STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

November 16, 2012

Christopher Bisson
New Cingular Wireless PCS, LLC
154 General Patton Drive
Naugatuck, CT 06770

RE: **EM-CING-028-121031A** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 600 Old Hartford Road, Colchester, Connecticut.

Dear Mr. Bisson:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated October 15, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding

the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

LRoberts

Linda Roberts
Executive Director

LR/CDM/cm

c: The Honorable Gregg B. Schuster, First Selectman, Town of Colchester
Adam Turner, Town Planner, Town of Colchester

New Cingular Wireless PCS, LLC
154 General Patton Dr.
Naugatuck, CT 06770
Phone: (203)-217-6200
Christopher Bisson
Real Estate Consultant

ORIGINAL

October 15, 2012

Hand Delivered

Ms. Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 600 Old Hartford Road, Colchester, CT 06415, know to AT&T as site CT2032.

Dear Ms. Roberts:

In order to accommodate technological changes, implement Uniform Mobile Telecommunications System ("UMTS") and/or Long Term Evolution ("LTE") capabilities, and enhance system performance in the state of Connecticut, New Cingular Wireless PCS, LLC ("AT&T") plans to modify the equipment configurations at many of its existing cell sites. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

UMTS offers services to mobile computer and phone users anywhere in the world. Based on the Global System for Mobile ("GSM") communication standard, UMTS is the planned worldwide standard for mobile users. UMTS, fully implemented, gives computer and phone users high-speed access to the internet as they travel. They have the same capabilities even when they roam, through both terrestrial wireless and satellite transmissions.

LTE is a new high-performance air interface for cellular mobile communications. It is designed to increase the capacity and speed of mobile telephone networks.

Attached is a summary of the planned modifications, including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration based on the supplied structural modification plan dated 4/26/2012 requiring the restacking of the existing coaxial cables.

The changes to the facility do not constitute modification as defined Connecticut General Statues ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for the R.C.S.A. Section 16-50j-72(b)(2).

1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. There will be no effect on the site compound as all proposed equipment will be located in the existing AT&T equipment shelter.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of one or more GSM channels for UMTS transmissions. Moreover, LTE will utilize additional radio frequencies newly licensed by the FCC for cellular mobile communications. However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons New Cingular Wireless PCS, LLC respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (203)-217-6200 or email CBisson@Transcendwireless.com with questions concerning this matter.
Thank you for your consideration.

Sincerely,

Christopher Bisson
Real Estate Consultant

FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249

www.nuddtowers.com

Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
September 26, 2012

Nudd Job Number: 112-13181

Site Location: 600 Old Hartford Road, Colchester, CT 06415, New London County (Latitude and Longitude: 41-35-12, -72-22-40)

Subject: Structural Analysis of an existing 180 ft Guyed Tower

Fred A. Nudd Corporation has completed a three-dimensional, finite element model structural analysis of the above noted guyed tower. This tower was analyzed considered appurtenance loads noted in the appurtenance loading table on the following page. The design loading criteria and strength design are per the TIA/EIA-222-F standard, which is the recommended design standard per the 2003 International Building Code (Sec. 1609 & 3108), including 2005 Connecticut Building Code Amendments and the 2008 Connecticut Supplement. Additional standards used in this analysis include the AISC Manual for Steel Construction, Allowable Stress Design, 9th Ed. and ACI 318-05, Building Code Requirements for Structural Concrete and Commentary. Tower and foundation dimensions have been taken from original design drawings by Fred A. Nudd Corporation (Drawing Number 00-7265-1 & 00-7265-2, March 10, 2000). Onsite soil conditions were taken from a geotechnical report by Coneco Engineers (dated March 15, 2000).

The purpose of this analysis is to determine the structure's ability to support new AT&T Mobility equipment installed at a rad center of 170 ft above ground level (AGL). The new equipment to be installed, which includes antennas, diplexers, and associated hardware are listed on the following page in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following page. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 72%.

The tower base foundation and anchors were analyzed considering onsite soil information from the aforementioned geotechnical report. Based on this analysis, the foundation and anchors will be able support the proposed appurtenance loading, in addition to the existing wireless equipment and tower superstructure. Specific design loads, capacities and stress ratios are provided on the following pages.

In conclusion, the tower superstructure and substructure can support the listed existing and proposed appurtenance loading.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,

STATE OF CONNECTICUT
C. H. DAVID TAN
No. 22092
LICENSED PROFESSIONAL ENGINEER

9-8-12

Fred A. Nudd Corporation

Code Design Criteria

TIA/EIA-222-F
Windspeed = 85 mph, fastest mile
Exposure = C
Structure Class II
Radial Ice = 0.5 inch
Ice Windspeed = 74 mph, fastest mile
Topographic Category = II
Seismic = Site Class D, S_s & S_1 = 0.234 & 0.062, respectively (Doesn't control any aspect of analysis)

Appurtenance Loading – Existing / Remaining

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
182	Sprint	(9) Decibel DB980H90	(3) 12 ft Boom / Frame	(9) 1-5/8
170	AT&T Mobility	(6) Powerwave 7770.00 (6) Powerwave LGP21401 (6) Diplexors	(3) 12 ft Boom / Frame	(12) 1-1/4

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*

Appurtenance Loading – Final Configuration for AT&T Mobility

Height (ft)	Carrier	Appurtenance	Mount	Coax (in)
170	AT&T Mobility	(1) Powerwave P65-17-XLH-RR (1) KMW AM-X-CD-16-65-00T-RET (1) Andrew SBNH-1D6565C (1) Raycap DC6-48-60-18-8F (6) Ericsson RRUs-11	--	(1) 1.34 Fiber (2) 0.65 DC

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*
- *AT&T Mobility's proposed coax is to be installed inside a 3 in conduit installed alongside the existing AT&T Mobility coax.*

Foundation Reaction Comparison

Design Load	Capacity (kips)	Analysis (kips)	Percentage
Base Axial	103.2	97.0	94
Anchor Uplift	57.4	37.9	66
Anchor Shear	50.3	46.4	92

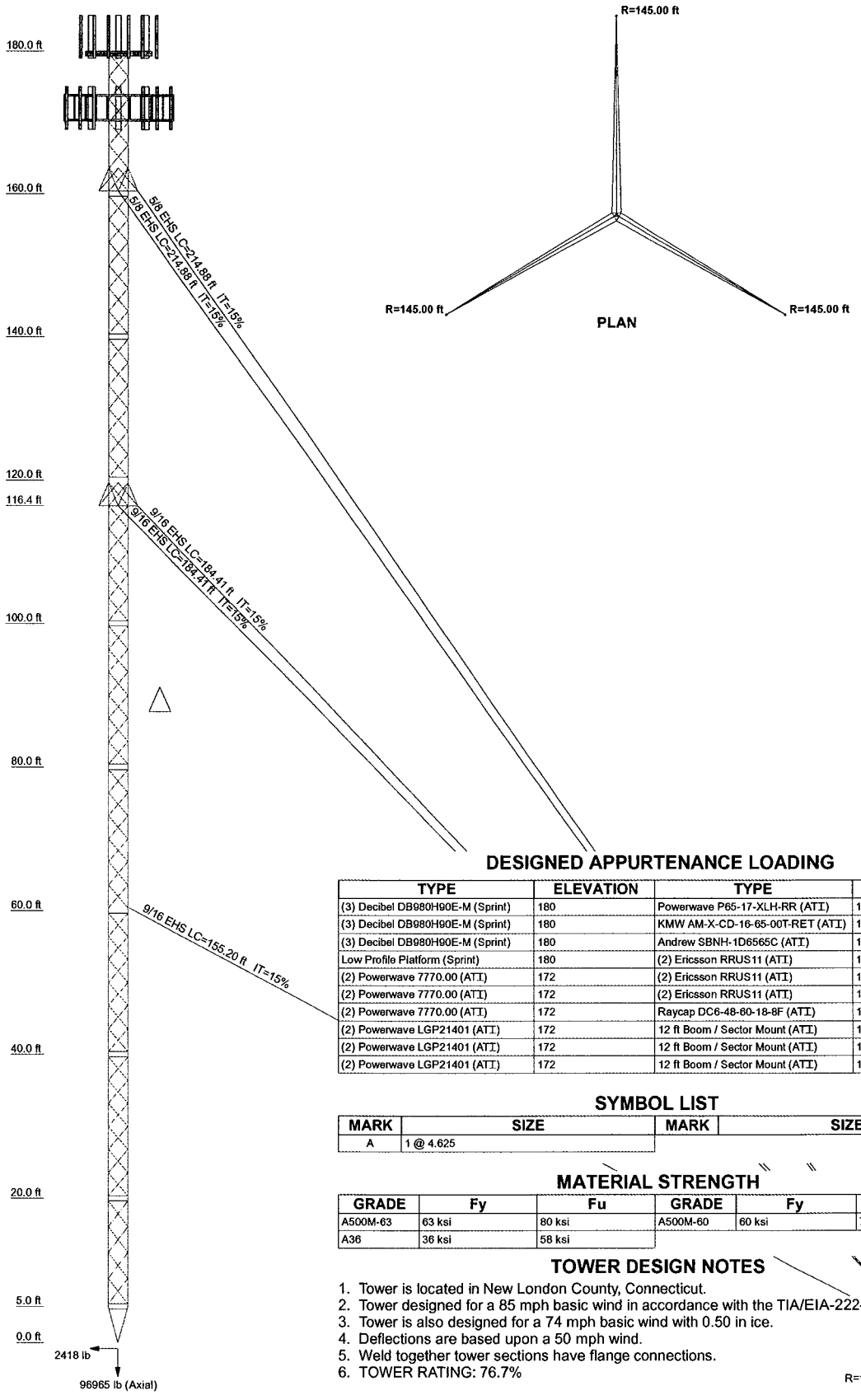
- *Percentage less than 100% denote foundation is satisfactory for loading*
- *Percentage greater than 100% indicates foundation analysis is required*

Maximum Member Usage

Member	Percentage
Leg	71
Diagonal	72
Horizontal	50
Bolts	52
Guys	69

- *Percentage less than 100% denote member stress levels are satisfactory for loading*
- *Percentage greater than 100% indicates member strengthening is required*

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs		A500M-63		A500M-60		A500M-63	A500M-60		A500M-63	
Leg Grade						P2.5x.203				
Diagonals	N.A.					SR 5/8				
Diagonal Grade	N.A.					A36				
Top Girts				L1 1/2x1 1/2x3/16			N.A.	L1 1/2x1 1/2x3/16		L1 3/4x1 3/4x3/16
Bottom Girts	N.A.		L1 1/2x1 1/2x3/16		N.A.		L1 1/2x1 1/2x3/16		N.A.	
Horizontals	N.A.				L1 1/2x1 1/2x3/16					L1 3/4x1 3/4x3/16
Top Guy Pull-Offs		N.A.			L1 1/2x1 1/2x3/16	N.A.	L1 1/2x1 1/2x3/16	N.A.		L1 1/2x1 1/2x3/16
Bot Guy Pull-Offs				N.A.			L1 1/2x1 1/2x3/16	N.A.		L1 1/2x1 1/2x3/16
Face Width (ft)						48 @ 3.20833				3.5
# Panels @ (ft)	A	4 @ 3.5625								
Weight (lb)	6303.0	111.2	480.3	658.2	658.2	658.2	572.6	658.2	658.2	889.4



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) Decibel DB980H90E-M (Sprint)	180	Powerwave P65-17-XLH-RR (ATI)	172
(3) Decibel DB980H90E-M (Sprint)	180	KMW AM-X-CD-16-65-00T-RET (ATI)	172
(3) Decibel DB980H90E-M (Sprint)	180	Andrew SBNH-1D6565C (ATI)	172
Low Profile Platform (Sprint)	180	(2) Ericsson RRUS11 (ATI)	172
(2) Powerwave 7770.00 (ATI)	172	(2) Ericsson RRUS11 (ATI)	172
(2) Powerwave 7770.00 (ATI)	172	(2) Ericsson RRUS11 (ATI)	172
(2) Powerwave 7770.00 (ATI)	172	Raycap DC6-48-60-18-8F (ATI)	172
(2) Powerwave LGP21401 (ATI)	172	12 ft Boom / Sector Mount (ATI)	170
(2) Powerwave LGP21401 (ATI)	172	12 ft Boom / Sector Mount (ATI)	170
(2) Powerwave LGP21401 (ATI)	172	12 ft Boom / Sector Mount (ATI)	170

SYMBOL LIST

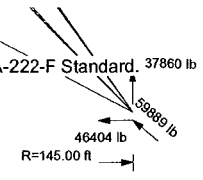
MARK	SIZE	MARK	SIZE
A	1 @ 4.625		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-63	63 ksi	80 ksi	A500M-60	60 ksi	75 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

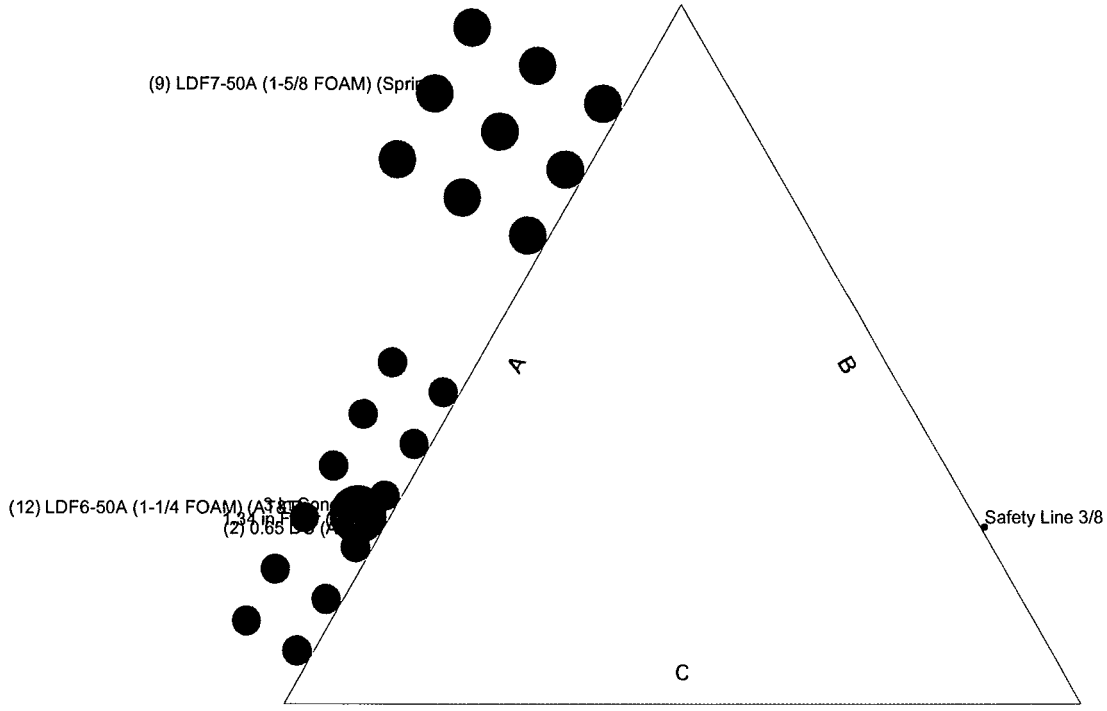
1. Tower is located in New London County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 50 mph wind.
5. Weld together tower sections have flange connections.
6. TOWER RATING: 76.7%



Phone: FAX:	Job: 112-13181		
	Project: Colchester, CT		
	Client: CDT	Drawn by: FAN	App'd:
	Code: TIA/EIA-222-F	Date: 09/26/12	Scale: NTS
	Path:		Dwg No. E-1

Feedline Plan

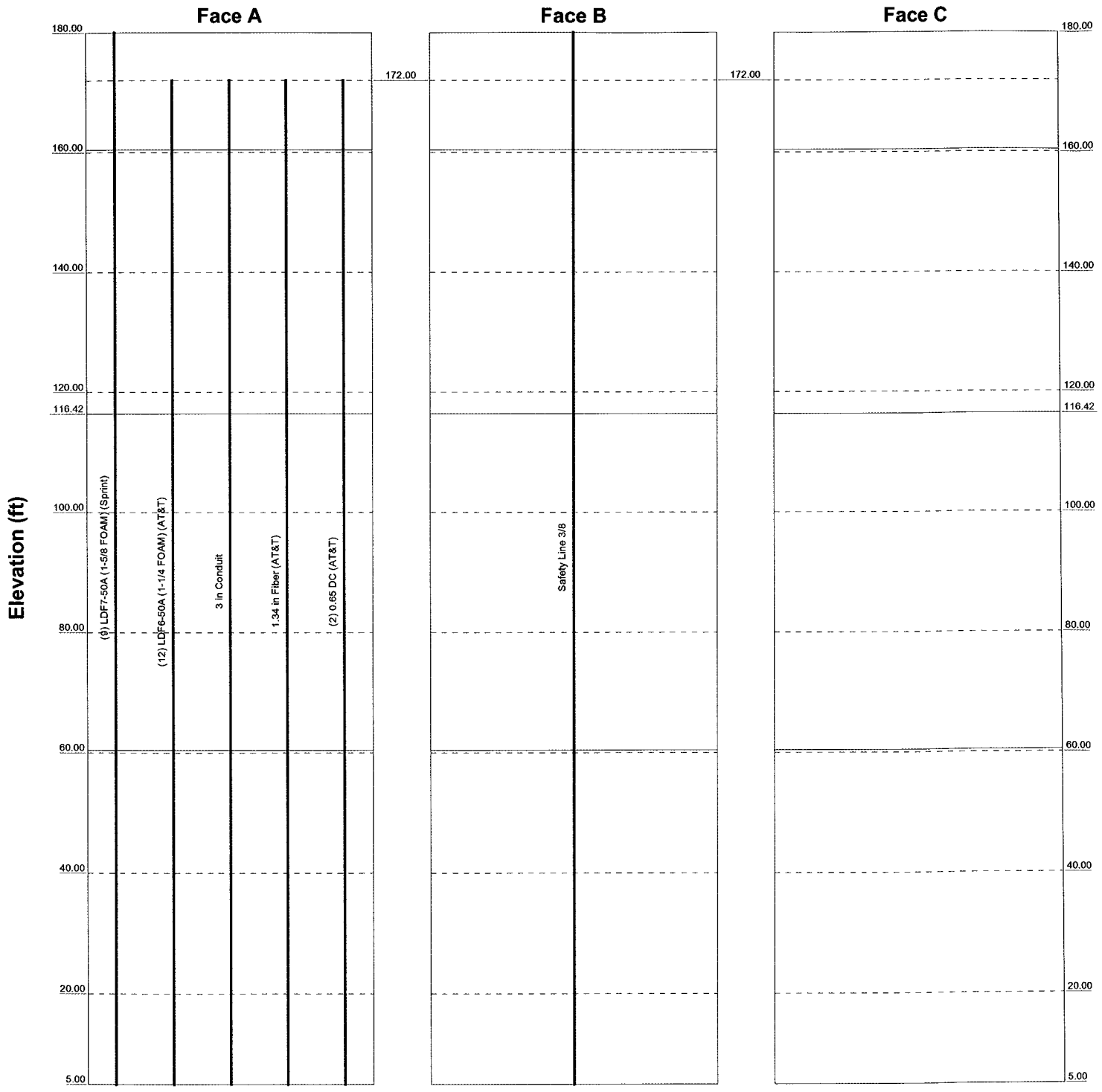
Round _____ Flat _____ App In Face App Out Face



