Michael Gentile, Site Acquisition
c/o New Cingular Wireless, PCS LLC (AT&T)
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767
Mobile: (508) 844-9813
mgentile@clinellc.com

March 23, 2017

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

RE: Notice of Exempt Modification // Site Number: CT2075
90 Tatnic Hill Road, Brooklyn, CT 06234 (Site Name: LTE 2C @ BROOKLYN)
N 41.7681// W -71.9714388

Dear Ms. Bachman:

New Cingular Wireless, PCS, LLC ("AT&T") currently maintains six (6) antennas at the 83 foot level of the existing 79'-8" foot Guyed tower at 90 Tatnic Hill Road, Brooklyn, CT 06234. The tower and property is owned by New Cingular Wireless (AT&T). AT&T now intends to swap three (3) of its existing antennas for three (3) new LTE models for its LTE upgrade. These antennas would be installed at the 83-foot level of the tower. AT&T also intends to install six (6) new RRUS (radios); one (1) surge arrestor, removing (6) triplexers, removing (3) TMA, installing six (6) DC cables and three (3) fiber cables.

The current proposal involves an antenna swap only (three for three); zero antennas will be added. AT&T was originally approved for six (6) antennas on April 30, 1990.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Richard Ives, First Selectman for the Town of Brooklyn, the tower/ground owner—AT&T, as well as the Town of Brooklyn Building Department, Planning Department and Zoning Departments.

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

Attached to accommodate this filing are construction drawings dated2/17/2017by Centek Engineering, a structural analysis dated 2/17/2017 by DESKTEK Engineering and an Emissions Analysis Report dated 2/24/2017 by Centerline Communications, LLC.

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

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

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

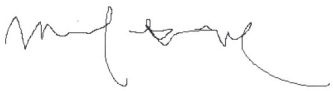
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

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

6. The existing structure and its foundation can support the proposed loading as shown in the attached structural analysis by DESKTEK Engineering, dated 2/17/2017.

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

Sincerely,



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mgentile@centerlincommunications.com

Attachments

cc: Richard Ives, First Selectman, Town of Brooklyn - as elected official
AT&T – as Tower Owner
AT&T – as Property Owner
Town of Brooklyn Building Department
Town of Brooklyn/Planning/Zoning/Land Use

CT-019-15-17

I want to...

Description

Parcel Report Abutters Report

Owner: SOUTHERN NEW ENGLAND TELEPHONE CO

Address: 90 TATNIC HILL RD

Town: Brooklyn

Hyperlinks

Vision Property Summary

Source Map

Details

Owner Name
SOUTHERN NEW ENGLAND TELEPHONE CO

Street Address
90 TATNIC HILL RD

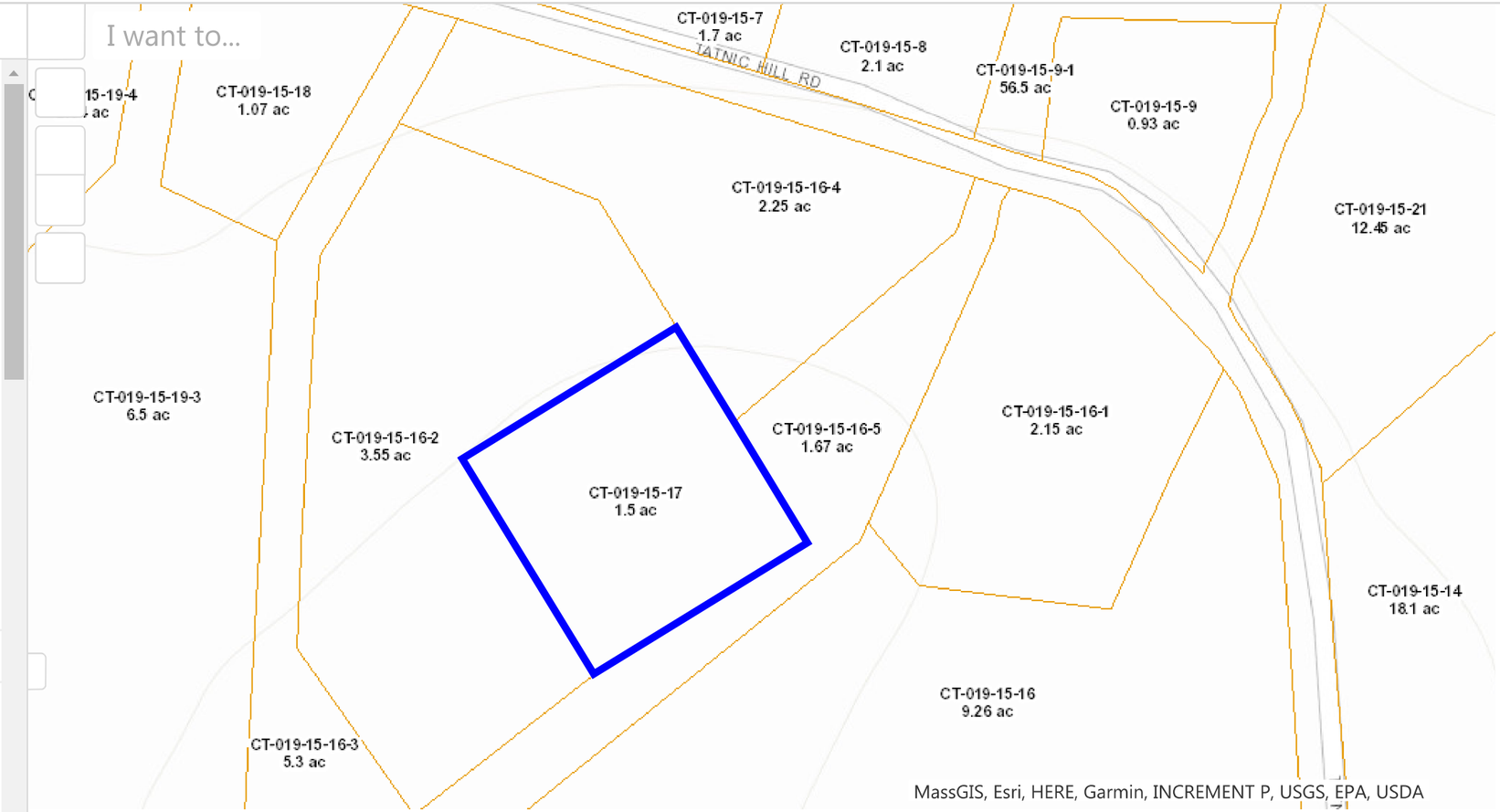
Town
N/A

Gis ID
CT-019-15-17

Account Number
00258500

Property Type
Fee Simple

Use Code
4310



Radio Frequency Emissions Analysis Report

AT&T Existing Facility

Site ID: CT2075

Brooklyn
Tatnic Hill Road
Brooklyn, CT 6234

February 24, 2017

Centerline Communications Project Number: 950006-040

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**6.48 %**

February 24, 2017

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

Emissions Analysis for Site: **CT2075 – Brooklyn**

Centerline Communications, LLC ("Centerline") was directed to analyze the proposed AT&T facility located at **Tatnic Hill Road, Brooklyn, CT**, for the purpose of determining whether the emissions from the Proposed AT&T Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general population 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 population 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.

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 700 and 850 MHz Bands are approximately 467 $\mu W/cm^2$ and 567 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 2300 MHz (WCS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

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

Additional details can be found in FCC OET 65.

CALCULATIONS

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

Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
UMTS	850 MHz	2	30
UMTS	1900 MHz (PCS)	2	30
LTE	700 MHz	2	60
LTE	1900 MHz (PCS)	2	60

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 700 MHz, 850 MHz and 1900 MHz (PCS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	Powerwave 7770	83
A	2	CCI TPA-65R-LCUUUU-H8	83
B	1	Powerwave 7770	83
B	2	Quintel QS46512-2	83
C	1	Powerwave 7770	83
C	2	CCI TPA-65R-LCUUUU-H8	83

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed AT&T configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	1.68
Antenna A2	CCI TPA-65R-LCUUUU-H8	700 MHz / 1900 MHz (PCS)	12.95 / 13.75	4	240	5,212.56	4.80
						Sector A Composite MPE%	**6.48**
Antenna B1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	1.68
Antenna B2	Quintel QS46512-2	700 MHz / 1900 MHz (PCS)	12.95 / 13.75	4	240	3,840.47	3.27
						Sector B Composite MPE%	**4.95**
Antenna C1	Powerwave 7770	850 MHz / 1900 MHz (PCS)	11.4 / 13.4	4	120	2,140.89	1.68
Antenna C2	CCI TPA-65R-LCUUUU-H8	700 MHz / 1900 MHz (PCS)	12.95 / 13.75	4	240	5,212.56	4.80
						Sector C Composite MPE%	**6.48**

Table 3: AT&T Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum AT&T MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, the sectors with the largest calculated MPE% are sectors A & C. *Table 5* below shows a summary for each AT&T Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max Sector Value	**6.48 %**
No Additional Carriers on Site	NA
Site Total MPE %:	**6.48 %**

Table 4: All Carrier MPE Contributions

AT&T Sector A Total:	6.48 %
AT&T Sector B Total:	4.95 %
AT&T Sector C Total:	6.48 %
Site Total:	6.48 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated AT&T sector(s). For this site, the sectors with the largest calculated MPE% are sectors A & C.

AT&T _ Frequency Band / Technology (Sectors A & C)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
AT&T 850 MHz UMTS	2	414.12	83	5.02	850 MHz	567	0.89%
AT&T 1900 MHz (PCS) UMTS	2	656.33	83	7.96	1900 MHz (PCS)	1000	0.80%
AT&T 700 MHz LTE	2	1,183.45	83	14.35	700 MHz	467	3.07%
AT&T 1900 MHz (PCS) LTE	2	1,422.82	83	17.25	1900 MHz (PCS)	1000	1.73%
						Total:	6.48%

Table 6: AT&T Maximum Sector MPE Power Values

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	6.48 %
Sector B:	4.95 %
Sector C:	6.48 %
AT&T Maximum Total (per sector):	6.48 %
Site Total:	6.48 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **6.48 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Scott Heffernan
RF Engineering Director
Centerline Communications, LLC
95 Ryan Drive, Suite 1
Raynham, MA 02767

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

80' Existing Guyed Lattice Tower

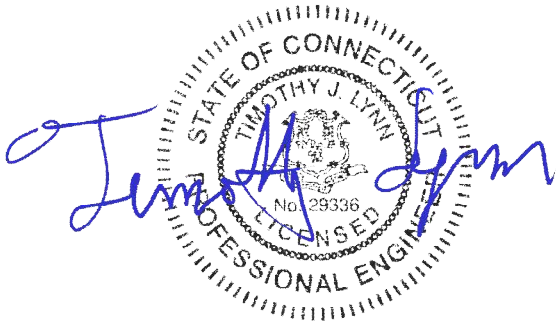
Proposed AT&T Mobility
Antenna Upgrade

AT&T Site Ref: CT2075 Brooklyn

Tatnic Hill Road
Brooklyn, CT 06234

Centek Project No. 16071.12

Date: February 17, 2017



Prepared for:

AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by AT&T Mobility on the existing guyed lattice tower located in Brooklyn, CT.

The host tower is a 80-ft, three legged, guyed lattice tower. The original tower design documents were unavailable for use in this report. The tower geometry, structure member sizes and foundation information were obtained from a tower mapping report prepared by GPD Group project no. 2012801.84 dated December 3, 2012 and a structural analysis report prepared by GPD Group project no. 2013723.02 dated August 21, 2013.

Antenna and appurtenance information were obtained from the aforementioned structural report and a AT&T RF data sheet.

The tower consists of eight (8) vertical sections consisting of steel angle legs with an assumed steel grade of ASTM A36. Diagonal and horizontal lateral support bracing consists of steel angles with an assumed steel grade of ASTM A36. The vertical tower sections are connected by bolted sleeves with the diagonal and horizontal bracing to legs consisting of bolted connections. The width of the tower face is 3.125-ft throughout its length.

Antenna and Appurtenance Summary

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

- UNKOWN (EXISTING):
  Antennas: One (1) 20-ft Omni-directional whip and one (1) 10-ft dipole mounted to the top of the tower.
  Coax Cables: Two (2) 1/2" ∅ coax cablse running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (EXISTING TO REMAIN):
  Antennas: Three (3) Powerwave 7770 panel antennas and six (6) Powerwave LGP17201 TMAs mounted on a 12-ft platform top mount with a RAD center elevation of 83-ft above grade.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (EXISTING TO REMOVE):
  Antennas: Three (3) KMW AM-X-CD-14-65-00T panel antennas and three (3) Powerwave TT19-08BP111-001 TMAs mounted on a 12-ft platform top mount with a RAD center elevation of 83-ft above grade.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **AT&T (PROPOSED):**
  Antennas: Two (2) CCI TPA-65R-LCUUUU-H8 panel antennas, one (1) Quintel QS46512-2 panel antenna, three (3) Ericsson RRUS-11 remote radio heads (relocated from ground), three (3) Ericsson RRUS-32 remote radio heads and one (1) DC6-48-60-18-8F Surge Arrestor mounted on a 12-ft platform top mount with a RAD center elevation of 83-ft above grade.
  Coax Cables: One (1) fiber trunk and two (2) DC trunks running on a leg/face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables routed as specified in Section 3 of this report.

Analysis

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

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 1.00" radial ice on the tower structure and its components.

Basic Wind Speed:	Windham; v = 100-110 mph (3-second gust)	*[Annex B of TIA-222-G-2005]*
	Brooklyn; v = 101 mph (3 second gust)	*[Appendix N of the 2016 CT Building Code]*
Load Cases:	Load Case 1; 101 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2016 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 1.00" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

[1] The 2012 International Building Code as amended by the 2016 Connecticut State Building Code (CSBC).

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Allowable stresses were determined based on Table 4-8 of the TIA code.

- Calculated stresses were found to be within allowable limits. In Load Case 2, per tnxTower "Section Capacity Table", this tower was found to be at **56.4%** of its total capacity.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Leg (T8)	0'-0"-10'-0"	56.2%	**PASS**
Diagonal (T1)	60'-0"-70'-0"	46.3%	**PASS**
Lattice Pole Diagonal (L1)	70'-0"-80'-0"	56.4%	**PASS**
Guy B @ 79-ft radius (T1)	70-ft	30.2%	**PASS**

Foundations and Anchorage

The existing tower base foundation consists of a 5.0-ft triangular x 4-ft long reinforced concrete pedestal bearing directly on the existing sub grade. Additionally, guy wire loading is transferred to three (3) 4.0-ft wide x 5.0-ft long x 5.0-ft thick concrete anchor support blocks. The sub-grade conditions used as the basis for the foundation analysis were derived from the aforementioned structural report.

- The worst case tower base and guy anchor reactions developed from the governing Load Case 1 were used in the verification of the anchorage foundations:

Tower Guy Reactions	
Vector	**Inner**
Horizontal (In Plane of GW)	16 kips
Horizontal (Out of Plane of GW)	0 kips
Vertical	14 kips
Resultant Force at end of Guy Wire	21 kips
Tower Base Reactions	
Vector	**Proposed Reaction**
Horizontal Shear	1.0 kips
Axial Compression	67.0 kips

Foundation	Design Limit	TIA-222-G Section 9.4 FS(1)	Proposed Loading (FS)(1)	Result
Reinf. Conc. Anchor Block (B) at 79-ft radius.	Uplift	1.0	1.44	**PASS**
	Sliding	1.0	1.80	**PASS**
		Ultimate Bearing	**Proposed**	
Base Foundation	Bearing	8.0 ksf	3.66 ksf	**PASS**

Note 1: FS denotes 'Factor of Safety'.

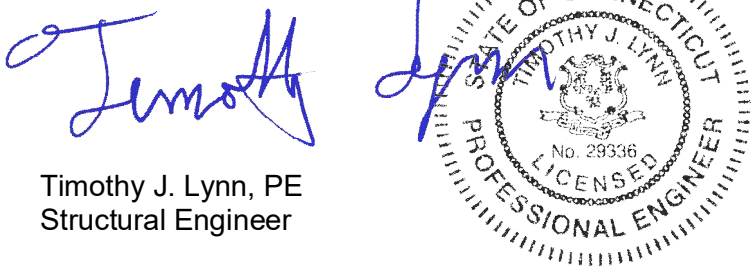
C o n c l u s i o n

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

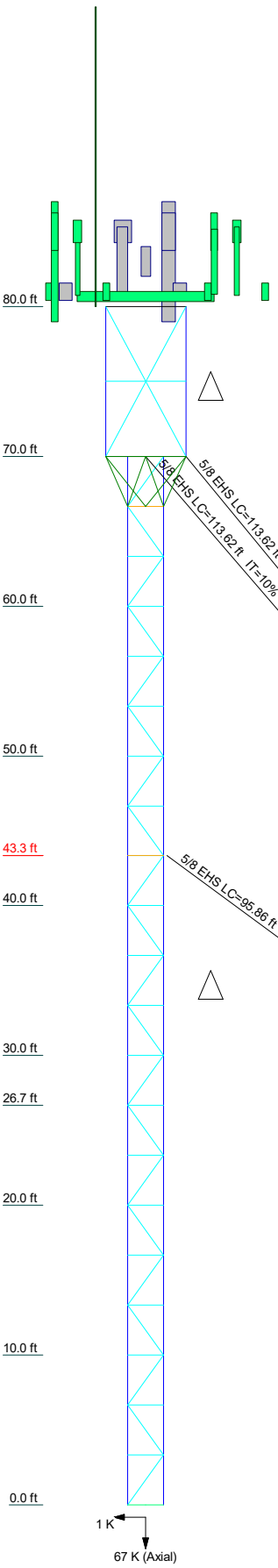
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or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

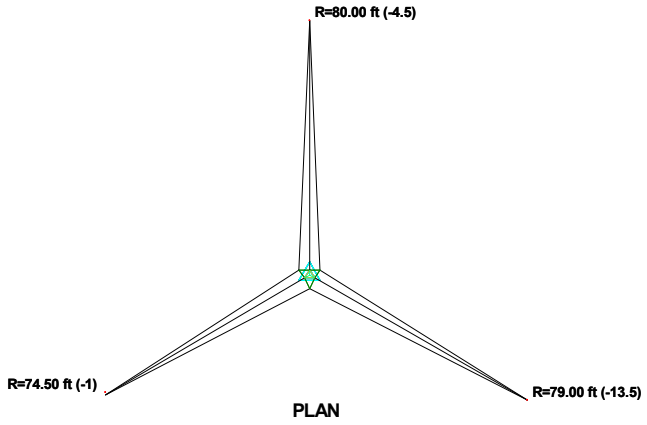
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

tnxTower Features:

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





Section	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs					V3x3x1/4				P3.5x.226
Leg Grade					A36				A53-B-35
Diagonals		L2x2x3/16				L1 1/2x1 1/2x3/16		L2x2x3/16	
Diagonal Grade						A36			
Top Girts					N.A.				L2x2x3/16
Bottom Girts					N.A.				L2x2x3/16
Horizontals					L1 1/4x1 1/4x3/16				N.A.
Sec. Horizontals					N.A.				L2x2x3/16
Top Guy Pull-Offs			N.A.			L2x2x3/8	N.A.	L3x2x1/4	N.A.
Bot Guy Pull-Offs				N.A.				L2x2x3/16	N.A.
Face Width (ft)					3.125				7
# Panels @ (ft)					21 @ 3.33333				1 @ 10
Weight (K)	3.0	0.3	0.2	0.1	0.3	0.3	0.3	0.7	0.6

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' x 3" Dia Omni	90	TPA-65R-LCUUUU-H8 (ATI Proposed)	83
10' Dipole	85	RRUS-11 (ATI Proposed)	83
7770.00 (ATI Existing)	83	RRUS-11 (ATI Proposed)	83
7770.00 (ATI Existing)	83	RRUS-11 (ATI Proposed)	83
7770.00 (ATI Existing)	83	RRUS-32 (ATI Proposed)	83
(2) LGP17201 TMA (ATI Existing)	83	RRUS-32 (ATI Proposed)	83
(2) LGP17201 TMA (ATI Existing)	83	RRUS-32 (ATI Proposed)	83
(2) LGP17201 TMA (ATI Existing)	83	DC6-48-60-18-8F Surge Arrestor (ATI Proposed)	83
TPA-65R-LCUUUU-H8 (ATI Proposed)	83	12-ft Top Mount (ATI Existing)	81
QS46512-2 (ATI Proposed)	83		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-35	35 ksi	63 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for Exposure B to the TIA-222-G Standard.
2. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. Bottom 23.5' of tower legs are reinforced. Reinforcement was not used in this analysis. Additonal capacity is provided by the reinforcment.
8. TOWER RATING: 56.4%

ALL REACTIONS ARE FACTORED

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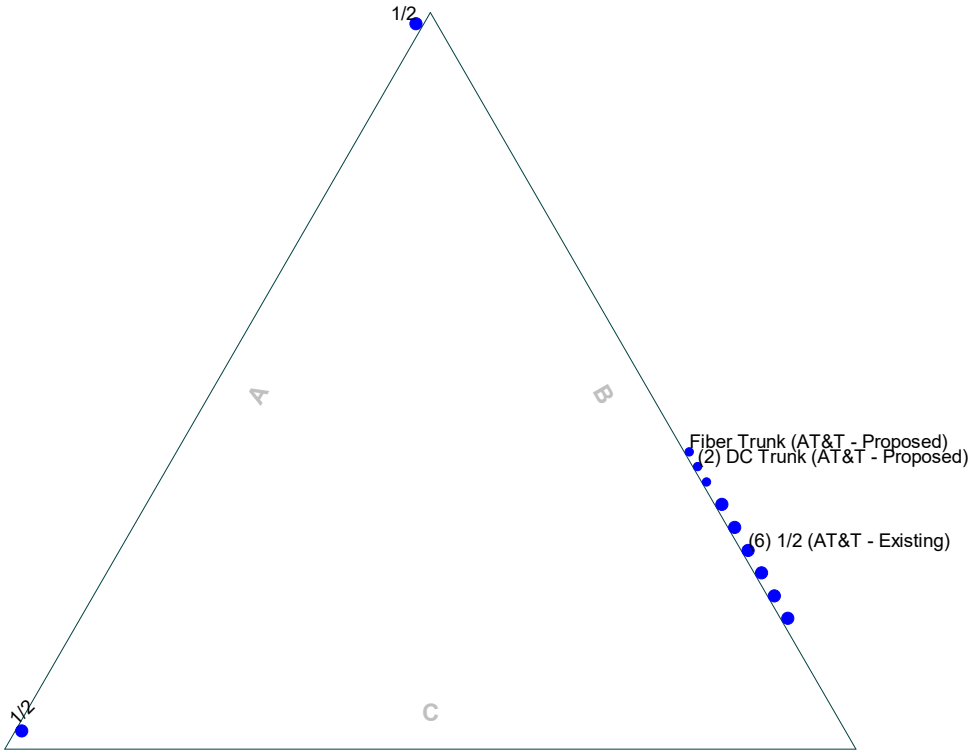
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: ***16071.12 - CT2075***			
Project: ***80' Guyed Tower - Tatnic Hill Road Brooklyn, CT***			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 02/17/17	Scale: NTS	
Path: J:\Jobs\1607100.WI\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\Calcs\ER\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-1	

Feed Line Plan

Round Flat App In Face App Out Face



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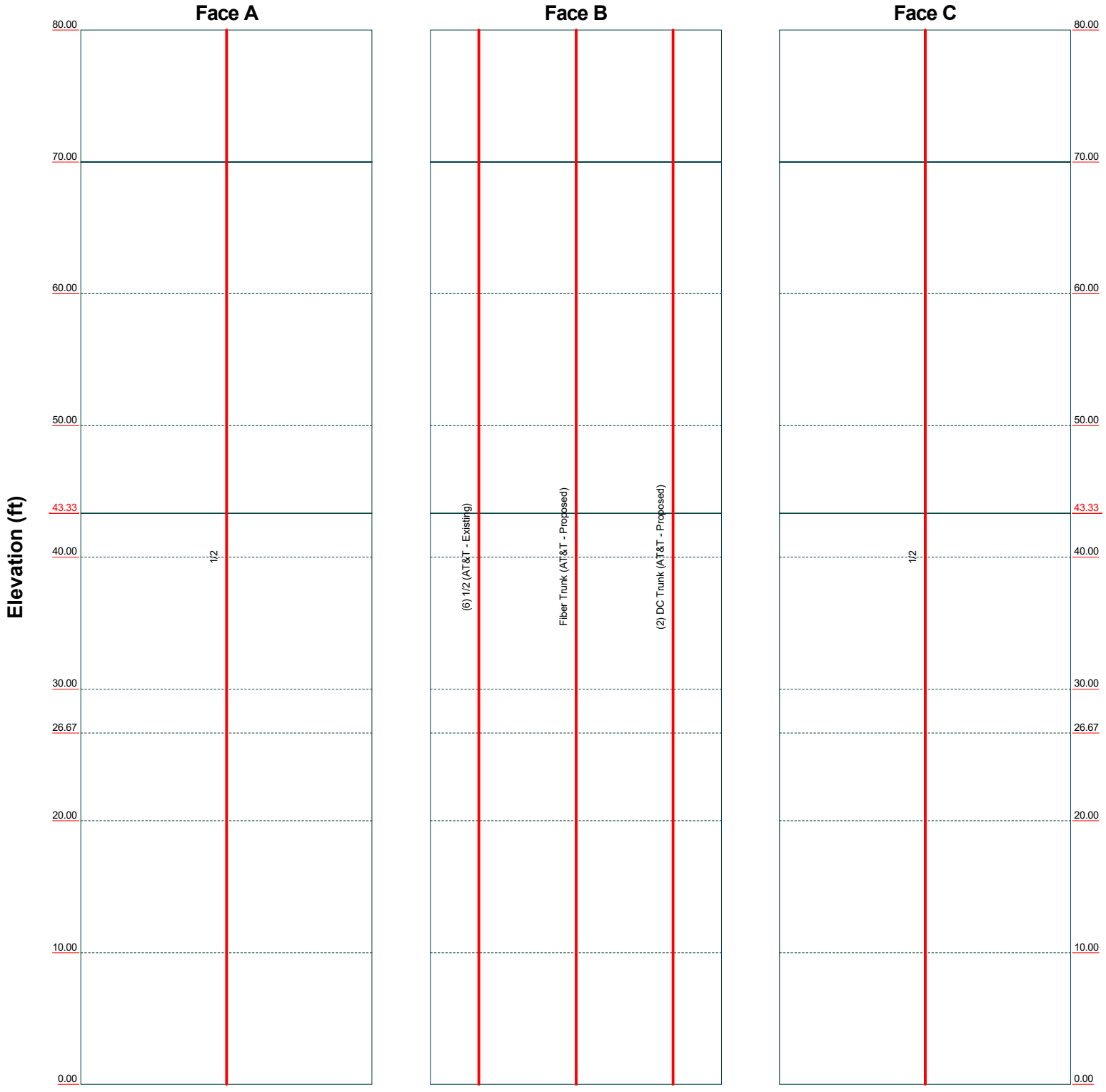
Path: J:\Jobs\1607100.W\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\CalcsERI\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 80'

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



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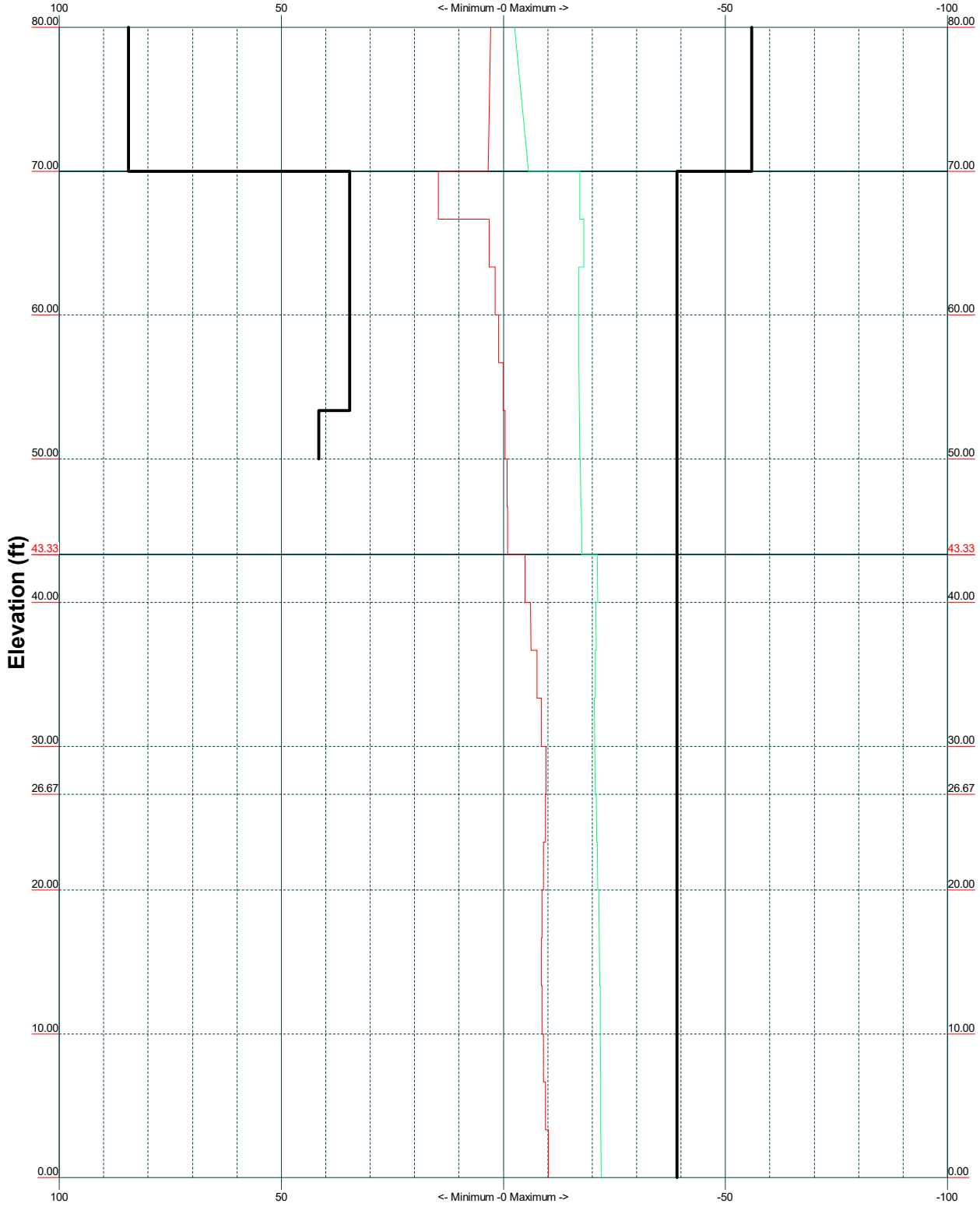
Path: J:\Jobs\1607100.W\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\Calcs\ER\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-7

