

T-Mobile

Approved:
[Signature]
12/22/2021

T-MOBILE SITE NUMBER: DN06191A
T-MOBILE SITE NAME: CO46049-A
T-MOBILE PROJECT: SPRINT RETAIN

SBA SITE ID: CO46049-A
SITE ADDRESS: 15646 HIGHWAY 94
JURISDICTION: COLORADO SPRINGS, CO 80930
EL PASO COUNTY

T-Mobile
 12920 SE 38TH STREET
 BELLEVUE, WA 98006

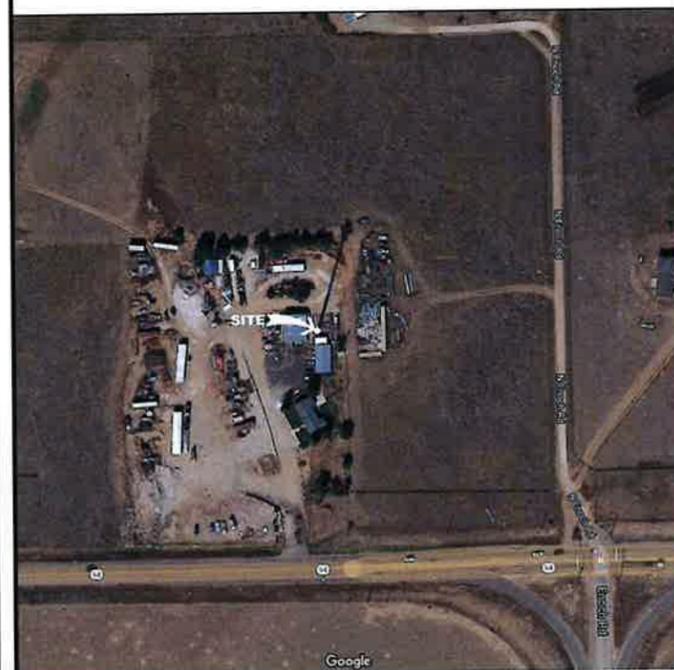


470 DAVIDSON ROAD
 PITTSBURGH, PA 15239
 TEL: (740) 260-9710

SITE INFORMATION

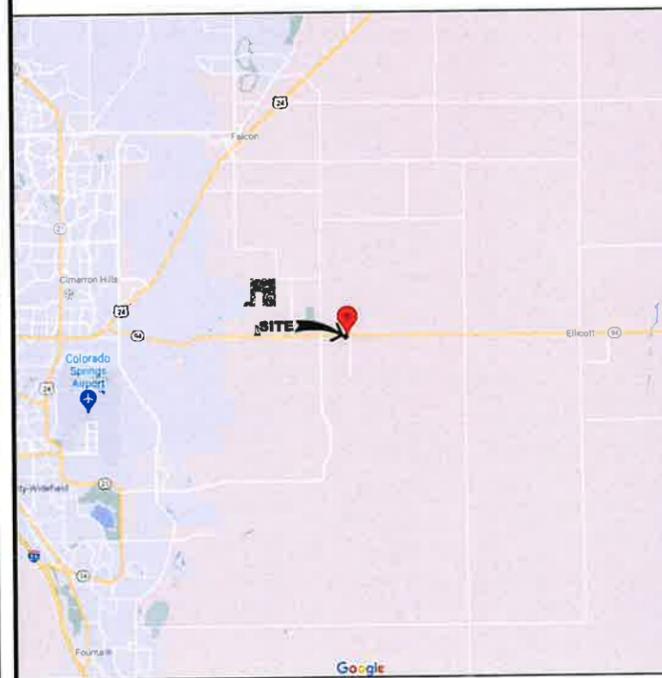
SBA SITE NAME: SCHRIEVER
SITE ADDRESS: 15646 HIGHWAY 94
 COLORADO SPRINGS, CO 80930
COUNTY: EL PASO
AREA OF CONSTRUCTION: EXISTING
LATITUDE: 38.839808° N
LONGITUDE: 104.536624° W
LAT/LONG TYPE: NAD83
JURISDICTION: EL PASO COUNTY
OCCUPANCY CLASSIFICATION: U
TYPE OF CONSTRUCTION: IIB
A.D.A. COMPLIANCE: FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
TOWER OWNER: SBA COMMUNICATIONS
 470 DAVIDSON ROAD
 PITTSBURGH, PA 15239
CARRIER/APPLICANT: T-MOBILE
 12920 SE 38TH STREET
 BELLEVUE, WA 98006

AERIAL MAP



NO SCALE

AREA MAP



NO SCALE

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1.1	OVERALL SITE PLAN
C-1.2	EXISTING EQUIPMENT PLAN
C-1.3	FINAL EQUIPMENT PLAN
C-2	TOWER ELEVATION & ANTENNA PLANS
C-3	ANTENNA SCHEDULE
C-4	PLUMBING DIAGRAM
C-5	EQUIPMENT SPECIFICATIONS
C-6	EQUIPMENT SPECIFICATIONS
C-7	EQUIPMENT SPECIFICATIONS
C-8	MOUNTING DETAIL
C-9	ICE BRIDGE DETAILS
G-1	GROUNDING DIAGRAM
G-2	GROUNDING DETAILS

Michael L. Oglesby, PE

GROUND SCOPE OF WORK

1. INSTALL NEW 600A SITE SUPPORT CABINET
2. INSTALL NEW BATTERY CABINET
3. INSTALL (2) ASIB
4. INSTALL (2) ASIK
5. INSTALL (1) FSMF
6. INSTALL (3) ABIA
7. INSTALL (6) ABIL
8. INSTALL (3) ABIC
9. INSTALL (2) AMIA
10. INSTALL (1) CSR IXRv V2
11. INSTALL (2) JUNCTION BOXES

TOWER SCOPE OF WORK

1. REMOVE (3) ANTENNAS
2. REMOVE (9) RRHS
3. REMOVE (3) POWER JUNCTION BOXES
4. REMOVE (3) OPTICAL JUNCTION BOXES
5. INSTALL NEW HEAVY COLLAR MOUNT
6. INSTALL NEW SUPPORT RAIL KIT
7. INSTALL NEW ANTENNA MOUNT PIPES
8. INSTALL NEW SUPPORT RAIL CENTER PIPE KITS
9. INSTALL (6) ANTENNAS
10. INSTALL (6) RRHS
11. INSTALL (2) HYBRID CABLES
12. INSTALL (2) BREAKOUT PENDANTS

THE POWER DESIGN FOR ANY AC ELECTRICAL POWER CHANGES IS TO BE PERFORMED BY OTHERS AND IS SHOWN HERE FOR REFERENCE PURPOSES ONLY. T-MOBILE IS SOLELY RESPONSIBLE FOR THE ELECTRICAL POWER DESIGN.

