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

December 18, 2017

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

Notice of Exempt Modification
1055 Wintergreen Ave., Hamden, CT
41 20 58.7900 N
72 58 20.9900 W
Sprint #: CT52XC069_DO Macro Upgrade

Dear Ms. Bachman:

Sprint (Clearwire) currently maintains antennas at the 140-foot level of the existing 197-foot Self Support Tower at 1055 Wintergreen Avenue, Hamden, CT. The property and tower are owned by MCM Acquisition 2017, an SBA entity. Sprint now intends to remove (3) existing cell antennas and replace with (3) newer technology cell antennas at the 140-foot level of the tower. The proposed full scope of work is as follows:

Remove:
(2) 2-1/4" lines
(3) (Clearwire) 20"x14"x7" RRHs
(1) (Clearwire) 18"X18"X7" Junction Box

Remove and Replace:
Remove: (3) (Clearwire) Argus LLPX310R-V1 Panel Antennas at 138'
Replace with: (3) KMW ETCR-654L12H6 Panel Antennas at 140'
Ground: (No change to existing compound – cabinet swap on existing pad)
Remove: (1) (Clearwire) equipment cabinet
Replace with: (1) new equipment cabinet

Install:
(3) ALU 1900 Mhz RRU/RRHs
(6) ALU 800 Mhz RRU/RRHs
(3) ALU TD-RRH8x20-25 RRU/RRHs
(6) Back-to-back pipe mounts
(9) SCH40 pipes
(6) 36" standoff arms
(1) ½" line
(4) 1-¼" lines
Ground: (No change to compound – H-frame on existing concrete pad)

[redacted]

(1) H-Frame
(1) PPC cabinet on H-frame
(1) telco cabinet on H-frame

Existing Equipment to Remain (Including entitlements):
(3) Dragonwave A-ANT-23G-2.5-C Dishes (1 is entitlement only)
(2) ½" lines

This facility was approved prior to the Council's jurisdiction by Special Permit on 10/9/01. Approval was given under Case 01-939 for a 195' tower. Conditions set included the placement of bollards around propane tanks and north pads, that a removal bond be posted, and that the tower be built within 3 years' time. A Minor Amendment to the Special Permit approved whips to be mounted for utility and first responder beepers/pagers and that the access road be moved further from the ledge. It is SBA's opinion that the proposed modification complies with all known tower conditions.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16.50j-72(b)(2). In accordance with R.C.S.A. § 16.50j-73, a copy of this letter is being sent to the Town's Mayor, Curt B. Leng, and Zoning Enforcement Officer, Holly Masi. (Separate notice is not being sent to the property or tower owner, as they are 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: Curt B. Leng, Mayor / with attachments
Town of Hamden, Office of the Mayor, 2750 Dixwell Avenue, Hamden, CT 06518
Holly Masi, Zoning Enforcement Officer / with attachments
Town of Hamden, Planning & Zoning Dept., 2750 Dixwell Avenue, Hamden, CT 06518

POWER DENSITY

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	**140 feet**	Height (AGL):	**140 feet**	Height (AGL):	**140 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**2.56 %**	Antenna B1 MPE%	**2.56 %**	Antenna C1 MPE%	**2.56 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.56 %**
Marcus	0.00 %
SkyTel	0.00 %
United Illuminating	0.00 %
American Messaging	0.00 %
Clearwire	0.10 %
ACES	0.00 %
Nextel	0.37 %
Adjacent 250' Tower	6.81 %
Site Total MPE %:	**9.84 %**

SPRINT Sector A Total:	2.56 %
SPRINT Sector B Total:	2.56 %
SPRINT Sector C Total:	2.56 %
Site Total:	9.84 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	432.54	140	0.87	850 MHz	567	0.15%
Sprint 850 MHz LTE	2	432.54	140	1.73	850 MHz	567	0.31%
Sprint 1900 MHz (PCS) CDMA	5	535.94	140	5.37	1900 MHz (PCS)	1000	0.54%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	140	5.37	1900 MHz (PCS)	1000	0.54%
Sprint 2500 MHz (BRS) LTE	8	639.78	140	10.25	2500 MHz (BRS)	1000	1.02%
						Total:	**2.56%**

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

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TOWN OF HAMDEN, CONNECTICUT
GEOGRAPHIC & PROPERTY INFORMATION NETWORK

2750 DIXWELL AVENUE
HAMDEN, CT 06518
203-287-2500
E-MAIL: GENERAL INFORMATION

» MAIN MENU
- GIS HOME
- GIS PROPERTY MAP SEARCH
- TOWN WIDE MAP GALLERY
- TOWN GRID MAPS
- INTERACTIVE MAPPING
- HELP

PROPERTY INFO DATA UPDATED
Nightly
CURRENT PARCEL COUNT
16,800 +/-

» SUMMARY PARCEL INFORMATION & MAP DOCUMENTS

Detailed Parcel Information

Parcel No
2220-001-00-0000

Unique ID
20299

Account T/C/M Acquisition 2017

Owner
~~WEST ROCK LLC~~ (SBA)

Location
1055 WINTERGREEN AVE

MAILING ADDRESS
8051 CONGRESS AVE
BOCA RATON FL 33487

address is correct for SBA corporate

2220-001-00-0000 10/24/2015

Scroll Down For Complete Property Detail

Click on the Google logo to go to Google Maps

Parcel Documents

Create Parcel Map | Property Summary Card

Full Size Assessor Maps

Full Assessor Map

Interactive GIS Maps of Property

GO TO VIRTUAL EARTH BIRDS EYE!

GO TO INTERACTIVE MAP!

Once in Interactive Map, Select Parcel and enter Abutters distance.

PARCEL VALUATIONS

	Appraised Value	Assessed Value
Buildings	45900	32130
Outbuildings	18900	13230
Improvements	64800	45360
Extra Features	0	0
Land	285000	210000
TOTAL:	349800	255360

PROPERTY INFORMATION

Land Acres	1.03
Land Use	RAD/TV TR M96
Land Class	I
Zoning	R1
Neighborhood	75
Lot Description	Above Street,Steep
Lot Setting	Rural
Lot Utilities	Well,Septic
Street Description	Paved

SALE INFORMATION

Sale Date	2/27/2003
Sale Price	0
Book / Page	2405/ 30

BUILDING AREA

Gross Building Area	617
Total Living Area	617

CONSTRUCTION DETAILS

Building Style	Warehouse
Building Use	Ind/Comm
Number of Rooms	

Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	1
Roof Style	Shed
Roof Cover	Metal/Tin
Primary Exterior Wall Type	Concr/Cinder
Secondary Exterior Wall Type	
Primary Interior Wall Type	Minim/Masonry
Secondary Interior Wall Type	
Primary Floor Type	Concr-Finished

Heating Type	None
Heating Fuel	Coal or Wood
Air Conditioning Type	None
Building Style	Warehouse
Building Use	Ind/Comm
Number of Rooms	
Number of Bedrooms	
Number of Bathrooms	0
Number of Half Bathrooms	
Kitchen Style	
Stories	1
Roof Style	Flat
Roof Cover	T&G/Rubber
Primary Exterior Wall Type	Concr/Cinder
Secondary Exterior Wall Type	
Primary Interior Wall Type	Minim/Masonry
Secondary Interior Wall Type	
Primary Floor Type	Concr-Finished
Secondary Floor Type	
Heating Type	None
Heating Fuel	Coal or Wood
Air Conditioning Type	None

Back | New Search | Town of Hamden

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: CT52XC069

SBA Westrock Park
1055 Wintergreen Avenue
Hamden, CT 06514

December 11, 2017

EBI Project Number: 6217005551

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	9.84 %

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

EBI Consulting
environmental | engineering | due diligence

December 11, 2017

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

Emissions Analysis for Site: **CT52XC069 – SBA Westrock Park**

EBI Consulting was directed to analyze the proposed SPRINT facility located at **1055 Wintergreen Avenue, Hamden, CT**, for the purpose of determining whether the emissions from the Proposed SPRINT Antenna Installation located on this property are within specified federal limits.

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

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

General population/uncontrolled exposure limits apply to situations in which the general public 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 public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **1055 Wintergreen Avenue, Hamden, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since SPRINT is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 1 CDMA channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

2) 2 LTE channels (850 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

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

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

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

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

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

8) The antennas used in this modeling are the **KMW ETCR-654L12H6** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antenna mounting height centerlines of the proposed antennas are **140 feet** above ground level (AGL) for **Sector A**, **140 feet** above ground level (AGL) for **Sector B** and **140 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. The cumulative value for this facility includes contributions from the adjacent 250-foot tower on the same property per the Connecticut Siting Council active database

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

SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6	Make / Model:	KMW ETCR-654L12H6
Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd	Gain:	13.35 / 15.25 / 15.05 dBd
Height (AGL):	**140 feet**	Height (AGL):	**140 feet**	Height (AGL):	**140 feet**
Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)	Frequency Bands	850 MHz / 1900 MHz (PCS) / 2500 MHz (BRS)
Channel Count	18	Channel Count	18	Channel Count	18
Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts	Total TX Power(W):	380 Watts
ERP (W):	11,775.31	ERP (W):	11,775.31	ERP (W):	11,775.31
Antenna A1 MPE%	**2.56 %**	Antenna B1 MPE%	**2.56 %**	Antenna C1 MPE%	**2.56 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**2.56 %**
Marcus	0.00 %
SkyTel	0.00 %
United Illuminating	0.00 %
American Messaging	0.00 %
Clearwire	0.10 %
ACES	0.00 %
Nextel	0.37 %
Adjacent 250' Tower	6.81 %
Site Total MPE %:	**9.84 %**

SPRINT Sector A Total:	2.56 %
SPRINT Sector B Total:	2.56 %
SPRINT Sector C Total:	2.56 %
Site Total:	9.84 %

SPRINT _ Frequency Band / Technology (All Sectors)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
Sprint 850 MHz CDMA	1	432.54	140	0.87	850 MHz	567	0.15%
Sprint 850 MHz LTE	2	432.54	140	1.73	850 MHz	567	0.31%
Sprint 1900 MHz (PCS) CDMA	5	535.94	140	5.37	1900 MHz (PCS)	1000	0.54%
Sprint 1900 MHz (PCS) LTE	2	1,339.86	140	5.37	1900 MHz (PCS)	1000	0.54%
Sprint 2500 MHz (BRS) LTE	8	639.78	140	10.25	2500 MHz (BRS)	1000	1.02%
						Total:	**2.56%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public 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 public exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	2.56 %
Sector B:	2.56 %
Sector C:	2.56 %
SPRINT Maximum Total (per sector):	2.56 %
Site Total:	9.84 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **9.84 %** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

ALLPRO
CONSULTING GROUP, INC.
9221 Lyndon B. Johnson Freeway, #204, Dallas, TX 75243 ✶ PHONE 972-231-8893 ✶ FAX 1-866-364-8375
www.allprocgi.com ✶ e-mail: info@allprocgi.com

Tower Structural Analysis Report for
SBA Network Services, Inc.

Existing 197' Self Supported Tower

SBA Site Name: Westrock Park
SBA Site ID: CT22107-A-01
Application #: 71143, v1
Carrier Name: Sprint Nextel
Carrier Site ID: CT52XC069/ SBA Westrock Park

Site Location:
1055 Wintergreen Avenue
Hamden, CT 06514

Latitude: 41.3498
Longitude: -72.9728

ACGI Job # 17-6574

ANALYSIS RESULTS		
Tower Components	42.9 %	**Pass**
Tower Base Foundation	79.6 %	**Pass**

Prepared By:
Saicharan Byrishetty, EIT

10/19/2017
Approved By:
Joji M. George, P.E.
CT PE # 24444

TABLE OF CONTENTS

1. ANALYSIS SUMMARY

The existing 197' Self Supported Tower located in Hamden, CT was analyzed by Allpro Consulting Group, Inc (ACGI) for the existing loads and the proposed Sprint Nextel antennas and coaxes as authorized by SBA Communication Corp. Based on the results of the analysis, the existing tower with mentioned proposed and existing loading is found to be in compliance with TIA-222-G Addendum 2, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures and 2016 Connecticut State Building Code, IBC 2012.

2. SCOPE & SOURCE OF INFORMATION

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

SOURCE OF INFORMATION		
Tower Data:	Valmont Structures	Original Tower Drawings by Valmont Structures. (Project # A-120742-F-1006960, dated 07/29/2004)
Foundation Data:	Tectonic Engineering and Surveying PC.	Foundation data is as per original foundation design by Tectonic Engineering and Surveying PC. (Work Order # 3997.02, dated 09/21/2004)
Geotechnical Report:	BL Companies.	Soil data is as per Geotechnical Report by BL Companies. (Project # C-3053, dated 11/12/2001)
Loading Data:	FDH Velocitel. SBA Communication Corp.	Existing Loading as per TIA Inspection report by FDH Velocitel, FDH Job # 17QAKI1500, dated 04/06/2017. Proposed final loading for Sprint Nextel as per sbasite.com, Application ID# 71143, v1
Authorization:	SBA Communication Corp.	

3. ANALYSIS METHODS & DATA

The analysis was performed in accordance with Telecommunication Industry Association specification TIA-222-G-Addendum 2. The tower was modeled using TNX Tower, a 3-D finite element program. TNX Tower is a general-purpose modeling, analysis, and design program created specifically for communication towers using the EIA-222-C, EIA-222-D, TIA/EIA-222-F or TIA-222-G standards. The 3-D model included the tower, with existing appurtenances and all proposed loads.

SITE DATA	
SBA Site Name:	Westrock Park
SBA Site Number:	CT22107-A-01
Carrier Site ID:	CT52XC069
City, State:	Hamden, CT
County:	New Haven County
Code Wind Load Requirement:	TIA-222-G & IBC 2012 (124 mph Ultimate wind speed equivalent to 95 mph nominal wind speed)
Wind Load Used:	TIA-222-G Code: • Nominal wind speed of 95 mph (3 second gust wind speed) • Structure Class II. • Exposure Category B. • Topographic Category 2. • Crest Height 300.00 ft. • A wind speed of 50 mph is used in Combination with ice. • Nominal ice thickness of 0.75 in.
Seismic Check	Ss = 0.189g < 1.0g, thus seismic loading can be ignored as per 2.7.3 of the TIA-222-G code.

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

TOWER DATA	
Tower Type:	Self-Supported Tower
Height:	197'
Cross Section:	Triangular
Steel Strength:	Legs – 50 ksi , Braces – 36 ksi
Type of Foundation:	Rock Anchor Foundation

TOWER HISTORY	
Tower Manufacturer / Model:	Valmont Structures.
Date of Original Design:	11/12/2001
Previous Modifications:	N/A
Original Design Code Requirements:	ANSI/TIA-222-F, 105 mph Basic Wind Speed, 25% reduced Wind speed with 0.5" ice.

4. CONCLUSIONS

RESULT SUMMARY		
MEMBER	***% Capacity***	***Result***
Legs	**31.3 %**	**Pass**
Diagonals	**42.9 %**	**Pass**
Girt	**0.5 %**	**Pass**
Bolt Checks	**42.9 %**	**Pass**
Anchor Bolts	**24.6 %**	**Passx**
FOUNDATION CAPACITY		
Safety against Overturning	**79.6 %**	**Pass**
Net bearing pressure	**19.2 %**	**Pass**
Horizontal Shear	**8.6 %**	**Pass**
OVERALL TOWER RATING = 79.6 %		

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

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

5. DISCLAIMER

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

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

6. ASSUMPTIONS

This analysis was completed based on the following assumptions:

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

7. APPURTENANCE LISTING

EXISTING LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
200.5'±	2	15' x 2.5" Omni	Direct	(2) 1-1/4"	Building B
187'±	1	8' Yagi w/ (8) 4' Elements	(1) 6' Standoff	(1) 1/2"	Building C
185'±	2	18' x 2.9" Omni	(1) 4' Standoff	(1) 7/8"	
182'±	1	1' Dish	-	(1) 1/4"	
182'±	1	12' x 2.9" Omni	(2) 12.5' T- Frames	(1) 7/8"	
167'±	2	15' x 2.9" Inverted Omni		(1) 1/2" (1) 7/8"	
177'±	1	5' Out Braodcast Antenna		(1) 1/2"	
141.3'±	1	Andrew VHLP2-18-DW1 Dish	(3) 2.5' Standoffs	(2) 1/2" (2) 2-1/4"	Sprint/ Clearwire
138.6'±	3	Argus LLPX310R-V1 Panels			
138.6'±	1	25" Dish			
138.4'±	3	20"x14"x7" RRHs			
137.5'±	1	18"x18"x7" Junction Box	Direct		
115'±	1	10' x 2" Omni	(3) 12.5' T-Frames	(1) 1/2"	Building C
112.5'±	1	5' x 1.5" Omni		(1) 1/2"	
107'±	1	Terrawave T09170p1000690 Panel		(1) 7/8"	
56.3'±	1	12' x 2.9" Omni	(1) 1.0' Standoff	(2) 1-1/4"	
43'±	1	3' Channel master Dish	(1) 2' Lx1'Tsa/2'6"T	(1) 1/4"	

FINAL SPRINT NEXTEL LOAD DESCRIPTION					
ELEV (ft.)	***Qty.***	***Antenna Description***	***Mount Type & Qty.***	***TX. LINE (in)***	***TENANT***
140'±	3	KMW ETCR-654L12H6 Antenna	(3) 2.5' Standoffs w/ (6) 3" x 7' pipe mounts	(4) 1-1/4" (3) 1/2"	Sprint Nextel
	3	Dragonwave A-ANT-23G-2.5-C Dish			
	3	ALU 1900 Mhz RRU/RRH			
	6	ALU 800 Mhz RRU/RRH			
	3	ALU TD-RRH8x20-25 RRU/RRH			

Notes:

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

8. SUMMARY OF WORKING PERCENTAGE OF STRUCTURAL COMPONENTS

Section Capacity Table

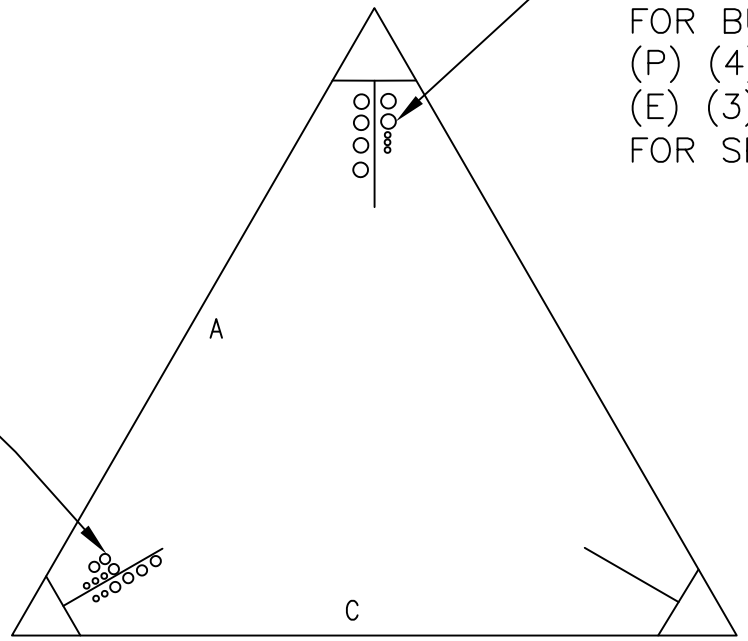
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP$_{allow}$ K	% Capacity	Pass Fail
T1	195 - 190	Leg	2 1/2	3	-1.05	186.65	0.6	Pass
T2	190 - 180	Leg	Pirod 105245	20	-3.13	214.86	10.3	Pass
T3	180 - 160	Leg	Pirod 105217	32	-9.21	214.86	27.1	Pass
T4	160 - 140	Leg	Pirod 105218	47	-39.86	300.68	13.3	Pass
T5	140 - 120	Leg	Pirod 105219	62	-53.75	399.87	22.4	Pass
T6	120 - 100	Leg	Pirod 105219	77	-100.07	399.87	25.0	Pass
T7	100 - 80	Leg	Pirod 105220	92	-134.15	512.38	26.2	Pass
T8	80 - 60	Leg	Pirod 139283	107	-157.28	613.14	25.7	Pass
T9	60 - 40	Leg	Pirod 139283	116	-192.14	613.14	31.3	Pass
T10	40 - 20	Leg	Pirod 139284	125	-226.45	741.99	30.5	Pass
T11	20 - 0	Leg	Pirod 139285	133	-257.87	883.14	29.2	Pass
T1	195 - 190	Diagonal	1	9	-0.33	12.57	2.6	Pass
T2	190 - 180	Diagonal	L2 1/2x2 1/2x3/16	27	-1.22	13.38	9.1 12.5 (b)	Pass
T3	180 - 160	Diagonal	L3x3x3/16	34	-4.32	17.30	25.0 41.6 (b)	Pass
T4	160 - 140	Diagonal	L3x3x3/16	50	-4.45	14.80	30.0 42.9 (b)	Pass
T5	140 - 120	Diagonal	L3x3x5/16	65	-6.38	19.26	33.1 36.8 (b)	Pass
T6	120 - 100	Diagonal	L3 1/2x3 1/2x5/16	79	-7.53	25.06	30.1 36.2 (b)	Pass
T7	100 - 80	Diagonal	L3 1/2x3 1/2x5/16	95	-7.86	20.49	38.4 40.0 (b)	Pass
T8	80 - 60	Diagonal	2L3 1/2x3 1/2x5/16	114	-11.76	52.58	22.4	Pass
T9	60 - 40	Diagonal	2L3 1/2x3 1/2x5/16	123	-12.57	48.27	26.0	Pass
T10	40 - 20	Diagonal	2L3 1/2x3 1/2x5/16	132	-12.47	44.30	28.1	Pass
T11	20 - 0	Diagonal	2L3 1/2x3 1/2x5/16	140	-14.43	40.67	35.5	Pass
T1	195 - 190	Top Girt	1	6	-0.03	6.85	0.5	Pass
T2	190 - 180	Top Girt	1	24	-0.02	6.85	0.3 0.4 (b)	Pass
							Summary	
						Leg (T9)	31.3	Pass
						Diagonal (T4)	42.9	Pass
						Top Girt (T1)	0.5	Pass
						Bolt Checks	42.9	Pass
						RATING =	**42.9**	**Pass**

