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

January 8, 2018

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

Notice of Exempt Modification
1 Hartford Square, New Britain, CT 06052
41.6663919 N
-72.8127989 W
Sprint #: CT52XC105_DO Macro Upgrade

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 172-foot level of the existing 175-foot Self-Support Tower at 1 Hartford Square. The tower is owned by SBA Towers. The property is owned by Hartford Square Associates. Sprint now intends to remove (3) existing (Clearwire) panel antennas and replace with (3) new panel antennas at the 172-foot level. The full scope of proposed work is as follows:

Remove:

- (3) Samsung RRUs
- (6) 5/16" RETs
- (1) 5/8" DC
- (1) tower top junction box

Remove and Replace:

- Remove (3) KMW ETCR-654L12H6 Panel Antennas and Replace with (3) Kathrein 840-10054 Panel Antennas
- Remove (1) Clearwire GPS antenna and Replace with (1) new GPS antenna

At ground level: Please note no change to existing compound size or area. Equipment swap within existing shelter.

- Remove (1) Clearwire Equipment Rack in existing shelter and Replace with (1) new Equipment Cabinet within the existing shelter

Install:

- (3) ALU 1900 MHz RRUs
- (6) ALU 800 MHz RRUs
- (3) ALU TD-RRH8x20-25 RRUs
- (4) 1-1/4" fiber

Existing Equipment to Remain (including entitlements):

- (9) Decibel DB844H90E-XY Panel Antennas
- (4) Andrew VHLP2-18 Dishes: (3) on tower/(1) is entitlement only
- (3) DragonWave Horizon Duos
- (3) T-Frames
- (12) 1-1/4" coax
- (4) ½" fiber

This facility was approved by the Department of Municipal Development for the City of New Britain on 7/17/00. Associated construction drawings state tenants are to have a maximum of four panel antennas per sector. This modification complies with the aforementioned condition.

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 Honorable Erin Stewart, Mayor of the City of New Britain, The Municipal Development Group, as planning representative for the City of New Britain, as well as the property owner Hartford Square Associates, LLC. (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: The Honorable Erin Stewart, Mayor of the City of New Britain–w/attachments
City Hall Room 204, 27 West Main St., New Britain, CT 06051
New Britain Municipal Development–representative for planning/zoning department—w/attachments
City Hall Room 311, 27 West Main St., New Britain, CT 06051
Hartford Square Associates, LLC– w/attachments
1 Hartford Square Door #19, New Britain, CT 06052

POWER DENSITY

Sprint Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	**172 feet**	Height (AGL):	**172 feet**	Height (AGL):	**172 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**1.67 %**	Antenna B1 MPE%	**1.67 %**	Antenna C1 MPE%	**1.67 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.67 %**
Nextel (Decommissioned)	0.21 %
Clearwire	0.07 %
T-Mobile	2.98 %
MetroPCS	0.79 %
Verizon Wireless	3.69 %
AT&T	2.25 %
Site Total MPE %:	**11.66 %**

SPRINT Sector A Total:	1.67 %
SPRINT Sector B Total:	1.67 %
SPRINT Sector C Total:	1.67 %
Site Total:	11.66 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	432.54	172	0.56	850 MHz	567	0.10%
Sprint 850 MHz LTE	2	432.54	172	1.13	850 MHz	567	0.20%
Sprint 1900 MHz (PCS) CDMA	5	535.94	172	3.50	1900 MHz (PCS)	1000	0.35%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	172	3.50	1900 MHz (PCS)	1000	0.35%
Sprint 2500 MHz (BRS) LTE	8	639.78	172	6.68	2500 MHz (BRS)	1000	0.67%
						Total:	**1.67%**

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

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City of New Britain, CT

Property Listing Report | Map Block Lot F4A 2 | Account 44950001

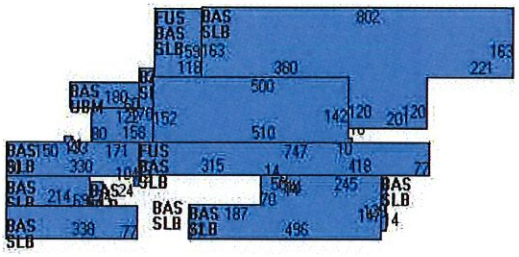
Property Information

Property Location	1 HARTFORD SQ
Owner	HARTFORD SQUARE ASSOCIATES LLC
Co-Owner	
Mailing Address	1 HARTFORD SQ WEST BOX #15 NEW BRITAIN CT 06052
Land Use	4010 Ind Whse MDL-96
Land Class	I
Zoning Code	I2
Census Tract	416400

Neighborhood	101G
Acreage	31.1
Utilities	All Public
Lot Setting/Desc	Level
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	1940
Stories	2
Building Style	Warehouse
Building Use	Ind/Comm
Building Condition	C
Floors	Finished Concr
Total Rooms	

Bedrooms	
Full Bathrooms	0
Half Bathrooms	
Bath Style	
Kitchen Style	
Roof Style	Gable
Roof Cover	Metal/Tin

Exterior Walls	Brick/Masonry
Interior Walls	Minimum/Masonr
Heating Type	99
Heating Fuel	Yes
AC Type	Partial
Gross Bldg Area	553361
Total Living Area	542561

Report Created On 1/3/2018

City of New Britain, CT

Property Listing Report | Map Block Lot F4A 2 | Account 44950001

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	4123000	2886100
Extras	13600	9520
Improvements	4466700	3126690
Outbuildings	330100	231070
Land	2076000	1453200
Total	6542700	4579890

Outbuilding and Extra Items

Type	Description
Utility Metal	3036.00 S.F.
Utility Metal	3036.00 S.F.
Utility Metal	320.00 S.F.
Utility Metal	320.00 S.F.
Utility Frame	320.00 S.F.
Utility Frame	320.00 S.F.
Tank Bulk	300000.00 Gal
Tank Bulk	300000.00 Gal
Central A/C	18000.00 S.F.
Central A/C	18000.00 S.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	466084	466084
First Floor	466084	466084
Slab	0	0
Slab	0	0
Basement	10800	0
Basement	10800	0
Finished Upper Story	76477	76477
Finished Upper Story	76477	76477
Total Area	553361	542561

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
HARTFORD SQUARE ASSOCIATES LLC	1903/1103	12/3/2014	
HARTFORD SQUARE ASSOCIATES LLC	1903/1103	12/3/2014	
HARTFORD SQUARE ASSOCIATES LLC	1895/ 267	7/22/2014	
HARTFORD SQUARE ASSOCIATES LLC	1895/ 267	7/22/2014	
HARTFORD SQUARE ASSOCIATES LLC	1895/ 157	7/22/2014	
HARTFORD SQUARE ASSOCIATES LLC	1895/ 157	7/22/2014	
HARTFORD SQUARE ASSOCIATES LLC	1830/ 539	12/6/2011	
HARTFORD SQUARE ASSOCIATES LLC	1830/ 539	12/6/2011	

Report Created On 1/3/2018

EBI Consulting
environmental | engineering | due diligence

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

SPRINT Existing Facility

Site ID: CT52XC105

New Britain - West
1 Hartford Square
New Britain, CT 06052

December 15, 2017

EBI Project Number: 6217005634

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.66 %

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

EBI Consulting
environmental | engineering | due diligence

December 15, 2017

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

Emissions Analysis for Site: **CT52XC105 – New Britain - West**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **1 Hartford Square, New Britain, 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.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 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 **1 Hartford Square, New Britain, 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 20 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 **KMW ETCR-654L12H6** 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 **172 feet** above ground level (AGL) for **Sector A**, **172 feet** above ground level (AGL) for **Sector B** and **172 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:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	**172 feet**	Height (AGL):	**172 feet**	Height (AGL):	**172 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**1.67 %**	Antenna B1 MPE%	**1.67 %**	Antenna C1 MPE%	**1.67 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**1.67 %**
Nextel (Decommissioned)	0.21 %
Clearwire	0.07 %
T-Mobile	2.98 %
MetroPCS	0.79 %
Verizon Wireless	3.69 %
AT&T	2.25 %
Site Total MPE %:	**11.66 %**

SPRINT Sector A Total:	1.67 %
SPRINT Sector B Total:	1.67 %
SPRINT Sector C Total:	1.67 %
Site Total:	11.66 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	432.54	172	0.56	850 MHz	567	0.10%
Sprint 850 MHz LTE	2	432.54	172	1.13	850 MHz	567	0.20%
Sprint 1900 MHz (PCS) CDMA	5	535.94	172	3.50	1900 MHz (PCS)	1000	0.35%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	172	3.50	1900 MHz (PCS)	1000	0.35%
Sprint 2500 MHz (BRS) LTE	8	639.78	172	6.68	2500 MHz (BRS)	1000	0.67%
						Total:	**1.67%**

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:	1.67 %
Sector B:	1.67 %
Sector C:	1.67 %
SPRINT Maximum Total (per sector):	1.67 %
Site Total:	11.66 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.66 %** 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 175' Self Support Tower

SBA Site Name: New Britain 2, CT
SBA Site Number: CT04382-S-01
Carrier Name: Sprint Nextel
Carrier Site ID/Name: CT52XC105/ New Britain-West
App #: 71153, v1.

Site Location:
1 Hartford Square,
New Britain, CT 06052-1161
Hartford County

Latitude: 41.666411
Longitude: -72.812803

ACGI Job # 17-6645
(Refer Previous SA ACGI Job # 17-1365, dated 03/24/2017)

ANALYSIS RESULTS		
Tower Components	90.7 %	**Pass**
Tower Foundation Capacity	58.9 %	**Pass**
Net Change in Tower Stress	-7.8 %	**Change from previous Structural Analysis Allpro Consulting Group, Inc ACGI Job # 17-1365, dated 03/24/2017**

Prepared By:
Saicharan Byrishetty, EIT

10/26/2017
Approved By:
Joji Geroge, P.E.
CT PE #24444

TABLE OF CONTENTS

1. ANALYSIS SUMMARY

The existing 175' Self Support Tower located in New Britain, CT was analyzed by Allpro Consulting Group, Inc (ACGI) for the existing loads and the proposed **Sprint Nextel** antennas and coaxes 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:	Rohn Industries, Inc.	Original Tower Drawings by Rohn Industries, Inc. (Eng. File No. 44545AE dated 08/18/2000)
	FDH Engineering, Inc.	Previous Structural Analysis by FDH Engineering, Inc.(FDH Project Number 16BICQ1400, dated 05/13/2016)
	Allpro Consulting Group Inc.,	Previous Structural Analysis by Allpro Consulting Group Inc., ACGI # 16-4300, dated 12/07/2016. Previous Modification Design by Allpro consulting Group Inc., ACGI # 17-0378, dated 03/09/2017. Previous Structural Analysis Allpro Consulting Group, Inc., ACGI Job # 17-1365, dated 03/24/2017
Foundation Data:	Rohn Industries, Inc.	Existing MAT foundation data is as per original foundation design by Rohn Industries, Inc. (Eng. File No. 44545AE dated 07/26/2000)
Geotechnical Report:	Jaworski Geotech, Inc	Foundation design was based on geotechnical report (No. 00309G dated 07/05/2000)
Loading Data:	Allpro Consulting Group Inc.,	Existing Loading as per previous Structural Analysis Allpro Consulting Group, Inc ., ACGI # 17-1365, dated 03/24/2017
	SBA Communication Corp.	Existing loading as per SBA Site Summary, dated 08/14/2017. Proposed final loading for Sprint Nextel as per SBA Portal, App #71153, v1.
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:	New Britain 2, CT
SBA Site Number:	CT04382-S-01
Carrier Site ID:	CT52XC105/ New Britain-West
City, State:	Hartford, CT
County:	Hartford County
Code Wind Load Requirement:	TIA-222-G & IBC 2012 (122 mph ultimate wind speed equivalent to 95 mph basic wind speed)
Wind Load Used:	TIA-222-G Code: • Basic wind speed of 95 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 1.0 in.
Seismic Check:	S_s=0.183 < 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:	175'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi , Braces – 36 ksi
Type of Foundation:	Mat Foundation with (3) Pedestals

TOWER HISTORY	
Tower Manufacturer / Model:	Rohn Industries, Inc.
Date of Original Design:	08/18/2000
Previous Modifications:	Allpro Consulting Group Inc, Job #17-0378, dated 03/03/2017.
Original Design Code Requirements:	TIA-222-F 2005, 80 mph wind speed + 1" radical ice 38 mph wind speed

7. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
172±	3	Kathrein 840-10054	(3) T-Frames	(6) 5/16" RET (1) 5/8" DC (12) 1-1/4" Coax (4) 1/2" Fiber	Sprint Nextel
	9	Decibel DB844H90E-XY Antenna			
	4	Andrew VHLP2-18 Dish			
	3	Samsung RRUs			
	3	Dragonwave Horizon Duo			
162±	3	Kathrein 800 10121	(3) T-Frames	(12) 1-5/8" Coax (2) 1/2" Fiber (4) 3/4" DC Power (1) 3" Flex Conduit	AT&T*
	3	Quintel Technology QS66512-2			
	6	KMW AM-X-CD-16-65-00T			
	3	Ericsson RRUS-32			
	3	Ericsson RRUS-11			
	3	Ericsson RRUS-32 B2s			
	6	Powerwave LGP 21401			
	6	CCI TPX-070821			
	6	Kathrein 860-10025			
	2	Raycap DC6-48-60-18-8F			
152±	3	Ericsson Air 21 B2A/B4P Antenna	(3) T-Frames	(12) 1-5/8" Coax (1) 1-5/8" Hybrid (1) 1-1/4" Hybrid	T-Mobile
	3	Ericsson Air 32 Antenna			
	3	Commscope LNX-6515DS-A1M Antenna			
	3	Ericsson KRY 112 144/1 TMA			
	3	Ericsson RRUS 11 (Band 12)			
140±	6	Andrew SBNHH-1D65B	(3) T-Frames	(12) 1-5/8" Coax (2) 1-5/8" Hybrid	Verizon
	3	Kathrein 800 10735v01			
	3	Antel BXA-80080/4CF			
	3	Alcatel Lucent RRH-2x60-AWS			
	3	Alcatel Lucent RRH-2x60-PCS			
	3	Alcatel Lucent RRH-2X60W-700U			
	1	RFS DB-T1-6Z-8AB-0Z			
130±	3	Kathrein 742 213	(3) Pipe Mounts	(6) 1-5/8" Coax	Metro PCS

*The (2) 1/2" Fiber Cable and (4) 3/4" DC Power Cable for ATT will be Installed in (1) 3" Conduit.

FINAL SPRINT NEXTEL LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
172±	**3**	**KMW ETCR-654L12H6 Antenna**	(3) T-Frames	(12) 1-1/4" Coax **(4) 1-1/4" Fiber** (4) 1/2" Fiber	Sprint Nextel
	9	Decibel DB844H90E-XY Antenna			
	4	Andrew VHLP2-18 Dish			
	3	DragonWave Horizon Duo ODU			
	3	**ALU 1900 Mhz RRUs**			
	6	**ALU 800 Mhz RRUs**			
	3	**ALU TD-RRH8x20-25 RRUs**			

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.

4. CONCLUSIONS

RESULT SUMMARY		
MEMBER	*% Capacity*	*Pass/Acceptable*
Legs	**62.6 %**	**Pass**
Diagonals	**90.7 %**	**Pass**
Top Girt	**4.4 %**	**Pass**
Bolt checks	**90.7 %**	**Pass**
Anchor Bolts	**53.3 %**	**Pass**
Foundation (see attached MathCAD for details)	**Net Soil Pressure (19.8 %)**	**Pass**
	Horizontal shear (27.0 %)	**Pass**
	Safety against overturning (58.9 %)	**Pass**
OVERALL TOWER RATING = 90.7 %		

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.

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.

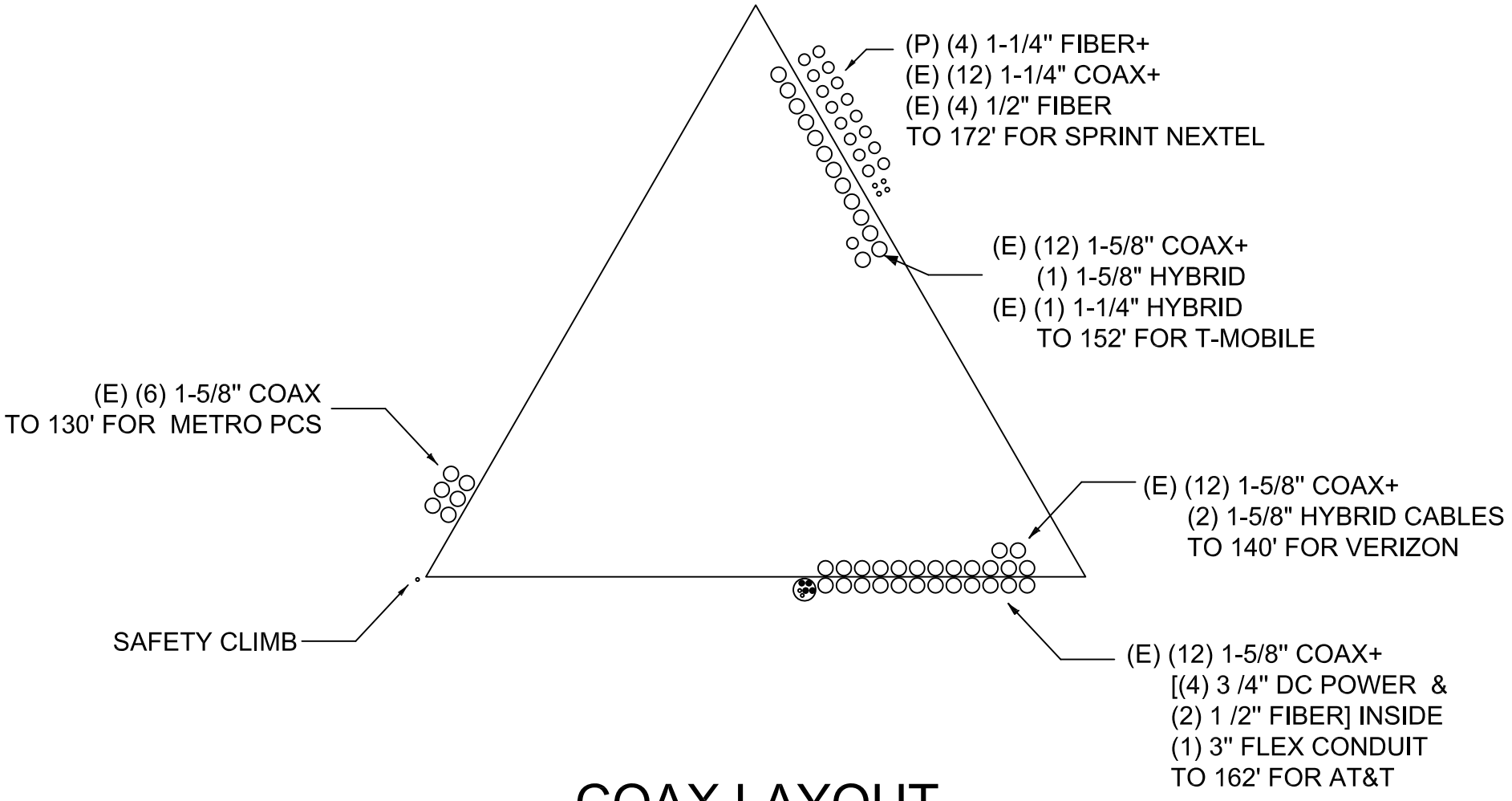
8. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP$_{allow}$ K	% Capacity	Pass Fail
T1	176 - 160	Leg	ROHN 3 EH	3	-15.66	119.12	13.1	Pass
T2	160 - 140	Leg	ROHN 4 EH	33	-57.75	183.54	31.5	Pass
T3	140 - 120	Leg	ROHN 5 EH	65	-103.19	254.38	40.6	Pass
T4	120 - 100	Leg	ROHN 6 EHS	92	-141.44	274.77	51.5	Pass
T5	100 - 93.3333	Leg	ROHN 6 EH	113	-154.03	343.10	44.9	Pass
T6	93.3333 - 86.6667	Leg	ROHN 6 EH	122	-166.07	343.10	48.4	Pass
T7	86.6667 - 80	Leg	ROHN 6 EH	131	-177.79	343.10	51.8	Pass
T8	80 - 60	Leg	ROHN 6 EH	140	-212.15	343.10	61.8	Pass
T9	60 - 40	Leg	ROHN 8 EHS	161	-241.95	386.39	62.6	Pass
T10	40 - 20	Leg	ROHN 8 X-STR	176	-273.33	505.55	54.1	Pass
							55.4 (b)	
T11	20 - 0	Leg	ROHN 8 EH	191	-303.35	505.55	60.0	Pass
T1	176 - 160	Diagonal	L2x2x1/4	9	-3.38	19.13	17.6	Pass
							35.1 (b)	
T2	160 - 140	Diagonal	L2x2x3/16	36	-4.55	11.91	38.3	Pass
							66.4 (b)	
T3	140 - 120	Diagonal	L2x2x3/16	70	-6.09	7.89	77.3	Pass
							90.7 (b)	
T4	120 - 100	Diagonal	L2 1/2x2 1/2x3/16	97	-6.87	9.76	70.4	Pass
							87.0 (b)	
T5	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	118	-6.93	8.87	78.1	Pass
							88.3 (b)	
T6	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	127	-7.05	8.09	87.1	Pass
							89.5 (b)	
T7	86.6667 - 80	Diagonal	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)	136	-7.10	16.03	44.3	Pass
							57.1 (b)	
T8	80 - 60	Diagonal	L3x3x1/4	145	-7.53	13.19	57.1	Pass
T9	60 - 40	Diagonal	L3 1/2x3 1/2x1/4	166	-8.84	14.60	60.5	Pass
							62.0 (b)	
T10	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	181	-9.15	12.18	75.1	Pass
T11	20 - 0	Diagonal	L4x4x1/4	196	-9.85	15.47	63.7	Pass
							67.7 (b)	
T1	176 - 160	Top Girt	L2x2x1/4	5	-0.46	12.90	3.6	Pass
							4.4 (b)	
							Summary	
						Leg (T9)	62.6	Pass
						Diagonal (T3)	90.7	Pass
						Top Girt (T1)	4.4	Pass
						Bolt Checks	90.7	Pass
						RATING =	**90.7**	**Pass**

APPENDIX

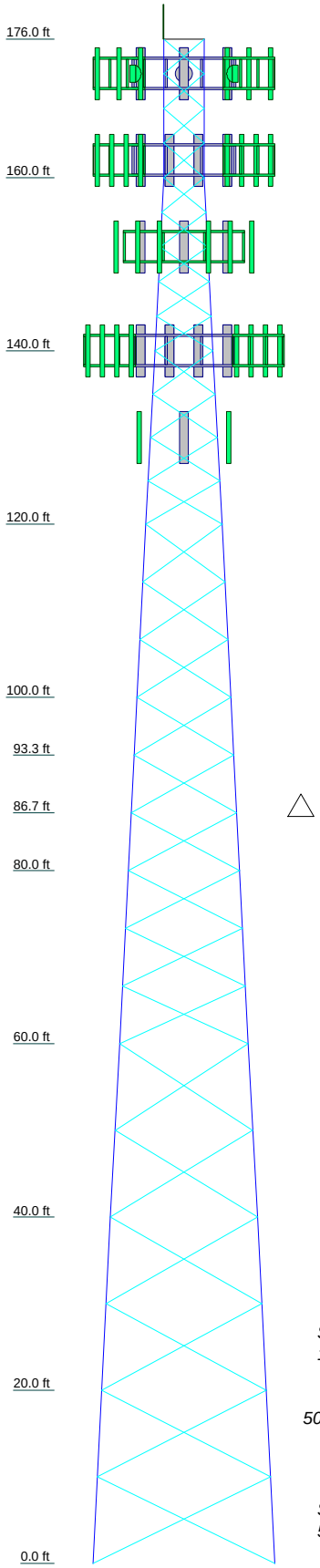
COAX LAYOUT


(P) (4) 1-1/4" FIBER+
(E) (12) 1-1/4" COAX+
(E) (4) 1/2" FIBER
TO 172' FOR SPRINT NEXTEL
(E) (12) 1-5/8" COAX+
(1) 1-5/8" HYBRID
(E) (1) 1-1/4" HYBRID
TO 152' FOR T-MOBILE
(E) (6) 1-5/8" COAX
TO 130' FOR METRO PCS
(E) (12) 1-5/8" COAX+
(2) 1-5/8" HYBRID CABLES
TO 140' FOR VERIZON
SAFETY CLIMB
(E) (12) 1-5/8" COAX+
[(4) 3 /4" DC POWER &
(2) 1 /2" FIBER] INSIDE
(1) 3" FLEX CONDUIT
TO 162' FOR AT&T

