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 27, 2018

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

Notice of Exempt Modification
131 Gifford Lane, Bozrah, CT
41 33 9.06 N
-72 9 2.55 W
Sprint #: CT33XC574

Dear Ms. Bachman:

Sprint currently maintains antennas at the 175-foot level of the existing 195-foot Self Support Tower at 131 Gifford Lane in Bozrah, CT. The tower is owned by SBA Towers, LLC. The property is owned by Richard Orr and Patti Duerrler. Sprint now intends to replace (6) existing cell antennas with (6) newer technology cell antennas at the 99-foot level of the tower. The proposed full scope of work is as follows:

Remove:

- (6) 1-5/8" lines

Remove and Replace:

- Remove:
  - (6) Decibel DB908h90e-m Panel Antennas
- Replace with:
  - (3) RFS APXVTM14-C-I20 Panel Antennas
  - (3) Commscope NNVV-65B-R4 Panel Antennas

Install:

- (3) ALU 1900 MHz RRHs
- (6) ALU 800 MHz RRHs
- (3) ALU TD-RRH 8x20-25
- (3) Sitepro SFS H-L
- (4) 1-1/4" fiber

Existing Equipment to Remain (Including entitlements):

- (3) T -Frames

This facility was originally approved by the Town of Bozrah's on February 11, 1999. The Planning & Zoning Commission approved Special Permit for a 196' telecom tower with the condition that the drive/access road be construction per the Town's guidelines. No further conditions were set. As such, this modification complies with all conditions.

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 Bozrah's First Selectman, Glenn Pianka, and Chair of the Planning & Zoning Commission, Seymour Adelman, as well as to the property owner. (Separate notice is not being sent to tower owner, as it belongs to SBA.)

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

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modification will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modification will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, 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: Glenn Painka, First Selectman / with attachments
Town of Bozrah, Town Hall, 1 River Road, Bozrah, CT 06334
Seymour Adelman, Chair-Planning & Zoning Commission / with attachments
Town of Bozrah, Town Hall, 1 River Road, Bozrah, CT 06334
Patti Duerrler and Richard Orr / with attachments
131 Gifford Lane, Bozrah, CT 06334

POWER DENSITY

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**175 feet**	Height (AGL):	**175 feet**	Height (AGL):	**175 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	**1.15 %**	Antenna B1 MPE%	**1.15 %**	Antenna C1 MPE%	**1.15 %**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-ALU- I20	Make / Model:	RFS APXVTM14-ALU- I20	Make / Model:	RFS APXVTM14-ALU- I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**175 feet**	Height (AGL):	**175 feet**	Height (AGL):	**175 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.78 %**	Antenna B2 MPE%	**0.78 %**	Antenna C2 MPE%	**0.78 %**

Site Composite MPE%	
Carrier	MPE%
SPRINT – Max per sector	**1.93 %**
Omnipoint (T-Mobile)	0.08 %
Verizon Wireless	1.91 %
AT&T	1.81 %
Site Total MPE %:	**5.73 %**

SPRINT Sector A Total:	1.93 %
SPRINT Sector B Total:	1.93 %
SPRINT Sector C Total:	1.93 %
Site Total:	5.73 %

SPRINT _ Frequency Band / Technology Max Power Values (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	1	376.73	175	0.47	850 MHz	567	0.09%
Sprint 850 MHz LTE	2	941.82	175	2.37	850 MHz	567	0.42%
Sprint 1900 MHz (PCS) CDMA	5	511.82	175	3.22	1900 MHz (PCS)	1000	0.32%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	175	3.22	1900 MHz (PCS)	1000	0.32%
Sprint 2500 MHz (BRS) LTE	8	778.09	175	7.84	2500 MHz (BRS)	1000	0.78%
						Total:	**1.93%**

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

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All information is for assessment purposes only. Assessments are calculated at 70% of the estimated October 1, 2017 market value which was the date of the last revaluation as completed by eQuality Valuation Services, LLC.

Information on the Property Records for the Municipality of Bozrah was last updated on 5/4/2018.

Property Summary Information

Parcel Data And Values | Building | Outbuildings | Sales | Permits | Google Map

Parcel Information

Location:	131 GIFFORD LA	Property Use:	Residential	Primary Use:	Residential
Unique ID:	00083400	Map Block Lot:	07/119-B	Acres:	1.97
490 Acres:	0.00	Zone:	R-1	Volume / Page:	0092/0318
Developers Map / Lot:		Census:	7131		

Value Information

	Appraised Value	Assessed Value
Land	67,710	47,390
Buildings	152,597	106,820
Detached Outbuildings	1,094	770
Total	221,401	154,980

Owner's Information

Owner's Data
ORR RICHARD & DUERRLER PATTI 131 GIFFORD LANE BOZRAH, CT 06334

Back To Search (JavaScript:window.history.back(1);)

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Information Published With Permission From The Assessor

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

SPRINT Existing Facility

Site ID: CT33XC574

N. Bozrah
131 Gifford Lane
Bozrah, CT 06334

July 6, 2018

EBI Project Number: 6218004931

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	5.73 %

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

EBI Consulting
environmental | engineering | due diligence

July 6, 2018

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

Emissions Analysis for Site: **CT33XC574 – N. Bozrah**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **131 Gifford Lane, Bozrah, 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.

General 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 **131 Gifford Lane, Bozrah, 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) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.

3) 5 CDMA channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 16 Watts per Channel.

4) 2 LTE channels (1900 MHz (PCS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 8 LTE channels (2500 MHz (BRS)) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

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

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

8) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-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.

9) The antenna mounting height centerlines of the proposed antennas are **175 feet** above ground level (AGL) for **Sector A**, **175 feet** above ground level (AGL) for **Sector B** and **175 feet** above ground level (AGL) for Sector C.

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

All calculations were done with respect to uncontrolled / general 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:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**175 feet**	Height (AGL):	**175 feet**	Height (AGL):	**175 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%	**1.15 %**	Antenna B1 MPE%	**1.15 %**	Antenna C1 MPE%	**1.15 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**175 feet**	Height (AGL):	**175 feet**	Height (AGL):	**175 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.78 %**	Antenna B2 MPE%	**0.78 %**	Antenna C2 MPE%	**0.78 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.93 %**
Omnipoint (T-Mobile)	0.08 %
Verizon Wireless	1.91 %
AT&T	1.81 %
Site Total MPE %:	**5.73 %**

SPRINT Sector A Total:	1.93 %
SPRINT Sector B Total:	1.93 %
SPRINT Sector C Total:	1.93 %
Site Total:	5.73 %

SPRINT _ Frequency Band / Technology Max Power Values (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	1	376.73	175	0.47	850 MHz	567	0.09%
Sprint 850 MHz LTE	2	941.82	175	2.37	850 MHz	567	0.42%
Sprint 1900 MHz (PCS) CDMA	5	511.82	175	3.22	1900 MHz (PCS)	1000	0.32%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	175	3.22	1900 MHz (PCS)	1000	0.32%
Sprint 2500 MHz (BRS) LTE	8	778.09	175	7.84	2500 MHz (BRS)	1000	0.78%
						Total:	**1.93%**

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:	1.93 %
Sector B:	1.93 %
Sector C:	1.93 %
SPRINT Maximum Total (per sector):	1.93 %
Site Total:	5.73 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.73 %** 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 Communications Corporation

Existing 195' Self Support Tower

SBA Site Name: Bozrah
SBA Site Number: CT01105-S-02
Carrier Name: Sprint Nextel
Carrier Site ID/Name: CT33XC574 / N. Bozrah
App #: 73320, v3

Site Location:
131 Gifford Lane,
Bozrah, CT 06334
New London County

Latitude: 41.552517
Longitude: -72.150708

ACGI Job # 18-3611

ANALYSIS RESULTS		
Tower Components	87.3 %	**Pass**
Tower Foundation Capacity	72.1 %	**Pass**
Net Change in Tower Stress	-1.4 %	**Change from previous Structural Analysis by SBA, Project # CT01105-VZW-011816, dated 01/26/2016 (F Code)**
Net change in stress due to Mount Modification	+2.2 %	Addition of (6) Site Pro 1 SCXx-K to (3) V-Brace Kit SFS-H-L Mounts.

Prepared By:
Bob Akech.

05/25/2018
Approved By:
Joji Geroge, P.E.
CT PE #24444

TABLE OF CONTENTS

1. ANALYSIS SUMMARY

The existing 195' Self Support Tower located in Bozrah, CT was analyzed by Allpro Consulting Group, Inc (ACGI) for the existing loads and the proposed **Sprint Nextel** antennas and coaxes as per application 73320, v3 as authorized by SBA Communication Corp. Based on the results of the analysis, the existing tower with mentioned proposed and existing loading is found **to be in code compliance** with *TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and IBC 2012.*

2. SCOPE & SOURCE OF INFORMATION

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

SOURCE OF INFORMATION		
Tower Data:	Pirod Inc. SBA	Original Tower Drawings by Pirod, Inc. (Job No. A-115466 dated 04/01/1999) Previous Structural Analysis by SBA, Project # CT01105-VZW-011816 dated 01/26/2016.
Foundation Data:	Pirod Inc.	Original Tower Drawings by Pirod, Inc. (Job No. A-115466 dated 04/01/1999)
Geotechnical Report:	Jaworski Geotech, Inc.	Geotechnical report by Jaworski Geotech, Inc., Project # C98492G, dated 12/14/1998.
Loading Data:	SBA SBA Communication Corp.	Existing loading as per redlined previous Structural Analysis by SBA, Project # CT01105-VZW-011816 dated 01/26/2016. Site information based on SBA Site Summary, dated 02/10/2017. Proposed final loading for Sprint Nextel as per SBA Portal, App #73320, v3.
Authorization:	SBA Communication Corp.	

3. ANALYSIS METHODS & DATA

The analysis was performed in accordance with Telecommunication Industry Association specification TIA-222-G. 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:	Bozrah
SBA Site Number:	CT01105-S-02
Carrier Site ID:	CT33XC574 / N. Bozrah
City, State:	Bozrah, CT
County:	New London County
Code Wind Load Requirement:	TIA-222-G & IBC 2012 (132 mph ultimate wind speed equivalent to 102 mph basic wind speed)
Wind Load Used:	TIA-222-G Code: • Basic wind speed of 102 mph (3 second gust wind speed) • Structure Class II*. • Exposure Category B. • Topographic Category 1. • Crest Height 0.00 ft. • A wind speed of 50 mph is used in combination with ice • Nominal ice thickness of 0.75 in.
Seismic Check:	S_s=0.170 < 1.0, thus seismic loading can be ignored as per 2.7.3 of the TIA-222-G Code

*This structural analysis is based upon the tower being classified as a class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

TOWER DATA	
Tower Type:	Self Support Tower
Height:	195s'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi , Braces – 36 ksi & 50 ksi
Type of Foundation:	Mat Foundation

TOWER HISTORY	
Tower Manufacturer / Model:	Pirod Inc./ U-22.0 x 193'
Date of Original Design:	04/01/1999
Previous Modifications:	N/A
Original Design Code Requirements:	TIA/EIA-222-F-1996 85 mph basic wind speed and 0.5" ice with 25% reduced wind speed

4. CONCLUSIONS

RESULT SUMMARY		
MEMBER	*% Capacity*	*Pass/Acceptable*
Legs	**71.0 %**	**Pass**
Diagonals	**87.3 %**	**Pass**
Girts	**6.1 %**	**Pass**
Bolt checks	**87.3 %**	**Pass**
Anchor Bolts	**26.7 %**	**Pass**
Foundation (see attached MathCAD for details)	**Bearing (3.3 %)**	**Pass**
	Horizontal shear (8.6 %)	**Pass**
	Safety against overturning (72.1 %)	**Pass**
OVERALL TOWER RATING = 87.3 %		

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

Maximum tower stress **is less than 100%, the acceptable stress ratio** making it **in code compliance** under the TIA-222-G code and 2012 International Building Code adopted by 2016 CSBC (Connecticut State Building Code).

5. DISCLAIMER

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

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

6. ASSUMPTIONS

This analysis was completed based on the following assumptions:

- Tower has been properly maintained.
- Tower erection was in accordance to manufacturer drawings and modification reports.
- 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 data was not provided. It is assumed that the foundation is designed to resist the original tower reactions.
- 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.

7. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
195±	9	EMS RR90-17-02DP	(1) Low Profile Platform	(12) 1-5/8"	T-Mobile
182±	6	CCI HPA-65R-BUU-H8 Antennas	(3) 12.5' TFrames (Commscope P/N: MTC 3615)	(12) 1-5/8" (2) 5/8" Fiber (4) 3/4" DC Power	AT&T
	3	Powerwave 7770 Antennas			
	6	Powerwave LGP21401 TMAs			
	6	Ericsson RRUS 11			
	3	Ericsson RRUS 12			
	3	Ericsson RRUS A2			
	3	Ericsson RRUS 32			
	3	Polyphases 1000860			
	6	Powerwave LGP21903			
	2	Raycap DC6-48-60-18-8F			
175±	6	Decibel DB908h90e-m Antennas	(3) T -Frames	(6) 1-5/8"	Sprint Nextel
162±	6	Commscope HBXX-6517DS-A2M	(3) T -Frames	(12) 1-5/8" Coax (2) 1-5/8" Fiber	Verizon
	3	Commscope LNX-6514DS-A1M			
	3	Amphenol QUAD656C0000x			
	3	Alcatel Lucent RRH2x60-AWS			
	3	Alcatel Lucent RRH2x60-1900			
	3	Alcatel Lucent RRH2x60-700			
	6	RFS FD9R6004/2CL-3CL			
	2	RFS DB-T1-6Z-8AB-0Z			
100±	1	Lucent KS24019-L112A GPS	Direct Mount	(1) GPS Line	
30±	2	Andrew PC1N0F-0190B-002ME911 Omnis	Direct Mount	(2) 1/2"	T-Mobile

FINAL SPRINT NEXTEL LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
175±	**3**	**RFS APXVTM14-C-I20 Antennas**	**(3) T –Frames (3) Sitepro SFS-H-L**	**(4) 1-1/4" Fiber**	Sprint Nextel
	3	**Commscope NNVV-65B-R4 Antenna**			
	3	**ALU 1900 MHz RRH**			
	6	**ALU 800 MHz RRH**			
	3	**ALU TD-RRH 8X20-25**			

1. ACGI should be notified of any discrepancies found in the data listed in this report.
2. Notify ACGI if any potential physical and other interference with existing antennas for a redesign.

8. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass Fail
T1	193 - 185	Leg	2	1	-6.21	111.48	5.6	Pass
		Diagonal	1	11	-1.28	13.28	9.6	Pass
		Horizontal	7/8	23	-0.15	3.94	3.9	Pass
		Top Girt	1 1/4	5	-0.62	16.42	3.8	Pass
		Bottom Girt	1 1/4	8	-0.69	16.42	4.2	Pass
T2	185 - 170	Leg	2	32	-43.07	111.48	38.6	Pass
		Diagonal	1	44	-5.90	13.28	44.4	Pass
		Horizontal	7/8	48	-0.34	3.94	8.7	Pass
		Top Girt	1 1/4	33	-0.23	16.42	1.4	Pass
		Bottom Girt	1 1/4	36	-1.00	16.42	6.1	Pass
		Mid Girt	1 1/4	39	-0.36	16.42	2.2	Pass
T3	170 - 160	Leg	Pirod 105244	84	-52.85	142.49	51.2	Pass
		Diagonal	L2 1/2x2 1/2x3/16	87	-9.87	13.56	72.8	Pass
							83.8 (b)	
T4	160 - 140	Leg	Pirod 105217	93	-107.86	214.86	50.2	Pass
		Diagonal	L3x3x3/16	102	-10.20	18.18	56.1	Pass
							87.3 (b)	
T5	140 - 120	Leg	Pirod 105217	108	-152.48	214.86	71.0	Pass
		Diagonal	L3x3x3/16	111	-8.30	14.96	55.5	Pass
							71.1 (b)	
T6	120 - 100	Leg	Pirod 105218	123	-192.63	300.68	64.1	Pass
		Diagonal	L3x3x5/16	126	-8.18	19.32	42.3	Pass
T7	100 - 80	Leg	Pirod 105219	138	-230.18	399.87	57.6	Pass
		Diagonal	L3x3x5/16	141	-8.26	15.76	52.4	Pass
T8	80 - 60	Leg	Pirod 105219	153	-265.76	399.87	66.5	Pass
		Diagonal	L3 1/2x3 1/2x5/16	158	-8.81	20.74	42.5	Pass
T9	60 - 40	Leg	Pirod 105220	168	-300.52	512.38	58.7	Pass
							60.3 (b)	
		Diagonal	L3 1/2x3 1/2x5/16	173	-8.92	17.15	52.0	Pass
T10	40 - 20	Leg	Pirod 105220	183	-336.18	512.38	65.6	Pass
							67.0 (b)	
		Diagonal	L3 1/2x3 1/2x5/16	194	-10.63	15.65	67.9	Pass
T11	20 - 0	Leg	Pirod 112738	198	-349.82	613.14	57.1	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x1	203	-19.22	44.46	43.2	Pass
							Summary	
						Leg (T5)	71.0	Pass
						Diagonal (T4)	87.3	Pass
						Horizontal (T2)	8.7	Pass
						Top Girt (T1)	3.8	Pass
						Bottom Girt (T2)	6.1	Pass
						Mid Girt (T2)	2.2	Pass
						Bolt Checks	87.3	Pass
						RATING =	**87.3**	**Pass**

APPENDIX

Tower Data

⚠ This is a beta release of the new ATC Hazards by Location website. Please contact us with feedback.

Hazards by Location

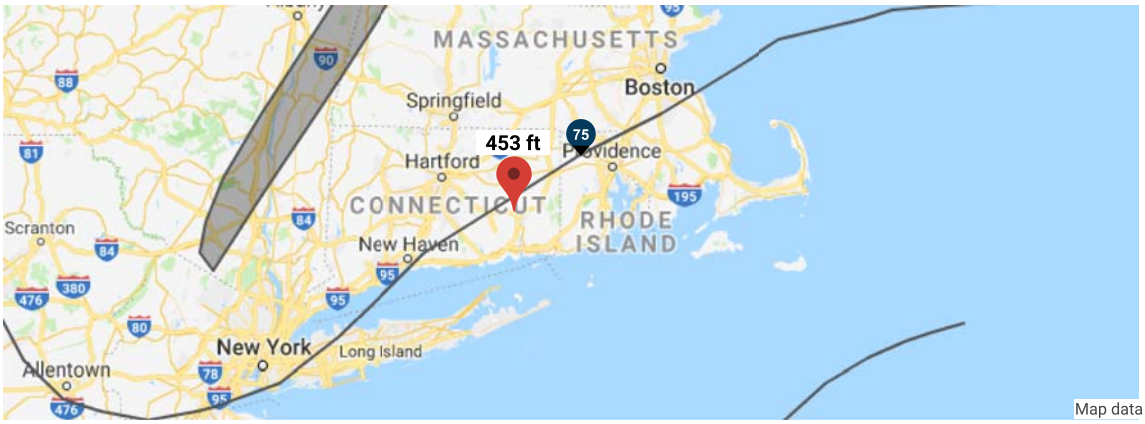
Search Information

Coordinates: 41.552517, -72.150708

Timestamp: 2018-05-25T21:18:21.618Z

Hazard Type: Wind

Map Results



Text Results

ASCE 7-16

MRI 10-Year	76 mph
MRI 25-Year	86 mph
MRI 50-Year	96 mph
MRI 100-Year	101 mph
Risk Category I	114 mph
Risk Category II	124 mph
Risk Category III	⚠ 133 mph

If the structure under consideration is a healthcare facility, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

Risk Category IV	⚠ 137 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

ASCE 7-10

MRI 10-Year	79 mph
MRI 25-Year	89 mph
MRI 50-Year	98 mph
MRI 100-Year	106 mph
Risk Category I	121 mph

Risk Category II ⚠ 132 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

Risk Category III-IV ⚠ 142 mph

If the structure under consideration is a healthcare facility, you are in a wind-borne debris region. If other occupancy, use the Risk Category II basic wind speed contours to determine if you are in a wind-borne debris region.

ASCE 7-05

ASCE 7-05 Wind Speed ⚠ 112 mph

You are in a wind-borne debris region if you are also within 1 mile of the coastal mean high water line.

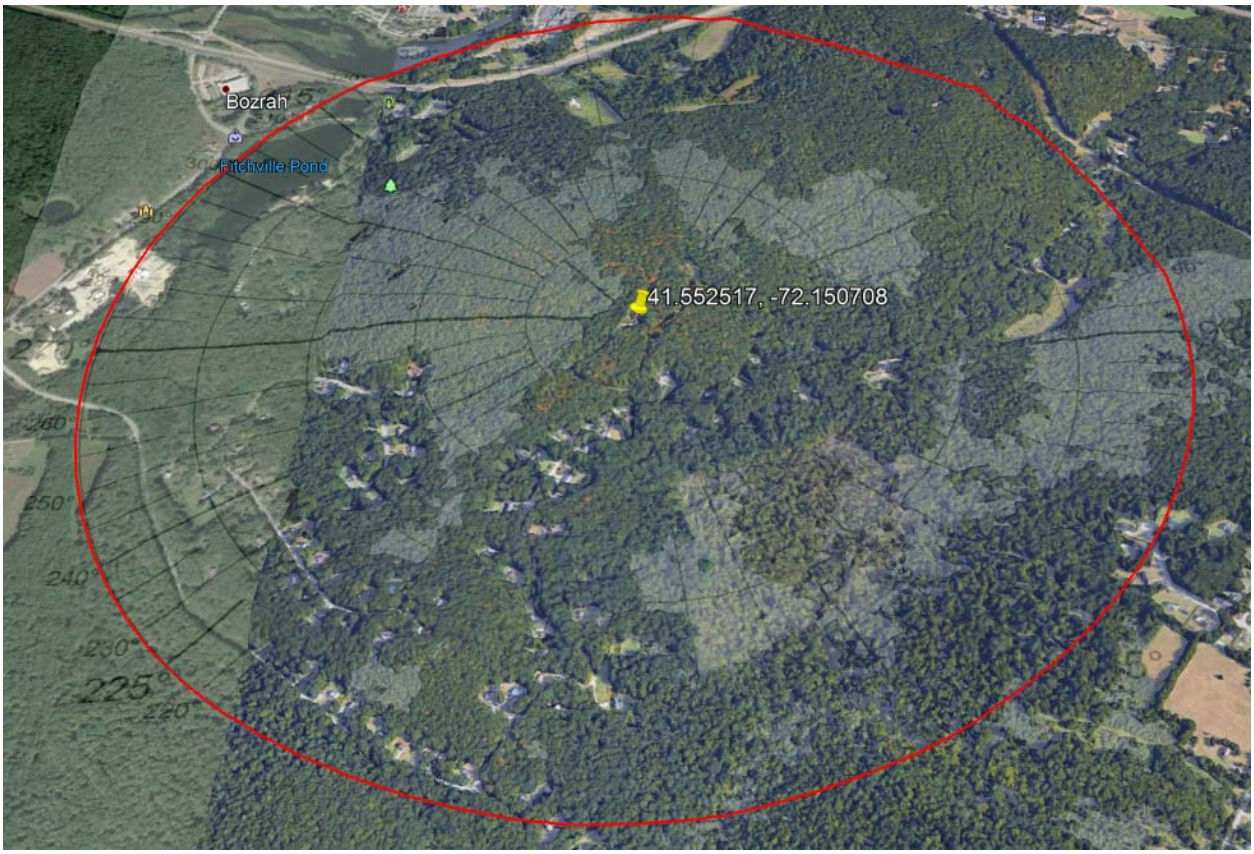
The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are interpolated from data provided in ASCE 7 and rounded up to the nearest whole integer. Per ASCE 7, islands and coastal areas outside the last contour should use the last wind speed contour of the coastal area – in some cases, this website will extrapolate past the last wind speed contour and therefore, provide a wind speed that is slightly higher. NOTE: For queries near wind-borne debris region boundaries, the resulting determination is sensitive to rounding which may affect whether or not it is considered to be within a wind-borne debris region.