APPENDIX

COAX LAYOUT

(E) (2) 1-1/4" COAX TO 193'
FOR BUILDING B
(P) (4) 1-1/4" HYBRID CABLE
(E) (3) 1/2" COAX
FOR SPRINT NEXTEL TO 140'

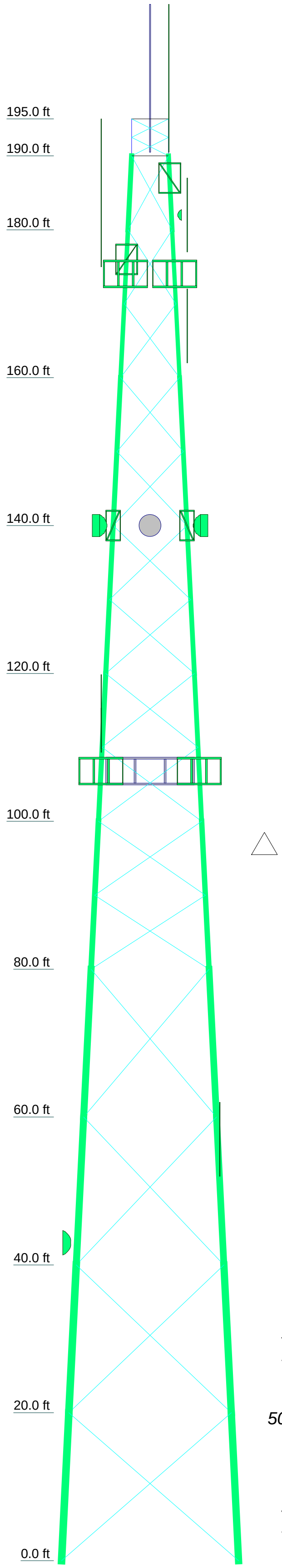
(E) (2) 1/2" TO 110'
(2) 7/8" TO 175'
(1) 7/8" TO 172'
(1) 1/2" TO 172'
(1) 1/2" TO 175'
(1) 1/2" TO 190'
(1) 7/8" TO 50.3'
(1) 1/4" TO 182'
(1) 1/4" 43'
FOR BUILDING C



COAX LAYOUT
N.T.S

TOWER ELEVATION DRAWING

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	A	A572-50	SR 1	A36	SR 1	5	2 @ 2.5	0.5
T2	B		C				11 @ 10	1.3
T3	Pirod 105217		L3x3x3/16		N.A.	6		2.4
T4	Pirod 105218					8		2.9
T5	Pirod 105219		L3x3x5/16			10		4.0
T6			L3 1/2x3 1/2x5/16			12		4.3
T7	Pirod 105220					14		5.0
T8	Pirod 139283		2L3 1/2x3 1/2x5/16			16	4 @ 20	7.1
T9						18		7.2
T10	Pirod 139284					20		7.6
T11	Pirod 139285					22		8.4
						24		50.6



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 2 1/2	C	L2 1/2x2 1/2x3/16
B	Pirod 105245		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 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 2 with Crest Height of 300.00 ft
8. TOWER RATING: 42.9%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 276 K
SHEAR: 34 K

UPLIFT: -223 K
SHEAR: 28 K

AXIAL 209 K
SHEAR 19 K
MOMENT 2021 kip-ft
TORQUE 5 kip-ft
50 mph WIND - 0.7500 in ICE

AXIAL 68 K
SHEAR 53 K
MOMENT 5266 kip-ft
TORQUE 12 kip-ft
REACTIONS - 96 mph WIND

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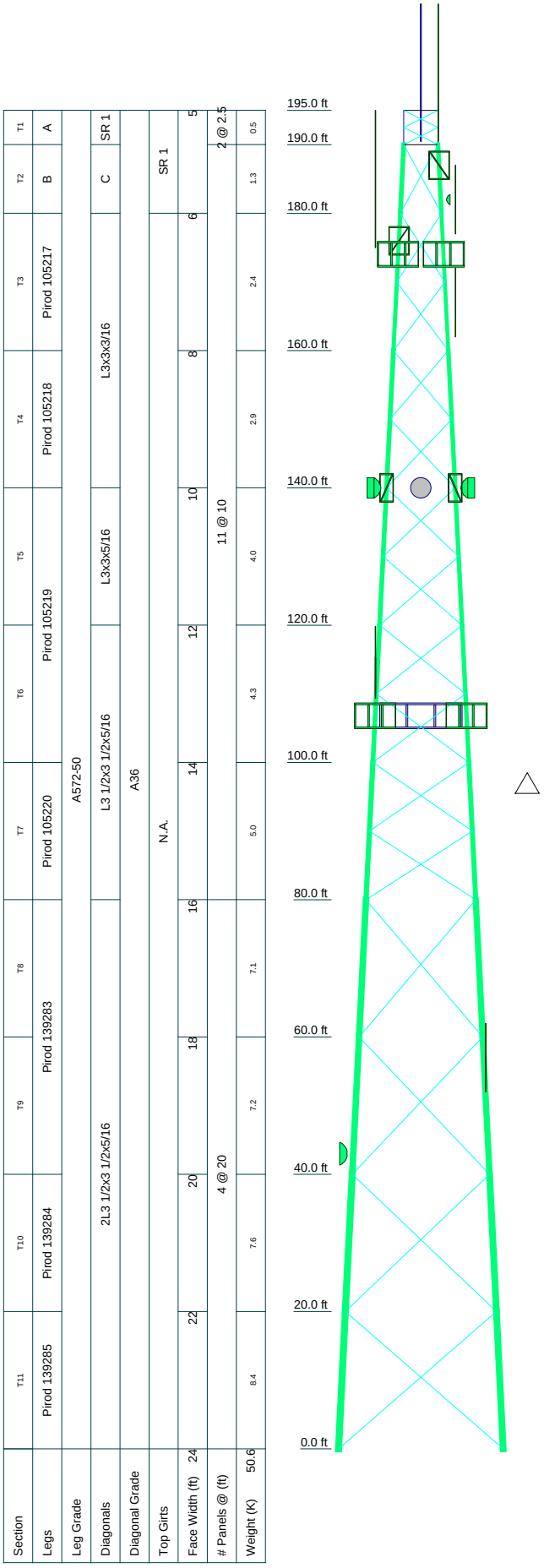
Job: ***17-6574***		
Project: ***CT22107-A-01/ Westrock Park***		
Client: SBA	Drawn by: sbyrishetty	App'd:
Code: TIA-222-G	Date: 10/19/17	Scale: NTS
Path: P:\2017\Structural\17-6574 CT22107-A-01 Westrock Park SBA SA\TNX (if required)\CT22107-A-01 Westrock Park SBA SA.eri		Dwg No. E-1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
15' x 2.5" Omni (Building B)	193	1900 MHz RRH (Sprint Nextel)	140
15' x 2.5" Omni (Building B)	193	1900 MHz RRH (Sprint Nextel)	140
8' Yagi w/ (8) 4' Elements (Building C)	187	2.5 Stand offs (Sprint Nextel)	140
6' Standoff (Building C)	187	2.5 Stand offs (Sprint Nextel)	140
1.0'dish (Building C)	182	2.5 Stand offs (Sprint Nextel)	140
5' Out Braodcast Antenna (Building C)	177	A-ANT-23G-2.5-C (Sprint Nextel)	140
4' Standoff (Building C)	176	A-ANT-23G-2.5-C (Sprint Nextel)	140
18' x 2.9" Omni (Building C)	176	A-ANT-23G-2.5-C (Sprint Nextel)	140
12' x 2.9" Omni (Building C)	174	ETCR-654L12H6 (Sprint Nextel)	140
(2) 15' x 2.9" Inverted Omni (Building C)	174	Terrawave T09170p1000690 Panel (Building C)	107
12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	174	12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	106.8
12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	174	12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	106.8
1900 MHz RRH (Sprint Nextel)	140	12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	106.8
800 MHz RRH (Sprint Nextel)	140		
800 MHz RRH (Sprint Nextel)	140	10' x 2" Omni (Building C)	106.8
800 MHz RRH (Sprint Nextel)	140	5' x 1.5" Omni (Building C)	106.8
TD-RRH8x20-25 (Sprint Nextel)	140	1' Standoff (Building C)	51
TD-RRH8x20-25 (Sprint Nextel)	140	12' x 2.9" Omni (Building C)	51
TD-RRH8x20-25 (Sprint Nextel)	140	3' Channel master Dish (Building C)	43
ETCR-654L12H6 (Sprint Nextel)	140	2'6"x4" Pipe Mount (Building C)	41
ETCR-654L12H6 (Sprint Nextel)	140		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	SR 2 1/2	C	L2 1/2x2 1/2x3/16
B	Pirod 105245		

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 96 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 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 2 with Crest Height of 300.00 ft

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Code: TIA-222-G	Date: 10/19/17	Scale: NTS
Path: P:\2017\Structural\17-6574 CT22107-A-01 Westrock Park SBA SA\TNX (if required)\CT22107-A-01 Westrock Park SBA SA.eri		Dwg No. E-1

MISCELLANEOUS PLOTS

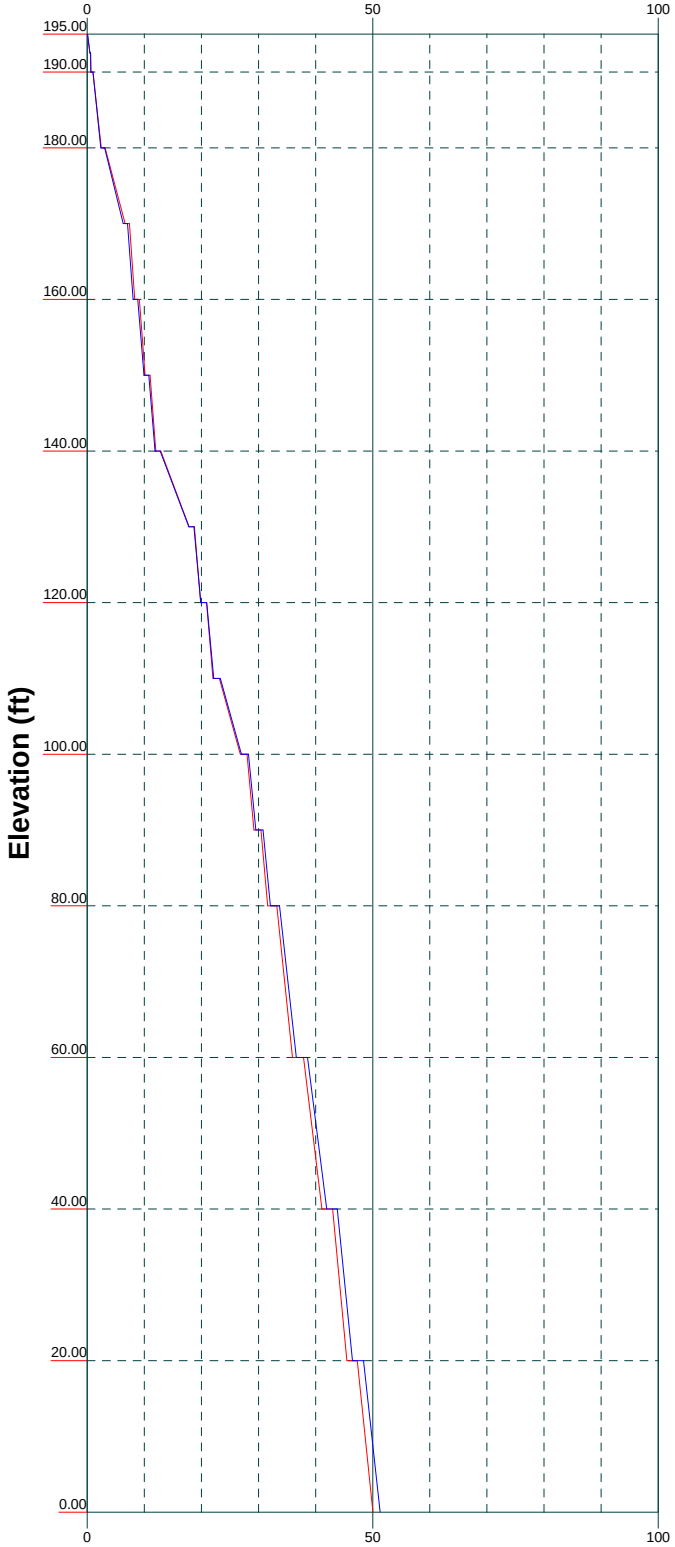
TIA-222-G - 96 mph/50 mph 0.7500 in Ice Exposure B

Vx Vz

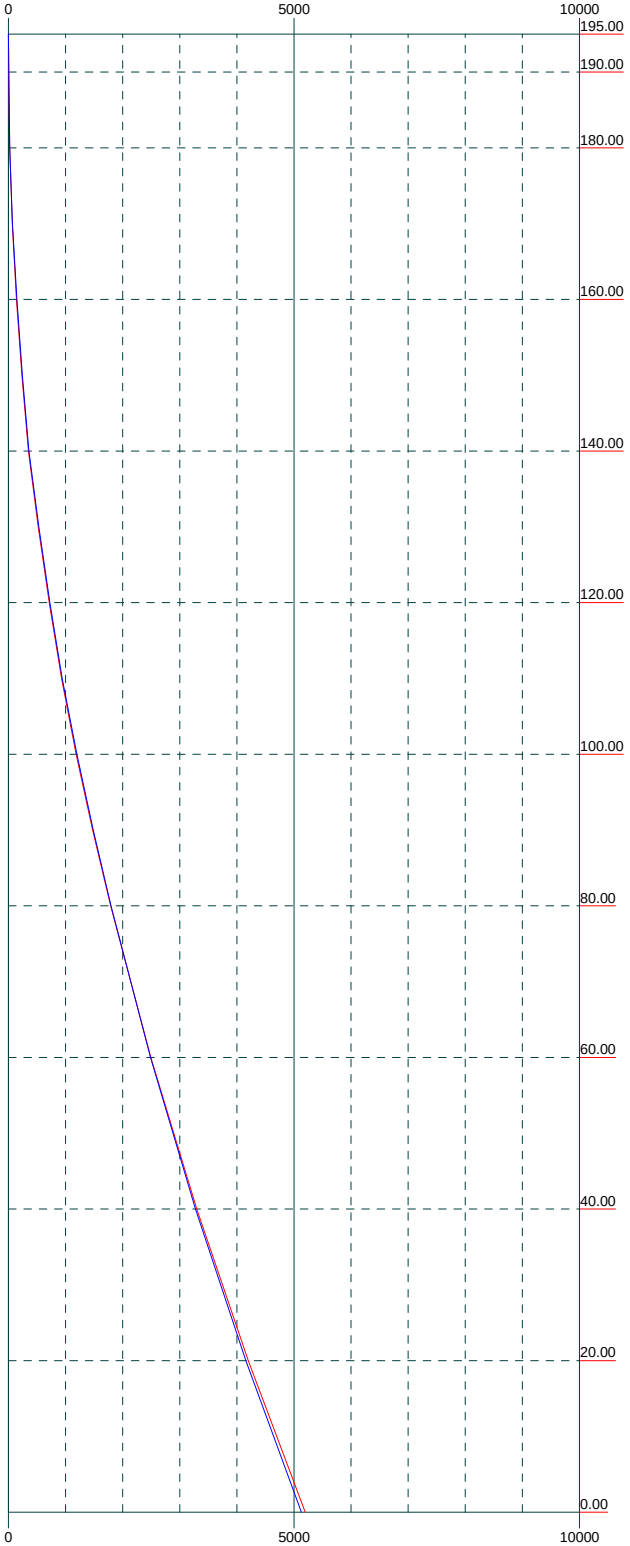
Maximum Values

Mx Mz

Global Mast Shear (K)



Global Mast Moment (kip-ft)



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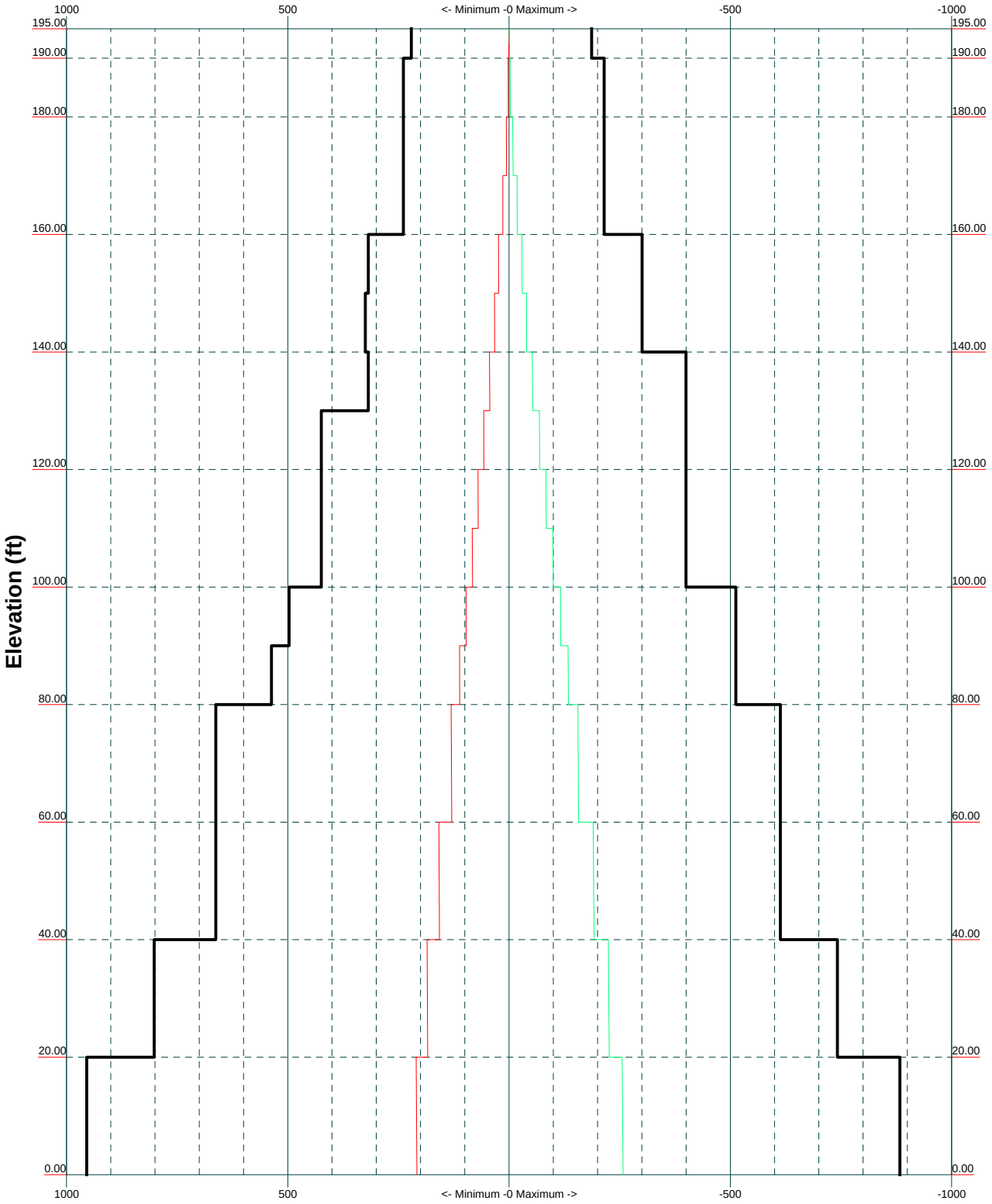
Client: SBA	Drawn by: sbyrishetty	App'd:
Code: TIA-222-G	Date: 10/19/17	Scale: NTS
Path: P:\2017\Structural\17-6574 CT22107-A-01 Westrock Park SBA SA\TNX (if required)\CT22107-A-01 Westrock Park SBA SA.eri		Dwg No. E-4

