Filed by:
Kri Pelletier, Property Specialist - SBA Communications
134 Flanders Rd., Suite 125, Westborough, MA 01581
508.251.0720 x 3804 - kpelletier@sbasite.com

September 15, 2016

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

Notice of Exempt Modification
2577 Main Street, Glastonbury, CT 06033
41 42 51.8
-72 36 46.9
AT&T #: 10071041_LTE – CT5273

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 110-foot level of the existing 130-foot Self-Support Tower at 2577 Main Street. The tower is owned by SBA 2012 TC Assets, LLC. The property is owned by Saint Paul's Roman Catholic Church. AT&T now intends to replace three (3) existing cell antennas with (3) newer antennas. These antennas would be installed at the 110-foot level of the tower. AT&T's proposed full scope of work is as follows:

Remove: None

Remove and Replace:

- Remove (2) KMW Panel antennas AM-X-CD-16-OOT and replace with (2) CCI panel antennas HPA-65R-RUU-H6
- Remove (1) Andrew Panel antenna SBNH-1D6565C and replace with (1) CCI panel antenna HPA-65R-BUU-H8
- Remove (3) RRU Ericsson RRUS-11 and replace with (3) RRU Ericsson RRUS-12

Install:

- (3) RRU Ericsson RRUS-A2
- (6) Powerwave LGP21901 Diplexer
- (3) Andrwe Bias T ATSBT-TOP-MF-4G

Existing Equipment to Remain (Including entitlements):

- (6) Kathrein Panel antennas 7770
- (18) 1-1/4" coax
- (36) ½" fiber
- (6) TMA Powerwave LGP21401 DB-850
- (12) Kathrein RET 860-10025
- (18) 3/8" lines
- (3) RRU Ericsson RRUS 11
- (1) Raycap surge protector

This facility was approved prior to the Council assuming jurisdiction. On 7/18/2000 the Town of Glastonbury and the Inland Wetlands and Watercourses Agency approved a 130' replacement tower within the wetlands' conservation buffer area at 2577 Main Street, west of St. Paul's Church. A preconstruction meeting was to be held to discuss environmental safeguards to be taken during construction and to determine any stabilization efforts for disturbed land areas. The gravel access driveway was to be a minimum of 12 feet in width. The Town has not provided any further restrictions and this modification complies with the aforementioned condition(s).

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 J. Johnson, Town Manager for the Town of Glastonbury, as well as the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. §16.50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification 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 modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Kri Pelletier
Property Specialist
SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581

508.251.0720 x3804 + T
508.366.2610 + F
203.446.7700 + C
kpelletier@sbasite.com

Attachments
cc: Town Manager, Richard J. Johnson – as elected official
Town of Glastonbury, 2155 Main Street, Glastonbury, CT 06033
Saint Paul's Roman Catholic Church – as property owner
2577 Main St. Glastonbury CT 06033-2023

POWER DENSITY

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.45 / 14.35 dBd	Gain:	11.45 / 14.35 dBd	Gain:	11.45 / 14.35 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,471.44	ERP (W):	2,471.44	ERP (W):	2,471.44
Antenna A1 MPE%	1.03 %	Antenna B1 MPE%	1.03 %	Antenna C1 MPE%	1.03 %
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,462.56	ERP (W):	6,229.75	ERP (W):	5,462.56
Antenna A2 MPE%	2.53 %	Antenna B2 MPE%	3.01 %	Antenna C2 MPE%	2.53 %
Antenna #:	3	Antenna #:	3	Antenna #:	3
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.45 / 0 / 0 / 0 dBd	Gain:	11.45 / 0 / 0 / 0 dBd	Gain:	11.45 / 0 / 0 / 0 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	837.82	ERP (W):	837.82	ERP (W):	837.82
Antenna A3 MPE%	0.49 %	Antenna B3 MPE%	0.49 %	Antenna C3 MPE%	0.49 %

Site Composite MPE%	
Carrier	MPE%
AT&T – Max per sector	4.54 %
T-Mobile	5.32 %
MetroPCS	1.38 %
Sprint	0.03 %
Clearwire	0.13 %
Nextel	0.38 %
Verizon Wireless	12.92 %
Site Total MPE %:	24.70 %

AT&T Sector A Total:	4.05 %
AT&T Sector B Total:	4.54 %
AT&T Sector C Total:	4.05 %
Site Total:	24.70 %

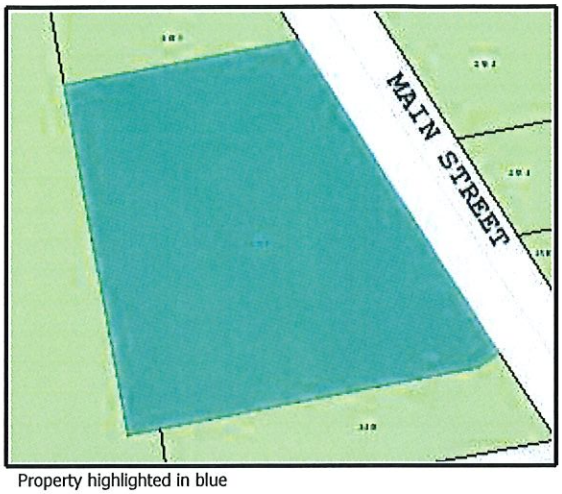
Town of Glastonbury GIS Parcel Report

Report Generated 8/16/2016 12:04:02 PM

Owner of Record

GIS ID: 41402577
Owner: ST PAULS ROMAN CATHOLIC CHURCH
Co-Owner:
Address: 2577 MAIN ST
City, State ZIP: GLASTONBURY, CT 06033-2023

Account Number: 41402577
Property Address: 2577 MAIN ST



Property highlighted in blue

Parcel Information

Map/Street/Lot D5 / 4140 / W0038 **Property ID:** 12111
Developer Lot ID: **Water:** Public-MDC
Parcel Acreage: 4.11 **Sewer:** Sewer Tax Rec
Zoning Code: PBD **Census:** 5203

Valuation Summary

Item	Appraised Value	Assessed Value
Buildings	1998600	1399000
Land	712300	498600
Appurtenances	14500	10200
Total	**2725400**	**1907800**

Owner of Record	Deed / Page	Sale Date	Sale Price
ST PAULS ROMAN CATHOLIC CHURCH	0450/0069	10/04/1988	0

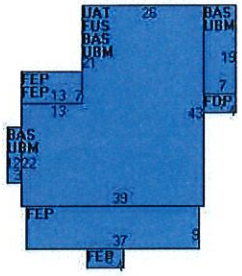
Town of Glastonbury GIS Parcel Report

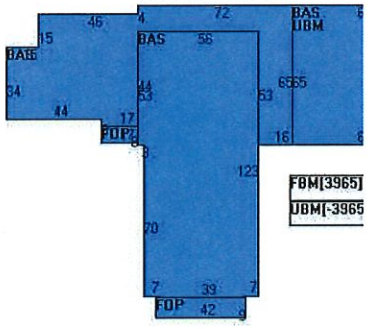
Report Generated 8/16/2016 12:04:03 PM

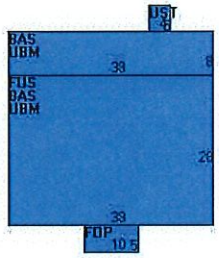
Building Information

Building ID 12111

Year Constructed :	1988	**Number of Rooms :**	
Building Type :	Comm/Ind	**Number of Bedrooms :**	00
Style :	Church Aux	**Number of Bathrooms :**	0
Occupany :	Exempt MDL-94	**Number of Half-Baths :**	
Stories :	2	**Exterior Wall :**	Vinyl
Building Zone :	PBD	**Interior Wall :**	Plaster
Roof Type :	Gable	**Interior Floor :**	Hardwood
Roof Material :	Asphalt Shingl	**Interior Floor #2 :**	No entry
Est. Gross S.F. :	6529	**Air Conditioning Type :**	None
Est. Living S.F. :	2977	**Heat Type :**	Forced Air
		Fuel Type :	None







Subarea Type	Est. Gross S.F.	Est. Living S.F.
First Floor	1573	1573
Porch, Enclosed	547	0
Porch, Open	28	0
Upper Story, Finished	1404	1404
Attic, Unfinished	1404	0
Basement	1573	0
First Floor	15149	15149

Outbuilding Type	Est. Gross S.F.	Comments
COMM TOWER	1.00	
Garage	775.00	

Basement, Finished	3965	0
Porch, Open	664	0
Basement	-60	0
First Floor	1368	1368
Porch, Open	50	0
Upper Story, Finished	1064	1064
Basement	1368	0
Utility, Storage, Unfinished	20	0

EBI Consulting
environmental | engineering | due diligence

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

AT&T Existing Facility

Site ID: CT5273

Glastonbury - NW
2577 Main Street
Glastonbury, CT 06033

September 3, 2016

EBI Project Number: 6216003860

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	24.70 %

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

EBI Consulting
environmental | engineering | due diligence

September 3, 2016

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

Emissions Analysis for Site: **CT5273 – Glastonbury - NW**

EBI Consulting was directed to analyze the proposed AT&T facility located at **2577 Main Street, Glastonbury, 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 public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). 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 done for the proposed AT&T Wireless antenna facility located at **2577 Main Street, Glastonbury, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since AT&T is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 UMTS channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

3) 2 LTE channels (700 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 GSM channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

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

7) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antennas used in this modeling are the **Kathrein 800-10121, CCI HPA-65R-BUU-H6 and the CCI HPA-65R-BUU-H8** 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.

9) The antenna mounting height centerlines of the proposed antennas are **110 feet** above ground level (AGL) for **Sector A**, **110 feet** above ground level (AGL) for **Sector B** and **110 feet** above ground level (AGL) for Sector C.

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

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

AT&T Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.45 / 14.35 dBd	Gain:	11.45 / 14.35 dBd	Gain:	11.45 / 14.35 dBd
Height (AGL):	**110 feet**	Height (AGL):	**110 feet**	Height (AGL):	**110 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	2,471.44	ERP (W):	2,471.44	ERP (W):	2,471.44
Antenna A1 MPE%	**1.03 %**	Antenna B1 MPE%	**1.03 %**	Antenna C1 MPE%	**1.03 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	CCI HPA-65R-BUU-H6	Make / Model:	CCI HPA-65R-BUU-H8	Make / Model:	CCI HPA-65R-BUU-H6
Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd	Gain:	11.95 / 14.75 dBd
Height (AGL):	**110 feet**	Height (AGL):	**110 feet**	Height (AGL):	**110 feet**
Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)	Frequency Bands	700 MHz / 1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	5,462.56	ERP (W):	6,229.75	ERP (W):	5,462.56
Antenna A2 MPE%	**2.53 %**	Antenna B2 MPE%	**3.01 %**	Antenna C2 MPE%	**2.53 %**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121	Make / Model:	Kathrein 800-10121
Gain:	11.45 / 0 / 0 / 0 dBd	Gain:	11.45 / 0 / 0 / 0 dBd	Gain:	11.45 / 0 / 0 / 0 dBd
Height (AGL):	**110 feet**	Height (AGL):	**110 feet**	Height (AGL):	**110 feet**
Frequency Bands	850 MHz	Frequency Bands	850 MHz	Frequency Bands	850 MHz
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts	Total TX Power(W):	60 Watts
ERP (W):	837.82	ERP (W):	837.82	ERP (W):	837.82
Antenna A3 MPE%	**0.49 %**	Antenna B3 MPE%	**0.49 %**	Antenna C3 MPE%	**0.49 %**

Site Composite MPE%	
Carrier	**MPE%**
AT&T – Max per sector	**4.54 %**
T-Mobile	5.32 %
MetroPCS	1.38 %
Sprint	0.03 %
Clearwire	0.13 %
Nextel	0.38 %
Verizon Wireless	12.92 %
Site Total MPE %:	**24.70 %**

AT&T Sector A Total:	4.05 %
AT&T Sector B Total:	4.54 %
AT&T Sector C Total:	4.05 %
Site Total:	24.70 %

AT&T _ Max Values Per Sector (Sector B)	# 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	418.91	110	2.78	850 MHz	567	0.49%
AT&T 1900 MHz (PCS) UMTS	2	816.81	110	5.43	1900 MHz (PCS)	1000	0.54%
AT&T 700 MHz LTE	2	1,239.23	110	8.24	700 MHz	467	1.76%
AT&T 1900 MHz (PCS) LTE	2	1,875.65	110	12.47	1900 MHz (PCS)	1000	1.25%
AT&T 850 MHz GSM	2	418.91	110	2.78	850 MHz	567	0.49%
						Total:	4.54%

Summary

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

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

AT&T Sector	Power Density Value (%)
Sector A:	4.05 %
Sector B:	4.54 %
Sector C:	4.05 %
AT&T Maximum Total (per sector):	4.54 %
Site Total:	24.70 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.70 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

ALLPRO
CONSULTING GROUP, INC.
9221 Lyndon B. Johnson Freeway, #204, Dallas, TX 75243 ★ PHONE 972-231-8893 ★ FAX 1-866-364-8375
www.allprocgi.com ★ e-mail: info@allprocgi.com

Tower Structural Analysis Report for
SBA Network Services, Inc.

Existing 130' Self-Support Tower
SBA Site Name: Glastonbury-main St.
SBA Site ID: CT46126-A -01

Carrier Name: AT&T
Carrier Site Name: 10071041
Site Location:
2577 Main Street
Glastonbury, CT 06033

Latitude: 41.714389°
Longitude: -72.613028°

ACGI Job # 16-2859

ANALYSIS RESULTS		
Tower Components	**98.7%**	**Pass**
Tower Foundation	**62.7%**	**Pass**
Net Change in Tower Stress	**+2.30%**	**From previous structural analysis by B+T Group, Job # 101341.001.01a, dated 09/29/2015**

Prepared By:
Moises Perez, EIT
Staff Engineer

08/16/2016
Approved By
Joji M. George, PE.
CT PE# 24444

TABLE OF CONTENTS

1. ANALYSIS SUMMARY

The existing 130' Self-support Tower located in Glastonbury, Connecticut was analyzed by Allpro Consulting Group, Inc. (ACGI) for the existing and the proposed AT&T antennas, radios and coaxes as authorized by SBA Communication Corp. Based on the results of the analysis, the existing tower with below mentioned proposed and existing loading is found to be **in code compliance** with *TIA/EIA-222-F*, *Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and the* 2003 International Building Code.

2. SCOPE & SOURCE OF INFORMATION

The purpose of this structural analysis is to determine whether the existing structure is capable of supporting additional proposed loads.

SOURCE OF INFORMATION		
Tower Data:	FRED A. NUDD Corporation	Original Tower Design by FRED A. NUDD Corporation PJ No. 6893, Sept, 1999
	FDH Engineering Inc.	Modification Drawings by FDH, Project No. 1338401400, dated 06/17/2013
	FDH Engineering Inc.	Modification Inspection Report by FDH, Project No. 1304001700, dated 11/01/2013
	FDH Engineering Inc.	Modification Inspection Report by FDH, Project No. 1305911700, dated 02/25/2014
	B+T Group	Existing Tower data as per previous structural analysis by B+T Group, Job # 101341.001.01a, dated 09/29/2015
Foundation Data:	FRED A. NUDD Corporation	Original Tower Design by FRED A. NUDD Corporation PJ No. 6893, Sept, 1999
Geotechnical Report:	Tectonic Engineering	Geotechnical Report by Tectonic Engineering Project # 1170.C057, dated 08/26/1999
Loading Data:	B+T Group	Existing loading as per previous structural analysis by B+T Group, Job # 101341.001.01a, dated 09/29/2015
	SBA Communication Corp.	Site Summary dated 08/02/2016
		Proposed final loading for AT&T as per Application ID # 39946, v1 downloaded from SBA portal
Authorization:	SBA Communication Corp.	

3. ANALYSIS METHODS & DATA

The analysis was performed in accordance with Telecommunication Industry Association specification TIA/EIA-222-F. The tower was modeled using TNX Tower, a 3-D finite element program. TNX Tower is a general-purpose modeling, analysis, and design program created specifically for communication towers using the EIA-222-C, EIA-222-D, TIA/EIA-222-F or TIA/EIA-222-G standards. The 3-D model included the tower, with existing appurtenances and all proposed loads.

SITE DATA	
SBA Site Name:	Glastonbury main st.
SBA Site Number:	CT146126-A-01
Carrier Site Name:	AT&T/10071041
City, State:	Glastonbury, CT
County:	Hartford
Code Wind Load Requirement:	ANSI/TIA-222-F (80 mph basic wind speed) & 2003 International Building Code.
Wind Load Used:	ANSI/TIA-222-F Code: • Basic wind speed of 80 mph • A wind speed of 38 mph is used in combination with ice. • Nominal ice thickness of 1.0 in.

TOWER DATA	
Tower Type:	3 Sided Self-support Tower
Height:	130'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi, Braces – 36 ksi
Type of Foundation:	Individual concrete pad with square pedestal

TOWER HISTORY	
Tower Manufacturer / Model:	ROHN/ SSV TOWER
Date of Original Design:	September 1999
Previous Modifications:	Modification Drawings by FDH, Project No. 1338401400, dated 06/17/2013
Original Design Code Reqts:	TIA/EIA 222-F 1996, 85mph + 1/2" ice

4. CONCLUSIONS

RESULT SUMMARY		
MEMBER	*% Capacity*	*Pass/Fail*
Leg	**97.0 %**	**Pass**
Diagonal	**95.8 %**	**Pass**
Horizontal	**4.20 %**	**Pass**
Sec. Horizontal	**98.7 %**	**Pass**
Girts	**14.2 %**	**Pass**
Bolt Checks	**98.7 %**	**Pass**
Overall Tower rating **98.7 %**		

FOUNDATION CAPACITY		
Direction	*% Capacity*	*Pass/Fail*
Overturning	**62.7 %**	**Pass**
Net Soil Bearing Pressure	**30.9 %**	**Pass**
Horizontal shear capacity	**18.1%**	**Pass**
Overall **62.7 %**		

As per the results of the analysis, the existing tower is **in code compliance** for the new and existing antenna loads.

Maximum tower member stress **less than allowable,** making it **in code compliance** under the EIA/TIA-222-F code and 2003 International Building Code requirements.

5. DISCLAIMER

Installation procedures and related loading are not within the scope of this analysis. A contractor experienced in similar work should perform all installation work. The engineering services provided by Allpro Consulting Group, Inc. (ACGI) are limited to the computer analysis and calculations of the structure with the proposed and existing loads. This analysis is considered void if the loading mentioned in this report is changed or is different as installed. It is assumed that the existing structure is properly maintained and is in good condition free of any defects. Scope of this analysis does not include existing connections, except as noted in this report.

ACGI does not make any warranties, expressed or implied in connection with this engineering analysis report and disclaims any liability arising from deficiencies or any existing conditions of the original structure. ACGI will not be responsible for consequential or incidental damages sustained by any parties as a result of any data or conclusions included in this Report. The maximum liability of ACGI pursuant to this report shall be limited to the consulting fee received for the preparation of the report.

6. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
130±	1	Andrew VHLP2.5	(3) T-Frames @128'	(6) 5/16 (4) 1/2	Sprint
128±	3	Unknown 24"x14"x9"			
	2	Argus Tech. LLPX310R			
	1	Kathrein 840 10054			
	1	Motorola TIMING 2000			
126±	1	Andrew VHLP2.5			
124±	3	Unknown MODEM			
	1	Andrew VHLP2.5			
120±	3	Alcatel Lucent TD-RRH8x20-25	(3) T-Arms @118.5'	(4) 1-1/4"	Sprint
	3	Rfs Celwave APXVTM14-C-120			
118.5±	3	Ericsson 1900 MHz			
	4	RFS ACU-A20-N RETs			
	3	Ericsson 800 MHz			
	1	Powerwave P40-16-XLPP-RR-A			
	2	RFS APXVSPP18-C-A20			
	3	Samsung 800 MHz Filter			
110±	6	Allgon 7700.00	(3) T-Frames @110'	(12) 1-1/4 (1) 3/8	AT&T
	1	Andrew SBNH-1D6565C			
	6	Ericsson RRUS-11 1900MHz			
	2	KMW AM-X-CD-16-65-00T-RET			
	6	Powerwave LGP13519			
	6	Powerwave LGP21401			
	1	Raycap DC6-48-60-18-8F			
93±	3	Ericsson AIR 21 B2A/B4P	(3) T-Frames (1) MT-195-12 (1) VSR-TS-B @93'	(13) 1-5/8	T-MOBILE
	3	Ericsson AIR 21 B4A/B2P			
	3	Ericsson KRY 112 144/1 TMA			
	3	Commscope LNX-6515DS-A1M			
	3	Ericsson S11B12			
80±	3	Alcatel Lucent RRH2X60-PCS	(3) T-Frames @80'	(2) 1-5/8	VERIZON
	3	Alcatel Lucent RRH2x60-700			
	3	Alcatel Lucent RRH2x60-AWS			
	6	Andrew HBXX-6517DS-A2M			
	6	Andrew LNX-6514DS-A1M			
	2	RFS DB-T1-6Z-8AB-0Z			

EXISTING LOAD DESCRIPTION Continuation…					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
55.5±	1	GPS Antenna	(2) Side-Arm @55.5'	(1) 1/2	
50.5±	2	GPS Antennas	(2) Side-Arm @50.5'	(2) 1/2	

AT&T FINAL LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
110±	2	CCI HPA-65R-BUU-H6 Antennas	(3) T-Frames @110'	(36) 1/2 fiber (18) 1-1/4 coax (18) 3/8"	AT&T
	1	CCI HPA-65R-BUU-H8 Antennas			
	6	Kathrein 800 10121 Antennas			
	3	Ericsson RRUS 11			
	3	Ericsson RRUS 12			
	3	Ericsson RRUS A2			
	6	Powerwave LGP 21401 DB-850 TMA			
	12	Kathrein 860-10025 RET			
	6	Powerwave LGP21901 diplexers			
	3	Andrew ATSBT-TOP-MF-4G			
	1	Raycap			

Notes:

1. ACGI should be notified of any discrepancies found in the data listed in this report.
2. Notify Allpro Consulting Group, Inc. of any potential physical & other interference with existing antennas for a redesign.

7. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section Capacity Table

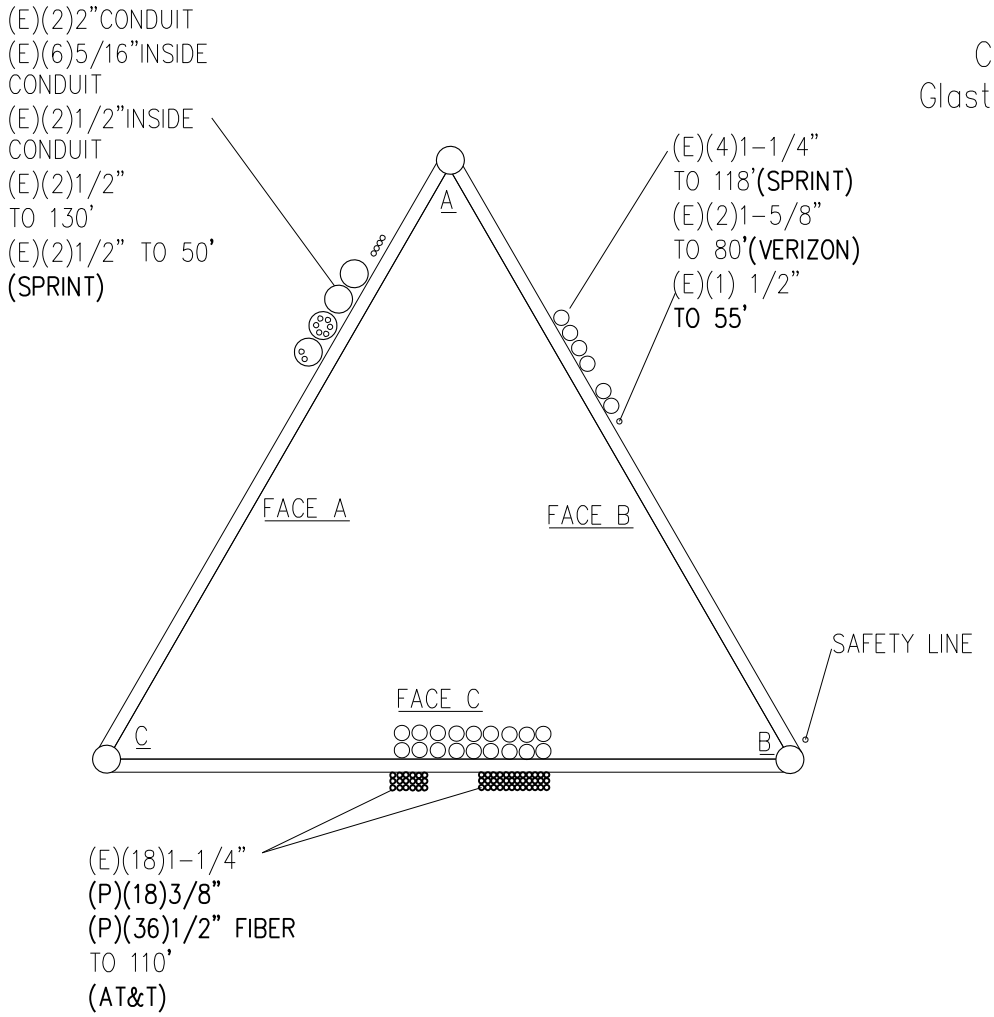
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T1	130 - 120	Leg	1 1/2	2	-7.914	42.280	18.7	Pass
T2	120 - 117.143	Leg	2	44	-12.819	83.570	15.3	Pass
T3	117.143 - 114.286	Leg	2	56	-19.281	83.570	23.1	Pass
T4	114.286 - 111.43	Leg	2	65	-26.000	82.306	31.6	Pass
T5	111.43 - 108.573	Leg	2	74	-34.196	82.306	41.5	Pass
T6	108.573 - 105.716	Leg	2	83	-44.659	82.306	54.3	Pass
T7	105.716 - 102.859	Leg	2	92	-56.490	82.306	68.6	Pass
T8	102.859 - 100	Leg	2	101	-67.042	101.583	66.0 67.3 (b)	Pass
T9	100 - 96	Leg	P4.5 x 0.237	116	-76.726	122.309	62.7	Pass
T10	96 - 92	Leg	P4.5 x 0.237	125	-89.534	122.309	73.2	Pass
T11	92 - 88	Leg	P4.5 x 0.237	134	-98.353	130.687	75.3	Pass
T12	88 - 84	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	146	-112.008	191.515	58.5	Pass
T13	84 - 80	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	158	-124.569	191.536	65.0	Pass
T14	80 - 75	Leg	P6.625x0.280	170	-141.999	220.348	64.4	Pass
T15	75 - 70	Leg	P6.625x0.280	179	-160.866	220.348	73.0	Pass
T16	70 - 65	Leg	P6.625x0.280	188	-178.357	220.348	80.9	Pass
T17	65 - 60	Leg	P6.625x0.280	197	-194.360	220.348	88.2	Pass
T18	60 - 55	Leg	P6.625x0.280	206	-206.358	231.994	88.9	Pass
T19	55 - 50	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	218	-224.229	295.949	75.8	Pass
T20	50 - 45	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	227	-236.930	295.949	80.1	Pass
T21	45 - 40	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301	236	-247.859	306.666	80.8	Pass
T22	40 - 33.3333	Leg	P6.625x.432	248	-262.992	316.102	83.2	Pass
T23	33.3333 - 26.6667	Leg	P6.625x.432	256	-279.148	316.102	88.3	Pass
T24	26.6667 - 20	Leg	P6.625x.432	265	-293.304	316.102	92.8	Pass
T25	20 - 13.3333	Leg	P6.625x.432	274	-306.610	316.102	97.0	Pass
T26	13.3333 - 6.66666	Leg	P6.625x.432	283	-318.292	343.191	92.7	Pass
T27	6.66666 - 0	Leg	BT101341- P6.625 x .432 w/ HP7.625x0.301	295	-330.259	382.811	86.3	Pass
T1	130 - 120	Diagonal	1/2	13	-1.472	1.872	78.7	Pass
T2	120 - 117.143	Diagonal	3/4	52	-2.302	7.257	31.7	Pass
T3	117.143 - 114.286	Diagonal	3/4	61	-3.107	7.257	42.8	Pass
T4	114.286 - 111.43	Diagonal	3/4	70	-2.903	7.203	40.3	Pass
T5	111.43 - 108.573	Diagonal	3/4	79	-3.911	7.203	54.3	Pass
T6	108.573 - 105.716	Diagonal	3/4	88	-4.966	7.203	68.9	Pass
T7	105.716 - 102.859	Diagonal	3/4	97	-4.894	7.203	67.9	Pass
T8	102.859 - 100	Diagonal	3/4	109	-5.131	7.255	70.7	Pass
T9	100 - 96	Diagonal	L1 1/2x1 1/2x3/16	121	-4.091	9.776	41.8 94.6 (b)	Pass
T10	96 - 92	Diagonal	L2x2x1/4	130	-4.898	19.502	25.1 62.4 (b)	Pass
T11	92 - 88	Diagonal	2L1 1/2x1 1/2x3/16x3/8	139	-7.547	24.551	30.7 86.6 (b)	Pass
T12	88 - 84	Diagonal	2L1 1/2x1 1/2x3/16x3/8	151	-7.023	24.298	28.9 81.5 (b)	Pass
T13	84 - 80	Diagonal	2L1 1/2x1 1/2x3/16x3/8	163	-6.180	24.039	25.7	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
							71.8 (b)	
T14	80 - 75	Diagonal	L2x2x1/4	175	-6.485	17.786	36.5	Pass
							82.6 (b)	
T15	75 - 70	Diagonal	2L1 1/2x1 1/2x3/16x3/8	184	-7.194	22.921	31.4	Pass
							79.9 (b)	
T16	70 - 65	Diagonal	2L1 1/2x1 1/2x3/16x3/8	193	-6.372	22.566	28.2	Pass
							69.3 (b)	
T17	65 - 60	Diagonal	2L1 1/2x1 1/2x3/16x3/8	202	-6.544	22.200	29.5	Pass
							72.2 (b)	
T18	60 - 55	Diagonal	2L1 1/2x1 1/2x3/16x3/8	208	-7.919	21.395	37.0	Pass
							88.7 (b)	
T19	55 - 50	Diagonal	2L1 1/2x1 1/2x3/16x3/8	220	-5.190	21.434	24.2	Pass
							56.9 (b)	
T20	50 - 45	Diagonal	2L1 1/2x1 1/2x3/16x3/8	229	-6.133	21.034	29.2	Pass
							68.0 (b)	
T21	45 - 40	Diagonal	L2x2x1/4	238	-6.602	15.634	42.2	Pass
							84.1 (b)	
T22	40 - 33.3333	Diagonal	2L1 3/4x1 3/4x3/16x3/8	250	-5.911	23.756	24.9	Pass
							53.8 (b)	
T23	33.3333 - 26.6667	Diagonal	2L1 3/4x1 3/4x3/16x3/8	259	-6.180	23.231	26.6	Pass
							56.2 (b)	
T24	26.6667 - 20	Diagonal	2L1 3/4x1 3/4x3/16x3/8	268	-5.709	22.687	25.2	Pass
							51.9 (b)	
T25	20 - 13.3333	Diagonal	L2x2x3/16	277	-5.784	8.144	71.0	Pass
							95.8 (b)	
T26	13.3333 - 6.66666	Diagonal	L2x2x3/16	286	-5.586	7.345	76.1	Pass
							93.2 (b)	
T27	6.66666 - 0	Diagonal	2L2x2x3/16x3/8	298	-7.138	27.363	26.1	Pass
							64.9 (b)	
T1	130 - 120	Horizontal	L1 1/4x1 1/4x3/16	36	-0.257	6.068	4.2	Pass
T8	102.859 - 100	Secondary Horizontal	L2x2x1/8	112	-1.161	9.513	12.2	Pass
T11	92 - 88	Secondary Horizontal	4x3/8	142	-2.884	14.141	20.4	Pass
							55.4 (b)	
T12	88 - 84	Secondary Horizontal	4x3/8	154	-3.539	12.213	29.0	Pass
							69.1 (b)	
T13	84 - 80	Secondary Horizontal	4x3/8	166	-3.048	10.644	28.6	Pass
							58.4 (b)	
T18	60 - 55	Secondary Horizontal	L2x2x1/8	214	3.577	11.778	30.4	Pass
							98.7 (b)	
T21	45 - 40	Secondary Horizontal	L3x3x5/16	244	4.295	45.945	9.3	Pass
							78.1 (b)	
T26	13.3333 - 6.66666	Secondary Horizontal	L2x2x1/4	292	-5.515	21.369	25.8	Pass
							64.2 (b)	
T1	130 - 120	Top Girt	L1 1/4x1 1/4x3/16	6	-0.061	6.068	1.0	Pass
T2	120 - 117.143	Top Girt	L1 1/4x1 1/4x3/16	48	-0.031	6.152	0.5	Pass
T1	130 - 120	Bottom Girt	L1 1/4x1 1/4x3/16	9	-0.208	6.068	3.4	Pass
T8	102.859 - 100	Bottom Girt	L1 1/4x1 1/4x3/16	105	-0.875	6.152	14.2	Pass
							Summary	
						Leg (T25)	97.0	Pass
						Diagonal (T25)	95.8	Pass
						Horizontal (T1)	4.2	Pass
						Secondary Horizontal (T18)	98.7	Pass
						Top Girt (T1)	1.0	Pass
						Bottom Girt (T8)	14.2	Pass
						Bolt Checks	98.7	Pass
						RATING =	**98.7**	**Pass**

APPENDIX

COAX LAYOUT

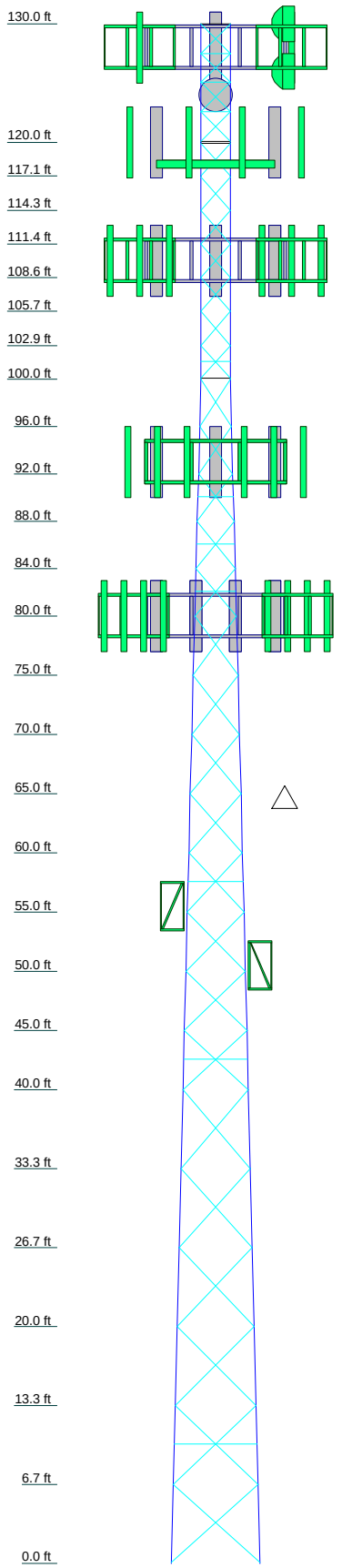
CT46126-A -01/
Glastonbury-main St.
130' SST



COAX LAYOUT

TOWER ELEVATION DRAWING

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
Legs	SR 1 1/2			SR 2					P4.5 x 0.237			A				P6.625x0.280			B		C			P6.625x.432			D
Leg Grade	A570-45																		A500M-54									
Diagonals	SR 1/2								SR 3/4			G		L2x2x1/4				2L1 1/2x1 1/2x3/16x3/8			L2x2x1/4		2L1 3/4x1 3/4x3/16x3/8		L2x2x3/16		H
Diagonal Grade																		A36										
Top Girts																		N.A.										
Bottom Girts	L1 1/4x1 1/4x3/16							I										N.A.										
Horizontals	L1 1/4x1 1/4x3/16																	N.A.										
Sec. Horizontals	2.5								N.A.			4x3/8						L2x2x1/8										N.A.
Face Width (ft) 7.5	4 @ 2.47917			2 @ 2.77344		4 @ 2.85677		L		2.70052	2.90104	3.09896	3.29948	3.53	3.75	4	4.25	4.5	4.75	5	5.25	5.5	5.83333	6.16667	6.5	6.83333	7.16667
# Panels @ (ft)	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.7	0.8	M	1.0
Weight (K) 11.9											5 @ 4							8 @ 5						5 @ 6.66667				



