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

November 9, 2018

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 N / -72 36 46.9 W
T-Mobile #: CT11786D_L700-4x2

Dear Ms. Bachman:

T-Mobile currently maintains antennas at the 93-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. T-Mobile now intends to replace (6) existing cell antennas with (6) newer technology cell antennas at the 93-foot level of the tower. T-Mobile's proposed full scope of work is as follows:

Remove:
- (3) Ericsson KRY 112 144/2 TMAs
- (1) 1-5/8" coax

Remove and Replace:
- Remove: (3) Ericsson AIR 21 B4A/B2P Panel Antennas
  - Replace with: Ericsson AIR 32 KRD901146-1_B66A Panel Antennas
- Remove: (3) Commscope LNX-6515DS-A1M Panel
  - Replace with: Ericsson APXVAARR24_43-U-NA20 Panel Antennas
- Remove: (3) Ericsson S11B12 RRUs
  - Replace with: (3) Ericsson Radio 4449 B71+B12
- Remove: (1) 1-5/8" fiber
  - Replace with: (2) 1-1/4" hybrid
- Remove: Existing Pipe Mast
  - Replace with: (3) 2" x-strong steel pipe mast

Install:
- SitePro1 SFS-V or approved equal

Existing Equipment to Remain (Including entitlements):
- (3) Ericsson Air 21 B2A/B4P Panel Antennas
- (3) Ericsson KRY 112 144/2 TMAs
- (3) T-Frames
- (11) 1-5/8" coax

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 the Town of Glastonbury's Town Manager, Richard J. Johnson, and Director of Land Use & Planning Services, Khara Dodds, as well as to the property owner, Saint Paul's Roman Catholic Church. (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, T-Mobile 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: Richard J. Johnson, Town Manager / with attachments
Glastonbury Town Hall, 2155 Main Street, Glastonbury, CT 06033
Khara Dodds, Director of Land Use & Planning Services / with attachments
Glastonbury Town Hall, 2155 Main Street, Glastonbury, CT 06033
Saint Paul's Roman Catholic Church / with attachments
2577 Main St. Glastonbury CT 06033-2023

POWER DENSITY

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B		Sector:	C
Antenna #:	1	Antenna #:	1		Antenna #:	1
Make / Model:	Ericsson AIR32 KRD901146-	Make / Model:	Ericsson AIR32 KRD901146-1		Make / Model:	Ericsson AIR32 KRD901146-
Gain:	15.9dB	Gain:	15.9dB		Gain:	15.9dB
Height (AGL):	93	Height (AGL):	93		Height (AGL):	93
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)		Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4		Channel Count	4
Total TX Power(W):	20	Total TX Power(W):	20		Total TX Power(W):	20
ERP (W):	7,780.9	ERP (W):	7,780.9		ERP (W):	7,780.9
Antenna A1 MPE%	**3.7**	Antenna B1 MPE%	**3.7**		Antenna C1 MPE%	**3.7**
Antenna #:	2	Antenna #:	2		Antenna #:	2
Make / Model:	Ericsson AIR21	Make / Model:	Ericsson AIR21 KRC118023-1 B2A/B4P		Make / Model:	Ericsson AIR21 KRC118023-1 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd		Gain:	15.9 dBd
Height (AGL):	93	Height (AGL):	93		Height (AGL):	93
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)		Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2		Channel Count	2
Total TX Power(W):	5	Total TX Power(W):	5		Total TX Power(W):	5
ERP (W):	2,139.7	ERP (W):	2,139.7		ERP (W):	2,139.7
Antenna A2 MPE%	**1.0**	Antenna B2 MPE%	**1.0**		Antenna C2 MPE%	**1.0**
Antenna #:	3	Antenna #:	3		Antenna #:	3
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20		Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd		Gain:	12.95 / 13.35 dBd
Height (AGL):	93	Height (AGL):	93		Height (AGL):	93
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz		Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4		Channel Count	4
Total TX Power(W):	12	Total TX Power(W):	12		Total TX Power(W):	12
ERP (W):	2,443.0	ERP (W):	2,443.0		ERP (W):	2,443.0
Antenna A3 MPE%	**2.7**	Antenna B3 MPE%	**2.7**		Antenna C3 MPE%	**2.7**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**7.47 %**
MetroPCS	**1.38 %**
Sprint	**3.87 %**
Clearwire	**0.13 %**
Nextel	**0.38 %**
AT&T	**4.54 %**
Verizon Wireless	**12.92 %**
Site Total MPE %:	**30.69 %**

T-Mobile Sector A Total:	7.47 %
T-Mobile Sector B Total:	7.47 %
T-Mobile Sector C Total:	7.47 %
Site Total:	30.69 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	93	14.78	PCS - 1900 MHz	1000.00	1.48%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	93	22.17	AWS - 2100 MHz	1000.00	2.22%
T-Mobile PCS - 1900 MHz GSM	1	583.57	93	2.77	PCS - 1900 MHz	1000.00	0.28%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	93	7.39	AWS - 2100 MHz	1000.00	0.74%
T-Mobile 600 MHz LTE	2	788.97	93	7.49	600 MHz	400.00	1.87%
T-Mobile 700 MHz LTE	2	432.54	93	4.11	700 MHz	467.00	0.88%
						Total:	**7.47%**

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Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

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2577 MAIN ST

Location	2577 MAIN ST	**M/B/L/U**	D5/ 4140/ W00038A/ TWR/
Acct#	D54140W0038A	**Owner**	ST PAULS ROMAN CATHOLIC CHURCH
Assessment	$722,400	**Appraisal**	$1,032,000
PID	106188	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$132,000	$900,000	$1,032,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$92,400	$630,000	$722,400

Owner of Record

Owner	ST PAULS ROMAN CATHOLIC CHURCH	**Sale Price**	$0
Co-Owner	ATTN TAX DEPT	**Certificate**	
		Book & Page	2610/0239
		Sale Date	08/01/2009

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
ST PAULS ROMAN CATHOLIC CHURCH	$0		2610/0239	08/01/2009

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Replacement Cost: $0
Building Percent Good:
Replacement Cost Less Depreciation: $0

Building Photo

Building Attributes	
Field	**Description**
Style	Outbuildings
Model	

Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure:	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Floor/Cover 1	
Floor/Cover 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Total Bthrms:	
Total Half Baths:	
Total Rooms:	
Bath Qlty:	
Kitchen Qlty:	
Extra Kitchens	
Style Sub Class	
Bsmt Garages	
Fireplaces	

(http://images.vgsi.com/photos2/GlastonburyCTPhotos//\02\01\30/75.jpg)

Building Layout

Building Layout

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 202
Description Commercial Land & OB
Zone

Land Line Valuation

Size (Acres) 0
Assessed Value $630,000
Appraised Value $900,000

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD4	Cell Shed			240 S.F.	$60,000	1
SHD4	Cell Shed			288 S.F.	$72,000	1
FNC	FENCE	M	Metal	600 L.F.	$0	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$132,000	$900,000	$1,032,000
2016	$132,000	$660,000	$792,000
2015	$132,000	$660,000	$792,000

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$92,400	$630,000	$722,400
2016	$92,400	$462,000	$554,400
2015	$92,400	$462,000	$554,400

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11786D

Nextel Glastonbury
2577 Main Street
Glastonbury, CT 06033

November 6, 2018

EBI Project Number: 6218006993

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	30.69 %

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

EBI Consulting
environmental | engineering | due diligence

November 6, 2018

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11786D – Nextel Glastonbury**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **2577 Main Street, Glastonbury, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

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 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency 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 T-Mobile 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 T-Mobile 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 for directional panel antennas, 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) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

7) 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.

8) 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 for directional panel antennas, 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.

9) The antennas used in this modeling are the **Ericsson AIR32 KRD901146-1 B66A/B2A** & **Ericsson AIR21 KRC118023-1 B2A/B4P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

10) The antenna mounting height centerline of the proposed antennas is **93 feet** above ground level (AGL).

11) 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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 KRD901146-1 B66A/B2A	Make / Model:	Ericsson AIR32 KRD901146-1 B66A/B2A	Make / Model:	Ericsson AIR32 KRD901146-1 B66A/B2A
Gain:	15.9dBd	Gain:	15.9dBd	Gain:	15.9dBd
Height (AGL):	93 feet	Height (AGL):	93 feet	Height (AGL):	93 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**3.70**	Antenna B1 MPE%	**3.70**	Antenna C1 MPE%	**3.70**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 KRC118023-1 B2A/B4P	Make / Model:	Ericsson AIR21 KRC118023-1 B2A/B4P	Make / Model:	Ericsson AIR21 KRC118023-1 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	93 feet	Height (AGL):	93 feet	Height (AGL):	93 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	55	Total TX Power(W):	55	Total TX Power(W):	55
ERP (W):	2,139.75	ERP (W):	2,139.75	ERP (W):	2,139.75
Antenna A2 MPE%	**1.02**	Antenna B2 MPE%	**1.02**	Antenna C2 MPE%	**1.02**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	93 feet	Height (AGL):	93 feet	Height (AGL):	93 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**2.75**	Antenna B3 MPE%	**2.75**	Antenna C3 MPE%	**2.75**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**7.47 %**
MetroPCS	**1.38** %
Sprint	**3.87** %
Clearwire	**0.13** %
Nextel	**0.38** %
AT&T	**4.54** %
Verizon Wireless	**12.92** %
Site Total MPE %:	**30.69 %**

T-Mobile Sector A Total:	7.47 %
T-Mobile Sector B Total:	7.47 %
T-Mobile Sector C Total:	7.47 %
Site Total:	30.69 %

T-Mobile Maximum MPE Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz LTE	2	1,556.18	93	14.78	PCS - 1900 MHz	1000.00	1.48%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	93	22.17	AWS - 2100 MHz	1000.00	2.22%
T-Mobile PCS - 1900 MHz GSM	1	583.57	93	2.77	PCS - 1900 MHz	1000.00	0.28%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	93	7.39	AWS - 2100 MHz	1000.00	0.74%
T-Mobile 600 MHz LTE	2	788.97	93	7.49	600 MHz	400.00	1.87%
T-Mobile 700 MHz LTE	2	432.54	93	4.11	700 MHz	467.00	0.88%
						Total:	**7.47%**

Summary

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

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

T-Mobile Sector	Power Density Value (%)
Sector A:	7.47 %
Sector B:	7.47 %
Sector C:	7.47 %
T-Mobile Maximum MPE % (Per Sector):	7.47 %
Site Total:	30.69 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **30.69%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

ALLPRO
CONSULTING GROUP, INC.
9221 Lyndon B. Johnson Freeway, #204, Dallas, TX 75243 ★ PHONE 972-231-8893 ★ FAX 1-866-364-8375
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Tower Structural Analysis Report for
SBA Network Services, Inc.

Existing 130' Self Supporting Tower

SBA Site Name: Glastonbury-main St.
SBA Site ID: CT46126-A-02
Carrier Name: T-Mobile
Carrier Site Name: CT11786D / Nextel Glastonbury
Application #88696, v3

Site Location: 2577 Main Street
Glastonbury, CT 06033
Hartford County
Latitude: 41.714389°
Longitude: -72.613028°

ACGI Job # 18-6523
(Ref. Previous job AGCI#17-1967 dated 05/05/2017)

ANALYSIS RESULTS		
Tower Components	99.8%	**Pass**
Tower Foundation	68.0%	**Pass**
Net Change in Tower Member Stresses	+13.6 %	Change from previous SA by Allpro Consulting Group, Inc., ACGI Job # 17-1967 dated 05/05/2017
Change in Tower stress due to mount modification	+0.7%	

Prepared By:
Anita Lama
Staff Engineer, E.I.T.

STATE OF CONNECTICUT
JOJI M. GEORGE
No. 24444
LICENSED
PROFESSIONAL ENGINEER

9/26/2018
Approved By:
Joji M. George, P.E.
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 loads and the proposed T-Mobile 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 compliance** with *TIA 222-G-Addendum 2, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and International Building Code 2012*.

2. SCOPE & SOURCE OF INFORMATION

The purpose of this structural analysis is to determine whether the existing structure is capable of supporting the 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
	Hudson Design Group LLC	Mount Analysis Report by Hudson Design Group LLC dated August 20,2018
	Allpro Consulting Group, Inc.	Previous Structural Analysis by ACGI (ACGI Job #16-2859, dated 8/16/2016)
	Allpro Consulting Group, Inc.	Previous Structural Analysis by ACGI (ACGI Job #16-4584, dated 12/09/2016)
	Allpro Consulting Group, Inc.	Previous Structural Analysis by ACGI (ACGI Job #17-1967 dated 05/05/2017)
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:	Allpro Consulting Group, Inc. SBA Communication Corp.	Existing loading as per previous Structural Analysis by ACGI, Project #17-1967 dated 05/05/2017. Proposed final loading forT-Mobile as per sbasite.com, Application ID 88696, v3.
Authorization:	SBA Communication Corp.	

3. ANALYSIS METHODS & DATA

The analysis was performed in accordance with Telecommunication Industry Association specification TIA-222-G-Addendum 2. 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-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:	CT46126-A-02
Carrier Site Name:	CT11786D / Nextel Glastonbury
City, State:	Glastonbury, CT
County:	Hartford
Code Wind Load Requirement:	TIA-222-G & IBC 2012 (Ultimate wind speed of 125 mph 3 sec gust equivalent to Nominal design wind speed of 97 mph basic wind speed)
Wind Load Used:	ANSI/TIA-222-G Code: • Nominal wind speed of 97 mph (3 second gust wind speed) • Structure Class II. • Exposure Category C. • Topographic Category 1. • A wind speed of 50 mph is used in combination with ice. • Nominal ice thickness of 1.0 in.
Seismic Check:	Ss = 0.180 g < 1.0g, thus seismic loading can be ignored as per 2.7.3 of the TIA-222-G code.

TOWER DATA	
Tower Type:	3 Sided Self Supporting Tower
Height:	130'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi, Braces – 36 ksi
Type of Foundation:	Mat Foundation

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

4. ASSUMPTIONS

This analysis was completed based on the following assumptions:

- Tower has been properly maintained
- Tower erection was in accordance to manufacturer drawings
- Leg flanges have been properly designed by manufacturer to not be a limiting reaction
- Welds have been properly designed and installed by manufacturer to not be a limiting reaction
- Foundation was constructed in accordance to manufacturer drawings
- Foundation does not have structural damage
- Bolts have been properly tightened according to manufacturer specifications
- Appurtenance, mount and transmission line sizes and weights are best estimates using the tnxTower database and manufacturer information

5. CONCLUSIONS

RESULT SUMMARY		
MEMBER	*% Capacity*	*Pass/Fail*
Leg	**96.7%**	**Pass**
Diagonal	**98.0%**	**Pass**
Horizontal	**3.5%**	**Pass**
Secondary Horizontal	**99.8%**	**Pass**
Top Girt	**3.4%**	**Pass**
Bottom Girt	**13.2%**	**Pass**
Bolt Checks	**99.8%**	**Pass**
Tower Foundation (See attached MATHCAD calculations)	**Bearing Capacity 24.7%**	**Pass**
	Overturning 68.0 %	**Pass**
	Horizontal Shear Capacity 17.9 %	**Pass**
Anchor Bolt Capacity (See attached MATHCAD calculations)	**68.8 %**	**Pass**
Tower Overall Rating = 99.8 % (Pass)		

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

Maximum tower member stress **is less than allowable**, making it **in compliance** under the TIA-222-G code and International Building Code 2012.

MAXIMUM DISH ROTATION AT SERVICE WIND SPEED Twist and Tilt (deg)					
Elev. (ft)	*Dish*	*Twist (deg)*	*Tilt (deg)*	*Allowable (deg)*	*Result*
124±	**(3) VHLP2.5 (Sprint-Clearwire)**	**0.023**	**0.584**	**Carrier to verify**	**-**

Th tower stress ratio increased by 13.8 % from previous SA(ACGI Job # 17-1967 dated 05/05/2017) since Exposure C is considered in this SA based on current stringent approach of determining exposure category.

6. 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.

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.

7. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
128±	3	Unknown 24"x14"x9" TMA	(3) T-Frames @128'	(6) 5/16" (4) 1/2"	Sprint-Clearwire
	2	Argus Tech. LLPX310R Panel			
	1	Kathrein 840 10054 Panel			
	1	Motorola TIMING 2000			
124±	3	Andrew VHLP2.5 Dish			
120±	**3**	RFS APXVSPP18-C-A20 Panel	(3) Sector Frames @118.5'	(4) 1-1/4" fiber	Sprint Nextel
	3	Rfs Celwave APXVTM14-C-120 Panel			
	4	RFS ACU-A20-N RET			
	3	ALU 1900 4x45 65 MHz RRU			
	3	ALU 800 MHz 2x50W RRU			
	3	ALU Lucent TD-RRH8x20-25 RRH			
	3	ALU 800 MHz Filter			
118.5±	3	ALU 800 MHz Filter			
110±	2	CCI HPA-65R-BUU-H6 Antenna	(3) T-Frames @110'	(36) 1/2" fiber (18) 1-1/4" coax (18) 3/8" RET	AT&T
	1	CCI HPA-65R-BUU-H8 Antenna			
	6	Kathrein 800 10121 Antenna			
	3	Ericsson RRUS 11 RRU			
	3	Ericsson RRUS 12 RRU			
	3	Ericsson RRUS A2 RRU Module			
	6	Powerwave LGP 21401 DB-850 TMA			
	12	Kathrein 860-10025 RET			
	6	Powerwave LGP21901 diplexers			
	3	Andrew ATSBT-TOP-MF-4G			
	1	Raycap DC6-48-60-18-8F			
93±	3	Ericsson AIR 21 B2A/B4P Panel	(3) T-Frames @93'	(12) 1-5/8" coax (1) 1-5/8" fiber	T-Mobile
	3	Ericsson AIR 21 B4A/B2P Panel			
	6	Ericsson KRY 112 144/2 TMA			
	3	Commscope LNX-6515DS-A1M Panel			
	3	Ericsson S11B12 RRU			
80±	6	Amphenol BXA-70063/6CF Panel	(3) T-Frames @80'	(2) 1-5/8	Verizon
	6	Amphenol BXA-171063/12CF Panel			
	6	RFS RRH2x40-700U RRH			
	3	RFS RRH2x40-AWS RRH			
	1	RFS DB-T1-6Z-8AB-0Z Distribution Box			

FINAL T-MOBILE LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
93±	3	Ericsson AIR 21 B2A/B4P Panel	(3) T-Frames @93' w/ **(3)2" x-strong pipe &Sitepro1 SFS-V stabilizer kit**	(11) 1-5/8" coax **(2) 1-1/4" hybrid**	T-Mobile
	3	**Ericsson AIR 32 KRD901146-1_B66A Panel**			
	3	Ericsson KRY 112 144/2 TMA			
	3	**Ericsson APXVAARR24_43-U-NA20 Panel**			
	3	**Ericsson Radio 4449 B71+B12**			

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 and other interference with existing antennas for a redesign.

8. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	130 - 120	Leg	1 1/2	1	-8.648	47.300	18.3	Pass
		Diagonal	1/2	12	-1.297	2.965	43.8	Pass
		Horizontal	L1 1/4x1 1/4x3/16	35	-0.238	6.709	3.5	Pass
		Top Girt	L1 1/4x1 1/4x3/16	6	-0.025	6.709	0.4	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	9	0.065	14.048	0.5	Pass
T2	120 - 117.143	Leg	2	43	-12.526	95.057	13.2	Pass
		Diagonal	3/4	52	-2.686	9.384	28.6	Pass
		Top Girt	L1 1/4x1 1/4x3/16	48	-0.233	6.795	3.4	Pass
T3	117.143 - 114.286	Leg	2	55	-19.635	95.057	20.7	Pass
		Diagonal	3/4	60	-2.689	9.384	28.6	Pass
T4	114.286 - 111.43	Leg	2	64	-26.150	93.381	28.0	Pass
		Diagonal	3/4	70	-2.669	9.369	28.5	Pass
T5	111.43 - 108.573	Leg	2	73	-40.425	93.381	43.3	Pass
		Diagonal	3/4	81	-3.829	9.369	40.9	Pass
T6	108.573 - 105.716	Leg	2	82	-52.196	93.381	55.9	Pass
		Diagonal	3/4	90	-5.148	9.369	54.9	Pass
T7	105.716 - 102.859	Leg	2	91	-66.052	93.381	70.7	Pass
		Diagonal	3/4	98	-5.030	9.369	53.7	Pass
T8	102.859 - 100	Leg	2	100	-85.799	118.274	72.5	Pass
		Diagonal	3/4	111	-5.450	9.384	58.1	Pass
		Secondary Horizontal	L2x2x1/8	112	-1.353	10.739	12.6	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	104	-0.900	6.795	13.2	Pass
T9	100 - 96	Leg	P4.5 x 0.237	115	-89.506	142.411	62.9	Pass
		Diagonal	L1 1/2x1 1/2x3/16	121	-4.426	10.892	40.6	Pass
							81.0 (b)	
T10	96 - 92	Leg	P4.5 x 0.237	124	-105.038	142.411	73.8	Pass
		Diagonal	L2x2x1/4	129	-5.031	22.096	22.8	Pass
							51.8 (b)	
T11	92 - 88	Leg	P4.5 x 0.237	135	-115.498	151.005	76.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	139	-8.614	28.334	30.4	Pass
							80.9 (b)	
		Secondary Horizontal	4x3/8	143	-3.010	16.048	18.8	Pass
							45.0 (b)	
T12	88 - 84	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	147	-131.819	221.384	59.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	151	-8.074	27.999	28.8	Pass
							77.6 (b)	
		Secondary Horizontal	4x3/8	155	-3.698	13.861	26.7	Pass
							56.2 (b)	
T13	84 - 80	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	159	-146.849	221.402	66.3	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	163	-6.999	27.654	25.3	Pass
							67.5 (b)	
		Secondary Horizontal	4x3/8	167	-3.261	12.081	27.0	Pass
							48.0 (b)	
T14	80 - 75	Leg	P6.625x0.280	171	-166.513	256.371	64.9	Pass
		Diagonal	L2x2x1/4	176	-6.772	19.872	34.1	Pass
							69.7 (b)	
T15	75 - 70	Leg	P6.625x0.280	180	-187.196	256.371	73.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	185	-7.571	26.164	28.9	Pass
							74.1 (b)	
T16	70 - 65	Leg	P6.625x0.280	189	-206.538	256.371	80.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	193	-6.755	25.691	26.3	Pass
							64.2 (b)	
T17	65 - 60	Leg	P6.625x0.280	198	-224.484	256.371	87.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	202	-7.011	25.205	27.8	Pass
							68.1 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T18	60 - 55	Leg	P6.625x0.280	207	-238.034	267.248	89.1	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	211	-8.967	24.144	37.1	Pass
							85.7 (b)	
		Secondary Horizontal	L2x2x1/8	215	4.124	13.254	31.1	Pass
							99.8 (b)	
T19	55 - 50	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	219	-258.325	344.376	75.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	223	-5.608	24.196	23.2	Pass
							54.5 (b)	
T20	50 - 45	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	228	-272.876	344.376	79.2	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	232	-6.739	23.674	28.5	Pass
							65.5 (b)	
T21	45 - 40	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301	237	-285.640	353.331	80.8	Pass
		Diagonal	L2x2x1/4	241	-7.612	17.253	44.1	Pass
							78.3 (b)	
		Secondary Horizontal	L3x3x5/16	245	4.949	51.700	9.6	Pass
							62.2 (b)	
T22	40 - 33.3333	Leg	P6.625x.432	249	-303.292	367.767	82.5	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	253	-6.768	26.573	25.5	Pass
							53.0 (b)	
T23	33.3333 - 26.6667	Leg	P6.625x.432	258	-322.507	367.767	87.7	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	262	-7.007	25.910	27.0	Pass
							53.2 (b)	
T24	26.6667 - 20	Leg	P6.625x.432	267	-339.539	367.767	92.3	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	271	-6.576	25.232	26.1	Pass
							49.0 (b)	
T25	20 - 13.3333	Leg	P6.625x.432	276	-355.697	367.767	96.7	Pass
		Diagonal	L2x2x3/16	280	-6.695	9.232	72.5	Pass
							96.6 (b)	
T26	13.3333 - 6.66666	Leg	P6.625x.432	285	-370.080	397.395	93.1	Pass
		Diagonal	L2x2x3/16	289	-6.654	8.336	79.8	Pass
							98.0 (b)	
		Secondary Horizontal	L2x2x1/4	293	6.412	24.485	26.2	Pass
							61.1 (b)	
T27	6.66666 - 0	Leg	BT101341- P6.625 x .432 w/ HP7.625x0.301	297	-396.574	445.367	89.0	Pass
		Diagonal	2L2x2x3/16x3/8	301	-8.742	30.610	28.6	Pass
							61.8 (b)	
							Summary	
						Leg (T25)	96.7	Pass
						Diagonal (T26)	98.0	Pass
						Horizontal (T1)	3.5	Pass
						Secondary Horizontal (T18)	99.8	Pass
						Top Girt (T2)	3.4	Pass
						Bottom Girt (T8)	13.2	Pass
						Bolt Checks	99.8	Pass
						RATING =	**99.8**	**Pass**

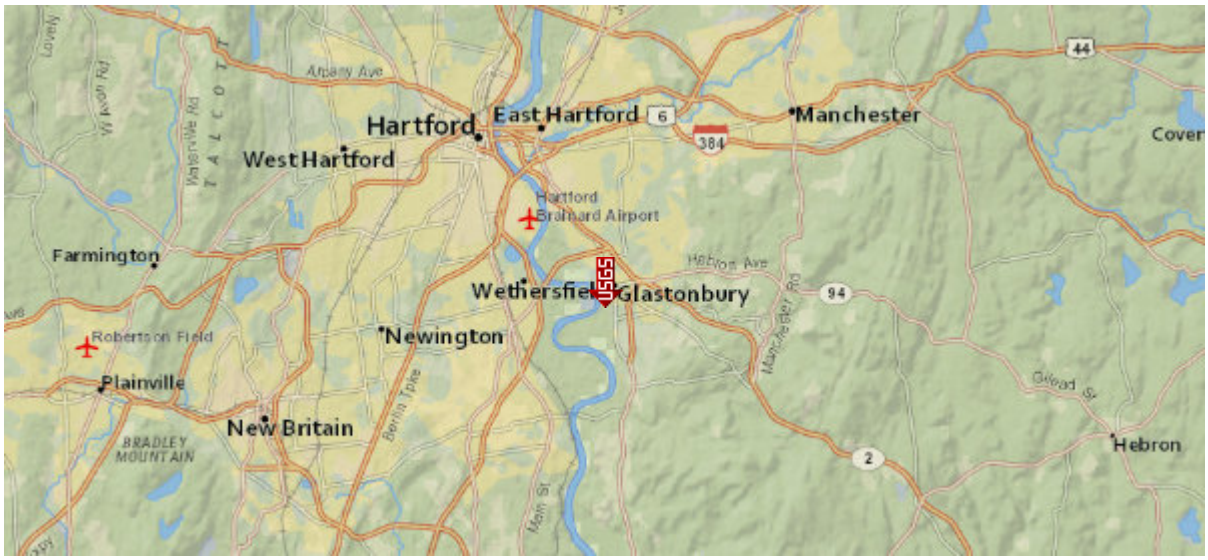
APPENDIX

TOWER DATA

USGS Design Maps Summary Report

User–Specified Input

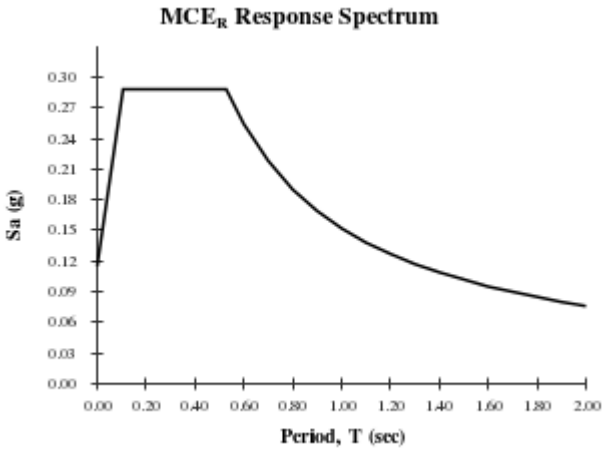
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.71439°N, 72.61303°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

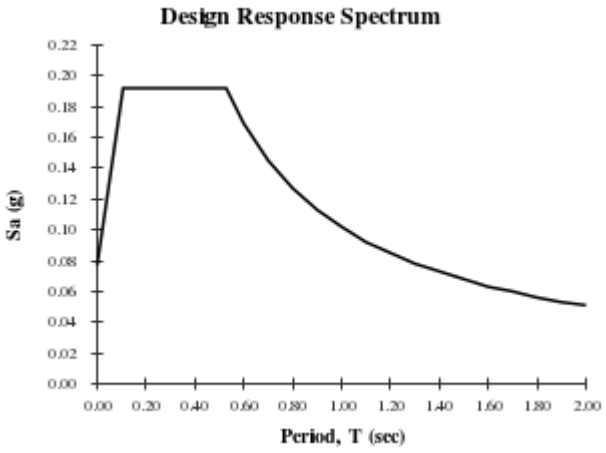


USGS–Provided Output

S_S =	0.180 g	S_{MS} =	0.288 g	S_{DS} =	0.192 g
S_1 =	0.063 g	S_{M1} =	0.152 g	S_{D1} =	0.102 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.



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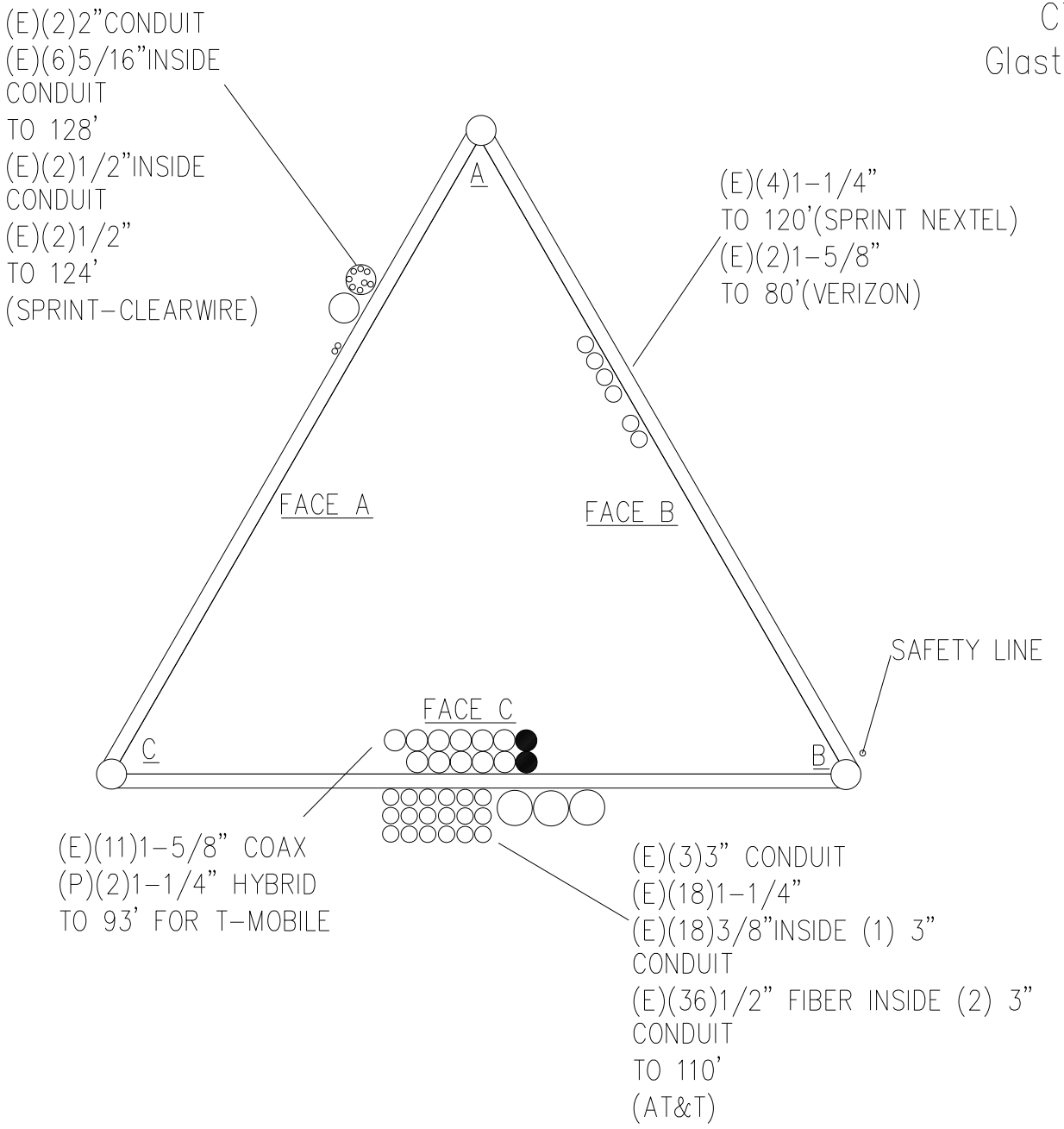
COAX LAYOUT

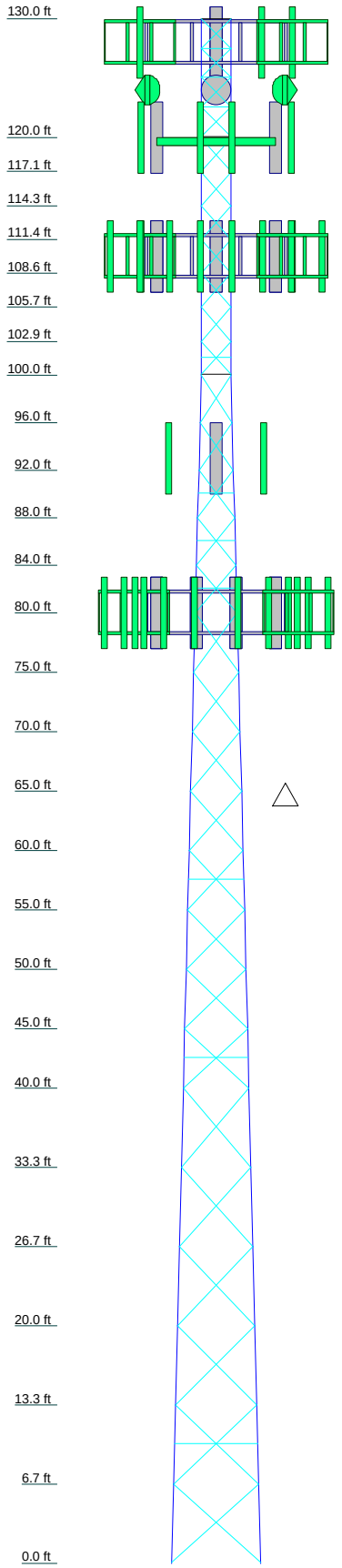
CT46126-A -03/
Glastonbury-main St.
130' SST



