Sprint®

TM

PROJECT:	**DO MACRO UPGRADE**
SITE NAME:	**RA73XC047**
SITE CASCADE:	**RA73XC047**
SITE ADDRESS:	**6080 HIGHWAY 421 N LILLINGTON, NC 27546**
SITE TYPE:	**195'-0" MONOPOLE TOWER**
SBA SITE ID:	**NC40177-T-01 / MAMERS**

SITE INFORMATION

APPLICANT:

SPRINT
3401 INTERNATIONAL AIRPORT DR
CHARLOTTE, NC 28208
NOCC PH#: 888-859-1400

PROPERTY OWNER:

ANTHONY W DICKENS
6080 HIGHWAY 421N
LILLINGTON, NC 27546

JURISDICTION:

HARNETT COUNTY

TAX ID:

0620-47-0562.000

ZONING CLASSIFICATION:

NONE

CONSTRUCTION TYPE:

V-B

USE GROUP:

U (UTILITY & MISCELLANEOUS)

LATITUDE (NAD83):

35° 25' 09.3" N
35.41925°

LONGITUDE (NAD83):

78° 55' 08.7" W
-78.919083°

POWER COMPANY :

SOUTH RIVER EMC

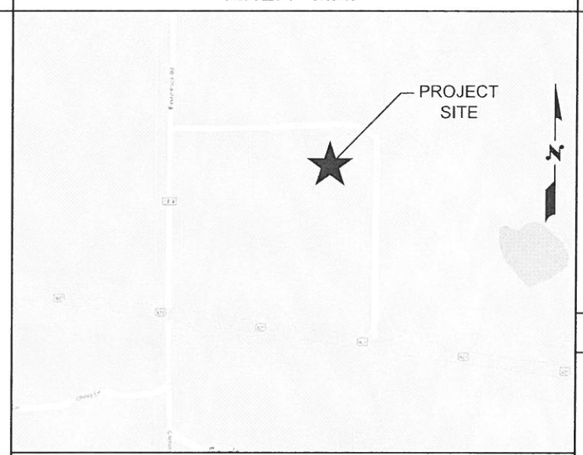
FIBER COMPANY:

CENTURY LINK

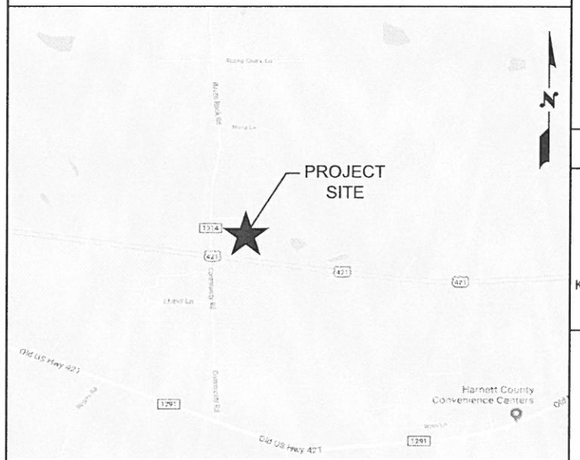
SPRINT CM:

CURTIS EBERSPACHER
704-965-9513
curtis.eberspacher@sprint.com

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION

- INSTALL 2500 EQUIPMENT IN EXISTING CABINET
- INSTALL (3) ANTENNAS
- INSTALL (3) RRH ON TOWER
- INSTALL (1) HYBRID CABLE
- REMOVE AND REPLACE EXISTING LOW PROFILE PLATFORM

CONTRACTORS SHALL CONFIRM EXACT SCOPE OF WORK WITH SPRINT PRIOR TO PROCEEDING WITH WORK

APPLICABLE CODES

2012 NORTH CAROLINA STATE BUILDING CODE
2012 NORTH CAROLINA STATE MECHANICAL CODE
2012 NORTH CAROLINA STATE FIRE CODE
2012 NORTH CAROLINA STATE REHABILITATION CODE (EXISTING BUILDINGS)
2014 NATIONAL ELECTRICAL CODE W/NORTH CAROLINA AMENDMENTS

DRAWING INDEX

SHEET NO	SHEET TITLE	ISSUE
T-1	TITLE SHEET & PROJECT DATA	0
B-1	APPENDIX B	0
B-2	APPENDIX B	0
SP-1	OUTLINE SPECIFICATIONS	0
SP-2	OUTLINE SPECIFICATIONS	0
A-1	SITE PLAN	0
A-2	COMPOUND PLAN	0
A-3	TOWER ELEVATION & CABLE PLAN	0
A-4	ANTENNA LAYOUTS & MOUNTING DETAILS	0
A-5	COLOR CODES	0
A-6	FIBER AND DC CONNECTION DETAILS	0
A-7	EQUIPMENT DETAILS	0
A-8	EQUIPMENT DETAILS	0
E-1	GROUNDING & ELECTRICAL PLAN	0
E-2	GROUNDING DETAILS	0
E-3	DC POWER & DISTRIBUTION	0

GENERAL NOTES

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

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE, AND SHALL IMMEDIATELY NOTIFY THE A/E FIRM IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

ALL NEW CONSTRUCTION ITEMS TO BE INSTALLED PER SPRINT SPECIFICATIONS

PROFESSIONAL'S STATEMENT

I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM DULY LICENSED PROFESSIONAL ENGINEER OR ARCHITECT UNDER THE LAWS OF THE STATE OF NORTH CAROLINA.

PROFESSIONAL OF RECORD: ROBERT LARA, AIA
MORRISON HERSHFIELD CORPORATION
rlara@morrisonhershfield.com
PHONE: (954) 577-4655
NC LICENSE#: 9871

JASON CEGLIA, PE
MORRISON HERSHFIELD CORPORATION
jceglia@morrisonhershfield.com
PHONE: (954 577-4655
NC LICENSE#: 042346

YAN WANG, PE
MORRISON HERSHFIELD CORPORATION
ywang@morrisonhershfield.com
PHONE: (954) 577-4655
NC LICENSE#: 031105

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:38:43-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

TITLE SHEET AND PROJECT INFORMATION

Project No.: 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No.: 0	Drawing No.: T-1

SCALE IS BASED ON 22" X 34" "D" SIZE

SPRINT CM TEMPLATE

2012 APPENDIX B
BUILDING CODE SUMMARY
FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: SPRINT DOKU – RA73XC047_CHARLOTTE (NC1283)
Address: 6080 HIGHWAY 421 N, LILLINGTON NC Zip Code 27546
Proposed Use: TELECOMMUNICATIONS
Owner/Authorized Agent: —— Phone # (____) ____-____ E-Mail N/A
Owned By: ☐ City/County ☒ Private ☐ State
Code Enforcement Jurisdiction: ☐ City_____ ☒ County HARNETT ☐ State

LEAD DESIGN PROFESSIONAL: ROBERT LARA

DESIGNER	FIRM	NAME	LICENSE#	TELEPHONE#	E-MAIL
Architectural	MORRISON HERSHFIELD	ROBERT LARA	#9871	(954) 577-4655	rlara@morrisonhershfield.com
Civil				( )	
Electrical	MORRISON HERSHFIELD	JASON CEGLIA	#042346	954 577-4655	jceglia@morrisonhershfield.com
Fire Alarm				( )	
Plumbing				( )	
Mechanical				( )	
Sprinkler/Standpipe				( )	
Structural	MORRISON HERSHFIELD	YAN WANG	#031105	(954 577-4655	ywang@morrisonhershfield.com
Retaining Walls >5' High				( )	
Other				( )	

2012 EDITION OF NC CODE FOR: ☐ New Construction ☒ ~~Addition~~ ☐ Upfit ————
EXISTING: ☐ Reconstruction ☐ Alteration ☐ Repair ☐ Renovation
CONSTRUCTED: (date) _____ **ORIGINAL USE (S) (Ch. 3):** TELECOMMUNICATIONS
RENOVATED: (date) _____ **CURRENT USE (S) (Ch.3):** TELECOMMUNICATIONS
PROPOSED USE (S) (Ch. 3): TELECOMMUNICATIONS

BASIC BUILDING DATA
Construction Type: (check all that apply) ☐ I-A ☐ I-B ☐ II-A ☐ II-B ☐ III-A ☐ III-B ☐ IV ☐ V-A ☒ V-B
Sprinklers ☐ No ☐ Partial ☐ Yes ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D
Standpipes: ☐ No ☐ Yes Class ☐ I ☐ II ☐ III ☐ Wet ☐ Dry
Fire District: ☐ No ☐ Yes (Primary) **Flood Hazard Area:** ☐ No ☐ Yes
Building Height (feet) _____
Gross Building Area:

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	SUB-TOTAL
6th Floor			
5th Floor			
4th Floor			
3rd Floor			
2nd Floor			
Mezzanine			
1st Floor			
Basement			
TOTAL	273 SQ. FT.	0	273 SQ. FT.

ALLOWABLE AREA

Occupancy:
Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☐
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4
I-3 Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ☐ S-1 Moderate ☐ S-2 Low ☐ High-piled ☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage
Utility and Miscellaneous ☒

Accessory Occupancies:
Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☐
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4
I-3 Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ☐ S-1 Moderate ☐ S-2 Low ☐ High-piled ☐ Parking Garage ☐ Open ☐ Enclosed ☐ Repair Garage
Utility and Miscellaneous ☐

Incidental Uses (Table 508.2[5]):
☐ Furnace room where any piece of equipment is over 400,000 Btu per hour input
☐ Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower
☐ Refrigerant machine room
☐ Hydrogen cutoff rooms, not classified as Group H
☐ Incinerator rooms
☐ Paint shops, not classified as Group H, located in occupancies other than Group F
☐ Laboratories and vocational shops, not classified as Group H, located in a Group E or I-2 occupancy
☐ Laundry rooms over 100 square feet
☐ Group I-3 cells equipped with padded surfaces
☐ Group I-2 waste and linen collection rooms
☐ Waste and linen collection rooms over 100 square feet
☐ Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons, or a lithium-ion capacity of 1,000 pounds used for facility standby power, emergency power or uninterrupted power supplies
☐ Rooms containing fire pumps
☐ Group I-2 storage rooms over 100 square feet
☐ Group I-2 commercial kitchens
☐ Group I-2 laundries equal to or less than 100 square feet
☐ Group I-2 rooms or spaces that contain fuel-fired heating equipment

Special Uses: ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412 ☐ 413 ☐ 414 ☐ 415 ☐ 416 ☐ 417 ☐ 418 ☐ 419 ☐ 420 ☐ 421 ☐ 422 ☐ 423 ☐ 424 ☐ 425 ☐ 426 ☐ 427
Special Provisions: ☐ 509.2 ☐ 509.3 ☐ 509.4 ☐ 509.5 ☐ 509.6 ☐ 509.7 ☐ 509.8 ☐ 509.9
Mixed Occupancy: ☐ No ☐ Yes **Separation:** _____ **Hr. Exception:** _____
☐ **Incidental Use Separation (508.2.5)**
This separation not exempt as a Non-Separated Use (see exceptions).
☐ **Non-Separated Use (508.3)**
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.
☐ **Separated Use (508.4) - See below for area calculations**
For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} < 1$$

$$+ \_\_\_\_\_ + \ldots = \_\_\_\_ < 1.00$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE503[3] AREA	(C) AREA FOR FRONTAGE INCREASE[1]	(D) AREA FOR SPRINKLER INCREASE[2]	(E) ALLOWABLE AREA OR UNLIMITED	(F) MAXIMUM BUILDING AREA[4]

