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

July 12, 2017

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
Sprint #: CT43XC822_2.5

Dear Ms. Bachman:

Sprint currently maintains antennas at the 120, 124 and 128-foot levels 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. Sprint now intends to replace (1) existing cell antenna with (1) newer technology cell antenna at the 120-foot level of the tower. Sprint's proposed full scope of work is as follows:

Remove: None

Remove and Replace:

- Swap (1) Powerwave P40-16-XLPP-RR-A panel antenna with (1) APXVSPP18-C-A20 panel antenna @ 120'

Install: None

Existing Equipment to Remain (Including entitlements):

Sprint-Clearwire / 128'
- (3) TMAs
- (2) Argus LLPX310R panel antennas
- (1) Kathrein 840 10054 panel antennas
- (1) Motorola TIMING 2000
- (3) T-Frames
- (6) 5/16" lines
- (4) ½" lines

Sprint-Clearwire / 124'

- (3) Andrew VHLP 2.5 Dish (at 124')

Sprint-Nextel / 120'

- (3) Alcatel Lucent TD-RRH8x20-25 RRUs
- (3) Rfs Celwave APXVTM14-C-120 panel antennas
- (3) ALU 1900 4x45 65 MHz RRUs
- (4) RFS ACU-A20-N RETs
- (3) ALU 800 MHz 2x50W RRUs
- (1) Powerwave P40-16-XLPP-RR-A panel antennas
- (2) RFS APXVSPP18-C-A20 panel antennas
- (4) 1-1/4" fiber

Sprint-Nextel / 118.5'

- (3) T-Arms
- (3) ALU 800 MHz Filters

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, Sprint 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

SPRINT Site Inventory and Power Data by Antenna

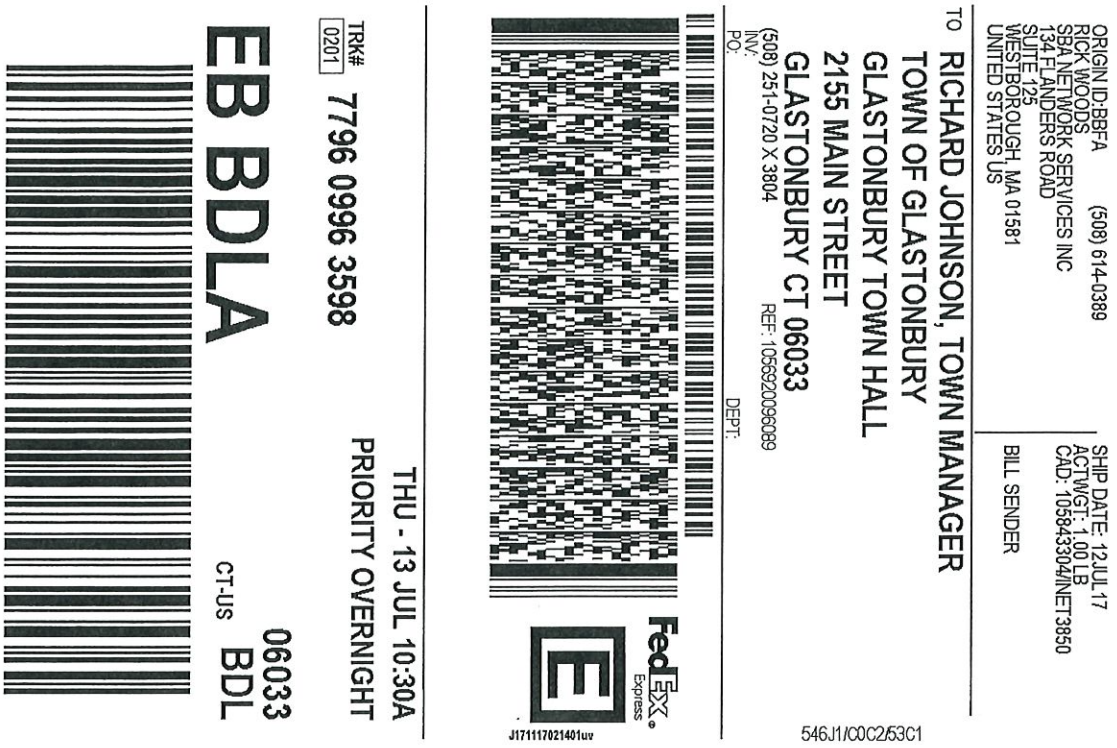
Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	8,315.47	ERP (W):	8,315.47	ERP (W):	8,315.47
Antenna A1 MPE%	**2.58 %**	Antenna B1 MPE%	**2.58 %**	Antenna C1 MPE%	**2.58 %**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	**1.29 %**	Antenna B2 MPE%	**1.29 %**	Antenna C2 MPE%	**1.29 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.87 %**
T-Mobile	5.32 %
MetroPCS	1.38 %
Clearwire	0.13 %
Nextel	0.38 %
AT&T	4.54 %
Verizon Wireless	12.92 %
Site Total MPE %:	**28.54 %**

SPRINT Sector A Total:	3.87 %
SPRINT Sector B Total:	3.87 %
SPRINT Sector C Total:	3.87 %
Site Total:	28.54 %

SPRINT Max Values Per Sector:

SPRINT _ Max Values per Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	2	656.33	120	3.63	850 MHz	567	0.64%
Sprint 1900 MHz (PCS) CDMA	2	1,167.14	120	6.46	1900 MHz (PCS)	1000	0.65%
Sprint 1900 MHz (PCS) LTE	2	2,334.27	120	12.91	1900 MHz (PCS)	1000	1.29%
Sprint 2500 MHz (BRS) LTE	2	2,334.27	120	12.91	2500 MHz (BRS)	1000	1.29%
						Total:	**3.87%**



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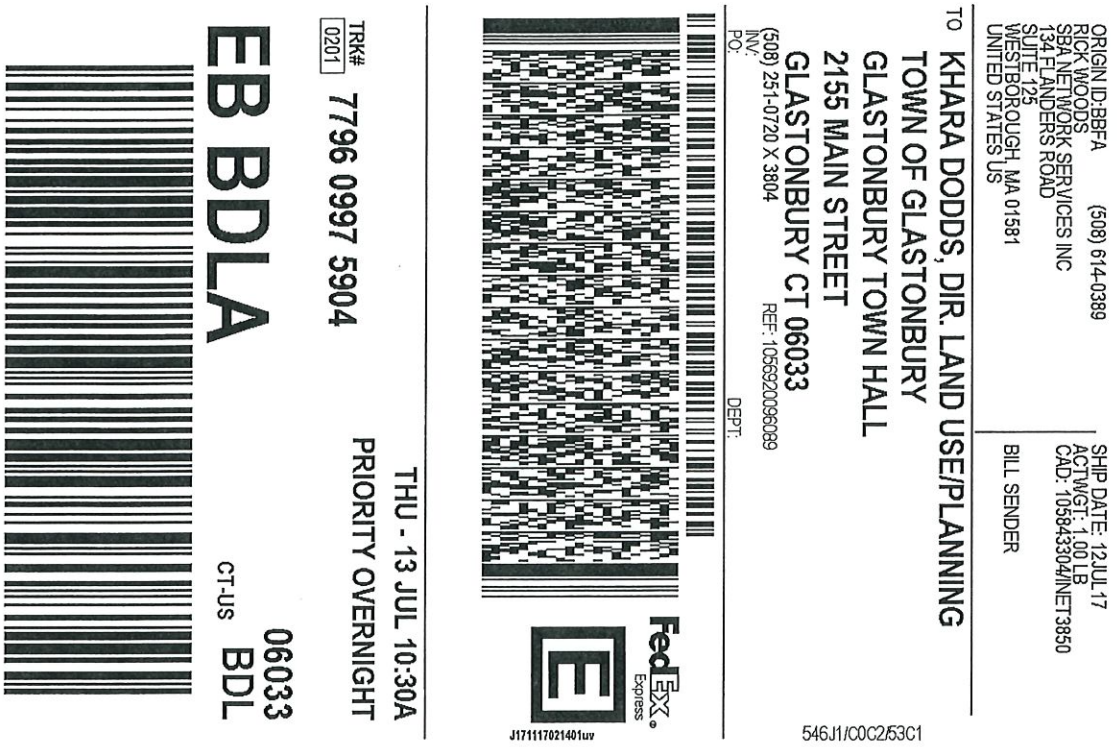
Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions 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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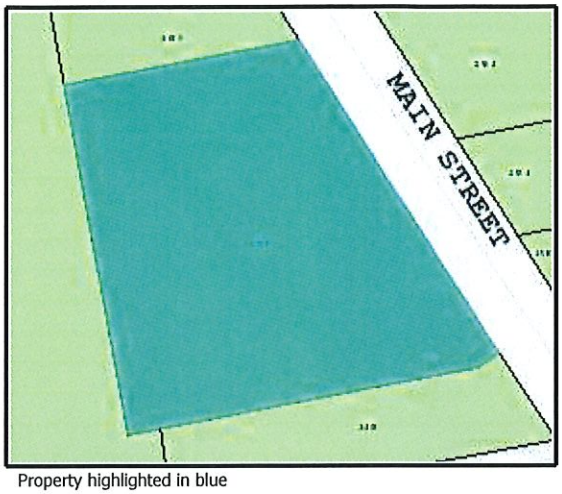
Town of Glastonbury GIS Parcel Report

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

Owner of Record

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

Account Number: 41402577
Property Address: 2577 MAIN ST



Property highlighted in blue

Parcel Information

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

Valuation Summary

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

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

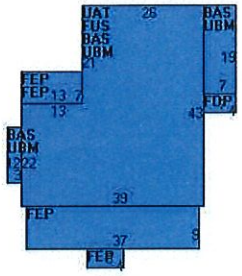
Town of Glastonbury GIS Parcel Report

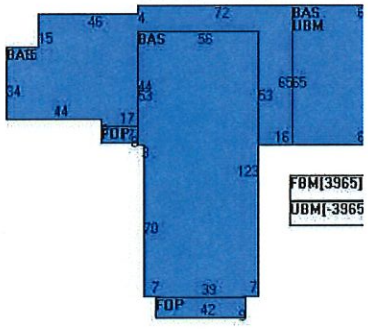
Report Generated 8/16/2016 12:04:03 PM

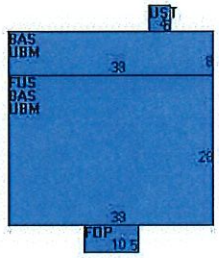
Building Information

Building ID 12111

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







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

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

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

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT43XC822

Glastonbury/Nextel
2577 Main Street
Glastonbury, CT 06033

July 5, 2017

EBI Project Number: 6217002914

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	28.54 %

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

EBI Consulting
environmental | engineering | due diligence

July 5, 2017

SPRINT
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, NJ 07495

Emissions Analysis for Site: **CT43XC822 – Glastonbury/Nextel**

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

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

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

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) 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 SPRINT 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 SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

3) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 2 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 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.

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

7) The antennas used in this modeling are the **RFS APXVSPP18-C-A20 and RFS APXVTM14-C-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

8) The antenna mounting height centerlines of the proposed antennas are **120 feet** above ground level (AGL) for **Sector A**, **120 feet** above ground level (AGL) for **Sector B** and **120 feet** above ground level (AGL) for Sector C.

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

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts	Total TX Power(W):	240 Watts
ERP (W):	8,315.47	ERP (W):	8,315.47	ERP (W):	8,315.47
Antenna A1 MPE%	**2.58 %**	Antenna B1 MPE%	**2.58 %**	Antenna C1 MPE%	**2.58 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20	Make / Model:	RFS APXVTM14-C-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**120 feet**	Height (AGL):	**120 feet**	Height (AGL):	**120 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts	Total TX Power(W):	120 Watts
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	**1.29 %**	Antenna B2 MPE%	**1.29 %**	Antenna C2 MPE%	**1.29 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.87 %**
T-Mobile	5.32 %
MetroPCS	1.38 %
Clearwire	0.13 %
Nextel	0.38 %
AT&T	4.54 %
Verizon Wireless	12.92 %
Site Total MPE %:	**28.54 %**

SPRINT Sector A Total:	3.87 %
SPRINT Sector B Total:	3.87 %
SPRINT Sector C Total:	3.87 %
Site Total:	28.54 %

SPRINT Max Values Per Sector:

SPRINT _ Max Values per Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	2	656.33	120	3.63	850 MHz	567	0.64%
Sprint 1900 MHz (PCS) CDMA	2	1,167.14	120	6.46	1900 MHz (PCS)	1000	0.65%
Sprint 1900 MHz (PCS) LTE	2	2,334.27	120	12.91	1900 MHz (PCS)	1000	1.29%
Sprint 2500 MHz (BRS) LTE	2	2,334.27	120	12.91	2500 MHz (BRS)	1000	1.29%
						Total:	**3.87%**

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 SPRINT 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:

SPRINT Sector	Power Density Value (%)
Sector A:	3.87 %
Sector B:	3.87 %
Sector C:	3.87 %
SPRINT Maximum Total (per sector):	3.87 %
Site Total:	28.54 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **28.54 %** 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
www.allprocgi.com ★ e-mail: info@allprocgi.com

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-03
Carrier Name: Sprint Nextel
Carrier Site Name: CT43XC822 / Glastonbury/Nextel
Application #56576, v1

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

ACGI Job # 17-1967

ANALYSIS RESULTS		
Tower Components	86.2%	**Pass**
Tower Foundation	56.6%	**Pass**
Net Change in Tower Member Stresses	- 3.4%	Change from previous SA by Allpro Consulting Group, Inc., ACGI Job # 16-4584, dated 12/09/2016

Prepared By:
Chris Delgado
Staff Engineer, E.I.T.

05/05/2017
Approved By:
Joji M. George, P.E.
CT PE # 24444

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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 Sprint Nextel 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
	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)
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 #16-4584 dated 12/09/2016. Existing loading from Site Summary as per sbasite.com, dated 1/23/2017 Proposed final loading for Sprint Nextel as per sbasite.com, Application ID 56576, v1.
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-03
Carrier Site Name:	CT43XC822 / Glastonbury/Nextel
City, State:	Glastonbury, CT
County:	Hartford
Code Wind Load Requirement:	TIA-222-G & IBC 2012 (Ultimate wind speed of 124 mph 3 sec gust equivalent to Nominal design wind speed of 96 mph basic wind speed)
Wind Load Used:	ANSI/TIA-222-G Code: • Nominal wind speed of 96 mph (3 second gust wind speed) • Structure Class II. • Exposure Category 1. • Topographic Category B. • 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:	Individual concrete pad with square pedestal

TOWER HISTORY	
Tower Manufacturer / Model:	ROHN/ SSV TOWER
Date of Original Design:	September 1999
Previous Modifications:	Modification Drawings by FDH, Project No. 1338401400, dated 06/17/2013
Original Design Code 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	**82.1 %**	**Pass**
Diagonal	**86.2 %**	**Pass**
Horizontal	**3.9 %**	**Pass**
Secondary Horizontal	**84.6 %**	**Pass**
Top Girt	**2.6 %**	**Pass**
Bottom Girt	**10.9 %**	**Pass**
Bolt Checks	**86.2 %**	**Pass**
Tower Foundation (See attached MATHCAD calculations)	**Bearing Capacity 20.7 %**	**Pass**
	Overturning 56.6 %	**Pass**
	Horizontal Shear Capacity 15.3 %	**Pass**
Anchor Bolt Capacity (See attached MATHCAD calculations)	**57.7 %**	**Pass**
Tower Overall Rating = 86.2 % (Pass)		

As per the results of the analysis, the existing tower **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**	**-**

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	Alcatel Lucent TD-RRH8x20-25 RRU	(3) T-Arms @118.5'	(4) 1-1/4" fiber	Sprint Nextel
	3	Rfs Celwave APXVTM14-C-I20 Panel			
	3	ALU 1900 4x45 65 MHz RRU			
	4	RFS ACU-A20-N RET			
	3	ALU 800 MHz 2x50W RRU			
	1	Powerwave P40-16-XLPP-RR-A Panel			
	2	RFS APXVSPP18-C-A20 Panel			
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 (1) MT-195-12 (1) VSR-TS-B @93'	(12) 1-5/8" coax (1) 1-5/8" fiber	T-Mobile
	3	Ericsson AIR 21 B4A/B2P Panel			
	6	Ericsson KRY 112 144/1 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 SPRINT NEXTEL LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
120±	**3**	RFS APXVSPP18-C-A20 Panel	(3) T-Arms @ 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			

