February 1, 2024

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

Re:	**Notice of Exempt Modification – Antenna and RRU Swap/Add**
Property Address:	**64 Tolland Ave Stafford, CT 06076**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16- 50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 177-foot level on an existing 186-foot self-support tower, owned by Cordless Data Transfer, Inc 600 Old Hartford Rd, Colchester, CT 06415.

AT&T desires to modify its existing telecommunications facility by swapping six (6) antennas, adding (3) remote radio units and associated lines. The centerline height of said antennas and remote radio units is and will remain at 177' on the existing antenna mount.

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.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to The Honorable William Morrison, First Selectman, Town of Stafford, 1 Main Street Stafford, CT 06076, Andrew Marchese, Zoning Enforcement Officer Town of Stafford, 1 Main Street Stafford, CT 06076, Nathaniel DaSilva, Property Owner 64 Tolland Ave Stafford, CT 06076. A copy of this letter is being sent to the tower owner Cordless Data 600 Old Hartford Rd, Colchester, CT 06415.

The following is a list of subsequent decisions by the Connecticut Siting Council:

- **EM-CING-134-180305** – AT&T Mobility, LLC notice of intent to modify an existing telecommunications facility located at 64 Tolland Ave Stafford, Connecticut.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 177-foot level of the 186-foot Guyed Tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

Carolyn Seeley
Real Estate Specialist
Smartlink on behalf of AT&T
(978) 760-5577
Carolyn.seeley@smartlinkgroup.com

CC w/enclosures:

The Honorable William Morrison, First Selectman, Town of Stafford
Andrew Marchese, Zoning Enforcement Officer, Town of Stafford
Cordless Data Transfer, Inc., Tower Owner
Nathaniel DaSilva, Property Owner

64 TOLLAND AVE

Location	64 TOLLAND AVE	**Mblu**	67/ / 11E/ /
Acct#	00445307	**Owner**	DASILVA NATHANIEL N
Assessment	$151,760	**Appraisal**	$216,800
PID	5147	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$176,900	$39,900	$216,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$123,830	$27,930	$151,760

Owner of Record

Owner	DASILVA NATHANIEL N	**Sale Price**	$179,500
Co-Owner		**Certificate**	
Address	64 TOLLAND AVE STAFFORD SPRINGS, CT 06076	**Book & Page**	0625/0521
		Sale Date	04/27/2015
		Instrument	18

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
DASILVA NATHANIEL N	$179,500		0625/0521	18	04/27/2015
FIGELLA JESSICA L	$0		0611/0761	01	01/07/2014
HOROWITZ JESSICA L+JEREMY J FIGELLA	$169,400	1	0438/0590	07	05/20/2003
WARREN BROTHERS LLC	$24,500	2	0421/0086	00	09/23/2002
JULIAN JOHN E EST %JENNIFER J DAVIS	$24,500	3	0421/0085	00	09/23/2002

Building Information

Building 1 : Section 1

Year Built: 2003

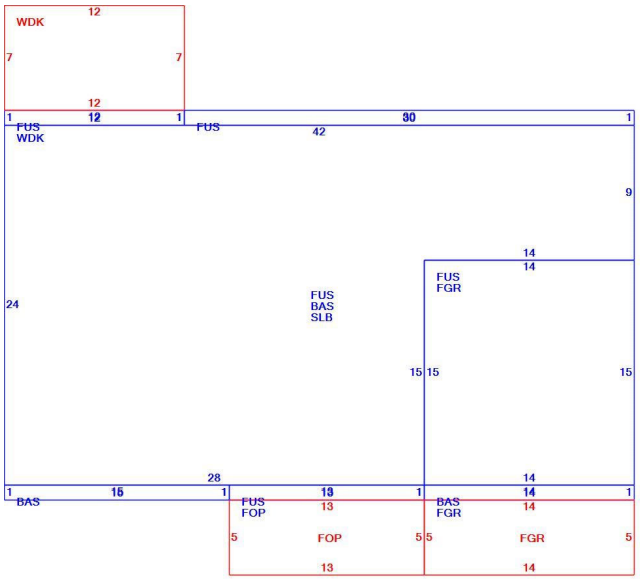
Living Area: 1,890
Replacement Cost: $198,103
Building Percent Good: 89
Replacement Cost Less Depreciation: $176,300

Building Attributes	
Field	**Description**
Style	High Ranch
Model	Residential
Grade:	C+
Stories	1
Occupancy	1
Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure	Gable
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	3
Full Bthrms:	2
Half Baths:	0
Extra Fixtures	0
Total Rooms:	6
Bath Style:	Average
Kitchen Style:	Average
Num Kitchens	1
Fireplaces	0
Extra Openings	
Prefab Fpl(s)	
Attic Type	None
Bsmt Type	Full
Bsmt Garage(s)	1
Fin Bsmnt	0
Fn. Bmt. Qual.	
Unfin Area	0.00
Fndtn Cndtn	
Basement	

Building Photo

(https://images.vgsi.com/photos2/StaffordCTPhotos//\00\00\88\78.jpg)

Building Layout



(ParcelSketch.ashx?pid=5147&bid=5147)

Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
FUS	Finished Upper Story	1,063	1,063
BAS	First Floor	827	827
FGR	Garage	294	0
FOP	Open Porch	78	0
SLB	Slab	798	0
WDK	Deck	96	0
		3,156	1,890

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	101
Description	Res Dwelling
Zone	B
Neighborhood	170
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	0.68
Frontage	
Depth	
Assessed Value	$27,930
Appraised Value	$39,900

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SOLR	SOLAR PANELS			26.00 UNITS	$0	1
SHD1	Shed	FR	Frame	96.00 S.F.	$600	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$176,900	$39,900	$216,800
2020	$176,900	$39,900	$216,800
2019	$168,000	$46,800	$214,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2021	$123,830	$27,930	$151,760
2020	$123,830	$27,930	$151,760
2019	$117,600	$32,760	$150,360

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
January 31, 2024

Nudd Job Number: 124-23005

Site Location: Tolland Avenue (64 Tolland Avenue, Stafford, CT 06076, Tolland County)

Subject: Structural Analysis of an existing 180 ft Guyed Tower

Fred A. Nudd Corporation has completed a structural analysis of an existing 180 ft guyed tower. The tower was originally designed by Fred A. Nudd Corporation. The design loading criteria and strength design are per the ANSI/TIA-222-H standard, which will meet the structural design requirements per the 2015 International Building Code (Sec. 1609 & 3108), , and the 2018 Connecticut State Building Code. Tower and foundation dimensions have been taken from drawings by Fred A. Nudd, project number 9898, dated December 29, 2003. Additional foundation dimensions and installation data was provided by Cordless Data Transfer. Design criteria per each analysis are noted on the following page. The tower is assumed to be in good, undamaged and equivalent to as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new AT&T equipment. The new equipment to be installed, which included antennas, coax, mounts and associated hardware are listed on the following page, along with already installed cellular equipment, 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 67%. Detailed calculation of the applied forces and member capacities are provided in the following pages.

The tower base foundation and anchor design loads were analyzed considering the aforementioned foundation data and assumed soil properties. Based on this, the base foundation and anchors are adequate to support the existing and new loading.

In conclusion, the tower superstructure and substructure can support the proposed AT&T equipment.

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

Best Regards,

Code Design Criteria

ANSI/TIA-222-G & ANSI/TIA-222-H
Windspeed = 118 mph, 3-second gust, V_{ult}
Exposure = B
Radial Ice = 1.5 inch
Ice Windspeed = 50 mph, 3-second gust
Structure Class / Risk Category = II
Topographic Category = 1

Proposed Appurtenance Loading – AT&T

Elevation (ft) [1]	Antenna	Mount	Coax[2]
177	(6) CCI OPA65R-BU8D (3) CCI OPA65R-BU4D (2) CCI TPA-65R-LCUUUU-H8 (1) Quintel QS46512-2 (3) Ericsson RRUS-32 B30 (3) Ericsson 478 B14 (3) Ericsson 8843B2/B66A (3) Ericsson 4449 B5/B12	(3) 12 ft Boom / Frame	(6) 1-5/8 (2) Fiber (2) Squids (4) DC Trunks

[1]Note elevation is measured from grade to center of antenna
[2]Additional coax is to be installed on the same tower face as the existing coax

Maximum Member Usage Results

Member	Usage (%)[1]
Legs	67
Diagonals	62
Horizontals	50
Guy Wires	42
Splice Bolts	28

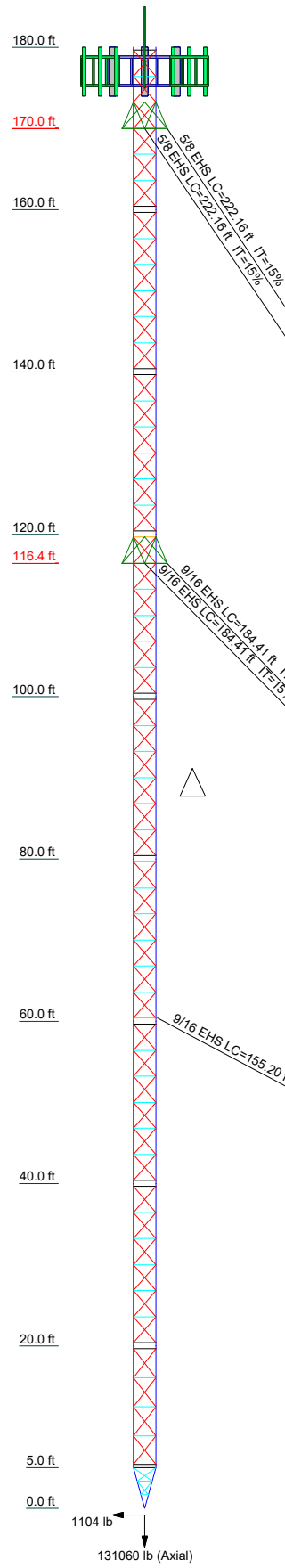
[1]Usage above 100% indicates the applied design load exceeds the member strength capacity and requires strengthening

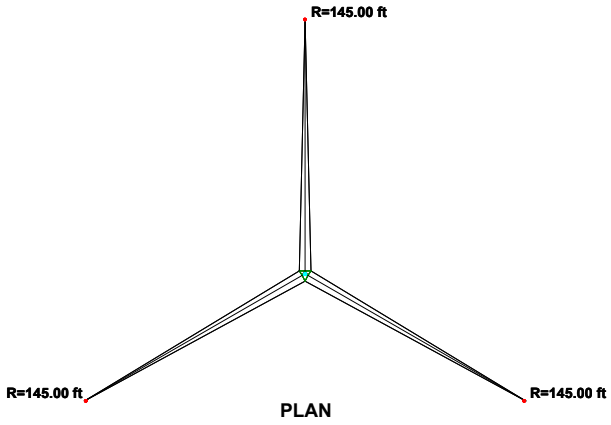
Foundation Usage Results

Base Reaction	Capacity (kip-ft)	Analysis (kip-ft)	Usage (%)[1]
Base Axial	217.8	131.1	64
Anchor Uplift	93.1	27.7	30
Anchor Shear	52.2	32.1	61

[1] Usage above 100% indicates the applied design load exceeds the foundation strength capacity and requires strengthening

Section	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs				L1 1/2x1 1/2x3/16		P2.5x.203				
Leg Grade						A500M-54				
Diagonals						SR 5/8				
Diagonal Grade						A36				
Top Girts				L1 1/2x1 1/2x3/16			N.A.		L1 1/2x1 1/2x3/16	
Bottom Girts	N.A.		L1 1/2x1 1/2x3/16		N.A.			L1 1/2x1 1/2x3/16		
Horizontals						L1 1/2x1 1/2x3/16				
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)	167.9	480.3	658.2	658.2	658.2	658.2	872.6	658.2	658.2	872.6





PLAN

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	180	Ericsson RUSS-32	177
Sector Frame Mount (ATI)	177	Ericsson RUSS-32	177
Sector Frame Mount (ATI)	177	Ericsson RUSS-32	177
Sector Frame Mount (ATI)	177	Ericsson 478 B	177
(2) CCI OPA-65R-BU8D	177	Ericsson 478 B	177
(2) CCI OPA-65R-BU8D	177	Ericsson 478 B	177
(2) CCI OPA-65R-BU8D	177	Ericsson 8843	177
CCI OPA-65R-BU4D	177	Ericsson 8843	177
CCI OPA-65R-BU4D	177	Ericsson 8843	177
CCI OPA-65R-BU4D	177	Ericsson 4449	177
CCI TPA-65R-LCUUUU-H8	177	Ericsson 4449	177
CCI TPA-65R-LCUUUU-H8	177	Ericsson 4449	177
Quintel QS46512-2	177		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	3 @ 1.66667		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500M-54	54 ksi	70 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.50 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft.
8. Weld together tower sections have flange connections.
9. TOWER RATING: 66.8%

ALL REACTIONS ARE FACTORED

Phone: FAX:	Job: 124-23005		
	Project: Tolland Ave., CT		
	Client: CDT	Drawn by:	App'd:
	Code: TIA-222-H	Date: 01/31/24	Scale: NTS
	Path:		Dwg No. E-1

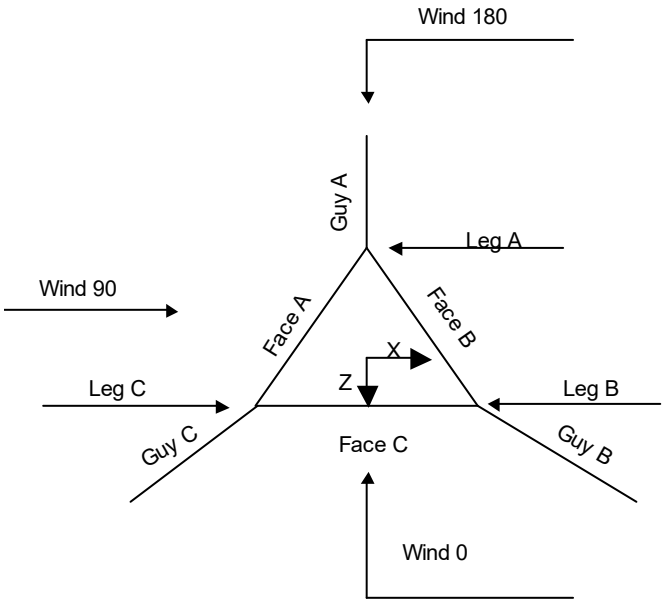
Tower Input Data

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-222-H standard.
The following design criteria apply:

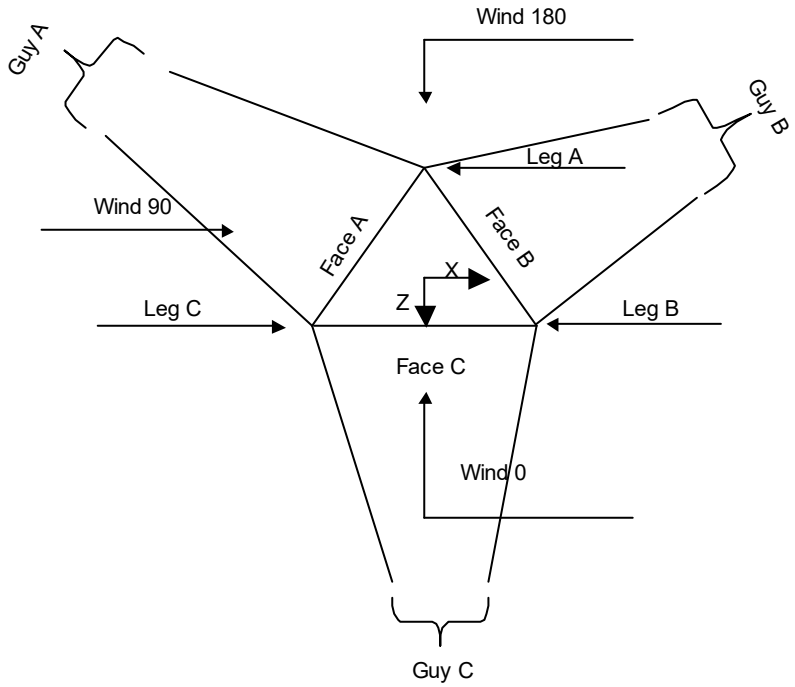
Tower is located in Tolland County, Connecticut.
Tower base elevation above sea level: 653.00 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Tension only take-up is 0.0313 in.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Safety factor used in guy design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-H Bracing Resist. Exemption
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Use TIA-222-H Tension Splice Exemption
√ Leg Bolts Are At Top Of Section	Add IBC .6D+W Combination	Poles
√ Secondary Horizontal Braces Leg	Sort Capacity Reports By Component	Include Shear-Torsion Interaction
Use Diamond Inner Bracing (4 Sided)	√ Triangulate Diamond Inner Bracing	Always Use Sub-Critical Flow
SR Members Have Cut Ends	Treat Feed Line Bundles As Cylinder	Use Top Mounted Sockets
SR Members Are Concentric	Ignore KL/ry For 60 Deg. Angle Legs	Pole Without Linear Attachments
		Pole With Shroud Or No Appurtenances
		Outside and Inside Corner Radii Are Known



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length 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	1.67	X Brace	No	Yes	0.0000	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-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T2 160.00-140.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T3 140.00-120.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T4 120.00-100.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T5 100.00-80.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T6 80.00-60.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T7 60.00-40.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T8 40.00-20.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T9 20.00-5.00	Pipe	P2.5x.203	A500M-54 (54 ksi)	Solid Round	5/8	A36 (36 ksi)
T10 5.00-0.00	Pipe	P2.5x.203	A500M-54 (54 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 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	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	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T8 40.00-20.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T9 20.00-5.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 5.00-0.00	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	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 1/2x1 1/2x3/16	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	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
140.00-120.00			(36 ksi)						
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
120.00-100.00			(36 ksi)						
T5	0.00	0.0000	A36	1	1	1	36.0000	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	36.0000
			(36 ksi)						
T7 60.00-40.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T8 40.00-20.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T9 20.00-5.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T10 5.00-0.00	0.00	0.0000	A36	1	1	1	36.0000	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	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
180.00-160.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T2	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
160.00-140.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T3	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
140.00-120.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T4	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
120.00-100.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T5	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
100.00-80.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T6	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
80.00-60.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T7	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
60.00-40.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T8	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
40.00-20.00				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T9 20.00-5.00	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
T10 5.00-0.00	No	Yes	1	1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1
				1	1	1	1	0.65	0.65	0.65	0.65	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 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 Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	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	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 100.00-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 80.00-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 60.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 20.00-5.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 5.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 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

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
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 %
170	EHS	A	5/8	6360.00	15%	21000	0.813	221.88	145.00	0.0000	0.00	100%
		B	5/8	6360.00	15%	21000	0.813	221.88	145.00	0.0000	0.00	100%
		C	5/8	6360.00	15%	21000	0.813	221.88	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
170	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
170.00	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
170	180.38	180.38	180.38		3.12 3.0 sec/pulse	3.12 3.0 sec/pulse	3.12 3.0 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
170	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
170	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
116.417	0.7500 A325N	2	0.0000	1	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	1
60.375	0.6250 A325N	0	0.0000	0.75	0.0000 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
170	A	85.00	28	5	1.6489
	B	85.00	28	5	1.6489
	C	85.00	28	5	1.6489
116.417	A	58.21	25	4	1.5876
	B	58.21	25	4	1.5876
	C	58.21	25	4	1.5876
60.375	A	30.19	21	4	1.4867
	B	30.19	21	4	1.4867
	C	30.19	21	4	1.4867

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
170	A	49.9259	6498.03 / 6360.00	-101.28	5009.66	-4137.32	-10123.16	14685.27	-17533.82
	A	49.9259	6498.03 / 6360.00	101.28	5009.66	-4137.32	-10123.16	-14685.27	17533.82
	B	49.9259	6498.03 / 6360.00	3633.66	5009.66	1980.95	20246.31	14685.27	0.00
	B	49.9259	6498.03 / 6360.00	3532.39	5009.66	2156.37	-10123.16	-14685.27	-17533.82
	C	49.9259	6498.03 / 6360.00	-3532.39	5009.66	2156.37	-10123.16	14685.27	17533.82
	C	49.9259	6498.03 / 6360.00	-3633.66	5009.66	1980.95	20246.31	-14685.27	0.00
			Sum:	0.00	30057.98	0.00	-0.00	0.00	0.00
116.417	A	39.1448	5328.01 / 5250.00	-100.37	3400.60	-4100.44	-6871.68	14554.35	-11902.11
	A	39.1448	5328.01 / 5250.00	100.37	3400.60	-4100.44	-6871.68	-14554.35	11902.11
	B	39.1448	5328.01 / 5250.00	3601.27	3400.60	1963.29	13743.37	14554.35	0.00
	B	39.1448	5328.01 / 5250.00	3500.89	3400.60	2137.14	-6871.68	-14554.35	-11902.11
	C	39.1448	5328.01 / 5250.00	-3500.89	3400.60	2137.14	-6871.68	14554.35	11902.11
	C	39.1448	5328.01 / 5250.00	-3601.27	3400.60	1963.29	13743.37	-14554.35	0.00
			Sum:	0.00	20403.61	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	5290.46 / 5250.00	0.00	2102.12	-4854.90	-4247.81	0.00	0.00
	B	22.8926	5290.46 / 5250.00	4204.47	2102.12	2427.45	2123.90	0.00	-3678.71
	C	22.8926	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

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
170	A	49.9259	9832.30 8916.83	-147.45	7769.83	-6023.46	-15700.69	21380.07	-27194.40
	A	49.9259	9832.30 8916.83	147.45	7769.83	-6023.46	-15700.69	-21380.07	27194.40
	B	49.9259	9832.30 8916.83	5290.19	7769.83	2884.04	31401.38	21380.07	0.00
	B	49.9259	9832.30 8916.83	5142.75	7769.83	3139.42	-15700.69	-21380.07	-27194.40
	C	49.9259	9832.30 8916.83	-5142.75	7769.83	3139.42	-15700.69	21380.07	27194.40
	C	49.9259	9832.30 8916.83	-5290.19	7769.83	2884.04	31401.38	-21380.07	0.00
			Sum:	0.00	46618.96	0.00	-0.00	0.00	0.00
116.417	A	39.1448	8161.99 7599.28	-149.36	5419.13	-6101.54	-10950.57	21657.20	-18966.95
	A	39.1448	8161.99 7599.28	149.36	5419.13	-6101.54	-10950.57	-21657.20	18966.95
	B	39.1448	8161.99 7599.28	5358.77	5419.13	2921.42	21901.14	21657.20	0.00
	B	39.1448	8161.99 7599.28	5209.41	5419.13	3180.12	-10950.57	-21657.20	-18966.95
	C	39.1448	8161.99 7599.28	-5209.41	5419.13	3180.12	-10950.57	21657.20	18966.95
	C	39.1448	8161.99 7599.28	-5358.77	5419.13	2921.42	21901.14	-21657.20	0.00
			Sum:	0.00	32514.76	-0.00	-0.00	0.00	0.00
60.375	A	22.8926	7815.32 7550.50	0.00	3328.32	-7071.17	-6725.63	0.00	0.00
	B	22.8926	7815.32 7550.50	6123.81	3328.32	3535.58	3362.82	0.00	-5824.57
	C	22.8926	7815.32 7550.50	-6123.81	3328.32	3535.58	3362.82	-0.00	5824.57
			Sum:	0.00	9984.97	-0.00	0.00	0.00	0.00

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom	F_x	F_y	F_z	M_x	M_y	M_z
ft		°	lb	lb	lb	lb	lb-ft	lb-ft	lb-ft
170	A	49.9259	6498.03 6360.00	-101.28	5009.66	-4137.32	-10123.16	14685.27	-17533.82
	A	49.9259	6498.03 6360.00	101.28	5009.66	-4137.32	-10123.16	-14685.27	17533.82
	B	49.9259	6498.03 6360.00	3633.66	5009.66	1980.95	20246.31	14685.27	0.00
	B	49.9259	6498.03 6360.00	3532.39	5009.66	2156.37	-10123.16	-14685.27	-17533.82
	C	49.9259	6498.03	-3532.39	5009.66	2156.37	-10123.16	14685.27	17533.82

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
			6360.00						
	C	49.9259	6498.03	-3633.66	5009.66	1980.95	20246.31	-14685.27	0.00
			6360.00						
			Sum:	0.00	30057.98	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-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation ft		H ft	V ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft
170	A	143.02	170.00	7147	2.78	6884	2.88	6622	2.99	6360	3.12	6099	3.25	5839	3.39	5579	3.55
	B	143.02	170.00	7147	2.78	6884	2.88	6622	2.99	6360	3.12	6099	3.25	5839	3.39	5579	3.55
	C	143.02	170.00	7147	2.78	6884	2.88	6622	2.99	6360	3.12	6099	3.25	5839	3.39	5579	3.55
116.417	A	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
	B	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
	C	143.02	116.42	6193	1.83	5878	1.93	5563	2.03	5250	2.15	4938	2.29	4627	2.44	4319	2.62
60.375	A	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04
	B	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04
	C	142.98	60.38	6582	1.22	6137	1.31	5692	1.41	5250	1.53	4810	1.67	4373	1.84	3942	2.04

