201	7.0686	-47.79	185.20	0.258*
T11	139.182 - 119.182	3	20.000	2.333	37.3 K=1.00	1.00	26.201	7.0686	-50.88	185.20	0.275*
T12	119.182 - 99.1822	3	20.000	2.333	37.3 K=1.00	1.00	26.201	7.0686	-55.13	185.20	0.298*
T13	99.1822 - 79.1822	3	20.000	2.333	37.3 K=1.00	0.96	25.229	7.0686	-60.67	178.33	0.340*
T14	79.1822 - 59.1822	3	20.000	2.333	37.3 K=1.00	0.96	25.229	7.0686	-62.27	178.33	0.349*
T15	59.1822 - 39.1822	3	20.000	2.333	37.3 K=1.00	0.96	25.229	7.0686	-63.71	178.33	0.357*
T16	39.1822 - 19.1822	3	20.000	2.333	37.3 K=1.00	0.96	25.229	7.0686	-65.02	178.33	0.365*
T17	19.1822 - 14.4112	3	4.771	2.302	36.8 K=1.00	0.96	25.229	7.0686	-65.10	178.33	0.365*
T18	14.4112 - 11.8302	3	2.581	2.581	41.3 K=1.00	0.98	25.229	7.0686	-64.57	178.33	0.362*
T19	11.8302 - 9.49947	3	2.331	1.165	18.6 K=1.00	0.89	25.229	7.0686	-65.41	178.33	0.367*
T20	9.49947 - 7.16874	3	2.331	1.165	18.6 K=1.00	0.89	25.229	7.0686	-63.86	178.33	0.358*
T21	7.16874 - 1.2	3	6.630	2.893	46.3 K=1.00	1.00	24.919	7.0686	-72.49	176.14	0.412*

* DL controls

Leg Bending Design Data (Compression)

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	311.351 - 310.351	2 3/4	1.11	-6.500	37.500	0.173	0.00	0.000	37.500	0.000
T2	310.351 - 299.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	299.182 - 279.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	279.182 - 259.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	259.182 - 239.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	239.182 - 219.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

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 $\frac{f_{by}}{F_{by}}$
T7	219.182 - 199.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	199.182 - 179.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T9	179.182 - 159.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T10	159.182 - 139.182	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	139.182 - 119.182	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	119.182 - 99.1822	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T13	99.1822 - 79.1822	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T14	79.1822 - 59.1822	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T15	59.1822 - 39.1822	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T16	39.1822 - 19.1822	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T17	19.1822 - 14.4112	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T18	14.4112 - 11.8302	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T19	11.8302 - 9.49947	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T20	9.49947 - 7.16874	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T21	7.16874 - 1.2	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Compression)

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	311.351 - 310.351	2 3/4	0.008	0.173	0.000	0.182* ✔	1.000	H1-3 ✔
T2	310.351 - 299.182	2 3/4	0.078	0.000	0.000	0.078 ✔	1.333	H1-3 ✔
T3	299.182 - 279.182	2 3/4	0.090	0.000	0.000	0.090* ✔	1.000	H1-3 ✔
T4	279.182 - 259.182	2 3/4	0.095	0.000	0.000	0.095* ✔	1.000	H1-3 ✔
T5	259.182 - 239.182	2 3/4	0.106	0.000	0.000	0.106* ✔	1.000	H1-3 ✔
T6	239.182 - 219.182	2 3/4	0.170	0.000	0.000	0.170* ✔	1.000	H1-3 ✔
T7	219.182 - 199.182	2 3/4	0.192	0.000	0.000	0.192* ✔	1.000	H1-3 ✔
T8	199.182 - 179.182	2 3/4	0.216	0.000	0.000	0.216* ✔	1.000	H1-3 ✔
T9	179.182 - 159.182	2 3/4	0.252	0.000	0.000	0.252* ✔	1.000	H1-3 ✔
T10	159.182 - 139.182	3	0.258	0.000	0.000	0.258* ✔	1.000	H1-3 ✔
T11	139.182 -	3	0.275	0.000	0.000	0.275* ✔	1.000	H1-3 ✔

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
T12	119.182 119.182 - 99.1822	3	0.298	0.000	0.000	0.298* ✔	1.000	H1-3 ✔
T13	99.1822 - 79.1822	3	0.340	0.000	0.000	0.340* ✔	1.000	H1-3 ✔
T14	79.1822 - 59.1822	3	0.349	0.000	0.000	0.349* ✔	1.000	H1-3 ✔
T15	59.1822 - 39.1822	3	0.357	0.000	0.000	0.357* ✔	1.000	H1-3 ✔
T16	39.1822 - 19.1822	3	0.365	0.000	0.000	0.365* ✔	1.000	H1-3 ✔
T17	19.1822 - 14.4112	3	0.365	0.000	0.000	0.365* ✔	1.000	H1-3 ✔
T18	14.4112 - 11.8302	3	0.362	0.000	0.000	0.362* ✔	1.000	H1-3 ✔
T19	11.8302 - 9.49947	3	0.367	0.000	0.000	0.367* ✔	1.000	H1-3 ✔
T20	9.49947 - 7.16874	3	0.358	0.000	0.000	0.358* ✔	1.000	H1-3 ✔
T21	7.16874 - 1.2	3	0.412	0.000	0.000	0.412* ✔	1.000	H1-3 ✔

