

PROPRIETY INFORMATION:
THE INFORMATION CONTAINED IN THIS
SET OF DRAWINGS IS PROPRIETARY BY
NATURE. ANY USE OR DISCLOSURE
OTHER THAN THAT WHICH RELATES TO
T-MOBILE SERVICES IS STRICTLY
PROHIBITED.

DISCLOSURE:
NO SITE WALK WAS CONDUCTED FOR
THESE DRAWINGS. DATA WAS PROVIDED
BY T-MOBILE AND CROWN CASTLE.
CONTRACTOR TO VERIFY MATERIALS
AND DESIGN PRIOR TO INSTALL.



SL01312A WEST WEBER BAUGH
4311 WEST 1200 SOUTH
WEST WEBER, UT 84401

SCOPE OF WORK

T-MOBILE IS PROPOSING TO REMOVE NINE (9) ANTENNAS AND FOUR (4) LINES OF COAX. T-MOBILE IS PROPOSING TO INSTALL SIX (6) NEW ANTENNAS AND ONE (1) NEW FIBER CABLE. FINAL TOWER CONFIGURATION WILL BE SIX (6) ANTENNAS, THREE (3) TMAs, TWELVE (12) LINES OF COAX AND ONE (1) FIBER CABLE.

GENERAL LOCATION MAP



VICINITY MAP



MODERNIZATION EQUIPMENT LIST

SECTOR	TYPE	MODEL	QUANTITY
ALPHA	ANTENNA	ERICSSON AIR 21	2
ALPHA	TMA	ANDREW TWIN AWS	1
ALPHA	COAX	1 5/8" - 140'	4
BETA	ANTENNA	ERICSSON AIR 21	2
BETA	TMA	ANDREW TWIN AWS	1
BETA	COAX	1 5/8" - 140'	4
GAMMA	ANTENNA	ERICSSON AIR 21	2
GAMMA	TMA	ANDREW TWIN AWS	1
GAMMA	COAX	1 5/8" - 140'	4
SITE	FIBER	9X18 MLE HYBRID	1

APPROVALS

APPROVED BY	PRINT NAME	INITIALS	DATE
PROJECT MANAGER			
RF ENGINEER			
OPS MANAGER			
CONSTRUCTION			
LANDLORD			

CONTACT INFORMATION

STRUCTURE OWNER
CROWN CASTLE USA, INC
5350 NORTH 48TH STREET
CHANDLER, AZ 85226

NETWORK SYSTEMS OWNER
T-MOBILE
121 WEST ELECTION RD. STE. 330
DRAPER, UT 84020

SITE ACQUISITION FIRM
RAGE DEVELOPMENT LLC
2181 HUGO AVENUE
SALT LAKE CITY, UT 84117

A/E FIRM
STILLWATER MANAGEMENT, LLC
2977 CONNOR STREET
SALT LAKE CITY, UT 84109



DATE: 5-1-2013
DRAWN BY: CJS (STILLWATER)
CHECKED BY: ROCKY SCHUTJER

REVISIONS		
DATE	DESCRIPTION	INT.
5-1-13	PRELIM ZDs	CJS
5-2-13	FINAL ZDs	CJS
5-14-13	PRELIM CDs	CJS
5-14-13	FINAL CDs	CJS

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WEST WEBER BAUGH
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WEST WEBER, UT 84401

DRAWING
TITLE:
TITLE SHEET

DRAWING NO.:
T-1

GENERAL CONSTRUCTION NOTES

1.

DRAWINGS WERE PREPARED FROM STANDARDIZED DETAILS DEVELOPED AND PROVIDED BY T-MOBILE WEST, LLC ("T-MOBILE"). STANDARDIZED DETAILS ARE TO BE CONFIRMED AND CORRELATED AT THE SITE BY THE CONTRACTOR. STANDARDIZED DETAILS THAT REQUIRE MODIFICATIONS DUE TO ACTUAL FIELD CONDITIONS AND REQUIREMENTS MUST BE SUBMITTED TO, AND APPROVED BY, T-MOBILE PRIOR TO START OF WORK.
2.

DRAWINGS ARE NOT TO BE SCALED. WRITTEN DIMENSIONS TAKE PRECEDENCE. THIS SET OF DOCUMENTS IS INTENDED TO BE USED FOR DIAGRAM PURPOSES ONLY. UNLESS OTHERWISE NOTED. THE CONTRACTOR IS RESPONSIBLE FOR ALL DIMENSIONS.
3.

THE GENERAL CONTRACTOR'S SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR, AND ANY REQUIREMENTS DEEMED NECESSARY TO COMPLETE INSTALLATION AS DESCRIBED IN THE DRAWINGS AND AS DISCUSSED ON THE SITE WALK.
4.

PRIOR TO THE SUBMISSION OF BIDS, CONTRACTORS INVOLVED SHALL VISIT THE JOB SITE TO FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THE PROPOSED PROJECT. CONTRACTORS SHALL VISIT THE CONSTRUCTION SITE WITH THE CONSTRUCTION DOCUMENTS TO VERIFY FIELD CONDITIONS AND CONFIRM THAT THE PROJECT WILL BE ACCOMPLISHED AS SHOWN. PRIOR TO PROCEEDING WITH CONSTRUCTION, ANY ERRORS, OMISSIONS, OR DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF T-MOBILE VERBALLY AND IN WRITING.
5.

THE GENERAL CONTRACTOR SHALL RECEIVE WRITTEN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS.
6.

THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
7.

THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8.

ALL WORK PERFORMED ON THE PROJECT 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, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK.
9.

GENERAL CONTRACTOR SHALL PROVIDE, AT THE PROJECT SITE, A FULL SET OF CONSTRUCTION DOCUMENTS UPDATED WITH THE LATEST REVISIONS AND ADDENDA OR CLARIFICATIONS FOR USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
10.

THE STRUCTURAL COMPONENTS OF ADJACENT CONSTRUCTION OR FACILITIES ARE NOT TO BE ALTERED BY THIS CONSTRUCTION PROJECT UNLESS NOTED OTHERWISE.
11.

CONTRACTOR TO SEAL ALL PENETRATIONS THROUGH FIRE-RATED AREAS WITH U.L. LISTED OR FIRE MARSHALL APPROVED MATERIALS IF APPLICABLE TO THIS FACILITY AND OR PROJECT SITE.

12.

CONTRACTOR TO PROVIDE A PORTABLE FIRE EXTINGUISHER WITH A RATING OF NOT LESS THAN 2-A OR 2-A10BC WITHIN 75 FEET TRAVEL DISTANCE TO ALL PORTIONS OF PROJECT AREA DURING CONSTRUCTION.
13.

CONTRACTOR SHALL MEET ALL OSHA REQUIREMENTS FOR ALL INSTALLATIONS.
14.

CONTRACTOR TO VERIFY LOCATION OF ALL BURIED UTILITIES PRIOR TO EXCAVATION.
15.

CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVING, CURBING, ETC. DURING CONSTRUCTION, UPON COMPLETION OF WORK, CONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
16.

CONTRACTOR SHALL KEEP GENERAL WORK AREA CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. CONTRACTOR SHALL REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OR PREMISES. SITE SHALL BE LEFT IN CLEAN CONDITION DAILY AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
17.

THE ARCHITECTS/ENGINEERS HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. CONTRACTORS BIDDING THE JOB ARE NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS. THE BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) T-MOBILE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO SUBMISSION OF CONTRACTOR'S PROPOSAL. IN THE EVENT OF DISCREPANCIES THE CONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED OTHERWISE.
18.

THE CONTRACTOR SHALL PERFORM WORK DURING OWNER'S PREFERRED HOURS TO AVOID DISTURBING NORMAL BUSINESS.
19.

THE CONTRACTOR SHALL PROVIDE T-MOBILE CORPORATION PROPER INSURANCE CERTIFICATES NAMING T-MOBILE WEST, LLC AS ADDITIONAL INSURED, AND T-MOBILE WEST, LLC PROOF OF LICENSE(S) AND PL & PD INSURANCE.

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT CONDITIONS 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.

A. UTAH UNIFORM BUILDING STANDARD ACT RULES
B. 2011 NATIONAL ELECTRIC CODE (NEC)
C. 2009 INTERNATIONAL BUILDING CODE (IBC)
D. 2006 NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 101)
E. 2009 INTERNATIONAL MECHANICAL CODE (IMC)
F. LOCAL BUILDING CODE
G. CITY OR COUNTY ORDINANCES

IMPORTANT NOTICE

THE EXISTING CONDITIONS REPRESENTED HEREIN ARE BASED ON VISUAL OBSERVATIONS AND INFORMATION PROVIDED BY OTHERS. STILLWATER MANAGEMENT CANNOT GUARANTEE THE CORRECTNESS NOR THE COMPLETENESS OF THE EXISTING CONDITIONS SHOWN AND ASSUMES NO RESPONSIBILITY THEREOF. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL EXISTING CONDITIONS AS REQUIRED FOR PROPER COMPLETION OF THE PROJECT.