COAX LAYOUT

TOWER ELEVATION DRAWING

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs	ROHN 3 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS	ROHN 6 EH				ROHN 8 EHS	ROHN 8 X-STR	ROHN 8 EH
Leg Grade	A572-50										
Diagonals	L2x2x1/4	L2x2x3/16		L2 1/2x2 1/2x3/16			A	L3x3x1/4	L3 1/2x3 1/2x1/4		L4x4x1/4
Diagonal Grade	A36							A572-50			
Top Girts	L2x2x1/4	N.A.									
Face Width (ft) 21	4.6875	6.72656	8.76563	10.8047	11.4844	12.1641	12.8438	14.8828	16.9219	18.9609	
# Panels @ (ft)	9 @ 4	4 @ 5	9 @ 6.66667					6 @ 10			
Weight (K) 24.7	1.1	1.5	1.9	2.1	0.9	0.9	0.9	3.2	3.4	4.2	4.6



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)		

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 Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 90.7%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 311 K
SHEAR: 32 K

UPLIFT: -265 K
SHEAR: 28 K

AXIAL 190 K
SHEAR 15 K *MOMENT 1793 kip-ft*
TORQUE 4 kip-ft
50 mph WIND - 1.0000 in ICE

AXIAL 64 K
SHEAR 50 K *MOMENT 5315 kip-ft*
TORQUE 16 kip-ft
REACTIONS - 95 mph WIND

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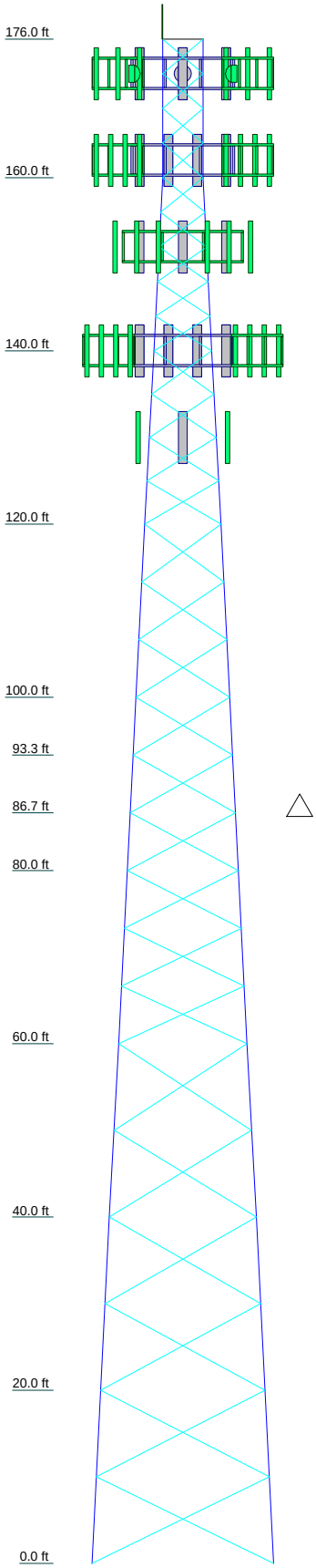
FAX: 866-364-8375

Job: **17-6645**			
Project: ***CT04382-S-01 New Britain 2, CT***			
Client: SBA Network Services, Inc.	Drawn by: sbyrishetty	App'd:	
Code: TIA-222-G	Date: 10/26/17	Scale: NTS	
Path:		Dwg No. E-1	

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11
Legs	ROHN 3 EH	ROHN 4 EH	ROHN 5 EH	ROHN 6 EHS				ROHN 6 EH	ROHN 8 EHS	ROHN 8 X-STR	ROHN 8 EH
Leg Grade	A572-50										
Diagonals	L2x2x1/4	L2x2x3/16		L2 1/2x2 1/2x3/16			A	L3x3x1/4	L3 1/2x3 1/2x1/4		L4x4x1/4
Diagonal Grade	A36							A572-50			
Top Girts	L2x2x1/4	N.A.									
Face Width (ft)	4.6875	6.72656	8.76563	10.8047	11.4844	12.1641	12.8438	14.8828	16.9219	18.9609	21
# Panels @ (ft)	9 @ 4	4 @ 5	9 @ 6.66667					6 @ 10			
Weight (K)	1.1	1.5	1.9	2.1	0.9	0.9	0.9	3.2	3.4	4.2	4.6	24.7



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod	176	DC6-48-60-18-8F	162
ETCR-654L12H6	172	DC6-48-60-18-8F	162
ETCR-654L12H6	172	(3) T-Frames	162
ETCR-654L12H6	172	(2) AM-X-CD-16-65-00T	162
1900 MHz RRH	172	(2) AM-X-CD-16-65-00T	162
1900 MHz RRH	172	(2) AM-X-CD-16-65-00T	162
1900 MHz RRH	172	AIR 21 B2A/B4P w/ Mount Pipe	152
Horizon Duo	172	AIR 21 B2A/B4P w/ Mount Pipe	152
Horizon Duo	172	AIR 21 B2A/B4P w/ Mount Pipe	152
Horizon Duo	172	Ericsson AIR 32	152
(2) 800 MHz RRH	172	Ericsson AIR 32	152
(2) 800 MHz RRH	172	Ericsson AIR 32	152
(2) 800 MHz RRH	172	Ericsson RRUS 11 (Band 12)	152
TD-RRH8x20-25	172	Ericsson RRUS 11 (Band 12)	152
TD-RRH8x20-25	172	Ericsson RRUS 11 (Band 12)	152
TD-RRH8x20-25	172	KRY 112 144/1	152
(3) DB844H90E-XY	172	KRY 112 144/1	152
(3) DB844H90E-XY	172	KRY 112 144/1	152
(3) DB844H90E-XY	172	(3) T-Frames	152
(3) T-Frames	172	LNX-6515DS-A1M w/ Mount Pipe	152
(2) VHLP2-18	172	LNX-6515DS-A1M w/ Mount Pipe	152
VHLP2-18	172	LNX-6515DS-A1M w/ Mount Pipe	152
VHLP2-18	172	800 10735v01 w/ Mount Pipe	140
Kathrein 800-10121	162	800 10735v01 w/ Mount Pipe	140
Kathrein 800-10121	162	800 10735v01 w/ Mount Pipe	140
Kathrein 800-10121	162	BXA-80080/4CF w/ Mount Pipe	140
QS65512-2	162	BXA-80080/4CF w/ Mount Pipe	140
QS65512-2	162	BXA-80080/4CF w/ Mount Pipe	140
QS65512-2	162	RRH-2x60-AWS	140
(2) LGP 21401	162	RRH-2x60-AWS	140
(2) LGP 21401	162	RRH-2x60-AWS	140
(2) LGP 21401	162	RRH-2x60-PCS	140
(2) Katherin 860-10025	162	RRH-2x60-PCS	140
(2) Katherin 860-10025	162	RRH-2x60-PCS	140
(2) Katherin 860-10025	162	RRH 2x60-700	140
Ericsson RRUS 11	162	RRH 2x60-700	140
Ericsson RRUS 11	162	RRH 2x60-700	140
Ericsson RRUS 11	162	DB-T1-6Z-8AB-0Z	140
Ericsson RRUS 32	162	(3) T-Frames	140
Ericsson RRUS 32	162	(2) SBNHH-1D65B w/ Mount Pipe	140
Ericsson RRUS 32	162	(2) SBNHH-1D65B w/ Mount Pipe	140
Ericsson RRUS 32 B2s	162	(2) SBNHH-1D65B w/ Mount Pipe	140
Ericsson RRUS 32 B2s	162	(3) Pipe Mounts	130
Ericsson RRUS 32 B2s	162	742 213 w/ Mount Pipe	130
(2) TPX-070821	162	742 213 w/ Mount Pipe	130
(2) TPX-070821	162	742 213 w/ Mount Pipe	130
(2) TPX-070821	162		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)		

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 Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 95 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft

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Job: ***17-6645***			
Project: ***CT04382-S-01 New Britain 2, CT***			
Client: SBA Network Services, Inc.	Drawn by: sbyrishetty	App'd:	
Code: TIA-222-G	Date: 10/26/17	Scale: NTS	
Path:		Dwg No. E-1	

MISCELLANEOUS PLOTS

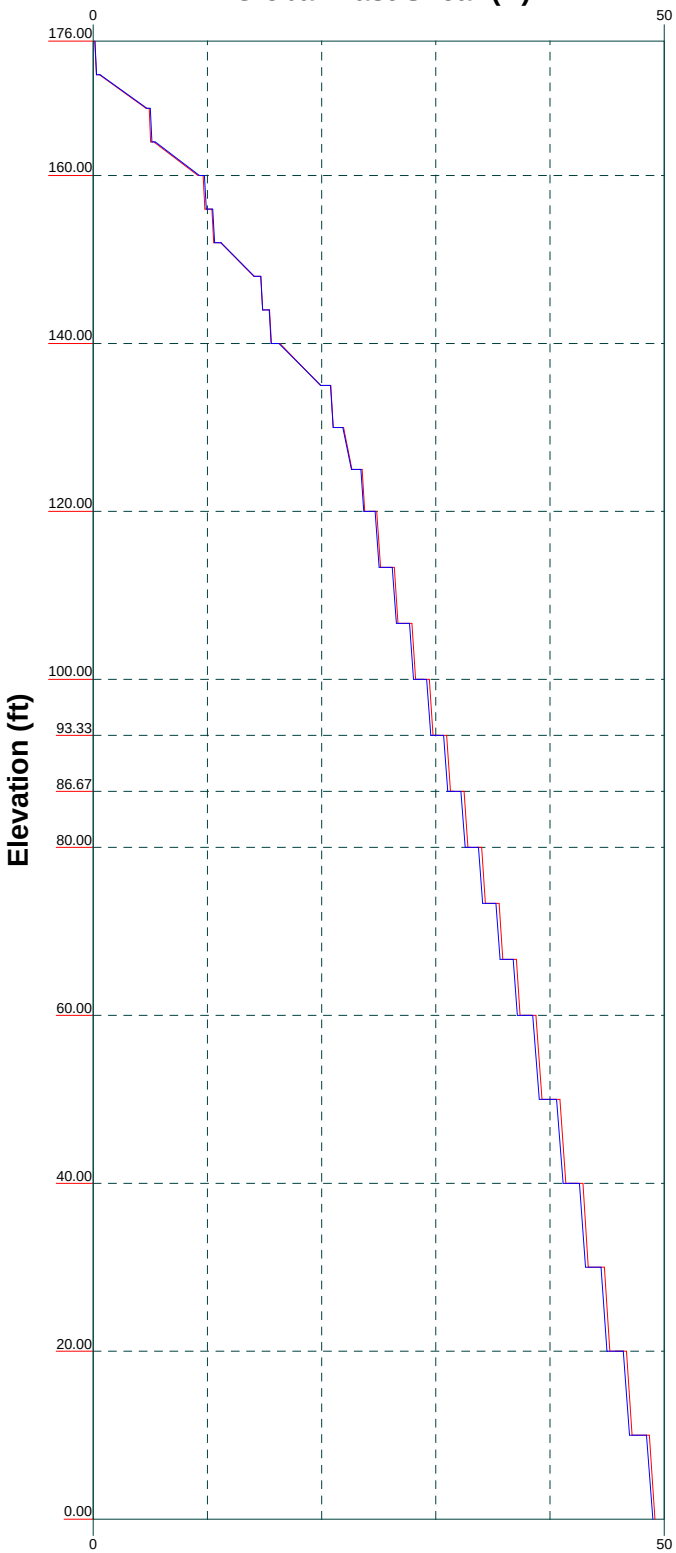
TIA-222-G - 95 mph/50 mph 1.0000 in Ice Exposure B

Vx Vz

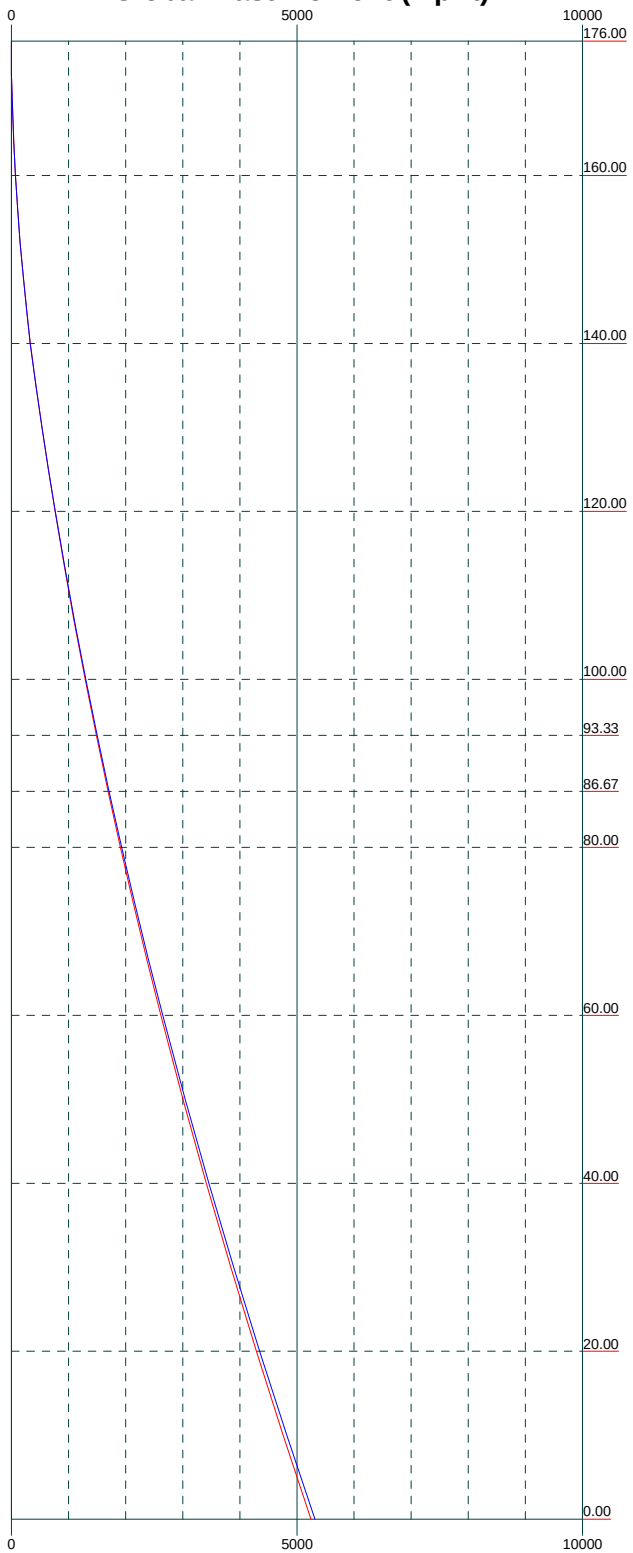
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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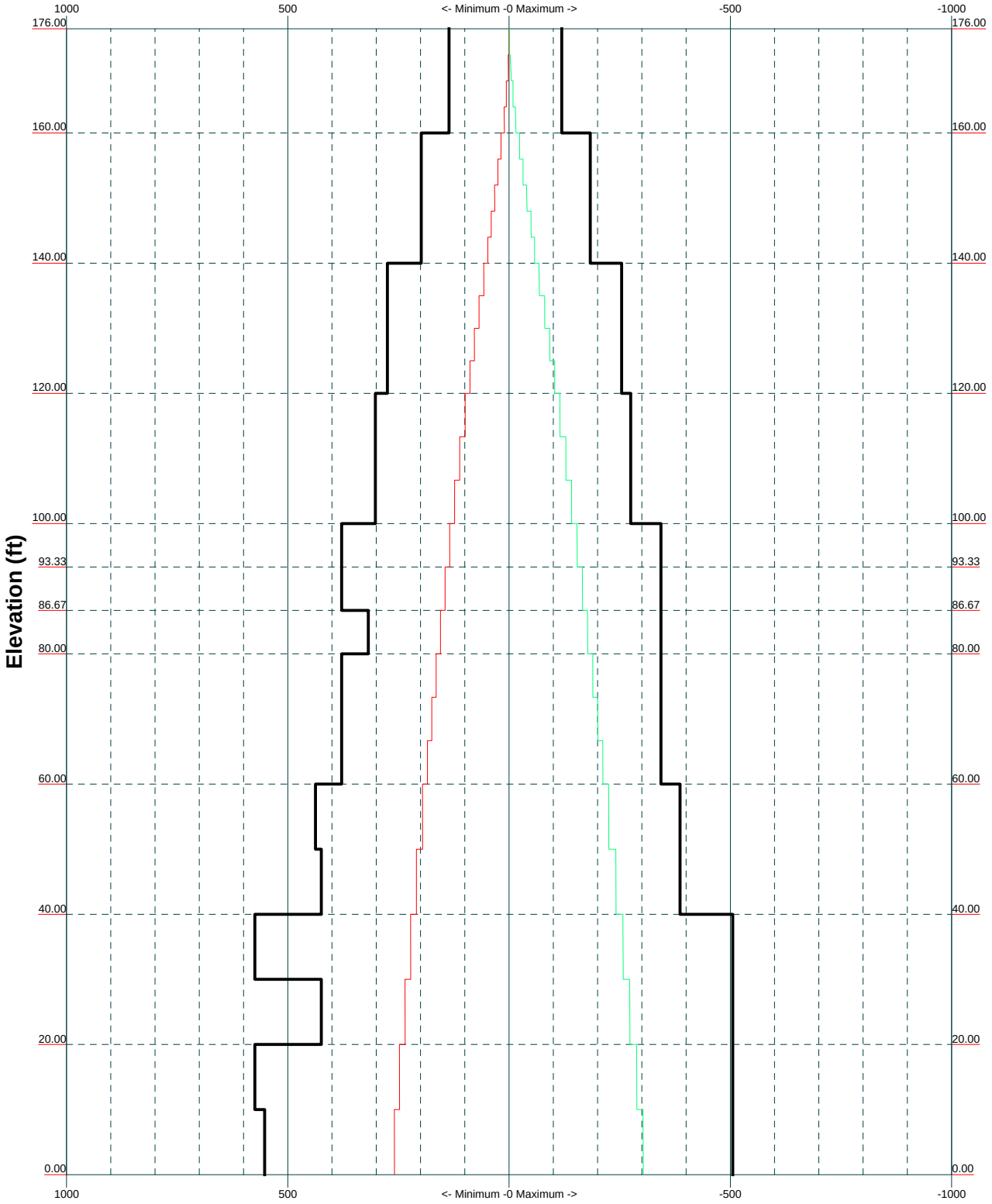
Project: ***CT04382-S-01 New Britain 2, CT***			
Client: SBA Network Services, Inc.	Drawn by: sbyrishetty	App'd:	
Code: TIA-222-G	Date: 10/26/17	Scale: NTS	
Path:		Dwg No. E-4	

TIA-222-G - 95 mph/50 mph 1.0000 in Ice Exposure B

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



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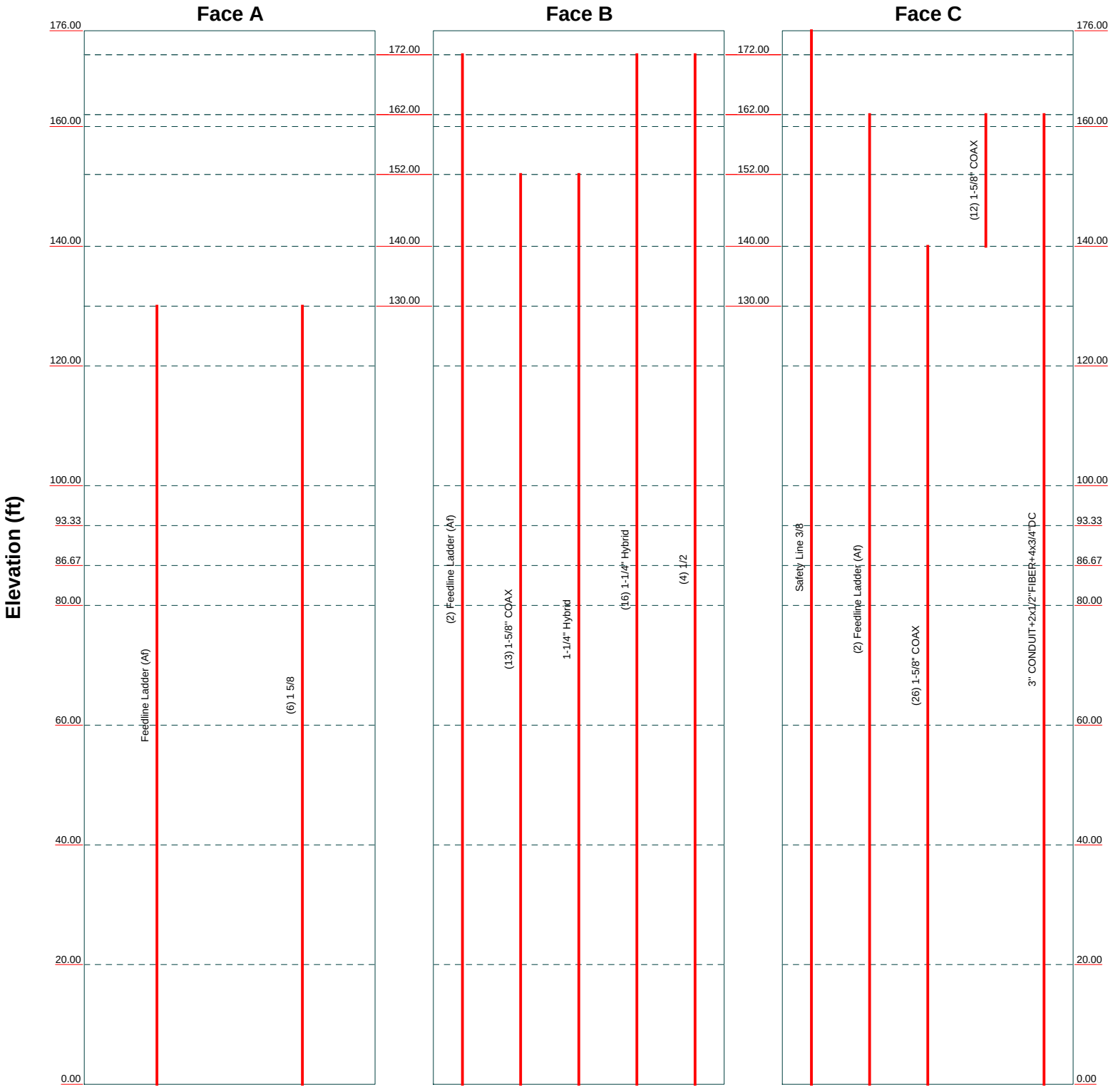
Job: ***17-6645***			
Project: ***CT04382-S-01 New Britain 2, CT***			
Client: SBA Network Services, Inc.	Drawn by: sbyrishetty	App'd:	
Code: TIA-222-G	Date: 10/26/17	Scale: NTS	
Path:		Dwg No. E-3	

Feed Line Distribution Chart
0' - 176'