TIA-222-G - 101 mph/50 mph 1.0000 in Ice Exposure B

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



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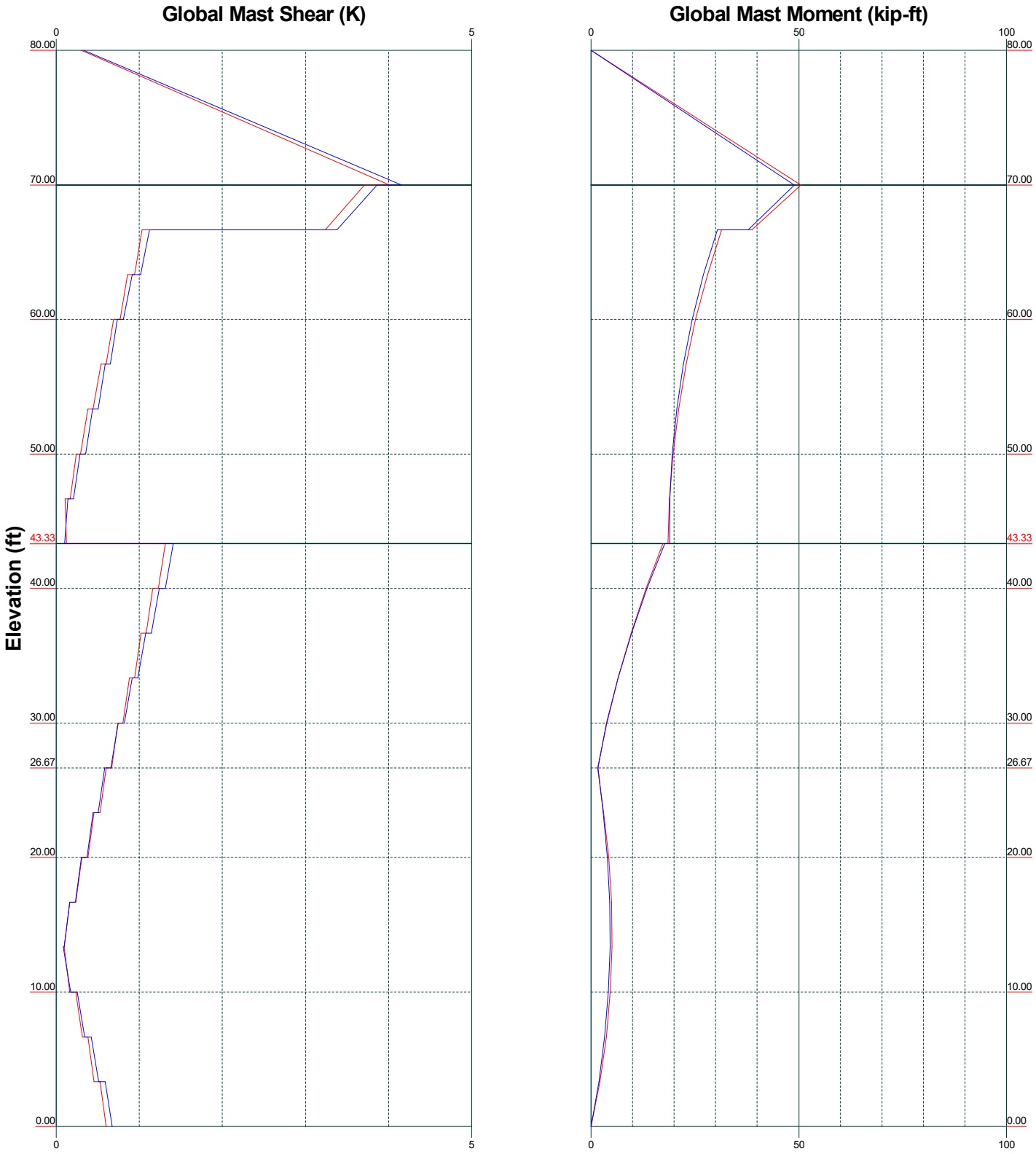
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 02/17/17	Scale: NTS
Path: J:\Jobs\1607100.W\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\Calcs\ERI\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-3

TIA-222-G - 101 mph/50 mph 1.0000 in Ice Exposure B

Vx Vz

Maximum Values

Mx Mz



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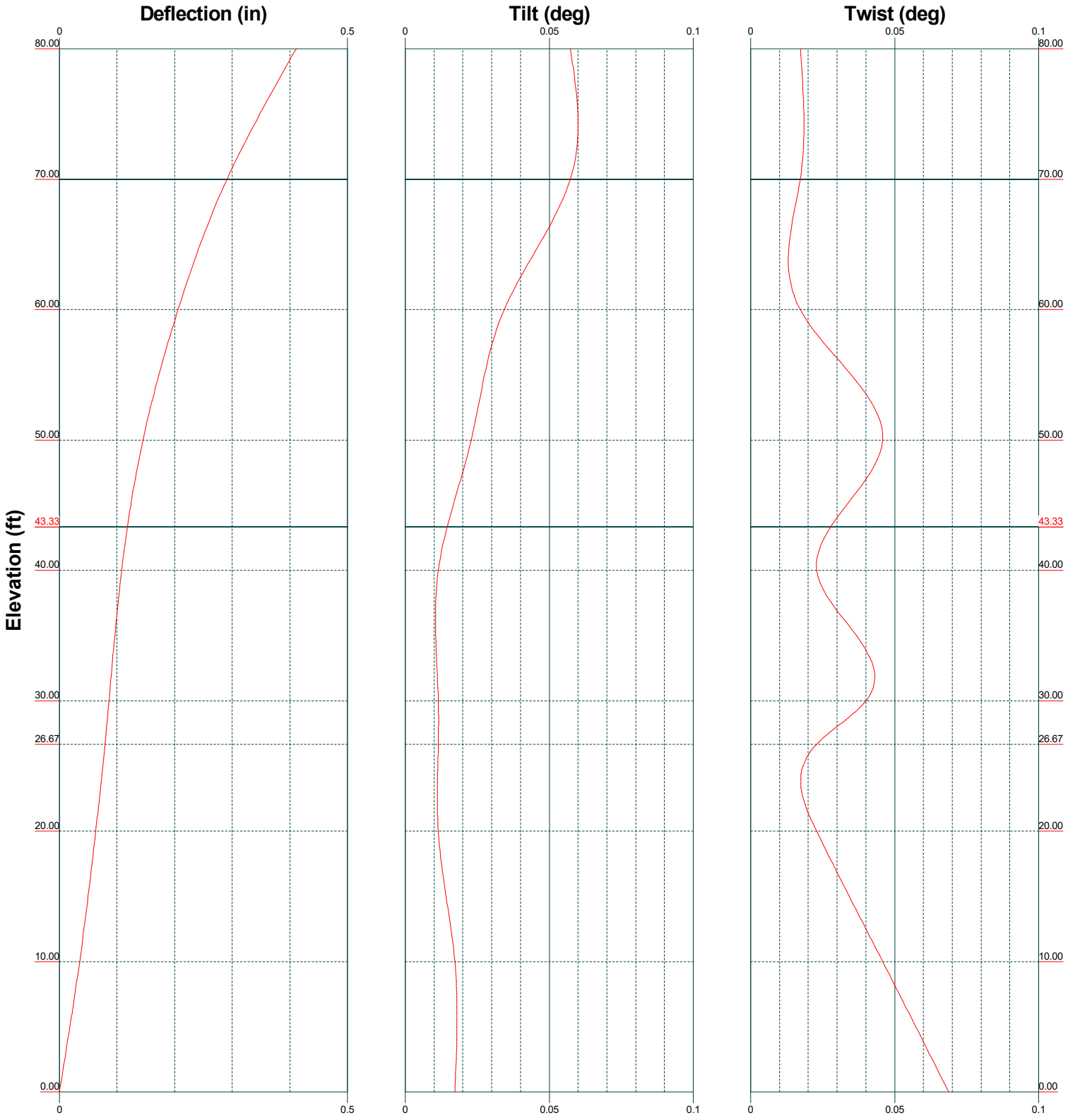
Client: AT&T Mobility	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 02/17/17	Scale: NTS
Path: J:\Jobs\1607100.WI\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\Calcs\ERI\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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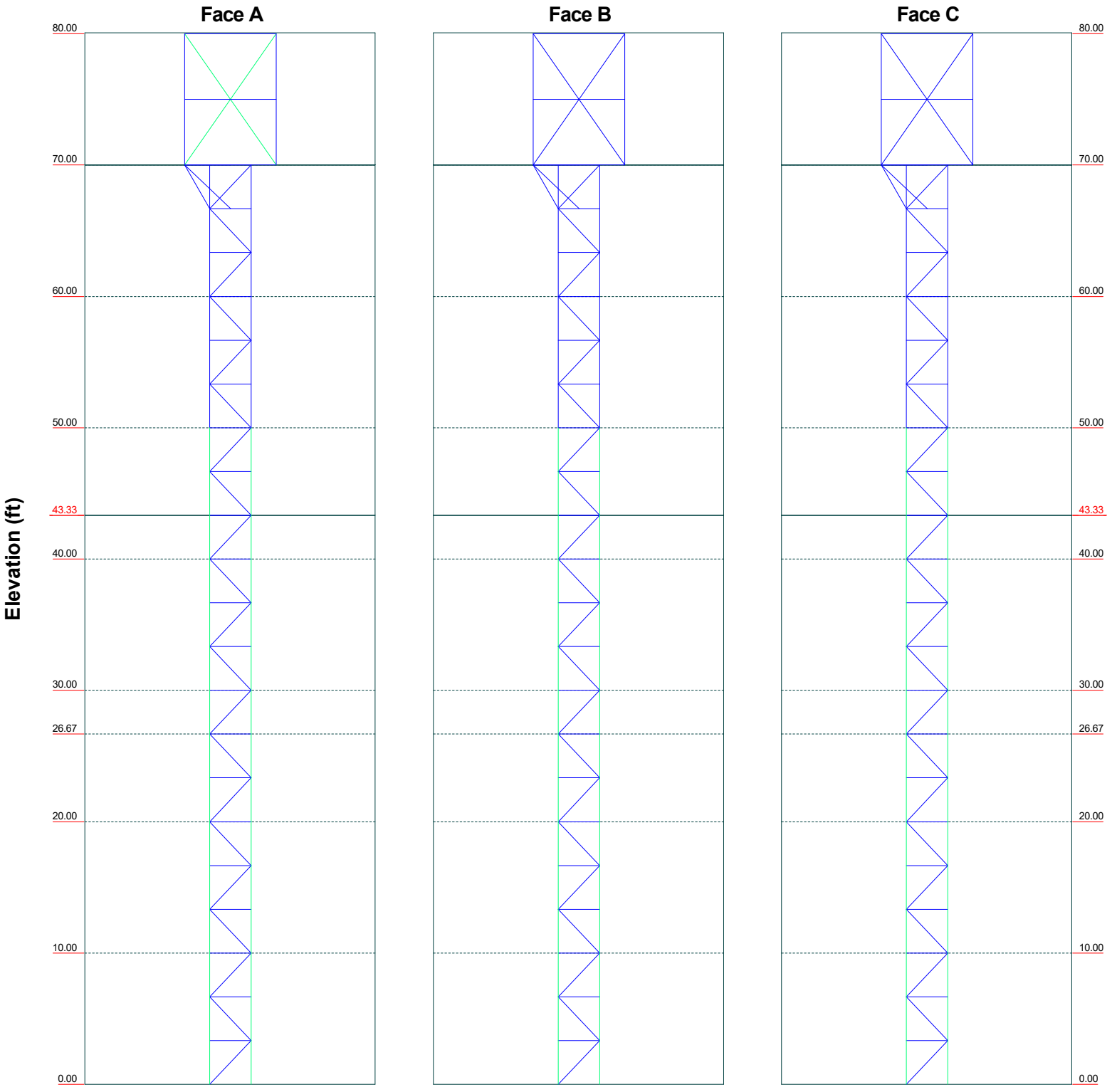
Code: TIA-222-G	Date: 02/17/17	Scale: NTS	
Path: J:\Jobs\1607100.WI\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\Calcs\ERI\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-5	

Stress Distribution Chart
0' - 80'

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



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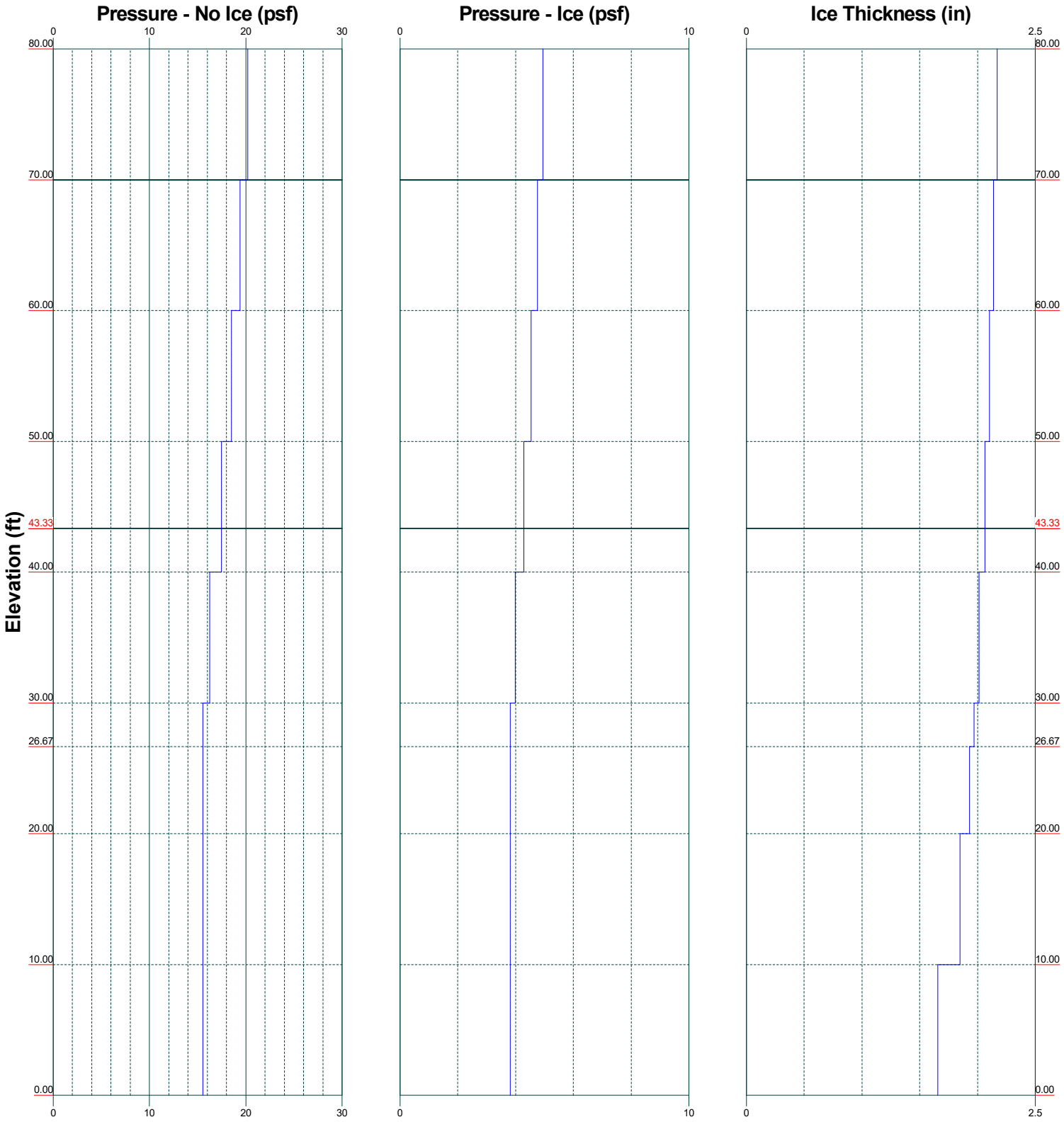
Code: TIA-222-G	Date: 02/17/17	Scale: NTS	
Path: J:\Jobs\1607100.W\12_Brooklyn CT2075\04_Structural\Tower\Backup Documentation\Calcs\ERI\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-8	

Wind Pressures and Ice Thickness

TIA-222-G - 101 mph/50 mph 1.0000 in Ice Exposure B



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Job: ***16071.12 - CT2075***			
Project: ***80' Guyed Tower - Tatnic Hill Road Brooklyn, CT***			
Client: AT&T Mobility	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 02/17/17	Scale: NTS	
Path: J:\Jobs\1607100.WI\12. Brooklyn CT2075\04. Structural\Tower\Backup Documentation\Calcs\ERI\80-ft Guyed Tower - Brooklyn, CT.eri		Dwg No. E-9	

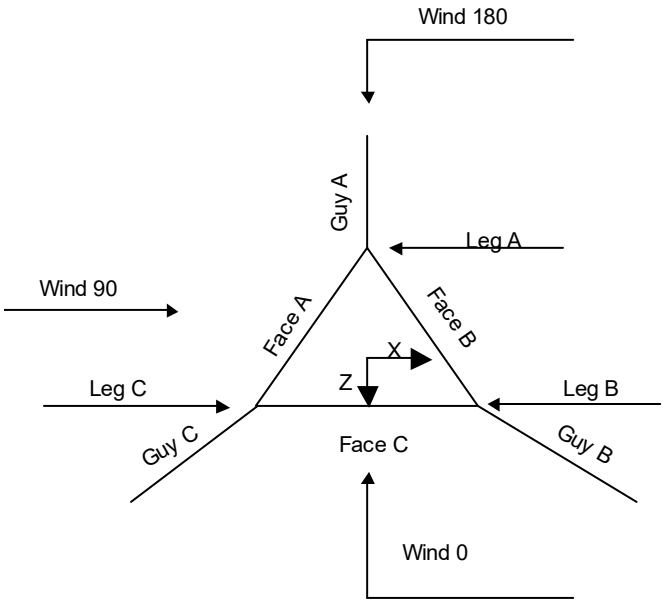
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 80.00 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 3.13 ft at the top and 3.13 ft at the base.
An index plate is provided at the 3 sided -tower connection.
There is a 3 sided latticed pole with a face width of 7.00 ft.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

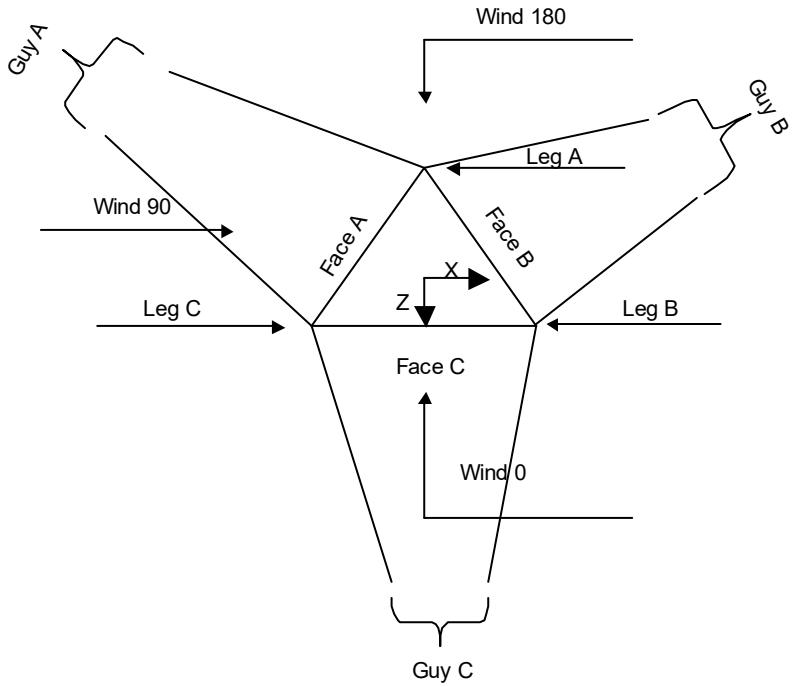
Basic wind speed of 101 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Bottom 23.5' of tower legs are reinforced. Reinforcement was not used in this analysis. Additonal capacity is provided by the reinforcment..
Pressures are calculated at each section.
Stress ratio used in latticed pole member design is 1.
Safety factor used in guy design is 1.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Corner & Starmount Guyed Tower



Face Guyed

3 Sided Latticed Pole Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
L1	80.00-70.00			7.00	1	10.00

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
L1	80.00-70.00	10.00	X Brace	No	Yes	0.0000	0.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
L1 80.00-70.00	Pipe	P3.5x.226	A53-B-35 (35 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)

3 Sided Latticed Pole 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
L1 80.00-70.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
L1 80.00-70.00	Single Angle	L2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

3 Sided Latticed Pole 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
L1 80.00-70.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

3 Sided Latticed Pole Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
L1 80.00-70.00	No	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

3 Sided Latticed Pole 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
L1 80.00-70.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

3 Sided Latticed Pole 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.
L1 80.00-70.00	Flange	0.7500 A325N	0	0.5000 A325N	2	0.5000 A325N	2	0.5000 A325N	2	0.6250 A325N	0	0.5000 A325N	2	0.6250 A325N	2

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	70.00-60.00			3.13	1	10.00
T2	60.00-50.00			3.13	1	10.00
T3	50.00-40.00			3.13	1	10.00
T4	40.00-30.00			3.13	1	10.00
T5	30.00-26.67			3.13	1	3.33
T6	26.67-20.00			3.13	1	6.67
T7	20.00-10.00			3.13	1	10.00
T8	10.00-0.00			3.13	1	10.00

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	70.00-60.00	3.33	K Brace Left	No	Yes	0.0000	0.0000
T2	60.00-50.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T3	50.00-40.00	3.33	K Brace Left	No	Yes	0.0000	0.0000

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
T4	40.00-30.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T5	30.00-26.67	3.33	K Brace Left	No	Yes	0.0000	0.0000
T6	26.67-20.00	3.33	K Brace Left	No	Yes	0.0000	0.0000
T7	20.00-10.00	3.33	K Brace Right	No	Yes	0.0000	0.0000
T8	10.00-0.00	3.33	K Brace Left	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 70.00-60.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T2 60.00-50.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T3 50.00-40.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 40.00-30.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T5 30.00-26.67	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T6 26.67-20.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T7 20.00-10.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T8 10.00-0.00	60 Angle	V3x3x1/4	A36 (36 ksi)	Single Angle	L2x2x3/16	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 70.00-60.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T2 60.00-50.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T3 50.00-40.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T4 40.00-30.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T5 30.00-26.67	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T6 26.67-20.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T7 20.00-10.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T8 10.00-0.00	None	Solid Round		A572-50 (50 ksi)	Single Angle	L1 1/4x1 1/4x3/16	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 70.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 30.00-26.67	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 26.67-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 20.00-10.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 10.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	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	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
70.00-60.00				1	1	1	1	1	1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
60.00-50.00				1	1	1	1	1	1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
50.00-40.00				1	1	1	1	1	1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
40.00-30.00				1	1	1	1	1	1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
30.00-26.67				1	1	1	1	1	1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
26.67-20.00				1	1	1	1	1	1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
20.00-10.00				1	1	1	1	1	1	1	1	1	1	1	1
T8 10.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 70.00-60.00	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
T2 60.00-50.00	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 50.00-40.00	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
T4 40.00-30.00	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 30.00-26.67	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 26.67-20.00	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
T7 20.00-10.00	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 10.00-0.00	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 70.00-60.00	Sleeve SS	0.6250 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T2 60.00-50.00	Sleeve SS	0.6250 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T3 50.00-40.00	Sleeve SS	0.6250 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T4 40.00-30.00	Sleeve SS	0.6250 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T5 30.00-26.67	Sleeve SS	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T6 26.67-20.00	Sleeve SS	0.6250 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T7 20.00-10.00	Sleeve SS	0.6250 A325N	12	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0
T8 10.00-0.00	Sleeve SS	0.6250 A325N	0	0.5000 A325N	1	0.5000 A325N	0	0.5000 A325N	0	0.6250 A325X	0	0.5000 A325N	1	0.6250 A325X	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
70	EHS	A	5/8	4.24	10%	21000	0.813	107.81	80.00	0.0000	-4.50	100%
		B	5/8	4.24	10%	21000	0.813	113.53	79.00	0.0000	-13.50	100%
		C	5/8	4.24	10%	21000	0.813	101.43	74.50	0.0000	-1.00	100%
43.3333	EHS	A	5/8	4.24	10%	21000	0.813	91.59	80.00	0.0000	-4.50	100%
		B	5/8	4.24	10%	21000	0.813	95.78	79.00	0.0000	-13.50	100%
		C	5/8	4.24	10%	21000	0.813	85.08	74.50	0.0000	-1.00	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
70	Torque Arm	7.00	30.0000	Bat Ear	A36 (36 ksi)	Single Angle	L2 1/2x2 1/2x1/2
43.3333	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
70.00	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Single Angle	L3x2x1/4 L2x2x3/16
43.33	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Single Angle	L2x2x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
70	0.09	0.09	0.08		1.11 1.8 sec/pulse	1.23 1.9 sec/pulse	0.98 1.7 sec/pulse	
43.3333	0.07	0.08	0.07		0.80 1.5 sec/pulse	0.88 1.6 sec/pulse	0.69 1.4 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
70	No	No	1	1	1	1	1	1
43.3333	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
70	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
43.3333	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
70	A	32.75	16	4	1.9985
	B	28.25	16	4	1.9692
	C	34.50	16	4	2.0089
43.3333	A	19.42	16	4	1.8967
	B	14.92	16	4	1.8473
	C	21.17	16	4	1.9131

Guy-Tensioning Information

Guy Elevation ft		H ft	V ft	Temperature At Time Of Tensioning 0 F Initial Tension K	0 F Intercept ft	20 F Initial Tension K	20 F Intercept ft	40 F Initial Tension K	40 F Intercept ft	60 F Initial Tension K	60 F Intercept ft	80 F Initial Tension K	80 F Intercept ft	100 F Initial Tension K	100 F Intercept ft	120 F Initial Tension K	120 F Intercept ft
70	A	78.06	74.50	5.236	0.90	4.903	0.96	4.571	1.03	4.240	1.11	3.911	1.20	3.584	1.31	3.261	1.44
	B	77.06	83.50	5.115	1.02	4.822	1.08	4.531	1.15	4.240	1.23	3.951	1.32	3.663	1.42	3.377	1.54
	C	72.56	71.00	5.214	0.80	4.888	0.85	4.564	0.91	4.240	0.98	3.918	1.06	3.598	1.15	3.280	1.27
43.3333	A	78.20	47.83	5.626	0.60	5.162	0.66	4.700	0.72	4.240	0.80	3.783	0.90	3.331	1.02	2.887	1.17
	B	77.20	56.83	5.475	0.68	5.062	0.73	4.650	0.80	4.240	0.88	3.833	0.97	3.429	1.08	3.030	1.22
	C	72.70	44.33	5.631	0.52	5.166	0.57	4.702	0.62	4.240	0.69	3.781	0.78	3.326	0.88	2.878	1.02

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1/2	A	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.48	1	1	0.5800	0.5800		0.25
1/2	C	No	Ar (CaAa)	80.00 - 0.00	-0.5000	0.48	1	1	0.5800	0.5800		0.25
1/2 (AT&T - Existing)	B	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.25	6	6	0.5800	0.5800		0.25
Fiber Trunk (AT&T - Proposed)	B	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.1	1	1	0.4000	0.4000		1.00
DC Trunk (AT&T - Proposed)	B	No	Ar (CaAa)	80.00 - 0.00	0.0000	0.13	2	2	0.4000	0.4000		0.11

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	80.00-70.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00
T1	70.00-60.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00
T2	60.00-50.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00
T3	50.00-40.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00
T4	40.00-30.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00
T5	30.00-26.67	A	0.000	0.000	0.193	0.000	0.00
		B	0.000	0.000	1.560	0.000	0.01
		C	0.000	0.000	0.193	0.000	0.00
T6	26.67-20.00	A	0.000	0.000	0.387	0.000	0.00
		B	0.000	0.000	3.120	0.000	0.02
		C	0.000	0.000	0.387	0.000	0.00
T7	20.00-10.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00
T8	10.00-0.00	A	0.000	0.000	0.580	0.000	0.00
		B	0.000	0.000	4.680	0.000	0.03
		C	0.000	0.000	0.580	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	80.00-70.00	A	2.171	0.000	0.000	4.922	0.000	0.08
		B		0.000	0.000	28.608	0.000	0.36
		C		0.000	0.000	4.922	0.000	0.08
T1	70.00-60.00	A	2.140	0.000	0.000	4.861	0.000	0.07
		B		0.000	0.000	28.335	0.000	0.35
		C		0.000	0.000	4.861	0.000	0.07
T2	60.00-50.00	A	2.105	0.000	0.000	4.790	0.000	0.07
		B		0.000	0.000	28.022	0.000	0.34
		C		0.000	0.000	4.790	0.000	0.07
T3	50.00-40.00	A	2.063	0.000	0.000	4.706	0.000	0.07
		B		0.000	0.000	27.653	0.000	0.33
		C		0.000	0.000	4.706	0.000	0.07
T4	40.00-30.00	A	2.012	0.000	0.000	4.604	0.000	0.07
		B		0.000	0.000	27.201	0.000	0.32
		C		0.000	0.000	4.604	0.000	0.07
T5	30.00-26.67	A	1.970	0.000	0.000	1.506	0.000	0.02
		B		0.000	0.000	8.943	0.000	0.10
		C		0.000	0.000	1.506	0.000	0.02
T6	26.67-20.00	A	1.932	0.000	0.000	2.962	0.000	0.04
		B		0.000	0.000	17.664	0.000	0.20
		C		0.000	0.000	2.962	0.000	0.04

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T7	20.00-10.00	A	1.848	0.000	0.000	4.277	0.000	0.06
		B		0.000	0.000	25.761	0.000	0.29
		C		0.000	0.000	4.277	0.000	0.06
T8	10.00-0.00	A	1.656	0.000	0.000	3.892	0.000	0.05
		B		0.000	0.000	24.071	0.000	0.25
		C		0.000	0.000	3.892	0.000	0.05

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	80.00-70.00	1.2717	0.0284	0.4940	-0.2854
T1	70.00-60.00	0.8012	0.0080	0.2444	-0.1470
T2	60.00-50.00	0.8754	0.0087	0.2686	-0.1573
T3	50.00-40.00	0.8422	0.0084	0.2528	-0.1434
T4	40.00-30.00	0.8754	0.0087	0.2867	-0.1562
T5	30.00-26.67	0.8754	0.0087	0.2952	-0.1556
T6	26.67-20.00	0.8391	0.0084	0.2941	-0.1503
T7	20.00-10.00	0.8391	0.0084	0.3119	-0.1487
T8	10.00-0.00	0.8391	0.0084	0.3574	-0.1434

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
L1	1	1/2	70.00 - 80.00	0.6000	0.5223
L1	2	1/2	70.00 - 80.00	0.6000	0.5223
L1	3	1/2	70.00 - 80.00	0.6000	0.5223
L1	4	Fiber Trunk	70.00 - 80.00	0.6000	0.5223
L1	5	DC Trunk	70.00 - 80.00	0.6000	0.5223
T1	1	1/2	60.00 - 70.00	0.6000	0.3808
T1	2	1/2	60.00 - 70.00	0.6000	0.3808
T1	3	1/2	60.00 - 70.00	0.6000	0.3808
T1	4	Fiber Trunk	60.00 - 70.00	0.6000	0.3808
T1	5	DC Trunk	60.00 - 70.00	0.6000	0.3808
T2	1	1/2	50.00 - 60.00	0.6000	0.4162
T2	2	1/2	50.00 - 60.00	0.6000	0.4162
T2	3	1/2	50.00 - 60.00	0.6000	0.4162
T2	4	Fiber Trunk	50.00 - 60.00	0.6000	0.4162
T2	5	DC Trunk	50.00 - 60.00	0.6000	0.4162
T3	1	1/2	40.00 - 50.00	0.6000	0.3836
T3	2	1/2	40.00 - 50.00	0.6000	0.3836
T3	3	1/2	40.00 - 50.00	0.6000	0.3836
T3	4	Fiber Trunk	40.00 - 50.00	0.6000	0.3836
T3	5	DC Trunk	40.00 - 50.00	0.6000	0.3836
T4	1	1/2	30.00 - 40.00	0.6000	0.4309
T4	2	1/2	30.00 - 40.00	0.6000	0.4309
T4	3	1/2	30.00 - 40.00	0.6000	0.4309
T4	4	Fiber Trunk	30.00 - 40.00	0.6000	0.4309
T4	5	DC Trunk	30.00 - 40.00	0.6000	0.4309

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	1	1/2	26.67 - 30.00	0.6000	0.4375
T5	2	1/2	26.67 - 30.00	0.6000	0.4375
T5	3	1/2	26.67 - 30.00	0.6000	0.4375
T5	4	Fiber Trunk	26.67 - 30.00	0.6000	0.4375
T5	5	DC Trunk	26.67 - 30.00	0.6000	0.4375
T6	1	1/2	20.00 - 26.67	0.6000	0.4295
T6	2	1/2	20.00 - 26.67	0.6000	0.4295
T6	3	1/2	20.00 - 26.67	0.6000	0.4295
T6	4	Fiber Trunk	20.00 - 26.67	0.6000	0.4295
T6	5	DC Trunk	20.00 - 26.67	0.6000	0.4295
T7	1	1/2	10.00 - 20.00	0.6000	0.4428
T7	2	1/2	10.00 - 20.00	0.6000	0.4428
T7	3	1/2	10.00 - 20.00	0.6000	0.4428
T7	4	Fiber Trunk	10.00 - 20.00	0.6000	0.4428
T7	5	DC Trunk	10.00 - 20.00	0.6000	0.4428
T8	1	1/2	0.00 - 10.00	0.6000	0.4738
T8	2	1/2	0.00 - 10.00	0.6000	0.4738
T8	3	1/2	0.00 - 10.00	0.6000	0.4738
T8	4	Fiber Trunk	0.00 - 10.00	0.6000	0.4738
T8	5	DC Trunk	0.00 - 10.00	0.6000	0.4738