DATE: 5-1-2013		
DRAWN BY: CJS (STILLWATER)		
CHECKED BY: ROCKY SCHUTJER		
REVISIONS		
DATE	DESCRIPTION	INT.
5-1-13	PRELIM ZDs	CJS
5-2-13	FINAL ZDs	CJS
5-14-13	PRELIM CDs	CJS
5-14-13	FINAL CDs	CJS

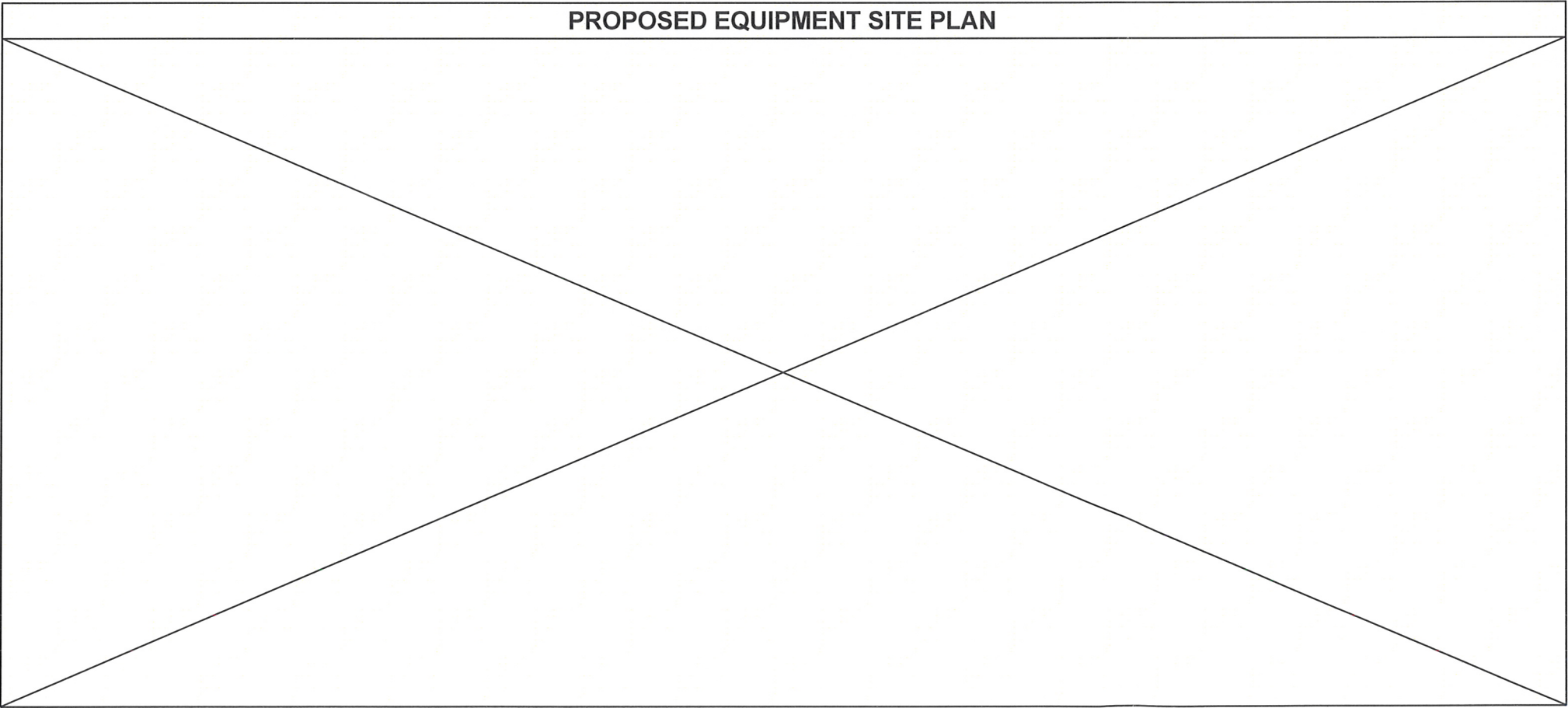
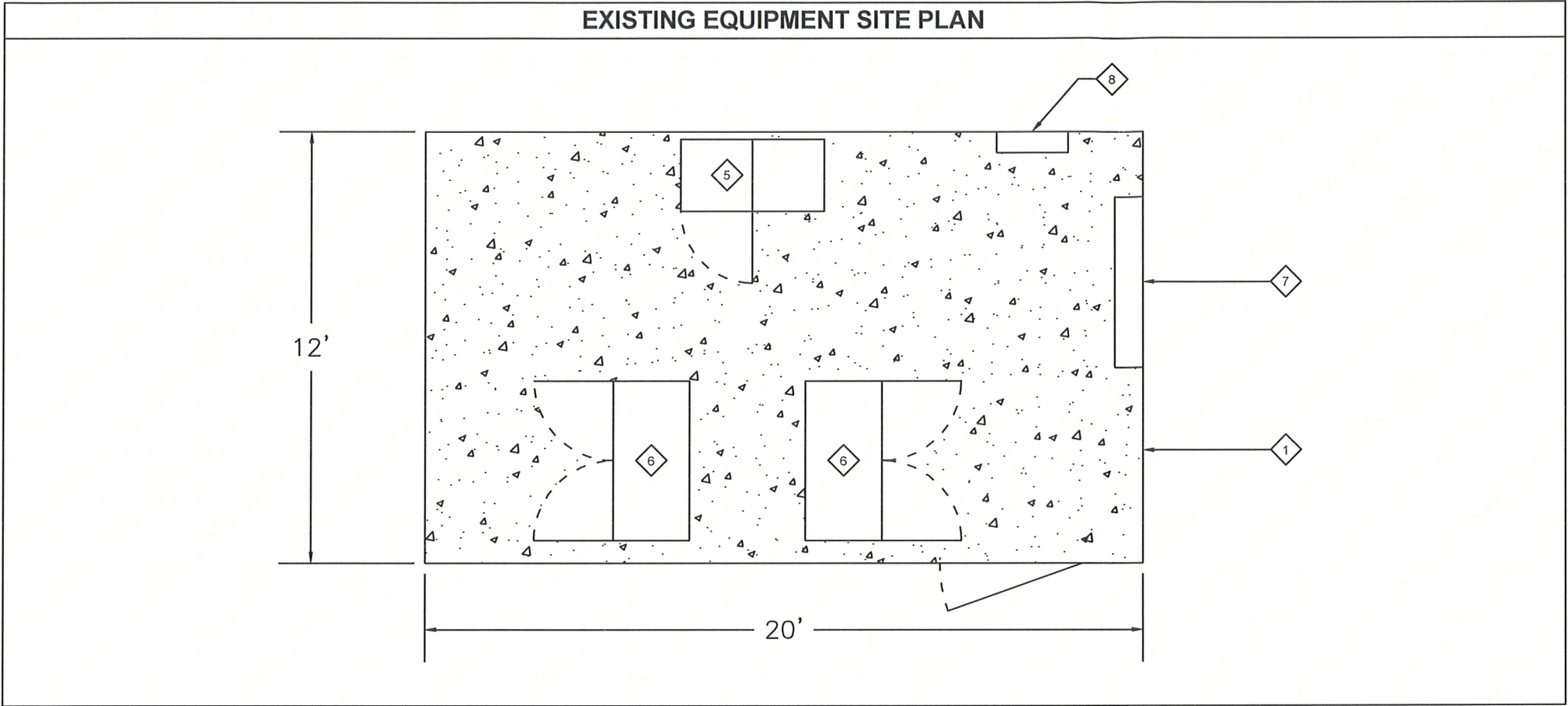
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DRAWING
TITLE:

GENERAL
NOTES

DRAWING NO.:

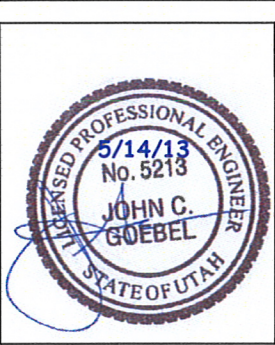
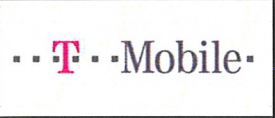
N-1



- KEY NOTES
- 1 T-MOBILE LEASE AREA
 - 2 EXISTING MONOPOLE
 - 3 SIX (6) PROPOSED ERICSSON AIR 21 ANTENNAS
 - 4 NINE (9) EXISTING ANTENNAS (TO BE REMOVED)
 - 5 ERICSSON RBS 3206 CABINET
 - 6 TWO (2) NORTEL 2G CABINETS
 - 7 TELCO EQUIPMENT MOUNTED ON WALL
 - 8 POWER EQUIPMENT MOUNTED ON WALL

SITE NOTES

NO CABINET CHANGES ARE PROPOSED FROM THE EXISTING EQUIPMENT LAYOUT.