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R w/ Mount Pipe (E)	128	(4) (P) Kathrein 860-10025 RET	110
LLPX310R w/ Mount Pipe (E)	128	(4) (P) Kathrein 860-10025 RET	110
840 10054 w/ Mount Pipe (E)	128	(4) (P) Kathrein 860-10025 RET	110
24"x14"x9" (E)	128	(2) (P) Powerwave LGP21901	110
24"x14"x9" (E)	128	(2) (P) Powerwave LGP21901	110
24"x14"x9" (E)	128	(2) (P) Powerwave LGP21901	110
TIMING 2000 (E)	128	(2) LGP13519 (E)	110
MODEM (E)	128	(2) LGP13519 (E)	110
MODEM (E)	128	(2) LGP13519 (E)	110
MODEM (E)	128	AIR 21 B2A/B4P (E)	93
Sector Mount [SM 803-3] (E)	128	AIR 21 B2A/B4P (E)	93
VHLP2.5 (E)	128	AIR 21 B2A/B4P (E)	93
VHLP2.5 (E)	128	AIR 21 B4A/B2P (E)	93
VHLP2.5 (E)	128	AIR 21 B4A/B2P (E)	93
APXVSPP18-C-A20 w/ Mount Pipe (E)	118.5	AIR 21 B4A/B2P (E)	93
APXVSPP18-C-A20 w/ Mount Pipe (E)	118.5	KRY 112 144/1 TMA (E)	93
P40-16-XLPP-RR-A w/ Mount Pipe (E)	118.5	KRY 112 144/1 TMA (E)	93
TD-RRH8x20-25 (E)	118.5	KRY 112 144/1 TMA (E)	93
TD-RRH8x20-25 (E)	118.5	LNX-6515DS-A1M w/ Mount Pipe (P)	93
TD-RRH8x20-25 (E)	118.5	LNX-6515DS-A1M w/ Mount Pipe (P)	93
1900 MHz (E)	118.5	LNX-6515DS-A1M w/ Mount Pipe (P)	93
1900 MHz (E)	118.5	S11B12 (P)	93
1900 MHz (E)	118.5	S11B12 (P)	93
800 MHz (E)	118.5	S11B12 (P)	93
800 MHz (E)	118.5	Sector Mount [SM 402-3] (E-2 Pipes Included)	93
800 MHz (E)	118.5		
(2) ACU-A20-N RETs (E)	118.5	Miscellaneous [NA 507-1] (P-MT-195-12)	93
ACU-A20-N RETs (E)	118.5	VSR-TS-B Stabilizer Kit (P)	93
ACU-A20-N RETs (E)	118.5	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	80
800 MHz Filter (E)	118.5	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	80
800 MHz Filter (E)	118.5	(2) HBXX-6517DS-A2M w/ Mount Pipe (E)	80
800 MHz Filter (E)	118.5		
6' x 2" Mount Pipe (E)	118.5		
6' x 2" Mount Pipe (E)	118.5		
6' x 2" Mount Pipe (E)	118.5	RRH2x60-700 (E)	80
T-Arm Mount [TA 601-3] (E)	118.5	RRH2x60-700 (E)	80
APXVTM14-C-120 w/ Mount Pipe (E)	118.5	RRH2x60-700 (E)	80
APXVTM14-C-120 w/ Mount Pipe (E)	118.5	RRH2x60-AWS (E)	80
APXVTM14-C-120 w/ Mount Pipe (E)	118.5	RRH2x60-AWS (E)	80
(2) LGP21401 (E)	110	RRH2x60-AWS (E)	80
(2) LGP21401 (E)	110	RRH2X60-PCS (E)	80
(2) LGP21401 (E)	110	RRH2X60-PCS (E)	80
(2) RRUS-11 1900MHz (E)	110	RRH2X60-PCS (E)	80
(2) RRUS-11 1900MHz (E)	110	(2) DB-T1-6Z-8AB-0Z (E)	80
(2) RRUS-11 1900MHz (E)	110	Sector Mount [SM 104-3] (E)	80
DC6-48-60-18-8F (E)	110	(2) LNX-6514DS-A1M w/ Mount Pipe (E)	80
Sector Mount [SM 409-3] (E)	110	(2) LNX-6514DS-A1M w/ Mount Pipe (E)	80
(P) HPA-65R-BUU-H6	110	(2) LNX-6514DS-A1M w/ Mount Pipe (E)	80
(P) HPA-65R-BUU-H6	110		
(2) (P) KATH 800-10121	110		
(2) (P) KATH 800-10121	110	GPS-QBW-20N (Reference)	55.5
(2) (P) KATH 800-10121	110	GPS (E)	55.5
(P) HPA-65R-BUU-H8	110	Side Arm Mount [SO 701-1] (E)	55.5
(P) RRUS 12	110	GPS (E)	50.5
(P) RRUS 12	110	Side Arm Mount [SO 701-1] (E)	50.5
(P) RRUS 12	110	GPS (E)	50.5
(P) RRUS A2	110	Side Arm Mount [SO 701-1] (E)	50.5
(P) RRUS A2	110		
(P) RRUS A2	110		

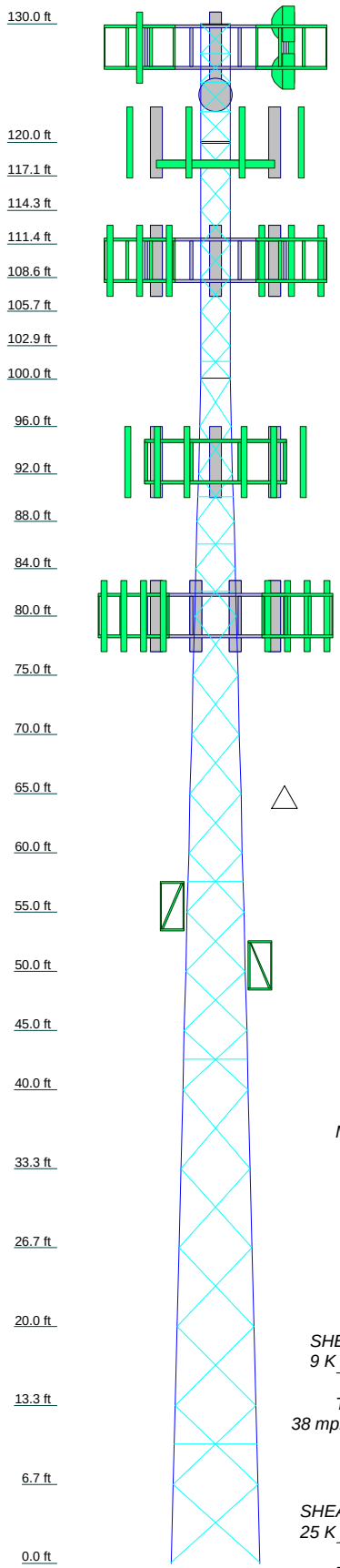
SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	H	2L2x2x3/16x3/8
B	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	I	L1 1/4x1 1/4x3/16
C	BT101341- P6.625x0.280 w/ HP7.625x0.301	J	L2x2x1/8
D	BT101341- P6.625 x .432 w/ HP7.625x0.301	K	L3x3x5/16
E	L1 1/2x1 1/2x3/16	L	1 @ 2.77604
F	L2x2x1/4	M	1 @ 6.58333
G	2L1 1/2x1 1/2x3/16x3/8		

ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-2859 130 SST***			
Project: ***Glastonbury-main st, CT (CT46126-A-01)***			
Client: SBA Communications Corporation	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 08/12/16	Scale: NTS	
Path: P:\2016\Structural\16-2859 CT46126-A-01 Glastonbury Structural Analysis\TNX\CT46126-A-02_Glastonbury-main st_.eri		Dwg No. E-1	

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22	T23	T24	T25	T26	T27
Legs	SR 1 1/2									P4.5 x 0.237		A				P6.625x0.280			B		C			P6.625x.432			D
Leg Grade	A570-45																		A500M-54									
Diagonals	SR 1/2				SR 3/4				E	F	G			L2x2x1/4		2L1 1/2x1 1/2x3/16x3/8				L2x2x1/4		2L1 3/4x1 3/4x3/16x3/8			L2x2x3/16		H
Diagonal Grade																												
Top Girts	L1 1/4x1 1/4x3/16																											
Bottom Girts	L1 1/4x1 1/4x3/16				N.A.			I																				
Horizontals	L1 1/4x1 1/4x3/16																											
Sec. Horizontals	2.5							J	N.A.		4x3/8			3.53	N.A.	4	4.25	L2x2x1/8	4.5	5	5.25	K	5.5	N.A.	6.5	6.83333	L2x2x1/4	N.A.
Face Width (ft)	4 @ 2.47917	4 @ 2.77344	2 @ 2.77344		4 @ 2.85677			L		2.70052	2.90104	3.09896	3.29948		3.75			4.75				5.5	5.83333	6.16667		6.83333	7.16667	7.5
# Panels @ (ft)	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.8	0.8	0.8	0.7	0.8	M	1.0
Weight (K)	11.9																											



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	H	2L2x2x3/16x3/8
B	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	I	L1 1/4x1 1/4x3/16
C	BT101341- P6.625x0.280 w/ HP7.625x0.301	J	L2x2x1/8
D	BT101341- P6.625 x .432 w/ HP7.625x0.301	K	L3x3x5/16
E	L1 1/2x1 1/2x3/16	L	1 @ 2.77604
F	L2x2x1/4	M	1 @ 6.58333

MATERIAL STRENGTH

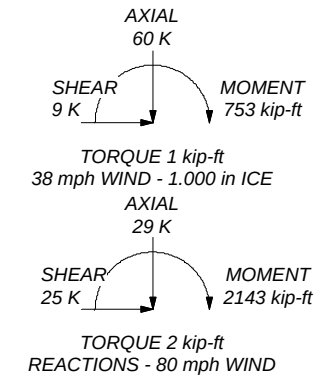
GRADE	Fy	Fu	GRADE	Fy	Fu
A570-45	45 ksi	60 ksi	A500M-54	54 ksi	70 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 38 mph basic wind with 1.00 in ice.
4. Deflections are based upon a 50 mph wind.
5. TOWER RATING: 98.7%

MAX. CORNER REACTIONS AT BASE:
DOWN: 339 K
SHEAR: 18 K

UPLIFT: -318 K
SHEAR: 17 K



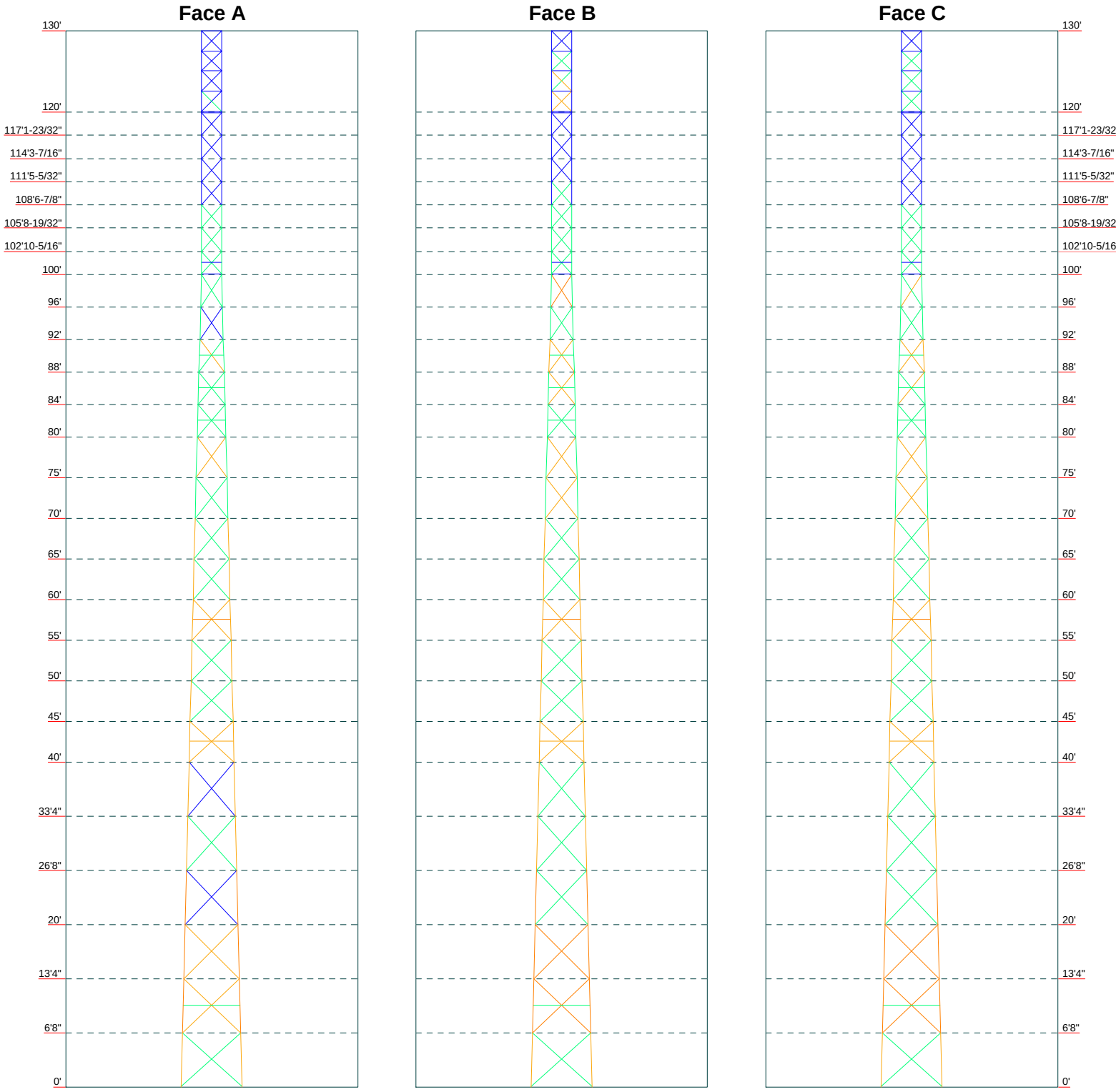
ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job:	***16-2859 130 SST***		
Project:	***Glastonbury-main st, CT (CT46126-A-01)***		
Client: SBA Communications Corporation	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 08/11/16	Scale: NTS	
Path: P:\2016\Structural\16-2859 CT46126-A-01 Glastonbury Structural Analysis\TNX\CT46126-A-02_Glastonbury-main st_.eri		Dwg No. E-1	

MISCELLANEOUS PLOTS

Stress Distribution Chart
0' - 130'

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

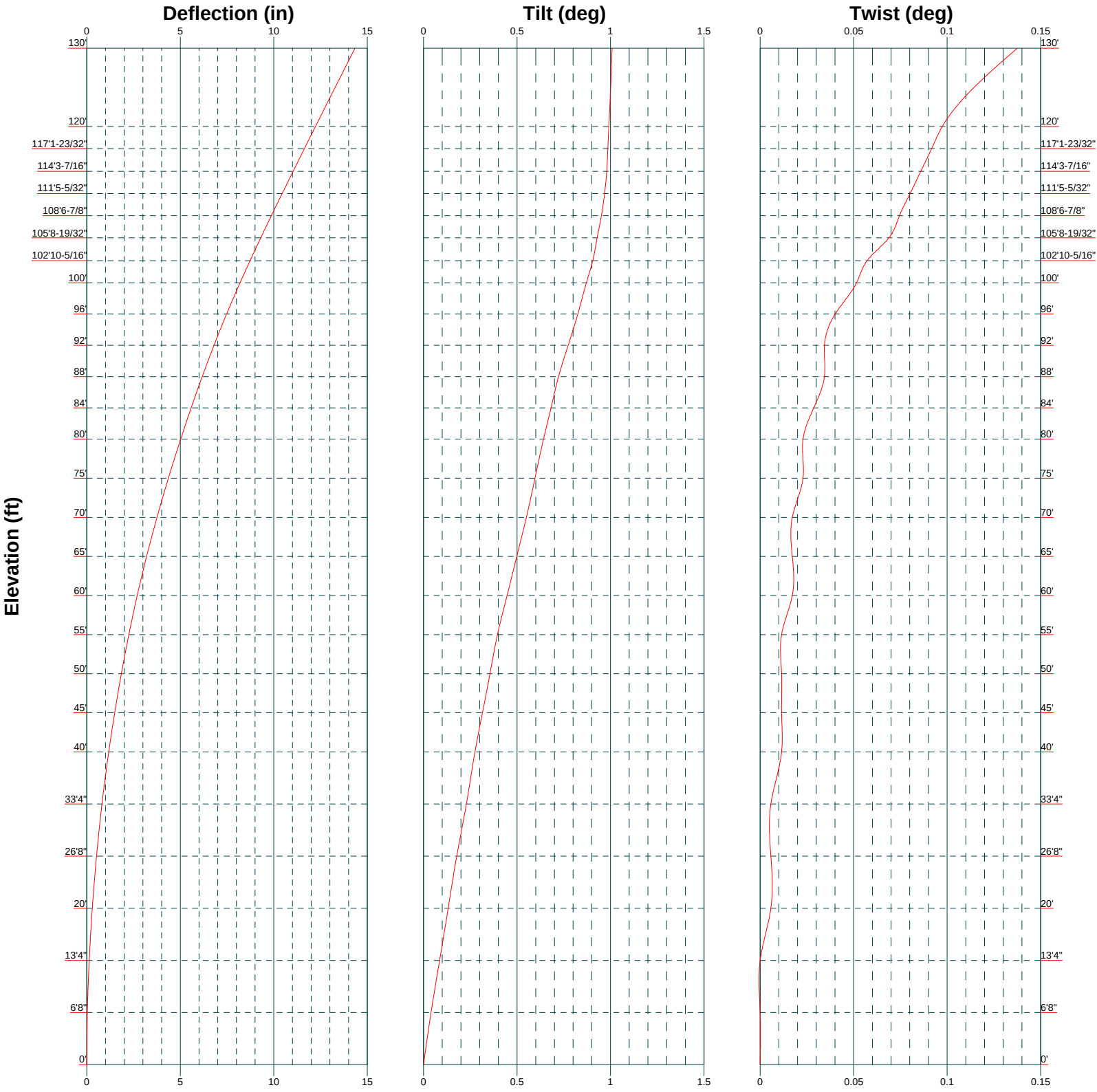


ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-2859 130 SST***			
Project: ***Glastonbury-main st, CT (CT46126-A-01)***			
Client: SBA Communications Corporation	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 08/12/16	Scale: NTS	
Path: P:\2016\Structural\16-2859 CT46126-A-01 Glastonbury Structural Analysis\TNX\CT46126-A-02_Glastonbury-main st_.eri		Dwg No. E-8	

TIA/EIA-222-F - Service - 50 mph

Maximum Values



ALLPRO CONSULTING GROUP
9221 LYNDON B. JOHNSON FWY 204
DALLAS, TX
Phone: (972)231-8893
FAX: 866-364-8375

Job: ***16-2859 130 SST***			
Project: ***Glastonbury-main st, CT (CT46126-A-01)***			
Client: SBA Communications Corporation	Drawn by: mperez	App'd:	
Code: TIA/EIA-222-F	Date: 08/12/16	Scale: NTS	
Path: P:\2016\Structural\16-2859 CT46126-A-01 Glastonbury Structural Analysis\TNX\CT46126-A-02_Glastonbury-main st_.eri		Dwg No. E-5	

CALCULATION PRINTOUT

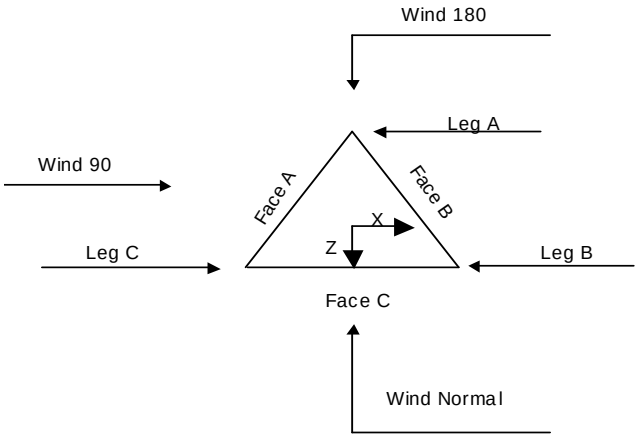
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 130' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 2'6" at the top and 7'6" at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Basic wind speed of 80 mph.
Nominal ice thickness of 1.000 in.
Ice density of 56.000 pcf.
A wind speed of 38 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 50 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	130'-120'			2'6"	1	10'
T2	120'-117'1-23/32"			2'6"	1	2'10-9/32"
T3	117'1-23/32"-114' 3-7/16"			2'6"	1	2'10-9/32"
T4	114'3-7/16"-111'5 -5/32"			2'6"	1	2'10-9/32"
T5	111'5-5/32"-108'6 -7/8"			2'6"	1	2'10-9/32"
T6	108'6-7/8"-105'8-19/32"			2'6"	1	2'10-9/32"
T7	105'8-19/32"-102' 10-5/16"			2'6"	1	2'10-9/32"
T8	102'10-5/16"-100'			2'6"	1	2'10-5/16"
T9	100'-96'			2'6"	1	4'
T10	96'-92'			2'8-13/32"	1	4'
T11	92'-88'			2'10-13/16"	1	4'
T12	88'-84'			3'1-3/16"	1	4'
T13	84'-80'			3'3-19/32"	1	4'
T14	80'-75'			3'6"	1	5'
T15	75'-70'			3'9"	1	5'
T16	70'-65'			4'	1	5'
T17	65'-60'			4'3"	1	5'
T18	60'-55'			4'6"	1	5'
T19	55'-50'			4'9"	1	5'
T20	50'-45'			5'	1	5'
T21	45'-40'			5'3"	1	5'

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T22	40'-33'4"			5'6"	1	6'8"
T23	33'4"-26'8"			5'10"	1	6'8"
T24	26'8"-20'			6'2"	1	6'8"
T25	20'-13'4"			6'6"	1	6'8"
T26	13'4"-6'8"			6'10"	1	6'8"
T27	6'8"-0'			7'2"	1	6'8"

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	130'-120'	2'5-3/4"	X Brace	No	Yes	0.000	1.000
T2	120'-117'1-23/32"	2'9-9/32"	X Brace	No	Yes	1.000	0.000
T3	117'1-23/32"-114' 3-7/16"	2'9-9/32"	X Brace	No	Yes	1.000	0.000
T4	114'3-7/16"-111'5 -5/32"	2'10-9/32"	X Brace	No	Yes	0.000	0.000
T5	111'5-5/32"-108'6 -7/8"	2'10-9/32"	X Brace	No	Yes	0.000	0.000
T6	108'6-7/8"-105'8- 19/32"	2'10-9/32"	X Brace	No	Yes	0.000	0.000
T7	105'8-19/32"-102' 10-5/16"	2'10-9/32"	X Brace	No	Yes	0.000	0.000
T8	102'10-5/16"-100'	2'9-5/16"	X Brace	No	Yes	0.000	1.000
T9	100'-96'	4'	X Brace	No	Yes	0.000	0.000
T10	96'-92'	4'	X Brace	No	Yes	0.000	0.000
T11	92'-88'	4'	X Brace	No	Yes	0.000	0.000
T12	88'-84'	4'	X Brace	No	Yes	0.000	0.000
T13	84'-80'	4'	X Brace	No	Yes	0.000	0.000
T14	80'-75'	5'	X Brace	No	Yes	0.000	0.000
T15	75'-70'	5'	X Brace	No	Yes	0.000	0.000
T16	70'-65'	5'	X Brace	No	Yes	0.000	0.000
T17	65'-60'	5'	X Brace	No	Yes	0.000	0.000
T18	60'-55'	5'	X Brace	No	Yes	0.000	0.000
T19	55'-50'	5'	X Brace	No	Yes	0.000	0.000
T20	50'-45'	5'	X Brace	No	Yes	0.000	0.000
T21	45'-40'	5'	X Brace	No	Yes	0.000	0.000
T22	40'-33'4"	6'8"	X Brace	No	Yes	0.000	0.000
T23	33'4"-26'8"	6'8"	X Brace	No	Yes	0.000	0.000
T24	26'8"-20'	6'8"	X Brace	No	Yes	0.000	0.000
T25	20'-13'4"	6'8"	X Brace	No	Yes	0.000	0.000
T26	13'4"-6'8"	6'8"	X Brace	No	Yes	0.000	0.000
T27	6'8"-0'	6'7"	X Brace	No	Yes	0.000	1.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 130'-120'	Solid Round	1 1/2	A570-45	Solid Round	1/2	A36

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
			(45 ksi)			(36 ksi)
T2 120'-117'1-23/32"	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T3 117'1-23/32"-114' 3-7/16"	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T4 114'3-7/16"-111'5 -5/32"	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T5 111'5-5/32"-108'6 -7/8"	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T6 108'6-7/8"-105'8- 19/32"	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T7 105'8-19/32"-102' 10-5/16"	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T8 102'10-5/16"-100'	Solid Round	2	A570-45 (45 ksi)	Solid Round	3/4	A36 (36 ksi)
T9 100'-96'	Pipe	P4.5 x 0.237	A500M-54 (54 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T10 96'-92'	Pipe	P4.5 x 0.237	A500M-54 (54 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T11 92'-88'	Pipe	P4.5 x 0.237	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T12 88'-84'	Pipe	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T13 84'-80'	Pipe	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T14 80'-75'	Pipe	P6.625x0.280	A500M-54 (54 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T15 75'-70'	Pipe	P6.625x0.280	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T16 70'-65'	Pipe	P6.625x0.280	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T17 65'-60'	Pipe	P6.625x0.280	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T18 60'-55'	Pipe	P6.625x0.280	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T19 55'-50'	Pipe	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T20 50'-45'	Pipe	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	A500M-54 (54 ksi)	Double Equal Angle	2L1 1/2x1 1/2x3/16x3/8	A36 (36 ksi)
T21 45'-40'	Pipe	BT101341- P6.625x0.280 w/ HP7.625x0.301	A500M-54 (54 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T22 40'-33'4"	Pipe	P6.625x.432	A500M-54 (54 ksi)	Double Equal Angle	2L1 3/4x1 3/4x3/16x3/8	A36 (36 ksi)
T23 33'4"-26'8"	Pipe	P6.625x.432	A500M-54 (54 ksi)	Double Equal Angle	2L1 3/4x1 3/4x3/16x3/8	A36 (36 ksi)
T24 26'8"-20'	Pipe	P6.625x.432	A500M-54 (54 ksi)	Double Equal Angle	2L1 3/4x1 3/4x3/16x3/8	A36 (36 ksi)
T25 20'-13'4"	Pipe	P6.625x.432	A500M-54 (54 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T26 13'4"-6'8"	Pipe	P6.625x.432	A500M-54 (54 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T27 6'8"-0'	Pipe	BT101341- P6.625 x .432 w/ HP7.625x0.301	A500M-54 (54 ksi)	Double Equal Angle	2L2x2x3/16x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 130'-120'	Equal Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)	Equal Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)
T2 120'-117'1-23/32"	Equal Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T8 102'10-5/16"-100'	Solid Round		A36 (36 ksi)	Equal Angle	L1 1/4x1 1/4x3/16	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 130'-120'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L1 1/4x1 1/4x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T8 102'10-5/16"-100'	Equal Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 92'-88'	Flat Bar	4x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T12 88'-84'	Flat Bar	4x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T13 84'-80'	Flat Bar	4x3/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T18 60'-55'	Equal Angle	L2x2x1/8	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T21 45'-40'	Equal Angle	L3x3x5/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T26 13'4"-6'8"	Equal Angle	L2x2x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 130'-120'	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T2 120'-117'1-23/32"	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T3 117'1-23/32"-114'3-7/16"	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T4 114'3-7/16"-111'5-5/32"	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T5 111'5-5/32"-108'6-7/8"	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T6 108'6-7/8"-105'8-19/32"	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T7 105'8-19/32"-102'10-5/16"	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T8 102'10-5/16"-100'	0.000	0.000	A36 (36 ksi)	1	1	1.05	0.000	0.000	36.000
T9 100'-96'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T10 96'-92'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T11 92'-88'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T12 88'-84'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T13 84'-80'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T14 80'-75'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T15 75'-70'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T16 70'-65'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T17 65'-60'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T18 60'-55'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T19 55'-50'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T20 50'-45'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T21 45'-40'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T22 40'-33'4"	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T23 33'4"-26'8"	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T24 26'8"-20'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T25 20'-13'4"	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000
T26 13'4"-6'8"	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000

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
T27 6'8"-0'	0.000	0.000	A36 (36 ksi)	1.05	1	1.05	0.000	0.000	36.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 130'-120'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T2 120'-117'1-23/32"	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T3 117'1-23/32"-114'3-7/16"	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T4 114'3-7/16"-111'5-5/32"	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T5 111'5-5/32"-108'6-7/8"	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 108'6-7/8"-105'8-19/32"	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 105'8-19/32"-102'10-5/16"	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 102'10-5/16"-100'	Yes	Yes	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 100'-96'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 96'-92'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T11 92'-88'	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T12 88'-84'	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T13 84'-80'	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T14 80'-75'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T15 75'-70'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T16 70'-65'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T17 65'-60'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T18 60'-55'	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T19 55'-50'	Yes	No	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	K Factors[1] X Brace Diags X	K Factors[1] X Brace Diags Y	K Factors[1] Single Diags X	K Factors[1] Single Diags Y	K Factors[1] Girts X	K Factors[1] Girts Y	K Factors[1] Horiz. X	K Factors[1] Horiz. Y	K Factors[1] Sec. Horiz. X	K Factors[1] Sec. Horiz. Y	K Factors[1] Inner Brace X	K Factors[1] Inner Brace Y
				1	1	1	1	1	1	1	1	1	1	1	1
T20 50'-45'	Yes	No	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
T21 45'-40'	No	No	1	1	1	1	1	1	1	1	1	1	0.5	1	1
				1	1	1	1	1	1	1	1	1	0.5	1	1
T22 40'-33'4"	Yes	No	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
T23 33'4"-26'8"	Yes	No	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
T24 26'8"-20'	Yes	No	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
T25 20'-13'4"	Yes	No	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
T26 13'4"-6'8"	No	No	1	1	1	1	1	1	1	1	1	1	0.5	1	1
				1	1	1	1	1	1	1	1	1	0.5	1	1
T27 6'8"-0'	Yes	No	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 Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 130'-120'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T2 120'-117'1-23/32"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T3 117'1-23/32"-114'3-7/16"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T4 114'3-7/16"-111'5-5/32"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 111'5-5/32"-108'6-7/8"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 108'6-7/8"-105'8-19/32"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 105'8-19/32"-102'10-5/16"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 102'10-5/16"-100'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 100'-96'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T10 96'-92'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T11 92'-88'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

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
T12 88'-84'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T13 84'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T14 80'-75'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T15 75'-70'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T16 70'-65'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T17 65'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T18 60'-55'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T19 55'-50'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T20 50'-45'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T21 45'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T22 40'-33'4"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T23 33'4"-26'8"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T24 26'8"-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T25 20'-13'4"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T26 13'4"-6'8"	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T27 6'8"-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	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 130'-120'	Flange	1.000 A325N	1	0.500 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T2 120'-117'1-23/32"	Flange	0.750 A325N	0	0.500 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T3 117'1-23/32"-114'3-7/16"	Flange	0.750 A325N	0	0.500 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T4 114'3-7/16"-111'5-5/32"	Flange	0.750 A325N	0	0.500 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T5 111'5-5/32"-108'6-7/8"	Flange	0.750 A325N	0	0.500 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T6 108'6-7/8"-105'8-19/32"	Flange	0.750 A325N	0	0.500 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T7 105'8-19/32"-102'10-5/16"	Flange	0.750 A325N	0	0.500 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T8 102'10-5/16"-100'	Flange	0.750 A325N	4	0.500 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T9 100'-96'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T10 96'-92'	Flange	1.000 A325N	0	0.500 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0

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.
T11 92'-88'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	1
T12 88'-84'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	1
T13 84'-80'	Flange	1.000 A325N	8	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	1
T14 80'-75'	Flange	1.000 A325N	0	0.500 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T15 75'-70'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T16 70'-65'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T17 65'-60'	Flange	1.000 A325N	8	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T18 60'-55'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	1
T19 55'-50'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T20 50'-45'	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T21 45'-40'	Flange	1.000 A325N	8	0.500 A325X	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	1
T22 40'-33'4"	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T23 33'4"-26'8"	Flange	1.000 A325N	0	0.500 A325N	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T24 26'8"-20'	Flange	1.000 A325N	8	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T25 20'-13'4"	Flange	1.500 A36M-55	0	0.500 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0
T26 13'4"-6'8"	Flange	1.500 A36M-55	0	0.500 A325X	1	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	1
T27 6'8"-0'	Flange	1.500 A36M-55	6	0.500 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.500 A325N	0

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 klf
ATCB-B01-040(5/16") (E-Inside Conduit)	A	Yes	Ar (CfAe)	128' - 6'	0.000	0.2	6	6	0.315	0.000		0.000
LDF4-50A(1/2") (E-Inside Conduit)	A	Yes	Ar (CfAe)	128' - 6'	0.000	0.2	2	2	0.500 0.630	0.000		0.000
2" Rigid Conduit (E)	A	Yes	Ar (CfAe)	128' - 0'	0.000	0.2	2	2	2.000	2.000		0.003
LDF4P-50A(1/2") (E)	A	Yes	Ar (CfAe)	128' - 6'	0.000	0.1	2	2	0.630	0.630		0.000

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 klf
LDF4P-50A(1 /2") (E)	A	Yes	Ar (CfAe)	50'6" - 6'	0.000	0.02	2	2	0.630	0.630		0.000
Feedline Ladder (Af) (E) *R*	A	Yes	Af (CfAe)	60' - 0'	0.000	0.2	1	1	3.000	3.000	12.000	0.008
LDF6-50A(1-1/4") (E)	B	Yes	Ar (CfAe)	118'6" - 6'	-1.000	0	4	4	0.850 0.750	1.550		0.001
Feedline Ladder (Af) (E) *R*	B	Yes	Af (CfAe)	118'6" - 0'	-1.000	0	1	1	3.000	3.000	12.000	0.008
LDF6-50A(1-1/4") (E)	C	Yes	Ar (CfAe)	110' - 6'	-1.000	0	18	6	0.850 0.750	1.550		0.001
Feedline Ladder (Af) (E)	C	Yes	Af (CfAe)	60' - 0'	-1.000	0	2	1	3.000 1.500	3.000	12.000	0.008
Feedline Ladder (Af) (E) *R* *R*	C	Yes	Af (CfAe)	93' - 60'	-1.000	0	1	1	3.000 1.500	3.000	12.000	0.008
LDF7-50A(1 5/8") (E)	B	Yes	Ar (CfAe)	80' - 6'	-1.000	0.1	2	2	0.850 0.750	1.980		0.001
LDF4P-50A(1 /2") (E) *R*	B	Yes	Ar (CfAe)	55'6" - 6'	-1.000	-0.08	1	1	0.630	0.630		0.000
Safety Line 3/8 (E) *R* *****	B	Yes	Ar (CfAe)	130' - 0'	0.000	-0.5	1	1	0.375	0.375		0.000
(P) 3/8"	C	Yes	Ar (CfAe)	110' - 6'	0.000	0	18	6	0.250	0.440		0.000
(P) (1/2 ") FIBER	C	Yes	Ar (CfAe)	110' - 6'	0.000	0	36	12	0.250	0.630		0.000

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
R							

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
T1	130'-120'	A	3.507	0.000	0.000	0.000	0.053