Phone: FAX:	Job: 112-13181		
	Project: Colchester, CT		
	Client: CDT	Drawn by: FAN	App'd:
	Code: TIA/EIA-222-F	Date: 09/26/12	Scale: NTS
	Path:		Dwg No. E-7

Feedline Distribution Chart
5' - 180'

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



Job: 112-13181			
Project: Colchester, CT			
Client: CDT	Drawn by: FAN	App'd:	
Code: TIA/EIA-222-F	Date: 09/26/12	Scale: NTS	
Path:		Dwg No. E-7	

Phone:
FAX:

52

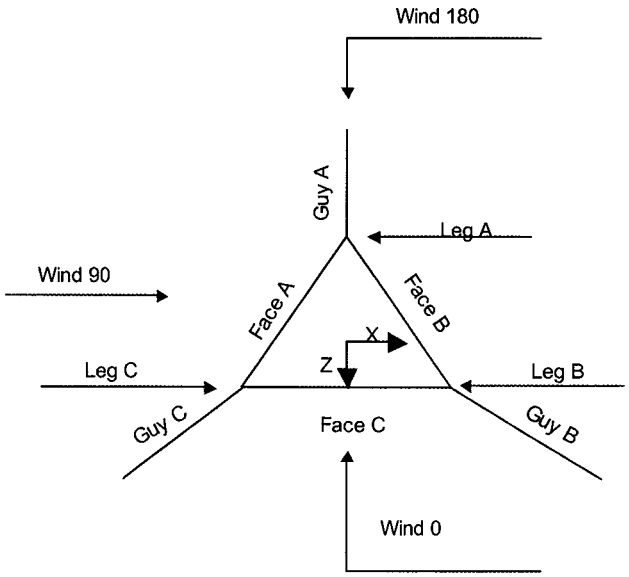
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 180.00 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 3.50 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:

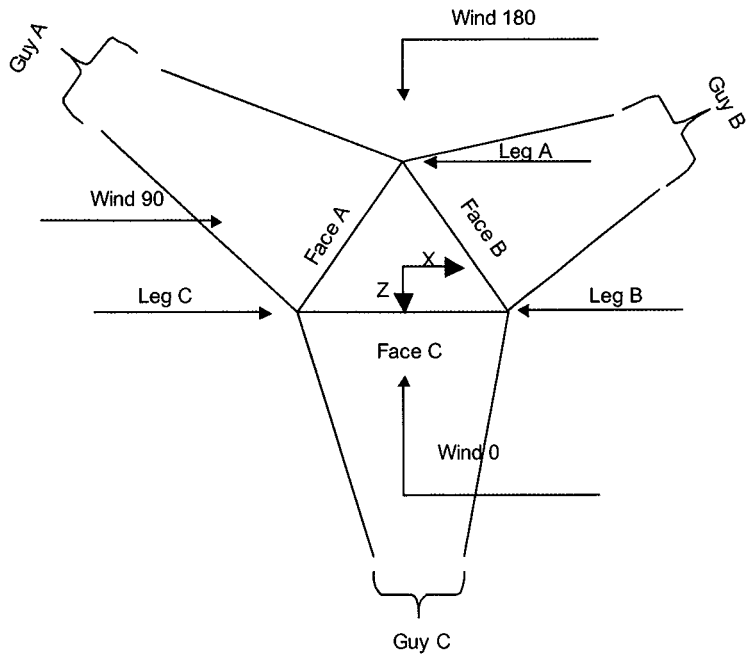
Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Tension only take-up is 0.0313 in.
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, feedline 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		



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	180.00-160.00			3.50	1	20.00
T2	160.00-140.00			3.50	1	20.00
T3	140.00-120.00			3.50	1	20.00
T4	120.00-100.00			3.50	1	20.00
T5	100.00-80.00			3.50	1	20.00
T6	80.00-60.00			3.50	1	20.00
T7	60.00-40.00			3.50	1	20.00
T8	40.00-20.00			3.50	1	20.00
T9	20.00-5.00			3.50	1	15.00
T10	5.00-0.00			3.50	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	180.00-160.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T2	160.00-140.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T3	140.00-120.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T4	120.00-100.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T5	100.00-80.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T6	80.00-60.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T7	60.00-40.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T8	40.00-20.00	3.21	TX Brace	No	Yes	4.5000	4.5000
T9	20.00-5.00	3.56	TX Brace	No	Yes	4.5000	4.5000
T10	5.00-0.00	4.63	TX Brace	No	Yes	4.5000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 160.00-140.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 140.00-120.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 100.00-80.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 80.00-60.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 60.00-40.00	Pipe	P2.5x.203	A500M-60 (60 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 40.00-20.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 20.00-5.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 5.00-0.00	Pipe	P2.5x.203	A500M-63 (63 ksi)	Solid Round	5/8	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 180.00-160.00	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	Equal Angle	L1 1/2x1 1/2x3/16	A36	Equal Angle	L1 1/2x1 1/2x3/16	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	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T7 60.00-40.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T8 40.00-20.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T9 20.00-5.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)
T10 5.00-0.00	Equal Angle	L1 1/2x1 1/2x3/16	(36 ksi) A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	(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
T1 180.00-160.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 160.00-140.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 120.00-100.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 100.00-80.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 80.00-60.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T7 60.00-40.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 40.00-20.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 20.00-5.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 5.00-0.00	None	Flat Bar		A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
140.00-120.00			(36 ksi)					
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000
120.00-100.00			(36 ksi)					
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000
100.00-80.00			(36 ksi)					
T6 80.00-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T7 60.00-40.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T8 40.00-20.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T9 20.00-5.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					
T10 5.00-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000
			(36 ksi)					

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	No	Yes	1	1	1	1	0.65	0.65	1	1
180.00-160.00				1	1	1	0.65	0.65	1	1
T2	No	Yes	1	1	1	1	0.65	0.65	1	1
160.00-140.00				1	1	1	0.65	0.65	1	1
T3	No	Yes	1	1	1	1	0.65	0.65	1	1
140.00-120.00				1	1	1	0.65	0.65	1	1
T4	No	Yes	1	1	1	1	0.65	0.65	1	1
120.00-100.00				1	1	1	0.65	0.65	1	1
T5	No	Yes	1	1	1	1	0.65	0.65	1	1
100.00-80.00				1	1	1	0.65	0.65	1	1
T6	No	Yes	1	1	1	1	0.65	0.65	1	1
80.00-60.00				1	1	1	0.65	0.65	1	1
T7	No	Yes	1	1	1	1	0.65	0.65	1	1
60.00-40.00				1	1	1	0.65	0.65	1	1
T8	No	Yes	1	1	1	1	0.65	0.65	1	1
40.00-20.00				1	1	1	0.65	0.65	1	1
T9 20.00-5.00	No	Yes	1	1	1	1	0.65	0.65	1	1
				1	1	1	0.65	0.65	1	1
T10 5.00-0.00	No	Yes	1	1	1	1	0.65	0.65	1	1
				1	1	1	0.65	0.65	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 180.00-160.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 160.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T5 100.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T6 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T7 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T8 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T9 20.00-5.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T10 5.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	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 180.00-160.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-80.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 80.00-60.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 60.00-40.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 40.00-20.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 20.00-5.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 5.00-0.00	Flange	0.7500 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
160.375	EHS	A	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
		B	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
		C	5/8	6360.00	15%	21000	0.813	214.61	145.00	0.0000	0.00	100%
116.417	EHS	A	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	184.18	145.00	0.0000	0.00	100%
60.375	EHS	A	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		B	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	100%
		C	9/16	5250.00	15%	21000	0.671	155.01	145.00	0.0000	0.00	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
160.375	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
116.417	Torque Arm	7.00	30.0000	Dog Ear	A36 (36 ksi)	Single Angle	L2x2x5/16 L3x3x1/4
60.375	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
160.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16
116.42	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16
60.38	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16

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
160.375	174.48	174.48	174.48		2.92 2.9 sec/pulse	2.92 2.9 sec/pulse	2.92 2.9 sec/pulse	
116.417	123.58	123.58	123.58		2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	2.15 2.5 sec/pulse	
60.375	104.01	104.01	104.01		1.53 2.1 sec/pulse	1.53 2.1 sec/pulse	1.53 2.1 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
160.375	No	No	1	1	0.65	0.65	1	1
116.417	No	No	1	1	0.65	0.65	1	1
60.375	No	No			0.65	0.65	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
160.375	0.7500 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
116.417	0.7500 A325N	2	0.0000	1	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
60.375	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
160.375	A	80.19	24	18	0.5000
	B	80.19	24	18	0.5000
	C	80.19	24	18	0.5000
116.417	A	58.21	22	16	0.5000
	B	58.21	22	16	0.5000
	C	58.21	22	16	0.5000
60.375	A	30.19	18	14	0.5000
	B	30.19	18	14	0.5000
	C	30.19	18	14	0.5000

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
160.375	A	48.2735	6490.22 / 6360.00	-104.64	4882.39	-4274.84	-9865.97	15173.38	-17088.36
	A	48.2735	6490.22	104.64	4882.39	-4274.84	-9865.97	-15173.38	17088.36

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
			6360.00						
	B	48.2735	6490.22	3754.44	4882.39	2046.79	19731.94	15173.38	0.00
			6360.00						
	B	48.2735	6490.22	3649.79	4882.39	2228.04	-9865.97	-15173.38	-17088.36
			6360.00						
	C	48.2735	6490.22	-3649.79	4882.39	2228.04	-9865.97	15173.38	17088.36
			6360.00						
	C	48.2735	6490.22	-3754.44	4882.39	2046.79	19731.94	-15173.38	0.00
			6360.00						
			Sum:	0.00	29294.33	0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71
			5250.00						
	C	22.8926	5290.46	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			5250.00						
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
160.375	A	48.2735	8233.12	-132.12	6215.76	-5397.33	-12560.35	19157.63	-21755.17
			7992.84						
	A	48.2735	8233.12	132.12	6215.76	-5397.33	-12560.35	-19157.63	21755.17
			7992.84						
	B	48.2735	8233.12	4740.29	6215.76	2584.24	25120.71	19157.63	0.00
			7992.84						
	B	48.2735	8233.12	4608.16	6215.76	2813.09	-12560.35	-19157.63	-21755.17
			7992.84						
	C	48.2735	8233.12	-4608.16	6215.76	2813.09	-12560.35	19157.63	21755.17
			7992.84						
	C	48.2735	8233.12	-4740.29	6215.76	2584.24	25120.71	-19157.63	0.00
			7992.84						
			Sum:	0.00	37294.58	0.00	-0.00	0.00	0.00
116.417	A	39.1448	6773.04	-127.07	4348.64	-5191.07	-8787.42	18425.51	-15220.26
			6619.57						
	A	39.1448	6773.04	127.07	4348.64	-5191.07	-8787.42	-18425.51	15220.26

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
			6619.57						
	B	39.1448	6773.04	4559.13	4348.64	2485.49	17574.84	18425.51	0.00
			6619.57						
	B	39.1448	6773.04	4432.06	4348.64	2705.58	-8787.42	-18425.51	-15220.26
			6619.57						
	C	39.1448	6773.04	-4432.06	4348.64	2705.58	-8787.42	18425.51	15220.26
			6619.57						
	C	39.1448	6773.04	-4559.13	4348.64	2485.49	17574.84	-18425.51	0.00
			6619.57						
			Sum:	0.00	26091.87	0.00	-0.00	0.00	0.00
60.375	A	22.8926	6717.98	0.00	2700.07	-6151.50	-5456.09	0.00	0.00
			6638.39						
	B	22.8926	6717.98	5327.35	2700.07	3075.75	2728.05	0.00	-4725.12
			6638.39						
	C	22.8926	6717.98	-5327.35	2700.07	3075.75	2728.05	-0.00	4725.12
			6638.39						
			Sum:	0.00	8100.20	0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom lb	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		lb	lb	lb	lb-ft	lb-ft	lb-ft
160.375	A	48.2735	6490.22	-104.64	4882.39	-4274.84	-9865.97	15173.38	-17088.36
			6360.00						
	A	48.2735	6490.22	104.64	4882.39	-4274.84	-9865.97	-15173.38	17088.36
			6360.00						
	B	48.2735	6490.22	3754.44	4882.39	2046.79	19731.94	15173.38	0.00
			6360.00						
	B	48.2735	6490.22	3649.79	4882.39	2228.04	-9865.97	-15173.38	-17088.36
			6360.00						
	C	48.2735	6490.22	-3649.79	4882.39	2228.04	-9865.97	15173.38	17088.36
			6360.00						
	C	48.2735	6490.22	-3754.44	4882.39	2046.79	19731.94	-15173.38	0.00
			6360.00						
			Sum:	0.00	29294.33	0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
			5250.00						
	A	39.1448	5328.01	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
			5250.00						
	B	39.1448	5328.01	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
			5250.00						
	B	39.1448	5328.01	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
			5250.00						
	C	39.1448	5328.01	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
			5250.00						
	C	39.1448	5328.01	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			5250.00						
			Sum:	0.00	20403.61	0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
			5250.00						
	B	22.8926	5290.46	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top Bottom lb	F_x lb	F_y lb	F_z lb	M_x lb-ft	M_y lb-ft	M_z lb-ft
	C	22.8926	5250.00 5290.46 5250.00	-4204.47	2102.12	2427.45	2123.90	-0.00	3678.71
			Sum:	0.00	6306.36	0.00	0.00	0.00	0.00

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
LDF7-50A (1-5/8 FOAM) (Sprint)	A	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.25	9	3	1.9800	1.9800		0.82
Safety Line 3/8	B	Yes	Ar (CfAe)	180.00 - 0.00	0.0000	0.25	1	1	0.3750	0.3750		0.22
LDF6-50A (1-1/4 FOAM) (AT&T)	A	Yes	Ar (CfAe)	172.00 - 0.00	0.0000	-0.25	12	6	1.5500	1.5500		0.66
3 in Conduit	A	Yes	Ar (CfAe)	172.00 - 0.00	0.0000	-0.25	1	1	0.3750	3.0000		0.22
1.34 in Fiber (AT&T)	A	Yes	Ar (CfAe)	172.00 - 0.00	0.0000	-0.25	1	1	1.0900	0.0000		0.15
0.65 DC (AT&T)	A	Yes	Ar (CfAe)	172.00 - 0.00	0.0000	-0.25	2	2	1.0900	0.0000		0.10

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	180.00-160.00	A	22.200	0.000	0.000	0.000	249.48
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00

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
T8	40.00-20.00	A	30.400	0.000	0.000	0.000	317.40
		B	0.625	0.000	0.000	0.000	4.40
		C	0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	22.800	0.000	0.000	0.000	238.05
		B	0.469	0.000	0.000	0.000	3.30
		C	0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	7.600	0.000	0.000	0.000	79.35
		B	0.156	0.000	0.000	0.000	1.10
		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	180.00-160.00	A	0.500	37.200	0.000	0.000	0.000	739.15
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T2	160.00-140.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T5	100.00-80.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T6	80.00-60.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T7	60.00-40.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T8	40.00-20.00	A	0.500	52.067	0.000	0.000	0.000	951.72
		B		2.292	0.000	0.000	0.000	15.09
		C		0.000	0.000	0.000	0.000	0.00
T9	20.00-5.00	A	0.500	39.050	0.000	0.000	0.000	713.79
		B		1.719	0.000	0.000	0.000	11.32
		C		0.000	0.000	0.000	0.000	0.00
T10	5.00-0.00	A	0.500	13.017	0.000	0.000	0.000	237.93
		B		0.573	0.000	0.000	0.000	3.77
		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	180.00-160.00	A	0.941	5.185	1.087	1.821
		B	0.026	0.319	0.031	0.112
		C	0.000	0.000	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T2	160.00-140.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T3	140.00-120.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T4	120.00-100.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T5	100.00-80.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T6	80.00-60.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T7	60.00-40.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T8	40.00-20.00	A	1.289	7.257	1.330	2.278
		B	0.026	0.319	0.027	0.100
		C	0.000	0.000	0.000	0.000
T9	20.00-5.00	A	0.904	5.109	0.950	1.627
		B	0.019	0.225	0.020	0.072
		C	0.000	0.000	0.000	0.000
T10	5.00-0.00	A	0.000	0.217	0.190	0.325
		B	0.000	0.010	0.004	0.014
		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	180.00-160.00	-4.0578	-2.0030	-3.7161	-1.5770
T2	160.00-140.00	-5.4995	-1.6353	-5.1561	-1.2217
T3	140.00-120.00	-5.4995	-1.6353	-5.1561	-1.2217
T4	120.00-100.00	-5.4995	-1.6353	-5.1561	-1.2217
T5	100.00-80.00	-5.4995	-1.6353	-5.1561	-1.2217
T6	80.00-60.00	-5.4995	-1.6353	-5.1561	-1.2217
T7	60.00-40.00	-5.4995	-1.6353	-5.1561	-1.2217
T8	40.00-20.00	-5.4995	-1.6353	-5.1561	-1.2217
T9	20.00-5.00	-5.5888	-1.6619	-5.2901	-1.2535
T10	5.00-0.00	-6.2108	-2.7190	-6.6034	-2.7375

Discrete Tower Loads

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
(3) Decibel DB980H90E-M (Sprint)	A	From Leg	3.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice	3.90 4.28	2.29 2.73	8.50 29.50
(3) Decibel DB980H90E-M (Sprint)	B	From Leg	3.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice	3.90 4.28	2.29 2.73	8.50 29.50
(3) Decibel DB980H90E-M (Sprint)	C	From Leg	3.00 0.00 2.00	0.0000	180.00	No Ice 1/2" Ice	3.90 4.28	2.29 2.73	8.50 29.50
Low Profile Platform (Sprint)	A	None		0.0000	180.00	No Ice 1/2" Ice	26.30 35.60	26.30 35.60	1950.00 2340.00
12 ft Boom / Sector Mount (AT&T)	A	From Leg	0.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	17.50 22.50	8.50 11.00	450.00 700.00
12 ft Boom / Sector Mount (AT&T)	B	From Leg	0.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	17.50 22.50	8.50 11.00	450.00 700.00
12 ft Boom / Sector Mount (AT&T)	C	From Leg	0.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	17.50 22.50	8.50 11.00	450.00 700.00
(2) Powerwave 7770.00 (AT&T)	A	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	5.88 6.25	2.93 3.29	35.00 67.60
(2) Powerwave 7770.00 (AT&T)	B	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	5.88 6.25	2.93 3.29	35.00 67.60
(2) Powerwave 7770.00 (AT&T)	C	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	5.88 6.25	2.93 3.29	35.00 67.60
(2) Powerwave LGP21401 (AT&T)	A	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	1.95 2.11	0.53 0.63	31.00 42.00
(2) Powerwave LGP21401 (AT&T)	B	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	1.95 2.11	0.53 0.63	31.00 42.00
(2) Powerwave LGP21401 (AT&T)	C	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	1.95 2.11	0.53 0.63	31.00 42.00
Powerwave P65-17-XLH-RR (AT&T)	A	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	11.47 12.08	4.00 4.68	62.00 124.10
KMW AM-X-CD-16-65-00T-RET (AT&T)	B	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	8.26 8.73	4.64 5.12	48.50 95.00
Andrew SBNH-1D6565C (AT&T)	C	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	11.41 12.03	7.70 8.36	60.90 126.60
(2) Ericsson RRUS11 (AT&T)	A	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	2.99 3.19	0.36 0.43	50.00 63.50
(2) Ericsson RRUS11 (AT&T)	B	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	2.99 3.19	0.36 0.43	50.00 63.50
(2) Ericsson RRUS11 (AT&T)	C	From Leg	3.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	2.99 3.19	0.36 0.43	50.00 63.50
Raycap DC6-48-60-18-8F	A	From Leg	3.00	0.0000	172.00	No Ice	2.57	2.57	31.80

