



L700 4x2 Sector Add

SITE NAME:
 SITE NUMBER:
 SITE ADDRESS:
 COORDINATES:

STRATMOOR WT
 DN04161A
 12 CLOVER CIR E, COLORADO
 SPRINGS, CO 80906
 38.77817501°, -104.79769723°

Approved
 By: Nina Ruiz
 Date: 01/28/2019
 El Paso County Planning & Community Development

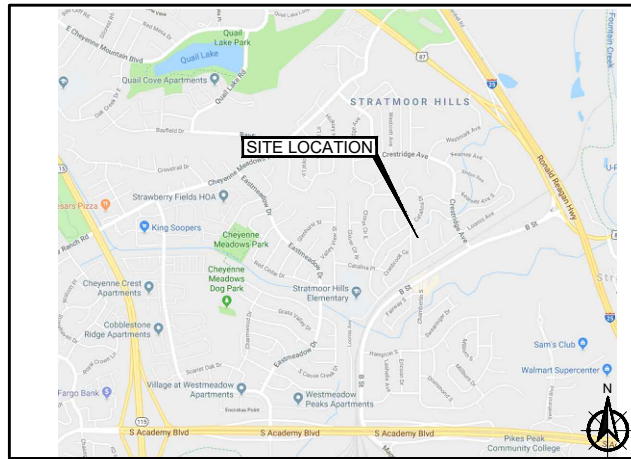


T-Mobile
 18400 EAST 22ND AVE. AURORA, CO 80216

PROJECT INFORMATION:
 SITE NAME:
 STRATMOOR WT
 SITE ID:
 DN04161A
 12 CLOVER CIR E,
 COLORADO SPRINGS, CO
 80906

Rev:	Date:	Description:	By:
1	7/10/18	PRELIMINARY	JRM
2	8/20/18	REV. 1	EC
3	8/31/18	REV. 2	EC
4	10/12/18	REV. 3	EC
5	11/02/18	FINAL CONST	EC

VICINITY MAP



SITE INFORMATION

PROPERTY OWNER:
 STRATMOOR HILLS WATER DISTRICT
 1811 B ST, COLORADO SPRINGS, CO
 80906-5303

APN: 6505104061

APPLICANT:
 T-MOBILE WEST LLC
 18400 EAST 22ND AVENUE
 AURORA, CO 80011
 303.313.6923

T-MOBILE CONSTRUCTION MANAGER
 18400 EAST 22ND AVENUE
 AURORA, CO 80011
 RICK SAWYER
 303.521.8061

T-MOBILE PROJECT MANAGEMENT
 JENNI BAKER
 18400 EAST 22ND AVENUE
 AURORA, CO 80011
 720.648.3172

SITE ACQUISITION:
 WYCO LAND SERVICES
 3980 QUEBEC ST
 DENVER, CO 80207
 ANNIE MACKIEWICZ
 303.601.7241

A&E:
 WYCO ENGINEERING SERVICES
 3980 QUEBEC ST
 DENVER, CO 80207
 CLIENT ACCOUNT MANAGER
 MICHAEL LASITER 303.601.4269

GOVERNING CODES, AS APPLICABLE:
 2015 IBC, 2015 IFC, 2015 IMC, 2015 IECC,
 2014 NEC

A.D.A. COMPLIANCE:
 NOT REQUIRED PER IBC 1103.2.9.

JURISDICTION:
 EL PASO COUNTY

RFDS DATE: 9/26/2018

DRAWING INDEX

T1	TITLE SHEET
A1	OVERALL SITE PLAN
A2	EQUIPMENT LAYOUT
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GN1	GENERAL NOTES

SITE PHOTO



PROJECT DESCRIPTION

MODIFICATION OF AN EXISTING "NON-INHABITABLE" T-MOBILE TELECOMMUNICATIONS SITE CONSISTING OF REMOVING (9) EXISTING ANTENNAS & INSTALLING (6) NEW ANTENNAS, (3) RRU'S, ON AN EXISTING STRUCTURE & INSTALLING (2) NEW SYSTEM MODULES & (1) NEW LARGE SSC WITHIN THE EXISTING EQUIPMENT AREA. NO LINE VOLT WORK REQUIRED.

DRIVING DIRECTIONS TO SITE

FROM 18400 EAST 22ND AVENUE AURORA, CO 80011: GET ON I-70 W (1.0 MI), FOLLOW I-225 S AND I-25 S TO LAKE AVE IN COLORADO SPRINGS. TAKE EXIT 138 FROM I-25 S (77.2 MI), CONTINUE ON LAKE AVE. TAKE VENETUCCI BLVD TO CLOVER CIR E IN STRATMOOR (1.8 MI)

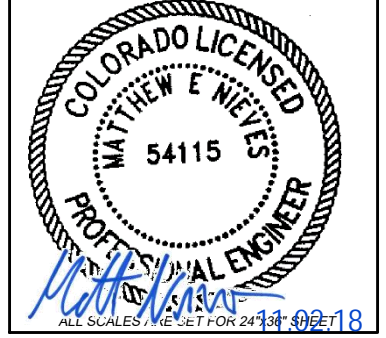
GENERAL CONSTRUCTION NOTES

1. THE FACILITY IS AN UNOCCUPIED WIRELESS FACILITY.
2. PLANS ARE NOT TO BE SCALED AND ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS NOTED OTHERWISE. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
3. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS SHALL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
4. THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
5. CONTRACTOR SHALL CONTACT LOCAL DIGGERS HOTLINE 48 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION, SITE WORK OR CONSTRUCTION.
6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
7. ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

PLANS PREPARED BY:

3980 QUEBEC STREET
 DENVER, CO 80207
 WYCOFIELDSERVICES.COM

LICENSURE NO:



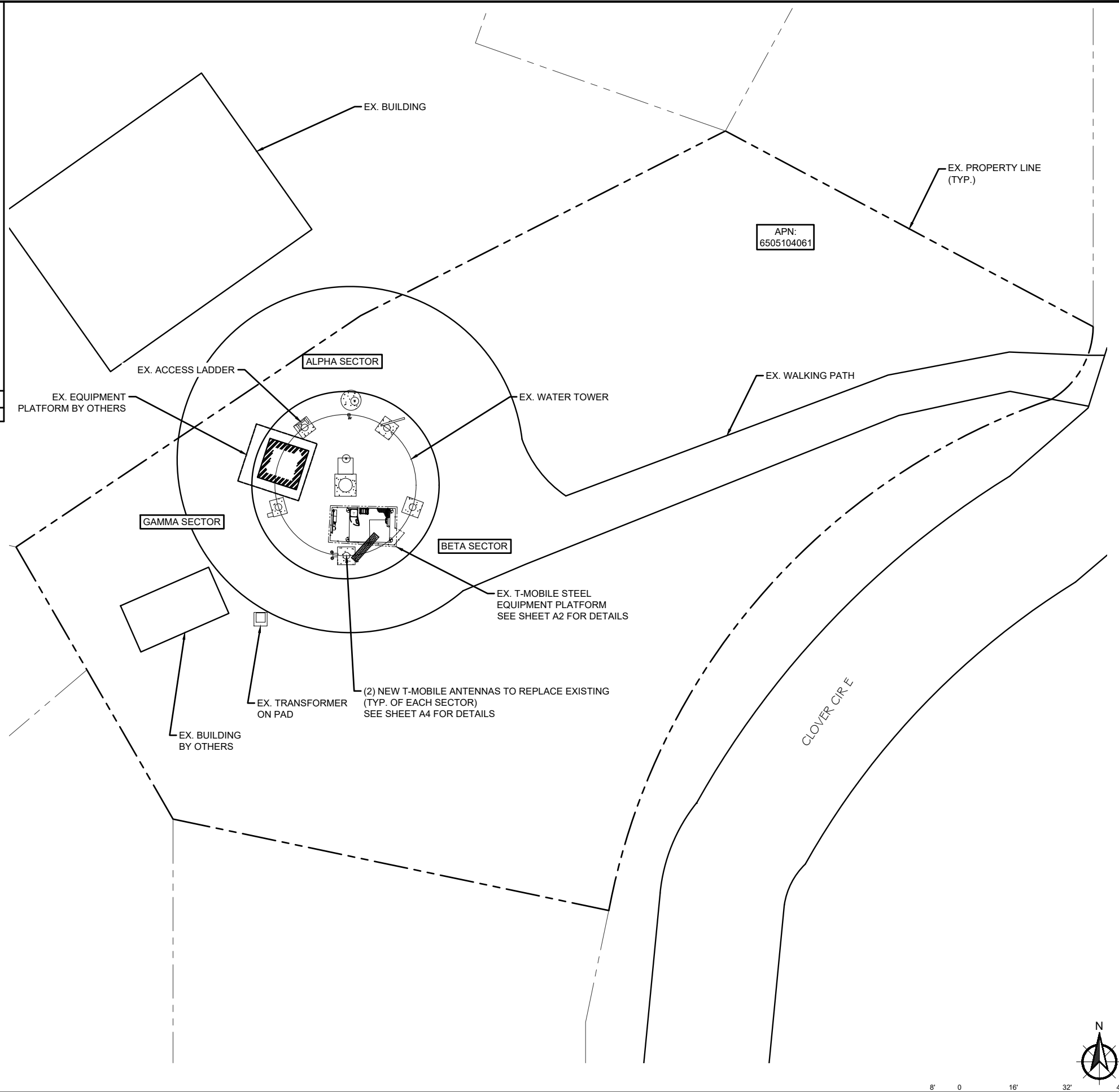
DRAWN BY: JRM
 CHK BY: ML
 APV BY: MN

Sheet Title:
TITLE SHEET

Sheet Number:
T1

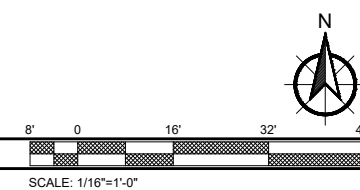


1 T-MOBILE LEASE AREA PHOTO
SCALE: N.T.S.



NOTE:
GROUND SURVEY WAS NOT PERFORMED AT THIS TIME. SITE PLAN DERIVED FROM: EXISTING DRAWINGS, GIS, AERIAL IMAGES & SITE PHOTOS.

2 OVERALL SITE PLAN
SCALE: AS NOTED



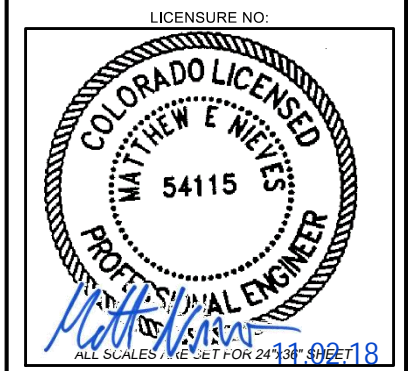
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PLANS PREPARED BY:
WYGO
FIELD SERVICES
Where quality still counts.