While the information presented on this website is believed to be correct, ATC and its sponsors and contributors assume no responsibility or liability for its accuracy. The material presented in the report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the report provided by this website. Users of the information from this website assume all liability arising from such use. Use of the output of this website does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site described by latitude/longitude location in the report.

CT01105-S-02 Bozrah

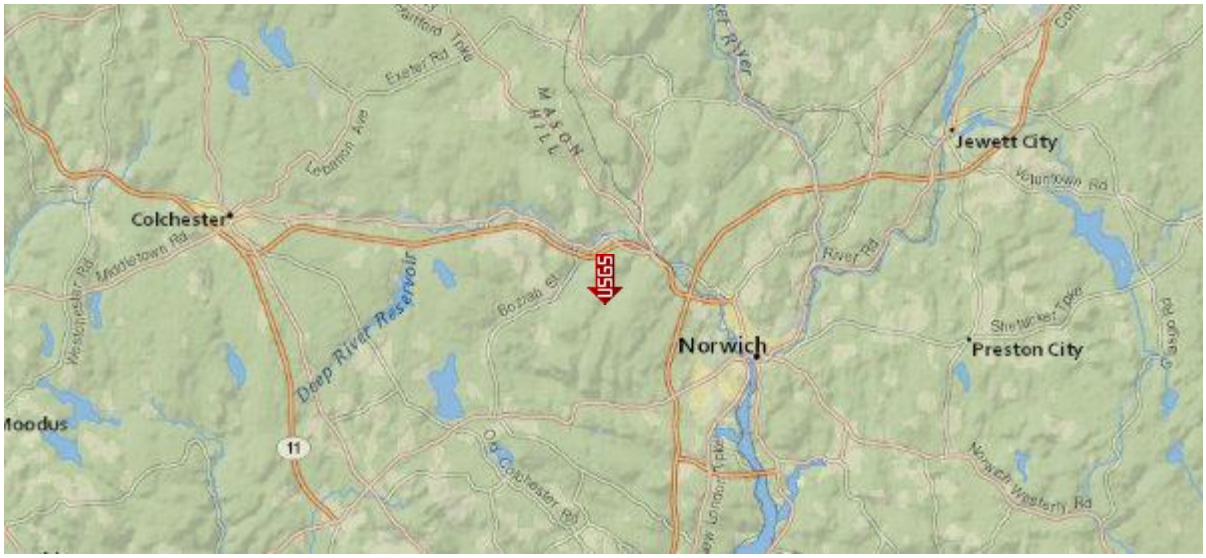


Exposure Category B.
Topographic Category 1.

USGS Design Maps Summary Report

User–Specified Input

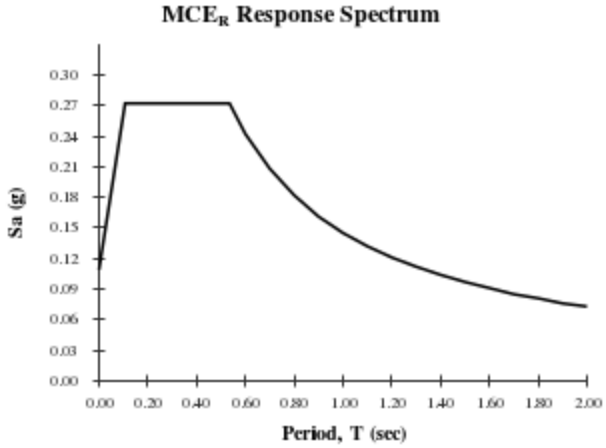
Report Title	CT01105-S-02 BOZRA Fri May 25, 2018 21:35:46 UTC
Building Code Reference Document	2012/2015 International Building Code (which utilizes USGS hazard data available in 2008)
Site Coordinates	41.55252°N, 72.15071°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	I/II/III

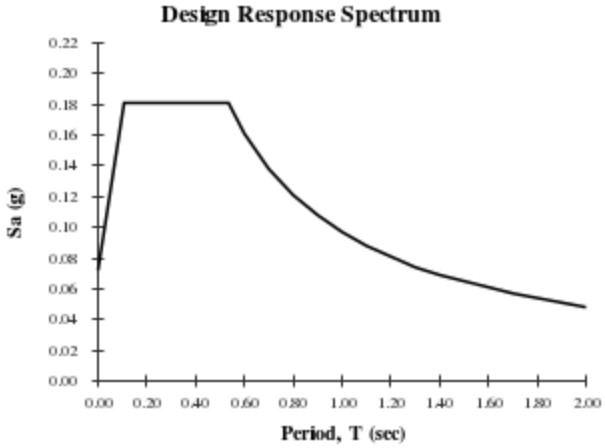


USGS–Provided Output

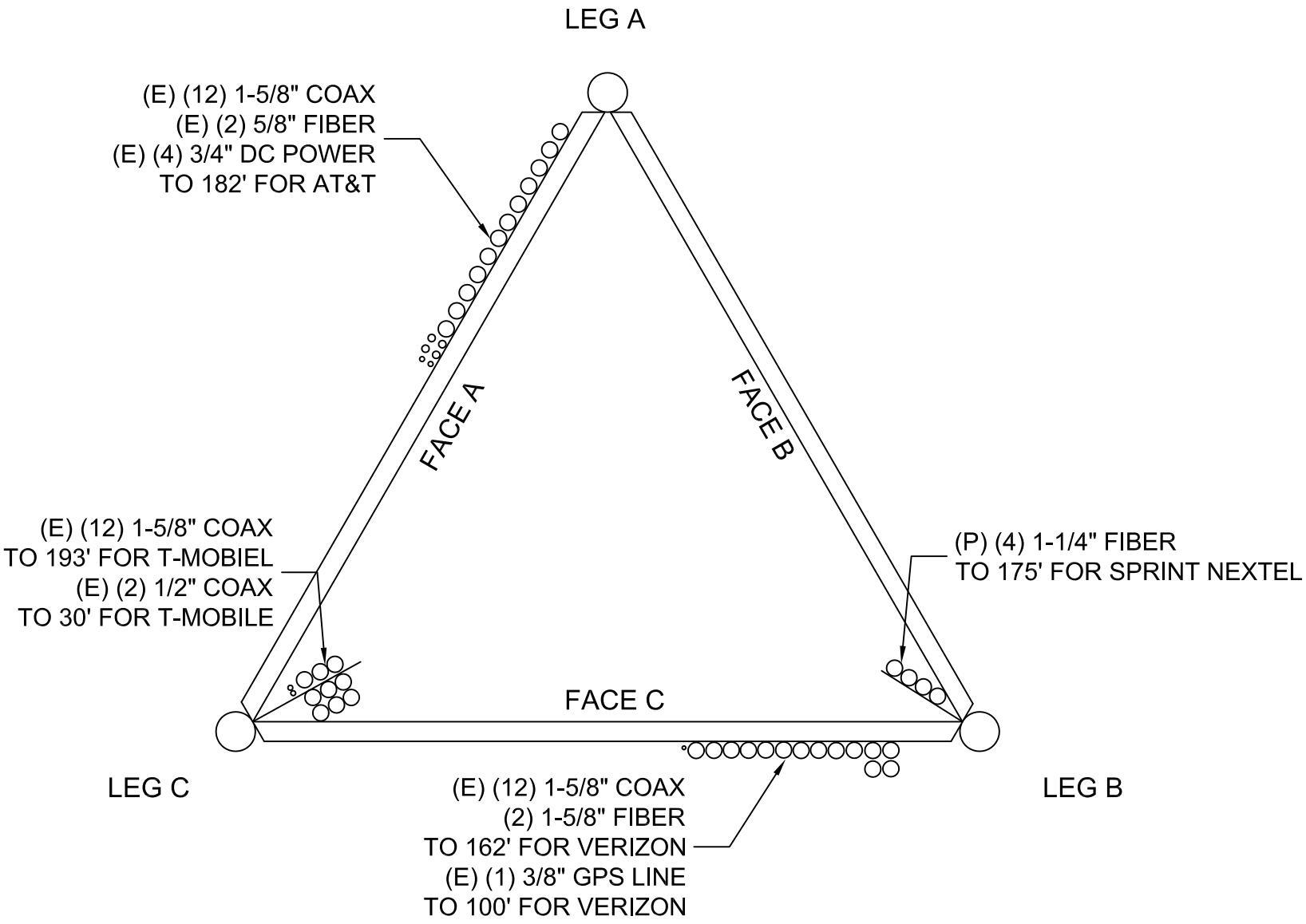
S_S =	0.170 g	S_{MS} =	0.272 g	S_{DS} =	0.181 g
S_1 =	0.061 g	S_{M1} =	0.145 g	S_{D1} =	0.097 g

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





COAX LAYOUT

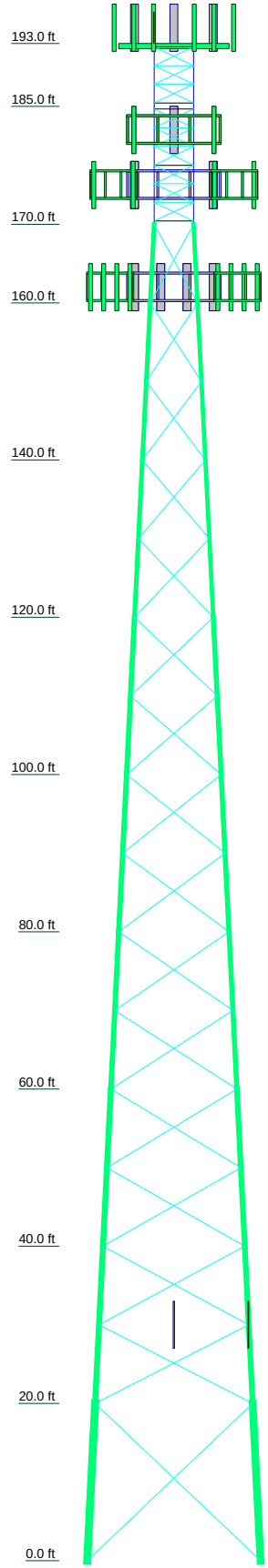


COAX LAYOUT

N.T.S.

TOWER ELEVATION DRAWING

Section	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Pirod 112738	Pirod 105220		Pirod 105219		Pirod 105218		Pirod 105217	A	SR 2	
Leg Grade	A572-50										
Diagonals	2L3 1/2x3 1/2x5/16x1	L3 1/2x3 1/2x5/16			L3x3x5/16			L3x3x3/16	B	SR 1	
Diagonal Grade				A36						A572-50	
Top Girts				N.A.						SR 1 1/4	
Mid Girts				N.A.						SR 1 1/4	N.A.
Bottom Girts				N.A.						SR 1 1/4	
Horizontals				N.A.						SR 7/8	
Face Width (ft)	22	20	18	16	14	12	10	8	6	5	
# Panels @ (ft)	1 @ 20				15 @ 10					9 @ 2.375	
Weight (K)	38.0	7.7	5.3	5.1	4.5	4.1	3.4	2.5	2.4	1.3	1.1	0.7



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244	B	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

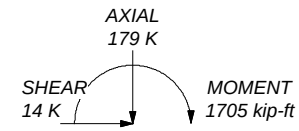
TOWER DESIGN NOTES

1. Tower is located in New London County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 102 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 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 0.00 ft
8. TOWER RATING: 87.3%

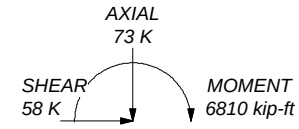
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 375 K
SHEAR: 43 K

UPLIFT: -321 K
SHEAR: 37 K



TORQUE 7 kip-ft
50 mph WIND - 0.7500 in ICE

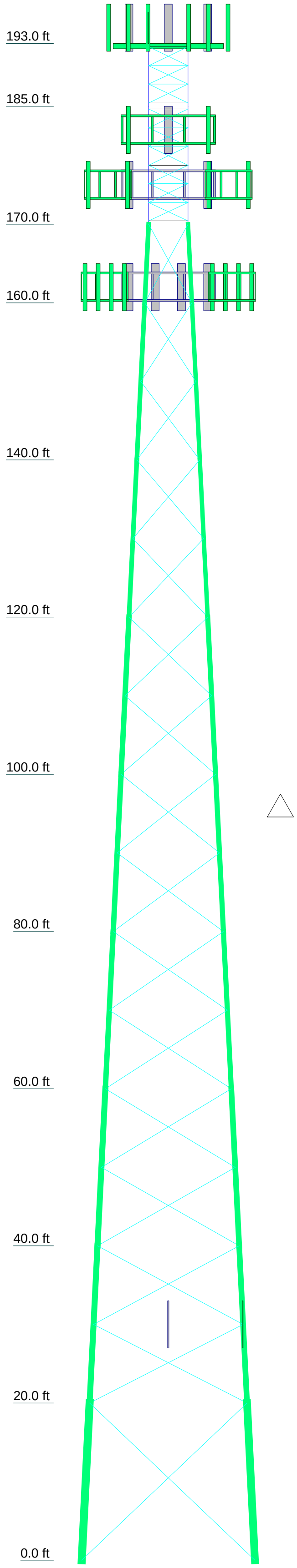


TORQUE 33 kip-ft
REACTIONS - 102 mph WIND

Allpro Consultants group inc
9221 lyndon B johson Freeway. Suite 204
Dalls Tx. 75243
Phone: 972 231 8893
FAX: 866 364 8375

Job: **18-3611**			
Project: **CT01105-S-02 BOZRAH**			
Client: SBA	Drawn by: bakech	App'd:	
Code: TIA-222-G	Date: 05/29/18	Scale: NTS	
Path:		Dwg No. E-1	

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Mid Girts	Bottom Girts	Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	SR 2	A572-50	SR 1	A572-50	SR 1 1/4	N.A.	SR 1 1/4	SR 7/8	5	9 @ 2.375	0.7
T2	SR 2	A572-50	SR 1	A572-50	SR 1 1/4	SR 1 1/4	SR 1 1/4	SR 7/8		9 @ 2.375	1.3
T3	A	A572-50	B	A36	N.A.	N.A.	N.A.	N.A.		15 @ 10	1.1
T4	Pirod 105217	A572-50	L3x3x3/16	A36	N.A.	N.A.	N.A.	N.A.	6	15 @ 10	2.4
T5	Pirod 105217	A572-50	L3x3x3/16	A36	N.A.	N.A.	N.A.	N.A.	8	15 @ 10	2.5
T6	Pirod 105218	A572-50	L3x3x5/16	A36	N.A.	N.A.	N.A.	N.A.	10	15 @ 10	3.4
T7	Pirod 105219	A572-50	L3x3x5/16	A36	N.A.	N.A.	N.A.	N.A.	12	15 @ 10	4.1
T8	Pirod 105219	A572-50	L3 1/2x3 1/2x5/16	A36	N.A.	N.A.	N.A.	N.A.	14	15 @ 10	4.5
T9	Pirod 105220	A572-50	L3 1/2x3 1/2x5/16	A36	N.A.	N.A.	N.A.	N.A.	16	15 @ 10	5.1
T10	Pirod 105220	A572-50	L3 1/2x3 1/2x5/16	A36	N.A.	N.A.	N.A.	N.A.	18	15 @ 10	5.3
T11	Pirod 112738	A572-50	2L3 1/2x3 1/2x5/16x1	A36	N.A.	N.A.	N.A.	N.A.	20	1 @ 20	7.7
									22		38.0



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
(3) RR90-17-02DP w/ Mount Pipe	193	NNVV-65B-R4 Antenna	175
(3) RR90-17-02DP w/ Mount Pipe	193	NNVV-65B-R4 Antenna	175
(3) RR90-17-02DP w/ Mount Pipe	193	(2) 800 MHz RRH	175
(1) Low Profile Platform	193	(2) 800 MHz RRH	175
Lightning Rod	193	(2) 800 MHz RRH	175
Powerwave 7770 w/ Mount Pipe	182	1900 MHz RRH	175
Powerwave 7770 w/ Mount Pipe	182	1900 MHz RRH	175
(2) HPA-65R-BUU-H8 w/ Mount Pipe	182	1900 MHz RRH	175
(2) HPA-65R-BUU-H8 w/ Mount Pipe	182	TD-RRH8x20-25	175
(2) HPA-65R-BUU-H8 w/ Mount Pipe	182	TD-RRH8x20-25	175
(2) LGP21401	182	TD-RRH8x20-25	175
(2) LGP21401	182	(2) FD9R6004/2C-3L	162
(2) LGP21401	182	Empty Mount Pipe	162
(2) LGP21903 Diplexer	182	Empty Mount Pipe	162
(2) LGP21903 Diplexer	182	Empty Mount Pipe	162
(2) LGP21903 Diplexer	182	RRH2x60-AWS	162
(2) RRUS 11	182	RRH2x60-AWS	162
(2) RRUS 11	182	RRH2x60-AWS	162
(2) RRUS 11	182	RRH2x60-1900	162
RRUS 12	182	RRH2x60-1900	162
RRUS 12	182	RRH2x60-1900	162
RRUS 12	182	RRH2x60-700	162
(2) RRUS A2	182	RRH2x60-700	162
RRUS A2	182	RRH2x60-700	162
RRUS A2	182	(3) T-Frames	162
RRUS-32	182	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
RRUS-32	182	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
RRUS-32	182	(2) HBXX-6517DS-A2M w/ Mount Pipe	162
1000860	182	LNX-6514DS-A1M	162
1000860	182	LNX-6514DS-A1M	162
1000860	182	LNX-6514DS-A1M	162
DC6-48-60-18-8F	182	QUAD656C0000x	162
DC6-48-60-18-8F	182	QUAD656C0000x	162
(3) 12.5' T-Frames (Commscope P/N: MTC3615)	182	QUAD656C0000x	162
		DB-T1-6Z-8AB-0Z	162
Powerwave 7770 w/ Mount Pipe	182	DB-T1-6Z-8AB-0Z	162
Modified T-Frames (3)	175	(2) FD9R6004/2C-3L	162
RFS APXVSPP18-C-A20	175	(2) FD9R6004/2C-3L	162
RFS APXVSPP18-C-A20	175	KS24019-L112A	100
RFS APXVSPP18-C-A20	175	PC1N0F-0190B-002M	30
NNVV-65B-R4 Antenna	175	PC1N0F-0190B-002M	30

SYMBOL LIST

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A	Pirod 105244	B	L2 1/2x2 1/2x3/16

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7. Topographic Category 1 with Crest Height of 0.00 ft

Allpro Consultants group inc
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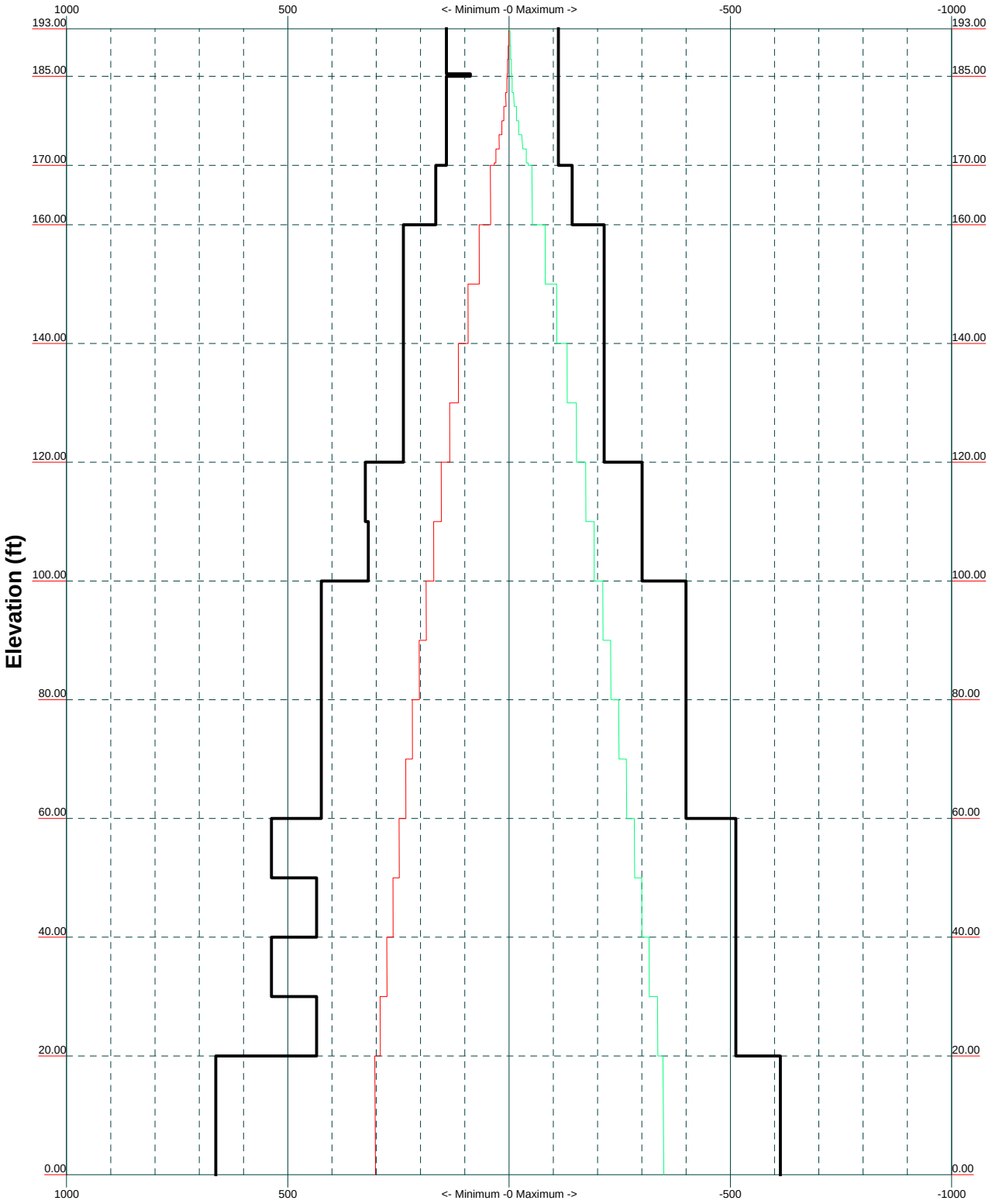
Dalls Tx. 75243
Phone: 972 231 8893
FAX: 866 364 8375

Job: ***18-3611***		
Project: ***CT01105-S-02 BOZRAH***		
Client: SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 05/29/18	Scale: NTS
Path:		Dwg No. E-1