COAX LAYOUT

TOWER ELEVATION DRAWINGS

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				P6.625x.432			D
Leg Grade	A570-45																			A500M-54							
Diagonals	SR 1/2			SR 3/4					E	F	G			L2x2x1/4							L2x2x1/4		2L1 3/4x1 3/4x3/16x3/8			L2x2x3/16	H
Diagonal Grade											A36																
Top Girts	L1 1/4x1 1/4x3/16										N.A.																
Bottom Girts	L1 1/4x1 1/4x3/16			N.A.				I			N.A.																
Horizontals	L1 1/4x1 1/4x3/16										N.A.																
Sec. Horizontals	2.5			N.A.				J	N.A.		4x3/8			3.53	3.75	N.A.	4.25	4.5	L2x2x1/8	N.A.	4.75	5	5.25	5.5	5.83333	6.16667	6.5	6.83333	N.A.
Face Width (ft)	4 @ 2.47917	4 @ 2.77344	2 @ 2.77344	2 @ 2.85677	4 @ 2.85677	4 @ 2.85677	4 @ 2.85677	L	4 @ 2.85677	4 @ 2.70052	5 @ 4	3.099962	3.299948	5 @ 4	4	4	4	8 @ 5	4.5	8 @ 5	4.75	5	5.25	5 @ 5.5	5 @ 5.83333	5 @ 6.16667	5 @ 6.5	5 @ 6.66667	7.5
# Panels @ (ft)	4 @ 2.47917	4 @ 2.77344	2 @ 2.77344	2 @ 2.85677	4 @ 2.85677	4 @ 2.85677	4 @ 2.85677	L	4 @ 2.85677	4 @ 2.70052	5 @ 4	3.099962	3.299948	5 @ 4	4	4	4	8 @ 5	4.5	8 @ 5	4.75	5	5.25	5 @ 5.5	5 @ 5.83333	5 @ 6.16667	5 @ 6.5	5 @ 6.66667	M
Weight (K)	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	1.0		11.9



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R	128	RRUS A2	110
LLPX310R	128	RRUS A2	110
840 10054	128	RRUS A2	110
24"x14"x9"	128	(4) 860 10025	110
24"x14"x9"	128	(4) 860 10025	110
24"x14"x9"	128	(4) 860 10025	110
TIMING 2000	128	(2) LGP21901	110
Sector Mount [SM 803-3]	128	(2) LGP21901	110
VHLP2.5	124	(2) LGP21901	110
VHLP2.5	124	ATSBT-TOP-MF-4G	110
VHLP2.5	124	ATSBT-TOP-MF-4G	110
APXVSPP18-C-A20 w/ Mount Pipe	120	ATSBT-TOP-MF-4G	110
APXVSPP18-C-A20 w/ Mount Pipe	120	Sector Mount [SM 409-3]	110
APXVSPP18-C-A20 w/ Mount Pipe	120	(2) LGP 21401 TMA	110
TD-RRH8x20-25	120	(2) LGP 21401 TMA	110
TD-RRH8x20-25	120	(2) LGP 21401 TMA	110
TD-RRH8x20-25	120	APXVAARR24_43-U-NA20	93
1900 MHz 4x45 RRH	120	APXVAARR24_43-U-NA20	93
1900 MHz 4x45 RRH	120	APXVAARR24_43-U-NA20	93
1900 MHz 4x45 RRH	120	KRY 112 144/1	93
800MHz 2x50W RRH	120	KRY 112 144/1	93
800MHz 2x50W RRH	120	KRY 112 144/1	93
800MHz 2x50W RRH	120	AIR 32 KRD901146-1_B66A	93
(2) ACU-A20-N	120	AIR 32 KRD901146-1_B66A	93
ACU-A20-N	120	AIR 32 KRD901146-1_B66A	93
ACU-A20-N	120	Radio 4449 B71+B12	93
800 MHz Filter	120	Radio 4449 B71+B12	93
800 MHz Filter	120	Radio 4449 B71+B12	93
800 MHz Filter	120	Sector Mount [SM 402-3]	93
6' x 2" Mount Pipe	120	SFS-V(stabilizer kit)	93
6' x 2" Mount Pipe	120	SFS-V(stabilizer kit)	93
6' x 2" Mount Pipe	120	SFS-V(stabilizer kit)	93
T-Arm Mount [TA 601-3]	120	Air 21 B2A/B4P	93
APXVTM14-C-I20	120	Air 21 B2A/B4P	93
APXVTM14-C-I20	120	Air 21 B2A/B4P	93
APXVTM14-C-I20	120	(2) RRH2x40-700U	80
RRUS 11	110	(2) RRH2x40-700U	80
RRUS 11	110	(2) RRH2x40-700U	80
RRUS 11	110	RRH2x40-AWS	80
DC6-48-60-18-8F	110	RRH2x40-AWS	80
(P) HPA-65R-BUU-H6	110	RRH2x40-AWS	80
(P) HPA-65R-BUU-H6	110	DB-T1-6Z-8AB-0Z	80
(2) 800-10121	110	Sector Mount [SM 104-3]	80
(2) 800-10121	110	(2) BXA-70063/6CF	80
(2) 800-10121	110	(2) BXA-70063/6CF	80
HPA-65R-BUU-H8	110	(2) BXA-70063/6CF	80
RRUS 12	110	(2) BXA-171063/12CF	80
RRUS 12	110	(2) BXA-171063/12CF	80
RRUS 12	110	(2) BXA-171063/12CF	80

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			

Allpro Consulting Group,Inc.
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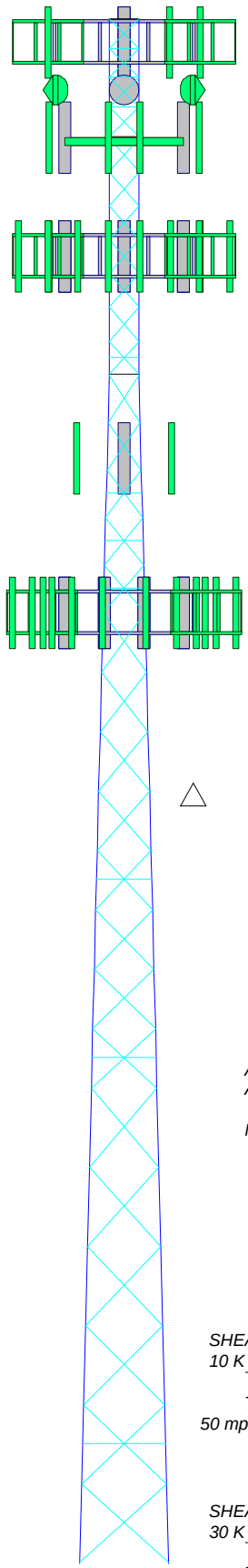
Dallas,TX 75243
Phone: 972-231-8893
FAX: 866-364-8375

Job:	***18-6523***		
Project:	***Glastonbury-main st, CT (CT46126-A-02)***		
Client: SBA Communications Corporation	Drawn by: Anita Lama	App'd:	
Code: TIA-222-G	Date: 09/26/18	Scale: NTS	
Path:		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	SR 2				SR 3/4				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																	A36										
Top Girts	L1 1/4x1 1/4x3/16																N.A.										
Bottom Girts	L1 1/4x1 1/4x3/16					N.A.			I								N.A.										
Horizontals	L1 1/4x1 1/4x3/16																N.A.										
Sec. Horizontals		2.5				N.A.			J		4x3/8				N.A.			L2x2x1/8			K		N.A.			L2x2x1/4	N.A.
Face Width (ft)																											7.5
# Panels @ (ft)	4 @ 2.47917	4 @ 2.77344	2 @ 2.77604		4 @ 2.85677			L			5 @ 4							8 @ 5						5 @ 6.66667			M
Weight (K)	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	1.0	11.9

130.0 ft
120.0 ft
117.1 ft
114.3 ft
111.4 ft
108.6 ft
105.7 ft
102.9 ft
100.0 ft
96.0 ft
92.0 ft
88.0 ft
84.0 ft
80.0 ft
75.0 ft
70.0 ft
65.0 ft
60.0 ft
55.0 ft
50.0 ft
45.0 ft
40.0 ft
33.3 ft
26.7 ft
20.0 ft
13.3 ft
6.7 ft
0.0 ft



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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 Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0'
8. TOWER RATING: 99.8%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 396 K
SHEAR: 22 K

UPLIFT: -357 K
SHEAR: 20 K

AXIAL 128 K
SHEAR 10 K
MOMENT 850 kip-ft
TORQUE 1 kip-ft
50 mph WIND - 1.000 in ICE
AXIAL 52 K
SHEAR 30 K
MOMENT 2461 kip-ft
TORQUE 4 kip-ft
REACTIONS - 97 mph WIND

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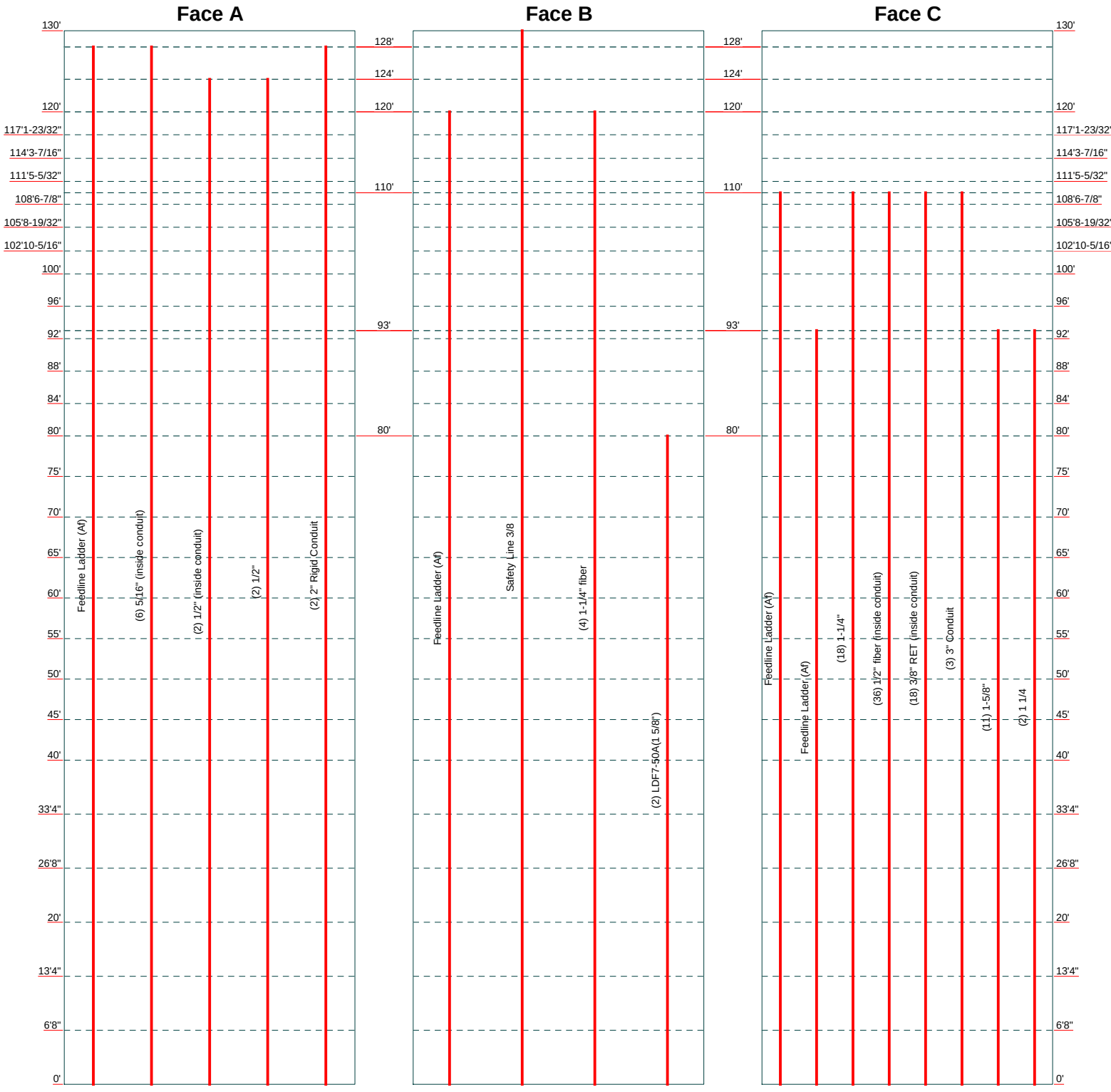
Job: **18-6523**			
Project: ***Glastonbury-main st, CT (CT46126-A-02)***			
Client: SBA Communications Corporation	Drawn by: Anita Lama	App'd:	
Code: TIA-222-G	Date: 09/26/18	Scale: NTS	
Path:		Dwg No. E-1	

MISCELLANEOUS PLOTS

Feed Line Distribution Chart
0' - 130'

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



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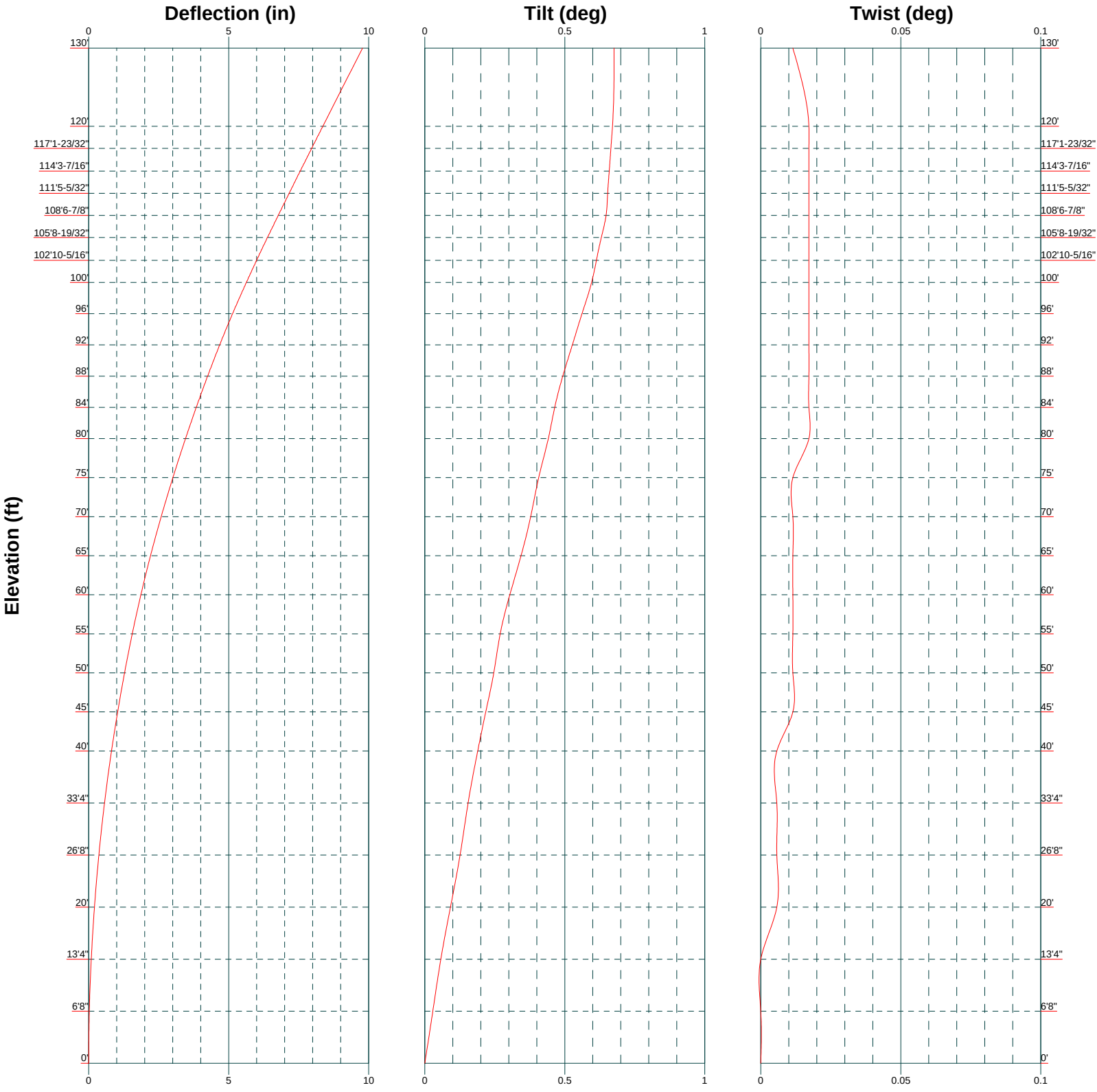
Code: TIA-222-G	Date: 09/26/18	Scale: NTS	
Path:		Dwg No. E-7	

TIA-222-G - Service - 60 mph

Maximum Values



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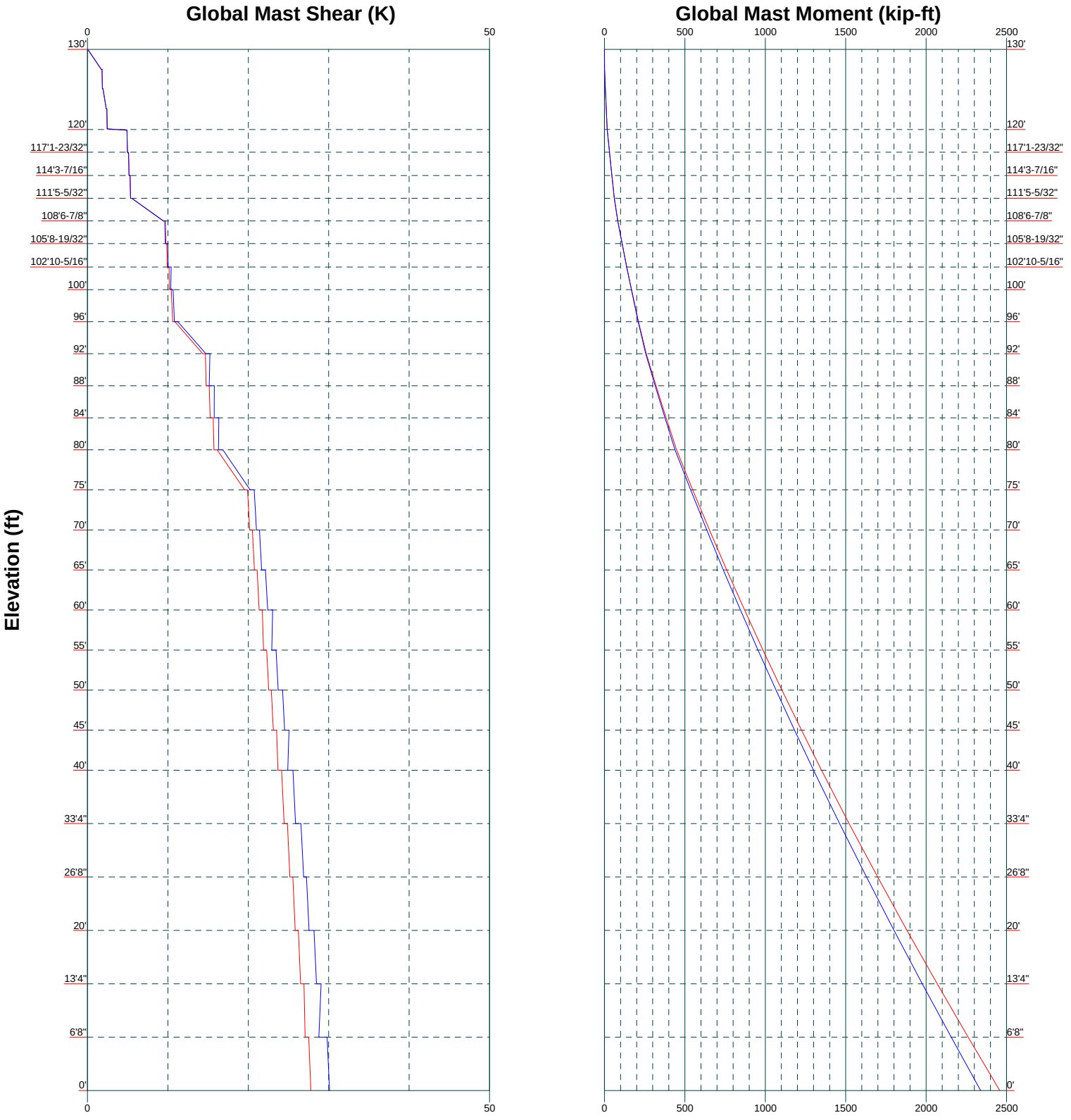
Code: TIA-222-G	Date: 09/26/18	Scale: NTS	
Path:		Dwg No. E-5	

TIA-222-G - 97 mph/50 mph 1.000 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz



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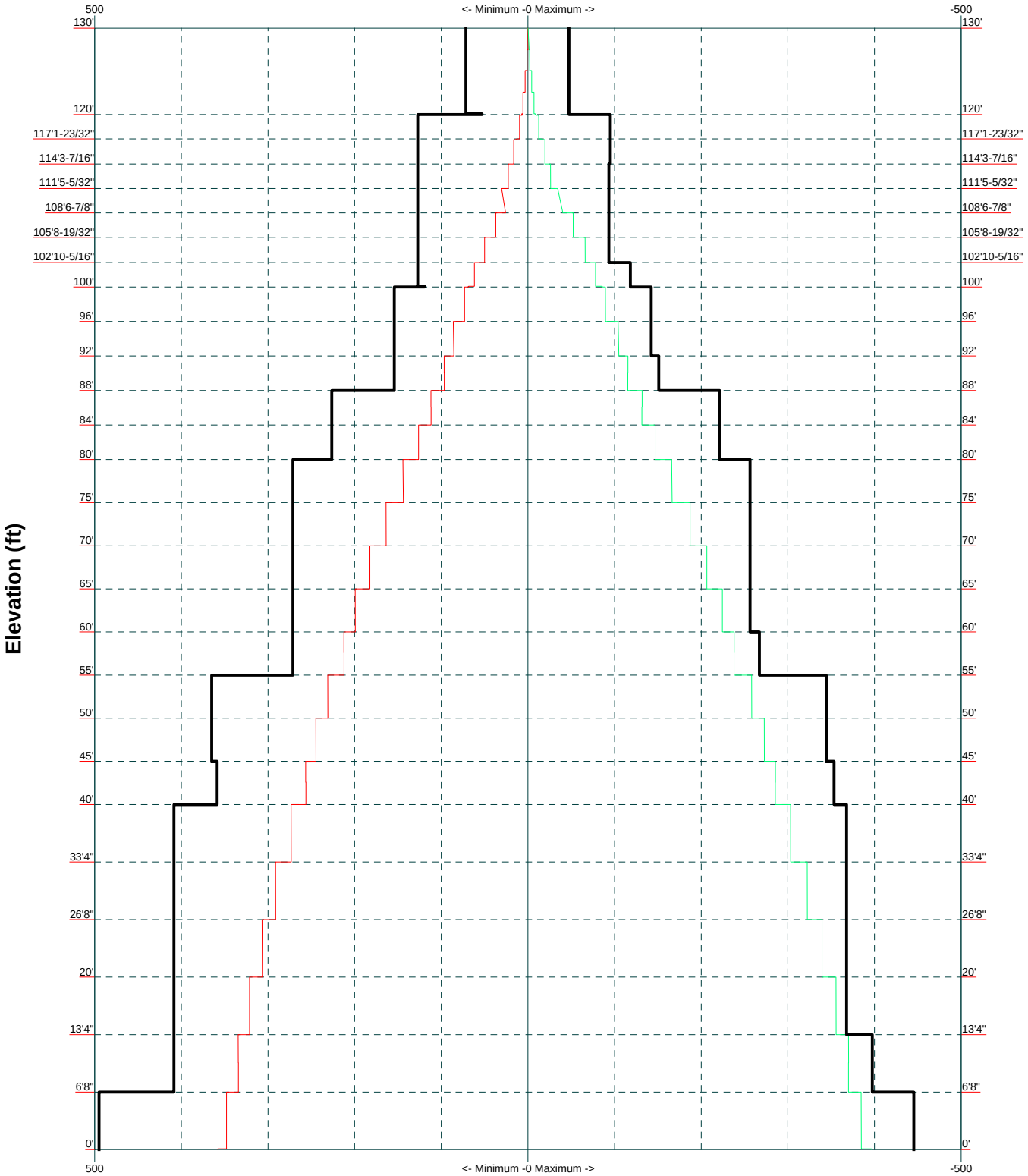
Job: ***18-6523***			
Project: ***Glastonbury-main st, CT (CT46126-A-02)***			
Client: SBA Communications Corporation	Drawn by: Anita Lama	App'd:	
Code: TIA-222-G	Date: 09/26/18	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-G - 97 mph/50 mph 1.000 in Ice Exposure C

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



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Job: ***18-6523***			
Project: ***Glastonbury-main st, CT (CT46126-A-02)***			
Client: SBA Communications Corporation	Drawn by: Anita Lama	App'd:	
Code: TIA-222-G	Date: 09/26/18	Scale: NTS	
Path:		Dwg No. E-3	

CALCULATION PRINTOUT

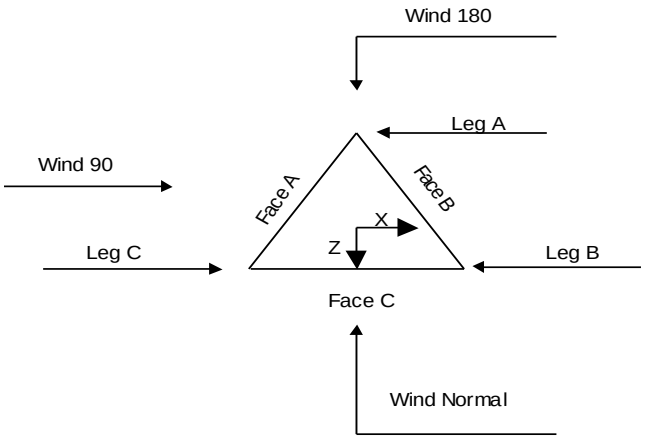
Tower Input Data

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

Tower is located in Hartford County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0'.
Nominal ice thickness of 1.000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



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 Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
				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
T21 45'-40'	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T22 40'-33'4"	Yes	No	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
T24 26'8"-20'	Yes	No	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
T26 13'4"-6'8"	No	No	1	1	1	1	1	1	0.5	1
				1	1	1	1	1	0.5	1
T27 6'8"-0'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 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
Feedline Ladder (Af)	A	No	Af (CaAa)	128' - 0'	0.000	0.2	1	1	3.000	3.000		0.008
Feedline Ladder (Af)	B	No	Af (CaAa)	120' - 0'	0.000	0	1	1	3.000	3.000		0.008
Feedline Ladder (Af)	C	No	Af (CaAa)	110' - 0'	0.000	0	1	1	3.000	3.000		0.008
Feedline Ladder (Af)	C	No	Af (CaAa)	93' - 0'	0.000	0	1	1	3.000	0.000		0.008
Safety Line 3/8 *****	B	No	Ar (CaAa)	130' - 0'	0.000	0.5	1	1	0.375	0.375		0.000
5/16" (inside conduit)	A	No	Ar (CaAa)	128' - 0'	0.000	0.2	6	6	0.313	0.000		0.000
1/2" (inside	A	No	Ar (CaAa)	124' - 0'	0.000	0.2	2	2	0.500	0.000		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
conduit)												
1/2"	A	No	Ar (CaAa)	124' - 0'	0.000	0.1	2	2	0.500	0.500		0.000
2" Rigid Conduit ***	A	No	Ar (CaAa)	128' - 0'	0.000	0.2	2	2	0.500	2.000		0.003
1-1/4" fiber ***	B	No	Ar (CaAa)	120' - 0'	-1.000	0	4	4	0.500	1.250		0.001
1-1/4"	C	No	Ar (CaAa)	110' - 0'	0.000	0	18	6	0.500	1.250		0.001
1/2" fiber (inside conduit)	C	No	Ar (CaAa)	110' - 0'	0.000	-0.14	36	12	0.500	0.000		0.000
3/8" RET (inside conduit)	C	No	Ar (CaAa)	110' - 0'	0.000	-0.14	18	6	0.440	0.000		0.000
3" Conduit ***	C	No	Ar (CaAa)	110' - 0'	0.000	-0.14	3	3	0.500	3.000		0.003
1-5/8"	C	No	Ar (CaAa)	93' - 0'	-3.000	0	11	6	0.500	1.980		0.001
1 1/4 ***	C	No	Ar (CaAa)	93' - 0'	-3.000	0	2	1	0.500	1.550		0.001
LDF7-50A(1 5/8")	B	No	Ar (CaAa)	80' - 0'	-1.000	0.1	2	2	0.500	1.980		0.001

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	0.000	0.000	7.601	0.000	0.118
		B	0.000	0.000	0.375	0.000	0.002
		C	0.000	0.000	0.000	0.000	0.000
T2	120'-117'1-23/32"	A	0.000	0.000	2.857	0.000	0.043
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	0.000	0.000	0.000
T3	117'1-23/32"-114' 3-7/16"	A	0.000	0.000	2.857	0.000	0.043
		B	0.000	0.000	2.964	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	0.000	0.000	2.857	0.000	0.043
		B	0.000	0.000	2.964	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	0.000	0.000	2.857	0.000	0.043
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	5.210	0.000	0.051
T6	108'6-7/8"-105'8-1 9/32"	A	0.000	0.000	2.857	0.000	0.043
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	10.429	0.000	0.101
T7	105'8-19/32"-102' 10-5/16"	A	0.000	0.000	2.857	0.000	0.043
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	10.429	0.000	0.101
T8	102'10-5/16"-100'	A	0.000	0.000	2.860	0.000	0.043
		B	0.000	0.000	2.967	0.000	0.032
		C	0.000	0.000	10.438	0.000	0.102
T9	100'-96'	A	0.000	0.000	4.000	0.000	0.060
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	14.602	0.000	0.142
T10	96'-92'	A	0.000	0.000	4.000	0.000	0.060
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	17.090	0.000	0.161

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
T11	92'-88'	A	0.000	0.000	4.000	0.000	0.060
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	24.554	0.000	0.217
T12	88'-84'	A	0.000	0.000	4.000	0.000	0.060
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	24.554	0.000	0.217
T13	84'-80'	A	0.000	0.000	4.000	0.000	0.060
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	24.554	0.000	0.217
T14	80'-75'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T15	75'-70'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T16	70'-65'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T17	65'-60'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T18	60'-55'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T19	55'-50'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T20	50'-45'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T21	45'-40'	A	0.000	0.000	5.000	0.000	0.075
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	30.693	0.000	0.271
T22	40'-33'4"	A	0.000	0.000	6.667	0.000	0.100
		B	0.000	0.000	9.557	0.000	0.086
		C	0.000	0.000	40.924	0.000	0.362
T23	33'4"-26'8"	A	0.000	0.000	6.667	0.000	0.100
		B	0.000	0.000	9.557	0.000	0.086
		C	0.000	0.000	40.924	0.000	0.362
T24	26'8"-20'	A	0.000	0.000	6.667	0.000	0.100
		B	0.000	0.000	9.557	0.000	0.086
		C	0.000	0.000	40.924	0.000	0.362
T25	20'-13'4"	A	0.000	0.000	6.667	0.000	0.100
		B	0.000	0.000	9.557	0.000	0.086
		C	0.000	0.000	40.924	0.000	0.362
T26	13'4"-6'8"	A	0.000	0.000	6.667	0.000	0.100
		B	0.000	0.000	9.557	0.000	0.086
		C	0.000	0.000	40.924	0.000	0.362
T27	6'8"-0'	A	0.000	0.000	6.667	0.000	0.100
		B	0.000	0.000	9.557	0.000	0.086
		C	0.000	0.000	40.924	0.000	0.362

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	2.285	0.000	0.000	33.871	0.000	0.543

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
		B		0.000	0.000	4.945	0.000	0.076
		C		0.000	0.000	0.000	0.000	0.000
T2	120'-117'1-23/32"	A	2.273	0.000	0.000	14.671	0.000	0.217
		B		0.000	0.000	8.587	0.000	0.163
		C		0.000	0.000	0.000	0.000	0.000
T3	117'1-23/32"-114' 3-7/16"	A	2.267	0.000	0.000	14.645	0.000	0.217
		B		0.000	0.000	8.575	0.000	0.162
		C		0.000	0.000	0.000	0.000	0.000
T4	114'3-7/16"-111'5-5/32"	A	2.262	0.000	0.000	14.619	0.000	0.216
		B		0.000	0.000	8.564	0.000	0.162
		C		0.000	0.000	0.000	0.000	0.000
T5	111'5-5/32"-108'6-7/8"	A	2.256	0.000	0.000	14.593	0.000	0.215
		B		0.000	0.000	8.551	0.000	0.161
		C		0.000	0.000	10.918	0.000	0.223
T6	108'6-7/8"-105'8-1 9/32"	A	2.250	0.000	0.000	14.566	0.000	0.215
		B		0.000	0.000	8.539	0.000	0.161
		C		0.000	0.000	21.830	0.000	0.445
T7	105'8-19/32"-102' 10-5/16"	A	2.244	0.000	0.000	14.538	0.000	0.214
		B		0.000	0.000	8.526	0.000	0.161
		C		0.000	0.000	21.802	0.000	0.444
T8	102'10-5/16"-100'	A	2.238	0.000	0.000	14.523	0.000	0.214
		B		0.000	0.000	8.521	0.000	0.160
		C		0.000	0.000	21.794	0.000	0.443
T9	100'-96'	A	2.230	0.000	0.000	20.266	0.000	0.298
		B		0.000	0.000	11.897	0.000	0.223
		C		0.000	0.000	30.440	0.000	0.618
T10	96'-92'	A	2.221	0.000	0.000	20.207	0.000	0.296
		B		0.000	0.000	11.870	0.000	0.222
		C		0.000	0.000	34.682	0.000	0.708
T11	92'-88'	A	2.211	0.000	0.000	20.145	0.000	0.294
		B		0.000	0.000	11.841	0.000	0.221
		C		0.000	0.000	47.487	0.000	0.980
T12	88'-84'	A	2.201	0.000	0.000	20.081	0.000	0.293
		B		0.000	0.000	11.812	0.000	0.220
		C		0.000	0.000	47.389	0.000	0.976
T13	84'-80'	A	2.191	0.000	0.000	20.014	0.000	0.291
		B		0.000	0.000	11.781	0.000	0.219
		C		0.000	0.000	47.286	0.000	0.972
T14	80'-75'	A	2.178	0.000	0.000	24.918	0.000	0.362
		B		0.000	0.000	21.467	0.000	0.360
		C		0.000	0.000	58.957	0.000	1.209
T15	75'-70'	A	2.164	0.000	0.000	24.802	0.000	0.359
		B		0.000	0.000	21.388	0.000	0.357
		C		0.000	0.000	58.779	0.000	1.202
T16	70'-65'	A	2.148	0.000	0.000	24.679	0.000	0.356
		B		0.000	0.000	21.304	0.000	0.354
		C		0.000	0.000	58.590	0.000	1.194
T17	65'-60'	A	2.132	0.000	0.000	24.547	0.000	0.352
		B		0.000	0.000	21.215	0.000	0.351
		C		0.000	0.000	58.388	0.000	1.186
T18	60'-55'	A	2.114	0.000	0.000	24.405	0.000	0.349
		B		0.000	0.000	21.119	0.000	0.348
		C		0.000	0.000	58.171	0.000	1.177
T19	55'-50'	A	2.095	0.000	0.000	24.251	0.000	0.345
		B		0.000	0.000	21.015	0.000	0.344
		C		0.000	0.000	57.936	0.000	1.168
T20	50'-45'	A	2.074	0.000	0.000	24.084	0.000	0.341
		B		0.000	0.000	20.902	0.000	0.341
		C		0.000	0.000	57.680	0.000	1.158
T21	45'-40'	A	2.051	0.000	0.000	23.900	0.000	0.337
		B		0.000	0.000	20.777	0.000	0.336