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
(AT&T)			0.00 0.00			1/2" Ice	2.77	2.77	54.40

Tower Pressures - No Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1 180.00-160.00	170.00	1.597	30	74.792	A	2.106	33.607	9.583	26.83	0.000	0.000
					B	3.162	12.946		59.49	0.000	0.000
					C	3.192	12.348		61.67	0.000	0.000
T2 160.00-140.00	150.00	1.541	29	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T3 140.00-120.00	130.00	1.48	27	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T4 120.00-100.00	110.00	1.411	26	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T5 100.00-80.00	90.00	1.332	25	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T6 80.00-60.00	70.00	1.24	23	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T7 60.00-40.00	50.00	1.126	21	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T8 40.00-20.00	30.00	1	18	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T9 20.00-5.00	12.50	1	18	56.094	A	1.088	31.022	7.188	22.38	0.000	0.000
					B	2.018	9.576		61.99	0.000	0.000
					C	2.038	9.126		64.38	0.000	0.000
T10 5.00-0.00	2.50	1	18	10.019	A	0.185	10.184	2.584	24.92	0.000	0.000
					B	0.371	2.740		83.06	0.000	0.000
					C	0.375	2.584		87.33	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.597	22	0.5000	76.458	A	1.371	54.021	12.917	23.32	0.000	0.000
180.00-160.00						B	3.080	23.978		47.74	0.000	0.000
						C	3.192	22.006		51.26	0.000	0.000
T2	150.00	1.541	21	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
160.00-140.00						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T3	130.00	1.48	21	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
140.00-120.00						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T4	110.00	1.411	20	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
120.00-100.00						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T5 100.00-80.00	90.00	1.332	18	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T6 80.00-60.00	70.00	1.24	17	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T7 60.00-40.00	50.00	1.126	16	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T8 40.00-20.00	30.00	1	14	0.5000	76.458	A	0.575	66.815	12.917	19.17	0.000	0.000
						B	2.753	23.978		48.32	0.000	0.000
						C	2.853	22.006		51.96	0.000	0.000
T9 20.00-5.00	12.50	1	14	0.5000	57.344	A	0.411	50.027	9.688	19.21	0.000	0.000
						B	1.966	17.580		49.56	0.000	0.000
						C	2.038	16.086		53.45	0.000	0.000
T10 5.00-0.00	2.50	1	14	0.5000	10.461	A	0.049	16.532	3.483	21.00	0.000	0.000
						B	0.360	4.296		74.80	0.000	0.000
						C	0.375	3.733		84.79	0.000	0.000

Tower Pressure - Service

$G_H = 1.121$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.597	10	74.792	A	2.106	33.607	9.583	26.83	0.000	0.000
180.00-160.00					B	3.162	12.946		59.49	0.000	0.000
					C	3.192	12.348		61.67	0.000	0.000
T2	150.00	1.541	10	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
160.00-140.00					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T3	130.00	1.48	9	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
140.00-120.00					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T4	110.00	1.411	9	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
120.00-100.00					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T5	90.00	1.332	9	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
100.00-80.00					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T6 80.00-60.00	70.00	1.24	8	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T7 60.00-40.00	50.00	1.126	7	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T8 40.00-20.00	30.00	1	6	74.792	A	1.523	41.459	9.583	22.30	0.000	0.000
					B	2.826	12.946		60.76	0.000	0.000
					C	2.853	12.348		63.05	0.000	0.000
T9 20.00-5.00	12.50	1	6	56.094	A	1.088	31.022	7.188	22.38	0.000	0.000
					B	2.018	9.576		61.99	0.000	0.000
					C	2.038	9.126		64.38	0.000	0.000
T10 5.00-0.00	2.50	1	6	10.019	A	0.185	10.184	2.584	24.92	0.000	0.000
					B	0.371	2.740		83.06	0.000	0.000
					C	0.375	2.584		87.33	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	253.88	674.99	A	0.477	1.931	0.686	1	1	25.169	1609.49	80.47	A
180.00-160.00		TA 214.38	B	0.215	2.545	0.594	1	1	10.847			
			C	0.208	2.57	0.592	1	1	10.503			
T2	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1870.87	93.54	A
160.00-140.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T3	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1795.92	89.80	A
140.00-120.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T4	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1712.21	85.61	A
120.00-100.00		TA 214.38	B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T5	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1616.81	80.84	A
100.00-80.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T6	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1504.78	75.24	A
80.00-60.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T7	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1366.86	68.34	A
60.00-40.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T8	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	1213.85	60.69	A
40.00-20.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T9 20.00-5.00	241.35	480.27	A	0.572	1.824	0.737	1	1	23.955	905.68	60.38	A
			B	0.207	2.574	0.592	1	1	7.685			
			C	0.199	2.599	0.59	1	1	7.424			
T10 5.00-0.00	80.45	111.24	A	1	2.1	1	1	1	10.369	415.43*	83.09	A
			B	0.311	2.268	0.619	1	1	2.068			
			C	0.295	2.309	0.614	1	1	1.963			
Sum Weight:	2828.28	6302.97			*2A_g limit					14011.90		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	253.88	674.99	A	0.477	1.931	0.686	0.8	1	24.748	1582.56	79.13	A
180.00-160.00		TA 214.38	B	0.215	2.545	0.594	0.8	1	10.215			
			C	0.208	2.57	0.592	0.8	1	9.864			
T2	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1853.14	92.66	A
160.00-140.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T3	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1778.90	88.95	A
140.00-120.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T4	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1695.99	84.80	A
120.00-100.00		TA 214.38	B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T5	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1601.48	80.07	A
100.00-80.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T6	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1490.52	74.53	A
80.00-60.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T7	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1353.90	67.70	A
60.00-40.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T8	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	1202.34	60.12	A
40.00-20.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T9 20.00-5.00	241.35	480.27	A	0.572	1.824	0.737	0.8	1	23.737	897.45	59.83	A
			B	0.207	2.574	0.592	0.8	1	7.282			
			C	0.199	2.599	0.59	0.8	1	7.016			
T10 5.00-0.00	80.45	111.24	A	1	2.1	1	0.8	1	10.332	415.43*	83.09	A
			B	0.311	2.268	0.619	0.8	1	1.993			
			C	0.295	2.309	0.614	0.8	1	1.888			
Sum Weight:	2828.28	6302.97			*2A_g limit					13871.72		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	253.88	674.99	A	0.477	1.931	0.686	0.85	1	24.853	1589.30	79.46	A
180.00-160.00		TA 214.38	B	0.215	2.545	0.594	0.85	1	10.373			
			C	0.208	2.57	0.592	0.85	1	10.024			
T2	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1857.57	92.88	A
160.00-140.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T3	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1783.16	89.16	A
140.00-120.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T4	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1700.04	85.00	A
120.00-100.00		TA 214.38	B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T5	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1605.32	80.27	A
100.00-80.00			B	0.211	2.56	0.593	0.85	1	10.075			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.203	2.585	0.591	0.85	1	9.723			
T6	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1494.09	74.70	A
80.00-60.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T7	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1357.14	67.86	A
60.00-40.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T8	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	1205.22	60.26	A
40.00-20.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T9 20.00-5.00	241.35	480.27	A	0.572	1.824	0.737	0.85	1	23.792	899.51	59.97	A
			B	0.207	2.574	0.592	0.85	1	7.383			
			C	0.199	2.599	0.59	0.85	1	7.118			
T10 5.00-0.00	80.45	111.24	A	1	2.1	1	0.85	1	10.341	415.43*	83.09	A
			B	0.311	2.268	0.619	0.85	1	2.012			
			C	0.295	2.309	0.614	0.85	1	1.906			
Sum Weight:	2828.28	6302.97			*2A_g limit					13906.77		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	754.24	1040.18	A	0.724	1.78	0.838	1	1	46.623	2060.66	103.03	A
180.00-160.00		TA 326.59	B	0.354	2.163	0.634	1	1	18.279			
			C	0.33	2.22	0.625	1	1	16.955			
T2	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	2963.71	148.19	A
160.00-140.00			B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T3	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	2844.98	142.25	A
140.00-120.00			B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T4	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	2712.38	135.62	A
120.00-100.00		TA 326.59	B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T5	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	2561.24	128.06	A
100.00-80.00			B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T6	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	2383.78	119.19	A
80.00-60.00			B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T7	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	2165.28	108.26	A
60.00-40.00			B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T8	966.81	1013.22	A	0.881	1.899	0.966	1	1	65.132	1922.90	96.14	A
40.00-20.00			B	0.35	2.172	0.632	1	1	17.915			
			C	0.325	2.231	0.624	1	1	16.583			
T9 20.00-5.00	725.11	736.71	A	0.88	1.896	0.965	1	1	48.665	1434.95	95.66	A
			B	0.341	2.193	0.629	1	1	13.028			
			C	0.316	2.254	0.621	1	1	12.026			
T10 5.00-0.00	241.70	159.64	A	1	2.1	1	1	1	16.582	325.30*	65.06	A
			B	0.445	1.982	0.671	1	1	3.243			
			C	0.393	2.079	0.649	1	1	2.796			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	8488.74	9682.25			*2A_g limit					21375.16		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	754.24	1040.18	A	0.724	1.78	0.838	0.8	1	46.349	2048.54	102.43	A
180.00-160.00		TA 326.59	B	0.354	2.163	0.634	0.8	1	17.663			
			C	0.33	2.22	0.625	0.8	1	16.316			
T2	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	2958.47	147.92	A
160.00-140.00			B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T3	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	2839.95	142.00	A
140.00-120.00			B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T4	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	2707.59	135.38	A
120.00-100.00		TA 326.59	B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T5	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	2556.72	127.84	A
100.00-80.00			B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T6	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	2379.57	118.98	A
80.00-60.00			B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T7	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	2161.46	108.07	A
60.00-40.00			B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T8	966.81	1013.22	A	0.881	1.899	0.966	0.8	1	65.017	1919.50	95.98	A
40.00-20.00			B	0.35	2.172	0.632	0.8	1	17.364			
			C	0.325	2.231	0.624	0.8	1	16.012			
T9 20.00-5.00	725.11	736.71	A	0.88	1.896	0.965	0.8	1	48.582	1432.53	95.50	A
			B	0.341	2.193	0.629	0.8	1	12.635			
			C	0.316	2.254	0.621	0.8	1	11.619			
T10 5.00-0.00	241.70	159.64	A	1	2.1	1	0.8	1	16.572	325.30*	65.06	A
			B	0.445	1.982	0.671	0.8	1	3.171			
			C	0.393	2.079	0.649	0.8	1	2.721			
Sum Weight:	8488.74	9682.25			*2A_g limit					21329.63		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	754.24	1040.18	A	0.724	1.78	0.838	0.85	1	46.418	2051.57	102.58	A
180.00-160.00		TA 326.59	B	0.354	2.163	0.634	0.85	1	17.817			
			C	0.33	2.22	0.625	0.85	1	16.476			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T2	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	2959.78	147.99	A
160.00-140.00			B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T3	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	2841.21	142.06	A
140.00-120.00			B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T4	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	2708.78	135.44	A
120.00-100.00		TA 326.59	B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T5	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	2557.85	127.89	A
100.00-80.00			B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T6	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	2380.62	119.03	A
80.00-60.00			B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T7	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	2162.42	108.12	A
60.00-40.00			B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T8	966.81	1013.22	A	0.881	1.899	0.966	0.85	1	65.045	1920.35	96.02	A
40.00-20.00			B	0.35	2.172	0.632	0.85	1	17.502			
			C	0.325	2.231	0.624	0.85	1	16.155			
T9 20.00-5.00	725.11	736.71	A	0.88	1.896	0.965	0.85	1	48.603	1433.14	95.54	A
			B	0.341	2.193	0.629	0.85	1	12.733			
			C	0.316	2.254	0.621	0.85	1	11.721			
T10 5.00-0.00	241.70	159.64	A	1	2.1	1	0.85	1	16.574	325.30*	65.06	A
			B	0.445	1.982	0.671	0.85	1	3.189			
			C	0.393	2.079	0.649	0.85	1	2.740			
Sum Weight:	8488.74	9682.25			*2A_g limit					21341.01		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	253.88	674.99	A	0.477	1.931	0.686	1	1	25.169	556.92	27.85	A
180.00-160.00		TA 214.38	B	0.215	2.545	0.594	1	1	10.847			
			C	0.208	2.57	0.592	1	1	10.503			
T2	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	647.36	32.37	A
160.00-140.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T3	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	621.43	31.07	A
140.00-120.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T4	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	592.46	29.62	A
120.00-100.00		TA 214.38	B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T5	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	559.45	27.97	A
100.00-80.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T6	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	520.69	26.03	A
80.00-60.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T7	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	472.96	23.65	A
60.00-40.00			B	0.211	2.56	0.593	1	1	10.498			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.203	2.585	0.591	1	1	10.151			
T8	321.80	658.24	A	0.575	1.822	0.738	1	1	32.138	420.02	21.00	A
40.00-20.00			B	0.211	2.56	0.593	1	1	10.498			
			C	0.203	2.585	0.591	1	1	10.151			
T9 20.00-5.00	241.35	480.27	A	0.572	1.824	0.737	1	1	23.955	313.38	20.89	A
			B	0.207	2.574	0.592	1	1	7.685			
			C	0.199	2.599	0.59	1	1	7.424			
T10 5.00-0.00	80.45	111.24	A	1	2.1	1	1	1	10.369	143.75*	28.75	A
			B	0.311	2.268	0.619	1	1	2.068			
			C	0.295	2.309	0.614	1	1	1.963			
Sum Weight:	2828.28	6302.97			*2A_g limit					4848.41		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	253.88	674.99	A	0.477	1.931	0.686	0.8	1	24.748	547.60	27.38	A
180.00-160.00		TA 214.38	B	0.215	2.545	0.594	0.8	1	10.215			
			C	0.208	2.57	0.592	0.8	1	9.864			
T2	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	641.22	32.06	A
160.00-140.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T3	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	615.54	30.78	A
140.00-120.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T4	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	586.85	29.34	A
120.00-100.00		TA 214.38	B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T5	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	554.15	27.71	A
100.00-80.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T6	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	515.75	25.79	A
80.00-60.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T7	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	468.48	23.42	A
60.00-40.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T8	321.80	658.24	A	0.575	1.822	0.738	0.8	1	31.833	416.04	20.80	A
40.00-20.00			B	0.211	2.56	0.593	0.8	1	9.933			
			C	0.203	2.585	0.591	0.8	1	9.581			
T9 20.00-5.00	241.35	480.27	A	0.572	1.824	0.737	0.8	1	23.737	310.54	20.70	A
			B	0.207	2.574	0.592	0.8	1	7.282			
			C	0.199	2.599	0.59	0.8	1	7.016			
T10 5.00-0.00	80.45	111.24	A	1	2.1	1	0.8	1	10.332	143.75*	28.75	A
			B	0.311	2.268	0.619	0.8	1	1.993			
			C	0.295	2.309	0.614	0.8	1	1.888			
Sum Weight:	2828.28	6302.97			*2A_g limit					4799.90		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	253.88	674.99	A	0.477	1.931	0.686	0.85	1	24.853	549.93	27.50	A
180.00-160.00		TA 214.38	B	0.215	2.545	0.594	0.85	1	10.373			
			C	0.208	2.57	0.592	0.85	1	10.024			
T2	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	642.76	32.14	A
160.00-140.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T3	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	617.01	30.85	A
140.00-120.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T4	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	588.25	29.41	A
120.00-100.00		TA 214.38	B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T5	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	555.47	27.77	A
100.00-80.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T6	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	516.99	25.85	A
80.00-60.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T7	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	469.60	23.48	A
60.00-40.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T8	321.80	658.24	A	0.575	1.822	0.738	0.85	1	31.909	417.03	20.85	A
40.00-20.00			B	0.211	2.56	0.593	0.85	1	10.075			
			C	0.203	2.585	0.591	0.85	1	9.723			
T9 20.00-5.00	241.35	480.27	A	0.572	1.824	0.737	0.85	1	23.792	311.25	20.75	A
			B	0.207	2.574	0.592	0.85	1	7.383			
			C	0.199	2.599	0.59	0.85	1	7.118			
T10 5.00-0.00	80.45	111.24	A	1	2.1	1	0.85	1	10.341	143.75*	28.75	A
			B	0.311	2.268	0.619	0.85	1	2.012			
			C	0.295	2.309	0.614	0.85	1	1.906			
Sum Weight:	2828.28	6302.97			*$2A_g$ limit					4812.03		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Leg Weight	3138.04			
Bracing Weight	3164.93			
Total Member Self-Weight	6302.97			
Guy Weight	2100.38			
Total Weight	15507.34			
Wind 0 deg - No Ice		1.29	-20355.46	-6701.64
Wind 30 deg - No Ice		10063.07	-17537.95	-6789.16
Wind 60 deg - No Ice		17398.11	-10108.76	-5091.38
Wind 90 deg - No Ice		20123.90	-1.29	-2050.07
Wind 120 deg - No Ice		17518.21	10176.61	1562.45
Wind 150 deg - No Ice		10060.83	17536.65	4739.09
Wind 180 deg - No Ice		-1.29	20215.29	6640.57
Wind 210 deg - No Ice		-10063.07	17537.95	6789.16
Wind 240 deg - No Ice		-17519.50	10178.85	5139.19

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 270 deg - No Ice		-20123.90	1.29	2050.07
Wind 300 deg - No Ice		-17396.81	-10106.52	-1549.19
Wind 330 deg - No Ice		-10060.83	-17536.65	-4739.09
Member Ice	3379.28			
Guy Ice	1903.96			
Total Weight Ice	28319.53			
Wind 0 deg - Ice		0.65	-27008.21	-9343.46
Wind 30 deg - Ice		13440.74	-23360.55	-9263.49
Wind 60 deg - Ice		23269.54	-13481.90	-6711.63
Wind 90 deg - Ice		26880.36	-0.65	-2367.20
Wind 120 deg - Ice		23308.33	13503.55	2618.42
Wind 150 deg - Ice		13439.62	23359.90	6896.29
Wind 180 deg - Ice		-0.65	26962.68	9325.32
Wind 210 deg - Ice		-13440.74	23360.55	9263.49
Wind 240 deg - Ice		-23308.98	13504.67	6725.03
Wind 270 deg - Ice		-26880.36	0.65	2367.20
Wind 300 deg - Ice		-23268.89	-13480.78	-2613.69
Wind 330 deg - Ice		-13439.62	-23359.90	-6896.29
Total Weight	15507.34			
Wind 0 deg - Service		0.45	-7043.41	-2318.91
Wind 30 deg - Service		3482.03	-6068.49	-2349.19
Wind 60 deg - Service		6020.11	-3497.84	-1761.72
Wind 90 deg - Service		6963.29	-0.45	-709.37
Wind 120 deg - Service		6061.66	3521.32	540.64
Wind 150 deg - Service		3481.26	6068.05	1639.82
Wind 180 deg - Service		-0.45	6994.91	2297.78
Wind 210 deg - Service		-3482.03	6068.49	2349.19
Wind 240 deg - Service		-6062.11	3522.09	1778.27
Wind 270 deg - Service		-6963.29	0.45	709.37
Wind 300 deg - Service		-6019.66	-3497.07	-536.05
Wind 330 deg - Service		-3481.26	-6068.05	-1639.82