3980 QUEBEC STREET
DENVER, CO 80207
WYCOFIELDSERVICES.COM



DRAWN BY:	CHK BY:	APV BY:
JRM	ML	MN

Sheet Title:
**OVERALL
SITE
PLAN**

Sheet Number:
A1

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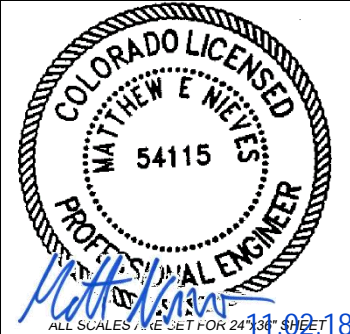
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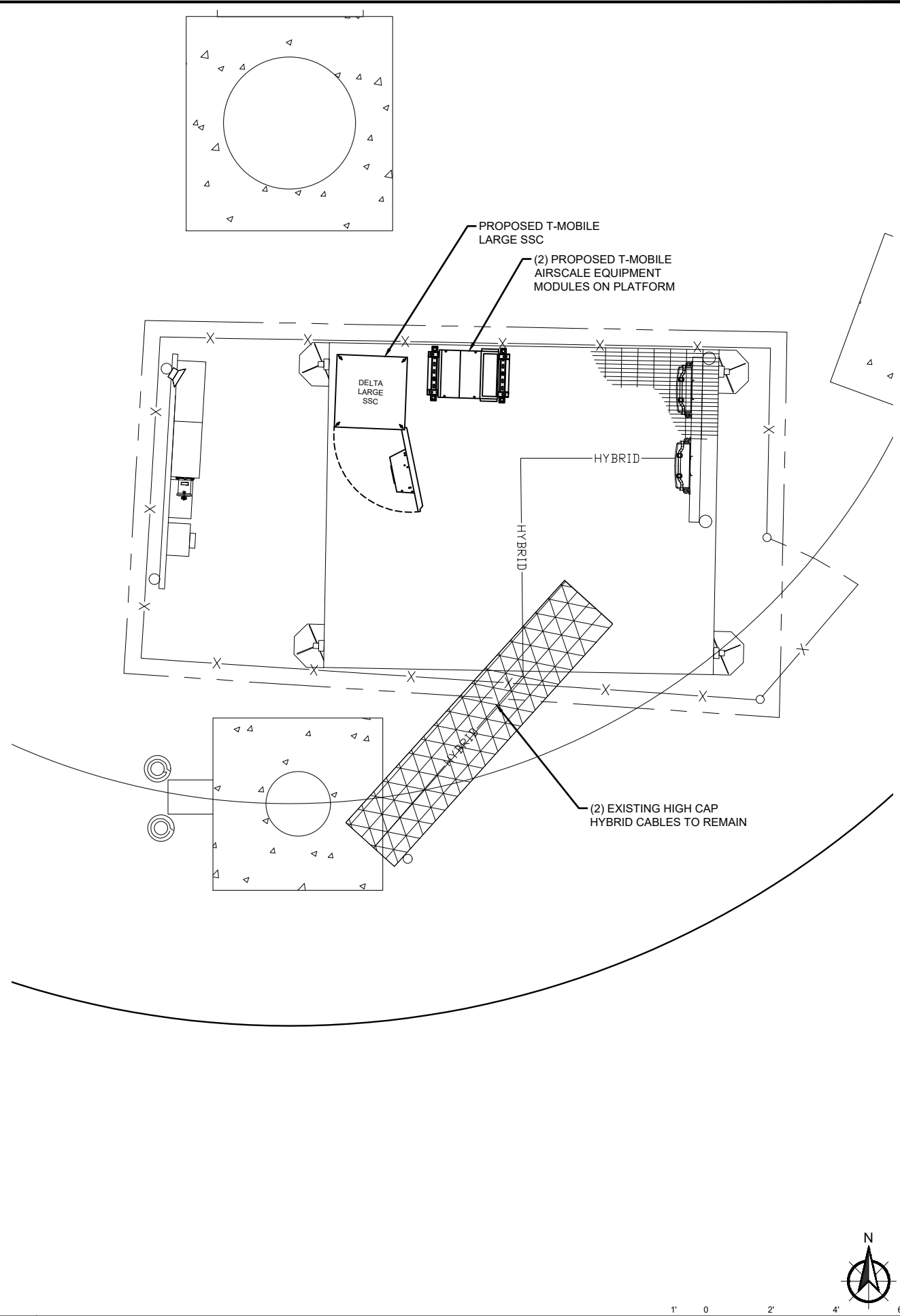
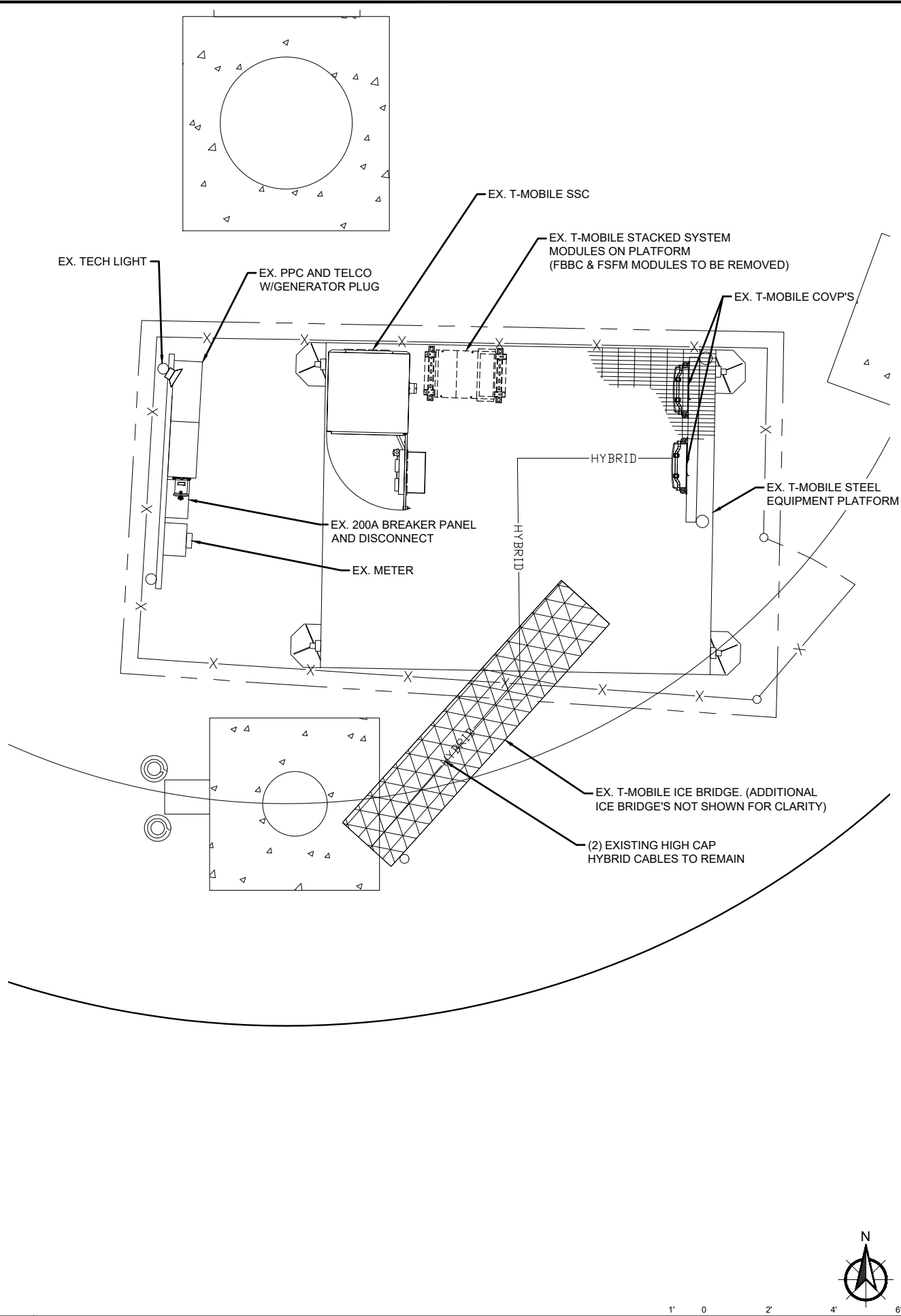
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JRM	ML	MN

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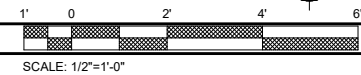
**EQUIPMENT
LAYOUT**

Sheet Number:

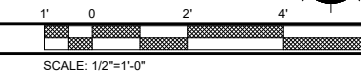
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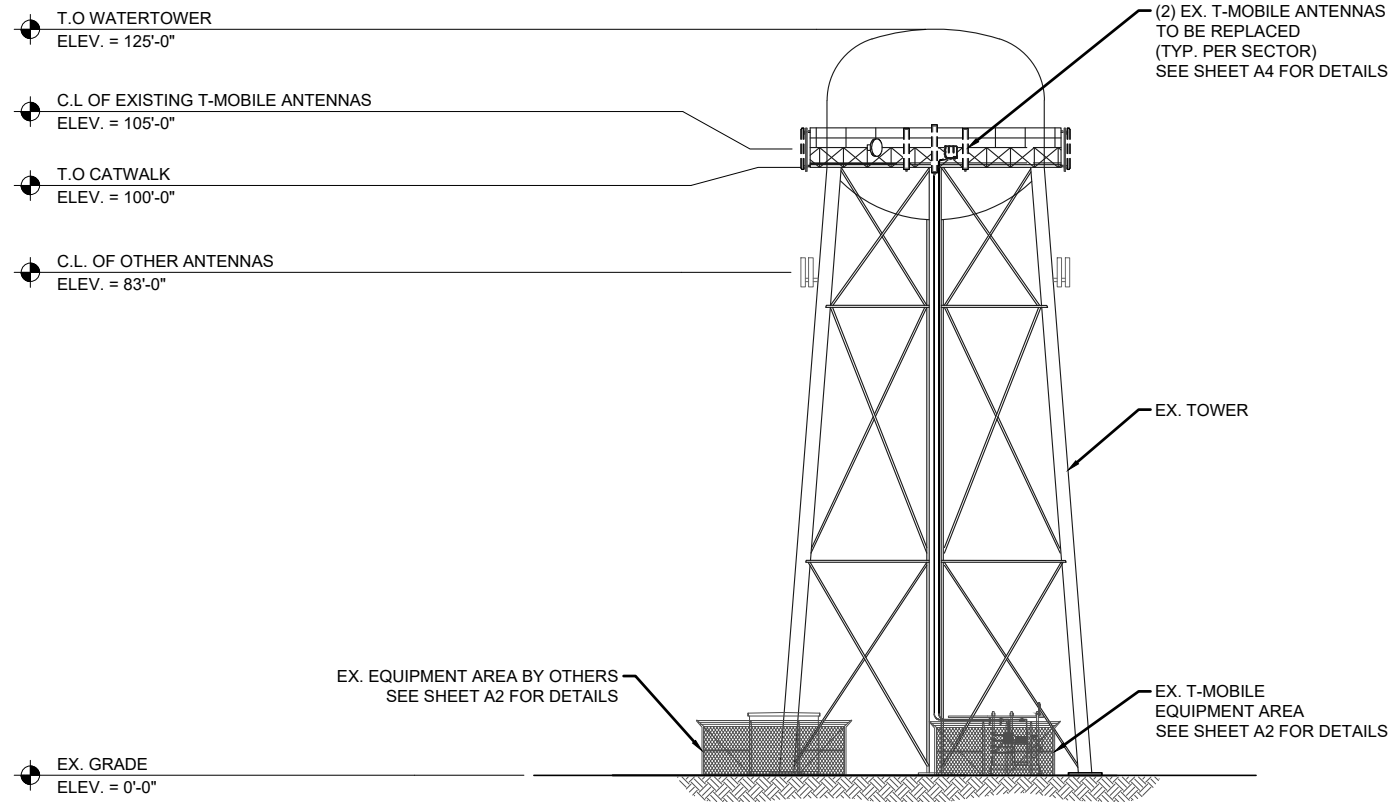


1 EXISTING EQUIPMENT LAYOUT
SCALE: 1/2" = 1'-0"



2 PROPOSED EQUIPMENT LAYOUT
SCALE: 1/2" = 1'-0"





STRUCTURAL NOTE/T-MOBILE STRUCTURAL SERVICES COMPLIANCE NOTE:
 NO WORK SHALL COMMENCE WITHOUT THE APPROVED STRUCTURAL TOWER/ANTENNA/MOUNT ANALYSIS REPORT (SIGNED AND SEALED) TO BE PROVIDED UNDER SEPARATE COVER. CONTRACTOR PRIOR TO CONSTRUCTION, SHALL REVIEW THE APPROVED TOWER/ANTENNA/MOUNT ANALYSIS REPORT SUPPLIED BY T-MOBILE AND MODIFY, IF REQUIRED, ALL APPLICABLE MEMBERS AS INDICATED IN CERTIFIED STRUCTURAL REPORT PRIOR TO INSTALLATION ON STRUCTURE. STRUCTURAL ANALYSIS BY OTHERS.



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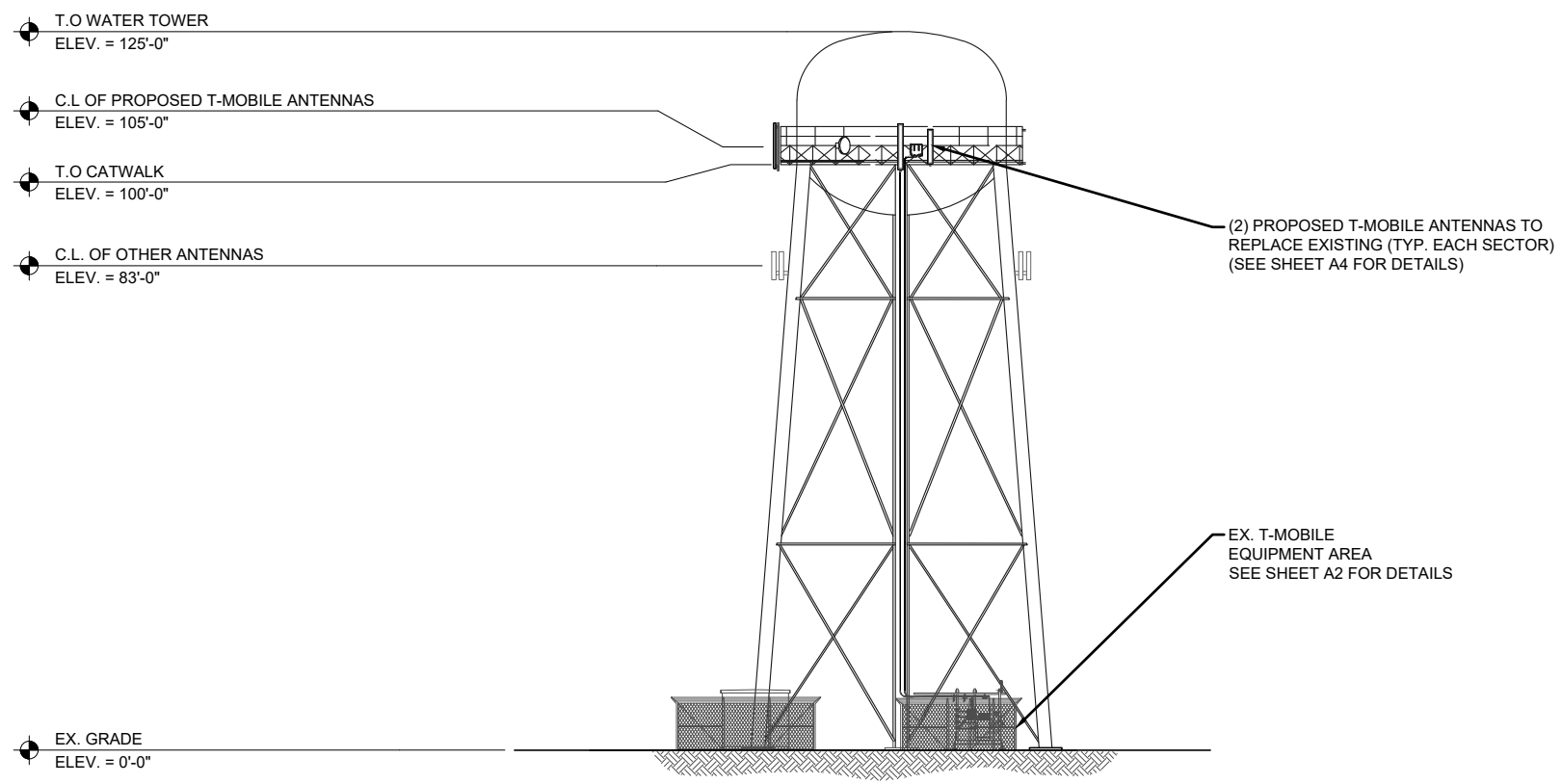
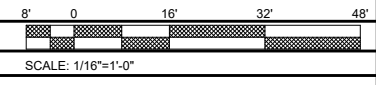
ALL SCALES ARE SET FOR 24" X 36" SHEET

DRAWN BY:	CHK BY:	APV BY:
JRM	ML	MN

Sheet Title:
SOUTH ELEVATIONS

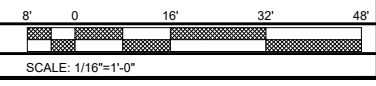
Sheet Number:
A3

1 EXISTING SOUTH ELEVATION
 SCALE: AS NOTED



NOTE:
 - PAINT ANTENNAS TO MATCH (E) WATER TOWER
 - INTERIM BUILD USES ONLY FRLBS FOR L700.
 AHLOAS WILL REPLACE THE FRLBS WHEN SPECTRUM CLEARING ALLOWS. DO NOT MOUNT BOTH RADIOS.

2 PROPOSED SOUTH ELEVATION
 SCALE: AS NOTED



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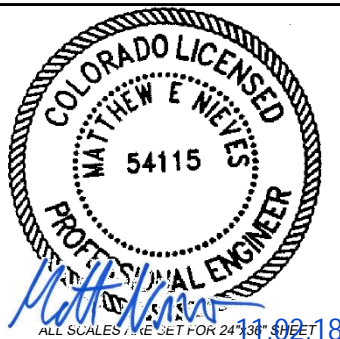
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LICENSURE NO:



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JRM ML MN

Sheet Title:

ANTENNA LAYOUT

Sheet Number:

A4

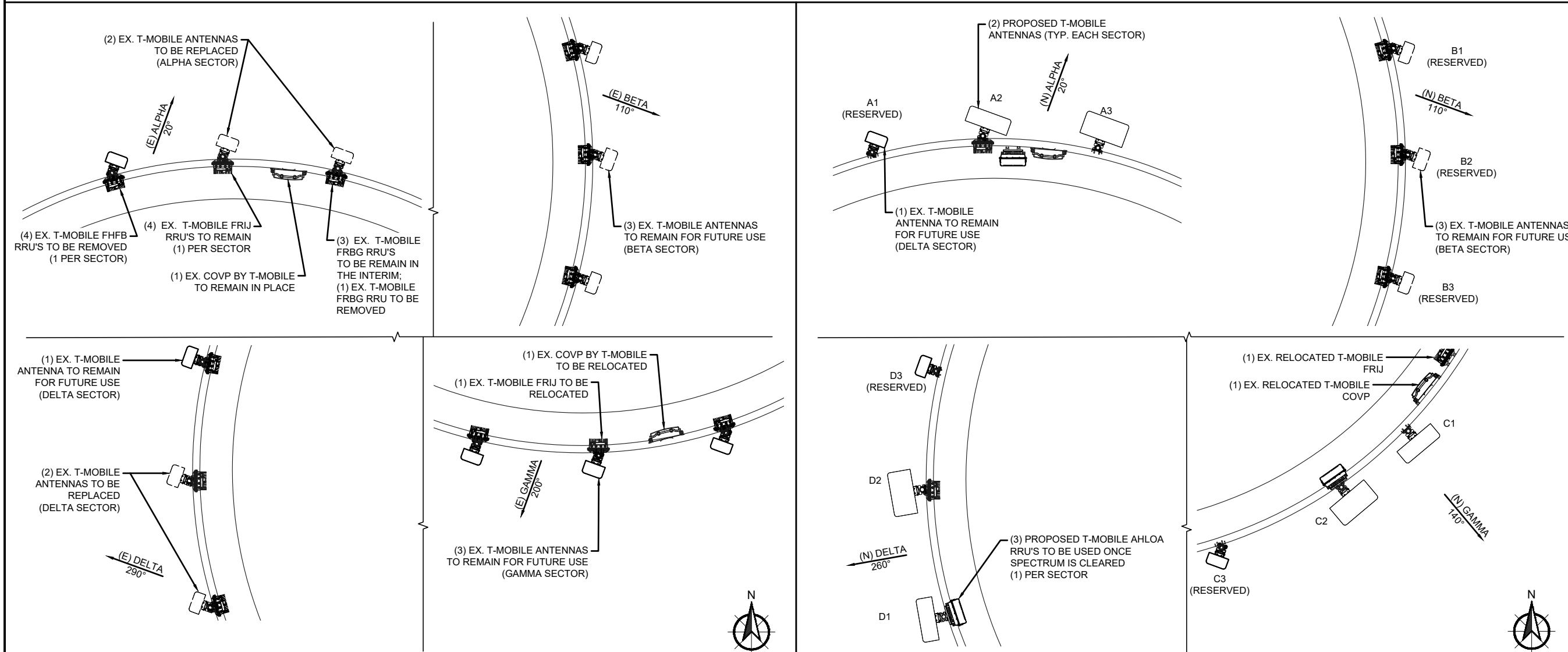
NOTE:
INFORMATION PER RFDS DATED: 9/26/2018
CONTRACTOR TO REFER TO MOST RECENT RFDS
BY T-MOBILE PRIOR TO COMMENCING WORK