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

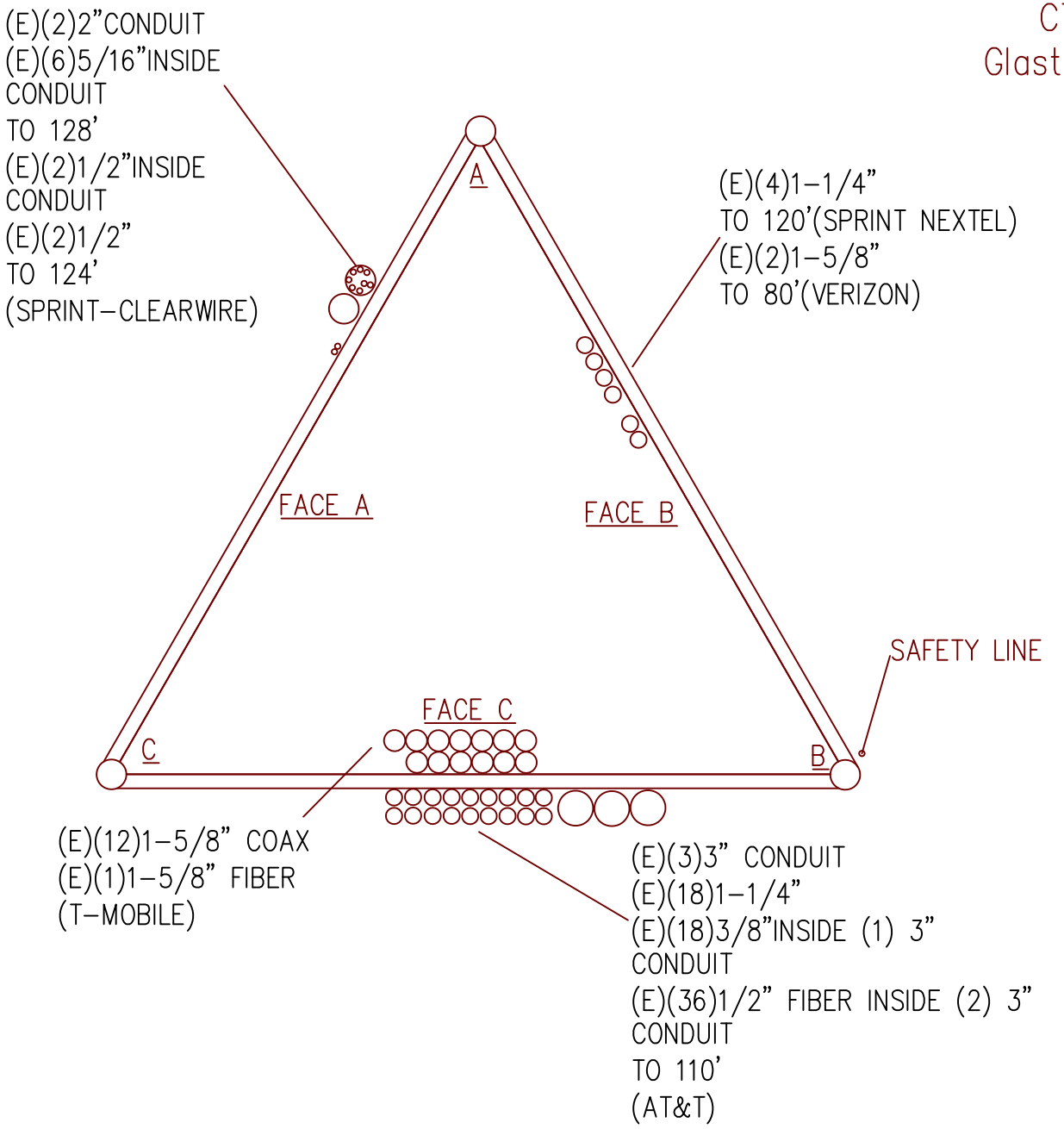
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	130 - 120	Leg	1 1/2	1	-8.782	47.300	18.6	Pass
		Diagonal	1/2	12	-1.263	2.965	42.6	Pass
		Horizontal	L1 1/4x1 1/4x3/16	35	-0.261	6.709	3.9	Pass
		Top Girt	L1 1/4x1 1/4x3/16	4	-0.024	6.709	0.4	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	7	-0.060	6.709	0.9	Pass
T2	120 - 117.143	Leg	2	45	-12.765	95.057	13.4	Pass
		Diagonal	3/4	51	-2.516	9.384	26.8	Pass
		Top Girt	L1 1/4x1 1/4x3/16	46	-0.179	6.795	2.6	Pass
T3	117.143 - 114.286	Leg	2	57	-18.978	95.057	20.0	Pass
		Diagonal	3/4	61	-2.477	9.384	26.4	Pass
T4	114.286 - 111.43	Leg	2	66	-24.610	93.381	26.4	Pass
		Diagonal	3/4	70	-2.474	9.369	26.4	Pass
T5	111.43 - 108.573	Leg	2	75	-39.817	93.381	42.6	Pass
		Diagonal	3/4	80	-3.416	9.369	36.5	Pass
T6	108.573 - 105.716	Leg	2	84	-49.736	93.381	53.3	Pass
		Diagonal	3/4	89	-4.558	9.369	48.7	Pass
T7	105.716 - 102.859	Leg	2	93	-61.535	93.381	65.9	Pass
		Diagonal	3/4	98	-4.414	9.369	47.1	Pass
T8	102.859 - 100	Leg	2	102	-78.206	118.274	66.1	Pass
		Diagonal	3/4	111	-4.822	9.384	51.4	Pass
		Secondary Horizontal	L2x2x1/8	113	-1.241	10.739	11.6	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	103	-0.744	6.795	10.9	Pass
T9	100 - 96	Leg	P4.5 x 0.237	117	-81.033	142.411	56.9	Pass
		Diagonal	L1 1/2x1 1/2x3/16	123	-4.025	10.892	37.0 69.6 (b)	Pass
T10	96 - 92	Leg	P4.5 x 0.237	126	-94.465	142.411	66.3	Pass
		Diagonal	L2x2x1/4	132	-4.179	22.096	18.9 44.1 (b)	Pass
T11	92 - 88	Leg	P4.5 x 0.237	135	-102.093	151.005	67.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	141	-7.291	28.334	25.7 64.9 (b)	Pass
		Secondary Horizontal	4x3/8	142	-2.454	16.048	15.3 40.1 (b)	Pass
T12	88 - 84	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	147	-115.061	221.384	52.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	153	-6.816	27.999	24.3 62.9 (b)	Pass
		Secondary Horizontal	4x3/8	154	-2.977	13.861	21.5 49.3 (b)	Pass
T13	84 - 80	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	157	-127.265	221.402	57.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	165	-5.848	27.654	21.1 54.4 (b)	Pass
		Secondary Horizontal	4x3/8	166	-2.626	12.081	21.7 41.9 (b)	Pass
T14	80 - 75	Leg	P6.625x0.280	169	-143.575	256.371	56.0	Pass
		Diagonal	L2x2x1/4	177	-5.510	19.872	27.7 56.7 (b)	Pass
T15	75 - 70	Leg	P6.625x0.280	178	-160.319	256.371	62.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	185	-6.178	26.164	23.6 61.6 (b)	Pass
T16	70 - 65	Leg	P6.625x0.280	187	-176.037	256.371	68.7	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	194	-5.546	25.691	21.6 53.5 (b)	Pass
T17	65 - 60	Leg	P6.625x0.280	196	-190.767	256.371	74.4	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	203	-5.771	25.205	22.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							57.1 (b)	
T18	60 - 55	Leg	P6.625x0.280	205	-201.765	267.248	75.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	213	-7.409	24.144	30.7	Pass
							69.7 (b)	
		Secondary Horizontal	L2x2x1/8	214	3.496	13.254	26.4	Pass
							84.6 (b)	
T19	55 - 50	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	217	-218.905	344.376	63.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	220	-4.657	24.196	19.2	Pass
							46.5 (b)	
T20	50 - 45	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	226	-231.114	344.376	67.1	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	229	-5.682	23.674	24.0	Pass
							55.8 (b)	
T21	45 - 40	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301	235	-241.834	353.331	68.4	Pass
		Diagonal	L2x2x1/4	238	-6.349	17.253	36.8	Pass
							65.3 (b)	
		Secondary Horizontal	L3x3x5/16	244	4.190	51.700	8.1	Pass
							52.7 (b)	
T22	40 - 33.3333	Leg	P6.625x.432	247	-257.004	367.767	69.9	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	250	-5.717	26.573	21.5	Pass
							44.4 (b)	
T23	33.3333 - 26.6667	Leg	P6.625x.432	256	-273.470	367.767	74.4	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	259	-5.998	25.910	23.1	Pass
							47.0 (b)	
T24	26.6667 - 20	Leg	P6.625x.432	265	-288.114	367.767	78.3	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	268	-5.687	25.232	22.5	Pass
							43.9 (b)	
T25	20 - 13.3333	Leg	P6.625x.432	274	-302.056	367.767	82.1	Pass
		Diagonal	L2x2x3/16	277	-5.870	9.232	63.6	Pass
							86.2 (b)	
T26	13.3333 - 6.66666	Leg	P6.625x.432	283	-314.608	397.395	79.2	Pass
		Diagonal	L2x2x3/16	286	-5.768	8.336	69.2	Pass
							84.2 (b)	
		Secondary Horizontal	L2x2x1/4	292	5.451	24.485	22.3	Pass
							51.9 (b)	
T27	6.66666 - 0	Leg	BT101341- P6.625 x .432 w/ HP7.625x0.301	295	-337.847	445.367	75.9	Pass
		Diagonal	2L2x2x3/16x3/8	298	-7.505	30.610	24.5	Pass
							53.2 (b)	
							Summary	
						Leg (T25)	82.1	Pass
						Diagonal (T25)	86.2	Pass
						Horizontal (T1)	3.9	Pass
						Secondary Horizontal (T18)	84.6	Pass
						Top Girt (T2)	2.6	Pass
						Bottom Girt (T8)	10.9	Pass
						Bolt Checks	86.2	Pass
						RATING =	**86.2**	**Pass**

APPENDIX

COAX LAYOUT

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



COAX LAYOUT

TOWER ELEVATION DRAWINGS

Section	T27	T26	T25	T24	T23	T22	T21	T20	T19	T18	T17	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	D			P6.625x.432			C		B			P6.625x0.280			A		P4.5 x 0.237				SR 2				SR 1 1/2	
Leg Grade									A500M-54													A570-45					
Diagonals	H	L2x2x3/16		2L1 3/4x1 3/4x3/16x3/8			L2x2x1/4		2L1 1/2x1 1/2x3/16x3/8					L2x2x1/4		G		F	E			SR 3/4					
Diagonal Grade												A36															
Top Girts									N.A.																	L1 1/4x1 1/4x3/16	
Bottom Girts								N.A.												I		N.A.				L1 1/4x1 1/4x3/16	
Horizontals									N.A.																	L1 1/4x1 1/4x3/16	
Sec. Horizontals	N.A.	L2x2x1/4		N.A.			K	N.A.		L2x2x1/8		N.A.				4x3/8		N.A.		J	N.A.						2.5
Face Width (ft)	7.5	6.83333	6.5	6.16667	5.83333	5.5	5.25	5	4.75	4.5	4.25	4	3.75	3.5	3.299483	3.098962	2.901042	2.70052		L	4 @ 2.85677		2 @ 2.77344		4 @ 2.47917		
# Panels @ (ft)	M		5 @ 6.66667							8 @ 5				5 @ 4													0.3
Weight (K)	11.9	1.0	0.8	0.7	0.8	0.8	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3

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
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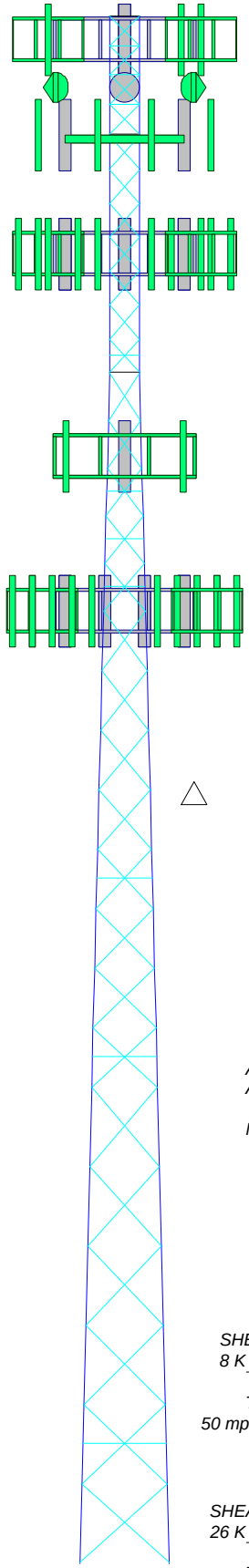
0.0 ft



SYMBOL LIST

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

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 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: 86.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 337 K
SHEAR: 19 K

UPLIFT: -296 K
SHEAR: 17 K

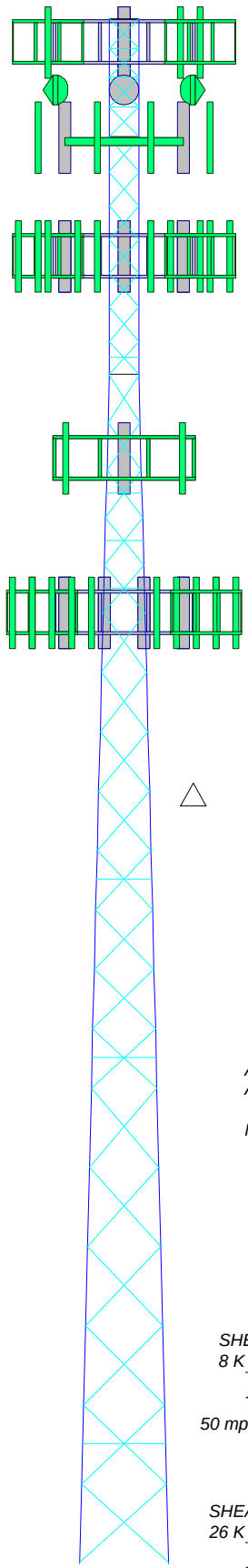
AXIAL 131 K
SHEAR 8 K
MOMENT 693 kip-ft
TORQUE 0 kip-ft
50 mph WIND - 1.000 in ICE
AXIAL 57 K
SHEAR 26 K
MOMENT 2068 kip-ft
TORQUE 1 kip-ft
REACTIONS - 96 mph WIND

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

Job: **17-1967**			
Project: ***Glastonbury-main st, CT (CT46126-A-03)***			
Client: SBA Communications Corporation	Drawn by: C Delgado	App'd:	
Code: TIA-222-G	Date: 05/05/17	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						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							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								J				4x3/8			N.A.			L2x2x1/8	N.A.	K			N.A.		L2x2x1/4		N.A.
Face Width (ft)	2.5										2.70052	2.901042	3.099962	3.53	3.75	4	4.25	4.5	4.75	5	5.25	5.5	5.83333	6.16667	6.5	6.83333	7.16667
# Panels @ (ft)	4 @ 2.47917	4 @ 2.77344	2 @ 2.77344	2 @ 2.85677		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



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LLPX310R	128	RRUS 12	110
LLPX310R	128	RRUS 12	110
840 10054	128	RRUS A2	110
24"x14"x9"	128	RRUS A2	110
24"x14"x9"	128	RRUS A2	110
24"x14"x9"	128	(4) 860 10025	110
TIMING 2000	128	(4) 860 10025	110
ODU	128	(4) 860 10025	110
ODU	128	(2) LGP21901	110
ODU	128	(2) LGP21901	110
Sector Mount [SM 803-3]	128	(2) LGP21901	110
VHLP2.5	124	ATSBT-TOP-MF-4G	110
VHLP2.5	124	ATSBT-TOP-MF-4G	110
VHLP2.5	124	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
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	Air 21 B4A/B2P	93
TD-RRH8x20-25	120	Air 21 B4A/B2P	93
1900 MHz 4x45 RRH	120	Air 21 B4A/B2P	93
1900 MHz 4x45 RRH	120	(2) KRY 112 144/1	93
1900 MHz 4x45 RRH	120	(2) KRY 112 144/1	93
800MHz 2x50W RRH	120	(2) KRY 112 144/1	93
800MHz 2x50W RRH	120	LNX-6515DS-A1M	93
800MHz 2x50W RRH	120	LNX-6515DS-A1M	93
(2) ACU-A20-N	120	LNX-6515DS-A1M	93
ACU-A20-N	120	S11B12	93
ACU-A20-N	120	S11B12	93
800 MHz Filter	120	S11B12	93
800 MHz Filter	120	Sector Mount [SM 402-3]	93
800 MHz Filter	120	Miscellaneous [NA 507-1]	93
6' x 2" Mount Pipe	120	VSR-TS-B Stabilizer Kit	93
6' x 2" Mount Pipe	120	Air 21 B2A/B4P	93
6' x 2" Mount Pipe	120	Air 21 B2A/B4P	93
T-Arm Mount [TA 601-3]	120	Air 21 B2A/B4P	93
APXVTM14-C-I20	120	(2) BXA-171063/12CF	80
APXVTM14-C-I20	120	(2) BXA-171063/12CF	80
APXVTM14-C-I20	120	(2) BXA-171063/12CF	80
RRUS 11	110	RRH2x40-700U	80
RRUS 11	110	RRH2x40-700U	80
RRUS 11	110	RRH2x40-700U	80
DC2-48-60-18-8F	110	RRH2x40-AWS	80
(P) HPA-65R-BUU-H6	110	RRH2x40-AWS	80
(P) HPA-65R-BUU-H6	110	RRH2x40-AWS	80
(2) 800-10121	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
HPA-65R-BUU-H8	110	(2) BXA-70063/6CF	80
RRUS 12	110	(2) BXA-70063/6CF	80

ALL REA
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AXI
13
SHEAR
8 K
TORQUE
50 mph WIND
AXI
57 K
SHEAR
26 K
TORQUE 1
REACTIONS -

SYMBOL LIST

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

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 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: 86.2%

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

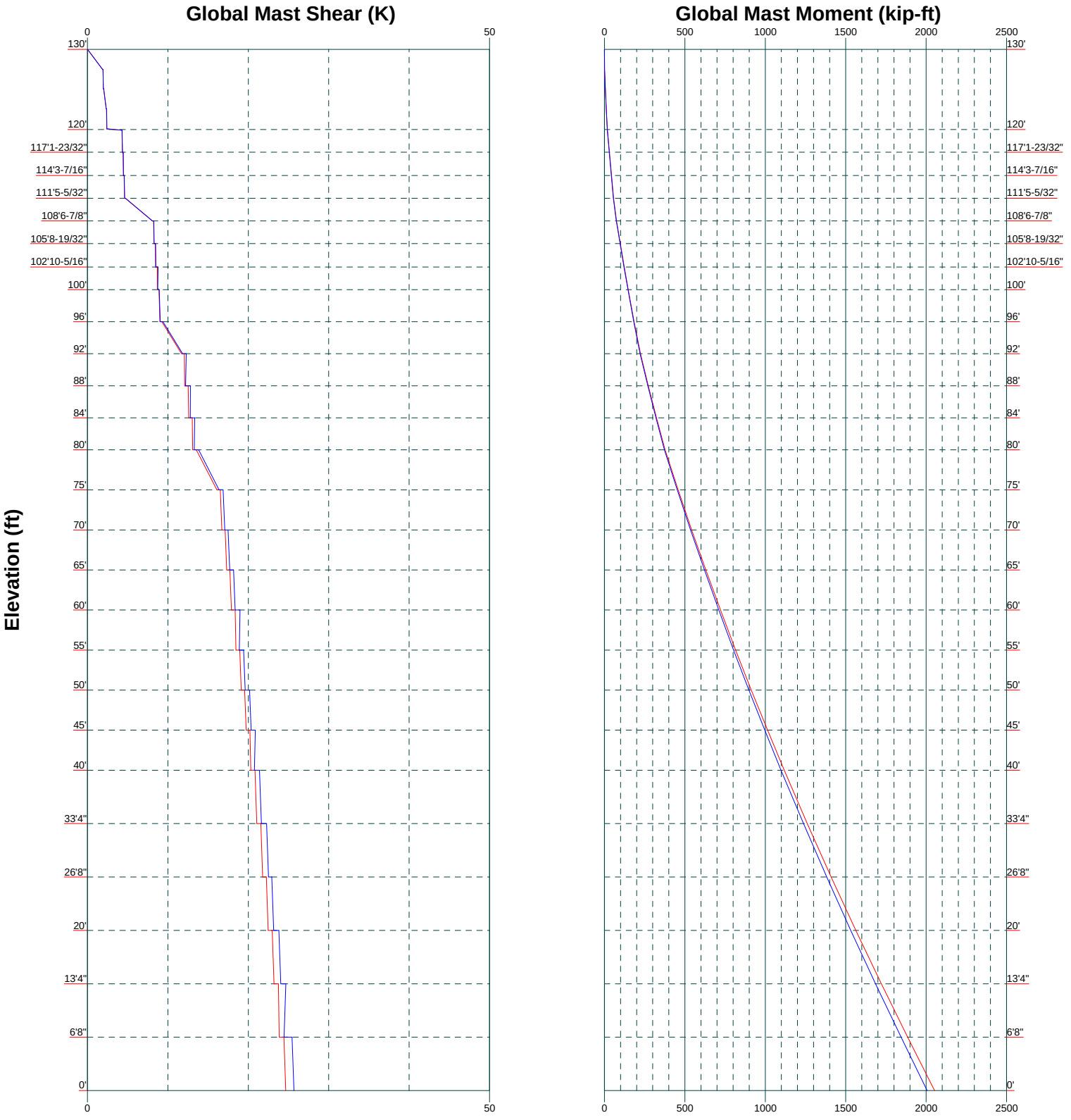
Job: **17-1967**			
Project: ***Glastonbury-main st, CT (CT46126-A-03)***			
Client: SBA Communications Corporation	Drawn by: C Delgado	App'd:	
Code: TIA-222-G	Date: 05/05/17	Scale: NTS	
Path:		Dwg No. E-1	

MISCELLANEOUS PLOTS

TIA-222-G - 96 mph/50 mph 1.000 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz



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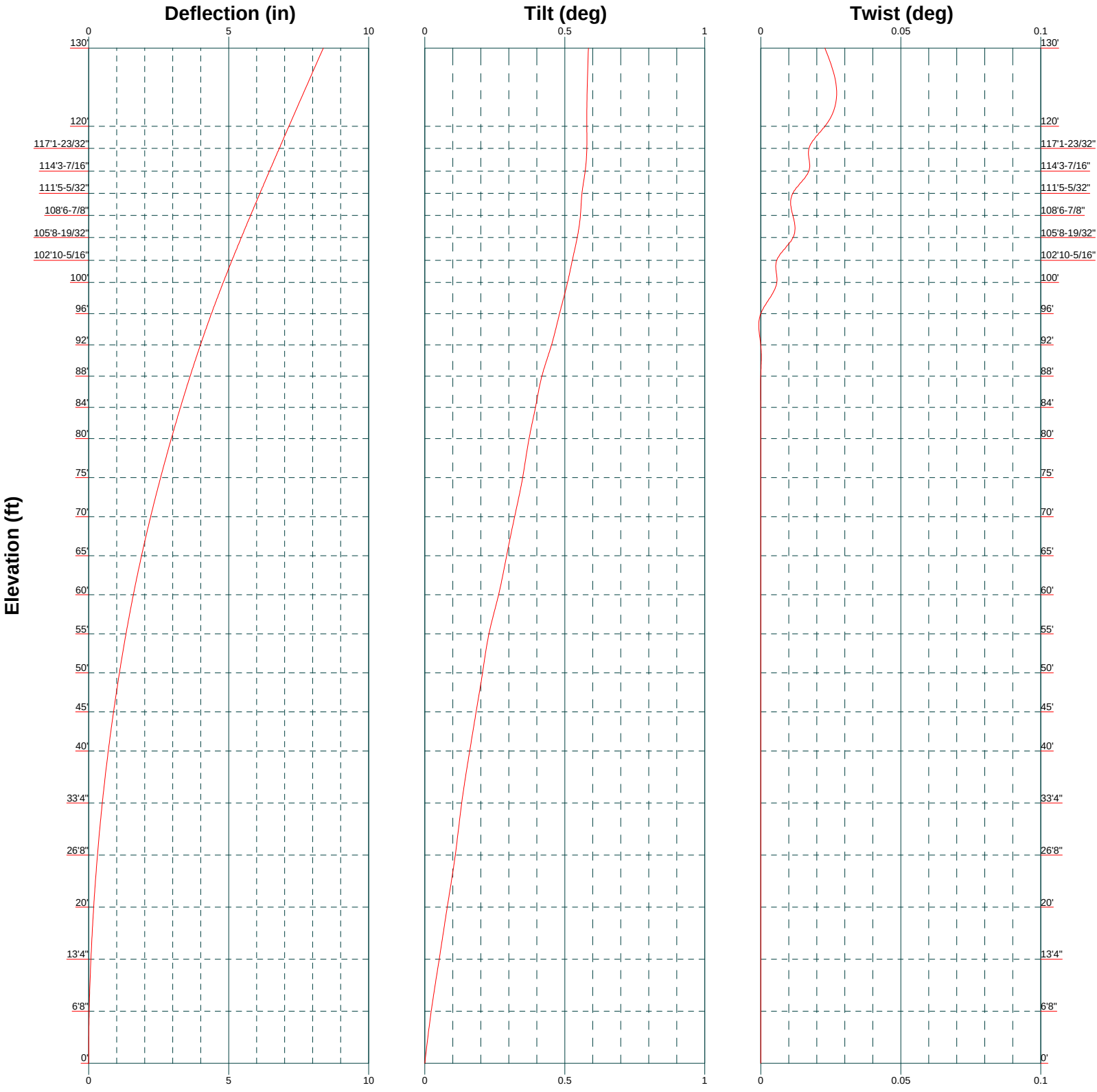
Code: TIA-222-G	Date: 05/05/17	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-G - Service - 60 mph

Maximum Values



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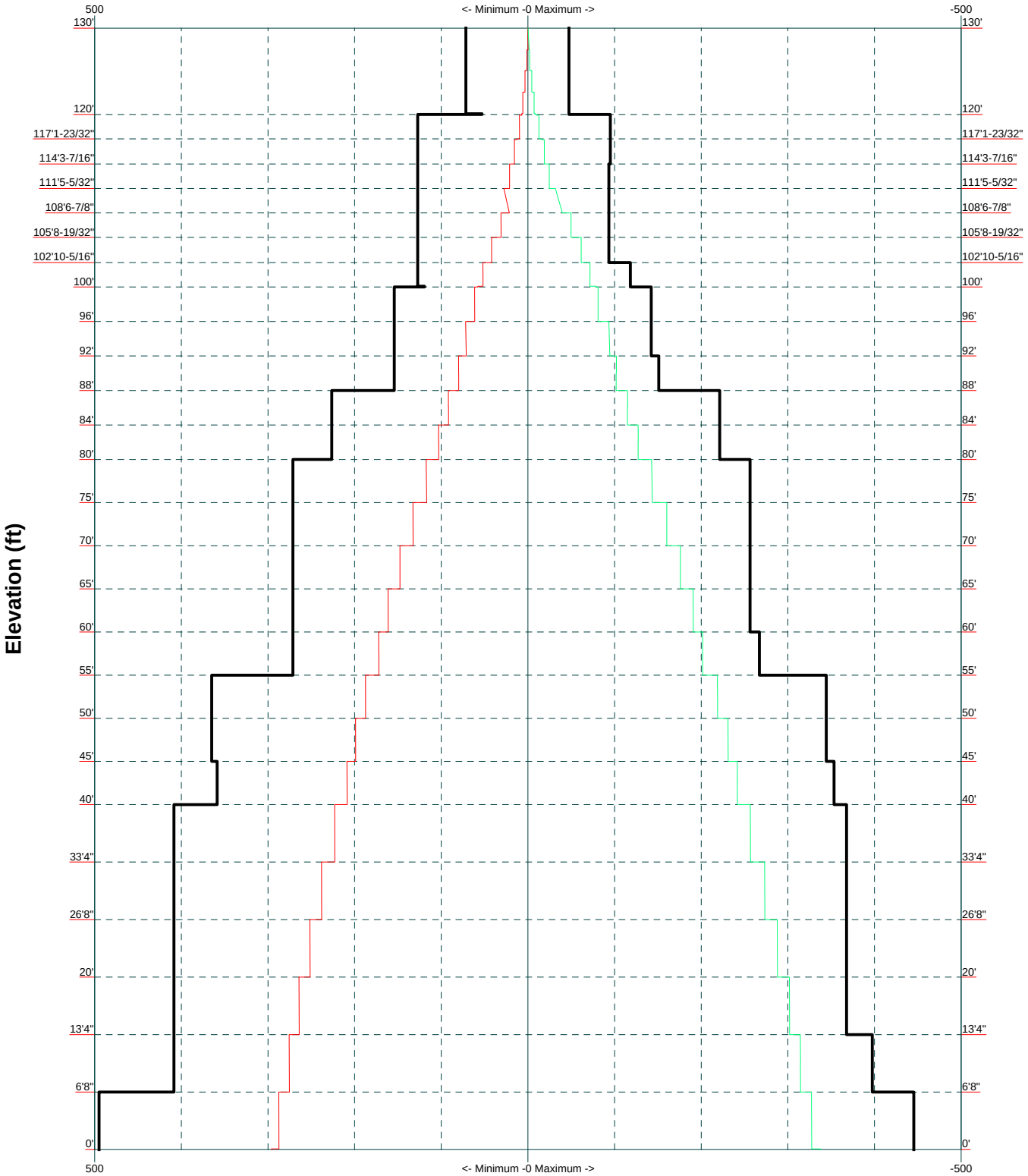
Project: ***Glastonbury-main st, CT (CT46126-A-03)***			
Client: SBA Communications Corporation	Drawn by: C Delgado	App'd:	
Code: TIA-222-G	Date: 05/05/17	Scale: NTS	
Path:		Dwg No. E-5	

TIA-222-G - 96 mph/50 mph 1.000 in Ice Exposure B

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



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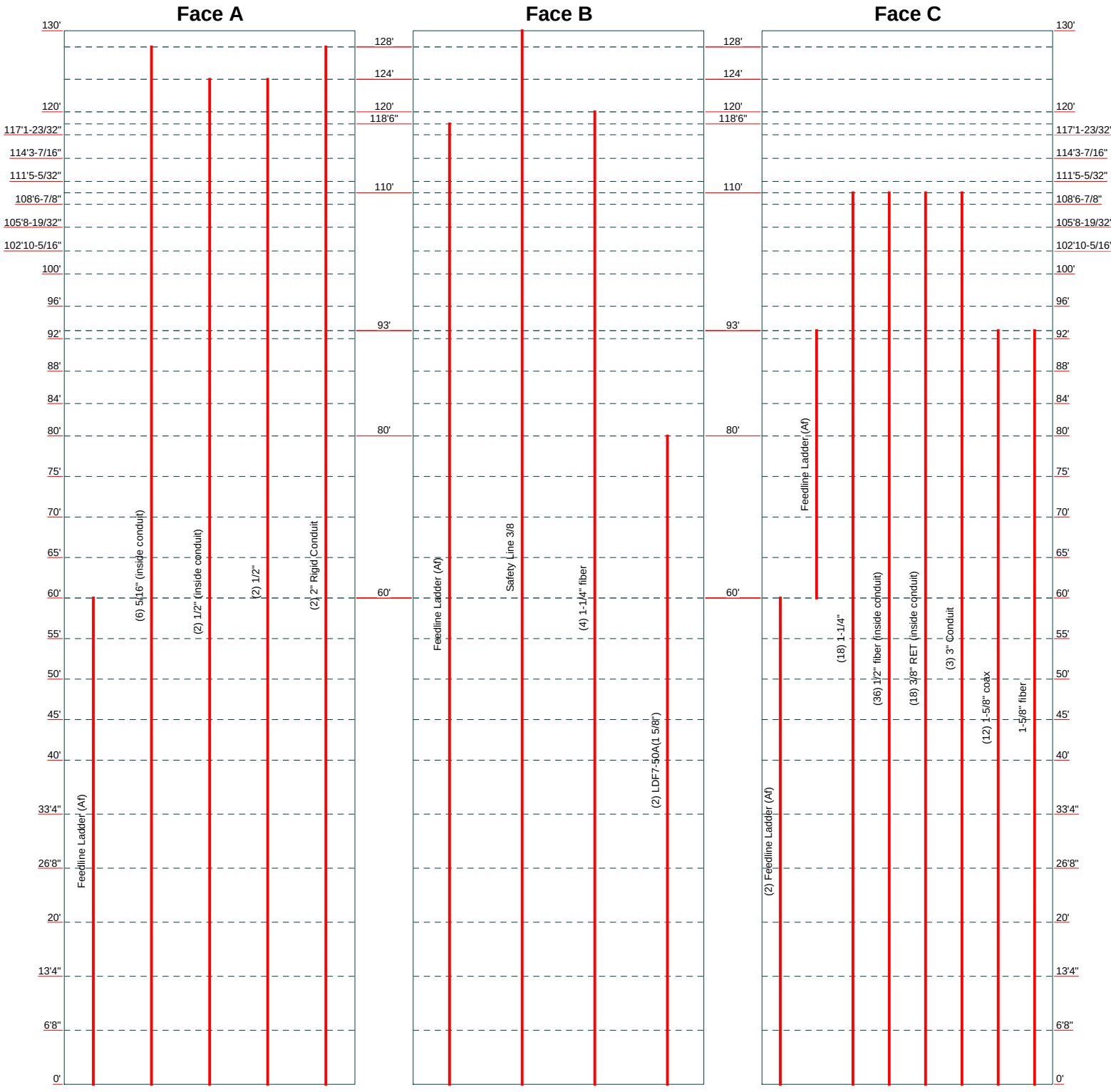
Job: ***17-1967***			
Project: ***Glastonbury-main st, CT (CT46126-A-03)***			
Client: SBA Communications Corporation	Drawn by: C Delgado	App'd:	
Code: TIA-222-G	Date: 05/05/17	Scale: NTS	
Path:		Dwg No. E-3	

Feed Line Distribution Chart
0' - 130'

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



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Job: ***17-1967***			
Project: ***Glastonbury-main st, CT (CT46126-A-03)***			
Client: SBA Communications Corporation	Drawn by: C Delgado	App'd:	
Code: TIA-222-G	Date: 05/05/17	Scale: NTS	
Path:		Dwg No. E-7	

CALCULATION PRINTOUT

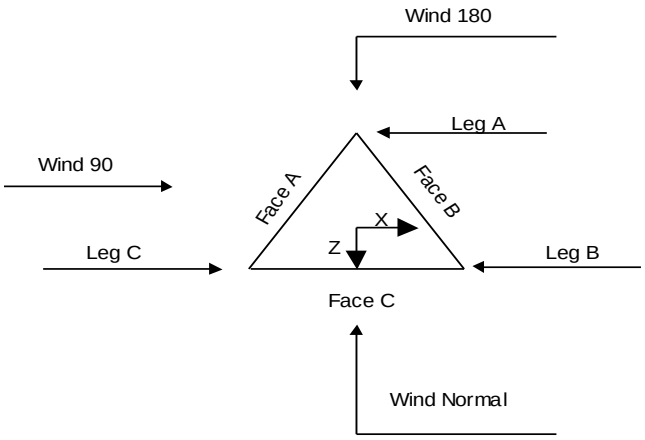
Tower Input Data

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 96 mph.
Structure Class II.
Exposure Category B.
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				



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)* *ft²*	*Gusset Thickness* *in*	*Gusset Grade*	*Adjust. Factor A_f*	*Adjust. Factor A_r*	*Weight Mult.*	*Double Angle Stitch Bolt Spacing Diagonals* *in*	*Double Angle Stitch Bolt Spacing Horizontals* *in*	*Double Angle Stitch Bolt Spacing Redundants* *in*
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)	60' - 0'	0.000	0.2	1	1	3.000	3.000		0.008
Feedline Ladder (Af)	B	No	Af (CaAa)	118'6" - 0'	-1.000	0	1	1	3.000	3.000		0.008
Feedline Ladder (Af)	C	No	Af (CaAa)	60' - 0'	-1.000	0	2	1	3.000	3.000		0.008
Feedline Ladder (Af)	C	No	Af (CaAa)	93' - 60'	-1.000	0	1	1	3.000	3.000		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	9	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" coax	C	No	Ar (CaAa)	93' - 0'	-3.000	0	12	6	0.500	1.625		0.001
1-5/8" fiber ***	C	No	Ar (CaAa)	93' - 0'	-3.000	0	1	1	0.500	1.625		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	3.600	0.000	0.051
		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	1.428	0.000	0.019
		B	0.000	0.000	2.214	0.000	0.020
		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	1.428	0.000	0.019
		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	1.428	0.000	0.019
		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	1.428	0.000	0.019
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	4.495	0.000	0.039
T6	108'6-7/8"-105'8-1 9/32"	A	0.000	0.000	1.428	0.000	0.019
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	8.999	0.000	0.077
T7	105'8-19/32"-102' 10-5/16"	A	0.000	0.000	1.428	0.000	0.019
		B	0.000	0.000	2.964	0.000	0.032
		C	0.000	0.000	8.999	0.000	0.077
T8	102'10-5/16"-100'	A	0.000	0.000	1.430	0.000	0.019
		B	0.000	0.000	2.967	0.000	0.032
		C	0.000	0.000	9.007	0.000	0.078
T9	100'-96'	A	0.000	0.000	2.000	0.000	0.027
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	12.600	0.000	0.108
T10	96'-92'	A	0.000	0.000	2.000	0.000	0.027
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	15.213	0.000	0.128

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	2.000	0.000	0.027
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	23.050	0.000	0.185
T12	88'-84'	A	0.000	0.000	2.000	0.000	0.027
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	23.050	0.000	0.185
T13	84'-80'	A	0.000	0.000	2.000	0.000	0.027
		B	0.000	0.000	4.150	0.000	0.045
		C	0.000	0.000	23.050	0.000	0.185
T14	80'-75'	A	0.000	0.000	2.500	0.000	0.033
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	28.813	0.000	0.231
T15	75'-70'	A	0.000	0.000	2.500	0.000	0.033
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	28.813	0.000	0.231
T16	70'-65'	A	0.000	0.000	2.500	0.000	0.033
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	28.813	0.000	0.231
T17	65'-60'	A	0.000	0.000	2.500	0.000	0.033
		B	0.000	0.000	7.167	0.000	0.065
		C	0.000	0.000	28.812	0.000	0.231
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	31.313	0.000	0.273
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	31.313	0.000	0.273
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	31.313	0.000	0.273
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	31.313	0.000	0.273
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	41.750	0.000	0.364
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	41.750	0.000	0.364
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	41.750	0.000	0.364
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	41.750	0.000	0.364
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	41.750	0.000	0.364
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	41.750	0.000	0.364

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	26.214	0.000	0.329

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	11.943	0.000	0.141
		B		0.000	0.000	7.155	0.000	0.123
		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	11.921	0.000	0.141
		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	11.899	0.000	0.140
		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	11.875	0.000	0.140
		B		0.000	0.000	8.551	0.000	0.161
		C		0.000	0.000	10.261	0.000	0.193
T6	108'6-7/8"-105'8-1 9/32"	A	2.250	0.000	0.000	11.852	0.000	0.140
		B		0.000	0.000	8.539	0.000	0.161
		C		0.000	0.000	20.517	0.000	0.385
T7	105'8-19/32"-102' 10-5/16"	A	2.244	0.000	0.000	11.827	0.000	0.139
		B		0.000	0.000	8.526	0.000	0.161
		C		0.000	0.000	20.494	0.000	0.384
T8	102'10-5/16"-100'	A	2.238	0.000	0.000	11.813	0.000	0.139
		B		0.000	0.000	8.521	0.000	0.160
		C		0.000	0.000	20.489	0.000	0.383
T9	100'-96'	A	2.230	0.000	0.000	16.482	0.000	0.193
		B		0.000	0.000	11.897	0.000	0.223
		C		0.000	0.000	28.620	0.000	0.535
T10	96'-92'	A	2.221	0.000	0.000	16.430	0.000	0.192
		B		0.000	0.000	11.870	0.000	0.222
		C		0.000	0.000	32.445	0.000	0.620
T11	92'-88'	A	2.211	0.000	0.000	16.376	0.000	0.191
		B		0.000	0.000	11.841	0.000	0.221
		C		0.000	0.000	43.989	0.000	0.880
T12	88'-84'	A	2.201	0.000	0.000	16.320	0.000	0.190
		B		0.000	0.000	11.812	0.000	0.220
		C		0.000	0.000	43.906	0.000	0.876
T13	84'-80'	A	2.191	0.000	0.000	16.261	0.000	0.188
		B		0.000	0.000	11.781	0.000	0.219
		C		0.000	0.000	43.819	0.000	0.872
T14	80'-75'	A	2.178	0.000	0.000	20.240	0.000	0.234
		B		0.000	0.000	21.467	0.000	0.360
		C		0.000	0.000	54.645	0.000	1.085
T15	75'-70'	A	2.164	0.000	0.000	20.138	0.000	0.232
		B		0.000	0.000	21.388	0.000	0.357
		C		0.000	0.000	54.494	0.000	1.079
T16	70'-65'	A	2.148	0.000	0.000	20.030	0.000	0.230
		B		0.000	0.000	21.304	0.000	0.354
		C		0.000	0.000	54.334	0.000	1.072
T17	65'-60'	A	2.132	0.000	0.000	19.914	0.000	0.227
		B		0.000	0.000	21.215	0.000	0.351
		C		0.000	0.000	54.162	0.000	1.065
T18	60'-55'	A	2.114	0.000	0.000	24.404	0.000	0.349
		B		0.000	0.000	21.119	0.000	0.348
		C		0.000	0.000	58.785	0.000	1.182
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	58.573	0.000	1.172
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	58.341	0.000	1.162
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	58.087	0.000	1.151
T22	40'-33'4"	A	2.021	0.000	0.000	31.545	0.000	0.441
		B		0.000	0.000	27.486	0.000	0.441
		C		0.000	0.000	77.004	0.000	1.516
T23	33'4"-26'8"	A	1.981	0.000	0.000	31.116	0.000	0.431
		B		0.000	0.000	27.196	0.000	0.432
		C		0.000	0.000	76.411	0.000	1.491
T24	26'8"-20'	A	1.932	0.000	0.000	30.591	0.000	0.419
		B		0.000	0.000	26.841	0.000	0.420
		C		0.000	0.000	75.685	0.000	1.460
T25	20'-13'4"	A	1.868	0.000	0.000	29.909	0.000	0.404
		B		0.000	0.000	26.379	0.000	0.406
		C		0.000	0.000	74.742	0.000	1.420
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	73.372	0.000	1.364
T27	6'8"-0'	A	1.590	0.000	0.000	26.948	0.000	0.341
		B		0.000	0.000	24.379	0.000	0.345
		C		0.000	0.000	70.659	0.000	1.256