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (AT&T)	C	No	No	Ar (CaAa)	178.00 - 0.00	6	6	1.9800	1.9800		1.04
1 5/8 Fiber (AT&T)	C	No	No	Ar (CaAa)	178.00 - 0.00	2	2	1.9800	1.9800		1.04

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
Safety Line 3/8	A	No	No	Ar (CaAa)	180.00 - 0.00	1	1	0.3750	0.3750		0.22
Fiber (AT&T)	C	No	No	Ar (CaAa)	178.00 - 0.00	2	2	0.3750	0.3750		0.22
DC (AT&T)	C	No	No	Ar (CaAa)	178.00 - 0.00	4	4	0.5800	0.5800		0.25

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	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	34.038	0.000	175.68
T2	160.00-140.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T3	140.00-120.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T4	120.00-100.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T5	100.00-80.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T6	80.00-60.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T7	60.00-40.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T8	40.00-20.00	A	0.000	0.000	0.750	0.000	4.40
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	37.820	0.000	195.20
T9	20.00-5.00	A	0.000	0.000	0.563	0.000	3.30
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	28.365	0.000	146.40
T10	5.00-0.00	A	0.000	0.000	0.188	0.000	1.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	9.455	0.000	48.80

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	1.767	0.000	0.000	7.819	0.000	96.90
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	116.077	0.000	1543.66
T2	160.00-140.00	A	1.745	0.000	0.000	7.731	0.000	94.81
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	128.390	0.000	1695.43
T3	140.00-120.00	A	1.720	0.000	0.000	7.632	0.000	92.49

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
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	127.731	0.000	1673.25
T4	120.00-100.00	A	1.692	0.000	0.000	7.518	0.000	89.85
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	126.973	0.000	1647.91
T5	100.00-80.00	A	1.658	0.000	0.000	7.383	0.000	86.79
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	126.081	0.000	1618.24
T6	80.00-60.00	A	1.617	0.000	0.000	7.219	0.000	83.12
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	124.989	0.000	1582.20
T7	60.00-40.00	A	1.564	0.000	0.000	7.005	0.000	78.47
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	123.571	0.000	1535.84
T8	40.00-20.00	A	1.486	0.000	0.000	6.693	0.000	71.95
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	121.510	0.000	1469.38
T9	20.00-5.00	A	1.361	0.000	0.000	4.646	0.000	46.61
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	88.667	0.000	1024.15
T10	5.00-0.00	A	1.159	0.000	0.000	1.346	0.000	11.96
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	28.227	0.000	300.82

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-0.1030	5.7729	-0.2792	4.8868
T2	160.00-140.00	-0.0982	6.1161	-0.2686	5.2767
T3	140.00-120.00	-0.0982	6.1161	-0.2696	5.3395
T4	120.00-100.00	-0.0982	6.1161	-0.2706	5.4112
T5	100.00-80.00	-0.0982	6.1161	-0.2717	5.4953
T6	80.00-60.00	-0.0982	6.1161	-0.2728	5.5973
T7	60.00-40.00	-0.0982	6.1161	-0.2738	5.7285
T8	40.00-20.00	-0.0982	6.1161	-0.2745	5.9168
T9	20.00-5.00	-0.0992	6.1753	-0.2828	6.4194
T10	5.00-0.00	-0.1040	6.4670	-0.1152	2.8915

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	1 5/8	160.00 - 178.00	0.6000	0.3885
T1	2	1 5/8 Fiber	160.00 - 178.00	0.6000	0.3885
T1	3	Safety Line 3/8	160.00 - 180.00	0.6000	0.3885
T1	4	Fiber	160.00 -	0.6000	0.3885

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	5	DC	178.00 - 160.00	0.6000	0.3885
T2	1	1 5/8	178.00 - 140.00	0.6000	0.3932
T2	2	1 5/8 Fiber	160.00 - 140.00	0.6000	0.3932
T2	3	Safety Line 3/8	160.00 - 140.00	0.6000	0.3932
T2	4	Fiber	160.00 - 140.00	0.6000	0.3932
T2	5	DC	160.00 - 140.00	0.6000	0.3932
T3	1	1 5/8	140.00 - 120.00	0.6000	0.3985
T3	2	1 5/8 Fiber	140.00 - 120.00	0.6000	0.3985
T3	3	Safety Line 3/8	140.00 - 120.00	0.6000	0.3985
T3	4	Fiber	140.00 - 120.00	0.6000	0.3985
T3	5	DC	140.00 - 120.00	0.6000	0.3985
T4	1	1 5/8	120.00 - 100.00	0.6000	0.4047
T4	2	1 5/8 Fiber	120.00 - 100.00	0.6000	0.4047
T4	3	Safety Line 3/8	120.00 - 100.00	0.6000	0.4047
T4	4	Fiber	120.00 - 100.00	0.6000	0.4047
T4	5	DC	120.00 - 100.00	0.6000	0.4047
T5	1	1 5/8	80.00 - 100.00	0.6000	0.4119
T5	2	1 5/8 Fiber	80.00 - 100.00	0.6000	0.4119
T5	3	Safety Line 3/8	80.00 - 100.00	0.6000	0.4119
T5	4	Fiber	80.00 - 100.00	0.6000	0.4119
T5	5	DC	80.00 - 100.00	0.6000	0.4119
T6	1	1 5/8	60.00 - 80.00	0.6000	0.4208
T6	2	1 5/8 Fiber	60.00 - 80.00	0.6000	0.4208
T6	3	Safety Line 3/8	60.00 - 80.00	0.6000	0.4208
T6	4	Fiber	60.00 - 80.00	0.6000	0.4208
T6	5	DC	60.00 - 80.00	0.6000	0.4208
T7	1	1 5/8	40.00 - 60.00	0.6000	0.4325
T7	2	1 5/8 Fiber	40.00 - 60.00	0.6000	0.4325
T7	3	Safety Line 3/8	40.00 - 60.00	0.6000	0.4325
T7	4	Fiber	40.00 - 60.00	0.6000	0.4325
T7	5	DC	40.00 - 60.00	0.6000	0.4325
T8	1	1 5/8	20.00 - 40.00	0.6000	0.4495
T8	2	1 5/8 Fiber	20.00 - 40.00	0.6000	0.4495
T8	3	Safety Line 3/8	20.00 - 40.00	0.6000	0.4495
T8	4	Fiber	20.00 - 40.00	0.6000	0.4495
T8	5	DC	20.00 - 40.00	0.6000	0.4495
T9	1	1 5/8	5.00 - 20.00	0.6000	0.4939
T9	2	1 5/8 Fiber	5.00 - 20.00	0.6000	0.4939
T9	3	Safety Line 3/8	5.00 - 20.00	0.6000	0.4939
T9	4	Fiber	5.00 - 20.00	0.6000	0.4939
T9	5	DC	5.00 - 20.00	0.6000	0.4939
T10	1	1 5/8	0.00 - 5.00	0.6000	0.1648
T10	2	1 5/8 Fiber	0.00 - 5.00	0.6000	0.1648
T10	3	Safety Line 3/8	0.00 - 5.00	0.6000	0.1648
T10	4	Fiber	0.00 - 5.00	0.6000	0.1648

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	5	DC	0.00 - 5.00	0.6000	0.1648

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
Sector Frame Mount (AT&T)	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.00 22.00 23.20 32.80	9.00 11.00 23.20 32.80	465.00 600.00 735.00 1005.00
Sector Frame Mount (AT&T)	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.00 22.00 23.20 32.80	9.00 11.00 23.20 32.80	465.00 600.00 735.00 1005.00
Sector Frame Mount (AT&T)	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.00 22.00 23.20 32.80	9.00 11.00 23.20 32.80	465.00 600.00 735.00 1005.00
Lightning Rod	C	None		0.0000	180.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 2.02 3.05 5.15	1.00 2.02 3.05 5.15	40.00 49.26 64.89 115.85
(2) CCI OPA-65R-BU8D	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.09 18.70 19.31 20.55	8.20 8.85 9.47 10.69	77.00 175.00 283.00 523.00
(2) CCI OPA-65R-BU8D	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.09 18.70 19.31 20.55	8.20 8.85 9.47 10.69	77.00 175.00 283.00 523.00
(2) CCI OPA-65R-BU8D	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	18.09 18.70 19.31 20.55	8.20 8.85 9.47 10.69	77.00 175.00 283.00 523.00
CCI OPA-65R-BU4D	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.40 8.74 9.09 9.82	3.54 3.85 4.15 4.78	53.00 105.00 163.00 295.00
CCI OPA-65R-BU4D	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.40 8.74 9.09 9.82	3.54 3.85 4.15 4.78	53.00 105.00 163.00 295.00
CCI OPA-65R-BU4D	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.40 8.74 9.09 9.82	3.54 3.85 4.15 4.78	53.00 105.00 163.00 295.00
CCI TPA-65R-LCUUUU-H8	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.61 8.22 8.82 10.04	5.12 5.75 6.38 7.59	75.00 154.00 242.00 441.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
CCI TPA-65R-LCUUUU-H8	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.61 8.22 8.82 10.04	5.12 5.75 6.38 7.59	75.00 154.00 242.00 441.00
Quintel QS46512-2	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.55 5.88 6.22 6.92	4.61 4.94 5.27 5.95	54.00 97.00 144.00 255.00
Ericsson RUSS-32	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.02 2.18 2.35 2.71	1.25 1.38 1.52 1.84	59.00 77.00 97.00 147.00
Ericsson RUSS-32	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.02 2.18 2.35 2.71	1.25 1.38 1.52 1.84	59.00 77.00 97.00 147.00
Ericsson RUSS-32	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.02 2.18 2.35 2.71	1.25 1.38 1.52 1.84	59.00 77.00 97.00 147.00
Ericsson 478 B	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.01 2.17 2.33 2.70	1.19 1.32 1.46 1.77	57.00 74.00 94.00 143.00
Ericsson 478 B	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.01 2.17 2.33 2.70	1.19 1.32 1.46 1.77	57.00 74.00 94.00 143.00
Ericsson 478 B	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.01 2.17 2.33 2.70	1.19 1.32 1.46 1.77	57.00 74.00 94.00 143.00
Ericsson 8843	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.79 1.94 2.28	1.16 1.29 1.42 1.71	50.00 66.00 85.00 131.00
Ericsson 8843	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.79 1.94 2.28	1.16 1.29 1.42 1.71	50.00 66.00 85.00 131.00
Ericsson 8843	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.79 1.94 2.28	1.16 1.29 1.42 1.71	50.00 66.00 85.00 131.00
Ericsson 4449	A	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.79 2.12 2.29 2.65	1.41 1.55 1.69 2.02	71.00 90.00 111.00 163.00
Ericsson 4449	B	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.79 2.12 2.29 2.65	1.41 1.55 1.69 2.02	71.00 90.00 111.00 163.00
Ericsson 4449	C	From Leg	1.50 0.00 0.00	0.0000	177.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.79 2.12 2.29 2.65	1.41 1.55 1.69 2.02	71.00 90.00 111.00 163.00

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1 180.00-160.00	170.00	1.15	34	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	34.038	0.000
T2 160.00-140.00	150.00	1.11	33	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T3 140.00-120.00	130.00	1.065	32	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T4 120.00-100.00	110.00	1.016	30	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T5 100.00-80.00	90.00	0.959	28	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T6 80.00-60.00	70.00	0.892	26	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T7 60.00-40.00	50.00	0.811	24	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T8 40.00-20.00	30.00	0.701	21	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T9 20.00-5.00	12.50	0.7	21	56.094	A	2.038	9.126	7.188	64.38	0.563	0.000
					B	2.038	9.126		64.38	0.000	0.000
					C	2.038	9.126		64.38	28.365	0.000
T10 5.00-0.00	2.50	0.7	21	10.019	A	0.785	3.127	2.584	66.05	0.188	0.000
					B	0.785	3.127		66.05	0.000	0.000
					C	0.785	3.127		66.05	9.455	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G 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 180.00-160.00	170.00	1.15	6	1.7672	80.682	A	2.853	46.484	21.365	43.30	7.819	0.000
						B	2.853	46.484		43.30	0.000	0.000
						C	2.853	46.484		43.30	116.077	0.000
T2 160.00-140.00	150.00	1.11	6	1.7452	80.609	A	2.853	46.059	21.218	43.38	7.731	0.000
						B	2.853	46.059		43.38	0.000	0.000
						C	2.853	46.059		43.38	128.390	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T3	130.00	1.065	6	1.7204	80.526	A	2.853	45.580	21.053	43.47	7.632	0.000
140.00-120.00						B	2.853	45.580		43.47	0.000	0.000
						C	2.853	45.580		43.47	127.731	0.000
T4	110.00	1.016	5	1.6919	80.431	A	2.853	45.030	20.863	43.57	7.518	0.000
120.00-100.00						B	2.853	45.030		43.57	0.000	0.000
						C	2.853	45.030		43.57	126.973	0.000
T5 100.00-80.00	90.00	0.959	5	1.6583	80.319	A	2.853	44.380	20.639	43.70	7.383	0.000
						B	2.853	44.380		43.70	0.000	0.000
						C	2.853	44.380		43.70	126.081	0.000
T6 80.00-60.00	70.00	0.892	5	1.6171	80.182	A	2.853	43.585	20.364	43.85	7.219	0.000
						B	2.853	43.585		43.85	0.000	0.000
						C	2.853	43.585		43.85	124.989	0.000
T7 60.00-40.00	50.00	0.811	4	1.5636	80.004	A	2.853	42.552	20.008	44.07	7.005	0.000
						B	2.853	42.552		44.07	0.000	0.000
						C	2.853	42.552		44.07	123.571	0.000
T8 40.00-20.00	30.00	0.701	4	1.4858	79.744	A	2.853	41.048	19.488	44.39	6.693	0.000
						B	2.853	41.048		44.39	0.000	0.000
						C	2.853	41.048		44.39	121.510	0.000
T9 20.00-5.00	12.50	0.7	4	1.3612	59.497	A	2.038	28.074	13.994	46.47	4.646	0.000
						B	2.038	28.074		46.47	0.000	0.000
						C	2.038	28.074		46.47	88.667	0.000
T10 5.00-0.00	2.50	0.7	4	1.1589	11.042	A	0.785	8.437	4.667	50.61	1.346	0.000
						B	0.785	8.437		50.61	0.000	0.000
						C	0.785	8.437		50.61	28.227	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	170.00	1.15	9	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
180.00-160.00					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	34.038	0.000
T2	150.00	1.11	8	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
160.00-140.00					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T3	130.00	1.065	8	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
140.00-120.00					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T4	110.00	1.016	8	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
120.00-100.00					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T5	90.00	0.959	7	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
100.00-80.00					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T6 80.00-60.00	70.00	0.892	7	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T7 60.00-40.00	50.00	0.811	6	74.792	A	2.853	12.348	9.583	63.05	0.750	0.000
					B	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T8 40.00-20.00	30.00	0.701	5	74.792	A	2.853	12.348	9.583	63.05	0.750	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	2.853	12.348		63.05	0.000	0.000
					C	2.853	12.348		63.05	37.820	0.000
T9 20.00-5.00	12.50	0.7	5	56.094	A	2.038	9.126	7.188	64.38	0.563	0.000
					B	2.038	9.126		64.38	0.000	0.000
					C	2.038	9.126		64.38	28.365	0.000
T10 5.00-0.00	2.50	0.7	5	10.019	A	0.785	3.127	2.584	66.05	0.188	0.000
					B	0.785	3.127		66.05	0.000	0.000
					C	0.785	3.127		66.05	9.455	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	180.08	658.24	A	0.203	2.585	34	1	1	9.953	1348.05	67.40	C
180.00-160.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T2	199.60	658.24	A	0.203	2.585	33	1	1	9.953	1364.03	68.20	C
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	199.60	658.24	A	0.203	2.585	32	1	1	9.953	1309.38	65.47	C
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	199.60	658.24	A	0.203	2.585	30	1	1	9.953	1248.35	62.42	C
120.00-100.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T5	199.60	658.24	A	0.203	2.585	28	1	1	9.953	1178.79	58.94	C
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	199.60	658.24	A	0.203	2.585	26	1	1	9.953	1097.12	54.86	C
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	199.60	658.24	A	0.203	2.585	24	1	1	9.953	996.56	49.83	C
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	199.60	658.24	A	0.203	2.585	21	1	1	9.953	861.23	43.06	C
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	149.70	480.27	A	0.199	2.599	21	1	1	7.279	638.70	42.58	C
			B	0.199	2.599		1	1	7.279			
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	49.90	167.93	A	0.39	2.083	21	1	1	2.762	203.17	40.63	C
			B	0.39	2.083		1	1	2.762			
			C	0.39	2.083		1	1	2.762			
Sum Weight:	1776.88	6342.91								10245.38		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	180.08	658.24	A	0.203	2.585	34	0.8	1	9.383	1305.38	65.27	C
180.00-160.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T2	199.60	658.24	A	0.203	2.585	33	0.8	1	9.383	1322.86	66.14	C
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	199.60	658.24	A	0.203	2.585	32	0.8	1	9.383	1269.86	63.49	C
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	199.60	658.24	A	0.203	2.585	30	0.8	1	9.383	1210.68	60.53	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T5	199.60	658.24	A	0.203	2.585	28	0.8	1	9.383	1143.22	57.16	C
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	199.60	658.24	A	0.203	2.585	26	0.8	1	9.383	1064.01	53.20	C
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	199.60	658.24	A	0.203	2.585	24	0.8	1	9.383	966.48	48.32	C
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	199.60	658.24	A	0.203	2.585	21	0.8	1	9.383	835.23	41.76	C
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	149.70	480.27	A	0.199	2.599	21	0.8	1	6.871	620.05	41.34	C
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	49.90	167.93	A	0.39	2.083	21	0.8	1	2.605	197.41	39.48	C
			B	0.39	2.083		0.8	1	2.605			
			C	0.39	2.083		0.8	1	2.605			
Sum Weight:	1776.88	6342.91								9935.18		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	180.08	658.24	A	0.203	2.585	34	0.85	1	9.526	1316.05	65.80	C
180.00-160.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T2	199.60	658.24	A	0.203	2.585	33	0.85	1	9.526	1333.15	66.66	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	199.60	658.24	A	0.203	2.585	32	0.85	1	9.526	1279.74	63.99	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T4	199.60	658.24	A	0.203	2.585	30	0.85	1	9.526	1220.10	61.00	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T5	199.60	658.24	A	0.203	2.585	28	0.85	1	9.526	1152.11	57.61	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	199.60	658.24	A	0.203	2.585	26	0.85	1	9.526	1072.28	53.61	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T7	199.60	658.24	A	0.203	2.585	24	0.85	1	9.526	974.00	48.70	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	199.60	658.24	A	0.203	2.585	21	0.85	1	9.526	841.73	42.09	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	149.70	480.27	A	0.199	2.599	21	0.85	1	6.973	624.71	41.65	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	49.90	167.93	A	0.39	2.083	21	0.85	1	2.644	198.85	39.77	C
			B	0.39	2.083		0.85	1	2.644			
			C	0.39	2.083		0.85	1	2.644			
Sum Weight:	1776.88	6342.91								10012.73		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1640.57	2759.48	A	0.611	1.797	6	1	1	37.766	602.50	30.13	C
180.00-160.00		TA 769.52	B	0.611	1.797		1	1	37.766			
			C	0.611	1.797		1	1	37.766			
T2	1790.24	2719.08	A	0.607	1.8	6	1	1	37.308	604.72	30.24	C
160.00-140.00			B	0.607	1.8		1	1	37.308			
			C	0.607	1.8		1	1	37.308			
T3	1765.74	2673.93	A	0.601	1.803	6	1	1	36.795	578.64	28.93	C
140.00-120.00			B	0.601	1.803		1	1	36.795			
			C	0.601	1.803		1	1	36.795			
T4	1737.76	2622.61	A	0.595	1.807	5	1	1	36.211	549.67	27.48	C
120.00-100.00		TA 738.18	B	0.595	1.807		1	1	36.211			
			C	0.595	1.807		1	1	36.211			
T5	1705.02	2562.85	A	0.588	1.812	5	1	1	35.529	516.85	25.84	C
100.00-80.00			B	0.588	1.812		1	1	35.529			
			C	0.588	1.812		1	1	35.529			
T6	1665.32	2490.82	A	0.579	1.818	5	1	1	34.703	478.59	23.93	C
80.00-60.00			B	0.579	1.818		1	1	34.703			
			C	0.579	1.818		1	1	34.703			
T7	1614.31	2399.07	A	0.568	1.828	4	1	1	33.646	431.87	21.59	C
60.00-40.00			B	0.568	1.828		1	1	33.646			
			C	0.568	1.828		1	1	33.646			
T8	1541.33	2269.35	A	0.551	1.843	4	1	1	32.141	369.73	18.49	C
40.00-20.00			B	0.551	1.843		1	1	32.141			
			C	0.551	1.843		1	1	32.141			
T9 20.00-5.00	1070.76	1497.28	A	0.506	1.892	4	1	1	21.362	273.46	18.23	C
			B	0.506	1.892		1	1	21.362			
			C	0.506	1.892		1	1	21.362			
T10 5.00-0.00	312.78	445.99	A	0.835	1.846	4	1	1	8.489	64.95	12.99	C
			B	0.835	1.846		1	1	8.489			
			C	0.835	1.846		1	1	8.489			
Sum Weight:	14843.83	23948.17								4471.00		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1640.57	2759.48	A	0.611	1.797	6	0.8	1	37.196	597.18	29.86	C
180.00-160.00		TA 769.52	B	0.611	1.797		0.8	1	37.196			
			C	0.611	1.797		0.8	1	37.196			
T2	1790.24	2719.08	A	0.607	1.8	6	0.8	1	36.738	599.57	29.98	C
160.00-140.00			B	0.607	1.8		0.8	1	36.738			
			C	0.607	1.8		0.8	1	36.738			
T3	1765.74	2673.93	A	0.601	1.803	6	0.8	1	36.225	573.69	28.68	C
140.00-120.00			B	0.601	1.803		0.8	1	36.225			
			C	0.601	1.803		0.8	1	36.225			
T4	1737.76	2622.61	A	0.595	1.807	5	0.8	1	35.641	544.95	27.25	C
120.00-100.00		TA 738.18	B	0.595	1.807		0.8	1	35.641			
			C	0.595	1.807		0.8	1	35.641			
T5	1705.02	2562.85	A	0.588	1.812	5	0.8	1	34.958	512.38	25.62	C
100.00-80.00			B	0.588	1.812		0.8	1	34.958			
			C	0.588	1.812		0.8	1	34.958			
T6	1665.32	2490.82	A	0.579	1.818	5	0.8	1	34.133	474.40	23.72	C
80.00-60.00			B	0.579	1.818		0.8	1	34.133			
			C	0.579	1.818		0.8	1	34.133			
T7	1614.31	2399.07	A	0.568	1.828	4	0.8	1	33.076	428.06	21.40	C
60.00-40.00			B	0.568	1.828		0.8	1	33.076			
			C	0.568	1.828		0.8	1	33.076			
T8	1541.33	2269.35	A	0.551	1.843	4	0.8	1	31.571	366.41	18.32	C
40.00-20.00			B	0.551	1.843		0.8	1	31.571			
			C	0.551	1.843		0.8	1	31.571			
T9 20.00-5.00	1070.76	1497.28	A	0.506	1.892	4	0.8	1	20.954	271.03	18.07	C
			B	0.506	1.892		0.8	1	20.954			
			C	0.506	1.892		0.8	1	20.954			
T10 5.00-0.00	312.78	445.99	A	0.835	1.846	4	0.8	1	8.332	64.04	12.81	C
			B	0.835	1.846		0.8	1	8.332			
			C	0.835	1.846		0.8	1	8.332			
Sum Weight:	14843.83	23948.17								4431.69		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	1640.57	2759.48	A	0.611	1.797	6	0.85	1	37.338	598.51	29.93	C
180.00-160.00		TA 769.52	B	0.611	1.797		0.85	1	37.338			
			C	0.611	1.797		0.85	1	37.338			
T2	1790.24	2719.08	A	0.607	1.8	6	0.85	1	36.880	600.86	30.04	C
160.00-140.00			B	0.607	1.8		0.85	1	36.880			
			C	0.607	1.8		0.85	1	36.880			
T3	1765.74	2673.93	A	0.601	1.803	6	0.85	1	36.368	574.93	28.75	C
140.00-120.00			B	0.601	1.803		0.85	1	36.368			
			C	0.601	1.803		0.85	1	36.368			
T4	1737.76	2622.61	A	0.595	1.807	5	0.85	1	35.783	546.13	27.31	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
120.00-100.00		TA 738.18	B	0.595	1.807		0.85	1	35.783			
			C	0.595	1.807		0.85	1	35.783			
T5	1705.02	2562.85	A	0.588	1.812	5	0.85	1	35.101	513.50	25.67	C
100.00-80.00			B	0.588	1.812		0.85	1	35.101			
			C	0.588	1.812		0.85	1	35.101			
T6	1665.32	2490.82	A	0.579	1.818	5	0.85	1	34.275	475.45	23.77	C
80.00-60.00			B	0.579	1.818		0.85	1	34.275			
			C	0.579	1.818		0.85	1	34.275			
T7	1614.31	2399.07	A	0.568	1.828	4	0.85	1	33.218	429.01	21.45	C
60.00-40.00			B	0.568	1.828		0.85	1	33.218			
			C	0.568	1.828		0.85	1	33.218			
T8	1541.33	2269.35	A	0.551	1.843	4	0.85	1	31.713	367.24	18.36	C
40.00-20.00			B	0.551	1.843		0.85	1	31.713			
			C	0.551	1.843		0.85	1	31.713			
T9 20.00-5.00	1070.76	1497.28	A	0.506	1.892	4	0.85	1	21.056	271.64	18.11	C
			B	0.506	1.892		0.85	1	21.056			
			C	0.506	1.892		0.85	1	21.056			
T10 5.00-0.00	312.78	445.99	A	0.835	1.846	4	0.85	1	8.371	64.27	12.85	C
			B	0.835	1.846		0.85	1	8.371			
			C	0.835	1.846		0.85	1	8.371			
Sum Weight:	14843.83	23948.17								4441.52		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	180.08	658.24	A	0.203	2.585	9	1	1	9.953	348.53	17.43	C
180.00-160.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T2	199.60	658.24	A	0.203	2.585	8	1	1	9.953	352.66	17.63	C
160.00-140.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T3	199.60	658.24	A	0.203	2.585	8	1	1	9.953	338.54	16.93	C
140.00-120.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T4	199.60	658.24	A	0.203	2.585	8	1	1	9.953	322.76	16.14	C
120.00-100.00		TA 214.38	B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T5	199.60	658.24	A	0.203	2.585	7	1	1	9.953	304.77	15.24	C
100.00-80.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T6	199.60	658.24	A	0.203	2.585	7	1	1	9.953	283.66	14.18	C
80.00-60.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T7	199.60	658.24	A	0.203	2.585	6	1	1	9.953	257.66	12.88	C
60.00-40.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T8	199.60	658.24	A	0.203	2.585	5	1	1	9.953	222.67	11.13	C
40.00-20.00			B	0.203	2.585		1	1	9.953			
			C	0.203	2.585		1	1	9.953			
T9 20.00-5.00	149.70	480.27	A	0.199	2.599	5	1	1	7.279	165.13	11.01	C
			B	0.199	2.599		1	1	7.279			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.199	2.599		1	1	7.279			
T10 5.00-0.00	49.90	167.93	A	0.39	2.083	5	1	1	2.762	52.53	10.51	C
			B	0.39	2.083		1	1	2.762			
			C	0.39	2.083		1	1	2.762			
Sum Weight:	1776.88	6342.91								2648.90		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	180.08	658.24	A	0.203	2.585	9	0.8	1	9.383	337.50	16.88	C
180.00-160.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T2	199.60	658.24	A	0.203	2.585	8	0.8	1	9.383	342.02	17.10	C
160.00-140.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T3	199.60	658.24	A	0.203	2.585	8	0.8	1	9.383	328.32	16.42	C
140.00-120.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T4	199.60	658.24	A	0.203	2.585	8	0.8	1	9.383	313.02	15.65	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T5	199.60	658.24	A	0.203	2.585	7	0.8	1	9.383	295.57	14.78	C
100.00-80.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T6	199.60	658.24	A	0.203	2.585	7	0.8	1	9.383	275.09	13.75	C
80.00-60.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T7	199.60	658.24	A	0.203	2.585	6	0.8	1	9.383	249.88	12.49	C
60.00-40.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T8	199.60	658.24	A	0.203	2.585	5	0.8	1	9.383	215.95	10.80	C
40.00-20.00			B	0.203	2.585		0.8	1	9.383			
			C	0.203	2.585		0.8	1	9.383			
T9 20.00-5.00	149.70	480.27	A	0.199	2.599	5	0.8	1	6.871	160.31	10.69	C
			B	0.199	2.599		0.8	1	6.871			
			C	0.199	2.599		0.8	1	6.871			
T10 5.00-0.00	49.90	167.93	A	0.39	2.083	5	0.8	1	2.605	51.04	10.21	C
			B	0.39	2.083		0.8	1	2.605			
			C	0.39	2.083		0.8	1	2.605			
Sum Weight:	1776.88	6342.91								2568.70		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	180.08	658.24	A	0.203	2.585	9	0.85	1	9.526	340.26	17.01	C
180.00-160.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T2	199.60	658.24	A	0.203	2.585	8	0.85	1	9.526	344.68	17.23	C
160.00-140.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T3	199.60	658.24	A	0.203	2.585	8	0.85	1	9.526	330.87	16.54	C
140.00-120.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T4	199.60	658.24	A	0.203	2.585	8	0.85	1	9.526	315.45	15.77	C
120.00-100.00		TA 214.38	B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T5	199.60	658.24	A	0.203	2.585	7	0.85	1	9.526	297.87	14.89	C
100.00-80.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T6	199.60	658.24	A	0.203	2.585	7	0.85	1	9.526	277.24	13.86	C
80.00-60.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T7	199.60	658.24	A	0.203	2.585	6	0.85	1	9.526	251.82	12.59	C
60.00-40.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T8	199.60	658.24	A	0.203	2.585	5	0.85	1	9.526	217.63	10.88	C
40.00-20.00			B	0.203	2.585		0.85	1	9.526			
			C	0.203	2.585		0.85	1	9.526			
T9 20.00-5.00	149.70	480.27	A	0.199	2.599	5	0.85	1	6.973	161.52	10.77	C
			B	0.199	2.599		0.85	1	6.973			
			C	0.199	2.599		0.85	1	6.973			
T10 5.00-0.00	49.90	167.93	A	0.39	2.083	5	0.85	1	2.644	51.41	10.28	C
			B	0.39	2.083		0.85	1	2.644			
			C	0.39	2.083		0.85	1	2.644			
Sum Weight:	1776.88	6342.91								2588.75		