NOTE:
- PAINT ANTENNAS TO MATCH (E) WATER TOWER
- INTERIM BUILD USES ONLY FRBG'S FOR L700.
AHLOAS WILL REPLACE THE FRBG'S WHEN
SPECTRUM CLEARING ALLOWS. DO NOT MOUNT
BOTH RADIOS.
-NOKIA AAFIA ANTENNA TO BE INSTALLED ON
EXISTING ANTENNA MOUNT CLOSEST TO TOWER
LEG - TYP. AT EACH SECTOR

SECTOR	POSITION	EXISTING/PROPOSED	AZIMUTH		ANTENNA MANUFACTURER - MODEL NUMBER	TECHNOLOGY
			1	2		
ALPHA	A1	EXISTING	-	-	-	RESERVED FOR FUTURE USE
	A2	PROPOSED	20°	105°-0"	COMMSCOPE - FFHH-65C-R3	L700/U2100/L600&N600 (DARK)
	A3	PROPOSED	20°	105°-0"	AAFIA - AIRSCALE MASSIVE MIMO	L2100/L1900
BETA	B1	EXISTING	-	-	-	RESERVED FOR FUTURE USE
	B2	EXISTING	-	-	-	RESERVED FOR FUTURE USE
	B3	EXISTING	-	-	-	RESERVED FOR FUTURE USE
GAMMA	C1	PROPOSED	140°	105°-0"	COMMSCOPE - FFHH-65C-R3	L700/U2100/L600&N600 (DARK)
	C2	PROPOSED	140°	105°-0"	AAFIA - AIRSCALE MASSIVE MIMO	L2100/L1900
	C3	RESERVED	-	-	-	-
DELTA	D1	PROPOSED	260°	105°-0"	COMMSCOPE - FFHH-65C-R3	L700/U2100/L600&N600 (DARK)
	D2	PROPOSED	260°	105°-0"	AAFIA - AIRSCALE MASSIVE MIMO	L2100/L1900
	D3	RESERVED	-	-	-	-

1 RF SCHEDULE

SCALE: N.T.S.



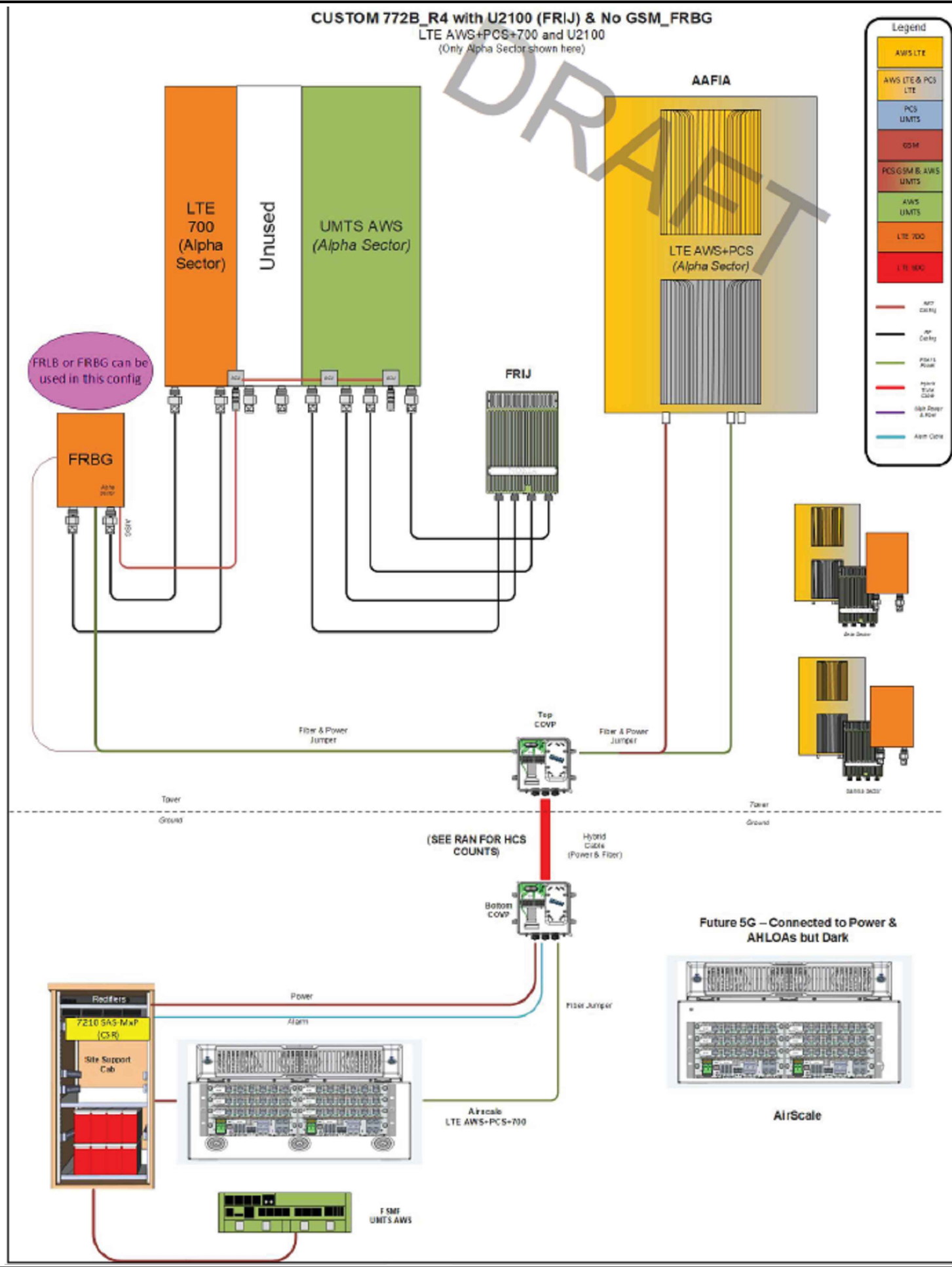
2 EXISTING ANTENNA LAYOUT

SCALE: 3/8" = 1'-0"

3 PROPOSED ANTENNA LAYOUT

SCALE: 3/8" = 1'-0"

SCALE: 3/8" = 1'-0"



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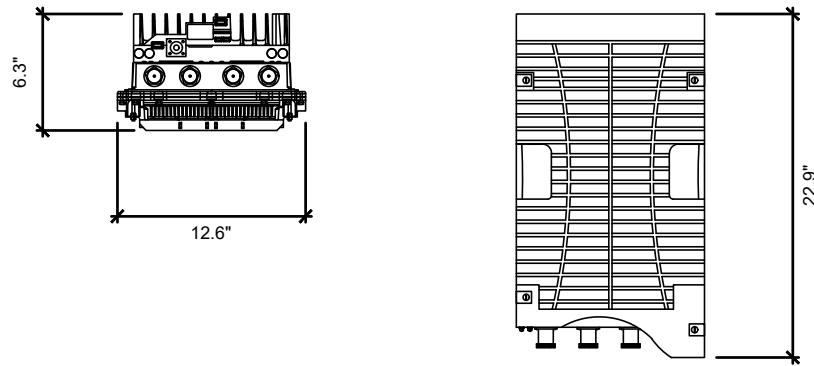
LICENSURE NO:

 ALL SCALES / ARE SET FOR 24" x 36" SHEET

DRAWN BY: JRM
 CHK BY: ML
 APV BY: MN

Sheet Title:
**RFDS
 DIAGRAM**

Sheet Number:
A5



NOTE:
FRBG TO BE VERTICALLY MOUNTED ONLY

CHARACTERISTIC	FRBG CAPABILITY
NOMINAL SUPPLY VOLTAGE	-48.0 VDC
NOMINAL INPUT VOLT RANGE	-40.5 TO -57.0 VDC
EXTENDED INPUT VOLT RANGE	-36.0 TO -40.5 VDC -57.0 TO -60.0 VDC
VOLTAGE	14.5 V (ANT 1, ANT 3, RET)
POWER PER PORT	40 W

DIMENSION	VALUE
HEIGHT	22.9 INCHES (W/ BRACKET 34.3 INCHES)
WIDTH	12.6 INCHES
DEPTH	6.3 INCHES
WEIGHT	53 LBS (W/ BRACKET 57 LBS)

AirScale System Module Installation Guidelines - AMOB

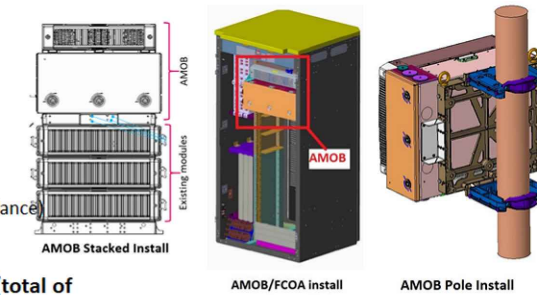
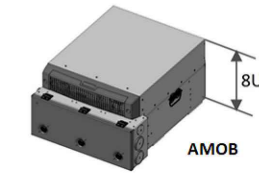
AMOB is an outdoor enclosure for the AirScale Baseband cards (ASIA/ABIA). The AMOB is primary for all outdoor sites.