APPLICABLE CODES/REFERENCE DOCS

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

CODE TYPE	CODE
BUILDING	2017 PPRBC (2015 IBC)
MECHANICAL	2017 PPRMC (2015 IMC)
ELECTRICAL	2014 NEC

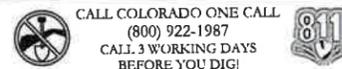
REFERENCE DOCUMENTS:

- STRUCTURAL ANALYSIS: TOWER ENGINEERING SYSTEMS (PROJECT #: 109307)
DATED: 06/17/2021
- MOUNT ANALYSIS: TOWER ENGINEERING SYSTEMS (PROJECT #: 109746)
DATED: 07/13/2021
- RFDS REVISION: 1
DATED: 01/28/2021

PROJECT TEAM

A&E FIRM: KIMLEY-HORN & ASSOCIATES, INC.
 3875 EMBASSY PKWY, SUITE 280
 AKRON, OH 44333
 KEVIN.CLEMENTS@KIMLEY-HORN.COM
SBA CONTACT: 470 DAVIDSON ROAD
 PITTSBURGH, PA 15239
 WILL SPICE - PROJECT MANAGER
 WSPICE@SBASITE.COM

**RR-5
 TOWER REMOVAL
 AGREEMENT - VA-03-003**



PLANS PREPARED BY:



421 FAYETTEVILLE ST, SUITE 600
 RALEIGH, NC 27601

REV: DATE: DESCRIPTION: BY:

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1	08/11/21	REVISED PER CLIENT	DLF
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DRAWN BY: HLM CHECKED BY: DLF

KHA PROJECT NUMBER:
KHCLE-7484

ENGINEER SEAL:
 Michael L. Oglesby, PE
 48589
 COLORADO LICENSED PROFESSIONAL ENGINEER
 08/11/21
 Exp. 10/31/21

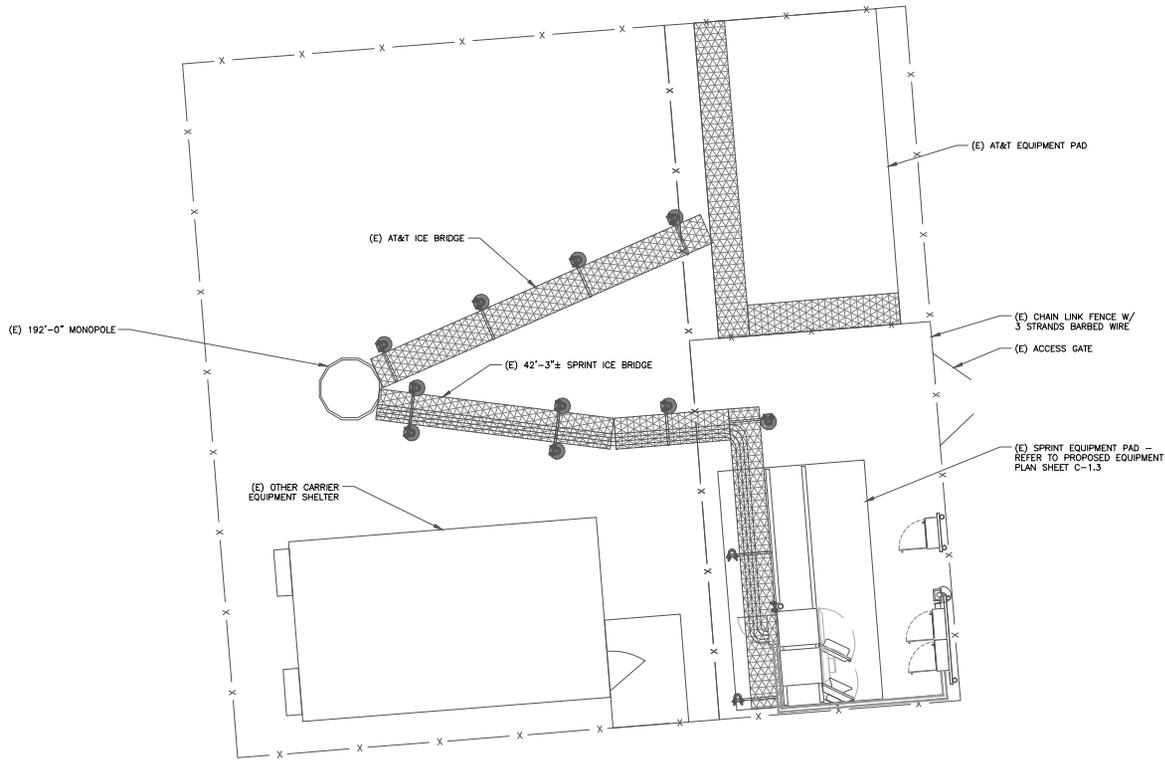
**DN06191A
 CO46049-A
 SBA #: CO46049-A
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 COLORADO SPRINGS, CO 80930**

SHEET TITLE:
TITLE SHEET

SHEET NUMBER:
T-1

SITE PLAN DISCLAIMER:

PROPERTY LINES AND STRUCTURES HAVE BEEN DIGITIZED FROM PREVIOUS PLAN SETS. KIMLEY-HORN HAS NOT COMPLETED A SITE SURVEY AND THEREFORE MAKES NO CLAIMS AS TO THE ACCURACY OF INFORMATION DEPICTED ON THIS SHEET.



1 OVERALL SITE PLAN
 SCALE: 1/4"=1'-0" (FULL SIZE)
 1/8"=1'-0" (1:12)



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Kimley Horn

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ENGINEER SEAL:



08/11/21
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SHEET TITLE:

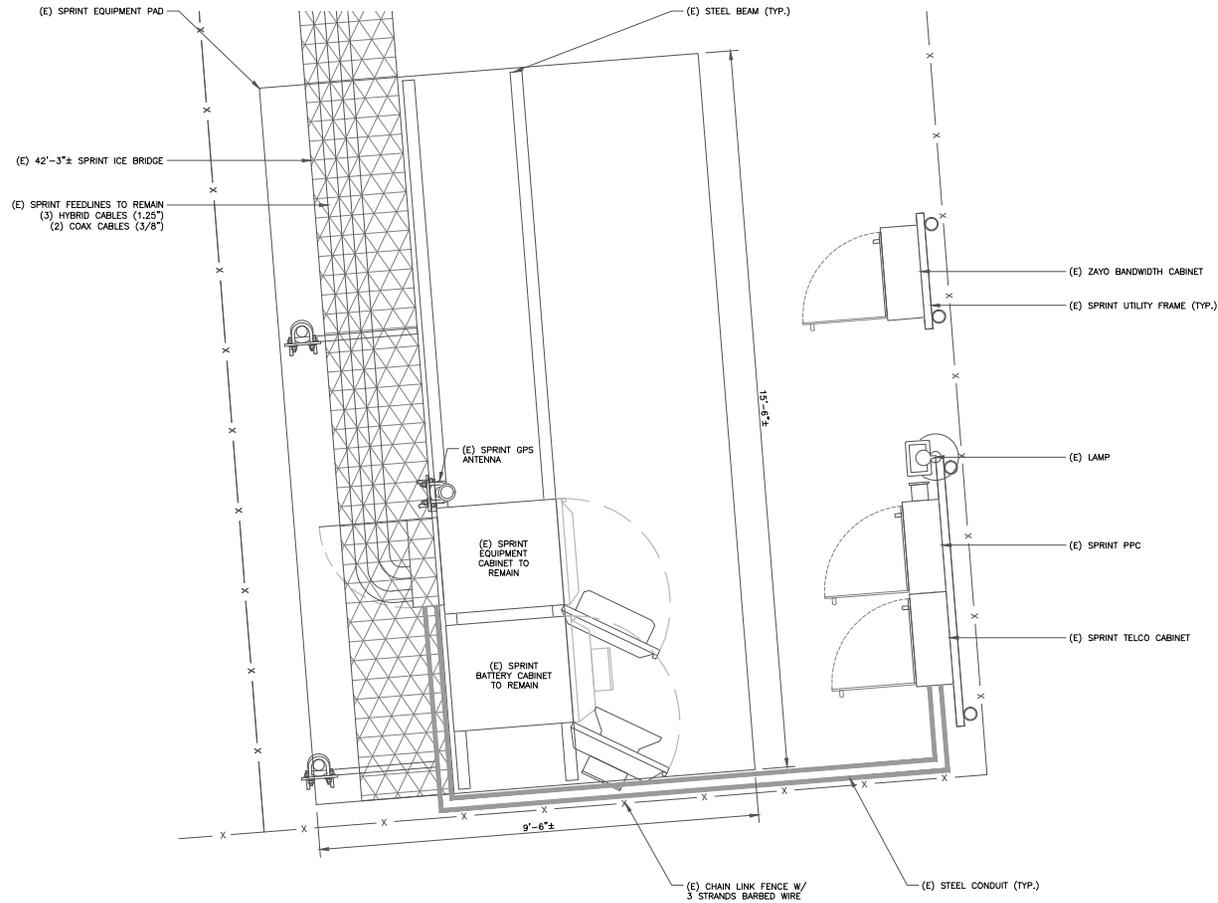
OVERALL SITE PLAN

SHEET NUMBER:

C-1.1

INSTALLER NOTE:

AMIAS ARE TO BE INSTALLED INTERNALLY IN THE 600A SSC CABINET. IF NO 600A SSC CABINET IS ON SITE, AMIAS ARE TO BE SUBSTITUTED WITH AMOBs. CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING APPROPRIATE LOCATION WITHIN T-MOBILE LEASE AREA FOR AMOB MOUNTING AND PROVIDE TO CONSTRUCTION MANAGER. AMOB LOCATIONS MUST BE APPROVED BY CONSTRUCTION MANAGER PRIOR TO INSTALLATION.



1 EXISTING EQUIPMENT PLAN
 SCALE: 3/4"=1'-0" (FULL SIZE)
 3/8"=1'-0" (11x17)



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KHCL-7484

ENGINEER SEAL:



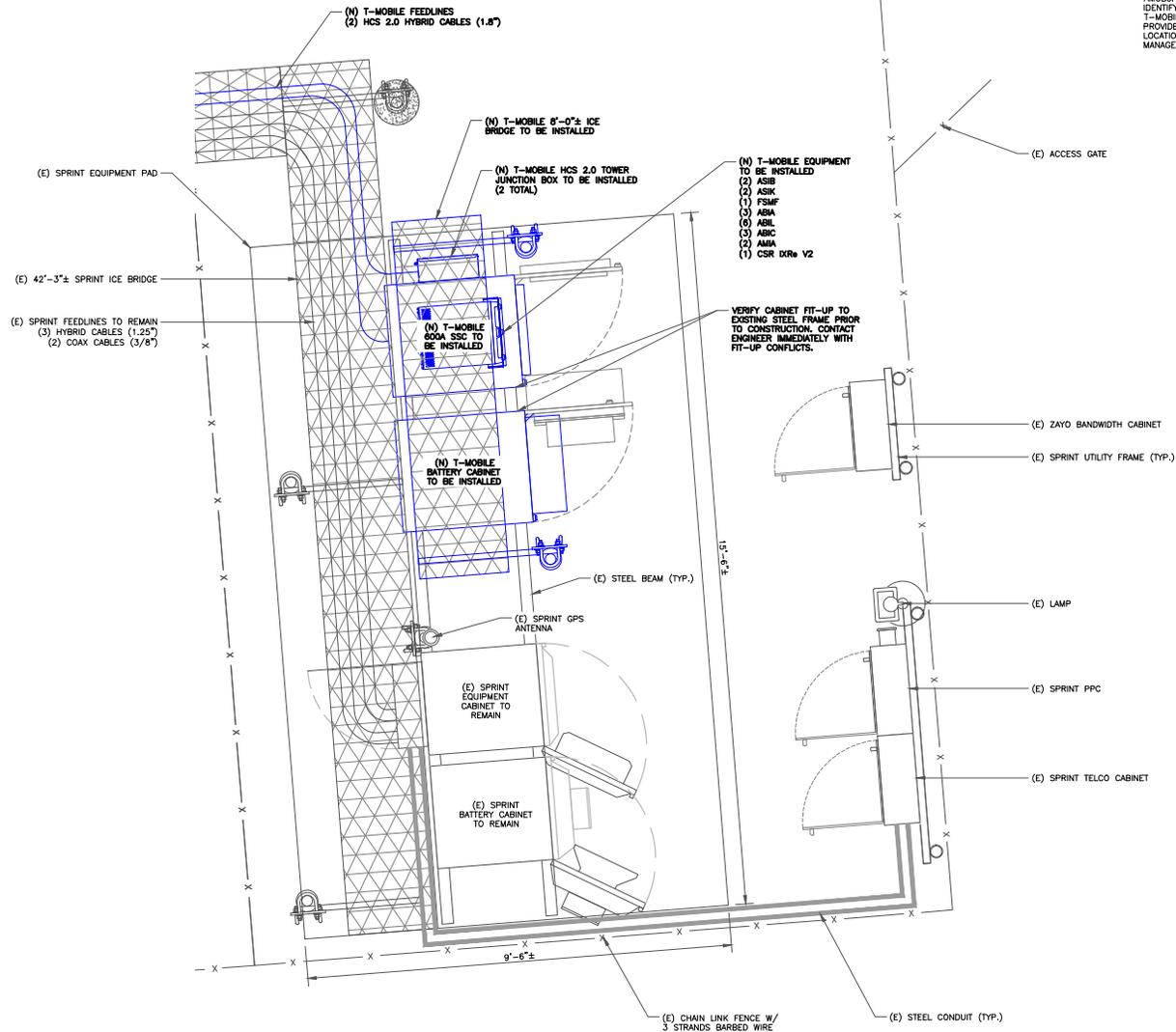
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 15646 HIGHWAY 94
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SHEET TITLE:
EXISTING EQUIPMENT PLAN

SHEET NUMBER:
C-1.2



INSTALLER NOTE:
 AMIAs ARE TO BE INSTALLED INTERNALLY IN THE 600A SSC CABINET. IF NO 600A SSC CABINET IS ON SITE, AMIAs ARE TO BE SUBSTITUTED WITH AM06s. CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING APPROPRIATE LOCATION WITHIN T-MOBILE LEASE AREA FOR AM06 MOUNTING AND PROVIDE TO CONSTRUCTION MANAGER. AM06 LOCATIONS MUST BE APPROVED BY CONSTRUCTION MANAGER PRIOR TO INSTALLATION.