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

Comb. No.	Description
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	180 - 160	Leg	Max Tension	12	13821.78	32.54	17.76
			Max. Compression	15	-37701.51	-117.68	430.99
			Max. Mx	17	-25831.66	-495.45	220.99
			Max. My	15	-5456.68	63.80	582.65
			Max. Vy	17	-1070.76	-495.45	220.99
			Max. Vx	21	-1263.06	-74.30	-582.26
		Diagonal	Max Tension	9	6344.91	0.00	0.00
		Horizontal	Max Tension	15	653.01	0.00	0.00
			Max. Compression	2	-5140.57	0.00	0.00
			Max. Mx	14	297.68	-5.91	0.00
			Max. My	26	613.00	0.00	0.00
			Max. Vy	14	6.75	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-2911.93	0.00	0.00
			Max. Mx	14	-2530.30	-5.91	0.00
			Max. My	26	-2524.64	0.00	0.00
			Max. Vy	14	6.75	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Guy A	Bottom Tension	21	14421.25		
			Top Tension	21	14660.22		
			Top Cable Vert	21	11120.93		
			Top Cable Norm	21	9552.32		
			Top Cable Tan	21	6.42		
			Bot Cable Vert	21	-10540.05		
			Bot Cable Norm	21	9842.74		
			Bot Cable Tan	21	6.34		
		Guy B	Bottom Tension	25	14260.57		
			Top Tension	25	14499.57		
			Top Cable Vert	25	11001.67		
			Top Cable Norm	25	9444.61		
			Top Cable Tan	25	5.54		
			Bot Cable Vert	25	-10420.80		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Norm	25	9735.03		
			Bot Cable Tan	25	7.23		
		Guy C	Bottom Tension	17	14304.95		
			Top Tension	17	14543.93		
			Top Cable Vert	17	11034.53		
			Top Cable Norm	17	9474.45		
			Top Cable Tan	17	6.40		
			Bot Cable Vert	17	-10453.65		
			Bot Cable Norm	17	9764.87		
			Bot Cable Tan	17	6.36		
		Top Guy Pull-Off	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-7671.63	0.00	0.00
			Max. Mx	14	-4103.08	-5.12	0.00
			Max. My	26	-4028.56	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Guy Pull-Off	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-3605.22	0.00	0.00
			Max. Mx	14	-1866.98	-5.12	0.00
			Max. My	26	-1940.76	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	16	12839.76	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	12293.95	-12.24	0.00
			Max. My	21	11808.37	0.00	-0.10
			Max. Vy	26	10.31	0.00	0.00
			Max. Vx	21	0.09	0.00	0.00
		Torque Arm Bottom	Max Tension	15	2383.34	0.00	0.00
			Max. Compression	21	-10182.03	0.00	0.00
			Max. Mx	17	-9711.52	-11.66	0.00
			Max. My	21	-1959.57	0.00	-0.00
			Max. Vy	17	13.33	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
T2	160 - 140	Leg	Max Tension	8	9340.79	22.38	-149.65
			Max. Compression	15	-36358.13	-21.05	143.61
			Max. Mx	17	-25844.05	305.09	-141.60
			Max. My	21	-25747.93	41.91	362.45
			Max. Vy	17	-1070.54	-95.27	39.53
			Max. Vx	21	-1263.06	-16.46	-109.88
		Diagonal	Max Tension	21	4371.90	0.00	0.00
		Horizontal	Max Tension	15	629.74	0.00	0.00
			Max. Compression	2	-4447.17	0.00	0.00
			Max. Mx	14	308.87	-5.12	0.00
			Max. My	26	593.22	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-2885.03	0.00	0.00
			Max. Mx	14	-1888.99	-5.12	0.00
			Max. My	26	-1886.93	0.00	0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-2218.17	0.00	0.00
			Max. Mx	14	-1890.47	-5.12	0.00
			Max. My	16	-1799.13	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T3	140 - 120	Leg	Max Tension	8	3906.28	-23.94	73.89

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	15	-38842.46	58.01	-258.34
			Max. Mx	18	-15591.61	292.30	6.43
			Max. My	15	-5738.83	-34.16	-309.29
			Max. Vy	18	1021.87	-90.09	-21.17
			Max. Vx	15	-1088.32	-21.11	97.58
		Diagonal	Max Tension	21	3866.15	0.00	0.00
		Horizontal	Max Tension	15	672.77	0.00	0.00
			Max. Compression	2	-4303.61	0.00	0.00
			Max. Mx	14	317.85	-5.12	0.00
			Max. My	16	630.56	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-2304.37	0.00	0.00
			Max. Mx	14	-1896.72	-5.12	0.00
			Max. My	16	-1798.24	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-2802.76	0.00	0.00
			Max. Mx	14	-1840.75	-5.12	0.00
			Max. My	21	-2229.92	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
T4	120 - 100	Leg	Max Tension	8	3902.87	0.63	-103.11
			Max. Compression	15	-47016.48	-109.03	100.41
			Max. Mx	18	156.43	-483.51	12.19
			Max. My	15	-26585.30	106.72	510.80
			Max. Vy	23	1126.70	428.66	-177.60
			Max. Vx	15	1343.72	106.92	510.77
		Diagonal	Max Tension	22	5753.56	0.00	0.00
		Horizontal	Max Tension	15	814.35	0.00	0.00
			Max. Compression	22	-4137.70	0.00	0.00
			Max. Mx	14	455.21	-5.12	0.00
			Max. My	21	646.79	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-1829.07	0.00	0.00
			Max. Mx	14	-1499.67	-5.12	0.00
			Max. My	15	-1572.59	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Guy A	Bottom Tension	21	10769.68		
			Top Tension	21	10922.55		
			Top Cable Vert	21	7036.99		
			Top Cable Norm	21	8353.61		
			Top Cable Tan	21	4.32		
			Bot Cable Vert	21	-6631.29		
			Bot Cable Norm	21	8485.99		
			Bot Cable Tan	21	3.81		
		Guy B	Bottom Tension	25	10480.07		
			Top Tension	25	10632.96		
			Top Cable Vert	25	6854.99		
			Top Cable Norm	25	8128.28		
			Top Cable Tan	25	3.84		
			Bot Cable Vert	25	-6449.29		
			Bot Cable Norm	25	8260.66		
			Bot Cable Tan	25	4.30		
		Guy C	Bottom Tension	17	10651.01		
			Top Tension	17	10803.89		

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	6962.41		
			Top Cable Norm	17	8261.29		
			Top Cable Tan	17	4.12		
			Bot Cable Vert	17	-6556.70		
			Bot Cable Norm	17	8393.67		
			Bot Cable Tan	17	4.02		
		Top Guy Pull-Off	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-2934.68	0.00	0.00
			Max. Mx	14	-1547.44	-5.12	0.00
			Max. My	21	-2162.28	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Bottom Guy Pull-Off	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-5564.56	0.00	0.00
			Max. Mx	14	-2903.61	-5.12	0.00
			Max. My	21	-4427.66	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Torque Arm Top	Max Tension	15	8075.15	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	16	7953.45	-12.17	0.00
			Max. My	21	7297.32	0.00	-0.07
			Max. Vy	16	10.25	0.00	0.00
			Max. Vx	21	0.06	0.00	0.00
		Torque Arm Bottom	Max Tension	22	2831.86	0.00	0.00
			Max. Compression	22	-6569.56	0.00	0.00
			Max. Mx	18	-4722.70	-11.66	0.00
			Max. My	21	-781.82	0.00	-0.00
			Max. Vy	18	13.33	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
T5	100 - 80	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-34555.21	140.35	86.57
			Max. Mx	23	-24500.26	-412.54	139.60
			Max. My	15	-27789.42	-129.99	-492.68
			Max. Vy	23	1121.85	7.20	-18.79
			Max. Vx	15	1338.03	-11.85	8.00
		Diagonal	Max Tension	22	4068.34	0.00	0.00
		Horizontal	Max Tension	17	598.51	0.00	0.00
			Max. Compression	29	-3199.33	0.00	0.00
			Max. Mx	14	465.31	-5.12	0.00
			Max. My	21	597.52	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-1940.44	0.00	0.00
			Max. Mx	14	-1506.40	-5.12	0.00
			Max. My	15	-1284.35	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	15	0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	37	-1682.60	0.00	0.00
			Max. Mx	14	-1471.62	-5.12	0.00
			Max. My	21	-1326.25	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
T6	80 - 60	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-34111.13	54.93	8.82
			Max. Mx	25	-26676.25	778.31	383.76
			Max. My	21	-26639.19	228.78	-867.71
			Max. Vy	25	1774.75	778.29	383.74

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	21	-1946.04	228.82	-867.40
		Diagonal	Max Tension	21	3758.49	0.00	0.00
		Horizontal	Max Tension	17	590.82	0.00	0.00
			Max. Compression	10	-3402.09	0.00	0.00
			Max. Mx	14	484.91	-5.12	0.00
			Max. My	21	589.86	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	29	-1684.45	0.00	0.00
			Max. Mx	14	-1478.30	-5.12	0.00
			Max. My	21	-1250.96	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Guy A	Bottom Tension	21	11575.50		
			Top Tension	21	11654.87		
			Top Cable Vert	21	4637.18		
			Top Cable Norm	21	10692.64		
			Top Cable Tan	21	2.68		
			Bot Cable Vert	21	-4380.09		
			Bot Cable Norm	21	10714.81		
			Bot Cable Tan	21	2.68		
		Guy B	Bottom Tension	25	11558.72		
			Top Tension	25	11638.09		
			Top Cable Vert	25	4630.68		
			Top Cable Norm	25	10677.16		
			Top Cable Tan	25	0.77		
			Bot Cable Vert	25	-4373.59		
			Bot Cable Norm	25	10699.33		
			Bot Cable Tan	25	0.77		
		Guy C	Bottom Tension	17	11574.85		
			Top Tension	17	11654.22		
			Top Cable Vert	17	4636.93		
			Top Cable Norm	17	10692.04		
			Top Cable Tan	17	1.85		
			Bot Cable Vert	17	-4379.84		
			Bot Cable Norm	17	10714.21		
			Bot Cable Tan	17	1.85		
		Top Guy Pull-Off	Max Tension	15	3166.57	0.00	0.00
			Max. Compression	12	-106.83	0.00	0.00
			Max. Mx	14	1426.50	-5.12	0.00
			Max. My	21	2498.56	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
T7	60 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-44457.87	-78.25	-38.51
			Max. Mx	25	-31419.36	-552.29	-264.99
			Max. My	21	-31590.04	-159.36	593.03
			Max. Vy	25	1776.18	113.29	59.68
			Max. Vx	21	-1948.45	34.47	-137.52
		Diagonal	Max Tension	22	4665.19	0.00	0.00
		Horizontal	Max Tension	25	770.03	0.00	0.00
			Max. Compression	4	-3149.91	0.00	0.00
			Max. Mx	14	528.18	-5.12	0.00
			Max. My	21	769.11	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	2	-1541.99	0.00	0.00
			Max. Mx	14	-1102.81	-5.12	0.00
			Max. My	21	-1399.84	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. Vy	14	5.85	0.00	0.00
			Max. Vx	21	0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	12	-1796.23	0.00	0.00
			Max. Mx	14	-1307.20	-5.12	0.00
			Max. My	22	-1225.67	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T8	40 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-47770.93	-33.01	-20.16
			Max. Mx	23	-38842.26	-226.69	83.30
			Max. My	21	-24675.92	3.58	277.59
			Max. Vy	23	529.43	-28.78	5.66
			Max. Vx	21	-642.74	-18.25	37.42
		Diagonal	Max Tension	2	2761.33	0.00	0.00
		Horizontal	Max Tension	25	827.42	0.00	0.00
			Max. Compression	12	-3258.14	0.00	0.00
			Max. Mx	14	538.66	-5.12	0.00
			Max. My	22	784.68	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	8	-1591.11	0.00	0.00
			Max. Mx	14	-1313.14	-5.12	0.00
			Max. My	22	-1217.80	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	12	-1596.27	0.00	0.00
			Max. Mx	14	-1264.44	-5.12	0.00
			Max. My	22	-1182.86	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T9	20 - 5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-45672.41	87.91	65.57
			Max. Mx	25	-36783.46	2177.30	1253.87
			Max. My	21	-36761.55	19.30	-2497.66
			Max. Vy	17	7031.94	-2148.31	1259.55
			Max. Vx	21	8095.56	19.30	-2497.66
		Diagonal	Max Tension	20	2941.56	0.00	0.00
		Horizontal	Max Tension	25	791.07	0.00	0.00
			Max. Compression	4	-2812.89	0.00	0.00
			Max. Mx	14	549.77	-5.12	0.00
			Max. My	22	753.83	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Top Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-1520.68	0.00	0.00
			Max. Mx	14	-1005.63	-5.12	0.00
			Max. My	22	-899.83	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
		Bottom Girt	Max Tension	22	2940.35	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2337.65	-5.12	0.00
			Max. My	22	2670.41	0.00	-0.00
			Max. Vy	14	5.85	0.00	0.00
			Max. Vx	22	0.00	0.00	0.00
T10	5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	17	-39878.52	-5.05	-1.51
			Max. Mx	25	-37168.16	2512.49	-1.73

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	20	-31835.32	-182.47	153.20
			Max. Vy	25	6349.77	2512.49	-1.73
			Max. Vx	16	-436.65	2220.97	-36.19
		Top Girt	Max Tension	18	4108.54	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	16	3222.36	-4.29	0.00
			Max. My	22	3670.07	0.00	-0.87
			Max. Vy	16	-5.30	0.00	0.00
			Max. Vx	22	1.07	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	21	96964.73	-48.29	-2258.07
	Max. H_x	24	95489.62	2231.25	-57.91
	Max. H_z	15	93534.26	-45.86	2329.57
	Max. M_x	1	0.00	-17.66	-9.03
	Max. M_z	1	0.00	-17.66	-9.03
	Max. Torsion	1	0.00	-17.66	-9.03
	Min. Vert	1	69407.45	-17.66	-9.03
	Min. H_x	18	95432.05	-2338.64	-58.63
	Min. H_z	21	96964.73	-48.29	-2258.07
	Min. M_x	1	0.00	-17.66	-9.03
	Min. M_z	1	0.00	-17.66	-9.03
	Min. Torsion	1	0.00	-17.66	-9.03
Guy C @ 145 ft Elev 0 ft Azimuth 240 deg	Max. Vert	23	-6710.24	-6906.16	3972.02
	Max. H_x	23	-6710.24	-6906.16	3972.02
	Max. H_z	17	-37778.00	-40121.92	23188.83
	Min. Vert	17	-37778.00	-40121.92	23188.83
	Min. H_x	17	-37778.00	-40121.92	23188.83
	Min. H_z	23	-6710.24	-6906.16	3972.02
Guy B @ 145 ft Elev 0 ft Azimuth 120 deg	Max. Vert	19	-6763.49	6932.11	4008.29
	Max. H_x	25	-37860.42	40190.96	23195.07
	Max. H_z	25	-37860.42	40190.96	23195.07
	Min. Vert	25	-37860.42	40190.96	23195.07
	Min. H_x	19	-6763.49	6932.11	4008.29
	Min. H_z	19	-6763.49	6932.11	4008.29
Guy A @ 145 ft Elev 0 ft Azimuth 0 deg	Max. Vert	15	-6677.95	-18.32	-7944.76
	Max. H_x	24	-22337.18	1465.91	-27154.55
	Max. H_z	15	-6677.95	-18.32	-7944.76
	Min. Vert	21	-37849.35	29.11	-46408.17
	Min. H_x	18	-22317.91	-1465.74	-27138.23
	Min. H_z	21	-37849.35	29.11	-46408.17

Tower Mast Reaction Summary

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
Dead Only	69407.45	17.66	9.03	0.00	0.00	0.00
Dead+Wind 0 deg - No Ice+Guy	71479.71	16.39	-1728.37	0.00	0.00	0.00
Dead+Wind 30 deg - No Ice+Guy	72188.54	864.83	-1481.14	0.00	0.00	0.00
Dead+Wind 60 deg - No Ice+Guy	72614.85	1487.05	-841.36	0.00	0.00	0.00
Dead+Wind 90 deg - No Ice+Guy	72134.60	1730.92	18.01	0.00	0.00	0.00
Dead+Wind 120 deg - No Ice+Guy	71409.35	1521.38	878.05	0.00	0.00	0.00
Dead+Wind 150 deg - No Ice+Guy	72172.84	881.57	1489.38	0.00	0.00	0.00
Dead+Wind 180 deg - No Ice+Guy	72642.63	16.09	1707.53	0.00	0.00	0.00
Dead+Wind 210 deg - No Ice+Guy	72172.96	-848.33	1488.30	0.00	0.00	0.00
Dead+Wind 240 deg - No Ice+Guy	71432.03	-1486.38	876.90	0.00	0.00	0.00
Dead+Wind 270 deg - No Ice+Guy	72148.60	-1695.42	17.86	0.00	0.00	0.00
Dead+Wind 300 deg - No Ice+Guy	72612.85	-1452.67	-840.01	0.00	0.00	0.00
Dead+Wind 330 deg - No Ice+Guy	72202.25	-831.69	-1479.57	0.00	0.00	0.00
Dead+Ice+Temp+Guy	88205.62	53.34	25.52	0.00	0.00	0.00
Dead+Wind 0 deg+Ice+Temp+Guy	93534.26	45.86	-2329.57	0.00	0.00	0.00
Dead+Wind 30 deg+Ice+Temp+Guy	95529.97	1157.21	-1970.13	0.00	0.00	0.00
Dead+Wind 60 deg+Ice+Temp+Guy	96923.11	1986.78	-1095.38	0.00	0.00	0.00
Dead+Wind 90 deg+Ice+Temp+Guy	95432.05	2338.64	58.63	0.00	0.00	0.00
Dead+Wind 120 deg+Ice+Temp+Guy	93415.13	2095.68	1206.16	0.00	0.00	0.00
Dead+Wind 150 deg+Ice+Temp+Guy	95489.92	1221.92	1988.64	0.00	0.00	0.00
Dead+Wind 180 deg+Ice+Temp+Guy	96964.73	48.29	2258.07	0.00	0.00	0.00
Dead+Wind 210 deg+Ice+Temp+Guy	95517.65	-1122.30	1979.57	0.00	0.00	0.00
Dead+Wind 240 deg+Ice+Temp+Guy	93481.08	-1989.27	1199.81	0.00	0.00	0.00
Dead+Wind 270 deg+Ice+Temp+Guy	95489.62	-2231.25	57.91	0.00	0.00	0.00
Dead+Wind 300 deg+Ice+Temp+Guy	96942.48	-1884.36	-1091.73	0.00	0.00	0.00
Dead+Wind 330 deg+Ice+Temp+Guy	95558.78	-1062.99	-1967.12	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	69641.74	17.61	-589.79	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	69609.98	313.42	-506.44	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	69583.57	530.11	-287.06	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	69610.45	611.72	10.43	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	69642.55	536.04	308.52	0.00	0.00	0.00

