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

September 15, 2017

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

Notice of Exempt Modification
500 Highland Avenue
Cheshire, CT 06410
Sprint Site #: NV2.5_CT43XC809
N 41° 30' 40.38"
W -72° 53' 54.69"

Dear Ms. Bachman:

Sprint currently maintains antennas at the 160-foot level of the existing 160-foot Monopole Tower at 500 Highland Avenue in Cheshire, CT. The tower is managed by SBA Site Management, LLC. The property is owned by the Town of Cheshire. Sprint now intends to add (3) newer technology cell antennas at the 160-foot level of the tower.

Please note: previous approval was given by the Siting Council on 8/22/14 under EM-SPRINT-025-140807. A Notification of Construction Not Complete was sent 13/3/15. Sprint now intends to resume construction. The proposed full scope of work is as follows:

Remove:
(3) Hybriflex

Remove and Replace:
Remove (6) 1-5/8" Lines / replace with (6) 1-1/4" lines

Install:
(3) RFS APXVTM14-C-I20 Panel Antennas
(4) RFS ACU-A20-N
(3) ALU 800 MHz Filters
(3) TD-RRH8x20 - 2500 MHz RRHs

Existing Equipment to Remain (Including entitlements):
(3) RFS APXVSPP18-C-A20 Panel Antennas
(3) ALU 1900 MHz RRHs
(3) ALU 800 MHz RRHs

A Site Management Agreement was made and entered into on June 12, 2003 by and between Tower Ventures II, LLC and the Town of Cheshire, CT. Assignment to SBA, as Tenant/Manager, was made October 20, 2008. The Agreement called for an existing tower to be removed and a replacement tower installed. The new tower was to house "operation of a 160' communications tower, including all radio equipment, equipment, foundations, cable and antenna mounts, fencing, landscaping, utilities, equipment buildings and shelters, supporting structures, guy wires and guy anchors, hangers, brackets, footing, platforms, spare parts and other equipment certain communications antennas, equipment and systems relating thereto... and the access and utilities easements to such Tower and Site Equipment..." The Town does not have record of any initial zoning decision. It has confirmed that building permits for the tower were issued in 2004, and concludes that the tower was approved under the jurisdiction of the CSC. However, we are unable to find such Decision within the Council's database. As such, all known conditions are met with this proposed modification.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town of Cheshire's Town Manager and representative for the Property Owner, the Town of Cheshire, Michael A. Milone, as well as to William S. Voelker, Town Planner. (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
kpelletier@sbasite.com

Attachments

cc: Michael A. Milone, Town Manager and Representative for the Town as Property Owner / with attachments
Town of Cheshire, 84 South Main Street, Cheshire, CT 06410
William S. Voelker, Town Planner / with attachments
Town of Cheshire, 84 South Main Street, Cheshire, CT 06410

POWER DENSITY

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**1.34 %**	Antenna B1 MPE%	**1.34 %**	Antenna C1 MPE%	**1.34 %**
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.97 %**	Antenna B2 MPE%	**0.97 %**	Antenna C2 MPE%	**0.97 %**

Site Composite MPE%	
Carrier	**MPE %**
SPRINT – Max per sector	**2.31 %**
MetroPCS	0.70 %
Town Emergency Services	0.55 %
T-Mobile	2.02 %
Verizon Wireless	3.35 %
Site Total MPE %:	**8.93 %**

SPRINT Sector A Total:	2.31 %
SPRINT Sector B Total:	2.31 %
SPRINT Sector C Total:	2.31 %
Site Total:	8.93 %

ORIGIN ID:BBFA (508) 614-0389
RICK WOODS
SBA NETWORK SERVICES INC
134 FLANDERS ROAD
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 15SEP17
ACTWGT: 1.00 LB
CAD: 105843304/INET3920

BILL SENDER

TO MICHAEL MILONE, TOWN MANAGER
TOWN OF CHESHIRE
84 SOUTH MAIN STREET

CHESHIRE CT 06410
(508) 251-0720 X 3804 REF: 1056920096089
INV:
PO: DEPT:

549J1/FF19/104C

FedEx Express

J172017062901uv

MON - 18 SEP 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7702 6793 5581

06410
CT-US BDL

SE HVNA

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ORIGIN ID:BBFA (508) 614-0389
RICK WOODS
SBA NETWORK SERVICES INC
134 FLANDERS ROAD
SUITE 125
WESTBOROUGH, MA 01581
UNITED STATES US

SHIP DATE: 15SEP17
ACTWGT: 1.00 LB
CAD: 105843304/INET3920

BILL SENDER

TO WILLIAM VOELKER, TOWN PLANNER
TOWN OF CHESHIRE
84 SOUTH MAIN STREET

CHESHIRE CT 06410
(508) 251-0720 X 3804 REF: 1056920096089
INV:
PO: DEPT:

549J1/FF19/104C

FedEx Express

J172017062901uv

MON - 18 SEP 10:30A
PRIORITY OVERNIGHT

TRK# 7702 6795 2919
0201

SE HVNA

06410
BDL
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The Assessor's office is responsible for the maintenance of records on the ownership of properties. Assessments are computed at 70% of the estimated market value of real property at the time of the last revaluation which was 2013.

Town of Cheshire

The bedding plant capital of Connecticut

Information on the Property Records for the Municipality of Cheshire was last updated on 8/31/2017.

* Please see attached email from Town Assessor *

Property Summary Information

Parcel Data And Values | Building | Outbuildings | Google Map

Parcel Information

Location:	490 HIGHLAND AVE	Property Use:	School	Primary Use:	Elementary School
Unique ID:	00478600	Map Block Lot:	51 2	Acres:	24.80
Zone:	C-1	Volume / Page:	0000/0000	Developers Map / Lot:	884315
Census:	3431				

Value Information

	Appraised Value	70% Assessed Value
Land	2,463,578	1,724,510
Buildings	17,288,518	12,101,960
Detached Outbuildings	60,912	42,640
Total	19,813,008	13,869,110

Owner's Information

Owner's Data

CHESHIRE TOWN OF
HIGHLAND SCHOOL
POLICE STATION
CHESHIRE, CT 06410

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

Print View (PrintPage.aspx?towncode=025&uniqueid=00478600)

Re: address / property card

Kri Pelletier

From: Waller, Diane <dwaller@cheshirect.org>
Sent: Thursday, August 31, 2017 8:52 AM
To: Kri Pelletier
Subject: RE: 500 Highland Ave - Property Card

Good Morning,

The address you want to put in is 490 Highland Ave. There are four properties on that lot (Police Station, School and Animal shelter, and the Police garage). The Police Station is where the antenna is which uses the mailing address of 500 Highland Ave. The Map is 51 and the Lot is 2. We do not have Blocks in Cheshire.

I just went on the website and it is there for you under the address of 490 Highland Ave.

If you need anything else let me know.

Diane Waller

Assessor
Town of Cheshire
Phone - 203-271-6620
Fax - 203-271-6615
Email - dwaller@cheshirect.org

From: Kri Pelletier [mailto:KPelletier@sbasite.com]
Sent: Wednesday, August 30, 2017 5:14 PM
To: Waller, Diane
Subject: 500 Highland Ave - Property Card

Good Evening Diane,

On behalf of Sprint, we're readying application materials for the CT Siting Council for antenna upgrades at the existing cell site located at 500 Highland Ave. The Siting Council now requires a property card showing property owner information when we apply for their review. A search of 500 Highland Ave (which we know to be owned by the Town) does not bring up property card information (please see screenshot below.)

Could you please supply a screenshot, or information by reply email stating the town to be the property owner (along with Map, Block, Lot) so that we can include with our submission to the Siting Council.

Thank you,

Re: Zoning Decision

Kri Pelletier

From: Voelker, William <wvoelker@cheshirect.org>
Sent: Thursday, August 31, 2017 11:32 AM
To: Kri Pelletier
Subject: RE: 500 Highland Avenue - Original Planning Docs (Spring CT43XC809)

Kri, we have searched extensively for a zoning file on this location, and we have none. We did check on when any building permits were issued for the electrical and the equipment structures, and these were issued in 2004. We conclude that this tower was approved under the jurisdiction of the Connecticut Siting Council. If there is anything else that you need, please give us a call at your convenience. Bill Voelker

William S. Voelker, AICP
Town Planner/Development Coordinator
Town of Cheshire
wvoelker@cheshirect.org
203 271-6670

From: Kri Pelletier [mailto:KPelletier@sbasite.com]
Sent: Monday, August 28, 2017 4:19 PM
To: Voelker, William
Subject: 500 Highland Avenue - Original Planning Docs (Spring CT43XC809)

Good Afternoon,

On behalf of Sprint, we are readying building permit application materials for minor upgrades to the existing cell site at 500 Highland Ave in Cheshire. Prior to applying for a building permit, we must secure authorization from the CT Siting Council, which now requires information on the original planning decision to allow a telecommunication site.

- Could you please provide a scanned copy of the original approval for this existing telecommunication site from the Town, as it appears to pre-date the Siting Council's jurisdiction over same.

Thank you,

Kri Pelletier
Property Specialist

SBA

SBA COMMUNICATIONS CORPORATION
134 Flanders Rd., Suite 125
Westborough, MA 01581

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: CT43XC809

Cheshire/Tower Ventures
500 Highland Avenue
Cheshire, CT 06410

September 7, 2017

EBI Project Number: 6217003983

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**8.93 %**

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

September 7, 2017

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

Emissions Analysis for Site: **CT43XC809 – Cheshire/Tower Ventures**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **500 Highland Avenue, Cheshire, 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.

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

Population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 850 MHz Band is approximately 567 $\mu W/cm^2$. The general population exposure limit for the 1900 MHz (PCS) and 2500 MHz (BRS) bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **500 Highland Avenue, Cheshire, 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 **RFS APXVSPP18-C-A20 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **157.5 feet** above ground level (AGL) for **Sector A**, **157.5 feet** above ground level (AGL) for **Sector B** and **157.5 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:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20	Make / Model:	RFS APXVSPP18-C-A20
Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd	Gain:	13.4 / 15.9 dBd
Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)	Frequency Bands	850 MHz / 1900 MHz (PCS)
Channel Count	10	Channel Count	10	Channel Count	10
Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts	Total TX Power(W):	220 Watts
ERP (W):	7,537.38	ERP (W):	7,537.38	ERP (W):	7,537.38
Antenna A1 MPE%	**1.34 %**	Antenna B1 MPE%	**1.34 %**	Antenna C1 MPE%	**1.34 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**	Height (AGL):	**157.5 feet**
Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)	Frequency Bands	2500 MHz (BRS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%	**0.97 %**	Antenna B2 MPE%	**0.97 %**	Antenna C2 MPE%	**0.97 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.31 %**
MetroPCS	0.70 %
Town Emergency Services	0.55 %
T-Mobile	2.02 %
Verizon Wireless	3.35 %
Site Total MPE %:	**8.93 %**

SPRINT Sector A Total:	2.31 %
SPRINT Sector B Total:	2.31 %
SPRINT Sector C Total:	2.31 %
Site Total:	8.93 %

SPRINT _ Max Values per Frequency Band / Technology Per Sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (µW/cm^2)	Frequency (MHz)	Allowable MPE (µW/cm^2)	Calculated % MPE
Sprint 850 MHz CDMA	1	437.55	157.5	0.69	850 MHz	567	0.12%
Sprint 850 MHz LTE	2	437.55	157.5	1.37	850 MHz	567	0.24%
Sprint 1900 MHz (PCS) CDMA	5	622.47	157.5	4.87	1900 MHz (PCS)	1000	0.49%
Sprint 1900 MHz (PCS) LTE	2	1,556.18	157.5	4.87	1900 MHz (PCS)	1000	0.49%
Sprint 2500 MHz (BRS) LTE	8	778.09	157.5	9.75	2500 MHz (BRS)	1000	0.97%
						Total:	**2.31%**

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:	2.31 %
Sector B:	2.31 %
Sector C:	2.31 %
SPRINT Maximum Total (per sector):	2.31 %
Site Total:	8.93 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **8.93 %** 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.

STRUCTURAL ANALYSIS REPORT

160' Monopole Tower

500 Highland Avenue
Cheshire, CT 06410

SBA Site Name: Cheshire
SBA Site Number: CT33762-M

Sprint Site Number: CT43XC809
Sprint Site Name: Cheshire/Tower Ventures

GPD Project Number: 2014778.33762.03

Analysis Results

Tower Components	76.7%	Sufficient
Foundation	42.8%	Sufficient

July 17, 2014

Respectfully submitted by:

STATE OF CONNECTICUT
JOHN N. KABAK
28836
LICENSED
PROFESSIONAL ENGINEER

7/17/14

John N. Kabak, P.E.
Connecticut #: 28836

520 South Main Street . Suite 2531 . Akron, Ohio 44311 . 330-572-2100 . Fax 330-572-2101 . www.GPDGroup.com
Glaus Pyle Schomer Burns and DeHaven, Inc.

TABLE OF CONTENTS

Executive Summary

The purpose of this analysis is to verify whether the existing monopole tower is structurally capable of carrying the proposed antenna and coax loads as specified by Sprint to SBA. This report was commissioned by Mr. Rick Woods of SBA Site Management.

The existing structure and its foundations have been analyzed using the following requirements:

Governing Code/s	TIA-222-G & 2005 CTBC
Wind Speed	105 MPH 3-Second Gust
Wind Speed w/ Ice	50 MPH 3-Second Gust
Radial Ice Thickness	3/4″
Structure Class	II
Exposure Class	B
Topographic Category	1

Conclusions & Recommendations

The designs of the tower and its foundation are sufficient for the proposed loading configuration considering the above analysis criteria and will not require modification.

Tower Description

The existing 160′ Monopole Tower is located in Cheshire, Connecticut. The tower was originally designed by Sabre in September of 2003. All structural information was obtained from a previous analysis performed by URS. The original design load for the tower was not available at the time of analysis.

Documents Provided:

Document Type	Remarks	Source
Previous Structural Analysis	URS Corporation Job #: 36917370, dated 10/10/2012	SBA
Previous Structural Analysis	Hudson Design Group dated 05/06/2013	SBA
Previous Structural Analysis	GPD Job #: 2014778.33762.02, dated 3/13/2014	SBA
Foundation Calculations	URS Corporation Job #: 36917370, dated 10/10/2012	SBA
Construction Drawings	Hudson Design Group, reviewed by SBA 7/10/2014	SBA

Tower Materials:

Structural Components	Material Strength
Pole	ASTM A572 (65 KSI Yield Strength)
Base Plate	ASTM A572 (60 KSI Yield Strength)
Anchor Rods	ASTM A615 (75 KSI Yield Strength)

Tower Loading

The following data shows the major loading that the tower supports. All existing/leased and proposed loading was provided by SBA.

Existing/Leased Loading

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Town of Cheshire	160	170	1		20' Omni	4	1/2	
		168	2	Decibel	DB224			
		166.17	1		6' Omni			
		160	3		T-Arm			
Sprint	160	162	3	RFS	APXVSPP18-C-A20	6 3	1-5/8 Hybriflex	
		160	1		LP Platform			
		158	6		RRH			
T-Mobile	152	149	3	Ericsson	AIR21 B2A/B4P	18	1-5/8	
			3	Ericsson	AIR21 B4A/B2P			
			3	RFS	APX16-PV-6PVL-C			
			3	Ericsson	KRY 112			
			3	RFS	ATMAA1412D			
		152	1		LP Platform			
Pocket	141.08	141.08	3	RFS	APXV18-206517S-C	6	1-5/8	1
			3		T-Arm			
AT&T	132	132	3	Kathrein	800 10121	12	1-5/8	
			2	Powerwave	P65-16-XL-2			
			2	KMW	AM-X-CD-16-65-00T-RET			
			2	Andrew	SBNM-1D6565C			
			12		TMA			
			1		LP Platform			
	125	125	6		RRH	1	3" Conduit	2
			1	Raycap	DC6-48-60-18-8F			
			1		Universal Ring Mount			
Verizon	122.5	122.5	3	Antel	BXA 70063/6CF	12 1	1-5/8 1-5/8 Fiber	
			3	Antel	BXA 185063/8CF			
			3	Andrew	HBX-6517DS-VTM			
			3	Andrew	LNX-6514DS-VTM			
			6	RFS	FD9R6004/2C-3L			
			3	Alcatel-Lucent	RRH2x40-AWS			
			1		DB-T1-6Z-8AB-0Z			
			1		LP Platform			
Town of Cheshire	89.08	89.08	1		Dipole Antenna	5	1/2	
			1		Collar Mount			
		81.25	1		Yagi Antenna			
		79.33	1		Yagi Antenna			
	83.17	83.17	1	PCTEL	GPS-TMG-HR-26N			
			1		Collar Mount			
		81.17	1		Yagi Antenna			

Notes:
1) Coax installed outside the monopole in a single row.
2) Conduit contains DC and power cables.

