Alex Murshteyn, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-0159
AMurshteyn@centerlincommunications.com

January 21, 2016

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

RE: Notice of Exempt Modification
99 Cedarwood Lane, Newington, CT 06111 (Cedarwood Lane, 2111 Berlin Turnpike)
N 41.6947944444444
W 72.7089722222222

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains 9 antennas at the 120-foot level of the existing 170-foot guyed tower at 99 Cedarwood Lane, Newington, CT. The tower is owned by Fred Callahan at Callahan Acres, LLC. The property is also owned by Callahan Acres, LLC. AT&T now intends to replace 3 of its existing antennas with 3 new GSM/WCS (850/2300 band) antennas for LTE. These antennas would be installed at the 120-foot level of the tower. AT&T also intends to install 3 remote radio units, 1 squid surge arrestor, 2 DC and 1 fiber trunk.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Stephen Woods, Mayor for the Town of Newington, as well as the property owner and the tower owner.

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

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

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

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Alex Murshteyn, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 821-0159
AMurshteyn@centerlincommunications.com

Attachments

cc: Stephen Woods, Mayor, Town of Newington - as elected official
Callahan Acres, LLC & Fred Callahan - as tower owner
Callahan Acres, LLC & Fred Callahan - as property owner (reference only / see above)

STRUCTURAL ANALYSIS REPORT – REV 1
GUYED TOWER

Prepared For:

Com-Ex Consultants, LLC
115 Route 46 – Suite E39
Mountain Lakes, NJ 07046

Structure Rating:

Guyed Tower:	**96.5% (Pass)**

Sincerely,
Destek Engineering, LLC

1-14-2016

STATE OF CONNECTICUT
AHMET COLAKOGLU
PEN. 27057
LICENSED
PROFESSIONAL ENGINEER

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

AT&T Site ID: CT1145
FA Number: 10035097
Site Name: NEWINGTON
99 Cedarwood Lane
Newington, CT 06111

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

CONTENTS

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

1.0 SUBJECT AND REFERENCES

The purpose of this analysis is to evaluate the structural capacity of the existing telecommunication installation on the guyed tower at 99 Cedarwood Lane, Newington, CT 06111 for the additions and alterations proposed by AT&T.

The structural analysis is based on the following information provided to Destek Engineering, LLC (Destek):

- Construction Drawings prepared by Com-Ex Consultants, dated 11/02/2015.
- Structural Analysis Report prepared by URS Corporation, Job#: 33931279.00000, dated 08/22/2014.
- RFDS prepared by AT&T, dated 08/28/2015.

1.1 STRUCTURE

The structure is a 170'-0" tall guyed, structural steel lattice tower with a section width of 3'-5". Pipe legs are K-braced for the lower three sections, not including the tapered base, and X-braced for the remainder of the tower sections. It is guyed at four (4) elevations above grade; 50.0 feet, 90.0 feet, 132.4 feet, and 152.3 feet, terminated approximately 106 feet away from the centerline of the structure. The tower has been upgraded previously. Please refer to the software output in Appendix A, for tower geometry, member sizes, and other details.

2.0 EXISTING AND PROPOSED APPURTENANCES

Existing Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
120.0	(6) Powerwave 7770 (3) AM-X-CD-16-65-00T-RET (12) Powerwave 7020 (12) Katherin 782-10250 (6) LGP 21901 (3) Powerwave7070 (6) LGP21401 (3) LGP 12104 (6) RRUS-11 (3) Powerwave 1001983 (3) Powerwave 1001940 (1) DC Squid (9) Polyphaser 100860	(3) Sector Mounts	(12) 7/8" (1) Fiber Cable (2) DC Cable

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Proposed and Final Configuration of AT&T Appurtenances:

Rad. Center (ft)	Antenna & TMA	Mount	Cables
120.0	(3) Powerwave 7770 (3) AM-X-CD-16-65-00T-RET (3) OPA-65R-LCUU-H6 (6) Powerwave 7020 (12) Katherin 782-10250 (6) LGP21401 (3) LGP 12104 (3) Powerwave7070 (6) RRUS-11, (3) RRUS-32 (3) Powerwave 1001983 (3) Powerwave 1001940 (2) DC Squid (9) Polyphaser 100860	(3) Sector Mounts	(12) 7/8” (2) Fiber Cable* (4) DC Cable*

*** Proposed feedlines should be stacked on existing 7/8” coax**

Existing Appurtenances by Others

RAD CENTER (FT) CARRIER	ANTENNA & TMA	MOUNT	COAX
175 Wethersfield	(1) DS4C03F36U-D (2) SC473-HF1LDF (1) TXRX 430-83H-01-M-X7 TTA Unit	(2) 5’ Side Mount (1) 1’ Side Mount	(2) 7/8” (1) 1-5/8” (1) 1/2"
167 Wethersfield	(1)RFD SC2-W100BC Dish	(1) Leg Mount	(1) 1/2”
163 T-Mobile	(3) Commscope LNX-6515DS-VTM (3) Bias-T (3) APX16DWV (3) APX19PV-15PV (6) TMAs	(3) Sector Mounts	(18) 1-5/8”
146 Clearwire	(1)Dish VHLP2-180	(1) Leg Mount	(1) 1/2"
145.5 Clearwire	(1)Dish VHLP800-11 (1)Dish VHLP2-180	(1) Leg Mount	(2) 1/2”
143 Clearwire	(3) LLRx310R-V1	(3) Sector Mounts	(2) 2” Rigid Cables (9) 1-1/4”
141 Sprint	(12) 844G65VTASX (3) RRHs		
109 Pocket Wireless	(3) 6’x6”x3” Panel Antennas	(3) Leg Mounts	(6) 1-5/8”
50 Town	(2) GPS Unit	(2) Leg Mounts	(2) LMR-400

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3.0 CODES AND LOADING

The tower was analyzed per *TIA/EIA-222-F* as referenced by *2005 Connecticut State Building Code with all of the adopted Addendums and Supplements*, International Code Council. The following wind loading was used in compliance with the standard for New Haven County:

- Basic wind speed 80 mph without ice (W)
- Basic wind speed 69.3 mph with 1/2" radial ice (W_i)

The following load combinations were used with wind blowing at 0^o, 60^o and 90^o, measured from a line normal to the face of the tower.

- $D + W_o$
- $D + W_i + I$

D: Dead Load
W_o: Wind Load, without ice
W_i: Wind Load with ice
I: Ice Gravity Load

4.0 STANDARD CONDITIONS FOR ENGINEERING SERVICES ON EXISTING STRUCTURES

The analysis is based on the information provided to Destek and is assumed to be current and correct. Unless otherwise noted, the structure is assumed to be in good condition, free of defects, and can achieve theoretical strength.

It is assumed that the structure has been maintained and shall be maintained during its service lifespan. The superstructure and the foundation system are assumed to be designed with proper engineering practice and fabricated, constructed and erected in accordance with the design documents. Destek will accept no liability which may arise due to any existing deficiency in design, material, fabrication, erection, construction, etc. or lack of maintenance.

The analysis does not include a qualification of the antenna mounts attached on the structure or their connections. The analysis is performed to verify the capacity of the main structural members, which is the current practice in the tower industry.

The analysis results presented in this report are only applicable for the previously mentioned existing and proposed appurtenances. Any deviation of the appurtenances and placement, etc., will require Destek to generate an additional structural analysis. Additionally, the proposed linear appurtenances should be placed per recommendations of this report.

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5.0 ANALYSIS AND ASSUMPTIONS

The tower was analyzed by utilizing tnxTower, a non-linear, three-dimensional, finite element-analysis software package, a product of Tower Numerics, Inc. Software output for this analysis is provided in Appendix A of this report.

6.0 RESULTS AND CONCLUSION

Based on an analysis per TIA/EIA-222-F, the existing tower is found to have **adequate** structural capacity for the proposed changes. For the aforementioned load combinations and as maximum, tower legs between 100'-120' AGL are stressed to **96.5%** of capacity. Maximum usage of diagonals and guy wires is **62.2%** and **79.6%** respectively.

Tower foundation is considered to have **adequate** capacity given the reactions comparison below.

Reaction Comparison:

Maximums	Destek Analysis	URS Analysis
Base Compression (kips)	119.4	125.7
Anchor Shear (kips)	43.4	46.6
Anchor Uplift (kips)	49.1	53.3

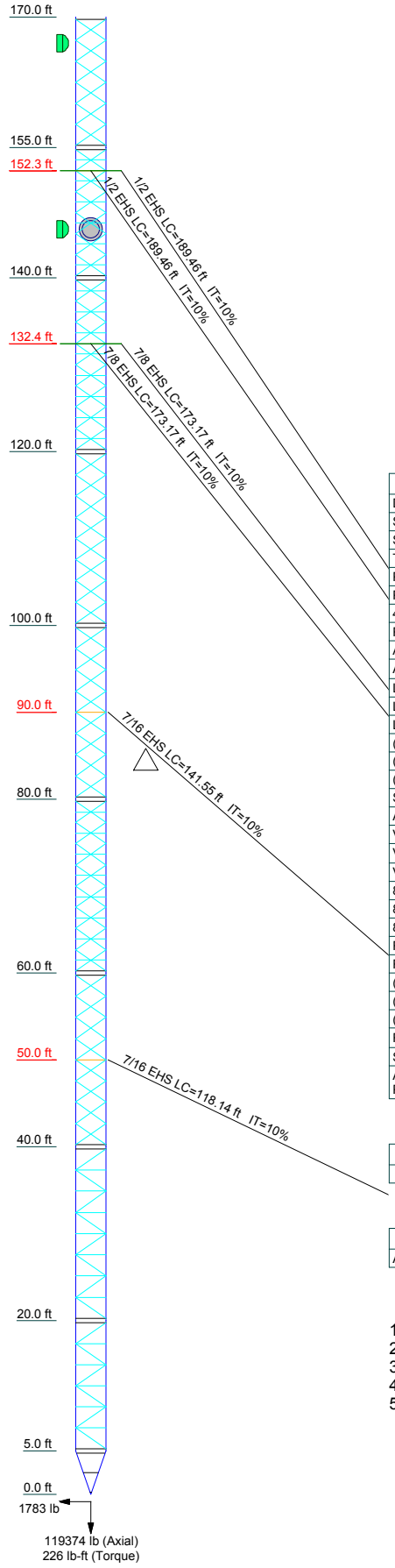
Therefore, the proposed additions and alterations by AT&T can be implemented as intended with the conditions outlined in this report.

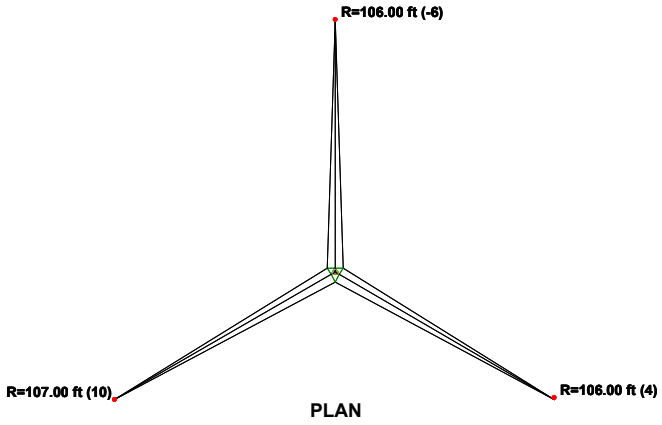
Should you have any questions about this report, please contact Ahmet Colakoglu at (770) 693-0835 or acolakoglu@destekengineering.com.

DESTEK ENGINEERING, LLC
1281 Kennestone Circle, Ste 100, Marietta, GA 30066 -Tel: (770) 693-0835

APPENDIX A
CALCULATIONS

Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Legs		ROHN 2 STD	ROHN 2 STD	Pipe 2STD w/ 1" Solid Rod	ROHN 2 STD	ROHN 2.5 STD	A		ROHN 2.5 STD		
Leg Grade						A572-50					
Diagonals	N.A.	ROHN 1.5 STD	ROHN 1.5 x 16GA	L1 3/4x1 3/4x1/4			ROHN 1.5 x 16GA				
Diagonal Grade	N.A.					A36					
Top Girts	3x1/4	ROHN 1.5 STD	ROHN 1.5 x 16GA	L1 1/2x1 1/2x1/8							
Mid Girts	3x1/4					N.A.					
Bottom Girts	3x1/4	ROHN 1.5 STD	ROHN 1.5 x 16GA	L1 3/4x1 3/4x1/8			ROHN 1.5 x 16GA				
Horizontals	N.A.					N.A.			SR 1" solid		
Sec. Horizontals		SR 1" solid	N.A.	L1 3/4x1 3/4x1/4		N.A.	L2x2x3/16		N.A.		
Top Guy Pull-Offs		N.A.	L2x2x3/16		N.A.	4x3/8	N.A.	4x3/8	N.A.		
Face Width (ft)							48 @ 2.4375				3.42
# Panels @ (ft)	B	12 @ 2.41667				12 @ 2.41667				6 @ 2.41667	
Weight (lb)	7488.9	333.6	1278.6	2016.4	438.9	628.8	806.2	628.8	680.7	537.5	139.4





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DS4C03F36U-D 8' Omni	175	AM-X-CD-16-65-00T-RET w/ Mount Pipe	120
SC473-HF1LDF	175	OPA-65R-LCUU-H6 w/ Mount Pipe	120
SC473-HF1LDF	175	OPA-65R-LCUU-H6 w/ Mount Pipe	120
TTA-429-83H-08179	170	OPA-65R-LCUU-H6 w/ Mount Pipe	120
Pirod 4' Side Mount Standoff	168	(2) 7020.00	120
Pirod 4' Side Mount Standoff	168	(2) 7020.00	120
4' Standoff	168	(2) 7020.00	120
RFS SC2-W100BC	167	(4) 782-10250	120
APX16DWV-16DWVS	163	(4) 782-10250	120
APX16DWV-16DWVS	163	(4) 782-10250	120
LNX-6515DS-VTM	163	(2) LGP21401	120
LNX-6515DS-VTM	163	(2) LGP21401	120
LNX-6515DS-VTM	163	(2) LGP21401	120
(2) TMA	163	LGP12104	120
(2) TMA	163	LGP12104	120
(2) TMA	163	LGP12104	120
Sector Mount [SM 303-3]	163	(2) RRUS 11	120
APX16DWV-16DWVS	163	(2) RRUS 11	120
VHLP800-11	145.6	(2) RRUS 11	120
VHLP2-180	145.6	RRUS 32	120
VHLP2-180	145.6	RRUS 32	120
844H90T11EXY	143	RRUS 32	120
844H90T11EXY	143	DC6-48-60-18-8F	120
844H90T11EXY	143	DC6-48-60-18-8F	120
RRUS 11	141.5	Sector Mount [SM 802-3]	120
RRUS 11	141.5	AM-X-CD-16-65-00T-RET w/ Mount Pipe	120
(4) 844G45VTZASX	141.5	7770.00 w/ Mount Pipe	120
(4) 844G45VTZASX	141.5	7770.00 w/ Mount Pipe	120
(4) 844G45VTZASX	141.5	7770.00 w/ Mount Pipe	120
RRUS 11	141.5	(2) GPS	50
Sector Mount [SM 402-3]	141		
AM-X-CD-16-65-00T-RET w/ Mount Pipe	120		

SYMBOL LIST

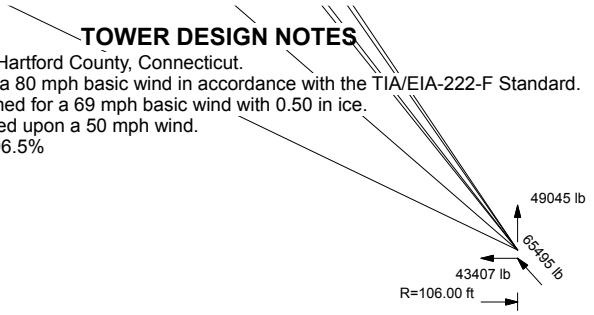
MARK	SIZE	MARK	SIZE
A	Pipe 2STD w/ 1/3 HSS3.5x0.3	B	2 @ 2.25

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 69 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 96.5%



Destek Engineering, LLC
1281 Kennestone Circle, Ste 100
Marietta, GA 30066
Phone: (770) 693-0835
FAX:

Job: ***1529180***			
Project: ***CT1145***			
Client: Com-Ex	Drawn by: Ahmet Colakoglu	App'd:	
Code: TIA/EIA-222-F	Date: 01/14/16	Scale: NTS	
Path: \\FILESERVER\Users\admin\Documents\2015\29 - Com-Ex Consultants\1529180 - CT1145\Tnxtower\Rev1\CT1145 Rev1.eri		Dwg No. E-1	

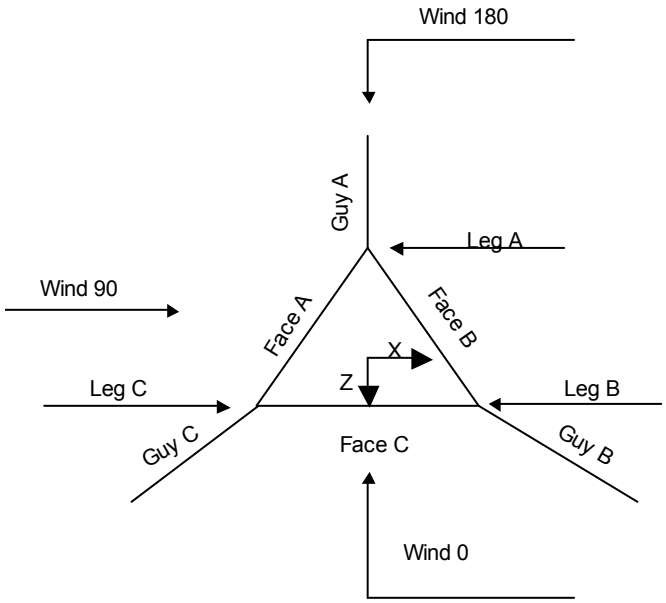
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 170.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.42 ft at the top and tapered at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

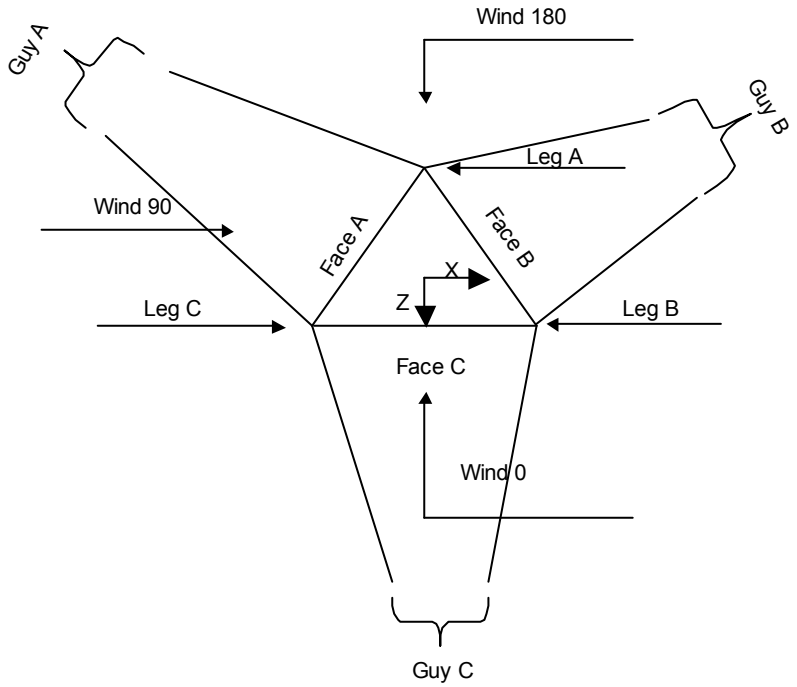
Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 69 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
User specified elevation for calculation of G_h is 170.00 ft.
Pressures are calculated at each section.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	170.00-155.00			3.42	1	15.00
T2	155.00-140.00			3.42	1	15.00
T3	140.00-120.00			3.42	1	20.00
T4	120.00-100.00			3.42	1	20.00
T5	100.00-80.00			3.42	1	20.00
T6	80.00-60.00			3.42	1	20.00
T7	60.00-40.00			3.42	1	20.00
T8	40.00-20.00			3.42	1	20.00
T9	20.00-5.00			3.42	1	15.00
T10	5.00-0.00			3.42	1	5.00