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
20' x 3" Dia Omni	C	From Leg	1.00 0.00 0.00	0.0000	90.00	No Ice 1/2" Ice 1" Ice	6.00 8.03 10.08	6.00 8.03 10.08	0.05 0.09 0.15
10' Dipole	A	From Leg	1.00 0.00 0.00	0.0000	85.00	No Ice 1/2" Ice 1" Ice	4.00 6.00 8.00	4.00 6.00 8.00	0.05 0.07 0.10
7770.00 (AT&T Existing)	A	From Leg	4.00 -2.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	2.93 3.27 3.63	0.04 0.07 0.11
7770.00 (AT&T Existing)	B	From Leg	4.00 -2.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	2.93 3.27 3.63	0.04 0.07 0.11
7770.00 (AT&T Existing)	C	From Leg	4.00 -2.00 0.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	5.51 5.87 6.23	2.93 3.27 3.63	0.04 0.07 0.11
(2) LGP17201 TMA (AT&T Existing)	A	From Leg	4.00 -2.00 -2.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.45 0.55 0.65	0.03 0.04 0.06
(2) LGP17201 TMA (AT&T Existing)	B	From Leg	4.00 -2.00 -2.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.45 0.55 0.65	0.03 0.04 0.06
(2) LGP17201 TMA (AT&T Existing)	C	From Leg	4.00 -2.00 -2.00	0.0000	83.00	No Ice 1/2" Ice 1" Ice	1.67 1.83 2.00	0.45 0.55 0.65	0.03 0.04 0.06
TPA-65R-LCUUUU-H8	A	From Leg	4.00	0.0000	83.00	No Ice	13.30	8.82	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(AT&T Proposed)			2.00			1/2" Ice	13.90	9.42	0.15
			0.00			1" Ice	14.50	10.03	0.24
QS46512-2	B	From Leg	4.00	0.0000	83.00	No Ice	5.55	5.08	0.08
(AT&T Proposed)			2.00			1/2" Ice	5.90	5.42	0.12
			0.00			1" Ice	6.26	5.77	0.17
TPA-65R-LCUUUU-H8	C	From Leg	4.00	0.0000	83.00	No Ice	13.30	8.82	0.08
(AT&T Proposed)			2.00			1/2" Ice	13.90	9.42	0.15
			0.00			1" Ice	14.50	10.03	0.24
RRUS-11	A	From Leg	4.00	0.0000	83.00	No Ice	2.57	1.07	0.05
(AT&T Proposed)			-2.00			1/2" Ice	2.76	1.21	0.07
			2.00			1" Ice	2.97	1.36	0.09
RRUS-11	B	From Leg	4.00	0.0000	83.00	No Ice	2.57	1.07	0.05
(AT&T Proposed)			-2.00			1/2" Ice	2.76	1.21	0.07
			2.00			1" Ice	2.97	1.36	0.09
RRUS-11	C	From Leg	4.00	0.0000	83.00	No Ice	2.57	1.07	0.05
(AT&T Proposed)			-2.00			1/2" Ice	2.76	1.21	0.07
			2.00			1" Ice	2.97	1.36	0.09
RRUS-32	A	From Leg	4.00	0.0000	83.00	No Ice	3.31	2.42	0.08
(AT&T Proposed)			2.00			1/2" Ice	3.56	2.64	0.10
			2.00			1" Ice	3.81	2.86	0.14
RRUS-32	B	From Leg	4.00	0.0000	83.00	No Ice	3.31	2.42	0.08
(AT&T Proposed)			2.00			1/2" Ice	3.56	2.64	0.10
			2.00			1" Ice	3.81	2.86	0.14
RRUS-32	C	From Leg	4.00	0.0000	83.00	No Ice	3.31	2.42	0.08
(AT&T Proposed)			2.00			1/2" Ice	3.56	2.64	0.10
			2.00			1" Ice	3.81	2.86	0.14
DC6-48-60-18-8F Surge	A	From Leg	2.00	0.0000	83.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T Proposed)			0.00			1" Ice	2.29	2.29	0.06
12-ft Top Mount	A	None		0.0000	81.00	No Ice	17.00	17.00	1.80
(AT&T Existing)						1/2" Ice	23.00	23.00	2.20
						1" Ice	29.00	29.00	2.60

Tower Pressures - No Ice

G_H = 0.850 (base tower), 1.100 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 80.00-70.00	75.00	0.91	20	73.333	A	7.208	6.667	6.667	48.05	0.580	0.000
					B	7.208	6.667		48.05	4.680	0.000
					C	7.208	6.667		48.05	0.580	0.000
T1 70.00-60.00	65.00	0.874	19	34.073	A	8.599	0.000	5.000	58.15	0.580	0.000
					B	8.599	0.000		58.15	4.680	0.000
					C	8.599	0.000		58.15	0.580	0.000
T2 60.00-50.00	55.00	0.833	18	34.073	A	7.475	0.000	5.000	66.89	0.580	0.000
					B	7.475	0.000		66.89	4.680	0.000
					C	7.475	0.000		66.89	0.580	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
T3 50.00-40.00	45.00	0.787	17	34.073	A	7.954	0.000	5.000	62.86	0.580	0.000
					B	7.954	0.000		62.86	4.680	0.000
					C	7.954	0.000		62.86	0.580	0.000
T4 40.00-30.00	35.00	0.732	16	34.073	A	7.475	0.000	5.000	66.89	0.580	0.000
					B	7.475	0.000		66.89	4.680	0.000
					C	7.475	0.000		66.89	0.580	0.000
T5 30.00-26.67	28.33	0.7	16	11.358	A	2.492	0.000	1.667	66.89	0.193	0.000
					B	2.492	0.000		66.89	1.560	0.000
					C	2.492	0.000		66.89	0.193	0.000
T6 26.67-20.00	23.33	0.7	16	22.716	A	5.333	0.000	3.333	62.50	0.387	0.000
					B	5.333	0.000		62.50	3.120	0.000
					C	5.333	0.000		62.50	0.387	0.000
T7 20.00-10.00	15.00	0.7	16	34.073	A	8.000	0.000	5.000	62.50	0.580	0.000
					B	8.000	0.000		62.50	4.680	0.000
					C	8.000	0.000		62.50	0.580	0.000
T8 10.00-0.00	5.00	0.7	16	34.073	A	8.000	0.000	5.000	62.50	0.580	0.000
					B	8.000	0.000		62.50	4.680	0.000
					C	8.000	0.000		62.50	0.580	0.000

Tower Pressure - With Ice

G_H = 0.850 (base tower), 1.100 (upper structure)

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
L1 80.00-70.00	75.00	0.91	5	2.1711	76.952	A	7.208	29.554	13.904	37.82	4.922	0.000
						B	7.208	29.554		37.82	28.608	0.000
						C	7.208	29.554		37.82	4.922	0.000
T1 70.00-60.00	65.00	0.874	5	2.1403	37.641	A	8.599	14.709	12.134	52.06	4.861	0.000
						B	8.599	14.709		52.06	28.335	0.000
						C	8.599	14.709		52.06	4.861	0.000
T2 60.00-50.00	55.00	0.833	5	2.1048	37.581	A	7.475	14.466	12.016	54.77	4.790	0.000
						B	7.475	14.466		54.77	28.022	0.000
						C	7.475	14.466		54.77	4.790	0.000
T3 50.00-40.00	45.00	0.787	4	2.0630	37.512	A	7.954	15.167	11.877	51.37	4.706	0.000
						B	7.954	15.167		51.37	27.653	0.000
						C	7.954	15.167		51.37	4.706	0.000
T4 40.00-30.00	35.00	0.732	4	2.0118	37.426	A	7.475	13.826	11.706	54.95	4.604	0.000
						B	7.475	13.826		54.95	27.201	0.000
						C	7.475	13.826		54.95	4.604	0.000
T5 30.00-26.67	28.33	0.7	4	1.9697	12.452	A	2.492	4.512	3.855	55.04	1.506	0.000
						B	2.492	4.512		55.04	8.943	0.000
						C	2.492	4.512		55.04	1.506	0.000
T6 26.67-20.00	23.33	0.7	4	1.9319	24.862	A	5.333	8.851	7.626	53.76	2.962	0.000
						B	5.333	8.851		53.76	17.664	0.000
						C	5.333	8.851		53.76	2.962	0.000
T7 20.00-10.00	15.00	0.7	4	1.8484	37.154	A	8.000	12.703	11.161	53.91	4.277	0.000
						B	8.000	12.703		53.91	25.761	0.000
						C	8.000	12.703		53.91	4.277	0.000
T8 10.00-0.00	5.00	0.7	4	1.6561	36.834	A	8.000	11.381	10.520	54.28	3.892	0.000
						B	8.000	11.381		54.28	24.071	0.000
						C	8.000	11.381		54.28	3.892	0.000

Tower Pressure - Service

G_H = 0.850 (base tower), 1.100 (upper structure)

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
L1 80.00-70.00	75.00	0.91	7	73.333	A	7.208	6.667	6.667	48.05	0.580	0.000
					B	7.208	6.667		48.05	4.680	0.000
					C	7.208	6.667		48.05	0.580	0.000
T1 70.00-60.00	65.00	0.874	7	34.073	A	8.599	0.000	5.000	58.15	0.580	0.000
					B	8.599	0.000		58.15	4.680	0.000
					C	8.599	0.000		58.15	0.580	0.000
T2 60.00-50.00	55.00	0.833	7	34.073	A	7.475	0.000	5.000	66.89	0.580	0.000
					B	7.475	0.000		66.89	4.680	0.000
					C	7.475	0.000		66.89	0.580	0.000
T3 50.00-40.00	45.00	0.787	6	34.073	A	7.954	0.000	5.000	62.86	0.580	0.000
					B	7.954	0.000		62.86	4.680	0.000
					C	7.954	0.000		62.86	0.580	0.000
T4 40.00-30.00	35.00	0.732	6	34.073	A	7.475	0.000	5.000	66.89	0.580	0.000
					B	7.475	0.000		66.89	4.680	0.000
					C	7.475	0.000		66.89	0.580	0.000
T5 30.00-26.67	28.33	0.7	5	11.358	A	2.492	0.000	1.667	66.89	0.193	0.000
					B	2.492	0.000		66.89	1.560	0.000
					C	2.492	0.000		66.89	0.193	0.000
T6 26.67-20.00	23.33	0.7	5	22.716	A	5.333	0.000	3.333	62.50	0.387	0.000
					B	5.333	0.000		62.50	3.120	0.000
					C	5.333	0.000		62.50	0.387	0.000
T7 20.00-10.00	15.00	0.7	5	34.073	A	8.000	0.000	5.000	62.50	0.580	0.000
					B	8.000	0.000		62.50	4.680	0.000
					C	8.000	0.000		62.50	0.580	0.000
T8 10.00-0.00	5.00	0.7	5	34.073	A	8.000	0.000	5.000	62.50	0.580	0.000
					B	8.000	0.000		62.50	4.680	0.000
					C	8.000	0.000		62.50	0.580	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	20	1	1	11.023	0.72	72.28	C
80.00-70.00			B	0.189	2.632		1	1	11.023			
			C	0.189	2.632		1	1	11.023			
T1	0.03	0.32	A	0.252	2.43	19	1	1	8.599	0.40	40.23	C
70.00-60.00		TA 0.38	B	0.252	2.43		1	1	8.599			
			C	0.252	2.43		1	1	8.599			
T2	0.03	0.26	A	0.219	2.533	18	1	1	7.475	0.35	35.26	C
60.00-50.00			B	0.219	2.533		1	1	7.475			
			C	0.219	2.533		1	1	7.475			
T3	0.03	0.31	A	0.233	2.488	17	1	1	7.954	0.35	34.57	C
50.00-40.00			B	0.233	2.488		1	1	7.954			
			C	0.233	2.488		1	1	7.954			
T4	0.03	0.26	A	0.219	2.533	16	1	1	7.475	0.31	30.99	C
40.00-30.00			B	0.219	2.533		1	1	7.475			
			C	0.219	2.533		1	1	7.475			
T5	0.01	0.09	A	0.219	2.533	16	1	1	2.492	0.10	29.63	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
30.00-26.67			B	0.219	2.533		1	1	2.492			
			C	0.219	2.533		1	1	2.492			
T6	0.02	0.19	A	0.235	2.484	16	1	1	5.333	0.21	30.87	C
26.67-20.00			B	0.235	2.484		1	1	5.333			
			C	0.235	2.484		1	1	5.333			
T7	0.03	0.29	A	0.235	2.484	16	1	1	8.000	0.31	30.87	C
20.00-10.00			B	0.235	2.484		1	1	8.000			
			C	0.235	2.484		1	1	8.000			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	16	1	1	8.000	0.31	30.87	C
			B	0.235	2.484		1	1	8.000			
			C	0.235	2.484		1	1	8.000			
Sum Weight:	0.26	3.00								3.06		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	20	0.825	1	9.761	0.65	64.90	C
80.00-70.00			B	0.189	2.632		0.825	1	9.761			
			C	0.189	2.632		0.825	1	9.761			
T1	0.03	0.32	A	0.252	2.43	19	0.825	1	7.094	0.34	34.20	C
70.00-60.00		TA 0.38	B	0.252	2.43		0.825	1	7.094			
			C	0.252	2.43		0.825	1	7.094			
T2	0.03	0.26	A	0.219	2.533	18	0.825	1	6.167	0.30	30.06	C
60.00-50.00			B	0.219	2.533		0.825	1	6.167			
			C	0.219	2.533		0.825	1	6.167			
T3	0.03	0.31	A	0.233	2.488	17	0.825	1	6.562	0.29	29.43	C
50.00-40.00			B	0.233	2.488		0.825	1	6.562			
			C	0.233	2.488		0.825	1	6.562			
T4	0.03	0.26	A	0.219	2.533	16	0.825	1	6.167	0.26	26.41	C
40.00-30.00			B	0.219	2.533		0.825	1	6.167			
			C	0.219	2.533		0.825	1	6.167			
T5	0.01	0.09	A	0.219	2.533	16	0.825	1	2.056	0.08	25.25	C
30.00-26.67			B	0.219	2.533		0.825	1	2.056			
			C	0.219	2.533		0.825	1	2.056			
T6	0.02	0.19	A	0.235	2.484	16	0.825	1	4.400	0.18	26.28	C
26.67-20.00			B	0.235	2.484		0.825	1	4.400			
			C	0.235	2.484		0.825	1	4.400			
T7	0.03	0.29	A	0.235	2.484	16	0.825	1	6.600	0.26	26.28	C
20.00-10.00			B	0.235	2.484		0.825	1	6.600			
			C	0.235	2.484		0.825	1	6.600			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	16	0.825	1	6.600	0.26	26.28	C
			B	0.235	2.484		0.825	1	6.600			
			C	0.235	2.484		0.825	1	6.600			
Sum Weight:	0.26	3.00								2.64		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	20	0.8	1	9.581	0.64	63.85	C
80.00-70.00			B	0.189	2.632		0.8	1	9.581			
			C	0.189	2.632		0.8	1	9.581			
T1	0.03	0.32	A	0.252	2.43	19	0.8	1	6.879	0.33	33.34	C
70.00-60.00		TA 0.38	B	0.252	2.43		0.8	1	6.879			
			C	0.252	2.43		0.8	1	6.879			
T2	0.03	0.26	A	0.219	2.533	18	0.8	1	5.980	0.29	29.31	C
60.00-50.00			B	0.219	2.533		0.8	1	5.980			
			C	0.219	2.533		0.8	1	5.980			
T3	0.03	0.31	A	0.233	2.488	17	0.8	1	6.363	0.29	28.70	C
50.00-40.00			B	0.233	2.488		0.8	1	6.363			
			C	0.233	2.488		0.8	1	6.363			
T4	0.03	0.26	A	0.219	2.533	16	0.8	1	5.980	0.26	25.76	C
40.00-30.00			B	0.219	2.533		0.8	1	5.980			
			C	0.219	2.533		0.8	1	5.980			
T5	0.01	0.09	A	0.219	2.533	16	0.8	1	1.993	0.08	24.63	C
30.00-26.67			B	0.219	2.533		0.8	1	1.993			
			C	0.219	2.533		0.8	1	1.993			
T6	0.02	0.19	A	0.235	2.484	16	0.8	1	4.267	0.17	25.62	C
26.67-20.00			B	0.235	2.484		0.8	1	4.267			
			C	0.235	2.484		0.8	1	4.267			
T7	0.03	0.29	A	0.235	2.484	16	0.8	1	6.400	0.26	25.62	C
20.00-10.00			B	0.235	2.484		0.8	1	6.400			
			C	0.235	2.484		0.8	1	6.400			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	16	0.8	1	6.400	0.26	25.62	C
			B	0.235	2.484		0.8	1	6.400			
			C	0.235	2.484		0.8	1	6.400			
Sum Weight:	0.26	3.00								2.57		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	20	0.85	1	9.942	0.66	65.95	C
80.00-70.00			B	0.189	2.632		0.85	1	9.942			
			C	0.189	2.632		0.85	1	9.942			
T1	0.03	0.32	A	0.252	2.43	19	0.85	1	7.309	0.35	35.06	C
70.00-60.00		TA 0.38	B	0.252	2.43		0.85	1	7.309			
			C	0.252	2.43		0.85	1	7.309			
T2	0.03	0.26	A	0.219	2.533	18	0.85	1	6.354	0.31	30.80	C
60.00-50.00			B	0.219	2.533		0.85	1	6.354			
			C	0.219	2.533		0.85	1	6.354			
T3	0.03	0.31	A	0.233	2.488	17	0.85	1	6.761	0.30	30.17	C
50.00-40.00			B	0.233	2.488		0.85	1	6.761			
			C	0.233	2.488		0.85	1	6.761			
T4	0.03	0.26	A	0.219	2.533	16	0.85	1	6.354	0.27	27.07	C
40.00-30.00			B	0.219	2.533		0.85	1	6.354			
			C	0.219	2.533		0.85	1	6.354			
T5	0.01	0.09	A	0.219	2.533	16	0.85	1	2.118	0.09	25.88	C
30.00-26.67			B	0.219	2.533		0.85	1	2.118			
			C	0.219	2.533		0.85	1	2.118			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T6	0.02	0.19	A	0.235	2.484	16	0.85	1	4.533	0.18	26.94	C
26.67-20.00			B	0.235	2.484		0.85	1	4.533			
			C	0.235	2.484		0.85	1	4.533			
T7	0.03	0.29	A	0.235	2.484	16	0.85	1	6.800	0.27	26.94	C
20.00-10.00			B	0.235	2.484		0.85	1	6.800			
			C	0.235	2.484		0.85	1	6.800			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	16	0.85	1	6.800	0.27	26.94	C
			B	0.235	2.484		0.85	1	6.800			
			C	0.235	2.484		0.85	1	6.800			
Sum Weight:	0.26	3.00								2.70		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.51	2.90	A	0.478	1.931	5	1	1	27.105	0.39	39.44	C
80.00-70.00			B	0.478	1.931		1	1	27.105			
			C	0.478	1.931		1	1	27.105			
T1	0.50	1.71	A	0.619	1.793	5	1	1	19.721	0.20	20.14	C
70.00-60.00		TA 1.13	B	0.619	1.793		1	1	19.721			
			C	0.619	1.793		1	1	19.721			
T2	0.48	1.48	A	0.584	1.815	5	1	1	18.087	0.19	18.67	C
60.00-50.00			B	0.584	1.815		1	1	18.087			
			C	0.584	1.815		1	1	18.087			
T3	0.47	1.60	A	0.616	1.795	4	1	1	19.393	0.18	17.83	C
50.00-40.00			B	0.616	1.795		1	1	19.393			
			C	0.616	1.795		1	1	19.393			
T4	0.45	1.40	A	0.569	1.826	4	1	1	17.494	0.16	16.13	C
40.00-30.00			B	0.569	1.826		1	1	17.494			
			C	0.569	1.826		1	1	17.494			
T5	0.15	0.46	A	0.562	1.832	4	1	1	5.743	0.05	15.30	C
30.00-26.67			B	0.562	1.832		1	1	5.743			
			C	0.562	1.832		1	1	5.743			
T6	0.29	0.96	A	0.571	1.825	4	1	1	11.755	0.10	15.34	C
26.67-20.00			B	0.571	1.825		1	1	11.755			
			C	0.571	1.825		1	1	11.755			
T7	0.40	1.36	A	0.557	1.837	4	1	1	17.115	0.15	15.09	C
20.00-10.00			B	0.557	1.837		1	1	17.115			
			C	0.557	1.837		1	1	17.115			
T8 10.00-0.00	0.34	1.21	A	0.526	1.868	4	1	1	15.961	0.15	14.54	C
			B	0.526	1.868		1	1	15.961			
			C	0.526	1.868		1	1	15.961			
Sum Weight:	3.59	14.22								1.57		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.51	2.90	A	0.478	1.931	5	0.825	1	25.844	0.38	38.12	C
80.00-70.00			B	0.478	1.931		0.825	1	25.844			
			C	0.478	1.931		0.825	1	25.844			
T1	0.50	1.71	A	0.619	1.793	5	0.825	1	18.216	0.19	19.05	C
70.00-60.00		TA 1.13	B	0.619	1.793		0.825	1	18.216			
			C	0.619	1.793		0.825	1	18.216			
T2	0.48	1.48	A	0.584	1.815	5	0.825	1	16.779	0.18	17.76	C
60.00-50.00			B	0.584	1.815		0.825	1	16.779			
			C	0.584	1.815		0.825	1	16.779			
T3	0.47	1.60	A	0.616	1.795	4	0.825	1	18.001	0.17	16.92	C
50.00-40.00			B	0.616	1.795		0.825	1	18.001			
			C	0.616	1.795		0.825	1	18.001			
T4	0.45	1.40	A	0.569	1.826	4	0.825	1	16.186	0.15	15.32	C
40.00-30.00			B	0.569	1.826		0.825	1	16.186			
			C	0.569	1.826		0.825	1	16.186			
T5	0.15	0.46	A	0.562	1.832	4	0.825	1	5.307	0.05	14.52	C
30.00-26.67			B	0.562	1.832		0.825	1	5.307			
			C	0.562	1.832		0.825	1	5.307			
T6	0.29	0.96	A	0.571	1.825	4	0.825	1	10.822	0.10	14.51	C
26.67-20.00			B	0.571	1.825		0.825	1	10.822			
			C	0.571	1.825		0.825	1	10.822			
T7	0.40	1.36	A	0.557	1.837	4	0.825	1	15.715	0.14	14.26	C
20.00-10.00			B	0.557	1.837		0.825	1	15.715			
			C	0.557	1.837		0.825	1	15.715			
T8 10.00-0.00	0.34	1.21	A	0.526	1.868	4	0.825	1	14.561	0.14	13.69	C
			B	0.526	1.868		0.825	1	14.561			
			C	0.526	1.868		0.825	1	14.561			
Sum Weight:	3.59	14.22								1.50		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.51	2.90	A	0.478	1.931	5	0.8	1	25.663	0.38	37.93	C
80.00-70.00			B	0.478	1.931		0.8	1	25.663			
			C	0.478	1.931		0.8	1	25.663			
T1	0.50	1.71	A	0.619	1.793	5	0.8	1	18.001	0.19	18.90	C
70.00-60.00		TA 1.13	B	0.619	1.793		0.8	1	18.001			
			C	0.619	1.793		0.8	1	18.001			
T2	0.48	1.48	A	0.584	1.815	5	0.8	1	16.592	0.18	17.63	C
60.00-50.00			B	0.584	1.815		0.8	1	16.592			
			C	0.584	1.815		0.8	1	16.592			
T3	0.47	1.60	A	0.616	1.795	4	0.8	1	17.802	0.17	16.79	C
50.00-40.00			B	0.616	1.795		0.8	1	17.802			
			C	0.616	1.795		0.8	1	17.802			
T4	0.45	1.40	A	0.569	1.826	4	0.8	1	15.999	0.15	15.20	C
40.00-30.00			B	0.569	1.826		0.8	1	15.999			
			C	0.569	1.826		0.8	1	15.999			
T5	0.15	0.46	A	0.562	1.832	4	0.8	1	5.245	0.05	14.41	C
30.00-26.67			B	0.562	1.832		0.8	1	5.245			
			C	0.562	1.832		0.8	1	5.245			
T6	0.29	0.96	A	0.571	1.825	4	0.8	1	10.688	0.10	14.39	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
26.67-20.00			B	0.571	1.825		0.8	1	10.688			
			C	0.571	1.825		0.8	1	10.688			
T7	0.40	1.36	A	0.557	1.837	4	0.8	1	15.515	0.14	14.14	C
20.00-10.00			B	0.557	1.837		0.8	1	15.515			
			C	0.557	1.837		0.8	1	15.515			
T8 10.00-0.00	0.34	1.21	A	0.526	1.868	4	0.8	1	14.361	0.14	13.57	C
			B	0.526	1.868		0.8	1	14.361			
			C	0.526	1.868		0.8	1	14.361			
Sum Weight:	3.59	14.22								1.49		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.51	2.90	A	0.478	1.931	5	0.85	1	26.024	0.38	38.31	C
80.00-70.00			B	0.478	1.931		0.85	1	26.024			
			C	0.478	1.931		0.85	1	26.024			
T1	0.50	1.71	A	0.619	1.793	5	0.85	1	18.431	0.19	19.21	C
70.00-60.00		TA 1.13	B	0.619	1.793		0.85	1	18.431			
			C	0.619	1.793		0.85	1	18.431			
T2	0.48	1.48	A	0.584	1.815	5	0.85	1	16.966	0.18	17.89	C
60.00-50.00			B	0.584	1.815		0.85	1	16.966			
			C	0.584	1.815		0.85	1	16.966			
T3	0.47	1.60	A	0.616	1.795	4	0.85	1	18.200	0.17	17.05	C
50.00-40.00			B	0.616	1.795		0.85	1	18.200			
			C	0.616	1.795		0.85	1	18.200			
T4	0.45	1.40	A	0.569	1.826	4	0.85	1	16.373	0.15	15.43	C
40.00-30.00			B	0.569	1.826		0.85	1	16.373			
			C	0.569	1.826		0.85	1	16.373			
T5	0.15	0.46	A	0.562	1.832	4	0.85	1	5.370	0.05	14.63	C
30.00-26.67			B	0.562	1.832		0.85	1	5.370			
			C	0.562	1.832		0.85	1	5.370			
T6	0.29	0.96	A	0.571	1.825	4	0.85	1	10.955	0.10	14.63	C
26.67-20.00			B	0.571	1.825		0.85	1	10.955			
			C	0.571	1.825		0.85	1	10.955			
T7	0.40	1.36	A	0.557	1.837	4	0.85	1	15.915	0.14	14.38	C
20.00-10.00			B	0.557	1.837		0.85	1	15.915			
			C	0.557	1.837		0.85	1	15.915			
T8 10.00-0.00	0.34	1.21	A	0.526	1.868	4	0.85	1	14.761	0.14	13.81	C
			B	0.526	1.868		0.85	1	14.761			
			C	0.526	1.868		0.85	1	14.761			
Sum Weight:	3.59	14.22								1.51		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	7	1	1	11.023	0.26	25.51	C
80.00-70.00			B	0.189	2.632		1	1	11.023			
			C	0.189	2.632		1	1	11.023			
T1	0.03	0.32	A	0.252	2.43	7	1	1	8.599	0.14	14.20	C
70.00-60.00		TA 0.38	B	0.252	2.43		1	1	8.599			
			C	0.252	2.43		1	1	8.599			
T2	0.03	0.26	A	0.219	2.533	7	1	1	7.475	0.12	12.44	C
60.00-50.00			B	0.219	2.533		1	1	7.475			
			C	0.219	2.533		1	1	7.475			
T3	0.03	0.31	A	0.233	2.488	6	1	1	7.954	0.12	12.20	C
50.00-40.00			B	0.233	2.488		1	1	7.954			
			C	0.233	2.488		1	1	7.954			
T4	0.03	0.26	A	0.219	2.533	6	1	1	7.475	0.11	10.94	C
40.00-30.00			B	0.219	2.533		1	1	7.475			
			C	0.219	2.533		1	1	7.475			
T5	0.01	0.09	A	0.219	2.533	5	1	1	2.492	0.03	10.46	C
30.00-26.67			B	0.219	2.533		1	1	2.492			
			C	0.219	2.533		1	1	2.492			
T6	0.02	0.19	A	0.235	2.484	5	1	1	5.333	0.07	10.90	C
26.67-20.00			B	0.235	2.484		1	1	5.333			
			C	0.235	2.484		1	1	5.333			
T7	0.03	0.29	A	0.235	2.484	5	1	1	8.000	0.11	10.90	C
20.00-10.00			B	0.235	2.484		1	1	8.000			
			C	0.235	2.484		1	1	8.000			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	5	1	1	8.000	0.11	10.90	C
			B	0.235	2.484		1	1	8.000			
			C	0.235	2.484		1	1	8.000			
Sum Weight:	0.26	3.00								1.08		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	7	0.825	1	9.761	0.23	22.90	C
80.00-70.00			B	0.189	2.632		0.825	1	9.761			
			C	0.189	2.632		0.825	1	9.761			
T1	0.03	0.32	A	0.252	2.43	7	0.825	1	7.094	0.12	12.07	C
70.00-60.00		TA 0.38	B	0.252	2.43		0.825	1	7.094			
			C	0.252	2.43		0.825	1	7.094			
T2	0.03	0.26	A	0.219	2.533	7	0.825	1	6.167	0.11	10.61	C
60.00-50.00			B	0.219	2.533		0.825	1	6.167			
			C	0.219	2.533		0.825	1	6.167			
T3	0.03	0.31	A	0.233	2.488	6	0.825	1	6.562	0.10	10.39	C
50.00-40.00			B	0.233	2.488		0.825	1	6.562			
			C	0.233	2.488		0.825	1	6.562			
T4	0.03	0.26	A	0.219	2.533	6	0.825	1	6.167	0.09	9.32	C
40.00-30.00			B	0.219	2.533		0.825	1	6.167			
			C	0.219	2.533		0.825	1	6.167			
T5	0.01	0.09	A	0.219	2.533	5	0.825	1	2.056	0.03	8.91	C
30.00-26.67			B	0.219	2.533		0.825	1	2.056			
			C	0.219	2.533		0.825	1	2.056			
T6	0.02	0.19	A	0.235	2.484	5	0.825	1	4.400	0.06	9.27	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
26.67-20.00			B	0.235	2.484		0.825	1	4.400			
			C	0.235	2.484		0.825	1	4.400			
T7	0.03	0.29	A	0.235	2.484	5	0.825	1	6.600	0.09	9.27	C
20.00-10.00			B	0.235	2.484		0.825	1	6.600			
			C	0.235	2.484		0.825	1	6.600			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	5	0.825	1	6.600	0.09	9.27	C
			B	0.235	2.484		0.825	1	6.600			
			C	0.235	2.484		0.825	1	6.600			
Sum Weight:	0.26	3.00								0.93		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	7	0.8	1	9.581	0.23	22.53	C
80.00-70.00			B	0.189	2.632		0.8	1	9.581			
			C	0.189	2.632		0.8	1	9.581			
T1	0.03	0.32	A	0.252	2.43	7	0.8	1	6.879	0.12	11.77	C
70.00-60.00		TA 0.38	B	0.252	2.43		0.8	1	6.879			
			C	0.252	2.43		0.8	1	6.879			
T2	0.03	0.26	A	0.219	2.533	7	0.8	1	5.980	0.10	10.34	C
60.00-50.00			B	0.219	2.533		0.8	1	5.980			
			C	0.219	2.533		0.8	1	5.980			
T3	0.03	0.31	A	0.233	2.488	6	0.8	1	6.363	0.10	10.13	C
50.00-40.00			B	0.233	2.488		0.8	1	6.363			
			C	0.233	2.488		0.8	1	6.363			
T4	0.03	0.26	A	0.219	2.533	6	0.8	1	5.980	0.09	9.09	C
40.00-30.00			B	0.219	2.533		0.8	1	5.980			
			C	0.219	2.533		0.8	1	5.980			
T5	0.01	0.09	A	0.219	2.533	5	0.8	1	1.993	0.03	8.69	C
30.00-26.67			B	0.219	2.533		0.8	1	1.993			
			C	0.219	2.533		0.8	1	1.993			
T6	0.02	0.19	A	0.235	2.484	5	0.8	1	4.267	0.06	9.04	C
26.67-20.00			B	0.235	2.484		0.8	1	4.267			
			C	0.235	2.484		0.8	1	4.267			
T7	0.03	0.29	A	0.235	2.484	5	0.8	1	6.400	0.09	9.04	C
20.00-10.00			B	0.235	2.484		0.8	1	6.400			
			C	0.235	2.484		0.8	1	6.400			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	5	0.8	1	6.400	0.09	9.04	C
			B	0.235	2.484		0.8	1	6.400			
			C	0.235	2.484		0.8	1	6.400			
Sum Weight:	0.26	3.00								0.91		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
L1	0.03	0.61	A	0.189	2.632	7	0.85	1	9.942	0.23	23.28	C
80.00-70.00			B	0.189	2.632		0.85	1	9.942			
			C	0.189	2.632		0.85	1	9.942			
T1	0.03	0.32	A	0.252	2.43	7	0.85	1	7.309	0.12	12.37	C
70.00-60.00		TA 0.38	B	0.252	2.43		0.85	1	7.309			
			C	0.252	2.43		0.85	1	7.309			
T2	0.03	0.26	A	0.219	2.533	7	0.85	1	6.354	0.11	10.87	C
60.00-50.00			B	0.219	2.533		0.85	1	6.354			
			C	0.219	2.533		0.85	1	6.354			
T3	0.03	0.31	A	0.233	2.488	6	0.85	1	6.761	0.11	10.65	C
50.00-40.00			B	0.233	2.488		0.85	1	6.761			
			C	0.233	2.488		0.85	1	6.761			
T4	0.03	0.26	A	0.219	2.533	6	0.85	1	6.354	0.10	9.55	C
40.00-30.00			B	0.219	2.533		0.85	1	6.354			
			C	0.219	2.533		0.85	1	6.354			
T5	0.01	0.09	A	0.219	2.533	5	0.85	1	2.118	0.03	9.13	C
30.00-26.67			B	0.219	2.533		0.85	1	2.118			
			C	0.219	2.533		0.85	1	2.118			
T6	0.02	0.19	A	0.235	2.484	5	0.85	1	4.533	0.06	9.51	C
26.67-20.00			B	0.235	2.484		0.85	1	4.533			
			C	0.235	2.484		0.85	1	4.533			
T7	0.03	0.29	A	0.235	2.484	5	0.85	1	6.800	0.10	9.51	C
20.00-10.00			B	0.235	2.484		0.85	1	6.800			
			C	0.235	2.484		0.85	1	6.800			
T8 10.00-0.00	0.03	0.29	A	0.235	2.484	5	0.85	1	6.800	0.10	9.51	C
			B	0.235	2.484		0.85	1	6.800			
			C	0.235	2.484		0.85	1	6.800			
Sum Weight:	0.26	3.00								0.95		