TIA-222-G - 96 mph/50 mph 0.7500 in Ice Exposure B

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



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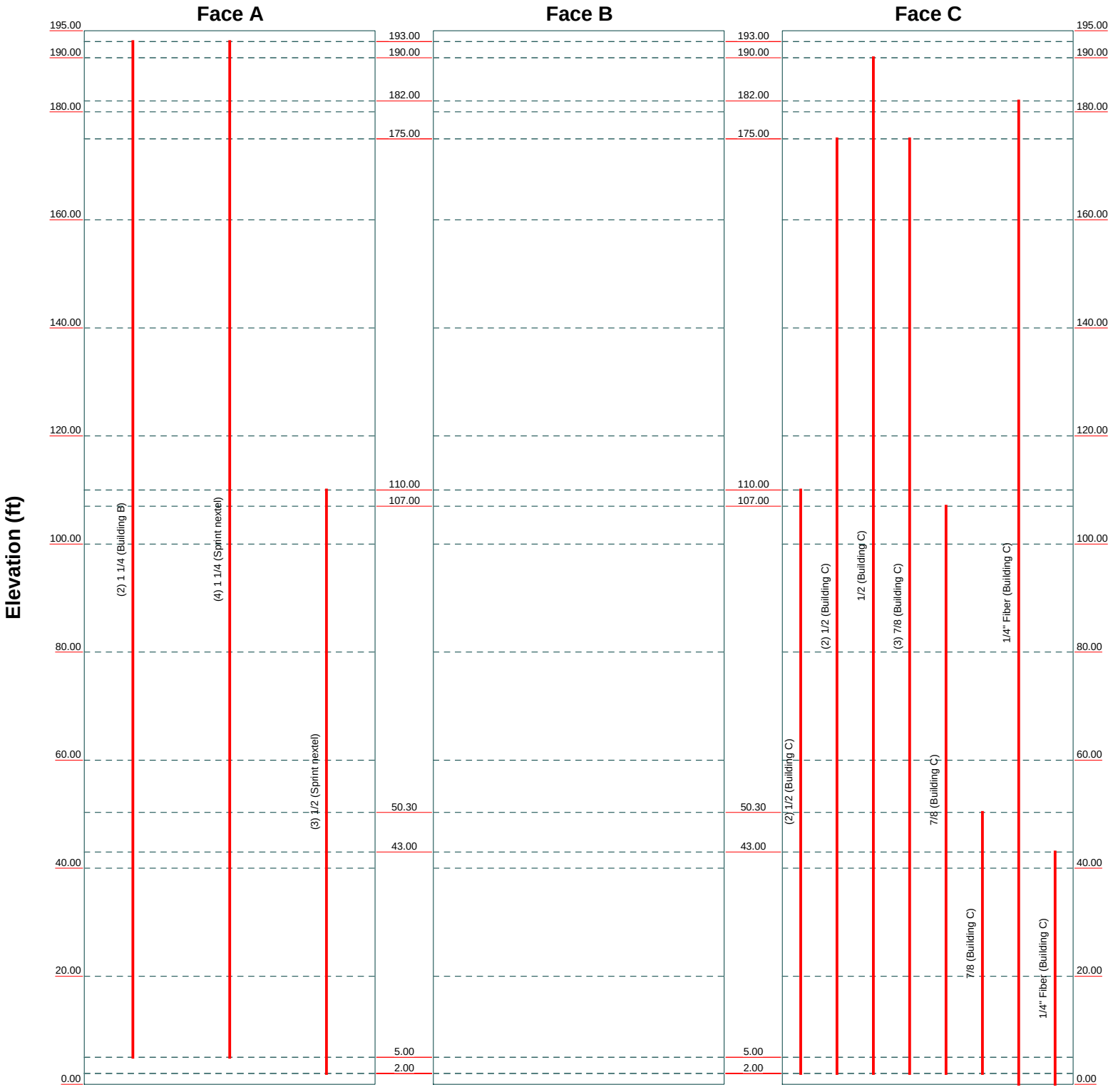
Job: ***17-6574***		
Project: ***CT22107-A-01/ Westrock Park***		
Client: SBA	Drawn by: sbyrishetty	App'd:
Code: TIA-222-G	Date: 10/19/17	Scale: NTS
Path: P:\2017\Structural\17-6574 CT22107-A-01 Westrock Park SBA SA\TNX (if required)\CT22107-A-01 Westrock Park SBA SA.eri		Dwg No. E-3

Feed Line Distribution Chart
0' - 195'

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



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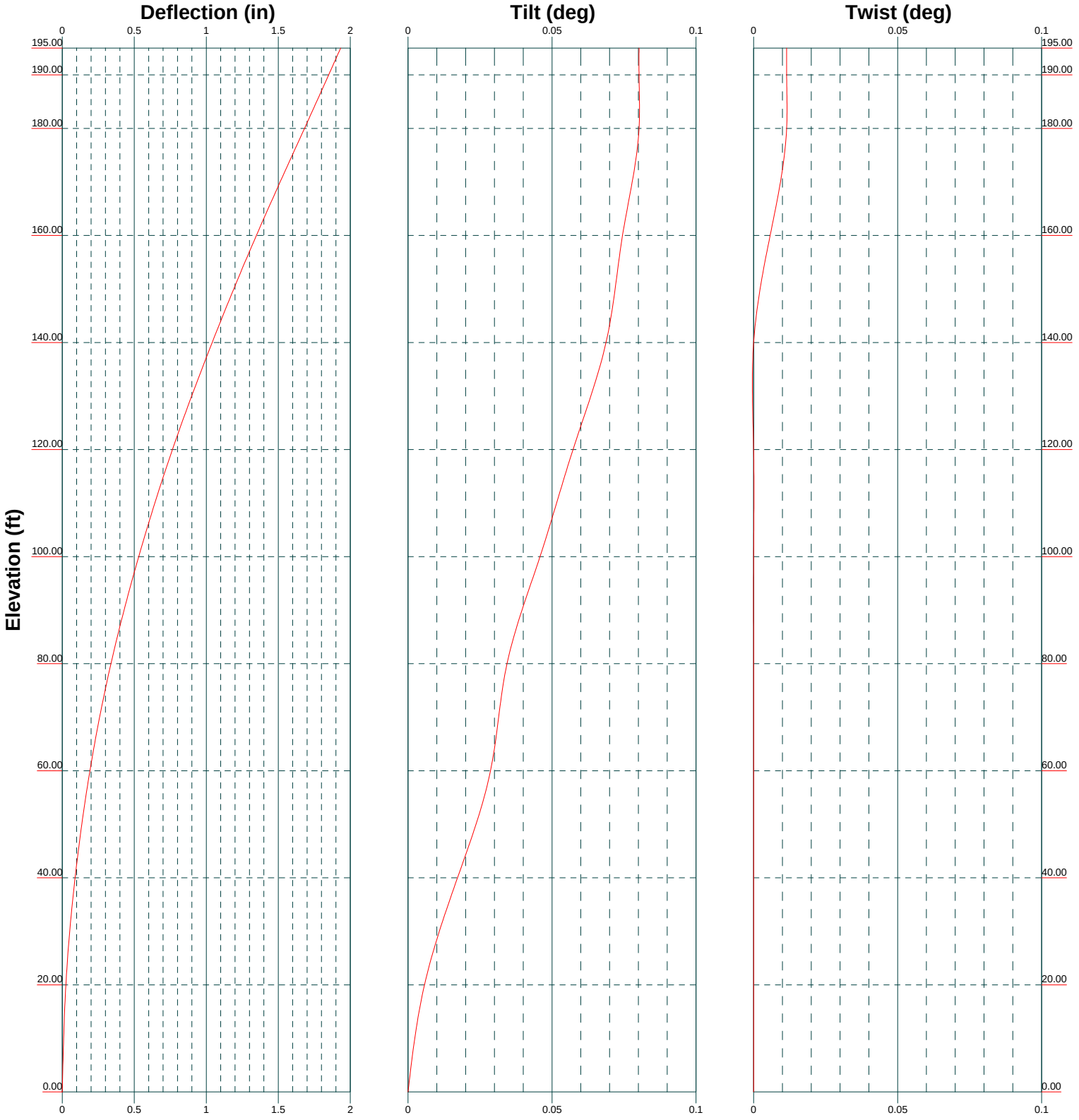
Client: SBA	Drawn by: sbyrishetty	App'd:
Code: TIA-222-G	Date: 10/19/17	Scale: NTS
Path: P:\2017\Structural\17-6574 CT22107-A-01 Westrock Park SBA SA\TNX (if required)\CT22107-A-01 Westrock Park SBA SA.eri		Dwg No. E-7

TIA-222-G - Service - 60 mph

Maximum Values



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Job: ***17-6574***		
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Code: TIA-222-G	Date: 10/19/17	Scale: NTS
Path: P:\2017\Structural\17-6574 CT22107-A-01 Westrock Park SBA SA\TNX (if required)\CT22107-A-01 Westrock Park SBA SA.eri		Dwg No. E-5

CALCULATION PRINTOUT

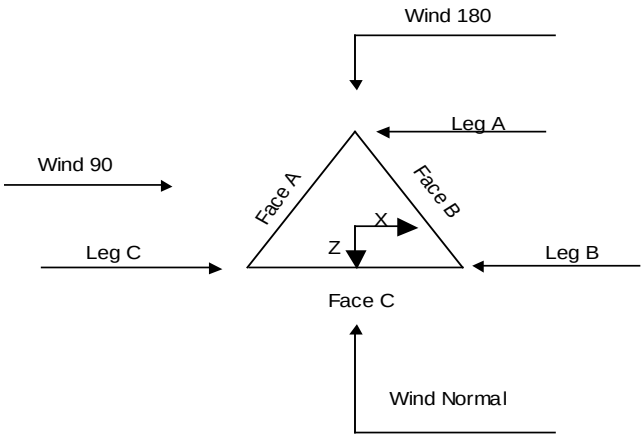
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 24.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 96 mph.
- Structure Class II.
- Exposure Category B.
- Topographic Category 2.
- Crest Height 300.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in tower member design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	195.00-190.00			5.00	1	5.00
T2	190.00-180.00			5.00	1	10.00
T3	180.00-160.00			6.00	1	20.00
T4	160.00-140.00			8.00	1	20.00
T5	140.00-120.00			10.00	1	20.00
T6	120.00-100.00			12.00	1	20.00
T7	100.00-80.00			14.00	1	20.00
T8	80.00-60.00			16.00	1	20.00
T9	60.00-40.00			18.00	1	20.00
T10	40.00-20.00			20.00	1	20.00
T11	20.00-0.00			22.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	195.00-190.00	2.50	X Brace	No	No	0.0000	0.0000
T2	190.00-180.00	10.00	X Brace	No	No	0.0000	0.0000
T3	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T4	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 195.00-190.00	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1	A36 (36 ksi)
T2 190.00-180.00	Truss Leg	Pirod 105245	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 180.00-160.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T4 160.00-140.00	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T5 140.00-120.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T6 120.00-100.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 100.00-80.00	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T8 80.00-60.00	Truss Leg	Pirod 139283	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16	A36 (36 ksi)
T9 60.00-40.00	Truss Leg	Pirod 139283	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16	A36 (36 ksi)
T10 40.00-20.00	Truss Leg	Pirod 139284	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16	A36 (36 ksi)
T11 20.00-0.00	Truss Leg	Pirod 139285	A572-50 (50 ksi)	Double Equal Angle	2L3 1/2x3 1/2x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 195.00-190.00	Solid Round	1	A572-50 (50 ksi)	Solid Round		A570-50 (50 ksi)
T2 190.00-180.00	Solid Round	1	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 195.00-190.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 190.00-180.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T5 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1]: Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 195.00-190.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 190.00-180.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 180.00-160.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 160.00-140.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1
T5 140.00-120.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	0.5 0.5	1 1
T6 120.00-100.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 100.00-80.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 80.00-60.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 60.00-40.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 40.00-20.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 20.00-0.00	Yes	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members: Leg Panels	X Brace Diagonals	Z Brace Diagonals
T2 190.00-180.00	1	0.5	0.85	1	0.5	0.85
T3 180.00-160.00	1	0.5	0.85	1	0.5	0.85
T4 160.00-140.00	1	0.5	0.85	1	0.5	0.85
T5 140.00-120.00	1	0.5	0.85	1	0.5	0.85
T6 120.00-100.00	1	0.5	0.85	1	0.5	0.85
T7 100.00-80.00	1	0.5	0.85	1	0.5	0.85
T8 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T9 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T10 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T11 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg: Net Width Deduct in	U	Diagonal: Net Width Deduct in	U	Top Girt: Net Width Deduct in	U	Bottom Girt: Net Width Deduct in	U	Mid Girt: Net Width Deduct in	U	Long Horizontal: Net Width Deduct in	U	Short Horizontal: Net Width Deduct in	U
T1 195.00-190.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 190.00-180.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 180.00-160.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 160.00-140.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 140.00-120.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 120.00-100.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 100.00-80.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 60.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T10 40.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 195.00-190.00	Flange	0.6250 A325N	0	0.0000 A325N	0	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 190.00-180.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 180.00-160.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 160.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T5 140.00-120.00	Flange	1.0000 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.5000 A325N	1
T6 120.00-100.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T7 100.00-80.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T8 80.00-60.00	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T9 60.00-40.00	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T10 40.00-20.00	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1
T11 20.00-0.00	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 1/4 (Building B)	A	No	Ar (CaAa)	193.00 - 5.00	-1.5000	0.45	2	2	0.5000	1.5500		0.66
1 1/4 (Sprint nextel)	A	No	Ar (CaAa)	193.00 - 5.00	-1.5000	0.45	4	4	0.5000	1.5500		0.66
1/2 (Sprint nextel)	A	No	Ar (CaAa)	110.00 - 2.00	-1.5000	0.45	3	3	0.5800	0.5800		0.25
1/2 (Building C)	C	No	Ar (CaAa)	110.00 - 2.00	-1.5000	0.45	2	2	0.5800	0.5800		0.25
1/2	C	No	Ar (CaAa)	175.00 - 2.00	-1.5000	0.45	2	2	0.5800	0.5800		0.25

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
(Building C) 1/2	C	No	Ar (CaAa)	190.00 - 2.00	-1.5000	0.45	1	1	0.5800	0.5800		0.25
(Building C) 7/8	C	No	Ar (CaAa)	175.00 - 2.00	-1.5000	0.45	3	3	0.5000	1.1100		0.54
(Building C) 7/8	C	No	Ar (CaAa)	107.00 - 2.00	-1.5000	0.45	1	1	0.5000	1.1100		0.54
(Building C) 7/8	C	No	Ar (CaAa)	50.30 - 2.00	-1.5000	0.45	1	1	0.5000	1.1100		0.54
(Building C) 1/4" Fiber	C	No	Ar (CaAa)	182.00 - 0.00	-1.5000	0.45	1	1	0.4400	0.4400		0.08
(Building C) 1/4" Fiber	C	No	Ar (CaAa)	43.00 - 0.00	-1.5000	0.45	1	1	0.4400	0.4400		0.08
(Building C) Feedline Ladder (Af)	A	No	Af (CaAa)	0.00 - 0.00	-1.5000	0.45	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	B	No	Af (CaAa)	0.00 - 0.00	-1.5000	0.45	1	1	3.0000	3.0000		8.40
Feedline Ladder (Af)	C	No	Af (CaAa)	0.00 - 0.00	-1.5000	0.45	1	1	3.0000	3.0000		8.40

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	195.00-190.00	A	0.000	0.000	2.790	0.000	0.01
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	190.00-180.00	A	0.000	0.000	9.300	0.000	0.04
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.668	0.000	0.00
T3	180.00-160.00	A	0.000	0.000	18.600	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	8.775	0.000	0.04
T4	160.00-140.00	A	0.000	0.000	18.600	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	11.020	0.000	0.05
T5	140.00-120.00	A	0.000	0.000	18.600	0.000	0.08
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	11.020	0.000	0.05
T6	120.00-100.00	A	0.000	0.000	20.340	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	12.957	0.000	0.06
T7	100.00-80.00	A	0.000	0.000	22.080	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	15.560	0.000	0.07
T8	80.00-60.00	A	0.000	0.000	22.080	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	15.560	0.000	0.07
T9	60.00-40.00	A	0.000	0.000	22.080	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.835	0.000	0.08
T10	40.00-20.00	A	0.000	0.000	22.080	0.000	0.09
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	18.660	0.000	0.08
T11	20.00-0.00	A	0.000	0.000	17.082	0.000	0.07

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	16.970	0.000	0.07

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	195.00-190.00	A	2.001	0.000	0.000	8.388	0.000	0.11
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	190.00-180.00	A	2.000	0.000	0.000	27.950	0.000	0.36
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	5.468	0.000	0.08
T3	180.00-160.00	A	1.997	0.000	0.000	55.856	0.000	0.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	50.072	0.000	0.60
T4	160.00-140.00	A	1.991	0.000	0.000	55.779	0.000	0.72
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	60.633	0.000	0.72
T5	140.00-120.00	A	1.983	0.000	0.000	55.672	0.000	0.71
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	60.461	0.000	0.72
T6	120.00-100.00	A	1.972	0.000	0.000	65.776	0.000	0.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	72.837	0.000	0.85
T7	100.00-80.00	A	1.956	0.000	0.000	75.700	0.000	0.92
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	87.958	0.000	1.03
T8	80.00-60.00	A	1.932	0.000	0.000	75.201	0.000	0.90
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	87.160	0.000	1.01
T9	60.00-40.00	A	1.893	0.000	0.000	74.410	0.000	0.88
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	92.204	0.000	1.07
T10	40.00-20.00	A	1.825	0.000	0.000	73.010	0.000	0.85
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	101.349	0.000	1.18
T11	20.00-0.00	A	1.660	0.000	0.000	54.981	0.000	0.60
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	86.662	0.000	0.94

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	195.00-190.00	0.0404	-2.6530	0.0097	-0.6395
T2	190.00-180.00	-0.1351	-2.4203	-0.2280	-0.3596
T3	180.00-160.00	-1.2027	-2.1433	-0.8632	-0.2587
T4	160.00-140.00	-1.7743	-2.3570	-1.3323	-0.2915
T5	140.00-120.00	-2.0735	-2.7212	-1.7238	-0.3717
T6	120.00-100.00	-2.6322	-3.0717	-2.2633	-0.4328
T7	100.00-80.00	-3.3089	-3.3144	-2.9174	-0.3545

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T8	80.00-60.00	-3.6602	-3.6507	-3.1982	-0.3988
T9	60.00-40.00	-4.3434	-3.7974	-4.0165	-0.1206
T10	40.00-20.00	-5.0757	-3.7293	-5.1147	0.4438
T11	20.00-0.00	-5.1882	-2.7580	-5.3441	0.7813

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	1 1/4	190.00 - 193.00	0.6000	0.4099
T1	2	1 1/4	190.00 - 193.00	0.6000	0.4099
T2	1	1 1/4	180.00 - 190.00	0.6000	0.2621
T2	2	1 1/4	180.00 - 190.00	0.6000	0.2621
T2	6	1/2	180.00 - 190.00	0.6000	0.2621
T2	10	1/4" Fiber	180.00 - 182.00	0.6000	0.2621
T3	1	1 1/4	160.00 - 180.00	0.6000	0.3900
T3	2	1 1/4	160.00 - 180.00	0.6000	0.3900
T3	5	1/2	160.00 - 175.00	0.6000	0.3900
T3	6	1/2	160.00 - 180.00	0.6000	0.3900
T3	7	7/8	160.00 - 175.00	0.6000	0.3900
T3	10	1/4" Fiber	160.00 - 180.00	0.6000	0.3900
T4	1	1 1/4	140.00 - 160.00	0.6000	0.4874
T4	2	1 1/4	140.00 - 160.00	0.6000	0.4874
T4	5	1/2	140.00 - 160.00	0.6000	0.4874
T4	6	1/2	140.00 - 160.00	0.6000	0.4874
T4	7	7/8	140.00 - 160.00	0.6000	0.4874
T4	10	1/4" Fiber	140.00 - 160.00	0.6000	0.4874
T5	1	1 1/4	120.00 - 140.00	0.6000	0.5530
T5	2	1 1/4	120.00 - 140.00	0.6000	0.5530
T5	5	1/2	120.00 - 140.00	0.6000	0.5530
T5	6	1/2	120.00 - 140.00	0.6000	0.5530
T5	7	7/8	120.00 - 140.00	0.6000	0.5530

