

App No:

2020071203

Revised 7.20.20- JR

Application General Information

Applicant Name NB+C

Updated 7/1/2020

Application Type Minor Modification

Ann. Plan? Yes

Carrier T-Mobile

Will site be used to support government telecommunications facilities or other equipment for government use? No

Solution Type Macro

Existing Existing

Gvt. Use Desc.

Application Description TMA's

T-Mobile proposes removing (3) antennas, (3) RRUs, and (1) Cabinet, and installing (3) antennas, (3) RRUs, and (1) cabinet at the existing telecommunications facility.

Site Information

Site Id 279

Zoning LSC-1.0

Structure Type Building

Latitude 39.102939

Address 9420 Key West Ave, Rockville

Longitude -77.193847

County Site Name Phillips Office Building

Ground Elevation 470

Carrier Site Name 7WAN094C

City Rockville

Site Owner Key West III LP

Lease Status In Process

Structure Owner Key West III LLC / DANAC

Does the structure require an antenna structure registration under FCC Title 47 No

Existing Structure Height 54

Distance to Residential Property (New, Replacement, Colocation Only)

Provide the proposed height of the replacement structure without any antenna (New, Replacement Apps Only)

Distance to Commercial Property (New, Replacement, Colocation Only)

Justification of why this site was selected:

Existing Telecommunications Facility

Nearby Sites (New, Replacement Apps Only):

App No:

2020071203

Screening considerations(New, Colocations, Replacement Apps Only):

App No:

2020071203

6409 Questions

Does this qualify as a 6409 application? (Minor Mod, Colocations Only)

Yes

For towers outside the public ROW will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 20 feet, whichever is greater?

No

Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet?

No

For towers outside the public ROW will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 20 feet?

No

More than four Equipment Cabinets? YN

No

Will the proposed installation require excavation or expansion outside the current boundaries of the site?

No

Will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 10 feet, whichever is greater?

No

Does the structure or current installation have concealment elements/measures?

No

If yes, describe how the proposed installation does not defeat the existing concealment.

[Empty text box for describing concealment]

Small Wireless Facility Informatio

Small Wireless Facility Questions

Small Wireless Facility?

No

Is the structure 10% taller than adjacent structures?

[Empty text box]

Cumulative volume of the proposed wireless equipment(s) exclusive of antennas in cubic feet

0

Please list adjacent structure heights

[Empty text box]

Cumulative volume of the proposed antenna antenna(s) exclusive of equipment

Tribal Lands?

No

ROW Information

PROW?

No

Pole Number

[Empty text box]

ROW owner

[Empty text box]

ROW width

[Empty text box]

App No:

2020071203

Antenna Information

Antenna Compliance: Yes

Compliance Desc:

Antenna Location: Yes

Antenna Loc. Desc.:

Env. Assessment:

Cat. Excluded? checked

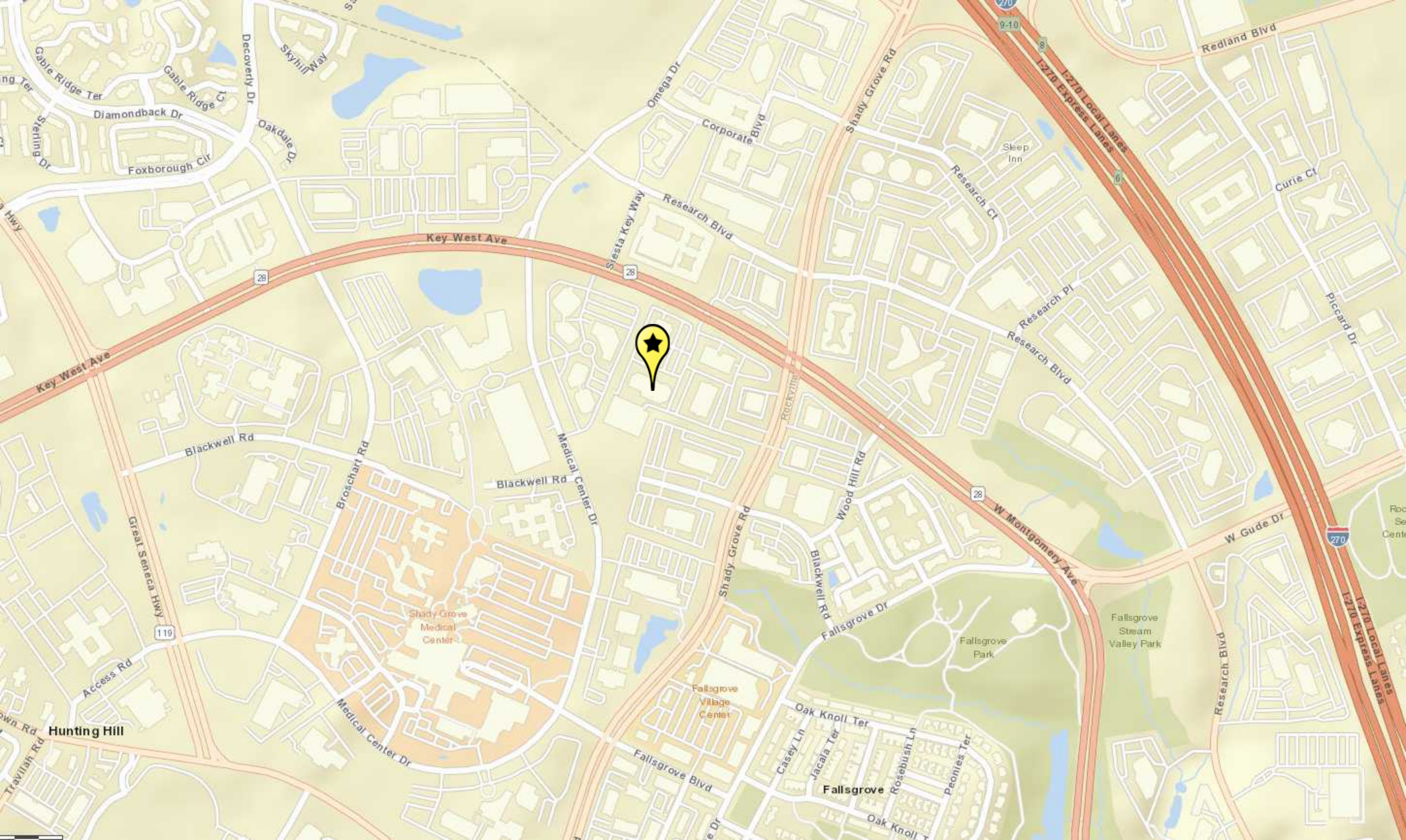
Routine Env. Evaluation:

Antenna Model: Ericsson AIRE6449 B41

Frequency: Tx & Rx: 2496-2690

RAD Center: 70.5 Max ERP: 854 Antenna Dimensions: 33.1"x20.6"x8.6" Quantity: 3





Key West Ave

Research Blvd

Blackwell Rd

Blackwell Rd

Shady Grove Medical Center

Falls Grove Park

Falls Grove Stream Valley Park

Falls Grove Village Center

Falls Grove

Hunting Hill

Redland Blvd

Sleep Inn

Curie Ct

Piccard Dr

W Guide Dr

Research Blvd

Oak Knoll Ter

Casey Ln

Jacala Ter

Rosebush Ln

Peonies Ter

Falls Grove Blvd

Oak Knoll T

Discovery Dr

Skyhill Way

Gable Ridge Ct

Diamondback Dr

Foxborough Cir

Oakdale Dr

Omega Dr

Corporate Blvd

Shady Grove Rd

Research Ct

Research Pl

Research Blvd

Rocky Hill

Wood Hill Rd

Blackwell Rd

Falls Grove Dr

Garrett Seneca Hwy

Access Rd

Hwy

Travilah Rd

9-10

270

6

1270 Local Lanes

1270 Express Lanes

270

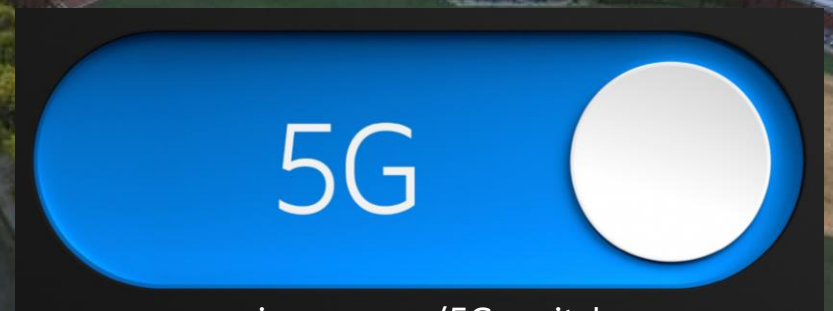
1270 Local Lanes

1270 Express Lanes



# Radio Portfolio B41 Products for T-Mobile

March 2020



[ericsson.com/5G-switch](https://ericsson.com/5G-switch)

# AIR 6488, B41



- Advanced Antenna System (AAS)
- 64TX/64RX with 128 AE
- Support operation frequency range 2496-2690 MHz
- Support output power up to 200W
- Support 100 MHz IBW & CBW
- Support NR and NR+LTE in split mode
- 3 x 10 Gbps eCPRI
- Power consumption < 1290W
- Weight: 58 kg
- Size (H x W x D): 884x520x183 mm
- -48 VDC (3-wire or 2-wire)
- -40 to +55°C
- Multi-layer MU MIMO
  - DL/UL: 16/8



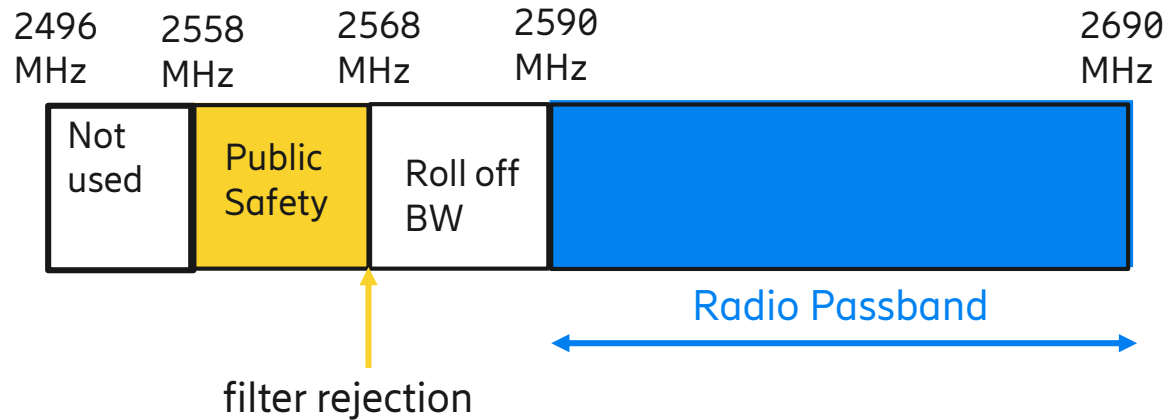
# AIR 6488, B41M



- Advanced Antenna System (AAS)
- 64TX/64RX with 128 AE
- Support operation frequency range 2590-2690 MHz
- Support output power up to 200W
- Support 100 MHz IBW & CBW
- Support NR and NR+LTE in split mode
- 3 x 10 Gbps eCPRI
- Power consumption < 1290W
- Weight: 58 kg
- Size (H x W x D): 884x520x183 mm
- -48 VDC (3-wire or 2-wire)
- -40 to +55°C
- Multi-layer MU MIMO
  - DL/UL: 16/8



# AIR 6488M for New York City Band 41M support



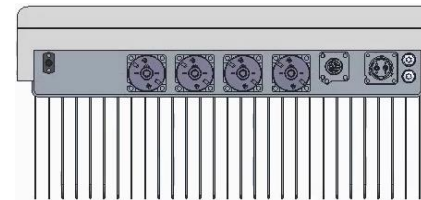
B41 in New York City currently has a UMTS Public Safety Network that requires OOB interference protection from New T-Mobile Network

# AIR 6449

Preliminary



- 192 antenna elements, 3:1 subarray
- Up to 300W
- Up to 200 MHz Operating BW & Carrier BW
- Two 25 Gb/s SFP(C2) and Two 10 Gb/s QSFP(C1FD and C2 backup)
- -48V 45 A Two wire and three wire versions
- APC light connector and Self test push button
- Sensor support but undefined
- Size B41:
  - 841 x 521 x 217 mm (H x W x D)
  - Volume: 95 liter
  - Weight: 47 kg



PRA: July 2020



# Radio 8863




Preliminary

- 8TX/8RX
- Support split mode (2 x 4T4R or 4 x 2T2R as multi-sector solution)
- Tx Power 8x40W
- 200MHz IBW TDD
- 2x10.1/25Gbps CPRI
- 21.5 liter, 21kg
- External antenna calibration
- -48 VDC 3-wire
- AISG RET support via RS-485 or RF connectors
- Optional fan for increased site flexibility
- 2 external alarm
- Convectional cooling
- IP 65, -40 to +55°C





# Radio Details: Mid Band TDD (Massive) MIMO (Band 41)

AIR or Radio Type	AIR 6488 (G2) 	AIR 6449 (G4) 	Radio 8863 
RATs supported	L, NR	L, NR	L, NR
Power capability	200W	300W	8x40W
Modulation	256QAM	256QAM	256QAM
Bandwidth (IBW/CBW)	100 MHz or 60L+60N	194 MHz	196 MHz
Tx and Rx Array	64T64R	64T64R	8 CSI-RS ports
MIMO layers (DL/UL)	16 DL / 8 UL	16 DL / 8 UL	16 DL / 8 UL
CPRI ports	3 x 10G	4 x 25G* (2x10G+2x25G)	2 x 25G*
Dimensions (HxWxD)	884mm x 520mm x 183mm (34.8" x 20.5" x 7.2")	840mm x 520mm x 210mm (33.1" x 20.5" x 8.3")	(21.5 ltr)
Weight	58 kg (128 lbs)	47 kg (103 lbs)	Approx. 21 kg (46 lbs)
Cooling	Convection	Convection	Convection
Power	-48VDC	-48VDC	-48VDC
Power Consumption	1290W	<1100W	TBD
Availability	Q2 2019	Q3 2020	Q2 2020





# Radio 4408 B41

- 4TX/4RX TDD
- 4x5W
- IBW up to 150 MHz CBW
- Up to 6 LTE carriers
- 2x 2.5/5/9.8/10.1Gbps CPRI
- 4 liter, less than 5kg incl bracket and cover
- AC or -48 VDC
- Integrated or external antenna
- 2 external alarm
- IP 65
- -40 to +55°C





## Ericsson 6230 Design Specification

The methods for configuring the 6230 for field deployment are presented.

T-Mobile Engineering & Operations

Ericsson

6230

MTS

M

Ericsson Design Specification		Ericsson Design Specification	
Ericsson Design Specification			
Ericsson Design Specification	Ericsson Design Specification		
Ericsson Design Specification	<a href="#">Ericsson Design Specification</a>		

## Table of Contents

<b>1</b>	<b>Introduction / Project Summary.....</b>	<b>3</b>
	Introduction	
	Product Description	
	Assumptions	
<b>2</b>	<b>General Equipment Overview .....</b>	<b>3</b>
<b>3</b>	<b>6230 Placement .....</b>	<b>6</b>
<b>4</b>	<b>Baseline Capacity.....</b>	<b>6</b>
<b>5</b>	<b>Provisioning for Deployment .....</b>	<b>7</b>
	Introduction	
	Architecture	
	Routing	
	Deployment Assumptions	
	Sizing	
	Monitoring	
	Alerting	
<b>6</b>	<b>Battery Backup Integration .....</b>	<b>14</b>
	Introduction	
	System Requirements	

# 1 Introduction / Project Summary

## 1.1 Purpose of Project

The purpose of this project is to design and develop a new product that meets the requirements of the customer. The project is divided into several phases, including requirements gathering, design, development, testing, and deployment. The goal is to deliver a high-quality product that is reliable, secure, and easy to use.

## 1.2 Product Description

The product is a software application that provides a secure and reliable way to manage data. It is designed to be used by a wide range of users, from small businesses to large enterprises. The product is built using modern technologies and follows industry best practices for security and performance. It is available as a cloud-based service and can be integrated with other systems.

## 1.3 Assumptions

The following assumptions are made for this project: the customer will provide all necessary data and requirements; the project will be completed within the agreed-upon timeline and budget; and the product will be used in a secure and controlled environment.

# 2 General Equipment Overview

The following table provides a general overview of the equipment used in the project.

<b>Mechanical Specification</b>	
Dimensions	1000 x 500 x 150 mm
Weight	5 kg
Material	Aluminum
Finish	Powder coat, RAL 9005
<b>Power System</b>	
Power Input	100-240V AC, 50/60Hz
Power Output	100W DC, 5V/2A
Power Consumption	10W
Power Efficiency	80%
Power Protection	Over-voltage, Over-current, Short-circuit
Power Regulation	±1%
Power Ripple	100mV
Power Noise	50dB
Power Temperature	0-40°C
Power Humidity	10-90% RH
Power Vibration	0.5g
Power Shock	10g
Power EMI	CE, FCC, RoHS
Power Safety	UL, CE, RoHS
Power Compliance	CE, FCC, RoHS
Power Certification	CE, FCC, RoHS
Power Testing	IEC 60950-1, IEC 60825-1
Power Reliability	MTBF > 100,000 hours
Power MTBF	100,000 hours
Power Mean Time to Failure	100,000 hours
Power Mean Time to Repair	10 minutes
Power Mean Time to Replace	10 minutes
Power Mean Time to Dispose	10 minutes
Power Mean Time to Recycle	10 minutes
Power Mean Time to Recover	10 minutes
Power Mean Time to Reuse	10 minutes
Power Mean Time to Repair	10 minutes
Power Mean Time to Replace	10 minutes
Power Mean Time to Dispose	10 minutes
Power Mean Time to Recycle	10 minutes
Power Mean Time to Recover	10 minutes
Power Mean Time to Reuse	10 minutes
<b>Operating Environmental</b>	



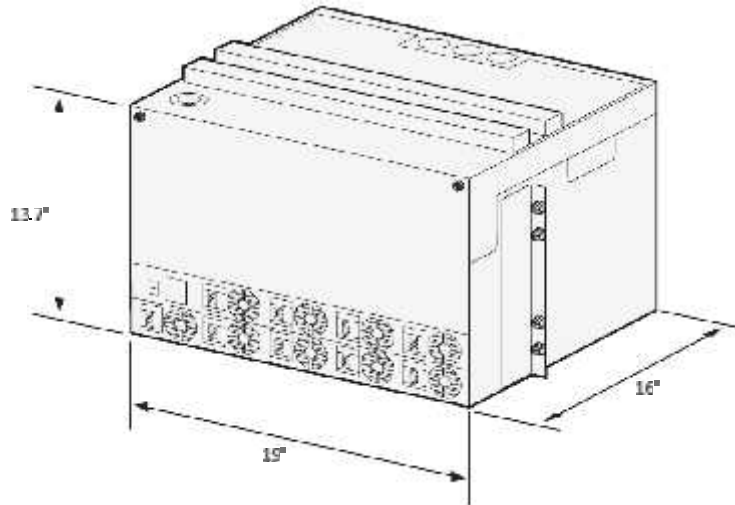


Figure 1

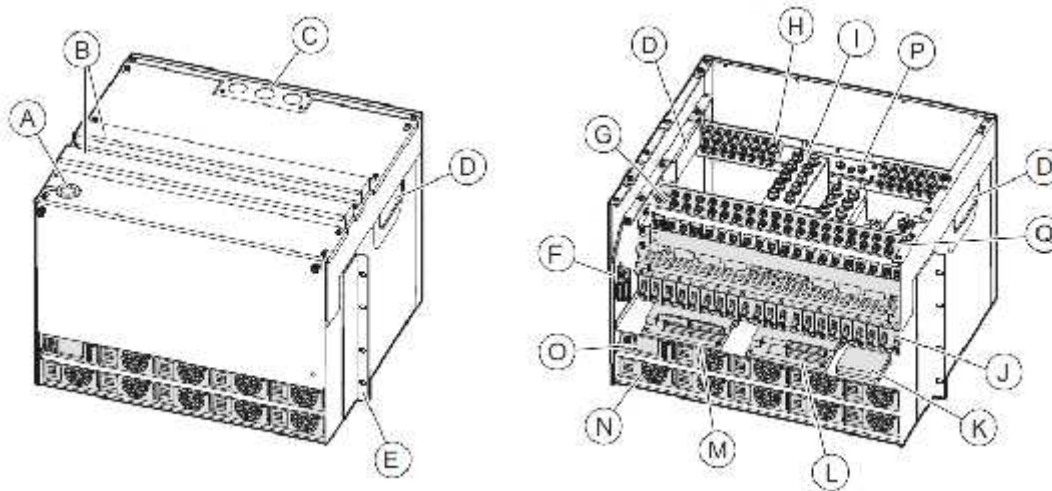


Figure 2

Feature	Unit
A	Antenna
B	Top cover
C	Bottom cover
D	Display
E	Keypad
F	Microprocessor
G	Memory
H	Power supply
I	Baseband processor
J	RF front end
K	Antenna
L	Keypad
M	Microprocessor
N	Memory
O	Microprocessor
P	Power supply
Q	Baseband processor

### 3 6230 Placement

The 6230 is a 19-inch wide, 63-inch high, 23.6-inch deep cabinet. It is designed to house a variety of network equipment. The cabinet features a top-mounted optional user equipment rack, a main equipment compartment with four bays, and a bottom-mounted equipment compartment with two bays. The cabinet is constructed from heavy-duty steel and is designed for outdoor use. The top-mounted rack is 8L deep and is used for housing user equipment. The main equipment compartment is 63.0 inches high and 27.6 inches wide. The bottom-mounted compartment is 23.6 inches deep. The cabinet is designed to be installed in a standard 19-inch rack environment.

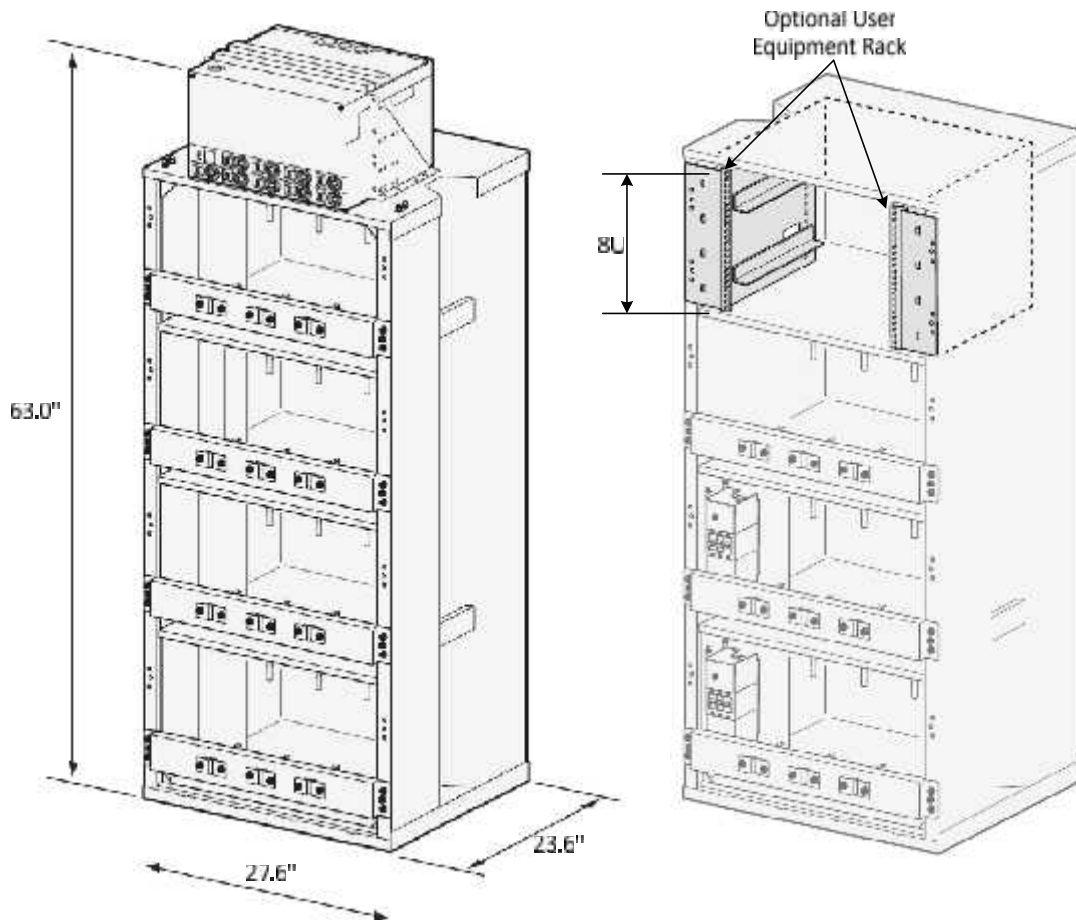


Figure 3

### 4 Baseline Capacity

The baseline capacity of the 6230 is determined by the number of equipment units that can be installed in the cabinet. The cabinet is designed to support a maximum of 10 equipment units. The top-mounted rack is designed to support up to 2 units. The main equipment compartment is designed to support up to 4 units. The bottom-mounted compartment is designed to support up to 4 units. The cabinet is designed to support a variety of equipment units, including network routers, switches, and servers.



Product Number	Description	Qty	Comment
BMG 907 157/1	6230 indoor Power rack	1	Power Unit and Battery Rack. Identity Label SVF 191 040/1 included
KDU 127 170/3	SCU 09 01, Support Control Unit	1	
SXK 109 1052/1	SCU/SAU Holder	2	
RPM 777 143/00500	Signal cable SCU - power system	1	
RPM 777 080/01000	Power Cable -> SCU	1	
KET 109 70/2	Temp sensor 10m	1	One included as standard
SXK 109 2011/7	SCU/SAU bracket extender	2	To attach SCU/SAU holder to
BML 901 450/1	Rectifier 3,5 kW HE	4	4 Rectifiers in base configuration
SXA 114 8381/1	Dummy plate Rectifier	5	
NFS 899 001/200	Bullet CB, 200A	2	For bulk feed of SPD boxes for regular radios
NFS 899 001/050	Bullet CB, 50A	3	For higher pc radios like AIR3246, AIR6488
NFS 899 001/030	Bullet CB, 30A	1	
NFS 899 001/010	Bullet CB, 10A	5	
BAF 903 46/1	6230 indoor Battery rack	1	
SXK 109 2010/2	Power Unit Mounting battery rack	1	
NTB 101 0646/2	Battery power cable to 3rd shelf	1	Support for 3rd battery string. Kit for two battery strings always included in BMG 907157/1
NTB 101 0637/1	Battery CB Connection box	1	For 3rd battery shelf. x2 included in BMG. 300A included
SXK 109 2011/6	19inch adaption plate 8U	1	Convert first battery shelf to 19-inch space
NTB 101 0558/3	Adjustable bracket 170Ah-200Ah	3	
ZHY 601 19/1	SAU 02 01	1	
SXA 134 5524/3	Cable Ladder 19 inch	1	
NTB 101 0429/1	Quantity package (for SAU)	1	
RPM 777 405/01000	Signal and Power Cable SCU to SAU	1	
NFD 302 34/08	OVP-ALM 8	2	
RPM 777 143/01000	Signal Cable SAU - OVP	4	Length adapted to mounting of OVP in 19" rack
NTM 503 019	DIN bar (19")	1	For OVPs in the 19" adaption plate 8U option.
NTB 101 0693/2	35mm <sup>2</sup> , 6m GND cable kit, dual-lug	1	

The RA is a rack assembly that contains the power supply units (PSUs) and the battery units. The RA is designed to be installed in a 6230 indoor power rack. The RA is composed of the following components:

- Power supply units (PSUs)
- Battery units
- Rectifiers
- SPD (Surge Protection Device)
- Rack assembly
- SAU (Support Control Unit)
- SAU Holder
- SAU Bracket Extender
- SAU Cable
- SAU Signal Cable
- SAU Power Cable
- SAU Temperature Sensor
- SAU Bracket
- SAU Bracket Extender
- SAU Cable Ladder
- SAU Quantity Package
- SAU Signal and Power Cable
- SAU OVP (Over Voltage Protection)
- SAU Signal Cable
- SAU DIN Bar
- SAU GND Cable Kit

## 5 Provisioning for Deployment

### 5.1 Prerequisite Grounding

The RA is a rack assembly that contains the power supply units (PSUs) and the battery units. The RA is designed to be installed in a 6230 indoor power rack. The RA is composed of the following components:

- Power supply units (PSUs)
- Battery units
- Rectifiers
- SPD (Surge Protection Device)
- Rack assembly
- SAU (Support Control Unit)
- SAU Holder
- SAU Bracket Extender
- SAU Cable
- SAU Signal Cable
- SAU Power Cable
- SAU Temperature Sensor
- SAU Bracket
- SAU Bracket Extender
- SAU Cable Ladder
- SAU Quantity Package
- SAU Signal and Power Cable
- SAU OVP (Over Voltage Protection)
- SAU Signal Cable
- SAU DIN Bar
- SAU GND Cable Kit



DC Distribution Unit (DDU) is a rack-mounted power distribution unit that provides power to the RR and AR. It consists of a DC Distribution Unit (DDU) and a DC Distribution Unit (DDU).

The DDU is a rack-mounted power distribution unit that provides power to the RR and AR. It consists of a DC Distribution Unit (DDU) and a DC Distribution Unit (DDU).

- DC Distribution Unit (DDU)
- DC Distribution Unit (DDU)
- DC Distribution Unit (DDU)

The DDU is a rack-mounted power distribution unit that provides power to the RR and AR. It consists of a DC Distribution Unit (DDU) and a DC Distribution Unit (DDU).

- DC Distribution Unit (DDU)
- DC Distribution Unit (DDU)
- DC Distribution Unit (DDU)

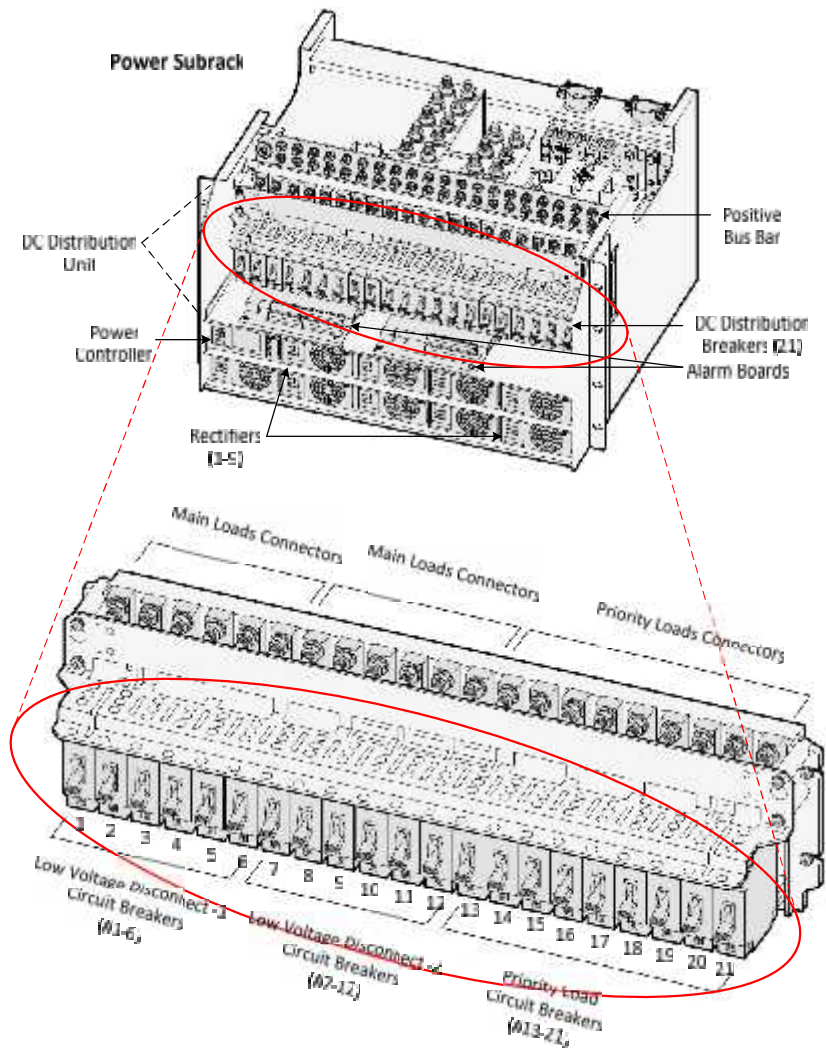


Figure 10

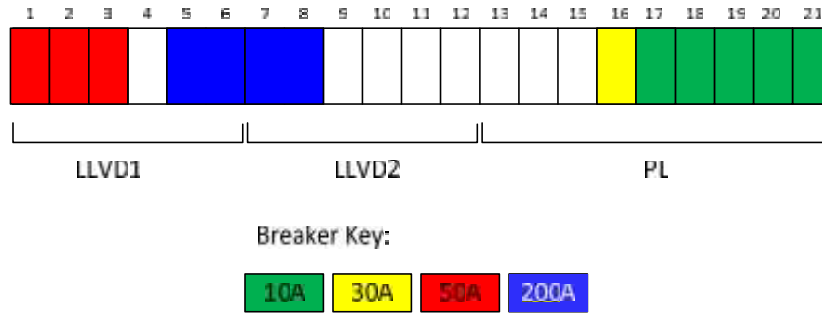


Figure 11

Technical drawing showing a top-down view of a breaker assembly with various components labeled.