* 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 $\frac{P}{P_a}$
T2	310.351 - 299.182	7/8	5.692	2.715	134.1 K=0.90	8.309	0.6013	-1.41	5.00	0.282 ✔
T3	299.182 - 279.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-1.39	5.32	0.261 ✔
T4	279.182 - 259.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-1.10	5.32	0.206 ✔
T5	259.182 - 239.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-2.31	5.32	0.435 ✔
T6	239.182 - 219.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-2.73	5.32	0.514 ✔
T7	219.182 - 199.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-2.57	5.32	0.483 ✔
T8	199.182 - 179.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-2.11	5.32	0.396 ✔
T9	179.182 - 159.182	7/8	5.518	2.632	130.0 K=0.90	8.841	0.6013	-2.80	5.32	0.526 ✔
T10	159.182 - 139.182	1	5.518	2.621	113.2 K=0.90	11.649	0.7854	-3.67	9.15	0.401 ✔
T11	139.182 - 119.182	7/8	5.518	2.621	129.4 K=0.90	8.919	0.6013	-3.46	5.36	0.645 ✔
T12	119.182 - 99.1822	7/8	5.518	2.621	129.4 K=0.90	8.919	0.6013	-3.24	5.36	0.604 ✔
T13	99.1822 - 79.1822	7/8	5.518	2.621	129.4 K=0.90	8.919	0.6013	-3.37	5.36	0.629 ✔

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 $\frac{P}{P_a}$
T14	79.1822 - 59.1822	7/8	5.518	2.621	129.4 K=0.90	8.919	0.6013	-2.53	5.36	0.472 ✔
T15	59.1822 - 39.1822	7/8	5.518	2.621	129.4 K=0.90	8.919	0.6013	-1.65	5.36	0.307 ✔
T16	39.1822 - 19.1822	7/8	5.518	2.621	129.4 K=0.90	8.919	0.6013	-1.98	5.36	0.368 ✔
T17	19.1822 - 14.4112	1	5.505	2.615	113.0 K=0.90	11.704	0.7854	-2.37	9.19	0.258 ✔
T18	14.4112 - 11.8302	1	5.627	2.673	115.5 K=0.90	11.201	0.7854	-2.29	8.80	0.260 ✔
T19	11.8302 - 9.49947	1 1/4	3.418	3.247	87.3 K=0.70	17.517	1.2272	-2.30	21.50	0.107 ✔
T20	9.49947 - 7.16874	1 1/4	3.418	3.247	87.3 K=0.70	17.517	1.2272	-2.85	21.50	0.133 ✔
T21	7.16874 - 1.2	1 1/4	3.080	2.412	96.0 K=1.04	15.611	1.2272	-8.56	19.16	0.447* ✔

* DL controls

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	311.351 - 310.351	6 x 1	5.000	4.771	198.3 K=1.00	21.600	6.0000	0.00	22.78	0.000
T19	11.8302 - 9.49947	6 x 3/4 KL/R > 200 (C) - 923	5.000	4.750	263.3 K=1.00	2.154	4.5000	-1.13	9.70	0.117*
T20	9.49947 - 7.16874	6 x 3/4 KL/R > 200 (C) - 950	5.000	4.750	263.3 K=1.00	2.154	4.5000	-1.28	9.70	0.132*

* DL controls

Horizontal 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	311.351 - 310.351	6 x 1	-0.28	-0.556	27.000	0.021	-0.00	-0.003	27.000	0.000
T19	11.8302 - 9.49947	6 x 3/4	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T20	9.49947 - 7.16874	6 x 3/4	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000

Horizontal 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	311.351 - 310.351	6 x 1	0.000	0.021	0.000	0.021 ✔	1.333	H1-3 ✔
T19	11.8302 - 9.49947	6 x 3/4	0.117	0.000	0.000	0.117* ✔	1.000	H1-3 ✔
T20	9.49947 - 7.16874	6 x 3/4	0.132	0.000	0.000	0.132* ✔	1.000	H1-3 ✔

* DL controls

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 $\frac{P}{P_a}$
T2	310.351 - 299.182	1 1/4	5.000	4.771	128.2 K=0.70	9.080	1.2272	-0.21	11.14	0.019 ✔
T4	279.182 - 259.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.13	4.56	0.028 ✔
T5	259.182 - 239.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.07	4.56	0.015 ✔
T6	239.182 - 219.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.39	4.56	0.085 ✔
T7	219.182 - 199.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.58	4.56	0.127 ✔
T8	199.182 - 179.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.31	4.56	0.068 ✔
T9	179.182 - 159.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.36	4.56	0.078 ✔
T10	159.182 - 139.182	1 1/4	5.000	4.750	127.7 K=0.70	9.160	1.2272	-0.87	11.24	0.078 ✔
T11	139.182 - 119.182	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.63	4.60	0.138 ✔
T13	99.1822 - 79.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.55	4.60	0.119 ✔
T14	79.1822 - 59.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.29	4.60	0.063 ✔
T16	39.1822 - 19.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.07	4.60	0.016 ✔
T17	19.1822 - 14.4112	1 1/4	5.000	4.750	127.7 K=0.70	9.160	1.2272	-0.06	11.24	0.006 ✔

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 $\frac{P}{P_a}$
T3	299.182 - 279.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.11	4.56	0.024 ✔
T4	279.182 - 259.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.06	4.56	0.014 ✔
T5	259.182 - 239.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.47	4.56	0.103 ✔
T6	239.182 - 219.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.54	4.56	0.118 ✔
T7	219.182 - 199.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.29	4.56	0.064 ✔
T8	199.182 - 179.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.06	4.56	0.012 ✔
T9	179.182 - 159.182	1	5.000	4.771	160.3 K=0.70	5.811	0.7854	-0.48	4.56	0.106 ✔
T10	159.182 - 139.182	1 1/4	5.000	4.750	127.7 K=0.70	9.160	1.2272	-0.74	11.24	0.066 ✔
T11	139.182 - 119.182	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.10	4.60	0.023 ✔
T12	119.182 - 99.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.48	4.60	0.104 ✔
T13	99.1822 - 79.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.40	4.60	0.086 ✔
T14	79.1822 - 59.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.12	4.60	0.026 ✔
T16	39.1822 - 19.1822	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.05	4.60	0.012 ✔