MISCELLANEOUS PLOTS

TIA-222-G - 102 mph/50 mph 0.7500 in Ice Exposure B

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



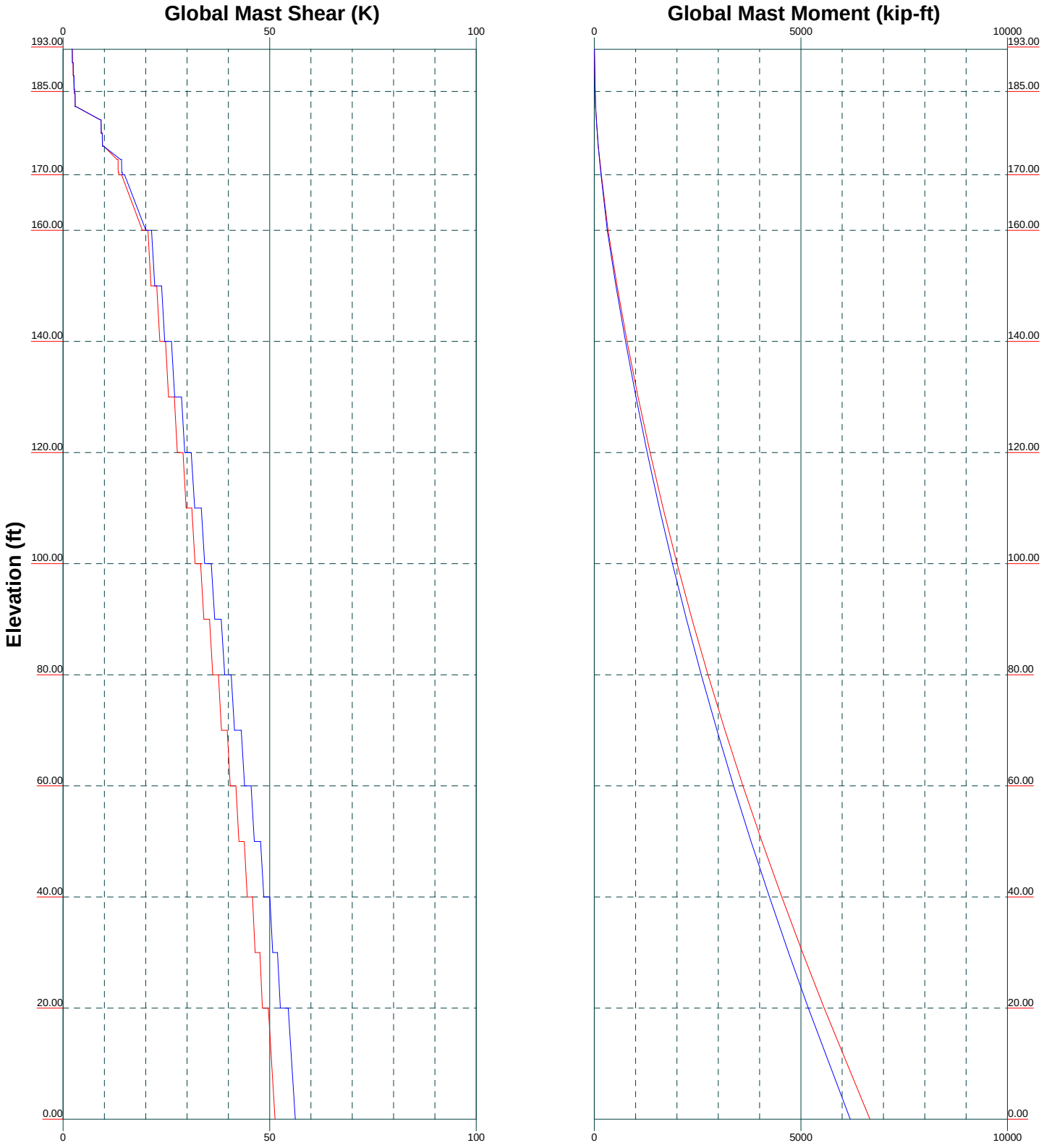
Allpro Consultants group inc
9221 lyndon B johson Freeway. Suite 204
Dalls Tx. 75243
Phone: 972 231 8893
FAX: 866 364 8375

Job: ***18-3611***			
Project: ***CT01105-S-02 BOZRAH***			
Client: SBA	Drawn by: bakech	App'd:	
Code: TIA-222-G	Date: 05/25/18	Scale: NTS	
Path:		Dwg No. E-3	

TIA-222-G - 102 mph/50 mph 0.7500 in Ice Exposure B

Maximum Values

Vx Vz Mx Mz

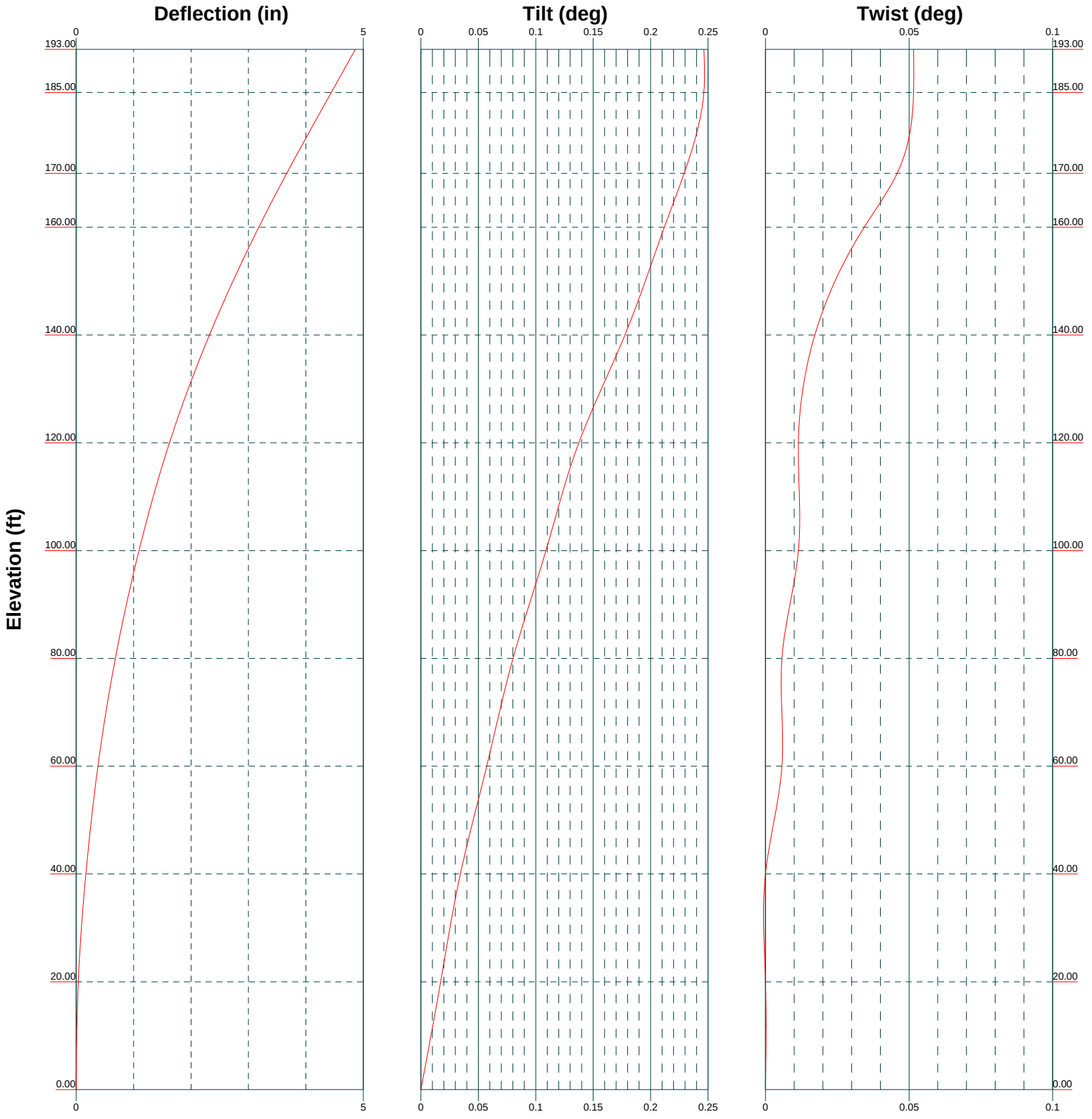


Allpro Consultants group inc
9221 lyndon B johson Freeway. Suite 204
Dalls Tx. 75243
Phone: 972 231 8893
FAX: 866 364 8375

Job: ***18-3611***		
Project: ***CT01105-S-02 BOZRAH***		
Client: SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 05/25/18	Scale: NTS
Path:		Dwg No. E-4

TIA-222-G - Service - 60 mph

Maximum Values



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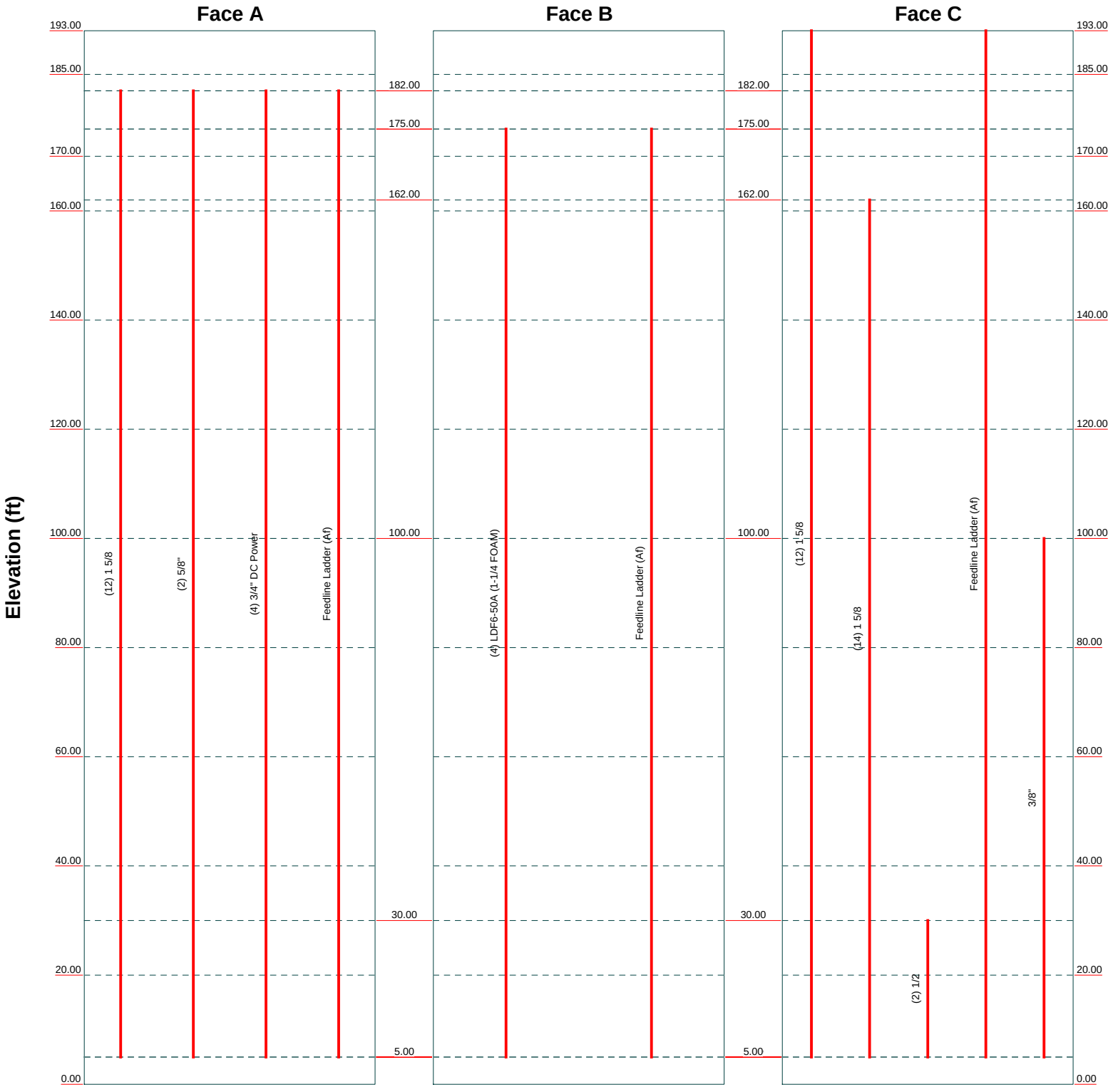
Job: ***18-3611***			
Project: ***CT01105-S-02 BOZRAH***			
Client: SBA	Drawn by: bakech	App'd:	
Code: TIA-222-G	Date: 05/25/18	Scale: NTS	
Path:		Dwg No. E-5	

Feed Line Distribution Chart
0' - 193'

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



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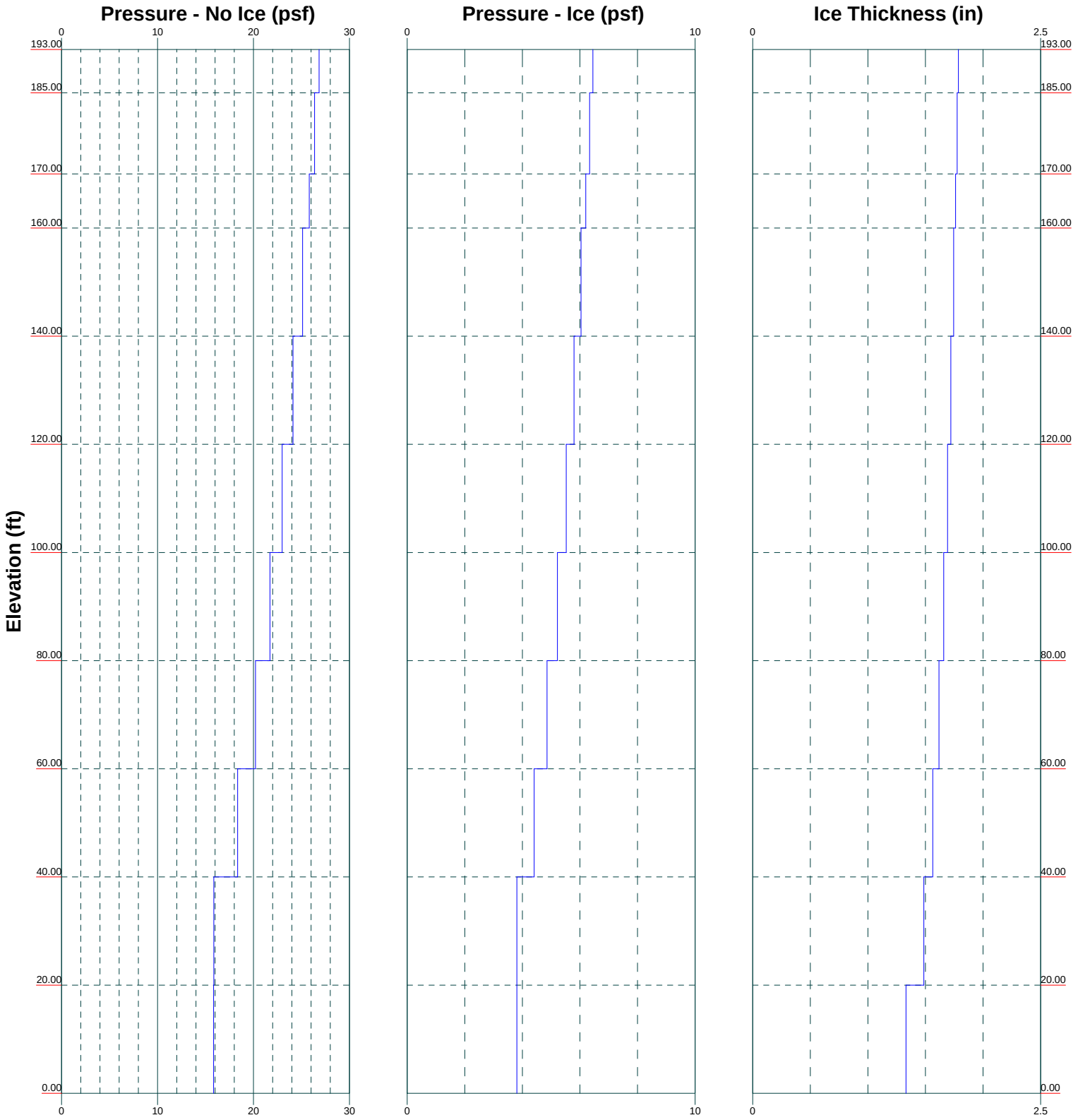
Dalls Tx. 75243
Phone: 972 231 8893
FAX: 866 364 8375

Job: ***18-3611***		
Project: ***CT01105-S-02 BOZRAH***		
Client: SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 05/25/18	Scale: NTS
Path:		Dwg No. E-7

Wind Pressures and Ice Thickness

TIA-222-G - 102 mph/50 mph 0.7500 in Ice Exposure B



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Dalls Tx. 75243
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Job: ***18-3611***		
Project: ***CT01105-S-02 BOZRAH***		
Client: SBA	Drawn by: bakech	App'd:
Code: TIA-222-G	Date: 05/25/18	Scale: NTS
Path:		Dwg No. E-9

TNX TOWER CALCULATION PRINTOUT

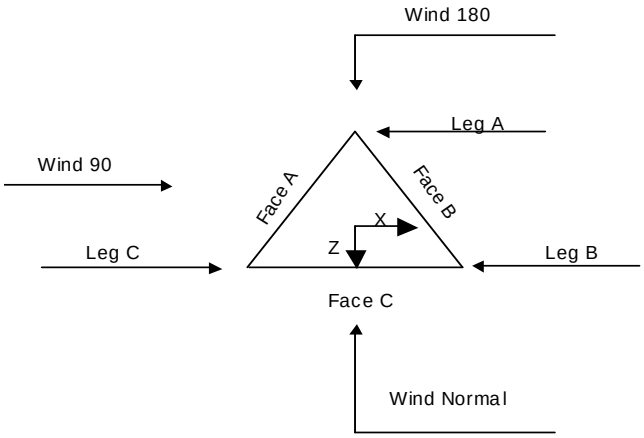
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 193.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 22.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New London County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 102 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	193.00-185.00			5.00	1	8.00
T2	185.00-170.00			5.00	1	15.00
T3	170.00-160.00			5.00	1	10.00
T4	160.00-140.00			6.00	1	20.00
T5	140.00-120.00			8.00	1	20.00
T6	120.00-100.00			10.00	1	20.00
T7	100.00-80.00			12.00	1	20.00
T8	80.00-60.00			14.00	1	20.00
T9	60.00-40.00			16.00	1	20.00
T10	40.00-20.00			18.00	1	20.00
T11	20.00-0.00			20.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	193.00-185.00	2.38	X Brace	No	Steps	5.2500	5.2500
T2	185.00-170.00	2.38	X Brace	No	Steps	4.5000	4.5000
T3	170.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T4	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T5	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T6	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T7	100.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T8	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T9	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T10	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T11	20.00-0.00	20.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 193.00-185.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2 185.00-170.00	Solid Round	2	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 170.00-160.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T4 160.00-140.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T5 140.00-120.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 120.00-100.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 100.00-80.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T8 80.00-60.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T9 60.00-40.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T10 40.00-20.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T11 20.00-0.00	Truss Leg	Pirod 112738	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16x1	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 193.00-185.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T2 185.00-170.00	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 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 193.00-185.00	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 185.00-170.00	1	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	7/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 193.00-185.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 185.00-170.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 170.00-160.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 160.00-140.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 140.00-120.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 120.00-100.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 100.00-80.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 80.00-60.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 60.00-40.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 40.00-20.00	0.00	0.5000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 20.00-0.00	0.00	1.0000	A36 (36 ksi)	1	1	1.05	0.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X 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 193.00-185.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 185.00-170.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 170.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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
T5	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				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	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T3	1	0.5	0.85	1	0.5	0.85
170.00-160.00						
T4	1	0.5	0.85	1	0.5	0.85
160.00-140.00						
T5	1	0.5	0.85	1	0.5	0.85
140.00-120.00						
T6	1	0.5	0.85	1	0.5	0.85
120.00-100.00						
T7	1	0.5	0.85	1	0.5	0.85
100.00-80.00						
T8	1	0.5	0.85	1	0.5	0.85
80.00-60.00						
T9	1	0.5	0.85	1	0.5	0.85
60.00-40.00						
T10	1	0.5	0.85	1	0.5	0.85
40.00-20.00						
T11	1	0.5	0.85	1	0.5	0.85
20.00-0.00						

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 193.00-185.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 185.00-170.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 170.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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 193.00-185.00	Sleeve DS	0.6250 A325N	5	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 185.00-170.00	Flange	1.0000 A325N	6	0.7500 A325N	0	0.7500 A325N	0	0.7500 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 170.00-160.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	0	1.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 160.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 140.00-120.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 120.00-100.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 100.00-80.00	Flange	1.2500 A325N>1"	6	1.2500 A325N>1"	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 80.00-60.00	Flange	1.2500 A325N>1"	6	1.2500 A325N>1"	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 60.00-40.00	Flange	1.2500 A325N>1"	6	1.2500 A325N>1"	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 40.00-20.00	Flange	1.2500 A325N>1"	6	1.2500 A325N>1"	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 20.00-0.00	Flange	2.0000 A687	6	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 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 plf
1 5/8	C	No	Ar (CaAa)	193.00 - 5.00	0.0000	0.15	12	4	0.5000	1.9800		1.04
***												
1 5/8	A	No	Ar (CaAa)	182.00 - 5.00	0.0000	0.3	12	12	0.5000	1.9800		1.04
5/8"	A	No	Ar (CaAa)	182.00 - 5.00	0.0000	0.25	2	1	0.5000	0.8800		0.40
3/4" DC Power	A	No	Ar (CaAa)	182.00 - 5.00	0.0000	0.2	4	2	0.5000	0.9950		0.47
***												
LDF6-50A (1-1/4 FOAM)	B	No	Ar (CaAa)	175.00 - 5.00	0.0000	0.15	4	4	0.5000	1.5500		0.66
***												
1 5/8	C	No	Ar (CaAa)	162.00 - 5.00	0.0000	0.2	14	12	0.5000	1.9800		1.04
***												
1/2	C	No	Ar (CaAa)	30.00 - 5.00	0.0000	0.4	2	1	0.5000 0.5800	0.5800		0.25
***												
Feedline Ladder (Af)	A	No	Af (CaAa)	182.00 - 5.00	0.0000	0.25	1	1	3.0000	1.5000		8.40
Feedline Ladder (Af)	C	No	Af (CaAa)	193.00 - 5.00	0.0000	0.2	1	1	3.0000	1.5000		8.40
***												
***												
3/8"	C	No	Ar (CaAa)	100.00 - 5.00	0.0000	0.28	1	1	0.3750	0.3750		0.18
Feedline Ladder (Af)	B	No	Af (CaAa)	175.00 - 5.00	0.0000	0.15	1	1	3.0000	1.5000		8.40