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



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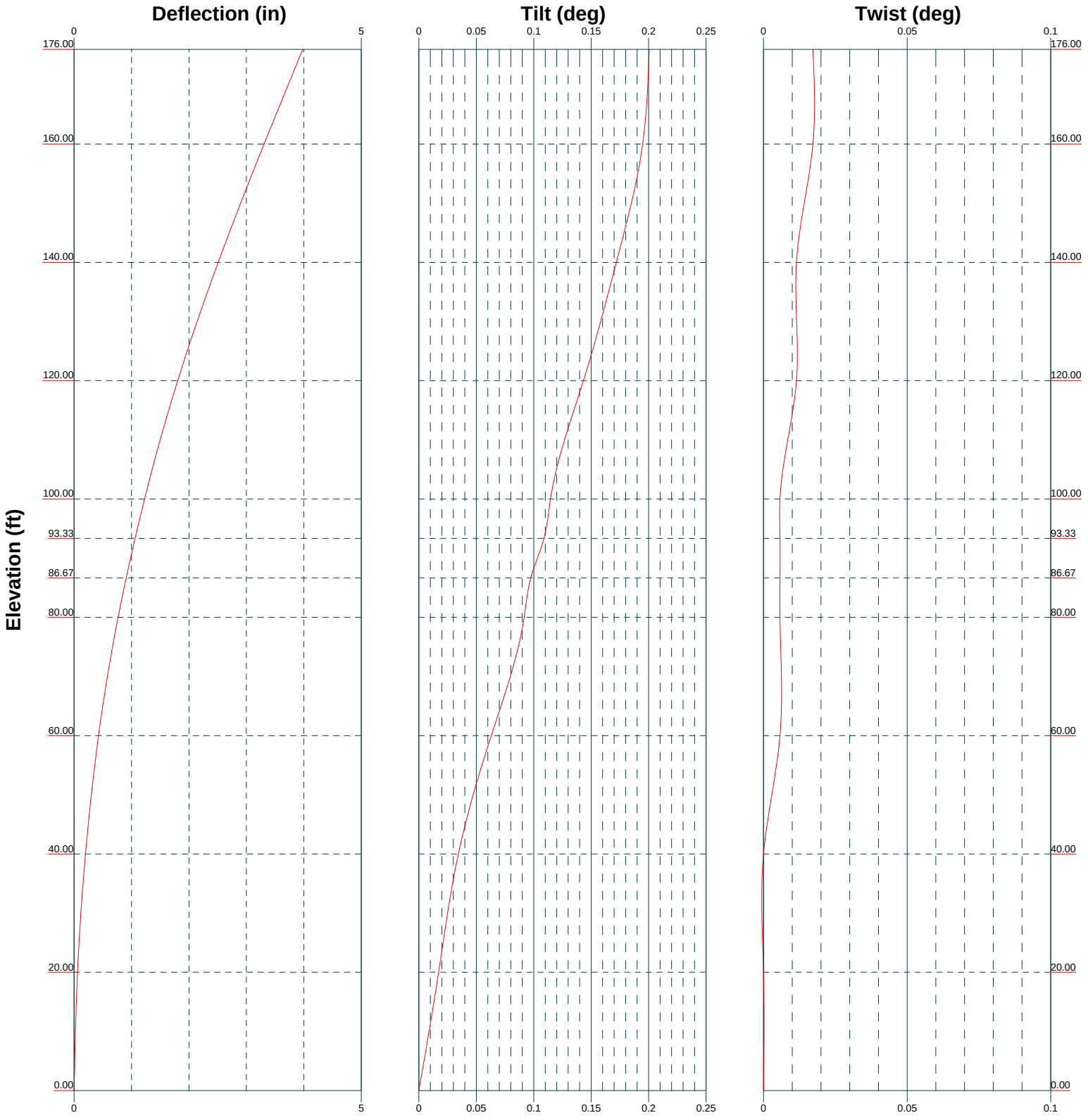
Job: **17-6645**			
Project: ***CT04382-S-01 New Britain 2, CT***			
Client: SBA Network Services, Inc.	Drawn by: sbyrishetty	App'd:	
Code: TIA-222-G	Date: 10/26/17	Scale: NTS	
Path:		Dwg No. E-7	

TIA-222-G - Service - 60 mph

Maximum Values



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Job: ***17-6645***			
Project: ***CT04382-S-01 New Britain 2, CT***			
Client: SBA Network Services, Inc.	Drawn by: sbyrishetty	App'd:	
Code: TIA-222-G	Date: 10/26/17	Scale: NTS	
Path:		Dwg No. E-5	

TNX TOWER CALCULATION PRINTOUT

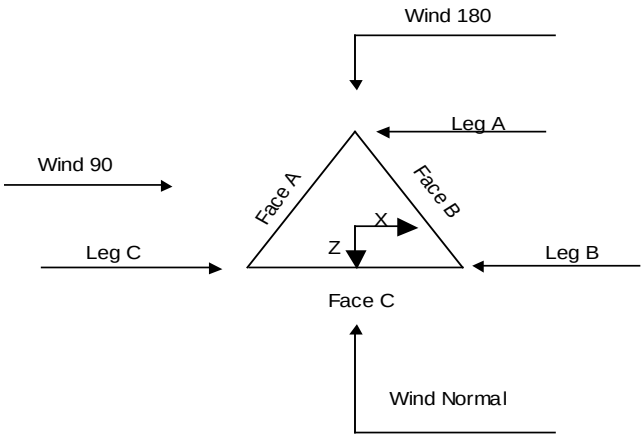
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 176.00 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 4.69 ft at the top and 21.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in Hartford County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 95 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 1.0000 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	176.00-160.00			4.69	1	16.00
T2	160.00-140.00			4.69	1	20.00
T3	140.00-120.00			6.73	1	20.00
T4	120.00-100.00			8.77	1	20.00
T5	100.00-93.33			10.80	1	6.67
T6	93.33-86.67			11.48	1	6.67
T7	86.67-80.00			12.16	1	6.67
T8	80.00-60.00			12.84	1	20.00
T9	60.00-40.00			14.88	1	20.00
T10	40.00-20.00			16.92	1	20.00
T11	20.00-0.00			18.96	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	176.00-160.00	4.00	X Brace	No	No	0.0000	0.0000
T2	160.00-140.00	4.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	5.00	X Brace	No	No	0.0000	0.0000
T4	120.00-100.00	6.67	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	100.00-93.33	6.67	X Brace	No	No	0.0000	0.0000
T6	93.33-86.67	6.67	X Brace	No	No	0.0000	0.0000
T7	86.67-80.00	6.67	X Brace	No	No	0.0000	0.0000
T8	80.00-60.00	6.67	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	10.00	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 176.00-160.00	Pipe	ROHN 3 EH	A572-50 (50 ksi)	Equal Angle	L2x2x1/4	A36 (36 ksi)
T2 160.00-140.00	Pipe	ROHN 4 EH	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T3 140.00-120.00	Pipe	ROHN 5 EH	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 120.00-100.00	Pipe	ROHN 6 EHS	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 100.00-93.33	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T6 93.33-86.67	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T7 86.67-80.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Arbitrary Shape	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)	A36 (36 ksi)
T8 80.00-60.00	Pipe	ROHN 6 EH	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T9 60.00-40.00	Pipe	ROHN 8 EHS	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 40.00-20.00	Pipe	ROHN 8 X-STR	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 20.00-0.00	Pipe	ROHN 8 EH	A572-50 (50 ksi)	Equal Angle	L4x4x1/4	A572-50 (50 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 176.00-160.00	Equal Angle	L2x2x1/4	A36 (36 ksi)	Flat Bar		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 176.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 100.00-93.33	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 93.33-86.67	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 86.67-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X 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 176.00-160.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 160.00-140.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 140.00-120.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 120.00-100.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 100.00-93.33	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 93.33-86.67	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 86.67-80.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 80.00-60.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 60.00-40.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 40.00-20.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 20.00-0.00	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 176.00-160.00	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
T2 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
T3 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
T4 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
T5 100.00-93.33	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 93.33-86.67	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 86.67-80.00	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 176.00-160.00	Flange	0.8750 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	1.0000 A325N	4	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	1.0000 A325N	6	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-93.33	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 93.33-86.67	Flange	1.0000 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 86.67-80.00	Flange	1.0000 A325N	6	0.6250 A325N	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	1.0000 A325N	8	0.7500 A325N	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	1.0000 A325N	8	0.7500 A325N	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	1.0000 A325N	8	0.7500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T11 20.00-0.00	Flange	1.0000 A354-BC	10	0.7500 A325N	1	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
***												
Safety Line 3/8	C	No	Ar (CaAa)	176.00 - 0.00	0.0000	-0.5	1	1	0.5000	0.3750		0.22
Feedline Ladder (Af)	A	No	Af (CaAa)	130.00 - 0.00	0.0000	-0.2	1	1	3.0000	2.5000		8.40
Feedline Ladder (Af)	B	No	Af (CaAa)	172.00 - 0.00	-2.0000	-0.2	2	1	3.0000	2.5000		8.40
Feedline Ladder (Af)	C	No	Af (CaAa)	162.00 - 0.00	-2.0000	-0.3	2	1	3.0000	2.5000		8.40
***												
1 5/8	A	No	Ar (CaAa)	130.00 - 0.00	0.0000	-0.4	6	3	0.5000	1.9800		1.04
***												
1-5/8" COAX	B	No	Ar (CaAa)	152.00 - 0.00	-0.5000	-0.2	13	12	0.5000	1.9800		1.04
1-1/4" Hybrid	B	No	Ar (CaAa)	152.00 - 0.00	-1.0000	-0.2	1	1	0.5000	1.5500		1.04
***												
***												
1-5/8" COAX	C	No	Ar (CaAa)	140.00 - 0.00	0.0000	-0.4	26	12	0.5000	1.9800		1.04
***												
1-5/8" COAX	C	No	Ar (CaAa)	162.00 - 140.00	-0.5000	-0.4	12	12	0.5000	1.9800		1.04
3" CONDUIT+2 x1/2"FIBER+4 x3/4"DC	C	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.3	1	1	0.5000	3.0000		2.25
1-1/4" Hybrid	B	No	Ar (CaAa)	172.00 - 0.00	0.0000	-0.2	16	8	0.5000	1.5500		1.04
1/2	B	No	Ar (CaAa)	172.00 - 0.00	0.0000	-0.2	4	2	0.5800	0.5800		0.25

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	176.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	42.544	0.000	0.41
		C	0.000	0.000	7.619	0.000	0.07
T2	160.00-140.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	103.655	0.000	0.86
		C	0.000	0.000	70.937	0.000	0.64
T3	140.00-120.00	A	0.000	0.000	16.047	0.000	0.15
		B	0.000	0.000	125.487	0.000	0.98
		C	0.000	0.000	126.377	0.000	0.93
T4	120.00-100.00	A	0.000	0.000	32.093	0.000	0.29
		B	0.000	0.000	125.487	0.000	0.98

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	126.377	0.000	0.93
T5	100.00-93.33	A	0.000	0.000	10.698	0.000	0.10
		B	0.000	0.000	41.829	0.000	0.33
		C	0.000	0.000	42.126	0.000	0.31
T6	93.33-86.67	A	0.000	0.000	10.698	0.000	0.10
		B	0.000	0.000	41.829	0.000	0.33
		C	0.000	0.000	42.126	0.000	0.31
T7	86.67-80.00	A	0.000	0.000	10.698	0.000	0.10
		B	0.000	0.000	41.829	0.000	0.33
		C	0.000	0.000	42.126	0.000	0.31
T8	80.00-60.00	A	0.000	0.000	32.093	0.000	0.29
		B	0.000	0.000	125.487	0.000	0.98
		C	0.000	0.000	126.377	0.000	0.93
T9	60.00-40.00	A	0.000	0.000	32.093	0.000	0.29
		B	0.000	0.000	125.487	0.000	0.98
		C	0.000	0.000	126.377	0.000	0.93
T10	40.00-20.00	A	0.000	0.000	32.093	0.000	0.29
		B	0.000	0.000	125.487	0.000	0.98
		C	0.000	0.000	126.377	0.000	0.93
T11	20.00-0.00	A	0.000	0.000	32.093	0.000	0.29
		B	0.000	0.000	125.487	0.000	0.98
		C	0.000	0.000	126.377	0.000	0.93

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	176.00-160.00	A	2.353	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	63.387	0.000	1.51
		C		0.000	0.000	21.058	0.000	0.42
T2	160.00-140.00	A	2.327	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	165.218	0.000	3.68
		C		0.000	0.000	138.876	0.000	3.00
T3	140.00-120.00	A	2.294	0.000	0.000	27.072	0.000	0.57
		B		0.000	0.000	204.281	0.000	4.42
		C		0.000	0.000	141.379	0.000	3.72
T4	120.00-100.00	A	2.256	0.000	0.000	53.726	0.000	1.12
		B		0.000	0.000	203.113	0.000	4.36
		C		0.000	0.000	140.565	0.000	3.67
T5	100.00-93.33	A	2.227	0.000	0.000	17.802	0.000	0.37
		B		0.000	0.000	67.408	0.000	1.44
		C		0.000	0.000	46.649	0.000	1.21
T6	93.33-86.67	A	2.211	0.000	0.000	17.744	0.000	0.37
		B		0.000	0.000	67.245	0.000	1.43
		C		0.000	0.000	46.536	0.000	1.20
T7	86.67-80.00	A	2.194	0.000	0.000	17.682	0.000	0.37
		B		0.000	0.000	67.072	0.000	1.42
		C		0.000	0.000	46.415	0.000	1.20
T8	80.00-60.00	A	2.156	0.000	0.000	52.628	0.000	1.08
		B		0.000	0.000	200.051	0.000	4.19
		C		0.000	0.000	138.433	0.000	3.54
T9	60.00-40.00	A	2.085	0.000	0.000	51.842	0.000	1.05
		B		0.000	0.000	197.861	0.000	4.08
		C		0.000	0.000	136.908	0.000	3.45
T10	40.00-20.00	A	1.981	0.000	0.000	50.698	0.000	1.00
		B		0.000	0.000	194.677	0.000	3.91
		C		0.000	0.000	134.689	0.000	3.32

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
T11	20.00-0.00	A	1.775	0.000	0.000	48.429	0.000	0.92
		B		0.000	0.000	188.366	0.000	3.59
		C		0.000	0.000	130.289	0.000	3.08

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	176.00-160.00	1.9109	-2.1206	1.3695	-0.9967
T2	160.00-140.00	3.6155	-0.8627	2.8760	-0.2304
T3	140.00-120.00	4.1522	-0.1038	3.1809	-0.2215
T4	120.00-100.00	4.1431	0.0214	3.3119	-0.1610
T5	100.00-93.33	4.6883	-0.0012	3.7423	-0.1997
T6	93.33-86.67	4.9577	-0.0124	3.9546	-0.2192
T7	86.67-80.00	5.1497	-0.0232	4.2334	-0.2428
T8	80.00-60.00	5.6643	-0.0449	4.5414	-0.2767
T9	60.00-40.00	6.3485	-0.0759	5.2377	-0.3451
T10	40.00-20.00	7.1024	-0.1070	5.8823	-0.4188
T11	20.00-0.00	7.7277	-0.1356	6.5031	-0.5155

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	Safety Line 3/8	160.00 - 176.00	0.6000	0.4161
T1	4	Feedline Ladder (Af)	160.00 - 172.00	1.0000	1.0000
T1	5	Feedline Ladder (Af)	160.00 - 162.00	1.0000	1.0000
T1	16	1-5/8" COAX	160.00 - 162.00	0.6000	0.4161
T1	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	160.00 - 162.00	0.6000	0.4161
T1	18	1-1/4" Hybrid	160.00 - 172.00	0.6000	0.4161
T1	19	1/2	160.00 - 172.00	0.6000	0.4161
T2	2	Safety Line 3/8	140.00 - 160.00	0.6000	0.4841
T2	4	Feedline Ladder (Af)	140.00 - 160.00	1.0000	1.0000
T2	5	Feedline Ladder (Af)	140.00 - 160.00	1.0000	1.0000
T2	9	1-5/8" COAX	140.00 - 152.00	0.5000	0.5000
T2	10	1-1/4" Hybrid	140.00 - 152.00	0.5000	0.5000
T2	16	1-5/8" COAX	140.00 -	0.6000	0.4841

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			160.00		
T2	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	140.00 - 160.00	0.6000	0.4841
T2	18	1-1/4" Hybrid	140.00 - 160.00	0.6000	0.4841
T2	19	1/2	140.00 - 160.00	0.6000	0.4841
T3	2	Safety Line 3/8	120.00 - 140.00	0.6000	0.5808
T3	3	Feedline Ladder (Af)	120.00 - 130.00	1.0000	1.0000
T3	4	Feedline Ladder (Af)	120.00 - 140.00	1.0000	1.0000
T3	5	Feedline Ladder (Af)	120.00 - 140.00	1.0000	1.0000
T3	7	1 5/8	120.00 - 130.00	0.6000	0.5808
T3	9	1-5/8" COAX	120.00 - 140.00	0.5000	0.5000
T3	10	1-1/4" Hybrid	120.00 - 140.00	0.5000	0.5000
T3	14	1-5/8" COAX	120.00 - 140.00	0.6000	0.5808
T3	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	120.00 - 140.00	0.6000	0.5808
T3	18	1-1/4" Hybrid	120.00 - 140.00	0.6000	0.5808
T3	19	1/2	120.00 - 140.00	0.6000	0.5808
T4	2	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T4	3	Feedline Ladder (Af)	100.00 - 120.00	1.0000	1.0000
T4	4	Feedline Ladder (Af)	100.00 - 120.00	1.0000	1.0000
T4	5	Feedline Ladder (Af)	100.00 - 120.00	1.0000	1.0000
T4	7	1 5/8	100.00 - 120.00	0.6000	0.6000
T4	9	1-5/8" COAX	100.00 - 120.00	0.5000	0.5000
T4	10	1-1/4" Hybrid	100.00 - 120.00	0.5000	0.5000
T4	14	1-5/8" COAX	100.00 - 120.00	0.6000	0.6000
T4	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	100.00 - 120.00	0.6000	0.6000
T4	18	1-1/4" Hybrid	100.00 - 120.00	0.6000	0.6000
T4	19	1/2	100.00 - 120.00	0.6000	0.6000
T5	2	Safety Line 3/8	93.33 - 100.00	0.6000	0.6000
T5	3	Feedline Ladder (Af)	93.33 - 100.00	1.0000	1.0000
T5	4	Feedline Ladder (Af)	93.33 - 100.00	1.0000	1.0000
T5	5	Feedline Ladder (Af)	93.33 - 100.00	1.0000	1.0000
T5	7	1 5/8	93.33 - 100.00	0.6000	0.6000
T5	9	1-5/8" COAX	93.33 - 100.00	0.5000	0.5000
T5	10	1-1/4" Hybrid	93.33 - 100.00	0.5000	0.5000
T5	14	1-5/8" COAX	93.33 - 100.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	93.33 - 100.00	0.6000	0.6000
T5	18	1-1/4" Hybrid	93.33 - 100.00	0.6000	0.6000
T5	19	1/2	93.33 - 100.00	0.6000	0.6000
T6	2	Safety Line 3/8	86.67 - 93.33	0.6000	0.6000
T6	3	Feedline Ladder (Af)	86.67 - 93.33	1.0000	1.0000
T6	4	Feedline Ladder (Af)	86.67 - 93.33	1.0000	1.0000
T6	5	Feedline Ladder (Af)	86.67 - 93.33	1.0000	1.0000
T6	7	1 5/8	86.67 - 93.33	0.6000	0.6000
T6	9	1-5/8" COAX	86.67 - 93.33	0.5000	0.5000
T6	10	1-1/4" Hybrid	86.67 - 93.33	0.5000	0.5000
T6	14	1-5/8" COAX	86.67 - 93.33	0.6000	0.6000
T6	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	86.67 - 93.33	0.6000	0.6000
T6	18	1-1/4" Hybrid	86.67 - 93.33	0.6000	0.6000
T6	19	1/2	86.67 - 93.33	0.6000	0.6000
T7	2	Safety Line 3/8	80.00 - 86.67	0.6000	0.6000
T7	3	Feedline Ladder (Af)	80.00 - 86.67	1.0000	1.0000
T7	4	Feedline Ladder (Af)	80.00 - 86.67	1.0000	1.0000
T7	5	Feedline Ladder (Af)	80.00 - 86.67	1.0000	1.0000
T7	7	1 5/8	80.00 - 86.67	0.6000	0.6000
T7	9	1-5/8" COAX	80.00 - 86.67	0.5000	0.5000
T7	10	1-1/4" Hybrid	80.00 - 86.67	0.5000	0.5000
T7	14	1-5/8" COAX	80.00 - 86.67	0.6000	0.6000
T7	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	80.00 - 86.67	0.6000	0.6000
T7	18	1-1/4" Hybrid	80.00 - 86.67	0.6000	0.6000
T7	19	1/2	80.00 - 86.67	0.6000	0.6000
T8	2	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T8	3	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T8	4	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T8	5	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T8	7	1 5/8	60.00 - 80.00	0.6000	0.6000
T8	9	1-5/8" COAX	60.00 - 80.00	0.5000	0.5000
T8	10	1-1/4" Hybrid	60.00 - 80.00	0.5000	0.5000
T8	14	1-5/8" COAX	60.00 - 80.00	0.6000	0.6000
T8	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	60.00 - 80.00	0.6000	0.6000
T8	18	1-1/4" Hybrid	60.00 - 80.00	0.6000	0.6000
T8	19	1/2	60.00 - 80.00	0.6000	0.6000
T9	2	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T9	3	Feedline Ladder (Af)	40.00 - 60.00	1.0000	1.0000
T9	4	Feedline Ladder (Af)	40.00 - 60.00	1.0000	1.0000
T9	5	Feedline Ladder (Af)	40.00 - 60.00	1.0000	1.0000
T9	7	1 5/8	40.00 - 60.00	0.6000	0.6000
T9	9	1-5/8" COAX	40.00 - 60.00	0.5000	0.5000
T9	10	1-1/4" Hybrid	40.00 - 60.00	0.5000	0.5000
T9	14	1-5/8" COAX	40.00 - 60.00	0.6000	0.6000
T9	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	40.00 - 60.00	0.6000	0.6000
T9	18	1-1/4" Hybrid	40.00 - 60.00	0.6000	0.6000
T9	19	1/2	40.00 - 60.00	0.6000	0.6000
T10	2	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T10	3	Feedline Ladder (Af)	20.00 - 40.00	1.0000	1.0000
T10	4	Feedline Ladder (Af)	20.00 - 40.00	1.0000	1.0000
T10	5	Feedline Ladder (Af)	20.00 - 40.00	1.0000	1.0000
T10	7	1 5/8	20.00 - 40.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	9	1-5/8" COAX	20.00 - 40.00	0.5000	0.5000
T10	10	1-1/4" Hybrid	20.00 - 40.00	0.5000	0.5000
T10	14	1-5/8" COAX	20.00 - 40.00	0.6000	0.6000
T10	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	20.00 - 40.00	0.6000	0.6000
T10	18	1-1/4" Hybrid	20.00 - 40.00	0.6000	0.6000
T10	19	1/2	20.00 - 40.00	0.6000	0.6000
T11	2	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000
T11	3	Feedline Ladder (Af)	0.00 - 20.00	1.0000	1.0000
T11	4	Feedline Ladder (Af)	0.00 - 20.00	1.0000	1.0000
T11	5	Feedline Ladder (Af)	0.00 - 20.00	1.0000	1.0000
T11	7	1 5/8	0.00 - 20.00	0.6000	0.6000
T11	9	1-5/8" COAX	0.00 - 20.00	0.5000	0.5000
T11	10	1-1/4" Hybrid	0.00 - 20.00	0.5000	0.5000
T11	14	1-5/8" COAX	0.00 - 20.00	0.6000	0.6000
T11	17	3" CONDUIT+2x1/2"FIBER+4x 3/4"DC	0.00 - 20.00	0.6000	0.6000
T11	18	1-1/4" Hybrid	0.00 - 20.00	0.6000	0.6000
T11	19	1/2	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Lightning Rod	C	From Leg	0.00	0.0000	176.00	No Ice	0.25	0.25	0.03
			0.00			1/2" Ice	0.66	0.66	0.03
			2.00			1" Ice	0.97	0.97	0.04
***									
ETCR-654L12H6	A	From Leg	3.00	0.0000	172.00	No Ice	15.71	6.00	0.08
			0.00			1/2" Ice	16.28	6.52	0.17
			0.00			1" Ice	16.86	7.05	0.26
ETCR-654L12H6	B	From Leg	3.00	0.0000	172.00	No Ice	15.71	6.00	0.08
			0.00			1/2" Ice	16.28	6.52	0.17
			0.00			1" Ice	16.86	7.05	0.26
ETCR-654L12H6	C	From Leg	3.00	0.0000	172.00	No Ice	15.71	6.00	0.08
			0.00			1/2" Ice	16.28	6.52	0.17
			0.00			1" Ice	16.86	7.05	0.26
1900 MHz RRH	A	From Leg	3.00	0.0000	172.00	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	172.00	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	172.00	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
Horizon Duo	A	From Leg	3.00	0.0000	172.00	No Ice	0.55	0.34	0.01
			0.00			1/2" Ice	0.65	0.43	0.01