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	10	1/4" Fiber	120.00 - 140.00	0.6000	0.5530
T6	1	1 1/4	100.00 - 120.00	0.6000	0.5937
T6	2	1 1/4	100.00 - 120.00	0.6000	0.5937
T6	3	1/2	100.00 - 110.00	0.6000	0.5937
T6	4	1/2	100.00 - 110.00	0.6000	0.5937
T6	5	1/2	100.00 - 120.00	0.6000	0.5937
T6	6	1/2	100.00 - 120.00	0.6000	0.5937
T6	7	7/8	100.00 - 120.00	0.6000	0.5937
T6	8	7/8	100.00 - 107.00	0.6000	0.5937
T6	10	1/4" Fiber	100.00 - 120.00	0.6000	0.5937
T7	1	1 1/4	80.00 - 100.00	0.6000	0.6000
T7	2	1 1/4	80.00 - 100.00	0.6000	0.6000
T7	3	1/2	80.00 - 100.00	0.6000	0.6000
T7	4	1/2	80.00 - 100.00	0.6000	0.6000
T7	5	1/2	80.00 - 100.00	0.6000	0.6000
T7	6	1/2	80.00 - 100.00	0.6000	0.6000
T7	7	7/8	80.00 - 100.00	0.6000	0.6000
T7	8	7/8	80.00 - 100.00	0.6000	0.6000
T7	10	1/4" Fiber	80.00 - 100.00	0.6000	0.6000
T8	1	1 1/4	60.00 - 80.00	0.6000	0.6000
T8	2	1 1/4	60.00 - 80.00	0.6000	0.6000
T8	3	1/2	60.00 - 80.00	0.6000	0.6000
T8	4	1/2	60.00 - 80.00	0.6000	0.6000
T8	5	1/2	60.00 - 80.00	0.6000	0.6000
T8	6	1/2	60.00 - 80.00	0.6000	0.6000
T8	7	7/8	60.00 - 80.00	0.6000	0.6000
T8	8	7/8	60.00 - 80.00	0.6000	0.6000
T8	10	1/4" Fiber	60.00 - 80.00	0.6000	0.6000
T9	1	1 1/4	40.00 - 60.00	0.6000	0.6000
T9	2	1 1/4	40.00 - 60.00	0.6000	0.6000
T9	3	1/2	40.00 - 60.00	0.6000	0.6000
T9	4	1/2	40.00 - 60.00	0.6000	0.6000
T9	5	1/2	40.00 - 60.00	0.6000	0.6000
T9	6	1/2	40.00 - 60.00	0.6000	0.6000
T9	7	7/8	40.00 - 60.00	0.6000	0.6000
T9	8	7/8	40.00 - 60.00	0.6000	0.6000
T9	9	7/8	40.00 - 50.30	0.6000	0.6000
T9	10	1/4" Fiber	40.00 - 60.00	0.6000	0.6000
T9	11	1/4" Fiber	40.00 - 43.00	0.6000	0.6000
T10	1	1 1/4	20.00 - 40.00	0.6000	0.6000
T10	2	1 1/4	20.00 - 40.00	0.6000	0.6000
T10	3	1/2	20.00 - 40.00	0.6000	0.6000
T10	4	1/2	20.00 - 40.00	0.6000	0.6000
T10	5	1/2	20.00 - 40.00	0.6000	0.6000
T10	6	1/2	20.00 - 40.00	0.6000	0.6000
T10	7	7/8	20.00 - 40.00	0.6000	0.6000
T10	8	7/8	20.00 - 40.00	0.6000	0.6000
T10	9	7/8	20.00 - 40.00	0.6000	0.6000
T10	10	1/4" Fiber	20.00 - 40.00	0.6000	0.6000
T10	11	1/4" Fiber	20.00 - 40.00	0.6000	0.6000
T11	1	1 1/4	5.00 - 20.00	0.6000	0.6000
T11	2	1 1/4	5.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T11	3	1/2	2.00 - 20.00	0.6000	0.6000
T11	4	1/2	2.00 - 20.00	0.6000	0.6000
T11	5	1/2	2.00 - 20.00	0.6000	0.6000
T11	6	1/2	2.00 - 20.00	0.6000	0.6000
T11	7	7/8	2.00 - 20.00	0.6000	0.6000
T11	8	7/8	2.00 - 20.00	0.6000	0.6000
T11	9	7/8	2.00 - 20.00	0.6000	0.6000
T11	10	1/4" Fiber	0.00 - 20.00	0.6000	0.6000
T11	11	1/4" Fiber	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
15' x 2.5" Omni	A	From Leg	0.00	0.0000	193.00	No Ice	3.75	3.75	0.03
(Building B)			0.00			1/2" Ice	5.28	5.28	0.04
			7.50			1" Ice	6.81	6.81	0.04
15' x 2.5" Omni	B	From Leg	0.00	0.0000	193.00	No Ice	3.75	3.75	0.03
(Building B)			0.00			1/2" Ice	5.28	5.28	0.04
			7.50			1" Ice	6.81	6.81	0.04
8' Yagi w/ (8) 4' Elements	B	From Leg	1.00	0.0000	187.00	No Ice	7.47	4.53	0.02
(Building C)			0.00			1/2" Ice	14.03	9.04	0.04
			0.00			1" Ice	20.59	13.55	0.06
5' Out Braodcast Antenna	C	From Leg	1.00	0.0000	177.00	No Ice	1.00	1.00	0.01
(Building C)			0.00			1/2" Ice	1.25	1.25	0.01
			0.00			1" Ice	1.50	1.50	0.01
18' x 2.9" Omni	C	From Leg	4.00	0.0000	176.00	No Ice	5.22	5.22	0.03
(Building C)			0.00			1/2" Ice	7.05	7.05	0.04
			9.00			1" Ice	8.89	8.89	0.04
12' x 2.9" Omni	B	From Leg	2.00	0.0000	174.00	No Ice	3.48	3.48	0.03
(Building C)			0.00			1/2" Ice	4.71	4.71	0.04
			8.00			1" Ice	5.95	5.95	0.04
(2) 15' x 2.9" Inverted Omni	B	From Leg	2.00	0.0000	174.00	No Ice	4.35	4.35	0.03
(Building C)			0.00			1/2" Ice	5.88	5.88	0.04
			-7.00			1" Ice	7.42	7.42	0.04
ETCR-654L12H6	A	From Leg	0.00	0.0000	140.00	No Ice	15.71	6.00	0.08
(Sprint Nextel)			0.00			1/2" Ice	16.28	6.52	0.17
			0.00			1" Ice	16.86	7.05	0.26
ETCR-654L12H6	B	From Leg	0.00	0.0000	140.00	No Ice	15.71	6.00	0.08
(Sprint Nextel)			0.00			1/2" Ice	16.28	6.52	0.17
			0.00			1" Ice	16.86	7.05	0.26
ETCR-654L12H6	C	From Leg	0.00	0.0000	140.00	No Ice	15.71	6.00	0.08
(Sprint Nextel)			0.00			1/2" Ice	16.28	6.52	0.17
			0.00			1" Ice	16.86	7.05	0.26
1900 MHz RRH	A	From Leg	0.00	0.0000	140.00	No Ice	2.31	2.38	0.05
(Sprint Nextel)			0.00			1/2" Ice	2.52	2.58	0.07
			0.00			1" Ice	2.73	2.79	0.10
1900 MHz RRH	B	From Leg	0.00	0.0000	140.00	No Ice	2.31	2.38	0.05
(Sprint Nextel)			0.00			1/2" Ice	2.52	2.58	0.07
			0.00			1" Ice	2.73	2.79	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
1900 MHz RRH	C	From Leg	0.00	0.0000	140.00	No Ice	2.31	2.38	0.05
(Sprint Nextel)			0.00			1/2" Ice	2.52	2.58	0.07
			0.00			1" Ice	2.73	2.79	0.10
800 MHz RRH	A	From Leg	0.00	0.0000	140.00	No Ice	2.06	1.71	0.05
(Sprint Nextel)			0.00			1/2" Ice	2.24	1.88	0.07
			0.00			1" Ice	2.43	2.06	0.09
800 MHz RRH	B	From Leg	0.00	0.0000	140.00	No Ice	2.06	1.71	0.05
(Sprint Nextel)			0.00			1/2" Ice	2.24	1.88	0.07
			0.00			1" Ice	2.43	2.06	0.09
800 MHz RRH	C	From Leg	0.00	0.0000	140.00	No Ice	2.06	1.71	0.05
(Sprint Nextel)			0.00			1/2" Ice	2.24	1.88	0.07
			0.00			1" Ice	2.43	2.06	0.09
TD-RRH8x20-25	A	From Leg	0.00	0.0000	140.00	No Ice	3.70	1.29	0.07
(Sprint Nextel)			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	B	From Leg	0.00	0.0000	140.00	No Ice	3.70	1.29	0.07
(Sprint Nextel)			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	C	From Leg	0.00	0.0000	140.00	No Ice	3.70	1.29	0.07
(Sprint Nextel)			0.00			1/2" Ice	3.95	1.46	0.09
			0.00			1" Ice	4.20	1.64	0.12
Terrawave T09170p1000690	C	From Leg	3.00	0.0000	107.00	No Ice	8.40	5.28	0.06
Panel			0.00			1/2" Ice	9.11	5.82	0.10
(Building C)			0.00			1" Ice	9.82	6.35	0.14
10' x 2" Omni	C	From Leg	0.00	0.0000	106.80	No Ice	2.00	2.00	0.02
(Building C)			0.00			1/2" Ice	3.02	3.02	0.03
			8.00			1" Ice	4.05	4.05	0.04
5' x 1.5" Omni	C	From Leg	0.00	0.0000	106.80	No Ice	0.75	0.75	0.02
(Building C)			0.00			1/2" Ice	1.26	1.26	0.03
			5.50			1" Ice	1.76	1.76	0.04
12' x 2.9" Omni	B	From Leg	0.00	0.0000	51.00	No Ice	3.48	3.48	0.03
(Building C)			0.00			1/2" Ice	4.71	4.71	0.04
			6.00			1" Ice	5.95	5.95	0.04
6' Standoff	B	From Leg	0.00	0.0000	187.00	No Ice	4.54	1.23	0.05
(Building C)			0.00			1/2" Ice	7.80	2.55	0.08
			0.00			1" Ice	11.06	3.88	0.10
4' Standoff	C	From Leg	0.00	0.0000	176.00	No Ice	4.54	1.23	0.05
(Building C)			0.00			1/2" Ice	7.80	2.55	0.08
			0.00			1" Ice	11.06	3.88	0.10
12.5' T-Frame Sector Mount/	B	From Leg	0.00	0.0000	174.00	No Ice	19.17	13.60	0.47
w (4) Pipe Mounts			0.00			1/2" Ice	26.62	18.40	0.60
(Building C)			0.00			1" Ice	34.08	23.20	0.73
12.5' T-Frame Sector Mount/	C	From Leg	0.00	0.0000	174.00	No Ice	19.17	13.60	0.47
w (4) Pipe Mounts			0.00			1/2" Ice	26.62	18.40	0.60
(Building C)			0.00			1" Ice	34.08	23.20	0.73
2.5 Stand offs	A	From Leg	0.00	0.0000	140.00	No Ice	5.26	5.26	0.05
(Sprint Nextel)			0.00			1/2" Ice	6.70	6.70	0.07
			0.00			1" Ice	8.14	8.14	0.09
2.5 Stand offs	B	From Leg	0.00	0.0000	140.00	No Ice	5.26	5.26	0.05
(Sprint Nextel)			0.00			1/2" Ice	6.70	6.70	0.07
			0.00			1" Ice	8.14	8.14	0.09
2.5 Stand offs	C	From Leg	0.00	0.0000	140.00	No Ice	5.26	5.26	0.05
(Sprint Nextel)			0.00			1/2" Ice	6.70	6.70	0.07
			0.00			1" Ice	8.14	8.14	0.09
12.5' T-Frame Sector Mount/	A	From Leg	0.00	0.0000	106.80	No Ice	19.17	13.60	0.47
w (4) Pipe Mounts			0.00			1/2" Ice	26.62	18.40	0.60
(Building C)			0.00			1" Ice	34.08	23.20	0.73

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	B	From Leg	0.00 0.00 0.00	0.0000	106.80	No Ice 1/2" Ice 1" Ice	19.17 26.62 34.08	13.60 18.40 23.20	0.47 0.60 0.73
12.5' T-Frame Sector Mount/ w (4) Pipe Mounts (Building C)	C	From Leg	0.00 0.00 0.00	0.0000	106.80	No Ice 1/2" Ice 1" Ice	19.17 26.62 34.08	13.60 18.40 23.20	0.47 0.60 0.73
1' Standoff (Building C)	B	From Leg	0.00 0.00 0.00	0.0000	51.00	No Ice 1/2" Ice 1" Ice	0.50 0.80 1.10	0.50 0.80 1.10	0.03 0.04 0.05
2'6"x4" Pipe Mount (Building C)	C	From Leg	0.00 0.00 0.00	0.0000	41.00	No Ice 1/2" Ice 1" Ice	0.66 0.91 1.09	0.66 0.91 1.09	0.03 0.04 0.05

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
A-ANT-23G-2.5-C (Sprint Nextel)	A	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		140.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	0.30 0.34 0.38
A-ANT-23G-2.5-C (Sprint Nextel)	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		140.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	0.30 0.34 0.38
A-ANT-23G-2.5-C (Sprint Nextel)	C	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	0.0000		140.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	0.30 0.34 0.38
3' Channel master Dish (Building C)	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		43.00	3.27	No Ice 1/2" Ice 1" Ice	8.38 8.81 9.24	0.05 0.09 0.14
1.0'dish (Building C)	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		182.00	1.50	No Ice 1/2" Ice 1" Ice	1.77 1.97 2.17	0.10 0.11 0.12

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105245	1090.3344	3308.1148	0.68	1.15	7.5718	22.9730	5.3014
Pirod 105217	2130.7479	6798.1437	0.62	2.37	7.3984	23.6047	5.3014
Pirod 105218	2263.4687	6865.1281	0.75	2.42	7.8593	23.8373	7.2158
Pirod 105219	2441.8688	6930.1926	0.94	2.45	8.4787	24.0632	9.4248
Pirod 105219	2441.8688	6920.3773	0.94	2.45	8.4787	24.0291	9.4248
Pirod 105220	2578.8005	6978.1263	1.12	2.48	8.9542	24.2296	11.9282

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 139283	3243.6487	8638.6806	1.57	4.49	11.2627	29.9954	14.7262
Pirod 139283	3243.6487	8611.2883	1.57	4.45	11.2627	29.9003	14.7262
Pirod 139284	3355.3919	9095.2145	1.66	4.43	11.6507	31.5806	17.8187
Pirod 139285	3477.9091	9043.8009	1.89	4.03	12.0761	31.4021	21.2058

Load Combinations

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

Comb. No.	Description
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 190	1.933	43	0.0793	0.0092
T2	190 - 180	1.850	43	0.0792	0.0092
T3	180 - 160	1.682	43	0.0788	0.0087
T4	160 - 140	1.348	47	0.0740	0.0040
T5	140 - 120	1.041	47	0.0665	0.0022
T6	120 - 100	0.765	47	0.0580	0.0019
T7	100 - 80	0.531	47	0.0470	0.0015
T8	80 - 60	0.338	47	0.0366	0.0010
T9	60 - 40	0.192	47	0.0271	0.0007
T10	40 - 20	0.089	47	0.0169	0.0005
T11	20 - 0	0.025	47	0.0078	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	15' x 2.5" Omni	43	1.900	0.0793	0.0092	763960
187.00	8' Yagi w/ (8) 4' Elements	43	1.800	0.0792	0.0092	601787
182.00	1.0'dish	43	1.716	0.0789	0.0090	527617
177.00	5' Out Braodcast Antenna	43	1.631	0.0784	0.0082	Inf
176.00	18' x 2.9" Omni	43	1.614	0.0782	0.0080	Inf
174.00	12' x 2.9" Omni	43	1.581	0.0778	0.0076	922049
140.00	A-ANT-23G-2.5-C	47	1.041	0.0665	0.0022	153953
107.00	Terrawave T09170p1000690 Panel	47	0.608	0.0509	0.0017	118005
106.80	10' x 2" Omni	47	0.606	0.0508	0.0017	118251
51.00	12' x 2.9" Omni	47	0.141	0.0225	0.0006	119541
43.00	3' Channel master Dish	47	0.102	0.0184	0.0005	137405
41.00	2'6"x4" Pipe Mount	47	0.094	0.0174	0.0005	140449

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 190	7.913	10	0.3230	0.0377
T2	190 - 180	7.574	10	0.3226	0.0379
T3	180 - 160	6.890	10	0.3209	0.0358
T4	160 - 140	5.526	10	0.3024	0.0163
T5	140 - 120	4.261	10	0.2724	0.0092
T6	120 - 100	3.131	10	0.2376	0.0078
T7	100 - 80	2.173	10	0.1922	0.0063
T8	80 - 60	1.383	10	0.1498	0.0041

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T9	60 - 40	0.783	10	0.1110	0.0030
T10	40 - 20	0.366	10	0.0690	0.0021
T11	20 - 0	0.104	18	0.0318	0.0010

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
193.00	15' x 2.5" Omni	10	7.777	0.3228	0.0378	190185
187.00	8' Yagi w/ (8) 4' Elements	10	7.369	0.3224	0.0378	155805
182.00	1.0'dish	10	7.028	0.3216	0.0367	137483
177.00	5' Out Braodcast Antenna	10	6.684	0.3195	0.0338	305687
176.00	18' x 2.9" Omni	10	6.615	0.3188	0.0330	592267
174.00	12' x 2.9" Omni	10	6.477	0.3174	0.0312	304859
140.00	A-ANT-23G-2.5-C	10	4.261	0.2724	0.0092	37843
107.00	Terrawave T09170p1000690 Panel	10	2.489	0.2085	0.0069	28824
106.80	10' x 2" Omni	10	2.479	0.2081	0.0069	28883
51.00	12' x 2.9" Omni	10	0.575	0.0921	0.0026	29209
43.00	3' Channel master Dish	10	0.419	0.0752	0.0022	33522
41.00	2'6"x4" Pipe Mount	10	0.383	0.0710	0.0021	34257

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	195	Top Girt	A325N	0.5000	1	0.03	7.95	0.004 ✔	1	Bolt Shear
T2	190	Leg	A325N	1.0000	6	0.34	53.01	0.006 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	1.15	9.14	0.125 ✔	1	Member Block Shear
		Top Girt	A325N	0.5000	1	0.03	7.95	0.004 ✔	1	Bolt Shear
T3	180	Leg	A325N	1.0000	6	1.02	53.01	0.019 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	4.23	10.16	0.416 ✔	1	Member Block Shear
T4	160	Leg	A325N	1.0000	6	3.97	53.01	0.075 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	4.36	10.16	0.429 ✔	1	Member Block Shear
T5	140	Leg	A325N	1.0000	6	7.37	53.01	0.139 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	6.31	17.14	0.368 ✔	1	Member Block Shear
T6	120	Leg	A325N	1.2500	6	11.68	82.83	0.141 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	7.44	20.54	0.362 ✔	1	Member Block Shear
T7	100	Leg	A325N	1.2500	6	16.22	82.83	0.196 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	8.22	20.54	0.400 ✔	1	Member Block Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T8	80	Leg	A325N	1.2500	12	10.90	82.83	0.132 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	5.64	35.53	0.159 ✔	1	Member Block Shear
T9	60	Leg	A325N	1.2500	12	13.21	82.83	0.160 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	6.11	35.53	0.172 ✔	1	Member Block Shear
T10	40	Leg	A325N	1.2500	12	15.45	82.83	0.186 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	6.20	35.53	0.174 ✔	1	Member Block Shear
T11	20	Leg	A325N	1.2500	12	17.49	82.83	0.211 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	6.76	35.53	0.190 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2 1/2	5.00	2.50	48.0 K=1.00	4.9087	-1.05	186.65	0.006 [1] ✔
T2	190 - 180	Pirod 105245	10.02	10.02	37.8 K=1.00	5.3014	-3.13	214.86	0.015 [1] ✔
T3	180 - 160	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-18.53	214.86	0.086 [1] ✔
T4	160 - 140	Pirod 105218	20.03	10.02	32.4 K=1.00	7.2158	-39.86	300.68	0.133 [1] ✔
T5	140 - 120	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-69.31	399.87	0.173 [1] ✔
T6	120 - 100	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-100.07	399.87	0.250 [1] ✔
T7	100 - 80	Pirod 105220	20.03	10.02	25.2 K=1.00	11.9282	-134.15	512.38	0.262 [1] ✔
T8	80 - 60	Pirod 139283	20.03	20.03	32.6 K=1.00	14.7262	-157.28	613.14	0.257 [1] ✔
T9	60 - 40	Pirod 139283	20.03	20.03	32.6 K=1.00	14.7262	-192.14	613.14	0.313 [1] ✔
T10	40 - 20	Pirod 139284	20.03	20.03	32.6 K=1.00	17.8187	-226.45	741.99	0.305 [1] ✔
T11	20 - 0	Pirod 139285	20.03	20.03	32.5 K=1.00	21.2057	-257.87	883.14	0.292 [1] ✔