### 5.5 SPD Function

Technical drawing showing a top-down view of a SPD (Surge Protection Device) assembly with various components labeled.

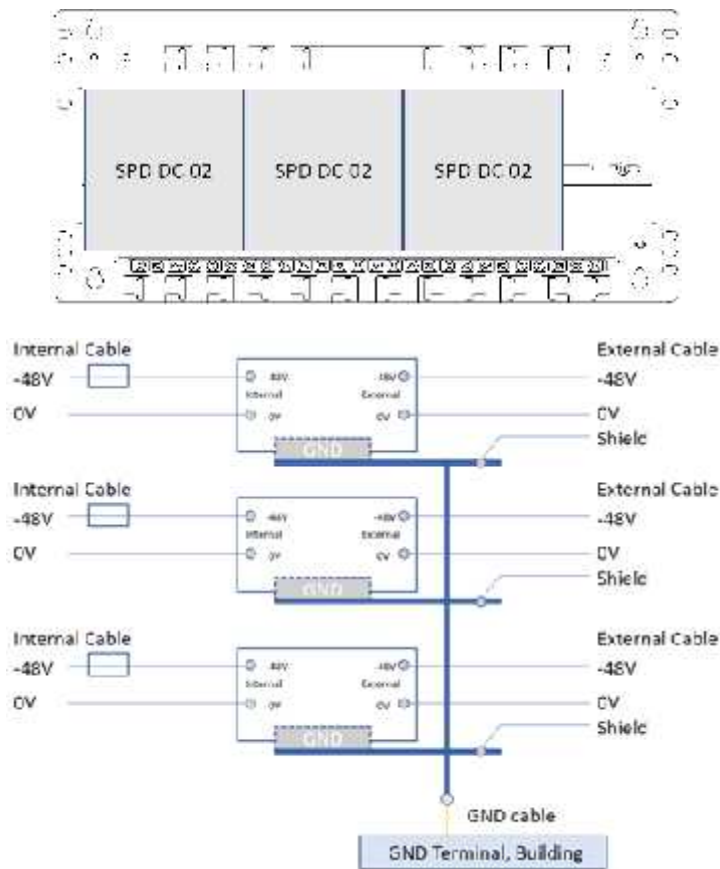


Figure 12

### 5.6 ENM Integration

Ericsson 6230 Design Specification

- M
- s
- A
- R
- d
- R
- s

- M
- d
- D
- T
- A
- R
- S
- s
- d

- M
- r
- r
- R
- s
- T

Ericsson 6230 Design Specification

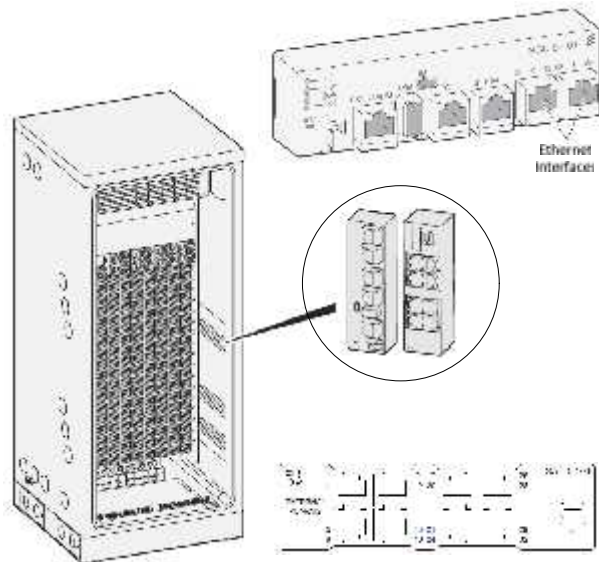


Figure 13

T-Mobile is a leading provider of mobile services and solutions. The company is committed to providing high-quality service and innovative solutions to its customers. The company's products and services are designed to meet the needs of its customers and to provide a seamless user experience.

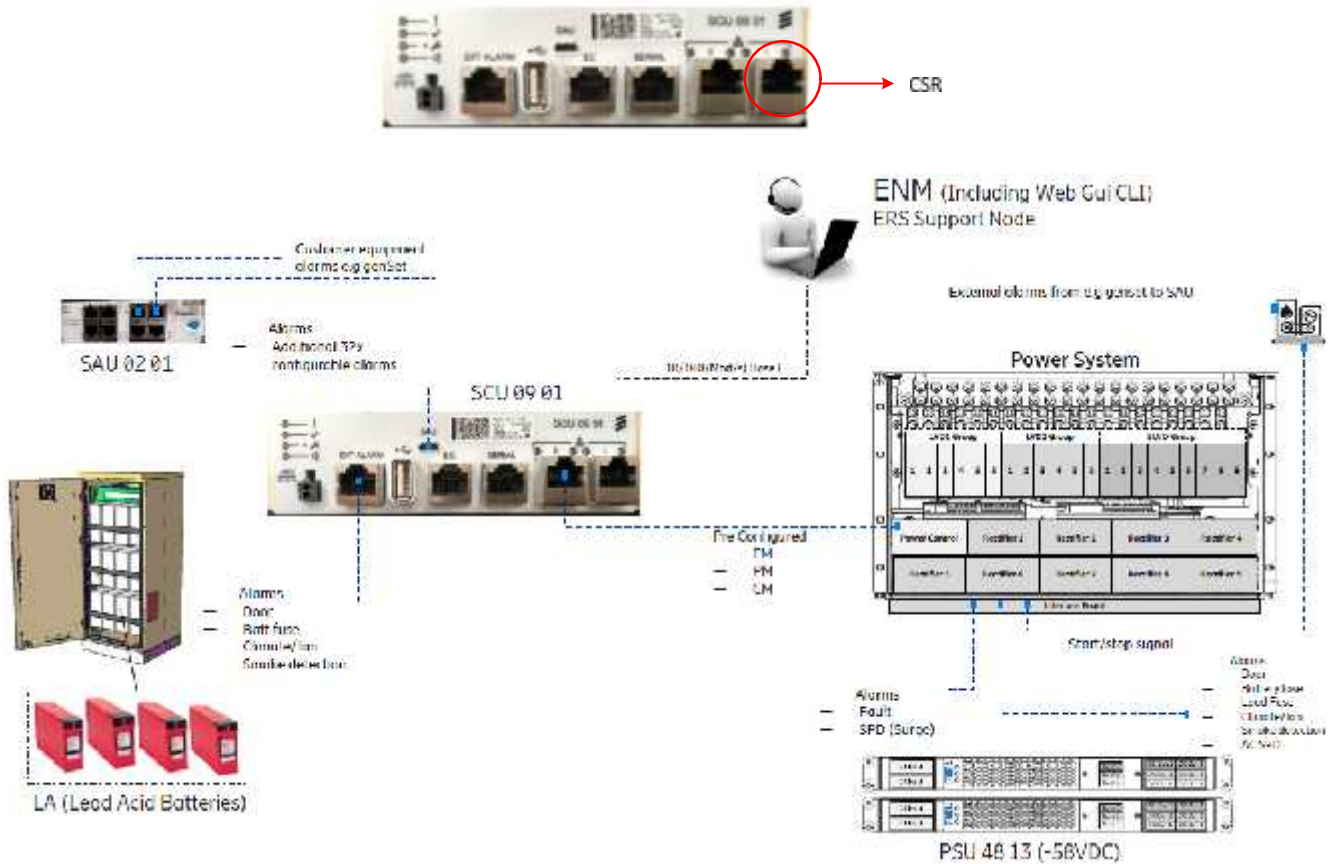


Figure 14

The system is designed to provide a high level of reliability and availability. The system is capable of handling a large number of alarms and events, and it is able to provide a detailed and accurate report of the system's status. The system is also capable of providing a high level of security and protection for the system's data and information.





### 5.7 External Alarm Integration

External alarm integration is supported through the use of a dedicated alarm input terminal on the device. This terminal is used to connect an external alarm device, such as a doorbell or fire alarm, to the device. The alarm input terminal is located on the back of the device, near the battery cover. The alarm input terminal is a 2-pin terminal, and the external alarm device should be connected to these two pins. The alarm input terminal is labeled "ALARM" and "GND".

## 6 Battery Backup Integration

### 6.1 Battery Terminals & Breakers

The battery terminals are used to connect the battery to the device. The battery terminals are located on the back of the device, near the battery cover. The battery terminals are labeled "POS" and "NEG". The battery terminals are used to connect the positive and negative terminals of the battery to the device. The battery terminals are also used to connect the battery to the device's internal circuitry. The battery terminals are protected by a battery cover, which is used to prevent short circuits and damage to the device.

### 6.2 Battery Temperature Sensor and Compensation

The battery temperature sensor is used to monitor the temperature of the battery. The temperature sensor is located on the back of the device, near the battery cover. The temperature sensor is used to provide temperature data to the device's internal circuitry, which is used to compensate for temperature variations. The temperature sensor is also used to provide temperature data to the device's external circuitry, which is used to provide temperature data to the device's user interface. The temperature sensor is labeled "TEMP" and "GND".

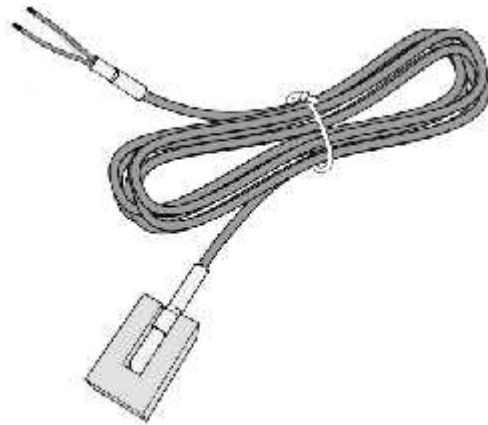


Figure 15



# T-Mobile

T-Mobile  
SITE NUMBER: 7WAN094C

SITE NAME: KEY WEST - ROCKVILLE

T-MOBILE ANCHOR INSTALLATION, DESIGN 4SEC-67D5A997DBA INDOOR

STATION  
ROCKVILLE  
MONTGOMERY

NOTE: DESIGN BASED ON RFDS  
VERSION: 9.0 DATED: 06/26/2020.

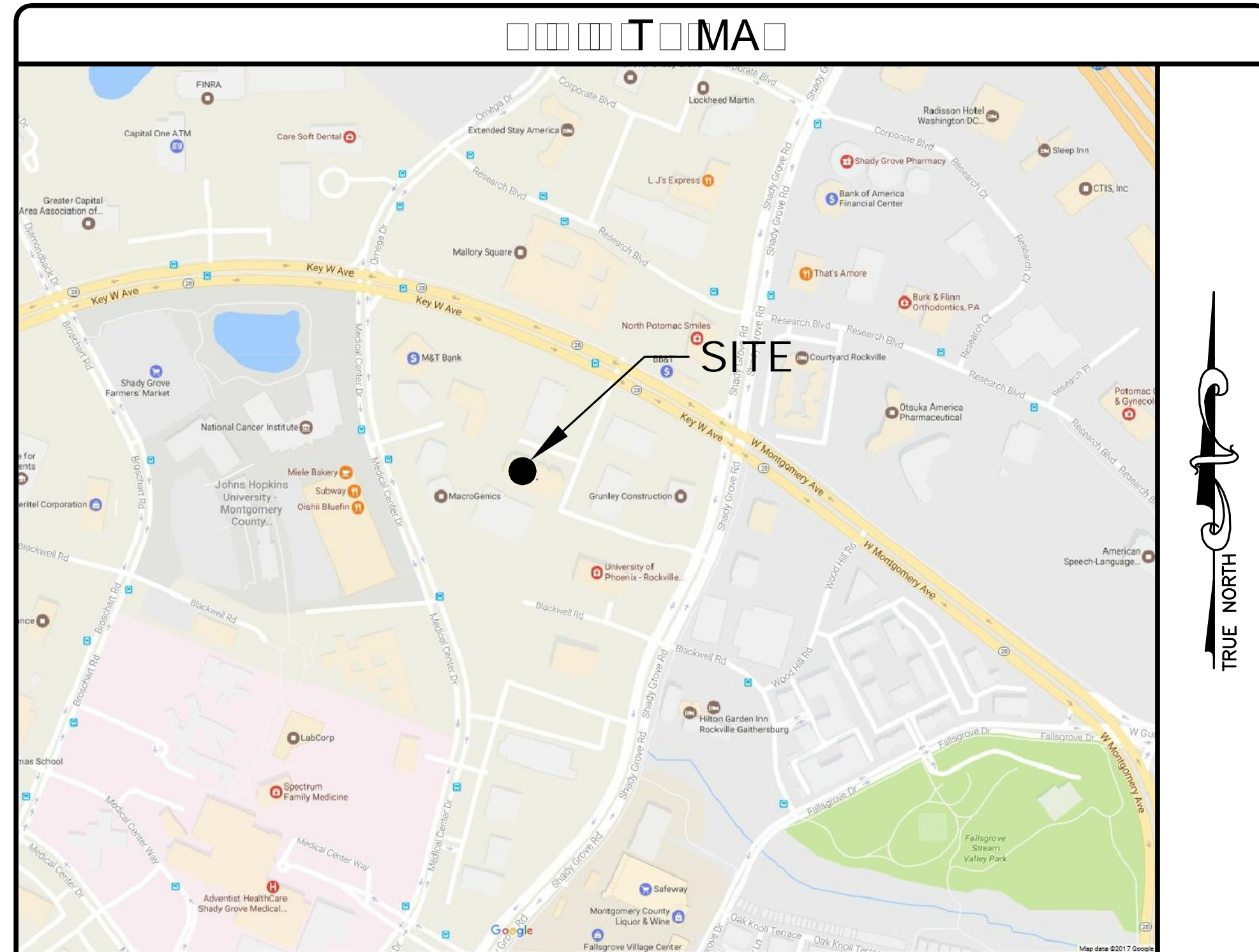


## STATION

STATION INFORMATION  
 STATION NAME: KEY WEST - ROCKVILLE  
 STATION TYPE: T-MOBILE ANCHOR  
 STATION ID: 7WAN094C  
 STATION ADDRESS: 10000 ROCKVILLE ROAD, ROCKVILLE, MD 20850  
 STATION COORDINATES: 39.085, -77.115  
 STATION ELEVATION: 100 FT  
 STATION OWNER: T-MOBILE  
 STATION INSTALLER: NB+C

## ROCKVILLE

ROCKVILLE INFORMATION  
 ROCKVILLE NAME: KEY WEST - ROCKVILLE  
 ROCKVILLE TYPE: T-MOBILE ANCHOR  
 ROCKVILLE ID: 7WAN094C  
 ROCKVILLE ADDRESS: 10000 ROCKVILLE ROAD, ROCKVILLE, MD 20850  
 ROCKVILLE COORDINATES: 39.085, -77.115  
 ROCKVILLE ELEVATION: 100 FT  
 ROCKVILLE OWNER: T-MOBILE  
 ROCKVILLE INSTALLER: NB+C



## DIRECTIONS

DIRECTIONS TO THE SITE  
 FROM THE INTERSECTION OF KEY WEST AND ROCKVILLE, TRAVEL SOUTH ON KEY WEST TO THE INTERSECTION OF ROCKVILLE. THE SITE IS LOCATED ON THE WEST SIDE OF ROCKVILLE, APPROXIMATELY 0.5 MILES SOUTH OF THE INTERSECTION.

## DRAMA

DRAMA INFORMATION  
 DRAMA NAME: KEY WEST - ROCKVILLE  
 DRAMA TYPE: T-MOBILE ANCHOR  
 DRAMA ID: 7WAN094C  
 DRAMA ADDRESS: 10000 ROCKVILLE ROAD, ROCKVILLE, MD 20850  
 DRAMA COORDINATES: 39.085, -77.115  
 DRAMA ELEVATION: 100 FT  
 DRAMA OWNER: T-MOBILE  
 DRAMA INSTALLER: NB+C

## DRAWING

DRAWING INFORMATION  
 DRAWING NAME: KEY WEST - ROCKVILLE  
 DRAWING TYPE: T-MOBILE ANCHOR  
 DRAWING ID: 7WAN094C  
 DRAWING ADDRESS: 10000 ROCKVILLE ROAD, ROCKVILLE, MD 20850  
 DRAWING COORDINATES: 39.085, -77.115  
 DRAWING ELEVATION: 100 FT  
 DRAWING OWNER: T-MOBILE  
 DRAWING INSTALLER: NB+C

## DRAMA DRAWING

DRAMA DRAWING INFORMATION  
 DRAMA DRAWING NAME: KEY WEST - ROCKVILLE  
 DRAMA DRAWING TYPE: T-MOBILE ANCHOR  
 DRAMA DRAWING ID: 7WAN094C  
 DRAMA DRAWING ADDRESS: 10000 ROCKVILLE ROAD, ROCKVILLE, MD 20850  
 DRAMA DRAWING COORDINATES: 39.085, -77.115  
 DRAMA DRAWING ELEVATION: 100 FT  
 DRAMA DRAWING OWNER: T-MOBILE  
 DRAMA DRAWING INSTALLER: NB+C

APPLICANT

T-Mobile  
 T-Mobile  
 T-Mobile

ENGINEER

NB+C  
 TOTALLY COMMITTED.  
 NB+C ENGINEERING SERVICES, LLC.

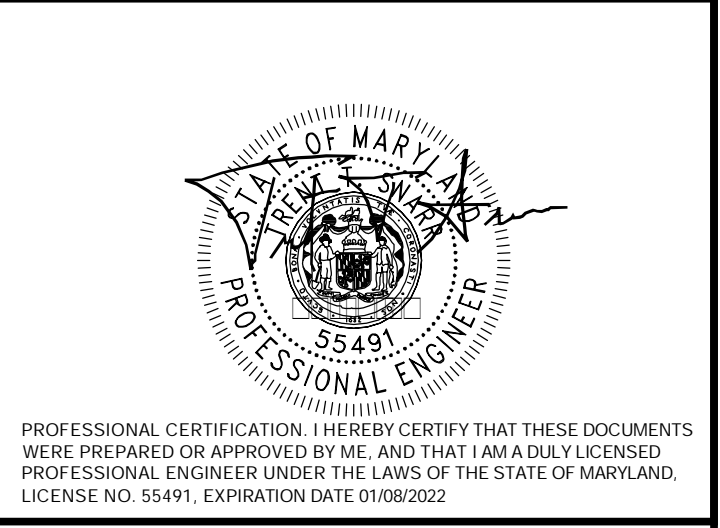
SITE INFORMATION

STATION  
 STATION NAME: KEY WEST - ROCKVILLE  
 STATION TYPE: T-MOBILE ANCHOR  
 STATION ID: 7WAN094C  
 STATION ADDRESS: 10000 ROCKVILLE ROAD, ROCKVILLE, MD 20850  
 STATION COORDINATES: 39.085, -77.115  
 STATION ELEVATION: 100 FT  
 STATION OWNER: T-MOBILE  
 STATION INSTALLER: NB+C

DESIGN RECORD

REV	DATE	DESCRIPTION	BY
1	07/13/2020	REV PER COMMENTS	DH
0	06/29/2020	FINAL CDs	CAR

PROFESSIONAL STAMP



ENGINEER

TRAVIS SARR  
 MAR 2018

SHEET TITLE

TITLE SHEET

SHEET NUMBER

T-1



**ELECTRICAL & GROUNDING NOTES**

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING AT EXPOSED INDOOR LOCATIONS SHALL BE IN ELECTRICAL METALLIC TUBING OR RIGID NONMETALLIC TUBING (RIGID SCHEDULE 40 PVC OR RIGID SCHEDULE 80 PVC FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) (AS PERMITTED BY CODE).
- ELECTRICAL AND TELCO WIRING AT CONCEALED INDOOR LOCATIONS SHALL BE IN ELECTRICAL METALLIC TUBING, ELECTRICAL NONMETALLIC TUBING, OR RIGID NONMETALLIC TUBING (RIGID SCHEDULE 40 PVC AS PERMITTED BY CODE).
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING, ABOVE GRADE AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS (RGS) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- BURIED CONDUIT SHALL BE RIGID NONMETALLIC CONDUIT (RIGID SCHEDULE 40 PVC); DIRECT BURIED IN AREAS OF OCCASIONAL LIGHT TRAFFIC, ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED INDOORS AND OUTDOORS IN AREAS WHERE VIBRATION OCCURS AND FLEXIBILITY IS NEEDED.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE THHN, THWN-2, OR THIN INSULATION.
- 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.
- 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.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTING PROTECTION SHALL BE DONE IN ACCORDANCE WITH T-MOBILE CELL SITE GROUNDING STANDARDS.
- GROUND CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 BARE TINNED COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.
- ALL POWER AND GROUND CONNECTIONS TO BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY HARGER (OR APPROVED EQUAL) RATED FOR OPERATION AT NO LESS THAN 75°C OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 6 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL MECHANICAL GROUND CONNECTIONS.
- CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXISTING TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, CABLE, AND LNA RETURN-LOSS AND DISTANCE-TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
- THE T-MOBILE ELECTRICAL EQUIPMENT INCLUDING PANEL, SWITCH GEAR AND DISCONNECT ARE TO BE LABELED WITH ENGRAVED BAKELITE LABELS.

**GENERAL NOTES**

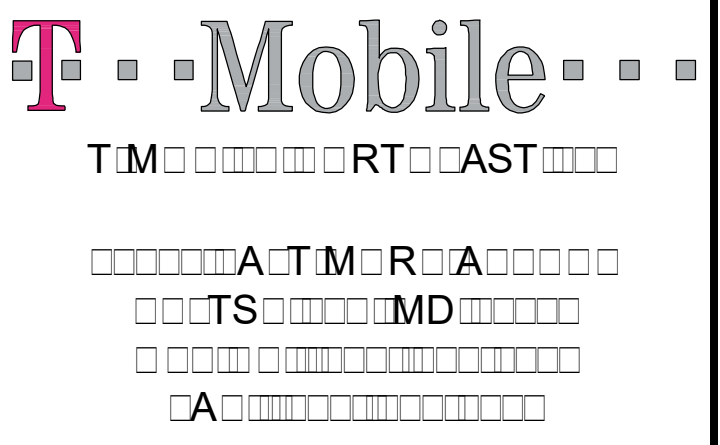
- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES COMPANY OR OTHER PUBLIC AUTHORITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
- THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
- TRANSMITTER EQUIPMENT AND ANTENNAS ARE DESIGNED TO MEET ANSI/EIA/TIA 222-G REQUIREMENTS.
- ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
- CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
- IF ANY UNDERGROUND UTILITIES OR STRUCTURES EXIST BENEATH THE PROJECT AREA, CONTRACTOR MUST LOCATE IT AND CONTACT THE APPLICANT & THE OWNER'S REPRESENTATIVE.
- OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION BY TECHNICIANS APPROXIMATELY 2 TIMES PER MONTH.
- PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS, AND PLANS OF RECORD AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
- THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
- THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF. THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
- NO SIGNIFICANT NOISE, SMOKE, DUST, OR ODOR WILL RESULT FROM THIS FACILITY.
- THE FACILITY IS UNMANNED AND NOT INTENDED FOR HUMAN HABITATION (NO HANDICAP ACCESS REQUIRED).
- THE FACILITY IS UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
- POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.

**STRUCTURAL NOTES**

- THE STRUCTURAL STEEL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANCHOR BOLT LOCATIONS, ELEVATION OF TOP OF CONCRETE AND BEARING PLATES, ALIGNMENT ETC. PRIOR TO START OF STEEL ERECTION.
- THE LATEST EDITION OF THE FOLLOWING SPECIFICATIONS SHALL GOVERN:
  - A. AISC - "ALLOWABLE STRESS DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".
  - B. AISC - "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
  - C. AWS - "D1.1 STRUCTURAL WELDING CODE - STEEL".
- MATERIAL, UNLESS OTHERWISE NOTED, SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS
 

STRUCTURAL WIDE FLANGE & M SHAPES	A992 OR A572 FY = 50KSI
OTHER STRUCTURAL SHAPES AND PLATES	A36, FY = 36 KSI
STRUCTURAL TUBING	A500, GRADE B FY = 46 KSI
HIGH STRENGTH BOLTS	A325
THREADED RODS	A354, GRADE BC
ANCHOR BOLTS	A325 OR A354 BC
PIPE (HANDRAIL)	SCH 40 PIPE
- ALL WELDING SHALL BE IN ACCORDANCE WITH AWS D1.1 USING E70XX ELECTRODES. UNLESS OTHERWISE NOTED PROVIDE CONTINUOUS MINIMUM SIZED FILLET WELDS PER AISC REQUIREMENTS.
- HOLES IN STEEL SHALL BE DRILLED OR PUNCHED. ALL SLOTTED HOLES SHALL BE PROVIDED WITH SMOOTH EDGES. BURNING OF HOLES AND TORCH CUTTING AT THE SITE IS NOT PERMITTED. ALL HOLES IN BEARING PLATES SHALL BE DRILLED.
- ALL STEEL TO BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123.
- EPOXY ANCHORS TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
- ALL BOLTS SHALL BE TIGHTENED USING TURN-OF-THE-NUT METHOD PER AISC SPECIFICATIONS USING STANDARD HOLES.
- CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND FIT PRIOR TO FABRICATION.