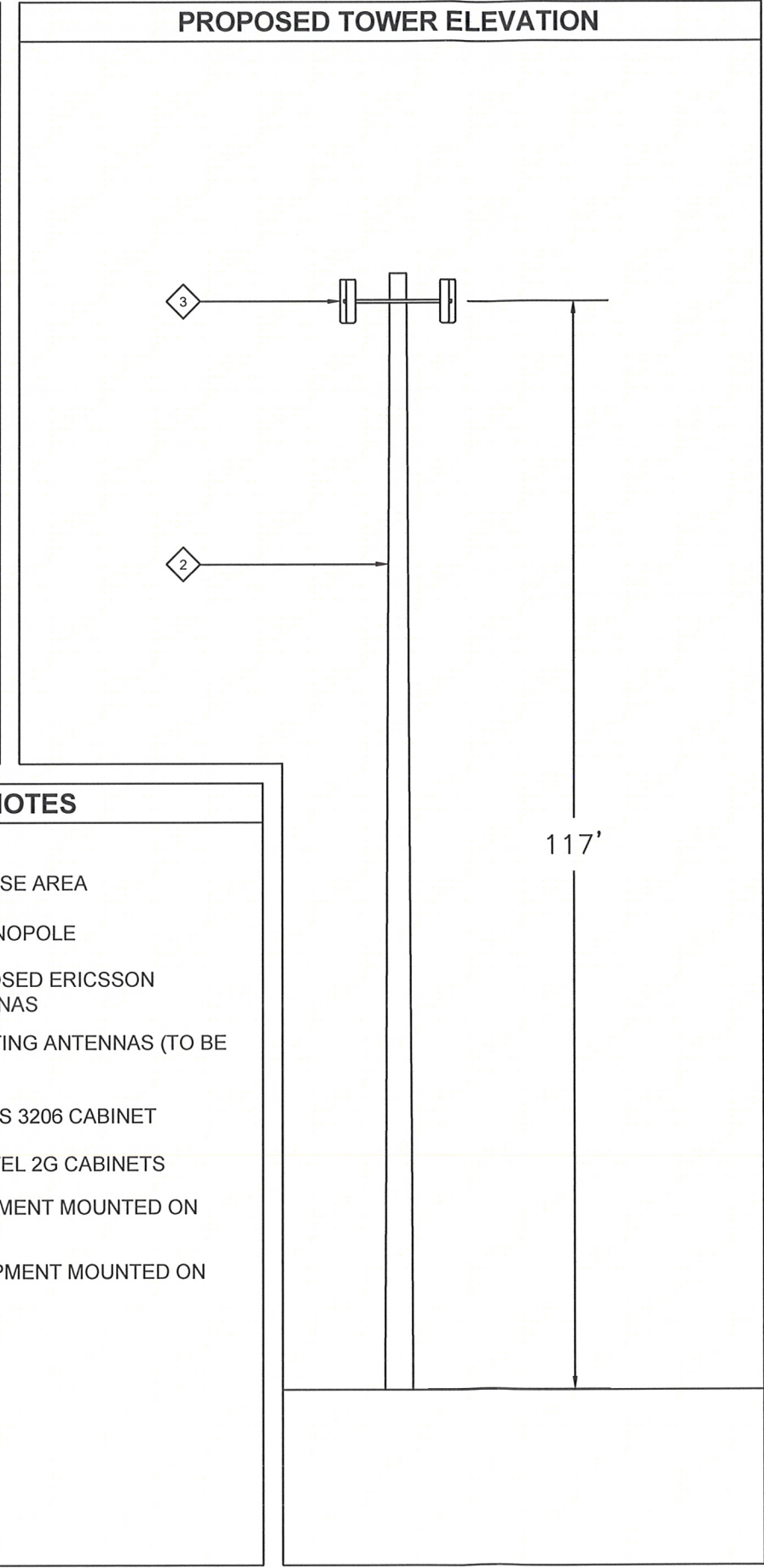
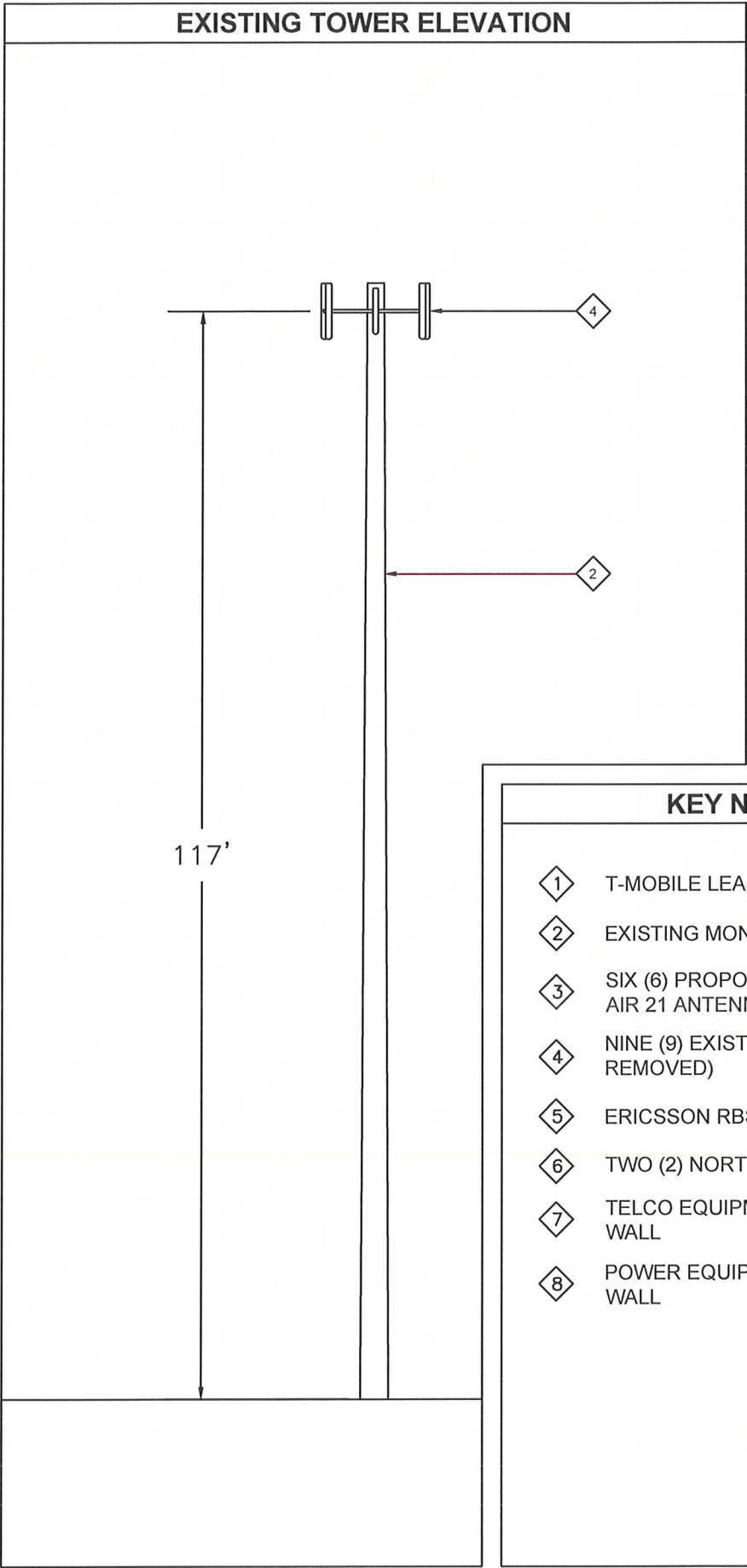
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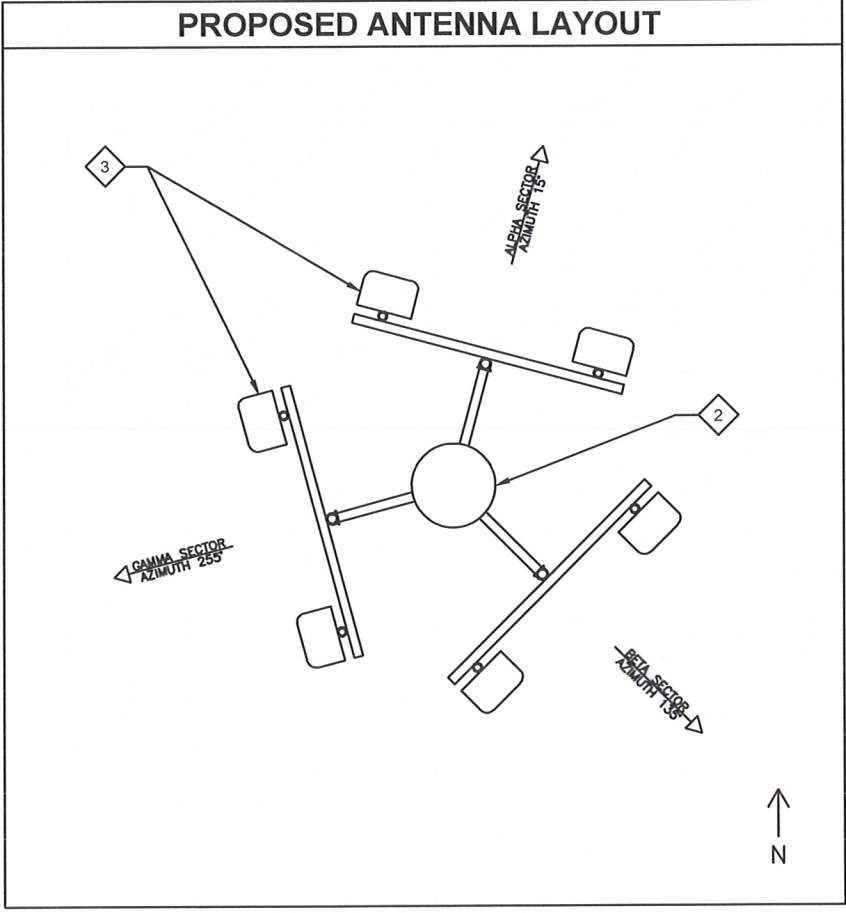
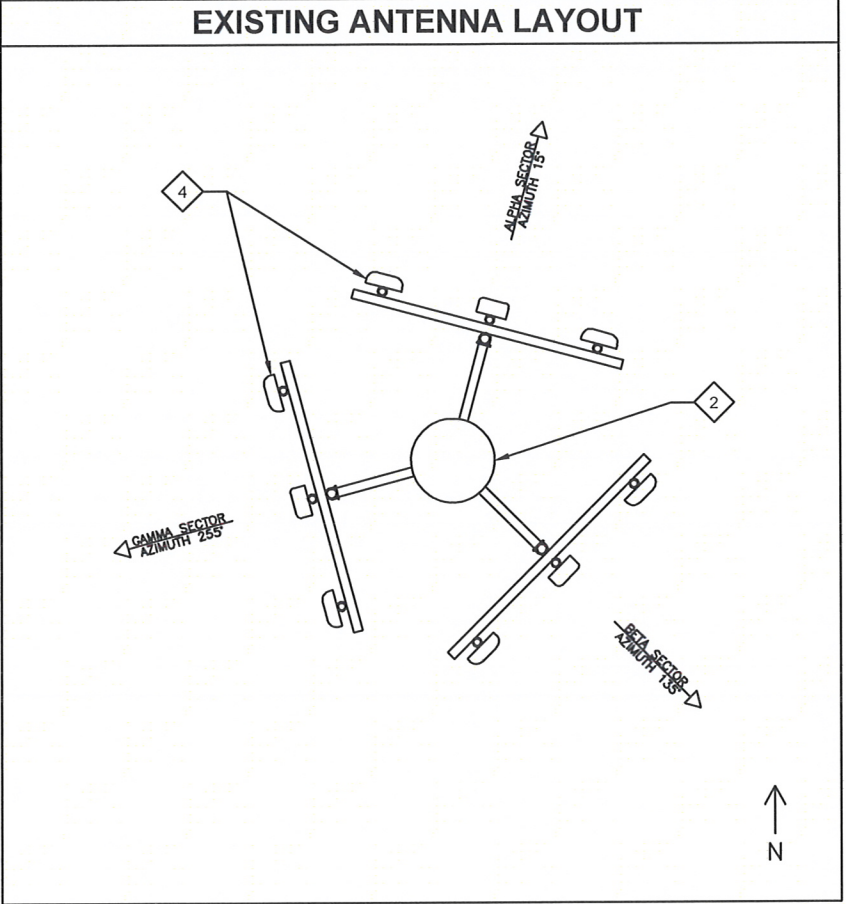
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DRAWING
TITLE:
EQUIPMENT
SITE PLAN