Mid 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 $\frac{P}{P_a}$
T11	139.182 - 119.182	1	5.000	4.750	159.6 K=0.70	5.863	0.7854	-0.14	4.60	0.030 ✔

Redundant Horizontal (1) 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 $\frac{P}{P_a}$
T19	11.8302 - 9.49947	7/8	1.250	1.125	67.9 K=1.10	21.326	0.6013	-1.13	12.82	0.088* ✔
T20	9.49947 - 7.16874	7/8	1.250	1.125	67.9 K=1.10	21.326	0.6013	-1.11	12.82	0.086* ✔

* DL controls

Redundant Diagonal (1) 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 $\frac{P}{P_a}$
T20	9.49947 - 7.16874	7/8	1.709	1.538	89.1 K=1.06	17.126	0.6013	-1.22	10.30	0.118 * ✔

* 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	311.351 - 310.351	2 3/4	1.000	1.000	17.5	30.000	5.9396	0.58	178.19	0.003
T2	310.351 - 299.182	2 3/4	11.169	2.719	47.5	30.000	5.9396	8.77	178.19	0.049
T6	239.182 - 219.182	2 3/4	20.000	2.333	40.7	30.000	5.9396	4.87	178.19	0.027
T8	199.182 - 179.182	2 3/4	20.000	2.333	40.7	30.000	5.9396	0.32	178.19	0.002
T11	139.182 - 119.182	3	20.000	2.333	37.3	32.500	4.3026	1.92	139.83	0.014 #
T12	119.182 - 99.1822	3	20.000	2.333	37.3	30.000	7.0686	2.14	212.06	0.010

Leg Bending Design Data (Tension)

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	311.351 - 310.351	2 3/4	0.99	5.843	37.500	0.156	0.00	0.000	37.500	0.000
T2	310.351 - 299.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	239.182 - 219.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	199.182 - 179.182	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	139.182 - 119.182	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	119.182 - 99.1822	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Tension)

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	311.351 - 310.351	2 3/4	0.003	0.156	0.000	0.159 ✔	1.333	H2-1 ✔
T2	310.351 - 299.182	2 3/4	0.049	0.000	0.000	0.049 ✔	1.333	H2-1 ✔
T6	239.182 - 219.182	2 3/4	0.027	0.000	0.000	0.027 ✔	1.333	H2-1 ✔
T8	199.182 - 179.182	2 3/4	0.002	0.000	0.000	0.002 ✔	1.333	H2-1 ✔
T11	139.182 - 119.182	3	0.014	0.000	0.000	0.014 # ✔	1.333	H2-1 ✔
T12	119.182 - 99.1822	3	0.010	0.000	0.000	0.010 ✔	1.333	H2-1 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	310.351 - 299.182	7/8	5.692	2.715	149.0	30.000	0.6013	1.54	18.04	0.085 ✔
T3	299.182 - 279.182	7/8	5.518	2.632	144.4	30.000	0.6013	1.35	18.04	0.075 ✔
T4	279.182 - 259.182	7/8	5.518	2.632	144.4	30.000	0.6013	1.04	18.04	0.058 ✔
T5	259.182 - 239.182	7/8	5.518	2.632	144.4	30.000	0.6013	2.25	18.04	0.125 ✔
T6	239.182 - 219.182	7/8	5.518	2.632	144.4	30.000	0.6013	2.62	18.04	0.145 ✔
T7	219.182 - 199.182	7/8	5.518	2.632	144.4	30.000	0.6013	2.43	18.04	0.135 ✔
T8	199.182 - 179.182	7/8	5.518	2.632	144.4	30.000	0.6013	1.92	18.04	0.106 ✔
T9	179.182 - 159.182	7/8	5.518	2.632	144.4	30.000	0.6013	2.69	18.04	0.149 ✔
T10	159.182 - 139.182	1	5.518	2.621	125.8	30.000	0.7854	3.40	23.56	0.144 ✔
T11	139.182 - 119.182	7/8	5.518	2.621	143.8	30.000	0.6013	3.28	18.04	0.182 ✔
T12	119.182 - 99.1822	7/8	5.518	2.621	143.8	30.000	0.6013	3.07	18.04	0.170 ✔
T13	99.1822 - 79.1822	7/8	5.518	2.621	143.8	30.000	0.6013	3.17	18.04	0.176 ✔
T14	79.1822 - 59.1822	7/8	5.518	2.621	143.8	30.000	0.6013	2.30	18.04	0.127 ✔
T15	59.1822 -	7/8	5.518	2.621	143.8	30.000	0.6013	1.37	18.04	0.076

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 $\frac{P}{P_a}$
	39.1822									✔
T16	39.1822 - 19.1822	7/8	5.518	2.621	143.8	30.000	0.6013	1.78	18.04	0.099 ✔
T17	19.1822 - 14.4112	1	5.505	2.615	125.5	30.000	0.7854	1.64	23.56	0.070 ✔
T18	14.4112 - 11.8302	1	5.627	2.673	128.3	30.000	0.7854	1.27	23.56	0.054 ✔
T19	11.8302 - 9.49947	1 1/4	3.418	3.247	124.7	30.000	1.2272	2.16	36.82	0.059 ✔
T20	9.49947 - 7.16874	1 1/4	3.418	3.247	124.7	30.000	1.2272	2.66	36.82	0.072 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	311.351 - 310.351	6 x 1	5.000	4.771	198.3	21.600	6.0000	0.00	129.60	0.000
T19	11.8302 - 9.49947	6 x 3/4	5.000	4.750	263.3	21.600	4.5000	2.27	97.20	0.023
T20	9.49947 - 7.16874	6 x 3/4	5.000	4.750	263.3	21.600	4.5000	13.49	97.20	0.139*
T21	7.16874 - 1.2	6 x 3/4	4.791	4.541	251.7	21.600	4.5000	6.96	97.20	0.072*