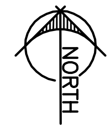
Final Proposed Loading Configuration

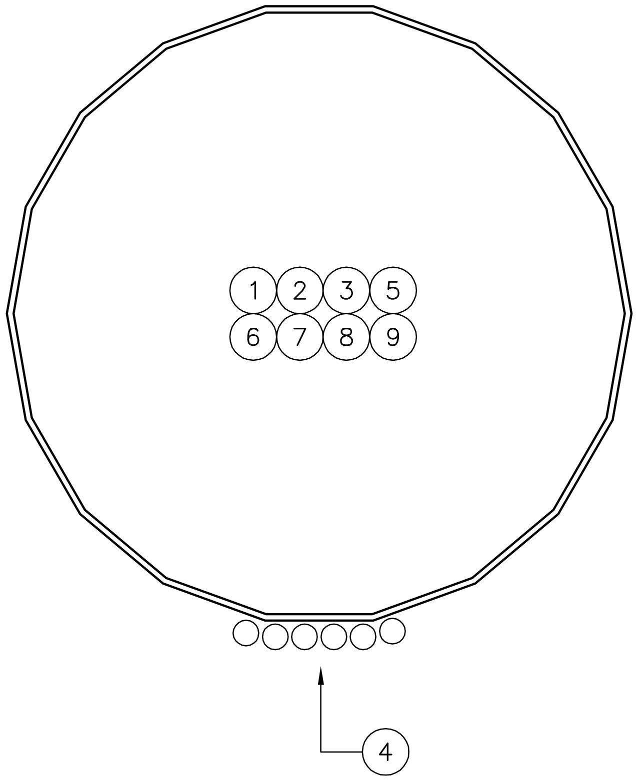
Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufact.	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Sprint	160	158	3	RFS	APXVSPP18-C-A20	6	1-1-/4	1
			3	RFS	APXVTM14-C-I20			
			4	RFS	ACU-A20-N			
			3	ALU	1900 MHz RRH			
			3	ALU	800 MHz RRH			
			3	ALU	2500 MHz RRH			
			3	ALU	800 MHz Filter			
		160	1		LP Platform			

Notes:

1)This loading represents the final configuration for Sprint. See the next page for the proposed coax layout.

Proposed Coax Configuration





#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Town of Cheshire	1/2"	4	160'	
2	Sprint	1-1/4" Fiber	6	160'	Proposed
3	T-Mobile	1-5/8"	18	152'	
4	Pocket	1-5/8"	6	141.08'	
5	AT&T	1-5/8"	6	132'	
6	AT&T	3" Conduit	1	125'	Carries DC and Power Cables
7	Verizon	1-5/8"	12	122.5'	
8	Verizon	1-5/8" Fiber	1	122.5'	
9	Town of Cheshire	1/2"	5	89.09'	

Assumptions

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the Existing/Reserved Loading and Proposed Loading Tables, and the specified documents.
4) All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
6) The proposed coax shall be installed internal to the monopole.
7) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
8) The existing loads on the tower were modeled from the previous structural analyses.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD Group should be allowed to review any new information to determine its effect on the structural integrity of the tower.

Tower Section Results

Capacity Summary of Structural Components

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$øP_{allow}$ K	% Capacity	Pass/ Fail
L1	160 - 146.5	Pole	TP20.91x16.75x0.1875	1	-4.72	865.69	21.0	Pass
L2	146.5 - 95.75	Pole	TP36.16x19.6876x0.25	2	-17.17	1841.20	76.7	Pass
L3	95.75 - 46.75	Pole	TP50.76x34.2745x0.3125	3	-29.70	3077.94	75.6	Pass
L4	46.75 - 0	Pole	TP64.53x48.1321x0.375	4	-49.06	4662.89	66.1	Pass
							Summary	
						Pole (L2)	76.7	Pass
						RATING =	**76.7**	**Pass**

Additional Capacities

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
	Anchor Rods	0	67.4	Pass
	Base Plate	0	42.0	Pass
	Tower Base Foundation	0	42.8	Pass

Disclaimer of Warranties

GPD GROUP has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD GROUP in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. All tower components have been assumed to only resist dead loads when no other loads are applied. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD GROUP does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD GROUP provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the feasibility of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD GROUP, but are beyond the scope of this report.

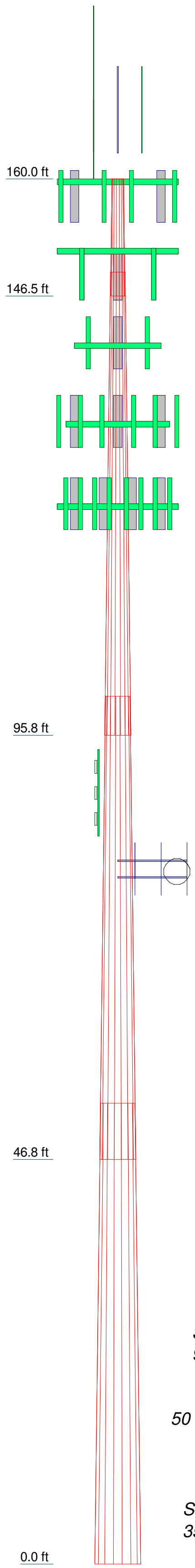
Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

GPD GROUP makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD GROUP will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD GROUP pursuant to this report will be limited to the total fee received for preparation of this report.

TNX TOWER OUTPUT

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	13.50	18	0.1875	2.75	16.7500	20.9100	A572-65	0.5
2	53.50	18	0.2500	4.50	19.6876	36.1600	A572-65	4.0
3	53.50	18	0.3125	6.50	34.2745	50.7600	A572-65	7.6
4	53.25	18	0.3750		48.1321	64.5300	A572-65	12.1
								24.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Omni (3" Diam)	160	800 10121 w/ Mount Pipe	132
DB224	160	SBNH-1D6565C w/ Mount Pipe	132
DB224	160	P65-15-XLH-RR w/ Mount Pipe	132
6' Omni	160	800 10121 w/ Mount Pipe	132
MTS 36" Standoff (3)	160	SBNH-1D6565C w/ Mount Pipe	132
APXVSPP18-C-A20 w/ Mount Pipe	160	AM-X-CD-16-65-00T-RET w/ Mount Pipe	132
APXVSPP18-C-A20 w/ Mount Pipe	160	800 10121 w/ Mount Pipe	132
APXVSPP18-C-A20 w/ Mount Pipe	160	AM-X-CD-16-65-00T-RET w/ Mount Pipe	132
APXVTM14-C-120 w/ Mount Pipe	160	P65-15-XLH-RR w/ Mount Pipe	132
APXVTM14-C-120 w/ Mount Pipe	160	(4) TMA	132
APXVTM14-C-120 w/ Mount Pipe	160	(4) TMA	132
Mount Pipe	160	(4) TMA	132
Mount Pipe	160	Mount Pipe	132
Mount Pipe	160	Mount Pipe	132
(2) ACU-A20-N	160	Mount Pipe	132
ACU-A20-N	160	Sabre 12' LP Platform	132
ACU-A20-N	160	(2) RRH	125
1900MHz RRH	160	(2) RRH	125
1900MHz RRH	160	(2) RRH	125
1900MHz RRH	160	DC6-48-60-18-8F	125
RRH 800 MHz	160	Universal Ring Mount w/8" Standoff	125
RRH 800 MHz	160	BXA-70063/6CF w/ Mount Pipe	122.5
RRH 800 MHz	160	BXA-70063/6CF w/ Mount Pipe	122.5
RRH 2500MHz	160	BXA-70063/6CF w/ Mount Pipe	122.5
RRH 2500MHz	160	BXA-185063/8CF w/ Mount Pipe	122.5
RRH 2500MHz	160	BXA-185063/8CF w/ Mount Pipe	122.5
800 MHz Filter	160	BXA-185063/8CF w/ Mount Pipe	122.5
800 MHz Filter	160	(2) FD9R6004/2C-3L	122.5
800 MHz Filter	160	(2) FD9R6004/2C-3L	122.5
Sabre 12' LP Platform	160	(2) FD9R6004/2C-3L	122.5
AIR21 B2A/B4P w/ mount pipe	152	HBX-6517DS-VTM w/ Mount Pipe	122.5
AIR21 B4A/B2P w/ mount pipe	152	HBX-6517DS-VTM w/ Mount Pipe	122.5
APX16-PV-6PVL-C w/ Mount Pipe	152	HBX-6517DS-VTM w/ Mount Pipe	122.5
AIR21 B2A/B4P w/ mount pipe	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
AIR21 B4A/B2P w/ mount pipe	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
APX16-PV-6PVL-C w/ Mount Pipe	152	LNX-6514DS-VTM w/ Mount Pipe	122.5
AIR21 B2A/B4P w/ mount pipe	152	RRH2x40-AWS	122.5
AIR21 B4A/B2P w/ mount pipe	152	RRH2x40-AWS	122.5
APX16-PV-6PVL-C w/ Mount Pipe	152	RRH2x40-AWS	122.5
KRY 112	152	DB-T1-6Z-8AB-0Z	122.5
ATMAA1412D	152	MTS 14.5' LP Platform	122.5
KRY 112	152	3' Yagi	89.08
ATMAA1412D	152	3' Yagi	89.08
KRY 112	152	Andrew Collar Mount	89.08
ATMAA1412D	152	14' Dipole	89.08
Sabre 12' LP Platform	152	3' Yagi	83.17
APXV18-206517S-C w/ Mount Pipe	141.08	Andrew Collar Mount	83.17
APXV18-206517S-C w/ Mount Pipe	141.08	GPS-TMG-HR-26N	83.17
APXV18-206517S-C w/ Mount Pipe	141.08		
MTS 36" Standoff (3)	141.08		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

ALL REACTIONS ARE FACTORED

AXIAL 84 K

SHEAR 9 K

MOMENT 1016 kip-ft

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 49 K

SHEAR 35 K

MOMENT 4010 kip-ft

TORQUE 1 kip-ft

REACTIONS - 105 mph WIND

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 76.7%

GPD Group
520 South Main St Suite 2531
Akron, Ohio 44311
Phone: (330) 572-2100
FAX: (330) 572-2103

Job: **CT33762-M Cheshire, CT**		
Project: **2014778.33762.03**		
Client: SBA	Drawn by: ebecker	App'd:
Code: TIA-222-G	Date: 07/17/14	Scale: NTS
Path: T:\SBA\33762\03 SA Sprint 2.5\tnx\CT33762_G Code.eri		Dwg No. E-1

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- Basic wind speed of 105 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
Use Clear Spans For KL/r
Retension Guys To Initial Tension
√ Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
SR Members Have Cut Ends
Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Use TIA-222-G Tension Splice Capacity Exemption

Treat Feedline Bundles As Cylinder
Use ASCE 10 X-Brace Ly Rules
Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
SR Leg Bolts Resist Compression
All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feedline Torque
Include Angle Block Shear Check

Poles

√ Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	*Sector*	*Component Type*	*Placement* *ft*	*Total Number*	*Number Per Row*	*Start/End Position*	*Width or Diameter* *in*	*Perimeter* *in*	*Weight* *plf*
LDF7-50A (1-5/8 FOAM)	C	Surface Ar (CaAa)	141.08 - 8.00	6	6	0.000 0.000	1.0000		0.82
Safety Line (3/8")	B	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.000 0.000	0.3750		0.22
Step Pegs	B	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.000 0.000	0.8000		2.72

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	160.00 - 8.00	4	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF6-50A (1-1/4 FOAM)	B	No	Inside Pole	160.00 - 8.00	6	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	152.00 - 8.00	18	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
LDF7-50A (1-5/8 FOAM)	B	No	Inside Pole	132.00 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
3" Innerduct	C	No	Inside Pole	125.00 - 8.00	1	No Ice	0.00	0.50
						1/2" Ice	0.00	0.50
						1" Ice	0.00	0.50
LDF7-50A (1-5/8 FOAM)	A	No	Inside Pole	122.50 - 8.00	12	No Ice	0.00	0.82
						1/2" Ice	0.00	0.82
						1" Ice	0.00	0.82
HB158-1-08U8-S8J18 (1-5/8")	A	No	Inside Pole	122.50 - 8.00	1	No Ice	0.00	1.30
						1/2" Ice	0.00	1.30
						1" Ice	0.00	1.30
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	89.08 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	81.25 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	B	No	Inside Pole	79.33 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	C	No	Inside Pole	83.17 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	Inside Pole	81.17 - 8.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.15
						1" Ice	0.00	0.15

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
20' Omni (3" Diam)	C	From Leg	2.50	0.0000	160.00	No Ice	6.00	6.00	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			10.00			1" Ice	10.08	10.08	0.14
DB224	A	From Leg	2.50	0.0000	160.00	No Ice	3.15	3.15	0.03
			0.00			1/2" Ice	5.67	5.67	0.04
			8.00			1" Ice	8.19	8.19	0.05
DB224	B	From Leg	2.50	0.0000	160.00	No Ice	3.15	3.15	0.03
			0.00			1/2" Ice	5.67	5.67	0.04
			8.00			1" Ice	8.19	8.19	0.05

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert (ft, ft, ft)	Azimuth Adjustment (°)	Placement (ft)		C_AA_A Front (ft^2)	C_AA_A Side (ft^2)	Weight (K)
6' Omni	C	From Leg	2.50	0.0000	160.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.04
			6.17			1" Ice	2.50	2.50	0.06
MTS 36" Standoff (3)	C	None		0.0000	160.00	No Ice	2.64	2.64	0.09
						1/2" Ice	4.10	4.10	0.13
						1" Ice	5.56	5.56	0.17
***									
APXVSPP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	8.26	6.71	0.08
			0.00			1/2" Ice	8.81	7.66	0.14
			-2.00			1" Ice	9.36	8.49	0.22
APXVSPP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	8.26	6.71	0.08
			0.00			1/2" Ice	8.81	7.66	0.14
			-2.00			1" Ice	9.36	8.49	0.22
APXVSPP18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	8.26	6.71	0.08
			0.00			1/2" Ice	8.81	7.66	0.14
			-2.00			1" Ice	9.36	8.49	0.22
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			-2.00			1" Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			-2.00			1" Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	7.13	4.96	0.08
			0.00			1/2" Ice	7.66	5.75	0.13
			-2.00			1" Ice	8.18	6.47	0.19
Mount Pipe	A	From Leg	4.00	0.0000	160.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			-2.00			1" Ice	1.57	1.57	0.04
Mount Pipe	B	From Leg	4.00	0.0000	160.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			-2.00			1" Ice	1.57	1.57	0.04
Mount Pipe	C	From Leg	4.00	0.0000	160.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			-2.00			1" Ice	1.57	1.57	0.04
(2) ACU-A20-N	A	From Leg	4.00	0.0000	160.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			-2.00			1" Ice	0.17	0.25	0.00
ACU-A20-N	B	From Leg	4.00	0.0000	160.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			-2.00			1" Ice	0.17	0.25	0.00
ACU-A20-N	C	From Leg	4.00	0.0000	160.00	No Ice	0.08	0.14	0.00
			0.00			1/2" Ice	0.12	0.19	0.00
			-2.00			1" Ice	0.17	0.25	0.00
1900MHz RRH	A	From Leg	4.00	0.0000	160.00	No Ice	2.94	1.19	0.06
			0.00			1/2" Ice	3.17	1.35	0.08
			-2.00			1" Ice	3.41	1.52	0.11
1900MHz RRH	B	From Leg	4.00	0.0000	160.00	No Ice	2.94	1.19	0.06
			0.00			1/2" Ice	3.17	1.35	0.08
			-2.00			1" Ice	3.41	1.52	0.11
1900MHz RRH	C	From Leg	4.00	0.0000	160.00	No Ice	2.94	1.19	0.06
			0.00			1/2" Ice	3.17	1.35	0.08
			-2.00			1" Ice	3.41	1.52	0.11
RRH 800 MHz	A	From Leg	4.00	0.0000	160.00	No Ice	2.01	1.67	0.05
			0.00			1/2" Ice	2.21	1.86	0.06
			-2.00			1" Ice	2.42	2.06	0.08
RRH 800 MHz	B	From Leg	4.00	0.0000	160.00	No Ice	2.01	1.67	0.05
			0.00			1/2" Ice	2.21	1.86	0.06

