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 C:\Users\dpeetz\appdata\local\temp\AcPublish\_3796\23983 MLO3XC3 13 RAMAKER 95s.dwg  
 Printed by: dpeetz on Dec 13, 2012 - 12:34pm



**SITE ID #:** MLO3XC3 | 3  
**SITE NAME:** MITCHELL MALL  
**SITE ADDRESS:** 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
**SITE TYPE:** NETWORK VISION MMBS LAUNCH  
 PROPOSED ANTENNA AND EQUIPMENT UPGRADE  
**PROJECT DESCRIPTION:** INSTALLATION OF NEW RADIO/TRANSMISSION EQUIPMENT TO INCLUDE NEW OUTDOOR EQUIPMENT CABINETS IN EXISTING SHELTER VIA SINGLE CABINET INSTALL REPLACEMENT, HYBRID FIBER OPTIC CABLES, REMOTE RADIO UNITS AND ASSOCIATED HI CAPACITY ANTENNAS VIA HOT SWAP REPLACEMENT ON EXISTING 69' ROOFTOP MOUNT.

**PROJECT INFORMATION**

**SITE INFORMATION:**  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
 COORDINATES: N 43° 00' 45.65" (43.01268°)  
 W 87° 55' 30.32" (87.92509°)  
**APPLICANT/LESEE:** SPRINT PCS  
 ADDRESS: 9801 W. HIGGINS ROAD  
 ROSEMONT, IL 60018  
**CONTACT:** JOHN BUCHERT  
 TELEPHONE: (847) 384-2852  
**SITE OWNER:** SCHUSTER HISTORIC BLDG LLC  
 ADDRESS: 1670 S 11TH ST  
 MILWAUKEE, WI 53204  
**CONTACT:** ABEL R ORTIZ  
 TELEPHONE: (414) 643-7368  
**SITE UTILITIES:**  
**POWER COMPANY:** WE ENERGIES  
 ADDRESS: 231 W MICHIGAN ST.  
 MILWAUKEE, WI 53203  
 TELEPHONE: (800) 662-4797  
**TELEPHONE CO.:** AT&T  
 TELEPHONE: (800) 244-4444  
**PROJECT TEAM:**  
**PROJ. MNGMT. FIRM:** NEXIUS SOLUTIONS, INC.  
 ADDRESS: 6737 WASHINGTON ST.  
 SUITE 2265  
 WEST ALLIS, WI 53214  
**CONTACT:** MIKE KOZLOWSKI  
 TELEPHONE: (414) 940-3159  
 WEBSITE: www.NEXIUS.com  
**ENGINEERING FIRM:** RAMAKER & ASSOCIATES  
 ADDRESS: 1120 DALLAS STREET  
 SAUK CITY, WI 53583  
 WEBSITE: www.RAMAKER.com  
**CONTACT:** TOMAS A. TORO-SANTOS  
 TELEPHONE: (608) 643-4100  
 MOBILE: (608) 963-2133  
 FACSIMILE: (608) 643-7999  
 EMAIL ADDRESS: TTORO@RAMAKER.COM  
**APPROVALS:**  
 MW ENGINEER: \_\_\_\_\_ DATE \_\_\_\_\_  
 SITE ACQUISITION: \_\_\_\_\_  
 SAMSUNG MNGR.: \_\_\_\_\_  
 RF ENGINEER: \_\_\_\_\_  
 CONST. MNGR.: \_\_\_\_\_  
 SITE OWNER/REP.: \_\_\_\_\_

**SHEET INDEX**

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**SPECIFICATIONS:**  
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**DESIGN CRITERIA:**  
 ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES.  
 1. INTERNATIONAL BUILDING CODE 2009  
 2. ACCESSIBILITY CODE IBC 2009, CHAPTER 11 & ICC/ANSI A 117.1-2003  
 3. 2008 NATIONAL ELECTRIC CODE  
 4. FIRE / LIFE SAFETY CODE - IFC 2009  
 5. ENERGY CODE IECC 2009

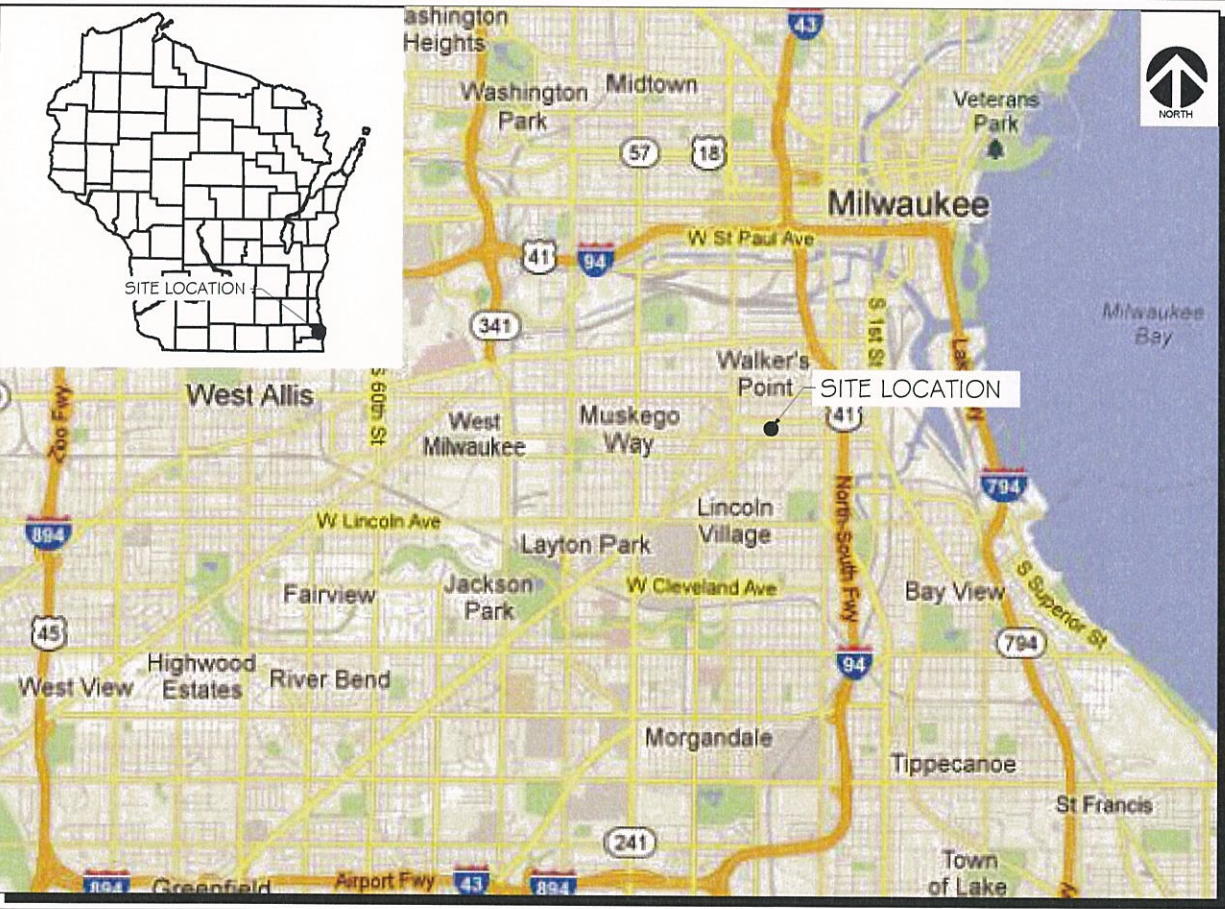
**Sprint**  
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 OVERLAND PARK, KS 66251

**NEXIUS**  
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 WEST ALLIS, WI 53214  
 OFFICE: (414) 940-3159

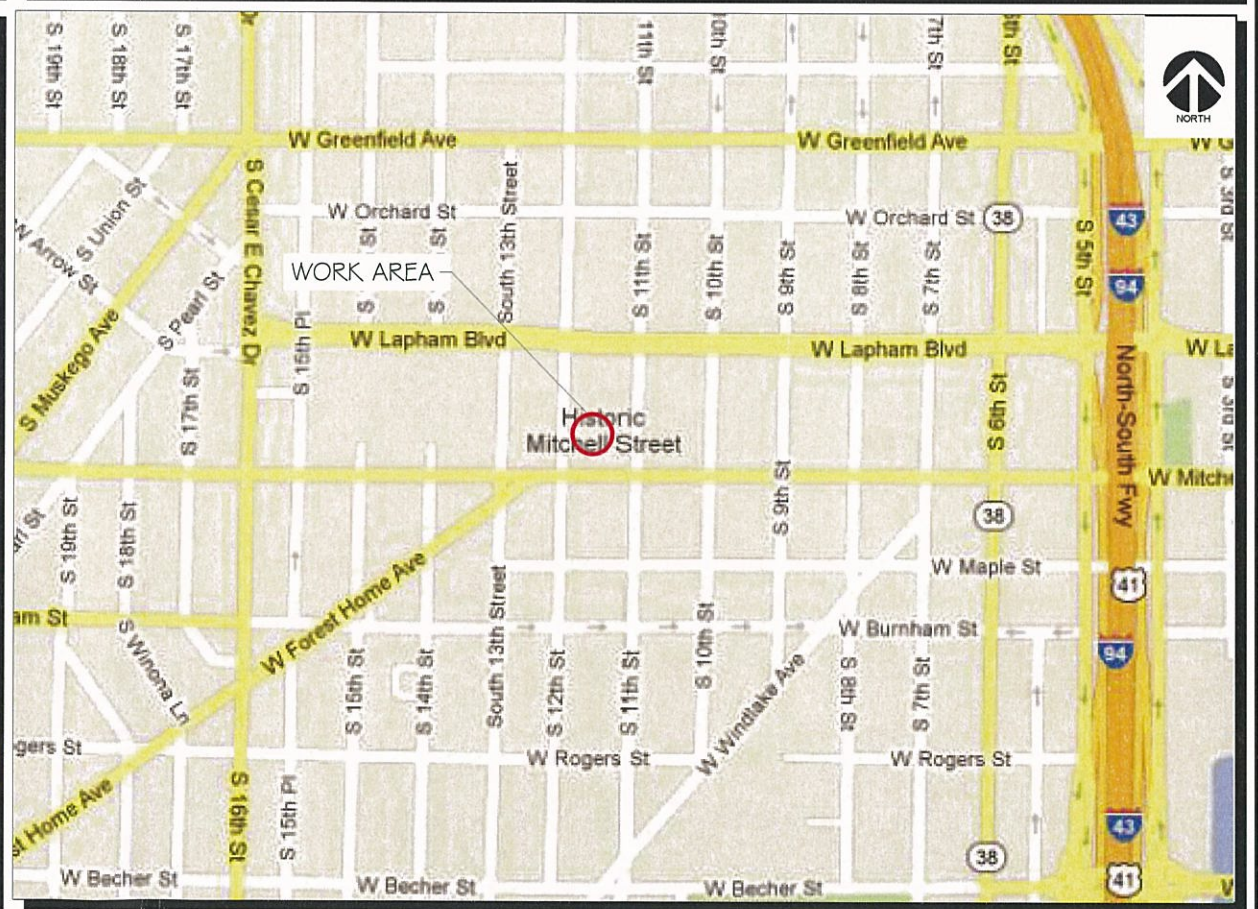
**RAMAKER & ASSOCIATES, INC.**  
 1120 Dallas Street, Sauk City, WI 53583  
 Phone: 608-643-4100 Fax: 608-643-7999  
 www.Ramaker.com

PROJECT NUMBER	23983
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**GENERAL LOCATION**



**VICINITY MAP**



**DRIVING DIRECTIONS:**  
 FROM GEN MITCHELL INTERNATIONAL AIRPORT, WI:  
 HEAD NORTH, TAKE THE 1ST RIGHT TOWARD E. JOSEPH M HUTSTEINER DR. TAKE THE 1ST LEFT ONTO E JOSEPH M HUTSTEINER DR. TURN RIGHT ONTO S. HOWELL AVE. CONTINUE ONTO S CHASE AVE. TURN LEFT ONTO W LINCOLN AVE. TAKE THE 1ST RIGHT ONTO S 6TH ST. TURN LEFT ONTO W HISTORIC MITCHELL ST / W MITCHELL ST. TURN RIGHT ONTO S 11TH ST. DESTINATION WILL BE ON THE RIGHT.

TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN  
**DIGGERS HOTLINE 811 OR 1-800-242-8511**  
 WISCONSIN STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

MARK	DATE	DESCRIPTION

Certification & Seal:  
 I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

**WISCONSIN**  
 TOMAS A. TORO-SANTOS  
 E-37748  
 WAUNAKEE, WI  
**PROFESSIONAL ENGINEER**  
 Signature: \_\_\_\_\_ Date: 12/13/2012

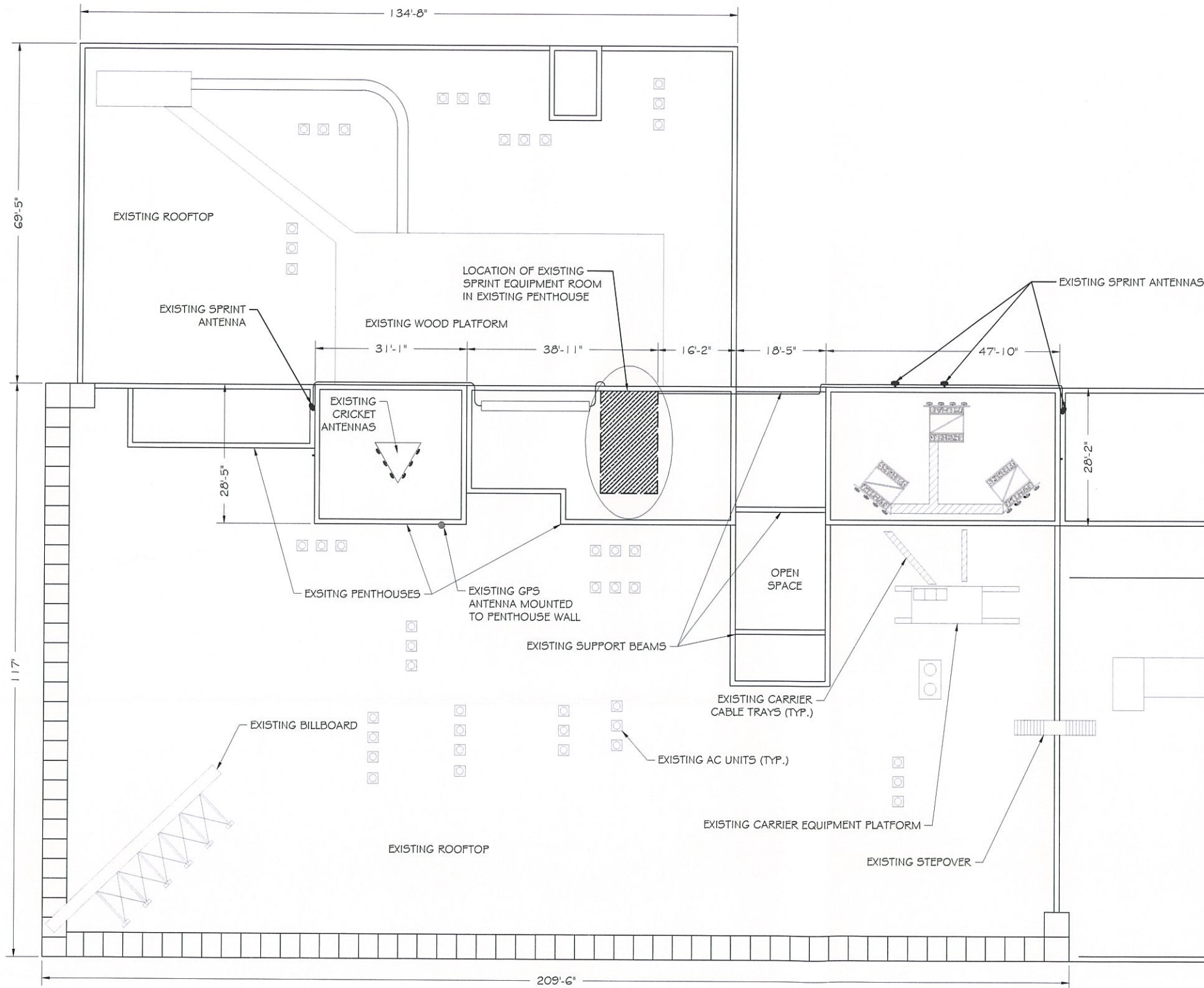
ISSUE PHASE	FINAL	DATE ISSUED	12/13/2012
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**SITE NAME:** MITCHELL MALL  
**ADDRESS:** 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
**SITE TYPE:** ROOFTOP  
**SHEET TITLE:** TITLE SHEET  
**SCALE:** NONE

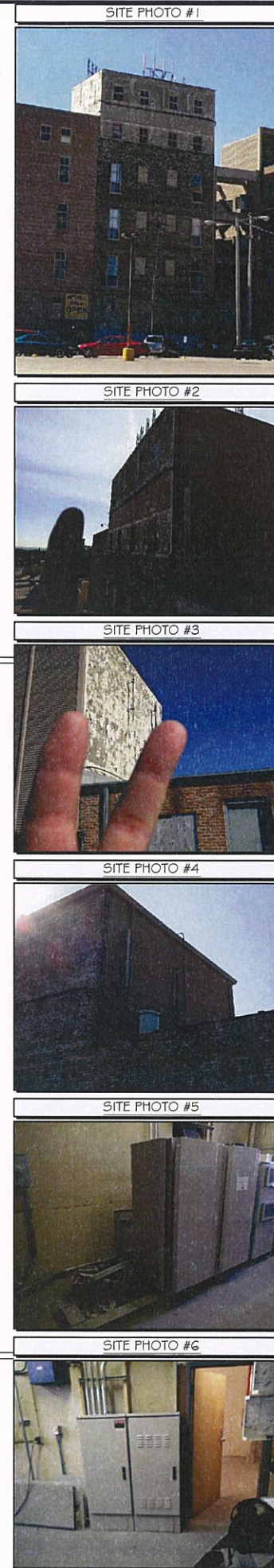
SHEET NUMBER	T-1
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**SITE PLAN**  
 SCALE: 1" = 25'






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		Signature: _____ Date: 12/13/2012
ISSUE PHASE	FINAL	DATE ISSUED 12/13/2012

---

SITE ID #:	MLO3XC313
SITE NAME:	MITCHELL MALL
ADDRESS:	1020 W. MITCHELL ST. MILWAUKEE, WI 53204
SITE TYPE:	ROOFTOP
SHEET TITLE:	TEMPORARY SITE PLAN

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SCALE:

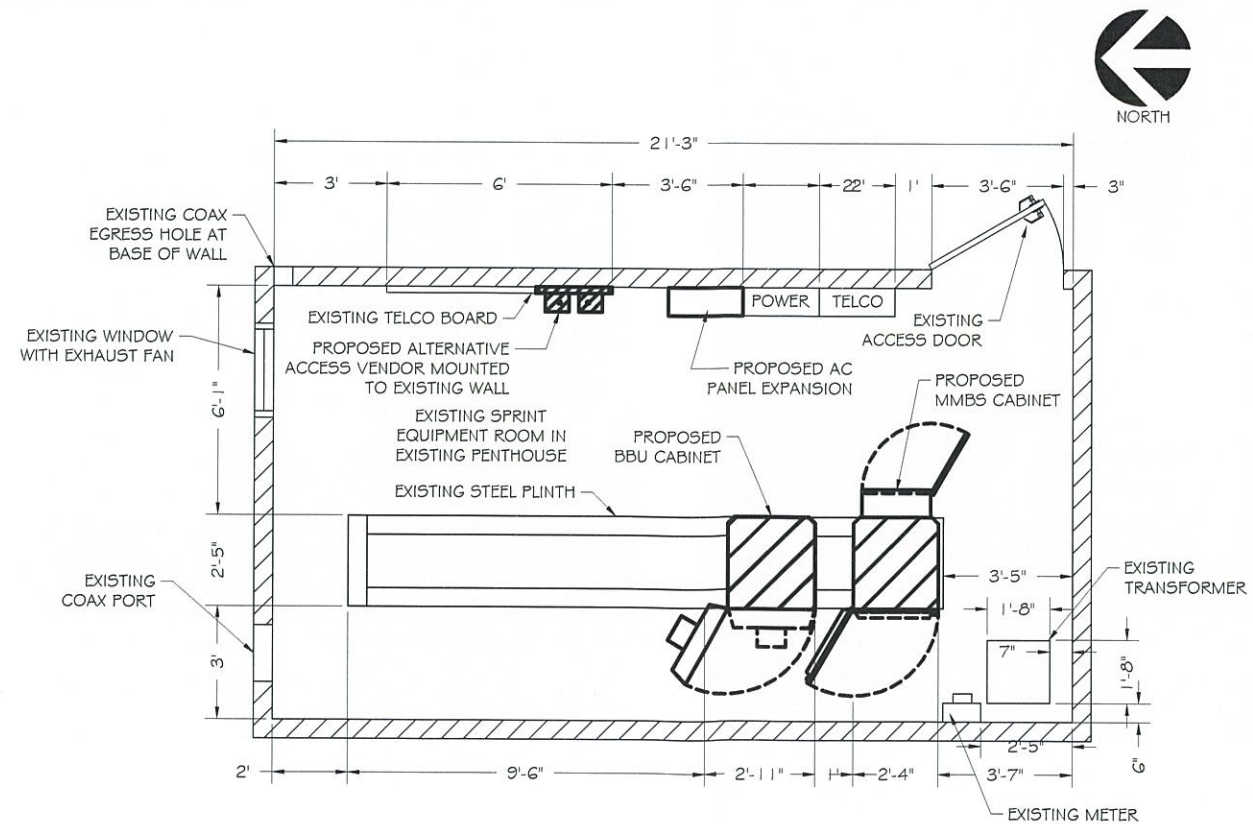
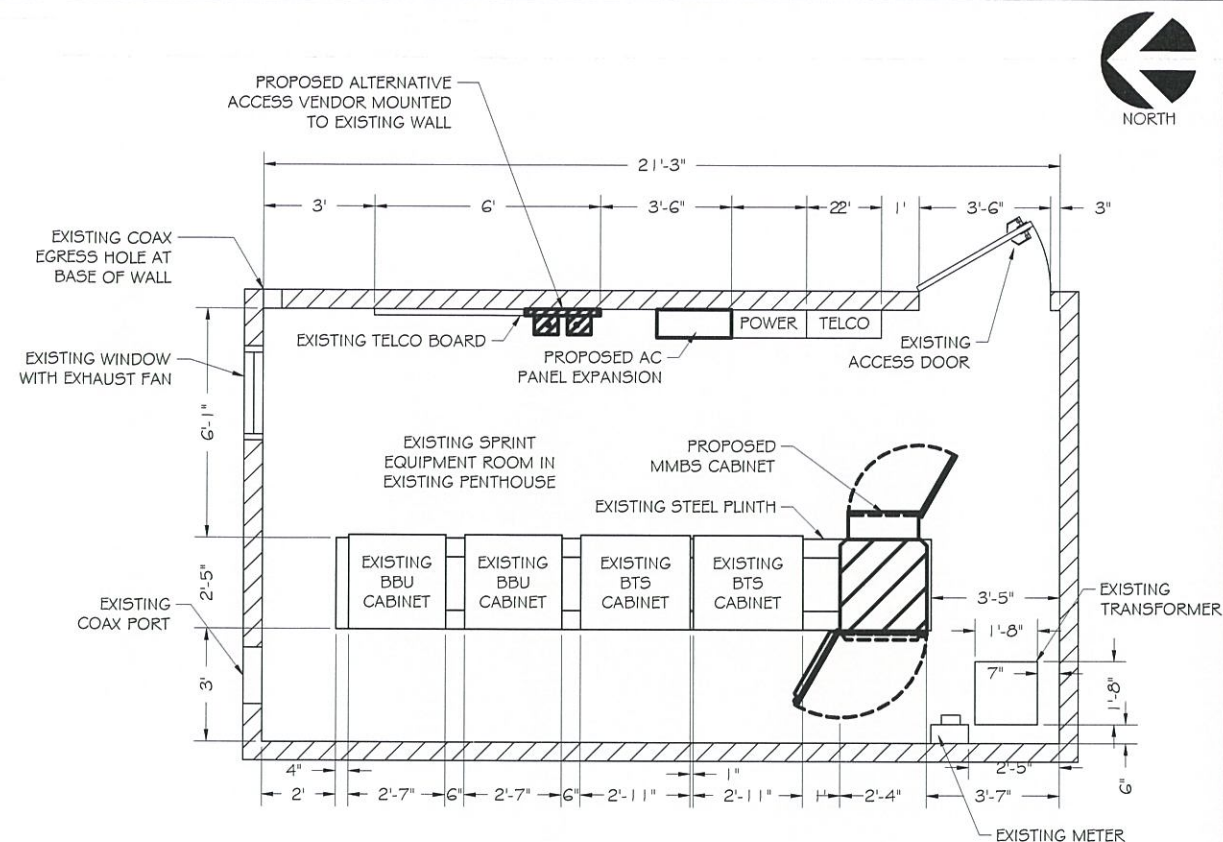
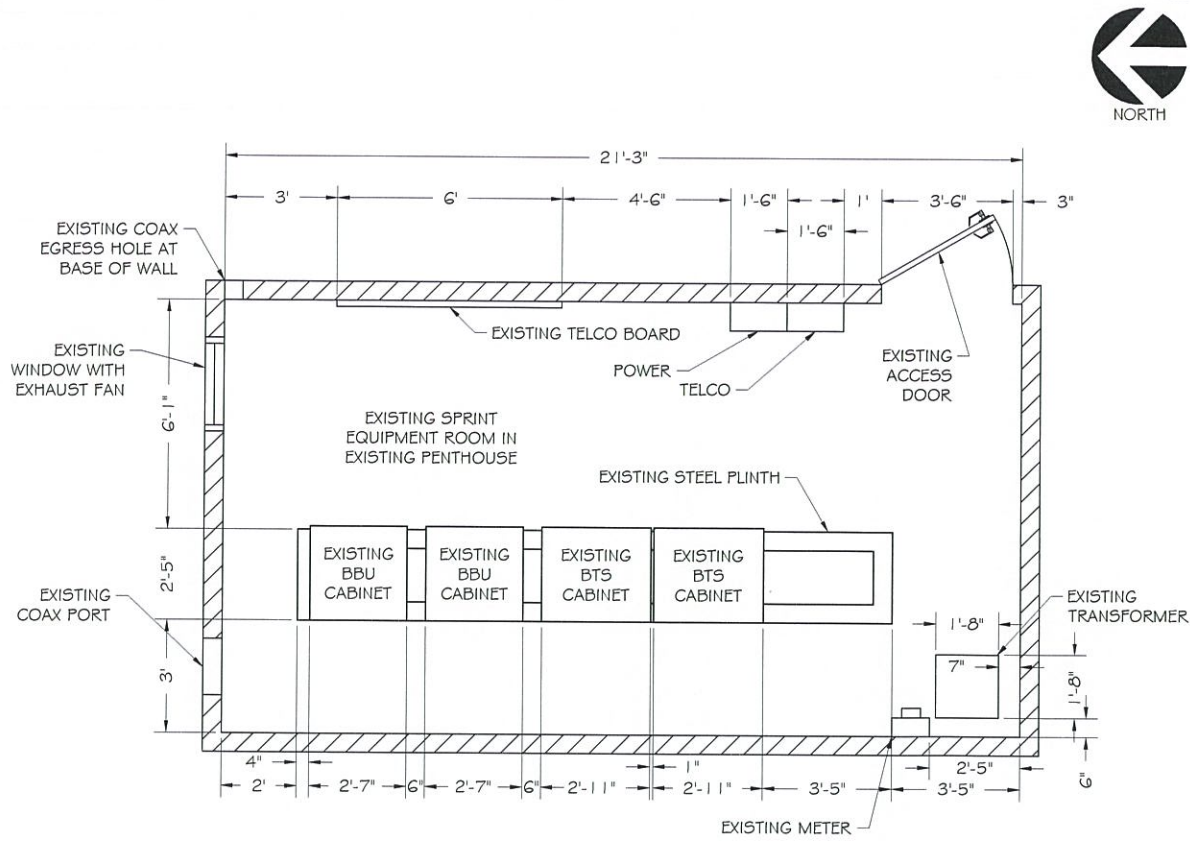


1 1/8" x 17" - 1" = 25'  
 22" x 34" - 1" = 12.5'

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SHEET NUMBER: A-1





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PROJECT NUMBER 23983

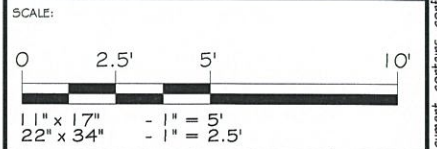
MARK DATE DESCRIPTION  
 Certification & Seal:  
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 SITE TYPE: ROOFTOP

SHEET TITLE:  
**EQUIPMENT PLAN**



SHEET NUMBER A-2





NOTE:  
 PROPOSED HYBRID CABLE LENGTHS:  
 ALPHA - 120'  
 BETA - 165'  
 GAMMA - 135'  
 PROPOSED GPS CABLE LENGTH:  
 115'

NOTE:  
 GPS LOCATION SHOWN DOES NOT INDICATE EXACT LOCATION OF EXISTING SPRINT GPS. USE AS REFERENCE ONLY.

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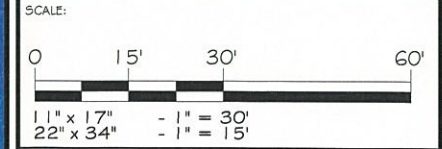
**WISCONSIN**  
 TOMAS A. TORO-SANTOS  
 E-37748  
 WAUNAKEE, WI  
 PROFESSIONAL ENGINEER

Signature: \_\_\_\_\_ Date: 12/13/2012

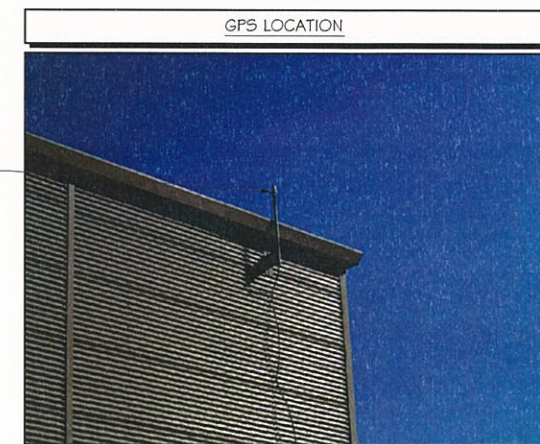
ISSUE PHASE	DATE ISSUED
FINAL	12/13/2012

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 SITE NAME: MITCHELL MALL  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
 SITE TYPE: ROOFTOP

SHEET TITLE:  
**TOWER ELEVATION**



SHEET NUMBER: A-3

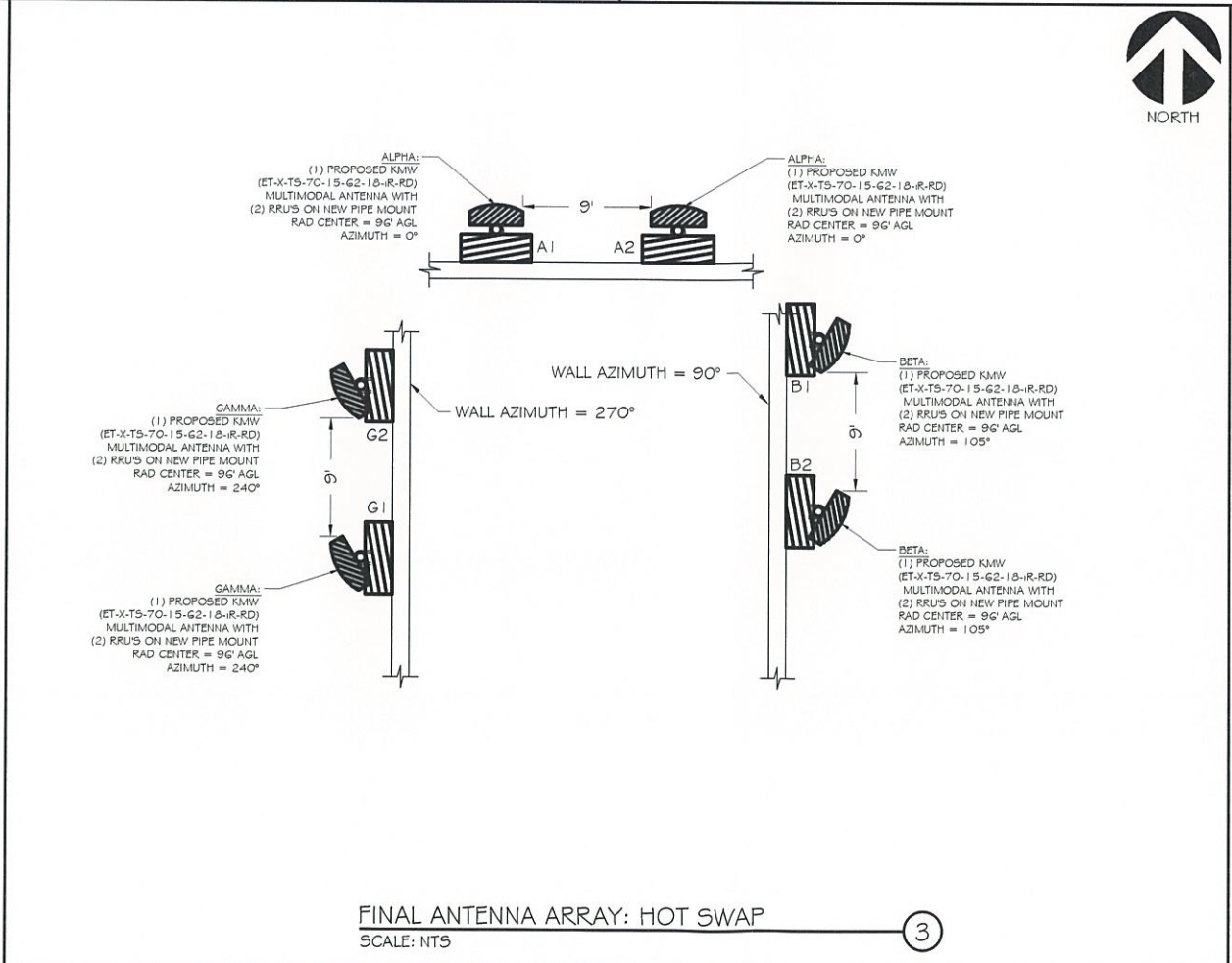
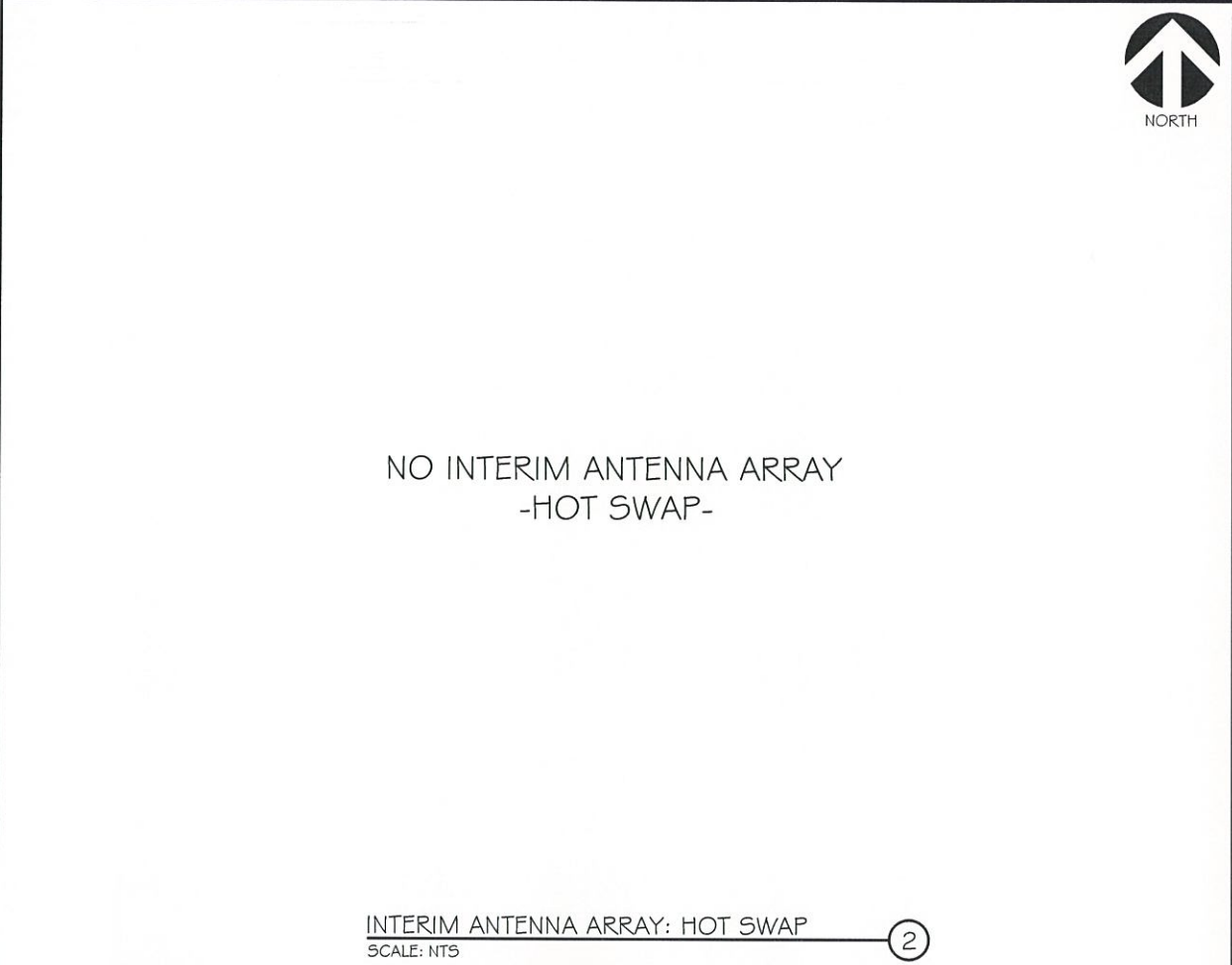
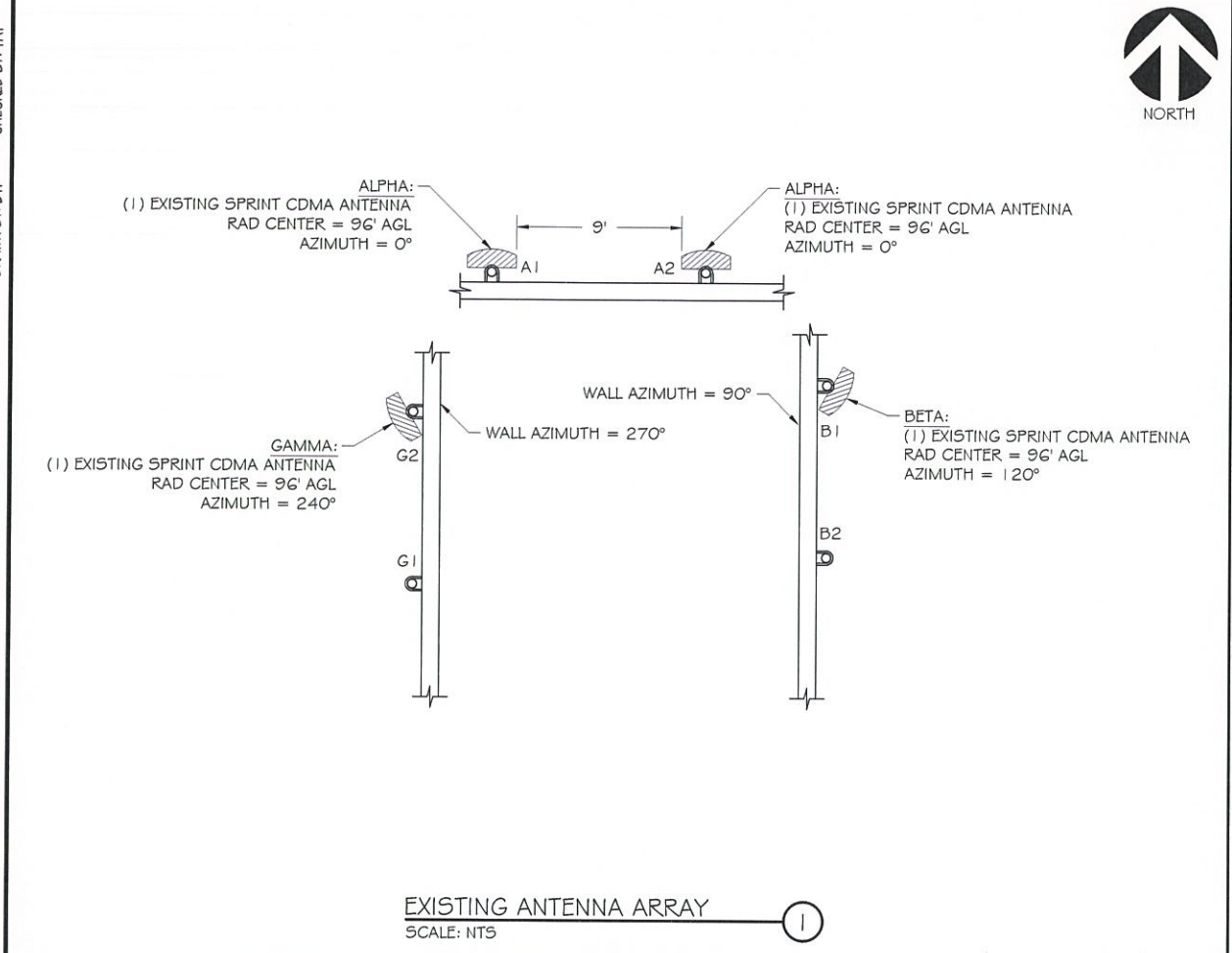


EXISTING GPS ANTENNA LOCATION: MOUNTED TO SOUTH WALL OF PENTHOUSE

AT THE TIME OF CREATING THIS PLAN SET, RAMAKER & ASSOCIATES HAS NOT PERFORMED A STRUCTURAL ANALYSIS FOR THIS PROJECT. PRIOR TO THE INSTALLATION OF THE PROPOSED EQUIPMENT OR MODIFICATION OF THE EXISTING STRUCTURE, A STRUCTURAL ANALYSIS SHALL BE PERFORMED BY THE OWNER'S AGENT TO CERTIFY THAT THE EXISTING/PROPOSED COMMUNICATION STRUCTURE AND COMPONENTS ARE STRUCTURALLY ADEQUATE TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, COAXIAL CABLES, AND OTHER APPURTENANCES.