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
		B	0.313	0.000	0.000	0.000	0.002
		C	0.000	0.000	0.000	0.000	0.000
T2	120'-117'1-23/32"	A	1.252	0.000	0.000	0.000	0.019
		B	0.790	0.339	0.000	0.000	0.016
		C	0.000	0.000	0.000	0.000	0.000
T3	117'1-23/32"-114' 3-7/16"	A	1.252	0.000	0.000	0.000	0.019
		B	1.565	0.714	0.000	0.000	0.032
		C	0.000	0.000	0.000	0.000	0.000
T4	114'3-7/16"-111'5-5/32"	A	1.252	0.000	0.000	0.000	0.019
		B	1.565	0.714	0.000	0.000	0.032
		C	0.000	0.000	0.000	0.000	0.000
T5	111'5-5/32"-108'6-7/8"	A	1.252	0.000	0.000	0.000	0.019
		B	1.565	0.714	0.000	0.000	0.032
		C	2.319	0.000	0.000	0.000	0.032
T6	108'6-7/8"-105'8-1 9/32"	A	1.252	0.000	0.000	0.000	0.019
		B	1.565	0.714	0.000	0.000	0.032
		C	4.642	0.000	0.000	0.000	0.064
T7	105'8-19/32"-102' 10-5/16"	A	1.252	0.000	0.000	0.000	0.019
		B	1.565	0.714	0.000	0.000	0.032
		C	4.642	0.000	0.000	0.000	0.064
T8	102'10-5/16"-100'	A	1.253	0.000	0.000	0.000	0.019
		B	1.567	0.715	0.000	0.000	0.032
		C	4.646	0.000	0.000	0.000	0.064
T9	100'-96'	A	1.753	0.000	0.000	0.000	0.027
		B	2.192	1.000	0.000	0.000	0.045
		C	6.500	0.000	0.000	0.000	0.089
T10	96'-92'	A	1.753	0.000	0.000	0.000	0.027
		B	2.192	1.000	0.000	0.000	0.045
		C	6.500	0.250	0.000	0.000	0.098
T11	92'-88'	A	1.753	0.000	0.000	0.000	0.027
		B	2.192	1.000	0.000	0.000	0.045
		C	6.500	1.000	0.000	0.000	0.123
T12	88'-84'	A	1.753	0.000	0.000	0.000	0.027
		B	2.192	1.000	0.000	0.000	0.045
		C	6.500	1.000	0.000	0.000	0.123
T13	84'-80'	A	1.753	0.000	0.000	0.000	0.027
		B	2.192	1.000	0.000	0.000	0.045
		C	6.500	1.000	0.000	0.000	0.123
T14	80'-75'	A	2.192	0.000	0.000	0.000	0.033
		B	4.390	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.154
T15	75'-70'	A	2.192	0.000	0.000	0.000	0.033
		B	4.390	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.154
T16	70'-65'	A	2.192	0.000	0.000	0.000	0.033
		B	4.390	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.154
T17	65'-60'	A	2.192	0.000	0.000	0.000	0.033
		B	4.390	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.154
T18	60'-55'	A	2.192	1.250	0.000	0.000	0.075
		B	4.416	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.196
T19	55'-50'	A	2.244	1.250	0.000	0.000	0.075
		B	4.652	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.196
T20	50'-45'	A	2.717	1.250	0.000	0.000	0.077
		B	4.652	1.250	0.000	0.000	0.065
		C	8.125	1.250	0.000	0.000	0.196
T21	45'-40'	A	2.717	1.250	0.000	0.000	0.077
		B	4.652	1.250	0.000	0.000	0.065

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
		C	8.125	1.250	0.000	0.000	0.196
T22	40'-33'4"	A	3.622	1.667	0.000	0.000	0.102
		B	6.203	1.667	0.000	0.000	0.087
		C	10.833	1.667	0.000	0.000	0.261
T23	33'4"-26'8"	A	3.622	1.667	0.000	0.000	0.102
		B	6.203	1.667	0.000	0.000	0.087
		C	10.833	1.667	0.000	0.000	0.261
T24	26'8"-20'	A	3.622	1.667	0.000	0.000	0.102
		B	6.203	1.667	0.000	0.000	0.087
		C	10.833	1.667	0.000	0.000	0.261
T25	20'-13'4"	A	3.622	1.667	0.000	0.000	0.102
		B	6.203	1.667	0.000	0.000	0.087
		C	10.833	1.667	0.000	0.000	0.261
T26	13'4"-6'8"	A	3.622	1.667	0.000	0.000	0.102
		B	6.203	1.667	0.000	0.000	0.087
		C	10.833	1.667	0.000	0.000	0.261
T27	6'8"-0'	A	2.362	1.667	0.000	0.000	0.094
		B	0.808	1.667	0.000	0.000	0.060
		C	1.083	1.667	0.000	0.000	0.127

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
T1	130'-120'	A	1.000	7.087	4.890	0.000	0.000	0.180
		B		1.979	0.000	0.000	0.000	0.019
		C		0.000	0.000	0.000	0.000	0.000
T2	120'-117'1-23/32"	A	1.000	2.531	1.746	0.000	0.000	0.064
		B		0.967	1.304	0.000	0.000	0.043
		C		0.000	0.000	0.000	0.000	0.000
T3	117'1-23/32"-114' 3-7/16"	A	1.000	2.531	1.746	0.000	0.000	0.064
		B		1.411	2.746	0.000	0.000	0.086
		C		0.000	0.000	0.000	0.000	0.000
T4	114'3-7/16"-111'5-5/32"	A	1.000	2.531	1.746	0.000	0.000	0.064
		B		1.411	2.746	0.000	0.000	0.086
		C		0.000	0.000	0.000	0.000	0.000
T5	111'5-5/32"-108'6-7/8"	A	1.000	2.531	1.746	0.000	0.000	0.064
		B		1.411	2.746	0.000	0.000	0.086
		C		1.025	2.989	0.000	0.000	0.115
T6	108'6-7/8"-105'8-1 9/32"	A	1.000	2.531	1.746	0.000	0.000	0.064
		B		1.411	2.746	0.000	0.000	0.086
		C		2.052	5.983	0.000	0.000	0.230
T7	105'8-19/32"-102' 10-5/16"	A	1.000	2.531	1.746	0.000	0.000	0.064
		B		1.411	2.746	0.000	0.000	0.086
		C		2.052	5.983	0.000	0.000	0.230
T8	102'10-5/16"-100'	A	1.000	2.533	1.748	0.000	0.000	0.064
		B		1.412	2.748	0.000	0.000	0.086
		C		2.054	5.988	0.000	0.000	0.230
T9	100'-96'	A	1.000	3.543	2.445	0.000	0.000	0.090
		B		1.975	3.844	0.000	0.000	0.120
		C		2.873	8.377	0.000	0.000	0.322
T10	96'-92'	A	1.000	3.543	2.445	0.000	0.000	0.090
		B		1.975	3.844	0.000	0.000	0.120
		C		2.873	8.738	0.000	0.000	0.337
T11	92'-88'	A	1.000	3.543	2.445	0.000	0.000	0.090
		B		1.975	3.844	0.000	0.000	0.120
		C		2.873	9.821	0.000	0.000	0.381

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
T12	88'-84'	A	1.000	3.543	2.445	0.000	0.000	0.090
		B		1.975	3.844	0.000	0.000	0.120
		C		2.873	9.821	0.000	0.000	0.381
T13	84'-80'	A	1.000	3.543	2.445	0.000	0.000	0.090
		B		1.975	3.844	0.000	0.000	0.120
		C		2.873	9.821	0.000	0.000	0.381
T14	80'-75'	A	1.000	4.429	3.056	0.000	0.000	0.113
		B		4.127	5.985	0.000	0.000	0.192
		C		3.592	12.276	0.000	0.000	0.476
T15	75'-70'	A	1.000	4.429	3.056	0.000	0.000	0.113
		B		4.127	5.985	0.000	0.000	0.192
		C		3.592	12.276	0.000	0.000	0.476
T16	70'-65'	A	1.000	4.429	3.056	0.000	0.000	0.113
		B		4.127	5.985	0.000	0.000	0.192
		C		3.592	12.276	0.000	0.000	0.476
T17	65'-60'	A	1.000	4.429	3.056	0.000	0.000	0.113
		B		4.127	5.985	0.000	0.000	0.192
		C		3.592	12.276	0.000	0.000	0.476
T18	60'-55'	A	1.000	4.429	4.862	0.000	0.000	0.185
		B		4.237	5.985	0.000	0.000	0.193
		C		3.592	12.276	0.000	0.000	0.548
T19	55'-50'	A	1.000	4.539	4.914	0.000	0.000	0.187
		B		5.223	5.985	0.000	0.000	0.203
		C		3.592	12.276	0.000	0.000	0.548
T20	50'-45'	A	1.000	5.525	5.387	0.000	0.000	0.203
		B		5.223	5.985	0.000	0.000	0.203
		C		3.592	12.276	0.000	0.000	0.548
T21	45'-40'	A	1.000	5.525	5.387	0.000	0.000	0.203
		B		5.223	5.985	0.000	0.000	0.203
		C		3.592	12.276	0.000	0.000	0.548
T22	40'-33'4"	A	1.000	7.367	7.182	0.000	0.000	0.270
		B		6.964	7.980	0.000	0.000	0.270
		C		4.789	16.369	0.000	0.000	0.731
T23	33'4"-26'8"	A	1.000	7.367	7.182	0.000	0.000	0.270
		B		6.964	7.980	0.000	0.000	0.270
		C		4.789	16.369	0.000	0.000	0.731
T24	26'8"-20'	A	1.000	7.367	7.182	0.000	0.000	0.270
		B		6.964	7.980	0.000	0.000	0.270
		C		4.789	16.369	0.000	0.000	0.731
T25	20'-13'4"	A	1.000	7.367	7.182	0.000	0.000	0.270
		B		6.964	7.980	0.000	0.000	0.270
		C		4.789	16.369	0.000	0.000	0.731
T26	13'4"-6'8"	A	1.000	7.367	7.182	0.000	0.000	0.270
		B		6.964	7.980	0.000	0.000	0.270
		C		4.789	16.369	0.000	0.000	0.731
T27	6'8"-0'	A	1.000	2.737	4.885	0.000	0.000	0.200
		B		1.884	2.965	0.000	0.000	0.126
		C		0.479	3.804	0.000	0.000	0.248

Feed Line Shielding

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
T1	130'-120'	A	0.165	3.809	0.183	0.624
		B	0.015	0.629	0.016	0.103
		C	0.000	0.000	0.000	0.000

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
T2	120'-117'1-23/32"	A	0.082	1.274	0.046	0.156
		B	0.074	0.699	0.041	0.086
		C	0.000	0.000	0.000	0.000
T3	117'1-23/32"-114'3-7/16"	A	0.082	1.025	0.000	0.000
		B	0.149	1.034	0.000	0.000
		C	0.000	0.000	0.000	0.000
T4	114'3-7/16"-111'5-5/32"	A	0.083	1.042	0.000	0.000
		B	0.151	1.051	0.000	0.000
		C	0.000	0.000	0.000	0.000
T5	111'5-5/32"-108'6-7/8"	A	0.083	1.042	0.000	0.000
		B	0.151	1.051	0.000	0.000
		C	0.154	0.978	0.000	0.000
T6	108'6-7/8"-105'8-19/32"	A	0.083	1.042	0.000	0.000
		B	0.151	1.051	0.000	0.000
		C	0.308	1.957	0.000	0.000
T7	105'8-19/32"-102'10-5/16"	A	0.083	1.042	0.000	0.000
		B	0.151	1.051	0.000	0.000
		C	0.308	1.957	0.000	0.000
T8	102'10-5/16"-100'	A	0.082	1.524	0.119	0.405
		B	0.149	1.538	0.216	0.409
		C	0.304	2.864	0.440	0.762
T9	100'-96'	A	0.000	0.915	0.201	0.687
		B	0.000	0.924	0.366	0.693
		C	0.000	1.720	0.745	1.290
T10	96'-92'	A	0.000	0.870	0.255	0.870
		B	0.000	0.878	0.464	0.878
		C	0.000	1.695	0.981	1.695
T11	92'-88'	A	0.000	1.081	0.329	1.123
		B	0.000	1.091	0.598	1.133
		C	0.000	2.332	1.406	2.422
T12	88'-84'	A	0.000	1.048	0.322	1.098
		B	0.000	1.058	0.585	1.108
		C	0.000	2.261	1.375	2.369
T13	84'-80'	A	0.000	1.020	0.315	1.077
		B	0.000	1.029	0.574	1.086
		C	0.000	2.200	1.349	2.323
T14	80'-75'	A	0.000	0.850	0.249	0.850
		B	0.000	1.180	0.640	1.180
		C	0.000	1.834	1.065	1.834
T15	75'-70'	A	0.000	0.815	0.179	0.611
		B	0.000	1.131	0.460	0.848
		C	0.000	1.757	0.765	1.318
T16	70'-65'	A	0.000	0.784	0.172	0.588
		B	0.000	1.088	0.443	0.816
		C	0.000	1.691	0.737	1.268
T17	65'-60'	A	0.000	0.758	0.166	0.568
		B	0.000	1.052	0.428	0.789
		C	0.000	1.634	0.712	1.226
T18	60'-55'	A	0.000	1.258	0.368	1.023
		B	0.000	1.381	0.606	1.123
		C	0.000	2.123	1.003	1.727
T19	55'-50'	A	0.000	0.929	0.250	0.697
		B	0.000	1.097	0.423	0.823
		C	0.000	1.542	0.671	1.156
T20	50'-45'	A	0.000	1.042	0.277	0.782
		B	0.000	1.070	0.412	0.802
		C	0.000	1.504	0.655	1.128
T21	45'-40'	A	0.000	1.392	0.559	1.578
		B	0.000	1.429	0.832	1.620
		C	0.000	2.008	1.322	2.277
T22	40'-33'4"	A	0.000	1.152	0.357	1.008

Section	Elevation ft	Face	A_R ft^2	A_R Ice ft^2	A_F ft^2	A_F Ice ft^2
		B	0.000	1.182	0.532	1.034
		C	0.000	1.662	0.844	1.454
T23	33'4"-26'8"	A	0.000	1.115	0.346	0.976
		B	0.000	1.145	0.515	1.001
		C	0.000	1.609	0.817	1.408
T24	26'8"-20'	A	0.000	1.083	0.336	0.948
		B	0.000	1.112	0.500	0.973
		C	0.000	1.563	0.794	1.367
T25	20'-13'4"	A	0.000	1.055	0.374	1.055
		B	0.000	1.083	0.556	1.083
		C	0.000	1.522	0.884	1.522
T26	13'4"-6'8"	A	0.000	1.403	0.497	1.403
		B	0.000	1.440	0.740	1.440
		C	0.000	2.025	1.176	2.025
T27	6'8"-0'	A	0.000	0.537	0.271	0.537
		B	0.000	0.351	0.166	0.351
		C	0.000	0.313	0.185	0.313

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	130'-120'	-0.978	-1.909	-0.043	-0.507
T2	120'-117'1-23/32"	-0.126	-2.131	0.145	-0.722
T3	117'1-23/32"-114'3-7/16"	0.705	-2.568	0.403	-1.215
T4	114'3-7/16"-111'5-5/32"	0.703	-2.559	0.402	-1.197
T5	111'5-5/32"-108'6-7/8"	0.545	0.147	0.341	-0.058
T6	108'6-7/8"-105'8-19/32"	0.445	1.863	0.296	0.781
T7	105'8-19/32"-102'10-5/16"	0.445	1.863	0.296	0.781
T8	102'10-5/16"-100'	0.366	1.533	0.294	0.631
T9	100'-96'	0.333	1.339	0.270	0.677
T10	96'-92'	0.351	1.383	0.295	0.736
T11	92'-88'	0.346	1.475	0.307	0.812
T12	88'-84'	0.380	1.547	0.327	0.852
T13	84'-80'	0.412	1.617	0.347	0.891
T14	80'-75'	0.868	1.550	0.450	0.938
T15	75'-70'	1.002	1.741	0.517	1.028
T16	70'-65'	1.082	1.837	0.559	1.082
T17	65'-60'	1.162	1.931	0.601	1.136
T18	60'-55'	0.853	1.361	0.369	0.720
T19	55'-50'	1.021	1.441	0.579	0.620
T20	50'-45'	0.907	1.369	0.550	0.591
T21	45'-40'	0.804	1.185	0.506	0.587
T22	40'-33'4"	1.026	1.475	0.630	0.628
T23	33'4"-26'8"	1.101	1.543	0.675	0.649
T24	26'8"-20'	1.176	1.610	0.720	0.670
T25	20'-13'4"	1.217	1.634	0.753	0.688
T26	13'4"-6'8"	1.194	1.574	0.730	0.691
T27	6'8"-0'	-0.283	-1.824	-0.052	-1.863

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*
LLPX310R w/ Mount Pipe	A	From Leg	4.000	0.000	128'	No Ice	5.065	2.985	0.045
(E)			0'			1/2" Ice	5.480	3.528	0.083
			0'			1" Ice	5.905	4.087	0.126
LLPX310R w/ Mount Pipe	B	From Leg	4.000	0.000	128'	No Ice	5.065	2.985	0.045
(E)			0'			1/2" Ice	5.480	3.528	0.083
			0'			1" Ice	5.905	4.087	0.126
840 10054 w/ Mount Pipe	C	From Leg	4.000	0.000	128'	No Ice	5.413	2.385	0.051
(E)			0'			1/2" Ice	5.833	2.917	0.088
			0'			1" Ice	6.263	3.466	0.129
24"x14"x9"	A	From Leg	4.000	0.000	128'	No Ice	3.442	2.639	0.064
(E)			0'			1/2" Ice	3.696	2.870	0.091
			0'			1" Ice	3.959	3.111	0.122
24"x14"x9"	B	From Leg	4.000	0.000	128'	No Ice	3.442	2.639	0.064
(E)			0'			1/2" Ice	3.696	2.870	0.091
			0'			1" Ice	3.959	3.111	0.122
24"x14"x9"	C	From Leg	4.000	0.000	128'	No Ice	3.442	2.639	0.064
(E)			0'			1/2" Ice	3.696	2.870	0.091
			0'			1" Ice	3.959	3.111	0.122
TIMING 2000	C	From Leg	4.000	0.000	128'	No Ice	0.126	0.126	0.001
(E)			0'			1/2" Ice	0.177	0.177	0.002
			0'			1" Ice	0.237	0.237	0.005
MODEM	A	From Leg	4.000	0.000	128'	No Ice	0.130	0.107	0.002
(E)			0'			1/2" Ice	0.183	0.157	0.003
			-4'			1" Ice	0.244	0.215	0.005
MODEM	B	From Leg	4.000	0.000	128'	No Ice	0.130	0.107	0.002
(E)			0'			1/2" Ice	0.183	0.157	0.003
			-4'			1" Ice	0.244	0.215	0.005
MODEM	C	From Leg	4.000	0.000	128'	No Ice	0.130	0.107	0.002
(E)			0'			1/2" Ice	0.183	0.157	0.003
			-4'			1" Ice	0.244	0.215	0.005
Sector Mount [SM 803-3]	C	None		0.000	128'	No Ice	40.400	40.400	0.985
(E)						1/2" Ice	51.200	51.200	1.226
						1" Ice	62.000	62.000	1.467
R									
APXVTM14-C-120 w/	A	From Leg	4.000	0.000	118'6"	No Ice	7.134	4.959	0.077
Mount Pipe			0'			1/2" Ice	7.662	5.754	0.131
(E)			1'6"			1" Ice	8.183	6.472	0.193
APXVTM14-C-120 w/	B	From Leg	4.000	0.000	118'6"	No Ice	7.134	4.959	0.077
Mount Pipe			0'			1/2" Ice	7.662	5.754	0.131
(E)			1'6"			1" Ice	8.183	6.472	0.193
APXVTM14-C-120 w/	C	From Leg	4.000	0.000	118'6"	No Ice	7.134	4.959	0.077
Mount Pipe			0'			1/2" Ice	7.662	5.754	0.131
(E)			1'6"			1" Ice	8.183	6.472	0.193
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	118'6"	No Ice	8.498	6.946	0.083
Mount Pipe			0'			1/2" Ice	9.149	8.127	0.151
(E)			0'			1" Ice	9.767	9.021	0.227
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	118'6"	No Ice	8.498	6.946	0.083
Mount Pipe			0'			1/2" Ice	9.149	8.127	0.151
(E)			0'			1" Ice	9.767	9.021	0.227
P40-16-XLPP-RR-A w/	C	From Leg	4.000	0.000	118'6"	No Ice	9.373	4.825	0.073
Mount Pipe			0'			1/2" Ice	9.912	5.571	0.136

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
(E)			0'			1" Ice	10.450	6.265	0.205
TD-RRH8x20-25	A	From Leg	4.000	0.000	118'6"	No Ice	4.720	1.703	0.070
(E)			0'			1/2" Ice	5.014	1.920	0.097
			1'6"			1" Ice	5.316	2.145	0.128
TD-RRH8x20-25	B	From Leg	4.000	0.000	118'6"	No Ice	4.720	1.703	0.070
(E)			0'			1/2" Ice	5.014	1.920	0.097
			1'6"			1" Ice	5.316	2.145	0.128
TD-RRH8x20-25	C	From Leg	4.000	0.000	118'6"	No Ice	4.720	1.703	0.070
(E)			0'			1/2" Ice	5.014	1.920	0.097
			1'6"			1" Ice	5.316	2.145	0.128
1900 MHz	A	From Leg	4.000	0.000	118'6"	No Ice	2.781	1.497	0.044
(E)			0'			1/2" Ice	3.012	1.690	0.063
			0'			1" Ice	3.252	1.890	0.084
1900 MHz	B	From Leg	4.000	0.000	118'6"	No Ice	2.781	1.497	0.044
(E)			0'			1/2" Ice	3.012	1.690	0.063
			0'			1" Ice	3.252	1.890	0.084
1900 MHz	C	From Leg	4.000	0.000	118'6"	No Ice	2.781	1.497	0.044
(E)			0'			1/2" Ice	3.012	1.690	0.063
			0'			1" Ice	3.252	1.890	0.084
800 MHz	A	From Leg	4.000	0.000	118'6"	No Ice	2.490	2.068	0.053
(E)			0'			1/2" Ice	2.706	2.271	0.074
			0'			1" Ice	2.931	2.481	0.098
800 MHz	B	From Leg	4.000	0.000	118'6"	No Ice	2.490	2.068	0.053
(E)			0'			1/2" Ice	2.706	2.271	0.074
			0'			1" Ice	2.931	2.481	0.098
800 MHz	C	From Leg	4.000	0.000	118'6"	No Ice	2.490	2.068	0.053
(E)			0'			1/2" Ice	2.706	2.271	0.074
			0'			1" Ice	2.931	2.481	0.098
(2) ACU-A20-N RETs	A	From Leg	4.000	0.000	118'6"	No Ice	0.078	0.136	0.001
(E)			0'			1/2" Ice	0.121	0.189	0.002
			0'			1" Ice	0.173	0.251	0.004
ACU-A20-N RETs	B	From Leg	4.000	0.000	118'6"	No Ice	0.078	0.136	0.001
(E)			0'			1/2" Ice	0.121	0.189	0.002
			0'			1" Ice	0.173	0.251	0.004
ACU-A20-N RETs	C	From Leg	4.000	0.000	118'6"	No Ice	0.078	0.136	0.001
(E)			0'			1/2" Ice	0.121	0.189	0.002
			0'			1" Ice	0.173	0.251	0.004
800 MHz Filter	A	From Leg	4.000	0.000	118'6"	No Ice	1.820	0.604	0.009
(E)			0'			1/2" Ice	2.008	0.747	0.019
			0'			1" Ice	2.205	0.899	0.032
800 MHz Filter	B	From Leg	4.000	0.000	118'6"	No Ice	1.820	0.604	0.009
(E)			0'			1/2" Ice	2.008	0.747	0.019
			0'			1" Ice	2.205	0.899	0.032
800 MHz Filter	C	From Leg	4.000	0.000	118'6"	No Ice	1.820	0.604	0.009
(E)			0'			1/2" Ice	2.008	0.747	0.019
			0'			1" Ice	2.205	0.899	0.032
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	118'6"	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	118'6"	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	118'6"	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
T-Arm Mount [TA 601-3]	C	None		0.000	118'6"	No Ice	10.900	10.900	0.726
(E)						1/2" Ice	14.650	14.650	0.926

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						1" Ice	18.400	18.400	1.125
R									
(2) LGP13519	A	From Leg	4.000	0.000	110'	No Ice	0.338	0.207	0.005
(E)			0'			1/2" Ice	0.422	0.280	0.008
			0'			1" Ice	0.515	0.362	0.012
(2) LGP13519	B	From Leg	4.000	0.000	110'	No Ice	0.338	0.207	0.005
(E)			0'			1/2" Ice	0.422	0.280	0.008
			0'			1" Ice	0.515	0.362	0.012
(2) LGP13519	C	From Leg	4.000	0.000	110'	No Ice	0.338	0.207	0.005
(E)			0'			1/2" Ice	0.422	0.280	0.008
			0'			1" Ice	0.515	0.362	0.012
(2) LGP21401	A	From Leg	4.000	0.000	110'	No Ice	1.288	0.233	0.014
(E)			0'			1/2" Ice	1.445	0.313	0.021
			0'			1" Ice	1.611	0.403	0.030
(2) LGP21401	B	From Leg	4.000	0.000	110'	No Ice	1.288	0.233	0.014
(E)			0'			1/2" Ice	1.445	0.313	0.021
			0'			1" Ice	1.611	0.403	0.030
(2) LGP21401	C	From Leg	4.000	0.000	110'	No Ice	1.288	0.233	0.014
(E)			0'			1/2" Ice	1.445	0.313	0.021
			0'			1" Ice	1.611	0.403	0.030
(2) RRUS-11 1900MHz	A	From Face	0.500	0.000	110'	No Ice	2.942	1.190	0.044
(E)			0'			1/2" Ice	3.172	1.351	0.063
			0'			1" Ice	3.410	1.521	0.086
(2) RRUS-11 1900MHz	B	From Face	0.500	0.000	110'	No Ice	2.942	1.190	0.044
(E)			0'			1/2" Ice	3.172	1.351	0.063
			0'			1" Ice	3.410	1.521	0.086
(2) RRUS-11 1900MHz	C	From Face	0.500	0.000	110'	No Ice	2.942	1.190	0.044
(E)			0'			1/2" Ice	3.172	1.351	0.063
			0'			1" Ice	3.410	1.521	0.086
DC6-48-60-18-8F	B	From Leg	0.500	0.000	110'	No Ice	1.467	1.467	0.019
(E)			0'			1/2" Ice	1.667	1.667	0.037
			0'			1" Ice	1.878	1.878	0.057
Sector Mount [SM 409-3]	C	None		0.000	110'	No Ice	22.470	22.470	1.035
(E)						1/2" Ice	31.990	31.990	1.500
						1" Ice	41.510	41.510	1.966
R									
AIR 21 B2A/B4P	A	From Leg	4.000	0.000	93'	No Ice	6.522	4.256	0.092
(E)			0'			1/2" Ice	6.966	4.656	0.133
			0'			1" Ice	7.419	5.082	0.179
AIR 21 B2A/B4P	B	From Leg	4.000	0.000	93'	No Ice	6.522	4.256	0.092
(E)			0'			1/2" Ice	6.966	4.656	0.133
			0'			1" Ice	7.419	5.082	0.179
AIR 21 B2A/B4P	C	From Leg	4.000	0.000	93'	No Ice	6.522	4.256	0.092
(E)			0'			1/2" Ice	6.966	4.656	0.133
			0'			1" Ice	7.419	5.082	0.179
AIR 21 B4A/B2P	A	From Leg	4.000	0.000	93'	No Ice	6.522	4.256	0.090
(E)			0'			1/2" Ice	6.966	4.656	0.132
			0'			1" Ice	7.419	5.082	0.178
AIR 21 B4A/B2P	B	From Leg	4.000	0.000	93'	No Ice	6.522	4.256	0.090
(E)			0'			1/2" Ice	6.966	4.656	0.132
			0'			1" Ice	7.419	5.082	0.178
AIR 21 B4A/B2P	C	From Leg	4.000	0.000	93'	No Ice	6.522	4.256	0.090
(E)			0'			1/2" Ice	6.966	4.656	0.132
			0'			1" Ice	7.419	5.082	0.178
KRY 112 144/1 TMA	A	From Leg	4.000	0.000	93'	No Ice	0.411	0.189	0.011
(E)			0'			1/2" Ice	0.500	0.256	0.014
			0'			1" Ice	0.597	0.332	0.018

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
KRY 112 144/1 TMA	B	From Leg	4.000	0.000	93'	No Ice	0.411	0.189	0.011
(E)			0'			1/2" Ice	0.500	0.256	0.014
			0'			1" Ice	0.597	0.332	0.018
KRY 112 144/1 TMA	C	From Leg	4.000	0.000	93'	No Ice	0.411	0.189	0.011
(E)			0'			1/2" Ice	0.500	0.256	0.014
			0'			1" Ice	0.597	0.332	0.018
LNX-6515DS-A1M w/	A	From Leg	4.000	0.000	93'	No Ice	11.683	9.842	0.083
Mount Pipe			0'			1/2" Ice	12.404	11.366	0.173
(P)			0'			1" Ice	13.135	12.914	0.273
LNX-6515DS-A1M w/	B	From Leg	4.000	0.000	93'	No Ice	11.683	9.842	0.083
Mount Pipe			0'			1/2" Ice	12.404	11.366	0.173
(P)			0'			1" Ice	13.135	12.914	0.273
LNX-6515DS-A1M w/	C	From Leg	4.000	0.000	93'	No Ice	11.683	9.842	0.083
Mount Pipe			0'			1/2" Ice	12.404	11.366	0.173
(P)			0'			1" Ice	13.135	12.914	0.273
S11B12	A	From Leg	4.000	0.000	93'	No Ice	3.306	1.361	0.051
(P)			0'			1/2" Ice	3.550	1.540	0.072
			0'			1" Ice	3.802	1.728	0.096
S11B12	B	From Leg	4.000	0.000	93'	No Ice	3.306	1.361	0.051
(P)			0'			1/2" Ice	3.550	1.540	0.072
			0'			1" Ice	3.802	1.728	0.096
S11B12	C	From Leg	4.000	0.000	93'	No Ice	3.306	1.361	0.051
(P)			0'			1/2" Ice	3.550	1.540	0.072
			0'			1" Ice	3.802	1.728	0.096
Sector Mount [SM 402-3]	C	None		0.000	93'	No Ice	18.910	18.910	0.851
(E-2 Pipes Included)						1/2" Ice	26.780	26.780	1.233
						1" Ice	34.650	34.650	1.616
Miscellaneous [NA 507-1]	C	None		0.000	93'	No Ice	4.800	4.800	0.245
(P-MT-195-12)						1/2" Ice	6.700	6.700	0.294
						1" Ice	8.600	8.600	0.343
VSR-TS-B Stabilizer Kit	C	None		0.000	93'	No Ice	14.500	14.500	0.376
(P)						1/2" Ice	17.400	17.400	0.396
						1" Ice	20.300	20.300	0.417
R									
(2) LNX-6514DS-A1M w/	A	From Leg	4.000	0.000	80'	No Ice	8.648	7.082	0.065
Mount Pipe			0'			1/2" Ice	9.305	8.273	0.134
(E)			0'			1" Ice	9.930	9.185	0.211
(2) LNX-6514DS-A1M w/	B	From Leg	4.000	0.000	80'	No Ice	8.648	7.082	0.065
Mount Pipe			0'			1/2" Ice	9.305	8.273	0.134
(E)			0'			1" Ice	9.930	9.185	0.211
(2) LNX-6514DS-A1M w/	C	From Leg	4.000	0.000	80'	No Ice	8.648	7.082	0.065
Mount Pipe			0'			1/2" Ice	9.305	8.273	0.134
(E)			0'			1" Ice	9.930	9.185	0.211
(2) HBXX-6517DS-A2M w/	A	From Leg	4.000	0.000	80'	No Ice	8.976	6.963	0.067
Mount Pipe			0'			1/2" Ice	9.647	8.182	0.137
(E)			0'			1" Ice	10.291	9.144	0.215
(2) HBXX-6517DS-A2M w/	B	From Leg	4.000	0.000	80'	No Ice	8.976	6.963	0.067
Mount Pipe			0'			1/2" Ice	9.647	8.182	0.137
(E)			0'			1" Ice	10.291	9.144	0.215
(2) HBXX-6517DS-A2M w/	C	From Leg	4.000	0.000	80'	No Ice	8.976	6.963	0.067
Mount Pipe			0'			1/2" Ice	9.647	8.182	0.137
(E)			0'			1" Ice	10.291	9.144	0.215
RRH2x60-700	A	From Leg	4.000	0.000	80'	No Ice	3.957	1.816	0.060
(E)			0'			1/2" Ice	4.272	2.075	0.083
			0'			1" Ice	4.596	2.360	0.109
RRH2x60-700	B	From Leg	4.000	0.000	80'	No Ice	3.957	1.816	0.060
(E)			0'			1/2" Ice	4.272	2.075	0.083

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	4.596	2.360	0.109
RRH2x60-700	C	From Leg	4.000	0.000	80'	No Ice	3.957	1.816	0.060
(E)			0'			1/2" Ice	4.272	2.075	0.083
			0'			1" Ice	4.596	2.360	0.109
RRH2x60-AWS	A	From Leg	4.000	0.000	80'	No Ice	3.957	1.816	0.060
(E)			0'			1/2" Ice	4.272	2.075	0.083
			0'			1" Ice	4.596	2.360	0.109
RRH2x60-AWS	B	From Leg	4.000	0.000	80'	No Ice	3.957	1.816	0.060
(E)			0'			1/2" Ice	4.272	2.075	0.083
			0'			1" Ice	4.596	2.360	0.109
RRH2x60-AWS	C	From Leg	4.000	0.000	80'	No Ice	3.957	1.816	0.060
(E)			0'			1/2" Ice	4.272	2.075	0.083
			0'			1" Ice	4.596	2.360	0.109
RRH2X60-PCS	A	From Leg	4.000	0.000	80'	No Ice	2.567	2.011	0.055
(E)			0'			1/2" Ice	2.791	2.218	0.075
			0'			1" Ice	3.025	2.435	0.099
RRH2X60-PCS	B	From Leg	4.000	0.000	80'	No Ice	2.567	2.011	0.055
(E)			0'			1/2" Ice	2.791	2.218	0.075
			0'			1" Ice	3.025	2.435	0.099
RRH2X60-PCS	C	From Leg	4.000	0.000	80'	No Ice	2.567	2.011	0.055
(E)			0'			1/2" Ice	2.791	2.218	0.075
			0'			1" Ice	3.025	2.435	0.099
(2) DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	80'	No Ice	5.600	2.333	0.044
(E)			0'			1/2" Ice	5.915	2.558	0.080
			0'			1" Ice	6.240	2.791	0.120
Sector Mount [SM 104-3]	C	None		0.000	80'	No Ice	30.020	30.020	0.953
(E)						1/2" Ice	40.480	40.480	1.405
						1" Ice	50.940	50.940	1.857
R									
GPS-QBW-20N	C	From Leg	3.000	0.000	55'6"	No Ice	0.151	0.151	0.000
(Reference)			0'			1/2" Ice	0.208	0.208	0.002
			0'			1" Ice	0.273	0.273	0.005
GPS	C	From Leg	3.000	0.000	55'6"	No Ice	0.151	0.151	0.000
(E)			0'			1/2" Ice	0.208	0.208	0.002
			0'			1" Ice	0.273	0.273	0.005
Side Arm Mount [SO 701-1]	C	From Leg	1.500	0.000	55'6"	No Ice	0.850	1.670	0.065
(E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
R									
GPS	A	From Leg	3.000	0.000	50'6"	No Ice	0.151	0.151	0.000
(E)			0'			1/2" Ice	0.208	0.208	0.002
			0'			1" Ice	0.273	0.273	0.005
GPS	B	From Leg	3.000	0.000	50'6"	No Ice	0.151	0.151	0.000
(E)			0'			1/2" Ice	0.208	0.208	0.002
			0'			1" Ice	0.273	0.273	0.005
Side Arm Mount [SO 701-1]	A	From Leg	1.500	0.000	50'6"	No Ice	0.850	1.670	0.065
(E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
Side Arm Mount [SO 701-1]	B	From Leg	1.500	0.000	50'6"	No Ice	0.850	1.670	0.065
(E)			0'			1/2" Ice	1.140	2.340	0.079
			0'			1" Ice	1.430	3.010	0.093
R									
*********									
(P) HPA-65R-BUU-H6	A	From Leg	4.000	0.000	110'	No Ice	10.122	5.486	0.043
			0'			1/2" Ice	10.688	5.942	0.100
			0'			1" Ice	11.263	6.405	0.164
(P) HPA-65R-BUU-H6	B	From Leg	4.000	0.000	110'	No Ice	10.122	5.486	0.043