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	130'-120'	-0.348	-0.789	0.053	-0.004
T2	120'-117'1-23/32"	0.266	-0.866	0.326	-0.189
T3	117'1-23/32"-114'3-7/16"	0.410	-0.897	0.543	-0.314
T4	114'3-7/16"-111'5-5/32"	0.409	-0.895	0.542	-0.315
T5	111'5-5/32"-108'6-7/8"	0.380	0.465	0.492	0.052
T6	108'6-7/8"-105'8-19/32"	0.367	1.055	0.458	0.291
T7	105'8-19/32"-102'10-5/16"	0.367	1.055	0.458	0.292
T8	102'10-5/16"-100'	0.348	1.000	0.539	-0.220
T9	100'-96'	0.340	0.956	0.473	0.230
T10	96'-92'	0.334	1.064	0.482	0.371
T11	92'-88'	0.281	1.258	0.472	0.624
T12	88'-84'	0.303	1.338	0.492	0.677
T13	84'-80'	0.325	1.418	0.513	0.728
T14	80'-75'	0.454	1.395	0.532	0.793
T15	75'-70'	0.497	1.512	0.562	0.870
T16	70'-65'	0.534	1.609	0.595	0.932
T17	65'-60'	0.570	1.705	0.628	0.994
T18	60'-55'	0.414	1.602	0.383	0.973
T19	55'-50'	0.448	1.716	0.431	1.066
T20	50'-45'	0.475	1.801	0.458	1.121
T21	45'-40'	0.479	1.801	0.451	1.107
T22	40'-33'4"	0.533	1.982	0.521	1.253
T23	33'4"-26'8"	0.569	2.095	0.558	1.332
T24	26'8"-20'	0.604	2.207	0.595	1.414
T25	20'-13'4"	0.635	2.303	0.629	1.494
T26	13'4"-6'8"	0.656	2.362	0.646	1.540

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T27	6'8"-0'	0.705	2.523	0.707	1.709

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
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	2	Feedline Ladder (Af)	117.14 - 118.50	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	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	2	Feedline Ladder (Af)	111.43 - 114.29	0.6000	0.2846
T4	5	Safety Line 3/8	111.43 - 114.29	0.6000	0.2846
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 -	0.6000	0.2846

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	12	1-1/4" fiber	114.29 - 111.43	0.6000	0.2846
T5	2	Feedline Ladder (Af)	114.29 - 108.57	0.6000	0.2858
T5	5	Safety Line 3/8	111.43 - 108.57	0.6000	0.2858
T5	7	5/16" (inside conduit)	111.43 - 108.57	0.6000	0.2858
T5	8	1/2" (inside conduit)	111.43 - 108.57	0.6000	0.2858
T5	9	1/2"	111.43 - 108.57	0.6000	0.2858
T5	10	2" Rigid Conduit	111.43 - 108.57	0.6000	0.2858
T5	12	1-1/4" fiber	111.43 - 108.57	0.6000	0.2858
T5	14	1-1/4"	111.43 - 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	2	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 - 108.57	0.6000	0.2871
T7	2	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 -	0.6000	0.2883

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			105.72		
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	2	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	2	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
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	2	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" coax	92.00 - 93.00	0.6000	0.2545
T10	20	1-5/8" fiber	92.00 - 93.00	0.6000	0.2545
T11	2	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
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" coax	88.00 - 92.00	0.6000	0.1848
T11	20	1-5/8" fiber	88.00 - 92.00	0.6000	0.1848
T12	2	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" coax	84.00 - 88.00	0.6000	0.2094
T12	20	1-5/8" fiber	84.00 - 88.00	0.6000	0.2094
T13	2	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
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" coax	80.00 - 84.00	0.6000	0.2318
T13	20	1-5/8" fiber	80.00 - 84.00	0.6000	0.2318
T14	2	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" coax	75.00 - 80.00	0.6000	0.3414
T14	20	1-5/8" fiber	75.00 - 80.00	0.6000	0.3414
T14	22	LDF7-50A(1 5/8")	75.00 - 80.00	0.6000	0.3414
T15	2	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" coax	70.00 - 75.00	0.6000	0.3957

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	20	1-5/8" fiber	70.00 - 75.00	0.6000	0.3957
T15	22	LDF7-50A(1 5/8")	70.00 - 75.00	0.6000	0.3957
T16	2	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" coax	65.00 - 70.00	0.6000	0.4201
T16	20	1-5/8" fiber	65.00 - 70.00	0.6000	0.4201
T16	22	LDF7-50A(1 5/8")	65.00 - 70.00	0.6000	0.4201
T17	2	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
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" coax	60.00 - 65.00	0.6000	0.4424
T17	20	1-5/8" fiber	60.00 - 65.00	0.6000	0.4424
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	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" coax	55.00 - 60.00	0.6000	0.3853
T18	20	1-5/8" fiber	55.00 - 60.00	0.6000	0.3853
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	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" coax	50.00 - 55.00	0.6000	0.4818

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T19	20	1-5/8" fiber	50.00 - 55.00	0.6000	0.4818
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	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" coax	45.00 - 50.00	0.6000	0.4994
T20	20	1-5/8" fiber	45.00 - 50.00	0.6000	0.4994
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	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" coax	40.00 - 45.00	0.6000	0.4045
T21	20	1-5/8" fiber	40.00 - 45.00	0.6000	0.4045
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	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" coax	33.33 - 40.00	0.6000	0.5516
T22	20	1-5/8" fiber	33.33 - 40.00	0.6000	0.5516
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	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T23	17	3" Conduit	26.67 - 33.33	0.6000	0.5719
T23	19	1-5/8" coax	26.67 - 33.33	0.6000	0.5719
T23	20	1-5/8" fiber	26.67 - 33.33	0.6000	0.5719
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	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
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" coax	20.00 - 26.67	0.6000	0.5914
T24	20	1-5/8" fiber	20.00 - 26.67	0.6000	0.5914
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	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" coax	13.33 - 20.00	0.6000	0.6000
T25	20	1-5/8" fiber	13.33 - 20.00	0.6000	0.6000
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	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" coax	6.67 - 13.33	0.6000	0.5656
T26	20	1-5/8" fiber	6.67 - 13.33	0.6000	0.5656
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	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

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
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" coax	0.00 - 6.67	0.6000	0.6000
T27	20	1-5/8" fiber	0.00 - 6.67	0.6000	0.6000
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 Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
LLPX310R	A	From Leg	4.000 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	4.000 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	4.000 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	4.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	3.442 3.696 3.959	2.639 2.870 3.111	0.064 0.091 0.122
24"x14"x9"	B	From Leg	4.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	3.442 3.696 3.959	2.639 2.870 3.111	0.064 0.091 0.122
24"x14"x9"	C	From Leg	4.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	3.442 3.696 3.959	2.639 2.870 3.111	0.064 0.091 0.122
TIMING 2000	C	From Leg	4.000 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
ODU	A	From Leg	4.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	1.068 1.198 1.335	0.403 0.493 0.591	0.010 0.018 0.028
ODU	B	From Leg	4.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	1.068 1.198 1.335	0.403 0.493 0.591	0.010 0.018 0.028
ODU	C	From Leg	4.000 0' 0'	0.000	128'	No Ice 1/2" Ice 1" Ice	1.068 1.198 1.335	0.403 0.493 0.591	0.010 0.018 0.028
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	4.000 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	4.000 0'	0.000	120'	No Ice 1/2" Ice	6.342 6.716	3.607 3.967	0.056 0.096

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft²*	*C_AA_A Side* *ft²*	*Weight* *K*
			0'			1" Ice	7.097	4.333	0.140
APXVTM14-C-I20	C	From Leg	4.000	0.000	120'	No Ice	6.342	3.607	0.056
			0'			1/2" Ice	6.716	3.967	0.096
			0'			1" Ice	7.097	4.333	0.140
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	120'	No Ice	8.498	6.946	0.083
Mount Pipe			0'			1/2" Ice	9.149	8.127	0.151
			0'			1" Ice	9.767	9.021	0.227
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	120'	No Ice	8.498	6.946	0.083
Mount Pipe			0'			1/2" Ice	9.149	8.127	0.151
			0'			1" Ice	9.767	9.021	0.227
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	120'	No Ice	8.498	6.946	0.083
Mount Pipe			0'			1/2" Ice	9.149	8.127	0.151
			0'			1" Ice	9.767	9.021	0.227
TD-RRH8x20-25	A	From Leg	4.000	0.000	120'	No Ice	3.704	1.294	0.066
			0'			1/2" Ice	3.946	1.465	0.090
			0'			1" Ice	4.196	1.642	0.117
TD-RRH8x20-25	B	From Leg	4.000	0.000	120'	No Ice	3.704	1.294	0.066
			0'			1/2" Ice	3.946	1.465	0.090
			0'			1" Ice	4.196	1.642	0.117
TD-RRH8x20-25	C	From Leg	4.000	0.000	120'	No Ice	3.704	1.294	0.066
			0'			1/2" Ice	3.946	1.465	0.090
			0'			1" Ice	4.196	1.642	0.117
1900 MHz 4x45 RRH	A	From Leg	4.000	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	A	From Leg	4.000	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	A	From Leg	4.000	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	4.000	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	4.000	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	4.000	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	4.000	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	4.000	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	4.000	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	4.000	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	4.000	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	4.000	0.000	120'	No Ice	0.300	0.150	0.011
			0'			1/2" Ice	0.370	0.204	0.014

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	0.448	0.265	0.018
6' x 2" Mount Pipe	A	From Leg	4.000	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	4.000	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	4.000	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
R									
(2) LGP 21401 TMA	A	From Leg	4.000	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	4.000	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	4.000	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
RRUS 11	A	From Face	0.500	0.000	110'	No Ice	2.522	1.303	0.051
			0'			1/2" Ice	2.719	1.453	0.072
			0'			1" Ice	2.923	1.609	0.097
RRUS 11	B	From Face	0.500	0.000	110'	No Ice	2.522	1.303	0.051
			0'			1/2" Ice	2.719	1.453	0.072
			0'			1" Ice	2.923	1.609	0.097
RRUS 11	C	From Face	0.500	0.000	110'	No Ice	2.522	1.303	0.051
			0'			1/2" Ice	2.719	1.453	0.072
			0'			1" Ice	2.923	1.609	0.097
DC2-48-60-18-8F	B	From Leg	0.500	0.000	110'	No Ice	2.200	2.200	0.033
			0'			1/2" Ice	2.398	2.398	0.056
			0'			1" Ice	2.604	2.604	0.081
(P) HPA-65R-BUU-H6	A	From Leg	4.000	0.000	110'	No Ice	10.122	5.486	0.043
			0'			1/2" Ice	10.688	5.942	0.100
			0'			1" Ice	11.263	6.405	0.164
(P) HPA-65R-BUU-H6	B	From Leg	4.000	0.000	110'	No Ice	10.122	5.486	0.043
			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	4.000	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	4.000	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	4.000	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	4.000	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	3.500	0.000	110'	No Ice	3.145	1.285	0.058
			0'			1/2" Ice	3.365	1.438	0.081
			0'			1" Ice	3.592	1.600	0.108
RRUS 12	B	From Leg	3.500	0.000	110'	No Ice	3.145	1.285	0.058

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	3.365	1.438	0.081
			0'			1" Ice	3.592	1.600	0.108
RRUS 12	C	From Leg	3.500	0.000	110'	No Ice	3.145	1.285	0.058
			0'			1/2" Ice	3.365	1.438	0.081
			0'			1" Ice	3.592	1.600	0.108
RRUS A2	A	From Leg	3.500	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	3.500	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	3.500	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	3.500	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	3.500	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	3.500	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
(2) LGP21901	A	From Leg	3.500	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	3.500	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	3.500	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	4.000	0.000	110'	No Ice	0.062	0.174	1.800
			0'			1/2" Ice	0.097	0.229	1.802
			0'			1" Ice	0.140	0.292	1.804
ATSBT-TOP-MF-4G	B	From Leg	4.000	0.000	110'	No Ice	0.062	0.174	1.800
			0'			1/2" Ice	0.097	0.229	1.802
			0'			1" Ice	0.140	0.292	1.804
ATSBT-TOP-MF-4G	C	From Leg	4.000	0.000	110'	No Ice	0.062	0.174	1.800
			0'			1/2" Ice	0.097	0.229	1.802
			0'			1" Ice	0.140	0.292	1.804
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
R									
Air 21 B2A/B4P	A	From Leg	4.000	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	4.000	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	4.000	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 B4A/B2P	A	From Leg	4.000	0.000	93'	No Ice	6.037	4.256	0.090
			0'			1/2" Ice	6.406	4.609	0.132
			0'			1" Ice	6.781	4.964	0.178

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Air 21 B4A/B2P	B	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	6.037 6.406	4.256 4.609	0.090 0.132
			0'			1" Ice	6.781	4.964	0.178
Air 21 B4A/B2P	C	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	6.037 6.406	4.256 4.609	0.090 0.132
			0'			1" Ice	6.781	4.964	0.178
(2) KRY 112 144/1	A	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	0.351 0.427	0.156 0.212	0.011 0.014
			0'			1" Ice	0.510	0.277	0.018
(2) KRY 112 144/1	B	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	0.351 0.427	0.156 0.212	0.011 0.014
			0'			1" Ice	0.510	0.277	0.018
(2) KRY 112 144/1	C	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	0.351 0.427	0.156 0.212	0.011 0.014
			0'			1" Ice	0.510	0.277	0.018
LNX-6515DS-A1M	A	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	11.445 12.064	7.696 8.289	0.050 0.116
			0'			1" Ice	12.689	8.889	0.190
LNX-6515DS-A1M	B	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	11.445 12.064	7.696 8.289	0.050 0.116
			0'			1" Ice	12.689	8.889	0.190
LNX-6515DS-A1M	C	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	11.445 12.064	7.696 8.289	0.050 0.116
			0'			1" Ice	12.689	8.889	0.190
S11B12	A	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	2.833 3.043	1.182 1.330	0.051 0.072
			0'			1" Ice	3.259	1.485	0.096
S11B12	B	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	2.833 3.043	1.182 1.330	0.051 0.072
			0'			1" Ice	3.259	1.485	0.096
S11B12	C	From Leg	4.000 0'	0.000	93'	No Ice 1/2" Ice	2.833 3.043	1.182 1.330	0.051 0.072
			0'			1" Ice	3.259	1.485	0.096
Sector Mount [SM 402-3]	C	None		0.000	93'	No Ice 1/2" Ice	18.910 26.780	18.910 26.780	0.851 1.233
						1" Ice	34.650	34.650	1.616
Miscellaneous [NA 507-1]	C	None		0.000	93'	No Ice 1/2" Ice	4.800 6.700	4.800 6.700	0.245 0.294
						1" Ice	8.600	8.600	0.343
VSR-TS-B Stabilizer Kit	C	None		0.000	93'	No Ice 1/2" Ice	14.500 17.400	14.500 17.400	0.376 0.396
R						1" Ice	20.300	20.300	0.417
(2) BXA-70063/6CF	A	From Leg	4.000 0'	0.000	80'	No Ice 1/2" Ice	7.731 8.424	4.158 4.627	0.017 0.059
			0'			1" Ice	9.134	5.161	0.102
(2) BXA-70063/6CF	B	From Leg	4.000 0'	0.000	80'	No Ice 1/2" Ice	7.731 8.424	4.158 4.627	0.017 0.059
			0'			1" Ice	9.134	5.161	0.102
(2) BXA-70063/6CF	C	From Leg	4.000 0'	0.000	80'	No Ice 1/2" Ice	7.731 8.424	4.158 4.627	0.017 0.059
			0'			1" Ice	9.134	5.161	0.102
(2) BXA-171063/12CF	A	From Leg	4.000 0'	0.000	80'	No Ice 1/2" Ice	4.967 5.483	3.618 4.040	0.013 0.041
			0'			1" Ice	6.051	4.551	0.069
(2) BXA-171063/12CF	B	From Leg	4.000 0'	0.000	80'	No Ice 1/2" Ice	4.967 5.483	3.618 4.040	0.013 0.041

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0'			1" Ice	6.051	4.551	0.069
(2) BXA-171063/12CF	C	From Leg	4.000	0.000	80'	No Ice	4.967	3.618	0.013
			0'			1/2" Ice	5.483	4.040	0.041
			0'			1" Ice	6.051	4.551	0.069
RRH2x40-700U	A	From Leg	4.000	0.000	80'	No Ice	2.161	1.420	0.044
			0'			1/2" Ice	2.360	1.590	0.061
			0'			1" Ice	2.565	1.768	0.082
RRH2x40-700U	B	From Leg	4.000	0.000	80'	No Ice	2.161	1.420	0.044
			0'			1/2" Ice	2.360	1.590	0.061
			0'			1" Ice	2.565	1.768	0.082
RRH2x40-700U	C	From Leg	4.000	0.000	80'	No Ice	2.161	1.420	0.044
			0'			1/2" Ice	2.360	1.590	0.061
			0'			1" Ice	2.565	1.768	0.082
RRH2x40-AWS	A	From Leg	4.000	0.000	80'	No Ice	2.161	1.420	0.044
			0'			1/2" Ice	2.360	1.590	0.061
			0'			1" Ice	2.565	1.768	0.082
RRH2x40-AWS	B	From Leg	4.000	0.000	80'	No Ice	2.161	1.420	0.044
			0'			1/2" Ice	2.360	1.590	0.061
			0'			1" Ice	2.565	1.768	0.082
RRH2x40-AWS	C	From Leg	4.000	0.000	80'	No Ice	2.161	1.420	0.044
			0'			1/2" Ice	2.360	1.590	0.061
			0'			1" Ice	2.565	1.768	0.082
DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	80'	No Ice	4.800	2.000	0.044
			0'			1/2" Ice	5.070	2.193	0.080
			0'			1" Ice	5.348	2.393	0.120
Sector Mount [SM 104-3]	C	None		0.000	80'	No Ice	30.020	30.020	0.953
						1/2" Ice	40.480	40.480	1.405
						1" Ice	50.940	50.940	1.857

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / 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	0.000		124'	2.500	No Ice	4.909	0.048
				0'					1/2" Ice	5.241	0.075
				0'					1" Ice	5.574	0.102
VHLP2.5	B	Paraboloid w/Radome	From Leg	4.000	0.000		124'	2.500	No Ice	4.909	0.048
				0'					1/2" Ice	5.241	0.075
				0'					1" Ice	5.574	0.102
VHLP2.5	C	Paraboloid w/Radome	From Leg	4.000	0.000		124'	2.500	No Ice	4.909	0.048
				0'					1/2" Ice	5.241	0.075
				0'					1" Ice	5.574	0.102
R											