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
Dead+Wind 150 deg - Service+Guy	69610.76	315.90	523.14	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	69584.12	17.66	601.16	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	69610.57	-280.52	523.06	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	69642.19	-500.56	308.40	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	69610.06	-576.24	10.38	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	69583.29	-494.74	-286.99	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	69609.78	-278.15	-506.34	0.00	0.00	0.00

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	-15506.89	0.00	-3.86	15506.89	-2.39	0.029%
2	1.29	-15680.64	-23036.66	-0.94	15679.09	22948.73	0.316%
3	11400.27	-15506.89	-19854.04	-11373.01	15505.42	19772.65	0.310%
4	19720.09	-15333.15	-11449.36	-19618.09	15331.76	11390.10	0.429%
5	22798.29	-15506.89	-1.29	-22716.95	15505.56	17.22	0.301%
6	19840.19	-15680.64	11517.21	-19767.90	15679.30	-11475.53	0.300%
7	11398.02	-15506.89	19852.74	-11342.13	15505.51	-19789.60	0.305%
8	-1.29	-15333.15	22896.48	2.39	15331.74	-22777.96	0.430%
9	-11400.27	-15506.89	19854.04	11344.83	15505.49	-19790.37	0.305%
10	-19841.49	-15680.64	11519.45	19768.28	15679.25	-11476.86	0.305%
11	-22798.29	-15506.89	1.29	22716.27	15505.53	15.08	0.303%
12	-19718.80	-15333.15	-11447.12	19617.32	15331.75	11386.91	0.429%
13	-11398.02	-15506.89	-19852.74	11371.52	15505.40	19770.43	0.313%
14	0.00	-28318.69	0.00	-10.12	28318.69	-5.26	0.040%
15	0.65	-28671.35	-32394.10	1.11	28669.10	32270.08	0.287%
16	16126.66	-28318.69	-28012.70	-16100.38	28316.15	27883.17	0.308%
17	27933.85	-27966.04	-16174.84	-27764.37	27962.65	16073.90	0.462%
18	32252.21	-28318.69	-0.65	-32134.70	28316.52	40.42	0.289%
19	27972.64	-28671.35	16196.49	-27871.24	28669.43	-16138.36	0.271%
20	16125.54	-28318.69	28012.05	-16030.13	28316.47	-27929.70	0.293%
21	-0.65	-27966.04	32348.56	-0.95	27962.54	-32148.91	0.467%
22	-16126.66	-28318.69	28012.70	16028.90	28316.22	-27925.71	0.305%
23	-27973.29	-28671.35	16197.61	27869.08	28669.24	-16136.07	0.280%
24	-32252.21	-28318.69	0.65	32132.67	28316.41	40.72	0.295%
25	-27933.21	-27966.04	-16173.72	27764.53	27962.69	16074.12	0.459%
26	-16125.54	-28318.69	-28012.05	16102.58	28316.29	27884.19	0.302%
27	0.45	-15567.01	-7971.16	-0.48	15566.99	7919.95	0.293%
28	3944.73	-15506.89	-6869.91	-3917.38	15506.84	6825.74	0.298%
29	6823.56	-15446.78	-3961.72	-6777.36	15446.69	3934.96	0.308%
30	7888.68	-15506.89	-0.45	-7836.88	15506.84	-1.24	0.298%
31	6865.12	-15567.01	3985.19	-6820.93	15566.99	-3959.59	0.292%
32	3943.95	-15506.89	6869.46	-3919.52	15506.84	-6823.60	0.298%
33	-0.45	-15446.78	7922.66	0.43	15446.69	-7869.13	0.308%
34	-3944.73	-15506.89	6869.91	3920.24	15506.84	-6824.04	0.299%
35	-6865.57	-15567.01	3985.97	6821.29	15566.99	-3960.35	0.293%
36	-7888.68	-15506.89	0.45	7836.77	15506.84	-2.13	0.299%
37	-6823.11	-15446.78	-3960.94	6776.83	15446.69	3934.15	0.308%
38	-3943.95	-15506.89	-6869.46	3916.54	15506.84	6825.26	0.299%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	50	0.00000001	0.00002506
2	Yes	71	0.00139112	0.00039119
3	Yes	71	0.00129969	0.00036715
4	Yes	69	0.00129809	0.00035003
5	Yes	71	0.00123507	0.00034193
6	Yes	71	0.00129613	0.00035597
7	Yes	71	0.00125875	0.00035236
8	Yes	69	0.00130006	0.00035319
9	Yes	71	0.00126380	0.00035533
10	Yes	71	0.00132174	0.00036606
11	Yes	71	0.00125050	0.00034785
12	Yes	69	0.00129858	0.00035021
13	Yes	71	0.00130947	0.00036997
14	Yes	50	0.00000001	0.00006211
15	Yes	73	0.00143117	0.00045619
16	Yes	73	0.00142576	0.00038877
17	Yes	70	0.00147081	0.00045284
18	Yes	73	0.00130749	0.00034666
19	Yes	73	0.00131958	0.00041851
20	Yes	73	0.00132318	0.00035136
21	Yes	70	0.00148629	0.00046145
22	Yes	73	0.00139875	0.00038029
23	Yes	73	0.00138422	0.00043959
24	Yes	73	0.00134845	0.00036057
25	Yes	70	0.00145628	0.00044609
26	Yes	73	0.00139182	0.00037418
27	Yes	67	0.00130632	0.00015278
28	Yes	67	0.00132621	0.00015426
29	Yes	67	0.00135782	0.00015719
30	Yes	67	0.00132791	0.00015314
31	Yes	67	0.00130878	0.00015161
32	Yes	67	0.00132821	0.00015385
33	Yes	67	0.00135832	0.00015790
34	Yes	67	0.00132729	0.00015433
35	Yes	67	0.00130774	0.00015226
36	Yes	67	0.00132706	0.00015350
37	Yes	67	0.00135727	0.00015716
38	Yes	67	0.00132626	0.00015415

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	2.176	37	0.2033	0.0643
T2	160 - 140	1.353	37	0.1587	0.0582
T3	140 - 120	0.851	33	0.0940	0.0778
T4	120 - 100	0.563	33	0.0401	0.0786
T5	100 - 80	0.509	29	0.0027	0.1346
T6	80 - 60	0.509	29	0.0044	0.1918

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	60 - 40	0.477	29	0.0057	0.2332
T8	40 - 20	0.450	31	0.0207	0.2672
T9	20 - 5	0.293	31	0.0550	0.2880
T10	5 - 0	0.080	31	0.0726	0.2963

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(3) Decibel DB980H90E-M	37	2.176	0.2033	0.0643	42697
172.00	(2) Powerwave 7770.00	37	1.822	0.1875	0.0588	26686
170.00	12 ft Boom / Sector Mount	37	1.737	0.1833	0.0578	21349
160.38	Guy	37	1.366	0.1597	0.0580	11537
116.42	Guy	33	0.539	0.0314	0.0845	18415
60.38	Guy	29	0.477	0.0056	0.2325	92636

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	7.672	25	0.6252	0.3153
T2	160 - 140	5.447	25	0.4977	0.3000
T3	140 - 120	4.058	21	0.3059	0.3878
T4	120 - 100	3.153	21	0.1381	0.3949
T5	100 - 80	3.029	21	0.0326	0.6669
T6	80 - 60	2.935	21	0.0545	0.8934
T7	60 - 40	2.615	17	0.0643	1.0525
T8	40 - 20	2.345	21	0.1287	1.2050
T9	20 - 5	1.484	17	0.2862	1.2859
T10	5 - 0	0.401	17	0.3663	1.3137

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	(3) Decibel DB980H90E-M	25	7.672	0.6252	0.3153	14947
172.00	(2) Powerwave 7770.00	25	6.714	0.5805	0.2962	9342
170.00	12 ft Boom / Sector Mount	25	6.483	0.5685	0.2931	7474
160.38	Guy	25	5.481	0.5008	0.2988	4034
116.42	Guy	21	3.083	0.1106	0.4257	4491
60.38	Guy	17	2.620	0.0640	1.0496	16015

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	180	Leg	A325N	0.7500	4	0.03	19436.30	0.000 ✔	1.333	Bolt Tension
		Torque Arm Top@160.375	A325N	0.7500	2	6419.88	9277.52	0.692 ✔	1.333	Bolt Shear
		Torque Arm Bottom@160.375	A325N	0.7500	2	5091.01	9277.52	0.549 ✔	1.333	Bolt Shear
T2	160	Leg	A325N	0.7500	4	2335.20	19435.30	0.120 ✔	1.333	Bolt Tension
T3	140	Leg	A325N	0.7500	4	265.78	19438.40	0.014 ✔	1.333	Bolt Tension
T4	120	Leg	A325N	0.7500	4	975.72	19437.00	0.050 ✔	1.333	Bolt Tension
		Torque Arm Top@116.417	A325N	0.7500	2	4037.58	9277.52	0.435 ✔	1.333	Bolt Shear
		Torque Arm Bottom@116.417	A325N	0.7500	2	3284.78	9277.52	0.354 ✔	1.333	Bolt Shear
T5	100	Leg	A325N	0.7500	4	0.00	19425.30	0.000 ✔	1.333	Bolt Tension
T6	80	Leg	A325N	0.7500	4	0.00	19435.80	0.000 ✔	1.333	Bolt Tension
T7	60	Leg	A325N	0.7500	4	0.00	19409.90	0.000 ✔	1.333	Bolt Tension
T8	40	Leg	A325N	0.7500	4	0.00	19435.70	0.000 ✔	1.333	Bolt Tension
T9	20	Leg	A325N	0.7500	4	0.00	19437.10	0.000 ✔	1.333	Bolt Tension
T10	5	Leg	A325N	0.7500	4	0.00	19151.90	0.000 ✔	1.333	Bolt Tension

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.
T1	160.38 (A) (541)	5/8 EHS	6360.00	42399.99	14150.50	21200.00	2.000	2.996 ✔
	160.38 (A) (542)	5/8 EHS	6360.00	42399.99	14660.20	21200.00	2.000	2.892 ✔
	160.38 (B) (535)	5/8 EHS	6360.00	42399.99	14499.60	21200.00	2.000	2.924 ✔
	160.38 (B) (536)	5/8 EHS	6360.00	42399.99	14352.30	21200.00	2.000	2.954 ✔
	160.38 (C) (529)	5/8 EHS	6360.00	42399.99	14543.90	21200.00	2.000	2.915 ✔
	160.38 (C) (530)	5/8 EHS	6360.00	42399.99	14180.80	21200.00	2.000	2.990 ✔
T4	116.42 (A) (559)	9/16 EHS	5250.00	35000.04	10135.30	17500.00	2.000	3.453 ✔
	116.42 (A) (560)	9/16 EHS	5250.00	35000.04	10922.60	17500.00	2.000	3.204 ✔
	116.42 (B) (553)	9/16 EHS	5250.00	35000.04	10633.00	17500.00	2.000	3.292 ✔
	116.42 (B) (554)	9/16 EHS	5250.00	35000.04	10404.10	17500.00	2.000	3.364 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T6	116.42 (C) (547)	9/16 EHS	5250.00	35000.04	10803.90	17500.00	2.000	3.240 ✔
	116.42 (C) (548)	9/16 EHS	5250.00	35000.04	10242.50	17500.00	2.000	3.417 ✔
	60.38 (A) (567)	9/16 EHS	5250.00	35000.04	11654.90	17500.00	2.000	3.003 ✔
	60.38 (B) (566)	9/16 EHS	5250.00	35000.04	11638.10	17500.00	2.000	3.007 ✔
	60.38 (C) (565)	9/16 EHS	5250.00	35000.04	11654.20	17500.00	2.000	3.003 ✔

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	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	31.525	1.7040	-37701.50	53719.30	0.702 ✔
T2	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	31.525	1.7040	-36358.10	53719.30	0.677 ✔
T3	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	30.219	1.7040	-38842.50	51494.50	0.754 ✔
T4	120 - 100	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	30.219	1.7040	-47016.50	51494.50	0.913 ✔
T5	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	31.525	1.7040	-26874.50	53719.30	0.500* ✔
T6	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	1.00	31.525	1.7040	-27996.40	53719.30	0.521* ✔
T7	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	29.860	1.7040	-44457.90	50882.10	0.874 ✔
T8	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	0.99	31.157	1.7040	-47770.90	53093.90	0.900 ✔
T9	20 - 5	P2.5x.203	15.00	3.56	45.1 K=1.00	1.00	30.554	1.7040	-45672.40	52065.10	0.877 ✔
T10	5 - 0	P2.5x.203	5.39	4.99	63.2 K=1.00	1.00	26.165	1.7040	-31787.30	44587.00	0.713* ✔

* DL controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	16.005	0.6211	-4877.02	9940.29	0.491* ✓
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3807.85	7695.87	0.495* ✓
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3779.25	7695.87	0.491* ✓
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3187.59	7695.87	0.414* ✓
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3177.89	7695.87	0.413* ✓
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3300.83	7695.87	0.429* ✓
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3002.29	7695.87	0.390* ✓
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-2933.43	7695.87	0.381* ✓
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-2642.29	7695.87	0.343* ✓

* DL controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	74.0 K=0.65	16.005	0.6211	-2541.06	9940.29	0.256* ✓
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-2885.03	7695.87	0.375 ✓
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1993.46	7695.87	0.259* ✓
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1676.19	7695.87	0.218* ✓
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1662.53	7695.87	0.216* ✓
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1364.51	7695.87	0.177* ✓
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1546.72	7695.87	0.201* ✓
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1271.78	7695.87	0.165* ✓

* DL controls

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 $\frac{P}{P_a}$
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1993.55	7695.87	0.259* ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-2802.76	7695.87	0.364 ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1679.22	7695.87	0.218* ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1665.74	7695.87	0.216* ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1550.21	7695.87	0.201* ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-1522.38	7695.87	0.198* ✔

* DL controls

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 $\frac{P}{P_a}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-7633.07	7695.87	0.992
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-2934.68	7695.87	0.381
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7 K=0.65	21.600	0.5273	0.00	7695.87	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 $\frac{f_{by}}{F_{by}}$
T1	180 - 160	L1 1/2x1 1/2x3/16	-3.62	-0.247	23.760	0.010	-3.62	-0.474	23.760	0.020
T4	120 - 100	L1 1/2x1 1/2x3/16	-3.62	-0.247	23.760	0.010	-3.62	-0.474	23.760	0.020
T6	80 - 60	L1 1/2x1 1/2x3/16	-3.62	-0.247	23.760	0.010	-3.62	-0.474	23.760	0.020

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	L1 1/2x1 1/2x3/16	0.992	0.010	0.020	1.022 ✔	1.333	H1-3 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T4	120 - 100	L1 1/2x1 1/2x3/16	0.381	0.010	0.020	0.412 ✔	1.333	H1-3 ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	0.000	0.010	0.020	0.030* ✔	1.000	H1-3 ✔

* DL controls

Bottom 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 $\frac{P}{P_a}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-3605.22	7695.87	0.468
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	14.594	0.5273	-5564.56	7695.87	0.723

Bottom 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 $\frac{f_{by}}{F_{by}}$
T1	180 - 160	L1 1/2x1 1/2x3/16	-1.94	-0.133	23.760	0.006	-1.94	-0.254	23.760	0.011
T4	120 - 100	L1 1/2x1 1/2x3/16	-3.62	-0.247	23.760	0.010	-3.62	-0.474	23.760	0.020

Bottom Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	180 - 160	L1 1/2x1 1/2x3/16	0.468	0.006	0.011	0.485 ✔	1.333	H1-3 ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	0.723	0.010	0.020	0.753 ✔	1.333	H1-3 ✔

Torque-Arm Bottom 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 $\frac{P}{P_a}$
T1	180 - 160 (533)	L3x3x1/4	3.50	3.38	68.5 K=1.00	16.584	1.4400	-10085.40	23880.20	0.422 ✔
T1	180 - 160 (534)	L3x3x1/4	3.50	3.38	68.5	16.584	1.4400	-10182.00	23880.20	0.426

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	180 - 160 (539)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-9711.53	23880.20	0.407 ✓
T1	180 - 160 (540)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-10047.30	23880.20	0.421 ✓
T1	180 - 160 (545)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-9916.35	23880.20	0.415 ✓
T1	180 - 160 (546)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-9677.32	23880.20	0.405 ✓
T4	120 - 100 (551)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-6566.12	23880.20	0.275 ✓
T4	120 - 100 (552)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-6569.56	23880.20	0.275 ✓
T4	120 - 100 (557)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-6038.12	23880.20	0.253 ✓
T4	120 - 100 (558)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-5977.56	23880.20	0.250 ✓
T4	120 - 100 (563)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-5810.93	23880.20	0.243 ✓
T4	120 - 100 (564)	L3x3x1/4	3.50	3.38	K=1.00 68.5	16.584	1.4400	-5770.31	23880.20	0.242 ✓

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	180 - 160	P2.5x.203	20.00	3.21	40.6	37.800	1.7040	13821.80	64413.10	0.215 ✓
T2	160 - 140	P2.5x.203	20.00	3.21	40.6	37.800	1.7040	9340.79	64413.10	0.145 ✓
T3	140 - 120	P2.5x.203	20.00	3.21	40.6	36.000	1.7040	3906.28	61345.80	0.064 ✓
T4	120 - 100	P2.5x.203	20.00	3.21	40.6	36.000	1.7040	3902.87	61345.80	0.064 ✓

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	180 - 160	5/8	4.75	4.42	339.7	21.600	0.3068	6344.91	6626.80	0.957 ✓

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	160 - 140	5/8	4.75	4.42	339.7	21.600	0.3068	4371.90	6626.80	0.660 ✓
T3	140 - 120	5/8	4.75	4.42	339.7	21.600	0.3068	3866.15	6626.80	0.583 ✓
T4	120 - 100	5/8	4.75	4.42	339.7	21.600	0.3068	5753.56	6626.80	0.868 ✓
T5	100 - 80	5/8	4.75	4.42	339.7	21.600	0.3068	4068.34	6626.80	0.614 ✓
T6	80 - 60	5/8	4.75	4.42	339.7	21.600	0.3068	3758.49	6626.80	0.567 ✓
T7	60 - 40	5/8	4.75	4.42	339.7	21.600	0.3068	4665.19	6626.80	0.704 ✓
T8	40 - 20	5/8	4.75	4.42	339.7	21.600	0.3068	2098.31	6626.80	0.317* ✓
T9	20 - 5	5/8	4.99	4.65	357.3	21.600	0.3068	2941.56	6626.80	0.444 ✓