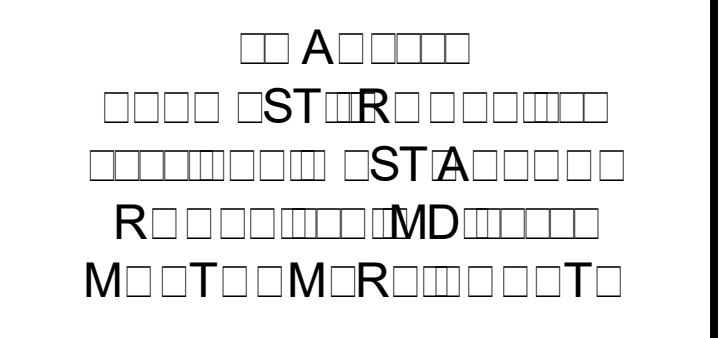
APPLICANT



ENGINEER



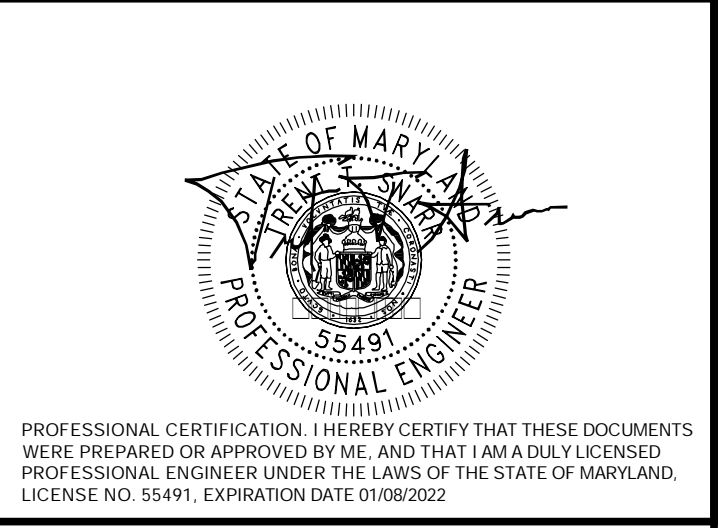
SITE INFORMATION



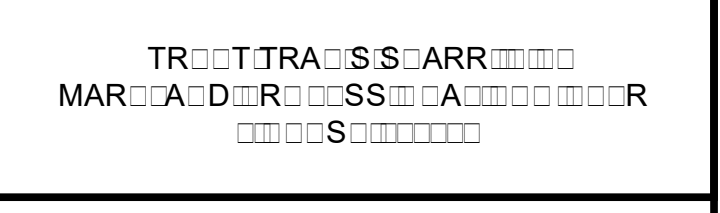
DESIGN RECORD

REVISIONS			
NO.	DATE	DESCRIPTION	BY
1	07/13/2020	REV PER COMMENTS	DH
0	06/29/2020	FINAL CDS	CAR

PROFESSIONAL STAMP



ENGINEER



SHEET TITLE

GENERAL NOTES

SHEET NUMBER

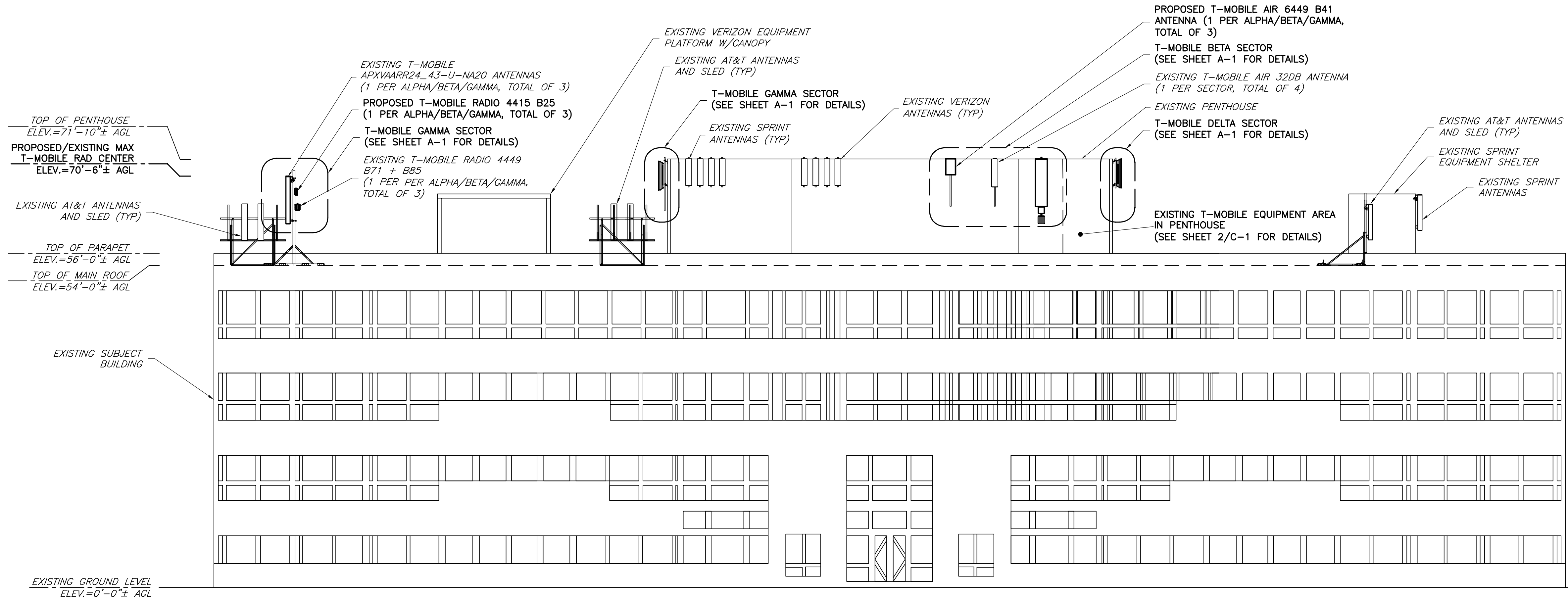
GN-1











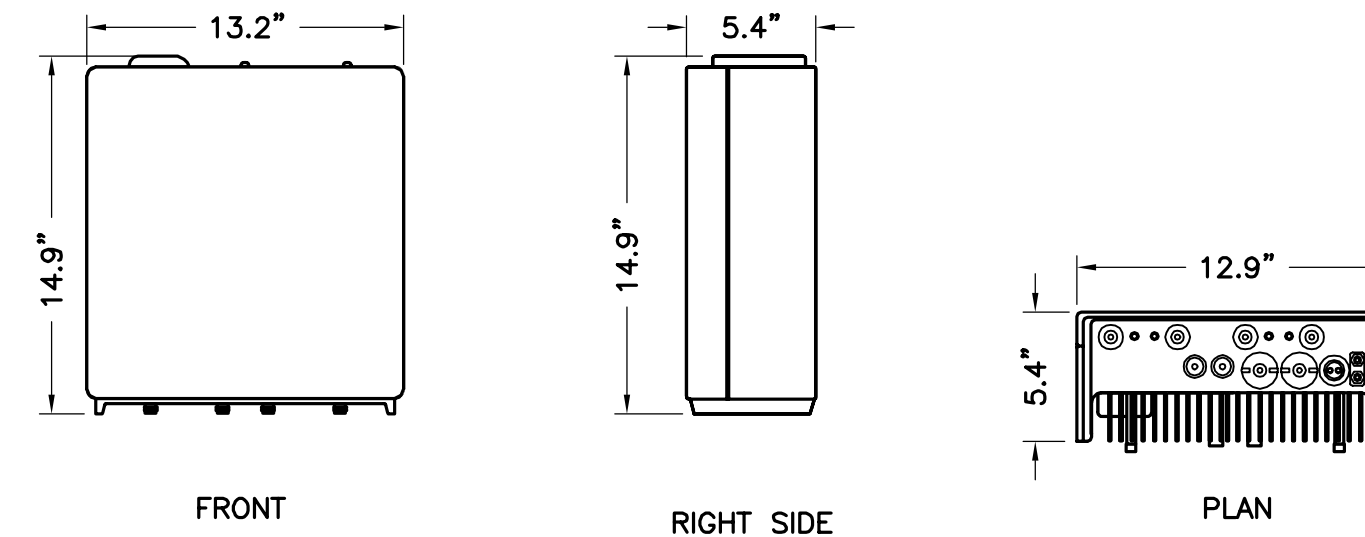
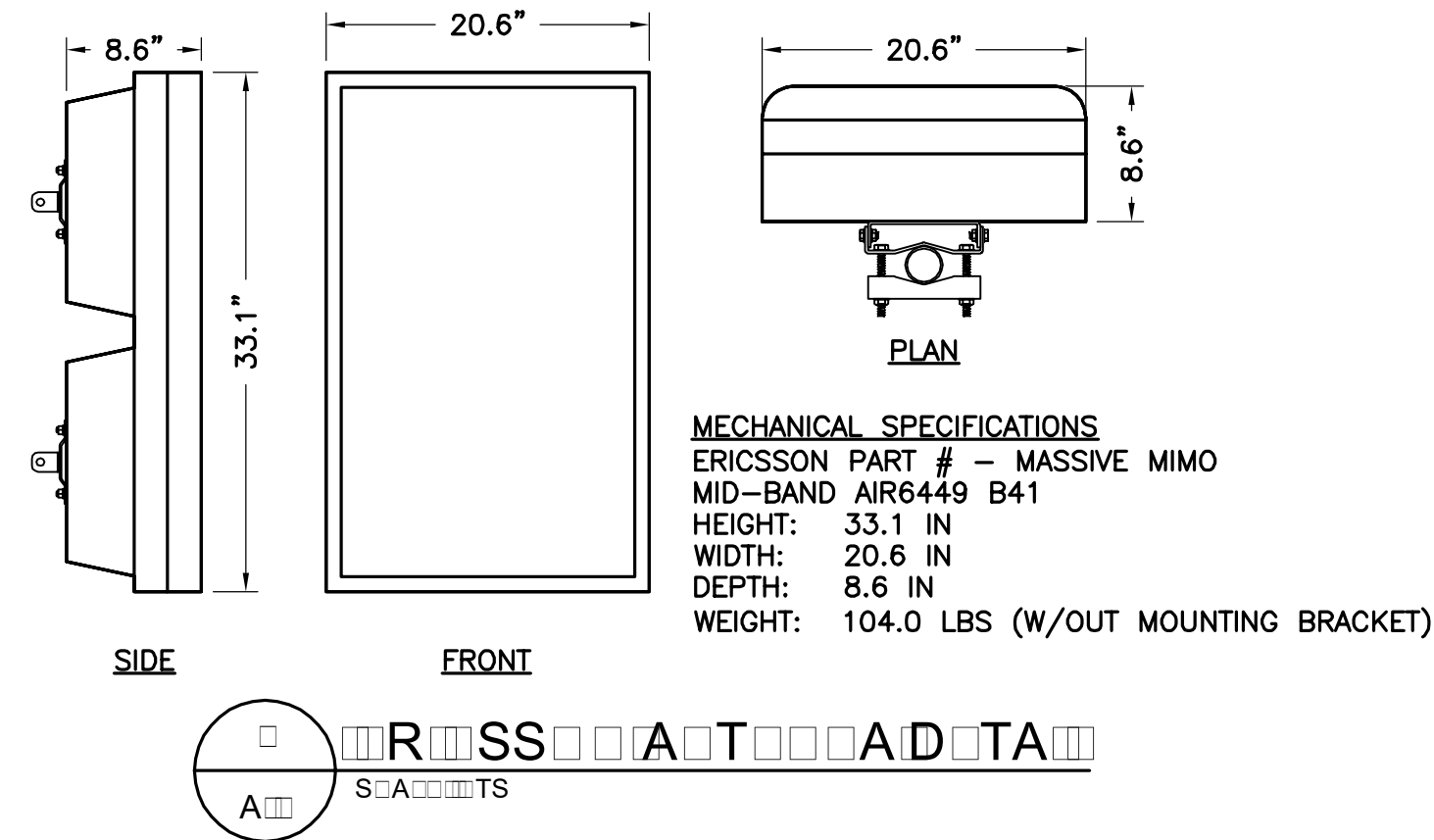
NOTE:  
ANTENNAS ARE TO BE MOUNTED FLUSH LEVEL WITH THE TOP OF THE WALL IN WHICH THEY ARE SUPPORTED BY.

STRUCTURAL NOTE:  
REFER TO THE PASSING STRUCTURAL ANALYSIS OF THE EXISTING BUILDING WITH THE EXISTING AND PROPOSED LOADS PERFORMED BY NB+C.  
NB+C PROJECT #: 100595.

APPLICANT	 T M O B I L E A T T M R A T S M D A																
ENGINEER	 <b>TOTALLY COMMITTED.</b> NB+C ENGINEERING SERVICES, LLC. M A R S A D R S T C R D M																
SITE INFORMATION	A S T R S T A R M D M T M R T																
DESIGN RECORD	<table border="1"> <tr> <td colspan="4">R O O S S</td> </tr> <tr> <td>1</td> <td>07/13/2020</td> <td>REV PER COMMENTS</td> <td>DH</td> </tr> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> <tr> <td>R</td> <td>DAT</td> <td>D S R T</td> <td></td> </tr> </table>	R O O S S				1	07/13/2020	REV PER COMMENTS	DH	0	06/29/2020	FINAL CDs	CAR	R	DAT	D S R T	
R O O S S																	
1	07/13/2020	REV PER COMMENTS	DH														
0	06/29/2020	FINAL CDs	CAR														
R	DAT	D S R T															
PROFESSIONAL STAMP	 PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 55491, EXPIRATION DATE 01/08/2022																
ENGINEER	T R O T T R A S S A R R M A R A D R S S A S																
SHEET TITLE	ELEVATION																
SHEET NUMBER	C-2																



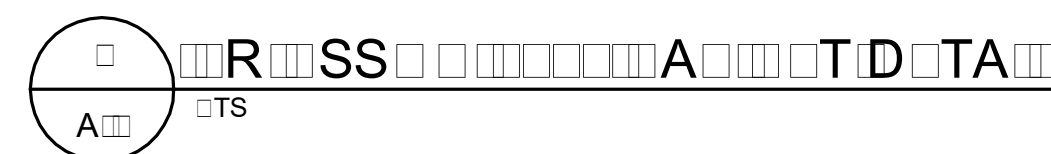
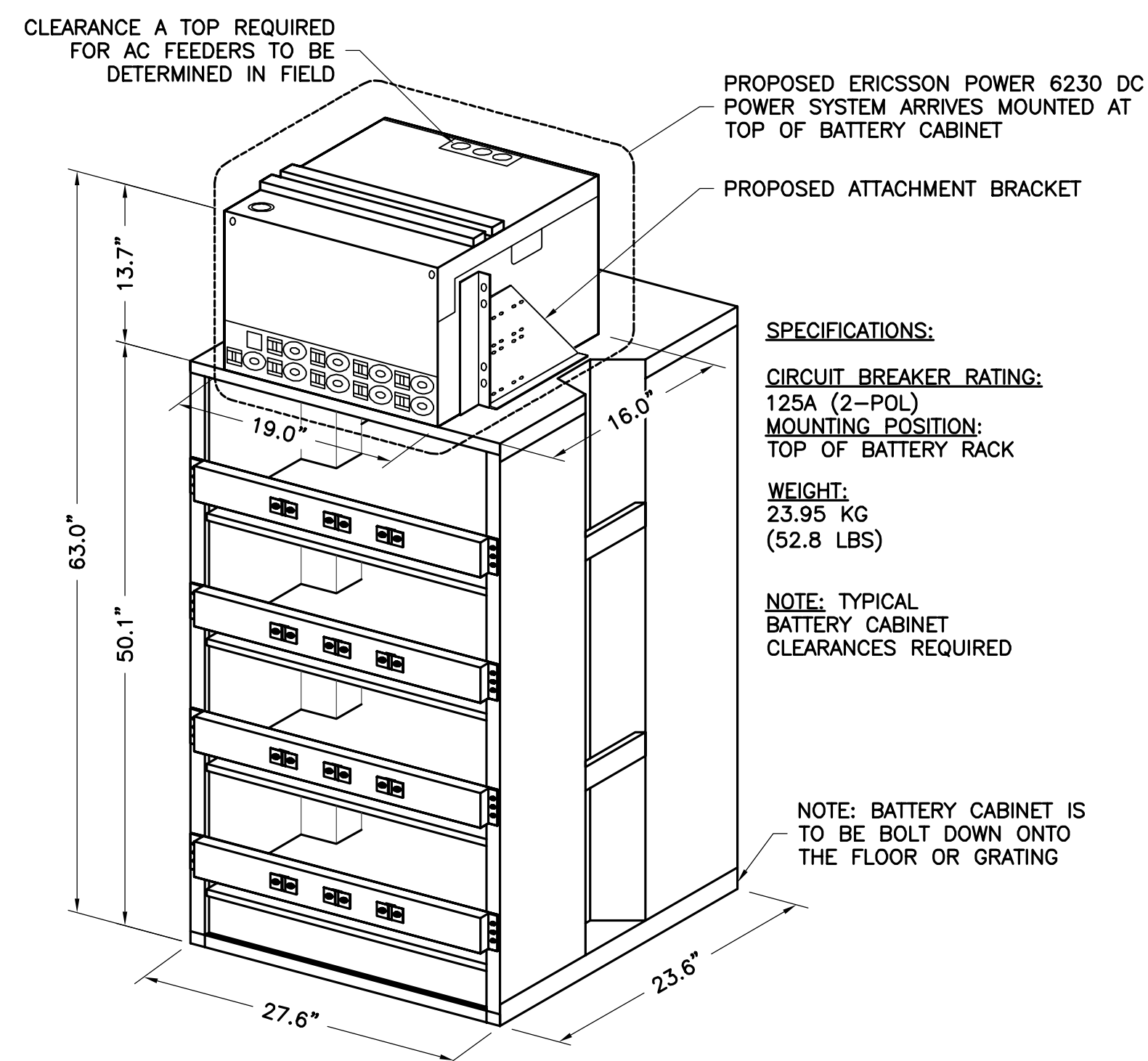
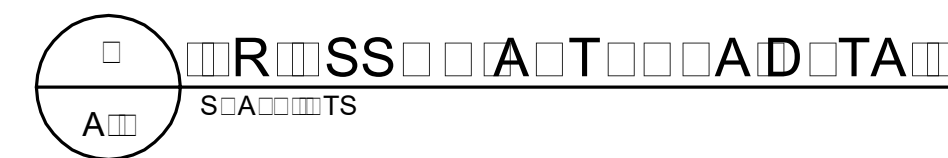




SIZE AND WEIGHT TABLE

RRU	WIDTH	DEPTH	HEIGHT	WEIGHT W/O BRACKET
RADIO 4415 B25	13.2"	5.4"	14.9"	46.3 LBS. (21 kg)

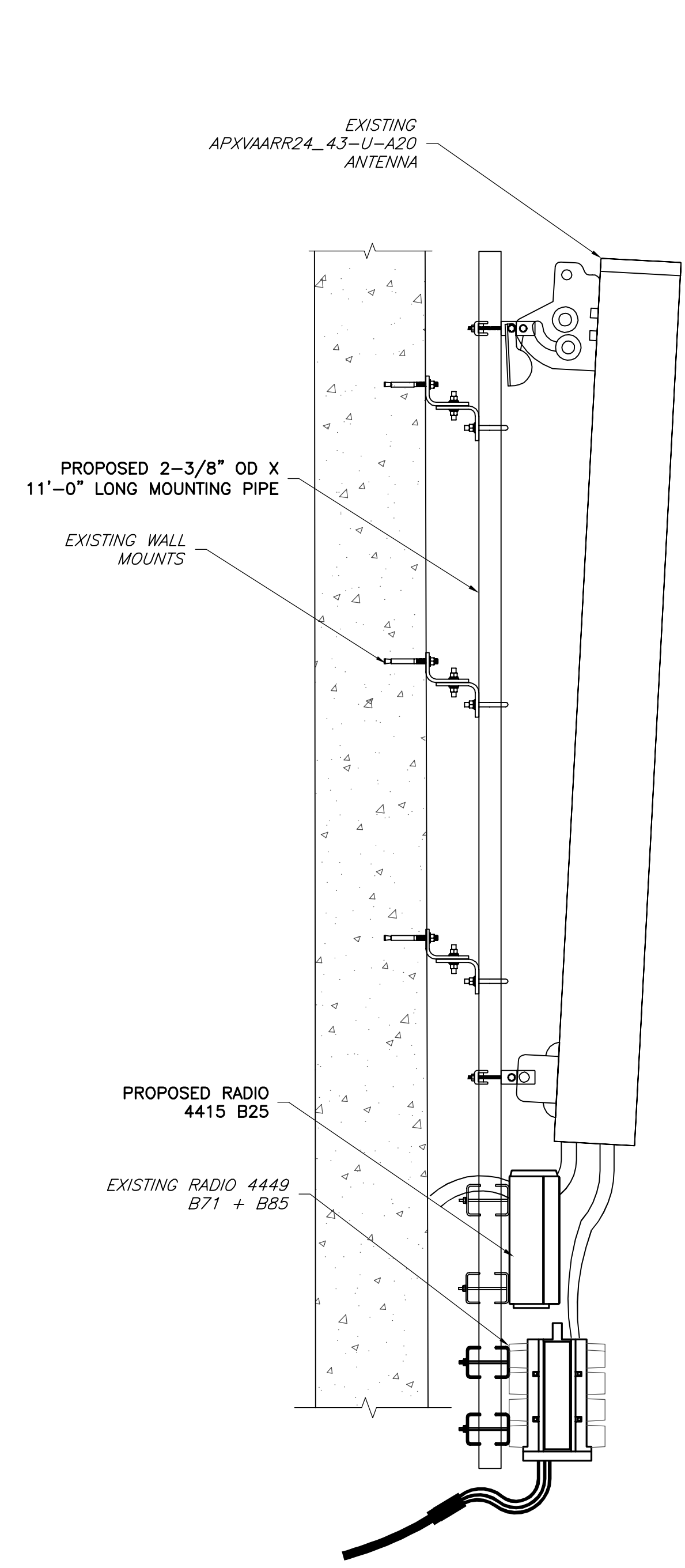
**NOTES:**  
 1. DO NOT PAINT THE RRU. RRU SOLAR SHIELD CAN BE PAINTED PER MANUFACTURER'S METHOD OF PROCEDURE.



NOTE: SEE SHEET G-1 FOR RRU AND ANTENNA GROUNDING

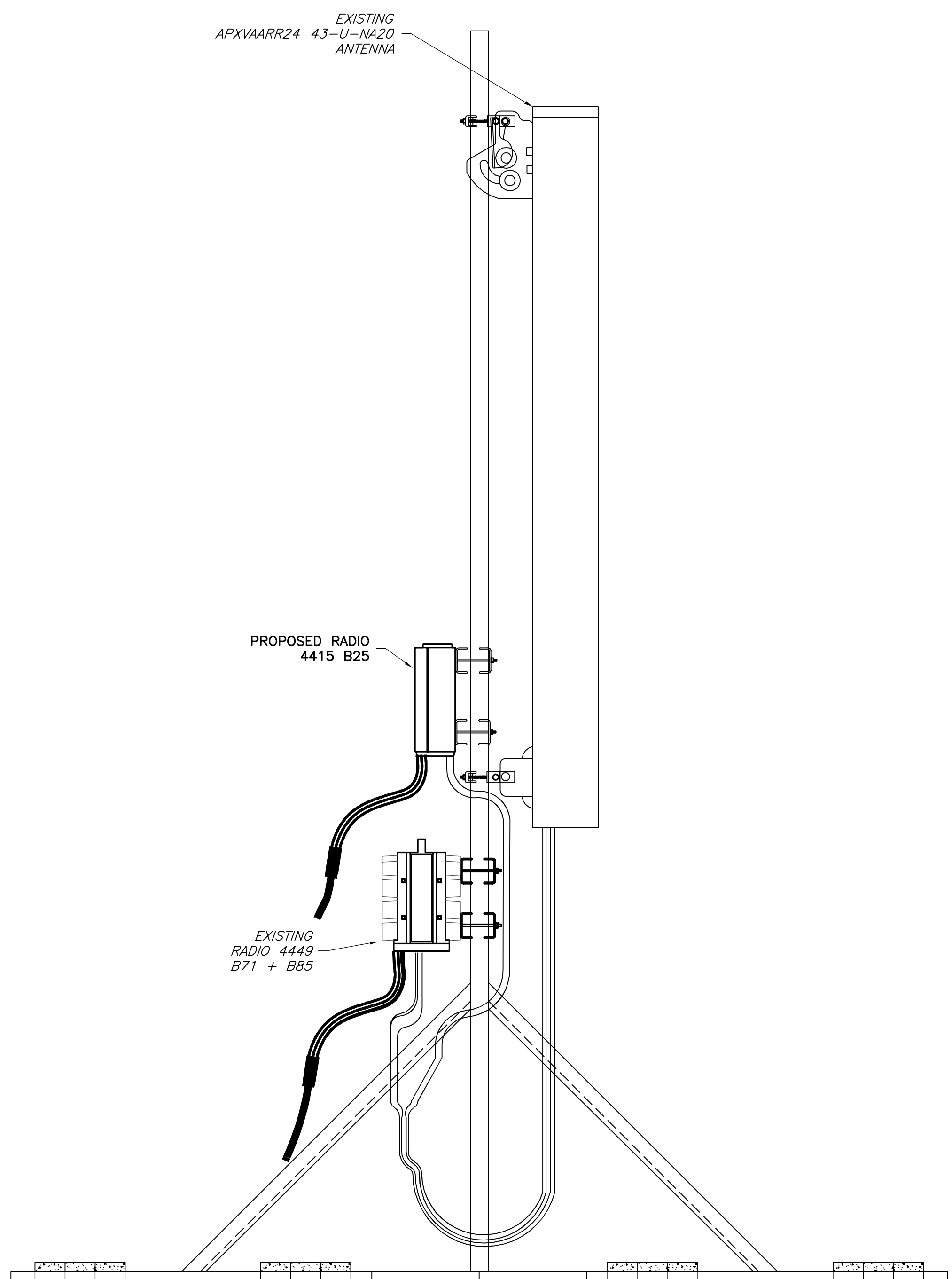
APPLICANT	 T-Mobile TIMOTHY R. CASTLE ATTORNEY AT LAW 10000 W. BRIDLE PATH AUSTIN, TEXAS 78738																
ENGINEER	 <b>NB+C</b> TOTALLY COMMITTED. NB+C ENGINEERING SERVICES, LLC. 10000 W. BRIDLE PATH AUSTIN, TEXAS 78738																
SITE INFORMATION	ANTENNA SITE RADIATION ANTENNA RADIATION MOUNTING RADIATION																
DESIGN RECORD	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>NO.</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>07/13/2020</td> <td>REV PER COMMENTS</td> <td>DH</td> </tr> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </tbody> </table>	REVISIONS				NO.	DATE	DESCRIPTION	BY	1	07/13/2020	REV PER COMMENTS	DH	0	06/29/2020	FINAL CDs	CAR
REVISIONS																	
NO.	DATE	DESCRIPTION	BY														
1	07/13/2020	REV PER COMMENTS	DH														
0	06/29/2020	FINAL CDs	CAR														
PROFESSIONAL STAMP	 PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 55491, EXPIRATION DATE 01/08/2022																
ENGINEER	TIMOTHY R. CASTLE MARYLAND REGISTERED PROFESSIONAL ENGINEER LICENSE NO. 55491																
SHEET TITLE	<b>ANTENNA          SPECIFICATIONS          &amp; DETAILS</b>																
SHEET NUMBER	<b>A-2</b>																





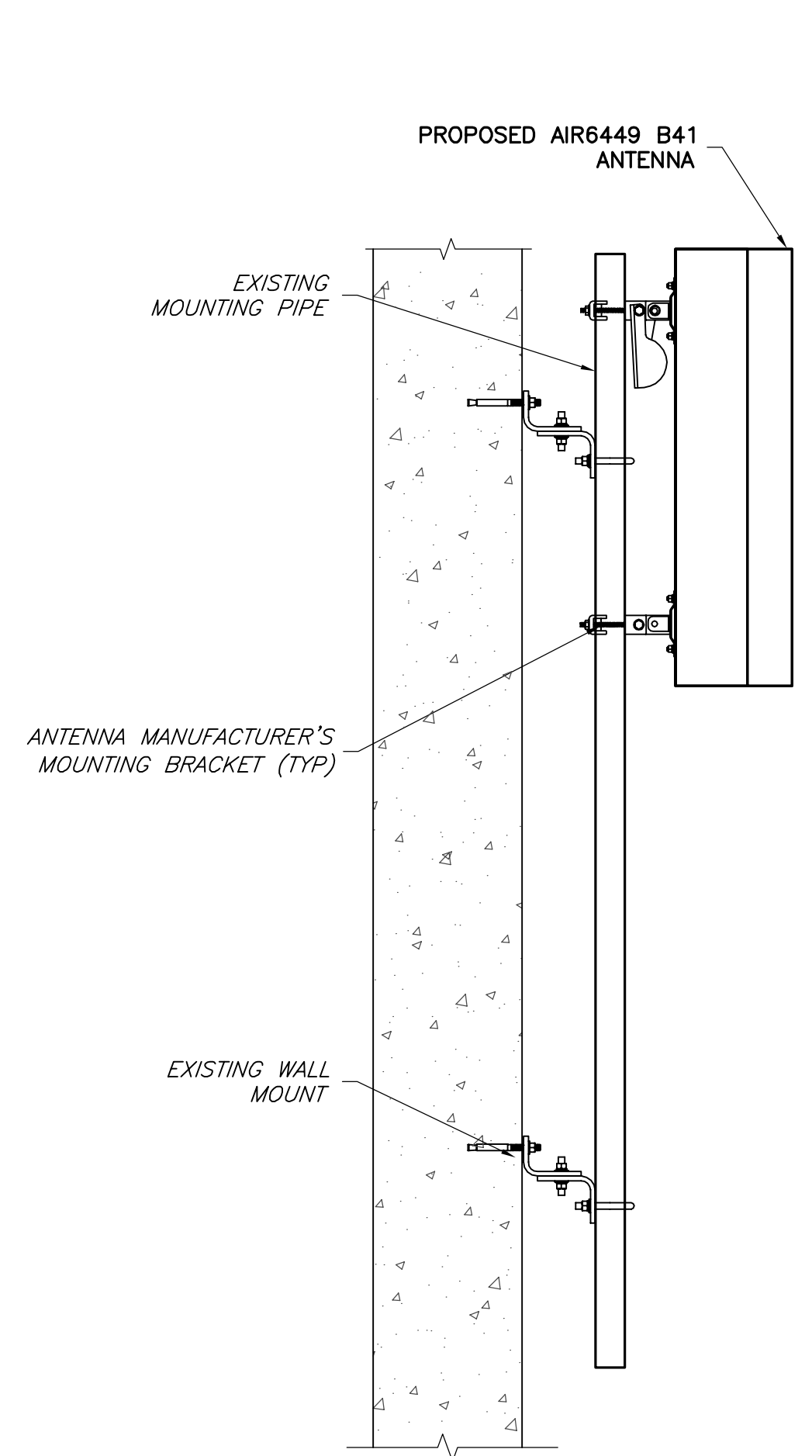
NOTE: SEE SHEET G-1 FOR RRU AND ANTENNA GROUNDING

RRUMTAAATA DTA  
A TS



NOTE: REFER TO STRUCTURAL REPORT COMPLETED BY NB+C ENGINEERING SERVICES, LLC FOR REQUIRED BALLAST WEIGHT

RRTRDIMDTA AMMA  
A TS



ALPHA/BETA/GAMMA

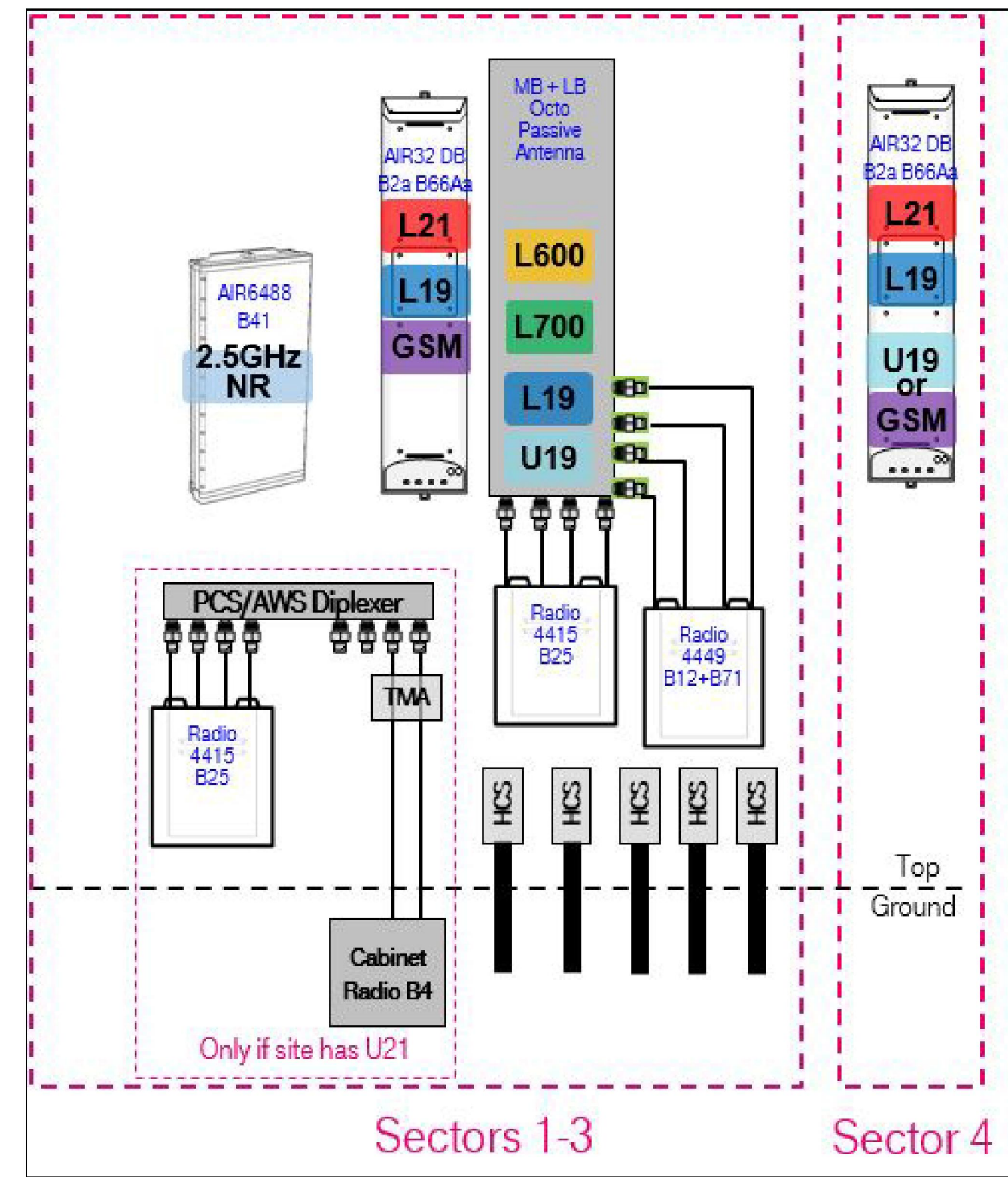
NOTE: SEE SHEET G-1 FOR RRU AND ANTENNA GROUNDING

ATA MDTA  
A TS

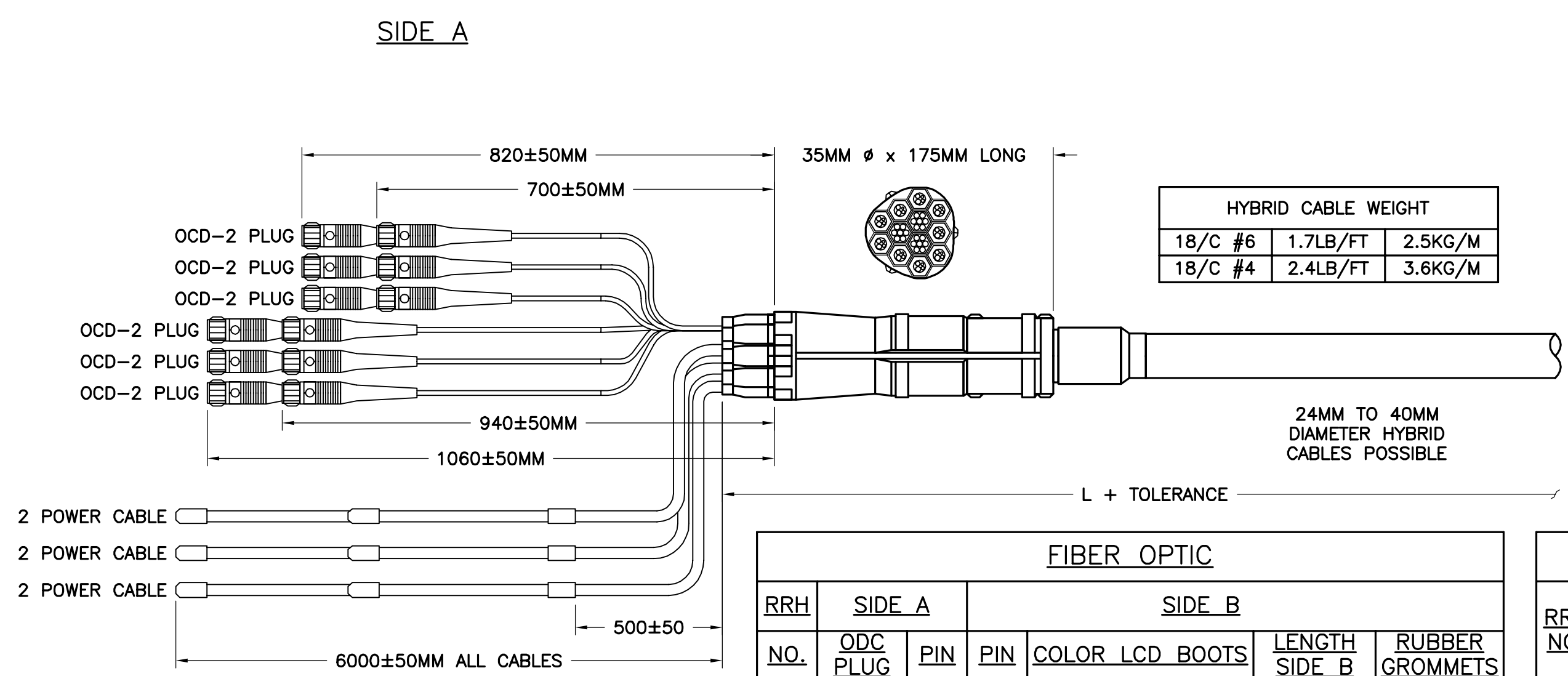
NOTE: ANTENNAS ARE TO BE MOUNTED FLUSH LEVEL WITH THE TOP OF THE WALL IN WHICH THEY ARE SUPPORTED BY.