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	1.30			
Bracing Weight	1.69			
Total Member Self-Weight	3.00			
Guy Weight	0.75			
Total Weight	6.85			
Wind 0 deg - No Ice		0.04	-5.36	-0.79
Wind 30 deg - No Ice		2.51	-4.35	-1.22
Wind 45 deg - No Ice		3.49	-3.52	-1.31
Wind 60 deg - No Ice		4.21	-2.48	-1.30
Wind 90 deg - No Ice		4.96	-0.04	-1.02
Wind 120 deg - No Ice		4.59	2.65	-0.49
Wind 135 deg - No Ice		3.68	3.71	-0.16
Wind 150 deg - No Ice		2.44	4.31	0.20
Wind 180 deg - No Ice		-0.04	4.88	0.83
Wind 210 deg - No Ice		-2.51	4.35	1.22
Wind 225 deg - No Ice		-3.49	3.52	1.31
Wind 240 deg - No Ice		-4.62	2.72	1.28
Wind 270 deg - No Ice		-4.96	0.04	1.02
Wind 300 deg - No Ice		-4.17	-2.41	0.47

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Wind 315 deg - No Ice		-3.68	-3.71	0.16
Wind 330 deg - No Ice		-2.44	-4.31	-0.20
Member Ice	11.22			
Guy Ice	5.68			
Total Weight Ice	32.19			
Wind 0 deg - Ice		0.01	-2.54	-0.47
Wind 30 deg - Ice		1.24	-2.15	-0.60
Wind 45 deg - Ice		1.74	-1.75	-0.61
Wind 60 deg - Ice		2.12	-1.23	-0.57
Wind 90 deg - Ice		2.46	-0.01	-0.39
Wind 120 deg - Ice		2.18	1.26	-0.10
Wind 135 deg - Ice		1.77	1.78	0.06
Wind 150 deg - Ice		1.22	2.14	0.22
Wind 180 deg - Ice		-0.01	2.45	0.48
Wind 210 deg - Ice		-1.24	2.15	0.60
Wind 225 deg - Ice		-1.74	1.75	0.61
Wind 240 deg - Ice		-2.19	1.28	0.57
Wind 270 deg - Ice		-2.46	0.01	0.39
Wind 300 deg - Ice		-2.11	-1.22	0.10
Wind 315 deg - Ice		-1.77	-1.78	-0.06
Wind 330 deg - Ice		-1.22	-2.14	-0.22
Total Weight	6.85			
Wind 0 deg - Service		0.01	-1.89	-0.28
Wind 30 deg - Service		0.89	-1.54	-0.43
Wind 45 deg - Service		1.23	-1.24	-0.46
Wind 60 deg - Service		1.49	-0.87	-0.46
Wind 90 deg - Service		1.75	-0.01	-0.36
Wind 120 deg - Service		1.62	0.93	-0.17
Wind 135 deg - Service		1.30	1.31	-0.06
Wind 150 deg - Service		0.86	1.52	0.07
Wind 180 deg - Service		-0.01	1.72	0.29
Wind 210 deg - Service		-0.89	1.54	0.43
Wind 225 deg - Service		-1.23	1.24	0.46
Wind 240 deg - Service		-1.63	0.96	0.45
Wind 270 deg - Service		-1.75	0.01	0.36
Wind 300 deg - Service		-1.47	-0.85	0.17
Wind 315 deg - Service		-1.30	-1.31	0.06
Wind 330 deg - Service		-0.86	-1.52	-0.07

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.6 Wind 45 deg - No Ice+1.0 Guy
5	1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy
6	1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy
7	1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy
8	1.2 Dead+1.6 Wind 135 deg - No Ice+1.0 Guy
9	1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy
10	1.2 Dead+1.6 Wind 180 deg - No Ice+1.0 Guy
11	1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy

Comb. No.	Description
12	1.2 Dead+1.6 Wind 225 deg - No Ice+1.0 Guy
13	1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy
14	1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy
15	1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy
16	1.2 Dead+1.6 Wind 315 deg - No Ice+1.0 Guy
17	1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy
18	1.2 Dead+1.0 Ice+1.0 Temp+Guy
19	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
28	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
29	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp+1.0 Guy
30	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
31	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
32	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
33	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp+1.0 Guy
34	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	80 - 70	Latticed Pole Leg	Max Tension	5	3.44	0.00	0.00
			Max. Compression	2	-5.62	0.00	0.00
			Max. Mx	31	-0.32	0.09	-0.00
			Max. My	19	-0.42	-0.00	0.10
			Max. Vy	6	-1.24	0.00	-0.00
			Max. Vx	10	-1.25	-0.00	0.00
		Latticed Pole Diagonal	Max Tension	4	2.54	0.01	0.00
			Max. Compression	12	-2.91	0.00	0.00
			Max. Mx	20	0.25	0.04	-0.00
			Max. My	5	-0.91	0.01	0.00
			Max. Vy	20	-0.04	0.04	-0.00
			Max. Vx	5	-0.00	0.01	0.00
		Latticed Pole	Max Tension	10	0.13	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Secondary Horizontal					
			Max. Compression	2	-0.14	0.01	-0.00
			Max. Mx	28	-0.01	0.03	-0.00
			Max. My	32	0.00	0.02	-0.00
			Max. Vy	28	0.04	0.03	-0.00
			Max. Vx	32	0.00	0.00	0.00
		Latticed Pole Top Girt	Max Tension	13	0.52	0.00	0.00
			Max. Compression	10	-0.36	0.00	0.00
			Max. Mx	18	0.18	-0.10	0.00
			Max. My	4	0.20	0.00	-0.00
			Max. Vy	18	0.06	0.00	0.00
			Max. Vx	4	0.00	0.00	0.00
		Latticed Pole Bottom Girt	Max Tension	34	0.00	0.00	0.00
			Max. Compression	34	-0.00	0.00	0.00
			Max. Mx	18	0.00	-0.10	0.00
			Max. My	14	0.00	0.00	0.00
			Max. Vy	18	0.06	0.00	0.00
			Max. Vx	14	-0.00	0.00	0.00
T1	70 - 60	Leg	Max Tension	5	14.61	0.02	0.17
			Max. Compression	2	-18.10	0.19	-0.03
			Max. Mx	17	-1.55	0.32	0.04
			Max. My	13	-17.21	0.09	-0.17
			Max. Vy	17	0.23	0.32	0.04
			Max. Vx	13	-0.15	0.09	-0.17
		Diagonal	Max Tension	4	2.87	0.00	0.00
			Max. Compression	2	-3.67	0.00	0.00
			Max. Mx	20	-0.60	-0.03	0.00
			Max. My	31	-0.20	0.00	0.00
			Max. Vy	20	-0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
		Horizontal	Max Tension	31	0.30	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	29	0.28	-0.01	0.00
			Max. Vy	27	-0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
		Guy A	Bottom Tension	10	7.39		
			Top Tension	10	7.45		
			Top Cable Vert	10	5.19		
			Top Cable Norm	10	5.35		
			Top Cable Tan	10	0.00		
			Bot Cable Vert	10	-5.05		
			Bot Cable Norm	10	5.40		
			Bot Cable Tan	10	0.00		
		Guy B	Bottom Tension	33	7.46		
			Top Tension	15	7.69		
			Top Cable Vert	33	5.86		
			Top Cable Norm	33	4.98		
			Top Cable Tan	33	0.02		
			Bot Cable Vert	15	-5.43		
			Bot Cable Norm	15	5.12		
			Bot Cable Tan	15	0.00		
		Guy C	Bottom Tension	5	7.58		
			Top Tension	5	7.63		
			Top Cable Vert	5	5.38		
			Top Cable Norm	5	5.41		
			Top Cable Tan	5	0.00		
			Bot Cable Vert	5	-5.25		
			Bot Cable Norm	5	5.46		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Tan	5	0.00		
		Top Guy Pull-Off	Max Tension	34	0.00	0.00	0.00
			Max. Compression	34	-0.00	0.00	0.00
			Max. Mx	18	0.00	-0.02	0.00
			Max. My	14	0.00	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	14	-0.00	0.00	0.00
		Bottom Guy Pull-Off	Max Tension	15	1.43	0.00	0.00
			Max. Compression	2	-1.63	0.00	0.00
			Max. Mx	25	0.61	-0.02	0.00
			Max. Vy	25	0.02	0.00	0.00
		Torque Arm Top	Max Tension	22	8.61	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	7.83	-0.04	0.00
			Max. My	4	2.37	0.00	0.00
			Max. Vy	23	0.04	0.00	0.00
			Max. Vx	4	-0.00	0.00	0.00
		Torque Arm Bottom	Max Tension	1	0.00	0.00	0.00
			Max. Compression	32	-8.42	0.00	0.00
			Max. Mx	34	-7.27	-0.05	0.00
			Max. My	5	-6.29	0.00	-0.00
			Max. Vy	34	-0.04	0.00	0.00
			Max. Vx	5	0.00	0.00	0.00
T2	60 - 50	Leg	Max Tension	10	1.04	-0.10	0.03
			Max. Compression	19	-17.20	0.31	-0.01
			Max. Mx	20	-16.94	0.31	-0.00
			Max. My	4	-14.00	-0.16	-0.04
			Max. Vy	20	-0.18	0.31	-0.00
			Max. Vx	2	0.02	-0.17	0.04
		Diagonal	Max Tension	5	0.39	0.00	0.00
			Max. Compression	9	-0.98	0.00	0.00
			Max. Mx	20	-0.60	-0.02	0.00
			Max. My	31	-0.38	0.00	0.00
			Max. Vy	20	0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
		Horizontal	Max Tension	34	0.36	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	0.33	-0.01	0.00
			Max. Vy	25	0.02	0.00	0.00
T3	50 - 40	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	24	-21.26	-0.38	-0.00
			Max. Mx	23	-21.00	-0.38	-0.00
			Max. My	14	-1.83	0.17	0.04
			Max. Vy	21	0.22	0.35	0.00
			Max. Vx	14	0.02	0.17	0.04
		Diagonal	Max Tension	9	0.97	0.00	0.00
			Max. Compression	17	-1.55	0.00	0.00
			Max. Mx	34	-0.44	-0.02	0.00
			Max. My	31	-0.54	0.00	0.00
			Max. Vy	34	0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
		Horizontal	Max Tension	20	0.89	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	0.35	-0.01	0.00
			Max. Vy	25	0.02	0.00	0.00
		Guy A	Bottom Tension	27	6.58		
			Top Tension	27	6.90		
			Top Cable Vert	27	3.83		
			Top Cable Norm	27	5.74		
			Top Cable Tan	27	0.00		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Bot Cable Vert	27	-3.19		
			Bot Cable Norm	27	5.75		
			Bot Cable Tan	27	0.00		
		Guy B	Bottom Tension	32	6.93		
			Top Tension	32	7.29		
			Top Cable Vert	32	4.54		
			Top Cable Norm	32	5.71		
			Top Cable Tan	32	0.00		
			Bot Cable Vert	32	-3.89		
			Bot Cable Norm	32	5.73		
			Bot Cable Tan	32	0.00		
		Guy C	Bottom Tension	22	6.62		
			Top Tension	22	6.92		
			Top Cable Vert	22	3.82		
			Top Cable Norm	22	5.77		
			Top Cable Tan	22	0.00		
			Bot Cable Vert	22	-3.22		
			Bot Cable Norm	22	5.79		
			Bot Cable Tan	22	0.00		
		Top Guy Pull-Off	Max Tension	20	2.80	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	31	2.56	-0.02	0.00
			Max. Vy	31	-0.03	0.00	0.00
T4	40 - 30	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	24	-20.95	0.39	-0.00
			Max. Mx	30	-20.29	0.40	-0.00
			Max. My	10	-12.39	-0.19	-0.02
			Max. Vy	19	-0.24	-0.40	0.00
			Max. Vx	9	-0.02	0.20	0.02
		Diagonal	Max Tension	17	0.80	0.00	0.00
			Max. Compression	9	-1.49	0.00	0.00
			Max. Mx	33	-0.89	-0.02	0.00
			Max. My	31	-0.53	0.00	0.00
			Max. Vy	33	0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
		Horizontal	Max Tension	33	0.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	30	0.42	-0.01	0.00
			Max. Vy	30	-0.02	0.00	0.00
T5	30 - 26.6667	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-20.73	-0.41	0.00
			Max. Mx	30	-20.73	-0.41	0.00
			Max. My	9	-9.98	0.21	0.01
			Max. Vy	30	0.25	0.40	-0.00
			Max. Vx	13	-0.02	0.20	-0.01
		Diagonal	Max Tension	9	0.37	0.00	0.00
			Max. Compression	17	-1.05	0.00	0.00
			Max. Mx	33	-0.82	-0.02	0.00
			Max. My	31	-0.49	0.00	0.00
			Max. Vy	33	0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
		Horizontal	Max Tension	27	0.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	26	0.46	-0.01	0.00
			Max. Vy	26	0.02	0.00	0.00
T6	26.6667 - 20	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	31	-21.26	-0.43	0.00
			Max. Mx	30	-21.22	-0.43	0.00
			Max. My	13	-8.98	0.20	0.01
			Max. Vy	19	0.26	-0.43	-0.00
			Max. Vx	13	-0.02	0.20	-0.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	17	0.20	0.00	0.00
			Max. Compression	9	-0.94	0.00	0.00
			Max. Mx	33	-0.75	-0.03	0.00
			Max. My	31	-0.60	0.00	0.00
			Max. Vy	33	0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
		Horizontal	Max Tension	28	0.48	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	30	0.46	-0.01	0.00
			Max. Vy	30	-0.02	0.00	0.00
T7	20 - 10	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	33	-21.87	0.44	-0.00
			Max. Mx	19	-21.77	0.44	0.00
			Max. My	13	-8.57	0.20	0.01
			Max. Vy	19	-0.27	-0.44	-0.00
			Max. Vx	2	-0.01	-0.20	-0.00
		Diagonal	Max Tension	1	0.00	0.00	0.00
			Max. Compression	30	-0.81	0.00	0.00
			Max. Mx	34	-0.67	-0.02	0.00
			Max. My	31	-0.74	0.00	0.00
			Max. Vy	34	-0.02	0.00	0.00
			Max. Vx	31	0.00	0.00	0.00
		Horizontal	Max Tension	31	0.50	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	31	0.47	-0.01	0.00
			Max. Vy	31	0.02	0.00	0.00
T8	10 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	19	-22.00	-0.46	0.03
			Max. Mx	30	-21.96	-0.46	0.02
			Max. My	32	-21.85	-0.45	0.03
			Max. Vy	30	0.28	-0.46	0.02
			Max. Vx	4	-0.02	-0.23	0.02
		Diagonal	Max Tension	2	0.16	0.00	0.00
			Max. Compression	31	-0.99	0.00	0.00
			Max. Mx	34	-0.51	-0.02	0.00
			Max. My	31	-0.81	0.00	0.00
			Max. Vy	34	0.02	0.00	0.00
			Max. Vx	31	-0.00	0.00	0.00
		Horizontal	Max Tension	22	0.52	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	25	0.49	-0.01	0.00
			Max. Vy	25	0.01	0.00	0.00
		Base Beam	Max Tension	31	0.58	-40.30	0.16
			Max. Compression	2	-0.11	0.02	0.00
			Max. Mx	19	-22.44	-40.46	-0.13
			Max. My	2	-11.04	-19.91	-0.39
			Max. Vy	19	-22.44	-40.46	-0.13
			Max. Vx	2	-0.21	-19.91	-0.39

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy C @ 74.5 ft Elev -1 ft Azimuth 240 deg	Max. Vert	13	-2.89	-3.36	1.93

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Max. H_x	13	-2.89	-3.36	1.93
	Max. H_z	21	-12.29	-13.75	7.99
	Min. Vert	5	-13.03	-13.22	7.65
	Min. H_x	22	-12.33	-13.81	7.98
	Min. H_z	13	-2.89	-3.36	1.93
Guy B @ 79 ft Elev -13.5 ft Azimuth 120 deg	Max. Vert	7	-3.96	3.84	2.21
	Max. H_x	32	-13.88	13.69	7.91
	Max. H_z	33	-13.84	13.64	7.93
	Min. Vert	15	-14.07	12.73	7.36
	Min. H_x	7	-3.96	3.84	2.21
	Min. H_z	7	-3.96	3.84	2.21
Guy A @ 80 ft Elev -4.5 ft Azimuth 0 deg	Max. Vert	2	-2.92	-0.01	-3.95
	Max. H_x	31	-10.48	0.23	-14.01
	Max. H_z	2	-2.92	-0.01	-3.95
	Min. Vert	10	-12.67	0.01	-15.16
	Min. H_x	23	-10.55	-0.23	-14.10
	Min. H_z	27	-11.98	0.00	-15.87
Mast	Max. Vert	19	67.31	0.05	0.19
	Max. H_x	13	32.74	0.60	-0.34
	Max. H_z	2	33.11	0.02	0.68
	Max. M_x	1	0.00	0.02	0.00
	Max. M_z	1	0.00	0.02	0.00
	Max. Torsion	1	0.00	0.02	0.00
	Min. Vert	47	31.50	0.14	0.00
	Min. H_x	7	33.32	-0.56	-0.33
	Min. H_z	10	33.47	0.02	-0.47
	Min. M_x	1	0.00	0.02	0.00
	Min. M_z	1	0.00	0.02	0.00
	Min. Torsion	1	0.00	0.02	0.00

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	31.55	-0.02	-0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice+1.0 Guy	33.11	-0.02	-0.68	0.00	0.00	0.00
1.2 Dead+1.6 Wind 30 deg - No Ice+1.0 Guy	33.61	0.25	-0.46	0.00	0.00	0.00
1.2 Dead+1.6 Wind 45 deg - No Ice+1.0 Guy	33.82	0.34	-0.36	0.00	0.00	0.00
1.2 Dead+1.6 Wind 60 deg - No Ice+1.0 Guy	33.90	0.39	-0.25	0.00	0.00	0.00
1.2 Dead+1.6 Wind 90 deg - No Ice+1.0 Guy	33.70	0.50	-0.01	0.00	0.00	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice+1.0 Guy	33.32	0.56	0.33	0.00	0.00	0.00
1.2 Dead+1.6 Wind 135 deg - No Ice+1.0 Guy	33.32	0.34	0.35	0.00	0.00	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice+1.0 Guy	33.42	0.24	0.45	0.00	0.00	0.00
1.2 Dead+1.6 Wind 180 deg -	33.47	-0.02	0.47	0.00	0.00	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
No Ice+1.0 Guy						
1.2 Dead+1.6 Wind 210 deg - No Ice+1.0 Guy	33.15	-0.28	0.45	0.00	0.00	0.00
1.2 Dead+1.6 Wind 225 deg - No Ice+1.0 Guy	32.91	-0.38	0.36	0.00	0.00	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice+1.0 Guy	32.74	-0.60	0.34	0.00	0.00	0.00
1.2 Dead+1.6 Wind 270 deg - No Ice+1.0 Guy	33.09	-0.54	-0.00	0.00	0.00	0.00
1.2 Dead+1.6 Wind 300 deg - No Ice+1.0 Guy	33.35	-0.42	-0.23	0.00	0.00	0.00
1.2 Dead+1.6 Wind 315 deg - No Ice+1.0 Guy	33.35	-0.37	-0.35	0.00	0.00	0.00
1.2 Dead+1.6 Wind 330 deg - No Ice+1.0 Guy	33.27	-0.28	-0.45	0.00	0.00	0.00
1.2 Dead+1.0 Ice+1.0 Temp+Guy	66.81	-0.05	0.01	0.00	0.00	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.31	-0.05	-0.19	0.00	0.00	0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.10	0.04	-0.15	0.00	0.00	0.00
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.95	0.08	-0.12	0.00	0.00	0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.86	0.11	-0.08	0.00	0.00	0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.97	0.14	0.02	0.00	0.00	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.08	0.13	0.12	0.00	0.00	0.00
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.00	0.09	0.14	0.00	0.00	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.87	0.05	0.17	0.00	0.00	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.71	-0.05	0.19	0.00	0.00	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.94	-0.15	0.18	0.00	0.00	0.00
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.10	-0.18	0.15	0.00	0.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.18	-0.23	0.12	0.00	0.00	0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.05	-0.24	0.02	0.00	0.00	0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.91	-0.20	-0.07	0.00	0.00	0.00
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp+1.0 Guy	66.97	-0.17	-0.11	0.00	0.00	0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	67.11	-0.14	-0.15	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	31.60	-0.02	-0.15	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	31.62	0.04	-0.11	0.00	0.00	0.00
Dead+Wind 45 deg - Service+Guy	31.63	0.06	-0.09	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	31.63	0.08	-0.06	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	31.65	0.10	-0.01	0.00	0.00	0.00
Dead+Wind 120 deg - Service+Guy	31.64	0.11	0.07	0.00	0.00	0.00

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead+Wind 135 deg - Service+Guy	31.62	0.06	0.08	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	31.59	0.04	0.10	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	31.54	-0.02	0.10	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	31.52	-0.08	0.10	0.00	0.00	0.00
Dead+Wind 225 deg - Service+Guy	31.52	-0.10	0.08	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	31.51	-0.15	0.07	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	31.50	-0.14	-0.00	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	31.50	-0.11	-0.06	0.00	0.00	0.00
Dead+Wind 315 deg - Service+Guy	31.52	-0.10	-0.08	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	31.55	-0.08	-0.11	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-6.85	0.00	-0.00	6.85	0.00	0.005%
2	0.06	-8.13	-9.35	-0.06	8.13	9.35	0.002%
3	4.41	-8.06	-7.63	-4.41	8.06	7.63	0.005%
4	6.14	-8.02	-6.18	-6.14	8.02	6.18	0.006%
5	7.42	-8.00	-4.35	-7.42	8.00	4.35	0.002%
6	8.72	-8.05	-0.06	-8.72	8.05	0.07	0.004%
7	8.02	-8.10	4.62	-8.02	8.10	-4.62	0.002%
8	6.05	-8.09	6.09	-6.05	8.09	-6.09	0.001%
9	4.30	-8.06	7.57	-4.30	8.06	-7.57	0.003%
10	-0.06	-8.01	8.58	0.06	8.01	-8.58	0.002%
11	-4.41	-8.08	7.63	4.41	8.08	-7.63	0.005%
12	-6.14	-8.12	6.18	6.14	8.12	-6.18	0.001%
13	-8.08	-8.14	4.73	8.08	8.14	-4.73	0.001%
14	-8.72	-8.09	0.06	8.72	8.09	-0.06	0.006%
15	-7.35	-8.04	-4.24	7.35	8.04	4.24	0.004%
16	-6.05	-8.05	-6.09	6.05	8.05	6.09	0.007%
17	-4.30	-8.08	-7.57	4.30	8.08	7.57	0.007%
18	0.00	-33.41	0.00	-0.00	33.41	-0.00	0.003%
19	0.01	-33.48	-3.40	-0.01	33.48	3.39	0.014%
20	1.67	-33.41	-2.89	-1.67	33.41	2.88	0.011%
21	2.36	-33.36	-2.35	-2.36	33.36	2.35	0.009%
22	2.88	-33.34	-1.66	-2.88	33.34	1.66	0.007%
23	3.34	-33.40	-0.01	-3.34	33.40	0.01	0.003%
24	2.95	-33.46	1.69	-2.94	33.46	-1.69	0.003%
25	2.35	-33.44	2.34	-2.35	33.44	-2.34	0.002%
26	1.66	-33.40	2.88	-1.66	33.40	-2.88	0.002%
27	-0.01	-33.35	3.31	0.01	33.35	-3.31	0.004%
28	-1.67	-33.42	2.89	1.67	33.42	-2.89	0.007%
29	-2.36	-33.47	2.35	2.36	33.47	-2.35	0.007%
30	-2.95	-33.49	1.71	2.95	33.49	-1.70	0.008%
31	-3.34	-33.43	0.01	3.34	33.43	-0.01	0.006%
32	-2.87	-33.37	-1.65	2.87	33.37	1.65	0.006%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
33	-2.35	-33.39	-2.34	2.35	33.39	2.34	0.008%
34	-1.66	-33.43	-2.88	1.66	33.43	2.88	0.010%
35	0.01	-6.86	-2.06	-0.01	6.86	2.06	0.000%
36	0.97	-6.85	-1.68	-0.97	6.85	1.68	0.000%
37	1.35	-6.84	-1.36	-1.35	6.84	1.36	0.000%
38	1.64	-6.83	-0.96	-1.64	6.83	0.96	0.000%
39	1.92	-6.85	-0.01	-1.92	6.85	0.01	0.001%
40	1.77	-6.86	1.02	-1.77	6.86	-1.02	0.000%
41	1.33	-6.85	1.34	-1.33	6.85	-1.34	0.001%
42	0.95	-6.85	1.67	-0.95	6.85	-1.67	0.001%
43	-0.01	-6.84	1.89	0.01	6.84	-1.89	0.000%
44	-0.97	-6.85	1.68	0.97	6.85	-1.68	0.000%
45	-1.35	-6.86	1.36	1.35	6.86	-1.36	0.000%
46	-1.78	-6.86	1.04	1.78	6.86	-1.04	0.000%
47	-1.92	-6.85	0.01	1.92	6.85	-0.01	0.000%
48	-1.62	-6.84	-0.93	1.62	6.84	0.93	0.000%
49	-1.33	-6.84	-1.34	1.33	6.84	1.34	0.000%
50	-0.95	-6.85	-1.67	0.95	6.85	1.67	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00008920
2	Yes	6	0.00000001	0.00006292
3	Yes	6	0.00000001	0.00014261
4	Yes	6	0.00000001	0.00013162
5	Yes	6	0.00000001	0.00011749
6	Yes	6	0.00000001	0.00013729
7	Yes	6	0.00000001	0.00008039
8	Yes	6	0.00000001	0.00011473
9	Yes	6	0.00000001	0.00013635
10	Yes	6	0.00000001	0.00012704
11	Yes	6	0.00000001	0.00017493
12	Yes	6	0.00000001	0.00015107
13	Yes	6	0.00000001	0.00013305
14	Yes	6	0.00000001	0.00020446
15	Yes	6	0.00000001	0.00012489
16	Yes	6	0.00000001	0.00019360
17	Yes	6	0.00000001	0.00023066
18	Yes	6	0.00000001	0.00009986
19	Yes	6	0.00000001	0.00019474
20	Yes	6	0.00000001	0.00015426
21	Yes	6	0.00000001	0.00013494
22	Yes	6	0.00000001	0.00011991
23	Yes	6	0.00000001	0.00009337
24	Yes	6	0.00000001	0.00007130
25	Yes	6	0.00000001	0.00007813
26	Yes	6	0.00000001	0.00008221
27	Yes	6	0.00000001	0.00009151
28	Yes	6	0.00000001	0.00011261
29	Yes	6	0.00000001	0.00012746
30	Yes	6	0.00000001	0.00014760
31	Yes	6	0.00000001	0.00015626
32	Yes	6	0.00000001	0.00016820
33	Yes	6	0.00000001	0.00017594

34	Yes	6	0.00000001	0.00018277
35	Yes	6	0.00000001	0.00001442
36	Yes	6	0.00000001	0.00002100
37	Yes	6	0.00000001	0.00002425
38	Yes	6	0.00000001	0.00002740
39	Yes	6	0.00000001	0.00002986
40	Yes	6	0.00000001	0.00002652
41	Yes	6	0.00000001	0.00003284
42	Yes	6	0.00000001	0.00003290
43	Yes	6	0.00000001	0.00003117
44	Yes	6	0.00000001	0.00002816
45	Yes	6	0.00000001	0.00002787
46	Yes	6	0.00000001	0.00002513
47	Yes	6	0.00000001	0.00002695
48	Yes	6	0.00000001	0.00002085
49	Yes	6	0.00000001	0.00001817
50	Yes	6	0.00000001	0.00001616

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	80 - 70	0.411	49	0.0567	0.0168
T1	70 - 60	0.291	49	0.0549	0.0147
T2	60 - 50	0.206	49	0.0353	0.0157
T3	50 - 40	0.145	49	0.0236	0.0444
T4	40 - 30	0.108	49	0.0139	0.0230
T5	30 - 26.6667	0.086	49	0.0111	0.0428
T6	26.6667 - 20	0.079	49	0.0112	0.0227
T7	20 - 10	0.063	49	0.0124	0.0227
T8	10 - 0	0.035	35	0.0151	0.0455

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' x 3" Dia Omni	49	0.411	0.0567	0.0168	46642
85.00	10' Dipole	49	0.411	0.0567	0.0168	46642
83.00	7770.00	49	0.411	0.0567	0.0168	46642
81.00	12-ft Top Mount	49	0.411	0.0567	0.0168	46642
70.00	Guy	49	0.291	0.0549	0.0147	26654
43.33	Guy	49	0.118	0.0167	0.0240	49324

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	80 - 70	1.761	15	0.2625	0.0816