1 FINAL EQUIPMENT PLAN
 SCALE: 3/4"=1'-0" (FULL SIZE)
 3/8"=1'-0" (1x1/2)



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DRAWN BY: HLM CHECKED BY: DLF

KHA PROJECT NUMBER: KHCL-7484

ENGINEER SEAL:



08/11/21
 Exp. 10/31/21

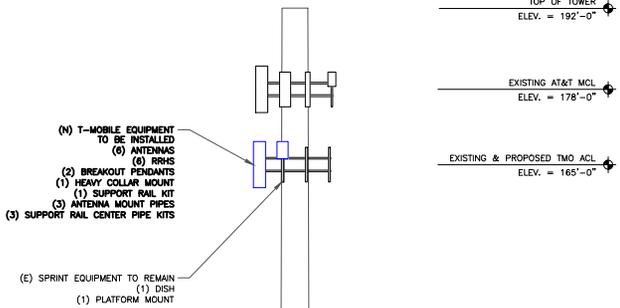
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 15646 HIGHWAY 94
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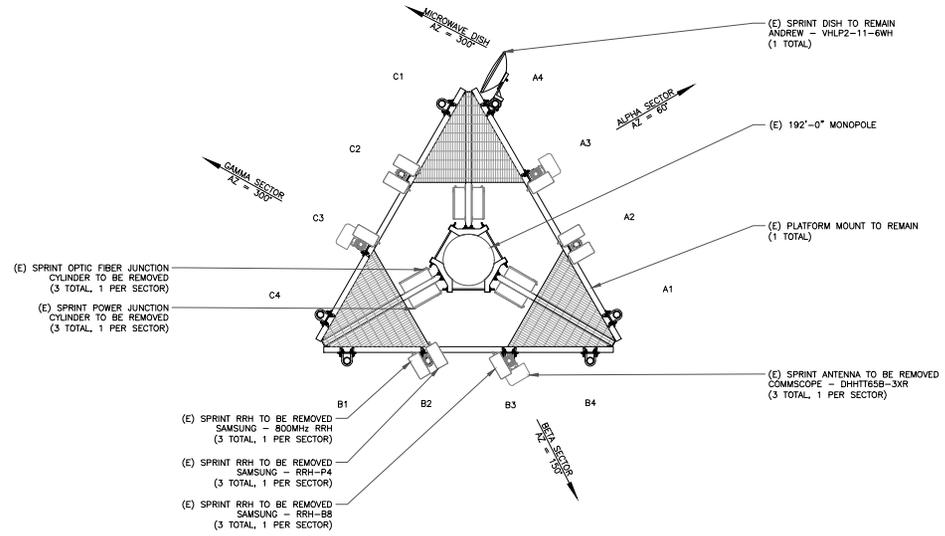
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FINAL EQUIPMENT PLAN

SHEET NUMBER:

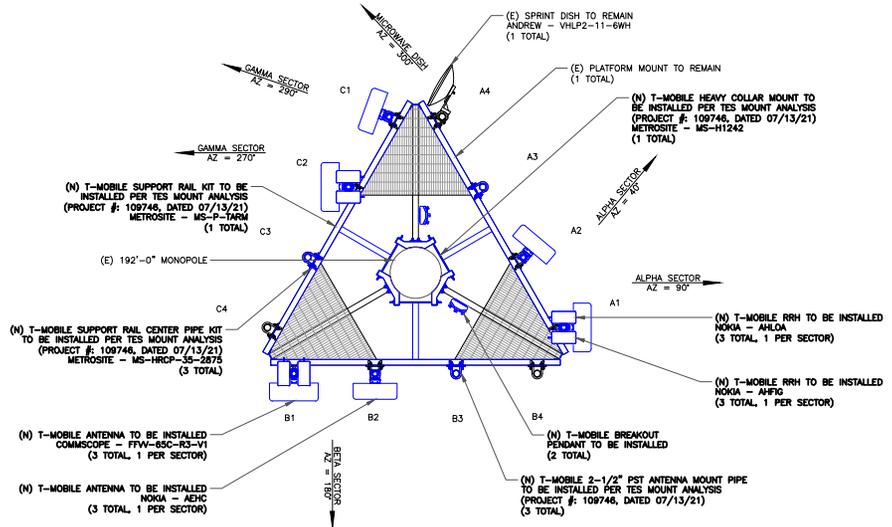
C-1.3



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA PLAN
SCALE: NOT TO SCALE



3 FINAL ANTENNA PLAN
SCALE: NOT TO SCALE

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HLM DLF

KHA PROJECT NUMBER:

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ENGINEER SEAL:



PROJECT INFORMATION:

DN06191A
CO46049-A
SBA #: CO46049-A
15646 HIGHWAY 94
COLORADO SPRINGS, CO 80930

SHEET TITLE:

TOWER ELEVATION & ANTENNA PLAN

SHEET NUMBER:

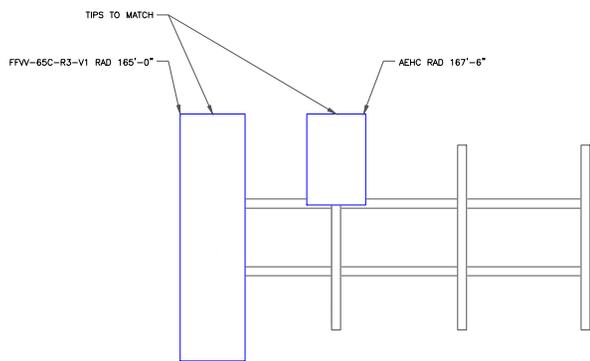
C-2

NEW AND EXISTING ANTENNA AND CABLE SCHEDULE

SECTOR	POS.	AZIMUTH	RAD CENTER	M. TILT	TECHNOLOGY	ANTENNA	STATUS	RRU TYPE	DIPLEXER/TMA	COVP	CABLE STATUS	COAX CABLE LENGTH	HCS FACTORY LENGTH	JUMPER LENGTH				
ALPHA	A4	300°	165'-0"	-	-	ANDREW - VHL P2-11-6WH	EXIST	-	-	(2) NEW BREAKOUT PENDANTS	(3) EXISTING 1.25" HYBRID CABLES, (2) 3/8" COAX CABLES, (2) NEW 1.8" HYBRID CABLES	EXISTING	EXISTING	<15'-0"				
	A3	-	-	-	-	-	-	-	-					-	-			
	A2	40°	167'-6"	0°	L2500 N2500	NOKIA - AEHC	NEW	-	-					-	-	<15'-0"		
	A1	90°	165'-0"	0°	L700 L600 N600 L2100 L1900 G1900 N1900 N2100	COMMSCOPE - FFV-65C-R3-V1	NEW	(1) NEW AHLOA (1) NEW AHFIG	-					-	-	<15'-0"		
BETA	B4	-	-	-	-	-	-	-	-					-	-	-	-	-
	B3	-	-	-	-	-	-	-	-					-	-	-	-	-
	B2	180°	167'-6"	0°	L2500 N2500	NOKIA - AEHC	NEW	-	-					-	-	-	<15'-0"	
	B1	180°	165'-0"	0°	L700 L600 N600 L2100 L1900 G1900 N1900 N2100	COMMSCOPE - FFV-65C-R3-V1	NEW	(1) NEW AHLOA (1) NEW AHFIG	-					-	-	<15'-0"		
GAMMA	C4	-	-	-	-	-	-	-	-					-	-	-	-	-
	C3	-	-	-	-	-	-	-	-					-	-	-	-	-
	C2	270°	165'-0"	0°	L700 L600 N600 L2100 L1900 G1900 N1900 N2100	COMMSCOPE - FFV-65C-R3-V1	NEW	(1) NEW AHLOA (1) NEW AHFIG	-					-	-	-	<15'-0"	
	C1	290°	167'-6"	0°	L2500 N2500	NOKIA - AEHC	NEW	-	-					-	-	-	<15'-0"	