**NORTH ELEVATION**  
 SCALE: 1" = 30'





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FINAL	12/13/2012

SITE ID #: MLO3XC3 | 3

SITE NAME: MITCHELL MALL

ADDRESS: 1020 W. MITCHELL ST.  
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SITE TYPE: ROOFTOP

SHEET TITLE:

ANTENNA ORIENTATION PLANS

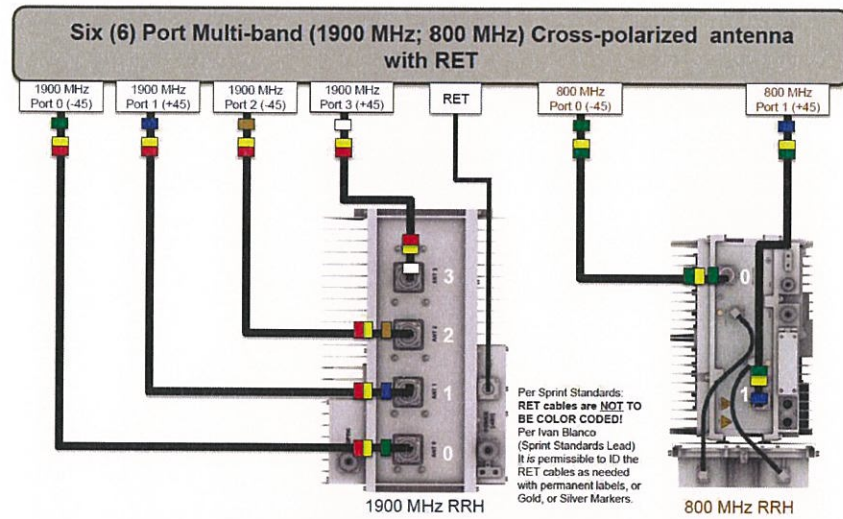
SCALE:

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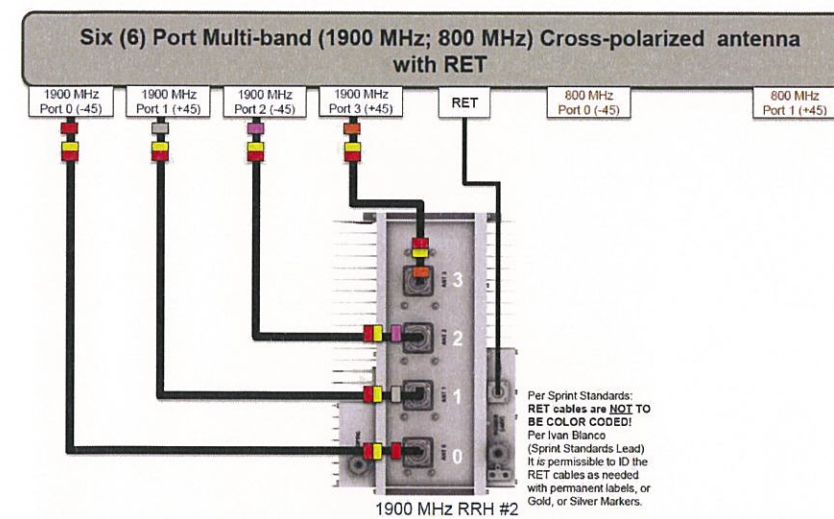
SHEET NUMBER

A-4

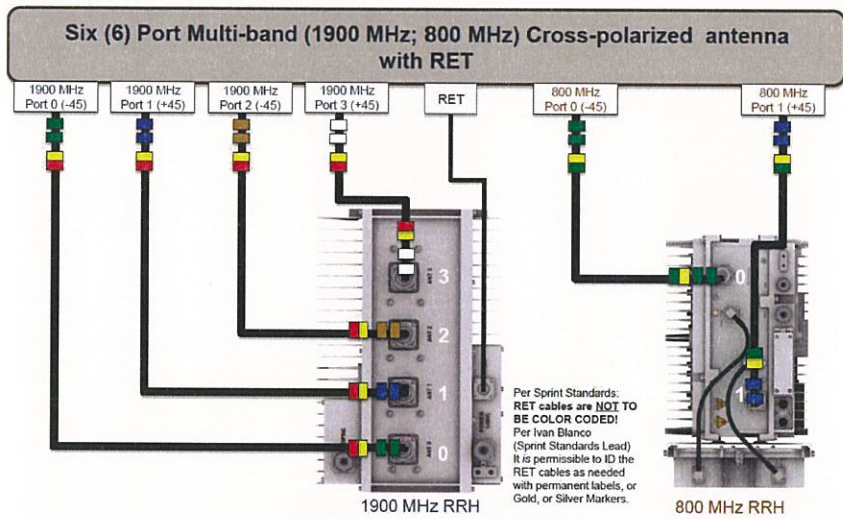




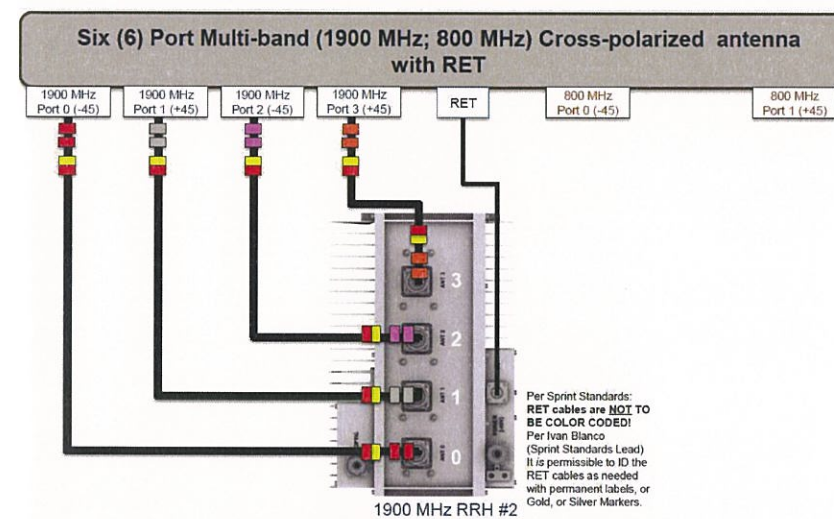
ALPHA RRU COLOR CODING  
 SCALE: NTS ①



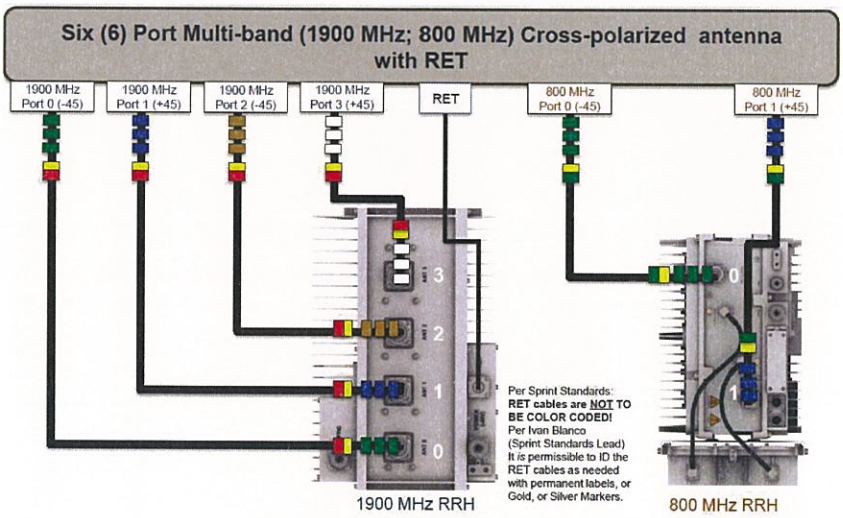
ALPHA RRU COLOR CODING:  
 HI-CAPACITY  
 SCALE: NTS ②



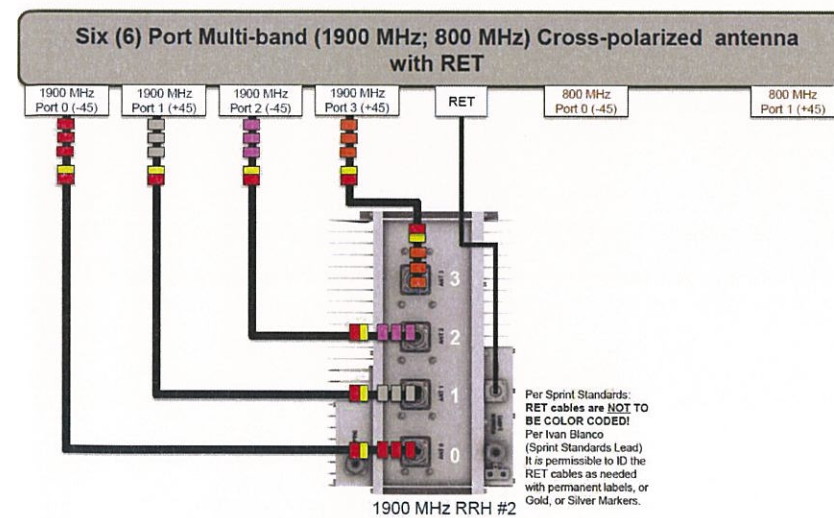
BETA RRU COLOR CODING  
 SCALE: NTS ③



BETA RRU COLOR CODING:  
 HI-CAPACITY  
 SCALE: NTS ④



GAMMA RRU COLOR CODING  
 SCALE: NTS ⑤



GAMMA RRU COLOR CODING:  
 HI-CAPACITY  
 SCALE: NTS ⑥



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PROJECT NUMBER 23983

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 MILWAUKEE, WI 53204

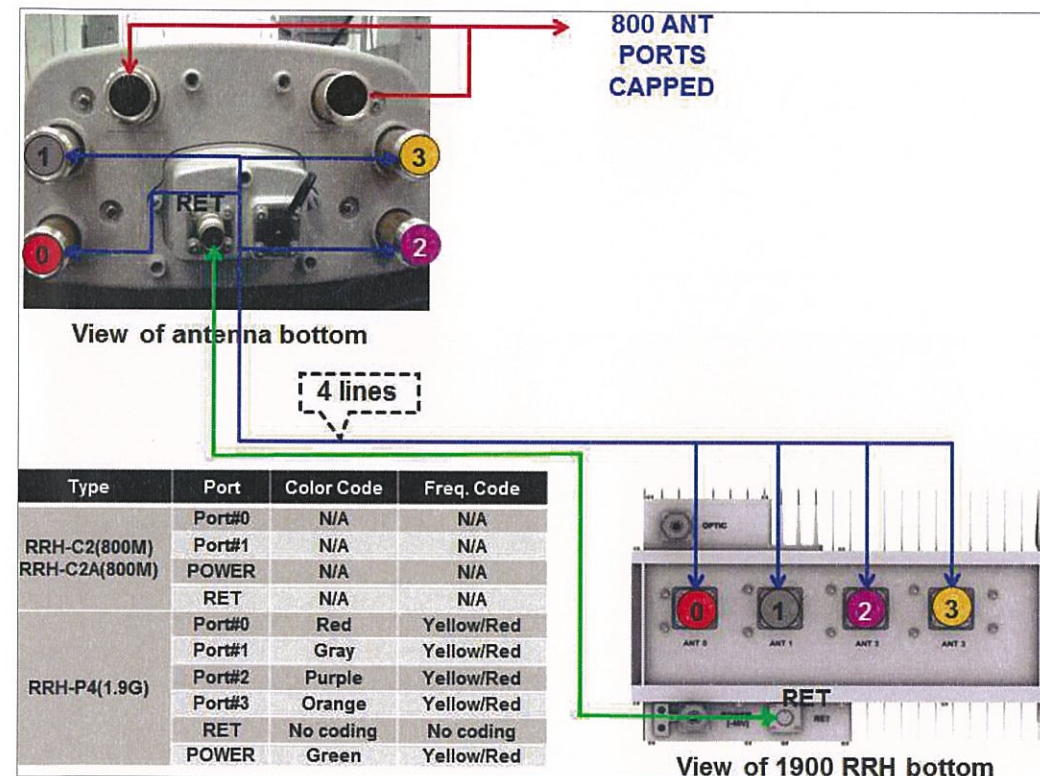
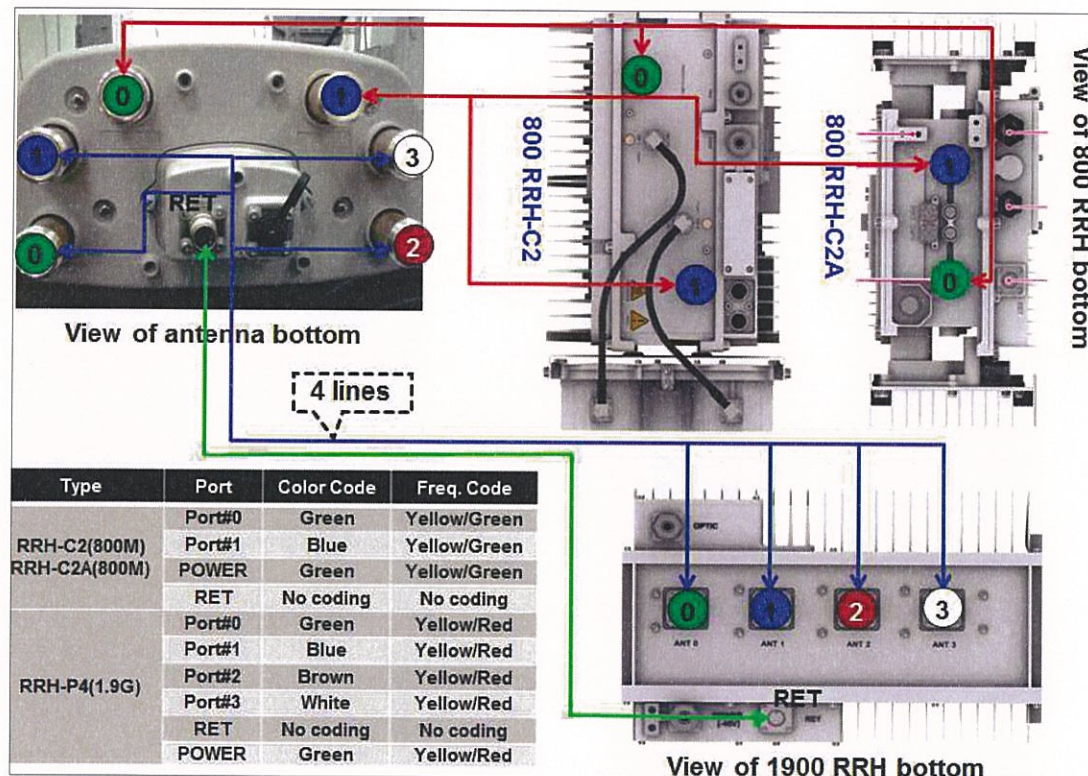
SITE TYPE: ROOFTOP

SHEET TITLE:  
 RRU COLOR CODING

SCALE:  
 SCALE: NONE

SHEET NUMBER A-5





KMW ANTENNA JUMPER CABLE CONNECTION ①  
 SCALE: NTS



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 MILWAUKEE, WI 53204  
 SITE TYPE: ROOFTOP

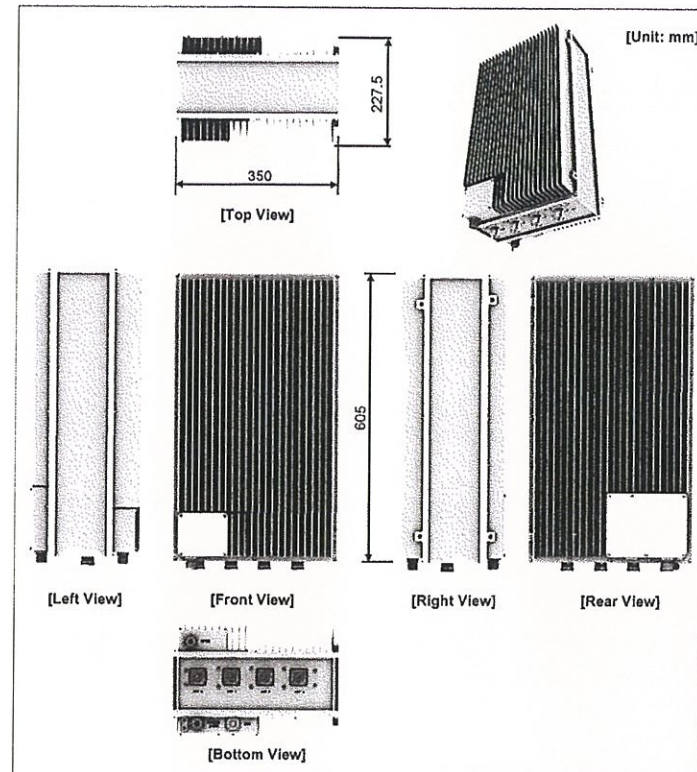
SHEET TITLE:  
 ANTENNA & RRU  
 COLOR CODING

SCALE:  
 SCALE: NONE

SHEET NUMBER  
 A-6



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**1900 MHz RRU MECHANICAL SPECIFICATIONS**  
SCALE: NTS

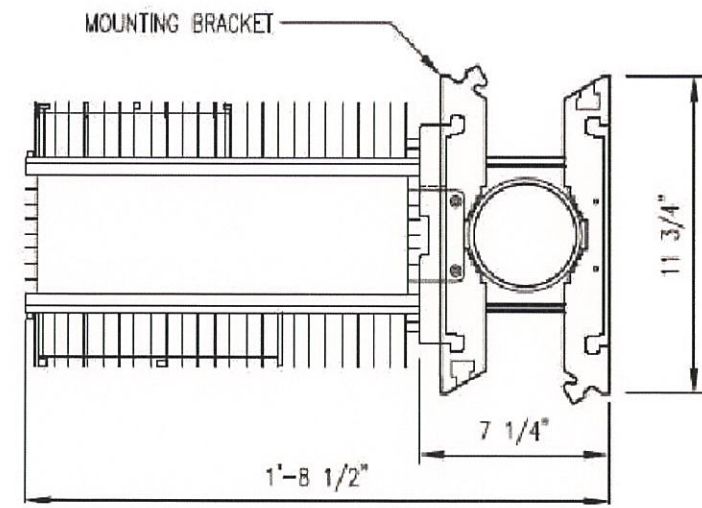
Item	Specifications
Air specification	CDMA/LTE FDD
Operating Frequency	- DL: 1,930~1,995 MHz - UL: 1,850~1,915 MHz
Channel Bandwidth	- CDMA: 1.25 MHz - LTE FDD: 5 MHz/10 MHz
Capacity	- CDMA: Max. 8Carrier - LTE FDD: Max. 6Carrier @5 MHz
RF Power per Sector <sup>a)</sup>	40 W 4Tx (Total 160W)
Multiple Antenna	- CDMA: 1T2R/2T2R/1T4R/2T4R - LTE: 2T2R / 2T4R/4T4R
DU-RRH-P4 Interface	2.5 Gbps, CPRI 4.0 (Optic)

**Input Power**  
The following table shows the power specifications for RRH-P4. RRH-P4 complies with UL60950 safety standard for electrical equipment.

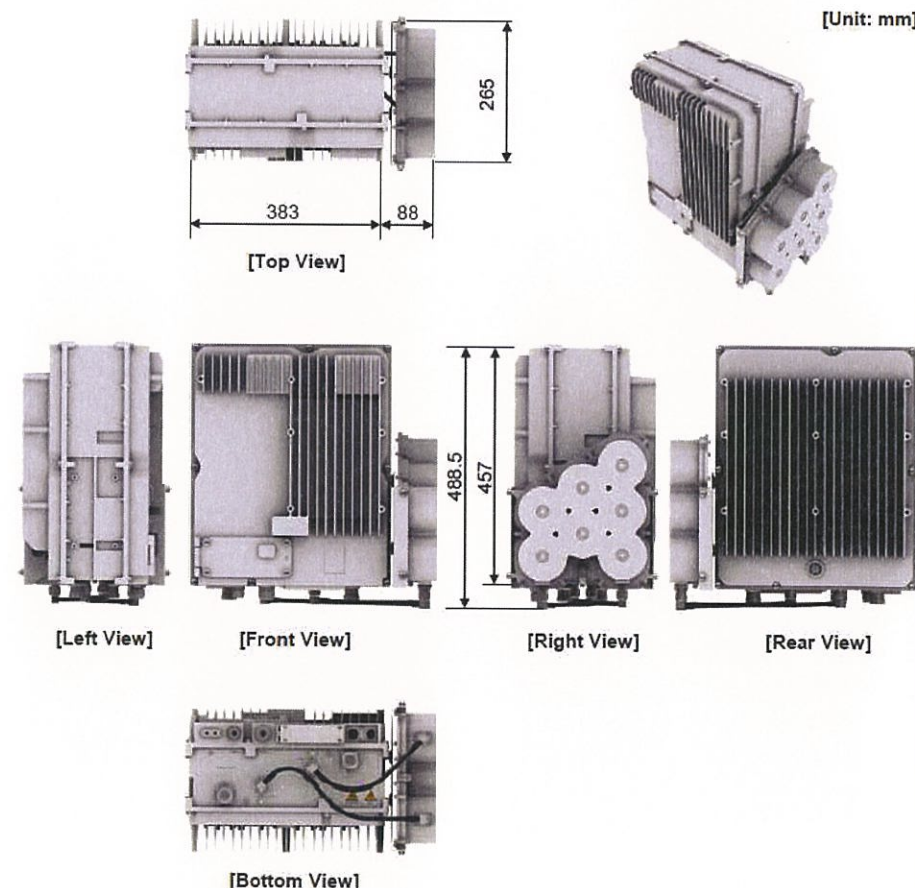
Item	Specifications
Input voltage	-48 VDC
Current consumption	20.3A

**Unit Size and Weight**  
The following table shows the size and weight of RRH-P4.

Item	Specifications
Size (mm, W D H)	350 227.5 605 (Measured without the solar shield)
Weight (kg)	27 or less



**RRU POLE INSTALLATION**  
SCALE: NTS



**800 MHz RRU MECHANICAL SPECIFICATIONS**  
SCALE: NTS

Item	Specifications
Air specification	CDMA/LTE FDD
Operating Frequency	DL: 862~869 MHz UL: 817~824 MHz
Channel Bandwidth	CDMA: 1.25 MHz LTE FDD: 5 MHz
Capacity	CDMA: Max. 5Carrier LTE FDD: Max. 1Carrier @5 MHz
RF Power per Sector <sup>a)</sup>	50 W x 2Tx (Total 100 W)
Multiple Antenna	CDMA: 1T2R/2T2R LTE: 2T2R
DU-RRH-C2 Interface	2.5 Gbps, CPRI 4.0 (Optic)

**Input Power**  
The following table shows the power specifications for RRH-C2. RRH-C2 complies with UL60950 safety standard for electrical equipment.