* DL controls

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 $\frac{P}{P_a}$
T1	180 - 160	L1 3/4x1 3/4x3/16	3.50	3.26	72.9	21.600	0.6211	653.01	13415.60	0.049 ✓
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	629.74	11390.60	0.055 ✓
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	672.77	11390.60	0.059 ✓
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	814.35	11390.60	0.071 ✓
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	465.48	11390.60	0.041* ✓
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	484.91	11390.60	0.043* ✓
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	770.03	11390.60	0.068 ✓
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	827.42	11390.60	0.073 ✓
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	791.07	11390.60	0.069 ✓

* DL controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T10	5 - 0	L1 1/2x1 1/2x3/16	3.24	3.00	78.8	21.600	0.5273	3403.43	11390.60	0.299* ✓

* 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 $\frac{P}{P_a}$
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	2337.65	11390.60	0.205* ✓

* DL controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	21.600	0.5273	3166.57	11390.60	0.278

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 $\frac{f_{by}}{F_{by}}$
T6	80 - 60	L1 1/2x1 1/2x3/16	-3.62	0.247	23.760	0.010	-3.62	0.478	23.760	0.020

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
T6	80 - 60	L1 1/2x1 1/2x3/16	0.278	0.010	0.020	0.308 ✓	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 $\frac{P}{P_a}$
T1	180 - 160 (531)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	12623.70	24840.00	0.508 ✓
T1	180 - 160 (532)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	12603.50	24840.00	0.507 ✓
T1	180 - 160 (537)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	12706.00	24840.00	0.512 ✓
T1	180 - 160 (538)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	12839.80	24840.00	0.517 ✓
T1	180 - 160 (543)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	12700.40	24840.00	0.511 ✓
T1	180 - 160 (544)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	12810.40	24840.00	0.516 ✓
T4	120 - 100 (549)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	8069.64	24840.00	0.325 ✓
T4	120 - 100 (550)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	8033.38	24840.00	0.323 ✓
T4	120 - 100 (555)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	8047.57	24840.00	0.324 ✓
T4	120 - 100 (556)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	8075.15	24840.00	0.325 ✓
T4	120 - 100 (561)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	8061.64	24840.00	0.325 ✓
T4	120 - 100 (562)	L2x2x5/16	4.75	4.59	91.6	21.600	1.1500	7993.92	24840.00	0.322 ✓

Torque-Arm Bottom 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 $\frac{P}{P_a}$
T1	180 - 160 (533)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2304.88	31104.00	0.074 ✓
T1	180 - 160 (534)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2383.34	31104.00	0.077 ✓
T1	180 - 160 (539)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2134.72	31104.00	0.069 ✓
T1	180 - 160 (540)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2190.10	31104.00	0.070 ✓
T1	180 - 160 (545)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2127.72	31104.00	0.068 ✓
T1	180 - 160 (546)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2130.78	31104.00	0.069 ✓
T4	120 - 100 (551)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2831.86	31104.00	0.091 ✓
T4	120 - 100 (552)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2830.68	31104.00	0.091 ✓
T4	120 - 100 (557)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2472.30	31104.00	0.079 ✓
T4	120 - 100 (558)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2356.62	31104.00	0.076 ✓

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 $\frac{P}{P_a}$
T4	120 - 100 (563)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2246.58	31104.00	0.072 ✓
T4	120 - 100 (564)	L3x3x1/4	3.50	3.38	43.6	21.600	1.4400	2171.95	31104.00	0.070 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	180 - 160	Leg	P2.5x.203	3	-37701.50	71607.82	52.7	Pass
		Diagonal	5/8	23	6344.91	8833.52	71.8	Pass
		Horizontal	L1 3/4x1 3/4x3/16	52	-4877.02	9940.29	49.1	Pass
		Top Girt	L1 3/4x1 3/4x3/16	4	-2541.06	9940.29	25.6	Pass
		Guy A@160.375	5/8	542	14660.20	21200.00	69.2	Pass
		Guy B@160.375	5/8	535	14499.60	21200.00	68.4	Pass
		Guy C@160.375	5/8	529	14543.90	21200.00	68.6	Pass
		Top Guy Pull-Off@160.375	L1 1/2x1 1/2x3/16	16	-7633.07	10258.59	76.7	Pass
		Bottom Guy Pull-Off@160.375	L1 1/2x1 1/2x3/16	7	-3605.22	10258.59	36.4	Pass
		Torque Arm Top@160.375	L2x2x5/16	538	12839.80	33111.72	38.8 51.9 (b)	Pass
		Torque Arm Bottom@160.375	L3x3x1/4	534	-10182.00	31832.30	32.0 41.2 (b)	Pass
T2	160 - 140	Leg	P2.5x.203	63	-36358.10	71607.82	50.8	Pass
		Diagonal	5/8	120	4371.90	8833.52	49.5	Pass
		Horizontal	L1 1/2x1 1/2x3/16	112	-3807.85	7695.87	49.5	Pass
		Top Girt	L1 1/2x1 1/2x3/16	64	-2885.03	10258.59	28.1	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	69	-1993.55	7695.87	25.9	Pass
T3	140 - 120	Leg	P2.5x.203	123	-38842.50	68642.17	56.6	Pass
		Diagonal	5/8	134	3866.15	8833.52	43.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	172	-3779.25	7695.87	49.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	124	-1993.46	7695.87	25.9	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	129	-2802.76	10258.59	27.3	Pass
T4	120 - 100	Leg	P2.5x.203	183	-47016.50	68642.17	68.5	Pass
		Diagonal	5/8	231	5753.56	8833.52	65.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	196	-3187.59	7695.87	41.4	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	189	-1679.22	7695.87	21.8	Pass
		Guy A@116.417	9/16	560	10922.60	17500.00	62.4	Pass
		Guy B@116.417	9/16	553	10633.00	17500.00	60.8	Pass
		Guy C@116.417	9/16	547	10803.90	17500.00	61.7	Pass
		Top Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	186	-2934.68	10258.59	30.9	Pass
		Bottom Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	232	-5564.56	10258.59	56.5	Pass
		Torque Arm Top@116.417	L2x2x5/16	556	8075.15	33111.72	24.4 32.6 (b)	Pass
		Torque Arm Bottom@116.417	L3x3x1/4	552	-6569.56	31832.30	20.6 26.6 (b)	Pass
T5	100 - 80	Leg	P2.5x.203	241	-26874.50	53719.30	50.0	Pass
		Diagonal	5/8	300	4068.34	8833.52	46.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	292	-3177.89	7695.87	41.3	Pass
		Top Girt	L1 1/2x1 1/2x3/16	245	-1676.19	7695.87	21.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	249	-1665.74	7695.87	21.6	Pass
T6	80 - 60	Leg	P2.5x.203	302	-27996.40	53719.30	52.1	Pass
		Diagonal	5/8	313	3758.49	8833.52	42.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
		Horizontal	L1 1/2x1 1/2x3/16	317	-3300.83	7695.87	42.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	305	-1662.53	7695.87	21.6	Pass
		Guy A@60.375	9/16	567	11654.90	17500.00	66.6	Pass
		Guy B@60.375	9/16	566	11638.10	17500.00	66.5	Pass
		Guy C@60.375	9/16	565	11654.20	17500.00	66.6	Pass
		Top Guy Pull-Off@60.375	L1 1/2x1 1/2x3/16	307	3166.57	15183.67	23.1	Pass
T7	60 - 40	Leg	P2.5x.203	362	-44457.90	67825.84	65.5	Pass
		Diagonal	5/8	420	4665.19	8833.52	52.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	414	-3002.29	7695.87	39.0	Pass
		Top Girt	L1 1/2x1 1/2x3/16	365	-1364.51	7695.87	17.7	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	369	-1550.21	7695.87	20.1	Pass
T8	40 - 20	Leg	P2.5x.203	422	-47770.90	70774.16	67.5	Pass
		Diagonal	5/8	475	2098.31	6626.80	31.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	474	-2933.43	7695.87	38.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	425	-1546.72	7695.87	20.1	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	429	-1522.38	7695.87	19.8	Pass
T9	20 - 5	Leg	P2.5x.203	482	-45672.40	69402.78	65.8	Pass
		Diagonal	5/8	493	2941.56	8833.52	33.3	Pass
		Horizontal	L1 1/2x1 1/2x3/16	497	-2642.29	7695.87	34.3	Pass
		Top Girt	L1 1/2x1 1/2x3/16	485	-1271.78	7695.87	16.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	488	2337.65	11390.60	20.5	Pass
T10	5 - 0	Leg	P2.5x.203	523	-31787.30	44587.00	71.3	Pass
		Top Girt	L1 1/2x1 1/2x3/16	528	3403.43	11390.60	29.9	Pass
							Summary	
						Leg (T10)	71.3	Pass
						Diagonal (T1)	71.8	Pass
						Horizontal (T2)	49.5	Pass
						Top Girt (T10)	29.9	Pass
						Bottom Girt (T3)	27.3	Pass
						Guy A (T1)	69.2	Pass
						Guy B (T1)	68.4	Pass
						Guy C (T1)	68.6	Pass
						Top Guy Pull-Off (T1)	76.7	Pass
						Bottom Guy Pull-Off (T4)	56.5	Pass
						Torque Arm Top (T1)	51.9	Pass
						Torque Arm Bottom (T1)	41.2	Pass
						Bolt Checks	51.9	Pass
						RATING =	**76.7**	**Pass**

Site Name:	**Colchester**
Client:	**CDT**
Job Number:	**112-13181**
Engineer:	**BKL**
Date:	**9/26/2012**

Design Base Loads (Unfactored) per TIA-222-F

Foundation Mapped:	N			
Moment (M):	0.0	k-ft		
Shear/Leg (V):	2.4	k		
Compression/Leg (P):	97.0	k		
Uplift/Leg (U):	0.0	k		
Tower Type (GT / SST):	GT			
Diameter of Prismatic Portion of Pier (d):	1.0	ft		
Depth to Base of Foundation:	2.0	ft		
Pier Height Above Ground (h):	2.00	ft		
Length / Width of Pad (w):	6.0	ft		
Thickness of Pad (t):	4.0	ft	Concrete Compressive Strength (f'_c):	3000 psi
Depth Below Ground Surface to Water Table (w):	20.0	ft	Bending/Tension Reduction Factor (ϕ_B):	0.90
Unit Weight of Concrete:	150.0	pcf	Shear Reduction Factor (ϕ_V):	0.75
Unit Weight of Water:	62.4	pcf	Compression Reduction Factor (ϕ_V):	0.65
Unit Weight of Soil Above Water Table:	120.0	pcf	Wind Design Factor:	1.30
Unit Weight of Soil Below Water Table:	65.0	pcf	Steel Elastic Modulus:	29000 ksi
Friction Angle of Uplift from Top of Pad:	30	Degrees	Pad Steel Rebar Size #:	4
Friction Angle of Uplift from Base of Pad:	30	Degrees	Pad Steel Rebar Area:	0.20 in^2
Uplift Angle Started at Top or Base of Pad (T/B):	T		Pad Steel Rebar Yield Strength (F_y):	60 ksi
Allowable Skin Friction:	0	psf	# of Rebar in Top of Pad:	
Allowable Compressive Bearing Pressure:	3000	psf	# of Rebar in Base of Pad:	2
Capacity Increase (Due to Transient Loads):	1.00		Pad Clear Cover:	3 in

Axial Capacities and Design Moment

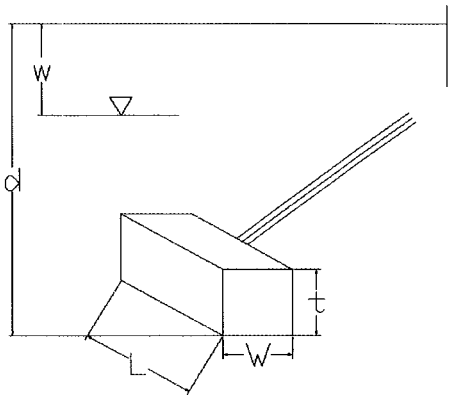
Weight of Concrete (Bouyancy Considered):	21.6	k
Weight of Soil (Bouyancy Considered):	0.0	k
Allowable Skin Friction Resistance:	0.0	k
Controlling Failure Mode (Top / Base):	Base	
Allowable Uplift Capacity per Leg:	11.3	k
Compressive Design Load:	101.5	k
Allowable Compression Capacity per Leg:	108.0	k
Uplift Design Load/Uplift Capacity:	0.00	Result: OK
Compression Design Load/Compression Capacity:	0.94	Result: OK

Pad Strength Capacity

β:	0.85	ACI318-05 - 10.2.7.3
One Way Design Shear (V_u):	0.0	k
One Way Shear Capacity (ϕV_c):	266.1	k - ACI318-05 - 11.3.1.1
$V_u / \phi V_c$:	0.00	Result: OK
Punching Design Shear (V_u):	61.7	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	1311.0	k - ACI318-05 - 11.12.2.1
$V_u / \phi V_c$:	0.05	Result: OK
Flexural Loading Due to Soil Pressure (M_u):	68.7	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	80.4	k-ft - ACI318-05 - 10.3
$M_u / \phi M_n$:	0.85	Result: OK

Site Name:	**Colchester**
Client:	**CDT**
Job Number:	**112-13181**
Engineer:	**BKL**
Date:	**9/26/2012**

Design Standard per TIA-222-F



Anchor Radius:	145.0	ft
Uplift (Unfactored):	37.9	k
Shear (Unfactored):	46.4	k
Berm Present:	N	
Design Anchor Rod:	Y	
Mapped Foundation:	N	
Anchor Base Depth (d):	7.5	ft
Width of Anchor (W):	5.5	ft
Length of Anchor (L):	11.5	ft
Thickness of Anchor (t):	2.0	ft
Depth Below Ground Surface to Water Table (w):	20.0	ft
Soil Uplift at Base / Top of Anchor (B/T):	T	
Unit Weight of Concrete:	150.0	pcf
Unit Weight of Soil Above Water Table:	120.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	65.0	pcf
Internal Angle of Friction:	30	Degrees
Cohesion:	500	psf
Allowable Skin Friction of Pad Sides to Soil:	0	psf
Ultimate Coefficient of Shear Friction:	0.30	
Maximum Top Conical Failure Angle:	30	Degrees
Maximum Base Conical Failure Angle:	30	Degrees
Allowable Capacity Increase:	1.00	(Due to Transient Loads)

Uplift

Weight of Concrete (Buoyancy Effect Considered):	19.0	k
Weight of Soil (Buoyancy Effect Considered):	84.3	k
Uplift Resistance from Skin Friction:	0.0	k
Allowable Uplift Resistance (FS = 1.5 to 2):	57.4	k
Uplift Design Load/Allowable Uplift Resistance:	0.66	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	6.9	k
Passive Pressure:	4072	psf
Ultimate Passure Pressure Resistance:	93.7	k
Allowable Shear Resistance (FS = 1.5 to 2):	50.3	k
Shear Design Load/Allowable Shear Resistance:	0.92	Result: OK

Anchor Rod Capacity

# of Anchor Rods:	1	
Anchor Rod Gross Area:	2.41	in^2
Anchor Rod Net Area:	2.41	in^2
Anchor Rod Yield Strength:	47	ksi
Anchor Rod Ultimate Strength:	62	ksi
Allowable Stress Increase:	1.00	
Resultant Tensile Load:	59.9	k
Anchor Rod Tensile Resistance:	67.8	k
Resultant Tensile Load / Anchor Rod Tensile Resistance:	0.88	Result: OK

Strength Analysis of Reinforced Concrete

Concrete Compressive Srength (f'_c):	3000	psi
Longitudinal Rebar Yield Strength:	60000	psi
# Longitudinal Rebar (Top):	9	
# Longitudinal Rebar (1 Side):	3	
Rebar Size:	4	
Wind Load Factor:	1.3	
Strength Reduction Factor for Shear (ϕ_v):	0.75	
Strength Reduction Factor for Flexure (ϕ_b):	0.9	
Compression Zone Factor (β_1):	0.85	
Area of Single Rebar:	0.20	in^2
One Way Shear due to Shear Load (V_u):	16.6	k
Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$):	122.3	k
$V_u/\phi_v V_n$:	0.14	Result: OK
One Way Shear due to Uplift (V_u):	21.0	k
Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$):	108.4	k
$V_u/\phi_v V_n$:	0.19	Result: OK
Pad Flexure due to Shear Load (M_u):	86.7	k-ft
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	167.4	k-ft
Pad Flexure due to Uplift (M_u):	70.8	k-ft
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	161.9	k-ft
$M_u/\phi_b M_n$ (Max.):	0.52	Result: OK

C Squared Systems, LLC
65 Dartmouth Drive, Unit A3
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions

at&t

CT2032

(Colchester-CDT)

600 Old Hartford Road, Colchester, CT 06415

October 12, 2012

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modifications to the existing AT&T antenna arrays mounted on the guyed wire tower located at 600 Old Hartford Road in Colchester, CT. The coordinates of the tower are 41° 35' 12.1" N, 72° 22' 41.7" W.

AT&T is proposing the following modifications:

1) Install three multi-band (700/850/1900/2100 MHz) antennas for their LTE network (one per sector).

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2} \right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the finished modifications.

4. Calculation Results

Table 1 below outlines the power density information for the site. Because the proposed AT&T antennas are directional in nature, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical patterns of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
Cingular UMTS	*170*	*880*	*1*	*500*	*0.0062*	*0.5867*	*1.06%*
Cingular GSM	*170*	*880*	*4*	*296*	*0.0147*	*0.5867*	*2.51%*
Cingular GSM	*170*	*1930*	*2*	*427*	*0.0106*	*1.0000*	*1.06%*
Sprint	180	1962.5	5	250	0.0139	1.0000	1.39%
AT&T UMTS	170	880	2	565	0.0014	0.5867	0.24%
AT&T UMTS	170	1900	2	875	0.0022	1.0000	0.22%
AT&T LTE	170	734	1	1615	0.0020	0.4893	0.41%
AT&T GSM	170	880	1	283	0.0004	0.5867	0.06%
AT&T GSM	170	1900	4	525	0.0026	1.0000	0.26%
						Total	**2.58%**

Table 1: Carrier Information[1] [2] [3]

[1] The existing CSC filing for Cingular should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for carriers other than AT&T was taken directly from the CSC database dated 7/26/2012. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] In the case where antenna models are not uniform across all 3 sectors for the same frequency band, the antenna model with the highest gain was used for the calculations to present a worse-case scenario.

[3] Antenna height listed for AT&T is in reference to the Fred A. Nudd Corporation Structural Analysis dated September 26, 2012.