* DL controls

Horizontal 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	311.351 - 310.351	6 x 1	-0.28	0.556	27.000	0.021	-0.00	0.003	27.000	0.000
T19	11.8302 - 9.49947	6 x 3/4	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T20	9.49947 - 7.16874	6 x 3/4	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000
T21	7.16874 - 1.2	6 x 3/4	0.00	0.000	27.000	0.000	0.00	0.000	27.000	0.000

Horizontal 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

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	311.351 - 310.351	6 x 1	0.000	0.021	0.000	0.021 ✔	1.333	H2-1 ✔
T19	11.8302 - 9.49947	6 x 3/4	0.023	0.000	0.000	0.023 ✔	1.333	H2-1 ✔
T20	9.49947 - 7.16874	6 x 3/4	0.139	0.000	0.000	0.139* ✔	1.000	H2-1 ✔
T21	7.16874 - 1.2	6 x 3/4	0.072	0.000	0.000	0.072* ✔	1.000	H2-1 ✔

* DL controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	310.351 - 299.182	1 1/4	5.000	4.771	183.2	30.000	1.2272	0.88	36.82	0.024* ✔
T3	299.182 - 279.182	1	5.000	4.771	229.0	30.000	0.7854	0.53	23.56	0.022* ✔
T4	279.182 - 259.182	1	5.000	4.771	229.0	30.000	0.7854	0.16	23.56	0.007 ✔
T5	259.182 - 239.182	1	5.000	4.771	229.0	30.000	0.7854	0.15	23.56	0.006 ✔
T6	239.182 - 219.182	1	5.000	4.771	229.0	30.000	0.7854	0.50	23.56	0.021 ✔
T7	219.182 - 199.182	1	5.000	4.771	229.0	30.000	0.7854	0.69	23.56	0.029 ✔
T8	199.182 - 179.182	1	5.000	4.771	229.0	30.000	0.7854	0.40	23.56	0.017 ✔
T9	179.182 - 159.182	1	5.000	4.771	229.0	30.000	0.7854	0.46	23.56	0.020 ✔
T10	159.182 - 139.182	1 1/4	5.000	4.750	182.4	30.000	1.2272	1.05	36.82	0.029 ✔
T11	139.182 - 119.182	1	5.000	4.750	228.0	30.000	0.7854	0.90	23.56	0.038 ✔
T12	119.182 - 99.1822	1	5.000	4.750	228.0	30.000	0.7854	0.17	23.56	0.007* ✔
T13	99.1822 - 79.1822	1	5.000	4.750	228.0	30.000	0.7854	0.79	23.56	0.034 ✔
T14	79.1822 - 59.1822	1	5.000	4.750	228.0	30.000	0.7854	0.63	23.56	0.027 ✔
T15	59.1822 - 39.1822	1	5.000	4.750	228.0	30.000	0.7854	0.25	23.56	0.011* ✔
T16	39.1822 - 19.1822	1	5.000	4.750	228.0	30.000	0.7854	0.41	23.56	0.017 ✔
T17	19.1822 - 14.4112	1 1/4	5.000	4.750	182.4	30.000	1.2272	0.72	36.82	0.020 ✔
T18	14.4112 - 11.8302	7/8	5.000	4.750	260.6	30.000	0.6013	0.95	18.04	0.052* ✔

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 $\frac{P}{P_a}$

* DL controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T2	310.351 - 299.182	1 1/4	5.000	4.771	183.2	30.000	1.2272	3.34	36.82	0.091* ✔
T3	299.182 - 279.182	1	5.000	4.771	229.0	30.000	0.7854	0.22	23.56	0.009 ✔
T4	279.182 - 259.182	1	5.000	4.771	229.0	30.000	0.7854	0.13	23.56	0.006 ✔
T5	259.182 - 239.182	1	5.000	4.771	229.0	30.000	0.7854	0.57	23.56	0.024 ✔
T6	239.182 - 219.182	1	5.000	4.771	229.0	30.000	0.7854	0.76	23.56	0.032 ✔
T7	219.182 - 199.182	1	5.000	4.771	229.0	30.000	0.7854	0.49	23.56	0.021 ✔
T8	199.182 - 179.182	1	5.000	4.771	229.0	30.000	0.7854	0.29	23.56	0.012 ✔
T9	179.182 - 159.182	1	5.000	4.771	229.0	30.000	0.7854	0.77	23.56	0.033 ✔
T10	159.182 - 139.182	1 1/4	5.000	4.750	182.4	30.000	1.2272	1.05	36.82	0.029 ✔
T11	139.182 - 119.182	1	5.000	4.750	228.0	30.000	0.7854	0.34	23.56	0.014 ✔
T12	119.182 - 99.1822	1	5.000	4.750	228.0	30.000	0.7854	0.74	23.56	0.031 ✔
T13	99.1822 - 79.1822	1	5.000	4.750	228.0	30.000	0.7854	0.63	23.56	0.027 ✔
T14	79.1822 - 59.1822	1	5.000	4.750	228.0	30.000	0.7854	0.38	23.56	0.016 ✔
T15	59.1822 - 39.1822	1	5.000	4.750	228.0	30.000	0.7854	0.28	23.56	0.012* ✔
T16	39.1822 - 19.1822	1	5.000	4.750	228.0	30.000	0.7854	0.35	23.56	0.015* ✔
T21	7.16874 - 1.2	6 x 3/4	0.428	0.178	9.8	21.600	4.5000	6.16	97.20	0.063* ✔