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
		C		0.000	0.000	57.399	0.000	1.147
T22	40'-33'4"	A	2.021	0.000	0.000	31.546	0.000	0.441
		B		0.000	0.000	27.486	0.000	0.441
		C		0.000	0.000	76.041	0.000	1.509
T23	33'4"-26'8"	A	1.981	0.000	0.000	31.117	0.000	0.431
		B		0.000	0.000	27.196	0.000	0.432
		C		0.000	0.000	75.385	0.000	1.484
T24	26'8"-20'	A	1.932	0.000	0.000	30.592	0.000	0.419
		B		0.000	0.000	26.841	0.000	0.420
		C		0.000	0.000	74.583	0.000	1.453
T25	20'-13'4"	A	1.868	0.000	0.000	29.910	0.000	0.404
		B		0.000	0.000	26.379	0.000	0.406
		C		0.000	0.000	73.540	0.000	1.413
T26	13'4"-6'8"	A	1.775	0.000	0.000	28.917	0.000	0.382
		B		0.000	0.000	25.709	0.000	0.385
		C		0.000	0.000	72.024	0.000	1.356
T27	6'8"-0'	A	1.590	0.000	0.000	26.949	0.000	0.341
		B		0.000	0.000	24.379	0.000	0.345
		C		0.000	0.000	69.020	0.000	1.247

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'	-1.342	-3.015	-0.101	-0.391
T2	120'-117'1-23/32"	0.422	-3.625	0.041	-1.258
T3	117'1-23/32"-114'3-7/16"	0.472	-3.948	0.081	-2.437
T4	114'3-7/16"-111'5-5/32"	0.471	-3.942	0.080	-2.394
T5	111'5-5/32"-108'6-7/8"	0.792	-1.308	0.468	-1.029
T6	108'6-7/8"-105'8-19/32"	0.961	0.519	0.751	0.074
T7	105'8-19/32"-102'10-5/16"	0.961	0.519	0.753	0.074
T8	102'10-5/16"-100'	0.836	0.451	0.063	0.006
T9	100'-96'	0.794	0.404	0.617	0.053
T10	96'-92'	0.825	0.388	0.697	0.088
T11	92'-88'	0.834	0.368	0.531	0.150
T12	88'-84'	0.881	0.363	0.621	0.164
T13	84'-80'	0.927	0.359	0.709	0.176
T14	80'-75'	1.430	0.253	1.373	0.168
T15	75'-70'	1.598	0.255	1.627	0.178
T16	70'-65'	1.699	0.244	1.784	0.175
T17	65'-60'	1.797	0.234	1.937	0.171
T18	60'-55'	1.780	0.211	1.790	0.142
T19	55'-50'	1.988	0.214	2.234	0.159
T20	50'-45'	2.080	0.205	2.379	0.152
T21	45'-40'	1.874	0.169	2.034	0.116
T22	40'-33'4"	2.267	0.183	2.753	0.136
T23	33'4"-26'8"	2.383	0.171	2.947	0.123
T24	26'8"-20'	2.494	0.159	3.140	0.107
T25	20'-13'4"	2.536	0.143	3.284	0.087
T26	13'4"-6'8"	2.466	0.124	3.188	0.059

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T27	6'8"-0'	2.751	0.122	3.596	0.023

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	Feedline Ladder (Af)	120.00 - 128.00	0.6000	0.0957
T1	5	Safety Line 3/8	120.00 - 130.00	0.6000	0.0957
T1	7	5/16" (inside conduit)	120.00 - 128.00	0.6000	0.0957
T1	8	1/2" (inside conduit)	120.00 - 124.00	0.6000	0.0957
T1	9	1/2"	120.00 - 124.00	0.6000	0.0957
T1	10	2" Rigid Conduit	120.00 - 128.00	0.6000	0.0957
T2	1	Feedline Ladder (Af)	117.14 - 120.00	0.6000	0.1587
T2	2	Feedline Ladder (Af)	117.14 - 120.00	0.6000	0.1587
T2	5	Safety Line 3/8	117.14 - 120.00	0.6000	0.1587
T2	7	5/16" (inside conduit)	117.14 - 120.00	0.6000	0.1587
T2	8	1/2" (inside conduit)	117.14 - 120.00	0.6000	0.1587
T2	9	1/2"	117.14 - 120.00	0.6000	0.1587
T2	10	2" Rigid Conduit	117.14 - 120.00	0.6000	0.1587
T2	12	1-1/4" fiber	117.14 - 120.00	0.6000	0.1587
T3	1	Feedline Ladder (Af)	114.29 - 117.14	0.6000	0.2894
T3	2	Feedline Ladder (Af)	114.29 - 117.14	0.6000	0.2894
T3	5	Safety Line 3/8	114.29 - 117.14	0.6000	0.2894
T3	7	5/16" (inside conduit)	114.29 - 117.14	0.6000	0.2894
T3	8	1/2" (inside conduit)	114.29 - 117.14	0.6000	0.2894
T3	9	1/2"	114.29 - 117.14	0.6000	0.2894
T3	10	2" Rigid Conduit	114.29 - 117.14	0.6000	0.2894
T3	12	1-1/4" fiber	114.29 - 117.14	0.6000	0.2894
T4	1	Feedline Ladder (Af)	111.43 - 114.29	0.6000	0.2846
T4	2	Feedline Ladder (Af)	111.43 - 114.29	0.6000	0.2846
T4	5	Safety Line 3/8	111.43 -	0.6000	0.2846

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	7	5/16" (inside conduit)	111.43 - 114.29	0.6000	0.2846
T4	8	1/2" (inside conduit)	111.43 - 114.29	0.6000	0.2846
T4	9	1/2"	111.43 - 114.29	0.6000	0.2846
T4	10	2" Rigid Conduit	111.43 - 114.29	0.6000	0.2846
T4	12	1-1/4" fiber	111.43 - 114.29	0.6000	0.2846
T5	1	Feedline Ladder (Af)	108.57 - 111.43	0.6000	0.2858
T5	2	Feedline Ladder (Af)	108.57 - 111.43	0.6000	0.2858
T5	3	Feedline Ladder (Af)	108.57 - 110.00	0.6000	0.2858
T5	5	Safety Line 3/8	108.57 - 111.43	0.6000	0.2858
T5	7	5/16" (inside conduit)	108.57 - 111.43	0.6000	0.2858
T5	8	1/2" (inside conduit)	108.57 - 111.43	0.6000	0.2858
T5	9	1/2"	108.57 - 111.43	0.6000	0.2858
T5	10	2" Rigid Conduit	108.57 - 111.43	0.6000	0.2858
T5	12	1-1/4" fiber	108.57 - 111.43	0.6000	0.2858
T5	14	1-1/4"	108.57 - 110.00	0.6000	0.2858
T5	15	1/2" fiber (inside conduit)	108.57 - 110.00	0.6000	0.2858
T5	16	3/8" RET (inside conduit)	108.57 - 110.00	0.6000	0.2858
T5	17	3" Conduit	108.57 - 110.00	0.6000	0.2858
T6	1	Feedline Ladder (Af)	105.72 - 108.57	0.6000	0.2871
T6	2	Feedline Ladder (Af)	105.72 - 108.57	0.6000	0.2871
T6	3	Feedline Ladder (Af)	105.72 - 108.57	0.6000	0.2871
T6	5	Safety Line 3/8	105.72 - 108.57	0.6000	0.2871
T6	7	5/16" (inside conduit)	105.72 - 108.57	0.6000	0.2871
T6	8	1/2" (inside conduit)	105.72 - 108.57	0.6000	0.2871
T6	9	1/2"	105.72 - 108.57	0.6000	0.2871
T6	10	2" Rigid Conduit	105.72 - 108.57	0.6000	0.2871
T6	12	1-1/4" fiber	105.72 - 108.57	0.6000	0.2871
T6	14	1-1/4"	105.72 - 108.57	0.6000	0.2871
T6	15	1/2" fiber (inside conduit)	105.72 - 108.57	0.6000	0.2871
T6	16	3/8" RET (inside conduit)	105.72 - 108.57	0.6000	0.2871
T6	17	3" Conduit	105.72 -	0.6000	0.2871

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			108.57		
T7	1	Feedline Ladder (Af)	102.86 - 105.72	0.6000	0.2883
T7	2	Feedline Ladder (Af)	102.86 - 105.72	0.6000	0.2883
T7	3	Feedline Ladder (Af)	102.86 - 105.72	0.6000	0.2883
T7	5	Safety Line 3/8	102.86 - 105.72	0.6000	0.2883
T7	7	5/16" (inside conduit)	102.86 - 105.72	0.6000	0.2883
T7	8	1/2" (inside conduit)	102.86 - 105.72	0.6000	0.2883
T7	9	1/2"	102.86 - 105.72	0.6000	0.2883
T7	10	2" Rigid Conduit	102.86 - 105.72	0.6000	0.2883
T7	12	1-1/4" fiber	102.86 - 105.72	0.6000	0.2883
T7	14	1-1/4"	102.86 - 105.72	0.6000	0.2883
T7	15	1/2" fiber (inside conduit)	102.86 - 105.72	0.6000	0.2883
T7	16	3/8" RET (inside conduit)	102.86 - 105.72	0.6000	0.2883
T7	17	3" Conduit	102.86 - 105.72	0.6000	0.2883
T8	1	Feedline Ladder (Af)	100.00 - 102.86	0.6000	0.0226
T8	2	Feedline Ladder (Af)	100.00 - 102.86	0.6000	0.0226
T8	3	Feedline Ladder (Af)	100.00 - 102.86	0.6000	0.0226
T8	5	Safety Line 3/8	100.00 - 102.86	0.6000	0.0226
T8	7	5/16" (inside conduit)	100.00 - 102.86	0.6000	0.0226
T8	8	1/2" (inside conduit)	100.00 - 102.86	0.6000	0.0226
T8	9	1/2"	100.00 - 102.86	0.6000	0.0226
T8	10	2" Rigid Conduit	100.00 - 102.86	0.6000	0.0226
T8	12	1-1/4" fiber	100.00 - 102.86	0.6000	0.0226
T8	14	1-1/4"	100.00 - 102.86	0.6000	0.0226
T8	15	1/2" fiber (inside conduit)	100.00 - 102.86	0.6000	0.0226
T8	16	3/8" RET (inside conduit)	100.00 - 102.86	0.6000	0.0226
T8	17	3" Conduit	100.00 - 102.86	0.6000	0.0226
T9	1	Feedline Ladder (Af)	96.00 - 100.00	0.6000	0.2325
T9	2	Feedline Ladder (Af)	96.00 - 100.00	0.6000	0.2325
T9	3	Feedline Ladder (Af)	96.00 - 100.00	0.6000	0.2325
T9	5	Safety Line 3/8	96.00 - 100.00	0.6000	0.2325
T9	7	5/16" (inside conduit)	96.00 - 100.00	0.6000	0.2325
T9	8	1/2" (inside conduit)	96.00 - 100.00	0.6000	0.2325
T9	9	1/2"	96.00 - 100.00	0.6000	0.2325
T9	10	2" Rigid Conduit	96.00 - 100.00	0.6000	0.2325
T9	12	1-1/4" fiber	96.00 - 100.00	0.6000	0.2325

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T9	14	1-1/4"	96.00 - 100.00	0.6000	0.2325
T9	15	1/2" fiber (inside conduit)	96.00 - 100.00	0.6000	0.2325
T9	16	3/8" RET (inside conduit)	96.00 - 100.00	0.6000	0.2325
T9	17	3" Conduit	96.00 - 100.00	0.6000	0.2325
T10	1	Feedline Ladder (Af)	92.00 - 96.00	0.6000	0.2545
T10	2	Feedline Ladder (Af)	92.00 - 96.00	0.6000	0.2545
T10	3	Feedline Ladder (Af)	92.00 - 96.00	0.6000	0.2545
T10	4	Feedline Ladder (Af)	92.00 - 93.00	0.6000	0.2545
T10	5	Safety Line 3/8	92.00 - 96.00	0.6000	0.2545
T10	7	5/16" (inside conduit)	92.00 - 96.00	0.6000	0.2545
T10	8	1/2" (inside conduit)	92.00 - 96.00	0.6000	0.2545
T10	9	1/2"	92.00 - 96.00	0.6000	0.2545
T10	10	2" Rigid Conduit	92.00 - 96.00	0.6000	0.2545
T10	12	1-1/4" fiber	92.00 - 96.00	0.6000	0.2545
T10	14	1-1/4"	92.00 - 96.00	0.6000	0.2545
T10	15	1/2" fiber (inside conduit)	92.00 - 96.00	0.6000	0.2545
T10	16	3/8" RET (inside conduit)	92.00 - 96.00	0.6000	0.2545
T10	17	3" Conduit	92.00 - 96.00	0.6000	0.2545
T10	19	1-5/8"	92.00 - 93.00	0.0010	0.0010
T10	20	1 1/4	92.00 - 93.00	0.0010	0.0010
T11	1	Feedline Ladder (Af)	88.00 - 92.00	0.6000	0.1848
T11	2	Feedline Ladder (Af)	88.00 - 92.00	0.6000	0.1848
T11	3	Feedline Ladder (Af)	88.00 - 92.00	0.6000	0.1848
T11	4	Feedline Ladder (Af)	88.00 - 92.00	0.6000	0.1848
T11	5	Safety Line 3/8	88.00 - 92.00	0.6000	0.1848
T11	7	5/16" (inside conduit)	88.00 - 92.00	0.6000	0.1848
T11	8	1/2" (inside conduit)	88.00 - 92.00	0.6000	0.1848
T11	9	1/2"	88.00 - 92.00	0.6000	0.1848
T11	10	2" Rigid Conduit	88.00 - 92.00	0.6000	0.1848
T11	12	1-1/4" fiber	88.00 - 92.00	0.6000	0.1848
T11	14	1-1/4"	88.00 - 92.00	0.6000	0.1848
T11	15	1/2" fiber (inside conduit)	88.00 - 92.00	0.6000	0.1848
T11	16	3/8" RET (inside conduit)	88.00 - 92.00	0.6000	0.1848
T11	17	3" Conduit	88.00 - 92.00	0.6000	0.1848
T11	19	1-5/8"	88.00 - 92.00	0.0010	0.0010
T11	20	1 1/4	88.00 - 92.00	0.0010	0.0010
T12	1	Feedline Ladder (Af)	84.00 - 88.00	0.6000	0.2094
T12	2	Feedline Ladder (Af)	84.00 - 88.00	0.6000	0.2094
T12	3	Feedline Ladder (Af)	84.00 - 88.00	0.6000	0.2094
T12	4	Feedline Ladder (Af)	84.00 - 88.00	0.6000	0.2094
T12	5	Safety Line 3/8	84.00 - 88.00	0.6000	0.2094
T12	7	5/16" (inside conduit)	84.00 - 88.00	0.6000	0.2094
T12	8	1/2" (inside conduit)	84.00 - 88.00	0.6000	0.2094
T12	9	1/2"	84.00 - 88.00	0.6000	0.2094
T12	10	2" Rigid Conduit	84.00 - 88.00	0.6000	0.2094
T12	12	1-1/4" fiber	84.00 - 88.00	0.6000	0.2094
T12	14	1-1/4"	84.00 - 88.00	0.6000	0.2094
T12	15	1/2" fiber (inside conduit)	84.00 - 88.00	0.6000	0.2094
T12	16	3/8" RET (inside conduit)	84.00 - 88.00	0.6000	0.2094
T12	17	3" Conduit	84.00 - 88.00	0.6000	0.2094
T12	19	1-5/8"	84.00 - 88.00	0.0010	0.0010
T12	20	1 1/4	84.00 - 88.00	0.0010	0.0010
T13	1	Feedline Ladder (Af)	80.00 - 84.00	0.6000	0.2318
T13	2	Feedline Ladder (Af)	80.00 - 84.00	0.6000	0.2318
T13	3	Feedline Ladder (Af)	80.00 - 84.00	0.6000	0.2318
T13	4	Feedline Ladder (Af)	80.00 - 84.00	0.6000	0.2318
T13	5	Safety Line 3/8	80.00 - 84.00	0.6000	0.2318
T13	7	5/16" (inside conduit)	80.00 - 84.00	0.6000	0.2318
T13	8	1/2" (inside conduit)	80.00 - 84.00	0.6000	0.2318
T13	9	1/2"	80.00 - 84.00	0.6000	0.2318
T13	10	2" Rigid Conduit	80.00 - 84.00	0.6000	0.2318
T13	12	1-1/4" fiber	80.00 - 84.00	0.6000	0.2318

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	14	1-1/4"	80.00 - 84.00	0.6000	0.2318
T13	15	1/2" fiber (inside conduit)	80.00 - 84.00	0.6000	0.2318
T13	16	3/8" RET (inside conduit)	80.00 - 84.00	0.6000	0.2318
T13	17	3" Conduit	80.00 - 84.00	0.6000	0.2318
T13	19	1-5/8"	80.00 - 84.00	0.0010	0.0010
T13	20	1 1/4	80.00 - 84.00	0.0010	0.0010
T14	1	Feedline Ladder (Af)	75.00 - 80.00	0.6000	0.3414
T14	2	Feedline Ladder (Af)	75.00 - 80.00	0.6000	0.3414
T14	3	Feedline Ladder (Af)	75.00 - 80.00	0.6000	0.3414
T14	4	Feedline Ladder (Af)	75.00 - 80.00	0.6000	0.3414
T14	5	Safety Line 3/8	75.00 - 80.00	0.6000	0.3414
T14	7	5/16" (inside conduit)	75.00 - 80.00	0.6000	0.3414
T14	8	1/2" (inside conduit)	75.00 - 80.00	0.6000	0.3414
T14	9	1/2"	75.00 - 80.00	0.6000	0.3414
T14	10	2" Rigid Conduit	75.00 - 80.00	0.6000	0.3414
T14	12	1-1/4" fiber	75.00 - 80.00	0.6000	0.3414
T14	14	1-1/4"	75.00 - 80.00	0.6000	0.3414
T14	15	1/2" fiber (inside conduit)	75.00 - 80.00	0.6000	0.3414
T14	16	3/8" RET (inside conduit)	75.00 - 80.00	0.6000	0.3414
T14	17	3" Conduit	75.00 - 80.00	0.6000	0.3414
T14	19	1-5/8"	75.00 - 80.00	0.0010	0.0010
T14	20	1 1/4	75.00 - 80.00	0.0010	0.0010
T14	22	LDF7-50A(1 5/8")	75.00 - 80.00	0.6000	0.3414
T15	1	Feedline Ladder (Af)	70.00 - 75.00	0.6000	0.3957
T15	2	Feedline Ladder (Af)	70.00 - 75.00	0.6000	0.3957
T15	3	Feedline Ladder (Af)	70.00 - 75.00	0.6000	0.3957
T15	4	Feedline Ladder (Af)	70.00 - 75.00	0.6000	0.3957
T15	5	Safety Line 3/8	70.00 - 75.00	0.6000	0.3957
T15	7	5/16" (inside conduit)	70.00 - 75.00	0.6000	0.3957
T15	8	1/2" (inside conduit)	70.00 - 75.00	0.6000	0.3957
T15	9	1/2"	70.00 - 75.00	0.6000	0.3957
T15	10	2" Rigid Conduit	70.00 - 75.00	0.6000	0.3957
T15	12	1-1/4" fiber	70.00 - 75.00	0.6000	0.3957
T15	14	1-1/4"	70.00 - 75.00	0.6000	0.3957
T15	15	1/2" fiber (inside conduit)	70.00 - 75.00	0.6000	0.3957
T15	16	3/8" RET (inside conduit)	70.00 - 75.00	0.6000	0.3957
T15	17	3" Conduit	70.00 - 75.00	0.6000	0.3957
T15	19	1-5/8"	70.00 - 75.00	0.0010	0.0010
T15	20	1 1/4	70.00 - 75.00	0.0010	0.0010
T15	22	LDF7-50A(1 5/8")	70.00 - 75.00	0.6000	0.3957
T16	1	Feedline Ladder (Af)	65.00 - 70.00	0.6000	0.4201
T16	2	Feedline Ladder (Af)	65.00 - 70.00	0.6000	0.4201
T16	3	Feedline Ladder (Af)	65.00 - 70.00	0.6000	0.4201
T16	4	Feedline Ladder (Af)	65.00 - 70.00	0.6000	0.4201
T16	5	Safety Line 3/8	65.00 - 70.00	0.6000	0.4201
T16	7	5/16" (inside conduit)	65.00 - 70.00	0.6000	0.4201
T16	8	1/2" (inside conduit)	65.00 - 70.00	0.6000	0.4201
T16	9	1/2"	65.00 - 70.00	0.6000	0.4201
T16	10	2" Rigid Conduit	65.00 - 70.00	0.6000	0.4201
T16	12	1-1/4" fiber	65.00 - 70.00	0.6000	0.4201
T16	14	1-1/4"	65.00 - 70.00	0.6000	0.4201
T16	15	1/2" fiber (inside conduit)	65.00 - 70.00	0.6000	0.4201
T16	16	3/8" RET (inside conduit)	65.00 - 70.00	0.6000	0.4201
T16	17	3" Conduit	65.00 - 70.00	0.6000	0.4201
T16	19	1-5/8"	65.00 - 70.00	0.0010	0.0010
T16	20	1 1/4	65.00 - 70.00	0.0010	0.0010
T16	22	LDF7-50A(1 5/8")	65.00 - 70.00	0.6000	0.4201
T17	1	Feedline Ladder (Af)	60.00 - 65.00	0.6000	0.4424
T17	2	Feedline Ladder (Af)	60.00 - 65.00	0.6000	0.4424
T17	3	Feedline Ladder (Af)	60.00 - 65.00	0.6000	0.4424
T17	4	Feedline Ladder (Af)	60.00 - 65.00	0.6000	0.4424
T17	5	Safety Line 3/8	60.00 - 65.00	0.6000	0.4424

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T17	7	5/16" (inside conduit)	60.00 - 65.00	0.6000	0.4424
T17	8	1/2" (inside conduit)	60.00 - 65.00	0.6000	0.4424
T17	9	1/2"	60.00 - 65.00	0.6000	0.4424
T17	10	2" Rigid Conduit	60.00 - 65.00	0.6000	0.4424
T17	12	1-1/4" fiber	60.00 - 65.00	0.6000	0.4424
T17	14	1-1/4"	60.00 - 65.00	0.6000	0.4424
T17	15	1/2" fiber (inside conduit)	60.00 - 65.00	0.6000	0.4424
T17	16	3/8" RET (inside conduit)	60.00 - 65.00	0.6000	0.4424
T17	17	3" Conduit	60.00 - 65.00	0.6000	0.4424
T17	19	1-5/8"	60.00 - 65.00	0.0010	0.0010
T17	20	1 1/4	60.00 - 65.00	0.0010	0.0010
T17	22	LDF7-50A(1 5/8")	60.00 - 65.00	0.6000	0.4424
T18	1	Feedline Ladder (Af)	55.00 - 60.00	0.6000	0.3853
T18	2	Feedline Ladder (Af)	55.00 - 60.00	0.6000	0.3853
T18	3	Feedline Ladder (Af)	55.00 - 60.00	0.6000	0.3853
T18	4	Feedline Ladder (Af)	55.00 - 60.00	0.6000	0.3853
T18	5	Safety Line 3/8	55.00 - 60.00	0.6000	0.3853
T18	7	5/16" (inside conduit)	55.00 - 60.00	0.6000	0.3853
T18	8	1/2" (inside conduit)	55.00 - 60.00	0.6000	0.3853
T18	9	1/2"	55.00 - 60.00	0.6000	0.3853
T18	10	2" Rigid Conduit	55.00 - 60.00	0.6000	0.3853
T18	12	1-1/4" fiber	55.00 - 60.00	0.6000	0.3853
T18	14	1-1/4"	55.00 - 60.00	0.6000	0.3853
T18	15	1/2" fiber (inside conduit)	55.00 - 60.00	0.6000	0.3853
T18	16	3/8" RET (inside conduit)	55.00 - 60.00	0.6000	0.3853
T18	17	3" Conduit	55.00 - 60.00	0.6000	0.3853
T18	19	1-5/8"	55.00 - 60.00	0.0010	0.0010
T18	20	1 1/4	55.00 - 60.00	0.0010	0.0010
T18	22	LDF7-50A(1 5/8")	55.00 - 60.00	0.6000	0.3853
T19	1	Feedline Ladder (Af)	50.00 - 55.00	0.6000	0.4818
T19	2	Feedline Ladder (Af)	50.00 - 55.00	0.6000	0.4818
T19	3	Feedline Ladder (Af)	50.00 - 55.00	0.6000	0.4818
T19	4	Feedline Ladder (Af)	50.00 - 55.00	0.6000	0.4818
T19	5	Safety Line 3/8	50.00 - 55.00	0.6000	0.4818
T19	7	5/16" (inside conduit)	50.00 - 55.00	0.6000	0.4818
T19	8	1/2" (inside conduit)	50.00 - 55.00	0.6000	0.4818
T19	9	1/2"	50.00 - 55.00	0.6000	0.4818
T19	10	2" Rigid Conduit	50.00 - 55.00	0.6000	0.4818
T19	12	1-1/4" fiber	50.00 - 55.00	0.6000	0.4818
T19	14	1-1/4"	50.00 - 55.00	0.6000	0.4818
T19	15	1/2" fiber (inside conduit)	50.00 - 55.00	0.6000	0.4818
T19	16	3/8" RET (inside conduit)	50.00 - 55.00	0.6000	0.4818
T19	17	3" Conduit	50.00 - 55.00	0.6000	0.4818
T19	19	1-5/8"	50.00 - 55.00	0.0010	0.0010
T19	20	1 1/4	50.00 - 55.00	0.0010	0.0010
T19	22	LDF7-50A(1 5/8")	50.00 - 55.00	0.6000	0.4818
T20	1	Feedline Ladder (Af)	45.00 - 50.00	0.6000	0.4994
T20	2	Feedline Ladder (Af)	45.00 - 50.00	0.6000	0.4994
T20	3	Feedline Ladder (Af)	45.00 - 50.00	0.6000	0.4994
T20	4	Feedline Ladder (Af)	45.00 - 50.00	0.6000	0.4994
T20	5	Safety Line 3/8	45.00 - 50.00	0.6000	0.4994
T20	7	5/16" (inside conduit)	45.00 - 50.00	0.6000	0.4994
T20	8	1/2" (inside conduit)	45.00 - 50.00	0.6000	0.4994
T20	9	1/2"	45.00 - 50.00	0.6000	0.4994
T20	10	2" Rigid Conduit	45.00 - 50.00	0.6000	0.4994
T20	12	1-1/4" fiber	45.00 - 50.00	0.6000	0.4994
T20	14	1-1/4"	45.00 - 50.00	0.6000	0.4994
T20	15	1/2" fiber (inside conduit)	45.00 - 50.00	0.6000	0.4994
T20	16	3/8" RET (inside conduit)	45.00 - 50.00	0.6000	0.4994
T20	17	3" Conduit	45.00 - 50.00	0.6000	0.4994
T20	19	1-5/8"	45.00 - 50.00	0.0010	0.0010
T20	20	1 1/4	45.00 - 50.00	0.0010	0.0010

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T20	22	LDF7-50A(1 5/8")	45.00 - 50.00	0.6000	0.4994
T21	1	Feedline Ladder (Af)	40.00 - 45.00	0.6000	0.4045
T21	2	Feedline Ladder (Af)	40.00 - 45.00	0.6000	0.4045
T21	3	Feedline Ladder (Af)	40.00 - 45.00	0.6000	0.4045
T21	4	Feedline Ladder (Af)	40.00 - 45.00	0.6000	0.4045
T21	5	Safety Line 3/8	40.00 - 45.00	0.6000	0.4045
T21	7	5/16" (inside conduit)	40.00 - 45.00	0.6000	0.4045
T21	8	1/2" (inside conduit)	40.00 - 45.00	0.6000	0.4045
T21	9	1/2"	40.00 - 45.00	0.6000	0.4045
T21	10	2" Rigid Conduit	40.00 - 45.00	0.6000	0.4045
T21	12	1-1/4" fiber	40.00 - 45.00	0.6000	0.4045
T21	14	1-1/4"	40.00 - 45.00	0.6000	0.4045
T21	15	1/2" fiber (inside conduit)	40.00 - 45.00	0.6000	0.4045
T21	16	3/8" RET (inside conduit)	40.00 - 45.00	0.6000	0.4045
T21	17	3" Conduit	40.00 - 45.00	0.6000	0.4045
T21	19	1-5/8"	40.00 - 45.00	0.0010	0.0010
T21	20	1 1/4	40.00 - 45.00	0.0010	0.0010
T21	22	LDF7-50A(1 5/8")	40.00 - 45.00	0.6000	0.4045
T22	1	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.5516
T22	2	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.5516
T22	3	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.5516
T22	4	Feedline Ladder (Af)	33.33 - 40.00	0.6000	0.5516
T22	5	Safety Line 3/8	33.33 - 40.00	0.6000	0.5516
T22	7	5/16" (inside conduit)	33.33 - 40.00	0.6000	0.5516
T22	8	1/2" (inside conduit)	33.33 - 40.00	0.6000	0.5516
T22	9	1/2"	33.33 - 40.00	0.6000	0.5516
T22	10	2" Rigid Conduit	33.33 - 40.00	0.6000	0.5516
T22	12	1-1/4" fiber	33.33 - 40.00	0.6000	0.5516
T22	14	1-1/4"	33.33 - 40.00	0.6000	0.5516
T22	15	1/2" fiber (inside conduit)	33.33 - 40.00	0.6000	0.5516
T22	16	3/8" RET (inside conduit)	33.33 - 40.00	0.6000	0.5516
T22	17	3" Conduit	33.33 - 40.00	0.6000	0.5516
T22	19	1-5/8"	33.33 - 40.00	0.0010	0.0010
T22	20	1 1/4	33.33 - 40.00	0.0010	0.0010
T22	22	LDF7-50A(1 5/8")	33.33 - 40.00	0.6000	0.5516
T23	1	Feedline Ladder (Af)	26.67 - 33.33	0.6000	0.5719
T23	2	Feedline Ladder (Af)	26.67 - 33.33	0.6000	0.5719
T23	3	Feedline Ladder (Af)	26.67 - 33.33	0.6000	0.5719
T23	4	Feedline Ladder (Af)	26.67 - 33.33	0.6000	0.5719
T23	5	Safety Line 3/8	26.67 - 33.33	0.6000	0.5719
T23	7	5/16" (inside conduit)	26.67 - 33.33	0.6000	0.5719
T23	8	1/2" (inside conduit)	26.67 - 33.33	0.6000	0.5719
T23	9	1/2"	26.67 - 33.33	0.6000	0.5719
T23	10	2" Rigid Conduit	26.67 - 33.33	0.6000	0.5719
T23	12	1-1/4" fiber	26.67 - 33.33	0.6000	0.5719
T23	14	1-1/4"	26.67 - 33.33	0.6000	0.5719
T23	15	1/2" fiber (inside conduit)	26.67 - 33.33	0.6000	0.5719
T23	16	3/8" RET (inside conduit)	26.67 - 33.33	0.6000	0.5719
T23	17	3" Conduit	26.67 - 33.33	0.6000	0.5719
T23	19	1-5/8"	26.67 - 33.33	0.0010	0.0010
T23	20	1 1/4	26.67 - 33.33	0.0010	0.0010
T23	22	LDF7-50A(1 5/8")	26.67 - 33.33	0.6000	0.5719
T24	1	Feedline Ladder (Af)	20.00 - 26.67	0.6000	0.5914
T24	2	Feedline Ladder (Af)	20.00 - 26.67	0.6000	0.5914
T24	3	Feedline Ladder (Af)	20.00 - 26.67	0.6000	0.5914
T24	4	Feedline Ladder (Af)	20.00 - 26.67	0.6000	0.5914
T24	5	Safety Line 3/8	20.00 - 26.67	0.6000	0.5914
T24	7	5/16" (inside conduit)	20.00 - 26.67	0.6000	0.5914
T24	8	1/2" (inside conduit)	20.00 - 26.67	0.6000	0.5914
T24	9	1/2"	20.00 - 26.67	0.6000	0.5914
T24	10	2" Rigid Conduit	20.00 - 26.67	0.6000	0.5914
T24	12	1-1/4" fiber	20.00 - 26.67	0.6000	0.5914