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			-2.00			1" Ice	2.42	2.06	0.08
RRH 800 MHz	C	From Leg	4.00	0.0000	160.00	No Ice	2.01	1.67	0.05
			0.00			1/2" Ice	2.21	1.86	0.06
			-2.00			1" Ice	2.42	2.06	0.08
RRH 2500MHz	A	From Leg	4.00	0.0000	160.00	No Ice	3.76	2.23	0.06
			0.00			1/2" Ice	4.03	2.46	0.08
			-2.00			1" Ice	4.30	2.69	0.11
RRH 2500MHz	B	From Leg	4.00	0.0000	160.00	No Ice	3.76	2.23	0.06
			0.00			1/2" Ice	4.03	2.46	0.08
			-2.00			1" Ice	4.30	2.69	0.11
RRH 2500MHz	C	From Leg	4.00	0.0000	160.00	No Ice	3.76	2.23	0.06
			0.00			1/2" Ice	4.03	2.46	0.08
			-2.00			1" Ice	4.30	2.69	0.11
800 MHz Filter	A	From Leg	4.00	0.0000	160.00	No Ice	0.49	0.48	0.01
			0.00			1/2" Ice	0.60	0.59	0.01
			-2.00			1" Ice	0.71	0.70	0.02
800 MHz Filter	B	From Leg	4.00	0.0000	160.00	No Ice	0.49	0.48	0.01
			0.00			1/2" Ice	0.60	0.59	0.01
			-2.00			1" Ice	0.71	0.70	0.02
800 MHz Filter	C	From Leg	4.00	0.0000	160.00	No Ice	0.49	0.48	0.01
			0.00			1/2" Ice	0.60	0.59	0.01
			-2.00			1" Ice	0.71	0.70	0.02
Sabre 12' LP Platform	A	None		0.0000	160.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
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AIR21 B2A/B4P w/ mount	A	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.09
pipe			0.00			1/2" Ice	7.08	6.27	0.14
			-3.00			1" Ice	7.55	7.01	0.21
AIR21 B4A/B2P w/ mount	A	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.10
pipe			0.00			1/2" Ice	7.08	6.27	0.16
			-3.00			1" Ice	7.55	7.01	0.22
APX16-PV-6PVL-C w/	A	From Leg	4.00	0.0000	152.00	No Ice	6.79	3.05	0.06
Mount Pipe			0.00			1/2" Ice	7.23	3.65	0.11
			-3.00			1" Ice	7.68	4.27	0.16
AIR21 B2A/B4P w/ mount	B	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.09
pipe			0.00			1/2" Ice	7.08	6.27	0.14
			-3.00			1" Ice	7.55	7.01	0.21
AIR21 B4A/B2P w/ mount	B	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.10
pipe			0.00			1/2" Ice	7.08	6.27	0.16
			-3.00			1" Ice	7.55	7.01	0.22
APX16-PV-6PVL-C w/	B	From Leg	4.00	0.0000	152.00	No Ice	6.79	3.05	0.06
Mount Pipe			0.00			1/2" Ice	7.23	3.65	0.11
			-3.00			1" Ice	7.68	4.27	0.16
AIR21 B2A/B4P w/ mount	C	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.09
pipe			0.00			1/2" Ice	7.08	6.27	0.14
			-3.00			1" Ice	7.55	7.01	0.21
AIR21 B4A/B2P w/ mount	C	From Leg	4.00	0.0000	152.00	No Ice	6.61	5.54	0.10
pipe			0.00			1/2" Ice	7.08	6.27	0.16
			-3.00			1" Ice	7.55	7.01	0.22
APX16-PV-6PVL-C w/	C	From Leg	4.00	0.0000	152.00	No Ice	6.79	3.05	0.06
Mount Pipe			0.00			1/2" Ice	7.23	3.65	0.11
			-3.00			1" Ice	7.68	4.27	0.16
KRY 112	A	From Leg	4.00	0.0000	152.00	No Ice	0.53	0.42	0.01
			0.00			1/2" Ice	0.63	0.53	0.02
			-3.00			1" Ice	0.75	0.64	0.02
ATMAA1412D	A	From Leg	4.00	0.0000	152.00	No Ice	1.17	0.47	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	1.31	0.57	0.02
			-3.00			1" Ice	1.47	0.69	0.03
KRY 112	B	From Leg	4.00	0.0000	152.00	No Ice	0.53	0.42	0.01
			0.00			1/2" Ice	0.63	0.53	0.02
			-3.00			1" Ice	0.75	0.64	0.02
ATMAA1412D	B	From Leg	4.00	0.0000	152.00	No Ice	1.17	0.47	0.02
			0.00			1/2" Ice	1.31	0.57	0.02
			-3.00			1" Ice	1.47	0.69	0.03
KRY 112	C	From Leg	4.00	0.0000	152.00	No Ice	0.53	0.42	0.01
			0.00			1/2" Ice	0.63	0.53	0.02
			-3.00			1" Ice	0.75	0.64	0.02
ATMAA1412D	C	From Leg	4.00	0.0000	152.00	No Ice	1.17	0.47	0.02
			0.00			1/2" Ice	1.31	0.57	0.02
			-3.00			1" Ice	1.47	0.69	0.03
Sabre 12' LP Platform	C	None		0.0000	152.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
***									
APXV18-206517S-C w/	A	From Leg	3.00	0.0000	141.08	No Ice	5.17	4.46	0.05
Mount Pipe			0.00			1/2" Ice	5.62	5.39	0.09
			0.00			1" Ice	6.08	6.20	0.14
APXV18-206517S-C w/	B	From Leg	3.00	0.0000	141.08	No Ice	5.17	4.46	0.05
Mount Pipe			0.00			1/2" Ice	5.62	5.39	0.09
			0.00			1" Ice	6.08	6.20	0.14
APXV18-206517S-C w/	C	From Leg	3.00	0.0000	141.08	No Ice	5.17	4.46	0.05
Mount Pipe			0.00			1/2" Ice	5.62	5.39	0.09
			0.00			1" Ice	6.08	6.20	0.14
MTS 36" Standoff (3)	B	None		0.0000	141.08	No Ice	2.64	2.64	0.09
						1/2" Ice	4.10	4.10	0.13
						1" Ice	5.56	5.56	0.17
***									
800 10121 w/ Mount Pipe	A	From Leg	4.00	0.0000	132.00	No Ice	6.27	5.19	0.08
			0.00			1/2" Ice	7.05	6.36	0.13
			0.00			1" Ice	7.78	7.39	0.19
SBNH-1D6565C w/ Mount	A	From Leg	4.00	0.0000	132.00	No Ice	11.45	9.60	0.09
Pipe			0.00			1/2" Ice	12.06	11.02	0.18
			0.00			1" Ice	12.69	12.29	0.27
P65-15-XLH-RR w/ Mount	A	From Leg	4.00	0.0000	132.00	No Ice	5.97	4.05	0.06
Pipe			0.00			1/2" Ice	6.39	4.64	0.10
			0.00			1" Ice	6.81	5.25	0.15
800 10121 w/ Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	6.27	5.19	0.08
			0.00			1/2" Ice	7.05	6.36	0.13
			0.00			1" Ice	7.78	7.39	0.19
SBNH-1D6565C w/ Mount	B	From Leg	4.00	0.0000	132.00	No Ice	11.45	9.60	0.09
Pipe			0.00			1/2" Ice	12.06	11.02	0.18
			0.00			1" Ice	12.69	12.29	0.27
AM-X-CD-16-65-00T-RET	B	From Leg	4.00	0.0000	132.00	No Ice	8.55	6.65	0.09
w/ Mount Pipe			0.00			1/2" Ice	9.18	7.68	0.16
			0.00			1" Ice	9.79	8.56	0.23
800 10121 w/ Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	6.27	5.19	0.08
			0.00			1/2" Ice	7.05	6.36	0.13
			0.00			1" Ice	7.78	7.39	0.19
AM-X-CD-16-65-00T-RET	C	From Leg	4.00	0.0000	132.00	No Ice	8.55	6.65	0.09
w/ Mount Pipe			0.00			1/2" Ice	9.18	7.68	0.16
			0.00			1" Ice	9.79	8.56	0.23
P65-15-XLH-RR w/ Mount	C	From Leg	4.00	0.0000	132.00	No Ice	5.97	4.05	0.06
Pipe			0.00			1/2" Ice	6.39	4.64	0.10

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* °	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			0.00			1" Ice	6.81	5.25	0.15
(4) TMA	A	From Leg	4.00	0.0000	132.00	No Ice	1.91	0.95	0.03
			0.00			1/2" Ice	2.09	1.09	0.04
			0.00			1" Ice	2.27	1.23	0.05
(4) TMA	B	From Leg	4.00	0.0000	132.00	No Ice	1.91	0.95	0.03
			0.00			1/2" Ice	2.09	1.09	0.04
			0.00			1" Ice	2.27	1.23	0.05
(4) TMA	C	From Leg	4.00	0.0000	132.00	No Ice	1.91	0.95	0.03
			0.00			1/2" Ice	2.09	1.09	0.04
			0.00			1" Ice	2.27	1.23	0.05
Mount Pipe	A	From Leg	4.00	0.0000	132.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.57	1.57	0.04
Mount Pipe	B	From Leg	4.00	0.0000	132.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			1" Ice	1.57	1.57	0.04
Mount Pipe	C	From Leg	4.00	0.0000	132.00	No Ice	1.43	1.43	0.02
			0.00			1/2" Ice	1.50	1.50	0.03
			0.00			□□□□	1.57	1.57	0.04
Sabre 12' LP Platform	C	None		0.0000	132.00	No Ice	28.47	28.47	1.12
						1/2" Ice	33.59	33.59	1.51
						1" Ice	38.71	38.71	1.91
***									
(2) RRH	A	From Leg	1.00	0.0000	125.00	No Ice	2.94	1.25	0.10
			0.00			1/2" Ice	3.17	1.41	0.12
			0.00			1" Ice	3.40	1.57	0.14
(2) RRH	B	From Leg	1.00	0.0000	125.00	No Ice	2.94	1.25	0.10
			0.00			1/2" Ice	3.17	1.41	0.12
			0.00			1" Ice	3.40	1.57	0.14
(2) RRH	C	From Leg	1.00	0.0000	125.00	No Ice	2.94	1.25	0.10
			0.00			1/2" Ice	3.17	1.41	0.12
			0.00			1" Ice	3.40	1.57	0.14
DC6-48-60-18-8F	C	From Leg	1.00	0.0000	125.00	No Ice	2.57	2.57	0.02
			0.00			1/2" Ice	2.80	2.80	0.04
			0.00			1" Ice	3.04	3.04	0.07
Universal Ring Mount w/8" Standoff	C	None		0.0000	125.00	No Ice	1.00	1.00	0.05
						1/2" Ice	1.50	1.50	0.07
						1" Ice	2.00	2.00	0.09
***									
BXA-70063/6CF w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	122.50	No Ice	8.23	5.66	0.05
			0.00			1/2" Ice	8.99	6.92	0.11
			0.00			1" Ice	9.71	8.04	0.18
BXA-70063/6CF w/ Mount Pipe	B	From Centroid-Leg	4.00	0.0000	122.50	No Ice	8.23	5.66	0.05
			0.00			1/2" Ice	8.99	6.92	0.11
			0.00			1" Ice	9.71	8.04	0.18
BXA-70063/6CF w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	122.50	No Ice	8.23	5.66	0.05
			0.00			1/2" Ice	8.99	6.92	0.11
			0.00			1" Ice	9.71	8.04	0.18
BXA-185063/8CF w/ Mount Pipe	A	From Centroid-Leg	4.00	0.0000	122.50	No Ice	3.64	3.46	0.04
			0.00			1/2" Ice	4.26	4.48	0.07
			0.00			1" Ice	4.79	5.23	0.11
BXA-185063/8CF w/ Mount Pipe	B	From Centroid-Leg	4.00	0.0000	122.50	No Ice	3.64	3.46	0.04
			0.00			1/2" Ice	4.26	4.48	0.07
			0.00			1" Ice	4.79	5.23	0.11
BXA-185063/8CF w/ Mount Pipe	C	From Centroid-Leg	4.00	0.0000	122.50	No Ice	3.64	3.46	0.04
			0.00			1/2" Ice	4.26	4.48	0.07
			0.00			1" Ice	4.79	5.23	0.11

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		C_AA_A *Front*	C_AA_A *Side*	*Weight*
			ft *ft* *ft*	°	*ft*		*ft²*	*ft²*	*K*
(2) FD9R6004/2C-3L	A	From	4.00	0.0000	122.50	No Ice	0.37	0.08	0.00
		Centroid-Le	0.00			1/2" Ice	0.45	0.14	0.01
		g	0.00			1" Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	B	From	4.00	0.0000	122.50	No Ice	0.37	0.08	0.00
		Centroid-Le	0.00			1/2" Ice	0.45	0.14	0.01
		g	0.00			1" Ice	0.54	0.20	0.01
(2) FD9R6004/2C-3L	C	From	4.00	0.0000	122.50	No Ice	0.37	0.08	0.00
		Centroid-Le	0.00			1/2" Ice	0.45	0.14	0.01
		g	0.00			1" Ice	0.54	0.20	0.01
HBX-6517DS-VTM w/	A	From	4.00	0.0000	122.50	No Ice	5.30	4.73	0.04
Mount Pipe		Centroid-Le	0.00			1/2" Ice	5.77	5.68	0.08
		g	0.00			1" Ice	6.25	6.50	0.13
HBX-6517DS-VTM w/	B	From	4.00	0.0000	122.50	No Ice	5.30	4.73	0.04
Mount Pipe		Centroid-Le	0.00			1/2" Ice	5.77	5.68	0.08
		g	0.00			1" Ice	6.25	6.50	0.13
HBX-6517DS-VTM w/	C	From	4.00	0.0000	122.50	No Ice	5.30	4.73	0.04
Mount Pipe		Centroid-Le	0.00			1/2" Ice	5.77	5.68	0.08
		g	0.00			1" Ice	6.25	6.50	0.13
LNX-6514DS-VTM w/	A	From	4.00	0.0000	122.50	No Ice	8.41	6.83	0.06
Mount Pipe		Centroid-Le	0.00			1/2" Ice	8.96	7.79	0.13
		g	0.00			1" Ice	9.52	8.62	0.20
LNX-6514DS-VTM w/	B	From	4.00	0.0000	122.50	No Ice	8.41	6.83	0.06
Mount Pipe		Centroid-Le	0.00			1/2" Ice	8.96	7.79	0.13
		g	0.00			1" Ice	9.52	8.62	0.20
LNX-6514DS-VTM w/	C	From	4.00	0.0000	122.50	No Ice	8.41	6.83	0.06
Mount Pipe		Centroid-Le	0.00			1/2" Ice	8.96	7.79	0.13
		g	0.00			1" Ice	9.52	8.62	0.20
RRH2x40-AWS	A	From	4.00	0.0000	122.50	No Ice	2.52	1.59	0.04
		Centroid-Le	0.00			1/2" Ice	2.75	1.80	0.06
		g	0.00			1" Ice	2.99	2.01	0.08
RRH2x40-AWS	B	From	4.00	0.0000	122.50	No Ice	2.52	1.59	0.04
		Centroid-Le	0.00			1/2" Ice	2.75	1.80	0.06
		g	0.00			1" Ice	2.99	2.01	0.08
RRH2x40-AWS	C	From	4.00	0.0000	122.50	No Ice	2.52	1.59	0.04
		Centroid-Le	0.00			1/2" Ice	2.75	1.80	0.06
		g	0.00			1" Ice	2.99	2.01	0.08
DB-T1-6Z-8AB-0Z	C	From	4.00	0.0000	122.50	No Ice	5.60	2.33	0.05
		Centroid-Le	0.00			1/2" Ice	5.92	2.56	0.09
		g	0.00			1" Ice	6.24	2.79	0.13
MTS 14.5' LP Platform	C	None		0.0000	122.50	No Ice	17.46	17.46	1.35
						1/2" Ice	22.44	22.44	1.62
						1" Ice	27.42	27.42	1.90
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3' Yagi	A	From Leg	1.50	0.0000	89.08	No Ice	0.52	0.52	0.02
			0.00			1/2" Ice	0.71	0.71	0.02
			-7.83			1" Ice	0.90	0.90	0.03
3' Yagi	A	From Leg	1.50	0.0000	89.08	No Ice	0.52	0.52	0.02
			0.00			1/2" Ice	0.71	0.71	0.02
			-9.75			1" Ice	0.90	0.90	0.03
3' Yagi	A	From Leg	1.50	0.0000	83.17	No Ice	0.52	0.52	0.02
			0.00			1/2" Ice	0.71	0.71	0.02
			-1.92			1" Ice	0.90	0.90	0.03
Andrew Collar Mount	C	None		0.0000	83.17	No Ice	2.14	2.14	0.19
						1/2" Ice	2.35	2.35	0.25
						1" Ice	2.57	2.57	0.30
Andrew Collar Mount	C	None		0.0000	89.08	No Ice	2.14	2.14	0.19

