Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

August 7, 2018

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

RE: **Notice of Exempt Modification for Sprint DO Macro: 806383**
Sprint Site ID: CT03XC205
56 Cosgrove Road, Willington, CT 06279
Latitude: 41° 53' 32.92"/ Longitude: -71° 15' 38.15"

Dear Ms. Bachman:

Sprint currently maintains six (6) antennas at the 125-foot level of the existing 140-foot self-support tower at 56 Cosgrove Road, Willington, CT. The tower is owned by Crown Castle. The property is owned by Ms. Isabella Drobney. Sprint now intends to replace six (6) antennas with six (6) new antennas. These antennas would be installed at the 125-foot level of the tower. Sprint also intends to install twelve (12) RRH's, four (4) Hybrid cables and remove six (6) coax cables.

The facility was constructed in or about 1986. An email was sent to Ms. Margaret Dupilka of the Land Use Department in the Town of Willington inquiring on original zoning documents. On March 13, 1997 the Connecticut Siting Council in Docket No. 58 approved modifications to the tower.

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.S.C.A. § 16-50j-73, a copy of this letter is being sent to First Selectman- Ms. Erika Wiecenski & Ms. Susan Yorgensen of the Planning & Zoning Commission. A copy of this letter is also being sent to the property owner, Ms. Isabella Drobney. Crown Castle is the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modification 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 Communication Commission safety standard.

5. The proposed modifications 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-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Jeffrey Barbadora.

Sincerely,

Jeffrey Barbadora
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
781-729-0053
Jeff.Barbadora@crowncastle.com

Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: Ms. Erika Wiecenski, First-Selectman
Town of Willington
40 Old Farms Road
Willington, CT 06279
(860) 487-3100

Ms. Susan Yorgensen
Town of Willington Planning and Zoning Commission
40 Old Farms Road
Willington, CT 06279
(860) 487-3123

Property owner:
Ms. Isabella Drobney
56 Cosgrove Road
Willington, CT 06279

TOWN OF WILLINGTON
APPLICATION FOR ZONING AND BUILDING PERMIT

NOTICE: This application must be typed or printed in ink and filed

The undersigned hereby applies for a permit to: ERECT (X), ALTER ( ), ENLARGE ( ), REPAIR ( ), REMOVE ( ), DEMOLISH ( ), a building or structure herein described and in accordance with plans and specifications submitted in duplicate, herewith, as shown on accompanying survey map.

LOCATION: Whitford Hill, Willington, CT (Street & Number or nearest cross Highway) E. ( ), W. ( ), S. ( ), N. ( ) side (If no number is assigned indicate above on which side of street)

LOT # ..... ZONE ..... INTENDED USE OF BUILDING To house electrical equipment for mobile telephone system

SIZE OF LOT: #FT. FRONT ..... #FT. DEEP ..... AREA OF LOT .....

SIZE OF BUILDING: 15 FT. X 21 FT. NO. OF STORIES 1 TOTAL FLOOR AREA 325.5 SQ. FT.

DISTANCE OF BUILDING FROM LOT LINES: FRONT SEE ATTACHED PLAN, SIDE ....., SIDE ....., REAR .....

WORK WILL START ON OR ABOUT November 1, 1986

OWNER OF LAND Martin W. & Isabella M. Brehmer ADDRESS Conserve Rd., N. Willington

OWNER OF BUILDING METRO MOBILE CTS of Hartford ADDRESS C/O METRO MOBILE CTS OF NEW H 5 Eversley Ave., Norwalk, CT

ARCHITECT CON-SERV, INC. 617-667-1424 ADDRESS 7 Karen Cir. S-3, Billerica,

BUILDER NORTHEAST ENGINEERING & CONSTRUCTION CORP. ADDRESS 740 A Main Street 01 Woburn, MA 01801

HOME IMPROVEMENT CONT. REG. # N/A

This space to be used for Buildings to be Altered, Enlarged, Repaired, Removed or Demolished, Change in use and Special Permit Application.

STATE PROPOSED WORK TO BE DONE OR CHANGE in USE IN DETAIL: (Attach separate sheet if necessary)

Terry D. II
Pager 1-800-718-2833

How is building presently occupied .....

How will building be occupied .....

If building is to be demolished or removed, have you notified the proper authorities or utilities, to have their respective service connections, removed or sealed and plugged. Water ( ), Sewer ( ), Elect. ( ), Gas ( ).

I hereby agree to comply with the requirements of the Zoning Regulations of the Town of Willington and the provisions of the State Building Code and all other State and Health Codes. The plans and specifications submitted herewith have been prepared in accordance with and are intended to meet these requirements. I hereby certify that I am familiar with the regulations or that I have employed competent persons to assist me in the preparation of the plans and specifications. I further agree that as owner or agent for the owner that the work will be done in accordance with these regulations and that I will employ whatever competent assistance or workmen as may be needed to carry on the work in accordance with the regulations and to remove, replace, or repair any work not found to be in accordance with the regulations by any authority.

Tel. of Person responsible 617-335-4975 Date of Submission 10/30/86

IMPORTANT: I hereby certify that I have read and understand the foregoing information.

SIGNED [signature] Owner or Duly Authorized Agent (Affidavit)

ADDRESS .....

DO NOT WRITE BELOW THIS LINE

PERMIT NO. /DATE

Map/Parcel

COMMENTS/CONDITIONS:

CERTIFICATE OF SITING COUNCIL OF CT. NEEDED (FOUND)

Est. Cost. Const. $90,000

Town 28,000
Footing 12,000
Slab 35,000
Site 15,000
90,000

Building	465
Zoning	15
Driveway	
Heating	
Electrical	
Plumbing	
Septic	
Other	
TOTAL FD.	480 pd
(chk #/cash)	

[signature] 11/24/86
ZONING AGENT/DATE

[signature] 12-11-86
BUILDING OFFICIAL/DATE

PLANNING & ZONING COMMISSION

Willington, Connecticut 06279

ZONING PERMIT

Date of Application ..... 19 ..

This permit is hereby applied for in accordance with the requirements of the Willington Zoning Regulations for:

☑ new construction ☐ swimming pool ☐ change of use ☑ other .....
☐ addition ☐ sign ☐ excavating/filling .....

Zoning District ..... Lot Area ..... Lot Frontage ..... Required Approvals ..... (all data)

Record Map # ..... Subdivision ..... Lot No. ..... Special Permit, yes ☐, no ☐

Location ..... Site Plan Approval, yes ☐, no ☐
(House Number) (Street)

Property Owner ..... Address ..... Phone .....

PROPERTY USE: ☐ Single Family Residence ☐ Multi-Family Residence ☐ Commercial ☐ Industrial ☐ Other .....

PROPOSED STRUCTURES

Existing Structures: No. ..... Use .....

1. Description .....
2. Dimensions .....
3. Livable Floor Area .....
4. Estimated Cost of Construction $ .....
☐ Health Dept. Approval: # ..... Date: .....
☐ Driveway permit: # ..... Date: .....

Conditions of Approval:

Reasons for Denial:

☐ Plot Plan Attached
☐ Conforming All Aspects
☐ Non Conforming

☐ Variance granted to .....

SIGN PERMIT ONLY — Permanent ☐ Temporary ☐
☐ Signed Legend

	Blackboard	Lettering
Color		
Dimensions		
Area		
Building Frontage		
Permitted Area		

Letter Style _____
Material _____
Finish _____
Lighting _____
Front Set-Back _____
Sketch to Scale Attached ☐

Approved by _____

Date _____

For ..... Date ..... 19 .....

Permit void if:
a. Work or activity not commenced within 3 months of the date of issuance
b. Construction authorized not completed within 1 year of the date of issuance.

This permit, if issued, is based upon the plot plan submitted. Falsification, by misrepresentation or omission; or failure to comply with the conditions of approval of this permit shall constitute a violation of the Willington Zoning Regulations.

..... Permit hereby ☐ Issued ☐ Denied
Signature of owner or authorized agent (Agent's phone)

Fee of ..... PAID .....
Date ..... 19 ..
Permit # .....

by _____
LAND USE AGENT
WILLINGTON LAND USE AGENCY

Zip # .....

ZONING CERTIFICATE OF COMPLIANCE

Willington, Connecticut 06279

Issued to ..... Address ..... Zone .....

For ..... (Premises covered by certificate)
(House No.) (Street)

Lot # ..... Record # ..... Subdivision # .....

To verify that a plot plan (attached) certified by ..... on ..... 19 ..... of the above-referenced lot and the structures thereon has been presented to the Zoning Enforcement Officer, and such plan indicates that the construction or use is in conformance with all the applicable Zoning Regulations. Such lot, structures, and/or use are hereby authorized for occupancy. This certificate is based on the certified plot plan submitted. Falsification, by mis-representation or omission shall constitute a violation of the Willington Zoning Regulations and shall invalidate this Certificate.

Date ..... 19 ... by _____
LAND USE AGENT
PLANNING ZONING COMMISSION

Barbadora, Jeff

From: Margaret DuPilka <mdupilka@willingtonct.org>
Sent: Tuesday, August 7, 2018 2:40 PM
To: Barbadora, Jeff
Subject: 56 Cosgrove Rd
Attachments: 20180807121251923.pdf

Note sure if this is what you are looking for. Peggy

-----Original Message-----
From: TOBCopyRoom@willingtonct.org [mailto:TOBCopyRoom@willingtonct.org]
Sent: Tuesday, August 07, 2018 12:13 PM
To: Margaret DuPilka <mdupilka@willingtonct.org>
Subject: Message from "TOB-COPYROOM-COPIER"

This E-mail was sent from "TOB-COPYROOM-COPIER" (MP C4503).

Scan Date: 08.07.2018 12:12:51 (-0400)
Queries to: TOBCopyRoom@willingtonct.org

Bell Atlantic NYNEX Mobile
20 Alexander Drive
P.O. Box 5029
Wallingford, CT 06492
Telephone: 203-269-8858

Jennifer Young Gaudet
Manager - Regulatory

February 25, 1997

RECEIVED
FEB 25 1997
CONNECTICUT
SITING COUNCIL

HAND DELIVERED

Mr. Joel M. Rinebold, Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051

Re: Bell Atlantic NYNEX Mobile - GPS Antennas - Windsor, Vernon, Wallingford, Rocky Hill, Branford, Milford, Darien, Fairfield, Guilford and North Haven Cell Sites

Dear Mr. Rinebold:

Bell Atlantic NYNEX Mobile ("BANM" or the "Company") plans to mount a small Global Positioning Satellite System ("GPS") receive-only antenna on its towers at the existing BANM facilities referenced above. Please accept this letter as notification, pursuant to R.C.S.A. § 16-50j-73, of construction which constitutes an exempt modification to each facility pursuant to R.C.S.A. § 16-50j-72(b). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the chief elected official of each town in which a referenced facility is located, as shown on the attached Appendix A.

The addition of BANM's GPS antenna to each tower site does not constitute a modification as defined in C.G.S. § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed or altered. The addition of the GPS antenna will have no effect on any of the sites.

The planned change to each facility falls squarely within those activities provided for in R.C.S.A. § 16-50j-72(b). The height of the tower will be unaffected. In the case of monopoles, the GPS antenna will be placed on the top platform, where BANM's other antennas are located, and will not extend above the existing antennas. In the case of lattice towers, the GPS antenna will be placed on an approximately 2' sidearm at the 60' level of the tower. Attached as Appendix B is relevant tower and site data for each of the sites. The addition of the GPS antenna will have no effect on the site boundary or noise levels at any of the sites. Nor will there be any effect on the total radio frequency electromagnetic radiation power density at any of the sites, because the GPS antennas are receive-only antennas.

BANM therefore respectfully requests the Council's acknowledgment under R.C.S.A. § 16-50j-72(b) of the addition of the GPS antennas at the referenced facilities.

Respectfully yours,

Jennifer Young Gaudet
Manager - Regulatory

Enclosures

Site	Address	Type of Tower	Tower Height	Docket
Windsor	482 Pigeon Hill Road	lattice	160'	58
Vernon	South Street	lattice	130'	58
Willington	Cosgrove Road	lattice	140'	58
Rocky Hill	France Street	monopole	140'	58
Branford	1801 North Main Street	monopole	110'	122
Milford	423 Oronoque Road	monopole	100'	56
Darien	Ledge Road	monopole	100'	155
Fairfield	281 Woodhouse Road	monopole	160'	86
Guilford	131 Manor Road	monopole	150'	56
North Haven	117 Washington Avenue	monopole	120'	117

Exempt Mod.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

10 Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

March 13, 1997

Jennifer Young Gaudet
Regulatory Manager
Bell Atlantic NYNEX Mobile
20 Alexander Drive, P.O. Box 5029
Wallingford, CT 06492

Re: **DOCKET NO. 56** - Bell Atlantic NYNEX Mobile Certificate of Environmental Compatibility and Public Need for telecommunications facilities in New Haven County. Notice of Intent to Modify Guilford & Milford Facilities.

DOCKET NO. 58 - Bell Atlantic NYNEX Mobile Certificate of Environmental Compatibility and Public Need for telecommunications facilities in the Towns of Glastonbury, Haddam, Hartford, Portland, Rocky Hill, Somers, Willington, Vernon, and Windsor Connecticut. Notice of Intent to Modify Rocky Hill, Vernon, [redacted] and Windsor Facilities.

DOCKET NO. 86 - Bell Atlantic NYNEX Mobile, Certificate of Environmental Compatibility and Public Need for telecommunications facilities in the Towns of Greenwich and Fairfield. Notice of Intent to Modify Fairfield Facility.

DOCKET NO. 117 - Bell Atlantic NYNEX Mobile Certificate of Environmental Compatibility and Public Need for a telecommunications facility in the Town of North Haven, Connecticut. Notice of Intent to Modify Facility.

DOCKET NO. 122 - Bell Atlantic NYNEX Mobile Certificate of Environmental Compatibility and Public Need for a telecommunications facility in the Town of Branford, Connecticut. Notice of Intent to Modify Facility.

DOCKET NO. 155 - Bell Atlantic NYNEX Mobile Certificate of Environmental Compatibility and Public Need for a telecommunications facility located in the Town of Darien, Connecticut. Notice of Intent to Modify Facility.

Dear Ms. Gaudet:

At a public meeting held on March 12, 1997, the Connecticut Siting Council (Council) acknowledged your notice to modify existing telecommunications facilities in Guilford, Milford, Rocky Hill, Vernon, Willington, Windsor, Fairfield, North Haven, Branford, and Darien, Connecticut, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified in your notice dated February 25, 1997. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequency electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequency now used on this tower. Any additional change to these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Science and Technology, Bulletin No. 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such

failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston

Mortimer A. Gelston
Chairman

MAG/RKE/ss

c: Honorable Francis J. Brady, Mayor of Windsor
Honorable Tony Muro, Mayor of Vernon
Honorable John Patton, First Selectman of Willington
Honorable Donald W. Unwin, Mayor of Rocky Hill
Honorable Dominic A. Buonocore, First Selectman of Branford
Honorable Frederick L. Lisman, Mayor of Milford
Honorable Henry M. Sanders, First Selectman of Darien
Honorable Paul A. Audley, First Selectman of Fairfield
Honorable Edward J. Lynch, First Selectman of Guilford
Honorable Anthony P. Rescigno, First Selectman of North Haven

56 COSGROVE RD

Location	56 COSGROVE RD	**Mblu**	33/ / 024-00/ /
Acct#	00058300	**Owner**	DROBNEY ISABEL N
Assessment	$172,310	**Appraisal**	$246,150
PID	3010	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$180,500	$65,650	$246,150
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2017	$126,360	$45,950	$172,310

Owner of Record

Owner	DROBNEY ISABEL N
Co-Owner	AKA ISABELLA
Address	56 COSGROVE RD
	WILLINGTON, CT 06279
Sale Price	$0
Certificate	
Book & Page	204/369
Sale Date	05/29/2013

Building Information

Building 1 : Section 1

Year Built:	1958
Living Area:	1,963
Replacement Cost:	$237,151
Building Percent Good:	71
Replacement Cost Less Depreciation:	$168,380

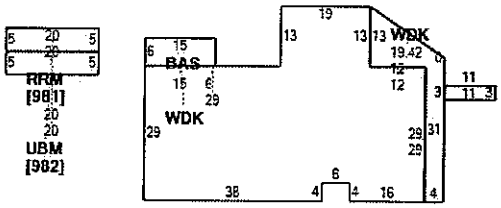
Building Attributes	
Field	**Description**
Style	Ranch
Model	Residential
Grade:	Good
Stories:	1
Occupancy	1

Building Photo

(http://images.vgsi.com/photos/WillingtonCTPhotos//\00\00\04\

Building Layout

Exterior Wall 1	Stucco/Masonry
Exterior Wall 2	Brick Veneer
Roof Structure:	Gable or Hip
Roof Cover	Asbestos Shing
Interior Wall 1	Drywall/Sheet
Interior Wall 2	Wood Panel
Interior Flr 1	Hardwood
Interior Flr 2	Linoleum
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	4 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	1
Total Rooms:	6
Bath Style:	Average
Kitchen Style:	Average
Fireplaces	2
Basement Garage	2



Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	1,963	1,963
RRM	Rec Room	0	0
UBM	Unfinished Basement	0	0
WDK	Wood Deck	326	0
		2,289	1,963

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code 1010
Description Single Fam MDL-01
Zone R80
Neighborhood 110
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 4.2
Frontage
Depth
Assessed Value $45,950
Appraised Value $65,650

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
SHD1	SHED FRAME			312.00 S.F.	$1,870	1
FGR3	GARAGE-POOR			1424.00 S.F.	$10,250	1