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	70 - 60	1.193	15	0.2545	0.0723
T2	60 - 50	0.782	15	0.1671	0.0697
T3	50 - 40	0.502	16	0.1081	0.1018
T4	40 - 30	0.339	16	0.0587	0.0736
T5	30 - 26.6667	0.260	2	0.0374	0.1004
T6	26.6667 - 20	0.243	2	0.0354	0.0733
T7	20 - 10	0.202	2	0.0368	0.0733
T8	10 - 0	0.116	2	0.0481	0.1031

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
90.00	20' x 3" Dia Omni	15	1.761	0.2625	0.0816	10909
85.00	10' Dipole	15	1.761	0.2625	0.0816	10909
83.00	7770.00	15	1.761	0.2625	0.0816	10909
81.00	12-ft Top Mount	15	1.761	0.2625	0.0816	10909
70.00	Guy	15	1.193	0.2545	0.0723	6232
43.33	Guy	16	0.381	0.0734	0.0678	11365

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
L1	80	Latticed Pole Diagonal	A325N	0.5000	2	1.45	7.95	0.183 ✔	1	Bolt Shear
		Latticed Pole Secondary Horizontal	A325N	0.6250	2	0.06	10.44	0.006 ✔	1	Member Bearing
		Latticed Pole Top Girt	A325N	0.5000	2	0.26	7.95	0.033 ✔	1	Bolt Shear
		Latticed Pole Bottom Girt	A325N	0.5000	2	0.00	7.95	0.000 ✔	1	Bolt Shear
T1	70	Leg	A325N	0.6250	12	2.84	12.43	0.229 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	2.87	6.20	0.463 ✔	1	Member Bearing
		Horizontal	A325N	0.5000	1	0.30	6.20	0.049 ✔	1	Member Bearing
T2	60	Leg	A325N	0.6250	12	2.87	12.43	0.231 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	0.98	7.95	0.123 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	0.36	6.20	0.058 ✔	1	Member Bearing
T3	50	Leg	A325N	0.6250	12	3.54	12.43	0.285 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.55	7.95	0.195 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	0.89	6.20	0.144 ✔	1	Member Bearing
T4	40	Leg	A325N	0.6250	12	3.43	12.43	0.276 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	1.49	7.95	0.187 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Horizontal	A325N	0.5000	1	0.46	6.20	0.074 ✔	1	Member Bearing
T5	30	Diagonal	A325N	0.5000	1	1.05	7.95	0.132 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	0.46	6.20	0.075 ✔	1	Member Bearing
T6	26.6667	Leg	A325N	0.6250	12	3.54	12.43	0.285 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	0.94	7.95	0.119 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	0.48	6.20	0.078 ✔	1	Member Bearing
T7	20	Leg	A325N	0.6250	12	3.65	12.43	0.293 ✔	1	Bolt SS
		Diagonal	A325N	0.5000	1	0.81	7.95	0.102 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	0.50	6.20	0.081 ✔	1	Member Bearing
T8	10	Diagonal	A325N	0.5000	1	0.99	7.95	0.124 ✔	1	Bolt Shear
		Horizontal	A325N	0.5000	1	0.52	6.20	0.084 ✔	1	Member Bearing

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T1	70.00 (A) (181)	5/8 EHS	4.24	42.40	7.24	25.44	1.000	3.512 ✔
	70.00 (A) (182)	5/8 EHS	4.24	42.40	7.45	25.44	1.000	3.414 ✔
	70.00 (B) (175)	5/8 EHS	4.24	42.40	7.69	25.44	1.000	3.308 ✔
	70.00 (B) (176)	5/8 EHS	4.24	42.40	7.69	25.44	1.000	3.309 ✔
	70.00 (C) (169)	5/8 EHS	4.24	42.40	7.63	25.44	1.000	3.333 ✔
	70.00 (C) (170)	5/8 EHS	4.24	42.40	7.34	25.44	1.000	3.468 ✔
T3	43.33 (A) (192)	5/8 EHS	4.24	42.40	6.90	25.44	1.000	3.687 ✔
	43.33 (B) (191)	5/8 EHS	4.24	42.40	7.29	25.44	1.000	3.490 ✔
	43.33 (C) (187)	5/8 EHS	4.24	42.40	6.92	25.44	1.000	3.675 ✔

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 K	ϕP_n K	Ratio $P_u / \phi P_n$
L1	80 - 70	P3.5x.226	10.00	10.00	89.8	2.6795	1.00	-5.62	55.88	0.101 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	Mast Stability Index	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60	V3x3x1/4	10.00	3.33	57.6 K=1.00	1.4375	1.00	-18.10	39.11	0.463 [1] ✓
T2	60 - 50	V3x3x1/4	10.00	3.33	57.6 K=1.00	1.4375	1.00	-17.20	39.11	0.440 [1] ✓
T3	50 - 40	V3x3x1/4	10.00	3.33	57.6 K=1.00	1.4375	1.00	-21.26	39.11	0.544 [1] ✓
T4	40 - 30	V3x3x1/4	10.00	3.33	57.6 K=1.00	1.4375	1.00	-20.95	39.11	0.536 [1] ✓
T5	30 - 26.6667	V3x3x1/4	3.33	3.33	57.6 K=1.00	1.4375	1.00	-20.73	39.11	0.530 [1] ✓
T6	26.6667 - 20	V3x3x1/4	6.67	3.33	57.6 K=1.00	1.4375	1.00	-21.26	39.11	0.544 [1] ✓
T7	20 - 10	V3x3x1/4	10.00	3.33	57.6 K=1.00	1.4375	1.00	-21.87	39.11	0.559 [1] ✓
T8	10 - 0	V3x3x1/4	10.00	3.33	57.6 K=1.00	1.4375	1.00	-22.00	39.11	0.562 [1] ✓

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	12.21	5.81	177.0 K=1.00	0.7150	-2.91	5.15	0.564 [1] ✓
T1	70 - 60	L2x2x3/16	4.57	4.00	121.7 K=1.00	0.7150	-3.67	10.62	0.345 [1] ✓
T2	60 - 50	L1 1/2x1 1/2x3/16	4.57	4.00	163.4 K=1.00	0.5273	-0.98	4.46	0.220 [1] ✓
T3	50 - 40	L1 1/2x1 1/2x3/16	4.57	4.00	163.4 K=1.00	0.5273	-1.55	4.46	0.348 [1] ✓
T4	40 - 30	L1 1/2x1 1/2x3/16	4.57	4.00	163.4 K=1.00	0.5273	-1.49	4.46	0.334 [1] ✓
T5	30 - 26.6667	L1 1/2x1 1/2x3/16	4.57	4.00	163.4 K=1.00	0.5273	-1.05	4.46	0.234 [1] ✓
T6	26.6667 - 20	L2x2x3/16	4.57	4.00	121.7 K=1.00	0.7150	-0.94	10.62	0.089 [1] ✓
T7	20 - 10	L2x2x3/16	4.57	4.00	121.7 K=1.00	0.7150	-0.81	10.62	0.076 [1] ✓
T8	10 - 0	L2x2x3/16	4.57	4.00	121.7 K=1.00	0.7150	-0.99	10.62	0.093 [1] ✓

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	7.00	6.67	129.7 K=1.00	0.7150	-0.14	9.56	0.015 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	7.00	6.67	203.0 K=1.00	0.7150	-0.36	3.92	0.091 [1] ✔
		KL/R > 200 (C) - 4							

[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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	7.00	6.67	203.0 K=1.00	0.7150	-0.00	3.92	0.000 [1] ✔
		KL/R > 200 (C) - 8							

[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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60	L3x2x1/4	3.13	2.88	79.3 K=1.00	1.1900	-0.00	27.69	0.000 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60	L2x2x3/16	3.13	2.88	87.6 K=1.00	0.7150	-1.63	15.47	0.105 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60 (173)	L2 1/2x2 1/2x1/2	4.84	4.67	115.0 K=1.00	2.2500	-7.93	36.35	0.218 [1] ✔
T1	70 - 60 (174)	L2 1/2x2 1/2x1/2	4.84	4.67	115.0 K=1.00	2.2500	-7.40	36.35	0.204 [1] ✔
T1	70 - 60 (179)	L2 1/2x2 1/2x1/2	4.84	4.67	115.0 K=1.00	2.2500	-7.66	36.35	0.211 [1] ✔
T1	70 - 60 (180)	L2 1/2x2 1/2x1/2	4.84	4.67	115.0 K=1.00	2.2500	-8.42	36.35	0.232 [1] ✔
T1	70 - 60 (185)	L2 1/2x2 1/2x1/2	4.84	4.67	115.0 K=1.00	2.2500	-7.91	36.35	0.218 [1] ✔
T1	70 - 60 (186)	L2 1/2x2 1/2x1/2	4.84	4.67	115.0 K=1.00	2.2500	-7.96	36.35	0.219 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	P3.5x.226	10.00	10.00	89.8	2.6795	3.44	84.41	0.041 [1] ✔
T1	70 - 60	V3x3x1/4	10.00	3.33	41.0	0.7969	14.61	34.66	0.422 [1] ✔
T2	60 - 50	V3x3x1/4	10.00	3.33	41.0	0.7969	1.04	34.66	0.030 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	12.21	5.81	113.1	0.4484	2.54	19.50	0.130 [1] ✔
T1	70 - 60	L2x2x3/16	4.57	4.00	81.8	0.4484	2.87	19.50	0.147 [1] ✔
T2	60 - 50	L1 1/2x1 1/2x3/16	4.57	4.00	110.5	0.3076	0.39	13.38	0.029 [1] ✔
T3	50 - 40	L1 1/2x1 1/2x3/16	4.57	4.00	110.5	0.3076	0.97	13.38	0.072 [1] ✔
T4	40 - 30	L1 1/2x1 1/2x3/16	4.57	4.00	110.5	0.3076	0.80	13.38	0.060 [1] ✔
T5	30 - 26.6667	L1 1/2x1 1/2x3/16	4.57	4.00	110.5	0.3076	0.37	13.38	0.028 [1] ✔
T6	26.6667 - 20	L2x2x3/16	4.57	4.00	81.8	0.4484	0.20	19.50	0.010 [1] ✔
T8	10 - 0	L2x2x3/16	4.57	4.00	81.8	0.4484	0.16	19.50	0.008 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.30	10.32	0.029 [1] ✔
T2	60 - 50	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.36	10.32	0.035 [1] ✔
T3	50 - 40	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.89	10.32	0.087 [1] ✔
T4	40 - 30	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.46	10.32	0.044 [1] ✔
T5	30 - 26.6667	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.46	10.32	0.045 [1] ✔
T6	26.6667 - 20	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.48	10.32	0.047 [1] ✔
T7	20 - 10	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.50	10.32	0.049 [1] ✔
T8	10 - 0	L1 1/4x1 1/4x3/16	3.13	2.67	91.6	0.2373	0.52	10.32	0.050 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	7.00	6.67	129.7	0.4308	0.13	18.74	0.007 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	7.00	6.67	129.7	0.4484	0.52	19.50	0.027 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	80 - 70	L2x2x3/16	7.00	6.67	129.7	0.4484	0.00	19.50	0.000 [1] ✔

[1] P_u / ϕP_n controls

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60	L3x2x1/4	3.13	2.88	60.3	1.1900	0.00	38.56	0.000 [1] ✔
T3	50 - 40	L2x2x3/8	3.13	2.88	58.1	1.3600	2.80	44.06	0.064 [1] ✔

[1] P_u / ϕP_n controls

Bottom Guy Pull-Off Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60	L2x2x3/16	3.13	2.88	55.9	0.7150	1.43	23.17	0.062 [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 K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	70 - 60 (171)	L2 1/2x2 1/2x1/2	3.51	3.38	54.9	2.2500	8.36	72.90	0.115 [1] ✔
T1	70 - 60 (172)	L2 1/2x2 1/2x1/2	3.51	3.38	54.9	2.2500	8.47	72.90	0.116 [1] ✔
T1	70 - 60 (177)	L2 1/2x2 1/2x1/2	3.51	3.38	54.9	2.2500	8.14	72.90	0.112 [1] ✔
T1	70 - 60 (178)	L2 1/2x2 1/2x1/2	3.51	3.38	54.9	2.2500	8.61	72.90	0.118 [1] ✔
T1	70 - 60 (183)	L2 1/2x2 1/2x1/2	3.51	3.38	54.9	2.2500	8.24	72.90	0.113 [1] ✔
T1	70 - 60 (184)	L2 1/2x2 1/2x1/2	3.51	3.38	54.9	2.2500	8.37	72.90	0.115 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	80 - 70	Latticed Pole Leg	P3.5x.226	3	-5.62	55.88	10.1	Pass
L1	80 - 70	Latticed Pole Diagonal	L2x2x3/16	15	-2.91	5.15	56.4	Pass
L1	80 - 70	Latticed Pole Secondary Horizontal	L2x2x3/16	17	-0.14	9.56	1.5	Pass
L1	80 - 70	Latticed Pole Top Girt	L2x2x3/16	4	-0.36	3.92	9.1	Pass
L1	80 - 70	Latticed Pole Bottom Girt	L2x2x3/16	8	-0.00	3.92	0.8	Pass
T1	70 - 60	Leg	V3x3x1/4	21	-18.10	39.11	46.3	Pass
T2	60 - 50	Leg	V3x3x1/4	42	-17.20	39.11	44.0	Pass
T3	50 - 40	Leg	V3x3x1/4	62	-21.26	39.11	54.4	Pass
T4	40 - 30	Leg	V3x3x1/4	83	-20.95	39.11	53.6	Pass
T5	30 - 26.6667	Leg	V3x3x1/4	104	-20.73	39.11	53.0	Pass
T6	26.6667 - 20	Leg	V3x3x1/4	113	-21.26	39.11	54.4	Pass
T7	20 - 10	Leg	V3x3x1/4	128	-21.87	39.11	55.9	Pass
T8	10 - 0	Leg	V3x3x1/4	149	-22.00	39.11	56.2	Pass
T1	70 - 60	Diagonal	L2x2x3/16	38	-3.67	10.62	34.5 46.3 (b)	Pass
T2	60 - 50	Diagonal	L1 1/2x1 1/2x3/16	59	-0.98	4.46	22.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T3	50 - 40	Diagonal	L1 1/2x1 1/2x3/16	68	-1.55	4.46	34.8	Pass
T4	40 - 30	Diagonal	L1 1/2x1 1/2x3/16	101	-1.49	4.46	33.4	Pass
T5	30 - 26.6667	Diagonal	L1 1/2x1 1/2x3/16	110	-1.05	4.46	23.4	Pass
T6	26.6667 - 20	Diagonal	L2x2x3/16	125	-0.94	10.62	8.9 11.9 (b)	Pass
T7	20 - 10	Diagonal	L2x2x3/16	135	-0.81	10.62	7.6 10.2 (b)	Pass
T8	10 - 0	Diagonal	L2x2x3/16	154	-0.99	10.62	9.3 12.4 (b)	Pass
T1	70 - 60	Horizontal	L1 1/4x1 1/4x3/16	28	0.30	10.32	2.9 4.9 (b)	Pass
T2	60 - 50	Horizontal	L1 1/4x1 1/4x3/16	50	0.36	10.32	3.5 5.8 (b)	Pass
T3	50 - 40	Horizontal	L1 1/4x1 1/4x3/16	70	0.89	10.32	8.7 14.4 (b)	Pass
T4	40 - 30	Horizontal	L1 1/4x1 1/4x3/16	92	0.46	10.32	4.4 7.4 (b)	Pass
T5	30 - 26.6667	Horizontal	L1 1/4x1 1/4x3/16	107	0.46	10.32	4.5 7.5 (b)	Pass
T6	26.6667 - 20	Horizontal	L1 1/4x1 1/4x3/16	122	0.48	10.32	4.7 7.8 (b)	Pass
T7	20 - 10	Horizontal	L1 1/4x1 1/4x3/16	137	0.50	10.32	4.9 8.1 (b)	Pass
T8	10 - 0	Horizontal	L1 1/4x1 1/4x3/16	159	0.52	10.32	5.0 8.4 (b)	Pass
T1	70 - 60	Guy A@70	5/8	182	7.45	25.44	29.3	Pass
T3	50 - 40	Guy A@43.3333	5/8	192	6.90	25.44	27.1	Pass
T1	70 - 60	Guy B@70	5/8	175	7.69	25.44	30.2	Pass
T3	50 - 40	Guy B@43.3333	5/8	191	7.29	25.44	28.7	Pass
T1	70 - 60	Guy C@70	5/8	169	7.63	25.44	30.0	Pass
T3	50 - 40	Guy C@43.3333	5/8	187	6.92	25.44	27.2	Pass
T1	70 - 60	Top Guy Pull-Off@70	L3x2x1/4	23	-0.00	27.69	0.3	Pass
T3	50 - 40	Top Guy Pull-Off@43.3333	L2x2x3/8	188	2.80	44.06	6.4	Pass
T1	70 - 60	Bottom Guy Pull-Off@70	L2x2x3/16	36	-1.63	15.47	10.5	Pass
T1	70 - 60	Torque Arm Top@70	L2 1/2x2 1/2x1/2	178	8.61	72.90	11.8	Pass
T1	70 - 60	Torque Arm Bottom@70	L2 1/2x2 1/2x1/2	180	-8.42	36.35	23.2	Pass

Summary		
Latticed Pole Leg (L1)	10.1	Pass
Latticed Pole Diagonal (L1)	56.4	Pass
Latticed Pole Secondary Horizontal (L1)	1.5	Pass
Latticed Pole Top Girt (L1)	9.1	Pass
Latticed Pole Bottom Girt (L1)	0.8	Pass
Leg (T8)	56.2	Pass
Diagonal	46.3	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						(T1) Horizontal (T3)	14.4	Pass
						Guy A (T1)	29.3	Pass
						Guy B (T1)	30.2	Pass
						Guy C (T1)	30.0	Pass
						Top Guy Pull-Off (T3)	6.4	Pass
						Bottom Guy Pull-Off (T1)	10.5	Pass
						Torque Arm Top (T1)	11.8	Pass
						Torque Arm Bottom (T1)	23.2	Pass
						Bolt Checks	46.3	Pass
						RATING =	**56.4**	**Pass**

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Subject:	Base Foundation Analysis
Location:	80-ft Guyed Lattice Tower Brooklyn, CT
Rev. 0: 2/17/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16071.21

Guyed Tower Base Foundation:

Input Data:

Tower Data

Shear Force =	$Shear := 1 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$Axial := 67 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 80 \cdot ft$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 1.5 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 2.5 \cdot ft$	(User Input)	
Width of Pier =	$W_p := 5 \cdot ft$	(User Input)	
Cross Sectional Area of Pier =	$Area_p := 21.9 \cdot ft^2$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Ultimate Soil Bearing Capacity =	$q_s := 8000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 120 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Calculated Factors:

Coefficient of Lateral Soil Pressure =

$$K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$$

Load Factor =

$$LF := \begin{cases} 1.333 & \text{if } H_t \le 700 \cdot ft \\ 1.7 & \text{if } H_t \ge 1200 \cdot ft \\ 1.333 + \left(\frac{H_t - 700ft}{1200ft - 700ft}\right) \cdot 0.4 & \text{otherwise} \end{cases} = 1.333$$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := \text{if}\left(\text{Bouyancy} = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}\right) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := \text{if}\left(\text{Bouyancy} = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}\right) = 120 \cdot pcf$

Passive Pressure = $P_{top} := 0$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 0.54 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 0.27 \cdot ksf$

$A_p := W_p \cdot D_f = 7.5$

Soil Shear Resistance = $Sl_1 := P_{ave} \cdot A_p = 2.03 \cdot kip$

Weight of Concrete = $WT_c := \left(Area_p L_p\right) \cdot \gamma_c = 13.14 \cdot kip$

Total Weight = $WT_{tot} := WT_c + Axial = 80.14 \cdot kip$

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 36.06 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := Sl_1 + Sl_2 = 38.09 \cdot kips$

Sliding Resistance Ratio = $Sliding\_Resistance_{ratio} := \frac{0.75 Sl_{tot}}{Shear} = 28.57$

$Sliding\_Resistance\_Check := \text{if}\left[\left(\frac{Shear}{0.75 Sl_{tot}} < 1.0\right), \text{"Okay"}, \text{"No Good"}\right]$

Sliding_Resistance_Check = "Okay"

Bearing Pressure Caused by Footing:

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{Area_p} = 3.66 \cdot ksf$

$Max\_Pressure\_Check := \text{if}\left(P_{max} < 0.6 q_s, \text{"Okay"}, \text{"No Good"}\right)$

Max_Pressure_Check = "Okay"

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Job :	AT&T ~ CT2075: 80-ft Guyed Lattice Tower	**Project No.**	16071.12	**Sheet**	1	of	2
Address:	Tatnic Hill Road Brooklyn, CT	**Computed by**	TJL	**Date**		2/17/17	
Description:	Guy Anchor Evaluation	**Checked by**	CFC	**Date**			

CHECK UPLIFT RESISTANCE

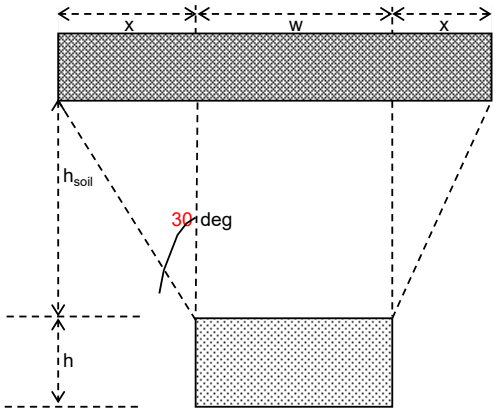
ANCHOR (B) AT 79ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	14	kips
Sliding =	16	kips
Wdepth =	50	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	4	ft
h =	5	ft
d =	5	ft
Vol. =	100.00	ft^3
Vol.sub =	0.00	ft^3
Wc =	*15.00*	kips
Ø =	*0.90*	
	13.50	



Foundation Section

SOIL PARAMETERS:

γ_{soil} =	120	pcf
$\gamma_{soil.sub}$ =	57.6	pcf
h_{soil} =	1.5	ft
x =	*0.87*	ft

Soil Weight (Wr):

B1 =	20.00
B2 =	20.00
B3 =	38.59

W.soil =	5.18	kips
W.soil.sub =	0.00	kips
Total =	*5.18*	kips
Ø =	*0.75*	
	3.89	

SF AGAINST SLIDING

1.44 **>** *1* ***OK***

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

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Job :	AT&T ~ CT2075: 80-ft Guyed Lattice Tower	**Project No.**	16071.12	**Sheet**	2	of	2
Address:	Tatnic Hill Road Brooklyn, CT	**Computed by**	TJL	**Date**		2/17/17	
Description:	Guy Anchor Evaluation	**Checked by**	CFC	**Date**			

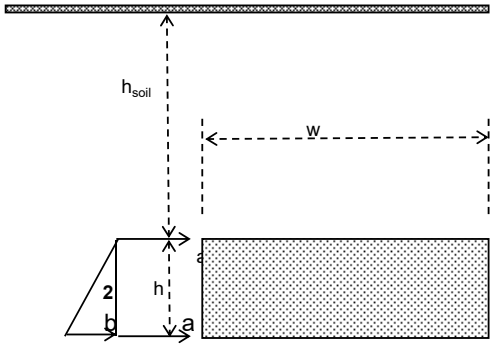
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

γ soil =	120	pcf
γ soil =	57.6	pcf
h_{soil} =	1.5	ft
h =	5	ft
ϕ =	30	degrees
Ø =	*0.75*	

ANCHOR PARAMETERS

w =	4.0	ft
h =	5.0	ft
d =	5.0	ft



Foundation Elevation View

κ_p = 3.00

HORIZONTAL FORCES

		0.54	ksf
		2.34	ksf
RESIST TO SLIDING =		36.00	k
SOIL & CONCRETE WEIGHT =	Wr + Wc =	17.39	k
UPLIFT REACTIONS =		-14	k
SUM =		3.39	k
COEF. OF FRICTION, (0.45) =		1.52	k
RESIST TO SLIDING =		36.00	k
SUM =		37.52	k
		28.14	

SF AGAINST SLIDING

SF = 1.8 > 1 OK

GUY ANCHORS AGAINST SLIDING NEED REINFORCEMENT

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTV2075	DATE:	01/25/2017	RF DESIGN ENG:	Md Mateen
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	
REVISION:	Final	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	MM093Q@ATT.COM
INITIATIVE /PROJECT:	LTE 2C 1900 w/Bronze Standard configuration.				

RF PERF ENG:		RFDS PROGRAM TYPE:	2017 LTE Next Carrier		
RF PERF PHONE:		RFDS TECHNOLOGY:	LTE 2C		
RF PERF EMAIL:		STATE/STATUS:	Final/Approved		
RFDS VERSION:	5.00	RFDS ID:	1114681		
GSM FREQUENCY:	850	Created By:	mm093q	Updated By:	dc5778
UMTS FREQUENCY:	850, 1900	Date Created:	3/10/2016 4:01:56 PM	Date Updated:	1/27/2017 10:28:30 AM
LTE FREQUENCY:	700, 1900				
I-PLAN JOB # 1:	NER-RCTB-16-00964	IPLAN PRD GRP || SUB GRP #1:	LTE Next Carrier || LTE 2C		
I-PLAN JOB # 2:		IPLAN PRD GRP || SUB GRP #2:			
I-PLAN JOB # 3:		IPLAN PRD GRP || SUB GRP #3:			
I-PLAN JOB # 4:		IPLAN PRD GRP || SUB GRP #4:			
I-PLAN JOB # 5:		IPLAN PRD GRP || SUB GRP #5:			
I-PLAN JOB # 6:		IPLAN PRD GRP || SUB GRP #6:			
I-PLAN JOB # 7:		IPLAN PRD GRP || SUB GRP #7:			
I-PLAN JOB # 8:		IPLAN PRD GRP || SUB GRP #8:			

Section 2 - LOCATION INFORMATION

USID:	71311	FA LOCATION CODE:	10035010	LOCATION NAME:	BROOKLYN
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT
ADDRESS:	TATNIC HILL ROAD	CITY:	BROOKLYN	STATE:	CT
ZIP CODE:	06234	COUNTY:	WINDHAM	LONG (DEC. DEG.):	-71.9714169
LATITUDE (D-M-S):	41d 46m5.27196s	LONGITUDE (D-M-S):	-71d -58m-17.10084s	LAT (DEC. DEG.):	41.7681311
DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:	2075 - BROOKLYN - RTE 6 EAST TO BROOKLYN THEN TURN RIGHT ON WINDHAM ROAD. TRAVEL APPROX. .4 MILES TO TATNIC ROAD. LEFT ON TATNIC ROAD. TRAVEL APPROX. .3 MILES TO TRIPP HOLLOW ROAD. RIGHT ON TRIPP HOLLOW ROAD. TRAVEL APPROX. .6 MILES TO TATNIC HILL ROAD ON LEFT. LEFT ON TATNIC HILL ROAD. TRAVEL APPROX. .5 MILES TO ACCES ROAD ON RIGHT. GATE COMBO 4722. STAY TO RIGHT ON ACCESS RD AS THERE ARE TWO TOWERS AT THIS LOCATION. THIS IS A GROUND LEVEL SHELTER, SMART CARDS INSIDE SHELTER. COMPOUND GATE 0043SHELTER DOOR COMBO 3534 OR MASTER CODELTE RADIOS:IN SHELTERMETER CL-P 89-125-366 2LTE RADIOS:IN SHELTER,MOUNTED ON SHELTER WALLGSMHCGS238922HCGS238923HCGS726746 (NOT CURRENTLY BEING USED)UMTS;ON FIBER				

ORACLE PTN # 1:		PACE JOB # 1:	MRCTB018255		
ORACLE PTN # 2:		PACE JOB # 2:			
ORACLE PTN # 3:		PACE JOB # 3:			
ORACLE PTN # 4:		PACE JOB # 4:			
ORACLE PTN # 5:		PACE JOB # 5:			
ORACLE PTN # 6:		PACE JOB # 6:			
ORACLE PTN # 7:		PACE JOB # 7:			
ORACLE PTN # 8:		PACE JOB # 8:			
BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:			
AM STUDY REQ'D (Y/N):	No	SEARCH_RING_ID:			
FREQ COORD:		BTA:		MSA / RSA:	
OPS DISTRICT:	CT-North	LAC(GSM):	05006		
OPS ZONE:	NE_CT_N_WDHM_S_CS	LAC(UMTS):	05990		
RF DISTRICT:	NPO Triage	BSC(GSM):	BCT06		
RF ZONE:	Hotseat	RNC(UMTS):	MDTWCTNICRBR05		
PARENT NAME(GSM):	MIDDLETOWN-GSM MTSO-BSC-6	MME POOL ID(LTE):	FF01		
PARENT NAME(UMTS):	MIDDLETOWN RNC05				

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	No	CGSA LOSS:		PCS REDUCED - UPS ZIP:	
CGSA - MINOR FILING NEEDED (Yes/No)::	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:	
CGSA - MAJOR FILING NEEDED (Yes/No):	Yes	CGSA SCORECARD UPDATED:			

CGSA CALL SIGNS:	z_KNLB312,z_KNLB312,z_KNLB312

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):		STRUCTURE TYPE:	GUYED
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	82.00	FCC ASR NUMBER:	NR
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	82.00		
LIGHTING TYPE:	NOT REQUIRED				

MARKET LOCATION 700 MHz Band:			
MARKET LOCATION 850 MHz Band:			
MARKET LOCATION 1900 MHz Band:			
MARKET LOCATION AWS Band:			
MARKET LOCATION WCS Band:			
MARKET LOCATION Future Band:			

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911	QUINEBAUG VALLEY EMERGENCY COMM	1384		INTRADO_MIAMI		0				
SECTOR B	QUINEBAUG VALLEY EMERGENCY COMM	1384		INTRADO_MIAMI		0				
SECTOR C	QUINEBAUG VALLEY EMERGENCY COMM	1384		INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:		
SECTOR A E-911	QUINEBAUG VALLEY EMERGENCY COMM	1384		INTRADO_MIAMI		0				
SECTOR B	QUINEBAUG VALLEY EMERGENCY COMM	1384		INTRADO_MIAMI		0				
SECTOR C	QUINEBAUG VALLEY EMERGENCY COMM	1384		INTRADO_MIAMI		0				
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 6 - RBS GENERAL INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RBS ID:	114403	114404	242748	330132	428533							
CTS COMMON ID:	358D2075	319D2075	CTV2075	CTU2075	CTL02075							
CELL ID / BCF:	358D2075	358D2075	CTV2075	CTV2075	CTL02075							
BTA/TID:	358G	358P	319U	319W	319L							
4-9 DIGIT SITE ID:	2075	2075	2075	2075	02075							
COW OR TOY?:	No	No	No	No	No							
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED							
SITE TYPE:	BTS-CONVENTIONAL	BTS-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:	GROUND	GROUND	INTERNAL	INTERNAL	INTERNAL							
BASE STATION TYPE:	BASE	BASE	BASE	OVERLAY	BASE							
EQUIPMENT NAME:	BROOKLYN	BROOKLYN	BROOKLYN	BROOKLYN	BROOKLYN LTE							
DISASTER PRIORITY:	0	0	0	3	0							

Section 6 - RBS GENERAL INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RBS ID:	114403		242748	330132	428533							
CTS COMMON ID:	358D2075		CTV2075	CTU2075	CTL02075							
CELL ID / BCF:	358D2075		CTV2075	CTV2075	CTL02075							
BTA/TID:	358G		319U	319W	319L							
4-9 DIGIT SITE ID:	2075		2075	2075	02075							
COW OR TOY?:	No		No	No	No							
CELL SITE TYPE:	SECTORIZED		SECTORIZED	SECTORIZED	SECTORIZED							
SITE TYPE:	BTS-CONVENTIONAL		MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL							
BTS LOCATION ID:	GROUND		INTERNAL	INTERNAL	INTERNAL							
BASE STATION TYPE:	BASE		BASE	OVERLAY	BASE							
EQUIPMENT NAME:	BROOKLYN		BROOKLYN	BROOKLYN	BROOKLYN LTE							
DISASTER PRIORITY:	0		0	3	0							