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	170.00-155.00	2.42	X Brace	No	No	3.0000	3.0000
T2	155.00-140.00	2.42	X Brace	No	Yes	3.0000	3.0000
T3	140.00-120.00	2.44	X Brace	No	Yes	3.0000	3.0000
T4	120.00-100.00	2.44	X Brace	No	Yes	3.0000	3.0000
T5	100.00-80.00	2.44	X Brace	No	No	3.0000	3.0000
T6	80.00-60.00	2.44	X Brace	No	Yes	3.0000	3.0000
T7	60.00-40.00	2.44	X Brace	No	No	3.0000	3.0000
T8	40.00-20.00	2.44	K Brace Right	No	Yes	3.0000	3.0000
T9	20.00-5.00	2.42	K Brace Right	No	Yes	3.0000	3.0000
T10	5.00-0.00	2.25	X Brace	No	Yes	3.0000	3.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 170.00-155.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T2 155.00-140.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 STD	A36 (36 ksi)
T3 140.00-120.00	Arbitrary Shape	Pipe 2STD w/ 1" Soild Rod	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/4	A36 (36 ksi)
T4 120.00-100.00	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T5 100.00-80.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T6 80.00-60.00	Arbitrary Shape	Pipe 2STD w/ 1/3 HSS3.5x0.3	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T7 60.00-40.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T8 40.00-20.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T9 20.00-5.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T10 5.00-0.00	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Pipe		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 170.00-155.00	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T2 155.00-140.00	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T3 140.00-120.00	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x1/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)	Pipe	ROHN 1.5 x 16GA	A36 (36 ksi)
T5 100.00-80.00	Pipe	ROHN 1.5 x 16GA	A36	Pipe	ROHN 1.5 x 16GA	A36

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T6 80.00-60.00	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)
T7 60.00-40.00	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)
T8 40.00-20.00	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)
T9 20.00-5.00	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36 (36 ksi)	Pipe	ROHN 1.5 EH	(36 ksi) A36 (36 ksi)
T10 5.00-0.00	Flat Bar	3x1/4	(36 ksi) A36 (36 ksi)	Flat Bar	3x1/4	(36 ksi) A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*No. of Mid Girts*	*Mid Girt Type*	*Mid Girt Size*	*Mid Girt Grade*	*Horizontal Type*	*Horizontal Size*	*Horizontal Grade*
T5 100.00-80.00	1	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36	Solid Round		(50 ksi) A572-50
T7 60.00-40.00	1	Pipe	ROHN 1.5 x 16GA	(36 ksi) A36	Solid Round		(50 ksi) A572-50
T8 40.00-20.00	None	Pipe		(36 ksi) A36	Solid Round	1" solid	(50 ksi) A572-50
T9 20.00-5.00	None	Pipe		(36 ksi) A36	Solid Round	1" solid	(50 ksi) A572-50
T10 5.00-0.00	1	Flat Bar	3x1/4	(36 ksi) A36 (36 ksi)	Solid Round		(50 ksi) A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Secondary Horizontal Type*	*Secondary Horizontal Size*	*Secondary Horizontal Grade*	*Inner Bracing Type*	*Inner Bracing Size*	*Inner Bracing Grade*
T2 155.00-140.00	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T3 140.00-120.00	Single Angle	L1 3/4x1 3/4x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T6 80.00-60.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 170.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T2 155.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T5 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T6 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T7 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T8 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T9 20.00-5.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000
T10 5.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	No	1	1	1	1	1	1	1	1
170.00-155.00				1	1	1	1	1	1	1
T2	No	No	1	1	1	1	1	1	1	1
155.00-140.00				1	1	1	1	1	1	1
T3	No	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	No	No	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T5	No	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T6	No	No	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T7	No	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T8	No	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T9 20.00-5.00	No	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 5.00-0.00	No	No	1	1	1	1	1	1	1	1
				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 170.00-155.00	0.0000	0.75	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 155.00-140.00	0.0000	0.75	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 140.00-120.00	0.0000	0.75	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 120.00-100.00	0.0000	0.75	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 100.00-80.00	0.0000	0.75	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 80.00-60.00	0.0000	0.75	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 60.00-40.00	0.0000	0.75	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 40.00-20.00	0.0000	0.75	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 20.00-5.00	0.0000	0.75	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 5.00-0.00	0.0000	0.75	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 170.00-155.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T2 155.00-140.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.6250 A325N	1
T3 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T4 120.00-100.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T5 100.00-80.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T6 80.00-60.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.7500 A325N	1	0.7500 A325N	1	0.7500 A325N	1	0.5000 A325N	1
T7 60.00-40.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T8 40.00-20.00	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T9 20.00-5.00	Flange	0.7500 A325N	0	0.5000 A325N	1	0.5000 A325N	1	0.5000 A490N	1	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	1
T10 5.00-0.00	Flange	0.7500 A325N	0	0.5000 A325N	0	0.5000 A325N	0	0.5000 A490N	0	0.6250 A325N	0	0.5000 A325N	0	0.5000 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
152.333	EHS	A	1/2	2690.00	10%	21000	0.517	189.29	106.00	0.0000	-6.00	100%
		B	1/2	2690.00	10%	21000	0.517	181.03	106.00	0.0000	4.00	100%
		C	1/2	2690.00	10%	21000	0.517	176.74	107.00	0.0000	10.00	100%
132.438	EHS	A	7/8	7970.00	10%	19000	1.581	173.02	106.00	0.0000	-6.00	100%
		B	7/8	7970.00	10%	19000	1.581	165.14	106.00	0.0000	4.00	100%
		C	7/8	7970.00	10%	19000	1.581	161.17	107.00	0.0000	10.00	100%
90	EHS	A	7/16	2080.00	10%	21000	0.399	141.43	106.00	0.0000	-6.00	100%
		B	7/16	2080.00	10%	21000	0.399	134.86	106.00	0.0000	4.00	100%
		C	7/16	2080.00	10%	21000	0.399	131.91	107.00	0.0000	10.00	100%
50	EHS	A	7/16	2080.00	10%	21000	0.399	118.04	106.00	0.0000	-6.00	100%
		B	7/16	2080.00	10%	21000	0.399	113.65	106.00	0.0000	4.00	100%
		C	7/16	2080.00	10%	21000	0.399	112.29	107.00	0.0000	10.00	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
152.333	Torque Arm	7.00	0.0000	Channel	A36 (36 ksi)	Channel	C12x20.7
132.438	Torque Arm	7.00	0.0000	Channel	A36 (36 ksi)	Arbitrary Shape	C12x20.7 w/ 8"x3/8" Plate
90	Corner						
50	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
152.33	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L2x2x3/16
132.44	A572-50 (50 ksi)	Solid Round				A53-B-35 (35 ksi)	Pipe	
90.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	4x3/8
50.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Flat Bar	4x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
152.333	97.87	93.59	91.38		3.39 3.2 sec/pulse	3.11 3.0 sec/pulse	2.96 3.0 sec/pulse	
132.438	273.54	261.08	254.81		2.93 3.0 sec/pulse	2.67 2.8 sec/pulse	2.55 2.8 sec/pulse	
90	56.43	53.81	52.63		1.90 2.4 sec/pulse	1.73 2.3 sec/pulse	1.66 2.2 sec/pulse	
50	47.10	45.34	44.80		1.33 2.0 sec/pulse	1.23 1.9 sec/pulse	1.21 1.9 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
152.333	No	No	1	1	1	1	1	1
132.438	No	No	1	1	1	1	1	1
90	No	No			1	1	1	1
50	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
152.333	0.7500 A325N	8	0.0000	1	0.7500 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
132.438	0.7500 A325N	8	0.0000	1	0.7500 A325N	1	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
90	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
50	0.0000 A325N	0	0.0000	1	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
152.333	A	73.17	21	15	0.5000
	B	78.17	21	16	0.5000
	C	81.17	21	16	0.5000
132.438	A	63.22	20	15	0.5000
	B	68.22	20	15	0.5000
	C	71.22	20	15	0.5000
90	A	42.00	18	13	0.5000
	B	47.00	18	14	0.5000

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
50	C	50.00	18	14	0.5000
	A	22.00	16	12	0.5000
	B	27.00	16	12	0.5000
	C	30.00	16	12	0.5000

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation ft		H ft	V ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft
152.333	A	104.04	158.33	3049	3.00	2929	3.12	2809	3.25	2690	3.39	2571	3.55	2453	3.72	2336	3.90
	B	104.04	148.33	3083	2.72	2951	2.84	2820	2.97	2690	3.11	2560	3.26	2431	3.43	2303	3.62
	C	105.04	142.33	3110	2.57	2969	2.69	2829	2.82	2690	2.96	2552	3.12	2414	3.30	2278	3.49
132.438	A	104.04	138.44	9163	2.55	8764	2.67	8366	2.79	7970	2.93	7576	3.08	7185	3.25	6798	3.43
	B	104.04	128.44	9279	2.30	8842	2.41	8405	2.54	7970	2.67	7538	2.82	7109	2.99	6684	3.18
	C	105.04	122.44	9372	2.17	8902	2.28	8435	2.41	7970	2.55	7508	2.70	7050	2.88	6597	3.07
90	A	104.03	96.00	2578	1.54	2411	1.64	2245	1.76	2080	1.90	1916	2.06	1755	2.25	1596	2.47
	B	104.03	86.00	2628	1.37	2445	1.47	2262	1.59	2080	1.73	1900	1.89	1723	2.09	1549	2.32
	C	105.03	80.00	2664	1.30	2468	1.40	2273	1.52	2080	1.66	1889	1.82	1700	2.03	1516	2.27
50	A	104.03	56.00	2797	0.99	2557	1.08	2317	1.19	2080	1.33	1846	1.50	1616	1.71	1393	1.98
	B	104.03	46.00	2854	0.90	2594	0.99	2336	1.10	2080	1.23	1827	1.40	1580	1.62	1342	1.91
	C	105.03	40.00	2888	0.87	2617	0.96	2347	1.07	2080	1.21	1816	1.38	1559	1.61	1312	1.91

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
LMR-400 (13/32 FOAM)	B	No	Ar (CfAe)	50.00 - 6.00	0.0000	0.48	2	2	0.4100	0.4100		0.07
LDF6-50A (1-1/4 FOAM)	C	Yes	Ar (CfAe)	141.00 - 6.00	0.0000	0.23	9	9	1.0000	1.5500		0.66
2" Rigid Conduit	C	Yes	Ar (CfAe)	143.00 - 6.00	2.0000	0	2	2	1.0000	2.0000		2.80
LDF7-50A(1-5/8")	B	Yes	Ar (CfAe)	162.00 - 6.00	0.0000	-0.2	12	6	1.0000	1.9800		0.82
LDF4-50A (1/2 FOAM)	B	No	Af (Leg)	167.00 - 6.00	0.0000	0.16	1	1	0.5800	0.5800	1.8221	0.25
LDF7-50A(1-5/8")	B	No	Ar (CfAe)	170.00 - 6.00	0.0000	0.15	2	1	0.5800	1.9800		0.82
LDF5-50A (7/8 FOAM)	B	No	Af (Leg)	170.00 - 6.00	0.0000	0.1	2	1	0.8750	1.1100	3.4872	0.54
LDF4-50A (1/2 FOAM)	B	No	Af (Leg)	170.00 - 6.00	0.0000	0.1	1	1	0.5800	0.5800	1.8221	0.25
LDF4-50A (1/2 FOAM)	C	No	Af (Leg)	146.00 - 6.00	0.0000	0.2	1	1	0.5800	0.5800	1.8221	0.25
LDF4-50A (1/2 FOAM)	C	No	Af (Leg)	146.00 - 6.00	0.0000	0.1	1	1	0.5800	0.5800	1.8221	0.25
LDF7-50A(1-5/8") ***AT&T***	B	Yes	Ar (CfAe)	163.00 - 6.00	2.0000	0.18	6	3	1.9800	1.9800		0.82
LDF5-50A(7/8")	A	Yes	Ar (CfAe)	120.00 - 6.00	0.0000	0	18	18	0.5000	1.0900		0.33

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	170.00-155.00	A	0.000	0.000	0.000	0.000	0.00
		B	13.365	2.692	0.000	0.000	155.79
		C	0.000	2.692	0.000	0.000	0.00
T2	155.00-140.00	A	0.000	0.580	0.000	0.000	0.00
		B	24.750	2.837	0.000	0.000	269.70
		C	2.163	3.418	0.000	0.000	25.74
T3	140.00-120.00	A	0.000	1.933	0.000	0.000	0.00
		B	33.000	3.783	0.000	0.000	359.60
		C	29.917	5.717	0.000	0.000	240.80
T4	120.00-100.00	A	32.700	1.933	0.000	0.000	118.80
		B	33.000	3.783	0.000	0.000	359.60
		C	29.917	5.717	0.000	0.000	240.80
T5	100.00-80.00	A	32.700	1.933	0.000	0.000	118.80
		B	33.000	3.783	0.000	0.000	359.60
		C	29.917	5.717	0.000	0.000	240.80
T6	80.00-60.00	A	32.700	1.933	0.000	0.000	118.80
		B	33.000	3.783	0.000	0.000	359.60
		C	29.917	5.717	0.000	0.000	240.80
T7	60.00-40.00	A	32.700	1.933	0.000	0.000	118.80
		B	33.683	3.783	0.000	0.000	361.00
		C	29.917	5.717	0.000	0.000	240.80
T8	40.00-20.00	A	32.700	1.933	0.000	0.000	118.80
		B	34.367	3.783	0.000	0.000	362.40
		C	29.917	5.717	0.000	0.000	240.80
T9	20.00-5.00	A	22.890	1.353	0.000	0.000	83.16
		B	24.057	2.648	0.000	0.000	253.68
		C	20.942	4.002	0.000	0.000	168.56
T10	5.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	170.00-155.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		11.423	13.717	0.000	0.000	503.98
		C		0.000	5.026	0.000	0.000	0.00
T2	155.00-140.00	A	0.500	0.000	1.247	0.000	0.000	0.00
		B		18.625	23.962	0.000	0.000	888.40
		C		0.962	9.034	0.000	0.000	61.44
T3	140.00-120.00	A	0.500	0.000	4.156	0.000	0.000	0.00
		B		24.833	31.950	0.000	0.000	1184.54
		C		9.250	50.272	0.000	0.000	658.04
T4	120.00-100.00	A	0.500	3.483	49.206	0.000	0.000	454.23
		B		24.833	31.950	0.000	0.000	1184.54
		C		9.250	50.272	0.000	0.000	658.04
T5	100.00-80.00	A	0.500	3.483	49.206	0.000	0.000	454.23
		B		24.833	31.950	0.000	0.000	1184.54
		C		9.250	50.272	0.000	0.000	658.04

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T6	80.00-60.00	A	0.500	3.483	49.206	0.000	0.000	454.23
		B		24.833	31.950	0.000	0.000	1184.54
		C		9.250	50.272	0.000	0.000	658.04
T7	60.00-40.00	A	0.500	3.483	49.206	0.000	0.000	454.23
		B		26.008	32.633	0.000	0.000	1195.48
		C		9.250	50.272	0.000	0.000	658.04
T8	40.00-20.00	A	0.500	3.483	49.206	0.000	0.000	454.23
		B		27.183	33.317	0.000	0.000	1206.42
		C		9.250	50.272	0.000	0.000	658.04
T9	20.00-5.00	A	0.500	2.438	34.444	0.000	0.000	317.96
		B		19.028	23.322	0.000	0.000	844.50
		C		6.475	35.191	0.000	0.000	
T10	5.00-0.00	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	170.00-155.00	A	0.000	0.000	0.000	0.000
		B	1.515	3.800	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	155.00-140.00	A	0.000	0.000	0.000	0.000
		B	4.569	11.289	0.248	0.373
		C	0.444	1.149	0.024	0.038
T3	140.00-120.00	A	0.000	0.000	0.000	0.000
		B	0.000	5.522	6.390	9.617
		C	0.000	5.960	6.436	10.381
T4	120.00-100.00	A	4.424	10.944	0.000	0.000
		B	4.018	10.080	0.000	0.000
		C	4.048	10.880	0.000	0.000
T5	100.00-80.00	A	4.424	11.146	0.545	0.809
		B	4.018	10.266	0.495	0.745
		C	4.048	11.081	0.499	0.804
T6	80.00-60.00	A	4.424	12.562	2.180	3.236
		B	4.018	11.570	1.980	2.980
		C	4.048	12.489	1.994	3.217
T7	60.00-40.00	A	4.424	11.146	0.545	0.809
		B	4.018	10.266	0.495	0.745
		C	4.048	11.081	0.499	0.804
T8	40.00-20.00	A	3.370	8.809	0.000	0.000
		B	3.061	8.113	0.000	0.000
		C	3.083	8.757	0.000	0.000
T9	20.00-5.00	A	2.470	6.373	0.000	0.000
		B	2.243	5.870	0.000	0.000
		C	2.259	6.336	0.000	0.000
T10	5.00-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	170.00-155.00	3.5152	-1.2789	3.2275	-0.6739
T2	155.00-140.00	3.4778	-1.6357	2.9016	-0.8413
T3	140.00-120.00	1.4335	0.9276	1.2370	0.8203
T4	120.00-100.00	-0.7718	-0.3481	-0.5374	-0.1725
T5	100.00-80.00	-0.7146	-0.3211	-0.4897	-0.1564
T6	80.00-60.00	-0.6141	-0.2723	-0.3509	-0.1089
T7	60.00-40.00	-0.6198	-0.2699	-0.4231	-0.1211
T8	40.00-20.00	-0.6179	-0.2637	-0.4694	-0.1243
T9	20.00-5.00	-0.5944	-0.2531	-0.4479	-0.1179
T10	5.00-0.00	0.0000	0.0000	0.0000	0.0000

