

CITY OF CAMBRIDGE MASSACHUSETTS BOARD OF ZONING APPEAL 831 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02139 617 349-6100

BZA APPLICATION FORM

Plan No:

BZA-016961-2018

The unders	signed he	reby peti	tions the Boa	ird of Zoning Appeal	I for the	e follow	ving:				
Special Per	rmit :		<u>e</u>	Variance :				Appea	1:		
PETITIONE	R:	Sprint	Spectrum F	Realty Company,	LLC	- C/O	Simon E	Brighent	ti, JD	Centerli	ne Com
PETITIONE	R'S ADD	RESS:	_750 We	st Center Stree	et Flo	oor 3	West Br	ridgewat	er, MA	02379	
LOCATION	OF PRO	PERTY:	400 Mai	n St Cambridge,	, MA	02142					
TYPE OF O	CCUPAN	ICY:	Utilities		z	ONING	DISTRICT	T: Res	idence	C-3B Zon	ıe
REASON F	OR PETI	TION :									
		Othe	er: Remove	and Replace ex	istin	g tel	ecom eq	uipment			
DESCRIPTI	ION OF P	ETITION	ER'S PROPOS	SAL:							
				itted rooftop t s an eligible f							_
SECTIONS	OF ZONI	NG ORD	NANCE CITE	D:							
Article	4.000		Section	4.32.G.1 (Tele	commu	nicat	ion Fac	ility).			
Article	4.000		Section	4.40 (Footnote	49)	(Tele	communi	cation	Facilit	y).	
Article	6409		Section	47 USC 1455 (a	i)						
				Original Signature((s) :		Simon	Brigh	Menorer(s) / (ΓD	
				Addre	ess:	<u>750</u>	D West	cente	r 5t.	Ste. 3	501
										er, MA	
				Tel. No	o. :		13-2		•	,	
				E-Mail	l Addre					rella.com	n
Data :	10/25	118									



Date: 10/25/18

CITY OF CAMBRIDGE MASSACHUSETTS BOARD OF ZONING APPEAL 831 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02139 617 349-6100

BZA APPLICATION FORM

Plan No:

BZA-016961-2018

The undersigned hereby petitions the Boa	rd of Zoning Appeal for the	following:
Special Permit : √	Variance :	Appeal :
PETITIONER: Sprint Spectrum F	tealty Company, LLC -	- C/O Simon Brighenti, JD Centerline Com
PETITIONER'S ADDRESS : 750 We	st Center Street Flo	oor 3 West Bridgewater, MA 02379
LOCATION OF PROPERTY: 400 Mai	n St Cambridge, MA C)2142
TYPE OF OCCUPANCY: Utilities	z	ONING DISTRICT: Residence C-3B Zone
REASON FOR PETITION :		
Other: Remove	and Replace existing	g telecom equipment
DESCRIPTION OF PETITIONER'S PROPOS	SAL:	
with upgraded equipment. This i	s an eligible facili	mmunication equipment and replace ty request pursuant to 47 USC 1455
SECTIONS OF ZONING ORDINANCE CITE		
	4.32.G.1 (Telecommun	, a construir de la construir
Article 4.000 Section	4.40 (Footnote 49)	(Telecommunication Facility).
Article 6409 Section	47 USC 1455 (a)	
	Original Signature(s) :	Muion Brigherni de. (Petitioner(s) / Owner)
		Simon Brighenti, J.D. (Print Name)
	Address:	750 West Center Street Ste. 301
		Wist Bridgewater, MA 02379
	Tel. No.:	413-237-1550
	E-Mail Addre	ss: Sbrighertia cline 116.com



CITY OF CAMBRIDGE **MASSACHUSETTS BOARD OF ZONING APPEAL** 831 MASSACHUSETTS AVENUE **CAMBRIDGE, MA 02139** 617 349-6100

BZA APPLICATION FORM

Plan No: BZA-016961-2018

The under	signed hereby peti	tions the Boar	d of Zoning Appeal for th	e following:			
Special Pe	ermit: <u>√</u>		Variance :	Ap	peal:	-	
PETITION	ER: Sprint	Spectrum Re	ealty Company, LLC	- C/O Simon Brigh	enti,	JD Centerline Com	
PETITION	ETITIONER'S ADDRESS: 750 West Center Street Floor 3 West Bridgewater, MA 02379						
LOCATION	OF PROPERTY:	400 Mair	n St Cambridge, MA	02142			
TYPE OF (OCCUPANCY:	Utilities	z	ONING DISTRICT :	Reside	nce C-3B Zone	
REASON F	OR PETITION :						
	Othe	er: Remove a	and Replace existir	ng telecom equipme	ent		
DESCRIPT	ION OF PETITION	ER'S PROPOSA	AL:				
with upo		nt. This is	tted rooftop teleco an eligible facil				
Article			4.32.G.1 (Telecommu	nication Facility	y).		
Article	(Comments of the Comments of	Section	4.40 (Footnote 49)	(Telecommunication	on Fac	ility).	
Article		- Section	47 USC 1455 (a)				
			Original Signature(s) :	Simon Brigh		(s) / Owner)	
			Address :			- St. Suito 301	
				West Bridgen			
			Tel. No. :	413 - 237 -		9	
			E-Mail Addre		30-TC-10	linella.com	
D-4-	() selie			_ Serigitin	1100		

OWNERSHIP CERTIFICATE

Project Address: 400 Main Street

Application Date:

This form is to be completed by the property owner, signed, and submitted with the Special Permit Application:

I hereby authorize the following Applicant:

T. Ranciato-Viele Centerline Communications LLC

at the following address:

750 W. Center St, W. Bridgewater, MA 02379

to apply for a special permit for:

Sprint's proposed modifications at an existing cell site.

on premises located at:

400 Main Street

for which the record title stands in the name of:

whose address is: 400 Main Street

by a deed duly recorded in the:

Book: 9737 Page: 321 Book: 12083 Page:668

OR Registry District of the Land

Registry of Deeds of County:

Book: 12954 Page: 374

Court.

Book:

Certificate No.:

Signature of Land Owner (If authorized Trustee, Officer or Agent, so identify)

To be completed by Notary Public:

Commonwealth of Massachusetts, County of

The above named Anthony P. Shorm personally appeared before me,

on the month, day and year October 33, 3018 and made oath that the above statement is true.

My Commission expires:

SHARON PINKSTEN March 5, 2021

CITY OF CAMBRIDGE, MA • PLANNING BOARD • SPECIAL PERMIT

APPLICATION

BZA APPLICATION FORM

SUPPORTING STATEMENT FOR A SPECIAL PERMIT

Please describe in complete detail how you meet each of the following criteria referring to the property and proposed changes or uses which are requested in your application. Attach sheets with additional information for special permits which have additional criteria, e.g.; fast food permits, comprehensive permits, etc., which must be met.

Granting the Special Permit requested for 400 Main St Cambridge, MA 02142 (location) would not be a detriment to the public interest because:

- A) Requirements of the Ordinance can or will be met for the following reasons:
 - The existing base station is an eligible support structure pursuant to Section 6409 of the Middle-Class Tax Relief and Job Creation Act of 2012, 47 USC 1455 Section 6409. There will be little to no change to the existing conditions.
- B) Traffic generated or patterns of access or egress would not cause congestion hazard, or substantial change in established neighborhood character for the following reasons:
 - There will be no additional traffic or congestion created subsequent to the minimal disruption concomitant with the removal and replecement of the subject equipment.
- The continued operation of or the development of adjacent uses as permitted in the Zoning Ordinance would not be adversely affected by the nature of the proposed use for the following reasons:
 - There will be no impact upon the existing cited conditions.
- Nuisance or hazard would not be created to the detriment of the health, safety and/or welfare of the occupant of the proposed use or the citizens of the City for the following reasons:
 - There will be no detriment to the health, safety and/or welfare of the residents of and visitors to the area. To the contrary, enhanced and more robust telecommunication service will supplement the ability to communicate in both emergency and non-emergency situations.
- E) For other reasons, the proposed use would not impair the integrity of the district or adjoining district or otherwise derogate from the intent or purpose of this ordinance for the following reasons:

 See attached supplemental information.

BZA APPLICATION FORM

DIMENSIONAL INFORMATION

REQUESTED

CONDITIONS

ORDINANCE REQUIREMENTS

APPLICANT: Centerline Communications, LLC PRESENT USE/OCCUPANCY: Educational/Telecom

LOCATION: 400 Main St Cambridge, MA 02142 ZONE: Residence C-3B Zone

PHONE: REQUESTED USE/OCCUPANCY: Educational/Telecom

EXISTING

CONDITIONS

		CONDITIONS	CONDITIONS	REQUIREMENTS	
TOTAL GROSS FLOOR AR	REA:	NA NA	NA	NA NA	(max.)
LOT AREA:		NA	NA	NA	(min.)
RATIO OF GROSS FLOOR TO LOT AREA: 2	AREA	NA NA	NA NA	NA	(max.)
LOT AREA FOR EACH DW	ELLING UNIT:	NA	NA	NA	(min.)
SIZE OF LOT:	WIDTH	NA	NA	NA	(min.)
	DEPTH	NA	NA	NA	
SETBACKS IN FEET:	FRONT	NA	NA	NA	(min.)
	REAR	NA	NA	NA	(min.)
	LEFT SIDE	NA	NA	NA	(min.)
	RIGHT SIDE	NA	NA	NA	(min.)
SIZE OF BLDG.:	HEIGHT	NA	NA	NA	(max.)
	LENGTH	NA	NA	NA	
	WIDTH	NA	NA	NA	
RATIO OF USABLE OPEN	SPACE	NA	NA	NA	(min.)
TO LOT AREA:	· ·	NA	NA	NA	(max.)
NO. OF PARKING SPACES:		NA NA	NA	NA	(min./max)
NO. OF LOADING AREAS:		NA	NA	NA	(min.)
DISTANCE TO NEAREST BLDG.		NA	NA	NA	(min.)
ON SAME LOT:					_
Describe where appl	icable, other	occupancies on sam	ne lot, the size of		on same lot,

Describe where applicable, other occupancies on same lot, the size of adjacent buildings on same lot, and type of construction proposed, e.g.; wood frame, concrete, brick, steel, etc.

NA

- 1. SEE CAMBRIDGE ZONING ORDINANCE ARTICLE 5.000, SECTION 5.30 (DISTRICT OF DIMENSIONAL REGULATIONS).
- 2. TOTAL GROSS FLOOR AREA (INCLUDING BASEMENT 7'-0" IN HEIGHT AND ATTIC AREAS GREATER THAN 5') DIVIDED BY LOT AREA.
- 3. OPEN SPACE SHALL NOT INCLUDE PARKING AREAS, WALKWAYS OR DRIVEWAYS AND SHALL HAVE A MINIMUM DIMENSION OF 15'.



10/25/18

Date:

CITY OF CAMBRIDGE MASSACHUSET. BOARD OF ZONING APPEAL 831 MASSACHUSETTS AVENUE CAMBRIDGE, MA 02139 617 349-6100

BZA APPLICATION FORM

Plan No:

DCT 300

					4 D:
The unders	signed hereby pet	itions the Boar	rd of Zoning Appeal for the	e following:	USE 5
Special Pe	rmit :	_	Variance :	Appeal:	TIS O
PETITIONE	R: Sprint	Spectrum R	ealty Company, LLC	- C/O Simon Brighenti,	JD Centerline Com
PETITIONE	R'S ADDRESS :	750 Wes	st Center Street Flo	oor 3 West Bridgewater,	MA 02379
LOCATION	OF PROPERTY :	400 Mai	n St Cambridge, MA	02142	
TYPE OF C	CCUPANCY:	Utilities	z	ONING DISTRICT: Reside	ence C-3B Zone
REASON F	OR PETITION :				
	Oth	er: Remove	and Replace existin	ng telecom equipment	
DESCRIPT	ION OF PETITION	ER'S PROPOS	AL:		
				ommunication equipment ity request pursuant to	
SECTIONS	OF ZONING ORD	INANCE CITE			
Article				unication Facility).	
Article				(Telecommunication Fac	ility).
Article		_	47 USC 1455 (a)		
				Λ.	
			Original Signature(s):	Mun Brigher (Petitioner	PC (V_ r(s) / Owner)
				Simon Brighenti,	Name)
			Address:	750 Vest Center	- St. Suito 301
				West Bridgewater	MA 02379
			Tel. No.:	413-237-155	•
			E-Mail Addre	10 to 12 to	3



CAMBRIDGE HISTORICAL COMMISSION

831 Massachusetts Avenue, 2nd Floor, Cambridge, Massachusetts 02139

Telephone: 617 349 4683 TTY: 617 349 6112

E-mail: histcomm@cambridgema.gov URL: http://www.cambridgema.gov/Historic

Bruce A. Irving, *Chair*; Susannah Barton Tobin, *Vice Chair*; Charles M. Sullivan, *Executive Director* William G. Barry, Jr., Robert G. Crocker, Joseph V. Ferrara, Chandra Harrington, Jo M. Solet, *Members* Gavin W. Kleespies, Paula A. Paris, Kyle Sheffield, *Alternates*

Jurisdiction Advice

	Jurisdiction Advice	
To the Owner of Property at	400 Main Street	
The above-referenced property is reason of the status referenced be		mbridge Historical Commission (CHC) by
Fort Washing	ing studied for designation:de, Ch. 2.78., Article III, and variou Restriction or Easement (as recorded fifty years or more old and therefore nolition permit, if one is required by of this page for definition of demolition permit application anticipated in: not a designated historic property	s City Council Orders) s Sity Council Orders) e subject to CHC review of any application ISD. (City Code, Ch. 2.78, Article II). See tion. and the structure is less than fifty years the National Register of Historic Places; request.
	ises applicants to complete Historica n reviews before appearing before the	
	sdiction is checked, the owner nee mine whether a hearing will be re	
CHC staff initialsSLB	Date	e_ July 16, 2018
Received by Uploaded to Relationship to project BZA 1		e <u>July 16, 2018</u>
cc: Applicant Inspectional Services Cor	mmissioner	

Demolition Delay Ordinance and Application Information

The Demolition Delay Ordinance (Chapter 2.78, Article II of the Cambridge Municipal Code) was adopted by the City Council in 1979 to afford public review of demolition permit applications for potentially significant buildings. When the Historical Commission determines that a building is significant and should be preserved, demolition will be delayed for up to six months so that solutions can be sought to preserve the building indefinitely. The Ordinance covers all buildings over 50 years old, city-wide. The Historical Commission archives provide dates of construction for all properties in the City.

Demolition is defined in the ordinance as "the act of pulling down, destroying, removing or razing a building or commencing the work of total or substantial destruction with the intent of completing the same." The Inspectional Services Commissioner has provided further guidelines to outline what actions require a demolition permit. In addition to complete demolition of a building, the following actions may require a demolition permit,

- removal of a roof,
- removal of one side of a building,
- gutting of a building's interior to the point where exterior features (windows, etc.) are impacted, and
- removal of more than 25% of a structure.

Please contact the building inspector or a staff member of the Historical Commission if you have questions about whether a demolition permit is required for a particular project.

Demolition permit applications can be obtained from the Inspectional Services Department. The completed application should be submitted to the Historical Commission, where the staff will review the application. If the Executive Director of the Historical Commission makes an initial determination that the building is significant, a public hearing will be scheduled with Historical Commission. If the staff makes an initial determination that the building is not significant, the application is released for further review by the Building Commissioner.

More information about the demolition permit application procedures is available on the Historical Commission's web site or by calling or dropping by the Historical Commission office.

July 2003

Cambridge Historical Commission 831 Massachusetts Ave., 2nd Fl. Cambridge, MA 02139 Ph: 617/349-4683 or TTY: 617/349-6112 http://www.cambridgema.gov/Historic **SPECIAL CONSTRUCTION NOTE:**

SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:

- st COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER OR AstE VENDOR).
- * COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR)
- * GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE—MENTIONED ANALYSIS AND ASSESSMENT.



PROJECT: DO MACRO UPGRADE

MIT EAST SITE NAME:

SITE CASCADE: BS80XC001

SITE ADDRESS: 400 MAIN STREET

CAMBRIDGE, MA 02139

TITLE SHEET

OUTLINE SPECIFICATIONS

OUTLINE SPECIFICATIONS

OUTLINE SPECIFICATIONS

ELEVATION PLAN

ANTENNA PLANS

RF DATA SHEET

RAN WIRING DIAGRAMS

EQUIPMENT DETAILS

EQUIPMENT DETAILS

STRUCTURAL DETAILS

ONE-LINE DIAGRAM & PPC DETAILS

DEPARTMENT AND MAY IMPOSE CHANGES OR MODIFICATIONS.

GROUNDING DETAILS & NOTES

ROOF & EQUIPMENT PLANS

SHEET NO.

A-3

A-6

A-7

S-1

E-2

SITE TYPE: ROOFTOP

SITE INFORMATION

PROPERTY OWNER: MASSACHUSETTS INSTITUTE OF TECHNOLOGY

238 MAIN STREET, SUITE 200

CAMBRIDGE, MA 02142

LATITUDE (NAD83): **GOOGLE EARTH 2-C CONFIRMATION**

N 42° 21' 44.36" 42.362322°

LONGITUDE (NAD83): GOOGLE EARTH 2-C CONFIRMATION

W 71° 05' 16.04" 71.087789°

COUNTY:

MIDDLESEX

ZONING JURISDICTION:

CITY OF CAMBRIDGE

ZONING DISTRICT: RESIDENCE C-3B

POWER COMPANY:

NSTAR ELECTRIC PHONE: 1-888-633-3797

AAV PROVIDER:

PHONE: 1-800-COMCAST

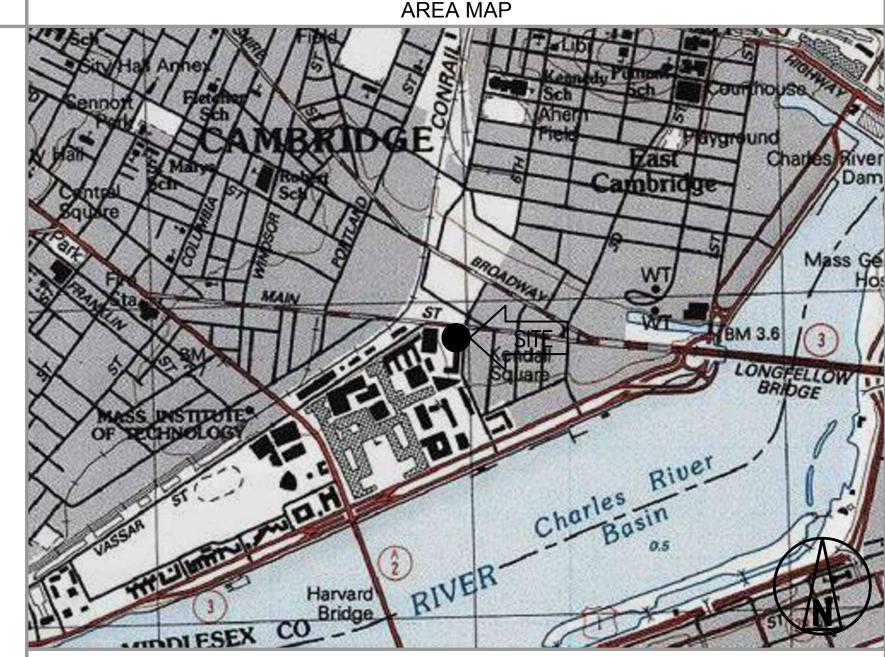
COMCAST

SPRINT CM:

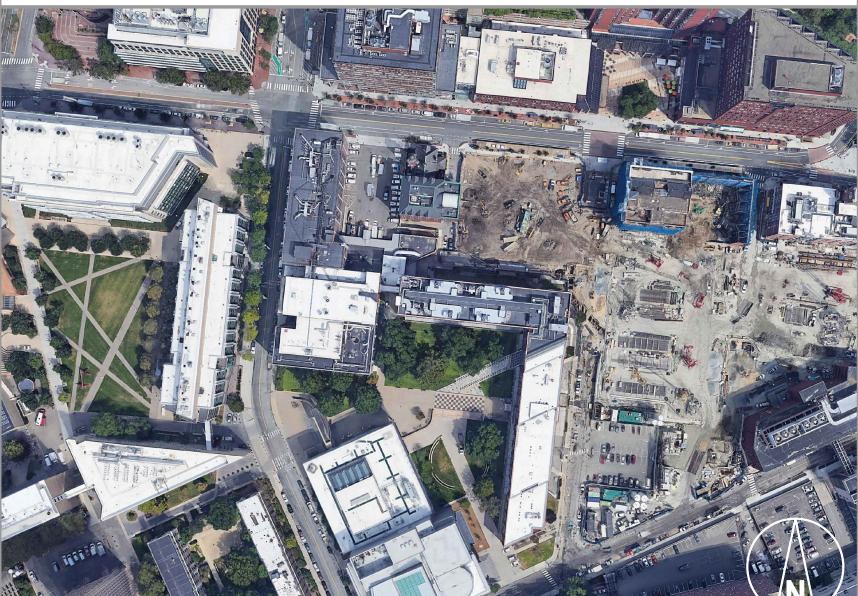
CHAD WAGNER PHONE: 617-529-0973 Chad.Wagner@sprint.com

EQUIPMENT SUPPLIER:

ALCATEL-LUCENT 600 MOUNTAIN AVENUE MURRAY HILL, NJ 07974 (908) 508-8080



LOCATION MAP - GOOGLE EARTH 2-C CONFIRMATION



GENERAL NOTES

PROJECT DESCRIPTION

SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN

(1) NEW 2.5GHz RETROFIT KIT & RECTIFIERS (AS REQ'D) WITHIN EXISTING MM-BTS EQUIPMENT CABINET

(1) ADDITIONAL BATTERY STRING(S) WITHIN EXISTING BATTERY RACK

• (6) PANEL ANTENNAS TO REPLACE EXISTING (3) PANEL ANTENNAS

BASED ON INFORMATION PROVIDED BY SPRINT REGULATORY COMPLIANCE

(VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT

DEPLOYMENT IS CONSIDERED AN ELIGIBLE FACILITY UNDER THE TAX RELIEF ACT OF

2012. 47 USC 1455(A). AND IS SUBJECT TO AN EXPEDITED ELIGIBLE FACILITIES

REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS

GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF

TOWER-TOP EQUIPMENT, INCLUDING INSTALLATION OF:

(6) REMOTE RADIO HEADS (RRH)

<u>SPECIAL ZONING NOTE:</u>

EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND SPECTRUM LICENSE FOR 2.5GHz FREQUENCY, INCLUDING INSTALLATION OF:

- THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY. AND IS NOT FOR HUMAN HABITATION. IT WILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE.
- ADA COMPLIANCE NOT REQUIRED. PORTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.
- NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
- CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACE THE RESPONSIBILITY ON THE SPRINT: CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
- NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES. BUILDING CODE: MASSACHUSETTS STATE BUILDING CODE 780-CMR (9TH EDITION) ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE
- STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

AT LEAST 72 HOURS PRIOR TO DIGGING, THE CONTRACTOR IS **REQUIRED TO CALL DIG SAFE AT 811**



TOWER OWNER:

CONSTRUCTION DATE: MANAGER: LEASING/ SITE ACQUISITION: RF ENGINEER: LANDLORD/

APPROVALS

THE FOLLOWING PARTIES HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND

AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED

HEREIN. ALL DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING

DRAWING INDEX

JMT

DATE:

JRV

JRV

JRV

0

SHEET TITLE

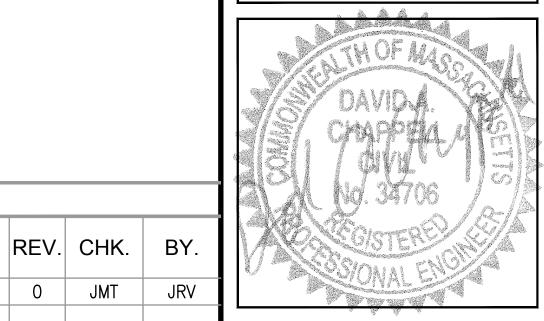




(844) 748-8878 www.centerlinecommunications.com



R.K. EXECUTIVE CENTRE 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752 www.chappellengineering.com



NOT BE REPRODUCED, DISSEMINATED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT OF SPRINT.

CHECKED BY:

APP	APPROVED BY:		
	SI	JBMITTALS	
REV.	DATE	DESCRIPTION	BY

SITE NUMBER: BS80XC001 SITE NAME:

0 06/22/18 ISSUED FOR REVIEW

SITE ADDRESS:

MIT EAST

400 MAIN STREET CAMBRIDGE, MA 02139

TITLE SHEET

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 1.13 CONTRACTOR SHALL TAKE ALL MEASURES AND PROVIDE ALL MATERIAL NECESSARY FOR MADE A PART OF THESE SPECIFICATIONS HEREWITH.
- 1.3 PRECEDENCE: SHOULD CONFLICTS OCCUR BETWEEN THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES INCLUDING THE STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES AND THE CONSTRUCTION DRAWINGS, INFORMATION ON THE CONSTRUCTION DRAWINGS SHALL TAKE PRECEDENCE. NOTIFY SPRINT CONSTRUCTION MANAGER IF THIS OCCURS.
- 1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:
- A. THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- 1. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- 2. GR-1089 CORE, ELECTROMAGNETIC COMPATIBILITY AND ELECTRICAL SAFETY -GENERIC CRITERIA FOR NETWORK TELECOMMUNICATIONS EQUIPMENT.
- 3. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE - "NEC") AND NFPA 101 (LIFE SAFETY CODE).
- 4. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM)
- 5. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE)
- 6. AMERICAN CONCRETE INSTITUTE (ACI)
- 7. AMERICAN WIRE PRODUCERS ASSOCIATION (AWPA)
- 8. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)
- 9. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)
- 10. PORTLAND CEMENT ASSOCIATION (PCA)
- 11. NATIONAL CONCRETE MASONRY ASSOCIATION (NCMA)
- 12. BRICK INDUSTRY ASSOCIATION (BIA)
- 13. AMERICAN WELDING SOCIETY (AWS)
- 14. NATIONAL ROOFING CONTRACTORS ASSOCIATION (NRCA)
- 15. SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)
- 16. DOOR AND HARDWARE INSTITUTE (DHI)
- 17. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
- 18. APPLICABLE BUILDING CODES INCLUDING UNIFORM BUILDING CODE, SOUTHERN BUILDING CODE, BOCA, AND THE INTERNATIONAL BUILDING CODE.
- 1.5 DEFINITIONS:
 - 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.
- 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 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.
- 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.

- 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 1.2 RELATED DOCUMENTS: WHERE SHOWN. ALL SUCH ACTIONS SHALL BE COORDINATED WITH THE UTILITY COMPANY
- 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.
- 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.
 - B. HOW TO INSTALL A NEW CABINET
 - BASE BAND UNIT IN EXISTING UNIT INSTALLATION OF BATTERIES
 - INSTALLATION OF HYBRID CABLE
 - INSTALLATION OF RRH'S
 - CABLING
 - TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS
 - SPRINT CELL SITE ENGINEERING NOTICE EN 2012-001, REV 1.
 - COMMISSIONING MOPS
 - SPRINT CELL SITE ENGINEERING NOTICE EN-2013-002
 - SPRINT ENGINEERING LETTER EL-0504
 - SPRINT ENGINEERING LETTER EL-0568 N. SPRINT TECHNICAL SPECIFICATION - TS-0193
- 1.15 USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:
 - CONTRACTOR WILL UTILIZE ITS BEST EFFORTS TO WORK WITH SPRINT ELECTRONIC PROJECT MANAGEMENT SYSTEMS. CONTRACTOR UNDERSTANDS THAT SUFFICIENT INTERNET ACCESS, EQUIVALENT TO "BROADBAND" OR BETTER, IS REQUIRED TO TIMELY AND EFFECTIVELY UTILIZE SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS AND AGREES TO MAINTAIN APPROPRIATE CONNECTIONS FOR CONTRACTOR'S STAFF AND OFFICES THAT ARE COMPATIBLE WITH SPRINT DATA AND DOCUMENT MANAGEMENT SYSTEMS

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- 3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.
- 3.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.
- 3.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.
- 3.4 <u>DIMENSIONS</u>: 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

- THROUGH THE SINGLE SPRINT CONSTRUCTION MANAGER APPOINTED TO MANAGE THE PROJECT 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 <u>RECEIPT OF MATERIAL AND EQUIPMENT:</u>
 - 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
 - VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
 - 3. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN
 - 4. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO SPRINT OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
 - 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 <u>DELIVERABLES:</u>
 - A. COMPLETE SHIPPING AND RECEIPT DOCUMENTATION IN ACCORDANCE WITH COMPANY PRACTICE.
 - B. IF APPLICABLE, COMPLETE LOST/STOLEN/DAMAGED DOCUMENTATION REPORT AS NECESSARY IN ACCORDANCE WITH COMPANY PRACTICE, AND AS DIRECTED BY COMPANY.
 - C. UPLOAD DOCUMENTATION INTO SPRINT SITE MANAGEMENT SYSTEM (SMS) AND/OR PROVIDE HARD COPY DOCUMENTATION AS REQUESTED.