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T24	14	1-1/4"	20.00 - 26.67	0.6000	0.5914
T24	15	1/2" fiber (inside conduit)	20.00 - 26.67	0.6000	0.5914
T24	16	3/8" RET (inside conduit)	20.00 - 26.67	0.6000	0.5914
T24	17	3" Conduit	20.00 - 26.67	0.6000	0.5914
T24	19	1-5/8"	20.00 - 26.67	0.0010	0.0010
T24	20	1 1/4	20.00 - 26.67	0.0010	0.0010
T24	22	LDF7-50A(1 5/8")	20.00 - 26.67	0.6000	0.5914
T25	1	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T25	2	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T25	3	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T25	4	Feedline Ladder (Af)	13.33 - 20.00	0.6000	0.6000
T25	5	Safety Line 3/8	13.33 - 20.00	0.6000	0.6000
T25	7	5/16" (inside conduit)	13.33 - 20.00	0.6000	0.6000
T25	8	1/2" (inside conduit)	13.33 - 20.00	0.6000	0.6000
T25	9	1/2"	13.33 - 20.00	0.6000	0.6000
T25	10	2" Rigid Conduit	13.33 - 20.00	0.6000	0.6000
T25	12	1-1/4" fiber	13.33 - 20.00	0.6000	0.6000
T25	14	1-1/4"	13.33 - 20.00	0.6000	0.6000
T25	15	1/2" fiber (inside conduit)	13.33 - 20.00	0.6000	0.6000
T25	16	3/8" RET (inside conduit)	13.33 - 20.00	0.6000	0.6000
T25	17	3" Conduit	13.33 - 20.00	0.6000	0.6000
T25	19	1-5/8"	13.33 - 20.00	0.0010	0.0010
T25	20	1 1/4	13.33 - 20.00	0.0010	0.0010
T25	22	LDF7-50A(1 5/8")	13.33 - 20.00	0.6000	0.6000
T26	1	Feedline Ladder (Af)	6.67 - 13.33	0.6000	0.5656
T26	2	Feedline Ladder (Af)	6.67 - 13.33	0.6000	0.5656
T26	3	Feedline Ladder (Af)	6.67 - 13.33	0.6000	0.5656
T26	4	Feedline Ladder (Af)	6.67 - 13.33	0.6000	0.5656
T26	5	Safety Line 3/8	6.67 - 13.33	0.6000	0.5656
T26	7	5/16" (inside conduit)	6.67 - 13.33	0.6000	0.5656
T26	8	1/2" (inside conduit)	6.67 - 13.33	0.6000	0.5656
T26	9	1/2"	6.67 - 13.33	0.6000	0.5656
T26	10	2" Rigid Conduit	6.67 - 13.33	0.6000	0.5656
T26	12	1-1/4" fiber	6.67 - 13.33	0.6000	0.5656
T26	14	1-1/4"	6.67 - 13.33	0.6000	0.5656
T26	15	1/2" fiber (inside conduit)	6.67 - 13.33	0.6000	0.5656
T26	16	3/8" RET (inside conduit)	6.67 - 13.33	0.6000	0.5656
T26	17	3" Conduit	6.67 - 13.33	0.6000	0.5656
T26	19	1-5/8"	6.67 - 13.33	0.0010	0.0010
T26	20	1 1/4	6.67 - 13.33	0.0010	0.0010
T26	22	LDF7-50A(1 5/8")	6.67 - 13.33	0.6000	0.5656
T27	1	Feedline Ladder (Af)	0.00 - 6.67	0.6000	0.6000
T27	2	Feedline Ladder (Af)	0.00 - 6.67	0.6000	0.6000
T27	3	Feedline Ladder (Af)	0.00 - 6.67	0.6000	0.6000
T27	4	Feedline Ladder (Af)	0.00 - 6.67	0.6000	0.6000
T27	5	Safety Line 3/8	0.00 - 6.67	0.6000	0.6000
T27	7	5/16" (inside conduit)	0.00 - 6.67	0.6000	0.6000
T27	8	1/2" (inside conduit)	0.00 - 6.67	0.6000	0.6000
T27	9	1/2"	0.00 - 6.67	0.6000	0.6000
T27	10	2" Rigid Conduit	0.00 - 6.67	0.6000	0.6000
T27	12	1-1/4" fiber	0.00 - 6.67	0.6000	0.6000
T27	14	1-1/4"	0.00 - 6.67	0.6000	0.6000
T27	15	1/2" fiber (inside conduit)	0.00 - 6.67	0.6000	0.6000
T27	16	3/8" RET (inside conduit)	0.00 - 6.67	0.6000	0.6000
T27	17	3" Conduit	0.00 - 6.67	0.6000	0.6000
T27	19	1-5/8"	0.00 - 6.67	0.0010	0.0010
T27	20	1 1/4	0.00 - 6.67	0.0010	0.0010
T27	22	LDF7-50A(1 5/8")	0.00 - 6.67	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LLPX310R	A	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	4.338 4.632 4.933	1.962 2.232 2.510	0.028 0.054 0.084
LLPX310R	B	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	4.338 4.632 4.933	1.962 2.232 2.510	0.028 0.054 0.084
840 10054	C	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	4.578 4.874 5.178	1.361 1.620 1.886	0.035 0.059 0.087
24"x14"x9"	A	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	1.400 1.600 1.800	2.639 2.870 3.111	0.064 0.091 0.122
24"x14"x9"	B	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	1.400 1.600 1.800	2.639 2.870 3.111	0.064 0.091 0.122
24"x14"x9"	C	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	1.400 1.600 1.800	2.639 2.870 3.111	0.064 0.091 0.122
TIMING 2000	C	From Leg	3.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	0.126 0.177 0.237	0.126 0.177 0.237	0.001 0.002 0.005
Sector Mount [SM 803-3]	C	None		0.000	128'	No Ice 1/2" Ice 1" Ice	40.400 51.200 62.000	40.400 51.200 62.000	0.985 1.226 1.467
*									
APXVTM14-C-I20	A	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	6.342 6.716 7.097	3.607 3.967 4.333	0.056 0.096 0.140
APXVTM14-C-I20	B	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	6.342 6.716 7.097	3.607 3.967 4.333	0.056 0.096 0.140
APXVTM14-C-I20	C	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	6.342 6.716 7.097	3.607 3.967 4.333	0.056 0.096 0.140
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	8.498 9.149 9.767	6.946 8.127 9.021	0.083 0.151 0.227
TD-RRH8x20-25	A	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	3.704 3.946 4.196	1.294 1.465 1.642	0.066 0.090 0.117
TD-RRH8x20-25	B	From Leg	3.000 0' 0'	0.000	120'	No Ice 1/2" Ice 1" Ice	3.704 3.946 4.196	1.294 1.465 1.642	0.066 0.090 0.117
TD-RRH8x20-25	C	From Leg	3.000 0'	0.000	120'	No Ice 1/2" Ice	3.704 3.946	1.294 1.465	0.066 0.090

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
			0'			1" Ice	4.196	1.642	0.117
1900 MHz 4x45 RRH	A	From Leg	3.000	0.000	120'	No Ice	2.322	2.238	0.060
			0'			1/2" Ice	2.527	2.441	0.083
			0'			1" Ice	2.739	2.651	0.110
1900 MHz 4x45 RRH	B	From Leg	3.000	0.000	120'	No Ice	2.322	2.238	0.060
			0'			1/2" Ice	2.527	2.441	0.083
			0'			1" Ice	2.739	2.651	0.110
1900 MHz 4x45 RRH	C	From Leg	3.000	0.000	120'	No Ice	2.322	2.238	0.060
			0'			1/2" Ice	2.527	2.441	0.083
			0'			1" Ice	2.739	2.651	0.110
800MHz 2x50W RRH	A	From Leg	3.000	0.000	120'	No Ice	1.362	2.058	0.053
			0'			1/2" Ice	1.519	2.240	0.071
			0'			1" Ice	1.683	2.429	0.092
800MHz 2x50W RRH	B	From Leg	3.000	0.000	120'	No Ice	1.362	2.058	0.053
			0'			1/2" Ice	1.519	2.240	0.071
			0'			1" Ice	1.683	2.429	0.092
800MHz 2x50W RRH	C	From Leg	3.000	0.000	120'	No Ice	1.362	2.058	0.053
			0'			1/2" Ice	1.519	2.240	0.071
			0'			1" Ice	1.683	2.429	0.092
(2) ACU-A20-N	A	From Leg	3.000	0.000	120'	No Ice	0.067	0.117	0.001
			0'			1/2" Ice	0.104	0.162	0.002
			0'			1" Ice	0.148	0.215	0.004
ACU-A20-N	B	From Leg	3.000	0.000	120'	No Ice	0.067	0.117	0.001
			0'			1/2" Ice	0.104	0.162	0.002
			0'			1" Ice	0.148	0.215	0.004
ACU-A20-N	C	From Leg	3.000	0.000	120'	No Ice	0.067	0.117	0.001
			0'			1/2" Ice	0.104	0.162	0.002
			0'			1" Ice	0.148	0.215	0.004
800 MHz Filter	A	From Leg	3.000	0.000	120'	No Ice	0.300	0.150	0.011
			0'			1/2" Ice	0.370	0.204	0.014
			0'			1" Ice	0.448	0.265	0.018
800 MHz Filter	B	From Leg	3.000	0.000	120'	No Ice	0.300	0.150	0.011
			0'			1/2" Ice	0.370	0.204	0.014
			0'			1" Ice	0.448	0.265	0.018
800 MHz Filter	C	From Leg	3.000	0.000	120'	No Ice	0.300	0.150	0.011
			0'			1/2" Ice	0.370	0.204	0.014
			0'			1" Ice	0.448	0.265	0.018
6' x 2" Mount Pipe	A	From Leg	3.000	0.000	120'	No Ice	1.425	1.425	0.022
			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	3.000	0.000	120'	No Ice	1.425	1.425	0.022
			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	3.000	0.000	120'	No Ice	1.425	1.425	0.022
			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	120'	No Ice	10.900	10.900	0.726
						1/2" Ice	14.650	14.650	0.926
						1" Ice	18.400	18.400	1.125
***									
(2) LGP 21401 TMA	A	From Leg	3.000	0.000	110'	No Ice	0.817	0.346	0.010
			0'			1/2" Ice	0.937	0.440	0.016
			0'			1" Ice	1.065	0.540	0.023
(2) LGP 21401 TMA	B	From Leg	3.000	0.000	110'	No Ice	0.817	0.346	0.010
			0'			1/2" Ice	0.937	0.440	0.016
			0'			1" Ice	1.065	0.540	0.023
(2) LGP 21401 TMA	C	From Leg	3.000	0.000	110'	No Ice	0.817	0.346	0.010

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	0.937	0.440	0.016
			0'			1" Ice	1.065	0.540	0.023
RRUS 11	A	From Face	0.500	0.000	110'	No Ice	2.522	1.020	0.055
			0'			1/2" Ice	2.719	1.158	0.074
			0'			1" Ice	2.923	1.304	0.097
RRUS 11	B	From Face	0.500	0.000	110'	No Ice	2.522	1.020	0.055
			0'			1/2" Ice	2.719	1.158	0.074
			0'			1" Ice	2.923	1.304	0.097
RRUS 11	C	From Face	0.500	0.000	110'	No Ice	2.522	1.020	0.055
			0'			1/2" Ice	2.719	1.158	0.074
			0'			1" Ice	2.923	1.304	0.097
DC6-48-60-18-8F	B	From Leg	0.500	0.000	110'	No Ice	1.560	4.783	0.026
			0'			1/2" Ice	1.722	5.063	0.063
			0'			1" Ice	1.892	5.350	0.104
(P) HPA-65R-BUU-H6	A	From Leg	3.000	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	3.000	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
(2) 800-10121	A	From Leg	3.000	0.000	110'	No Ice	5.162	3.293	0.046
			0'			1/2" Ice	5.514	3.639	0.079
			0'			1" Ice	5.874	3.994	0.117
(2) 800-10121	B	From Leg	3.000	0.000	110'	No Ice	5.162	3.293	0.046
			0'			1/2" Ice	5.514	3.639	0.079
			0'			1" Ice	5.874	3.994	0.117
(2) 800-10121	C	From Leg	3.000	0.000	110'	No Ice	5.162	3.293	0.046
			0'			1/2" Ice	5.514	3.639	0.079
			0'			1" Ice	5.874	3.994	0.117
HPA-65R-BUU-H8	C	From Leg	3.000	0.000	110'	No Ice	12.976	7.516	0.068
			0'			1/2" Ice	13.558	8.087	0.142
			0'			1" Ice	14.147	8.666	0.223
RRUS 12	A	From Leg	3.000	0.000	110'	No Ice	2.700	1.213	0.060
			0'			1/2" Ice	2.903	1.363	0.081
			0'			1" Ice	3.114	1.519	0.106
RRUS 12	B	From Leg	3.000	0.000	110'	No Ice	2.700	1.213	0.060
			0'			1/2" Ice	2.903	1.363	0.081
			0'			1" Ice	3.114	1.519	0.106
RRUS 12	C	From Leg	3.000	0.000	110'	No Ice	2.700	1.213	0.060
			0'			1/2" Ice	2.903	1.363	0.081
			0'			1" Ice	3.114	1.519	0.106
RRUS A2	A	From Leg	3.000	0.000	110'	No Ice	2.066	0.498	0.022
			0'			1/2" Ice	2.245	0.607	0.035
			0'			1" Ice	2.431	0.724	0.050
RRUS A2	B	From Leg	3.000	0.000	110'	No Ice	2.066	0.498	0.022
			0'			1/2" Ice	2.245	0.607	0.035
			0'			1" Ice	2.431	0.724	0.050
RRUS A2	C	From Leg	3.000	0.000	110'	No Ice	2.066	0.498	0.022
			0'			1/2" Ice	2.245	0.607	0.035
			0'			1" Ice	2.431	0.724	0.050
(4) 860 10025	A	From Leg	3.000	0.000	110'	No Ice	0.142	0.121	0.010
			0'			1/2" Ice	0.196	0.173	0.012
			0'			1" Ice	0.259	0.231	0.014
(4) 860 10025	B	From Leg	3.000	0.000	110'	No Ice	0.142	0.121	0.010
			0'			1/2" Ice	0.196	0.173	0.012
			0'			1" Ice	0.259	0.231	0.014
(4) 860 10025	C	From Leg	3.000	0.000	110'	No Ice	0.142	0.121	0.010

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
			0'			1/2" Ice	0.196	0.173	0.012
			0'			1" Ice	0.259	0.231	0.014
(2) LGP21901	A	From Leg	3.000	0.000	110'	No Ice	0.231	0.110	2.200
			0'			1/2" Ice	0.294	0.155	2.202
			0'			1" Ice	0.365	0.207	2.206
(2) LGP21901	B	From Leg	3.000	0.000	110'	No Ice	0.231	0.110	2.200
			0'			1/2" Ice	0.294	0.155	2.202
			0'			1" Ice	0.365	0.207	2.206
(2) LGP21901	C	From Leg	3.000	0.000	110'	No Ice	0.231	0.110	2.200
			0'			1/2" Ice	0.294	0.155	2.202
			0'			1" Ice	0.365	0.207	2.206
ATSBT-TOP-MF-4G	A	From Leg	3.000	0.000	110'	No Ice	0.062	0.174	0.002
			0'			1/2" Ice	0.097	0.229	0.003
			0'			1" Ice	0.140	0.292	0.003
ATSBT-TOP-MF-4G	B	From Leg	3.000	0.000	110'	No Ice	0.062	0.174	0.002
			0'			1/2" Ice	0.097	0.229	0.003
			0'			1" Ice	0.140	0.292	0.003
ATSBT-TOP-MF-4G	C	From Leg	3.000	0.000	110'	No Ice	0.062	0.174	0.002
			0'			1/2" Ice	0.097	0.229	0.003
			0'			1" Ice	0.140	0.292	0.003
Sector Mount [SM 409-3]	C	None		0.000	110'	No Ice	22.470	22.470	1.035
						1/2" Ice	31.990	31.990	1.500
						1" Ice	41.510	41.510	1.966
****									
Air 21 B2A/B4P	A	From Leg	3.000	0.000	93'	No Ice	6.037	4.256	0.092
			0'			1/2" Ice	6.406	4.609	0.133
			0'			1" Ice	6.781	4.964	0.179
Air 21 B2A/B4P	B	From Leg	3.000	0.000	93'	No Ice	6.037	4.256	0.092
			0'			1/2" Ice	6.406	4.609	0.133
			0'			1" Ice	6.781	4.964	0.179
Air 21 B2A/B4P	C	From Leg	3.000	0.000	93'	No Ice	6.037	4.256	0.092
			0'			1/2" Ice	6.406	4.609	0.133
			0'			1" Ice	6.781	4.964	0.179
APXVAARR24_43-U-NA20	A	From Leg	3.000	0.000	93'	No Ice	22.377	9.035	0.116
			0'			1/2" Ice	23.384	9.722	0.229
			0'			1" Ice	24.391	10.409	0.342
APXVAARR24_43-U-NA20	B	From Leg	3.000	0.000	93'	No Ice	22.377	9.035	0.116
			0'			1/2" Ice	23.384	9.722	0.229
			0'			1" Ice	24.391	10.409	0.342
APXVAARR24_43-U-NA20	C	From Leg	3.000	0.000	93'	No Ice	22.377	9.035	0.116
			0'			1/2" Ice	23.384	9.722	0.229
			0'			1" Ice	24.391	10.409	0.342
KRY 112 144/1	A	From Leg	3.000	0.000	93'	No Ice	0.351	0.156	0.011
			0'			1/2" Ice	0.427	0.212	0.014
			0'			1" Ice	0.510	0.277	0.018
KRY 112 144/1	B	From Leg	3.000	0.000	93'	No Ice	0.351	0.156	0.011
			0'			1/2" Ice	0.427	0.212	0.014
			0'			1" Ice	0.510	0.277	0.018
KRY 112 144/1	C	From Leg	3.000	0.000	93'	No Ice	0.351	0.156	0.011
			0'			1/2" Ice	0.427	0.212	0.014
			0'			1" Ice	0.510	0.277	0.018
AIR 32 KRD901146-1_B66A	A	From Leg	3.000	0.000	93'	No Ice	6.510	4.712	0.132
			0'			1/2" Ice	6.887	5.068	0.178
			0'			1" Ice	7.271	5.431	0.229
AIR 32 KRD901146-1_B66A	B	From Leg	3.000	0.000	93'	No Ice	6.510	4.712	0.132
			0'			1/2" Ice	6.887	5.068	0.178
			0'			1" Ice	7.271	5.431	0.229

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
AIR 32 KRD901146-1_B66A	C	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	6.510 6.887 7.271	4.712 5.068 5.431	0.132 0.178 0.229
Radio 4449 B71+B12	A	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	0.950 1.470 1.990	1.152 1.291 1.436	0.074 0.091 0.110
Radio 4449 B71+B12	B	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	0.950 1.470 1.990	1.152 1.291 1.436	0.074 0.091 0.110
Radio 4449 B71+B12	C	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	0.950 1.470 1.990	1.152 1.291 1.436	0.074 0.091 0.110
Sector Mount [SM 402-3]	C	None		0.000	93'	No Ice 1/2" Ice 1" Ice	18.910 26.780 34.650	18.910 26.780 34.650	0.851 1.233 1.616
****									
(2) BXA-70063/6CF	A	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	7.731 8.424 9.134	4.158 4.627 5.161	0.017 0.059 0.102
(2) BXA-70063/6CF	B	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	7.731 8.424 9.134	4.158 4.627 5.161	0.017 0.059 0.102
(2) BXA-70063/6CF	C	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	7.731 8.424 9.134	4.158 4.627 5.161	0.017 0.059 0.102
(2) BXA-171063/12CF	A	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	4.967 5.483 6.051	3.618 4.040 4.551	0.013 0.041 0.069
(2) BXA-171063/12CF	B	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	4.967 5.483 6.051	3.618 4.040 4.551	0.013 0.041 0.069
(2) BXA-171063/12CF	C	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	4.967 5.483 6.051	3.618 4.040 4.551	0.013 0.041 0.069
(2) RRH2x40-700U	A	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	1.260 1.410 1.560	1.420 1.590 1.768	0.044 0.061 0.082
(2) RRH2x40-700U	B	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	1.260 1.410 1.560	1.420 1.590 1.768	0.044 0.061 0.082
(2) RRH2x40-700U	C	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	1.260 1.410 1.560	1.420 1.590 1.768	0.044 0.061 0.082
RRH2x40-AWS	A	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	1.260 1.410 1.560	1.420 1.590 1.768	0.044 0.061 0.082
RRH2x40-AWS	B	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	1.260 1.410 1.560	1.420 1.590 1.768	0.044 0.061 0.082
RRH2x40-AWS	C	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	1.260 1.410 1.560	1.420 1.590 1.768	0.044 0.061 0.082
DB-T1-6Z-8AB-0Z	C	From Leg	3.000 0' 0'	0.000	80'	No Ice 1/2" Ice 1" Ice	4.800 5.070 5.348	2.000 2.193 2.393	0.044 0.080 0.120
Sector Mount [SM 104-3]	C	None		0.000	80'	No Ice 1/2" Ice	30.020 40.480	30.020 40.480	0.953 1.405

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	50.940	50.940	1.857
SFS-V(stabilizer kit)	A	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	2.400 3.000 3.600	1.760 2.270 2.780	0.065 0.091 0.117
SFS-V(stabilizer kit)	B	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	2.400 3.000 3.600	1.760 2.270 2.780	0.065 0.091 0.117
SFS-V(stabilizer kit)	C	From Leg	3.000 0' 0'	0.000	93'	No Ice 1/2" Ice 1" Ice	2.400 3.000 3.600	1.760 2.270 2.780	0.065 0.091 0.117

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 ft^2	Weight K
VHLP2.5	A	Paraboloid w/Radome	From Leg	4.000 0' 0'	0.000		124'	2.500	No Ice 1/2" Ice 1" Ice	4.909 5.241 5.574	0.048 0.075 0.102
VHLP2.5	B	Paraboloid w/Radome	From Leg	4.000 0' 0'	0.000		124'	2.500	No Ice 1/2" Ice 1" Ice	4.909 5.241 5.574	0.048 0.075 0.102
VHLP2.5	C	Paraboloid w/Radome	From Leg	4.000 0' 0'	0.000		124'	2.500	No Ice 1/2" Ice 1" Ice	4.909 5.241 5.574	0.048 0.075 0.102
R											

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	130	Leg	A325N	1.000	1	7.158	53.014	0.135 ✔	1	Bolt Tension
T8	102.859	Leg	A325N	0.750	4	17.173	29.821	0.576 ✔	1	Bolt Tension
T9	100	Diagonal	A325N	0.500	1	3.800	4.690	0.810 ✔	1	Member Block Shear
T10	96	Diagonal	A325X	0.500	1	5.031	9.719	0.518 ✔	1	Bolt Shear
T11	92	Diagonal	A325N	0.500	1	7.584	9.380	0.809 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.581	7.952	0.450 ✔	1	Bolt Shear
T12	88	Diagonal	A325N	0.500	1	7.277	9.380	0.776 ✔	1	Member Block

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
		Secondary Horizontal	A325N	0.500	1	4.468	7.952	0.562 ✔	1	Shear Bolt Shear
T13	84	Leg	A325N	1.000	8	15.771	53.014	0.297 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	6.335	9.380	0.675 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.813	7.952	0.480 ✔	1	Bolt Shear
T14	80	Diagonal	A325X	0.500	1	6.772	9.719	0.697 ✔	1	Bolt Shear
T15	75	Diagonal	A325N	0.500	1	6.953	9.380	0.741 ✔	1	Member Block Shear
T16	70	Diagonal	A325N	0.500	1	6.023	9.380	0.642 ✔	1	Member Block Shear
T17	65	Leg	A325N	1.000	8	24.907	53.014	0.470 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	6.389	9.380	0.681 ✔	1	Member Block Shear
T18	60	Diagonal	A325N	0.500	1	8.038	9.380	0.857 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	4.124	4.133	0.998 ✔	1	Member Bearing
T19	55	Diagonal	A325N	0.500	1	5.116	9.380	0.545 ✔	1	Member Block Shear
T20	50	Diagonal	A325N	0.500	1	6.142	9.380	0.655 ✔	1	Member Block Shear
T21	45	Leg	A325N	1.000	8	32.039	53.014	0.604 ✔	1	Bolt Tension
		Diagonal	A325X	0.500	1	7.612	9.719	0.783 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.500	1	4.949	7.952	0.622 ✔	1	Bolt Shear
T22	40	Diagonal	A325N	0.500	1	6.050	11.419	0.530 ✔	1	Member Block Shear
T23	33.3333	Diagonal	A325N	0.500	1	6.079	11.419	0.532 ✔	1	Member Block Shear
T24	26.6667	Leg	A325N	1.000	8	38.348	53.014	0.723 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	5.590	11.419	0.490 ✔	1	Member Block Shear
T25	20	Diagonal	A325X	0.500	1	5.986	6.199	0.966 ✔	1	Member Bearing
T26	13.3333	Diagonal	A325X	0.500	1	6.077	6.199	0.980 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.625	1	6.412	10.500	0.611 ✔	1	Member Block Shear
T27	6.66666	Leg	A36M-55	1.500	6	59.649	84.492	0.706 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	7.661	12.398	0.618 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	1 1/2	10'	2'5-3/4"	79.3 K=1.00	1.767	-8.648	47.300	0.183 [1] ✔
T2	120 - 117.143	2	2'10-9/32"	2'9-9/32"	66.6 K=1.00	3.142	-12.526	95.057	0.132 [1] ✔
T3	117.143 - 114.286	2	2'10-9/32"	2'9-9/32"	66.6 K=1.00	3.142	-19.635	95.057	0.207 [1] ✔
T4	114.286 - 111.43	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-26.150	93.381	0.280 [1] ✔
T5	111.43 - 108.573	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-40.425	93.381	0.433 [1] ✔
T6	108.573 - 105.716	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-52.196	93.381	0.559 [1] ✔
T7	105.716 - 102.859	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-66.052	93.381	0.707 [1] ✔
T8	102.859 - 100	2	2'10-5/16"	1'4-21/32"	33.3 K=1.00	3.142	-85.799	118.274	0.725 [1] ✔
T9	100 - 96	P4.5 x 0.237	4'1/32"	4'1/32"	31.8 K=1.00	3.174	-89.506	142.411	0.629 [1] ✔
T10	96 - 92	P4.5 x 0.237	4'1/32"	4'1/32"	31.8 K=1.00	3.174	-105.038	142.411	0.738 [1] ✔
T11	92 - 88	P4.5 x 0.237	4'1/32"	2'13/16"	16.4 K=1.00	3.174	-115.498	151.005	0.765 [1] ✔
T12	88 - 84	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'25/32"	16.8 K=1.00	4.658	-131.819	221.384	0.595 [1] ✔
T13	84 - 80	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'23/32"	16.8 K=1.00	4.658	-146.849	221.402	0.663 [1] ✔
T14	80 - 75	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-166.513	256.371	0.649 [1] ✔
T15	75 - 70	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-187.196	256.371	0.730 [1] ✔
T16	70 - 65	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-206.538	256.371	0.806 [1] ✔
T17	65 - 60	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-224.484	256.371	0.876 [1] ✔
T18	60 - 55	P6.625x0.280	5'1/32"	2'6-13/16"	13.7 K=1.00	5.581	-238.034	267.248	0.891 [1] ✔
T19	55 - 50	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1 K=1.00	7.511	-258.325	344.376	0.750 [1] ✔
T20	50 - 45	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1 K=1.00	7.511	-272.876	344.376	0.792 [1] ✔
T21	45 - 40	BT101341- P6.625x0.280 w/ HP7.625x0.301	5'1/32"	2'6-23/32"	13.9 K=1.00	7.382	-285.640	353.331	0.808 [1] ✔
T22	40 - 33.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-303.292	367.767	0.825 [1] ✔
T23	33.3333 - 26.6667	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-322.507	367.767	0.877 [1] ✔
T24	26.6667 - 20	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-339.539	367.767	0.923 [1] ✔
T25	20 - 13.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-355.697	367.767	0.967 [1] ✔
T26	13.3333 - 6.66666	P6.625x.432	6'8-1/32"	3'4-31/32"	18.7 K=1.00	8.405	-370.080	397.395	0.931 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
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	10.183	-396.574	445.367	0.890 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	1/2	3'6-1/4"	1'8-1/16"	120.4 K=0.75	0.196	-1.297	2.965	0.438 [1] ✔
T2	120 - 117.143	3/4	3'8-13/16"	1'8-29/32"	89.6 K=0.80	0.442	-2.686	9.384	0.286 [1] ✔
T3	117.143 - 114.286	3/4	3'8-13/16"	1'8-29/32"	89.6 K=0.80	0.442	-2.689	9.384	0.286 [1] ✔
T4	114.286 - 111.43	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-2.669	9.369	0.285 [1] ✔
T5	111.43 - 108.573	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-3.829	9.369	0.409 [1] ✔
T6	108.573 - 105.716	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-5.148	9.369	0.549 [1] ✔
T7	105.716 - 102.859	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-5.030	9.369	0.537 [1] ✔
T8	102.859 - 100	3/4	3'8-27/32"	1'8-29/32"	89.6 K=0.80	0.442	-5.450	9.384	0.581 [1] ✔
T9	100 - 96	L1 1/2x1 1/2x3/16	4'9-1/4"	2'7/16"	92.5 K=1.11	0.527	-4.426	10.892	0.406 [1] ✔
T10	96 - 92	L2x2x1/4	4'10-19/32"	2'15/16"	77.8 K=1.22	0.938	-5.031	22.096	0.228 [1] ✔
T11	92 - 88	2L1 1/2x1 1/2x3/16x3/8	5'	2'3-1/4"	59.7 K=1.00	1.055	-8.614	28.334	0.304 [1] ✔
T12	88 - 84	2L1 1/2x1 1/2x3/16x3/8	5'1-15/32"	2'4-3/32"	61.5 K=1.00	1.055	-8.074	27.999	0.288 [1] ✔
T13	84 - 80	2L1 1/2x1 1/2x3/16x3/8	5'3"	2'4-31/32"	63.4 K=1.00	1.055	-6.999	27.654	0.253 [1] ✔
T14	80 - 75	L2x2x1/4	6'2-1/8"	2'7-3/16"	89.8 K=1.13	0.938	-6.772	19.872	0.341 [1] ✔
T15	75 - 70	2L1 1/2x1 1/2x3/16x3/8	6'3-29/32"	2'8-17/32"	71.2 K=1.00	1.055	-7.571	26.164	0.289 [1] ✔
T16	70 - 65	2L1 1/2x1 1/2x3/16x3/8	6'5-25/32"	2'9-5/8"	73.6 K=1.00	1.055	-6.755	25.691	0.263 [1] ✔
T17	65 - 60	2L1 1/2x1 1/2x3/16x3/8	6'7-23/32"	2'10-23/32"	76.0 K=1.00	1.055	-7.011	25.205	0.278 [1] ✔
T18	60 - 55	2L1 1/2x1 1/2x3/16x3/8	6'9-23/32"	3'1-3/32"	81.2 K=1.00	1.055	-8.967	24.144	0.371 [1] ✔
T19	55 - 50	2L1 1/2x1 1/2x3/16x3/8	6'11-13/16"	3'31/32"	81.0 K=1.00	1.055	-5.608	24.196	0.232 [1] ✔
T20	50 - 45	2L1 1/2x1 1/2x3/16x3/8	7'1-29/32"	3'2-1/8"	83.5 K=1.00	1.055	-6.739	23.674	0.285 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T21	45 - 40	L2x2x1/4	7'4-3/32"	3'4-9/16"	103.7 K=1.00	0.938	-7.612	17.253	0.441 [1]
T22	40 - 33.3333	2L1 3/4x1 3/4x3/16x3/8	8'9"	3'11-11/16"	88.8 K=1.00	1.242	-6.768	26.573	0.255 [1]
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	1.242	-7.007	25.910	0.270 [1]
T24	26.6667 - 20	2L1 3/4x1 3/4x3/16x3/8	9'2-11/32"	4'2-9/16"	94.2 K=1.00	1.242	-6.576	25.232	0.261 [1]
T25	20 - 13.3333	L2x2x3/16	9'5-5/32"	4'4-1/16"	132.2 K=1.00	0.715	-6.695	9.232	0.725 [1]
T26	13.3333 - 6.66666	L2x2x3/16	9'8"	4'6-13/16"	139.2 K=1.00	0.715	-6.654	8.336	0.798 [1]
T27	6.66666 - 0	2L2x2x3/16x3/8	9'10-1/4"	4'6-3/4"	88.7 K=1.00	1.430	-8.742	30.610	0.286 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	118.5 K=1.01	0.434	-0.238	6.709	0.035 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	102.859 - 100	L2x2x1/8	2'6"	2'4"	82.4 K=1.84	0.484	-1.353	10.739	0.126 [1]
T11	92 - 88	4x3/8	2'11-31/32"	2'7-15/32"	145.3 K=0.50	1.500	-3.010	16.048	0.188 [1]
T12	88 - 84	4x3/8	3'2-11/32"	2'9-27/32"	156.4 K=0.50	1.500	-3.698	13.861	0.267 [1]
T13	84 - 80	4x3/8	3'4-3/4"	3'1/4"	167.5 K=0.50	1.500	-3.261	12.081	0.270 [1]
T18	60 - 55	L2x2x1/8	4'7-15/32"	4'27/32"	39.0 K=0.50	0.484	-4.124	14.034	0.294 [1]
T21	45 - 40	L3x3x5/16	5'4-15/32"	4'9-27/32"	31.4 K=0.50	1.780	-4.949	54.761	0.090 [1]
T26	13.3333 - 6.66666	L2x2x1/4	6'11-15/16"	6'5-5/16"	63.5 K=0.50	0.938	-6.412	24.581	0.261 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
									✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	118.5 K=1.01	0.434	-0.025	6.709	0.004 [1] ✔
T2	120 - 117.143	L1 1/4x1 1/4x3/16	2'6"	2'4"	117.5 K=1.02	0.434	-0.233	6.795	0.034 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	118.5 K=1.01	0.434	-0.029	6.709	0.004 [1] ✔
T8	102.859 - 100	L1 1/4x1 1/4x3/16	2'6"	2'4"	117.5 K=1.02	0.434	-0.900	6.795	0.132 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	1 1/2	10'	2'5-3/4"	79.3	1.767	7.158	71.569	0.100 [1] ✔
T2	120 - 117.143	2	2'10-9/32"	2'9-9/32"	66.6	3.142	9.738	127.235	0.077 [1] ✔
T3	117.143 - 114.286	2	2'10-9/32"	2'9-9/32"	66.6	3.142	16.431	127.235	0.129 [1] ✔
T4	114.286 -	2	2'10-9/3	2'10-9/3	68.6	3.142	22.731	127.235	0.179 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	111.43		2"	2"					✔
T5	111.43 - 108.573	2	2'10-9/32"	2'10-9/32"	68.6	3.142	30.372	127.235	0.239 [1] ✔
T6	108.573 - 105.716	2	2'10-9/32"	2'10-9/32"	68.6	3.142	37.134	127.235	0.292 [1] ✔
T7	105.716 - 102.859	2	2'10-9/32"	2'10-9/32"	68.6	3.142	50.017	127.235	0.393 [1] ✔
T8	102.859 - 100	2	2'10-5/16"	1'4-21/32"	33.3	3.142	68.693	127.235	0.540 [1] ✔
T9	100 - 96	P4.5 x 0.237	4'1/32"	4'1/32"	31.8	3.174	73.097	154.259	0.474 [1] ✔
T10	96 - 92	P4.5 x 0.237	4'1/32"	4'1/32"	31.8	3.174	86.084	154.259	0.558 [1] ✔
T11	92 - 88	P4.5 x 0.237	4'1/32"	2'13/16"	16.4	3.174	96.695	154.259	0.627 [1] ✔
T12	88 - 84	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'25/32"	16.8	4.658	111.985	226.401	0.495 [1] ✔
T13	84 - 80	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'23/32"	16.8	4.658	126.283	226.401	0.558 [1] ✔
T14	80 - 75	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	144.319	271.254	0.532 [1] ✔
T15	75 - 70	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	163.752	271.254	0.604 [1] ✔
T16	70 - 65	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	182.399	271.254	0.672 [1] ✔
T17	65 - 60	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	199.258	271.254	0.735 [1] ✔
T18	60 - 55	P6.625x0.280	5'1/32"	2'6-13/16"	13.7	5.581	212.432	271.254	0.783 [1] ✔
T19	55 - 50	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1	7.511	231.008	365.013	0.633 [1] ✔
T20	50 - 45	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1	7.511	244.711	365.013	0.670 [1] ✔
T21	45 - 40	BT101341- P6.625x0.280 w/ HP7.625x0.301	5'1/32"	2'6-23/32"	13.9	7.382	256.544	358.744	0.715 [1] ✔
T22	40 - 33.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	273.371	408.480	0.669 [1] ✔
T23	33.3333 - 26.6667	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	291.204	408.480	0.713 [1] ✔
T24	26.6667 - 20	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	306.784	408.480	0.751 [1] ✔
T25	20 - 13.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	321.295	408.480	0.787 [1] ✔
T26	13.3333 - 6.66666	P6.625x.432	6'8-1/32"	3'4-31/32"	18.7	8.405	334.399	408.480	0.819 [1] ✔
T27	6.66666 - 0	BT101341- P6.625 x .432 w/ HP7.625x0.301	6'8-1/32"	6'7-1/32"	36.5	10.183	357.896	494.913	0.723 [1] ✔