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert*	*Azimuth Adjustment*	*Placement*		*C_AA_A Front*	*C_AA_A Side*	*Weight*
			ft ft ft	*°*	*ft*		*ft^2*	*ft^2*	*K*
						1/2" Ice	2.35	2.35	0.25
						1" Ice	2.57	2.57	0.30
14' Dipole	C	From Leg	1.00	0.0000	89.08	No Ice	2.80	2.80	0.03
			0.00			1/2" Ice	4.22	4.22	0.05
			0.00			1" Ice	5.67	5.67	0.08
GPS-TMG-HR-26N	B	From Leg	1.00	0.0000	83.17	No Ice	0.16	0.16	0.00
			0.00			1/2" Ice	0.21	0.21	0.00
			0.00			1" Ice	0.28	0.28	0.01

Compression Checks

Pole Design Data

Section No.	*Elevation*	*Size*	*L*	*L_u*	*Kl/r*	*A*	*P_u*	*ϕP_n*	*Ratio $\frac{P_u}{\phi P_n}$*
	ft		*ft*	*ft*		*in^2*	*K*	*K*	
L1	160 - 146.5 (1)	TP20.91x16.75x0.1875	13.50	0.00	0.0	11.8282	-4.72	865.69	0.005
L2	146.5 - 95.75 (2)	TP36.16x19.6876x0.25	53.50	0.00	0.0	27.3952	-17.17	1841.20	0.009
L3	95.75 - 46.75 (3)	TP50.76x34.2745x0.3125	53.50	0.00	0.0	48.0510	-29.70	3077.94	0.010
L4	46.75 - 0 (4)	TP64.53x48.1321x0.375	53.25	0.00	0.0	76.3605	-49.06	4662.89	0.011

Pole Bending Design Data

Section No.	*Elevation*	*Size*	*M_{ux}*	*ϕM_{nx}*	*Ratio $\frac{M_{ux}}{\phi M_{nx}}$*	*M_{uy}*	*ϕM_{ny}*	*Ratio $\frac{M_{uy}}{\phi M_{ny}}$*
	ft		*kip-ft*	*kip-ft*		*kip-ft*	*kip-ft*	
L1	160 - 146.5 (1)	TP20.91x16.75x0.1875	71.99	353.25	0.204	0.00	353.25	0.000
L2	146.5 - 95.75 (2)	TP36.16x19.6876x0.25	990.52	1307.93	0.757	0.00	1307.93	0.000
L3	95.75 - 46.75 (3)	TP50.76x34.2745x0.3125	2290.79	3070.47	0.746	0.00	3070.47	0.000
L4	46.75 - 0 (4)	TP64.53x48.1321x0.375	4010.18	6163.78	0.651	0.00	6163.78	0.000

Pole Shear Design Data

Section No.	*Elevation*	*Size*	*Actual V_u*	*ϕV_n*	*Ratio $\frac{V_u}{\phi V_n}$*	*Actual T_u*	*ϕT_n*	*Ratio $\frac{T_u}{\phi T_n}$*
	ft		*K*	*K*		*kip-ft*	*kip-ft*	
L1	160 - 146.5 (1)	TP20.91x16.75x0.1875	10.65	432.84	0.025	0.03	707.37	0.000
L2	146.5 - 95.75 (2)	TP36.16x19.6876x0.25	25.31	920.60	0.027	0.42	2619.07	0.000
L3	95.75 - 46.75 (3)	TP50.76x34.2745x0.3125	29.89	1538.97	0.019	0.29	6148.46	0.000
L4	46.75 - 0 (4)	TP64.53x48.1321x0.375	34.68	2331.45	0.015	0.29	12342.67	0.000

Section Capacity Table

Section No.	*Elevation ft*	*Component Type*	*Size*	*Critical Element*	*P K*	*ϕP_{allow} K*	*% Capacity*	*Pass Fail*
L1	160 - 146.5	Pole	TP20.91x16.75x0.1875	1	-4.72	865.69	21.0	Pass
L2	146.5 - 95.75	Pole	TP36.16x19.6876x0.25	2	-17.17	1841.20	76.7	Pass
L3	95.75 - 46.75	Pole	TP50.76x34.2745x0.3125	3	-29.70	3077.94	75.6	Pass
L4	46.75 - 0	Pole	TP64.53x48.1321x0.375	4	-49.06	4662.89	66.1	Pass
							Summary	
						Pole (L2)	76.7	Pass
						RATING =	**76.7**	**Pass**

ADDITIONAL CALCULATIONS

Anchor Rod and Base Plate Stresses, TIA-222-G-1
CT33762-M/Cheshire, CT

Overturning Moment =	4010.00	k*ft
Axial Force =	49.00	k
Shear Force =	35.00	k

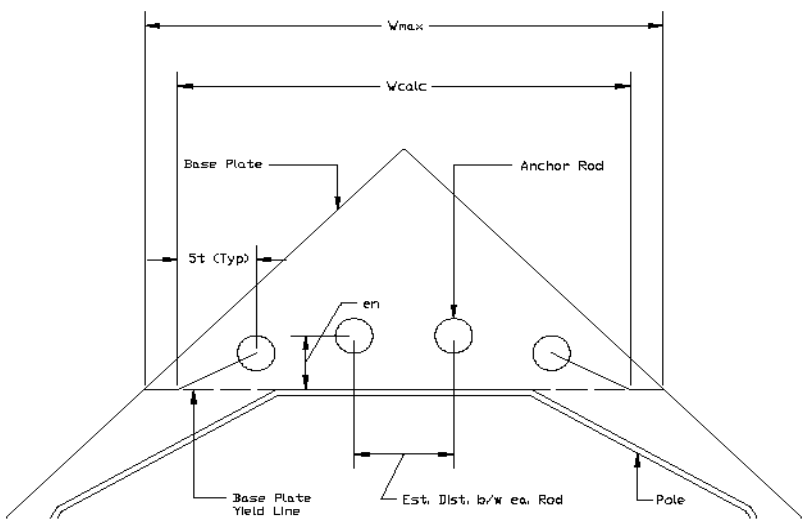
Acceptable Stress Ratio =	100.0%	

Anchor Rods		
Pole Diameter =	64.53	in
Number of Rods =	16	
ϕ =	0.8	
Rod Ultimate Strength (F_u) =	100	ksi
Base Plate Detail Type* =	d	
Rod Circle =	71.651	in
Rod Diameter =	2.25	in
Net Tensile Area =	3.25	in^2
Max Tension on Rod =	164.75	kips
Max Compression on Rod =	170.88	kips
P_u =	170.88	kips
V_u =	2.19	kips
η =	0.50	
φR_{nt} =	260.00	kips
Anchor Rod Capacity =	**67.4%**	**OK**

(Section 4.9.9, TIA-222-G-1)

Base Plate		
Plate Strength (Fy) =	60	ksi
ϕ =	0.9	
Plate Thickness =	3	in
Plate Width =	73	in
Est. Dist. b/w ea. Rod =	6	in
w_{calc} =	47.83	in
w_{max} =	38.71	in
w =	38.71	in
Z =	87.09	in^3
M_u =	1975.67	k-in
φM_n =	4702.97	k-in
Base Plate Capacity =	**42.0%**	**OK**

***This analysis assumes the clear distance from the top of the concrete to the bottom of the leveling nut is less than the diameter of the anchor rod. Notify GPD Group immediately if existing field conditions do not meet this assumption.**



Mat Foundation Analysis
CT33762-M/Cheshire, CT

General Info	
Code	TIA-222-G
Bearing On	Soil
Foundation Type	Mono Pad
Pier Type	Round
Reinforcing Known	Yes
Max Capacity	1

Tower Reactions		
Moment, M	4010	k-ft
Axial, P	49	k
Shear, V	35	k

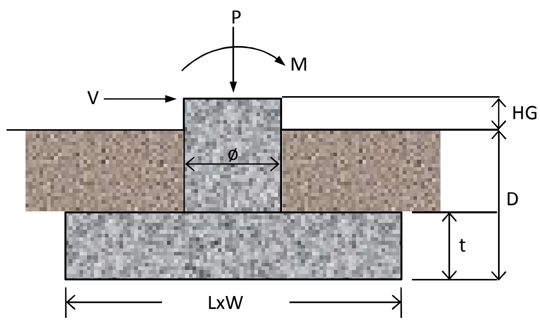
Pad & Pier Geometry		
Pier Diameter, ø	8	ft
Pad Length, L	27	ft
Pad Width, W	27	ft
Pad Thickness, t	5	ft
Depth, D	13.25	ft
Height Above Grade, HG	0	ft

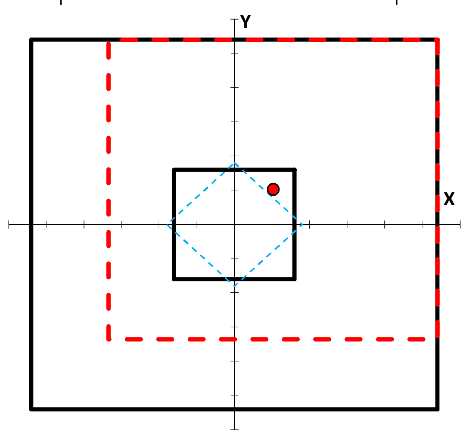
Pad & Pier Reinforcing		
Rebar Fy	60	ksi
Concrete Fc'	4	ksi
Clear Cover	3	in
Reinforced Top & Bottom?	Yes	
Pad Reinforcing Size	# 8	
Pad Quantity Per Layer	42	
Pier Rebar Size	# 9	
Pier Quantity of Rebar	38	

Soil Properties		
Soil Type	Granular	
Soil Unit Weight	100	pcf
Angle of Friction, ø	35	°
Bearing Type	Gross	
Ultimate Bearing	8	ksf
Water Table Depth	0	ft
Frost Depth	3.33333	ft

Bearing Summary			Load Case
Qxmax	1.49	ksf	1.2D+1.6W
Qymax	1.49	ksf	1.2D+1.6W
Qmax @ 45°	1.52	ksf	1.2D+1.6W
$Q_{(all)\ Gross}$	6.00	ksf	
Controlling Capacity	**25.4%**	**Pass**	

Overturning Summary (Required FS=1.0)			Load Case
FS(ot)x	2.34	≥1.0	0.9D+1.6W
FS(ot)y	2.34	≥1.0	0.9D+1.6W
Controlling Capacity	**42.8%**	**Pass**	





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

Sprint

NOTE:

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

NOTE:

THESE PLANS ARE BASED ON INFORMATION OBTAINED IN 2014. THEY HAVE NOT BEEN FIELD VERIFIED. THE SPRINT CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ITEMS AND NOTIFYING THE ENGINEER OF RECORD OF ANY DISCREPANCIES.

PROJECT:	2.5 EQUIPMENT DEPLOYMENT
SITE NAME:	CHESHIRE/TOWER VENTURES
SITE CASCADE:	CT43XC809-A
MARKET:	NORTHERN CONNECTICUT
SBA SITE ID:	CT33762-M / 500 HIGHLAND AVE / LIGHT TOWER
SITE ADDRESS:	490 HIGHLAND AVENUE CHESHIRE, CT 06410
SITE TYPE:	160' MONOPOLE

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

SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
WESTBOROUGH, MA 01752
TEL: (508) 251-0720

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

STATE OF CONNECTICUT DEREK J. CREASER No.28551 LICENSED PROFESSIONAL ENGINEER

SITE INFORMATION

PROPERTY OWNER:
TOWN OF CHESHIRE
84 SOUTH MAIN STREET
CHESHIRE, CT 06410

TOWER OWNER:
SBA SITE MANAGEMENT
1480 ROUTE 9 NORTH, SUITE 303
WOODBRIDGE, NJ 07095

SBA REGIONAL SITE MANAGER:
RON LENNOX
PHONE: 201-316-7348
RLennox@sbasite.com

LATITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION
41° 30' 40.38" N
41.511217°

LONGITUDE (NAD83):
GOOGLE EARTH 2-C CONFIRMATION
-72° 53' 54.69" W
-72.898525°

COUNTY:
NEW HAVEN

ZONING DISTRICT:
C-1

POWER COMPANY:
CL&P

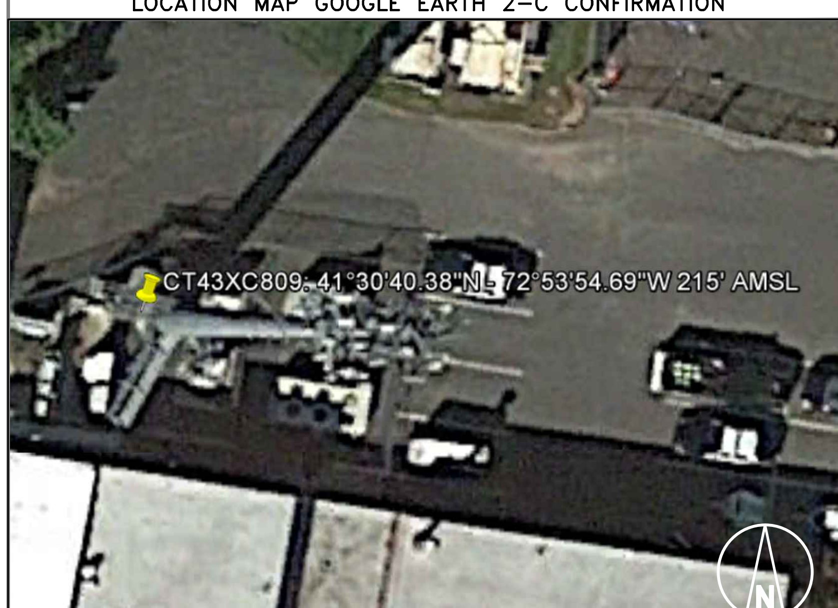
AAV PROVIDER:
AT&T

SPRINT CONSTRUCTION MANAGER:
ANDREW CLARK
PHONE: 315-719-6636
andrew.clark@sprint.com

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

AREA MAP

LOCATION MAP GOOGLE EARTH 2-C CONFIRMATION



PROJECT DESCRIPTION

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

GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF:
* INSTALL NEW GROWTH CABINET WITH 2.5 RADIO ACCESS NETWORK (RAN) EQUIPMENT & (2) BATTERY STRINGS

TOWER-TOP EQUIPMENT, INCLUDING INSTALLATION OF:
* (3) PANEL ANTENNAS
* (3) REMOTE RADIO HEADS (RRH)
* (1) HYBRID CABLE (AND ASSOCIATED FIBER, DC POWER, COAXIAL CABLE JUMPERS AND ANTENNA REMOTE ELECTRICAL-TILT (RET) CABLE

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

DRAWING INDEX

SHEET NO:	SHEET TITLE	REV	CHK	BY
T-1	TITLE SHEET	2	BB	AN
SP-1	OUTLINE SPECIFICATIONS	2	BB	AN
SP-2	OUTLINE SPECIFICATIONS	2	BB	AN
SP-3	OUTLINE SPECIFICATIONS	2	BB	AN
A-1	COMPOUND PLAN	2	BB	AN
A-2	ELEVATION AND ANTENNA PLANS	2	BB	AN
A-3	RF DATA SHEET	2	BB	AN
A-4	RAN WIRING DIAGRAM	2	BB	AN
A-5	EQUIPMENT DETAILS	2	BB	AN
A-6	EQUIPMENT DETAILS	2	BB	AN
S-1	STRUCTURAL DETAILS	2	BB	AN
E-1	ONE LINE DIAGRAM	2	BB	AN
E-2	GROUNDING DETAILS AND NOTES	2	BB	AN

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
- ADA COMPLIANCE NOT REQUIRED.
- POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
- NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.

2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.

3. NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES.
BUILDING CODE: IBC 2012 WITH 2016 CT STATE BUILDING CODE AMENDMENTS
ELECTRICAL CODE: 2014 NATIONAL ELECTRICAL CODE
STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

811 Know what's below. Call before you dig. www.CBYD.com

APPROVALS

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

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

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/11/17	REVISED-CODE UPDATE	AN
1	07/18/14	ISSUED FOR CONSTRUCTION	JA
0	05/15/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC809-A
SITE NAME:
CHESHIRE/ TOWER VENTURES
SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

1.5 DEFINITIONS:

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

CONTINUE SHEET SP-2

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

SBA
SBA COMMUNICATIONS CORP.
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Hudson Design Group LLC
1600 OSGOOD STREET
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STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/11/17	REVISED-CODE UPDATE	AN
1	07/18/14	ISSUED FOR CONSTRUCTION	JA
0	05/15/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC809-A

SITE NAME:
CHESHIRE/
TOWER VENTURES

SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

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
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
2	09/11/17	REVISED-CODE UPDATE	AN
1	07/18/14	ISSUED FOR CONSTRUCTION	JA
0	05/15/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC809-A

SITE NAME:
CHESHIRE/
TOWER VENTURES

SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

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 IN TS 0200 REV 4.
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
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

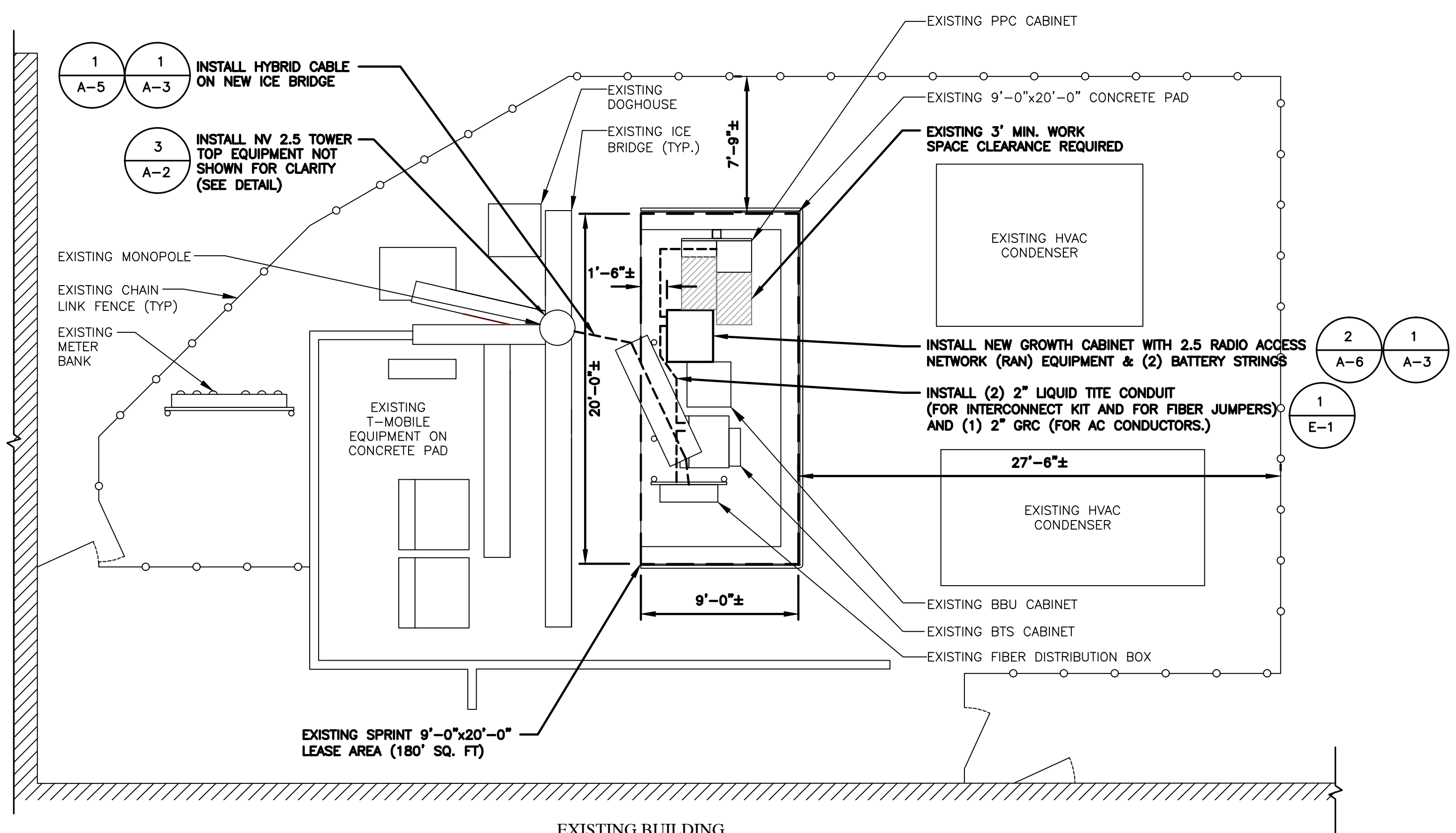
SUBMITTALS

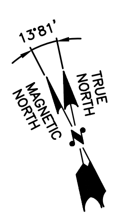
REV.	DATE	DESCRIPTION	BY
2	09/11/17	REVISED-CODE UPDATE	AN
1	07/18/14	ISSUED FOR CONSTRUCTION	JA
0	05/15/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC809-A
SITE NAME:
CHESHIRE/
TOWER VENTURES
SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER





COMPOUND PLAN (1 / A-1)

SCALE: 3/16"=1'-0"

GRAPHIC SCALE: 0, 2'-8", 5'-4", 10'-8", 16'-0"

INSTALL NEW GROWTH CABINET WITH 2.5 RADIO ACCESS NETWORK (RAN) EQUIPMENT & (2) BATTERY STRINGS (1/A-3, 2/A-6)

EXISTING BTS CABINET

EXISTING BBU CABINET

SOURCE: SPRINT SITE AUDIT 8-13-13

RAN EQUIPMENT PHOTO DETAIL (2 / A-1)

SCALE: N.T.S.

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TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/11/17	REVISED-CODE UPDATE	AN
1	07/18/14	ISSUED FOR CONSTRUCTION	JA
0	05/15/14	ISSUED FOR CONSTRUCTION	SF

SITE NUMBER:
CT43XC809-A

SITE NAME:
CHESHIRE/ TOWER VENTURES

SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

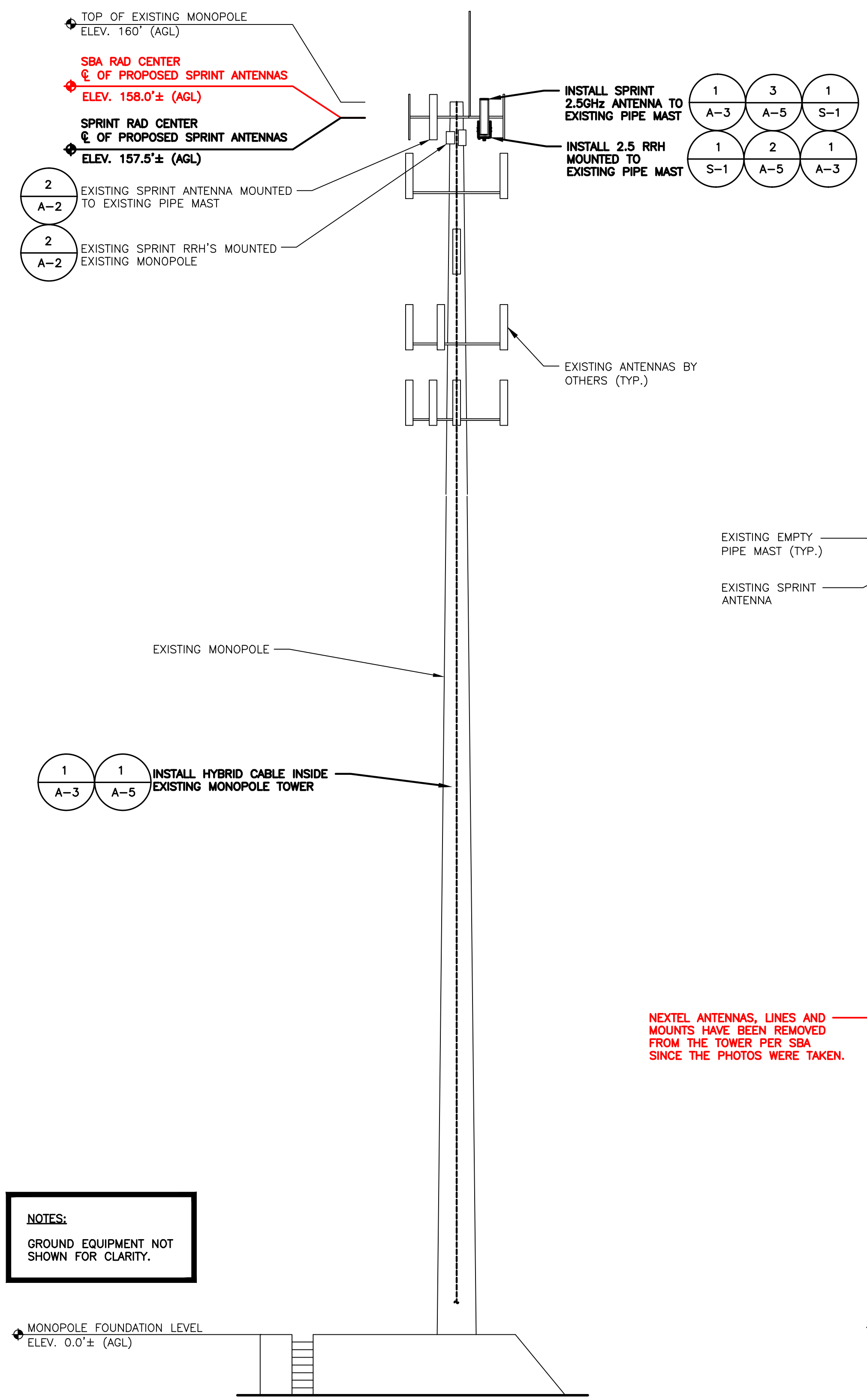
SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1

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

NOTE:
EXISTING AZIMUTHS FROM SPRINT SITE AUDIT DATED 08/13/13

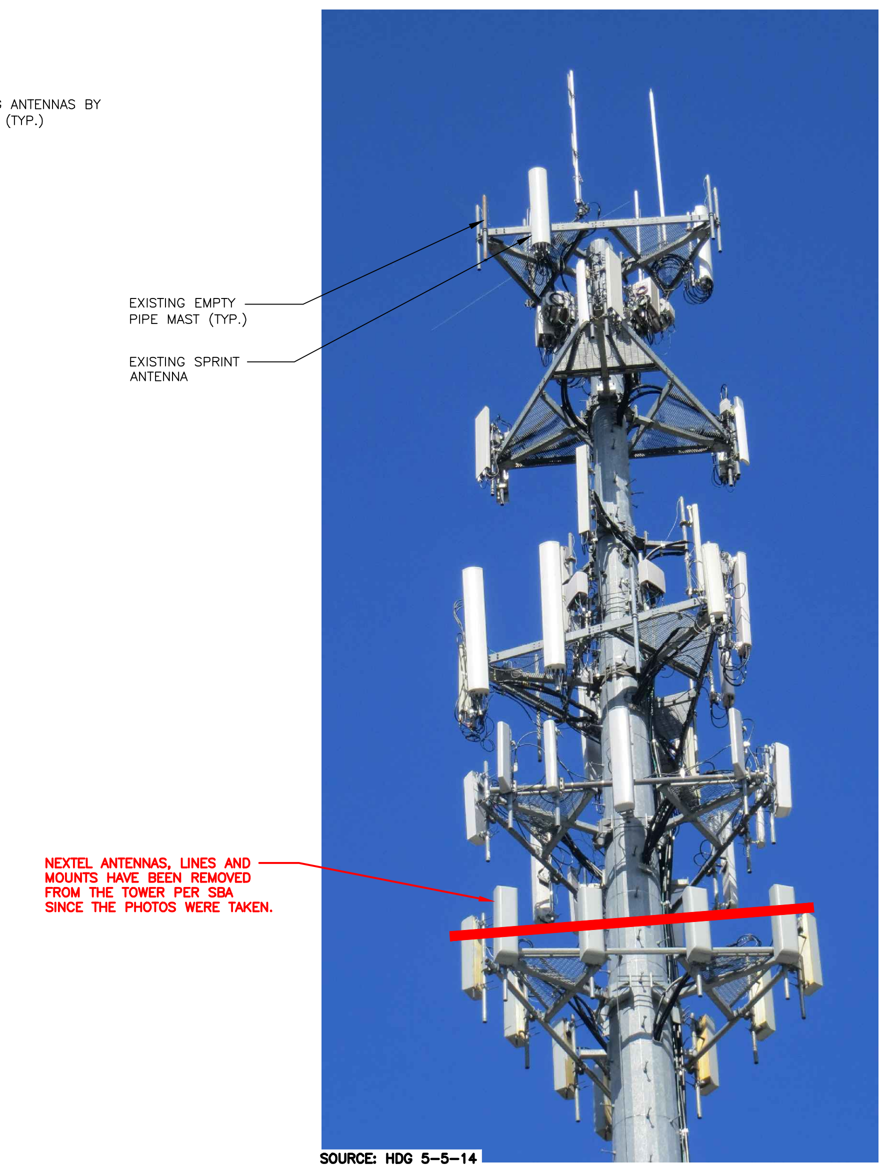
NOTE:
SPRINT RAD CENTER SHOWN IN RED TEXT BASED ON SBA–PROVIDED COLLOCATION APPLICATION, EQUIPMENT DATABASE, AND STRUCTURAL ANALYSIS. THE SBA–PROVIDED ANTENNA RAD CENTER SHALL SUPERSEDE ANY CONFLICTING INFORMATION DERIVED FROM THE SPRINT NV 2.5 RFDS.



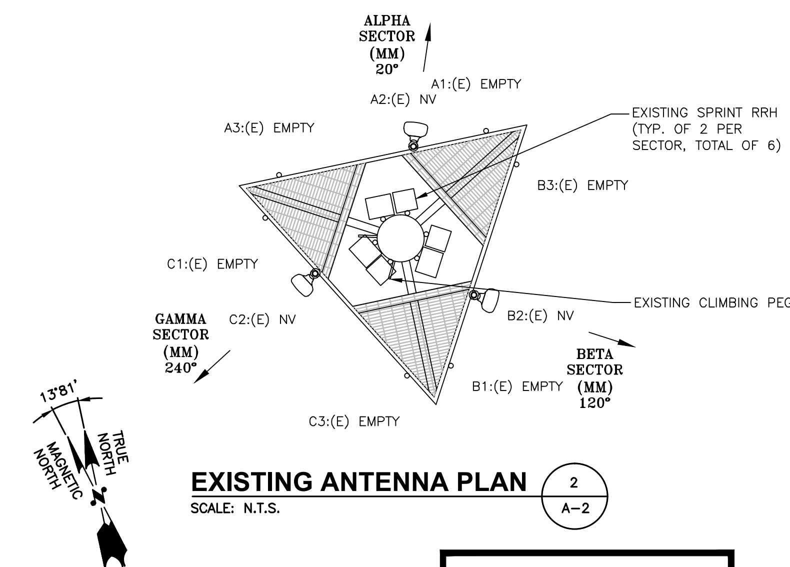
NOTES:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

ELEVATION 1/A–2
SCALE: 3/32"=1'–0"

GRAPHIC SCALE 0 5'–4" 10'–8" 21'–4" 32'–0"



EXISTING PARTIAL ELEVATION PHOTO DETAIL
SCALE: N.T.S.

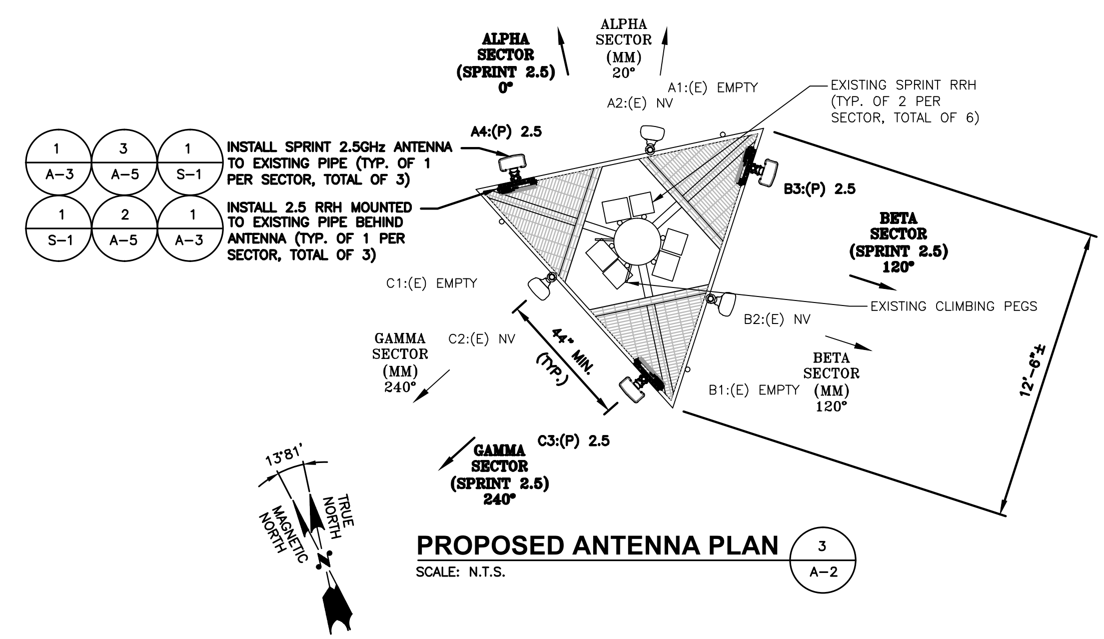


EXISTING ANTENNA PLAN 2/A–2
SCALE: N.T.S.