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	0.76	0.52	0.02
Horizon Duo	B	From Leg	3.00	0.0000	172.00	No Ice	0.55	0.34	0.01
			0.00			1/2" Ice	0.65	0.43	0.01
			0.00			1" Ice	0.76	0.52	0.02
Horizon Duo	C	From Leg	3.00	0.0000	172.00	No Ice	0.55	0.34	0.01
			0.00			1/2" Ice	0.65	0.43	0.01
			0.00			1" Ice	0.76	0.52	0.02
(2) 800 MHz RRH	A	From Leg	3.00	0.0000	172.00	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	B	From Leg	3.00	0.0000	172.00	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	172.00	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
TD-RRH8x20-25	A	From Leg	3.00	0.0000	172.00	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	B	From Leg	3.00	0.0000	172.00	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	C	From Leg	3.00	0.0000	172.00	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
(3) DB844H90E-XY	A	From Leg	3.00	0.0000	172.00	No Ice	3.06	3.61	0.01
			0.00			1/2" Ice	3.37	3.92	0.04
			0.00			1" Ice	3.67	4.23	0.06
(3) DB844H90E-XY	B	From Leg	3.00	0.0000	172.00	No Ice	3.06	3.61	0.01
			0.00			1/2" Ice	3.37	3.92	0.04
			0.00			1" Ice	3.67	4.23	0.06
(3) DB844H90E-XY	C	From Leg	3.00	0.0000	172.00	No Ice	3.06	3.61	0.01
			0.00			1/2" Ice	3.37	3.92	0.04
			0.00			1" Ice	3.67	4.23	0.06
(3) T-Frames	A	None		0.0000	172.00	No Ice	33.11	33.11	1.54
						1/2" Ice	44.90	44.90	2.16
						1" Ice	56.69	56.69	2.78
***									
(2) AM-X-CD-16-65-00T	A	From Leg	3.00	0.0000	162.00	No Ice	8.26	4.64	0.05
			0.00			1/2" Ice	8.97	5.14	0.10
			0.00			1" Ice	9.60	5.69	0.14
(2) AM-X-CD-16-65-00T	B	From Leg	3.00	0.0000	162.00	No Ice	8.26	4.64	0.05
			0.00			1/2" Ice	8.97	5.14	0.10
			0.00			1" Ice	9.60	5.69	0.14
(2) AM-X-CD-16-65-00T	C	From Leg	3.00	0.0000	162.00	No Ice	8.26	4.64	0.05
			0.00			1/2" Ice	8.97	5.14	0.10
			0.00			1" Ice	9.60	5.69	0.14
Kathrein 800-10121	A	From Leg	3.00	0.0000	162.00	No Ice	5.46	3.29	0.04
			0.00			1/2" Ice	6.01	3.72	0.08
			0.00			1" Ice	6.57	4.18	0.11
Kathrein 800-10121	B	From Leg	3.00	0.0000	162.00	No Ice	5.46	3.29	0.04
			0.00			1/2" Ice	6.01	3.72	0.08
			0.00			1" Ice	6.57	4.18	0.11
Kathrein 800-10121	C	From Leg	3.00	0.0000	162.00	No Ice	5.46	3.29	0.04
			0.00			1/2" Ice	6.01	3.72	0.08
			0.00			1" Ice	6.57	4.18	0.11
QS65512-2	A	From Leg	3.00	0.0000	162.00	No Ice	8.40	6.80	0.11

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					1/2" Ice	9.11	7.41	0.17
			0.00					1" Ice	9.83	8.11	0.23
QS65512-2	B	From Leg	3.00			0.0000	162.00	No Ice	8.40	6.80	0.11
			0.00					1/2" Ice	9.11	7.41	0.17
			0.00					1" Ice	9.83	8.11	0.23
QS65512-2	C	From Leg	3.00			0.0000	162.00	No Ice	8.40	6.80	0.11
			0.00					1/2" Ice	9.11	7.41	0.17
			0.00					1" Ice	9.83	8.11	0.23
(2) LGP 21401	A	From Leg	3.00			0.0000	162.00	No Ice	1.95	0.53	0.03
			0.00					1/2" Ice	2.19	0.69	0.04
			0.00					1" Ice	2.45	0.86	0.05
(2) LGP 21401	B	From Leg	3.00			0.0000	162.00	No Ice	1.95	0.53	0.03
			0.00					1/2" Ice	2.19	0.69	0.04
			0.00					1" Ice	2.45	0.86	0.05
(2) LGP 21401	C	From Leg	3.00			0.0000	162.00	No Ice	1.95	0.53	0.03
			0.00					1/2" Ice	2.19	0.69	0.04
			0.00					1" Ice	2.45	0.86	0.05
(2) Katherin 860-10025	A	From Leg	3.00			0.0000	162.00	No Ice	0.14	0.12	0.00
			0.00					1/2" Ice	0.22	0.19	0.00
			0.00					1" Ice	0.31	0.28	0.00
(2) Katherin 860-10025	B	From Leg	3.00			0.0000	162.00	No Ice	0.14	0.12	0.00
			0.00					1/2" Ice	0.22	0.19	0.00
			0.00					1" Ice	0.31	0.28	0.00
(2) Katherin 860-10025	C	From Leg	3.00			0.0000	162.00	No Ice	0.14	0.12	0.00
			0.00					1/2" Ice	0.22	0.19	0.00
			0.00					1" Ice	0.31	0.28	0.00
Ericsson RRUS 11	A	From Leg	3.00			0.0000	162.00	No Ice	2.94	1.19	0.06
			0.00					1/2" Ice	3.42	1.40	0.07
			0.00					1" Ice	3.56	1.63	0.09
Ericsson RRUS 11	B	From Leg	3.00			0.0000	162.00	No Ice	2.94	1.19	0.06
			0.00					1/2" Ice	3.42	1.40	0.07
			0.00					1" Ice	3.56	1.63	0.09
Ericsson RRUS 11	C	From Leg	3.00			0.0000	162.00	No Ice	2.94	1.19	0.06
			0.00					1/2" Ice	3.42	1.40	0.07
			0.00					1" Ice	3.56	1.63	0.09
Ericsson RRUS 32	A	From Leg	3.00			0.0000	162.00	No Ice	1.93	0.67	0.08
			0.00					1/2" Ice	2.19	0.88	0.09
			0.00					1" Ice	2.47	1.11	0.10
Ericsson RRUS 32	B	From Leg	3.00			0.0000	162.00	No Ice	1.93	0.67	0.08
			0.00					1/2" Ice	2.19	0.88	0.09
			0.00					1" Ice	2.47	1.11	0.10
Ericsson RRUS 32	C	From Leg	3.00			0.0000	162.00	No Ice	1.93	0.67	0.08
			0.00					1/2" Ice	2.19	0.88	0.09
			0.00					1" Ice	2.47	1.11	0.10
Ericsson RRUS 32 B2s	A	From Leg	3.00			0.0000	162.00	No Ice	3.52	2.51	0.05
			0.00					1/2" Ice	3.86	2.83	0.08
			0.00					1" Ice	4.22	3.16	0.11
Ericsson RRUS 32 B2s	B	From Leg	3.00			0.0000	162.00	No Ice	3.52	2.51	0.05
			0.00					1/2" Ice	3.86	2.83	0.08
			0.00					1" Ice	4.22	3.16	0.11
Ericsson RRUS 32 B2s	C	From Leg	3.00			0.0000	162.00	No Ice	3.52	2.51	0.05
			0.00					1/2" Ice	3.86	2.83	0.08
			0.00					1" Ice	4.22	3.16	0.11
(2) TPX-070821	A	From Leg	3.00			0.0000	162.00	No Ice	0.55	0.12	0.01
			0.00					1/2" Ice	0.68	0.19	0.01
			0.00					1" Ice	0.84	0.28	0.01
(2) TPX-070821	B	From Leg	3.00			0.0000	162.00	No Ice	0.55	0.12	0.01

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			1/2" Ice	0.68	0.19	0.01
			0.00			1" Ice	0.84	0.28	0.01
(2) TPX-070821	C	From Leg	3.00	0.0000	162.00	No Ice	0.55	0.12	0.01
			0.00			1/2" Ice	0.68	0.19	0.01
			0.00			1" Ice	0.84	0.28	0.01
DC6-48-60-18-8F	A	From Leg	3.00	0.0000	162.00	No Ice	2.57	4.32	0.03
			0.00			1/2" Ice	2.87	4.68	0.06
			0.00			1" Ice	3.18	5.06	0.10
DC6-48-60-18-8F	B	From Leg	3.00	0.0000	162.00	No Ice	2.57	4.32	0.03
			0.00			1/2" Ice	2.87	4.68	0.06
			0.00			1" Ice	3.18	5.06	0.10
(3) T-Frames	C	None		0.0000	162.00	No Ice	33.11	33.11	1.54
						1/2" Ice	44.90	44.90	2.16
						1" Ice	56.69	56.69	2.78
***									
LNX-6515DS-A1M w/ Mount Pipe	A	From Leg	3.00	0.0000	152.00	No Ice	11.45	9.36	0.08
			0.00			1/2" Ice	12.06	10.68	0.16
			0.00			1" Ice	12.69	11.71	0.25
LNX-6515DS-A1M w/ Mount Pipe	B	From Leg	3.00	0.0000	152.00	No Ice	11.45	9.36	0.08
			0.00			1/2" Ice	12.06	10.68	0.16
			0.00			1" Ice	12.69	11.71	0.25
LNX-6515DS-A1M w/ Mount Pipe	C	From Leg	3.00	0.0000	152.00	No Ice	11.45	9.36	0.08
			0.00			1/2" Ice	12.06	10.68	0.16
			0.00			1" Ice	12.69	11.71	0.25
AIR 21 B2A/B4P w/ Mount Pipe	A	From Leg	3.00	0.0000	152.00	No Ice	7.09	6.02	0.12
			0.00			1/2" Ice	7.78	7.17	0.18
			0.00			1" Ice	8.37	8.03	0.25
AIR 21 B2A/B4P w/ Mount Pipe	B	From Leg	3.00	0.0000	152.00	No Ice	7.09	6.02	0.12
			0.00			1/2" Ice	7.78	7.17	0.18
			0.00			1" Ice	8.37	8.03	0.25
AIR 21 B2A/B4P w/ Mount Pipe	C	From Leg	3.00	0.0000	152.00	No Ice	7.09	6.02	0.12
			0.00			1/2" Ice	7.78	7.17	0.18
			0.00			1" Ice	8.37	8.03	0.25
Ericsson AIR 32	A	From Leg	3.00	0.0000	152.00	No Ice	6.51	4.71	0.13
			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
Ericsson AIR 32	B	From Leg	3.00	0.0000	152.00	No Ice	6.51	4.71	0.13
			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
Ericsson AIR 32	C	From Leg	3.00	0.0000	152.00	No Ice	6.51	4.71	0.13
			0.00			1/2" Ice	6.89	5.07	0.18
			0.00			1" Ice	7.27	5.43	0.23
Ericsson RRUS 11 (Band 12)	A	From Leg	3.00	0.0000	152.00	No Ice	2.52	1.07	0.06
			0.00			1/2" Ice	2.72	1.21	0.07
			0.00			1" Ice	2.92	1.36	0.10
Ericsson RRUS 11 (Band 12)	B	From Leg	3.00	0.0000	152.00	No Ice	2.52	1.07	0.06
			0.00			1/2" Ice	2.72	1.21	0.07
			0.00			1" Ice	2.92	1.36	0.10
Ericsson RRUS 11 (Band 12)	C	From Leg	3.00	0.0000	152.00	No Ice	2.52	1.07	0.06
			0.00			1/2" Ice	2.72	1.21	0.07
			0.00			1" Ice	2.92	1.36	0.10
KRY 112 144/1	A	From Leg	3.00	0.0000	152.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			0.00			1" Ice	0.60	0.33	0.02
KRY 112 144/1	B	From Leg	3.00	0.0000	152.00	No Ice	0.41	0.19	0.01
			0.00			1/2" Ice	0.50	0.26	0.01
			0.00			1" Ice	0.60	0.33	0.02

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
KRY 112 144/1	C	From Leg	3.00 0.00 0.00	0.0000	152.00	No Ice 1/2" Ice 1" Ice	0.41 0.50 0.60	0.19 0.26 0.33	0.01 0.01 0.02
(3) T-Frames	A	None		0.0000	152.00	No Ice 1/2" Ice 1" Ice	33.11 44.90 56.69	33.11 44.90 56.69	1.54 2.16 2.78
***									
(2) SBNHH-1D65B w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.86 9.62 10.34	7.30 8.58 9.72	0.07 0.14 0.22
(2) SBNHH-1D65B w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.86 9.62 10.34	7.30 8.58 9.72	0.07 0.14 0.22
(2) SBNHH-1D65B w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.86 9.62 10.34	7.30 8.58 9.72	0.07 0.14 0.22
800 10735v01 w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.96 9.60 10.23	5.41 6.60 7.50	0.06 0.12 0.19
800 10735v01 w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.96 9.60 10.23	5.41 6.60 7.50	0.06 0.12 0.19
800 10735v01 w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	8.96 9.60 10.23	5.41 6.60 7.50	0.06 0.12 0.19
BXA-80080/4CF w/ Mount Pipe	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	5.49 5.94 6.40	4.03 4.65 5.30	0.03 0.08 0.13
BXA-80080/4CF w/ Mount Pipe	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	5.49 5.94 6.40	4.03 4.65 5.30	0.03 0.08 0.13
BXA-80080/4CF w/ Mount Pipe	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	5.49 5.94 6.40	4.03 4.65 5.30	0.03 0.08 0.13
RRH-2x60-AWS	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.35 2.56 2.79	1.53 1.72 1.92	0.04 0.06 0.08
RRH-2x60-AWS	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.35 2.56 2.79	1.53 1.72 1.92	0.04 0.06 0.08
RRH-2x60-AWS	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.35 2.56 2.79	1.53 1.72 1.92	0.04 0.06 0.08
RRH-2x60-PCS	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.45 2.67 2.90	1.43 1.61 1.81	0.06 0.07 0.09
RRH-2x60-PCS	B	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.45 2.67 2.90	1.43 1.61 1.81	0.06 0.07 0.09
RRH-2x60-PCS	C	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.45 2.67 2.90	1.43 1.61 1.81	0.06 0.07 0.09
RRH 2x60-700	A	From Leg	3.00 0.00 0.00	0.0000	140.00	No Ice 1/2" Ice 1" Ice	2.57 2.79 3.02	1.93 2.13 2.34	0.03 0.05 0.07
RRH 2x60-700	B	From Leg	3.00 0.00	0.0000	140.00	No Ice 1/2" Ice	2.57 2.79	1.93 2.13	0.03 0.05

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	3.02	2.34	0.07
RRH 2x60-700	C	From Leg	3.00	0.0000	140.00	No Ice	2.57	1.93	0.03
			0.00			1/2" Ice	2.79	2.13	0.05
			0.00			1" Ice	3.02	2.34	0.07
DB-T1-6Z-8AB-0Z	A	From Leg	3.00	0.0000	140.00	No Ice	5.60	2.33	0.04
			0.00			1/2" Ice	5.92	2.56	0.08
			0.00			1" Ice	6.24	2.79	0.12
(3) T-Frames	C	None		0.0000	140.00	No Ice	30.02	30.02	0.95
						1/2" Ice	40.48	40.48	1.40
						1" Ice	50.94	50.94	1.86
***									
742 213 w/ Mount Pipe	A	From Leg	1.50	0.0000	130.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
742 213 w/ Mount Pipe	B	From Leg	1.50	0.0000	130.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
742 213 w/ Mount Pipe	C	From Leg	1.50	0.0000	130.00	No Ice	5.37	4.62	0.05
			0.00			1/2" Ice	5.95	6.00	0.09
			0.00			1" Ice	6.50	6.98	0.15
(3) Pipe Mounts	C	None		0.0000	130.00	No Ice	5.78	5.78	0.16
						1/2" Ice	7.37	7.37	0.18
						1" Ice	8.96	8.96	0.20

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
(2) VHLP2-18	A	Paraboloid w/Shroud (HP)	From Leg	3.00	0.0000		172.00	2.00	No Ice	3.14	0.05
				0.00					1/2" Ice	3.41	0.06
				0.00					1" Ice	3.68	0.06
VHLP2-18	B	Paraboloid w/Shroud (HP)	From Leg	3.00	0.0000		172.00	2.00	No Ice	3.14	0.05
				0.00					1/2" Ice	3.41	0.06
				0.00					1" Ice	3.68	0.06
VHLP2-18	C	Paraboloid w/Shroud (HP)	From Leg	3.00	0.0000		172.00	2.00	No Ice	3.14	0.05
				0.00					1/2" Ice	3.41	0.06
				0.00					1" Ice	3.68	0.06

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice

Comb. No.	Description
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	176 - 160	3.980	42	0.2000	0.0164
T2	160 - 140	3.308	42	0.1947	0.0161
T3	140 - 120	2.509	42	0.1721	0.0131
T4	120 - 100	1.804	42	0.1453	0.0099
T5	100 - 93.3333	1.227	42	0.1149	0.0075
T6	93.3333 - 86.6667	1.062	42	0.1064	0.0066

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T7	86.6667 - 80	0.908	42	0.0977	0.0058
T8	80 - 60	0.766	42	0.0888	0.0050
T9	60 - 40	0.426	42	0.0613	0.0035
T10	40 - 20	0.199	42	0.0370	0.0022
T11	20 - 0	0.060	42	0.0185	0.0010

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	Lightning Rod	42	3.980	0.2000	0.0164	341654
172.00	(2) VHLP2-18	42	3.811	0.1994	0.0165	341654
162.00	(2) AM-X-CD-16-65-00T	42	3.391	0.1960	0.0162	122180
152.00	LNX-6515DS-A1M w/ Mount Pipe	42	2.980	0.1873	0.0151	73542
140.00	(2) SBNHH-1D65B w/ Mount Pipe	42	2.509	0.1721	0.0131	49729
130.00	742 213 w/ Mount Pipe	42	2.142	0.1592	0.0114	40958

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	176 - 160	15.664	4	0.7859	0.0659
T2	160 - 140	13.023	4	0.7646	0.0646
T3	140 - 120	9.883	4	0.6758	0.0524
T4	120 - 100	7.110	8	0.5705	0.0398
T5	100 - 93.3333	4.840	8	0.4512	0.0299
T6	93.3333 - 86.6667	4.189	8	0.4177	0.0267
T7	86.6667 - 80	3.582	8	0.3836	0.0234
T8	80 - 60	3.023	8	0.3489	0.0202
T9	60 - 40	1.684	4	0.2406	0.0138
T10	40 - 20	0.789	4	0.1452	0.0090
T11	20 - 0	0.239	4	0.0727	0.0042

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
176.00	Lightning Rod	4	15.664	0.7859	0.0659	91089
172.00	(2) VHLP2-18	4	15.000	0.7833	0.0660	91089
162.00	(2) AM-X-CD-16-65-00T	4	13.349	0.7696	0.0651	32537
152.00	LNX-6515DS-A1M w/ Mount Pipe	4	11.735	0.7352	0.0607	19068
140.00	(2) SBNHH-1D65B w/ Mount Pipe	4	9.883	0.6758	0.0524	12794
130.00	742 213 w/ Mount Pipe	4	8.439	0.6248	0.0457	10460

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	176	Leg	A325N	0.8750	4	2.82	40.59	0.069	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.20	9.11	0.351	1	Member Block Shear
		Top Girt	A325N	0.6250	1	0.40	9.11	0.044	1	Member Block Shear
T2	160	Leg	A325N	1.0000	4	12.01	53.01	0.227	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4.53	6.83	0.664	1	Member Block Shear
T3	140	Leg	A325N	1.0000	6	14.74	53.01	0.278	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6.20	6.83	0.907	1	Member Block Shear
T4	120	Leg	A325N	1.0000	6	20.49	53.01	0.387	1	Bolt Tension
		Diagonal	A325N	0.6250	1	6.81	7.83	0.870	1	Member Bearing
T5	100	Diagonal	A325N	0.6250	1	6.91	7.83	0.883	1	Member Bearing
T6	93.3333	Diagonal	A325N	0.6250	1	7.01	7.83	0.895	1	Member Bearing
T7	86.6667	Leg	A325N	1.0000	6	25.82	53.01	0.487	1	Bolt Tension
		Diagonal	A325N	0.6250	1	7.10	12.43	0.571	1	Bolt Shear
T8	80	Leg	A325N	1.0000	8	23.04	53.01	0.435	1	Bolt Tension
		Diagonal	A325N	0.7500	1	7.54	14.14	0.533	1	Member Bearing
T9	60	Leg	A325N	1.0000	8	26.17	53.01	0.494	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8.76	14.14	0.620	1	Member Bearing
T10	40	Leg	A325N	1.0000	8	29.38	53.01	0.554	1	Bolt Tension
		Diagonal	A325N	0.7500	1	8.97	14.14	0.635	1	Member Bearing
T11	20	Leg	A354-BC	1.0000	10	25.91	55.22	0.469	1	Bolt Tension
		Diagonal	A325N	0.7500	1	9.57	14.14	0.677	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	176 - 160	ROHN 3 EH	16.00	4.00	42.2 K=1.00	3.0159	-15.66	119.12	0.131 [1]
T2	160 - 140	ROHN 4 EH	20.03	4.01	32.6 K=1.00	4.4074	-57.75	183.54	0.315 [1]
T3	140 - 120	ROHN 5 EH	20.03	5.01	32.7 K=1.00	6.1120	-103.19	254.38	0.406 [1]
T4	120 - 100	ROHN 6 EHS	20.03	6.68	36.0 K=1.00	6.7133	-141.44	274.77	0.515 [1]
T5	100 - 93.3333	ROHN 6 EH	6.68	6.68	36.5 K=1.00	8.4049	-154.03	343.10	0.449 [1]
T6	93.3333 - 86.6667	ROHN 6 EH	6.68	6.68	36.5 K=1.00	8.4049	-166.07	343.10	0.484 [1]
T7	86.6667 - 80	ROHN 6 EH	6.68	6.68	36.5 K=1.00	8.4049	-177.79	343.10	0.518 [1]
T8	80 - 60	ROHN 6 EH	20.03	6.68	36.5	8.4049	-212.15	343.10	0.618 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	60 - 40	ROHN 8 EHS	20.03	10.02	K=1.00 41.2	9.7193	-241.95	386.39	0.626 [1]
T10	40 - 20	ROHN 8 X-STR	20.03	10.02	K=1.00 41.8	12.7627	-273.33	505.55	0.541 [1]
T11	20 - 0	ROHN 8 EH	20.03	10.02	K=1.00 41.8 K=1.00	12.7627	-303.35	505.55	0.600 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	176 - 160	L2x2x1/4	6.16	2.77	93.8 K=1.10	0.9380	-3.38	19.13	0.176 [1]
T2	160 - 140	L2x2x3/16	7.65	3.61	112.4 K=1.02	0.7148	-4.55	11.91	0.383 [1]
T3	140 - 120	L2x2x3/16	9.87	4.70	143.1 K=1.00	0.7148	-6.09	7.89	0.773 [1]
T4	120 - 100	L2 1/2x2 1/2x3/16	12.41	5.96	144.5 K=1.00	0.9023	-6.87	9.76	0.704 [1]
T5	100 - 93.3333	L2 1/2x2 1/2x3/16	12.99	6.25	151.6 K=1.00	0.9023	-6.93	8.87	0.781 [1]
T6	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	13.58	6.55	158.7 K=1.00	0.9023	-7.05	8.09	0.871 [1]
T7	86.6667 - 80	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)	14.17	6.97	108.2 K=1.00	0.9165	-7.10	16.03	0.443 [1]
T8	80 - 60	L3x3x1/4	16.00	7.75	157.0 K=1.00	1.4400	-7.53	13.19	0.571 [1]
T9	60 - 40	L3 1/2x3 1/2x1/4	19.22	9.35	161.7 K=1.00	1.6900	-8.84	14.60	0.605 [1]
T10	40 - 20	L3 1/2x3 1/2x1/4	20.99	10.24	177.1 K=1.00	1.6900	-9.15	12.18	0.751 [1]
T11	20 - 0	L4x4x1/4	22.80	11.15	168.3 K=1.00	1.9400	-9.85	15.47	0.637 [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	176 - 160	L2x2x1/4	4.69	4.16	127.6 K=1.00	0.9380	-0.46	12.90	0.036 [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	176 - 160	ROHN 3 EH	16.00	4.00	42.2	3.0159	11.27	135.72	0.083 [1]
T2	160 - 140	ROHN 4 EH	20.03	4.01	32.6	4.4074	48.04	198.34	0.242 [1]
T3	140 - 120	ROHN 5 EH	20.03	5.01	32.7	6.1120	88.43	275.04	0.322 [1]
T4	120 - 100	ROHN 6 EHS	20.03	6.68	36.0	6.7133	122.94	302.10	0.407 [1]
T5	100 - 93.3333	ROHN 6 EH	6.68	6.68	36.5	8.4049	134.08	378.22	0.354 [1]
T6	93.3333 - 86.6667	ROHN 6 EH	6.68	6.68	36.5	8.4049	144.68	378.22	0.383 [1]
T7	86.6667 - 80	ROHN 6 EH	6.68	6.68	36.5	8.4049	154.92	378.22	0.410 [1]
T8	80 - 60	ROHN 6 EH	20.03	6.68	36.5	8.4049	184.32	378.22	0.487 [1]
T9	60 - 40	ROHN 8 EHS	20.03	10.02	41.2	9.7193	209.32	437.37	0.479 [1]
T10	40 - 20	ROHN 8 X-STR	20.03	10.02	41.8	12.7627	235.06	574.32	0.409 [1]
T11	20 - 0	ROHN 8 EH	20.03	10.02	41.8	12.7627	259.09	574.32	0.451 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	176 - 160	L2x2x1/4	6.16	2.77	56.9	0.5629	3.20	24.49	0.131 [1]
T2	160 - 140	L2x2x3/16	7.31	3.44	69.1	0.4307	4.53	18.73	0.242 [1]
T3	140 - 120	L2x2x3/16	9.44	4.48	89.4	0.4307	6.20	18.73	0.331 [1]
T4	120 - 100	L2 1/2x2 1/2x3/16	12.41	5.96	93.7	0.5713	6.81	24.85	0.274 [1]
T5	100 - 93.3333	L2 1/2x2 1/2x3/16	12.99	6.25	98.2	0.5713	6.91	24.85	0.278 [1]
T6	93.3333 - 86.6667	L2 1/2x2 1/2x3/16	13.58	6.55	102.8	0.5713	7.01	24.85	0.282 [1]
T7	86.6667 - 80	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)	14.17	6.97	108.2	0.9165	7.04	29.70	0.237 [1]
T8	80 - 60	L3x3x1/4	16.00	7.75	101.7	0.9159	7.54	44.65	0.169 [1]
T9	60 - 40	L3 1/2x3 1/2x1/4	19.22	9.35	104.5	1.1034	8.76	53.79	0.163 [1]
T10	40 - 20	L3 1/2x3 1/2x1/4	20.99	10.24	114.2	1.1034	8.97	53.79	0.167 [1]
T11	20 - 0	L4x4x1/4	22.80	11.15	108.3	1.2909	9.57	62.93	0.152 [1]