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	1/2	3'6-1/4"	1'8-1/16"	160.6	0.196	1.238	6.362	0.195 [1] ✔
T2	120 - 117.143	3/4	3'8-13/16"	1'8-29/32"	111.5	0.442	2.648	14.314	0.185 [1] ✔
T3	117.143 - 114.286	3/4	3'8-13/16"	1'8-29/32"	111.5	0.442	2.708	14.314	0.189 [1] ✔
T4	114.286 - 111.43	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	2.616	14.314	0.183 [1] ✔
T5	111.43 - 108.573	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	3.869	14.314	0.270 [1] ✔
T6	108.573 - 105.716	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	5.020	14.314	0.351 [1] ✔
T7	105.716 - 102.859	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	5.058	14.314	0.353 [1] ✔
T8	102.859 - 100	3/4	3'8-27/32"	1'8-29/32"	111.6	0.442	5.126	14.314	0.358 [1] ✔
T9	100 - 96	L1 1/2x1 1/2x3/16	4'9-1/4"	2'7/16"	56.3	0.308	3.800	13.381	0.284 [1] ✔
T10	96 - 92	L2x2x1/4	4'10-19/32"	2'15/16"	43.4	0.586	4.925	25.505	0.193 [1] ✔
T11	92 - 88	2L1 1/2x1 1/2x3/16x3/8	5'	2'3-1/4"	59.7	0.615	7.584	26.763	0.283 [1] ✔
T12	88 - 84	2L1 1/2x1 1/2x3/16x3/8	5'1-15/32"	2'4-3/32"	61.5	0.615	7.277	26.763	0.272 [1] ✔
T13	84 - 80	2L1 1/2x1 1/2x3/16x3/8	5'3"	2'4-31/32"	63.4	0.615	6.335	26.763	0.237 [1] ✔
T14	80 - 75	L2x2x1/4	6'2-1/8"	2'7-3/16"	53.7	0.586	6.272	25.505	0.246 [1] ✔
T15	75 - 70	2L1 1/2x1 1/2x3/16x3/8	6'3-29/32"	2'8-17/32"	74.0	0.615	6.953	26.763	0.260 [1] ✔
T16	70 - 65	2L1 1/2x1 1/2x3/16x3/8	6'5-25/32"	2'9-5/8"	76.4	0.615	6.023	26.763	0.225 [1] ✔
T17	65 - 60	2L1 1/2x1 1/2x3/16x3/8	6'7-23/32"	2'10-23/32"	78.8	0.615	6.389	26.763	0.239 [1] ✔
T18	60 - 55	2L1 1/2x1 1/2x3/16x3/8	6'9-23/32"	3'1-3/32"	81.2	0.615	8.038	26.763	0.300 [1] ✔
T19	55 - 50	2L1 1/2x1 1/2x3/16x3/8	6'11-13/16"	3'31/32"	83.7	0.615	5.116	26.763	0.191 [1] ✔
T20	50 - 45	2L1 1/2x1 1/2x3/16x3/8	7'1-29/32"	3'2-1/8"	86.2	0.615	6.142	26.763	0.229 [1] ✔
T21	45 - 40	L2x2x1/4	7'4-3/32"	3'4-9/16"	66.6	0.586	7.022	25.505	0.275 [1] ✔
T22	40 - 33.3333	2L1 3/4x1 3/4x3/16x3/8	8'9"	3'11-11/16"	91.1	0.756	6.050	32.880	0.184 [1] ✔
T23	33.3333 - 26.6667	2L1 3/4x1 3/4x3/16x3/8	8'11-5/8"	4'1-1/8"	93.8	0.756	6.079	32.880	0.185 [1] ✔
T24	26.6667 - 20	2L1 3/4x1 3/4x3/16x3/8	9'2-11/32"	4'2-9/16"	96.5	0.756	5.590	32.880	0.170 [1] ✔
T25	20 - 13.3333	L2x2x3/16	9'5-5/32"	4'4-1/16"	86.3	0.448	5.986	19.499	0.307 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T26	13.3333 - 6.66666	L2x2x3/16	9'8"	4'6-13/16"	88.8	0.448	6.077	19.499	0.312 [1] ✔
T27	6.66666 - 0	2L2x2x3/16x3/8	9'10-1/4"	4'6-3/4"	90.8	0.897	7.661	39.007	0.196 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	75.7	0.434	0.272	14.048	0.019 [1] ✔

[1] P_u / ϕP_n controls

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	102.859 - 100	L2x2x1/8	2'6"	2'4"	44.7	0.484	1.353	15.694	0.086 [1] ✔
T11	92 - 88	4x3/8	2'11-31/32"	2'7-15/32"	290.6	0.949	3.581	41.291	0.087 [1] ✔
T12	88 - 84	4x3/8	3'2-11/32"	2'9-27/32"	312.7	0.949	4.468	41.291	0.108 [1] ✔
T13	84 - 80	4x3/8	3'4-3/4"	3'1/4"	335.0	0.949	3.813	41.291	0.092 [1] ✔
T18	60 - 55	L2x2x1/8	4'7-15/32"	4'27/32"	78.0	0.305	4.124	13.254	0.311 [1] ✔
T21	45 - 40	L3x3x5/16	5'4-15/32"	4'9-27/32"	62.7	1.189	4.949	51.700	0.096 [1] ✔
T26	13.3333 - 6.66666	L2x2x1/4	6'11-15/16"	6'5-5/16"	127.0	0.563	6.412	24.485	0.262 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	75.7	0.434	0.030	14.048	0.002 [1] ✔
T2	120 - 117.143	L1 1/4x1 1/4x3/16	2'6"	2'4"	74.4	0.434	0.275	14.048	0.020 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	L1 1/4x1 1/4x3/16	2'6"	2'4-1/2"	75.7	0.434	0.065	14.048	0.005 [1] ✔
T8	102.859 - 100	L1 1/4x1 1/4x3/16	2'6"	2'4"	74.4	0.434	1.007	14.048	0.072 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	130 - 120	Leg	1 1/2	1	-8.648	47.300	18.3	Pass
		Diagonal	1/2	12	-1.297	2.965	43.8	Pass
		Horizontal	L1 1/4x1 1/4x3/16	35	-0.238	6.709	3.5	Pass
		Top Girt	L1 1/4x1 1/4x3/16	6	-0.025	6.709	0.4	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	9	0.065	14.048	0.5	Pass
T2	120 - 117.143	Leg	2	43	-12.526	95.057	13.2	Pass
		Diagonal	3/4	52	-2.686	9.384	28.6	Pass
		Top Girt	L1 1/4x1 1/4x3/16	48	-0.233	6.795	3.4	Pass
T3	117.143 - 114.286	Leg	2	55	-19.635	95.057	20.7	Pass
		Diagonal	3/4	60	-2.689	9.384	28.6	Pass
T4	114.286 - 111.43	Leg	2	64	-26.150	93.381	28.0	Pass
		Diagonal	3/4	70	-2.669	9.369	28.5	Pass
T5	111.43 - 108.573	Leg	2	73	-40.425	93.381	43.3	Pass
		Diagonal	3/4	81	-3.829	9.369	40.9	Pass
T6	108.573 - 105.716	Leg	2	82	-52.196	93.381	55.9	Pass
		Diagonal	3/4	90	-5.148	9.369	54.9	Pass
T7	105.716 - 102.859	Leg	2	91	-66.052	93.381	70.7	Pass
		Diagonal	3/4	98	-5.030	9.369	53.7	Pass
T8	102.859 - 100	Leg	2	100	-85.799	118.274	72.5	Pass
		Diagonal	3/4	111	-5.450	9.384	58.1	Pass
		Secondary Horizontal	L2x2x1/8	112	-1.353	10.739	12.6	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	104	-0.900	6.795	13.2	Pass
T9	100 - 96	Leg	P4.5 x 0.237	115	-89.506	142.411	62.9	Pass
		Diagonal	L1 1/2x1 1/2x3/16	121	-4.426	10.892	40.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							81.0 (b)	
T10	96 - 92	Leg	P4.5 x 0.237	124	-105.038	142.411	73.8	Pass
		Diagonal	L2x2x1/4	129	-5.031	22.096	22.8	Pass
							51.8 (b)	
T11	92 - 88	Leg	P4.5 x 0.237	135	-115.498	151.005	76.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	139	-8.614	28.334	30.4	Pass
							80.9 (b)	
		Secondary Horizontal	4x3/8	143	-3.010	16.048	18.8	Pass
							45.0 (b)	
T12	88 - 84	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	147	-131.819	221.384	59.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	151	-8.074	27.999	28.8	Pass
							77.6 (b)	
		Secondary Horizontal	4x3/8	155	-3.698	13.861	26.7	Pass
							56.2 (b)	
T13	84 - 80	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	159	-146.849	221.402	66.3	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	163	-6.999	27.654	25.3	Pass
							67.5 (b)	
		Secondary Horizontal	4x3/8	167	-3.261	12.081	27.0	Pass
							48.0 (b)	
T14	80 - 75	Leg	P6.625x0.280	171	-166.513	256.371	64.9	Pass
		Diagonal	L2x2x1/4	176	-6.772	19.872	34.1	Pass
							69.7 (b)	
T15	75 - 70	Leg	P6.625x0.280	180	-187.196	256.371	73.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	185	-7.571	26.164	28.9	Pass
							74.1 (b)	
T16	70 - 65	Leg	P6.625x0.280	189	-206.538	256.371	80.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	193	-6.755	25.691	26.3	Pass
							64.2 (b)	
T17	65 - 60	Leg	P6.625x0.280	198	-224.484	256.371	87.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	202	-7.011	25.205	27.8	Pass
							68.1 (b)	
T18	60 - 55	Leg	P6.625x0.280	207	-238.034	267.248	89.1	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	211	-8.967	24.144	37.1	Pass
							85.7 (b)	
		Secondary Horizontal	L2x2x1/8	215	4.124	13.254	31.1	Pass
							99.8 (b)	
T19	55 - 50	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	219	-258.325	344.376	75.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	223	-5.608	24.196	23.2	Pass
							54.5 (b)	
T20	50 - 45	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	228	-272.876	344.376	79.2	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	232	-6.739	23.674	28.5	Pass
							65.5 (b)	
T21	45 - 40	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301	237	-285.640	353.331	80.8	Pass
		Diagonal	L2x2x1/4	241	-7.612	17.253	44.1	Pass
							78.3 (b)	
		Secondary Horizontal	L3x3x5/16	245	4.949	51.700	9.6	Pass
							62.2 (b)	
T22	40 - 33.3333	Leg	P6.625x.432	249	-303.292	367.767	82.5	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	253	-6.768	26.573	25.5	Pass
							53.0 (b)	
T23	33.3333 - 26.6667	Leg	P6.625x.432	258	-322.507	367.767	87.7	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	262	-7.007	25.910	27.0	Pass
							53.2 (b)	
T24	26.6667 - 20	Leg	P6.625x.432	267	-339.539	367.767	92.3	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	271	-6.576	25.232	26.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							49.0 (b)	
T25	20 - 13.3333	Leg	P6.625x.432	276	-355.697	367.767	96.7	Pass
		Diagonal	L2x2x3/16	280	-6.695	9.232	72.5	Pass
							96.6 (b)	
T26	13.3333 - 6.66666	Leg	P6.625x.432	285	-370.080	397.395	93.1	Pass
		Diagonal	L2x2x3/16	289	-6.654	8.336	79.8	Pass
							98.0 (b)	
		Secondary Horizontal	L2x2x1/4	293	6.412	24.485	26.2	Pass
							61.1 (b)	
T27	6.66666 - 0	Leg	BT101341- P6.625 x .432 w/ HP7.625x0.301	297	-396.574	445.367	89.0	Pass
		Diagonal	2L2x2x3/16x3/8	301	-8.742	30.610	28.6	Pass
							61.8 (b)	
							Summary	
							Leg (T25) 96.7	Pass
							Diagonal (T26) 98.0	Pass
							Horizontal (T1) 3.5	Pass
							Secondary Horizontal (T18) 99.8	Pass
							Top Girt (T2) 3.4	Pass
							Bottom Girt (T8) 13.2	Pass
							Bolt Checks 99.8	Pass
							RATING = 99.8	**Pass**

MATHCAD CALCULATION PRINTOUT

EXISTING 130' SELF SUPPORT TOWER ANCHOR BOLT CHECK

REACTIONS ON THE FOUNDATION

As per Tnx output (see attached)

Down load; $Pv := 396 \cdot kips$ Shear; $V_u := 20 \cdot kips$

Uplift load; $P_{up} := 357 \cdot kips$ Moment; $M := 0 \cdot kips \cdot ft$

Anchor Rod Data is as per tower design by Fred A Nudd project #6893 dated Sept 1999

Number of Anchor Rods: $N_{anchors} := 6$

Diameter of Anchors: $D_{anchors} := 1.5in$ $n := 6in^{-1}$

Area of anchor bolts $A_b := \frac{\pi \cdot \left(D_{anchors}^{2}\right)}{4} = 1.767 \cdot in^2$

Net Tensile Area of Anchors: $A_{net} := \frac{\pi}{4} \cdot \left(D_{anchors} - \frac{0.9743}{n}\right)^2 = 1.405 \cdot in^2$

Minimum Yield Stress $F_{Yanchors} := 36ksi$ (Grade ASTM36)

Ultimate Tensile Stress: $F_{Uanchors} := 85ksi$ (per design drawing)

Saftey Factor for Anchor: $\phi_t := 0.8$ (Section 4.9.9, TIA-222-G Addendum 2)

Allowable Axial Load per Anchor: $T_{cap} := \phi_t \cdot F_{Uanchors} \cdot A_{net}$

$T_{cap} = 95.557 \cdot kips$

Interaction Equation for Anchor Rods as per Section 4.9.9, TIA-222-G Addendum 1 and Figure 4.4

For detail type (C) as per Figure 4.4 $\eta := 0.55$

$P_u := \text{if}\left(\eta > 0.5, P_{up}, Pv\right) = 357 \cdot kips$

Maximum Load on Anchor: $T_{max} := \frac{P_u + \frac{V_u}{\eta}}{N_{anchors}}$

$T_{max} = 65.561 \cdot kips$

Anchor Rod Capacity: $\frac{T_{max}}{T_{cap}} = 68.609 \cdot \%$ OK!

$Anchor\_Rod\_Check := \text{if}\left(T_{max} < T_{cap}, \text{"OK"}, \text{"Not OK"}\right)$

Anchor_Rod_Check = "OK"

Summary

-Foundation Reactions from Tower Base-

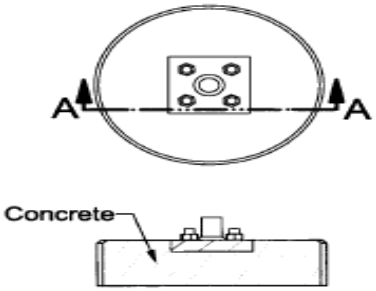
Shear	$V_u = 20 \cdot kips$
Down load	$Pv = 396 \cdot kips$
Uplift load	$P_{up} = 357 \cdot kips$
Moment	$M = 0 \cdot ft \cdot kip$

Anchor Rod Check $T_{max} = 65.561 \cdot kips$ < $T_{cap} = 95.557 \cdot kips$

Anchor_Rod_Check := if$\left(T_{max} < T_{cap}, \text{"OK"}, \text{"Not OK"}\right)$

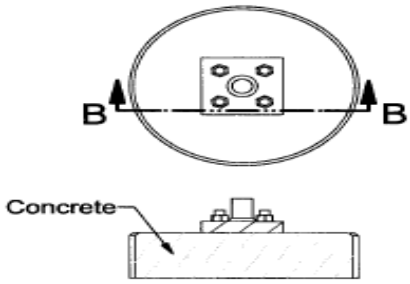
Anchor_Rod_Check = "OK"

ANSI/TIA-222-G



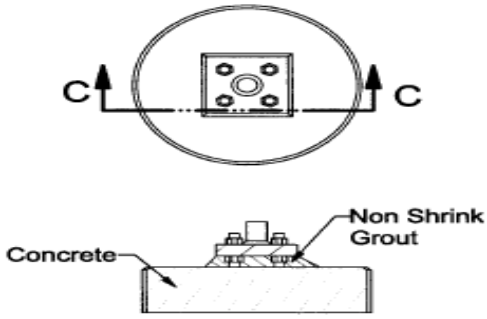
SECTION A-A

Detail Type (a)



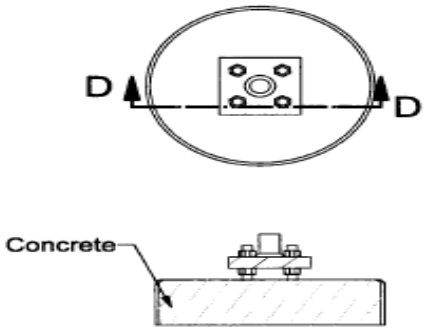
SECTION B-B

Detail Type (b)



SECTION C-C

Detail Type (c)



SECTION D-D

Detail Type (d)

(See Note 1 below)

Note:

1. When clear distance from top of concrete to the bottom face of the leveling nut exceeds 1.5 times the diameter of the anchor rod, bending of the anchor rod shall be considered (refer to 4.9.9).

Figure 4-4: Anchor Rod Detail Types

4.9.9 Anchor Rods

For anchor rods, the following interaction equation shall be satisfied:

$$\left(\frac{P_u + \frac{V_u}{\eta}}{\phi R_{nt}} \right) \leq 1$$

where:

$\phi = 0.80$

P_u = tension force for detail types (a), (b) & (c) and larger of compression or tension force for type (d) as depicted in Figure 4-4.

V_u = shear force (direct shear and torsion components) corresponding to P_u

R_{nt} = nominal tensile strength of anchor rod as per 4.9.6.1

η = 0.90 for detail type (a)
= 0.70 for detail type (b)
= 0.55 for detail type (c)
= 0.50 for detail type (d)

For detail type (d), when the clear distance from the top of concrete to the bottom leveling nut exceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied:

$$\left(\frac{V_u}{\phi R_{nv}} \right)^2 + \left(\left| \frac{P_u}{\phi R_{nt}} \right| + \left| \frac{M_u}{\phi R_{nm}} \right| \right)^2 \leq 1$$

where:

M_u = bending moment corresponding to V_u
= $0.65\, l_{ar} V_u$

l_{ar} = length from top of concrete to bottom of anchor rod leveling nut

Addendum 1

ϕR_{nv} = design shear strength of anchor rod as per 4.9.6.3

ϕR_{nm} = design flexural strength of anchor rod in accordance with 4.7.1 using the tensile root diameter for the determination of z

d_{rt} = tensile root diameter of rod, in [mm]
= d – 0.9743/n inches
= d – 0.9382(p) mm

d = nominal rod diameter, in [mm]

n = number of threads per inch

p = pitch of threads, mm

4.9.6.3 Design Shear Strength

The design shear strength of a bolt, ϕR_{nv}, shall be taken as:

$\phi = 0.75$

(a) When threads are excluded from the shear plane:
$R_{nv} = 0.55\ F_{ub}\ A_b$

(b) When threads are included in the shear plane:
$R_{nv} = 0.45\ F_{ub}\ A_b$

where:

F_{ub} = Specified minimum tensile strength of bolt

A_b = nominal unthreaded area of bolt

4.7.1 Solid Round Members

For solid round members, M_n shall be determined as follows:

$M_n = F_y'Z$

where:

F_y' = effective yield stress as determined from 4.5.4.1

Z = plastic section modulus

4.5.4.1 Effective Yield Stress

For 60^O and 90^O angle members, the effective yield stress for axial compression, F'_y, shall be determined as follows:

$w/t \le 0.47\sqrt{\frac{E}{F_y}}$	$F'_y = F_y$
$0.47\sqrt{\frac{E}{F_y}} < w/t \le 0.85\sqrt{\frac{E}{F_y}}$	$F'_y = \left[1.677-0.677\left(\frac{w/t}{0.47\sqrt{E/F_y}}\right)\right] F_y$
$0.85\sqrt{\frac{E}{F_y}} < w/t \le 25$	$F'_y = [0.0332\ \pi^2\ E/(w/t)^2]$

The width to thickness ratio (w/t) shall not exceed 25 for angle members (refer to Figure 4-3).

For solid round members, the effective yield stress, F'_y, shall be equal to F_y.

For tubular round members, the diameter to thickness ratio (D/t) shall not exceed 400. The effective yield stress, F'_y, shall be determined as follows:

$D/t \le 0.114\ E/F_y$	$F'_y = F_y$
$0.114\ E/F_y < D/t \le 0.448\ E/F_y$	$F'_y = \left(\frac{0.0379E}{(D/t)F_y}+\frac{2}{3}\right)F_y$
$0.448\ E/F_y < D/t \le 400$	$F'_y = \frac{0.337E}{(D/t)}$

SELF SUPPORTING TOWER

MAT FOUNDATION CHECK

Existing 130' Self-Support Tower

SBA Site Name: Glastonbury-main St.
SBA Site ID: CT46126-A-02

Carrier Name: Sprint Nextel
Carrier Site Name: 10071041
Site Location:
2577 Main Street
Glastonbury, CT 06033

Latitude: 41.714389°
Longitude: -72.613028°

ACGI Job # 18-6523

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 output results from the Tower Structural Analysis by Allpro Consulting Group Inc.)

Total Shear $S := 30 \cdot kips$

Moment $M := 2461 \cdot ft\_K$

Down load, Tower weight $Pv := 52 \cdot kips$

Compression on Pedestal: $P_c := 396 \cdot kips$

Uplift on Pedestal: $P_{up} := 357 \cdot kips$

Shear on Pedestal: $Sh := 22 \cdot kips$

-Soil Properties- **Soil data is 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 $Brg_{allw} := 3000 \cdot psf$

$SF_b := 2$

Ultimate Bearing Capacity $Brg_{ult} := Brg_{allw} \cdot SF_b = 6 \cdot ksf$

Passive earth pressure coefficient $K_p := 1.0$

Internal angle of friction for soil $\phi := 0$

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 $FF := 0.35$ (Assumed)

Depth to be neglected $L_{neg} := 1 \cdot ft$

-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, $f_c := 60000 \cdot psi$

-Factor of Safety for soil strength-

$\phi_{s\_Bear} := 0.75$ as per TIA-222-G code for bearing, 9.4.1

$\phi_{s\_friction} := 0.75$ as per TIA-222-G code for skin friction resistance, 9.4.1

$\phi_{s\_lateral} := 0.75$ as per TIA-222-G code for lateral resistance, 9.4.1

$\phi_{s\_uplift} := 0.75$ as per TIA-222-G code for lateral resistance, 9.4.1

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, $D_f := 4 \cdot ft$

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

Pedestal size, $Ped_s := 3 \cdot ft$ No. of pedestals $Nped := 3$

Extension above the grade, $E_g := 0.5 \cdot ft$

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

MAT CALCULATIONS

$$P_{pave} := \frac{\left(D_f - T_f - L_{neg}\right) \cdot K_p \cdot \gamma_s + \left(D_f - L_{neg}\right) \cdot K_p \cdot \gamma_s}{2} \qquad P_{pave} = 0.18 \cdot ksf$$

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.	$C_w := L \cdot B \cdot T_f \cdot \left(\gamma_c\right) + Area_{ped} \cdot \gamma_c \cdot \left(D_f + E_g - T_f\right) \cdot Nped$ $C_w = 308.971 \cdot kips$	$L_c := \frac{L}{2}$ $L_c = 13\,ft$	$R_c := C_w \cdot L_c$ $R_c = 4016.627 \cdot ft\_K$
2) Soil wt.	$S_w := \left[L \cdot B \cdot \left(D_f - T_f\right) - Area_{ped} \cdot \left(D_f - T_f\right) \cdot Nped\right] \cdot \gamma_s$ $S_w = 78.575 \cdot kips$	$L_s := \frac{L}{2}$ $L_s = 13\,ft$	$R_s := S_w \cdot L_s$ $R_s = 1021.479 \cdot ft\_K$
3) Wt. of soil wedge	$W_w := \left(D_f\right) \cdot \frac{1}{2} \cdot \left(D_f \cdot \tan(\phi)\right) \cdot B \cdot \left(\gamma_s\right)$ $W_w = 0 \cdot kips$	$L_w := \left(L + D_f \cdot \frac{\tan(\phi)}{3}\right)$ $L_w = 26\,ft$	$R_w := W_w \cdot L_w$ $R_w = 0 \cdot ft\_K$
4) Passive pressure	$Pe_p := T_f \cdot B \cdot P_{pave}$ $Pe_p = 14.04 \cdot kips$	$L_p := \frac{T_f}{3}$ $L_p = 1\,ft$	$R_p := Pe_p \cdot L_p$ $R_p = 14.04 \cdot ft\_K$
5) Vertical	$Pv = 52 \cdot kips$		
$S_{w1} := L \cdot B \cdot D_f \cdot \gamma_s$	$S_{w1} = 324.48 \cdot kips$ <--- for net calcs	$L_v := \frac{L}{2}$	$R_v := Pv \cdot L_v$

Total weight $T_w := C_w + S_w + W_w + Pv$ $T_w = 439.547 \cdot kips$ $L_v = 13\,ft$ $R_v = 676 \cdot ft\_K$

Total resisting Moment= $M_r := R_c + R_s + R_w + R_p + R_v$ $M_r = 5728.146 \cdot ft\_K$

Overturning Moments component	value, kips	lever arm, ft	Overturning Moment ft-kips
1) Moment on foundation due to eccentric location of tower	$Pv = 52 \cdot kips$	$L_{pe} = 0$	$M_{pe} := L_{pe} \cdot Pv$ $M_{pe} = 0 \cdot ft\_K$
2) Moment on foundation	-	-	$M = 2461 \cdot ft\_K$
3) Moment due to horizontal shear	$S_t := S$	$L_{hs} := D_f + E_g$ $L_{hs} = 4.5\,ft$	$O_{hs} := L_{hs} \cdot S_t$ $O_{hs} = 135 \cdot ft\_K$

Total Overturning Moment= $M_o := M + O_{hs} + M_{pe}$ $M_o = 2596 \cdot ft\_K$

Check Safety Factor against Overturning about mid axis parallel to base

$SF := \frac{M_r}{M_o}$ $SF = 2.207$ > 1.5 **O.K!**

Calculate eccentricity, e

$e := \frac{M_o}{T_w}$ $e = 5.906\,ft$

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 $T_{w1} := S_{w1}$ $T_{w1} = 324.48 \cdot kips$

$P_{max1} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 + \left(6 \cdot \frac{e}{L}\right)\right], 4 \cdot \frac{T_w}{3 \cdot B \cdot (L - 2 \cdot e)}\right]$ $P_{max1} = 1.589 \cdot ksf$

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

Net soil pressure, $P_{net} = 1.109 \cdot ksf$ < $Brg_{ult} \cdot \phi_{s\_Bear} = 4.5 \cdot ksf$ **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 $P_{hor} := Pe_p + (Pv + C_w + S_w) \cdot FF$

$P_{hor} = 167.881 \cdot kips$ > $S = 30 \cdot kips$ Since P.hor > S It is safe!

REINFORCED CONCRETE CHECK CALCULATIONS

General Input parameters

Rebar yield strength, $f_y := 60000.psi$

Concrete Cover $cc := 3.0 \cdot in$

Reduction factors as per respective ACI 318-11 sections

$\phi_{shear} := 0.85$ 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

Reinforced concrete load factor as per EIA 3.1.16 $RC_{fac} := 1.0$ (Loads already factored under TIA/EIA-222-G Code)

Check for wide beam or single shear in mat

Allowable shear stress in concrete for wide beam shear criteria=

$\nu_{wide} := 2 \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi}$ $\nu_{wide} = 416.413 \cdot psi$

Effective depth of stee $d := T_f - cc$ $d = 33 \cdot in$ $L_{eff} := if\left(e \le L_{loc}, L, L - 2 \cdot e\right)$ $L_{eff} = 14.188\,ft$

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

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

shear on the face of concrete=

$$Shear_{wide} := (dist) \cdot B \cdot \left[\frac{P_{maxf} + \left[P_{maxf} - \frac{P_{maxf} - P_{minf}}{L_{eff}} \cdot (dist)\right]}{2}\right] \qquad Shear_{wide} = 145.775 \cdot kips$$

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

Shear stress acting on concrete face= $\nu_{act} := \frac{Shear_{wide}}{A_{shear}}$ $\nu_{act} = 14.158 \cdot psi$

Check for punching or two-way shear in mat

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

$\beta := \frac{L}{B}$ $\beta = 1$

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

$\nu_{punch} = 832.827 \cdot psi$ $Area_{col} := if\left[col_t = 0, \frac{\pi}{4} \cdot \left(Ped_s + d\right)^2, \left(Ped_s + d\right)^2\right]$

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

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

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

$\nu_{act} = 13.336 \cdot psi$ < $\nu_{punch} = 832.827 \cdot psi$ **O.K!**

Check of Pedestal Column

Check pedestal steel for uplift

$d_i := Ped_s - 2 \cdot cc$ $d_i = 30 \cdot in$

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

$D_{pier} := Ped_s$

$M_{col} := Sh \cdot (D_f - T_f + E_g)$ $M_{col} = 33 \cdot ft\_K$ $\sigma_{bend} := 0.6 \cdot f_y$ $\sigma_{bend} = 36000 \cdot psi$

-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 $d_{bar} := 8$

-Rebar details-

$No := (0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8 \quad 9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15 \quad 16 \quad 17 \quad 18)^T$

$d_h := (0 \quad 0 \quad 0 \quad 0.375 \quad 0.5 \quad 0.625 \quad 0.75 \quad 0.875 \quad 1.00 \quad 1.125 \quad 1.25 \quad 1.41 \quad 0 \quad 0 \quad 1.693 \quad 0 \quad 0 \quad 0 \quad 2.257)^T \cdot in$

$A_b := (0 \quad 0 \quad 0 \quad 0.11 \quad 0.20 \quad 0.31 \quad 0.44 \quad 0.60 \quad 0.79 \quad 1.00 \quad 1.27 \quad 1.56 \quad 0 \quad 0 \quad 2.25 \quad 0 \quad 0 \quad 0 \quad 4.00)^T \cdot in^2$

$B_1 := d_{bar}$ $d_{b_{B_1}} = 1 \cdot in$ Bar area= $Area_{abar} := A_{b_{B_1}}$ $Area_{abar} = 0.79 \cdot in^2$

-Number of vertical rebars required-

$Lg_{dia} := d_{b_{B_1}}$

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

Provided $NRB := 11$

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

$Mn := 2519.848 \cdot in \cdot kips$ As per L-Pile calculation output

$0.9 \cdot Mn = 188.989 \cdot kips \cdot ft$ > $M_{col} = 33 \cdot kips \cdot ft$ **OK** $\frac{M_{col}}{0.9Mn} = 17.461 \cdot \%$

Check pedestal in compression

Allowable compressive load on column ACI 10.15= $P_{comp} := \phi_{compr} \cdot 0.85 \cdot f_c \cdot Area_{ped}$

$P_{comp} = 38933.758 \cdot kips$ > $P_c = 396 \cdot kips$ **O.K!**

Check of mat footing

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

$P_{upnet} := P_{up} - \frac{C_{wped} + S_w \cdot 0.95}{Nped}$ $P_{upnet} = 330.527 \cdot kips$ 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:

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

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

$B_{mo} := RC_{fac} \cdot \left[(TWFW \cdot P_{upnet}) \cdot Langle + S_t \cdot (D_f + E_g)\right]$ $B_{mo} = 2281.838 \cdot ft\_K$

required R_u $R_u := \frac{B_{mo}}{\phi_{bend} \cdot B \cdot d^2}$ $R_u = 89.545 \cdot psi$ $m := \frac{f_y}{\beta_1 \cdot f_c}$ $m = 1.538$

required

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

required area of steel for mat=

$Ast_f := \rho \cdot B \cdot d$ $Ast_f = 15.384 \cdot in^2$

minimum area of steel required,

$Ast_{minf} := .0018 \cdot B \cdot T_f$ $Ast_{minf} = 20.218 \cdot in^2$ per ACI 10.5.3 & 7.12

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

bar size provided

$f_{bar} := 8$ $f_{dia} := \frac{f_{bar}}{8} \cdot in$ $f_{dia} = 1 \cdot in$ $f_{abar} := \pi \cdot \frac{f_{dia}^2}{4}$ $f_{abar} = 0.785 \cdot in^2$

Number of bars required= $Nf_{bars} := \frac{Ast_{fuse}}{f_{abar}}$ $Nf_{bars} = 25.742$ $Nf_{bars} := ceil(Nf_{bars})$

Required $Nf_{bars} = 26$ *bars each way in the footing at the top and bottom*

Provided Reinforcement is 34#8 bars Top and bottom OK!

Summary

-Foundation Reactions-

Shear $S = 30 \cdot kips$

Down load $Pv = 52 \cdot kips$ (Weight)

Uplift load $P_{up} = 357 \cdot kips$

Moment; $M = 2461 \cdot ft \cdot kip$

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 $Ped_s = 3\,ft$

Stability Calculations

Safety Factor against Overturning	$SF = 2.207$	> 1.5	$\frac{1.5}{SF} = 67.98 \cdot \%$	**O.K !**
Net soil pressure	$P_{net} = 1.109 \cdot ksf$	< $Brg_{ult} \cdot \phi_{s\_Bear} = 4.5 \cdot ksf$	$\frac{P_{net}}{Brg_{ult} \cdot \phi_{s\_Bear}} = 24.639 \cdot \%$	**O.K.!**
Check for horizontal shear	$P_{hor} = 167.881 \cdot kips$	> $S = 30 \cdot kips$	$\frac{S}{P_{hor}} = 17.87 \cdot \%$	**O.K.!**

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

==========

```
                    LPile for Windows, Version 2018-10.006

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

Path to file locations:
\2018\Structural\18-6523 CT46126-A-02 Glastonbury-main St. SA SBA 130'SST\LPile\

Name of input data file:
Lpile - Rebar check.lp10

Name of output report file:
Lpile - Rebar check.lp10

Name of plot output file:
Lpile - Rebar check.lp10

Name of runtime message file:
Lpile - Rebar check.lp10



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

               Date:  September 26, 2018          Time:  10:52:53



--------------------------------------------------------------------------------
                                   Problem Title
--------------------------------------------------------------------------------
```

CT46126-A-02 Glastonbury-main St.
Job Number: 18-6523
Client: SBA

Description: Mat Foundation (Pedestals)

Program Options and Settings

Computational Options:
- Compute nonlinear bending properties of pile only

Engineering Units Used for Data Input and Computations:
- US Customary System Units (pounds, feet, inches)

Output Options:
- Output files use decimal points to denote decimal symbols.
- Print using wide report formats

Pile Structural Properties and Geometry

Number of pile sections defined = 1
Total length of pile = 4.500 ft
Depth of ground surface below top of pile = 0.0000 ft

Pile diameters used for p-y curve computations are defined using 2 points.

p-y curves are computed using pile diameter values interpolated with depth over the length of the pile. A summary of values of pile diameter vs. depth follows.