SECTION 01 300 - CELL SITE CONSTRUCTION

PART 1 — GENERAL

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

- 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. TOWER OWNER NOTIFICATION: ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, THE CONTRACTOR WILL CONTACT THE 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 TO NOTIFY THE CARRIER 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:
- PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
- 2. PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND COMPOUND SURFACE TREATMENTS.
- MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND
- 4. INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMMUNICATIONS CONDUITS, AND UNDERGROUND GROUNDING SYSTEM.
- INSTALL ABOVE GROUND GROUNDING SYSTEMS.
- PROVIDE NEW HVAC INSTALLATIONS AND MODIFICATIONS.
- INSTALL "H-FRAMES", CABINETS AND SHELTERS AS INDICATED.
- INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.
- 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
- 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
- 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 <u>DELIVERABLES:</u>
 - 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.
 - 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).

CONTINUE SHEET SP-2

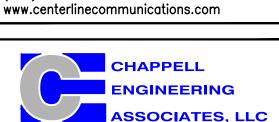


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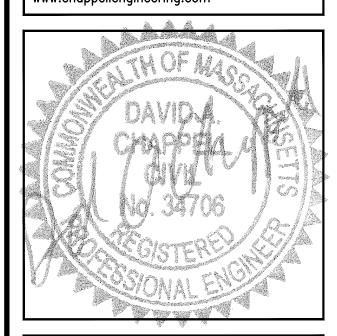
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CAMBRIDGE, MA 02139

OUTLINE SPECIFICATIONS

CONTINUED FROM SP-1:

- 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, AND INSPECTIONS

PART 1 - GENERAL

- 1.1 <u>THE WORK:</u> 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.
- CONCRETE BREAK TESTS AS SPECIFIED HEREIN.
 SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.
- 4. ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.
- 5. CHEMICAL GROUNDING DESIGN.
- C. ALTERNATES: AT THE COMPANY'S REQUEST, ANY ALTERNATIVES TO THE MATERIALS OR METHODS SPECIFIED SHALL BE SUBMITTED TO SPRINT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO BEING SHIPPED TO SITE. SPRINT WILL REVIEW AND APPROVE ONLY THOSE REQUESTS MADE IN WRITING. NO VERBAL APPROVALS WILL BE CONSIDERED. SUBMITTAL FOR APPROVAL SHALL INCLUDE A STATEMENT OF COST REDUCTION PROPOSED FOR USE OF ALTERNATE PRODUCT.

1.4 TESTS AND INSPECTIONS:

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- 1. COAX SWEEPS AND FIBER TESTS PER SPRINT TS-0200 CURRENT VERSION ANTENNA LINE ACCEPTANCE STANDARDS.
- 2. AGL, AZIMUTH AND DOWNTILT USING ELECTRONIC COMMERCIAL MADE—FOR—THE—PURPOSE ANTENNA ALIGNMENT TOOL.
- 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 <u>COMMISSIONING:</u> PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS
- 1.6 <u>INTEGRATION:</u> PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS
- PART 2 PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 REQUIREMENTS FOR TESTING:

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

3.2 REQUIRED TESTS:

- A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- 1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVING.
- ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY TESTING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVING.
 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
- 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.
- FORMING FOR CONCRETE AND REBAR PLACEMENT PRIOR TO POUR DOCUMENTED WITH DIGITAL PHOTOGRAPHS BY CONTRACTOR, APPROVED BY A&E OR SPRINT REPRESENTATIVE.
 COMPACTION OF BACKFILL MATERIALS; AGGREGATE BASE FOR ROADS, PADS, AND ANCHORS;
- ASPHALT PAVING; AND SHAFT BACKFILL FOR CONCRETE AND WOOD POLES, BY INDEPENDENT THIRD PARTY AGENCY.
- 4. PRE— AND POST—CONSTRUCTION ROOFTOP AND STRUCTURAL INSPECTIONS ON EXISTING FACILITIES.
- 5. TOWER ERECTION SECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL PHOTOGRAPHS BY THIRD PARTY AGENCY.
 6. ANTENNA AZIMUTH, DOWN TILT AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS —
- ANTENNALIGN ALIGNMENT TOOL (AAT)
 7 VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT BY A&F SIT
- 7. VERIFICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE DEVELOPMENT REP, OR RF REP.
- 8. FINAL INSPECTION CHECKLIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SMS.
- 9. COAX SWEEP AND FIBER TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.

 10. SCAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT
- 11. ALL AVAILABLE JURISDICTIONAL INFORMATION
- 12. PDF SCAN OF REDLINES PRODUCED IN FIELD
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF TESTING.
- F. CONSTRUCTION INSPECTIONS AND CORRECTIVE MEASURES SHALL BE DOCUMENTED BY THE CONTRACTOR WITH WRITTEN REPORTS AND PHOTOGRAPHS. PHOTOGRAPHS MUST BE DIGITAL AND OF SUFFICIENT QUALITY TO CLEARLY SHOW THE SITE CONSTRUCTION. PHOTOGRAPHS MUST CLEARLY IDENTIFY THE PHOTOGRAPHED ITEM AND BE LABELED WITH THE SITE CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.
- 3.4 <u>DELIVERABLES:</u> 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;
- TEST WELLS AND TRENCHES: PHOTOGRAPHS OF ALL TEST WELLS; PHOTOGRAPHS SHOWING ALL
 OPEN EXCAVATIONS AND TRENCHING PRIOR TO BACKFILLING SHOWING A TAPE MEASURE
 VISIBLE IN THE EXCAVATIONS INDICATING DEPTH.
- 2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF CONDUCTORS AND CONNECTORS; PHOTOGRAPHS SHOWING TYPICAL BEND RADIUS OF INSTALLED GROUND WIRES AND GROUND ROD SPACING;
- 3. CONCRETE FORMS AND REINFORCING: CONCRETE FORMING AT TOWER AND EQUIPMENT/SHELTER PAD/FOUNDATIONS PHOTOGRAPHS SHOWING ALL REINFORCING STEEL, UTILITY AND CONDUIT STUB OUTS; PHOTOGRAPHS SHOWING CONCRETE POUR OF SHELTER SLAB/FOUNDATION, TOWER FOUNDATION AND GUY ANCHORS WITH VIBRATOR IN USE; PHOTOGRAPHS SHOWING EACH ANCHOR ON GUYED TOWERS, BEFORE CONCRETE POUR.
- 4. TOWER, ANTENNAS AND MAINLINE: INSPECTION AND PHOTOGRAPHS OF SECTION STACKING; INSPECTION AND PHOTOGRAPHS OF PLATFORM COMPONENT ATTACHMENT POINTS; PHOTOGRAPHS OF TOWER TOP GROUNDING; PHOTOS OF TOWER COAX LINE COLOR CODING AT THE TOP AND AT GROUND LEVEL; INSPECTION AND PHOTOGRAPHS OF OPERATIONAL OF TOWER LIGHTING, AND PLACEMENT OF FAA REGISTRATION SIGN; PHOTOGRAPHS SHOWING ADDITIONAL GROUNDING POINTS FOR TOWERS GREATER THAN 200 FEET.; PHOTOS OF ANTENNA GROUND BAR, EQUIPMENT GROUND BAR, AND MASTER GROUND BAR; PHOTOS OF GPS ANTENNA(S); PHOTOS OF EACH SECTOR OF ANTENNAS; ONE PHOTOGRAPH LOOKING AT THE SECTOR AND ONE FROM BEHIND SHOWING THE PROJECTED COVERAGE AREA; PHOTOS OF COAX WEATHERPROOFING TOP AND BOTTOM; PHOTOS OF COAX GROUNDING——TOP AND BOTTOM; PHOTOS OF ANTENNA AND MAST GROUNDING; PHOTOS OF COAX CABLE ENTRY INTO SHELTER; PHOTOS OF PLATFORM
- MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

 5. ROOF TOPS: PRE-CONSTRUCTION AND POST-CONSTRUCTION VISUAL INSPECTION AND PHOTOGRAPHS OF THE ROOF AND INTERIOR TO DETERMINE AND DOCUMENT CONDITIONS; ROOF TOP CONSTRUCTION INSPECTIONS AS REQUIRED BY THE JURISDICTION; PHOTOGRAPHS OF CABLE TRAY AND/OR ICE BRIDGE; PHOTOGRAPHS OF DOGHOUSE/CABLE EXIT FROM ROOF;
- 6. SITE LAYOUT PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENT PLATFORM FROM ALL FOUR CORNERS.
- 7. FINISHED UTILITIES: CLOSE-UP PHOTOGRAPHS OF THE PPC BREAKER PANEL; CLOSE-UP PHOTOGRAPH OF THE INSIDE OF THE TELCO PANEL AND NIU; CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENCLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACILITY DISTRIBUTION PANEL.

 8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL
- REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PAVING MIX DESIGN.

 9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 500 - PROJECT REPORTING

PART 1 - GENERAL

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

1.2 <u>RELATED DOCUMENTS:</u>

- A. THE REQUIREMENTS OF THIS SECTION APPLY TO ALL SECTIONS IN THIS SPECIFICATION.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 WEEKLY REPORTS:

- A. CONTRACTOR SHALL PROVIDE SPRINT WITH WEEKLY REPORTS SHOWING PROJECT STATUS. THIS STATUS REPORT FORMAT WILL BE PROVIDED TO THE CONTRACTOR BY SPRINT. THE REPORT WILL CONTAIN SITE ID NUMBER, THE MILESTONES FOR EACH SITE, INCLUDING THE BASELINE DATE, ESTIMATED COMPLETION DATE AND ACTUAL COMPLETION DATE.
- B. REPORT INFORMATION WILL BE TRANSMITTED TO SPRINT VIA ELECTRONIC MEANS AS REQUIRED. THIS INFORMATION WILL PROVIDE A BASIS FOR PROGRESS MONITORING AND PAYMENT.

3.2 PROJECT CONFERENCE CALLS:

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

3.3 PROJECT TRACKING IN SMS:

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

3.4 ADDITIONAL REPORTING:

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

3.5 PROJECT PHOTOGRAPHS:

- A. FILE DIGITAL PHOTOGRAPHS OF COMPLETED SITE IN JPEG FORMAT IN THE SMS PHOTO LIBRARY FOR THE RESPECTIVE SITE. PHOTOGRAPHS SHALL BE CLEARLY LABELED WITH SITE NUMBER, NAME AND DESCRIPTION, AND SHALL INCLUDE AT A MINIMUM THE FOLLOWING AS APPLICABLE:
- 1. SHELTER AND TOWER OVERVIEW.
- 2. TOWER FOUNDATION(S) FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).
- TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).
 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.
- 12. PLATFORM MECHANICAL CONNECTIONS TO TOWERY 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 <u>FINAL PROJECT ACCEPTANCE:</u> COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

SECTION 07 500 - ROOF CUTTING, PATCHING AND REPAIR

SUMMARY:

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

1.4 SUBMITTALS:

- A. <u>PRE-CONSTRUCTION ROOF PHOTOS:</u> COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.
- B. PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3
- C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS.



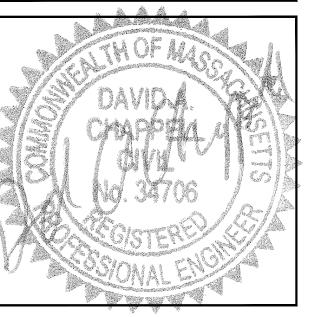
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JMT

	SUBMITTALS				
REV.	DATE	DESCRIPTION	В		

SITE NUMBER:

BS80XC001

SITE NAME:

0 | 06/22/18 | ISSUED FOR REVIEW

SITE ADDRESS: 400 MAIN STREET

MIT EAST

CAMBRIDGE, MA 02139

OUTLINE SPECIFICATIONS

SP-2

CONTINUE SHEET SP-3

CONTINUED FROM SP-2:

SECTION 09 900 - PAINTING

QUALITY ASSURANCE

- A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- B. COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS **MATERIALS**:
- A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL. PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING SYSTEMS.

PAINT SCHEDULE:

- A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS. PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE
- B. ROOF TOP CONSTRUCTION: TOUCH UP PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

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

TOUCHUP PAINTING:

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

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

INSTALLATION

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

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

HYBRID CABLE:

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

JUMPERS AND CONNECTORS:

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

REMOTE ELECTRICAL TILT (RET) CABLES:

MISCELLANEOUS:

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

ANTENNA INSTALLATION:

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

- A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.
- B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS.

HYBRID CABLES INSTALLATION:

- A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.
- C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND INSTALLATION.
- 1. FASTENING MAIN HYBRID CABLES: ALL CABLES SHALL BE PERMANENTLY FASTENED TO THE COAX LADDER AT 4'-0" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS. 2. FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA). WITHIN THE
- MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES: a. FIBER: SUPPORT FIBER BUNDLES USING 1/3" 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. 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
 - c. HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED
- 5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED
- 6. HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER SPRINT 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, REV1
- WEATHERPROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS: A. ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED.
- B. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
- 1. COLD SHRINK: ENCOMPASS CONNECTOR IN COLD SHRINK TUBING AND PROVIDE A DOUBLE WRAP OF 2" ELECTRICAL TAPE EXTENDING 2" BEYOND TUBING. PROVIDE 3M COLD SHRINK CXS SERIES OR EQUAL.
- 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

- THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI)
- B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
- C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

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

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

- A. THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS. POWER DISTRIBUTION UNITS. BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
- B. CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
- SUPPORTING DEVICES:
- A. MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
 - ALLIED TUBE AND CONDUIT
 - 2. B-LINE SYSTEM 3. UNISTRUT DIVERSIFIED PRODUCTS
- 4. THOMAS & BETTS
- B. FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
- 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.
- CONCRETE INSERTS OR EXPANSION BOLTS ON CONCRETE OR SOLID MASONRY.
- MACHINE SCREWS, WELDED THREADED STUDS, OR SPRING-TENSION CLAMPS ON STEEL. 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
- 9. IN PARTITIONS OF LIGHT STEEL CONSTRUCTION, USE SHEET METAL SCREWS.

SUPPORTING DEVICES:

- A. INSTALL SUPPORTING DEVICES TO FASTEN ELECTRICAL COMPONENTS SECURELY AND PERMANENTLY IN ACCORDANCE WITH NEC.
- B. COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.
- C. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, FASTEN ELECTRICAL ITEMS AND THEIR SUPPORTING HARDWARE SECURELY TO THE STRUCTURE IN ACCORDANCE WITH THE FOLLOWING:
- D. ENSURE THAT THE LOAD APPLIED BY ANY FASTENER DOES NOT EXCEED 25 PERCENT OF THE PROOF TEST LOAD.
- E. USE VIBRATION AND SHOCK-RESISTANT FASTENERS FOR ATTACHMENTS TO CONCRETE SLABS.

ELECTRICAL IDENTIFICATION:

- A. UPDATE AND PROVIDE TYPED CIRCUIT BREAKER SCHEDULES IN THE MOUNTING BRACKET. INSIDE DOORS OF AC PANEL BOARDS WITH ANY CHANGES MADE TO THE AC SYSTEM.
- B. BRANCH CIRCUITS FEEDING AVIATION OBSTRUCTION LIGHTING EQUIPMENT SHALL BE CLEARLY IDENTIFIED AS SUCH AT THE BRANCH CIRCUIT PANELBOARD.

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT:

- 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.
- UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE FOR DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVENT WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL
- C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
- D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WW-C-563, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE.
- E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL
- F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM)

HUBS AND BOXES:

- A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
- B. CABLE TERMINATION FITTINGS FOR CONDUIT
- CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY 0-Z/GEDNEY OR EQUAL 2. CABLE TERMINATORS FOR LFMC SHALL BE ETCO - CL2075; OR MADE FOR THE PURPOSE PRODUCTS BY ROXTEC.
- C. EXTERIOR PULL BOXES AND PULL BOXES IN INTERIOR INDUSTRIAL AREAS SHALL BE PLATED CAST ALLOY, HEAVY DUTY, WEATHERPROOF, DUST PROOF, WITH GASKET, PLATED IRON ALLOY COVER AND STAINLESS STEEL COVER SCREWS, CROUSE-HINDS WAB SERIES OR EQUAL
- CONDUIT OUTLET BODIES SHALL BE PLATED CAST ALLOY WITH SIMILAR GASKETED COVERS. OUTLET BODIES SHALL BE OF THE CONFIGURATION AND SIZE SUITABLE FOR THE APPLICATION. PROVIDE CROUSE-HINDS FORM 8 OR EQUAL.
- E. MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE-HINDS, COOPER, ADALET, APPLETON, O-Z GEDNEY, RACO, OR APPROVED

SUPPLEMENTAL GROUNDING SYSTEM

- A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS, SUPPORT SYSTEM WITH NON-MAGNETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.
- B. SUPPLEMENTAL GROUNDING SYSTEM: ALL CONNECTIONS TO BE MADE WITH CAD WELDS, EXCEPT AT EQUIPMENT USE LUGS OR OTHER AVAILABLE GROUNDING MEANS AS REQUIRED BY MANUFACTURER; AT GROUND BARS USE TWO HOLE SPADES WITH NO OX.
- C. STOLEN GROUND-BARS: IN THE EVENT OF STOLEN GROUND BARS, CONTACT SPRINT CM FOR REPLACEMENT INSTRUCTION USING THREADED ROD KITS.

EXISTING STRUCTURE:

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

CONDUIT AND CONDUCTOR INSTALLATION:

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



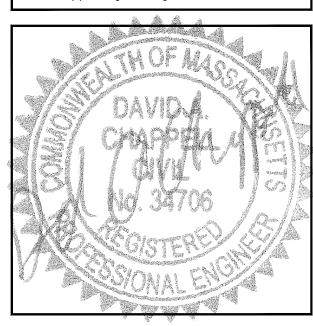
INTERNATIONAL BLVD, SUITE 800 MAHWAH, NJ 07495 (800) 357-7641



RAYNHAM, MA 02767 (844) 748-8878 www.centerlinecommunications.com



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APPROVED BY: JMT

REV. DATE DESCRIPTION BY	0	06/22/18	ISSUED FOR REVIEW	JRV
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SUBMITTALS	REV.	DATE	DESCRIPTION	BY
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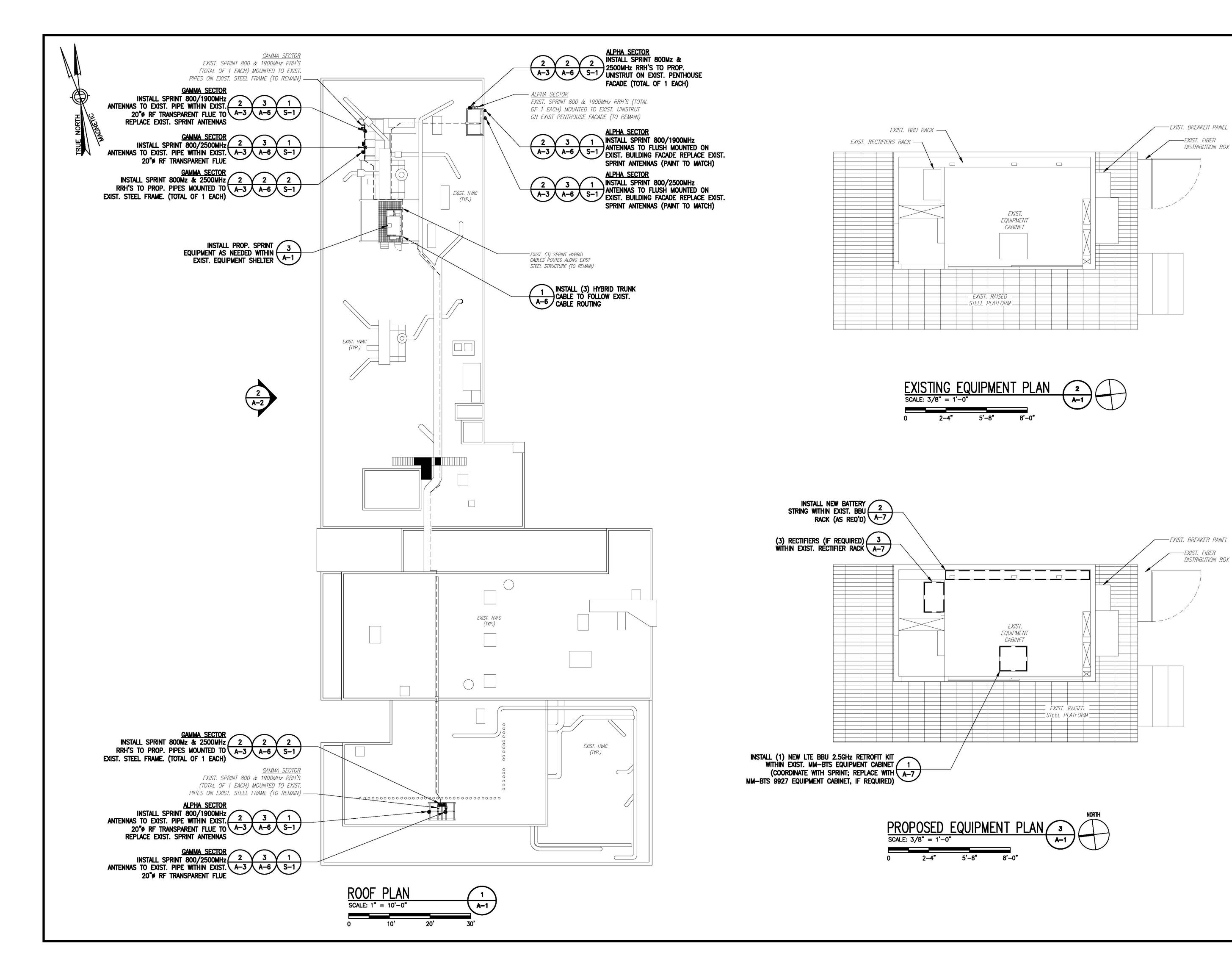
SITE NUMBER: BS80XC001 SITE NAME:

MIT EAST

SITE ADDRESS: **400 MAIN STREET** CAMBRIDGE, MA 02139

SHEET TITLE

OUTLINE SPECIFICATIONS





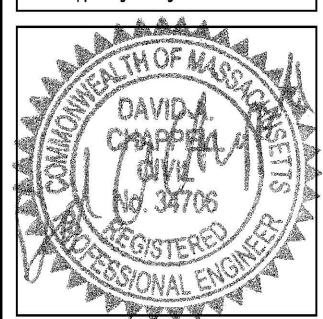
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BY

SITE NUMBER:
BS80XC001
SITE NAME:

MIT EAST

SITE ADDRESS: 400 MAIN STREET

CAMBRIDGE, MA 02139

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ROOF & EQUIPMENT PLANS

SHEET NUME

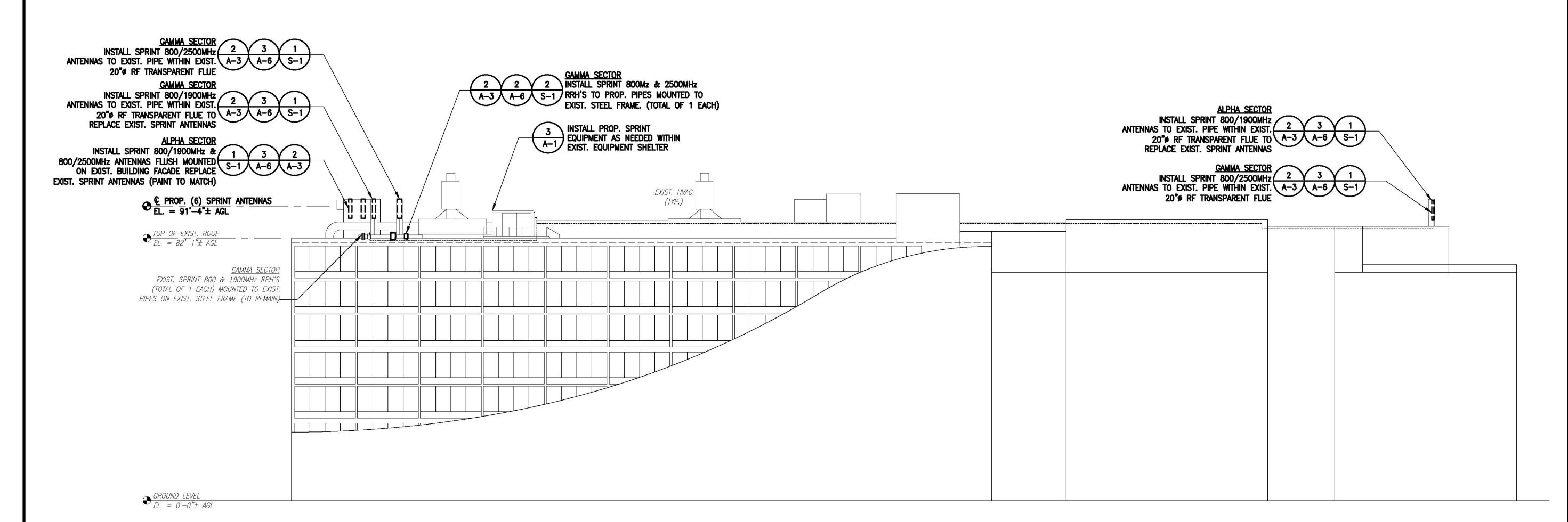
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SPECIAL CONSTRUCTION NOTE:
SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING: * COMPLETION OF A GLOBAL STRUCTURAL STABILITY ANALYSIS (PROVIDED BY TOWER OWNER OR A&E VENDOR). * COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT

(PROVIDED BY A&E VENDOR). * GC SHALL FURNISH, INSTALL AND COMPLETE ALL REQUIRED STRUCTURAL

MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.