Discrete Appurtenance Pressures - No Ice $G_H = 0.850$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
Torque Arm Face C	180.0000	0.00	0.00	2.53	170.89	1.152	34	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	170.89	1.152	34	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	170.89	1.152	34	3.54	5.32
Torque Arm Face C	180.0000	0.00	0.00	2.53	117.30	1.034	31	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	117.30	1.034	31	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	117.30	1.034	31	3.54	5.32
Sector Frame Mount	0.0000	465.00	0.00	-3.52	177.00	1.163	34	18.00	9.00
Sector Frame Mount	120.0000	465.00	3.05	1.76	177.00	1.163	34	18.00	9.00
Sector Frame Mount	240.0000	465.00	-3.05	1.76	177.00	1.163	34	18.00	9.00
Lightning Rod	0.0000	40.00	0.00	0.00	180.00	1.169	35	1.00	1.00
CCI OPA-65R-BU8D	0.0000	154.00	0.00	-3.52	177.00	1.163	34	36.18	16.40
CCI OPA-65R-BU8D	120.0000	154.00	3.05	1.76	177.00	1.163	34	36.18	16.40
CCI OPA-65R-BU8D	240.0000	154.00	-3.05	1.76	177.00	1.163	34	36.18	16.40
CCI OPA-65R-BU4D	0.0000	53.00	0.00	-3.52	177.00	1.163	34	8.40	3.54
CCI OPA-65R-BU4D	120.0000	53.00	3.05	1.76	177.00	1.163	34	8.40	3.54
CCI OPA-65R-BU4D	240.0000	53.00	-3.05	1.76	177.00	1.163	34	8.40	3.54
CCI	0.0000	75.00	0.00	-3.52	177.00	1.163	34	7.61	5.12

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
TPA-65R-LCUUUU-H8 CCI	120.0000	75.00	3.05	1.76	177.00	1.163	34	7.61	5.12
TPA-65R-LCUUUU-H8 Quintel QS46512-2	240.0000	54.00	-3.05	1.76	177.00	1.163	34	5.55	4.61
Ericsson RUSS-32	0.0000	59.00	0.00	-3.52	177.00	1.163	34	2.02	1.25
Ericsson RUSS-32	120.0000	59.00	3.05	1.76	177.00	1.163	34	2.02	1.25
Ericsson RUSS-32	240.0000	59.00	-3.05	1.76	177.00	1.163	34	2.02	1.25
Ericsson 478 B	0.0000	57.00	0.00	-3.52	177.00	1.163	34	2.01	1.19
Ericsson 478 B	120.0000	57.00	3.05	1.76	177.00	1.163	34	2.01	1.19
Ericsson 478 B	240.0000	57.00	-3.05	1.76	177.00	1.163	34	2.01	1.19
Ericsson 8843	0.0000	50.00	0.00	-3.52	177.00	1.163	34	1.65	1.16
Ericsson 8843	120.0000	50.00	3.05	1.76	177.00	1.163	34	1.65	1.16
Ericsson 8843	240.0000	50.00	-3.05	1.76	177.00	1.163	34	1.65	1.16
Ericsson 4449	0.0000	71.00	0.00	-3.52	177.00	1.163	34	1.79	1.41
Ericsson 4449	120.0000	71.00	3.05	1.76	177.00	1.163	34	1.79	1.41
Ericsson 4449	240.0000	71.00	-3.05	1.76	177.00	1.163	34	1.79	1.41
	Sum Weight:	2971.00							

Discrete Appurtenance Pressures - With Ice $G_H = 0.850$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Torque Arm Face C	180.0000	0.00	0.00	2.53	170.89	1.152	6	6.04	8.90	1.7672
Torque Arm Face B	60.0000	0.00	2.19	-1.26	170.89	1.152	6	6.04	8.90	1.7672
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	170.89	1.152	6	6.04	8.90	1.7672
Torque Arm Face C	180.0000	0.00	0.00	2.53	117.30	1.034	5	5.93	8.75	1.6919
Torque Arm Face B	60.0000	0.00	2.19	-1.26	117.30	1.034	5	5.93	8.75	1.6919
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	117.30	1.034	5	5.93	8.75	1.6919
Sector Frame Mount	0.0000	944.07	0.00	-3.52	177.00	1.163	6	30.63	30.63	1.7743
Sector Frame Mount	120.0000	944.07	3.05	1.76	177.00	1.163	6	30.63	30.63	1.7743
Sector Frame Mount	240.0000	944.07	-3.05	1.76	177.00	1.163	6	30.63	30.63	1.7743
Lightning Rod	0.0000	104.50	0.00	0.00	180.00	1.169	6	4.68	4.68	1.7773
CCI OPA-65R-BU8D	0.0000	937.68	0.00	-3.52	177.00	1.163	6	40.54	20.83	1.7743
CCI OPA-65R-BU8D	120.0000	937.68	3.05	1.76	177.00	1.163	6	40.54	20.83	1.7743
CCI OPA-65R-BU8D	240.0000	937.68	-3.05	1.76	177.00	1.163	6	40.54	20.83	1.7743
CCI OPA-65R-BU4D	0.0000	265.21	0.00	-3.52	177.00	1.163	6	9.66	4.64	1.7743
CCI OPA-65R-BU4D	120.0000	265.21	3.05	1.76	177.00	1.163	6	9.66	4.64	1.7743
CCI OPA-65R-BU4D	240.0000	265.21	-3.05	1.76	177.00	1.163	6	9.66	4.64	1.7743
CCI TPA-65R-LCUUUU-H8	0.0000	396.09	0.00	-3.52	177.00	1.163	6	9.76	7.32	1.7743
CCI TPA-65R-LCUUUU-H8	120.0000	396.09	3.05	1.76	177.00	1.163	6	9.76	7.32	1.7743
Quintel QS46512-2	240.0000	229.95	-3.05	1.76	177.00	1.163	6	6.76	5.80	1.7743
Ericsson RUSS-32	0.0000	135.72	0.00	-3.52	177.00	1.163	6	2.63	1.77	1.7743
Ericsson RUSS-32	120.0000	135.72	3.05	1.76	177.00	1.163	6	2.63	1.77	1.7743
Ericsson RUSS-32	240.0000	135.72	-3.05	1.76	177.00	1.163	6	2.63	1.77	1.7743
Ericsson 478 B	0.0000	131.94	0.00	-3.52	177.00	1.163	6	2.62	1.70	1.7743
Ericsson 478 B	120.0000	131.94	3.05	1.76	177.00	1.163	6	2.62	1.70	1.7743
Ericsson 478 B	240.0000	131.94	-3.05	1.76	177.00	1.163	6	2.62	1.70	1.7743
Ericsson 8843	0.0000	120.62	0.00	-3.52	177.00	1.163	6	2.20	1.64	1.7743
Ericsson 8843	120.0000	120.62	3.05	1.76	177.00	1.163	6	2.20	1.64	1.7743
Ericsson 8843	240.0000	120.62	-3.05	1.76	177.00	1.163	6	2.20	1.64	1.7743
Ericsson 4449	0.0000	151.27	0.00	-3.52	177.00	1.163	6	2.57	1.95	1.7743
Ericsson 4449	120.0000	151.27	3.05	1.76	177.00	1.163	6	2.57	1.95	1.7743
Ericsson 4449	240.0000	151.27	-3.05	1.76	177.00	1.163	6	2.57	1.95	1.7743
	Sum	9186.19								

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
	Weight:									

Discrete Appurtenance Pressures - Service $G_H = 0.850$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Torque Arm Face C	180.0000	0.00	0.00	2.53	170.89	1.152	9	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	170.89	1.152	9	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	170.89	1.152	9	3.54	5.32
Torque Arm Face C	180.0000	0.00	0.00	2.53	117.30	1.034	8	3.54	5.32
Torque Arm Face B	60.0000	0.00	2.19	-1.26	117.30	1.034	8	3.54	5.32
Torque Arm Face A	300.0000	0.00	-2.19	-1.26	117.30	1.034	8	3.54	5.32
Sector Frame Mount	0.0000	465.00	0.00	-3.52	177.00	1.163	9	18.00	9.00
Sector Frame Mount	120.0000	465.00	3.05	1.76	177.00	1.163	9	18.00	9.00
Sector Frame Mount	240.0000	465.00	-3.05	1.76	177.00	1.163	9	18.00	9.00
Lightning Rod	0.0000	40.00	0.00	0.00	180.00	1.169	9	1.00	1.00
CCI OPA-65R-BU8D	0.0000	154.00	0.00	-3.52	177.00	1.163	9	36.18	16.40
CCI OPA-65R-BU8D	120.0000	154.00	3.05	1.76	177.00	1.163	9	36.18	16.40
CCI OPA-65R-BU8D	240.0000	154.00	-3.05	1.76	177.00	1.163	9	36.18	16.40
CCI OPA-65R-BU4D	0.0000	53.00	0.00	-3.52	177.00	1.163	9	8.40	3.54
CCI OPA-65R-BU4D	120.0000	53.00	3.05	1.76	177.00	1.163	9	8.40	3.54
CCI OPA-65R-BU4D	240.0000	53.00	-3.05	1.76	177.00	1.163	9	8.40	3.54
CCI TPA-65R-LCUUUU-H8	0.0000	75.00	0.00	-3.52	177.00	1.163	9	7.61	5.12
CCI TPA-65R-LCUUUU-H8	120.0000	75.00	3.05	1.76	177.00	1.163	9	7.61	5.12
Quintel QS46512-2	240.0000	54.00	-3.05	1.76	177.00	1.163	9	5.55	4.61
Ericsson RUSS-32	0.0000	59.00	0.00	-3.52	177.00	1.163	9	2.02	1.25
Ericsson RUSS-32	120.0000	59.00	3.05	1.76	177.00	1.163	9	2.02	1.25
Ericsson RUSS-32	240.0000	59.00	-3.05	1.76	177.00	1.163	9	2.02	1.25
Ericsson 478 B	0.0000	57.00	0.00	-3.52	177.00	1.163	9	2.01	1.19
Ericsson 478 B	120.0000	57.00	3.05	1.76	177.00	1.163	9	2.01	1.19
Ericsson 478 B	240.0000	57.00	-3.05	1.76	177.00	1.163	9	2.01	1.19
Ericsson 8843	0.0000	50.00	0.00	-3.52	177.00	1.163	9	1.65	1.16
Ericsson 8843	120.0000	50.00	3.05	1.76	177.00	1.163	9	1.65	1.16
Ericsson 8843	240.0000	50.00	-3.05	1.76	177.00	1.163	9	1.65	1.16
Ericsson 4449	0.0000	71.00	0.00	-3.52	177.00	1.163	9	1.79	1.41
Ericsson 4449	120.0000	71.00	3.05	1.76	177.00	1.163	9	1.79	1.41
Ericsson 4449	240.0000	71.00	-3.05	1.76	177.00	1.163	9	1.79	1.41
	Sum Weight:	2971.00							

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	3204.87			
Total Member Self-Weight	6342.91			
Guy Weight	2135.83			
Total Weight	13226.62			
Wind 0 deg - No Ice		-15.71	-15023.94	-48.11

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 30 deg - No Ice		7372.97	-12801.78	2485.07
Wind 60 deg - No Ice		12718.91	-7343.27	4352.37
Wind 90 deg - No Ice		14773.15	15.71	5053.46
Wind 120 deg - No Ice		13003.26	7525.58	4400.48
Wind 150 deg - No Ice		7400.18	12817.49	2568.39
Wind 180 deg - No Ice		15.71	14713.75	48.11
Wind 210 deg - No Ice		-7372.97	12801.78	-2485.07
Wind 240 deg - No Ice		-12987.55	7498.37	-4352.37
Wind 270 deg - No Ice		-14773.15	-15.71	-5053.46
Wind 300 deg - No Ice		-12734.62	-7370.48	-4400.48
Wind 330 deg - No Ice		-7400.18	-12817.49	-2568.39
Member Ice	17605.26			
Guy Ice	12437.17			
Total Weight Ice	62551.19			
Wind 0 deg - Ice		-2.70	-5761.69	-81.43
Wind 30 deg - Ice		2862.21	-4962.89	930.67
Wind 60 deg - Ice		4951.68	-2858.85	1693.39
Wind 90 deg - Ice		5729.09	2.70	2002.37
Wind 120 deg - Ice		4988.42	2883.18	1774.82
Wind 150 deg - Ice		2866.88	4965.58	1071.70
Wind 180 deg - Ice		2.70	5722.38	81.43
Wind 210 deg - Ice		-2862.21	4962.89	-930.67
Wind 240 deg - Ice		-4985.72	2878.51	-1693.39
Wind 270 deg - Ice		-5729.09	-2.70	-2002.37
Wind 300 deg - Ice		-4954.38	-2863.53	-1774.82
Wind 330 deg - Ice		-2866.88	-4965.58	-1071.70
Total Weight	13226.62			
Wind 0 deg - Service		-4.06	-3884.39	-12.44
Wind 30 deg - Service		1906.26	-3309.85	642.51
Wind 60 deg - Service		3288.43	-1898.58	1125.29
Wind 90 deg - Service		3819.55	4.06	1306.55
Wind 120 deg - Service		3361.95	1945.71	1137.73
Wind 150 deg - Service		1913.29	3313.92	664.05
Wind 180 deg - Service		4.06	3804.19	12.44
Wind 210 deg - Service		-1906.26	3309.85	-642.51
Wind 240 deg - Service		-3357.88	1938.68	-1125.29
Wind 270 deg - Service		-3819.55	-4.06	-1306.55
Wind 300 deg - Service		-3292.49	-1905.61	-1137.73
Wind 330 deg - Service		-1913.29	-3313.92	-664.05

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy
10	1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy

Comb. No.	Description
11	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
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 Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	15	131060.34	-3.68	490.98
	Max. H_x	11	71433.50	1056.63	4.01
	Max. H_z	2	70982.40	-0.23	1103.73
	Max. M_x	1	0.00	-0.24	10.48
	Max. M_z	1	0.00	-0.24	10.48
	Max. Torsion	1	0.00	-0.24	10.48
	Min. Vert	1	67855.78	-0.24	10.48
	Min. H_x	5	71432.98	-1057.23	3.87
	Min. H_z	8	71842.07	-0.36	-1027.47
	Min. M_x	1	0.00	-0.24	10.48
	Min. M_z	1	0.00	-0.24	10.48
	Min. Torsion	1	0.00	-0.24	10.48
Guy C @ 145 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-9486.85	-9827.49	5685.24
	Max. H_x	10	-9486.85	-9827.49	5685.24
	Max. H_z	17	-25574.73	-28542.41	16474.04
	Min. Vert	4	-27675.61	-27752.07	16009.70
	Min. H_x	17	-25574.73	-28542.41	16474.04
	Min. H_z	10	-9486.85	-9827.49	5685.24
Guy B @ 145 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-9464.54	9812.27	5676.60
	Max. H_x	25	-25579.96	28549.03	16477.58
	Max. H_z	25	-25579.96	28549.03	16477.58

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy A @ 145 ft Elev 0 ft Azimuth 0 deg	Min. Vert	12	-27698.72	27769.02	16019.37
	Min. H_x	6	-9464.54	9812.27	5676.60
	Min. H_z	6	-9464.54	9812.27	5676.60
	Max. Vert	2	-9478.47	-0.09	-11346.05
	Max. H_x	24	-22028.66	719.52	-28431.57
	Max. H_z	2	-9478.47	-0.09	-11346.05
	Min. Vert	8	-27712.73	0.06	-32068.26
	Min. H_x	18	-22032.84	-719.42	-28434.90
	Min. H_z	21	-25682.86	0.20	-33037.77

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	67855.78	0.24	-10.48	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	70982.40	0.23	-1103.73	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	71431.00	522.10	-931.51	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	71842.00	901.11	-531.71	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	71432.98	1057.23	-3.87	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	70986.53	944.94	533.52	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	71436.18	535.14	899.05	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	71842.07	0.36	1027.47	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	71433.63	-534.42	898.97	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	70986.16	-944.26	533.40	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	71433.50	-1056.63	-4.01	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	71845.67	-900.58	-531.82	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	71434.08	-521.62	-931.57	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	129916.68	3.62	-78.63	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	131060.34	3.68	-490.98	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	130666.47	195.17	-432.00	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	130290.40	343.60	-273.53	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	130659.28	406.28	-65.68	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	131054.12	361.31	129.59	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	130663.57	214.66	265.89	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180	130292.53	3.69	315.32	0.00	0.00	0.00

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
deg+1.0 Ice+1.0 Temp+1.0 Guy 1.2 Dead+1.0 Wind 210	130663.97	-207.25	265.89	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy 1.2 Dead+1.0 Wind 240	131054.79	-353.89	129.56	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy 1.2 Dead+1.0 Wind 270	130659.99	-398.87	-65.71	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy 1.2 Dead+1.0 Wind 300	130290.92	-336.21	-273.54	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy 1.2 Dead+1.0 Wind 330	130666.79	-187.79	-432.00	0.00	0.00	0.00
deg+1.0 Ice+1.0 Temp+1.0 Guy Dead+Wind 0 deg - Service+Guy	67992.76	0.21	-292.99	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	67952.80	137.39	-249.20	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	67913.89	236.44	-146.79	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	67952.79	275.57	-9.80	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	67992.69	244.57	130.68	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	67952.56	138.42	227.74	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	67913.60	0.29	262.69	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	67952.67	-137.89	227.72	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	67992.82	-244.05	130.64	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	67952.86	-275.07	-9.83	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	67913.87	-235.96	-146.83	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	67952.76	-136.92	-249.22	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	-13226.17	0.00	0.00	13226.17	0.01	0.000%
2	-15.71	-15593.08	-17461.72	15.72	15593.07	17459.27	0.010%
3	8589.00	-15444.32	-14908.00	-8588.53	15444.30	14904.57	0.015%
4	14830.08	-15295.57	-8562.15	-14827.17	15295.52	8560.28	0.015%
5	17205.21	-15444.32	15.71	-17202.03	15444.27	-14.62	0.015%
6	15114.44	-15593.08	8744.46	-15112.27	15593.04	-8743.33	0.010%
7	8616.21	-15444.32	14923.72	-8613.44	15444.30	-14921.60	0.015%
8	15.71	-15295.57	17151.52	-15.69	15295.55	-17148.07	0.015%
9	-8589.00	-15444.32	14908.00	8586.26	15444.30	-14905.89	0.015%
10	-15098.72	-15593.08	8717.25	15096.56	15593.04	-8716.12	0.010%
11	-17205.21	-15444.32	-15.71	17202.05	15444.27	16.79	0.014%
12	-14845.80	-15295.57	-8589.37	14842.89	15295.52	8587.48	0.015%
13	-8616.21	-15444.32	-14923.72	8615.75	15444.30	14920.27	0.015%
14	0.00	-64766.27	0.00	-0.03	64766.22	0.21	0.000%
15	-2.70	-64938.08	-8562.23	2.68	64937.99	8543.50	0.029%
16	4259.19	-64766.27	-7382.53	-4250.89	64766.17	7368.01	0.026%
17	7377.02	-64594.45	-4259.12	-7363.02	64594.34	4251.03	0.025%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
18	8523.06	-64766.27	2.70	-8506.32	64766.17	-2.66	0.026%
19	7413.76	-64938.08	4283.45	-7397.49	64937.99	-4274.09	0.029%
20	4263.86	-64766.27	7385.23	-4255.44	64766.17	-7370.74	0.026%
21	2.70	-64594.45	8522.92	-2.73	64594.34	-8506.68	0.025%
22	-4259.19	-64766.27	7382.53	4250.69	64766.17	-7368.02	0.026%
23	-7411.06	-64938.08	4278.78	7394.71	64937.99	-4269.40	0.029%
24	-8523.06	-64766.27	-2.70	8506.25	64766.17	2.75	0.026%
25	-7379.72	-64594.45	-4263.80	7365.66	64594.34	4255.71	0.025%
26	-4263.86	-64766.27	-7385.23	4255.52	64766.17	7370.72	0.026%
27	-4.06	-13264.63	-4514.66	4.06	13264.63	4514.22	0.003%
28	2220.65	-13226.17	-3854.41	-2220.43	13226.17	3854.07	0.003%
29	3834.26	-13187.71	-2213.71	-3833.90	13187.70	2213.49	0.003%
30	4448.35	-13226.17	4.06	-4447.94	13226.16	-4.09	0.003%
31	3907.78	-13264.63	2260.85	-3907.41	13264.62	-2260.64	0.003%
32	2227.69	-13226.17	3858.47	-2227.50	13226.17	-3858.11	0.003%
33	4.06	-13187.71	4434.46	-4.06	13187.71	-4434.04	0.003%
34	-2220.65	-13226.17	3854.41	2220.47	13226.17	-3854.05	0.003%
35	-3903.72	-13264.63	2253.81	3903.35	13264.62	-2253.61	0.003%
36	-4448.35	-13226.17	-4.06	4447.94	13226.16	4.03	0.003%
37	-3838.33	-13187.71	-2220.75	3837.96	13187.70	2220.53	0.003%
38	-2227.69	-13226.17	-3858.47	2227.47	13226.17	3858.13	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	13	0.00000001	0.00000001
2	Yes	13	0.00000001	0.00002786
3	Yes	13	0.00000001	0.00004404
4	Yes	13	0.00000001	0.00003997
5	Yes	13	0.00000001	0.00004567
6	Yes	13	0.00000001	0.00003011
7	Yes	13	0.00000001	0.00004478
8	Yes	13	0.00000001	0.00003869
9	Yes	13	0.00000001	0.00004387
10	Yes	13	0.00000001	0.00003006
11	Yes	13	0.00000001	0.00004505
12	Yes	13	0.00000001	0.00004010
13	Yes	13	0.00000001	0.00004434
14	Yes	13	0.00000001	0.00001361
15	Yes	13	0.00086162	0.00011809
16	Yes	13	0.00076385	0.00010257
17	Yes	13	0.00072075	0.00008711
18	Yes	13	0.00075357	0.00009551
19	Yes	13	0.00085572	0.00011266
20	Yes	13	0.00076149	0.00009875
21	Yes	13	0.00072572	0.00008789
22	Yes	13	0.00076410	0.00009929
23	Yes	13	0.00085957	0.00011336
24	Yes	13	0.00075654	0.00009608
25	Yes	13	0.00072219	0.00008736
26	Yes	13	0.00076426	0.00010263
27	Yes	13	0.00000001	0.00000864
28	Yes	13	0.00000001	0.00000714
29	Yes	13	0.00000001	0.00000695
30	Yes	13	0.00000001	0.00000759