Valuation History

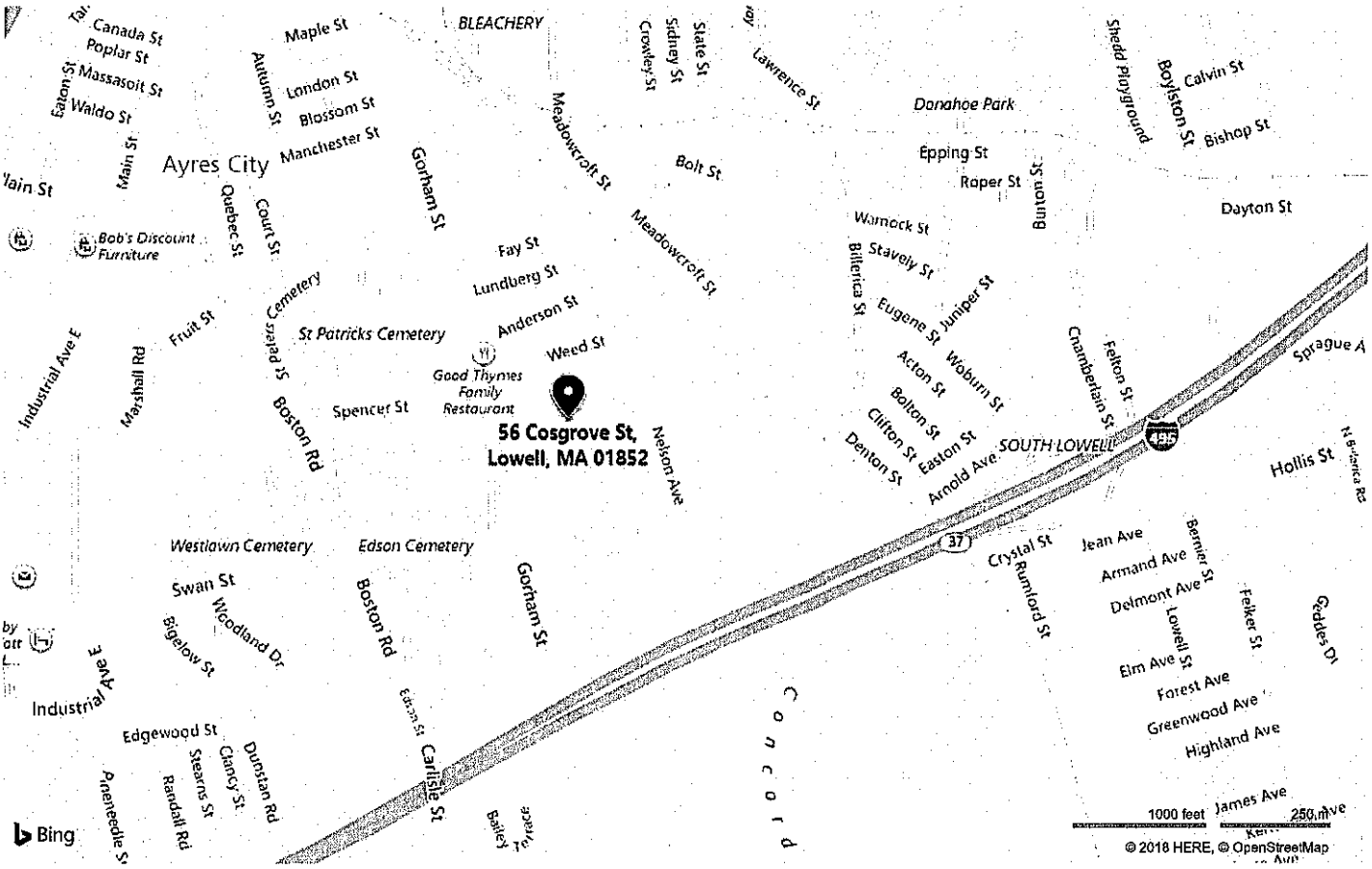
Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$180,500	$65,650	$246,150

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$126,360	$45,950	$172,310

bing maps

56 Cosgrove St, Lowell, MA 01852

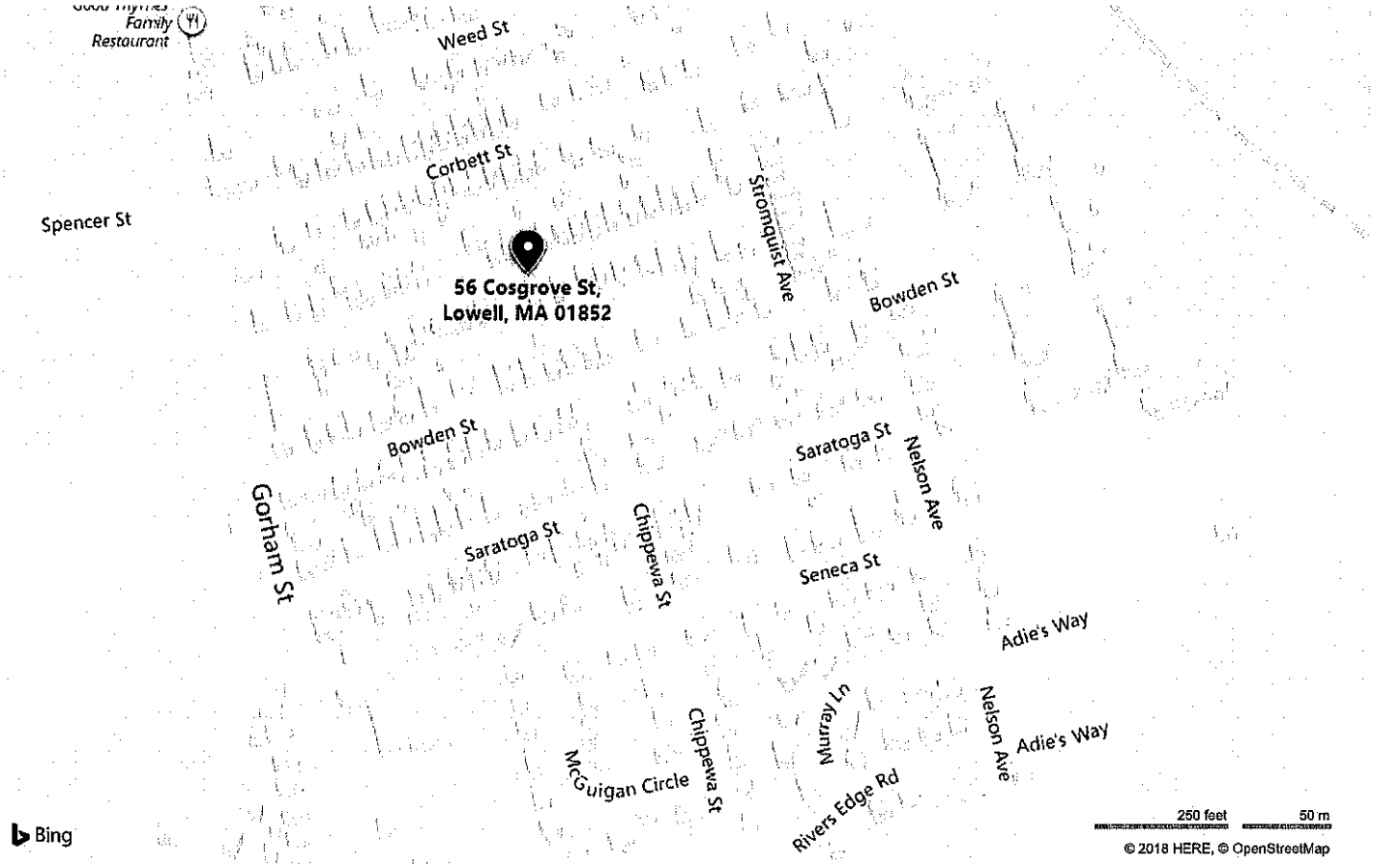
Location: 42.619881485361084, -71.30272803319164



bing maps

56 Cosgrove St, Lowell, MA 01852

Location: 42.619881485361084, -71.30272803319164



Sprint

CROWN CASTLE

PROJECT:	DO MACRO UPGRADE
SITE NAME:	WILLINGTON (CROWN)
SITE CASCADE:	CT03XC205
SITE NUMBER:	806383
SITE ADDRESS:	COSGROVE ROAD WEST WILLINGTON, CT 06279
SITE TYPE:	SELF SUPPORT TOWER
MARKET:	NORTHERN CONNECTICUT

SITE INFORMATION

TOWER OWNER:
CROWN ATLANTIC COMPANY LLC
2000 CORPORATE DRIVE
CANONSBURG, PA 15317
(704) 405-6555

LATITUDE (NAD83):
41° 53' 32.92" N
41.892478

LONGITUDE (NAD83):
-72° 15' 38.15" W
-72.260597

COUNTY:
TOLLAND

ZONING JURISDICTION:
CONNECTICUT SITING COUNCIL

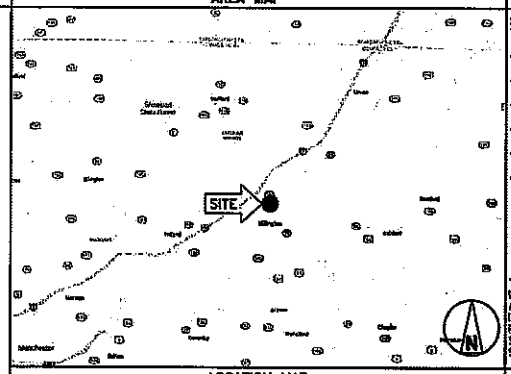
ZONING DISTRICT:
RESIDENTIAL

POWER COMPANY:
CONNECTICUT LINE & POWER
(800) 286-2000

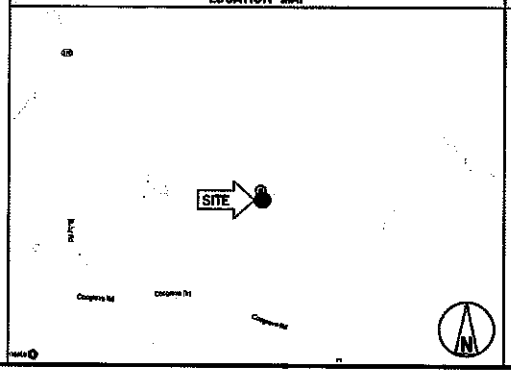
SPRINT CONSTRUCTION:
TBD

CROWN PM:
SCOTT WIATROSKI
(201) 236-9228

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY.

- INSTALL 2.5 EQUIPMENT INSIDE EXISTING N.V. MMBS CABINET
- REMOVE (6) PANEL ANTENNAS
- INSTALL (6) PANEL ANTENNAS (3 800/1900, 3 2500)
- INSTALL (12) RRHs ON TOWER (6 800, 3 1900, 3 2500)
- REMOVE (6) COAX CABLES
- INSTALL (4) HYBRID CABLES

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

APPLICABLE CODES

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

1. INTERNATIONAL BUILDING CODE (2015 IBC)
2. TIA-222-G OR LATEST EDITION
3. NFPA 780 – LIGHTNING PROTECTION CODE
4. 2011 NATIONAL ELECTRIC CODE OR LATEST EDITION
5. ANY OTHER NATIONAL OR LOCAL APPLICABLE CODES, MOST RECENT EDITIONS
6. LOCAL BUILDING CODE
7. CITY/COUNTY ORDINANCES

811 Know what's below. Call before you dig. www.call811.com

DRAWING INDEX

SHEET NO.	SHEET TITLE	REV.
T-1	TITLE SHEET & PROJECT DATA	0
SP-1	SPRINT SPECIFICATIONS	0
SP-2	SPRINT SPECIFICATIONS	0
SP-3	SPRINT SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	TOWER ELEVATION & CABLE PLAN	0
A-3	ANTENNA LAYOUT & MOUNTING DETAILS	0
A-4	EQUIPMENT & MOUNTING DETAILS	0
A-5	CWL DETAILS	0
A-6	PLUMBING DIAGRAM	0
E-1	ELECTRICAL & GROUNDING DETAILS	0
E-2	ELECTRICAL & GROUNDING DETAILS	0

PLANS PREPARED FOR:
Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:
INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 336-163

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
12/31/2019
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:
THESE DOCUMENTS ARE CONFIDENTIAL AND ARE THE SOLE PROPERTY OF SPRINT AND MAY NOT BE REPRODUCED, DISSEMINATED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPRINT.

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/19	RCD	0
ISSUED FOR REVIEW	06/14/19	RCD	A

SITE NAME:
WILLINGTON (CROWN)

SITE CASCADE:
CT03XC205

SITE ADDRESS:
COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:
TITLE SHEET
& PROJECT DATA

SHEET NUMBER:
T-1

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

SECTION 01 100 – SCOPE OF WORK

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

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

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

1.5 DEFINITIONS:

A. WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.

B. COMPANY: SPRINT CORPORATION

C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.

D. CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.

E. THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

F. OFCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.

G. CONSTRUCTION MANAGER – ALL PROJECTS RELATED COMMUNICATION TO FLOW THROUGH SPRINT REPRESENTATIVE IN CHARGE OF PROJECT...

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

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

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

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

A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN RED PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

B. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK.

C. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SPRINT CONSTRUCTION MANAGER PRIOR TO PROCEEDING WITH THE WORK.

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

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

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

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

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

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

1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

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

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

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

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

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

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 RECEIPT OF MATERIAL AND EQUIPMENT:

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

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

1 ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.

2. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.

3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.

4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.

5. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

6. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

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

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

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

SECTION 01 300 – CELL SITE CONSTRUCTION CO.

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 NOTICE TO PROCEED

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

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

TOWER OWNER NOTIFICATION
ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 FUNCTIONAL REQUIREMENTS:

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

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

C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES

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

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
1033 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 225-16

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24786
LICENSED PROFESSIONAL ENGINEER
JUL 05 2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/06/18	RCD	0
ISSUED FOR REVIEW	06/14/18	RCD	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-1

CONTINUE FROM SP-1

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

3.2 GENERAL REQUIREMENTS FOR CIVIL CONSTRUCTION:

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

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

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

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

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

E. CONDUCT TESTING AS REQUIRED HEREIN.

3.3 DELIVERABLES:

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

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

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

1.3 SUBMITTALS:

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

B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

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

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

1.4 TESTS AND INSPECTIONS:

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

B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. COAX SWEEPS AND FIBER TESTS PER CURRENT VERSION OF SPRINT'S TS-0200 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.

C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING;

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

1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPs

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 REQUIREMENTS FOR TESTING:

A. THIRD PARTY TESTING AGENCY:

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

3.2 REQUIRED TESTS:

A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
3. FIELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND ANCHOR LOCATIONS
5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.
6. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
7. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
8. GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS
9. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

3.3 REQUIRED INSPECTIONS

A. SCHEDULE INSPECTIONS WITH COMPANY REPRESENTATIVE.

B. CONDUCT INSPECTIONS INCLUDING BUT NOT LIMITED TO THE FOLLOWING:

1. GROUNDING SYSTEM INSTALLATION PRIOR TO EARTH CONCEALMENT DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
2. FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
3. COMPACTION OF BACKFILL MATERIALS: AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS; ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
4. PRE- AND POST-CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
6. ANTENNA AZIMUTH , DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

INFINIGY

FROM ZERO TO INFINIGY

the solutions are endless

1933 Watervliet Shaker Rd | Albany, NY 12205
Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 326-403

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24795
REGISTERED
PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/04/16	RDD	0
ISSUED FOR REVIEW	06/14/16	RDD	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-2

CONTINUE FROM SP-2

7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.
10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
11. ALL AVAILABLE JURISDICTIONAL INFORMATION
12. PDF SCAN OF REDLINES PRODUCED IN FIELD

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

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

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

A. THE FOLLOWING TEST AND INSPECTION REPORTS SHALL BE PROVIDED AS APPLICABLE.

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

B. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES THE FOLLOWING:

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

SECTION 01 400 – SUBMITTALS & TESTS

PART 1 – GENERAL

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

1.2 RELATED DOCUMENTS:

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

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

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 WEEKLY REPORTS:

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

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

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:

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

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

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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www.infinigy.com
JOB NUMBER 025-005

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. SHELTON
JUL 31 2018
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/18	RCD	0
ISSUED FOR REVIEW	06/11/18	RCD	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

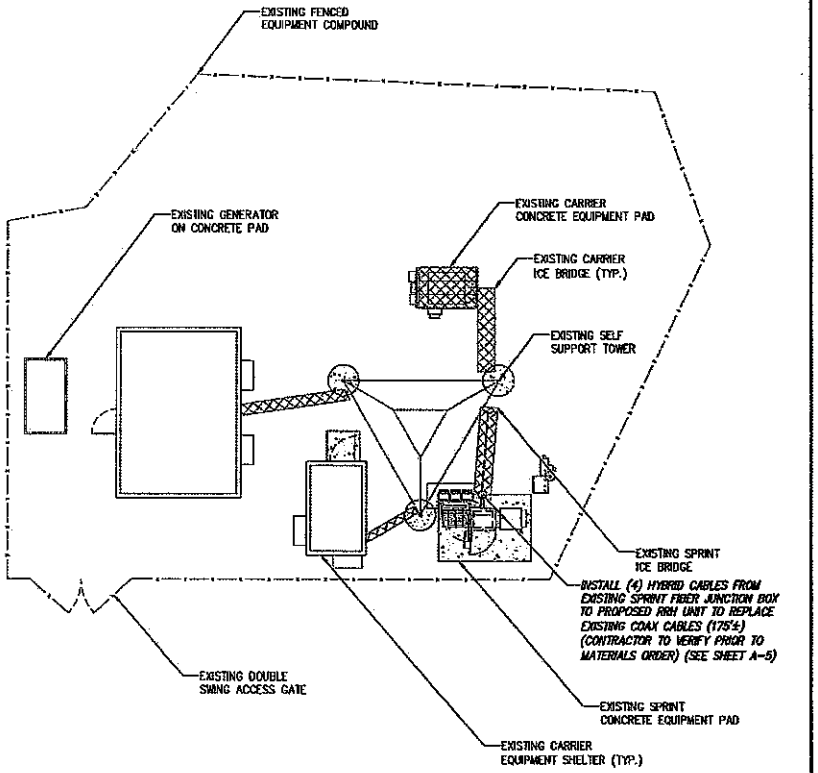
COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

SPRINT SPECIFICATIONS

SHEET NUMBER:

SP-3



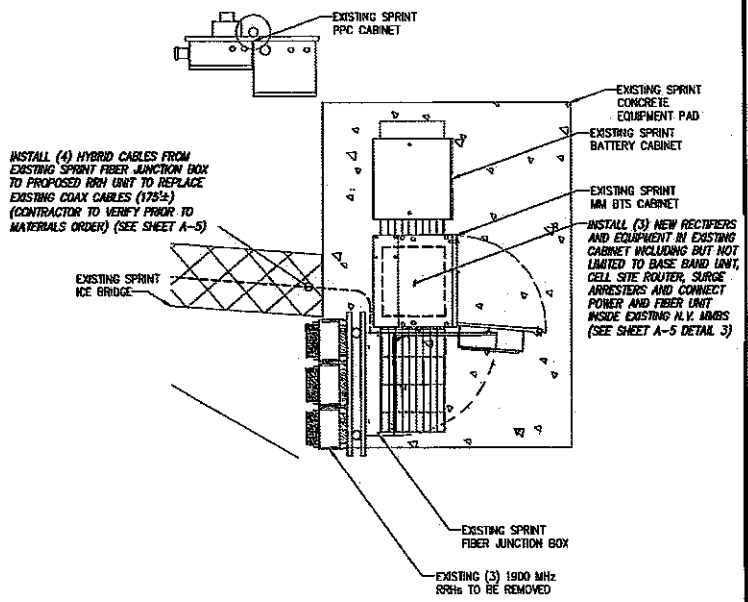
GRAPHIC SCALE:

15' 7.5' 0 7.5' 15'

SCALE (11x17): 1" = 15'-0"
SCALE (22x34): 1" = 7'-6"

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

OVERALL SITE PLAN | SCALE: AS NOTED | 1



NOTE:
NO LIQUID TIGHT FLEXIBLE METALLIC CONDUIT IS TO EXCEED 6 FEET PER SP-2 SECTION 26 200 ITEM E.