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1/2" Ice	10.688	5.942	0.100
			0'			1" Ice	11.263	6.405	0.164
(2) (P) KATH 800-10121	C	From Leg	4.000	0.000	110'	No Ice	5.458	3.293	0.046
			0'			1/2" Ice	5.882	3.639	0.079
			0'			1" Ice	6.315	3.994	0.117
(2) (P) KATH 800-10121	A	From Leg	4.000	0.000	110'	No Ice	5.458	3.293	0.046
			0'			1/2" Ice	5.882	3.639	0.079
			0'			1" Ice	6.315	3.994	0.117
(2) (P) KATH 800-10121	B	From Leg	4.000	0.000	110'	No Ice	5.458	3.293	0.046
			0'			1/2" Ice	5.882	3.639	0.079
			0'			1" Ice	6.315	3.994	0.117
(P) HPA-65R-BUU-H8	C	From Leg	4.000	0.000	110'	No Ice	5.162	3.293	0.046
			0'			1/2" Ice	5.664	3.716	0.079
			0'			1" Ice	6.166	4.139	0.112
(P) RRUS 12	A	From Leg	3.500	0.000	110'	No Ice	1.488	3.669	0.058
			0'			1/2" Ice	1.673	3.926	0.081
			0'			1" Ice	1.866	4.191	0.108
(P) RRUS 12	B	From Leg	3.500	0.000	110'	No Ice	1.488	3.669	0.058
			0'			1/2" Ice	1.673	3.926	0.081
			0'			1" Ice	1.866	4.191	0.108
(P) RRUS 12	C	From Leg	3.500	0.000	110'	No Ice	1.488	3.669	0.058
			0'			1/2" Ice	1.673	3.926	0.081
			0'			1" Ice	1.866	4.191	0.108
(P) RRUS A2	A	From Leg	3.500	0.000	110'	No Ice	2.411	0.533	0.022
			0'			1/2" Ice	2.619	0.665	0.035
			0'			1" Ice	2.837	0.806	0.050
(P) RRUS A2	B	From Leg	3.500	0.000	110'	No Ice	2.411	0.533	0.022
			0'			1/2" Ice	2.619	0.665	0.035
			0'			1" Ice	2.837	0.806	0.050
(P) RRUS A2	C	From Leg	3.500	0.000	110'	No Ice	2.411	0.533	0.022
			0'			1/2" Ice	2.619	0.665	0.035
			0'			1" Ice	2.837	0.806	0.050
(4) (P) Kathrein 860-10025 RET	A	From Leg	3.500	0.000	110'	No Ice	0.110	0.100	0.001
			0'			1/2" Ice	0.190	0.170	0.002
			0'			1" Ice	0.270	0.240	0.003
(4) (P) Kathrein 860-10025 RET	B	From Leg	3.500	0.000	110'	No Ice	0.110	0.100	0.001
			0'			1/2" Ice	0.190	0.170	0.002
			0'			1" Ice	0.270	0.240	0.003
(4) (P) Kathrein 860-10025 RET	C	From Leg	3.500	0.000	110'	No Ice	0.110	0.100	0.001
			0'			1/2" Ice	0.190	0.170	0.002
			0'			1" Ice	0.270	0.240	0.003
(2) (P) Powerwave LGP21901	A	From Leg	3.500	0.000	110'	No Ice	0.230	0.110	0.000
			0'			1/2" Ice	0.320	0.180	0.000
			0'			1" Ice	0.410	0.250	0.000
(2) (P) Powerwave LGP21901	B	From Leg	3.500	0.000	110'	No Ice	0.230	0.110	0.000
			0'			1/2" Ice	0.320	0.180	0.000
			0'			1" Ice	0.410	0.250	0.000
(2) (P) Powerwave LGP21901	C	From Leg	3.500	0.000	110'	No Ice	0.230	0.110	0.000
			0'			1/2" Ice	0.320	0.180	0.000
			0'			1" Ice	0.410	0.250	0.000

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft²	Weight K
VHLP2.5 (E)	A	Paraboloid w/Shroud (HP)	From Leg	4.000 0' -4'	0.000		128'	2.917	No Ice 1/2" Ice 1" Ice	6.681 7.069 7.456	0.048 0.077 0.106
VHLP2.5 (E)	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0' 2'	0.000		128'	2.917	No Ice 1/2" Ice 1" Ice	6.681 7.069 7.456	0.048 0.077 0.106
VHLP2.5 (E) *R*	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0' -2'	0.000		128'	2.917	No Ice 1/2" Ice 1" Ice	6.681 7.069 7.456	0.048 0.077 0.106

Load Combinations

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

Comb. No.	Description
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	130 - 120	Leg	Max Tension	12	8.353	0.039	0.018
			Max. Compression	6	-9.516	-0.122	-0.079
			Max. Mx	5	-0.357	0.159	-0.003
			Max. My	8	-0.467	0.007	0.156
			Max. Vy	10	-1.070	0.132	-0.060
			Max. Vx	2	-1.190	0.021	0.142
		Diagonal	Max Tension	13	1.431	0.000	0.000
			Max. Compression	13	-1.472	0.000	0.000
			Max. Mx	18	0.236	-0.001	0.000
			Max. My	9	-0.964	-0.001	-0.001
			Max. Vy	18	0.002	-0.001	-0.000
			Max. Vx	9	-0.000	0.000	0.000
		Horizontal	Max Tension	10	0.291	0.000	0.000
			Max. Compression	12	-0.257	0.000	0.000
			Max. Mx	14	0.051	-0.004	0.000
			Max. My	9	0.011	0.000	0.000
			Max. Vy	14	0.006	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
		Top Girt	Max Tension	6	0.055	0.000	0.000
			Max. Compression	12	-0.061	0.000	0.000
			Max. Mx	14	-0.001	-0.004	0.000
			Max. My	9	0.004	0.000	0.000
			Max. Vy	14	0.006	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
		Bottom Girt	Max Tension	12	0.235	0.000	0.000
			Max. Compression	6	-0.208	0.000	0.000
			Max. Mx	14	0.018	-0.004	0.000
			Max. My	9	-0.004	0.000	0.000
			Max. Vy	14	0.006	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
T2	120 - 117.143	Leg	Max Tension	12	10.548	0.203	0.140
			Max. Compression	6	-12.819	-0.056	-0.037
			Max. Mx	5	-0.176	0.426	-0.004
			Max. My	8	-6.605	-0.022	0.422
			Max. Vy	10	-1.069	0.221	-0.102
			Max. Vx	2	-1.189	0.040	0.242
		Diagonal	Max Tension	8	2.383	0.000	0.000
			Max. Compression	2	-2.302	0.000	0.000
			Max. Mx	6	0.283	-0.003	-0.000
			Max. My	9	-1.065	-0.002	-0.001
			Max. Vy	18	0.003	-0.001	-0.000
			Max. Vx	9	-0.000	0.000	0.000
		Top Girt	Max Tension	10	0.058	0.000	0.000
			Max. Compression	12	-0.031	0.000	0.000
			Max. Mx	14	0.021	-0.004	0.000
			Max. My	9	0.016	0.000	0.000
			Max. Vy	14	0.006	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
T3	117.143 - 114.286	Leg	Max Tension	12	16.916	0.239	0.161
			Max. Compression	6	-19.281	0.085	0.057
			Max. Mx	5	13.989	-0.258	0.058

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	8	16.287	-0.018	-0.286
			Max. Vy	10	-2.308	0.251	-0.146
			Max. Vx	2	-2.598	0.018	0.285
		Diagonal	Max Tension	13	3.114	0.000	0.000
			Max. Compression	13	-3.107	0.000	0.000
			Max. Mx	10	-0.074	-0.004	-0.000
			Max. My	8	-2.846	-0.001	-0.002
			Max. Vy	18	-0.003	-0.002	-0.000
			Max. Vx	8	-0.001	0.000	0.000
T4	114.286 - 111.43	Leg	Max Tension	12	23.659	-0.086	-0.057
			Max. Compression	6	-26.000	-0.221	-0.148
			Max. Mx	11	-22.162	0.244	-0.030
			Max. My	2	-25.539	0.022	0.265
			Max. Vy	5	0.119	-0.243	0.027
			Max. Vx	2	-0.136	0.022	0.265
		Diagonal	Max Tension	13	2.869	0.000	0.000
			Max. Compression	13	-2.903	0.000	0.000
			Max. Mx	11	1.524	-0.003	-0.000
			Max. My	9	-2.056	0.001	-0.001
			Max. Vy	19	0.003	-0.002	-0.000
			Max. Vx	9	0.001	0.001	-0.001
T5	111.43 - 108.573	Leg	Max Tension	12	31.058	0.219	0.147
			Max. Compression	6	-34.196	-0.186	-0.124
			Max. Mx	5	-1.453	0.452	-0.007
			Max. My	8	-18.920	0.024	0.477
			Max. Vy	11	-0.505	0.265	-0.000
			Max. Vx	2	-0.525	-0.016	0.267
		Diagonal	Max Tension	13	3.914	0.000	0.000
			Max. Compression	13	-3.911	0.000	0.000
			Max. Mx	11	2.425	-0.004	-0.000
			Max. My	8	-3.293	0.000	-0.002
			Max. Vy	20	0.003	-0.002	-0.000
			Max. Vx	8	-0.001	0.000	0.000
T6	108.573 - 105.716	Leg	Max Tension	12	40.858	0.191	0.127
			Max. Compression	6	-44.659	-0.046	-0.021
			Max. Mx	11	-3.472	0.265	-0.000
			Max. My	2	20.436	-0.016	0.267
			Max. Vy	11	0.106	0.265	-0.000
			Max. Vx	2	0.106	-0.016	0.267
		Diagonal	Max Tension	13	4.896	0.000	0.000
			Max. Compression	13	-4.966	0.000	0.000
			Max. Mx	11	2.635	-0.005	-0.000
			Max. My	8	-4.374	0.000	-0.002
			Max. Vy	19	0.004	-0.002	-0.000
			Max. Vx	8	-0.001	0.000	0.000
T7	105.716 - 102.859	Leg	Max Tension	12	52.520	0.037	0.016
			Max. Compression	6	-56.490	0.034	0.017
			Max. Mx	11	-3.845	0.189	-0.013
			Max. My	13	-3.056	0.084	0.170
			Max. Vy	11	-0.080	0.189	-0.013
			Max. Vx	3	-0.078	-0.083	0.169
		Diagonal	Max Tension	13	4.839	0.000	0.000
			Max. Compression	13	-4.894	0.000	0.000
			Max. Mx	11	2.245	-0.005	-0.000
			Max. My	8	-4.515	0.001	-0.003
			Max. Vy	11	-0.004	-0.005	-0.000
			Max. Vx	8	-0.001	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T8	102.859 - 100	Leg	Max Tension	12	69.316	0.065	0.032
			Max. Compression	6	-73.555	-0.353	-0.223
			Max. Mx	10	-72.599	0.365	-0.195
			Max. My	2	-72.743	0.029	0.412
			Max. Vy	10	-3.622	0.365	-0.195
			Max. Vx	2	-4.115	0.029	0.412
		Diagonal	Max Tension	13	5.018	-0.002	0.001
			Max. Compression	13	-5.131	0.000	0.000
			Max. Mx	6	3.785	-0.006	0.002
			Max. My	8	-2.778	0.005	-0.003
			Max. Vy	6	0.004	-0.006	0.002
			Max. Vx	8	0.002	0.005	-0.003
		Secondary Horizontal	Max Tension	6	1.161	0.000	0.000
			Max. Compression	6	-1.161	0.010	-0.004
			Max. Mx	12	0.612	0.023	-0.002
			Max. My	2	1.148	0.009	-0.004
			Max. Vy	12	0.019	0.023	-0.002
			Max. Vx	2	-0.003	0.009	-0.004
		Bottom Girt	Max Tension	12	0.877	0.000	0.000
			Max. Compression	6	-0.875	0.000	0.000
			Max. Mx	14	0.048	-0.004	0.000
			Max. My	9	-0.015	0.000	0.000
			Max. Vy	14	0.006	0.000	0.000
			Max. Vx	9	-0.000	0.000	0.000
T9	100 - 96	Leg	Max Tension	12	72.865	-0.419	-0.018
			Max. Compression	6	-76.726	1.211	0.042
			Max. Mx	12	72.811	-1.226	-0.036
			Max. My	9	-3.725	0.001	1.638
			Max. Vy	12	0.225	-1.226	-0.036
			Max. Vx	9	-0.392	0.001	1.638
		Diagonal	Max Tension	8	3.943	0.038	0.008
			Max. Compression	2	-4.091	0.000	0.000
			Max. Mx	13	2.204	0.041	0.001
			Max. My	13	-3.815	-0.029	-0.016
			Max. Vy	13	0.018	0.041	0.001
			Max. Vx	13	0.007	0.000	0.000
T10	96 - 92	Leg	Max Tension	12	84.481	-1.226	-0.036
			Max. Compression	6	-89.534	0.087	0.011
			Max. Mx	12	84.481	-1.226	-0.036
			Max. My	9	-4.177	0.001	1.638
			Max. Vy	6	0.536	1.211	0.042
			Max. Vx	7	0.672	-0.045	-1.307
		Diagonal	Max Tension	7	4.581	0.096	-0.004
			Max. Compression	13	-4.898	0.000	0.000
			Max. Mx	11	-2.535	-0.129	0.005
			Max. My	9	-3.604	-0.095	0.016
			Max. Vy	11	0.057	0.000	0.000
			Max. Vx	9	-0.007	-0.095	0.016
T11	92 - 88	Leg	Max Tension	12	92.637	-0.225	-0.008
			Max. Compression	6	-98.484	3.535	-0.004
			Max. Mx	6	-98.484	3.535	-0.004
			Max. My	11	-5.242	-0.198	-1.882
			Max. Vy	6	2.717	3.535	-0.004
			Max. Vx	13	-0.962	-0.180	1.878
		Diagonal	Max Tension	8	7.220	-0.056	-0.001
			Max. Compression	2	-7.547	0.000	0.000
			Max. Mx	6	2.207	-0.081	0.011
			Max. My	9	-3.650	0.066	-0.023
			Max. Vy	6	0.036	-0.081	0.011
			Max. Vx	8	0.009	0.078	-0.023

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Secondary Horizontal	Max Tension	13	3.042	-0.080	0.007
			Max. Compression	13	-2.884	0.062	-0.006
			Max. Mx	11	1.854	-0.113	0.003
			Max. My	13	3.042	-0.080	0.007
			Max. Vy	11	-0.079	-0.113	0.003
			Max. Vx	13	0.004	-0.080	0.007
T12	88 - 84	Leg	Max Tension	12	105.721	1.732	-0.018
			Max. Compression	6	-112.145	3.772	-0.002
			Max. Mx	6	-112.145	3.772	-0.002
			Max. My	11	-5.560	-0.198	-1.882
			Max. Vy	6	-3.018	3.772	-0.002
			Max. Vx	11	-1.033	-0.198	-1.882
		Diagonal	Max Tension	8	6.792	-0.039	-0.002
			Max. Compression	2	-7.023	0.000	0.000
			Max. Mx	6	1.635	-0.057	0.006
			Max. My	3	2.475	-0.052	0.016
			Max. Vy	6	0.026	-0.057	0.006
			Max. Vx	3	-0.006	0.000	0.000
		Secondary Horizontal	Max Tension	13	3.797	-0.051	0.004
			Max. Compression	13	-3.539	0.028	-0.004
			Max. Mx	11	2.069	-0.076	0.002
			Max. My	13	3.797	-0.051	0.004
			Max. Vy	11	-0.052	-0.076	0.002
			Max. Vx	13	0.003	0.000	0.000
T13	84 - 80	Leg	Max Tension	12	117.755	1.626	-0.013
			Max. Compression	6	-124.599	3.652	-0.007
			Max. Mx	6	-124.599	3.652	-0.007
			Max. My	11	-5.851	-0.140	-1.620
			Max. Vy	6	-2.855	3.652	-0.007
			Max. Vx	11	-0.868	-0.140	-1.620
		Diagonal	Max Tension	8	5.981	-0.046	-0.016
			Max. Compression	2	-6.180	0.000	0.000
			Max. Mx	7	3.116	-0.054	-0.012
			Max. My	7	-5.771	0.036	-0.020
			Max. Vy	7	0.025	-0.054	-0.012
			Max. Vx	7	-0.007	0.000	0.000
		Secondary Horizontal	Max Tension	13	3.211	0.062	0.004
			Max. Compression	13	-3.048	-0.054	-0.004
			Max. Mx	13	3.211	0.062	0.004
			Max. My	11	-3.003	-0.054	-0.004
			Max. Vy	13	0.041	0.000	0.000
			Max. Vx	13	0.002	0.000	0.000
T14	80 - 75	Leg	Max Tension	12	134.039	0.264	-0.040
			Max. Compression	6	-141.999	2.871	0.025
			Max. Mx	12	133.294	-2.896	-0.006
			Max. My	11	-6.995	0.025	-3.191
			Max. Vy	4	-0.754	0.270	-0.016
			Max. Vx	7	-1.080	-0.070	-1.517
		Diagonal	Max Tension	13	6.102	0.069	-0.006
			Max. Compression	13	-6.485	0.000	0.000
			Max. Mx	12	5.526	0.084	0.004
			Max. My	8	-5.316	-0.035	0.012
			Max. Vy	12	0.030	0.084	0.004
			Max. Vx	8	-0.004	0.000	0.000
T15	75 - 70	Leg	Max Tension	12	151.848	-2.896	-0.006
			Max. Compression	6	-160.866	2.496	0.016
			Max. Mx	12	151.848	-2.896	-0.006
			Max. My	11	-7.202	0.025	-3.191

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	12	-0.117	-2.896	-0.006
			Max. Vx	9	0.272	0.011	3.180
		Diagonal	Max Tension	13	6.663	-0.047	-0.002
			Max. Compression	13	-7.194	0.000	0.000
			Max. Mx	6	5.754	-0.056	-0.003
			Max. My	9	-6.669	0.042	-0.009
			Max. Vy	6	0.022	-0.056	-0.003
			Max. Vx	9	0.003	0.041	-0.009
T16	70 - 65	Leg	Max Tension	12	168.835	-2.484	-0.005
			Max. Compression	6	-178.357	2.973	0.023
			Max. Mx	6	-178.357	2.973	0.023
			Max. My	11	-7.455	0.034	-2.955
			Max. Vy	10	-0.126	2.966	0.036
			Max. Vx	9	-0.221	0.023	2.935
		Diagonal	Max Tension	13	5.775	-0.048	0.005
			Max. Compression	13	-6.372	0.000	0.000
			Max. Mx	12	4.813	-0.057	-0.003
			Max. My	8	-5.689	0.023	-0.009
			Max. Vy	6	0.021	-0.055	-0.004
			Max. Vx	8	0.003	0.000	0.000
T17	65 - 60	Leg	Max Tension	12	184.082	-2.950	-0.005
			Max. Compression	6	-194.360	0.433	0.022
			Max. Mx	6	-194.237	2.973	0.023
			Max. My	11	-7.710	-0.082	-3.267
			Max. Vy	6	0.537	2.973	0.023
			Max. Vx	9	-0.098	-0.087	3.247
		Diagonal	Max Tension	13	6.021	-0.049	-0.005
			Max. Compression	13	-6.544	0.000	0.000
			Max. Mx	6	5.075	-0.059	-0.005
			Max. My	9	-6.080	0.043	-0.012
			Max. Vy	6	0.022	-0.059	-0.005
			Max. Vx	9	0.004	0.041	-0.012
T18	60 - 55	Leg	Max Tension	12	195.672	-0.713	-0.004
			Max. Compression	6	-206.457	7.590	0.010
			Max. Mx	6	-206.457	7.590	0.010
			Max. My	11	-7.576	-0.082	-3.267
			Max. Vy	6	-2.955	7.590	0.010
			Max. Vx	13	0.925	-0.084	3.262
		Diagonal	Max Tension	4	7.392	-0.047	0.010
			Max. Compression	10	-7.919	0.000	0.000
			Max. Mx	6	2.242	-0.057	0.021
			Max. My	7	-0.220	-0.048	-0.023
			Max. Vy	6	0.022	-0.057	0.021
			Max. Vx	10	0.007	0.000	0.000
		Secondary Horizontal	Max Tension	6	3.577	-0.002	-0.020
			Max. Compression	6	-3.577	0.000	0.000
			Max. Mx	10	-0.326	0.009	0.000
			Max. My	11	-3.422	0.001	0.024
			Max. Vy	23	-0.011	0.008	-0.000
			Max. Vx	11	0.011	0.000	0.000
T19	55 - 50	Leg	Max Tension	12	212.340	-0.600	-0.006
			Max. Compression	6	-224.229	3.267	0.021
			Max. Mx	6	-224.229	3.267	0.021
			Max. My	11	-8.303	0.003	-3.588
			Max. Vy	10	-0.628	3.265	0.036
			Max. Vx	9	-0.257	-0.006	3.567
		Diagonal	Max Tension	5	4.741	0.000	0.000
			Max. Compression	11	-5.190	0.000	0.000
			Max. Mx	12	3.894	-0.044	-0.005
			Max. My	4	-4.751	0.014	0.011

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	19	0.018	-0.024	-0.001
			Max. Vx	4	-0.003	0.000	0.000
T20	50 - 45	Leg	Max Tension	12	224.238	-3.232	-0.001
			Max. Compression	6	-236.930	0.422	0.013
			Max. Mx	6	-236.780	3.267	0.021
			Max. My	11	-8.407	0.003	-3.588
			Max. Vy	10	0.595	3.265	0.036
			Max. Vx	9	0.294	-0.006	3.567
		Diagonal	Max Tension	11	5.665	0.000	0.000
			Max. Compression	11	-6.133	0.000	0.000
			Max. Mx	6	4.630	-0.046	-0.008
			Max. My	9	-5.726	0.029	-0.017
			Max. Vy	19	0.020	-0.028	-0.004
			Max. Vx	9	0.005	0.028	-0.017
T21	45 - 40	Leg	Max Tension	12	234.415	-0.592	-0.002
			Max. Compression	6	-247.912	8.260	0.001
			Max. Mx	6	-247.783	8.260	0.001
			Max. My	11	-8.656	-0.051	-3.104
			Max. Vy	6	-3.221	8.260	0.001
			Max. Vx	9	-1.146	-0.055	3.103
		Diagonal	Max Tension	4	6.251	0.054	-0.019
			Max. Compression	10	-6.602	0.000	0.000
			Max. Mx	10	2.383	0.065	-0.012
			Max. My	10	-6.593	-0.048	0.021
			Max. Vy	10	-0.023	0.065	-0.012
			Max. Vx	10	0.006	0.000	0.000
		Secondary Horizontal	Max Tension	6	4.295	-0.022	-0.020
			Max. Compression	6	-4.295	0.000	0.000
			Max. Mx	9	-3.851	0.034	0.027
			Max. My	3	-3.828	0.034	0.027
			Max. Vy	22	-0.023	0.017	0.009
			Max. Vx	3	0.010	0.000	0.000
T22	40 - 33.3333	Leg	Max Tension	12	248.902	-0.952	-0.001
			Max. Compression	6	-262.992	2.674	0.019
			Max. Mx	12	248.683	-2.696	-0.000
			Max. My	11	-9.282	-0.031	-3.638
			Max. Vy	6	-0.320	2.674	0.019
			Max. Vx	9	-0.115	-0.038	3.617
		Diagonal	Max Tension	4	5.268	0.000	0.000
			Max. Compression	11	-5.911	0.000	0.000
			Max. Mx	12	5.017	-0.070	0.013
			Max. My	11	-5.896	0.046	-0.023
			Max. Vy	19	0.024	-0.038	-0.004
			Max. Vx	11	0.006	0.000	0.000
T23	33.3333 - 26.6667	Leg	Max Tension	12	264.048	-2.696	-0.000
			Max. Compression	10	-279.148	2.982	0.022
			Max. Mx	10	-279.148	2.982	0.022
			Max. My	11	-9.571	-0.031	-3.638
			Max. Vy	2	-0.077	2.968	-0.027
			Max. Vx	9	0.325	-0.038	3.617
		Diagonal	Max Tension	5	5.368	0.000	0.000
			Max. Compression	11	-6.180	0.000	0.000
			Max. Mx	10	4.733	-0.072	-0.009
			Max. My	9	-5.748	0.044	-0.015
			Max. Vy	19	0.025	-0.043	-0.004
			Max. Vx	9	0.003	0.043	-0.015
T24	26.6667 - 20	Leg	Max Tension	12	276.967	-2.917	0.001
			Max. Compression	10	-293.304	2.259	-0.003
			Max. Mx	10	-293.086	2.982	0.022

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	11	-10.164	-0.072	-3.292
			Max. Vy	2	0.139	2.968	-0.027
			Max. Vx	13	-0.272	-0.072	3.278
		Diagonal	Max Tension	11	4.885	0.000	0.000
			Max. Compression	11	-5.709	0.000	0.000
			Max. Mx	12	4.121	-0.066	0.005
			Max. My	4	-5.023	0.020	0.011
			Max. Vy	19	0.026	-0.042	-0.001
			Max. Vx	4	-0.003	0.000	0.000
T25	20 - 13.3333	Leg	Max Tension	12	288.846	-2.337	-0.001
			Max. Compression	10	-306.610	0.719	0.022
			Max. Mx	12	288.846	-2.337	-0.001
			Max. My	11	-10.317	-0.072	-3.292
			Max. Vy	6	0.262	2.260	0.022
			Max. Vx	13	0.188	-0.072	3.278
		Diagonal	Max Tension	11	5.207	0.000	0.000
			Max. Compression	11	-5.784	0.000	0.000
			Max. Mx	10	4.013	0.051	0.002
			Max. My	9	-5.360	-0.031	0.008
			Max. Vy	19	-0.018	0.031	0.002
			Max. Vx	9	-0.002	-0.031	0.008
T26	13.3333 - 6.66666	Leg	Max Tension	12	299.295	-0.829	0.001
			Max. Compression	10	-318.291	0.302	0.090
			Max. Mx	10	-318.180	8.437	-0.002
			Max. My	9	-10.371	-0.245	6.738
			Max. Vy	10	2.398	8.437	-0.002
			Max. Vx	9	-1.982	-0.245	6.738
		Diagonal	Max Tension	4	5.066	0.042	-0.010
			Max. Compression	11	-5.586	0.000	0.000
			Max. Mx	10	2.967	0.046	-0.007
			Max. My	10	-5.476	-0.033	0.013
			Max. Vy	23	-0.020	0.035	-0.003
			Max. Vx	10	0.003	0.000	0.000
		Secondary Horizontal	Max Tension	10	5.515	0.000	0.000
			Max. Compression	10	-5.515	-0.004	-0.010
			Max. Mx	17	-0.979	0.024	0.006
			Max. My	9	-3.475	0.013	0.017
			Max. Vy	17	0.021	0.024	0.006
			Max. Vx	9	-0.005	0.000	0.000
T27	6.66666 - 0	Leg	Max Tension	12	318.250	0.631	-0.001
			Max. Compression	10	-339.853	0.000	0.000
			Max. Mx	15	-131.432	1.346	-0.024
			Max. My	9	-10.556	-0.245	6.738
			Max. Vy	10	-8.702	0.000	0.000
			Max. Vx	9	1.049	-0.245	6.738
		Diagonal	Max Tension	4	6.373	0.000	0.000
			Max. Compression	10	-7.138	0.000	0.000
			Max. Mx	10	2.931	-0.087	-0.026
			Max. My	9	-5.721	0.044	-0.041
			Max. Vy	19	0.030	-0.040	-0.011
			Max. Vx	9	0.009	0.042	-0.041

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	10	339.487	15.665	-8.906
	Max. H_x	10	339.487	15.665	-8.906
	Max. H_z	4	-316.096	-14.880	8.444
	Min. Vert	4	-316.096	-14.880	8.444
	Min. H_x	4	-316.096	-14.880	8.444
	Min. H_z	10	339.487	15.665	-8.906
Leg B	Max. Vert	6	339.208	-15.592	-8.962
	Max. H_x	12	-317.874	14.868	8.573
	Max. H_z	12	-317.874	14.868	8.573
	Min. Vert	12	-317.874	14.868	8.573
	Min. H_x	6	339.208	-15.592	-8.962
	Min. H_z	6	339.208	-15.592	-8.962
Leg A	Max. Vert	2	337.702	0.084	17.941
	Max. H_x	5	8.318	0.983	0.280
	Max. H_z	2	337.702	0.084	17.941
	Min. Vert	8	-316.438	-0.118	-17.089
	Min. H_x	11	11.366	-0.993	0.377
	Min. H_z	8	-316.438	-0.118	-17.089

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	28.631	0.000	0.000	2.444	-0.331	-0.000
Dead+Wind 0 deg - No Ice	28.631	-0.151	-25.105	-2131.449	22.555	1.491
Dead+Wind 30 deg - No Ice	28.631	12.455	-21.448	-1827.224	-1063.136	2.423
Dead+Wind 60 deg - No Ice	28.631	21.473	-12.311	-1046.839	-1837.906	1.844
Dead+Wind 90 deg - No Ice	28.631	24.858	0.019	7.962	-2123.744	0.817
Dead+Wind 120 deg - No Ice	28.631	21.762	12.602	1078.336	-1849.905	0.250
Dead+Wind 150 deg - No Ice	28.631	12.448	21.463	1837.409	-1067.182	-0.650
Dead+Wind 180 deg - No Ice	28.631	0.064	24.703	2117.313	-11.837	-1.725
Dead+Wind 210 deg - No Ice	28.631	-12.399	21.533	1843.405	1054.504	-2.424
Dead+Wind 240 deg - No Ice	28.631	-21.890	12.501	1059.709	1862.751	-1.753
Dead+Wind 270 deg - No Ice	28.631	-24.949	-0.084	-11.836	2135.044	-0.813
Dead+Wind 300 deg - No Ice	28.631	-21.485	-12.392	-1062.865	1841.987	-0.108
Dead+Wind 330 deg - No Ice	28.631	-12.505	-21.484	-1835.093	1074.398	0.647
Dead+Ice+Temp	60.056	0.000	-0.000	7.318	-1.194	-0.000
Dead+Wind 0 deg+Ice+Temp	60.056	-0.038	-8.872	-739.597	4.701	0.385
Dead+Wind 30 deg+Ice+Temp	60.056	4.329	-7.466	-628.515	-370.006	0.583
Dead+Wind 60 deg+Ice+Temp	60.056	7.418	-4.261	-356.415	-636.598	0.432
Dead+Wind 90 deg+Ice+Temp	60.056	8.644	0.005	8.869	-738.284	0.183
Dead+Wind 120 deg+Ice+Temp	60.056	7.688	4.449	383.257	-648.561	0.034
Dead+Wind 150 deg+Ice+Temp	60.056	4.327	7.470	644.746	-371.089	-0.195
Dead+Wind 180 deg+Ice+Temp	60.056	0.016	8.543	739.333	-4.186	-0.436
Dead+Wind 210 deg+Ice+Temp	60.056	-4.314	7.487	646.265	365.549	-0.583
Dead+Wind 240 deg+Ice+Temp	60.056	-7.720	4.423	378.427	649.597	-0.419
Dead+Wind 270 deg+Ice+Temp	60.056	-8.667	-0.022	3.736	738.940	-0.182
Dead+Wind 300 deg+Ice+Temp	60.056	-7.421	-4.282	-360.568	635.417	0.004
Dead+Wind 330 deg+Ice+Temp	60.056	-4.342	-7.475	-630.556	370.691	0.194
Dead+Wind 0 deg - Service	28.631	-0.059	-9.807	-831.258	8.610	0.584
Dead+Wind 30 deg - Service	28.631	4.866	-8.378	-712.392	-415.548	0.928
Dead+Wind 60 deg - Service	28.631	8.388	-4.809	-407.483	-718.254	0.720
Dead+Wind 90 deg - Service	28.631	9.710	0.007	4.637	-829.950	0.339
Dead+Wind 120 deg - Service	28.631	8.501	4.923	422.824	-722.978	0.098
Dead+Wind 150 deg - Service	28.631	4.862	8.385	719.375	-417.166	-0.274
Dead+Wind 180 deg - Service	28.631	0.025	9.650	828.722	-4.827	-0.676

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Dead+Wind 210 deg - Service	28.631	-4.843	8.412	721.709	411.806	-0.928
Dead+Wind 240 deg - Service	28.631	-8.551	4.883	415.539	727.582	-0.684
Dead+Wind 270 deg - Service	28.631	-9.746	-0.033	-3.099	833.949	-0.337
Dead+Wind 300 deg - Service	28.631	-8.393	-4.841	-413.739	719.438	-0.043
Dead+Wind 330 deg - Service	28.631	-4.886	-8.392	-715.463	419.545	0.273

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	0.000	-28.631	0.000	-0.000	28.631	0.000	0.000%
2	-0.151	-28.631	-25.105	0.151	28.631	25.105	0.000%
3	12.457	-28.631	-21.448	-12.455	28.631	21.448	0.004%
4	21.474	-28.631	-12.312	-21.473	28.631	12.311	0.003%
5	24.859	-28.631	0.018	-24.858	28.631	-0.019	0.004%
6	21.762	-28.631	12.602	-21.762	28.631	-12.602	0.000%
7	12.448	-28.631	21.465	-12.448	28.631	-21.463	0.004%
8	0.064	-28.631	24.704	-0.064	28.631	-24.703	0.003%
9	-12.398	-28.631	21.535	12.399	28.631	-21.533	0.004%
10	-21.890	-28.631	12.501	21.890	28.631	-12.501	0.000%
11	-24.950	-28.631	-0.086	24.949	28.631	0.084	0.004%
12	-21.486	-28.631	-12.392	21.485	28.631	12.392	0.003%
13	-12.507	-28.631	-21.484	12.505	28.631	21.484	0.004%
14	0.000	-60.056	0.000	-0.000	60.056	0.000	0.000%
15	-0.038	-60.056	-8.871	0.038	60.056	8.872	0.000%
16	4.329	-60.056	-7.466	-4.329	60.056	7.466	0.000%
17	7.418	-60.056	-4.261	-7.418	60.056	4.261	0.000%
18	8.644	-60.056	0.005	-8.644	60.056	-0.005	0.000%
19	7.688	-60.056	4.448	-7.688	60.056	-4.449	0.000%
20	4.327	-60.056	7.470	-4.327	60.056	-7.470	0.000%
21	0.016	-60.056	8.543	-0.016	60.056	-8.543	0.000%
22	-4.314	-60.056	7.488	4.314	60.056	-7.487	0.000%
23	-7.720	-60.056	4.423	7.720	60.056	-4.423	0.000%
24	-8.667	-60.056	-0.022	8.667	60.056	0.022	0.000%
25	-7.421	-60.056	-4.282	7.421	60.056	4.282	0.000%
26	-4.342	-60.056	-7.475	4.342	60.056	7.475	0.000%
27	-0.059	-28.631	-9.807	0.059	28.631	9.807	0.000%
28	4.866	-28.631	-8.378	-4.866	28.631	8.378	0.000%
29	8.388	-28.631	-4.809	-8.388	28.631	4.809	0.000%
30	9.710	-28.631	0.007	-9.710	28.631	-0.007	0.000%
31	8.501	-28.631	4.923	-8.501	28.631	-4.923	0.000%
32	4.862	-28.631	8.385	-4.862	28.631	-8.385	0.000%
33	0.025	-28.631	9.650	-0.025	28.631	-9.650	0.000%
34	-4.843	-28.631	8.412	4.843	28.631	-8.412	0.000%
35	-8.551	-28.631	4.883	8.551	28.631	-4.883	0.000%
36	-9.746	-28.631	-0.033	9.746	28.631	0.033	0.000%
37	-8.393	-28.631	-4.841	8.393	28.631	4.841	0.000%
38	-4.886	-28.631	-8.392	4.886	28.631	8.392	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000924
3	Yes	4	0.00000001	0.00003637
4	Yes	4	0.00000001	0.00002101
5	Yes	4	0.00000001	0.00003631
6	Yes	4	0.00000001	0.00001074
7	Yes	4	0.00000001	0.00003736
8	Yes	4	0.00000001	0.00001914
9	Yes	4	0.00000001	0.00003668
10	Yes	4	0.00000001	0.00001090
11	Yes	4	0.00000001	0.00003685
12	Yes	4	0.00000001	0.00002109
13	Yes	4	0.00000001	0.00003753
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00008883
16	Yes	4	0.00000001	0.00009314
17	Yes	4	0.00000001	0.00009567
18	Yes	4	0.00000001	0.00009174
19	Yes	4	0.00000001	0.00009022
20	Yes	4	0.00000001	0.00009310
21	Yes	4	0.00000001	0.00009449
22	Yes	4	0.00000001	0.00009300
23	Yes	4	0.00000001	0.00008994
24	Yes	4	0.00000001	0.00009172
25	Yes	4	0.00000001	0.00009568
26	Yes	4	0.00000001	0.00009310
27	Yes	4	0.00000001	0.00001027
28	Yes	4	0.00000001	0.00001159
29	Yes	4	0.00000001	0.00001197
30	Yes	4	0.00000001	0.00001137
31	Yes	4	0.00000001	0.00001042
32	Yes	4	0.00000001	0.00001158
33	Yes	4	0.00000001	0.00001183
34	Yes	4	0.00000001	0.00001160
35	Yes	4	0.00000001	0.00001040
36	Yes	4	0.00000001	0.00001142
37	Yes	4	0.00000001	0.00001201
38	Yes	4	0.00000001	0.00001161

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	130 - 120	14.342	31	1.006	0.137
T2	120 - 117.143	12.229	31	0.994	0.100
T3	117.143 - 114.286	11.632	31	0.988	0.094
T4	114.286 - 111.43	11.037	31	0.979	0.087
T5	111.43 - 108.573	10.450	31	0.967	0.081
T6	108.573 - 105.716	9.868	31	0.952	0.074
T7	105.716 - 102.859	9.295	31	0.931	0.067
T8	102.859 - 100	8.736	31	0.904	0.059
T9	100 - 96	8.197	31	0.872	0.052
T10	96 - 92	7.474	31	0.824	0.041
T11	92 - 88	6.801	31	0.773	0.035
T12	88 - 84	6.171	31	0.719	0.032
T13	84 - 80	5.580	31	0.681	0.028