Feed Line/Linear Appurtenances - Entered As Area

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

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	193.00-185.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	21.008	0.000	0.17
T2	185.00-170.00	A	0.000	0.000	38.400	0.000	0.28
		B	0.000	0.000	4.350	0.000	0.06
		C	0.000	0.000	39.390	0.000	0.31
T3	170.00-160.00	A	0.000	0.000	32.000	0.000	0.24
		B	0.000	0.000	8.700	0.000	0.11
		C	0.000	0.000	31.804	0.000	0.24
T4	160.00-140.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	107.960	0.000	0.71

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
T5	140.00-120.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	107.960	0.000	0.71
T6	120.00-100.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	107.960	0.000	0.71
T7	100.00-80.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	108.710	0.000	0.71
T8	80.00-60.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	108.710	0.000	0.71
T9	60.00-40.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	108.710	0.000	0.71
T10	40.00-20.00	A	0.000	0.000	64.000	0.000	0.47
		B	0.000	0.000	17.400	0.000	0.22
		C	0.000	0.000	109.870	0.000	0.72
T11	20.00-0.00	A	0.000	0.000	48.000	0.000	0.35
		B	0.000	0.000	13.050	0.000	0.17
		C	0.000	0.000	83.272	0.000	0.54

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	193.00-185.00	A	1.786	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	21.570	0.000	0.53
T2	185.00-170.00	A	1.775	0.000	0.000	80.939	0.000	1.30
		B		0.000	0.000	10.745	0.000	0.19
		C		0.000	0.000	40.351	0.000	0.98
T3	170.00-160.00	A	1.762	0.000	0.000	67.295	0.000	1.08
		B		0.000	0.000	21.421	0.000	0.37
		C		0.000	0.000	35.265	0.000	0.80
T4	160.00-140.00	A	1.745	0.000	0.000	134.192	0.000	2.14
		B		0.000	0.000	42.664	0.000	0.73
		C		0.000	0.000	137.728	0.000	2.74
T5	140.00-120.00	A	1.720	0.000	0.000	133.601	0.000	2.12
		B		0.000	0.000	42.401	0.000	0.72
		C		0.000	0.000	137.305	0.000	2.71
T6	120.00-100.00	A	1.692	0.000	0.000	132.922	0.000	2.09
		B		0.000	0.000	42.099	0.000	0.71
		C		0.000	0.000	136.819	0.000	2.68
T7	100.00-80.00	A	1.658	0.000	0.000	132.122	0.000	2.05
		B		0.000	0.000	41.742	0.000	0.70
		C		0.000	0.000	143.629	0.000	2.73
T8	80.00-60.00	A	1.617	0.000	0.000	131.142	0.000	2.01
		B		0.000	0.000	41.307	0.000	0.68
		C		0.000	0.000	142.762	0.000	2.69
T9	60.00-40.00	A	1.564	0.000	0.000	129.869	0.000	1.95
		B		0.000	0.000	40.740	0.000	0.66
		C		0.000	0.000	141.636	0.000	2.63
T10	40.00-20.00	A	1.486	0.000	0.000	128.018	0.000	1.87
		B		0.000	0.000	39.918	0.000	0.64
		C		0.000	0.000	147.374	0.000	2.62
T11	20.00-0.00	A	1.331	0.000	0.000	93.261	0.000	1.29

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	28.717	0.000	0.44
		C		0.000	0.000	112.815	0.000	1.88

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	193.00-185.00	-9.4121	20.3071	-9.8164	19.9308
T2	185.00-170.00	-6.7049	-9.8412	-6.3408	-8.9762
T3	170.00-160.00	-5.6740	-10.9638	-4.3959	-9.8672
T4	160.00-140.00	-10.3423	-10.7581	-8.7107	-9.5225
T5	140.00-120.00	-13.2447	-13.9660	-11.1696	-12.3828
T6	120.00-100.00	-16.1471	-17.1738	-13.6456	-15.2608
T7	100.00-80.00	-19.1912	-19.9332	-17.0302	-15.8375
T8	80.00-60.00	-22.1155	-23.0717	-19.6805	-18.4445
T9	60.00-40.00	-25.0399	-26.2103	-22.3689	-21.1226
T10	40.00-20.00	-28.3271	-28.3259	-26.4734	-21.2047
T11	20.00-0.00	-31.2825	-29.9238	-30.3834	-21.2641

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	1 5/8	185.00 - 193.00	0.6000	0.4614
T1	15	Feedline Ladder (Af)	185.00 - 193.00	0.6000	0.4614
T2	1	1 5/8	170.00 - 185.00	0.6000	0.4628
T2	3	1 5/8	170.00 - 182.00	0.6000	0.4628
T2	5	5/8"	170.00 - 182.00	0.6000	0.4628
T2	6	3/4" DC Power	170.00 - 182.00	0.6000	0.4628
T2	8	LDF6-50A (1-1/4 FOAM)	170.00 - 175.00	0.6000	0.4628
T2	14	Feedline Ladder (Af)	170.00 - 182.00	0.6000	0.4628
T2	15	Feedline Ladder (Af)	170.00 - 185.00	0.6000	0.4628
T2	19	Feedline Ladder (Af)	170.00 - 175.00	0.6000	0.4628
T3	1	1 5/8	160.00 - 170.00	0.6000	0.3192
T3	3	1 5/8	160.00 - 170.00	0.6000	0.3192
T3	5	5/8"	160.00 - 170.00	0.6000	0.3192
T3	6	3/4" DC Power	160.00 -	0.6000	0.3192

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	8	LDF6-50A (1-1/4 FOAM)	170.00 160.00 - 170.00	0.6000	0.3192
T3	10	1 5/8	160.00 - 162.00	0.6000	0.3192
T3	14	Feedline Ladder (Af)	160.00 - 170.00	0.6000	0.3192
T3	15	Feedline Ladder (Af)	160.00 - 170.00	0.6000	0.3192
T3	19	Feedline Ladder (Af)	160.00 - 170.00	0.6000	0.3192
T4	1	1 5/8	140.00 - 160.00	0.6000	0.4127
T4	3	1 5/8	140.00 - 160.00	0.6000	0.4127
T4	5	5/8"	140.00 - 160.00	0.6000	0.4127
T4	6	3/4" DC Power	140.00 - 160.00	0.6000	0.4127
T4	8	LDF6-50A (1-1/4 FOAM)	140.00 - 160.00	0.6000	0.4127
T4	10	1 5/8	140.00 - 160.00	0.6000	0.4127
T4	14	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.4127
T4	15	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.4127
T4	19	Feedline Ladder (Af)	140.00 - 160.00	0.6000	0.4127
T5	1	1 5/8	120.00 - 140.00	0.6000	0.5118
T5	3	1 5/8	120.00 - 140.00	0.6000	0.5118
T5	5	5/8"	120.00 - 140.00	0.6000	0.5118
T5	6	3/4" DC Power	120.00 - 140.00	0.6000	0.5118
T5	8	LDF6-50A (1-1/4 FOAM)	120.00 - 140.00	0.6000	0.5118
T5	10	1 5/8	120.00 - 140.00	0.6000	0.5118
T5	14	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5118
T5	15	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5118
T5	19	Feedline Ladder (Af)	120.00 - 140.00	0.6000	0.5118
T6	1	1 5/8	100.00 - 120.00	0.6000	0.5764
T6	3	1 5/8	100.00 - 120.00	0.6000	0.5764
T6	5	5/8"	100.00 - 120.00	0.6000	0.5764
T6	6	3/4" DC Power	100.00 - 120.00	0.6000	0.5764
T6	8	LDF6-50A (1-1/4 FOAM)	100.00 - 120.00	0.6000	0.5764
T6	10	1 5/8	100.00 - 120.00	0.6000	0.5764
T6	14	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5764
T6	15	Feedline Ladder (Af)	100.00 -	0.6000	0.5764

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			120.00		
T6	19	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.5764
T7	1	1 5/8	80.00 - 100.00	0.6000	0.6000
T7	3	1 5/8	80.00 - 100.00	0.6000	0.6000
T7	5	5/8"	80.00 - 100.00	0.6000	0.6000
T7	6	3/4" DC Power	80.00 - 100.00	0.6000	0.6000
T7	8	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.6000	0.6000
T7	10	1 5/8	80.00 - 100.00	0.6000	0.6000
T7	14	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	15	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T7	18	3/8"	80.00 - 100.00	0.6000	0.6000
T7	19	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T8	1	1 5/8	60.00 - 80.00	0.6000	0.6000
T8	3	1 5/8	60.00 - 80.00	0.6000	0.6000
T8	5	5/8"	60.00 - 80.00	0.6000	0.6000
T8	6	3/4" DC Power	60.00 - 80.00	0.6000	0.6000
T8	8	LDF6-50A (1-1/4 FOAM)	60.00 - 80.00	0.6000	0.6000
T8	10	1 5/8	60.00 - 80.00	0.6000	0.6000
T8	14	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	15	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T8	18	3/8"	60.00 - 80.00	0.6000	0.6000
T8	19	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T9	1	1 5/8	40.00 - 60.00	0.6000	0.6000
T9	3	1 5/8	40.00 - 60.00	0.6000	0.6000
T9	5	5/8"	40.00 - 60.00	0.6000	0.6000
T9	6	3/4" DC Power	40.00 - 60.00	0.6000	0.6000
T9	8	LDF6-50A (1-1/4 FOAM)	40.00 - 60.00	0.6000	0.6000
T9	10	1 5/8	40.00 - 60.00	0.6000	0.6000
T9	14	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	15	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T9	18	3/8"	40.00 - 60.00	0.6000	0.6000
T9	19	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T10	1	1 5/8	20.00 - 40.00	0.6000	0.6000
T10	3	1 5/8	20.00 - 40.00	0.6000	0.6000
T10	5	5/8"	20.00 - 40.00	0.6000	0.6000
T10	6	3/4" DC Power	20.00 - 40.00	0.6000	0.6000
T10	8	LDF6-50A (1-1/4 FOAM)	20.00 - 40.00	0.6000	0.6000
T10	10	1 5/8	20.00 - 40.00	0.6000	0.6000
T10	12	1/2	20.00 - 30.00	0.6000	0.6000
T10	14	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	15	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T10	18	3/8"	20.00 - 40.00	0.6000	0.6000
T10	19	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T11	1	1 5/8	5.00 - 20.00	0.6000	0.6000
T11	3	1 5/8	5.00 - 20.00	0.6000	0.6000
T11	5	5/8"	5.00 - 20.00	0.6000	0.6000
T11	6	3/4" DC Power	5.00 - 20.00	0.6000	0.6000
T11	8	LDF6-50A (1-1/4 FOAM)	5.00 - 20.00	0.6000	0.6000
T11	10	1 5/8	5.00 - 20.00	0.6000	0.6000
T11	12	1/2	5.00 - 20.00	0.6000	0.6000
T11	14	Feedline Ladder (Af)	5.00 - 20.00	0.6000	0.6000
T11	15	Feedline Ladder (Af)	5.00 - 20.00	0.6000	0.6000
T11	18	3/8"	5.00 - 20.00	0.6000	0.6000
T11	19	Feedline Ladder (Af)	5.00 - 20.00	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)
(3) RR90-17-02DP w/ Mount Pipe	A	From Leg	3.00 0.00 2.00	0.0000	193.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.03 0.07 0.12
(3) RR90-17-02DP w/ Mount Pipe	B	From Leg	3.00 0.00 2.00	0.0000	193.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.03 0.07 0.12
(3) RR90-17-02DP w/ Mount Pipe	C	From Leg	3.00 0.00 2.00	0.0000	193.00	No Ice 1/2" Ice 1" Ice	4.59 5.09 5.58	3.32 4.09 4.78	0.03 0.07 0.12
(1) Low Profile Platform	A	None		0.0000	193.00	No Ice 1/2" Ice 1" Ice	24.33 30.22 36.11	24.33 30.22 36.11	1.65 2.03 2.41
***									
Powerwave 7770 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	6.46 7.14 7.73	4.59 5.66 6.45	0.06 0.11 0.17
Powerwave 7770 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	6.46 7.14 7.73	4.59 5.66 6.45	0.06 0.11 0.17
Powerwave 7770 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	6.46 7.14 7.73	4.59 5.66 6.45	0.06 0.11 0.17
(2) HPA-65R-BUU-H8 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	13.30 13.99 14.70	9.18 10.48 11.49	0.09 0.19 0.29
(2) HPA-65R-BUU-H8 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	13.30 13.99 14.70	9.18 10.48 11.49	0.09 0.19 0.29
(2) HPA-65R-BUU-H8 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	13.30 13.99 14.70	9.18 10.48 11.49	0.09 0.19 0.29
(2) LGP21401	A	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.23 0.31 0.40	0.01 0.02 0.03
(2) LGP21401	B	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.23 0.31 0.40	0.01 0.02 0.03
(2) LGP21401	C	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.23 0.31 0.40	0.01 0.02 0.03
(2) LGP21903 Diplexer	A	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	0.27 0.34 0.43	0.18 0.25 0.32	0.01 0.01 0.01
(2) LGP21903 Diplexer	B	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	0.27 0.34 0.43	0.18 0.25 0.32	0.01 0.01 0.01
(2) LGP21903 Diplexer	C	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	0.27 0.34 0.43	0.18 0.25 0.32	0.01 0.01 0.01
(2) RRUS 11	A	From Leg	3.00 0.00 0.00	0.0000	182.00	No Ice 1/2" Ice 1" Ice	3.25 3.49 3.74	1.37 1.55 1.74	0.05 0.07 0.10
(2) RRUS 11	B	From Leg	3.00 0.00	0.0000	182.00	No Ice 1/2" Ice	3.25 3.49	1.37 1.55	0.05 0.07

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
			0.00			1" Ice	3.74	1.74	0.10
(2) RRUS 11	C	From Leg	3.00	0.0000	182.00	No Ice	3.25	1.37	0.05
			0.00			1/2" Ice	3.49	1.55	0.07
			0.00			1" Ice	3.74	1.74	0.10
RRUS 12	A	From Leg	3.00	0.0000	182.00	No Ice	3.67	1.49	0.06
			0.00			1/2" Ice	3.93	1.67	0.08
			0.00			1" Ice	4.19	1.87	0.11
RRUS 12	B	From Leg	3.00	0.0000	182.00	No Ice	3.67	1.49	0.06
			0.00			1/2" Ice	3.93	1.67	0.08
			0.00			1" Ice	4.19	1.87	0.11
RRUS 12	C	From Leg	3.00	0.0000	182.00	No Ice	3.67	1.49	0.06
			0.00			1/2" Ice	3.93	1.67	0.08
			0.00			1" Ice	4.19	1.87	0.11
(2) RRUS A2	A	From Leg	3.00	0.0000	182.00	No Ice	2.41	0.53	0.02
			0.00			1/2" Ice	2.62	0.67	0.03
			0.00			1" Ice	2.84	0.81	0.05
RRUS A2	B	From Leg	3.00	0.0000	182.00	No Ice	2.41	0.53	0.02
			0.00			1/2" Ice	2.62	0.67	0.03
			0.00			1" Ice	2.84	0.81	0.05
RRUS A2	C	From Leg	3.00	0.0000	182.00	No Ice	2.41	0.53	0.02
			0.00			1/2" Ice	2.62	0.67	0.03
			0.00			1" Ice	2.84	0.81	0.05
RRUS-32	A	From Leg	3.00	0.0000	182.00	No Ice	3.87	2.76	0.08
			0.00			1/2" Ice	4.15	3.02	0.10
			0.00			1" Ice	4.44	3.29	0.14
RRUS-32	B	From Leg	3.00	0.0000	182.00	No Ice	3.87	2.76	0.08
			0.00			1/2" Ice	4.15	3.02	0.10
			0.00			1" Ice	4.44	3.29	0.14
RRUS-32	C	From Leg	3.00	0.0000	182.00	No Ice	3.87	2.76	0.08
			0.00			1/2" Ice	4.15	3.02	0.10
			0.00			1" Ice	4.44	3.29	0.14
1000860	A	From Leg	3.00	0.0000	182.00	No Ice	1.95	0.50	0.03
			0.00			1/2" Ice	2.13	0.62	0.04
			0.00			1" Ice	2.33	0.75	0.06
1000860	B	From Leg	3.00	0.0000	182.00	No Ice	1.95	0.50	0.03
			0.00			1/2" Ice	2.13	0.62	0.04
			0.00			1" Ice	2.33	0.75	0.06
1000860	C	From Leg	3.00	0.0000	182.00	No Ice	1.95	0.50	0.03
			0.00			1/2" Ice	2.13	0.62	0.04
			0.00			1" Ice	2.33	0.75	0.06
DC6-48-60-18-8F	B	From Leg	3.00	0.0000	182.00	No Ice	2.57	2.57	0.02
			0.00			1/2" Ice	2.80	2.80	0.04
			0.00			1" Ice	3.04	3.04	0.07
DC6-48-60-18-8F	C	From Leg	3.00	0.0000	182.00	No Ice	2.57	2.57	0.02
			0.00			1/2" Ice	2.80	2.80	0.04
			0.00			1" Ice	3.04	3.04	0.07
(3) 12.5' T-Frames (Commscope P/N: MTC3615) ***	C	None		0.0000	182.00	No Ice	49.30	49.30	2.29
						1/2" Ice	52.20	52.20	2.68
						1" Ice	55.10	55.10	3.07
PC1N0F-0190B-002M	A	From Leg	0.00	0.0000	30.00	No Ice	0.03	0.03	0.00
			0.00			1/2" Ice	0.06	0.06	0.00
			0.00			1" Ice	0.10	0.10	0.00
PC1N0F-0190B-002M	B	From Leg	0.00	0.0000	30.00	No Ice	0.03	0.03	0.00
			0.00			1/2" Ice	0.06	0.06	0.00
			0.00			1" Ice	0.10	0.10	0.00
***									

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
Lightning Rod	C	From Leg	0.00	0.00	0.0000	193.00	No Ice	0.25	0.25	0.03
			0.00	2.00			1/2" Ice	0.66	0.66	0.03
							1" Ice	0.97	0.97	0.04
***										
***										
(3) T-Frames	C	None			0.0000	162.00	No Ice	19.83	19.83	0.92
							1/2" Ice	29.41	29.41	1.33
							1" Ice	38.99	38.99	1.73
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.00	0.00	0.0000	162.00	No Ice	8.98	6.96	0.07
			0.00	0.00			1/2" Ice	9.65	8.18	0.14
							1" Ice	10.29	9.14	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.00	0.00	0.0000	162.00	No Ice	8.98	6.96	0.07
			0.00	0.00			1/2" Ice	9.65	8.18	0.14
							1" Ice	10.29	9.14	0.21
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.00	0.00	0.0000	162.00	No Ice	8.98	6.96	0.07
			0.00	0.00			1/2" Ice	9.65	8.18	0.14
							1" Ice	10.29	9.14	0.21
LNX-6514DS-A1M	A	From Leg	4.00	0.00	0.0000	162.00	No Ice	8.41	5.41	0.04
			0.00	0.00			1/2" Ice	8.96	5.86	0.09
							1" Ice	9.52	6.33	0.15
LNX-6514DS-A1M	B	From Leg	4.00	0.00	0.0000	162.00	No Ice	8.41	5.41	0.04
			0.00	0.00			1/2" Ice	8.96	5.86	0.09
							1" Ice	9.52	6.33	0.15
LNX-6514DS-A1M	C	From Leg	4.00	0.00	0.0000	162.00	No Ice	8.41	5.41	0.04
			0.00	0.00			1/2" Ice	8.96	5.86	0.09
							1" Ice	9.52	6.33	0.15
QUAD656C0000x	A	From Leg	4.00	0.00	0.0000	162.00	No Ice	13.24	5.62	0.05
			0.00	0.00			1/2" Ice	14.01	6.32	0.13
							1" Ice	14.78	7.02	0.21
QUAD656C0000x	B	From Leg	4.00	0.00	0.0000	162.00	No Ice	13.24	5.62	0.05
			0.00	0.00			1/2" Ice	14.01	6.32	0.13
							1" Ice	14.78	7.02	0.21
QUAD656C0000x	C	From Leg	4.00	0.00	0.0000	162.00	No Ice	13.24	5.62	0.05
			0.00	0.00			1/2" Ice	14.01	6.32	0.13
							1" Ice	14.78	7.02	0.21
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.00	0.0000	162.00	No Ice	4.80	2.00	0.04
			0.00	0.00			1/2" Ice	5.21	2.29	0.08
							1" Ice	5.62	2.58	0.12
DB-T1-6Z-8AB-0Z	B	From Leg	4.00	0.00	0.0000	162.00	No Ice	4.80	2.00	0.04
			0.00	0.00			1/2" Ice	5.21	2.29	0.08
							1" Ice	5.62	2.58	0.12
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.00	0.0000	162.00	No Ice	0.37	0.08	0.00
			0.00	0.00			1/2" Ice	0.45	0.14	0.01
							1" Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00	0.00	0.0000	162.00	No Ice	0.37	0.08	0.00
			0.00	0.00			1/2" Ice	0.45	0.14	0.01
							1" Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.00	0.00	0.0000	162.00	No Ice	0.37	0.08	0.00
			0.00	0.00			1/2" Ice	0.45	0.14	0.01
							1" Ice	0.54	0.20	0.01
KS24019-L112A	A	From Leg	4.00	0.00	0.0000	100.00	No Ice	0.16	0.16	0.01
			0.00	0.00			1/2" Ice	0.22	0.22	0.01
							1" Ice	0.30	0.30	0.01
***										
Empty Mount Pipe	A	From Leg	4.00	0.00	0.0000	162.00	No Ice	1.43	1.43	0.02
			0.00	0.00			1/2" Ice	1.92	1.92	0.03
							1" Ice	2.29	2.29	0.05

Allpro Consultants group inc
9221 lyndon B johson Freeway. Suite 204
Dalls Tx. 75243
Phone: 972 231 8893
FAX: 866 364 8375