DRAWING NO.:
A-2



- KEY NOTES**
- 1 T-MOBILE LEASE AREA
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RAGE
DEVELOPMENT LLC

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management

PROFESSIONAL ENGINEER
5/14/13
No. 5213
JOHN C. GOEBEL
STATE OF UTAH

DATE: 5-1-2013
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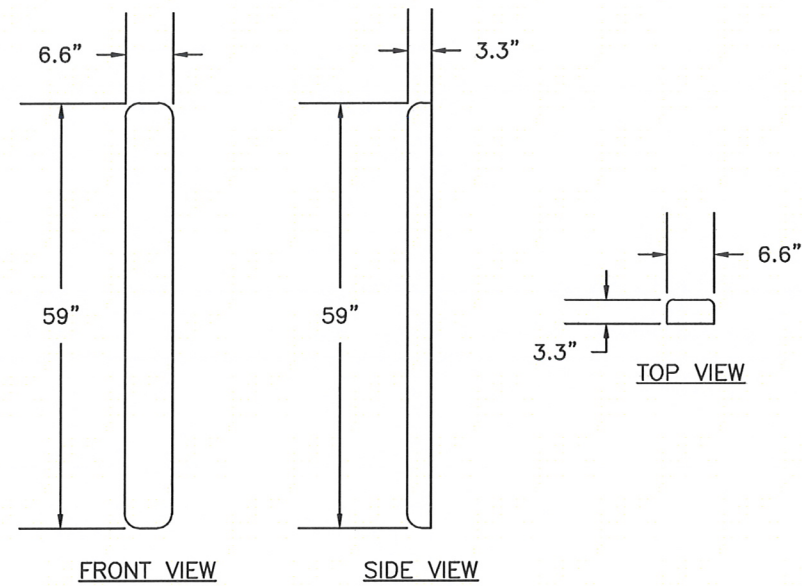
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WEST WEBER, UT 84401