- It is 8U high and a 19" Rack Mount

AMOB Mounting Options	FCOA	Wall/H-Frame	Pole	Stack with Flexi*
Blank panels kit for AMOB**	✓	✓	✓	✓
FCOA installation kit	✓	✓	✓	✓
Cable glands**	✓	✓	✓	✓
Stack/Wall/Pole installation kit		✓	✓	✓
FPKA			✓	✓
FMFA		✓	✓	✓

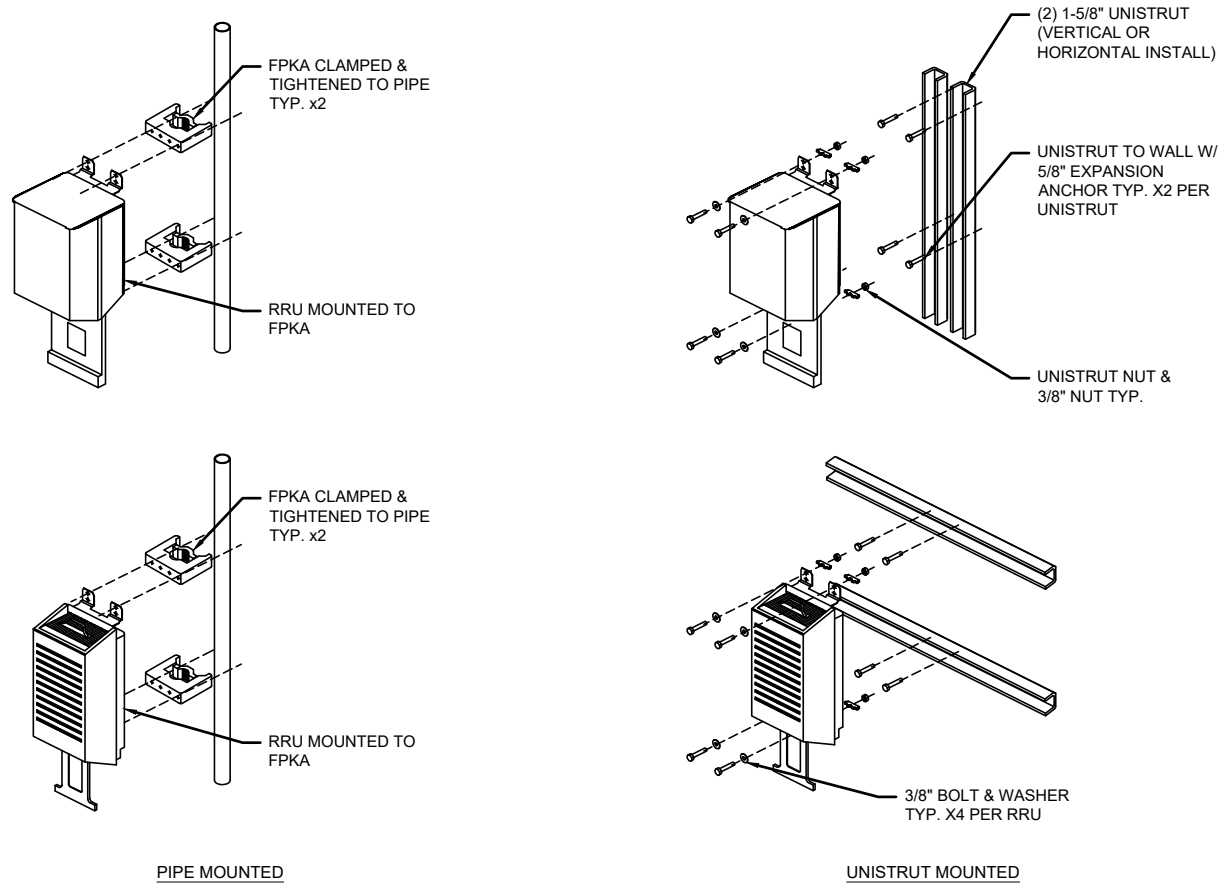
*Maximum 3 existing Flexi modules on the stack (Zone 4 earthquake compliance)
** Included with AMOB delivery contents

FCOA installation uses special front and bottom support brackets (total of 9U required)
FCOA heat consideration needed for AMOB installation



1 RRU SPECIFICATIONS (FRBG)

SCALE: N.T.S.



3 RRU MOUNTING DETAIL

SCALE: N.T.S.

2 AIRSCALE SYSTEM MODULE

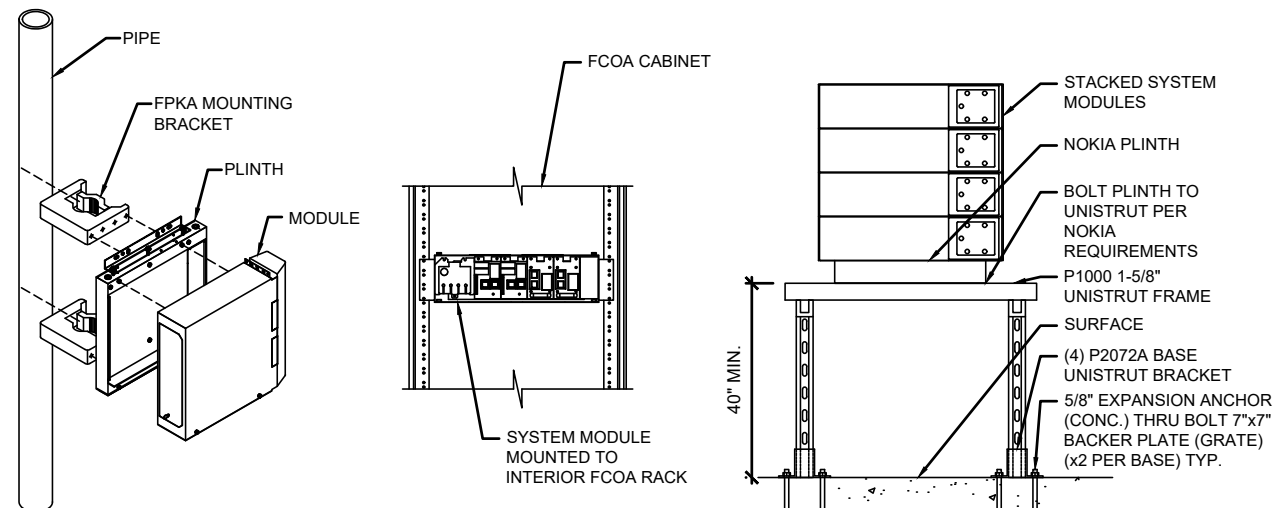
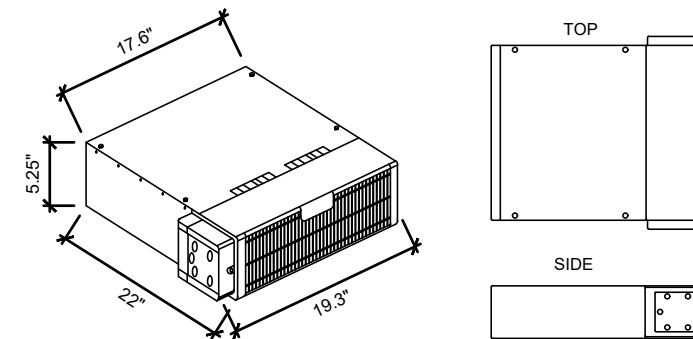
SCALE: N.T.S.

NOKIA FLEXI SYSTEM/RADIO MODULES

FSMF, FSME, FRIE & FXFC

CLEARANCES:
FRONT: 23.6"
BACK: 8"
TOP: 1.2"
SIDES: 4"
44 lbs
MODULE CAN BE INSTALLED VERTICALLY & HORIZONTALLY

WEIGHT:
ADDITIONAL NOTE:



4 SYSTEM / RADIO MODULE SPECIFICATIONS

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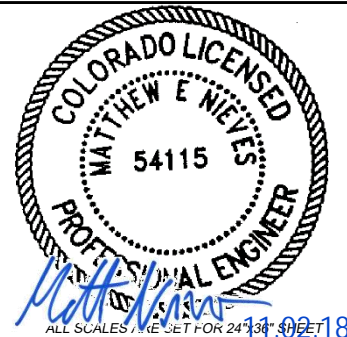
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EQUIPMENT DETAILS

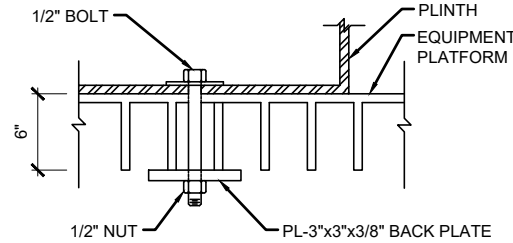
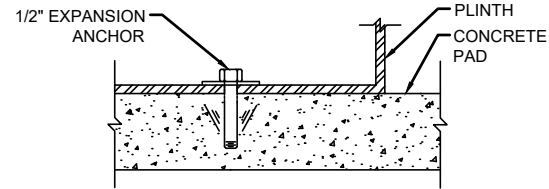
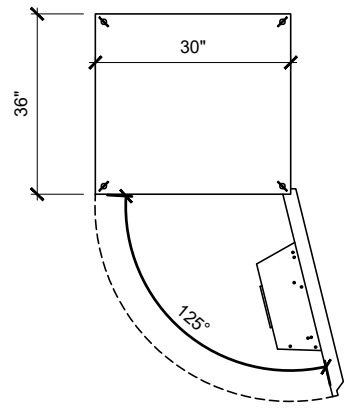
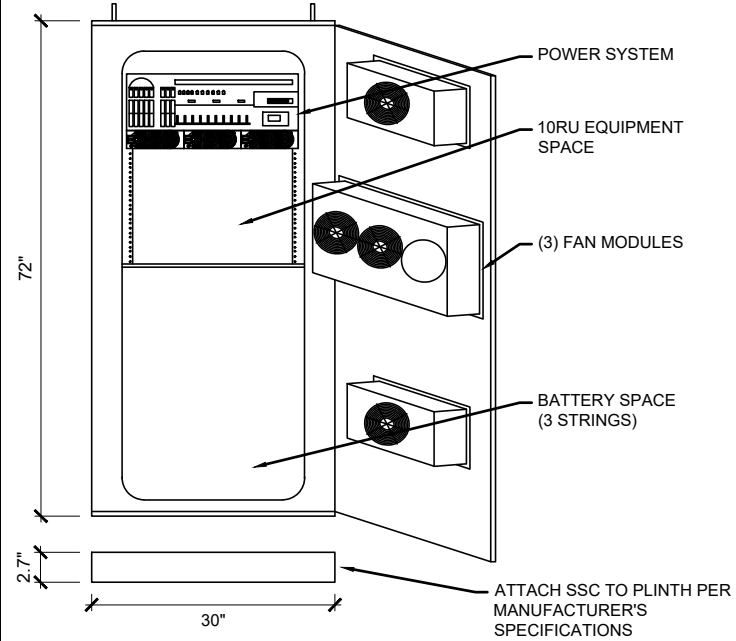
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A6

**DELTA LARGE OUTDOOR ENCLOSURE:
ESOA-CCU03**

AC INPUT VOLTAGE: 100 - 120V/200 - 240V
 AC INPUT CURRENT: 80A
 DC OUTPUT CURRENT: 400A
 DC OUTPUT VOLTAGE: 42 -56 VDC
 CLEARANCES: 36" ON ALL SIDES
 POWER SYSTEM: 8000W (N+1)
 ADDITIONAL SPECS: 3 RU FOR DC DISTRIBUTION, RECTIFIER = DPR2900,
 2Px3 POSITIONS FOR BATTERY BREAKER,, 10 RU
 FOR EQUIPMENT 19" OR 23", (3) STRINGS FOR
 BATTERIES

NOKIA FMFA PLINTH:
 WEIGHT: 2.7" H x 30" W x 36" D - 20.5 lbs
 500 lbs (WITHOUT BATTERIES)



1 | **SSC SPECIFICATIONS**

SCALE: N.T.S.