GRAPHIC SCALE:

4' 2' 0 2' 4'

SCALE (11x17): 1" = 4'-0"
SCALE (22x34): 1" = 2'-0"

SPRINT EQUIPMENT PLAN | SCALE: AS NOTED | 2

PLANS PREPARED FOR:

Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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www.infinigy.com
JOB NUMBER 526-103

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
12/31/2019
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/16	RCD	0
ISSUED FOR REVIEW	06/14/16	RCD	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

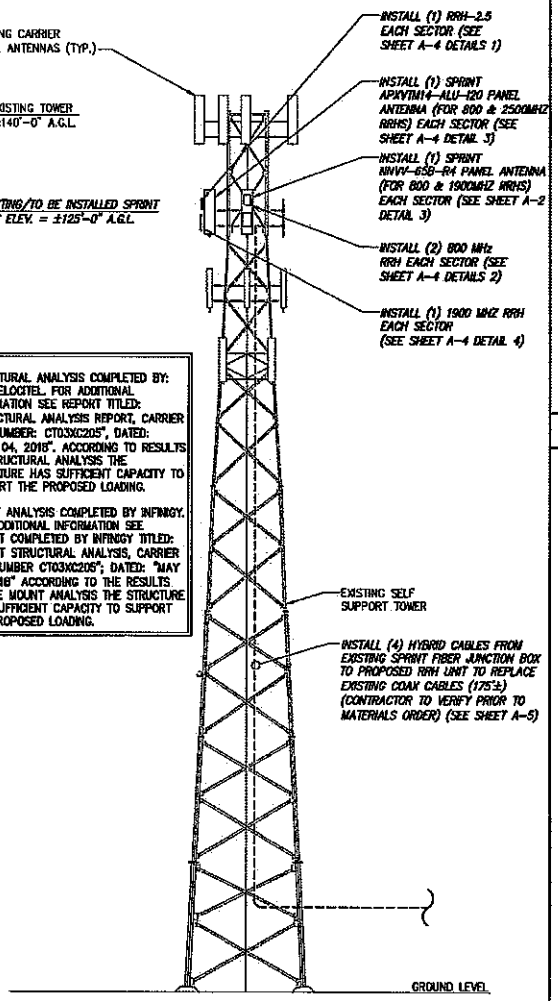
COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

SITE PLAN

SHEET NUMBER:

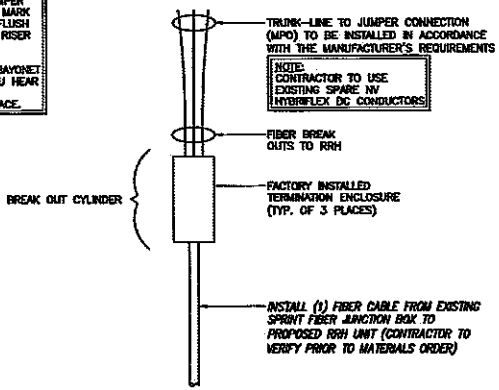
A-1



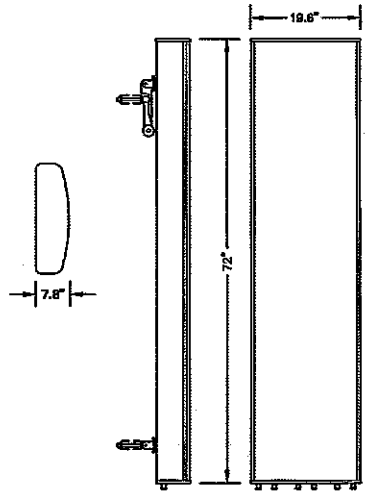
TOWER ELEVATION | NO SCALE | 1

NOTE:
CONTRACTOR TO LINE UP WHITE MARKINGS ON JUMPER AND RISER IP-MPO CONNECTORS AND SLIDE THE RISER CONNECTOR TO THE JUMPER CONNECTOR. PUSH THE WHITE MARK ON THE JUMPER CONNECTOR FLUSH AGAIN THE RED SEAL ON THE RISER CONNECTOR.

CONTRACTOR TO ROTATE THE BAYONET HOUSING CLOCKWISE UNTIL YOU HEAR A CLICK SOUND TO ENSURE A PROPER CONNECTION IS IN PLACE.



HYBRID BREAKOUT DETAIL | NO SCALE | 2



ANTENNA COMMSCOPE NNVV-65B-R4

RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD.in(mm):	72"x19.6"x7.8"
WEIGHT:	77.4 lbs
CONNECTORS:	(8) 4.3-10 DIN FEMALE

ANTENNA | NO SCALE | 3

PLANS PREPARED FOR:
Sprint
6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:
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Phone: 518-690-0790 | Fax: 518-690-0793
www.infinigy.com
JOB NUMBER 156-105

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
12
JUNE 5, 2018
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

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ISSUED FOR REVIEW	06/11/18	RCD	A

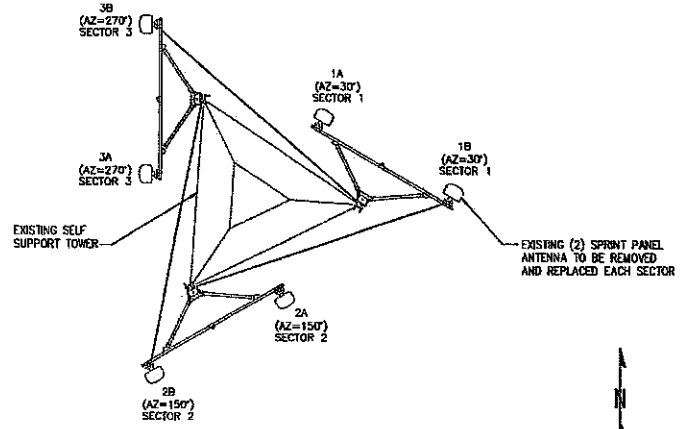
SITE NAME:
WILLINGTON (CROWN)

SITE CASCADES:
CT03XC205

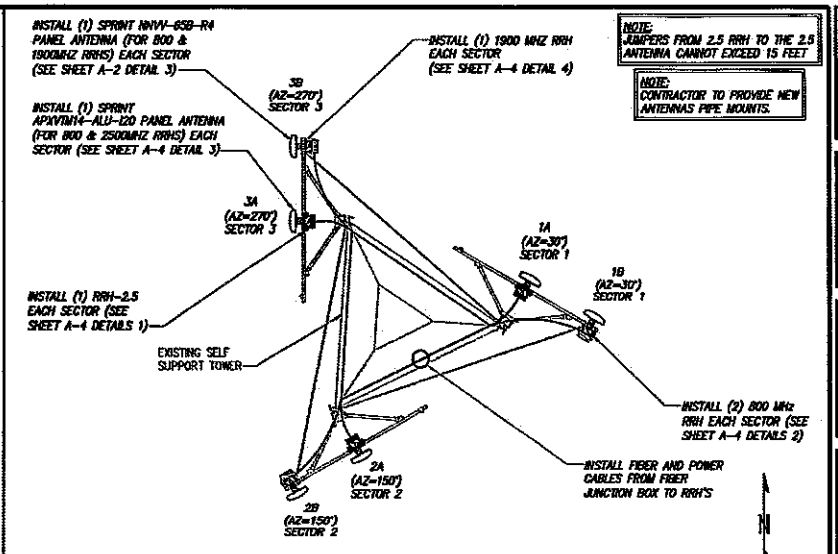
SITE ADDRESS:
COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:
TOWER ELEVATION
& CABLE PLAN

SHEET NUMBER:
A-2



EXISTING ANTENNA LAYOUT | NO SCALE | 1



FINAL ANTENNA & RRH LAYOUT | NO SCALE | 2

NOTES:

1. ALL ANTENNA HEIGHTS ARE TO CENTER OF HORIZONTAL ANTENNA.

2. VERIFY AZIMUTH AND CL HEIGHT WITH AS-BUILT DRAWINGS IF AVAILABLE.

3. NO OBJECT IS TO BE WITHIN 45 DEGREES OF BORE-SIGHT OF 2.5G OR ANY OTHER TOWER ANTENNA. IF NECESSARY, 2.5G ANTENNA CAN BE PLACED AT FAR EDGE OF HORIZONTAL ANTENNA MOUNT MEMBER FOR CLEAR LINE OF SITE OR EVEN ON ANOTHER SECTOR FOR CLEAR LINE OF SITE.

4. 2.5G ANTENNA MUST BE AT LEAST 6" FROM 1900MHZ ANTENNA, 30" FROM 800MHZ ANTENNA AND 30MHZ FROM DUAL BAND 1900MHZ AND 800MHZ ANTENNA.

5. IF ANTENNAS ARE MOUNTED ON A FACE SURFACE SUCH AS A BUILDING WALL, PARAPET WALL, OR WATER TOWER WALL, THIS RFDS MUST BE ACCOMPANIED BY A SKETCH PROVIDED BY ITS ORIGINATING RF ENGINEER CALLING OUT THE EXACT LOCATION OF WHERE ANTENNA IS TO BE LOCATED. CONTACT SPRINT RF ENGINEER IF THE SKETCH IS MISSING.

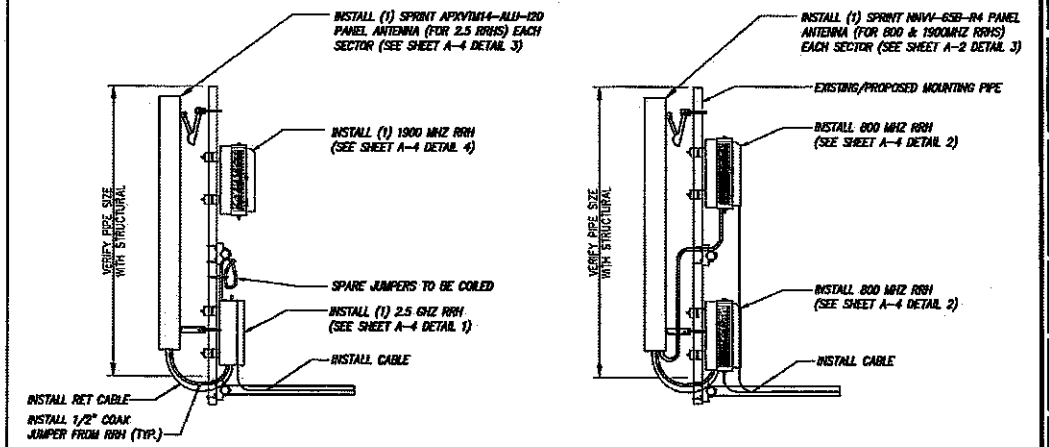
6. GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND CL HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT BELOW, HALT ANTENNA WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING CONTACT INFORMATION ABOVE FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5G ANTENNA AT SAME CL HEIGHT AS 1.9G ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900 MHZ AND 800 MHZ ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.

7. 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.

8. 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. IN ADDITION, 2.5G ANTENNA IS NOT TO BE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.

9. 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/

NOTES | NO SCALE | 3



NOTES:

1. CUT DC CONDUCTORS TO LENGTH.
2. COIL FIBER CABLE AND SECURE AT SIDE OF RRH.
3. DO NO EXCEED BEND RADIUS.

NOTE:
CONTRACTOR TO POSITION RRH ON MOUNT BEHIND ANTENNA SUCH THAT THE RRH DOES NOT INTERFERE WITH THE EXISTING PLATFORM/T-ARM MOUNTING HARDWARE.

NOTE:
SPARE DC CABLES ARE COILED UP ON NV RRHS AT SPRINT ARRAY. THESE ARE TO BE USED TO POWER UP DIE 2.5 RRHS AND TIED INTO EXISTING DC BREAKERS INSIDE THE FIBER JUNCTION BOX LOCATED AT EQUIPMENT.

NOTE:
THE DIAGRAM IS FOR CONCEPTUAL PURPOSES ONLY. CONTRACTOR IS TO REFER TO PASSING STRUCTURAL ANALYSIS FOR ANTENNA AND RRH MOUNTING DETAILS.

TYPICAL ANTENNA & RRH MOUNTING DETAILS | NO SCALE | 4

PLANS PREPARED FOR:

Sprint

6580 Sprint Parkway
Overland Park, Kansas 66251

PLANS PREPARED BY:

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www.infinigy.com
JOB NUMBER 139-003

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
REGISTERED
PROFESSIONAL ENGINEER
MAY 05 2016

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/04/16	BCD	0
ISSUED FOR REVIEW	06/14/16	BCD	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

COSGROVE ROAD
WEST WILLINGTON, CT 06279

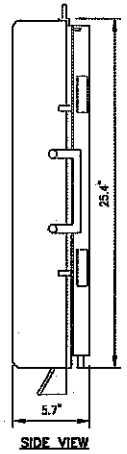
SHEET DESCRIPTION:

ANTENNA LAYOUT
& MOUNTING DETAILS

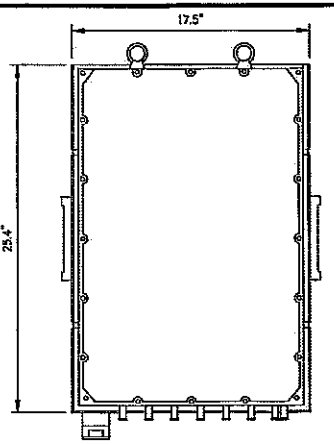
SHEET NUMBER:

A-3

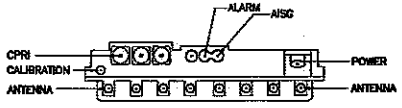
RRH: ALCATEL LUCENT TD-RRH8X20
COLOR: LIGHT GREY
WEIGHT: 70 LBS.



SIDE VIEW



FRONT VIEW



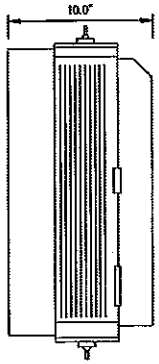
PLAN VIEW

NOTES
COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.

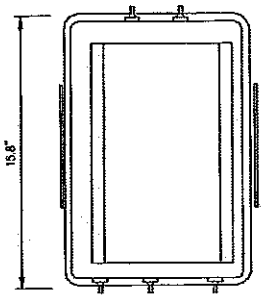
2.5 RRH'S | NO SCALE | 1

RRH: ALCATEL LUCENT RRH 800 MHz 2x50W
COLOR: LIGHT GREY
WEIGHT: 53 LBS.

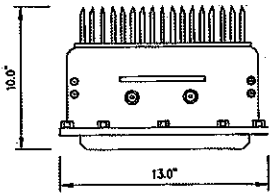
NOTES
COMPLY WITH MANUFACTURERS INSTRUCTIONS TO ENSURE THAT ALL RRH'S RECEIVE ELECTRICAL POWER WITHIN 24 HOURS OF BEING REMOVED FROM THE MANUFACTURER'S PACKAGING. DO NOT OPEN RRH PACKAGES IN THE RAIN.



SIDE VIEW



FRONT VIEW

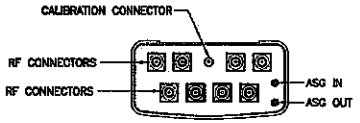


PLAN VIEW

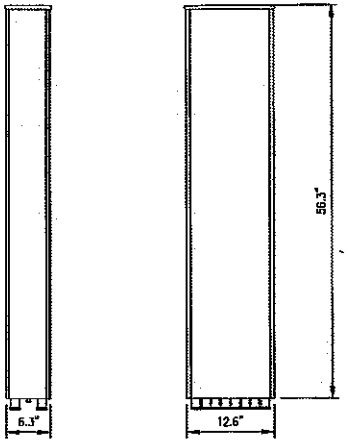
800 MHz RRH | NO SCALE | 2

ANTENNA RFS APXVTM14-ALU-I20

RADOME MATERIAL:	ASA
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD,in(mm):	56.3"x12.6"x6.3" (1430x320x160mm)
WEIGHT:	56.2 lbs
CONNECTORS:	(8) 4.1/9.5 DIN FEMALE (1) NF - CALIBRATION CONNECTOR



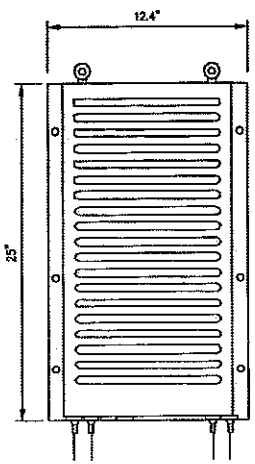
PLAN VIEW



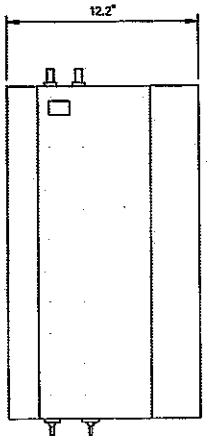
SIDE VIEW FRONT VIEW

2.5 ANTENNA | NO SCALE | 3

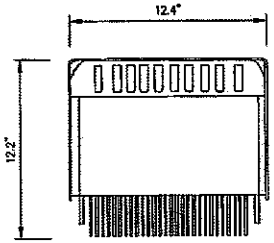
RRH: ALCATEL LUCENT 1900 MHz
COLOR: LIGHT GREY
WEIGHT: 70 LBS.
(INCLUDING OPTIONAL SOLAR SHIELD)



FRONT VIEW



SIDE VIEW



TOP VIEW

1900 RRH'S | NO SCALE | 4

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JOB NUMBER 535-103

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
REGISTERED
PROFESSIONAL ENGINEER
10/05/2016

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/16	RCD	0
ISSUED FOR REVIEW	05/11/16	RCD	A

SITE NAME:
WILLINGTON (CROWN)

SITE CASCADE:
CT03XC205

SITE ADDRESS:
COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:
EQUIPMENT & MOUNTING DETAILS

SHEET NUMBER:
A-4

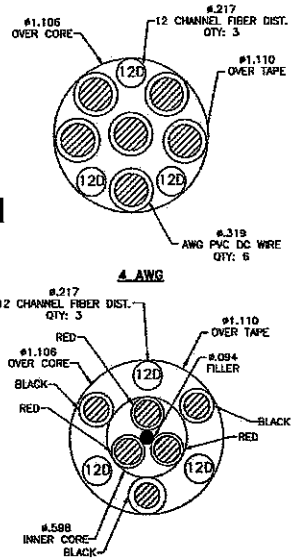
RFS HYBRIFLEX RISER CABLE SCHEDULE

Fiber Only (Existing DC Power)	Hybrid cable MN: HB058-M12-050F 12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC Connectors, 5/8 cable, 50 ft	50 ft
	MN: HB058-M12-075F	75 ft
	MN: HB058-M12-100F	100 ft
	MN: HB058-M12-125F	125 ft
	MN: HB058-M12-150F	150 ft
	MN: HB058-M12-175F	175 ft
	MN: HB059-M12-200F	200 ft
8 AWG Power	Hybrid cable MN: HB114-08U3M12-050F 3x8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 50 ft	50 ft
	MN: HB114-08U3M12-075F	75 ft
	MN: HB114-08U3M12-100F	100 ft
	MN: HB114-08U3M12-125F	125 ft
	MN: HB114-08U3M12-150F	150 ft
	MN: HB114-08U3M12-175F	175 ft
	MN: HB114-08U3M12-200F	200 ft
6 AWG Power	Hybrid cable MN: HB114-13U3M12-225F 3x6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft	225 ft
	MN: HB114-13U3M12-250F	250 ft
	MN: HB114-13U3M12-275F	275 ft
	MN: HB114-13U3M12-300F	300 ft
4 AWG Power	Hybrid cable MN: HB114-21U3M12-325F 3x4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 325 ft	325 ft
	MN: HB114-21U3M12-350F	350 ft
	MN: HB114-21U3M12-375F	375 ft

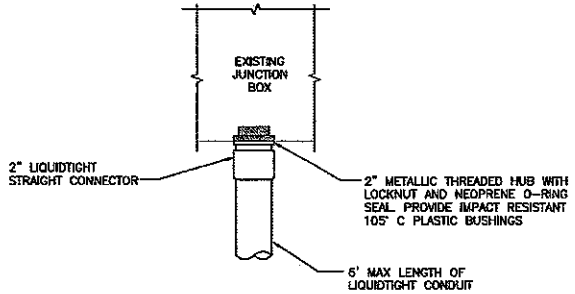
RFS HYBRIFLEX JUMPER CABLE SCHEDULE

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

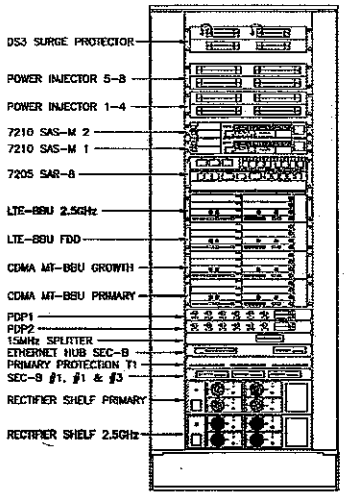
NOTE:
SPRINT CM TO CONFIRM HYBRID OR FIBER RISER CABLE AND HYBRID OR FIBER JUMPER CABLE MODEL NUMBERS IF HYBRID CABLES ARE REQUIRED BEFORE PREPARING BOM.