APPLICANT	<p>T-Mobile TM RT CAST ATM R A TS MD A</p>								
ENGINEER	<p>NB+C TOTALLY COMMITTED. NB+C ENGINEERING SERVICES, LLC. MARS ADDRESS RD MD</p>								
SITE INFORMATION	<p>A STR STA RMD MTRT</p>								
DESIGN RECORD	<p>R S S</p> <table border="1"> <tr> <td>1</td> <td>07/13/2020</td> <td>REV PER COMMENTS</td> <td>DH</td> </tr> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </table> <p>R DAT DSR T</p>	1	07/13/2020	REV PER COMMENTS	DH	0	06/29/2020	FINAL CDs	CAR
1	07/13/2020	REV PER COMMENTS	DH						
0	06/29/2020	FINAL CDs	CAR						
PROFESSIONAL STAMP	<p>PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 55491, EXPIRATION DATE 01/08/2022</p>								
ENGINEER	<p>TRTRA SARR MARADR S A R S</p>								
SHEET TITLE	<p>ANTENNA &amp; RRU MOUNTING DETAILS</p>								
SHEET NUMBER	<p>A-3</p>								

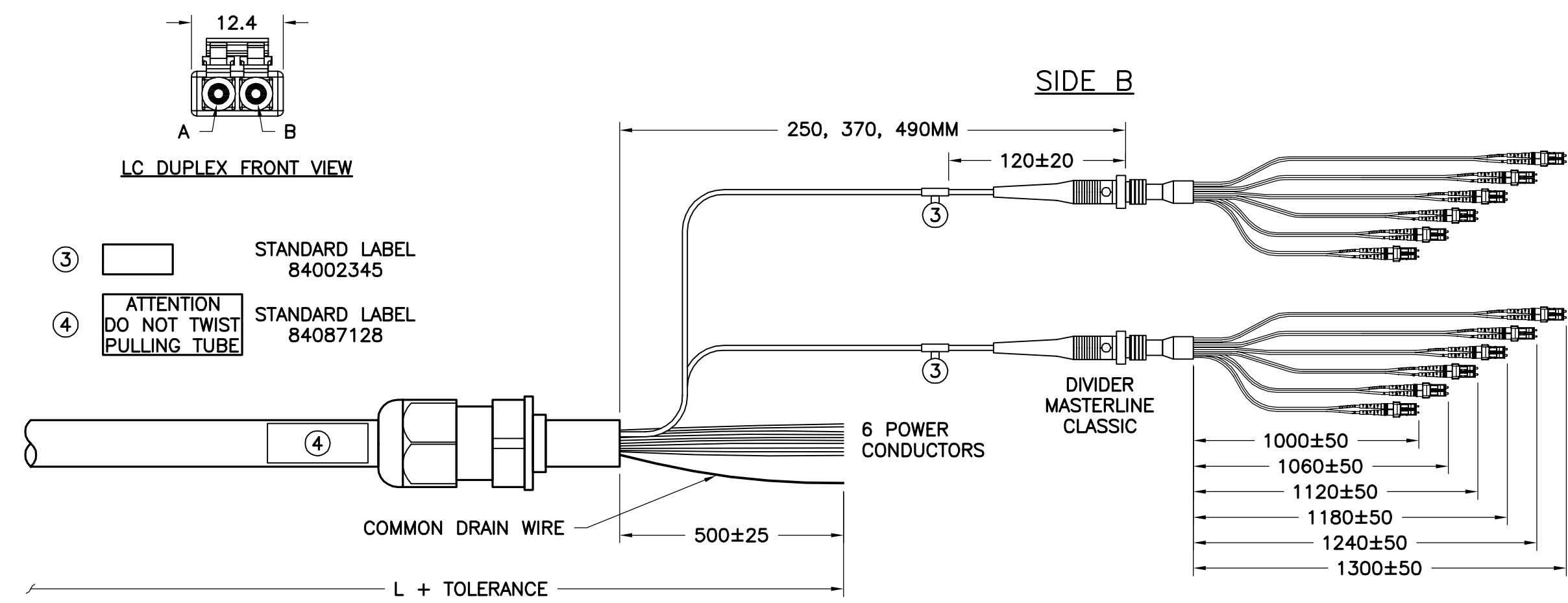




M O D I F I C A T I O N S  
A



HYBRID CABLE WEIGHT		
18/C #6	1.7LB/FT	2.5KG/M
18/C #4	2.4LB/FT	3.6KG/M

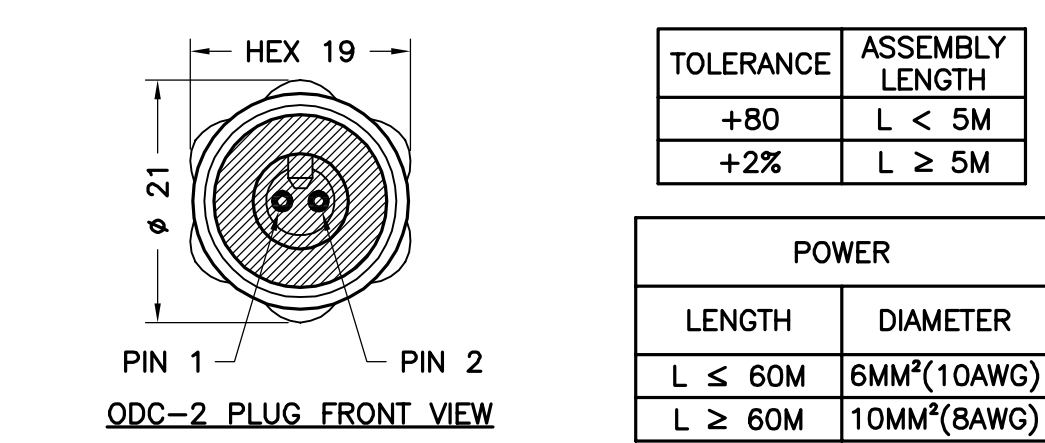


STANDARD LABEL 84002345  
ATTENTION DO NOT TWIST PULLING TUBE  
STANDARD LABEL 84087128

RRH NO.	SIDE A		SIDE B		
	ODC PLUG	PIN	PIN	COLOR LCD BOOTS	LENGTH SIDE B
1	ODC-2 RED	1 B	2 A	RED (SHORT BREAKOUT)	1000 ± 50
2	ODC-2 GREEN	1 B	2 A	GREEN	1060 ± 50
3	ODC-2 BLUE	1 B	2 A	BLUE	1120 ± 50
4	ODC-2 YELLOW	1 B	2 A	RED (SHORT BREAKOUT)	1180 ± 50
5	ODC-2 WHITE	1 B	2 A	GREEN	1240 ± 50
6	ODC-2 BLACK	1 B	2 A	BLUE	1300 ± 50

RRH NO.	REF HOOK UP	SIDE A		SIDE B
		WIRE COLOR	CABLE DESIGNATOR	WIRE COLOR
1	-48V	BLACK		RED
	0V	GREY	RED	BLACK
	GROUND	DRAIN		COMMON DRAIN
2	-48V	BLACK		GREEN
	0V	GREY	GREEN	WHITE
	GROUND	DRAIN		COMMON DRAIN
3	-48V	BLACK		BLUE
	0V	GREY	BLUE	ORANGE
	GROUND	DRAIN		COMMON DRAIN

RRH NO.	REF HOOK UP	SIDE A		SIDE B
		WIRE COLOR	CABLE DESIGNATOR	WIRE COLOR
4	-48V	BLACK		RED
	0V	GREY	RED 2X BANDS	BLACK
	GROUND	DRAIN		COMMON DRAIN
5	-48V	BLACK		GREEN
	0V	GREY	GREEN 2X BANDS	WHITE
	GROUND	DRAIN		COMMON DRAIN
6	-48V	BLACK		BLUE
	0V	GREY	BLUE 2X BANDS	ORANGE
	GROUND	DRAIN		COMMON DRAIN



TOLERANCE	ASSEMBLY LENGTH
+80	L < 5M
+2%	L ≥ 5M

POWER	
LENGTH	DIAMETER
L ≤ 60M	6MM <sup>2</sup> (10AWG)
L ≥ 60M	10MM <sup>2</sup> (8AWG)

M O D I F I C A T I O N S  
A

**T-Mobile**  
T M O B I L E  
A T T M R A  
T S M D  
A

**NB+C**  
TOTALLY COMMITTED.  
NB+C ENGINEERING SERVICES, LLC.  
M A R S A D R I S T  
C R D M

A  
S T R  
S T A  
R M D  
M T M R T

R O S S

REV	DATE	DESCRIPTION	BY
1	07/13/2020	REV PER COMMENTS	DH
0	06/29/2020	FINAL CDs	CAR

PROFESSIONAL STAMP  
STATE OF MARYLAND  
PROFESSIONAL ENGINEER  
55491  
PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022

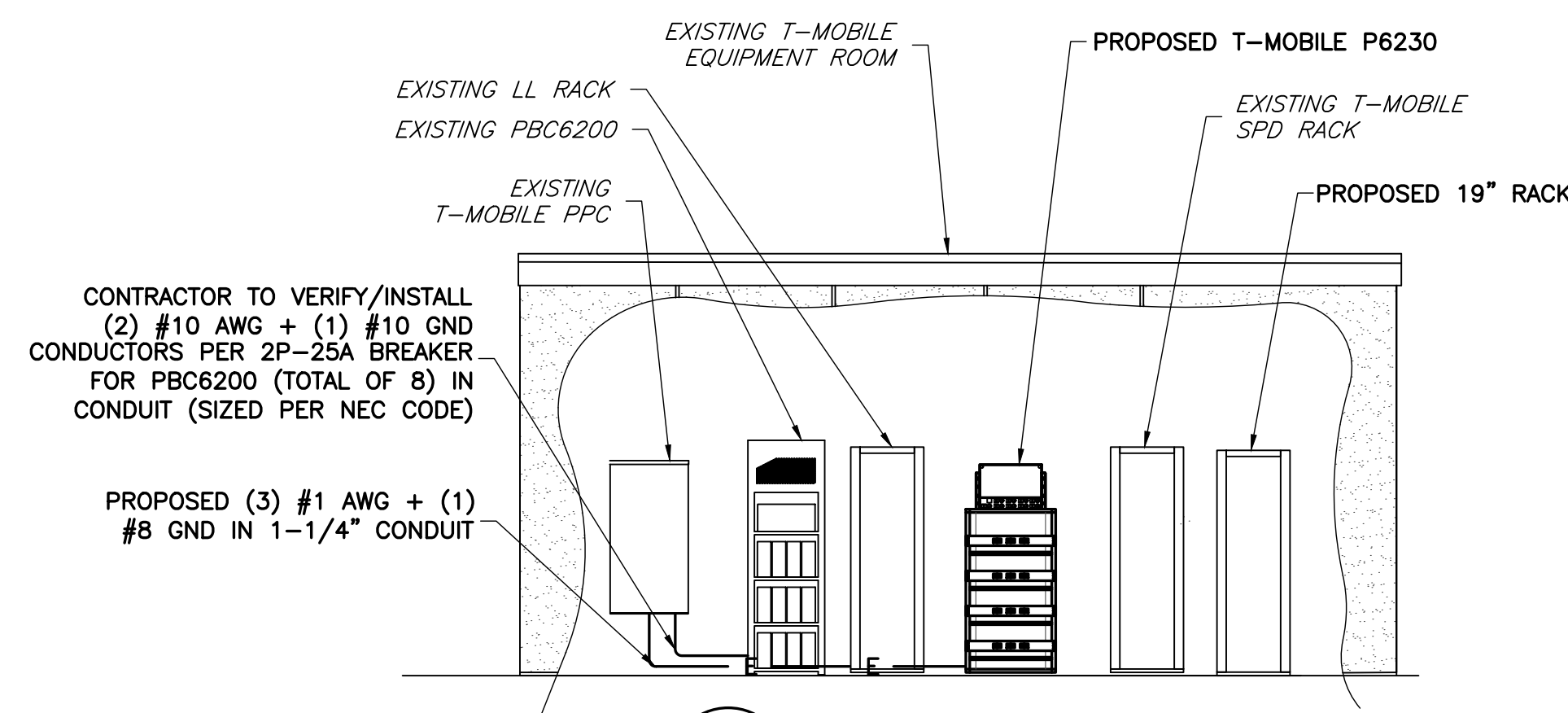
T R A N S I S A R R  
M A R A D R O S S A  
S

SHEET TITLE  
**CABLING DETAILS & PLUMBING DIAGRAM**

SHEET NUMBER  
**A-4**

PPC PANEL												
PANEL NAME: PPC 120/240 VOLTS 3 WIRE 1 PHASE MAIN BREAKER: 200A												
LOAD DESCRIPTION	LOAD PER PHASE		TRIP	POLES	LOAD PER PHASE TOTALS		POLES	TRIP	LOAD PER PHASE		LOAD DESCRIPTION	
	PHASE				A	B			PHASE			
	A	B							A	B		
1 SURGE ARRESTOR	0		60	2	180		1	10	180		2 FAN	
3		0				360	1	15		360	4 GFCI RECEPTACLE	
5 *PBC6200 CABINET	1350		25	2	2700		2	25	1350		6 *PBC6200 CABINET	
7		1350				2700	2	25		1350	8 *PBC6200 CABINET	
9 *PBC6200 CABINET	1350		25	2	2700		2	25	1350		10 *PBC6200 CABINET	
11		1350				2700	2	25		1350	12 *PBC6200 CABINET	
13 *PBC6200 CABINET	1350		25	2	2700		2	25	1350		14 *PBC6200 CABINET	
15		1350				2700	2	25		1350	16 *PBC6200 CABINET	
17 *PBC6200 CABINET	1350		25	2	8350		2	100	7000		18 *P6230	
19		1350				8350	-	-	0		20 SPACE	
21 *PBC6200 CABINET	1350		25	2	1350		-	-	0		22 SPACE	
23		1350				1350	-	-	0		24 SPACE	
NOTES:  *EXISTING PBC6200 REQUIRES (8) 2P-25A BREAKERS, CONTRACTOR TO INSTALL REMAINING BREAKERS **INSTALL (1) 2P-100A BREAKER FOR PROPOSED P6230					SUBTOTALS		TOTAL CONNECTED LOAD (VA):		36140			
					17980	18160	MAXIMUM LOAD CURRENT:		151.3			
							PANEL CAPACITY:		200			
							SPARE CAPACITY:		48.7			

1 PANEL SCHEDULE  
E-1 NTS

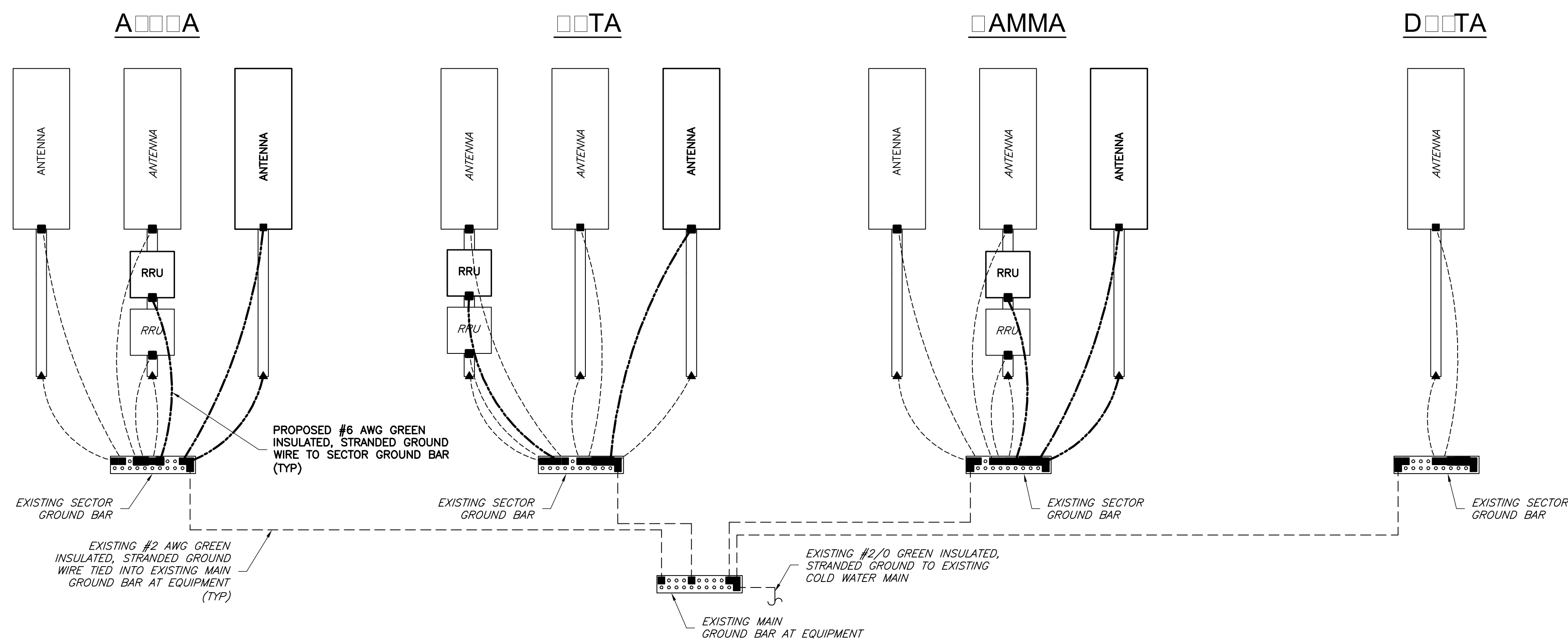


3 POWER DIAGRAM  
G-1 NTS

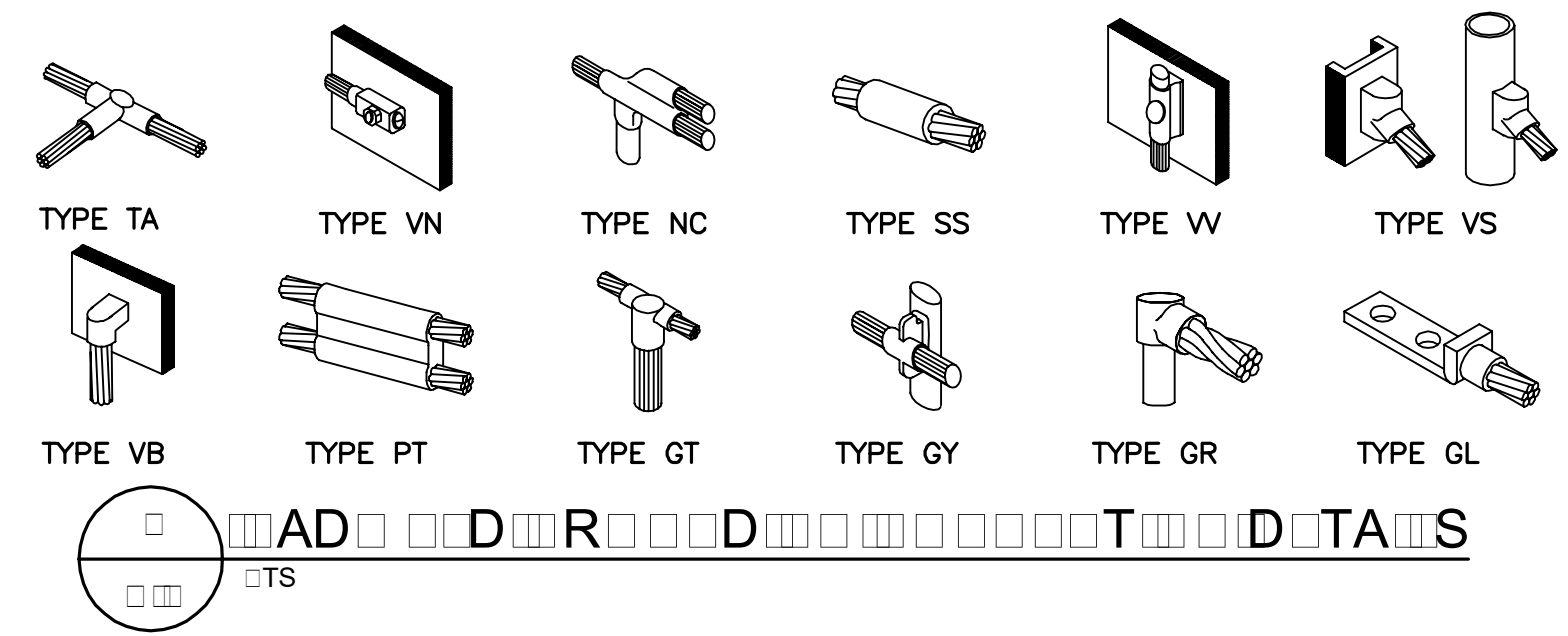
ELECTRICAL LEGEND		
	A	AMPERE
	C	CONDUIT
	EMT	ELECTRICAL METALLIC TUBING
	G	GROUND
	GFI	GROUND FAULT INTERRUPTING
	KWH	KILOWATT HOUR
	MCB	MAIN CIRCUIT BREAKER
	P	POLE
	SW	SWITCH
	V	VOLT
	W	WIRE

APPLICANT	 <b>T-Mobile</b> T-MOBILE NORTHEAST LLC 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610												
ENGINEER	 <b>NB+C</b> <b>TOTALLY COMMITTED.</b> <b>NB+C ENGINEERING SERVICES, LLC.</b> <small>6095 MARSHALEE DRIVE, SUITE 300          ELK RIDGE, MD 21075          (410) 712-7092</small>												
SITE INFORMATION	7WAN094C KEYWEST - ROCKVILLE 9420 KEY WEST AVENUE ROCKVILLE, MD 20850 MONTGOMERY COUNTY												
DESIGN RECORD	<table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>07/13/2020</td> <td>REV PER COMMENTS</td> <td>DH</td> </tr> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY	1	07/13/2020	REV PER COMMENTS	DH	0	06/29/2020	FINAL CDs	CAR
REV	DATE	DESCRIPTION	BY										
1	07/13/2020	REV PER COMMENTS	DH										
0	06/29/2020	FINAL CDs	CAR										
PROFESSIONAL STAMP	 <small>PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022.</small>												
ENGINEER	TRENT TRAVIS SNARR, P.E. MARYLAND PROFESSIONAL ENGINEER LICENSE #55491												
SHEET TITLE	<b>ELECTRICAL DETAILS</b>												
SHEET NUMBER	<b>E-1</b>												

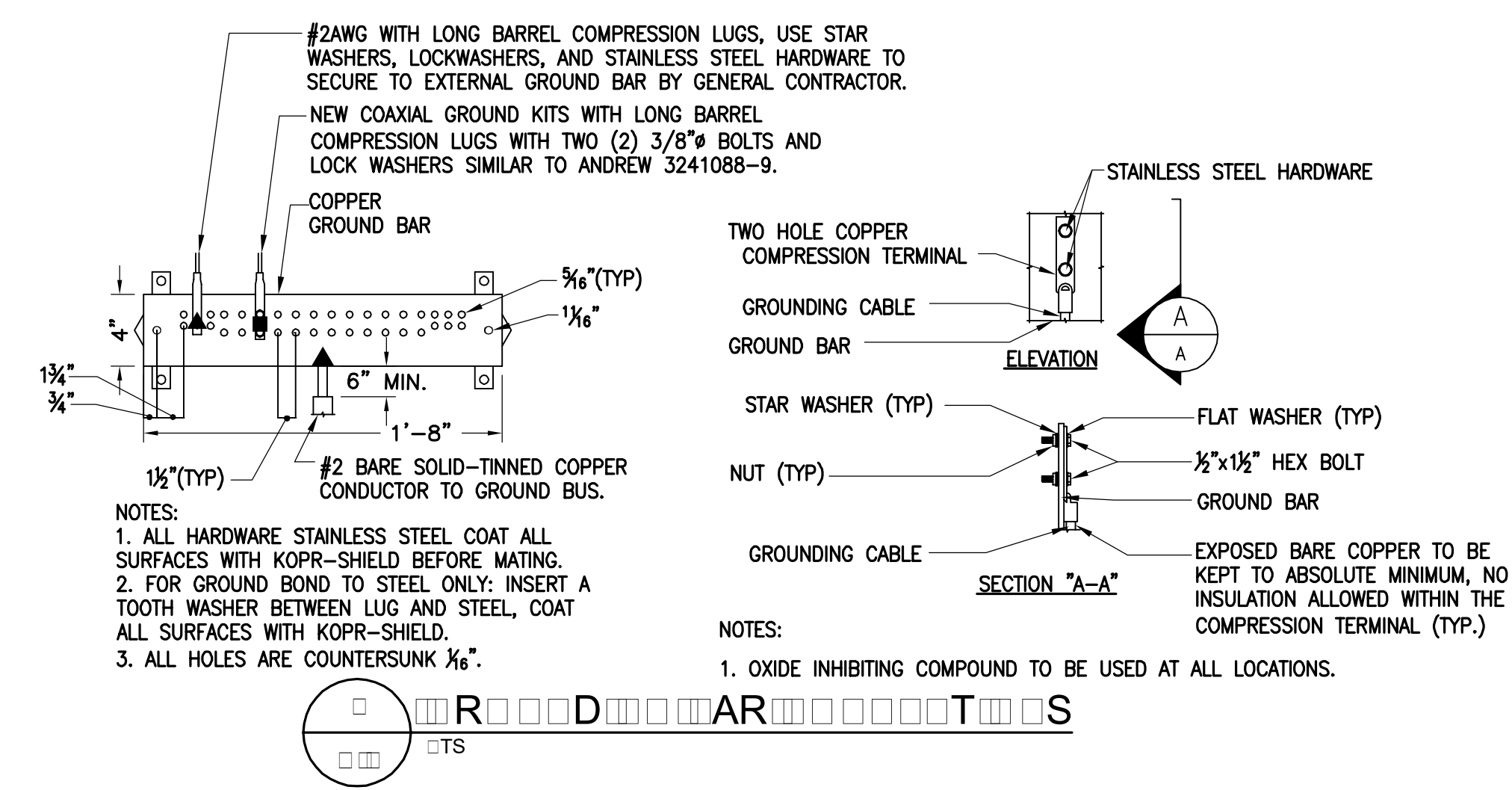




ATS  
A T A R D D T A



ATS  
A D R D T D T A S



- NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
  2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
  3. ALL HOLES ARE COUNTERSUNK 1/8".

- NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

ATS  
R D A R T S

GROUNDING LEGEND	
■	MECHANICAL FITTING CONNECTION
▲	CADWELD CONNECTION
●	EXOTHERMIC WELD CONNECTION
—	PROPOSED GROUND WIRING
- - - - -	EXISTING GROUND WIRING

APPLICANT	<p>TIMORCAST ATMRO TSMO A</p>								
ENGINEER	<p>TOTALLY COMMITTED. NB+C ENGINEERING SERVICES, LLC. MARS ANDRIST RDM</p>								
SITE INFORMATION	<p>A STRO STIA RMD MTCMRT</p>								
DESIGN RECORD	<p>RSSS</p> <table border="1"> <tr> <td>1</td> <td>07/13/2020</td> <td>REV PER COMMENTS</td> <td>DH</td> </tr> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </table> <p>R DAT DSR T</p>	1	07/13/2020	REV PER COMMENTS	DH	0	06/29/2020	FINAL CDs	CAR
1	07/13/2020	REV PER COMMENTS	DH						
0	06/29/2020	FINAL CDs	CAR						
PROFESSIONAL STAMP	<p>PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND, LICENSE NO. 55491, EXPIRATION DATE 01/08/2022</p>								
ENGINEER	<p>TRTTRASSARR MARDRSSA S</p>								
SHEET TITLE	GROUNDING DETAILS								
SHEET NUMBER	G-1								

App No:

2020071203

Application General Information

Applicant Name

Updated

Application Type

Ann. Plan?

Carrier

Will site be used to support government telecommunications facilities or other equipment for government use?

Solution Type

Existing

Gvt. Use Desc.

Application Description

T-Mobile proposes removing (3) antennas, (3) RRUs, and (1) Cabinet, and installing (3) antennas, (3) RRUs, and (1) cabinet at the existing telecommunications facility.

Site Information

Site Id

Zoning

Structure Type

Latitude

Address

Longitude

County Site Name

Ground Elevation

Carrier Site Name

City

Site Owner

Lease Status

Structure Owner

Does the structure require an antenna structure registration under FCC Title 47

Existing Structure Height

Distance to Residential Property (New, Replacement, Colocation Only)

Provide the proposed height of the replacement structure without any antenna (New, Replacement Apps Only)

Distance to Commercial Property (New, Replacement, Colocation Only)

Justification of why this site was selected:

Existing Telecommunications Facility

Nearby Sites (New, Replacement Apps Only):

App No:

2020071203

Screening considerations(New, Colocations, Replacement Apps Only):

App No:

2020071203

6409 Questions

Does this qualify as a 6409 application? (Minor Mod, Colocations Only)

Yes

For towers outside the public ROW will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 20 feet, whichever is greater?

No

Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet?

No

For towers outside the public ROW will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 20 feet?

No

More than four Equipment Cabinets? YN

No

Will the proposed installation require excavation or expansion outside the current boundaries of the site?

No

Will the proposed installation increase the height of the structure by: (1) more than 10% or (2) more than 10 feet, whichever is greater?

No

Does the structure or current installation have concealment elements/measures?

No

If yes, describe how the proposed installation does not defeat the existing concealment.

Small Wireless Facility Informatio

Small Wireless Facility Questions

Small Wireless Facility?

No

Is the structure 10% taller than adjacent structures?

Cumulative volume of the proposed wireless equipment(s) exclusive of antennas in cubic feet

0

Please list adjacent structure heights

Cumulative volume of the proposed antenna antenna(s) exclusive of equipment

Tribal Lands?

No

ROW Information

PROW?