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T14	80 - 75	5.021	31	0.640	0.026
T15	75 - 70	4.362	31	0.595	0.022
T16	70 - 65	3.755	31	0.547	0.020
T17	65 - 60	3.198	31	0.497	0.018
T18	60 - 55	2.696	31	0.446	0.016
T19	55 - 50	2.249	31	0.394	0.014
T20	50 - 45	1.849	35	0.355	0.012
T21	45 - 40	1.492	35	0.315	0.011
T22	40 - 33.3333	1.174	35	0.275	0.009
T23	33.3333 - 26.6667	0.812	35	0.227	0.008
T24	26.6667 - 20	0.521	35	0.179	0.006
T25	20 - 13.3333	0.294	35	0.131	0.005
T26	13.3333 - 6.66666	0.131	35	0.085	0.003
T27	6.66666 - 0	0.029	35	0.038	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130'	VHLP2.5	31	14.342	1.006	0.137	39457
128'	LLPX310R w/ Mount Pipe	31	13.918	1.004	0.128	39457
126'	VHLP2.5	31	13.494	1.002	0.120	39457
124'	VHLP2.5	31	13.071	0.999	0.113	33125
118'6"	APXVTM14-C-120 w/ Mount Pipe	31	11.916	0.991	0.097	38600
110'	(2) LGP13519	31	10.158	0.960	0.078	13125
93'	AIR 21 B2A/B4P	31	6.965	0.786	0.036	4217
80'	(2) LNX-6514DS-A1M w/ Mount Pipe	31	5.021	0.640	0.026	6731
55'6"	GPS-QBW-20N	31	2.292	0.399	0.014	6314
50'6"	GPS	35	1.887	0.358	0.012	6838

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	130 - 120	36.644	12	2.569	0.350
T2	120 - 117.143	31.244	11	2.542	0.257
T3	117.143 - 114.286	29.720	11	2.528	0.240
T4	114.286 - 111.43	28.198	11	2.506	0.224
T5	111.43 - 108.573	26.699	11	2.475	0.208
T6	108.573 - 105.716	25.213	11	2.435	0.191
T7	105.716 - 102.859	23.750	11	2.381	0.171
T8	102.859 - 100	22.322	11	2.313	0.152
T9	100 - 96	20.943	11	2.232	0.133
T10	96 - 92	19.097	11	2.108	0.104
T11	92 - 88	17.377	11	1.975	0.091
T12	88 - 84	15.768	11	1.839	0.081
T13	84 - 80	14.256	11	1.740	0.073
T14	80 - 75	12.828	11	1.636	0.066
T15	75 - 70	11.143	11	1.521	0.058

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T16	70 - 65	9.591	10	1.399	0.051
T17	65 - 60	8.171	10	1.271	0.045
T18	60 - 55	6.890	10	1.139	0.040
T19	55 - 50	5.748	10	1.007	0.036
T20	50 - 45	4.725	10	0.906	0.032
T21	45 - 40	3.813	10	0.804	0.028
T22	40 - 33.3333	3.000	10	0.701	0.024
T23	33.3333 - 26.6667	2.075	10	0.579	0.020
T24	26.6667 - 20	1.332	10	0.457	0.016
T25	20 - 13.3333	0.753	10	0.336	0.013
T26	13.3333 - 6.66666	0.334	10	0.216	0.007
T27	6.66666 - 0	0.076	10	0.097	0.002

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
130'	VHLP2.5	12	36.644	2.569	0.350	16031
128'	LLPX310R w/ Mount Pipe	12	35.559	2.565	0.329	16031
126'	VHLP2.5	12	34.475	2.561	0.308	16031
124'	VHLP2.5	12	33.393	2.556	0.289	13459
118'6"	APXVTM14-C-120 w/ Mount Pipe	11	30.443	2.536	0.248	15744
110'	(2) LGP13519	11	25.953	2.456	0.200	5158
93'	AIR 21 B2A/B4P	11	17.796	2.010	0.093	1643
80'	(2) LNX-6514DS-A1M w/ Mount Pipe	11	12.828	1.636	0.066	2632
55'6"	GPS-QBW-20N	10	5.856	1.019	0.036	2470
50'6"	GPS	10	4.822	0.915	0.032	2661

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	130	Leg	A325N	1.000	1	8.353	34.462	0.242 ✔	1.333	Bolt Tension
T8	102.859	Leg	A325N	0.750	4	17.329	19.316	0.897 ✔	1.333	Bolt Tension
T9	100	Diagonal	A325N	0.500	1	3.943	3.127	1.261 ✔	1.333	Member Block Shear
T10	96	Diagonal	A325X	0.500	1	4.898	5.890	0.832 ✔	1.333	Bolt Shear
T11	92	Diagonal	A325N	0.500	1	7.220	6.253	1.155 ✔	1.333	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.042	4.123	0.738 ✔	1.333	Bolt Shear
T12	88	Diagonal	A325N	0.500	1	6.792	6.253	1.086 ✔	1.333	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.797	4.123	0.921 ✔	1.333	Bolt Shear
T13	84	Leg	A325N	1.000	8	14.702	34.554	0.425 ✔	1.333	Bolt Tension

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
		Diagonal	A325N	0.500	1	5.981	6.253	0.957 ✔	1.333	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.211	4.123	0.779 ✔	1.333	Bolt Shear
T14	80	Diagonal	A325X	0.500	1	6.485	5.890	1.101 ✔	1.333	Bolt Shear
T15	75	Diagonal	A325N	0.500	1	6.663	6.253	1.066 ✔	1.333	Member Block Shear
T16	70	Diagonal	A325N	0.500	1	5.775	6.253	0.923 ✔	1.333	Member Block Shear
T17	65	Leg	A325N	1.000	8	23.010	34.557	0.666 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.500	1	6.021	6.253	0.963 ✔	1.333	Member Block Shear
T18	60	Diagonal	A325N	0.500	1	7.392	6.253	1.182 ✔	1.333	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.577	2.719	1.316 ✔	1.333	Member Bearing
T19	55	Diagonal	A325N	0.500	1	4.741	6.253	0.758 ✔	1.333	Member Block Shear
T20	50	Diagonal	A325N	0.500	1	5.665	6.253	0.906 ✔	1.333	Member Block Shear
T21	45	Leg	A325N	1.000	8	29.272	34.551	0.847 ✔	1.333	Bolt Tension
		Diagonal	A325X	0.500	1	6.602	5.890	1.121 ✔	1.333	Bolt Shear
		Secondary Horizontal	A325N	0.500	1	4.295	4.123	1.042 ✔	1.333	Bolt Shear
T22	40	Diagonal	A325N	0.500	1	5.911	8.247	0.717 ✔	1.333	Bolt Shear
T23	33.3333	Diagonal	A325N	0.500	1	6.180	8.247	0.749 ✔	1.333	Bolt Shear
T24	26.6667	Leg	A325N	1.000	8	34.621	34.557	1.002 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.500	1	5.709	8.247	0.692 ✔	1.333	Bolt Shear
T25	20	Diagonal	A325X	0.500	1	5.207	4.078	1.277 ✔	1.333	Member Bearing
T26	13.3333	Diagonal	A325X	0.500	1	5.066	4.078	1.242 ✔	1.333	Member Bearing
		Secondary Horizontal	A325N	0.625	1	5.515	6.443	0.856 ✔	1.333	Bolt Shear
T27	6.66666	Leg	A36M-55	1.500	6	53.042	49.568	1.070 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.500	1	7.138	8.247	0.866 ✔	1.333	Bolt Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio P / P_a
T1	130 - 120	1 1/2	10'	2'5-3/4"	79.3 K=1.00	17.949	1.767	-7.914	31.718	0.250 ✔
T2	120 - 117.143	2	2'10-9/32' '	2'9-9/32"	66.6 K=1.00	19.956	3.142	-12.819	62.693	0.204

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T3	117.143 - 114.286	2	2'10-9/32"	2'9-9/32"	66.6 K=1.00	19.956	3.142	-19.281	62.693	0.308
T4	114.286 - 111.43	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	19.654	3.142	-26.000	61.745	0.421
T5	111.43 - 108.573	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	19.654	3.142	-34.196	61.745	0.554
T6	108.573 - 105.716	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	19.654	3.142	-44.659	61.745	0.723
T7	105.716 - 102.859	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	19.654	3.142	-56.490	61.745	0.915
T8	102.859 - 100	2	2'10-5/16"	1'4-21/32"	33.3 K=1.00	24.257	3.142	-67.042	76.206	0.880
T9	100 - 96	P4.5 x 0.237	4'1/32"	4'1/32"	31.8 K=1.00	28.908	3.174	-76.726	91.755	0.836
T10	96 - 92	P4.5 x 0.237	4'1/32"	4'1/32"	31.8 K=1.00	28.908	3.174	-89.534	91.755	0.976
T11	92 - 88	P4.5 x 0.237	4'1/32"	2'13/16"	16.4 K=1.00	30.888	3.174	-98.353	98.040	1.003
T12	88 - 84	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'25/32"	16.8 K=1.00	30.841	4.658	-112.008	143.672	0.780
T13	84 - 80	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'23/32"	16.8 K=1.00	30.844	4.658	-124.569	143.688	0.867
T14	80 - 75	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	29.617	5.581	-141.999	165.302	0.859
T15	75 - 70	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	29.617	5.581	-160.866	165.302	0.973
T16	70 - 65	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	29.617	5.581	-178.357	165.302	1.079
T17	65 - 60	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	29.617	5.581	-194.360	165.302	1.176
T18	60 - 55	P6.625x0.280	5'1/32"	2'6-13/16"	13.7 K=1.00	31.182	5.581	-206.358	174.039	1.186
T19	55 - 50	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1 K=1.00	29.561	7.511	-224.229	222.017	1.010
T20	50 - 45	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1 K=1.00	29.561	7.511	-236.930	222.017	1.067
T21	45 - 40	BT101341- P6.625x0.280 w/ HP7.625x0.301	5'1/32"	2'6-23/32"	13.9 K=1.00	31.166	7.382	-247.859	230.057	1.077
T22	40 - 33.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	28.214	8.405	-262.992	237.136	1.109
T23	33.3333 - 26.6667	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	28.214	8.405	-279.148	237.136	1.177
T24	26.6667 - 20	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	28.214	8.405	-293.304	237.136	1.237
T25	20 - 13.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	28.214	8.405	-306.610	237.136	1.293
T26	13.3333 - 6.66666	P6.625x.432	6'8-1/32"	3'4-31/32"	18.7 K=1.00	30.632	8.405	-318.292	257.458	1.236
T27	6.66666 - 0	BT101341- P6.625 x .432 w/ HP7.625x0.301	6'8-1/32"	6'7-1/32"	36.5 K=1.00	28.201	10.183	-330.259	287.180	1.150

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	1/2	3'6-1/4"	1'8-1/16"	144.5 K=0.90	7.152	0.196	-1.472	1.404	1.049 ✔
T2	120 - 117.143	3/4	3'8-13/16'	1'8-29/32'	105.1 K=0.94	12.322	0.442	-2.302	5.444	0.423 ✔
T3	117.143 - 114.286	3/4	3'8-13/16'	1'8-29/32'	105.1 K=0.94	12.322	0.442	-3.107	5.444	0.571 ✔
T4	114.286 - 111.43	3/4	3'9-9/16"	1'9-1/4"	105.8 K=0.93	12.231	0.442	-2.903	5.403	0.537 ✔
T5	111.43 - 108.573	3/4	3'9-9/16"	1'9-1/4"	105.8 K=0.93	12.231	0.442	-3.911	5.403	0.724 ✔
T6	108.573 - 105.716	3/4	3'9-9/16"	1'9-1/4"	105.8 K=0.93	12.231	0.442	-4.966	5.403	0.919 ✔
T7	105.716 - 102.859	3/4	3'9-9/16"	1'9-1/4"	105.8 K=0.93	12.231	0.442	-4.894	5.403	0.906 ✔
T8	102.859 - 100	3/4	3'8-27/32'	1'8-29/32'	105.1 K=0.94	12.320	0.442	-5.131	5.443	0.943 ✔
T9	100 - 96	L1 1/2x1 1/2x3/16	4'9-1/4"	2'7/16"	92.5 K=1.11	13.907	0.527	-4.091	7.334	0.558 ✔
T10	96 - 92	L2x2x1/4	4'10-19/32"	2'15/16"	77.8 K=1.22	15.597	0.938	-4.898	14.630	0.335 ✔
T11	92 - 88	2L1 1/2x1 1/2x3/16x3/8	5'	2'3-1/4"	59.7 K=1.00	17.463	1.055	-7.547	18.418	0.410 ✔
T12	88 - 84	2L1 1/2x1 1/2x3/16x3/8	5'1-15/32'	2'4-3/32"	61.5 K=1.00	17.283	1.055	-7.023	18.228	0.385 ✔
T13	84 - 80	2L1 1/2x1 1/2x3/16x3/8	5'3"	2'4-31/32'	63.4 K=1.00	17.098	1.055	-6.180	18.034	0.343 ✔
T14	80 - 75	L2x2x1/4	6'2-1/8"	2'7-3/16"	89.8 K=1.13	14.225	0.938	-6.485	13.343	0.486 ✔
T15	75 - 70	2L1 1/2x1 1/2x3/16x3/8	6'3-29/32'	2'8-17/32'	71.2 K=1.00	16.303	1.055	-7.194	17.195	0.418 ✔
T16	70 - 65	2L1 1/2x1 1/2x3/16x3/8	6'5-25/32'	2'9-5/8"	73.6 K=1.00	16.051	1.055	-6.372	16.928	0.376 ✔
T17	65 - 60	2L1 1/2x1 1/2x3/16x3/8	6'7-23/32'	2'10-23/32"	76.0 K=1.00	15.790	1.055	-6.544	16.654	0.393 ✔
T18	60 - 55	2L1 1/2x1 1/2x3/16x3/8	6'9-23/32'	3'1-3/32"	81.2 K=1.00	15.218	1.055	-7.919	16.050	0.493 ✔
T19	55 - 50	2L1 1/2x1 1/2x3/16x3/8	6'11-13/16"	3'31/32"	81.0 K=1.00	15.246	1.055	-5.190	16.080	0.323 ✔
T20	50 - 45	2L1 1/2x1 1/2x3/16x3/8	7'1-29/32'	3'2-1/8"	83.5 K=1.00	14.961	1.055	-6.133	15.779	0.389 ✔
T21	45 - 40	L2x2x1/4	7'4-3/32"	3'4-9/16"	103.7 K=1.00	12.503	0.938	-6.602	11.728	0.563 ✔
T22	40 - 33.3333	2L1 3/4x1 3/4x3/16x3/8	8'9"	3'11-11/16"	88.8 K=1.00	14.347	1.242	-5.911	17.821	0.332 ✔
T23	33.3333 - 26.6667	2L1 3/4x1 3/4x3/16x3/8	8'11-5/8"	4'1-1/8"	91.5 K=1.00	14.030	1.242	-6.180	17.428	0.355 ✔
T24	26.6667 - 20	2L1 3/4x1 3/4x3/16x3/8	9'2-11/32'	4'2-9/16"	94.2 K=1.00	13.701	1.242	-5.709	17.020	0.335 ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T25	20 - 13.3333	L2x2x3/16	9'5-5/32"	4'4-1/16"	132.2 K=1.00	8.547	0.715	-5.784	6.110	0.947 ✔
T26	13.3333 - 6.66666	L2x2x3/16	9'8"	4'6-13/16"	139.2 K=1.00	7.708	0.715	-5.586	5.510	1.014 ✔
T27	6.66666 - 0	2L2x2x3/16x3/8	9'10-1/4"	4'6-3/4"	88.7 K=1.00	14.355	1.430	-7.138	20.527	0.348 ✔

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	118.5 K=1.01	10.498	0.434	-0.257	4.552	0.056 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T8	102.859 - 100	L2x2x1/8	2'6"	2'4"	82.4 K=1.84	14.733	0.484	-1.161	7.136	0.163 ✔
T11	92 - 88	4x3/8	2'11-31/32"	2'7-15/32"	145.3 K=0.50	7.072	1.500	-2.884	10.608	0.272 ✔
T12	88 - 84	4x3/8	3'2-11/32"	2'9-27/32"	156.4 K=0.50	6.108	1.500	-3.539	9.162	0.386 ✔
T13	84 - 80	4x3/8	3'4-3/4"	3'1/4"	167.5 K=0.50	5.324	1.500	-3.048	7.985	0.382 ✔
T18	60 - 55	L2x2x1/8	4'7-15/32"	4'27/32"	39.0 K=0.50	18.668	0.484	-3.577	9.042	0.396 ✔
T21	45 - 40	L3x3x5/16	5'4-15/32"	4'9-27/32"	31.4 K=0.50	19.844	1.780	-4.295	35.322	0.122 ✔
T26	13.3333 - 6.66666	L2x2x1/4	6'11-15/16"	6'5-5/16"	63.5 K=0.50	17.090	0.938	-5.515	16.030	0.344 ✔

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	118.5 K=1.01	10.498	0.434	-0.061	4.552	0.013 ✔
T2	120 - 117.143	L1 1/4x1 1/4x3/16	2'6"	2'4"	117.5 K=1.02	10.643	0.434	-0.031	4.615	0.007 ✔

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

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	118.5 K=1.01	10.498	0.434	-0.208	4.552	0.046 ✔
T8	102.859 - 100	L1 1/4x1 1/4x3/16	2'6"	2'4"	117.5 K=1.02	10.643	0.434	-0.875	4.615	0.190 ✔

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	1 1/2	10'	1"	2.7	27.000	1.767	8.353	47.713	0.175 ✔
T2	120 - 117.143	2	2'10-9/32"	2'9-9/32"	66.6	27.000	3.142	10.548	84.823	0.124 ✔
T3	117.143 - 114.286	2	2'10-9/32"	2'9-9/32"	66.6	27.000	3.142	16.916	84.823	0.199 ✔
T4	114.286 - 111.43	2	2'10-9/32"	2'10-9/32"	68.6	27.000	3.142	23.659	84.823	0.279 ✔
T5	111.43 - 108.573	2	2'10-9/32"	2'10-9/32"	68.6	27.000	3.142	31.058	84.823	0.366 ✔
T6	108.573 - 105.716	2	2'10-9/32"	2'10-9/32"	68.6	27.000	3.142	40.858	84.823	0.482 ✔
T7	105.716 - 102.859	2	2'10-9/32"	2'10-9/32"	68.6	27.000	3.142	52.520	84.823	0.619 ✔
T8	102.859 - 100	2	2'10-5/16"	1"	2.0	27.000	3.142	69.316	84.823	0.817 ✔
T9	100 - 96	P4.5 x 0.237	4'1/32"	4'1/32"	31.8	32.400	3.174	72.865	102.839	0.709 ✔
T10	96 - 92	P4.5 x 0.237	4'1/32"	4'1/32"	31.8	32.400	3.174	84.481	102.839	0.821 ✔
T11	92 - 88	P4.5 x 0.237	4'1/32"	1'11-7/32"	15.4	32.400	3.174	92.637	102.839	0.901 ✔
T12	88 - 84	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	1'11-1/4"	15.8	32.400	4.658	105.721	150.934	0.700 ✔
T13	84 - 80	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	1'11-5/16"	15.9	32.400	4.658	117.755	150.934	0.780 ✔
T14	80 - 75	P6.625x0.280	5'1/32"	5'1/32"	26.7	32.400	5.581	134.039	180.836	0.741

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T15	75 - 70	P6.625x0.280	5'1/32"	5'1/32"	26.7	32.400	5.581	151.848	180.836	0.840 ✔
T16	70 - 65	P6.625x0.280	5'1/32"	5'1/32"	26.7	32.400	5.581	168.835	180.836	0.934 ✔
T17	65 - 60	P6.625x0.280	5'1/32"	5'1/32"	26.7	32.400	5.581	184.082	180.836	1.018 ✔
T18	60 - 55	P6.625x0.280	5'1/32"	2'5-3/16"	13.0	32.400	5.581	195.673	180.836	1.082 ✔
T19	55 - 50	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1	32.400	7.511	212.340	243.342	0.873 ✔
T20	50 - 45	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1	32.400	7.511	224.238	243.342	0.921 ✔
T21	45 - 40	BT101341- P6.625x0.280 w/ HP7.625x0.301	5'1/32"	2'5-5/16"	13.2	32.400	7.382	234.415	239.163	0.980 ✔
T22	40 - 33.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	32.400	8.405	248.902	272.320	0.914 ✔
T23	33.3333 - 26.6667	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	32.400	8.405	264.048	272.320	0.970 ✔
T24	26.6667 - 20	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	32.400	8.405	276.967	272.320	1.017 ✔
T25	20 - 13.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	32.400	8.405	288.846	272.320	1.061 ✔
T26	13.3333 - 6.66666	P6.625x.432	6'8-1/32"	3'3-1/16"	17.8	32.400	8.405	299.295	272.320	1.099 ✔
T27	6.66666 - 0	BT101341- P6.625 x .432 w/ HP7.625x0.301	6'8-1/32"	1"	0.5	32.400	10.183	318.250	329.942	0.965 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	1/2	3'6-1/4"	1'8-1/16"	160.6	21.600	0.196	1.431	4.241	0.337 ✔
T2	120 - 117.143	3/4	3'8-13/16' '	1'8-29/32' '	111.5	21.600	0.442	2.383	9.543	0.250 ✔
T3	117.143 - 114.286	3/4	3'8-13/16' '	1'8-29/32' '	111.5	21.600	0.442	3.114	9.543	0.326 ✔
T4	114.286 - 111.43	3/4	3'9-9/16"	1'9-1/4"	113.4	21.600	0.442	2.869	9.543	0.301 ✔
T5	111.43 - 108.573	3/4	3'9-9/16"	1'9-1/4"	113.4	21.600	0.442	3.914	9.543	0.410 ✔
T6	108.573 - 105.716	3/4	3'9-9/16"	1'9-1/4"	113.4	21.600	0.442	4.896	9.543	0.513 ✔
T7	105.716 - 102.859	3/4	3'9-9/16"	1'9-1/4"	113.4	21.600	0.442	4.839	9.543	0.507 ✔
T8	102.859 - 100	3/4	3'8-27/32' '	1'8-29/32' '	111.6	21.600	0.442	5.018	9.543	0.526 ✔
T9	100 - 96	L1 1/2x1 1/2x3/16	4'9-1/4"	2'7/16"	56.3	29.000	0.308	3.943	8.921	0.442

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T10	96 - 92	L2x2x1/4	4'10-19/32"	2'15/16"	43.4	29.000	0.586	4.581	17.003	0.269
T11	92 - 88	2L1 1/2x1 1/2x3/16x3/8	5'	2'3-1/4"	59.7	29.000	0.615	7.220	17.842	0.405
T12	88 - 84	2L1 1/2x1 1/2x3/16x3/8	5'1-15/32"	2'4-3/32"	61.5	29.000	0.615	6.792	17.842	0.381
T13	84 - 80	2L1 1/2x1 1/2x3/16x3/8	5'3"	2'4-31/32"	63.4	29.000	0.615	5.981	17.842	0.335
T14	80 - 75	L2x2x1/4	6'2-1/8"	2'7-3/16"	53.7	29.000	0.586	6.102	17.003	0.359
T15	75 - 70	2L1 1/2x1 1/2x3/16x3/8	6'3-29/32"	2'8-17/32"	74.0	29.000	0.615	6.663	17.842	0.373
T16	70 - 65	2L1 1/2x1 1/2x3/16x3/8	6'5-25/32"	2'9-5/8"	76.4	29.000	0.615	5.775	17.842	0.324
T17	65 - 60	2L1 1/2x1 1/2x3/16x3/8	6'7-23/32"	2'10-23/32"	78.8	29.000	0.615	6.021	17.842	0.337
T18	60 - 55	2L1 1/2x1 1/2x3/16x3/8	6'9-23/32"	3'1-3/32"	81.2	29.000	0.615	7.392	17.842	0.414
T19	55 - 50	2L1 1/2x1 1/2x3/16x3/8	6'11-13/16"	3'31/32"	83.7	29.000	0.615	4.741	17.842	0.266
T20	50 - 45	2L1 1/2x1 1/2x3/16x3/8	7'1-29/32"	3'2-1/8"	86.2	29.000	0.615	5.665	17.842	0.318
T21	45 - 40	L2x2x1/4	7'4-3/32"	3'4-9/16"	66.6	29.000	0.586	6.251	17.003	0.368
T22	40 - 33.3333	2L1 3/4x1 3/4x3/16x3/8	8'9"	3'11-11/16"	91.1	29.000	0.756	5.268	21.920	0.240
T23	33.3333 - 26.6667	2L1 3/4x1 3/4x3/16x3/8	8'11-5/8"	4'1-1/8"	93.8	29.000	0.756	5.368	21.920	0.245
T24	26.6667 - 20	2L1 3/4x1 3/4x3/16x3/8	9'2-11/32"	4'2-9/16"	96.5	29.000	0.756	4.885	21.920	0.223
T25	20 - 13.3333	L2x2x3/16	9'5-5/32"	4'4-1/16"	86.3	29.000	0.448	5.207	12.999	0.401
T26	13.3333 - 6.66666	L2x2x3/16	9'8"	4'6-13/16"	88.8	29.000	0.448	5.066	12.999	0.390
T27	6.66666 - 0	2L2x2x3/16x3/8	9'10-1/4"	4'6-3/4"	90.8	29.000	0.897	6.373	26.005	0.245

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	75.7	21.600	0.434	0.291	9.366	0.031

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T8	102.859 - 100	L2x2x1/8	2'6"	2'4"	44.7	21.600	0.484	1.161	10.463	0.111 ✔
T11	92 - 88	4x3/8	2'11-31/32"	2'7-15/32"	290.6	29.000	0.949	3.042	27.527	0.111 ✔
T12	88 - 84	4x3/8	3'2-11/32"	2'9-27/32"	312.7	29.000	0.949	3.797	27.527	0.138 ✔
T13	84 - 80	4x3/8	3'4-3/4"	3'1/4"	335.0	29.000	0.949	3.211	27.527	0.117 ✔
T18	60 - 55	L2x2x1/8	4'7-15/32"	4'27/32"	78.0	29.000	0.305	3.577	8.836	0.405 ✔
T21	45 - 40	L3x3x5/16	5'4-15/32"	4'9-27/32"	62.7	29.000	1.189	4.295	34.467	0.125 ✔
T26	13.3333 - 6.66666	L2x2x1/4	6'11-15/16"	6'5-5/16"	127.0	29.000	0.563	5.515	16.323	0.338 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	75.7	21.600	0.434	0.055	9.366	0.006 ✔
T2	120 - 117.143	L1 1/4x1 1/4x3/16	2'6"	2'4"	74.4	21.600	0.434	0.058	9.366	0.006 ✔

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P K	Allow. P_a K	Ratio $\frac{P}{P_a}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	75.7	21.600	0.434	0.235	9.366	0.025 ✔
T8	102.859 - 100	L1 1/4x1 1/4x3/16	2'6"	2'4"	74.4	21.600	0.434	0.877	9.366	0.094 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T1	130 - 120	Leg	1 1/2	2	-7.914	42.280	18.7	Pass
T2	120 - 117.143	Leg	2	44	-12.819	83.570	15.3	Pass
T3	117.143 - 114.286	Leg	2	56	-19.281	83.570	23.1	Pass
T4	114.286 - 111.43	Leg	2	65	-26.000	82.306	31.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P_{allow} K	% Capacity	Pass Fail
T5	111.43 - 108.573	Leg	2	74	-34.196	82.306	41.5	Pass
T6	108.573 - 105.716	Leg	2	83	-44.659	82.306	54.3	Pass
T7	105.716 - 102.859	Leg	2	92	-56.490	82.306	68.6	Pass
T8	102.859 - 100	Leg	2	101	-67.042	101.583	66.0 67.3 (b)	Pass
T9	100 - 96	Leg	P4.5 x 0.237	116	-76.726	122.309	62.7	Pass
T10	96 - 92	Leg	P4.5 x 0.237	125	-89.534	122.309	73.2	Pass
T11	92 - 88	Leg	P4.5 x 0.237	134	-98.353	130.687	75.3	Pass
T12	88 - 84	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	146	-112.008	191.515	58.5	Pass
T13	84 - 80	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	158	-124.569	191.536	65.0	Pass
T14	80 - 75	Leg	P6.625x0.280	170	-141.999	220.348	64.4	Pass
T15	75 - 70	Leg	P6.625x0.280	179	-160.866	220.348	73.0	Pass
T16	70 - 65	Leg	P6.625x0.280	188	-178.357	220.348	80.9	Pass
T17	65 - 60	Leg	P6.625x0.280	197	-194.360	220.348	88.2	Pass
T18	60 - 55	Leg	P6.625x0.280	206	-206.358	231.994	88.9	Pass
T19	55 - 50	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	218	-224.229	295.949	75.8	Pass
T20	50 - 45	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	227	-236.930	295.949	80.1	Pass
T21	45 - 40	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301	236	-247.859	306.666	80.8	Pass
T22	40 - 33.3333	Leg	P6.625x.432	248	-262.992	316.102	83.2	Pass
T23	33.3333 - 26.6667	Leg	P6.625x.432	256	-279.148	316.102	88.3	Pass
T24	26.6667 - 20	Leg	P6.625x.432	265	-293.304	316.102	92.8	Pass
T25	20 - 13.3333	Leg	P6.625x.432	274	-306.610	316.102	97.0	Pass
T26	13.3333 - 6.66666	Leg	P6.625x.432	283	-318.292	343.191	92.7	Pass
T27	6.66666 - 0	Leg	BT101341- P6.625 x .432 w/ HP7.625x0.301	295	-330.259	382.811	86.3	Pass
T1	130 - 120	Diagonal	1/2	13	-1.472	1.872	78.7	Pass
T2	120 - 117.143	Diagonal	3/4	52	-2.302	7.257	31.7	Pass
T3	117.143 - 114.286	Diagonal	3/4	61	-3.107	7.257	42.8	Pass
T4	114.286 - 111.43	Diagonal	3/4	70	-2.903	7.203	40.3	Pass
T5	111.43 - 108.573	Diagonal	3/4	79	-3.911	7.203	54.3	Pass
T6	108.573 - 105.716	Diagonal	3/4	88	-4.966	7.203	68.9	Pass
T7	105.716 - 102.859	Diagonal	3/4	97	-4.894	7.203	67.9	Pass
T8	102.859 - 100	Diagonal	3/4	109	-5.131	7.255	70.7	Pass
T9	100 - 96	Diagonal	L1 1/2x1 1/2x3/16	121	-4.091	9.776	41.8 94.6 (b)	Pass
T10	96 - 92	Diagonal	L2x2x1/4	130	-4.898	19.502	25.1 62.4 (b)	Pass
T11	92 - 88	Diagonal	2L1 1/2x1 1/2x3/16x3/8	139	-7.547	24.551	30.7 86.6 (b)	Pass
T12	88 - 84	Diagonal	2L1 1/2x1 1/2x3/16x3/8	151	-7.023	24.298	28.9 81.5 (b)	Pass
T13	84 - 80	Diagonal	2L1 1/2x1 1/2x3/16x3/8	163	-6.180	24.039	25.7 71.8 (b)	Pass
T14	80 - 75	Diagonal	L2x2x1/4	175	-6.485	17.786	36.5 82.6 (b)	Pass
T15	75 - 70	Diagonal	2L1 1/2x1 1/2x3/16x3/8	184	-7.194	22.921	31.4 79.9 (b)	Pass
T16	70 - 65	Diagonal	2L1 1/2x1 1/2x3/16x3/8	193	-6.372	22.566	28.2 69.3 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$SF*P_{allow}$ K	% Capacity	Pass Fail
T17	65 - 60	Diagonal	2L1 1/2x1 1/2x3/16x3/8	202	-6.544	22.200	29.5 72.2 (b)	Pass
T18	60 - 55	Diagonal	2L1 1/2x1 1/2x3/16x3/8	208	-7.919	21.395	37.0 88.7 (b)	Pass
T19	55 - 50	Diagonal	2L1 1/2x1 1/2x3/16x3/8	220	-5.190	21.434	24.2 56.9 (b)	Pass
T20	50 - 45	Diagonal	2L1 1/2x1 1/2x3/16x3/8	229	-6.133	21.034	29.2 68.0 (b)	Pass
T21	45 - 40	Diagonal	L2x2x1/4	238	-6.602	15.634	42.2 84.1 (b)	Pass
T22	40 - 33.3333	Diagonal	2L1 3/4x1 3/4x3/16x3/8	250	-5.911	23.756	24.9 53.8 (b)	Pass
T23	33.3333 - 26.6667	Diagonal	2L1 3/4x1 3/4x3/16x3/8	259	-6.180	23.231	26.6 56.2 (b)	Pass
T24	26.6667 - 20	Diagonal	2L1 3/4x1 3/4x3/16x3/8	268	-5.709	22.687	25.2 51.9 (b)	Pass
T25	20 - 13.3333	Diagonal	L2x2x3/16	277	-5.784	8.144	71.0 95.8 (b)	Pass
T26	13.3333 - 6.66666	Diagonal	L2x2x3/16	286	-5.586	7.345	76.1 93.2 (b)	Pass
T27	6.66666 - 0	Diagonal	2L2x2x3/16x3/8	298	-7.138	27.363	26.1 64.9 (b)	Pass
T1	130 - 120	Horizontal	L1 1/4x1 1/4x3/16	36	-0.257	6.068	4.2	Pass
T8	102.859 - 100	Secondary Horizontal	L2x2x1/8	112	-1.161	9.513	12.2	Pass
T11	92 - 88	Secondary Horizontal	4x3/8	142	-2.884	14.141	20.4 55.4 (b)	Pass
T12	88 - 84	Secondary Horizontal	4x3/8	154	-3.539	12.213	29.0 69.1 (b)	Pass
T13	84 - 80	Secondary Horizontal	4x3/8	166	-3.048	10.644	28.6 58.4 (b)	Pass
T18	60 - 55	Secondary Horizontal	L2x2x1/8	214	3.577	11.778	30.4 98.7 (b)	Pass
T21	45 - 40	Secondary Horizontal	L3x3x5/16	244	4.295	45.945	9.3 78.1 (b)	Pass
T26	13.3333 - 6.66666	Secondary Horizontal	L2x2x1/4	292	-5.515	21.369	25.8 64.2 (b)	Pass
T1	130 - 120	Top Girt	L1 1/4x1 1/4x3/16	6	-0.061	6.068	1.0	Pass
T2	120 - 117.143	Top Girt	L1 1/4x1 1/4x3/16	48	-0.031	6.152	0.5	Pass
T1	130 - 120	Bottom Girt	L1 1/4x1 1/4x3/16	9	-0.208	6.068	3.4	Pass
T8	102.859 - 100	Bottom Girt	L1 1/4x1 1/4x3/16	105	-0.875	6.152	14.2	Pass
							Summary	
							Leg (T25) 97.0	Pass
							Diagonal (T25) 95.8	Pass
							Horizontal (T1) 4.2	Pass
							Secondary Horizontal (T18) 98.7	Pass
							Top Girt (T1) 1.0	Pass
							Bottom Girt (T8) 14.2	Pass
							Bolt Checks 98.7	Pass
							RATING = 98.7	**Pass**

MATHCAD CALCULATION PRINTOUT

SELF SUPPORTING TOWER

MAT FOUNDATION CHECK

Existing 130' Self-Support Tower

SBA Site Name: Glastonbury-main St.
SBA Site ID: CT46126-A -01

Carrier Name: AT&T
Carrier Site Name: 10071041
Site Location:
2577 Main Street
Glastonbury, CT 06033

Latitude: 41.714389°
Longitude: -72.613028°

ACGI Job # 16-2859

By:

Allpro Consulting Group, Inc.
9221 Lyndon B. Johnson Freeway, #204
Dallas, TX 75243
Phone: 972-231-8893
Fax: 866-364-8375

Foundation check

-Foundation Reactions-

((As per tnx Tower Printout) TIA-222-F

Total Shear	$S := 25 \cdot kips$	Compression on Pedestal:	$P_c := 339 \cdot kips$
		Uplift on Pedestal:	$P_{up} := 318 \cdot kips$
Moment	$M := 2143 \cdot ft\_K$	Shear on Pedestal:	$Sh := 18 \cdot kips$
Down load, Tower weight	$Pv := 29 \cdot kips$		

-Soil Properties- **Soil data as per** Geotechnical Report by Tectonic Engineering Project # 1170.C057, dated 08/26/1999 & previous structural analysis by B+T Group, Job # 101341.001.01a, dated 09/29/2015