Item	Specifications
Input voltage	-48 VDC
Current consumption	-

**Unit Size and Weight**  
The following table shows the size and weight of RRH-C2.

Item	Specifications
Size (mm, W x D x H)	280 x 390 x 460 (Measured without the solar shield)
Weight (kg)	27 kg (Ext. Filter 4 kg)



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SITE NAME: MITCHELL MALL

ADDRESS: 1020 W. MITCHELL ST.  
MILWAUKEE, WI 53204

SITE TYPE: ROOFTOP

SHEET TITLE:

RRU DETAILS

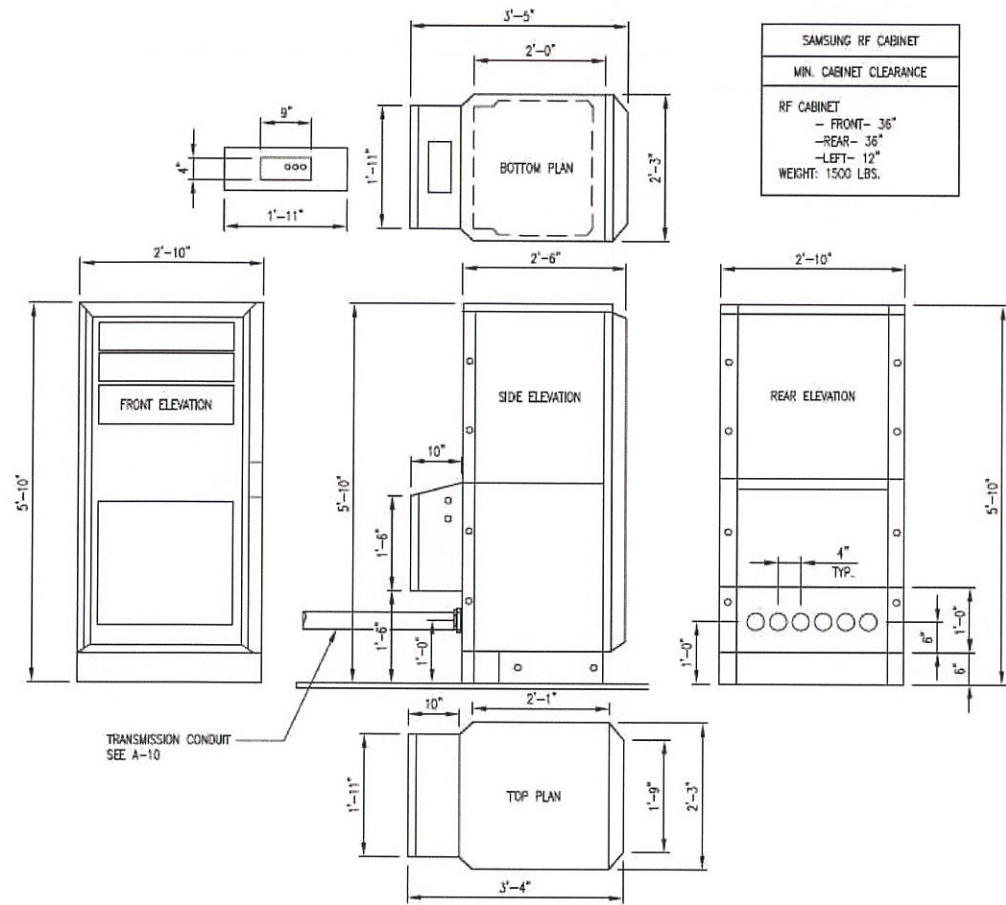
SCALE:

SCALE: NONE

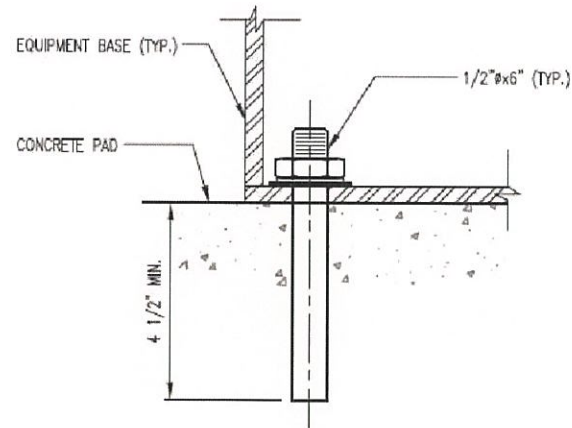
SHEET NUMBER: A-7

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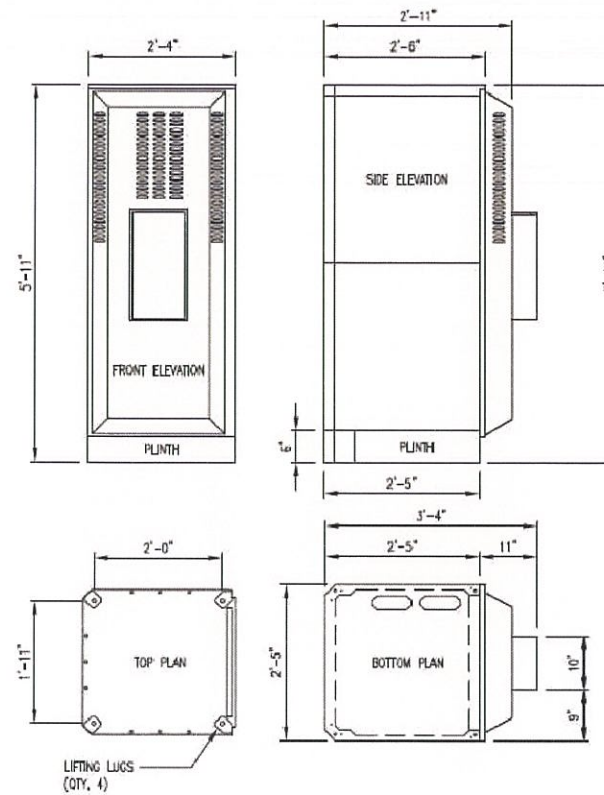




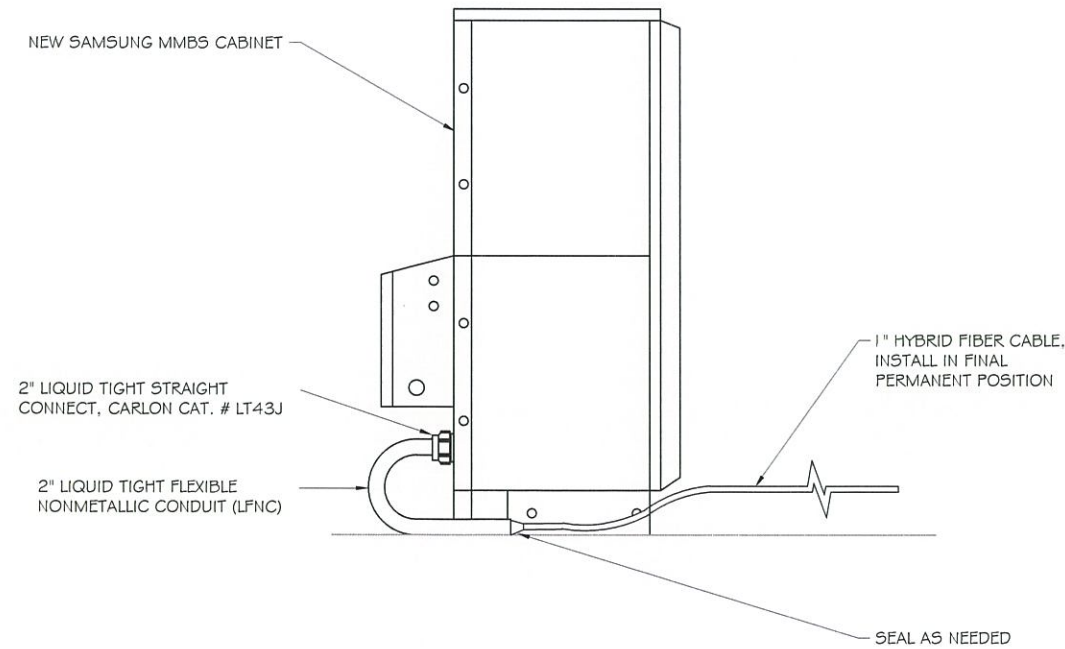
RF CABINET DETAILS  
 SCALE: NTS



EQUIPMENT ANCHOR DETAIL  
 SCALE: NTS



BATTERY CABINET DETAILS  
 SCALE: NTS



CABLE ENTRY DETAIL  
 SCALE: NTS

SAMSUNG BATTERY CABINET	
MIN. CABINET CLEARANCE	
RF CABINET	
- FRONT	36"
- REAR	36"
BATTERY CABINET & 4 STRINGS	MAXIMUM WEIGHT: 2500 LBS.



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 OFFICE: (414) 940-3159



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 www.Ramaker.com

PROJECT NUMBER 23983

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Signature: \_\_\_\_\_ Date: 12/13/2012  
 ISSUE PHASE FINAL DATE ISSUED 12/13/2012

SITE ID #: MLO3XC313  
 SITE NAME: MITCHELL MALL  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204

SITE TYPE: ROOFTOP  
 SHEET TITLE:  
**CABINET DETAILS**

SCALE:  
 SCALE: NONE

SHEET NUMBER A-8



ANTENNA AND COAXIAL CABLE SCHEDULE

SECTOR	ANTENNA NUMBER	ANTENNA MAKE/ MODEL	COAX		AZIMUTH	RAD CENTER	ANTENNA GAIN (dBd) 800 / 1900	ANTENNA FREQUENCY BAND 800 MHz	ANTENNA FREQUENCY BAND 1900 MHz	ELECT. DOWNTILT 800 / 1900	MECH. DOWNTILT 800 / 1900	EFF. DOWNTILT 800 / 1900	TOP JUMPER LENGTH	TOP JUMPER DIA	MINIMUM BENDING RADIUS	CABLE LENGTH	RET LENGTH	RET CABLE MANUFACTURER	RET CABLE MODEL NUMBER
			NUMBER (PER SECTOR)	SIZE (DIA)															
A1	800/1900 MHz	KMW ET-X-TS-70-15-62-18-iR-RD	2	SAMSUNG # (2) HFC-1 - 1/8"	0°	96'	13.4 / 15.9	806-869 MHz	1850-1995 MHz	6 / 6	0 / 0	6 / 6	6'-0"	1/2"	13"	120'	TBD	TBD	TBD
A2	800/1900 MHz	KMW ET-X-TS-70-15-62-18-iR-RD					13.4 / 15.9	806-869 MHz	1850-1995 MHz	6 / 6	0 / 0	6 / 6	6'-0"	1/2"			TBD	TBD	TBD
B1	800/1900 MHz	KMW ET-X-TS-70-15-62-18-iR-RD	2	SAMSUNG # (2) HFC-1 - 1/8"	105°	96'	13.4 / 15.9	806-869 MHz	1850-1995 MHz	2 / 2	0 / 0	2 / 2	6'-0"	1/2"	13"	165'	TBD	TBD	TBD
B2	800/1900 MHz	KMW ET-X-TS-70-15-62-18-iR-RD					13.4 / 15.9	806-869 MHz	1850-1995 MHz	2 / 2	0 / 0	2 / 2	6'-0"	1/2"			TBD	TBD	TBD
G1	800/1900 MHz	KMW ET-X-TS-70-15-62-18-iR-RD	2	SAMSUNG # (2) HFC-1 - 1/8"	24°	96'	13.4 / 15.9	806-869 MHz	1850-1995 MHz	2 / 2	0 / 0	2 / 2	6'-0"	1/2"	13"	135'	TBD	TBD	TBD
G2	800/1900 MHz	KMW ET-X-TS-70-15-62-18-iR-RD					13.4 / 15.9	806-869 MHz	1850-1995 MHz	2 / 2	0 / 0	2 / 2	6'-0"	1/2"			TBD	TBD	TBD
		GPS	1												115'				

- NOTES:
- EXISTING ANTENNAS ARE CDMA UNLESS NOTED OTHERWISE
  - DIMENSIONS OF EXISTING ANTENNA SPACING OR PLATFORMS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY PRIOR TO START OF CONSTRUCTION.
  - PROPOSED PRINT ANTENNAS INCLUDE RESPECTIVE RRU'S WHICH SHALL BE MOUNTED ON THE PIPE BEHIND THE ANTENNA SIMILAR TO THAT SHOWN ON DETAIL 1, SHEET 5-1.
  - FIELD VERIFY EXISTING AZIMUTH BEFORE RELOCATING THE ANTENNA, IF REQUIRED. PRIOR APPROVAL FROM SPRINT TO BE GRANTED BEFORE RELOCATION OF ANTENNAS.

NOTE:  
 CONTRACTOR TO VERIFY ANTENNA INFORMATION WITH CURRENT EBTS PRIOR TO CONSTRUCTION.

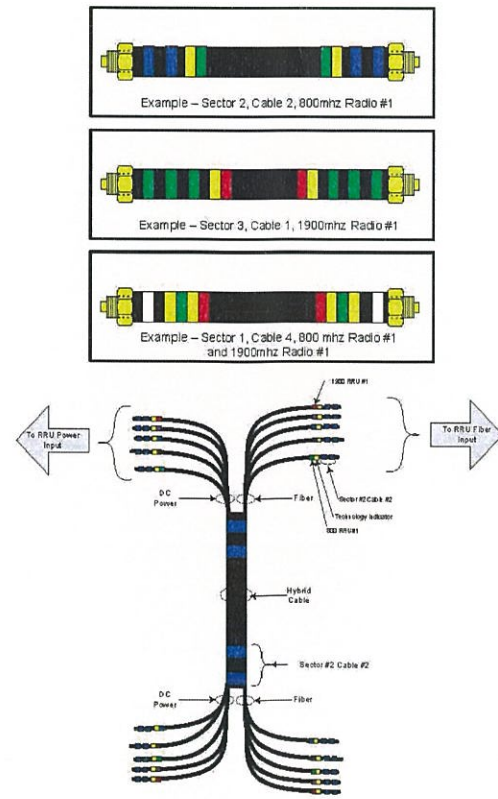
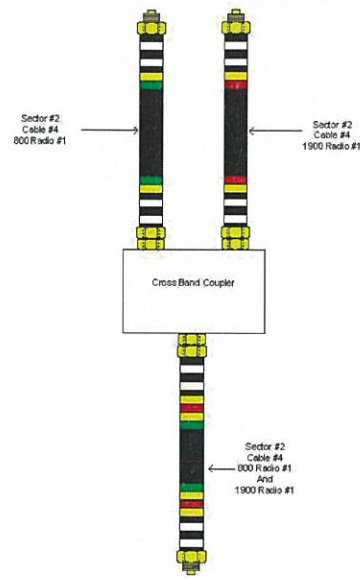
ANTENNA RF INFORMATION

SCALE: NTS

1

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

Frequency	Indicator	ID
800 #1	Yellow	Green
1900 #1	Yellow	Red
1900 #2	Yellow	Brown
Reserved	Yellow	Blue
Reserved	Yellow	Slate
Reserved	Yellow	Orange
Reserved	Yellow	White
1600 #1	Yellow	



COLOR CODING CHARTS

SCALE: NTS

2

[CPRI Cable connection]

L9CA-B4T (Shelf ID: 2)

L9CA-B4T	L0	L1	L2	L3	L4	L5
Tube Color	RED	RED	RED			
Cable	Taping	Taping	Taping			
Indication	1 turn	2 turn	3 turn			
Cable Color	Blue	Blue	Blue			
Destination	1.9G	1.9G	1.9G			
RRH	Alpha	Beta	Gamma			

CIMA-A (Shelf ID: 1)

CIMA-A	L0	L1	L2	L3	L4	L5
Tube Color	RED	RED	RED			
Cable	Taping	Taping	Taping			
Indication	1 turn	2 turn	3 turn			
Cable Color	Brown	Brown	Brown			
Destination	1.9G	1.9G	1.9G			
RRH	Alpha	Beta	Gamma			

CIMA-A (Shelf ID: 0)

CIMA-A	L0	L1	L2	L3	L4	L5
Tube Color	RED	RED	RED	BLACK	BLACK	BLACK
Cable	Taping	Taping	Taping	Taping	Taping	Taping
Indication <sup>(1)</sup>	1 turn	2 turn	3 turn	1 turn	2 turn	3 turn
Cable Color	Orange <sup>(2)</sup>	Orange <sup>(2)</sup>	Orange <sup>(2)</sup>	Orange	Orange	Orange
Destination	1.9G	1.9G	1.9G	800M	800M	800M
RRH	Alpha	Beta	Gamma	Alpha	Beta	Gamma

[Note]

- Indication taping each optical cable is made by installation team.
- Usage of these ports is TBD.

MMBS COLOR CODING CHARTS

SCALE: NTS

3



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SITE NAME: MITCHELL MALL

ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204

SITE TYPE: ROOFTOP

SHEET TITLE:  
 ANTENNA RF DATA & COLOR CODING SPECIFICATIONS

SCALE:

SCALE: NONE

SHEET NUMBER

A-9



SECTOR	PROPOSED ANTENNA COUNT	PROPOSED ANTENNA HEIGHT/RAD CENTER	PROPOSED ANTENNA MANUFACTURER	PROPOSED ANTENNA MODEL #	RRU FILTER	800 MHz PROPOSED RRU MODEL #	1900 MHz PROPOSED RRU MODEL #	PROPOSED RRU COUNT	PROPOSED HYBRID CABLE COUNT	PROPOSED RRU INSTALLATION LOCATION
A1	1	96'	KMW	ET-X-TS-70-15-G2-18-R-RD	(1) 800 MHz FILTER	RRH-C2A	RRH-P4	2	1	ANTENNAS ON TOWER
A2	1		KMW	ET-X-TS-70-15-G2-18-R-RD			RRH-P4	1		
B1	1	96'	KMW	ET-X-TS-70-15-G2-18-R-RD	(1) 800 MHz FILTER	RRH-C2A	RRH-P4	2	1	ANTENNAS ON TOWER
B2	1		KMW	ET-X-TS-70-15-G2-18-R-RD			RRH-P4	1		
G1	1	96'	KMW	ET-X-TS-70-15-G2-18-R-RD	(1) 800 MHz FILTER	RRH-C2A	RRH-P4	2	1	ANTENNAS ON TOWER
G2	1		KMW	ET-X-TS-70-15-G2-18-R-RD			RRH-P4	1		

RF DATA INFORMATION  
 SCALE: NTS ①

APPLICABLE FOR (MLO3XC3 I 3)

Ref. Hybrid cable type (sort by length)					
	Type 1	Type 2	Type 3	Type 4	Type 5
<b>Total Length</b>	~35 m	~55 m	~65 m	~80 m	~100 m
<b>Hybrid Power Cable configuration</b>	AWG 10 1 pair, AWG 12 3 pair	AWG 8 1 pair, AWG 10 3 pair	AWG 6 1 pair, AWG 8 1 pair, AWG 10 2 pair	AWG 6 1 pair, AWG 8 3 pair	AWG 4 1 pair, AWG 6 1 pair, AWG 8 2 pair
<b>Cable diameter</b>	25mm	27mm	30mm	30/32mm <sup>1)</sup>	32mm
<b>Bending radius</b>	300mm	330mm	390mm	450mm	450mm
<b>Optic cable</b>	LC/PC-to-LC/PC, Single mode				
<b>DU cabinet (power cable terminal max size AWG 4)</b>	2 pair power and optic cable With PE pipe				
<b>RRU Power cable Spec</b>	AWG 8, 14.7~15.4 mm AWG 10, 11.5~12.4 mm				
<b>Non use Power and optic cable protection</b>	2 pair power and optic cable With PE pipe	2 pair power and optic cable With PE pipe	2 pair power and optic cable With PE pipe	2 pair power and optic cable With PE pipe	

HYBRID CABLE SPECIFICATIONS  
 SCALE: NTS ①

● Electrical Specification

Product Number	ET-X-TS-70-15-G2-18-R-RD	
Frequency Range	800-900MHz	1850-1995MHz
3dB Beam Width	Horizontal 70° Vertical 12.0°	82° 5.2°
Gain (dBi @dBd)	15.2 / 13.4	18.0 / 15.9
Electrical Down TIR Range	0° - 10°	0° - 10°
1 <sup>st</sup> Upper Sidelobe Suppression	> 18dB (up to 15° EL)	> 18dB (up to 10° EL)
Front-to-Back Ratio @180±15°	> 30dB	> 28dB
Polarization Type	Dual, Slant ±45°	Quad, Slant ±45°
Cross-Polar Discrimination (XPD)	0°, Boresight > 18dB ±60° > 10dB	> 18dB > 10dB
Input Maximum CW Power	250W	250W
Impedance	50Ω	50Ω
Return Loss	> 15dB	> 15dB
Isolation Between Ports	> 28dB	> 28dB
HDW Squint across the same ports	±2°	±5°
Passive Intermodulation, IM3	≤ -110dBm (@2x43dBm, @ 2 minute duration)	
Antenna Control Interface	Field Replaceable Internal RET, AISG2.0	



● Mechanical Specification

Dimension (Length x Width x Depth)	1875mm x 300mm x 150mm (73.8" x 11.8" x 5.9")
Weight without Clamp	19.0kg (41.9lbs)
Max. Wind Speed	67m/s (150mph)
Wind Load (@100mph), Front / Side / Rear	863.0N / 431.5N / 863.0N (194.1lbf / 97.0lbf / 194.1lbf)
Connector (Type / Position)	6 x 7/16" DIN(Female) / Bottom