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 lb
175ft									
DS4C03F36U-D 8' Omni	A	From Leg	1.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	2.56 3.28	2.56 3.28	30.00 48.53
SC473-HF1LDF	B	From Leg	1.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	1.44 1.74	1.44 1.74	17.00 29.43
SC473-HF1LDF	C	From Leg	1.00 0.00 0.00	0.0000	175.00	No Ice 1/2" Ice	1.44 1.74	1.44 1.74	17.00 29.43
TTA-429-83H-08179	A	From Leg	1.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	1.63 1.81	0.95 1.09	25.00 37.44
168ft									
Pirod 4' Side Mount Standoff	A	From Leg	0.50 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00
Pirod 4' Side Mount Standoff	B	From Leg	0.50 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice	2.72 4.91	2.72 4.91	50.00 89.00
4' Standoff	C	From Leg	0.50 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice	3.42 3.67	3.42 3.67	111.16 147.20
163ft									
APX16DWV-16DWVS	A	From Leg	3.00 6.00 0.00	0.0000	163.00	No Ice 1/2" Ice	7.23 7.68	2.15 2.49	40.70 74.24
APX16DWV-16DWVS	B	From Leg	3.00 6.00 0.00	0.0000	163.00	No Ice 1/2" Ice	7.23 7.68	2.15 2.49	40.70 74.24
APX16DWV-16DWVS	C	From Leg	3.00 6.00 0.00	0.0000	163.00	No Ice 1/2" Ice	7.23 7.68	2.15 2.49	40.70 74.24
LNX-6515DS-VTM	A	From Leg	3.00 -6.00	0.0000	163.00	No Ice 1/2" Ice	11.41 12.03	7.70 8.29	50.27 115.98

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
LNX-6515DS-VTM	B	From Leg	3.00 -6.00 0.00	0.0000	163.00	No Ice 1/2" Ice	11.41 12.03	7.70 8.29	50.27 115.98
LNX-6515DS-VTM	C	From Leg	3.00 -6.00 0.00	0.0000	163.00	No Ice 1/2" Ice	11.41 12.03	7.70 8.29	50.27 115.98
(2) TMA	A	From Leg	3.00 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	20.00 26.53
(2) TMA	B	From Leg	3.00 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	20.00 26.53
(2) TMA	C	From Leg	3.00 0.00 0.00	0.0000	163.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	20.00 26.53
Sector Mount [SM 303-3]	C	None		0.0000	163.00	No Ice 1/2" Ice	43.57 61.82	43.57 61.82	1879.50 2704.43
143ft									
844H90T11EXY	A	From Leg	1.00 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	14.00 40.30
844H90T11EXY	B	From Leg	1.00 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	14.00 40.30
844H90T11EXY	C	From Leg	1.00 0.00 0.00	0.0000	143.00	No Ice 1/2" Ice	3.06 3.39	3.73 4.10	14.00 40.30
(4) 844G45VTZASX	A	From Leg	1.00 0.00 0.00	0.0000	141.50	No Ice 1/2" Ice	7.00 7.41	3.97 4.34	15.00 58.04
(4) 844G45VTZASX	B	From Leg	1.00 0.00 0.00	0.0000	141.50	No Ice 1/2" Ice	7.00 7.41	3.97 4.34	15.00 58.04
(4) 844G45VTZASX	C	From Leg	1.00 0.00 0.00	0.0000	141.50	No Ice 1/2" Ice	7.00 7.41	3.97 4.34	15.00 58.04
RRUS 11	A	From Leg	1.00 0.00 0.00	0.0000	141.50	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	50.70 71.50
RRUS 11	B	From Leg	1.00 0.00 0.00	0.0000	141.50	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	50.70 71.50
RRUS 11	C	From Leg	1.00 0.00 0.00	0.0000	141.50	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	50.70 71.50
Sector Mount [SM 402-3]	C	None		0.0000	141.00	No Ice 1/2" Ice	18.91 26.78	18.91 26.78	850.68 1233.15
120ft									
7770.00 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	55.38 102.81
7770.00 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	55.38 102.81
7770.00 w/ Mount Pipe	C	From Leg	3.00 0.00	0.0000	120.00	No Ice 1/2" Ice	6.12 6.63	4.25 5.01	55.38 102.81

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		C_AA_A *Front* *ft²*	C_AA_A *Side* *ft²*	*Weight* *lb*
			0.00						
AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	74.05 139.04
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	74.05 139.04
AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	8.50 9.15	6.30 7.48	74.05 139.04
OPA-65R-LCUU-H6 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	98.55 175.48
OPA-65R-LCUU-H6 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	98.55 175.48
OPA-65R-LCUU-H6 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	10.60 11.27	7.18 8.36	98.55 175.48
(2) 7020.00	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.12 0.17	0.20 0.28	2.20 5.16
(2) 7020.00	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.12 0.17	0.20 0.28	2.20 5.16
(2) 7020.00	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.12 0.17	0.20 0.28	2.20 5.16
(4) 782-10250	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.52 0.63	0.27 0.36	6.40 10.06
(4) 782-10250	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.52 0.63	0.27 0.36	6.40 10.06
(4) 782-10250	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.52 0.63	0.27 0.36	6.40 10.06
(2) LGP21401	A	From Leg	0.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	17.50 23.31
(2) LGP21401	B	From Leg	0.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	17.50 23.31
(2) LGP21401	C	From Leg	0.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.95 1.09	0.37 0.48	17.50 23.31
LGP12104	A	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.52 0.66	0.03 0.06	1.80 5.00
LGP12104	B	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.52 0.66	0.03 0.06	1.80 5.00
LGP12104	C	From Leg	3.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	0.52 0.66	0.03 0.06	1.80 5.00
(2) RRUS 11	A	From Leg	2.00 0.00	0.0000	120.00	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	50.70 71.50

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
(2) RRUS 11	B	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	50.70 71.50
(2) RRUS 11	C	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	50.70 71.50
RRUS 32	A	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	3.33 3.60	1.98 2.21	55.12 77.39
RRUS 32	B	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	3.33 3.60	1.98 2.21	55.12 77.39
RRUS 32	C	From Leg	2.00 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	3.33 3.60	1.98 2.21	55.12 77.39
DC6-48-60-18-8F	A	From Leg	0.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	2.57 2.80	2.57 2.80	18.90 41.46
DC6-48-60-18-8F	B	From Leg	0.50 0.00 0.00	0.0000	120.00	No Ice 1/2" Ice	2.57 2.80	2.57 2.80	18.90 41.46
Sector Mount [SM 802-3]	C	None		0.0000	120.00	No Ice 1/2" Ice	24.41 31.39	24.41 31.39	930.00 1362.00
50ft									
(2) GPS	C	None		0.0000	50.00	No Ice 1/2" Ice	1.00 1.50	1.00 1.50	10.00 15.00

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 lb
VHLP800-11	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	Worst		145.60	2.80	No Ice 1/2" Ice	6.16 6.53	49.00 80.00
VHLP2-180	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		145.60	2.00	No Ice 1/2" Ice	3.14 3.41	25.00 40.00
VHLP2-180	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		145.60	2.00	No Ice 1/2" Ice	3.14 3.41	25.00 40.00
RFS SC2-W100BC	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	Worst		167.00	2.00	No Ice 1/2" Ice	3.14 3.41	20.00 37.50

Load Combinations

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	170 - 155	Leg	Max Tension	8	11770.46	-2.84	399.65
			Max. Compression	15	-15016.07	1.91	33.88
			Max. Mx	24	7784.04	-368.07	-72.36
			Max. My	21	11212.30	4.19	407.85
			Max. Vy	18	1657.39	-46.97	6.45
			Max. Vx	21	1814.07	-3.06	-45.48
		Diagonal	Max Tension	26	2009.58	0.00	0.00
			Max. Compression	26	-2055.55	0.00	0.00
			Max. Mx	15	1677.83	-6.35	0.58
			Max. My	9	-1685.22	0.73	2.73
			Max. Vy	15	4.89	-6.35	0.58
			Max. Vx	9	-1.30	0.73	2.73

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Top Girt	Max Tension	2	23.37	0.00	0.00
			Max. Compression	8	-31.28	0.00	0.00
			Max. Mx	14	-5.59	3.16	0.00
			Max. My	18	-4.82	0.00	-0.00
			Max. Vy	14	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	21	723.59	0.00	0.00
			Max. Compression	15	-624.02	0.00	0.00
			Max. Mx	14	60.61	3.16	0.00
			Max. My	18	71.29	0.00	-0.00
			Max. Vy	14	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
T2	155 - 140	Leg	Max Tension	21	14553.17	10.85	283.92
			Max. Compression	15	-36637.68	0.81	522.92
			Max. Mx	25	14348.78	507.99	296.57
			Max. My	21	14548.69	-1.95	-597.55
			Max. Vy	23	-3246.46	454.79	-262.64
			Max. Vx	15	-3767.11	0.81	522.92
		Diagonal	Max Tension	21	2165.92	0.00	0.00
			Max. Compression	19	-3271.78	0.00	0.00
			Max. Mx	15	1020.45	-82.00	-5.17
			Max. My	18	-2544.42	9.25	-8.70
			Max. Vy	15	42.86	-82.00	-5.17
			Max. Vx	18	4.16	9.25	-8.70
		Secondary Horizontal	Max Tension	17	791.08	0.00	0.00
			Max. Compression	15	-634.58	0.00	0.00
			Max. Mx	24	707.46	5.44	0.00
			Max. My	18	557.57	0.00	-0.00
			Max. Vy	24	-6.37	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Top Girt	Max Tension	21	120.37	0.00	0.00
			Max. Compression	10	-21.29	0.00	0.00
			Max. Mx	14	70.01	3.16	0.00
			Max. My	18	58.44	0.00	-0.00
			Max. Vy	14	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	21	310.00	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	292.62	3.16	0.00
			Max. My	18	202.24	0.00	0.00
			Max. Vy	23	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	7036.42		
			Top Tension	21	7213.71		
			Top Cable Vert	21	6144.19		
			Top Cable Norm	21	3779.75		
			Top Cable Tan	21	6.66		
			Bot Cable Vert	21	-5741.91		
			Bot Cable Norm	21	4067.14		
			Bot Cable Tan	21	7.19		
		Guy B	Bottom Tension	25	6980.35		
			Top Tension	25	7146.46		
			Top Cable Vert	25	5965.92		
			Top Cable Norm	25	3934.41		
			Top Cable Tan	25	6.69		
			Bot Cable Vert	25	-5577.13		
			Bot Cable Norm	25	4197.73		
			Bot Cable Tan	25	6.53		
		Guy C	Bottom Tension	17	6931.38		
			Top Tension	17	7090.80		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Vert	17	5820.96		
			Top Cable Norm	17	4049.17		
			Top Cable Tan	17	6.18		
			Bot Cable Vert	17	-5439.63		
			Bot Cable Norm	17	4295.87		
			Bot Cable Tan	17	6.53		
		Top Guy Pull-Off	Max Tension	4	3180.67	0.00	0.00
			Max. Compression	2	-2396.35	0.00	0.00
			Max. Mx	14	419.19	-6.57	0.00
			Max. My	18	324.72	0.00	0.00
			Max. Vy	14	7.68	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	16	3539.11	0.00	0.00
			Max. Compression	3	-1165.59	0.00	0.00
			Max. Mx	21	-371.07	-21693.54	-0.00
			Max. My	18	164.35	-13460.53	-0.00
			Max. Vy	21	6248.68	-21693.54	-0.00
			Max. Vx	18	-0.00	-13460.53	-0.00
T3	140 - 120	Leg	Max Tension	21	31102.92	-567.77	3.37
			Max. Compression	15	-56866.89	146.72	2.58
			Max. Mx	15	-53552.31	-1595.47	-26.78
			Max. My	20	-11325.81	-748.87	-1792.88
			Max. Vy	23	-3770.87	1467.70	-15.55
			Max. Vx	20	1805.20	-748.87	-1792.88
		Diagonal	Max Tension	24	4204.64	-99.17	-24.79
			Max. Compression	18	-5339.63	-63.78	-30.29
			Max. Mx	21	2646.49	136.39	0.31
			Max. My	22	-4042.87	40.77	61.46
			Max. Vy	21	-68.93	136.39	0.31
			Max. Vx	22	-29.27	40.77	61.46
		Secondary Horizontal	Max Tension	21	2843.67	0.00	0.00
			Max. Compression	19	-1372.16	0.00	0.00
			Max. Mx	14	693.68	-6.79	0.00
			Max. My	19	968.49	0.00	0.00
			Max. Vy	14	-7.94	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Top Girt	Max Tension	23	982.22	0.00	0.00
			Max. Compression	21	-633.11	0.00	0.00
			Max. Mx	23	-226.53	-4.14	0.00
			Max. My	18	859.23	0.00	-0.00
			Max. Vy	23	4.84	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	1230.24	0.00	0.00
			Max. Compression	8	-380.86	0.00	0.00
			Max. Mx	14	409.99	-4.75	0.00
			Max. My	19	85.70	0.00	0.00
			Max. Vy	14	-5.56	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Guy A	Bottom Tension	21	18382.14		
			Top Tension	21	18715.60		
			Top Cable Vert	21	15116.28		
			Top Cable Norm	21	11035.02		
			Top Cable Tan	21	6.10		
			Bot Cable Vert	21	-14490.40		
			Bot Cable Norm	21	11310.67		
			Bot Cable Tan	21	8.41		
		Guy B	Bottom Tension	25	17880.53		
			Top Tension	25	18189.94		
			Top Cable Vert	25	14290.45		
			Top Cable Norm	25	11254.20		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Tan	25	6.27		
			Bot Cable Vert	25	-13690.75		
			Bot Cable Norm	25	11501.15		
			Bot Cable Tan	25	7.49		
		Guy C	Bottom Tension	17	17435.88		
			Top Tension	17	17730.89		
			Top Cable Vert	17	13615.50		
			Top Cable Norm	17	11357.93		
			Top Cable Tan	17	5.90		
			Bot Cable Vert	17	-13030.37		
			Bot Cable Norm	17	11585.31		
			Bot Cable Tan	17	7.26		
		Torque Arm Top	Max Tension	26	11818.93	-10779.22	-0.00
			Max. Compression	20	-5259.23	0.00	0.00
			Max. Mx	21	-3485.69	-50770.75	0.00
			Max. My	19	4311.89	-40112.20	-0.00
			Max. Vy	21	14585.83	-50770.75	0.00
			Max. Vx	19	-0.00	-40112.20	-0.00
T4	120 - 100	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-36233.30	-2.82	157.29
			Max. Mx	24	-25642.77	-317.61	-95.80
			Max. My	21	-26464.42	-10.34	349.23
			Max. Vy	18	-2587.39	-102.25	107.07
			Max. Vx	21	-2937.26	3.80	-140.54
		Diagonal	Max Tension	16	1226.41	0.00	0.00
			Max. Compression	15	-1704.98	-4.88	0.52
			Max. Mx	22	-478.41	-27.26	-0.41
			Max. My	20	-373.23	-26.04	-1.15
			Max. Vy	22	14.83	-27.26	-0.41
			Max. Vx	20	0.55	-26.04	-1.15
		Top Girt	Max Tension	23	720.96	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	494.63	3.16	0.00
			Max. My	19	487.03	0.00	-0.00
			Max. Vy	14	-3.69	0.00	0.00
			Max. Vx	19	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	441.72	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	301.74	3.16	0.00
			Max. My	18	323.35	0.00	0.00
			Max. Vy	14	-3.69	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-45033.99	-9.67	67.36
			Max. Mx	17	-29860.80	-257.14	-77.25
			Max. My	15	-23376.57	0.32	282.35
			Max. Vy	19	-778.11	-204.89	-104.96
			Max. Vx	15	878.27	-15.60	233.74
		Diagonal	Max Tension	16	1027.10	0.00	0.00
			Max. Compression	16	-1314.81	0.00	0.00
			Max. Mx	22	-122.91	-19.48	-0.29
			Max. My	15	-357.22	-1.51	0.83
			Max. Vy	22	11.12	-19.48	-0.29
			Max. Vx	15	-0.40	0.00	0.00
		Top Girt	Max Tension	23	427.64	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	313.22	3.16	0.00
			Max. My	18	325.66	0.00	0.00
			Max. Vy	14	-3.69	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	769.19	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	343.47	3.16	0.00
			Max. My	24	720.29	0.00	0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	7275.58		
			Top Tension	21	7368.19		
			Top Cable Vert	21	5071.92		
			Top Cable Norm	21	5344.70		
			Top Cable Tan	21	0.23		
			Bot Cable Vert	21	-4832.79		
			Bot Cable Norm	21	5438.58		
			Bot Cable Tan	21	0.23		
		Guy B	Bottom Tension	25	7039.63		
			Top Tension	25	7122.63		
			Top Cable Vert	25	4611.64		
			Top Cable Norm	25	5428.13		
			Top Cable Tan	25	0.20		
			Bot Cable Vert	25	-4387.90		
			Bot Cable Norm	25	5504.79		
			Bot Cable Tan	25	0.20		
		Guy C	Bottom Tension	17	6856.98		
			Top Tension	17	6934.21		
			Top Cable Vert	17	4274.28		
			Top Cable Norm	17	5460.20		
			Top Cable Tan	17	0.06		
			Bot Cable Vert	17	-4059.95		
			Bot Cable Norm	17	5525.85		
			Bot Cable Tan	17	0.06		
		Top Guy Pull-Off	Max Tension	15	3507.17	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	21	2751.57	10.77	0.00
			Max. My	18	2327.78	0.00	0.00
			Max. Vy	21	12.60	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-46036.59	-393.55	70.31
			Max. Mx	21	-44186.03	-591.53	0.89
			Max. My	23	-41544.40	-538.81	-130.79
			Max. Vy	23	-1111.56	17.92	-0.02
			Max. Vx	22	-442.99	53.93	-6.32
		Diagonal	Max Tension	20	211.08	0.00	0.00
			Max. Compression	20	-1412.49	0.00	0.00
			Max. Mx	22	-1213.83	-16.72	-0.34
			Max. My	15	-1064.04	12.60	0.89
			Max. Vy	22	9.81	-16.72	-0.34
			Max. Vx	15	0.43	0.00	0.00
		Secondary Horizontal	Max Tension	23	1133.47	0.00	0.00
			Max. Compression	22	-797.38	0.00	0.00
			Max. Mx	17	531.94	-6.57	0.00
			Max. My	18	765.31	0.00	0.00
			Max. Vy	17	7.68	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Top Girt	Max Tension	23	199.64	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	171.19	3.16	0.00
			Max. My	24	158.20	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Bottom Girt	Max Tension	21	221.64	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	216.07	3.16	0.00
			Max. My	18	169.08	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-48139.31	-190.91	94.03
			Max. Mx	25	-32518.33	332.21	121.15
			Max. My	15	-27935.96	-1.44	350.18
			Max. Vy	24	-987.38	270.31	-103.72
			Max. Vx	15	-1080.96	11.67	293.18
		Diagonal	Max Tension	20	1189.70	0.00	0.00
			Max. Compression	22	-1456.71	0.00	0.00
			Max. Mx	22	141.47	-21.30	0.59
			Max. My	23	-768.36	-12.59	1.25
			Max. Vy	22	11.99	-21.30	0.59
			Max. Vx	23	-0.60	0.00	0.00
		Top Girt	Max Tension	23	797.25	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	350.34	3.16	0.00
			Max. My	18	502.77	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	20	745.35	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	289.92	3.16	0.00
			Max. My	18	623.99	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	8220.84		
			Top Tension	21	8274.96		
			Top Cable Vert	21	3978.37		
			Top Cable Norm	21	7255.86		
			Top Cable Tan	21	0.28		
			Bot Cable Vert	21	-3817.29		
			Bot Cable Norm	21	7280.83		
			Bot Cable Tan	21	0.28		
		Guy B	Bottom Tension	25	7967.64		
			Top Tension	25	8012.11		
			Top Cable Vert	25	3293.31		
			Top Cable Norm	25	7303.97		
			Top Cable Tan	25	0.20		
			Bot Cable Vert	25	-3149.12		
			Bot Cable Norm	25	7318.90		
			Bot Cable Tan	25	0.20		
		Guy C	Bottom Tension	17	7781.75		
			Top Tension	17	7820.42		
			Top Cable Vert	17	2835.37		
			Top Cable Norm	17	7288.33		
			Top Cable Tan	17	0.14		
			Bot Cable Vert	17	-2699.86		
			Bot Cable Norm	17	7298.38		
			Bot Cable Tan	17	0.14		
		Top Guy Pull-Off	Max Tension	23	4538.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	1499.04	10.77	0.00
			Max. My	18	2907.46	0.00	-0.00
			Max. Vy	17	12.60	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-51154.78	429.01	72.42