[1] **Frontage area increases from Section 506.2 are computed thus:**
a. **Perimeter which fronts a public way or open space having 20 feet minimum width =** _____ **(F)**
b. **Total Building Perimeter =** _____ **(P)**
c. **Ratio (F/P) =** _____ **(F/P)**
d. **W = Minimum width of public way =** _____ **(W)**
e. **Percent of frontage increase If = 100 [F/P - 0.25] x W/30 =** _____ **(%)**
[2] **The sprinkler increase per Section 506.3 is as follows:**
a. **Multistory building = 200 percent**
b. **Single story building = 300 percent**
[3] **Unlimited area applicable under conditions of Section 507**
[4] **Maximum Building Area = total number of stories in the building x E (506.4).**
[5] **The maximum area of open parking garages must comply with Table 406.3.5. The maximum area of air traffic towers must comply with Table 412.1.2.**

ALLOWABLE HEIGHT

	ALLOWABLE (TABLE503)	INCREASE FOR SPRINKLERS	SHOWN ON PLANS	CODE REFERENCE
Type of Construction	Type _____		Type _____	
Building Height in Feet		Feet = H + 20' = _____		
Building Height in Stories		Stories + 1 = _____		

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG
2018.02.09 16:38:52-05'00'
YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:
SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:
Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:
MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:
APPENDIX B

Project No.: 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No.: 0	Drawing No.: B-1

SPRINT ARD TEMPLATE
SCALE IS BASED ON 24" X 36" "D" SIZE

FIRE PROTECTION REQUIREMENTS

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING FROM	RATING PROVIDED (w/ % REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGNS FOR RATED PENETRATION	DESIGNS FOR RATED JOINTS
Structural Frame including columns, girders, trusses							
Bearing Walls							
Exterior							
North							
East							
West							
South							
Interior							
Nonbearing Walls and Partitions							
Exterior walls							
North							
East							
West							
South							
Interior walls and partitions							
Floor Construction Including supporting beams							
Roof Construction Including supporting beams and joists							
Shaft Enclosures - Exit							
Shaft Enclosures - Others							
Corridor Separation							
Occupancy Separation							
Party/Fire Wall Separation							
Smoke Barrier Separation							
Tenant Separation							
Incidental Use Separation							

N/A

* Indicate section number permitting reduction

LIFE SAFETY SYSTEM REQUIREMENTS

N/A

Emergency Lighting: ☐ No ☐ Yes
Exit Signs: ☐ No ☐ Yes
Fire Alarm: ☐ No ☐ Yes
Smoke Detection Systems: ☐ No ☐ Yes ☐ Partial _____
Panic Hardware: ☐ No ☐ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: _____

- ☐ Fire and/or smoke rated wall locations (Chapter 7)
- ☐ Assumed and real property line locations
- ☐ Exterior wall opening area with respect to distance to assumed property lines (705.8)
- ☐ Existing structures within 30' of the proposed building
- ☐ Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1)
- ☐ Occupant loads for each area
- ☐ Exit access travel distances (1016)
- ☐ Common path of travel distances (1014.3 & 1028.8)
- ☐ Dead end lengths (1018.4)
- ☐ Clear exit widths for each exit door
- ☐ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1)
- ☐ Actualoccupant load for each exit door
- ☐ A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
- ☐ Location of doors with panic hardware (1008.1.10)
- ☐ Location of doors with delayed egress locks and the amount of delay (1008.1.9.7)
- ☐ Location of doors with electromagnetic egress locks (1008.1.9.8)
- ☐ Location of doors equipped with hold-open devices
- ☐ Location of emergency escape windows (102.9)
- ☐ The square footage of each fire area (902)
- ☐ The square footage of each smoke compartment (407.4)
- ☐ Note any code exceptions or table notes that may have been utilized regarding the items above

ACCESSIBLE DWELLING UNITS
(SECTION 1107)

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED

N/A

ACCESSIBLE PARKING
(SECTION 1106)

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES		# OF ACCESSIBLE SPACES PROVIDED			TOTAL ACCESSIBLE PROVIDED
	REQUIRED	PROVIDED	SIGNAGE WITH 5' ACCESS AISLE	VAN SPACES WITH 132" ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	
TOTAL						

N/A

STRUCTURAL DESIGN

DESIGN LOADS:

Importance Factors: Wind (I_w) 1.0; Snow (I_s) 1.0; Seismic (I_e) 1.0

Live Loads: Roof N/A psf; Mezzanine N/A psf; Floor N/A psf

Ground Snow Load: N/A psf

Wind Load: Basic Wind Speed 94 mph (ASCE-7)
Exposure Category C
Wind Base Shears (for MWFRS) Vx = ANALYSIS Vy = ANALYSIS

SEE STRUCT. SEE STRUCT.

SEISMIC DESIGN CATEGORY: ☐ A ☐ B ☒ C ☐ D

Provide the following Seismic Design Parameters:
Occupancy Category (Table 1604.5) ☐ I ☒ II ☐ III ☐ IV
Spectral Response Acceleration S_s 24.6 %g S_1 9.0 %g
Site Classification (Table 1613.5.2) ☐ A ☐ B ☐ C ☒ D ☐ E ☐ F
Data Source: ☐ Field Test ☒ Presumptive ☐ Historical Data
Basic structural system (check one)
☐ Bearing Wall ☐ Dual w/Special Moment Frame
☐ Building Frame ☐ Dual w/Intermediate R/C or Special Steel
☐ Moment Frame ☐ Inverted Pendulum ☒ N/A
Seismic base shear: V_x = N/A V_y = N/A
Analysis Procedure: ☐ Simplified ☒ Equivalent Lateral Force ☐ Dynamic
Architectural, Mechanical, Components anchored? ☐ Yes ☒ No

LATERAL DESIGN CONTROL: Earthquake ☐ Wind ☒

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) _____ psf
Presumptive Bearing capacity N/A psf
Pile size, type, and capacity _____

SPECIAL INSPECTIONS REQUIRED: ☐ Yes ☒ No

PLUMBING FIXTURE REQUIREMENTS
(TABLE 2902.1)

USE		WATER CLOSETS		URINALS	LAVATORIES		SHOWERS/ TUBS	DRINKING FOUNTAINS	
		MALE	FEMALE		MALE	FEMALE		REGULAR	ACCESSIBLE
SPACE	EXISTING								
	NEW								
	REQUIRED								

N/A

SPECIAL APPROVALS

Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, ICC, etc., describe below)

_____

_____

_____

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:39:01-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

APPENDIX B

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. B-2

SPRINT ARB TEMPLATE

SCALE IS BASED ON 22" X 34" "D" SIZE

D:\Charlotte\PROJ\716 Series\716011800 SBA_Byrkit Local Adv HC_MV\8.0 Sites\DO MACRO\RA73XC047\8.2 Design & Development\DAD\DO MACRO UPGRADE_RA73XC047_ PLOTTED BY: Pdobbins 07 Feb 2018 - 8:02am

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

THE WORK:

SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF.

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.

SITE FAMILIARITY:

CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

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.

DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE:

THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.

A. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE AND FUNCTIONING SYSTEM. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

B. CONTRACTOR SHALL NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY VARIATIONS PRIOR TO PROCEEDING WITH THE WORK. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS NOTED OTHERWISE. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.

C. MARK THE FIELD SET OF DRAWINGS IN RED, DOCUMENTING ANY CHANGES FROM THE CONSTRUCTION DOCUMENTS.

METHODS OF PROCEDURE (MOPS) FOR CONSTRUCTION:

CONTRACTOR SHALL PERFORM WORK AS DESCRIBED IN

A. COAX COLOR CODING SWEEPS AND FIBER TESTING TS–0200 AND EL–0568

B. CABLE LABELING EN–2012–00

C. APPLICABLE INSTALLATION MOPS IDENTIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS

SECTION 01 200 – COMPANY FURNISHED MATERIAL AND EQUIPMENT

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

CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT TO ENSURE IT IS PROTECTED AND HANDLED PROPERLY THROUGHOUT THE CONSTRUCTION DURATION.

CONTRACTOR RESPONSIBLE FOR RECEIPT OF SPRINT FURNISHED EQUIPMENT AT CELL SITE OR CONTRACTORS LOCATION. CONTRACTOR TO COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.

SECTION 01 300 – CELL SITE CONSTRUCTION

NOTICE TO PROCEED:

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

SITE CLEANLINESS:

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.

SECTION 01 400 – SUBMITTALS & TESTS

ALTERNATES:

AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINTS CONSTRUCTION MANAGER FOR APPROVAL SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED.

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 LATEST VERSION OF TS–0200 ANTENNA LINE ACCEPTANCE STANDARDS.
2. AGL, AZIMUTH AND DOWNTILT PROVIDE AN AUTOMATED REPORT UPLOADED TO SITERRA USING A COMMERCIAL MADE–FOR THE PURPOSE ELECTRONIC ANTENNA ALIGNMENT TOOL (AAT). INSTALLED AZIMUTH, CENTERLINE AND DOWNTILT MUST CONFORM WITH RF CONFIGURATION DATA.
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.
4. ALL TESTING REQUIRED BY APPLICABLE INSTALLATION MOPS.

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

1. AZIMUTH, DOWNTILT, AGL FROM SUNSIGHT INSTRUMENTS – ANTENNALIGN ALIGNMENT TOOL (AAT)
2. SWEEP AND FIBER TESTS
3. SCALABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
4. ALL AVAILABLE JURISDICTIONAL PERMIT AND OCCUPANCY INFORMATION
5. PDF SCAN OF REDLINES PRODUCED IN FIELD
6. A PDF SCAN OF REDLINE MARK–UPS SUITABLE FOR USE IN ELECTRONIC AS–BUILT DRAWING PRODUCTION
7. LIEN WAVERS
8. FINAL PAYMENT APPLICATION
9. REQUIRED FINAL CONSTRUCTION PHOTOS
10. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
11. APPLICABLE POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD)
12. CLOSEOUT PHOTOGRAPHS AND CLOSEOUT CHECKLISTS: SPRINT WILL PROVIDE SEPARATE GUIDANCE

SECTION 11 700 – ANTENNA ASSEMBLY, REMOTE RADIO UNITS AND CABLE INSTALLATION

SUMMARY:

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

ANTENNAS AND RRU'S:

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

HYBRID CABLE:

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

JUMPERS AND CONNECTORS:

FURNISH AND INSTALL 1/2" COAX JUMPER CABLES BETWEEN THE RRU'S AND ANTENNAS. JUMPERS SHALL BE TYPE LDF 4, FLC 12–50, CR 540, OR FXL 540. SUPER–FLEX CABLES ARE NOT ACCEPTABLE. JUMPERS BETWEEN THE RRU'S AND ANTENNAS OR TOWER TOP AMPLIFIERS SHALL CONSIST OF 1/2 INCH FOAM DIELECTRIC, OUTDOOR RATED COAXIAL CABLE, MIN LENGTH FOR JUMPER SHALL BE 10'–0".

REMOTE ELECTRICAL TILT (RET) CABLES: A/E TO INSERT SPECIFICATION

MISCELLANEOUS:

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

ANTENNA INSTALLATION:

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

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

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

HYBRID CABLE INSTALLATION:

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

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

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

1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE INSTALLED INSIDE MONOPOLE WITH CABLE SUPPORT GRIPS AS REQUIRED BY THE MANUFACTURER.
2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:
   - a. FIBER: SUPPORT FIBER BUNDLES USING 1/2" VELCRO STRAPS OF THE REQUIRED LENGTH @ 18" OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL INSTALLATIONS AS MANUFACTURED BY TEXTOL OR APPROVED EQUAL.
   - b. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.
3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.
4. CABLE INSTALLATION:
   - a. INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER.
   - b. CABLE ROUTING: CABLE INSTALLATION SHALL BE PLANNED TO ENSURE THAT THE LINES WILL BE PROPERLY ROUTED IN THE CABLE ENVELOP AS INDICATED ON THE DRAWINGS. AVOID TWISTING AND CROSSOVERS.
   - c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURERS RECOMMENDED MAXIMUM BEND RADIUS.