31	Yes	13	0.00000001	0.00000827
32	Yes	13	0.00000001	0.00000703
33	Yes	13	0.00000001	0.00000768
34	Yes	13	0.00000001	0.00000705
35	Yes	13	0.00000001	0.00000891
36	Yes	13	0.00000001	0.00000759
37	Yes	13	0.00000001	0.00000687
38	Yes	13	0.00000001	0.00000713

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	0.871	33	0.0475	0.0291
T2	160 - 140	0.687	33	0.0396	0.0374
T3	140 - 120	0.525	33	0.0379	0.0469
T4	120 - 100	0.377	33	0.0238	0.0452
T5	100 - 80	0.333	35	0.0066	0.0766
T6	80 - 60	0.311	27	0.0082	0.1083
T7	60 - 40	0.273	27	0.0072	0.1308
T8	40 - 20	0.246	27	0.0130	0.1495
T9	20 - 5	0.157	27	0.0300	0.1604
T10	5 - 0	0.043	27	0.0389	0.1641

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod	33	0.871	0.0475	0.0291	476718
177.00	Sector Frame Mount	33	0.842	0.0460	0.0301	476718
170.00	Guy	33	0.776	0.0427	0.0326	238358
116.42	Guy	37	0.362	0.0201	0.0484	37130
60.38	Guy	27	0.273	0.0073	0.1304	119074

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	3.705	8	0.2021	0.1181
T2	160 - 140	2.915	8	0.1712	0.1502
T3	140 - 120	2.215	8	0.1626	0.1870
T4	120 - 100	1.584	8	0.1046	0.1803
T5	100 - 80	1.359	4	0.0345	0.3018
T6	80 - 60	1.234	4	0.0375	0.4243
T7	60 - 40	1.061	4	0.0317	0.5111
T8	40 - 20	0.943	4	0.0522	0.5836
T9	20 - 5	0.603	10	0.1151	0.6260
T10	5 - 0	0.164	10	0.1495	0.6404

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

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.00	Lightning Rod	8	3.705	0.2021	0.1181	120977
177.00	Sector Frame Mount	8	3.582	0.1962	0.1219	120977
170.00	Guy	8	3.300	0.1833	0.1316	60488
116.42	Guy	12	1.515	0.0896	0.1928	9300
60.38	Guy	4	1.063	0.0317	0.5096	30015

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	180	Leg	A325N	0.7500	4	4.12	30101.40	0.000 ✔	1	Bolt Tension
		Torque Arm Top@170	A325N	0.7500	2	5599.20	19880.40	0.282 ✔	1	Bolt Shear
		Torque Arm Bottom@170	A325N	0.7500	2	3387.95	19880.40	0.170 ✔	1	Bolt Shear
T2	160	Leg	A325N	0.7500	4	1632.74	30101.40	0.054 ✔	1	Bolt Tension
T3	140	Leg	A325N	0.7500	4	1748.31	30101.40	0.058 ✔	1	Bolt Tension
T4	120	Leg	A325N	0.7500	4	2102.06	30101.40	0.070 ✔	1	Bolt Tension
		Torque Arm Top@116.417	A325N	0.7500	2	4011.87	19880.40	0.202 ✔	1	Bolt Shear
		Torque Arm Bottom@116.417	A325N	0.7500	2	1968.50	19880.40	0.099 ✔	1	Bolt Shear
T5	100	Leg	A325N	0.7500	4	2832.23	30101.40	0.094 ✔	1	Bolt Tension
T6	80	Leg	A325N	0.7500	4	3015.12	30101.40	0.100 ✔	1	Bolt Tension
T7	60	Leg	A325N	0.7500	4	3338.49	30101.40	0.111 ✔	1	Bolt Tension
T8	40	Leg	A325N	0.7500	4	3631.34	30101.40	0.121 ✔	1	Bolt Tension
T9	20	Leg	A325N	0.7500	4	3752.30	30101.40	0.125 ✔	1	Bolt Tension
T10	5	Leg	A325N	0.7500	4	3914.46	30101.40	0.130 ✔	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T_u lb	Allowable ϕT_n lb	Required S.F.	Actual S.F.
T1	170.00 (A) (559)	5/8 EHS	6360.00	42399.99	10520.40	25440.00	1.000	2.418 ✔
	170.00 (A) (560)	5/8 EHS	6360.00	42399.99	10521.60	25440.00	1.000	2.418 ✔
	170.00 (B) (553)	5/8 EHS	6360.00	42399.99	10609.80	25440.00	1.000	2.398 ✔
	170.00 (B) (554)	5/8 EHS	6360.00	42399.99	10411.60	25440.00	1.000	2.443 ✔
	170.00 (C) (547)	5/8 EHS	6360.00	42399.99	10398.30	25440.00	1.000	2.447 ✔
	170.00 (C) (548)	5/8 EHS	6360.00	42399.99	10594.70	25440.00	1.000	2.401 ✔
T4	116.42 (A) (577)	9/16 EHS	5250.00	35000.04	8430.53	21000.00	1.000	2.491 ✔
	116.42 (A) (578)	9/16 EHS	5250.00	35000.04	8435.80	21000.00	1.000	2.489 ✔
	116.42 (B) (571)	9/16 EHS	5250.00	35000.04	8494.70	21000.00	1.000	2.472 ✔
	116.42 (B) (572)	9/16 EHS	5250.00	35000.04	8370.97	21000.00	1.000	2.509 ✔
	116.42 (C) (565)	9/16 EHS	5250.00	35000.04	8367.87	21000.00	1.000	2.510 ✔
	116.42 (C) (566)	9/16 EHS	5250.00	35000.04	8485.17	21000.00	1.000	2.475 ✔
T6	60.38 (A) (585)	9/16 EHS	5250.00	35000.04	8507.93	21000.00	1.000	2.468 ✔
	60.38 (B) (584)	9/16 EHS	5250.00	35000.04	8529.34	21000.00	1.000	2.462 ✔
	60.38 (C) (583)	9/16 EHS	5250.00	35000.04	8529.39	21000.00	1.000	2.462 ✔

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-23309.40	72691.90	0.321 [1] ✔
T2	160 - 140	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-24919.60	72691.90	0.343 [1] ✔
T3	140 - 120	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-28356.00	72691.90	0.390 [1] ✔
T4	120 - 100	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-38344.60	72691.90	0.527 [1] ✔
T5	100 - 80	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-38882.00	72691.90	0.535 [1] ✔
T6	80 - 60	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	1.00	-40121.90	72691.90	0.552 [1] ✔
T7	60 - 40	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-45588.80	71495.30	0.638 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	40 - 20	P2.5x.203	20.00	3.21	40.6 K=1.00	1.7040	0.98	-47209.80	71503.10	0.660 [1] ✔
T9	20 - 5	P2.5x.203	15.00	3.56	45.1 K=1.00	1.7040	1.00	-46656.00	70516.80	0.662 [1] ✔
T10	5 - 0	P2.5x.203	5.39	1.80	22.8 K=1.00	1.7040	0.90	-47822.70	71600.60	0.668 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T10	5 - 0	5/8	2.44	1.46	105.4 K=0.94	0.3068	-3423.33	5538.29	0.618 [1] ✔

[1] $P_u / \phi P_n$ controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-6359.09	14497.90	0.439 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4742.63	14497.90	0.327 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4910.40	14497.90	0.339 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4228.29	14497.90	0.292 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4134.02	14497.90	0.285 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4359.51	14497.90	0.301 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4001.88	14497.90	0.276 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-4079.79	14497.90	0.281 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3574.01	14497.90	0.247 [1] ✔
T10	5 - 0	L1 1/2x1 1/2x3/16	2.33	2.09	55.7 K=0.65	0.5273	-875.70	17134.20	0.051 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3014.54	14497.90	0.208 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2592.94	14497.90	0.179 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2539.56	14497.90	0.175 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2318.36	14497.90	0.160 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2187.41	14497.90	0.151 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2007.90	14497.90	0.138 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2055.70	14497.90	0.142 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-1885.90	14497.90	0.130 [1] ✔
T10	5 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-875.70	14497.90	0.060 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2552.82	14497.90	0.176 [1] ✔
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2584.67	14497.90	0.178 [1] ✔
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3036.17	14497.90	0.209 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2256.81	14497.90	0.156 [1] ✔
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2155.47	14497.90	0.149 [1] ✔
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2208.48	14497.90	0.152 [1] ✔
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-2066.18	14497.90	0.143 [1] ✔
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-808.11	14497.90	0.056 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-7209.29	14497.90	0.497 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-3015.63	14497.90	0.208 [1] ✔
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-399.37	14497.90	0.028 [1] ✔

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-5360.08	14497.90	0.370 [1] ✔
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	86.7 K=0.65	0.5273	-5524.96	14497.90	0.381 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (551)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-6566.19	44187.30	0.149 [1] ✔
T1	180 - 160 (552)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-6688.14	44187.30	0.151 [1] ✔
T1	180 - 160 (557)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-6775.90	44187.30	0.153 [1] ✔
T1	180 - 160 (558)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-6765.08	44187.30	0.153 [1] ✔
T1	180 - 160 (563)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-6575.34	44187.30	0.149 [1] ✔
T1	180 - 160 (564)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-6687.14	44187.30	0.151 [1] ✔
T4	120 - 100 (569)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-3584.85	44187.30	0.081 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100 (570)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-3604.86	44187.30	0.082 [1] ✔
T4	120 - 100 (575)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-3937.01	44187.30	0.089 [1] ✔
T4	120 - 100 (576)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-3936.19	44187.30	0.089 [1] ✔
T4	120 - 100 (581)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-3580.64	44187.30	0.081 [1] ✔
T4	120 - 100 (582)	L3x3x1/4	3.50	3.38	68.5 K=1.00	1.4400	-3599.53	44187.30	0.081 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	P2.5x.203	20.00	3.21	40.6	1.7040	0.00	82816.80	0.000 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	5/8	4.75	4.42	339.7	0.3068	5751.63	9940.20	0.579 [1] ✔
T2	160 - 140	5/8	4.75	4.42	339.7	0.3068	3863.68	9940.20	0.389 [1] ✔
T3	140 - 120	5/8	4.75	4.42	339.7	0.3068	4359.20	9940.20	0.439 [1] ✔
T4	120 - 100	5/8	4.75	4.42	339.7	0.3068	4095.88	9940.20	0.412 [1] ✔
T5	100 - 80	5/8	4.75	4.42	339.7	0.3068	3941.72	9940.20	0.397 [1] ✔
T6	80 - 60	5/8	4.75	4.42	339.7	0.3068	3869.62	9940.20	0.389 [1] ✔
T7	60 - 40	5/8	4.75	4.42	339.7	0.3068	3867.81	9940.20	0.389 [1] ✔
T8	40 - 20	5/8	4.75	4.42	339.7	0.3068	3223.96	9940.20	0.324 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	20 - 5	5/8	4.99	4.65	357.3	0.3068	3086.87	9940.20	0.311 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	403.73	17085.90	0.024 [1]
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	431.62	17085.90	0.025 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	491.14	17085.90	0.029 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	664.15	17085.90	0.039 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	673.46	17085.90	0.039 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	694.93	17085.90	0.041 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	789.62	17085.90	0.046 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	817.70	17085.90	0.048 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	808.11	17085.90	0.047 [1]
T10	5 - 0	L1 1/2x1 1/2x3/16	2.33	2.09	55.0	0.5273	2876.29	17085.90	0.168 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	431.62	17085.90	0.025 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	491.14	17085.90	0.029 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	673.46	17085.90	0.039 [1]
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	694.93	17085.90	0.041 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	789.62	17085.90	0.046 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	817.70	17085.90	0.048 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	808.11	17085.90	0.047 [1]
T10	5 - 0	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	7075.82	17085.90	0.414 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	403.73	17085.90	0.024 [1]
T2	160 - 140	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	431.62	17085.90	0.025 [1]
T3	140 - 120	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	491.14	17085.90	0.029 [1]
T4	120 - 100	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	664.15	17085.90	0.039 [1]
T5	100 - 80	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	673.46	17085.90	0.039 [1]
T7	60 - 40	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	789.62	17085.90	0.046 [1]
T8	40 - 20	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	817.70	17085.90	0.048 [1]
T9	20 - 5	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	1935.87	17085.90	0.113 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T6	80 - 60	L1 1/2x1 1/2x3/16	3.50	3.26	85.7	0.5273	2225.63	17085.90	0.130 [1]

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (549)	L2x2x5/16	4.75	4.59	91.6	1.1500	11190.60	37260.00	0.300 [1] ✔
T1	180 - 160 (550)	L2x2x5/16	4.75	4.59	91.6	1.1500	11196.80	37260.00	0.301 [1] ✔
T1	180 - 160 (555)	L2x2x5/16	4.75	4.59	91.6	1.1500	11140.40	37260.00	0.299 [1] ✔
T1	180 - 160 (556)	L2x2x5/16	4.75	4.59	91.6	1.1500	11155.60	37260.00	0.299 [1] ✔
T1	180 - 160 (561)	L2x2x5/16	4.75	4.59	91.6	1.1500	11176.30	37260.00	0.300 [1] ✔
T1	180 - 160 (562)	L2x2x5/16	4.75	4.59	91.6	1.1500	11198.40	37260.00	0.301 [1] ✔
T4	120 - 100 (567)	L2x2x5/16	4.75	4.59	91.6	1.1500	7983.55	37260.00	0.214 [1] ✔
T4	120 - 100 (568)	L2x2x5/16	4.75	4.59	91.6	1.1500	8018.76	37260.00	0.215 [1] ✔
T4	120 - 100 (573)	L2x2x5/16	4.75	4.59	91.6	1.1500	7999.09	37260.00	0.215 [1] ✔
T4	120 - 100 (574)	L2x2x5/16	4.75	4.59	91.6	1.1500	7997.53	37260.00	0.215 [1] ✔
T4	120 - 100 (579)	L2x2x5/16	4.75	4.59	91.6	1.1500	7984.11	37260.00	0.214 [1] ✔
T4	120 - 100 (580)	L2x2x5/16	4.75	4.59	91.6	1.1500	8023.73	37260.00	0.215 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	180 - 160 (551)	L3x3x1/4	3.50	3.38	43.6	1.4400	5.52	46656.00	0.000 [1] ✔
T1	180 - 160 (552)	L3x3x1/4	3.50	3.38	43.6	1.4400	94.82	46656.00	0.002 [1] ✔
T1	180 - 160 (557)	L3x3x1/4	3.50	3.38	43.6	1.4400	192.09	46656.00	0.004 [1] ✔
T1	180 - 160 (558)	L3x3x1/4	3.50	3.38	43.6	1.4400	176.00	46656.00	0.004 [1] ✔
T1	180 - 160 (563)	L3x3x1/4	3.50	3.38	43.6	1.4400	18.02	46656.00	0.000 [1] ✔
T1	180 - 160 (564)	L3x3x1/4	3.50	3.38	43.6	1.4400	91.83	46656.00	0.002 [1] ✔
T4	120 - 100 (569)	L3x3x1/4	3.50	3.38	43.6	1.4400	632.15	46656.00	0.014 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100 (570)	L3x3x1/4	3.50	3.38	43.6	1.4400	670.90	46656.00	0.014 [1]
T4	120 - 100 (575)	L3x3x1/4	3.50	3.38	43.6	1.4400	960.30	46656.00	0.021 [1]
T4	120 - 100 (576)	L3x3x1/4	3.50	3.38	43.6	1.4400	960.50	46656.00	0.021 [1]
T4	120 - 100 (581)	L3x3x1/4	3.50	3.38	43.6	1.4400	627.40	46656.00	0.013 [1]
T4	120 - 100 (582)	L3x3x1/4	3.50	3.38	43.6	1.4400	666.02	46656.00	0.014 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	180 - 160	Leg	P2.5x.203	2	-23309.40	72691.90	32.1	Pass
		Diagonal	5/8	46	5751.63	9940.20	57.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	54	-6359.09	14497.90	43.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	6	-3014.54	14497.90	20.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	7	-2552.82	14497.90	17.6	Pass
		Guy A@170	5/8	560	10521.60	25440.00	41.4	Pass
		Guy B@170	5/8	553	10609.80	25440.00	41.7	Pass
		Guy C@170	5/8	548	10594.70	25440.00	41.6	Pass
		Top Guy Pull-Off@170	L1 1/2x1 1/2x3/16	45	-7209.29	14497.90	49.7	Pass
		Bottom Guy Pull-Off@170	L1 1/2x1 1/2x3/16	36	-5360.08	14497.90	37.0	Pass
		Torque Arm Top@170	L2x2x5/16	562	11198.40	37260.00	30.1	Pass
		Torque Arm Bottom@170	L3x3x1/4	557	-6775.90	44187.30	15.3 17.0 (b)	Pass
T2	160 - 140	Leg	P2.5x.203	62	-24919.60	72691.90	34.3	Pass
		Diagonal	5/8	115	3863.68	9940.20	38.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	114	-4742.63	14497.90	32.7	Pass
		Top Girt	L1 1/2x1 1/2x3/16	66	-2592.94	14497.90	17.9	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	67	-2584.67	14497.90	17.8	Pass
T3	140 - 120	Leg	P2.5x.203	122	-28356.00	72691.90	39.0	Pass
		Diagonal	5/8	131	4359.20	9940.20	43.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	138	-4910.40	14497.90	33.9	Pass
		Top Girt	L1 1/2x1 1/2x3/16	125	-2539.56	14497.90	17.5	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	127	-3036.17	14497.90	20.9	Pass
T4	120 - 100	Leg	P2.5x.203	182	-38344.60	72691.90	52.7	Pass
		Diagonal	5/8	226	4095.88	9940.20	41.2	Pass
		Horizontal	L1 1/2x1 1/2x3/16	198	-4228.29	14497.90	29.2	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	187	-2256.81	14497.90	15.6	Pass
		Guy A@116.417	9/16	578	8435.80	21000.00	40.2	Pass
		Guy B@116.417	9/16	571	8494.70	21000.00	40.5	Pass
		Guy C@116.417	9/16	566	8485.17	21000.00	40.4	Pass
		Top Guy Pull-Off@116.417	L1 1/2x1 1/2x3/16	184	-3015.63	14497.90	20.8	Pass
		Bottom Guy	L1 1/2x1 1/2x3/16	234	-5524.96	14497.90	38.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Pull-Off@116.417						
		Torque Arm Top@116.417	L2x2x5/16	580	8023.73	37260.00	21.5	Pass
		Torque Arm Bottom@116.417	L3x3x1/4	575	-3937.01	44187.30	8.9 9.9 (b)	Pass
T5	100 - 80	Leg	P2.5x.203	241	-38882.00	72691.90	53.5	Pass
		Diagonal	5/8	295	3941.72	9940.20	39.7	Pass
		Horizontal	L1 1/2x1 1/2x3/16	257	-4134.02	14497.90	28.5	Pass
		Top Girt	L1 1/2x1 1/2x3/16	246	-2318.36	14497.90	16.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	247	-2155.47	14497.90	14.9	Pass
T6	80 - 60	Leg	P2.5x.203	301	-40121.90	72691.90	55.2	Pass
		Diagonal	5/8	312	3869.62	9940.20	38.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	317	-4359.51	14497.90	30.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	305	-2187.41	14497.90	15.1	Pass
		Guy A@60.375	9/16	585	8507.93	21000.00	40.5	Pass
		Guy B@60.375	9/16	584	8529.34	21000.00	40.6	Pass
		Guy C@60.375	9/16	583	8529.39	21000.00	40.6	Pass
		Top Guy Pull-Off@60.375	L1 1/2x1 1/2x3/16	308	2225.63	17085.90	13.0	Pass
T7	60 - 40	Leg	P2.5x.203	361	-45588.80	71495.30	63.8	Pass
		Diagonal	5/8	415	3867.81	9940.20	38.9	Pass
		Horizontal	L1 1/2x1 1/2x3/16	377	-4001.88	14497.90	27.6	Pass
		Top Girt	L1 1/2x1 1/2x3/16	365	-2007.90	14497.90	13.8	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	367	-2208.48	14497.90	15.2	Pass
T8	40 - 20	Leg	P2.5x.203	421	-47209.80	71503.10	66.0	Pass
		Diagonal	5/8	476	3223.96	9940.20	32.4	Pass
		Horizontal	L1 1/2x1 1/2x3/16	472	-4079.79	14497.90	28.1	Pass
		Top Girt	L1 1/2x1 1/2x3/16	425	-2055.70	14497.90	14.2	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	427	-2066.18	14497.90	14.3	Pass
T9	20 - 5	Leg	P2.5x.203	481	-46656.00	70516.80	66.2	Pass
		Diagonal	5/8	493	3086.87	9940.20	31.1	Pass
		Horizontal	L1 1/2x1 1/2x3/16	497	-3574.01	14497.90	24.7	Pass
		Top Girt	L1 1/2x1 1/2x3/16	485	-1885.90	14497.90	13.0	Pass
		Bottom Girt	L1 1/2x1 1/2x3/16	489	1935.87	17085.90	11.3	Pass
T10	5 - 0	Leg	P2.5x.203	523	-47822.70	71600.60	66.8	Pass
		Diagonal	5/8	536	-3423.33	5538.29	61.8	Pass
		Horizontal	L1 1/2x1 1/2x3/16	538	2876.29	17085.90	16.8	Pass
		Top Girt	L1 1/2x1 1/2x3/16	526	7075.82	17085.90	41.4	Pass
							Summary	
						Leg (T10)	66.8	Pass
						Diagonal (T10)	61.8	Pass
						Horizontal (T1)	43.9	Pass
						Top Girt (T10)	41.4	Pass
						Bottom Girt (T3)	20.9	Pass
						Guy A (T1)	41.4	Pass
						Guy B (T1)	41.7	Pass
						Guy C (T1)	41.6	Pass
						Top Guy Pull-Off (T1)	49.7	Pass
						Bottom Guy Pull-Off (T4)	38.1	Pass
						Torque Arm Top (T1)	30.1	Pass
						Torque Arm Bottom (T1)	17.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
						Bolt Checks	28.2	Pass
						RATING =	**66.8**	**Pass**

Site Name:	**Stafford Tolland Ave.**
Job Number:	**124-23005**
Date:	**1/31/2024**