Point No.	Depth Below Pile Head feet	Pile Diameter inches
1	0.000	36.0000
2	4.500	36.0000

Input Structural Properties for Pile Sections:

Pile Section No. 1:

Section 1 is a round drilled shaft, bored pile, or CIDH pile
Length of section = 4.500000 ft
Shaft Diameter = 36.000000 in

```
   Shear capacity of section                          =       0.0000 lbs




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

Axial thrust force values were determined from input values

Number of Pile Sections Analyzed = 1

Pile Section No. 1:
-------------------

Dimensions and Properties of Drilled Shaft (Bored Pile):
--------------------------------------------------------

Length of Section                                     =     4.500000 ft
Shaft Diameter                                        =    36.000000 in
Concrete Cover Thickness (to edge of long. rebar)     =     3.500000 in
Number of Reinforcing Bars                            =           11 bars
Yield Stress of Reinforcing Bars                      =       60000. psi
Modulus of Elasticity of Reinforcing Bars             =    29000000. psi
Gross Area of Shaft                                   =        1018. sq. in.
Total Area of Reinforcing Steel                       =     8.690000 sq. in.
Area Ratio of Steel Reinforcement                     =         0.85 percent
Edge-to-Edge Bar Spacing                              =     6.888512 in
Maximum Concrete Aggregate Size                       =     0.750000 in
Ratio of Bar Spacing to Aggregate Size                =         9.18
Offset of Center of Rebar Cage from Center of Pile    =       0.0000 in

Axial Structural Capacities:
----------------------------

Nom. Axial Structural Capacity = 0.85 Fc Ac + Fy As   =     3094.824 kips
Tensile Load for Cracking of Concrete                 =     -394.570 kips
Nominal Axial Tensile Capacity                        =     -521.400 kips


Reinforcing Bar Dimensions and Positions Used in Computations:

     Bar          Bar Diam.      Bar Area          X              Y
    Number         inches         sq. in.        inches         inches
  ----------     ----------     ----------     ----------     ----------
      1            1.000000       0.790000      14.000000        0.00000
      2            1.000000       0.790000      11.777549       7.568971
      3            1.000000       0.790000       5.815810      12.734848
      4            1.000000       0.790000      -1.992408      13.857500
      5            1.000000       0.790000      -9.168050      10.580494
      6            1.000000       0.790000     -13.432902       3.944256
      7            1.000000       0.790000     -13.432902      -3.944256
      8            1.000000       0.790000      -9.168050     -10.580494
      9            1.000000       0.790000      -1.992408     -13.857500
     10            1.000000       0.790000       5.815810     -12.734848
```

```
     11            1.000000       0.790000      11.777549      -7.568971


NOTE: The positions of the above rebars were computed by LPile

Minimum spacing between any two bars not equal to zero =  6.889 inches
between bars 8 and 9.

Ratio of bar spacing to maximum aggregate size = 9.18


Concrete Properties:
--------------------

Compressive Strength of Concrete                        =        3000. psi
Modulus of Elasticity of Concrete                       =     3122019. psi
Modulus of Rupture of Concrete                          =  -410.791918 psi
Compression Strain at Peak Stress                       =     0.001634
Tensile Strain at Fracture of Concrete                  =   -0.0001160
Maximum Coarse Aggregate Size                           =     0.750000 in


Input Axial Thrust Forces:
--------------------------

Number of Axial Thrust Force Values Determined from Input Data = 2

   Number     Axial Thrust Force
                     kips
   ------     ------------------
      1              -357.000
      2               396.000


Definitions of Run Messages and Notes:
--------------------------------------

  C = concrete in section has cracked in tension.
  Y = stress in reinforcing steel has reached yield stress.
  T = ACI 318 criteria for tension-controlled section met, tensile strain in
      reinforcement exceeds 0.005 while simultaneously compressive strain in
      concrete more than 0.003. See ACI 318, Section 10.3.4.
  Z = depth of tensile zone in concrete section is less than 10 percent of
      section depth.

Bending Stiffness (EI) = Computed Bending Moment / Curvature.
Position of neutral axis is measured from edge of compression side of pile.
Compressive stresses and strains are positive in sign.
Tensile stresses and strains are negative in sign.


Axial Thrust Force =   -357.000 kips

    Bending       Bending       Bending      Depth to      Max Comp      Max Tens
Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
```

```
Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
ksi           ksi
------------- ------------- ------------- ------------- ------------- ------------- ----
--------- ------------- ---
  6.25000E-07   192.1927744
307508439.  -130.2399468   -0.00008140    -0.0001039    -0.2919226    -3.0098365
   0.00000125   384.3498277
307479862.   -56.1428763   -0.00007018    -0.0001152    -0.2530174    -3.3336543
   0.00000188   384.3498277    204986575.  -737.5241499    -0.0013829    -0.0014504
    0.00000   -42.0505881 C
   0.00000250   384.3498277    153739931.  -548.6427563    -0.0013716    -0.0014616
    0.00000   -42.3735498 C
   0.00000313   384.3498277    122991945.  -435.3139201    -0.0013604    -0.0014729
    0.00000   -42.6965115 C
   0.00000375   384.3498277    102493287.  -359.7613627    -0.0013491    -0.0014841
    0.00000   -43.0194732 C
   0.00000438   384.3498277     87851389.  -305.7952502    -0.0013379    -0.0014954
    0.00000   -43.3424349 C
   0.00000500   384.3498277     76869966.  -265.3206659    -0.0013266    -0.0015066
    0.00000   -43.6653965 C
   0.00000563   384.3498277     68328858.  -233.8404336    -0.0013154    -0.0015179
    0.00000   -43.9883582 C
   0.00000625   384.3498277     61495972.  -208.6562478    -0.0013041    -0.0015291
    0.00000   -44.3113199 C
   0.00000688   384.3498277     55905429.  -188.0510049    -0.0012929    -0.0015404
    0.00000   -44.6342816 C
   0.00000750   384.3498277     51246644.  -170.8799691    -0.0012816    -0.0015516
    0.00000   -44.9572433 C
   0.00000813   384.3498277     47304594.  -156.3506311    -0.0012703    -0.0015628
    0.00000   -45.2802049 C
   0.00000875   384.3498277     43925695.  -143.8969129    -0.0012591    -0.0015741
    0.00000   -45.6031666 C
   0.00000938   384.3498277     40997315.  -133.1036904    -0.0012478    -0.0015853
    0.00000   -45.9261283 C
   0.00001000   384.3498277     38434983.  -123.6596207    -0.0012366    -0.0015966
    0.00000   -46.2490900 C
   0.00001063   384.3498277     36174101.  -115.3266180    -0.0012253    -0.0016078
    0.00000   -46.5720517 C
   0.00001125   384.3498277     34164429.  -107.9195046    -0.0012141    -0.0016191
    0.00000   -46.8950133 C
   0.00001188   384.3498277     32366301.  -101.2920872    -0.0012028    -0.0016303
    0.00000   -47.2179750 C
   0.00001250   384.3498277     30747986.   -95.3274117    -0.0011916    -0.0016416
    0.00000   -47.5409367 C
   0.00001313   384.3498277     29283796.   -89.9308004    -0.0011803    -0.0016528
    0.00000   -47.8638984 C
   0.00001375   384.3498277     27952715.   -85.0247902    -0.0011691    -0.0016641
    0.00000   -48.1868600 C
   0.00001438   384.3498277     26737379.   -80.5453896    -0.0011578    -0.0016753
    0.00000   -48.5098217 C
   0.00001500   384.3498277     25623322.   -76.4392723    -0.0011466    -0.0016866
    0.00000   -48.8327834 C
   0.00001563   386.9020057     24761728.   -72.6616444    -0.0011353    -0.0016978
    0.00000   -49.1557451 C
   0.00001625   402.3577441     24760477.   -69.1746033    -0.0011241    -0.0017091
```

```
 0.00000   -49.4787070 C
0.00001688   417.8134825     24759317.   -65.9458615    -0.0011128    -0.0017203
 0.00000   -49.8016684 C
0.00001750   433.2692210     24758241.   -62.9477442    -0.0011016    -0.0017316
 0.00000   -50.1246300 C
0.00001813   448.7249594     24757239.   -60.1563935    -0.0010903    -0.0017428
 0.00000   -50.4475920 C
0.00001875   464.1806978     24756304.   -57.5511329    -0.0010791    -0.0017541
 0.00000   -50.7705530 C
0.00001938   479.6364362     24755429.   -55.1139537    -0.0010678    -0.0017653
 0.00000   -51.0935149 C
0.00002000   495.0921746     24754609.   -52.8290981    -0.0010566    -0.0017766
 0.00000   -51.4164765 C
0.00002063   510.5479131     24753838.   -50.6827186    -0.0010453    -0.0017878
 0.00000   -51.7394385 C
0.00002125   526.0036515     24753113.   -48.6625968    -0.0010341    -0.0017991
 0.00000   -52.0624002 C
0.00002188   541.4593899     24752429.   -46.7579105    -0.0010228    -0.0018103
 0.00000   -52.3853623 C
0.00002250   556.9151284     24751783.   -44.9590400    -0.0010116    -0.0018216
 0.00000   -52.7083239 C
0.00002313   572.3708668     24751173.   -43.2574059    -0.0010003    -0.0018328
 0.00000   -53.0312850 C
0.00002375   587.8266052     24750594.   -41.6453314    -0.0009891    -0.0018441
 0.00000   -53.3542465 C
0.00002438   603.2823436     24750045.   -40.1159274    -0.0009778    -0.0018553
 0.00000   -53.6772087 C
0.00002563   634.1938205     24749027.   -37.2809346    -0.0009553    -0.0018778
 0.00000   -54.3231313 C
0.00002688   665.1052973     24748104.   -34.7096621    -0.0009328    -0.0019003
 0.00000   -54.9690553 C
0.00002813   696.0167742     24747263.   -32.3669471    -0.0009103    -0.0019228
 0.00000   -55.6149786 C
0.00002938   726.9282510     24746494.   -30.2236122    -0.0008878    -0.0019453
 0.00000   -56.2609020 C
0.00003063   757.8397279     24745787.   -28.2552433    -0.0008653    -0.0019678
 0.00000   -56.9068255 C
0.00003188   788.7512047     24745136.   -26.4412564    -0.0008428    -0.0019903
 0.00000   -57.5527488 C
0.00003313   819.6626816     24744534.   -24.7641741    -0.0008203    -0.0020128
 0.00000   -58.1986721 C
0.00003438   850.5741584     24743976.   -23.2090614    -0.0007978    -0.0020353
 0.00000   -58.8445955 CY
0.00003563   881.4856353     24743456.   -21.7630794    -0.0007753    -0.0020578
 0.00000   -59.4905190 CY
0.00003688   912.3971121     24742973.   -20.4151301    -0.0007528    -0.0020803
 0.00000   -60.0000000 CY
0.00003813   943.3085890     24742520.   -19.1555710    -0.0007303    -0.0021028
 0.00000   -60.0000000 CY
0.00003938   974.2200658     24742097.   -17.9759838    -0.0007078    -0.0021253
 0.00000   -60.0000000 CY
0.00004063         1005.     24741700.   -16.8689866    -0.0006853    -0.0021478
 0.00000   -60.0000000 CY
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    0.0005144         2478.      4817611.     3.5344582     0.0018180    -0.0166995
  2.9902171   -60.0000000 CY
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  2.9999970   -60.0000000 CY
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2.9934762    60.0000000 CY
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2.9807519    60.0000000 CY
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2.9990425    60.0000000 CY
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2.9765859    60.0000000 CYT
    0.0009344         2541.      2719565.     3.5584661     0.0033249    -0.0303126
2.9716932    60.0000000 CYT
    0.0009644         2543.      2637256.     3.5664370     0.0034394    -0.0312781
2.9879249    60.0000000 CYT
    0.0009944         2545.      2559767.     3.5748615     0.0035548    -0.0322427
2.9974455    60.0000000 CYT
    0.0010244         2547.      2486643.     3.5838736     0.0036712    -0.0332063
2.9980455    60.0000000 CYT
    0.0010544         2549.      2417141.     3.5916783     0.0037870    -0.0341705
2.9863418    60.0000000 CYT
    0.0010844         2549.      2351119.     3.5977713     0.0039013    -0.0351362
2.9749264    60.0000000 CYT


Axial Thrust Force =    396.000 kips

    Bending       Bending       Bending      Depth to      Max Comp      Max Tens
Max Conc      Max Steel  Run
   Curvature      Moment       Stiffness      N Axis        Strain        Strain
Stress        Stress    Msg
    rad/in.       in-kip        kip-in2         in           in/in         in/in
ksi           ksi
------------- ------------- ------------- ------------- ------------- ------------- ----
--------- ------------- ---
  6.25000E-07   190.9342118    305494739.   182.9396128     0.0001143    0.00009184
0.4048753     3.3125180
   0.00000125   381.8942471    305515398.   100.4929398     0.0001256    0.00008062
0.4428811     3.6363441
   0.00000188   572.8410207    305515211.    73.0209787     0.0001369    0.00006941
0.4806713     3.9607282
   0.00000250   763.7679113    305507165.    59.2926963     0.0001482    0.00005823
0.5182445     4.2856705
   0.00000313   954.6682967    305493855.    51.0618860     0.0001596    0.00004707
0.5555992     4.6111709
   0.00000375         1146.    305476147.    45.5798128     0.0001709    0.00003592
0.5927340     4.9372296
   0.00000438         1336.    305454412.    41.6684471     0.0001823    0.00002480
0.6296474     5.2638467
   0.00000500         1527.    305428834.    38.7387747     0.0001937    0.00001369
0.6663380     5.5910223
   0.00000563         1718.    305399516.    36.4635652     0.0002051    0.00000261
0.7028044     5.9187566
   0.00000625         1909.    305365227.    34.6464607     0.0002165   -0.00000846
0.7390446     6.2470460
   0.00000688         2099.    305311841.    33.1622895     0.0002280   -0.00001951
0.7750521     6.5758440
   0.00000750         2289.    305222319.    31.9274553     0.0002395   -0.00003054
0.8108171     6.9050715
   0.00000813         2479.    305088621.    30.8841214     0.0002509   -0.00004157
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0.9857552     8.5556410
   0.00001125          3418.     303778487.     27.4179560     0.0003085    -0.00009655
1.0199335     8.8863832
   0.00001188          3603.     303410072.     26.9452425     0.0003200     -0.0001075
1.0538351     9.2172804
   0.00001250          3603.     288239568.     25.4862332     0.0003186     -0.0001314
1.0493674     9.1735096 C
   0.00001313          3603.     274513875.     24.9774875     0.0003278     -0.0001447
1.0763409     9.4385437 C
   0.00001375          3603.     262035971.     24.5050253     0.0003369     -0.0001581
1.1027265     9.6996039 C
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   0.00001500          3603.     240199640.     23.6556921     0.0003548     -0.0001852
1.1539775    10.2119261 C
   0.00001563          3603.     230591655.     23.2717171     0.0003636     -0.0001989
1.1788808    10.4634343 C
   0.00001625          3630.     223367003.     22.9111043     0.0003723     -0.0002127
1.2033298    10.7120329 C
   0.00001688          3698.     219113464.     22.5715985     0.0003809     -0.0002266
1.2273465    10.9578885 C
   0.00001750          3763.     215039084.     22.2513268     0.0003894     -0.0002406
1.2509554    11.2011984 C
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1.3417913    12.1530099 C
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   0.00006063         6692.    110391612.    14.7156614     0.0008921    -0.0012904
  2.3636834   -37.1040651 C
   0.00006188         6762.    109282444.    14.6393490     0.0009058    -0.0013217
  2.3862280   -38.0060304 C
   0.00006313         6831.    108211875.    14.5659067     0.0009195    -0.0013530
```

```
 2.4083504   -38.9082743 C
  0.00006438         6899.    107170133.    14.4936140     0.0009330    -0.0013845
 2.4298912   -39.8136966 C
  0.00006563         6967.    106165314.    14.4243937     0.0009466    -0.0014159
 2.4510654   -40.7185131 C
  0.00006688         7035.    105195329.    14.3580753     0.0009602    -0.0014473
 2.4718714   -41.6227201 C
  0.00006813         7103.    104258239.    14.2945009     0.0009738    -0.0014787
 2.4923073   -42.5263139 C
  0.00006938         7170.    103352246.    14.2335242     0.0009875    -0.0015100
 2.5123715   -43.4292908 C
  0.00007063         7237.    102468730.    14.1733668     0.0010010    -0.0015415
 2.5318940   -44.3350105 C
  0.00007188         7303.    101611419.    14.1151232     0.0010145    -0.0015730
 2.5509994   -45.2411024 C
  0.00007313         7370.    100780935.    14.0591638     0.0010281    -0.0016044
 2.5697366   -46.1465731 C
  0.00007438         7436.     99975910.    14.0053753     0.0010416    -0.0016359
 2.5881038   -47.0514184 C
  0.00007938         7698.     96979109.    13.8079954     0.0010960    -0.0017615
 2.6576483   -50.6688830 C
  0.00008438         7955.     94285062.    13.6333659     0.0011503    -0.0018872
 2.7207061   -54.2879201 C
  0.00008938         8210.     91856707.    13.4816314     0.0012049    -0.0020126
 2.7776509   -57.8982587 C
  0.00009438         8460.     89639347.    13.3451028     0.0012594    -0.0021381
 2.8280383   -60.0000000 CY
  0.00009938         8707.     87614180.    13.2262267     0.0013144    -0.0022631
 2.8722553   -60.0000000 CY
   0.0001044         8950.     85750905.    13.1218163     0.0013696    -0.0023879
 2.9101172   -60.0000000 CY
   0.0001094         9186.     83984030.    13.0256262     0.0014247    -0.0025128
 2.9412669   -60.0000000 CY
   0.0001144         9379.     81999025.    12.9250109     0.0014783    -0.0026392
 2.9652363   -60.0000000 CY
   0.0001194         9531.     79840486.    12.8201232     0.0015304    -0.0027671
 2.9825340   -60.0000000 CY
   0.0001244         9664.     77701356.    12.7169708     0.0015817    -0.0028958
 2.9937983   -60.0000000 CY
   0.0001294         9789.     75667606.    12.6205799     0.0016328    -0.0030247
 2.9993493   -60.0000000 CY
   0.0001344         9885.     73559307.    12.5212130     0.0016825    -0.0031550
 2.9993748   -60.0000000 CY
   0.0001394         9971.     71542752.    12.4288932     0.0017323    -0.0032852
 2.9991974   -60.0000000 CY
   0.0001444        10055.     69642986.    12.3413303     0.0017818    -0.0034157
 2.9987239   -60.0000000 CY
   0.0001494        10136.     67856752.    12.2617010     0.0018316    -0.0035459
 2.9979601   -60.0000000 CY
   0.0001544        10209.     66133835.    12.1862954     0.0018813    -0.0036762
 2.9999936   -60.0000000 CY
   0.0001594        10266.     64413084.    12.1098277     0.0019300    -0.0038075
 2.9995891   -60.0000000 CY
   0.0001644        10314.     62746991.    12.0349411     0.0019782    -0.0039393
 2.9982055   -60.0000000 CY
   0.0001694        10360.     61165733.    11.9629886     0.0020262    -0.0040713
```

```
  2.9999849   -60.0000000 CY
    0.0001744        10405.     59668432.    11.8969768     0.0020745    -0.0042030
  2.9989993   -60.0000000 CY
    0.0001794        10449.     58249658.    11.8361001     0.0021231    -0.0043344
2.9989138    60.0000000 CY
    0.0001844        10491.     56902185.    11.7801310     0.0021720    -0.0044655
2.9992526    60.0000000 CY
    0.0001894        10533.     55621666.    11.7284170     0.0022211    -0.0045964
2.9983335    60.0000000 CY
    0.0001944        10573.     54396848.    11.6788487     0.0022701    -0.0047274
2.9991031    60.0000000 CY
    0.0001994        10609.     53209320.    11.6283391     0.0023184    -0.0048591
2.9993812    60.0000000 CY
    0.0002044        10637.     52046563.    11.5774970     0.0023662    -0.0049913
2.9982062    60.0000000 CY
    0.0002094        10660.     50911664.    11.5262273     0.0024133    -0.0051242
2.9998463    60.0000000 CY
    0.0002144        10680.     49820048.    11.4772622     0.0024604    -0.0052571
2.9965640    60.0000000 CY
    0.0002194        10700.     48776308.    11.4313653     0.0025078    -0.0053897
2.9986992    60.0000000 CY
    0.0002244        10720.     47777715.    11.3881856     0.0025552    -0.0055223
2.9999410    60.0000000 CY
    0.0002294        10739.     46820600.    11.3477901     0.0026029    -0.0056546
2.9959021    60.0000000 CY
    0.0002344        10758.     45900373.    11.3070914     0.0026501    -0.0057874
2.9983641    60.0000000 CY
    0.0002394        10776.     45016980.    11.2679917     0.0026973    -0.0059202
2.9997960    60.0000000 CY
    0.0002444        10794.     44168381.    11.2312047     0.0027446    -0.0060529
2.9976363    60.0000000 CY
    0.0002494        10811.     43352553.    11.1965659     0.0027921    -0.0061854
2.9967969    60.0000000 CY
    0.0002544        10828.     42568040.    11.1637566     0.0028398    -0.0063177
2.9989855    60.0000000 CY
    0.0002594        10845.     41813013.    11.1326798     0.0028875    -0.0064500
2.9999513    60.0000000 CY
    0.0002644        10862.     41085283.    11.1034679     0.0029355    -0.0065820
2.9964567    60.0000000 CY
    0.0002694        10878.     40383773.    11.0758235     0.0029835    -0.0067140
2.9964560    60.0000000 CY
    0.0002744        10895.     39707248.    11.0495738     0.0030317    -0.0068458
2.9986951    60.0000000 CYT
    0.0003044        10964.     36022818.    10.8985199     0.0033172    -0.0076403
2.9997559    60.0000000 CYT
    0.0003344        10988.     32861367.    10.7695640     0.0036011    -0.0084364
2.9996080    60.0000000 CYT
    0.0003644        10988.     30155800.    10.7156632     0.0039045    -0.0092130
2.9993196    60.0000000 CYT


--------------------------------------------------------------------------------
   Summary of Results for Nominal (Unfactored) Moment Capacity for Section 1
--------------------------------------------------------------------------------

Moment values interpolated at maximum compressive strain = 0.003
```

or maximum developed moment if pile fails at smaller strains.

Load No.	Axial Thrust kips	Nominal Mom. Cap. in-kip	Max. Comp. Strain
1	-357.000	2533.941	0.00300000
2	396.000	10883.944	0.00300000

Note that the values of moment capacity in the table above are not factored by a strength reduction factor (phi-factor).

In ACI 318, the value of the strength reduction factor depends on whether the transverse reinforcing steel bars are tied hoops (0.65) or spirals (0.70).

The above values should be multiplied by the appropriate strength reduction factor to compute ultimate moment capacity according to ACI 318, Section 9.3.2.2 or the value required by the design standard being followed.

The following table presents factored moment capacities and corresponding bending stiffnesses computed for common resistance factor values used for reinforced concrete sections.

Axial Load No.	Resist. Factor for Moment	Nominal Moment Cap in-kips	Ult. (Fac) Ax. Thrust kips	Ult. (Fac) Moment Cap in-kips	Bend. Stiff. at Ult Mom kip-in^2
1	0.65	2534.	-232.050000	1647.	17189125.
2	0.65	10884.	257.400000	7075.	104646472.
1	0.70	2534.	-249.900000	1774.	15418742.
2	0.70	10884.	277.200000	7619.	97882195.
1	0.75	2534.	-267.750000	1900.	14283028.
2	0.75	10884.	297.000000	8163.	92302832.

The analysis ended normally.

August 20, 2018 (Rev.2)

SBA Communications Corporation
134 Flanders Rd., Suite 125
Westborough, MA 01581

RE:

SBA Site ID:	CT46126-A
Site Number:	CT11786D
Site Name:	NEXTEL GLASTONBURY
Site Address:	2557 Main Street Glastonbury, CT 06033

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by T-Mobile to perform a mount analysis on the existing T-Mobile antenna mounts to determine their capabilities of supporting the following equipment loading:

- (3) AIR 21 KRC118023-1_B2A_B4P Antennas (56.0"x12.0"x8.0" – Wt. = 83 lbs. /each)
- (3) KRY 112 144/2 TMA's (6.9"x6.1"x2.8" – Wt. = 11 lbs. /each)
- **(3) APXVAARR24_43-U-NA20 Antennas (96.0"x24.0"x8.7" – Wt. = 128 lbs. /each)**
- **(3) AIR 32 KRD901146-1_B66A_B2A Antennas (56.6"x12.9"x8.7" – Wt. = 132 lbs. /each)**
- **(3) RRUS 4449 B71 + B12 RRH's (13.1"x14.9"x9.2" – Wt. = 74 lbs. /each)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's sub-consultant, ProVertic LLC, conducted a ground audit of the existing T-Mobile antenna mounts on July 16, 2018.

Based on our analysis, we have determined that the existing antenna mount **IS CAPABLE** of supporting the proposed antenna installations with the following modifications:

- **Replace existing pipe mast with new 2" x-strong. (2.38" O.D.) steel pipe mast secured to the existing mount (typ. of 1 per sector, total of 3).**
- **Install new Sector Frame Stabilizer Kit, SitePro1 SFS-V (or approved equal) (typ. of 1 per sector, total of 3).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	7	LC3	171%	**FAIL**
Proposed Mount Rating	6	LC3	96%	**PASS**

This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, and the International Building Code 2012 (See the attached analysis).

This determination was based on the following limitations and assumptions:

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

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

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Structural Dept. Head

STATE OF CONNECTICUT
DANIEL HAMM
24178
LICENSED
PROFESSIONAL ENGINEER

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:

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p: 413.588.8139 f: 413.517.0590 a: 116 Pleasant Street, Ste 302, Easthampton, MA 01027

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 8/20/2018
Project Name: NEXTEL GLASTONBURY
Project Number: CT11786D
Designed By: BD **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01 (z/z_g)^{2/\alpha}$

		z=	93 (ft)
		z_g=	1200 (ft)
K_z=	**0.968**	α=	7.0

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_e
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.4 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_e K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}=	**#DIV/0!**	K_h=	#DIV/0!
		K_e=	0 (from Table 2-4)
(If Category 1 then K_{zt}=1.0)		K_t=	0 (from Table 2-5)
		f=	0 (from Table 2-5)
Category=	1	z=	93
		H=	0 (Ht. of the crest above surrounding terrain)
		K_{zt}=	1.00
		K_{iz} =	1.11 (from Sec. 2.6.8)

2.6.8 Design Ice Thickness

Max Ice Thickness = t_i = 1.00 in

$t_{iz} = 2.0*t_i*I*K_{iz}*(Kzt)^{0.35}$ t_{iz} = 2.22 in

Date: 8/20/2018
Project Name: NEXTEL GLASTONBURY
Project Number: CT11786D
Designed By: BD Checked By: MSC

HUDSON Design Group LLC

2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

Gh = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	130	Gh=	0.85

2.6.7.2 Guyed Masts Gh= 0.85

2.6.7.3 Pole Structures Gh= 1.1

2.6.9 Appurtenances Gh= 1.0

2.6.7.4 Structures Supported on Other Structures
(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

Gh=	1.35	**Gh=**	**1.00**

2.6.9.2 Design Wind Force on Appurtenances

$F = q_z * Gh * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_d * V_{max}^2 * I$

		K_z=	0.968
		K_{zt}=	1.0
q_z=	**23.22**	K_d=	0.85
$q_{z\,(ice)}$=	**5.27**	V_{max}=	105
		$V_{max\,(ice)}$=	50
		I=	1.0

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95

Date: 8/20/2018
Project Name: NEXTEL GLASTONBURY
Project Number: CT11786D
Designed By: BD Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-8

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{1.0})$
	C > 64 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance, and the section length considered to have uniform wind load).

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 2.22 in

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (Ice)
APXVAARR24_43-U-NA20 Antenna	96.0	24.0	8.7	16.00	4.00	1.27	**471**	**132**
AIR 32 KRD901146-1_B66A_B2A Antenna	56.6	12.9	8.7	5.07	4.39	1.28	**151**	**50**
AIR 21 KRC118023-1_B2A_B4P Antenna	56.0	12.0	8.0	4.67	4.67	1.30	**140**	**47**
RRUS 4449 B71 + B12 RRH	13.1	14.9	9.2	1.36	0.88	1.20	**38**	**15**
KRY 112 144/2 TMA	6.9	6.1	2.8	0.29	1.13	1.20	**8**	**5**

Date: 8/20/2018
Project Name: NEXTEL GLASTONBURY
Project Number: CT11786D
Designed By: BD **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 2.22 in.
Density of ice: 56 pcf

AIR 21 KRC118023-1_B2A_B4P Antenna

Weight of ice based on total radial SF area:

Height (in):	56.0	
Width (in):	12.0	
Depth (in):	8.0	
Total weight of ice on object:		211 lbs
Weight of object:	83 lbs	
Combined weight of ice and object:		294 lbs

AIR 32 KRD901146-1_B66A_B2A Antenna

Weight of ice based on total radial SF area:

Height (in):	56.6	
Width (in):	12.9	
Depth (in):	8.7	
Total weight of ice on object:		227 lbs
Weight of object:	132 lbs	
Combined weight of ice and object:		359 lbs

APXVAARR24_43-U-NA20 Antenna

Weight of ice based on total radial SF area:

Height (in):	96.0	
Width (in):	24.0	
Depth (in):	8.7	
Total weight of ice on object:		602 lbs
Weight of object:	128 lbs	
Combined weight of ice and object:		730 lbs

4449 B71+B12 RRH

Weight of ice based on total radial SF area:

Height (in):	13.1	
Width (in):	14.9	
Depth (in):	9.2	
Total weight of ice on object:		58 lbs
Weight of object:	74 lbs	
Combined weight of ice and object:		132 lbs

KRY 112 144/2 TMA

Weight of ice based on total radial SF area:

Height (in):	6.9	
Width (in):	6.1	
Depth (in):	2.8	
Total weight of ice on object:		14 lbs
Weight of object:	11 lbs	
Combined weight of ice and object:		25 lbs

2" pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		12 plf

4" Pipe

Per foot weight of ice:

diameter (in):	4.5	
Per foot weight of ice on object:		18 plf

L 9x8x3/8 Angles

Weight of ice based on total radial SF area:

Height (in):	9	
Width (in):	8	
Per foot weight of ice on object:		39 plf

PL 6x3/8

Weight of ice based on total radial SF area:

Height (in):	6	
Width (in):	0.375	
Per foot weight of ice on object:		22 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)

Bentley

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Bentley

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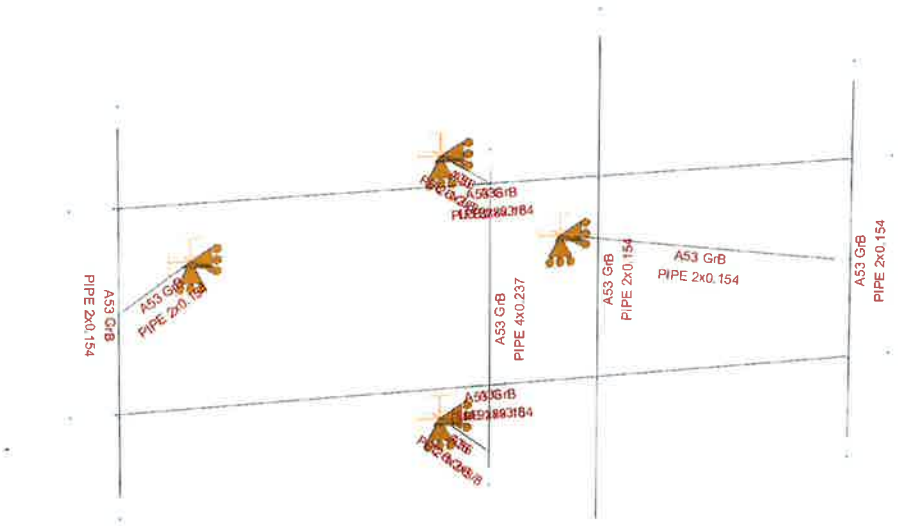

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Load data

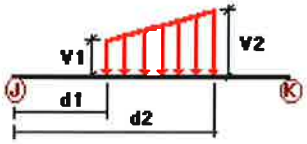
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

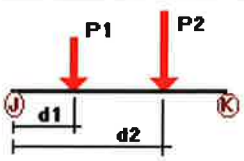
Condition	Description	Comb.	Category
DL	Dead Load	No	DL
Wo	Wind Load (No Ice)	No	WIND
Wi	Wind Load (With Ice)	No	WIND
Di	Ice Load	No	LL

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Di	1	Y	-0.022	-0.022	0.00	Yes	100.00	Yes
	3	Y	-0.018	-0.018	0.00	Yes	100.00	Yes
	5	Y	-0.039	-0.039	0.00	Yes	100.00	Yes
	6	Y	-0.012	-0.012	0.00	Yes	100.00	Yes
	7	Y	-0.022	-0.022	0.00	Yes	100.00	Yes
	70	Y	-0.012	-0.012	0.00	Yes	100.00	Yes
	72	Y	-0.039	-0.039	0.00	Yes	100.00	Yes
	80	Y	-0.012	-0.012	0.00	Yes	100.00	Yes
	81	Y	-0.012	-0.012	0.00	Yes	100.00	Yes
	83	Y	-0.012	-0.012	0.00	Yes	100.00	Yes
	87	Y	-0.012	-0.012	0.00	Yes	100.00	Yes
	88	Y	-0.012	-0.012	0.00	Yes	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	80	y	-0.066	0.64	No
		y	-0.066	5.36	No
	81	y	-0.042	0.67	No
		y	-0.042	5.33	No
		y	-0.011	3.50	No
	83	y	-0.064	0.00	No
		y	-0.064	8.00	No
		y	-0.074	4.00	No
Wo	80	z	-0.076	0.64	No
		z	-0.076	5.36	No
	81	z	-0.07	0.67	No
		z	-0.07	5.33	No
	83	z	-0.236	0.00	No
		z	-0.236	8.00	No
Wi	80	z	-0.025	0.64	No
		z	-0.025	5.36	No
	81	z	-0.024	0.67	No
		z	-0.024	5.33	No
	83	z	-0.066	0.00	No
		z	-0.066	8.00	No
Di	80	y	-0.114	0.64	No
		y	-0.114	5.36	No
	81	y	-0.106	0.67	No
		y	-0.106	5.33	No
		y	-0.014	3.50	No
	83	y	-0.301	0.00	No
		y	-0.301	8.00	No
		y	-0.058	4.00	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (No Ice)	No	0.00	0.00	0.00
Wi	Wind Load (With Ice)	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
Wo	0.00	0.00	0.00
Wi	0.00	0.00	0.00
Di	0.00	0.00	0.00