Allowable Bearing Capacity	$Brg_{allw} := 3 \cdot ksf$
Internal angle of friction for soil,	$\phi := 0 \cdot deg$
Unit wt. of soil,	$\gamma_s := 0.12 \cdot kcf$
Alowable Passive Pressure	see next page
Cohesion of soil,	$c_u := 0 \cdot ksf$
Friction Factor	$FF := 0.35$
Depth to be neglected	$L_{neg} := 3.3 \cdot ft$

-Material Parameters-

Conforming to the design requirements as in ACI 318-99

Unit wt. of concrete,	$\gamma_c := 0.150 \cdot kcf$
Concrete compressive strength,	$f_c := 3000 \cdot psi$
Rebar yield strength,	$f_y := 60000 \cdot psi$

-Factor of Safety for soil strength-

$FS_{SOIL} := 2$

DIMENSIONS: Original Tower Design by FRED A. NUDD Corporation PJ No. 6893, Sept, 1999

Tower face width $TWFW := 7.5 \cdot ft$ Tower ht. $Tw_{ht} := 130 \cdot ft$

The tower location is eccentric by $L_{pe} := 0 \cdot ft$

with respect to the mat foundation center towards the base

Type of column, col.t=0 for circular,=1 for rectangular/square $col_t := 0$

Depth of mat, $D_f := 4 \cdot ft$ No. of pedestals $Nped := 3$

Thickness of mat, $T_f := 3 \cdot ft$

Pedestal size, $Ped_s := 3 \cdot ft$

Extension above the grade, $E_g := 6 \cdot in$

Mat Dimensions, LxB $L := 26 \cdot ft$ x $B := L$ $B = 26\,ft$

$Brg_{allw} = 3 \cdot ksf$ $FS := 2.0$

MAT SIZING CALCULATIONS

$$K_p := \tan\left(45 \cdot deg + \frac{\phi}{2}\right)^2 \qquad K_p = 1$$

$$P_{pave} := \frac{\left(D_f - T_f - L_{neg}\right) \cdot K_p \cdot \gamma_s + \left(D_f - L_{neg}\right) \cdot K_p \cdot \gamma_s}{2} \qquad P_{pave} = -0.096 \cdot ksf$$

Calculate safety against overturning and location of resultant on the base

Resisting Moments about mid axis parallel to base

$$Area_{ped} := if\left(col_t = 1, Ped_s^2, \frac{\pi}{4} \cdot Ped_s^2\right) \qquad Area_{ped} = 7.069\,ft^2$$

component	value, kips	lever arm, ft	resisting moment, ft-kips
1) Concrete wt.	$C_w := L \cdot B \cdot T_f \cdot (\gamma_c) + Area_{ped} \cdot \gamma_c \cdot (D_f + E_g - T_f) \cdot Nped$	$L_c := \frac{L}{2}$	$R_c := C_w \cdot L_c$
	$C_w = 308.971 \cdot kips$	$L_c = 13\,ft$	$R_c = 4016.627 \cdot ft\_K$
2) Soil wt.	$S_w := \left[L \cdot B \cdot (D_f - T_f) - Area_{ped} \cdot (D_f - T_f) \cdot Nped\right] \cdot \gamma_s$	$L_s := \frac{L}{2}$	$R_s := S_w \cdot L_s$
	$S_w = 78.575 \cdot kips$	$L_s = 13\,ft$	$R_s = 1021.479 \cdot ft\_K$
3) Wt. of soil wedge	$W_w := (D_f) \cdot \frac{1}{2} \cdot (D_f \cdot \tan(\phi)) \cdot B \cdot (\gamma_s)$	$L_w := \left(L + D_f \cdot \frac{\tan(\phi)}{3}\right)$	$R_w := W_w \cdot L_w$
	$W_w = 0 \cdot kips$	$L_w = 26\,ft$	$R_w = 0 \cdot ft\_K$
4) Passive pressure	$Pe_p := T_f \cdot B \cdot P_{pave}$	$L_p := \frac{T_f}{3}$	$R_p := Pe_p \cdot L_p$
	$Pe_p = -7.488 \cdot kips$	$L_p = 1\,ft$	$R_p = -7.488 \cdot ft\_K$
5) Vertical	$Pv = 29 \cdot kips$	$L_v := \frac{L}{2}$	$R_v := Pv \cdot L_v$
	$L_v = 13\,ft$	$R_v = 377 \cdot ft\_K$	
$S_{w1} := L \cdot B \cdot D_f \cdot \gamma_s$	$S_{w1} = 324.48 \cdot kips$ <--- for net calcs		
Total weight $T_w := C_w + S_w + W_w + Pv$	$T_w = 416.547 \cdot kips$		

Total resisting Moment= $M_r := R_c + R_s + R_w + R_p + R_v$ $M_r = 5407.618 \cdot ft\_K$

Overturning Moments component	value, kips	lever arm, ft	Overturning Moment ft-kips
1) Moment on foundation due to eccentric location of tower	$Pv = 29 \cdot kips$	$L_{pe} = 0$	$M_{pe} := L_{pe} \cdot Pv$ $M_{pe} = 0 \cdot ft\_K$
2) Moment on foundation	-	-	$M = 2143 \cdot ft\_K$
3) Moment due to horizontal shear	$S_t := S$	$L_{hs} := D_f + E_g$	$O_{hs} := L_{hs} \cdot S_t$
		$L_{hs} = 4.5\,ft$	$O_{hs} = 112.5 \cdot ft\_K$

Total Overturning Moment= $M_o := M + O_{hs} + M_{pe}$ $M_o = 2255.5 \cdot ft\_K$

Check Safety Factor against Overturning about mid axis parallel to base

$SF := \frac{M_r}{M_o}$ $SF = 2.398 > 1.5$ **O.K!** Calculate eccentricity, e $e := \frac{M_o}{T_w}$ $e = 5.415\,ft$

Check location of eccentricity and determine pressure distribution under the mat

$L_{loc} := \frac{L}{6}$ $L_{loc} = 4.333\,ft$ For net bearing calcs $T_{w1} := S_{w1} + W_w$ $T_{w1} = 324.48 \cdot kips$

$P_{max1} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 + \left(6 \cdot \frac{e}{L}\right)\right], 4 \cdot \frac{T_w}{3 \cdot B \cdot (L - 2 \cdot e)}\right]$ $P_{max1} = 1.408 \cdot ksf$

$P_{max2} := \left(\frac{T_{w1}}{L \cdot B}\right)$ $P_{max2} = 0.48 \cdot ksf$ $P_{net} := P_{max1} - P_{max2}$ $P_{max} := P_{net}$

Net soil pressure, $P_{net} = 0.928 \cdot ksf$ < $Brg_{allw} = 3 \cdot ksf$ **O.K.!**

$P_{min} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 - \left(6 \cdot \frac{e}{L}\right)\right], 0 \cdot ksf\right]$ $P_{min} = 0 \cdot ksf$

Check for horizontal shear $P_{hor} := Pe_p + T_w \cdot 0.35$

$P_{hor} = 138.303 \cdot kips$ $S = 25 \cdot kips$ Since P.hor > S it is safe!

Check for uplift

Component	**Down load value, kips**
1) Soil Weight	$S_w := \left[L \cdot B \cdot (D_f - T_f) - Area_{ped} \cdot (D_f - T_f) \cdot Nped\right] \cdot \gamma_s$ $S_w = 78.575 \cdot kips$
2) Wt. of soil wedge	$W_w := (D_f) \cdot \frac{1}{2} \cdot (D_f \cdot \tan(\phi)) \cdot B \cdot (\gamma_s)$ $W_w = 0 \cdot kips$
3)Concrete wt.	$C_w := L \cdot B \cdot T_f \cdot (\gamma_c) + Area_{ped} \cdot \gamma_c \cdot (D_f + E_g - T_f) \cdot Nped$ $C_w = 308.971 \cdot kips$

Total down load:

$TWT1 := S_w + W_w + C_w$ $TWT1 = 387.547 \cdot kips$ Total down load

Skin friction around footing:

$SKF := FF \cdot c_u \cdot (L + B) \cdot 2 \cdot 1.5 \cdot ft$ $SKF = 0 \cdot kips$

$T_{down} := (TWT1 + SKF)$ $T_{down} = 387.547 \cdot kips$ > $P_{up} = 318 \cdot kips$ **OK!**

REINFORCED CONCRETE REVIEW

General Input parameters

Concrete Cover, $cc := 3.0 \cdot in$ $RC_{fac} := 1.3$

Reduction factors as per respective ACI sections

$\phi_{shear} := 0.75$ as per ACI 9.3.2.3 $\phi_{compr} := 0.75$ as per ACI 9.3.2.2

$\phi_{axten} := 0.9$ as per ACI 9.3.2.2 a

Check for wide beam or single shear in mat

Allowable shear stress in concrete for wide beam shear criteria=

$\nu_{wide} := 2 \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi}$ $\nu_{wide} = 82.158 \cdot psi$

Effective depth of stee $d := T_f - cc$ $d = 33 \cdot in$ $L_{eff} := if\left(e \le L_{loc}, L, L - 2 \cdot e\right)$ $L_{eff} = 15.17\ ft$

$$dist := if\left[Nped = 3, \left(\frac{L}{2} - \frac{1}{3} \cdot \sin(60 \cdot deg) \cdot TWFW - \frac{1}{2} \cdot Ped_s - d\right), \left(\frac{L}{2} - \frac{TWFW}{2} - \frac{1}{2} \cdot Ped_s - d\right)\right]$$

Factor load by RC $P_{maxf} := P_{max} \cdot RC_{fac}$ $P_{minf} := P_{min} \cdot RC_{fac}$

shear on the face of concrete=

$$Shear_{wide} := (dist) \cdot B \cdot \left[\frac{P_{maxf} + \left[P_{maxf} - \frac{P_{maxf} - P_{minf}}{L_{eff}} \cdot (dist)\right]}{2}\right] \qquad Shear_{wide} = 161.734 \cdot kips$$

Area of concrete in shear= $A_{shear} := B \cdot d$ $A_{shear} = 10296 \cdot in^2$

Shear stress acting on concrete fa $\nu_{act} := \frac{Shear_{wide}}{A_{shear}}$ $\nu_{act} = 15.708 \cdot psi$

$\nu_{act} = 15.708 \cdot psi$ < $\nu_{wide} = 82.158 \cdot psi$ **O.K!**

Check for punching or two-way shear in mat

Calculate allowable shear stress in concrete for punching/two-way shear

$\beta := \frac{L}{B}$ $\beta = 1$ $\nu_{punch} := if\left[\left(2 + \frac{4}{\beta}\right) \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi} \le 4 \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi}, \left(2 + \frac{4}{\beta}\right) \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi}, 4 \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi}\right]$

$\nu_{punch} = 164.317 \cdot psi$ $Area_{col} := if\left[col_t = 0, \frac{\pi}{4} \cdot \left(Ped_s + d\right)^2, \left(Ped_s + d\right)^2\right]$

$P_{avg} := \frac{P_{maxf} + P_{minf}}{2}$ $Peri_{col} := if\left[col_t = 0, 2 \cdot \pi \cdot \frac{Ped_s + d}{2}, 4 \cdot \left(Ped_s + d\right)\right]$

Factor vertical load $Pvf := RC_{fac} \cdot Pv$

Shear stress acting on the concrete face= $\nu_{act} := \frac{P_c - Area_{col} \cdot P_{avg}}{Peri_{col} \cdot d \cdot 4}$

$\nu_{act} = 11.3 \cdot psi$ < $\nu_{punch} = 164.317 \cdot psi$ **O.K!**

Concrete pedestal steel check

Effective diameter/size= $D_{pier} := Ped_s$

$D_{eff} := Ped_s - cc \cdot 2$ $D_{eff} = 30 \cdot in$ $h := Ped_s$ $h = 36 \cdot in$

Effective pier diameter $D_{eff} := D_{pier} - cc \cdot 2$ $D_{eff} = 2.5\,ft$

-Minimum required area of steel per ACI-

$Area_{stlmin} := 0.005 \cdot \frac{\pi}{4} \cdot D_{pier}^{2}$ -(ACI 10.8.4) & (ACI 10.9.1)

$Area_{stlmin} = 5.089 \cdot in^2$

-Rebar details-

Selected rebar size $d_{bar} := 8$

-Number of vertical rebars required-

$NRB := ceil\left(\frac{Area_{stlmin}}{Area_{abar}}\right)$ $NRB = 7$ $Area_{stluse} := Area_{abar} \cdot NRB$ $Area_{stluse} = 5.53 \cdot in^2$

Rebar used $NRB := 11$ $Area_{stluse1} := Area_{abar} \cdot NRB = 8.69 \cdot in^2$ OK!

$Mn := 10232 \cdot in \cdot kips$ from L-PILE OUTPUT. Moment capacity of pedestal

$0.75 \cdot Mn = 639.5 \cdot kips \cdot ft$ > $M_S := O_{hs} = 112.5 \cdot kips \cdot ft$ **OK**

($NRB = 11$) $d_{bar} = 8$ vertical bars OK!

Evaluation of mat footing 26'x26'

$C_{wped} := Area_{ped} \cdot \gamma_c \cdot (D_f + E_g - T_f) \cdot Nped$ Wt. of concrete pedestals

$P_{upnet} := P_{up} - \frac{C_{wped} + 0.95 S_w}{Nped}$ $P_{upnet} = 291.527 \cdot kips$ Net uplift acting at mat level creating bending moment in the slab. Soil wt. reduced by 5 % to account for variation in compaction . ACI 9.3.2.2

Calculate bending moment for mat design:

$\phi_{bend} := 0.9$ $Langle := if(Nped = 3, sin(60 \cdot deg), 1)$

$$\beta_1 := \text{if}\left[f_c \le 4000\cdot psi, 0.85, \text{if}\left[f_c \ge 8000\cdot psi, 0.65, 0.85 - \left(\frac{f_c}{psi} - 4000\right)\cdot 0.05\right]\right]$$ ACI 10.2.7.3

$$B_{mo} := RC_{fac}\cdot\left[\left(TWFW\cdot P_{up}\right)\cdot Langle + Sh\cdot\left(D_f + E_g\right) - \left(C_w + S_w\right)\cdot\left(TWFW\cdot Langle\cdot\frac{1}{3}\right)\right]$$

$B := L$ $B = 26\,ft$ $B_{mo} = 1699.63\cdot ft\_K$

$$B_{mo1} := \frac{P_{max} - P_{min}}{(L - 2\cdot e)\cdot 2}\cdot\left(TWFW\cdot Langle\cdot\frac{1}{3} + \frac{Ped_s}{2}\right)\cdot\left[\left[(L - 2\cdot e) - \left(TWFW\cdot Langle\cdot\frac{1}{3} + \frac{Ped_s}{2}\right)\right]^2\cdot 0.5\right]\cdot B$$

$W_e := TWFW\cdot Langle + Ped_s$ $W_e = 9.495\,ft$

Reinforcement middle bandwidth.

$B_{mo1} = 192.925\cdot ft\_K$

required R_u $R_u := \frac{B_{mo}}{\phi_{bend}\cdot B\cdot d^2}$ $R_u = 66.698\cdot psi$ $m := \frac{f_y}{\beta_1\cdot f_c}$ $m = 23.529$

$$\rho := \frac{1}{m}\cdot\left[1 - \sqrt{1 - \left(\frac{2\cdot m\cdot R_u}{f_y}\right)}\right]$$ $\rho = 0.001$

required area of steel for mat=

$Ast_f := \rho\cdot B\cdot d$ $Ast_f = 11.599\cdot in^2$

Provided bar size to be used $f_{bar} := 8$ $f_{dia} := \frac{f_{bar}}{8}\cdot in$ $f_{dia} = 1\cdot in$

Bar area= $f_{abar} := \pi\cdot\frac{f_{dia}^2}{4}$ $f_{abar} = 0.785\cdot in^2$

$N_{req} := \frac{(Ast_f)}{f_{abar}} = 14.768$ **OK!!! 17 # 8 INSTALLED**

minimum area of steel required,

$Ast_{minf} := .0018\cdot B\cdot T_f$ $Ast_{minf} = 20.218\cdot in^2$

$Ast_{fuse} := \text{if}\left(Ast_f > Ast_{minf}, Ast_f, Ast_{minf}\right)$ $Ast_{fuse} = 20.218\cdot in^2$

Number of bars required= $Nf_{bars} := \text{if}\left(Ast_{fuse} = Ast_{minf}, \frac{Ast_{fuse}}{f_{abar}}, \frac{Ast_{fuse}}{f_{abar}}\cdot\frac{L}{W_e}\right)$ $Nf_{bars} = 25.742$

Total used 34 # 8 T& B

OK!

Summary

-Foundation Reactions-

Shear	$S = 25 \cdot kips$
Down load	$Pv = 29 \cdot kips$
Uplift load	$P_{up} = 318 \cdot kips$
Moment;	$M = 2143 \cdot ft\_K$

Stability Calculations

Safety Factor against Overturning $SF = 2.398$ > 1.5 **O.K!**

Net soil pressure, $P_{net} = 0.928 \cdot ksf$ < $Brg_{allw} = 3 \cdot ksf$ **O.K.!**

Check for horizontal shear $P_{hor} = 138.303 \cdot kips$ $S = 25 \cdot kips$ Since P.hor > S it is safe!

Size of Mat

$L = 26\,ft$ $B = 26\,ft$

Depth of base of mat $D_f = 4\,ft$ Thickness of Mat $T_f = 3\,ft$

Pedestal size $Ped_s = 3\,ft$

RESULTS: Based on the above calcultions the existing Mat foundation will be able to support the load imposed from the self supporting tower.

```
================================================================================

                LPILE Plus for Windows, Version 5.0 (5.0.47)

               Analysis of Individual Piles and Drilled Shafts
              Subjected to Lateral Loading Using the p-y Method

                        (c) 1985-2010 by Ensoft, Inc.
                             All Rights Reserved

================================================================================

This program is licensed to:

allpro
allpro

--------------------------------------------------------------------------------
                            Files Used for Analysis
--------------------------------------------------------------------------------

Path to file locations:      P:\2016\Structural\16-2859 CT46126-A-01 Glastonbury
Structural Analysis\LPILE\
Name of input data file:     36 PEDESTAL.lpd
Name of output file:         36 PEDESTAL.lpo
Name of plot output file:    36 PEDESTAL.lpp
Name of runtime file:        36 PEDESTAL.lpr


--------------------------------------------------------------------------------
                          Time and Date of Analysis
--------------------------------------------------------------------------------

               Date:  August 12, 2016     Time:   9:38:31


--------------------------------------------------------------------------------
                                Problem Title
--------------------------------------------------------------------------------

New LPILE Plus 5.0 Data File


--------------------------------------------------------------------------------
                                Program Options
--------------------------------------------------------------------------------

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 2:
- Computation of Ultimate Bending Moment of Cross Section (Section Design)
```

```
--------------------------------------------------------------------------------
   Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness
--------------------------------------------------------------------------------

Number of sections =  1



Pile Section No.  1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter                        =      36.0000 in

Material Properties:

Compressive Strength of Concrete        =        3.000 kip/in**2
Yield Stress of Reinforcement           =         60. kip/in**2
Modulus of Elasticity of Reinforcement =       29000. kip/in**2
Number of Reinforcing Bars              =          11
Area of Single Bar                      =     0.79000 in**2
Number of Rows of Reinforcing Bars      =          11
Area of Steel                           =        8.690 in**2
Area of Shaft                           =     1017.876 in**2
Percentage of Steel Reinforcement       =        0.854 percent
Cover Thickness (edge to bar center)    =        3.700 in

Unfactored Axial Squash Load Capacity  =      3094.82 kip

Distribution and Area of Steel Reinforcement

 Row          Area of        Distance to
Number     Reinforcement   Centroidal Axis
              in**2             in
------     -------------   ---------------
   1            0.790              14.154
   2            0.790              13.008
   3            0.790              10.807
   4            0.790               7.731
   5            0.790               4.029
   6            0.790               0.000
   7            0.790              -4.029
   8            0.790              -7.731
   9            0.790             -10.807
  10            0.790             -13.008
  11            0.790             -14.154


Axial Thrust Force =   -318000.00  lbs

    Bending       Bending       Bending       Maximum     Neutral Axis Max. Concrete
Max. Steel
    Moment       Stiffness     Curvature      Strain       Position       Stress
Stress
    in-lbs        lb-in2        rad/in        in/in         inches         psi
psi
```

```
 ------------ ------------ ------------ ------------ ------------ ------------ -
------------
  353194.94438  2.825560E+11    0.00000125  1.341105E-12    0.00000107       0.00000
1165.59865
  697346.65086  2.789387E+11    0.00000250  2.682209E-12    0.00000107       0.00000
2331.19730
      1032455.  2.753214E+11    0.00000375  4.023314E-12    0.00000107       0.00000
3496.79595
      1032455.  2.064910E+11    0.00000500  5.364418E-12    0.00000107       0.00000
4662.39460
      1032455.  1.651928E+11    0.00000625  6.705523E-12    0.00000107       0.00000
5827.99326
      1032455.  1.376607E+11    0.00000750  8.046627E-12    0.00000107       0.00000
6993.59191
      1032455.  1.179949E+11    0.00000875  9.387732E-12    0.00000107       0.00000
8159.19056
      1032455.  1.032455E+11    0.00001000  1.072884E-11    0.00000107       0.00000
9324.78921
      1032455.  9.177379E+10    0.00001125  1.206994E-11    0.00000107       0.00000
10490.38786
      1032455.  8.259641E+10    0.00001250  1.341105E-11    0.00000107       0.00000
11655.98651
      1032455.  7.508765E+10    0.00001375  1.475215E-11    0.00000107       0.00000
12821.58516
      1032455.  6.883034E+10    0.00001500  1.609325E-11    0.00000107       0.00000
13987.18381
      1032455.  6.353570E+10    0.00001625  1.743436E-11    0.00000107       0.00000
15152.78246
      1032455.  5.899744E+10    0.00001750  1.877546E-11    0.00000107       0.00000
16318.38111
      1032455.  5.506427E+10    0.00001875  2.011657E-11    0.00000107       0.00000
17483.97977
      1032455.  5.162276E+10    0.00002000  2.145767E-11    0.00000107       0.00000
18649.57842
      1032455.  4.858612E+10    0.00002125  2.279878E-11    0.00000107       0.00000
19815.17707
      1032455.  4.588689E+10    0.00002250  2.413988E-11    0.00000107       0.00000
20980.77572
      1032455.  4.347179E+10    0.00002375  2.548099E-11    0.00000107       0.00000
22146.37437
      1032455.  4.129820E+10    0.00002500  2.682209E-11    0.00000107       0.00000
23311.97302
      1032455.  3.933162E+10    0.00002625  2.816319E-11    0.00000107       0.00000
24477.57167
      1032455.  3.754382E+10    0.00002750  2.950430E-11    0.00000107       0.00000
25643.17032
      1032455.  3.591148E+10    0.00002875  3.084540E-11    0.00000107       0.00000
26808.76897
      1032455.  3.441517E+10    0.00003000  3.218651E-11    0.00000107       0.00000
27974.36763
      1032455.  3.303856E+10    0.00003125  3.352761E-11    0.00000107       0.00000
29139.96628
      1032455.  3.176785E+10    0.00003250  3.486872E-11    0.00000107       0.00000
30305.56493
      1032455.  3.059126E+10    0.00003375  3.620982E-11    0.00000107       0.00000
31471.16358
```

```
      1032455.  2.949872E+10    0.00003500  3.755093E-11    0.00000107       0.00000
32636.76223
      1032455.  2.848152E+10    0.00003625  3.889203E-11    0.00000107       0.00000
33802.36088
      1032455.  2.753214E+10    0.00003750  4.023314E-11    0.00000107       0.00000
34967.95953
      1032455.  2.664400E+10    0.00003875  4.157424E-11    0.00000107       0.00000
36133.55818
      1032455.  2.581138E+10    0.00004000  4.291534E-11    0.00000107       0.00000
37299.15683
      1062879.  2.576676E+10    0.00004125  4.425645E-11    0.00000107       0.00000
38464.75548
      1095087.  2.576676E+10    0.00004250  4.559755E-11    0.00000107       0.00000
39630.35414
      1127296.  2.576676E+10    0.00004375  4.693866E-11    0.00000107       0.00000
40795.95279
      1159504.  2.576676E+10    0.00004500  4.827976E-11    0.00000107       0.00000
41961.55144
      1191713.  2.576676E+10    0.00004625  4.962087E-11    0.00000107       0.00000
43127.15009
      1223921.  2.576676E+10    0.00004750  5.096197E-11    0.00000107       0.00000
44292.74874
      1256130.  2.576676E+10    0.00004875  5.230308E-11    0.00000107       0.00000
45458.34739
      1320547.  2.576676E+10    0.00005125  5.498528E-11    0.00000107       0.00000
47789.54469
      1384963.  2.576676E+10    0.00005375  5.766749E-11    0.00000107       0.00000
50120.74199
      1449380.  2.576676E+10    0.00005625  6.034970E-11    0.00000107       0.00000
52451.93930
      1513797.  2.576676E+10    0.00005875  6.303191E-11    0.00000107       0.00000
54783.13660
      1578214.  2.576676E+10    0.00006125  6.571412E-11    0.00000107       0.00000
57114.33390
      1642631.  2.576676E+10    0.00006375  6.839633E-11    0.00000107       0.00000
59445.53120
      1687181.  2.546688E+10    0.00006625  7.107854E-11    0.00000107       0.00000
60000.00000
      1706810.  2.482633E+10    0.00006875  7.376075E-11    0.00000107       0.00000
60000.00000
      1722058.  2.416924E+10    0.00007125  7.644296E-11    0.00000107       0.00000
60000.00000
      1739451.  2.358578E+10    0.00007375    0.00001828    0.24788439       0.00000
60000.00000
      1771884.  2.323782E+10    0.00007625    0.00005142    0.67430842   89.09508462
60000.00000
      1805018.  2.292086E+10    0.00007875    0.00008455    1.07365716     188.26949
60000.00000
      1847427.  2.273756E+10    0.00008125    0.00011311    1.39210403     271.80103
60000.00000
      1886711.  2.252790E+10    0.00008375    0.00014313    1.70902956     358.10787
60000.00000
      1935716.  2.244308E+10    0.00008625    0.00016809    1.94885337     428.22115
60000.00000
      1972682.  2.222741E+10    0.00008875    0.00019301    2.17473829     497.08749
60000.00000
```

```
      2002376.  2.194385E+10    0.00009125    0.00021602    2.36735094     559.51592
60000.00000
      2039078.  2.175017E+10    0.00009375    0.00023347    2.49033558     605.70777
60000.00000
      2071509.  2.152217E+10    0.00009625    0.00025423    2.64136755     660.35395
60000.00000
      2103800.  2.130430E+10    0.00009875    0.00027505    2.78535712     714.38080
60000.00000
      2135950.  2.109581E+10    0.00010125    0.00029594    2.92283857     767.78468
60000.00000
      2173519.  2.094958E+10    0.00010375    0.00031203    3.00749981     807.94674
60000.00000
      2207562.  2.077705E+10    0.00010625    0.00033115    3.11674941     855.45408
60000.00000
      2241480.  2.061131E+10    0.00010875    0.00035034    3.22148860     902.44576
60000.00000
      2270707.  2.041085E+10    0.00011125    0.00036843    3.31170309     946.04983
60000.00000
      2290965.  2.014035E+10    0.00011375    0.00038433    3.37868965     983.66545
60000.00000
      2311157.  1.988092E+10    0.00011625    0.00040026    3.44311845    1020.92643
60000.00000
      2331282.  1.963185E+10    0.00011875    0.00041624    3.50515044    1057.82926
60000.00000
      2351339.  1.939248E+10    0.00012125    0.00043225    3.56494009    1094.37241
60000.00000
      2363136.  1.909605E+10    0.00012375    0.00044550    3.59999979    1123.96639
60000.00000
      2395164.  1.897159E+10    0.00012625    0.00045770    3.62534344    1150.80481
60000.00000
      2415688.  1.876263E+10    0.00012875    0.00047272    3.67159116    1183.89220
60000.00000
      2436155.  1.856118E+10    0.00013125    0.00048777    3.71632183    1216.65685
60000.00000
      2456562.  1.836682E+10    0.00013375    0.00050285    3.75962126    1249.09629
60000.00000
      2476910.  1.817916E+10    0.00013625    0.00051796    3.80157101    1281.20866
60000.00000
      2497199.  1.799783E+10    0.00013875    0.00053311    3.84224617    1312.99190
60000.00000
      2517427.  1.782249E+10    0.00014125    0.00054829    3.88171756    1344.44419
60000.00000
      2537593.  1.765282E+10    0.00014375    0.00056351    3.92004740    1375.56254
60000.00000
      2557699.  1.748854E+10    0.00014625    0.00057876    3.95730007    1406.34596
60000.00000
      2573231.  1.729903E+10    0.00014875    0.00059268    3.98443329    1433.97410
60000.00000
      2594722.  1.687624E+10    0.00015375    0.00061777    4.01802528    1482.57670
60000.00000
      2616085.  1.647927E+10    0.00015875    0.00064294    4.05001009    1530.25819
60000.00000
      2637319.  1.610576E+10    0.00016375    0.00066819    4.08054650    1577.01109
60000.00000
      2658421.  1.575361E+10    0.00016875    0.00069352    4.10976970    1622.82600
60000.00000
```

```
      2679390.  1.542095E+10    0.00017375    0.00071894    4.13779986    1667.69347
60000.00000
      2700226.  1.510616E+10    0.00017875    0.00074445    4.16474855    1711.60535
60000.00000
      2720925.  1.480776E+10    0.00018375    0.00077004    4.19071019    1754.55142
60000.00000
      2732141.  1.447492E+10    0.00018875    0.00079275    4.19999921    1791.41683
60000.00000
      2737739.  1.413027E+10    0.00019375    0.00081375    4.19999921    1824.54318
60000.00000
      2784196.  1.400853E+10    0.00019875    0.00083643    4.20845997    1859.68824
60000.00000
      2804589.  1.376485E+10    0.00020375    0.00086137    4.22760236    1897.56754
60000.00000
      2824852.  1.353222E+10    0.00020875    0.00088639    4.24618256    1934.49264
60000.00000
      2843606.  1.330342E+10    0.00021375    0.00091093    4.26168144    1969.63198
60000.00000
      2853186.  1.304313E+10    0.00021875    0.00093193    4.26023304    1998.54832
60000.00000
      2862693.  1.279416E+10    0.00022375    0.00095296    4.25904429    2026.78800
60000.00000
      2872124.  1.255573E+10    0.00022875    0.00097404    4.25809801    2054.34598
60000.00000
      2881480.  1.232719E+10    0.00023375    0.00099516    4.25738132    2081.21813
60000.00000
      2890761.  1.210790E+10    0.00023875    0.00101633    4.25688350    2107.40057
60000.00000
      2899965.  1.189729E+10    0.00024375    0.00103754    4.25659168    2132.88829
60000.00000
      2909093.  1.169484E+10    0.00024875    0.00105880    4.25649726    2157.67727
60000.00000
      2918142.  1.150007E+10    0.00025375    0.00108011    4.25658953    2181.76247
60000.00000
      2927113.  1.131252E+10    0.00025875    0.00110146    4.25685990    2205.13921
60000.00000
      2936004.  1.113177E+10    0.00026375    0.00112286    4.25729978    2227.80248
60000.00000
      2944817.  1.095746E+10    0.00026875    0.00114431    4.25790489    2249.74829
60000.00000
      2953550.  1.078922E+10    0.00027375    0.00116581    4.25866663    2270.97110
60000.00000
      2962201.  1.062673E+10    0.00027875    0.00118736    4.25957859    2291.46574
60000.00000
      2970769.  1.046967E+10    0.00028375    0.00120895    4.26063430    2311.22684
60000.00000
      2979256.  1.031777E+10    0.00028875    0.00123060    4.26183164    2330.24997
60000.00000
      2987661.  1.017076E+10    0.00029375    0.00125230    4.26316416    2348.52929
60000.00000
      2995979.  1.002838E+10    0.00029875    0.00127406    4.26462543    2366.05879
60000.00000
      3004215.  9.890420E+09    0.00030375    0.00129586    4.26621544    2382.83392
60000.00000
      3012365.  9.756647E+09    0.00030875    0.00131772    4.26792777    2398.84825
60000.00000
```

```
      3020427.  9.626859E+09    0.00031375    0.00133964    4.26975811    2414.09579
60000.00000
      3028404.  9.500875E+09    0.00031875    0.00136161    4.27170646    2428.57128
60000.00000
      3036291.  9.378505E+09    0.00032375    0.00138363    4.27376640    2442.26786
60000.00000
      3044090.  9.259590E+09    0.00032875    0.00140571    4.27593791    2455.17987
60000.00000
      3051801.  9.143973E+09    0.00033375    0.00142786    4.27821887    2467.30098
60000.00000
      3059420.  9.031499E+09    0.00033875    0.00145005    4.28060496    2478.62428
60000.00000
      3066947.  8.922027E+09    0.00034375    0.00147231    4.28309405    2489.14311
60000.00000
      3071696.  8.807731E+09    0.00034875    0.00149257    4.27975738    2497.92458
60000.00000
      3077558.  8.578559E+09    0.00035875    0.00153053    4.26628411    2512.47188
60000.00000
      3083191.  8.361197E+09    0.00036875    0.00156864    4.25394595    2524.68845
60000.00000
      3088594.  8.154705E+09    0.00037875    0.00160691    4.24266350    2534.54470
60000.00000
      3093761.  7.958228E+09    0.00038875    0.00164533    4.23236167    2542.00957
60000.00000
      3098692.  7.771015E+09    0.00039875    0.00168391    4.22298038    2547.05150
60000.00000
      3103379.  7.592365E+09    0.00040875    0.00172266    4.21445739    2549.63713
60000.00000
      3107638.  7.421224E+09    0.00041875    0.00176157    4.20674336    2547.08926
60000.00000
      3107638.  7.248135E+09    0.00042875    0.00180075    4.19999921    2540.74376
60000.00000
      3107638.  7.082935E+09    0.00043875    0.00184275    4.19999921    2533.90290
60000.00000
      3107638.  6.925098E+09    0.00044875    0.00188475    4.19999921    2531.35239
60000.00000
      3107638.  6.774142E+09    0.00045875    0.00192675    4.19999921    2539.18102
60000.00000
      3107638.  6.629627E+09    0.00046875    0.00196875    4.19999921    2544.89171
60000.00000
      3107638.  6.491149E+09    0.00047875    0.00201075    4.19999921    2548.48445
60000.00000
      3107638.  6.358338E+09    0.00048875    0.00205275    4.19999921    2549.95925
60000.00000
      3107638.  6.230853E+09    0.00049875    0.00209475    4.19999921    2545.34820
60000.00000
      3107638.  6.108379E+09    0.00050875    0.00213675    4.19999921    2539.55978
60000.00000
      3107638.  5.990627E+09    0.00051875    0.00217875    4.19999921    2533.77136
60000.00000
      3107638.  5.877329E+09    0.00052875    0.00222075    4.19999921    2527.98294
60000.00000
      3107638.  5.768237E+09    0.00053875    0.00226275    4.19999921    2523.61262
60000.00000
      3107638.  5.663121E+09    0.00054875    0.00230475    4.19999921    2531.55381
60000.00000
```

```
      3107638.  5.561768E+09    0.00055875    0.00234675    4.19999921    2538.07721
60000.00000
      3107638.  5.463978E+09    0.00056875    0.00238875    4.19999921    2543.18281
60000.00000
      3107638.  5.369568E+09    0.00057875    0.00243075    4.19999921    2546.87061
60000.00000
      3107638.  5.278366E+09    0.00058875    0.00247275    4.19999921    2549.14062
60000.00000
      3107638.  5.190209E+09    0.00059875    0.00251475    4.19999921    2549.99283
60000.00000
      3107638.  5.104949E+09    0.00060875    0.00255675    4.19999921    2545.74288
60000.00000
      3107638.  5.022445E+09    0.00061875    0.00259875    4.19999921    2541.00690
60000.00000
      3107638.  4.942565E+09    0.00062875    0.00264075    4.19999921    2536.27092
60000.00000
      3107638.  4.865186E+09    0.00063875    0.00268275    4.19999921    2531.53494
60000.00000
      3107638.  4.790193E+09    0.00064875    0.00272475    4.19999921    2526.79896
60000.00000


Axial Thrust Force =    339000.00  lbs

    Bending       Bending       Bending       Maximum     Neutral Axis Max. Concrete
Max. Steel
    Moment       Stiffness     Curvature      Strain       Position       Stress
Stress
    in-lbs        lb-in2        rad/in        in/in         inches         psi
psi
 ------------- ------------- ------------- ------------- ------------- ------------- -
------------
  337260.14478  2.698081E+11    0.00000125    0.00012388   99.10780871     374.14819
3453.25676
  674442.60361  2.697770E+11    0.00000250    0.00014658   58.63121903     438.59209
3971.96076
      1011501.  2.697337E+11    0.00000375    0.00016935   45.15934575     502.28235
4492.87492
      1348391.  2.696781E+11    0.00000500    0.00019219   38.43865693     565.20908
5016.00001
      1684825.  2.695721E+11    0.00000625    0.00021511   34.41772091     627.34996
5541.20537
      2022072.  2.696096E+11    0.00000750    0.00023813   31.75065672     688.77618
6069.35998
      2355924.  2.692485E+11    0.00000875    0.00026116   29.84699214     749.23715
6597.86508
      2686653.  2.686653E+11    0.00001000    0.00028420   28.41979516     808.71417
7126.53011
      3016523.  2.681354E+11    0.00001125    0.00030731   27.31661332     867.38984
7657.43330
      3341311.  2.673048E+11    0.00001250    0.00033036   26.42901671     924.90117
8186.50546
      3341311.  2.430044E+11    0.00001375    0.00033568   24.41292250     937.29749
8201.23844
      3341311.  2.227540E+11    0.00001500    0.00035360   23.57307565     980.93724
8581.47219
```

```
      3341311.  2.056191E+11    0.00001625    0.00037115   22.83972752    1023.07924
8951.00456
      3341311.  1.909320E+11    0.00001750    0.00038850   22.19999921    1064.17878
9314.88126
      3445738.  1.837727E+11    0.00001875    0.00040525   21.61333144    1103.28413
9661.22932
      3555771.  1.777886E+11    0.00002000    0.00042188   21.09383476    1141.57954
10004.00320
      3661465.  1.723042E+11    0.00002125    0.00043828   20.62490523    1178.84357
10340.27558
      3763820.  1.672809E+11    0.00002250    0.00045451   20.20055401    1215.22225
10671.63791
      3860251.  1.625369E+11    0.00002375    0.00047036   19.80472004    1250.24947
10991.87604
      3955809.  1.582324E+11    0.00002500    0.00048619   19.44760430    1284.76298
11311.48692
      4050206.  1.542935E+11    0.00002625    0.00050199   19.12351191    1318.75533
11630.34593
      4138068.  1.504752E+11    0.00002750    0.00051727   18.80982435    1351.15334
11934.00610
      4228490.  1.470779E+11    0.00002875    0.00053284   18.53369415    1383.74897
12246.23736
      4312595.  1.437532E+11    0.00003000    0.00054785   18.26177609    1414.71054
12542.11376
      4396472.  1.406871E+11    0.00003125    0.00056289   18.01236069    1445.30412
12838.66913
      4481214.  1.378835E+11    0.00003250    0.00057806   17.78650796    1475.77062
13541.78218
      4561763.  1.351633E+11    0.00003375    0.00059283   17.56533730    1504.99149
14279.09075
      4645549.  1.327300E+11    0.00003500    0.00060804   17.37262809    1534.69043
15003.54580
      4723169.  1.302943E+11    0.00003625    0.00062255   17.17388928    1562.58919
15748.31090
      4800580.  1.280155E+11    0.00003750    0.00063709   16.98897350    1590.14088
16492.45202
      4877782.  1.258782E+11    0.00003875    0.00065164   16.81654823    1617.34408
17235.96332
      4956941.  1.239235E+11    0.00004000    0.00066652   16.66299498    1644.76397
17970.08390
      5031613.  1.219785E+11    0.00004125    0.00068083   16.50485837    1670.71549
18720.81994
      5106084.  1.201432E+11    0.00004250    0.00069515   16.35651720    1696.32779
19470.94801
      5180352.  1.184081E+11    0.00004375    0.00070950   16.21713245    1721.59921
20220.46735
      5257075.  1.168239E+11    0.00004500    0.00072430   16.09548247    1747.28558
20956.94822
      5329190.  1.152257E+11    0.00004625    0.00073841   15.96554768    1771.37179
21713.36070
      5401111.  1.137076E+11    0.00004750    0.00075254   15.84288275    1795.12619
22469.17923
      5472838.  1.122633E+11    0.00004875    0.00076669   15.72693193    1818.54745
23224.39889
      5618808.  1.096353E+11    0.00005125    0.00079564   15.52475774    1865.35020
24715.87509
```

```
      5758086.  1.071272E+11    0.00005375    0.00082356   15.32207930    1908.96771
26237.45256
      5896611.  1.048286E+11    0.00005625    0.00085156   15.13887370    1951.27480
27756.65333
      6038353.  1.027805E+11    0.00005875    0.00088057   14.98834813    1993.61559
29246.74031
      6173192.  1.007868E+11    0.00006125    0.00090824   14.82843482    2032.52201
30775.32845
      6307294.  9.893794E+10    0.00006375    0.00093600   14.68236387    2070.13161
32301.51299
      6440649.  9.721734E+10    0.00006625    0.00096384   14.54858387    2106.43269
33825.26382
      6573246.  9.561085E+10    0.00006875    0.00099177   14.42576873    2141.41328
35346.55153
      6708215.  9.415039E+10    0.00007125    0.00102073   14.32597339    2176.19562
36838.08281
      6837769.  9.271551E+10    0.00007375    0.00104839   14.21542346    2207.94208
38367.08577
      6966580.  9.136498E+10    0.00007625    0.00107614   14.11327422    2238.37666
39893.54247
      7094637.  9.009062E+10    0.00007875    0.00110398   14.01874030    2267.48673
41417.41931
      7221930.  8.888529E+10    0.00008125    0.00113190   13.93113720    2295.25974
42938.67281
      7348445.  8.774263E+10    0.00008375    0.00115993   13.84985769    2321.68240
44457.27037
      7477961.  8.670100E+10    0.00008625    0.00118964   13.79288113    2348.15866
45926.86568
      7601957.  8.565586E+10    0.00008875    0.00121748   13.71808183    2371.45156
47450.59387
      7725185.  8.465956E+10    0.00009125    0.00124542   13.64844739    2393.39273
48971.50045
      7847630.  8.370805E+10    0.00009375    0.00127346   13.58358085    2413.96787
50489.54130
      7969279.  8.279771E+10    0.00009625    0.00130160   13.52312815    2433.16235
52004.66767
      8090123.  8.192530E+10    0.00009875    0.00132984   13.46677601    2450.96148
53516.81670
      8210145.  8.108785E+10    0.00010125    0.00135819   13.41423476    2467.34959
55025.94708
      8329334.  8.028273E+10    0.00010375    0.00138664   13.36525118    2482.31110
56531.99177
      8447674.  7.950752E+10    0.00010625    0.00141521   13.31959140    2495.82966
58034.89763
      8565152.  7.876002E+10    0.00010875    0.00144388   13.27704513    2507.88854
59534.60494
      8664502.  7.788317E+10    0.00011125    0.00147175   13.22918379    2518.14875
60000.00000
      8757613.  7.699000E+10    0.00011375    0.00150150   13.19999921    2527.53940
60000.00000
      8845797.  7.609288E+10    0.00011625    0.00152895   13.15224516    2534.73772
60000.00000
      8910823.  7.503851E+10    0.00011875    0.00155491   13.09395969    2540.26200
60000.00000
      8975275.  7.402288E+10    0.00012125    0.00158096   13.03885210    2544.56398
60000.00000
```

```
      9039142.  7.304357E+10    0.00012375    0.00160711   12.98674214    2547.62994
60000.00000
      9102415.  7.209834E+10    0.00012625    0.00163335   12.93746459    2549.44583
60000.00000
      9165064.  7.118497E+10    0.00012875    0.00165970   12.89086926    2549.69832
60000.00000
      9215755.  7.021527E+10    0.00013125    0.00168534   12.84071839    2547.35702
60000.00000
      9257533.  6.921520E+10    0.00013375    0.00171047   12.78856337    2549.16763
60000.00000
      9298891.  6.824874E+10    0.00013625    0.00173569   12.73898542    2549.96157
60000.00000
      9339654.  6.731282E+10    0.00013875    0.00176102   12.69203603    2547.05484
60000.00000
      9379974.  6.640690E+10    0.00014125    0.00178645   12.64742124    2548.05008
60000.00000
      9419913.  6.552983E+10    0.00014375    0.00181196   12.60495222    2549.48491
60000.00000
      9464900.  6.471726E+10    0.00014625    0.00184136   12.59048116    2549.53897
60000.00000
      9503035.  6.388595E+10    0.00014875    0.00186662   12.54870951    2545.87789
60000.00000
      9578394.  6.229850E+10    0.00015375    0.00191739   12.47081602    2549.40002
60000.00000
      9634917.  6.069239E+10    0.00015875    0.00196674   12.38890350    2547.54275
60000.00000
      9679201.  5.910963E+10    0.00016375    0.00201529   12.30709827    2547.92526
60000.00000
      9722720.  5.761612E+10    0.00016875    0.00206409   12.23163807    2549.88475
60000.00000
      9765146.  5.620228E+10    0.00017375    0.00211322   12.16243279    2545.65988
60000.00000
      9806787.  5.486314E+10    0.00017875    0.00216262   12.09855545    2547.88731
60000.00000
      9847793.  5.359343E+10    0.00018375    0.00221224   12.03939450    2549.82311
60000.00000
      9900774.  5.245443E+10    0.00018875    0.00226500   12.00000036    2546.00590
60000.00000
      9932456.  5.126429E+10    0.00019375    0.00231801   11.96391928    2546.84406
60000.00000
      9970307.  5.016507E+10    0.00019875    0.00236743   11.91157329    2549.28836
60000.00000
     10006972.  4.911397E+10    0.00020375    0.00241695   11.86232579    2549.47916
60000.00000
     10026163.  4.802952E+10    0.00020875    0.00246393   11.80326569    2544.65848
60000.00000
     10045133.  4.699477E+10    0.00021375    0.00251105   11.74760234    2545.21082
60000.00000
     10063877.  4.600630E+10    0.00021875    0.00255831   11.69511688    2547.99381
60000.00000
     10082389.  4.506096E+10    0.00022375    0.00260570   11.64560544    2549.59043
60000.00000
     10100608.  4.415566E+10    0.00022875    0.00265327   11.59899509    2549.20355
60000.00000
     10118379.  4.328718E+10    0.00023375    0.00270107   11.55538881    2544.76541
60000.00000
```

```
     10135988.  4.245440E+10    0.00023875    0.00274899   11.51407850    2542.47089
60000.00000
     10153432.  4.165511E+10    0.00024375    0.00279701   11.47492898    2545.83261
60000.00000
     10170707.  4.088727E+10    0.00024875    0.00284516   11.43781793    2548.21695
60000.00000
     10187810.  4.014901E+10    0.00025375    0.00289342   11.40263379    2549.60875
60000.00000
     10232927.  3.954754E+10    0.00025875    0.00294975   11.40000093    2548.11075
60000.00000
     10232927.  3.879783E+10    0.00026375    0.00300095   11.37799394    2543.60355
60000.00000
     10242908.  3.811315E+10    0.00026875    0.00304860   11.34362733    2539.75781
60000.00000
     10258506.  3.747399E+10    0.00027375    0.00309634   11.31084216    2543.23863
60000.00000
     10273544.  3.685576E+10    0.00027875    0.00314440   11.28035080    2546.03803
60000.00000
     10284879.  3.624627E+10    0.00028375    0.00319429   11.25740397    2548.24856
60000.00000
     10296065.  3.565737E+10    0.00028875    0.00324431   11.23570168    2549.57450
60000.00000
     10307091.  3.508797E+10    0.00029375    0.00329447   11.21521389    2549.87028
60000.00000
     10317738.  3.453636E+10    0.00029875    0.00334492   11.19639122    2546.01961
60000.00000
     10327694.  3.400064E+10    0.00030375    0.00339524   11.17773807    2542.19293
60000.00000
     10330550.  3.345927E+10    0.00030875    0.00344285   11.15093529    2538.84032
60000.00000
     10333351.  3.293498E+10    0.00031375    0.00349053   11.12520969    2539.18818
60000.00000
     10336101.  3.242698E+10    0.00031875    0.00353829   11.10051835    2542.26482
60000.00000
     10338796.  3.193450E+10    0.00032375    0.00358612   11.07681406    2544.83785
60000.00000
     10341437.  3.145684E+10    0.00032875    0.00363402   11.05405819    2546.90056
60000.00000
     10344021.  3.099332E+10    0.00033375    0.00368200   11.03220785    2548.44580
60000.00000
     10346550.  3.054332E+10    0.00033875    0.00373005   11.01123083    2549.46651
60000.00000
     10349019.  3.010624E+10    0.00034375    0.00377819   10.99108851    2549.95521
60000.00000
     10349393.  2.967568E+10    0.00034875    0.00382795   10.97620332    2547.98784
60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =   10232.92656
in-kip


The analysis ended normally.
```