Design Base Loads (Factored) per TIA-222-H

Moment (M_u):	0.0	k-ft	Concrete Compressive Strength (f'_c):	3000	psi
Shear/Leg (V_u):	1.1	k	Vertical Steel Rebar Size #:	5	
Compression/Leg (P_u):	131.1	k	Vertical Steel Rebar Area:	0.31	in^2
Uplift/Leg (T_u):	0.0	k	# of Vertical Steel Rebars:	5	
Tower Type (GT / SST):	GT		Vertical Steel Rebar Yield Strength (F_y):	60	ksi
Diameter of Prismatic Portion of Pier (d):	1.0	ft	Tie / Stirrup Size #:	4	
Depth to Base of Foundation:	5.0	ft	Tie / Stirrup Area:	0.20	in^2
Pier Height Above Ground (h):	0.25	ft	Tie / Stirrup Spacing:	10.0	in
Length / Width of Pad (w):	5.5	ft	Tie / Stirrup Steel Yield Strength (F_y):	40	ksi
Thickness of Pad (t):	5.5	ft	Rebar Cage Diameter:	4.0	in
Depth Below Ground Surface to Water Table (w):	10.0	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:	110.0	pcf	Steel Elastic Modulus:	29000	ksi
Unit Weight of Soil Below Water Table:	55.0	pcf	Pad Steel Rebar Size #:	5	
Friction Angle of Uplift from Top of Pad:	30	Degrees	Pad Steel Rebar Area:	0.31	in^2
Friction Angle of Uplift from Base of Pad:	30	Degrees	Pad Steel Rebar Yield Strength (F_y):	60	ksi
Uplift Angle Started at Top or Base of Pad (T/B):	T		# of Rebar in Top of Pad:	0	
Ultimate Skin Friction:	0	psf	# of Rebar in Base of Pad:	5	
Ultimate Compressive Bearing Pressure:	12000	psf	Pad Clear Cover:	3	in
Capacity Increase (Due to Transient Loads):	1.00				
Bearing Strength Reduction Factor (ϕ_s):	0.60				
Uplift Strength Reduction Factor (ϕ_s):	0.75				

Axial Capacities and Design Moment

Weight of Concrete (Bouyancy Considered):	24.9	k	
Weight of Soil (Bouyancy Considered):	0.0	k	
Ultimate Skin Friction Resistance:	0.0	k	
Controlling Failure Mode (Top / Base):	Top		
Nominal Uplift Capacity per Leg ($\phi_s T_n$):	17.6	k	
Nominal Compressive Capacity per Leg ($\phi_s P_n$):	217.8	k	
P_u:	139.1	k	
$T_u/\phi_s T_n$:	0.00	Result:	OK
$P_u/\phi_s P_n$:	0.64	Result:	OK

Depth (ft) Top	Depth (ft) Bottom	Ultimate Lateral Bearing Pressure (psf)	Increment (psf/ft)	γ_{Soil} (pcf)	Cohesion (psf)	ϕ (degree)
0.0	2.0	0.0	110.0	110	0	0
2	-0.5	660.0	330.0	110	0	30

Inflection Point (Below Ground Surface):	0.0	ft
Factored Design Moment At Inflection Point (M_u):	0.0	k-ft

Pad Strength Capacity

β:	0.85	ACI318-05 - 10.2.7.3
Lower Pad Flexural Reinforcement Ratio:	0.0004	OK - Minimum Reinforcement Ratio Met - A
Upper Pad Flexural Reinforcement Ratio:	0.0000	OK - Minimum Reinforcement Ratio Met - A
Lower Pad Flexural Reinforcement Spacing:	15	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
Upper Pad Flexural Reinforcement Spacing:	0	in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4
One Way Design Shear (V_u):	0.0	k
One Way Shear Capacity (ϕV_c):	341.5	k - ACI318-05 - 11.3.1.1
V_u / ϕV_c:	0.00	Result: OK
Punching Design Shear (V_u):	0.0	k
Nominal Punching Shear Capacity ($\phi_c V_n$):	2416.9	k - ACI318-05 - 11.12.2.1
V_u / ϕV_c:	0.00	Result: OK
Flexural Loading Due to Soil Pressure (M_u):	63.4	k-ft
Lower Steel Pad Moment Capacity (ϕM_n):	435.3	k-ft - ACI318-05 - 10.3
M_u / ϕM_n:	0.15	Result: OK
Flexural Loading Due to Uplift (M_u):	0.0	k-ft
Upper Steel Pad Moment Capacity (ϕM_n):	0.0	k-ft - ACI318-05 - 10.3
M_u / ϕM_n:	0.00	Result: OK

Site Name:	**Stafford Tolland Ave.**
Site Number:	**124-23005**
Date:	**1/31/2024**

Design Standard per TIA-222-H

Anchor Radius:	145.0	ft
Uplift (Factored - P_u):	27.7	k
Shear (Factored - V_u):	32.1	k
Anchor Base Depth (d):	8.5	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):	10.0	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:	110.0	pcf
Unit Weight of Water:	62.4	pcf
Submerged Soil Unit Weight:	50.0	pcf
Internal Angle of Friction:	30	Degrees
Cohesion:	0	psf
Ultimate 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
Uplift Strength Reduction Factor (ϕ_u):	0.75	
Shear Strength Reduction Factor (ϕ_v):	0.75	
Concrete Uplift Strength Reduction Factor (ϕ_u):	0.90	

Uplift

Weight of Concrete (Buoyancy Effect Considered):	19.0	k
Weight of Soil (Buoyancy Effect Considered):	101.4	k
Ultimate Uplift Resistance from Skin Friction:	0.0	k
Nominal Factored Uplift Resistance ($\phi_u P_n$):::	93.1	k
P_u / $\phi_u P_n$:	0.30	Result: OK

Shear

Ultimate Shear Friction Resistance Due to Normal Force - Uplift:	13.0	k
Passive Pressure:	2475	psf
Ultimate Passure Pressure Resistance:	56.9	k
Nominal Shear Resistance ($\phi_v V_n$):	52.5	k
V_u / $\phi_v V_n$:	0.61	Result: OK

Anchor Rod Capacity

# of Anchor Rods:	1		Rod F_y:	49 ksi
Anchor Rod Gross Area:	1.77	in^2	Rod F_u:	62 ksi
Anchor Rod Net Area:	1.77	in^2	ϕ_y:	0.80
Resultant Tensile Load (T_u):	42.4	k	ϕ_t:	0.65
Anchor Rod Tensile Resistance (ϕT_n):::	69.3	k		
T_u / ϕT_n:	0.61	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	
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):	8.8	k
Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$):	122.3	k
$V_u/\phi_v V_n$:	0.07	Result: OK
One Way Shear due to Uplift (V_u):	11.8	k
Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$):	108.4	k
$V_u/\phi_v V_n$:	0.11	Result: OK
Pad Flexure due to Shear Load (M_u):	46.1	k-ft
Nominal Flexural Capacity for Shear Load ($\phi_b M_n$):	167.4	k-ft
Pad Flexure due to Uplift (M_u):	39.8	k-ft
Nominal Flexural Capacity for Uplift ($\phi_b M_n$):	161.9	k-ft
$M_u/\phi_b M_n$ (Max.):	0.28	Result: OK

October 26, 2022
November 15, 2022 (Rev. 1)
May 18, 2023 (Rev. 2)

Smartlink, LLC
1997 Annapolis Exchange Pkwy, Suite 200
Annapolis, MD 21401

RE:		
	AT&T Site Number:	CT1185 (C-Band)
	FA Number:	10092207
	PACE Number:	MRCTB062250
	PT Number:	2051A147CA
	TEP Project Number:	317743.850066
	AT&T Site Name:	STAFFORD SPRINGS TOLLAND AVENUE
	Site Address:	64 Tolland Avenue Stafford, CT 06076

To Whom It May Concern:

TEP Northeast (TEP NE) has been authorized by Smartlink, LLC to perform a mount analysis on the existing AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading (based on RFDS V3.0 dated 4/25/2023):

- (2) TPA-65R-LCUUUU-H8 Antennas (96.0"x14.4"x8.6" – Wt. = 75 lbs. /each)
- (1) QS46512-2 Antenna (52.0"x12.0"x10.8" – Wt. = 75 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each) (Standoff)
- (2) DC6-48-60-18-8F Surge Arrestors (31.4"x10.2"Ø – Wt. = 29 lbs. /each) (Tower mounted)
- **(4) OPA65R-BU8DA Antennas (96.0"x20.7"x7.7" – Wt. = 77 lbs. /each)**
- **(2) OPA65R-BU4DA Antennas (48.0"x20.7"x7.7"– Wt. = 46 lbs. /each)**
- **(3) 4478 B14 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each) (Standoff)**
- **(3) 8843 B2/B66A RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each) (Standoff)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each) (Standoff)**
- **(3) 2012 B29 RRH's (16.5"x13.5"x5.9" – Wt. = 43 lbs. /each) (Pos. 3)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. This office conducted a survey climb and mapping of the existing AT&T antenna mounts on October 12, 2022.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2021 with 2022 Connecticut State Building Code, and AT&T Mount Technical Directive – R22.
- TEP NE considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix P of the Connecticut State Building Code, the max basic wind speed for this site is equal to 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.77 in was used for this analysis.
- TEP NE considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- TEP NE considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- TEP NE considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.173 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.064.
- The mounts have been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mounts have been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mounts are secured to the existing guyed tower with ubolts tightened around the tower leg. TEP NE considers the ubolts as the governing connection members.

Based on our evaluation, we have determined that the modified mounts **ARE CAPABLE** of supporting the proposed installation with the following modifications:

- **Install proposed L2x2x1/4 angle brace secured to existing angle mount standoff (typ. of 2 per sector, total of 6).**
- **Install proposed 2" std. (2.38" O.D.) pipe brace secured to the existing mount and tower leg (typ. of 1 per sector, total of 3).**
- **Install proposed 2-1/2" std. (2.88" O.D.) pipe mast secured to the existing mount (typ. of 3 per sector, total of 9).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Modified (C-Band) Mount Rating	11	LC46	80%	**PASS**

Reference Documents:

- Mount mapping report prepared by TEP NE dated October 17, 2022.

This determination was based on the following limitations and assumptions:

1. TEP NE is not responsible for any modifications completed prior to and hereafter which TEP NE was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mounts have been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. TEP NE performed a localized analysis on the mounts itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
TEP Northeast

Michael Cabral
Director

Daniel P. Hamm, PE
Vice President

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

10/12/2022

Wind & Ice
Calculations

[illegible]
[illegible]
[illegible]
[illegible]

TEP NORTHEAST

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible] [illegible]
[illegible]		[illegible]	[illegible] [illegible]
		[illegible]	[illegible] [illegible]
[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible] [illegible]
		[illegible]	[illegible] [illegible]
		[illegible]	[illegible] [illegible]
		[illegible]	[illegible] [illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

TEP NORTHEAST

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] [illegible]

[illegible] [illegible] [illegible] [illegible]

[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible]

[illegible] [illegible] [illegible]

[illegible]
[illegible]

[illegible] [illegible] [illegible] [illegible]

[illegible]

[illegible]

[illegible] [illegible]

[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]

[illegible]

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

[illegible]

TEP NORTHEAST

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]
[illegible]
[illegible]
[illegible]

[illegible]

[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TEP NORTHEAST

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]

[illegible]

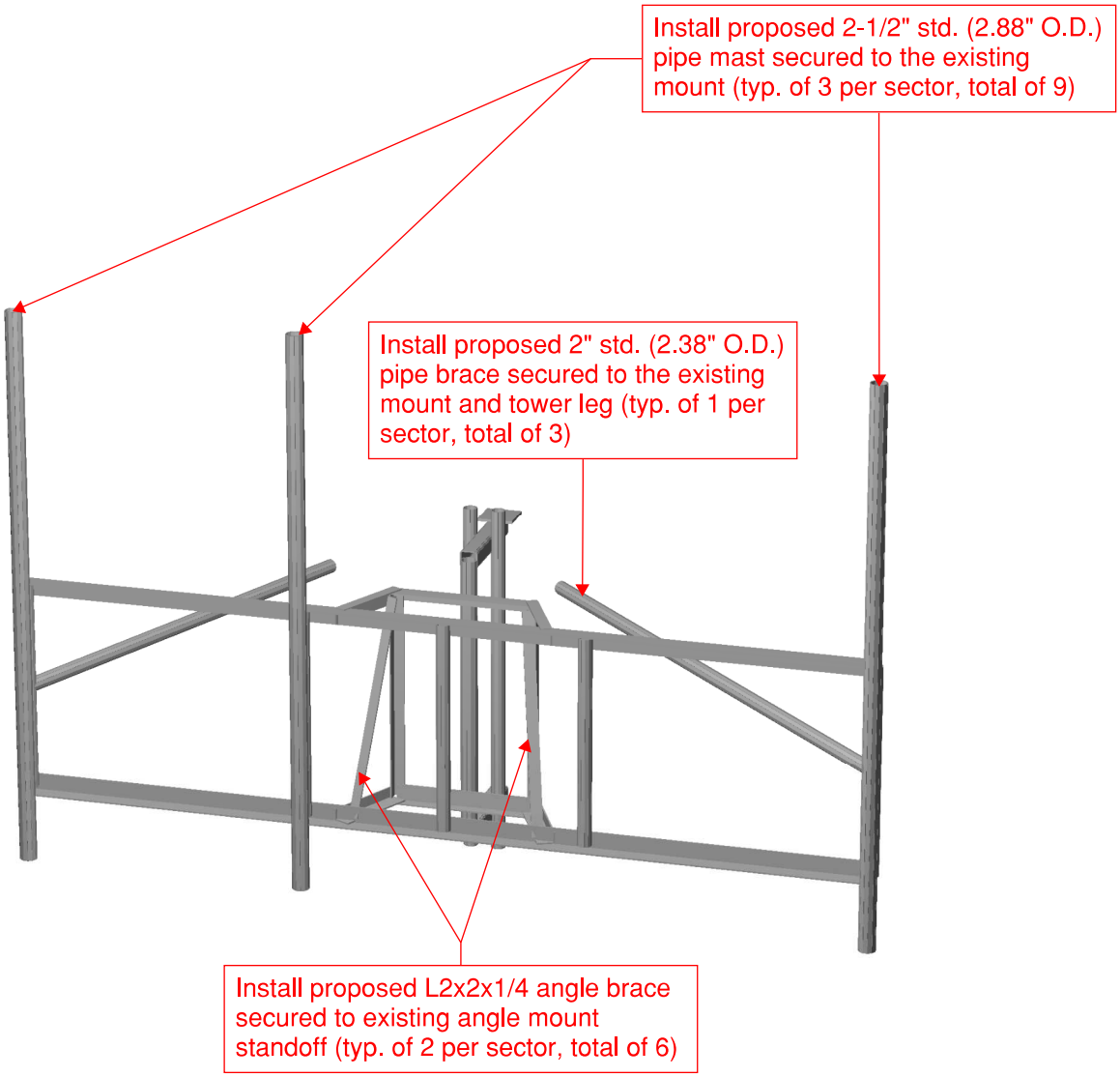
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]												
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

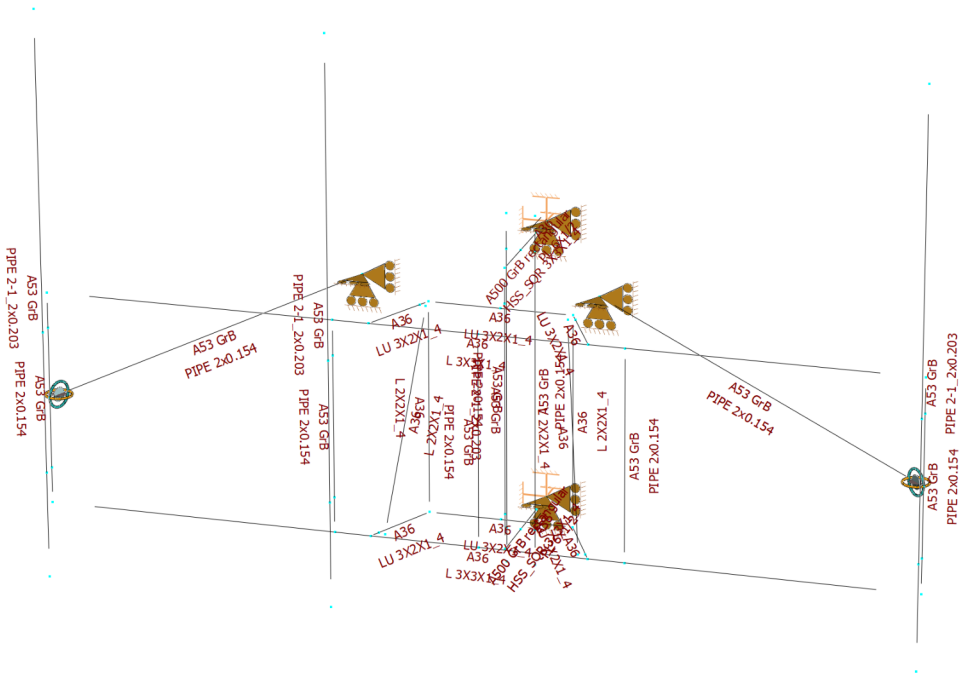
TEP NORTHEAST

TEP NORTHEAST

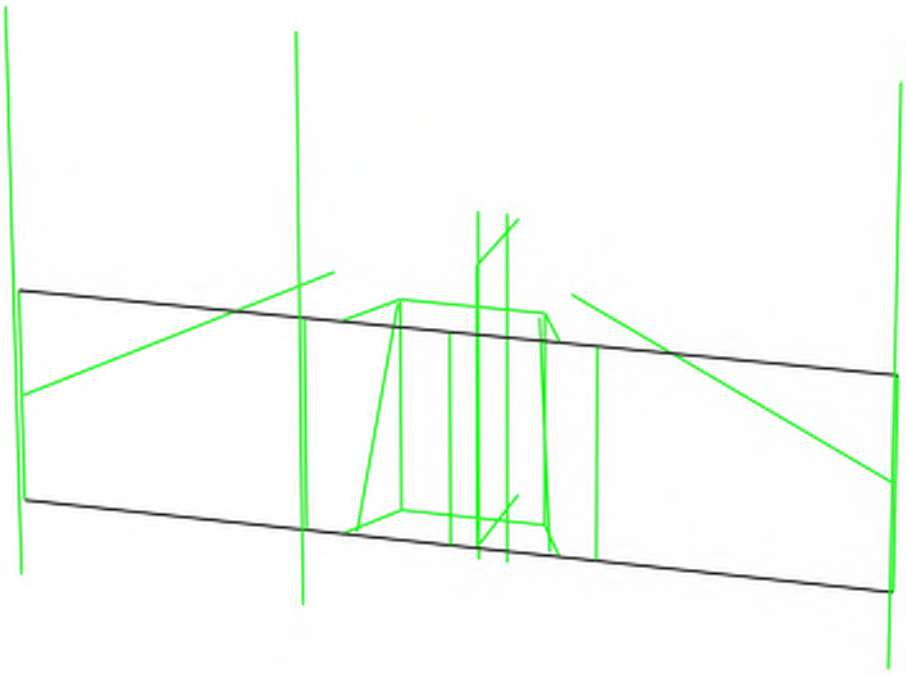
[illegible]

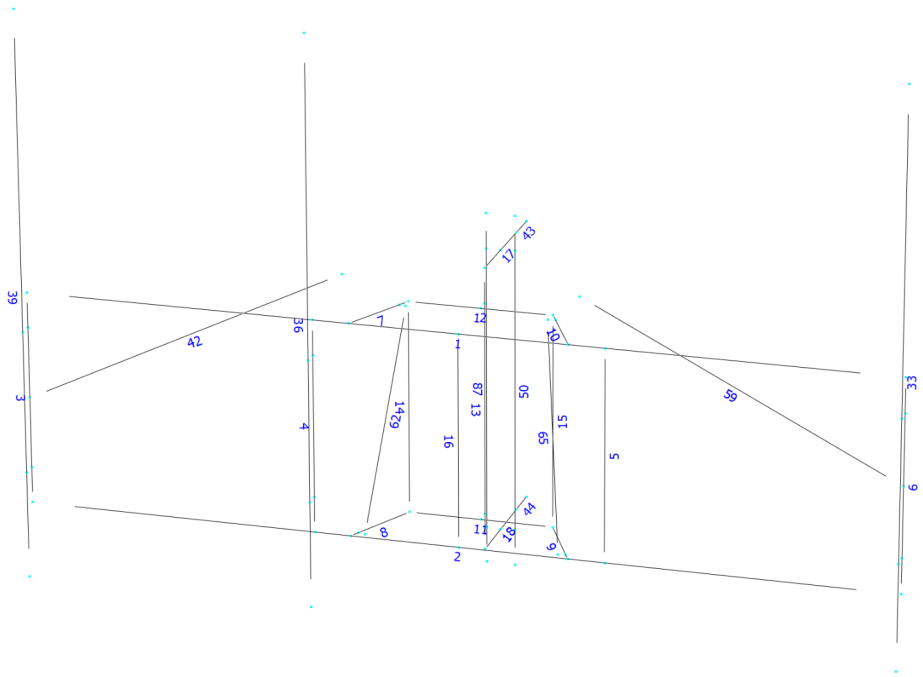
Mount Calculations
(Modified Conditions)

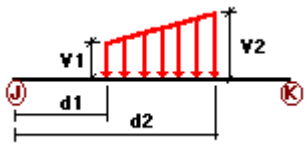

Install proposed 2-1/2" std. (2.88" O.D.) pipe mast secured to the existing mount (typ. of 3 per sector, total of 9)
Install proposed 2" std. (2.38" O.D.) pipe brace secured to the existing mount and tower leg (typ. of 1 per sector, total of 3)
Install proposed L2x2x1/4 angle brace secured to existing angle mount standoff (typ. of 2 per sector, total of 6)
Y
X
Z

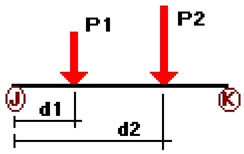

A53 GrB
PIPE 2x0.154
PIPE 2-1_2x0.203
PIPE 2x0.154
A36
LU 3X2X1_4
L 3X3X1_4
L 2X2X1_4
A500 GrB
HSS_SQR 3X3X1_4
Y
X
Z

Design status
- Not designed
- Error on design
- Design O.K.
- With warnings




39
42
56
7
12
10
43
17
1
3
4
14
29
13
87
16
50
55
51
68
5
33
9
44
11
18
8
2
6
Y
X
Z


V1
V2
J
K
d1
d2


P1
P2
J
K
d1
d2

| | | |

RAM® Elements
CONNECT Edition

RAM® Elements
CONNECT Edition

□□□□□□□□

□□□□□□□

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

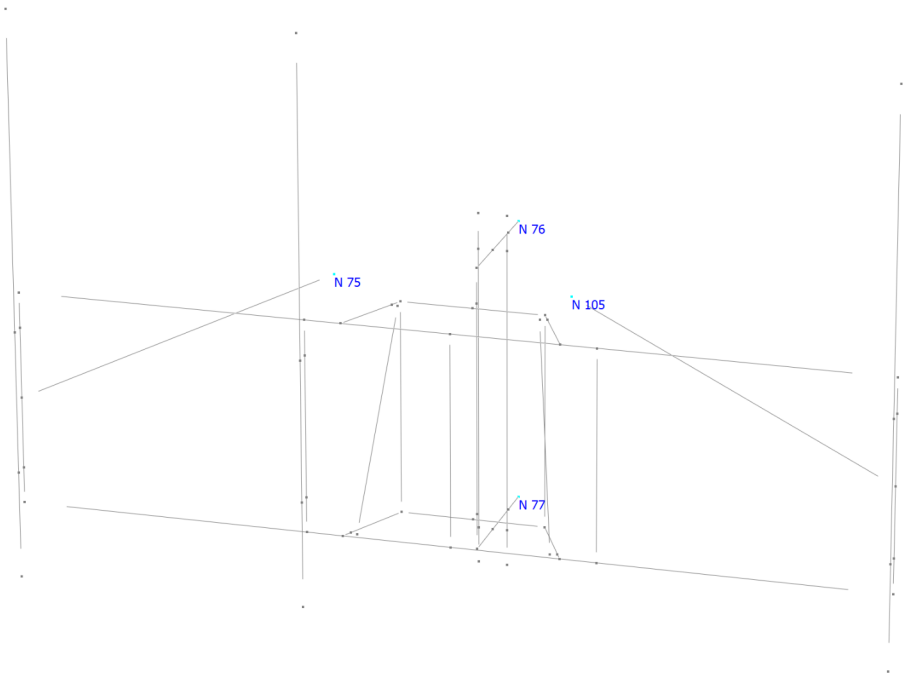
[illegible]

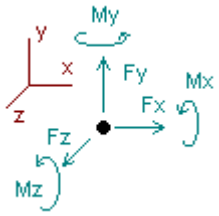
[illegible]

[illegible]

[illegible]

[illegible]


N 76
N 75
N 105
N 77
Y
X
Z


My
y
x
Fy
Mx
Fx
z
Fz
Mz

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Condition **LC62=1.2D-WL120+1.6LLa2**

75	-0.00575	0.01314	0.01379	0.00000	0.00000	0.00000
76	0.40746	1.03525	-1.11790	-0.72990	0.66727	-0.05704
77	-0.47850	1.01949	1.14187	-0.72692	-0.83037	-0.06627
105	0.01951	0.01720	0.01951	0.00000	0.00000	0.00000
SUM	-0.05728	2.08508	0.05728	-1.45682	-0.16310	-0.12331

Condition **LC63=1.2D-WL150+1.6LLa2**

75	-0.00803	0.01312	0.01928	0.00000	0.00000	0.00000
76	0.38532	1.03461	-1.10804	-0.72838	0.62371	-0.05435
77	-0.48677	1.02015	1.13768	-0.72681	-0.84872	-0.06703
105	0.03028	0.01718	0.03028	0.00000	0.00000	0.00000
SUM	-0.07920	2.08508	0.07920	-1.45518	-0.22501	-0.12138

Condition **LC64=1.2D+WL0+1.6LLa3**

75	-0.01996	0.01272	0.04790	0.00000	0.00000	0.00000
76	1.20021	1.03342	-1.08613	-0.72510	2.12487	-0.16750
77	-1.21754	1.02168	1.12993	-0.72679	-2.17452	-0.17243
105	0.03730	0.01726	0.03730	0.00000	0.00000	0.00000
SUM	0.00000	2.08508	0.12900	-1.45189	-0.04966	-0.33993

Condition **LC65=1.2D+WL30+1.6LLa3**

75	-0.01707	0.01278	0.04096	0.00000	0.00000	0.00000
76	1.27480	1.03514	-1.11184	-0.72915	2.27039	-0.17659
77	-1.19214	1.01993	1.13648	-0.72651	-2.11766	-0.17014
105	0.01360	0.01723	0.01360	0.00000	0.00000	0.00000
SUM	0.07920	2.08508	0.07920	-1.45566	0.15273	-0.34673

Condition **LC66=1.2D+WL60+1.6LLa3**

75	-0.01239	0.01289	0.02974	0.00000	0.00000	0.00000
76	1.25770	1.03554	-1.12105	-0.73046	2.23612	-0.17444
77	-1.19530	1.01942	1.14132	-0.72679	-2.12566	-0.17030
105	0.00727	0.01722	0.00727	0.00000	0.00000	0.00000
SUM	0.05728	2.08508	0.05728	-1.45725	0.11046	-0.34474

Condition **LC67=1.2D+WL90+1.6LLa3**

75	-0.00520	0.01306	0.01247	0.00000	0.00000	0.00000
76	1.27268	1.03683	-1.15067	-0.73479	2.26119	-0.17615
77	-1.18784	1.01798	1.14784	-0.72662	-2.11108	-0.16946
105	-0.00964	0.01721	-0.00964	0.00000	0.00000	0.00000
SUM	0.07000	2.08508	0.00000	-1.46141	0.15011	-0.34560

Condition **LC68=1.2D+WL120+1.6LLa3**

75	0.00343	0.01327	-0.00824	0.00000	0.00000	0.00000
76	1.26524	1.03924	-1.17977	-0.73960	2.24139	-0.17509
77	-1.18729	1.01537	1.15485	-0.72594	-2.11260	-0.16919
105	-0.02411	0.01719	-0.02412	0.00000	0.00000	0.00000
SUM	0.05728	2.08508	-0.05728	-1.46554	0.12879	-0.34428

[illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] [illegible]

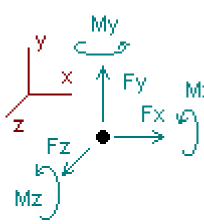
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible] [illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]


My
y
x
Fy
Mx
Fx
z
Fz
Mz

Connection Check

□□□□□□□□□□□□□□□□ 5/18/2023
□□□□□□□□□□ □□ □□ STAFFORD SPRINGS TOLLAND AVENUE
□□□□□□□□□□ □□□ CT1185
□□□□□□□□□□□□ JC □□□□□□□□□□□□ MSC

CHECK CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A36 5/8" U-Bolt

Allowable Tensile Load =

F_{Tall} = 6673 lbs.