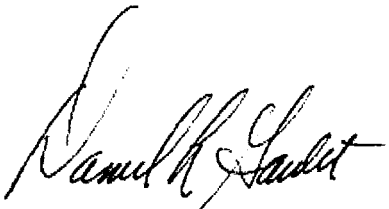
5. Conclusion

The above analysis verifies that emissions from the existing site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **2.58% of the FCC limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

October 12, 2012
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[4]

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

(B) Limits for General Population/Uncontrolled Exposure[5]

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

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

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[4] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[5] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

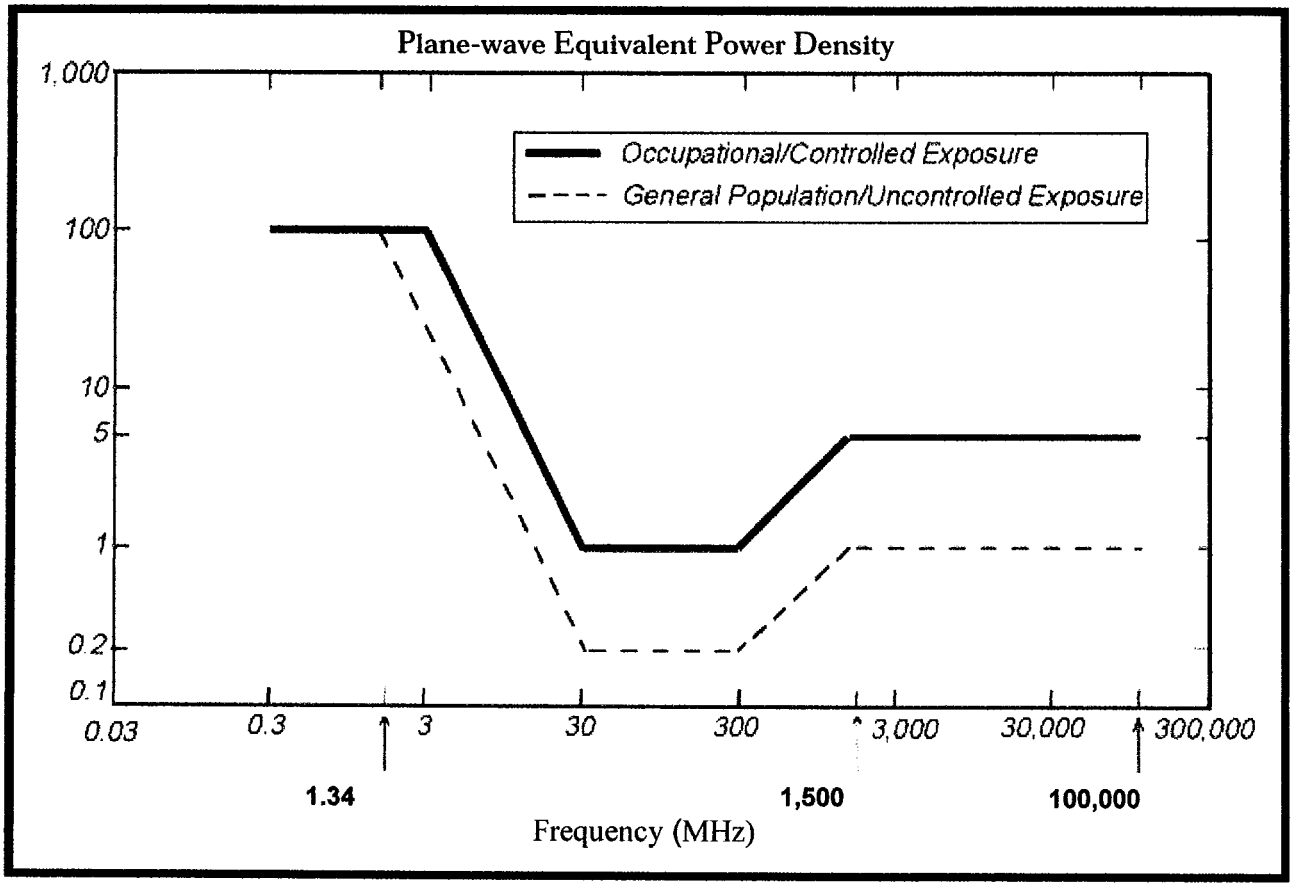
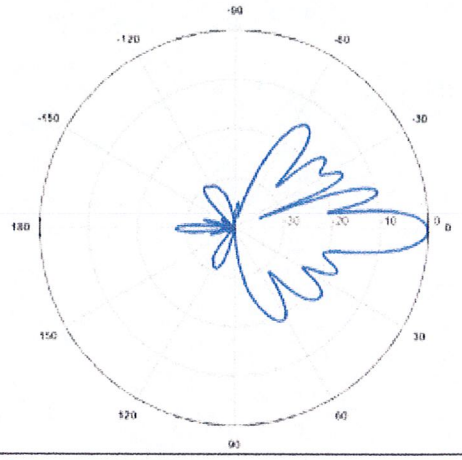


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Antenna Data Sheets and Electrical Patterns

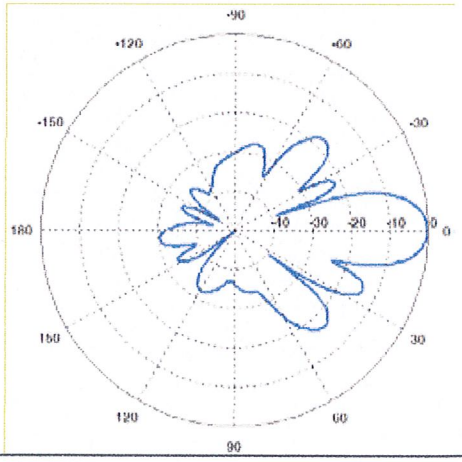
700 MHz

Manufacturer:	Powerwave
Model #:	P65-17-XLH-RR
Frequency Band:	698-806 MHz
Gain:	14.3 dBd
Vertical Beamwidth:	8.4°
Horizontal Beamwidth:	70°
Polarization:	Dual Linear ± 45°
Size L x W x D:	96.0" x 12.0" x 6.0"



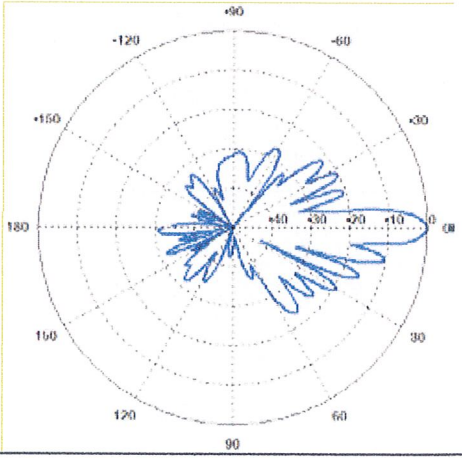
850 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	824-896 MHz
Gain:	11.5 dBd
Vertical Beamwidth:	15°
Horizontal Beamwidth:	82°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55.0" x 11.0" x 5.0"



1900 MHz

Manufacturer:	Powerwave
Model #:	7770
Frequency Band:	1850-1990 MHz
Gain:	13.4 dBd
Vertical Beamwidth:	7°
Horizontal Beamwidth:	86°
Polarization:	Dual Linear ± 45°
Size L x W x D:	55.0" x 11.0" x 5.0"



PROJECT INFORMATION

SCOPE OF WORK:	TELECOMMUNICATIONS FACILITY UPGRADE (LTE): 1. INSTALL (3) NEW LTE ANTENNAS, (6) RRH'S, (1) SURGE ARRESTOR, (1) FIBER LINE, (2) DC POWER LINES & (1) GPS ANTENNA 2. INSTALL (1) LTE 6601 CABINET
SITE ADDRESS:	600 OLD HARTFORD ROAD COLCHESTER, CT 06415
LATITUDE:	41.58669 N 41° 35' 12.1" N
LONGITUDE:	72.37825 W 72° 22' 41.7" W
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

at&t

SITE NUMBER: CT2032
SITE NAME: COLCHESTER - CDT

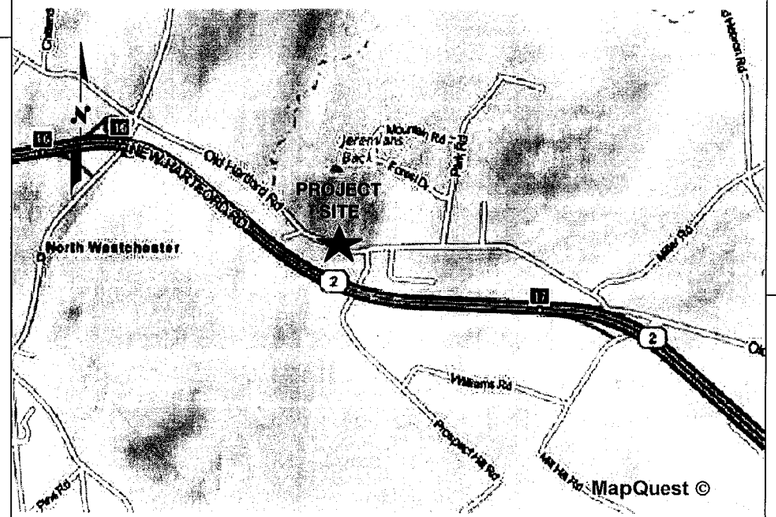
DRAWING INDEX

		REV
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND AND EQUIPMENT PLAN	1
A-2	ELEVATION AND ANTENNA PLAN	1
A-3	DETAILS	1
G-1	PLUMBING DIAGRAM & GROUNDING DETAILS	1

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DR TOWARD CAPITOL BLVD. TURN LEFT ONTO CAPITOL BLVD. TURN LEFT ONTO WEST ST. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD. 4.4 MI. MERGE ONTO CT-3 N VIA EXIT 25 TOWARD GLASTONBURY. 2.4 MI. MERGE ONTO CT-2 E TOWARD NORWICH. 15.8 MI. TAKE THE CT-149 EXIT, EXIT 16, TOWARD WESTCHESTER/MOODUS. 0.2 MI. TURN LEFT ONTO WESTCHESTER RD/CT-149. 0.3 MI. TURN RIGHT ONTO OLD HARTFORD RD. 0.8 MI. END AT 600 OLD HARTFORD RD COLCHESTER, CT 06415.



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.

CALL

BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455 OR DIAL 811

UNDERGROUND SERVICE ALERT

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

NEXLINK GLOBAL SERVICES
a UniTek GLOBAL SERVICES company
800 MARSHALL PHELPS ROAD UNIT#: 2A
WINDSOR, CT 06095

SITE NUMBER: CT2032
SITE NAME: COLCHESTER - CDT
600 OLD HARTFORD ROAD
COLCHESTER, CT 06415
NEW LONDON COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

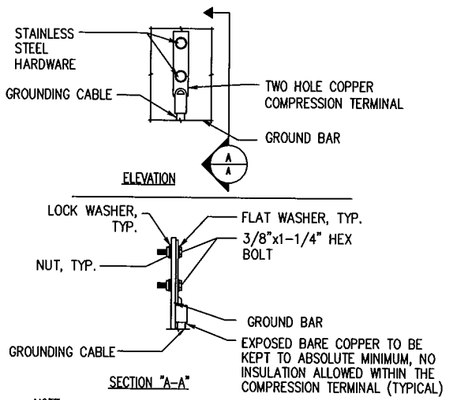
NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/04/12	ISSUED FOR CONSTRUCTION	CM	DC	DPH
0	08/02/12	ISSUED FOR REVIEW	RM	DC	DPH

SCALE: AS SHOWN DESIGNED BY: DC DRAWN BY: RM

AT&T

TITLE SHEET (LTE)

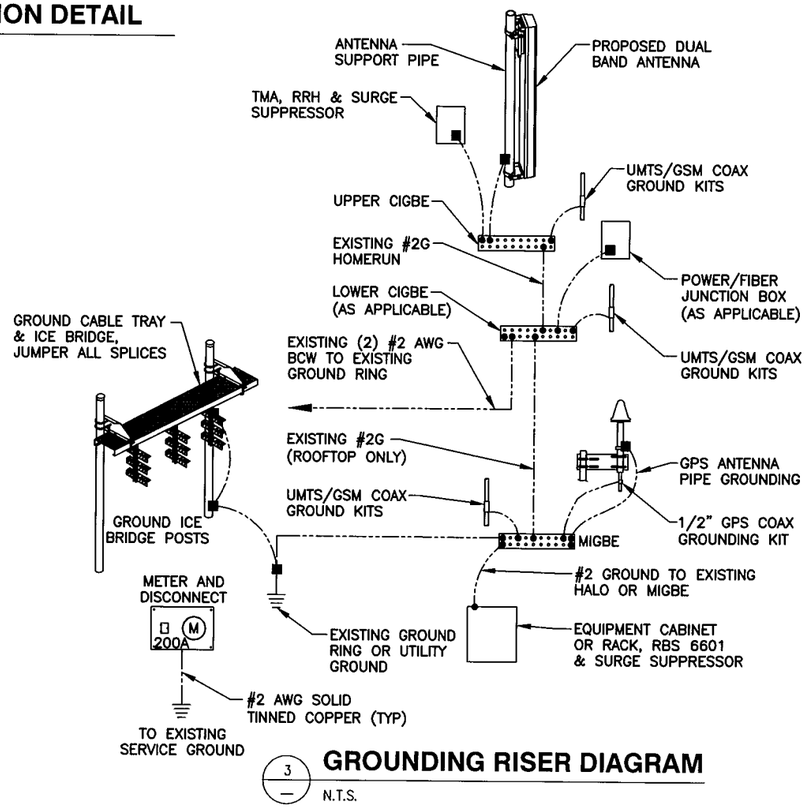
JOB NUMBER	DRAWING NUMBER	REV
10032.01	T-1	1



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

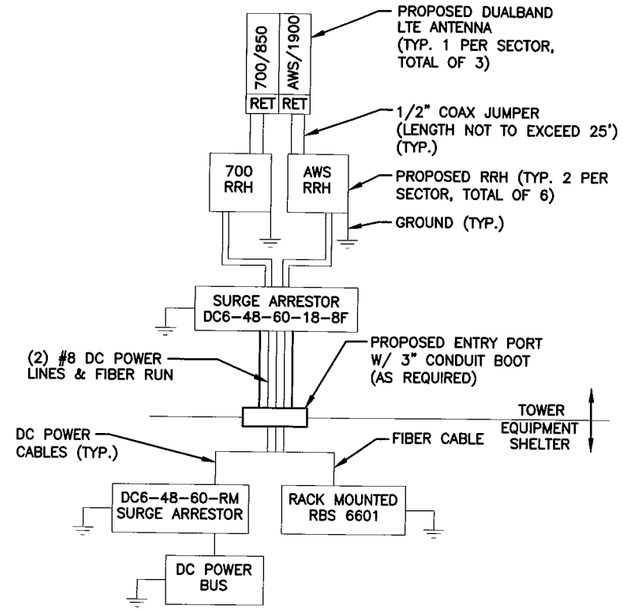
TYPICAL GROUND BAR CONNECTION DETAIL

1 — N.T.S.



GROUNDING RISER DIAGRAM

3 — N.T.S.



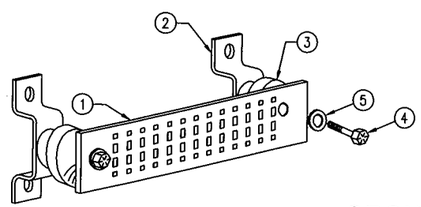
NOTE:

CONTRACTOR TO CONFIRM ALL PARTS & INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS.

LTE PLUMBING DIAGRAM

2 — N.T.S.

WIRELESS SOLUTIONS INC.			
NO.	REQ.	PART NO.	DESCRIPTION
1	1	HLGB-0420-IS	SOLID GND. BAR (20"x4"x1/4")
2	2	———	WALL MTG. BRKT.
3	2	———	INSULATORS
4	4	———	5/8"-11x1" H.H.C.S.
5	4	———	5/8 LOCKWASHER



GROUND BAR DETAIL

4 — N.T.S.

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)

Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
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FAX: (978) 336-5586

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0	08/02/12	ISSUED FOR REVIEW	RM	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

AT&T

PLUMBING DIAGRAM & GROUNDING DETAILS (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2032.01	G-1	1

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.

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 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 SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTIING HAVING 20 FT. OR MORE 1/2" 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 – NEXLINK
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

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.

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. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

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

8. 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.

9. 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.

10. 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.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF 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.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

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

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. 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) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T MOBILITY SITES."

17. 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.

18. 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 SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS 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 ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. APPLICABLE BUILDING CODES:
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.
   BUILDING CODE: 2003 IBC WITH 2005 CT SUPPLEMENT & 2009 CT AMENDMENTS
   ELECTRICAL CODE: REFER TO ELECTRICAL DRAWINGS
   LIGHTENING CODE: REFER TO ELECTRICAL DRAWINGS

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, ASD, NINTH EDITION;

TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-F, STRUCTURAL STANDARDS FOR STEEL

ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES; REFER TO ELECTRICAL DRAWINGS FOR SPECIFIC ELECTRICAL STANDARDS.

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.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	G.C.	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
AWG	AMERICAN WIRE GAUGE	MGB	MASTER GROUND BUS		
BCW	BARE COPPER WIRE	MIN	MINIMUM	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	PROPOSED	NEW	TBR	TO BE REMOVED
EXISTING	EXISTING	N.T.S.	NOT TO SCALE	TBRR	TO BE REMOVED AND REPLACED
EG	EQUIPMENT GROUND	REF	REFERENCE		
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED	TYP	TYPICAL

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WINDSOR, CT 06095

SITE NUMBER: CT2032
SITE NAME: COLCHESTER - CDT
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COLCHESTER, CT 06415
NEW LONDON COUNTY

at&t
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ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/04/12	ISSUED FOR CONSTRUCTION	CM	DC	DPH
0	08/02/12	ISSUED FOR REVIEW	RM	DC	DPH

SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

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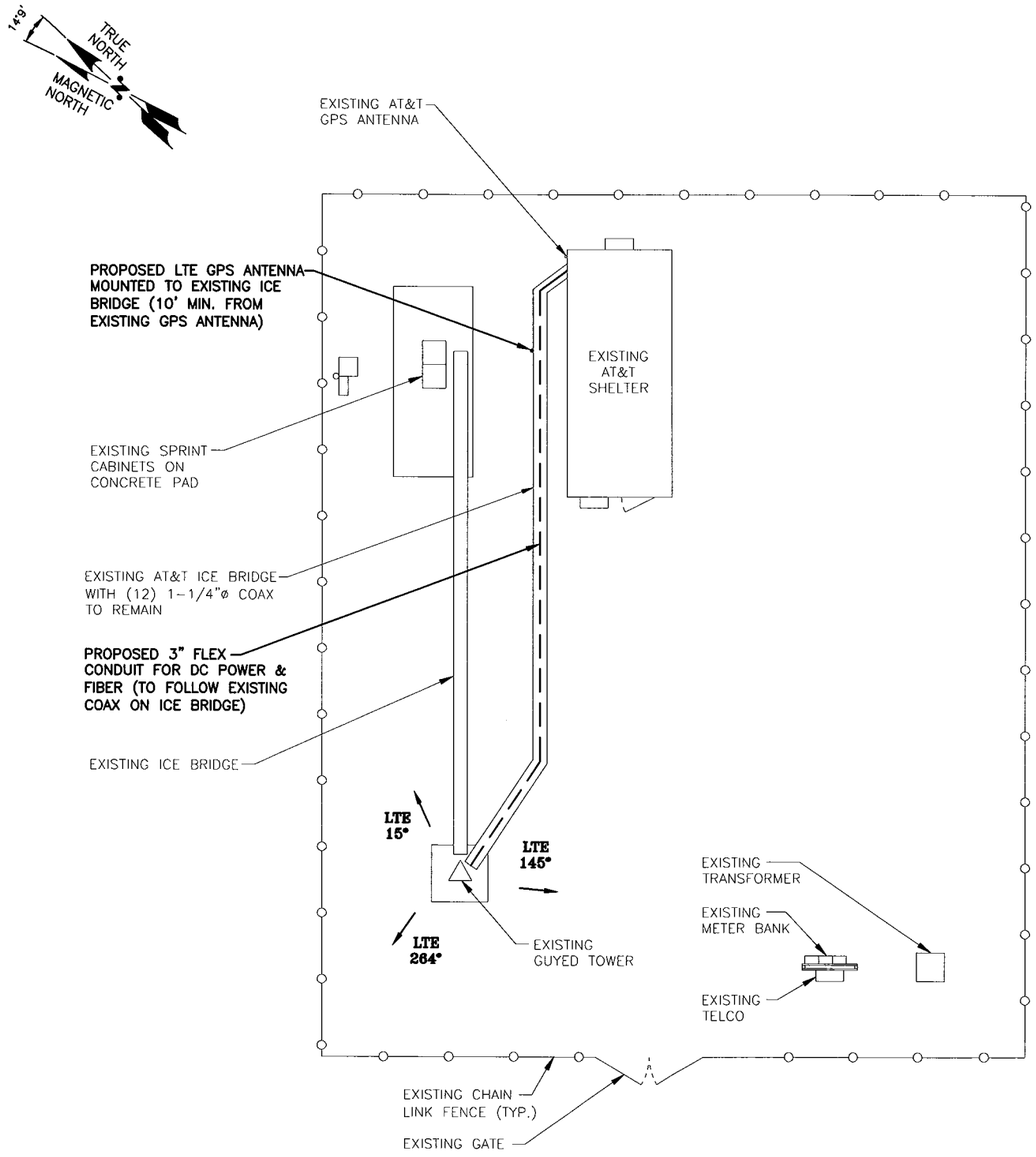
GENERAL NOTES
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
8032.01	GN-1	1