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:39:12-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

OUTLINE SPECIFICATIONS

Project No.	
7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. SP-1

SCALE IS BASED ON 22" X 34" "D" SIZE

SPRINT ARE TRADEMARKS

CONTINUE FROM SP-1

5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.

6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER LATEST VERSION OF TS 0200.

7. HYBRID CABLE LABELING: INDIVIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-NUMERICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE – EN 2012-001, REV 1

WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

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

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

1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.

2. SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE 2" BEYOND CONNECTOR. APPLY A SECOND WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. APPLY DOUBLE WRAP OF 2" WIDE ELECTRICAL TAPE EXTENDING 2" BEYOND THE SELF-AMALGAMATING TAPE.

3. 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED.

4. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE.

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

SUMMARY:

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

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

C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

A. NEW DC CIRCUIT IS REQUIRED IN MMBTS CABINET SHALL BE CLEARLY IDENTIFIED AS TO RRU BEING SERVICED

SECTION 26 100 – BASIC ELECTRICAL REQUIREMENTS

SUMMARY:

THIS SECTION SPECIFIES BASIC ELECTRICAL REQUIREMENTS FOR SYSTEMS AND COMPONENTS.

QUALITY ASSURANCE:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

B. MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

C. MANUFACTURERS OF EQUIPMENT: ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. ALL EQUIPMENT FURNISHED UNDER DIVISION 26 SHALL CARRY UL LABELS AND LISTINGS WHERE SUCH LABELS AND LISTINGS ARE AVAILABLE IN THE INDUSTRY.

MANUFACTURERS OF EQUIPMENT SHALL HAVE A MINIMUM OF THREE YEARS EXPERIENCE WITH THEIR EQUIPMENT INSTALLED AND OPERATING IN THE FIELD IN A USE SIMILAR TO THE PROPOSED USE FOR THIS PROJECT.

MANUFACTURERS OF EQUIPMENT:
ALL MATERIALS AND EQUIPMENT SPECIFIED IN DIVISION 26 OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND SHALL BE NEW, OF THE BEST QUALITY AND DESIGN, AND FREE FROM DEFECTS.

SUPPORTING DEVICES:

A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING.

1. ALLIED TUBE AND CONDUIT
2. B-LINE SYSTEM
3. SUNISTRUT DIVERSIFIED PRODUCTS
4. THOMAS & BETTS

B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:

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

SUPPORTING DEVICES:

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

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

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

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

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

ELECTRICAL IDENTIFICATION:

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

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

SECTION 26 200 – ELECTRICAL MATERIALS AND EQUIPMENT CONDUIT:

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

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

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

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

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

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

HUBS AND BOXES:

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

B. CABLE TERMINATION FITTINGS FOR CONDUIT

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

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

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

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

SUPPLEMENTAL GROUNDING SYSTEM

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

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

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

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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

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

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER JAI WANG

2018.02.09 16:39:29-05'00'

REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

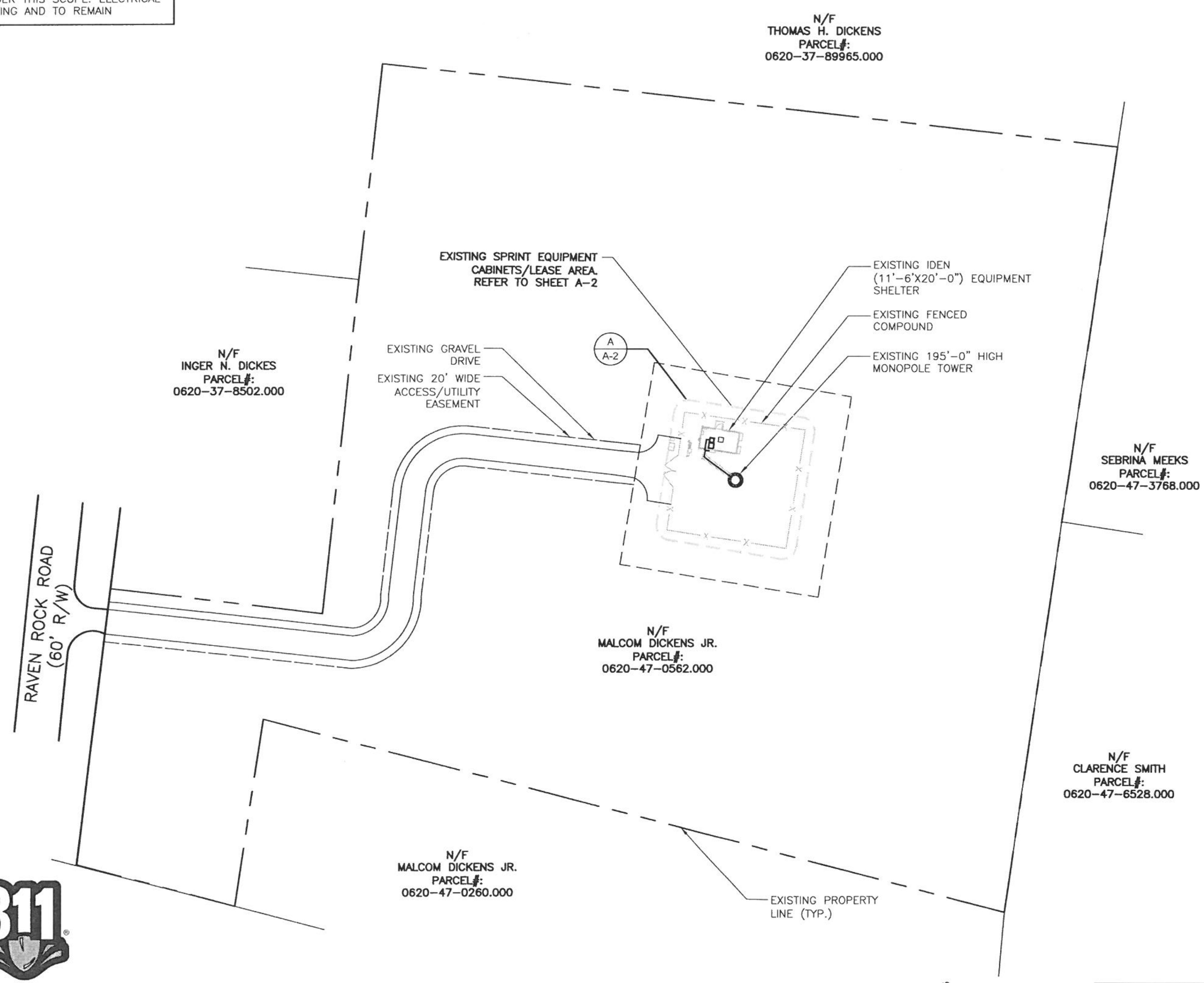
OUTLINE SPECIFICATIONS

Project No.: 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No.: 0	Drawing No.: SP-2

SCALE IS BASED ON 22" X 34" 'D' SIZE

SPRINT ANT TEMPLATE

NOTE;
NO WORK TO BE PERFORMED ON AC SIDE OF POWER UNDER THIS SCOPE. ELECTRICAL PANEL IS EXISTING AND TO REMAIN



811

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

A / A-1 SITE PLAN

22"x34" SCALE: 1" = 30'-0"
11"x17" SCALE: 1" = 60'-0"

30' 15' 0" 30'

MAG NORTH / TRUE NORTH

NOTE:
THE NEW CONSTRUCTION WILL NOT DISTURB OR DESTROY EXISTING LANDSCAPING OR TREES.

NOTE:
SITE PLAN INFORMATION CONTAINED HEREIN IS TAKEN FROM THE DOCUMENTS PROVIDED BY CLIENT. NEITHER WARRANTY NOR GUARANTEE IS GIVEN BY THE ARCHITECT NOR MORRISON HERSHFIELD CORPORATION TO THE ACCURACY NOR THE COMPLETENESS OF THE COPIED SURVEY/SITE PLAN INFORMATION.

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:39:37-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

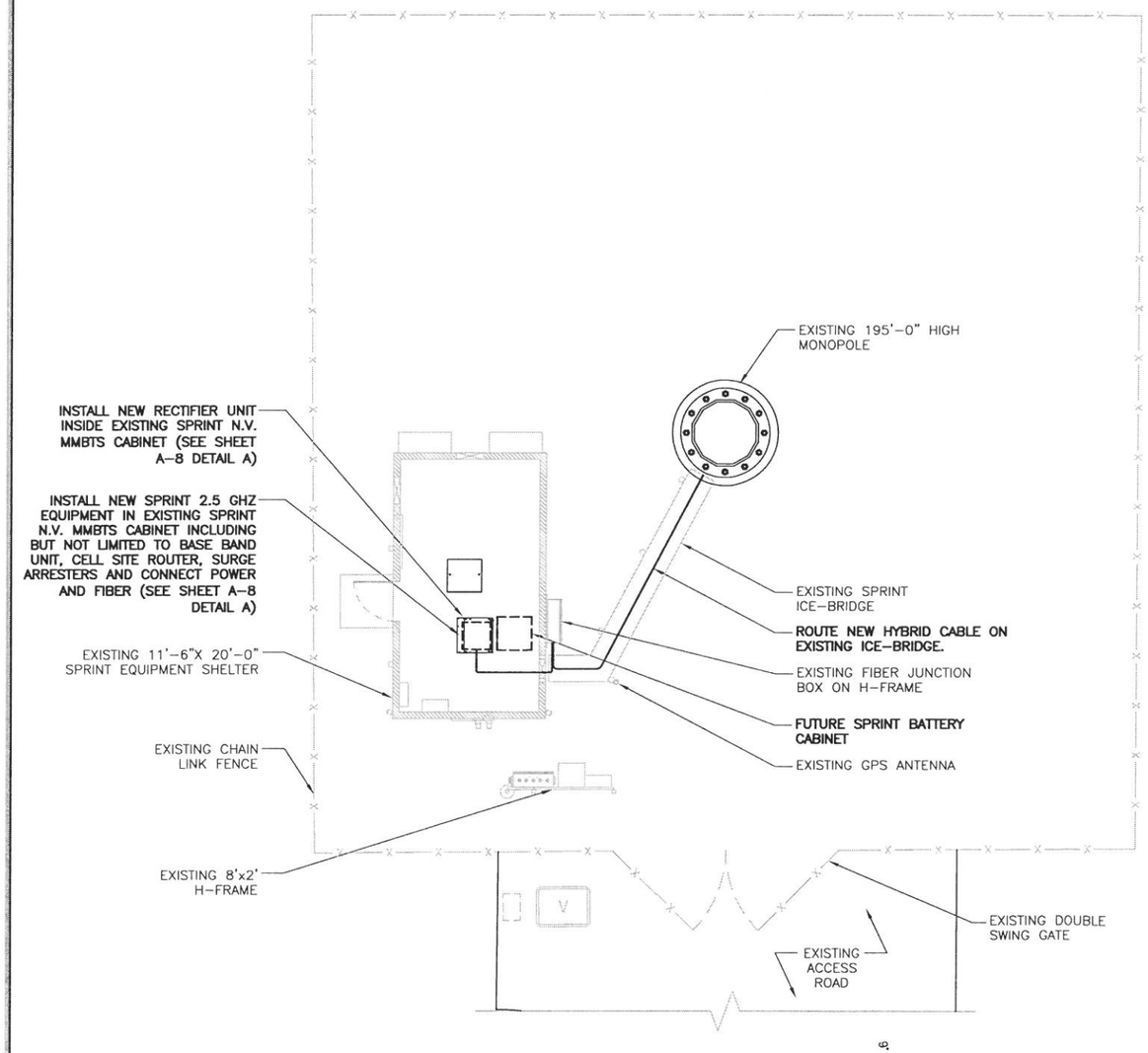
A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:
SITE PLAN