ANTENNA STATUS LEGEND:
EMPTY – EMPTY PIPE
(E) – EXISTING
(P) – INSTALL
NV – SPRINT ANTENNA MODEL APXVSPP18–C–A20
2.5 – SPRINT ANTENNA

SPECIAL WORK NOTE:
JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA CAN NOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY.

NOTES:
1) VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.



PROPOSED ANTENNA PLAN 3/A–2
SCALE: N.T.S.

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LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

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CT43XC809–A
SITE NAME:
CHESHIRE/ TOWER VENTURES
SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

SHEET TITLE
ELEVATION AND ANTENNA PLANS

SHEET NUMBER
A–2

**A&E: (1) HYBRID TRUNK, ALL SECTORS
A; B; C: 200'

1 / A-5 **A&E: (1) HYBRID JUMPER, EACH SECTOR
A; 15', B; 15', C; 15'

A **A&E: (1) COAX JUMPERS, EACH SECTOR
A; 8', B; 8', C; 8'

A **A&E: (1) AISG CABLE, EACH SECTOR
A; 8', B; 8', C; 8'

Sprint

RFDS Sheet

(by SBA Network Services 4/8/14. NOTE: General Contractor/Tower Crew shall verify that the latest RFDS is used for equipment installation.)

General Site Information

Site ID	CT43XC809	Equipment Vendor	ALU
Market	Southern Connecticut	Latitude	41.511111
Region	East	Longitude	-72.898333
MLA	SBA	LL SITE ID	CT33762-M
Structure Type	MONOPOLE		
BTS Type	Outdoor Macro		

Solution ID	Not Available	Siterra SR Equipment Type	Outdoor Macro	Incremental Power Draw Needed by Added Equipment	100
		Equipment Vendor	ALU	(40A PER SPRINT UPDATE)	

Base Equipment

BBU Kit	ALU BBU Kit	Top Hat	None
BBU Kit Qty	0	Top Hat Qty	N/A
		Top Hat Dimensions (Inches)	N/A
		Top Hat Weight (Lbs.)	N/A
Growth Cabinet	ALU 9929 Expansion Cabinet		
Growth Cabinet Qty	1		
Growth Cabinet Dimensions (Inches)	63.65" X 31.5" X 35.5"		
Growth Cabinet Weight (Lbs.)	1,600		

RF Path Information

RRH	TD-RRH8x20-25	
RRH Qty	3	
RRH Dimensions (Inches)	26.1" x 18.6" x 6.7"	
RRH Weight (Lbs.)	70.0	
RRH Mount Weight (Lbs.)	10	
Power and Fiber Cable	ALU Fiber only	
Cable Qty	1	
Weight per Foot (Lbs.)	0.242	
Diameter (Inches)	0.730	
Hybrid Cable Length (Feet) (**)	189	(Estimated by Sprint as Antenna CL plus 20%: DO NOT BOM using this length.)
Coax Jumper	Coax Jumper. Mfg TBD.	
Coax Jumper Qty	27	
Coax Jumper Length (Feet) (**)	8	
Coax Jumper Weight (Lbs.)	1.7	
Coax Jumper Diameter (Inches)	0.5	
AISG Cable	Commscope ATCB-B01-006	
AISG Cable Qty	3	
AISG Diameter (Inches)	0.315	
AISG Cable Length (Feet) (**)	8	
Weight of Entire AISG Cable (Lbs.)	1.3	

Antenna Sector Information

	Sector 1	Sector 2	Sector 3
Antenna Make/Model	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20	RFS APXV9TM14-ALU-I20
Antenna Qty	1	1	1
Antenna Dimensions (Inches)	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3	56.3 x 12.6 x 6.3
Antenna Weight (Lbs.)	55.1	55.1	55.1
Antenna Mounting Kit Weight (Lbs.)	11.5	11.5	11.5
CL Height (Feet) (* SBA 158)	157.5	157.5	157.5
Antenna Azimuth (Degrees)	0	120	240
Antenna Mechanical Downtilt (Degrees)	0	0	0
Antenna Etilt (Degrees)	-2	-2	-2
RF Filter Make/Model	N/A	N/A	N/A

Comments

RFDS generated 4/8/14 by SBA Network Services from Sprint Plan of Record dated 4/2/14.

Comments in Red Text provided by A&E Vendor.

IMPORTANT CONSTRUCTION NOTE: General Contractor/Tower Crew shall verify that the latest RFDS is used for equipment installation.

*** Note: Antenna Rad Center based on SBA-Provided Collocation Application, Equipment Database, and Structural Analysis. The SBA-Provided Antenna Rad Center shall supersede any conflicting information derived from the Sprint NV 2.5 Database.**

**** Note: Sprint CM shall confirm Hybrid Cable Length, Coax Jumper Length and AISG Cable Length before preparing BOM. A&E Recommended Hybrid Cable Length based on NV 2.5 Equipment Audit plus 20 Feet for (2) 10-foot coils at each end of the fiber trunk.**

A SPECIAL WORK NOTE:
JUMPERS (COAX/AISG) FROM 2.5 RRH TO 2.5 ANTENNA CANNOT EXCEED 15'.
NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY

RF DATA SHEET 1 / A-3
SCALE: N.T.S.

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 2.5G ANTENNA AT SAME CL HEIGHT AS 1.9G ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS–BUILD DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900 MHZ AND 800 MHZ 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 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. IN ADDITION, 2.5G ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON–SPRINT ANTENNAS.
- 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/.

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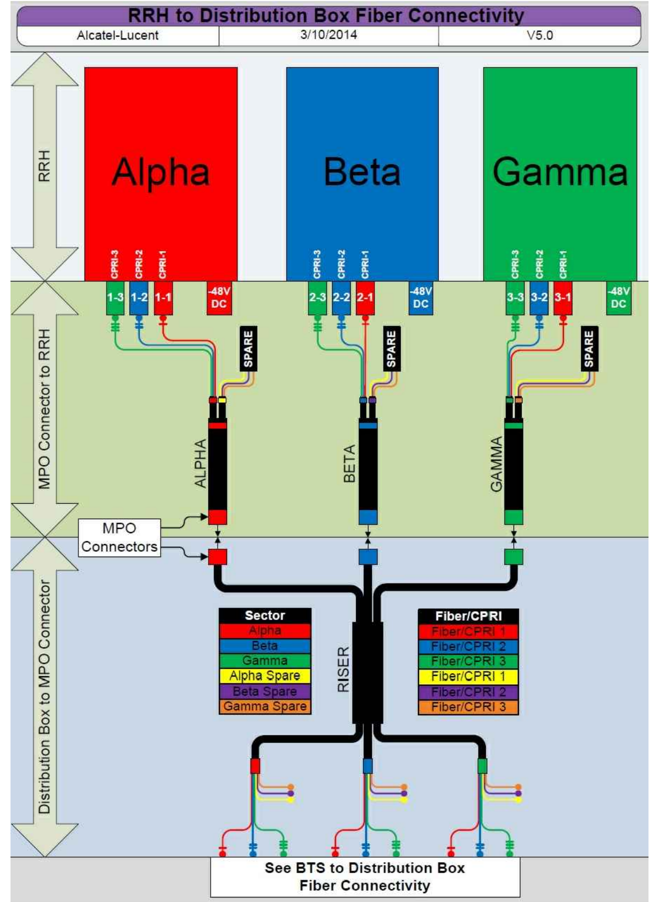
SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

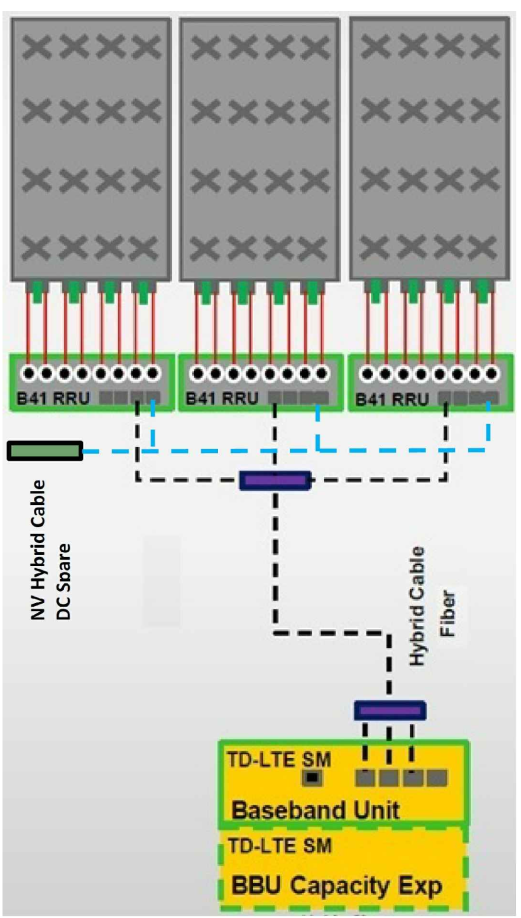
SHEET TITLE
RF DATA SHEET

SHEET NUMBER
A–3



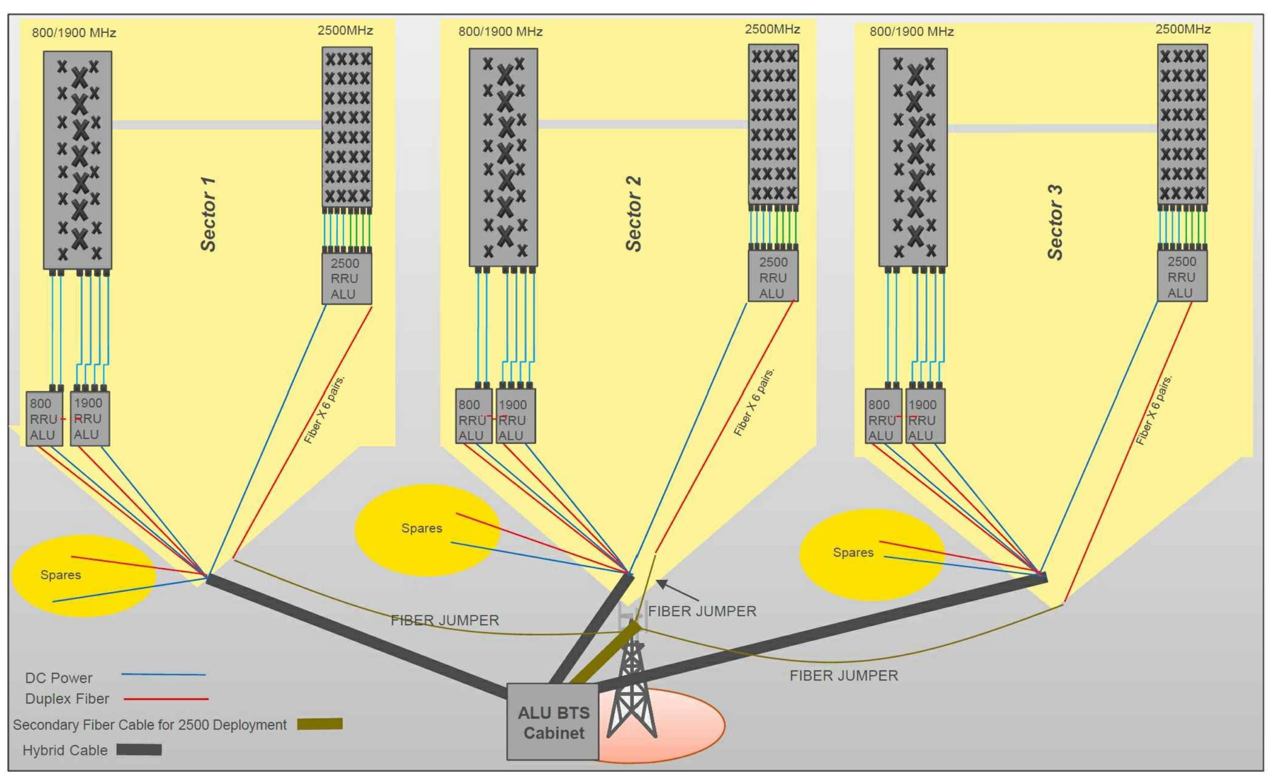
CABLE COLOR CODING DIAGRAM

SCALE: N.T.S.



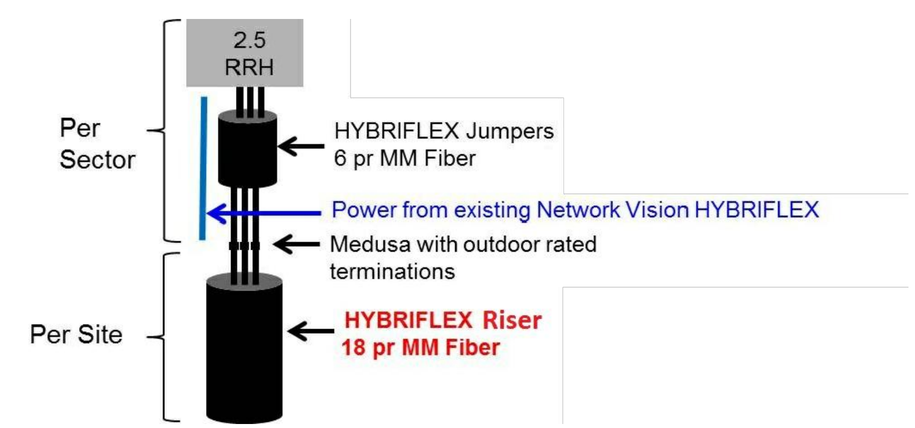
ALU 2.5 ALU SCENARIO 1

SCALE: N.T.S.



RAN WIRING DIAGRAM: ALU EQUIPMENT

SCALE: N.T.S.



RFS 2.5 ALU SCENARIO 1

SCALE: N.T.S.

NOTE:

GENERAL CONTRACTOR/TOWER CREW SHALL VERIFY THAT THE LATEST RF DATA SHEET IS USED FOR EQUIPMENT INSTALLATION.

DC POWER INSTALLATION NOTE (FIBER–ONLY SCENARIO):

USE SPACE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.

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490 HIGHLAND AVENUE
CHESHIRE, CT 06410

SHEET TITLE
RAN WIRING DIAGRAM

SHEET NUMBER
A–4

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE			
MANUF: RFS			
CABLE	LENGTH	DC CONDUCTOR	CABLE DIAMETER
(*) FIBER ONLY	VARIES	USE NV HYBRIFLEX	5/8"
HYBRIFLEX	<200'	8 AWG	1-1/4"
HYBRIFLEX	225-300'	6 AWG	1-1/4"
HYBRIFLEX	325-375'	4 AWG	1-1/4"

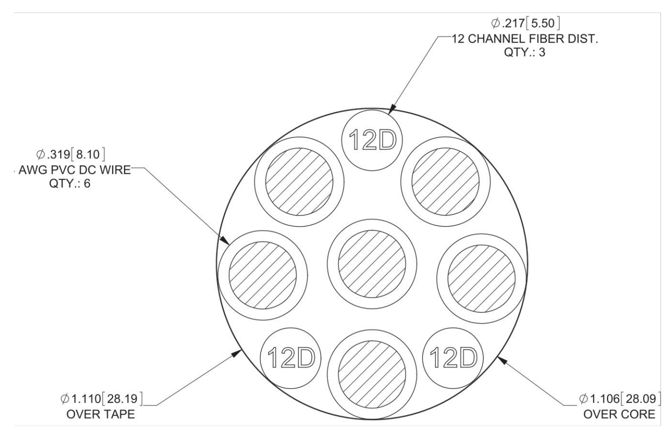
RFS HYBRIFLEX RISER CABLE SCHEDULE

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

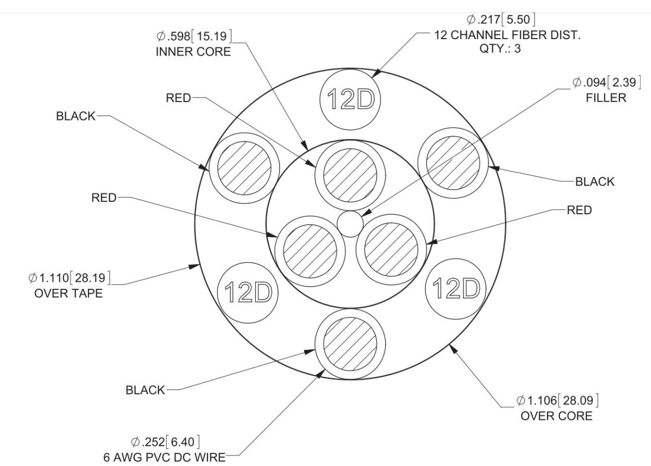
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

Fiber Only	**Hybrid Jumper cable** MN: HBF012-M3-5F1 5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	5 ft
	MN: HBF012-M3-10F1	10 ft
(*)	MN: HBF012-M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	
8 AWG Power	**Hybrid Jumper cable** MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-08U1M3-10F1	10 ft
	MN: HBF058-08U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	
6 AWG Power	**Hybrid Jumper cable** MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
	MN: HBF058-13U1M3-10F1	10 ft
	MN: HBF058-13U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	
4 AWG Power	**Hybrid Jumper cable** MN: HBF078-21U1M3-5F1 5 ft, 1x 4 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 7/8 cable	5 ft
	MN: HBF078-21U1M3-10F1	10 ft
	MN: HBF078-21U1M3-15F1	15 ft
	SPECIAL INSTALLATION NOTE: JUMPERS FROM 2.5 RRH TO 2.5 ANTENNA SHALL NOT EXCEED 15'. NOTIFY SPRINT CM OF ANY DISCREPANCY.	