No

Pole Number

ROW owner

ROW width

App No:

2020071203

Antenna Information

Antenna Compliance:

Compliance Desc:

Antenna Location:

Antenna Loc. Desc.:

Env. Assessment:

Cat. Excluded?:

Routine Env. Evaluation:

Antenna Model:

Frequency:

RAD Center:  Max ERP:  Antenna Dimensions:  Quantity:

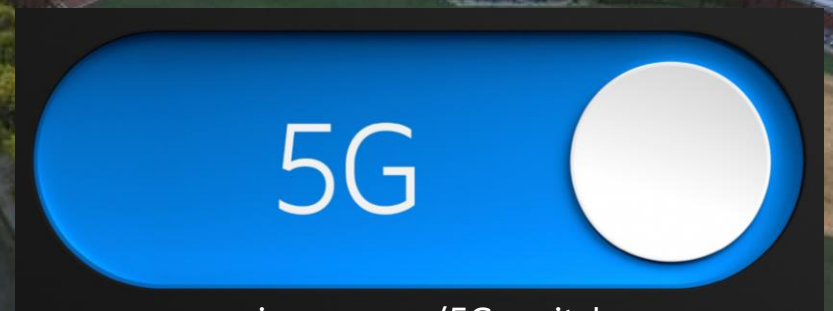






# Radio Portfolio B41 Products for T-Mobile

March 2020



[ericsson.com/5G-switch](https://ericsson.com/5G-switch)

# AIR 6488, B41



- Advanced Antenna System (AAS)
- 64TX/64RX with 128 AE
- Support operation frequency range 2496-2690 MHz
- Support output power up to 200W
- Support 100 MHz IBW & CBW
- Support NR and NR+LTE in split mode
- 3 x 10 Gbps eCPRI
- Power consumption < 1290W
- Weight: 58 kg
- Size (H x W x D): 884x520x183 mm
- -48 VDC (3-wire or 2-wire)
- -40 to +55°C
- Multi-layer MU MIMO
  - DL/UL: 16/8



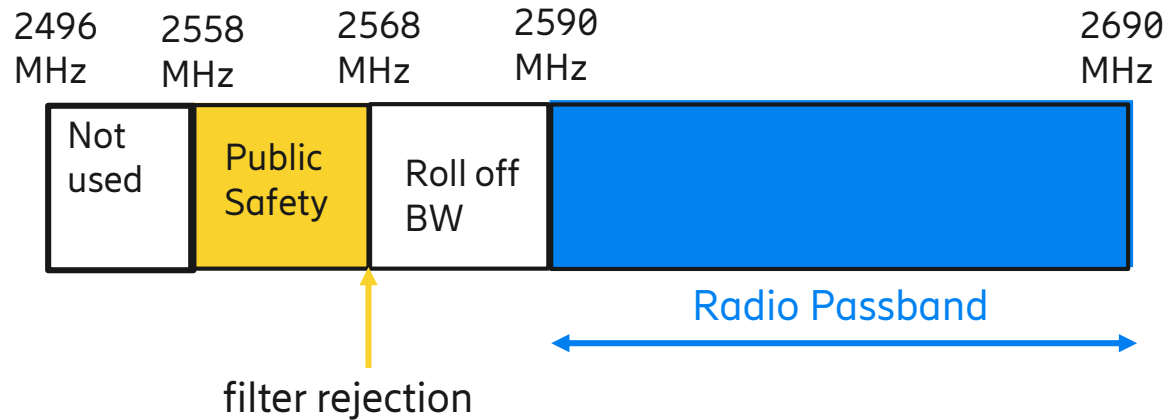
# AIR 6488, B41M



- Advanced Antenna System (AAS)
- 64TX/64RX with 128 AE
- Support operation frequency range 2590-2690 MHz
- Support output power up to 200W
- Support 100 MHz IBW & CBW
- Support NR and NR+LTE in split mode
- 3 x 10 Gbps eCPRI
- Power consumption < 1290W
- Weight: 58 kg
- Size (H x W x D): 884x520x183 mm
- -48 VDC (3-wire or 2-wire)
- -40 to +55°C
- Multi-layer MU MIMO
  - DL/UL: 16/8



# AIR 6488M for New York City Band 41M support



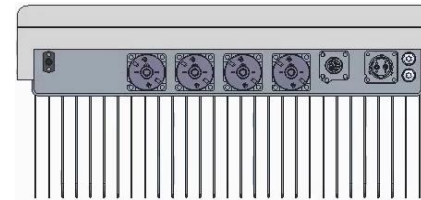
B41 in New York City currently has a UMTS Public Safety Network that requires OOB interference protection from New T-Mobile Network

# AIR 6449

Preliminary



- 192 antenna elements, 3:1 subarray
- Up to 300W
- Up to 200 MHz Operating BW & Carrier BW
- Two 25 Gb/s SFP(C2) and Two 10 Gb/s QSFP(C1FD and C2 backup)
- -48V 45 A Two wire and three wire versions
- APC light connector and Self test push button
- Sensor support but undefined
- Size B41:
  - 841 x 521 x 217 mm (H x W x D)
  - Volume: 95 liter
  - Weight: 47 kg



PRA: July 2020



# Radio 8863




Preliminary

- 8TX/8RX
- Support split mode (2 x 4T4R or 4 x 2T2R as multi-sector solution)
- Tx Power 8x40W
- 200MHz IBW TDD
- 2x10.1/25Gbps CPRI
- 21.5 liter, 21kg
- External antenna calibration
- -48 VDC 3-wire
- AISG RET support via RS-485 or RF connectors
- Optional fan for increased site flexibility
- 2 external alarm
- Convictional cooling
- IP 65, -40 to +55°C





# Radio Details: Mid Band TDD (Massive) MIMO (Band 41)

AIR or Radio Type	AIR 6488 (G2) 	AIR 6449 (G4) 	Radio 8863 
RATs supported	L, NR	L, NR	L, NR
Power capability	200W	300W	8x40W
Modulation	256QAM	256QAM	256QAM
Bandwidth (IBW/CBW)	100 MHz or 60L+60N	194 MHz	196 MHz
Tx and Rx Array	64T64R	64T64R	8 CSI-RS ports
MIMO layers (DL/UL)	16 DL / 8 UL	16 DL / 8 UL	16 DL / 8 UL
CPRI ports	3 x 10G	4 x 25G* (2x10G+2x25G)	2 x 25G*
Dimensions (HxWxD)	884mm x 520mm x 183mm (34.8" x 20.5" x 7.2")	840mm x 520mm x 210mm (33.1" x 20.5" x 8.3")	(21.5 ltr)
Weight	58 kg (128 lbs)	47 kg (103 lbs)	Approx. 21 kg (46 lbs)
Cooling	Convection	Convection	Convection
Power	-48VDC	-48VDC	-48VDC
Power Consumption	1290W	<1100W	TBD
Availability	Q2 2019	Q3 2020	Q2 2020



# Radio 4408 B41

- 4TX/4RX TDD
- 4x5W
- IBW up to 150 MHz CBW
- Up to 6 LTE carriers
- 2x 2.5/5/9.8/10.1Gbps CPRI
- 4 liter, less than 5kg incl bracket and cover
- AC or -48 VDC
- Integrated or external antenna
- 2 external alarm
- IP 65
- -40 to +55°C





## Ericsson 6230 Design Specification

The methods for configuring the 6230 for field deployment are presented.

T-Mobile Engineering & Operations

Ericsson

6230

MTS

Mobile

Ericsson Design Specification		Ericsson Design Specification	
Ericsson Design Specification			
Ericsson Design Specification	Ericsson Design Specification		
Ericsson Design Specification	<a href="#">Ericsson Design Specification</a>		

## Table of Contents

<b>1</b>	<b>Introduction / Project Summary.....</b>	<b>3</b>
	• Overview.....	
	• Introduction.....	
	• Assumptions.....	
<b>2</b>	<b>General Equipment Overview .....</b>	<b>3</b>
<b>3</b>	<b>6230 Placement .....</b>	<b>6</b>
<b>4</b>	<b>Baseline Capacity.....</b>	<b>6</b>
<b>5</b>	<b>Provisioning for Deployment .....</b>	<b>7</b>
	• Overview.....	
	• Activation.....	
	• Rollout.....	
	• Deployment Assumptions.....	
	• Sizing.....	
	• Migration.....	
	• Activation.....	
<b>6</b>	<b>Battery Backup Integration .....</b>	<b>14</b>
	• Overview.....	
	• System Requirements.....	

# 1 Introduction / Project Summary

## 1.1 Purpose of Project

The purpose of this project is to design and develop a new product that meets the requirements of the customer. The project is divided into several phases, including requirements gathering, design, development, testing, and deployment. The goal is to deliver a high-quality product that is reliable, secure, and easy to use.

## 1.2 Product Description

The product is a mobile application that allows users to manage their accounts and services. It features a user-friendly interface and robust security measures. The application is designed to be accessible on a wide range of mobile devices and operating systems. Key features include account management, service selection, and secure payment processing.

## 1.3 Assumptions

The following assumptions are made for this project: the customer will provide all necessary data and resources; the development team has the expertise to complete the project; and the project will be completed within the specified timeline and budget.

# 2 General Equipment Overview

The following table provides a general overview of the equipment specifications.

<b>Mechanical Specification</b>	
Dimensions	100 mm x 50 mm
Weight	0.5 kg
Material	Aluminum
Finish	Black powder coat
<b>Power System</b>	
Power Source	AC power supply
Power Consumption	100 W
Power Factor	0.95
Efficiency	90%
Temperature Range	0°C to 40°C
Humidity	5% to 95%
Vibration	10 m/s²
Shock	1500 g
EMC	CE mark
ESD	Class 1
Fire Rating	UL94V-0
RoHS	Compliant
REACH	Compliant
Warranty	3 years
Lead Time	12 weeks
Storage	1 year
<b>Operating Environmental</b>	





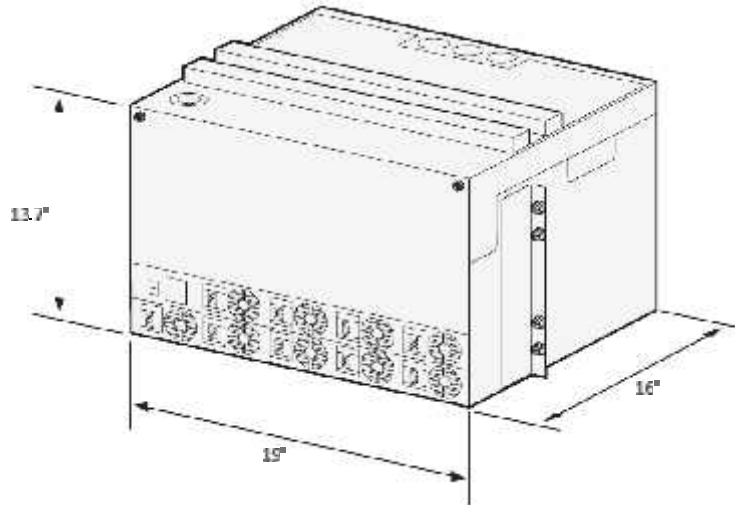


Figure 1

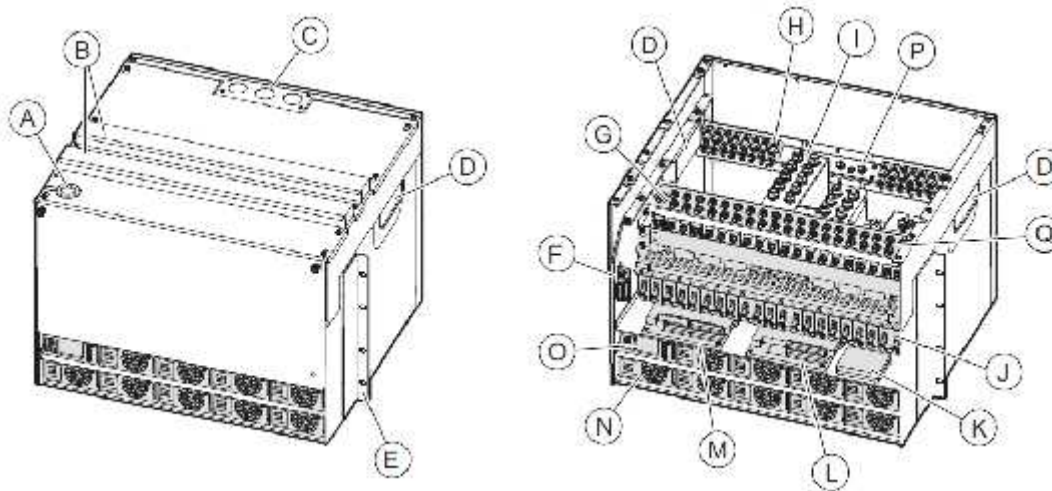


Figure 2

Feature	Unit
A	Antenna
B	Top cover
C	Bottom cover
D	Display
E	Keypad
F	Front panel
G	Speaker
H	Microphone
I	Camera
J	Earpiece
K	Volume keys
L	Power key
M	Memory card
N	Internal battery
O	Internal antenna
P	Internal display
Q	Internal keypad

### 3 6230 Placement

The 6230 is a 19-inch wide, 63-inch high, 23.6-inch deep equipment rack. It is designed to hold up to 10 1U equipment units. The rack is made of steel and is painted black. It has a front door that is hinged on the right side and can be locked. The rack is designed to be used in a server room or data center. It is compatible with standard 1U equipment units. The rack is also compatible with optional user equipment racks. The rack is designed to be used in a server room or data center. It is compatible with standard 1U equipment units. The rack is also compatible with optional user equipment racks.

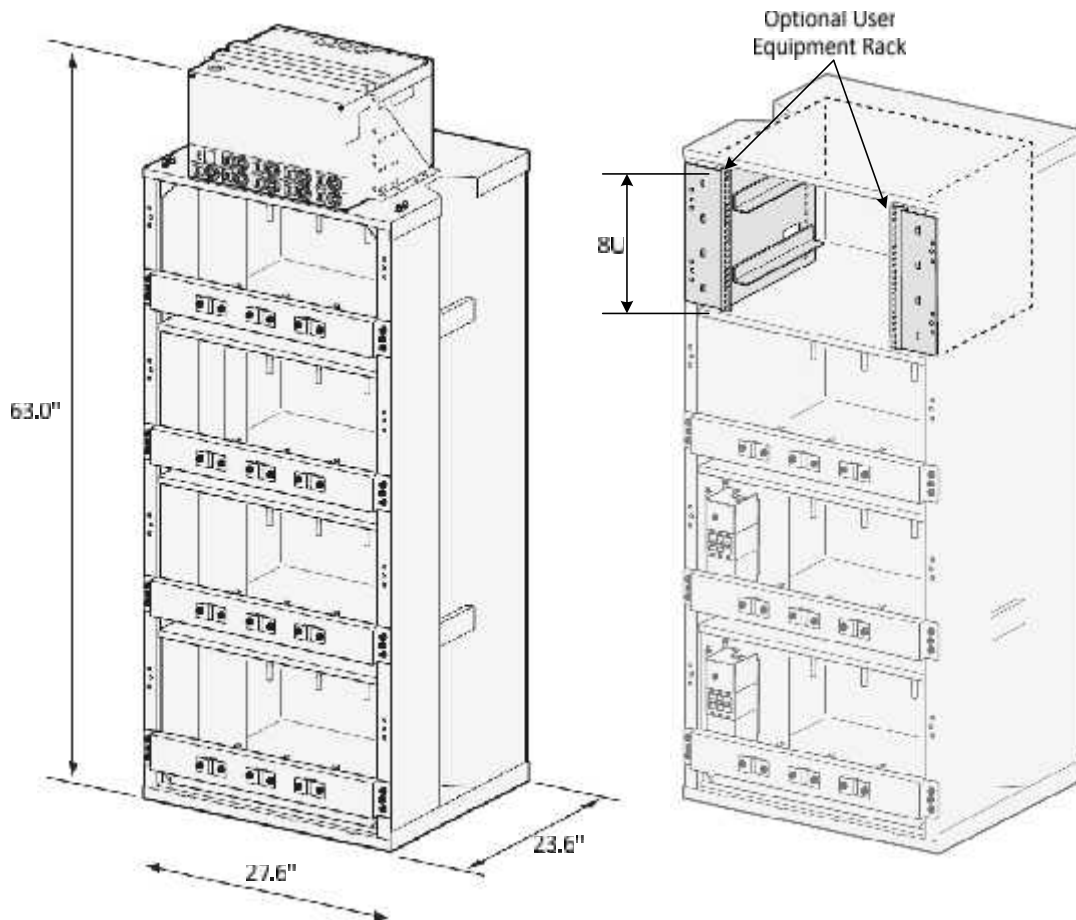


Figure 3

### 4 Baseline Capacity

The baseline capacity of the 6230 is 10 1U equipment units. The rack is designed to hold up to 10 1U equipment units. The rack is compatible with standard 1U equipment units. The rack is also compatible with optional user equipment racks. The rack is designed to be used in a server room or data center. It is compatible with standard 1U equipment units. The rack is also compatible with optional user equipment racks.







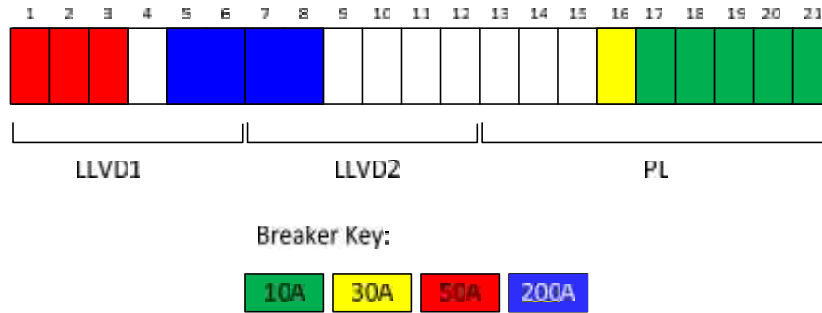


Figure 11

Ericsson 6230 Design Specification

### 5.5 SPD Function

Ericsson 6230 Design Specification

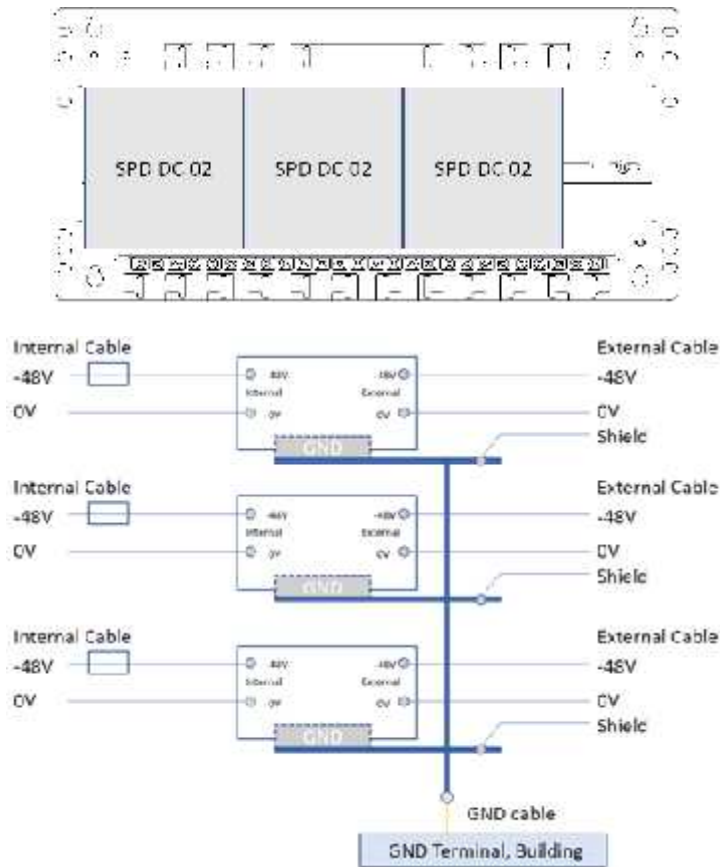


Figure 12









### 5.7 External Alarm Integration

External alarm integration is supported through the use of a dedicated alarm input terminal on the device. This terminal is used to connect an external alarm device, such as a doorbell or fire alarm, to the device's alarm system. The alarm system is designed to trigger a specific action, such as a call or text message, when the alarm is activated. The alarm input terminal is located on the back of the device, near the battery cover. The alarm system is designed to be compatible with a wide range of alarm devices, and the user can configure the device to respond to the alarm in a variety of ways. The alarm system is also designed to be easy to install and use, and the user can find detailed instructions in the user manual.

## 6 Battery Backup Integration

### 6.1 Battery Terminals & Breakers

The battery terminals and breakers are designed to provide a secure and reliable connection between the battery and the device. The terminals are made of a high-quality material that is resistant to corrosion and wear. The breakers are designed to protect the battery and the device from overcurrent and short-circuiting. The terminals and breakers are located on the back of the device, near the battery cover. The user can access the terminals and breakers by removing the battery cover. The terminals and breakers are designed to be easy to install and use, and the user can find detailed instructions in the user manual.

### 6.2 Battery Temperature Sensor and Compensation

The battery temperature sensor and compensation system is designed to monitor the temperature of the battery and adjust the charging current accordingly. This system helps to prevent the battery from overheating and extends its life. The temperature sensor is located on the battery, and the compensation system is located on the device. The user can find detailed information about the battery temperature sensor and compensation system in the user manual.

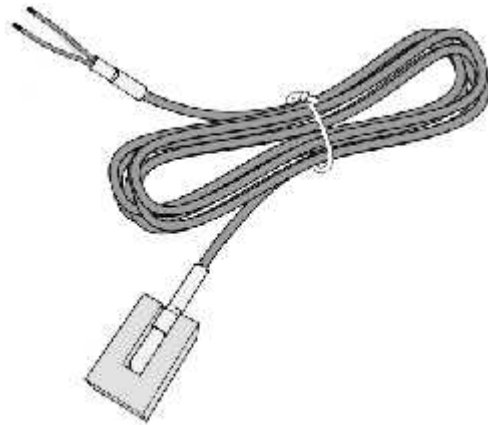


Figure 15



T-MOBILE NORTHEAST LLC

**SITE NUMBER: 7WAN094C**

**SITE NAME: KEY WEST - ROCKVILLE**

**T-MOBILE ANCHOR INSTALLATION, DESIGN 4SEC-67D5A997DBA INDOOR**

9420 KEY WEST AVENUE  
ROCKVILLE, MD 20850  
MONTGOMERY COUNTY

NOTE: DESIGN BASED ON RFDS  
VERSION: 9.0 DATED: 06/26/2020.



Know what's below.  
Call before you dig.

**SITE INFORMATION**

**SCOPE OF WORK:** PROJECT CONSISTS OF THE FOLLOWING TO THE EXISTING WIRELESS TELECOMMUNICATIONS FACILITY:  
REMOVING:  
(3) EXISTING ANTENNAS  
(3) EXISTING TMAS  
(12) EXISTING COAX  
(1) EXISTING CABINET  
  
INSTALLING:  
(3) PROPOSED ANTENNAS  
(3) PROPOSED RRU  
(1) PROPOSED P6230 CABINET  
(3) PROPOSED 6X12 HYBRID CABLES  
(1) PROPOSED 19" RACK

**PROJECT DESIGN:** 4SEC-67D5A997DBA INDOOR (AS IDENTIFIED ON RFDS)

**SITE ID NUMBER:** 7WAN094C

**911 SITE ADDRESS:** 9420 KEY WEST AVENUE  
ROCKVILLE, MD 20850

**LATITUDE (NAD 83):** 39.103055°  
**LONGITUDE (NAD 83):** -77.193888°

**JURISDICTION:** MONTGOMERY COUNTY  
**ZONING:** LSC-1.0/H-110T

**TAX ACCOUNT NUMBER:** 09-02344337  
**PARCEL AREA:** 3.62± ACRES  
**PARCEL OWNER:** KEY WEST III LTD PTNSHP  
C/O DANAC, LLC  
**ADDRESS:** 5404 WISCONSIN AVENUE #301  
CHEVY CHASE, MD 20815

**GROUND ELEVATION:** 470.0' (AMSL)

**STRUCTURE TYPE:** ROOFTOP

**STRUCTURE HEIGHT:** 54.0' (AGL)

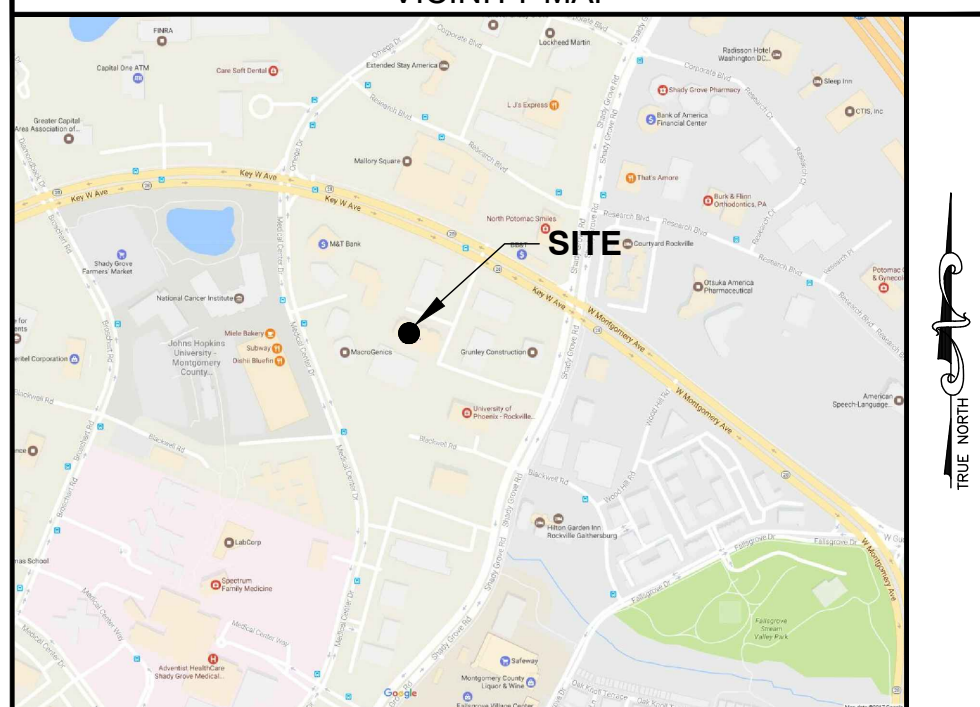
**PROJECT TEAM**

**APPLICANT:** T-MOBILE NORTHEAST LLC  
12050 BALTIMORE AVENUE  
BELTSVILLE, MD 20705  
OFFICE: (240) 264-8600  
FAX: (240) 264-8610

**PROJECT MANAGEMENT FIRM:** NETWORK BUILDING + CONSULTING, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELKRIDGE, MD 21075  
(410) 712-7092

**ENGINEERING FIRM:** NB+C ENGINEERING SERVICES, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELKRIDGE, MD 21075  
(410) 712-7092  
MARCO GROTTI  
mgrotti@nbcllc.com  
(410)712-7092 - EXT 1556

**VICINITY MAP**



**DIRECTIONS**

FROM: 12050 BALTIMORE AVENUE, BELTSVILLE, MD 20705.  
DEPART US-1 / BALTIMORE AVE TOWARD RITZ WAY. TURN LEFT ONTO RITZ WAY. TURN RIGHT ONTO VIRGINIA MANOR RD. KEEP STRAIGHT ONTO KONTERRA DR. TAKE RAMP LEFT FOR MD-200 W / MD-200 TOLL. ROAD NAME CHANGES TO I-370 W. ROAD NAME CHANGES TO SAM EIG HWY. TURN LEFT ONTO MD-119 E / GREAT SENECA HWY. TURN LEFT ONTO MD-28 E / KEY WEST AVE. ARRIVE AT MD-28 E / KEY WEST AVE.

**CODE COMPLIANCE**

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 THE LATEST EDITIONS OF THE FOLLOWING CODES.

- 2015 INTERNATIONAL BUILDING CODE
- 2014 NATIONAL ELECTRICAL CODE
- 2015 NFPA 101, LIFE SAFETY CODE
- AMERICAN CONCRETE INSTITUTE
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- MANUAL OF STEEL CONSTRUCTION 13TH EDITION
- ANSI/TIA-222-G
- TIA 607
- INSTITUTE FOR ELECTRICAL & ELECTRONICS ENGINEER 81
- IEEE C2 NATIONAL ELECTRIC SAFETY CODE LATEST EDITION
- TELECordia GR-1275
- ANSI/T 311

**DRAWING INDEX**

T-1	TITLE SHEET
GN-1	GENERAL NOTES
SP-1	SITE PLAN
C-1	ROOFTOP & EQUIPMENT PLAN
C-2	ELEVATION
A-1	ANTENNA PLANS & ANTENNA SCHEDULE
A-2	ANTENNA SPECIFICATIONS & DETAILS
A-3	ANTENNA & RRU MOUNTING DETAILS
A-4	CABLING DETAIL & PLUMBING DIAGRAM
E-1	ELECTRICAL DETAILS
G-1	GROUNDING DETAILS

**DO NOT SCALE DRAWINGS**

THESE DRAWINGS ARE FORMATTED TO BE FULL-SIZE AT 22"X34". CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE DESIGNER / ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR MATERIAL ORDERS OR BE RESPONSIBLE FOR THE SAME. CONTRACTOR SHALL USE BEST MANAGEMENT PRACTICE TO PREVENT STORM WATER POLLUTION DURING CONSTRUCTION.

APPLICANT

**T-Mobile**  
T-MOBILE NORTHEAST LLC  
12050 BALTIMORE AVENUE  
BELTSVILLE, MD 20705  
OFFICE: (240) 264-8600  
FAX: (240) 264-8610

ENGINEER

**NB+C**  
TOTALLY COMMITTED.  
NB+C ENGINEERING SERVICES, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELKRIDGE, MD 21075  
(410) 712-7092

SITE INFORMATION

7WAN094C  
KEYWEST - ROCKVILLE  
9420 KEY WEST AVENUE  
ROCKVILLE, MD 20850  
MONTGOMERY COUNTY

DESIGN RECORD

**REVISIONS**

REV	DATE	DESCRIPTION	BY
0	06/29/2020	FINAL CDs	CAR

PROFESSIONAL STAMP



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022

ENGINEER

TRENT TRAVIS SNARR, P.E.  
MARYLAND PROFESSIONAL ENGINEER  
LICENSE #55491

SHEET TITLE

**TITLE SHEET**

SHEET NUMBER

**T-1**



**ELECTRICAL & GROUNDING NOTES**

- ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
- ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PROCURED PER SPECIFICATION REQUIREMENTS.
- THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
- GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND IS RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
- ELECTRICAL AND TELCO WIRING AT EXPOSED INDOOR LOCATIONS SHALL BE IN ELECTRICAL METALLIC TUBING OR RIGID NONMETALLIC TUBING (RIGID SCHEDULE 40 PVC OR RIGID SCHEDULE 80 PVC FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) (AS PERMITTED BY CODE).
- ELECTRICAL AND TELCO WIRING AT CONCEALED INDOOR LOCATIONS SHALL BE IN ELECTRICAL METALLIC TUBING, ELECTRICAL NONMETALLIC TUBING, OR RIGID NONMETALLIC TUBING (RIGID SCHEDULE 40 PVC AS PERMITTED BY CODE).
- ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING, ABOVE GRADE AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS (RGS) AND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
- BURIED CONDUIT SHALL BE RIGID NONMETALLIC CONDUIT (RIGID SCHEDULE 40 PVC); DIRECT BURIED IN AREAS OF OCCASIONAL LIGHT TRAFFIC, ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT SHALL BE USED INDOORS AND OUTDOORS IN AREAS WHERE VIBRATION OCCURS AND FLEXIBILITY IS NEEDED.
- ELECTRICAL WIRING SHALL BE COPPER WITH TYPE THHN, THWN-2, OR THIN INSULATION.
- 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.
- 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.
- ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NEMA 3R ENCLOSURE.
- GROUNDING SHALL COMPLY WITH NEC ART. 250. ADDITIONALLY, GROUNDING, BONDING AND LIGHTING PROTECTION SHALL BE DONE IN ACCORDANCE WITH T-MOBILE CELL SITE GROUNDING STANDARDS.
- GROUND CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURERS CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
- INSTALL #2 AWG GREEN-INSULATED STRANDED WIRE FOR ABOVE GRADE GROUNDING AND #2 BARE TINNED COPPER WIRE FOR BELOW GRADE GROUNDING UNLESS OTHERWISE NOTED.
- ALL POWER AND GROUND CONNECTIONS TO BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY HARGER (OR APPROVED EQUAL) RATED FOR OPERATION AT NO LESS THAN 75°C OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
- ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY. BOND ANY METAL OBJECTS WITHIN 8 FEET OF PROJECT OWNER EQUIPMENT OR CABINET TO MASTER GROUND BAR OR GROUNDING RING.
- CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
- APPLY OXIDE INHIBITING COMPOUND TO ALL MECHANICAL GROUND CONNECTIONS.
- CONTRACTOR SHALL PROVIDE AND INSTALL OMNI DIRECTIONAL ELECTRONIC MARKER SYSTEM (EMS) BALLS OVER EACH GROUND ROD AND BONDING POINT BETWEEN EXISTING TOWER/ MONOPOLE GROUNDING RING AND EQUIPMENT GROUNDING RING.
- CONTRACTOR SHALL TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION. 5 OHMS MINIMUM RESISTANCE REQUIRED.
- CONTRACTOR SHALL CONDUCT ANTENNA, CABLE, AND LNA RETURN-LOSS AND DISTANCE-TO-FAULT MEASUREMENTS (SWEEP TESTS) AND RECORD RESULTS FOR PROJECT CLOSE OUT.
- THE T-MOBILE ELECTRICAL EQUIPMENT INCLUDING PANEL, SWITCH GEAR AND DISCONNECT ARE TO BE LABELED WITH ENGRAVED BAKELITE LABELS.