2.5 CABLE CROSS SECTION DATA | NO SCALE | 1



FIBER JUNCTION BOX PENETRATION | NO SCALE | 2



CABINET LAYOUT | NO SCALE | 3

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AOR NUMBER 528-NOS

MLA PARTNER:
CROWN CASTLE

ENGINEERING LICENSE:
STATE OF CONNECTICUT
JOHN S. STEVENS
JULNO.870918
LICENSED
PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/19	RCD	B
ISSUED FOR REVIEW	06/14/19	RCD	A

SITE NAME:
WILLINGTON (CROWN)

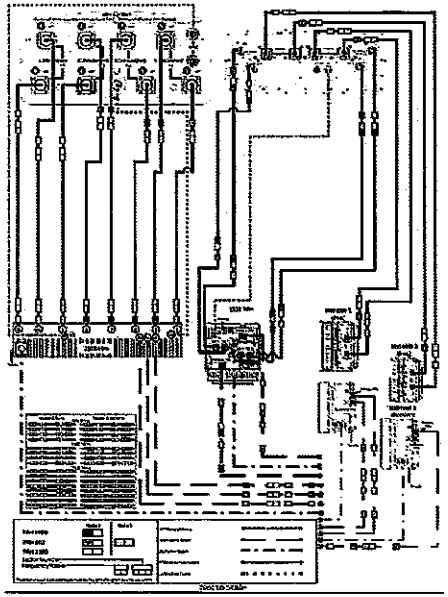
SITE CASCADE:
CT03XC205

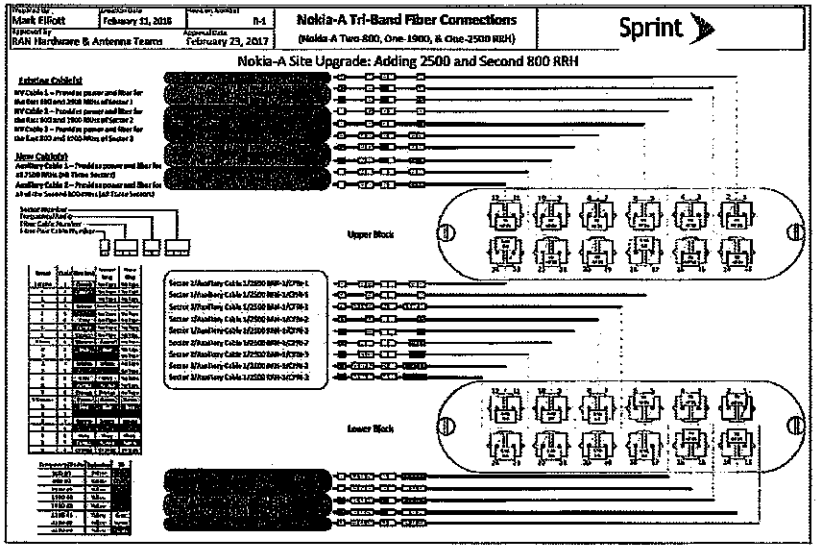
SITE ADDRESS:
COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:
CIVIL DETAILS

SHEET NUMBER:
A-5

ALU 211 APXVTM14-ALU-I20 & NMW-65B-R4 w/o Filters





PLUMBING DIAGRAM | NO SCALE | 1

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JOB NUMBER 828-103

MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
JUN 03 2019
LICENSED PROFESSIONAL ENGINEER

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/19	RCI	0
ISSUED FOR REVIEW	05/14/19	RCI	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

PLUMBING DIAGRAM

SHEET NUMBER:

A-6

FINAL EQUIPMENT CONFIGURATION

SECTOR	ANTENNA MANUFACTURER	ANTENNA MODEL	RAD CENTER	AZIMUTH	RRH/ODU MAKE AND MODEL
1	COMMSCOPE	NNVV-65B-R4	125'	30°	(2) ALU 800MHZ 2x50-800 (1) ALU 1900MHZ 4X45W
	RFS	APXVTM14-ALU-I20	125'	70°	(1) ALU 2.5GHZ RRH80/20-25
2	COMMSCOPE	NNVV-65B-R4	125'	150°	(2) ALU 800MHZ 2x50-800 (1) ALU 1900MHZ 4X45W
	RFS	APXVTM14-ALU-I20	125'	150°	(1) ALU 2.5GHZ RRH80/20-25
3	COMMSCOPE	NNVV-65B-R4	125'	270°	(2) ALU 800MHZ 2x50-800 (1) ALU 1900MHZ 4X45W
	RFS	APXVTM14-ALU-I20	125'	270°	(1) ALU 2.5GHZ RRH80/20-25

FEEDER CABLES

MANUFACTURER	MODEL	LENGTH	QTY
RFS	HB114-13U5M12-175F	175±	(1)
RFS	HB114-13U5M12-175F	175±	(3)

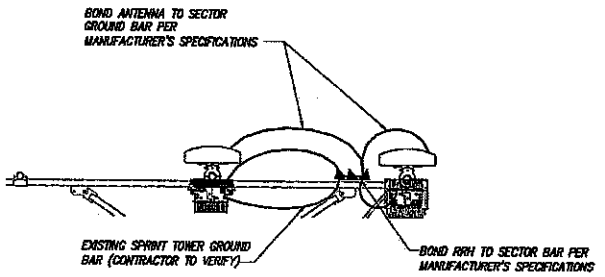
LEGEND
EXISTING
PROPOSED

NOTES:
1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT DATA AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS PRIOR TO CONSTRUCTION.

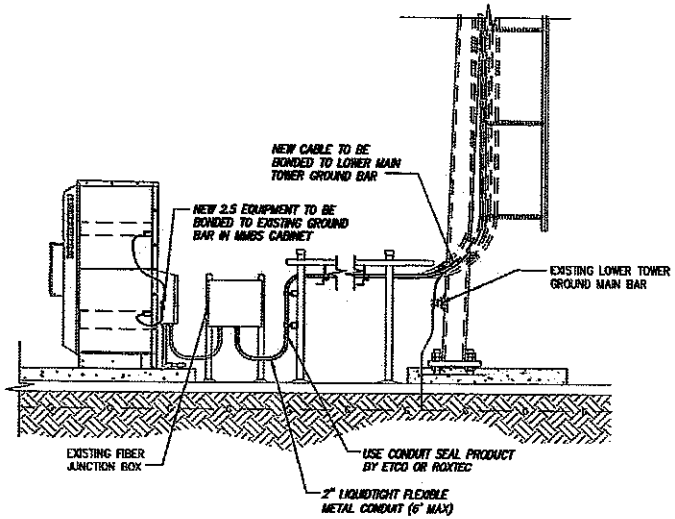
ANTENNA/CABLE SCHEDULE — NO SCALE — 1

LEGEND:

- EXISTING GROUND RING
- CADWELD CONNECTION (EXOTHERMIC WELD)
- MECHANICAL CONNECTION
- GROUND ROD
- CABLE GROUND KIT



TYPICAL ANTENNA GROUNDING PLAN — NO SCALE — 2



TYPICAL EQUIPMENT GROUNDING PLAN (ELEVATION) — NO SCALE — 3

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JOB NUMBER: 328-163

MLA PARTNER:

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ENGINEERING LICENSE:

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
5/15/2018

DRAWING NOTICE:

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/18	RCS	0
ISSUED FOR REVIEW	05/14/18	RCS	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

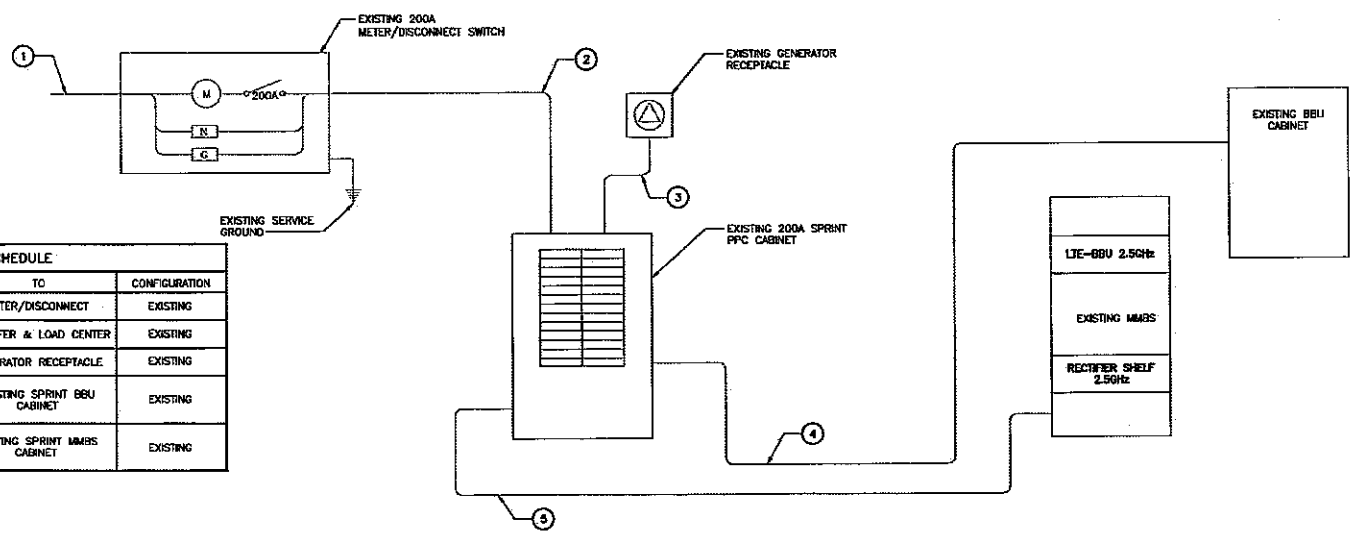
ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-1

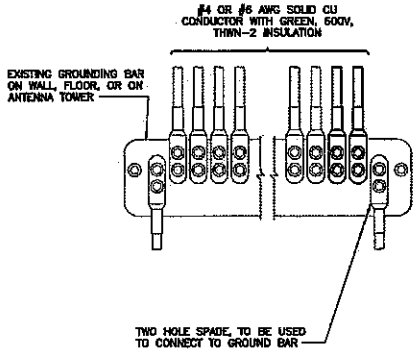
NOTES

CG SHALL REFERENCE ALL SPECS FOR "CONNECTING THE POWER SUPPLY" OF THE NEW INSTALLATION DOCUMENTS, FOR ALL CONNECTION SPECIFICATIONS.



CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	EXISTING
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	EXISTING SPRINT BBU CABINET	EXISTING
5	TRANSFER & LOAD CENTER	EXISTING SPRINT MMBS CABINET	EXISTING

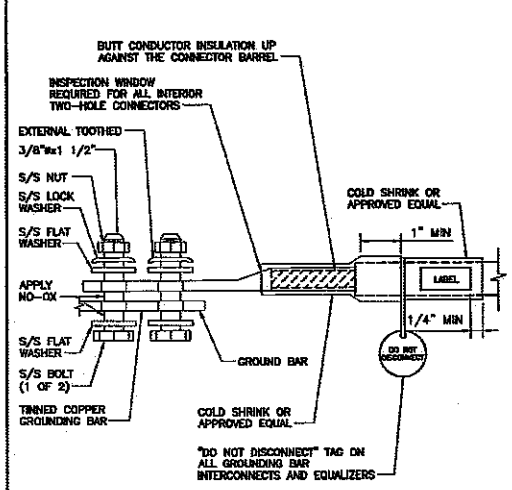
ELECTRICAL ONE-LINE DIAGRAM — NO SCALE — 1



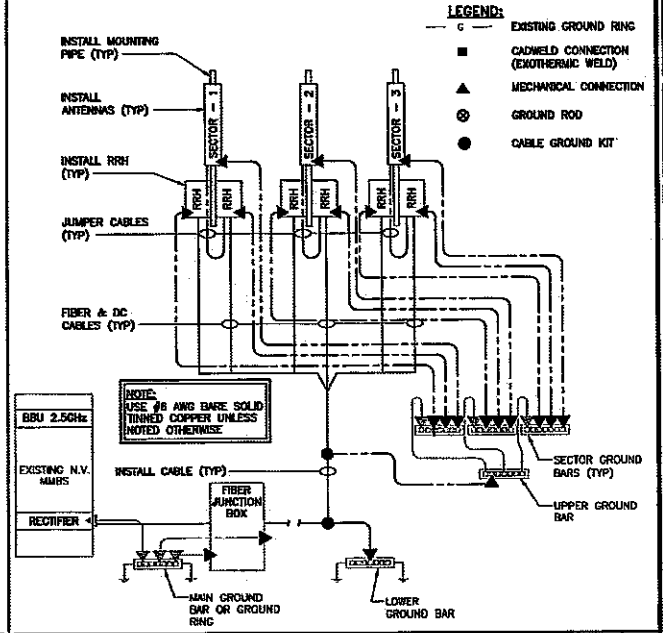
NOTES

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

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR — NO SCALE — 2



TWO HOLE LUG — NO SCALE — 3



GROUNDING RISER DIAGRAM — NO SCALE — 4

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MLA PARTNER:

CROWN CASTLE

ENGINEERING LICENSE:

STATE OF CONNECTICUT — JOHN S. STEVENS — No. 24705 — LICENSED PROFESSIONAL ENGINEER — JUL 05 2018

REVISIONS:

DESCRIPTION	DATE	BY	REV
ISSUED FOR CONSTRUCTION	07/01/18	RCD	0
ISSUED FOR REVIEW	05/14/18	RCD	A

SITE NAME:

WILLINGTON (CROWN)

SITE CASCADE:

CT03XC205

SITE ADDRESS:

COSGROVE ROAD
WEST WILLINGTON, CT 06279

SHEET DESCRIPTION:

ELECTRICAL & GROUNDING DETAILS

SHEET NUMBER:

E-2

Date: **June 04, 2018**

Denice Nicholson
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065

FDH Infrastructure Services, LLC
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
9197551012

Subject: **Structural Analysis Report**

Carrier Designation:	***Sprint PCS* Co-Locate**	
	Carrier Site Number:	CT03XC205
	Carrier Site Name:	CT03XC205
Crown Castle Designation:	**Crown Castle BU Number:**	806383
	Crown Castle Site Name:	HRT 087 943325
	Crown Castle JDE Job Number:	505812
	Crown Castle Work Order Number:	1580451
	Crown Castle Order Number:	441319 Rev. 0
Engineering Firm Designation:	**FDH-IS Project Number:**	18SRNE1400

Site Data: **COSGROVE ROAD WHIFFORD HILL, WEST WILLINGTON, Tolland County, CT**
Latitude *41° 53' 32.92"*, Longitude *-72° 15' 38.15"*
140 Foot - Self Support Tower

Dear Denice Nicholson,

FDH Infrastructure Services, LLC is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 1195978, in accordance with order 441319, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC5: Existing + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.000 and Risk Category II was used in this analysis.