Section 7 - RBS SPECIFIC INFORMATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	NOKIA	NOKIA	ERICSSON	ERICSSON	ERICSSON							
EQUIPMENT TYPE:	ULTRASITE	ULTRASITE	3206 INDOOR	3206 INDOOR	6601 INDOOR MU							
BASEBAND CONFIGURATION:												
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:	Yes	Yes	Yes	Yes	Yes							
NODE B NUMBER:	0	0	0	0	2075							

Section 7 - RBS SPECIFIC INFORMATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS							
RAC:												
EQUIPMENT VENDOR:	NOKIA		ERICSSON	ERICSSON	ERICSSON							
EQUIPMENT TYPE:	ULTRASITE		3206 INDOOR	3206 INDOOR	6601 INDOOR MU							
BASEBAND CONFIGURATION:					1x6601 / 1xDUS41 / 1xXMU03							
LOCATION:												
CABINET LOCATION:												
MARKET STATE CODE:					CT							
AGPS:	Yes		Yes	Yes	Yes							
NODE B NUMBER:	0		0	0	2075							

Section 8 - RBS/SECTOR ASSOCIATION - existing

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS														
CTS Common ID	358D2075	319D2075	CTV2075	CTU2075	CTL02075														
Soft Sector IDs	319G20751	319P20751	CTV20751	CTU20757	CTL02075_7A_1														
	319G20752	319P20752	CTV20752	CTU20758	CTL02075_7B_1														
	319G20753	319P20753	CTV20753	CTU20759	CTL02075_7C_1														

Section 8 - RBS/SECTOR ASSOCIATION - final

	GSM 1ST RBS	GSM 2ND RBS	UMTS 1ST RBS	UMTS 2ND RBS	LTE 1ST RBS														
CTS Common ID	358D2075		CTV2075	CTU2075	CTL02075														
Soft Sector IDs			CTV20751	CTU20757	CTL02075_7A_1														
			CTV20752	CTU20758	CTL02075_7B_1														
			CTV20753	CTU20759	CTL02075_7C_1														
					CTL02075_9A_1														
					CTL02075_9B_1														
					CTL02075_9C_1														

Section 9 - SOFT SECTOR ID - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900																				
USEID (excluding Hard Sector)	71311.850.25G.1	71311.1900.25G.1	71311.850.3G.1	71311.1900.3G.2																						
SECTOR A SOFT SECTOR ID	319G20751	319P20751	CTV20751	CTU20757	CTL02075_7A_1																					
SECTOR B	319G20752	319P20752	CTV20752	CTU20758	CTL02075_7B_1																					
SECTOR C	319G20753	319P20753	CTV20753	CTU20759	CTL02075_7C_1																					
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - SOFT SECTOR ID - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900																				
USEID (excluding Hard Sector)			71311.850.3G.1	71311.1900.3G.2																						
SECTOR A SOFT SECTOR ID			CTV20751	CTU20757	CTL02075_7A_1	CTL02075_9A_1																				
SECTOR B			CTV20752	CTU20758	CTL02075_7B_1	CTL02075_9B_1																				
SECTOR C			CTV20753	CTU20759	CTL02075_7C_1	CTL02075_9C_1																				
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - Cell Number - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900																				
USEID (excluding Hard Sector)	71311.850.25G.1	71311.1900.25G.1	71311.850.3G.1	71311.1900.3G.2																						
SECTOR A CELL NUMBER					15																					
SECTOR B					16																					
SECTOR C					17																					
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 9 - Cell Number - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900																				
USEID (excluding Hard Sector)			71311.850.3G.1	71311.1900.3G.2																						
SECTOR A CELL NUMBER					15	8																				
SECTOR B					16	9																				
SECTOR C					17	10																				
SECTOR D																										
SECTOR E																										
SECTOR F																										
OMNI																										

Section 10 - CID/SAC - existing

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900																						
SECTOR A CID/SAC	20751	20751	20751	20757																								
SECTOR B	20752	20752	20752	20758																								
SECTOR C	20753	20753	20753	20759																								
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 10 - CID/SAC - final

	GSM 1ST 850	GSM 1ST 1900	UMTS 1ST 850	UMTS 1ST 1900	LTE 1ST 700	LTE 1ST 1900																						
SECTOR A CID/SAC			20751	20757																								
SECTOR B			20752	20758																								
SECTOR C			20753	20759																								
SECTOR D																												
SECTOR E																												
SECTOR F																												
OMNI																												

Section 15A - CURRENT SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						AM-X-CD-14-65-00T-RET							
ANTENNA VENDOR	Powerwave						KMW							
ANTENNA SIZE (H x W x D)	55X11X5						48X11.8X5.9							
ANTENNA WEIGHT	35						36.4							
AZIMUTH	143						35							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	89						89							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2						2							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							2	APTDC-BDFDM-DB						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					2	CCI Triplexer -TPX-070821						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)							1	Powerwave 7070						
DC BLOCK (QTY/MODEL)								LTE RRH						
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)					1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860						AISG Compliant Diplexer						
PDU FOR TMAS (QTY/MODEL)	1	LGP 18104 (Full Dual Band TMA)												
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		71311.A.850.3G.1	CTV20751	CTV20751		UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	130.033293									
	PORT 2		71311.A.850.25G.1	319G20751	319G20751		GSM 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	130.033293	RxAIT 850				12.58	161.43			
	PORT 3		71311.A.1900.3G.2	CTU20757	CTU20757		UMTS 1900	7770.00.1900.00	15.5		0	None	Andrew 1-5/8 (1900)	130.033293									
ANTENNA POSITION 4	PORT 1		71311.A.700.4G.1	CTL02075_7A_1	CTL02075_7A_1		LTE 700	AM-X-CD-17-65-00T-RET_725MHz_05DT	16.79		5	Bottom	Andrew 7/8 (850)	130									

Section 15B - CURRENT SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						AM-X-CD-14-65-00T-RET							
ANTENNA VENDOR	Powerwave						KMW							
ANTENNA SIZE (H x W x D)	55X11X5						48X11.8X5.9							
ANTENNA WEIGHT	35						36.4							
AZIMUTH	263						165							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	89						89							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2						2							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							2	APTDC-BDFDM-DB						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					2	CCI Triplexer -TPX-070821						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)														
DC BLOCK (QTY/MODEL)								LTE RRH						
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)					1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		71311.B.850.3G.1	CTV20752	CTV20752		UMTS 850	7770.00.850.06	13.5		6	None	Andrew 1-5/8 (850)	130.033293									
	PORT 2		71311.B.850.25G.1	319G20752	319G20752		GSM 850	7770.00.850.06	13.5		6	None	Andrew 1-5/8 (850)	130.033293	RxAIT 850				17.78	228.03			
	PORT 3		71311.B.1900.3G.2	CTU20758	CTU20758		UMTS 1900	7770.00.1900.00	15.5		0	None	Andrew 1-5/8 (1900)	130.033293									
ANTENNA POSITION 4	PORT 1		71311.B.700.4G.1	CTL02075_7B_1	CTL02075_7B_1		LTE 700	80010764_716MHz_06DT	14.3		6	Bottom	Andrew 7/8 (850)	130									

Section 15C - CURRENT SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						AM-X-CD-14-65-00T-RET							
ANTENNA VENDOR	Powerwave						KMW							
ANTENNA SIZE (H x W x D)	55X11X5						48X11.8X5.9							
ANTENNA WEIGHT	35						36.4							
AZIMUTH	23						275							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	89						89							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2						2							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							2	APTDC-BDFDM-DB						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901					2	CCI Triplexer -TPX-070821						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)														
DC BLOCK (QTY/MODEL)								LTE RRH						
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)					1	Pwav TT19-08BP111-001 Twin 1900 w/ 850BP (850)						
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860						AISG Compliant Diplexer						
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)														
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1														
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1		71311.C.850.3G.1	CTV20753	CTV20753		UMTS 850	7770.00.850.07	13.5		7	None	Andrew 1-5/8 (850)	130.033293									
	PORT 2		71311.C.850.25G.1	319G20753	319G20753		GSM 850	7770.00.850.07	13.5		7	None	Andrew 1-5/8 (850)	130.033293	RxAIT 850				12.58	161.43			
	PORT 3		71311.C.1900.3G.2	CTU20759	CTU20759		UMTS 1900	7770.00.1900.00	15.5		0	None	Andrew 1-5/8 (1900)	130.033293									
ANTENNA POSITION 4	PORT 1		71311.C.700.4G.1	CTL02075_7C_1	CTL02075_7C_1		LTE 700	AM-X-CD-14-65-00T-RET_725MHz_07DT	16.79		7	Bottom	Andrew 7/8 (850)	130									

Section 16A - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				TPA-65R-LCUUUU-H8			
ANTENNA VENDOR				CCI			
ANTENNA SIZE (H x W x D)				96X14.4X8.6			
ANTENNA WEIGHT				94.2			
AZIMUTH				35			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				89			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)				1 DC/Fiber Squid			
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 2C 1900 w/Bronze Standard- Replace the existing LTE Antenna with 12 port Antenna- Install LTE RRUS-32 B2 at top by replacing bottom radio RRUS-11.- Add DC Fiber Squid- DUL to DUS upgrade, Add XMU.						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		71311.A.1900.4G.1	CTL02075_9A_1	CTL02075_9A_1		LTE 1900	TPA-65R-LCUUUU-H8_1930MHz_04DT	16.2		4	TOP	FIBER	0									

Section 16B - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				QS46512-2			
ANTENNA VENDOR				Quintel			
ANTENNA SIZE (H x W x D)				52X12X10.8			
ANTENNA WEIGHT				75			
AZIMUTH				165			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				89			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 2C 1900 w/Bronze Standard- Replace the existing LTE Antenna with 12 port Antenna- Install LTE RRUS-32 B2 at top by replacing bottom radio RRUS-11.- Add DC Fiber Squid- DUL to DUS upgrade, Add XMU.						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		71311.B.1900.4G.1	CTL02075_9B_1	CTL02075_9B_1		LTE 1900	QS46512-2_1930MHz_10DT	14.9		10	TOP	FIBER	0									

Section 16C - NEW/PROPOSED SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL				TPA-65R-LCUUUU-H8			
ANTENNA VENDOR				CCI			
ANTENNA SIZE (H x W x D)				96X14.4X8.6			
ANTENNA WEIGHT				94.2			
AZIMUTH				275			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)				89			
ANTENNA TIP HEIGHT							
MECHANICAL DOWNTILT				0			
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)				Internal			
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)				1 RRUS-32 B2			
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	LTE 2C 1900 w/Bronze Standard- Replace the existing LTE Antenna with 12 port Antenna- Install LTE RRUS-32 B2 at top by replacing bottom radio RRUS-11.- Add DC Fiber Squid- DUL to DUS upgrade, Add XMU.						
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 4	PORT 3		71311.C.1900.4G.1	CTL02075_9C_1	CTL02075_9C_1		LTE 1900	TPA-65R-LCUUUU-H8_1930MHz_05DT	16.2		5	TOP	FIBER	0									

Section 17A - FINAL SECTOR/CELL INFORMATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						TPA-65R-LCUUUU-H8							
ANTENNA VENDOR	Powerwave						CCI							
ANTENNA SIZE (H x W x D)	55X11X5						96X14.4X8.6							
ANTENNA WEIGHT	35						94.2							
AZIMUTH	143						35							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	89						89							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)							1	DC/Fiber Squid						
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)	1	Powerwave 7070						LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860												
PDU FOR TMAS (QTY/MODEL)	1	LGP 18104 (Full Dual Band TMA)												
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C 1900 w/Bronze Standard- Replace the existing LTE Antenna with 12 port Antenna- Install LTE RRUS-32 B2 at top by replacing bottom radio RRUS-11.- Add DC Fiber Squid- DUL to DUS upgrade, Add XMU.													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	71311.A.850.3G.1	71311.A.850.3G.1	CTV20751	CTV20751		UMTS 850	7770.00.850.10	13.5		10	None	Andrew 1-5/8 (850)	130.033293						323.59		1	
	PORT 3	71311.A.1900.3G.2	71311.A.1900.3G.2	CTU20757	CTU20757		UMTS 1900	7770.00.1900.00	15.5		0	None	Andrew 1-5/8 (850)	130.033293						435.51		1	
ANTENNA POSITION 4	PORT 1	71311.A.700.4G.1	71311.A.700.4G.1	CTL02075_7A_1	CTL02075_7A_1		LTE 700	TPA-65R-LCUUUU-H8_725MHz_05DT	15.3		5	TOP	FIBER	0						1475.7065		7	
	PORT 3	71311.A.1900.4G.tmp1	71311.A.1900.4G.1	CTL02075_9A_1	CTL02075_9A_1		LTE 1900	TPA-65R-LCUUUU-H8_1930MHz_04DT	16.2		4	TOP	FIBER	0						3664.3757		8	

Section 17B - FINAL SECTOR/CELL INFORMATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						QS46512-2							
ANTENNA VENDOR	Powerwave						Quintel							
ANTENNA SIZE (H x W x D)	55X11X5						52X12X10.8							
ANTENNA WEIGHT	35						75							
AZIMUTH	263						165							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	89						89							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)								LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C 1900 w/Bronze Standard- Replace the existing LTE Antenna with 12 port Antenna- Install LTE RRUS-32 B2 at top by replacing bottom radio RRUS-11.- Add DC Fiber Squid- DUL to DUS upgrade, Add XMU.													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	71311.B.850.3G.1	71311.B.850.3G.1	CTV20752	CTV20752		UMTS 850	7770.00.850.06	13.5		6	None	Andrew 1-5/8 (850)	130.033293						323.59		9	
	PORT 3	71311.B.1900.3G.2	71311.B.1900.3G.2	CTU20758	CTU20758		UMTS 1900	7770.00.1900.00	15.5		0	None	Andrew 1-5/8 (850)	130.033293						435.51		9	
ANTENNA POSITION 4	PORT 1	71311.B.700.4G.1	71311.B.700.4G.1	CTL02075_7B_1	CTL02075_7B_1		LTE 700	QS46512-2_722MHz_10DT	12.5		10	TOP	FIBER	0						1475.7065		7	
	PORT 3	71311.B.1900.4G.tmp1	71311.B.1900.4G.1	CTL02075_9B_1	CTL02075_9B_1		LTE 1900	QS46512-2_1930MHz_10DT	14.9		10	TOP	FIBER	0						3664.3757		8	

Section 17C - FINAL SECTOR/CELL INFORMATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA	ANTENNA POSITION 1		ANTENNA POSITION 2		ANTENNA POSITION 3		ANTENNA POSITION 4		ANTENNA POSITION 5		ANTENNA POSITION 6		ANTENNA POSITION 7	
ANTENNA MAKE - MODEL	7770						TPA-65R-LCUUUU-H8							
ANTENNA VENDOR	Powerwave						CCI							
ANTENNA SIZE (H x W x D)	55X11X5						96X14.4X8.6							
ANTENNA WEIGHT	35						94.2							
AZIMUTH	23						275							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	89						89							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0						0							
FEEDER AMOUNT	2													
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)														
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)														
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)														
Antenna RET Motor (QTY/MODEL)	2	Powerwave 7020						Internal						
SURGE ARRESTOR (QTY/MODEL)														
DIPLEXER (QTY/MODEL)	2	Powerwave / LGP 21901												
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)								LTE RRH						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	Powerwave / LGP 17201 (Full Dual Band)												
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	Polyphaser 1000860												
PDU FOR TMAS (QTY/MODEL)														
FILTER (QTY/MODEL)														
SQUID (QTY/MODEL)														
FIBER TRUNK (QTY/MODEL)														
DC TRUNK (QTY/MODEL)														
RRH - 700 band (QTY/MODEL)							1	RRUS-11						
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)							1	RRUS-32 B2						
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
Additional RRH #1 - any band (QTY/MODEL)														
Additional RRH #2 - any band (QTY/MODEL)														
Additional Component 1 (QTY/MODEL)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	LTE 2C 1900 w/Bronze Standard- Replace the existing LTE Antenna with 12 port Antenna- Install LTE RRUS-32 B2 at top by replacing bottom radio RRUS-11.- Add DC Fiber Squid- DUL to DUS upgrade, Add XMU.													
Local Market Note 2														
Local Market Note 3														

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX ?	TECHNOLOGY/FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID (CSSNG)
ANTENNA POSITION 1	PORT 1	71311.C.850.3G.1	71311.C.850.3G.1	CTV20753	CTV20753		UMTS 850	7770.00.850.07	13.5		7	None	Andrew 1-5/8 (850)	130.033293						323.59		17	
	PORT 3	71311.C.1900.3G.2	71311.C.1900.3G.2	CTU20759	CTU20759		UMTS 1900	7770.00.1900.00	15.5		0	None	Andrew 1-5/8 (850)	130.033293						435.51		17	
ANTENNA POSITION 4	PORT 1	71311.C.700.4G.1	71311.C.700.4G.1	CTL02075_7C_1	CTL02075_7C_1		LTE 700	TPA-65R-LCUUUU-H8_725MHz_07DT	15.3		7	TOP	FIBER	0						1475.7065		7	
	PORT 3	71311.C.1900.4G.tmp1	71311.C.1900.4G.1	CTL02075_9C_1	CTL02075_9C_1		LTE 1900	TPA-65R-LCUUUU-H8_1930MHz_05DT	16.2		5	TOP	FIBER	0						3664.3757		8	

Diagram - Sector	A	Diagram File Name - CT2075_A_B_C_BrzStd_2C_Rev3.vsd					
Atoll Site Name -	CTV2075	Location Name -	BROOKLYN	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

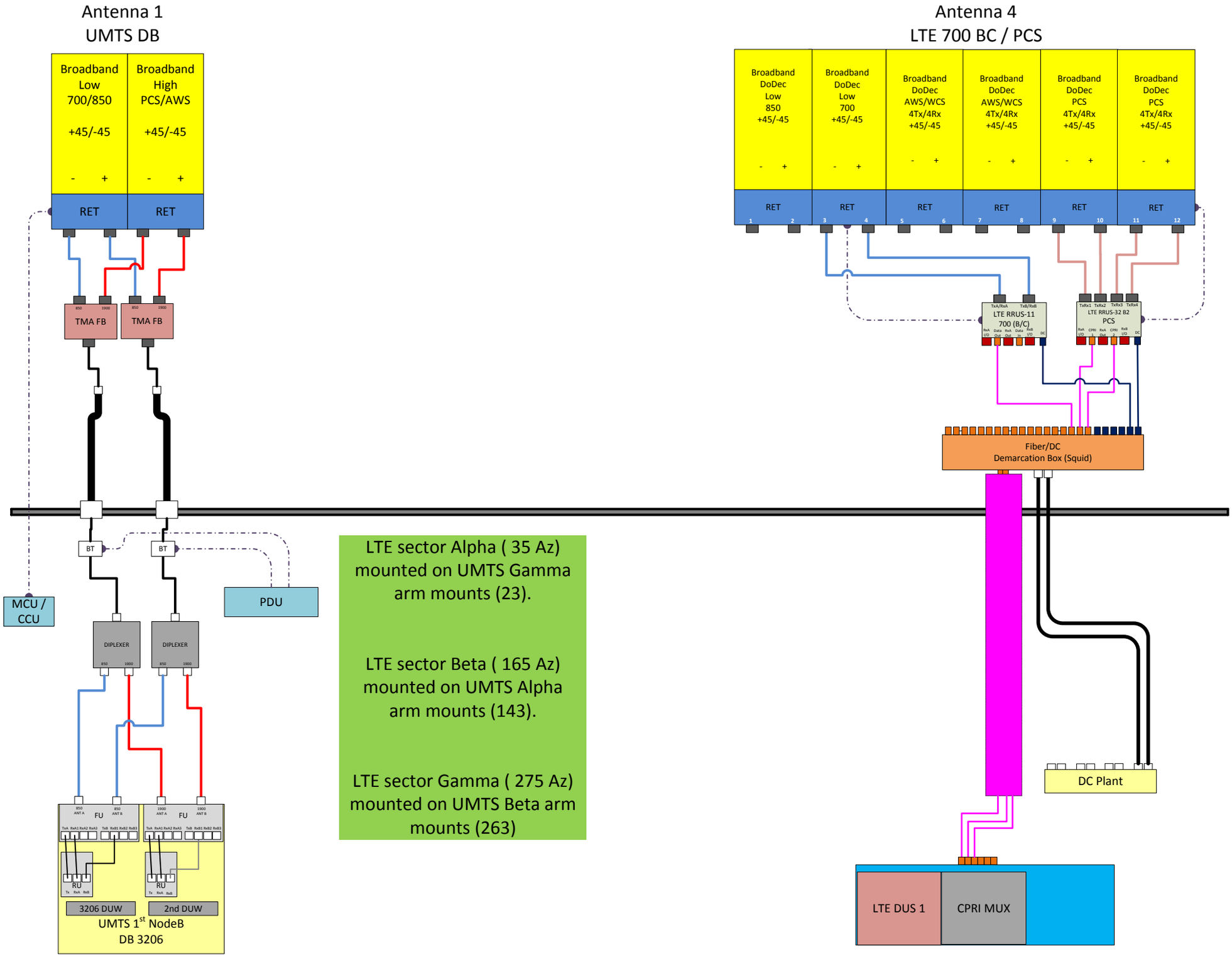


Diagram - Sector	B	Diagram File Name - CT2075_A_B_C_BrzStd_2C_Rev3.vsd					
Atoll Site Name -	CTV2075	Location Name -	BROOKLYN	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							

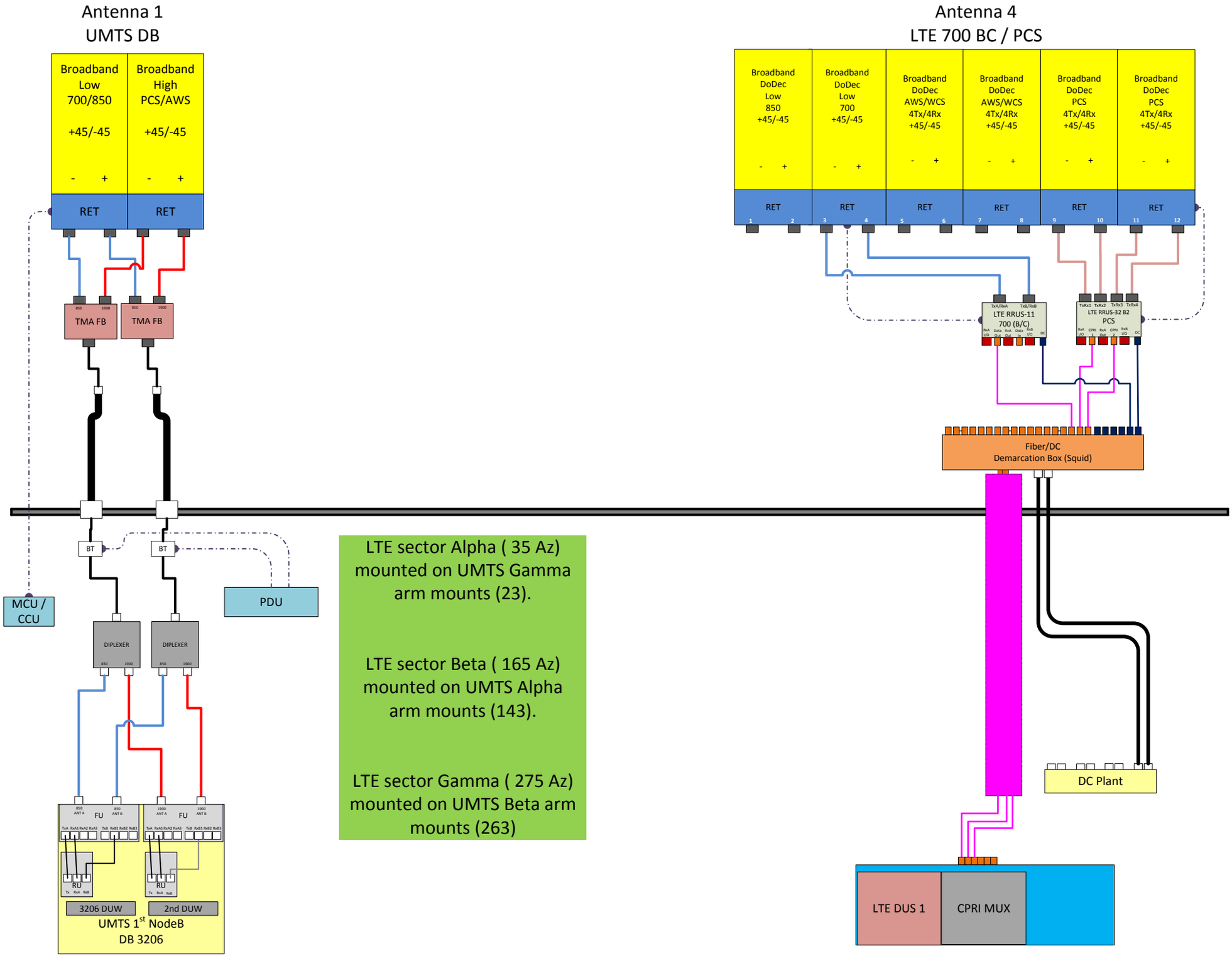
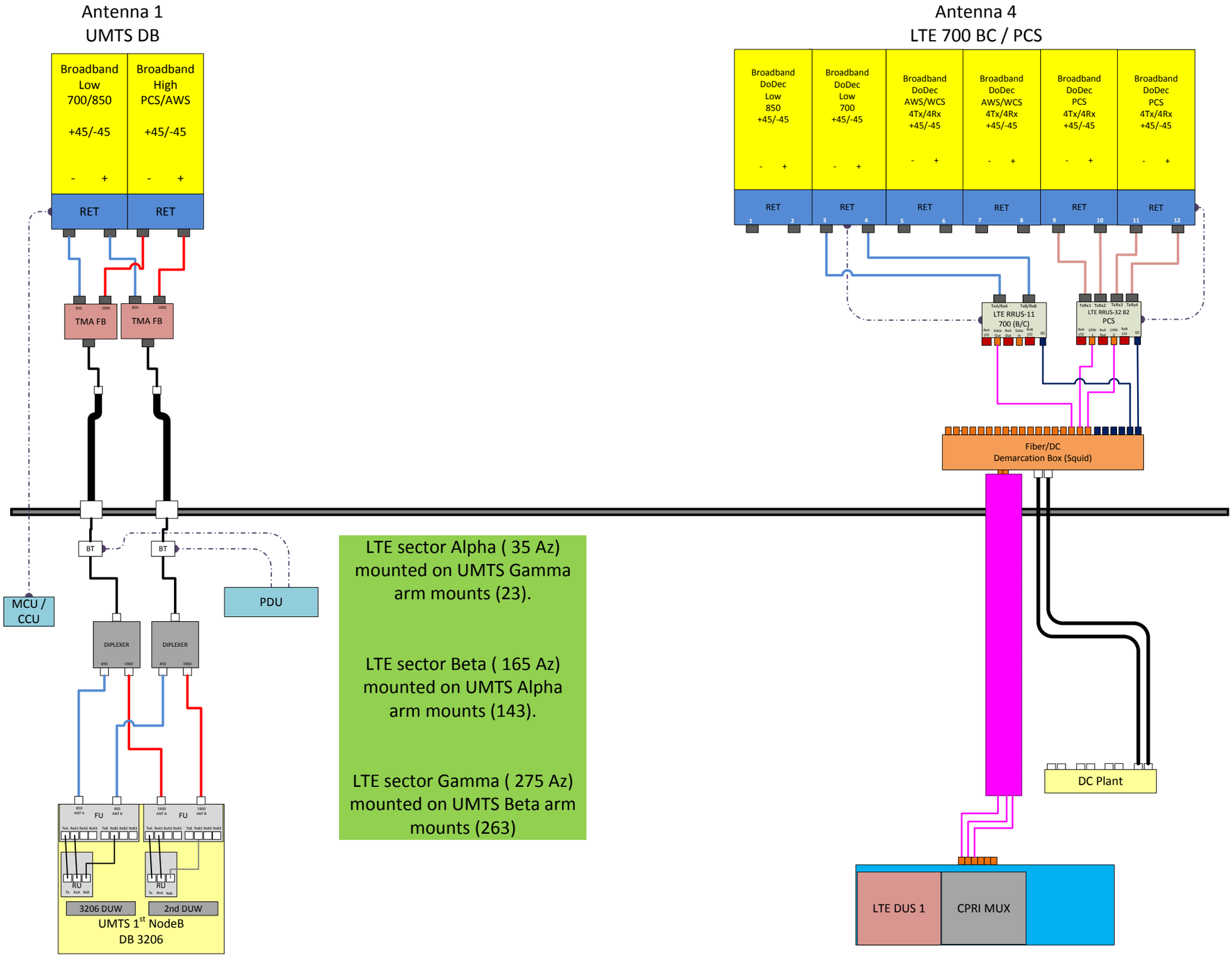


Diagram - Sector	C	Diagram File Name - CT2075_A_B_C_BrzStd_2C_Rev3.vsd					
Atoll Site Name -	CTV2075	Location Name -	BROOKLYN	Market -	CONNECTICUT	Market Cluster -	NEW ENGLAND
Comments:							



NOTES			
Date Time (Central)	Version	ATTUID	Note
3/22/2016 9:15:15 AM	1.00	dr701e	Updated RFDS with PACE number
12/27/2016 6:16:38 PM	4.00	mm093q	Updated to version 4, Revised to show 2 Antenna per sector in existing Sec 15, (3) Powerwave 7770 and (3) KMW AM-X antenna (4' Version), total 6 Antenna total and radio installed in shelter as per email.
1/27/2017 10:16:33 AM	5.00	mr673a	Updated RFDS & PD as confirmation received for design on e-mail.

WORKFLOW SUMMARY							
Date	FROM State / Status	FROM ATTUID	TO State / Status	TO ATTUID	Operation	Comments	PACE Status
03/29/2016	Preliminary In Progress	mm093q	Preliminary Submitted for Approval	AB014M	Promote	LTE 2C Preliminary RFDS.	
04/14/2016	Preliminary Submitted for Approval	AB014M	Preliminary Approved	BG144B	Promote		
05/16/2016	Preliminary Approved	BG144B	Preliminary Modification Recommended	om636a	Demote	Demote // Change to RRUS-12 and add XMU	
06/21/2016	Preliminary Modification Recommended	om636a	Preliminary Submitted for Approval	AB014M	Promote	As per revised direction of Q&D-2016 to propose RRUS-12+XMU	
06/23/2016	Preliminary Submitted for Approval	AB014M	Preliminary Approved	BG144B	Promote		
08/08/2016	Preliminary Approved	BG144B	Final RF Approval	OM636A	Promote	Needs Final	
08/10/2016	Final RF Approval	MM093Q	Final Approved	BG144B	Promote	RFDS Final	
12/20/2016	Final Approved	BG144B	Final Modification Recommended	OM636A	Demote	Existing Equipment Configuration - Screenshot below depicts what is installed on-site (6-total antennas with three of them being the LTE KMWs). The RRUs are within the shelter as shown on the attached photos. The current RFDS shows existing and final to have 9 antennas. Please have them clarify if their intent is to have final count of 9 with RRUs up top and have them supply (3) additional antenna models. Please let me know if there are any questions or concerns regarding this matter.	
12/22/2016	Final Modification Recommended	OM636A	Final Modification Recommended	MM093Q	Reassign	Successfully Reassigned	
12/28/2016	Final Modification Recommended	MM093Q	Final Approved	BG144B	Promote	Updated to version 4, Revised to show 2 Antenna per sector in existing Sec 15, (3) Powerwave 7770 and (3) KMW AM-X antenna (4' Version), total 6 Antenna total and radio installed in shelter as per email	
01/24/2017	Final Approved	BG144B	Final Approved	DC5778	Reassign	Successfully Reassigned	
01/24/2017	Final Approved	DC5778	Final Modification Recommended	OM636A	Demote	Existing config is 1 KMW w/2 triplexers and 1 Powerwave w/2 TMAs per sector.	
01/24/2017	Final Modification Recommended	OM636A	Final Modification Recommended	MR673A	Reassign	Successfully Reassigned	
01/27/2017	Final Modification Recommended	MR673A	Final Approved	DC5778	Promote	Updated RFDS & PD as confirmation received for design on e-mail.	