(*) SHARED WITH ALL SECTORS

IMPORTANT NOTE: PLEASE REFER TO LATEST RFDS SHEET FOR NSN CONFIGURATION. GC TO CAP ALL UNUSED PORTS



1 ANTENNA ELEVATION
SCALE: N/A

2 NOT USED
SCALE: N/A

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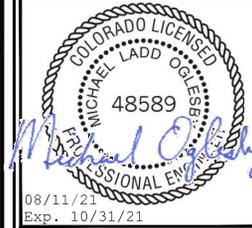
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HLM DLF

KHA PROJECT NUMBER:

KHCL-7484

ENGINEER SEAL:



PROJECT INFORMATION:

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COLORADO SPRINGS, CO 80930

SHEET TITLE:

ANTENNA SCHEDULE

SHEET NUMBER:

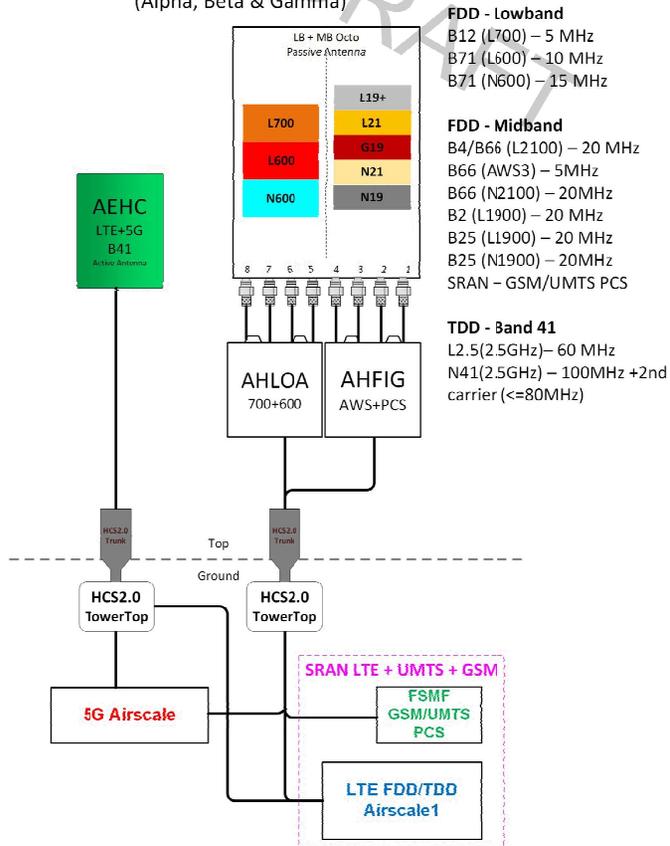
C-3

Section 3 - Proposed Template Images

56791EZ_SR_N21_N19.jpg

Configuration 56791EZ_SR

* For 5G and LTE Airscale BB dimensioning refer to Fiber Port matrices.
(Alpha, Beta & Gamma)



Notes:

1 RFDS
SCALE: N/A

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FOR
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ONLY

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SHEET TITLE:

PLUMBING DIAGRAM

SHEET NUMBER:

C-4

FFW-65C-R3-V1



8-port sector antenna, 4x 617-894 and 4x 1695-2690 MHz, 65° HPBW, 3x RET

General Specifications

Antenna Type	Sector
Band	617-894
Color	Light Gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Performance Note	Outdoor usage
Radome Material	Fiberglass, UV resistant
Radistor Material	Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4-3-10 Female
RF Connector Location	360°
RF Connector Quantity, high band	4
RF Connector Quantity, low band	4
RF Connector Quantity, total	8

Remote Electrical Tilt (RET) Information

RET Interface	8-pin D15 Female / 8-pin D15 Male
RET Interface, quantity	1 female / 1 male
Input Voltage	10-30 VDC
Input RET	High band (2) / Low band (1)
Power Consumption, life state, maximum	1 W
Power Consumption, normal conditions, maximum	10 W
Protocol	3GPP R456.1.0 (Single RET)

Dimensions

Width	340 mm / 13.393 in
Depth	235 mm / 9.252 in
Length	1497 mm / 59.343 in
Net weight, without mounting kit	35.5 kg / 78.311 lb

1 ANTENNA SPECIFICATIONS
SCALE: NOT TO SCALE

AEHC AirScale MAA 64T64R 192AE n41 240W

Preliminary Technical datasheet

Specification	3GPP/ETSI compliant, TDD
Frequency range	2496 - 2690 MHz
Max. supported modulation	256 QAM
Number of TX/RX paths	64T / 64R
MIMO streams	16
Instantaneous bandwidth IEM	194 MHz
Occupied bandwidth OBW	194 MHz
Total average EIRP	70.3 dBm
Max. output power per TRX	3.75 W / TRX (240 W total)
Antenna configuration	12 rows, 8 columns, 2 (±45° X-polarized)
Max. antenna gain	21.5 dBi
Horizontal beamwidth	13° (bore-sight)
Vertical beamwidth	6° (bore-sight)
Horizontal coverage angle	±45° (3 dB), ±60° (5 dB)
Vertical steering angle	±5°
Dimensions	TBD 900 mm (H) x 580 mm (W) x 210 mm (D)
Volume / Windward area	TBD < 110 L / < 0.6 m ²
Weight	~65kg (without mounting brackets)
Supply voltage / Connector type	DC -40.5 V ... -57 V / 2 pole connector
Power consumption	600 W typical (75% DL duty cycle, 50% RF load) 1300 W max (75% DL duty cycle, 100% RF load)



Optical ports	4 x SFP28, 10/25Gb eSFP (with RCT)
Other interfaces / Connector type	Control AISG RF monitor port / SMA Female External Alarm / MQR26 status LED
Operational temperature range	-40 °C ... +55 °C
Cooling	Natural convection cooling
Ingress protection class	IP65
Installation options	Pole / Wall, ± 0° vertical adjustment
Surge protection	Class II 20 kA

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2 ANTENNA SPECIFICATIONS
SCALE: NOT TO SCALE

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SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-5

AirScale Dual RRH 4T4R B12/71 240W AHLOA



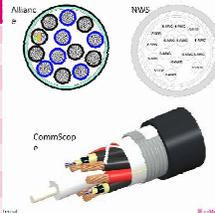
Product Code:	174231A
Supported Frequency Bands:	3GPP Band 12/71
Frequencies:	Band 12 Adjacent: LL 695 - 716 MHz; DL 728 - 746 MHz Band 71: LL 663 MHz - 596 MHz; DL 517 MHz - 652 MHz
Number of TX/RX ports/pipes:	4 pipes; 2T2R, 2T1R, 4T1R for both bands
Instantaneous Bandwidth BW:	17 MHz for B12 and 35MHz for B71 1 MHz below B71 N816T Future use
Occupied Bandwidth OBW:	LL: 3.5MHz contiguous DL: B12: 17MHz x 1.1MHz NR; B71 Future use: B71 35MHz
Output Power:	60W per TX shared between bands
Supply Voltage / Range:	DC: 48 V / -35 V to -50 V
Typical Power Consumption:	610W (ETD Busy Hour Load at 4.7x@60W) 450W (ETD Busy Hour Load at 4.7x@70W)
Antenna Ports:	4 ports, 4.3-10"
Optical Ports:	2 x CPRI 6.8 Gbps
ALO Control Interfaces:	ASG3.0 and 4ET LDC on RMT1 & AMT3
Other Interfaces:	External Alarm NDR: 24 (4 inputs, 1 Output) DC Circular Power Connector
Physical:	380 mm x 308 mm x 189 mm Approximately 38kg with no covers or brackets
Operating Temperature Range:	+40°C to -5°C (with no cover, 100%)
Surge Protection:	Class B 3k
Installation Options:	Pole, Wall, Back Mount