* DL controls

Mid 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 $\frac{P}{P_a}$
T3	299.182 - 279.182	1	5.000	4.771	229.0	30.000	0.7854	0.11	23.56	0.005*
T4	279.182 - 259.182	1	5.000	4.771	229.0	30.000	0.7854	0.11	23.56	0.004*
T5	259.182 - 239.182	1	5.000	4.771	229.0	30.000	0.7854	0.12	23.56	0.005*
T6	239.182 - 219.182	1	5.000	4.771	229.0	30.000	0.7854	4.06	23.56	0.172*
T7	219.182 - 199.182	1	5.000	4.771	229.0	30.000	0.7854	0.20	23.56	0.009*
T8	199.182 - 179.182	1	5.000	4.771	229.0	30.000	0.7854	0.22	23.56	0.010*
T9	179.182 - 159.182	1	5.000	4.771	229.0	30.000	0.7854	0.24	23.56	0.010*
T10	159.182 - 139.182	1 1/4	5.000	4.750	182.4	30.000	1.2272	5.33	36.82	0.145*
T11	139.182 - 119.182	1	5.000	4.750	228.0	30.000	0.7854	0.60	23.56	0.025
T12	119.182 - 99.1822	1	5.000	4.750	228.0	30.000	0.7854	0.38	23.56	0.016*
T13	99.1822 - 79.1822	1	5.000	4.750	228.0	30.000	0.7854	4.86	23.56	0.206*
T14	79.1822 - 59.1822	1	5.000	4.750	228.0	30.000	0.7854	0.44	23.56	0.019*
T15	59.1822 - 39.1822	1	5.000	4.750	228.0	30.000	0.7854	0.45	23.56	0.019*
T16	39.1822 - 19.1822	1	5.000	4.750	228.0	30.000	0.7854	0.47	23.56	0.020*
T17	19.1822 - 14.4112	7/8	5.000	4.750	260.6	30.000	0.6013	0.86	18.04	0.048*

* DL controls

Redundant Horizontal (1) 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 $\frac{P}{P_a}$
T19	11.8302 - 9.49947	7/8	1.250	1.125	61.7	30.000	0.6013	1.13	18.04	0.063*
T20	9.49947 - 7.16874	7/8	1.250	1.125	61.7	30.000	0.6013	1.75	18.04	0.097*

* DL controls

Redundant Diagonal (1) 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 $\frac{P}{P_a}$
T20	9.49947 - 7.16874	7/8	1.709	1.538	84.4	30.000	0.6013	0.76	18.04	0.042* ✔