EAST ELEVATION

0 16'-0" 32'-0" 48'-0"'

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

A-2



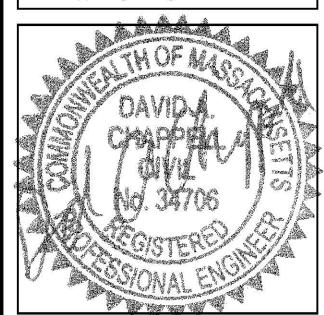
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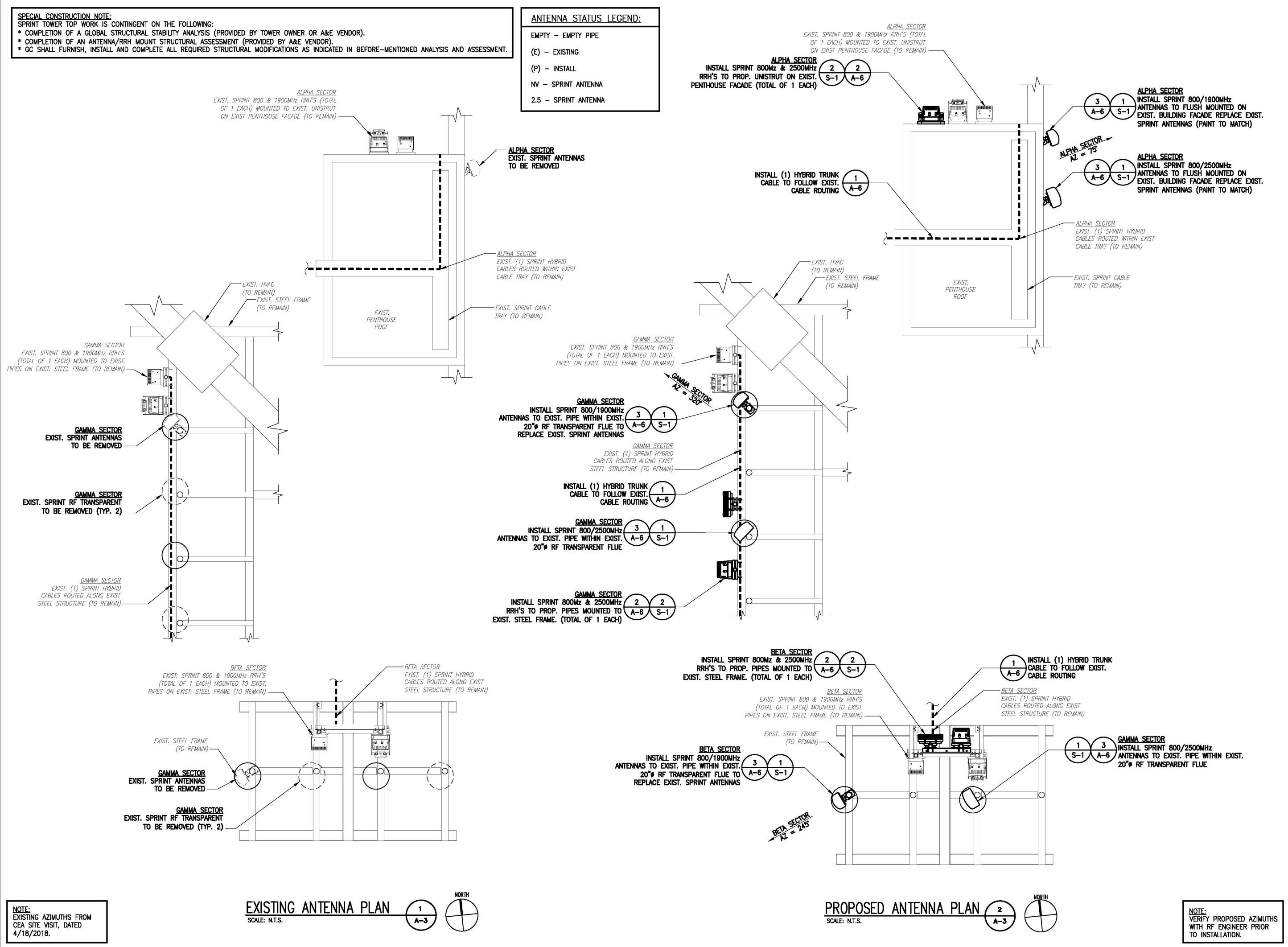
0	06/22/18	ISSUED FOR REVIEW	JRV

SITE NUMBER: BS80XC001 SITE NAME: MIT EAST

SITE ADDRESS: **400 MAIN STREET** CAMBRIDGE, MA 02139

SHEET TITLE

ELEVATION





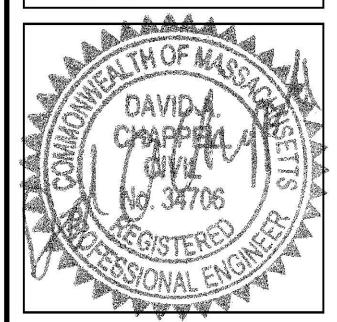
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CHECKED BY:

APPROVED BY:

0	06/22/18	ISSUED FOR REVIEW	JR
REV.	DATE	DESCRIPTION	BY
	S	UBMITTALS	

SITE NUMBER: BS80XC001 SITE NAME: MIT EAST

SITE ADDRESS: **400 MAIN STREET** CAMBRIDGE, MA 02139

SHEET TITLE

ANTENNA PLANS

SHEET NUMBER

A-3

	Region: Northeast Market	Boston	Revision 2.2	Rev Date: 20-Nov-2017
	Cascade ID	BS80XC001	BTS OEM: ALU	RFDS Type: Preliminary
	Augment Import Code: SPDOMU01_DO_Macro_Upgrade	Augment: DO Macro Upgrade	Structure Type:	Rooftop
ıta	Address: 400 Main Street, Cambridge, MA, 02142	Sprint Eng. Name: Bill Hastings	Bill.M.Hastings@sprint.com	Eng. Phone: 978-590-9700
Data	Latitude: 42.362322 Longitude: -71.087789	Manager Name: Jonathan Hull	<u>Jonathan.B.Hull@sprint.com</u>	Manager Phone: 617-233-2920
Site	Detailed RFDS Description:	RFE: Praveen Meesarapu	Praveen.Meesarapu@sprint.com	RFE Phone: 301-728-0006
	Triband final config using NV + dual 800/2.5 G antenna. Adding 2nd 800 RRH, 1900 RRH and 2.5 RRH.	Filter Analysis Complete: YES	Border Analysis Complete: YES	Channel Plan Complete: YES
		Alpha	Beta	Gamma
	1900MHz_Azimuth	75	245	320
	1900MHz_No_of_Antennas	1	1	1
	1900MHz_RADCenter(ft)	91.3	91.3	91.3
	1900MHz_Antenna Make	RFS	RFS	RFS
	1900MHz_Antenna Model	APXVSPP18-C-A20	APXVSPP18-C-A20	APXVSPP18-C-A20
	1900MHz_Horizontal_Beamwidth	65	65	65
	1900MHz_Vertical_Beamwidth	6	6	6
	1900MHz_Antenna Dimensions (ft) & Weight (lbs)	72 x 11.8 x 7.9 62 (lbs)	72 x 11.8 x 7.9 62 (lbs)	72 x 11.8 x 7.9 62 (lbs)
	1900MHz_AntennaGain(dBi)	18	18	18
	1900MHz_E_Tilt	0	0	0
	1900MHz _M_Tilt	0	0	0
	1900_Effective_Tilt	0	0	0
	1900MHz_Carrier_Forecast_Year_2017			
	1900MHz RRH Manufacturer	ALU	ALU	ALU
	1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
	1900MHz_RRH Count	1	1	1
	1900MHz_RRH Specs	25 x 11.1 x 11.4 (60 lbs)	25 x 11.1 x 11.4 (60 lbs)	25 x 11.1 x 11.4 (60 lbs)
	1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	1900MHz Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
00	1900MHz Power Split Ratio (Main/Split)			
1900	1900MHz Splitter Manufacturer			
	1900MHz Splitter Model	No Splitter Required	No Splitter Required	No Splitter Required
	1900MHz Number of Splitters	0	0	0
	1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for			
	TT or Main Coax to Antenna for Ground Mount, ft)	8	8	8
	1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-			
	Antenna for TT or Main Coax to Antenna for Ground Mount)	LCF12-50J	LCF12-50J	LCF12-50J
	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if			
	applicable, ft) 1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if			
	applicable)			
	1900MHz_Main_Cable_Length (ft)	116.3	116.3	116.3
	1900MHz_Main_Cable_Model	HB114-1-08U4-M5F	HB114-1-08U4-M5F	HB114-1-08U4-M5F
	1900MHz_Bottom_Jumper #1_Length (Ground based RRH to	TIBELL L SOCI WIST	TIBELLI E GOOT WIS	1121111 000 1 11101
	Combiner-OR-Main Coax, ft)			
	1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to			
	Combiner-OR-Main Coax)			
	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to			
	Main Coax, ft)			
	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner			
	to Main Coax)			

NOTES:

- 1. COMMENTS IN RED TEXT PROVIDED BY A&E VENDOR.
- 2. ANTENNA RAD CENTER BASED ON EQUIPMENT DATABASE AND STRUCTURAL ANALYSIS.
- 3. SPRINT CM SHALL CONFIRM HYBRID CABLE LENGTH, COAX JUMPER LENGTH AND AISG CABLE LENGTH BEFORE PREPARING BOM. A&E RECOMMENDED HYBRID CABLE LENGTH BASED ON NV 2.5 EQUIPMENT AUDIT PLUS 20 FEET FOR (2) 10-FOOT COILS AT EACH END OF THE FIBER TRUNK.

<u>NOTE</u>

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

SPECIAL WORK NOTE:

JUMPERS (COAX/AISG) FROM THE 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY.

	800MHz_Azimuth	75	245	320
		V 1999	V-0.0-0-1	
	800MHz_No_of_Antennas	1	1	1
	800MHz_RADCenter(ft)	91.3	91.3	91.3
	800MHz_AntennaMake	NA	NA	NA
		Antenna assigned on a different		Antenna assigned on a different
	800MHz_AntennaModel	band	Antenna assigned on a different band	band
	800MHz_Horizontal_Beamwidth	NA	NA	NA
	800MHz_Vertical_Beamwidth	NA	NA	NA
	800MHz_Antenna Dimensions (ft) & Weight (lbs)	NA NA	NA NA	NA NA
	800MHz_AntennaGain (dBi)	NA	NA	NA
	800MHz_E_Tilt	0	0	0
	800MHz_M_Tilt	0	0	0
	800 MHz_Effective Tilt (degrees)	0	0	0
	800MHz_RRH Manufacturer	ALU	ALU	ALU
	800_Combiner_Model	No Combiner Required	No Combiner Required	No Combiner Required
		· · · · · · · · · · · · · · · · · · ·	<u> </u>	· · · · · · · · · · · · · · · · · · ·
800	800MHz_RRH Model	RRH 800 MHz 2x50W	RRH 800 MHz 2x50W	RRH 800 MHz 2x50W
8(800MHz_RRH Specs	15.8 x 13.0 x 14.0 (64 lbs)	15.8 x 13.0 x 14.0 (64 lbs)	15.8 x 13.0 x 14.0 (64 lbs)
	800MHz_RRH Count	2	2	2
	800MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
	800MHz BILT Border Filter	na	na	na
	800MHz Splitter Manufacturer			
	800MHz Splitter Model			
	800MHz Number of Splitters	0	0	0
	800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to			
	Antenna for GM)	8	8	8
	800_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax			
	to Antenna for GM)	LCF12-50J	LCF12-50J	LCF12-50J
	800MHz_Main_Coax_Cable_Length (ft)	NA	NA	NA
	800MHz_Main_Coax_Cable_Model	NA	NA	NA
		10.555		To the Control of the
	800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)			
	800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main			
	Coax)			
	2500MHz_Azimuth	75	245	320
	2500MHz_No_of_Antennas	1	1	1
	2500MHz_RADCenter(ft)	91.3	91.3	91.3
		RFS	RFS	RFS
	2500MHz_AntennaMake	Kr3	KF3	NF3
	2500MHz_AntennaModel	APXVTSM18-C-I20	APXVTSM18-C-I20	APXVTSM18-C-I20
	2500MHz_Horizontal_Beamwidth	70	70	70
	2500MHz_Vertical_Beamwidth	5	5	5
	2500MHz_AntennaHeight (ft)	72 x 14.6 x 8.1 40.8 (lbs)	72 x 14.6 x 8.1 40.8 (lbs)	72 x 14.6 x 8.1 40.8 (lbs)
	2500MHz_AntennaGain (dBi)	17.3	17.3	17.3
	2500MHz_E_Tilt	0	0	
			0	0
	2500MHz_M_Tilt	0	0	0
	2500MHz_M_Tilt 2500 MHz_Effective Tilt (degrees)			
		0	0	0
	2500 MHz_Effective Tilt (degrees)	0	0	0
00	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model	0 0 ALU	0 0 ALU	0 0 ALU
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required	0 0 ALU No Combiner Required TD-RRH8x20-25
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split)	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model	0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower	0 OALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25	0 0 ALU No Combiner Required TD-RRH8x20-25
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 OALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500MHz_Main_Cable_Length (ft)	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500MHz_Main_Cable_Length (ft) 2500MHz_Main_Cable_Model	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500MHz_Main_Cable_Length (ft) 2500MHz_Main_Cable_Model	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500MHz_Main_Cable_Length (ft) 2500MHz_Main_Cable_Model 2500_Bottom_Jumper #1_Length (Ground based RRH to Main Coax) 2500_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3
2500	2500 MHz_Effective Tilt (degrees) 2500MHz_RRH Manufacturer 2500_Combiner_Model 2500MHz_RRH Model 2500MHz_RRH Count 2500MHz_RRH Location 2500MHz Power Split Ratio (Main/Split) 2500MHz Splitter Manufacturer 2500MHz Splitter Model 2500MHz Number of Splitters 2500_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM) 2500MHz_Main_Cable_Length (ft) 2500MHz_Main_Cable_Model	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0	0 0 ALU No Combiner Required TD-RRH8x20-25 1 Top of the Pole/Tower 0 8 LCF12-50J 116.3



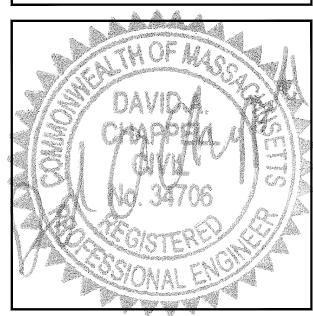
1 INTERNATIONAL BLVD, SUITE 800 MAHWAH, NJ 07495 (800) 357-7641



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BS80XC001

SITE NAME:
MIT EAST

SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

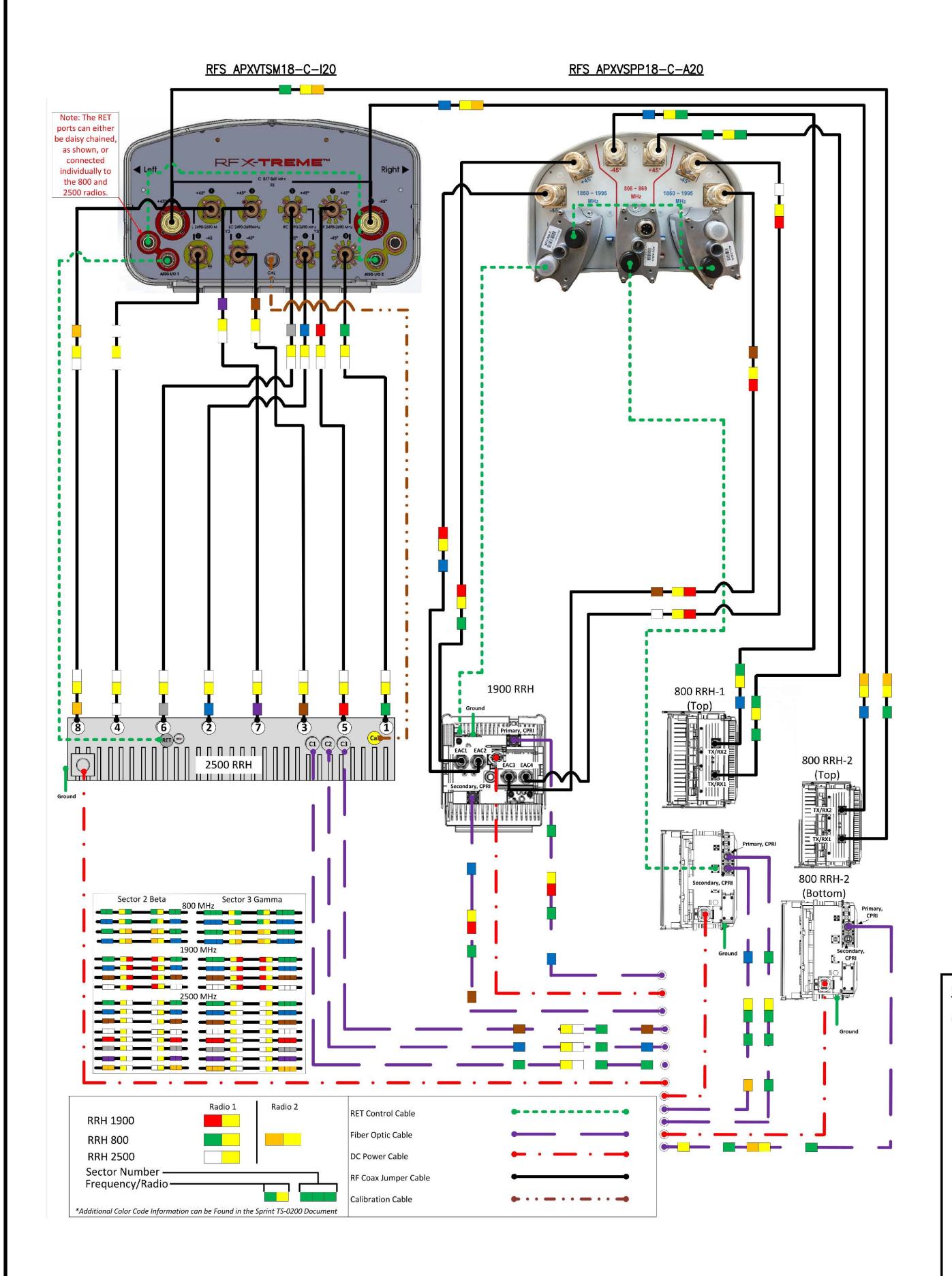
RF DATA SHEET

A-4

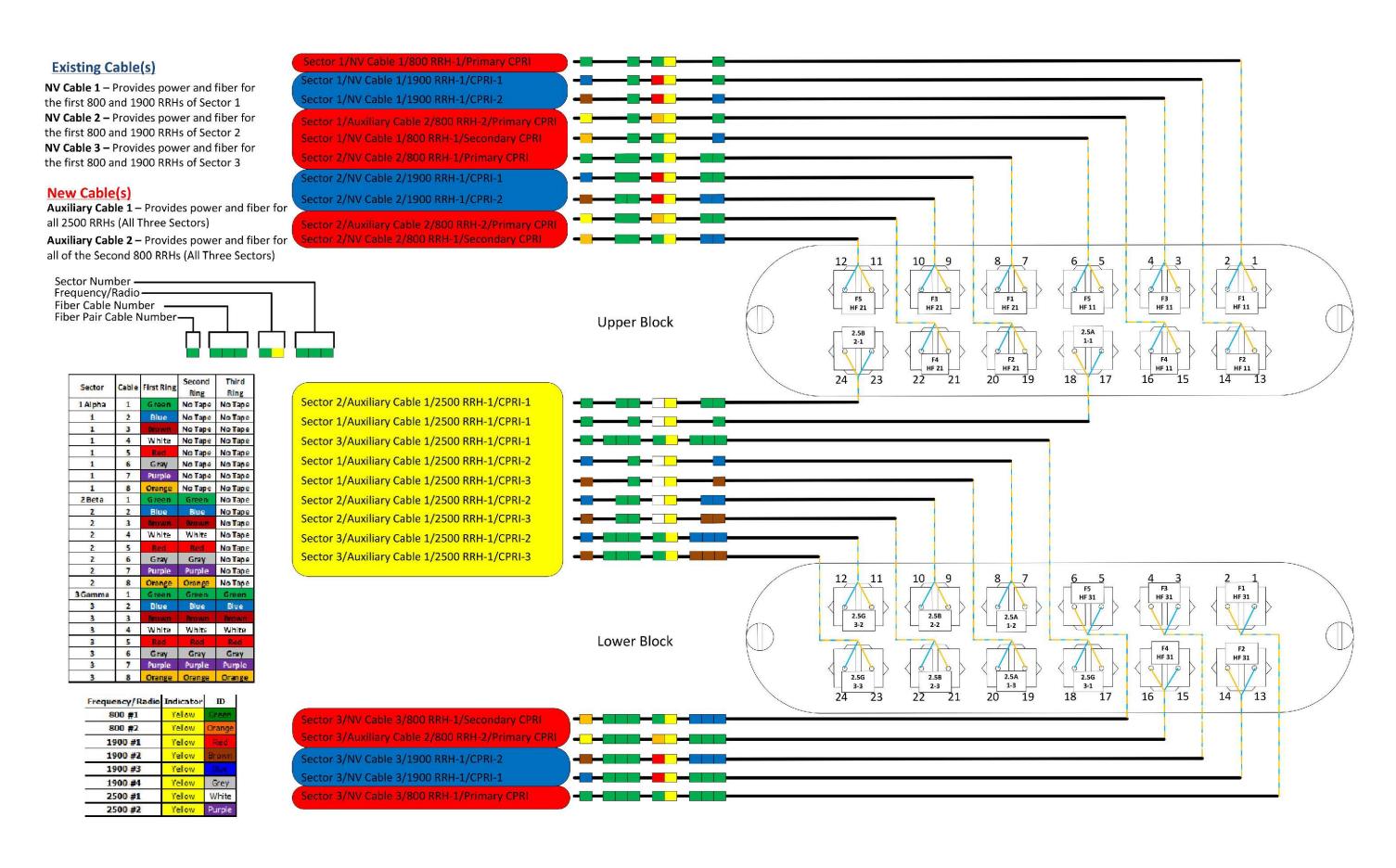
RF DATA SHEET

N.T.S.

1
A-4



PLUMBING DIAGRAM



CABLE COLOR-CODING SCHEMATIC (2)

SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

- CONSTRUCTION STANDARDS: INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES (CURRENT VERSION), INCLUDING EXHIBITS A-M.
- CONSTRUCTION SPECIFICATIONS: CONSTRUCTION STANDARDS EXHIBIT A STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES (CURRENT VERSION).
- GROUNDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN.
- GROUNDING STANDARDS (SUPPLEMENT): ANTI-THEFT UPDATE TO SPRINT GROUNDING 082412 AND SPRINT ENGINEERING LETTER EL-0504 DATED 04.20.12. - WEATHER PROOFING STANDARDS: EXCÉRPT FROM CONSTRUCTION STANDARDS EXHIBIT A, SECTION 3.6 WEATHERPROOFING CONNECTORS AND GROUND KITS.
- COLOR CODING: SPRINT NEXTEL ANT AND LINE COLOR CODING PER SPRINT TS-0200 CURRENT VERSION.
- GENERAL CONTRACTOR TO FIELD VERIFY AZIMUTH AND CL HEIGHT AND MECHANICAL DOWNTILT. IF DIFFERENT THAN CALLED OUT IN RFDS, HALT ANTENNA WORK FOR WORK FOR ONE HOUR, CALL SPRINT RF ENGINEER (OR MANAGER IF RF ENGINEER DOES NOT ANSWER, BUT STILL LEAVE A MESSAGE TO RF ENGINEER) USING SPRINT-PROVIDED CONTACT INFORMATION FOR FURTHER INSTRUCTIONS. IF SPRINT DOES NOT RESPOND WITHIN ONE HOUR, PLACE 2.5GHz ANTENNA AT SAME CL AS 1.9GHz ANTENNA AND EMAIL CORRECT CL HEIGHT AND AZIMUTH TO SPRINT RF ENGINEER. UPDATE AS-BUILD DRAWING WITH CORRECT CL HEIGHT. ALSO EMAIL CORRECT 1900MHz AND 800MHz ANTENNA CL HEIGHT, AZIMUTH AND MECHANICAL DOWNTILT TO RF ENGINEER.
- AISG TESTS TO VERIFY OPERATION IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISG CABLES HAVE BEEN CONNECTED. VERIFY OPERATION OF ALL EXISTING SPRINT AISG EQUIPMENT INCLUDING 800MHz, 1.9GHz, AND 2.5GHz. TEST INCLUDE COMPLETE DOWNTILT, AZIMUTH (IF APPLICABLE) AND BEAMWIDTH SWINGS (IF APPLICABLE). DOCUMENT AISG TEST RESULTS IN COAX SWEEP TEST SPREADSHEET
- GENERAL CONTRACTOR MUST INSURE THAT NO OBJECT IS LOCATED IN FRONT OF ANTENNA. THIS MEANS NO OBJECT IS TO BE LOCATED 45 DEGREES LEFT AND RIGHT OF FRONT OF ANTENNA OR 7 DEGREES UP AND DOWN FROM CENTER OF ANTENNA. IF THIS IS NOT POSSIBLE, CONTACT RF ENGINEER FOR FURTHER INSTRUCTION. IN ADDITION, 2.5GHz ANTENNA IS NOT TO THE PLACED IN FRONT OF ANY OTHER ANTENNA USING THE SAME 45 DEGREE RULE. THIS INCLUDES SPRINT AND NON-SPRINT ANTENNAS.
- GENERAL CONTRACT IS REQUIRED TO USE A DIGITAL ALIGNMENT TOOL TO SET AZIMUTH, ROLL AND DOWNTILT. AZIMUTH ACCURACY IS TO BE WITHIN 1 DEGREES. DOWNTILT AND ROLL(LEFT TO RIGHT TILT) IS TO BE WITHIN 0.1 DEGREES. IF FOR SOME REASON THIS ACCURACY CANNOT BE ACHIEVED, UPDATE AS-BUILT DRAWINGS AND EMAIL SPRINT RF ENGINEER WITH AS-BUILTS SETTINGS. USE 3Z RF ALIGNMENT TOOL OR EQUIVALENT TOOL. HTTP://WWW.3ZTELECOM.COM/ANTENNA-ALIGNMENT-TOOL/.



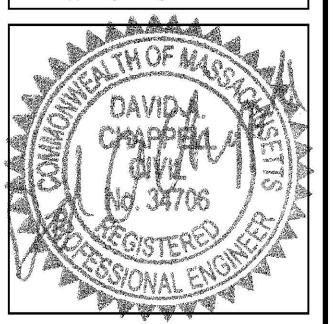
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MIT EAST

SITE ADDRESS: **400 MAIN STREET**

CAMBRIDGE, MA 02139

RAN WIRING DIAGRAMS

HYBRID CABLE DC CONDUCTOR SIZE GUIDELINE MANUF: RFS CABLE LENGTH DC CONDUCTOR CABLE DIAMETER	
FIBER ONLY VARIES USE NV HYBRIFLEX 5/8"	.
(*) HYBRIFLEX <200' 8 AWG 1-1/4"	(2
HYBRIFLEX 225-300' 6 AWG 1-1/4"	
HYBRIFLEX 325-375' 4 AWG 1-1/4"	

RFS HYBRIFLEX RISER CABLE SCHEDULE

	Hybrid cable		
~	MN: HB058-M12-050F	50 ft	
Ne Ne	12x multi-mode fiber pairs, Top: Outdoor protected connectors, Bottom: LC	50 IL	
_≥ δ	Connectors, 5/8 cable, 50 ft		
6 Ö	MN: HB058-M12-075F	75 ft	
Fiber Only ting DC Po	MN: HB058-M12-100F	100 ft	
Fiber Only (Existing DC Power)	MN: HB058-M12-125F	125 ft	
xis	MN: HB058-M12-150F	150 ft	
<u> </u>	MN: HB058-M12-175F	175 ft	
	MN: HB058-M12-200F	200 ft	
	Hybrid cable	<u> </u>	
	MN: HB114-08U3M12-050F		
	3x 8 AWG power pairs, 12x multi-mode fiber pairs, Outdoor rated connectors & LC	50 ft	
¥e	Connectors, 1 1/4 cable, 50 ft		
Q	MN: HB114-08U3M12-075F	75 ft	
5	MN: HB114-08U3M12-100F	100 ft	
8 AWG Power	MN: HB114-08U3M12-125F	125 ft	
∞	MN: HB114-08U3M12-150F	150 ft	- `
	MN: HB114-08U3M12-175F	175 ft	
	MN: HB114-08U3M12-200F	200 ft	
			<u> </u>
<u>.</u>	Hybrid cable		
We	MN: HB114-13U3M12-225F	225 ft	
8	3x 6 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC Connectors, 1 1/4 cable, 225 ft		
NG NG	MN: HB114-13U3M12-250F	250 ft	
6 AWG Power	MN: HB114-13U3M12-275F	275 ft	
9	MN: HB114-13U3M12-300F	300 ft	
ē	Hybrid cable		
8	MN: HB114-21U3M12-325F	325 ft	
<u>C</u>	3x 4 AWG power pair, 12x multi-mode fiber pairs, Outdoor rated connectors & LC		
4 AWG Power	Connectors, 1 1/4 cable, 325 ft MN: HB114-21U3M12-350F	350 ft	—
4		- t	—
7	MN: HB114-21U3M12-375F	375 ft	

RFS HYBRIFLEX JUMPER CABLE SCHEDULE

	Hybrid Jumper cable	
	MN: HBF012-M3-5F1	5 ft
Only	5 ft, 3x multi-mode fiber pairs, Outdoor & LC connectors, 1/2 cable	
	MN: HBF012-M3-10F1	10 ft
Fiber	MN: HBF012-M3-15F1	15 ft
Œ	MN: HBF012-M3-20F1	20 ft
	MN: HBF012-M3-25F1	25 ft
	MN: HBF012-M3-30F1	30 ft