[1] $P_u / \phi P_n$ 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 $\frac{P_u}{\phi P_n}$

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	176 - 160	L2x2x1/4	4.69	4.16	86.6	0.5629	0.40	24.49	0.016 [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	176 - 160	Leg	ROHN 3 EH	3	-15.66	119.12	13.1	Pass
T2	160 - 140	Leg	ROHN 4 EH	33	-57.75	183.54	31.5	Pass
T3	140 - 120	Leg	ROHN 5 EH	65	-103.19	254.38	40.6	Pass
T4	120 - 100	Leg	ROHN 6 EHS	92	-141.44	274.77	51.5	Pass
T5	100 - 93.3333	Leg	ROHN 6 EH	113	-154.03	343.10	44.9	Pass
T6	93.3333 - 86.6667	Leg	ROHN 6 EH	122	-166.07	343.10	48.4	Pass
T7	86.6667 - 80	Leg	ROHN 6 EH	131	-177.79	343.10	51.8	Pass
T8	80 - 60	Leg	ROHN 6 EH	140	-212.15	343.10	61.8	Pass
T9	60 - 40	Leg	ROHN 8 EHS	161	-241.95	386.39	62.6	Pass
T10	40 - 20	Leg	ROHN 8 X-STR	176	-273.33	505.55	54.1 55.4 (b)	Pass
T11	20 - 0	Leg	ROHN 8 EH	191	-303.35	505.55	60.0	Pass
T1	176 - 160	Diagonal	L2x2x1/4	9	-3.38	19.13	17.6 35.1 (b)	Pass
T2	160 - 140	Diagonal	L2x2x3/16	36	-4.55	11.91	38.3 66.4 (b)	Pass
T3	140 - 120	Diagonal	L2x2x3/16	70	-6.09	7.89	77.3 90.7 (b)	Pass
T4	120 - 100	Diagonal	L2 1/2x2 1/2x3/16	97	-6.87	9.76	70.4 87.0 (b)	Pass
T5	100 - 93.3333	Diagonal	L2 1/2x2 1/2x3/16	118	-6.93	8.87	78.1 88.3 (b)	Pass
T6	93.3333 - 86.6667	Diagonal	L2 1/2x2 1/2x3/16	127	-7.05	8.09	87.1 89.5 (b)	Pass
T7	86.6667 - 80	Diagonal	L2.5x2.5x3/16 + L2.5x2.5x3/16 (C-shape)	136	-7.10	16.03	44.3 57.1 (b)	Pass
T8	80 - 60	Diagonal	L3x3x1/4	145	-7.53	13.19	57.1	Pass
T9	60 - 40	Diagonal	L3 1/2x3 1/2x1/4	166	-8.84	14.60	60.5 62.0 (b)	Pass
T10	40 - 20	Diagonal	L3 1/2x3 1/2x1/4	181	-9.15	12.18	75.1	Pass
T11	20 - 0	Diagonal	L4x4x1/4	196	-9.85	15.47	63.7 67.7 (b)	Pass
T1	176 - 160	Top Girt	L2x2x1/4	5	-0.46	12.90	3.6 4.4 (b)	Pass
						Summary		
						Leg (T9)	62.6	Pass
						Diagonal (T3)	90.7	Pass
						Top Girt (T1)	4.4	Pass
						Bolt Checks	90.7	Pass
						RATING =	**90.7**	**Pass**

Program Version 7.0.7.0 - 7/18/2016 File:P:/2017/Structural/17-6645 CT04382-S-01 New Britain 2, CT SBA SA/TNX (if required)/expo B/CT04382-S-01_New Britain 2_Sprint Nextel_10252017_SA.eri

MATHCAD CALCULATION PRINTOUT

EXISTING 176' SELF SUPPORT TOWER ANCHOR BOLT CHECK

REACTIONS ON THE FOUNDATION

As per Tnx output (see attached)

Down load; $Pv := 311 \cdot kips$ Shear; $S := 32 \cdot kips$

Uplift load; $P_{up} := 265 \cdot kips$ Moment; $M := 0 \cdot kips \cdot ft$

Anchor Rod Data is as per tower design by ROHN DWG No. C880790 R3, dated 08/12/1988.

Number of Anchor Rods: $N_{anchors} := 10$

Diameter of Anchors: $D_{anchors} := 1.0in$ $n := 8in^{-1}$

Net Tensile Area of Anchors: $A_{anchors} := \frac{\pi}{4} \cdot \left(D_{anchors} - \frac{0.9743}{n} \right)^2 = 0.606 \cdot in^2$

Ultimate Tensile Stress: $F_{anchors} := 125ksi$ (ASTM A354 Gr. BC)

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

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

$T_{cap} = 60.574 \cdot kips$

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

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

Maximum Load on Anchor: $T_{max} := \frac{P_{up} + \frac{S}{\eta}}{N_{anchors}}$ $T_{max} = 32.318 \cdot kips$

Anchor Rod Capacity: $\frac{T_{max}}{T_{cap}} = 53.353 \cdot \%$ OK!

Summary

-Foundation Reactions from Tower Base-

$S = 32 \cdot kips$

Down load $Pv = 311 \cdot kips$

Uplift load $P_{up} = 265 \cdot kips$

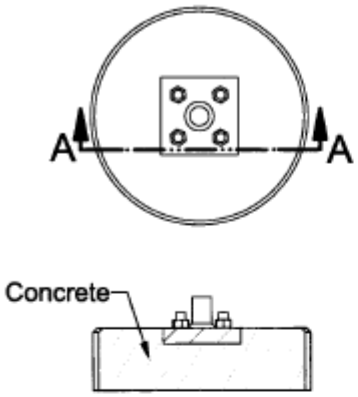
Moment $M = 0 \cdot ft \cdot kip$

Anchor Rod Check $T_{max} = 32.318 \cdot kips$ < $T_{cap} = 60.574 \cdot kips$

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

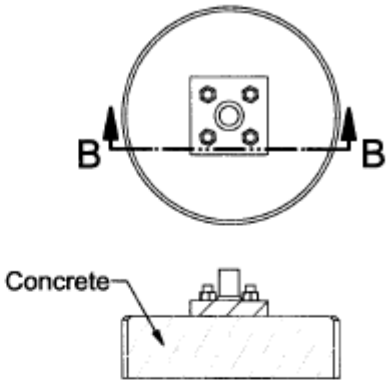
Anchor_Rod_Check = "OK"

ANSI/TIA-222-G



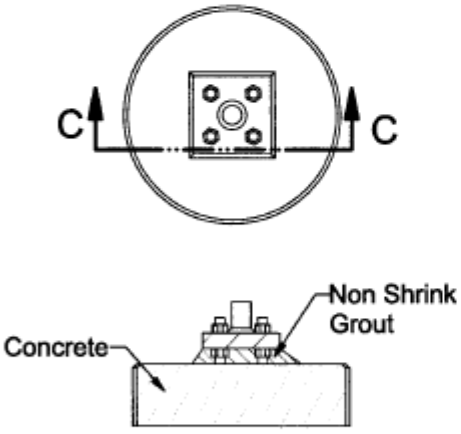
SECTION A-A

Detail Type (a)



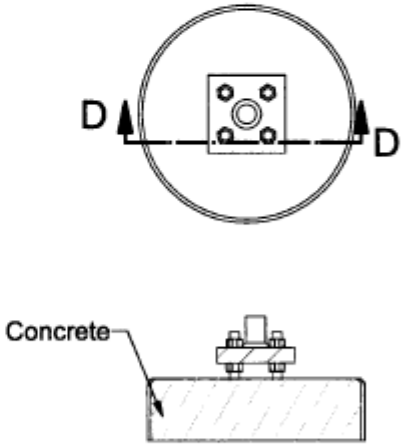
SECTION B-B

Detail Type (b)



SECTION C-C

Detail Type (c)



SECTION D-D

Detail Type (d)

(See Note 1 below)

Note:

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

Figure 4-4: Anchor Rod Detail Types

4.9.9 Anchor Rods

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

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

where:

ϕ= 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

Foundation Check for 175' Self Supporting Tower

Customer Name: SBA
Customer Site Number: CT04382-S-01 / New Britain 2, CT

CarrierName: Sprint Nextel
ACGI JOB # 17-6645

By:

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

Foundation check

-Foundation Reactions-

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

Total Shear	$S := 50 \cdot kips$	Compression on Pedestal:	$P_c := 311 \cdot kips$
Moment	$M := 5315 \cdot ft\_K$	Uplift on Pedestal:	$P_{up} := 265 \cdot kips$
Down load, Tower weight	$Pv := 64 \cdot kips$	Shear on Pedestal:	$Sh := 32 \cdot kips$

-Soil Properties- **Soil data as per Geotechnical Evaluation of Subsurface Conditions report by Jaworski Geotech, Inc., Project # 00309G, dated 07/05/2000**

Allowable Bearing Capacity $Brg_{allw} := 5 \cdot ksf$ Safety Factor $SF := 2$ (Estimated)

Umtimate Bearing Capacity $Brg_{ultimate} := Brg_{allw} \cdot SF$ $Brg_{ultimate} = 10 \cdot ksf$

Internal angle of friction for soil, $\phi := 30 \cdot deg$

Unit wt. of soil, $\gamma_s := 0.115 \cdot kcf$

Alowable Passive Pressure see next page

Cohesion of soil, $c_u := 0.0 \cdot ksf$

Friction Factor $FF := 0.50$

Depth to be neglected $L_{neg} := 1.0 \cdot ft$

-Reinforcement Data-

Typical concrete cover $cc := 3in$

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

-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, $f_c := 3000 \cdot psi$

-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

Tower face width $TWFW := 21 \cdot ft$ Tower ht. $Tw_{ht} := 175 \cdot ft$

The tower location is eccentric by $L_{pe} := 0 \cdot ft$ with respect to the mat foundation center towards the base

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

Depth of mat, $D_f := 3.5 \cdot ft$

Thickness of mat, $T_f := 4 \cdot ft$

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

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

-Foundation Data as per original foundation drawing by Rohn Industries, Inc., Eng. File No. 44545AE, dated 7/26/2000

Mat Dimensions, LxB $L := 31.5 \cdot ft$ x $B := L$ $B = 31.5\,ft$

$Brg_{ultimate} = 10 \cdot ksf$ (From Geotech Report)

MAT CALCULATIONS

$$K_p := \tan\left(45deg + \frac{\phi}{2}\right)^2 \qquad K_p = 3$$

$$P_{pave} := \frac{\left(D_f - T_f - L_{neg}\right)\cdot K_p \cdot \gamma_s + \left(D_f - L_{neg}\right)\cdot K_p \cdot \gamma_s}{2} \qquad P_{pave} = 0.172 \cdot ksf$$

Calculate safety against overturning and location of resultant on the base

Resisting Moments about mid axis parallel to base

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

component	value, kips	lever arm, ft	resisting moment, ft-kips
1) Concrete wt.	$C_w := L\cdot B\cdot T_f\cdot(\gamma_c) + Area_{ped}\cdot\gamma_c\cdot(D_f + E_g - T_f)\cdot Nped$	$L_c := \frac{L}{2}$	$R_c := C_w \cdot L_c$
	$C_w = 595.35 \cdot kips$	$L_c = 15.75\,ft$	$R_c = 9376.763 \cdot ft\_K$
2) Soil wt.	$S_w := 0 \cdot kips$	$L_s := \frac{L}{2}$	$R_s := S_w \cdot L_s$
	$S_w = 0 \cdot kips$	$L_s = 15.75\,ft$	$R_s = 0 \cdot ft\_K$
3) Wt. of soil wedge	$W_w := 0kips$	$L_w := \left[L + \left[\left(D_f - T_f\right)\cdot\frac{\tan(\phi)}{3}\right]\right]$	$R_w := W_w \cdot L_w$
	$W_w = 0 \cdot kips$	$L_w = 31.404\,ft$	$R_w = 0 \cdot ft\_K$

4) Passive pressure $Pe_p := (D_f - E_g)\cdot B\cdot P_{pave}$ $Pe_p = 16.301\cdot kips$ $L_p := \frac{T_f}{3}$ $L_p = 1.333\,ft$ $R_p := Pe_p\cdot L_p$ $R_p = 21.735\cdot ft\_K$

5) Vertical $Pv = 64\cdot kips$

$S_{w1} := L\cdot B\cdot D_f\cdot\gamma_s$ $S_{w1} = 399.381\cdot kips$ <--- for net calcs $L_v := \frac{L}{2}$ $R_v := Pv\cdot L_v$ $R_v = 1.008\times 10^6\,ft\cdot$

Total weight $T_w := C_w + S_w + W_w + Pv$ $T_w = 659.35\cdot kips$ $L_v = 15.75\,ft$ $R_v = 1008\cdot ft\_K$

Total resisting Moment= $M_r := R_c + R_s + R_w + R_p + R_v$ $M_r = 10406.498\cdot ft\_K$

Overturning Moments

component	value, kips	lever arm, ft	Overturning Moment ft-kips
1) Moment on foundation due to eccentric location of tower	$Pv = 64\cdot kips$	$L_{pe} = 0$	$M_{pe} := L_{pe}\cdot Pv$ $M_{pe} = 0\cdot ft\_K$
2) Moment on foundation	-	-	$M = 5315\cdot ft\_K$
3) Moment due to horizontal shear	$S_t := S$	$L_{hs} := D_f + E_g$ $L_{hs} = 4\,ft$	$O_{hs} := L_{hs}\cdot S_t$ $O_{hs} = 200\cdot ft\_K$

Total Overturning Moment= $M_o := M + O_{hs} + M_{pe}$ $M_o = 5515\cdot ft\_K$

Check Safety Factor against Overturning about mid axis parallel to base

$SF := \frac{0.9M_r}{M_o}$ $SF = 1.698$ > 1.0 $\frac{1.0}{SF} = 58.884\cdot\%$ **O.K!**

Calculate eccentricity, e

$e := \frac{M_o}{T_w}$ $e = 8.364\,ft$

Check location of eccentricity and determine pressure distribution under the mat

$L_{loc} := \frac{L}{6}$ $L_{loc} = 5.25\,ft$ For net bearing calcs $T_{w1} := S_{w1} + W_w$ $T_{w1} = 399.381\cdot kips$

$P_{max1} := \text{if}\left[e \le L_{loc}, \frac{T_w}{L\cdot B}\cdot\left[1 + \left(6\cdot\frac{e}{L}\right)\right], 4\cdot\frac{T_w}{3\cdot B\cdot(L - 2\cdot e)}\right]$ $P_{max1} = 1.889\cdot ksf$

$P_{max2} := \left(\frac{T_{w1}}{L\cdot B}\right)$ $P_{max2} = 0.402\cdot ksf$ $P_{net} := P_{max1} - P_{max2}$ $P_{max} := P_{net}$

Net soil pressure, $P_{net} = 1.487 \cdot ksf$ < $\phi_{s\_Bear} \cdot Brg_{ultimate} = 7.5 \cdot ksf$ $\frac{P_{net}}{(\phi_{s\_Bear} \cdot Brg_{ultimate})} = 19.825 \cdot \%$

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

Check for horizontal shear $P_{hor} := \phi_{s\_lateral} \cdot \left[Pe_p + (Pv + C_w + S_w) \cdot 0.35\right]$

$P_{hor} = 185.305 \cdot kips$ > $S = 50 \cdot kips$ $\frac{S}{P_{hor}} = 26.982 \cdot \%$ **O.K!**

Since P.hor > S it is safe!

REINFORCED CONCRETE CHECK CALCULATIONS

General Input parameters

Concrete Cover, $cc := 3.0 \cdot in$

Reduction factors as per respective ACI sections

$\phi_{shear} := 0.85$ as per ACI 9.3.2.3

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

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

Reinforced concrete load factor as per EIA 3.1.16 $RC_{fac} := 1.0$

(Loads already factored under TIA/EIA-222-G Code)

Check for wide beam or single shear in mat

Allowable shear stress in concrete for wide beam shear criteria=

$\nu_{wide} := 2 \cdot \phi_{shear} \cdot \sqrt{f_c \cdot psi}$ $\nu_{wide} = 93.113 \cdot psi$

Effective depth of stee $d := T_f - cc$ $d = 45 \cdot in$ $L_{eff} := if(e \le L_{loc}, L, L - 2 \cdot e)$ $L_{eff} = 14.771\,ft$

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

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

shear on the face of concrete=

$Shear_{wide} := (dist) \cdot B \cdot \left[\frac{P_{maxf} + \left[P_{maxf} - \frac{P_{maxf} - P_{minf}}{L_{eff}} \cdot (dist)\right]}{2}\right]$ $Shear_{wide} = 222.213 \cdot kips$

Area of concrete in shear= $A_{shear} := B \cdot d$ $A_{shear} = 17010 \cdot in^2$

Shear stress acting on concrete face= $\nu_{act} := \frac{Shear_{wide}}{A_{shear}}$ $\nu_{act} = 13.064 \cdot psi$

$\nu_{act} = 13.064 \cdot psi$ < $\nu_{wide} = 93.113 \cdot psi$ **O.K!**

Check for punching or two-way shear in mat

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

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

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

$\nu_{punch} = 186.226\cdot psi$ $Area_{col} := if\left[col_t = 0\,,\frac{\pi}{4}\cdot\left(Ped_s + d\right)^2\,,\left(Ped_s + d\right)^2\right]$

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

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

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

$\nu_{act} = 11.899\cdot psi$ < $\nu_{punch} = 186.226\cdot psi$ **O.K!**

Check of mat footing

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

$P_{upnet} := P_{up} - \frac{C_{wped} + S_w\cdot 0.95}{Nped}$ $P_{upnet} = 265\cdot kips$

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

$B_{mo} := RC_{fac}\cdot\left[\left(TWFW\cdot P_{upnet}\right)\cdot Langle + S_t\cdot\left(D_f + E_g\right)\right]$ $B_{mo} = 5019.431\cdot ft\_K$

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

$W_e := TWFW\cdot Langle + Ped_s$ $W_e = 18.187\,ft$ Reinforcement middle bandwidth. $B_{mo1} = 364499.089\,ft\cdot lb$

required R_u $R_u := \frac{B_{mo}}{\phi_{bend}\cdot B\cdot d^2}$ $R_u = 87.433\cdot psi$ $m := \frac{f_y}{\beta_1\cdot f_c}$ $m = 23.529$

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=

$Ast_f := \rho\cdot B\cdot d$ $Ast_f = 25.227\cdot in^2$

bar size provided $f_{bar} := 9$ $f_{dia} := \frac{f_{bar}}{8}\cdot in$ $f_{dia} = 1.125\cdot in$

Bar area= $f_{abar} := \pi\cdot\frac{f_{dia}^2}{4}$ $f_{abar} = 0.994\cdot in^2$

Number of bars required= $Nf_{bars} := \frac{Ast_f}{f_{abar}}$ $Nf_{bars} = 25.379$

Used $Nf_{bars} := 32$ > 27 OK!