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	23	-47237.73	-517.03	-23.01
			Max. My	23	-46682.66	-236.04	461.12
			Max. Vy	18	-872.40	17.62	-177.12
			Max. Vx	26	831.70	-169.32	76.87
		Diagonal	Max Tension	16	813.67	0.00	0.00
			Max. Compression	18	-1758.60	0.00	0.00
			Max. Mx	20	99.59	3.90	0.00
			Max. My	19	-824.19	0.00	0.02
			Max. Vy	20	-3.72	0.00	0.00
			Max. Vx	19	-0.02	0.00	0.00
		Horizontal	Max Tension	22	886.03	0.00	0.00
			Max. Compression	22	-886.03	0.00	0.00
			Max. Mx	17	565.19	5.44	0.00
			Max. My	18	861.48	0.00	-0.00
			Max. Vy	17	-6.37	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Top Girt	Max Tension	18	433.11	0.00	0.00
			Max. Compression	16	-251.18	0.00	0.00
			Max. Mx	17	169.66	3.16	0.00
			Max. My	18	433.08	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	23	397.23	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	271.91	3.16	0.00
			Max. My	18	352.71	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
T9	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-50916.35	-408.43	-44.12
			Max. Mx	24	-43420.13	1822.12	872.86
			Max. My	22	-43815.90	-82.98	-2043.81
			Max. Vy	24	-8179.06	1822.12	872.86
			Max. Vx	20	9377.25	-122.63	-2029.11
		Diagonal	Max Tension	19	1753.37	0.00	0.00
			Max. Compression	22	-2700.96	0.00	0.00
			Max. Mx	20	1729.26	3.90	0.00
			Max. My	19	-424.18	0.00	0.02
			Max. Vy	20	3.72	0.00	0.00
			Max. Vx	19	0.02	0.00	0.00
		Horizontal	Max Tension	22	881.90	0.00	0.00
			Max. Compression	22	-881.90	0.00	0.00
			Max. Mx	17	638.64	5.44	0.00
			Max. My	18	860.31	0.00	-0.00
			Max. Vy	17	-6.37	0.00	0.00
			Max. Vx	18	0.00	0.00	0.00
		Top Girt	Max Tension	22	466.58	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	188.10	3.16	0.00
			Max. My	18	130.61	0.00	-0.00
			Max. Vy	17	-3.69	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	22	5617.90	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	17	4511.08	7.72	0.00
			Max. My	18	5442.31	0.00	-0.00
			Max. Vy	17	-9.03	0.00	0.00
			Max. Vx	18	-0.00	0.00	0.00
T10	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-47079.48	-26.28	6.65
			Max. Mx	22	-44151.79	2043.76	-78.51

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	23	-42496.43	-7.64	-240.31
			Max. Vy	22	7515.62	2043.76	-78.51
			Max. Vx	24	-540.78	-1069.38	65.33
		Top Girt	Max Tension	23	4856.95	-12.44	0.01
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	20	4298.74	-186.07	-2.28
			Max. My	18	4042.96	-142.57	-3.51
			Max. Vy	20	95.90	-186.07	-2.28
			Max. Vx	18	3.06	-142.57	-3.51
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	20	-3807.13	-466.07	-1.34
			Max. Mx	23	-3657.26	-494.71	-0.37
			Max. My	18	-3602.31	-440.71	-3.35
			Max. Vy	23	-2386.62	-494.71	-0.37
			Max. Vx	18	31.39	-440.71	-3.35
		Mid Girt	Max Tension	19	2.27	0.00	0.00
			Max. Compression	22	-38.82	0.00	0.00
			Max. Mx	25	-17.46	1.52	0.00
			Max. My	18	-5.00	0.00	0.30
			Max. Vy	25	-3.56	0.00	0.00
			Max. Vx	18	-0.70	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	22	119374.08	868.85	-1387.10
	Max. H_x	24	118641.35	1663.88	-45.56
	Max. H_z	15	117858.96	2.45	1736.67
	Max. M_x	1	0.00	2.55	9.10
	Max. M_z	1	0.00	2.55	9.10
	Max. Torsion	18	116.06	-1652.21	-32.19
	Min. Vert	1	77784.87	2.55	9.10
	Min. H_x	18	117916.21	-1652.21	-32.19
	Min. H_z	21	117738.31	14.79	-1543.32
	Min. M_x	1	0.00	2.55	9.10
	Min. M_z	1	0.00	2.55	9.10
	Min. Torsion	24	-225.86	1663.88	-45.56
Guy C @ 107 ft Elev 10 ft Azimuth 240 deg	Max. Vert	10	-1605.57	-1068.33	615.14
	Max. H_x	10	-1605.57	-1068.33	615.14
	Max. H_z	17	-43563.82	-38497.00	22232.56
	Min. Vert	17	-43563.82	-38497.00	22232.56
	Min. H_x	17	-43563.82	-38497.00	22232.56
	Min. H_z	10	-1605.57	-1068.33	615.14
Guy B @ 106 ft Elev 4 ft Azimuth 120 deg	Max. Vert	6	-2211.80	1392.65	800.78
	Max. H_x	25	-45886.63	38150.68	22034.35
	Max. H_z	25	-45886.63	38150.68	22034.35
	Min. Vert	25	-45886.63	38150.68	22034.35
	Min. H_x	6	-2211.80	1392.65	800.78
	Min. H_z	6	-2211.80	1392.65	800.78
Guy A @ 106 ft Elev -6 ft	Max. Vert	2	-3296.56	0.95	-2241.91

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Azimuth 0 deg					
	Max. H_x	24	-26896.65	1397.71	-23217.39
	Max. H_z	2	-3296.56	0.95	-2241.91
	Min. Vert	21	-49045.19	-2.19	-43407.10
	Min. H_x	18	-27492.48	-1391.16	-23663.61
	Min. H_z	21	-49045.19	-2.19	-43407.10

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	77784.87	-2.55	-9.10	0.00	0.00	33.16
Dead+Wind 0 deg - No Ice+Guy	84379.43	0.87	-1290.14	0.00	0.00	-55.72
Dead+Wind 30 deg - No Ice+Guy	84757.97	573.43	-1058.80	0.00	0.00	-64.85
Dead+Wind 60 deg - No Ice+Guy	84116.61	998.57	-583.90	0.00	0.00	-100.12
Dead+Wind 90 deg - No Ice+Guy	84471.84	1213.59	25.95	0.00	0.00	-105.85
Dead+Wind 120 deg - No Ice+Guy	84040.06	1143.02	644.39	0.00	0.00	-22.77
Dead+Wind 150 deg - No Ice+Guy	84911.66	641.54	1009.02	0.00	0.00	85.98
Dead+Wind 180 deg - No Ice+Guy	83900.41	-6.16	1131.55	0.00	0.00	129.63
Dead+Wind 210 deg - No Ice+Guy	85008.29	-655.75	1015.67	0.00	0.00	146.84
Dead+Wind 240 deg - No Ice+Guy	84138.75	-1162.19	657.57	0.00	0.00	190.44
Dead+Wind 270 deg - No Ice+Guy	84729.36	-1222.83	38.33	0.00	0.00	181.78
Dead+Wind 300 deg - No Ice+Guy	84172.44	-998.91	-575.98	0.00	0.00	80.57
Dead+Wind 330 deg - No Ice+Guy	84938.94	-570.48	-1055.74	0.00	0.00	-20.83
Dead+Ice+Temp+Guy	103339.59	-11.49	4.67	0.00	0.00	46.63
Dead+Wind 0 deg+Ice+Temp+Guy	117858.96	-2.45	-1736.67	0.00	0.00	-15.48
Dead+Wind 30 deg+Ice+Temp+Guy	117976.56	791.52	-1432.06	0.00	0.00	8.42
Dead+Wind 60 deg+Ice+Temp+Guy	117044.02	1360.41	-784.10	0.00	0.00	-62.68
Dead+Wind 90 deg+Ice+Temp+Guy	117916.21	1652.21	32.19	0.00	0.00	-116.06
Dead+Wind 120 deg+Ice+Temp+Guy	118274.53	1525.61	868.82	0.00	0.00	-16.40
Dead+Wind 150 deg+Ice+Temp+Guy	119135.37	843.04	1379.27	0.00	0.00	118.17
Dead+Wind 180 deg+Ice+Temp+Guy	117738.31	-14.79	1543.32	0.00	0.00	125.98
Dead+Wind 210 deg+Ice+Temp+Guy	119374.08	-868.85	1387.10	0.00	0.00	113.21
Dead+Wind 240 deg+Ice+Temp+Guy	118766.82	-1549.81	882.22	0.00	0.00	194.83
Dead+Wind 270	118641.35	-1663.88	45.56	0.00	0.00	225.86

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
deg+Ice+Temp+Guy Dead+Wind 300	117471.10	-1367.51	-769.74	0.00	0.00	97.38
deg+Ice+Temp+Guy Dead+Wind 330	118465.61	-795.17	-1420.59	0.00	0.00	-23.21
deg+Ice+Temp+Guy Dead+Wind 0 deg - Service+Guy	78434.83	-1.20	-475.10	0.00	0.00	-4.28
Dead+Wind 30 deg - Service+Guy	78494.26	226.90	-404.49	0.00	0.00	-10.52
Dead+Wind 60 deg - Service+Guy	78487.69	392.17	-235.76	0.00	0.00	-17.83
Dead+Wind 90 deg - Service+Guy	78288.16	457.73	-8.87	0.00	0.00	-11.80
Dead+Wind 120 deg - Service+Guy	78073.89	406.63	223.91	0.00	0.00	19.31
Dead+Wind 150 deg - Service+Guy	77997.38	228.91	384.46	0.00	0.00	54.03
Dead+Wind 180 deg - Service+Guy	78000.35	-3.84	442.35	0.00	0.00	70.59
Dead+Wind 210 deg - Service+Guy	77939.74	-236.67	386.45	0.00	0.00	77.54
Dead+Wind 240 deg - Service+Guy	77975.24	-414.18	227.41	0.00	0.00	85.51
Dead+Wind 270 deg - Service+Guy	78160.39	-463.59	-5.33	0.00	0.00	78.93
Dead+Wind 300 deg - Service+Guy	78373.12	-396.14	-233.12	0.00	0.00	47.94
Dead+Wind 330 deg - Service+Guy	78424.67	-229.68	-403.16	0.00	0.00	12.82

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-21348.11	-0.00	-0.27	21347.72	1.71	0.008%
2	-11.01	-21439.36	-28363.11	10.96	21439.20	28361.53	0.004%
3	13965.33	-21323.35	-24306.13	-13965.48	21323.22	24304.49	0.005%
4	24105.99	-21211.88	-13983.33	-24104.51	21211.81	13983.25	0.004%
5	27925.97	-21338.53	6.79	-27924.85	21338.42	-5.92	0.004%
6	24442.81	-21466.80	14190.50	-24441.49	21466.63	-14189.59	0.005%
7	13984.17	-21363.30	24325.18	-13983.26	21363.20	-24324.62	0.003%
8	11.01	-21256.88	27988.09	-11.54	21256.77	-27986.34	0.005%
9	-13965.33	-21372.89	24306.13	13964.15	21372.76	-24305.44	0.004%
10	-24430.77	-21484.35	14170.84	24429.74	21484.22	-14170.16	0.003%
11	-27925.97	-21357.71	-6.79	27925.11	21357.61	7.43	0.003%
12	-24118.03	-21229.44	-14002.99	24115.50	21229.32	14003.22	0.007%
13	-13984.17	-21332.93	-24325.18	13984.20	21332.86	24324.24	0.003%
14	0.00	-42543.98	-0.00	-1.02	42543.97	2.69	0.007%
15	-21.62	-42724.95	-36126.96	21.56	42724.57	36124.90	0.004%
16	17690.10	-42492.10	-30765.42	-17690.25	42491.91	30764.15	0.002%
17	30227.53	-42268.68	-17521.34	-30225.47	42268.54	17521.89	0.004%
18	35369.46	-42523.94	12.90	-35368.55	42523.76	-12.15	0.002%
19	31154.83	-42782.57	18081.69	-31153.08	42782.16	-18080.50	0.004%
20	17726.58	-42575.84	30802.81	-17725.25	42575.58	-30802.08	0.003%
21	21.62	-42363.03	35082.58	-22.59	42362.92	-35081.69	0.002%
22	-17690.10	-42595.88	30765.42	17688.39	42595.55	-30764.51	0.004%
23	-31131.98	-42819.30	18043.53	31130.61	42818.98	-18042.64	0.003%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
24	-35369.46	-42564.04	-12.90	35368.15	42563.77	13.92	0.003%
25	-30250.38	-42305.41	-17559.50	30249.50	42305.37	17560.38	0.002%
26	-17726.58	-42512.15	-30802.81	17726.68	42511.93	30801.41	0.003%
27	-4.30	-21383.75	-11079.34	4.22	21383.73	11078.15	0.005%
28	5455.21	-21338.44	-9494.58	-5454.80	21338.41	9492.44	0.009%
29	9416.40	-21294.90	-5462.24	-9415.00	21294.87	5461.65	0.006%
30	10908.58	-21344.37	2.65	-10906.30	21344.33	-1.40	0.011%
31	9547.97	-21394.48	5543.17	-9546.77	21394.44	-5542.08	0.007%
32	5462.57	-21354.05	9502.02	-5460.72	21353.99	-9499.15	0.014%
33	4.30	-21312.48	10932.85	-4.43	21312.43	-10929.71	0.013%
34	-5455.21	-21357.79	9494.58	5454.34	21357.76	-9493.50	0.006%
35	-9543.27	-21401.33	5535.48	9541.71	21401.29	-5534.27	0.008%
36	-10908.58	-21351.86	-2.65	10905.74	21351.81	3.95	0.013%
37	-9421.11	-21301.76	-5469.92	9419.23	21301.73	5469.21	0.008%
38	-5462.57	-21342.18	-9502.02	5461.72	21342.15	9499.79	0.010%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	10	0.00000001	0.00006727
2	Yes	17	0.00000001	0.00009667
3	Yes	16	0.00000001	0.00009946
4	Yes	12	0.00000001	0.00006685
5	Yes	17	0.00000001	0.00008810
6	Yes	18	0.00013377	0.00009405
7	Yes	18	0.00000001	0.00006551
8	Yes	13	0.00000001	0.00009028
9	Yes	18	0.00000001	0.00008283
10	Yes	19	0.00000001	0.00006824
11	Yes	18	0.00000001	0.00006696
12	Yes	12	0.00000001	0.00011587
13	Yes	17	0.00000001	0.00005845
14	Yes	9	0.00000001	0.00007438
15	Yes	19	0.00013910	0.00010040
16	Yes	19	0.00000001	0.00006792
17	Yes	13	0.00013866	0.00008936
18	Yes	20	0.00000001	0.00006228
19	Yes	20	0.00013494	0.00009813
20	Yes	20	0.00010305	0.00007693
21	Yes	15	0.00000001	0.00006535
22	Yes	20	0.00012997	0.00009593
23	Yes	21	0.00010027	0.00007318
24	Yes	20	0.00012391	0.00008466
25	Yes	15	0.00000001	0.00006176
26	Yes	19	0.00010409	0.00007363
27	Yes	11	0.00000001	0.00006369
28	Yes	10	0.00000001	0.00009035
29	Yes	10	0.00000001	0.00006116
30	Yes	10	0.00000001	0.00011251
31	Yes	11	0.00000001	0.00008542
32	Yes	10	0.00000001	0.00013733
33	Yes	10	0.00000001	0.00011363
34	Yes	11	0.00000001	0.00006934
35	Yes	11	0.00000001	0.00010492
36	Yes	10	0.00000001	0.00013634

37	Yes	10	0.00000001	0.00007697
38	Yes	10	0.00000001	0.00009620

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 155	2.096	33	0.1732	0.0263
T2	155 - 140	1.600	33	0.1503	0.0245
T3	140 - 120	1.281	33	0.0729	0.0231
T4	120 - 100	1.222	33	0.0179	0.0251
T5	100 - 80	1.214	33	0.0163	0.0314
T6	80 - 60	1.126	33	0.0282	0.0357
T7	60 - 40	0.953	33	0.0512	0.0393
T8	40 - 20	0.727	33	0.0575	0.0469
T9	20 - 5	0.436	33	0.0876	0.0568
T10	5 - 0	0.114	33	0.1054	0.0513

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	DS4C03F36U-D 8' Omni	33	2.096	0.1732	0.0263	41370
170.00	TTA-429-83H-08179	33	2.096	0.1732	0.0263	41370
168.00	Pirod 4' Side Mount Standoff	33	2.026	0.1721	0.0260	41370
167.00	RFS SC2-W100BC	33	1.991	0.1715	0.0259	41370
163.00	APX16DWV-16DWVS	33	1.854	0.1680	0.0254	29550
152.33	Guy	33	1.526	0.1395	0.0241	12438
145.60	VHLP800-11	33	1.370	0.1042	0.0234	9872
143.00	844H90T11EXY	33	1.323	0.0895	0.0232	9166
141.50	(4) 844G45VTZASX	33	1.300	0.0811	0.0231	8941
141.00	Sector Mount [SM 402-3]	33	1.293	0.0783	0.0231	8912
132.44	Guy	33	1.225	0.0378	0.0232	12769
120.00	7770.00 w/ Mount Pipe	33	1.222	0.0179	0.0251	66905
90.00	Guy	33	1.181	0.0214	0.0340	53583
50.00	Guy	33	0.845	0.0539	0.0422	92533

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 155	6.686	21	0.4950	0.1312
T2	155 - 140	5.277	21	0.4340	0.1241
T3	140 - 120	4.518	20	0.2105	0.1173
T4	120 - 100	4.861	23	0.2462	0.1193
T5	100 - 80	5.778	23	0.1350	0.1295
T6	80 - 60	6.112	23	0.0661	0.1345
T7	60 - 40	5.685	23	0.1994	0.1357

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T8	40 - 20	4.559	23	0.3421	0.1412
T9	20 - 5	2.698	23	0.5482	0.1408
T10	5 - 0	0.699	23	0.6495	0.1191