* DL controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
L1	346.351 - 329.351	Pole	P10x.365 (10.75 OD)	1	-1.10	139.54	10.6	Pass
L2	329.351 - 311.351	Pole	P10x.365 (10.75 OD)	2	-1.87	139.54	38.3	Pass
T1	311.351 - 310.351	Leg	2 3/4	3	-1.40	169.65	18.2	Pass
T2	310.351 - 299.182	Leg	2 3/4	10	-11.42	195.88	5.8	Pass
T3	299.182 - 279.182	Leg	2 3/4	43	-13.75	152.82	9.0	Pass
T4	279.182 - 259.182	Leg	2 3/4	103	-14.54	152.82	9.5	Pass
T5	259.182 - 239.182	Leg	2 3/4	162	-16.22	152.82	10.6	Pass
T6	239.182 - 219.182	Leg	2 3/4	222	-25.96	152.82	17.0	Pass
T7	219.182 - 199.182	Leg	2 3/4	284	-29.28	152.82	19.2 20.6 (b)	Pass
T8	199.182 - 179.182	Leg	2 3/4	344	-32.97	152.82	21.6	Pass
T9	179.182 - 159.182	Leg	2 3/4	404	-38.53	152.82	25.2	Pass
T10	159.182 - 139.182	Leg	3	464	-47.79	185.20	25.8	Pass
T11	139.182 - 119.182	Leg	3	524	-50.88	185.20	27.5 30.2 (b)	Pass
T12	119.182 - 99.1822	Leg	3	584	-55.13	185.20	29.8	Pass
T13	99.1822 - 79.1822	Leg	3	644	-60.67	178.33	34.0 36.0 (b)	Pass
T14	79.1822 - 59.1822	Leg	3	704	-62.27	178.33	34.9	Pass
T15	59.1822 - 39.1822	Leg	3	764	-63.71	178.33	35.7 37.9 (b)	Pass
T16	39.1822 - 19.1822	Leg	3	824	-65.02	178.33	36.5	Pass
T17	19.1822 - 14.4112	Leg	3	884	-65.10	178.33	36.5 38.7 (b)	Pass
T18	14.4112 - 11.8302	Leg	3	905	-64.57	178.33	36.2	Pass
T19	11.8302 - 9.49947	Leg	3	917	-65.41	178.33	36.7 38.9 (b)	Pass
T20	9.49947 - 7.16874	Leg	3	935	-63.86	178.33	35.8 37.9 (b)	Pass
T21	7.16874 - 1.2	Leg	3	959	-72.49	176.14	41.2	Pass
T2	310.351 - 299.182	Diagonal	7/8	25	-1.41	6.66	21.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T3	299.182 - 279.182	Diagonal	7/8	101	-1.39	7.09	19.5	Pass
T4	279.182 - 259.182	Diagonal	7/8	161	-1.10	7.09	15.5	Pass
T5	259.182 - 239.182	Diagonal	7/8	174	-2.31	7.09	32.6	Pass
T6	239.182 - 219.182	Diagonal	7/8	237	-2.73	7.09	38.5	Pass
T7	219.182 - 199.182	Diagonal	7/8	339	-2.57	7.09	36.3	Pass
T8	199.182 - 179.182	Diagonal	7/8	399	-2.11	7.09	29.7	Pass
T9	179.182 - 159.182	Diagonal	7/8	414	-2.80	7.09	39.4	Pass
T10	159.182 - 139.182	Diagonal	1	479	-3.67	12.20	30.1	Pass
T11	139.182 - 119.182	Diagonal	7/8	581	-3.46	7.15	48.4	Pass
T12	119.182 - 99.1822	Diagonal	7/8	594	-3.24	7.15	45.3	Pass
T13	99.1822 - 79.1822	Diagonal	7/8	696	-3.37	7.15	47.2	Pass
T14	79.1822 - 59.1822	Diagonal	7/8	761	-2.53	7.15	35.4	Pass
T15	59.1822 - 39.1822	Diagonal	7/8	821	-1.65	7.15	23.1	Pass
T16	39.1822 - 19.1822	Diagonal	7/8	834	-1.98	7.15	27.6	Pass
T17	19.1822 - 14.4112	Diagonal	1	897	-2.37	12.25	19.4	Pass
T18	14.4112 - 11.8302	Diagonal	1	909	-2.29	11.73	19.5	Pass
T19	11.8302 - 9.49947	Diagonal	1 1/4	919	-2.30	28.66	8.0	Pass
T20	9.49947 - 7.16874	Diagonal	1 1/4	940	-2.85	28.66	10.0	Pass
T21	7.16874 - 1.2	Diagonal	1 1/4	968	-8.56	19.16	44.7	Pass
T1	311.351 - 310.351	Horizontal	6 x 1	7	0.00	172.76	1.6	Pass
T19	11.8302 - 9.49947	Horizontal	6 x 3/4	923	-1.13	9.70	11.7	Pass
T20	9.49947 - 7.16874	Horizontal	6 x 3/4	950	13.49	97.20	13.9	Pass
T21	7.16874 - 1.2	Horizontal	6 x 3/4	961	6.96	97.20	7.2	Pass
T2	310.351 - 299.182	Top Girt	1 1/4	12	0.88	36.82	2.4	Pass
T3	299.182 - 279.182	Top Girt	1	45	0.53	23.56	2.2	Pass
T4	279.182 - 259.182	Top Girt	1	105	-0.13	6.08	2.1	Pass
T5	259.182 - 239.182	Top Girt	1	167	-0.07	6.08	1.1	Pass
T6	239.182 - 219.182	Top Girt	1	226	-0.39	6.08	6.4	Pass
T7	219.182 - 199.182	Top Girt	1	287	-0.58	6.08	9.5	Pass
T8	199.182 - 179.182	Top Girt	1	347	-0.31	6.08	5.1	Pass
T9	179.182 - 159.182	Top Girt	1	407	-0.36	6.08	5.9	Pass
T10	159.182 -	Top Girt	1 1/4	467	-0.87	14.98	5.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
	139.182							
T11	139.182 - 119.182	Top Girt	1	527	-0.63	6.14	10.3	Pass
T12	119.182 - 99.1822	Top Girt	1	586	0.17	23.56	0.7	Pass
T13	99.1822 - 79.1822	Top Girt	1	645	-0.55	6.14	8.9	Pass
T14	79.1822 - 59.1822	Top Girt	1	705	-0.29	6.14	4.7	Pass
T15	59.1822 - 39.1822	Top Girt	1	766	0.25	23.56	1.1	Pass
T16	39.1822 - 19.1822	Top Girt	1	826	0.41	31.41	1.3	Pass
T17	19.1822 - 14.4112	Top Girt	1 1/4	886	0.72	49.08	1.5	Pass
T18	14.4112 - 11.8302	Top Girt	7/8	907	0.95	18.04	5.2	Pass
T2	310.351 - 299.182	Bottom Girt	1 1/4	17	3.34	36.82	9.1	Pass
T3	299.182 - 279.182	Bottom Girt	1	49	-0.11	6.08	1.8	Pass
T4	279.182 - 259.182	Bottom Girt	1	110	-0.06	6.08	1.0	Pass
T5	259.182 - 239.182	Bottom Girt	1	170	-0.47	6.08	7.8	Pass
T6	239.182 - 219.182	Bottom Girt	1	228	-0.54	6.08	8.8	Pass
T7	219.182 - 199.182	Bottom Girt	1	288	-0.29	6.08	4.8	Pass
T8	199.182 - 179.182	Bottom Girt	1	348	-0.06	6.08	0.9	Pass
T9	179.182 - 159.182	Bottom Girt	1	408	-0.48	6.08	7.9	Pass
T10	159.182 - 139.182	Bottom Girt	1 1/4	468	-0.74	14.98	4.9	Pass
T11	139.182 - 119.182	Bottom Girt	1	529	-0.10	6.14	1.7	Pass
T12	119.182 - 99.1822	Bottom Girt	1	588	-0.48	6.14	7.8	Pass
T13	99.1822 - 79.1822	Bottom Girt	1	649	-0.40	6.14	6.5	Pass
T14	79.1822 - 59.1822	Bottom Girt	1	709	-0.12	6.14	2.0	Pass
T15	59.1822 - 39.1822	Bottom Girt	1	768	0.28	23.56	1.2	Pass
T16	39.1822 - 19.1822	Bottom Girt	1	828	0.35	23.56	1.5	Pass
T21	7.16874 - 1.2	Bottom Girt	6 x 3/4	964	6.16	97.20	6.3	Pass
T3	299.182 - 279.182	Mid Girt	1	51	0.11	23.56	0.5	Pass
T4	279.182 - 259.182	Mid Girt	1	111	0.11	23.56	0.4	Pass
T5	259.182 - 239.182	Mid Girt	1	171	0.12	23.56	0.5	Pass
T6	239.182 - 219.182	Mid Girt	1	233	4.06	23.56	17.2	Pass
T7	219.182 - 199.182	Mid Girt	1	292	0.20	23.56	0.9	Pass
T8	199.182 - 179.182	Mid Girt	1	352	0.22	23.56	1.0	Pass
T9	179.182 -	Mid Girt	1	412	0.24	23.56	1.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
	159.182							
T10	159.182 - 139.182	Mid Girt	1 1/4	471	5.33	36.82	14.5	Pass
T11	139.182 - 119.182	Mid Girt	1	531	-0.14	6.14	2.2	Pass
T12	119.182 - 99.1822	Mid Girt	1	593	0.38	23.56	1.6	Pass
T13	99.1822 - 79.1822	Mid Girt	1	653	4.86	23.56	20.6	Pass
T14	79.1822 - 59.1822	Mid Girt	1	712	0.44	23.56	1.9	Pass
T15	59.1822 - 39.1822	Mid Girt	1	772	0.45	23.56	1.9	Pass
T16	39.1822 - 19.1822	Mid Girt	1	832	0.47	23.56	2.0	Pass
T17	19.1822 - 14.4112	Mid Girt	7/8	890	0.86	18.04	4.8	Pass
T19	11.8302 - 9.49947	Redund Horz 1 Bracing	7/8	927	-1.13	12.82	8.8	Pass
T20	9.49947 - 7.16874	Redund Horz 1 Bracing	7/8	945	1.75	18.04	9.7	Pass
T20	9.49947 - 7.16874	Redund Diag 1 Bracing	7/8	946	-1.22	10.30	11.8	Pass
T3	299.182 - 279.182	Guy A@299.182	13/16	983	15.10	40.00	37.7	Pass
T6	239.182 - 219.182	Guy A@229.182	7/8	986	18.83	46.00	40.9	Pass
T10	159.182 - 139.182	Guy A@149.182	13/16	989	18.91	40.00	47.3	Pass
T13	99.1822 - 79.1822	Guy A@89.1822	3/4	992	15.32	34.00	45.1	Pass
T3	299.182 - 279.182	Guy B@299.182	3/4	982	15.91	34.00	46.8	Pass
T6	239.182 - 219.182	Guy B@229.182	13/16	985	18.79	40.00	47.0	Pass
T10	159.182 - 139.182	Guy B@149.182	7/8	988	21.23	46.00	46.2	Pass
T13	99.1822 - 79.1822	Guy B@89.1822	13/16	991	16.59	40.00	41.5	Pass
T3	299.182 - 279.182	Guy C@299.182	3/4	981	15.00	34.00	44.1	Pass
T6	239.182 - 219.182	Guy C@229.182	13/16	984	17.51	40.00	43.8	Pass
T10	159.182 - 139.182	Guy C@149.182	7/8	987	19.81	46.00	43.1	Pass
T13	99.1822 - 79.1822	Guy C@89.1822	13/16	990	15.70	40.00	39.2	Pass