2 | **NOT USED**

SCALE: N.T.S.

3 | **NOT USED**

SCALE: N.T.S.

4 | **NOT USED**

SCALE: N.T.S.



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**EQUIPMENT
 DETAILS**

Sheet Number:

A6.1

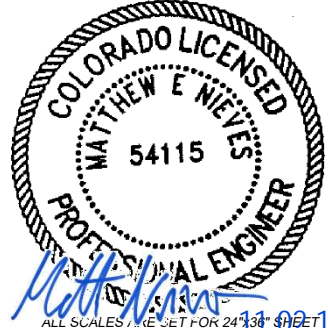
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4	10/12/18	REV. 3	EC
5	11/02/18	FINAL CONST	EC

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LICENSURE NO:

ALL SCALES, UNLESS SET FOR 24" X 36" SHEET

DRAWN BY:	CHK BY:	APV BY:
JRM	ML	MN

Sheet Title:
ANTENNA SPECIFICATIONS

Sheet Number:
A7

AirScale MAA 16T16R B25/B66 200W AAFIA

Dual band massive MIMO, 5G New Radio ready, integrated antenna system



Radios	FDD LTE/LTE-A/LTE-Pro/NR	
RF power per band	100W (16 x 6.3W)	
Band specification	RX	TX
Band 66	1710 - 1780 MHz	2110 - 2200 MHz
Band 25	1850 - 1915 MHz	1930 - 1995 MHz
Instantaneous Bandwidth	Band 66: DL 90MHz/UL 70MHz , Band 25: DL/UL 65MHz	
Occupied Bandwidth	Band 66: 40MHz, Band 25: 40MHz	
Power Consumption	1600W (70% load), 2400W 100% load on both bands	
Beamforming	Horizontal Sectorization, Azimuth Beamforming	
Modulation Schemes	QPSK, 16QAM, 64QAM, 256QAM, 1024QAM	
L1 Split	L1 Low in RF	
Fronthaul Interface	CPRI (Rate 7), two 9.8Gb/s SFP ports per band	
Mounting	Wall, Pole	
IP Rating	IP65	
Input Power	-48V DC (range: -40V~-57V)	
Size	1840 x 650 x 300 mm 124kg	

Product Specifications



FFHH-65C-R3

8-port sector antenna, 4x 617-806 and 4x 1695-2360 MHz, 65° HPBW, 3x RET, 600 MHz-Ready Antenna Technology

Electrical Specifications

Frequency Band, MHz	617-698	698-806	1695-1880	1850-1990	1920-2200	2300-2360
Gain, dBi	15.3	15.5	17.8	18.2	18.9	19.6
Beamwidth, Horizontal, degrees	67	63	65	66	64	55
Beamwidth, Vertical, degrees	10.2	9.1	5.7	5.3	4.9	4.4
Beam Tilt, degrees	2-13	2-13	2-12	2-12	2-12	2-12
USLS (First Lobe), dB	19	17	20	19	19	21
Front-to-Back Ratio at 180°, dB	32	29	35	40	40	41
Isolation, dB	28	28	28	28	28	28
Isolation, Intersystem, dB	28	28	28	28	28	28
VSWR Return Loss, dB	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0	1.5 14.0
PIM, 3rd Order, 2 x 20 W, dBc		-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	250	250	250	250	250	200
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	617-698	698-806	1695-1880	1850-1990	1920-2200	2300-2360
Gain by all Beam Tilts, average, dBi	15.0	15.2	17.4	17.9	18.5	19.3
Gain by all Beam Tilts Tolerance, dB	±0.6	±0.5	±0.4	±0.5	±0.6	±0.5
	2° 14.8	2° 15.0	2° 17.2	2° 17.6	2° 18.1	2° 18.8
Gain by Beam Tilt, average, dBi	8° 15.1	8° 15.3	7° 17.5	7° 18.0	7° 18.6	7° 19.4
	13° 15.0	13° 15.1	12° 17.4	12° 17.8	12° 18.4	12° 19.2
Beamwidth, Horizontal Tolerance, degrees	±2.7	±4.8	±5.5	±5.2	±4.9	±6.4
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.7	±0.4	±0.3	±0.4	±0.1
USLS, beampeak to 20° above beampeak, dB	17	12	15	16	16	18
Front-to-Back Total Power at 180° ± 30°, dB	23	21	29	31	31	31
CPR at Boresight, dB	24	23	21	20	21	22
CPR at Sector, dB	6	10	9	9	9	8

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, [download the whitepaper Time to Raise the Bar on BSAs](#).

Array Layout

Product Specifications

FFHH-65C-R3

RF Connector Quantity, high band	4
RF Connector Interface	4.3-10 Female
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Location	Bottom
Wind Loading, frontal	1055.0 N @ 150 km/h 237.2 lbf @ 150 km/h
Wind Loading, lateral	355.0 N @ 150 km/h 79.8 lbf @ 150 km/h
Wind Loading, maximum	1433.0 N @ 150 km/h 322.2 lbf @ 150 km/h
Wind Speed, maximum	241 km/h 150 mph

Dimensions

Length	2437.0 mm 95.9 in
Width	640.0 mm 25.2 in
Depth	235.0 mm 9.3 in
Net Weight, without mounting kit	57.9 kg 127.6 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10-30 Vdc
Internal RET	High band (2) Low band (1)
Power Consumption, idle state, maximum	1 W
Power Consumption, normal conditions, maximum	10 W
Protocol	3GPP/AISG 2.0 (Single RET)
RET Interface	8-pin DIN Female 8-pin DIN Male
RET Interface, quantity	1 female 1 male

Packed Dimensions

Length	2590.0 mm 102.0 in
Width	752.0 mm 29.6 in
Depth	380.0 mm 15.0 in
Shipping Weight	84.4 kg 186.1 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

PROJECT INFORMATION:

SITE NAME:
STRATMOOR WT
SITE ID:
DN04161A

12 CLOVER CIR E,
COLORADO SPRINGS, CO
80906

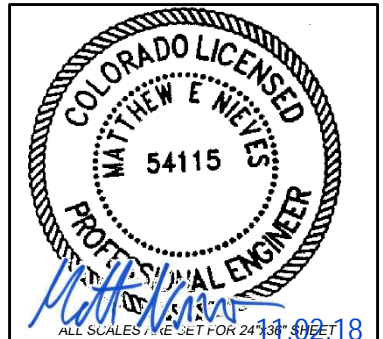
Rev:	Date:	Description:	By:
1	7/10/18	PRELIMINARY	JRM
2	8/20/18	REV. 1	EC
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PLANS PREPARED BY:



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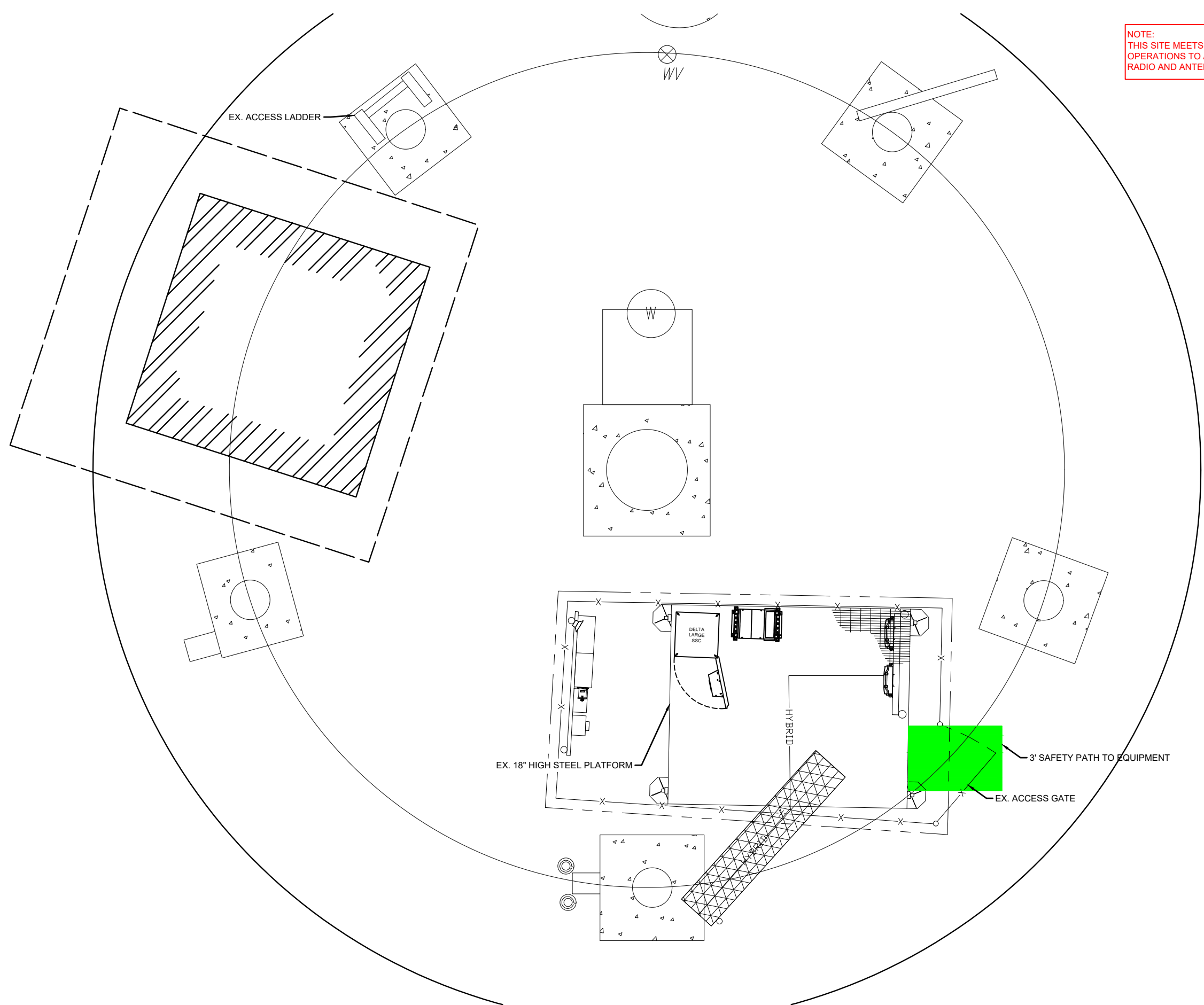
DRAWN BY:	CHK BY:	APV BY:
JRM	ML	MN

Sheet Title:



**ANTENNA
SPECIFICATIONS**

Sheet Number:

A7.1



NOTE:
 THIS SITE MEETS OSHA COMPLIANCE FOR FIELD OPERATIONS TO ACCESS BTS EQUIPMENT ON ROOFTOP. RADIO AND ANTENNAS ACCESS BY TOWER CREW ONLY.