We at *FDH Infrastructure Services, LLC* appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Morgan Gebert
Project Engineer I

Reviewed by:

Dennis D. Abel, PE
Director, New Product Development
CT PE License No. 23247

STATE OF CONNECTICUT
DENNIS D. ABEL
No. 23247
LICENSED PROFESSIONAL ENGINEER

06-04-2018

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 140 ft Self Support tower designed by ROHN in December of 1986. The tower was originally designed for EIA zone 'A' with 0.5" radial ice.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standard for Antenna Supporting Structures and Antennas using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 1 inch ice thickness and 60 mph under service loads, exposure category B with topographic category 1.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
124.0	125.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz	1 3	7/8 1-1/4	-
		6	alcatel lucent	RRH2x50-800			
		3	alcatel lucent	TD-RRH8x20-25			
		3	commscope	NNVV-65B-R4			
		3	rfs celwave	APXVTM14-ALU-I20			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
137.0	139.0	3	alcatel lucent	RRH2X60-AWS	1 14	3/8 1-5/8	1
		3	alcatel lucent	RRH2X60-PCS			
		6	andrew	HBXX-6517DS-VTM			
		3	andrew	LNX-6514DS-VTM			
		3	andrew	LNX-8513DS-A1M			
		2	rfs celwave	DB-T1-6Z-8AB-0Z			
		6	rfs celwave	FD9R6004/2C-3L			
	137.0	1	-	Sector Mount [SM 510-3]			
124.0	125.0	6	decibel	DB980H90E-M	6	1-5/8	2
	124.0	1	-	Sector Mount [SM 502-3]	-	-	1
101.0	101.0	3	commscope	ATBT-BOTTOM-24V	1 12	1/4 1-1/4	1
		3	commscope	LNX-6515DS-VTM			
		1	-	Side Arm Mount [SO 304-3]			
		3	ems wireless	RR90-17-00DP			
		3	ericsson	KRY 112 13/1			
60.0	60.0	1	-	Side Arm Mount [SO 201-1]	1	1/2	1
		1	gps	GPS_A			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
50.0	50.0	1	gps	GPS_A	1	1/2	1

Notes:
1) Existing Equipment
2) Existing Equipment To Be Removed; Not Considered in this Analysis

Table 3 - Design Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
140.0	140.0	4	--	PD10017	--	--
		4	--	3' Side Arm Mount		
131.0	131.0	6	--	PD1132	--	--
		3	--	6' Side Arm Mount		
121.0	121.0	2	--	6' STD dishes	--	--
100.0	100.0	1	--	PD1109	--	--
		1	--	6' Side Arm Mount		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	JGI Eastern	1069386	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn	1069383	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn	1069394	CCISITES
4-POST-MODIFICATION INSPECTION	Sinnott Gering and Schmitt Towers, Inc.	5786395	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	FDH Velocitel	5670805	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built in accordance with the manufacturer's specifications.
2) The tower and structures have been maintained in accordance with the manufacturer's specification.
3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. FDH Infrastructure Services, LLC should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	140 - 120	Leg	ROHN 2 STD	2	-19.66	36.84	53.4	Pass
T2	120 - 100	Leg	ROHN 2.5 EH	39	-45.17	74.43	60.7	Pass
T3	100 - 80	Leg	ROHN 3 EH	69	-68.51	94.34	72.6	Pass
T4	80 - 60	Leg	ROHN 3.5 EH	90	-91.32	125.73	72.6	Pass
T5	60 - 40	Leg	ROHN 4 X-STR	111	-113.11	159.90	70.7	Pass
T6	40 - 20	Leg	ROHN 5 EH	132	-132.77	201.25	66.0	Pass
T7	20 - 0	Leg	ROHN 5 X-STR	147	-153.32	201.77	76.0	Pass
T1	140 - 120	Diagonal	L1 3/4x1 3/4x3/16	7	-3.53	8.66	40.8 59.8 (b)	Pass
T2	120 - 100	Diagonal	L1 3/4x1 3/4x3/16	44	-3.07	5.05	60.7	Pass
T3	100 - 80	Diagonal	L2x2x3/16	74	-3.89	4.74	82.0	Pass
T4	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	96	-4.19	7.26	57.8 67.1 (b)	Pass
T5	60 - 40	Diagonal	L3x3x3/16	117	-4.57	9.92	46.1 73.3 (b)	Pass
T6	40 - 20	Diagonal	L3x3x3/16	138	-5.51	6.80	81.1	Pass
T7	20 - 0	Diagonal	L3x3x1/4	153	-5.80	7.46	77.8	Pass
T1	140 - 120	Top Girt	L2x2x1/8	6	-0.42	3.21	13.0	Pass
T2	120 - 100	Top Girt	L2x2x1/8	41	-0.19	3.17	5.9	Pass
							Summary	
						Leg (T7)	76.0	Pass
						Diagonal (T3)	82.0	Pass
						Top Girt (T1)	13.0	Pass
						Bolt Checks	73.3	Pass
						RATING =	**82.0**	**Pass**

Table 6 - Tower Component Stresses vs. Capacity – LC5

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	69.7	Pass
1	Base Foundation Structural	0	26.7	Pass
1	Base Foundation Soil Interaction	0	42.5	Pass

Structure Rating (max from all components) =	82.0%

Notes:
1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

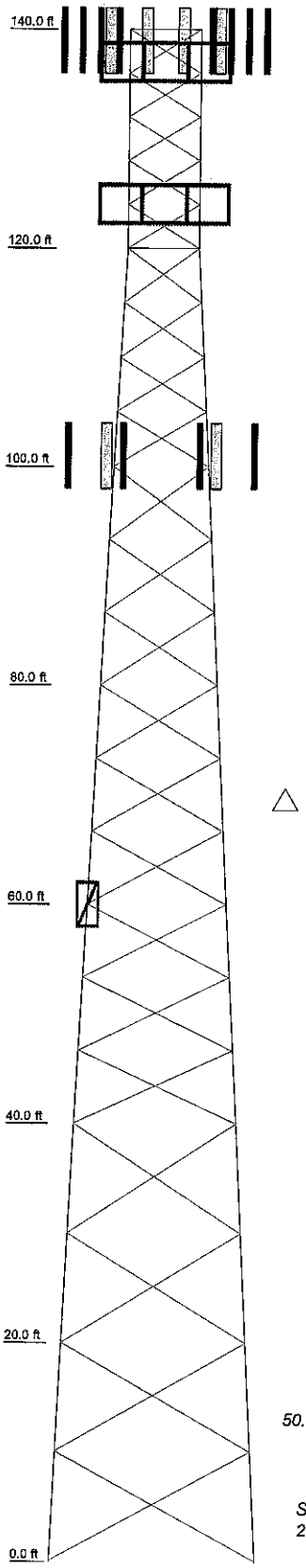
4.1) Recommendations

The tower and its foundation have sufficient capacity to carry the proposed load configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section		T1	T2	T3	T4	T5	T6	T7
Legs		ROHN 2 STD	ROHN 2.5 EH	ROHN 3 EH	ROHN 3.5 EH	ROHN 4 X-STR	ROHN 5 EH	ROHN 5 X-STR
Leg Grade		A618-50						
Diagonals		L1 3/4x1 3/4x3/16		L2x2x3/16	L2 1/2x2 1/2x3/16	L3x3x3/16		L3x3x1/4
Diagonal Grade		A36						A572-50
Top Girts		L2x2x1/8				N.A.		
Face Width (ft)	18.7708	6.5225		8.6041	10.6354	12.6771	14.7708	16.7708
# Panels @ (ft)		5 @ 4	4 @ 5		9 @ 6.66667		2 @ 10	2 @ 9.95833
Weight (K)	11.3	0.8	1.0	1.2	1.6	2.0	2.2	2.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
LNX-8513DS-A1M w/ Mount Pipe	137	PCS 1900MHz 4x45W-65MHz	124
LNX-8513DS-A1M w/ Mount Pipe	137	PCS 1900MHz 4x45W-65MHz	124
LNX-8513DS-A1M w/ Mount Pipe	137	PCS 1900MHz 4x45W-65MHz	124
(2) HBXX-6517DS-VTM w/ Mount Pipe	137	(2) RRH2x50-800	124
(2) HBXX-6517DS-VTM w/ Mount Pipe	137	(2) RRH2x50-800	124
(2) HBXX-6517DS-VTM w/ Mount Pipe	137	(2) RRH2x50-800	124
LNX-6514DS-VTM w/ Mount Pipe	137	Empty Mount Pipe	124
LNX-6514DS-VTM w/ Mount Pipe	137	Empty Mount Pipe	124
LNX-6514DS-VTM w/ Mount Pipe	137	Empty Mount Pipe	124
RRH2X60-PCS	137	Sector Mount [SM 502-3]	124
RRH2X60-PCS	137	RR90-17-00DP w/ Mount Pipe	101
RRH2X60-PCS	137	RR90-17-00DP w/ Mount Pipe	101
(2) FD9R6004/2C-3L	137	RR90-17-00DP w/ Mount Pipe	101
(2) FD9R6004/2C-3L	137	LNX-6515DS-VTM w/ Mount Pipe	101
(2) FD9R6004/2C-3L	137	LNX-6515DS-VTM w/ Mount Pipe	101
RRH2X60-AWS	137	LNX-6515DS-VTM w/ Mount Pipe	101
RRH2X60-AWS	137	KRY 112 13/1	101
RRH2X60-AWS	137	KRY 112 13/1	101
DB-T1-6Z-8AB-0Z	137	KRY 112 13/1	101
DB-T1-6Z-8AB-0Z	137	ATBT-BOTTOM-24V	101
Sector Mount [SM 510-3]	137	ATBT-BOTTOM-24V	101
NNVV-65B-R4 w/ Mount Pipe	124	ATBT-BOTTOM-24V	101
NNVV-65B-R4 w/ Mount Pipe	124	Side Arm Mount [SO 304-3]	101
NNVV-65B-R4 w/ Mount Pipe	124	1.9" x10' Horizontal Pipe	101
APXVTM14-ALU-I20 w/ Mount Pipe	124	1.9" x10' Horizontal Pipe	101
APXVTM14-ALU-I20 w/ Mount Pipe	124	1.9" x10' Horizontal Pipe	101
APXVTM14-ALU-I20 w/ Mount Pipe	124	GPS_A	60
TD-RRH8x20-25	124	Side Arm Mount [SO 201-1]	60
TD-RRH8x20-25	124	GPS_A	50
TD-RRH8x20-25	124		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A618-50	50 ksi	70 ksi	A572-50	50 ksi	65 ksi
A36	36 ksi	58 ksi			

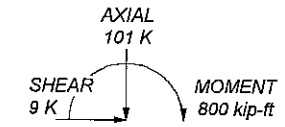
TOWER DESIGN NOTES

1. Tower is located in Tolland County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97.00 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50.00 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60.00 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 82%

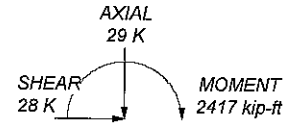
ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 158 K
SHEAR: 17 K

UPLIFT: -135 K
SHEAR: 15 K



TORQUE 2 kip-ft
50.00 mph WIND - 1.00 in ICE



TORQUE 7 kip-ft
REACTIONS - 97.00 mph WIND

FDH Velocitel
6521 Meridien Drive, Suite 107
Raleigh, North Carolina 27616
Phone: 9197551012
FAX: 9197551031

Tower Analysis

Job: *806383-HRT 087 943325*		
Project: *18SRNE1400*		
Client: Crown Castle	Drawn by: MGebert	App'd:
Code: TIA-222-G	Date: 06/04/18	Scale: NTS
Path: C:\Users\MGebert\Desktop\806383_HRT 087 943325_18SRNE1400_STA SDD_SPIR.0\Analyzed\Revised\Tower\806383-HRT 087 943325.eri		Dwg No. E-1

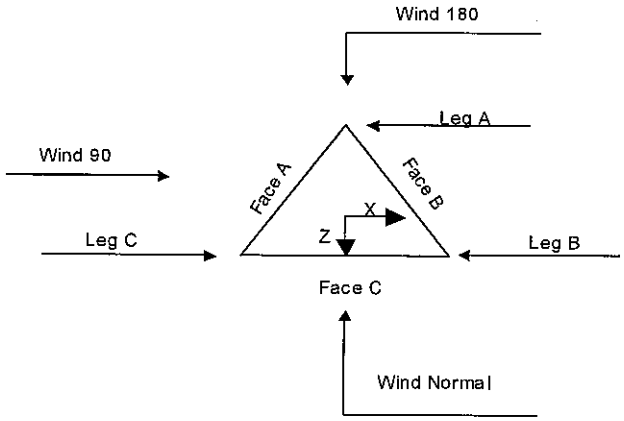
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 140.00 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 6.52 ft at the top and 18.77 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in Tolland County, Connecticut.
ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
Basic wind speed of 97.00 mph.
Structure Class II.
Exposure Category B.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.00 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50.00 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60.00 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	140.00-120.00			6.52	1	20.00
T2	120.00-100.00		08N087	6.56	1	20.00
T3	100.00-80.00		09N006	8.60	1	20.00
T4	80.00-60.00		10N007	10.64	1	20.00
T5	60.00-40.00		11N007	12.68	1	20.00
T6	40.00-20.00		12N004	14.77	1	20.00
T7	20.00-0.00		13N003	16.77	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	140.00-120.00	4.00	X Brace	No	No	0.00	0.00
T2	120.00-100.00	5.00	X Brace	No	No	0.00	0.00
T3	100.00-80.00	6.67	X Brace	No	No	0.00	0.00
T4	80.00-60.00	6.67	X Brace	No	No	0.00	0.00
T5	60.00-40.00	6.67	X Brace	No	No	0.00	0.00
T6	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T7	20.00-0.00	9.96	X Brace	No	No	0.00	1.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 140.00-120.00	Pipe	ROHN 2 STD	A618-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 120.00-100.00	Pipe	ROHN 2.5 EH	A618-50 (50 ksi)	Single Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T3 100.00-80.00	Pipe	ROHN 3 EH	A618-50 (50 ksi)	Single Angle	L2x2x3/16	A36 (36 ksi)
T4 80.00-60.00	Pipe	ROHN 3.5 EH	A618-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 60.00-40.00	Pipe	ROHN 4 X-STR	A618-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T6 40.00-20.00	Pipe	ROHN 5 EH	A618-50 (50 ksi)	Single Angle	L3x3x3/16	A36 (36 ksi)
T7 20.00-0.00	Pipe	ROHN 5 X-STR	A618-50 (50 ksi)	Single Angle	L3x3x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 140.00-120.00	Equal Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)
T2 120.00-100.00	Single Angle	L2x2x1/8	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 140.00-120.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T2 120.00-100.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T3 100.00-80.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T4 80.00-60.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T5 60.00-40.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T6 40.00-20.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00
T7 20.00-0.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	36.00	36.00	36.00

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	Yes	No	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
100.00-80.00				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T7 20.00-0.00	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg 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	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
140.00-120.00														
T2	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
120.00-100.00														
T3	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
100.00-80.00														
T4 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T5 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T6 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75
T7 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	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 140.00-120.00	Flange	0.63 A325N	4	0.50 A325N	1	0.50 A325N	1	0.50 A325N	0	0.50 A325N	0	0.50 A325N	0	0.50 A325N	0
T2 120.00-100.00	Flange	0.75 A325N	4	0.50 A325N	1	0.50 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T3 100.00-80.00	Flange	0.88 A325N	4	0.50 A325N	1	0.50 A325N	0	0.00 A325N	0	0.50 A325N	0	0.50 A325N	0	0.50 A325N	0
T4 80.00-60.00	Flange	0.88 A325N	4	0.50 A325N	1	0.50 A325N	0	0.50 A325N	0	0.50 A325N	0	0.50 A325N	0	0.50 A325N	0
T5 60.00-40.00	Flange	1.00 A325N	4	0.50 A325N	1	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T6 40.00-20.00	Flange	1.00 A325N	4	0.63 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0
T7 20.00-0.00	Flange	1.00 A449	0	0.63 A325N	1	0.63 A325N	0	0.00 A325N	0	0.63 A325N	0	0.63 A325N	0	0.63 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
****												
LDF7-50A(1-5/8)	C	No	Ar (CaAa)	137.00 - 8.00	0.00	0.3	14	8	0.50	1.98		0.82
LDF2-50(3/8) ****	C	No	Ar (CaAa)	137.00 - 8.00	0.00	0.25	1	1	0.50	0.44		0.08
HB114-08U3M12-XXXF(7/8)	B	No	Ar (CaAa)	124.00 - 8.00	0.00	-0.33	1	1	0.50	1.11		0.68
HB114-1-08U4-M5F(1-1/4) *** ***	B	No	Ar (CaAa)	124.00 - 8.00	0.00	-0.35	3	3	0.50	1.54		1.30
LDF1-50A(1/4)	A	No	Ar (CaAa)	101.00 - 8.00	0.00	0.365	1	1	0.50	0.34		0.06
FLC 114-50J(1-1/4) ***	A	No	Ar (CaAa)	101.00 - 8.00	0.00	0.4	12	6	0.50	1.58		0.70
LDF4-50A(1/2) ***	C	No	Ar (CaAa)	60.00 - 8.00	4.00	0.26	1	1	0.50	0.63		0.15
LDF4-50A(1/2) ***	B	No	Ar (CaAa)	50.00 - 8.00	0.00	0.05	2	2	0.50	0.63		0.15
Feedline Ladder (Af)	A	No	Af (CaAa)	101.00 - 8.00	0.00	0.4	1	1	3.00	3.00		8.40
Feedline Ladder (Af)	B	No	Af (CaAa)	124.00 - 8.00	0.00	-0.35	1	1	3.00	3.00		8.40
Feedline Ladder (Af) ***	C	No	Af (CaAa)	137.00 - 8.00	0.00	0.3	1	1	3.00	3.00		8.40
Safety Line 3/8 ****	C	No	Ar (CaAa)	140.00 - 8.00	0.00	0.5	1	1	0.50	0.38		0.22

Feed Line/Linear Appurtenances - Entered As Area

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

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	140.00-120.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	4.292	0.000	0.05
		C	0.000	0.000	57.122	0.000	0.34
T2	120.00-100.00	A	0.000	0.000	2.430	0.000	0.02
		B	0.000	0.000	21.460	0.000	0.26
		C	0.000	0.000	67.070	0.000	0.40
T3	100.00-80.00	A	0.000	0.000	48.610	0.000	0.34
		B	0.000	0.000	21.460	0.000	0.26
		C	0.000	0.000	67.070	0.000	0.40
T4	80.00-60.00	A	0.000	0.000	48.610	0.000	0.34
		B	0.000	0.000	21.460	0.000	0.26
		C	0.000	0.000	67.070	0.000	0.40
T5	60.00-40.00	A	0.000	0.000	48.610	0.000	0.34
		B	0.000	0.000	22.710	0.000	0.26
		C	0.000	0.000	68.320	0.000	0.41
T6	40.00-20.00	A	0.000	0.000	48.610	0.000	0.34
		B	0.000	0.000	23.960	0.000	0.27
		C	0.000	0.000	68.320	0.000	0.41
T7	20.00-0.00	A	0.000	0.000	29.166	0.000	0.20
		B	0.000	0.000	14.376	0.000	0.16
		C	0.000	0.000	40.992	0.000	0.24

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	140.00-120.00	A	2.294	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	12.067	0.000	0.24
		C		0.000	0.000	89.132	0.000	1.93
T2	120.00-100.00	A	2.256	0.000	0.000	3.738	0.000	0.08
		B		0.000	0.000	59.771	0.000	1.18
		C		0.000	0.000	102.409	0.000	2.20
T3	100.00-80.00	A	2.211	0.000	0.000	74.092	0.000	1.61
		B		0.000	0.000	59.105	0.000	1.15
		C		0.000	0.000	101.583	0.000	2.16
T4	80.00-60.00	A	2.156	0.000	0.000	73.286	0.000	1.58
		B		0.000	0.000	58.290	0.000	1.12
		C		0.000	0.000	100.571	0.000	2.11
T5	60.00-40.00	A	2.085	0.000	0.000	72.238	0.000	1.53
		B		0.000	0.000	66.754	0.000	1.17

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	108.846	0.000	2.19
T6	40.00-20.00	A	1.981	0.000	0.000	70.714	0.000	1.46
		B		0.000	0.000	74.006	0.000	1.20
		C		0.000	0.000	106.520	0.000	2.09
T7	20.00-0.00	A	1.775	0.000	0.000	40.616	0.000	0.80
		B		0.000	0.000	41.703	0.000	0.64
		C		0.000	0.000	61.143	0.000	1.13

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	140.00-120.00	-3.68	3.46	-2.72	2.21
T2	120.00-100.00	-3.40	1.64	-2.43	0.31
T3	100.00-80.00	-3.61	-2.20	-2.82	-2.70
T4	80.00-60.00	-4.13	-2.56	-3.28	-3.15
T5	60.00-40.00	-4.49	-2.75	-3.77	-3.03
T6	40.00-20.00	-5.05	-3.21	-4.30	-3.54
T7	20.00-0.00	-4.63	-2.95	-3.94	-3.26