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
Empty Mount Pipe	B	From Leg	4.00	0.0000	162.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
Empty Mount Pipe	C	From Leg	4.00	0.0000	162.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.92	1.92	0.03
			0.00			1" Ice	2.29	2.29	0.05
RRH2x60-AWS	A	From Leg	4.00	0.0000	162.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.89	2.17	0.08
			0.00			1" Ice	4.28	2.52	0.10
RRH2x60-AWS	B	From Leg	4.00	0.0000	162.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.89	2.17	0.08
			0.00			1" Ice	4.28	2.52	0.10
RRH2x60-AWS	C	From Leg	4.00	0.0000	162.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.89	2.17	0.08
			0.00			1" Ice	4.28	2.52	0.10
RRH2x60-1900	A	From Leg	4.00	0.0000	162.00	No Ice	1.87	1.22	0.04
			0.00			1/2" Ice	2.14	1.44	0.06
			0.00			1" Ice	2.41	1.66	0.08
RRH2x60-1900	B	From Leg	4.00	0.0000	162.00	No Ice	1.87	1.22	0.04
			0.00			1/2" Ice	2.14	1.44	0.06
			0.00			1" Ice	2.41	1.66	0.08
RRH2x60-1900	C	From Leg	4.00	0.0000	162.00	No Ice	1.87	1.22	0.04
			0.00			1/2" Ice	2.14	1.44	0.06
			0.00			1" Ice	2.41	1.66	0.08
RRH2x60-700	A	From Leg	4.00	0.0000	162.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.89	2.17	0.08
			0.00			1" Ice	4.28	2.52	0.10
RRH2x60-700	B	From Leg	4.00	0.0000	162.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.89	2.17	0.08
			0.00			1" Ice	4.28	2.52	0.10
RRH2x60-700	C	From Leg	4.00	0.0000	162.00	No Ice	3.50	1.82	0.06
			0.00			1/2" Ice	3.89	2.17	0.08
			0.00			1" Ice	4.28	2.52	0.10
******									
Modified T-Frames (3)	C	None		0.0000	175.00	No Ice	26.91	26.91	1.50
						1/2" Ice	34.78	34.78	2.00
						1" Ice	42.65	42.65	2.50
RFS APXVSPP18-C-A20	A	From Leg	3.00	0.0000	175.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
RFS APXVSPP18-C-A20	B	From Leg	3.00	0.0000	175.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
RFS APXVSPP18-C-A20	C	From Leg	3.00	0.0000	175.00	No Ice	8.02	5.28	0.06
			0.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
NNVV-65B-R4 Antenna	A	From Leg	3.00	0.0000	175.00	No Ice	12.27	5.75	0.08
			0.00			1/2" Ice	12.77	6.21	0.16
			0.00			1" Ice	13.27	6.67	0.24
NNVV-65B-R4 Antenna	A	From Leg	3.00	0.0000	175.00	No Ice	12.27	5.75	0.08
			0.00			1/2" Ice	12.77	6.21	0.16
			0.00			1" Ice	13.27	6.67	0.24
NNVV-65B-R4 Antenna	A	From Leg	3.00	0.0000	175.00	No Ice	12.27	5.75	0.08
			0.00			1/2" Ice	12.77	6.21	0.16
			0.00			1" Ice	13.27	6.67	0.24
(2) 800 MHz RRH	A	From Leg	30.00	0.0000	175.00	No Ice	2.06	1.71	0.05
			0.00			1/2" Ice	2.24	1.88	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.43	2.06	0.09
(2) 800 MHz RRH	B	From Leg	3.00	0.0000	175.00	No Ice	2.06	1.71	0.05
			0.00			1/2" Ice	2.24	1.88	0.07
			0.00			1" Ice	2.43	2.06	0.09
(2) 800 MHz RRH	C	From Leg	3.00	0.0000	175.00	No Ice	2.06	1.71	0.05
			0.00			1/2" Ice	2.24	1.88	0.07
			0.00			1" Ice	2.43	2.06	0.09
1900 MHz RRH	A	From Leg	3.00	0.0000	175.00	No Ice	2.31	2.38	0.05
			0.00			1/2" Ice	2.52	2.58	0.07
			0.00			1" Ice	2.73	2.79	0.10
1900 MHz RRH	B	From Leg	3.00	0.0000	175.00	No Ice	2.31	2.38	0.05
			0.00			1/2" Ice	2.52	2.58	0.07
			0.00			1" Ice	2.73	2.79	0.10
1900 MHz RRH	C	From Leg	3.00	0.0000	175.00	No Ice	2.31	2.38	0.05
			0.00			1/2" Ice	2.52	2.58	0.07
			0.00			1" Ice	2.73	2.79	0.10
TD-RRH8x20-25	A	From Leg	3.00	0.0000	175.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	A	From Leg	3.00	0.0000	175.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	A	From Leg	3.00	0.0000	175.00	No Ice	3.70	1.29	0.07
			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244	1026.8606	3167.5615	0.56	0.62	7.1310	21.9970	3.6816
Pirod 105217	2130.7479	6575.8153	0.62	1.19	7.3984	22.8327	5.3014
Pirod 105217	2130.7479	6553.8954	0.62	1.16	7.3984	22.7566	5.3014
Pirod 105218	2263.4687	6600.7000	0.75	1.16	7.8593	22.9191	7.2158
Pirod 105219	2441.8688	6642.9857	0.94	1.16	8.4787	23.0659	9.4248
Pirod 105219	2441.8688	6606.6036	0.94	1.12	8.4787	22.9396	9.4248
Pirod 105220	2578.8005	6631.3031	1.12	1.08	8.9542	23.0254	11.9282
Pirod 105220	2578.8005	6562.4670	1.12	1.00	8.9542	22.7863	11.9282
Pirod 112738	3466.5160	8653.0272	1.69	1.18	12.0365	30.0452	14.7262

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice

Comb. No.	Description
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	193 - 185	4.861	50	0.2465	0.0506
T2	185 - 170	4.442	50	0.2455	0.0509
T3	170 - 160	3.666	50	0.2318	0.0461
T4	160 - 140	3.180	50	0.2145	0.0326
T5	140 - 120	2.320	50	0.1804	0.0199

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T6	120 - 100	1.624	50	0.1393	0.0126
T7	100 - 80	1.094	50	0.1069	0.0093
T8	80 - 60	0.682	50	0.0816	0.0065
T9	60 - 40	0.379	50	0.0561	0.0045
T10	40 - 20	0.169	50	0.0360	0.0026
T11	20 - 0	0.037	50	0.0158	0.0008

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	(3) RR90-17-02DP w/ Mount Pipe	50	4.861	0.2465	0.0506	Inf
182.00	Powerwave 7770 w/ Mount Pipe	50	4.285	0.2442	0.0510	211425
175.00	Modified T-Frames (3)	50	3.920	0.2384	0.0497	58322
162.00	(3) T-Frames	50	3.275	0.2181	0.0353	33792
100.00	KS24019-L112A	50	1.094	0.1069	0.0093	43549
30.00	PC1N0F-0190B-002M	50	0.091	0.0257	0.0016	51237

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	193 - 185	22.274	24	1.1194	0.2345
T2	185 - 170	20.370	24	1.1148	0.2362
T3	170 - 160	16.845	24	1.0552	0.2137
T4	160 - 140	14.627	24	0.9805	0.1511
T5	140 - 120	10.680	24	0.8278	0.0922
T6	120 - 100	7.484	24	0.6404	0.0584
T7	100 - 80	5.041	24	0.4920	0.0429
T8	80 - 60	3.146	24	0.3759	0.0303
T9	60 - 40	1.746	24	0.2583	0.0208
T10	40 - 20	0.778	24	0.1657	0.0120
T11	20 - 0	0.173	24	0.0726	0.0039

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	(3) RR90-17-02DP w/ Mount Pipe	24	22.274	1.1194	0.2345	257382
182.00	Powerwave 7770 w/ Mount Pipe	24	19.656	1.1089	0.2365	47787
175.00	Modified T-Frames (3)	24	18.003	1.0835	0.2305	14208
162.00	(3) T-Frames	24	15.059	0.9961	0.1635	7768
100.00	KS24019-L112A	24	5.041	0.4920	0.0429	9493
30.00	PC1N0F-0190B-002M	24	0.422	0.1183	0.0076	11113

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	193	Leg	A325N	0.6250	5	1.24	24.85	0.050 ✔	1	Bolt DS
T2	185	Leg	A325N	1.0000	6	5.57	53.01	0.105 ✔	1	Bolt Tension
T3	170	Leg	A325N	1.0000	6	7.04	53.01	0.133 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8.94	10.66	0.838 ✔	1	Member Block Shear
T4	160	Leg	A325N	1.0000	6	15.47	53.01	0.292 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	10.19	11.68	0.873 ✔	1	Member Block Shear
T5	140	Leg	A325N	1.0000	6	22.37	53.01	0.422 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8.30	11.68	0.711 ✔	1	Member Block Shear
T6	120	Leg	A325N	1.0000	6	28.38	53.01	0.535 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	7.96	19.47	0.409 ✔	1	Member Block Shear
T7	100	Leg	A325N>1'	1.2500	6	33.85	72.48	0.467 ✔	1	Bolt Tension
		Diagonal	A325N>1'	1.2500	1	7.95	20.30	0.391 ✔	1	Member Block Shear
T8	80	Leg	A325N>1'	1.2500	6	38.92	72.48	0.537 ✔	1	Bolt Tension
		Diagonal	A325N>1'	1.2500	1	8.34	23.70	0.352 ✔	1	Member Block Shear
T9	60	Leg	A325N>1'	1.2500	6	43.72	72.48	0.603 ✔	1	Bolt Tension
		Diagonal	A325N>1'	1.2500	1	8.69	23.70	0.366 ✔	1	Member Block Shear
T10	40	Leg	A325N>1'	1.2500	6	48.56	72.48	0.670 ✔	1	Bolt Tension
		Diagonal	A325N>1'	1.2500	1	10.58	23.70	0.446 ✔	1	Member Block Shear
T11	20	Leg	A687	2.0000	6	50.56	220.89	0.229 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	8.16	35.53	0.230 ✔	1	Member Block Shear

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	193 - 185	2	8.00	2.38	57.0 K=1.00	3.1416	-6.21	111.48	0.056 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	185 - 170	2	15.00	2.38	57.0 K=1.00	3.1416	-43.07	111.48	0.386 [1]
T3	170 - 160	Pirod 105244	10.02	10.02	45.4 K=1.00	3.6816	-52.85	142.49	0.371 [1]
T4	160 - 140	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-107.86	214.86	0.502 [1]
T5	140 - 120	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-152.48	214.86	0.710 [1]
T6	120 - 100	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-192.63	300.68	0.641 [1]
T7	100 - 80	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-230.18	399.87	0.576 [1]
T8	80 - 60	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-265.76	399.87	0.665 [1]
T9	60 - 40	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-300.52	512.38	0.587 [1]
T10	40 - 20	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-336.18	512.38	0.656 [1]
T11	20 - 0	Pirod 112738	20.03	20.03	32.6 K=1.00	14.7262	-349.82	613.14	0.571 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	170 - 160	0.5	1.48	121.0	165.67	0.1963	1.73	3.39	0.512
T4	160 - 140	0.5	1.47	120.0	238.57	0.1963	0.30	3.34	0.090
T5	140 - 120	0.5	1.47	120.0	238.57	0.1963	0.31	3.34	0.093
T6	120 - 100	0.5	1.46	119.0	324.71	0.1963	0.26	3.38	0.077
T7	100 - 80	0.625	1.45	94.4	424.12	0.3068	0.26	6.96	0.038
T8	80 - 60	0.625	1.45	94.4	424.12	0.3068	0.27	6.96	0.039
T9	60 - 40	0.625	1.43	93.6	536.77	0.3068	0.45	7.01	0.065
T10	40 - 20	0.625	1.43	93.6	536.77	0.3068	2.95	7.01	0.422
T11	20 - 0	0.75	1.73	93.9	662.68	0.4418	1.48	14.36	0.104

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	193 - 185	1	5.54	2.68	115.6 K=0.90	0.7854	-1.28	13.28	0.096 [1] ✔
T2	185 - 170	1	5.54	2.68	115.6 K=0.90	0.7854	-5.90	13.28	0.444 [1] ✔
T3	170 - 160	L2 1/2x2 1/2x3/16	11.42	4.98	120.8 K=1.00	0.9023	-9.87	13.56	0.728 [1] ✔
T4	160 - 140	L3x3x3/16	11.93	5.38	111.2 K=1.03	1.0898	-10.20	18.18	0.561 [1] ✔
T5	140 - 120	L3x3x3/16	13.80	6.33	127.3 K=1.00	1.0898	-8.30	14.96	0.555 [1] ✔
T6	120 - 100	L3x3x5/16	15.24	7.08	144.3 K=1.00	1.7800	-8.18	19.32	0.423 [1] ✔
T7	100 - 80	L3x3x5/16	16.80	7.84	159.7 K=1.00	1.7800	-8.26	15.76	0.524 [1] ✔
T8	80 - 60	L3 1/2x3 1/2x5/16	18.45	8.68	150.9 K=1.00	2.0900	-8.81	20.74	0.425 [1] ✔
T9	60 - 40	L3 1/2x3 1/2x5/16	20.16	9.54	165.9 K=1.00	2.0900	-8.92	17.15	0.520 [1] ✔
T10	40 - 20	L3 1/2x3 1/2x5/16	21.03	9.99	173.7 K=1.00	2.0900	-10.63	15.65	0.679 [1] ✔
T11	20 - 0	2L3 1/2x3 1/2x5/16x1	29.01	13.87	145.7 K=0.95	4.1797	-19.22	44.46	0.432 [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	193 - 185	7/8	5.00	4.83	185.6 K=0.70	0.6013	-0.15	3.94	0.039 [1] ✔
T2	185 - 170	7/8	5.00	4.83	185.6 K=0.70	0.6013	-0.34	3.94	0.087 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	193 - 185	1 1/4	5.00	4.83	129.9 K=0.70	1.2272	-0.62	16.42	0.038 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	185 - 170	1 1/4	5.00	4.83	129.9 K=0.70	1.2272	-0.23	16.42	0.014 [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	193 - 185	1 1/4	5.00	4.83	129.9 K=0.70	1.2272	-0.69	16.42	0.042 [1] ✔
T2	185 - 170	1 1/4	5.00	4.83	129.9 K=0.70	1.2272	-1.00	16.42	0.061 [1] ✔

[1] P_u / ϕP_n controls

Mid 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 $\frac{P_u}{\phi P_n}$
T2	185 - 170	1 1/4	5.00	4.83	129.9 K=0.70	1.2272	-0.36	16.42	0.022 [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	193 - 185	2	8.00	2.38	57.0	1.7942	4.26	87.47	0.049 [1 #] ✔
T2	185 - 170	2	15.00	2.38	57.0	3.1416	33.39	141.37	0.236 [1] ✔
T3	170 - 160	Pirod 105244	10.02	10.02	45.4	3.6816	42.27	165.67	0.255 [1] ✔
T4	160 - 140	Pirod 105217	20.03	10.02	37.8	5.3014	92.82	238.57	0.389 [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	140 - 120	Pirod 105217	20.03	10.02	37.8	5.3014	134.23	238.57	0.563 [1] ✔
T6	120 - 100	Pirod 105218	20.03	10.02	32.4	7.2158	170.29	324.71	0.524 [1] ✔
T7	100 - 80	Pirod 105219	20.03	10.02	28.4	9.4248	203.07	424.12	0.479 [1] ✔
T8	80 - 60	Pirod 105219	20.03	10.02	28.4	9.4248	233.50	424.12	0.551 [1] ✔
T9	60 - 40	Pirod 105220	20.03	10.02	25.2	11.9282	262.34	536.77	0.489 [1] ✔
T10	40 - 20	Pirod 105220	20.03	10.02	25.2	11.9282	291.36	536.77	0.543 [1] ✔
T11	20 - 0	Pirod 112738	20.03	20.03	32.6	14.7262	303.35	662.68	0.458 [1] ✔

[1] P_u / ϕP_n controls
[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	170 - 160	0.5	1.48	121.0	165.67	0.1963	1.73	3.39	0.512 ✔
T4	160 - 140	0.5	1.47	120.0	238.57	0.1963	0.30	3.34	0.090 ✔
T5	140 - 120	0.5	1.47	120.0	238.57	0.1963	0.31	3.34	0.093 ✔
T6	120 - 100	0.5	1.46	119.0	324.71	0.1963	0.26	3.38	0.077 ✔
T7	100 - 80	0.625	1.45	94.4	424.12	0.3068	0.26	6.96	0.038 ✔
T8	80 - 60	0.625	1.45	94.4	424.12	0.3068	0.27	6.96	0.039 ✔
T9	60 - 40	0.625	1.43	93.6	536.77	0.3068	0.45	7.01	0.065 ✔
T10	40 - 20	0.625	1.43	93.6	536.77	0.3068	2.95	7.01	0.422 ✔
T11	20 - 0	0.75	1.73	93.9	662.68	0.4418	1.48	14.36	0.104 ✔

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	193 - 185	1	5.54	2.68	128.4	0.7854	1.24	35.34	0.035 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	185 - 170	1	5.54	2.68	128.4	0.7854	5.80	35.34	0.164 [1]
T3	170 - 160	L2 1/2x2 1/2x3/16	11.42	4.98	80.0	0.5186	8.94	22.56	0.396 [1]
T4	160 - 140	L3x3x3/16	11.93	5.38	71.4	0.6592	10.19	28.67	0.356 [1]
T5	140 - 120	L3x3x3/16	13.13	6.02	79.5	0.6592	8.30	28.67	0.290 [1]
T6	120 - 100	L3x3x5/16	14.50	6.73	90.3	1.0713	7.96	46.60	0.171 [1]
T7	100 - 80	L3x3x5/16	16.01	7.45	100.3	1.0127	7.95	44.05	0.180 [1]
T8	80 - 60	L3 1/2x3 1/2x5/16	18.45	8.68	99.2	1.2452	8.34	54.17	0.154 [1]
T9	60 - 40	L3 1/2x3 1/2x5/16	20.16	9.54	108.8	1.2452	8.69	54.17	0.160 [1]
T10	40 - 20	L3 1/2x3 1/2x5/16	21.92	10.43	118.6	1.2452	10.58	54.17	0.195 [1]
T11	20 - 0	2L3 1/2x3 1/2x5/16x1	29.01	13.87	156.9	2.6074	16.31	113.42	0.144 [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	193 - 185	7/8	5.00	4.83	265.1	0.6013	0.21	19.48	0.011 [1]
T2	185 - 170	7/8	5.00	4.83	265.1	0.6013	0.55	19.48	0.028 [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	193 - 185	1 1/4	5.00	4.83	185.6	1.2272	0.61	55.22	0.011 [1]
T2	185 - 170	1 1/4	5.00	4.83	185.6	1.2272	0.25	55.22	0.005 [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	193 - 185	1 1/4	5.00	4.83	185.6	1.2272	0.74	55.22	0.013 [1] ✔
T2	185 - 170	1 1/4	5.00	4.83	185.6	1.2272	1.17	55.22	0.021 [1] ✔

[1] P_u / ϕP_n controls

Mid 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 $\frac{P_u}{\phi P_n}$
T2	185 - 170	1 1/4	5.00	4.83	185.6	1.2272	0.55	55.22	0.010 [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	193 - 185	Leg	2	1	-6.21	111.48	5.6	Pass
		Diagonal	1	11	-1.28	13.28	9.6	Pass
		Horizontal	7/8	23	-0.15	3.94	3.9	Pass
		Top Girt	1 1/4	5	-0.62	16.42	3.8	Pass
		Bottom Girt	1 1/4	8	-0.69	16.42	4.2	Pass
T2	185 - 170	Leg	2	32	-43.07	111.48	38.6	Pass
		Diagonal	1	44	-5.90	13.28	44.4	Pass
		Horizontal	7/8	48	-0.34	3.94	8.7	Pass
		Top Girt	1 1/4	33	-0.23	16.42	1.4	Pass
		Bottom Girt	1 1/4	36	-1.00	16.42	6.1	Pass
		Mid Girt	1 1/4	39	-0.36	16.42	2.2	Pass
T3	170 - 160	Leg	Pirod 105244	84	-52.85	142.49	51.2	Pass
		Diagonal	L2 1/2x2 1/2x3/16	87	-9.87	13.56	72.8	Pass
							83.8 (b)	
T4	160 - 140	Leg	Pirod 105217	93	-107.86	214.86	50.2	Pass
		Diagonal	L3x3x3/16	102	-10.20	18.18	56.1	Pass
							87.3 (b)	
T5	140 - 120	Leg	Pirod 105217	108	-152.48	214.86	71.0	Pass
		Diagonal	L3x3x3/16	111	-8.30	14.96	55.5	Pass
							71.1 (b)	
T6	120 - 100	Leg	Pirod 105218	123	-192.63	300.68	64.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
		Diagonal	L3x3x5/16	126	-8.18	19.32	42.3	Pass
T7	100 - 80	Leg	Pirod 105219	138	-230.18	399.87	57.6	Pass
		Diagonal	L3x3x5/16	141	-8.26	15.76	52.4	Pass
T8	80 - 60	Leg	Pirod 105219	153	-265.76	399.87	66.5	Pass
		Diagonal	L3 1/2x3 1/2x5/16	158	-8.81	20.74	42.5	Pass
T9	60 - 40	Leg	Pirod 105220	168	-300.52	512.38	58.7	Pass
							60.3 (b)	
		Diagonal	L3 1/2x3 1/2x5/16	173	-8.92	17.15	52.0	Pass
T10	40 - 20	Leg	Pirod 105220	183	-336.18	512.38	65.6	Pass
							67.0 (b)	
		Diagonal	L3 1/2x3 1/2x5/16	194	-10.63	15.65	67.9	Pass
T11	20 - 0	Leg	Pirod 112738	198	-349.82	613.14	57.1	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x1	203	-19.22	44.46	43.2	Pass
							Summary	
						Leg (T5)	71.0	Pass
						Diagonal (T4)	87.3	Pass
						Horizontal (T2)	8.7	Pass
						Top Girt (T1)	3.8	Pass
						Bottom Girt (T2)	6.1	Pass
						Mid Girt (T2)	2.2	Pass
						Bolt Checks	87.3	Pass
						RATING =	**87.3**	**Pass**

MATHCAD CALCULATION PRINTOUT

EXISTING 195' SELF SUPPORT TOWER ANCHOR BOLT CHECK

REACTIONS ON THE FOUNDATION

As per Tnx output (see attached)

Down load; $Pv := 375 \cdot kips$ Shear; $V_u := 37 \cdot kips$

Uplift load; $P_{up} := 321 \cdot kips$ Moment; $M := 0 \cdot kips \cdot ft$

Anchor Rod Data is as per tower design by Pirod Inc., ENG. File No. A-115466 dated 04/01/1999

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

Diameter of Anchors: $D_{anchors} := 2.0in$ $n := 4.5in^{-1}$

Area of anchor bolts $A_b := \frac{\pi \cdot \left(D_{anchors}^{2}\right)}{4} = 3.142 \cdot in^2$

Net Tensile Area of Anchors: $A_{net} := \frac{\pi}{4} \cdot \left(D_{anchors} - \frac{0.9743}{n}\right)^2 = 2.498 \cdot in^2$

Minimum Yield Stress $F_{Yanchors} := 105ksi$ (Grade A354)

Ultimate Tensile Stress: $F_{Uanchors} := 125ksi$

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

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

$T_{cap} = 249.822 \cdot kips$

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

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

$P_u := if\left(\eta > 0.5, P_{up}, Pv\right) = 321 \cdot kips$

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

$T_{max} = 64.712 \cdot kips$

Anchor Rod Capacity: $\frac{T_{max}}{T_{cap}} = 25.903 \cdot \%$ OK!