DATA SHEET

Twelve Port Multi-Band Antenna

TPA-65R-LCUUUU-H8

- Eight High Broadband ports simultaneously covering PCS, AWS and WCS bands
- Eight High Broadband ports with four Low Band ports in one antenna
- Excellent elevation side-lobe performance
- Excellent MIMO performance due to array spacing
- Supports up to 8x8 MIMO in high band
- Excellent PIM Performance
- A multi-network solution in one radome
- Reduces tower loading
- Frees up space for tower mounted Remote Radio Heads
- All Band design simplifies radio assignments
- Single radome with twelve ports
- Sharp elevation beam eases network planning

Overview

The CCI 12-port Multi-Band Antenna Array is an industry first 12-port antenna with eight high band ports that simultaneously cover the full PCS, AWS and WCS bands. In addition to the eight high band ports, the antenna includes two 700 MHz ports and two 850 MHz ports. The 12-port antenna is ready for 8x8 MIMO or dual 4x4 MIMO in high band.
Modern networks demand high performance, consequently CCI has incorporated several new and innovative design techniques to provide an antenna with excellent side-lobe performance, sharp elevation beams, and high front to back ratio.
Multiple networks can now be connected to a single antenna, reducing tower loading and leasing expense, while decreasing deployment time and installation cost.
Full band capability for 700 MHz , Cellular 850 MHz, PCS 1900 MHz, AWS 1695/2180 MHz and WCS 2300 MHz coverage in a single enclosure.

CCI antennas are designed and produced to ISO 9001:2008 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

Applications

- 8x8 MIMO or Dual 4x4 MIMO on High Band
- 2x2 MIMO on 700 & 850 Low Bands
- Adding additional capacity without adding additional antennas

MultiPort Series

SPECIFICATIONS

Twelve Port Multi-Band Antenna

TPA-65R-LCUUUU-H8

Electrical

Ports	2 Low Band Ports for 698-798 MHz	2 Low Band Ports for 824-896 MHz	8 High Band Ports for 1695-2360 MHz			
Frequency Range	698-798 MHz	824-896 MHz	1850-1990 MHz	1695-1780 / 2110-2180 MHz		2305-2360 MHz
Gain	15.1 dBi	15.6 dBi	15.9 dBi	15.4 dBi	16.4 dBi	16.6 dBi
Azimuth Beamwidth (-3dB)	66°	67°	68°	69°	62°	59°
Elevation Beamwidth (-3dB)	9.3°	7.9°	6.9°	8.1°	6.4°	6.1°
Electrical Downtilt	2° to 10°	2° to 10°	0° to 10°	0° to 10°	0° to 10°	0° to 10°
Elevation Sidelobes (1st Upper)	< -16 dB	< -17 dB	< -17 dB	< -18 dB	< -17 dB	< -17 dB
Front-to-Back Ratio @180°	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB	> 30 dB
Front-to-Back Ratio over ± 20°	> 30 dB	> 30 dB	> 27 dB	> 27 dB	> 27 dB	> 27 dB
Cross-Polar Discrimination (at Peak)	> 22 dB	> 25 dB	> 24 dB	> 26 dB	> 22 dB	> 26 dB
Cross-Polar Discrimination (at ± 60°)	> 18 dB	> 19 dB	> 17 dB	> 17 dB	> 17 dB	> 16 dB
Cross-Polar Port-to-Port Isolation	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB	> 25 dB
Voltage Standing Wave Ratio(VSWR)	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1	< 1.5:1
Passive Intermodulation (2x20W)	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc	≤ -150 dBc
Input Power Continuous Wave (CW)	500 watts	500 watts	300 watts	300 watts	300 watts	300 watts
Polarization	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°	Dual Pol 45°
Input Impedance	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms	50 ohms
Lightning Protection	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground	DC Ground

Mechanical

Dimensions (LxWxD)	96.0x14.4x8.6 in (2437x366x218 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	340 lbs (1514 N) @ 100 mph (161 kph)
Side Wind Load	225 lbs (1001 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	13.3 ft^2 (1.2 m^2)
Weight *	75 lbs (34.0 kg)
RET System Weight	6.6 lbs (3.0 kg)
Connector	12 x 4.3-10 Female
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting and RET*

Quintel®
New Dimensions in Wireless™

QS46512-2

4ft 65° XXX MultiServ™ 12-Port Antenna

2x698-806MHz / 2x824-894MHz / 4x1850-1990MHz / 4x1695-1780+2110-2400MHz

MultiServ

- Provides 12 antenna Ports in a slim-line form factor
- Optimized Azimuth patterns for Min Inter-Sector Interference
- Industry leading Minimal Wind-Load design
- 700, 850, PCS, AWS & WCS bands in one antenna
- AISG & 3GPP compliant internal remote electrical tilt (RET)
- AWS & PCS Cross band PIM >159dBc

The Quintel MultiServ™ Multiband 12 Port Antenna with patented QTilt™ technology uniquely delivers four independent services in a single slim-line antenna. This enables existing antenna network sites to be upgraded constraint free to add new services such as LTE for 700, 850, PCS, AWS and WCS bands with the replacement of one antenna. The QS46512-2 also provides 4x1695-1780+2110-2400MHz & 4x1850-1990MHz ports as two side-by-side (CLA-2X) arrays, each set of 4x ports having independent tilt, for connection to 2T4R/4T4R services.

Electrical Characteristics	2x Ports 1&2	2x Ports 3&4	4x Ports 5-8			4x Ports 9-12
Operating Frequency (MHz)	**698-806**	**824-894**	**1695-1780 and 2110-2400**			**1850-1990**
	698-806	824-894	1695-1780	2110-2180	2300-2400	1850-1990
Azimuth beamwidth[1]	65°	61°	72°	65°	60°	68°
Elevation beamwidth[1]	15.5°	14°	7.7°	6.2°	5.7°	7.3°
Gain[1] (dBi)	12.7	12.5	15.5	16.0	16.2	15.3
Polarization	±45°	±45°	±45° ±45°			±45° ±45°
Electrical down-tilt range	2°-10°	2°-10°	2° – 10°			2° – 10°
Upper SLL (20° > mainbeam)[1]	-16dB	-19dB	-17.5dB	-16dB	-17dB	-19dB
Front to Back Ratio(180°±10°)[1]	≥25dB	≥24dB	≥34dB	≥28dB	≥30dB	≥28dB
Port to Port isolation[1]	≥26dB	≥29dB	≥30dB	≥30dB	≥30dB	≥30dB
Return loss (VSWR)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB(1.5)	14dB (1.5)	14dB(1.5)
X Polar Discrimination (at 0°)	>16dB	>17.5dB	>21dB	>20dB	>21dB	>18dB
Max Power handling (per any port)	500 watts	500 watts	250 watts			250 watts
Total Composite Power (all ports)	1750 watts					
PIM (3rd Order) (2x43dBm)	>153dBc	>153dBc	>153dBc			>153dBc
XBand PIM (3rd Order) (2x43dBm)			>159dBc			

[1] *Typical Performance across frequency and Downtilt.*

Mechanical Characteristics	
Dimensions	L 52"(1320mm) x W 12"(304mm) x D 10.8"(275mm)
Weight (excl mounting brackets)	75lbs (34kg)
No. of Connectors	12x 4.3-10.0 DIN Female Long Neck
Max Wind Speed	150mph (67m/s)
Equivalent Flat Plate Area	2.02ft² (0.19m²)
Wind Load @160km/h (45m/s)	Front: 445N (100 lbs), Side: 267N (60 lbs)
Operating Temperature	-40°C to +65°C

Fully Integrated RET Characteristics	
AISG Standards	V1.1,V 2.0 and 3GPP
Factory Default	AISG 2.0
Surge immunity	IEC 61000-4-5:2005 4KV(AISG PIN)
Device Type	SRET Type 1
AISG Data rate	9.6 kbps
No of connectors	RET1 1in/1out.
Connector type	IEC 60130-9 (Ed 3.0)
MTBF	36,000 Operational moves

All specifications are subject to change without notice. Please contact your Quintel representative for complete information.

WIRELESS COMMUNICATIONS FACILITY
CT2075 - LTE 2C
BROOKLYN
89 TATNIC HILL ROAD
BROOKLYN, CT 06234

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE, INCLUDING THE TIA-222 REVISION "G" STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES, 2016 CONNECTICUT FIRE SAFETY CODE AND, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. THE COMPOUND, TOWER, PRIMARY GROUND RING, ELECTRICAL SERVICE TO THE METER BANK AND TELEPHONE SERVICE TO THE DEMARCATION POINT ARE PROVIDED BY SITE OWNER. AS BUILT FIELD CONDITIONS REGARDING THESE ITEMS SHALL BE CONFIRMED BY THE CONTRACTOR. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
4. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
5. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
6. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
7. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
8. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING BUILDING'S/PROPERTY'S OPERATIONS, COORDINATE WORK WITH BUILDING/PROPERTY OWNER.
10. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
11. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
15. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
16. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
17. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
18. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
19. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
20. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED PRIOR TO ANY EXCAVATION WORK. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
21. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

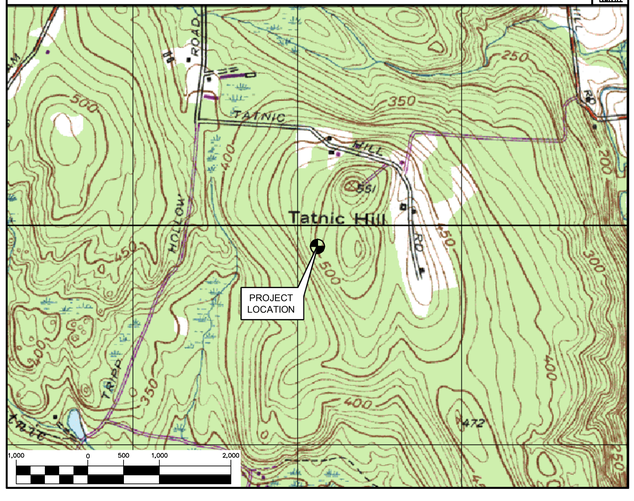
SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT
TO: TATNIC HILL ROAD, BROOKLYN, CONNECTICUT

1.	HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD	0.31 MI
2.	TURN LEFT ONTO CAPITAL BLVD	0.27 MI
3.	TURN LEFT ONTO WEST ST	0.16 MI
4.	MERGE ONTO I-91 N TOWARD HARTFORD	7.79 MI
5.	MERGE ONTO CT-15 N/WILBUR CROSS HWY EXIT 29 TOWARD I-84 E/E HARTFORD/BOSTON	2.14 MI
6.	CT-15 N/WILBUR CROSS HWY N BECOMES I-84 E/US-6 WILBUR CROSS HWY N	1.50 MI
7.	KEEP RIGHT TO TAKE I-384 E EXIT 59 TOWARDS PROVIDENCE	8.67 MI
8.	I-384 E BECOMES US-6 E/US-44 E/BOSTON TURNPIKE	0.22 MI
9.	TAKE US-6 E TOWARD WILLIMANTIC/PROVIDENCE	10.84 MI
10.	TURN SLIGHT LEFT ONTO ROUTE 6/US-6 E. CONTINUE TO FOLLOW US-6 E.	5.34 MI
11.	MERGE ONTO US-6 E TOWARD PROVIDENCE/WINDHAM AIRPORT/DANIELSON	12.74 MI
12.	TURN RIGHT ONTO WINDHAM RD.	0.35 MI
13.	TURN SHARP LEFT ONTO TATNIC RD.	0.29 MI
14.	TAKE THE 1ST RIGHT ONTO TATNIC RD.	0.55 MI
15.	TAKE THE 1ST LEFT ONTO TATNIC HILL RD.	0.18 MI

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   - A. REMOVE AND REPLACE EXISTING LTE ANTENNA FOR PROPOSED LTE TWELVE PORT ANTENNA, (1) PER SECTOR.
   - B. REMOVE (3) EXISTING RRUS-11'S FROM EXISTING EQUIPMENT SHELTER AND RELOCATE ON EXISTING TOWER MOUNT
   - C. INSTALL (3) NEW RRUS-32 B2 ON EXISTING TOWER MOUNT
   - D. INSTALL (1) AT&T SURGE ARRESTOR
   - E. REMOVE (3) EXISTING TMA'S BEHIND EXISTING POS.1 ANTENNA
   - F. REMOVE (6) EXISTING TRIPLEXERS WITHIN EXISTING EQUIPMENT SHELTER
   - G. INSTALL (6) PROPOSED DC CONDUCTOR CABLES, (2) PER SECTOR AND INSTALL (3) PROPOSED FIBER TRUCK CABLES, (1) PER SECTOR.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT2075
AT&T SITE NAME:	BROOKLYN
SITE ADDRESS:	89 TATNIC HILL ROAD BROOKLYN, CT 06234
LESSEE/APPLICANT:	AT&T MOBILITY 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41°-46'-05.39" N LONGITUDE: 71°-58'-17.35" W GROUND ELEVATION: ±549' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES AND SPECIFICATIONS	0
C-1	PLANS, ELEVATION AND DETAILS	0
C-2	LTE 2C EQUIPMENT DETAILS	0
E-1	LTE SCHEMATIC DIAGRAM AND NOTES	0
E-2	LTE WIRING DIAGRAM	0
E-3	TYPICAL ELECTRICAL DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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BROOKLYN
CT2075 - LTE 2C
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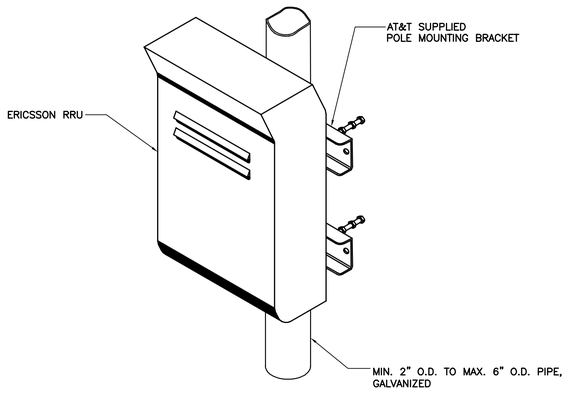
JOB NO. 16071.12

TITLE SHEET

T-1

Sheet No. 1 of 7

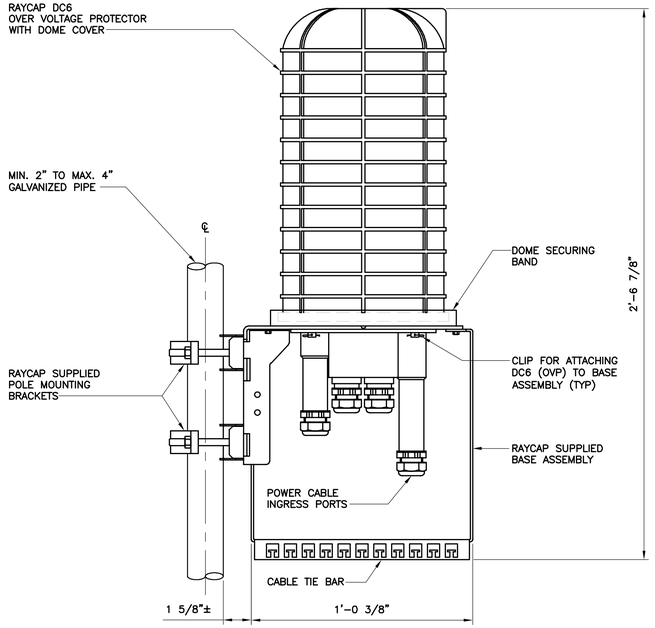


ISOMETRIC VIEW

NOTES:

1. AT&T SHALL SUPPLY RRU, AND RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE–MOUNTING BRACKET. CONTRACTOR SHALL INSTALLS RRU AND MAKES CABLE TERMINATIONS.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 / N–1 **TYPICAL RRUS MOUNTING DETAILS**
SCALE: NTS



ELEVATION

NOTES:

1. RAYCAP VIA AT&T SUPPLIES THE DC6 OVER VOLTAGE PROTECTOR AND PIPE MOUNTING BRACKETS. SUBCONTRACTOR SHALL SUPPLY THE PIPE.

2 / N–1 **RAYCAP DC6 MOUNTING DETAIL**
SCALE: 3" = 1'–0"

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2012 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2016 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:
   - WIND LOAD: PER TIA 222 G (ANTENNA MOUNTS): 100–110 MPH (3 SECOND GUST)
   - RISK CATEGORY: II (BASED ON IBC TABLE 1604.5)
   - NOMINAL DESIGN SPEED (OTHER STRUCTURE): 101 MPH (Vasd) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7–10) PER 2012 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2016 CONNECTICUT STATE BUILDING CODE.
   - SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7–10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF–SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)
   - A. STRUCTURAL STEEL (W SHAPES)–––ASTM A992 (FY = 50 KSI)
   - B. STRUCTURAL STEEL (OTHER SHAPES)–––ASTM A36 (FY = 36 KSI)
   - C. STRUCTURAL HSS (RECTANGULAR SHAPES)–––ASTM A500 GRADE B, (FY = 46 KSI)
   - D. STRUCTURAL HSS (ROUND SHAPES)–––ASTM A500 GRADE B, (FY = 42 KSI)
   - E. PIPE–––ASTM A53 (FY = 35 KSI)
   - F. CONNECTION BOLTS–––ASTM A325–N
   - G. U–BOLTS–––ASTM A36
   - H. ANCHOR RODS–––ASTM F 1554
   - I. WELDING ELECTRODE–––ASTM E 70XX
2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON–GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT–DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

PAINT NOTES

PAINTING SCHEDULE:

1. ANTENNA PANELS:
   - A. SHERWIN WILLIAMS POLANE–B
   - B. COLOR TO BE MATCHED WITH EXISTING TOWER STRUCTURE.
2. COAXIAL CABLES:
   - A. ONE COAT OF DTM BONDING PRIMER (2–5 MILS. DRY FINISH)
   - B. TWO COATS OF DTM ACRYLIC PRIMER/FINISH (2.5–5 MILS. DRY FINISH)
   - C. COLOR TO BE FIELD MATCHED WITH EXISTING STRUCTURE.

EXAMINATION AND PREPARATION:

1. DO NOT APPLY PAINT IN SNOW, RAIN, FOG OR MIST OR WHEN RELATIVE HUMIDITY EXCEEDS 85%. DO NOT APPLY PAINT TO DAMP OR WET SURFACES.
2. VERIFY THAT SUBSTRATE CONDITIONS ARE READY TO RECEIVE WORK. EXAMINE SURFACE SCHEDULED TO BE FINISHED PRIOR TO COMMENCEMENT OF WORK. REPORT ANY CONDITION THAT MAY POTENTIALLY AFFECT PROPER APPLICATION.
3. TEST SHOP APPLIED PRIMER FOR COMPATIBILITY WITH SUBSEQUENT COVER MATERIALS.
4. PERFORM PREPARATION AND CLEANING PROCEDURE IN STRICT ACCORDANCE WITH COATING MANUFACTURER'S INSTRUCTIONS FOR EACH SUBSTRATE CONDITION.
5. CORRECT DEFECTS AND CLEAN SURFACES WHICH AFFECT WORK OF THIS SECTION. REMOVE EXISTING COATINGS THAT EXHIBIT LOOSE SURFACE DEFECTS.
6. IMPERVIOUS SURFACE: REMOVE MILDEW BY SCRUBBING WITH SOLUTION OF TRI–SODIUM PHOSPHATE AND BLEACH. RINSE WITH CLEAN WATER AND ALLOW SURFACE TO DRY.
7. ALUMINUM SURFACE SCHEDULED FOR PAINT FINISH: REMOVE SURFACE CONTAMINATION BY STEAM OR HIGH–PRESSURE WATER. REMOVE OXIDATION WITH ACID ETCH AND SOLVENT WASHING. APPLY ETCHING PRIMER IMMEDIATELY FOLLOWING CLEANING.
8. FERROUS METALS: CLEAN UNGALVANIZED FERROUS METAL SURFACES THAT HAVE NOT BEEN SHOP COATED; REMOVE OIL, GREASE, DIRT, LOOSE MILL SCALE, AND OTHER FOREIGN SUBSTANCES. USE SOLVENT OR MECHANICAL CLEANING METHODS THAT COMPLY WITH THE STEEL STRUCTURES PAINTING COUNCIL'S (SSPC) RECOMMENDATIONS. TOUCH UP BARE AREAS AND SHOP APPLIED PRIME COATS THAT HAVE BEEN DAMAGED. WIRE BRUSH, CLEAN WITH SOLVENTS RECOMMENDED BY PAINT MANUFACTURER, AND TOUCH UP WITH THE SAME PRIMER AS THE SHOP COAT.
9. GALVANIZED SURFACES: CLEAN GALVANIZED SURFACES WITH NON–PETROLEUM–BASED SOLVENTS SO SURFACE IS FREE OF OIL AND SURFACE CONTAMINANTS. REMOVE PRETREATMENT FROM GALVANIZED SHEET METAL FABRICATED FROM COIL STOCK BY MECHANICAL METHODS.
10. ANTENNA PANELS: REMOVE ALL OIL, DUST, GREASE, DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION. PANELS MUST BE WIPED WITH METHYL ETHYL KETONE (MEK).
11. COAXIAL CABLES: REMOVE ALL OIL, DUST, GREASE. DIRT, AND OTHER FOREIGN MATERIAL TO ENSURE ADEQUATE ADHESION.

CLEANING:

1. COLLECT WASTE MATERIAL, WHICH MAY CONSTITUTE A FIRE HAZARD, PLACE IN CLOSED METAL CONTAINERS AND REMOVE DAILY FROM SITE.

APPLICATION:

1. APPLY PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. DO NOT APPLY FINISHES TO SURFACES THAT ARE NOT DRY.
3. APPLY EACH COAT TO UNIFORM FINISH.
4. APPLY EACH COAT OF PAINT SLIGHTLY DARKER THAN PRECEDING COAT UNLESS OTHERWISE APPROVED.
5. SAND METAL LIGHTLY BETWEEN COATS TO ACHIEVE REQUIRED FINISH.
6. VACUUM CLEAN SURFACES FREE OF LOOSE PARTICLES. USE TACK CLOTH JUST PRIOR TO APPLYING NEXT COAT.
7. ALLOW APPLIED COAT TO DRY BEFORE NEXT COAT IS APPLIED.

COMPLETED WORK:

1. SAMPLES: PREPARE 24" X 24" SAMPLE AREA FOR REVIEW.
2. MATCH APPROVED SAMPLES FOR COLOR, TEXTURE AND COVERAGE. REMOVE REFINISH OR REPAINT WORK NOT IN COMPLIANCE WITH SPECIFIED REQUIREMENTS.

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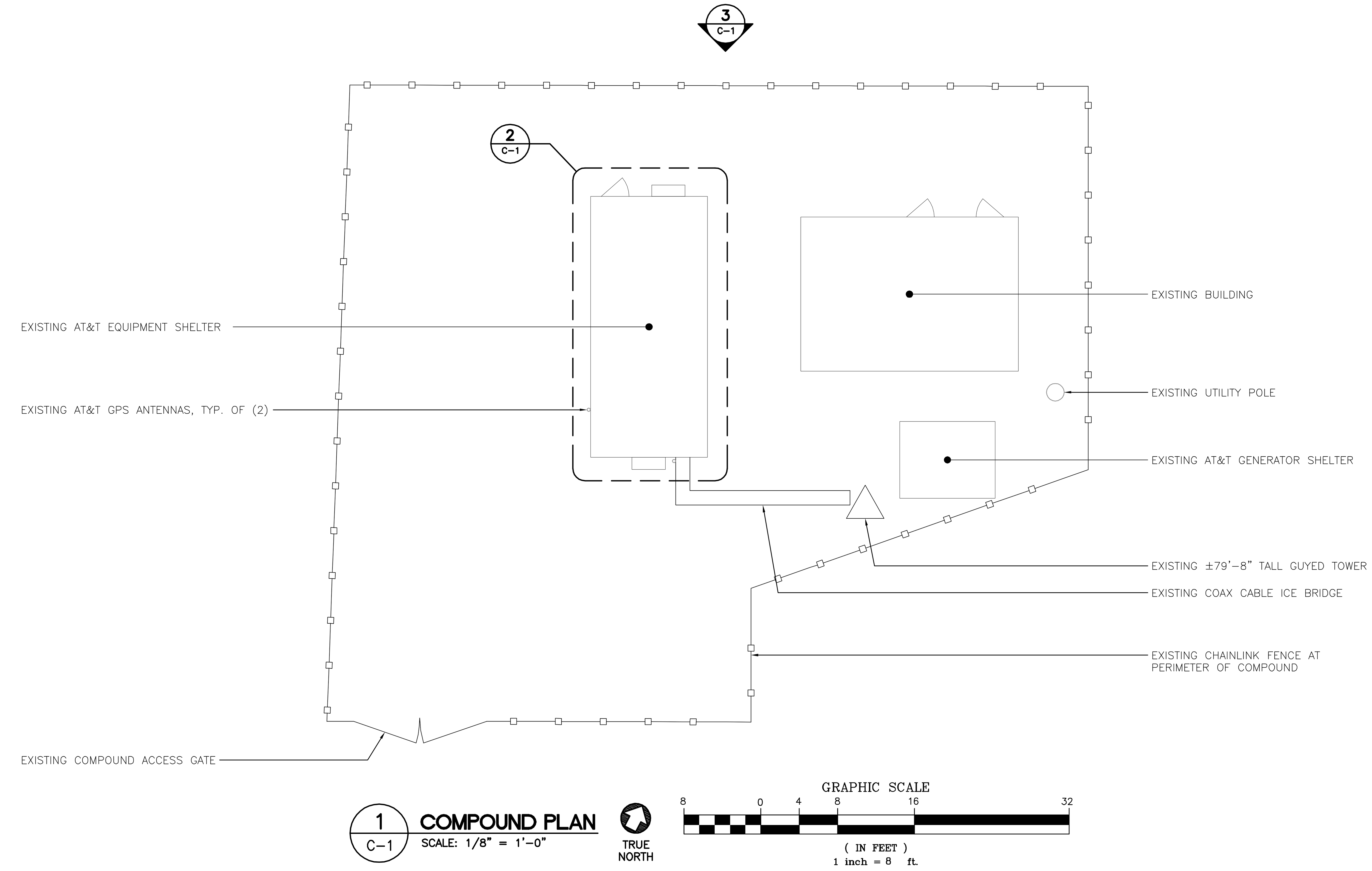
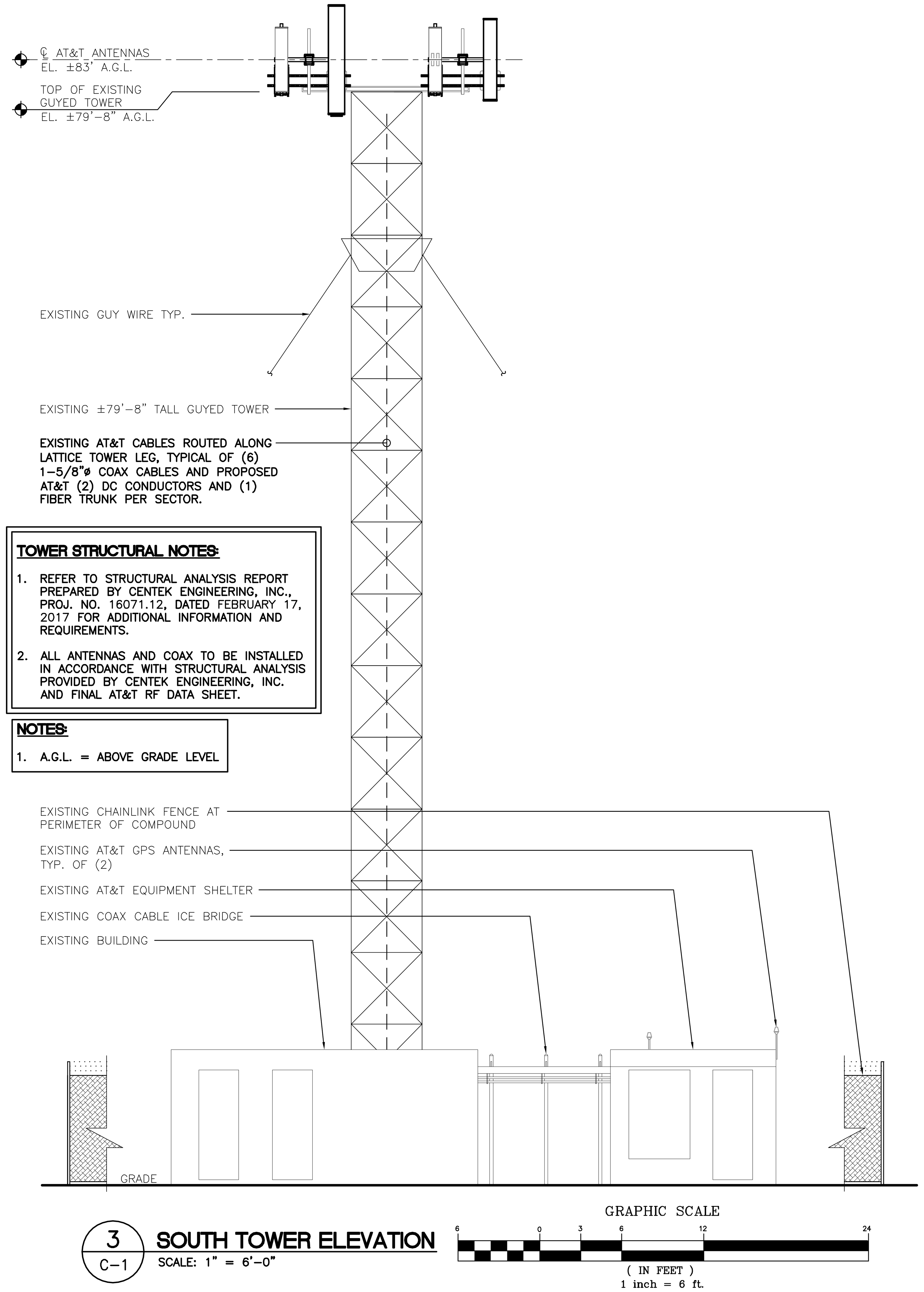
NOTES AND SPECIFICATIONS

N–1
Sheet No. 2 of 7



1 C-1 **COMPOUND PLAN**
SCALE: 1/8" = 1'-0"



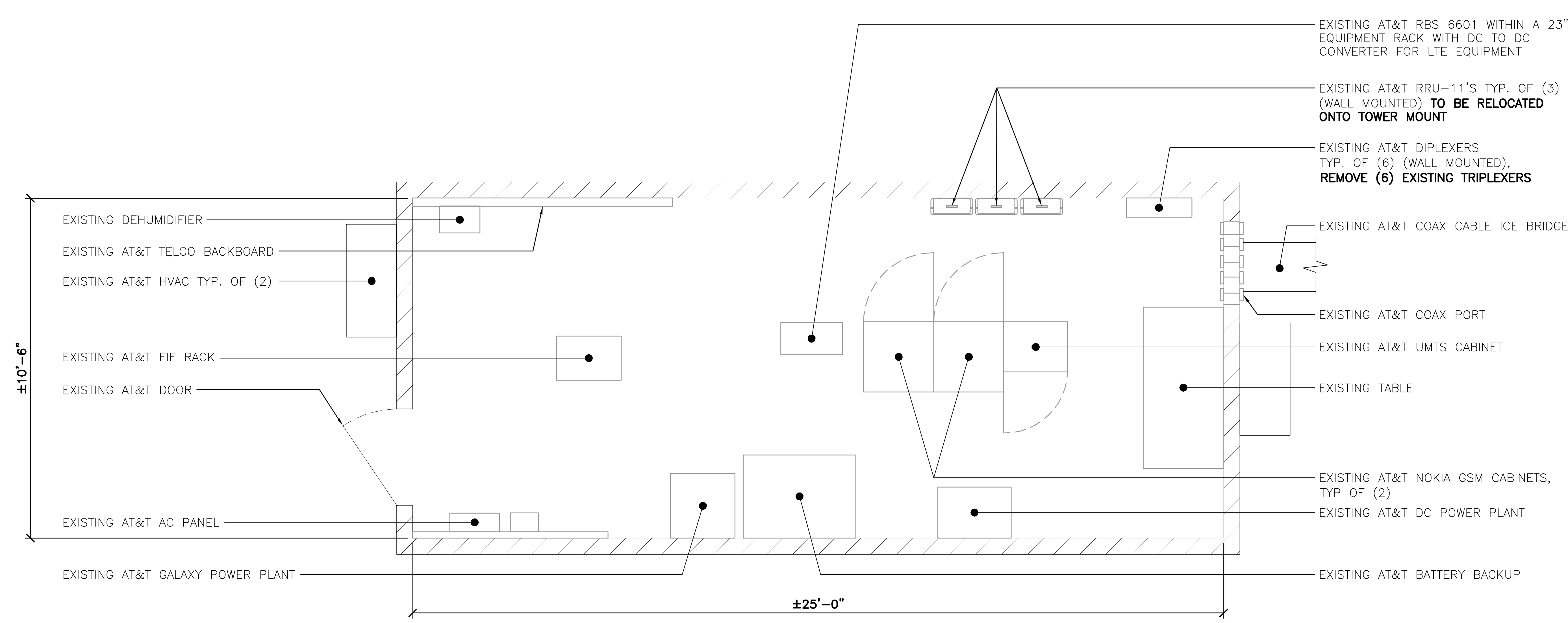
TOWER STRUCTURAL NOTES:

1. REFER TO STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJ. NO. 16071.12, DATED FEBRUARY 17, 2017 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY CENTEK ENGINEERING, INC. AND FINAL AT&T RF DATA SHEET.