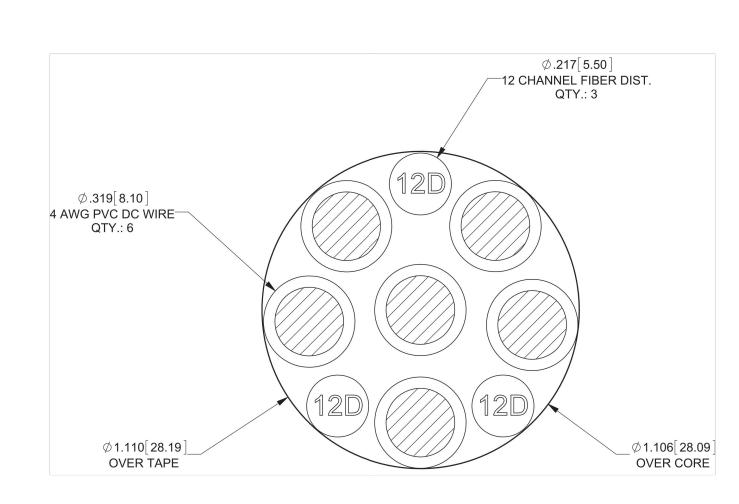
Power		Hybrid Jumper cable MN: HBF058-08U1M3-5F1 5 ft, 1x 8 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
		MN: HBF058-08U1M3-10F1	10 ft
AW G	(*)	MN: HBF058-08U1M3-15F1	15 ft
8		MN: HBF058-08U1M3-20F1	20 ft
		MN: HBF058-08U1M3-25F1	25 ft
		MN: HBF058-08U1M3-30F1	30 ft

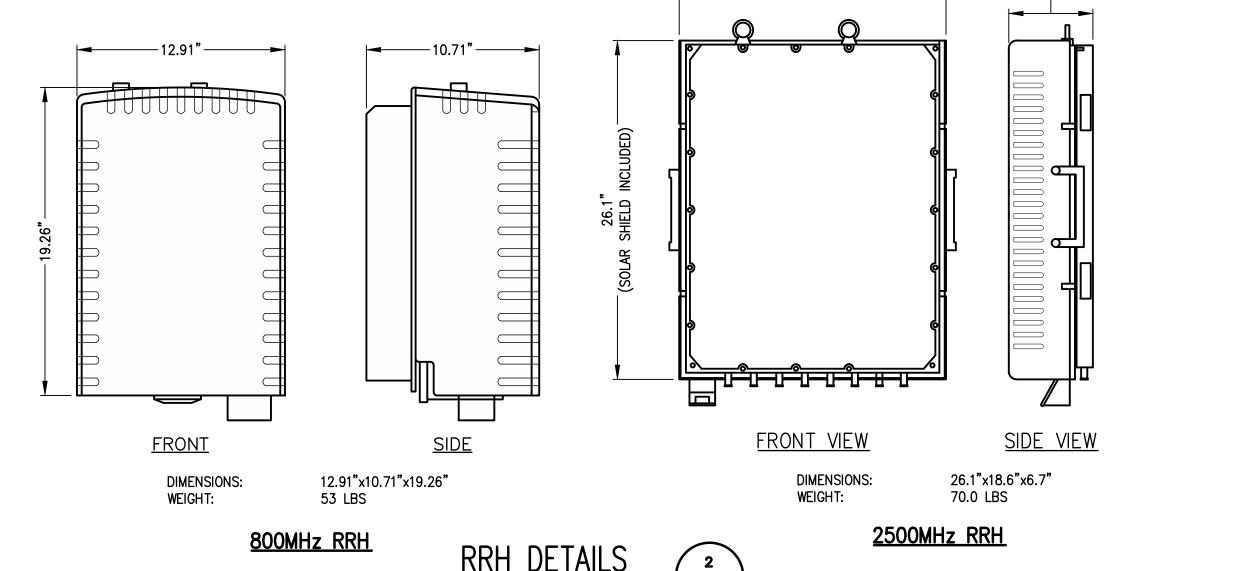
Power	Hybrid Jumper cable MN: HBF058-13U1M3-5F1 5 ft, 1x 6 AWG power pair, 3x multi-mode fiber pairs, Outdoor & LC Connectors, 5/8 cable	5 ft
U	MN: HBF058-13U1M3-10F1	10 ft
ΑW	MN: HBF058-13U1M3-15F1	15 ft
9	MN: HBF058-13U1M3-20F1	20 ft
	MN: HBF058-13U1M3-25F1	25 ft
	MN: HBF058-13U1M3-30F1	30 ft

ower	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
G P	MN: HBF078-21U1M3-10F1	10 ft
ΑW	MN: HBF078-21U1M3-15F1	15 ft
4	MN: HBF078-21U1M3-20F1	20 ft
	MN: HBF078-21U1M3-25F1	25 ft
	MN: HBE078-21U1 M3-30E1	30 ft

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

2500MHz HYBRID CABLE X-SECTION & DATA (1)



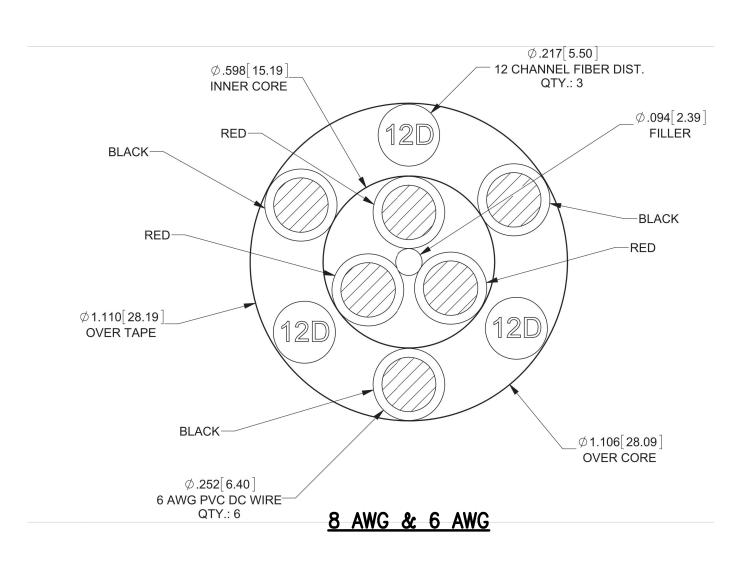


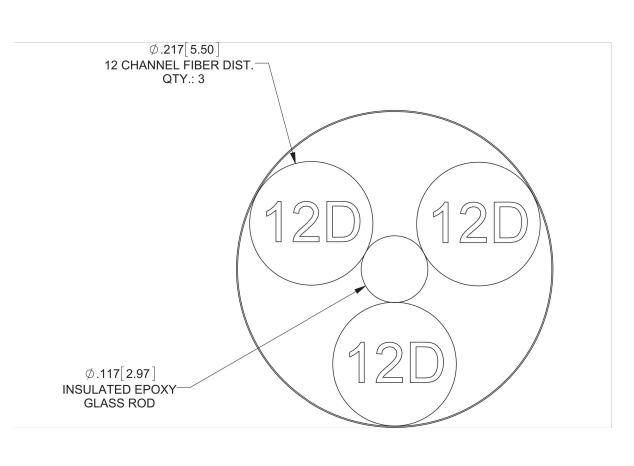
RF CONNECTORS -

A-6

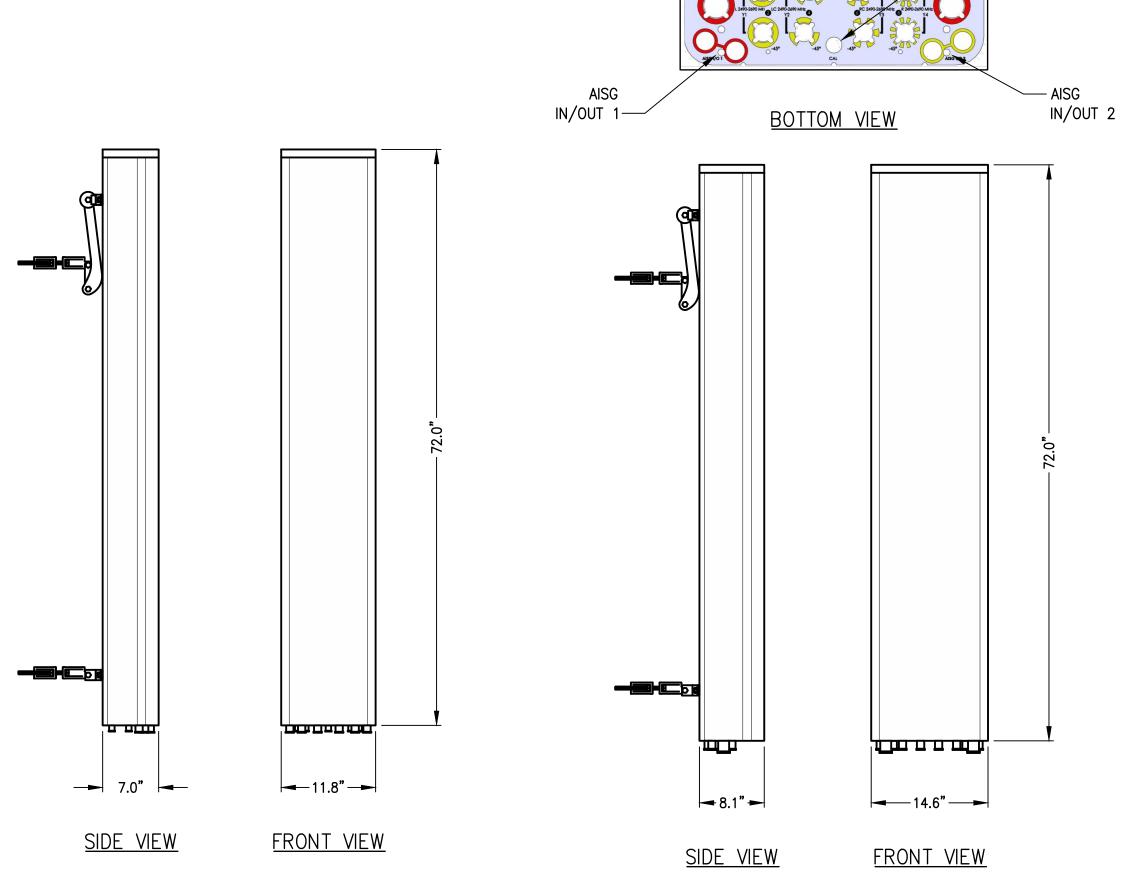
(SOLAR SHIELD INCLUDED)

4 AWG





FIBER ONLY



800/1900MHz ANTENNA

72.0"x11.8"x7.0" **DIMENSIONS:** WEIGHT:

RFS APXVSPP18-C-A20 PANEL ANTENNA

64.5 LBS W/ HARDWARE 806-869 MHZ FREQUENCY RANGE: 1850-1995 MHZ

800/2500MHz ANTENNA

COMMSCOPE APXVTSM18-C-I20 PANEL ANTENNA

72.0"x14.6"x8.1" **DIMENSIONS:** WEIGHT: 87.5 LBS W/ HARDWARE FREQUENCY RANGE: 817-869 MHz 2490-2690 MHZ

ANTENNA DETAILS A-6



(SOLAR SHIELD INCLUDED)

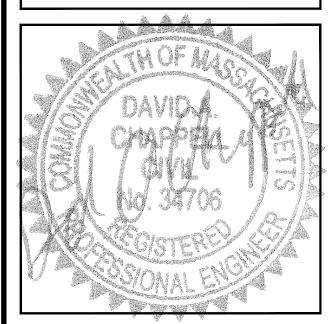
- CALIBRATION



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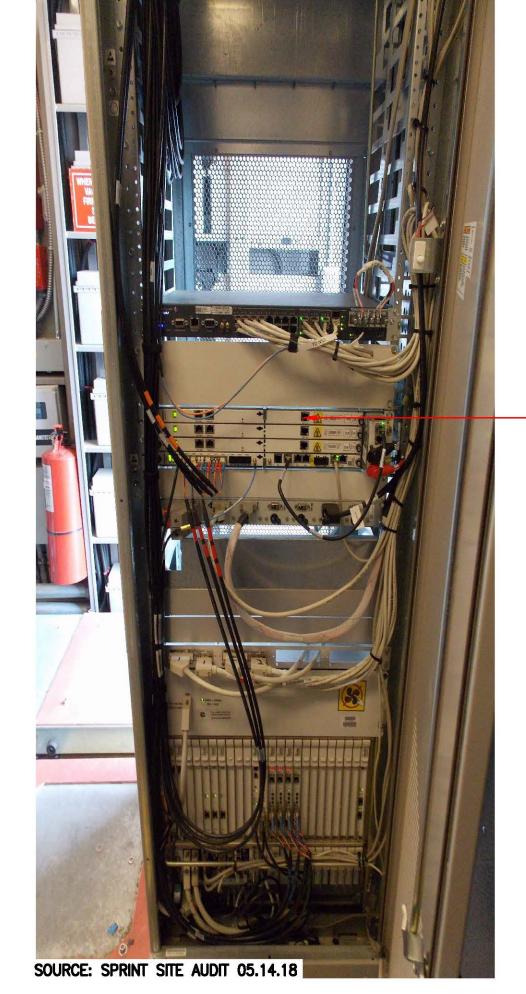
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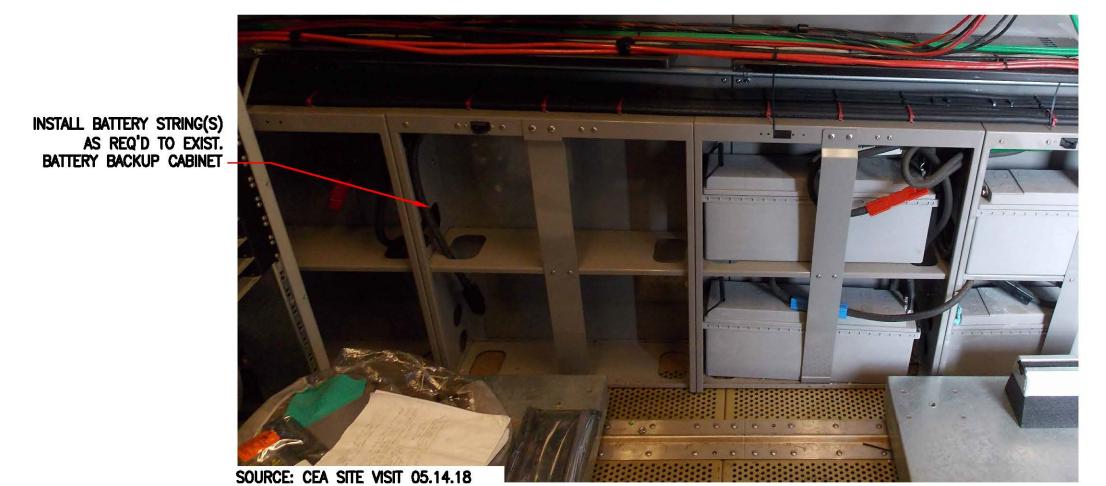
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SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

EQUIPMENT DETAILS



- INSTALL NEW LTE BBU 2.5 GHz IN EXIST. MM-BTS 9928 EQUIPMENT CABINET



FRONT VIEW

EXISTING BATTERY RACK
SCALE: NTS

1 A-7

FRONT VIEW

EXISTING MM—BTS EQUIPMENT CABINET

SCALE: NTS

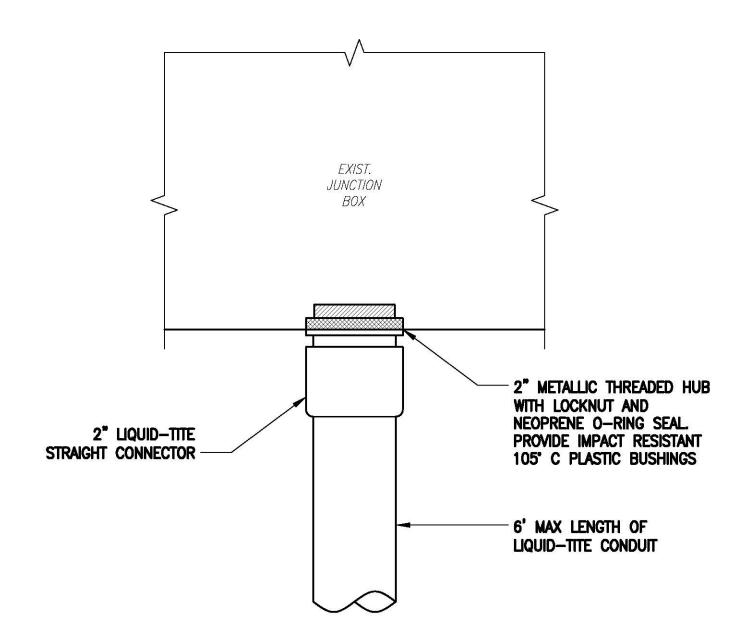


- Install (3) rectifiers in exist. Rectifier rack (if req'd.)

EXISTING RECTIFIER RACK

SCALE: NTS

SCALE: NTS



FIBER JUNCTION BOX PENETRATION

SCALE: NTS

4
A-7

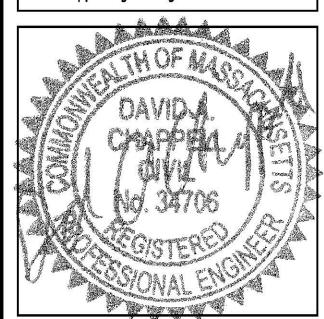




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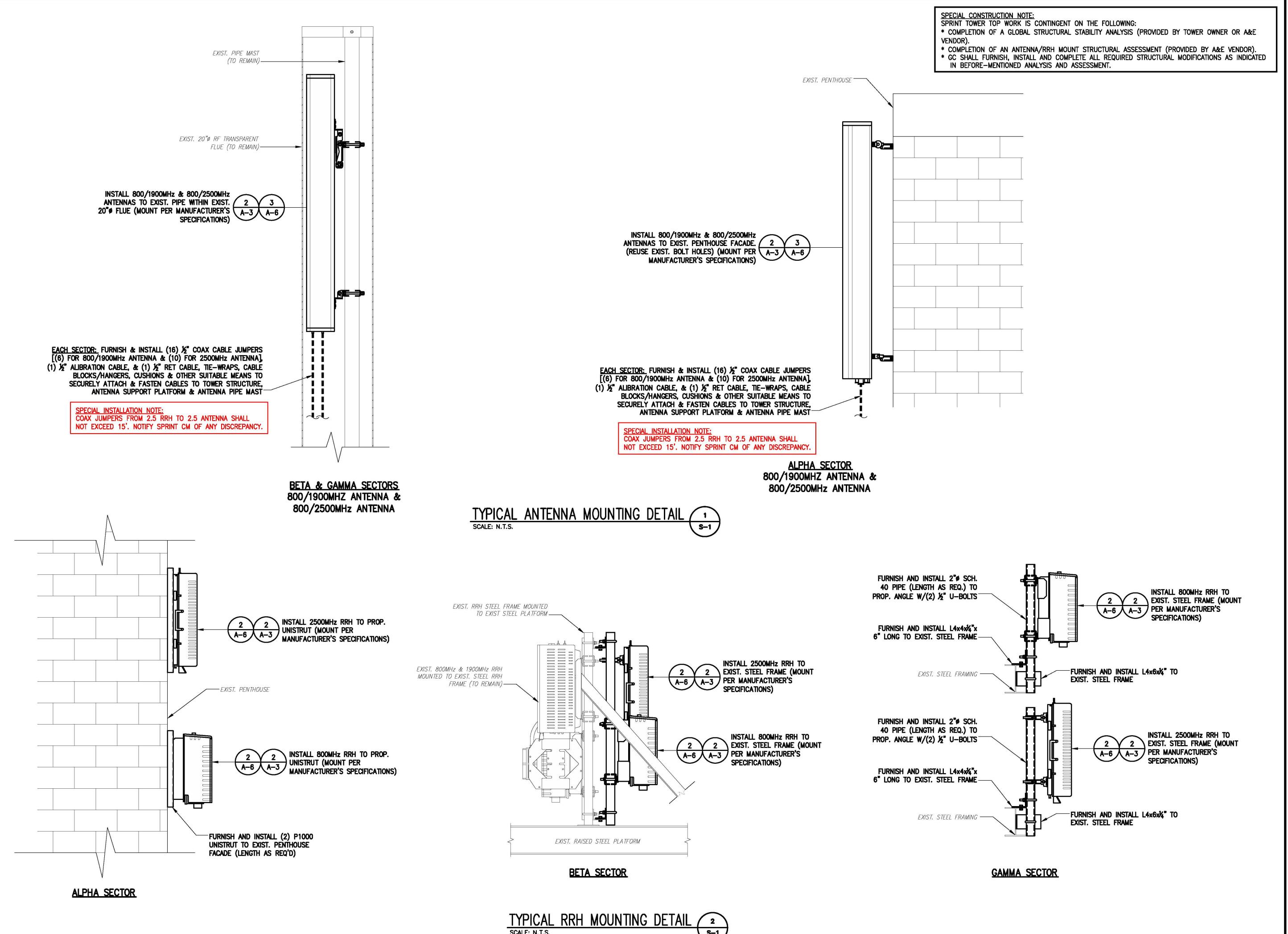
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SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

EQUIPMENT DETAILS

A-7

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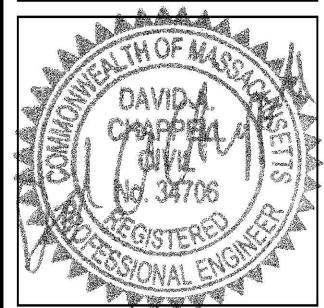
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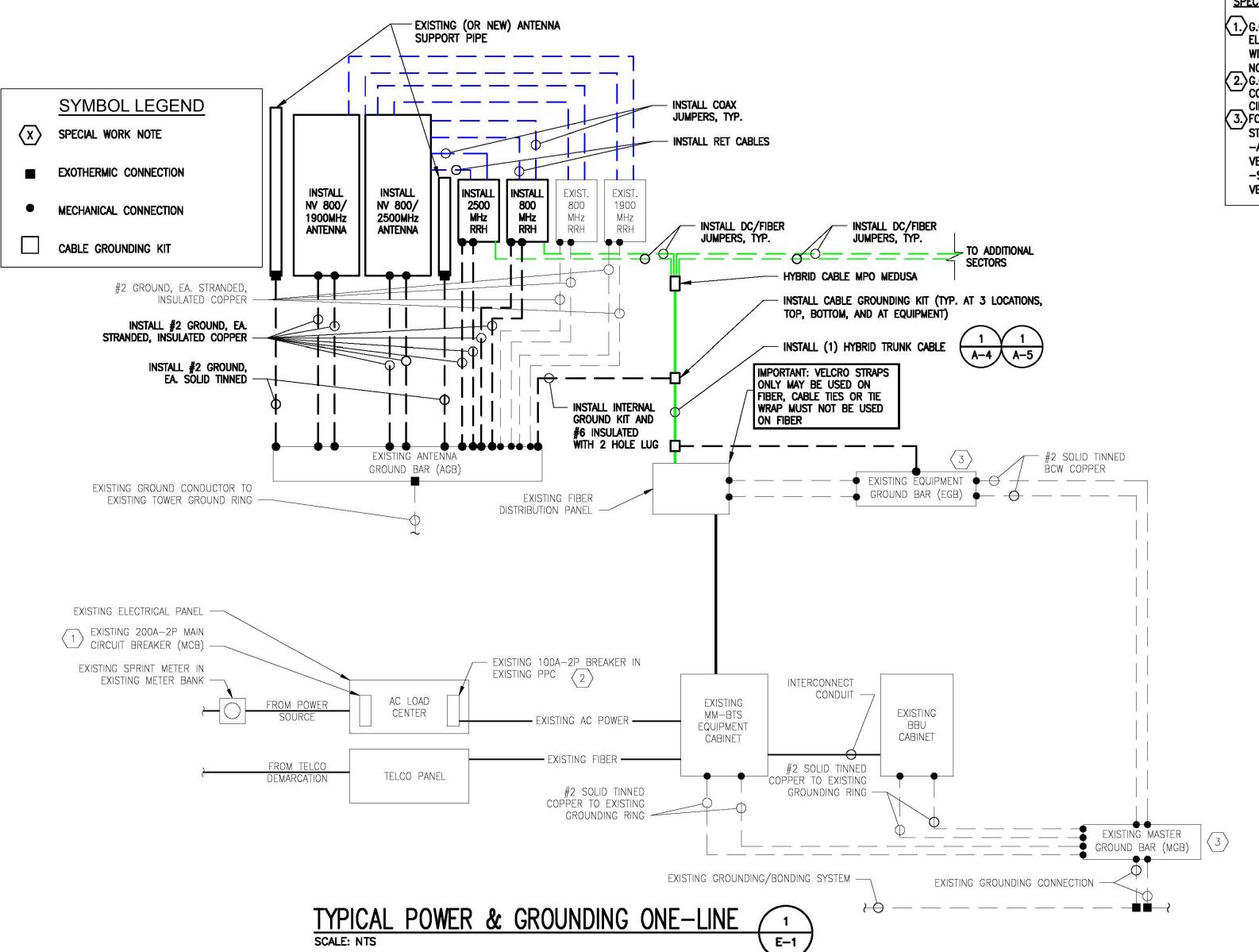
TDI ICTI IDA

SHEET TITLE

STRUCTURAL DETAILS

SHEET NUMBER

S-1



SPECIAL WORK NOTE:

- 1. G.C. TO FURNISH AND INSTALL ALL COMPONENTS TO UPGRADE EXISTING ELECTRICAL SERVICE, CONDUIT, CONDUCTOR, PPC AND MCB IN ACCORDANCE WITH SPRINT CONSTRUCTION STANDARDS NV 2.5 ADDENDUM "ENGINEERING NOTICE 2013-002 (POWER UPGRADES) REV.O" (OR CURRENT VERSION)

 2. G.C. TO FURNISH AND INSTALL UPGRADE THE EXISTING MMBTS BREAKER, CONDUCTOR, AND CONDUIT TO A MINIMUM NEC RATING FOR A 100-AMP. 240V
- 3.) FOR NEW OR REPAIRED GROUNDING EQUIPMENT, REFER TO SPRINT GROUNDING STANDARDS AND FOLLOWING (SUPPLEMENTS):

 -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT VERSION)
- -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)

ELECTRICAL NOTES

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

NOTES



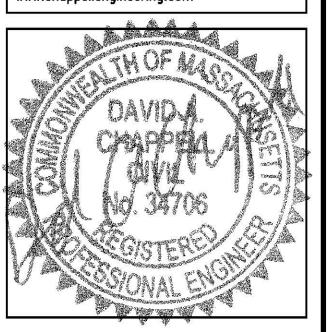
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ONE-LINE DIAGRAM & PPC DETAILS

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E-1

FURNISH & INSTALL (1)
100A-2º CIRCUIT BREAKER FOR
ELIEK ECAB EXPANSION CARINET

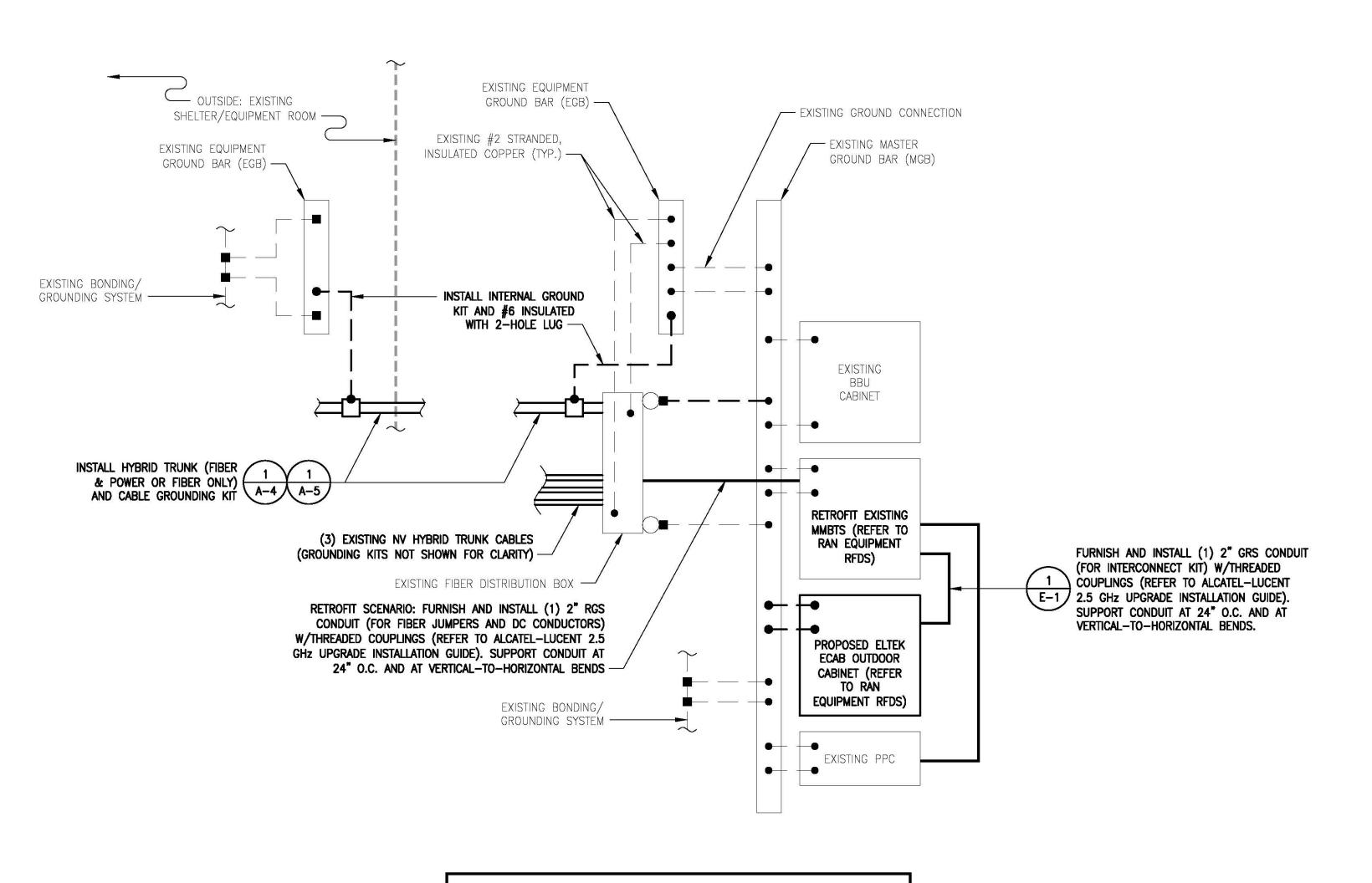
PXISI. 200A-2º NAIN
CIRCUIT BREAKER (NCB)

ROMANA ROUNDE

ALTERNATE SOLINGE.