KMW - ET-X-TS-70-15-G2-18-R-RD  
 ANTENNA SPECIFICATIONS  
 SCALE: NTS ③



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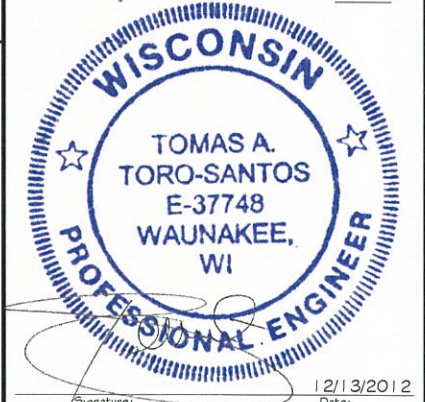
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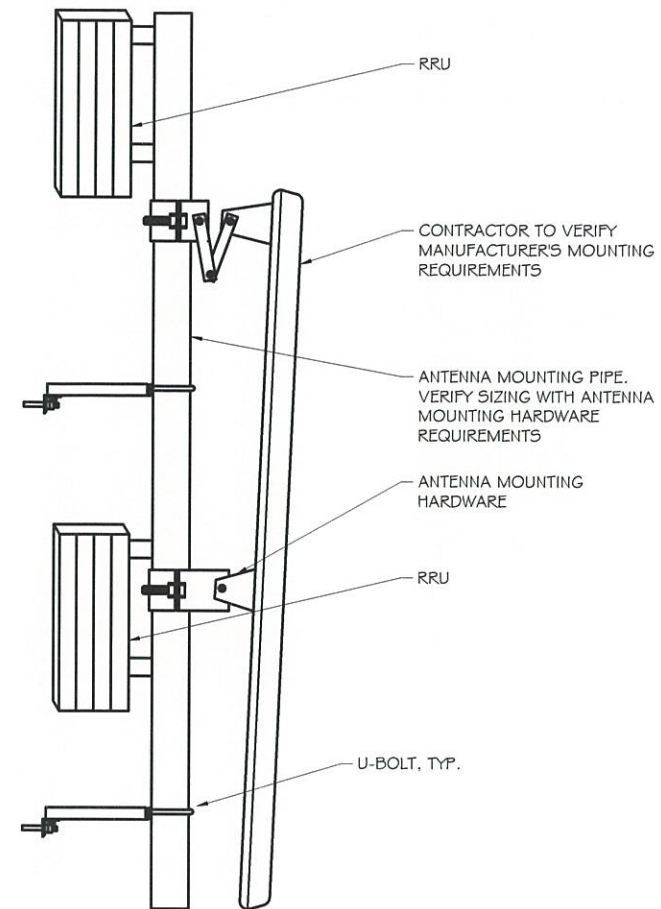
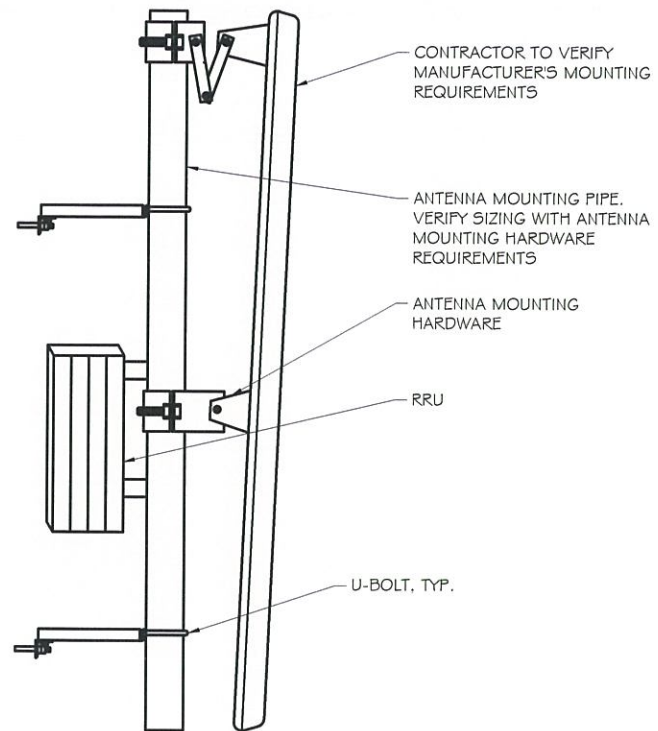
SITE ID #: MLO3XC3 I 3  
 SITE NAME: MITCHELL MALL  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
 SITE TYPE: ROOFTOP

SHEET TITLE:  
 RRU RF DATA &  
 ANTENNA & HYBRID CABLE  
 SPECIFICATIONS

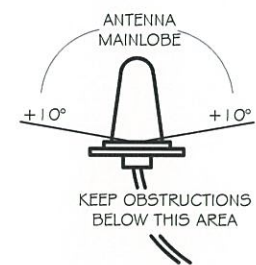
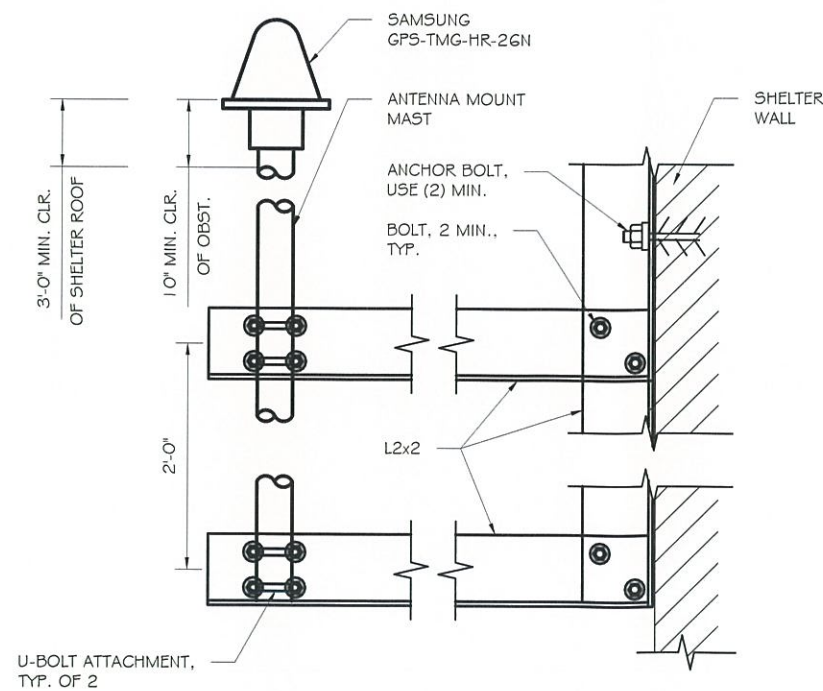
SCALE:  
 SCALE: NONE

SHEET NUMBER A-10





ANTENNA MOUNT DETAIL  
 SCALE: NTS



- NOTES:
- A. VERIFY ALL ATTACHMENT AND MOUNTING HARDWARE WITH CONSTRUCTION MANAGER.
  - B. SEE MFR.'S SPECIFICATIONS FOR ADDITIONAL MOUNTING REQUIREMENTS.
  - C. GPS MUST BE 10 FT AWAY FROM ANY TX ANTENNA.

GPS MOUNTING DETAILS  
 SCALE: NTS



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ISSUE PHASE	DATE ISSUED
FINAL	12/13/2012

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SITE NAME: MITCHELL MALL

ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204

SITE TYPE: ROOFTOP

SHEET TITLE:

STRUCTURAL DETAILS

SCALE:

SCALE: NONE

SHEET NUMBER

S-1





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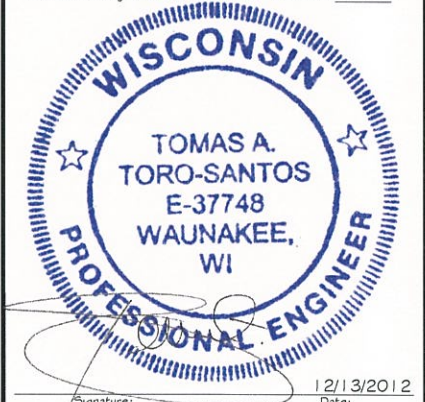
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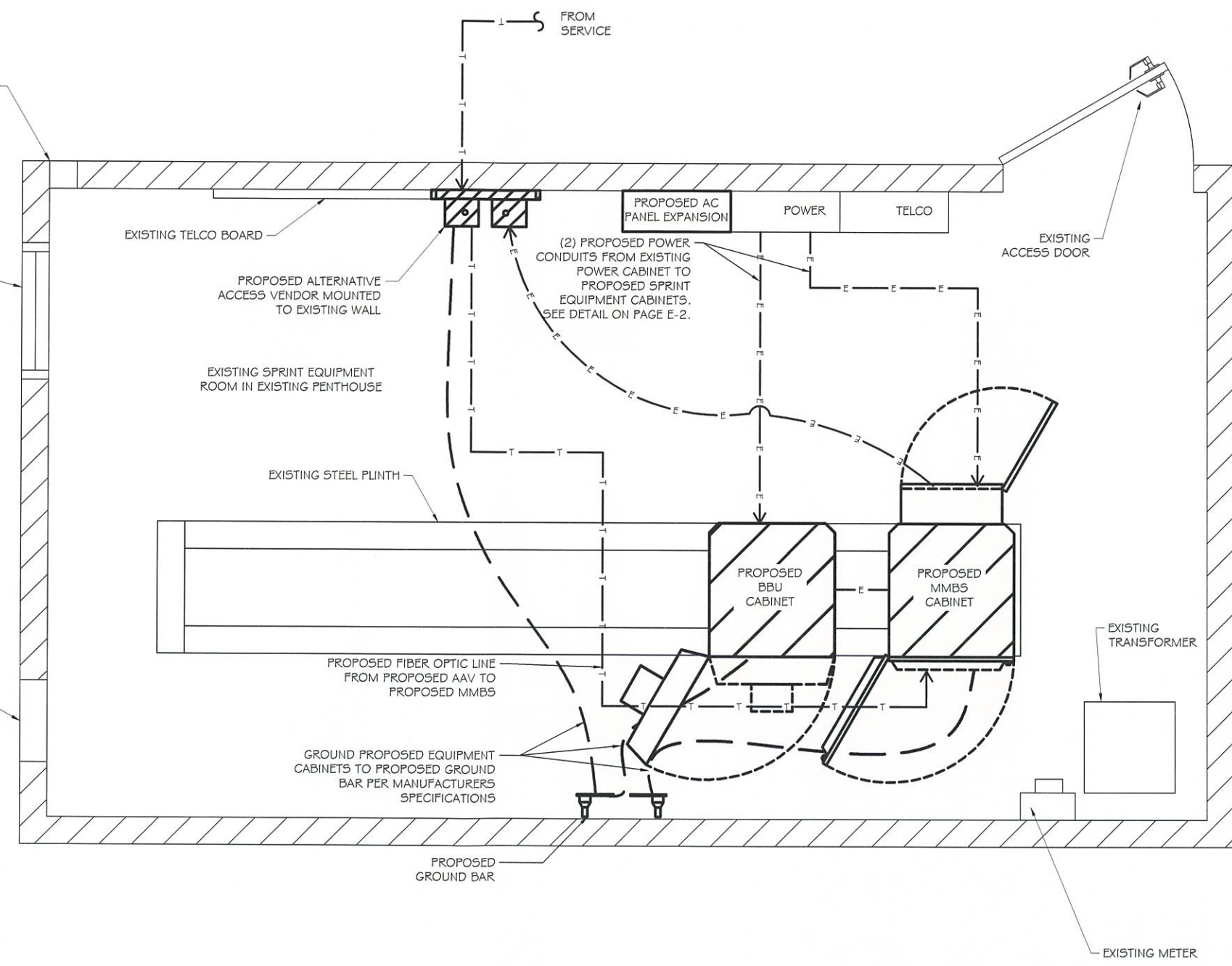
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SITE ID #: MLO3XC313  
 SITE NAME: MITCHELL MALL  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
 SITE TYPE: ROOFTOP

SHEET TITLE:  
**UTILITY & GROUNDING SITE PLAN**

SCALE:  
 0 1.25' 2.5' 5'  
 1" = 2.5'  
 22" x 34" - 1" = 1.25'

SHEET NUMBER E-1



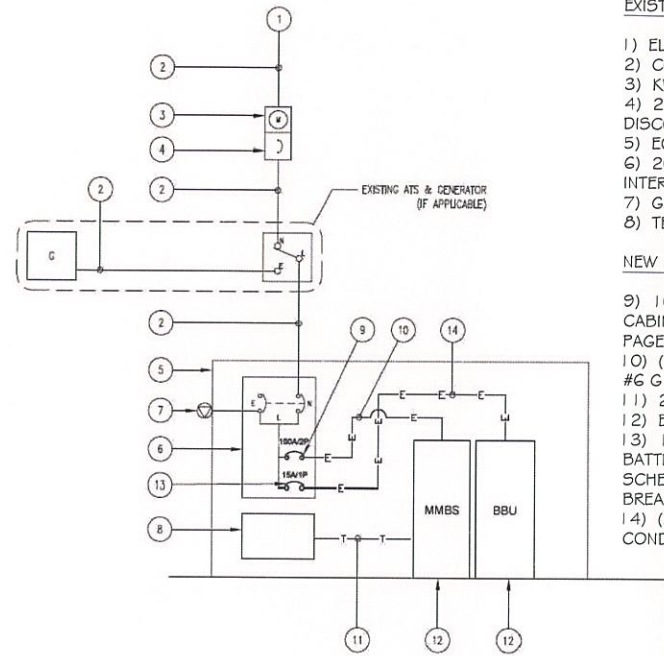
LEGEND:	
---	EXISTING GROUND CABLE
---	PROPOSED GROUND CABLE
■	MECHANICAL CONNECTION
▲	EXOTHERMIC CONNECTION
⊕	FIRE HYDRANT
☆	LIGHT POLE
⊕	UTILITY POLE
---	EASEMENT
---	PROPOSED ELECTRIC
---	PROPOSED TELCO
---	EXISTING FIBER
---	OVERHEAD ELECTRIC
---	RIGHT OF WAY
---	GAS LINE
---	ELECTRIC LINE
---	TELEPHONE LINE

NOTE:  
 UTILITY/GROUNDING LINES ARE SHOWN FOR SCHEMATIC PURPOSES ONLY & DO NOT REPRESENT THE EXACT LOCATION OF THE RUN. CONTRACTOR SHALL FIELD VERIFY PROPOSED & EXISTING SERVICE LOCATIONS. NOTIFY CONSTRUCTION/PROJECT MANAGER IMMEDIATELY OF ANY DISCREPANCIES.

MEMBER  
  
 TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN WISCONSIN  
**DIGGERS HOTLINE 811 OR 1-800-242-8511**  
 WISCONSIN STATUTE 182.0175 (1974) REQUIRES MIN. OF 3 WORK DAYS NOTICE BEFORE YOU EXCAVATE.

UTILITY & GROUNDING SITE PLAN  
 SCALE: 1" = 2.5'





**KEY NOTE LEGEND**

**EXISTING ITEMS**

- 1) ELECTRICAL SERVICE, 200 AMP, 120/240V
- 2) CONDUIT AND CONDUCTORS.
- 3) KWH METER.
- 4) 200A 2P CIRCUIT BREAKER OR FUSED DISCONNECT.
- 5) EQUIPMENT SHELTER.
- 6) 200A LOAD CENTER WITH MECHANICAL INTERLOCK MTS.
- 7) GENERATOR RECEPTACLE.
- 8) TELCO BACKBOARD

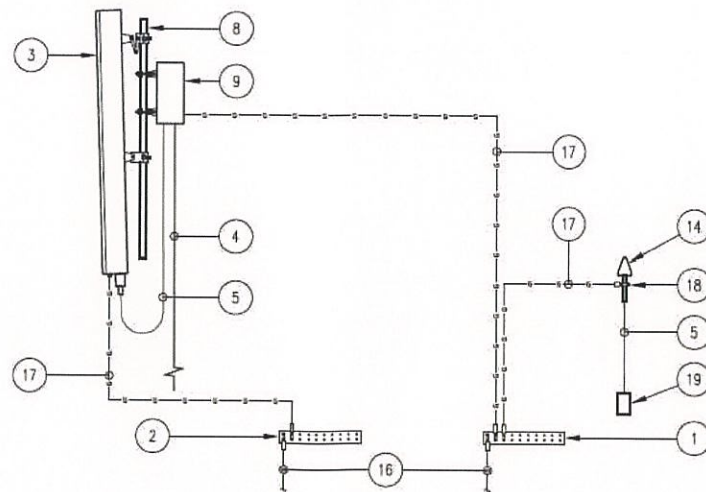
**NEW ITEMS**

- 9) 100A 2P CIRCUIT BREAKER TO FEED MMBS CABINET; SEE ELECTRICAL PANEL SCHEDULE ON PAGE E-3 FOR AVAILABLE BREAKER POSITIONS.
- 10) (2) #2 THWN CU + (1) #2 THWN CU + (1) #6 G IN 2" CONDUIT.
- 11) 2" TELCO CONDUIT WITH PULLSTRING.
- 12) EQUIPMENT CABINETS
- 13) 15A 1P CIRCUIT BREAKER TO FEED BATTERY CABINET FAN; SEE ELECTRICAL PANEL SCHEDULE ON PAGE E-3 FOR AVAILABLE BREAKER POSITIONS.
- 14) (2) #12 THWN CU + (1) #12 G IN 3/4" CONDUIT.

**RISER DIAGRAM**  
 SCALE: NTS

**KEY NOTE LEGEND**

- 1) MAIN GROUND BAR.
- 2) TOWER GROUND BAR.
- 3) NEW ANTENNA.
- 4) HYBRID FANOUT CABLE.
- 5) COAXIAL JUMPER CABLE.
- 6) N/A.
- 7) N/A.
- 8) PIPE MOUNT.
- 9) REMOTE RADIO UNIT (RRU)
- 10) N/A.
- 11) N/A.
- 12) N/A.
- 13) N/A.
- 14) GPS ANTENNA.
- 15) N/A.
- 16) #2 AWG SOLID BARE TINNED COPPER WIRE.
- 17) #6 STRANDED GREEN INSULATED.
- 18) GROUND CLAMP FOR GPS MOUNT W/ #6 AWG GROUND LEAD
- 19) GPS SURGE ARRESTOR.



**ANTENNA GROUNDING SCHEMATIC**  
 SCALE: NTS



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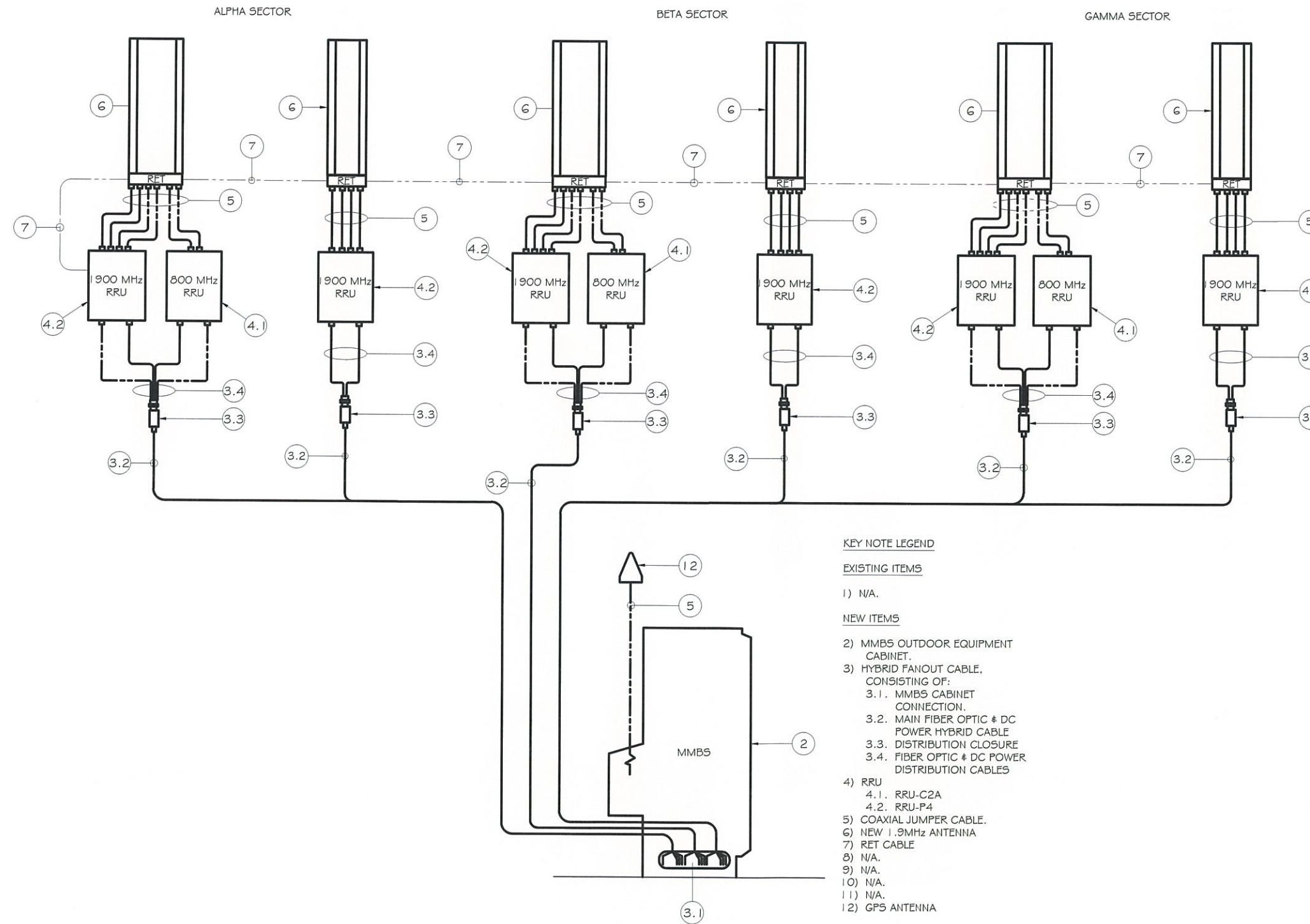
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 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
 SITE TYPE: ROOFTOP

SHEET TITLE:  
 RISER DIAGRAM

SCALE:  
 SCALE: NONE

SHEET NUMBER: E-2





**KEY NOTE LEGEND**

**EXISTING ITEMS**

1) N/A.