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	130 - 120	8.378	47	0.587	0.022
T2	120 - 117.143	7.152	47	0.581	0.021

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	117.143 - 114.286	6.805	47	0.577	0.019
T4	114.286 - 111.43	6.460	47	0.571	0.017
T5	111.43 - 108.573	6.119	47	0.564	0.014
T6	108.573 - 105.716	5.780	47	0.555	0.012
T7	105.716 - 102.859	5.447	47	0.542	0.010
T8	102.859 - 100	5.121	47	0.527	0.007
T9	100 - 96	4.806	47	0.509	0.005
T10	96 - 92	4.384	47	0.481	0.003
T11	92 - 88	3.991	47	0.451	0.002
T12	88 - 84	3.623	47	0.420	0.001
T13	84 - 80	3.278	47	0.397	0.001
T14	80 - 75	2.952	47	0.374	0.001
T15	75 - 70	2.568	47	0.347	0.002
T16	70 - 65	2.213	47	0.320	0.002
T17	65 - 60	1.888	47	0.291	0.002
T18	60 - 55	1.595	47	0.261	0.002
T19	55 - 50	1.333	47	0.231	0.002
T20	50 - 45	1.098	47	0.208	0.002
T21	45 - 40	0.888	47	0.185	0.002
T22	40 - 33.3333	0.700	47	0.162	0.002
T23	33.3333 - 26.6667	0.486	47	0.134	0.002
T24	26.6667 - 20	0.313	47	0.106	0.001
T25	20 - 13.3333	0.178	47	0.078	0.001
T26	13.3333 - 6.66666	0.080	47	0.050	0.001
T27	6.66666 - 0	0.018	47	0.023	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128'	LLPX310R	47	8.132	0.586	0.023	134439
124'	VHLP2.5	47	7.642	0.584	0.023	111858
120'	APXVTM14-C-I20	47	7.152	0.581	0.021	54687
110'	(2) LGP 21401 TMA	47	5.949	0.560	0.013	22368
93'	Air 21 B2A/B4P	47	4.087	0.459	0.002	7071
80'	(2) BXA-70063/6CF	47	2.952	0.374	0.001	11158

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	130 - 120	34.689	18	2.421	0.093
T2	120 - 117.143	29.597	18	2.398	0.089
T3	117.143 - 114.286	28.153	18	2.384	0.078
T4	114.286 - 111.43	26.720	18	2.364	0.068
T5	111.43 - 108.573	25.303	18	2.336	0.058
T6	108.573 - 105.716	23.899	18	2.300	0.048
T7	105.716 - 102.859	22.514	18	2.251	0.039
T8	102.859 - 100	21.162	18	2.187	0.031
T9	100 - 96	19.855	18	2.111	0.022

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T10	96 - 92	18.107	18	1.994	0.011
T11	92 - 88	16.478	18	1.868	0.007
T12	88 - 84	14.956	18	1.738	0.005
T13	84 - 80	13.528	18	1.644	0.004
T14	80 - 75	12.178	18	1.545	0.005
T15	75 - 70	10.591	18	1.435	0.007
T16	70 - 65	9.126	18	1.320	0.008
T17	65 - 60	7.784	18	1.200	0.008
T18	60 - 55	6.572	18	1.078	0.008
T19	55 - 50	5.491	18	0.954	0.008
T20	50 - 45	4.521	18	0.859	0.008
T21	45 - 40	3.655	18	0.764	0.007
T22	40 - 33.3333	2.882	18	0.667	0.007
T23	33.3333 - 26.6667	2.000	18	0.552	0.006
T24	26.6667 - 20	1.289	18	0.437	0.005
T25	20 - 13.3333	0.733	18	0.322	0.005
T26	13.3333 - 6.66666	0.328	18	0.207	0.003
T27	6.66666 - 0	0.076	18	0.093	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
128'	LLPX310R	18	33.668	2.418	0.094	33121
124'	VHLP2.5	18	31.629	2.410	0.095	27561
120'	APXVTM14-C-I20	18	29.597	2.398	0.089	14245
110'	(2) LGP 21401 TMA	18	24.599	2.319	0.053	5823
93'	Air 21 B2A/B4P	18	16.875	1.901	0.008	1718
80'	(2) BXA-70063/6CF	18	12.178	1.545	0.005	2685

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	130	Leg	A325N	1.000	1	7.342	53.014	0.138 ✔	1	Bolt Tension
T8	102.859	Leg	A325N	0.750	4	14.437	29.821	0.484 ✔	1	Bolt Tension
T9	100	Diagonal	A325N	0.500	1	3.263	4.690	0.696 ✔	1	Member Block Shear
T10	96	Diagonal	A325X	0.500	1	4.285	9.719	0.441 ✔	1	Bolt Shear
T11	92	Diagonal	A325N	0.500	1	6.089	9.380	0.649 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.188	7.952	0.401 ✔	1	Bolt Shear
T12	88	Diagonal	A325N	0.500	1	5.897	9.380	0.629 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.918	7.952	0.493 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T13	84	Leg	A325N	1.000	8	12.876	53.014	0.243 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	5.102	9.380	0.544 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.328	7.952	0.419 ✔	1	Bolt Shear
T14	80	Diagonal	A325X	0.500	1	5.510	9.719	0.567 ✔	1	Bolt Shear
T15	75	Diagonal	A325N	0.500	1	5.779	9.380	0.616 ✔	1	Member Block Shear
T16	70	Diagonal	A325N	0.500	1	5.021	9.380	0.535 ✔	1	Member Block Shear
T17	65	Leg	A325N	1.000	8	20.173	53.014	0.381 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	5.356	9.380	0.571 ✔	1	Member Block Shear
T18	60	Diagonal	A325N	0.500	1	6.539	9.380	0.697 ✔	1	Member Block Shear
		Secondary Horizontal	A325N	0.500	1	3.496	4.133	0.846 ✔	1	Member Bearing
T19	55	Diagonal	A325N	0.500	1	4.361	9.380	0.465 ✔	1	Member Block Shear
T20	50	Diagonal	A325N	0.500	1	5.233	9.380	0.558 ✔	1	Member Block Shear
T21	45	Leg	A325N	1.000	8	26.087	53.014	0.492 ✔	1	Bolt Tension
		Diagonal	A325X	0.500	1	6.349	9.719	0.653 ✔	1	Bolt Shear
		Secondary Horizontal	A325N	0.500	1	4.190	7.952	0.527 ✔	1	Bolt Shear
T22	40	Diagonal	A325N	0.500	1	5.067	11.419	0.444 ✔	1	Member Block Shear
T23	33.3333	Diagonal	A325N	0.500	1	5.368	11.419	0.470 ✔	1	Member Block Shear
T24	26.6667	Leg	A325N	1.000	8	31.452	53.014	0.593 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	5.014	11.419	0.439 ✔	1	Member Block Shear
T25	20	Diagonal	A325X	0.500	1	5.345	6.199	0.862 ✔	1	Member Bearing
T26	13.3333	Diagonal	A325X	0.500	1	5.218	6.199	0.842 ✔	1	Member Bearing
		Secondary Horizontal	A325N	0.625	1	5.451	10.500	0.519 ✔	1	Member Block Shear
T27	6.66666	Leg	A36M-55	1.500	6	49.345	84.492	0.584 ✔	1	Bolt Tension
		Diagonal	A325N	0.500	1	6.599	12.398	0.532 ✔	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	1.767	-8.782	47.300	0.186 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=1.00				✔
T2	120 - 117.143	2	2'10-9/32"	2'9-9/32"	66.6 K=1.00	3.142	-12.765	95.057	0.134 [1] ✔
T3	117.143 - 114.286	2	2'10-9/32"	2'9-9/32"	66.6 K=1.00	3.142	-18.978	95.057	0.200 [1] ✔
T4	114.286 - 111.43	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-24.610	93.381	0.264 [1] ✔
T5	111.43 - 108.573	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-39.817	93.381	0.426 [1] ✔
T6	108.573 - 105.716	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-49.736	93.381	0.533 [1] ✔
T7	105.716 - 102.859	2	2'10-9/32"	2'10-9/32"	68.6 K=1.00	3.142	-61.535	93.381	0.659 [1] ✔
T8	102.859 - 100	2	2'10-5/16"	1'4-21/32"	33.3 K=1.00	3.142	-78.206	118.274	0.661 [1] ✔
T9	100 - 96	P4.5 x 0.237	4'1/32"	4'1/32"	31.8 K=1.00	3.174	-81.033	142.411	0.569 [1] ✔
T10	96 - 92	P4.5 x 0.237	4'1/32"	4'1/32"	31.8 K=1.00	3.174	-94.465	142.411	0.663 [1] ✔
T11	92 - 88	P4.5 x 0.237	4'1/32"	2'13/16"	16.4 K=1.00	3.174	-102.093	151.005	0.676 [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	-115.061	221.384	0.520 [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	-127.265	221.402	0.575 [1] ✔
T14	80 - 75	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-143.575	256.371	0.560 [1] ✔
T15	75 - 70	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-160.319	256.371	0.625 [1] ✔
T16	70 - 65	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-176.037	256.371	0.687 [1] ✔
T17	65 - 60	P6.625x0.280	5'1/32"	5'1/32"	26.7 K=1.00	5.581	-190.767	256.371	0.744 [1] ✔
T18	60 - 55	P6.625x0.280	5'1/32"	2'6-13/16"	13.7 K=1.00	5.581	-201.765	267.248	0.755 [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	-218.905	344.376	0.636 [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	-231.114	344.376	0.671 [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	-241.834	353.331	0.684 [1] ✔
T22	40 - 33.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-257.004	367.767	0.699 [1] ✔
T23	33.3333 - 26.6667	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-273.470	367.767	0.744 [1] ✔
T24	26.6667 - 20	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-288.114	367.767	0.783 [1] ✔
T25	20 - 13.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5 K=1.00	8.405	-302.056	367.767	0.821 [1] ✔
T26	13.3333 - 6.66666	P6.625x.432	6'8-1/32"	3'4-31/32"	18.7 K=1.00	8.405	-314.608	397.395	0.792 [1] ✔
T27	6.66666 - 0	BT101341- P6.625 x .432 w/	6'8-1/32"	6'7-1/32"	36.5	10.183	-337.847	445.367	0.759 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
		HP7.625x0.301	'	'	K=1.00				✔