DRAWING TITLE:
TOWER ELEVATION AND PLAN

DRAWING NO.:
A-3

ANTENNA DETAIL 1

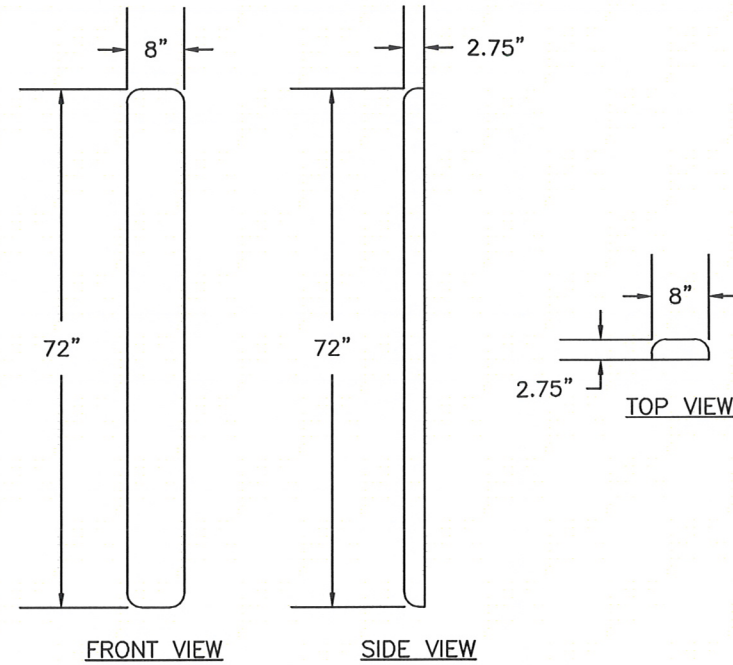
ANDREW TMBX-6516-R2M



EXISTING — TO BE REMOVED

ANTENNA DETAIL 2

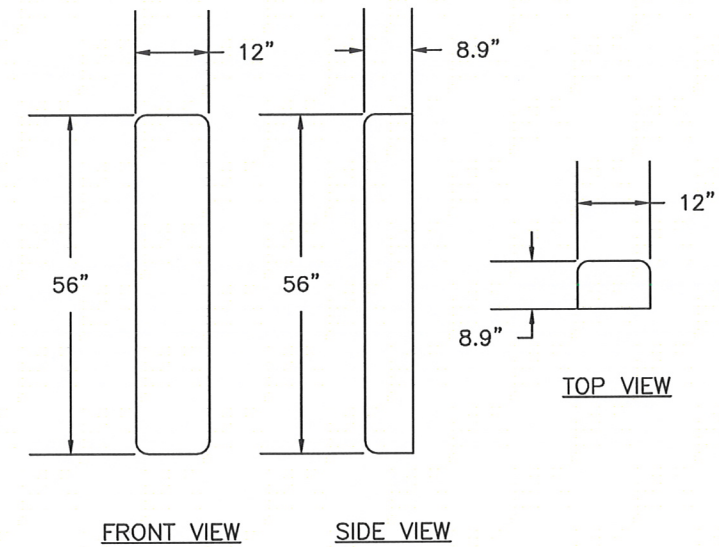
EMS DUAL PORT ANTENNA



EXISTING — TO BE REMOVED

ANTENNA DETAIL 3

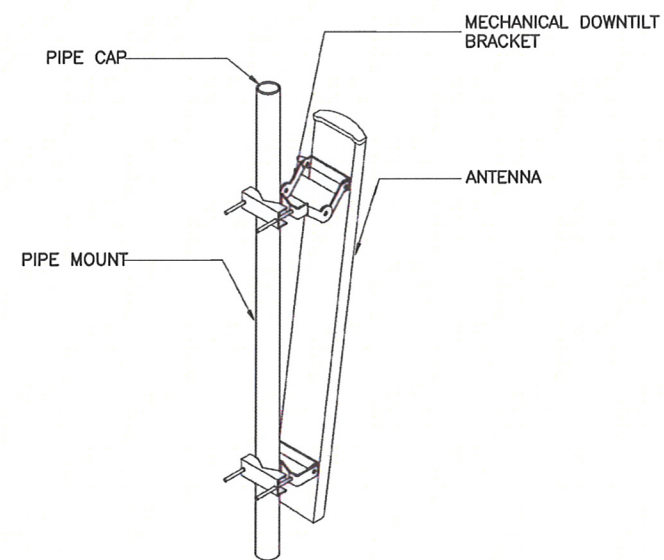
ERICSSON AIR 21



PROPOSED — TO BE INSTALLED

ANTENNA MOUNT DETAIL

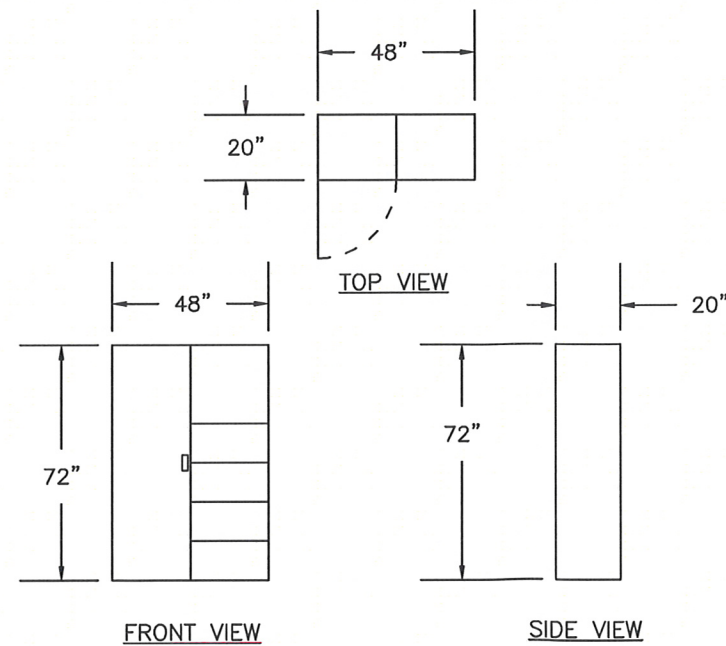
MECHANICAL TILT PIPE MOUNT



EXISTING — TO REMAIN

CABINET DETAIL 1

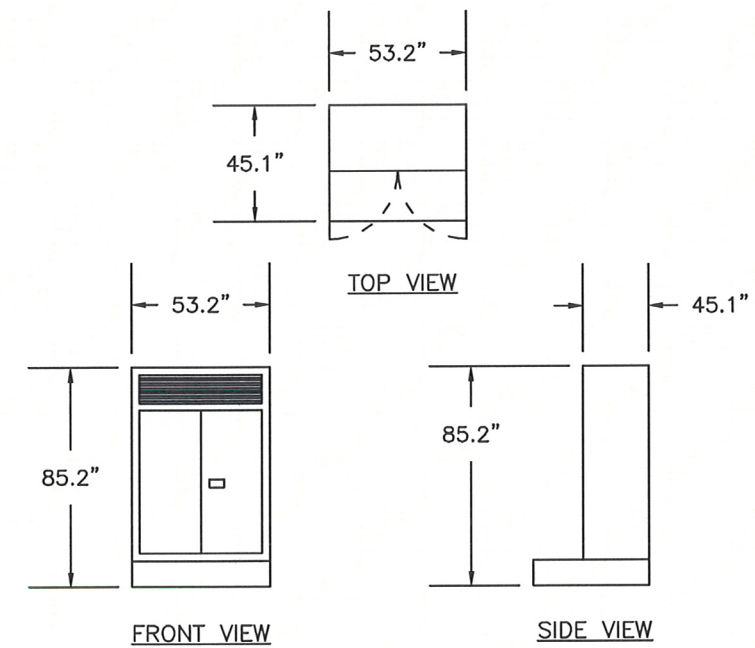
ERICSSON RBS 3206



EXISTING — TO REMAIN

CABINET DETAIL 2

NORTEL 2G CABINET



EXISTING — TO REMAIN

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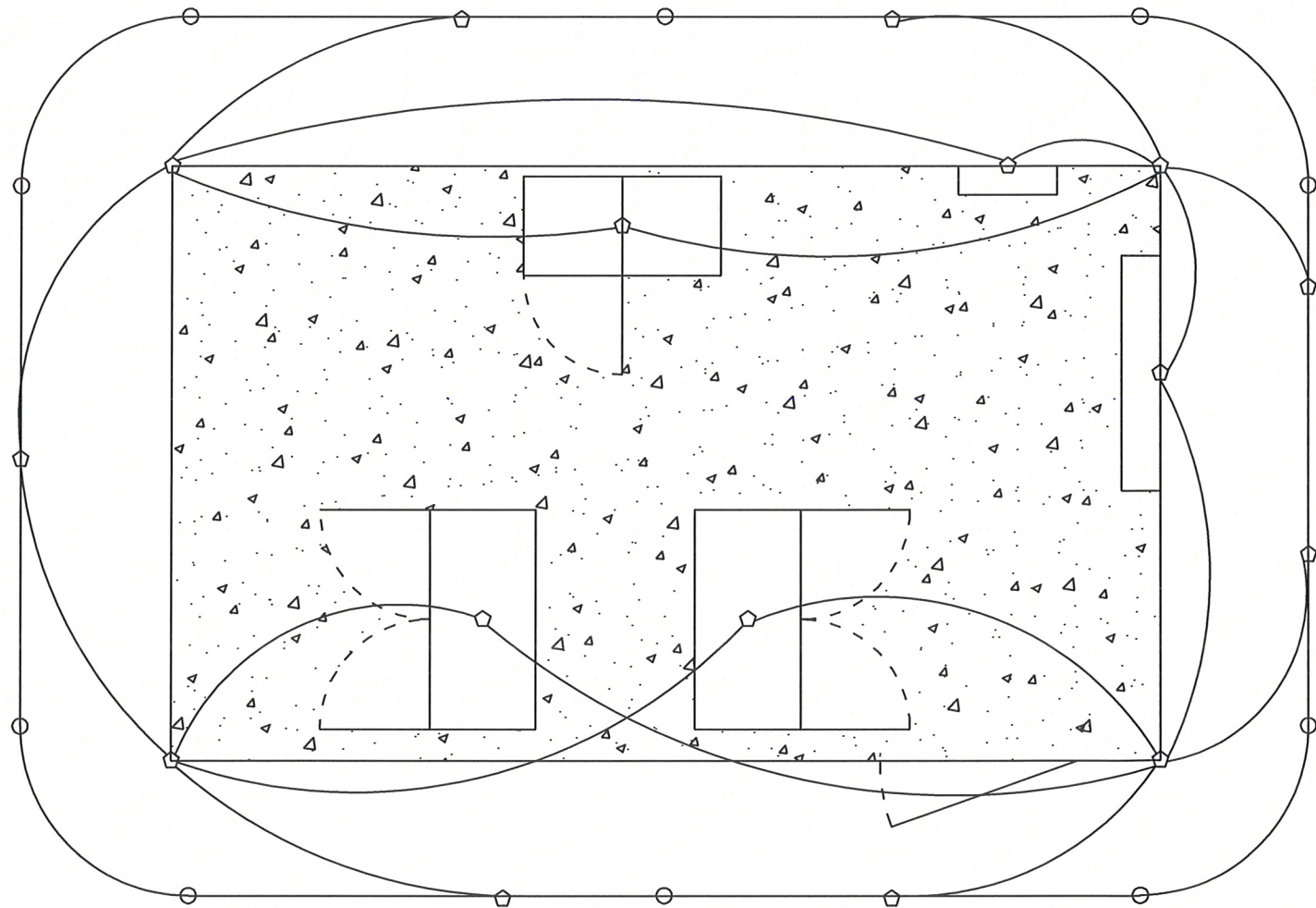
DATE	DESCRIPTION	INT.
5-1-13	PRELIM ZDs	CJS
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DRAWING
TITLE:
EQUIPMENT
DETAIL

DRAWING NO.:
E-1

GROUNDING PLAN



NOTE: TYPICAL GROUNDING PLAN SHOWN. CONTRACTOR TO TIE ANY NEW EQUIPMENT INTO EXISTING GROUNDING PLAN AT A MINIMUM OF TWO CONNECTIONS

GROUNDING NOTES

1. ALL SAFETY GROUNDING OF THE ELECTRICAL EQUIPMENT SHALL BE CARRIED OUT IN ACCORDANCE WITH THE CURRENT REVISION OF NEC.
2. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL INSTALLATION AND SITE CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS. IF SITE SOIL CONDITIONS ARE CORROSIVE, USE OF A LARGER MAIN GROUND RING CONDUCTOR MAY BE NECESSARY.
3. GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING GROUND WIRES AND CONNECT TO SURFACE MOUNTED BUS BARS. FOLLOW ANTENNA AND BTS MANUFACTURERS PRACTICES FOR GROUNDING REQUIREMENTS. GROUND COAX SHIELD AT BOTH ENDS AND EXIT FROM TOWER OR MONOPOLE USING MANUFACTURERS PRACTICES.
4. ALL GROUND CONNECTIONS SHALL BE CADWELD. ALL WIRES SHALL BE COPPER THHN/THWN. ALL GROUND WIRE SHALL BE SOLID COPPER WITH GREEN INSULATED WIRE ABOVE GROUND.
5. CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE TO A MAXIMUM OF 5 OHMS. IF GROUND TEST DID NOT ACHIEVE THE MAXIMUM 5 OHMS, CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADDITIONAL GROUNDING TO OHM MAX REQUIREMENT. GROUNDING AND OTHER OPERATIONAL TESTING WILL BE WITNESSED BY A T-MOBILE REPRESENTATIVE.
6. ELECTRICAL CONTRACTOR TO PROVIDE DETAILED DESIGN OF GROUNDING SYSTEM, AND RECEIVE APPROVAL OF DESIGN BY AN AUTHORIZED T-MOBILE REPRESENTATIVE, PRIOR TO INSTALLATION OF GROUNDING SYSTEM.
7. NOTIFY T-MOBILE IF THERE ARE ANY DIFFICULTIES INSTALLING GROUND SYSTEM DUE TO SITE SOIL CONDITIONS.
8. IF SURGE SUPPRESSER IS AN EXTERIOR MOUNT, RUN A #2 THHN GROUND WIRE IN A 1" SCHED. 40 PVC CONDUIT TO SIDE SPLICE CADWELD AT GROUND RING. HEAT RADIUS CONDUIT TO PRODUCE LARGE RADIUS BENDS. STRAP TO SLAB AT A MINIMUM OF TWO POINTS.
9. ALL GROUNDING WIRE RUNS AND CONNECTIONS, BOTH ABOVE AND BELOW GRADE, SHALL BE LOCATED INSIDE OF THE LEASE AREA.
10. TIE NEW GROUNDING INTO EXISTING GROUND GRID IN AT LEAST TWO LOCATIONS.
11. THE INFORMATION CONTAINED IN THIS SET OF CONSTRUCTION DOCUMENTS IS PROPRIETARY BY NATURE. ANY USE OR DISCLOSURE OTHER THAN THAT WHICH RELATES TO T-MOBILE SERVICES IS STRICTLY PROHIBITED.