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	LDF7-50A(1-5/8)	120.00 - 137.00	0.6000	0.5345
T1	3	LDF2-50(3/8)	120.00 - 137.00	0.6000	0.5345
T1	5	HB114-08U3M12-XXXF(7/8)	120.00 - 124.00	0.6000	0.5345
T1	6	HB114-1-08U4-M5F(1-1/4)	120.00 - 124.00	0.6000	0.5345
T1	18	Feedline Ladder (Af)	120.00 - 124.00	0.6000	0.5345
T1	19	Feedline Ladder (Af)	120.00 - 137.00	0.6000	0.5345
T1	21	Safety Line 3/8	120.00 - 140.00	0.6000	0.5345
T2	2	LDF7-50A(1-5/8)	100.00 - 120.00	0.6000	0.6000
T2	3	LDF2-50(3/8)	100.00 - 120.00	0.6000	0.6000
T2	5	HB114-08U3M12-XXXF(7/8)	100.00 - 120.00	0.6000	0.6000
T2	6	HB114-1-08U4-M5F(1-1/4)	100.00 - 120.00	0.6000	0.6000
T2	10	LDF1-50A(1/4)	100.00 - 101.00	0.6000	0.6000
T2	11	FLC 114-50J(1-1/4)	100.00 - 101.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	17	Feedline Ladder (Af)	100.00 - 101.00	0.6000	0.6000
T2	18	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T2	19	Feedline Ladder (Af)	100.00 - 120.00	0.6000	0.6000
T2	21	Safety Line 3/8	100.00 - 120.00	0.6000	0.6000
T3	2	LDF7-50A(1-5/8)	80.00 - 100.00	0.6000	0.6000
T3	3	LDF2-50(3/8)	80.00 - 100.00	0.6000	0.6000
T3	5	HB114-08U3M12-XXXF(7/8)	80.00 - 100.00	0.6000	0.6000
T3	6	HB114-1-08U4-M5F(1-1/4)	80.00 - 100.00	0.6000	0.6000
T3	10	LDF1-50A(1/4)	80.00 - 100.00	0.6000	0.6000
T3	11	FLC 114-50J(1-1/4)	80.00 - 100.00	0.6000	0.6000
T3	17	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T3	18	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T3	19	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.6000
T3	21	Safety Line 3/8	80.00 - 100.00	0.6000	0.6000
T4	2	LDF7-50A(1-5/8)	60.00 - 80.00	0.6000	0.6000
T4	3	LDF2-50(3/8)	60.00 - 80.00	0.6000	0.6000
T4	5	HB114-08U3M12-XXXF(7/8)	60.00 - 80.00	0.6000	0.6000
T4	6	HB114-1-08U4-M5F(1-1/4)	60.00 - 80.00	0.6000	0.6000
T4	10	LDF1-50A(1/4)	60.00 - 80.00	0.6000	0.6000
T4	11	FLC 114-50J(1-1/4)	60.00 - 80.00	0.6000	0.6000
T4	17	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T4	18	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T4	19	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.6000
T4	21	Safety Line 3/8	60.00 - 80.00	0.6000	0.6000
T5	2	LDF7-50A(1-5/8)	40.00 - 60.00	0.6000	0.6000
T5	3	LDF2-50(3/8)	40.00 - 60.00	0.6000	0.6000
T5	5	HB114-08U3M12-XXXF(7/8)	40.00 - 60.00	0.6000	0.6000
T5	6	HB114-1-08U4-M5F(1-1/4)	40.00 - 60.00	0.6000	0.6000
T5	10	LDF1-50A(1/4)	40.00 - 60.00	0.6000	0.6000
T5	11	FLC 114-50J(1-1/4)	40.00 - 60.00	0.6000	0.6000
T5	13	LDF4-50A(1/2)	40.00 - 60.00	0.6000	0.6000
T5	15	LDF4-50A(1/2)	40.00 - 50.00	0.6000	0.6000
T5	17	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T5	18	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T5	19	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.6000
T5	21	Safety Line 3/8	40.00 - 60.00	0.6000	0.6000
T6	2	LDF7-50A(1-5/8)	20.00 - 40.00	0.6000	0.6000
T6	3	LDF2-50(3/8)	20.00 - 40.00	0.6000	0.6000
T6	5	HB114-08U3M12-XXXF(7/8)	20.00 - 40.00	0.6000	0.6000
T6	6	HB114-1-08U4-M5F(1-1/4)	20.00 - 40.00	0.6000	0.6000
T6	10	LDF1-50A(1/4)	20.00 - 40.00	0.6000	0.6000
T6	11	FLC 114-50J(1-1/4)	20.00 - 40.00	0.6000	0.6000
T6	13	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T6	15	LDF4-50A(1/2)	20.00 - 40.00	0.6000	0.6000
T6	17	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T6	18	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T6	19	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T6	21	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T7	2	LDF7-50A(1-5/8)	8.00 - 20.00	0.6000	0.6000
T7	3	LDF2-50(3/8)	8.00 - 20.00	0.6000	0.6000
T7	5	HB114-08U3M12-XXXF(7/8)	8.00 - 20.00	0.6000	0.6000
T7	6	HB114-1-08U4-M5F(1-1/4)	8.00 - 20.00	0.6000	0.6000
T7	10	LDF1-50A(1/4)	8.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	11	FLC 114-50J(1-1/4)	8.00 - 20.00	0.6000	0.6000
T7	13	LDF4-50A(1/2)	8.00 - 20.00	0.6000	0.6000
T7	15	LDF4-50A(1/2)	8.00 - 20.00	0.6000	0.6000
T7	17	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T7	18	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T7	19	Feedline Ladder (Af)	8.00 - 20.00	0.6000	0.6000
T7	21	Safety Line 3/8	8.00 - 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
***									
LNX-8513DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21
LNX-8513DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21
LNX-8513DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21
(2) HBXX-6517DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.77 9.34 9.89	6.96 8.18 9.14	0.07 0.14 0.21
(2) HBXX-6517DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.77 9.34 9.89	6.96 8.18 9.14	0.07 0.14 0.21
(2) HBXX-6517DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.77 9.34 9.89	6.96 8.18 9.14	0.07 0.14 0.21
LNX-6514DS-VTM w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
LNX-6514DS-VTM w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
LNX-6514DS-VTM w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	8.32 8.88 9.40	7.00 8.19 9.08	0.06 0.13 0.20
RRH2X60-PCS	A	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.65 1.83 2.01	0.05 0.07 0.09
RRH2X60-PCS	B	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.65 1.83 2.01	0.05 0.07 0.09
RRH2X60-PCS	C	From Leg	4.00 0.00 2.00	0.000	137.00	No Ice 1/2" Ice 1" Ice	2.20 2.39 2.59	1.65 1.83 2.01	0.05 0.07 0.09
(2) FD9R6004/2C-3L	A	From Leg	4.00	0.000	137.00	No Ice	0.31	0.08	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00				1/2" Ice	0.39	0.12	0.01
			2.00				1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L	B	From Leg	4.00		0.000	137.00	No Ice	0.31	0.08	0.00
			0.00				1/2" Ice	0.39	0.12	0.01
			2.00				1" Ice	0.47	0.17	0.01
(2) FD9R6004/2C-3L	C	From Leg	4.00		0.000	137.00	No Ice	0.31	0.08	0.00
			0.00				1/2" Ice	0.39	0.12	0.01
			2.00				1" Ice	0.47	0.17	0.01
RRH2X60-AWS	C	From Leg	4.00		0.000	137.00	No Ice	1.88	1.24	0.04
			0.00				1/2" Ice	2.06	1.39	0.06
			2.00				1" Ice	2.24	1.54	0.08
RRH2X60-AWS	B	From Leg	4.00		0.000	137.00	No Ice	1.88	1.24	0.04
			0.00				1/2" Ice	2.06	1.39	0.06
			2.00				1" Ice	2.24	1.54	0.08
RRH2X60-AWS	A	From Leg	4.00		0.000	137.00	No Ice	1.88	1.24	0.04
			0.00				1/2" Ice	2.06	1.39	0.06
			2.00				1" Ice	2.24	1.54	0.08
DB-T1-6Z-8AB-0Z	A	From Leg	4.00		0.000	137.00	No Ice	4.80	2.00	0.04
			0.00				1/2" Ice	5.07	2.19	0.08
			2.00				1" Ice	5.35	2.39	0.12
DB-T1-6Z-8AB-0Z	B	From Leg	4.00		0.000	137.00	No Ice	4.80	2.00	0.04
			0.00				1/2" Ice	5.07	2.19	0.08
			2.00				1" Ice	5.35	2.39	0.12
Sector Mount [SM 510-3]	C	None			0.000	137.00	No Ice	40.10	40.10	2.40
							1/2" Ice	57.33	57.33	3.09
							1" Ice	74.56	74.56	3.78
***										
NNVV-65B-R4 w/ Mount Pipe	A	From Leg	4.00		0.000	124.00	No Ice	12.56	7.76	0.12
			0.00				1/2" Ice	13.14	8.80	0.21
			1.00				1" Ice	13.70	9.69	0.32
NNVV-65B-R4 w/ Mount Pipe	B	From Leg	4.00		0.000	124.00	No Ice	12.56	7.76	0.12
			0.00				1/2" Ice	13.14	8.80	0.21
			1.00				1" Ice	13.70	9.69	0.32
NNVV-65B-R4 w/ Mount Pipe	C	From Leg	4.00		0.000	124.00	No Ice	12.56	7.76	0.12
			0.00				1/2" Ice	13.14	8.80	0.21
			1.00				1" Ice	13.70	9.69	0.32
APXVTM14-ALU-I20 w/ Mount Pipe	A	From Leg	4.00		0.000	124.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			1.00				1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	B	From Leg	4.00		0.000	124.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			1.00				1" Ice	7.47	6.47	0.19
APXVTM14-ALU-I20 w/ Mount Pipe	C	From Leg	4.00		0.000	124.00	No Ice	6.58	4.96	0.08
			0.00				1/2" Ice	7.03	5.75	0.13
			1.00				1" Ice	7.47	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00		0.000	124.00	No Ice	3.70	1.29	0.07
			0.00				1/2" Ice	3.95	1.46	0.09
			1.00				1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	B	From Leg	4.00		0.000	124.00	No Ice	3.70	1.29	0.07
			0.00				1/2" Ice	3.95	1.46	0.09
			1.00				1" Ice	4.20	1.64	0.12
TD-RRH8x20-25	C	From Leg	4.00		0.000	124.00	No Ice	3.70	1.29	0.07
			0.00				1/2" Ice	3.95	1.46	0.09
			1.00				1" Ice	4.20	1.64	0.12
PCS 1900MHz 4x45W-65MHz	A	From Leg	4.00		0.000	124.00	No Ice	2.32	2.24	0.06
			0.00				1/2" Ice	2.53	2.44	0.08
			1.00				1" Ice	2.74	2.65	0.11

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
PCS 1900MHz 4x45W-65MHz	B	From Leg	4.00 0.00 1.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
PCS 1900MHz 4x45W-65MHz	C	From Leg	4.00 0.00 1.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	2.32 2.53 2.74	2.24 2.44 2.65	0.06 0.08 0.11
(2) RRH2x50-800	A	From Leg	4.00 0.00 1.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.79 1.96 2.14	0.05 0.07 0.10
(2) RRH2x50-800	B	From Leg	4.00 0.00 1.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.79 1.96 2.14	0.05 0.07 0.10
(2) RRH2x50-800	C	From Leg	4.00 0.00 1.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	2.13 2.32 2.51	1.79 1.96 2.14	0.05 0.07 0.10
Empty Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	1.20 1.50 1.81	1.20 1.50 1.81	0.02 0.03 0.04
Empty Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	1.20 1.50 1.81	1.20 1.50 1.81	0.02 0.03 0.04
Empty Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice	1.20 1.50 1.81	1.20 1.50 1.81	0.02 0.03 0.04
Sector Mount [SM 502-3]	C	None		0.000	124.00	No Ice 1/2" Ice 1" Ice	33.02 47.36 61.70	33.02 47.36 61.70	1.67 2.22 2.77
***									
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RR90-17-00DP w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	4.59 5.02 5.44	3.32 4.09 4.78	0.03 0.07 0.12
RR90-17-00DP w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	4.59 5.02 5.44	3.32 4.09 4.78	0.03 0.07 0.12
RR90-17-00DP w/ Mount Pipe	C	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	4.59 5.02 5.44	3.32 4.09 4.78	0.03 0.07 0.12
LNX-6515DS-VTM w/ Mount Pipe	A	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
LNX-6515DS-VTM w/ Mount Pipe	C	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	11.68 12.40 13.14	9.84 11.37 12.91	0.08 0.17 0.27
KRY 112 13/1	A	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	0.29 0.36 0.44	0.21 0.27 0.34	0.00 0.01 0.01
KRY 112 13/1	B	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	0.29 0.36 0.44	0.21 0.27 0.34	0.00 0.01 0.01
KRY 112 13/1	C	From Leg	2.00 0.00 0.00	0.000	101.00	No Ice 1/2" Ice 1" Ice	0.29 0.36 0.44	0.21 0.27 0.34	0.00 0.01 0.01
ATBT-BOTTOM-24V	A	From Leg	2.00	0.000	101.00	No Ice	0.10	0.06	0.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	0.15	0.10	0.00
			0.00			1" Ice	0.20	0.15	0.01
ATBT-BOTTOM-24V	B	From Leg	2.00	0.000	101.00	No Ice	0.10	0.06	0.00
			0.00			1/2" Ice	0.15	0.10	0.00
			0.00			1" Ice	0.20	0.15	0.01
ATBT-BOTTOM-24V	C	From Leg	2.00	0.000	101.00	No Ice	0.10	0.06	0.00
			0.00			1/2" Ice	0.15	0.10	0.00
			0.00			1" Ice	0.20	0.15	0.01
Side Arm Mount [SO 304-3]	C	None		0.000	101.00	No Ice	1.76	1.76	0.07
						1/2" Ice	2.75	2.75	0.10
						1" Ice	3.74	3.74	0.12
1.9" x10' Horizontal Pipe	A	From Leg	0.50	0.000	101.00	No Ice	0.04	1.90	0.03
			0.00			1/2" Ice	0.06	2.92	0.04
			0.00			1" Ice	0.10	3.96	0.08
1.9" x10' Horizontal Pipe	B	From Leg	0.50	0.000	101.00	No Ice	0.04	1.90	0.03
			0.00			1/2" Ice	0.06	2.92	0.04
			0.00			1" Ice	0.10	3.96	0.08
1.9" x10' Horizontal Pipe	C	From Leg	0.50	0.000	101.00	No Ice	0.04	1.90	0.03
			0.00			1/2" Ice	0.06	2.92	0.04
			0.00			1" Ice	0.10	3.96	0.08
***									
GPS_A	C	From Leg	2.00	0.000	60.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			0.00			1" Ice	0.39	0.39	0.01
Side Arm Mount [SO 201-1]	C	From Leg	0.00	0.000	60.00	No Ice	2.96	2.11	0.10
			0.00			1/2" Ice	4.10	2.93	0.12
			0.00			1" Ice	5.24	3.75	0.14
***									
GPS_A	C	From Leg	0.50	0.000	50.00	No Ice	0.26	0.26	0.00
			0.00			1/2" Ice	0.32	0.32	0.00
			0.00			1" Ice	0.39	0.39	0.01
***									

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

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

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	140 - 120	Leg	Max Tension	15	14.83	-0.00	-0.00
			Max. Compression	10	-19.66	0.08	-0.01
			Max. Mx	22	-0.44	0.69	-0.01
			Max. My	16	-1.48	0.01	-0.74
			Max. Vy	3	-1.21	0.52	-0.01
			Max. Vx	4	1.20	-0.00	-0.46
		Diagonal	Max Tension	9	3.42	0.00	0.00
			Max. Compression	20	-3.53	0.00	0.00
			Max. Mx	35	0.74	0.04	-0.00
			Max. My	12	-2.06	0.00	0.00
			Max. Vy	35	-0.04	0.04	-0.00
			Max. Vx	12	-0.00	0.00	0.00
		Top Girt	Max Tension	14	0.45	0.00	0.00
			Max. Compression	11	-0.42	0.00	0.00
			Max. Mx	26	0.03	-0.09	0.00
			Max. My	26	0.04	0.00	0.00
			Max. Vy	26	0.05	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	26	-0.00	0.00	0.00
T2	120 - 100	Leg	Max Tension	23	37.63	-0.11	0.00
			Max. Compression	2	-45.17	0.26	0.01
			Max. Mx	10	-45.10	0.26	-0.00
			Max. My	24	-4.13	-0.00	0.20
			Max. Vy	6	0.36	-0.25	0.00
			Max. Vx	24	-0.34	-0.00	0.20
		Diagonal	Max Tension	8	3.10	0.00	0.00
			Max. Compression	8	-3.13	0.00	0.00
			Max. Mx	35	0.94	0.04	-0.01
			Max. My	32	0.95	0.04	-0.01
			Max. Vy	37	0.04	0.04	-0.01
			Max. Vx	32	0.00	0.00	0.00
		Top Girt	Max Tension	6	0.19	0.00	0.00
			Max. Compression	19	-0.19	0.00	0.00
			Max. Mx	26	-0.01	-0.09	0.00
			Max. My	26	-0.00	0.00	0.00
			Max. Vy	26	0.05	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
T3	100 - 80	Leg	Max Tension	23	58.59	-0.15	0.00
			Max. Compression	2	-68.51	0.14	0.01
			Max. Mx	10	-51.97	0.26	-0.00
			Max. My	24	-4.92	-0.01	0.21
			Max. Vy	10	0.07	0.26	-0.00
			Max. Vx	2	-0.06	-0.09	0.19
		Diagonal	Max Tension	4	3.84	0.00	0.00
			Max. Compression	4	-3.89	0.00	0.00
			Max. Mx	37	0.93	0.07	-0.01
			Max. My	34	-1.38	0.06	-0.01
			Max. Vy	37	0.06	0.07	-0.01
			Max. Vx	34	0.00	0.00	0.00
T4	80 - 60	Leg	Max Tension	23	78.64	-0.15	-0.00
			Max. Compression	2	-91.32	0.25	0.01
			Max. Mx	10	-90.44	0.25	0.00
			Max. My	24	-5.82	-0.01	0.23
			Max. Vy	33	-0.06	-0.18	-0.01
			Max. Vx	2	-0.06	-0.09	0.22
		Diagonal	Max Tension	16	4.16	0.00	0.00
			Max. Compression	16	-4.19	0.00	0.00
			Max. Mx	37	0.82	0.11	-0.01
			Max. My	27	0.76	0.11	0.01
			Max. Vy	37	0.08	0.11	-0.01
			Max. Vx	27	-0.00	0.00	0.00
T5	60 - 40	Leg	Max Tension	23	97.25	-0.20	-0.00
			Max. Compression	2	-113.11	0.33	0.01
			Max. Mx	33	5.48	-0.56	-0.01
			Max. My	24	-6.70	-0.01	0.27
			Max. Vy	33	0.15	-0.56	-0.01
			Max. Vx	12	-0.06	0.01	-0.16
		Diagonal	Max Tension	16	4.54	0.00	0.00
			Max. Compression	16	-4.57	0.00	0.00
			Max. Mx	35	1.13	0.16	0.02
			Max. My	34	-1.32	0.13	-0.02
			Max. Vy	37	0.09	0.14	0.02
			Max. Vx	34	0.01	0.00	0.00
T6	40 - 20	Leg	Max Tension	23	113.78	-0.34	-0.00
			Max. Compression	2	-132.77	0.56	0.02
			Max. Mx	33	6.44	-0.93	-0.00
			Max. My	24	-8.15	-0.04	0.66
			Max. Vy	33	0.17	-0.93	-0.00
			Max. Vx	20	-0.13	-0.05	-0.65