Summary		
Pole (L2)	38.3	Pass
Leg (T21)	41.2	Pass
Diagonal (T11)	48.4	Pass
Horizontal (T20)	13.9	Pass
Top Girt (T11)	10.3	Pass
Bottom Girt (T2)	9.1	Pass
Mid Girt (T13)	20.6	Pass
Redund	9.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
						Horz 1 Bracing (T20)		
						Redund Diag 1 Bracing (T20)	11.8	Pass
						Guy A (T10)	47.3	Pass
						Guy B (T6)	47.0	Pass
						Guy C (T3)	44.1	Pass
						Bolt Checks	51.8	Pass
						RATING =	**51.8**	**Pass**

FDH VELOCITEL
ENGINEERING INNOVATION
FDH Velocitel -- 6521 Meridien Drive, Raleigh, NC 27616 -- Ph. 919.755.1012 -- Fax 919.755.1031

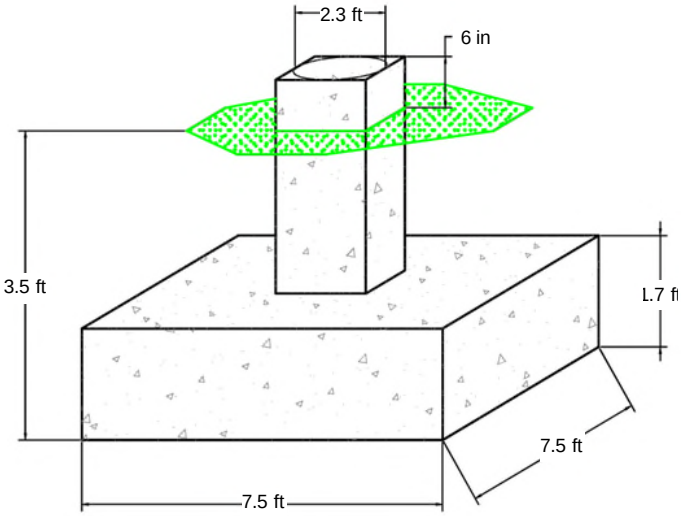
Version: 3.6
Version Date: 5/20/2016

Guyed Tower Pad & Pier Calculator

Project & Site Details			
Project No.	16PAIQ1400	Rev.	0
Project Name	West Hartford		
Site ID	CT15879-A		
Date	Friday, August 12, 2016		
Code	TIA/EIA-222-F		
Overstress Capacity, Soil	110%		
Overstress Capacity, Steel	100%		