**GENERAL NOTES**

- THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES ORDINANCES, LAWS AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES COMPANY OR OTHER PUBLIC AUTHORITIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY OR MUNICIPAL AUTHORITIES.
- THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THIS FACILITY.
- THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
- TRANSMITTER EQUIPMENT AND ANTENNAS ARE DESIGNED TO MEET ANSI/EIA/TIA 222-G REQUIREMENTS.
- ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL.
- CONTRACTOR SHALL MAKE A UTILITY "ONE CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
- IF ANY UNDERGROUND UTILITIES OR STRUCTURES EXIST BENEATH THE PROJECT AREA, CONTRACTOR MUST LOCATE IT AND CONTACT THE APPLICANT & THE OWNER'S REPRESENTATIVE.
- OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION BY TECHNICIANS APPROXIMATELY 2 TIMES PER MONTH.
- PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS, AND PLANS OF RECORD AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
- THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
- THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF. THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
- NO SIGNIFICANT NOISE, SMOKE, DUST, OR ODOR WILL RESULT FROM THIS FACILITY.
- THE FACILITY IS UNMANNED AND NOT INTENDED FOR HUMAN HABITATION (NO HANDICAP ACCESS REQUIRED).
- THE FACILITY IS UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SANITARY SERVICE.
- POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.

**STRUCTURAL NOTES**

- THE STRUCTURAL STEEL CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ANCHOR BOLT LOCATIONS, ELEVATION OF TOP OF CONCRETE AND BEARING PLATES, ALIGNMENT ETC. PRIOR TO START OF STEEL ERECTION.
- THE LATEST EDITION OF THE FOLLOWING SPECIFICATIONS SHALL GOVERN:
  - A. AISC - "ALLOWABLE STRESS DESIGN SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS".
  - B. AISC - "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".
  - C. AWS - "D1.1 STRUCTURAL WELDING CODE - STEEL".
- MATERIAL, UNLESS OTHERWISE NOTED, SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS
 

STRUCTURAL WIDE FLANGE & M SHAPES	A992 OR A572 FY = 50KSI
OTHER STRUCTURAL SHAPES AND PLATES	A36, FY = 36 KSI
STRUCTURAL TUBING	A500, GRADE B FY = 46 KSI
HIGH STRENGTH BOLTS	A325
THREADED RODS	A354, GRADE BC
ANCHOR BOLTS	A325 OR A354 BC
PIPE (HANDRAIL)	SCH 40 PIPE
- ALL WELDING SHALL BE IN ACCORDANCE WITH AWS D1.1 USING E70XX ELECTRODES. UNLESS OTHERWISE NOTED PROVIDE CONTINUOUS MINIMUM SIZED FILLET WELDS PER AISC REQUIREMENTS.
- HOLES IN STEEL SHALL BE DRILLED OR PUNCHED. ALL SLOTTED HOLES SHALL BE PROVIDED WITH SMOOTH EDGES. BURNING OF HOLES AND TORCH CUTTING AT THE SITE IS NOT PERMITTED. ALL HOLES IN BEARING PLATES SHALL BE DRILLED.
- ALL STEEL TO BE HOT-DIPPED GALVANIZED AFTER FABRICATION PER ASTM A123.
- EPOXY ANCHORS TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
- ALL BOLTS SHALL BE TIGHTENED USING TURN-OF-THE-NUT METHOD PER AISC SPECIFICATIONS USING STANDARD HOLES.
- CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS AND FIT PRIOR TO FABRICATION.

APPLICANT

**T-Mobile**  
 T-MOBILE NORTHEAST LLC  
 12050 BALTIMORE AVENUE  
 BELTSVILLE, MD 20705  
 OFFICE: (240) 264-8600  
 FAX: (240) 264-8610

ENGINEER

**NB+C**  
 TOTALLY COMMITTED.  
 NB+C ENGINEERING SERVICES, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
 ELKRDGE, MD 21075  
 (410) 712-7092

SITE INFORMATION

7WAN094C  
 KEYWEST - ROCKVILLE  
 9420 KEY WEST AVENUE  
 ROCKVILLE, MD 20850  
 MONTGOMERY COUNTY

DESIGN RECORD

REVISIONS			
REV	DATE	DESCRIPTION	BY
0	06/29/2020	FINAL CDs	CAR

PROFESSIONAL STAMP

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022

ENGINEER

TRENT TRAVIS SNARR, P.E.  
 MARYLAND PROFESSIONAL ENGINEER  
 LICENSE #55491

SHEET TITLE

**GENERAL NOTES**

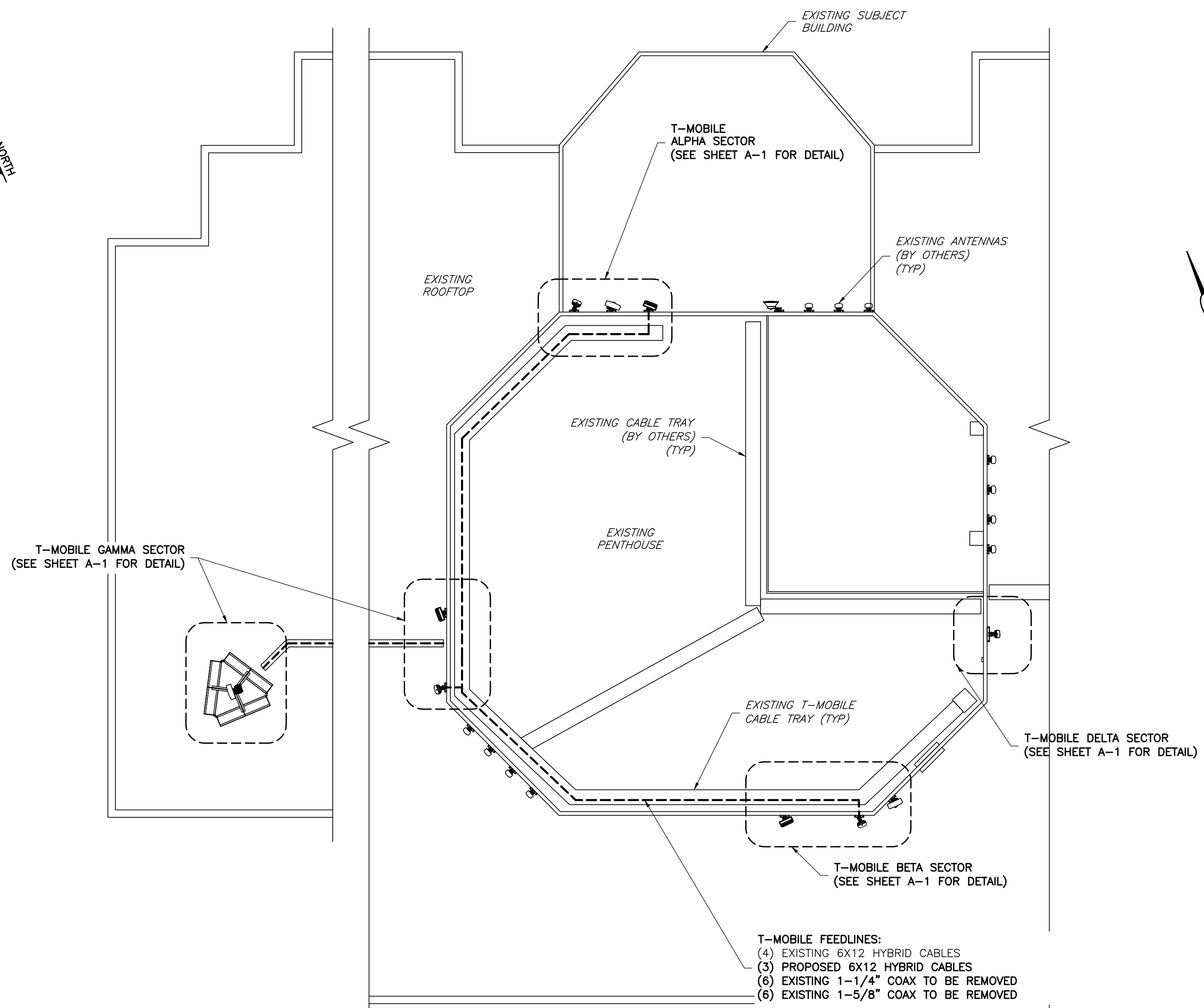
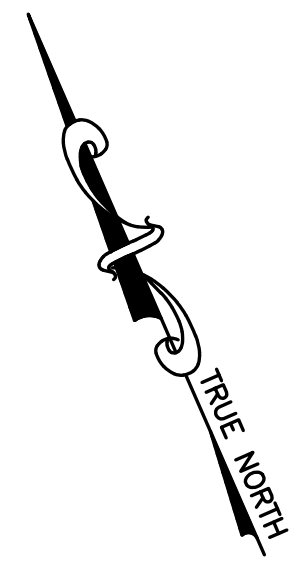
SHEET NUMBER

**GN-1**

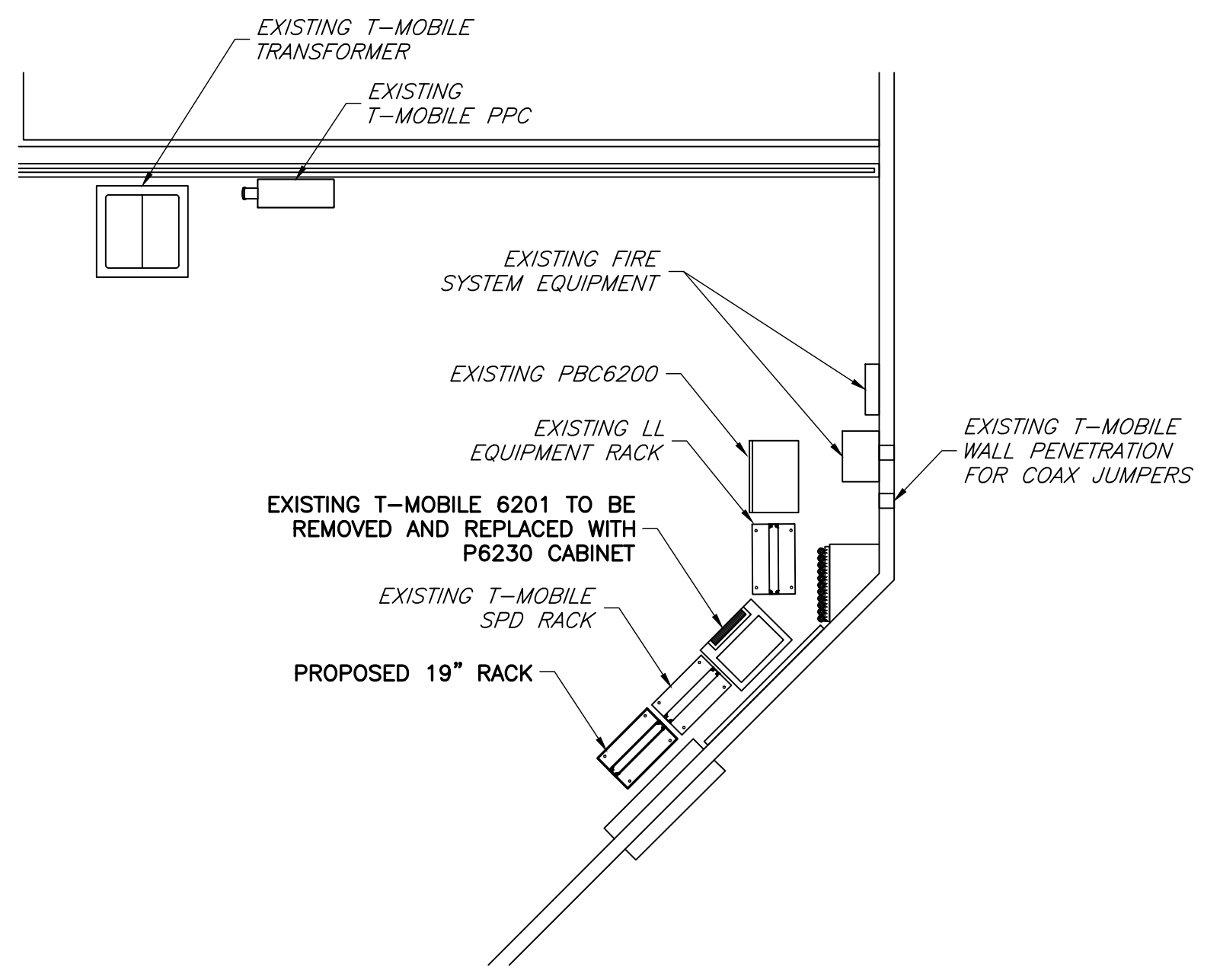
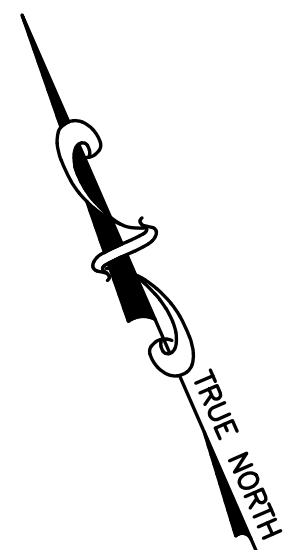








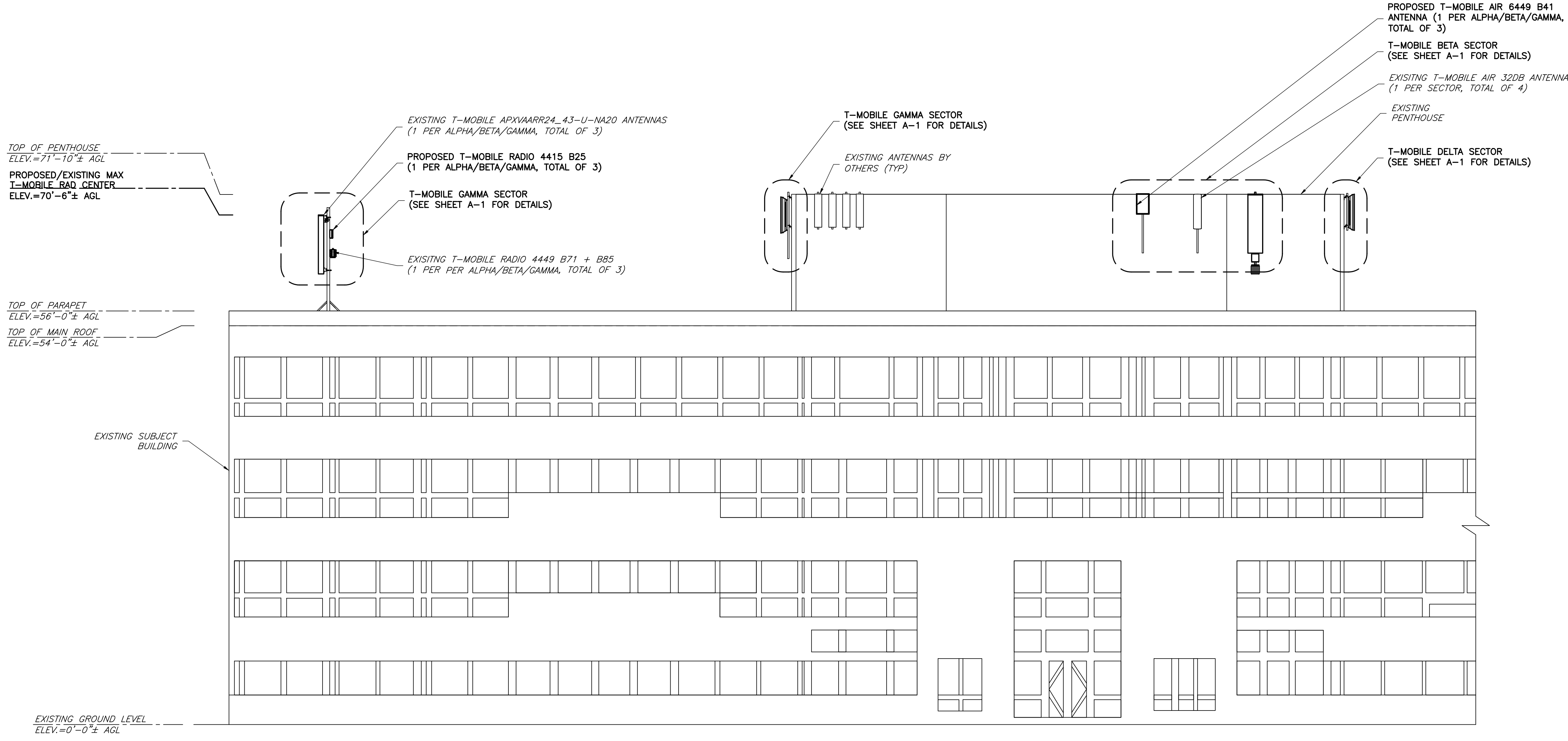
**1 PARTIAL ROOFTOP PLAN**  
 SCALE: 1" = 10' (22X34)  
 SCALE: 1" = 20' (11X17)  
 GRAPHIC SCALE  
 1 INCH = 10 FEET (22X34)  
 1 INCH = 20 FEET (11X17)



**2 EQUIPMENT PLAN**  
 SCALE: 1/4" = 1' (22X34)  
 SCALE: 1/8" = 1' (11X17)  
 GRAPHIC SCALE  
 1/4 INCH = 1 FOOT (22X34)  
 1/8 INCH = 1 FOOT (11X17)

STRUCTURAL NOTE:  
 REFER TO THE PASSING STRUCTURAL ANALYSIS OF THE EXISTING BUILDING WITH THE EXISTING AND PROPOSED LOADS PERFORMED BY NB+C.  
 NB+C PROJECT #: 100595.

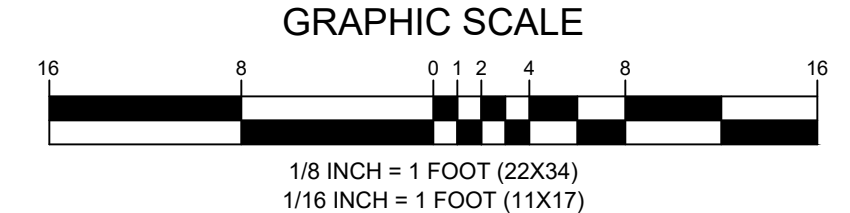
APPLICANT	<p>T-MOBILE NORTHEAST LLC          12050 BALTIMORE AVENUE          BELTSVILLE, MD 20705          OFFICE: (240) 264-8600          FAX: (240) 264-8610</p>								
ENGINEER	<p>TOTALLY COMMITTED.          NB+C ENGINEERING SERVICES, LLC.          6095 MARSHALEE DRIVE, SUITE 300          ELK RIDGE, MD 21075          (410) 712-7092</p>								
SITE INFORMATION	<p>7WAN094C          KEYWEST - ROCKVILLE          9420 KEY WEST AVENUE          ROCKVILLE, MD 20850          MONTGOMERY COUNTY</p>								
DESIGN RECORD	<p><b>REVISIONS</b></p> <table border="1"> <thead> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </tbody> </table>	REV	DATE	DESCRIPTION	BY	0	06/29/2020	FINAL CDs	CAR
REV	DATE	DESCRIPTION	BY						
0	06/29/2020	FINAL CDs	CAR						
PROFESSIONAL STAMP	<p>PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022.</p>								
ENGINEER	<p>TRENT TRAVIS SNARR, P.E.          MARYLAND PROFESSIONAL ENGINEER          LICENSE #55491</p>								
SHEET TITLE	<p><b>ROOFTOP &amp; EQUIPMENT PLAN</b></p>								
SHEET NUMBER	<p><b>C-1</b></p>								



**NOTE:**  
ANTENNAS ARE TO BE MOUNTED FLUSH LEVEL WITH THE TOP OF THE WALL IN WHICH THEY ARE SUPPORTED BY.

**STRUCTURAL NOTE:**  
REFER TO THE PASSING STRUCTURAL ANALYSIS OF THE EXISTING BUILDING WITH THE EXISTING AND PROPOSED LOADS PERFORMED BY NB+C.  
NB+C PROJECT #: 100595.

**1**  
**ELEVATION**  
SCALE: 1/8" = 1' (22X34)  
SCALE: 1/16" = 1' (11X17)



**APPLICANT**

**T-Mobile**  
T-MOBILE NORTHEAST LLC  
12050 BALTIMORE AVENUE  
BELTSVILLE, MD 20705  
OFFICE: (240) 264-8600  
FAX: (240) 264-8610

**ENGINEER**

**NB+C**  
**TOTALLY COMMITTED.**  
NB+C ENGINEERING SERVICES, LLC.  
6095 MARSHALEE DRIVE, SUITE 300  
ELK RIDGE, MD 21075  
(410) 712-7092

**SITE INFORMATION**

7WAN094C  
KEYWEST - ROCKVILLE  
9420 KEY WEST AVENUE  
ROCKVILLE, MD 20850  
MONTGOMERY COUNTY

**DESIGN RECORD**

REV	DATE	DESCRIPTION	BY
0	06/29/2020	FINAL CDs	CAR

**PROFESSIONAL STAMP**

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022

**ENGINEER**

TRENT TRAVIS SNARR, P.E.  
MARYLAND PROFESSIONAL ENGINEER  
LICENSE #55491

**SHEET TITLE**

**ELEVATION**

**SHEET NUMBER**

**C-2**



### ANTENNA INFORMATION

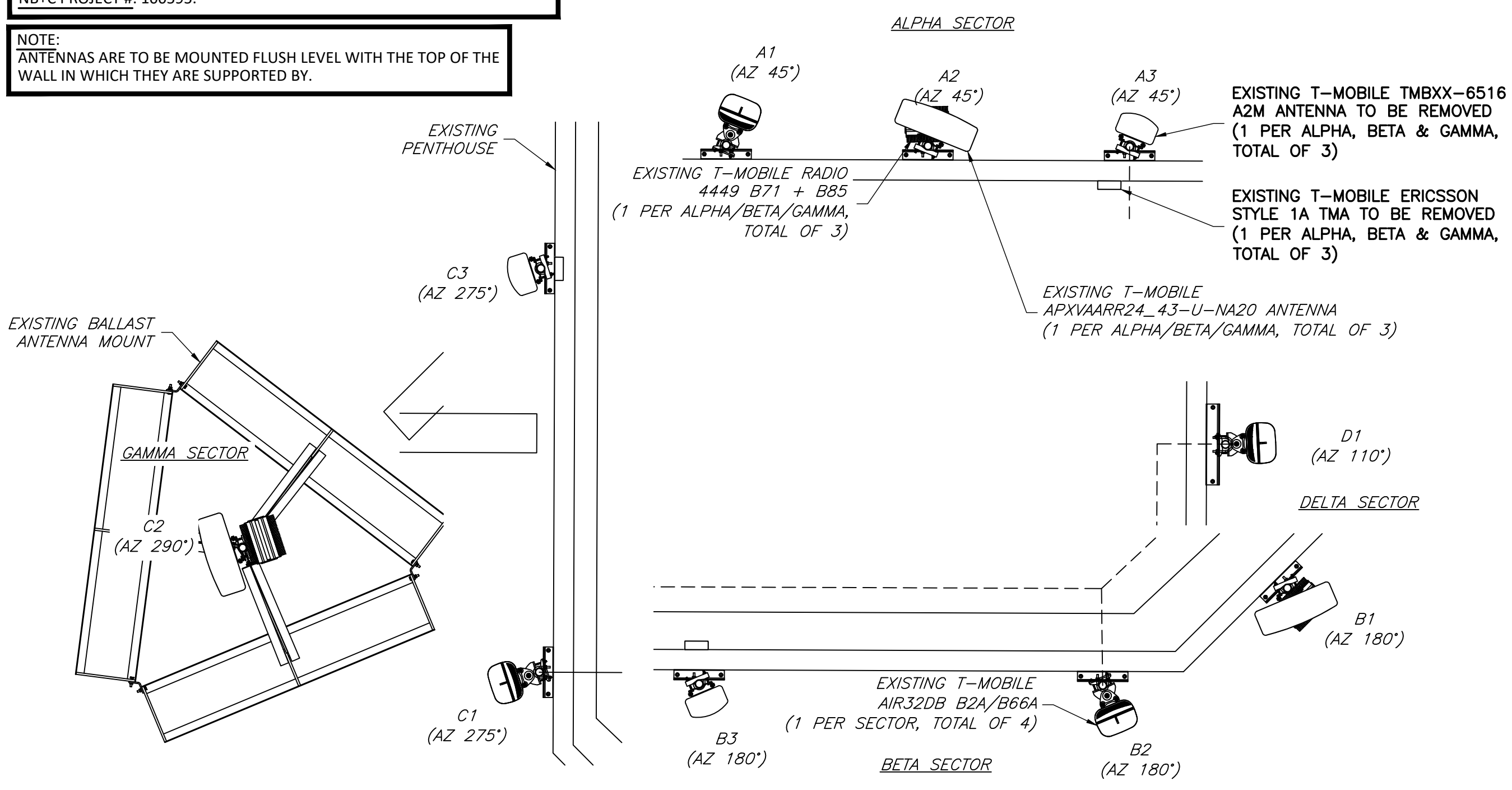
SECTOR	STATUS	ANTENNA MANUFACTURER	ANTENNA MODEL	ANTENNA DIMENSIONS (HxWxD)	MECHANICAL DOWN TILT	ELECTRICAL DOWN TILT	RAD CENTER	AZIMUTH	TMA/RRU QUANTITY & MODEL	CABLE QUANTITY & TYPE	CABLE LENGTH
A1	EXISTING	ERICSSON	AIR32DB B2A/B66Aa	56.6"x12.9"x8.7"	0	4°/4°/4°/4°	69'-6"	45°	-	(2) EXISTING 1-1/4" COAX CABLES (TO BE REMOVED) (2) EXISTING 1-5/8" COAX CABLES (TO BE REMOVED) (1) PROPOSED 6x12 HYBRID CABLE (1) EXISTING 6X12 HYBRID CABLES	160'-0"±
A2	EXISTING	RFS	APXVAARR24_43-U-NA20	95.9"x24.0"x8.7"	0°	6°/6°/4°/4°	67'-0"	45°	(1) EXISTING 4449 B71+B85 (1) PROPOSED 4415 B25		
A3	EXISTING TO BE REMOVED	ANDREW	TMBXX-6516-A2M	59.0"x11.9"x6.3"	0°	4°	69'-6"	45°	(1) ERICSSON STYLE 1A TMA (TO BE REMOVED)		
A3	PROPOSED	ERICSSON	AIR6449 B41	33.1"x20.6"x8.6"	0°	2°/2°	70'-6"	45°	-		
B1	EXISTING	RFS	APXVAARR24_43-U-NA20	95.9"x24.0"x8.7"	0°	6°/6°/4°/4°	67'-0"	180°	(1) EXISTING 4449 B71+B85 (1) PROPOSED 4415 B25	(2) EXISTING 1-1/4" COAX CABLES (TO BE REMOVED) (2) EXISTING 1-5/8" COAX CABLES (TO BE REMOVED) (1) PROPOSED 6x12 HYBRID CABLE (1) EXISTING 6X12 HYBRID CABLES	35'-0"±
B2	EXISTING	ERICSSON	AIR32DB B2A/B66Aa	56.6"x12.9"x8.7"	0	4°/4°/4°/4°	69'-6"	180°	-		
B3	EXISTING TO BE REMOVED	ANDREW	TMBXX-6516-A2M	59.0"x11.9"x6.3"	0°	3°	69'-6"	180°	(1) ERICSSON STYLE 1A TMA (TO BE REMOVED)		
B3	PROPOSED	ERICSSON	AIR6449 B41	33.1"x20.6"x8.6"	0°	2°/2°	70'-6"	180°	-		
C1	EXISTING	ERICSSON	AIR32DB B2A/B66Aa	56.6"x12.9"x8.7"	0	4°/4°/4°/4°	69'-6"	275°	-	(2) EXISTING 1-1/4" COAX CABLES (TO BE REMOVED) (2) EXISTING 1-5/8" COAX CABLES (TO BE REMOVED) (1) PROPOSED 6x12 HYBRID CABLE (1) EXISTING 6X12 HYBRID CABLES	95'-0"±
C2	EXISTING	RFS	APXVAARR24_43-U-NA20	95.9"x24.0"x8.7"	0°	6°/6°/4°/4°	67'-0"	275°	(1) EXISTING 4449 B71+B85 (1) PROPOSED 4415 B25		
C3	EXISTING TO BE REMOVED	ANDREW	TMBXX-6516-A2M	59.0"x11.9"x6.3"	0°	7°	69'-6"	275°	(1) ERICSSON STYLE 1A TMA (TO BE REMOVED)		
C3	PROPOSED	ERICSSON	AIR6449 B41	33.1"x20.6"x8.6"	0°	2°/2°	70'-6"	275°	-		
D1	EXISTING	ERICSSON	AIR32DB B2A/B66Aa	56.6"x12.9"x8.7"	0°	4°/4°/4°/4°	69'-6"	110°	-	(1) EXISTING 6X12 HYBRID CABLE	40'-0"±

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

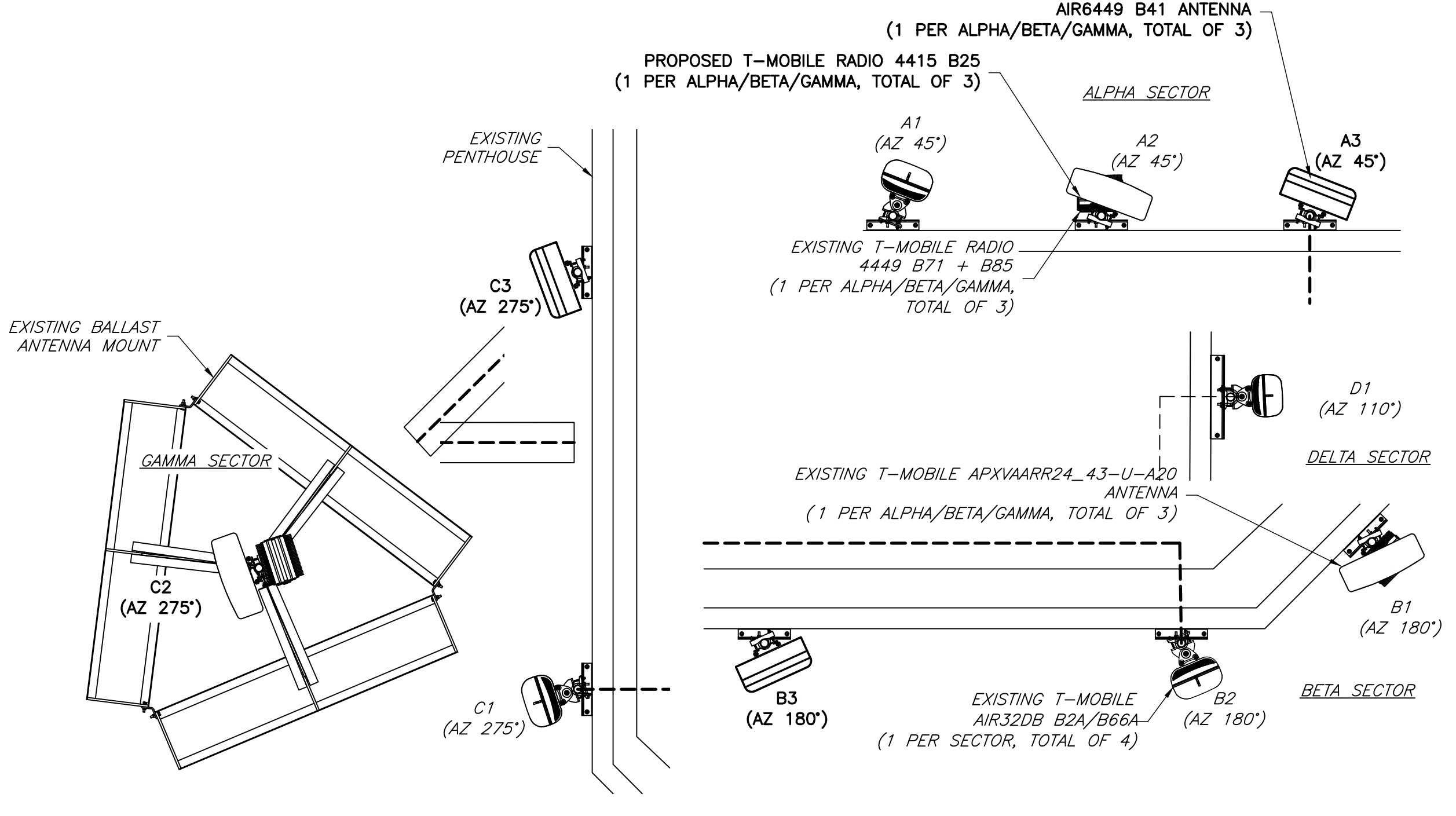
NOTE: DESIGN BASED ON RFDS  
 VERSION: 9.0 DATED: 06/26/2020.