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. A-1



A A-2 COMPOUND PLAN

22"x34" SCALE: 3/16" = 1'-0"
11"x17" SCALE: 3/32" = 1'-0"

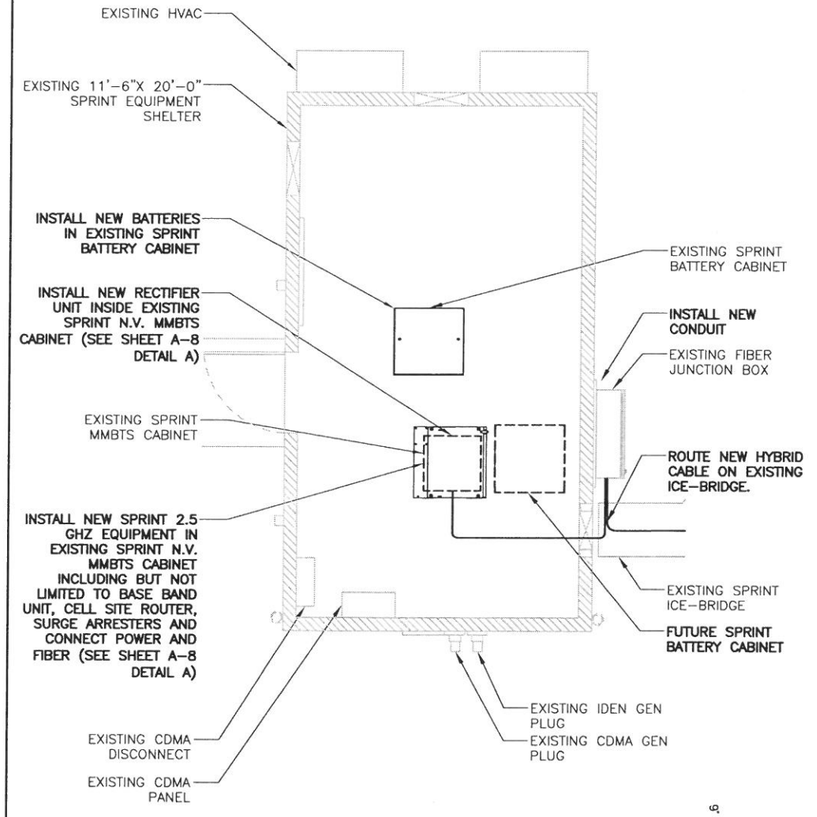
4' 2' 0" 4'

MAG NORTH 8° 1' W TRUE NORTH

NOTE:
THE NEW CONSTRUCTION WILL NOT DISTURB OR DESTROY EXISTING LANDSCAPING OR TREES.

3RD PARTY INSPECTIONS
CONTRACTOR SHALL BE RESPONSIBLE FOR HIRING ALL 3RD PARTY SPECIAL INSPECTIONS AS REQUIRED BY MINICIPALITY

NOTE: PLAN INFORMATION CONTAINED HEREIN IS TAKEN FROM DOCUMENTS PROVIDED BY THE CLIENT. NEITHER WARRANTY NOR GUARANTEE IS GIVEN BY THE ARCHITECT NOR MORRISON HERSHFIELD CORPORATION TO THE ACCURACY NOR THE COMPLETENESS OF THE COMPOUND OR EQUIPMENT PLAN INFORMATION.



B A-2 SPRINT EQUIPMENT AREA

22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

2' 1' 0" 2'

MAG NORTH 8° 1' W TRUE NORTH

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:39:46-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD

8504 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6661 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

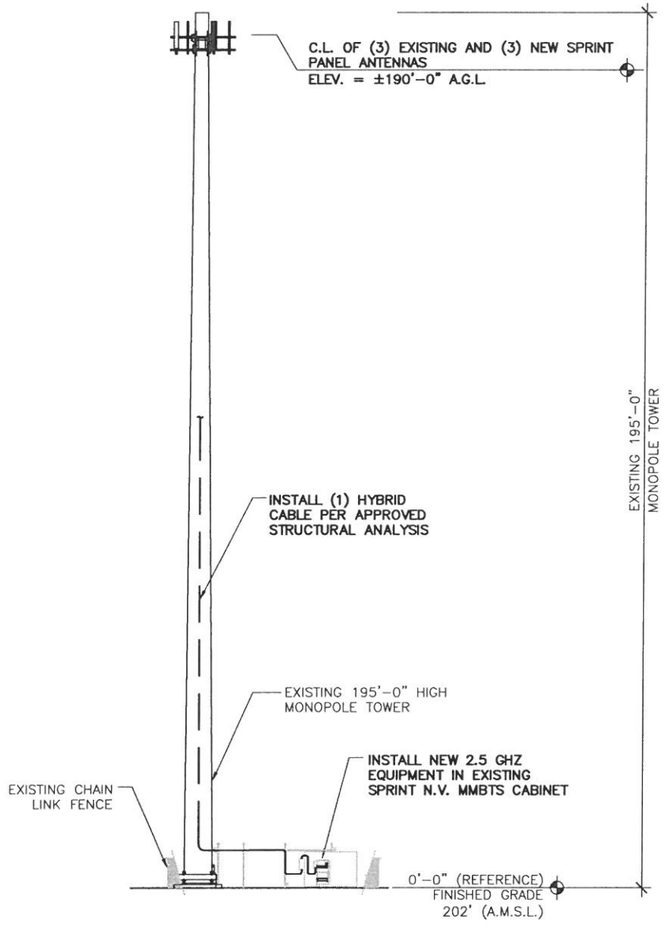
COMPOUND AND EQUIPMENT PLAN

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. A-2

SCALE IS BASED ON 22" X 34" "D" SIZE

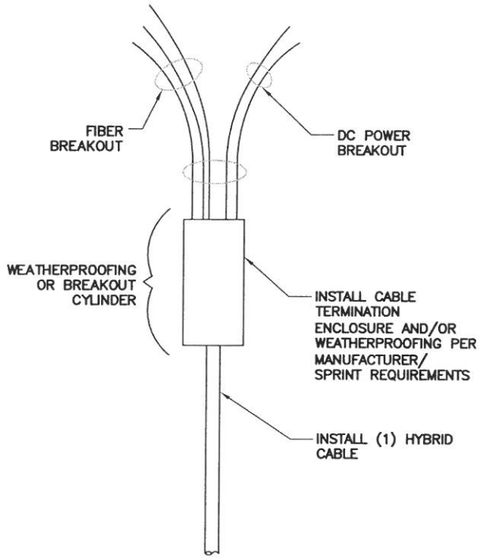
SPRINT ARE TEMPLATE

0:\Charlotte\PROJ\716 Series\7160119.020 SBA_Sprint Local Ark NC_NR\6.0 Sites\DO 1AGRO\RA73XC047\6.2 Design & Development\CAD\DO 1AGRO UPGRADE_RA73XC047_ plotted by: Plotdate 07 Feb 2018 - 8:02am

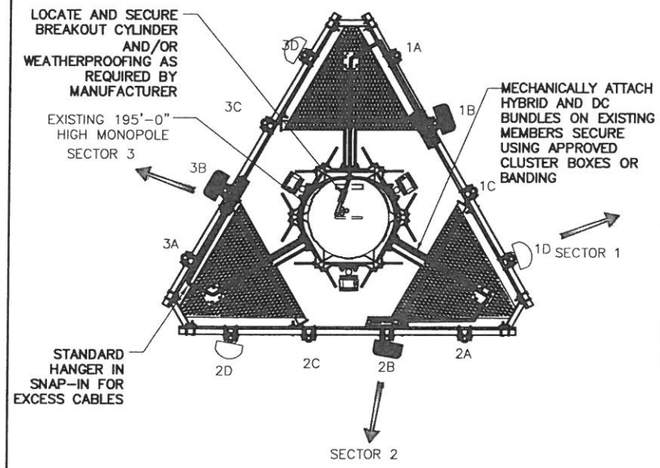


NOTE:
NO WORK SHALL COMMENCE WITHOUT THE APPROVED TOWER/ANTENNA MOUNT STRUCTURAL ANALYSIS REPORT SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER UNDER SEPARATE COVER. IF REQUIRED, THE CONTRACTOR SHALL MODIFY TOWER AND/OR ANTENNA MOUNTS AS INDICATED IN THE ABOVE MENTIONED STRUCTURAL REPORT OR ASSOCIATED MODIFICATION DESIGN DRAWINGS.

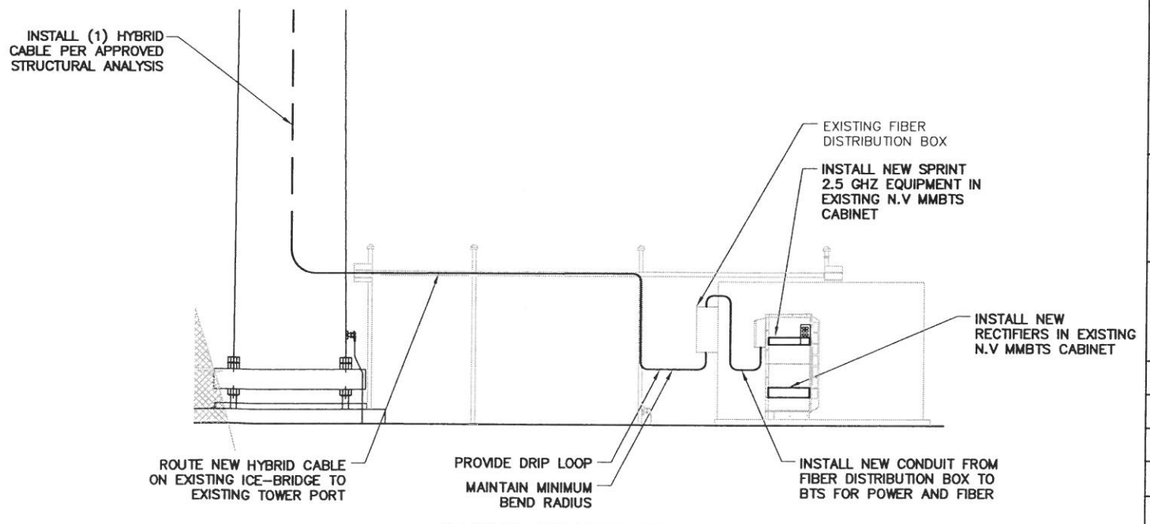
A / A-3 TOWER ELEVATION
22"x34" SCALE: 1/8" = 1'-0"
11"x17" SCALE: 1/16" = 1'-0"
8' 6' 4' 2' 0" 8'



B / A-3 HYBRID BREAKOUT DETAIL
NOT TO SCALE



C / A-3 TYPICAL HYBRID DETAIL
NOT TO SCALE



D / A-3 CABLE ROUTE FROM CABINET
NOT TO SCALE

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG
2018.02.09 16:39:55-05'00'
YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:
SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:
Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:
MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