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T2	190 - 180	0.5	1.47	120.0	238.57	0.1963	0.36	3.45	0.103 ✔
T3	180 - 160	0.5	1.47	120.0	238.57	0.1963	0.90	3.34	0.271 ✔
T4	160 - 140	0.5	1.46	119.0	324.71	0.1963	0.27	3.38	0.081 ✔
T5	140 - 120	0.625	1.45	94.4	424.12	0.3068	1.56	6.96	0.224 ✔
T6	120 - 100	0.625	1.45	94.4	424.12	0.3068	0.81	6.96	0.116 ✔
T7	100 - 80	0.625	1.43	93.6	536.77	0.3068	0.70	7.01	0.100 ✔
T8	80 - 60	0.75	1.73	93.9	662.68	0.4418	0.80	14.36	0.056 ✔
T9	60 - 40	0.75	1.73	93.9	662.68	0.4418	0.88	14.36	0.061 ✔
T10	40 - 20	0.75	1.74	94.4	801.84	0.4418	1.08	14.10	0.077 ✔
T11	20 - 0	0.625	1.72	112.3	954.26	0.3068	1.21	7.47	0.163 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	1	5.59	2.68	115.7 K=0.90	0.7854	-0.33	12.57	0.026 [1] ✔
T2	190 - 180	L2 1/2x2 1/2x3/16	11.42	5.02	121.8 K=1.00	0.9023	-1.22	13.38	0.091 [1] ✔
T3	180 - 160	L3x3x3/16	12.50	5.67	115.6 K=1.01	1.0898	-4.32	17.30	0.250 [1] ✔
T4	160 - 140	L3x3x3/16	13.80	6.37	128.2 K=1.00	1.0898	-4.45	14.80	0.300 [1] ✔
T5	140 - 120	L3x3x5/16	15.24	7.09	144.5 K=1.00	1.7800	-6.38	19.26	0.331 [1] ✔
T6	120 - 100	L3 1/2x3 1/2x5/16	16.80	7.89	137.3 K=1.00	2.0900	-7.53	25.06	0.301 [1] ✔
T7	100 - 80	L3 1/2x3 1/2x5/16	18.45	8.73	151.8 K=1.00	2.0900	-7.86	20.49	0.384 [1] ✔
T8	80 - 60	2L3 1/2x3 1/2x5/16	26.26	12.45	134.0 K=0.97	4.1800	-11.76	52.58	0.224 [1] ✔
T9	60 - 40	2L3 1/2x3 1/2x5/16	27.59	13.14	139.9 K=0.96	4.1800	-12.57	48.27	0.260 [1] ✔
T10	40 - 20	2L3 1/2x3 1/2x5/16	29.01	13.87	146.0 K=0.95	4.1800	-12.47	44.30	0.281 [1] ✔
T11	20 - 0	2L3 1/2x3 1/2x5/16	30.49	14.62	152.4	4.1800	-14.43	40.67	0.355 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
					K=0.94				✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	1	5.00	4.79	161.0 K=0.70	0.7854	-0.03	6.85	0.005 [1] ✔
T2	190 - 180	1	5.00	4.79	161.0 K=0.70	0.7854	-0.02	6.85	0.003 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	2 1/2	5.00	2.50	48.0	4.9087	0.73	220.89	0.003 [1] ✔
T2	190 - 180	Pirod 105245	10.02	10.02	37.8	5.3014	2.02	238.57	0.008 [1] ✔
T3	180 - 160	Pirod 105217	20.03	10.02	37.8	5.3014	14.11	238.57	0.059 [1] ✔
T4	160 - 140	Pirod 105218	20.03	10.02	32.4	7.2158	32.81	324.71	0.101 [1] ✔
T5	140 - 120	Pirod 105219	20.03	10.02	28.4	9.4248	57.34	424.12	0.135 [1] ✔
T6	120 - 100	Pirod 105219	20.03	10.02	28.4	9.4248	83.19	424.12	0.196 [1] ✔
T7	100 - 80	Pirod 105220	20.03	10.02	25.2	11.9282	111.86	536.77	0.208 [1] ✔
T8	80 - 60	Pirod 139283	20.03	20.03	32.6	14.7262	130.84	662.68	0.197 [1] ✔
T9	60 - 40	Pirod 139283	20.03	20.03	32.6	14.7262	158.55	662.68	0.239 [1] ✔
T10	40 - 20	Pirod 139284	20.03	20.03	32.6	17.8187	185.35	801.84	0.231 [1] ✔
T11	20 - 0	Pirod 139285	20.03	20.03	32.5	21.2057	209.87	954.26	0.220 [1] ✔

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

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T2	190 - 180	0.5	1.47	120.0	238.57	0.1963	0.36	3.45	0.103 ✔
T3	180 - 160	0.5	1.47	120.0	238.57	0.1963	0.90	3.34	0.271 ✔
T4	160 - 140	0.5	1.46	119.0	324.71	0.1963	0.27	3.38	0.081 ✔
T5	140 - 120	0.625	1.45	94.4	424.12	0.3068	1.56	6.96	0.224 ✔
T6	120 - 100	0.625	1.45	94.4	424.12	0.3068	0.81	6.96	0.116 ✔
T7	100 - 80	0.625	1.43	93.6	536.77	0.3068	0.70	7.01	0.100 ✔
T8	80 - 60	0.75	1.73	93.9	662.68	0.4418	0.80	14.36	0.056 ✔
T9	60 - 40	0.75	1.73	93.9	662.68	0.4418	0.88	14.36	0.061 ✔
T10	40 - 20	0.75	1.74	94.4	801.84	0.4418	1.08	14.10	0.077 ✔
T11	20 - 0	0.625	1.72	112.3	954.26	0.3068	1.21	7.47	0.163 ✔

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 190	1	5.59	2.68	128.6	0.7854	0.33	25.45	0.013 [1] ✔
T2	190 - 180	L2 1/2x2 1/2x3/16	11.42	5.02	80.0	0.5186	1.15	22.56	0.051 [1] ✔
T3	180 - 160	L3x3x3/16	12.50	5.67	74.5	0.6592	4.23	28.67	0.148 [1] ✔
T4	160 - 140	L3x3x3/16	13.80	6.37	83.5	0.6592	4.36	28.67	0.152 [1] ✔
T5	140 - 120	L3x3x5/16	15.24	7.09	94.9	1.0127	6.31	44.05	0.143 [1] ✔
T6	120 - 100	L3 1/2x3 1/2x5/16	16.80	7.89	89.9	1.2452	7.44	54.17	0.137 [1] ✔
T7	100 - 80	L3 1/2x3 1/2x5/16	17.62	8.32	94.6	1.2452	8.22	54.17	0.152 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	80 - 60	2L3 1/2x3 1/2x5/16	26.26	12.45	141.6	2.6077	11.28	113.43	0.099 [1] ✔
T9	60 - 40	2L3 1/2x3 1/2x5/16	27.59	13.14	149.3	2.6077	12.23	113.43	0.108 [1] ✔
T10	40 - 20	2L3 1/2x3 1/2x5/16	29.01	13.87	157.3	2.6077	12.39	113.43	0.109 [1] ✔
T11	20 - 0	2L3 1/2x3 1/2x5/16	30.49	14.62	165.7	2.6077	13.52	113.43	0.119 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	190 - 180	1	5.00	4.79	230.0	0.7854	0.03	35.34	0.001 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	195 - 190	Leg	2 1/2	3	-1.05	186.65	0.6	Pass
T2	190 - 180	Leg	Pirod 105245	20	-3.13	214.86	10.3	Pass
T3	180 - 160	Leg	Pirod 105217	32	-9.21	214.86	27.1	Pass
T4	160 - 140	Leg	Pirod 105218	47	-39.86	300.68	13.3	Pass
T5	140 - 120	Leg	Pirod 105219	62	-53.75	399.87	22.4	Pass
T6	120 - 100	Leg	Pirod 105219	77	-100.07	399.87	25.0	Pass
T7	100 - 80	Leg	Pirod 105220	92	-134.15	512.38	26.2	Pass
T8	80 - 60	Leg	Pirod 139283	107	-157.28	613.14	25.7	Pass
T9	60 - 40	Leg	Pirod 139283	116	-192.14	613.14	31.3	Pass
T10	40 - 20	Leg	Pirod 139284	125	-226.45	741.99	30.5	Pass
T11	20 - 0	Leg	Pirod 139285	133	-257.87	883.14	29.2	Pass
T1	195 - 190	Diagonal	1	9	-0.33	12.57	2.6	Pass
T2	190 - 180	Diagonal	L2 1/2x2 1/2x3/16	27	-1.22	13.38	9.1	Pass
T3	180 - 160	Diagonal	L3x3x3/16	34	-4.32	17.30	12.5 (b) 25.0	Pass
T4	160 - 140	Diagonal	L3x3x3/16	50	-4.45	14.80	41.6 (b) 30.0	Pass
T5	140 - 120	Diagonal	L3x3x5/16	65	-6.38	19.26	42.9 (b) 33.1	Pass
T6	120 - 100	Diagonal	L3 1/2x3 1/2x5/16	79	-7.53	25.06	36.8 (b) 30.1	Pass
T7	100 - 80	Diagonal	L3 1/2x3 1/2x5/16	95	-7.86	20.49	36.2 (b) 38.4	Pass
T8	80 - 60	Diagonal	2L3 1/2x3 1/2x5/16	114	-11.76	52.58	40.0 (b) 22.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T9	60 - 40	Diagonal	2L3 1/2x3 1/2x5/16	123	-12.57	48.27	26.0	Pass
T10	40 - 20	Diagonal	2L3 1/2x3 1/2x5/16	132	-12.47	44.30	28.1	Pass
T11	20 - 0	Diagonal	2L3 1/2x3 1/2x5/16	140	-14.43	40.67	35.5	Pass
T1	195 - 190	Top Girt	1	6	-0.03	6.85	0.5	Pass
T2	190 - 180	Top Girt	1	24	-0.02	6.85	0.3	Pass
							0.4 (b)	
							Summary	
						Leg (T9)	31.3	Pass
						Diagonal (T4)	42.9	Pass
						Top Girt (T1)	0.5	Pass
						Bolt Checks	42.9	Pass
						RATING =	**42.9**	**Pass**

MATHCAD CALCULATION PRINTOUT

Existing 200' Self-Supported Tower
Individual Pier Evaluation

SBA Site Name: Westrock Park
SBA Site ID: CT22107-A-01
Carrier Name: Sprint Nextel

ACGI # 17-6574

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

CAPACITY CHECK OF EXISTING TOWER ROCK ANCHOR FOUNDATION

REACTIONS ON THE FOUNDATION

As per 200' SST structural analysis report - Factored load G-Code

Download $P_{dwn} := 276kips$

Uplift; $U_a := 223 \cdot kips$

Shear; $S_a := 34 \cdot kips$

$\Delta := \operatorname{atan}\left(\frac{U_a}{S_a}\right) = 81.33 \cdot deg$

-Factor of Safety for soil strength-

Tower ht. $Tw_{ht} := 195 \cdot ft$

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

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

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

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

SOIL PARAMETERS as per GeoTechnical Report by BL Companies Project # C-3053, dated 11/12/2001

Conforming to the design requirements as in ACI 318

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

Concrete compressive strength, $fc := 4000 \cdot psi$

Rebar yield strength, $f_{ya} := 60 \cdot ksi$

Soil parameters $\gamma_s := 0.170 \cdot kcf$

Internal angle of friction for soil, $\phi := 35 \cdot deg$

Ultimate Bearing capacity, $BC_{ult} := 40ksf$

Passive Pressure, $K_p := \tan\left(45 \cdot deg + \frac{\phi}{2}\right)^2$ $K_p = 3.69$

Coefficient of Friction of soil $C_f := 0.40$

Cohesion, $C_u := 0ksf$

All fill is to be compacted to 95% of proctor density.

Anchor Block Dimensions

Foundation Dimensions as per Foundation drawings by Tectonic Engineering and Surveying Consultants P.C., Work Order 3997.02 dated 09/21/2004.

Depth, $D_g := 8.5 \cdot ft$

Thickness, $T_g := 10 \cdot ft$ Width, $W_g := 8 \cdot ft$ Length, $L_g := 6 \cdot ft$

Volume of concrete,

$V_c := L_g \cdot T_g \cdot W_g$ $V_c = 17.7778 \cdot cy$

with toe: $I_{toe} := 0$ (0- No, 1- Yes)

$D_{neg} := 3 \cdot ft$

$A_{block} := \frac{V_c}{T_g} = 48\,ft^2$

$\sigma_v := \frac{(D_g - D_{neg}) \cdot (\gamma_s)}{2}$

$P_{ave} := \sigma_v \cdot K_p$

$P_{ave} = 1.73 \cdot ksf$ Average Passive Pressure

ANCHOR DESIGN

SHEAR CAPACITY:

$concwt := V_c \cdot \gamma_c$ $concwt = 72 \cdot kips$

Area on which this passive pr. acts $A_p := L_g \cdot (D_g - D_{neg})$ $A_p = 33\,ft^2$

Additional Shear resistance from the (6) 1.25" Rock Anchors

Assuming ASTM A722 anchors rods $f_y := 120ksi$

Perimeter of 4" dia grout $Perimeter_{grout} := \pi \cdot 4in = 1.05\,ft$

Area of 1.25" dia anchor rod $Area_{anchor} := 1.27in^2$

Bond Length $L_{anchor} := 12 \cdot ft$

Weight of anchor rod $W_{anchor} := 4.3plf$

Length of anchor in Concrete block $E_{anchor} := 8.5ft$ $\phi_{anchor} := 0.5$

Base Frictional resistance

$N_f := (concwt + 4 \cdot W_{anchor} L_{anchor}) C_f$

$N_f = 28.88 \cdot kips$

Shear strength of 6 anchor rods

$S_{anchor} := 0.36 \cdot Area_{anchor} \cdot f_y = 54.86 \cdot kips$

Shear Capacity

$Shear := \left(P_{ave} \cdot A_p\right) \cdot \phi_{s\_lateral} + N_f \cdot \phi_{s\_friction} + 6 \cdot S_{anchor}$

$Shear = 393.54 \cdot kips \quad > \quad S_a = 34 \cdot kips \qquad \frac{S_a}{Shear} = 8.64 \cdot \%$ **OK!**

DOWNLAOD CAPACITY:

$P_{dwncap} := \phi_{s\_Bear} \cdot A_{block} \cdot BC_{ult} = 1440 \cdot kips$

$P_{dwn} = 276 \cdot kips$

$\frac{P_{dwn}}{P_{dwncap}} = 19.17 \cdot \%$

UPLIFT CAPACITY:

A. *Inverted Truncated Pyramid Weight Theory:* **weight component**

1) **Weight of soil wedge above anchor,**

Angle between failure plane & vertical Axis,

$a_1 := W_g \qquad b_1 := L_g$

$h := if\left(I_{toe} = 0, D_g - T_g, D_g\right) \qquad h = -1.5\,ft$

$a_2 := a_1 + (2 \cdot h \cdot \tan(\phi))$

$b_2 := b_1 + (2 \cdot h \cdot \tan(\phi))$

$V := \frac{1}{6} \cdot h \cdot \left[\left(a_1 \cdot b_1\right) + \left[\left(a_1 + a_2\right) \cdot \left(b_1 + b_2\right)\right] + \left(a_2 \cdot b_2\right)\right] \cdot (1)$

$V := \max(V, 0) = 0\,ft^3 \qquad W_s := V \cdot \gamma_s \qquad W_s = 0 \cdot kip$

2) **Weight of Concrete anchor**

$W_c := L_g \cdot T_g \cdot W_g \cdot \gamma_c \qquad W_c = 72 \cdot kips$

Ultimate Uplift Capacity, $\qquad U_u := W_c + W_s \qquad U_u = 72 \cdot kips$

3) **uplift resistance from rock anchors** Ultimate frictional resistance

$UL_{friction} := 8ksf$

Uplift resistance of anchor

$U_{anchor} := \phi_{anchor} \cdot UL_{friction} \cdot Perimeter_{grout} \cdot \left(L_{anchor}\right)$

Uplift Capacity,

$U_{c3} := \phi_{s\_uplift} \cdot \left(U_u + 6U_{anchor}\right)$

$U_{c3} = 280.19 \cdot kips \quad > \quad U_a = 223 \cdot kips \qquad \frac{U_a}{U_{c3}} = 79.59 \cdot \%$ **OK!**

EXISTING 195' SELF SUPPORT TOWER ANCHOR BOLT CHECK

REACTIONS ON THE FOUNDATION

As per Tnx output (see attached)

Down load; $Pv := 276 \cdot kips$ Shear; $S := 34 \cdot kips$

Uplift load; $P_{up} := 223 \cdot kips$ Moment; $M := 0 \cdot kips \cdot ft$

Anchor Rod Data is as per tower design by Valmont Structures Eng File No.A-120742-F-1006960, dated 07/29/2004.

Number of Anchor Rods: $N_{anchors} := 12$

Diameter of Anchors: $D_{anchors} := 1.25in$ $n := 7in^{-1}$

Net Tensile Area of Anchors: $A_{anchors} := \frac{\pi}{4} \cdot \left(D_{anchors} - \frac{0.9743}{n} \right)^2 = 0.969 \cdot in^2$

Ultimate Tensile Stress: $F_{anchors} := 150ksi$ (ASTM A687)

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

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

$T_{cap} = 116.293 \cdot kips$

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

For detail type (D) as per Figure 4.4 $\eta := 0.50$

Maximum Load on Anchor: $T_{max} := \frac{Pv + \frac{S}{\eta}}{N_{anchors}}$ $T_{max} = 28.667 \cdot kips$

Anchor Rod Capacity: $\frac{T_{max}}{T_{cap}} = 24.65 \cdot \%$ OK!

For detail type (d), when the clear distance from top of concrete to the bottom of leveling nut exceeds 1.0 times the diameter of the anchor rod, the interaction equation as per section 4.9.9.,TIA-222-G Addendum 1 shall also be satisfied.

Clear distance > $D_{anchors}$ We need to check!

$l_{ar} := 2.5in$ (estimated)

$$\text{Bending} := \left(\frac{\frac{S}{N_{anchors}}}{0.55 \cdot 0.75 \cdot F_{anchors} \cdot \frac{\pi}{4} \cdot D_{anchors}^{2}} \right)^{2} + \left[\frac{\frac{Pv}{N_{anchors}}}{T_{cap}} + \frac{0.65 l_{ar} \cdot \frac{S}{N_{anchors}}}{\phi_{anchor} \cdot 65 \cdot ksi \cdot \frac{\left(D_{anchors} - \frac{0.9743}{n} \right)^{3}}{6}} \right]^{2}$$

Bending = 0.344 < 1 OK!

Summary

-Foundation Reactions from Tower Base-

$S = 34 \cdot kips$

Down load $Pv = 276 \cdot kips$

Uplift load $P_{up} = 223 \cdot kips$

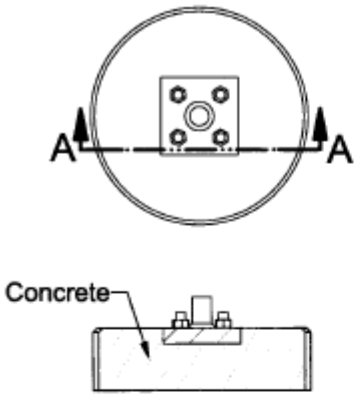
Moment $M = 0 \cdot ft \cdot kip$

Anchor Rod Check $T_{max} = 28.667 \cdot kips$ < $T_{cap} = 116.293 \cdot kips$

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

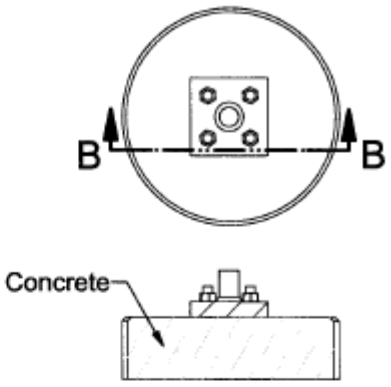
Anchor_Rod_Check = "OK"

ANSI/TIA-222-G



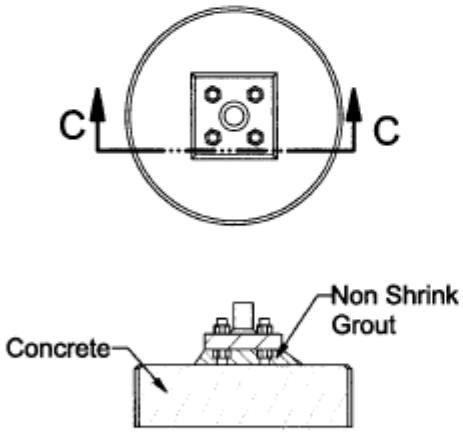
SECTION A-A

Detail Type (a)



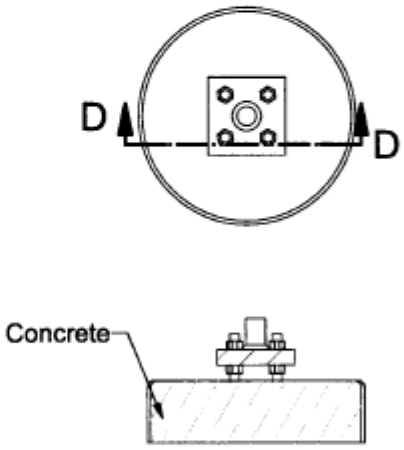
SECTION B-B

Detail Type (b)



SECTION C-C

Detail Type (c)



SECTION D-D

Detail Type (d)

(See Note 1 below)

Note:

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

Figure 4-4: Anchor Rod Detail Types

4.9.9 Anchor Rods

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

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

where:

ϕ= 0.80

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

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

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

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

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

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

where:

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

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

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

Sprint®

SITE NAME: SBA WESTROCK PARK

SITE NUMBER: CT52XC069

AUGMENT ID: CT-NHN0069Q17.1

SITE ADDRESS: 1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

JURISDICTION: TOWN OF HAMDEN / CT SITING COUNCIL

SITE TYPE: EXISTING 196.7' SELF SUPPORT TOWER

PROGRAM: DO MACRO UPGRADE EQUIPMENT DEPLOYMENT

PROJECT INFORMATION

SITE INFORMATION

LATTITUDE: (PER SBA RECORD)	41° 20' 59.30" N (41.3498°)
LONGITUDE: (PER SBA RECORD)	72° 58' 21.67" W (-72.9727°)
GROUND ELEVATION:	442'± AMSL (PER GOOGLE EARTH)
STRUCTURE HEIGHT:	196.7'± AGL (FROM RECORD TIA INSPECTION REPORT)
STRUCTURE TYPE:	SELF SUPPORT TOWER
ZONING JURISDICTION	TOWN OF HAMDEN / CT SITING COUNCIL
ZONING DISTRICT/ OCCUPANCY:	R1 (RESIDENTIAL)
COUNTY:	NEW HAVEN

APPLICANT

SPRINT
1 INTERNATIONAL BLVD. SUITE 800
MAHWAH, NJ 07495

PROPERTY OWNER:

N/F WEST ROCK LLC
8051 CONGRESS AVENUE
BOCA RATON, FL 33487

TOWER OWNER:

MCM ACQUISITION 2017, LLC
8051 CONGRESS AVENUE
BOCA RATON, FL 33487
(561) 995-7670

SBA SITE ID: CT22107-A

SBA SITE NAME: WESTROCK PARK

SBA CONTACT:

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

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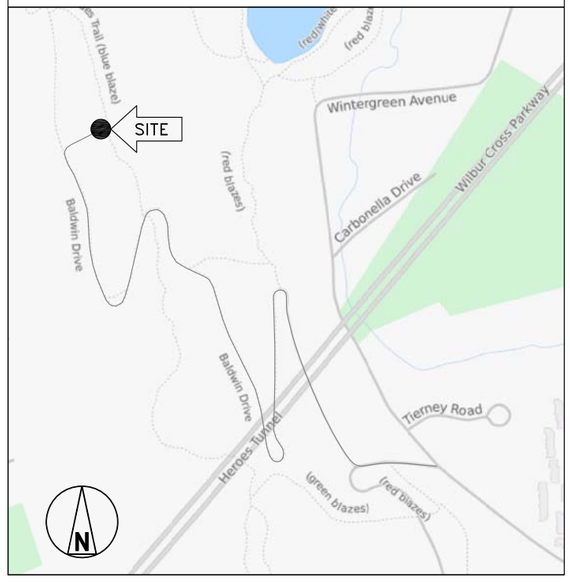
LOCATION MAP N.T.S.