**NEW ITEMS**

- 2) MMBS OUTDOOR EQUIPMENT CABINET.
- 3) HYBRID FANOUT CABLE, CONSISTING OF:
  - 3.1. MMBS CABINET CONNECTION.
  - 3.2. MAIN FIBER OPTIC & DC POWER HYBRID CABLE
  - 3.3. DISTRIBUTION CLOSURE
  - 3.4. FIBER OPTIC & DC POWER DISTRIBUTION CABLES
- 4) RRU
  - 4.1. RRU-C2A
  - 4.2. RRU-P4
- 5) COAXIAL JUMPER CABLE.
- 6) NEW 1.9MHz ANTENNA
- 7) RET CABLE
- 8) N/A.
- 9) N/A.
- 10) N/A.
- 11) N/A.
- 12) GPS ANTENNA

**RF RISER DIAGRAM**  
 SCALE: NTS



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Signature: \_\_\_\_\_ Date: 12/13/2012

ISSUE PHASE FINAL DATE ISSUED 12/13/2012

SITE ID #: MLO3XC313

SITE NAME: MITCHELL MALL

ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204

SITE TYPE: ROOFTOP

SHEET TITLE:

RISER DIAGRAM

SCALE:

SCALE: NONE

SHEET NUMBER

E-3



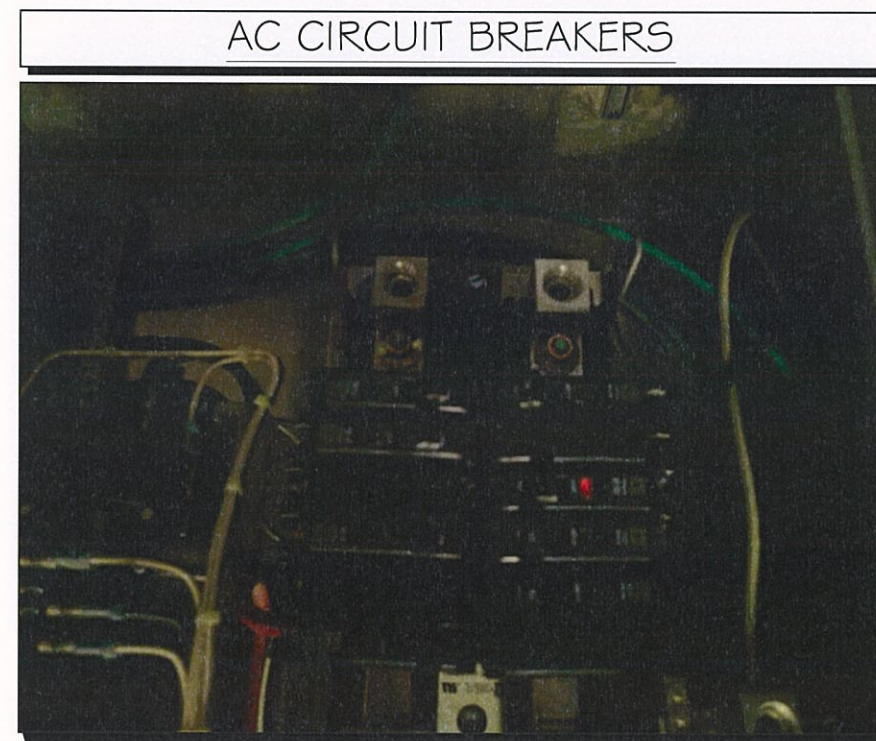
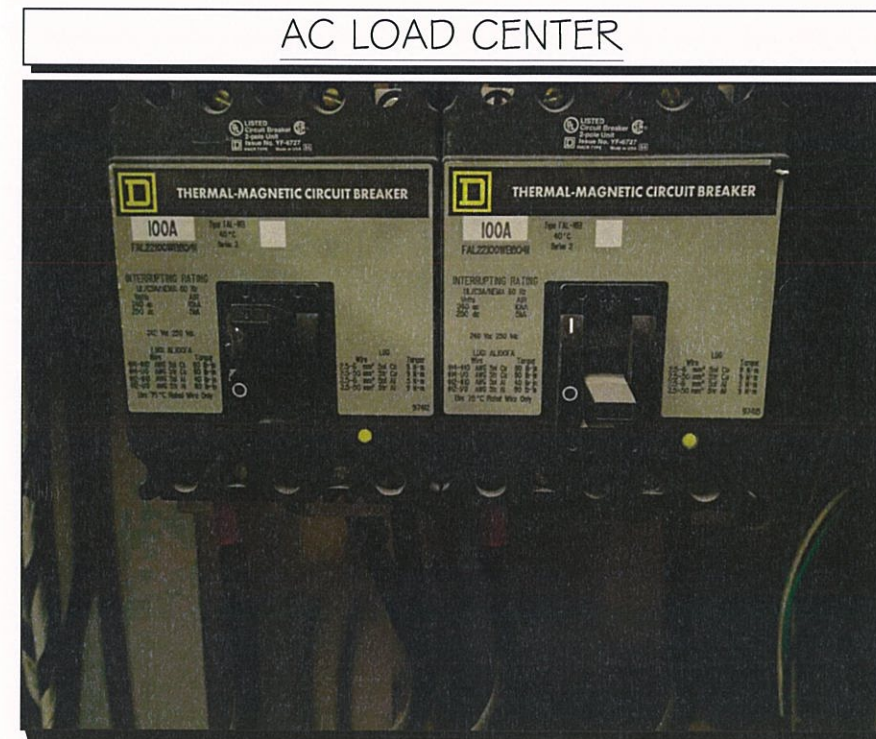
MAIN: 100 AMP MAIN BREAKER		ELECTRICAL PANEL SCHEDULE						PHASE: 1	
VOLTAGE: 240/120								WIRE: 3	
LOCATION: PPC CABINET								MOUNT: SURFACE	
CIRCUIT	LOAD DESCRIPTION	BREAKER		PHASE		BREAKER		LOAD DESCRIPTION	CIRCUIT
		AMPS	POLES	A	B	POLES	AMPS		
1	REC 3, 4	100	2	■		2	?	TBSS	7
2					■				8
3	FAN	20	1	■		2	?	UNKNOWN (OFF)	9
4	TELCO FAN (TRIPPED)	?	1		■				10
5	REC 1, 2	?	2			1	?	UNKNOWN	11
6						1	?	UNKNOWN	12

EXISTING PANEL SCHEDULE (FULL) ①  
 SCALE: NTS

MAIN: 200 AMP MAIN BREAKER		ELECTRICAL PANEL SCHEDULE						PHASE: 1	
VOLTAGE: 240/120								WIRE: 3	
LOCATION: PPC CABINET								MOUNT: SURFACE	
CIRCUIT	LOAD DESCRIPTION	BREAKER		PHASE		BREAKER		LOAD DESCRIPTION	CIRCUIT
		AMPS	POLES	A	B	POLES	AMPS		
1	PROPOSED MMBS	100	2	■				OPEN	7
2					■			OPEN	8
3	PROPOSED BBU FAN	15	2	■				OPEN	9
4					■			OPEN	10
5	OPEN					1		OPEN	11
6	OPEN					1		OPEN	12

■ = PROPOSED CIRCUITS

PROPOSED PANEL SCHEDULE ②  
 SCALE: NTS



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SITE TYPE: ROOFTOP

SHEET TITLE:  
 PANEL SCHEDULE

SCALE:  
 SCALE: NONE

SHEET NUMBER E-4



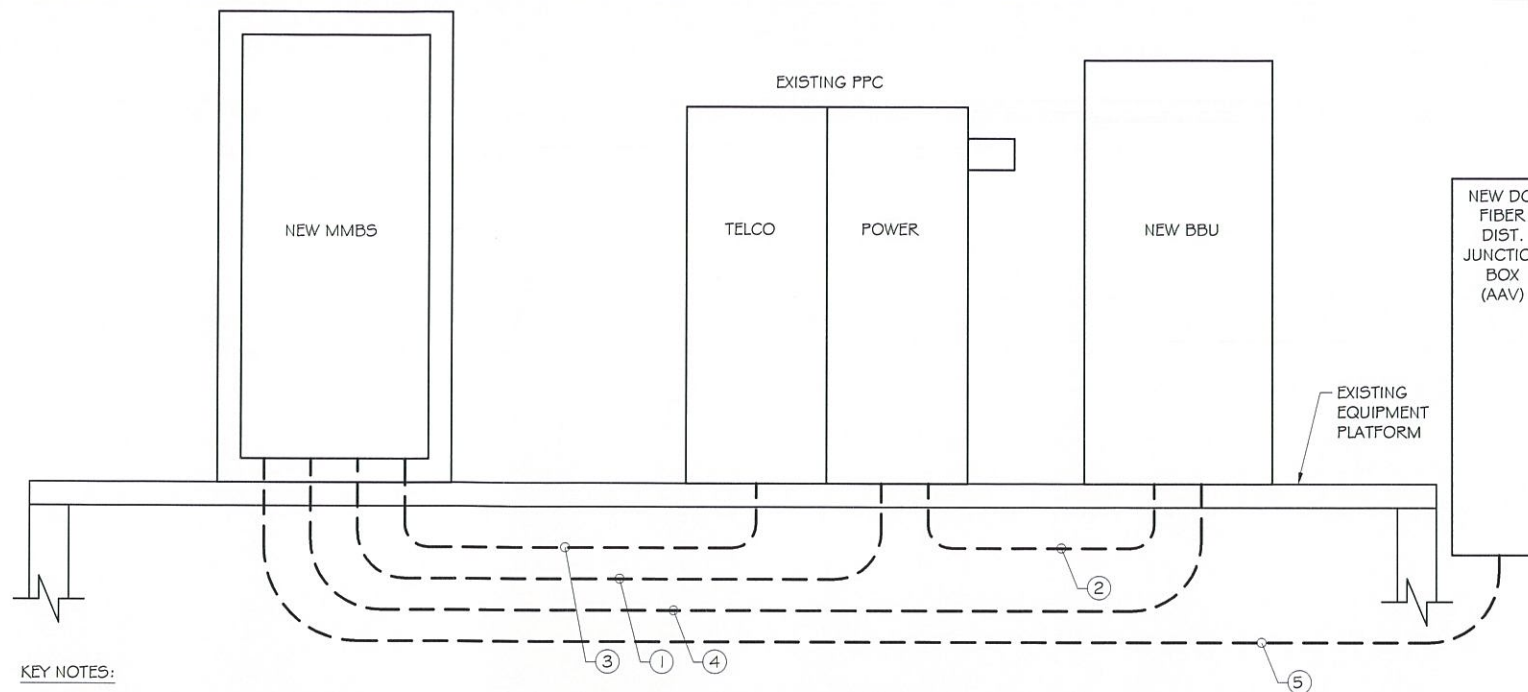
**GENERAL NOTES:**

1. OBTAIN PERMITS AND PAY FEES RELATED TO ELECTRICAL WORK PERFORMED ON THIS PROJECT. DELIVER COPIES OF ALL PERMITS TO SPRINT.
2. SCHEDULE AND ATTEND INSPECTIONS RELATED TO ELECTRICAL WORK REQUIRED BY JURISDICTION HAVING AUTHORITY. CORRECT AND PAY FOR ANY WORK REQUIRED TO PASS ANY FAILED INSPECTION.
3. REDLINED AS-BUILTS ARE TO BE DELIVERED TO SPRINT REPRESENTATIVE.
4. PROVIDE TWO COPIES OF OPERATION AND MAINTENANCE MANUALS IN THREE-RING BINDER.
5. FURNISH AND INSTALL THE COMPLETE ELECTRICAL SYSTEM, TELCO SYSTEM, AND THE GROUNDING SYSTEM AS SHOWN ON THESE DRAWINGS.
6. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH ALL APPLICABLE BUILDING CODES AND LOCAL ORDINANCES, INSTALLED IN A NEAT MANNER AND SHALL BE SUBJECT TO APPROVAL BY SPRINT.
7. CONDUCT A PRE-CONSTRUCTION SITE VISIT AND VERIFY EXISTING SITE CONDITIONS AFFECTING THIS WORK. REPORT ANY OMISSIONS OR DISCREPANCIES FOR CLARIFICATION PRIOR TO THE START OF CONSTRUCTION.
8. PROTECT ADJACENT STRUCTURES AND FINISHES FROM DAMAGE. REPAIR TO ORIGINAL CONDITION ANY DAMAGED AREA.
9. REMOVE DEBRIS ON A DAILY BASIS. DEBRIS NOT REMOVED IN A TIMELY FASHION WILL BE REMOVED BY OTHERS AND THE RESPONSIBLE SUBCONTRACTOR SHALL BE CHARGED ACCORDINGLY. REMOVAL OF DEBRIS SHALL BE COORDINATED WITH THE SITE OWNERS REPRESENTATIVE. DEBRIS SHALL BE REMOVED FROM THE PROPERTY AND DISPOSED OF LEGALLY. USE OF THE PROPERTY'S DUMPSTER IS PROHIBITED.
10. CONTRACTOR TO CONFIRM AVAILABLE CAPACITY AT EXISTING UTILITY PEDESTAL AND ADVISE ENGINEER OF SERVICE SIZE AND FAULT CURRENT LEVEL.
11. IF PEDESTAL DOES NOT HAVE ADEQUATE CAPACITY, CONTRACTOR TO SUBMIT COST QUOTATION TO UPGRADE. UPON APPROVAL OF SUBMITTED COST QUOTATION, THE CONTRACTOR SHALL PROVIDE NEW SERVICE AND/OR UPGRADE SERVICE. FEEDERS AND EQUIPMENT/ELECTRODE GROUNDING CONDUCTORS SIZE ACCORDINGLY.
12. CONTRACTOR SHALL VERIFY SEPARATION DIMENSION BETWEEN POWER COMPANY ELECTRICAL CONDUITS AND LP GAS PIPES AS PER UTILITY COMPANY. LOCAL CODES, NEC, NFPA, AND GAS TANK MANUFACTURER'S SPECIFICATION.
13. CONTRACTOR SHALL VERIFY THAT THE TOTAL NUMBER OF SERVICE ENTRANCE DISCONNECTS IN THE EXISTING UTILITY COMPANY PEDESTAL MUST NOT EXCEED SIX. IF THE NEW SERVICE ADDED EXCEEDS THIS VALUE, CONTRACTOR MUST COORDINATE WITH THE UTILITY COMPANY AND AUTHORITY HAVING JURISDICTION. THE RUNNING OF AN ADDITIONAL EXCLUSIVE AND DEDICATED SERVICE LATERAL SET FOR THE NEW LOAD ADDED TO THE COMPOUND AS PER NEC ARTICLE 230-2(B).
14. THE EQUIPMENT/PROTECTIONS MUST BE RATED FOR STANDARD AIC RATE HIGHER THAN INCOMING EQUIPMENT AND/OR UTILITY COMPANY AIC RATE.

**ELECTRICAL NOTES:**

1. REFERENCE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES FOR GENERAL ELECTRICAL REQUIREMENTS.
2. WIRING SHALL BE AWG STRANDED COPPER WITH THHN OR EQUIVALENT INSULATION. #12 MINIMUM INSTALLED IN " MINIMUM CONDUIT. SIGNAL WIRING SHALL BE INSULATED #22 AWG. NO BX OR ROMEX CABLE IS PERMITTED. CONDUITS SHALL BE SURFACE MOUNTED.
3. WIRING DEVICES AND EQUIPMENT SHALL BE UL LISTED SPECIFICATIONS GRADE.
4. MATERIALS SHALL BE NEW AND CONFORM TO THE APPLICABLE STANDARDS ESTABLISHED FOR EACH ITEM BY THE ORGANIZATIONS LISTED BELOW.  
 - AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM) - UNDERWRITER'S LABORATORY (UL) - NATIONAL ELECTRICAL MANUFACTURING ASSOCIATION (NEMA) - AMERICAN STANDARDS ASSOCIATION (ASA) - NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
5. INSTALLATION OF MATERIALS SHALL COMPLY WITH REGULATIONS OF: - THE NATIONAL ELECTRIC CODE (NFPA 70) - THE NATIONAL ELECTRICAL SAFETY CODE (ANSI C-2) - THE LIFE SAFETY CODE (NFPA 101) - LOCAL BUILDING CODES
6. THE ENTIRE SYSTEM SHALL BE SOLIDLY GROUNDING USING LOCKOUTS AND BONDING NUTS ON CONDUITS AND PROPERLY BONDED GROUND CONDUCTOR. RECEPTACLES AND EQUIPMENT BRANCH CIRCUITS SHALL BE GROUNDING WITH A FULL-SIZED EQUIPMENT GROUNDING CONDUCTOR RUN IN THE CIRCUITS CONDUIT.
7. OUTLET AND JUNCTION BOXES SHALL BE ZINC-COATED OR CADMIUM PLATED STEEL NOT LESS THAN 4" SQUARE AND SUITABLE FOR THE TYPE SERVICE AND OUTLET. OUTLET AND JUNCTION BOXES SHALL BE SURFACE MOUNTED AND LABELED WITH BRANCH CIRCUIT BREAKER NUMBER.
8. LABEL ALL EQUIPMENT SERVED FROM SPRINT PANEL BOARD WITH PHENOLIC LABELS SIZED IN RELATION TO USAGE.
9. INDOOR CONDUCTORS SHALL BE INSTALLED IN EMT UNLESS NOTED OTHERWISE. OUTDOOR CONDUCTORS SHALL BE INSTALLED IN RIGID GALVANIZED STEEL UNLESS NOTED OTHERWISE. WHERE EMT IS USED, IT SHALL BE WITH ONLY LISTED COMPRESSION FITTINGS. NO SET SCREW FITTINGS SHALL BE ALLOWED.
10. CONTRACTOR TO PROVIDE AND INSTALL ENGRAVED LABEL ON THE SPRINT METER SOCKET ENCLOSURE.

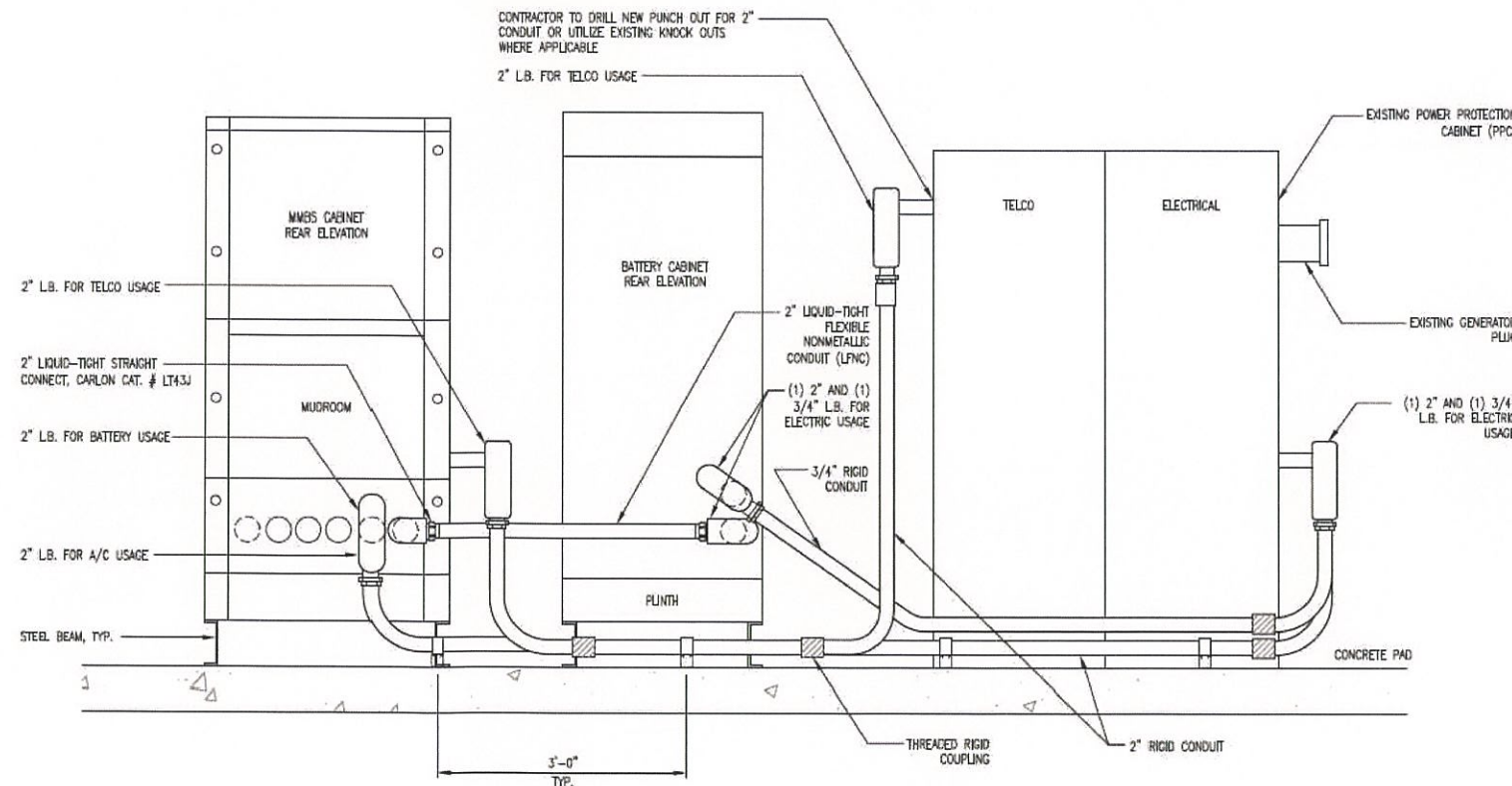
11. CONTRACTOR IS TO OBTAIN ALL PERMITS, PAY PERMIT FEES, AND BE RESPONSIBLE FOR SCHEDULING INSPECTIONS. THE CONTRACTOR IS TO OBTAIN LOCAL POWER AND TELEPHONE COMPANY APPROVAL & COORDINATE WITH UTILITY COMPANIES SERVICE ENTRANCE REQUIREMENTS.