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	16	5.40	0.00	0.00
			Max. Compression	16	-5.51	0.00	0.00
			Max. Mx	37	0.74	0.20	-0.02
			Max. My	27	1.57	0.19	0.03
			Max. Vy	37	0.10	0.19	0.03
			Max. Vx	27	-0.01	0.00	0.00
T7	20 - 0	Leg	Max Tension	23	135.76	0.60	-0.00
			Max. Compression	2	-159.10	0.00	-0.00
			Max. Mx	33	9.35	-0.93	-0.00
			Max. My	24	-9.43	-0.05	0.94
			Max. Vy	10	-8.14	0.00	0.00
			Max. Vx	12	2.12	0.00	0.00
		Diagonal	Max Tension	16	5.69	0.00	0.00
			Max. Compression	16	-5.80	0.00	0.00
			Max. Mx	37	0.39	0.25	-0.03
			Max. My	38	2.49	0.20	0.03
			Max. Vy	38	0.11	0.21	0.03
			Max. Vx	38	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	157.50	14.81	-8.74
	Max. H_x	18	157.50	14.81	-8.74
	Max. H_z	7	-133.81	-12.93	7.61
	Min. Vert	7	-133.81	-12.93	7.61
	Min. H_x	7	-133.81	-12.93	7.61
	Min. H_z	18	157.50	14.81	-8.74
Leg B	Max. Vert	10	156.77	-14.91	-8.57
	Max. H_x	23	-135.12	13.05	7.49
	Max. H_z	23	-135.12	13.05	7.49
	Min. Vert	23	-135.12	13.05	7.49
	Min. H_x	10	156.77	-14.91	-8.57
	Min. H_z	10	156.77	-14.91	-8.57
Leg A	Max. Vert	2	158.37	-0.22	17.23
	Max. H_x	21	8.01	2.02	0.58
	Max. H_z	2	158.37	-0.22	17.23
	Min. Vert	15	-133.91	0.19	-15.02
	Min. H_x	8	10.10	-2.04	0.74
	Min. H_z	15	-133.91	0.19	-15.02

Tower Mast Reaction Summary

Load Combination	Vertical K	$Shear_x$ K	$Shear_z$ K	Overturning Moment, M_x kip-ft	Overturning Moment, M_z kip-ft	Torque kip-ft
Dead Only	24.18	-0.00	-0.00	-9.21	9.11	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	29.01	-0.02	-27.86	-2417.26	14.99	-6.84
0.9 Dead+1.6 Wind 0 deg - No Ice	21.76	-0.02	-27.86	-2414.49	12.26	-6.84

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 30 deg - No Ice	29.01	13.14	-22.80	-1995.37	-1130.03	-6.30
0.9 Dead+1.6 Wind 30 deg - No Ice	21.76	13.14	-22.80	-1992.61	-1132.76	-6.30
1.2 Dead+1.6 Wind 60 deg - No Ice	29.01	22.75	-13.13	-1159.09	-1977.53	-4.41
0.9 Dead+1.6 Wind 60 deg - No Ice	21.76	22.75	-13.13	-1156.33	-1980.27	-4.41
1.2 Dead+1.6 Wind 90 deg - No Ice	29.01	26.32	0.02	-6.99	-2278.02	-2.05
0.9 Dead+1.6 Wind 90 deg - No Ice	21.76	26.32	0.02	-4.23	-2280.75	-2.05
1.2 Dead+1.6 Wind 120 deg - No Ice	29.01	24.11	13.95	1195.56	-2070.87	1.17
0.9 Dead+1.6 Wind 120 deg - No Ice	21.76	24.11	13.95	1198.33	-2073.60	1.17
1.2 Dead+1.6 Wind 150 deg - No Ice	29.01	13.18	22.83	1977.33	-1137.06	4.36
0.9 Dead+1.6 Wind 150 deg - No Ice	21.76	13.18	22.83	1980.09	-1139.79	4.36
1.2 Dead+1.6 Wind 180 deg - No Ice	29.01	0.02	26.31	2292.06	6.87	6.30
0.9 Dead+1.6 Wind 180 deg - No Ice	21.76	0.02	26.31	2294.83	4.14	6.30
1.2 Dead+1.6 Wind 210 deg - No Ice	29.01	-13.14	22.80	1973.27	1151.89	6.30
0.9 Dead+1.6 Wind 210 deg - No Ice	21.76	-13.14	22.80	1976.03	1149.16	6.30
1.2 Dead+1.6 Wind 240 deg - No Ice	29.01	-24.09	13.91	1188.53	2088.68	4.84
0.9 Dead+1.6 Wind 240 deg - No Ice	21.76	-24.09	13.91	1191.30	2085.94	4.84
1.2 Dead+1.6 Wind 270 deg - No Ice	29.01	-26.32	-0.02	-15.11	2299.89	2.05
0.9 Dead+1.6 Wind 270 deg - No Ice	21.76	-26.32	-0.02	-12.35	2297.15	2.05
1.2 Dead+1.6 Wind 300 deg - No Ice	29.01	-22.77	-13.18	-1166.13	2003.46	-1.05
0.9 Dead+1.6 Wind 300 deg - No Ice	21.76	-22.77	-13.18	-1163.36	2000.73	-1.05
1.2 Dead+1.6 Wind 330 deg - No Ice	29.01	-13.18	-22.83	-1999.43	1158.93	-4.36
0.9 Dead+1.6 Wind 330 deg - No Ice	21.76	-13.18	-22.83	-1996.67	1156.19	-4.36
1.2 Dead+1.0 Ice+1.0 Temp	100.64	-0.00	-0.00	-34.27	48.01	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	100.64	-0.00	-8.56	-788.40	48.65	-1.73
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	100.64	4.17	-7.23	-674.42	-320.85	-1.87
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	100.64	7.23	-4.17	-404.19	-592.71	-1.54
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	100.64	8.35	0.00	-33.64	-690.80	-0.87
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	100.64	7.41	4.28	343.34	-604.76	0.04
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	100.64	4.18	7.24	606.51	-321.94	0.99
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	100.64	0.00	8.35	706.66	47.38	1.67
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	100.64	-4.17	7.23	605.87	416.87	1.87

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_z	Overturning Moment, M_x	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	100.64	-7.41	4.28	342.24	700.16	1.60
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	100.64	-8.35	-0.00	-34.91	786.83	0.87
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	100.64	-7.23	-4.18	-405.29	689.37	-0.04
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	100.64	-4.18	-7.24	-675.05	417.97	-0.99
Dead+Wind 0 deg - Service	24.18	-0.01	-6.66	-584.61	10.08	-1.64
Dead+Wind 30 deg - Service	24.18	3.14	-5.45	-483.73	-263.73	-1.51
Dead+Wind 60 deg - Service	24.18	5.44	-3.14	-283.75	-466.40	-1.05
Dead+Wind 90 deg - Service	24.18	6.29	0.01	-8.24	-538.25	-0.49
Dead+Wind 120 deg - Service	24.18	5.77	3.34	279.33	-488.72	0.28
Dead+Wind 150 deg - Service	24.18	3.15	5.46	466.28	-265.41	1.04
Dead+Wind 180 deg - Service	24.18	0.01	6.29	541.54	8.14	1.51
Dead+Wind 210 deg - Service	24.18	-3.14	5.45	465.31	281.95	1.51
Dead+Wind 240 deg - Service	24.18	-5.76	3.33	277.65	505.97	1.16
Dead+Wind 270 deg - Service	24.18	-6.29	-0.01	-10.18	556.47	0.49
Dead+Wind 300 deg - Service	24.18	-5.45	-3.15	-285.43	485.59	-0.25
Dead+Wind 330 deg - Service	24.18	-3.15	-5.46	-484.70	283.63	-1.04

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-24.18	0.00	0.00	24.18	0.00	0.000%
2	-0.02	-29.01	-27.86	0.02	29.01	27.86	0.000%
3	-0.02	-21.76	-27.86	0.02	21.76	27.86	0.000%
4	13.14	-29.01	-22.80	-13.14	29.01	22.80	0.000%
5	13.14	-21.76	-22.80	-13.14	21.76	22.80	0.000%
6	22.75	-29.01	-13.13	-22.75	29.01	13.13	0.000%
7	22.75	-21.76	-13.13	-22.75	21.76	13.13	0.000%
8	26.32	-29.01	0.02	-26.32	29.01	-0.02	0.000%
9	26.32	-21.76	0.02	-26.32	21.76	-0.02	0.000%
10	24.11	-29.01	13.95	-24.11	29.01	-13.95	0.000%
11	24.11	-21.76	13.95	-24.11	21.76	-13.95	0.000%
12	13.18	-29.01	22.83	-13.18	29.01	-22.83	0.000%
13	13.18	-21.76	22.83	-13.18	21.76	-22.83	0.000%
14	0.02	-29.01	26.31	-0.02	29.01	-26.31	0.000%
15	0.02	-21.76	26.31	-0.02	21.76	-26.31	0.000%
16	-13.14	-29.01	22.80	13.14	29.01	-22.80	0.000%
17	-13.14	-21.76	22.80	13.14	21.76	-22.80	0.000%
18	-24.09	-29.01	13.91	24.09	29.01	-13.91	0.000%
19	-24.09	-21.76	13.91	24.09	21.76	-13.91	0.000%
20	-26.32	-29.01	-0.02	26.32	29.01	0.02	0.000%
21	-26.32	-21.76	-0.02	26.32	21.76	0.02	0.000%
22	-22.77	-29.01	-13.18	22.77	29.01	13.18	0.000%
23	-22.77	-21.76	-13.18	22.77	21.76	13.18	0.000%
24	-13.18	-29.01	-22.83	13.18	29.01	22.83	0.000%
25	-13.18	-21.76	-22.83	13.18	21.76	22.83	0.000%
26	0.00	-100.64	0.00	0.00	100.64	0.00	0.000%
27	-0.00	-100.64	-8.56	0.00	100.64	8.56	0.000%
28	4.17	-100.64	-7.23	-4.17	100.64	7.23	0.000%
29	7.23	-100.64	-4.17	-7.23	100.64	4.17	0.000%
30	8.35	-100.64	0.00	-8.35	100.64	-0.00	0.000%
31	7.41	-100.64	4.28	-7.41	100.64	-4.28	0.000%
32	4.18	-100.64	7.24	-4.18	100.64	-7.24	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
33	0.00	-100.64	8.35	-0.00	100.64	-8.35	0.000%
34	-4.17	-100.64	7.23	4.17	100.64	-7.23	0.000%
35	-7.41	-100.64	4.28	7.41	100.64	-4.28	0.000%
36	-8.35	-100.64	-0.00	8.35	100.64	0.00	0.000%
37	-7.23	-100.64	-4.18	7.23	100.64	4.18	0.000%
38	-4.18	-100.64	-7.24	4.18	100.64	7.24	0.000%
39	-0.01	-24.18	-6.66	0.01	24.18	6.66	0.000%
40	3.14	-24.18	-5.45	-3.14	24.18	5.45	0.000%
41	5.44	-24.18	-3.14	-5.44	24.18	3.14	0.000%
42	6.29	-24.18	0.01	-6.29	24.18	-0.01	0.000%
43	5.77	-24.18	3.34	-5.77	24.18	-3.34	0.000%
44	3.15	-24.18	5.46	-3.15	24.18	-5.46	0.000%
45	0.01	-24.18	6.29	-0.01	24.18	-6.29	0.000%
46	-3.14	-24.18	5.45	3.14	24.18	-5.45	0.000%
47	-5.76	-24.18	3.33	5.76	24.18	-3.33	0.000%
48	-6.29	-24.18	-0.01	6.29	24.18	0.01	0.000%
49	-5.45	-24.18	-3.15	5.45	24.18	3.15	0.000%
50	-3.15	-24.18	-5.46	3.15	24.18	5.46	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	140 - 120	2.66	39	0.174	0.006
T2	120 - 100	1.94	39	0.156	0.006
T3	100 - 80	1.32	39	0.127	0.005
T4	80 - 60	0.82	39	0.097	0.004
T5	60 - 40	0.46	39	0.067	0.003
T6	40 - 20	0.21	39	0.041	0.002
T7	20 - 0	0.06	39	0.021	0.001

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.00	LNX-8513DS-A1M w/ Mount Pipe	39	2.55	0.172	0.006	153423
124.00	NNVV-65B-R4 w/ Mount Pipe	39	2.08	0.161	0.006	47964
101.00	RR90-17-00DP w/ Mount Pipe	39	1.34	0.129	0.005	37638
60.00	GPS_A	39	0.46	0.067	0.003	40076
50.00	GPS_A	39	0.32	0.053	0.002	46134

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	140 - 120	11.04	2	0.726	0.025
T2	120 - 100	8.03	2	0.650	0.024
T3	100 - 80	5.45	2	0.527	0.020
T4	80 - 60	3.40	2	0.400	0.016
T5	60 - 40	1.89	2	0.278	0.011
T6	40 - 20	0.87	2	0.168	0.007
T7	20 - 0	0.25	2	0.086	0.003

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
137.00	LNX-8513DS-A1M w/ Mount Pipe	2	10.58	0.717	0.025	37061
124.00	NNVV-65B-R4 w/ Mount Pipe	2	8.61	0.669	0.025	11586
101.00	RR90-17-00DP w/ Mount Pipe	2	5.57	0.534	0.021	9087
60.00	GPS_A	2	1.89	0.278	0.011	9679
50.00	GPS_A	2	1.33	0.220	0.009	11153

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	140	Leg	A325N	0.63	4	3.56	20.71	0.172	1	Bolt Tension
		Diagonal	A325N	0.50	1	3.42	5.71	0.598	1	Member Block Shear
		Top Girt	A325N	0.50	1	0.45	4.13	0.109	1	Member Bearing
T2	120	Leg	A325N	0.75	4	9.41	29.82	0.315	1	Bolt Tension
		Diagonal	A325N	0.50	1	3.10	5.71	0.543	1	Member Block Shear
		Top Girt	A325N	0.50	1	0.19	4.13	0.046	1	Member Bearing
T3	100	Leg	A325N	0.88	4	14.65	40.59	0.361	1	Bolt Tension
		Diagonal	A325N	0.50	1	3.84	6.20	0.620	1	Member Bearing
T4	80	Leg	A325N	0.88	4	19.66	40.59	0.484	1	Bolt Tension
		Diagonal	A325N	0.50	1	4.16	6.20	0.671	1	Member Bearing
T5	60	Leg	A325N	1.00	4	24.31	53.01	0.459	1	Bolt Tension
		Diagonal	A325N	0.50	1	4.54	6.20	0.733	1	Member Bearing
T6	40	Leg	A325N	1.00	4	28.45	53.01	0.537	1	Bolt Tension
		Diagonal	A325N	0.63	1	5.40	7.83	0.690	1	Member Bearing
T7	20	Diagonal	A325N	0.63	1	5.69	11.70	0.487	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	140 - 120	ROHN 2 STD	20.00	4.00	61.0 K=1.00	1.07	-19.66	36.84	0.534 [1]
T2	120 - 100	ROHN 2.5 EH	20.03	5.01	65.0 K=1.00	2.25	-45.17	74.43	0.607 [1]
T3	100 - 80	ROHN 3 EH	20.03	6.68	70.5 K=1.00	3.02	-68.51	94.34	0.726 [1]
T4	80 - 60	ROHN 3.5 EH	20.03	6.68	61.3 K=1.00	3.68	-91.32	125.73	0.726 [1]
T5	60 - 40	ROHN 4 X-STR	20.04	6.68	54.3 K=1.00	4.41	-113.11	159.90	0.707 [1]
T6	40 - 20	ROHN 5 EH	20.03	10.02	65.4 K=1.00	6.11	-132.77	201.25	0.660 [1]
T7	20 - 0	ROHN 5 X-STR	20.03	9.97	65.1 K=1.00	6.11	-153.32	201.77	0.760 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	140 - 120	L1 3/4x1 3/4x3/16	7.68	3.62	126.6 K=1.00	0.62	-3.53	8.66	0.408 [1]
T2	120 - 100	L1 3/4x1 3/4x3/16	9.73	4.77	166.7 K=1.00	0.62	-3.07	5.05	0.607 [1]
T3	100 - 80	L2x2x3/16	12.27	6.06	184.5 K=1.00	0.71	-3.89	4.74	0.820 [1]
T4	80 - 60	L2 1/2x2 1/2x3/16	14.02	6.91	167.6 K=1.00	0.90	-4.19	7.26	0.578 [1]
T5	60 - 40	L3x3x3/16	15.89	7.83	157.6 K=1.00	1.09	-4.57	9.92	0.461 [1]
T6	40 - 20	L3x3x3/16	19.10	9.45	190.3 K=1.00	1.09	-5.51	6.80	0.811 [1]
T7	20 - 0	L3x3x1/4	20.80	10.30	208.8 K=1.00	1.44	-5.80	7.46	0.778 [1]
		KL/R > 200 (C) - 153							

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Compression)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	140 - 120	L2x2x1/8	6.52	6.11	184.6 K=1.00	0.48	-0.42	3.21	0.130 [1]
T2	120 - 100	L2x2x1/8	6.56	6.16	185.8	0.48	-0.19	3.17	0.059 [1]

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

[1] $P_u / \phi P_n$ controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	140 - 120	ROHN 2 STD	20.00	4.00	61.0	1.07	14.23	48.35	0.294 [1]
T2	120 - 100	ROHN 2.5 EH	20.03	5.01	65.0	2.25	37.63	101.41	0.371 [1]
T3	100 - 80	ROHN 3 EH	20.03	6.68	70.5	3.02	58.59	135.72	0.432 [1]
T4	80 - 60	ROHN 3.5 EH	20.03	6.68	61.3	3.68	78.64	165.53	0.475 [1]
T5	60 - 40	ROHN 4 X-STR	20.04	6.68	54.3	4.41	97.25	198.34	0.490 [1]
T6	40 - 20	ROHN 5 EH	20.03	10.02	65.4	6.11	113.78	275.04	0.414 [1]
T7	20 - 0	ROHN 5 X-STR	20.03	0.08	0.5	6.11	135.76	275.04	0.494 [1]

[1] $P_u / \phi P_n$ controls

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	140 - 120	L1 3/4x1 3/4x3/16	7.68	3.62	83.3	0.38	3.42	16.44	0.208 [1]
T2	120 - 100	L1 3/4x1 3/4x3/16	9.73	4.77	109.0	0.38	3.10	16.44	0.188 [1]
T3	100 - 80	L2x2x3/16	12.27	6.06	119.8	0.45	3.84	19.50	0.197 [1]
T4	80 - 60	L2 1/2x2 1/2x3/16	14.02	6.91	108.2	0.59	4.16	25.60	0.163 [1]
T5	60 - 40	L3x3x3/16	15.89	7.83	101.3	0.73	4.54	31.74	0.143 [1]
T6	40 - 20	L3x3x3/16	19.10	9.45	122.3	0.71	5.40	30.97	0.174 [1]
T7	20 - 0	L3x3x1/4	20.80	10.30	134.5	0.94	5.69	45.79	0.124 [1]

[1] $P_u / \phi P_n$ controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	140 - 120	L2x2x1/8	6.52	6.11	121.2	0.30	0.45	13.25	0.034 [1]
T2	120 - 100	L2x2x1/8	6.56	6.16	122.0	0.30	0.19	13.25	0.014 [1]