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1 NOKIA - AHLOA
SCALE: NOT TO SCALE

Trunk Cable General Specifications

Characteristic	Alliance	CommScope	NWS
Outer Diam.	1.46"	1.55"	1.48"
Weight	1.61 lb/ft	1.71 lb/ft	1.61 lb/ft
Min. Bend Rad.	34.6"	18.6"	21.5"
DC Conductors	12 x 6AWG	12 x 6AWG	12 x 6AWG
Armor	Corrugated Cu	Corrugated Al	Cu tape, PVC
Conductor Termination	None	None	None
Single-Mode Fibers	48	48	48
Fiber Termination	LC pair	LC pair	LC pair



Breakout Feature General Specifications

Characteristics	Alliance	CommScope	NWS
Dimensions, in.	9.3x14.0x5.8	6.7x16.0x4.7	10.2x16.0x3.2
Weight	1.01 lb/ft	0.97 lb/ft	1.01 lb/ft
Port Interface	Scnio II	Scnio II	Scnio II
Hybrid Ports	12	12	12
Conductor Termination	None	None	None
Single Mode Fibers	40	40	40
Fiber Termination	LC pair	LC pair	LC pair
Max RRU	12	12	12



Note: Permanently attached to trunk cable, not field removable/replaceable.
None: No external DCP

2 HYBRID CABLE & BREAKOUT
SCALE: NOT TO SCALE

AirScale System Module Installation Guidelines - AMIA

AMIA is primary for indoor sites (environmentally controlled) or site support cabinets

- For a 19" rack installation 3U of space is needed (adapters/support required for 23" rack)
- For Medium/Large HP/ Large Delta SSC - Fan/filter kit required (SKU# 32168) to support medium config
- For Medium Purcell SSC - Nothing required to support minimal config (single LTE layer)
- For Medium Purcell SSC - Door upgrade kit required (SKU# 33401) to support full config

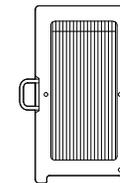
Item Description	3U Space*	4U Space
19 to 23 inch adaptor bracket, 3U w/abt	x	
19 to 23 inch adaptor bracket, 4U w/abt		x
ASSY, SHIELD		x

*Bottom support is available



© Nokia

3 AMIA SPECIFICATIONS
SCALE: NOT TO SCALE



NOKIA - AHFIG
WEIGHT (FULLY EQUIPPED): 79.4 LBS
SIZE (HxWxD): 27.6x13.4x5.6 IN.
CONNECTOR TYPE: 4.3-1 FEMALE

4 NOKIA - AHFIG
SCALE: NOT TO SCALE

T-Mobile

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RALEIGH, NC 27601

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REV. #	DATE	DESCRIPTION	BY:
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HLM DLF

KHA PROJECT NUMBER:

KHCL- 7484

ENGINEER SEAL:

FOR
REFERENCE
PURPOSES
ONLY

PROJECT INFORMATION:

DN06191A
CO46049-A
SBA #: CO46049-A
15646 HIGHWAY 94
COLORADO SPRINGS, CO 80930

SHEET TITLE:

EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-6



Outdoor Power & Battery Enclosures for AAV Equipment

The following products are described in this section. Please refer to Shelf power section for rectifiers, controllers and circuit breakers.

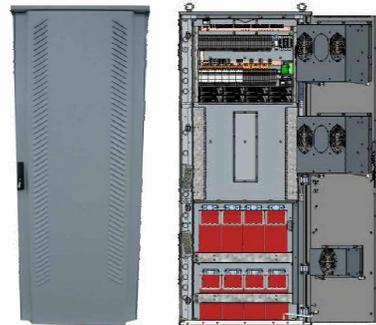
Products: *Small SSC, LP Small SSC, Medium SSC, Large SSC, HP Large SSC, Battery Enclosure Advantage 1kW, Advantage 2kW & Advantage 6U*



Basic Overview Pad Mount Power Cabinets					
Parameter	LP Small SSC	Small SSC	Medium SSC	Large SSC	HP Large SSC
Max Output (@-54V)	150	200	200	200	400
Height	37"	37"	54"	72"	72"
Width	26"	26"	30"	30"	30"
Depth	27"	27"	35"	35"	35"
Weight (w/ Rectifiers)	196	198	320	419	470
Open Rack Space	7RU	6RU	10RU	10RU	12RU
Max Eqmt Depth	15"	15"	20"	20"	20"
No. Battery Strings	1 x 100Ah	1 x 100Ah	1 x 100Ah 1 x 185Ah	3 x 185Ah	2 x 185Ah
Load Circuit Positions	17	17	17	17	52



HP Large Site Support Cabinet



HP Large SSC

- Corrosion Resistant Aluminum Construction
- Direct Air Cooling with optional Gore filter upgrade
- Compact design for power, battery, and equipment
- 72"H x 30"W x 36"D
- 400A/48V Power System
- Supports 2 Battery strings of 185 Ahr each
- 12RU/19" or 23" rack for Equipment

T-Mobile SAP Number	Delta Part Number	Product Description
33112	ESDA400 CCU01	HP Large SS Cabinet w/ (3) 2900W rectifiers
33113	3799442800-S	Optional Mounting Plinth, 6"
30068	ESR-48/40C F-A	DPR2000 Rectifier Module, -48V, 2000W, 96% efficiency
31910	ESR-48/56C F-A	DPR2900 Rectifier Module, -48V, 2900W, 96% efficiency
See Page 27	See Page 27	Load Circuit Breakers, DIN rail type
14502	0999142300	-48V String (4 batteries) of PVL12V185FT with intercell connectors
32186	3799252800-S	Gore filter upgrade kit w/ fan
	CU-19C A13	CSU502 Controller (FRU)

HP Large SS SAP number includes: enclosure with thermal management (fans & heaters), AC load center with surge protection, 23" 10.5RU power system with CSU502 controller, power system equipped with (1) 200A 4-pole breaker for battery string, (1) 150A 3-pole breaker for load, (3) 10A 1-pole breakers for load, (2) thermal probes for battery strings. In addition, HP Large SS ships with (3) 50A rectifiers.