Foundation Check Summary

-Foundation Reactions-

$S = 50\cdot kips$

Down load $Pv = 64\cdot kips$ (Weight)

Uplift load $P_{up} = 265\cdot kips$

$M = 5315\cdot ft\_K$

Stability Calculations

Safety Factor against Overturning $SF = 1.698$ > 1.0 OK! $\frac{1.0}{SF} = 58.884\cdot\%$ **OK!**

Net soil pressure, $P_{net} = 1.487\cdot ksf$ < $0.75Brg_{ultimate} = 7.5\cdot ksf$ $\frac{P_{net}}{0.75Brg_{ultimate}} = 19.825\cdot\%$ **OK!**

Check for horizontal shear $P_{hor} = 185.305\cdot kips$ > $S = 50\cdot kips$ $\frac{S}{P_{hor}} = 26.982\cdot\%$ **OK!**

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

Sprint®

SITE NAME: NEW BRITAIN - WEST

SITE NUMBER: CT52XC105

AUGMENT ID: CT-HFD0113Q17.1

SITE ADDRESS: 1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

JURISDICTION: CITY OF NEW BRITAIN / CT SITING COUNCIL

SITE TYPE: EXISTING 176' SELF SUPPORT

PROGRAM: DO MACRO UPGRADE EQUIPMENT DEPLOYMENT

PROJECT INFORMATION

SITE INFORMATION

LATTITUDE: (PER SBA RECORD)	41° 39' 59.08" N (41.6664°)
LONGITUDE: (PER SBA RECORD)	72° 48' 46.09" W (-72.8128°)
GROUND ELEVATION:	226'± AMSL (PER GOOGLE EARTH)
STRUCTURE HEIGHT:	176'± AGL (FROM RECORD STRUCTURAL)
STRUCTURE TYPE:	SELF SUPPORT
ZONING JURISDICTION	CITY OF NEW BRITAIN / CT SITING COUNCIL
ZONING DISTRICT/ OCCUPANCY:	I2 (GENERAL INDUSTRY)
COUNTY:	HARTFORD

APPLICANT

SPRINT
1 INTERNATIONAL BLVD. SUITE 800
MAHWAH, NJ 07495

PROPERTY OWNER:

N/F HARTFORD SQUARE ASSOCIATES LLC
1 HARTFORD SQUARE WEST BOX #15
NEW BRITAIN, CT 06052

TOWER OWNER:

SBA TOWERS, LLC
8051 CONGRESS AVENUE
BOCA RATON, FL 33487
(561) 995-7670

SBA SITE ID: CT04382-S

SBA SITE NAME: NEW BRITAIN 2, CT

SBA CONTACT:

STEPHEN ROTH
(860) 539-4920
SRoth@sbasite.com

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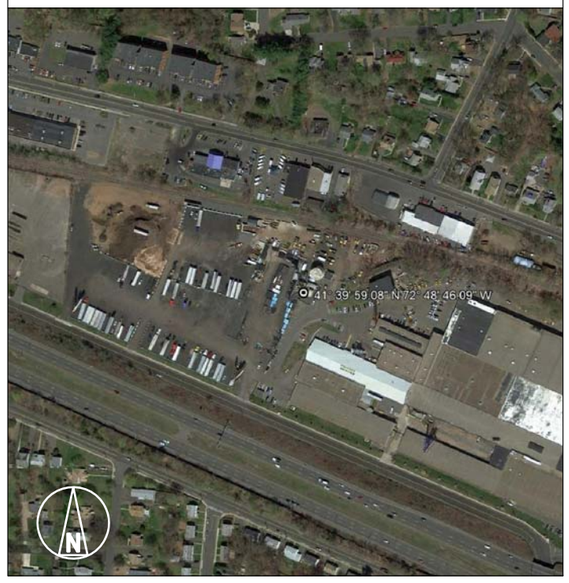
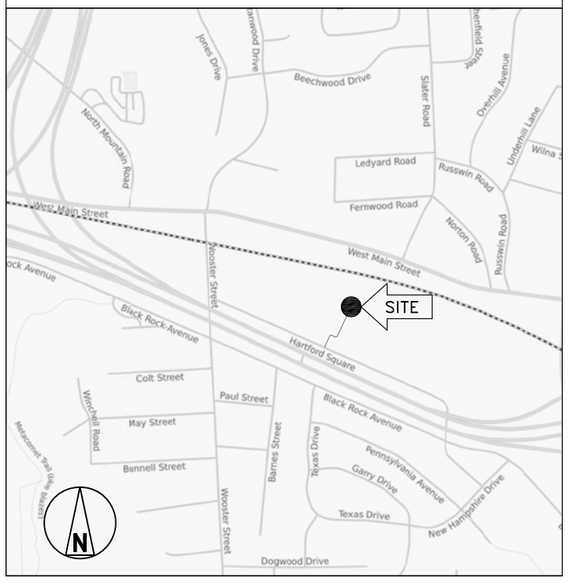
LOCATION MAP N.T.S.



AREA MAP N.T.S.



DRAWING INDEX

SHEET NO.	SHEET DESCRIPTION	REV. NO.
T-1	TITLE SHEET	0
SP-1	OUTLINE SPECIFICATIONS	0
SP-2	OUTLINE SPECIFICATIONS	0
SP-3	OUTLINE SPECIFICATIONS	0
A-1	COMPOUND PLAN	0
A-2	ELEVATION AND ANTENNA PLANS	0
A-3	TOWER EQUIPMENT DETAILS	0
S-1	ANTENNA AND RRH MOUNTING DETAILS	0
S-2	GROUND EQUIPMENT DETAILS	0
E-1	ELECTRICAL AND GROUNDING DETAILS	0
RF-1	RF DATA SHEET	0
RF-2	PLUMBING DIAGRAM AND RAN WIRING	0

SCOPE OF WORK

1. REMOVE (1) EXISTING SPRINT (CLEARWIRE) TOWER TOP JUNCTION BOX.
2. REMOVE EXISTING CABLING AND REPLACE WITH (4) HYBRID CABLES.
3. REMOVE (3) EXISTING SPRINT (CLEARWIRE) PANEL ANTENNAS AND REPLACE WITH (3) NEW SPRINT PANEL ANTENNAS.
4. REMOVE (3) EXISTING SPRINT (CLEARWIRE) RRHS.
5. INSTALL (6) NEW SPRINT 800 MHz RRHS.
6. INSTALL (3) NEW SPRINT 1900 MHz RRHS.
7. INSTALL (3) NEW SPRINT 2500 MHz RRHS.
8. REMOVE EXISTING SPRINT (CLEARWIRE) EQUIPMENT RACK IN SHELTER AND REPLACE WITH NEW SPRINT EQUIPMENT CABINET WITH CABLING CABINET WITHIN THE EXISTING EQUIPMENT SHELTER.
9. REMOVE EXISTING SPRINT (CLEARWIRE) GPS ANTENNA AND REPLACE WITH NEW SPRINT GPS ANTENNA.

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.

CODE COMPLIANCE

1. 2016 CONNECTICUT STATE BUILDING CODE WITH AMENDMENTS.
2. 2014 NATIONAL ELECTRICAL CODE WITH AMENDMENTS
3. TIA-EIA-222-G

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

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.

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MAHWAH, NJ 07495
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SBA COMMUNICATIONS CORP.
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WESTBOROUGH, MA 01581 TEL: (508) 251-0720

ProTerra DESIGN GROUP, LLC
4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918

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

CHECKED BY: 12/7 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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

SECTION 01 100 - SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:

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

1.5 DEFINITIONS:

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

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

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

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

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

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

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

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

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

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

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

A. TOP HAT
B. HOW TO INSTALL A NEW CABINET
C. BASE BAND UNIT IN EXISTING UNIT
D. INSTALLATION OF BATTERIES
E. INSTALLATION OF HYBRID CABLE
F. INSTALLATION OF RRH'S
G. CABLING
H. TS–0200 REV 4 – ANTENNA LINE ACCEPTANCE STANDARDS
I. SPRINT CELL SITE ENGINEERING NOTICE – EN 2012–001, REV 1.
J. COMMISSIONING MOPS
K. SPRINT CELL SITE ENGINEERING NOTICE – EN–2013–002
L. SPRINT ENGINEERING LETTER – EL–0504
M. SPRINT ENGINEERING LETTER – EL–0568
N. SPRINT TECHNICAL SPECIFICATION – TS–0193

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

B. THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 - CELL SITE CONSTRUCTION

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

D. PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
2. PREPARE GROUND SITES; PROVIDE DE–GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
3. MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND TELCO BACKHAUL.
4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
5. INSTALL ABOVE GROUND GROUNDING SYSTEMS.
6. PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
7. INSTALL "H–FRAMES", CABINETS AND SHELTERS AS INDICATED.
8. INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
9. ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.
10. PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.
11. PROVIDE SLABS AND EQUIPMENT PLATFORMS.
12. INSTALL COMPOUND FENCING, SIGHT SHIELDING, LANDSCAPING AND ACCESS BARRIERS.
13. PERFORM INSPECTION AND MATERIAL TESTING AS REQUIRED HEREINAFTER.
14. CONDUCT SITE RESISTANCE TO EARTH TESTING AS REQUIRED HEREINAFTER
15. INSTALL FIXED GENERATOR SETS AND OTHER STANDBY POWER SOLUTIONS.
16. INSTALL TOWERS, ANTENNA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.
17. INSTALL CELL SITE RADIOS, MICROWAVE, GPS, COAXIAL MAINLINE, ANTENNAS, CROSS BAND COUPLERS, TOWER TOP AMPLIFIERS, LOW NOISE AMPLIFIERS AND RELATED EQUIPMENT.
18. PERFORM, DOCUMENT, AND CLOSE OUT ANY CONSTRUCTION CONTROL DOCUMENTS THAT MAY BE REQUIRED BY GOVERNMENT AGENCIES AND LANDLORDS.
19. PERFORM ANTENNAL AND COAX SWEEP TESTING AND MAKE ANY AND ALL NECESSARY CORRECTIONS.
20. REMAIN ON SITE MOBILIZED THROUGHOUT HAND–OFF AND INTEGRATION TO ASSIST AS NEEDED UNTIL SITE IS DEEMED SUBSTANTIALLY COMPLETE AND PLACED "ON AIR."

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

C. CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

B. PROVIDE DOCUMENTATION INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING. DOCUMENTATION SHALL BE FORWARDED IN ORIGINAL FORMAT AND/OR UPLOADED INTO SMS.

1. ALL CORRESPONDENCE AND PRELIMINARY CONSTRUCTION REPORTS.
2. PROJECT PROGRESS REPORTS.
3. CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
4. ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
5. LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
6. POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
7. TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
8. PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
9. TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS)
13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

CONTINUE SHEET SP-2

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

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

ProTerra
DESIGN GROUP, LLC
4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph:(413)320–4918

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

CHECKED BY: 12/7/17 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/EN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–1

CONTINUED FROM SP-1:

SECTION 01 400 - SUBMITTALS, TESTS, AND INSPECTIONS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

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

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

1.4 TESTS AND INSPECTIONS:

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

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

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

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

3.2 REQUIRED TESTS:

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

3.3 REQUIRED INSPECTIONS:

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

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

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

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

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

SECTION 01 500 - PROJECT REPORTING

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

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

SECTION 07 500 - ROOF CUTTING, PATCHING AND REPAIR

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

1.4 SUBMITTALS:

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

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

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

SECTION 09 900 - PAINTING

QUALITY ASSURANCE:

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

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

CONTINUE SHEET SP-3

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

CHECKED BY: 12/7/17 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–2

CONTINUED FROM SP-2:

MATERIALS:

A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL. PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.

B. ROOF TOP CONSTRUCTION: TOUCH UP – PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

1. INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK MEANS ACCEPTANCE OF SUBSTRATE.
2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK. COORDINATE WITH WORK OF OTHER SECTIONS.
3. MATCH APPROVED MOCK-UPS FOR COLOR, TEXTURE, AND PATTERN. RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION.
4. CLEAN UP, TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

1. GALVANIZING DAMAGE AND ALL BOLTS AND NUTS SHALL BE TOUCHED UP AFTER TOWER ERECTION WITH "GALVANOX," "DRY GALV," OR "ZINC-IT."
2. FIELD TOUCHUP PAINT SHALL BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. ALL METAL COMPONENTS SHALL BE HANDLED WITH CARE TO PREVENT DAMAGE TO THE COMPONENTS, THEIR PRESERVATIVE TREATMENT, OR THEIR PROTECTIVE COATINGS.

SECTION 11 700 - ANTENNA ASSEMBLY, REMOTE RADIO HEADS AND CABLE INSTALLATION

SUMMARY:
THIS SECTION SPECIFIES INSTALLATION OF ANTENNAS, RRH'S, AND CABLE EQUIPMENT, INSTALLATION, AND TESTING OF COAXIAL FIBER CABLE.

ANTENNAS AND RRH'S:
THE NUMBER AND TYPE OF ANTENNAS AND RRH'S TO BE INSTALLED IS DETAILED ON THE CONSTRUCTION DRAWINGS.

HYBRID CABLE:
HYBRID CABLE WILL BE DC/FIBER AND FURNISHED FOR INSTALLATION AT EACH SITE. CABLE SHALL BE INSTALLED PER THE CONSTRUCTION DRAWINGS AND THE APPLICABLE MANUFACTURER'S REQUIREMENTS.

JUMPERS AND CONNECTORS:
FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRH'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12-50, CR 540, OR FXL 540. SUPER-FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRH'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE. DO NOT USE SUPERFLEX OUTDOORS. JUMPERS SHALL BE FACTORY FABRICATED IN APPROPRIATE LENGTHS WITH A MAXIMUM OF 4 FEET EXCESS PER JUMPER AND HAVE CONNECTORS AT EACH END, MANUFACTURED BY SUPPLIER. IF JUMPERS ARE FIELD FABRICATED, FOLLOW MANUFACTURER'S REQUIREMENTS FOR INSTALLATION OF CONNECTORS

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:
INSTALL SPLITTERS, COMBINERS, FILTERS PER RF DATA SHEET, FURNISHED BY SPRINT.

ANTENNA INSTALLATION:
THE CONTRACTOR SHALL ASSEMBLE ALL ANTENNAS ONSITE IN ACCORDANCE WITH THE INSTRUCTIONS SUPPLIED BY THE MANUFACTURER. ANTENNA HEIGHT, AZIMUTH, AND FEED ORIENTATION INFORMATION SHALL BE A DESIGNATED ON THE CONSTRUCTION DRAWINGS.

A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.

B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLES INSTALLATION:

A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.

C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
   a. FIBER: SUPPORT FIBER BUNDLES USING ½" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
   b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
   a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
   b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
   c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.
5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER SPRINT TS 0200 CURRENT VERSION.
7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE-EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.

B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.
3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.
4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

SECTION 11 800 – INSTALLATION OF MULTIMODAL BASE STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

A. LABEL CIRCUIT BREAKERS ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1.

SECTION 11 800 - INSTALLATION OF MULTIMODAL BASE TRANSCIEVER STATIONS (MMBTS) AND RELATED EQUIPMENT

SUMMARY:

A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).

B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
1. ALLIED TUBE AND CONDUIT
2. B-LINE SYSTEM
3. UNISTRUT DIVERSIFIED PRODUCTS
4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
1. EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
2. POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.
3. FASTEN BY MEANS OF WOOD SCREWS ON WOOD.
4. TOGGLE BOLTS ON HOLLOW MASONRY UNITS.
5. CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
6. MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL.
7. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE SHALL NOT BE PERMITTED.
8. DO NOT WELD CONDUIT, PIPE STRAPS, OR ITEMS OTHER THAN THREADED STUDS TO STEEL STRUCTURES.
9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.

B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.

C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:

D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.

E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET, INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.

B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

A. RIGID GALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINISHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COATED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS C80.1, FEDERAL SPECIFICATION WW-C-581 AND SHALL BE LISTED WITH THE UNDERWRITERS' LABORATORIES. FITTINGS SHALL BE THREADED – SET SCREW OR COMPRESSION FITTINGS WILL NOT BE ACCEPTABLE. RGS CONDUITS SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND.

B. UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.

C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.

D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.

E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.

F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.

B. CABLE TERMINATION FITTINGS FOR CONDUIT
1. CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY O-Z/GEDNEY OR EQUAL.
2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO – CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.

C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL.

D. CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.

E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED EQUAL.

SUPPLEMENTAL GROUNDING SYSTEM

A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.

B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.

C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

A. EXISTING EXPOSED WIRING AND ALL EXPOSED OUTLETS, RECEPTACLES, SWITCHES, DEVICES, BOXES, AND OTHER EQUIPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-ENERGIZED AND CAPPED IN THE WALL, CEILING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE. WALL, CEILING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION.

CONDUIT AND CONDUCTOR INSTALLATION:

A. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER, PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.

B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE.

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

CHECKED BY: 12/7 JMM/TEJ

APPROVED BY: JMM/TEJ

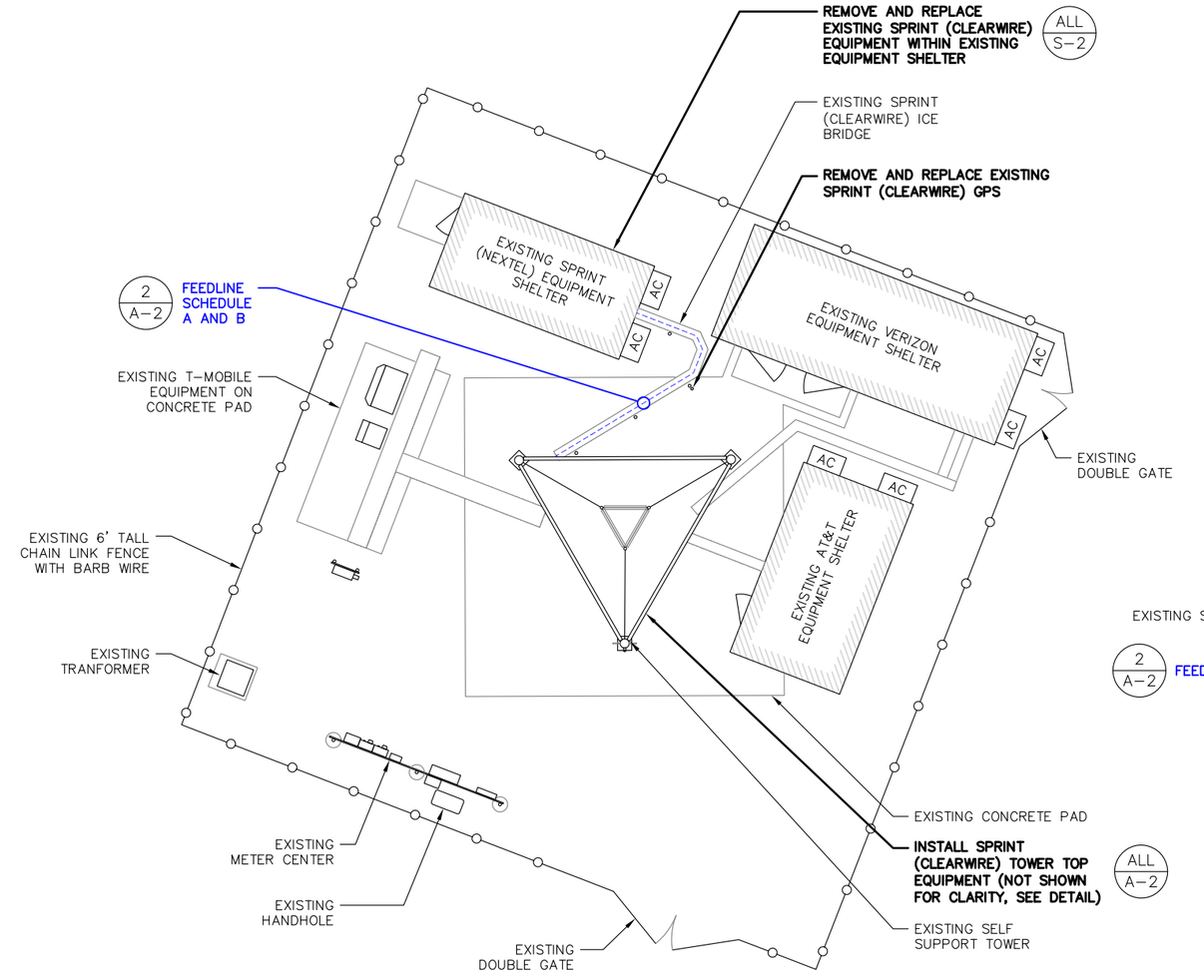
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP-3



COMPOUND PLAN

SCALE: 1"=15' (11"x17")
1"=7.5' (22"x34")

1 / A-1

15 7.5 0 15

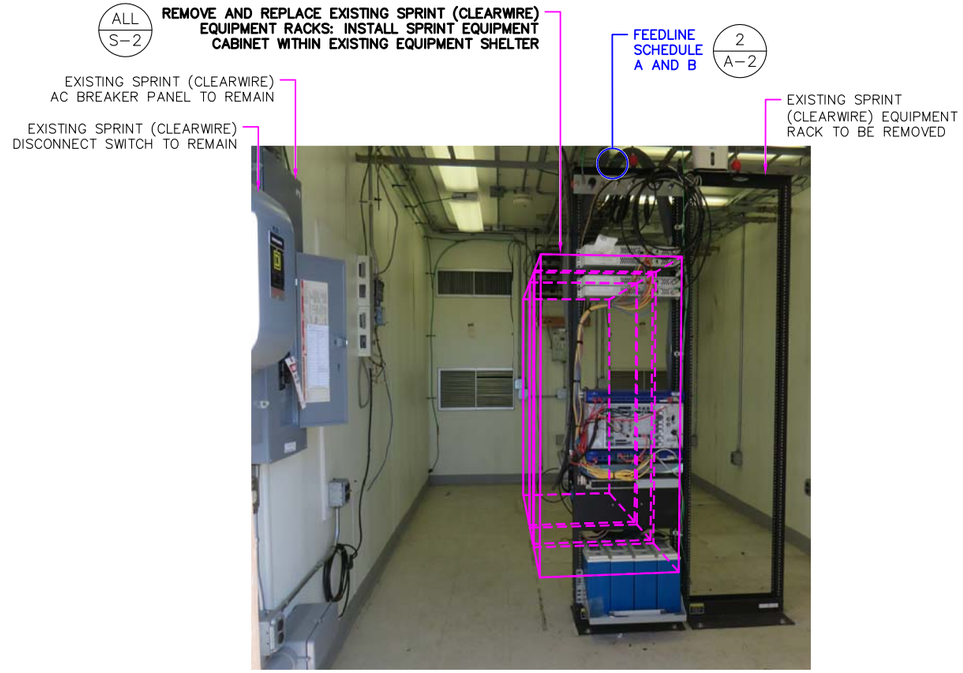


IMAGE SOURCE: PROTERRA 10/12/2017
(VIEW FROM NORTHWEST)

IMAGE SOURCE: PROTERRA 10/12/2017
(VIEW FROM SOUTHEAST)

EQUIPMENT PLAN PHOTO DETAIL

SCALE: N.T.S.

2 / A-1

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SUBMITTALS

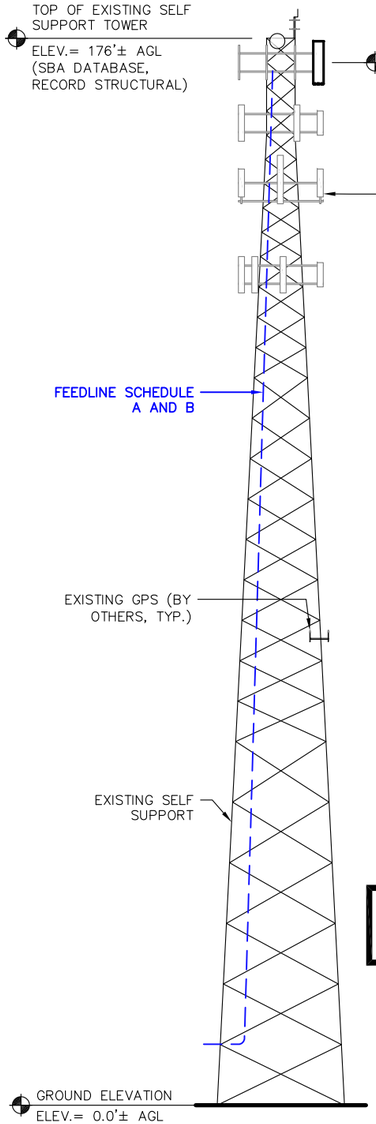
REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST

SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1



NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION

SCALE: 1"=25' (11"x17")
1"=12.5' (22"x34")

1 / A–2

25 12.5 0 25

IMAGE SOURCE: PROTERRA 10/12/2017

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO BE REMOVED: (6) ⅞" COAX AND (1) 1¼" HYBRID (PER COLO–APP, IN FLEX CONDUIT) TO 172' RAD EXISTING TO REMAIN: (4) ½" MICROWAVE DISH CABLE TO 172' RAD	UP SELF SUPPORT TOWER FACE TO RAD
B	PROPOSED: (4) HYBRID TO 172' RAD;	UP SELF SUPPORT TOWER FACE TO RAD

NOTE:
EXISTING SPRINT EQUIPMENT FEEDLINE INVENTORY BASED ON COLOCATION APPLICATION, SBA RECORD, AND FIELD OBSERVATIONS. RFDS AND FEEDLINE LEASING ENTITLEMENTS MAY DIFFER

TOWER ELEVATION PHOTO DETAIL

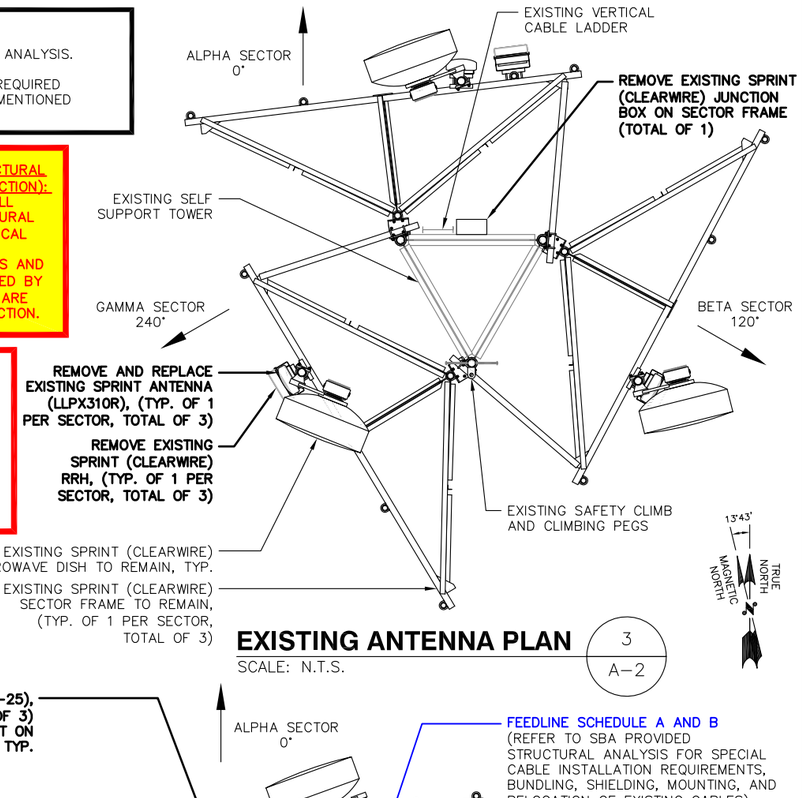
SCALE: N.T.S.