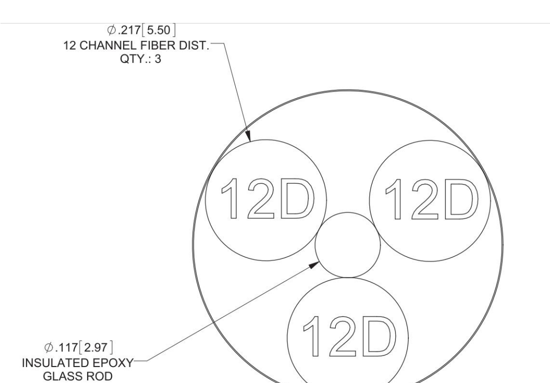
* NOTE: SPRINT CM TO CONFIRM HYBRID RISER CABLE AND HYBRID JUMPER CABLE MODEL NUMBERS BEFORE PREPARING BOM.



4 AWG



8 AWG & 6 AWG



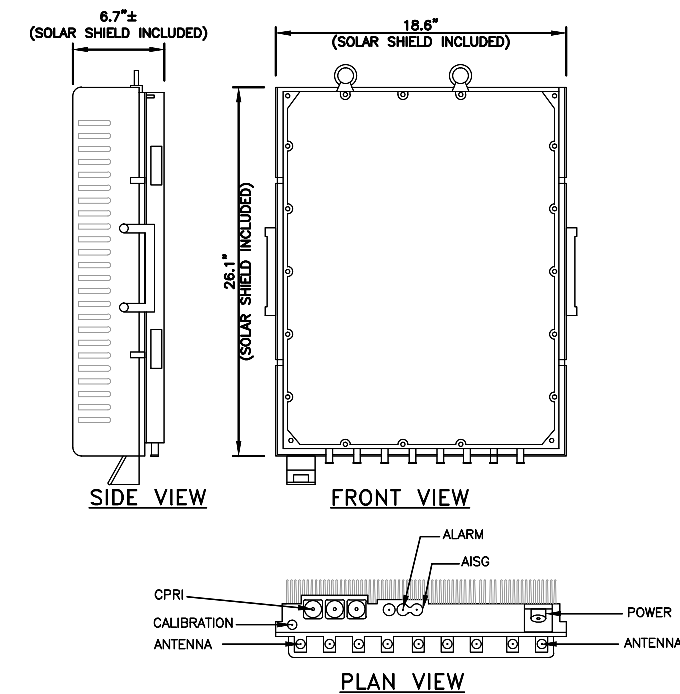
FIBER ONLY

2.5 HYBRID CABLE X-SECTION AND DATA

1
A-5

SCALE: N.T.S.

MANUF:	ALCATEL-LUCENT
MODEL:	TD-RRH8x20-25
LENGTH:	26.1
WIDTH:	18.6
DEPTH:	6.7
WEIGHT:	70 LBS
AREA:	3.5 SF

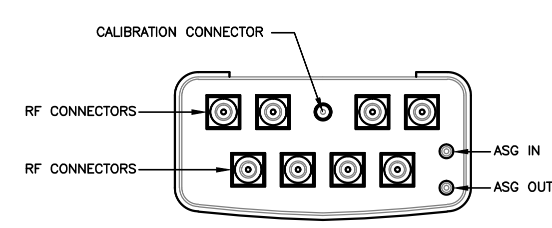


2.5 RRH'S

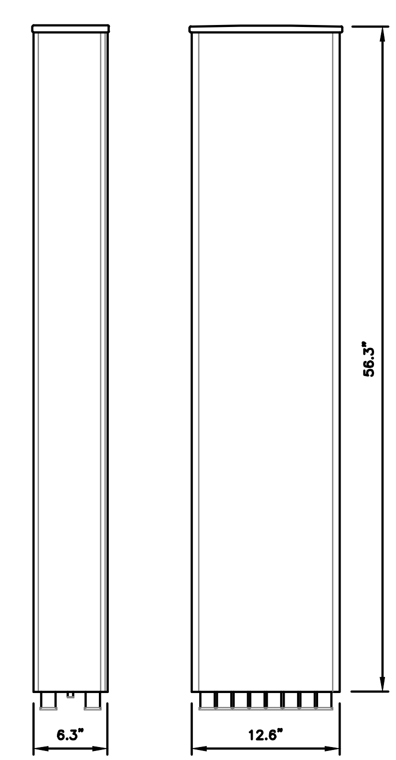
2
A-5

SCALE: N.T.S.

MANUF:	RFS
MODEL:	APXV9TM14-ALU-I20
LENGTH:	56.3
WIDTH:	12.6
DEPTH:	6.3
WEIGHT:	55.1 LBS
AREA:	4.9 SF



PLAN VIEW



2.5 ANTENNA SPECIFICATIONS

3
A-5

SCALE: N.T.S.

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Hudson Design Group LLC

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N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DEREK J. CREASER
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: BB

APPROVED BY: DJC

SUBMITTALS			
REV.	DATE	DESCRIPTION	BY
2	09/11/17	REVISED-CODE UPDATE	AN
1	07/18/14	ISSUED FOR CONSTRUCTION	JA
0	05/15/14	ISSUED FOR CONSTRUCTION	SF

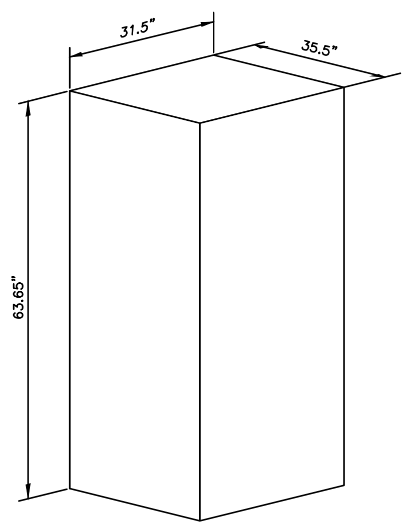
SITE NUMBER:
CT43XC809-A

SITE NAME:
CHESHIRE/
TOWER VENTURES

SITE ADDRESS:
490 HIGHLAND AVENUE
CHESHIRE, CT 06410

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-5



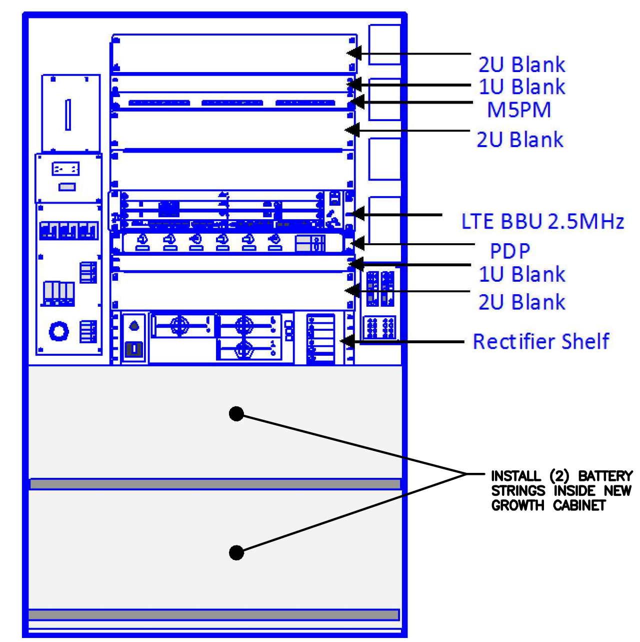
MANUFACTURER	ALU
MODEL	9929
HEIGHT	63.65"
WIDTH	31.5"
DEPTH	35.5"
TOTAL WEIGHT (FULLY LOADED)	1600 lbs

NOTE:
EQUIPMENT SHALL BE ANCHORED PER MANUFACTURERS SPECIFICATIONS.

9929 MMBTS
OUTDOOR CABINET

SCALE: N.T.S.

1
A-6



FRONT VIEW

PROPOSED MMBTS OUTDOOR CABINET
WITH LTE 2.5 BBU EQUIPMENT

SCALE: N.T.S.

2
A-6

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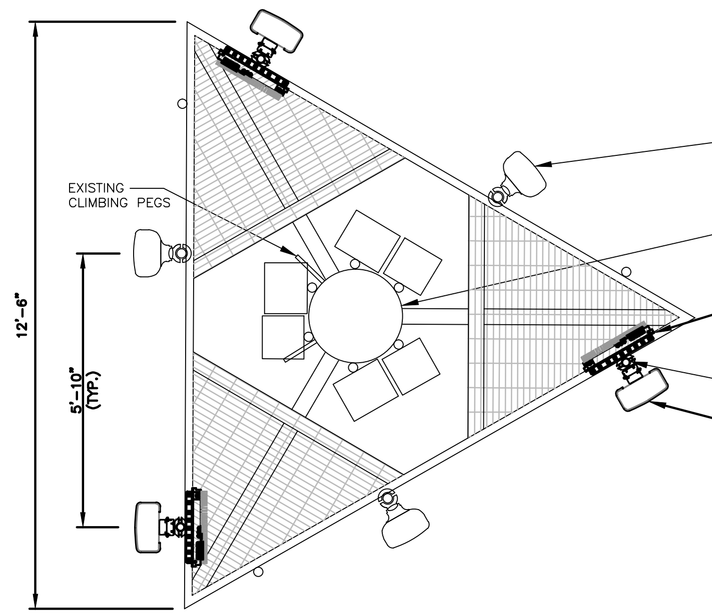
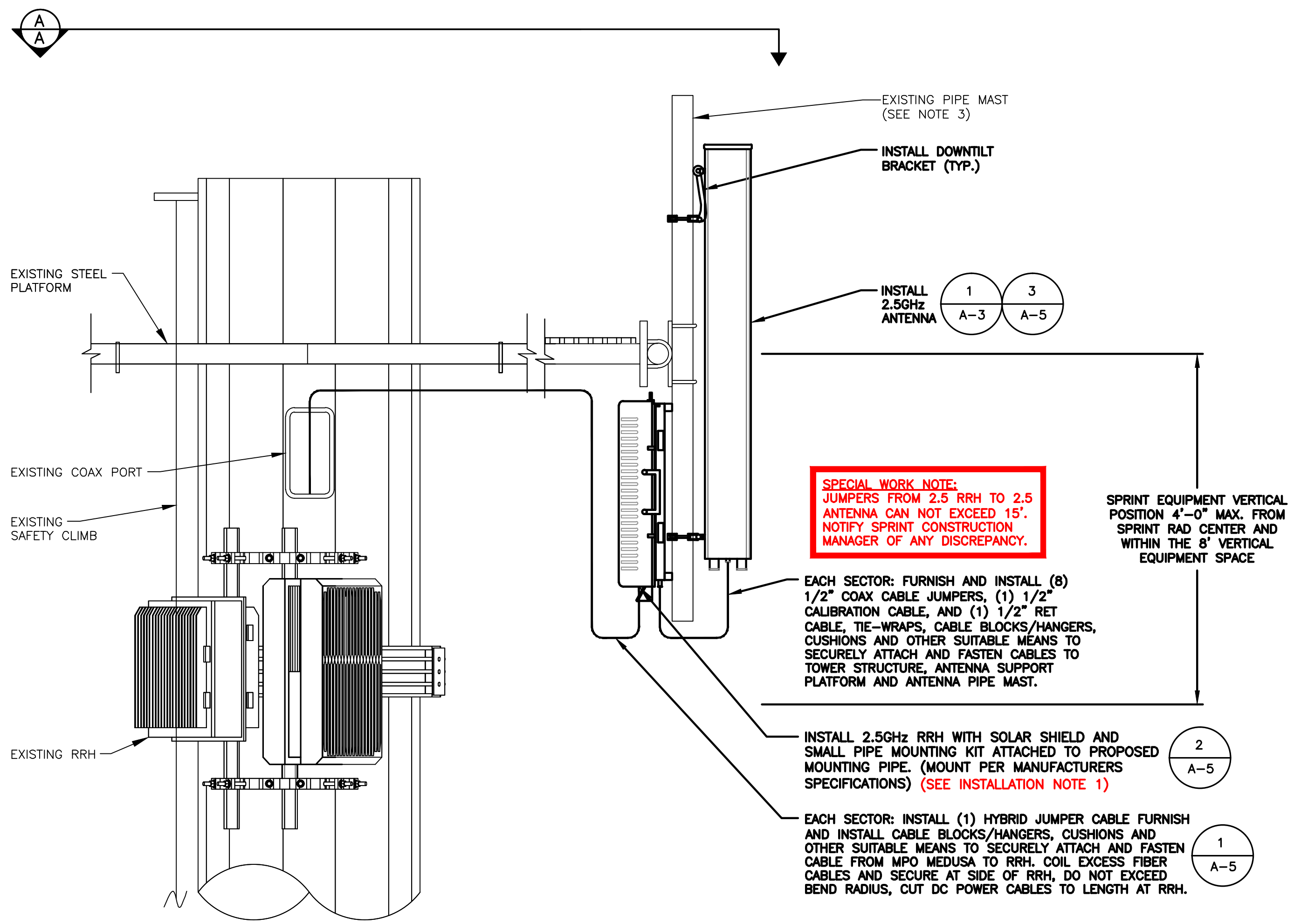


SECTION A-A

NOTE: ONE SECTOR SHOWN FOR CLARITY



NOTE: ONE SECTOR SHOWN FOR CLARITY

2.5 ANTENNA AND RRH MOUNTING DETAIL (1 / S-1)

SCALE: N.T.S.

INSTALLATION NOTES:

1. CONTRACTOR TO ENSURE THAT RRH MOUNTING DOES NOT INTERFERE WITH CLIMBING LADDER/PEGS, CABLE CLIMB, OR COAX PORTS. MONOPOLE: COLLAR-MOUNT RRH CLUSTER SHALL PROVIDE AN OPENING BETWEEN ADJACENT RRH AT LEAST 30" WIDE CENTERED ON THE EXISTING SAFETY-CLIMB AND 30" DEEP FROM THE FACE OF THE POLE. SELF-SUPPORT: RRH LEG-MOUNT OR FACE-MOUNT SHALL PROVIDE AN UNOBSTRUCTED VERTICAL CLIMBING PASSAGE AT LEAST 30" WIDE AND 30" DEEP CENTERED ON THE LEG WITH THE CLIMBING LADDER/PEGS.
2. CONTRACTOR TO VERIFY DIAMETER OF EXISTING MONOPOLE BEFORE ORDERING PARTS.
3. CONTRACTOR TO VERIFY IN FIELD SIZE OF EXISTING MOUNTING PIPE TO BE 2-1/2" STD (2.88 O.D.) PIPE MAST (6'-0" LONG).
4. VERIFY EXACT RRH AND ANTENNA MODEL & AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION.
5. ROTATE EXISTING ANTENNA FRAME AS NEEDED TO ACCOMMODATE INSTALL ANTENNAS.
6. RRH PLACEMENT FOR REFERENCE ONLY. CONTRACTOR SHALL PLACE RRH IN CORRECT ORDER MATCHING INSTALL ANTENNA PLACEMENT AND ENSURE THAT THERE IS ENOUGH CLEARANCE FOR RRHS TO BE PLACED ON THE INSIDE ON THE ANTENNA FRAME.
7. INSTALL EQUIPMENT TO BE MOUNTED PER MANUFACTURERS SPECIFICATIONS.