SYMBOL KEY

- ◇ MECHANICAL CONNECTION
- COPPER GROUND ROD
- △ CADWELD CONNECTION
- GROUND BAR

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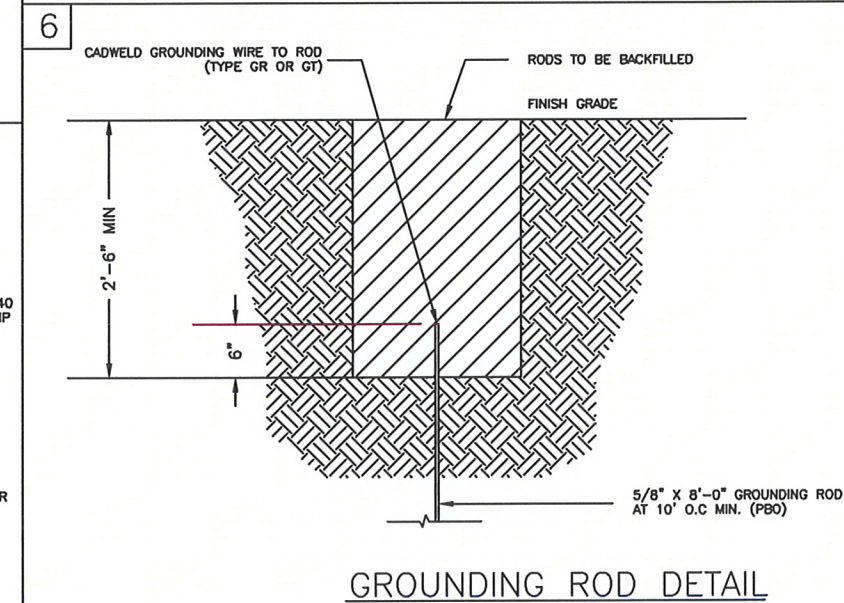
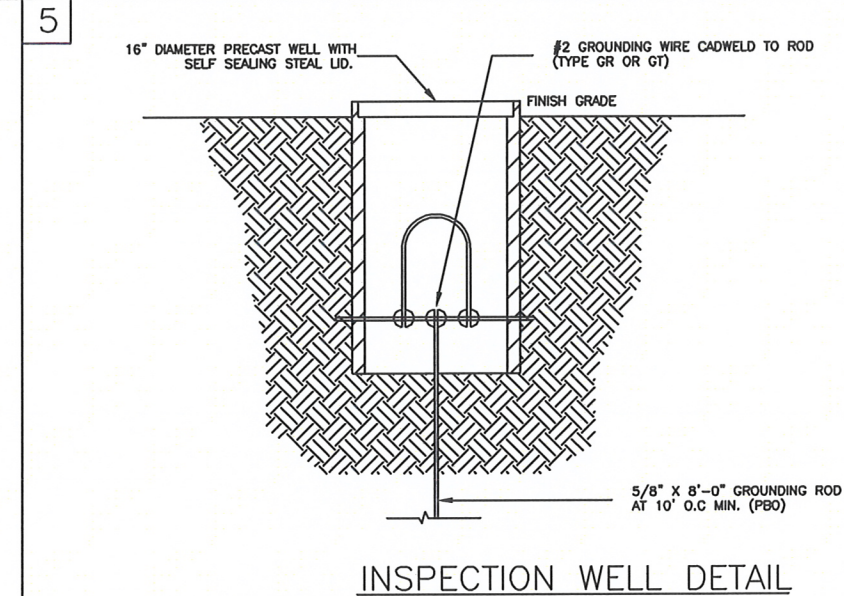
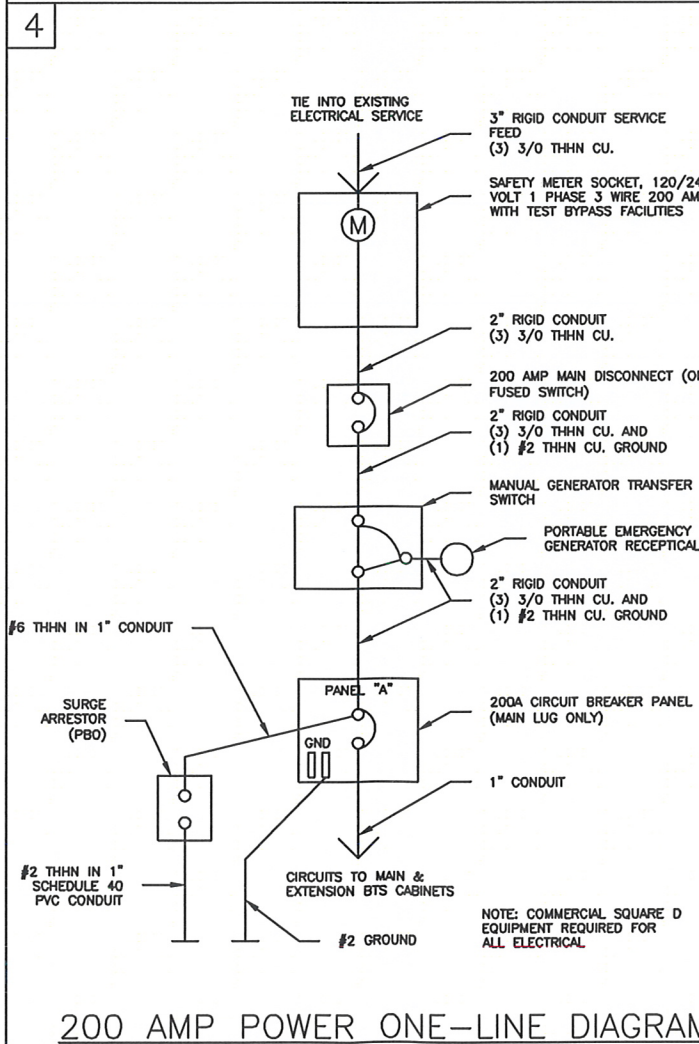
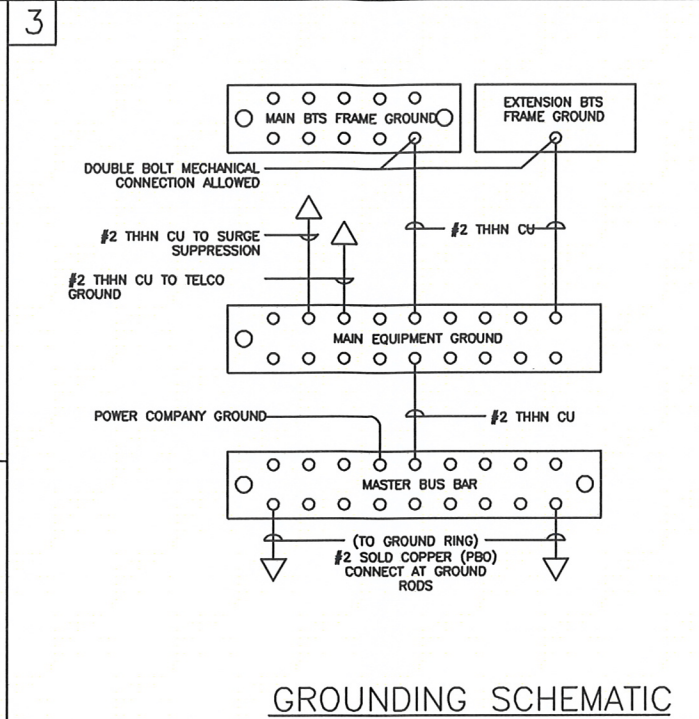
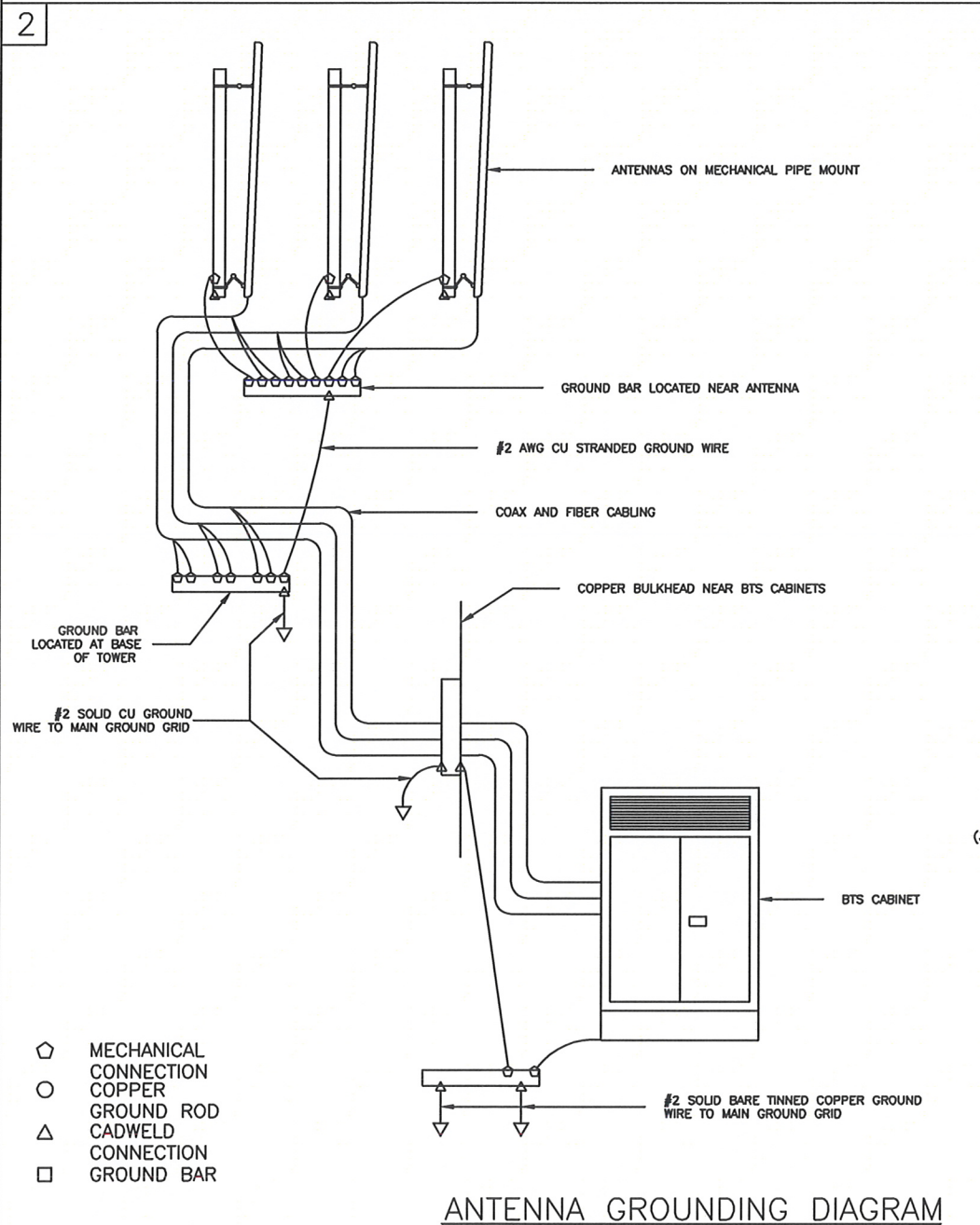
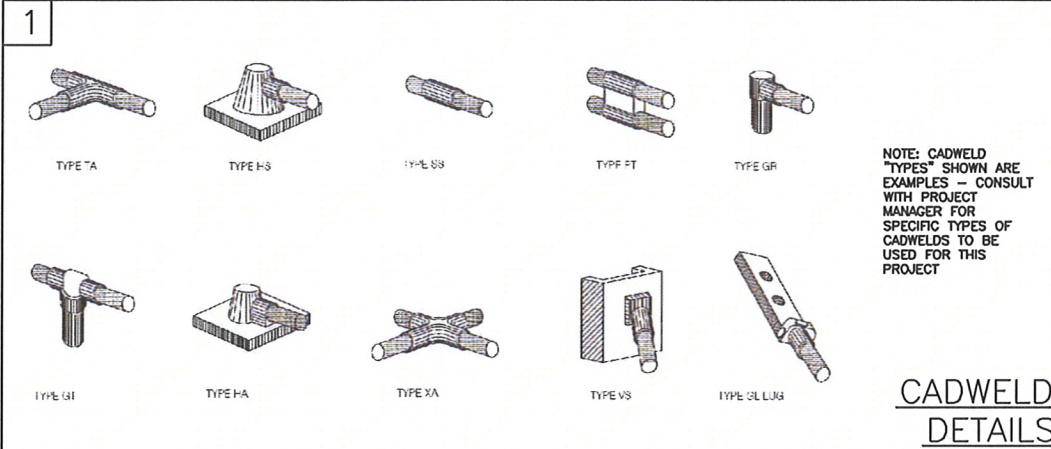
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DRAWING
TITLE:
GROUNDING
PLAN