AREA MAP N.T.S.



SCOPE OF WORK

1. REMOVE (1) EXISTING SPRINT (CLEARWIRE) TOWER TOP JUNCTION BOXES.
2. REMOVE EXISTING CABLING AND REPLACE WITH (4) HYBRID CABLES.
3. REMOVE (3) EXISTING SPRINT (CLEARWIRE) PANEL ANTENNAS AND REPLACE WITH (3) NEW SPRINT PANEL ANTENNAS.
4. REMOVE (3) EXISTING SPRINT (CLEARWIRE) RRHS.
5. INSTALL (6) NEW SPRINT 800 MHz RRHS.
6. INSTALL (3) NEW SPRINT 1900 MHz RRHS.
7. INSTALL (3) NEW SPRINT 2500 MHz RRHS.
8. REMOVE EXISTING SPRINT (CLEARWIRE) EQUIPMENT CABINET AND REPLACE WITH NEW SPRINT EQUIPMENT CABINET WITH CABLING CABINET.
9. REMOVE EXISTING SPRINT (CLEARWIRE) GPS ANTENNA AND REPLACE WITH NEW SPRINT GPS ANTENNA.
10. INSTALL NEW SPRINT PPC MOUNTED TO A NEW H-FRAME.
11. INSTALL NEW SPRINT TELCO CABINET MOUNTED TO A NEW H-FRAME.

GENERAL NOTES

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION:
   - ADA COMPLIANCE NOT REQUIRED.
   - POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
   - NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.

DRAWING INDEX

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

CODE COMPLIANCE

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

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

APPROVALS

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

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

Sprint®
1 INTERNATIONAL BLVD, SUITE 800
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SBA
SBA COMMUNICATIONS CORP.
134 FLANDERS ROAD, SUITE 125
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ProTerra DESIGN GROUP, LLC
4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320-4918

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

CHECKED BY: 12/4/17 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB/FN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
TITLE SHEET

SHEET NUMBER
T-1

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

SECTION 01 100 - SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

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

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

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

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

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

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

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 - COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

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

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 - CELL SITE CONSTRUCTION

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

CONTINUE SHEET SP-2

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

SBA
SBA COMMUNICATIONS CORP.
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4 Bay Road, Building A
Suite 200
Hadley, MA 01035 Ph: (413)320–4918

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

CHECKED BY: 12/4/17 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB FN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–1

CONTINUED FROM SP-1:

SECTION 01 400 - SUBMITTALS, TESTS, AND INSPECTIONS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

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

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

1.4 TESTS AND INSPECTIONS:

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

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

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

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

3.2 REQUIRED TESTS:

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

3.3 REQUIRED INSPECTIONS:

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

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

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

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

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

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

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

SECTION 01 500 - PROJECT REPORTING

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

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

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

SECTION 07 500 - ROOF CUTTING, PATCHING AND REPAIR

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

1.4 SUBMITTALS:

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

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

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

SECTION 09 900 - PAINTING

QUALITY ASSURANCE:

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

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

CONTINUE SHEET SP-3

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

CHECKED BY: 12/4/17 JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–2

CONTINUED FROM SP-2:

MATERIALS:

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

PAINT SCHEDULE:

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

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

PAINTING APPLICATION:

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

TOUCHUP PAINTING:

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

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

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

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

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

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

REMOTE ELECTRICAL TILT (RET) CABLES:

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

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

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

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

HYBRID CABLES INSTALLATION:

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

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

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

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

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

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

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

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

SUMMARY:

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

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

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START–UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

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

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

SUMMARY:

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

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

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START–UP REQUIREMENTS

SUPPORTING DEVICES:

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

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

SUPPORTING DEVICES:

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

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

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

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

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

ELECTRICAL IDENTIFICATION:

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

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

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

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

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

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

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

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

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

HUBS AND BOXES:

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

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

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

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

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

SUPPLEMENTAL GROUNDING SYSTEM

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

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

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

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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

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

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

CHECKED BY: 12/4/17 JMM/TEJ

APPROVED BY: JMM/TEJ

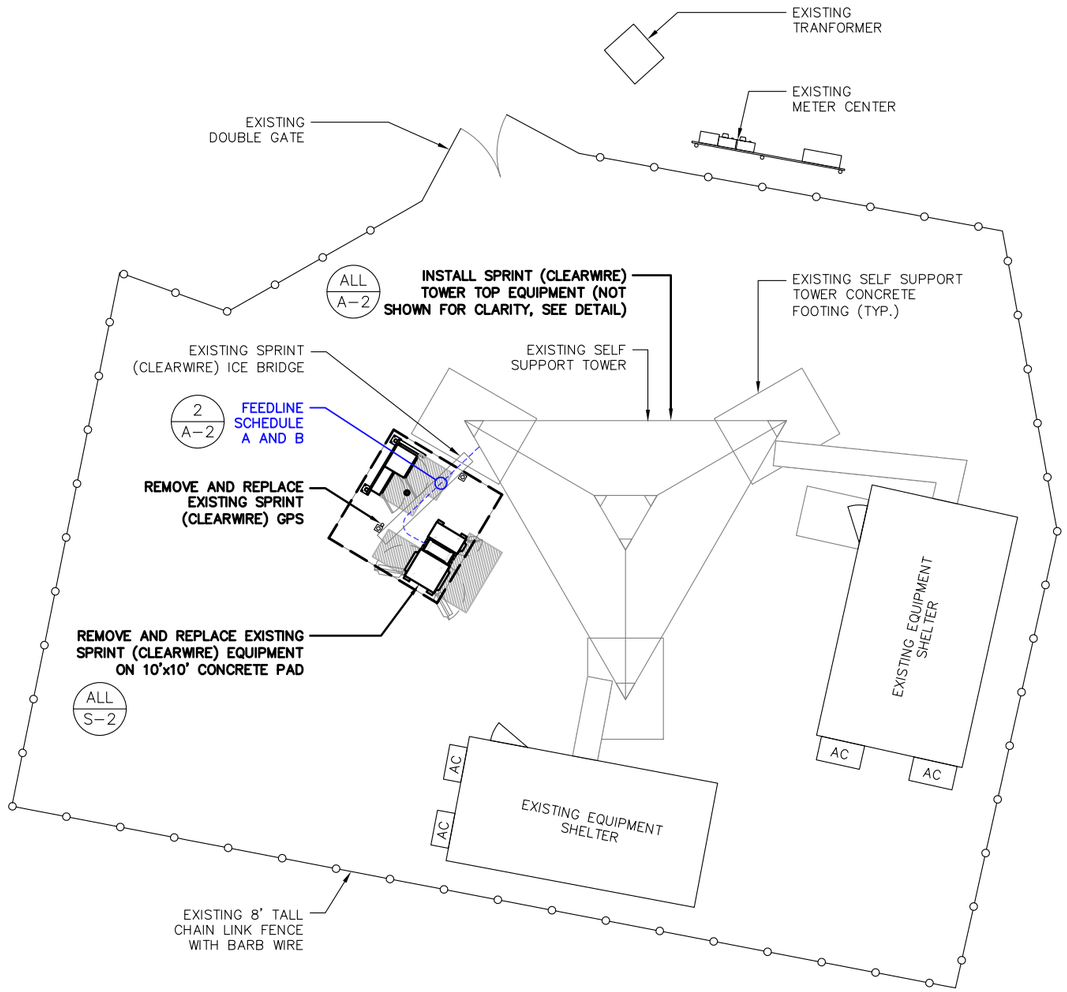
SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB PN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
OUTLINE SPECIFICATIONS

SHEET NUMBER
SP–3



13°34'

MAGNETIC NORTH

TRUE NORTH

COMPOUND PLAN

1 / A-1

SCALE: 1"=12' (11"x17")
1"=6' (22"x34")

12 6 0 12

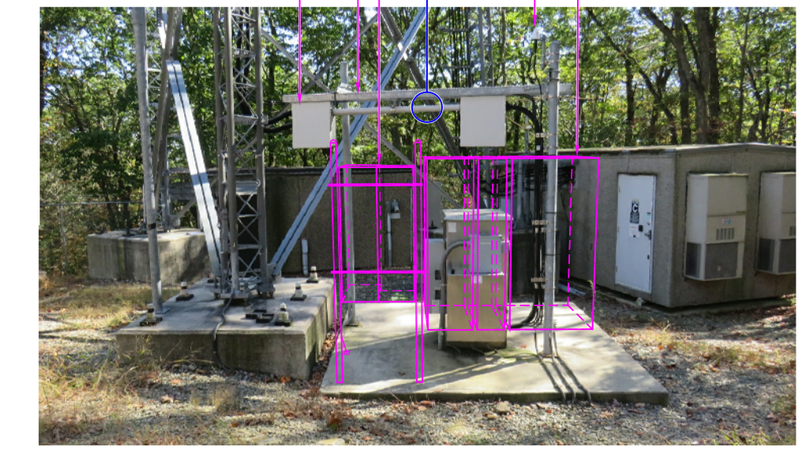


IMAGE SOURCE: PROTERRA 10/19/2017
(VIEW FROM NORTHWEST)

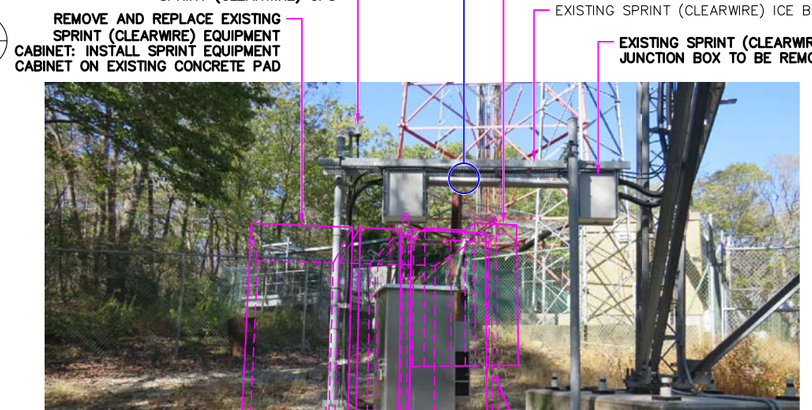


IMAGE SOURCE: PROTERRA 10/19/2017
(VIEW FROM SOUTHEAST)

EQUIPMENT PLAN PHOTO DETAIL

2 / A-1

SCALE: N.T.S.

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SUBMITTALS

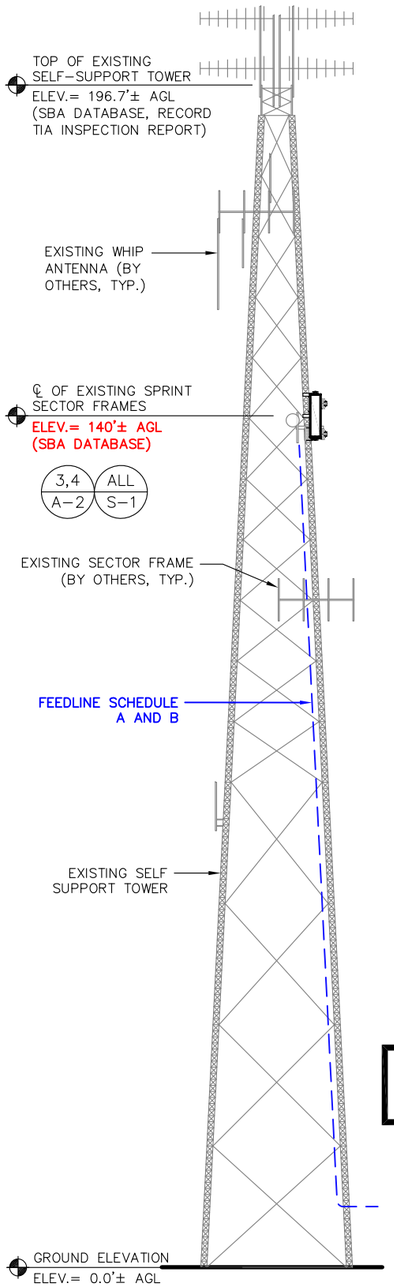
REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB, PN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK

SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1



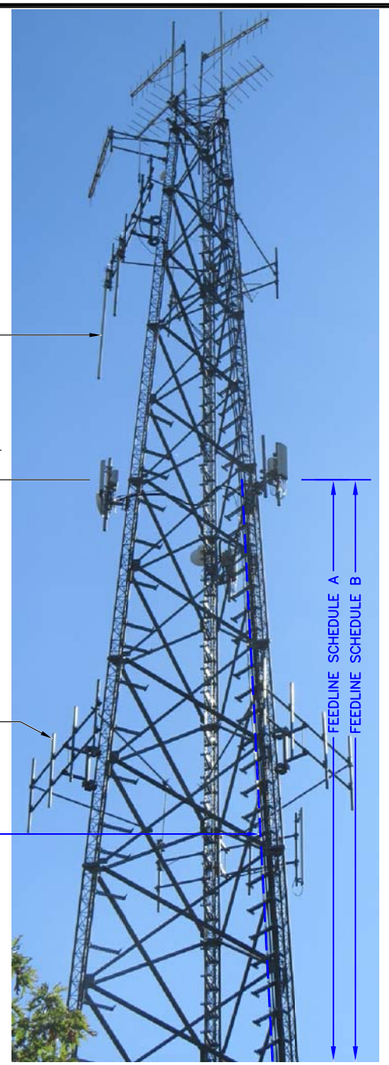


IMAGE SOURCE: PROTERRA 10/19/2017

NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION

1 / A-2

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

25 12.5 0 25

FEEDLINE SCHEDULE	FEEDLINE DESCRIPTION	LOCATION
A	EXISTING TO BE REMOVED: (6) 7/8" COAX, (3) 1/2" DC, AND (3) 1 1/4" HYBRID (PER COLO-APP, IN FLEX CONDUIT) TO 140' RAD EXISTING TO REMAIN: (2) 1/2" MICROWAVE DISH CABLE TO 140' RAD	UP SELF SUPPORT TOWER LEG TO RAD
B	PROPOSED: (4) HYBRID TO 140' RAD;	UP SELF SUPPORT TOWER LEG TO RAD

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

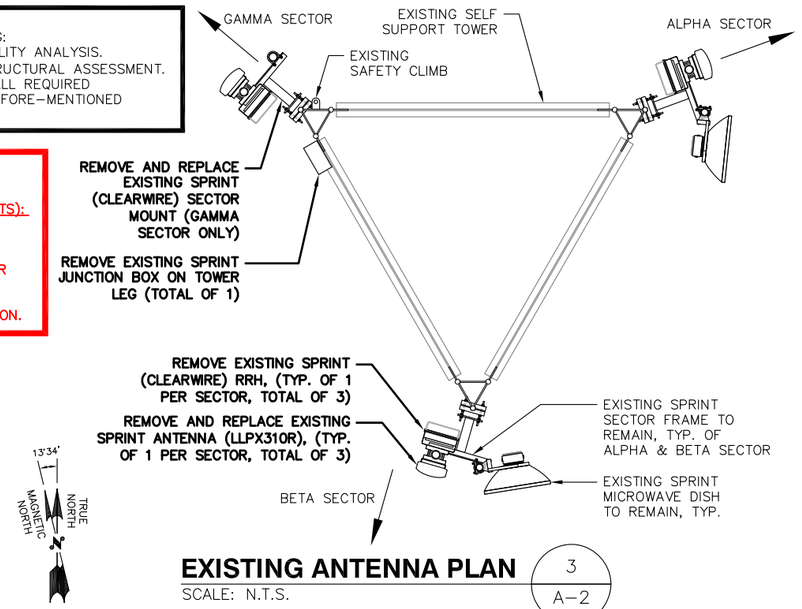
TOWER ELEVATION PHOTO DETAIL

2 / A-2

SCALE: N.T.S.

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

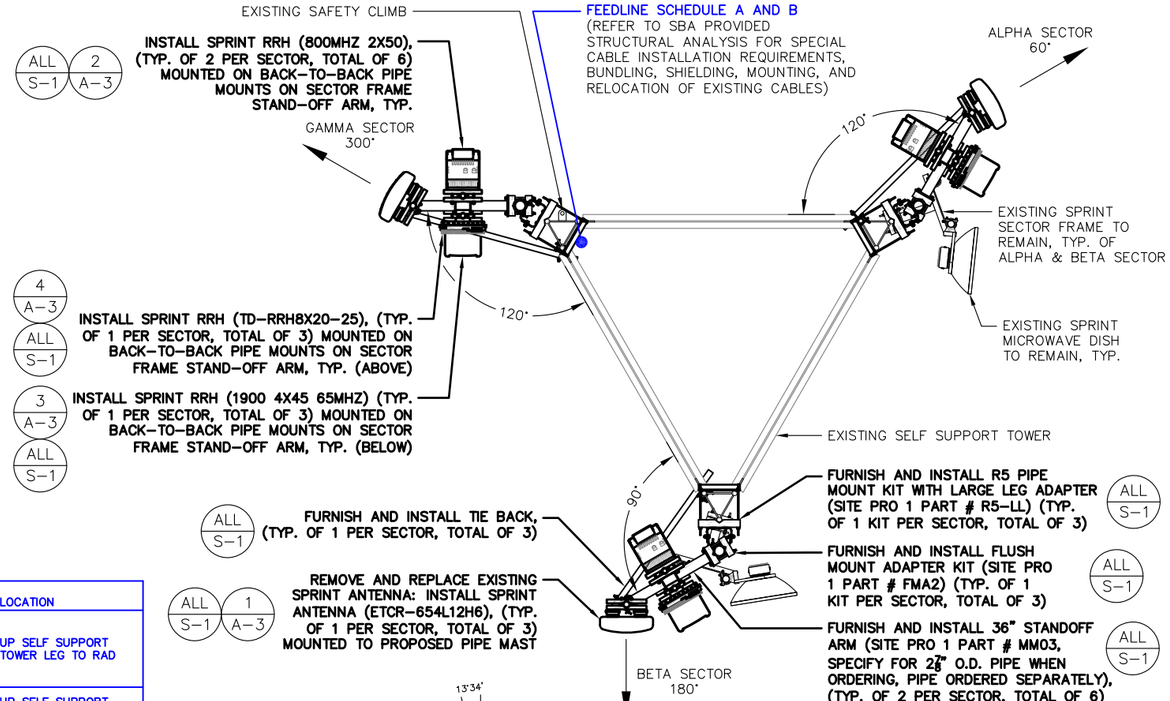
SPECIAL PRE-CONSTRUCTION WORK NOTE (SBA-PROVIDED TOWER STRUCTURAL ANALYSIS SPECIAL EQUIPMENT INSTALLATION REQUIREMENTS):
GENERAL CONTRACTOR SHALL FURNISH AND INSTALL ALL SPECIAL OR SUPPLEMENTAL ADDITIONAL TOWER-MOUNTED EQUIPMENT PER RECOMMENDATIONS FROM SBA-PROVIDED TOWER STRUCTURAL ANALYSIS FOR ANY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



EXISTING ANTENNA PLAN

3 / A-2

SCALE: N.T.S.



PROPOSED ANTENNA PLAN

4 / A-2

SCALE: N.T.S.

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

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

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

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

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

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

CHECKED BY: 12/4/JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB/PN

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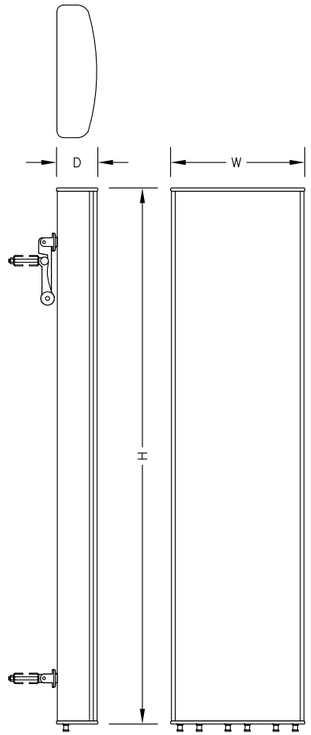
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

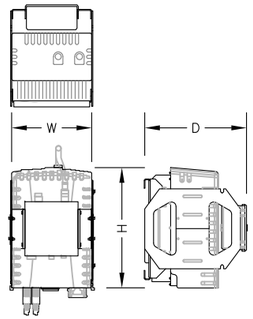
SHEET TITLE
ELEVATION AND ANTENNA PLANS

SHEET NUMBER
A-2



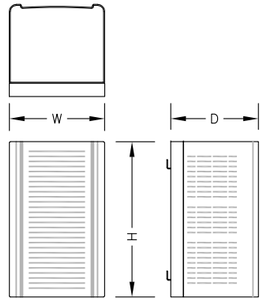
ANTENNA SPECIFICATIONS	
MANUF.	KMW
MODEL #	ETCR-654L12H6
HEIGHT	84.9"
WIDTH	21.0"
DEPTH	6.3"
WEIGHT	84.9± LBS.