EXIST. BREAKER PANEL (SCALE: NTS

2 E-1



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

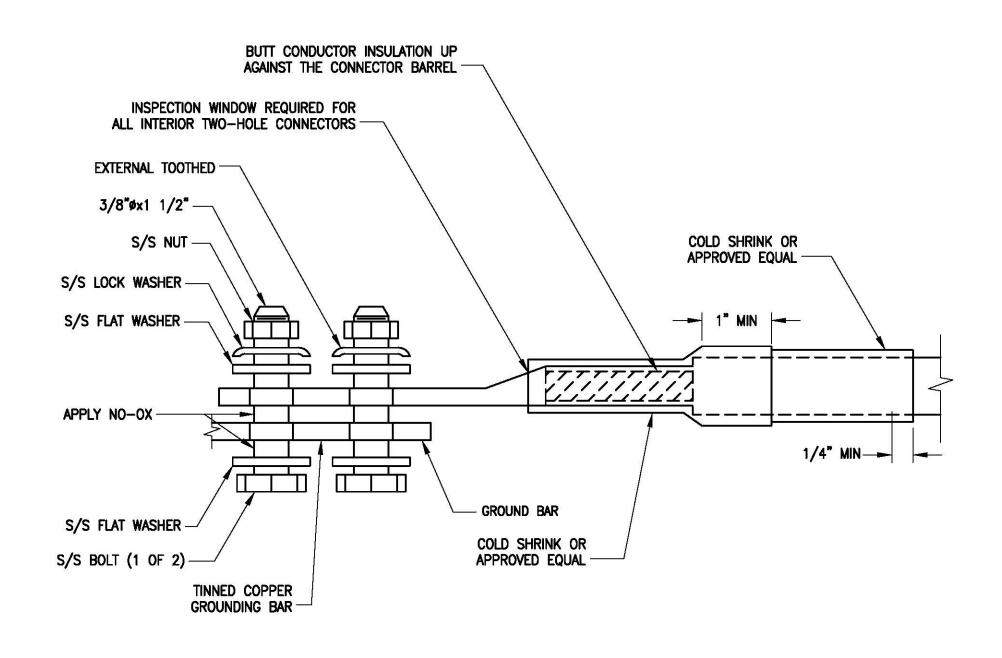
EQUIPMENT GROUNDING SCHEMATIC SCALE: N.T.S. 1 E-2

#2 AWG STRANDED INSULATED, #4 OR #6 AWG SOLID CU CONDUCTOR WITH GREEN, 600V, THWN—2 INSULATION EXISTING GROUNDING BAR ON WALL, FLOOR OR ON ANTENNA TOWER TWO HOLE SPADE, TO BE USED TO CONNECT TO GROUND BAR

<u>NOTES</u>

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

INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR SCALE: N.T.S.



(3) E-2

TWO HOLE LUG

SCALE: N.T.S.

SYMBOL LEGEND

- EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- CABLE GROUNDING KIT

GROUNDING/BONDING

CONDUIT

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

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

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

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

 -ANTI-THEFT UPDATE TO SPRINT GROUNDING DATED 08-24-12 (OR CURRENT MERSION)
- -SPRINT ENGINEERING LETTER EL-0504 DATED 04-20-12 (OR CURRENT VERSION)



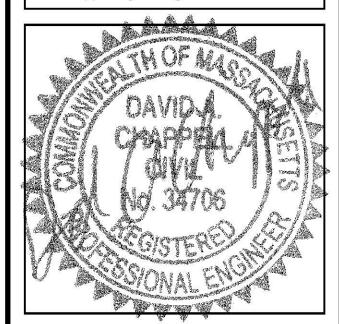
1 INTERNATIONAL BLVD, SUITE 800 MAHWAH, NJ 07495 (800) 357-7641



95 RYAN DRIVE, SUITE 1 RAYNHAM, MA 02767 (844) 748-8878 www.centerlinecommunications.com



R.K. EXECUTIVE CENTRE
201 BOSTON POST ROAD WEST, SUITE 101
MARLBOROUGH, MA 01752
(508) 481-7400
www.chappellengineering.com



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CHECKED BY: JMT

APPROVED BY: JMT

SUBMITTALS

REV. DATE DESCRIPTION BY

0 06/22/18 ISSUED FOR REVIEW JRV

SITE NUMBER:
BS80XC001
SITE NAME:

MIT EAST

SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

SHEET TITLE

GROUNDING DETAILS & NOTES

SHEET NUMBER

E-2



June 27, 2018

Sprint 1 International Blvd Suite 800 Mahwah, NJ 07495

Candidate Name

Structural Evaluation of Antenna Loads

RE: Candidate Number BS80XC001

MIT East Candidate Address 400 Main Street Cambridge, MA 02139

To whom it may concern:

Chappell Engineering Associates, LLC has reviewed the existing antenna installation at the above referenced location. Based upon the site audit completed on 05-14-2018, the existing antenna mounts consist of antennas mounted to the façade of the existing rooftop penthouse (alpha sector), mounted within existing RF flues secured to a self-supporting ballast frame (beta sector), and mounted within existing RF flues secured to the existing HVAC frame (gamma sector)

The current Sprint antenna is summarized below:

<u>Sector</u>	<u>Antenna(s)</u>	Remote Radio Unit	Antenna Support
Alpha	(1) RFS APXVSPP18-C-A20	800MHz & 1900MHz*	Façade Pipe Mount on Penthouse Face
Beta	(1) RFS APXVSPP18-C-A20	800MHz & 1900MHz*	Inside RF Radome Flue on Ballast Frame
Gamma	(1) RFS APXVSPP18-C-A20	800MHz & 1900MHz*	Inside RF Radome Flue on HVAC Frame

^{*} Existing RRH's are mounted in separate locations adjacent to panel antennas

Sprint currently proposes to reconfigure the existing site to include the additional antennas and final configuration listed below:

<u>Sector</u>	Antenna(s)	Remote Radio Unit	Antenna Support
Alpha	(1) RFS APXVSPP18-C-A20	800MHz & 1900MHz*	Façade Pipe Mount on Penthouse Face
	Commscope APXVTSM18-C-120	800MHz & 2500MHz*	Façade Pipe Mount on Penthouse Face
Beta	(1) RFS APXVSPP18-C-A20	800MHz & 1900MHz*	Inside RF Radome Flue on Ballast Frame
	Commscope APXVTSM18-C-120	800MHz & 2500MHz*	Inside RF Radome Flue on Ballast Frame
Gamma	(1) RFS APXVSPP18-C-A20	800MHz & 1900MHz*	Inside RF Radome Flue on HVAC Frame
	Commscope APXVTSM18-C-120	800MHz & 2500MHz*	Inside RF Radome Flue on HVAC Frame

^{*} Existing RRH's are mounted in separate locations adjacent to panel antennas

The proposed antennas will replace the existing in-service antennas.

Sprint also proposes to run (1) new Hybriflex trunk cable along the existing cable path. The new cable will be run alongside the existing in-service cables within the rooftop cable tray along the existing roof and wall structure.

Based upon our site evaluation on 05/14/2018 and a review of the proposed antenna/RRH sizes, the proposed antennas/RRHs being installed represent an acceptable increase in both the static and wind loaded conditions on the existing structure and on the overall stability of the structure. Chappell Engineering Associates, LLC has determined that the existing structure has adequate capacity to support the proposed DO Macro upgrade configuration as shown above. Photos of the existing antennas and the proposed locations of the new antennas/RRHs are enclosed for your convenience. A copy of the DO Macro upgrade mounting plan being proposed by Chappell Engineering Associates, LLC is also enclosed.

If you have any questions regarding this matter, please do not hesitate to call.

Very truly yours,

CHAPPELL ENGINEERING AS

Clement J Salek, P.E.

CJS/cjs



Existing Alpha Sector Antennas



Existing Alpha Sector RRH's Mounted to Wall Face





Existing Beta Sector Antenna Frame and RRH's



Existing Gamma Sector Antenna Flues



Existing Gamma Sector RRH's

SPECIAL CONSTRUCTION NOTE:
SPRINT TOWER TOP WORK IS CONTINGENT ON THE FOLLOWING:

OWNETION OF A CONSTRUCTURAL STRUCTURAL STRUCTURAL STRUCTURAL ASSESSMENT (PROVIDED BY TOWER OWNER OR A&E VENDOR).

**COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).

**COMPLETION OF AN ANTENNA/RRH MOUNT STRUCTURAL ASSESSMENT (PROVIDED BY A&E VENDOR).

**COSHALL PROVISH, HISTALL AND COMPLETE ALL REQUIRED STRUCTURAL MODIFICATIONS AS INDICATED IN BEFORE-MENTIONED ANALYSIS AND ASSESSMENT.



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PROJECT: DO MACRO UPGRADE

SITE NAME: MIT EAST

SITE CASCADE: BS80XC001

400 MAIN STREET SITE ADDRESS:

CAMBRIDGE, MA 02139

TITLE SHEET

OUTLINE SPECIFICATIONS

OUTLINE SPECIFICATIONS

OUTLINE SPECIFICATIONS

ELEVATION PLAN

ANTENNA PLANS

RF DATA SHEET

RAN WIRING DIAGRAMS

EQUIPMENT DETAILS

EQUIPMENT DETAILS

STRUCTURAL DETAILS

ONE-LINE DIAGRAM & PPC DETAILS

GROUNDING DETAILS & NOTES

ROOF & EQUIPMENT PLANS

SHEET NO.

SITE TYPE: ROOFTOP

PROJECT DESCRIPTION

SPRINT EQUIPMENT MODIFICATIONS REQUIRED TO SUPPORT MODERNIZATION OF AN

SPECTRUM LICENSE FOR 2.5GHz FREQUENCY, INCLUDING INSTALLATION OF

(1) ADDITIONAL BATTERY STRING(S) WITHIN EXISTING BATTERY RACK

(6) PANEL ANTENNAS TO REPLACE EXISTING (3) PANEL ANTENNAS

SPECIAL ZONING NOTE: BASED ON INFORMATION PROVIDED BY SPRINT REGULATORY COMPLIANCE

PROFESSIONALS AND LEGAL COUNSEL, THIS TELECOMMUNICATIONS EQUIPMENT

VARIANCE, SPECIAL PERMIT, SITE PLAN REVIEW, ADMINISTRATIVE REVIEW).

DEPLOYMENT IS CONSIDERED AN <u>ELIGIBLE FACILITY</u> UNDER THE TAX RELIEF ACT OF 2012, 47 USC 1455(A), AND IS SUBJECT TO AN EXPEDITED <u>ELIGIBLE FACILITIES</u>

REQUEST/REVIEW AND ZONING PRE-EMPTION FOR LOCAL DISCRETIONARY PERMITS

GROUND-LEVEL RAN EQUIPMENT, CONSISTING OF

TOWER-TOP EQUIPMENT, INCLUDING INSTALLATION OF

(6) REMOTE RADIO HEADS (RRH)

EXISTING WIRELESS COMMUNICATIONS FACILITY AND UTILIZATION OF FCC BROADBAND

(1) NEW 2.5GHz RETROFIT KIT & RECTIFIERS (AS REQ'D) WITHIN EXISTING MM-BTS EQUIPMENT CABINET

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





R.K. EXECUTIVE CENTRE 201 BOSTON POST ROAD WEST, SUITE 101 MARLBOROUGH, MA 01752 (508) 481-7400



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APPROVED BY: JM			
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0	06/22/18	ISSUED FOR REVIEW	JRV

SITE NUMBER BS80XC001 SITE NAME: MIT EAST

SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

TITLE SHEET

T-1

SITE INFORMATION

PROPERTY OWNER:

MASSACHUSETTS INSTITUTE OF TECHNOLOGY 238 MAIN STREET, SUITE 200

LATITUDE (NAD83)

GOOGLE EARTH 2-C CONFIRMATION N 42" 21" 44.36" 42.362322"

LONGITUDE (NAD83)

GOOGLE EARTH 2-C CONFIRMATION

W 71° 05' 16.04" 71.087789

COUNTY:

MIDDLESEX

ZONING JURISDICTION:

CITY OF CAMBRIDGE

ZONING DISTRICT:

RESIDENCE C-3B

POWER COMPANY:

NSTAR ELECTRIC PHONE: 1-888-633-3797

AAV PROVIDER:

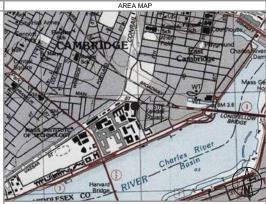
COMCAST PHONE: 1-800-COMCAST

SPRINT CM:

CHAD WAGNER PHONE: 617-529-0973 Chad.Wagner@sprint.com

EQUIPMENT SUPPLIER:

ALCATEL - LUCENT 600 MOUNTAIN AVENUE MURRAY HILL, NJ 07974 (908) 508-8080



LOCATION MAP - GOOGLE EARTH 2-C CONFIRMATION

GENERAL NOTES THIS IS AN UNMANNED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY. THIS IS AN UNMANUED AND RESTRICTED ACCESS TELECOMMUNICATION FACILITY, AND IS NOT FOR HUMAN HABITATION. IT MILL BE USED FOR THE TRANSMISSION OF RADIO SIGNAL FOR THE PURPOSE OF PROVIDING PUBLIC CELLULAR SERVICE. ADA COMPLIANCE NOT REQUIRED.

PORTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.

NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.

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

NEW CONSTRUCTION WILL CONFORM TO ALL APPLICABLE CODES AND ORDINANCES. BUILDING CODE: MASSACHUSETTS STATE BUILDING CODE 780-CMR (9TH EDITION) ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE

STRUCTURAL CODE: TIA/EIA-222-G STRUCTURAL STANDARDS FOR ANTENNA

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

APPROVALS

DRAWING INDEX

REV. CHK.

JMT JRV

JMT

JMT

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BY.

JRV

JRV

JRV

SHEET TITLE

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

AT LEAST 72 HOURS PRIOR TO DIGGING THE CONTRACTOR IS REQUIRED TO CALL DIG SAFE AT 811 DigSafe

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.
- 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

1.4 NATIONALLY RECOGNIZED CODES AND STANDARDS:

- THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL AND LOCAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT. OF TELECOMMUNICATIONS EQUIPMENT.

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

- WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT
- DOCUMENTS.
 COMPANY: SPRINT CORPORATION

- COMPANY, SPRINT CORPORATION ENGINEER AND 'A&E'. THE DESIGN ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND 'A&E'. THE DESIGN PROFESSIONAL HAWING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT. CONTRACTION CONSTRUCTION OF SOMETHING ON STRUCTION OF MIDDING, INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK THIRD PARTY ENDIGH 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.
- OCI: OWNER FURNISHED, CONTRACTOR INSTALLED EQUIPMENT.
 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 REQUEST TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LOCK OF KNOWLEDGE OF 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.
 - THE JOBBITE 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 BY 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.
- FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS. 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.
 DIMENSIONS SHOWN ARE TO FINISH SUFFACES UNLESS NOTED OTHERWISE. SPACING BETWEEN EQUIPMENT IS THE REQUIRED CLEARANCE. SHOULD THERE BE ANY QUESTIONS RECARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SERBUT CONSTRUCTION WITH THE MANAGED BEDING TO REPORT TO PROPER SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE SERBUT CONSTRUCTION. 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 <u>UTILITIES SERVICES:</u> 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 <u>PERMITS / FEES;</u> 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.
- B. SPRINT "STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES" ARE INCLUDED IN AND MADE A PART OF THESE SPECIFICATIONS HEREWITH.

 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.
 - TOP HAT HOW TO INSTALL A NEW CABINET
 - BASE BAND UNIT IN EXISTING UNIT INSTALLATION OF BATTERIES INSTALLATION OF HYBRID CABLE

 - INSTALLATION OF RRH'S

 - CABLING TS-0200 REV 4 ANTENNA LINE ACCEPTANCE STANDARDS SPRINT CELL SITE ENGINEERING NOTICE - EN 2012-001, REV 1.

 - SPRINT CELL SITE ENGINEERING NOTICE EN 2012-001, COMMISSIONION MOPES SPRINT CELL SITE ENGINEERING NOTICE EN-2013-002 SPRINT ENGINEERING LETTER EL-0504 SPRINT ENGINEERING LETTER EL-0568 SPRINT TENGINEERING LETTER EL-0568 SPRINT TENGINGAL SPECIFICATION TS-0193

USE OF ELECTRONIC PROJECT MANAGEMENT SYSTEMS:

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

- 3.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.
- 3.2 <u>ACCESS TO WORK:</u> 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. SPECIFICATIONS SPICE IS DEADER ANY THEO PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.
- 3.4 <u>DIMENSIONS:</u> 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 WRITERN APPROVAL FROM THE ARCHITECT AND

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.
- 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:

- COMPANY FURNISHED MATERIAL AND EQUIPMENT IS IDENTIFIED ON THE RF DATA SHEET IN THE CONSTRUCTION DOCUMENTS.
- THE CONTRACTOR IS RESPONSIBLE FOR SPRINT PROVIDED MATERIAL AND EQUIPMENT AND UPON
- ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
 VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES
- TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN
- AGREEMENT.

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

 PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.

 COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING

AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

3.2 DELIVERABLES:

- 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

- 1.1 HEIGHT | HEIGHT | HEIG
- 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.
- TOWER OWNER NOTIFICATION: ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, THE CONTRACTOR WILL CONTACT THE 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 TO NOTIFY THE CARRIER 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
- C. MANAGE AND CONDUCT ALL FIELD CONSTRUCTION SERVICE RELATED ACTIVITIES
- PROVIDE CONSTRUCTION ACTIVITIES TO THE EXTENT REQUIRED BY THE CONTRACT DOCUMENTS.
- INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- PERFORM ANY REQUIRED SITE ENVIRONMENTAL MITIGATION.
 PREPARE GROUND SITES; PROVIDE DE-GRUBBING; AND ROUGH AND FINAL GRADING, AND
- COMPOUND SURFACE TREATMENTS.

 MANAGE AND CONDUCT ALL ACTIVITIES FOR INSTALLATION OF UTILITIES INCLUDING ELECTRICAL AND
- INSTALL UNDERGROUND FACILITIES INCLUDING UNDERGROUND POWER AND COMM CONDUTING, AND UNDERGROUND GROUNDING SYSTEM.

 INSTALL ABOVE GROUND GROUNDING SYSTEMS.

 PROVIDE NEW PIAMC, INSTALLATIONS AND MODIFICATIONS.

 INSTALL ROADS, ACCESS WAYS, CURBS AND DRAINS AS INDICATED.

 ACCOMPLISH REQUIRED MODIFICATION OF EXISTING FACILITIES.

 PROVIDE ANTENNA SUPPORT STRUCTURE FOUNDATIONS.

 INSTALL COMPOUND FROM THE PLATFORMS.

 INSTALL COMPOUND FROM AND EXPENSE AND DRAIPS AS TO ACCESS BARRIERS.

 PROVIDE SLABS AND EQUIPMENT PLATFORMS.

 INSTALL COMPOUND FROM A MERCAL TESTING AS RECHIRED HEREMATERS. INSTALL LINDERGROUND FACILITIES INCLUDING LINDERGROUND POWER AND COMMUNICATIONS

- 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
- 16. INSTALL TOWERS, AMENINA SUPPORT STRUCTURES AND PLATFORMS ON EXISTING TOWERS AS REQUIRED.

 17. INSTALL CELL SITE RADIOS, MICROWAYE, 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
- 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, MIPCLAMENTS, 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
 - 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 WRITING THE MORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITING THE MORANY.
 - 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 INDIMIDUALS TO THE HAZARD.
- 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.

PROJECT PROGRESS REPORTS.

3.3 DELIVERABLES:

- CONTRACTOR SHALL REVIEW, APPROVE, AND SUBMIT TO SPRINT SHOP DRAWINGS, PRODUCT DATA, SAMPLES, AND SIMILAR SUBMITTALS AS REQUIRED HEREINAFTER
- 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.
- CIVIL CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION) ELECTRICAL SERVICE COMPLETION DATE (POPULATE FIELD IN SMS AND/OR FORWARD
- NOTIFICATION) LINES AND ANTENNA INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
- POWER INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).

 TELCO READY DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
- PPC (OR SHELTER) INSTALL DATE (POPULATE FIELD IN SMS AND/OR FORWARD NOTIFICATION).
 TOWER CONSTRUCTION START DATE (POPULATE FIELD IN SMS AND/OR FORWARD
- NOTIFICATION). 10. TOWER CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD
- 11. BTS AND RADIO EQUIPMENT DELIVERED AT SITE DATE (POPULATE FIELD IN SMS AND/OR

CONTINUE SHEET SP-2





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OUTLINE SPECIFICATIONS

SP-1

CONTINUED FROM SP-1:

- 12. NETWORK OPERATIONS HANDOFF CHECKLIST (HOC WALK) COMPLETE (UPLOAD FORM IN SMS) 13. CIVIL CONSTRUCTION COMPLETE DATE (POPULATE FIELD IN SMS AND/OR FORWARD
- 14. SITE CONSTRUCTION PROGRESS PHOTOS UNLOADED INTO SMS.

SECTION 01 400 - SUBMITTALS, TESTS, AND INSPECTIONS

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:

- THE WORK IN ALL ASPECTS SHALL COMPLY WITH THE CONSTRUCTION DRAWINGS AND
- B. SUBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL UBMIT THE FOLLOWING TO COMPANY REPRESENTATIVE FOR APPROVAL.

 CONCRETE MR-DESIONS FOR TOWER FOUNDATIONS, ANCHORS PIERS, AND CONCRETE PAVING.

 CONCRETE BREAK TESTS AS SPECIFIED HERBIN.

 SPECIAL FINISHES FOR INTERIOR SPACES, IF ANY.

 ALL EQUIPMENT AND MATERIALS SO IDENTIFIED ON THE CONSTRUCTION DRAWINGS.

 CHEMICAL GROUNDING DESIGN.

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

1.4 TESTS AND INSPECTIONS:

- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- COAX SWEEPS AND FIBER TESTS PER SPRINT TS-0200 CURRENT VERSION ANTENNA LINE
- COAX SWEEPS AND FIBER TESTS PER SPRINT TS-0200 CURRENT VERSION ANTENNA LINE ACCEPTIANCE STANDARDS.
 AGL, AZIMUTH AND DOWNTLLT USING ELECTRONIC COMMERCIAL MADE-FOR-THE-PURPOSE ANTENNA ALIGNMENT TOOL.
 CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK DENTIFIED SUNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF
- C. REQUIRED CLOSEOUT DOCUMENTATION INCLUDES. BUT IS NOT LIMITED TO THE FOLLOWING:
- 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 FDF FORMATS. ANY FIELD CHANGE MUST BE REFLICTED BY MODIFING THE PLANS, ELEVATIONS, AND DETRIALS IN THE DRAWING SETS. GENERAL NOTES INDICATING MODIFICATIONS MULL NOT BE ACCEPTED. CHANGES SHALL BE HIGHLIGHTED AS "CLOUDS" IDENTIFIED AS THE "AS-BUILT" CONDITION.
- 6 LIEN WAIVERS
- 7. FINAL PAYMENT APPLICATION
- 8. REQUIRED FINAL CONSTRUCTION PHOTOS
- 9. CONSTRUCTION AND COMMISSIONING CHECKLIST COMPLETE WITH NO DEFICIENT ITEMS
- 10. ALL POST NTP TASKS INCLUDING DOCUMENT UPLOADS COMPLETED IN SITERRA (SPRINTS DOCUMENT REPOSITORY OF RECORD).
- 1.5 COMMISSIONING: PERFORM ALL COMMISSIONING AS REQUIRED BY APPLICABLE MOPS
- 1.6 INTEGRATION: PERFORM ALL INTEGRATION ACTIVITIES AS REQUIRED BY APPLICABLE MOPS
- PART 2 PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 REQUIREMENTS FOR TESTING:

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

3.2 REQUIRED TESTS:

- A. CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- 1. CONCRETE CYLINDER BREAK TESTS FOR THE TOWER AND ANCHOR FOUNDATIONS AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE PAVINO.
 2. ASPHALT ROADWAY COMPACTED THICKNESS, SURFACE SMOOTHNESS, AND COMPACTED DENSITY SETSING AS SPECIFIED IN SECTION: HOT MIX ASPHALT PAVINO.
 3. FELD QUALITY CONTROL TESTING AS SPECIFIED IN SECTION: PORTLAND CEMENT CONCRETE MADE A PART OF 1
- 4. TESTING REQUIRED UNDER SECTION: AGGREGATE BASE FOR ACCESS ROADS, PADS AND PART 2 PRODUCTS (NOT USED)
- ANCHOR LOCATIONS
- 5. STRUCTURAL BACKFILL COMPACTION TESTS FOR THE TOWER FOUNDATION.

- SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
 ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
 GROUNDING AT ANTENNA MASTS FOR GPS AND ANTENNAS.
 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
- FACILITES.

 TOWER EXECTION STACKING AND PLATFORM ATTACHMENT DOCUMENTED BY DIGITAL

 TOWER EMPLOY BY THIRD PARTY SCIENCY.

 ANTENNAL AZIMUTH DOWN TILL AND PER SUNLIGHT TOOL SUNSIGHT INSTRUMENTS —
 AMTERNAL AZIMUTH TOOL (AAT)

 7. VERRICATION DOCUMENTED WITH THE ANTENNA CHECKLIST REPORT, BY A&E, SITE
 DEVELOPMENT REP, OR REP.
- INFL. 10E RF REP.

 FINAL INSPECTION OF SECULIST AND HANDOFF WALK (HOC.). SIGNED FORM SHOWING ACCEPTANCE BY FIELD OPS IS TO BE UPLOADED INTO SUS.

 COAX SWEEP AND FIERE TESTING DOCUMENTS SUBMITTED VIA SMS FOR RF APPROVAL.

 S.CAN-ABLE BARCODE PHOTOGRAPHS OF TOWER TOP AND INACCESSIBLE SERIALIZED EQUIPMENT

- 11. ALL AVAILABLE JURISDICTIONAL INFORMATION
 12. PDF SCAN OF REDLINES PRODUCED IN FIELD
- E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL CORRECTIONS TO ANY WORK IDENTIFIED AS UNACCEPTABLE IN SITE INSPECTION ACTIVITIES AND/OR AS A RESULT OF
- 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 THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THEM AND BE LABELED WITH THE PHOTOGRAPHED THEM AND BE LABELED WITH THE SITE OF THE PHOTOGRAPHED THE PHOTOGRAPHED THEM AND BE LABELED WITH THE PHOTOGRAPHED THEM AND BE LABELED WITH THE PHOTOGRAPHED THEM AND BE LABELED WITH THE PHOTOGRAPHED THE PHOTOGRA CASCADE NUMBER, SITE NAME, DESCRIPTION, AND DATE.
- CONTRACTOR SHALL ACCOMPLISH TESTING INCLUDING BUT NOT LIMITED TO THE 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.
 - CONCRETE MIX AND CYLINDER BREAK REPORTS.