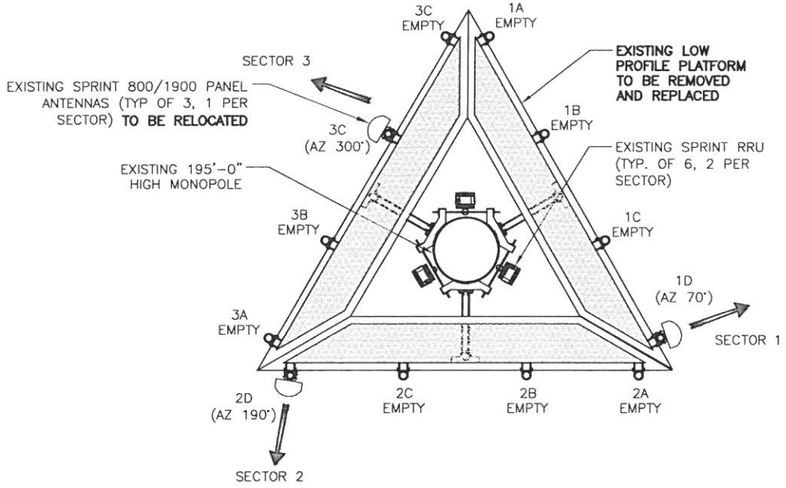
Drawing Title:
TOWER ELEVATION & CABLE PLAN

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. A-3

SCALE IS BASED ON 22" X 34" "D" SIZE
SPRINT ARE TEMPLATE

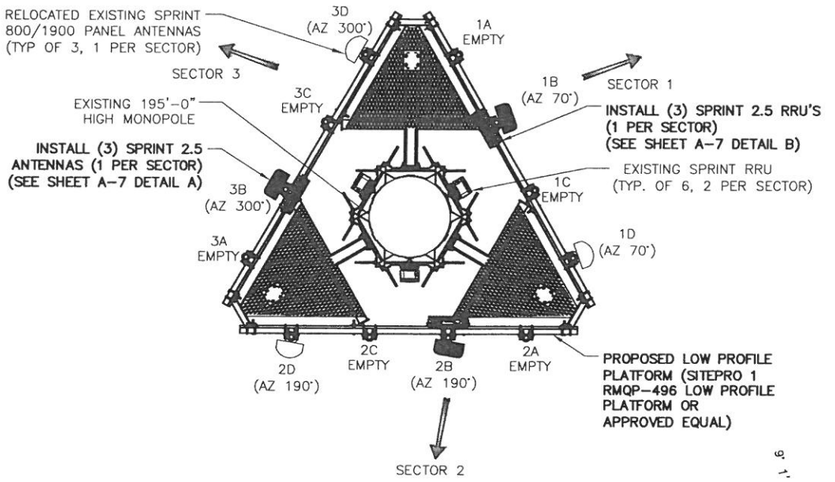
D:\Charlotte\PROJ\716 Series\716019.00 SBA_Sprint Local Ant MC_MV\0.0 Sheet\00 MACRO\RA73XC047\0.2 Design & Development\CAD\00 MACRO UPGRADE_RA73XC047_ FOL_ 02.09.18.dwg plotted by: Plotdate= 07 Feb 2018 - 8:02am

1 2 3 4 5 6



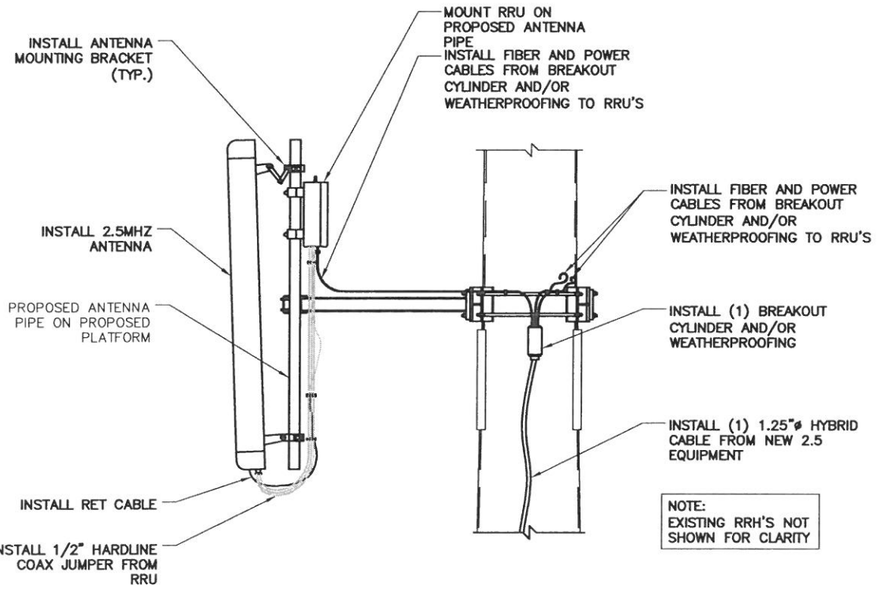
A A-4 EXISTING ANTENNA & RRU LAYOUT @ 190'-0"

NOT TO SCALE



B A-4 FINAL ANTENNA LAYOUT @ 190'-0"

NOT TO SCALE



C A-4 TYPICAL HYBRID DETAIL

NOT TO SCALE

D A-4 NOT USED

NOT TO SCALE

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:40:04-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

ANTENNA LAYOUT & HYBRID DETAIL

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. A-4

SCALE IS BASED ON 22" X 34" "D" SIZE

SPRINT A/E TEMPLATE

SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING
1 ALPHA	1	GREEN	NO TAPE	NO TAPE
	2	BLUE	NO TAPE	NO TAPE
	3	BROWN	NO TAPE	NO TAPE
	4	WHITE	NO TAPE	NO TAPE
	5	RED	NO TAPE	NO TAPE
	6	GREY	NO TAPE	NO TAPE
	7	PURPLE	NO TAPE	NO TAPE
	8	ORANGE	NO TAPE	NO TAPE
2 BETA	1	GREEN	GREEN	NO TAPE
	2	BLUE	BLUE	NO TAPE
	3	BROWN	BROWN	NO TAPE
	4	WHITE	WHITE	NO TAPE
	5	RED	RED	NO TAPE
	6	GREY	GREY	NO TAPE
	7	PURPLE	PURPLE	NO TAPE
	8	ORANGE	ORANGE	NO TAPE
3 GAMMA	1	GREEN	GREEN	GREEN
	2	BLUE	BLUE	BLUE
	3	BROWN	BROWN	BROWN
	4	WHITE	WHITE	WHITE
	5	RED	RED	RED
	6	GREY	GREY	GREY
	7	PURPLE	PURPLE	PURPLE
	8	ORANGE	ORANGE	ORANGE

A A-5 SPRINT CABLE COLOR CODE
NOT TO SCALE

FREQUENCY	INDICATOR	ID
800 #1	YELLOW	GREEN
1900 #1	YELLOW	RED
1900 #2	YELLOW	BROWN
1900 #3	YELLOW	BLUE
1900 #4	YELLOW	GREY
800 #2	YELLOW	ORANGE
2500 #1	YELLOW	WHITE
2500 #2	YELLOW	PURPLE

B A-5 FREQUENCY COLOR CODE
NOT TO SCALE

GPS	FIRST RING		SECOND RING	
1	YELLOW	BLACK	NO TAPE	
	BLACK	YELLOW		
2	YELLOW	BLACK	YELLOW	BLACK
	BLACK	YELLOW	BLACK	YELLOW

C A-5 GPS CABLE COLOR CODE
NOT TO SCALE

2500MHz #1 CAL CABLE–SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING	FOURTH RING	FIFTH RING	SIXTH RING
1 ALPHA	1	YELLOW	BLACK	YELLOW	WHITE	BLACK	BLACK
2 BETA	2	YELLOW	YELLOW	BLACK	YELLOW	WHITE	BLACK
3 GAMMA	3	YELLOW	YELLOW	YELLOW	BLACK	YELLOW	WHITE

2500MHz #2 CAL CABLE–SECTOR	CABLE	FIRST RING	SECOND RING	THIRD RING	FOURTH RING	FIFTH RING	SIXTH RING
1 ALPHA	1	YELLOW	BLACK	YELLOW	PURPLE	BLACK	BLACK
2 BETA	2	YELLOW	YELLOW	BLACK	YELLOW	PURPLE	BLACK
3 GAMMA	3	YELLOW	YELLOW	YELLOW	BLACK	YELLOW	PURPLE

D A-5 2500MHz RADIO CALIBRATION CABLE COLOR CODE
NOT TO SCALE

Figure 1: Antenna Orientation

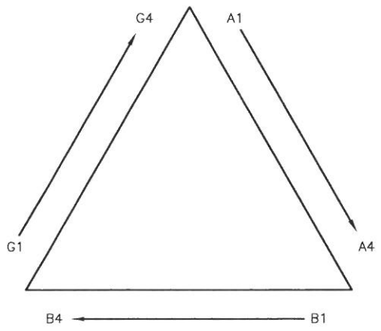


Figure 2: Tag Detail Example

NOTE*: All color code tape shall be 3M–35 and shall be installed using a minimum of (3) wraps of tape.
NOTE*: All color bands installed at the tower top shall be minimum of 3" wide and shall have a minimum of 3/4" of spacing between each color.
NOTE*: All color bands installed at or near the ground may be only 3/4" wide. Each top–jumper shall be color coded with (1) set of 3" wide bands.
NOTE*: Each main coax shall be color coded with (1) set of 3" bands near the top–jumper connection and with 3/4" color bands just prior to entering the BTS of transmitter building.
NOTE*: All bottom jumpers shall be color coded with (1) set of 3/4" bands on each end of the bottom jumper.
NOTE*: All color codes shall be installed so as to align neatly with one another from side–to–side.
NOTE*: Each color band shall have a minimum of (3) wraps and shall be neatly trimmed and smoothed out so as to avoid unraveling.
NOTE*: X–pole Antennas should use "xx–1" for the "+45" port, "xx–2" for the "–45" port.
NOTE*: Colorband #4 refers to the Frequency Band: ORANGE=850, VIOLET=1900. Used on jumpers only.
NOTE*: RF feedline shall be identified with a metal tag (Stainless or brass) and stamped with the sector, antenna position, and cable number.
NOTE*: Antennas must be identified, using the sector letter and antenna number, with a black marker prior to installation.

CABLE MARKING TAGS

TO PROVIDE ADDITIONAL IDENTIFICATION RF CABLES SHALL BE IDENTIFIED WITH A METAL TAG MADE OF STAINLESS STEEL OR BRASS AND STAMPED WITH THE SECTOR, ANTENNA POSITION, AND CABLE NUMBER. THE ID MARKING LOCATIONS SHOULD BE AS PER "CABLE MARKING LOCATIONS TABLE". THE TAG SHOULD BE ATTACHED WITH CORROSIVE PROOF WIRE OR WAX STRING AROUND THE CABLE. THE TAG SHOULD BE LABELED AS SHOWN IN FIGURE 2.

CABLE MARKING LOCATIONS TABLE		
TAPE	TAG	LOCATIONS
X		EACH TOP–JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
X		EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP–JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
	X	MARKING TAGS SHALL BE ATTACHED AT CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
X		ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF BOTTOM JUMPER.