Allowable Shear Load =

F_{Vall} = 4004 lbs.

TENSILE FORCES

Reaction **F =** 1985 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 1541 lbs. (See Bentley Output)
Reactions in Y direction: 1659 lbs. (See Bentley Output)

Resultant: 2264 lbs.

No. of Supports = 1
No. of Bolts / Support = 2

Tension Design Load /Bolts =

f_t = 992.50 lbs. < 6673 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v = 1132.14 lbs. < 4004 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.149	+	0.283	=	0.432	<	1.0	**Therefore, OK !**

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING GUYED TOWER:
- INSTALL STRUCTURAL MOUNT MODIFICATIONS (REFER TO "S" SHEETS)
- INSTALL ANTENNA (OPA65R-BU8D) @ POS. 1 & 4 (TYP. OF 2 PER ALPHA & BETA SECTORS, TOTAL OF 4).
- INSTALL ANTENNA (OPA65R-BU4D) @ POS. 1 & 4 (GAMMA SECTOR, TOTAL OF 2).
- INSTALL RRUS 4478 B14 (700) @ POS. 1 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL RRUS 8843 B2/B66A (1900/AWS) @ POS. 1 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (ADD Y-CABLE).
- INSTALL RRUS 4449 B5/B12 (700/850) @ POS. 4 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (ADD Y-CABLE).
- INSTALL RRUS 2012 B29 (700) @ POS. 3 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- INSTALL (6) Y-CABLES (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- RELOCATED EXISTING RRUS-32 B30 (WCS) @ POS. 4 (TYP. OF 1 PER SECTOR, TOTAL OF 3)

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD (2) -48V RECTIFIERS TO EXISTING DC POWER PLANT.
- ADD (1) 6651+XCEDE CABLE

FINAL: 1x5216/1xXMU/1x6651+XCEDE CABLE

ITEMS TO BE REMOVED:
- DECOMMISSION EXISTING AT&T UMTS ANTENNA (7770) (TYP. OF 1 PER SECTOR TOTAL OF 3).
- DECOMMISSION EXISTING LTE AT&T ANTENNA (SBNH-1D6565C) (1 PER ALPHA SECTOR, TOTAL OF 1).
- DECOMMISSION EXISTING LTE AT&T ANTENNA (P65-17-XLH-RR) (1 PER BETA SECTOR, TOTAL OF 1).
- DECOMMISSION EXISTING LTE AT&T ANTENNA (AM-X-CD-14-65-00T-RET) (1 PER GAMMA SECTOR, TOTAL OF 1).
- DECOMMISSION EXISTING RRUS-11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- DECOMMISSION EXISTING RRUS-32 B2 (1900) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- DECOMMISSION EXISTING DIPLEXERS (LGP 21901) (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- DECOMMISSION EXISTING DIPLEXERS (DBC0061F1V51-2F) (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- DECOMMISSION EXISTING TMAS (LGP 13519) (TYP. OF 2 PER SECTOR, TOTAL OF 6).

ITEMS TO REMAIN:
- (3) ANTENNAS, (3) RRHs, (2) SURGE ARRESTORS, (12) 1-5/8" COAX, (2) DC POWER & (2) FIBER.

RFDS:	REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23
SITE ADDRESS:	64 TOLLAND AVENUE STAFFORD, CT 06076
LATITUDE:	41.9446750° N, 41° 56' 40.83" N
LONGITUDE:	72.3176489° W, 72° 19' 3.53" W
TYPE OF SITE:	GUYED TOWER / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	182'-0"±
RAD CENTER:	177'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	2
GN-1	GENERAL NOTES	2
A-1	COMPOUND & EQUIPMENT PLANS	2
A-2	ANTENNA LAYOUT PLANS	2
A-3	ELEVATION	2
A-4	DETAILS	2
SN-1	STRUCTURAL NOTES	2
S-1	STRUCTURAL DETAILS	2
S-2	STRUCTURAL DETAILS	2
G-1	GROUNDING DETAILS	2
RF-1	RF PLUMBING DIAGRAM	2

NOTE TO GENERAL CONTRACTOR: (PRIOR TO CONSTRUCTION COMPLETION)

- TEP NORTHEAST (TEP OPCO, LLC.) TO PERFORM POST/CLIMB AND INSPECTION TO CONFIRM PROPOSED INSTALLATION COMPLIES WITH THE RECORD STAMPED DRAWINGS AND STRUCTURAL REPORTS PRIOR TO SUBMITTING FCCA (FINAL CONSTRUCTION CONTROL AFFIDAVIT). GC IS RESPONSIBLE FOR COORDINATING INSPECTIONS WITH TEP NORTHEAST (TEP OPCO, LLC.) PRIOR TO CONSTRUCTION BEING COMPLETED.

at&t

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE
FA CODE: 10092207
PACE ID: MRCTB062250, MRCTB062137, MRCTB062403, MRCTB062177, MRCTB062263, MRCTB066240
PROJECT: 5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE 6C, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

HEAD SOUTH TOWARD ENTERPRISE DR, TURN LEFT ONTO ENTERPRISE DR, TURN LEFT ONTO CAPITAL BLVD, USE THE LEFT LANE TO TURN LEFT ONTO STATE HWY 411, TURN LEFT TO MERGE WITH I-91 N, MERGE WITH I-91 N, USE THE LEFT LANE TO TAKE EXIT 29 FOR U.S.5 N/CONNECTICUT 15 N/I-84 E TOWARD E HARTFORD/BOSTON, MERGE WITH US-5 N, CONTINUE ONTO CT-15 N, TAKE THE EXIT ON THE LEFT ONTO I-84 E TOWARD BOSTON, TAKE EXIT 70 FOR CT-32 TOWARD STAFFORD SPRINGS, TURN LEFT ONTO CT-32 N/RIVER RD, AT THE ROUNDABOUT, TAKE THE 2ND EXIT ONTO MAIN ST, SLIGHT LEFT ONTO PARK ST/TOLLAND AVE CONTINUE TO FOLLOW TOLLAND AVE, CONTINUE STRAIGHT TO STAY ON TOLLAND AVE, TURN LEFT ONTO FOREST EDGE STAFFORD, CT 06076.

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 MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

STATE OF CONNECTICUT
DANIEL R. KRAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

AT&T

TITLE SHEET
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE 6C, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	T-1	2

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 STANDARDS) 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 AND #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 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 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SMARTLINK
   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. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T 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: IBC 2021 WITH 2022 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2020 NATIONAL ELECTRICAL CODE (NFPA 70-2017)

    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, FOURTEENTH EDITION;

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

    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	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD CL	RADIATION CENTER LINE	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT · DANIEL R. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES

5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE DE, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

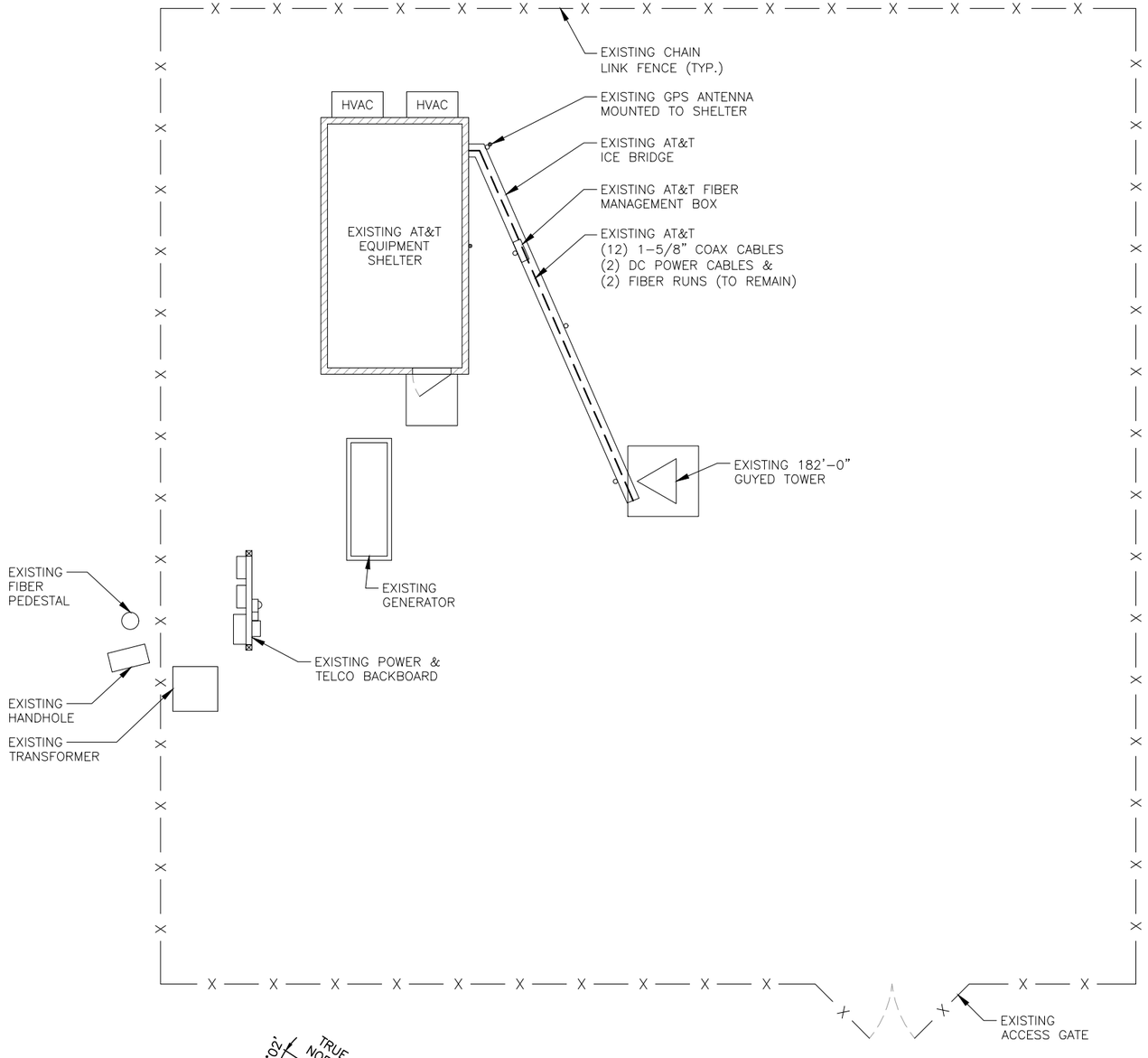
SITE NUMBER	DRAWING NUMBER	REV
CTL01185	GN-1	2

NOTE:

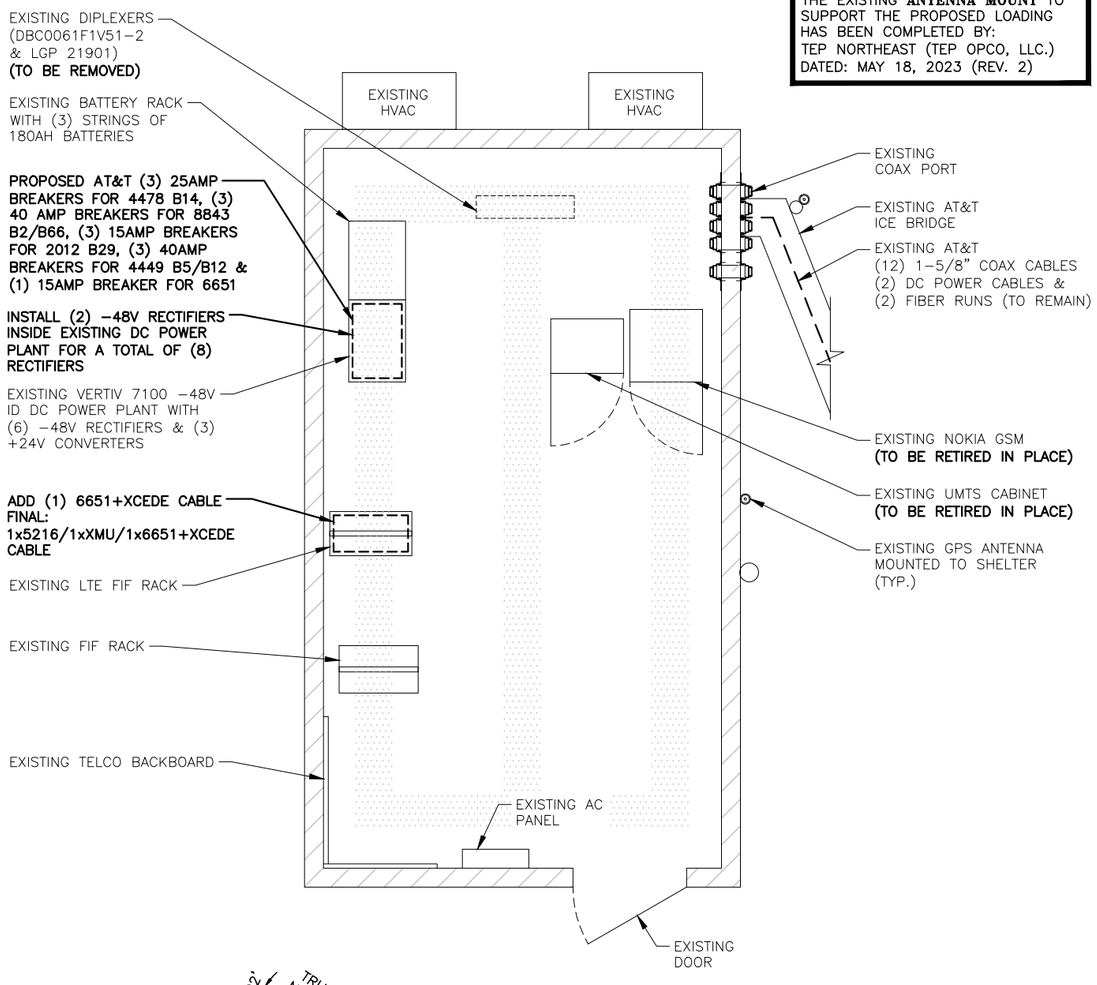
REFER TO FINAL APPROVED RFDS V3
DATED 04/25/23

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: MAY 18, 2023 (REV. 2)



COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"
0 2'-8" 5'-4" 10'-8" 16'-0"



EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"
0 1'-0" 2'-0" 4'-0" 6'-0"

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLANS
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE 2C, ANTENNA MODIFICATIONS, 4T4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	A-1	2

NOTE:

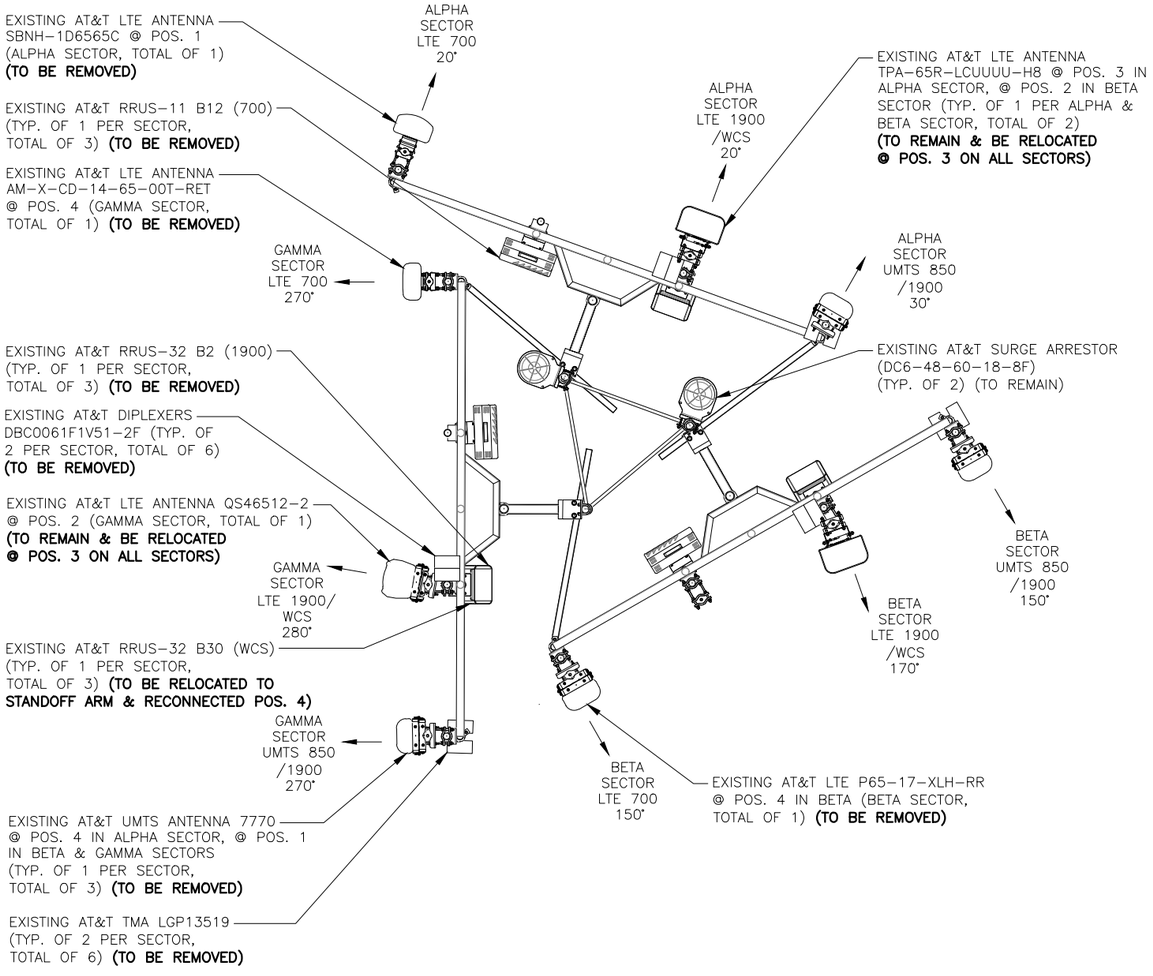
1.) 3' MINIMUM SEPARATION BETWEEN ALL ANTENNAS.
2.) 6' MINIMUM SEPARATION BETWEEN 700BC & 700 DE.
3.) 12" VERTICAL SEPARATION BETWEEN DOD & C-BAND ANTENNA.
4.) USE "Y" CABLE FOR DUAL BAND RRHs.