 - STRUCTURAL BACKFILL COMPACTION REPORTS. SITE RESISTANCE TO EARTH TEST.
 - 3. SIE RESISTANCE 10 EARTH IEST.
 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 SHOWNG ALL OPEN INCOMATIONS AND TERLECHING PHOPOR TO BACKFILLING SHOWING A TAPE MEASURE WISILE IN THE EXCAVATIONS INDICATING DEPTH.

 2. CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING TYPICAL INSTALLATION OF
 - CONDUITS, CONDUCTORS AND GROUNDING: PHOTOGRAPHS SHOWING ITERAL 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

 - MECHANICAL CONNECTIONS TO TOWER/MONOPOLE.

 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 EXT FROM ROOF: STE LAYOUT PHOTOGRAPHS OF THE OVERFALL COMPOUND, INCLUDING EQUIPMENT PLATFORM

 - 6. SITE LAYOUT PHOTOGRAPHS OF THE OVERALL COMPOUND, INCLUDING EQUIPMENI PLAITORM 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 NUIZ CLOSE-UP PHOTOGRAPH OF THE POWER METER AND DISCONNECT; PHOTOS OF POWER AND TELCO ENTRANCE TO COMPANY ENLOSURE; PHOTOGRAPHS AT METER BOX AND/OR FACULTY DISTRIBUTION PANEL.
 8. REQUIRED MATERIALS CERTIFICATIONS: CONCRETE MIX DESIGNS; MILL CERTIFICATION FOR ALL REINFORCING AND STRUCTURAL STEEL; AND ASPHALT PANING MIX DESIGN.
 9. ANY AND ALL SUBMITTALS BY THE JURISDICTION OR COMPANY.

SECTION 01 500 - PROJECT REPORTING

PART 1 - GENERAL

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

- 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 C. ROOF INSPECTION PHOTOGRAPHS SHOULD BE UPLOADED WITH CLOSEOUT PHOTOGRAPHS. MADE A PART OF THESE SPECIFICATIONS HEREWITH.

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 PROJECTIONS, AND ANSWER ANY OTHER SITE STATUS QUESTIONS AS NECESSARY. UPCOMING MILESTONE

3.3 PROJECT TRACKING IN SMS:

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

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:

 - SHELTER AND TOWER OVERVIEW.

 TOWER FOUNDATION(S) FORMS AND STEEL BEFORE POUR (EACH ANCHOR ON GUYED TOWERS).

 TOWER FOUNDATION(S) POUR WITH VIBRATOR IN USE (EACH ANCHOR ON GUYED TOWERS).

 - TOWER STEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).

 CHOCKED SEEL AS BEING INSTALLED INTO HOLE (SHOW ANCHOR STEEL ON GUYED TOWERS).

 CONCRETE TESTING / SAMPLES.

 PLACING OF ANCHOR BOLTS IN TOWER FOUNDATION.
- 7. PLULING OF ANCHOR BULLS IN TOWER FOUNTAIN.

 8. BULLIND, VAMEET TANK FROM ROAD FOR TENANT IMPROVEMENTS OR COMMENTS.

 9. SHELITER FOUNDATION —FORMS AND STEEL BEFORE POURING.

 10. SHELITER FOUNDATION FOR WITH IMBRATOR IN USE.

 11. COAX CABLE ENTRY INTO SHELITER.

 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
- REND 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.

- 27. ANTIENNA 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.
- 31. CABLE INAT ANU/OVE WAVESUIDE BRIDGE.
 32. DOCHOUSE/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.

- ELECTRICAL DISTRIBUTION WALL.
 CABLE ENTRY WITH SURGE SUPPRESSION.
- 37. CABLE ENTRY WITH SOME SOFTRESSION.
 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.
- FINAL PROJECT ACCEPTANCE: COMPLETE ALL REQUIRED REPORTING TASKS PER CONTRACT, CONTRACT DOCUMENTS OR THE SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES AND UPLOAD INTO SITERRA.

SECTION 07 500 - ROOF CUTTING, PATCHING AND REPAIR

EXISTING WARRANTY, AND LOCAL JURISDICTIONAL STANDARDS

SUMMARY:
THIS SECTION SPECIFIES CUTTING AND PATCHING EXISTING ROOFING SYSTEMS WHERE THIS SECTION SPECIFIES COTTING AND PART-UNING EXISTING ROUTING STSTEMS WHERE CONDUIT OF AGREES EXIT THE BUILDING ONTO THE ROOF OR BUILDING—MOUNTED ANTENNAS, AND AS REQUIRED FOR WATERINGT PERFORMANCE, ROOFTOP ENTRY OPENINGS IN MEMBRAS, ROOFTOPS SHALL BE CONSTRUCTED TO COMPLY WITH LANDLORD, ANY

1.4 SUBMITTALS:

- <u>PRE-CONSTRUCTION ROOF PHOTOS:</u> COMPLETE A ROOF INSPECTION PRIOR TO THE INSTALLATION OF SPRINT EQUIPMENT ON ANY ROOFTOP BUILD. AT A MINIMUM INSPECT AND PHOTOGRAPH (MINIMUM 3 EA.) ALL AREAS IMPACTED BY THE ADDITION OF THE SPRINT EQUIPMENT.
- PROVIDE SIMILAR PHOTOGRAPHS SHOWING ROOF CONDITIONS AFTER CONSTRUCTION (MINIMUM 3





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CAMBRIDGE, MA 02139

OUTLINE SPECIFICATIONS

SP-2

PART 3 - EXECUTION

CONTINUE SHEET SP-3

CONTINUED FROM SP-2:

SECTION 09 900 - PAINTING

QUALITY ASSURANCE:

- A. COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- COMPLY WITH ALL ENVIRONMENTAL REGULATIONS FOR VOLATILE ORGANIC COMPOUNDS. MATERIALS:
- A. MANUFACTURERS: BENJAMIN MOORE, ICI DEVOE COATINGS, PPG, SHERWIN WILLIAMS OR APPROVED EQUAL, PROVIDE PREMIUM GRADE, PROFESSIONAL-QUALITY PRODUCTS FOR COATING

PAINT SCHEDULE:

- A. EXTERIOR ANTENNAE AND ANTENNA MOUNTING HARDWARE: ONE COAT OF PRIMER AND TWO FINISH COATS, PAINT FOR ANTENNAE SHALL BE NON-METALLIC BASED AND CONTAIN NO METALLIC PARTICLES. PROVIDE COLORS AND PATTERNS AS REQUIRED TO MASK APPEARANCE. OF ANTENNAE ON ADJACENT BUILDING SURFACES AND AS ACCEPTABLE TO THE OWNER. REFER TO ANTENNA MANUFACTURER'S INSTRUCTIONS WHENEVER POSSIBLE.
- ROOF TOP CONSTRUCTION: TOUCH UP PREPARE SURFACES TO BE REPAIRED. FOLLOW INDUSTRY STANDARDS AND REQUIREMENTS OF OWNER TO MATCH EXISTING COATING AND FINISH.

PAINTING APPLICATION:

- INSPECT SURFACES, REPORT UNSATISFACTORY CONDITIONS IN WRITING; BEGINNING WORK
- MEANS ACCEPTANCE OF SUBSTRATE.

 2. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION,
- COMMENT WITH MONOTONIC TORKS INSTRUCTIONS AND RECOMMENDATIONS FOR PREPARATION, PRIMING AND COATING WORK COORDINATE WITH WORK OF OTHER SECTIONS.

 MATCH APPROVED MOCK-UP'S FOR COLOR, TEXTURE, AND PATTERN, RE-COAT OR REMOVE AND REPLACE WORK WHICH DOES NOT MATCH OR SHOWS LOSS OF ADHESION. 4. CLEAN UP. TOUCH UP AND PROTECT WORK.

TOUCHUP PAINTING:

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

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

SUMMARY:

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

ANTENNAS AND RRH'S:

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

HYBRID CABLE:

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

JUMPERS AND CONNECTORS:

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

REMOTE ELECTRICAL TILT (RET) CABLES:

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

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

- A. THE CONTRACTOR SHALL POSITION THE ANTENNA ON TOWER PIPE MOUNTS SO THAT THE BOTTOM STRUT IS LEVEL. THE PIPE MOUNTS SHALL BE PLUMB TO WITHIN 1 DEGREE.
- B. ANTENNA MOUNTING REQUIREMENTS: PROVIDE ANTENNA MOUNTING HARDWARE AS INDICATED ON THE DRAWINGS

HYBRID CABLES INSTALLATION:

- A. THE CONTRACTOR SHALL ROUTE, TEST, AND INSTALL ALL CABLES AS INDICATED ON THE CONSTRUCTION DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- B. THE INSTALLED RADIUS OF THE CABLES SHALL NOT BE LESS THAN THE MANUFACTURER'S SPECIFICATIONS FOR BENDING RADII.
- C. EXTREME CARE SHALL BE TAKEN TO AVOID DAMAGE TO THE CABLES DURING HANDLING AND 1 FASTENING MAIN HYBRID CARLES: ALL CARLES SHALL BE PERMANENTLY FASTENED TO THE COAX
- FASIENING MAIN THROUG CABLES: ALL CABLES SHALL BE PERMANENTLY FASIENED TO THE COAX LADDER AT 4 "O" OC USING NON-MAGNETIC STAINLESS STEEL CLIPS.
 FASTENING INDIVIDUAL FIBER AND DC CABLES ABOVE BREAKOUT ENCLOSURE (MEDUSA), WITHIN THE MINIST CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES.
- MMBTS CABINET AND ANY INTERMEDIATE DISTRIBUTION BOXES:

 a. FIBER: SUPPORT FIBER BUNDLES USING ½" VELCRO STRAPS OF THE REQUIRED LENGTH

 18*

 OC. STRAPS SHALL BE UV, OIL AND WATER RESISTANT AND SUITABLE FOR INDUSTRIAL
 INSTALLATIONS AS MANUFACTURED BY TEXTOL. OR APPROVED EQUAL

 B. DC: SUPPORT DC BUNDLES WITH ZIP TIES OF THE ADEQUATE LENGTH. ZIP TIES TO BE UV
- STABILIZED, BLACK NYLON, WITH TENSILE STRENGTH AT 12,000 PSI AS MANUFACTURED BY NELCO PRODUCTS OR EQUAL.

- 3. FASTENING JUMPERS: SECURE JUMPERS TO THE SIDE ARMS OR HEAD FRAMES USING STAINLESS STEEL TIE WRAPS OR STAINLESS STEEL BUTTERFLY CLIPS.

 4. CABLE INSTALLATION:
- - INSPECT CABLE PRIOR TO USE FOR SHIPPING DAMAGE, NOTIFY THE CONSTRUCTION MANAGER. CABLE ROUTING: SABLE 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.
 HOIST CABLE USING PROPER HOISTING GRIPS. DO NOT EXCEED MANUFACTURES RECOMMENDED MAXIMUM BEND RADIUS.
- 5. GROUNDING OF TRANSMISSION LINES: ALL TRANSMISSION LINES SHALL BE GROUNDED AS INDICATED ON DRAWINGS.
- GROUNDING OF HAMSIMSSIUM LINES: ALL IRANSMISSIUM LINES SITHAL DE GROUNTEUER ÀS INTERNACION D'ARMINIS.
 HYBRID CABLE COLOR CODING: ALL COLOR CODING SHALL BE AS REQUIRED PER SPRINT TS-0200 CURRENT VERSION.
 HYBRID CABLE LABELING: INDIMIDUAL HYBRID AND DC BUNDLES SHALL BE LABELED ALPHA-INDIMICALLY ACCORDING TO SPRINT CELL SITE ENGINEERING NOTICE EN 2012-001, REVI

WEATHER PROOFING EXTERIOR CONNECTORS AND HYBRID CABLE GROUND KITS:

- ALL FIBER & COAX CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED. WEATHERPROOFED USING ONE OF THE FOLLOWING METHODS. ALL INSTALLATIONS MUST В BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INDUSTRY BEST PRACTICES.
- DUSINY BEST PRACTICES.

 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.

 SELF-AMALGAMATING TAPE: CLEAN SURFACES. APPLY A DOUBLE WRAP OF SELF-AMALGAMATING TAPE IN OPPOSITE DIRECTION. 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.
- 3M SLIM LOCK CLOSURE 716: SUBSTITUTIONS WILL NOT BE ALLOWED. OPEN FLAME ON JOB SITE IS NOT ACCEPTABLE

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

SUMMARY:

- THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL EQUIPMENT INCLUDING BY NOT LIMITED TO RECTIFIERS, POWER DISTRIBUTION UNITS, BASE BAND UNITS, SURGE ARRESTORS, BATTERIES, AND SIMILAR EQUIPMENT FURNISHED BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
- CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS
- C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

DC CIRCUIT BREAKER LABELING

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

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

SUMMARY

- THIS SECTION SPECIFIES MMBTS CABINETS, POWER CABINETS, AND INTERNAL MISCHIEF OF THE METAL STATE OF THE METAL A. BY THE COMPANY FOR INSTALLATION BY THE CONTRACTOR (OFCI).
- CONTRACTOR SHALL PROVIDE AND INSTALL ALL MISCELLANEOUS MATERIALS AND PROVIDE ALL LABOR REQUIRED FOR INSTALLATION EQUIPMENT IN EXISTING CABINET OR NEW CABINET AS SHOWN ON DRAWINGS AND AS REQUIRE BY THE APPLICABLE INSTALLATION MOPS.
- C. COMPLY WITH MANUFACTURERS INSTALLATION AND START-UP REQUIREMENTS

SUPPORTING DEVICES:

- MANUFACTURED STRUCTURAL SUPPORT MATERIALS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY THE FOLLOWING:
- ALLIED TUBE AND CONDUIT
 B-LINE SYSTEM
 UNISTRUT DIVERSIFIED PRODUCTS
 THOMAS & BETTS
- FASTENERS: TYPES, MATERIALS, AND CONSTRUCTION FEATURES AS FOLLOWS:
- EXPANSION ANCHORS: CARBON STEEL WEDGE OR SLEEVE TYPE.
 POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE

- POWER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL, DESIGNED SPECIFICALLY FOR THE INTENDED SERVICE.

 FASTEN BY MEANS OF WOOD SCREWS ON WOOD.

 FASTEN BY MEANS OF WOOD SCREWS ON WOOD.

 FOR STEEL STORM OF STEEL STRONG OF STEEL STRON
- 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.
- COORDINATE WITH THE BUILDING STRUCTURAL SYSTEM AND WITH OTHER TRADES.
- C. UNIESS OTHERWISE INDICATED ON THE DRAWINGS. FASTEN FLECTRICAL 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

ELECTRICAL IDENTIFICATION:

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

SECTION 26 200 - ELECTRICAL MATERIALS AND EQUIPMENT

CONDUIT

- RIGID CALVANIZED STEEL (RGS) CONDUIT SHALL BE USED FOR EXTERIOR LOCATIONS ABOVE GROUND AND IN UNFINSHED INTERIOR LOCATIONS AND FOR ENCASED RUNS IN CONCRETE. RIGID CONDUIT AND FITTINGS SHALL BE STEEL, COARED WITH ZINC EXTERIOR AND INTERIOR BY THE HOT DIP GALVANIZING PROCESS. CONDUIT SHALL BE PRODUCED TO ANSI SPECIFICATIONS COB.1, FEDERAL SPECIFICATION WHO—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.
- UNDERGROUND CONDUIT IN CONCRETE SHALL BE POLYVINYLCHLORIDE (PVC) SUITABLE DIRECT BURIAL AS APPLICABLE. JOINTS SHALL BE BELLED, AND FLUSH SOLVEN WELDED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE CARLON ELECTRICAL PRODUCTS OR APPROVED EQUAL.
- C. TRANSITIONS BETWEEN PVC AND RIGID (RGS) SHALL BE MADE WITH PVC COATED METALLIC LONG SWEEP RADIUS ELBOWS.
- D. EMT OR RIGID GALVANIZED STEEL CONDUIT MAY BE USED IN FINISHED SPACES CONCEALED IN WALLS AND CEILINGS. EMT SHALL BE MILD STEEL, ELECTRICALLY WELDED, ELECTRO-GALVANIZED OR HOT-DIPPED GALVANIZED AND PRODUCED TO ANSI WELDED, ELECTRO—GALVANIZED OR HOT—DIPPED GALVANIZED AND PRODUCED TO ANSI SPECIFICATION C80.3, FEDERAL SPECIFICATION WO—C583, AND SHALL BE UL LISTED. EMT SHALL BE MANUFACTURED BY ALLIED, REPUBLIC OR WHEATLAND, OR APPROVED EQUAL. FITTINGS SHALL BE METALLIC COMPRESSION. SET SKEET CONNECTIONS SHALL NOT BE ACCEPTABLE.
- E. LIQUID TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED FOR FINAL CONNECTION TO EQUIPMENT. FITTINGS SHALL BE METALLIC GLAND TYPE COMPRESSION FITTINGS, MAINTAINING THE INTEGRITY OF CONDUIT SYSTEM. SET SCREW CONNECTIONS SHALL NOT BE ACCEPTABLE. MAXIMUM LENGTH OF FLEXIBLE CONDUIT SHALL NOT EXCEED 6-FEET. LFMC SHALL BE PROTECTED AND SUPPORTED AS REQUIRE BY NEC. MANUFACTURERS OF FLEXIBLE CONDUITS SHALL BE CAROL, ANACONDA METAL HOSE OR UNIVERSAL METAL HOSE, OR APPROVED EQUAL.
- F. MINIMUM SIZE CONDUIT SHALL BE 3/4 INCH (21MM).

HUBS AND BOXES:

- A. AT ENTRANCES TO CABINETS OR OTHER EQUIPMENT NOT HAVING INTEGRAL THREADED HUBS PROVIDE METALLIC THREADED HUBS OF THE SIZE AND CONFIGURATION REQUIRED. HUB SHALL INCLUDE LOCKNUT AND NEOPRENE O-RING SEAL. PROVIDE IMPACT RESISTANT 105 DEGREE C PLASTIC BUSHINGS TO PROTECT CABLE INSULATION.
- B CABLE TERMINATION FITTINGS FOR CONDUIT
- CABLE TERMINATORS FOR RGS CONDUITS SHALL BE TYPE CRC BY 0-Z/GEDNEY OR EQUAL 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 FOUAL.
- 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.
- MANUFACTURER FOR BOXES AND COVERS SHALL BE HOFFMAN, SQUARE "D", CROUSE—HINDS, COOPER, ADALET, APPLETON, O—Z GEDNEY, RACO, OR APPROVED

SUPPLEMENTAL GROUNDING SYSTEM

- A. FURNISH AND INSTALL A SUPPLEMENTAL GROUNDING SYSTEM AS INDICATED ON THE DRAWINGS. SUPPORT SYSTEM WITH NON-MAGRIETIC STAINLESS STEEL CLIPS WITH RUBBER GROMMETS. GROUNDING CONNECTORS SHALL BE TINNED COPPER WIRE, SIZES AS INDICATED ON THE DRAWINGS. PROVIDE STRANDED OR SOLID BARE OR INSULATED CONDUCTORS AS INDICATED.
- 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 COUPMENT THAT ARE NOT TO BE UTILIZED IN THE COMPLETED PROJECT SHALL BE REMOVED OR DE-BLERGIZED AND CAPPED IN THE WALL, CELLING, OR FLOOR SO THAT THEY ARE CONCEALED AND SAFE, WALL, CELLING, OR FLOOR SHALL BE PATCHED TO MATCH THE ADJACENT CONSTRUCTION

CONDUIT AND CONDUCTOR INSTALLATION:

- CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON-PERFORATED 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 HISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE RESIDED TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGHLY CLAMPED TO BOXES BY GALVANIZED MALLESER (ROUT). BUSHING ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND
- B. CONDUCTORS SHALL BE PULLED IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE







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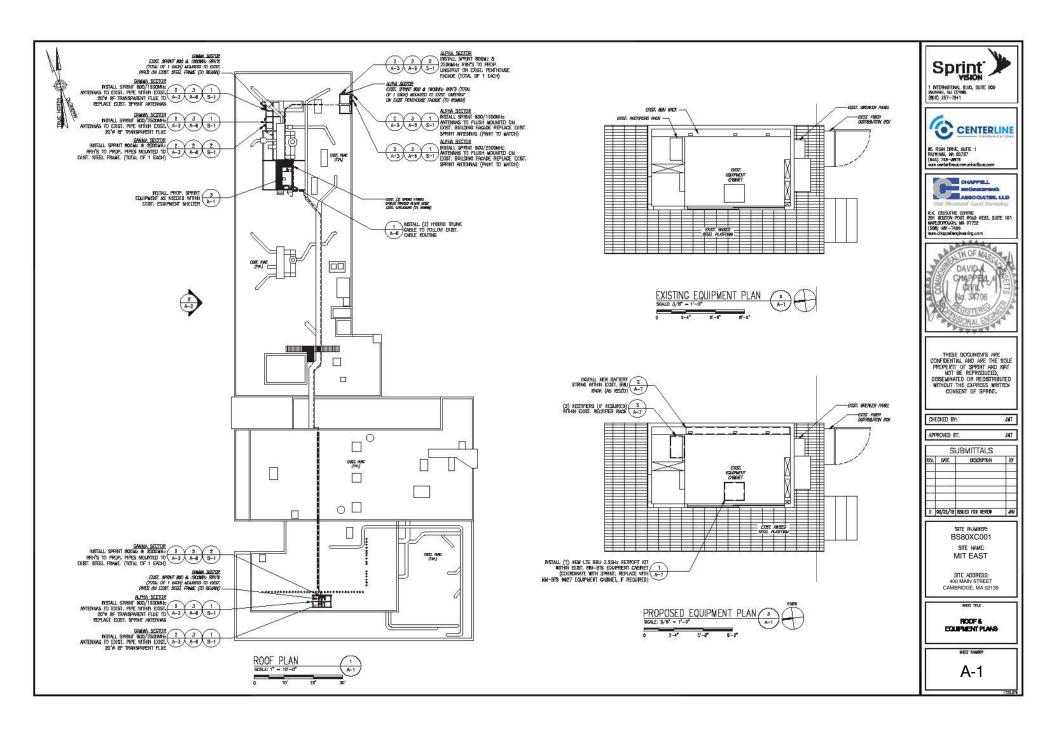
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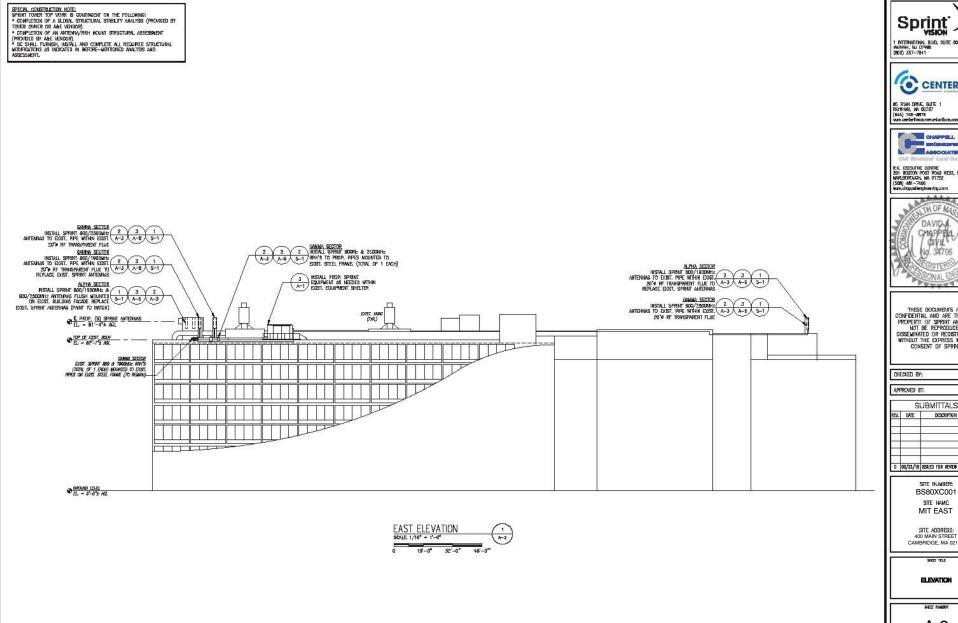
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SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

OUTLINE SPECIFICATIONS

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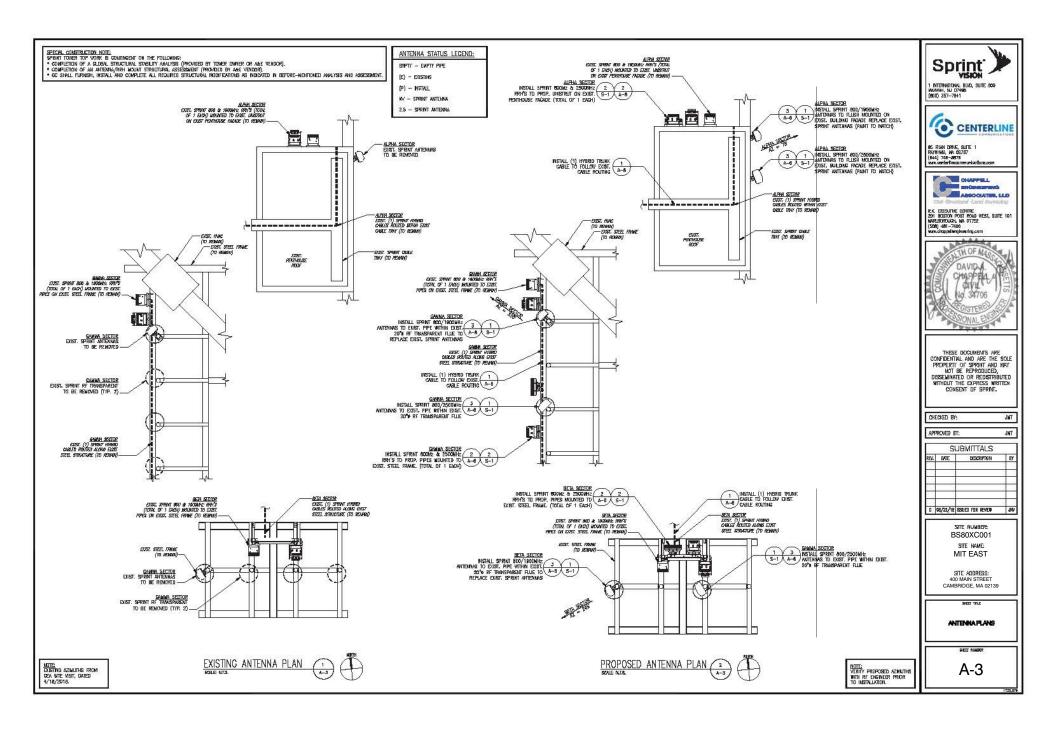
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Region: Northeast Market	Boston	Fevision 2.2	Rev Date: 20-Nov-2017
Cascade 10	BSBOXC001	BTS GEM: ALU	RFDS Type: Preliminary
Augment Import Code: SPDOMU01_00_Macro_Upgrade	Augment: DO Macro Upgrade	Structure Type:	Rooftop
Address: 600 Main Street, Cambridge, MA, 02142	Sprint Eng. Name: Bill Hastings	Bill.M. Hastings@sprint.com	Eng. Phone: 978-590-9700
Latitude: 42.362322 Lingitude: -71.087785	Manager Name: Jonathan Hull	Jonathan B.Hull@sprint.com	Manager Phone: 617-233-292
Detailed RFDS Description:	RFE: Praveen Meesarapu	Prayeen, Meesarapu@sprint.com	RFE Phone: 301-728-0006
Triband final config using NV + dual 800/2.5 G antenna. Adding 2nd 800 RRH, 1900 RRH and 2.5 RRH.	Filter Analysis Complete: YES	Border Analysis Complete: YES	Channel Plan Complete: YES
	Alpha	Setta	Gamma
1900MHz_Azimuth	75	245	320
1900MHz_No_of_Anternas	1	1	1
1900MHz_RADCenter(ft)	91.3	91.3	91.3
1900MHz_Antenna Make	RFS	RFS	RFS
1900MHz_Antenna Model	APXVSPP18-C-A20	APXVSPP18-C-A20	APXVSPP18-C-A20
1900MHz_Horizontal_Bramwidth	65	65	65
1900MHz_Vertical_Beamwidth	6	6	6
1900MHz_Antenna Dimensions (ft) & Weight (ibs	72 x 11.8 x 7.9 62 (bs)	72 x 11.8 x 7.9 62 (lbs)	72 x 11.8 x 7.9 62 (lbs)
1900MHz_AntennaGain(dBi)	18	18	18
1900MHz_E_Tift	0	0	0
1900MHz_M_Tilt	0	0	D
1900_Effective_Tilt	0	0	D
1900MHz_Carrier_Forecast_Year_2017			
1900MHz_RRH Manufacturer	ALU	ALU	ALU
1900MHz RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
1900MHz_RRH Count	1	1	1
1900MHz_RRH Specs	25 x 11.1 x 11.4 (60 lbs)	25 x 11.1 x 11.4 (60 lbs)	25 x 11.1 x 11.4 (60 lbs)
1900MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
1900MHz Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
1900MHz Power Split Ratio (Main/Split)			
1900MHz Splitter Manufacturer			
1900MHz Splitter Mode	No Splitter Required	No Splitter Required	No Splitter Required
1900MHz Number of Splitters	0	0	0
1900MHz_Top_lumper F1_Length (RRH or Combiner-to-Antenna for FT or Main Coax to Antenna for Ground Mount, ft)	8	8	81
1900MHz_Top_Jumper F1_Cable_Model (RRH or Combiner-to-	70200000	5.255.0	100000000000000000000000000000000000000
Antenna for TT or Main Coax to Antenna for Ground Mount)	LCF12-501	LCF12-50i	LCF12-500
1900MHz_Top_Jumper F2_Length (RRH to Combiner for TT if applicable, ft)			
1900MHz_Top_lumper F2_Cable_Model (RRH to Combiner for TT if applicable)			
1900MHz Main Cable (ength (ft)	116.1	116.3	116.3
1900MHz Main Cable Model	HB114-1-08U4-M5F	HB134-1-08U4-M5F	HB114-1-08U4-MSF
1900MHz Bottom Jumper #1 Length (Ground based RRH to	MULTA-T-ORDA MOL	H0234-2-00/04-WIS!	100714-7-0004-M3L
Combiner OR-Main Coax, ft)			
1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner OR-Main Coat)			
1900MHz_Bottorn_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)			
1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combine to Main Coax)			

- NOTES: 1. COMMENTS IN RED TEXT PROVIDED BY A&E VENDOR.