**STRUCTURAL NOTE:**  
 REFER TO THE PASSING STRUCTURAL ANALYSIS OF THE EXISTING BUILDING WITH THE EXISTING AND PROPOSED LOADS PERFORMED BY NB+C.  
 NB+C PROJECT #: 100595.

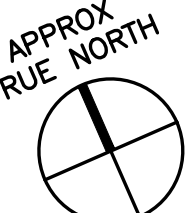
**NOTE:**  
 ANTENNAS ARE TO BE MOUNTED FLUSH LEVEL WITH THE TOP OF THE WALL IN WHICH THEY ARE SUPPORTED BY.



1  
A-1 NTS  
EXISTING ANTENNA ORIENTATION PLAN



2  
A-1 NTS  
PROPOSED ANTENNA ORIENTATION PLAN



APPLICANT

**T-Mobile**

T-MOBILE NORTHEAST LLC  
 12050 BALTIMORE AVENUE  
 BELTSVILLE, MD 20705  
 OFFICE: (240) 264-8600  
 FAX: (240) 264-8610

ENGINEER

**NB+C**  
 TOTALLY COMMITTED.

**NB+C ENGINEERING SERVICES, LLC.**  
 6095 MARSHLEE DRIVE, SUITE 300  
 ELK RIDGE, MD 21075  
 (410) 712-7092

SITE INFORMATION

7WAN094C  
 KEYWEST - ROCKVILLE  
 9420 KEY WEST AVENUE  
 ROCKVILLE, MD 20850  
 MONTGOMERY COUNTY

DESIGN RECORD

REVISIONS				
REV	DATE	DESCRIPTION	BY	
0	06/29/2020	FINAL CDs	CAR	

PROFESSIONAL STAMP

**STATE OF MARYLAND**  
 PROFESSIONAL ENGINEER  
 55491

PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022

ENGINEER

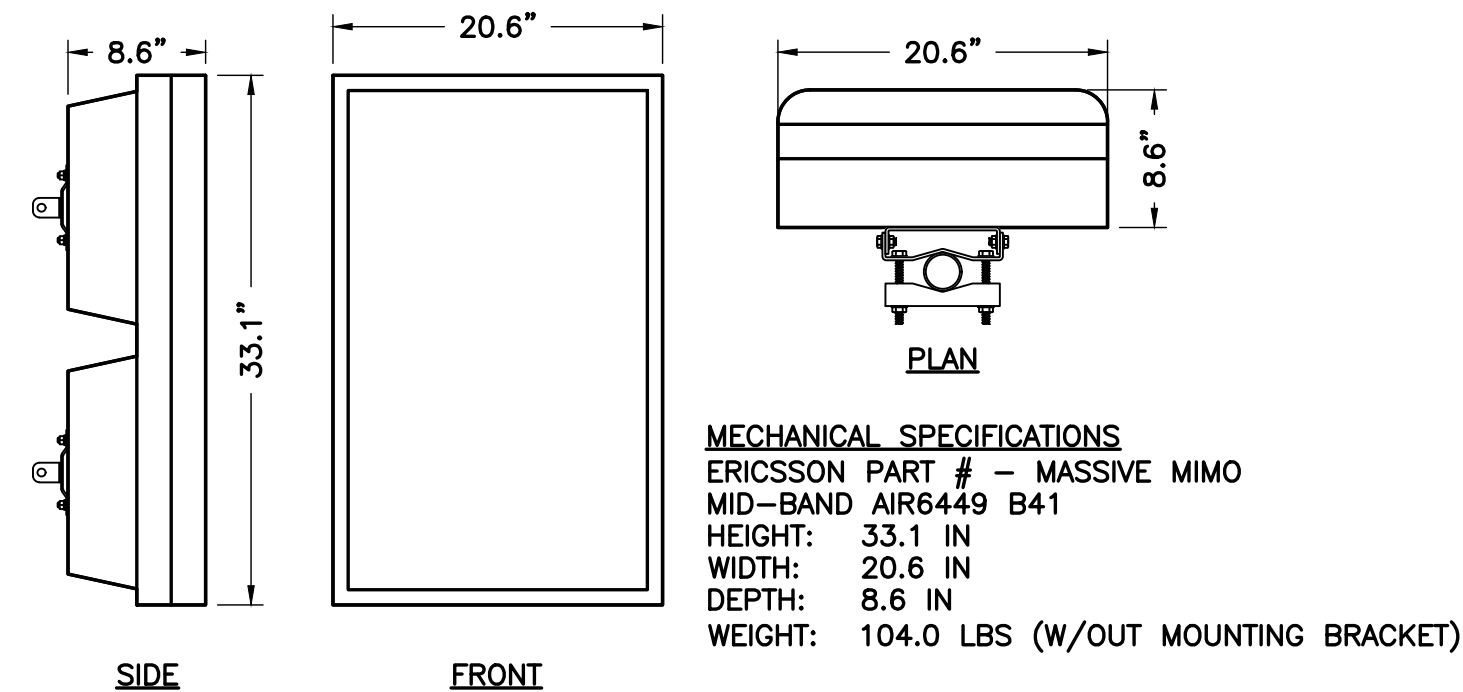
TRENT TRAVIS SNARR, P.E.  
 MARYLAND PROFESSIONAL ENGINEER  
 LICENSE #55491

SHEET TITLE

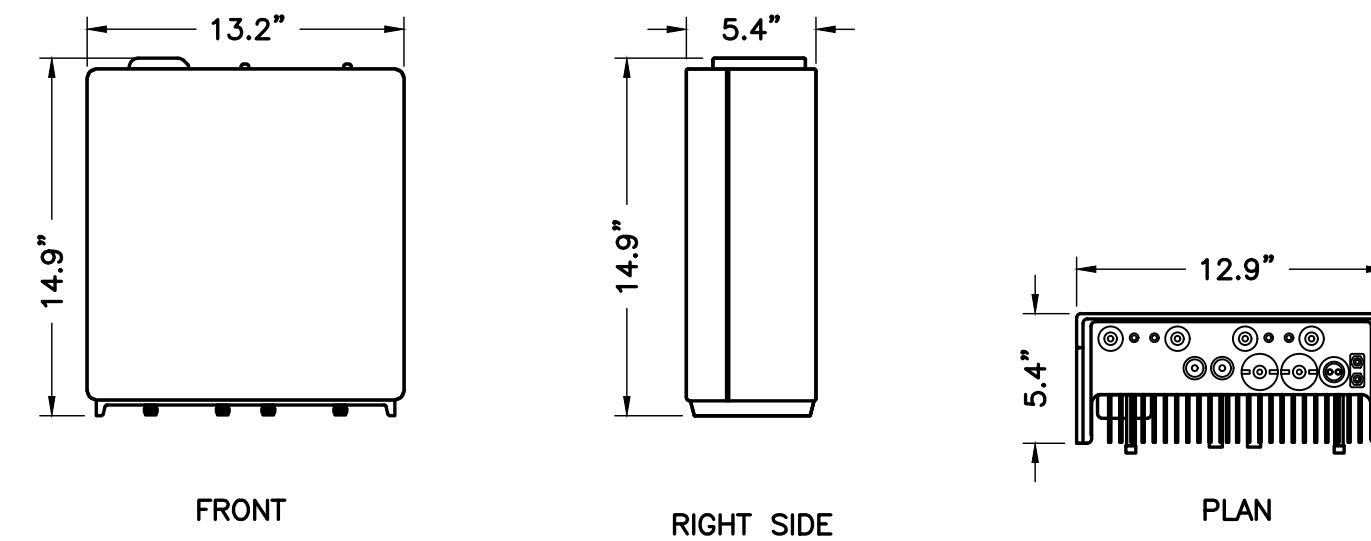
**ANTENNA PLANS  
 & ANTENNA  
 SCHEDULE**

SHEET NUMBER

**A-1**



1 ERICSSON ANTENNA DETAIL  
 SCALE: NTS

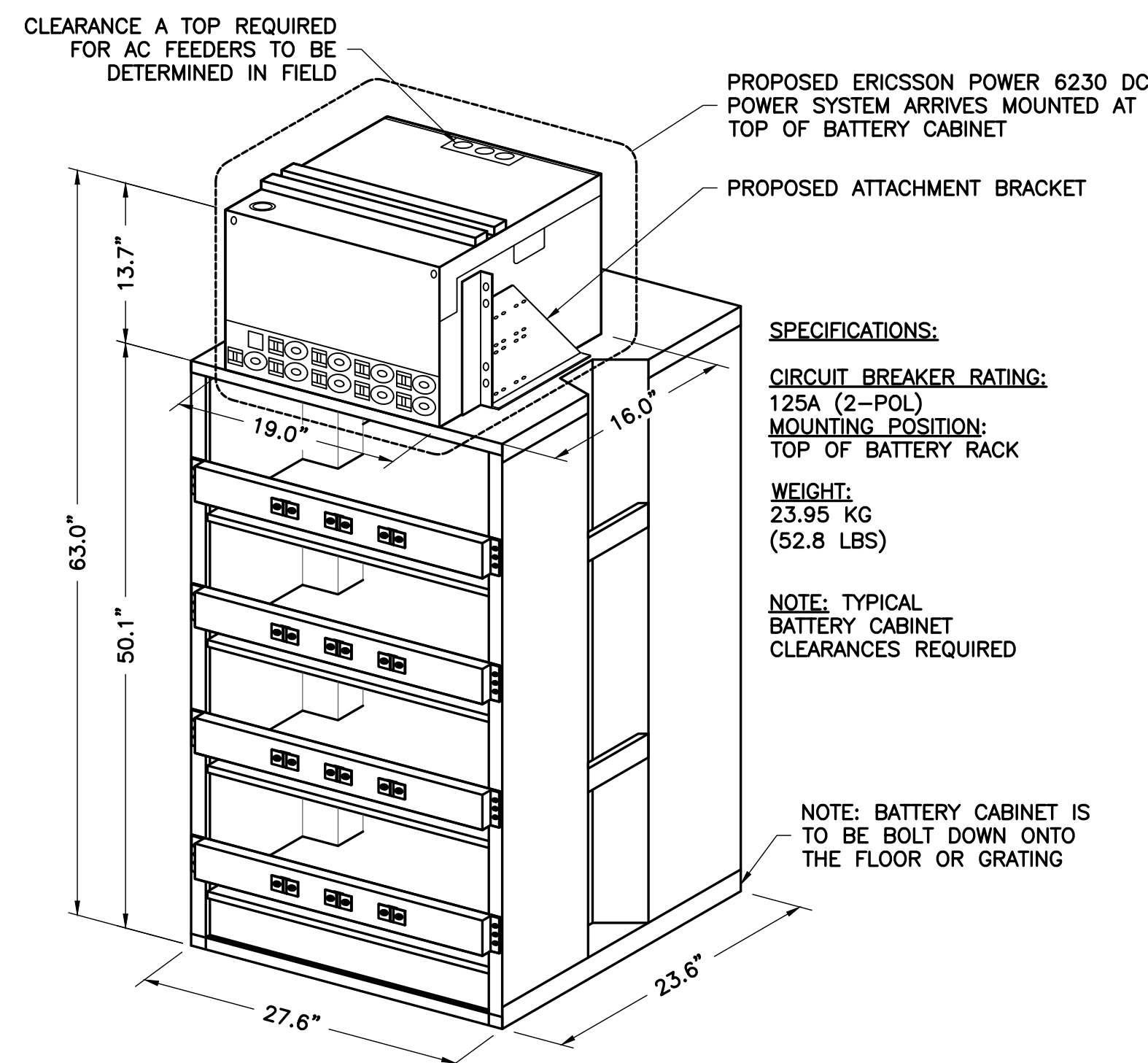


SIZE AND WEIGHT TABLE

RRU	WIDTH	DEPTH	HEIGHT	WEIGHT W/O BRACKET
RADIO 4415 B25	13.2"	5.4"	14.9"	46.3 LBS. (21 kg)



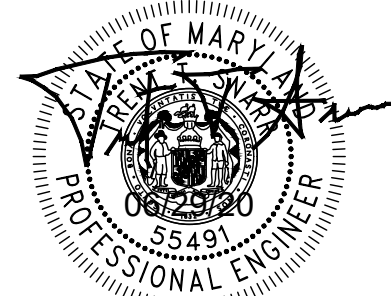
**NOTES:**  
 1. DO NOT PAINT THE RRU. RRU SOLAR SHIELD CAN BE PAINTED PER MANUFACTURER'S METHOD OF PROCEDURE.

2 ERICSSON REMOTE RADIO UNIT (RRU)  
 NTS

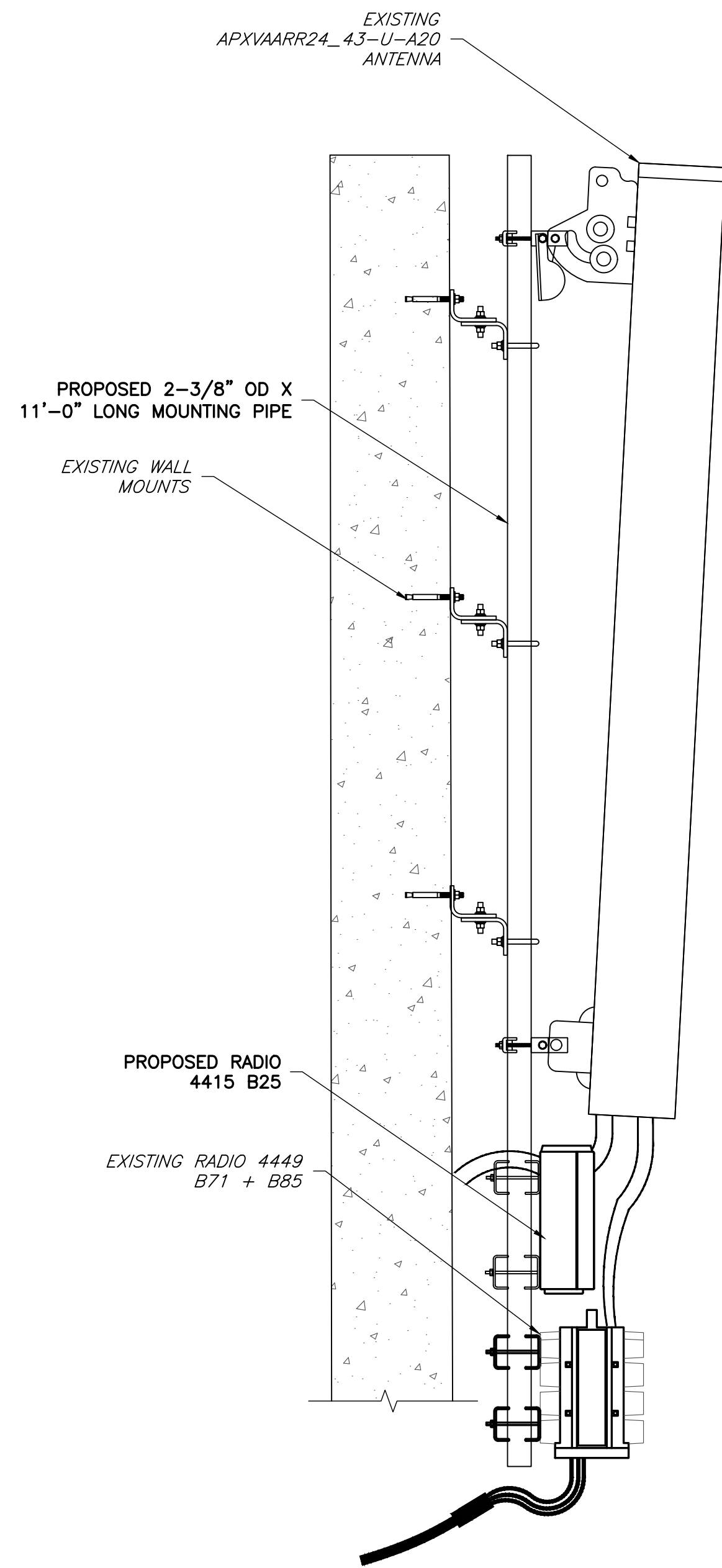


3 ERICSSON 6230 CABINET DETAIL  
 NTS

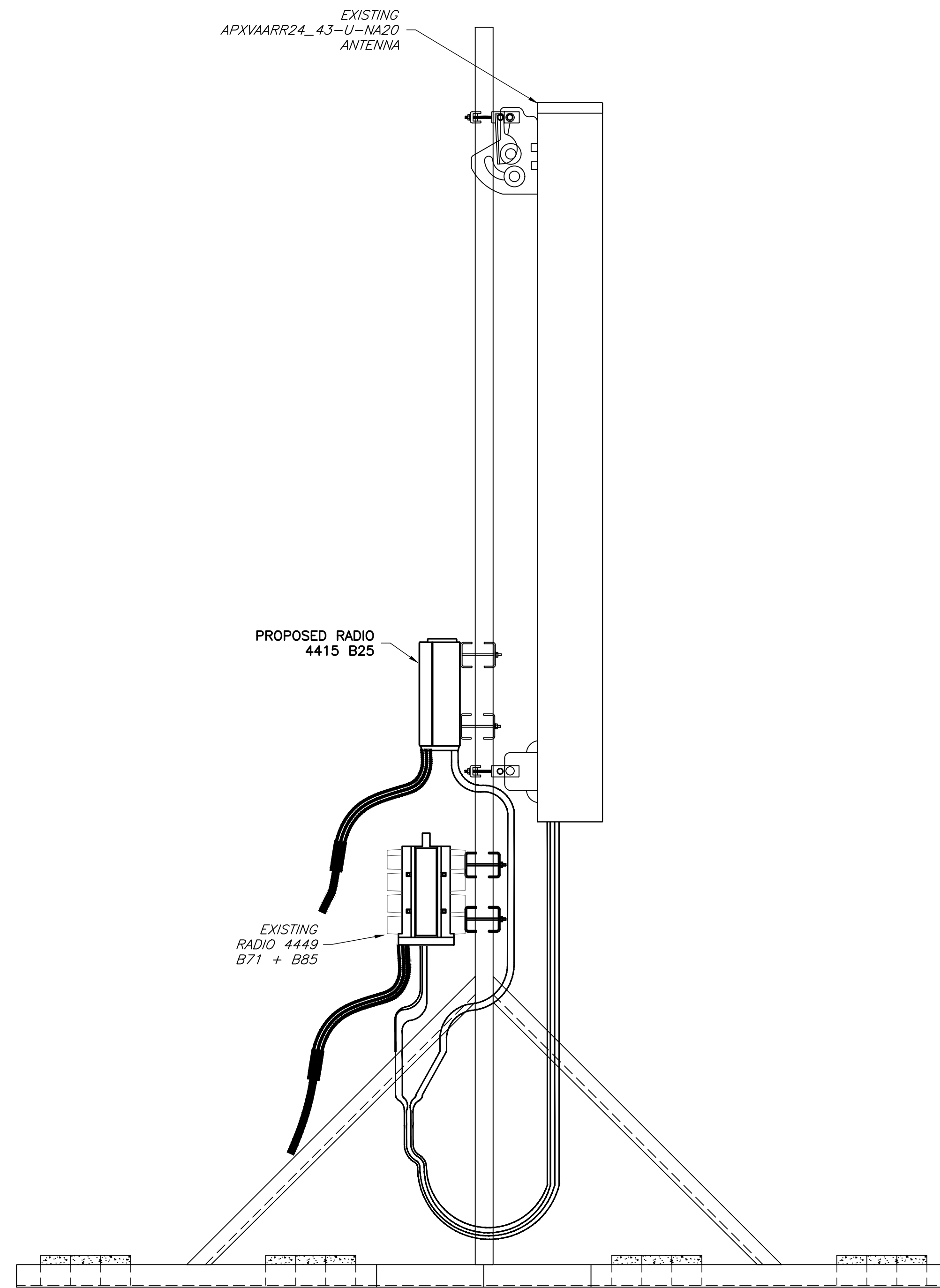
NOTE: SEE SHEET G-1 FOR RRU AND ANTENNA GROUNDING

APPLICANT	 <b>T-Mobile</b> T-MOBILE NORTHEAST LLC  12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610												
ENGINEER	 <b>NB+C</b> <b>TOTALLY COMMITTED.</b>  <b>NB+C ENGINEERING SERVICES, LLC.</b> <small>6095 MARSHALLEE DRIVE, SUITE 300          ELKRDIDGE, MD 21075          (410) 712-7092</small>												
SITE INFORMATION	7WAN094C KEYWEST - ROCKVILLE 9420 KEY WEST AVENUE ROCKVILLE, MD 20850 MONTGOMERY COUNTY												
DESIGN RECORD	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </tbody> </table>	REVISIONS				REV	DATE	DESCRIPTION	BY	0	06/29/2020	FINAL CDs	CAR
REVISIONS													
REV	DATE	DESCRIPTION	BY										
0	06/29/2020	FINAL CDs	CAR										
PROFESSIONAL STAMP	 <small>PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022</small>												
ENGINEER	TRENT TRAVIS SNARR, P.E. MARYLAND PROFESSIONAL ENGINEER LICENSE #55491												
SHEET TITLE	<b>ANTENNA SPECIFICATIONS &amp; DETAILS</b>												
SHEET NUMBER	<b>A-2</b>												

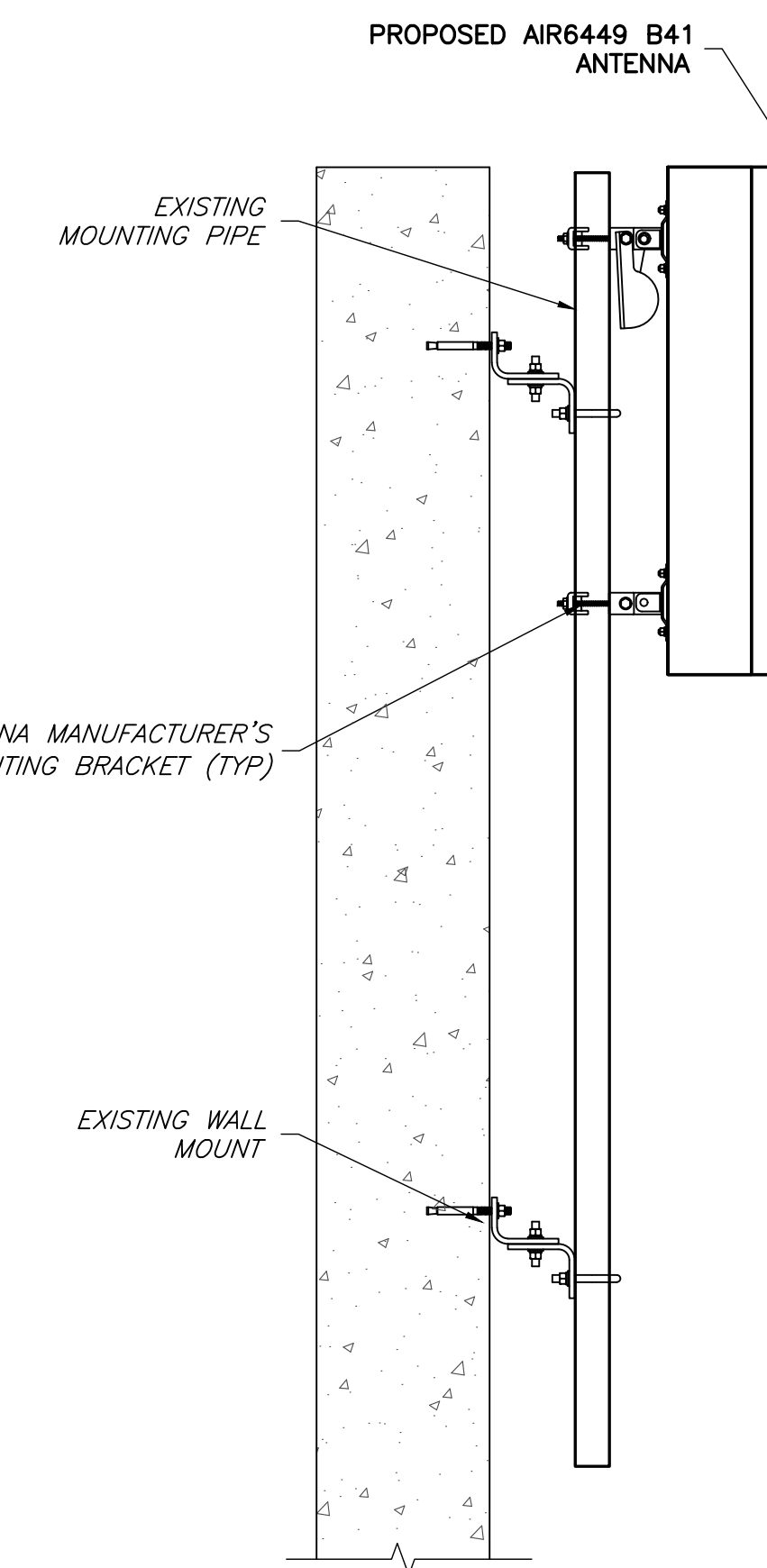




1 RRU MOUNTING (ALPHA & BETA) DETAIL  
A-3 NTS



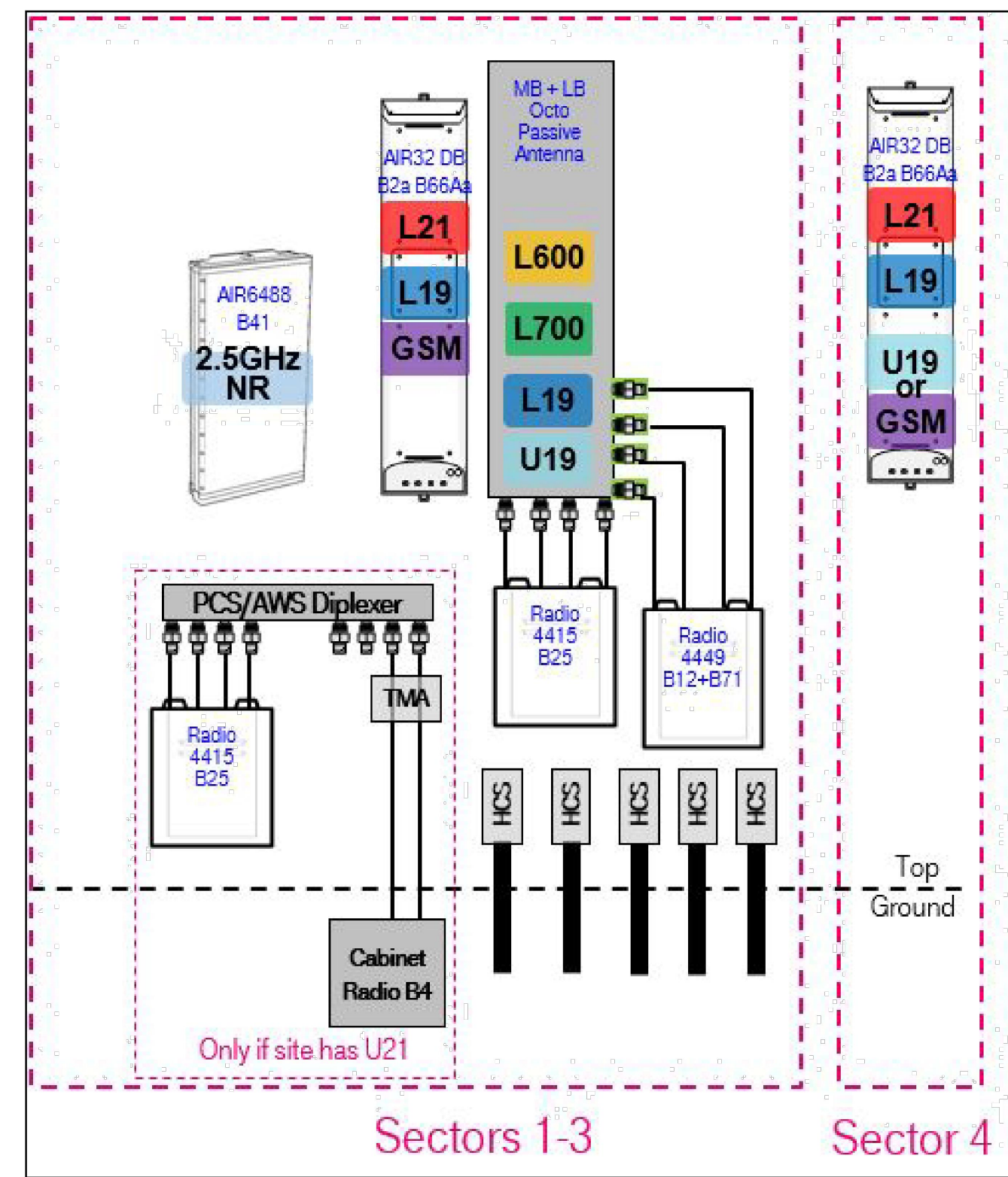
2 RRU TRIPOD MOUNTING DETAIL (GAMMA)  
A-3 NTS



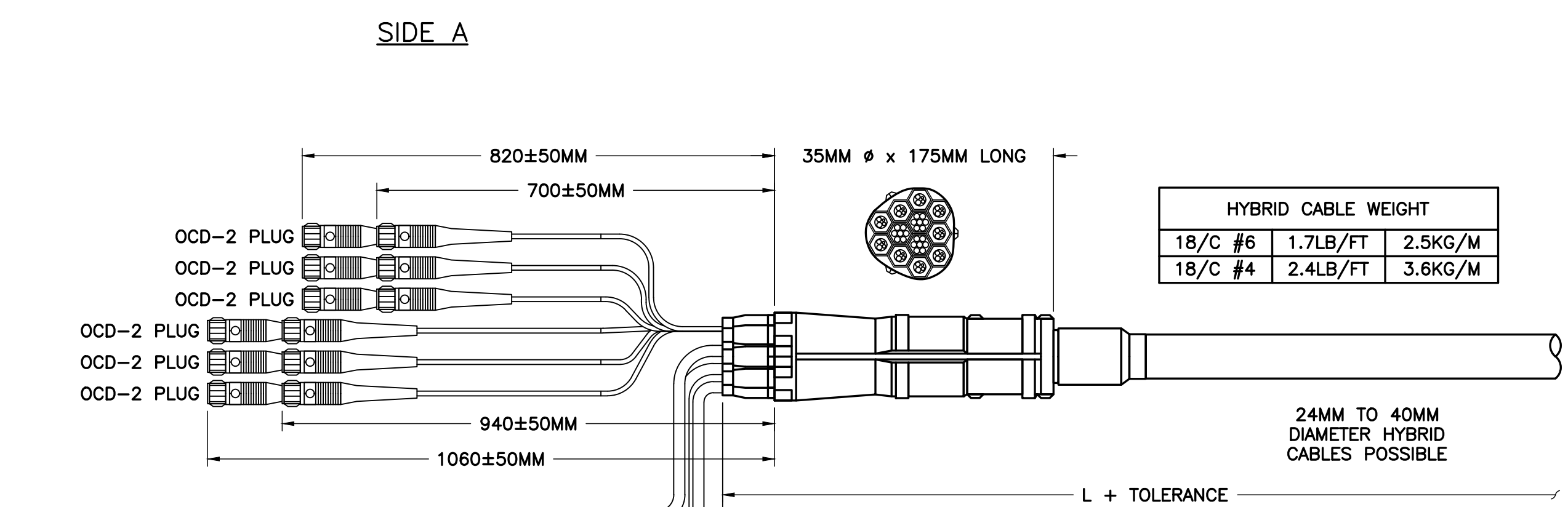
3 ANTENNA MOUNTING DETAIL  
A-3 NTS

NOTE:  
ANTENNAS ARE TO BE MOUNTED FLUSH LEVEL WITH THE TOP OF THE  
WALL IN WHICH THEY ARE SUPPORTED BY.