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
175.00	DS4C03F36U-D 8' Omni	21	6.686	0.4950	0.1312	16066
170.00	TTA-429-83H-08179	21	6.686	0.4950	0.1312	16066
168.00	Pirod 4' Side Mount Standoff	21	6.488	0.4940	0.1303	16066
167.00	RFS SC2-W100BC	21	6.389	0.4932	0.1299	16066
163.00	APX16DWV-16DWVS	21	6.000	0.4862	0.1280	11476
152.33	Guy	21	5.061	0.3994	0.1227	4432
145.60	VHLP800-11	20	4.690	0.2961	0.1193	3061
143.00	844H90T11EXY	20	4.593	0.2561	0.1183	2740
141.50	(4) 844G45VTZASX	20	4.551	0.2331	0.1177	2631
141.00	Sector Mount [SM 402-3]	20	4.539	0.2255	0.1176	2611
132.44	Guy	20	4.504	0.1173	0.1164	3678
120.00	7770.00 w/ Mount Pipe	23	4.861	0.2462	0.1193	14515
90.00	Guy	23	6.038	0.0499	0.1329	6461
50.00	Guy	23	5.205	0.2719	0.1378	7272

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	170	Leg	A325N	0.7500	4	65.77	19438.60	0.003 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	2009.58	2523.00	0.797 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	23.37	2523.00	0.009 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	723.59	2523.00	0.287 ✔	1.333	Member Bearing
T2	155	Leg	A325N	0.7500	4	2942.24	19416.60	0.152 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	3271.78	4123.34	0.793 ✔	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.6250	1	791.08	6442.72	0.123 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	120.37	2523.00	0.048 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	310.00	2523.00	0.123 ✔	1.333	Member Bearing
		Top Guy Pull-Off@152.333	A325N	0.7500	1	3180.67	4621.88	0.688 ✔	1.333	Member Block Shear
		Torque Arm Top@152.333	A325N	0.7500	8	442.39	9277.52	0.048 ✔	1.333	Bolt Shear
T3	140	Leg	A325N	0.7500	4	3636.69	19350.10	0.188 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.6250	1	5339.63	6442.72	0.829 ✔	1.333	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Secondary Horizontal	A325N	0.5000	1	2843.67	4123.34	0.690 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.6250	1	982.22	2129.69	0.461 ✔	1.333	Member Block Shear
		Bottom Girt	A325N	0.6250	1	1230.24	2582.81	0.476 ✔	1.333	Member Block Shear
		Torque Arm Top@132.438	A325N	0.7500	8	1477.37	9277.52	0.159 ✔	1.333	Bolt Shear
T4	120	Leg	A325N	0.7500	4	0.00	19425.40	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1226.41	2523.00	0.486 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	720.96	2523.00	0.286 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	441.72	2523.00	0.175 ✔	1.333	Member Bearing
T5	100	Leg	A325N	0.7500	4	0.00	19438.40	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1027.10	2523.00	0.407 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	427.64	2523.00	0.169 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	769.19	2523.00	0.305 ✔	1.333	Member Bearing
T6	80	Leg	A325N	0.7500	4	0.00	19437.30	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1412.49	4036.80	0.350 ✔	1.333	Member Bearing
		Secondary Horizontal	A325N	0.5000	1	1133.47	4078.13	0.278 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	154.24	2523.00	0.061 ✔	1	Member Bearing
		Bottom Girt	A325N	0.7500	1	221.64	3784.50	0.059 ✔	1.333	Member Bearing
T7	60	Leg	A325N	0.7500	4	0.00	19436.40	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1189.70	2523.00	0.472 ✔	1.333	Member Bearing
		Top Girt	A325N	0.5000	1	797.25	2523.00	0.316 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	745.35	2523.00	0.295 ✔	1.333	Member Bearing
T8	40	Leg	A325N	0.7500	4	0.00	19437.50	0.000 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1758.60	4036.80	0.436 ✔	1.333	Member Bearing
		Horizontal	A325N	0.5000	1	886.03	4123.34	0.215 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	433.11	2523.00	0.172 ✔	1.333	Member Bearing
		Bottom Girt	A325N	0.5000	1	397.23	2523.00	0.157 ✔	1.333	Member Bearing
T9	20	Diagonal	A325N	0.5000	1	1753.37	2523.00	0.695 ✔	1.333	Member Bearing
		Horizontal	A325N	0.5000	1	881.90	4123.34	0.214 ✔	1.333	Bolt Shear
		Top Girt	A325N	0.5000	1	466.58	2523.00	0.185 ✔	1.333	Member Bearing
		Bottom Girt	A490N	0.5000	1	5617.90	5497.79	1.022 ✔	1.333	Bolt Shear

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T2	152.33 (A) (567)	1/2 EHS	2690.00	26900.04	7213.71	13450.00	2.000	3.729 ✔
	152.33 (A) (568)	1/2 EHS	2690.00	26900.04	7192.30	13450.00	2.000	3.740 ✔
	152.33 (B) (563)	1/2 EHS	2690.00	26900.04	7090.76	13450.00	2.000	3.794 ✔
	152.33 (B) (564)	1/2 EHS	2690.00	26900.04	7146.46	13450.00	2.000	3.764 ✔
	152.33 (C) (556)	1/2 EHS	2690.00	26900.04	7090.80	13450.00	2.000	3.794 ✔
	152.33 (C) (557)	1/2 EHS	2690.00	26900.04	7051.73	13450.00	2.000	3.815 ✔
T3	132.44 (A) (579)	7/8 EHS	7970.00	79699.84	18715.60	39850.00	2.000	4.258 ✔
	132.44 (A) (580)	7/8 EHS	7970.00	79699.84	18650.40	39850.00	2.000	4.273 ✔
	132.44 (B) (575)	7/8 EHS	7970.00	79699.84	18007.70	39850.00	2.000	4.426 ✔
	132.44 (B) (576)	7/8 EHS	7970.00	79699.84	18189.90	39850.00	2.000	4.382 ✔
	132.44 (C) (571)	7/8 EHS	7970.00	79699.84	17730.90	39850.00	2.000	4.495 ✔
	132.44 (C) (572)	7/8 EHS	7970.00	79699.84	17592.30	39850.00	2.000	4.530 ✔
T5	90.00 (A) (585)	7/16 EHS	2080.00	20800.02	7368.19	10400.00	2.000	2.823 ✔
	90.00 (B) (584)	7/16 EHS	2080.00	20800.02	7122.63	10400.00	2.000	2.920 ✔
	90.00 (C) (583)	7/16 EHS	2080.00	20800.02	6934.21	10400.00	2.000	3.000 ✔
T7	50.00 (A) (588)	7/16 EHS	2080.00	20800.02	8274.96	10400.00	2.000	2.514 ✔
	50.00 (B) (587)	7/16 EHS	2080.00	20800.02	8012.11	10400.00	2.000	2.596 ✔
	50.00 (C) (586)	7/16 EHS	2080.00	20800.02	7820.42	10400.00	2.000	2.660 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 2 STD	15.00	2.42	36.8 K=1.00	1.00	26.267	1.0745	-15016.10	28224.70	0.532 ✔
T2	155 - 140	ROHN 2 STD	15.00	1.21	18.4 K=1.00	1.00	28.464	1.0745	-36637.70	30585.10	1.198 ✔
T3	140 - 120	Pipe 2STD w/ 1" Soild Rod	20.00	1.22	24.2 K=1.00	0.99	27.496	1.8578	-56866.90	51081.90	1.113 ✔
T4	120 - 100	ROHN 2 STD	20.00	2.44	37.2 K=1.00	1.00	26.224	1.0745	-36233.30	28178.50	1.286 ✔
T5	100 - 80	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	1.00	27.044	1.7040	-45034.00	46084.60	0.977 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	80 - 60	Pipe 2STD w/ 1/3 HSS3.5x0.3	20.00	1.22	17.6 K=1.00	0.97	27.698	1.8100	-46036.60	50134.30	0.918 ✔
T7	60 - 40	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	0.98	26.528	1.7040	-48139.30	45205.70	1.065 ✔
T8	40 - 20	ROHN 2.5 STD	20.00	2.44	30.9 K=1.00	0.98	26.551	1.7040	-51154.80	45243.80	1.131 ✔
T9	20 - 5	ROHN 2.5 STD	15.00	2.42	30.6 K=1.00	0.98	26.551	1.7040	-50916.40	45243.80	1.125 ✔
T10	5 - 0	ROHN 2.5 STD	5.38	2.42	30.6 K=1.00	0.97	26.289	1.7040	-37074.00	44797.00	0.828* ✔

* 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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 1.5 x 16GA	4.19	1.97	46.4 K=1.00	18.663	0.2627	-2055.55	4903.67	0.419 ✔
T2	155 - 140	ROHN 1.5 STD	4.19	1.97	38.0 K=1.00	19.346	0.7995	-3271.78	15465.90	0.212 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	4.20	1.98	69.5 K=1.00	16.478	0.8125	-5339.63	13388.70	0.399 ✔
T4	120 - 100	ROHN 1.5 x 16GA	4.20	1.98	46.5 K=1.00	18.651	0.2627	-1704.98	4900.68	0.348 ✔
T5	100 - 80	ROHN 1.5 x 16GA	4.20	1.95	45.9 K=1.00	18.703	0.2627	-1314.81	4914.11	0.268 ✔
T6	80 - 60	ROHN 1.5 x 16GA	4.20	1.94	45.7 K=1.00	18.718	0.2627	-1412.49	4918.28	0.287 ✔
T7	60 - 40	ROHN 1.5 x 16GA	4.20	1.95	45.9 K=1.00	18.703	0.2627	-1456.71	4914.11	0.296 ✔
T8	40 - 20	ROHN 1.5 x 16GA	4.20	3.91	91.9 K=1.00	13.983	0.2627	-1758.60	3674.10	0.479 ✔
T9	20 - 5	ROHN 1.5 x 16GA	4.19	3.89	91.6 K=1.00	14.015	0.2627	-2700.96	3682.43	0.733 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	40 - 20	1" solid	3.42	3.18	152.7 K=1.00	6.408	0.7854	-886.03	5032.58	0.176 ✔
T9	20 - 5	1" solid	3.42	3.18	152.7	6.408	0.7854	-881.90	5032.58	0.175

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=1.00					✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	155 - 140	1" solid	3.42	3.22	154.7 K=1.00	6.243	0.7854	-634.58	4903.26	0.129 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	3.42	3.22	113.3 K=1.00	11.643	0.8125	-1372.16	9459.53	0.145 ✔
T6	80 - 60	L2x2x3/16	3.42	3.17	96.5 K=1.00	13.420	0.7150	-797.38	9595.17	0.083 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 1.5 x 16GA	3.42	3.22	75.8 K=1.00	15.818	0.2627	-31.28	4156.28	0.008 ✔
T2	155 - 140	ROHN 1.5 x 16GA	3.42	3.22	75.8 K=1.00	15.818	0.2627	-21.29	4156.28	0.005 ✔
T3	140 - 120	L1 1/2x1 1/2x1/8	3.42	3.22	130.5 K=1.00	8.765	0.3594	-633.11	3149.98	0.201 ✔
T8	40 - 20	ROHN 1.5 x 16GA	3.42	3.18	74.8 K=1.00	15.924	0.2627	-251.18	4184.02	0.060 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 1.5 x 16GA	3.42	3.22	75.8 K=1.00	15.818	0.2627	-624.02	4156.28	0.150 ✔
T3	140 - 120	L1 3/4x1 3/4x1/8	3.42	3.22	111.5 K=1.00	11.473	0.4219	-380.86	4840.04	0.079 ✔
T10	5 - 0	3x1/4	0.17	0.00	0.0 K=1.00	21.600	0.7500	-3245.04	16200.00	0.200* ✔

* DL controls

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T10	5 - 0	3x1/4	1.71	1.47	244.5 K=1.00	2.498	0.7500	-38.82	1873.56	0.021 ✔
		KL/R > 200 (C) - 555								

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	155 - 140	L2x2x3/16	3.42	3.22	98.1 K=1.00	13.213	0.7150	-2396.35	9446.97	0.254
T5	100 - 80	4x3/8	3.42	3.18	352.6 K=1.00	21.600	1.5000	0.00	1802.16	0.000*
T7	60 - 40	4x3/8	3.42	3.18	352.6 K=1.00	21.600	1.5000	0.00	1802.16	0.000*

* DL controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140	L2x2x3/16	-2.64	-0.099	23.760	0.004	-2.64	-0.192	23.760	0.008
T5	100 - 80	4x3/8	10.77	-0.129	27.000	0.005	0.00	0.000	27.000	0.000
T7	60 - 40	4x3/8	10.77	-0.129	27.000	0.005	-0.00	-0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140	L2x2x3/16	0.254	0.004	0.008	0.266 ✔	1.333	H1-3 ✔
T5	100 - 80	4x3/8	0.000	0.005	0.000	0.005* ✔	1.000	H1-3 ✔
T7	60 - 40	4x3/8	0.000	0.005	0.000	0.005* ✔	1.000	H1-3 ✔

* DL controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	155 - 140 (558)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-443.87	74898.00	0.006
T2	155 - 140 (559)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-313.95	74898.00	0.004
T2	155 - 140 (565)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-314.31	74898.00	0.004
T2	155 - 140 (566)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-386.23	74898.00	0.005
T2	155 - 140 (569)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-425.29	74898.00	0.006
T2	155 - 140 (570)	C12x20.7	3.50	3.40	105.3 K=1.00	12.299	6.0900	-371.14	74898.00	0.005
T3	140 - 120 (573)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4 K=1.00	18.140	10.2082	-3151.19	185173.00	0.017
T3	140 - 120 (574)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4 K=1.00	18.140	10.2082	-3416.09	185173.00	0.018
T3	140 - 120 (577)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4 K=1.00	18.140	10.2082	-3137.15	185173.00	0.017
T3	140 - 120 (578)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4 K=1.00	18.140	10.2082	-3024.37	185173.00	0.016
T3	140 - 120 (581)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4 K=1.00	18.140	10.2082	-3312.77	185173.00	0.018
T3	140 - 120 (582)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4 K=1.00	18.140	10.2082	-3485.86	185173.00	0.019

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140 (558)	C12x20.7	-20734.50	-11.573	21.600	0.536	-0.00	-0.000	21.600	0.000
T2	155 - 140 (559)	C12x20.7	-21687.58	-12.105	21.600	0.560	-0.00	-0.000	21.600	0.000
T2	155 - 140 (565)	C12x20.7	-21123.17	-11.790	21.600	0.546	0.00	-0.000	21.600	0.000
T2	155 - 140 (566)	C12x20.7	-20723.50	-11.567	21.600	0.535	-0.00	-0.000	21.600	0.000
T2	155 - 140 (569)	C12x20.7	-21137.67	-11.798	21.600	0.546	0.00	-0.000	21.600	0.000
T2	155 - 140 (570)	C12x20.7	-21693.58	-12.108	21.600	0.561	-0.00	-0.000	21.600	0.000
T3	140 - 120 (573)	C12x20.7 w/ 8"x3/8" Plate	-45877.25	-21.467	21.600	0.994	0.00	-0.000	21.600	0.000
T3	140 - 120 (574)	C12x20.7 w/ 8"x3/8" Plate	-50759.08	-23.751	21.600	1.100	-0.00	-0.000	21.600	0.000
T3	140 - 120 (577)	C12x20.7 w/ 8"x3/8" Plate	-47940.83	-22.433	21.600	1.039	0.00	-0.000	21.600	0.000
T3	140 - 120 (578)	C12x20.7 w/ 8"x3/8" Plate	-45849.00	-21.454	21.600	0.993	-0.00	-0.000	21.600	0.000
T3	140 - 120 (581)	C12x20.7 w/ 8"x3/8" Plate	-47979.92	-22.451	21.600	1.039	-0.00	-0.000	21.600	0.000
T3	140 - 120 (582)	C12x20.7 w/ 8"x3/8" Plate	-50770.7	-23.757	21.600	1.100	0.00	-0.000	21.600	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
			5							

Torque-Arm Top 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
T2	155 - 140 (558)	C12x20.7	0.006	0.536	0.000	0.542 ✔	1.333	H1-3 ✔
T2	155 - 140 (559)	C12x20.7	0.004	0.560	0.000	0.565 ✔	1.333	H1-3 ✔
T2	155 - 140 (565)	C12x20.7	0.004	0.546	0.000	0.550 ✔	1.333	H1-3 ✔
T2	155 - 140 (566)	C12x20.7	0.005	0.535	0.000	0.541 ✔	1.333	H1-3 ✔
T2	155 - 140 (569)	C12x20.7	0.006	0.546	0.000	0.552 ✔	1.333	H1-3 ✔
T2	155 - 140 (570)	C12x20.7	0.005	0.561	0.000	0.566 ✔	1.333	H1-3 ✔
T3	140 - 120 (573)	C12x20.7 w/ 8"x3/8" Plate	0.017	0.994	0.000	1.011 ✔	1.333	H1-3 ✔
T3	140 - 120 (574)	C12x20.7 w/ 8"x3/8" Plate	0.018	1.100	0.000	1.118 ✔	1.333	H1-3 ✔
T3	140 - 120 (577)	C12x20.7 w/ 8"x3/8" Plate	0.017	1.039	0.000	1.055 ✔	1.333	H1-3 ✔
T3	140 - 120 (578)	C12x20.7 w/ 8"x3/8" Plate	0.016	0.993	0.000	1.010 ✔	1.333	H1-3 ✔
T3	140 - 120 (581)	C12x20.7 w/ 8"x3/8" Plate	0.018	1.039	0.000	1.057 ✔	1.333	H1-3 ✔
T3	140 - 120 (582)	C12x20.7 w/ 8"x3/8" Plate	0.019	1.100	0.000	1.119 ✔	1.333	H1-3 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 2 STD	15.00	2.42	36.8	30.000	1.0745	11770.50	32235.90	0.365 ✔
T2	155 - 140	ROHN 2 STD	15.00	1.21	18.4	30.000	1.0745	14553.20	32235.90	0.451 ✔
T3	140 - 120	Pipe 2STD w/ 1" Soild Rod	20.00	1.22	24.2	30.000	1.8578	31102.90	55734.00	0.558 ✔

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

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 1.5 x 16GA	4.19	1.97	46.4	21.600	0.2627	2009.58	5675.41	0.354 ✔
T2	155 - 140	ROHN 1.5 STD	4.19	1.97	38.0	21.600	0.7995	2165.92	17268.30	0.125 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	4.20	1.98	44.9	29.000	0.4688	4204.64	13593.80	0.309 ✔
T4	120 - 100	ROHN 1.5 x 16GA	4.20	1.98	46.5	21.600	0.2627	1226.41	5675.41	0.216 ✔
T5	100 - 80	ROHN 1.5 x 16GA	4.20	1.95	45.9	21.600	0.2627	1027.10	5675.41	0.181 ✔
T6	80 - 60	ROHN 1.5 x 16GA	4.20	1.94	45.7	21.600	0.2627	211.08	5675.41	0.037 ✔
T7	60 - 40	ROHN 1.5 x 16GA	4.20	1.95	45.9	21.600	0.2627	1189.70	5675.41	0.210 ✔
T8	40 - 20	ROHN 1.5 x 16GA	4.20	3.91	91.9	21.600	0.2627	813.67	5675.41	0.143 ✔
T9	20 - 5	ROHN 1.5 x 16GA	4.19	3.89	91.6	21.600	0.2627	1753.37	5675.41	0.309 ✔

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	40 - 20	1" solid	3.42	3.18	152.7	30.000	0.7854	886.03	23561.90	0.038 ✔
T9	20 - 5	1" solid	3.42	3.18	152.7	30.000	0.7854	881.90	23561.90	0.037 ✔