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HLM	DLF
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KHA PROJECT NUMBER:

KHCL- 7484

ENGINEER SEAL:

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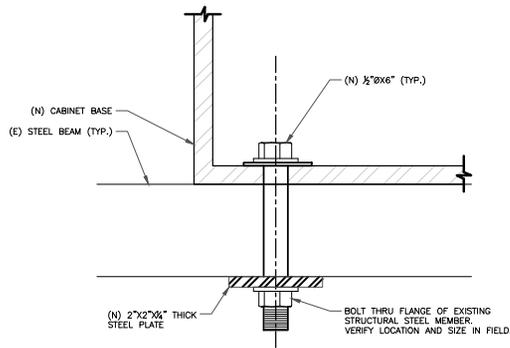
DN06191A
CO46049-A
SBA #: CO46049-A
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COLORADO SPRINGS, CO 80930

SHEET TITLE:

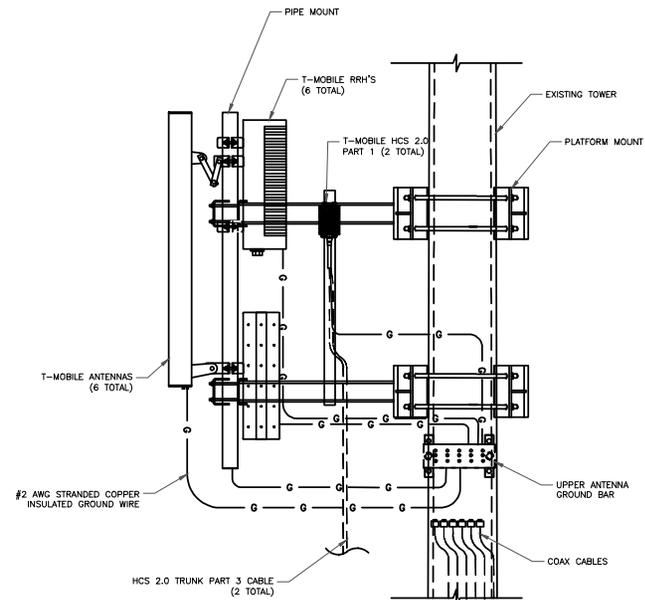
EQUIPMENT
SPECIFICATIONS

SHEET NUMBER:

C-7



1 CABINET BOLT DOWN DETAIL
SCALE: NOT TO SCALE



2 ANTENNA/RRU MOUNT DIAGRAM
SCALE: NOT TO SCALE

T-Mobile

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KHA PROJECT NUMBER: KHCL-7484

ENGINEER SEAL:



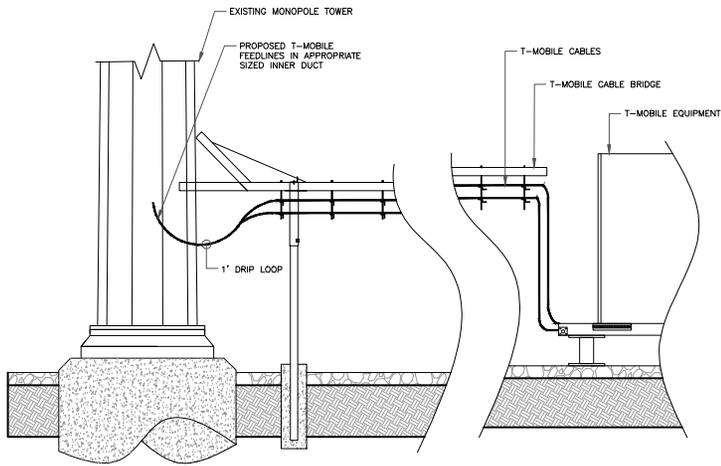
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Exp. 10/31/21

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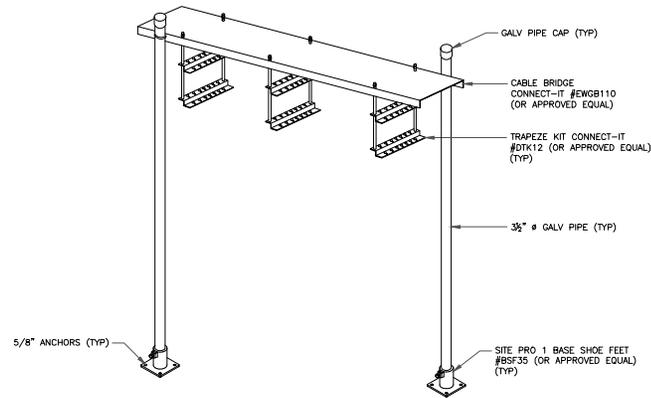
DN06191A
CO46049-A
SBA #: CO46049-A
15646 HIGHWAY 94
COLORADO SPRINGS, CO 80930

SHEET TITLE: MOUNTING DETAIL

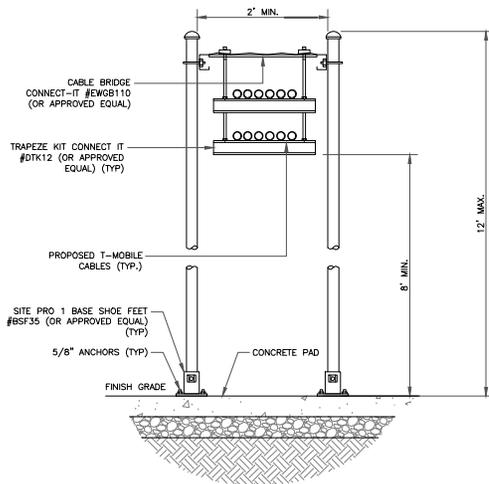
SHEET NUMBER: C-8



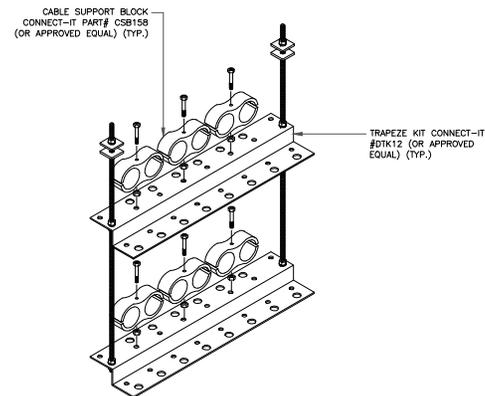
1 CABLE BRIDGE ELEVATION (TYP)
SCALE: NOT TO SCALE



2 CABLE BRIDGE ANONOMETRIC (TYP)
SCALE: NOT TO SCALE



3 CABLE BRIDGE CROSS SECTION
SCALE: NOT TO SCALE



4 TRAPEZE KIT ISOMETRIC
SCALE: NOT TO SCALE

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ENGINEER SEAL:

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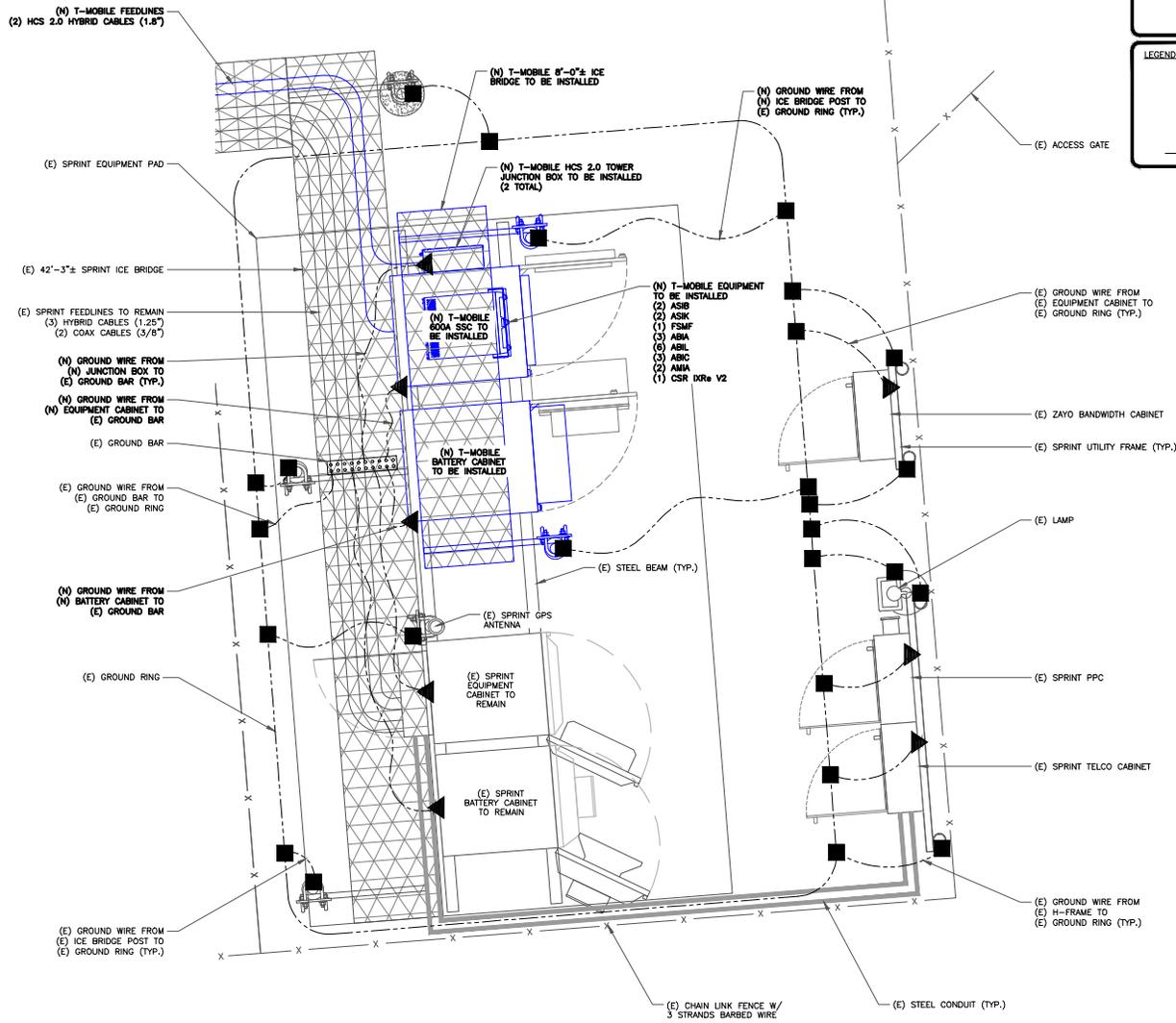
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CO46049-A
SBA #: CO46049-A
15646 HIGHWAY 94
COLORADO SPRINGS, CO 80930

SHEET TITLE:

ICE BRIDGE
DETAILS

SHEET NUMBER:

C-9



INSTALLER NOTE:
ALL TRENCHING REQUIRED WITHIN COMPOUND SHALL BE PERFORMED BY HAND-DIGGING ONLY.

LEGEND:

- ▲ MECHANICAL CONNECTION
- ⊗ GROUND ROD
- ⊠ TEST WELL
- EXOTHERMIC WELD
- GROUND CONDUCTOR

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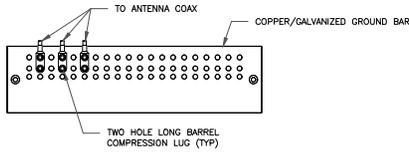
GROUNDING DIAGRAM

SHEET NUMBER:

G-1

1 EQUIPMENT GROUNDING PLAN
SCALE: 3/4"=1'-0" (FULL SIZE)
3/8"=1'-0" (1:1.2)

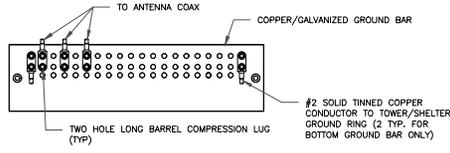




NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE

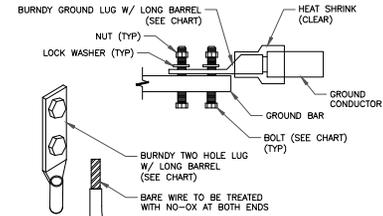


NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE

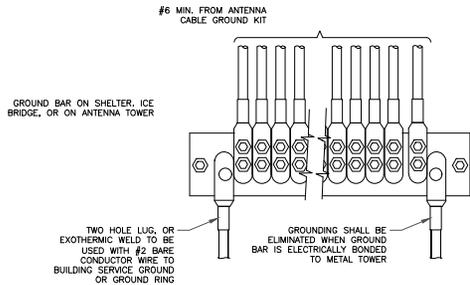
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 SOLID TINNED	YA3C-2TC38	3/8" - 16 NC SS 2 BOLT
#2 STRANDED	YA2C-2TC38	3/8" - 16 NC SS 2 BOLT
#2/0 STRANDED	YA26-2TC38	3/8" - 16 NC SS 2 BOLT
#4/0 STRANDED	YA28-2N	1/2" - 16 NC SS 2 BOLT



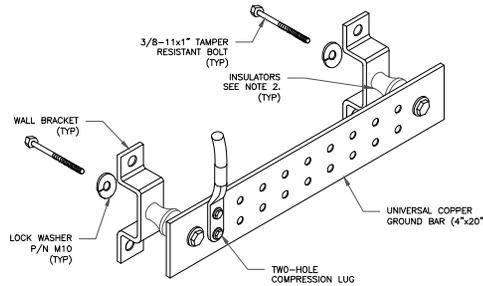
NOTE:

ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER, GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

3 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



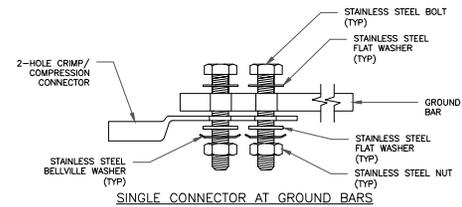
4 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



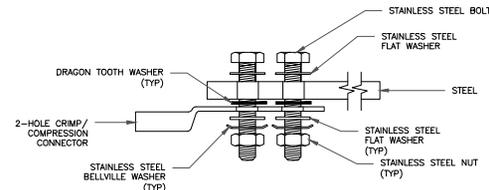
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE USA INC. TOWER. PER THE GROUNDING DOWN CONDUCTOR POLICY GAS-STD-10091. NO MODIFICATION OR GRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION. CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL. USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

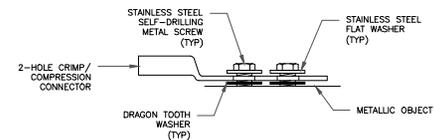
5 GROUND BAR DETAIL
SCALE: NOT TO SCALE



SINGLE CONNECTOR AT GROUND BARS

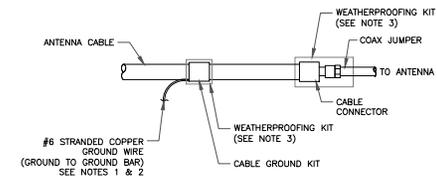


SINGLE CONNECTOR AT STEEL OBJECTS



SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

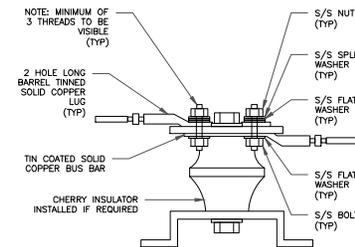
8 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

6 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE

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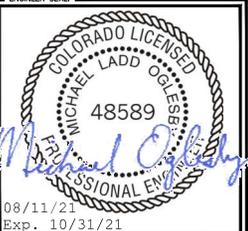
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G-2