2 / A–2

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

SPECIAL CONSTRUCTION NOTE (ANTENNA MOUNT STRUCTURAL AUGMENT SCHEMATIC DESIGN NOT FOR FINAL CONSTRUCTION):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS AND STRUCTURAL MODIFICATIONS AT THE SPRINT (CLEARWIRE) RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA–PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS). SCHEMATIC DESIGNS DEPICTED IN MAGENTA ARE PRELIMINARY ONLY AND ARE NOT FOR FINAL CONSTRUCTION.

SPECIAL PRE–CONSTRUCTION WORK NOTE (SBA–PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER–MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA–PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.



EXISTING ANTENNA PLAN

SCALE: N.T.S.

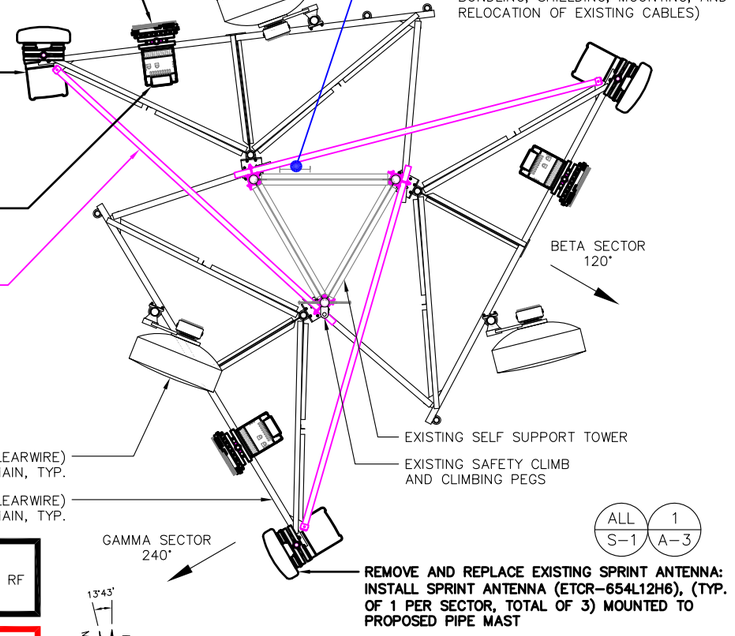
3 / A–2

ALL / S–1 — 4 / A–3 — INSTALL SPRINT RRH (TD–RRH8X20–25), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO PROPOSED PIPE MAST ON FACE OF EXISTING SECTOR FRAME, TYP.

ALL / S–1 — 3 / A–3 — INSTALL SPRINT RRH (1900 4X45 65MHZ) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON PIPE MOUNT BEHIND PROPOSED ANTENNA

ALL / S–1 — 2 / A–3 — INSTALL SPRINT RRH (800MHZ 2X50), (TYP. OF 2 PER SECTOR, TOTAL OF 6) MOUNTED TO PROPOSED PIPE MAST ON FACE OF EXISTING SECTOR FRAME, TYP.

6 / A–3 — FURNISH AND INSTALL STIFF ARM KIT, (DETAILS TBD BY OTHERS) (TYP. OF 1 PER SECTOR, TOTAL OF 3)



NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

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

PROPOSED ANTENNA PLAN

SCALE: N.T.S.

4 / A–2

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

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WESTBOROUGH, MA 01581 TEL: (508) 251-0720

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

CHECKED BY: 12/7 JMM/TEJ

APPROVED BY: JMM/TEJ

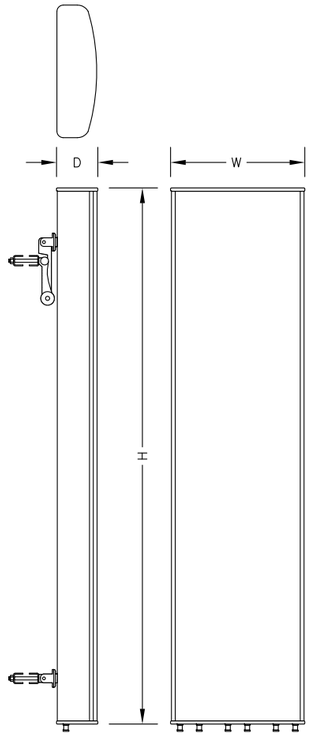
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

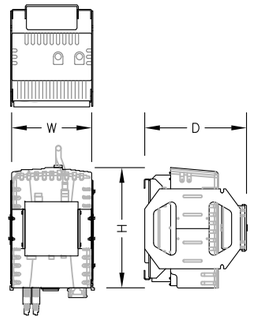
SHEET TITLE
ELEVATION AND ANTENNA PLANS

SHEET NUMBER
A–2



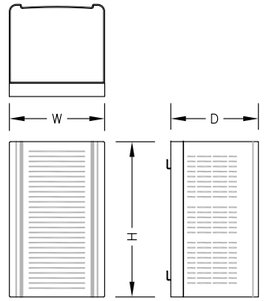
ANTENNA SPECIFICATIONS	
MANUF.	KMW
MODEL #	ETCR-654L12H6
HEIGHT	84.9"
WIDTH	21.0"
DEPTH	6.3"
WEIGHT	84.9± LBS.

ANTENNA DETAIL (1 / A-3)
SCALE: N.T.S.



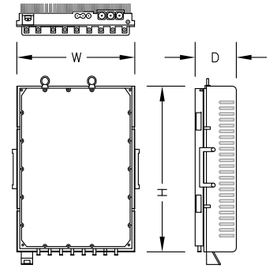
800 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	800MHZ 2X50W
HEIGHT	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53± LBS

800 MHz RRH DETAIL (2 / A-3)
SCALE: N.T.S.



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 DETAIL (3 / A-3)
SCALE: N.T.S.



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

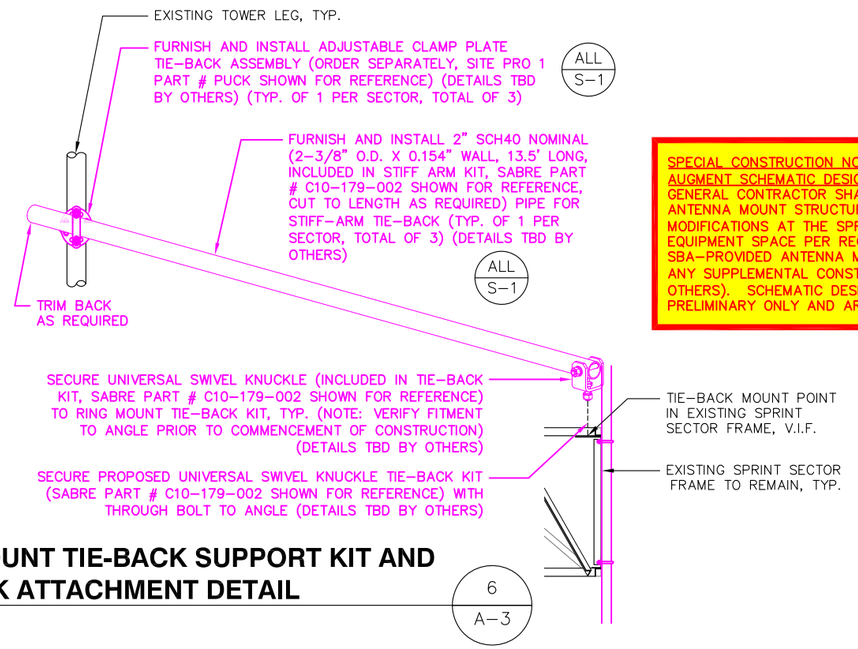
2.5 GHz RRH DETAIL (4 / A-3)
SCALE: N.T.S.

MAJOR RF EQUIPMENT LIST

(GC SHALL FURNISH AND INSTALL ALL OTHER MATERIALS AND EQUIPMENT NOT SUPPLIED BY SPRINT)

DESCRIPTION	QUANTITY	UNITS	MAKE/MODEL/MATERIAL	PROVIDED BY
ANTENNA	3	EA	KMW ETCR-654L12H6	SPRINT
2500 RRH	3	EA	NOKIA (ALU) TD-RRH8x20-25	SPRINT
1900 RRH	3	EA	NOKIA (ALU) 1900 4X45 65MHZ	SPRINT
800 RRH	6	EA	NOKIA (ALU) 800MHz 2x50W	SPRINT
FIBER	4 @ 270'± FROM FIBER CABINET	LINEAR FEET LISTED [INCLUDES (2) 10' COILS]	1-1/4" HYBRIFLEX	SPRINT

SPRINT-PROVIDED EQUIPMENT SCHEDULE (5 / A-3)
SCALE: N.T.S.



RING MOUNT TIE-BACK SUPPORT KIT AND TIE-BACK ATTACHMENT DETAIL (6 / A-3)
SCALE: N.T.S.

SPECIAL CONSTRUCTION NOTE (ANTENNA MOUNT STRUCTURAL AUGMENT SCHEMATIC DESIGN NOT FOR FINAL CONSTRUCTION): GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS AND STRUCTURAL MODIFICATIONS AT THE SPRINT (CLEARWIRE) RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS). SCHEMATIC DESIGNS DEPICTED IN MAGENTA ARE PRELIMINARY ONLY AND ARE NOT FOR FINAL CONSTRUCTION.

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SUBMITTALS

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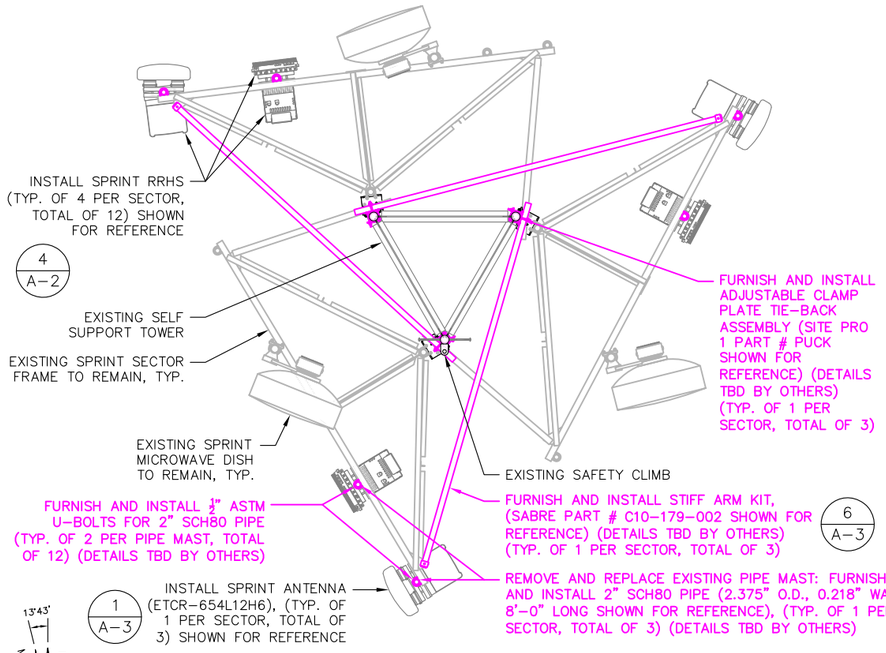
CT52XC105
SITE NAME:
NEW BRITAIN - WEST

SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
TOWER EQUIPMENT DETAILS

SHEET NUMBER
A-3



SECTOR FRAME PLAN DETAIL

SCALE: N.T.S.

1 / S-1

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

SPECIAL CONSTRUCTION NOTE (ANTENNA MOUNT STRUCTURAL AUGMENT SCHEMATIC DESIGN NOT FOR FINAL CONSTRUCTION):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL ANTENNA MOUNT STRUCTURAL AUGMENTS AND STRUCTURAL MODIFICATIONS AT THE SPRINT (CLEARWIRE) RAD/VERTICAL EQUIPMENT SPACE PER RECOMMENDATIONS FROM SBA-PROVIDED ANTENNA MOUNT STRUCTURAL ANALYSIS AND ANY SUPPLEMENTAL CONSTRUCTION DRAWINGS (PROVIDED BY OTHERS). SCHEMATIC DESIGNS DEPICTED IN MAGENTA ARE PRELIMINARY ONLY AND ARE NOT FOR FINAL CONSTRUCTION.

SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY SPECIAL SHIELDING OF TOWER TOP EQUIPMENT AND FOR ANY SPECIAL FEEDLINE BUNDLING OR RELOCATION.

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

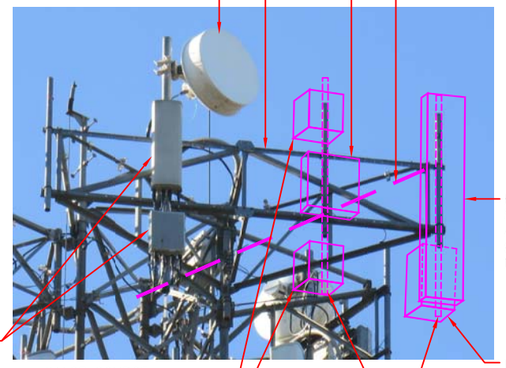


IMAGE SOURCE: PROTERRA 10/12/2017

INSTALL SPRINT RRH (TD-RRH8X20-25), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO PROPOSED PIPE MAST ON FACE OF EXISTING SECTOR FRAME, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR) — 4 / A-3, 1,2 / S-2

FURNISH AND INSTALL STIFF ARM KIT, (SABRE PART # C10-179-002 SHOWN FOR REFERENCE) (DETAILS TBD BY OTHERS) (TYP. OF 1 PER SECTOR, TOTAL OF 3) — 6 / A-3, 1,2 / S-2

REMOVE AND REPLACE EXISTING SPRINT ANTENNA: INSTALL SPRINT ANTENNA (ETCR-654L12H6), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO PROPOSED PIPE MAST — 1 / A-3, 1,2 / S-2

INSTALL SPRINT RRH (1900 4X45 65MHZ) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON PIPE MOUNT BEHIND PROPOSED ANTENNA — 3 / A-3, 1,2 / S-2

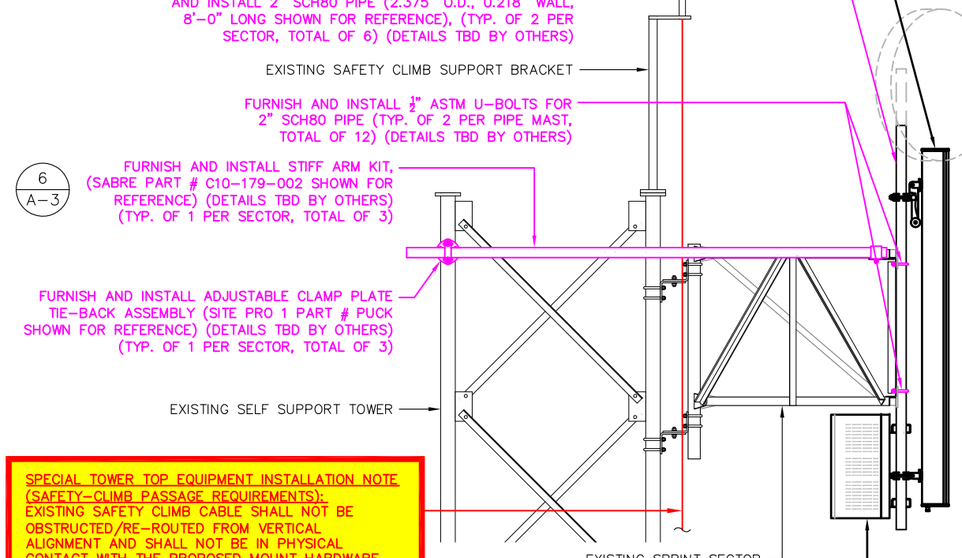
INSTALL SPRINT RRH (800MHZ 2X50), (TYP. OF 2 PER SECTOR, TOTAL OF 6) MOUNTED TO PROPOSED PIPE MAST ON FACE OF EXISTING SECTOR FRAME, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR) — 2 / A-3, 1,2 / S-2

REMOVE AND REPLACE EXISTING PIPE MAST: FURNISH AND INSTALL 2" SCH80 PIPE (2.375" O.D., 0.218" WALL, 8'-0" LONG SHOWN FOR REFERENCE), (TYP. OF 2 PER SECTOR, TOTAL OF 6) (DETAILS TBD BY OTHERS)

ANTENNA AND RRH MOUNT PHOTO DETAIL

SCALE: N.T.S.

3 / S-1

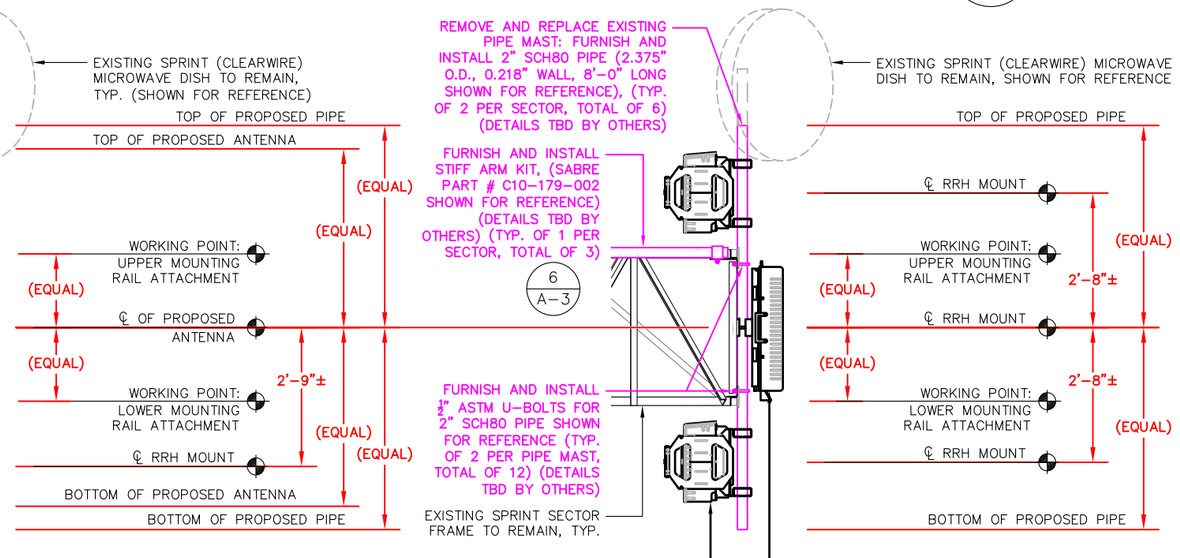


SPECIAL TOWER TOP EQUIPMENT INSTALLATION NOTE (SAFETY-CLIMB PASSAGE REQUIREMENTS):
EXISTING SAFETY CLIMB CABLE SHALL NOT BE OBSTRUCTED/RE-ROUTED FROM VERTICAL ALIGNMENT AND SHALL NOT BE IN PHYSICAL CONTACT WITH THE PROPOSED MOUNT HARDWARE. GENERAL CONTRACTOR SHALL INSTALL NEW OR ADDITIONAL SAFETY-CLIMB 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.

ANTENNA AND RRH MOUNTING DETAIL

SCALE: N.T.S.

2 / S-1



INSTALL SPRINT RRH (1900 4X45 65MHZ) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON PIPE MOUNT BEHIND PROPOSED ANTENNA — 3 / A-3

INSTALL SPRINT RRH (800MHZ 2X50), (TYP. OF 2 PER SECTOR, TOTAL OF 6) MOUNTED TO PROPOSED PIPE MAST ON FACE OF EXISTING SECTOR FRAME, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR) — 2 / A-3

INSTALL SPRINT RRH (TD-RRH8X20-25), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED TO PROPOSED PIPE MAST ON FACE OF EXISTING SECTOR FRAME, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR) — 4 / A-3

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CT52XC105
SITE NAME:
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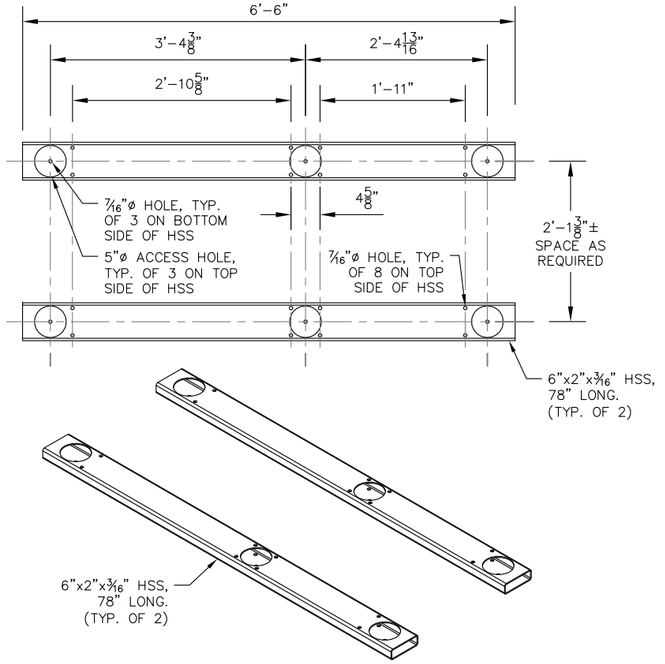
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
ANTENNA AND RRH MOUNTING DETAILS

SHEET NUMBER
S-1



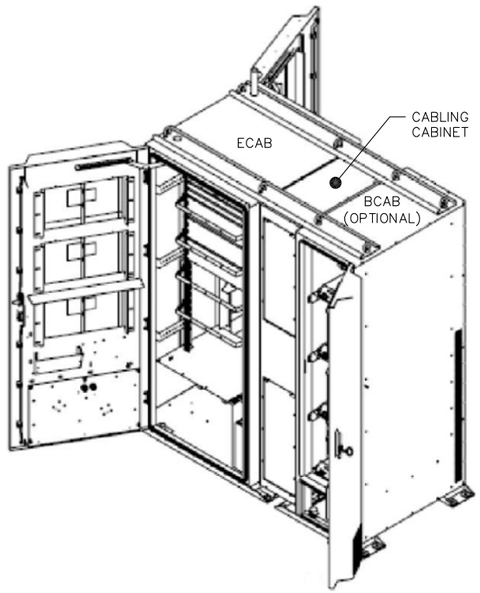
NOTE:
CONTRACTOR TO V.I.F. FLOOR TYPE AND SECURE SLEEPERS TO THE FLOOR AS REQUIRED:
FOR A NON-CONCRETE VICOR STYLE FLOOR:
FURNISH AND INSTALL (6) ½" TOGGLE ANCHOR WITH NUT, FLAT AND LOCKING WASHERS

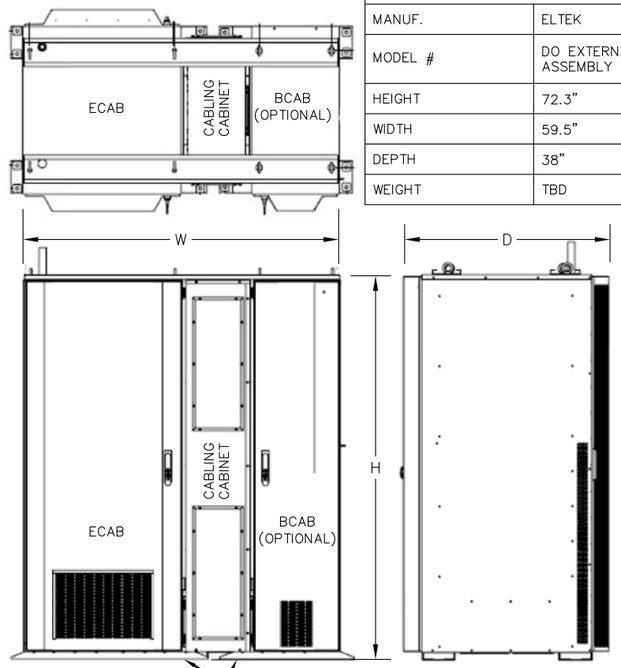
FOR MINIMUM 2.5" THICK LIGHT WEIGHT CONCRETE FLOOR:
FURNISH AND INSTALL (6) ½" HILTI HDI DROP IN ANCHORS AND ½" SS 304 THREADED ROD, (LENGTH AS REQUIRED) WITH NUT, FLAT AND LOCKING WASHERS

STEEL SLEEPER DETAIL

1 / S-2

SCALE: N.T.S.