DRAWING NO.:
E-2

TYPICAL GROUNDING DETAIL

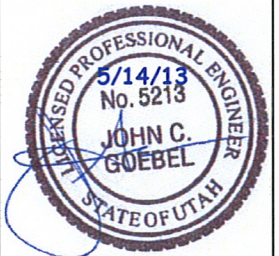


- 7
- PERFORM DETAILED VERIFICATION OF WORK PRIOR TO ORDERING THE ELECTRICAL EQUIPMENT AND COMMENCING CONSTRUCTION. NOTIFY T-MOBILE OF ANY DISCREPANCIES.
 - PRIOR TO BEGINNING WORK, COORDINATE ALL POWER AND TELCO WORK WITH THE LOCAL UTILITY COMPANY AS IT MAY APPLY TO THIS SITE. ALL WORK TO COMPLY WITH THE RULES AND REGULATIONS OF THE UTILITIES INVOLVED.
 - RUN TELEPHONE FROM EXISTING PEDESTAL OR TELEPHONE BOARD TO PPC LOCATION. CONTRACTOR SHALL FIELD VERIFY EXACT ROUTING OF POWER AND TELCO. FOLLOW ALL APPLICABLE LOCAL CODES AND UTILITY REQUIREMENTS.
 - FABRICATION AND INSTALLATION OF THE COMPLETE ELECTRICAL SYSTEM SHALL BE DONE IN A FIRST CLASS WORKMANSHIP BY QUALIFIED PERSONNEL EXPERIENCED IN SUCH WORK.
 - PROVIDE 4" CONDUIT EQUIPPED WITH ONE PULL STRING AND ONE 1" INNERDUCT. ALL TELEPHONE CONDUITS AND TELEPHONE WIRING MUST MAINTAIN A MINIMUM SEPARATION DISTANCE OF 18" AWAY FROM ALL A/C POWER CONDUITS AND WIRING.
 - CONTRACTOR TO PROVIDE 1" CONDUIT FOR POWER ROUTING TO BTS.
 - ALL ELECTRICAL WORK SHALL CONFORM TO THE EDITION OF THE NEC ACCEPTED BY THE LOCAL JURISDICTION AND TO THE APPLICABLE LOCAL CODES AND REGULATIONS.
 - SCHEDULE THE WORK IN AN ORDERLY MANNER SO AS NOT TO IMPEDE PROGRESS OF THE PROJECT.
 - CONTRACTOR TO VERIFY AZIMUTHS WITH FINAL RF DATA SHEET FROM RF ENGINEER.
- ELECTRICAL/TELEPHONE/SITE NOTES

T-Mobile

RAGE
DEVELOPMENT LLC

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DRAWING TITLE:
POWER, TELEPHONE, GROUNDING

DRAWING NO.:
E-3

SWEEP TEST PROCEDURE	
THE FOLLOWING DESCRIBES THE TEST AND FAULT FINDING PROCEDURE FOR ALL ANTENNAS:	
1.	TEST EQUIPMENT SHOULD CONSIST OF A SWEEP OSCILLATOR SET TO RUN BETWEEN 1800 AND 2000 MHZ, DIRECTIONAL COUPLER WITH AT LEAST 35 DB DIRECTIVITY AND SCALAR NETWORK ANALYZER WITH RESOLUTION OF BETTER THAN 0.2 DB. A MATCHED 50 OHM LOAD AND SHORT CIRCUIT TERMINATION ARE ALSO REQUIRED.
2.	SET UP THE RETURN LOSS MEASURING SET AS PER THE MANUFACTURERS' INSTRUCTIONS AND CALIBRATE WITH THE SHORT (ODB RETURN LOSS VSWR = INFINITY).
3.	INFORM T-MOBILE OPERATIONS PERSONNEL AT THE SWITCH THAT SWEEP TESTS ARE TO BEGIN AT THIS SITE SO THEY CAN DISABLE TRANSMISSION TO AVOID POTENTIAL TRX DAMAGE WITH THE ANTENNA PORT OPEN.
4.	COMPOSITE RETURN LOSS: DISCONNECT THE BOTTOM JUMPER AT THE BTS AND CONNECT IT TO THE MAIN PORT OF THE BRIDGE. RETURN LOSS OF THE COMPOSITE JUMPERS, FEEDER AND ANTENNA SHOULD BE < 1.4DB (VSWR > 1.5:1) BETWEEN 1800 AND 2000 MHZ.
5.	FEEDER RETURN LOSS: TURN OFF THE SWEEP GENERATOR, DISCONNECT THE TOP JUMPER AT THE ANTENNA AND CONNECT A DUMMY LOAD TO THE END OF THE JUMPER WITH A DIN - N ADAPTER. POWER UP THE GENERATOR AND MEASURE THE RETURN LOSS LOOKING INTO THE BOTTOM JUMPER. THE RETURN LOSS SHOULD NOT EXCEED 1.8DB (VSWR > 1.3:A) BETWEEN 1800 AND 2000 MHZ.
6.	FEEDER INSERTION LOSS: REPLACE THE LOAD WITH A SHORT CIRCUIT TERMINATION AND MEASURE THE MAXIMUM AND MINIMUM RETURN LOSS BETWEEN 1800 AND 2000 MHZ. ADD THESE TOGETHER AND DIVIDE BY 4 TO GIVE THE AVERAGE ONE-WAY INSERTION LOSS WHICH SHOULD NE < 3 DB.
7.	IF THE CONDITIONS IN 4, 5 AND 6 ARE MET, THE TEST IS COMPLETE. IF ITEM 4 FAILED BUT 5 AND 6 PASSED, REPLACE THE ANTENNA AND RETEST. IF ITEMS 5 OR 6 FAILED, MEASURE RETURN LOSS OF MAIN FEEDER ONLY. IF RETURN LOSS IMPROVES TO -20 OR BETTER OR INSERTION LOSS IMPROVES BY MORE THAN 2DB, REPLACE OR RETERMINATE THE BOTTOM AND TOP JUMPER. OTHERWISE, REPLACE THE MAIN FEEDER. NOTIFY T-MOBILE OF ANY FAULTY HARDWARE.
ALL TEST RESULTS SHOULD BE CLEARLY MARKED WITH SITE, FEEDER NUMBER, DATE AND MEASUREMENT TIME.	

CABLING IDENTIFICATION	
THE FOLLOWING DESCRIBES THE PROCEDURE FOR MARKING AND IDENTIFYING ANTENNA CABLING:	
1.	LOCATION: MARKINGS SHALL BE MADE BY USE OF 3M COLORED, TWO-INCH WIDE TAPE AFFIXED AT TYPICALLY FOUR PLACES ON THE CABLE RUN AS FOLLOWS: <div><div>A) ON THE COAX AT THE CONNECTOR NEAREST THE ANTENNA WHERE THE COAX AND JUMPER ARE CONNECTED.</div><div>B) AT THE BASE OF THE TOWER STRUCTURE (FOR TOWERS ONLY).</div><div>C) AT A POINT OUTSIDE THE BTS.</div><div>D) AT CONNECTION POINT INSIDE THE BTS</div></div>
2.	SECTOR IDENTIFICATION: A SITE CAN HAVE MULTIPLE SECTORS. SECTORS SHALL BE DESIGNATED BY NUMBERING EACH IN A CLOCKWISE MANNER (THE FIRST SECTOR IS THE ONE CLOSEST TO ZERO DEGREES, OR NORTH). <div><div>A) SECTOR #1 COAX WILL HAVE ONE BAND OF RED COLORED TAPE.</div><div>B) SECTOR #2 COAX WILL HAVE ONE BAND OF WHITE COLORED TAPE.</div><div>C) SECTOR #3 COAX WILL HAVE ONE BAND OF BLUE COLORED TAPE.</div></div>
3.	FOR MORE THAN ONE ANTENNA PER SITE THE FOLLOWING WILL BE ADHERED TO: <div><div>FACING THE BACK OF THE ANTENNA, STARTING FROM YOUR LEFT ANTENNA, MARK IT WITH ONE BAND, MOVING RIGHT ON THE SAME SECTOR TO THE NEXT ANTENNA, MARK IT WITH TWO BANDS OF COLORED TAPE. CONTINUE WITH THE SAME METHOD FOR AS MANY ANTENNAS YOU HAVE FOR EACH SECTOR. REPEAT THIS FOR EVERY SECTOR.</div></div>
4.	IN ADDITION TO THE COLORED TAPE APPLY PERMANENT MARKINGS AS FOLLOWS: <div><div>ONE-INCH BRASS ROUND TAGS MARKED WITH PRINCIPAL 1 (P1), PRINCIPAL 2 (P2), PRINCIPAL 3 (P3), DIVERSITY 1 (D1), DIVERSITY 2 (D2), AND DIVERSITY 3 (D3) TO BE ATTACHED BY A FOURTEEN (14) GAUGE BLACK ELECTRICAL WIRE.</div></div>