Bentley

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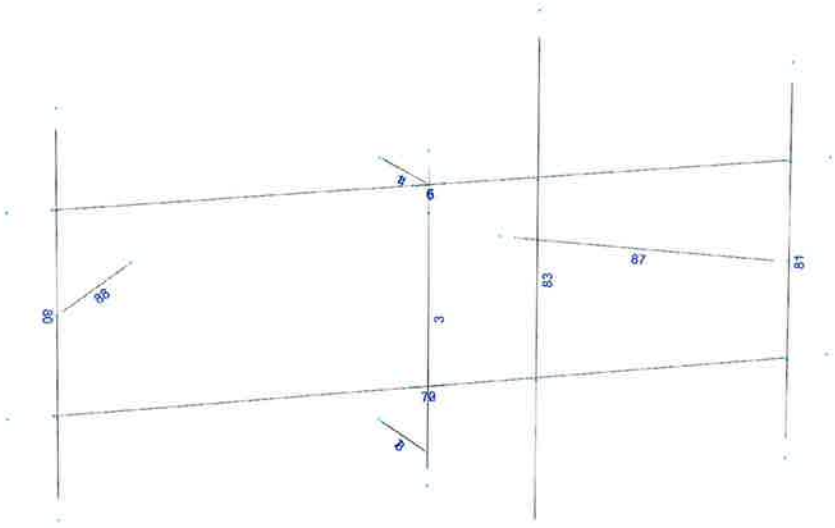
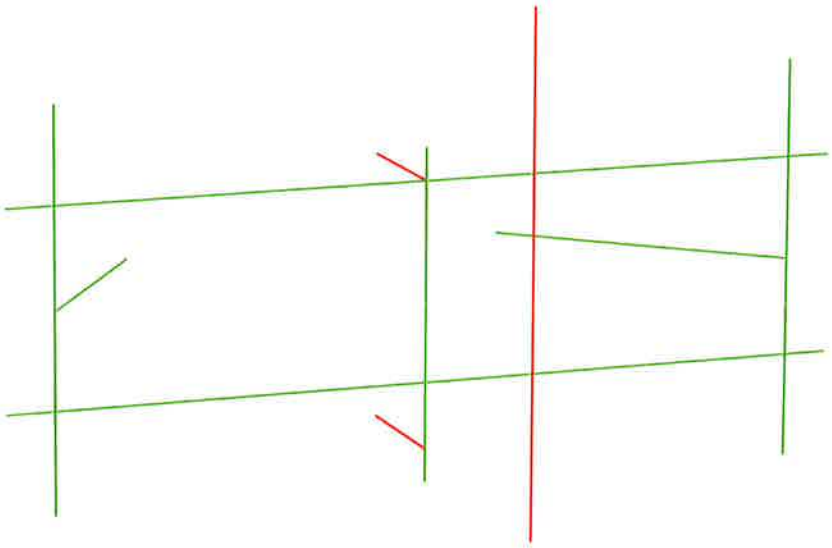


Design status

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



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Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	LU 9x8x3/8	**5**	LC1 at 50.00%	**0.25**	**OK**	Eq. H3-8
			LC2 at 50.00%	0.25	OK	
			LC3 at 50.00%	0.16	OK	
			LC4 at 50.00%	0.03	OK	
			LC5 at 50.00%	0.02	OK	
		72	LC1 at 100.00%	0.13	OK	
			LC2 at 100.00%	0.14	OK	
			LC3 at 50.00%	**0.15**	**OK**	Eq. H3-8
			LC4 at 50.00%	0.05	OK	
			LC5 at 50.00%	0.04	OK	
	PIPE 2x0.154	**6**	LC1 at 47.32%	0.46	OK	Eq. H3-6
			LC2 at 47.32%	0.44	OK	
			LC3 at 47.32%	**0.79**	**OK**	Eq. H1-1b
			LC4 at 52.68%	0.27	OK	
			LC5 at 52.68%	0.20	OK	
		70	LC1 at 47.32%	0.43	OK	Eq. H3-6
			LC2 at 47.32%	0.39	OK	
			LC3 at 47.32%	**0.99**	**OK**	Eq. H1-1b
			LC4 at 47.32%	0.25	OK	
			LC5 at 47.32%	0.19	OK	
		80	LC1 at 48.44%	0.32	OK	Eq. H1-1b
			LC2 at 48.44%	0.30	OK	
			LC3 at 25.00%	**0.54**	**OK**	Eq. H1-1b
			LC4 at 25.00%	0.19	OK	
			LC5 at 25.00%	0.15	OK	
		81	LC1 at 48.44%	**0.42**	**OK**	Eq. H1-1b
			LC2 at 48.44%	0.40	OK	
			LC3 at 25.00%	0.39	OK	Eq. H1-1b
			LC4 at 25.00%	0.11	OK	
			LC5 at 25.00%	0.08	OK	
		83	LC1 at 68.75%	**1.07**	**N.G.**	Eq. H1-1b
			LC2 at 68.75%	1.07	N.G.	
			LC3 at 31.25%	0.54	OK	
			LC4 at 66.67%	0.16	OK	
			LC5 at 31.25%	0.12	OK	
		87	LC1 at 100.00%	0.19	OK	

		LC2 at 100.00%	0.15	OK	
		LC3 at 100.00%	**0.63**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.18	OK	
		LC5 at 100.00%	0.14	OK	
	88	LC1 at 100.00%	0.22	OK	
		LC2 at 100.00%	0.16	OK	
		LC3 at 100.00%	**0.64**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.22	OK	
		LC5 at 100.00%	0.16	OK	
PIPE 4x0.237	**3**	LC1 at 88.75%	0.12	OK	
		LC2 at 88.75%	0.09	OK	
		LC3 at 10.00%	**0.57**	**OK**	Eq. H1-1b
		LC4 at 10.00%	0.18	OK	
		LC5 at 10.00%	0.13	OK	
PL 2-1/2x3/8	**4**	LC1 at 0.00%	0.45	OK	
		LC2 at 0.00%	0.34	OK	
		LC3 at 0.00%	**1.53**	**N.G.**	Eq. H1-1a
		LC4 at 0.00%	0.46	OK	
		LC5 at 0.00%	0.34	OK	
	8	LC1 at 0.00%	0.44	OK	
		LC2 at 0.00%	0.32	OK	
		LC3 at 0.00%	**1.57**	**N.G.**	Eq. H1-1a
		LC4 at 0.00%	0.48	OK	
		LC5 at 0.00%	0.36	OK	
PL 6x3/8	**1**	LC1 at 12.50%	0.48	With warnings	
		LC2 at 12.50%	0.40	With warnings	
		LC3 at 12.50%	**1.18**	**N.G.**	Eq. H1-1a
		LC4 at 100.00%	0.34	With warnings	
		LC5 at 100.00%	0.26	With warnings	
	7	LC1 at 100.00%	0.56	With warnings	
		LC2 at 100.00%	0.44	With warnings	
		LC3 at 100.00%	1.71	**N.G.**	Eq. H1-1a
		LC4 at 100.00%	0.52	With warnings	
		LC5 at 100.00%	0.39	With warnings	

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	0.00	-4.00	0.00	0
3	0.00	-4.00	2.1875	0
4	0.00	0.00	2.1875	0
5	0.00	-0.42	2.1875	0
7	0.00	0.50	2.1875	0
8	0.00	-4.50	2.1875	0
9	0.00	-4.00	0.25	0
10	0.00	0.00	0.25	0
11	-0.25	0.00	2.1875	0
12	0.25	0.00	2.1875	0
13	6.33	0.00	2.1875	0
14	-6.33	0.00	2.1875	0
19	5.62	0.00	2.1875	0
21	-5.66	0.00	2.1875	0
23	1.62	0.00	2.1875	0
25	5.62	0.00	2.3575	0
27	1.62	0.00	2.3575	0
30	-5.66	0.00	2.3575	0
77	-5.66	-1.50	2.3575	0
79	-6.33	-3.00	2.1875	0

80	-5.66	-3.00	2.1875	0
81	-5.66	-3.00	2.3575	0
88	1.62	-3.00	2.1875	0
89	1.62	-3.00	2.3575	0
90	-0.25	-3.00	2.1875	0
91	0.25	-3.00	2.1875	0
92	6.33	-3.00	2.1875	0
93	5.62	-3.00	2.1875	0
94	5.62	-3.00	2.3575	0
100	-5.66	1.50	2.3575	0
101	5.62	1.50	2.3575	0
102	-5.66	-4.50	2.3575	0
103	5.62	-4.50	2.3575	0
106	1.62	2.50	2.3575	0
107	1.62	-5.50	2.3575	0
115	5.62	-1.50	2.3575	0
116	3.00	-2.00	-3.00	0
117	-3.00	-2.00	-3.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	1	1	1
2	1	1	1	1	1	1
116	1	1	1	1	1	1
117	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	1	4		PL 6x3/8	A36	0.00	0.00	0.00
3	7	8		PIPE 4x0.237	A53 GrB	0.00	0.00	0.00
4	4	10		PL 2-1/2x3/8	A36	0.00	0.00	0.00
5	11	12		LU 9x8x3/8	A36	0.00	0.00	0.00
6	13	14		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	2	3		PL 6x3/8	A36	0.00	0.00	0.00
8	3	9		PL 2-1/2x3/8	A36	0.00	0.00	0.00
70	92	79		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
72	90	91		LU 9x8x3/8	A36	0.00	0.00	0.00
80	100	102		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
81	101	103		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
83	106	107		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
87	115	116		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
88	77	117		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	90.00	0	0.00	0.00	0.00
3	45.00	0	0.00	0.00	0.00
5	90.00	0	0.00	0.00	0.00
7	90.00	0	0.00	0.00	0.00
72	90.00	0	0.00	0.00	0.00
80	45.00	0	0.00	0.00	0.00
83	45.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
4	0.00	-1.25	0.00	0.00	-1.25	0.00
5	0.00	0.00	4.50	0.00	0.00	4.50
6	0.00	3.00	7.00	0.00	3.00	7.00
8	0.00	-1.25	0.00	0.00	-1.25	0.00
70	0.00	3.00	7.00	0.00	3.00	7.00
72	0.00	0.00	4.50	0.00	0.00	4.50
80	0.00	3.00	7.00	0.00	3.00	7.00
81	0.00	3.00	7.00	0.00	3.00	7.00
83	0.00	3.00	7.00	0.00	3.00	7.00
87	0.00	3.00	7.00	0.00	3.00	7.00
88	0.00	3.00	7.00	0.00	3.00	7.00

HUDSON
Design Group LLC

Mount Calculations
(Proposed Conditions)

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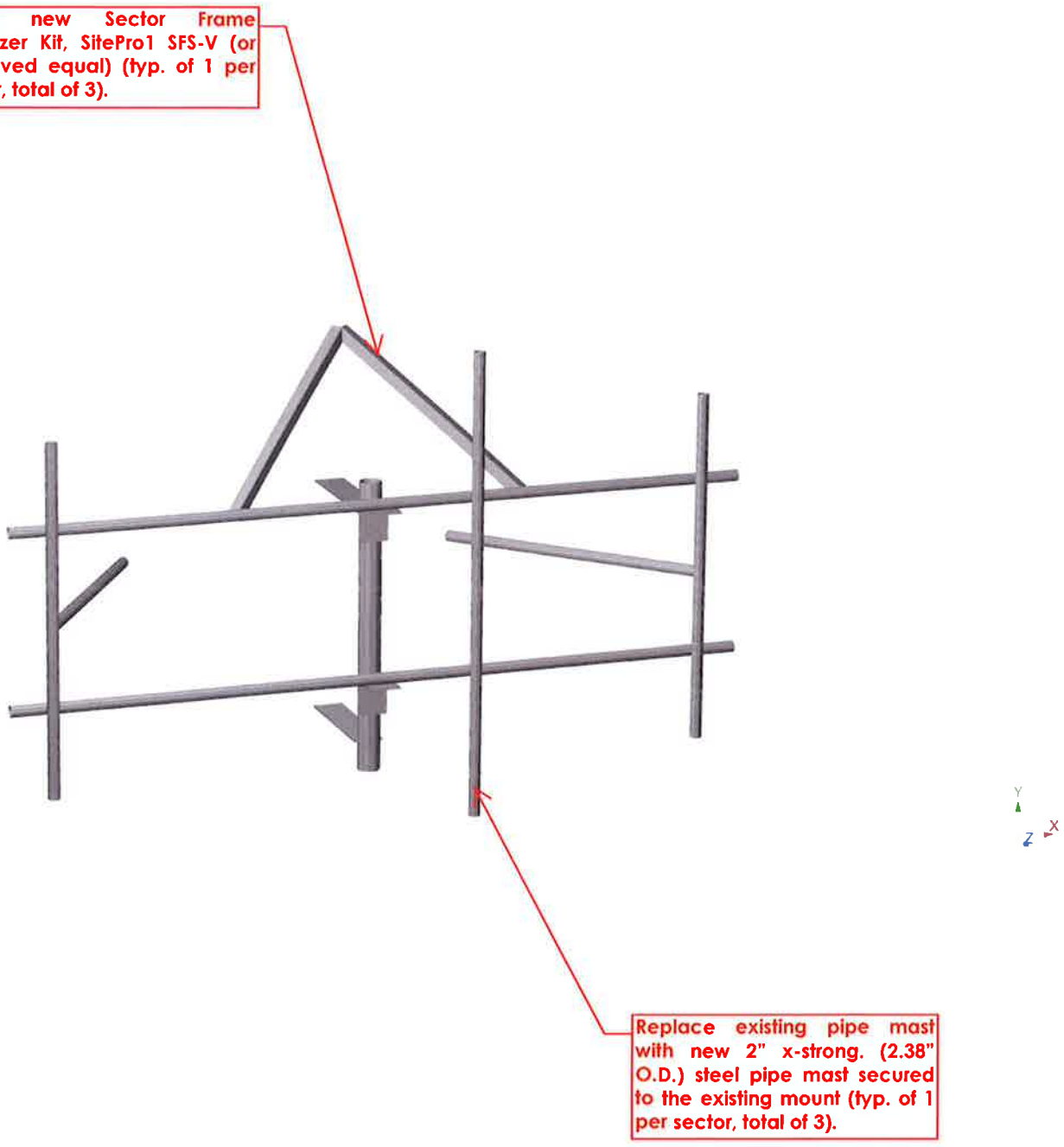

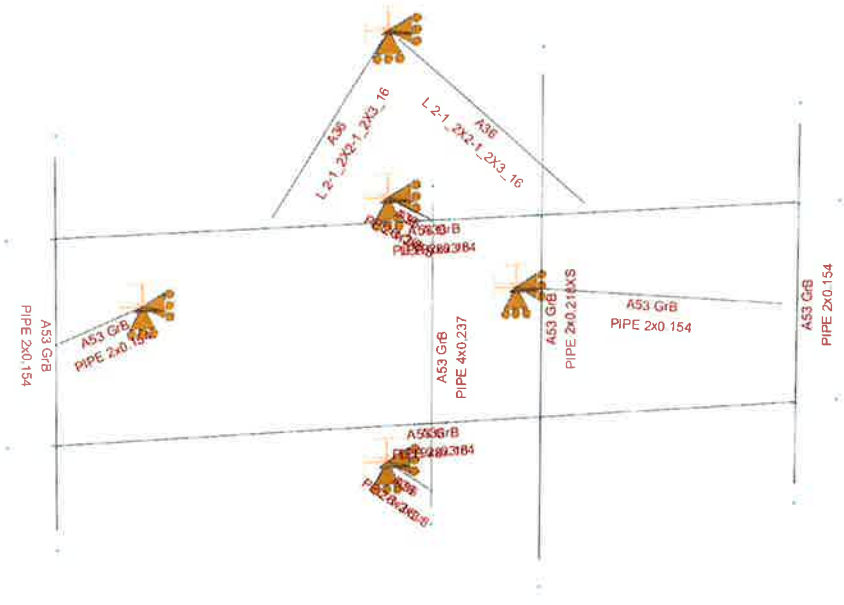
A36
L 2-1_2X2-1_2X3_16
A36
L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 4x0.237
A53 GrB
PIPE 2x0.218XS
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2x0.154
Y
X
Z

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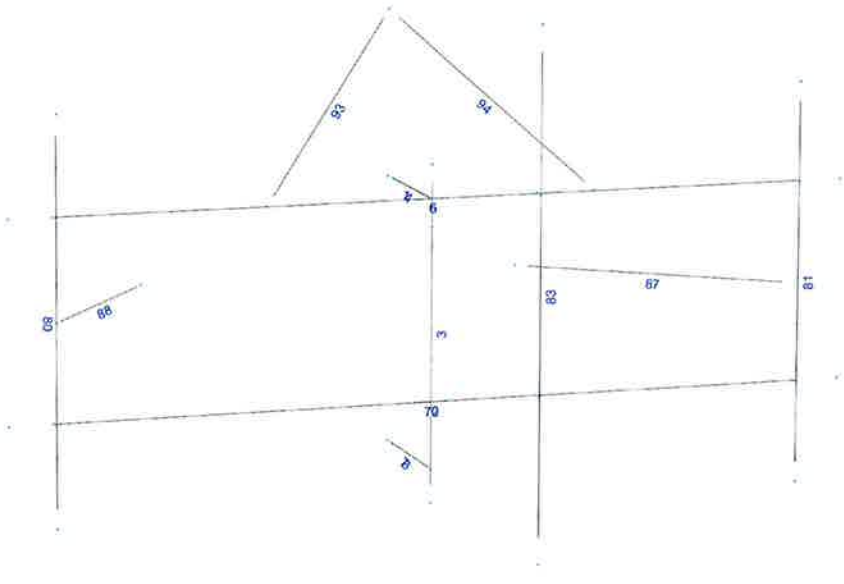

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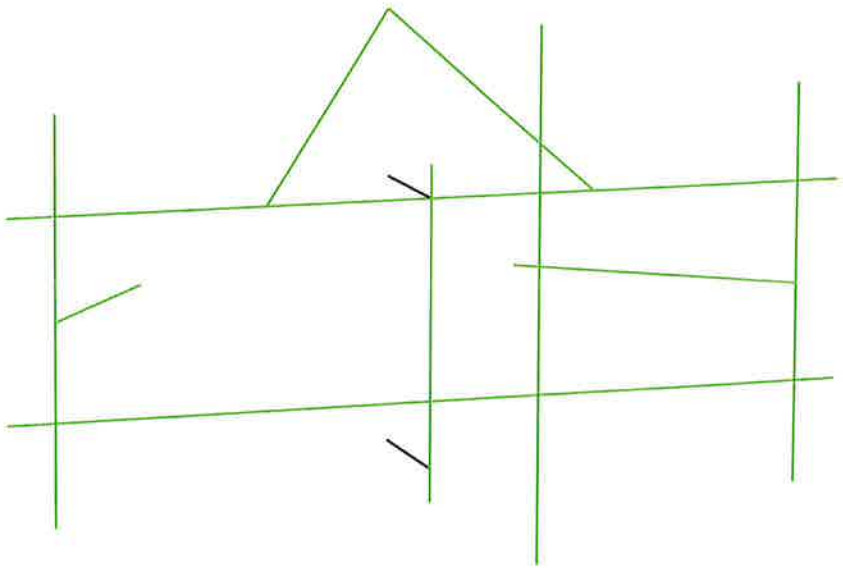
Design status

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



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Steel Code Check

Report: Summary - For all selected load conditions

Load conditions to be included in design :

LC1=1.2DL+1.6Wo
LC2=0.9DL+1.6Wo
LC3=1.2DL+Wi+Di
LC4=1.2DL
LC5=0.9DL

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	L 2-1_2X2-1_2X3_16	**93**	LC1 at 100.00%	0.09	OK	
			LC2 at 100.00%	0.07	OK	
			LC3 at 0.00%	**0.23**	**OK**	Eq. H2-1
			LC4 at 0.00%	0.08	OK	
			LC5 at 0.00%	0.06	OK	
		94	LC1 at 0.00%	0.26	OK	Eq. H2-1
			LC2 at 0.00%	0.24	OK	
			LC3 at 100.00%	**0.34**	**OK**	Eq. H2-1
			LC4 at 100.00%	0.10	OK	
			LC5 at 100.00%	0.07	OK	
	LU 9x8x3/8	**5**	LC1 at 50.00%	**0.21**	**OK**	Eq. H3-8
			LC2 at 50.00%	0.20	OK	
			LC3 at 50.00%	0.15	OK	
			LC4 at 50.00%	0.04	OK	
			LC5 at 50.00%	0.03	OK	
		72	LC1 at 100.00%	0.13	OK	
			LC2 at 100.00%	**0.13**	**OK**	Eq. H3-8
			LC3 at 50.00%	0.06	OK	
			LC4 at 50.00%	0.02	OK	
			LC5 at 50.00%	0.02	OK	
	PIPE 2x0.154	**6**	LC1 at 47.92%	0.53	OK	
			LC2 at 47.92%	0.47	OK	
			LC3 at 30.56%	**0.96**	**OK**	Eq. H1-1b
			LC4 at 70.14%	0.31	OK	
			LC5 at 70.14%	0.23	OK	
		70	LC1 at 47.32%	0.35	OK	Eq. H3-6
			LC2 at 47.32%	0.35	OK	Eq. H3-6
			LC3 at 47.32%	**0.38**	**OK**	Eq. H1-1b
			LC4 at 52.68%	0.12	OK	Eq. H1-1b
			LC5 at 52.68%	0.09	OK	
		80	LC1 at 48.44%	0.33	OK	Eq. H1-1b
			LC2 at 48.44%	0.31	OK	
			LC3 at 25.00%	**0.55**	**OK**	Eq. H1-1b
			LC4 at 25.00%	0.19	OK	
			LC5 at 25.00%	0.15	OK	
		81	LC1 at 48.44%	**0.39**	**OK**	Eq. H1-1b

		LC2 at 48.44%	0.37	OK	
		LC3 at 25.00%	0.34	OK	Eq. H1-1b
		LC4 at 25.00%	0.11	OK	
		LC5 at 25.00%	0.08	OK	
	87	LC1 at 100.00%	0.13	OK	
		LC2 at 100.00%	0.10	OK	
		LC3 at 100.00%	**0.40**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.11	OK	
		LC5 at 100.00%	0.08	OK	
	88	LC1 at 100.00%	0.14	OK	
		LC2 at 100.00%	0.11	OK	
		LC3 at 100.00%	**0.40**	**OK**	Eq. H1-1b
		LC4 at 100.00%	0.13	OK	
		LC5 at 100.00%	0.10	OK	
PIPE 2x0.218XS	**83**	LC1 at 68.75%	**0.79**	**OK**	Eq. H1-1b
		LC2 at 68.75%	0.79	OK	
		LC3 at 66.67%	0.16	OK	
		LC4 at 31.25%	0.05	OK	
		LC5 at 31.25%	0.04	OK	
PIPE 4x0.237	**3**	LC1 at 10.00%	0.05	OK	
		LC2 at 10.00%	0.04	OK	
		LC3 at 88.75%	**0.11**	**OK**	Eq. H1-1b
		LC4 at 88.75%	0.03	OK	
		LC5 at 88.75%	0.03	OK	
PL 2-1/2x3/8	**4**	LC1 at 0.00%	0.16	OK	
		LC2 at 0.00%	0.13	OK	
		LC3 at 0.00%	**0.45**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.14	OK	
		LC5 at 0.00%	0.10	OK	
	8	LC1 at 0.00%	0.14	OK	
		LC2 at 0.00%	0.11	OK	
		LC3 at 0.00%	**0.40**	**OK**	Eq. H1-1b
		LC4 at 0.00%	0.12	OK	
		LC5 at 0.00%	0.09	OK	
PL 6x3/8	**1**	LC1 at 100.00%	0.30	With warnings	
		LC2 at 12.50%	0.18	With warnings	
		LC3 at 96.88%	**0.56**	**With warnings**	Eq. H1-1a
		LC4 at 12.50%	0.15	With warnings	
		LC5 at 12.50%	0.11	With warnings	
	7	LC1 at 0.00%	0.17	With warnings	
		LC2 at 0.00%	0.15	With warnings	
		LC3 at 12.50%	**0.45**	**With warnings**	Eq. H1-1a
		LC4 at 12.50%	0.12	With warnings	
		LC5 at 12.50%	0.09	With warnings	

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Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	0.00	-4.00	0.00	0
3	0.00	-4.00	2.1875	0
4	0.00	0.00	2.1875	0
5	0.00	-0.42	2.1875	0
7	0.00	0.50	2.1875	0
8	0.00	-4.50	2.1875	0
9	0.00	-4.00	0.25	0
10	0.00	0.00	0.25	0
11	-0.25	0.00	2.1875	0
12	0.25	0.00	2.1875	0
13	6.33	0.00	2.1875	0
14	-6.33	0.00	2.1875	0
19	5.62	0.00	2.1875	0
21	-5.66	0.00	2.1875	0
23	1.62	0.00	2.1875	0
25	5.62	0.00	2.3575	0
27	1.62	0.00	2.3575	0
30	-5.66	0.00	2.3575	0
77	-5.66	-1.50	2.3575	0
79	-6.33	-3.00	2.1875	0

80	-5.66	-3.00	2.1875	0
81	-5.66	-3.00	2.3575	0
88	1.62	-3.00	2.1875	0
89	1.62	-3.00	2.3575	0
90	-0.25	-3.00	2.1875	0
91	0.25	-3.00	2.1875	0
92	6.33	-3.00	2.1875	0
93	5.62	-3.00	2.1875	0
94	5.62	-3.00	2.3575	0
100	-5.66	1.50	2.3575	0
101	5.62	1.50	2.3575	0
102	-5.66	-4.50	2.3575	0
103	5.62	-4.50	2.3575	0
106	1.62	2.50	2.3575	0
107	1.62	-5.50	2.3575	0
115	5.62	-1.50	2.3575	0
116	3.00	-2.00	-3.00	0
117	-3.00	-2.00	-3.00	0
128	2.50	0.00	2.1875	0
129	-2.50	0.00	2.1875	0
130	0.00	2.50	0.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	1	1	1
2	1	1	1	1	1	1
116	1	1	1	1	1	1
117	1	1	1	1	1	1
130	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	1	4		PL 6x3/8	A36	0.00	0.00	0.00
3	7	8		PIPE 4x0.237	A53 GrB	0.00	0.00	0.00
4	4	10		PL 2-1/2x3/8	A36	0.00	0.00	0.00
5	11	12		LU 9x8x3/8	A36	0.00	0.00	0.00
6	13	14		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	2	3		PL 6x3/8	A36	0.00	0.00	0.00
8	3	9		PL 2-1/2x3/8	A36	0.00	0.00	0.00
70	92	79		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
72	90	91		LU 9x8x3/8	A36	0.00	0.00	0.00
80	100	102		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
81	101	103		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
83	106	107		PIPE 2x0.218XS	A53 GrB	0.00	0.00	0.00
87	115	116		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
88	77	117		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
93	129	130		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
94	128	130		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	90.00	0	0.00	0.00	0.00
3	45.00	0	0.00	0.00	0.00
5	90.00	0	0.00	0.00	0.00
7	90.00	0	0.00	0.00	0.00
72	90.00	0	0.00	0.00	0.00
80	45.00	0	0.00	0.00	0.00
83	45.00	0	0.00	0.00	0.00
93	180.00	0	0.00	0.00	0.00
94	90.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
4	0.00	-1.25	0.00	0.00	-1.25	0.00
5	0.00	0.00	4.50	0.00	0.00	4.50
6	0.00	3.00	7.00	0.00	3.00	7.00
8	0.00	-1.25	0.00	0.00	-1.25	0.00
70	0.00	3.00	7.00	0.00	3.00	7.00
72	0.00	0.00	4.50	0.00	0.00	4.50
80	0.00	3.00	7.00	0.00	3.00	7.00
81	0.00	3.00	7.00	0.00	3.00	7.00
83	0.00	3.00	7.00	0.00	3.00	7.00
87	0.00	2.00	7.00	0.00	2.00	7.00
88	0.00	2.00	7.00	0.00	2.00	7.00
93	0.00	3.00	7.00	0.00	3.00	7.00
94	0.00	3.00	7.00	0.00	3.00	7.00

SITE NAME: NEXTEL GLASTONBURY

2577 MAIN STREET
GLASTONBURY, CT 06033

SITE NUMBER: CT11786D

PROJECT: T-MOBILE L600

CONFIGURATION: 67D92DB

T-MOBILE TECHNICIAN SITE SAFETY NOTES

LOCATION	SPECIAL RESTRICTIONS
ANTENNA/TMA	
SECTOR A:	ACCESS NOT PERMITTED
SECTOR B:	ACCESS NOT PERMITTED
SECTOR C:	ACCESS NOT PERMITTED
GPS/LMU:	UNRESTRICTED*
(*CAUTION: OSHA-APPROVED PORTABLE 8' STEP-LADDER REQUIRED)	
RADIO CABINETS:	UNRESTRICTED
PPC DISCONNECT:	UNRESTRICTED
MAIN CIRCUIT D/C:	UNRESTRICTED
NIU/T DEMARC:	UNRESTRICTED
OTHER/SPECIAL:	NONE

GENERAL NOTES

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

SPECIAL CONSTRUCTION NOTES

1. TOWER OWNER SHALL PROVIDE GLOBAL STRUCTURAL STABILITY ANALYSIS OF EXISTING ANTENNA SUPPORT STRUCTURE. GENERAL CONTRACTOR SCOPE OF WORK SHALL INCLUDE TO FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS, RE-BUNDLING OF COAXIAL CABLES OR OTHER SPECIAL MODIFICATIONS AS OUTLINED THEREIN.
2. GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.
3. PROTERRA DESIGN GROUP ASSUMES THAT THE SELF SUPPORT TOWER IS PROPERLY CONSTRUCTED AND MAINTAINED. ALL STRUCTURAL MEMBERS AND THEIR CONNECTION ARE ASSUMED TO BE IN GOOD CONDITION AND ARE FREE FROM DEFECTS WITH NO DETERIORATION TO ITS MEMBER CAPACITIES.
4. ANY REQUIRED ANTENNA MOUNT WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE ANTENNA MOUNT STRUCTURAL ANALYSIS, (MSA) PREPARED BY OTHERS.

PROJECT INFORMATION

SCOPE OF WORK:	UNMANNED TELECOMMUNICATIONS FACILITY T-MOBILE EQUIPMENT MODERNIZATION
ZONING JURISDICTION:	SPECIAL ZONING NOTE (ELIGIBLE FACILITY REQUEST): BASED ON INFORMATION PROVIDED BY T-MOBILE REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE MIDDLE CLASS TAX RELIEF AND JOB CREATION ACT OF 2012, 47 USC 1455(A), SECTION 6409(A), AND IS SUBJECT TO AN ELIGIBLE FACILITY REQUEST, EXPEDITED REVIEW AND LIMITED/PARTIAL ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW OR ADMINISTRATIVE REVIEW).
SITE ADDRESS:	2577 MAIN STREET GLASTONBURY, CT 06033
LATITUDE:	41° 42' 51.80" N (41.7144°) (FROM SBA RECORD)
LONGITUDE:	72° 36' 46.90" W (-72.6130°) (FROM SBA RECORD)
JURISDICTION:	TOWN OF GLASTONBURY / CT SITING COUNCIL
BUILDING CODE:	2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS (IBC 2012 BASED)
ELECTRICAL CODE:	2014 NATIONAL ELECTRICAL CODE AND AMENDMENTS
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
TOWER OWNER:	SBA 2012 TC ASSETS, LLC
SBA SITE ID:	CT46126-A
SBA SITE NAME:	GLASTONBURY-MAIN ST.
SBA REGIONAL SITE MANAGER:	STEPHEN ROTH (860) 539-4920

APPROVALS

PROJECT MANAGER	DATE
CONSTRUCTION	DATE
RF ENGINEERING	DATE
ZONING / SITE ACQ.	DATE
OPERATIONS	DATE
TOWER OWNER	DATE

DIG SAFE SYSTEM
(MA, ME, NH, RI, VT):
1-888-344-7233

CALL BEFORE YOU DIG
(CT): 1-800-922-4455

UNDERGROUND SERVICE ALERT

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
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A-3	EXISTING & PROPOSED ANTENNA PLAN	0
A-4	DETAILS	0
A-5	DETAILS	0
E-1	ONE-LINE DIAGRAM & GROUNDING DETAILS	0

T-MOBILE NORTHEAST LLC
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4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918

STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 8/22/18 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	08/22/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CT11786D
SITE NAME:
NEXTEL GLASTONBURY
SITE ADDRESS:
2577 MAIN STREET
GLASTONBURY, CT 06033

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER SURCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS 2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH 6 AWS COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

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

   CONTRACTOR – SBA COMMUNICATIONS CORP.
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – T-MOBILE
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CUR\BS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.
14. ANY NEW CONCRETE NEEDED FOR CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (FY = 36 KSI) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (FY = 35 KSI). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCHUP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH UMTS SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF T-MOBILE SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. APPLICABLE BUILDING CODES:
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), STEEL CONSTRUCTION MANUAL, 14TH EDITION;

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

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

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

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	RAN	RADIO ACCESS NETWORK
AWG	AMERICAN WIRE GAUGE	G.C.	GENERAL CONTRACTOR	REF	REFERENCE
BTCW	BARE TINNED SOLID COPPER WIRE	GRC	GALVANIZED RIGID CONDUIT	REQ	REQUIRED
		MSA	MOUNT STRUCTURAL ANALYSIS	RF	RADIO FREQUENCY
BGR	BURIED GROUND RING	MGB	MASTER GROUND BAR	TBD	TO BE DETERMINED
BTS	BASE TRANSCEIVER STATION	MIN	MINIMUM	TBR	TO BE REMOVED
EXISTING	EXISTING OR (E)	PROPOSED	NEW OR (P)	TBRR	TO BE REMOVED AND REPLACED
EGB	EQUIPMENT GROUND BAR	N.T.S.	NOT TO SCALE	TYP	TYPICAL
EGR	EQUIPMENT GROUND RING	RAD	RADIATION CENTERLINE (ANTENNA)	VIF	VERIFY IN FIELD

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER
8/22/18

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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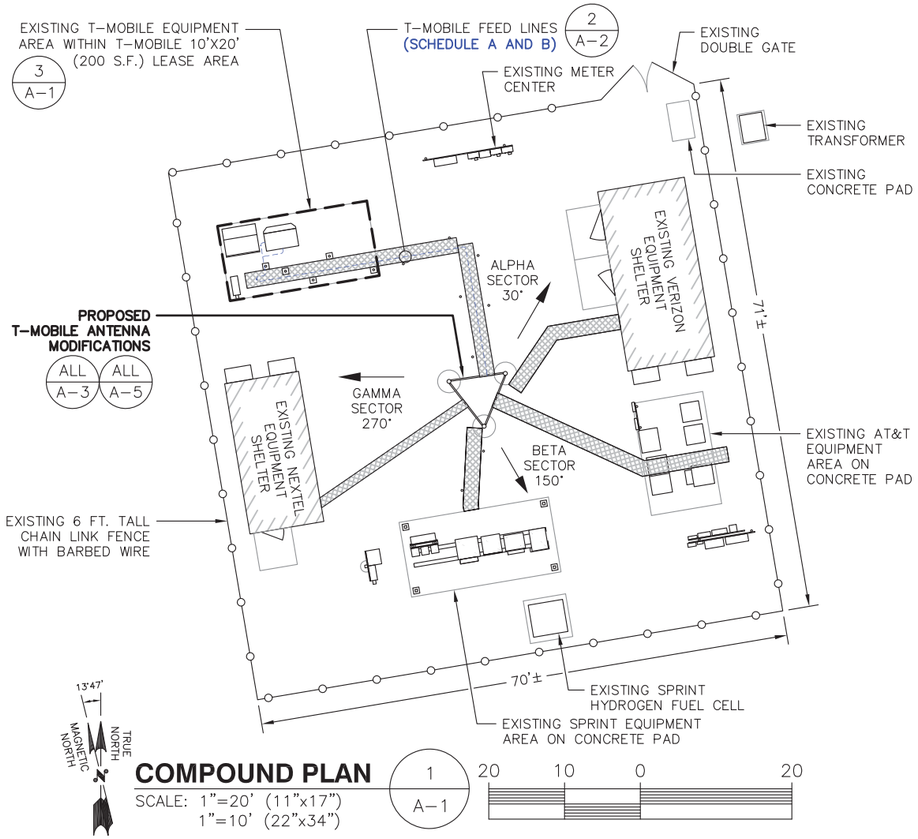
SITE NUMBER:
CT11786D
SITE NAME:
NEXTEL GLASTONBURY
SITE ADDRESS:
2577 MAIN STREET
GLASTONBURY, CT 06033

SHEET TITLE
GENERAL NOTES

SHEET NUMBER
GN-1



COMPOUND PLAN

SCALE: 1"=20' (11"x17")
1"=10' (22"x34")

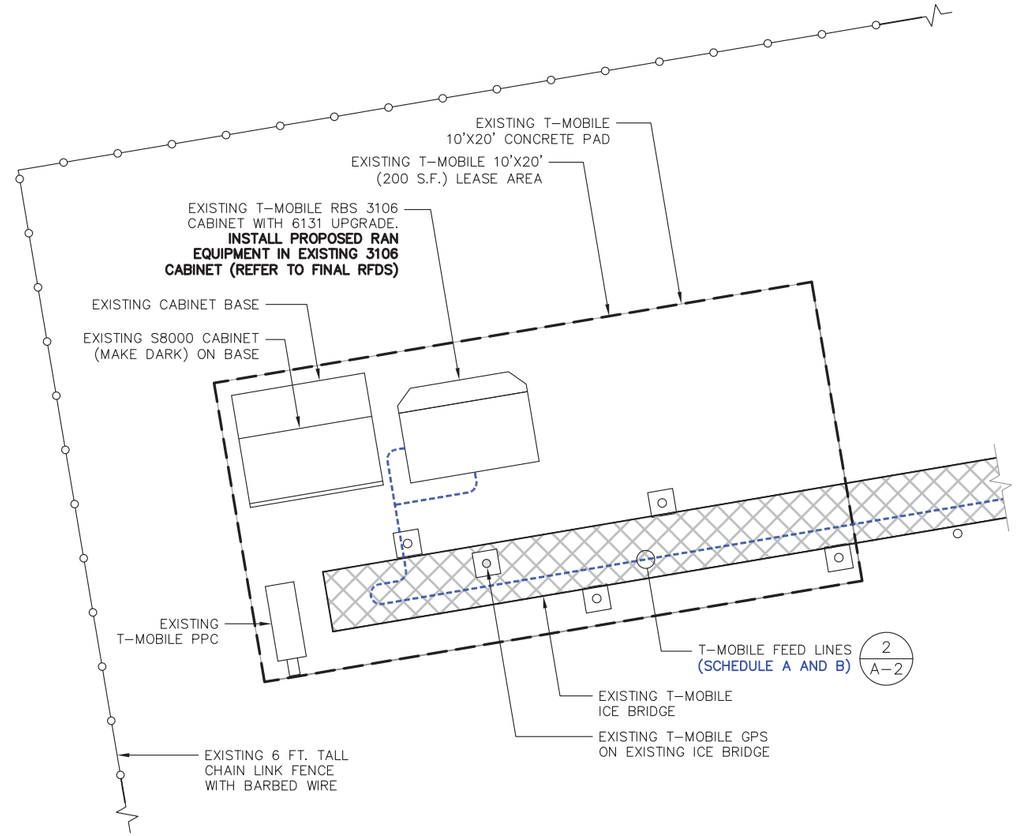
1 A–1

IMAGE SOURCE: PROTERRA 07/13/2018

EQUIPMENT PHOTO DETAIL

SCALE: N.T.S.