WIRELESS COMMUNICATIONS FACILITY
CT5273 - LTE 2C
GLASTONBURY - NW
SBA SITE ID: CT46126
2577 MAIN STREET
GLASTONBURY, CT 06033

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMENDMENTS, INCLUDING THE TIA/EIA-222 REVISION "F" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2005 CONNECTICUT FIRE SAFETY CODE AND 2009 AMENDMENTS, 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.

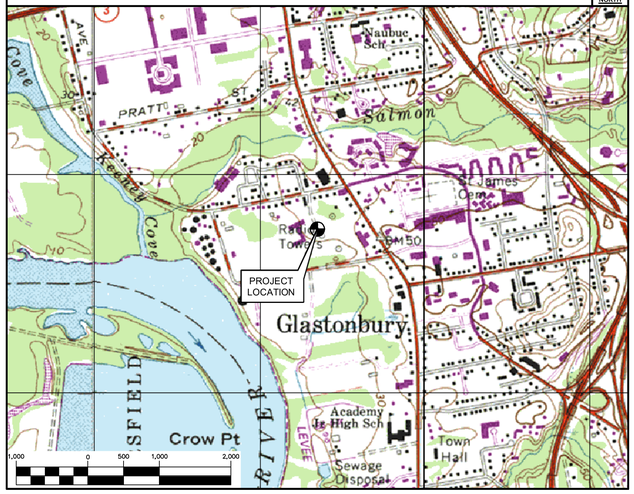
SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT
TO: 2577 MAIN STREET, GLASTONBURY, 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.	TURN LEFT TO MERGE ONTO I-91 N TOWARD HARTFORD	4.44 MI
5.	MERGE ONTO CT-3 N via EXIT 25 TOWARD GLASTONBURY	1.80 MI
6.	TAKE THE EXIT TOWARD MAIN ST/GLASTONBURY	1.80 MI
7.	TURN LEFT ONTO GLASTONBURY BLVD	0.35 MI
8.	TURN RIGHT ONTO MAIN ST	0.56 MI
9.	2577 MAIN ST IS ON THE RIGHT	

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 POS.1 ANTENNAS FOR PROPOSED UMTS HEXPORT ANTENNA.
   B. REMOVE AND REPLACE (1) EXISTING RRU-11 FOR PROPOSED RRU-12+A2.

PROJECT INFORMATION

AT&T SITE NUMBER:	CT5273
AT&T SITE NAME:	GLASTONBURY - NW SBA SITE ID: CT46126
SITE ADDRESS:	2577 MAIN ST GLASTONBURY, CT 06033
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°-42'-51.75" N LONGITUDE: 72°-36'-47.02" W GROUND ELEVATION: ±44' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES, SPECIFICATIONS AND DETAILS	0
C-1	PLANS AND NORTH ELEVATION	0
C-2	LTE EQUIPMENT DETAILS	0
C-3	LTE 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
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
GLASTONBURY - NW
CT5273 - LTE 2C
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 08/10/16
SCALE: AS NOTED
JOB NO. 16071.36

TITLE SHEET

T-1

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2003 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD: PER EIA/TIA 222 F-96 (ANTENNA MOUNTS): 80 MPH (FASTEST MILE), EQUIVALENT TO 105 MPH (3 SECOND GUST)
- BUILDING CLASSIFICATION: II (BASED ON IBC TABLE 1604.5)
- BASIC WIND SPEED (OTHER STRUCTURE): 100 MPH (3 SECOND GUST) (EXPOSURE B/IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-02) PER 2003 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2005 CONNECTICUT SUPPLEMENT AND 2009 AMMENDMENT.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-02 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.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

GLASTONBURY - NW

CT5273 - LTE 2C

2577 MAIN STREET

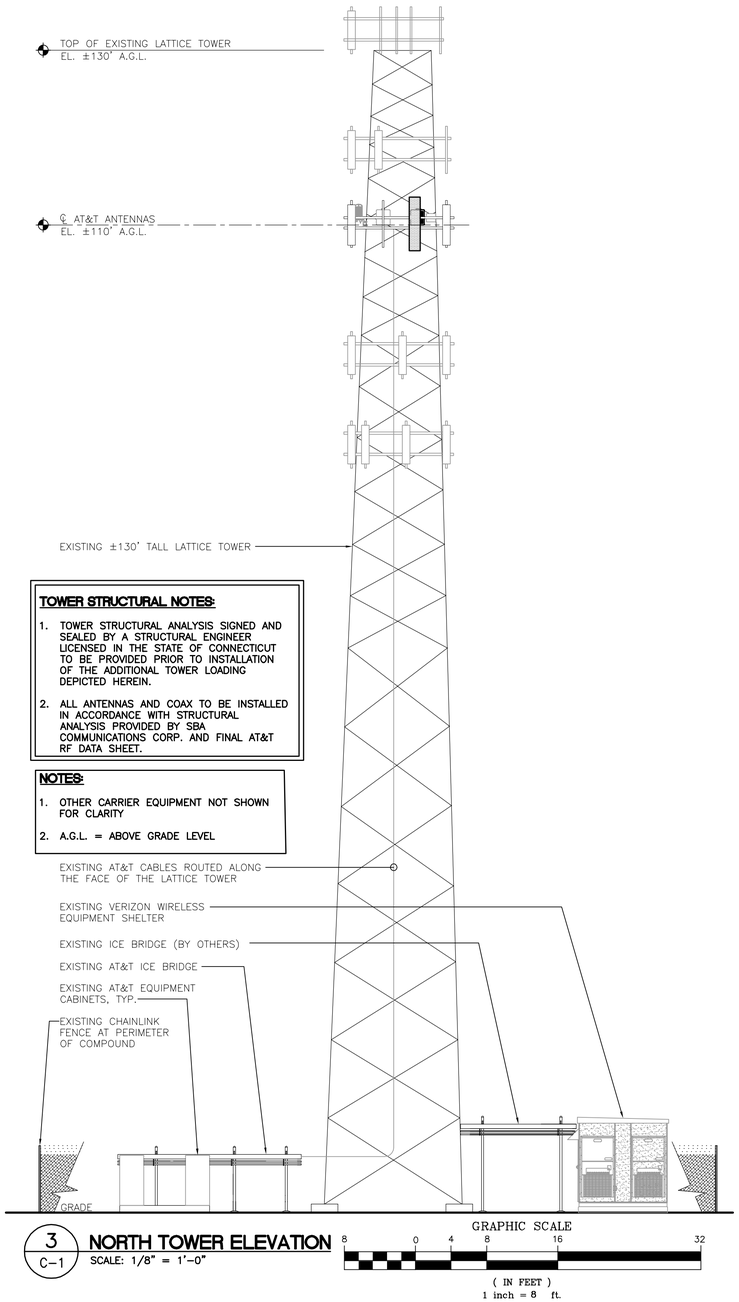
GLASTONBURY, CT 06033

DATE: 08/10/16
SCALE: AS NOTED
JOB NO. 16071.36

NOTES, SPECIFICATIONS, & DETAILS

N-1

Sheet No. 2 of 8



TOWER STRUCTURAL NOTES:

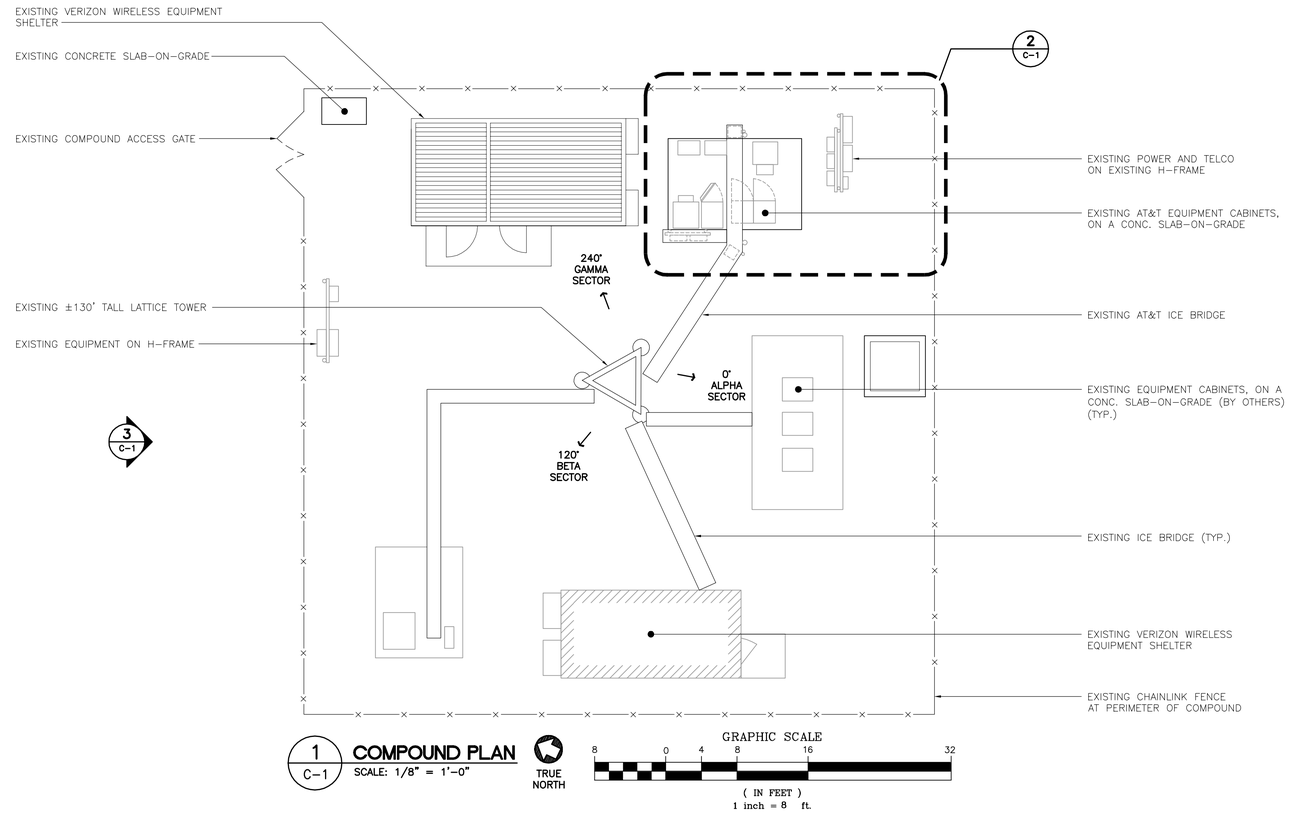
1. TOWER STRUCTURAL ANALYSIS SIGNED AND SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF CONNECTICUT TO BE PROVIDED PRIOR TO INSTALLATION OF THE ADDITIONAL TOWER LOADING DEPICTED HEREIN.
2. ALL ANTENNAS AND COAX TO BE INSTALLED IN ACCORDANCE WITH STRUCTURAL ANALYSIS PROVIDED BY SBA COMMUNICATIONS CORP. AND FINAL AT&T RF DATA SHEET.

NOTES:

1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.G.L. = ABOVE GRADE LEVEL

3 / C-1 **NORTH TOWER ELEVATION**
SCALE: 1/8" = 1'-0"

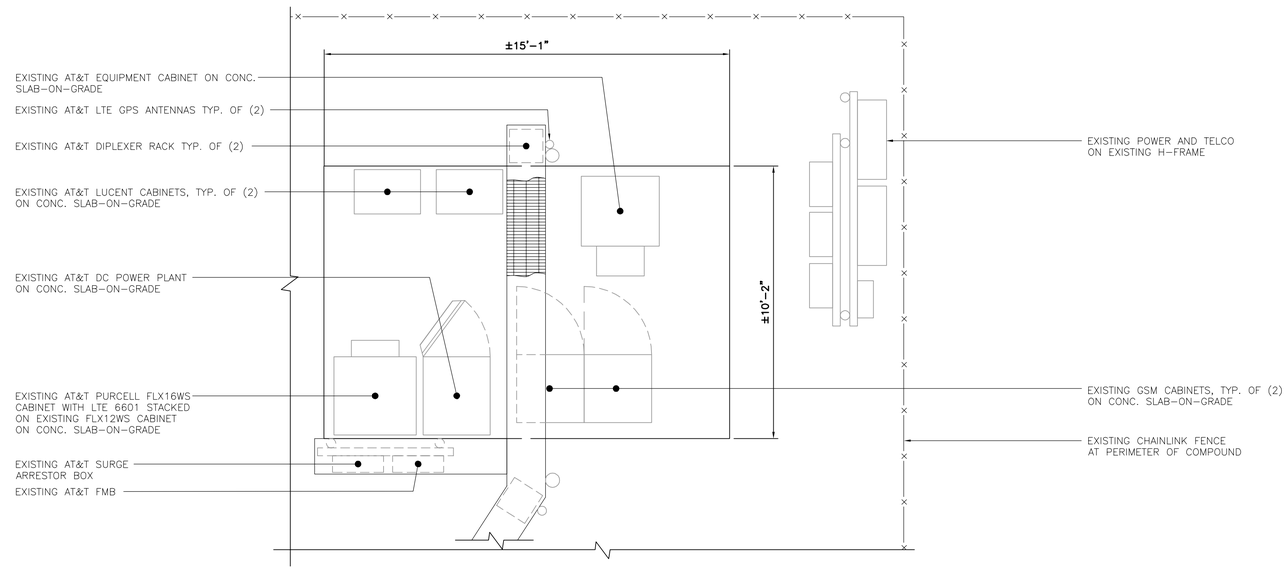
GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.



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

TRUE NORTH

GRAPHIC SCALE
8 0 4 8 16 32
(IN FEET)
1 inch = 8 ft.



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

TRUE NORTH

REV.	DATE	DRAWN BY	CHK'D	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

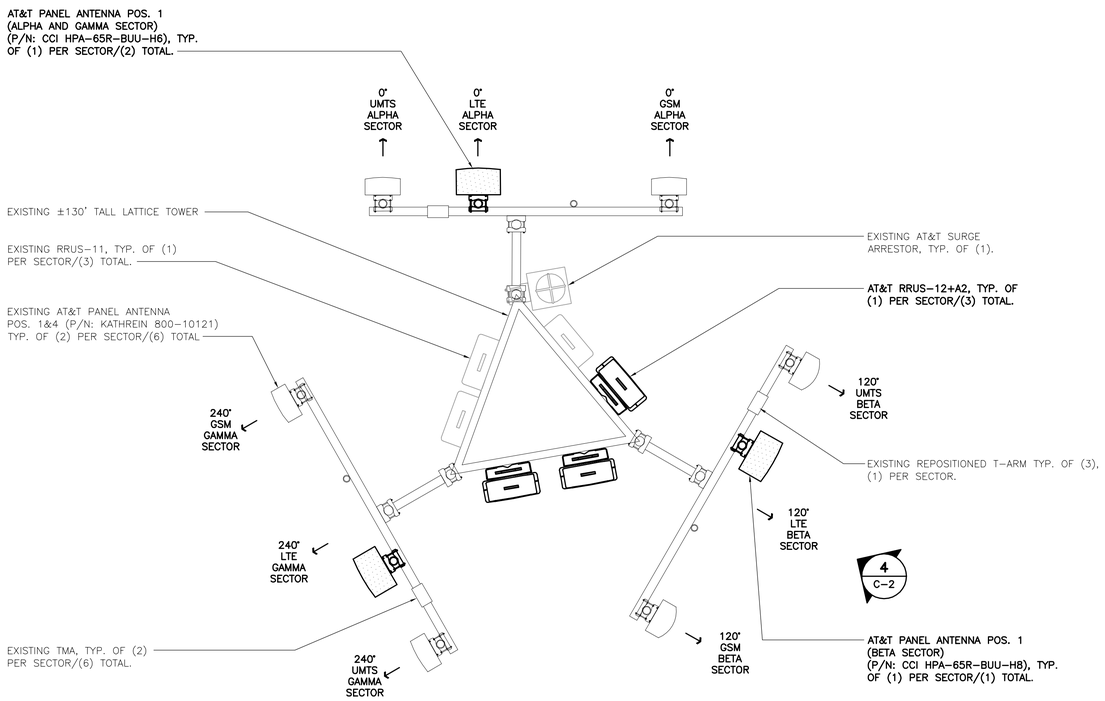
AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
GLASTONBURY – NW
CT5273 – LTE 2C
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 08/10/16
SCALE: AS NOTED
JOB NO. 16071.36

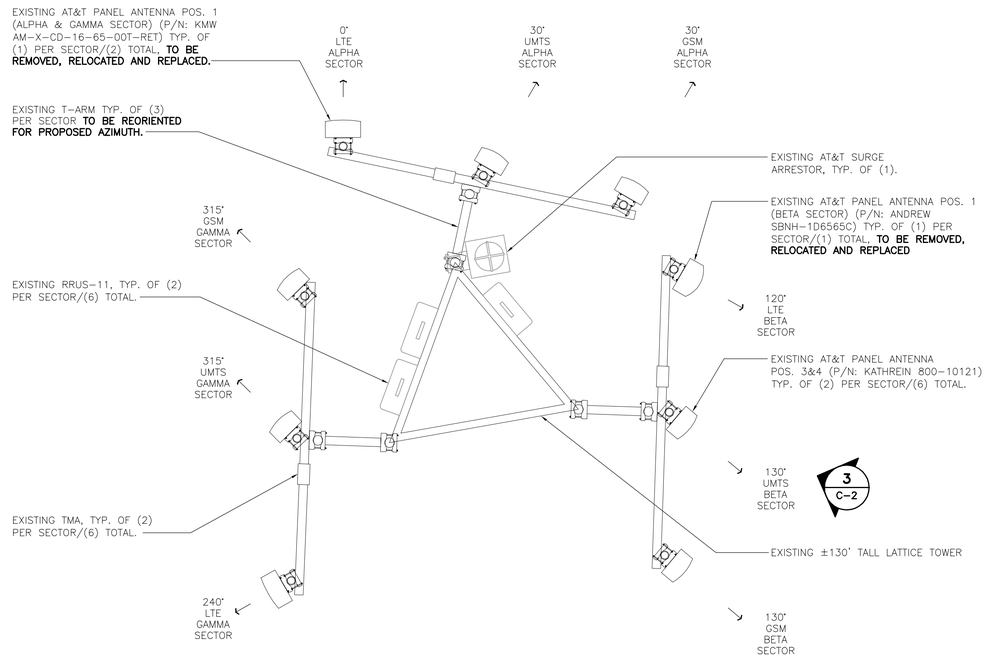
PLANS AND NORTH ELEVATION

C-1

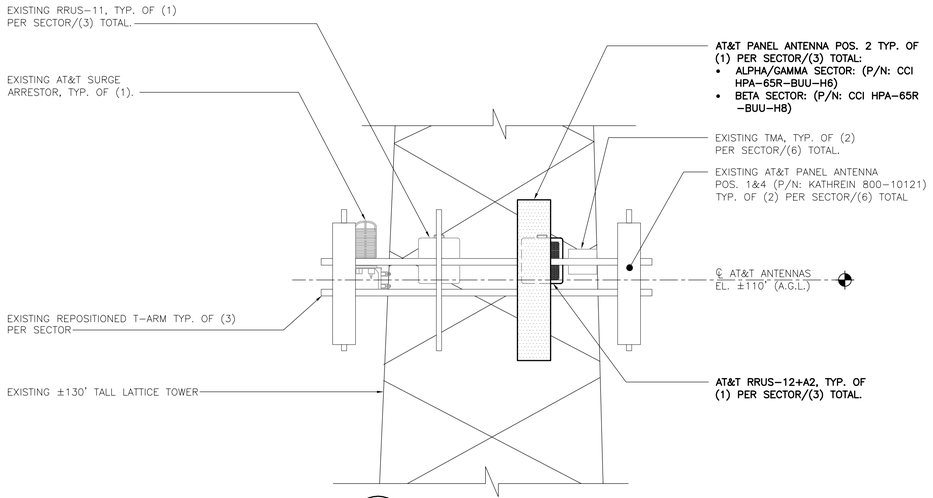
Sheet No. 3 of 8



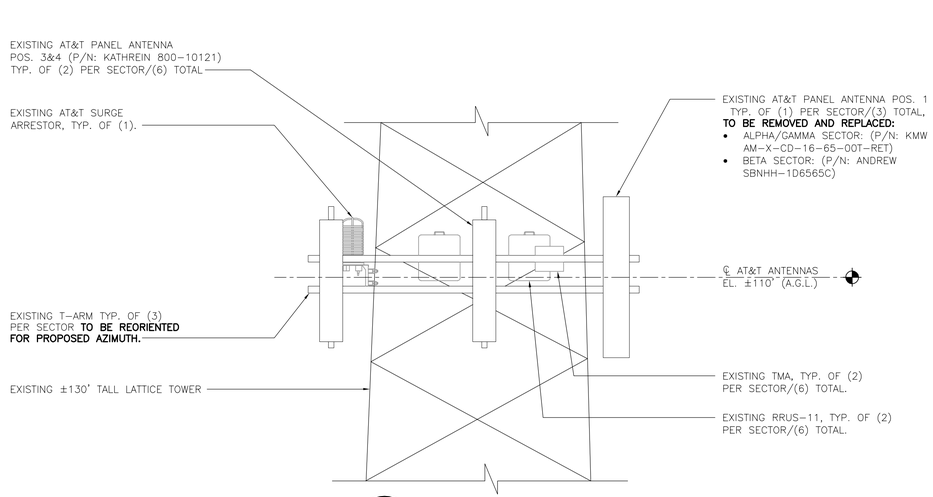
2 C-2 **PROPOSED ANTENNA PLAN**
SCALE: 1/2" = 1'-0"
TRUE NORTH



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



4 C-2 **PROPOSED ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"



3 C-2 **EXISTING ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

GLASTONBURY - NW

CT5273 - LTE 2C

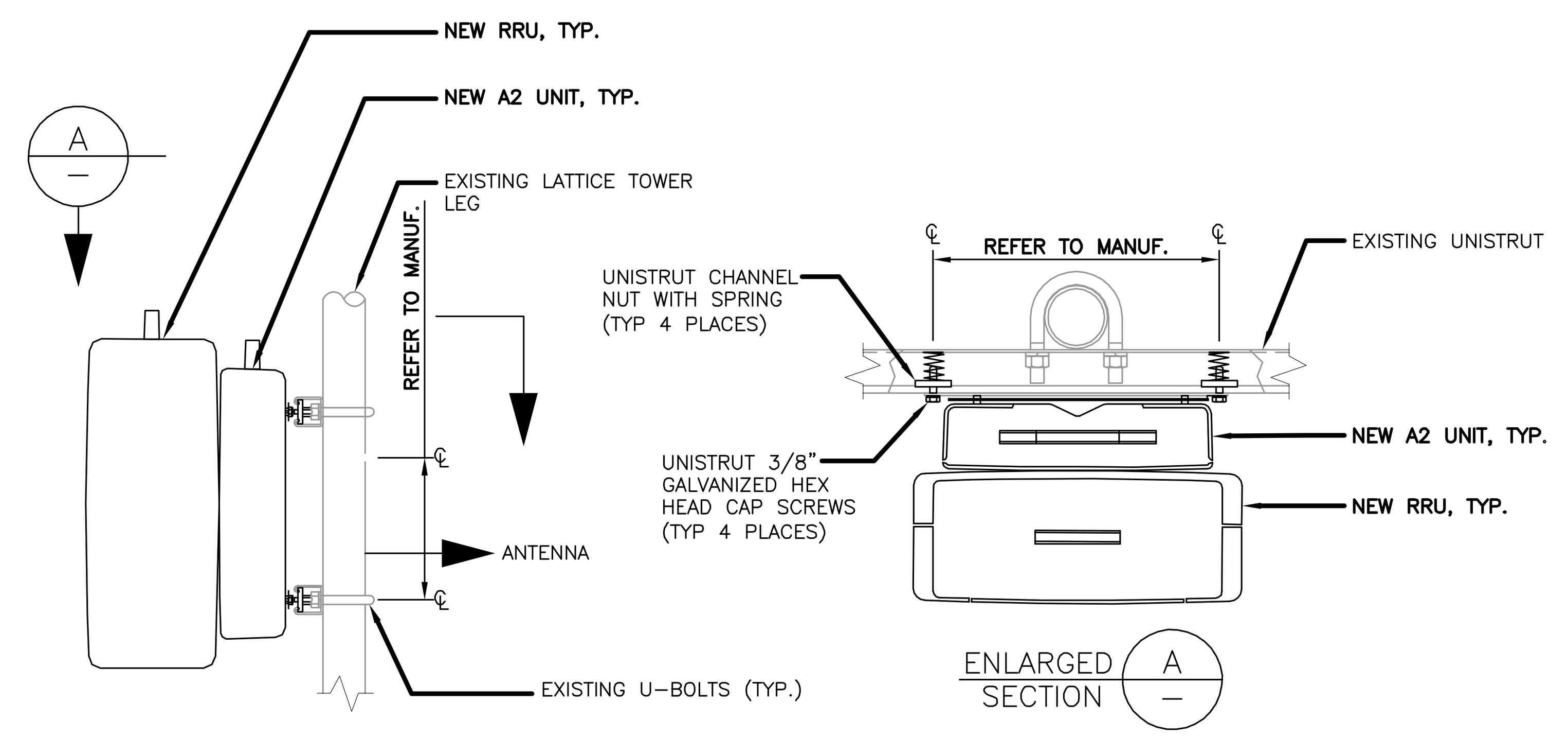
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE:	08/10/16
SCALE:	AS NOTED
JOB NO.	16071.36