[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	-1.263	2.965	0.426 [1] ✔
T2	120 - 117.143	3/4	3'8-13/16"	1'8-29/32"	89.6 K=0.80	0.442	-2.516	9.384	0.268 [1] ✔
T3	117.143 - 114.286	3/4	3'8-13/16"	1'8-29/32"	89.6 K=0.80	0.442	-2.477	9.384	0.264 [1] ✔
T4	114.286 - 111.43	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-2.474	9.369	0.264 [1] ✔
T5	111.43 - 108.573	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-3.416	9.369	0.365 [1] ✔
T6	108.573 - 105.716	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-4.558	9.369	0.487 [1] ✔
T7	105.716 - 102.859	3/4	3'9-9/16"	1'9-1/4"	89.7 K=0.79	0.442	-4.414	9.369	0.471 [1] ✔
T8	102.859 - 100	3/4	3'8-27/32"	1'8-29/32"	89.6 K=0.80	0.442	-4.822	9.384	0.514 [1] ✔
T9	100 - 96	L1 1/2x1 1/2x3/16	4'9-1/4"	2'7/16"	92.5 K=1.11	0.527	-4.025	10.892	0.370 [1] ✔
T10	96 - 92	L2x2x1/4	4'10-19/32"	2'15/16"	77.8 K=1.22	0.938	-4.179	22.096	0.189 [1] ✔
T11	92 - 88	2L1 1/2x1 1/2x3/16x3/8	5'	2'3-1/4"	59.7 K=1.00	1.055	-7.291	28.334	0.257 [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	-6.816	27.999	0.243 [1] ✔
T13	84 - 80	2L1 1/2x1 1/2x3/16x3/8	5'3"	2'4-31/32"	63.4 K=1.00	1.055	-5.848	27.654	0.211 [1] ✔
T14	80 - 75	L2x2x1/4	6'2-1/8"	2'7-3/16"	89.8 K=1.13	0.938	-5.510	19.872	0.277 [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	-6.178	26.164	0.236 [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	-5.546	25.691	0.216 [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	-5.771	25.205	0.229 [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	-7.409	24.144	0.307 [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	-4.657	24.196	0.192 [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	-5.682	23.674	0.240 [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	-6.349	17.253	0.368 [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	-5.717	26.573	0.215 [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	-5.998	25.910	0.231 [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	-5.687	25.232	0.225 [1] ✔
T25	20 - 13.3333	L2x2x3/16	9'5-5/32"	4'4-1/16"	132.2 K=1.00	0.715	-5.870	9.232	0.636 [1] ✔
T26	13.3333 - 6.66666	L2x2x3/16	9'8"	4'6-13/16"	139.2 K=1.00	0.715	-5.768	8.336	0.692 [1] ✔
T27	6.66666 - 0	2L2x2x3/16x3/8	9'10-1/4"	4'6-3/4"	88.7 K=1.00	1.430	-7.505	30.610	0.245 [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	-0.261	6.709	0.039 [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	-1.241	10.739	0.116 [1] ✔
T11	92 - 88	4x3/8	2'11-31/32"	2'7-15/32"	145.3 K=0.50	1.500	-2.454	16.048	0.153 [1] ✔
T12	88 - 84	4x3/8	3'2-11/32"	2'9-27/32"	156.4 K=0.50	1.500	-2.977	13.861	0.215 [1] ✔
T13	84 - 80	4x3/8	3'4-3/4"	3'1/4"	167.5 K=0.50	1.500	-2.626	12.081	0.217 [1] ✔
T18	60 - 55	L2x2x1/8	4'7-15/32"	4'27/32"	39.0 K=0.50	0.484	-3.496	14.034	0.249 [1] ✔
T21	45 - 40	L3x3x5/16	5'4-15/32"	4'9-27/32"	31.4 K=0.50	1.780	-4.190	54.761	0.077 [1] ✔
T26	13.3333 - 6.66666	L2x2x1/4	6'11-15/16"	6'5-5/16"	63.5 K=0.50	0.938	-5.451	24.581	0.222 [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	-0.024	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	-0.179	6.795	0.026 [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	-0.060	6.709	0.009 [1] ✔
T8	102.859 - 100	L1 1/4x1 1/4x3/16	2'6"	2'4"	117.5 K=1.02	0.434	-0.744	6.795	0.109 [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	7.342	71.569	0.103 [1] ✔
T2	120 - 117.143	2	2'10-9/32"	2'9-9/32"	66.6	3.142	9.762	127.235	0.077 [1] ✔
T3	117.143 - 114.286	2	2'10-9/32"	2'9-9/32"	66.6	3.142	15.620	127.235	0.123 [1] ✔
T4	114.286 - 111.43	2	2'10-9/32"	2'10-9/32"	68.6	3.142	21.094	127.235	0.166 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	111.43 - 108.573	2	2'10-9/32"	2'10-9/32"	68.6	3.142	27.658	127.235	0.217 [1] ✔
T6	108.573 - 105.716	2	2'10-9/32"	2'10-9/32"	68.6	3.142	31.063	127.235	0.244 [1] ✔
T7	105.716 - 102.859	2	2'10-9/32"	2'10-9/32"	68.6	3.142	41.922	127.235	0.329 [1] ✔
T8	102.859 - 100	2	2'10-5/16"	1'4-21/32"	33.3	3.142	57.748	127.235	0.454 [1] ✔
T9	100 - 96	P4.5 x 0.237	4'1/32"	4'1/32"	31.8	3.174	61.459	154.259	0.398 [1] ✔
T10	96 - 92	P4.5 x 0.237	4'1/32"	4'1/32"	31.8	3.174	71.931	154.259	0.466 [1] ✔
T11	92 - 88	P4.5 x 0.237	4'1/32"	2'13/16"	16.4	3.174	80.044	154.259	0.519 [1] ✔
T12	88 - 84	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'25/32"	16.8	4.658	91.846	226.401	0.406 [1] ✔
T13	84 - 80	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	4'1/32"	2'23/32"	16.8	4.658	103.137	226.401	0.456 [1] ✔
T14	80 - 75	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	117.392	271.254	0.433 [1] ✔
T15	75 - 70	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	132.661	271.254	0.489 [1] ✔
T16	70 - 65	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	147.694	271.254	0.544 [1] ✔
T17	65 - 60	P6.625x0.280	5'1/32"	5'1/32"	26.7	5.581	161.384	271.254	0.595 [1] ✔
T18	60 - 55	P6.625x0.280	5'1/32"	2'6-13/16"	13.7	5.581	172.274	271.254	0.635 [1] ✔
T19	55 - 50	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1	7.511	187.433	365.013	0.513 [1] ✔
T20	50 - 45	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	5'1/32"	5'1/32"	27.1	7.511	198.886	365.013	0.545 [1] ✔
T21	45 - 40	BT101341- P6.625x0.280 w/ HP7.625x0.301	5'1/32"	2'6-23/32"	13.9	7.382	208.911	358.744	0.582 [1] ✔
T22	40 - 33.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	223.067	408.480	0.546 [1] ✔
T23	33.3333 - 26.6667	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	238.208	408.480	0.583 [1] ✔
T24	26.6667 - 20	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	251.618	408.480	0.616 [1] ✔
T25	20 - 13.3333	P6.625x.432	6'8-1/32"	6'8-1/32"	36.5	8.405	264.234	408.480	0.647 [1] ✔
T26	13.3333 - 6.66666	P6.625x.432	6'8-1/32"	3'4-31/32"	18.7	8.405	275.631	408.480	0.675 [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	296.069	494.913	0.598 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	130 - 120	1/2	3'6-1/4"	1'8-1/16"	160.6	0.196	1.204	6.362	0.189 [1] ✔
T2	120 - 117.143	3/4	3'8-13/16"	1'8-29/32"	111.5	0.442	2.473	14.314	0.173 [1] ✔
T3	117.143 - 114.286	3/4	3'8-13/16"	1'8-29/32"	111.5	0.442	2.502	14.314	0.175 [1] ✔
T4	114.286 - 111.43	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	2.419	14.314	0.169 [1] ✔
T5	111.43 - 108.573	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	3.465	14.314	0.242 [1] ✔
T6	108.573 - 105.716	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	4.420	14.314	0.309 [1] ✔
T7	105.716 - 102.859	3/4	3'9-9/16"	1'9-1/4"	113.4	0.442	4.496	14.314	0.314 [1] ✔
T8	102.859 - 100	3/4	3'8-27/32"	1'8-29/32"	111.6	0.442	4.446	14.314	0.311 [1] ✔
T9	100 - 96	L1 1/2x1 1/2x3/16	4'9-1/4"	2'7/16"	56.3	0.308	3.263	13.381	0.244 [1] ✔
T10	96 - 92	L2x2x1/4	4'10-19/32"	2'15/16"	43.4	0.586	4.285	25.505	0.168 [1] ✔
T11	92 - 88	2L1 1/2x1 1/2x3/16x3/8	5'	2'3-1/4"	59.7	0.615	6.089	26.763	0.228 [1] ✔
T12	88 - 84	2L1 1/2x1 1/2x3/16x3/8	5'1-15/32"	2'4-3/32"	61.5	0.615	5.897	26.763	0.220 [1] ✔
T13	84 - 80	2L1 1/2x1 1/2x3/16x3/8	5'3"	2'4-31/32"	63.4	0.615	5.102	26.763	0.191 [1] ✔
T14	80 - 75	L2x2x1/4	6'2-1/8"	2'7-3/16"	53.7	0.586	5.123	25.505	0.201 [1] ✔
T15	75 - 70	2L1 1/2x1 1/2x3/16x3/8	6'3-29/32"	2'8-17/32"	74.0	0.615	5.779	26.763	0.216 [1] ✔
T16	70 - 65	2L1 1/2x1 1/2x3/16x3/8	6'5-25/32"	2'9-5/8"	76.4	0.615	5.021	26.763	0.188 [1] ✔
T17	65 - 60	2L1 1/2x1 1/2x3/16x3/8	6'7-23/32"	2'10-23/32"	78.8	0.615	5.356	26.763	0.200 [1] ✔
T18	60 - 55	2L1 1/2x1 1/2x3/16x3/8	6'9-23/32"	3'1-3/32"	81.2	0.615	6.539	26.763	0.244 [1] ✔
T19	55 - 50	2L1 1/2x1 1/2x3/16x3/8	6'11-13/16"	3'31/32"	83.7	0.615	4.361	26.763	0.163 [1] ✔
T20	50 - 45	2L1 1/2x1 1/2x3/16x3/8	7'1-29/32"	3'2-1/8"	86.2	0.615	5.233	26.763	0.196 [1] ✔
T21	45 - 40	L2x2x1/4	7'4-3/32"	3'4-9/16"	66.6	0.586	5.793	25.505	0.227 [1] ✔
T22	40 - 33.3333	2L1 3/4x1 3/4x3/16x3/8	8'9"	3'11-11/16"	91.1	0.756	5.067	32.880	0.154 [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	5.368	32.880	0.163 [1] ✔
T24	26.6667 - 20	2L1 3/4x1 3/4x3/16x3/8	9'2-11/32"	4'2-9/16"	96.5	0.756	5.014	32.880	0.153 [1] ✔
T25	20 - 13.3333	L2x2x3/16	9'5-5/32"	4'4-1/16"	86.3	0.448	5.345	19.499	0.274 [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	5.218	19.499	0.268 [1] ✔
T27	6.66666 - 0	2L2x2x3/16x3/8	9'10-1/4"	4'6-3/4"	90.8	0.897	6.599	39.007	0.169 [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	0.295	14.048	0.021 [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	1.241	15.694	0.079 [1] ✔
T11	92 - 88	4x3/8	2'11-31/32"	2'7-15/32"	290.6	0.949	3.188	41.291	0.077 [1] ✔
T12	88 - 84	4x3/8	3'2-11/32"	2'9-27/32"	312.7	0.949	3.918	41.291	0.095 [1] ✔
T13	84 - 80	4x3/8	3'4-3/4"	3'1/4"	335.0	0.949	3.328	41.291	0.081 [1] ✔
T18	60 - 55	L2x2x1/8	4'7-15/32"	4'27/32"	78.0	0.305	3.496	13.254	0.264 [1] ✔
T21	45 - 40	L3x3x5/16	5'4-15/32"	4'9-27/32"	62.7	1.189	4.190	51.700	0.081 [1] ✔
T26	13.3333 - 6.66666	L2x2x1/4	6'11-15/16"	6'5-5/16"	127.0	0.563	5.451	24.485	0.223 [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	0.029	14.048	0.002 [1] ✔
T2	120 - 117.143	L1 1/4x1 1/4x3/16	2'6"	2'4"	74.4	0.434	0.221	14.048	0.016 [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	0.082	14.048	0.006 [1] ✔
T8	102.859 - 100	L1 1/4x1 1/4x3/16	2'6"	2'4"	74.4	0.434	0.909	14.048	0.065 [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	-8.782	47.300	18.6	Pass
		Diagonal	1/2	12	-1.263	2.965	42.6	Pass
		Horizontal	L1 1/4x1 1/4x3/16	35	-0.261	6.709	3.9	Pass
		Top Girt	L1 1/4x1 1/4x3/16	4	-0.024	6.709	0.4	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	7	-0.060	6.709	0.9	Pass
T2	120 - 117.143	Leg	2	45	-12.765	95.057	13.4	Pass
		Diagonal	3/4	51	-2.516	9.384	26.8	Pass
		Top Girt	L1 1/4x1 1/4x3/16	46	-0.179	6.795	2.6	Pass
T3	117.143 - 114.286	Leg	2	57	-18.978	95.057	20.0	Pass
		Diagonal	3/4	61	-2.477	9.384	26.4	Pass
T4	114.286 - 111.43	Leg	2	66	-24.610	93.381	26.4	Pass
		Diagonal	3/4	70	-2.474	9.369	26.4	Pass
T5	111.43 - 108.573	Leg	2	75	-39.817	93.381	42.6	Pass
		Diagonal	3/4	80	-3.416	9.369	36.5	Pass
T6	108.573 - 105.716	Leg	2	84	-49.736	93.381	53.3	Pass
		Diagonal	3/4	89	-4.558	9.369	48.7	Pass
T7	105.716 - 102.859	Leg	2	93	-61.535	93.381	65.9	Pass
		Diagonal	3/4	98	-4.414	9.369	47.1	Pass
T8	102.859 - 100	Leg	2	102	-78.206	118.274	66.1	Pass
		Diagonal	3/4	111	-4.822	9.384	51.4	Pass
		Secondary Horizontal	L2x2x1/8	113	-1.241	10.739	11.6	Pass
		Bottom Girt	L1 1/4x1 1/4x3/16	103	-0.744	6.795	10.9	Pass
T9	100 - 96	Leg	P4.5 x 0.237	117	-81.033	142.411	56.9	Pass
		Diagonal	L1 1/2x1 1/2x3/16	123	-4.025	10.892	37.0	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							69.6 (b)	
T10	96 - 92	Leg	P4.5 x 0.237	126	-94.465	142.411	66.3	Pass
		Diagonal	L2x2x1/4	132	-4.179	22.096	18.9	Pass
							44.1 (b)	
T11	92 - 88	Leg	P4.5 x 0.237	135	-102.093	151.005	67.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	141	-7.291	28.334	25.7	Pass
							64.9 (b)	
		Secondary Horizontal	4x3/8	142	-2.454	16.048	15.3	Pass
							40.1 (b)	
T12	88 - 84	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	147	-115.061	221.384	52.0	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	153	-6.816	27.999	24.3	Pass
							62.9 (b)	
		Secondary Horizontal	4x3/8	154	-2.977	13.861	21.5	Pass
							49.3 (b)	
T13	84 - 80	Leg	BT101341- P4.5 x 0.237 w/ HP5.625x0.375	157	-127.265	221.402	57.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	165	-5.848	27.654	21.1	Pass
							54.4 (b)	
		Secondary Horizontal	4x3/8	166	-2.626	12.081	21.7	Pass
							41.9 (b)	
T14	80 - 75	Leg	P6.625x0.280	169	-143.575	256.371	56.0	Pass
		Diagonal	L2x2x1/4	177	-5.510	19.872	27.7	Pass
							56.7 (b)	
T15	75 - 70	Leg	P6.625x0.280	178	-160.319	256.371	62.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	185	-6.178	26.164	23.6	Pass
							61.6 (b)	
T16	70 - 65	Leg	P6.625x0.280	187	-176.037	256.371	68.7	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	194	-5.546	25.691	21.6	Pass
							53.5 (b)	
T17	65 - 60	Leg	P6.625x0.280	196	-190.767	256.371	74.4	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	203	-5.771	25.205	22.9	Pass
							57.1 (b)	
T18	60 - 55	Leg	P6.625x0.280	205	-201.765	267.248	75.5	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	213	-7.409	24.144	30.7	Pass
							69.7 (b)	
		Secondary Horizontal	L2x2x1/8	214	3.496	13.254	26.4	Pass
							84.6 (b)	
T19	55 - 50	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	217	-218.905	344.376	63.6	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	220	-4.657	24.196	19.2	Pass
							46.5 (b)	
T20	50 - 45	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301(45'-55')	226	-231.114	344.376	67.1	Pass
		Diagonal	2L1 1/2x1 1/2x3/16x3/8	229	-5.682	23.674	24.0	Pass
							55.8 (b)	
T21	45 - 40	Leg	BT101341- P6.625x0.280 w/ HP7.625x0.301	235	-241.834	353.331	68.4	Pass
		Diagonal	L2x2x1/4	238	-6.349	17.253	36.8	Pass
							65.3 (b)	
		Secondary Horizontal	L3x3x5/16	244	4.190	51.700	8.1	Pass
							52.7 (b)	
T22	40 - 33.3333	Leg	P6.625x.432	247	-257.004	367.767	69.9	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	250	-5.717	26.573	21.5	Pass
							44.4 (b)	
T23	33.3333 - 26.6667	Leg	P6.625x.432	256	-273.470	367.767	74.4	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	259	-5.998	25.910	23.1	Pass
							47.0 (b)	
T24	26.6667 - 20	Leg	P6.625x.432	265	-288.114	367.767	78.3	Pass
		Diagonal	2L1 3/4x1 3/4x3/16x3/8	268	-5.687	25.232	22.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							43.9 (b)	
T25	20 - 13.3333	Leg	P6.625x.432	274	-302.056	367.767	82.1	Pass
		Diagonal	L2x2x3/16	277	-5.870	9.232	63.6	Pass
							86.2 (b)	
T26	13.3333 - 6.66666	Leg	P6.625x.432	283	-314.608	397.395	79.2	Pass
		Diagonal	L2x2x3/16	286	-5.768	8.336	69.2	Pass
							84.2 (b)	
		Secondary Horizontal	L2x2x1/4	292	5.451	24.485	22.3	Pass
							51.9 (b)	
T27	6.66666 - 0	Leg	BT101341- P6.625 x .432 w/ HP7.625x0.301	295	-337.847	445.367	75.9	Pass
		Diagonal	2L2x2x3/16x3/8	298	-7.505	30.610	24.5	Pass
							53.2 (b)	
							Summary	
							Leg (T25) 82.1	Pass
							Diagonal (T25) 86.2	Pass
							Horizontal (T1) 3.9	Pass
							Secondary Horizontal (T18) 84.6	Pass
							Top Girt (T2) 2.6	Pass
							Bottom Girt (T8) 10.9	Pass
							Bolt Checks 86.2	Pass
							RATING = 86.2	**Pass**

MATHCAD CALCULATION PRINTOUT

EXISTING 250' SST TOWER ANCHOR BOLT CHECK

REACTIONS ON THE FOUNDATION

As per Tnx output (see attached)

Down load;	$Pv := 337 \cdot kips$	Shear;	$S := 19 \cdot kips$
Uplift load;	$P_{up} := 296 \cdot kips$	Moment;	$M := 0 \cdot kips \cdot ft$

Anchor Rod Data as per tower design by Rohn Industries, Inc., drawing # A971996 dated 05/30/1997, site photos dated 3/16/2016

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

Diameter of Anchors: $D_{anchors} := 1.5in$

Net Tensile Area of Anchors: $A_{anchors} := 1.405in^2$ (Course series assumed)

Ultimate Tensile Stress: $F_{anchors} := 85ksi$ (Grade ASTM A36)

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

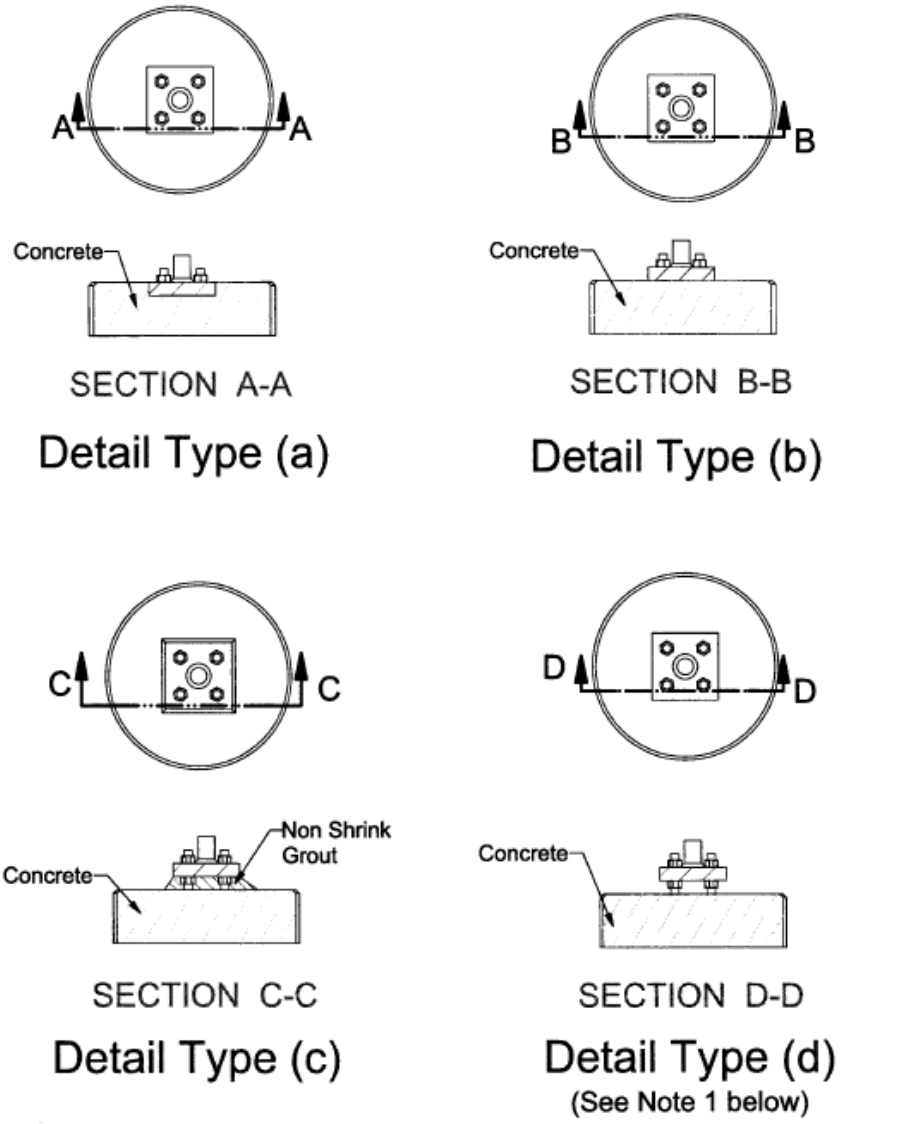
Allowable Axial Load per Anchor: $T_{cap} := \phi_{anchor} \cdot F_{anchors} \cdot A_{anchors}$

$T_{cap} = 95.54 \cdot kips$

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 $\eta := 0.55$

Maximum Load on Anchor: $T_{max} := \dfrac{P_{up} + \dfrac{S}{\eta}}{N_{anchors}}$ $T_{max} = 55.091 \cdot kips$



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

Anchor Rod Capacity: $\frac{T_{max}}{T_{cap}} = 57.663 \cdot \%$ OK!

Summary

-Foundation Reactions from Tower Base-

$S = 19 \cdot kips$

Down load $Pv = 337 \cdot kips$

Uplift load $P_{up} = 296 \cdot kips$

Moment $M = 0 \cdot ft \cdot kip$

Anchor Rod Check $T_{max} = 55.091 \cdot kips$ < $T_{cap} = 95.54 \cdot kips$

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

$Anchor\_Rod\_Check = "OK"$

SELF SUPPORTING TOWER

MAT FOUNDATION CHECK

Existing 130' Self-Support Tower

SBA Site Name: Glastonbury-main St.
SBA Site ID: CT46126-A-03

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

Latitude: 41.714389°
Longitude: -72.613028°

ACGI Job # 17-1967

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 $S := 26 \cdot kips$

Moment $M := 2068 \cdot ft\_K$

Down load, Tower weight $Pv := 57 \cdot kips$

Compression on Pedestal: $P_c := 337 \cdot kips$

Uplift on Pedestal: $P_{up} := 296 \cdot kips$

Shear on Pedestal: $Sh := 19 \cdot kips$

-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.	$C_w := L \cdot B \cdot T_f \cdot (\gamma_c) + Area_{ped} \cdot \gamma_c \cdot (D_f + E_g - T_f) \cdot Nped$	$L_c := \frac{L}{2}$	$R_c := C_w \cdot L_c$
	$C_w = 308.971 \cdot kips$	$L_c = 13\,ft$	$R_c = 4016.627 \cdot ft\_K$
2) Soil wt.	$S_w := \left[L \cdot B \cdot (D_f - T_f) - Area_{ped} \cdot (D_f - T_f) \cdot Nped\right] \cdot \gamma_s$	$L_s := \frac{L}{2}$	$R_s := S_w \cdot L_s$
	$S_w = 78.575 \cdot kips$	$L_s = 13\,ft$	$R_s = 1021.479 \cdot ft\_K$
3) Wt. of soil wedge	$W_w := (D_f) \cdot \frac{1}{2} \cdot (D_f \cdot \tan(\phi)) \cdot B \cdot (\gamma_s)$	$L_w := \left(L + D_f \cdot \frac{\tan(\phi)}{3}\right)$	$R_w := W_w \cdot L_w$
	$W_w = 0 \cdot kips$	$L_w = 26\,ft$	$R_w = 0 \cdot ft\_K$
4) Passive pressure	$Pe_p := T_f \cdot B \cdot P_{pave}$	$L_p := \frac{T_f}{3}$	$R_p := Pe_p \cdot L_p$
	$Pe_p = 14.04 \cdot kips$	$L_p = 1\,ft$	$R_p = 14.04 \cdot ft\_K$
5) Vertical	$Pv = 57 \cdot kips$	$L_v := \frac{L}{2}$	$R_v := Pv \cdot L_v$

$S_{w1} := L \cdot B \cdot D_f \cdot \gamma_s$ $S_{w1} = 324.48 \cdot kips$ <--- for net calcs

Total weight $T_w := C_w + S_w + W_w + Pv$ $T_w = 444.547 \cdot kips$ $L_v = 13\,ft$ $R_v = 741 \cdot ft\_K$

Total resisting Moment= $M_r := R_c + R_s + R_w + R_p + R_v$ $M_r = 5793.146 \cdot ft\_K$

Overturning Moments component	value, kips	lever arm, ft	Overturning Moment ft-kips
1) Moment on foundation due to eccentric location of tower	$Pv = 57 \cdot kips$	$L_{pe} = 0$	$M_{pe} := L_{pe} \cdot Pv$ $M_{pe} = 0 \cdot ft\_K$
2) Moment on foundation	-	-	$M = 2068 \cdot ft\_K$
3) Moment due to horizontal shear	$S_t := S$	$L_{hs} := D_f + E_g$ $L_{hs} = 4.5\,ft$	$O_{hs} := L_{hs} \cdot S_t$ $O_{hs} = 117 \cdot ft\_K$

Total Overturning Moment= $M_o := M + O_{hs} + M_{pe}$ $M_o = 2185 \cdot ft\_K$

Check Safety Factor against Overturning about mid axis parallel to base

$SF := \frac{M_r}{M_o}$ $SF = 2.651$ > 1.5 **O.K!**

Calculate eccentricity, e

$e := \frac{M_o}{T_w}$ $e = 4.915\,ft$

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

$P_{max1} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 + \left(6 \cdot \frac{e}{L}\right)\right], 4 \cdot \frac{T_w}{3 \cdot B \cdot (L - 2 \cdot e)}\right]$ $P_{max1} = 1.41 \cdot ksf$