NOTE:

REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23

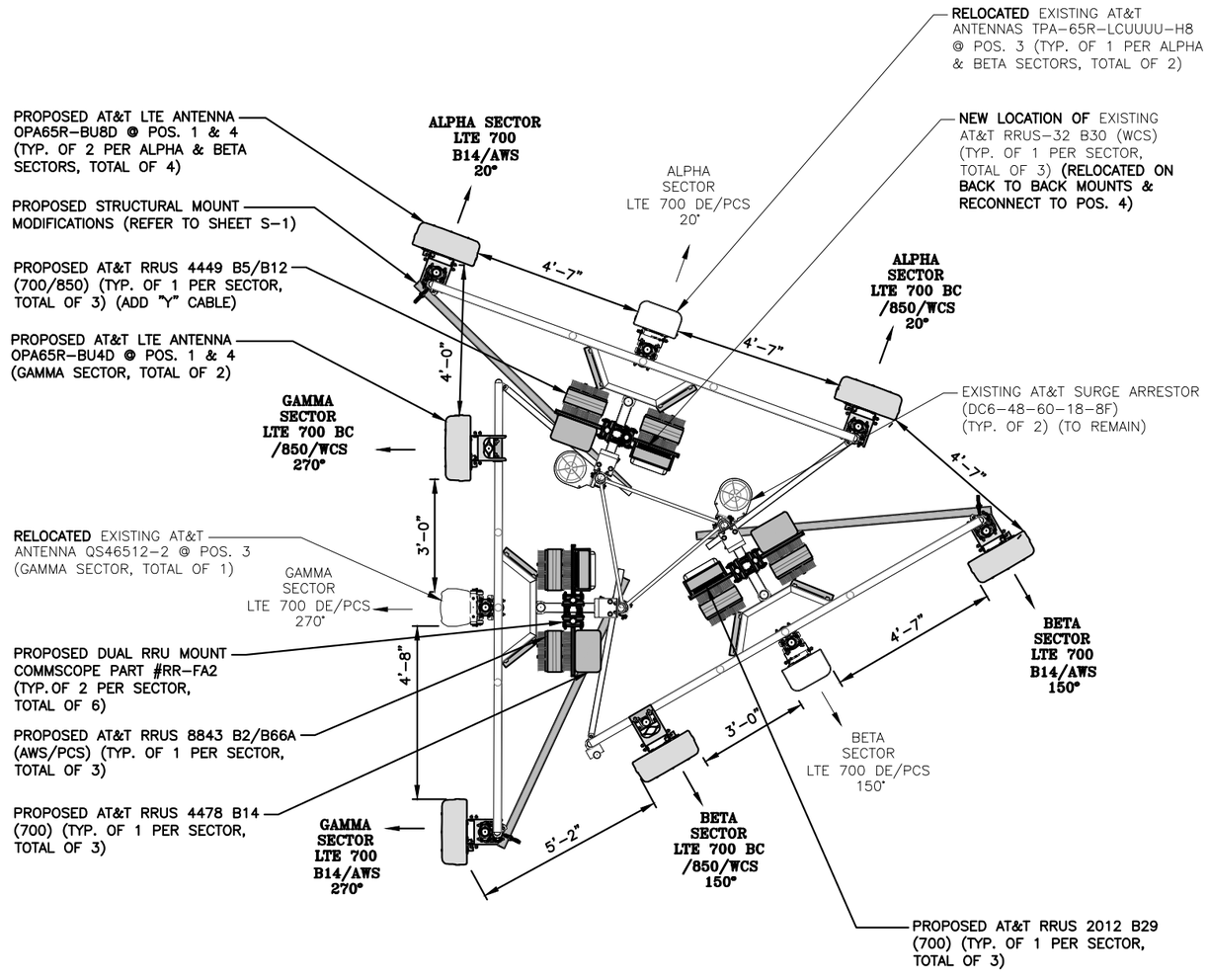
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: MAY 18, 2023 (REV. 2)



EXISTING ANTENNA LAYOUT (1 / A-2)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

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



PROPOSED ANTENNA LAYOUT (2 / A-2)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

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

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

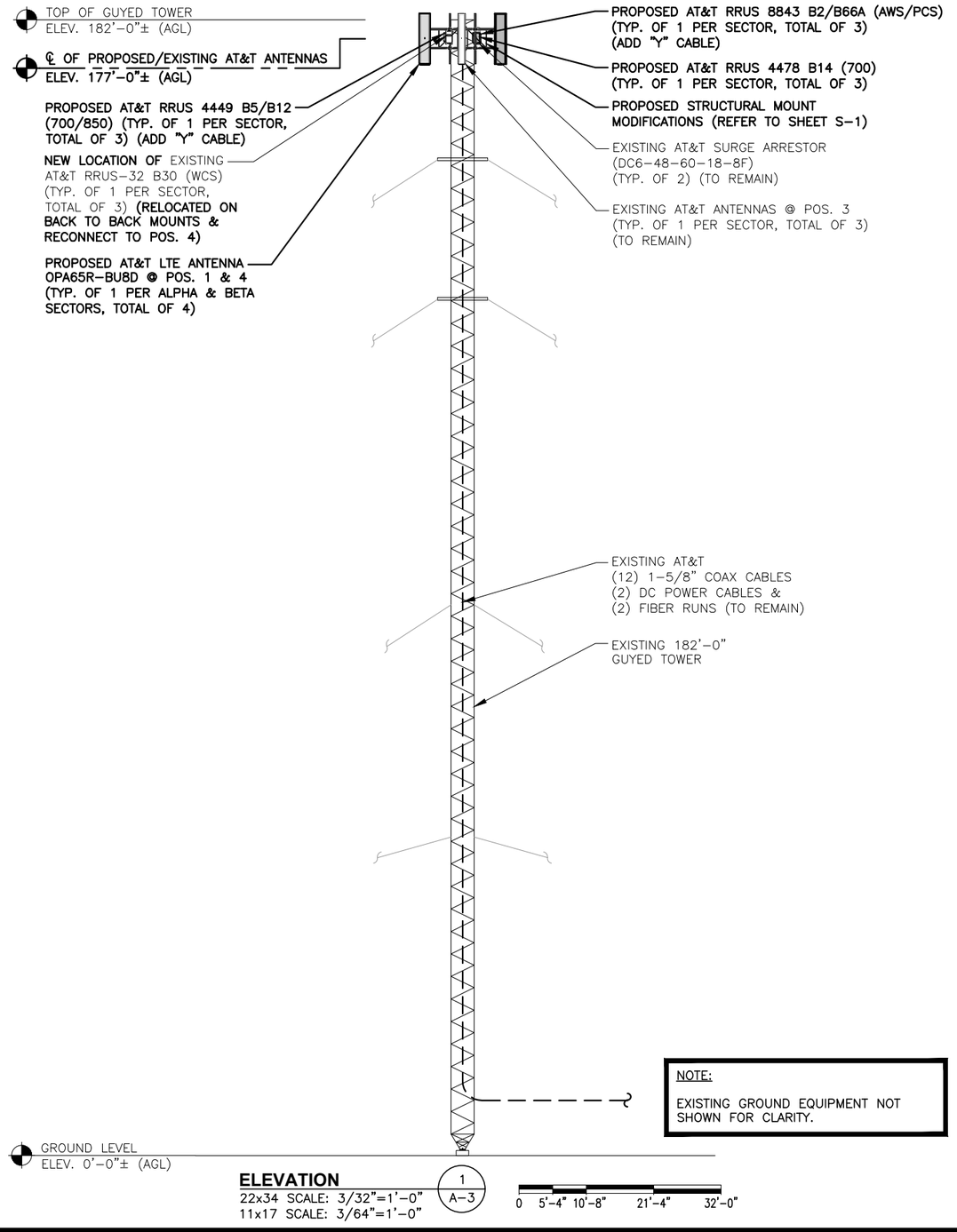
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUT PLANS
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE 2S, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	A-2	2



NOTE:

EXISTING GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

ELEVATION 1 / A-3

22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

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

NOTE:

REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: MAY 18, 2023 (REV. 2)

NOTE:

ANTENNAS AND MOUNTS TO BE ADJUSTED AS REQUIRED TO ACHIEVE A 3'-0" SIDE-TO-SIDE MINIMUM SEPARATION BETWEEN ANTENNAS

NOTE:

1.) 3' MINIMUM SEPARATION BETWEEN ALL ANTENNAS.
2.) 6' MINIMUM SEPARATION BETWEEN 700BC & 700 DE.
3.) 12" VERTICAL SEPARATION BETWEEN DOD & C-BAND ANTENNA.
4.) USE "Y" CABLE FOR DUAL BAND RRHs.

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

ELEVATION
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE DE, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	A-3	2

ANTENNA SCHEDULE

REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23

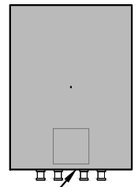
SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	**PROPOSED**	**LTE 700 B14/AWS**	**OPA65R-BU8D**	**96"X20.7"X7.7"**	**177'-0"±**	**20°**	–	**(P)(1) 4478 B14 (700) (P)(1) 8843 B2/B66A (AWS)**	**18.1"x13.4"x8.3" 14.9"x13.2"x10.9"**	**– (P)(1) Y-CABLE**	(E) (1) RAYCAP DC6-48-60-18-8F
A2	–	–	–	–	–	–	–	–	–	(E)(4) 1-5/8" COAX, (E)(2) DC POWER & (E)(1) FIBER	
A3	EXISTING	LTE 700 DE/PCS	TPA-65R-LCUUUU-H8	96"X14.4"X8.6"	177'-0"±	20°	–	**(P)(1) 2012 B29 (700/1900)**	**18.1"x13.4"x8.3"**	–	
A4	**PROPOSED**	**LTE 700 BC /850/WCS**	**OPA65R-BU8D**	**96"X20.7"X7.7"**	**177'-0"±**	**20°**	–	**(P)(1) 4449 B5/B12 (700/850) (E)(1) RRUS-32 B30 (WCS)**	**17.9"x13.2"x10.4" –**	**(P)(1) Y-CABLE –**	
B1	**PROPOSED**	**LTE 700 B14/AWS**	**OPA65R-BU8D**	**96"X20.7"X7.7"**	**177'-0"±**	**150°**	–	**(P)(1) 4478 B14 (700) (P)(1) 8843 B2/B66A (AWS)**	**18.1"x13.4"x8.3" 14.9"x13.2"x10.9"**	**– (P)(1) Y-CABLE**	(E) (1) RAYCAP DC6-48-60-18-8F
B2	EXISTING	LTE 700 DE/PCS	TPA-65R-LCUUUU-H8	96"X14.4"X8.6"	177'-0"±	150°	–	–	–	(E)(4) 1-5/8" COAX, (E)(2) DC POWER & (E)(1) FIBER	
B3	–	–	–	–	–	–	–	**(P)(1) 2012 B29 (700/1900)**	**18.1"x13.4"x8.3"**	–	
B4	**PROPOSED**	**LTE 700 BC /850/WCS**	**OPA65R-BU8D**	**96"X20.7"X7.7"**	**177'-0"±**	**150°**	–	**(P)(1) 4449 B5/B12 (700/850) (E)(1) RRUS-32 B30 (WCS)**	**17.9"x13.2"x10.4" –**	**(P)(1) Y-CABLE –**	
C1	**PROPOSED**	**LTE 700 B14/AWS**	**OPA65R-BU4D**	**48"X22"X9.6"**	**177'-0"±**	**270°**	–	**(P)(1) 4478 B14 (700) (P)(1) 8843 B2/B66A (AWS)**	**18.1"x13.4"x8.3" 14.9"x13.2"x10.9"**	**– (P)(1) Y-CABLE**	
C2	EXISTING	LTE 700 DE/PCS	QS46512-2	52"X12"X10.8"	177'-0"±	270°	–	–	–	(E)(4) 1-5/8" COAX	
C3	–	–	–	–	–	–	–	**(P)(1) 2012 B29 (700/1900)**	**18.1"x13.4"x8.3"**	–	
C4	**PROPOSED**	**LTE 700 BC /850/WCS**	**OPA65R-BU4D**	**48"X20.7"X7.7"**	**177'-0"±**	**270°**	–	**(P)(1) 4449 B5/B12 (700/850) (E)(1) RRUS-32 B30 (WCS)**	**17.9"x13.2"x10.4" –**	**(P)(1) Y-CABLE –**	

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
(3)(P)	**4478 B14 (700)**	**18.1"x13.4"x8.3"**
(3)(P)	**8843 B2B/66A (PCS/AWS)**	**14.9"x13.2"x10.9"**
(3)(P)	**4449 B5/B12 (850/700)**	**17.9"x13.2"x10.4"**
(3)(P)	**2012 B29 (700/1900)**	**18.1"x13.4"x8.3"**
(3)(E)	RRUS-32 B30 (WCS)	27.2"x12.1"x7.0"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

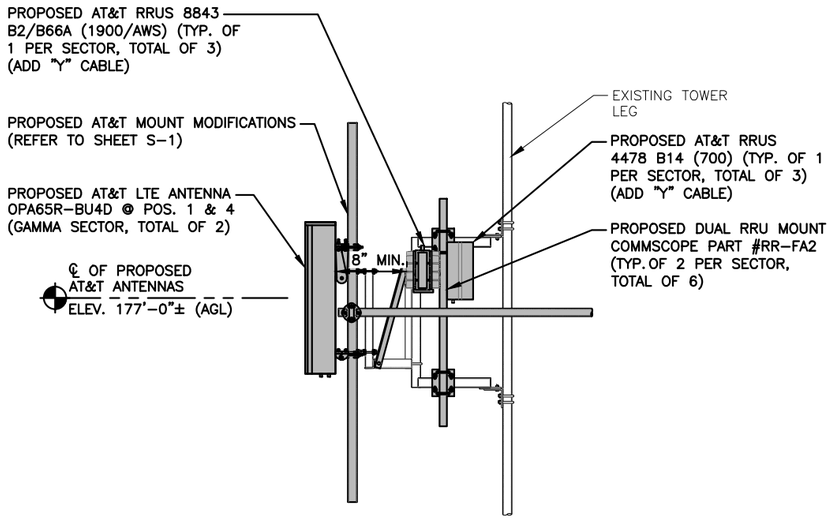
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (2 / A-4)
SCALE: N.T.S

NOTE:
REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23

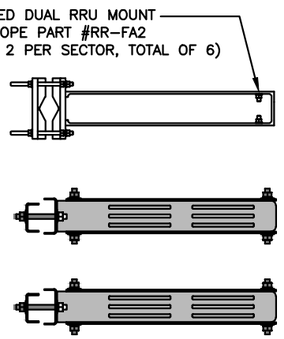
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: MAY 18, 2023 (REV. 2)

FINAL ANTENNA CONFIGURATION (1 / A-4)
SCALE: N.T.S

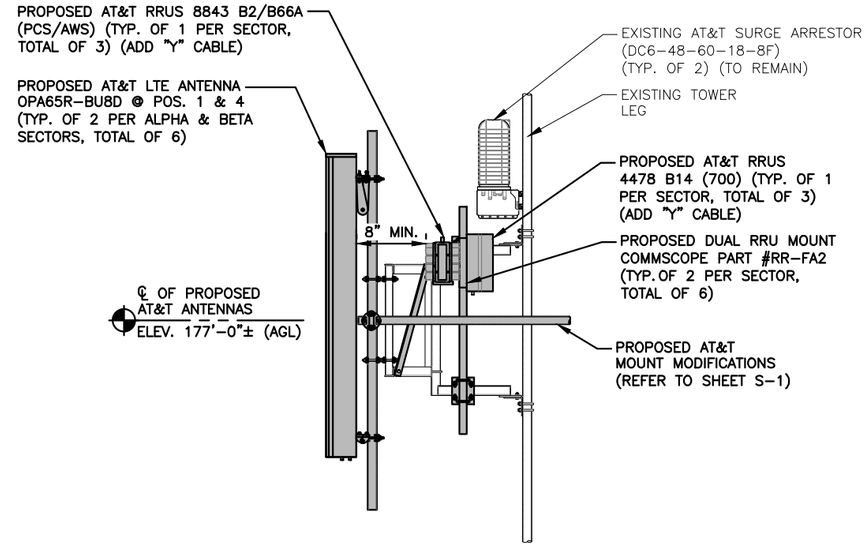


PROPOSED ANTENNA MOUNTING DETAIL @ POS. 1 & 4 (GAMMA SECTOR) (4 / A-4)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

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



BACK TO BACK RRU MOUNT DETAIL (3 / A-4)
SCALE: N.T.S



PROPOSED ANTENNA MOUNTING DETAIL @ POS. 1 & 4 (ALPHA & BETA SECTORS) (5 / A-5)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

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

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE DE, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	A-4	2

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-G STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

STRUCTURAL NOTES
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE DC, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

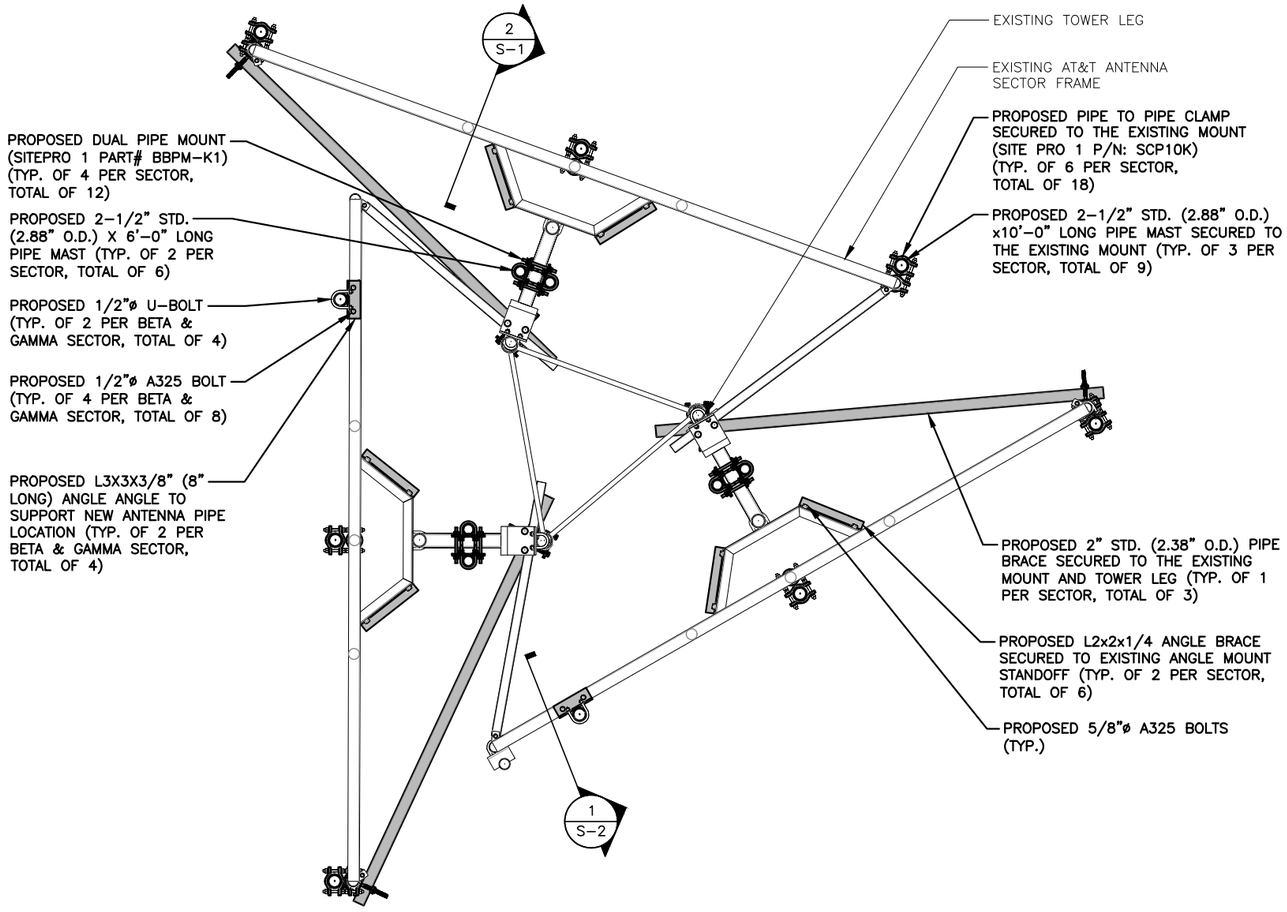
SITE NUMBER	DRAWING NUMBER	REV
CTL01185	SN-1	2

NOTE:

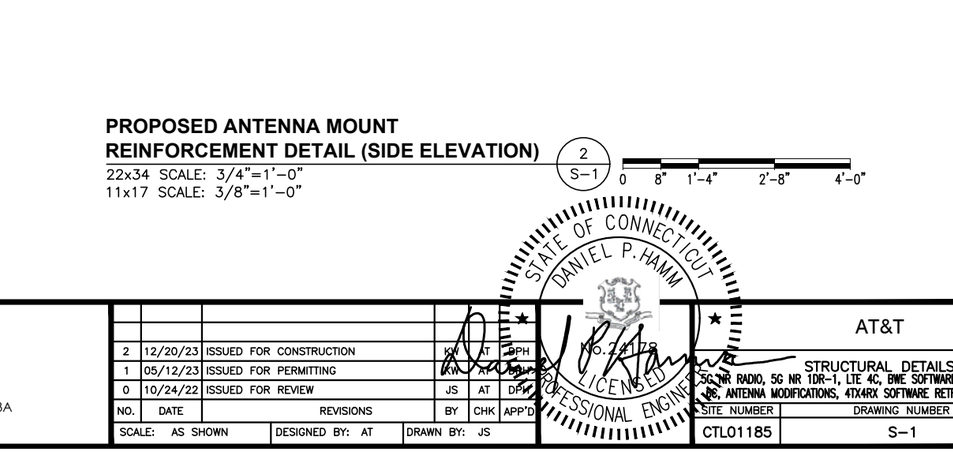
REFER TO FINAL APPROVED RFDS V3
DATED 04/25/23

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: MAY 18, 2023 (REV. 2)



PROPOSED ANTENNA MOUNT REINFORCEMENT DETAIL (1 / S-1)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"



PROPOSED ANTENNA MOUNT REINFORCEMENT DETAIL (SIDE ELEVATION) (2 / S-1)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"

14°02'
TRUE NORTH
MAGNETIC NORTH

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

AT&T

STRUCTURAL DETAILS
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE 256, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

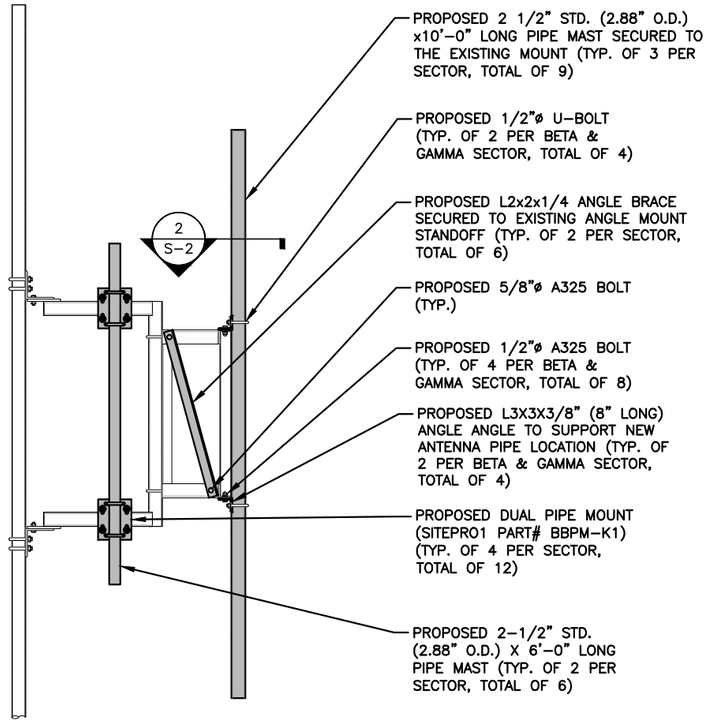
SITE NUMBER	DRAWING NUMBER	REV
CTL01185	S-1	2

NOTE:

REFER TO FINAL APPROVED RFDS V3
DATED 04/25/23

NOTE:

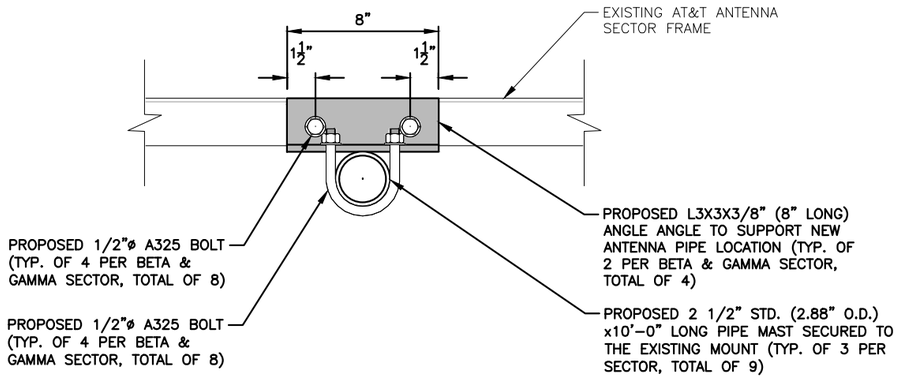
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: MAY 18, 2023 (REV. 2)



PROPOSED ANTENNA MOUNT
REINFORCEMENT DETAIL (SIDE ELEVATION) 1/S-2

22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

0 8" 1'-4" 2'-8" 4'-0"



PROPOSED ANTENNA MOUNT
BETA & GAMMA ANTENNA RELOCATION (PLAN) 2/S-2

22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

0 8" 1'-4" 2'-8" 4'-0"

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

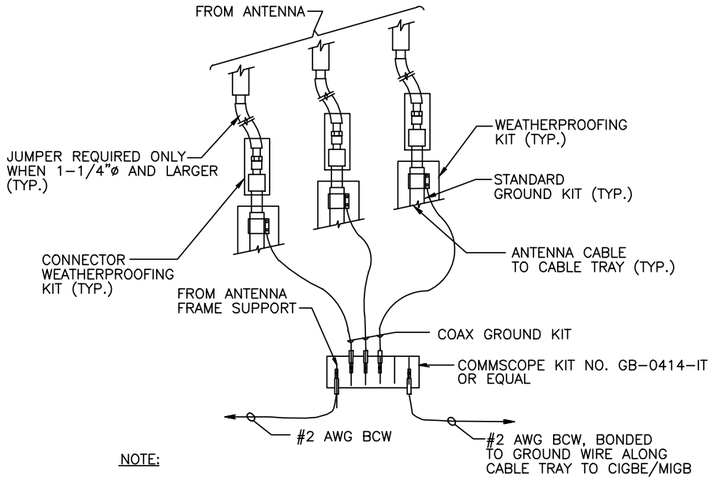
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

STRUCTURAL DETAILS
5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE 2C, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	S-2	2



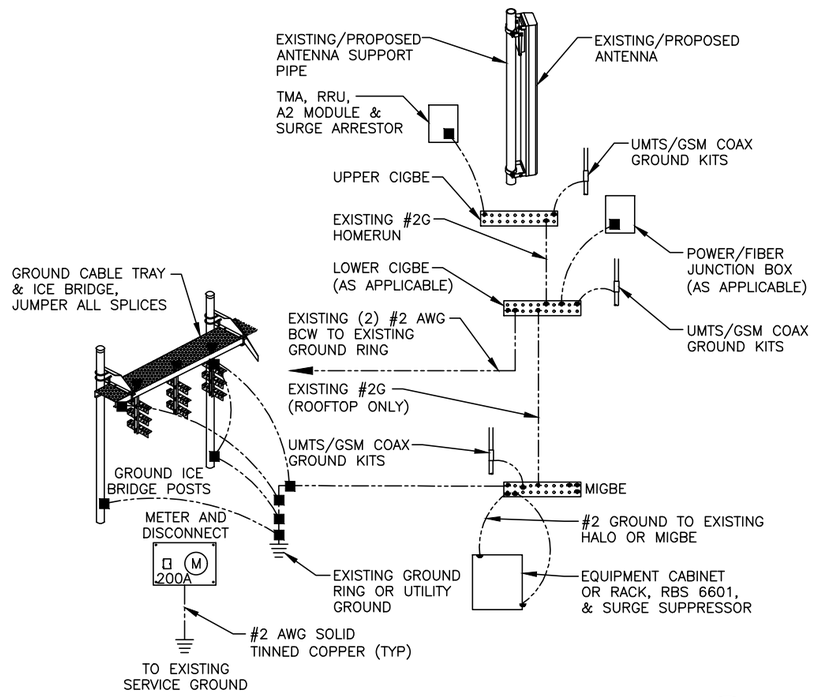
NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