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	155 - 140	1" solid	3.42	3.22	154.7	30.000	0.7854	791.08	23561.90	0.034 ✔
T3	140 - 120	L1 3/4x1 3/4x1/4	3.42	3.22	73.1	32.500	0.4922	2843.67	15996.10	0.178 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	80 - 60	L2x2x3/16	3.42	3.17	61.6	29.000	0.4484	1133.47	13002.40	0.087 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 1.5 x 16GA	3.42	3.22	75.8	21.600	0.2627	23.37	5675.41	0.004 ✔
T2	155 - 140	ROHN 1.5 x 16GA	3.42	3.22	75.8	21.600	0.2627	120.37	5675.41	0.021 ✔
T3	140 - 120	L1 1/2x1 1/2x1/8	3.42	3.22	83.1	29.000	0.1992	982.22	5777.34	0.170 ✔
T4	120 - 100	ROHN 1.5 x 16GA	3.42	3.22	75.8	21.600	0.2627	720.96	5675.41	0.127 ✔
T5	100 - 80	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	427.64	5675.41	0.075 ✔
T6	80 - 60	ROHN 1.5 x 16GA	3.42	3.17	74.5	21.600	0.2627	154.24	5675.41	0.027* ✔
T7	60 - 40	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	797.25	5675.41	0.140 ✔
T8	40 - 20	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	433.11	5675.41	0.076 ✔
T9	20 - 5	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	466.58	5675.41	0.082 ✔
T10	5 - 0	3x1/4	3.25	3.01	500.4	21.600	0.7500	3874.44	16200.00	0.239* ✔
		L/R > 500 (T) - 548								

* 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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	170 - 155	ROHN 1.5 x 16GA	3.42	3.22	75.8	21.600	0.2627	723.59	5675.41	0.127 ✔
T2	155 - 140	ROHN 1.5 x 16GA	3.42	3.22	75.8	21.600	0.2627	310.00	5675.41	0.055 ✔
T3	140 - 120	L1 3/4x1 3/4x1/8	3.42	3.22	70.8	29.000	0.2461	1230.24	7136.72	0.172 ✔
T4	120 - 100	ROHN 1.5 x 16GA	3.42	3.22	75.8	21.600	0.2627	441.72	5675.41	0.078 ✔
T5	100 - 80	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	769.19	5675.41	0.136 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	80 - 60	ROHN 1.5 x 16GA	3.42	3.17	74.5	21.600	0.2627	221.64	5675.41	0.039 ✔
T7	60 - 40	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	745.35	5675.41	0.131 ✔
T8	40 - 20	ROHN 1.5 x 16GA	3.42	3.18	74.8	21.600	0.2627	397.23	5675.41	0.070 ✔
T9	20 - 5	ROHN 1.5 EH	3.42	3.18	63.1	21.600	1.0681	5617.90	23071.90	0.243 ✔

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 lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T10	5 - 0	3x1/4	1.71	1.47	244.5	21.600	0.7500	2.27	16200.00	0.000 ✔

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	155 - 140	L2x2x3/16	3.42	3.22	62.7	29.000	0.4132	3102.95	11982.90	0.259
T5	100 - 80	4x3/8	3.42	3.18	352.6	21.600	1.5000	3507.17	32400.00	0.108
T7	60 - 40	4x3/8	3.42	3.18	352.6	21.600	1.5000	4538.45	32400.00	0.140

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140	L2x2x3/16	-4.64	0.173	23.760	0.007	-4.64	0.340	23.760	0.014
T5	100 - 80	4x3/8	10.77	0.129	27.000	0.005	0.00	0.000	27.000	0.000
T7	60 - 40	4x3/8	10.77	0.129	27.000	0.005	-0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T2	155 - 140	L2x2x3/16	0.259	0.007	0.014	0.280 ✔	1.333	H2-1 ✔

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
T5	100 - 80	4x3/8	0.108	0.005	0.000	0.113 ✔	1.333	H2-1 ✔
T7	60 - 40	4x3/8	0.140	0.005	0.000	0.145 ✔	1.333	H2-1 ✔

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	155 - 140 (558)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	311.66	131544.00	0.002
T2	155 - 140 (559)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	543.65	131544.00	0.004
T2	155 - 140 (565)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	532.26	131544.00	0.004
T2	155 - 140 (566)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	416.72	131544.00	0.003
T2	155 - 140 (569)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	334.86	131544.00	0.003
T2	155 - 140 (570)	C12x20.7	3.50	3.40	51.1	21.600	6.0900	446.04	131544.00	0.003
T3	140 - 120 (573)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4	21.600	10.2082	66.09	220497.00	0.000
T3	140 - 120 (574)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4	21.600	10.2082	265.50	220497.00	0.001
T3	140 - 120 (577)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4	21.600	10.2082	213.96	220497.00	0.001
T3	140 - 120 (578)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4	21.600	10.2082	251.02	220497.00	0.001
T3	140 - 120 (581)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4	21.600	10.2082	197.75	220497.00	0.001
T3	140 - 120 (582)	C12x20.7 w/ 8"x3/8" Plate	3.50	3.40	52.4	21.600	10.2082	203.11	220497.00	0.001

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T2	155 - 140 (558)	C12x20.7	-19319.33	10.783	21.600	0.499	0.00	0.000	27.000	0.000
T2	155 - 140 (559)	C12x20.7	-20508.17	11.446	21.600	0.530	0.00	0.000	27.000	0.000
T2	155 - 140 (565)	C12x20.7	-20063.67	11.198	21.600	0.518	-0.00	0.000	27.000	0.000
T2	155 - 140 (566)	C12x20.7	-19574.75	10.925	21.600	0.506	-0.00	0.000	27.000	0.000
T2	155 - 140 (569)	C12x20.7	-19610.50	10.945	21.600	0.507	0.00	0.000	27.000	0.000
T2	155 - 140 (570)	C12x20.7	-20309.25	11.335	21.600	0.525	-0.00	0.000	27.000	0.000
T3	140 - 120 (573)	C12x20.7 w/ 8"x3/8" Plate	-42593.25	19.930	21.600	0.923	-0.00	0.000	21.600	0.000
T3	140 - 120 (574)	C12x20.7 w/ 8"x3/8" Plate	-42218.00	19.755	21.600	0.915	-0.00	0.000	21.600	0.000
T3	140 - 120 (577)	C12x20.7 w/ 8"x3/8" Plate	-45850.33	21.454	21.600	0.993	0.00	0.000	21.600	0.000
T3	140 - 120 (578)	C12x20.7 w/ 8"x3/8" Plate	-43454.50	20.333	21.600	0.941	-0.00	0.000	21.600	0.000
T3	140 - 120 (581)	C12x20.7 w/ 8"x3/8" Plate	-38991.50	18.245	21.600	0.845	0.00	0.000	21.600	0.000
T3	140 - 120 (582)	C12x20.7 w/ 8"x3/8" Plate	-41827.00	19.572	21.600	0.906	0.00	0.000	21.600	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$

Torque-Arm Top 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
T2	155 - 140 (558)	C12x20.7	0.002	0.499	0.000	0.502 ✔	1.333	H2-1 ✔
T2	155 - 140 (559)	C12x20.7	0.004	0.530	0.000	0.534 ✔	1.333	H2-1 ✔
T2	155 - 140 (565)	C12x20.7	0.004	0.518	0.000	0.522 ✔	1.333	H2-1 ✔
T2	155 - 140 (566)	C12x20.7	0.003	0.506	0.000	0.509 ✔	1.333	H2-1 ✔
T2	155 - 140 (569)	C12x20.7	0.003	0.507	0.000	0.509 ✔	1.333	H2-1 ✔
T2	155 - 140 (570)	C12x20.7	0.003	0.525	0.000	0.528 ✔	1.333	H2-1 ✔
T3	140 - 120 (573)	C12x20.7 w/ 8"x3/8" Plate	0.000	0.923	0.000	0.923 ✔	1.333	H2-1 ✔
T3	140 - 120 (574)	C12x20.7 w/ 8"x3/8" Plate	0.001	0.915	0.000	0.916 ✔	1.333	H2-1 ✔
T3	140 - 120 (577)	C12x20.7 w/ 8"x3/8" Plate	0.001	0.993	0.000	0.994 ✔	1.333	H2-1 ✔
T3	140 - 120 (578)	C12x20.7 w/ 8"x3/8" Plate	0.001	0.941	0.000	0.942 ✔	1.333	H2-1 ✔
T3	140 - 120 (581)	C12x20.7 w/ 8"x3/8" Plate	0.001	0.845	0.000	0.846 ✔	1.333	H2-1 ✔
T3	140 - 120 (582)	C12x20.7 w/ 8"x3/8" Plate	0.001	0.906	0.000	0.907 ✔	1.333	H2-1 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	170 - 155	Leg	ROHN 2 STD	3	-15016.10	37623.52	39.9	Pass
T2	155 - 140	Leg	ROHN 2 STD	48	-36637.70	40769.94	89.9	Pass
T3	140 - 120	Leg	Pipe 2STD w/ 1" Soild Rod	111	-56866.90	68092.17	83.5	Pass
T4	120 - 100	Leg	ROHN 2 STD	192	-36233.30	37561.94	96.5	Pass
T5	100 - 80	Leg	ROHN 2.5 STD	249	-45034.00	61430.77	73.3	Pass
T6	80 - 60	Leg	Pipe 2STD w/ 1/3 HSS3.5x0.3	309	-46036.60	66829.02	68.9	Pass
T7	60 - 40	Leg	ROHN 2.5 STD	390	-48139.30	60259.19	79.9	Pass
T8	40 - 20	Leg	ROHN 2.5 STD	450	-51154.80	60309.98	84.8	Pass
T9	20 - 5	Leg	ROHN 2.5 STD	504	-50916.40	60309.98	84.4	Pass
T10	5 - 0	Leg	ROHN 2.5 STD	546	-37074.00	44797.00	82.8	Pass
T1	170 - 155	Diagonal	ROHN 1.5 x 16GA	13	-2055.55	6536.59	31.4 59.8 (b)	Pass
T2	155 - 140	Diagonal	ROHN 1.5 STD	57	-3271.78	20616.04	15.9 59.5 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
T3	140 - 120	Diagonal	L1 3/4x1 3/4x1/4	159	-5339.63	17847.14	29.9 62.2 (b)	Pass
T4	120 - 100	Diagonal	ROHN 1.5 x 16GA	246	-1704.98	6532.61	26.1 36.5 (b)	Pass
T5	100 - 80	Diagonal	ROHN 1.5 x 16GA	282	-1314.81	6550.51	20.1 30.5 (b)	Pass
T6	80 - 60	Diagonal	ROHN 1.5 x 16GA	318	-1412.49	6556.07	21.5 26.2 (b)	Pass
T7	60 - 40	Diagonal	ROHN 1.5 x 16GA	429	-1456.71	6550.51	22.2 35.4 (b)	Pass
T8	40 - 20	Diagonal	ROHN 1.5 x 16GA	499	-1758.60	4897.58	35.9	Pass
T9	20 - 5	Diagonal	ROHN 1.5 x 16GA	513	-2700.96	4908.68	55.0	Pass
T8	40 - 20	Horizontal	1" solid	467	-886.03	6708.43	13.2 16.1 (b)	Pass
T9	20 - 5	Horizontal	1" solid	515	-881.90	6708.43	13.1 16.0 (b)	Pass
T2	155 - 140	Secondary Horizontal	1" solid	62	-634.58	6536.04	9.7	Pass
T3	140 - 120	Secondary Horizontal	L1 3/4x1 3/4x1/4	169	2843.67	21322.80	13.3 51.7 (b)	Pass
T6	80 - 60	Secondary Horizontal	L2x2x3/16	332	1133.47	17332.20	6.5 20.9 (b)	Pass
T1	170 - 155	Top Girt	ROHN 1.5 x 16GA	4	-31.28	5540.32	0.6 0.7 (b)	Pass
T2	155 - 140	Top Girt	ROHN 1.5 x 16GA	49	120.37	7565.32	1.6 3.6 (b)	Pass
T3	140 - 120	Top Girt	L1 1/2x1 1/2x1/8	112	-633.11	4198.92	15.1 34.6 (b)	Pass
T4	120 - 100	Top Girt	ROHN 1.5 x 16GA	194	720.96	7565.32	9.5 21.4 (b)	Pass
T5	100 - 80	Top Girt	ROHN 1.5 x 16GA	251	427.64	7565.32	5.7 12.7 (b)	Pass
T6	80 - 60	Top Girt	ROHN 1.5 x 16GA	311	154.24	5675.41	2.7 4.6 (b)	Pass
T7	60 - 40	Top Girt	ROHN 1.5 x 16GA	392	797.25	7565.32	10.5 23.7 (b)	Pass
T8	40 - 20	Top Girt	ROHN 1.5 x 16GA	451	433.11	7565.32	5.7 12.9 (b)	Pass
T9	20 - 5	Top Girt	ROHN 1.5 x 16GA	506	466.58	7565.32	6.2 13.9 (b)	Pass
T10	5 - 0	Top Girt	3x1/4	548	3874.44	16200.00	23.9	Pass
T1	170 - 155	Bottom Girt	ROHN 1.5 x 16GA	7	-624.02	5540.32	11.3 21.5 (b)	Pass
T2	155 - 140	Bottom Girt	ROHN 1.5 x 16GA	52	310.00	7565.32	4.1 9.2 (b)	Pass
T3	140 - 120	Bottom Girt	L1 3/4x1 3/4x1/8	116	1230.24	9513.25	12.9 35.7 (b)	Pass
T4	120 - 100	Bottom Girt	ROHN 1.5 x 16GA	197	441.72	7565.32	5.8 13.1 (b)	Pass
T5	100 - 80	Bottom Girt	ROHN 1.5 x 16GA	254	769.19	7565.32	10.2 22.9 (b)	Pass
T6	80 - 60	Bottom Girt	ROHN 1.5 x 16GA	313	221.64	7565.32	2.9 4.4 (b)	Pass
T7	60 - 40	Bottom Girt	ROHN 1.5 x 16GA	396	745.35	7565.32	9.9 22.2 (b)	Pass
T8	40 - 20	Bottom Girt	ROHN 1.5 x 16GA	456	397.23	7565.32	5.3 11.8 (b)	Pass
T9	20 - 5	Bottom Girt	ROHN 1.5 EH	510	5617.90	30754.84	18.3 76.7 (b)	Pass
T10	5 - 0	Bottom Girt	3x1/4	552	-3243.00	16200.00	22.1	Pass
T10	5 - 0	Mid Girt	3x1/4	555	-38.82	2497.46	1.6	Pass
T2	155 - 140	Guy A@152.333	1/2	567	7213.71	13450.00	53.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T3	140 - 120	Guy A@132.438	7/8	579	18715.60	39850.00	47.0	Pass
T5	100 - 80	Guy A@90	7/16	585	7368.19	10400.00	70.8	Pass
T7	60 - 40	Guy A@50	7/16	588	8274.96	10400.00	79.6	Pass
T2	155 - 140	Guy B@152.333	1/2	564	7146.46	13450.00	53.1	Pass
T3	140 - 120	Guy B@132.438	7/8	576	18189.90	39850.00	45.6	Pass
T5	100 - 80	Guy B@90	7/16	584	7122.63	10400.00	68.5	Pass
T7	60 - 40	Guy B@50	7/16	587	8012.11	10400.00	77.0	Pass
T2	155 - 140	Guy C@152.333	1/2	556	7090.80	13450.00	52.7	Pass
T3	140 - 120	Guy C@132.438	7/8	571	17730.90	39850.00	44.5	Pass
T5	100 - 80	Guy C@90	7/16	583	6934.21	10400.00	66.7	Pass
T7	60 - 40	Guy C@50	7/16	586	7820.42	10400.00	75.2	Pass
T2	155 - 140	Top Guy Pull-Off@152.333	L2x2x3/16	561	3102.95	15973.21	21.0 51.6 (b)	Pass
T5	100 - 80	Top Guy Pull-Off@90	4x3/8	256	3507.17	43189.20	8.5	Pass
T7	60 - 40	Top Guy Pull-Off@50	4x3/8	398	4538.45	43189.20	10.9	Pass
T2	155 - 140	Torque Arm Top@152.333	C12x20.7	570	-371.14	99839.03	42.4	Pass
T3	140 - 120	Torque Arm Top@132.438	C12x20.7 w/ 8"x3/8" Plate	582	-3485.86	246835.60	83.9	Pass
							Summary	
						Leg (T4)	96.5	Pass
						Diagonal (T3)	62.2	Pass
						Horizontal (T8)	16.1	Pass
						Secondary Horizontal (T3)	51.7	Pass
						Top Girt (T3)	34.6	Pass
						Bottom Girt (T9)	76.7	Pass
						Mid Girt (T10)	1.6	Pass
						Guy A (T7)	79.6	Pass
						Guy B (T7)	77.0	Pass
						Guy C (T7)	75.2	Pass
						Top Guy Pull-Off (T2)	51.6	Pass
						Torque Arm Top (T3)	83.9	Pass
						Bolt Checks	76.7	Pass
						RATING =	**96.5**	**Pass**

EBI Consulting
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RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

AT&T Existing Facility

Site ID: CT1145

Newington
99 Cedarwood Lane
Newington, CT 06111

November 16, 2015

EBI Project Number: 6215005565

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	12.25 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

November 16, 2015

AT&T Mobility – New England
Attn: Cameron Syme, RF Manager
550 Cochituate Road
Suite 550 – 13&14
Framingham, MA 06040

Emissions Analysis for Site: **CT1145 – Newington**

EBI Consulting was directed to analyze the proposed AT&T facility located at **99 Cedarwood Lane, Newington, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (mW/cm2). The number of mW/cm^2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter (μW/cm^2). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 μW/cm^2 and 567 μW/cm^2 respectively. The general population exposure limit for the PCS, AWS and WCS bands is 1000 μW/cm^2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed AT&T Wireless antenna facility located at **99 Cedarwood Lane, Newington, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 4 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel

4) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (PCS Band – 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 GSM channels (850 MHz Band) was considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 2 LTE channels (WCS Band – 2300 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

8) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

9) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antennas used in this modeling are the **Powerwave 7770** for 1900 MHz (PCS) and 850 MHz channels, the **CCI OPA-65R-LCUU-H6** for 850 MHz and 2300 MHz (WCS) and the **KMW AM-X-CD-16-65-00T-RET** for 700 MHz and 1900 MHz (PCS. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

11) The antenna mounting height centerline of the proposed antennas is **120 feet** above ground level (AGL).

12) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

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AT&T Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770	Make / Model:	Powerwave 7770
Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd	Gain:	11.4 / 13.4 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	8	Channel Count	8	# PCS Channels:	8
Total TX Power:	240	Total TX Power:	240	# AWS Channels:	240
ERP (W):	4,281.78	ERP (W):	4,281.78	ERP (W):	4,281.78
Antenna A1 MPE%	**1.53**	Antenna B1 MPE%	**1.53**	Antenna C1 MPE%	**1.53**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6	Make / Model:	CCI OPA-65R-LCUU-H6
Gain:	12.5 / 15.5 dBd	Gain:	12.5 / 15.5 dBd	Gain:	12.5 / 15.5 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)	Frequency Bands	850 MHz / 2300 MHz (WCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	180	Total TX Power:	180	Total TX Power:	180
ERP (W):	5,324.73	ERP (W):	5,324.73	ERP (W):	5,324.73
Antenna A2 MPE%	**1.70**	Antenna B2 MPE%	**1.70**	Antenna C2 MPE%	**1.70**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET	Make / Model:	KMW AM-X-CD-16-65-00T-RET
Gain:	13.35 / 15.25 dBd	Gain:	13.35 / 15.25 dBd	Gain:	13.35 / 15.25 dBd
Height (AGL):	120 feet	Height (AGL):	120 feet	Height (AGL):	120 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	240	Total TX Power:	240	Total TX Power:	240
ERP (W):	6,614.85	ERP (W):	6,614.85	ERP (W):	6,614.85
Antenna A3 MPE%	**2.65**	Antenna B3 MPE%	**2.65**	Antenna C3 MPE%	**2.65**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**5.52**
Clearwire	0.09 %
Nextel	0.39 %
Carbone's Auto Body	5.52 %
Town of Weathersfield	0.08 %
T-Mobile	0.65 %
Site Total MPE %:	**12.25 %**

AT&T Sector 1 Total:	5.52 %
AT&T Sector 2 Total:	5.52 %
AT&T Sector 3 Total:	5.52 %
Site Total:	12.25 %

AT&T _ Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (mW/cm^2)	Frequency (MHz)	Allowable MPE (mW/cm^2)	Calculated % MPE
AT&T 850 MHz UMTS	4	414.12	120	4.58	850	567	0.81 %
AT&T 1900 MHz (PCS) UMTS	2	656.33	120	3.63	1900	1000	0.36 %
AT&T 1900 MHz (PCS) GSM	2	656.33	120	3.63	1900	1000	0.36 %
AT&T 850 MHz LTE	2	533.48	120	2.95	850	567	0.52 %
AT&T 2300 MHz (WCS) LTE	2	2128.88	120	11.78	2300	1000	1.18 %
AT&T 700 MHz LTE	2	1297.63	120	7.18	700	467	1.54 %
AT&T 1900 MHz (PCS) LTE	2	2009.79	120	11.12	1900	1000	1.11 %
						Total:	5.88 %

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Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the AT&T facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

AT&T Sector	Power Density Value (%)
Sector 1:	5.52 %
Sector 2:	5.52 %
Sector 3 :	5.52 %
AT&T Maximum Total (per sector):	5.52 %
Site Total:	12.25 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **12.25%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
RF Engineering Director

EBI Consulting
21 B Street
Burlington, MA 01803

PROJECT INFORMATION

SCOPE OF WORK:
- AT&T ANTENNAS: (1) NEW ANTENNA PER SECTOR, FOR A TOTAL (3) NEW ANTENNAS. (2) EXISTING ANTENNAS PER SECTOR FOR 3 SECTORS, FOR A TOTAL OF (6) EXISTING ANTENNAS TO REMAIN. (1) EXISTING ANTENNA PER SECTOR FOR (3) SECTORS, FOR A TOTAL OF (3) EXISTING ANTENNAS TO BE REMOVED.
- AT&T RRUs: (1) NEW RRUs PER SECTOR WITH (3) SECTORS, FOR A TOTAL OF (3) NEW RRUs; (2) EXISTING RRU PER SECTOR TO BE REUSED, FOR A TOTAL OF (6) EXISTING RRUs.
- AT&T SQUID: (1) NEW DC6 SURGE, FOR A TOTAL OF (1) NEW SQUID, (1) EXISTING DC-6 SURGE PROTECTOR, FOR A TOTAL OF (1) EXISTING SQUID TO REMAIN.
- AT&T CABLING: INSTALL (1) NEW FIBER TRUNK AND (2) DC TRUNKS

SITE ADDRESS:	99 CEDARWOOD LANE NEWINGTON, CT 06111
LATITUDE: LONGITUDE:	41.694770° 41° 41' 41.172"N -72.708971° 73° 42' 32.29596"W
USID:	59389
TOWER OWNER:	FREDRICK H. CALLAHAN, JR. 2111 BERLIN TURNPIKE NEWINGTON, CT 06111
TYPE OF SITE:	GUYED TOWER
TOWER HEIGHT:	170'-0"±
RAD CENTER:	120'-0"± AGL
CURRENT USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
PROPOSED USE:	UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

DRAWING INDEX

		REV.
T-1	TITLE SHEET	0
GN-1	GROUNDING & GENERAL NOTES	0
A-1	COMPOUND LAYOUT	0
A-2	EQUIPMENT LAYOUTS	0
A-3	ANTENNA LAYOUTS & ELEVATIONS	0
A-4	DETAILS	0
G-1	GROUNDING, ONE-LINE DIAGRAM & DETAILS	0

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE SUBCONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN, ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AMD MAY IMPOSE CHANGES OR SITE MODIFICATIONS.

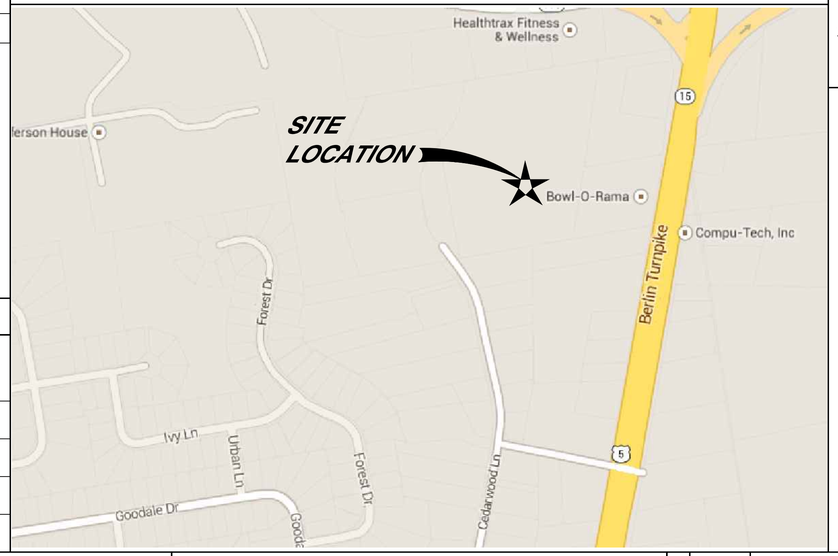
DISCIPLINE:	NAME:	DATE:
SITE ACQUISITION:		
CONSTRUCTION MANAGER:		
AT&T PROJECT MANAGER:		

at&t MOBILITY

FA CODE: 10035097
SITE NUMBER: CT1145
SITE NAME: NEWINGTON

VICINITY MAP

PROCEED EAST ON ENTERPRISE DR. TURN LEFT ON CAPITOL BLVD. TURN LEFT ON WEST ST. LEFT TURN HARTFORD/I-91 N. EXIT RIGHT FOLLOWING THE SIGN WINDSOR/BLOOMFIELD (EXIT 35A-35B). AT RAMP'S END, TAKE A LEFT TO PUTNAM HWY/CT-218. TURN RIGHT ON PINE LN. SITE WILL BE ON THE RIGHT.



PROJECT TEAM

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GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY, AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

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CONNECTICUT LAW REQUIRES TWO WORKING DAYS NOTICE PRIOR TO ANY EARTH MOVING ACTIVITIES BY CALLING 800-922-4455 OR DIAL 811

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PHONE: 862.209.4300
FAX: 862.209.4301

16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1145
SITE NAME: NEWINGTON
99 CEDARWOOD LANE
NEWINGTON, CT 06111
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL: STATE OF CONNECTICUT · NICHOLAS D. BARILE · No. 28643 · PROFESSIONAL ENGINEER
04/25/14

AT&T MOBILITY

DRAWING TITLE: TITLE SHEET

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	T-1	0

GROUNDING NOTES:

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH 25471-000-3PS-EG00-0001, DESIGN & TESTING OF FACILITY GROUNDING FOR CELL SITES.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; 2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED WITH STAINLESS STEEL HARDWARE TO THE BRIDGE AND THE TOWER GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.

13. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV-G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE CHANGED FROM 2 AWG TO 2/0 AWG. IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM EIGHT FEET (8') TO TEN FEET (10').

14. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE ½" OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID TINNED COPPER GROUND WIRE, PER NEC 250.50.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
   - CONTRACTOR – EMPIRE TELECOM
   - SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   - OWNER – AT&T MOBILITY
   - OEM – ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR (EMPIRE TELECOM).

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

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

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

7. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

8. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR. ROUTING OF TRENCHING SHALL BE APPROVED BY CONTRACTOR

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

10. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OFF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

11. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

12. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

13. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS UNLESS OTHERWISE SPECIFIED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

14. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy=36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

15. CONSTRUCTION SHALL COMPLY WITH SPECIFICATION 25741-000-3APS-A00Z-00002, "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

16. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

17. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK MAY NEED TO BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

18. SINCE THE CELL SITE MAY BE ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE REQUIRED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

19. SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.
   - INTERNATIONAL BUILDING CODE: IBC 2009 WITH LOCAL & COUNTY AMENDMENTS
   - NATIONAL ELECTRICAL CODE: NEC 2011 WITH LOCAL & COUNTY AMENDMENTS
   - FIRE/LIFE SAFETY CODE: NFPA-101 2009 WITH LOCAL & COUNTY AMENDMENTS

20. SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
   - AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION
   - AMERICAN SOCIETY OF TESTING OF MATERIALS, ASTM
   - TELECOMMUNICATIONS INDUSTRY ASSOCIATION (ANSI/TIA-222-G-1), STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES:
   - TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS
   - OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, OSHA
   - INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVELY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
   - TELCORDIA GR-1503, COAXIAL CABLE CONNECTIONS

21. FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

22. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

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550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

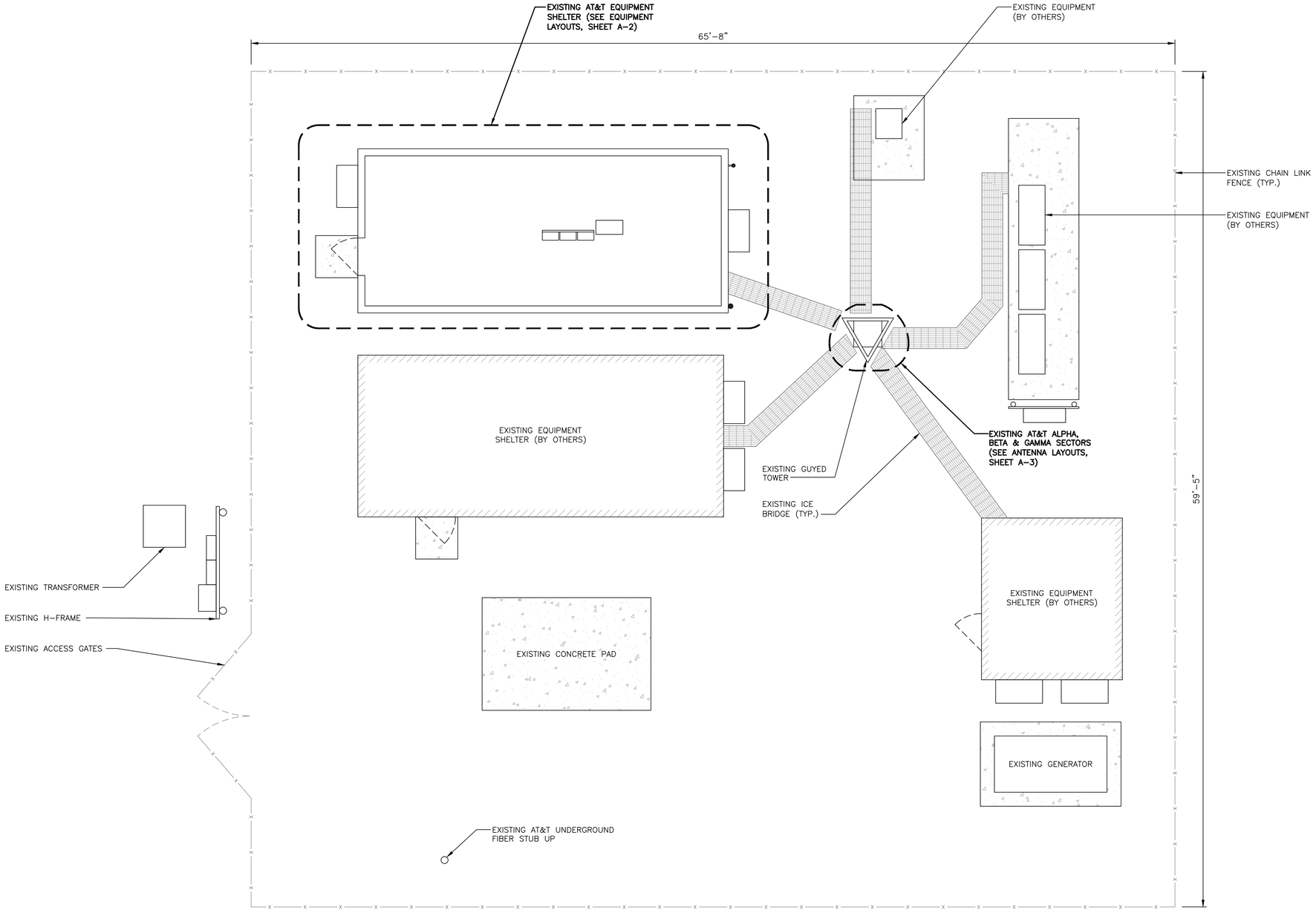
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:
STATE OF CONNECTICUT
NICHOLAS D. BARTLE
No. 28643
REGISTERED
PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643
04/25/14

AT&T MOBILITY

DRAWING TITLE:
GROUNDING & GENERAL NOTES

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	GN-1	0



NORTH

COMPOUND LAYOUT

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

0 2 4 8

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

NOTE:
CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA AND SUBMIT TO THE ENGINEER ANY DISCREPANCIES FROM THE DRAWINGS.

COM-EX Consultants
115 ROUTE 46
SUITE E39
MOUNTAIN LAKES, NJ 07046
PHONE: 862.209.4300
FAX: 862.209.4301

16 ESQUIRE ROAD
BILLERICA, MA 01821

SITE NUMBER: CT1145
SITE NAME: NEWINGTON

99 CEDARWOOD LANE
NEWINGTON, CT 06111
HARTFORD COUNTY

at&t MOBILITY
550 COCHITUATE ROAD
FRAMINGHAM, MA 01701

NO.	DATE	REVISIONS	BY	CHK	APP'D
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

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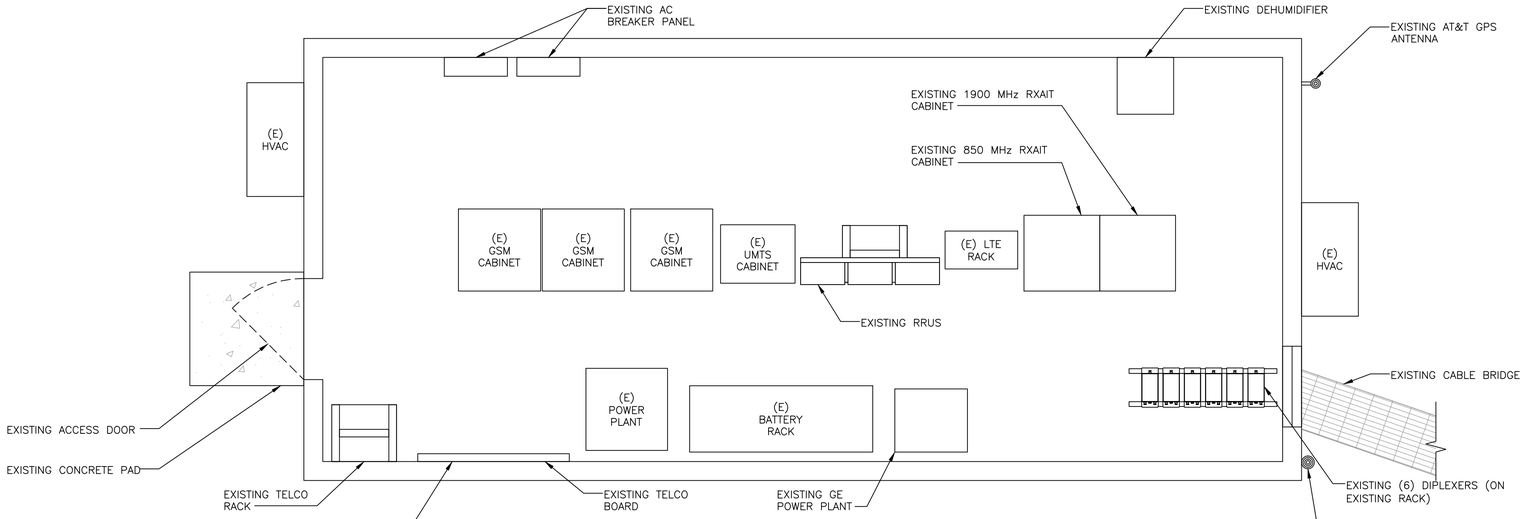
NICHOLAS D. BARTH
No. 28643
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643
04/25/14

AT&T MOBILITY

DRAWING TITLE:
COMPOUND LAYOUT

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	A-1	0



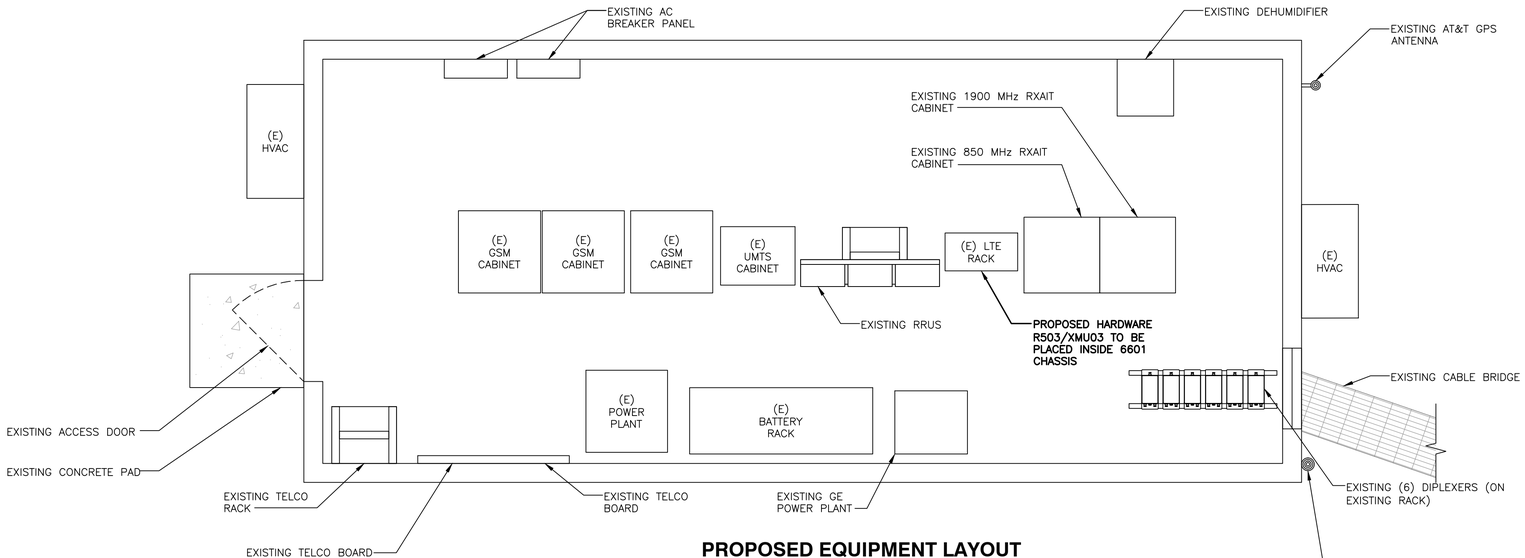
EXISTING EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NORTH