ANCHOR CABINET TO HSS STEEL SLEEPER PER MANUFACTURER RECOMMENDED HARDWARE OR MINIMUM OF ½"ø SS 304 BOLT, LENGTH AS REQUIRED CABINET, (TYP OF 4 ANCHORS PER SKID, TOTAL OF 16)

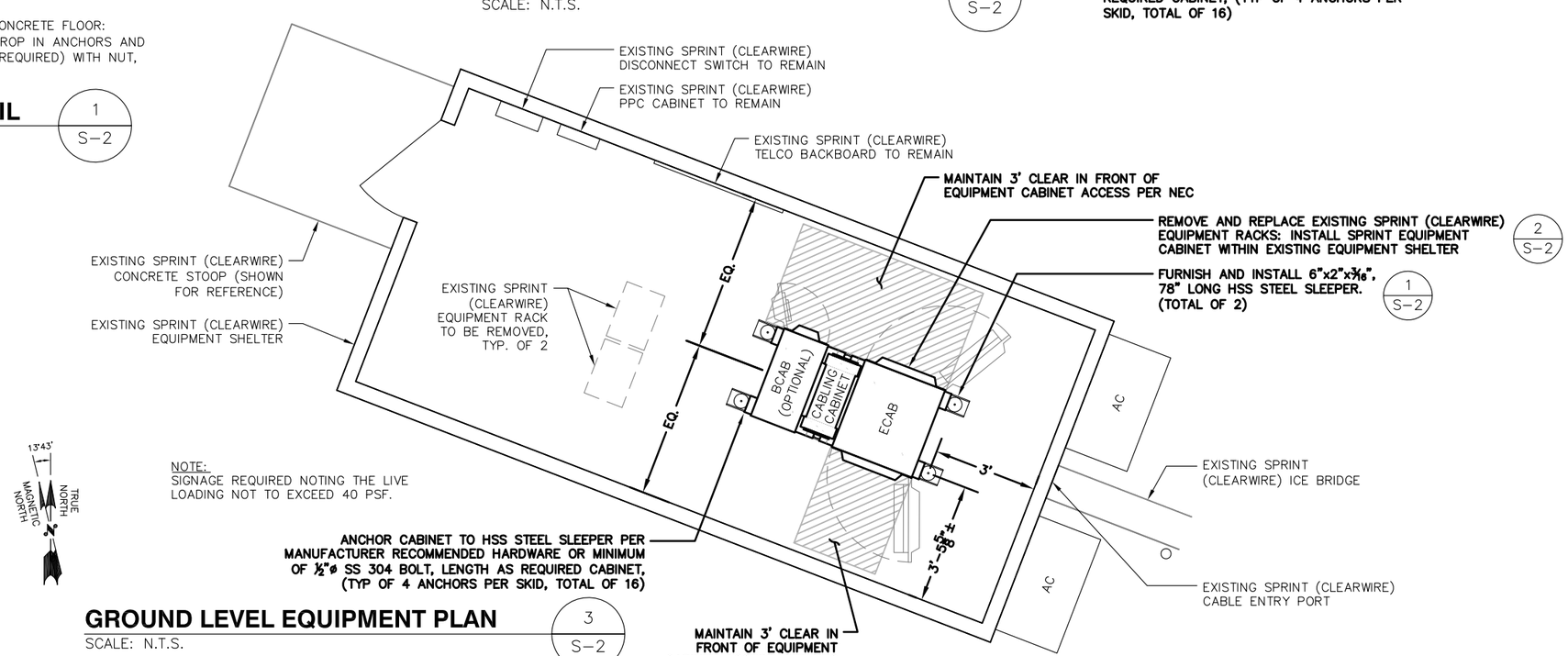
ELTEK EQUIPMENT CABINET

MANUF.	ELTEK
MODEL #	DO EXTERNAL ECAB & BCAB ASSEMBLY
HEIGHT	72.3"
WIDTH	59.5"
DEPTH	38"
WEIGHT	TBD

ELTEK EQUIPMENT CABINET DETAIL

2 / S-2

SCALE: N.T.S.



NOTE:
SIGNAGE REQUIRED NOTING THE LIVE LOADING NOT TO EXCEED 40 PSF.

GROUND LEVEL EQUIPMENT PLAN

3 / S-2

SCALE: N.T.S.

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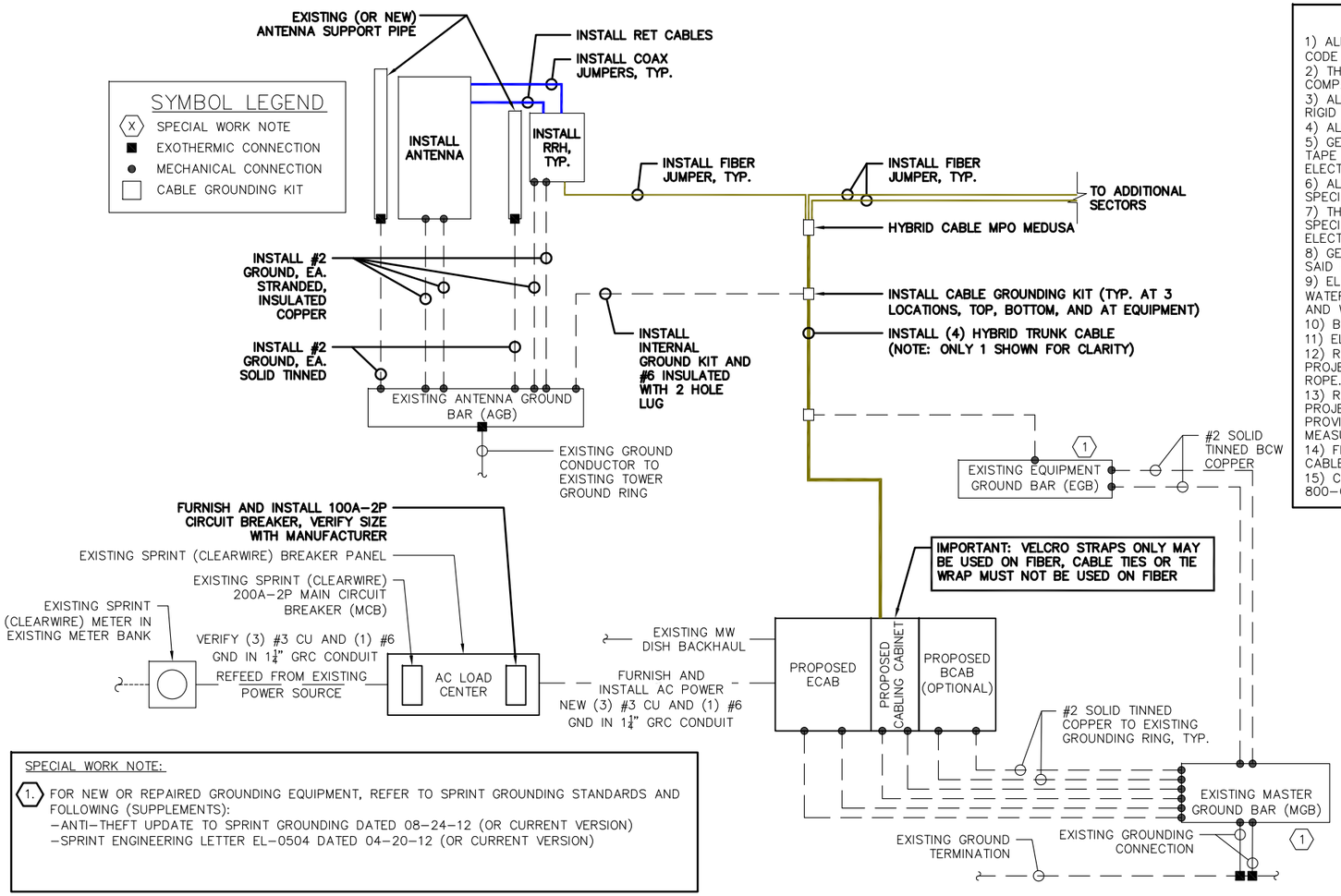
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
GROUND EQUIPMENT DETAILS

SHEET NUMBER
S-2



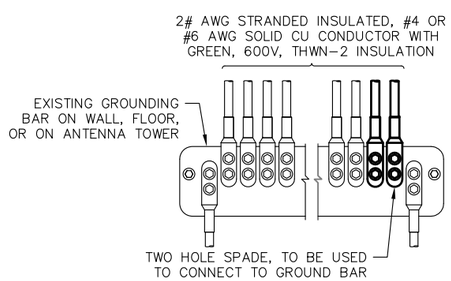
SPECIAL WORK NOTE:

1. 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)

TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

SCALE: N.T.S.

1 / E-1

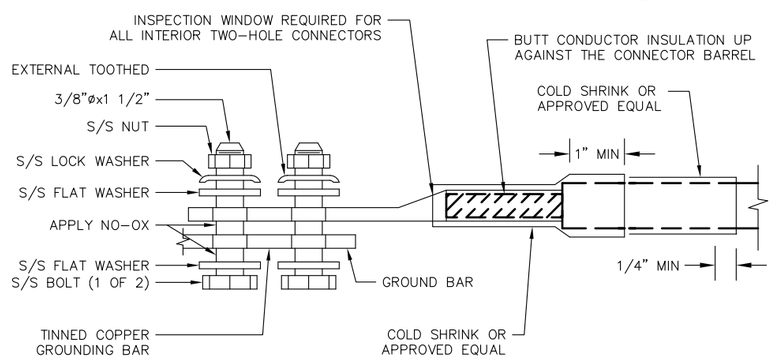


1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

SCALE: N.T.S.

2 / E-1



TWO HOLE LUG

SCALE: N.T.S.

3 / E-1

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)
    -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)

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

CHECKED BY: 12/7 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST

SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
ELECTRICAL AND GROUNDING DETAILS

SHEET NUMBER
E-1

SprintVision

RF Design Sheet

Site Identification	
Cascade	CTHFD0113
SMS Schedule ID	12323470
SMS Schedule Name	DO Macro Upgrade
PID	DOKU_CT52XC105
RRU OEM	Alcatel Lucent
Switch OEM	ALU
RFDS Issue Date	
RFDS Revision Date	2017-04-11 00:00:00.0
RFDS Revision	1

Filter Analysis Complete	YES
RFDS - Issue Date	
Design Status	Complete
Border Analysis Complete	YES
Project Description	DO Macro Upgrade- Add 800MHz (3G + 4G) and 1900 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	41.66641111
Longitude	-72.81280278
Market	Northern Connecticut
Region	Northeast
City	New Britain
State	CT
Zip Code	CT,06052
County	Hartford

2500MHz	
1900MHz	3
800MHz	3

Additional RF Notes

Replace Existing Antenna with 16 port KMW Panel Antenna for 1900 4T4R, 800 2T4R and 2500 8T8R.

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	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)	172.0144412	172.0144412	172.0144412	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	ETCR-654L12H6	ETCR-654L12H6	ETCR-654L12H6			
Weight (lbs)	85	85	85	N/A	N/A	N/A
Dimensions	84.9 x 21 x 6.3	84.9 x 21 x 6.3	84.9 x 21 x 6.3	N/A	N/A	N/A
Manufacturer	KMW	KMW	KMW	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	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)	172.0144412	172.0144412	172.0144412	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

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qty	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)	172.0144412	172.0144412	172.0144412	N/A	N/A	N/A
Antenna 1 Electrical DT	5	5	5	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

NOTE: RFDS PROVIDED BY SPRINT DATED 04/11/2017. EXCERPTS TAKEN DEPICT RELEVANT RF DESIGN INFORMATION. A&E VENDOR SCOPE OF WORK LIMITED TO DESIGN OF MECHANICAL/STRUCUTRAL EQUIPMENT ATTACHMENTS.

RF DATA SHEET

SCALE: N.T.S.

1
RF-1

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

GPS Antenna Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
GPS Antenna needed at site	1

BTS #1 Model	
Model Number	Ecab Eltek
Weight (Lbs.)	505
Dimensions (In.)	73.5 x 30 x 38
Manufacturer	Eltek
Number of BTS #1	1

Power Protection Cabinet Model	
Model Number	PPC w/ATS cabinet
Weight (Lbs.)	175
Dimensions (In.)	64.00 x 30.18 x 12.28
Manufacturer	
Power Protection Cabinet	1

BTS #2 Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
Needed at site	1

SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

- CONSTRUCTION STANDARDS: INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES – CURRENT VERSION, INCLUDING EXHIBITS A–M.
- CONSTRUCTION SPECIFICATIONS: CONSTRUCTION STANDARDS EXHIBIT A – STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES (CURRENT VERSION).
- GROUNDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN. GROUNDING STANDARDS (SUPPLEMENT): ANTI–THEFT UPDATE TO SPRINT GROUNDING 082412 AND SPRINT ENGINEERING LETTER EL–0504 DATED 04.20.12.
- WEATHER PROOFING STANDARDS: EXCERPT FROM CONSTRUCTION STANDARDS EXHIBIT A, SECTION 3.6 WEATHERPROOFING CONNECTORS AND GROUND KITS.
- COLOR CODING: SPRINT NEXTEL ANT AND LINE COLOR CODING PER SPRINT TS–0200 CURRENT VERSION.
- GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND CL HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT IN RFDS, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING SPRINT–PROVIDED CONTACT INFORMATION FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE ANTENNA AT SAME CL HEIGHT AS PLAN AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS–BUILT DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
- AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHZ, 1.9GHZ AND 2.5G. TEST INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET.
- GENERAL CONTRACTOR MUST INSURE THAT NO OBJECT IS LOCATED IN FRONT OF ANTENNA. THIS MEANS NO OBJECT IS TO BE LOCATED 45 DEGREES LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION.
- GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREES. DOWNTILT AND ROLL (LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS–BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS–BUILT SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL.
  HTTP://WWW.3ZTELECOM.COM/ANTENNA–ALIGNMENT–TOOL/.

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: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-4x45-1900	RRH-4x45-1900	RRH-4x45-1900	N/A	N/A	N/A
Weight (lbs)	69.5	69.5	69.5	N/A	N/A	N/A
Dimensions	25 x 12 x 12	25 x 12 x 12	25 x 12 x 12	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	1900 Hybrid_ALU	1900 Hybrid_ALU	1900 Hybrid_ALU	N/A	N/A	N/A
Weight (Lbs.)	1.1	1.1	1.1	N/A	N/A	N/A
Dimensions (In.)	1.25	1.25	1.25	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	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

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Hadley, MA 01035 Ph: (413)320-4918

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

CHECKED BY: 12/7 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST

SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

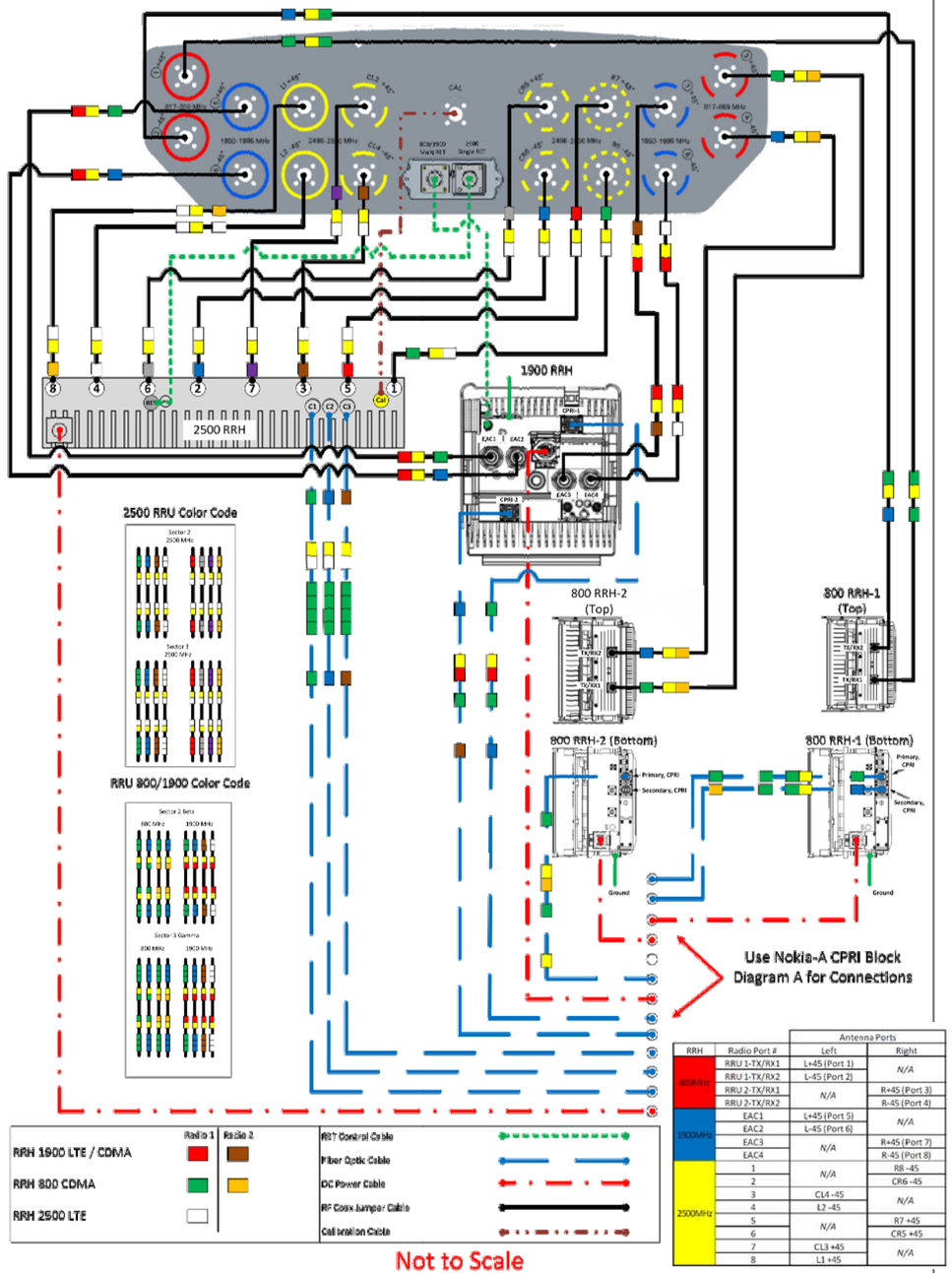
SHEET TITLE
RF DATA SHEET

SHEET NUMBER
RF-1

Prepared By	Creation Date	Revision Number
Mark Elliott	September 12, 2016	R-4
Approved By	Approval Date	
TBD	TBD	

Sprint

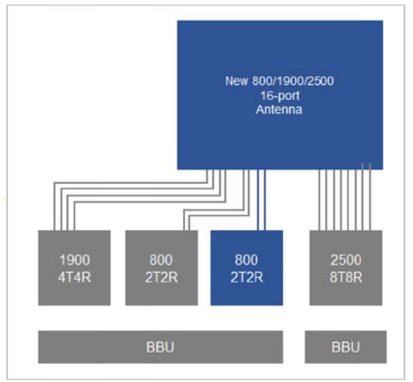
KMW 16 Port Nokia-A RRH 800, 1900, and 2500 (Sprint Scenario 4)



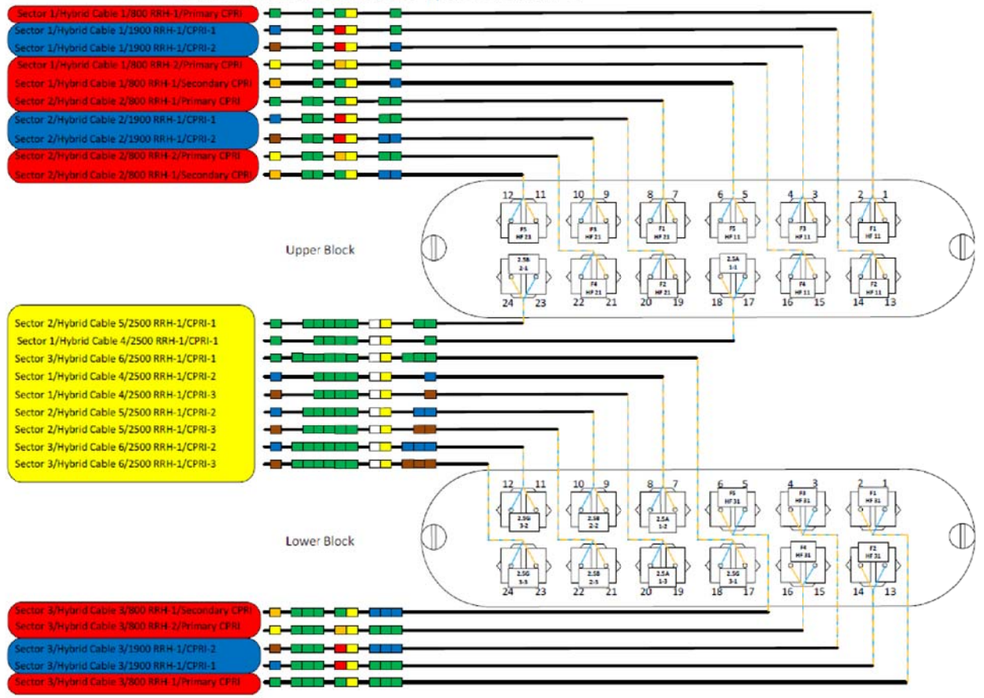
RRH	Radio Port #	Antenna Ports Left	Antenna Ports Right
800MHz	RRU 1-TX/RX1	L+45 (Port 1)	N/A
	RRU 1-TX/RX2	L-45 (Port 2)	
	RRU 2-TX/RX1	N/A	R+45 (Port 3)
	RRU 2-TX/RX2		R-45 (Port 4)
1900MHz	EAC1	L+45 (Port 5)	N/A
	EAC2	L-45 (Port 6)	
	EAC3	N/A	R+45 (Port 7)
	EAC4		R-45 (Port 8)
2500MHz	1	N/A	R8 -45
	2		CR6 -45
	3	CL4 -45	N/A
	4	L2 -45	
	5	N/A	R7 +45
	6		CR5 +45
	7	CL3 +45	N/A
	8	L1 +45	

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Gray	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Gray	Gray	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Gray	Gray	Gray

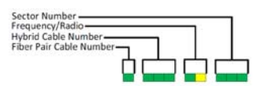
Future



CPRI Block Connections for Sprint Scenario 4



Frequency/Radio	Indicator	ID
800 #1	Yellow	Green
800 #2	Yellow	Orange
1900 #1	Yellow	Red
1900 #2	Yellow	Brown
1900 #3	Yellow	Blue
1900 #4	Yellow	Grey
2500 #1	Yellow	White
2500 #2	Yellow	Purple



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THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 12/7 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/07/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC105
SITE NAME:
NEW BRITAIN - WEST
SITE ADDRESS:
1 HARTFORD SQUARE
NEW BRITAIN, CT 06052

SHEET TITLE
PLUMBING DIAGRAM AND RAN WIRING

SHEET NUMBER
RF-2