LEGEND	
	15' FALL ZONE & INACCESSIBLE AREAS
	3' WIDE SAFETY PATH TO EQUIPMENT

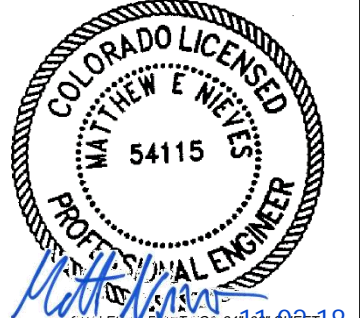
T-Mobile
 18400 EAST 22ND AVE. AURORA, CO 80216

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Sheet Title:
SAFETY PLAN

Sheet Number:
A8

GENERAL CONSTRUCTION NOTES

- THE FACILITY IS AN UNOCCUPIED WIRELESS FACILITY.
- PLANS ARE NOT TO BE SCALED AND ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS NOTED OTHERWISE. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTORS SHALL VISIT THE JOB SITE AND BE RESPONSIBLE FOR ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES ARE TO BE BROUGHT TO THE ATTENTION OF THE IMPLEMENTATION ENGINEER AND ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL CONTACT LOCAL DIGGERS HOTLINE 48 HOURS PRIOR TO PROCEEDING WITH ANY EXCAVATION, SITE WORK OR CONSTRUCTION.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
- ALL WORK PERFORMED AND MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- THE GENERAL CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK, USING THE BEST SKILLS AND ATTENTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT INCLUDING CONTACT AND COORDINATION WITH THE CONSTRUCTION FIELD ENGINEER AND WITH THE LANDLORD'S AUTHORIZED REPRESENTATIVE.
- DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- REPRESENTATIONS OF TRUE NORTH, OTHER THAN THOSE FOUND ON THE PLOT OF SURVEY DRAWING, SHALL NOT BE USED TO IDENTIFY OR ESTABLISH THE BEARING OF TRUE NORTH AT THE SITE. THE CONTRACTOR SHALL RELY SOLELY ON THE PLOT OF SURVEY DRAWING AND ANY SURVEYOR'S MARKINGS AT THE SITE FOR THE ESTABLISHMENT OF TRUE NORTH, AND SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO PROCEEDING WITH THE WORK IF ANY DISCREPANCY IS FOUND BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND THE TRUE NORTH ORIENTATION AS DEPICTED ON THE PLAT OF SURVEY. THE CONTRACTOR SHALL ASSUME SOLE LIABILITY FOR ANY FAILURE TO NOTIFY THE ARCHITECT/ENGINEER.

STRUCTURAL NOTES

- 1.0 GENERAL CONDITIONS
- DESIGN AND CONSTRUCTION OF ALL WORK SHALL CONFORM TO THE APPROVED EDITION OF THE IBC EDITION AND ALL OTHER APPLICABLE STATE CODES, ORDINANCES, AND REGULATIONS. IN CASE OF CONFLICT BETWEEN THE CODES, STANDARDS, AND REGULATIONS, SPECIFICATIONS, GENERAL NOTES AND/OR MANUFACTURER'S REQUIREMENTS. USE THE MOST STRINGENT PROVISION.
 - IT IS THE EXPRESS INTENT OF THE PARTIES INVOLVED IN THIS PROJECT THAT THE CONTRACTOR OR SUBCONTRACTOR OR INDEPENDENT CONTRACTOR OR THEIR RESPECTIVE EMPLOYEES SHALL EXCULPATE THE ARCHITECT, THE ENGINEER, THE CONSTRUCTION MANAGER, THE OWNER, AND THEIR AGENTS, FROM ANY LIABILITY WHATSOEVER AND HOLD THEM HARMLESS AGAINST LOSS, DAMAGES, LIABILITY OR ANY EXPENSE ARISING IN ANY MATTER FROM THE WRONGFUL OR NEGLIGENT ACT, OR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, OR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OR FAILURE TO CONFORM TO THE STATE SCAFFOLDING ACT IN CONNECTION WITH THE WORK.
 - DO NOT SCALE DRAWINGS.
 - VERIFY ALL EQUIPMENT MOUNTING DIMENSIONS PER MANUFACTURER DRAWINGS.
 - SUBMIT ONE SEPIA AND TWO PRINTS OF ALL STRUCTURAL SHOP DRAWINGS. MARKED UP SEPIA SHALL BE RETURNED.

STRUCTURAL STEEL NOTES:

- CHANNELS, ANGLES AND PLATES SHALL BE ASTM A36 MATERIAL, UNLESS NOTED OTHERWISE.
- SQUARE AND RECTANGULAR TUBE STEEL HSS SECTIONS SHALL BE ASTM A500, GRADE B (Fy = 46 ksi) MATERIAL.
- ROUND PIPE SECTIONS SHALL BE ASTM A53, GRADE B (Fy =35 ksi) MATERIAL.
- DESIGN, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", WITH COMMENTARY AND THE "CODE OF STANDARD PRACTICE".
- ALL STEEL SHALL HAVE ONE COAT OF SHOP PRIMER. DO NOT PAINT AREAS WITHIN 3" OF BOLTS, WELDS OR HEADED STUDS.
- BOLTS SHALL BE HIGH STRENGTH BOLTS, A325, CONFORMING TO ASTM SPECIFICATIONS. ALL CONNECTIONS SHALL HAVE A MINIMUM OF 2 BOLTS.
- WELDING SHALL BE CONDUCTED BY CERTIFIED WELDERS AND SHALL CONFORM TO THE AWS CODES FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION.
- WELDS SHALL BE MADE USING E70XX ELECTRODES AND SHALL BE 3/16" MINIMUM UNLESS OTHERWISE NOTED.
- WELDING SHALL BE PERFORMED IN ACCORDANCE WITH A WELDED PROCEDURE SPECIFICATION (WPS) AS PER AWS D1.1, D1.3 AND D1.4.
- ONLY PRE-QUALIFIED WELDING PROCEDURES SHALL BE USED.
- UNLESS SPECIFICALLY ADDRESSED IN THE SPECIFICATIONS OR THE DETAILS, ALL STEEL ITEMS PERMANENTLY EXPOSED TO EARTH OR WEATHER SHALL BE CORROSION-RESISTANT BY GALVANIZING OR BY THE USE OF STAINLESS STEEL.
- ALL FIELD WELDS ON GALVANIZED MATERIAL SHALL BE BRUSH-COATED WITH A ZINC-RICH PAINT.

FRP Notes:

- ALL FRP MATERIAL SHALL BE EXTREN SERIES 500 OR EQUIVALENT, PRODUCED BY THE PULTRUSION METHOD.
- ALL ADHESIVE RESIN SHALL BE PLEXUS METHACRYLATE OR AN EQUIVALENT ADHESIVE RESIN THAT IS COMPATIBLE WITH THE RESIN MATRIX USED IN THE STRUCTURAL SHAPES.
- ALL FRP CONNECTIONS SHALL BE FULLY-BONDED AT EACH SIDE WITH A 1/4" PLATE AND A

- MINIMUM OF (2) 3/8" DIAMETER FLATHEAD FRP SCREWS PER MEMBER.
- ISOPLAST NUTS AND BOLTS SHALL BE TIGHTENED TO A SNUG-TIGHT FIT PLUS AN ADDITIONAL 1/2 TURN, PRIOR TO BEING LOCKED WITH EPOXY.
- ALL PANELS / SHEATHING SHALL BE FULLY BONDED WITH 3/8" FLATHEAD FRP SCREWS AT 12" O.C.
- ALL FIELD CUT AND DRILLED EDGES, HOLES AND ABRASIONS SHALL BE SEALED WITH A CATALYZED EPOXY RESIN COMPATIBLE WITH THE MANUFACTURER'S ORIGINAL RESIN.

3.0 STANDARDS FOR ALL CONCRETE WORK

- ALL CONCRETE WORK SHALL CONFORM WITH ACI 318 OR LATEST. DETAIL REINFORCING IN CONFORMANCE WITH ACI SP66 LATEST.
- NO SPLICES OF REINFORCEMENT SHALL BE MADE EXCEPT AS DETAILED OR AUTHORIZED BY THE STRUCTURAL ENGINEER. LAP SPLICES WHERE PERMITTED SHALL BE A MINIMUM OF 30 BAR DIAMETERS.
- PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING AT POSITIONS SHOW ON DRAWINGS.
- WIRE FABRIC REINFORCEMENT MUST LAP ONE FULL MESH AT SIDE AND END LAPS SHALL BE TIED TOGETHER.
- CURE AFTER FINISHING CONCRETE. KEEP MOIST FOR 7 DAYS AFTER POURING.
- COMPACT STRUCTURAL FILL 95% PROCTOR DENSITY PRIOR TO PLACING CONCRETE UNDER SLABS.
- 1/4" CHAMFER ON ALL CORNERS AND EDGES.
- ALL CONCRETE SHALL BE PORTLAND, TYPE 1 CEMENT WITH A MINIMUM OF 28 DAY STRENGTH OF 3000 PSI., 4" SLUMP AND A MINIMUM AIR ENTRAPMENT OF 4%.
- ALL REINFORCING STEEL SHALL BE GRADE 60. ALL REINFORCING MESH SHALL CONFORM TO ASTM A 185.