2 A–1



GROUND EQUIPMENT PLAN

SCALE: 1"=5' (11"x17")
1"=2.5' (22"x34")

3 A–1

T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
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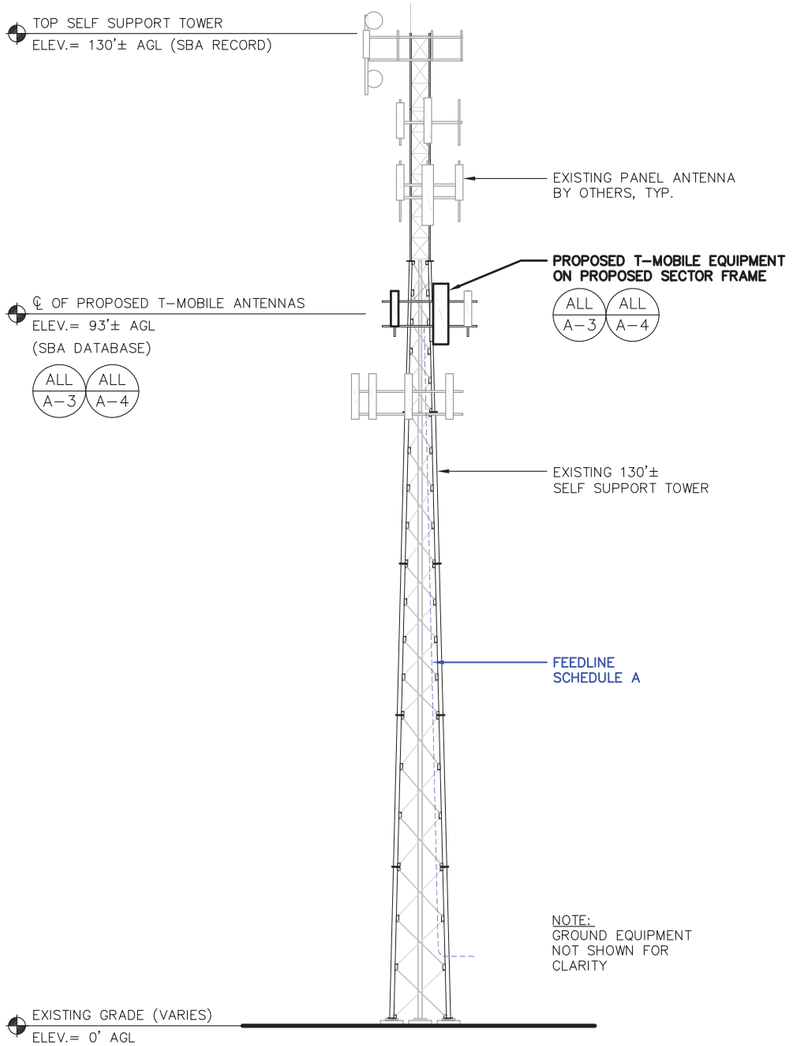
GLASTONBURY, CT 06033

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A–1



ELEVATION DETAIL

1 / A-2

SCALE: 1"=20' (11"x17")
1"=10' (22"x34")

20 10 0 20

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO REMAIN: (11) 1⅝" COAX AND (1) HYBRID TO 93' RAD; EXISTING TO BE REMOVED: (1) 1⅝" COAX	UP SELF SUPPORT TOWER TO RAD
B	PROPOSED: (1) 6 X 12 HYBRID TO 93' RAD;	UP SELF SUPPORT TOWER TO RAD

NOTE: EXISTING T-MOBILE EQUIPMENT FEEDLINE INVENTORY BASED ON OBSERVED FIELD CONDITIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER

IMAGE SOURCE: PROTERRA 07/13/2018

FEEDLINE PHOTO DETAIL AT TOWER BASE

2 / A-2

SCALE: N.T.S.

IMAGE SOURCE: PROTERRA 07/13/2018

PARTIAL ELEVATION PHOTO DETAIL

3 / A-2

SCALE: N.T.S.

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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER
8/22/18

CHECKED BY: JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

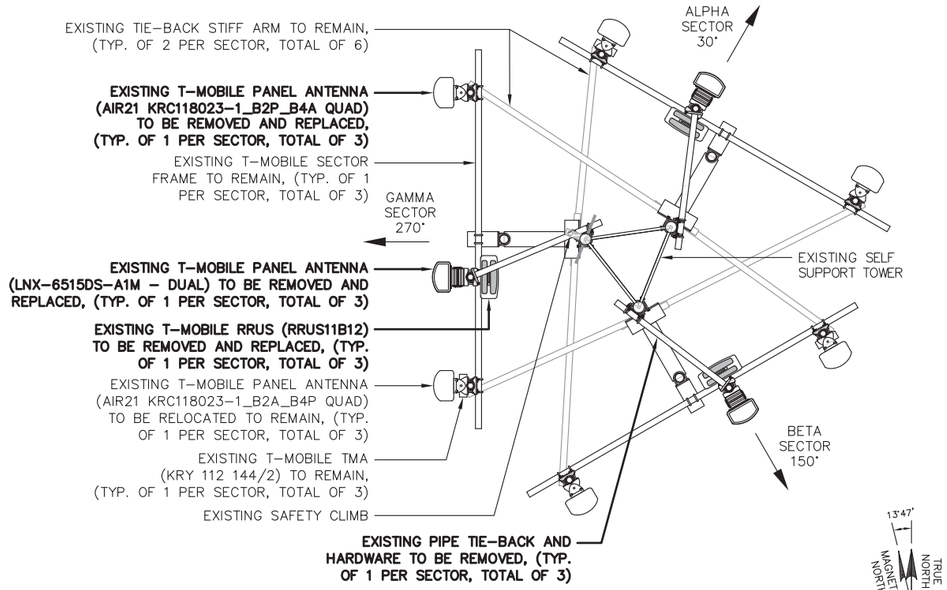
REV.	DATE	DESCRIPTION	BY
0	08/22/18	ISSUED FOR CONSTRUCTION	JEB

SITE NUMBER:
CT11786D
SITE NAME:
NEXTEL GLASTONBURY

SITE ADDRESS:
2577 MAIN STREET
GLASTONBURY, CT 06033

SHEET TITLE
ELEVATIONS

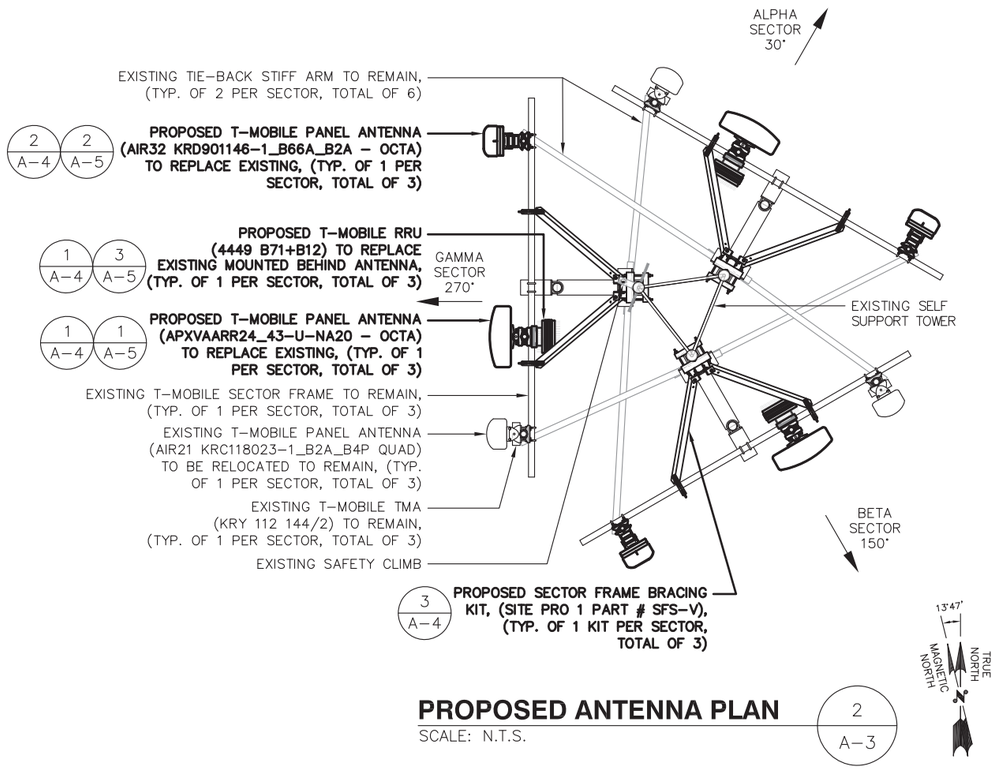
SHEET NUMBER
A-2



EXISTING ANTENNA PLAN

SCALE: N.T.S.

1 / A-3



PROPOSED ANTENNA PLAN

SCALE: N.T.S.

2 / A-3

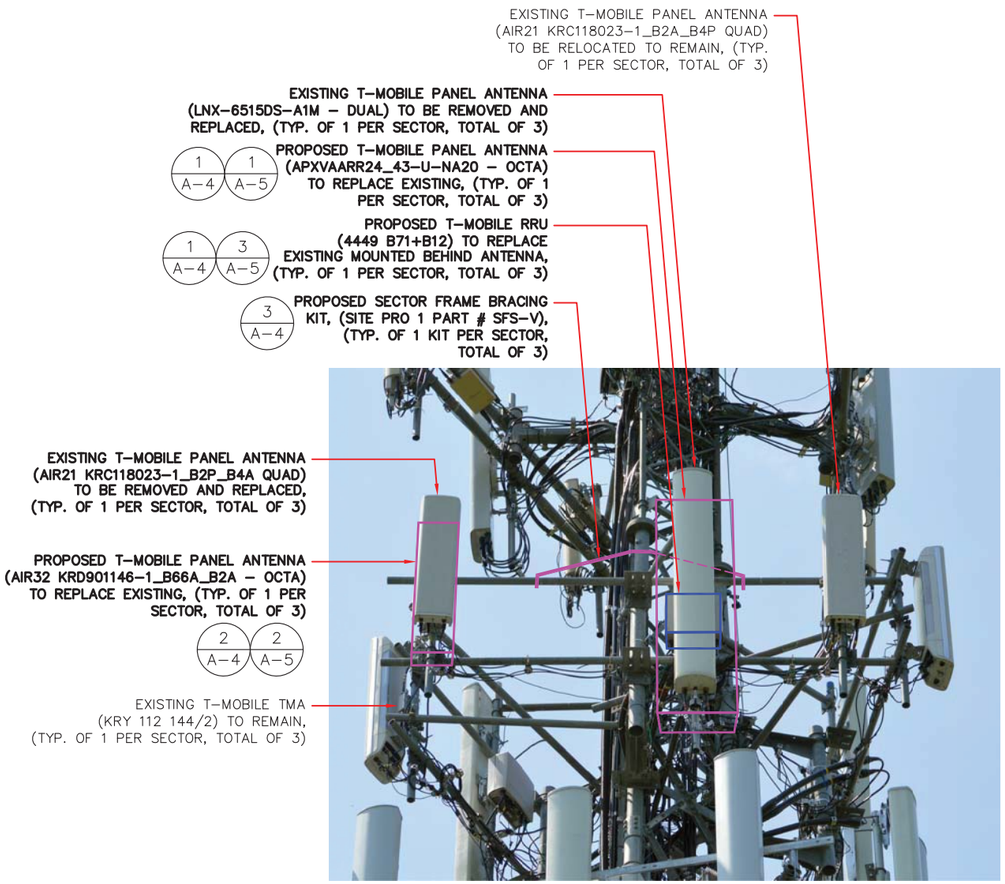


IMAGE SOURCE: PROTERRA 07/13/2018
NOTE: ONLY SECTOR SHOWN FOR CLARITY

ANTENNA PHOTO DETAIL

SCALE: N.T.S.

3 / A-3

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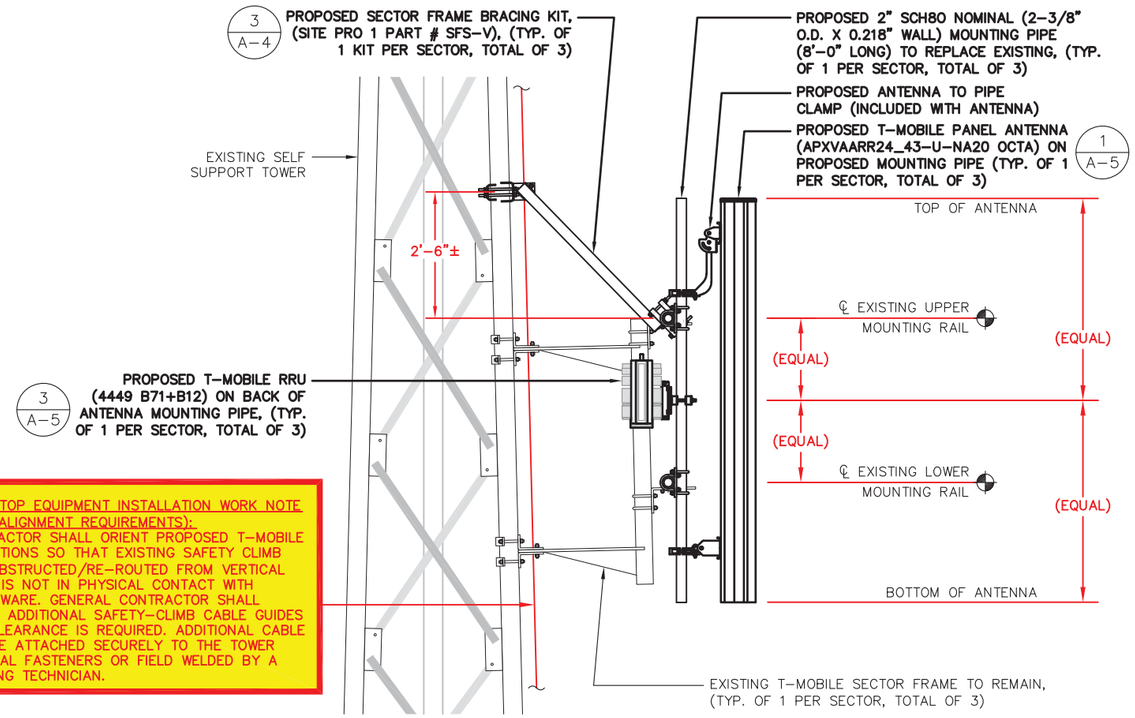
SHEET TITLE
EXISTING & PROPOSED ANTENNA PLAN

SHEET NUMBER
A-3

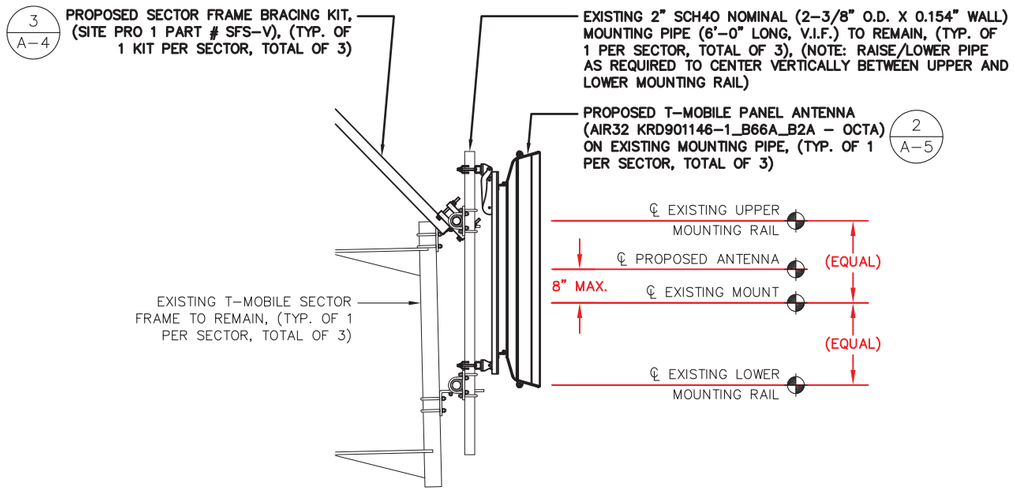


SPECIAL TOWER TOP EQUIPMENT INSTALLATION WORK NOTE (SAFETY-CLIMB ALIGNMENT REQUIREMENTS):
GENERAL CONTRACTOR SHALL ORIENT PROPOSED T-MOBILE MOUNT MODIFICATIONS SO THAT EXISTING SAFETY CLIMB CABLE IS NOT OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND IS NOT IN PHYSICAL CONTACT WITH PROPOSED HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB CABLE GUIDES IF ADDITIONAL CLEARANCE IS REQUIRED. ADDITIONAL CABLE GUIDES SHALL BE ATTACHED SECURELY TO THE TOWER USING MECHANICAL FASTENERS OR FIELD WELDED BY A CERTIFIED WELDING TECHNICIAN.

PROPOSED ANTENNA MOUNTING DETAIL (APXVAARR24_43-U-NA20 - OCTA)

1 / A-4

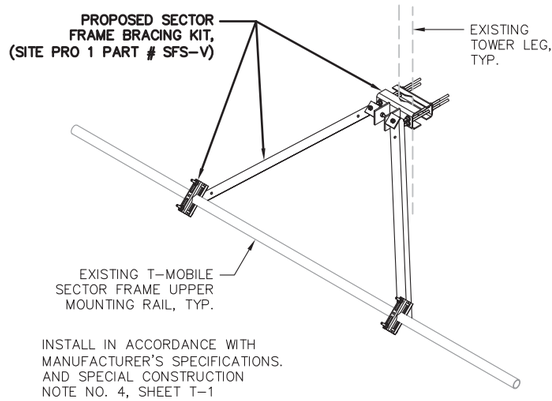
SCALE: N.T.S.



PROPOSED ANTENNA MOUNTING DETAIL (AIR32 KRD901146-1_B66A_B2A - OCTA)

2 / A-4

SCALE: N.T.S.



INSTALL IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS. AND SPECIAL CONSTRUCTION NOTE NO. 4, SHEET T-1

SECTOR FRAME BRACING KIT DETAIL (SITE PRO 1 PART # SFS-V)

3 / A-4

SCALE: N.T.S.

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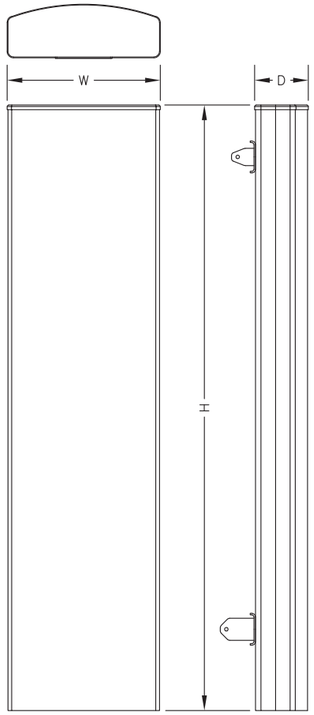
SHEET TITLE
DETAILS

SHEET NUMBER
A-4



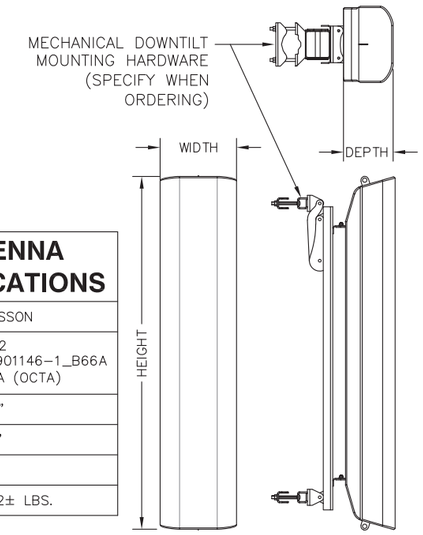
APXVAARR24_43-U-NA20 (OCTA) ANTENNA SPECIFICATIONS

MANUF.	RFS
MODEL #	APXVAARR24_43-U-NA20 (OCTA)
HEIGHT	95.9"
WIDTH	24"
DEPTH	8.7"
WEIGHT	128± LBS.

ANTENNA DETAIL (APXVAARR24_43-U-NA20 OCTA)

1 / A-5

SCALE: N.T.S.



AIR ANTENNA SPECIFICATIONS

MANUF.	ERICSSON
MODEL #	AIR32 KRD901146-1_B66A _B2A (OCTA)
HEIGHT	56.6"
WIDTH	12.9"
DEPTH	8.7"
WEIGHT	132.2± LBS.

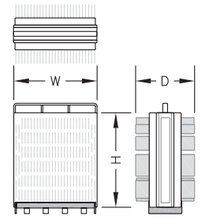
ANTENNA DETAIL (AIR32 KRD901146-1_B66A_B2A OCTA)

2 / A-5

SCALE: N.T.S.

RRU SPECIFICATIONS

MANUF.	ERICSSON
MODEL #	4449 B71+B12
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	9.2"
WEIGHT	74± LBS.



REMOTE RADIO UNIT (RRU) DETAIL (4449 B71+B12)

3 / A-5

SCALE: N.T.S.

ANTENNA CONFIGURATION

SECTOR	BAND	ANTENNA MODEL	ANTENNA RAD (SBA DATABASE)	AZIMUTH	RADIOS	CABLE FEED LINES
ALPHA	G1900 U2100	ERICSSON – AIR21 KRC118023-1-B2A_B4P (QUAD)	93'±	30°	EXISTING (1) KRY 112 144/2	EXISTING (2) 1-5/8" COAX
	L600 L700	RFS – APXVAARR24_43-U-NA20 (OCTA)	93'±	30°	PROPOSED (1) 4449 B71+B12 RRU,	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
	L1900 L2100	ERICSSON – AIR32 KRD901146-1_B66A_B2A (OCTA)	93'±	30°	–	EXISTING (1) SHARED 6X12 HYBRID CABLE TRUNK
BETA	G1900 U2100	ERICSSON – AIR21 KRC118023-1-B2A_B4P (QUAD)	93'±	150°	EXISTING (1) KRY 112 144/2	EXISTING (2) 1-5/8" COAX
	L600 L700	RFS – APXVAARR24_43-U-NA20 (OCTA)	93'±	150°	PROPOSED (1) 4449 B71+B12 RRU,	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
	L1900 L2100	ERICSSON – AIR32 KRD901146-1_B66A_B2A (OCTA)	93'±	150°	–	EXISTING (1) SHARED 6X12 HYBRID CABLE TRUNK
GAMMA	G1900 U2100	ERICSSON – AIR21 KRC118023-1-B2A_B4P (QUAD)	93'±	270°	EXISTING (1) KRY 112 144/2	EXISTING (2) 1-5/8" COAX
	L600 L700	RFS – APXVAARR24_43-U-NA20 (OCTA)	93'±	270°	PROPOSED (1) 4449 B71+B12 RRU,	PROPOSED (1) SHARED 6X12 HYBRID CABLE TRUNK
	L1900 L2100	ERICSSON – AIR32 KRD901146-1_B66A_B2A (OCTA)	93'±	270°	–	EXISTING (1) SHARED 6X12 HYBRID CABLE TRUNK

REFER TO FINAL RFDS FOR FINAL ANTENNA SETTINGS, CONFIGURATION, QUANTITIES AND RAN WIRING.

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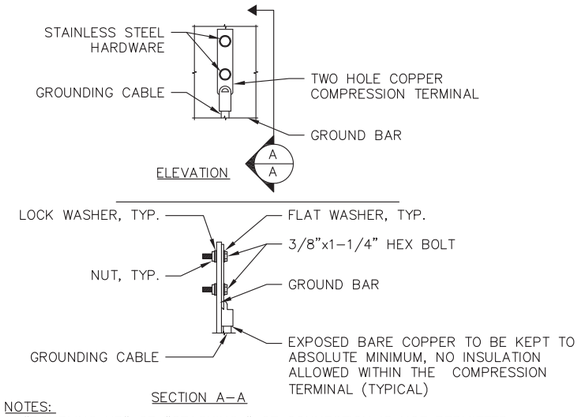
SHEET TITLE
DETAILS

SHEET NUMBER
A-5

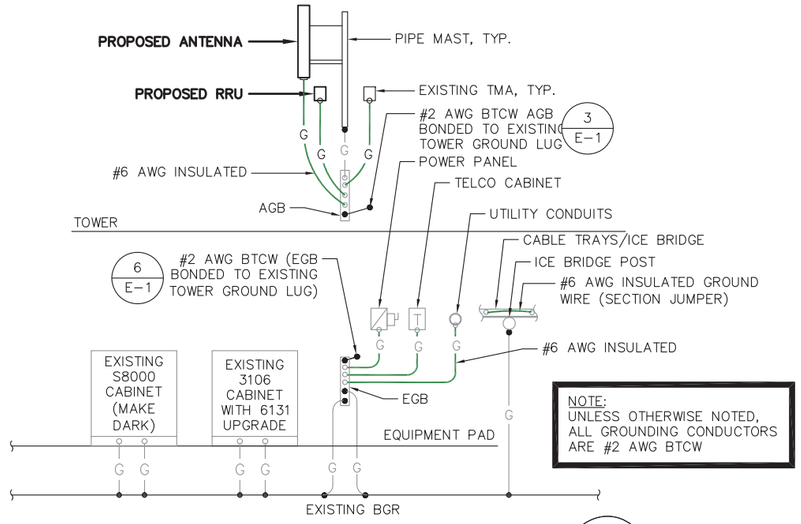


NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB.

TYPICAL GROUND BAR CONNECTION DETAIL

1 / E-1

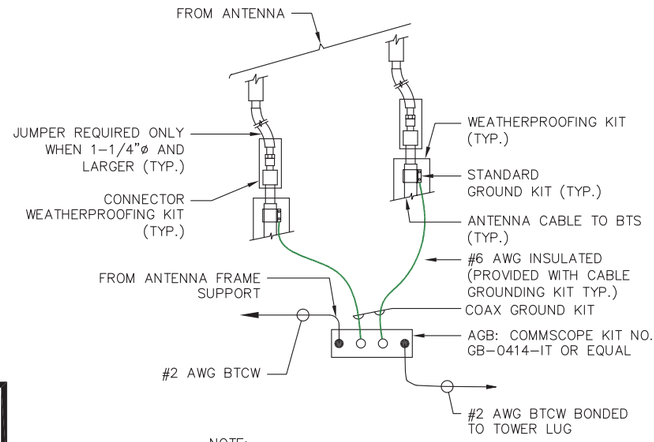
SCALE: N.T.S.



TYPICAL GROUNDING RISER DIAGRAM

2 / E-1

SCALE: N.T.S.

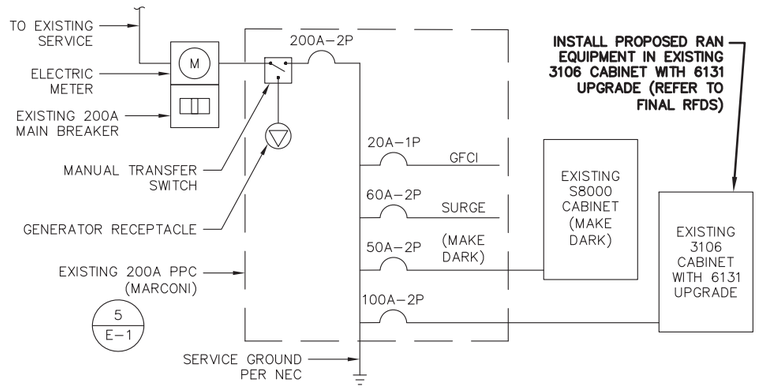


NOTE:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB.

TOWER TOP CABLE GROUNDING DETAIL

3 / E-1

SCALE: N.T.S.



ONE LINE POWER SCHEMATIC

4 / E-1

SCALE: N.T.S.

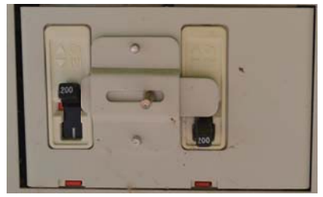


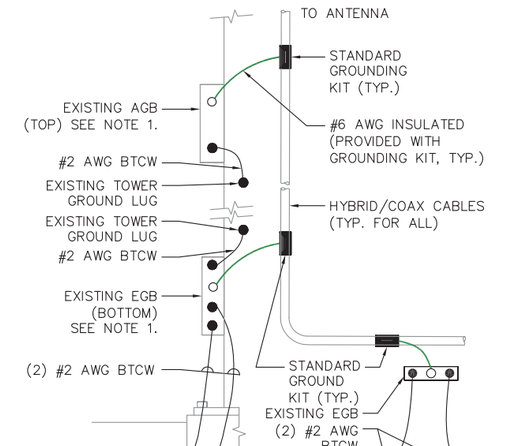
IMAGE SOURCE: PROTERRA 07/13/2018

IMAGE SOURCE: PROTERRA 07/13/2018

PHOTO DETAIL: PPC PANEL

5 / E-1

SCALE: N.T.S.



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

TOWER BOTTOM CABLE GROUNDING DETAIL

6 / E-1

SCALE: N.T.S.

ELECTRICAL LEGEND

A	AMPERE
V	VOLT
KWH	KILOWATT - HOUR
C	CONDUIT
GRC	GALVANIZED RIGID CONDUIT
BTCW	BARE TINNED (SOLID) COPPER WIRE (#2 AWG, UNLESS NOTES OTHERWISE)
G	GROUND
MGB	GROUND
	MASTER GROUND BAR ○ MECHANICAL CONNECTION ● CADWELD CONNECTION
AGB/EGB	EQUIPMENT GROUND BAR/ANTENNA GROUND BAR
G	GROUND COPPER WIRE, SIZE AS NOTED
	EXPOSED WIRING
	INSULATED GROUNDING CONDUCTOR (#6 AWG STRANDED, UNLESS NOTED OTHERWISE)
	5/8"x10' COPPER CLAD STAINLESS STEEL GROUND ROD
	● EXOTHERMIC (CAD WELD) OR ○ MECHANICAL (COMPRESSION TYPE) CONNECTION
PPC	POWER PROTECTION CABINET
	OMNI-DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALL

CONTRACTOR NOTE:
G.C. TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

ELECTRICAL & GROUNDING NOTES:

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) 2014 AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION AS REQUIRED BY NEC.
8. RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE POWER PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON DRAWING A-1. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUND COAXIAL CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSULATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE DRAWING.
14. ALL GROUND CONNECTIONS TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PRODUCERS (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN BTS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LYGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTIONS.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20. BOND ANTENNA EGB'S AND MGB TO WATER MAIN/GROUND RING.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.

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SHEET TITLE
ONE-LINE DIAGRAM & GROUNDING DETAILS

SHEET NUMBER
E-1