**KEY NOTES:**

1. CONTRACTOR TO INSTALL PROPOSED 100A, 2 POLE BREAKER IN EXISTING PPC. VERIFY EXISTING CONDUCTORS ARE (3) #3 AWG OR LARGER. IF NOT, CONTRACTOR TO REPLACE UNDERSIZED ITEM(S). CONTRACTOR ALSO TO PROVIDE (1) 2" CONDUIT FROM EXISTING PPC TO PROPOSED MMBS.
2. CONTRACTOR TO INSTALL PROPOSED 15A, 1 POLE BREAKER IN EXISTING PPC. VERIFY EXISTING CONDUCTORS ARE (3) #14 AWG OR LARGER. IF NOT, CONTRACTOR TO REPLACE UNDERSIZED ITEM(S). CONTRACTOR ALSO TO PROVIDE (1) 3/4" CONDUIT FROM EXISTING PPC TO PROPOSED BBU.
3. CONTRACTOR TO PROVIDE (1) 2" EMPTY CONDUIT WITH HEAVY DUTY PULLSTRING FROM EXISTING TELCO TO PROPOSED MMBS.
4. CONTRACTOR TO PROVIDE (1) 2" SEAL-TIGHT CONDUIT WITH (2) #3 DLO.
5. (1) PROPOSED 2" PVC CONDUIT (FIBER) AND (1) PROPOSED 1" PVC CONDUIT (POWER). GALVANIZED STEEL OR LIQUID-TIGHT FLEXIBLE CONDUITS ACCEPTABLE AT CM'S DISCRETION. LIQUID-TIGHT CONDUIT LENGTHS NOT TO EXCEED 6'-0".

**SINGLE LINE DIAGRAM**  
 SCALE: NTS



**CONDUIT DETAILS**  
 SCALE: NTS



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 SITE NAME: MITCHELL MALL  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204  
 SITE TYPE: ROOFTOP

SHEET TITLE:  
**UTILITY DETAILS & NOTES**

SCALE:  
 SCALE: NONE

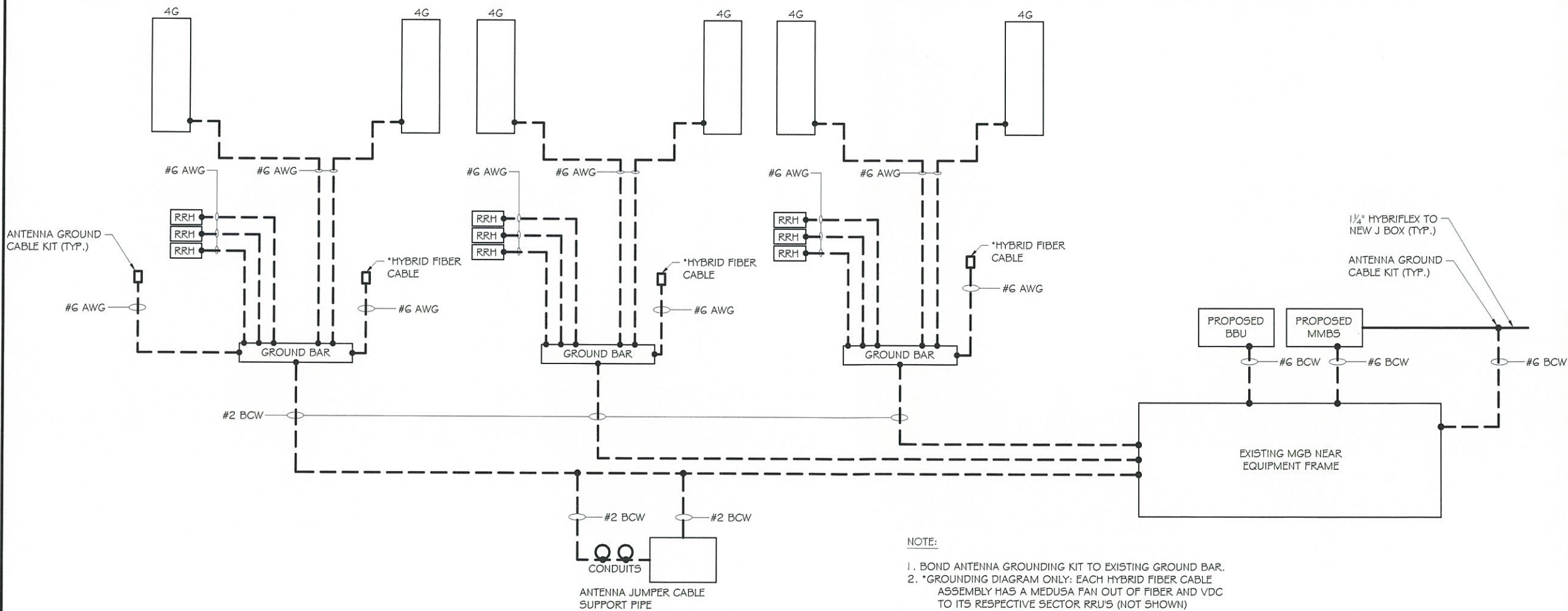
SHEET NUMBER  
 E-5



**GROUNDING SPECIFICATIONS:**

1. REFERENCE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AND SPRINT EXTERIOR GROUNDING SYSTEM DESIGN (REV 06/29/05) FOR GENERAL GROUNDING REQUIREMENTS.
2. GROUNDING SHALL COMPLY WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE. ALL GROUNDING DEVICES SHALL BE U.L. APPROVED OR LISTED FOR THEIR INTENDED USE.
3. GROUND WIRES SHALL BE TINNED #2 AWG BARE SOLID COPPER UNLESS NOTED OTHERWISE.
4. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC (CADWELD) NOTED OTHERWISE. CLEAN SURFACES TO SHINE METAL. WHERE GROUND WIRES ARE CADWELDED TO GALVANIZED SURFACES, SPRAY CADWELD WITH GALVANIZING PAINT.
5. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE. BEND GROUNDING LEADS WITH A MINIMUM 8" RADIUS.
6. PRIOR TO INSTALLING LUGS ON GROUND WIRES, APPLY THOMAS # BETSS KOPR-SHIELD (TM OF JET LUBE, INC.). PRIOR TO BOLTING GROUND WIRE LUGS TO GROUND BARS, APPLY KOPR-SHIELD OR EQUAL.
7. WHERE BARE COPPER GROUND WIRES ARE ROUTED FROM ANY CONNECTION ABOVE GRADE TO GROUND RING, INSTALL WIRE IN 3/4" PVC SLEEVE, FROM 1'-0" MIN. ABOVE GRADE AND SEAL TOP WITH SILICONE MATERIAL.
8. PREPARE ALL BONDING SURFACES FOR GROUNDING CONNECTIONS BY REMOVING ALL PAINT AND CORROSION DOWN TO SHINY METAL. FOLLOWING CONNECTION, APPLY APPROPRIATE ANTI-OXIDIZATION PAINT.
9. GROUNDING WIRE CONNECTIONS SHALL BE 3-CRIMP C-TAP COMPRESSION TYPE. SPLIT BOLTS ARE NOT ACCEPTABLE.
10. GROUND RODS SHALL BE COPPER CLAD STEEL 3/8" x 10' SPACE NOT LESS THAN 10' O.C.
11. CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS.
12. SURFACE CONNECTIONS SHALL BE MADE TO BARE METAL. PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. APPLY NON-OXIDIZING AGENT TO CONNECTIONS.
13. COPPER BUSES SHALL BE CLEANED, POLISHED AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
14. GROUNDING CONDUCTORS SHALL BE RUN THROUGH PVC SLEEVE WHERE ROUTED THROUGH WALLS, FLOORS, AND CEILINGS. ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
15. HARDWARE (I.E. NUTS, BOLTS, WASHERS, ETC.) TO BE STAINLESS STEEL.
16. EXOTHERMIC WELDS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

17. THE ENTIRE SYSTEM SHALL BE SOLIDLY GROUNDED USING LOCKNUTS AND BONDING NUTS ON CONDUITS AND PROPERLY BONDED GROUND CONDUCTORS. RECEPTACLES AND EQUIPMENT BRANCH CIRCUITS SHALL BE GROUNDED WITH A FULL SIZED EQUIPMENT GROUNDING CONDUCTOR RUN IN THE CIRCUIT'S CONDUIT.
18. INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUS IN THE PANEL BOARD.
19. GROUND BARS (SECTOR, COLLECTOR, MASTER) SHALL BE MIN. BARE 1/4" x 4" COPPER AND LARGE ENOUGH TO ACCOMMODATE THE REQUIRED NUMBER OF GROUND CONNECTIONS. THE HARDWARE SECURING THE MASTER GROUND BAR (MGB) SHALL ELECTRICALLY INSULATE THE MGB FROM ANY STRUCTURE TO WHICH IT IS FASTENED.
20. APPLY THOMAS # BETSS KOPR-SHIELD OR APPROVED EQUIVALENT PRIOR TO MAKING MECHANICAL CONNECTIONS. CONNECTIONS SHALL BE MADE WITH STAINLESS STEEL BOLTS, NUTS AND LOCK WASHERS 3/8" DIAMETER, MIN. WHERE GALVANIZING IS REMOVED FROM METAL IT SHALL BE PAINTED OR TOUCHED UP WITH 'GALVONOX' OR EQUAL.
21. ALL TERMINATIONS AT EQUIPMENT ENCLOSURES, PANELS, FRAMES OF EQUIPMENT AND WHERE EXPOSED FOR GROUNDING CONDUCTOR TERMINATION SHALL BE PERFORMED UTILIZING TWO HOLE BOLTED TONGUE COMPRESSION TYPE WITH STAINLESS STEEL SELF-TAPPING SCREWS.
22. ALL CLAMPS AND SUPPORTS USED TO SUPPORT THE GROUNDING SYSTEM CONDUCTOR 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.
23. ALL BOLTS, WASHERS, AND NUTS USED ON GROUNDING CONNECTIONS SHALL BE STAINLESS STEEL.
24. THE CONTRACTOR SHALL ENGAGE AN INDEPENDENT ELECTRICAL TESTING FIRM TO TEST AND VERIFY THAT RESISTANCE TO EARTH DOES NOT EXCEED 5.0 OHMS. PROVIDE A COPY OF TESTING REPORT, INCLUDING THE METHOD AND INSTRUMENTS USED TO VERIFY RESISTANCE TO SPRINT REPRESENTATIVE.
25. COAX CABLE SHALL BE GROUNDED AT ANTENNA LEVEL WITHIN 5' OF ANTENNA. COAX WILL ADDITIONALLY BE GROUNDED AT THE BASE OF THE TOWER 18" BEFORE THE CABLE REACHES A HORIZONTAL PLANE. IF EQUIPMENT CABINET IS MORE THAN 15' FROM THE TOWER AN ADDITIONAL GROUND KIT WILL BE ADDED 24" BEFORE CABLE ENTERS CABINET.
26. ALL COAX GROUND KITS WILL BE ANDREW 'COMPACT SURE GROUND' OR APPROVED EQUIVALENT.
27. VERIFY THE GROUNDING CONTINUITY BETWEEN THE TOWER BASE AND THE NEW SPRINT CABINET GROUND BAR. CONTRACTOR SHALL ENSURE THAT ALL METALLIC OBJECTS WITHIN 6' FROM CABINET HAVE GROUNDING CONTINUITY. THE CONTRACTOR SHALL CORRECT ANY DEFECTS BY ADDING GROUNDING CONDUCTOR TO ENSURE CONTINUITY.
28. GROUNDING CONDUCTORS SHALL BE COPPER ONLY. EITHER SOLID OR STRANDED CONDUCTORS ARE PERMITTED. ALL EXTERNAL BURIED CONDUCTORS MUST BE BARE. EQUIPMENT GROUND LEADS IN CABLE TRAYS MUST BE GREEN INSULATED.
29. CONTRACTOR TO PROVIDE GROUND WIRES, BARS, AND CONNECTIONS AS SHOWN ON GROUNDING RISER DIAGRAM.



**GROUNDING SCHEMATIC DETAIL**  
 SCALE: NTS

**NOTE:**

1. BOND ANTENNA GROUNDING KIT TO EXISTING GROUND BAR.
2. \*GROUNDING DIAGRAM ONLY: EACH HYBRID FIBER CABLE ASSEMBLY HAS A MEDUSA FAN OUT OF FIBER AND VDC TO ITS RESPECTIVE SECTOR RRU'S (NOT SHOWN)



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PROJECT NUMBER 23983

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ISSUE PHASE	DATE ISSUED
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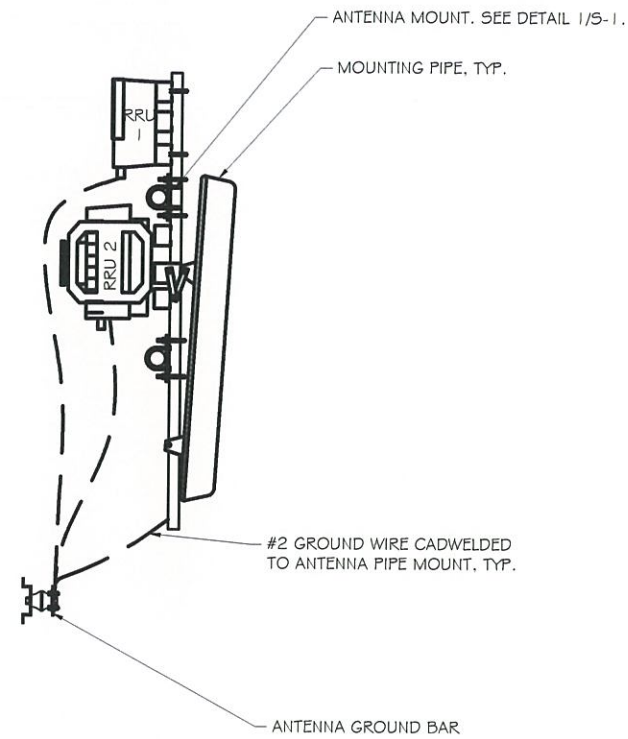
SITE ID #: MLO3XC313  
 SITE NAME: MITCHELL MALL  
 ADDRESS: 1020 W. MITCHELL ST.  
 MILWAUKEE, WI 53204

SITE TYPE: ROOFTOP  
 SHEET TITLE:  
**GROUNDING DETAIL & NOTES**

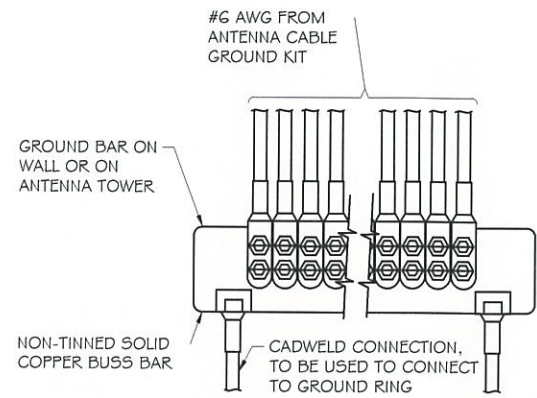
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SHEET NUMBER E-6



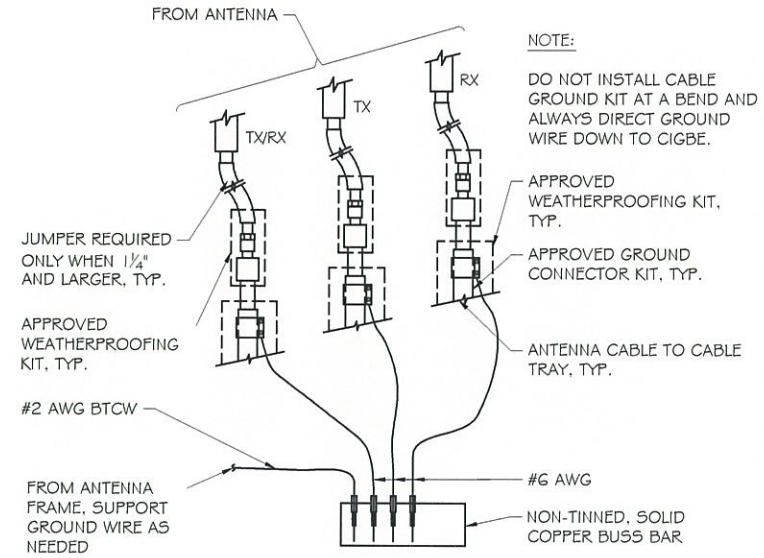


ANTENNA GROUNDING DETAIL 1  
 SCALE: NTS



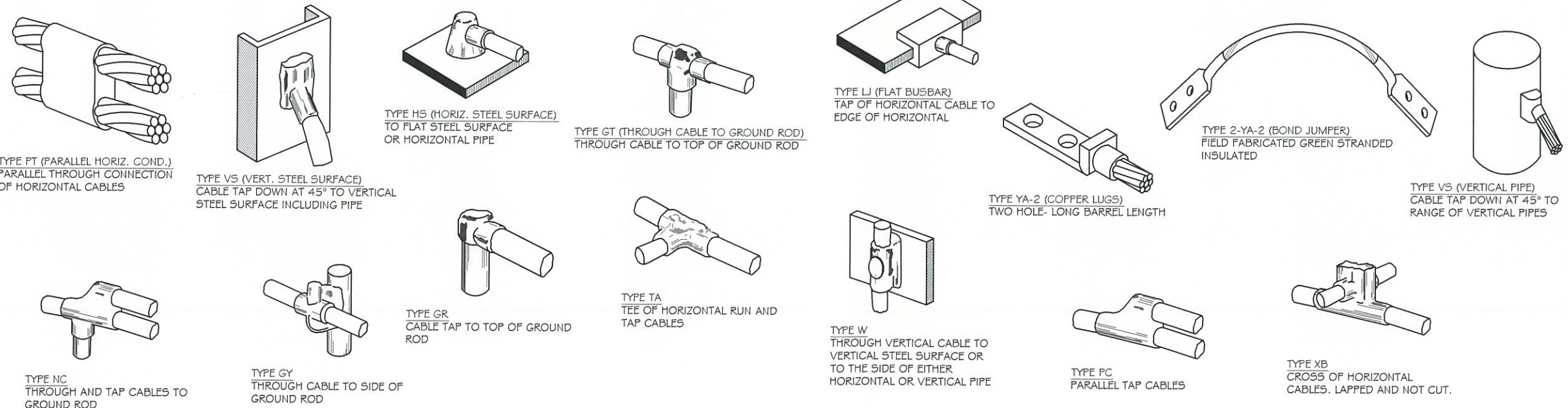
NOTE:  
 1. CONTRACTOR TO UTILIZE ANTIOXIDANT ON ALL LUG CONNECTIONS  
 2. USE HARGER GB114420M GROUND BAR OR EQUIVALENT.