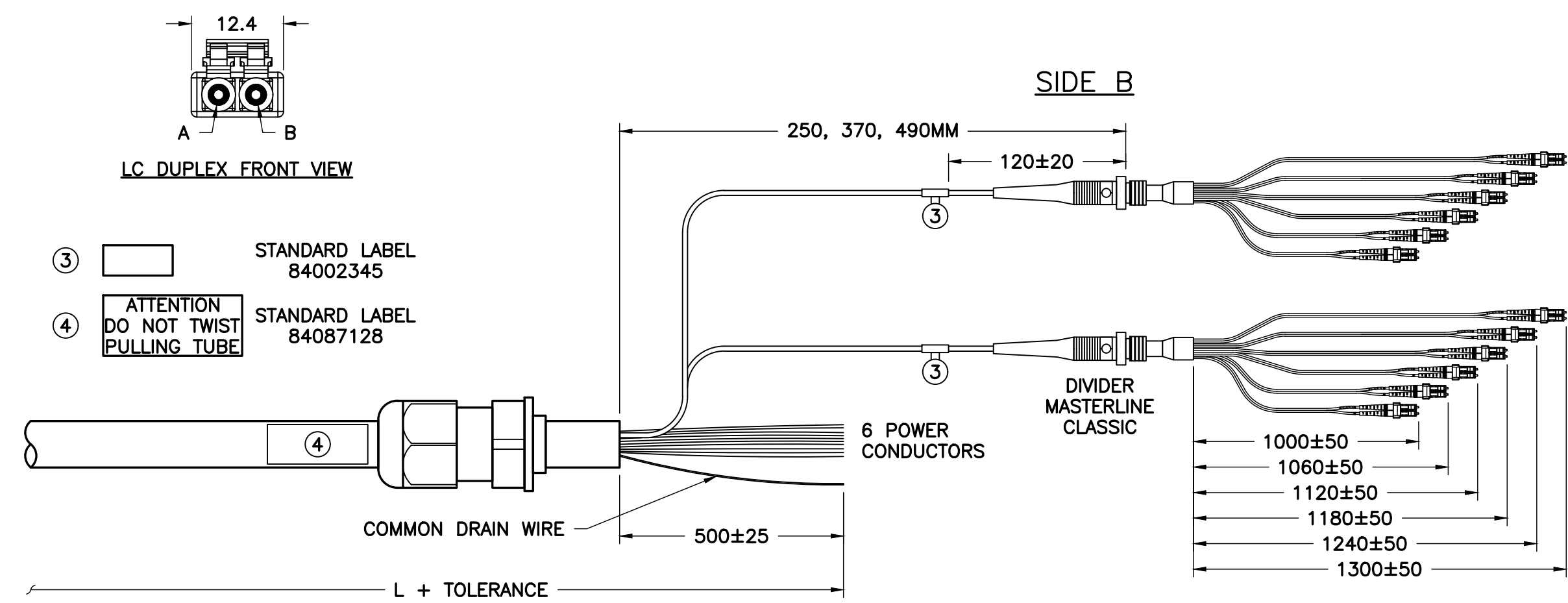
APPLICANT	T-MOBILE NORTHEAST LLC 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610												
ENGINEER	NB+C TOTALLY COMMITTED. NB+C ENGINEERING SERVICES, LLC. <small>6095 MARSHALEE DRIVE, SUITE 300          ELK RIDGE, MD 21075          (410) 712-7092</small>												
SITE INFORMATION	7WAN094C KEYWEST - ROCKVILLE 9420 KEY WEST AVENUE ROCKVILLE, MD 20850 MONTGOMERY COUNTY												
DESIGN RECORD	<table border="1"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </tbody> </table>	REVISIONS				REV	DATE	DESCRIPTION	BY	0	06/29/2020	FINAL CDs	CAR
REVISIONS													
REV	DATE	DESCRIPTION	BY										
0	06/29/2020	FINAL CDs	CAR										
PROFESSIONAL STAMP													
ENGINEER	TRENT TRAVIS SNARR, P.E. MARYLAND PROFESSIONAL ENGINEER LICENSE #55491												
SHEET TITLE	<b>ANTENNA &amp; RRU MOUNTING DETAILS</b>												
SHEET NUMBER	<b>A-3</b>												



1 PLUMBING DIAGRAM  
NTS  
A-3



HYBRID CABLE WEIGHT		
18/C #6	1.7LB/FT	2.5KG/M
18/C #4	2.4LB/FT	3.6KG/M



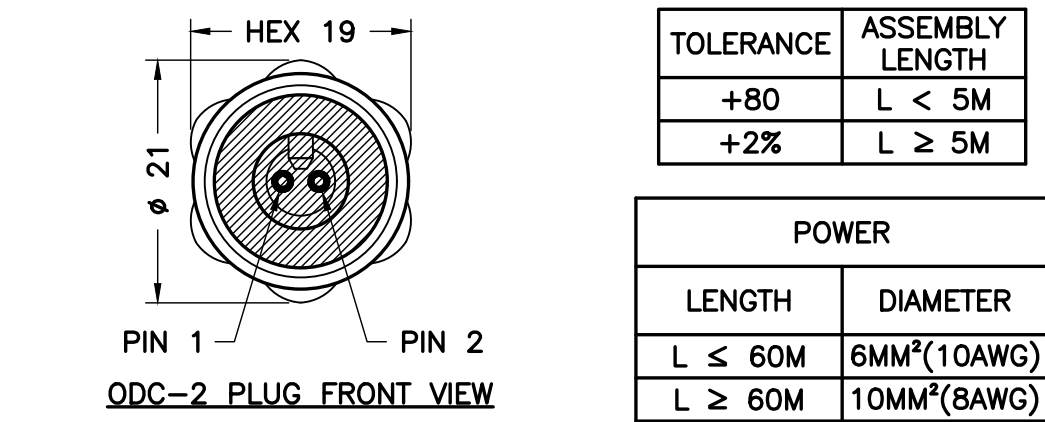
- ③ STANDARD LABEL 84002345
- ④ ATTENTION DO NOT TWIST PULLING TUBE STANDARD LABEL 84087128

RRH NO.	SIDE A		SIDE B		LENGTH SIDE B	RUBBER GROMMETS
	ODC PLUG	PIN	PIN	COLOR LCD BOOTS		
1	ODC-2 RED	1	B	RED (SHORT BREAKOUT)	1000 ± 50	1
		2	A	GREEN	1060 ± 50	
2	ODC-2 GREEN	1	B	BLUE	1120 ± 50	1
		2	A	RED (SHORT BREAKOUT)	1180 ± 50	
3	ODC-2 BLUE	1	B	GREEN	1240 ± 50	1
		2	A	BLUE	1300 ± 50	
4	ODC-2 YELLOW	1	B			
		2	A			
5	ODC-2 WHITE	1	B			
		2	A			
6	ODC-2 BLACK	1	B			
		2	A			

RRH NO.	REF HOOK UP	SIDE A		SIDE B
		WIRE COLOR	CABLE DESIGNATOR	WIRE COLOR
1	-48V	BLACK		RED
	0V	GREY	RED	BLACK
	GROUND	DRAIN		COMMON DRAIN
2	-48V	BLACK		GREEN
	0V	GREY	GREEN	WHITE
	GROUND	DRAIN		COMMON DRAIN
3	-48V	BLACK		BLUE
	0V	GREY	BLUE	ORANGE
	GROUND	DRAIN		COMMON DRAIN

RRH NO.	REF HOOK UP	SIDE A		SIDE B
		WIRE COLOR	CABLE DESIGNATOR	WIRE COLOR
4	-48V	BLACK	RED 2X BANDS	RED
	0V	GREY		BLACK
	GROUND	DRAIN		COMMON DRAIN
5	-48V	BLACK	GREEN 2X BANDS	GREEN
	0V	GREY		WHITE
	GROUND	DRAIN		COMMON DRAIN
6	-48V	BLACK	BLUE 2X BANDS	BLUE
	0V	GREY		ORANGE
	GROUND	DRAIN		COMMON DRAIN

2 MLE HYBRID CABLE (6 POWER/12 FIBER)  
NTS  
A-3



TOLERANCE	ASSEMBLY LENGTH
+80	L < 5M
+2%	L ≥ 5M

POWER	
LENGTH	DIAMETER
L ≤ 60M	6MM <sup>2</sup> (10AWG)
L ≥ 60M	10MM <sup>2</sup> (8AWG)

APPLICANT	 <b>T-Mobile</b> T-MOBILE NORTHEAST LLC 12050 BALTIMORE AVENUE BELTSVILLE, MD 20705 OFFICE: (240) 264-8600 FAX: (240) 264-8610												
ENGINEER	 <b>NB+C</b> <b>TOTALLY COMMITTED.</b> NB+C ENGINEERING SERVICES, LLC. <small>6095 MARSHLEE DRIVE, SUITE 300          ELK RIDGE, MD 21075          (410) 712-7092</small>												
SITE INFORMATION	7WAN094C KEYWEST - ROCKVILLE 9420 KEY WEST AVENUE ROCKVILLE, MD 20850 MONTGOMERY COUNTY												
DESIGN RECORD	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">REVISIONS</th> </tr> <tr> <th>REV</th> <th>DATE</th> <th>DESCRIPTION</th> <th>BY</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>06/29/2020</td> <td>FINAL CDs</td> <td>CAR</td> </tr> </tbody> </table>	REVISIONS				REV	DATE	DESCRIPTION	BY	0	06/29/2020	FINAL CDs	CAR
REVISIONS													
REV	DATE	DESCRIPTION	BY										
0	06/29/2020	FINAL CDs	CAR										
PROFESSIONAL STAMP													
ENGINEER	TRENT TRAVIS SNARR, P.E. MARYLAND PROFESSIONAL ENGINEER LICENSE #55491												
SHEET TITLE	<b>CABLING DETAILS &amp; PLUMBING DIAGRAM</b>												
SHEET NUMBER	<b>A-4</b>												



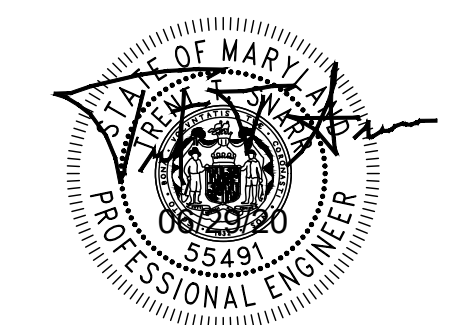
**T-Mobile**  
 T-MOBILE NORTHEAST LLC  
 12050 BALTIMORE AVENUE  
 BELTSVILLE, MD 20705  
 OFFICE: (240) 264-8600  
 FAX: (240) 264-8610

**NB+C**  
 TOTALLY COMMITTED.  
 NB+C ENGINEERING SERVICES, LLC.  
 6095 MARSHALEE DRIVE, SUITE 300  
 ELK RIDGE, MD 21075  
 (410) 712-7092

7WAN094C  
 KEYWEST - ROCKVILLE  
 9420 KEY WEST AVENUE  
 ROCKVILLE, MD 20850  
 MONTGOMERY COUNTY

**REVISIONS**

REV	DATE	DESCRIPTION	BY
0	06/29/2020	FINAL CDs	CAR



PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022

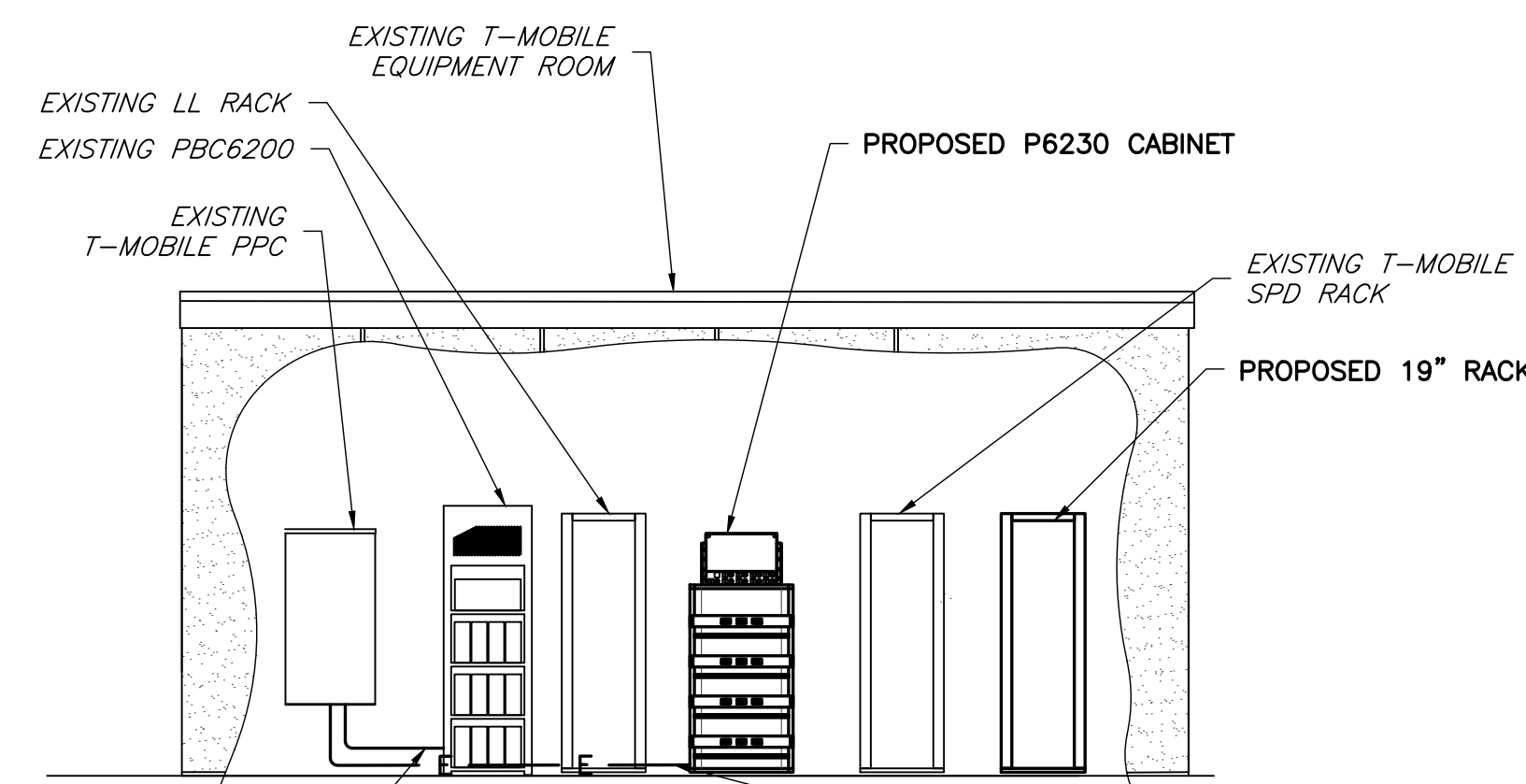
TRENT TRAVIS SNARR, P.E.  
 MARYLAND PROFESSIONAL ENGINEER  
 LICENSE #55491

**ELECTRICAL DETAILS**

**E-1**

PPC PANEL														
PANEL NAME: PPC      120/240 VOLTS      3 WIRE      1 PHASE      MAIN BREAKER: 200A														
LOAD DESCRIPTION	LOAD PER PHASE		TRIP	POLES	(AMOUNT) #WIRE SIZE	LOAD PER PHASE TOTALS		(AMOUNT) #WIRE SIZE	POLES	TRIP	LOAD PER PHASE		LOAD DESCRIPTION	
	PHASE					A	B				PHASE			
	A	B									A	B		
1 SURGE ARRESTOR	0		60	2	(3) #4	180		(3) #1/0	1	10	180		FAN	2
3		0					360	(3) #1/0	1	15		360	GFCI RECEPTACLE	4
5 *P6200 CABINET	1350		25	2	(2) #10	2700		(2) #10	2	25	1350		*P6200 CABINET	6
7		1350					2700					1350		8
9 *P6200 CABINET	1350		25	2	(2) #10	2700		(2) #10	2	25	1350		*P6200 CABINET	10
11		1350					2700					1350		12
13 *P6200 CABINET	1350		25	2	(2) #10	2700		(2) #10	2	25	1350		*P6200 CABINET	14
15		1350					2700					1350		16
17 *P6200 CABINET	1350		25	2	(2) #10	8350		(2) #10	2	100	7000		*P6230	18
19		1350					8350					7000		20
21 *P6200 CABINET	1350		25	2	(2) #10	1350		-	-	-	0		SPACE	22
23		1350					1350					0		24
SUBTOTALS						17980	18160	TOTAL CONNECTED LOAD (VA):		36140				
						149.8	151.3	MAXIMUM LOAD CURRENT:		151.3				
								PANEL CAPACITY:		200				
								SPARE CAPACITY:		48.7				
NOTES:														
*EXISTING PBC 6200 REQUIRES (8) 2P-25A BREAKERS, CONTRACTOR TO INSTALL REMAINING BREAKERS														
**INSTALL (1) 2P-100A BREAKER FOR PROPOSED P6230														

1 PANEL SCHEDULE  
 E-1 NTS



3 POWER DIAGRAM  
 G-1 NTS  
 CONTRACTOR TO VERIFY/INSTALL (2) #10 AWG + (1) #10 AWG GND IN 1/2" CONDUIT PER 2P-25A BREAKER, TOTAL OF 8  
 PROPOSED (3) #1 AWG + (1) #8 GND IN 1-1/4" CONDUIT

**ELECTRICAL LEGEND**

	A	AMPERE
	C	CONDUIT
	EMT	ELECTRICAL METALLIC TUBING
	G	GROUND
	GFI	GROUND FAULT INTERRUPTING CIRCUIT BREAKER
	KWH	KILOWATT HOUR
	MCB	MAIN CIRCUIT BREAKER
	P	POLE
	SW	SWITCH
	V	VOLT
	W	WIRE



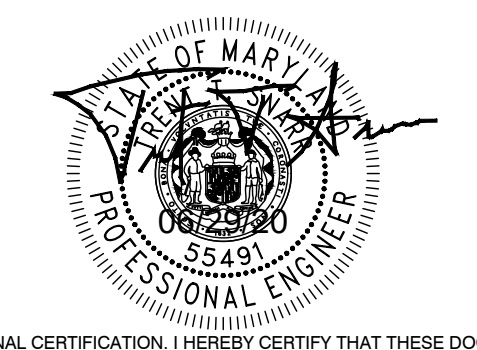
**T-Mobile**  
 T-MOBILE NORTHEAST LLC  
 12050 BALTIMORE AVENUE  
 BELTSVILLE, MD 20705  
 OFFICE: (240) 264-8600  
 FAX: (240) 264-8610

**NB+C**  
 TOTALLY COMMITTED.  
 NB+C ENGINEERING SERVICES, LLC.  
 6095 MARSHALEE DRIVE, SUITE 300  
 ELKRDGE, MD 21075  
 (410) 712-7092

7WAN094C  
 KEYWEST - ROCKVILLE  
 9420 KEY WEST AVENUE  
 ROCKVILLE, MD 20850  
 MONTGOMERY COUNTY

**REVISIONS**

REV	DATE	DESCRIPTION	BY
0	06/29/2020	FINAL CDs	CAR

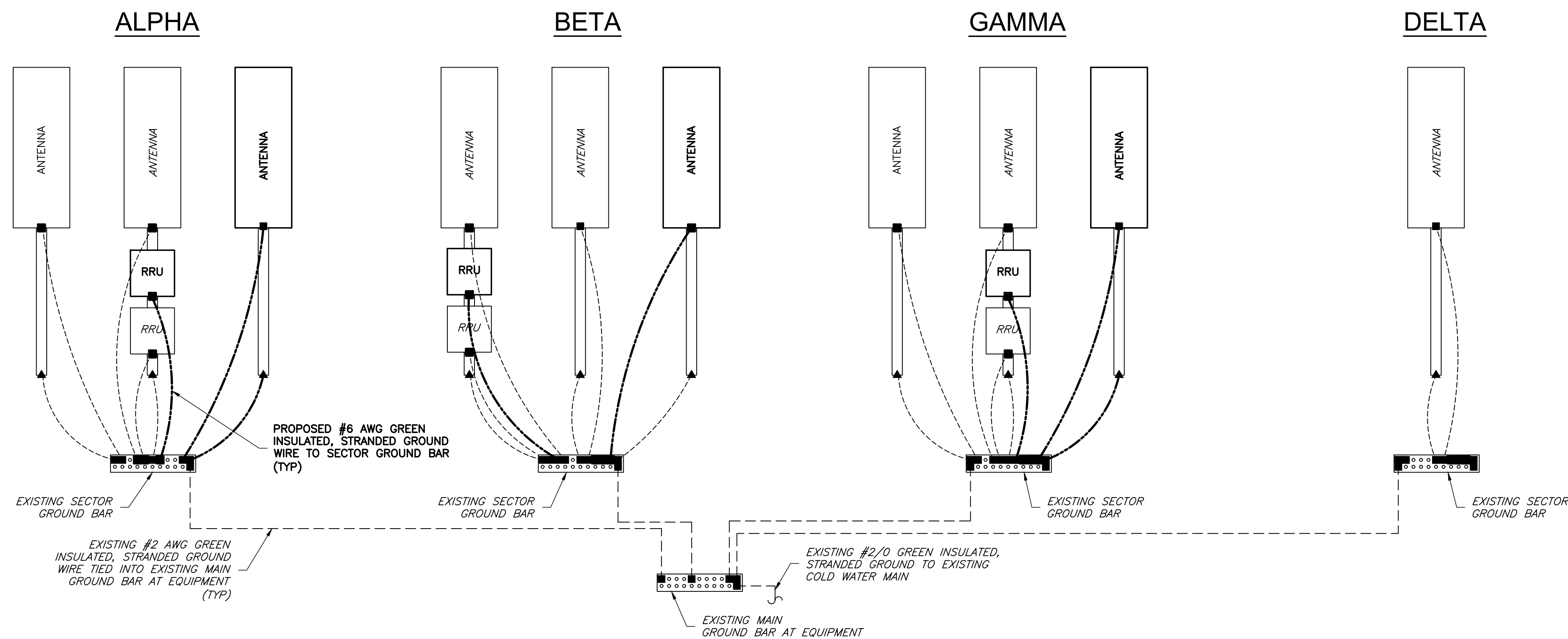


PROFESSIONAL CERTIFICATION. I HEREBY CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MARYLAND. LICENSE NO. 55491, EXPIRATION DATE 01/08/2022.

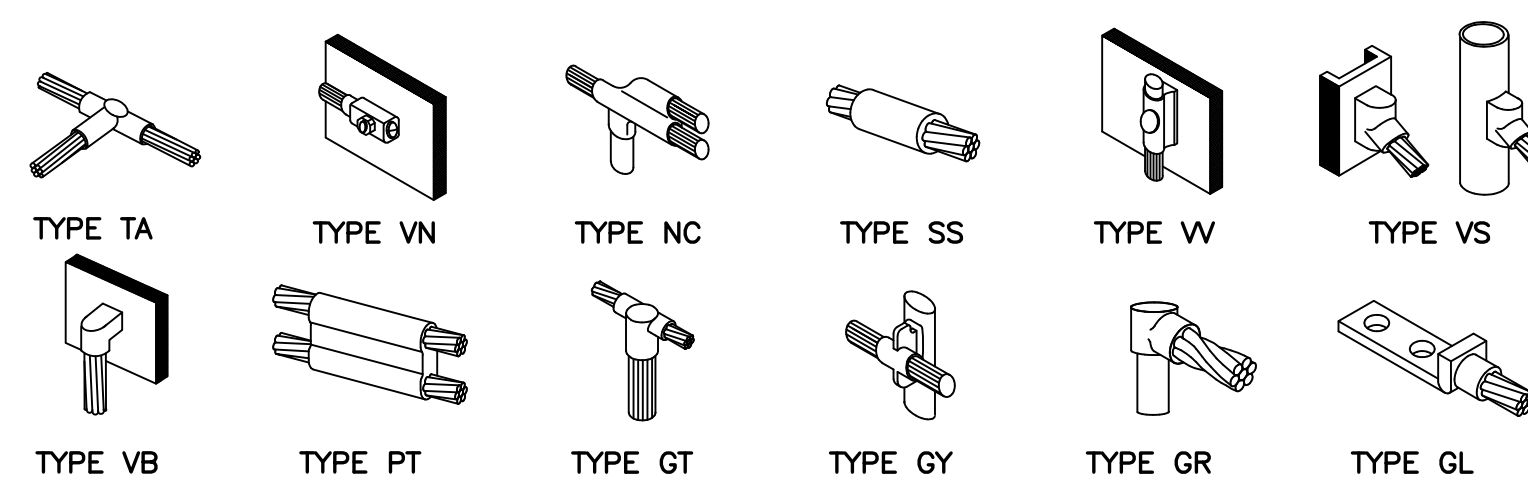
TRENT TRAVIS SNARR, P.E.  
 MARYLAND PROFESSIONAL ENGINEER  
 LICENSE #55491

**GROUNDING DETAILS**

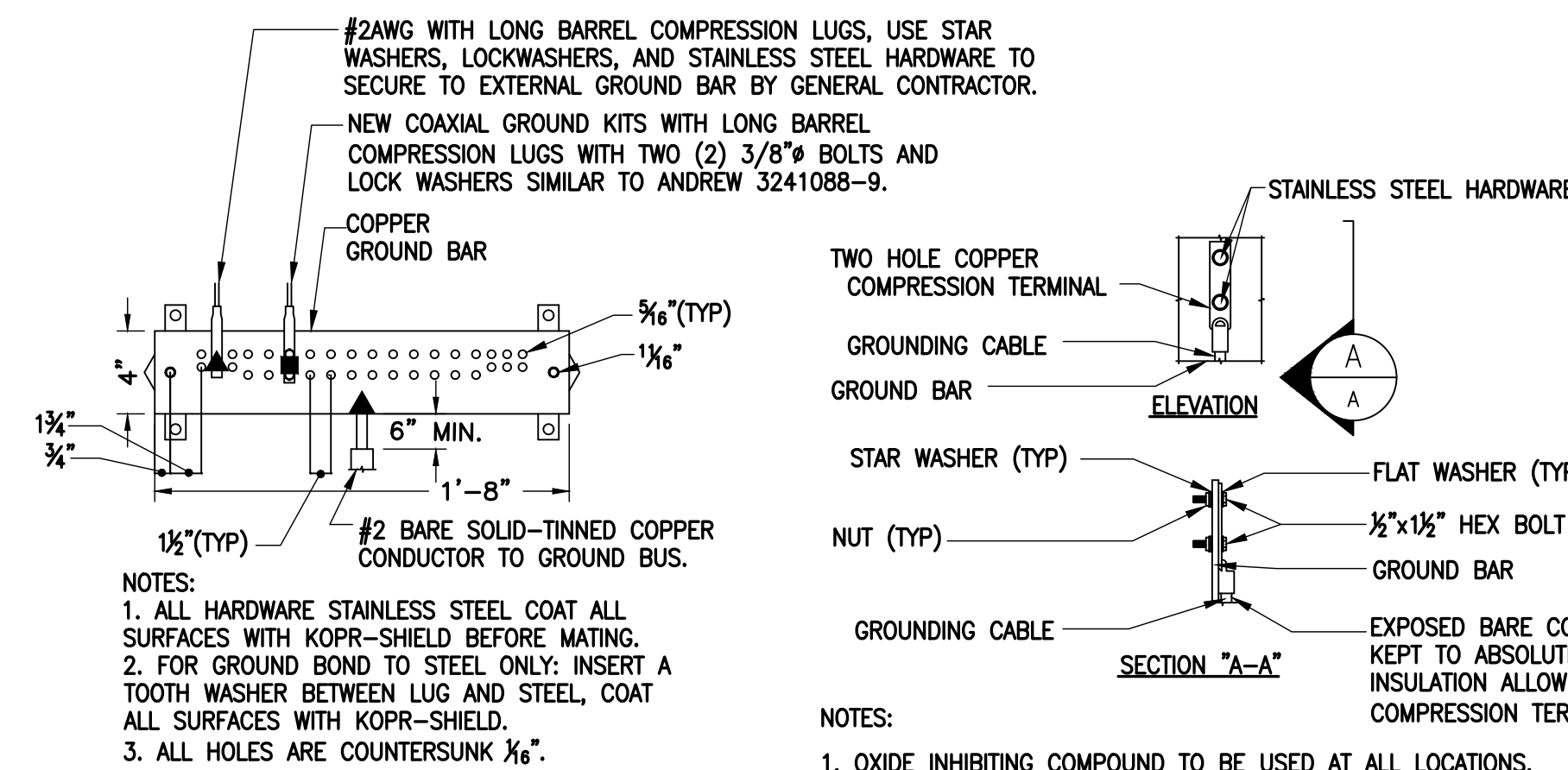
**G-1**



1 ANTENNA GROUNDING DETAIL  
 NTS  
 G-1



2 CADWELD GROUNDING CONNECTION DETAILS  
 NTS  
 G-1



3 GROUNDING BAR CONNECTIONS  
 NTS  
 G-1

**GROUNDING LEGEND**

- MECHANICAL FITTING CONNECTION
- ▲ CADWELD CONNECTION
- EXOTHERMIC WELD CONNECTION
- PROPOSED GROUND WIRING
- - - - - EXISTING GROUND WIRING