PROPOSED EQUIPMENT LAYOUT

SCALE: 1" = 2'-0"

2 0 1 2 4 8

(IN FEET)
1/2 Inch = 1 Foot

NORTH

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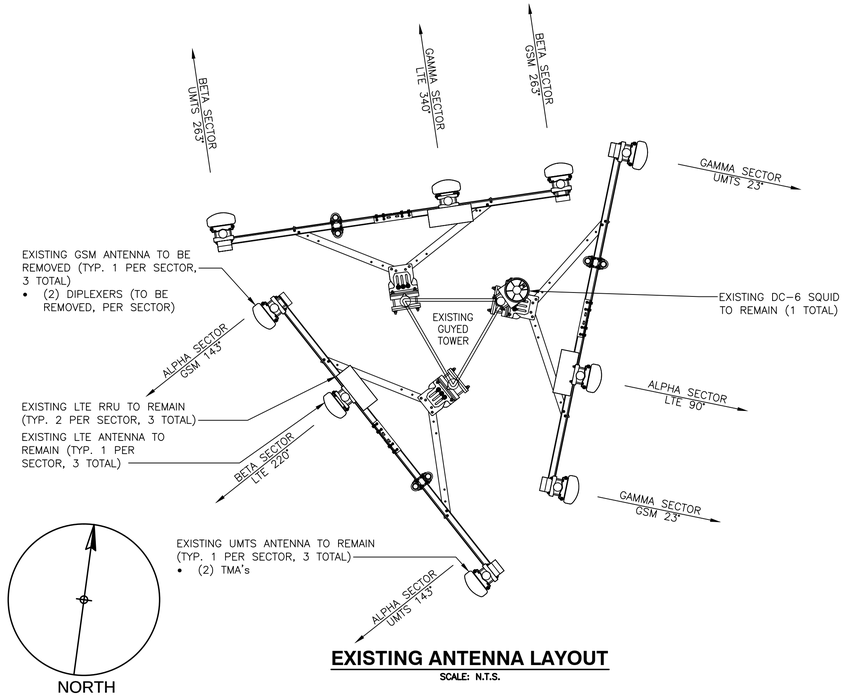
DOUGLAS B. BRAY
No. 28643
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE No. 28643
04/25/14

AT&T MOBILITY

DRAWING TITLE:
EQUIPMENT LAYOUTS

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	A-2	0

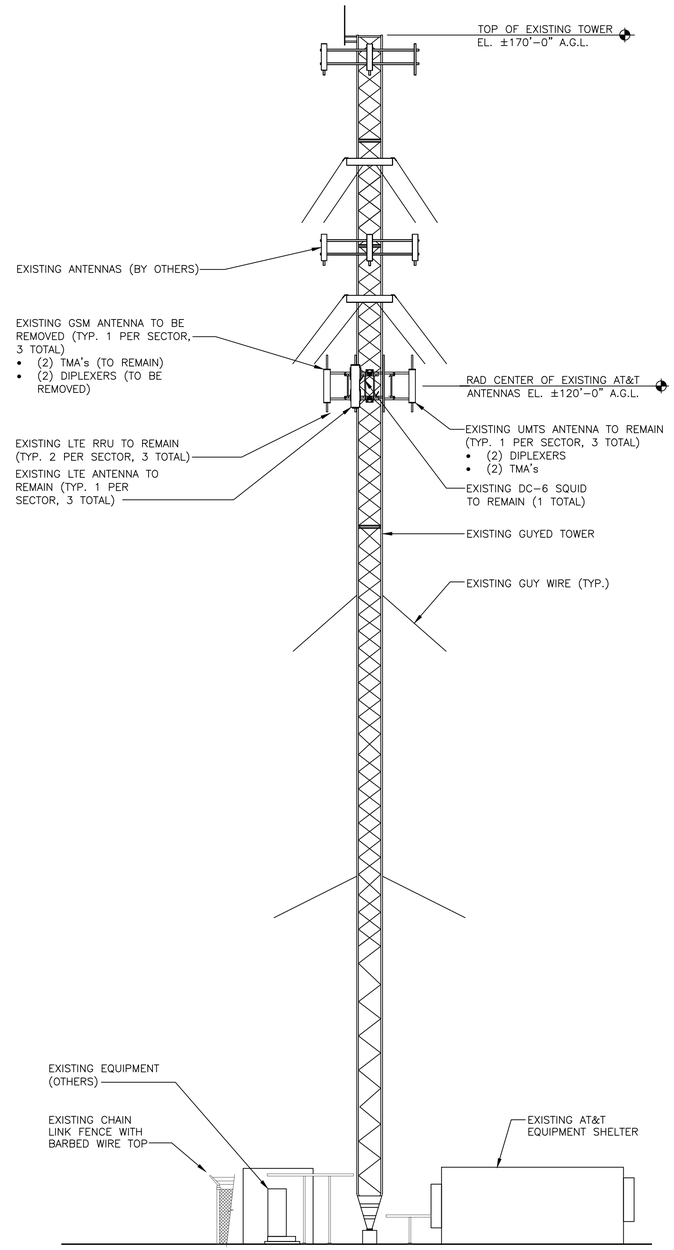


EXISTING ANTENNA LAYOUT

SCALE: N.T.S.

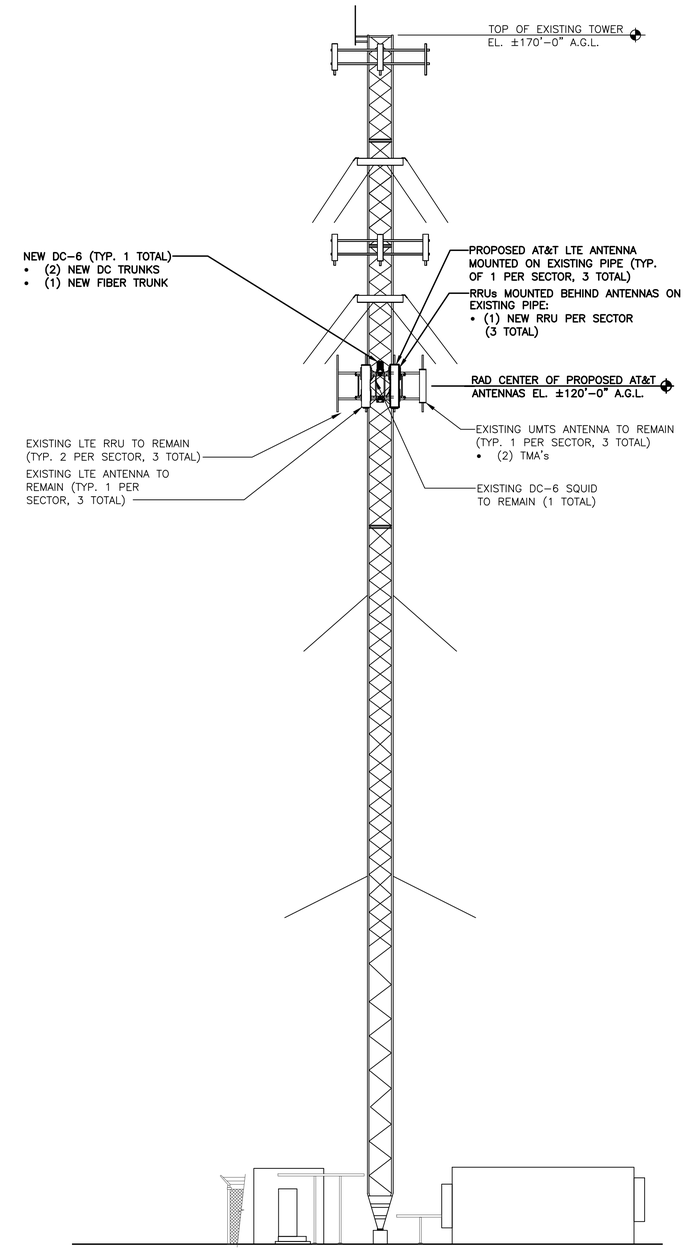
PROPOSED ANTENNA LAYOUT

SCALE: N.T.S.



EXISTING TOWER ELEVATION

SCALE: NTS



PROPOSED TOWER ELEVATION

SCALE: NTS

PROJECT OWNER IS RESPONSIBLE FOR PROVIDING A STRUCTURAL STABILITY ANALYSIS TO DETERMINE THE CAPACITY AND SUITABILITY OF THE EXISTING ANTENNA SUPPORT STRUCTURE TO SAFELY CARRY ALL ADDITIONAL LOADS IMPOSED BY THE PROPOSED EQUIPMENT AS SHOWN HEREIN. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR INCORPORATING ANY REQUIRED STRUCTURAL MODIFICATIONS INTO THEIR SCOPE OF WORK.

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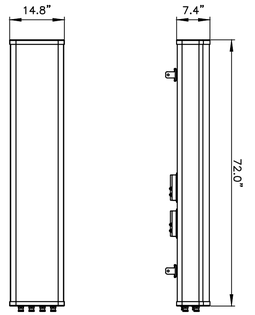
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643
04/25/14

AT&T MOBILITY

DRAWING TITLE:
ANTENNA LAYOUTS & ELEVATIONS

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	A-3	0



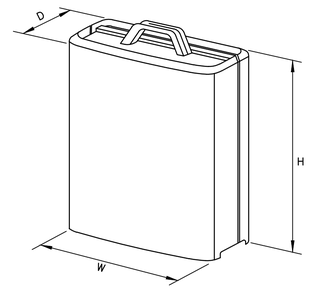
FRONT VIEW

SIDE VIEW

BOTTOM VIEW

MANUFACTURER	CCI
MODEL	OPA-65R-LCUU-H6
WEIGHT	73 LBS

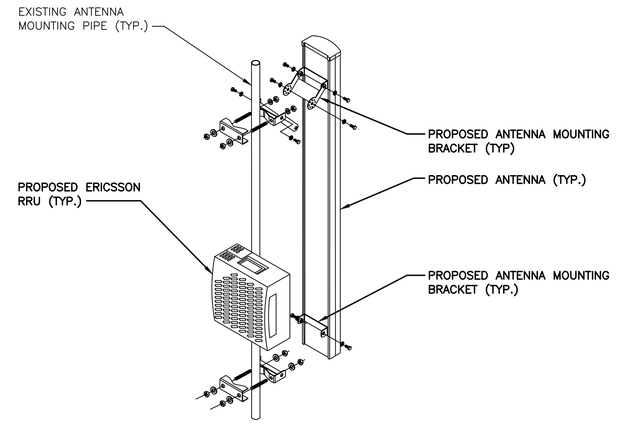
LTE ANTENNA DETAIL
SCALE: N.T.S.



MODEL	L x W x H	WEIGHT
*RRUS-11	19.69" x 16.97" x 7.17"	50.7 LBS
RRUS-32	29.9" x 13.3" x 9.5"	77 LBS

*DENOTES EXISTING.

RRUS DETAIL
SCALE: N.T.S.



ANTENNA AND RRU MOUNTING DETAIL
SCALE: N.T.S.

EXISTING ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	–	–	–
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	POWERWAVE	7770	55"x11"x5"
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	–	–	–
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	POWERWAVE	7770	55"x11"x5"
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	–	–	–
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	POWERWAVE	7770	55"x11"x5"

FINAL ANTENNA SCHEDULE

SECTOR	POSITION	MAKE	MODEL	SIZE (INCHES)
ALPHA	A1	POWERWAVE	7770	55"x11"x5"
	A2	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x7.4"**
	A3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	A4	–	–	–
BETA	B1	POWERWAVE	7770	55"x11"x5"
	B2	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x7.4"**
	B3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	B4	–	–	–
GAMMA	G1	POWERWAVE	7770	55"x11"x5"
	G2	**CCI**	**OPA-65R-LCUU-H6**	**72"x14.8"x7.4"**
	G3	KMW	AM-X-CD-16-65-00T-RET	72"x11.8"x5.9"
	G4	–	–	–

PROPOSED RRU SCHEDULE

SECTOR	MAKE	MODEL	SIZE (INCHES)	ADDITIONAL COMPONENT	SIZE (INCHES)
ALPHA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
BETA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		
GAMMA	**ERICSSON**	**RRUS-32**	**29.9"x13.3"x9.5"**	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"	–	–
	ERICSSON	RRUS-11 (EXISTING)	19.7"x16.9"x7.2"		

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NO.	DATE	REVISIONS	BY	CHK	APP'D
0	01/21/16	ISSUED AS FINAL	NJM	NDB	NDB

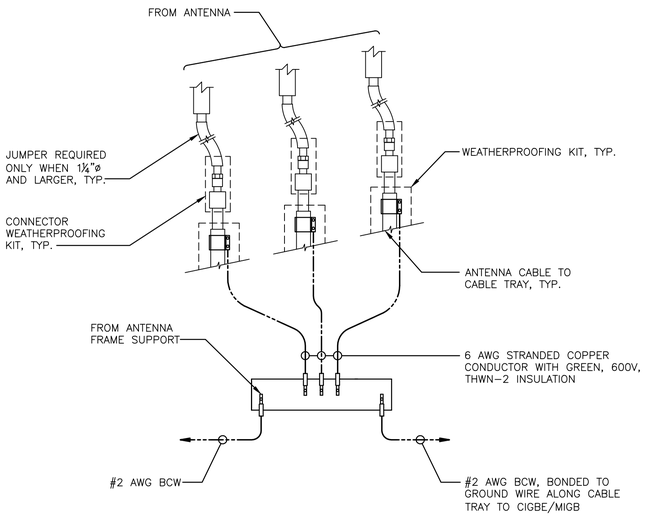
SCALE: AS SHOWN | DESIGNED BY: NJM | DRAWN BY: NJM

SEAL:
STATE OF CONNECTICUT
DOUGLAS B. BRUSH
No. 28643
REGISTERED PROFESSIONAL ENGINEER
PROFESSIONAL ENGINEER
CT LICENSE NO. 28643
04/25/14

AT&T MOBILITY

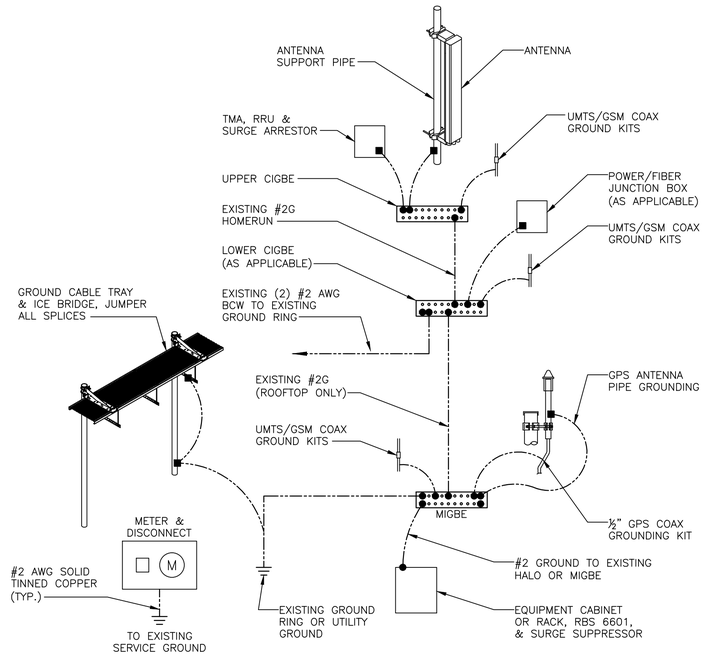
DRAWING TITLE:
DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	A-4	0



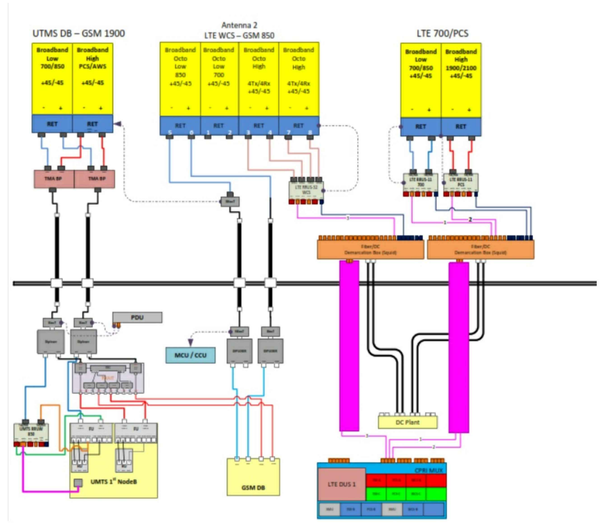
GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



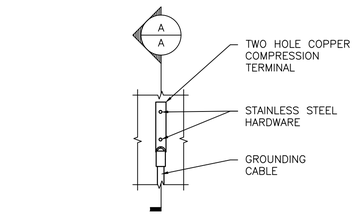
GROUNDING RISER DIAGRAM

SCALE: N.T.S.

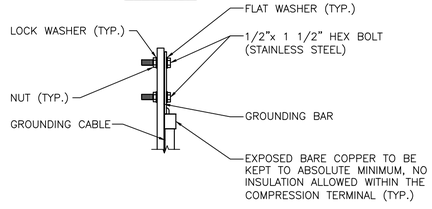


TYPICAL PLUMBING DIAGRAM (PER SECTOR)

SCALE: N.T.S.



ELEVATION



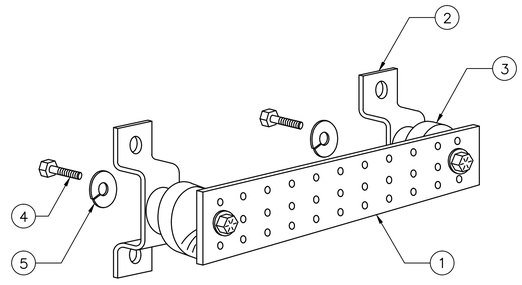
SECTION "A–A"

NOTE:

1. "DOUBLING UP" OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S.



ITEM NO.	QTY.	DESCRIPTION
1	1	SOLID GROUND BAR (20"x 4"x ¼")
2	2	WALL MOUNTING BRACKET
3	2	INSULATORS
4	4	⅝"–11x1" H.H.C.S.
5	4	⅝" LOCK WASHER

NOTES:

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION

SECTION "P" – SURGE PRODUCERS
- CABLE ENTRY PORTS (HATCH PLATES) (#2)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2)
- +24V POWER SUPPLY RETURN BAR (#2)
- –48V POWER SUPPLY RETURN BAR (#2)
- RECTIFIER FRAMES

SECTION "A" – SURGE ABSORBERS
- INTERIOR GROUND RING (#2)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2)
- BUILDING STEEL (IF AVAILABLE) (#2)

GROUND BAR DETAIL

SCALE: N.T.S.

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PROFESSIONAL ENGINEER
CT LICENSE NO. 28643
04/25/14

AT&T MOBILITY

DRAWING TITLE:
GROUNDING, ONE-LINE DIAGRAM & DETAILS

JOB NUMBER	DRAWING NUMBER	REV
15055-EMP	G-1	0