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

Net soil pressure, $P_{net} = 0.93 \cdot ksf$ < $Brg_{ult} \cdot \phi_{s\_Bear} = 4.5 \cdot ksf$ **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 $P_{hor} := Pe_p + (Pv + C_w + S_w) \cdot FF$

$P_{hor} = 169.631 \cdot kips$ > $S = 26 \cdot kips$ 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 $d := T_f - cc$ $d = 33 \cdot in$ $L_{eff} := if\left(e \le L_{loc}, L, L - 2 \cdot e\right)$ $L_{eff} = 16.17\,ft$

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

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

shear on the face of concrete=

$$Shear_{wide} := (dist) \cdot B \cdot \left[\frac{P_{maxf} + \left[P_{maxf} - \frac{P_{maxf} - P_{minf}}{L_{eff}} \cdot (dist)\right]}{2}\right] \qquad Shear_{wide} = 126.785 \cdot kips$$

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

Shear stress acting on concrete face= $\nu_{act} := \frac{Shear_{wide}}{A_{shear}}$ $\nu_{act} = 12.314 \cdot psi$

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= $\nu_{act} := \frac{P_c - Area_{col} \cdot P_{avg}}{Peri_{col} \cdot d \cdot 4}$

$\nu_{act} = 11.356 \cdot psi$ < $\nu_{punch} = 832.827 \cdot psi$ **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= $D_{eff} := Ped_s - cc \cdot 2$ $D_{eff} = 30 \cdot in$ $h := Ped_s$ $h = 36 \cdot in$

$D_{pier} := Ped_s$

$M_{col} := Sh \cdot (D_f - T_f + E_g)$ $M_{col} = 28.5 \cdot ft\_K$ $\sigma_{bend} := 0.6 \cdot f_y$ $\sigma_{bend} = 36000 \cdot psi$

-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**

$Mn := 3386.987 \cdot in \cdot kips$ As per L-Pile calculation output

$0.9 \cdot Mn = 254.024 \cdot kips \cdot ft$ > $M_{col} = 28.5 \cdot kips \cdot ft$ **OK** $\frac{M_{col}}{0.9Mn} = 11.219 \cdot \%$

Check pedestal in compression

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

$P_{comp} = 38933.758 \cdot kips$ > $P_c = 337 \cdot kips$ **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

$P_{upnet} := P_{up} - \frac{C_{wped} + S_w \cdot 0.95}{Nped}$ $P_{upnet} = 269.527 \cdot kips$ 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

$B_{mo} := RC_{fac} \cdot \left[(TWFW \cdot P_{upnet}) \cdot Langle + S_t \cdot (D_f + E_g)\right]$ $B_{mo} = 1867.632 \cdot ft\_K$

required R_u $R_u := \frac{B_{mo}}{\phi_{bend} \cdot B \cdot d^2}$ $R_u = 73.29 \cdot psi$ $m := \frac{f_y}{\beta_1 \cdot f_c}$ $m = 1.538$

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=

$Ast_f := \rho \cdot B \cdot d$ $Ast_f = 12.588 \cdot in^2$

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 $S = 26 \cdot kips$

Down load $Pv = 57 \cdot kips$ (Weight)

Uplift load $P_{up} = 296 \cdot kips$

Moment; $M = 2068 \cdot ft \cdot kip$

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	$SF = 2.651$	> 1.5	$\frac{1.5}{SF} = 56.575 \cdot \%$	**O.K !**
Net soil pressure	$P_{net} = 0.93 \cdot ksf$	< $Brg_{ult} \cdot \phi_{s\_Bear} = 4.5 \cdot ksf$	$\frac{P_{net}}{Brg_{ult} \cdot \phi_{s\_Bear}} = 20.664 \cdot \%$	**O.K.!**
Check for horizontal shear	$P_{hor} = 169.631 \cdot kips$	> $S = 26 \cdot kips$	$\frac{S}{P_{hor}} = 15.327 \cdot \%$	**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 2015-08.007

                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:
\2017\Structural\17-1967 CT46126-A-03 Glastonbury-main St. 130' SST (SBA)\LPile\

Name of input data file:
Lpile - Rebar check.lp8d

Name of output report file:
Lpile - Rebar check.lp8o

Name of plot output file:
Lpile - Rebar check.lp8p

Name of runtime message file:
Lpile - Rebar check.lp8r



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

               Date:  May 5, 2017                 Time:  11:47:33



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

CT46126-A-03 Glastonbury-main St.
Job Number: 17-1967
Client: SBA
Engineer: Chris Delgado
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 pile-head loading conditions

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	=	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 Number	Bar Diam. inches	Bar Area sq. in.	X inches	Y 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	-296.000
2	337.000

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 = -296.000 kips

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

```
    rad/in.       in-kip        kip-in2         in           in/in         in/in
ksi           ksi
------------- ------------- ------------- ------------- ------------- ------------- -
------------ ------------- ---
  6.25000E-07   194.0447369
310471579.  -104.3297306   -0.00006521   -0.00008771    -0.2351162    -2.5402139
   0.00000125   388.0589315
310447145.   -43.1875459   -0.00005398   -0.00009898    -0.1958055    -2.8640235
   0.00000188   582.0601179
310432063.   -22.8169170   -0.00004278    -0.0001103    -0.1562851    -3.1883824
   0.00000250   582.0601179    232824047.  -451.8212016    -0.0011296    -0.0012196
    0.00000   -35.3539871 C
   0.00000313   582.0601179    186259238.  -357.8566764    -0.0011183    -0.0012308
    0.00000   -35.6769488 C
   0.00000375   582.0601179    155216031.  -295.2136596    -0.0011071    -0.0012421
    0.00000   -35.9999105 C
   0.00000438   582.0601179    133042313.  -250.4686476    -0.0010958    -0.0012533
    0.00000   -36.3228721 C
   0.00000500   582.0601179    116412024.  -216.9098885    -0.0010845    -0.0012645
    0.00000   -36.6458338 C
   0.00000563   582.0601179    103477354.  -190.8086315    -0.0010733    -0.0012758
    0.00000   -36.9687955 C
   0.00000625   582.0601179     93129619.  -169.9276259    -0.0010620    -0.0012870
    0.00000   -37.2917572 C
   0.00000688   582.0601179     84663290.  -152.8431668    -0.0010508    -0.0012983
    0.00000   -37.6147189 C
   0.00000750   582.0601179     77608016.  -138.6061175    -0.0010395    -0.0013095
    0.00000   -37.9376805 C
   0.00000813   582.0601179     71638168.  -126.5593835    -0.0010283    -0.0013208
    0.00000   -38.2606424 C
   0.00000875   582.0601179     66521156.  -116.2336115    -0.0010170    -0.0013320
    0.00000   -38.5836039 C
   0.00000938   582.0601179     62086413.  -107.2846091    -0.0010058    -0.0013433
    0.00000   -38.9065656 C
   0.00001000   582.0601179     58206012.   -99.4542320    -0.0009945    -0.0013545
    0.00000   -39.2295273 C
   0.00001063   582.0601179     54782129.   -92.5450758    -0.0009833    -0.0013658
    0.00000   -39.5524889 C
   0.00001125   582.0601179     51738677.   -86.4036035    -0.0009720    -0.0013770
    0.00000   -39.8754506 C
   0.00001188   582.0601179     49015589.   -80.9086020    -0.0009608    -0.0013883
    0.00000   -40.1984123 C
   0.00001250   582.0601179     46564809.   -75.9631007    -0.0009495    -0.0013995
    0.00000   -40.5213740 C
   0.00001313   582.0601179     44347438.   -71.4885995    -0.0009383    -0.0014108
    0.00000   -40.8443353 C
   0.00001375   582.0601179     42331645.   -67.4208712    -0.0009270    -0.0014220
    0.00000   -41.1672974 C
   0.00001438   582.0601179     40491139.   -63.7068583    -0.0009158    -0.0014333
    0.00000   -41.4902592 C
   0.00001500   582.0601179     38804008.   -60.3023465    -0.0009045    -0.0014445
    0.00000   -41.8132208 C
   0.00001563   582.0601179     37251848.   -57.1701957    -0.0008933    -0.0014558
    0.00000   -42.1361828 C
   0.00001625   582.0601179     35819084.   -54.2789795    -0.0008820    -0.0014670
    0.00000   -42.4591441 C
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 0.00000   -42.7821057 C
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 0.00000   -43.1050674 C
0.00001813   582.0601179     32113662.   -46.8016963    -0.0008483    -0.0015008
 0.00000   -43.4280289 C
0.00001875   582.0601179     31043206.   -44.6415923    -0.0008370    -0.0015120
 0.00000   -43.7509905 C
0.00001938   582.0601179     30041813.   -42.6208498    -0.0008258    -0.0015233
 0.00000   -44.0739521 C
0.00002000   582.0601179     29103006.   -40.7264038    -0.0008145    -0.0015345
 0.00000   -44.3969143 C
0.00002063   582.0601179     28221097.   -38.9467726    -0.0008033    -0.0015458
 0.00000   -44.7198753 C
0.00002125   582.0601179     27391064.   -37.2718256    -0.0007920    -0.0015570
 0.00000   -45.0428374 C
0.00002188   582.0601179     26608463.   -35.6925899    -0.0007808    -0.0015683
 0.00000   -45.3657992 C
0.00002250   582.0601179     25869339.   -34.2010895    -0.0007695    -0.0015795
 0.00000   -45.6887608 C
0.00002313   582.0601179     25170167.   -32.7902108    -0.0007583    -0.0015908
 0.00000   -46.0117226 C
0.00002375   587.7397109     24746935.   -31.4535888    -0.0007470    -0.0016020
 0.00000   -46.3346843 C
0.00002438   603.1954494     24746480.   -30.1855115    -0.0007358    -0.0016133
 0.00000   -46.6576460 C
0.00002563   634.1069262     24745636.   -27.8349293    -0.0007133    -0.0016358
 0.00000   -47.3035694 C
0.00002688   665.0184031     24744871.   -25.7030058    -0.0006908    -0.0016583
 0.00000   -47.9494926 C
0.00002813   695.9298799     24744174.   -23.7605867    -0.0006683    -0.0016808
 0.00000   -48.5954159 C
0.00002938   726.8413568     24743536.   -21.9834799    -0.0006458    -0.0017033
 0.00000   -49.2413394 C
0.00003063   757.7528336     24742950.   -20.3514429    -0.0006233    -0.0017258
 0.00000   -49.8872627 C
0.00003188   788.6643105     24742410.   -18.8474089    -0.0006008    -0.0017483
 0.00000   -50.5331861 C
0.00003313   819.5757873     24741911.   -17.4568869    -0.0005783    -0.0017708
 0.00000   -51.1791093 C
0.00003438   850.4872642     24741448.   -16.1674938    -0.0005558    -0.0017933
 0.00000   -51.8250327 C
0.00003563   881.3987410     24741017.   -14.9685844    -0.0005333    -0.0018158
 0.00000   -52.4709561 C
0.00003688   912.3102179     24740616.   -13.8509569    -0.0005108    -0.0018383
 0.00000   -53.1168795 C
0.00003813   943.2216947     24740241.   -12.8066166    -0.0004883    -0.0018608
 0.00000   -53.7628028 C
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 0.00000   -54.4087261 C
0.00004063        1005.      24739561.   -10.9107371    -0.0004432    -0.0019057
 0.00000   -55.0546495 C
0.00004188        1036.      24739251.   -10.0476875    -0.0004207    -0.0019282
 0.00000   -55.7005729 C
0.00004313        1067.      24738959.    -9.2346698    -0.0003982    -0.0019507
 0.00000   -56.3464963 C
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  0.00000   -56.9924196 C
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  0.00000   -57.6383429 C
 0.00004688          1160.     24738177.     -7.0557822     -0.0003307     -0.0020182
  0.00000   -58.2842663 C
 0.00004813          1191.     24737943.     -6.4049457     -0.0003082     -0.0020407
  0.00000   -58.9301897 C
 0.00004938          1221.     24737721.     -5.7870629     -0.0002857     -0.0020632
  0.00000   -59.5761131 CY
 0.00005063          1252.     24737510.     -5.1996928     -0.0002632     -0.0020857
  0.00000   -60.0000000 CY
 0.00005188          1283.     24737310.     -4.6406298     -0.0002407     -0.0021082
  0.00000   -60.0000000 CY
 0.00005313          1314.     24737118.     -4.1078756     -0.0002182     -0.0021307
  0.00000   -60.0000000 CY
 0.00005438          1345.     24736936.     -3.5996158     -0.0001957     -0.0021532
  0.00000   -60.0000000 CY
 0.00005563          1376.     24736762.     -3.1141991     -0.0001732     -0.0021757
  0.00000   -60.0000000 CY
 0.00005688          1407.     24736595.     -2.6501195     -0.0001507     -0.0021982
  0.00000   -60.0000000 CY
 0.00005813          1438.     24736436.     -2.2060003     -0.0001282     -0.0022207
  0.00000   -60.0000000 CY
 0.00005938          1469.     24736283.     -1.7805808     -0.0001057     -0.0022432
  0.00000   -60.0000000 CY
 0.00006063          1500.     24736137.     -1.3727044    -0.00008322     -0.0022657
  0.00000   -60.0000000 CY
 0.00006188          1531.     24735996.     -0.9813079    -0.00006072     -0.0022882
  0.00000   -60.0000000 CY
 0.00006313          1561.     24731288.     -0.6066883    -0.00003830     -0.0023108
  0.00000   -60.0000000 CY
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2.9941607    60.0000000 CYT
    0.0009344         3395.      3633152.     4.1779751     0.0039038    -0.0297337
2.9825937    60.0000000 CYT


Axial Thrust Force =    337.000 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   192.7469860    308395178.   157.7170656    0.00009857    0.00007607
0.3507436     2.8553593
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0.3891443     3.1791774
   0.00000188   578.2696274    308410468.    64.6130719     0.0001211    0.00005365
0.4273294     3.5035483
   0.00000250   771.0046866    308401875.    52.9865096     0.0001325    0.00004247
0.4652976     3.8284720
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0.5030475     4.1539485
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0.5405775     4.4799780
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0.5778863     4.8065605
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0.6149723     5.1336962
   0.00000563         1734.    308286558.    33.6596366     0.0001893   -0.00001316
0.6518321     5.4613657
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0.9375299     8.0937019
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    0.0001344         9395.     69916432.    11.9928558     0.0016115    -0.0032260
  2.9975998   -60.0000000 CY
    0.0001394         9483.     68041439.    11.9039654     0.0016591    -0.0033584
  2.9999025   -60.0000000 CY
    0.0001444         9570.     66283932.    11.8236769     0.0017070    -0.0034905
  2.9999775   -60.0000000 CY
    0.0001494         9648.     64592128.    11.7480731     0.0017549    -0.0036226
  2.9998063   -60.0000000 CY
    0.0001544         9708.     62888065.    11.6690460     0.0018014    -0.0037561
  2.9992008   -60.0000000 CY
    0.0001594         9759.     61233950.    11.5903218     0.0018472    -0.0038903
  2.9977699   -60.0000000 CY
    0.0001644         9809.     59671829.    11.5181265     0.0018933    -0.0040242
  2.9999517   -60.0000000 CY
    0.0001694         9857.     58194761.    11.4520421     0.0019397    -0.0041578
  2.9990394   -60.0000000 CY
    0.0001744         9904.     56796597.    11.3913373     0.0019864    -0.0042911
  2.9984331   -60.0000000 CY
    0.0001794         9950.     55469890.    11.3353608     0.0020333    -0.0044242
  2.9995496   -60.0000000 CY
    0.0001844         9994.     54205862.    11.2805056     0.0020798    -0.0045577
  2.9970151   -60.0000000 CY
    0.0001894        10036.     52996376.    11.2290159     0.0021265    -0.0046910
 2.9996204    60.0000000 CY
    0.0001944        10070.     51806992.    11.1765687     0.0021724    -0.0048251
 2.9970765    60.0000000 CY
```

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    0.0001994        10096.     50638550.    11.1232066     0.0022177    -0.0049598
2.9992426    60.0000000 CY
    0.0002044        10119.     49513907.    11.0718813     0.0022628    -0.0050947
2.9991962    60.0000000 CY
    0.0002094        10142.     48437860.    11.0238364     0.0023081    -0.0052294
2.9980633    60.0000000 CY
    0.0002144        10164.     47410198.    10.9786919     0.0023536    -0.0053639
2.9998052    60.0000000 CY
    0.0002194        10184.     46423559.    10.9330913     0.0023984    -0.0054991
2.9969620    60.0000000 CY
    0.0002244        10204.     45479115.    10.8903513     0.0024435    -0.0056340
2.9983618    60.0000000 CY
    0.0002294        10224.     44574618.    10.8501120     0.0024887    -0.0057688
2.9998421    60.0000000 CY
    0.0002344        10244.     43706992.    10.8124086     0.0025342    -0.0059033
2.9969544    60.0000000 CY
    0.0002394        10263.     42874189.    10.7769882     0.0025797    -0.0060378
2.9977407    60.0000000 CY
    0.0002444        10282.     42074490.    10.7435584     0.0026255    -0.0061720
2.9995586    60.0000000 CY
    0.0002494        10301.     41305710.    10.7120795     0.0026713    -0.0063062
2.9988879    60.0000000 CY
    0.0002544        10319.     40565671.    10.6825801     0.0027174    -0.0064401
2.9958353    60.0000000 CY
    0.0002594        10337.     39853398.    10.6546748     0.0027636    -0.0065739
2.9984451    60.0000000 CY
    0.0002644        10354.     39165699.    10.6279265     0.0028098    -0.0067077
2.9997955    60.0000000 CY
    0.0002694        10371.     38499743.    10.6006829     0.0028556    -0.0068419
2.9979617    60.0000000 CY
    0.0002744        10385.     37850947.    10.5728205     0.0029009    -0.0069766
2.9950875    60.0000000 CY
    0.0003044        10438.     34293903.    10.4046330     0.0031669    -0.0077906
2.9965389    60.0000000 CYT
    0.0003344        10474.     31325157.    10.2730245     0.0034350    -0.0086025
2.9953478    60.0000000 CYT
    0.0003644        10498.     28810287.    10.1733368     0.0037069    -0.0094106
2.9916627    60.0000000 CYT
    0.0003944        10498.     26618696.    10.1414218     0.0039995    -0.0101980
2.9951442    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           Axial Thrust        Nominal Mom. Cap.      Max. Comp.
  No.              kips                in-kip               Strain
 ----         ----------------     ------------------     ------------
   1              -296.000             3386.987           0.00300000
   2               337.000            10405.041           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	3387.	-192.400000	2202.	23670413.
2	0.65	10405.	219.050000	6763.	96884424.
1	0.70	3387.	-207.200000	2371.	22594497.
2	0.70	10405.	235.900000	7284.	91432325.
1	0.75	3387.	-222.000000	2540.	21297493.
2	0.75	10405.	252.750000	7804.	86926274.

This analysis ended normally

SPECIAL CONSTRUCTION NOTE:
SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER).
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.
* SBA COMMUNICATIONS CORPORATION SHALL PROVIDE WRITTEN ACCEPTANCE/APPROVAL FOR THE COMPLETION OF ALL TOWER/FOUNDATION STRUCTURAL MODIFICATIONS INCLUDING (AS NECESSARY) CONTROLLED CONSTRUCTION INSPECTIONS, SHOP-DRAWING APPROVALS, MATERIALS TEST RESULTS, AND FINAL ENGINEER'S AFFIDAVIT.