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

Anchor_Rod_Check = "OK"

Summary

-Foundation Reactions from Tower Base-

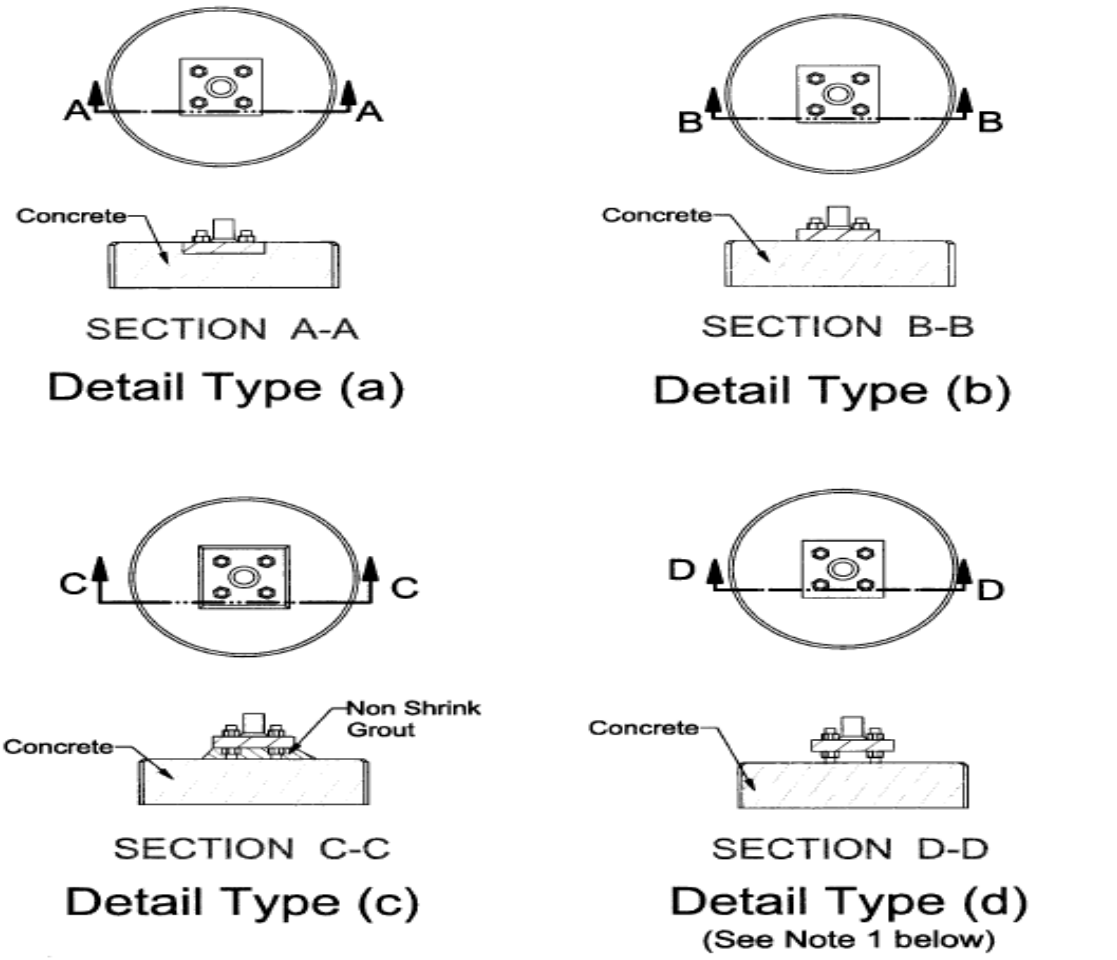
Shear	$V_u = 37 \cdot kips$
Down load	$Pv = 375 \cdot kips$
Uplift load	$P_{up} = 321 \cdot kips$
Moment	$M = 0 \cdot ft \cdot kip$

Anchor Rod Check $T_{max} = 64.712 \cdot kips$ < $T_{cap} = 249.822 \cdot kips$

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

Anchor_Rod_Check = "OK"

ANSI/TIA-222-G



Note:

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

Figure 4-4: Anchor Rod Detail Types

4.9.9 Anchor Rods

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

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

where:

$\phi = 0.80$

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

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

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

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

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

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

where:

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

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

Addendum 1

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

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

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

d = nominal rod diameter, in [mm]

n = number of threads per inch

p = pitch of threads, mm

4.9.6.3 Design Shear Strength

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

$\phi = 0.75$

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

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

where:

F_{ub} = Specified minimum tensile strength of bolt

A_b = nominal unthreaded area of bolt

4.7.1 Solid Round Members

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

$M_n = F_y'Z$

where:

F_y' = effective yield stress as determined from 4.5.4.1

Z = plastic section modulus

4.5.4.1 Effective Yield Stress

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

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

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

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

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

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

Existing 195 ft. Self Support Tower Foundation Check

Customer Name: SBA Communications Corporation
Customer Site Name: Bozrah
Customer Site ID: CT01105-S-02

Carrier Name: Sprint Nextel

Foundation check

-Foundation Reactions-

(As per TNX output results from the Tower Structural Analysis by Allpro Consulting Group Inc.)

Total Shear $S := 58 \cdot kips$

Moment $M := 6810 \cdot ft\_K$

Down load, Tower weight $Pv := 73 \cdot kips$

Compression on Pedestal: $P_c := 375 \cdot kips$

Uplift on Pedestal: $P_{up} := 321 \cdot kips$

Shear on Pedestal: $Sh := 43 \cdot kips$

-Soil Properties- **Soil data is as per Geotechnical Report by Jaworski Geotech, Inc.. Projetc # C98492G, dated 12/14/1998**

Factor of Saftey $FS_b := 3$

Allowable Bearing Capacity $Brg_{all} := 20ksf$

Ultimate Bearing Capacity $Brg_{ult} := FS_b \cdot Brg_{all} = 60 \cdot ksf$

Internal angle of friction for soil, $\phi := 30 \cdot deg$ (Reduced Internal Friction due to backfill Actual 34 deg)

Unit wt. of soil, $\gamma_s := 0.170 \cdot kcf$

Alowable Passive Pressure see next page

Cohesion of soil, $c_u := 0 \cdot ksf$

Friction Factor $FF := 0.7$

Depth to be neglected $L_{neg} := 1.5ft$ (frost depth)

-Material Parameters-

Conforming to the design requirements as in ACI 318-10

Unit wt. of concrete, $\gamma_c := 0.150 \cdot kcf$

Concrete compressive strength, $f_c := 3000 \cdot psi$

Rebar yield strength, $f_y := 60000 \cdot psi$

-Factor of Safety for soil strength-

$\phi_{s\_Bear} := 0.75$ 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

Dimensions of foundation as per Foundation design by Pirod Inc., Job No. A-115466 dated 04/01/1999

Tower face width $TWFW := 22 \cdot ft$ Tower ht. $Tw_{ht} := 195 \cdot ft$

The tower location is eccentric by $L_{pe} := 3.177 \cdot ft$

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

Depth of mat, $D_f := 4.5 \cdot ft$

Thickness of mat, $T_f := 5 \cdot ft$

Pedestal size, $Ped_s := 0 \cdot ft$ No. of pedestals $Nped := 3$

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

Mat Dimensions, LxB $L := 32.5 \cdot ft$ x $B := 32.5 \cdot ft$

-Reinforcement Data-

Typical concrete cover $cc := 3in$

MAT CALCULATIONS

$K_p := 5$ (As per Geotechnical Report)

$$P_{pave} := \frac{\left(D_f - T_f - L_{neg}\right) \cdot K_p \cdot \gamma_s + \left(D_f - L_{neg}\right) \cdot K_p \cdot \gamma_s}{2} \qquad P_{pave} = 0.425 \cdot ksf$$

Safety against overturning and location of resultant on the base

Resisting Moments about mid axis parallel to base

$$Area_{ped} := if\left(col_t = 1 \,, Ped_s^{\,2} \,, \frac{\pi}{4} \cdot Ped_s^{\,2}\right) \qquad Area_{ped} = 0$$

component	value, kips	lever arm, ft	resisting moment, ft-kips
1) Concrete wt.	$C_w := L \cdot B \cdot T_f \cdot (\gamma_c) + Area_{ped} \cdot \gamma_c \cdot (D_f + E_g - T_f) \cdot Nped$	$L_c := \frac{L}{2}$	$R_c := C_w \cdot L_c$
	$C_w = 792.187 \cdot kips$	$L_c = 16.25\,ft$	$R_c = 12873.047 \cdot ft\_K$
2) Soil wt.	$S_w := 0$	$L_s := \frac{L}{2}$	$R_s := S_w \cdot L_s$
	$S_w = 0 \cdot kips$	$L_s = 16.25\,ft$	$R_s = 0 \cdot ft\_K$
3) Wt. of soil wedge	$W_w := (D_f) \cdot \frac{1}{2} \cdot (D_f \cdot \tan(\phi)) \cdot B \cdot (\gamma_s)$	$L_w := \left(L + D_f \cdot \frac{\tan(\phi)}{3}\right)$	$R_w := W_w \cdot L_w$
	$W_w = 32.297 \cdot kips$	$L_w = 33.366\,ft$	$R_w = 1077.634 \cdot ft\_K$
4) Passive pressure	$Pe_p := T_f \cdot B \cdot P_{pave}$	$L_p := \frac{T_f}{3}$	$R_p := Pe_p \cdot L_p$
	$Pe_p = 69.063 \cdot kips$	$L_p = 1.667\,ft$	$R_p = 115.104 \cdot ft\_K$
5) Vertical	$Pv = 73 \cdot kips$	$L_v := \frac{L}{2}$	$R_v := Pv \cdot L_v$
$S_{w1} := L \cdot B \cdot D_f \cdot \gamma_s$	$S_{w1} = 808.031 \cdot kips$ <--- for net calcs		
Total weight	$T_w := C_w + S_w + W_w + Pv$ $T_w = 897.485 \cdot kips$	$L_v = 16.25\,ft$	$R_v = 1186.25 \cdot ft\_K$

Total resisting Moment= $M_r := R_c + R_s + R_w + R_p + R_v$ $M_r = 15252.035 \cdot ft\_K$

Overturning Moments

component	value, kips	lever arm, ft	Overturning Moment ft-kips
1) Moment on foundation due to eccentric location of tower	$Pv = 73 \cdot kips$	$L_{pe} = 3.177\ ft$	$M_{pe} := L_{pe} \cdot Pv$ $M_{pe} = 231.921 \cdot ft\_K$
2) Moment on foundation	-	-	$M = 6810 \cdot ft\_K$
3) Moment due to horizontal shear	$S_t := S$	$L_{hs} := D_f + E_g$ $L_{hs} = 5\ ft$	$O_{hs} := L_{hs} \cdot S_t$ $O_{hs} = 290 \cdot ft\_K$

Total Overturning Moment= $M_o := M + O_{hs} + M_{pe}$ $M_o = 7331.921 \cdot ft\_K$

Check Safety Factor against Overturning about mid axis parallel to base

$SF := \frac{M_r}{M_o}$ $SF = 2.08$ > 1.5 **O.K!**

Calculate eccentricity, e

$e := \frac{M_o}{T_w}$ $e = 8.169\ ft$

Check location of eccentricity and determine pressure distribution under the mat

$L_{loc} := \frac{L}{6}$ $L_{loc} = 5.417\ ft$ For net bearing calcs $T_{w1} := S_{w1} + W_w$ $T_{w1} = 840.329 \cdot kips$

$P_{max1} := if\left[e \le L_{loc}, \frac{T_w}{L \cdot B} \cdot \left[1 + \left(6 \cdot \frac{e}{L}\right)\right], 4 \cdot \frac{T_w}{3 \cdot B \cdot (L - 2 \cdot e)}\right]$ $P_{max1} = 2.278 \cdot ksf$

$P_{max2} := \left(\frac{T_{w1}}{L \cdot B}\right)$ $P_{max2} = 0.796 \cdot ksf$ $P_{net} := P_{max1} - P_{max2}$ $P_{max} := P_{net}$

Net soil pressure, $P_{net} = 1.483 \cdot ksf$ < $Brg_{ult} \cdot \phi_{s\_Bear} = 45 \cdot ksf$ **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 $P_{hor} := Pe_p + (Pv + C_w + S_w) \cdot FF$

$P_{hor} = 674.694 \cdot kips$ > $S = 58 \cdot kips$ Since P.hor < S It is safe!

REINFORCED CONCRETE DESIGN CALCULATIONS

General Input parameters

Concrete Cover $cc := 3.0 \cdot in$

Reduction factors as per respective ACI sections

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

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

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

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=

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

Effective depth of stee $d := T_f - cc$ $d = 57 \cdot in$ $L_{eff} := if(e \le L_{loc}, L, L - 2 \cdot e)$ $L_{eff} = 16.161\,ft$

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

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

shear on the face of concrete=

$$Shear_{wide} := (dist) \cdot B \cdot \frac{\left[P_{maxf} + \left[P_{maxf} - \frac{P_{maxf} - P_{minf}}{L_{eff}} \cdot (dist)\right]\right]}{2} \qquad Shear_{wide} = 208.6 \cdot kips$$

Area of concrete in shear= $A_{shear} := B \cdot d$ $A_{shear} = 22230 \cdot in^2$

Shear stress acting on concrete fa $\nu_{act} := \frac{Shear_{wide}}{A_{shear}}$ $\nu_{act} = 9.384 \cdot psi$

$\nu_{act} = 9.384 \cdot psi$ < $\nu_{wide} = 82.158 \cdot psi$ **O.K!**

Check for punching or two-way shear in mat

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

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

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

$\nu_{punch} = 164.317 \cdot psi$

$P_{avg} := \frac{P_{maxf} + P_{minf}}{2}$

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

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

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

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

$\nu_{act} = 8.863 \cdot psi$ < $\nu_{punch} = 164.317 \cdot psi$ **O.K!**

Design of mat footing

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

$P_{upnet} := P_{up} - \frac{C_{wped} + S_w \cdot 0.95}{Nped}$ $P_{upnet} = 321 \cdot kips$

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

$B_{mo} := RC_{fac} \cdot \left[(TWFW \cdot P_{upnet}) \cdot Langle + S_t \cdot (D_f + E_g)\right]$ $B_{mo} = 6405.871 \cdot ft\_K$

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

$W_e := TWFW \cdot Langle + Ped_s$ $W_e = 19.053\,ft$

Reinforcement middle bandwidth.

$B_{mo1} = 455624.425\,ft \cdot lb$

required R_u $R_u := \frac{B_{mo}}{\phi_{bend} \cdot B \cdot d^2}$ $R_u = 67.407 \cdot psi$ $m := \frac{f_y}{\beta_1 \cdot f_c}$ $m = 23.529$

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=

$Ast_f := \rho \cdot B \cdot d$ $Ast_f = 25.313 \cdot in^2$

minimum area of steel required,

$Ast_{minf} := .0018 \cdot B \cdot T_f$ $Ast_{minf} = 42.12 \cdot in^2$ per ACI 10.5.3 & 7.12

$Ast_{fuse} := if(Ast_f > Ast_{minf}, Ast_f, Ast_{minf})$ $Ast_{fuse} = 42.12 \cdot in^2$

bar size used $f_{bar} := 11$ $f_{dia} := \frac{f_{bar}}{8} \cdot in$ $f_{dia} = 1.375 \cdot in$

Bar area= $f_{abar} := \pi \cdot \frac{f_{dia}^2}{4}$ $f_{abar} = 1.485 \cdot in^2$

Number of bars required= $Nf_{bars} := if\left(Ast_{fuse} = Ast_{minf}, \frac{Ast_{fuse}}{f_{abar}}, \frac{Ast_{fuse}}{f_{abar}} \cdot \frac{L}{W_e}\right)$ $Nf_{bars} = 28.366$

(Total 49 Horizontal bars provided each way, Top and Bottom Total = 196)

$Nf_{bars} := 49$ OK !

Summary

-Foundation Reactions-

Shear $S = 58 \cdot kips$

Down load $Pv = 73 \cdot kips$ (Weight)

Uplift load $P_{up} = 321 \cdot kips$

Moment; $M = 6810 \cdot ft \cdot kip$

Size of Mat

$L = 32.5\,ft$ $B = 32.5\,ft$

Depth of base of mat $D_f = 4.5\,ft$ Thickness of Mat $T_f = 5\,ft$

Pedestal size $Ped_s = 0$

The tower location is eccentric by $L_{pe} = 3.177\,ft$ with respect to the mat foundation center towards the base

Stability Calculations

Safety Factor against Overturning	$SF = 2.08$	>	1.5	$\frac{1.5}{SF} = 72.11 \cdot \%$	**O.K !**
Net soil pressure	$P_{net} = 1.483 \cdot ksf$	<	$Brg_{ult} \cdot \phi_{s\_Bear} = 45 \cdot ksf$	$\frac{P_{net}}{Brg_{ult} \cdot \phi_{s\_Bear}} = 3.29 \cdot \%$	**O.K.!**
Check for horizontal shear	$P_{hor} = 674.694 \cdot kips$	>	$S = 58 \cdot kips$	$\frac{S}{P_{hor}} = 8.6 \cdot \%$	**O.K.!**

SPECIAL CONSTRUCTION NOTE:
SPRINT WORK IS CONTINGENT ON THE FOLLOWING:
* COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS.
* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.

Sprint

PROGRAM: DO MACRO UPGRADE
EQUIPMENT DEPLOYMENT

SITE NUMBER: CT33XC574

SITE ADDRESS: 131 GIFFORD LANE
BOZRAH, CT 06334

SITE TYPE: EXISTING 195' SELF SUPPORT TOWER

PROJECT INFORMATION

SITE INFORMATION:

LATITUDE: 41° 33' .0893" N
(PER SBA RECORDS) 41.55251667°

LONGITUDE: -72° 09' 02.73" W
(PER SBA RECORDS) -72.15070833°

STRUCTURE HEIGHT: 195'±

STRUCTURE TYPE: SELF SUPPORT TOWER

APPLICANT:

SPRINT
1 INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495

TOWER OWNER:

SBA TOWERS LLC.
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

SBA SITE ID: CT01105-S

SBA SITE NAME: BOZRAH

SBA CONTACT: STEPHEN ROTH
(860) 539-4920
sroth@sbasite.com

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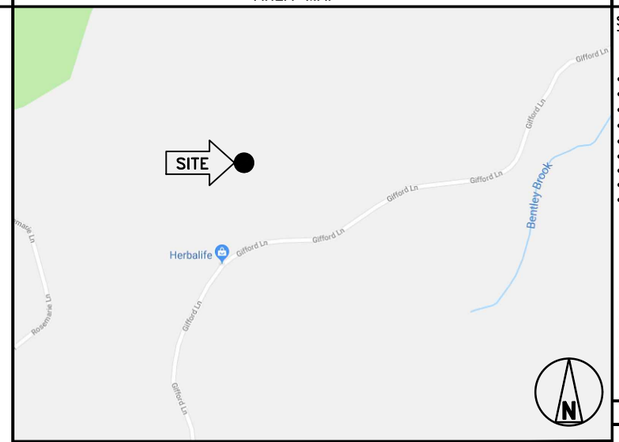
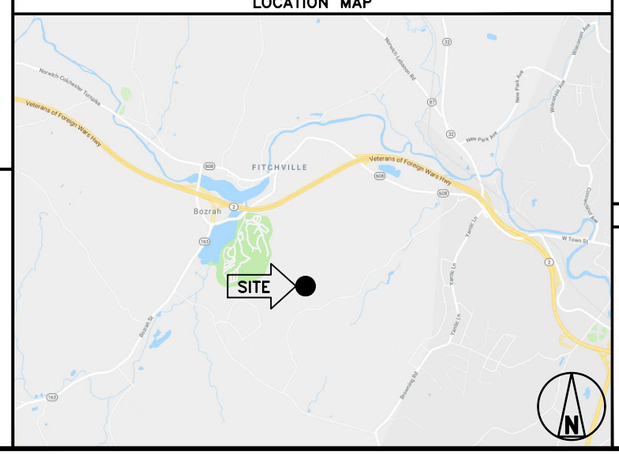
AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- REMOVE (6) PANEL ANTENNAS
- INSTALL (6) PANEL ANTENNAS
- INSTALL (3) 2.5 GHz RRH'S ON PROPOSED DUAL RRH MOUNT
- RELOCATE (3) 1900 MHz RRH'S ON PROPOSED DUAL RRH MOUNT
- INSTALL (6) 800 MHz RRH'S ON PROPOSED DUAL RRH MOUNT
- INSTALL (4) HYBRID CABLES
- INSTALL STRUCTURAL AUGMENTS
- INSTALL RAN EQUIPMENT INSIDE EXISTING MMBTS CABINET
- REMOVE (4) RUNS OF EXISTING 1-5/8" COAX

THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.

APPLICABLE CODES

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALL IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

1. INTERNATIONAL BUILDING CODE (2012 IBC)
2. TIA-222-G OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2014 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. CT BUILDING CODE
7. LOCAL BUILDING CODE
8. CITY/COUNTY ORDINANCES

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.

DRAWING INDEX

SHEET NO.	SHEET TITLE	REV.
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SP-1	OUTLINE SPECIFICATIONS	0
SP-2	OUTLINE SPECIFICATIONS	0
SP-3	OUTLINE SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	EQUIPMENT & MOUNTING DETAILS	0
A-5	DETAILS	0
E-1	ELECTRICAL & GROUNDING DETAILS	0
RF-1	RF DATA SHEET	0
RF-2	PLUMBING DIAGRAM	0

APPROVALS

TITLE	SIGNATURE	DATE
PROJECT MANAGER:		
CONSTRUCTION:		
RF ENGINEER:		
ZONING/SITE ACQ:		
OPERATIONS:		
TOWER OWNER:		

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.

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

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

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:
STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
4-20-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
ISSUED FOR REVIEW	01/18/18	RCD	A

SITE NUMBER:
CT33XC574

SITE ADDRESS:
131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:
TITLE SHEET
& PROJECT DATA

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-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
5. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
3. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY –GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
4. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC") AND NFPA 101 (LIFE SAFETY CODE).
5. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
6. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
7. AMERICAN CONCRETE INSTITUTE (ACI)
8. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
9. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
10. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
11. PORTLAND CEMENT ASSOCIATION (PCA)
12. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
13. BRICK INDUSTRY ASSOCIATION (BIA)
14. AMERICAN WELDING SOCIETY (AWS)
15. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
16. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
17. DOOR AND HARDWARE INSTITUTE (DHI)
18. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
19. 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.

NOTE: IN SHORT-FORM SPECIFICATIONS ON THE DRAWINGS, A/E TO INSERT LIST OF APPLICABLE MOPS INCLUDING EN-2012-001, EN-2013-002, EL-0568, AND TS-0193

1.15 USE OF ELECTRONIC PROJECT 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. 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 CO.

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:

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

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

PLANS PREPARED BY:
INFINIGY
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the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
4-20-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
ISSUED FOR REVIEW	01/18/18	RCD	A

SITE NUMBER:
CT33XC574

SITE ADDRESS:
131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:
OUTLINE SPECIFICATIONS

SHEET NUMBER:
SP-1

CONTINUE FROM SP-1

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.

SECTION 01 400 – SUBMITTALS & TESTS

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

D. 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 TS-0200 REV 4 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:

1. 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.
2. 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.
3. EXPERIENCE IN SOILS, CONCRETE, MASONRY, AGGREGATE, AND ASPHALT TESTING USING ASTM, AASJTO, AND OTHER METHODS IS NEEDED.
4. 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)

PLANS PREPARED FOR:

Sprint

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

PROJECT MANAGER:

SBA

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

PLANS PREPARED BY:

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1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com

JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
4-20-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
ISSUED FOR REVIEW	01/18/18	RCD	A

SITE NUMBER:

CT33XC574

SITE ADDRESS:

131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:

OUTLINE SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

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

C. 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.

D. 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 01 400 – SUBMITTALS & TESTS

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. 1SHELTER 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.