LTE EQUIPMENT DETAILS

C-2

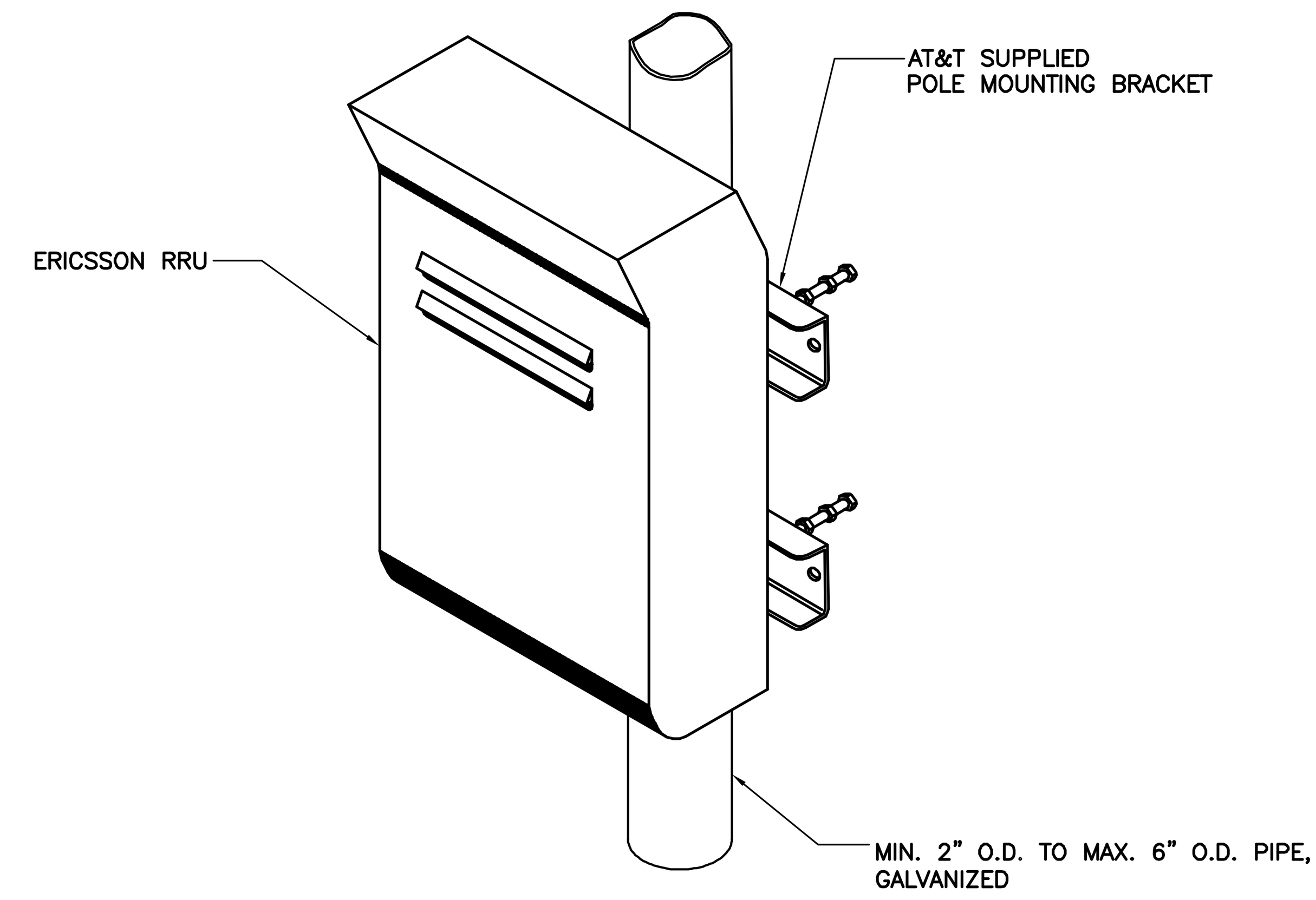
Sheet No. 4 of 8



TYPICAL RRU SECTOR MOUNT

3 C-1 **TYPICAL RRH MOUNTING DETAILS**

SCALE: NOT TO SCALE



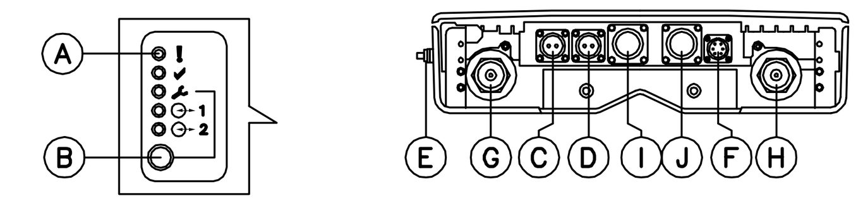
ISOMETRIC VIEW

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.

2 C-3 **TYPICAL RRUS MOUNTING DETAILS**

SCALE: NTS



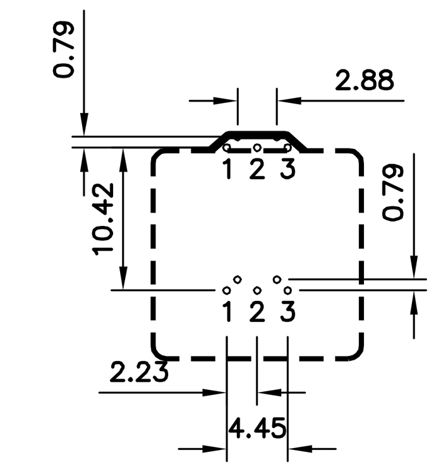
SIDE PANEL BOTTOM VIEW

CONNECTION INTERFACE

POSITION (ID)	DESCRIPTION	MARKING
A	OPTICAL INDICATORS	!, ✓, 🔧, ⊖-1, ⊖-2
B	MAINTENANCE	🔧
C	-48V DC POWER SUPPLY	POW IN
D	-48V DC POWER SUPPLY TO RRU	POW OUT
E	GROUNDING	⏚
F	RET	RET
G	ANTENNA B	← B
H	ANTENNA A	← A
I	OPTICAL CABLE 1	⊖-1
J	OPTICAL CABLE 2	⊖-2

NOTES:

1. STACKING OF RRU's IS NOT PERMITTED.
2. NO PAINTING OF RRU OR THE SOLAR SHIELD IS ALLOWED.
3. A SINGLE RRUS A2 CAN BE INSTALLED AS A STAND ALONE UNIT OR MOUNTED TO THE BACK OF ITS ASSOCIATED RRU.

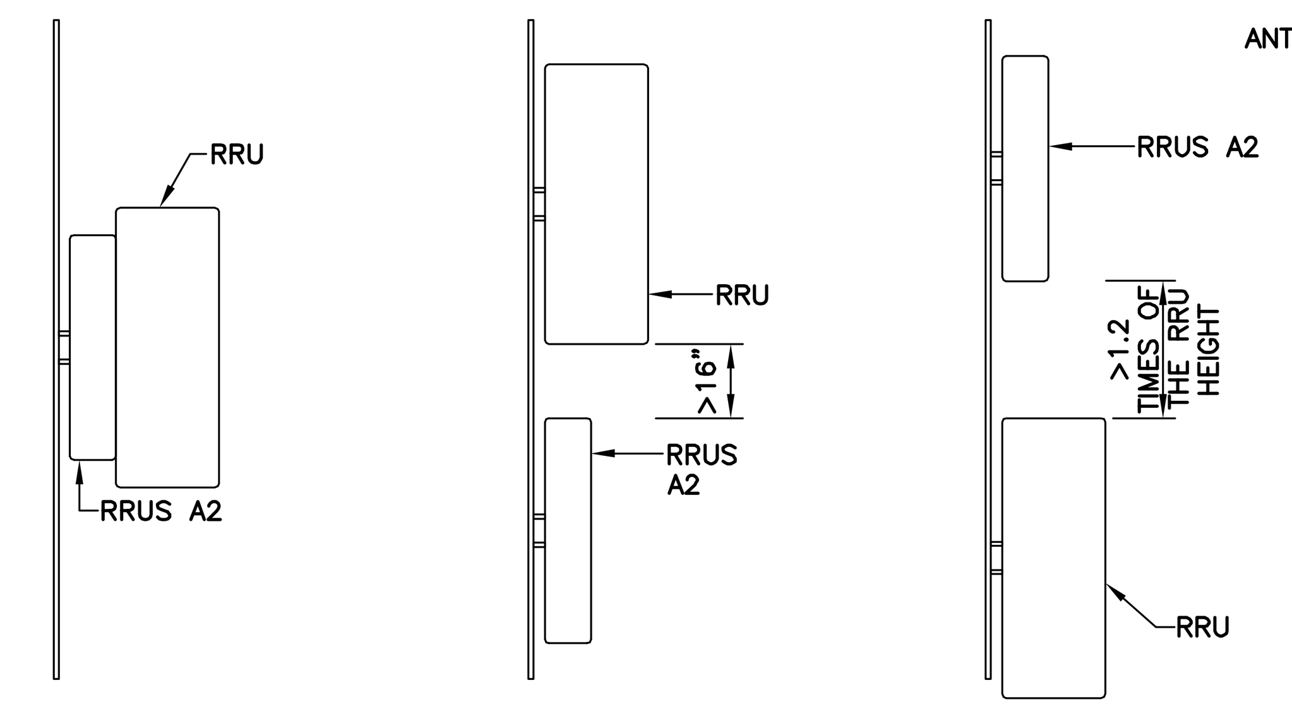


THE NUMBER OF BOLT HOLES DEPENDS ON THE WALL MATERIAL, AS SPECIFIED BY THE SITE ENGINEER. A MINIMUM OF TWO BOLT HOLES ARE RECOMMENDED FOR EACH BRACKET.

ONE OF THE FOLLOWING SOLUTIONS FOR HOLE POSITIONS MUST BE USED:

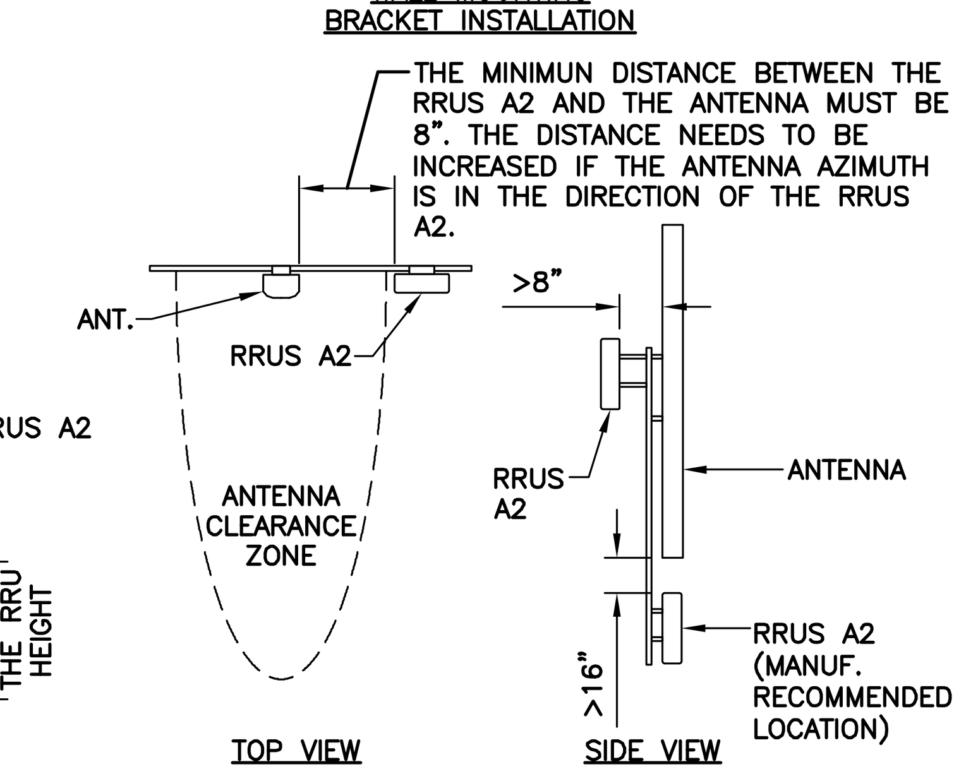
- 1, 3
- 1, 2, 3

WALL MOUNTING BRACKET INSTALLATION

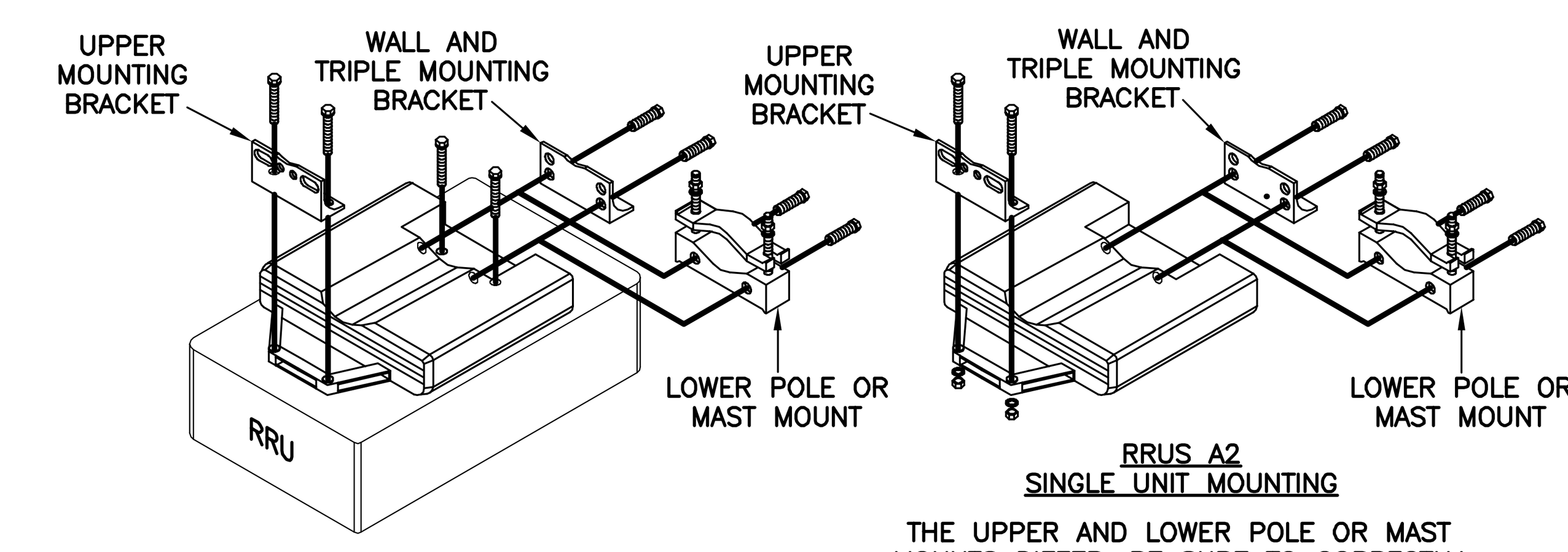


SIDE VIEW

RRUS A2 MANUFACTURER INSTALLATION REQUIREMENTS



TOP VIEW SIDE VIEW



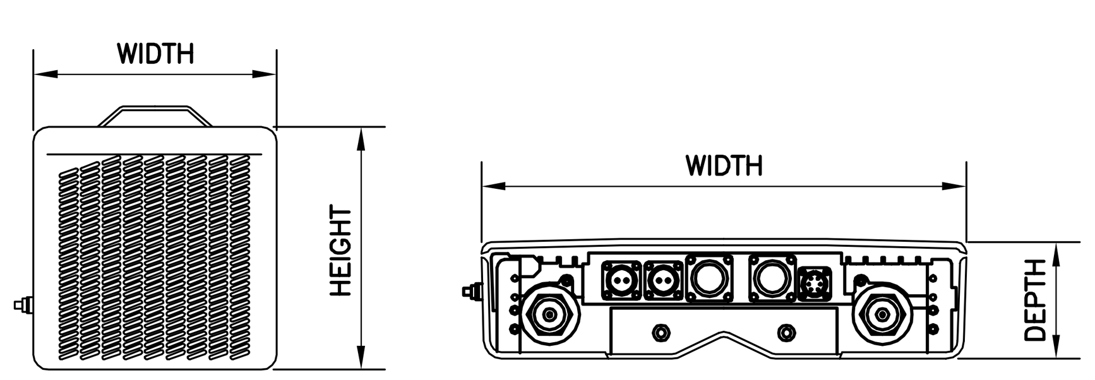
RRUS A2 W/ASSOCIATED RRU MOUNTING

RRUS A2 SINGLE UNIT MOUNTING

THE UPPER AND LOWER POLE OR MAST MOUNTS DIFFER, BE SURE TO CORRECTLY POSITION THE MOUNTS BEFORE INSTALLATION.

1 C-3 **ERICSSON RRU A2 DETAILS**

NOT TO SCALE



FRONT VIEW BOTTOM VIEW

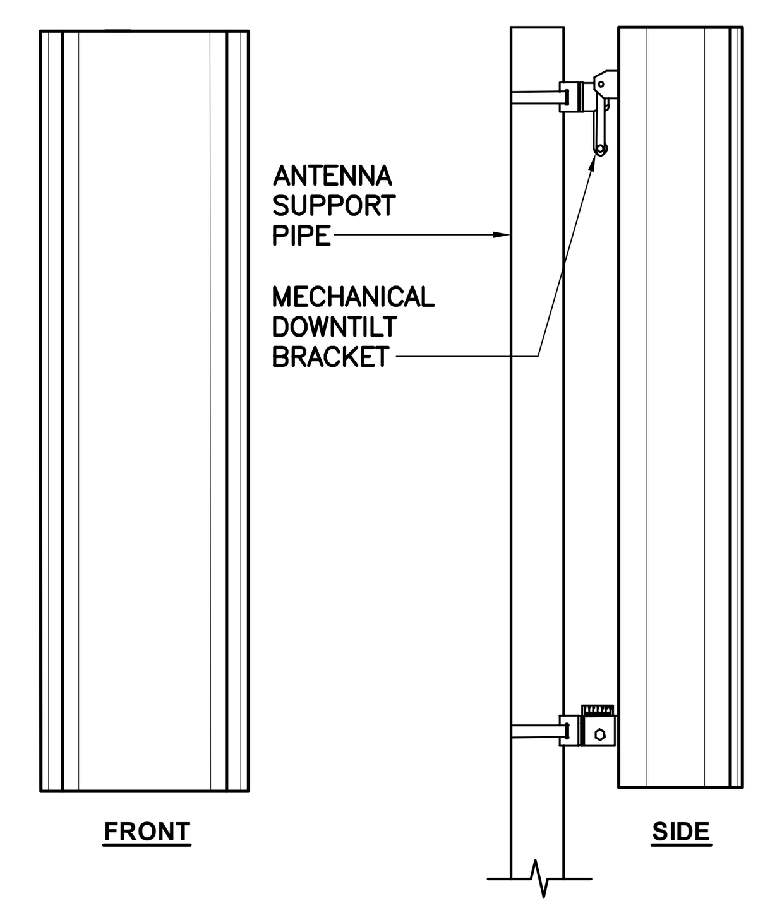
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS A2	16.42"L x 15.19"W x 3.35"D	22.05 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

NOTES:

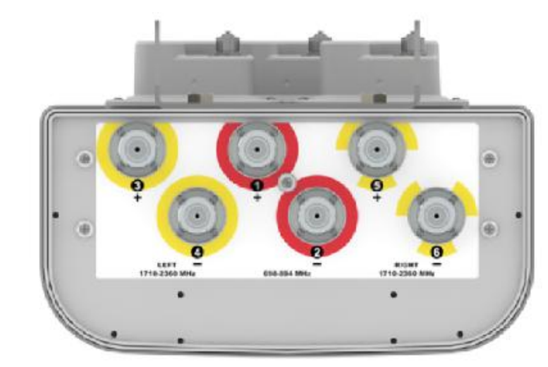
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH AT&T CONSTRUCTION MANAGER PRIOR TO ORDERING.

6 C-3 **ERICSSON RRUS A2 DETAIL**

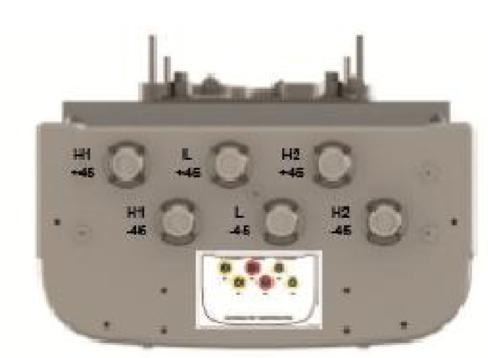
SCALE: NTS



FRONT SIDE



CCI-H6 BOTTOM

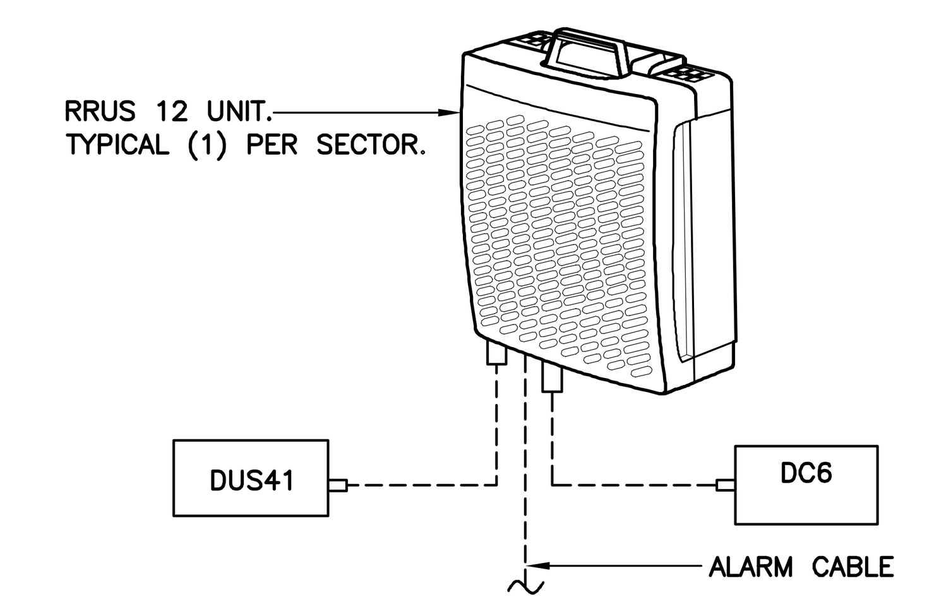


CCI-H8 BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: CCI MODEL: HPA-65R-BUU-H6	72.3"L x 14.4"W x 7.3"D	42.9 LBS.
MAKE: CCI MODEL: HPA-65R-BUU-H8	92.4"L x 14.8"W x 7.4"D	68 LBS.

5 C-3 **PROPOSED ANTENNA DETAIL**

SCALE: NTS



RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RRUS 12	20.4"L x 18.5"W x 7.5"D	50 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.

4 C-3 **ERICSSON RRUS 12 DETAIL**

SCALE: NTS

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions™
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

GLASTONBURY - NW

CT5273 - LTE 2C

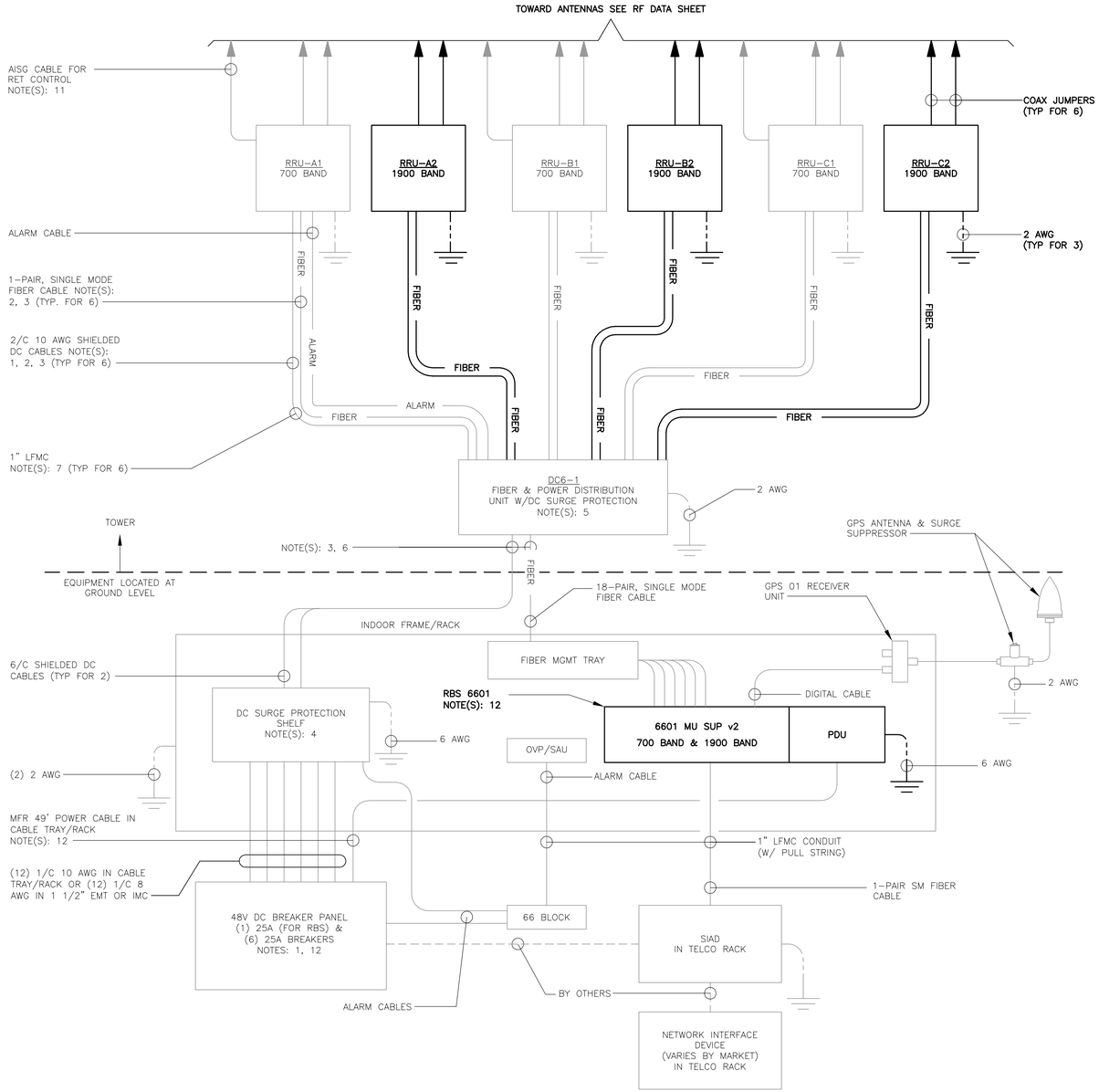
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 08/10/16
SCALE: AS NOTED
JOB NO. 16071.36

LTE EQUIPMENT DETAILS

C-3

Sheet No. 5 of 8



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.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

CONNECTICUT LICENSED PROFESSIONAL ENGINEER

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

GLASTONBURY - NW

CT5273 - LTE 2C

2577 MAIN STREET

GLASTONBURY, CT 06033

DATE: 08/10/16

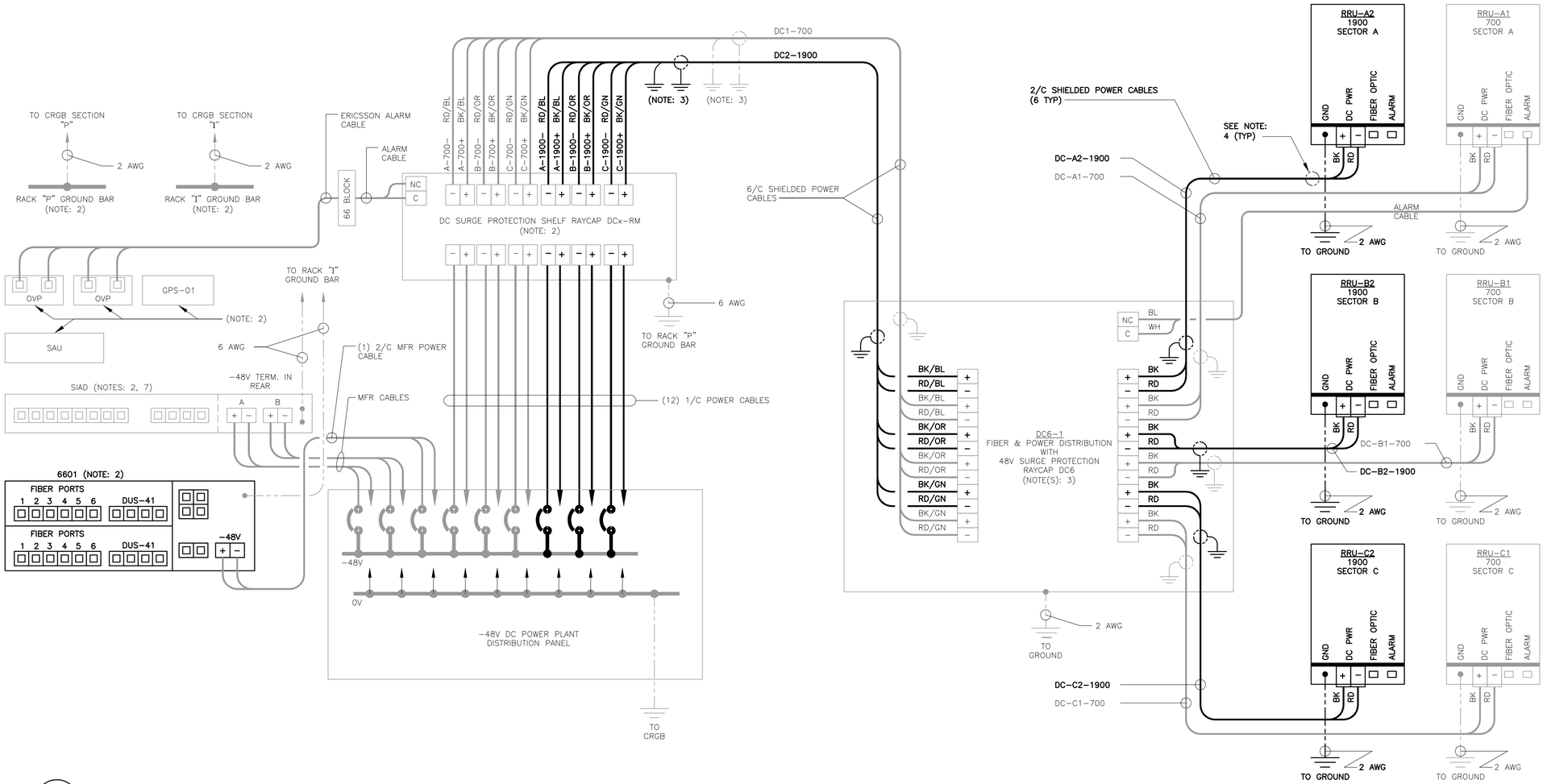
SCALE: AS NOTED

JOB NO. 16071.36

LTE SCHEMATIC DIAGRAM AND NOTES

E-1

Sheet No. 6 of 8



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.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY

WIRELESS COMMUNICATIONS FACILITY

GLASTONBURY - NW

CT5273 - LTE 2C

2577 MAIN STREET

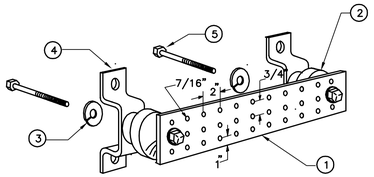
GLASTONBURY, CT 06033

DATE:	08/10/16
SCALE:	AS NOTED
JOB NO.	16071.36

LTE WIRING DIAGRAM

E-2

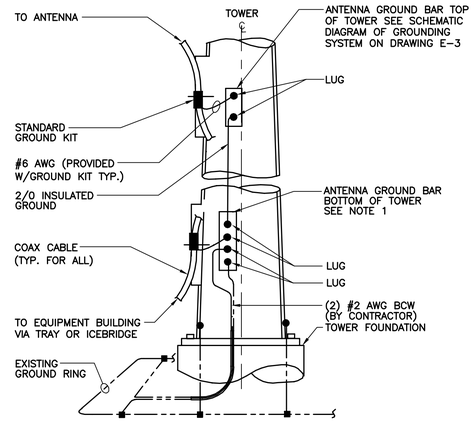
Sheet No. 7 of 8



LEGEND

1. TINNED COPPER GROUND BAR, 1/4"x 4"x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG .
2. INSULATORS, NEWTON INSTRUMENT CAT. NO. 2. 3061-4.
3. 3. 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4. WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. 4. CAT NO. A-6056.
5. STAINLESS STEEL SECURITY SCREWS.

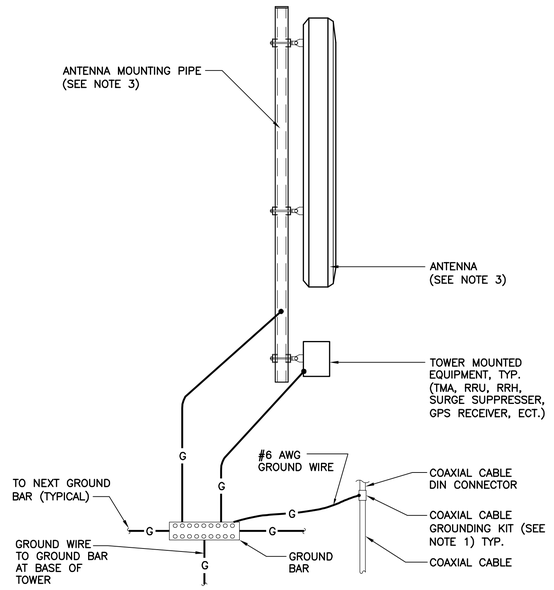
3 GROUND BAR DETAIL
E-3 NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

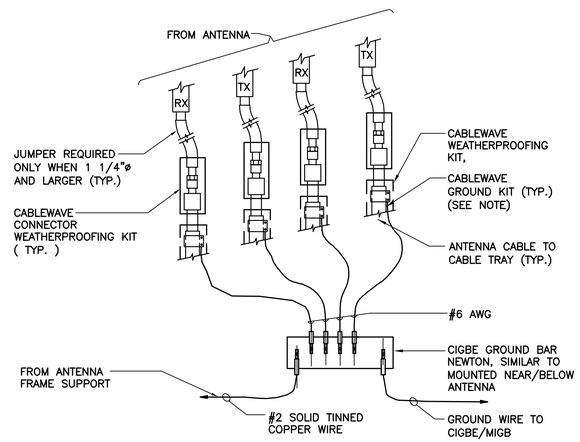
2 ANTENNA CABLE GROUNDING - TOWER
E-3 NOT TO SCALE



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.

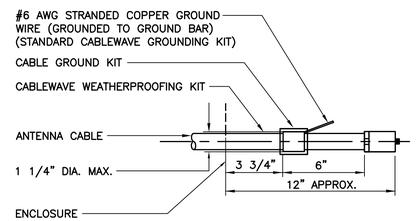
1 TYPICAL ANTENNA GROUNDING DETAIL
E-3 NOT TO SCALE



NOTE:

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

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



NOTE:

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

4 ANTENNA CABLE GROUNDING DETAIL
E-3 NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/29/16	KAWJR	CAG	CONSTRUCTION DOCUMENTS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

at&t

EMPIRE telecom

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

AT&T MOBILITY
WIRELESS COMMUNICATIONS FACILITY
GLASTONBURY - NW
CT5273 - LTE 2C
2577 MAIN STREET
GLASTONBURY, CT 06033

DATE: 08/10/16
SCALE: AS NOTED
JOB NO. 16071.36

TYPICAL ELECTRICAL DETAILS

E-3

Sheet No. 8 of 8