E A-5 RRU CABLE MARKING LOCATIONS DIAGRAM
NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:40:14-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

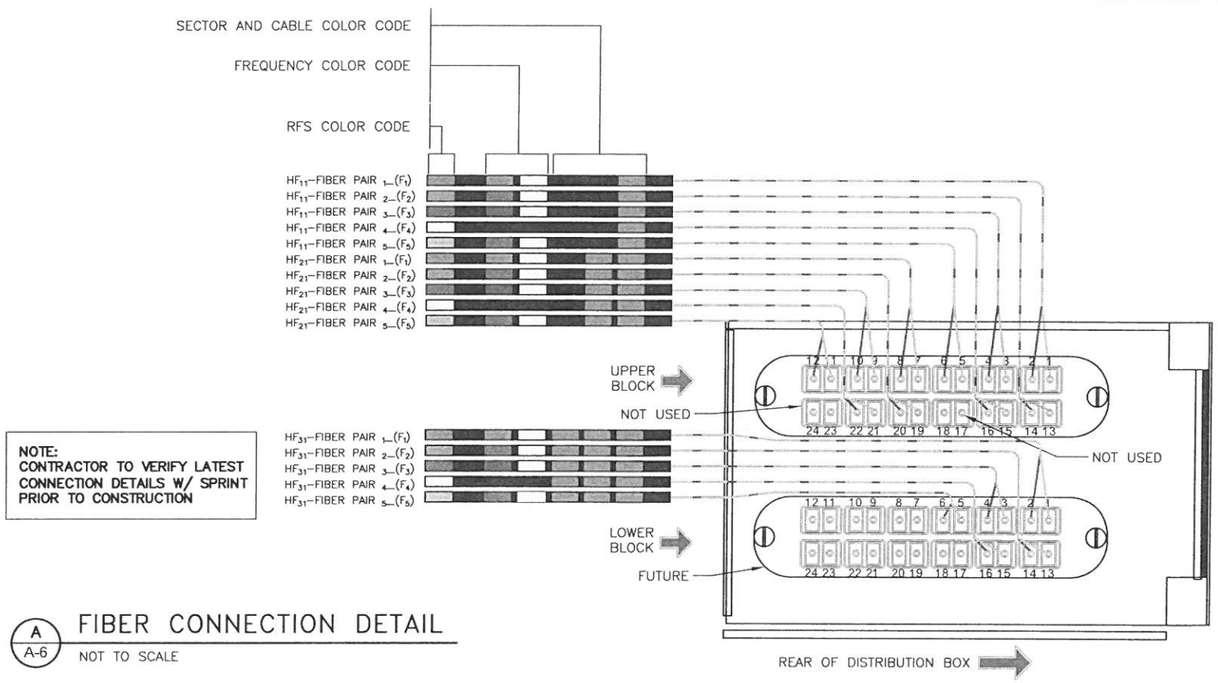
MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:
RF COLOR CODES

Project No.: 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No.: 0	Drawing No.: A-5

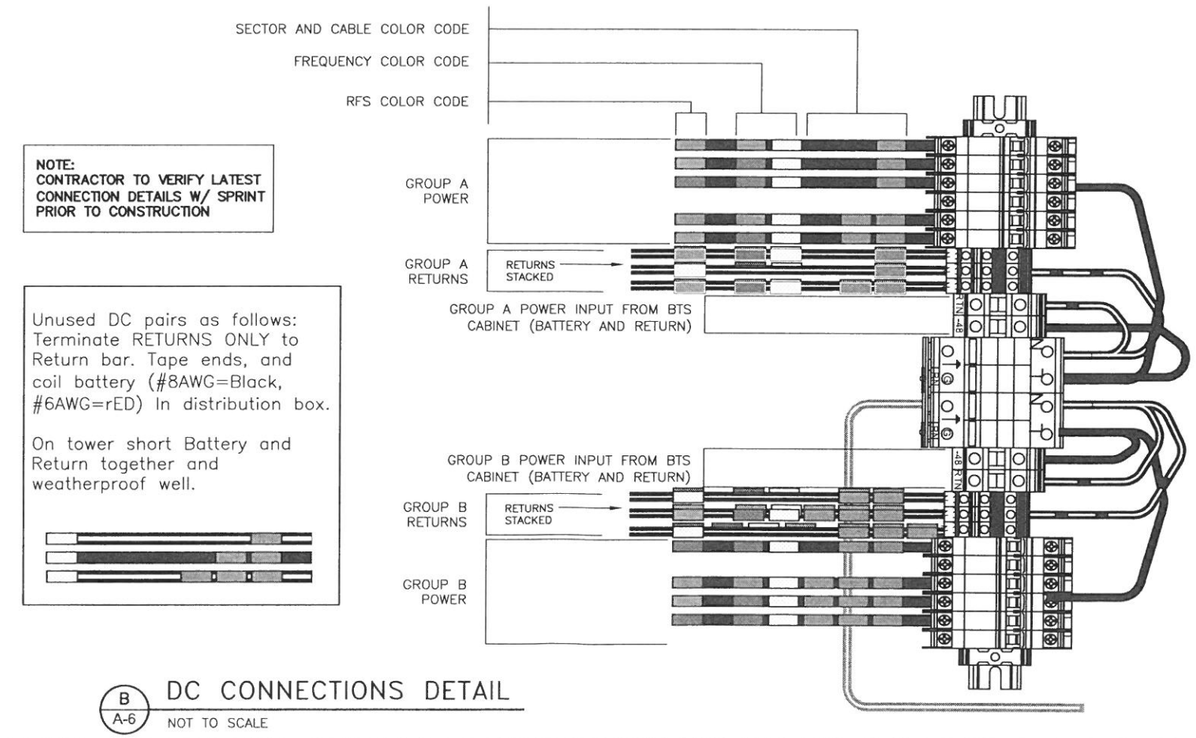
SCALE IS BASED ON 22" X 34" "D" SIZE



NOTE:
CONTRACTOR TO VERIFY LATEST CONNECTION DETAILS W/ SPRINT PRIOR TO CONSTRUCTION

A / A-6 FIBER CONNECTION DETAIL

NOT TO SCALE



NOTE:
CONTRACTOR TO VERIFY LATEST CONNECTION DETAILS W/ SPRINT PRIOR TO CONSTRUCTION

Unused DC pairs as follows:
Terminate RETURNS ONLY to Return bar. Tape ends, and coil battery (#8AWG=Black, #6AWG=rED) In distribution box.

On tower short Battery and Return together and weatherproof well.

B / A-6 DC CONNECTIONS DETAIL

NOT TO SCALE

DO NOT SCALE DRAWINGS. CONTRACTOR MUST VERIFY ALL DIMENSIONS AND ADVISE CONSULTANTS OF ANY ERRORS OR OMISSIONS. NO VARIATIONS OR MODIFICATIONS TO WORK SHOWN SHALL BE IMPLEMENTED WITHOUT PRIOR WRITTEN APPROVAL. ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED BY THE LATEST REVISION. ALL DRAWINGS AND SPECIFICATIONS REMAIN THE PROPERTY OF MORRISON HERSHFIELD CORPORATION. NEITHER MORRISON HERSHFIELD NOR THE ARCHITECT WILL BE PROVIDING CONSTRUCTION REVIEW OF THIS PROJECT.

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:40:23-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:
FIBER AND DC CONNECTION DETAILS

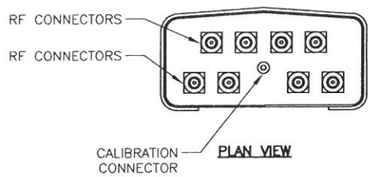
Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. A-6

SCALE IS BASED ON 22" X 34" "D" SIZE

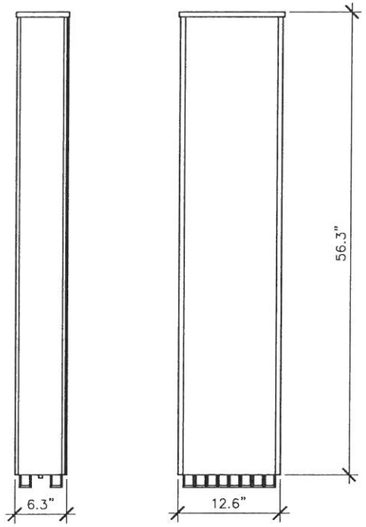
SPRINT ANT TEMPLATE

RFS APXVTM14-ALU-I20

RANDOME MATERIAL:	ASA
RANDOME COLOR:	LIGHT GRAY RAL7035
DIMENSIONS, HxWxD.in (mm):	56.3"x12.6"x6.3" (1430x320x160 mm)
WEIGHT:	56.2 lbs
CONNECTORS:	(8) 4.1/9.5 DIN FEMALE (1) NF – CALIBRATION PORT

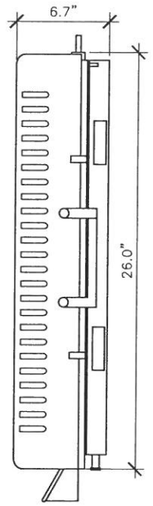


PLAN VIEW



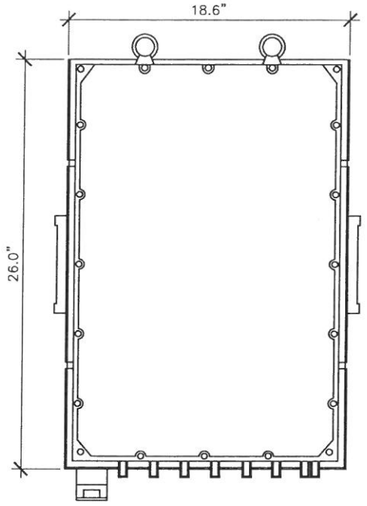
A A-7 2.5 ANTENNA

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

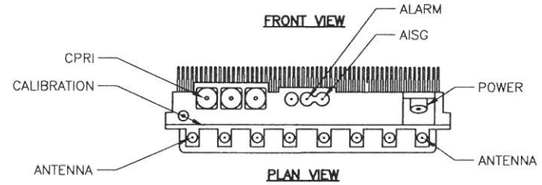


SIDE VIEW

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



FRONT VIEW



PLAN VIEW

B A-7 ALU 2.5 RRU – (MODEL# TD-RRH8x20-25)

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

C A-7 DETAIL NOT USED

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

D A-7 DETAIL NOT USED

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:40:33-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD
8504 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

EQUIPMENT DETAILS

Project No.: 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No.: 0	Drawing No.: A-7

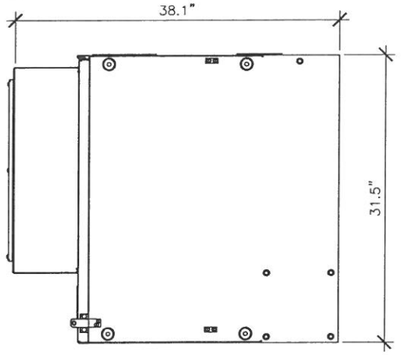
SCALE IS BASED ON 22" X 34" 'D' SIZE

SPRINT A&E TEMPLATE

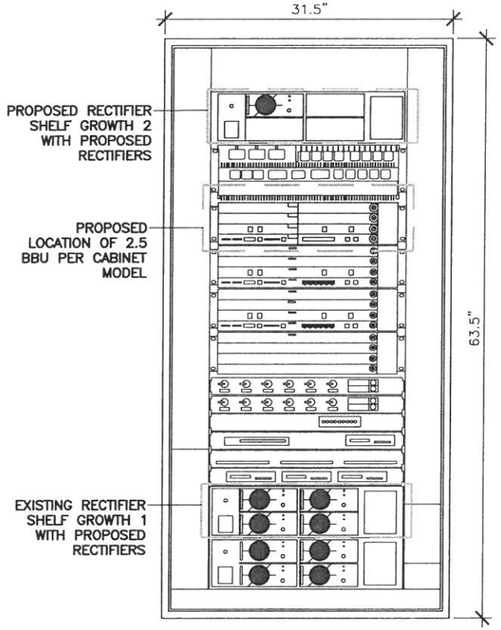
D:\Charlotte\PROJ\716 Series\7160119.00 SBA_Sprint Local Act. MC_MV\8.0 Sites\DG MACRO\RA73XC047\8.2 Design & Development\DAY\DG MACRO UPGRADE_RA73XC047_FD2_ 02.06.18.dwg plotted by: Pdobbins 07 Feb 2018 - 8:02am