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

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

PLANS PREPARED BY:
INFINIGY
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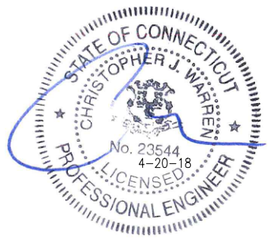
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:



CHECKED BY:

APPROVED BY:

REVISIONS:

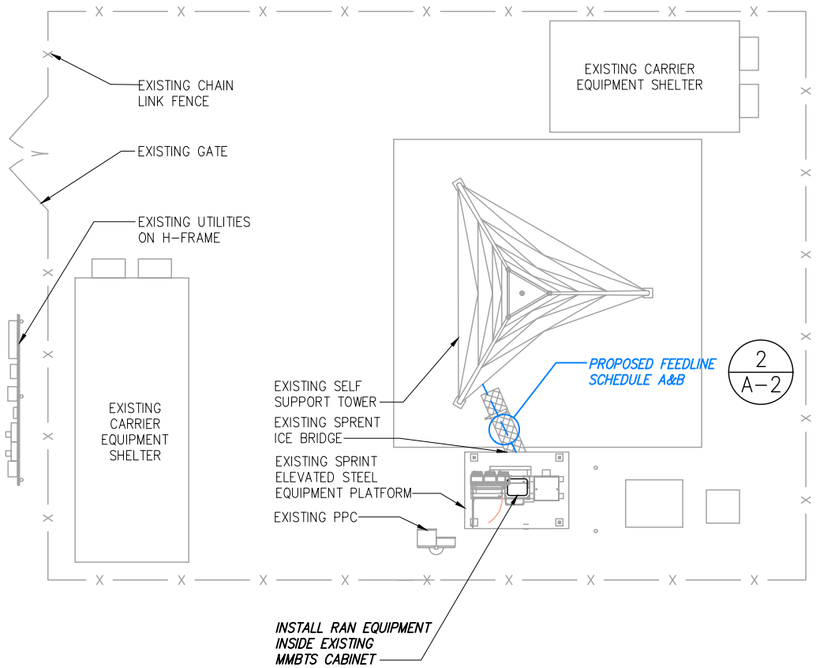
DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
ISSUED FOR REVIEW	01/18/18	RCD	A

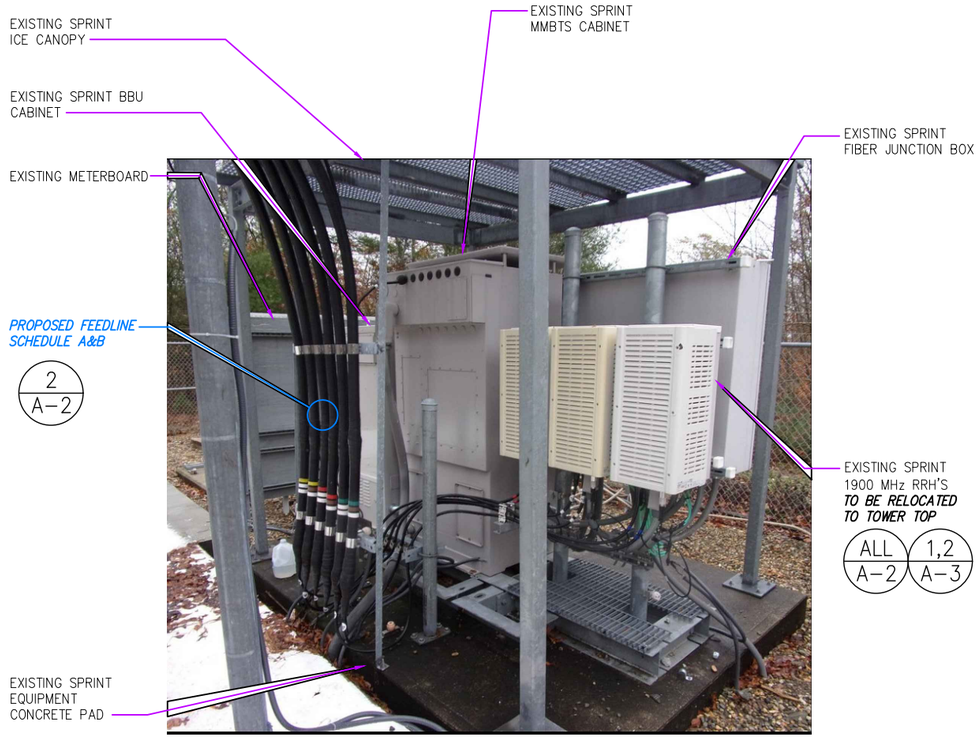
SITE NUMBER:
CT33XC574

SITE ADDRESS:
131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:
OUTLINE SPECIFICATIONS

SHEET NUMBER:
SP-3





SOURCE: WESTCHESTER SERVICES 11/14/17

INFORMATION CONTAINED WITHIN DRAWINGS ARE BASED ON PROVIDED INFORMATION AND ARE NOT THE RESULT OF A FIELD SURVEY.

GRAPHIC SCALE:

8' 16' 0 8' 16'

SCALE (11x17): 1" = 16'-0"
SCALE (22x34): 1" = 8'-0"

OVERALL SITE PLAN | SCALE: AS NOTED | 1

SPRINT EQUIPMENT PHOTO DETAIL | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint

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

PROJECT MANAGER:

SBA

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

PLANS PREPARED BY:

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Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
4-20-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

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CT33XC574

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131 GIFFORD LANE,
BOZRAH, CT 06334

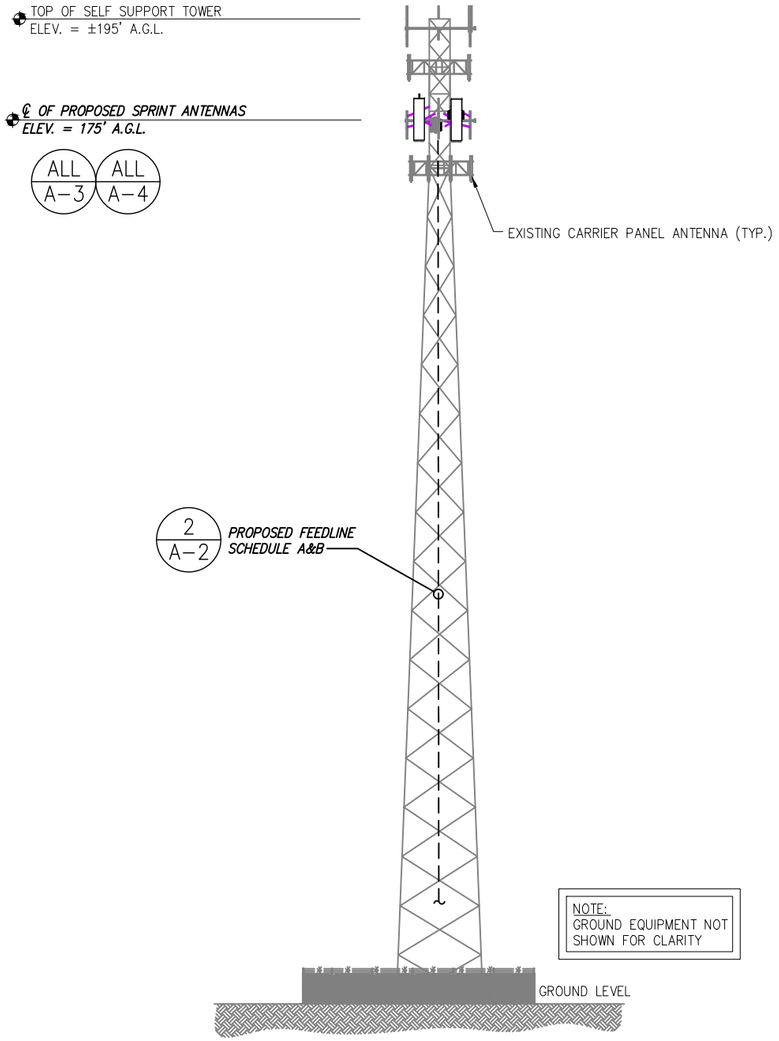
SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

A-1

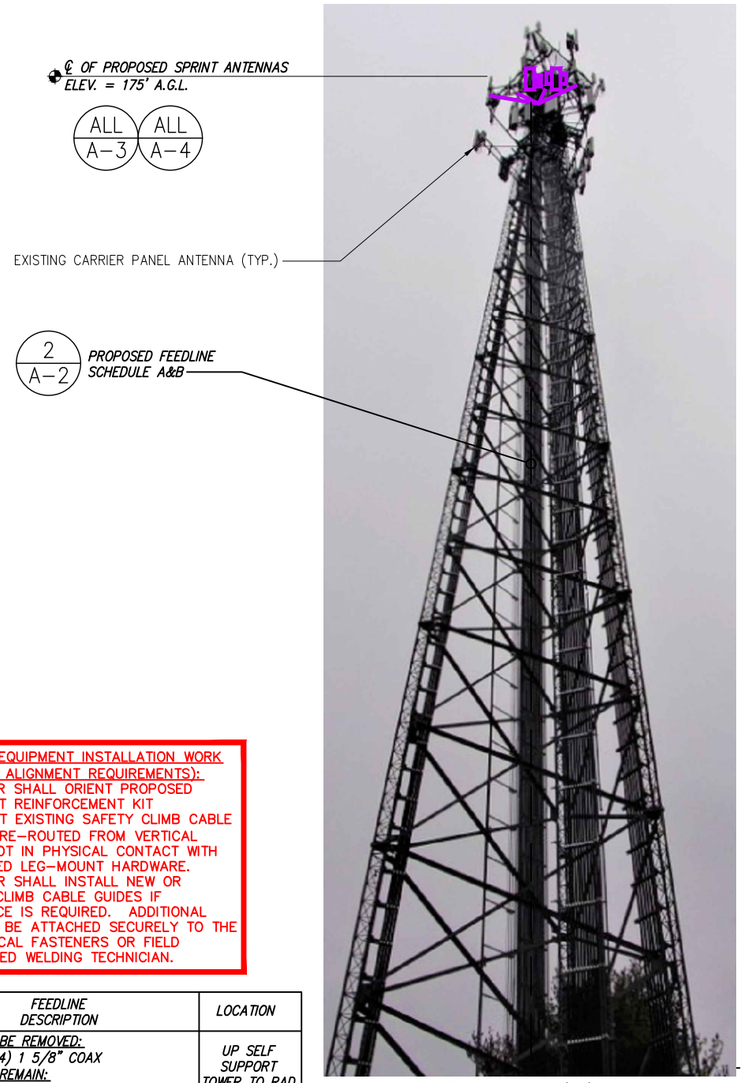
THESE PLANS HAVE BEEN DEVELOPED FOR THE MODIFICATION OF AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY OWNED OR LEASED BY SPRINT IN ACCORDANCE WITH THE SCOPE OF WORK PROVIDED BY SPRINT. INFINIGY HAS INCORPORATED THIS SCOPE OF WORK IN THE PLANS. THESE PLANS ARE NOT FOR CONSTRUCTION UNLESS ACCOMPANIED BY A PASSING STRUCTURAL STABILITY ANALYSIS PREPARED BY A LICENSED STRUCTURAL ENGINEER. STRUCTURAL ANALYSIS MUST INCLUDE BOTH TOWER AND MOUNT.



TOWER ELEVATION | NO SCALE | 1

SPECIAL INSTALLATION NOTE:
JUMPERS FROM RRHs TO ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION



SOURCE: WESTCHESTER SERVICES 11/14/17

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

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO BE REMOVED: (4) 1 5/8" COAX EXISTING TO REMAIN: (2) 1 5/8" COAX	UP SELF SUPPORT TOWER TO RAD
B	PROPOSED: (4) HYBRID TO 175' RAD	UP SELF SUPPORT TOWER TO RAD

NOTE:
EXISTING SPRINT EQUIPMENT FEEDLINE INVENTORY BASED ON COLOCATION APPLICATION AND SBA RECORD, NOT FIELD OBSERVATIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER.

TOWER ELEVATION PHOTO DETAIL | NO SCALE | 2

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

PROJECT MANAGER:
SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
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ENGINEERING LICENSE:
STATE OF CONNECTICUT
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APPROVED BY:

REVISIONS:

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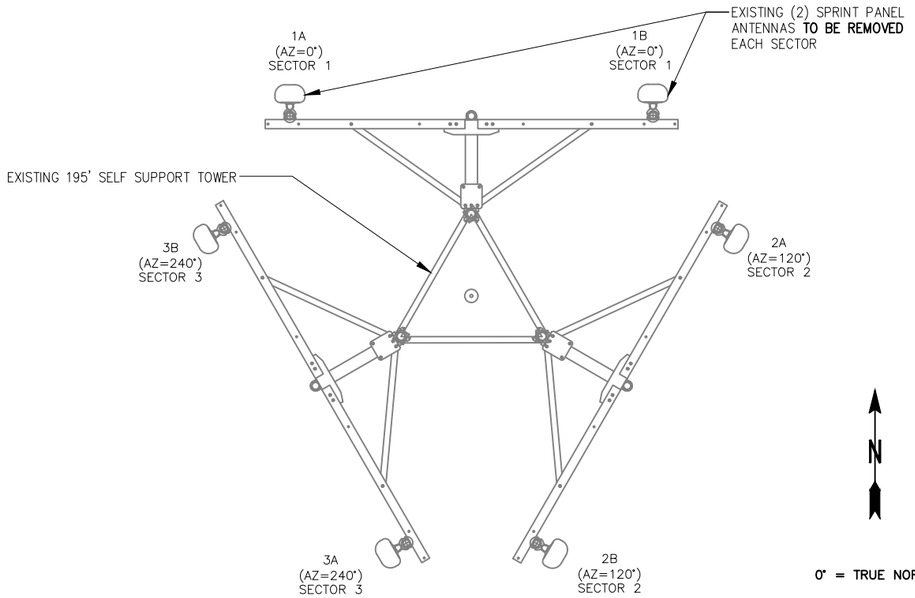
CT33XC574

SITE ADDRESS:
131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:
TOWER ELEVATION

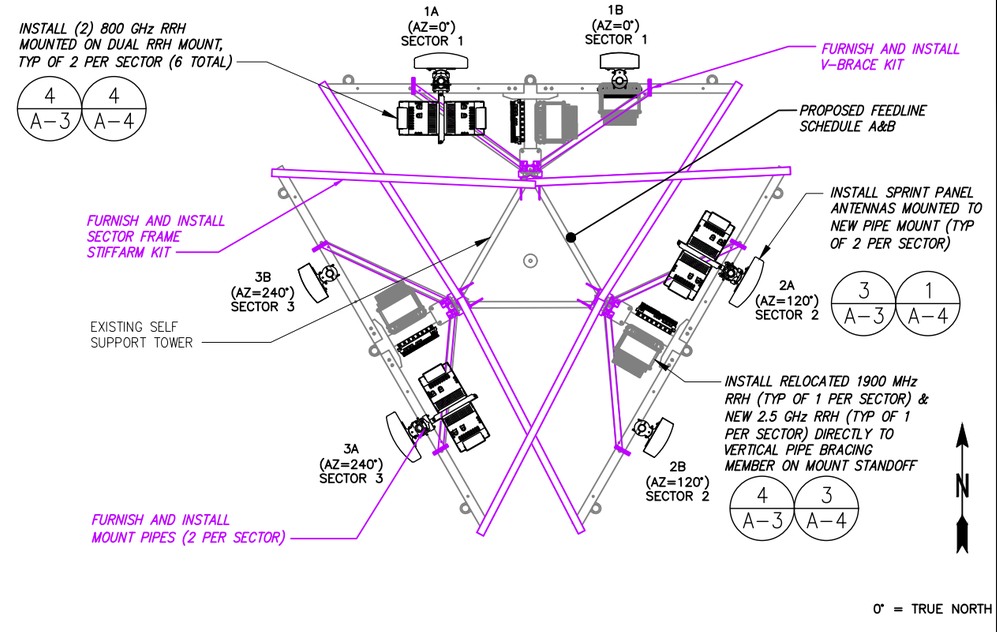
SHEET NUMBER:
A-2



EXISTING ANTENNA & RRH LAYOUT | NO SCALE | 1

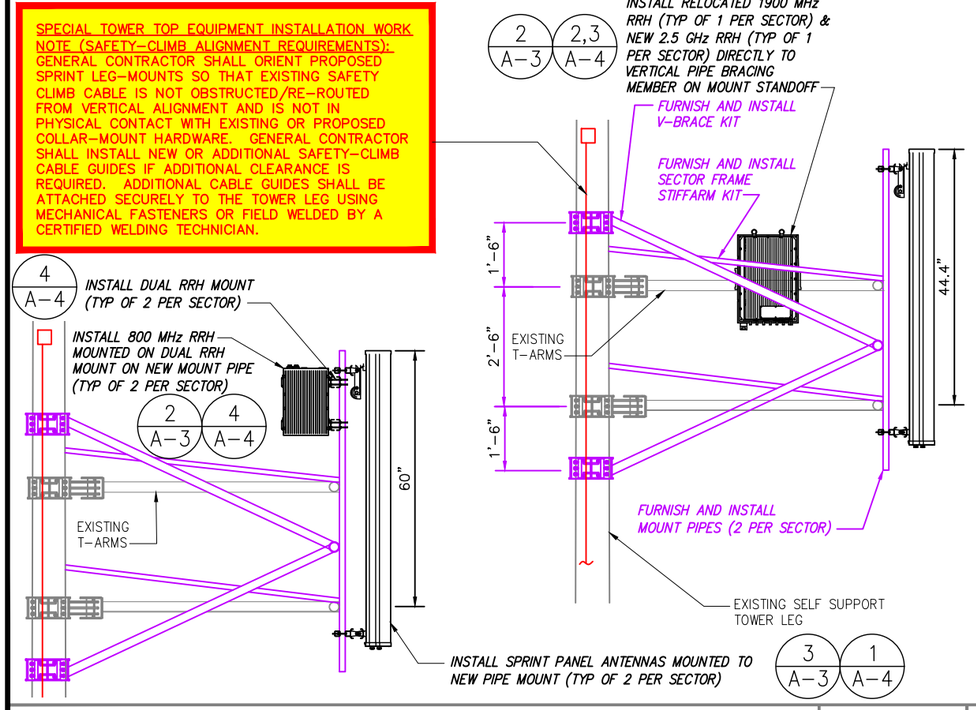
SPECIAL INSTALLATION NOTE:
JUMPERS FROM RRHs TO ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

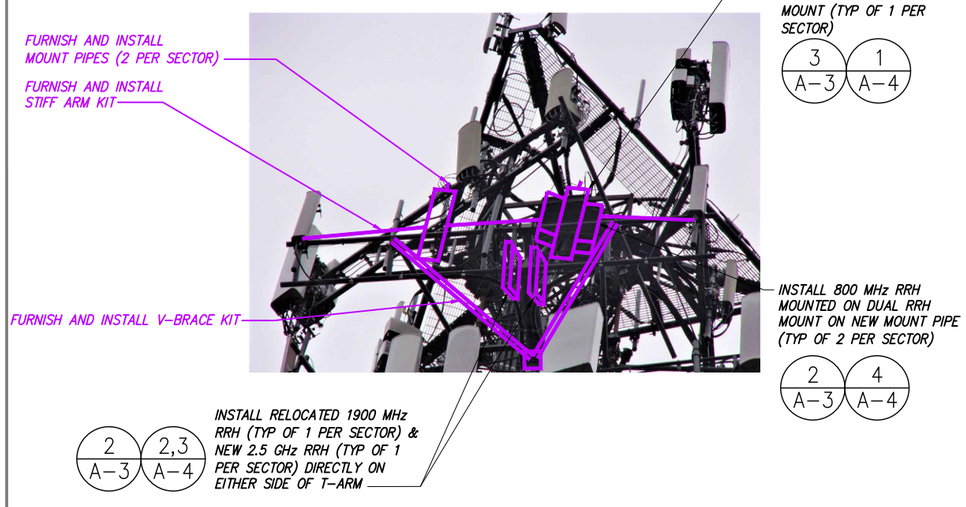


FINAL ANTENNA & RRH LAYOUT | NO SCALE | 2

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



TYPICAL MOUNTING DETAIL | NO SCALE | 3



ANTENNA & RRH MOUNTING PHOTO DETAIL | NO SCALE | 4

PLANS PREPARED FOR:
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INTERNATIONAL BLVD, SUITE 800
MAHWAH, NJ 07495
TEL: (800) 357-7641

PROJECT MANAGER:
SBA
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134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01581
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SITE ADDRESS:
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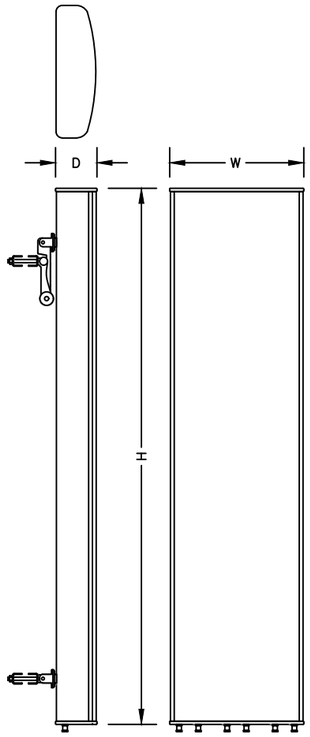
BOZRAH, CT 06334

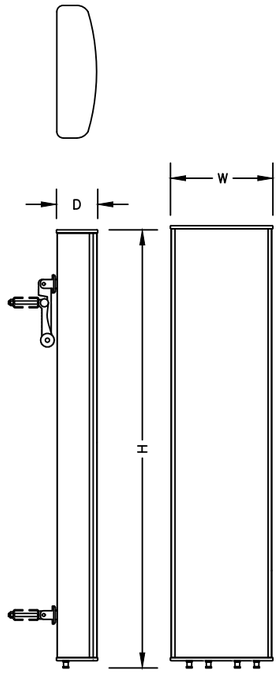
SHEET DESCRIPTION:
ANTENNA LAYOUT
& MOUNTING DETAILS

SHEET NUMBER:
A-3



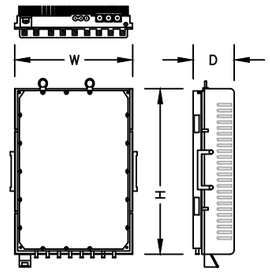
ANTENNA SPECIFICATIONS	
MANUF.	COMMSCOPE
MODEL #	NNVV-65B-R4
HEIGHT	72"
WIDTH	19.6"
DEPTH	7.8"
WEIGHT	84.7± LBS.

ANTENNA DETAIL | NO SCALE | 1



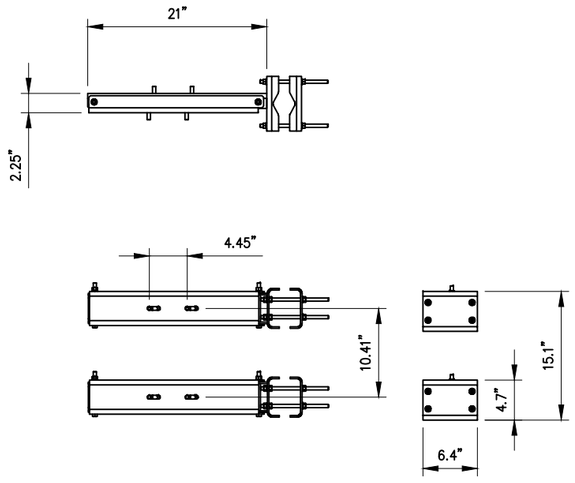
ANTENNA SPECIFICATIONS	
MANUF.	RFS
MODEL #	APXVTM14-ALU-I20
HEIGHT	56.3"
WIDTH	12.6"
DEPTH	6.3"
WEIGHT	56.2± LBS.