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



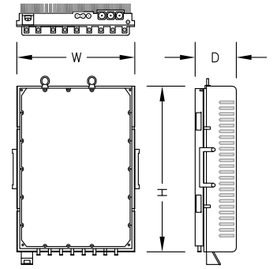
800 MHZ RRH SPECIFICATIONS	
MANUF.	NOKIA (ALU)
MODEL #	800MHZ 2X50W
HEIGHT	19.7"
WIDTH	13"
DEPTH	10.8"
WEIGHT	53± LBS

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



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

1900 MHz RRH DETAIL 3 / A-3
SCALE: N.T.S.



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

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

MAJOR RF EQUIPMENT LIST

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

DESCRIPTION	QUANTITY	UNITS	MAKE/MODEL/MATERIAL	PROVIDED BY
ANTENNA	3	EA	KMW ETCR-654L12H6	SPRINT
2500 RRH	3	EA	NOKIA (ALU) TD-RRH8x20-25	SPRINT
1900 RRH	3	EA	NOKIA (ALU) 1900 4X45 65MHZ	SPRINT
800 RRH	6	EA	NOKIA (ALU) 800MHz 2x50W	SPRINT
FIBER	4 @ 210'± FROM FIBER CABINET	LINEAR FEET LISTED [INCLUDES (2) 10' COILS]	1-1/4" HYBRIFLEX	SPRINT

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

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

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

ProTerra DESIGN GROUP, LLC
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STATE OF CONNECTICUT
THOMAS E. JOHNSON
No. 28192
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: 12/4/JMM/TEJ
APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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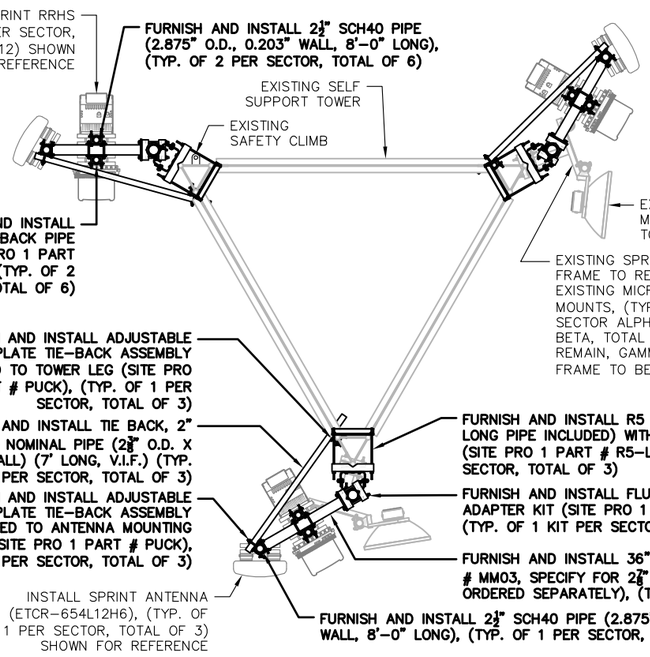
SITE NAME:
SBA WESTROCK PARK

SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
TOWER EQUIPMENT DETAILS

SHEET NUMBER
A-3



SECTOR FRAME PLAN DETAIL

1 / S-1

SCALE: N.T.S.

SPECIAL CONSTRUCTION NOTE:
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* COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT.
* GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.

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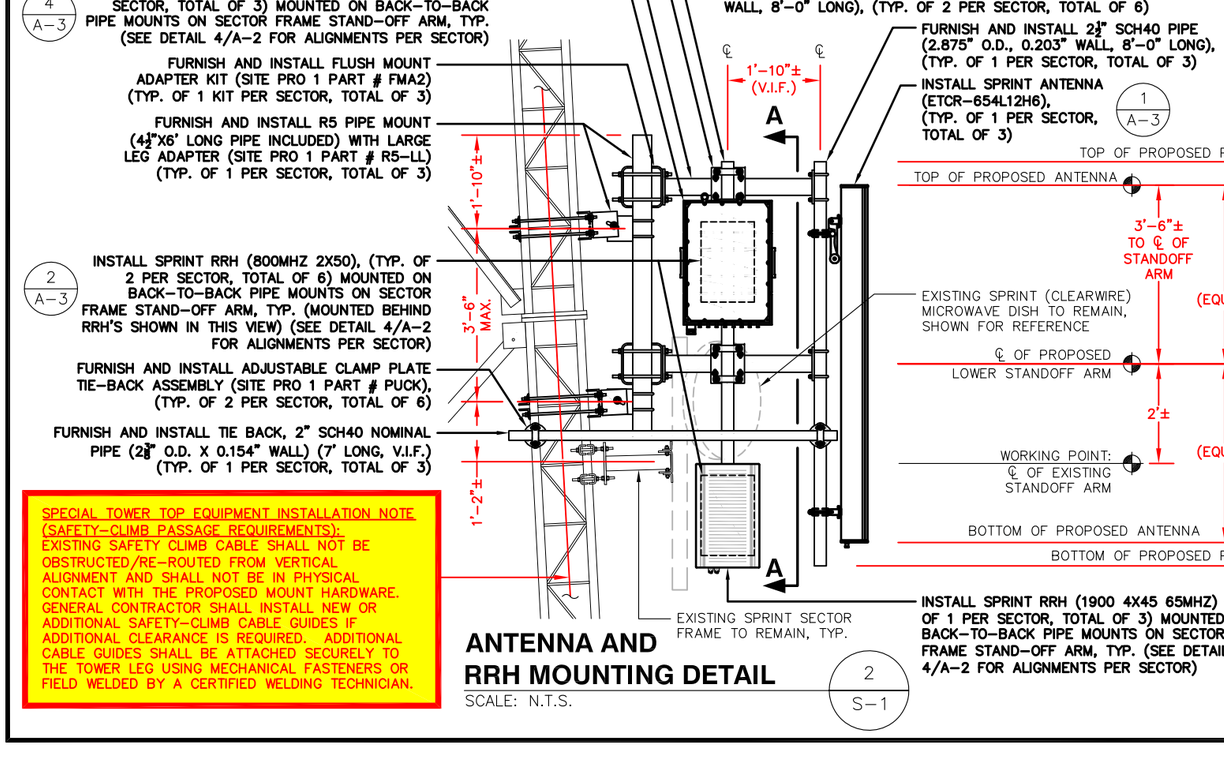
NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION



ANTENNA AND RRH MOUNTING DETAIL

2 / S-1

SCALE: N.T.S.

FURNISH AND INSTALL R5 PIPE MOUNT (4½"X6' LONG PIPE INCLUDED) WITH LARGE LEG ADAPTER (SITE PRO 1 PART # R5-LL) (TYP. OF 1 PER SECTOR, TOTAL OF 3)
1,2 / S-2
INSTALL SPRINT RRH (TD-RRH8X20-25), (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON BACK-TO-BACK PIPE MOUNTS ON SECTOR FRAME STAND-OFF ARM, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR)
1,2 / S-2 — 4 / A-3
FURNISH AND INSTALL 36" STANDOFF ARM (SITE PRO 1 PART # MM03, SPECIFY FOR 2⅞" O.D. PIPE WHEN ORDERING, PIPE ORDERED SEPARATELY), (TYP. OF 2 PER SECTOR, TOTAL OF 6)
FURNISH AND INSTALL 2½" SCH40 PIPE (2.875" O.D., 0.203" WALL, 8'-0" LONG), (TYP. OF 1 PER SECTOR, TOTAL OF 3)
INSTALL SPRINT ANTENNA (ETCR-654L12H6), (TYP. OF 1 PER SECTOR, TOTAL OF 3)
1,2 / S-2 — 1 / A-3
FURNISH AND INSTALL FLUSH MOUNT ADAPTER KIT (SITE PRO 1 PART # FMA2) (TYP. OF 1 KIT PER SECTOR, TOTAL OF 3)
1,2 / S-2

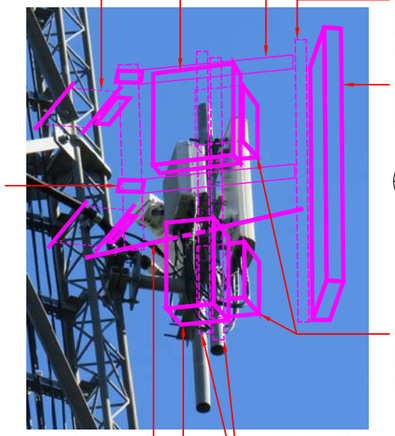


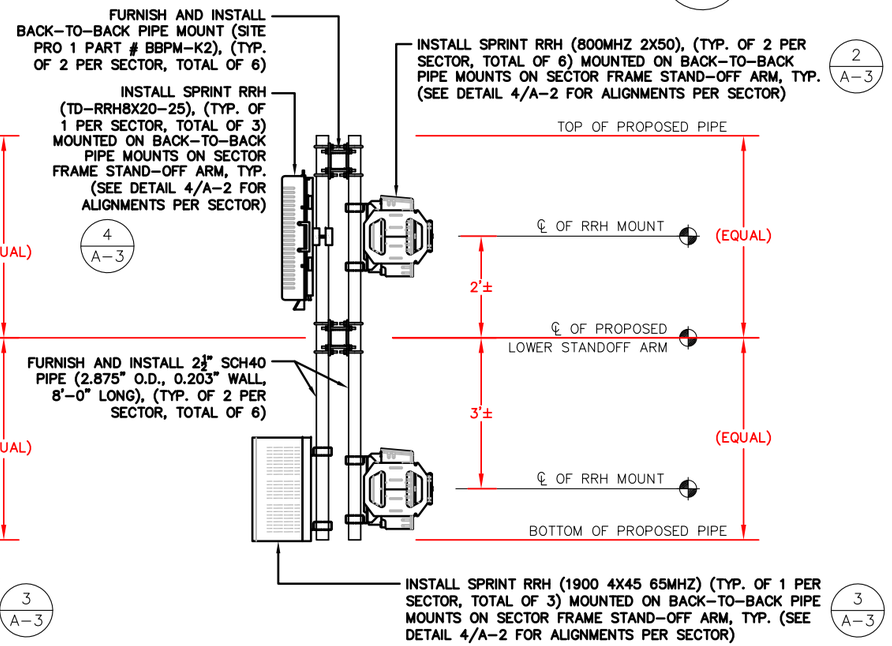
IMAGE SOURCE: PROTERRA 10/19/2017

INSTALL SPRINT RRH (800MHZ 2X50), (TYP. OF 2 PER SECTOR, TOTAL OF 6) MOUNTED ON BACK-TO-BACK PIPE MOUNTS ON SECTOR FRAME STAND-OFF ARM, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR)
2 / A-3 — 1,2 / S-2
FURNISH AND INSTALL TIE BACK, 2" SCH40 NOMINAL PIPE (2⅜" O.D. X 0.154" WALL) (7' LONG, V.I.F.) (TYP. OF 1 PER SECTOR, TOTAL OF 3)
INSTALL SPRINT RRH (1900 4X45 65MHZ) (TYP. OF 1 PER SECTOR, TOTAL OF 3) MOUNTED ON BACK-TO-BACK PIPE MOUNTS ON SECTOR FRAME STAND-OFF ARM, TYP. (SEE DETAIL 4/A-2 FOR ALIGNMENTS PER SECTOR)
3 / A-3
FURNISH AND INSTALL 2½" SCH40 PIPE (2.875" O.D., 0.203" WALL, 8'-0" LONG), (TYP. OF 2 PER SECTOR, TOTAL OF 6)

ANTENNA AND RRH MOUNT PHOTO DETAIL

3 / S-1

SCALE: N.T.S.



SECTION A-A

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

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

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Suite 200
Hadley, MA 01035 Ph: (413)320-4918

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

CHECKED BY: 12/4/JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

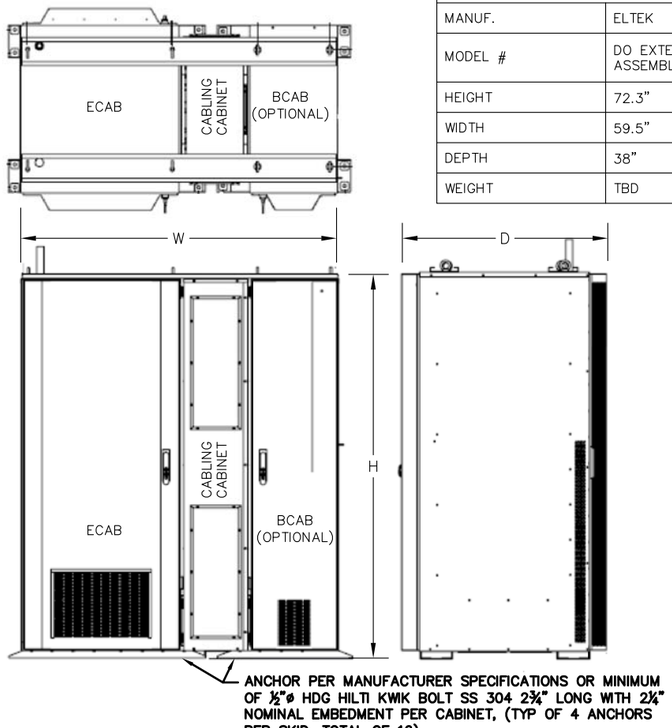
REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
ANTENNA AND RRH MOUNTING DETAILS

SHEET NUMBER
S-1

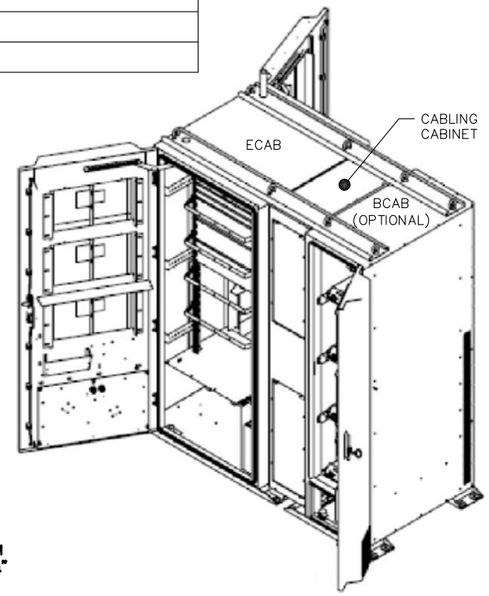
ELTEK EQUIPMENT CABINET	
MANUF.	ELTEK
MODEL #	DO EXTERNAL ECAB & BCAB ASSEMBLY
HEIGHT	72.3"
WIDTH	59.5"
DEPTH	38"
WEIGHT	TBD

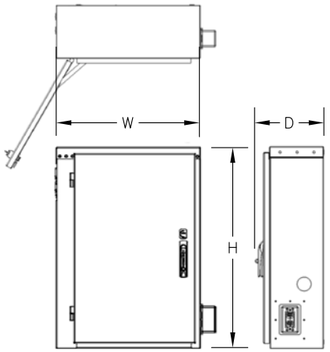


ELTEK EQUIPMENT CABINET DETAIL

1 / S-2

SCALE: N.T.S.



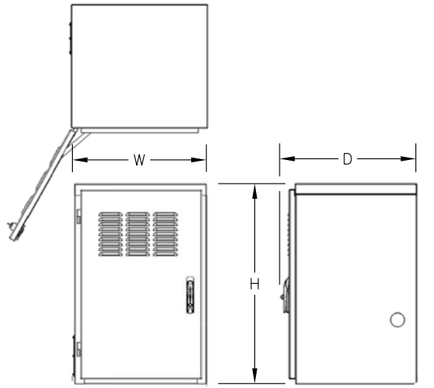


PPC CABINET	
MANUF.	PURCELL SYSTEMS, INC.
MODEL #	PPC (VERIFY WITH SPRINT MODEL)
HEIGHT	36"
WIDTH	26"
DEPTH	12.2"
WEIGHT	67± LBS

PPC DETAIL

2 / S-2

SCALE: N.T.S.

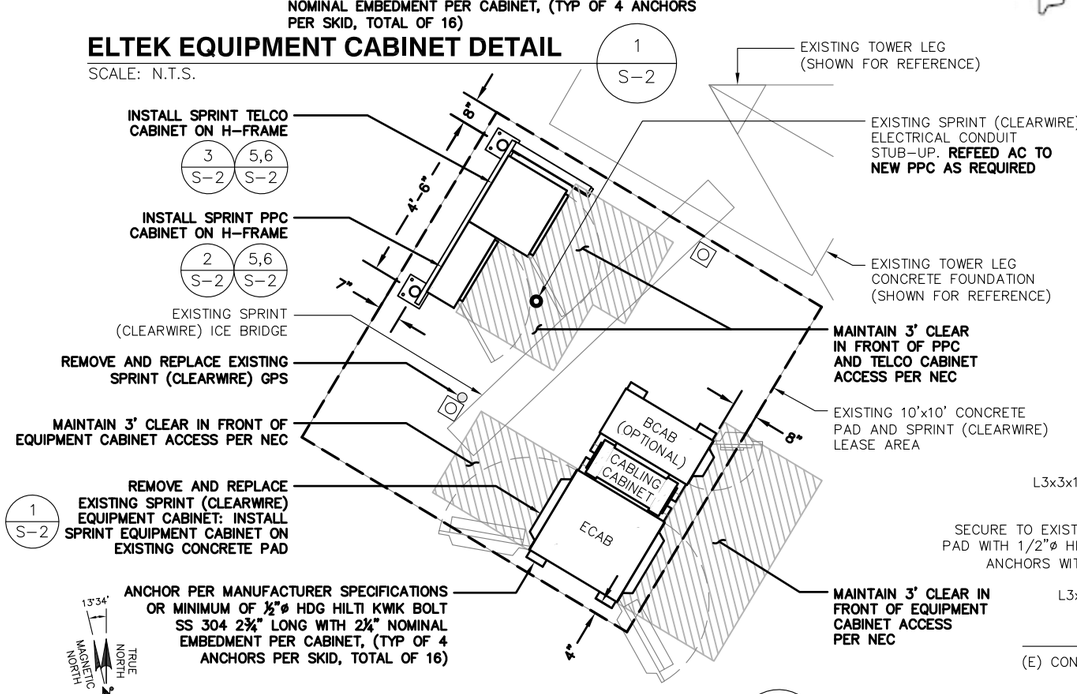


TELCO CABINET	
MANUF.	PURCELL SYSTEMS, INC.
MODEL #	TELCO CABINET (VERIFY WITH SPRINT MODEL)
HEIGHT	36.1"
WIDTH	24.3"
DEPTH	24.4"
WEIGHT	60± LBS

TELCO CABINET DETAIL

3 / S-2

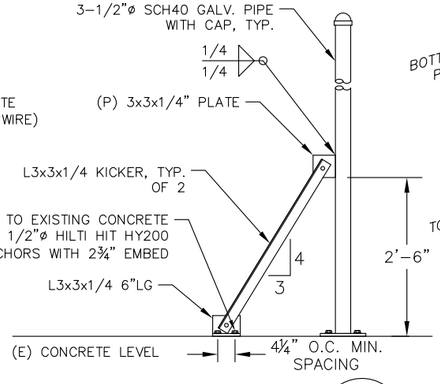
SCALE: N.T.S.



GROUND LEVEL EQUIPMENT PLAN

4 / S-2

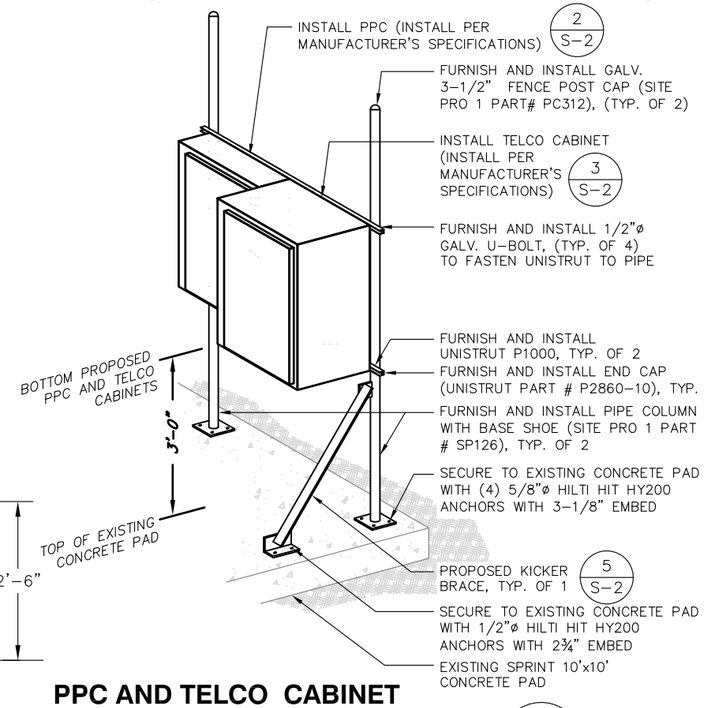
SCALE: N.T.S.