Tower Reactions		
Shear Load, V_{TNX}	4	k
Axial Load, P_{TNX}	201	k

Foundation Information		
Density Concrete	0.15	kcf
Pier Shape	Round	ft
Pier Diameter, d	2.3	ft
Pier Height Above Grade, ext	0.5	ft
Pad Length, L	7.5	ft
Pad Width, W	7.5	ft
Pad Thickness, T	1.7	ft
Pad Bearing Depth, D	3.5	ft
Has is been Modified?	No	-



Soil Information			
Ultimate Bearing Capacity, Net	50	ksf	Boring Log
# of Layers Above Pad	1	-	B-1
Average Soil Unit Weight	170	pcf	
Soil Layer stop at Top of Pad	TRUE	Depth	1.8'

Layer	Depth at Bottom (ft)	Unit Weight (pcf)	Layer Thickness (ft)
1	1.8	170	1.8

Soil Bearing Capacity		
Weight of Concrete	15.8	k
Axial Force, P_u	258.8	k
Axial Bearing Stress, q_u	4.9	ksf
Allowable Bearing Stress, Φq_n	25.0	ksf
Bearing Capacity	**19.6%**	**PASS**

Pad Steel Information		
Horizontal Bar Size	#8	-
Pad Bar Diameter, d_b	1	in
Number of Horizontal Bars, n	4	-
Strength of Concrete, f_c'	3000	psi
Clear Cover, cc_{pad}	3	in
Yield Strength of Steel, F_y	60	ksi

Pad Steel Capacities		
One-Way Critical Shear, V_{crit}	46.5	k
Nominal Shear Strength, ΦV_n	117.6	k
One-Way Shear Capacity	**39.6%**	**PASS**
Two-Way Critical Shear, V_{crit}	50.1	k
Nominal Shear Strength, ΦV_n	113.6	k
Two-Way Shear Capacity	**44.1%**	**PASS**
Moment at Edge of Pier, M_u	122.8	k-ft
Nominal Flexural Strength, ΦM_n	219.0	k-ft
Steel Yielding?	**OK**	
Pad Flexural Capacity	**56.1%**	**PASS**

Pier Steel Information		
Vertical Bar Size	#7	-
Pier Bar Diameter, d_v	0.875	in
Number of Vertical Bars, n_v	5	-
Tie Size	#3	-
Tie Bar Diameter, d_t	0.375	in
Clear Cover, cc_{pier}	3	in

Pier Steel Capacities		
Axial Compressive Load, P_u	261.3	k
Nominal Compressive Strength, ΦP_n	883.1	k
Compressive Capacity	**29.6%**	**PASS**
Reinforcement Stress, f_t	9.6	ksi
Allowable Stress, F_t	54.0	ksi
Bending Capacity	**17.7%**	**PASS**

FDH VELOCITEL
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Version:	2.0
Version Date:	6/24/2015

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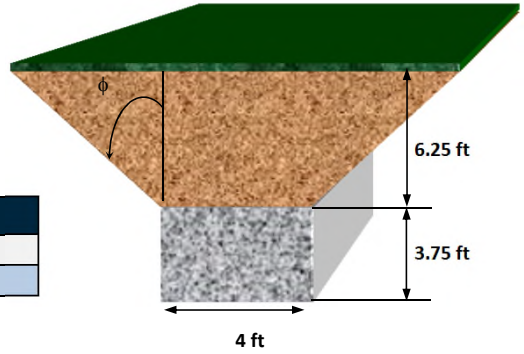
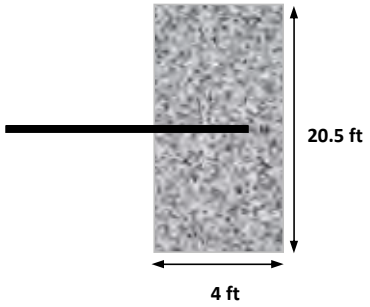
Guy Anchor Block Foundation Calculator

Project & Site Details	
Project No.	16PAIQ1400
Project Name	West Hartford
Site ID	CT15879-A
Date	Friday, August 12, 2016
Code	TIA/EIA-222-F





Anchor Block Information			
Density Concrete	150	pcf	Anchor
Length	20.5	ft	Outer
Width	4	ft	
Thickness	3.75	ft	
Depth to Top of Block	6.25	ft	
Anchor Angle from Grade	37	º	

Soil Information			
Frost Depth	3.33	ft	Boring Log
Water Table Depth	99	ft	B-2/3/4
Consider Lateral Passive Pressure within the Frost Depth?	Partial		
# of Layers Above Anchor:	2	Must Be Int. >=1,<=7	
# of Layers Adjacent Anchor:	1	Must Be Int. >=1,<=7	Soil Layers OK?
Total # of Layers:	3	Must Be Int. >=2,<=8	Yes

Layer	Depth at Bottom (ft)	Soil Type (C/S)	Unit Weight (pcf)	Thickness (ft)	Friction Angle (°)	Cohesion (psf)
1	3.33	S	135	3.33	30	0
2	6.25	S	135	2.92	30	0
3	10	S	135	3.75	30	0

Uplift Capacity		
Anchor Uplift	43	k
Allowable Uplift Load	163.6	k
Capacity	26.3%	Pass

Lateral Capacity		
Anchor Lateral	56	k
Allowable Lateral Load	157.57	k
Capacity	35.5%	Pass

Anchor Shaft Capacity		
Anchor Tension	70	k
No. of Anchors	2	-
Anchor Type	Solid Rod	-
Cross Sectional Area	3.976	in^2
Yield Strength, F_y	36	ksi
Factor (ASD)	0.6	-
Allowable Tension	229.0	k
Capacity	30.6%	Pass