GROUND LEADS TO GROUND BAR 2  
 SCALE: NTS



NOTE:  
 DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

COAX GROUND WIRES TO GROUND BAR 3  
 SCALE: NTS



TYPICAL CADWELD TYPES 4  
 SCALE: NTS



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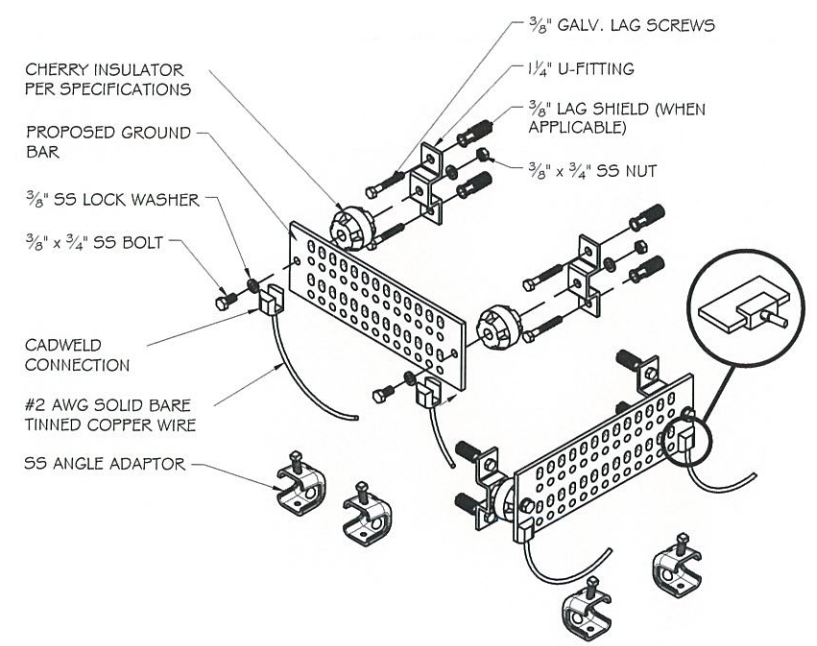
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SHEET TITLE:  
**GROUNDING DETAILS**

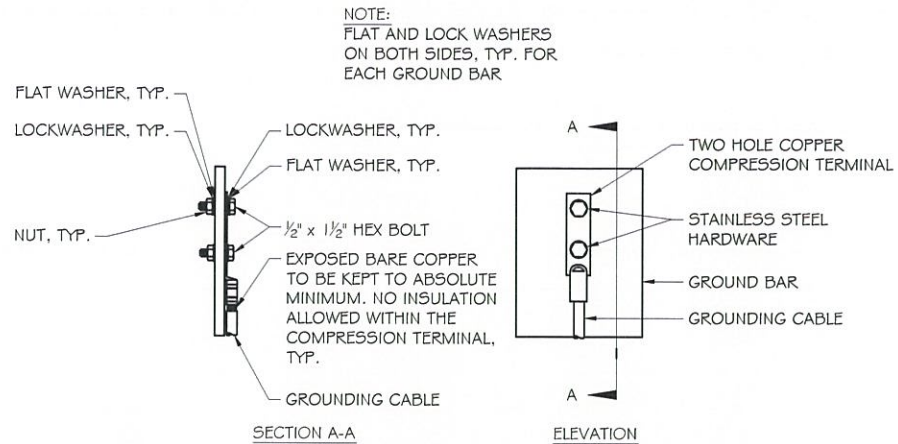
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SHEET NUMBER  
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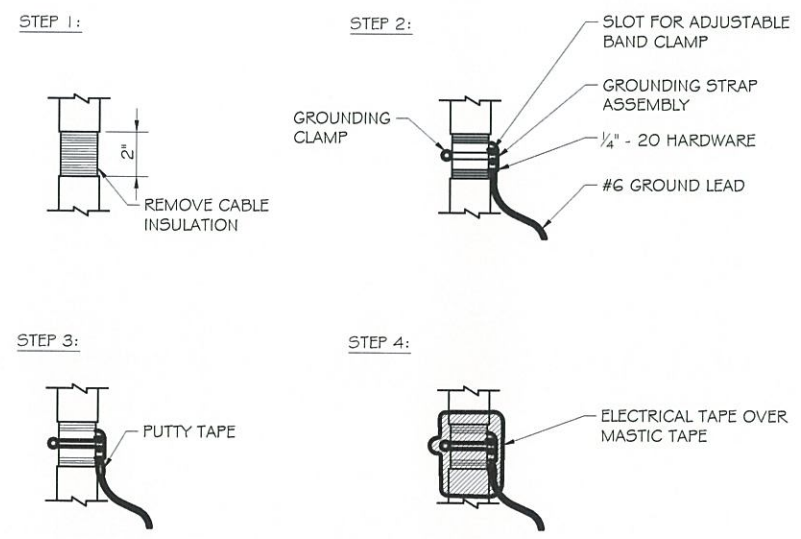


**GROUND BAR DETAIL**  
 SCALE: NTS

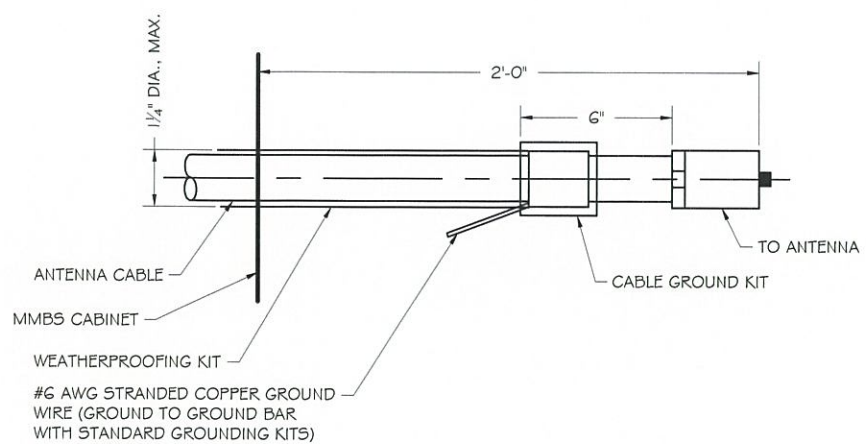


- NOTE:**
1. DOUBLING UP OR "STACKING" OF CONNECTIONS IS NOT PERMITTED.
  2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
  3. COAT WIRE END WITH ANTI-OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
  4. APPLY ANTI-OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

**GENERAL LUG DETAIL**  
 SCALE: NTS



**TYP. COAX CABLE WEATHERPROOFING**  
 SCALE: NTS



**GROUND KIT DETAIL**  
 SCALE: NTS



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SHEET TITLE:  
**GROUNDING DETAILS**

SCALE:  
 SCALE: NONE

SHEET NUMBER  
 E-8



1 - GENERAL PROVISIONS

1.1 CONTRACT OVERVIEW

- The intention of the documents is to show the complete installation and to include all labor and materials reasonably necessary, whether or not specifically indicated, for the proper execution and completion of the work as stipulated in the contract. The intent of this document is not to designate the means and methods of procedure of the work. The contractor shall supervise and coordinate all work, using his professional knowledge and skills. He is solely responsible for all construction means, methods, techniques, procedures, sequencing and coordinating all portions of the work under the contract.
  - All work shall be performed in accordance with the latest edition of the following codes, standards and supplements:
    - IBC - International Building Code 2009 and all subsequent supplements
    - AISC - American Institute of Steel Construction specifications
    - IEEE - Institute of Electrical and Electronic Engineers
    - NEC - National Electrical Code
    - NEMA - National Electrical Manufacturers Association
    - UL - Underwriters Laboratories
    - NSPC - National Standard Plumbing Code
    - IMC - International Mechanical Code
    - NFPA - National Fire Protection Association
    - OSHA - Occupational Safety and Health Administration
    - ANSI/TIA - Telecommunications Industry Association - 222-G Standard
    - All governing state, county and local codes and ordinances
- The most stringent code will apply in the case of discrepancies or differences in the code requirements.
- The engineering drawings show principal areas where work must be accomplished under this contract. Incidental work may also be necessary in areas not shown on the engineering drawings due to changes affecting existing electrical or other systems. Such incidental work is also a part of this contract. Inspect those areas and ascertain what is needed to do that work in accordance with the contract requirements at no additional cost to the owner.
  - Do not scale drawings. All dimensions take precedence over scale.
  - Minor deviations from the design layout are anticipated and shall be considered as part of the work, however, no change that alters the character intent of the design will be made or permitted by the owner without a change order.
  - General civil, structural, electrical and antenna drawings are interrelated. In performance of the work, each contractor must refer to all drawings. All coordination shall be the responsibility of the general contractor.
  - The general notes contained herein are part of the plans and specifications, and are to be complied with in all respects. The most restrictive notes specified are to take precedence. Certain sections of the general notes may not apply to every site. The contractor is to comply with all applicable general notes in all respects.
  - All general notes and standard details are the minimum requirement to be used in conditions which are not specifically shown otherwise.
  - Representation of True North other than those found on the plot of the survey drawings shall not be used to identify or establish the bearing of the True North at the site. The contractor shall rely solely on the plot of the survey drawing and any marking at the site for establishment of the True North, and shall notify the engineer prior to proceeding with the work if any discrepancy is found between the various elements of the working drawings and the True North orientation as depicted on the civil survey. The contractor shall assume sole liability for any failure to notify the engineer.
  - The contractor shall use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts, and who are completely familiar with the specified requirements and methods needed for proper performance of the work.
  - The contractor will be required to assume sole and complete responsibility for job site conditions during the course of the construction project, including safety of all persons and property, that this requirement shall be made to apply continuously and not be limited to normal working hours. The contractor further agrees to indemnify and hold the design engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project.
  - The contractor shall be responsible for complying with all safety precautions and regulations such as OSHA compliance during the progress of the work. The engineer will not advise nor provide direction as to safety precautions and programs.
  - The contractor shall assume complete responsibility of the security of the site until completion of the construction.
  - It is the contractor's responsibility to examine all plan sheets and specifications and coordinate his work with the work of all other contractors to ensure that work progression is not interrupted.
  - The contractor is instructed to cooperate with any and all other contractors performing work on this job site during the performance of this contract to avoid delays in the contract schedule or other work performed in the vicinity of the construction area.
  - The contractor shall submit a construction schedule to the property owner well in advance of the starting date of the work. The owner shall also be notified of a change in the construction schedule.
  - The contractor shall comply with all required permits.
  - Each contractor is responsible for application and payment of contractor licenses, bonds and insurances. Documentation shall be provided to the owner prior to the work.
  - Nexus is to provide the owner with a full set of record drawings with actual dimensions, routing and circuits upon completion of construction.
  - The contractor shall be responsible for all temporary bracing, shoring, ties,

form work and the protection of all work during construction to avoid damage, collapse, distortion, misalignment, and alteration.

- The contractor is responsible to provide temporary power, water and toilet and facilities as required by the property owner or governing agency.
- The contractor shall monitor all existing structures during construction.
- The contractor shall coordinate the final dimensions of any type of beam layout with the footprint of the new equipment before ordering any materials.
- All materials and equipment shall be new and in safe conditions prior to installations, and shall be of the best grade and of the same manufacturer throughout for each class or group of equipment.
- All materials must be stored in a level and dry location and in a manner that will not obstruct the flow of other work related or not to this contract. Any equipment or material storage must meet all recommendations of the manufacturer. The contractor shall inspect thoroughly all materials and equipment prior to final installation. Damaged equipment or materials shall not be installed.
- All materials shall be installed per the manufacturers' instructions.
- All equipment shall be installed level and plumb.

1.2 EXISTING CONDITIONS AND STRUCTURES

- Before beginning work at the site, the contractor shall inspect the existing compound or building and determine the extent of existing finishes, specialties, equipment and other items which must be removed and reinstalled in order to perform the work under this contract. The contractor must verify all dimensions, conditions and elevations before starting work. No extra charge or compensation shall be allowed due to differences between actual dimensions and dimensions indicated on the construction drawings. All discrepancies shall be called to the attention of the engineer and shall be resolved before proceeding with the work. All work shall be performed in a workmanlike manner in accordance with accepted construction practices.
- By submitting a bid for this work, the contractor acknowledges that he has thoroughly reviewed and understood the construction documents, visited the site and is familiar with the conditions encountered at the site.
- The contractor, if awarded the contract, will not be allowed any extra compensation by reason of any matter or thing which such the contractor might not have fully informed himself of prior to bidding.
- No plea of ignorance of conditions that exist, or of difficulties that may be encountered or of any other relevant matter concerning the work to be performed will be accepted as a reason for any failure or omission on the part of the contractor to fulfill the requirements of the contract documents.
- It is understood by the owner that the contractor in submitting his bid, warrants that he has carefully examined the site of the project to acquaint himself with the surrounding properties, the means of approach to the site, the conditions of the actual job site, the facilities for delivering, stoning, placing, handling and the removal of materials and equipment and any and all difficulties that may be encountered during the execution of all the work in accord with the contract documents.
- The location of existing underground utilities have not been verified by the owner or its representative. The contractor is responsible for having all underground utilities located within the limits of construction and accepts full responsibility for any and all damages which might be caused by the contractor failure to locate all underground utilities before commencing work. Before you dig or drill, call the underground services alert number on sheet T-1 at the required time.
- Should any error or inconsistency appear in the drawings or specifications, the contractor before proceeding with the work must make mention of the same to the engineer and owner for proper adjustment and in no case proceed with the work in uncertainty or with insufficient drawings.
- Trade, product names or manufacturer's names or catalog numbers and indications of existing product types shown on the drawings are believed to be accurate. If they are discovered to be inaccurate, notify engineers immediately and do not proceed without instructions.
- Prior to starting construction, the contractor shall protect all areas from damages which may occur during construction. Any damages to new or existing surfaces, structures or equipment shall be immediately repaired or replaced to the satisfaction of the property owner. The contractor shall bear the cost of repairing or replacing any damaged areas.
- The contractor shall protect the structural integrity of existing structures when work is performed in the vicinity of existing structures.

- The contractor shall protect existing property line monumentation. Any monumentation disturbed or destroyed, as judged by the owner or owner's representative shall be replaced at the contractor's expense under the supervision of a licensed land surveyor.
- New construction added to existing construction shall be matched in form, texture, material and paint color except as noted in the plans.
- Where indicated on the plans, the contractor shall paint all new antenna shrouds and related mounting hardware to match the existing adjacent surfaces, the contractor shall not use a metal based paint for antennas. All surface contamination shall be removed prior to painting new surfaces.
- The plans show some known subsurface structures, above-ground structures and/or utilities believed to exist in the working area, exact location of which may vary from the locations indicated, in particular, the contractor is warned that the exact or even approximate location of such pipelines, subsurface structures and/or utilities in the area may be shown or may not be shown; and it shall be his responsibility to proceed with great care in executing any work.
- All existing active sewer, water, gas, electric and other utilities where encountered in the work shall be protected at all times, where required for the proper execution of the work, shall be relocated as directed by engineers. Extreme caution should be used by the contractor when excavating or pier drilling around or near utilities. The contractor shall provide safety training for the working crew.
- If an inactive electrical, telephone, sewer, water or any other utility are encountered and interfere with the execution of the work, the contractor is to remove the utility and cap, plug or otherwise terminate the utility at a point where it no longer conflicts with the work. The utility work shall be done in accordance with the utility companies recommendations and per local

- authority having jurisdiction.
- All utility work involving connections to existing systems shall be coordinated with the owner or owner's representative and the utility owner before each and every connection to existing systems is made.
- Maintain flow for all existing utilities.
- The contractor shall restore all public or private property damaged or removed to at least as good of condition as before disturbed as determined by the owner or owner's representative.
- Protect finished surfaces including jambs and heads of openings used as passageways through which equipment and materials will pass.
- Provide protection for equipment room surfaces prior to allowing equipment or materials to be moved over such surfaces.
- Maintain finished surfaces clean, unharmed and suitably protected until job site is accepted by the owner.
- In the event of damage to an existing structure, the contractor shall notify the owner or its representative immediately, and then promptly make all replacements and repairs to the satisfaction of the owner. The owner may elect to use a third party contractor to perform the repairs. All expenses associated with the repairs and replacements shall be paid by the general contractor selected for this contract.
- Additional time required to secure replacement and make repairs will not be considered by the owner to justify an extension in the contract time for completion.

1.3 ACCESS

- Use most direct route from public street as agreed to by compound or building owner. For access to an existing building interior, use loading dock as agreed to by building owner.
- Coordinate with site owner construction schedule & site access. Ensure that the owner of parent parcel is notified in writing of construction activities.
- A list of workers involved in this project may be required by the property owner or its representative.
- The contractor shall coordinate all special considerations of construction such as noisy operation, interruption of any mechanical and/or electrical services, material deliveries and storage, staging area, crane lifts with the owner prior to the start of work.
- Contractor shall coordinate with an owner representative, the temporary removal of fence, landscaping & any expected damage to access road or adjacent repair of property prior to commencing the work.
- The contractor shall coordinate work hours & staging areas with owner.
- Contractor to notify appropriate parties of construction start date well in advance of construction.

1.4 SITE MAINTENANCE

- Remove staining or reactive materials from new and existing surfaces immediately. Remove hazardous accumulations of debris promptly, at least daily. Confine dust producing operations during cutting, drilling, painting and finishing. There should be no over spraying paint in parking area. Vacuum immediately after completion.
- There shall not be any creation of noise outside normal business hours, unless otherwise agreed upon with the owner. Noise should be kept to a minimum throughout construction.
- Noise and existing building structure vibration generated by construction procedures, equipment, tool and operations are to be kept to a practicable minimum. Where use of high noise level equipment is unavoidable, and can be heard, confine to hours after 7 A.M. and before 6 P.M. Monday through Friday or as agreed to by building owner.
- The contractor is to provide portable fire extinguishers with a rating of not less than 2-A or 2 ABC within 75 feet of travel to all portions of the construction area.
- The contractor is responsible for maintaining a neat and orderly site, yard and grounds, remove and dispose legally off site all rubbish, waste materials litter and all foreign substances. Remove petrochemical spills, stains and other foreign deposits. Rake grounds to a smooth even-textured surface.
- At project completion, remove temporary services, construction equipment, tools and facilities, mockups, temporary structures, surplus materials, debris, and rubbish from building owners property. Put site in neat, orderly condition, ready for use. Leave roof areas, pipe spaces and other spaces clean and free from debris on a daily basis.
- The site and/or building security shall be maintained at all times during construction in order to prevent unauthorized persons from entering the premises. Existing and new equipment and materials remain the contractor's responsibility at all time during construction.
- The tenant's ingress and egress of the site and/or building shall be maintained throughout construction.
- The contractor shall take all measures necessary to maintain pollution control, comply with all governing regulation pertaining to environmental protection, and promptly remove all debris and accumulation of materials resulting from the work.

1.5 TEMPORARY FACILITIES

- The contractor shall consider that water, power and light may not be available at this site. Electrical cords and connections to be furnished by the contractors and must be disconnected and properly stored during non-working hours.
- The contractor is responsible to provide temporary power, water and toilet facilities as required by the property owner or governing agency.

2 - DEMOLITION AND EXISTING STRUCTURAL ALTERATION

2.1 DEMOLITION SPECIFICS

- General contractor is to demolish and remove from site (and dispose of appropriately) all items noted for demolition in the architectural, civil, electrical and/or structural drawings, including below grade foundation and structures. Contractor shall coordinate with the owner representative the disposal of equipment and materials.
- General contractor is to exercise utmost care during demolition and promptly inform the engineer of any deviation to the existing structure from what is shown in these plans prior to proceeding with the work.

- General contractor is solely responsible for the shoring, bracing, providing lateral support and for maintaining the integrity of the existing structure during all phases of the demolition and construction and shall provide, if required, signed & sealed shop drawings, by a registered professional engineer, for the shoring of all walls, beams, slabs, roof joists, or other elevated structural items, that are having the support below noted for demolition.
- Any damage due to demolition, or other construction activities, done to any existing surface to remain shall be repaired to match existing at no additional cost to the owner.

2.2 CUTTING & PATCHING

- Do not drill or cut existing floor joists, beams, columns or other structural elements unless specifically indicated. Drill slabs where approved. Core drill circular openings through concrete slab. Line drill for rectangular openings. Make openings of proper size for conduit, ducts, pipes and other items passing through openings. Make all new holes or openings be weather tight or fire safe as required by local building codes & ordinances.
- Prepare, submit and receive approval of sleeves and opening drawings before locating sleeves and openings in new construction and before drilling existing structure. Show each opening and sleeve in the entire project.
- Seal water tight and protect with fire proofing materials new sleeves and openings through roofs, floors and in vertical chases as required by code and industry standards. All floor and wall penetrations shall be sealed with fire retardant compound meeting UL CAJ5045.
- Use approved materials to fill/ seal penetrations through fire rated assemblies.
- Where cutting of existing surfaces or removal of existing finishes is required to perform the work under this contract and a new finish is not indicated, fill resulting openings and patch the surface after doing the work and finish to match adjacent existing surfaces.
- All concrete and masonry penetrations shall be done using rotary action only (no hammering action).
- Core locations, if required, shall be chosen so as to avoid cutting any reinforcing bars. Firestop floor or wall penetrations with two-hour rated sealant to meet UL CAJ5045. Provide weatherproofing of any roof penetrations.
- Repair, patch, finish and/or refinish as applicable to match adjacent existing finishes those existing surfaces damaged or new proposed surfaces during performance of the work under this contract.
- Where conduits, ducts, pipes and similar items are shown to be installed in existing walls or partitions, neatly chase the walls or partitions. Install the items and patch the walls or partitions to make the installation not discernible in the finished work.
- Install new conduits and pipes in every case, and new duct where possible above existing ceiling. Remove existing ceiling as necessary. After installation of concealed work, reinstall removed ceiling and patch and refinish to match adjacent unremoved ceilings.
- Repair all metal surface that have been cut or damaged by removing any existing rust and applying cold galvanization.

3 - ROOFTOP (IF APPLICABLE)

3.1 GENERAL

- General contractor is solely responsible for the shoring, bracing, providing lateral support and for maintaining the integrity of the existing structure and roofing membrane during all phases of the construction.
- Roof pitch pocket, if used, are to be filled, sealed and maintained with flexible material to be compatible with existing roofing material and able to accommodate lateral displacement of 1/4 inch maximum in each direction.
- If required, the general contractor shall use the building owner's approved roofing contractor to prevent voiding any existing roofing warranties. Any damage to the existing roofing membrane shall be repaired immediately to avoid moisture intrusion in the building shell.
- Avoid any penetration of existing roof slab, UNO.
- No staging of materials and equipment is permitted on the roof.
- The location of existing building roof, penthouse walls, penthouse slabs and new equipment shown in these drawings are not exact and are not based on surveyed information. All dimensions shall be field verified by field measurements prior to ordering any material for this project.
- Any damage due to construction activities, done to any existing roofing surface shall be repaired to match existing at no additional cost to the owner.
- The contractor shall verify the load generated from the equipment is directly transferred through bearing walls or columns to the foundation of the building. The engineer shall be notified if this criteria is not met.
- The contractor shall provide temporary fall protection measures in the vicinity of the work.
- The shelter and/or equipment shall be painted to match the existing building color if this is required by the building owner.
- Submit for approval a list of the procedures proposed to protect existing elevator from harm during use. Protect cab, entrances and adjacent surfaces from damage. Do not overload elevator.
- Construction personnel may use existing stairs and corridors for construction purposes. Protect stair and access ways and return to original condition at completion. Coordinate with building management for use of washroom facility.
- Provide proper temporary protection of high traffic areas.

4 - STANDARD CONSTRUCTION SPECIFICATIONS

- Contractor shall refer to the latest version of the "Sprnt Standard Construction Specifications for Wireless Sites" for all other specifications.
- Latest version of the "Sprnt Standard Construction Specifications for Wireless Sites" may be downloaded from <https://sprnt.siterra.com/apollo/sprnt>.

LEGEND AND ABBREVIATIONS

BTS	BASE TRANSMISSION SYSTEM
GEN	GENERATOR
MMBS	MULTI-MODE BASE STATION
PPC	POWER PROTECTION CABINET
TYP	TYPICAL



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PROJECT NUMBER 23983

MARK	DATE	DESCRIPTION
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I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.



Signature: \_\_\_\_\_ Date: 12/13/2012

ISSUE PHASE FINAL DATE ISSUED 12/13/2012

SITE ID #: MLO3XC3 | 3  
SITE NAME: MITCHELL MALL  
ADDRESS: 1020 W. MITCHELL ST. MILWAUKEE, WI 53204  
SITE TYPE: ROOFTOP  
SHEET TITLE: SPECIFICATIONS

SCALE: NONE

SHEET NUMBER SP-1