1 / G-1



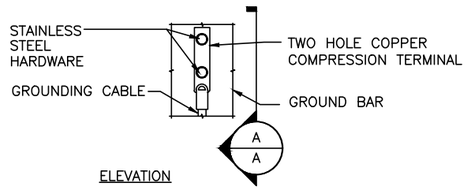
GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1

AT&T GROUNDING STANDARDS TO BE FOLLOWED:

ATT-TP-76416
ATT-TP-76300
ATT-CEM-18002
ATT-002-290-531
ATT-002-290-701
ATT-CEM-23001



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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3 / G-1

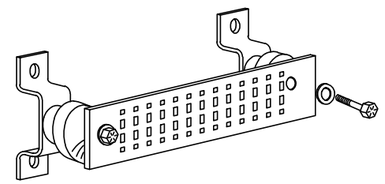
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
+24V POWER SUPPLY RETURN BAR (#2 AWG)
-48V POWER SUPPLY RETURN BAR (#2 AWG)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED)

SCALE: N.T.S

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

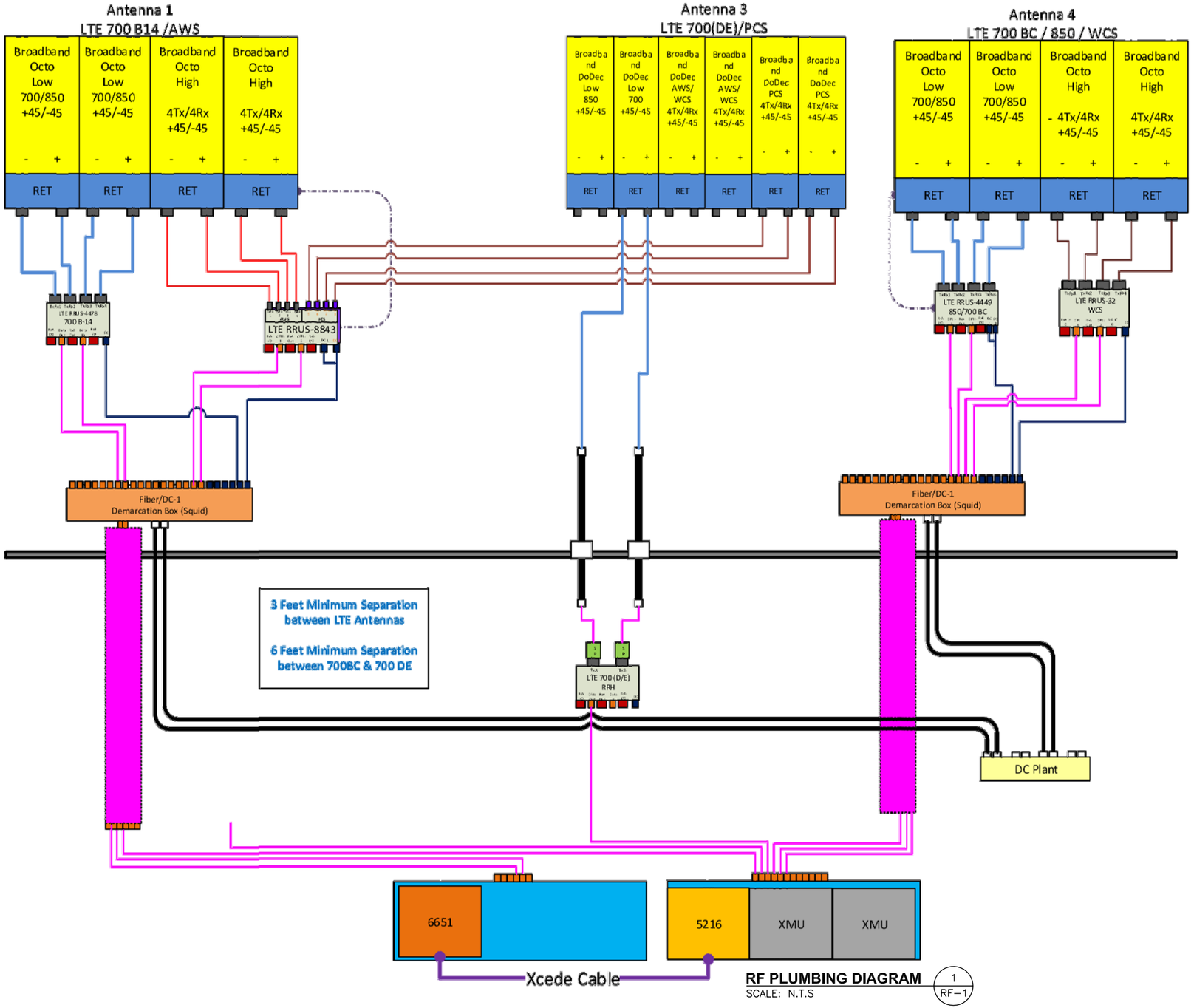
AT&T

GROUNDING DETAILS

5G NR RADIO, 5G NR 1DR-1, LTE 4C, BWE SOFTWARE CARRIER, LTE 5C,LTE DE, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	G-1	2

REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:

REFER TO FINAL APPROVED RFDS V3 DATED 04/25/23

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

smartlink
SMARTLINK
1997 ANNAPOLIS EXCHANGE PKWY SUITE 200
ANNAPOLIS, MD 21401

SITE NUMBER: CTL01185
SITE NAME: STAFFORD SPRINGS TOLLAND AVENUE

64 TOLLAND AVENUE
STAFFORD, CT 06076
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
2	12/20/23	ISSUED FOR CONSTRUCTION	KW	AT	DPH
1	05/12/23	ISSUED FOR PERMITTING	KW	AT	DPH
0	10/24/22	ISSUED FOR REVIEW	JS	AT	DPH

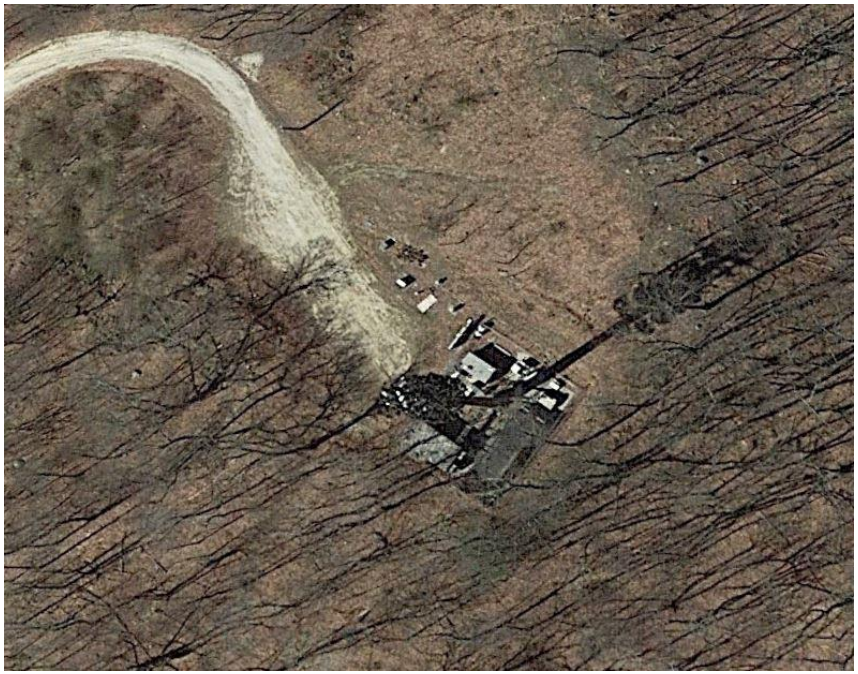
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: JS

AT&T

RF PLUMBING DIAGRAM
5G NR RADIO, 5G NR 1DR–1, LTE 4C, BME SOFTWARE CARRIER, LTE 5C,LTE 6C, ANTENNA MODIFICATIONS, 4TX4RX SOFTWARE RETROFIT, 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL01185	RF–1	2

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



Site Name:	STAFFORD SPRINGS TOLLAND AVENUE
AT&T Mobility FA#	10092207
Site ID:	CTL01185
Project Name:	LTE
Address:	64 TOLLAND AVENUE, STAFFORD, CT 06076
County:	TOLLAND
Latitude:	41.94467
Longitude:	-72.31764
Structure Type:	GUYED
Property Owner:	NA
Property Contact:	NA

AT&T Existing Facility

Report Information

Report Writer: Monti Kumar **Report Generated Date:** 12-20-2023

Site Compliance Statement

Compliance Status	Compliant
Cumulative General Population % MPE (Ground Level)	0.0484%

December 20, 2023

Emissions Analysis for Site: **CTL01185– STAFFORD SPRINGS TOLLAND AVENUE**

MobileComm Professionals, Inc was directed to analyze the proposed AT&T facility located at **64 TOLLAND AVENUE, STAFFORD, CT 06076**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the 700 and 850 MHz Bands are approximately 0.467 mW/cm^2 and 0.567 mW/cm^2 respectively or 466.667 μW/cm2 and 566.667 μW/cm2 respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS), 2300 MHz (WCS), 3540 MHz (DoD Band) and 3840 MHz (C-Band) bands is 1 mW/cm^2 or 1000 μW/cm2. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

1. Theoretical Calculations: Methods and Procedures

MobileComm Professionals, Inc has performed theoretical modeling of the site using a software tool, RoofMaster® Version 40.12.23.2022, which incorporates calculation methodologies detailed in FCC OET 65. RoofMaster® uses a cylindrical model for conservative power density predictions within the near field of the antenna where the antenna pattern has not truly formed yet. Within this area power density values tend to decrease based upon an inverse distance function. At the point where it is appropriate for modeling to change from near-field calculations to far-field calculations, the power decreases inversely with the square of the distance. The modeling is based on worst-case assumptions in terms of transmitter power and duty cycle. No losses were included in the power calculations unless they were specifically provided for the project.

In OET 65, a far field model is presented to calculate the spatial peak power density. The RoofMaster® implementation of this model incorporates antenna manufacturer's horizontal and vertical pattern data to determine the power density in all directions. This model yields the power density at a single point in space. In order to determine the spatial power density for comparison to the FCC limits, the average of several points calculated within the human profile (0-6') must be conducted. RoofMaster® calculates seven power density values between 0-6' above the specified study plane and performs a linear spatial average.

The following table details the antennas and operating parameters for the AT&T antenna system as well as any other antenna systems at the site. This is based on antenna information provided by the client and data compiled from other sources where necessary. The data below was input into Roofmaster® to perform the theoretical exposure calculations at the ground.

The theoretical calculations performed in Roofmaster® determine the cumulative exposure at all sample points at ground level (0-6' spatial average). The results from highest cumulative sample point at ground level surrounding the site are displayed in the table below. The contribution from directional antennas to the maximum cumulative totals varies greatly depending on location; therefore, the contribution from one antenna sector at the highest calculated exposure point may be greater or less than other sectors since sectorized directional antennas are pointed in different directions and there is not much overlapping exposure.

The contribution to the cumulative power density and % MPE for each antenna/frequency band is listed in the table. The cumulative power density and cumulative % MPE are displayed at the bottom of the table.

2. Antenna Inventory & Power Data

Sector	Ant ID	Operator	Antenna Mfg	Antenna Model	Antenna Type	FREQ. (MHz)	TECH.	AZ. (^{0})	HBW (^{0})	Antenna Gain (dBd)	Antenna Aperture (ft)	#of Channels	Transmitter Power Per Channel (Watts)	Total ERP (Watts)	Total EIRP (Watts)	Height (ft)	Calculated Power Density ($\mu W/cm^2$)	Allowable MPE ($\mu W/cm^2$)	Calculated MPE%
A	1	AT&T	CCI	OPA65R-BU8D	Panel	700	LTE(B12)	20	75	13.55	8	4	40.00	3229.39	5298.10	177.00	0.000012	466.67	0.000002
A	1	AT&T	CCI	OPA65R-BU8D	Panel	2100	LTE/5G	20	69	16.05	8	4	40.00	5742.75	9421.50	177.00	0.000000	1000.00	0.000000
A	2	AT&T	CCI	TPA-65R-LCUUUU-H8	Panel	700	LTE(B29)	20	66	12.95	8	2	40.00	1406.34	2307.23	177.00	0.000058	466.67	0.000012
A	2	AT&T	CCI	TPA-65R-LCUUUU-H8	Panel	1900	LTE/5G	20	68	13.75	8	4	40.00	3381.58	5547.79	177.00	0.000215	1000.00	0.000022
A	3	AT&T	CCI	OPA65R-BU8D	Panel	700	LTE(FN)	20	75	13.55	8	4	40.00	3229.39	5298.10	177.00	0.000001	466.67	0.000000
A	3	AT&T	CCI	OPA65R-BU8D	Panel	850	5G	20	63	14.45	8	4	40.00	3973.01	6518.08	177.00	0.000010	566.67	0.000002
A	3	AT&T	CCI	OPA65R-BU8D	Panel	2300	LTE	20	54	16.15	8	4	25.00	3672.82	6025.60	177.00	0.000001	1000.00	0.000000
B	4	AT&T	CCI	OPA65R-BU8D	Panel	700	LTE(B12)	150	75	13.55	8	4	40.00	3229.39	5298.10	177.00	0.000004	466.67	0.000001
B	4	AT&T	CCI	OPA65R-BU8D	Panel	2100	LTE/5G	150	69	16.05	8	4	40.00	5742.75	9421.50	177.00	0.000006	1000.00	0.000001
B	5	AT&T	CCI	TPA-65R-LCUUUU-H8	Panel	700	LTE(B29)	150	66	12.95	8	2	40.00	1406.34	2307.23	177.00	0.000001	466.67	0.000000
B	5	AT&T	CCI	TPA-65R-LCUUUU-H8	Panel	1900	LTE/5G	150	68	13.75	8	4	40.00	3381.58	5547.79	177.00	0.000002	1000.00	0.000000
B	6	AT&T	CCI	OPA65R-BU8D	Panel	700	LTE(FN)	150	75	13.55	8	4	40.00	3229.39	5298.10	177.00	0.000003	466.67	0.000001
B	6	AT&T	CCI	OPA65R-BU8D	Panel	850	5G	150	63	14.45	8	4	40.00	3973.01	6518.08	177.00	0.000006	566.67	0.000001
B	6	AT&T	CCI	OPA65R-BU8D	Panel	2300	LTE	150	54	16.15	8	4	25.00	3672.82	6025.60	177.00	0.000007	1000.00	0.000001
C	7	AT&T	CCI	OPA65R-BU4D	Panel	700	LTE(B12)	270	73	11.05	4	4	40.00	1816.02	2979.34	177.00	0.008877	466.67	0.001902
C	7	AT&T	CCI	OPA65R-BU4D	Panel	2100	LTE/5G	270	70	14.55	4	4	40.00	4065.56	6669.91	177.00	0.006862	1000.00	0.000686
C	8	AT&T	Quintel	QS46512-2	Panel	700	LTE(B29)	270	65	11.05	4.3	2	40.00	908.01	1489.67	177.00	0.013741	466.67	0.002944
C	8	AT&T	Quintel	QS46512-2	Panel	1900	LTE/5G	270	71	12.95	4.3	4	40.00	2812.68	4614.45	177.00	0.025313	1000.00	0.002531
C	9	AT&T	CCI	OPA65R-BU4D	Panel	700	LTE(FN)	270	73	11.05	4	4	40.00	1816.02	2979.34	177.00	0.090502	466.67	0.019393
C	9	AT&T	CCI	OPA65R-BU4D	Panel	850	5G	270	62	11.85	4	4	40.00	2183.33	3581.95	177.00	0.087280	566.67	0.015402
C	9	AT&T	CCI	OPA65R-BU4D	Panel	2300	LTE	270	59	14.85	4	4	25.00	2722.70	4466.84	177.00	0.055010	1000.00	0.005501
																Calculated Power Density ($\mu W/cm^2$)	**0.287911%**	**Calculated MPE%**	**0.0484%**

Table 2: Antenna Inventory & Power Data

3. Compliance Summary

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

The anticipated composite MPE value for this site assuming all carriers present is 0.0484% of the allowable FCC established general public limit sampled at the ground level.

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

FedEx

FedEx® Tracking

DELIVERED

Saturday

2/3/24 at 3:29 PM

Your package was released as requested and safely delivered.

Signed for by: S.IGNATURE NOT REQ

Obtain proof of delivery

DELIVERY STATUS

Delivered

TRACKING ID

775036966350

FROM
Smartlink LLC
Carolyn Seeley
6 Jasmine Rd
Oxford, MA US 01540
9787605577

Label Created
2/1/24 11:56 AM

WE HAVE YOUR PACKAGE
WEST BOYLSTON, MA
2/2/24 3:22 PM

ON THE WAY
WILLINGTON, CT
2/3/24 5:05 AM

OUT FOR DELIVERY

FedEx

DELIVERED
Nathaniel DaSilva
64 TOLLAND AVE
STAFFORD SPRINGS, CT US 06076
9787605577

Delivered
2/3/24 at 3:29 PM

↓ View travel history

Want updates on this shipment? Enter your email and we will do the rest!

YOUR EMAIL SUBMIT

MORE OPTIONS

Manage Delivery

Shipment facts

Shipment overview

TRACKING NUMBER 775036966350

DELIVERED TO Shipping/Receiving

SHIPPER REFERENCE CTL01185

SHIP DATE 2/2/24

STANDARD TRANSIT 2/6/24 before 8:00 PM

ACTUAL DELIVERY 2/3/24 at 3:29 PM

Services

SERVICE FedEx 2Day

TERMS Shipper

SPECIAL HANDLING SECTION Deliver Weekday

Package details

WEIGHT 0.5 lbs / 0.23 kgs

FedEx

TOTAL SHIPMENT WEIGHT 0.5 lbs / 0.23 kgs

PACKAGING FedEx Envelope

↑ Back to to

Travel history

Ascending

Local Scan Time

Thursday, 2/1/24

- 11:56 AM
  Shipment information sent to FedEx

Friday, 2/2/24

- 3:22 PM
  Picked up
  WEST BOYLSTON, MA
- 3:23 PM
  Shipment arriving early
  WEST BOYLSTON, MA
- 8:11 PM
  Left FedEx origin facility
  WEST BOYLSTON, MA

- 12:32 AM
  Arrived at FedEx hub
  WILLINGTON, CT
- 4:59 AM
  At local FedEx facility
  WILLINGTON, CT
- 5:03 AM
  On FedEx vehicle for delivery
  WILLINGTON, CT
- 5:05 AM
  Shipment arriving early
  WILLINGTON, CT
- 3:28 PM
  Delivered
  STAFFORD SPRINGS, CT

3:29 PM
Delivered
STAFFORD SPRINGS, CT

Back to to

All (30)

FedEx

FedEx® Tracking

DELIVERED

Monday

2/5/24 at 8:32 AM

Signed for by: B.DADALT

Obtain proof of delivery

DELIVERY STATUS

Delivered

TRACKING ID

775036071593

FROM
Smartlink LLC
Carolyn Seeley
6 Jasmine Rd
Oxford, MA US 01540
9787605577

Label Created
2/1/24 11:11 AM

WE HAVE YOUR PACKAGE
WEST BOYLSTON, MA
2/2/24 3:22 PM

ON THE WAY
WILLINGTON, CT
2/5/24 6:37 AM

OUT FOR DELIVERY
WILLINGTON, CT
2/5/24 4:00 AM

DELIVERED
Town of Stafford
Andrew Marchese

Delivered
2/5/24 at 8:32 AM

↓ View travel history

Want updates on this shipment? Enter your email and we will do the rest!

YOUR EMAIL
pbaker915

SUBMIT

✖ Your email is invalid.

MORE OPTIONS

Manage Delivery

Shipment facts

Travel history

All (30)

FedEx

FedEx® Tracking

DELIVERED

Monday

2/5/24 at 8:32 AM

Signed for by: B.DADALT

Obtain proof of delivery

DELIVERY STATUS

Delivered

TRACKING ID

775036062452

FROM
Smartlink LLC
Carolyn Seeley
6 Jasmine Rd
Oxford, MA US 01540
9787605577

Label Created
2/1/24 11:10 AM

WE HAVE YOUR PACKAGE

ON THE WAY
WILLINGTON, CT
2/5/24 6:36 AM

OUT FOR DELIVERY
WILLINGTON, CT
2/5/24 4:00 AM

DELIVERED
Town of Stafford
William Morrison
1 Main Street

FedEx

2/5/24 at 8:32 AM

↓ View travel history

Want updates on this shipment? Enter your email and we will do the rest!

YOUR EMAIL
pbaker915

SUBMIT

✖ Your email is invalid.

MORE OPTIONS

Manage Delivery

Shipment facts

Shipment overview

TRACKING NUMBER 775036062452

DELIVERED TO Shipping/Receiving

SHIPPER REFERENCE CTL01185

SHIP DATE 2/1/24

STANDARD TRANSIT 2/5/24 before 5:00 PM

ACTUAL DELIVERY 2/5/24 at 8:32 AM

Services

SERVICE FedEx 2Day

TERMS Shipper

SPECIAL HANDLING SECTION Deliver Weekday

Package details

WEIGHT 0.5 lbs / 0.23 kgs

TOTAL PIECES 1

TOTAL SHIPMENT WEIGHT 0.5 lbs / 0.23 kgs

PACKAGING FedEx Envelope

FedEx

Travel history

Ascending

Local Scan Time

Thursday, 2/1/24

- 11:10 AM
  Shipment information sent to FedEx

Saturday, 2/3/24

- 12:37 AM
  Arrived at FedEx hub
  WILLINGTON, CT
- 12:38 AM
  Shipment arriving On-Time
  WILLINGTON, CT
- 4:56 AM
  At local FedEx facility
  WILLINGTON, CT

Monday, 2/5/24

- 3:55 AM
  At local FedEx facility
  WILLINGTON, CT
- 4:00 AM
  On FedEx vehicle for delivery
  WILLINGTON, CT
- 6:36 AM
  Shipment arriving On-Time
  WILLINGTON, CT
- 8:32 AM
  Delivered
  STAFFORD SPRINGS, CT

Back to to

All (30)

Corporate Responsibility
Newsroom
Contact Us

MORE FROM FEDEX
FedEx Compatible
FedEx Developer Portal
FedEx Logistics
ShopRunner

LANGUAGE
United States

FOLLOW FEDEX

Site Map | Terms of Use | Privacy & Security

FedEx

FedEx® Tracking

DELIVERED

Saturday

2/3/24 at 10:11 AM

Your package was released as requested and safely delivered.

Signed for by: S.IGNATURE NOT REQ

Obtain proof of delivery

DELIVERY STATUS

Delivered

TRACKING ID

775036027553

FROM

Smartlink LLC
Carolyn Seeley
6 Jasmine Rd
Oxford, MA US 01540
9787605577

Label Created

2/1/24 11:08 AM

WE HAVE YOUR PACKAGE

WEST BOYLSTON, MA
2/2/24 3:22 PM

ON THE WAY

FedEx

OUT FOR DELIVERY
SOUTH WINDSOR, CT
2/3/24 8:02 AM

DELIVERED
Cordless Data Transfer, Inc.
600 OLD HARTFORD RD
COLCHESTER, CT US 06415
9787605577

Delivered
2/3/24 at 10:11 AM

↓ View travel history

Want updates on this shipment? Enter your email and we will do the rest!

YOUR EMAIL
pbaker915

SUBMIT

✖ Your email is invalid.

MORE OPTIONS

Manage Delivery

Shipment facts

Shipment overview

TRACKING NUMBER 775036027553

DELIVERED TO Shipping/Receiving

SHIPPER REFERENCE CTL01185

SHIP DATE 2/2/24

STANDARD TRANSIT 2/6/24 before 8:00 PM

ACTUAL DELIVERY 2/3/24 at 10:11 AM

Services

SERVICE FedEx 2Day

TERMS Shipper

SPECIAL HANDLING SECTION Deliver Weekday

FedEx

WEIGHT 0.5 lbs / 0.23 kgs

TOTAL PIECES 1

TOTAL SHIPMENT WEIGHT 0.5 lbs / 0.23 kgs

PACKAGING FedEx Envelope

↑ Back to to

Travel history

Ascending

Local Scan Time

Thursday, 2/1/24

- 11:08 AM
  Shipment information sent to FedEx

Friday, 2/2/24

- 3:22 PM
  Picked up
  WEST BOYLSTON, MA
- 3:23 PM
  Shipment arriving early
  WEST BOYLSTON, MA

- 12:26 AM
  Arrived at FedEx hub
  WILLINGTON, CT
- 3:18 AM
  Departed FedEx hub
  WILLINGTON, CT
- 7:42 AM
  At local FedEx facility
  SOUTH WINDSOR, CT
- 8:02 AM
  On FedEx vehicle for delivery
  SOUTH WINDSOR, CT
- 8:04 AM
  Shipment arriving early
  SOUTH WINDSOR, CT
- 10:07 AM
  Delivered
  COLCHESTER, CT
- 10:11 AM
  Delivered
  COLCHESTER, CT

10:11 AM
Delivered
COLCHESTER, CT

↑ Back to to

All (30)