1 2 3 4 5 6

D C B A



BOTTOM VIEW

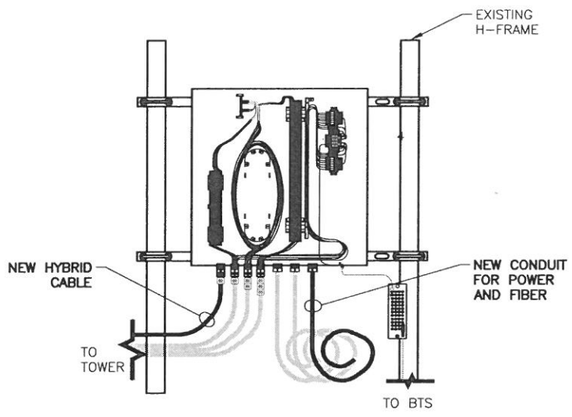


FRONT VIEW

NOTE:
EQUIPMENT INSTALLER TO VERIFY CABINET FRAME PRIOR TO 2.5 EQUIPMENT INSTALLATION

(A) A-8 EXISTING MM-BTS WITH 2.5 EQUIPMENT

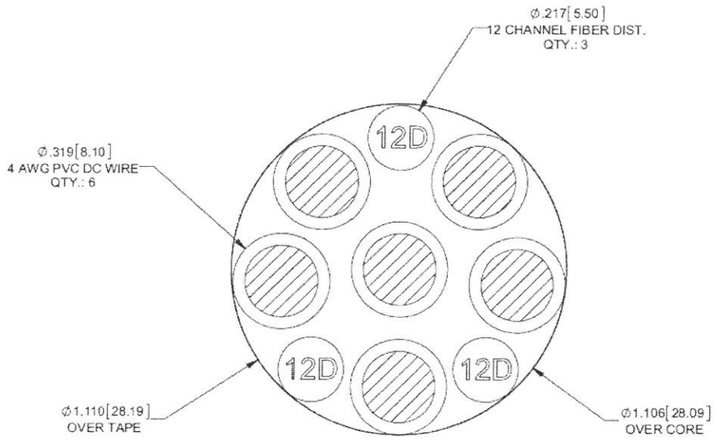
NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)



FRONT VIEW WITH DOOR REMOVED TO SHOW DETAIL

(C) A-8 DISTRIBUTION BOX INSTALL COMPLETE VIEW

NOT TO SCALE



COLOR CODING

NOTE: CABLE CROSS-SECTION NOT DRAWN TO SCALE

NOTE:
GC TO CONFIRM CABLE CONFIGURATION WITH SPRINT CM PRIOR TO CONSTRUCTION.

Structure			
Outer Conductor Armor:	Corrugated Aluminum	[mm (in)]	36.0 (1.42)
Jacket:	Flame Retardant, UV-Resistant	[mm (in)]	39.0 (1.54)
UV-Protection:	Individual and External Jackets		Yes
Standards (meets or exceeds)			UL1569 Type MC UL Listed
Mechanical Properties			
Weight, Approximate		[kg/m (lb/ft)]	1.82 (1.22)
Minimum Bending Radius, Single Bending		[mm (in)]	150 (6)
Minimum Bending Radius, Repeated Bending		[mm (in)]	350 (10)
Recommended/Maximum Clamp Spacing		[m (ft)]	1.0 / 1.2 (3.25 / 4.0)
Electrical Properties			
DC-Resistance Outer Conductor Armor		[Ω/km (Ω/1000ft)]	0.9 (0.27)
DC-Resistance Power Cable, 21.1mm² (4AWG)		[Ω/km (Ω/1000ft)]	0.85 (0.26)
Fiber Optic Properties			
Version			Multi-mode bend tolerant fiber-12 channel cable
Quantity, Fiber Count			18 pairs (9 main, 9 spares)
Core/Clad		[µm]	50/125
Primary Coating (Acrylate)		[µm]	250
Minimum Bending Radius (installation)		[mm (in)]	114.3 (4.5)
Insertion Loss @ wavelength 850nm		dB/km	3.0
Insertion Loss @ wavelength 1310nm		dB/km	1.0
Standards (Meets or exceeds)			UL Listed Type OFNR (UL1666) RoHS Compliant
DC Power Cable Properties			
Size (Power)		[mm² (AWG)]	21.1 (4)
Quantity, Wire Count (Power)			6 (3 pairs)
Type			PVC
Strands			19
Primary Jacket Diameter, Nominal		[mm (in)]	8.1 (0.319)
Standards (Meets or exceeds)			Power Wires UL Standard 83, 1581 National Electrical Code, NFPA 70 VW-1, THHN/THWN RoHS/REACH Compliant Oil and Gasoline Resistance II
Environment			
Installation Temperature		[°C (°F)]	-20 to +65 (-4 to +149)
Operation Temperature		[°C (°F)]	-40 to +65 (-40 to +149)
Storage Temperature		[°C (°F)]	-40 to +70 (-40 to +158)

(B) A-8 1-1/4" HYBRIFLEX RRH HB114-21U3M13 HYBRID CABLE X-SECTION AND DATA

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 031105 ENGINEER YAN WANG

2018.02.09 16:40:44-05'00'

YAN WANG
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#031105

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

EQUIPMENT DETAILS

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. A-8

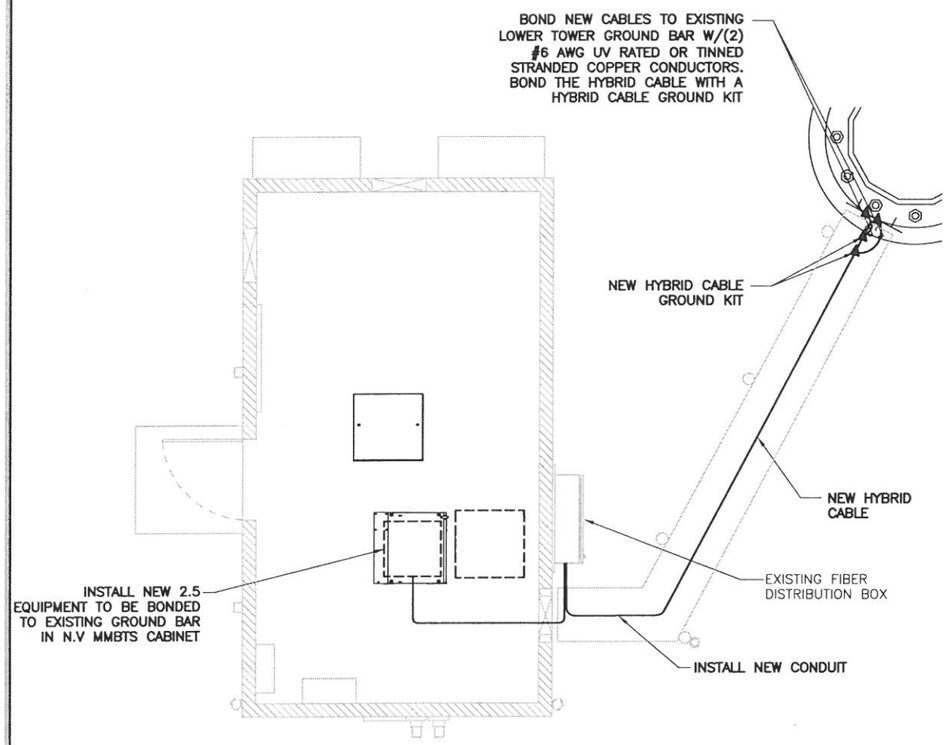
SCALE IS BASED ON 22" X 34" "D" SIZE

SPRINT RF TEMPLATE

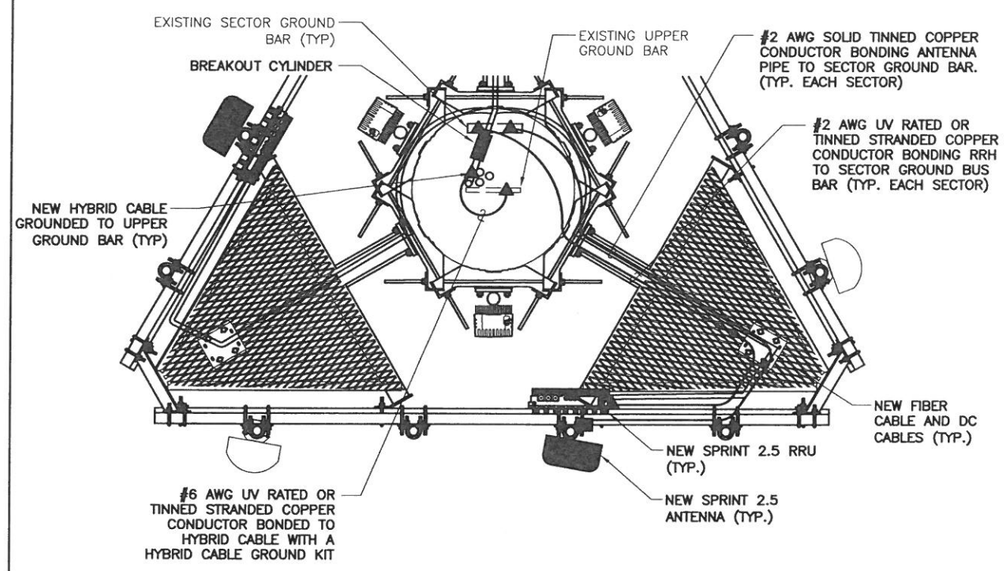
SYMBOL LEGEND

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION

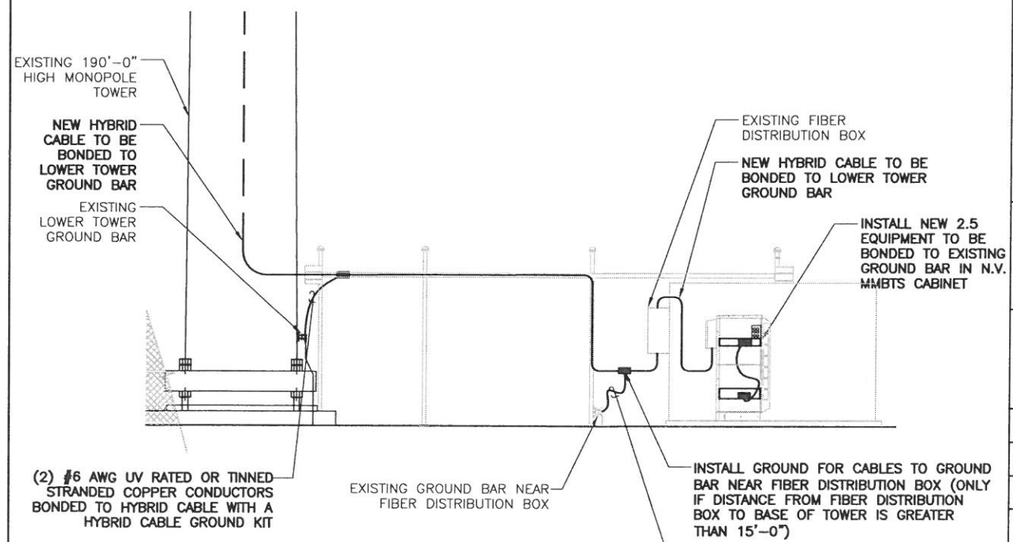
NOTE;
NO WORK TO BE PERFORMED ON AC SIDE OF POWER UNDER THIS SCOPE. ELECTRICAL PANEL IS EXISTING AND TO REMAIN