- 1. COMMENTS IN RED TEXT PROVIDED BY A&E VENDOR.
 2. ANTENNA RAD CENTER BASED ON EQUIPMENT DATABASE AND
 STRUCTURAL ANALYSIS.
 3. SPRINT CM SHALL CONFIRM HYBRID CABLE LENGTH, COAX JUMPER LENGTH
 AND AISG CABLE LENGTH BEFORE PREPARING BOM. A&E RECOMMENDED
 HYBRID CABLE LENGTH BASED ON NY 2.5 EQUIPMENT AUDIT PLUS 20 FEET
 FOR (2) 10-FOOT COILS AT EACH END OF THE FIBER TRUNK.

NOTE:

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

SPECIAL WORK NOTE:

JUMPERS (COAX/AISG) FROM THE 2.5 RRH TO THE 2.5 ANTENNA CANNOT EXCEED 15'. NOTIFY SPRINT CONSTRUCTION MANAGER OF ANY DISCREPANCY.

800MHz_Azimuth	75	245	310
800MHz_No_of_Antennas	1	1	1
BOOMHz_RADCenter(ft)	91.3	91.3	91.3
800MHz_AntennaMake	NA.	NA NA	NA.
and the second s	Antenna assigned on a different	has a complete and a second and	Antenna assigned on a differ
800MHz_AntennaModel	band	Antenna assigned on a different band	bond
800MHz_Horizontal_Beamwidth	NA.	NA NA	NA NA
800MHz_Vertical_Beamwidth	NA.	NA NA	NA.
800MHz_Antenna Dimensions (ft) & Weight (lbs)	NA NA	NA NA	NA NA
BOOMHz_AntennaGain (dBi)	NA.	NA.	NA NA
BOOMHz_E_Tilt	0	0	0
800MHz M Tilt	0	0	0
800 MHz. Effective Tilt (degrees)	0	0)
BOOMHz RRH Manufacturer	ALU	ALU	ALU
800 Combiner Model	No Combiner Required	No Combiner Required	No Combiner Required
BOOMHz ISH Model	RRH 800 MHz 2x50W	RRH 800 MHz 2x50W	RRH 800 MHz 2x50W
800MHz RRH Specs	15.8 x 13.0 x 14.0 (64 lbs.)	15.8 x 13.0 x 14.0 (64 lbs)	15.8 × 13.0 × 14.0 (64 lbs
800MHz_RRH Count	15.8 x 13.0 x 14.0 (64 l0s;	25.8 x 13.0 x 14.0 (64 l05)	12.8 K 13.0 1 14.0 (64.0)
800MHz_RRH Location	Top of the Pole/Tower	Top of the Pole/Tower	Top of the Pole/Tower
800MHz BILT Border Filter	na	na	na
BOOMHz Splitter Manufacturer			
800MHz Splitter Model			
800MHz Number of Splitters	0	0	0
800_Top_Jumper #1_Length (JERH to Antenna for TT or Main Coax to	7		
Antenna for GM)		8	: E
600_Top_rumper_Cable_model (finn to America for TT or main Coax			
to Antenna for GM)	LCF12-501	LCF12-50/	LCF12-50J
800MHz_Main_Coax_Cable_Length (ft)	NA	NA NA	NA NA
BOOMHz_Main_Coox_Cable_Model	NA	NA NA	NA NA
2500MHz_Azimuth 2500MHz No. of Anternas	75	245	320
		1	1
	91.1	91.1	9:3
2500MHz_RADCenter(ft)	91.3	91.3	91.3
2500MHz_AntennaMake	91.3 RFS	91.3 RFS	91.3 RFS
2500MHz_RADCenter(ft) 2500MHz_AntennaMake 2500MHz_AntennaModel	91.3 RFS APXVTSM18-C420	91.3 RFS APXVTSM18-C-I20	9).3 RFS APXVTSM18-C-120
2500MHz_RADCenter(ft) 2500MHz_AnternaMake 2500MHz_AnternaModel 2500MHz_Horizontal_Beamwidth	91.3 RFS APXVTSM18-C120 70	91.3 RFS APXVTSM18-C-120 70	91.3 RFS APXVTSM18-C-120 20
2500MHz_RADCenter(ft) 2500MHz_AntennaMake 2500MHz_AntennaModel 2500MHz_Horisontal_Beamwidth 2500MHz_Vertical_Beamwidth	91.3 RFS APXVTSM18-C-120 70 5	91.3 RFS. APXVTSM18-C-120 70 5	91.3 RFS APXVTSM18-C420 20 5
1500MHz_AbCcenter(f)	91.3 RFS APXVTSM18-C420 70 5 72 x14.6 x 8.1 [40.8 (bs)	91.3 8F5 APX/TSM18-C-120 70 5 72 x 14.6 x 8.1 40.8 (bs)	91.3 RFS APXVTSM18-C+20 70 5 72 x 14.6 x 8.1 40.8 (ib:
3500MHz, AntennaMslav 3500MHz, AntennaMslav 3500MHz, AntennaMslav 3500MHz, AntennaMslav 3500MHz, AntennaMslav 3500MHz, SantennaMslav 3500MHz, Ventionatal, Bramwidth 3500MHz, Ventionatal, Bramwidth 3500MHz, AntennaHseight (TI) 3500MHz, AntennaGaint (III)	91.3 RFS APXVTSM18-C120 70 5 72 x 14.6 x 8.1 40.8 (bs) 17.3	91.3 875 APXVTSM18-C-120 70 5 72 x 14.6 x 8.1 [40.8 (bs] 27.3	91.3 875 APXVTSM18-C-420 70 5 72 x 14.6 x 8.1 40.8 (lb) 11.3
1500MHz_AbCcenter(f)	91.3 RFS APXVTSM18-C420 70 5 72 x14.6 x 8.1 [40.8 (bs)	91.3 8F5 APX/TSM18-C-120 70 5 72 x 14.6 x 8.1 40.8 (bs)	91.3 RFS APXVTSM18-C+20 70 5 72 x 14.6 x 8.1 40.8 (ib:
3500MHz, AnternaMide 3500MHz, AnternaModel 3500MHz, Moranta (Bermidth 3500MHz, AnternaGain (Bh) 3500MHz, AnternaGain (Bh) 3500MHz, If III	91.3 RFS APXVTSM18-C120 70 5 72 x 14.6 x 8.1 40.8 (bs) 17.3	91.3 875 APXVTSM18-C-120 70 5 72 x 14.6 x 8.1 [40.8 (bs] 27.3	91.3 875 APXVTSM18-C-420 70 5 72 x 14.6 x 8.1 40.8 (lb) 11.3
2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaModel 2500MHz, AntennaModel 2500MHz, Environtal, Bramwidth 2500MHz, Vinited Bearwidth 2500MHz, Vinited Bearwidth 2500MHz, AntennaHeight (TI) 2500MHz, AntennaGain (BIO) 2500MHz, ETR	91.3 RF5 AFXVTSM18-C-120 70 5 72 x 14.6 x 8.1 40.8 (lbs) 17.3 0	91.3 875 APXVTSM18-C-120 70 5 72 × 14.6 × 8.1 40.8 (bs.) 17.3 0	91.3 RFS APXVTSM18-C+20 70 5 72 x 14.6 x 8.1 40.8 (lbs) 17.3 0
3500MHz, AntermaNuke 3500MHz, AntermaNuke 3500MHz, AntermaNukee 3500MHz, Sillesteve (It (degrees);	91.3 RFS APXVTSM18-C120 70 5 72 x 14.6 x 8.1 40.8 (bs) 17.3 0	91.3 AF5 AF9XYTSM18-C-120 70 5 5 72 x 146 x 8.1 40.8 (bs.) 17.3 0 0	91.3 RFS APXVTSM18-C+20 70 5 5 72 x 14.6 x 8.1 40.8 (lbs) 17.3 9
3500MHz, AntermaNuke 3500MHz, AntermaNuke 3500MHz, AntermaNukee 3500MHz, Sillesteve (It (degrees);	91.3 RF5 APXVTSM18-C120 70 5 72 x 14.5 x 8.1 [40.8 (bs) 12.3 0 0	91.3 875 APXYTSM18-C-120 70 5 72 x 14.6 x 8.1 40.8 (bs.) 27.3 0 0	91.3 RF5 APXVTSM18-C-J20 20 20 5 72 x 14.6 x 8.1 40.8 (bit 17.3 9 9 0 ALU
3500MHz, AntennaMake 3500MHz, AntennaMake 3500MHz, AntennaModel 3500MHz, AntennaModel 3500MHz, AntennaModel 3500MHz, Portical, Beamwidth 3500MHz, AntennaModel 3500MHz, AntennaModel 3500MHz, AntennaModel 3500MHz, AntennaModel 3500MHz, AntennaModel 3500MHz, Bitt 3500MHz	91.3 8FS APXYTSM18-C120 70 70 72 x 14.6 x 8.1 [40.8 (bs.) 12.3 0 0 ALU No Combiner Required	91.3 875 AP9/TSM18-C-120 70 75 72 x 16 4 x R.1 40 8 (9s) 17.3 0 0 0 ALU No Combiner Required	91.3 RFS APXVTSM18-C+20 70 5 5 72 x 14.6 x 8.1 40.8 (bit 17.3 9 9 ALU NO Combiner Required
2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, Maria 2500MHz, AntennaHala 2500MHz, AntennaHala 2500MHz, AntennaHala 2500MHz, AntennaHala 2500MHz, Tilt 2500MHz, Tilt 2500MHz, Tilt 2500MHz, MintennaMalaturer 2500 AntennaMalaturer 2500 AntennaMala	91.3 RFS APXVTSM18-C120 70 5 72 x 14.6 x 8.1 [40.8 [bs.] 17.3 0 0 ALU	91.3 AP5 APVISM18-C-120 70 5 5 72 x 14 6 x 8.1 40 8 (8x) 0 0 ALU	91.3 RF5 APXVTSM18-C-J20 20 20 5 72 x 14.6 x 8.1 40.8 (bit 17.3 9 9 0 ALU
3-500MHz, AntennaMake 3-500MHz, AntennaMake 3-500MHz, AntennaModel 3-500MHz, Horizontal, Brammidth 3-500MHz, Horizontal, Brammidth 3-500MHz, Lincian Brammidth 3-500MHz, Lincian Brammidth 3-500MHz, JantennaMakel	9.1.3 875 875 875 875 875 10 10 10 10 10 10 10 10 10 10 10 10 10 1	91.3 875 AP9VTSM18-C-100 70 5 72 x 146 x R.1 40 8 (bst) 17.3 0 0 0 AU No Combiner Required TD HI99820-25 1	91.3 RFS APXVTSM18-C+20 70 5 72 × 14.6 × 8.1 40.8 (bit 11.3 9 9 3 AU No Combiner Required TD-RB+9s/20-25
2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, AntennaMala 2500MHz, Marian Benmudth 2500MHz, Marian Benmudth 2500MHz, AntennaHeight (1) 2500MHz, AntennaHeight (1) 2500MHz, AntennaHeight (1) 2500MHz, Tilt 2500MHz, Tilt 2500MHz, Mintendeurer 2500 AntennaMalarian	91.3 RFS APXVTSM18-C120 70 70 72 x 14.5 x 8.1 [40.8 (bs) 12.3 0 0 0 ALU No Combiner Required To RHRINZ-0-25	91.3 885 APAYSM18-C120 70 5 5 72 x 146 x 8.1 40 8 (8s) 0 0 0 ALU No Combiner Required TD MBH2-20-25	91.3 RFS APXVTSM18-C+20 70 5: 72 x 14.6 x 8.1 40.8 (bit 11.3 9 9 ALU No Combiner Required TD-RR6 82/20-25
3-500MHz, AntennaMake 3-500MHz, AntennaMake 3-500MHz, AntennaModel 3-500MHz, Britzer Tit (degrees) 3-500MHz, Britzer Tit	9.1.3 875 875 875 875 875 10 10 10 10 10 10 10 10 10 10 10 10 10 1	91.3 875 AP9VTSM18-C-100 70 5 72 x 146 x R.1 40 8 (bst) 17.3 0 0 0 AU No Combiner Required TD HI99820-25 1	91.3 RFS APXVTSM18-C+20 70 5 72 × 14.6 × 8.1 40.8 (bit 11.3 9 9 3 AU No Combiner Required TD-RB+9s/20-25
2500MHz, AntennaMake 2500MHz, AntennaMake 2500MHz, AntennaMakel 2500MHz, AntennaMakel 2500MHz, AntennaMakel 2500MHz, Miller Bermwidth 2500MHz, Miller Bermwidth 2500MHz, AntennaHeight (10) 2500MHz, AntennaHeight (10) 2500MHz, AntennaHeight (10) 2500MHz, Lift 2500MHz, Miller Miller Miller (10) 2500MHz, Miller Miller (10) 2500MHz, Biller (10) 2500MHz, B	9.1.3 875 875 875 875 875 10 10 10 10 10 10 10 10 10 10 10 10 10 1	91.3 875 AP9VTSM18-C-100 70 5 72 x 146 x R.1 40 8 (bst) 17.3 0 0 0 AU No Combiner Required TD HI99820-25 1	91.3 RFS APXVTSM18-C+20 70 5 72 × 14.6 × 8.1 40.8 (bit 11.3 9 9 3 AU No Combiner Required TD-RB+9s/20-25
3-500MHz, AntennaMake 3-500MHz, AntennaMake 3-500MHz, AntennaModel 3-500MHz, Tim 3-500MHz, AntennaModel 3-500MHz, Tim 3-500MHz, Station 3-500MHz, Sta	91.3 885 APXVTSAL18 C 100 70 5 5 72 x 16.6 x 8.1 40.8 (bt) 17.3 0 0 0 AU No Combiner Required TD #81862-0-15 TO s of the Pole/Tower	91.3 875. APW15418-C-10 70 5 5 72 x 166 x 8.1 40.8 (bs) 17.3 0 0 0 ALU No Combiner Required TO MINR2D-25 1 Top of the Pole/Tower	91.3 855 APXYISM18 C120 70 5 5 72 x 14.6 y 8.1 1 40.8 (bit 11.3 3 3 3 4 10 No Combine Required TD-RH-9420-25 Top of the Pole/Tower
2500MHz, AntennaMake 2500MHz, AntennaMake 2500MHz, AntennaMakel 2500MHz, AntennaMakel 2500MHz, AntennaMakel 2500MHz, Marian Bermardth 2500MHz, Marian Bermardth 2500MHz, AntennaHeight (ft) 2500MHz, AntennaHeight (ft) 2500MHz, AntennaHeight (ft) 2500MHz, Tilt 2500MHz, Tilt 2500MHz, Tilt 2500MHz, Bilt Marianturer 2500 Onther, Medical 2500MHz, Bilt Marianturer 2500, Chonher, Middel 2500MHz, Bilt Marianturer 2500MHz, Bilt Marianturer 2500MHz, Bilt Ratio Marianturer 2500MHz, Bilt Cautin 2500MHz, Bilt Cautin 2500MHz, Bilt Cautin 2500MHz, Bilt Cautin 2500MHz, Spitter Marianturer 2500MHz, Spitter Marianturer 2500MHz, Spitter Model 2500MHz, Spitter Model	9.1.3 875 875 875 875 875 10 10 10 10 10 10 10 10 10 10 10 10 10 1	91.3 875 AP9VTSM18-C-100 70 5 72 x 146 x R.1 40 8 (bst) 17.3 0 0 0 AU No Combiner Required TD HI99820-25 1	91.3 RFS APXVTSM18-C+20 70 5 72 × 14.6 × 8.1 40.8 (bit 11.3 9 9 3 AU No Combiner Required TD-RB+9s/20-25
2500MHz, AntennaMakie 2500MHz, AntennaMakie 2500MHz, AntennaMakie 2500MHz, AntennaMakie 2500MHz, AntennaMakie 2500MHz, Martina Bennawidh 2500MHz, Martina Bennawidh 2500MHz, Martina Bennawidh 2500MHz, AntennaHeight (ft) 2500MHz, AntennaHeight (ft) 2500MHz, Tilt 2500MHz, Mit Tilt 2500MHz, Mit Martina Bennawidh 2500MHz, Bilt Martinafaturer 2500, Combiner, Model 2500MHz, Bilt Martinafaturer 2500, Combiner, Model 2500MHz, Bilt Kallen Martinafaturer 2500MHz, Bilt Kallen Martinafaturer 2500MHz, Bilt Kallen Martinafaturer 2500MHz, Bilt Courtina 2500MHz, Spitter Model	91.3 885 APXVTSAL18 C 100 70 5 5 72 x 16.6 x 8.1 40.8 (bt) 17.3 0 0 0 AU No Combiner Required TD #81862-0-15 TO s of the Pole/Tower	91.3 875. APW15418-C-10 70 5 5 72 x 166 x 8.1 40.8 (bs) 17.3 0 0 0 ALU No Combiner Required TO MINR2D-25 1 Top of the Pole/Tower	91.3 855 APXYISM18 C120 70 5 5 72 x 14.6 y 8.1 1 40.8 (bit 11.3 3 3 3 4 10 No Combine Required TD-RH-9420-25 Top of the Pole/Tower
3500MHz, AntennaMakie 2500MHz, AntennaMakie 2500MHz, KortennaMakie 2500MHz, KortennaMakie 2500MHz, KortennaMakie 3500MHz, KortennaMakie 3500MHz, Merchall, Benmwidth 3500MHz, AntennaHeight (TI) 3500MHz, AntennaHeight (TI) 3500MHz, Liftit 3500MHz, Liftit 3500MHz, Liftit 3500MHz, Liftit 3500MHz, Michael (Tildegreek) 3500MHz, Michael (Til	91.3 RF5 AFXYTSM18-C120 70 70 72 × 1.4.6 × 8.1 (4.0.8 (lbs) 1.2.3 0 0 0 0 AU No Combiner Required 10- MINESSP 2.5 Top of the Pole/Fower	91.3 875 AFAVTSM18-C120 70 70 5 72 x 146 x 8.1 40 8 (bs) 0 0 AMAD Required 10 Molecular Required 10 Holles2-0-2-5 Top of the Pole/Tower	91.3 895 APWYSM18-C-200 70 70 72 × 14.6 × 8.1 40.8 (bit) 9 9 AU AU No Combiner Required 10 Reteab.20 25 Top of the Rele/Tower
3500MHz, AntennaMalair 3500MHz, AntennaHalair 3500MHz, AntennaHalair 3500MHz, AntennaHalair 3500MHz, AntennaHalair 3500MHz, AntennaHalair 3500MHz, Bill 3500MH	91.3 RFS AFXYTSM18-C120 70 70 72.3 1.6 c. 8.1 (4.0.8 (lot) 0 0 0 0 No Combiner Required To MMR420-15 10 of the Pole/Yover	91.3 875 AFWTSM18-C120 70 70 5 1 46 s.8.1 40 8 (bn) 0 0 0 0 No Condition Required TO MHM28-25-5 1 Top of the Pole/Tower	91.3 895 APWYSM18-C-120 70 70 72 x 14.6 x 8.1 40.8 (bit 9 9 9 10 No Combree Required 10-H0-820-25 11 Top of the Pole/Tower
J.SOOMER_ANDCenter(FI)	91.3 8875 APAYISALIS CLOD 70 70 72 × 14.6 x 8.1 40.8 (lbs) 17.2 × 14.6 x 8.1 40.8 (lbs) 0 0 0 ALU No Combiner Required TD 488720 75 1 10 of the PolicyTower 8 LCF12-503	91.3 875 AFWTSM18-C120 70 70 5 1 46 s.8.1 40 8 (bn) 0 0 0 0 No Condition Required TO MHM28-25-5 1 Top of the Pole/Tower	91.3 855 APKYTM18 C-120 70 70 77 x 14.6 x 8.1 4 0.5 (b) 13 3 3 3 7 8 9 AU NO Combiner Requires 10 and 40 Top of the Pole/Tower 1 (CF32-500)
2500MHz, AndrennaModel 2500MHz, AntennaModel 2500MHz, AntennaModel 2500MHz, Horizontal, Beamwidth 2500MHz, Horizontal, Beamwidth 2500MHz, Horizontal, Beamwidth 2500MHz, JanennaModel 2500MHz, AntennaModel 2500MHz, AntennaModel 2500MHz, AntennaModel 2500MHz, Liftit 2500MHz, Liftit 2500MHz, Mitter Titt (diagrees) 2500MHz, Mitter Model 2500MHz, Spiriter Model 2500MHz, Mitter Mitter M	91.3 RFS AFXYTSM18-C120 70 70 72 × 14.6 x 8.1 40.8 (lbs) 0 0 0 0 No Combiner Required TD MMR42-0-15 1 To sof the Pote/Tower	91.3 875 AFWTSM18-C120 70 70 5 1 46 s.8.1 40 8 (bn) 0 0 0 0 No Condition Required TO MHM28-25-5 1 Top of the Pole/Tower	91.3 875 APWYSM18-C+20 70 72 x 14.6 x 8.1 40.5 (bit) 93 9 93 AU No Combiner Required 178-849-8420-55 1 Top of the Prole/Tower 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1



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> BS80XC001 SITE NAME: MIT EAST

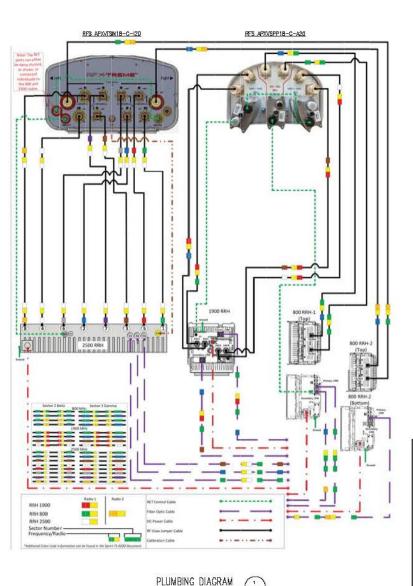
SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

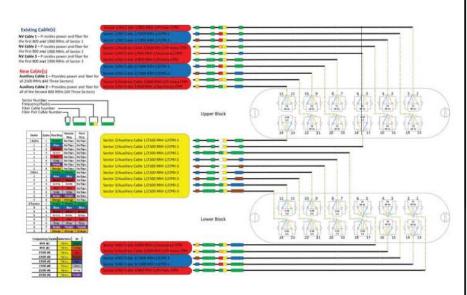
RF DATA SHEET

A-4

RF DATA SHEET

1 A-4





CABLE COLOR-CODING SCHEMATIC

SPRINT CONSTRUCTION STANDARDS:

GENERAL CONTRACTOR SHALL ADHERE TO THE FOLLOWING SPRINT CONSTRUCTION STANDARDS.

- CONSTRUCTION STANDARDS: INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES (CURRENT VERSION), INCLUDING EXHIBITS A-M. CONSTRUCTION SPECIFICATIONS: CONSTRUCTION STANDARDS EXHIBITS A STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES
- CONTRETA VERSIALLY.

 FORWINDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN.

 GROUNDING STANDARDS: EXTERIOR GROUNDING SYSTEM DESIGN.

 GROUNDING STANDARDS (SUPPLEMENT): ANTI-THEFT UPDATE TO SPRINT GROUNDING GB2412 AND SPRINT ENGINEERING LETTER EL-OSO4 DATED D4.20.12.

 GROUNDING STANDARDS (SUPPLEMENT): ANTI-THEFT UPDATE TO SPRINT TS-OZOG CURRENT VERSION.

 CENTRE CONTROL STANDARDS EXCERT FROM CONSTRUCTION STANDARDS EXHIBIT A, SECTION 3.6 WEATHER PROPRING CONNECTORS AND GROUND MTS.

 CENTRE CONTROL STANDARD TO STANDARD CONTROL TO STANDARD CONTROL TO SPRINT TS-OZOG CURRENT VERSION.

 GROUNDING STANDARD VERSION STANDARD VERSION STANDARD STANDARD CONTROL TO STANDARD CONTROL TO SPRINT TS-OZOG CURRENT VERSION.

 GROUNDING STANDARD VERSION STANDARD VERSION STANDARD CONTROL TO SPRINT TS-OZOG CURRENT VERSION.

 GROUNDING STANDARD VERSION VERSION
- POR ONE HOUR, CALL SPRINT OF ENGINEER (OR MANAGER IF RE PROJECTED OSS INCT ASSESSED TO RE ENGINEER) USING SPRINT-PROMOED CONTROL INFORMATION FOR FURTHER WITHOUT STREET OF THE REGISTED OSS INCT ASSESSED TO RE ENGINEER USING SPRINT-PROMOED CONTROL INFORMATION FOR FURTHER WITHOUT STREET OF THE REGISTED OSS INTO ASSESSED TO RESENTE AND ASSESSED TO RESENTE ASSESSED TO RESENT ASSESSED TO R
- AISC TESTS TO VERY OFFERIOR IS TO BE PERFORMED AFTER FINAL INSTALLATION OF ANTENNAS AND AISC CHALLS NAVE BEEN CONNECTED, VEHITY OFFERIOR OF ALL SCISTING SPRINT AISE COLUMNOT INCLUDIAS BOOMEN, 3 GREY, AID 2.56Hz. TEST INCLUDE CONVELED CONTINUENT (F) REPULACIAL) AND BEAMMOND WINNES (F APPLICABLE), DOCUMENT AISE TEST RESULTS IN COAK STREET TEST SPREASHETT.