TYPICAL GROUNDING SYSTEM NOTES	
1.	TOWER RADIAL GROUND: <div>#2 SOLID COPPER WIRE CADWELDED (OR FASTENER APPROVED BY PROJECT MANAGER) TO TOWER BASE. EXTEND WIRE 30' MINIMUM IN SWEEPING CONFIGURATION AT A MINIMUM DEPTH OF 24". ALL GROUND RODS TO BE 8' COPPER OR COPPER CLAD. FIRST GROUND RODS FROM TOWER ARE TO BE PLACED 10' EQUAL DISTANCE (BETWEEN ROD CENTERS) AND A MINIMUM OF EVERY 10' ALONG TOTAL LENGTH. ALL BENDS MUST MAINTAIN A MINIMUM 12" RADIUS.</div>
2.	TOWER EQUIPMENT RING GROUND INTERCONNECT: <div>ONLY ONE CONNECTION OF THIS TYPE FOR EACH TOWER. SAME CONSTRUCTION AS NOTE 1 ABOVE EXCEPT THE TERMINATION AT THE GROUNDING RING MUST BE THREE-WAY CONNECTED. ALL BENDS MUST MAINTAIN A MINIMUM 12" RADIUS.</div>
3.	EQUIPMENT BUILDING RING GROUND: <div>ALWAYS OBSERVE THE TURN DIRECTIONS SHOWN WHEN PLACING BENDS OR CONNECTIONS. USE #2 SOLID COPPER WIRE PLACED WITHIN 3' (+/- 6") FROM EDGE OF BUILDING CONCRETE FOUNDATION AT A MINIMUM DEPTH OF 24". ALL CONNECTIONS TO GROUND RING ARE TO BE CADWELDED. ALL GROUND RODS TO BE 10' COPPER OR COPPER CLAD AND PLACED 10' EQUAL DISTANCE (BETWEEN ROD CENTERS) AND A MINIMUM OF EVERY 10' ALONG TOTAL LENGTH. ALL BENDS MUST MAINTAIN A MINIMUM 12" RADIUS.</div>
4.	SINGLE POINT GROUND BAR (COAX BULKHEAD): <div>ALWAYS OBSERVE THE DIRECTIONS SHOWN WHEN PLACING BENDS OR CONNECTIONS TO GROUND RING. USE TWO #2 SOLID COPPER WIRE OR TWO 3" COPPER RIBBONS ATTACHED ON OPPOSITE ENDS OF BAR OR BULKHEAD EXTENDING DIRECTLY TO GROUND. ALL WIRE CONNECTIONS TO GROUND RING ARE TO BE CADWELDED, RIBBONS MAY BE ATTACHED TO GROUND RING WITH A "LISTED" PRESSURE CONNECTION WITH APPROVAL OF CONSTRUCTION MANAGER. ALL BENDS MUST MAINTAIN A MINIMUM 12" RADIUS.</div>
5.	EQUIPMENT SHELTER INNER BONDING RING: <div>#2 SOLID COPPER WIRE CADWELDED (TO INNER BONDING RING AT A LOCATION EITHER ABOVE THE SOIL LINE OR JUST INSIDE INTERIOR OF BUILDING. ALWAYS USE PVC (NONMETALLIC) SLEEVES WHEN ENTERING THE STRUCTURE. THIS TYPE OF BOND IS REQUIRED AT EACH OUTSIDE CORNER AND AT DISTANCES NOT TO EXCEED 50' ALONG ANY STRAIGHT WALL. ALL BENDS MUST MAINTAIN A MINIMUM 12" RADIUS.</div>
6.	FENCE EQUALIZATION BOND: <div>#2 SOLID COPPER WIRE CADWELDED TO BUILDING RING GROUND AND ATTACHED TO EACH INSIDE OR OUTSIDE CORNER FENCE POST AND/OR GATE POST WITH A "LISTED" WIRE CLAMP. PLACE AT A MINIMUM 12" DEPTH (SEE NOTE 11 BELOW FOR CROSSING CLEARANCES). IF METALLIC POST IS NOT SET IN CEMENT, PLACE AN ADDITIONAL 8' GROUND ROD AT POST LOCATION.</div>
7.	GATE EQUALIZATION BOND: <div>#2 SOLID COPPER WIRE CADWELDED TO FENCE EQUALIZATION WIRE AND ATTACHED TO EACH GATE POST WITH A "LISTED" WIRE CLAMP. IF METALLIC POST IS NOT SET IN CEMENT, PLACE AN ADDITIONAL 10' GROUND ROD AT EACH POST LOCATION.</div>
8.	POWER / TELEPHONE TRENCH: <div>UTILITIES CAN EITHER BE PLACED IN SAME TRENCH (NESC RANDOM SEPARATION) OR IN SEPARATE TRENCH AT A 36" DEPTH. ALWAYS PLACE THESE FACILITIES BELOW WHILE MAINTAINING A 36" HORIZONTAL SEPARATION AND A 12" VERTICAL SEPARATION FROM ANY RADIAL OR RING GROUND SYSTEMS IN, ON, OR ADJACENT TO THE RADIO SITE.</div>
9.	POWER / TELEPHONE ENTRANCE: <div>THE BUILDING RING GROUND MEETS OR EXCEEDS THE NEC ARTICLE 250 UTILITY PROTECTION GROUND. THEREFORE, INFORM LOCAL INSPECTOR THAT ADDITIONAL GROUND RODS ARE NOT REQUIRED. ALL UTILITY GROUNDS MAY BE ATTACHED TO THE #2 SOLID COPPER WIRE DETAILED IN NOTE 10 BELOW. IF LOCAL POWER COMPANY CODES REQUIRE AN ADDITIONAL GROUND ROD, BOND THE TWO FACILITIES TOGETHER AT THIS LOCATION.</div>
10.	UTILITY GROUNDING ELECTRODE BOND: <div>USE #2 SOLID COPPER WIRE PLACED WITHIN 3' OF UTILITY ENTRANCE AT DEMARCATION CABINET ENTRY PORT. ALL CONNECTIONS TO GROUND RING ARE TO BE CADWELDED. CONNECTION TO DEMARCATION CABINET ENTRY PORT TO BE WITH A "LISTED" CONNECTION. ALL BENDS MUST MAINTAIN A MINIMUM 12" RADIUS.</div>
11.	RADIAL GROUND / FENCE BOND CROSSINGS: <div>WHEREVER PRACTICAL, TO REDUCE MAGNETIC COUPLING, THESE FACILITIES MUST CROSS AT A 90 DEGREE ANGLE WHILE MAINTAINING 18" VERTICAL SEPARATION.</div>
12.	COAX GROUNDING KITS: <div>USE INDIVIDUAL "LISTED" GROUNDING KITS FOR EACH COAX CABLE. BOND TO TOWER BONDING BUSS BAR WITH #2 THHN SOLID COPPER WIRE WITH 2 HOLE CRIMPED CONNECTIONS.</div>
13.	GROUNDING BUSS BAR KIT: <div>THE GROUNDING BUSS BAR AND ATTACHMENT KIT MUST BE DIRECTLY BOLTED TO THE TOWER STRUCTURE WITHOUT ELECTRICAL INSULATORS.</div>
14.	ICE BRIDE BONDING: <div>THE ICE BRIDGE SHOULD NOT BE BONDED TO THE TOWER STRUCTURE. IT SHOULD ONLY BE BONDED AT ONE END TO THE ENTRANCE BULKHEAD (SINGLE POINT GROUND BAR). USE #2 THHN SOLID COPPER WIRE WITH 2 HOLE CRIMPED CONNECTIONS.</div>
15.	RADIO BAY TO COAX BULKHEAD BOND: <div>THIS IS THE ONLY CABINET TO GROUND BOND WIRE ATTACHED TO THE RADIO BAY. USE #2 THHN SOLID COPPER WIRE WITH 2 HOLE CRIMPED CONNECTIONS OR A 3" COPPER STRAP.</div>
16.	RADIO BAY ISOLATION KIT: <div>CONTACT RADIO EQUIPMENT SUPPLIER FOR SPECIFICATION AND INSTALLATION PROCEDURES.</div>

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RAGE

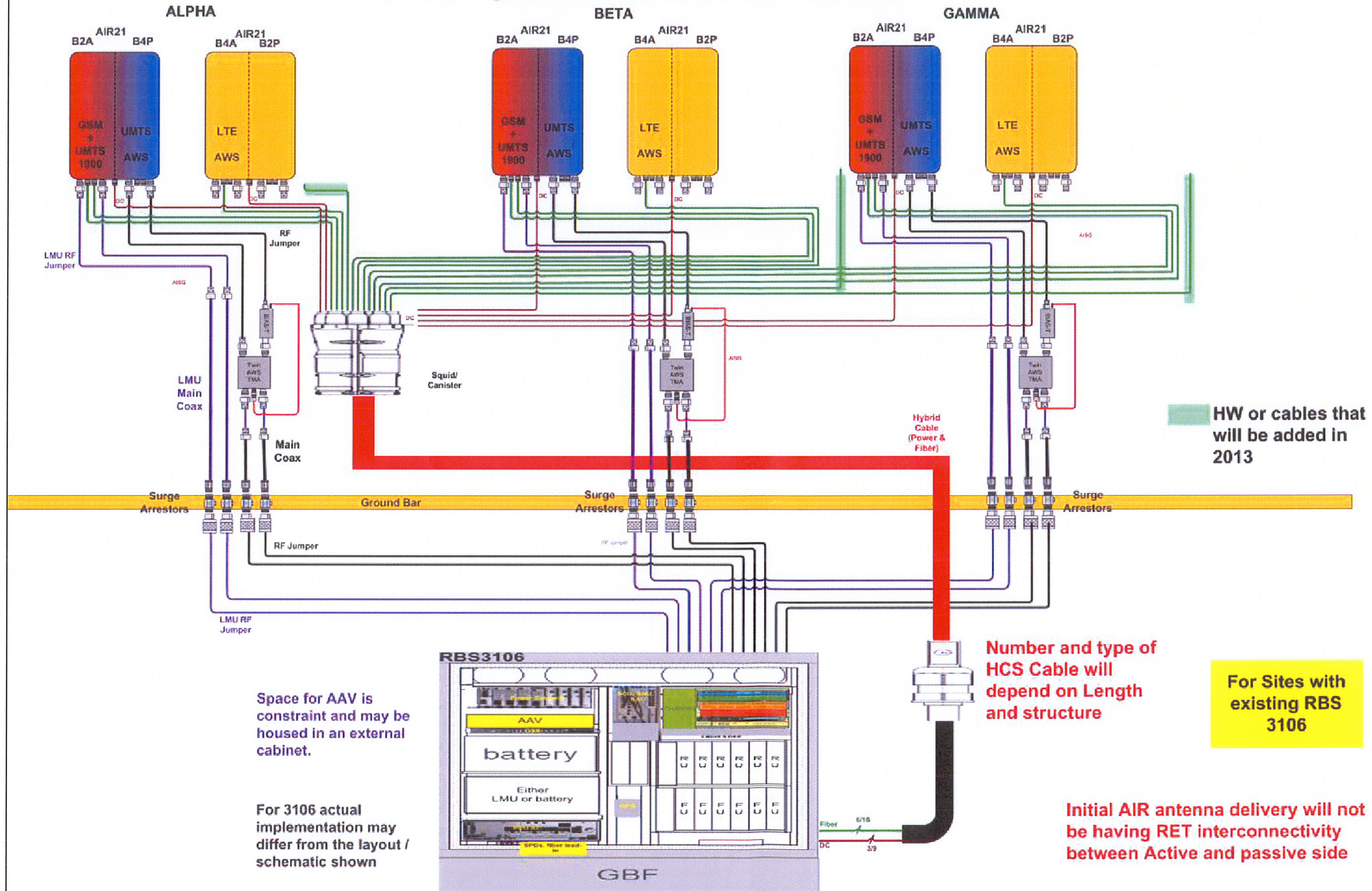
DEVELOPMENT LLC

stillwater

management

ANTENNA DIAGRAM

Site Configuration 2C – AIR Based with RBS3106



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stillwater
management



DATE: 5-1-2013		
DRAWN BY: CJS (STILLWATER)		
CHECKED BY: ROCKY SCHUTJER		
REVISIONS		
DATE	DESCRIPTION	INT.
5-1-13	PRELIM ZDs	CJS
5-2-13	FINAL ZDs	CJS
5-14-13	PRELIM CDs	CJS
5-14-13	FINAL CDs	CJS

SL01312A
WEST WEBER BAUGH
12 NORTH MAIN STREET
WEST WEBER, UT 84401

DRAWING
TITLE:
ANTENNA
DIAGRAM

DRAWING NO.:
E-5