Sprint

NOTE:

OWNER AND TENANT MAY, FROM TIME TO TIME AT TENANT'S OPTION, REPLACE THIS EXHIBIT WITH AN EXHIBIT SETTING FORTH THE LEGAL DESCRIPTION OF THE SITE, OR WITH ENGINEERED OR AS-BUILT DRAWING DEPICTING THE SITE OR ILLUSTRATING STRUCTURAL MODIFICATIONS OR CONSTRUCTION PLANS OF THE SITE. ANY VISUAL OR TEXTUAL REPRESENTATION OF THE EQUIPMENT LOCATED WITHIN THE SITE CONTAINED IN THESE OTHER DOCUMENTS IS ILLUSTRATIVE ONLY, AND DOES NOT LIMIT THE RIGHTS OF SPRINT AS PROVIDED FOR IN THE AGREEMENT. THE LOCATIONS OF ANY ACCESS AND UTILITY EASEMENTS ARE ILLUSTRATIVE ONLY. ACTUAL LOCATIONS MAY BE DETERMINED BY TENANT AND/OR THE SERVICING UTILITY COMPANY IN COMPLIANCE WITH LOCAL LAWS AND REGULATIONS.

NOTE:

THESE PLANS ARE BASED ON PHOTOS (NOVEMBER 2014) AND AS-BUILT PLANS (JANUARY 2015) BY SBA TO HDG

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	GLASTONBURY/NEXTEL
SITE CASCADE:	CT43XC822-B
MARKET:	NORTHERN CONNECTICUT
SBA SITE ID:	CT46126-A/GLASTONBURY/MAIN STREET
SITE ADDRESS:	2577 MAIN STREET GLASTONBURY, CT 06033
SITE TYPE:	130' SELF SUPPORT TOWER

SITE INFORMATION

PROPERTY OWNER:
ST. PAULS ROMAN CATHOLIC CHURCH
2577 MAIN STREET
GLASTONBURY, CT 06033

TOWER OWNER:
SBA 2012 ASSETS, INC.
8051 CONGRESS AVENUE
BOCA RATON, FL 33487
PHONE: 561-995-7670

SBA REGIONAL SITE MANAGER:
STEPHEN ROTH
PHONE: 860-539-4920
SRoth@sbasite.com

LATITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION
41° 42' 51.80" N
41.714389°

LONGITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION
-72° 36' 46.90" W
-72.613028°

COUNTY:
HARTFORD

ZONING JURISDICTION:
TOWN OF GLASTONBURY

ZONING DISTRICT:
PBD

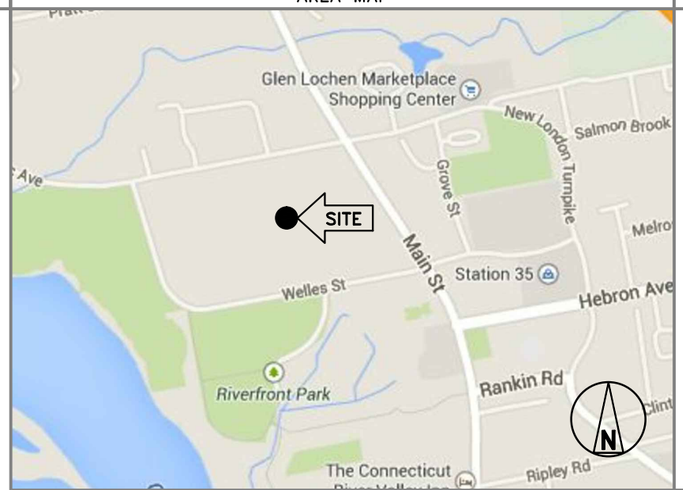
POWER COMPANY:
CL & P

AAV PROVIDER:
COX COMMUNICATION

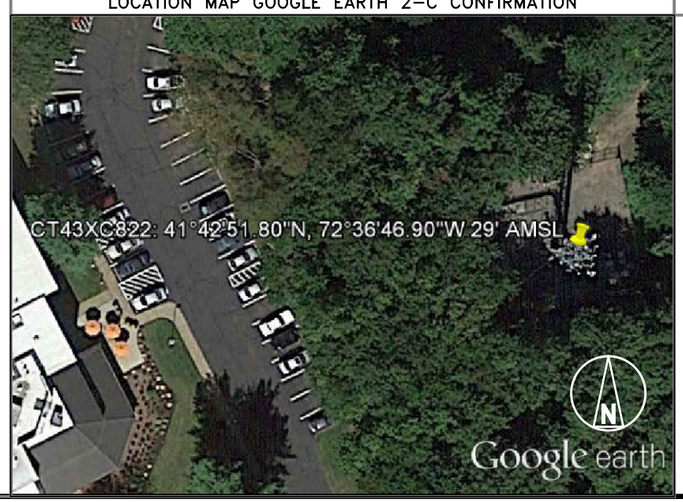
SPRINT CONSTRUCTION MANAGER:
MICHAEL DELIA
PHONE: 781-316-6348
michael.delia@sprint.com

EQUIPMENT SUPPLIER:
ALCATEL-LUCENT
600 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974

AREA MAP



LOCATION MAP GOOGLE EARTH 2-C CONFIRMATION



PROJECT DESCRIPTION

SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND SPECTRUM LICENSE FOR 2.5GHz FREQUENCY, INCLUDING INSTALLATION OF:

TOWER-TOP EQUIPMENT, INCLUDING INSTALLATION OF:
* (1) ANTENNA SWAP AND REALIGN (5) EXISTING ANTENNAS

SPECIAL ZONING NOTE:
BASED ON INFORMATION PROVIDE BY SPRINT REGULATORY COMPLIANCE PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT DEPLOYMENT IS CONSIDERED AND ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS (VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
- ADA COMPLIANCE NOT REQUIRED.
- POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
- NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
BUILDING CODE: IBC 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS
ELECTRICAL CODE: 2005 NATIONAL ELECTRICAL CODE
STRUCTURAL CODE: TIA/EIA-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

811
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DRAWING INDEX

SHEET NO:	SHEET TITLE	REV	CHK	BY
T-1	TITLE SHEET	4	BB	AN
SP-1	OUTLINE SPECIFICATIONS	4	BB	AN
SP-2	OUTLINE SPECIFICATIONS	4	BB	AN
SP-3	OUTLINE SPECIFICATIONS	4	BB	AN
A-1	COMPOUND PLAN	4	BB	AN
A-2	ELEVATION AND ANTENNA PLANS	4	BB	AN
A-3	EQUIPMENT DETAILS	4	BB	AN
E-1	ONE LINE DIAGRAM	4	BB	AN
E-2	GROUNDING DETAILS AND NOTES	4	BB	AN

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

SPRINT:	_____	DATE:	_____
CONSTRUCTION MANAGER:	_____	DATE:	_____
LEASING/ SITE ACQUISITION:	_____	DATE:	_____
RF ENGINEER:	_____	DATE:	_____
LANDLORD/ TOWER OWNER:	_____	DATE:	_____

Sprint
1 INTERNATIONAL BLVD. SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
TEL: (508) 251-0720
FAX: (508) 251-1755

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

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
4	05/11/17	CONSTRUCTION REVISED	AN
3	04/14/17	CONSTRUCTION FINAL	DJM
2	10/28/14	ISSUED FOR CONSTRUCTION	JA
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	05/12/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC822-B
SITE NAME:
GLASTONBURY/NEXTEL
SITE ADDRESS:
2577 MAIN STREET
GLASTONBURY, CT 06033

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

THESE OUTLINE SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS, INCLUDING CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE SPRINT CONSTRUCTION STANDARDS FOR WIRELESS SITES, CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
1. GR–78–CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
2. GR–1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
6. AMERICAN CONCRETE INSTITUTE (ACI)
7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
10. PORTLAND CEMENT ASSOCIATION (PCA)
11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
12. BRICK INDUSTRY ASSOCIATION (BIA)
13. AMERICAN WELDING SOCIETY (AWS)
14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
16. DOOR AND HARDWARE INSTITUTE (DHI)
17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
18. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B. COMPANY: SPRINT CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.
F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

1.6 SITE FAMILIARITY: CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OR FIELD CONDITIONS.

1.7 POINT OF CONTACT: COMMUNICATION BETWEEN SPRINT AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT FOR SPRINT.

1.8 ON–SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.9 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS–BUILT" DRAWINGS.
B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.
C . DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

1.10 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.11 UTILITIES SERVICES: WHERE NECESSARY TO CUT EXISTING PIPES, ELECTRICAL WIRES, CONDUITS, CABLES, ETC., OF UTILITY SERVICES, OR OF FIRE PROTECTION OR COMMUNICATIONS SYSTEMS, THEY SHALL BE CUT AND CAPPED AT SUITABLE PLACES OR WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY INVOLVED:

1.12 PERMITS / FEES: WHEN REQUIRED THAT A PERMIT OR CONNECTION FEE BE PAID TO A PUBLIC UTILITY PROVIDER FOR NEW SERVICE TO THE CONSTRUCTION PROJECT, PAYMENT OF SUCH FEE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR PROTECTING EXISTING EQUIPMENT AND PROPERTY.

1.14 METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION: CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN THE FOLLOWING INSTALLATION AND COMMISSIONING MOPS.

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASE BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF HYBRID CABLE
F. INSTALLATION OF RRH'S
G. CABLING
H. SPRINT TS–0200 (CURRENT VERSION) – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012–001, REV 1.
J. COMMISSIONING MOPS
K. SPRINT CELL SITE ENGINEERING NOTICE – EN–2013–002
L. SPRINT ENGINEERING LETTER – EL–0504
M. SPRINT ENGINEERING LETTER – EL–0568
N. SPRINT TECHNICAL SPECIFICATION – TS–0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

A. CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD–PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

3.4 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

3.5 EXISTING CONDITIONS: NOTIFY THE SPRINT CONSTRUCTION MANAGER OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

A. COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
1. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY–FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF–LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.

C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 – CELL SITE CONSTRUCTION

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 NOTICE TO PROCEED:

A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF THE WORK ORDER.

B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE SPRINT WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

A. THE ACTIVITIES DESCRIBED IN THIS PARAGRAPH REPRESENT MINIMUM ACTIONS AND PROCESSES REQUIRED TO SUCCESSFULLY COMPLETE THE WORK. THE ACTIVITIES DESCRIBED ARE NOT EXHAUSTIVE, AND CONTRACTOR SHALL TAKE ANY AND ALL ACTIONS AS NECESSARY TO SUCCESSFULLY COMPLETE THE CONSTRUCTION OF A FULLY FUNCTIONING WIRELESS FACILITY AT THE SITE IN ACCORDANCE WITH COMPANY PROCESSES.

B. SUBMIT SPECIFIC DOCUMENTATION AS INDICATED HEREIN, AND OBTAIN REQUIRED APPROVALS WHILE THE WORK IS BEING PERFORMED.

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE–GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H–FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND–OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

A. CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

B. EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
1. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
2. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

D. CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

A. CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.
1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

CONTINUE SHEET SP–2

Sprint
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
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Hudson Design Group LLC
1600 OSGOOD STREET
BUILDING 20 NORTH, SUITE 3090
N. ANDOVER, MA 01845
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STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
4	05/11/17	CONSTRUCTION REVISED	AN
3	04/14/17	CONSTRUCTION FINAL	DJM
2	10/28/14	ISSUED FOR CONSTRUCTION	JA
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	05/12/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC822–B

SITE NAME:
GLASTONBURY/NEXTEL

SITE ADDRESS:
2577 MAIN STREET
GLASTONBURY, CT 06033

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–1

CONTINUED FROM SP-1:

SECTION 01 400 – SUBMITTALS, TESTS, AND INSPECTIONS

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

1.3 SUBMITTALS:

A. THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND THESE SPECIFICATIONS.

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.
1. CONCRETE MIX–DESIGNS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.
2. CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
3. SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
5. CHEMICAL GROUNDING DESIGN.

C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. COAX SWEEPS AND FIBER TESTS PER SPRINT TS–0200 (CURRENT VERSION) ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE–FOR–THE–PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;
1. AZIMUTH, DOWNTILT, AGL – UPLOAD REPORT FROM ANTENNA ALIGNMENT TOOL TO SITERRA TASK 465. INSTALLED AZIMUTH, DOWNTILT, AND AGL MUST CONFORM TO THE RF DATA SHEETS. SWEEP AND FIBER TESTS
2. SCANABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
3. ALL AVAILABLE JURISDICTIONAL INFORMATION
4. PDF SCAN OF REDLINES PRODUCED IN FIELD
5. ELECTRONIC AS–BUILT DRAWINGS IN AUTOCAD AND PDF FORMATS. ANY FIELD CHANGE MUST BE REFLECTED BY MODIFYING THE PLANS, ELEVATIONS, AND DETAILS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS WILL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS–BUILT" CONDITION.
6. LIEN WAIVERS
7. FINAL PAYMENT APPLICATION
8. REQUIRED FINAL CONSTRUCTION PHOTOS
9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY: WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
1. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
2. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS:

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE– AND POST–CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)
7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
10. SCAN–ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
11. ALL AVAILABLE JURISDICTIONAL INFORMATION
12. PDF SCAN OF REDLINES PRODUCED IN FIELD

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

F. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.

3.4 DELIVERABLES: TEST AND INSPECTION REPORTS AND CLOSEOUT DOCUMENTATION SHALL BE UPLOADED TO THE SMS AND/OR FORWARDED TO SPRINT FOR INCLUSION INTO THE PERMANENT SITE FILES.

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.
1. CONCRETE MIX AND CYLINDER BREAK REPORTS.
2. STRUCTURAL BACKFILL COMPACTION REPORTS.
3. SITE RESISTANCE TO EARTH TEST.
4. ANTENNA AZIMUTH AND DOWN TILT VERIFICATION
5. TOWER ERECTION INSPECTIONS AND MEASUREMENTS DOCUMENTING TOWER INSTALLED PER SUPPLIER'S REQUIREMENTS AND THE APPLICABLE SECTIONS HEREIN.
6. COAX CABLE SWEEP TESTS PER COMPANY'S "ANTENNA LINE ACCEPTANCE STANDARDS".

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING;
1. TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS – PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING – TOP AND BOTTOM; PHOTOS OF COAX GROUNDING––TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
5. ROOF TOPS: PRE–CONSTRUCTION AND POST–CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
6. SITE LAYOUT – PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
7. FINISHED UTILITIES: CLOSE–UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE–UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE–UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.
8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.
9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 500 – PROJECT REPORTING

PART 1 – GENERAL

1.1 THE WORK: THESE STANDARD CONSTRUCTION SPECIFICATIONS IN CONJUNCTION WITH THE OTHER CONTRACT DOCUMENTS AND THE CONSTRUCTION DRAWINGS DESCRIBE THE WORK TO BE PERFORMED BY THE CONTRACTOR.

1.2 RELATED DOCUMENTS:

A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.

B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.

B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

A. SPRINT MAY HOLD WEEKLY PROJECT CONFERENCE CALLS. CONTRACTOR WILL BE REQUIRED TO COMMUNICATE SITE STATUS, MILESTONE COMPLETIONS AND UPCOMING MILESTONE PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY.

3.3 PROJECT TRACKING IN SMS:

A. CONTRACTOR SHALL PROVIDE SCHEDULE UPDATES AND PROJECTIONS IN THE SMS SYSTEM ON A WEEKLY BASIS.

3.4 ADDITIONAL REPORTING:

A. ADDITIONAL OR ALTERNATE REPORTING REQUIREMENTS MAY BE ADDED TO THE REPORT AS DETERMINED TO BE REASONABLY NECESSARY BY COMPANY.

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:
1. SHELTER AND TOWER OVERVIEW.
2. TOWER FOUNDATION(S) – FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
3. TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
4. TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).
5. PHOTOS OF TOWER SECTION STACKING.
6. CONCRETE TESTING / SAMPLES.
7. PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
8. BUILDING/WATER TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.
9. SHELTER FOUNDATION––FORMS AND STEEL BEFORE POURING.
10. SHELTER FOUNDATION POUR WITH VIBRATOR IN USE.
11. COAX CABLE ENTRY INTO SHELTER.
12. PLATFORM MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.
13. ROOFTOP PRE AND POST CONSTRUCTION PHOTOS TO INCLUDE PENETRATIONS AND INTERIOR CEILING.
14. PHOTOS OF TOWER TOP COAX LINE COLOR CODING AND COLOR CODING AT GROUND LEVEL.
15. PHOTOS OF ALL APPROPRIATE COMPANY OR REGULATORY SIGNAGE.
16. PHOTOS OF EQUIPMENT BOLT DOWN INSIDE SHELTER.
17. POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE AND POWER AND TELCO SUPPLY LOCATIONS INCLUDING METER/DISCONNECT.
18. ELECTRICAL TRENCH(S) WITH ELECTRICAL / CONDUIT BEFORE BACKFILL.
19. ELECTRICAL TRENCH(S) WITH FOIL–BACKED TAPE BEFORE FURTHER BACKFILL.
20. TELCO TRENCH WITH TELEPHONE / CONDUIT BEFORE BACKFILL.
21. TELCO TRENCH WITH FOIL–BACKED TAPE BEFORE FURTHER BACKFILL.
22. SHELTER GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
23. TOWER GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
24. FENCE GROUND–RING TRENCH WITH GROUND–WIRE BEFORE BACKFILL (SHOW ALL CAD WELDS AND BEND RADII).
25. ALL BTS GROUND CONNECTIONS.
26. ALL GROUND TEST WELLS.
27. ANTENNA GROUND BAR AND EQUIPMENT GROUND BAR.
28. ADDITIONAL GROUNDING POINTS ON TOWERS ABOVE 200'.
29. HVAC UNITS INCLUDING CONDENSERS ON SPLIT SYSTEMS.
30. GPS ANTENNAS.
31. CABLE TRAY AND/OR WAVEGUIDE BRIDGE.
32. DOGHOUSE/CABLE EXIT FROM ROOF.
33. EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA.
34. MASTER BUS BAR.
35. TELCO BOARD AND NIU.
36. ELECTRICAL DISTRIBUTION WALL.
37. CABLE ENTRY WITH SURGE SUPPRESSION.
38. ENTRANCE TO EQUIPMENT ROOM.
39. COAX WEATHERPROOFING–TOP AND BOTTOM OF TOWER.
40. COAX GROUNDING –TOP AND BOTTOM OF TOWER.
41. ANTENNA AND MAST GROUNDING.
42. LANDSCAPING – WHERE APPLICABLE.

3.6 FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

SECTION 07 500 – ROOF CUTTING, PATCHING AND REPAIR

SUMMARY:
THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE CONDUIT OR CABLES EXIT THE BUILDING ONTO THE ROOF OR BUILDING–MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERTIGHT PERFORMANCE. ROOFTOP ENTRY OPENINGS IN MEMBRANE ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS.

1.4 SUBMITTALS:

A. PRE–CONSTRUCTION ROOF PHOTOS: COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.

B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3 EA.)

C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.

SECTION 09 900 – PAINTING

QUALITY ASSURANCE:

A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS.

CONTINUE SHEET SP–3

Sprint
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SBA
SBA COMMUNICATIONS CORP.
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Hudson Design Group LLC
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BUILDING 20 NORTH, SUITE 3090
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TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
4	05/11/17	CONSTRUCTION REVISED	AN
3	04/14/17	CONSTRUCTION FINAL	DJM
2	10/28/14	ISSUED FOR CONSTRUCTION	JA
1	05/16/14	ISSUED FOR CONSTRUCTION	SF
0	05/12/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC822–B

SITE NAME:
GLASTONBURY/NEXTEL

SITE ADDRESS:
2577 MAIN STREET
GLASTONBURY, CT 06033

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–2