A / E-1 EQUIPMENT GROUNDING PLAN
NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)



B / E-1 ANTENNA GROUNDING PLAN
NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)



C / E-1 CABLE GROUND DETAIL
NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 042346 ENGINEER JASON M. CEGLIA

2018.02.09 16:41:03-05'00'

JASON M. CEGLIA
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#042346

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:
SBA
SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:
Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

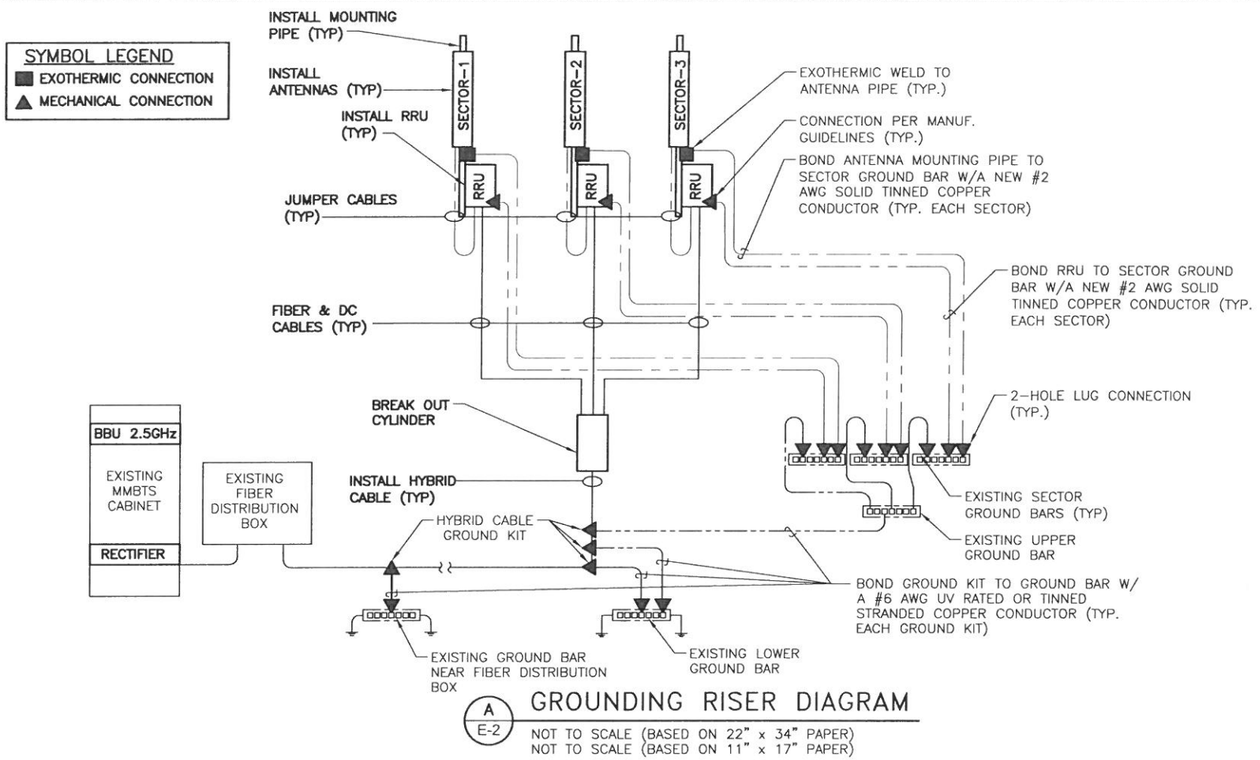
A/E Consultant:
MORRISON HERSHFIELD
8504 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:
EQUIPMENT GROUNDING PLAN

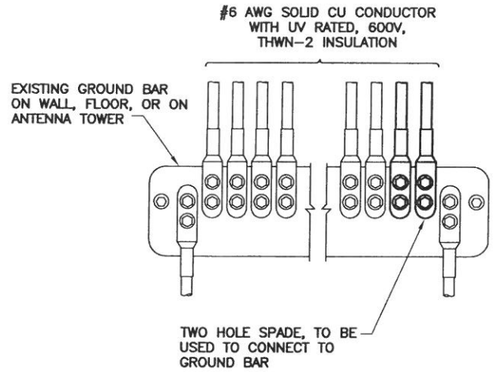
Project No.: 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No.: 0	Drawing No.: E-1

SCALE IS BASED ON 22" X 34" "D" SIZE



A E-2 GROUNDING RISER DIAGRAM

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

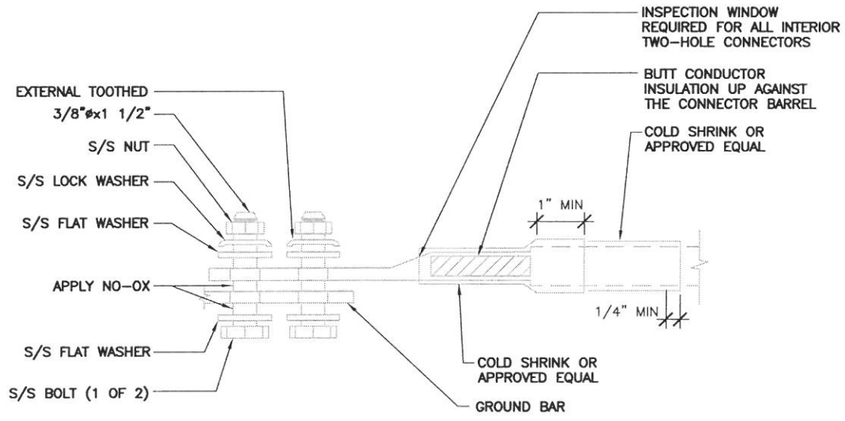


NOTES
1. APPLY NO-OX TO LUG AND BAR CONTACT SURFACE. DO NOT COAT INLINE LUG.

2. IF STOLEN GROUND BARS ARE ENCOUNTERED, CONTACT SPRINT CM FOR REPLACEMENT THREADED ROD KIT.

B E-2 INSTALLATION OF GROUNDING CONDUCTOR TO GROUND BAR

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)



C E-2 TWO HOLE LUG

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

D E-2 NOT USED

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

Professional Certification:

NORTH CAROLINA PROFESSIONAL SEAL 042346 ENGINEER JASON M. CEGLIA

2018.02.09 16:41:14-05'00'

JASON M. CEGLIA
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#042346

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint

6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD

8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:

RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:

GROUNDING DETAILS

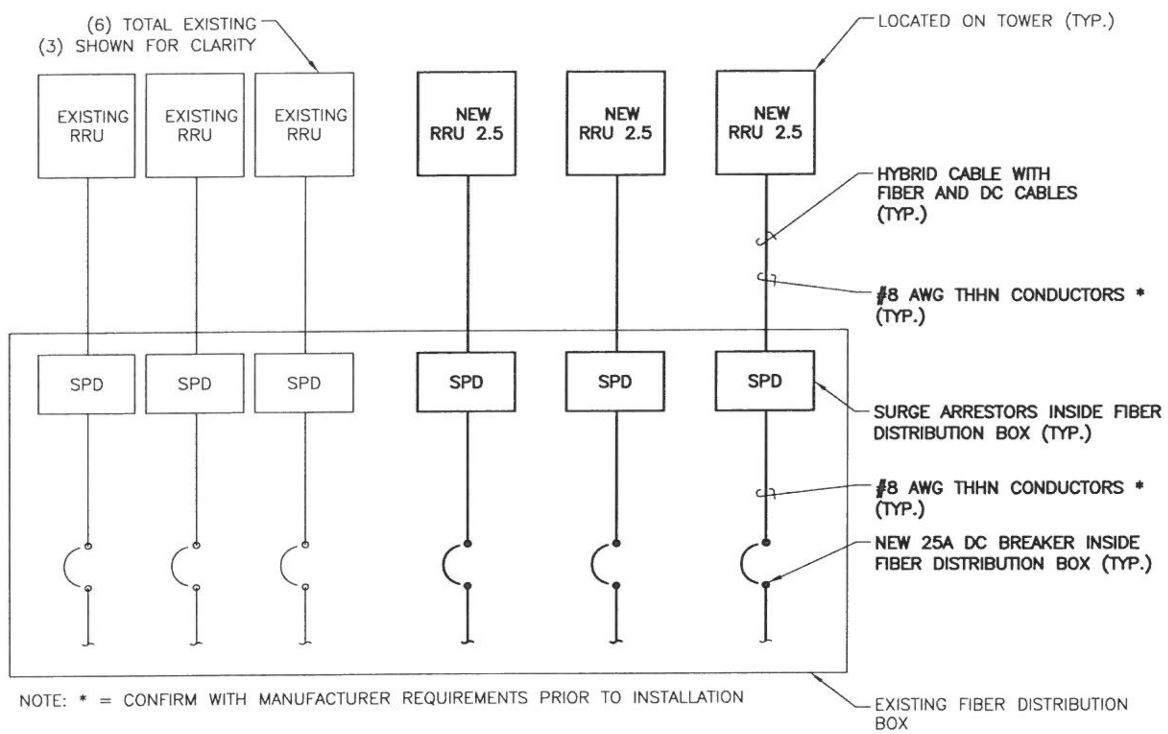
Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. E-2

SPRINT A/E TEMPLATE

SCALE IS BASED ON 22" x 34" 'D' SIZE

1 2 3 4 5 6

D C B A



NOTE: * = CONFIRM WITH MANUFACTURER REQUIREMENTS PRIOR TO INSTALLATION

(A / E-3) DC ONE-LINE DIAGRAM

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

(B / E-3) NOT USED

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

(C / E-3) NOT USED

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

(D / E-3) NOT USED

NOT TO SCALE (BASED ON 22" x 34" PAPER)
NOT TO SCALE (BASED ON 11" x 17" PAPER)

Professional Certification:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042346 JASON M. CEGLIA

2018.02.09 16:41:25-05'00'
JASON M. CEGLIA
REGISTERED ENGINEER
STATE OF NORTH CAROLINA
PE#042346

No.	Date	Action
0	02/07/18	REVIEW FOR PERMIT
A	01/19/18	ISSUED FOR REVIEW

Tower Owner / Client:

SBA COMMUNICATIONS CORPORATION
8051 CONGRESS AVE.
BOCA RATON, FL 33487-2797

Applicant:

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

A/E Consultant:

MORRISON HERSHFIELD
8604 Cliff Cameron Drive, Suite 152
Charlotte, NC 28269
TEL: 704.499.6861 FAX: 704.547.5231
www.morrisonhershfield.com

Project:
RA73XC047
RA73XC047
6080 HIGHWAY 421 N
LILLINGTON, NC 27546

Drawing Title:
DC POWER & DISTRIBUTION

Project No. 7160119	
Designer: CG	Date: 01/19/18
Drawn By: RR	Checked By: CG
PM Review: JG	Client Approval
Issue No. 0	Drawing No. E-3

SCALE IS BASED ON 22" X 34" "D" SIZE