 CEREBUL CONTINUENT AISE STEET AISE STREET AND ROATED THE ATTENDATE THE MEANS NO DELECT IS TO BE LOCATED 45 DEGREES LEFT AND ROAT OF ARTENIA. THIS MEANS NO DELECT IS TO BE LOCATED AND ROATED THE AID TO A REPORT OF ARTENIA SENT OF THE PLACED A FRONT COHEN CEPTURE OF ARTENIAS. IF THIS IS NOT POSSIBLE, CONTROL FIRST BUILDESS SPRINT AND AID AND ADMINISTRATION OF ARTENIA AID AND A STREET AND ROATED AND A STREET AID AND A STREET AND ROATED AND A STREET AND ROATED AND A STREET AND ROATED AND A STREET AND A
- SPRINT RF ENGINEER WITH AS-BUILTS SETTINGS. USE 32 RF ALIGNMENT TOOL OR EQUIVALENT TOOL, HTTP://WWW.3ZTELECOM.COM/ANTENNA-ALIGNMENT-TOOL/







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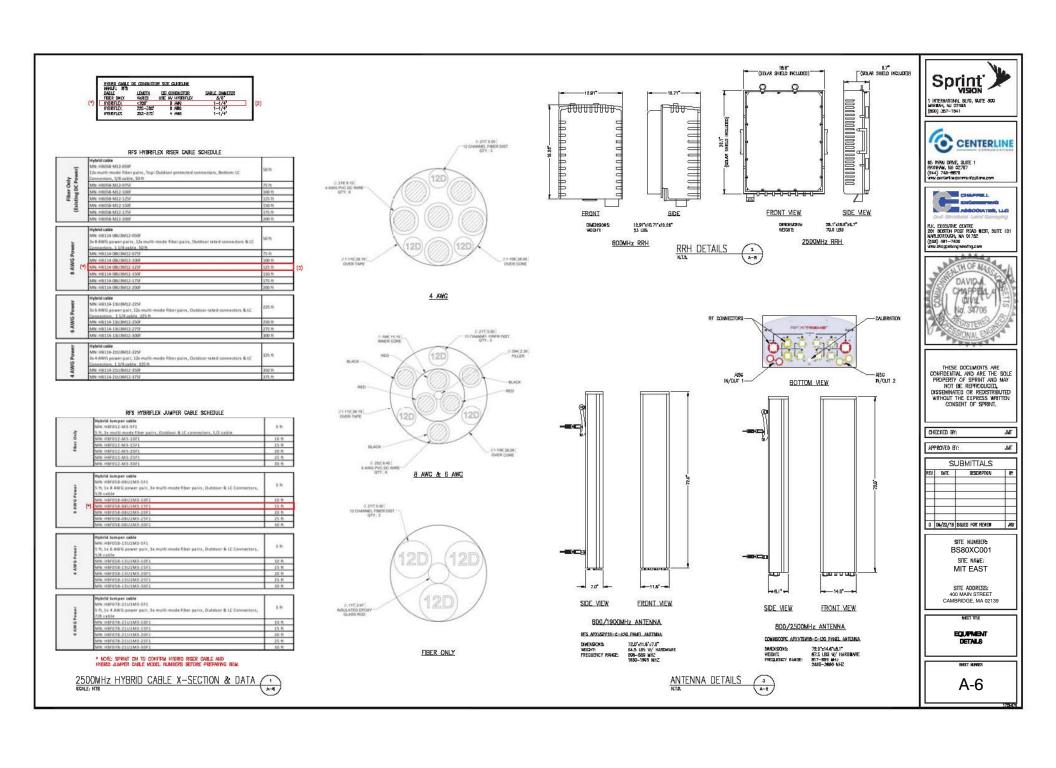
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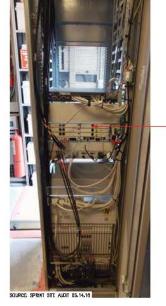
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SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

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- INSTALL NEW LITE BBU 2 GHz IN EXIST. MM-BTS 9928 EQUIPMENT CABINE INSTALL BATTERY STRING(S)
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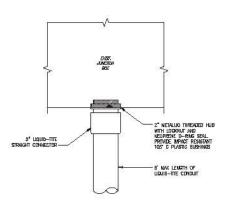
EXISTING BATTERY RACK

EXISTING MM-BTS EQUIPMENT CABINET



- INSTALL (3) RECTIFIERS IN EXIST. RECTIFIER RACK (IF RED'D.)





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R.K. EXECUTIVE DEVITEE
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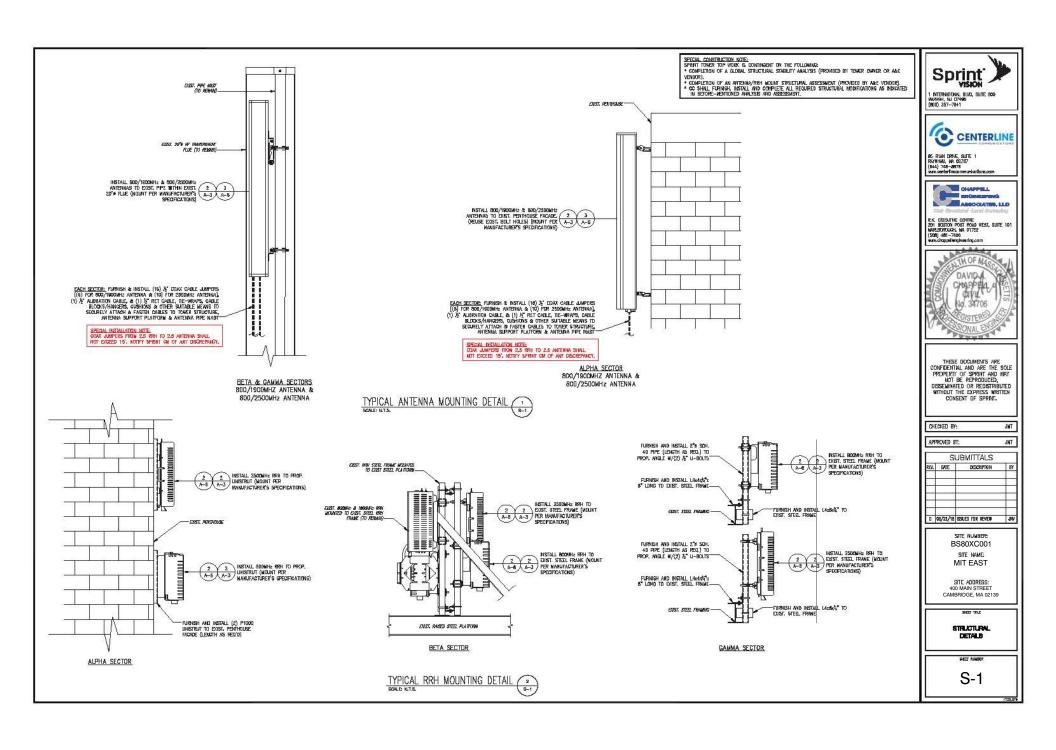
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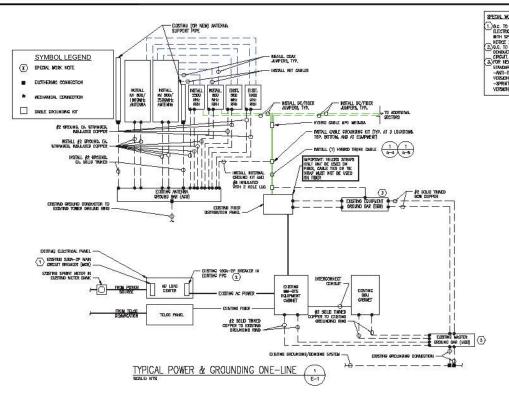
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EQUIPMENT DETAILB

REET RUMBE

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SPECIAL WORK NOTE:

SPECIA MORE NOTE.

(1) D.C. TO FIRSTEN AND INSTALL ALL COMPONEDGYS TO LPORNICE COSTING
EIERTRON, SERME, CONDUT, COMBUCTOR, PICK MIN GR. IN ACCIDENTIC
BIRT SPRINT CENTRICING STREAMED NO 2.8 ADMINISTRAL TO SERVER
EINT SPRINT CENTRICING STREAMED NO 2.8 ADMINISTRAL TO SERVER
(2) CR. TO FIRSTEN AND SERVEL VICTORIES. THE COSTING WHITE SPRINTS,
ECOLOGICAR AND CIRCLART TO A SHARK MINE SINGE FOR A 100-A-M-2. 2007

(3) PRINT OF REMARES ADMINISTRAL CONTROL OF THE TO SPRINT GROUNDING
ENDALMERS AND FOULDMENT (CHARLESTO).

-WHITTHERE OF THE TO SPRINT GROUNDING DATE OF 2-4-12 (OR CURRENT
USERSIO)
-SPRINT DICHEROIS CHARLESTON.

ELECTRICAL NOTES

- 1) ALL ELECTRICAL BURK SHALL COMPORN TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- 2) THE ELECTRICAL CONTRACTOR SHALL CONDUNITE ALL CONDUIT ROUTING WITH LODGE, LITTLEY COMPANIES AND SPRINT CONSTRUCTION MANAGER.
- 3) ALL CONDUITS ROUTED BELLIN CAMPE SHALL TRANSMICM TO RIGID CALIBRATED STEEL CONDUIT ABOVE BRADE.
- AT ALL DETAL CONDUCTS SHALL BE PROVIDED WITH CROLINDING BUSHINGS.
- 5) DEVERAL CONTRACTOR SHALL PROVIDE ALL DIRECT BURIED COMBUINS WITH PLASTIC MARKING THRE CIRCUMSTRAINE CONTRIVES. THRE DOLLORS SHALL BE ORANGE FOR TELEPHONE AND RED FOR ELECTRIC.
- 6) ALL ELECTRICAL TIENS SHALL BE U.L. APPROVED OR LISTED WID PROGLED PER SPECIFICATION REQUIREMENTS.
- 7) THE ELECTRICAL WIND: MOLIDIES ALL LABOR AND MATERIALS DESCRIBED BY DRWANKS AND SPECIFICATIONS NOLLIDING INCIDENTAL MORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- a) GENERAL CONTRACTOR SHALL PAY FIRS FOR PICKING, WILD IS RESPONSIBLE FOR OBTAINING SHIP PERMITS AND COORDINATION OF INSPECTIONS.
- 9) ELECTRICAL AND TELLO MERNO CUISIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN MATER TIGHT CAUGALED HIND STEEL CAUGUTS OR SO-FEDULE BO INC. (OS FERNITED BY CODE) AND INVESE REQUIRED IN LIQUID TIBHT FLEDIBLE METAL OR NONHECULIC COMBUTS.
- 10) BURBED CONDUIT SHALL BE SCHEDULE 40 PAC.
- 11) ELECTRICAL BIRTYS SHALL BE COPPER WITH TYPE XHAW, THAY, OR THAN INSULATION
- 12) RUM ELECTRICAL CONDUIT OF CABLE BETBERN ELECTRICAL UTLITY DEMARGATION POINT AND PROJECT GAMER GELL SIT. PPC AS NINGHED ON THIS DRAWNAY, PROMDE FULL LEGATH PULL TYPE, COMPRISE INSTALLATION WITH UTLITY COMPANY.
- 13) RUN TELGO COMBUIT OR CABLE BEIMEDI TELEPHONE UTILLTY DIAMPONITON POINT AND PROJECT GAMER CELL SITE TELGO PORMET AND ETS CHAMPE AS IMMONITOD ON THIS CHAMMAR PROJECT RULL DATON FILL POINT IN INSTALLED TELGO COMBUIT. PROJUCE GREENLES COMBUT NEASURNON TAPE AT ESCH END.
- 14) RIBER CIPTIC CRECUITS SHALL BE IN ACCORDANCE WITH NEC ARTICLE 770-OPTICAL FREIR CARLES AND RACEWAYS.
- 16) COMMUNICATIONS CIRCUITS SHALL BE IN ADDORDANCE WITH NEC ARTICLE 800—DOWNUNICATIONS SYSTEMS.



1 INTERNATIONAL BIND, SUITE 800 WARNAH, NJ 07998 (800) 357-7841



5 RYAN DRIVE, SUITE 1 GYNHAN, MA 022787



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SITE NUMBER BS80XC001 SITE NAME: MIT EAST

SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

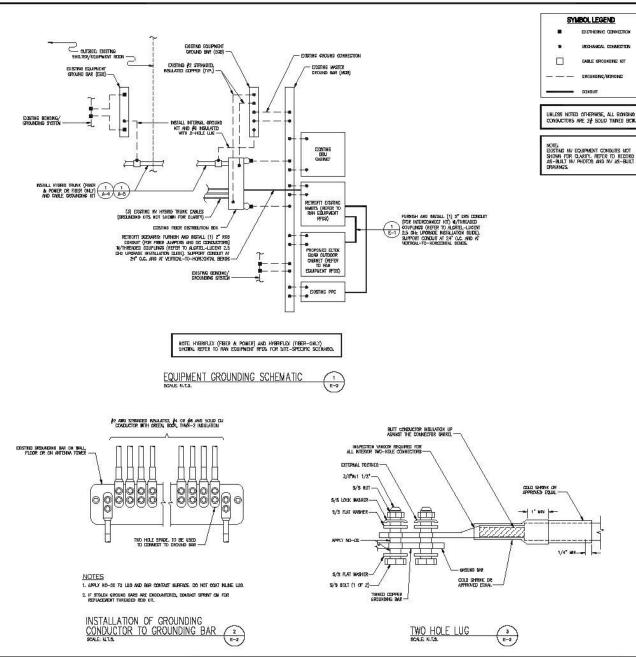
ONE-LINE DIAGRAM & PPC DETAILS

RHEET RIVADOR

E-1

FURNISH & INSTALL (1) 1004-29 CIRCUIT BREAUER FOR ELTEK EGAB EXPANSION CABINE EXIST. 2004-2P WIN GROUT BREAVER (WCB) SOURCE SPRINT SITE AUDIT

EXIST. BREAKER PANEL



UNLESS NOTED OTHERWISE, ALL BONDING CONDUCTORS ARE 24 SOUD TIMES BOW.

PROTECTIVE GROUNDING SYSTEMS GENERAL NOTES:

- GROUNDING SHALL BE IN ACCORDANCE WITH NEC ARTICLE 250-SKOUNDING AND BONDING.
- Grounding Stall be in accordance with sprint seed documents 3.018.02.004 "Bonding, decurding and temesian protection for cell sites" and 3.016.10.002 "Site resistance to earth testing".
- PROVIDE CRIBIND CONNECTIONS FOR ALL METALLIC STRUCTURES, EMOLOSLIPES, RACENSIAS AND OTHER CONDUCTIVE ITEMS ASSOCIATED MITH THE INSTALLATION OF
- 4. BROUND CONNECTIONS CLEAN SURFACES THOROLOMIT BEFORE APPLIND ORCUND LIUGS OR CLAMPS, IF SURFACE IS COLORED, REMAYS THE COSTRIC, APPLY A MICH-COEXCIDE AFFERDED REPORTING TO CLEAN AFFERZE AND RESTALL LLICS OR CLAWFE, MIDDE SOLVENDER OS RESURCED FROM METCH, IT SHALL SE PRIMED OR TRUCKED UP WITH "SULPANIE" OR EDUCK.
- 5. ALL GROUNDING WIPES SHALL PROMOTE A STRAIGHT, DOMENIARD PATH TO GROUND WITH GROUND BLOOPED OR SHALL NOT BE LOOPED OR SHAMEN, EBET.
- ALL CLAIPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SISTEM CONDUCTORS AND FOR COMMUNE SHALL BE FIG. THE (NON CONDUCTINE), DO NOT USE METAL BROXETS OR SUPPORTS WHICH WOULD FORM A COMPLETE RING PATURE ANY GROUNDING CONDUCTOR.
- 7. ALL OROUND MRES SHALL BE #2 SOLID TRIVED BOW LINLESS MOTED OTHERWISE.
- PROVIDE DEDICATED \$2 MAD COPPER CHOUND WHE FROM EACH WITEHWA. WOUNTING PIPE TO ASSOCIATED CREEK.
- D. DRUMD ATTIONS DESCRIPTION, CAME AND A THE MITTALLY
 COMPOUNDS WITH \$5 MINIMATE THAN STANDED COPERS FORWARD
 COMPOUNDS WITH \$5 MINIMATE THAN STANDED COPERS FORWARD
 COMMETTED METALS SHALL FILLIAN MANIFOCITIES'S SPECIFICATIONS
 GROUDBOOK.
- 10. EACH EQUIPMENT CASINET SHALL BE CONNECTED TO THE WASTER SOLUTION GROUND BAR (MGB) WITH \$2 SOLID TINNED BOW EQUIPMENT CASINETS WALL HAVE (2) CONNECTIONS.
- 11. CROWND HAMMER SHELD AT TOP, BOTTON AND AT TRANSMICH TO HAMMER LANGER CASLES AT EQUIPMENT CASHET ENTRANCE USING MALLEAUTURER'S DUDELINGS. WHEN KYBRITEK CASLE EXCERTS 200", GROWND AT INTERVALS NOT
- THE CONTRACTOR SHALL VERIFY THAT THE EXISTING GROUND BARS HAVE ENOUGH SPACE/HOLES FOR ADDITIONAL TWO HOLE LUGS.
- 13. COTHERING WELDING IS RECOUNDEDED FOR GREUNDING CONNECTION INFORE PRATICAL CHREMES THE CONNECTION SHALL BE MOSE USING COMPRESSION ITTER-2 HOLES, LONG BASING LUSS OF ROUSE COMP TO CAMP. THE CORPER CAMPS TO CAMP THE CORPER CAMPS SETTIS KORR-SHALL) BEFORE MANNING THE CORP CONNECTION STREET CONTRACTOR SHALL STALLOW. WANDFACTURER'S RECOMMENDED TOROUGE ON THE BOLT ASSEMBLY TO SECURE COMMETTORS.
- 15. THE MATTER CROUND BARE (MORE) SHALL BE MADE OF BARE 1/4*2" DEPPER FOR OUTDOOR APPLICATIONS IT SHALL BE TIMED COPPERLY AD LAKE SHALL FOR OUTDOORS HE HE WILL BARE OF THE MADE CAREFORD THE HARMAN SECURIZE THE WIRE SHALL EXECUTED, INSULATE THE MES FACE ANY STRUCTURE OF WHICH IT S INSTITUTION.
- 16. ALL BOLTS, WASHERS, AND NUTS USED ON CROUNDING CONNECTIONS SHALL BE STANCESS STEEL.
- ALL GROWNDING CONNECTIONS SHALL BE COUTED WITH A COPPER SHELD ANTI-CONSTINUE ACENT SUCH AS THE ROPE SHELL VERSEY PRODUCT WITH SPRINT CONSTRUCTION NAMED.





5 RYAN DRIVE, SUITE 1 GYNHAN, MA 022787



r.K. Executive Centre 201 Boston Post Road West, Suite 101 MARLEDROUGH, NA 01752 (508) 481–7400 should be not be and no so or



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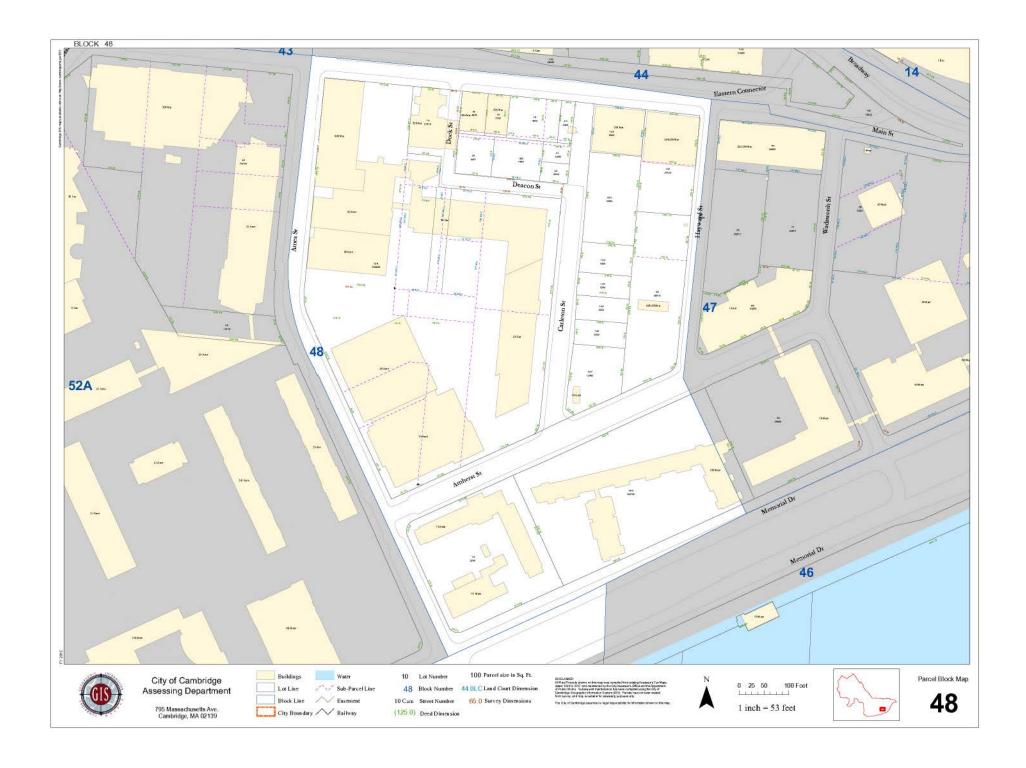
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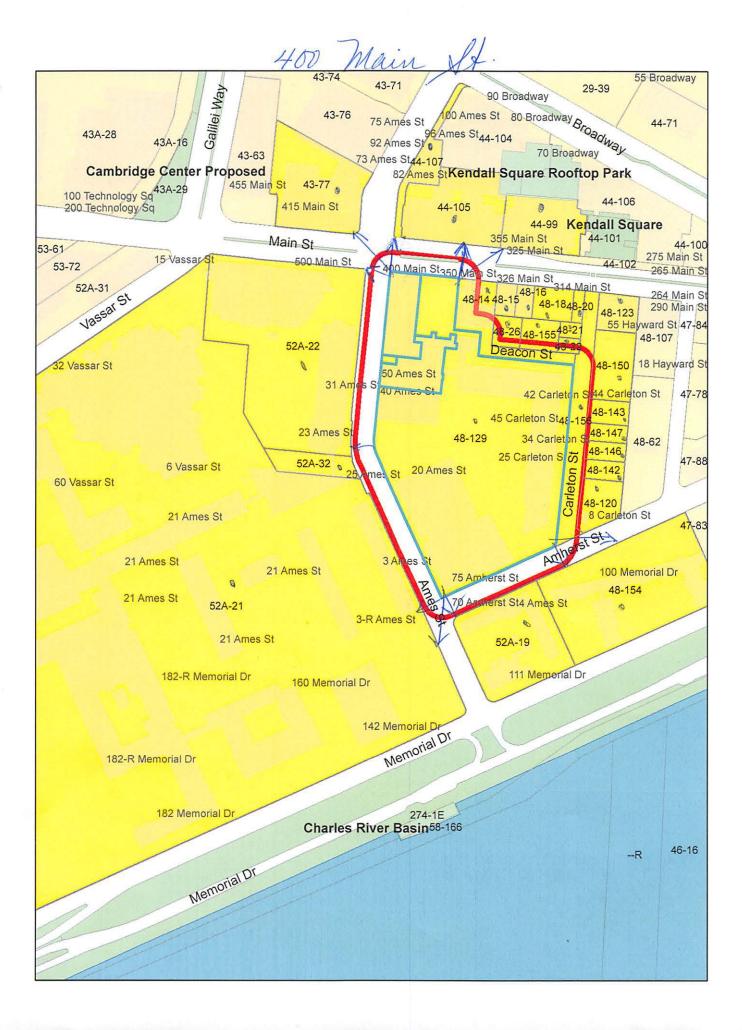
SITE ADDRESS: 400 MAIN STREET CAMBRIDGE, MA 02139

GROUNDING DETAILS ANOTES

RHEET RIVADOR

E-2





44-105 BP FIVE CC LLC, C/O BOSTON PROPERTIES LP 800 BOYLSTON ST, STE #1900 BOSTON, MA 02199

48-15-16-18-21-22-26-123-129-142-143-146 48-147-150-155 / 52A-19-21-22-32 MASSACHUSETTS INSTITUTE OF TECHNOLOGY C/O OFFICE OF THE TREASURER 238 MAIN ST. SUITE 200 CAMBRIDGE, MA 02142

48-154
NEW ENGLAND MUTUAL LIFE INSURANCE
COMPANY - C/O THE DOLBEN CO.
100 MEMORIAL DRIVE
CAMBRIDGE, MA 02142

48-156 CAMBRIDGE CITY OF C/O LOUIE DEPASQUALE CITY MANAGER 400 main St

44-99
ZUCKERMAN, MORTIMER B., EDWARD H. LINDE &
DAVID BARRETT, TRS. OF THREE CAMBRIDGE
C/O BOSTON PROPERTIES INC
800 BOYLSTON ST
BOSTON, MA 02199

48-120 MIT 8 CARLETON STREET LLC, C/O MIT INVESTMENT MANAGEMENT COMPANY 238 MAIN ST. SUITE 200 CAMBRIDGE, MA 02142

48-14 FIREHOUSE INN, LLC 6 PRENTISS STREET CAMBRIDGE, MA 02140

48-156 CITY OF CAMBRIDGE C/O NANCY GLOWA CITY SOLICITOR Petitioner

CENTERLINE COMMUNICATIONS, LLC C/O SIMON BRIGHENTI 750 WEST CENTER ST.- Floor 3 WEST BRIDGEWATER, MA 02379

48-20 MASSACHUSETTS BAY TRANSPORTATION AUTHORITY 10 PARK PLAZA BOSTON, MA 02116

44-107 BP CAMBRIDGE CENTER RESIDENTIAL LLC 800 BOYLSTON ST., STE#1900 BOSTON, MA 02199

43-77 MIT 415 MAIN STREET FEE OWNER LLC C/O MIT INVESTMENT MGMT CO 238 MAIN ST., SUITE 200 CAMBRIDGE, MA 02142



July 12, 2018

City of Cambridge Board of Zoning Appeals 831 Massachusetts Avenue Cambridge, MA 02139

RE: Sprint Spectrum Realty Company, LLC Special Permit Application – 400 Main Street, Cambridge, MA

Dear Chair and Members:

Please accept the accompanying material in application for a Special Permit to remove existing telecommunications equipment on the rooftop of the property known locally as 400 Main Street and to replace it with upgraded equipment. This structure has hosted telecommunications equipment for several years. As disclosed in the accompanying plans and the photographic simulations, this proposed removal and replacement will have a very minimal aesthetic or visual impact as there will be very minor noticeable change to the current conditions should this requested zoning relief be granted and the new equipment installed. There will be, however, an enhanced service available to individuals both inside and outside of the surrounding buildings as well as the vehicles passing through the general area, in both emergency and non-emergency situations.

The Applicant submits that the accompanying application materials meet the requirements of the City of Cambridge Zoning Ordinance and respectfully requests that the requested relief be granted by the Board of Zoning Appeal.

Simon J. Brighenti, Jr.

Simon J. Brighenti, Jr., JD Senior Site Acquisition Consultant 750 W. Center Street – Floor 3 | W. Bridgewater, MA 02379 Phone: (413) 237-1550

sbrighenti@clinellc.com |

www.centerlinecommunications.com



July 12, 2018

City of Cambridge Board of Zoning Appeals 831 Massachusetts Avenue Cambridge, MA 02139

RE: Sprint Spectrum Realty Company, LLC Special Permit Application 400 Main Street, Cambridge, MA Supporting Statement

Dear Chair and Members:

I am a network development consultant to Sprint Spectrum Realty Company, LLC successor in interest to Sprint Spectrum LP ("Sprint"). Sprint is an FCC-licensed provider of wireless telecommunications services to the general public in the City of Cambridge and throughout the Commonwealth of Massachusetts. The purpose of this supplement is to provide support to the within application seeking approval to modify the existing base station¹ or eligible support structure previously installed at the building operated by MIT at 400 Main Street. The building is located in a non-residential use and structure in a residential district and has hosted at least one wireless facility for several years. The existing Sprint base station consists of antennas secured by mounts to the roof of the building and camouflaged behind screening. The within application seeks to replace existing antennas with a new generation of antennas which will provide more robust service to the students and visitors to the hospital and surrounding properties and roads.

Applicant submits that this application constitutes an *eligible facilities request* in that the request for modification does not substantially change the physical dimensions of the *base station*. There is no increase in height of the *support stricture*, nor does the proposed modification defeat the *concealment elements* of the *support structure*²

Approval of the within Application will result in no visible change to the existing facility. There will be no increase in vehicular or pedestrian traffic subsequent to installation, no increased impact on municipal resources, and Sprint will continue to monitor and maintain the facility pursuant to current practice.

¹ Certain italicized terms in context shall be defined as set forth in Section 6409 of the Middle-Class Tax Relief and Job Creation Act of 2012, 47 U.S.C. 1455 Section 6409.

² Note that one sector does not currently incorporate a *concealment element*. However, in that case, there will be no addition to the number of antennas; in fact, there will be a reduction in number.



400 Main Street Cambridge, MA 02139 Application for Special Permit July 12, 2018 Page 2 of 2

The Applicant submits that the accompanying application materials meet the requirements of the City of Cambridge Zoning Ordinance and respectfully request that the requested relief be granted by the Board of Zoning Appeal.

Símon J. Bríghentí, Jr.

Simon J. Brighenti, Jr. JD Site Acquisition Consultant 750 W. Center Street – Floor 3 W. Bridgewater, MA 02379 Phone: (413) 237.1550 sbrighenti@clinellc.com www.centerlinecommunications.com