ELECTRICAL NOTES

- SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT. CONTRACTOR IS RESPONSIBLE FOR ALL FIELD VERIFICATION.
- THESE PLANS ARE DIAGRAMMATIC ONLY, AND NOT TO BE SCALED.
- ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC. FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
- ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDER-WRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
- ALL CONDUIT INSTALLED SHALL BE SURFACE MOUNTED UNLESS OTHERWISE NOTED.
- ELECTRICAL CONTRACTOR SHALL CARRY OUT HIS WORK WITH ACCORDANCE WITH ALL GOVERNING STATE, COUNTY, LOCAL CODES AND O.S.H.A.
- ELECTRICAL CONTRACTOR SHALL SECURE ALL NECESSARY ELECTRICAL PERMITS, AND PAY ALL REQUIRED FEES.
- COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF NO LESS THAN ONE YEAR AFTER THE DATE OF JOB COMPLETION. ANY WORK, MATERIAL, OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
- ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE, AND TRUE TAPE.
- PROVIDE THE OWNER WITH ONE SET OF COMPLETE DIMENSIONS AND CIRCUITS, WITHIN 10 WORKING DAYS OF PROJECT COMPLETION. ELECTRICAL "AS BUILT" DRAWINGS, SHOWING ACTUAL LOCATION OF CONDUITS.
- ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO PROJECT MANAGER AT JOB COMPLETION.
- USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURE. ALL CONDUCTORS SHALL BE COPPER.
- THE EXTERIOR GROUND RING SHALL BE TESTED PER CCI SPECIFICATIONS AND SHALL HAVE A RESISTANCE TO EARTH OF 5 OHMS OR LESS. IF NOT NOTIFY ENGINEER.
- ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT-CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
- PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
- IN DRILLING HOLES INTO CONCRETE (WHETHER FOR FASTENING OR ANCHORING PURPOSES OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC.) IT MUST BE CLEARLY UNDERSTOOD THAT TENDONS AND RE-BARS WILL NOT BE DRILLED INTO, CUT, OR DAMAGED UNDER ANY CIRCUMSTANCES.
- LOCATION OF TENDONS AN RE-BARS ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT VIA X-RAY, OR OTHER DEVICES THAT CAN ACCURATELY LOCATE THE REINFORCING STEEL TENDONS.
- PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH APPLICABLE LOCAL BUILDING CODES. USING U.L. RATED MATERIALS.

- ELECTRICAL CONTRACTOR IS TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOK-UP COSTS SHALL BE PAID BY THE CONTRACTOR.
- ELECTRICAL CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND/OR CATALOG CUT-SHEETS ON ALL NON-SPECIFIED ORIGINAL MATERIALS AND EQUIPMENT, TO PROJECT MANAGER PRIOR TO COMMENCEMENT OF THE WORK.
- UPON COMPLETION OF WORK, CONDUCT CONTINUITY AND SHORT CIRCUIT, AS WELL AS, GROUNDING TEST, GROUNDING TEST SHALL BE PERFORMED BY INDEPENDENT TESTING AGENCY, WITH WRITTEN REPORT SUBMITTED TO THE PROJECT MANAGER FOR REVIEW AND APPROVAL.
- CLEAN PREMISES DAILY OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK PREMISES IN A COMPLETE AND UNDAMAGED CONDITION.
- ALL EXTERIOR WALL PENETRATIONS SHALL BE SEALED WITH POLYSEAM SEALANT.
- ALL #2 TINNED BARE COPPER DOWNLEADS TO BE PROTECTED BY 1/2" P.V.C. PIPE AND SECURED.
- COMPRESSION FITTINGS TO BE USED ON ALL CONDUITS (NO SET SCREWS).
- ALL #6 STRANDED COPPER WITH GREEN INSULATION TO BE ATTACHED WITH CRIMPED DOUBLE LUG, ATTACHED WITH NUTS, BOLTS AND STAR WASHERS TYPICAL AND NO-OX GREASE BETWEEN LUG AND BUS BAR.
- ALL ABOVE GROUND CONDUIT SHALL BE RIGID GALVANIZED CONDUIT WITH WEATHERPROOF FITTINGS.

GROUNDING

- ALL METALLIC PARTS OF ELECTRICAL EQUIPMENT WHICH DO NOT CARRY CURRENT SHALL BE GROUNDED IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING MANUFACTURER, T-MOBILE GROUNDING AND BONDING STANDARDS, AND THE NATIONAL ELECTRICAL CODE.
- PROVIDE ELECTRICAL GROUNDING AND BONDING SYSTEM INDICATED WITH ASSEMBLY OF MATERIALS, INCLUDING GROUNDING ELECTRODES, BONDING JUMPERS AND ADDITIONAL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- ALL GROUNDING CONDUCTORS SHALL PROVIDE A STRAIGHT DOWNWARD PATH TO GROUND WITH GRADUAL BEND AS REQUIRED. GROUNDING CONDUCTORS SHALL NOT BE LOOPED OR SHARPLY BENT. ROUTE GROUNDING CONNECTIONS AND CONDUCTORS TO GROUND IN THE SHORTEST AND STRAIGHTEST PATHS POSSIBLE TO MINIMIZE TRANSIENT VOLTAGE RISES. BUILDINGS AND/OR NEW TOWERS GREATER THAN 75 FEET IN HEIGHT AND WHERE THE MAIN
- GROUNDING CONDUCTORS ARE REQUIRED TO BE ROUTED TO GRADE, THE CONTRACTOR SHALL ROUTE TWO GROUNDING CONDUCTORS FROM THE ROOFTOP, TOWERS, AND WATER TOWERS GROUND RING, TO THE EXISTING GROUNDING SYSTEM, THE GROUNDING CONDUCTORS SHALL NOT BE SMALLER THAN #2 AWG COPPER. ROOFTOP GROUND RING SHALL BE BONDED TO THE EXISTING GROUNDING SYSTEM, THE BUILDING STEEL COLUMNS, LIGHTNING PROTECTION SYSTEM, AND BUILDING MAIN WATER LINE (FERROUS OR NONFERROUS METAL PIPING ONLY).
- TIGHTEN GROUNDING AND BONDING CONNECTORS, INCLUDING SCREWS AND BOLTS, IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED TORQUE TIGHTENING VALUES FOR CONNECTORS AND BOLTS. WHERE MANUFACTURER'S TORQUING REQUIREMENTS ARE NOT AVAILABLE, TIGHTEN CONNECTIONS TO COMPLY WITH TIGHTENING TORQUE VALUES SPECIFIED IN UL TO ASSURE PERMANENT AND EFFECTIVE GROUNDING. CONTRACTOR SHALL VERIFY THE LOCATIONS OF GROUNDING TIE-IN-POINTS TO THE EXISTING
- ALL UNDERGROUND GROUNDING CONNECTIONS SHALL BE MADE BY THE GROUNDING SYSTEM. EXOTHERMIC WELD PROCESS AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- ALL GROUNDING CONNECTIONS SHALL BE INSPECTED FOR TIGHTNESS. EXOTHERMIC WELDED CONNECTIONS SHALL BE APPROVED BY THE INSPECTOR HAVING JURISDICTION BEFORE BEING PERMANENTLY CONCEALED.
- APPLY CORROSION-RESISTANCE FINISH TO FIELD CONNECTIONS AND PLACES WHERE FACTORY APPLIED PROTECTIVE COATINGS HAVE BEEN DESTROYED.
- A SEPARATE, CONTINUOUS, INSULATED EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS.
- BOND ALL INSULATED GROUNDING BUSHINGS WITH A BARE 6 AWG GROUNDING CONDUCTOR TO A GROUND BUS.
- DIRECT BURIED GROUNDING CONDUCTORS SHALL BE INSTALLED AT A NOMINAL DEPTH OF 36" MINIMUM BELOW GRADE, OR 6" BELOW THE FROST LINE, USE THE GREATER OF THE TWO DISTANCES.
- ALL GROUNDING CONDUCTORS EMBEDDED IN OR PENETRATING CONCRETE SHALL BE INSTALLED IN SCHEDULE 40 PVC CONDUIT.
- THE INSTALLATION OF CHEMICAL ELECTROLYTIC GROUNDING SYSTEM IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. REMOVE SEALING TAPE FROM LEACHING AND BREATHER HOLES. INSTALL PROTECTIVE BOX FLUSH WITH GRADE.
- DRIVE GROUND RODS UNTIL TOPS ARE A MINIMUM DISTANCE OF 36" DEPTH OR 6" BELOW FROST LINE, USING THE GREATER OF THE TWO DISTANCES.
- IF COAX ON THE ICE BRIDGE IS MORE THAN 6 FT. FROM THE GROUND BAR AT THE BASE OF THE TOWER, A SECOND GROUND BAR WILL BE NEEDED AT THE END OF THE ICE BRIDGE, TO GROUND THE COAX CABLE GROUNDING KITS AND IN-LINE ARRESTORS
- CONTRACTOR SHALL REPAIR, AND/OR REPLACE, EXISTING GROUNDING SYSTEM COMPONENTS DAMAGED DURING CONSTRUCTION AT THE CONTRACTORS EXPENSE.



18400 EAST 22ND AVE. AURORA, CO 80216

PROJECT INFORMATION:

SITE NAME:
STRATMOOR WT
SITE ID:
DN04161A

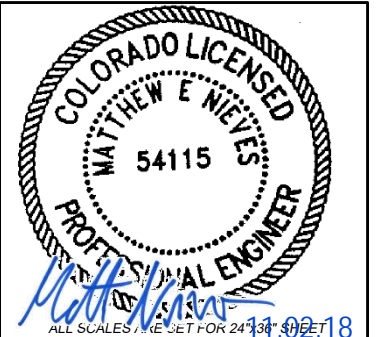
12 CLOVER CIR E,
COLORADO SPRINGS, CO
80906

Rev:	Date:	Description:	By:
1	7/10/18	PRELIMINARY	JRM
2	8/20/18	REV. 1	EC
3	8/31/18	REV. 2	EC
4	10/12/18	REV. 3	EC
5	11/02/18	FINAL CONST	EC

PLANS PREPARED BY:

3980 QUEBEC STREET
DENVER, CO 80207
WYCOFIELDSERVICES.COM

LICENSURE NO:



DRAWN BY:	CHK BY:	APV BY:
JRM	ML	MN

Sheet Title:

GENERAL NOTES

Sheet Number:

GN1