COMPOUND PLAN

SCALE: 1/8"=1'-0"

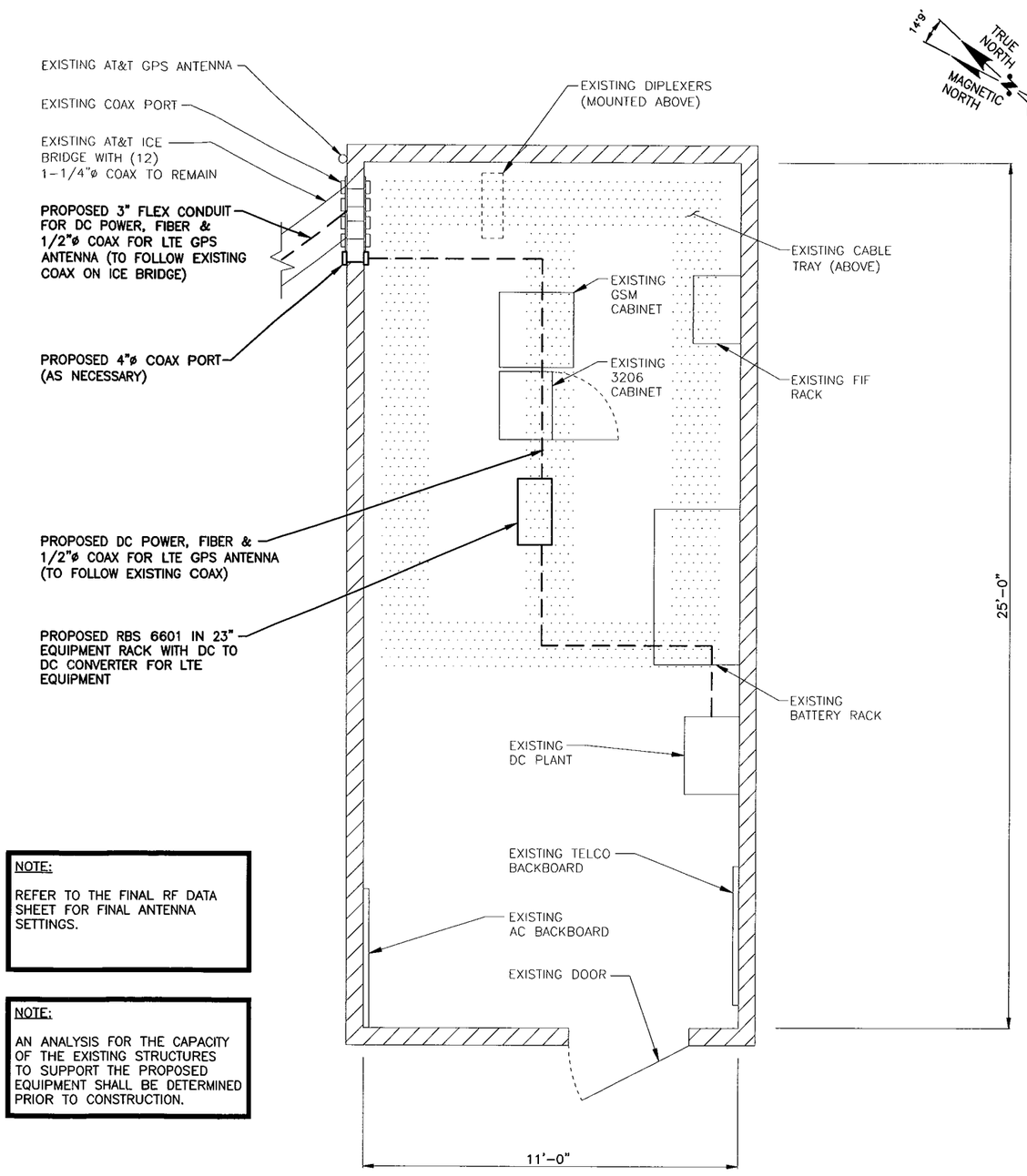
0 4'-0" 8'-0" 16'-0" 24'-0"

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.



EQUIPMENT PLAN

SCALE: 1/2"= 1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

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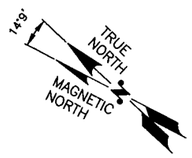
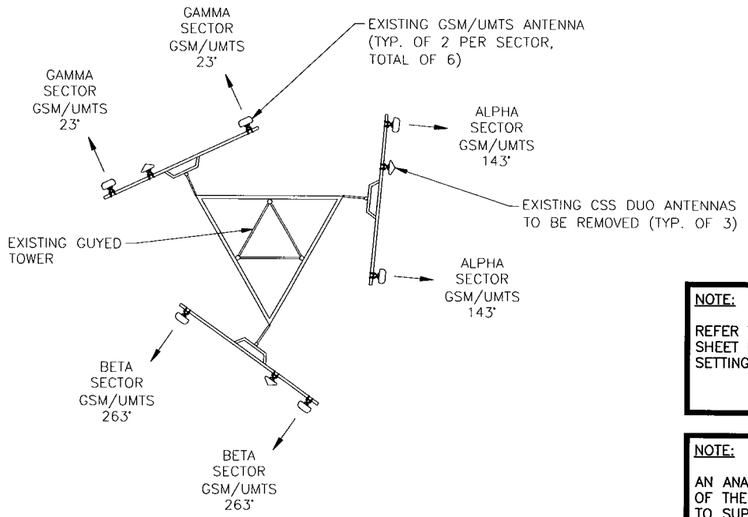
COMPOUND AND EQUIPMENT PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
2032.01	A-1	1





EXISTING GSM/UMTS ANTENNA PLAN

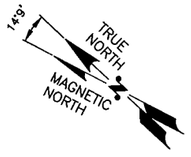
SCALE: N.T.S.

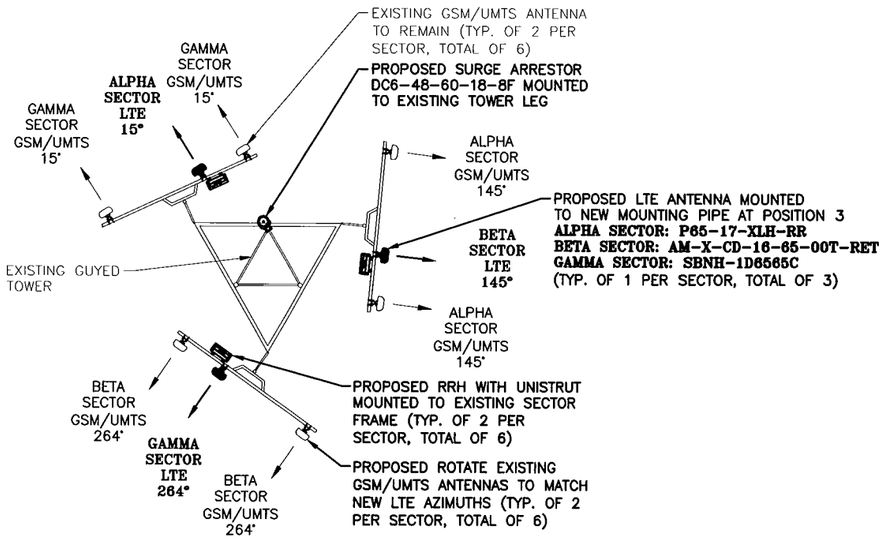
NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

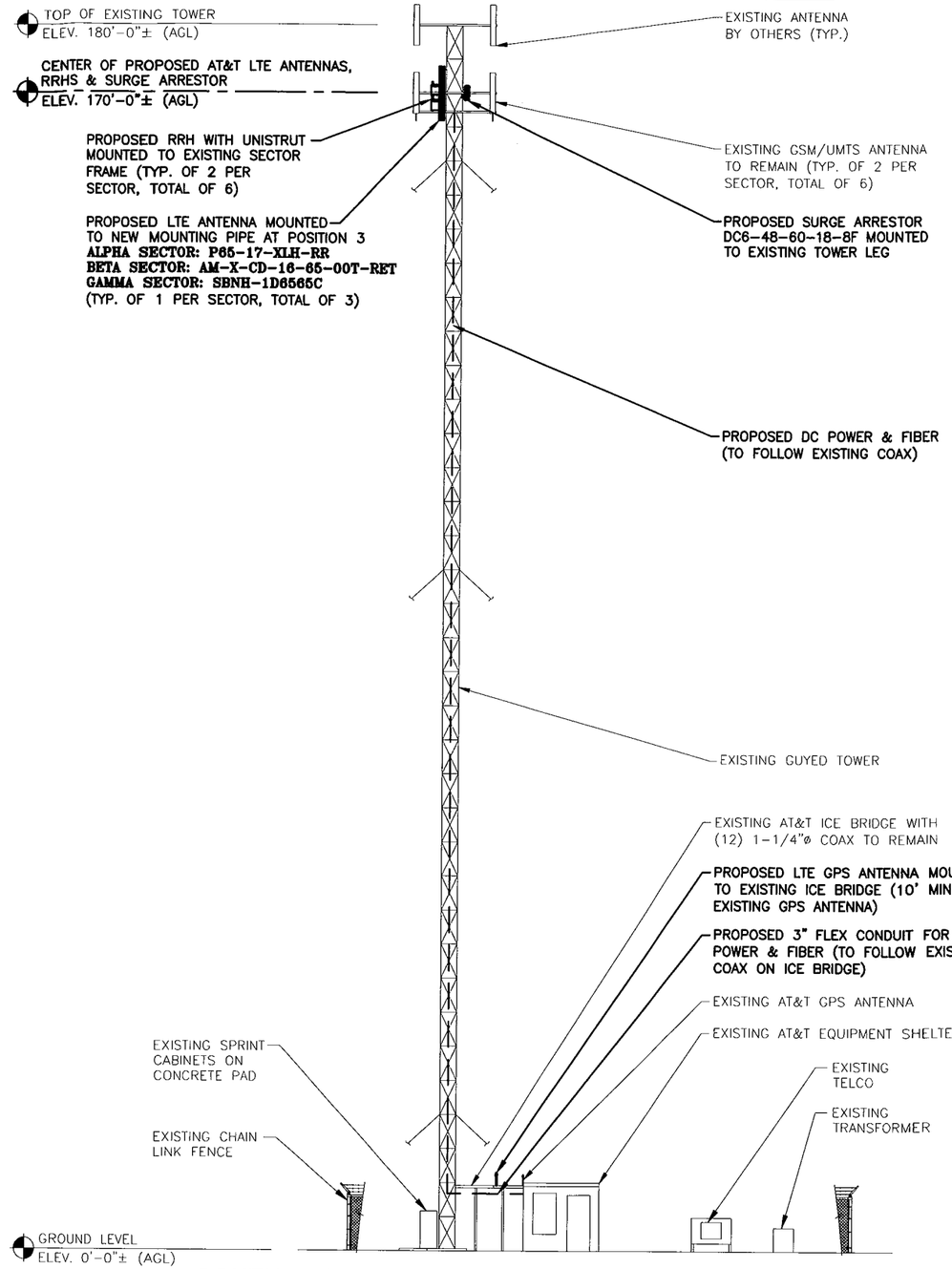
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.





PROPOSED LTE ANTENNA PLAN

SCALE: N.T.S.



SOUTHWEST ELEVATION

SCALE: 3/32"=1'-0"

0' 5'-4" 10'-8" 21'-4" 32'-0"

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

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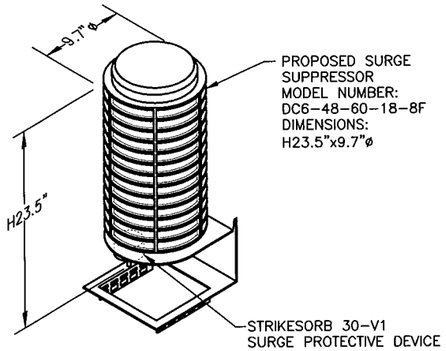
ELEVATION & ANTENNA PLAN (LTE)

JOB NUMBER	DRAWING NUMBER	REV
8032.01	A-2	1



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

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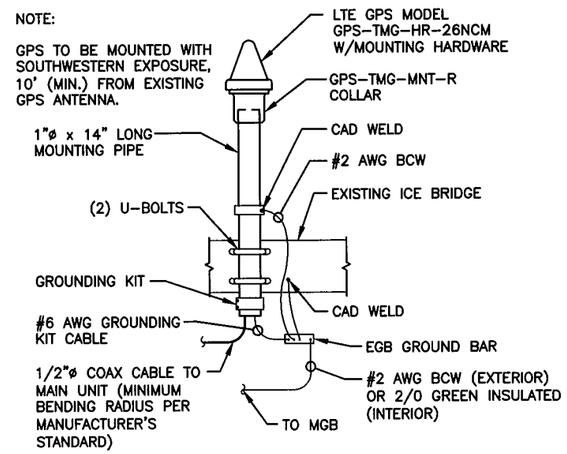
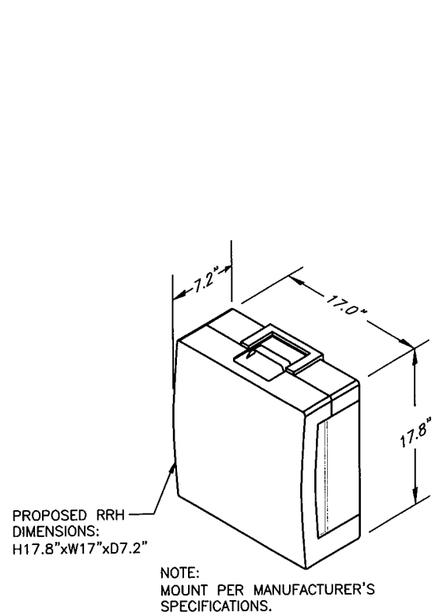


GPS MOUNTING DETAIL

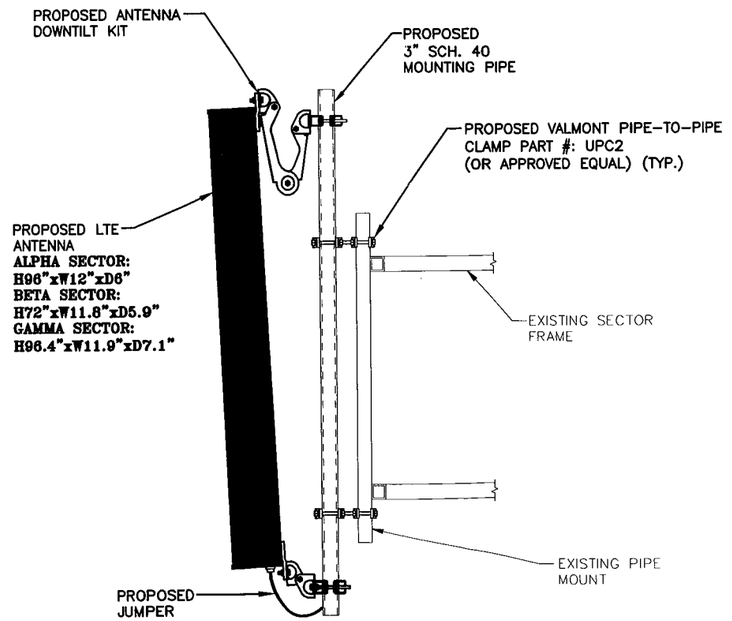
SCALE: N.T.S.



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

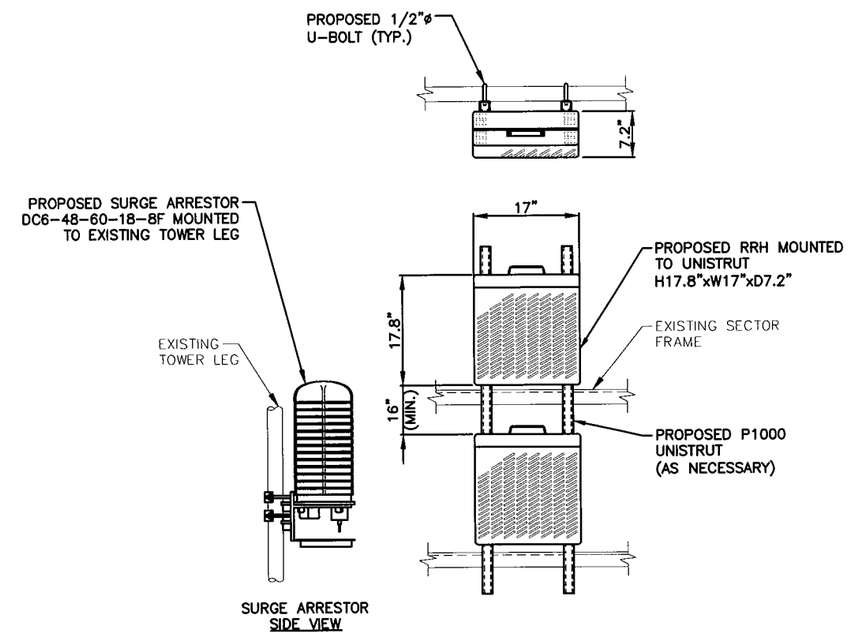
RRH DETAIL

SCALE: N.T.S.



PROPOSED LTE ANTENNA MOUNTING DETAIL

SCALE: N.T.S.



PROPOSED RRH & SURGE ARRESTOR MOUNTING DETAIL

SCALE: N.T.S.

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SCALE: AS SHOWN | DESIGNED BY: DC | DRAWN BY: RM

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DETAILS
(LTE)

JOB NUMBER	DRAWING NUMBER	REV
2032.01	A-3	1