ANTENNA DETAIL | NO SCALE | 2

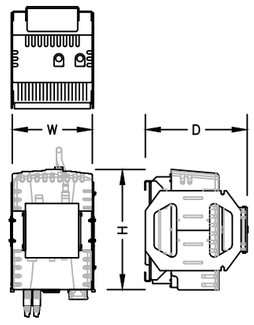


2.5 GHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	TD-RRH8X20-25
HEIGHT	26.1"
WIDTH	18.6"
DEPTH	6.7"
WEIGHT	70± LBS

2.5 RRH | NO SCALE | 3

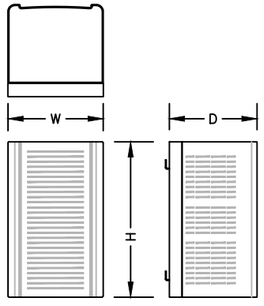


DUAL RRH MOUNT DETAIL | NO SCALE | 4



800 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	800MHZ 2X50W
HEIGHT	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53± LBS

800 MHz RRH | NO SCALE | 5



1900 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	1900 4X45 65MHZ
HEIGHT	25"
WIDTH	11.1"
DEPTH	11.4"
WEIGHT	60± LBS

1900 MHz RRH (EXISTING TO BE RELOCATED) | NO SCALE | 6

PLANS PREPARED FOR:

Sprint

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

PROJECT MANAGER:

SBA

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

PLANS PREPARED BY:

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1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
4-20-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
ISSUED FOR REVIEW	01/18/18	RCD	A

SITE NUMBER:

CT33XC574

SITE ADDRESS:

131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:

EQUIPMENT &
MOUNTING DETAILS

SHEET NUMBER:

A-4

RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	**Hybrid cable** MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB058-M12-200F	200 ft
8 AWG Power	**Hybrid cable** MN: HB114-08U3M12-050F 3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	**Hybrid cable** MN: HB114-13U3M12-225F 3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	**Hybrid cable** MN: HB114-21U3M12-325F 3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

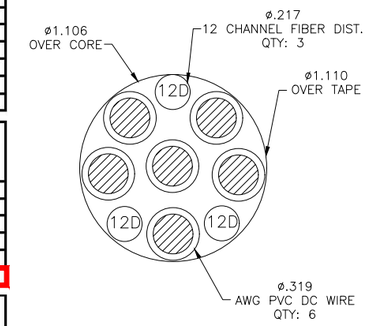
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	**Hybrid Jumper cable** MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
	MN: HBF012-M3-15F1	15 ft
	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft
8 AWG Power	**Hybrid Jumper cable** MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	MN: HBF058-08U1M3-20F1	20 ft
	MN: HBF058-08U1M3-25F1	25 ft
	MN: HBF058-08U1M3-30F1	30 ft
6 AWG Power	**Hybrid Jumper cable** MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft
4 AWG Power	**Hybrid Jumper cable** MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBF078-21U1M3-30F1	30 ft

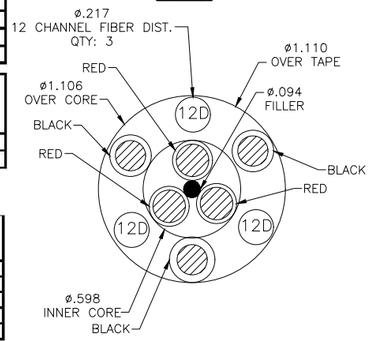
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.

* PROPOSED CABLE LENGTH WAS DETERMINED USING THE SUM OF THE RAD CENTER OF ANTENNAS, AND DISTANCE FROM EXISTING EQUIPMENT AREA TO TOWER BASE WITH AN ADDITIONAL 20' BUFFER. LENGTH TO BE VERIFIED IN FIELD PRIOR TO ORDERING MATERIALS.

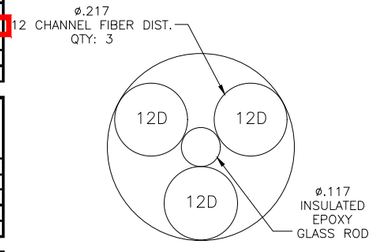
* SPRINT CM TO CONFIRM HYBRID RISER CABLE AND HYBRID JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.



4 AWG



8 & 6 AWG



FIBER ONLY

800/1900/2500 CROSS SECTION DATA

NO SCALE

1

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

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REVISIONS:

DESCRIPTION	DATE	BY	REV.
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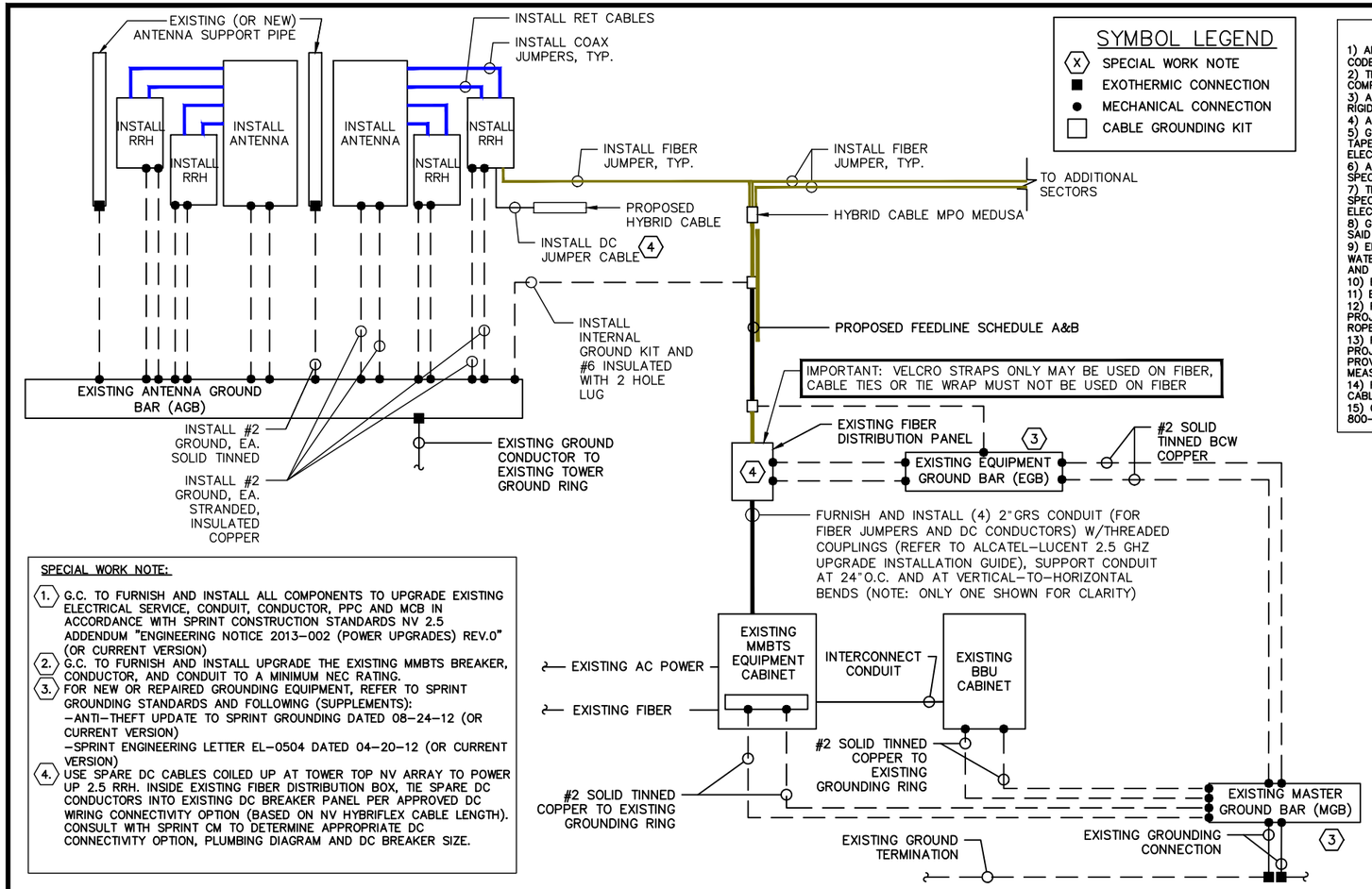
ISSUED FOR REVIEW	01/18/18	RCD	A

SITE NUMBER:
CT33XC574

SITE ADDRESS:
131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:
DETAILS

SHEET NUMBER:
A-5



TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

1 / E-1

SCALE: N.T.S.

SPECIAL WORK NOTE:

1. G.C. TO FURNISH AND INSTALL ALL COMPONENTS TO UPGRADE EXISTING ELECTRICAL SERVICE, CONDUIT, CONDUCTOR, PPC AND MCB IN ACCORDANCE WITH SPRINT CONSTRUCTION STANDARDS NV 2.5 ADDENDUM "ENGINEERING NOTICE 2013-002 (POWER UPGRADES) REV.0" (OR CURRENT VERSION)
2. G.C. TO FURNISH AND INSTALL UPGRADE THE EXISTING MMBTS BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING.
3. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
   -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)
   -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
4. USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.

SYMBOL LEGEND

- (X) SPECIAL WORK NOTE
- ■ EXOTHERMIC CONNECTION
- ● MECHANICAL CONNECTION
- □ CABLE GROUNDING KIT

ELECTRICAL NOTES

1) ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2) THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT ROUTING WITH LOCAL UTILITY COMPANIES AND SPRINT CONSTRUCTION MANAGER.
3) ALL CONDUITS ROUTED BELOW GRADE SHALL TRANSITION TO RIGID GALVANIZED ELBOWS WITH RIGID GALVANIZED STEEL CONDUIT ABOVE GRADE.
4) ALL METAL CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS.
5) GENERAL CONTRACTOR SHALL PROVIDE ALL DIRECT BURIED CONDUITS WITH PLASTIC WARNING TAPE IDENTIFYING CONTENTS. TAPE COLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.
6) ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
7) THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIALS DESCRIBED BY DRAWINGS AND SPECIFICATIONS INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
8) GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
9) ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
10) BURIED CONDUIT SHALL BE SCHEDULE 40 PVC.
11) ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
12) RUN ELECTRICAL CONDUIT OR CABLE BETWEEN ELECTRICAL UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE PPC AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
13) RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
14) FIBER OPTIC CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 770-OPTICAL FIBER CABLES AND RACEWAYS.
15) COMMUNICATIONS CIRCUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 800-COMMUNICATIONS SYSTEMS.

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-GROUNDING AND BONDING.
2. GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
3. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
4. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON-CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX" OR EQUAL.
5. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
6. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
7. ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
8. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
9. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
10. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
11. GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
12. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
13. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI-OXIDANT (THOMAS BETTS KOPR-SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
14. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF-TAPPING SCREWS.
15. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
16. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
17. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI-CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
18. FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
   -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)
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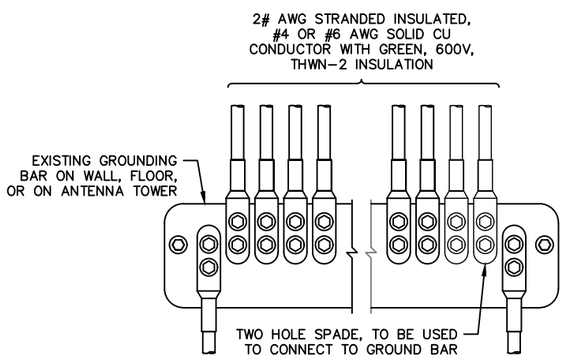
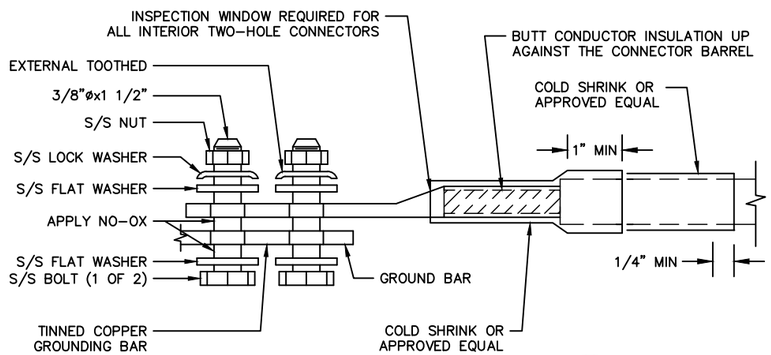


1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

2 / E-1

SCALE: N.T.S.



TWO HOLE LUG

3 / E-1

SCALE: N.T.S.

PLANS PREPARED FOR:

Sprint

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

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SITE NUMBER:

CT33XC574

SITE ADDRESS:

131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-1

SprintVision

RF Design Sheet

Site Identification	
Cascade	CT33XC574
SMS Schedule ID	12343898
SMS Schedule Name	DO Macro Upgrade
PID	
RRU OEM	ALU
Switch OEM	Alcatel Lucent
RFDS Issue Date	2017-08-15 00:00:00.0
RFDS Revision Date	2017-10-20 10:11:35.0
RFDS Revision	3

Filter Analysis Complete	YES
RFDS - Issue Date	08/15/2017
Design Status	Complete
Project Description	DO Macro Upgrade - Add 800MHz (3G + 4G) and 2500 MHz

Contact Information	
Engineer Email	Bill.M.Hastings@sprint.com
Sprint Badged RF Engineer	Bill Hastings
RF Engineer Email	Bill.M.Hastings@sprint.com
RF Engineer Phone	978-590-9700
RF Manager	Jonathan Hull
RF Manager Email	Jonathan.B.Hull@Sprint.com
RF Manager Phone	617-233-2920

Carrier Count	
2500 LTE	3
1900 LTE	1
1900 EVDO	
1900 Voice	1
800 LTE	1
800 Voice	1

Location Details	
Latitude	41.55139
Longitude	-72.15139
Market	Northern Connecticut
Region	Northeast
City	Bozrah
State	CT
Zip Code	CT/06334
County	New London

2500MHz	3
1900MHz	3
800MHz	3

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	TD-RRH8x20-25	TD-RRH8x20-25	TD-RRH8x20-25	N/A	N/A	N/A
Weight (lbs)	76.2	76.2	76.2	N/A	N/A	N/A
Dimensions	26 x 18.6 x 6.7	26 x 18.6 x 6.7	26 x 18.6 x 6.7	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
Trunk Cable 1						
Model Number	Hybriflex	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	1	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	1.54	N/A	N/A	N/A	N/A	N/A
Manufacturer	ALU	N/A	N/A	N/A	N/A	N/A

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-2x50-800	RRH-2x50-800	RRH-2x50-800	N/A	N/A	N/A
Weight (lbs)	69.1	69.1	69.1	N/A	N/A	N/A
Dimensions	16 x 13 x 10	16 x 13 x 10	16 x 13 x 10	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	2	2	2	0	0	0

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	APXVTM14-ALU-I20	APXVTM14-ALU-I20	APXVTM14-ALU-I20			
Weight (lbs)	56.2	56.2	56.2	N/A	N/A	N/A
Dimensions	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	N/A	N/A	N/A
Manufacturer	RFS	RFS	RFS	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	2.5 Jumper 8	2.5 Jumper 8	2.5 Jumper 8	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	0	120	240	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	174.9671972	174.9671972	174.9671972	N/A	N/A	N/A
Antenna 1 Electrical DT	2	2	2	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	NNVV-65B-R4	NNVV-65B-R4	NNVV-65B-R4			
Weight (lbs)	84.7	84.7	84.7	N/A	N/A	N/A
Dimensions	72 x 19.6 x 7.8	72 x 19.6 x 7.8	72 x 19.6 x 7.8	N/A	N/A	N/A
Manufacturer	CommScope	CommScope	CommScope	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	800/1900 Jumper 4	800/1900 Jumper 4	800/1900 Jumper 4	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	0	120	240	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	174.9671972	174.9671972	174.9671972	N/A	N/A	N/A
Antenna 1 Electrical DT	3	3	3	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Additional RF Notes Special Construction Requirements

10/10/2017 (WR): RFDS revised to modify RRU location to "GM to Standard".

PLANS PREPARED FOR:

Sprint

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

PROJECT MANAGER:

SBA

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

PLANS PREPARED BY:

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Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 526-104

ENGINEERING LICENSE:

STATE OF CONNECTICUT
CHRISTOPHER J. WARREN
No. 23544
4-20-18
LICENSED PROFESSIONAL ENGINEER

CHECKED BY:

APPROVED BY:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
ISSUED FOR REVIEW	01/18/18	RCD	A

SITE NUMBER:

CT33XC574

SITE ADDRESS:

131 GIFFORD LANE,
BOZRAH, CT 06334

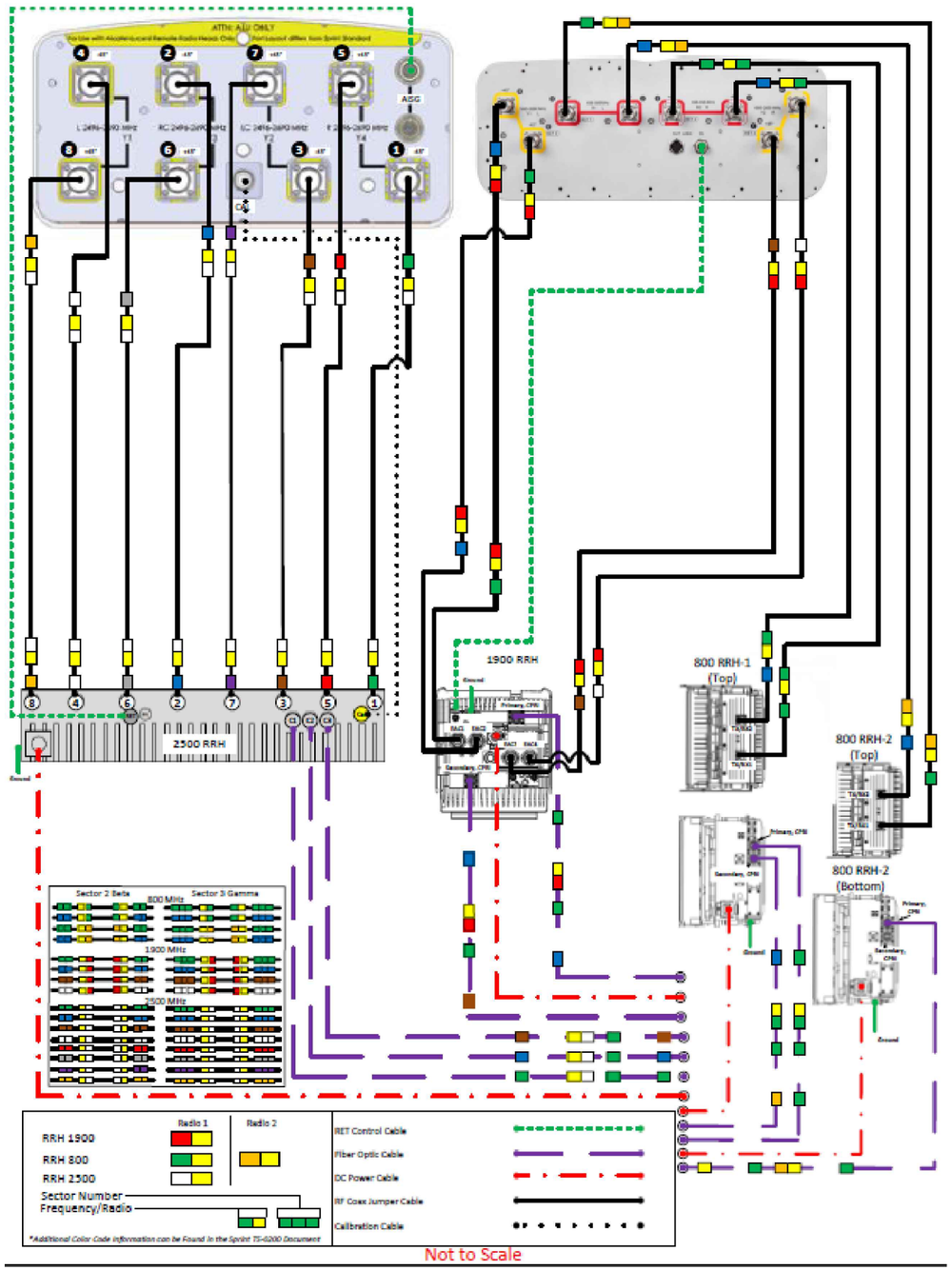
SHEET DESCRIPTION:

RF DATA SHEET

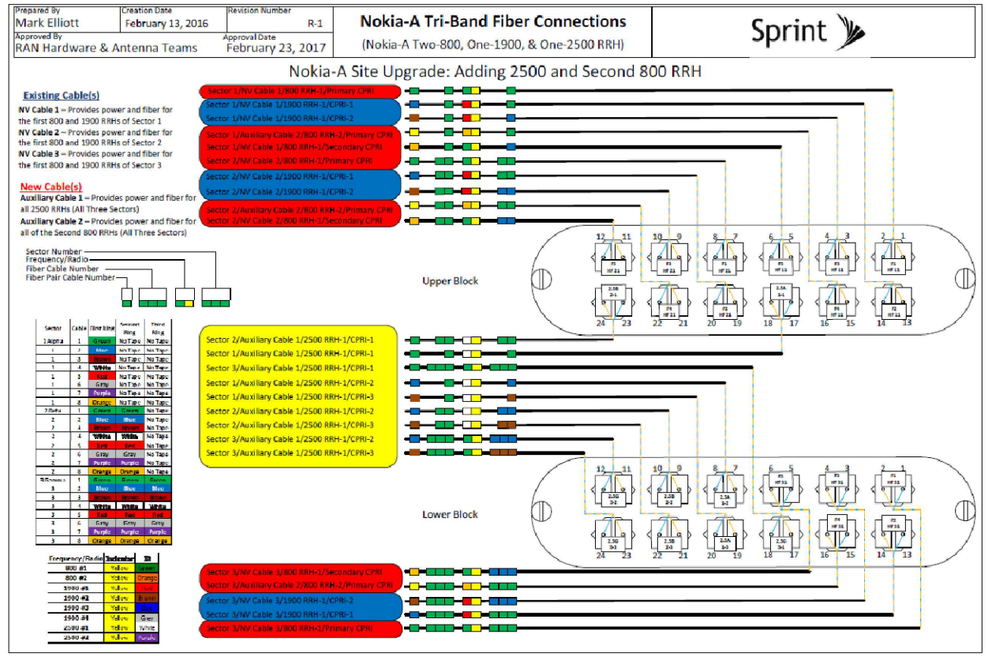
SHEET NUMBER:

RF-1

ALU 211 APXVTM14-ALU-I20 & NNVV-65B-R4 wo Filters



Not to Scale



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DESCRIPTION	DATE	BY	REV.
ISSUED FOR CONSTRUCTION	03/22/18	SL	0
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SITE NUMBER:

CT33XC574

SITE ADDRESS:

131 GIFFORD LANE,
BOZRAH, CT 06334

SHEET DESCRIPTION:

PLUMBING DIAGRAM

SHEET NUMBER:

RF-2

PLUMBING DIAGRAM | NO SCALE | 1