SPECIAL CONSTRUCTION NOTE:

SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:

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

SOURCE: HDG 5-5-14

NOTE: ONE SECTOR SHOWN FOR CLARITY

2.5 ANTENNA AND RRH PHOTO DETAIL AND EQUIPMENT SCHEMATIC (2 / S-1)

SCALE: N.T.S.

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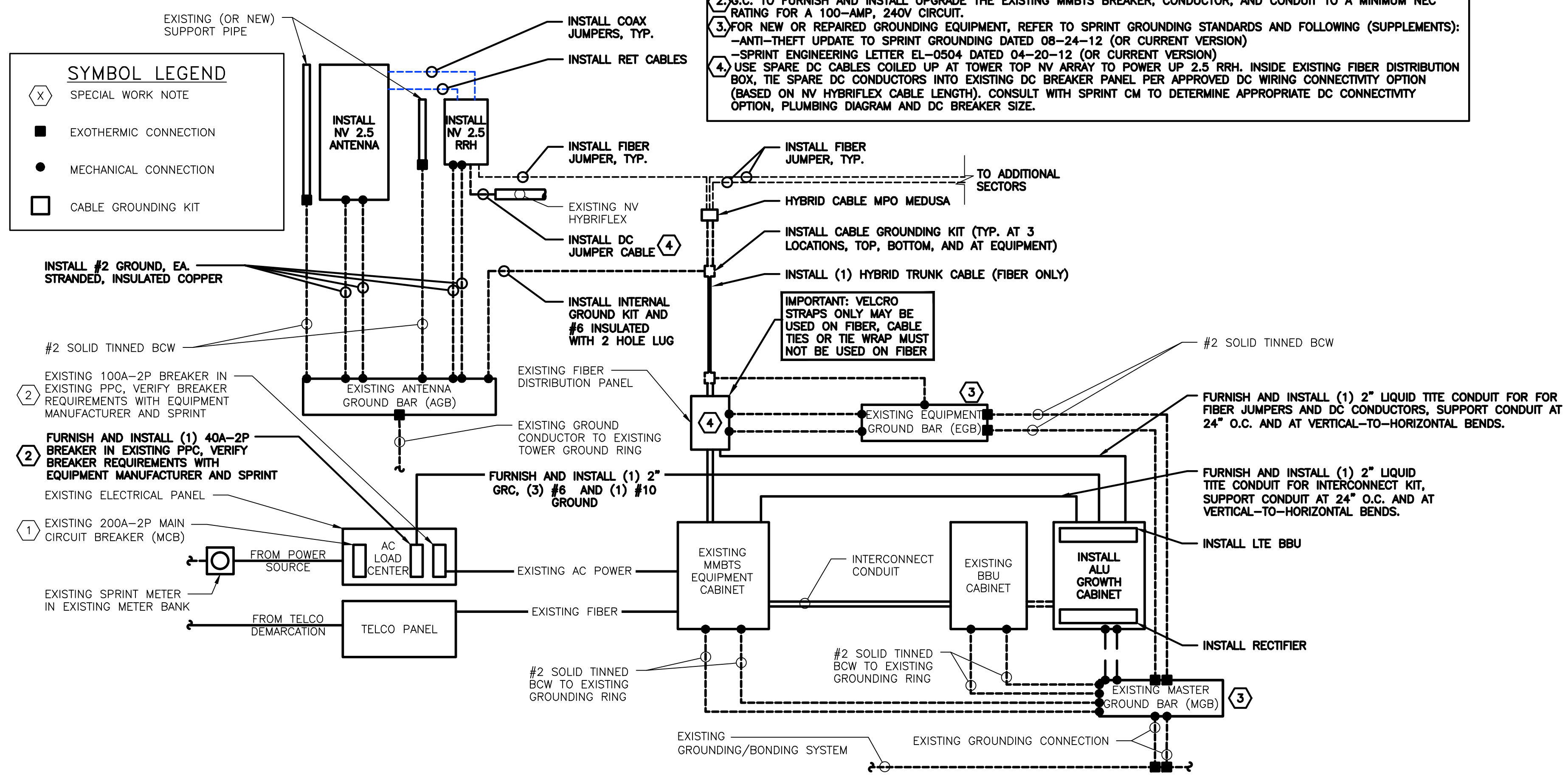
STRUCTURAL DETAILS

SHEET NUMBER

S-1

SPECIAL WORK NOTE:

1. G.C. TO FURNISH AND INSTALL ALL COMPONENTS TO UPGRADE EXISTING ELECTRICAL SERVICE, CONDUIT, CONDUCTOR, PPC AND MCB IN ACCORDANCE WITH SPRINT CONSTRUCTION STANDARDS NV 2.5 ADDENDUM "ENGINEERING NOTICE 2013-002 (POWER UPGRADES) REV.0" (OR CURRENT VERSION)
2. G.C. TO FURNISH AND INSTALL UPGRADE THE EXISTING MMBTS BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING FOR A 100-AMP, 240V CIRCUIT.
3. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS): -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION) -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)
4. USE SPARE DC CABLES COILED UP AT TOWER TOP NV ARRAY TO POWER UP 2.5 RRH. INSIDE EXISTING FIBER DISTRIBUTION BOX, TIE SPARE DC CONDUCTORS INTO EXISTING DC BREAKER PANEL PER APPROVED DC WIRING CONNECTIVITY OPTION (BASED ON NV HYBRIFLEX CABLE LENGTH). CONSULT WITH SPRINT CM TO DETERMINE APPROPRIATE DC CONNECTIVITY OPTION, PLUMBING DIAGRAM AND DC BREAKER SIZE.



TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

SCALE: N.T.S.

1 / 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 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.

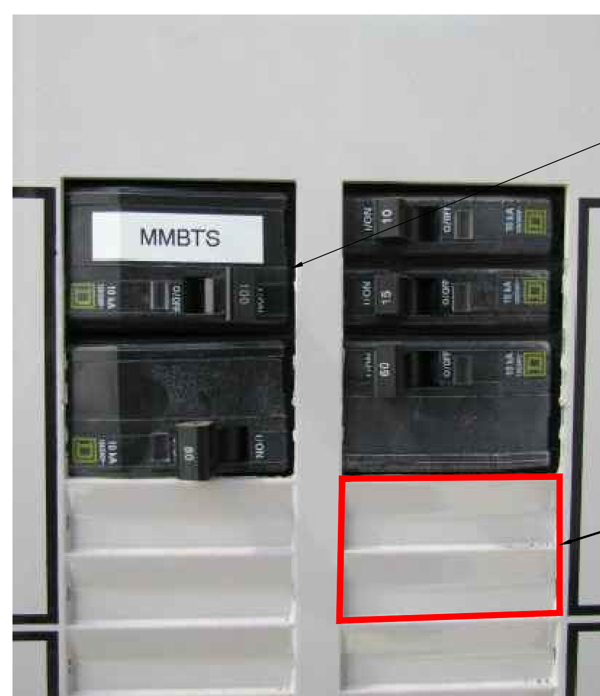
13) RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROJECT OWNER CELL SITE TELCO CABINET AND BTS CABINET AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE IN INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.

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.

EXISTING 200A-2P MAIN CIRCUIT BREAKER (MCB)

SOURCE: SPRINT SITE AUDIT 8-13-13



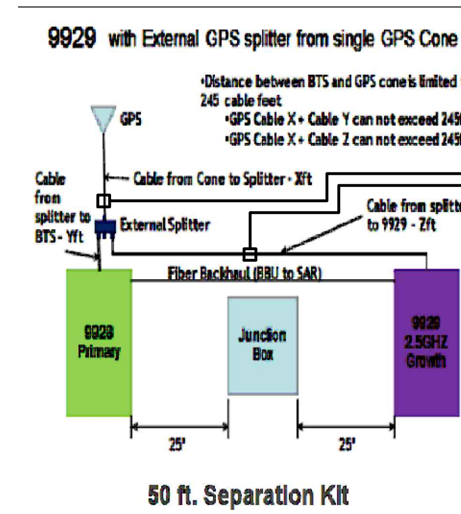
EXISTING 100A-2P MMBTS CIRCUIT BREAKER

FURNISH AND INSTALL 40A-2P BREAKER IN EXISTING PPC, VERIFY BREAKER REQUIREMENTS WITH EQUIPMENT MANUFACTURER AND SPRINT

SOURCE: SPRINT SITE AUDIT 8-13-13

EXISTING PPC BREAKER PANEL

SCALE: N.T.S.



EXISTING GROUND CONNECTION

FURNISH AND INSTALL INTERNAL GROUND KIT AND #6 INSULATED WITH 2 HOLE LUG

EXISTING MASTER GROUND BAR (MGB)

GPS SPLITTER DETAIL

SCALE: N.T.S.

2 / E-1

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SHEET TITLE
ONE LINE DIAGRAM

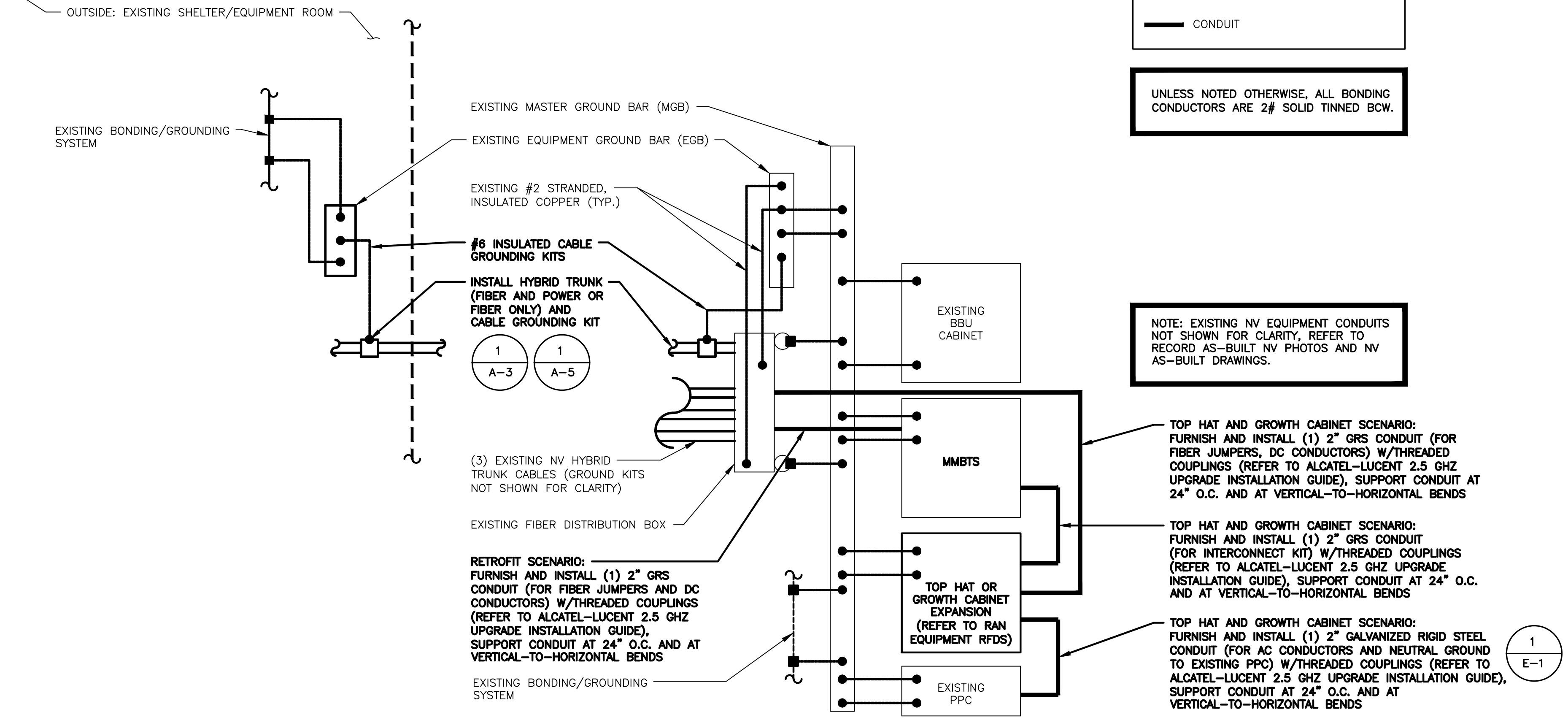
SHEET NUMBER
E-1

SYMBOL LEGEND

- ■ EXOTHERMIC CONNECTION
- ● MECHANICAL CONNECTION
- □ CABLE GROUNDING KIT
- —— GROUNDING/BONDING
- ━━ CONDUIT

UNLESS NOTED OTHERWISE, ALL BONDING CONDUCTORS ARE 2# SOLID TINNED BCW.

NOTE: EXISTING NV EQUIPMENT CONDUITS NOT SHOWN FOR CLARITY, REFER TO RECORD AS–BUILT NV PHOTOS AND NV AS–BUILT DRAWINGS.



NOTE: HYBRIFLEX (FIBER & POWER) AND HYBRIFLEX (FIBER–ONLY) SHOWN. REFER TO RAN EQUIPMENT RFDS FOR SITE–SPECIFIC SCENARIO.

2.5 RAN EQUIPMENT GROUNDING SCHEMATIC (1 / E–2)

SCALE: N.T.S.

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):
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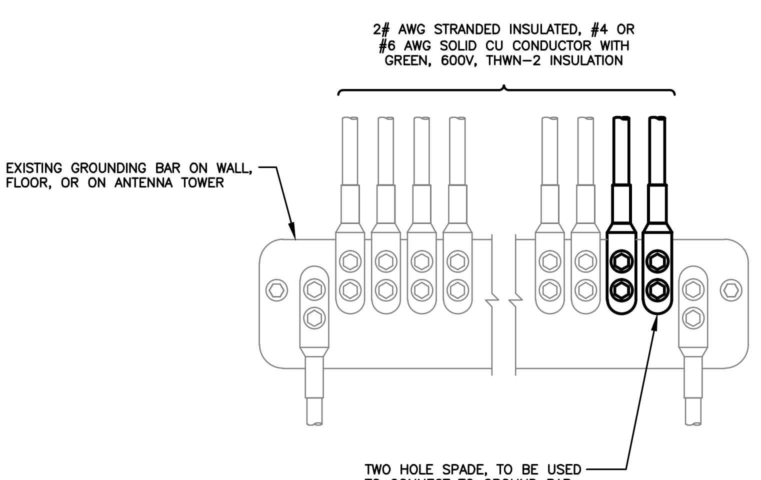
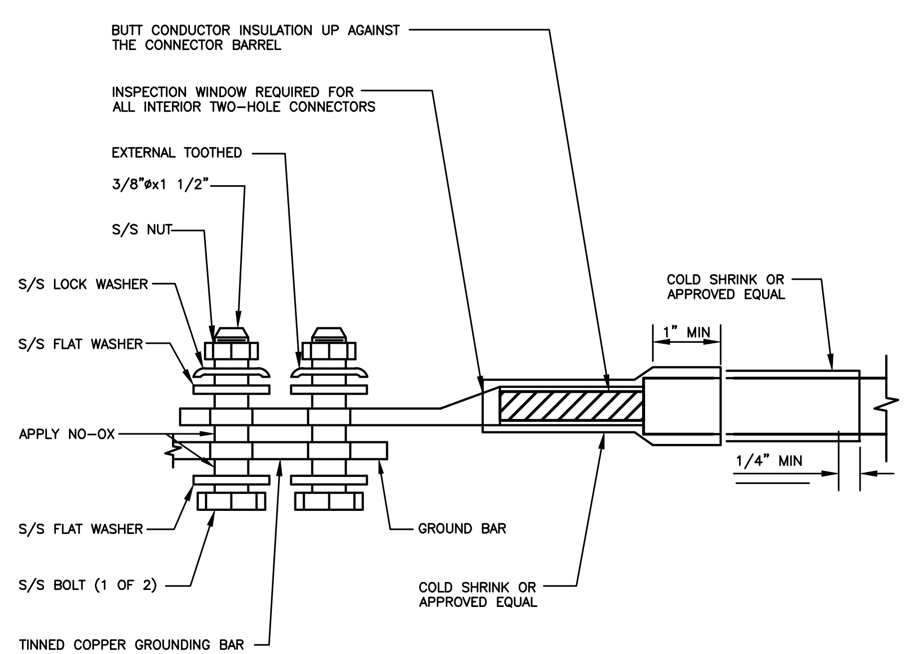


NOTES

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

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR (2 / E–2)

SCALE: N.T.S.



TWO HOLE LUG (3 / E–2)

SCALE: N.T.S.

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E–2