NOTES:

1. A.G.L. = ABOVE GRADE LEVEL

3 C-1 **SOUTH TOWER ELEVATION**
SCALE: 1" = 6'-0"



2 C-1 **EQUIPMENT SHELTER PLAN**
SCALE: 3/8" = 1'-0"

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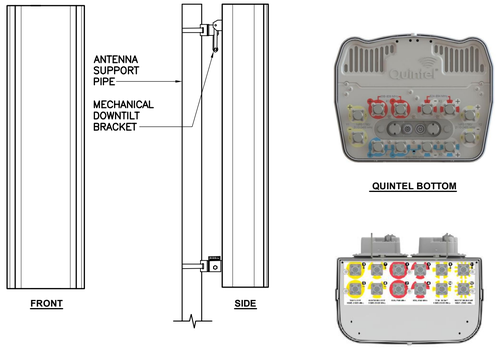
JOB NO.	16071.12

PLANS, ELEVATION AND DETAILS

C-1

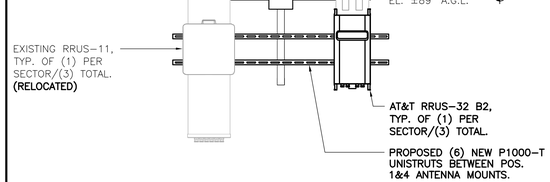


QUINTEL BOTTOM

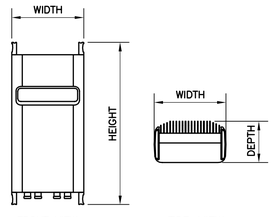
CCI BOTTOM

ALPHA/BETA/GAMMA ANTENNA			
EQUIPMENT		DIMENSIONS	WEIGHT
MAKE: MODEL:	CCI TPA-65R-LCUUUU-H8	96"L x 14.4"W x 8.6"D	94.2 LBS.
EQUIPMENT		DIMENSIONS	WEIGHT
MAKE: MODEL:	QUINTEL QS46512-2	52"H x 12"W x 10.8"D	75 LBS.

5 C-2 PROPOSED ANTENNA DETAIL
SCALE: 1/2" = 1'-0"



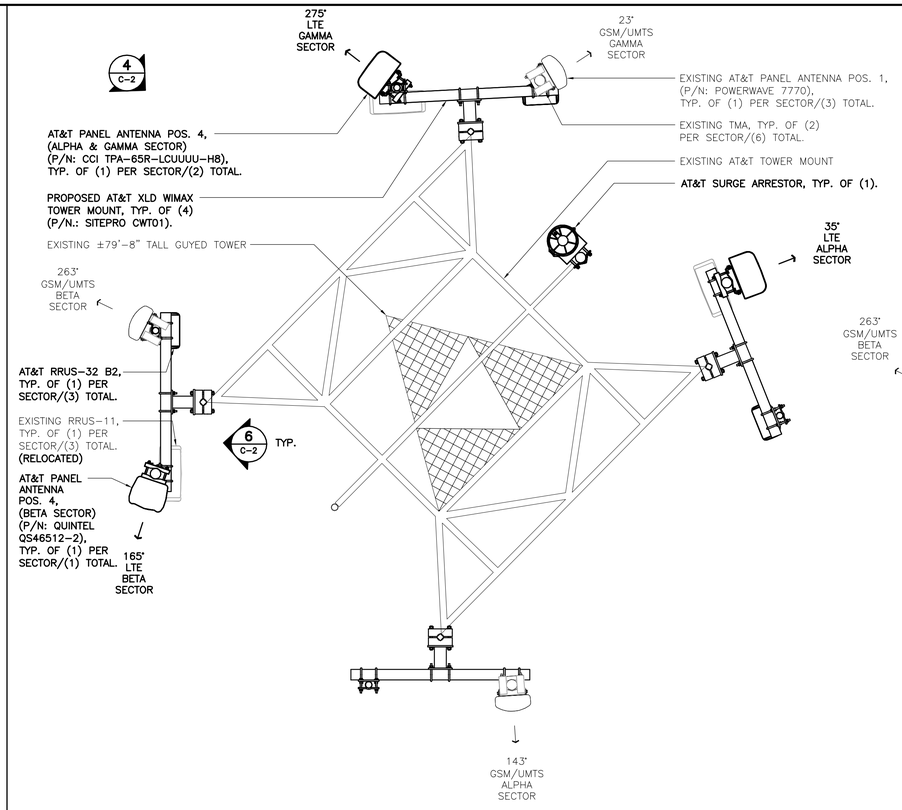
6 C-2 TYP APPURTENANCE MOUNTING DETAIL
SCALE: 1/2" = 1'-0"



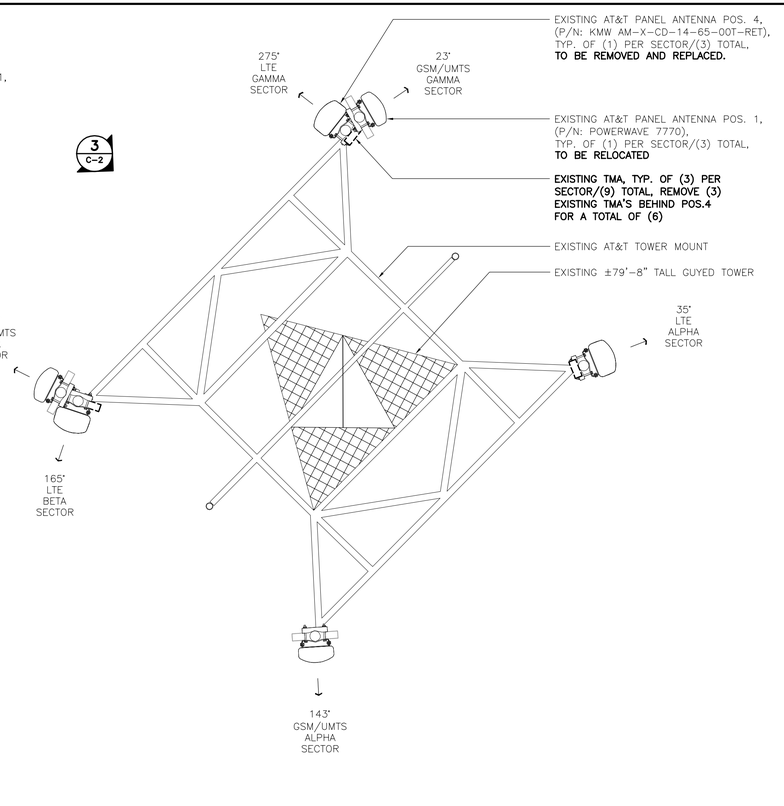
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS-32 B2	27.17"H x 12.05"W x 7.01"D	52.91 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

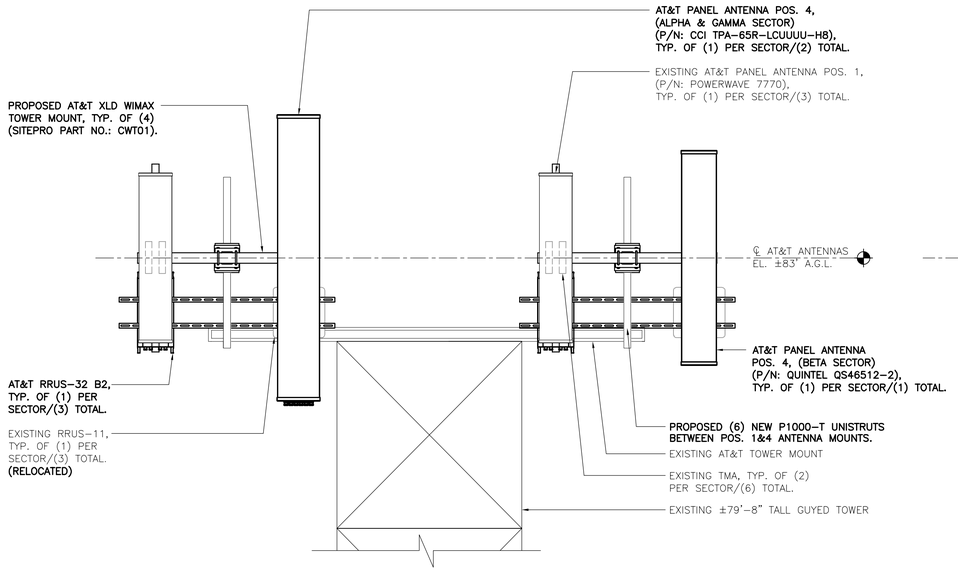
7 C-2 ERICSSON RRUS 32 B2 DETAIL
SCALE: 1" = 1'-0"



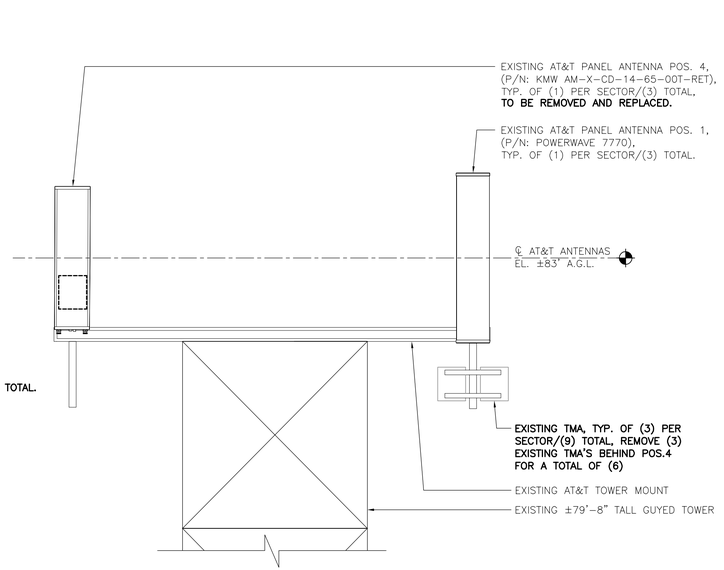
2 C-2 PROPOSED ANTENNA PLAN
SCALE: 1/2" = 1'-0" NORTH



1 C-2 EXISTING ANTENNA PLAN
SCALE: 1/2" = 1'-0" NORTH



4 C-2 PROPOSED ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"



3 C-2 EXISTING ANTENNA ELEVATION
SCALE: 1/2" = 1'-0"

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LTE 2C EQUIPMENT DETAILS

C-2

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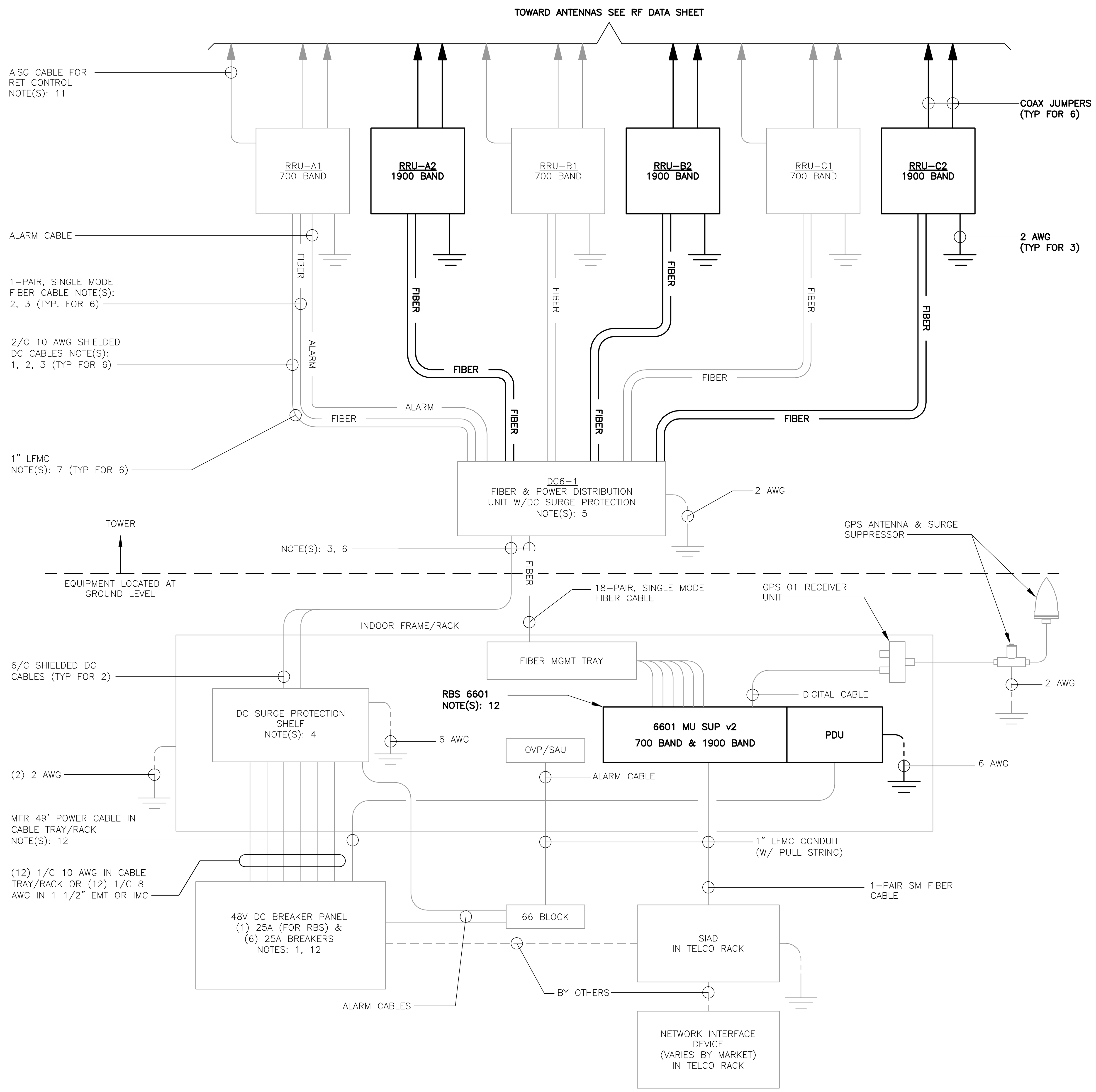

1 / E-1 LTE SCHEMATIC DIAGRAM

NOT TO SCALE

LTE SCHEMATIC DIAGRAM NOTES:

1. BREAKERS TO BE TAGGED AND LOCKED OUT. A 20A (MIN.) OR 30A (MAX.) BREAKER FOR RRUs MAY BE SUBSTITUTED FOR THE RECOMMENDED 25A BREAKER. SIZE 12 CONDUCTORS MAY BE USED ONLY WITH 20A BREAKERS.
2. LEAVE COILED AND PROTECTED UNTIL TERMINATED.
3. DC AND FIBER CABLE SHALL BE ROUTED WITH THE EXISTING COAX CABLE.
4. DC SURGE PROTECTION SHELF SHALL BE RAYCAP DCx-48-60-RM.
5. FIBER & DC DISTRIBUTION BOX W/DC SURGE PROTECTION SHALL BE RAYCAP DC6-48-60-18-8F.
6. SUPPORT FIBER & DC POWER CABLES WITH SNAP-IN HANGERS SPACED NO GREATER THAN 3 FEET APART ON TOWER. SUPPORT FIBER AND DC POWER CABLES INSIDE MONOPOLE WITH CABLE HOISTING GRIPS AT 250 FT MAXIMUM INTERVALS. DRESS CABLES TO PREVENT CONTACT WITH ENTRANCE AND EXIT OPENINGS.
7. CONDUIT TO BE USED ON A TOWER IF THE RRU IS MORE THAN 10' FROM THE DISTRIBUTION UNITS. MAX CABLE LENGTH IS 16 FEET.
8. SINGLE-CONDUCTOR DC POWER CABLES SHALL BE TELCOFLEX® OR KS24194™, COPPER, UL LISTED RHH NON-HALOGEN, LOW SMOKE WITH BRAIDED COVER, TYPE TC (1/0 AND LARGER). UNLESS OTHERWISE NOTED, STRANDING SHALL BE CLASS B (TYPE III) FOR CABLES SIZES 14, 12 & 10 AWG AND CLASS I (TYPE IV) FOR SIZES 8 AWG AND LARGER. CABLES SHALL BE COLOR CODED RED FOR +24V, BLUE FOR -48V AND GRAY FOR 24V AND 48V RETURN CONDUCTORS. MULTI-CONDUCTOR DC POWER CABLES SHALL BE COPPER, CLASS B STRANDING WITH FLAME RETARDANT PVC JACKET, TYPE TC, UL LISTED FOR 90°C DRY/ 75°C WET INSTALLATION.
9. GROUNDING WIRES SHALL BE COPPER, GREEN THHN/THWN UL LISTED FOR 90°C DRY/75°C WET INSTALLATION. MINIMUM SIZE IS 6 AWG UNLESS NOTED OTHERWISE.
10. FIBER OPTIC CABLES SHALL BE INSTALLED IN FLEXIBLE CONDUIT AS SCOPED BY MARKET.
11. RET CONTROL FROM THE RRU IS AN OPTIONAL METHOD OF CONNECTION. REFER TO RF DATA SHEET FOR APPLICABILITY.
12. RBS 6601 VARIANT 2 REQUIRES A 25A BREAKER AND 10 AWG (MIN.) CONDUCTORS. REPLACE EXISTING 15A OR 20A BREAKERS AND 12 AWG CONDUCTORS WHEN UPGRADING AN EXISTING RBS 6601 VARIANT 1.

ELECTRICAL NOTES

1. PRIOR TO START OF CONSTRUCTION CONTRACTOR SHALL COORDINATE WITH OWNER FOR ALL CONSTRUCTION STANDARDS AND SPECIFICATIONS, AND ALL MANUFACTURER DOCUMENTATION FOR ALL EQUIPMENT TO BE INSTALLED.
2. INSTALL ALL EQUIPMENT IN ACCORDANCE WITH LOCAL BUILDING CODE, NATIONAL ELECTRIC CODE, OWNER AND MANUFACTURER'S SPECIFICATIONS.
3. CONNECT ALL NEW EQUIPMENT TO EXISTING TELCO AS REQUIRED BY MANUFACTURER.
4. MAINTAIN ALL CLEARANCES REQUIRED BY NEC AND EQUIPMENT MANUFACTURER.
5. PRIOR TO INSTALLATION CONTRACTOR SHALL MEASURE EXISTING ELECTRICAL LOAD AND VERIFY EXISTING AVAILABLE CAPACITY FOR PROPOSED INSTALLATION. IF INADEQUATE CAPACITY IS AVAILABLE, CONTRACTOR SHALL COORDINATE WITH LOCAL ELECTRIC UTILITY COMPANY TO UPGRADE EXISTING ELECTRIC SERVICE.
6. CONTRACTOR SHALL INSPECT EXISTING GROUNDING AND LIGHTNING PROTECTION SYSTEM AND ENSURE THAT IT IS IN COMPLIANCE WITH NEC, AND SITE OWNER'S SPECIFICATIONS. THE RESULTS OF THIS INSPECTION SHALL BE PRESENTED TO OWNERS REPRESENTATIVE, AND ANY DEFICIENCIES SHALL BE CORRECTED.
7. ALL TRANSMISSION TOWER SITES CONTAIN AN EXTENSIVE BURIED GROUNDING SYSTEM. ALL GROUNDING WORK MUST BE COORDINATED WITH, AND APPROVED BY, THE TOWER OWNER'S SITE REPRESENTATIVE. ALL OF THE TOWER OWNER'S SPECIFICATIONS MUST BE STRICTLY FOLLOWED.
8. PROVIDE AND INSTALL GROUND KITS FOR ALL NEW COAXIAL CABLES AND BOND TO EXISTING OWNERS GROUNDING SYSTEM PER OWNERS SPECIFICATIONS AND NEC.
9. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS, #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:
10. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.
11. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.
12. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNER'S REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES AS MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR SCHEDULING OF ALL INSPECTIONS AS MAY BE REQUIRED BY THE LOCAL AUTHORITY.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE SITE AND/OR BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.
15. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.
16. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.
17. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.
18. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.
19. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122. (MIN. #12 AWG).
20. CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 5 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.
2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.
3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. TESTING SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNERS CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

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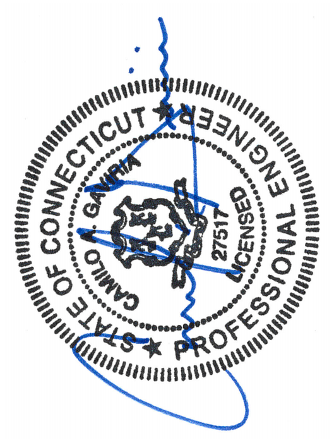

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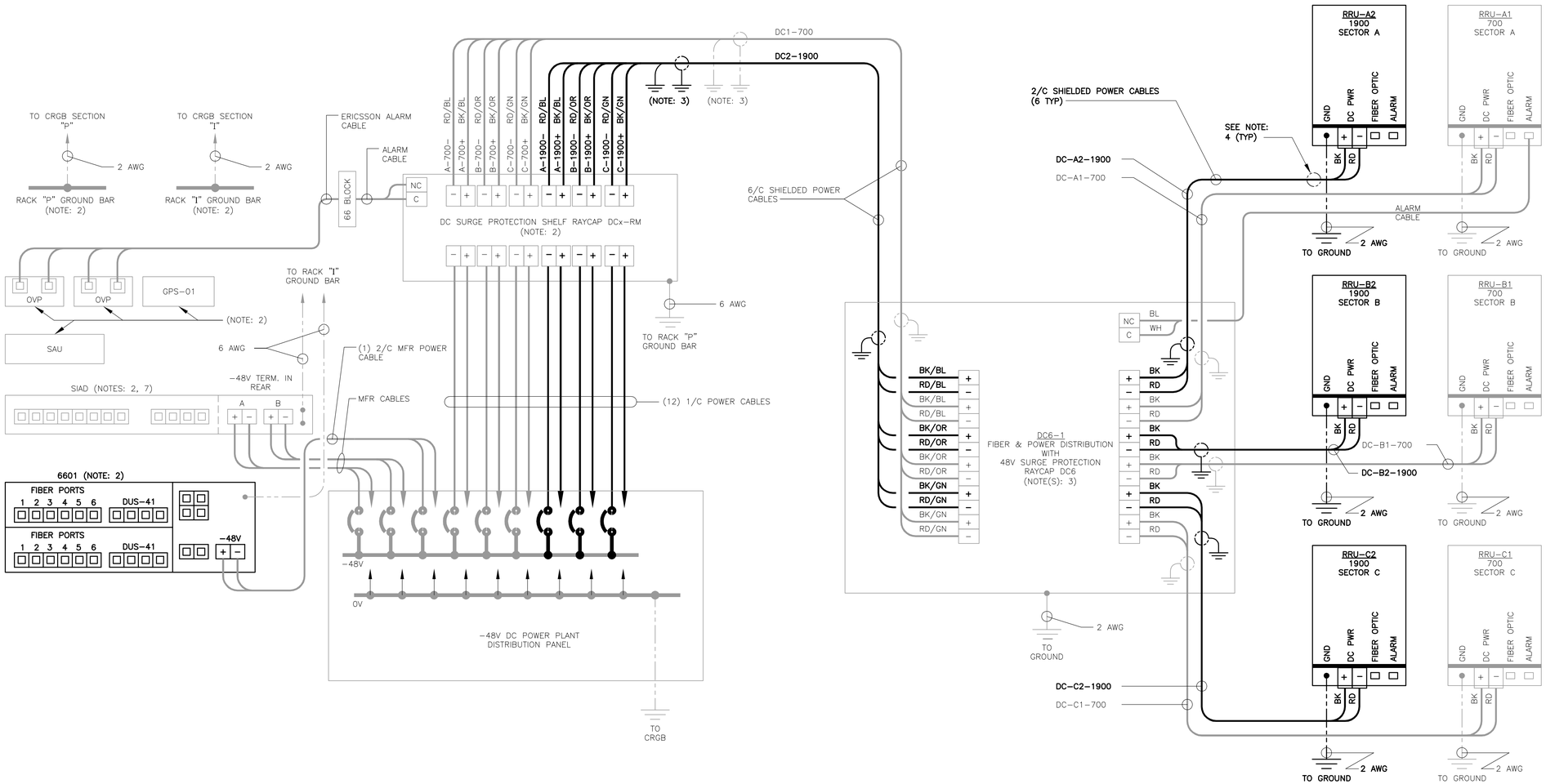
LTE SCHEMATIC DIAGRAM AND NOTES

E-1



1 / E-2 LTE WIRING DIAGRAM

NOT TO SCALE

LTE WIRING DIAGRAM NOTES:

1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. "A-1900+". CABLE AND WIRE LABELS SHOWN ARE REPRESENTATIVE AND MAY BE MODIFIED AS DIRECTED BY AT&T.
2. INSTALL ON BASEBAND EQUIPMENT RACK.
3. THE BARE GROUND WIRE OF EACH MULTI-CONDUCTOR CABLE SHALL BE CONNECTED TO THE "P" GROUND BAR ON THE RACK. WHEN A SHIELDED CABLE IS USED, THE DRAIN WIRE ALSO SHALL BE CONNECTED TO THE "P" GROUND BAR.
4. CABLE GROUND WIRE AND SHIELD DRAIN WIRE TO BE LEFT UN-TERMINATED AT RRU AND DC POWER PLANT.
5. SEE LTE SCHEMATIC DIAGRAM DETAIL 1/E-1 FOR BREAKER RATING.

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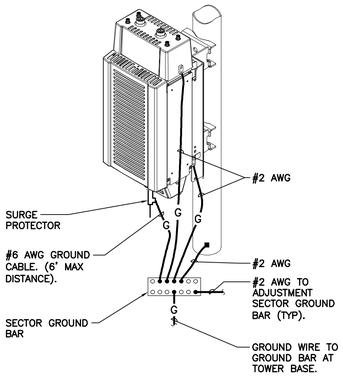
LTE WIRING DIAGRAM

E-2

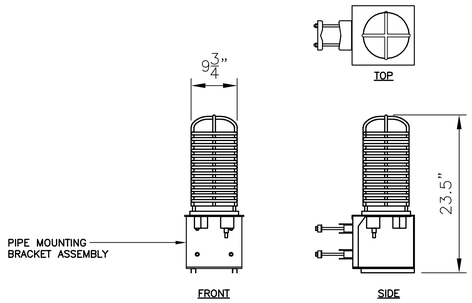
Sheet No. 6 of 7

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



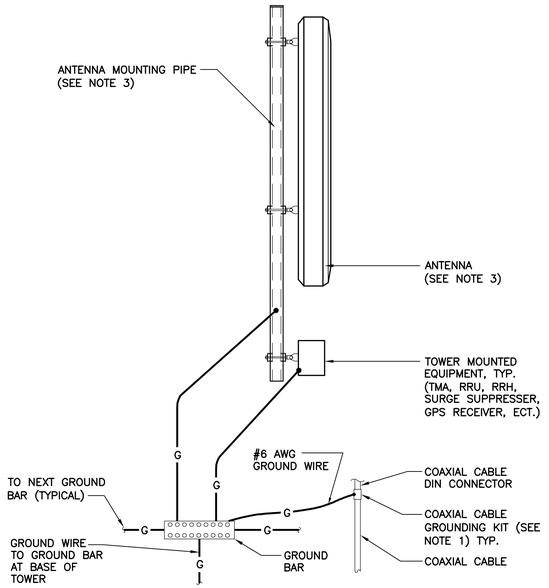
3 E-3 **RRU POLE MOUNT GROUNDING**
NOT TO SCALE



SITE TYPE	ARRESTOR MAKE/MODEL	QTY REQUIRED	ARRESTOR LOCATION	WEIGHT
	MAKE: RAYCAP (SQUID) MODEL: DC6-48-60-18-8F	(1) PER SITE	TOWER MOUNT	20 LBS. (WITHOUT MOUNT)

NOTES:
1. CONTRACTOR TO COORDINATE FINAL SURGE ARRESTOR MODEL SELECTION(S) WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.
2. CONTRACTOR TO INSTALL ARRESTOR IN CONFORMANCE WITH MANUFACTURERS RECOMMENDATIONS.

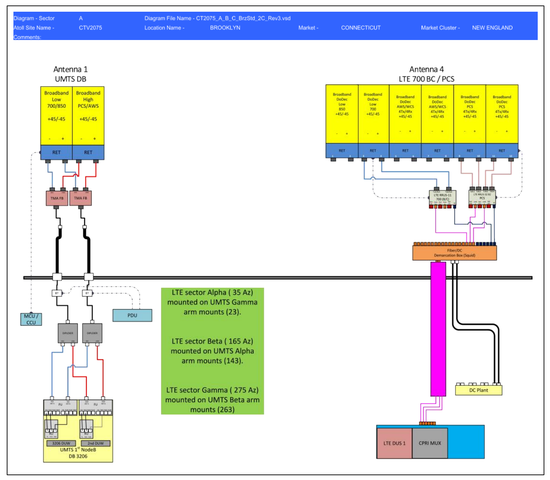
2 E-3 **SURGE ARRESTOR DETAIL**
SCALE: NTS



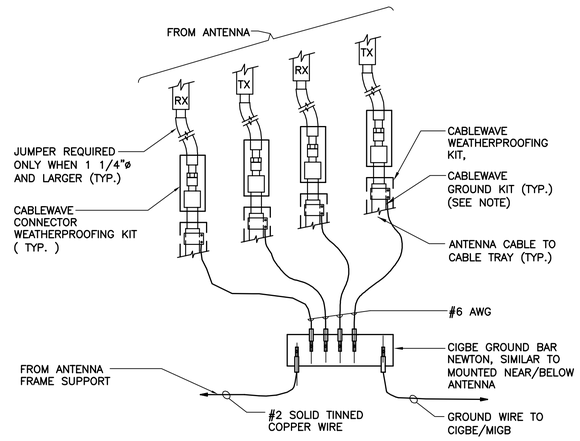
NOTES:

1. BOND COAXIAL CABLE GROUND KITS TO EACH OWNER'S GROUND BAR ALONG ENTIRE COAX RUN FROM ANTENNA TO SHELTER.
2. BOND ALL EQUIPMENT TO GROUND PER NEC AND MANUFACTURERS SPECIFICATIONS.
3. DETAIL IS TYPICAL FOR ALL ANTENNA SECTORS, INCLUDING GPS ANTENNA.

1 E-3 **TYPICAL ANTENNA GROUNDING DETAIL**
NOT TO SCALE



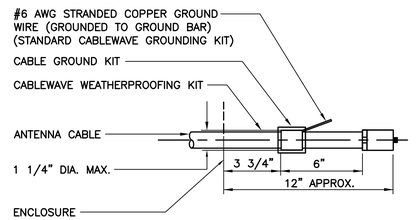
4 E-3 **RF PLUMBING DIAGRAM**
NOT TO SCALE



NOTE:

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

5 E-3 **CONNECTION OF GROUND WIRES TO GROUND BAR**
NOT TO SCALE



NOTE:

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

6 E-3 **ANTENNA CABLE GROUNDING DETAIL**
NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

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