KICKER DETAIL

5 / S-2

SCALE: N.T.S.



PPC AND TELCO CABINET H-FRAME MOUNTING DETAIL

6 / S-2

SCALE: N.T.S.

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

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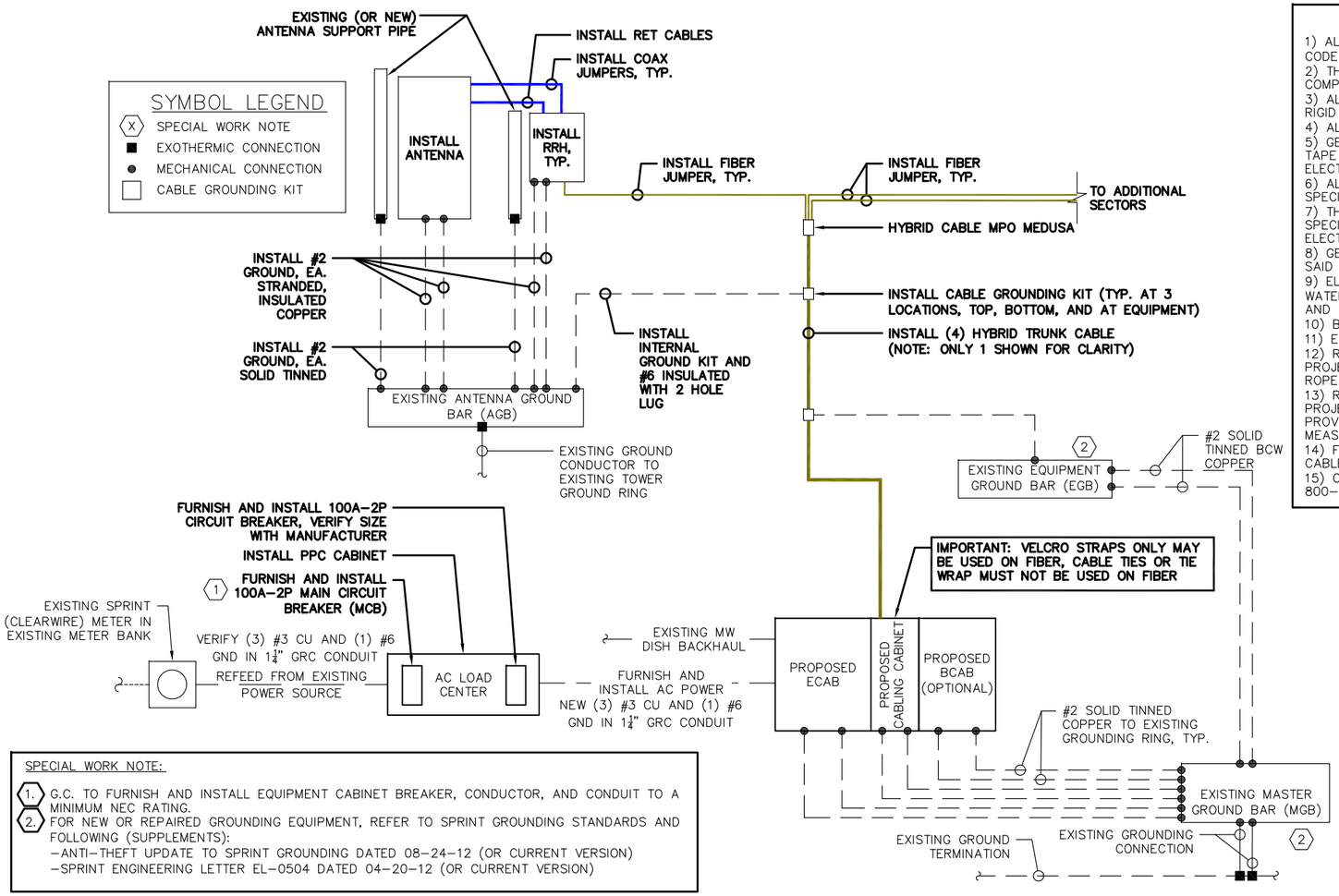
SHEET TITLE
GROUND EQUIPMENT DETAILS

SHEET NUMBER
S-2



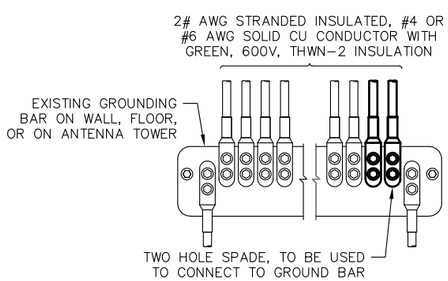
SPECIAL WORK NOTE:

1. G.C. TO FURNISH AND INSTALL EQUIPMENT CABINET BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING.
2. FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
   - –ANTI–THEFT UPDATE TO SPRINT GROUNDING DATED 08–24–12 (OR CURRENT VERSION)
   - –SPRINT ENGINEERING LETTER EL–0504 DATED 04–20–12 (OR CURRENT VERSION)

TYPICAL POWER AND GROUNDING ONE LINE DIAGRAMS

SCALE: N.T.S.

1 / E–1

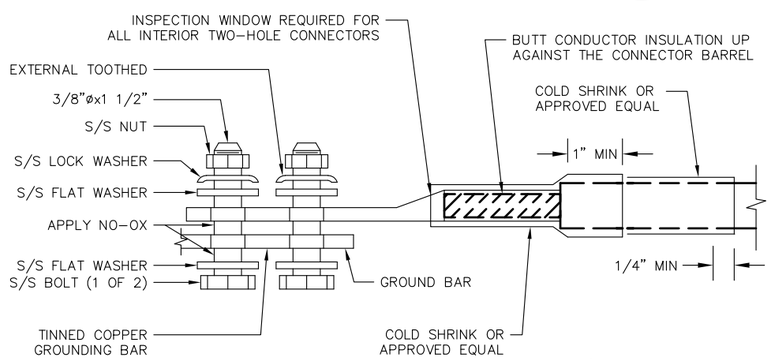


1. APPLY NO–OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.
2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR

SCALE: N.T.S.

2 / E–1



TWO HOLE LUG

SCALE: N.T.S.

3 / E–1

ELECTRICAL NOTES

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

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

1. GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250–GROUNDING AND BONDING.
2. GROUNDING SHALL BE IN ACCORDANCE WITH SPRINT SSEO DOCUMENTS 3.018.02.004 "BONDING, GROUNDING AND TRANSIENT PROTECTION FOR CELL SITES" AND 3.018.10.002 "SITE RESISTANCE TO EARTH TESTING".
3. PROVIDE GROUND CONNECTIONS FOR ALL METALLIC STRUCTURES, ENCLOSURES, RACEWAYS AND OTHER CONDUCTIVE ITEMS ASSOCIATED WITH THE INSTALLATION OF CARRIER'S EQUIPMENT.
4. GROUND CONNECTIONS: CLEAN SURFACES THOROUGHLY BEFORE APPLYING GROUND LUGS OR CLAMPS. IF SURFACE IS COATED, REMOVE THE COATING, APPLY A NON–CORROSIVE APPROVED COMPOUND TO CLEAN SURFACE AND INSTALL LUGS OR CLAMPS. WHERE GALVANIZING IS REMOVED FROM METAL, IT SHALL BE PAINTED OR TOUCHED UP WITH "GALVAMOX" OR EQUAL.
5. ALL GROUNDING WIRES SHALL PROVIDE A STRAIGHT, DOWNWARD PATH TO GROUND WITH GRADUAL BENDS AS REQUIRED. GROUND WIRES SHALL NOT BE LOOPED OR SHARPLY BENT.
6. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTORS AND PVC CONDUITS SHALL BE PVC TYPE (NON CONDUCTIVE). DO NOT USE METAL BRACKETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING AROUND ANY GROUNDING CONDUCTOR.
7. ALL GROUND WIRES SHALL BE #2 SOLID TINNED BCW UNLESS NOTED OTHERWISE.
8. PROVIDE DEDICATED #2 AWG COPPER GROUND WIRE FROM EACH ANTENNA MOUNTING PIPE TO ASSOCIATED CIGBE.
9. GROUND ANTENNA BASES, FRAMES, CABLE RACKS, AND OTHER METALLIC COMPONENTS WITH #2 INSULATED TINNED STRANDED COPPER GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
10. EACH EQUIPMENT CABINET SHALL BE CONNECTED TO THE MASTER ISOLATION GROUND BAR (MGB) WITH #2 SOLID TINNED BCW EQUIPMENT CABINETS WALL HAVE (2) CONNECTIONS.
11. GROUND HYBRIFLEX SHIELD AT TOP, BOTTOM AND AT TRANSITION TO HYBRIFLEX JUMPER CABLES AT EQUIPMENT CABINET ENTRANCE USING MANUFACTURER'S GUIDELINES. WHEN HYBRIFLEX CABLE EXCEEDS 200', GROUND AT INTERVALS NOT EXCEEDING 100'.
12. THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
13. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL OTHERWISE. THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE–2 HOLES, LONG BARREL LUGS OR DOUBLE CRIMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH AN ANTI–OXIDANT (THOMAS BETTS KOPR–SHILD) BEFORE MAKING THE CRIMP CONNECTIONS THE CONTRACTOR SHALL FOLLOW MANUFACTURER'S RECOMMENDED TORQUES ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS.
14. AT ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANEL, AND FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING. CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE LUGS WITH STAINLESS STEEL SELF–TAPPING SCREWS.
15. THE MASTER GROUND BAR (MGB) SHALL BE MADE OF BARE 1/4"x2" COPPER (FOR OUTDOOR APPLICATIONS IT SHALL BE TINNED COPPER) AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MGB SHALL ELECTRICAL INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
16. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
17. ALL GROUNDING CONNECTIONS SHALL BE COATED WITH A COPPER SHIELD ANTI–CORROSIVE AGENT SUCH AS T&B KOPR SHIELD. VERIFY PRODUCT WITH SPRINT CONSTRUCTION MANAGER.
18. FOR NEW OR REPAIRED GROUNDING EQUIPMENT. REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):
    - –ANTI–THEFT UPDATE TO SPRINT GROUNDING DATED 08–24–12 (OR CURRENT VERSION)
    - –SPRINT ENGINEERING LETTER EL–0504 DATED 04–20–12 (OR CURRENT VERSION)

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

CHECKED BY: 12/4/ JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK

SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
ELECTRICAL AND GROUNDING DETAILS

SHEET NUMBER
E–1

SprintVision RF Design Sheet

Site Identification	
Cascade	CT-NHN0069
SMS Schedule ID	12323438
SMS Schedule Name	DO Macro Upgrade
PID	DOKU_CT52XC069
RRU OEM	Alcatel Lucent
Switch OEM	ALU
RFDS Issue Date	
RFDS Revision Date	2017-03-13 00:00:00.0
RFDS Revision	1

Filter Analysis Complete	YES
RFDS - Issue Date	
Design Status	Complete
Border Analysis Complete	YES
Project Description	DO Macro Upgrade - Add 800MHz (3G + 4G) and 1900 MHz

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

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

Location Details	
Latitude	41.349667
Longitude	-72.972864
Market	Southern Connecticut
Region	Northeast
City	Hamden
State	CT
Zip Code	CT06514
County	New Haven

2500MHz	
1900MHz	3
800MHz	3

Additional RF Notes

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

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	2.5 Jumper 8	2.5 Jumper 8	2.5 Jumper 8	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	60	180	300	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	139.9934428	139.9934428	139.9934428	N/A	N/A	N/A
Antenna 1 Electrical DT	2	2	2	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	ETCR-654L12H6	ETCR-654L12H6	ETCR-654L12H6			
Weight (lbs)	85	85	85	N/A	N/A	N/A
Dimensions	84.9 x 21 x 6.3	84.9 x 21 x 6.3	84.9 x 21 x 6.3	N/A	N/A	N/A
Manufacturer	KMW	KMW	KMW	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	800/1900 Jumper 4	800/1900 Jumper 4	800/1900 Jumper 4	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	60	180	300	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	139.9934428	139.9934428	139.9934428	N/A	N/A	N/A
Antenna 1 Electrical DT	3	3	3	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	800/1900 Jumper 4	800/1900 Jumper 4	800/1900 Jumper 4	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	60	180	300	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	139.9934428	139.9934428	139.9934428	N/A	N/A	N/A
Antenna 1 Electrical DT	5	5	5	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A

NOTE: RFDS PROVIDED BY SPRINT DATED 03/13/2017. EXCERPTS TAKEN DEPICT RELEVANT RF DESIGN INFORMATION.
A&E VENDOR SCOPE OF WORK LIMITED TO DESIGN OF MECHANICAL/STRUCUTRAL EQUIPMENT ATTACHMENTS.

NOTE:
VERIFY PROPOSED AZIMUTHS WITH RF ENGINEER PRIOR TO INSTALLATION

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

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

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

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

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

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-4x45-1900	RRH-4x45-1900	RRH-4x45-1900	N/A	N/A	N/A
Weight (lbs)	69.5	69.5	69.5	N/A	N/A	N/A
Dimensions	25 x 12 x 12	25 x 12 x 12	25 x 12 x 12	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
Trunk Cable 1						
Model Number	1900 Hybrid_ALU	1900 Hybrid_ALU	1900 Hybrid_ALU	N/A	N/A	N/A
Weight (Lbs.)	1.1	1.1	1.1	N/A	N/A	N/A
Dimensions (In.)	1.25	1.25	1.25	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A

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

SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

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

RF DATA SHEET
SCALE: N.T.S.

1
RF–1

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

CHECKED BY: 12/4/JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	12/04/17	ISSUED FOR CONSTRUCTION	JEB/PN

SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

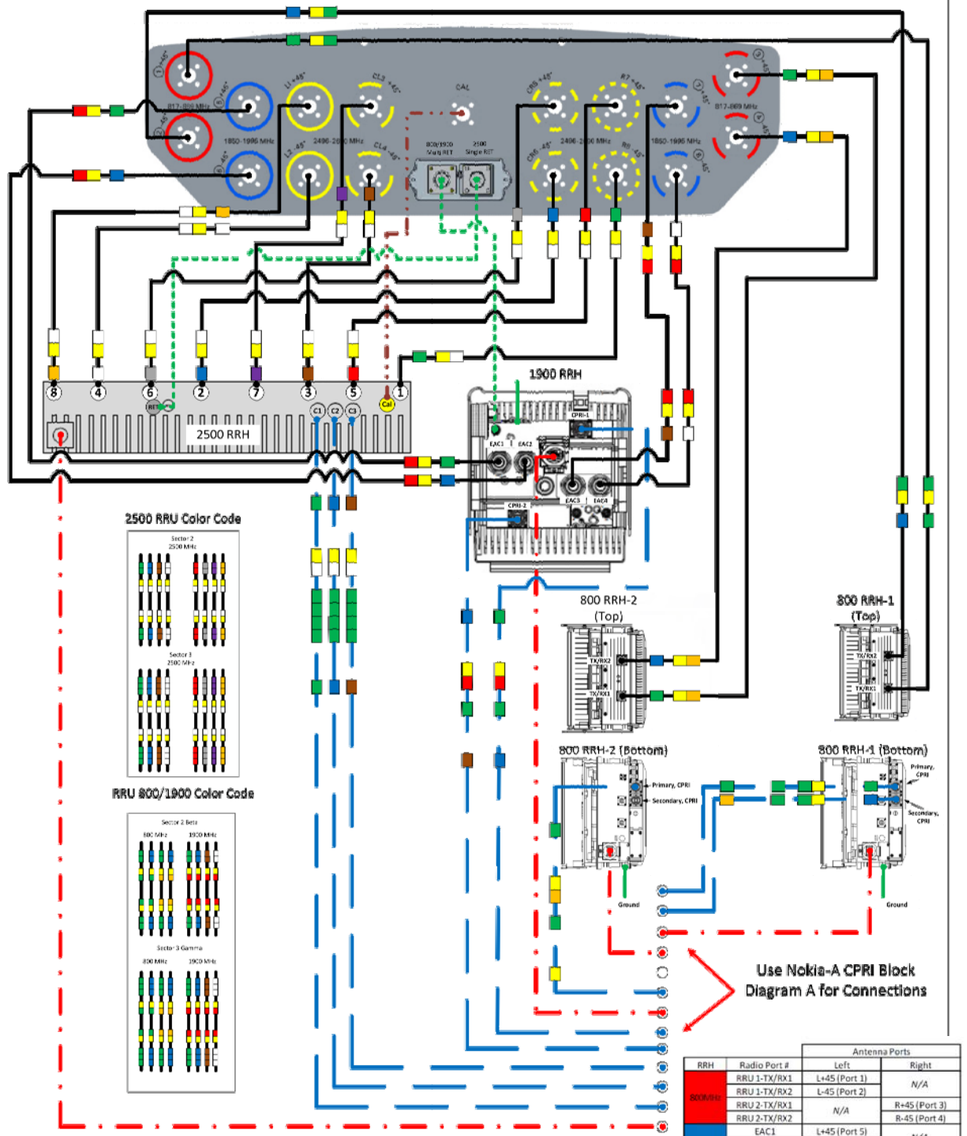
SHEET TITLE
RF DATA SHEET

SHEET NUMBER
RF–1

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

Sprint

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

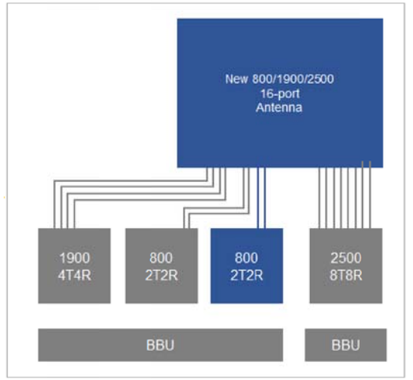


Not to Scale

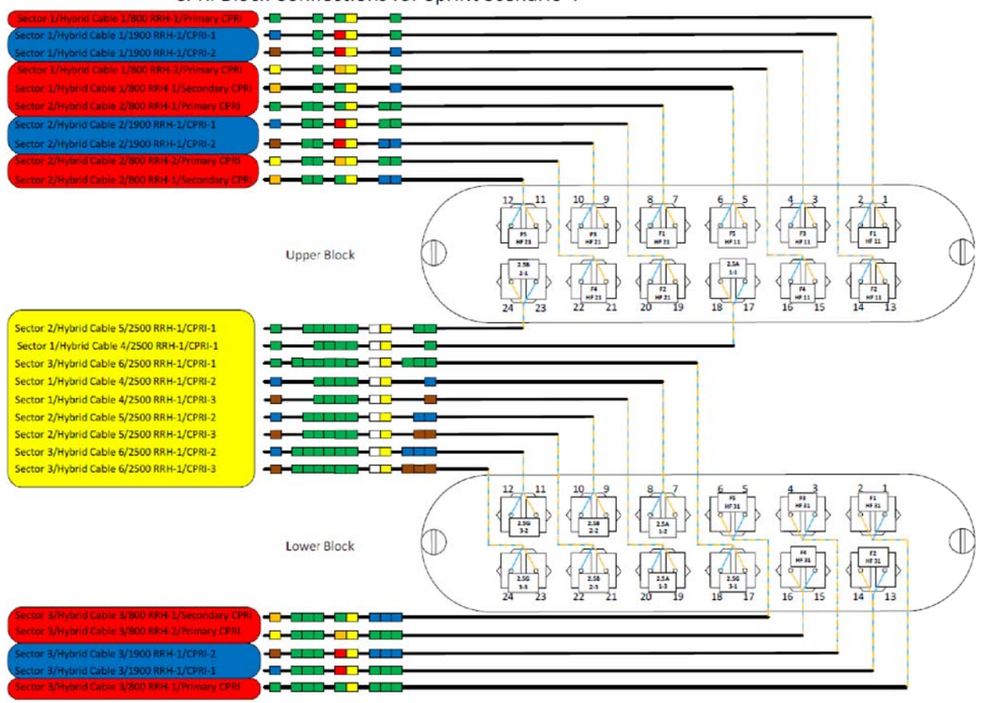
RRH	Radio Port #	Antenna Ports Left	Antenna Ports Right
800MHz	RRU 1-TX/RX1	L+45 (Port 1)	N/A
	RRU 1-TX/RX2	L-45 (Port 2)	
	RRU 2-TX/RX1	N/A	R+45 (Port 3)
	RRU 2-TX/RX2		R-45 (Port 4)
1900MHz	EAC1	L+45 (Port 5)	N/A
	EAC2	L-45 (Port 6)	
	EAC3	N/A	R+45 (Port 7)
	EAC4		R-45 (Port 8)
2500MHz	1	N/A	RB -45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

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

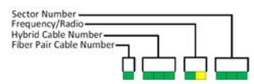
Future



CPRI Block Connections for Sprint Scenario 4



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



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

CHECKED BY: 12/4/ JMM/TEJ

APPROVED BY: JMM/TEJ

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
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SITE NUMBER:
CT52XC069
SITE NAME:
SBA WESTROCK PARK
SITE ADDRESS:
1055 WINTERGREEN AVENUE
HAMDEN, CT 06514

SHEET TITLE
PLUMBING DIAGRAM AND RAN WIRING

SHEET NUMBER
RF-2