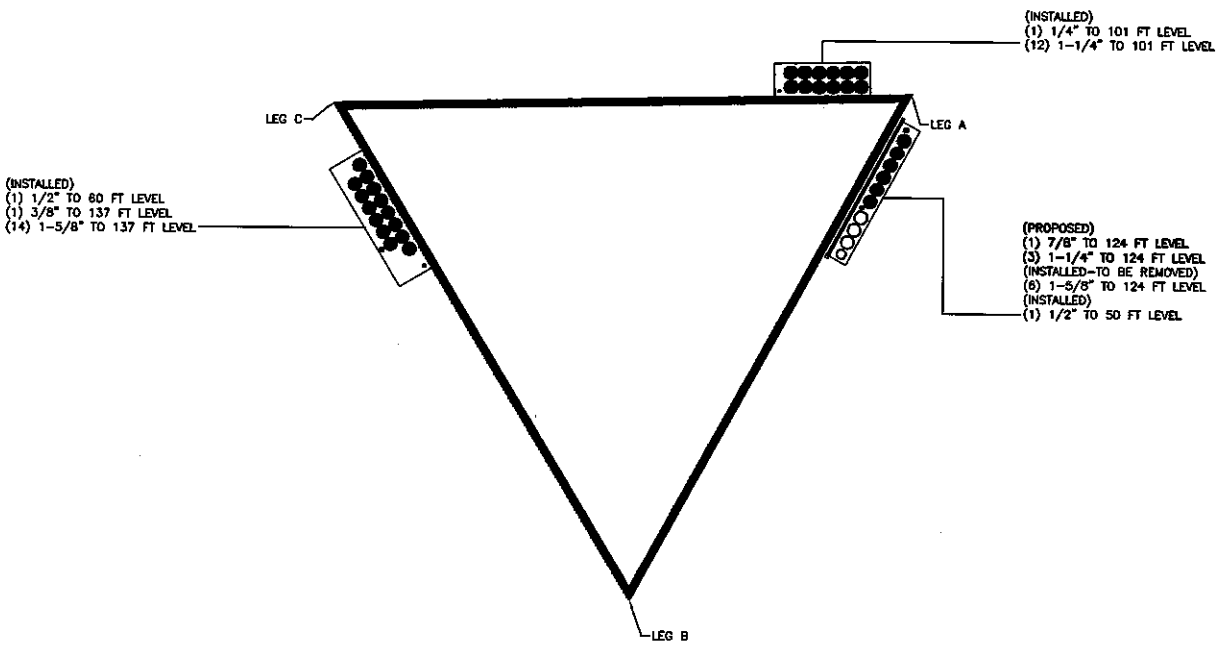
[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	140 - 120	Leg	ROHN 2 STD	2	-19.66	36.84	53.4	Pass
T2	120 - 100	Leg	ROHN 2.5 EH	39	-45.17	74.43	60.7	Pass
T3	100 - 80	Leg	ROHN 3 EH	69	-68.51	94.34	72.6	Pass
T4	80 - 60	Leg	ROHN 3.5 EH	90	-91.32	125.73	72.6	Pass
T5	60 - 40	Leg	ROHN 4 X-STR	111	-113.11	159.90	70.7	Pass
T6	40 - 20	Leg	ROHN 5 EH	132	-132.77	201.25	66.0	Pass
T7	20 - 0	Leg	ROHN 5 X-STR	147	-153.32	201.77	76.0	Pass
T1	140 - 120	Diagonal	L1 3/4x1 3/4x3/16	7	-3.53	8.66	40.8	Pass
							59.8 (b)	
T2	120 - 100	Diagonal	L1 3/4x1 3/4x3/16	44	-3.07	5.05	60.7	Pass
T3	100 - 80	Diagonal	L2x2x3/16	74	-3.89	4.74	82.0	Pass
T4	80 - 60	Diagonal	L2 1/2x2 1/2x3/16	96	-4.19	7.26	57.8	Pass
							67.1 (b)	
T5	60 - 40	Diagonal	L3x3x3/16	117	-4.57	9.92	46.1	Pass
							73.3 (b)	
T6	40 - 20	Diagonal	L3x3x3/16	138	-5.51	6.80	81.1	Pass
T7	20 - 0	Diagonal	L3x3x1/4	153	-5.80	7.46	77.8	Pass
T1	140 - 120	Top Girt	L2x2x1/8	6	-0.42	3.21	13.0	Pass
T2	120 - 100	Top Girt	L2x2x1/8	41	-0.19	3.17	5.9	Pass
							Summary	
						Leg (T7)	76.0	Pass
						Diagonal (T3)	82.0	Pass
						Top Girt (T1)	13.0	Pass
						Bolt Checks	73.3	Pass
						RATING =	**82.0**	**Pass**

APPENDIX B

BASE LEVEL DRAWING


(INSTALLED)
(1) 1/4" TO 101 FT LEVEL
(12) 1-1/4" TO 101 FT LEVEL
LEG C
LEG A
(INSTALLED)
(1) 1/2" TO 60 FT LEVEL
(1) 3/8" TO 137 FT LEVEL
(14) 1-5/8" TO 137 FT LEVEL
(PROPOSED)
(1) 7/8" TO 124 FT LEVEL
(3) 1-1/4" TO 124 FT LEVEL
(INSTALLED-TO BE REMOVED)
(6) 1-5/8" TO 124 FT LEVEL
(INSTALLED)
(1) 1/2" TO 50 FT LEVEL
LEG B

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9

Site Data	
BU#:	**806383**
Site Name:	**HRT 087 943325**
App:	**441319 Rev. 0**

Anchor Rod Data		
Qty:	**4**	
Diam:	**1**	in
Rod Material:	**A449 (1/4 to 1 Incl.)**	
Strength (Fu):	120	ksi
Yield (Fy):	92	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exists.*

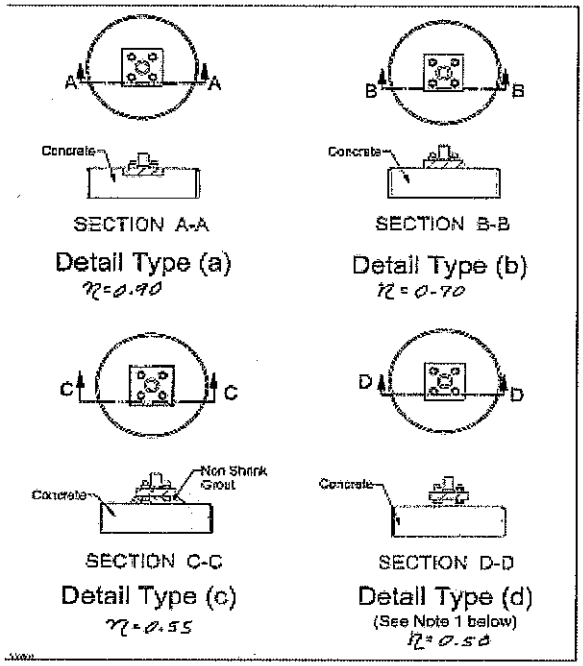


Figure 4-4 of TIA-222-G

Reactions		
Eta Factor, η	**0.55**	Detail Type
Uplift, Pu:	**135**	kips
Shear, Vu:	**15**	kips

l_{ar}:		in
$Mu = 0.65 * l_{ar} * V_u$		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ń):	40.6	Kips
Allowable Axial, Φ*Fu*Anet:	58.2	Kips
Anchor Rod Stress Ratio:	69.7%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv} = \phi * 0.45 * F_{ub} * A_b =$		kips
$\phi R_{nt} = \phi * F_u * A_{net} =$		kips
$\phi R_{nm} = \phi * F_y * Z =$		ft-kips

Maximum Acceptable Ratio: **105** %

Governing Stress Ratio: **69.7%** **Pass**

Pier and Pad Foundation

BU # :	805383
Site Name:	HRT 087 943325
App. Number:	441319 Rev. 0

TIA-222 Revision:	G
Tower Type:	Self Support

Block Foundation?:	☐

Superstructure Analysis Reactions		
Compression, P_{comp}:	158	kips
Compression Shear, Vu_comp:	17	kips
Uplift, P_{uplift}:	135	kips
Uplift Shear, V_{u_uplift}:	15	kips
Tower Height, **H**:	140	ft
Base Face Width, **BW**:	18.77	ft
BP Dist. Above Fdn, bp_{dist}:	1.75	in

Pier Properties		
Pier Shape:	Circular	
Pier Diameter, **dpier**:	3.0	ft
Ext. Above Grade, **E**:	0.50	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	16	
Pier Tie/Spiral Size, **St**:	3	
Pier Tie/Spiral Quantity, **mt**:	12	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, cc_{pier}:	3	in

Pad Properties		
Depth, **D**:	12.5	ft
Pad Width, **W**:	7.0	ft
Pad Thickness, **T**:	2.0	ft
Pad Rebar Size, **Sp**:	6	
Pad Rebar Quantity, **mp**:	8	
Pad Clear Cover, cc_{pad}:	3	in

Material Properties		
Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, **δc**:	150	pcf

Soil Properties		
Total Soil Unit Weight, **γ**:	115	pcf
Ultimate Net Bearing, Qnet:	22.670	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, **ϕ**:	35	degrees
SPT Blow Count, N_{blows}:	50	
Base Friction, **μ**:		
Neglected Depth, **N**:	3.00	ft
Foundation Bearing on Rock?	No	
Groundwater Depth, **gw**:	None	ft

<--Toggle between Gross and Net

Foundation Analysis Checks				
	Capacity	**Demand**	**Rating**	**Check**
Uplift (kips)	317.37	135.00	**42.5%**	**Pass**
Lateral (Sliding) (kips)	99.58	15.00	**15.1%**	**Pass**
Bearing Pressure (ksf)	18.08	5.11	**28.3%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	830.41	187.00	**22.5%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	617.21	165.00	**26.7%**	**Pass**
Pier Compression (kip)	1727.31	172.00	**10.0%**	**Pass**
*Pad Flexure (kip*ft)*	307.01	46.22	**15.1%**	**Pass**
Pad Shear - 1-way (kips)	137.16	7.94	**5.8%**	**Pass**
Pad Shear - 2-way (ksi)	0.16	0.03	**17.1%**	**Pass**

Soil Rating:	**42.5%**
Structural Rating:	**26.7%**

Version 2.5.5

EBI Consulting

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

SPRINT Existing Facility

Site ID: CT03XC205

Willington (Crown)
Cosgrove Road
West Willington, CT 06279

July 31, 2018

EBI Project Number: 6218005227

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**11.53 %**

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

EBI Consulting
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July 31, 2018

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

Emissions Analysis for Site: **CT03XC205 – Willington (Crown)**

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

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

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed SPRINT Wireless antenna facility located at **Cosgrove Road, West Willington, 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 for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

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

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

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

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

8) The antennas used in this modeling are the **Commscope NNVV-65B-R4 and the RFS APXVTM14-ALU-I20** for transmission in the 850 MHz, 1900 MHz (PCS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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 panel antennas are **125 feet** above ground level (AGL) for **Sector A**, **125 feet** above ground level (AGL) for **Sector B** and **125 feet** above ground level (AGL) for Sector C.

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

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

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SPRINT Site Inventory and Power Data by Antenna

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4	Make / Model:	Commscope NNVV-65B-R4
Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd	Gain:	12.75 / 15.05 dBd
Height (AGL):	**125 feet**	Height (AGL):	**125 feet**	Height (AGL):	**125 feet**
Frequency Bands:	850 MHz / 1900 MHz (PCS)	Frequency Bands:	850 MHz / 1900 MHz (PCS)	Frequency Bands:	850 MHz / 1900 MHz (PCS)
Channel Count:	10	Channel Count:	10	Channel Count:	10
Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts	Total TX Power(W):	280 Watts
ERP (W):	7,378.61	ERP (W):	7,378.61	ERP (W):	7,378.61
Antenna A1 MPE%:	**2.31 %**	Antenna B1 MPE%:	**2.31 %**	Antenna C1 MPE%:	**2.31 %**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20	Make / Model:	RFS APXVTM14-ALU-I20
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	**125 feet**	Height (AGL):	**125 feet**	Height (AGL):	**125 feet**
Frequency Bands:	2500 MHz (BRS)	Frequency Bands:	2500 MHz (BRS)	Frequency Bands:	2500 MHz (BRS)
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts	Total TX Power(W):	160 Watts
ERP (W):	6,224.72	ERP (W):	6,224.72	ERP (W):	6,224.72
Antenna A2 MPE%:	**1.58 %**	Antenna B2 MPE%:	**1.58 %**	Antenna C2 MPE%:	**1.58 %**

Site Composite MPE%	
Carrier	**MPE%**
SPRINT – Max per sector	**3.89 %**
Verizon Wireless	2.97 %
T-Mobile	3.37 %
Willington FD	0.10 %
MetroPCS	0.96 %
Nextel	0.24 %
Site Total MPE %:	**11.53 %**

SPRINT Sector A Total:	3.89 %
SPRINT Sector B Total:	3.89 %
SPRINT Sector C Total:	3.89 %
Site Total:	11.53 %

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	376.73	125	0.96	850 MHz	567	0.17%
Sprint 850 MHz LTE	2	941.82	125	4.78	850 MHz	567	0.84%
Sprint 1900 MHz (PCS) CDMA	5	511.82	125	6.50	1900 MHz (PCS)	1000	0.65%
Sprint 1900 MHz (PCS) LTE	2	1,279.56	125	6.50	1900 MHz (PCS)	1000	0.65%
Sprint 2500 MHz (BRS) LTE	8	778.09	125	15.80	2500 MHz (BRS)	1000	1.58%
						Total:	**3.89%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the SPRINT facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

SPRINT Sector	Power Density Value (%)
Sector A:	3.89 %
Sector B:	3.89 %
Sector C:	3.89 %
SPRINT Maximum MPE % (per sector):	3.89 %
Site Total:	11.53 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.53 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Barbadora, Jeff

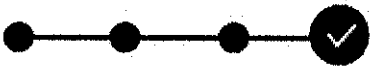
From: TrackingUpdates@fedex.com
Sent: Wednesday, August 8, 2018 11:30 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 772913263919 Delivered

Your package has been delivered

Tracking # 772913263919

Ship date:
Tue, 8/7/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US



Delivered

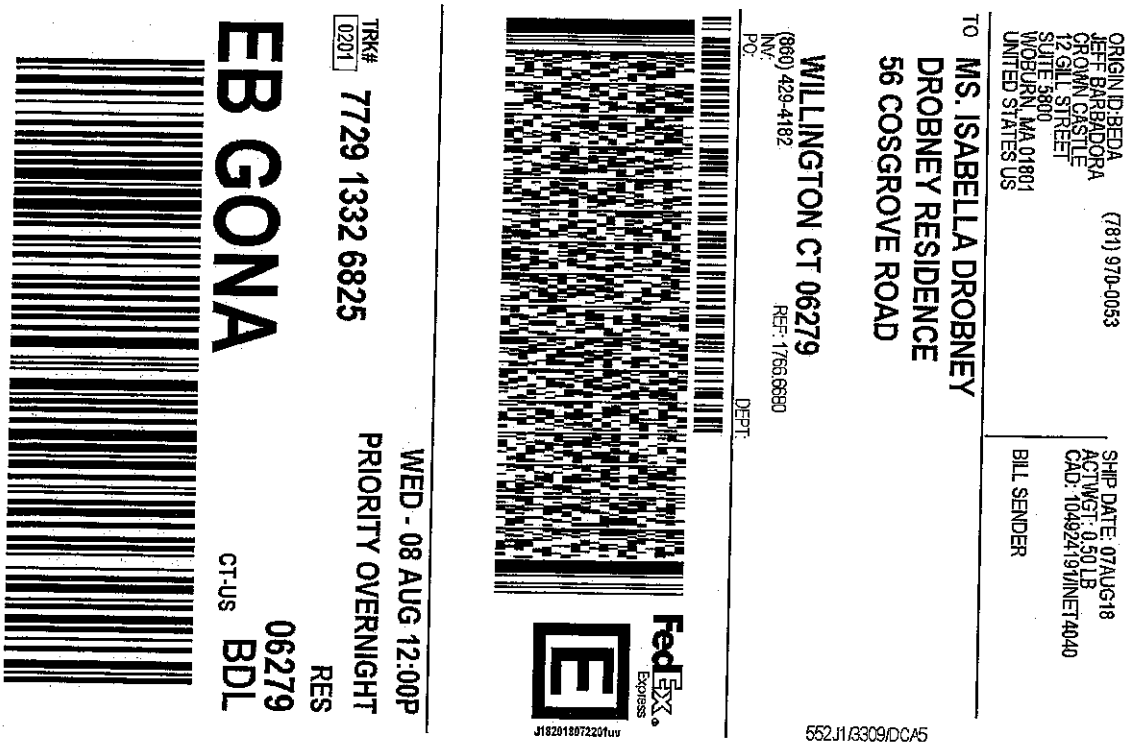
Delivery date:
Wed, 8/8/2018 11:28 am

First Selectman-Ms. Erika Wiecenski
Town of Willington
40 Old Farms Road
WILLINGTON, CT 06279
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772913263919
Status:	Delivered: 08/08/2018 11:28 AM Signed for By: E.WIECHELE
Reference:	1766.6680
Signed for by:	E.WIECHELE
Delivery location:	WILLINGTON, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	8/8/2018 by 12:00 pm



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1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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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.

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 8, 2018 11:39 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 772913326825 Delivered

Your package has been delivered

Tracking # 772913326825

Ship date:
Tue, 8/7/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US

Delivery date:
Wed, 8/8/2018 11:37 am

Ms. Isabella Drobney
Drobney Residence
56 Cosgrove Road
WILLINGTON, CT 06279
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772913326825
Status:	Delivered: 08/08/2018 11:37 AM Signed for By: Signature not required
Reference:	1766.6680
Signed for by:	Signature not required
Delivery location:	WILLINGTON, CT
Delivered to:	Residence
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday Residential Delivery
Standard transit:	8/8/2018 by 12:00 pm

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

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

Barbadora, Jeff

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 8, 2018 11:30 AM
To: Barbadora, Jeff
Subject: FedEx Shipment 772913282281 Delivered

Your package has been delivered

Tracking # 772913282281

Ship date:
Tue, 8/7/2018

Jeff Barbadora
Crown Castle
WOBURN, MA 01801
US

Delivered

Delivery date:
Wed, 8/8/2018 11:28 am

Plan& Zone Comm. Ms. Susan Yorgense
Town of Willington
40 Old Farms Road
WILLINGTON, CT 06279
US

Shipment Facts

Our records indicate that the following package has been delivered.

Tracking number:	772913282281
Status:	Delivered: 08/08/2018 11:28 AM Signed for By: E.WIECHELE
Reference:	1766.6680
Signed for by:	E.WIECHELE
Delivery location:	WILLINGTON, CT
Delivered to:	Receptionist/Front Desk
Service type:	FedEx Priority Overnight®
Packaging type:	FedEx® Envelope
Number of pieces:	1
Weight:	1.00 lb.
Special handling/Services:	Deliver Weekday
Standard transit:	8/8/2018 by 12:00 pm