

FIRST AMENDMENT TO
LICENSE AGREEMENT BETWEEN THE CITY OF ANN ARBOR AND
SPRINT SPECTRUM L.P., A DELAWARE LIMITED PARTNERSHIP
(Sprint Site ID #DE03XC208)

THIS FIRST AMENDMENT TO LICENSE AGREEMENT (“First Amendment”) is made as of the ___ day of _____, 2014, by and between the City of Ann Arbor, a Michigan municipal corporation, whose address is 301 East Huron Street, Ann Arbor, Michigan (“Licensor”) and Sprint Spectrum L.P., a Delaware limited partnership, (“Licensee”), whose address is 6391 Sprint Parkway, Overland Park, KS 66251.

WHEREAS, Licensor and Licensee entered into a License Agreement dated September 21, 2007, to permit Licensee to erect and use telecommunications equipment (“Equipment”) on the Ann-Ashley Parking Structure, located at 220 N. Ashley Street, Ann Arbor, Michigan (“Site”), which License Agreement was modified by an Interim Addendum dated December 16, 2013 (“Interim Addendum”), to allow replacement of certain equipment to be covered by this amendment; and

WHEREAS, Licensor and Licensee desire to amend the Agreement to allow for the installation of additional antennas, associated cables and other communications instruments (“Additional Equipment”); and

WHEREAS, Licensor and Licensee agree that, as consideration for Licensee’s Additional Equipment, the current License Fee payable under the Agreement shall be increased as set forth herein; and

WHEREAS, Licensor and Licensee desire to amend the Agreement to add or modify provisions, including provisions related to notice; and

WHEREAS, Licensor and Licensee, in their mutual interest, wish to amend the Agreement as set forth below accordingly.

NOW THEREFORE, in consideration of the foregoing and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Licensor and Licensee agree to amend the License Agreement as follows:

1. **Subsection (a), General Use, of Section 5, Use of Site**, is amended by adding the following paragraph at the end of Subsection (a) and by adding new Exhibits #2A and #3A:

Additional Equipment. After execution of this First Amendment by both Licensee and Licensor and subject to its provisions, Licensee shall have the right to add antennas and other facilities and equipment, all as identified in attached Exhibit #2A and as shown and described on attached Exhibit #3A design drawings (“Additional Equipment”). Licensee’s existing Equipment on the Site shall remain unchanged for a period up to 90 days after execution of this First Amendment, at which time Licensee shall remove

antennas and other existing Equipment identified and shown as equipment to be removed on the Exhibit #3A design drawings. Licensee's Additional Equipment shall be subject to all the terms and conditions of the Agreement, unless and except as specifically modified by this First Amendment.

Future Equipment. Licensee reserves the right to replace/upgrade once within 18 months from the date of this amendment any other "Legacy Equipment," including antennas, radios and supporting equipment, without further adjustment of fees other than the 4% escalation on July 1st. Legacy Equipment is defined as the equipment currently installed as of December 11, 2013. The right to replace/upgrade shall survive the decommissioning of the Legacy Equipment. Licensee shall be required to pay all normal review and inspection fees and seek all required approvals required by the City of Ann Arbor prior to any such replacement/upgrade. The replacement/upgraded equipment will be similar to the Additional Equipment, described herein. No additional footprint is anticipated nor will there be any additional penetrations or welding without Licensor's prior approval. Licensee's Future Equipment shall be subject to all the terms and conditions of the Agreement, unless and except as specifically modified by this First Amendment.

All reference in the License Agreement to Exhibit #2 shall be deemed to include reference to Exhibit #2A, all references in the License Agreement to Exhibit #3 shall be deemed to include reference to Exhibit #3A, and all rights and obligations contained in the License Agreement relative to the Equipment shall also apply to the Additional Equipment unless clear from the context that they apply only to the original Equipment..

2. **Section 4. Fees and Escalator** is amended as follows:

Starting within ten (10) days after the Commencement Date, Licensee agrees to pay Licensor an annual fee of \$31,000, which will increase 4% per year starting on July 1, 2008, and annually thereafter for the first 5 year term ("License Fee"). The first payment of the License Fee covers the period from the Commencement Date through June 30, 2008. After the first payment, the due date for the License Fee is July 1 of each year.

Starting December 12, 2013, the current annual License Fee shall be increased from \$39,224.89 to \$45,000.00. The December 12, 2013, to June 30, 2014, portion of the License Fee that was due and paid by July 1, 2013 (\$21,600.56), is credited against the adjusted Licensee Fee due for the December 12, 2013, to June 30, 2014, period (\$24,780.82). Within thirty (30) days after execution of this First Amendment by Licensee and Licensor, Licensee shall pay Licensor an additional license fee amount of \$3,227.73 for the Additional Equipment for the period December 12, 2013, through June 30, 2014. The License Fee shall not be prorated for any partial term during which this Agreement is in effect except as may be explicitly provided elsewhere.

The License Fee shall not be prorated for any partial term during which this Agreement is in effect except as may be explicitly provided elsewhere. Timely payment is of the

essence of this agreement. There shall be a \$500 processing fee due for each payment received fourteen (14) days or more after the due date.

3. **Section 6. Submission of Plans and General Structural Requirements** is amended by adding the following at the end:

Additional Equipment. Licensee has provided to Licensor for review and approval complete plans and specifications for the Additional Equipment Licensee intends to install, construct, or otherwise place at the Site. With modifications, Licensor has approved the plans and specifications for installation, construction and placement of Licensee's Equipment at the Site, as shown more specifically on Exhibit #3A. Licensor and Licensee agree that Licensee has fully reimbursed Licensor for all its reasonable costs for such review and approval.

If any changes are made by Licensee or its agents to the plans and specifications reviewed and approved by Licensor prior to completion of the installation, Licensee agrees to submit revised plans and specifications showing those changes to Licensor for review and approval and agrees to reimburse Licensor for all its reasonable costs for said review and approval. Licensee shall pay all amounts due prior to installation of the Additional Equipment according to these changes.

Following review and approval of changes by Licensor, Licensee will submit a revised Exhibit #3A showing the changes and clearly showing the date of the approved changes within one (1) week.

Within fourteen (14) days of completion of installation of the Additional Equipment, Licensor or its contracted agent will perform a final inspection of such installation and submit a final inspection report to Licensee. Licensee shall be responsible for correcting all punch list items reasonably determined by Licensor or its agent during their final inspection within fourteen (14) days of receipt of notice of correction. Licensee shall provide digital photos documenting correction of all punch list items within this (14) fourteen day period. If digital photos do not adequately document that all punch list items have been completed as determined by Licensor or its agent, Licensee shall be required to reimburse Licensor for it or its agent's cost to re-inspect and confirm that all punch list items have been addressed. Licensor and Licensee agree that the reasonable costs of these inspection services, including re-inspections, will be solely the responsibility of Licensee.

All construction, installation, placement or relocation of the Additional Equipment shall be coordinated with Licensor in advance of the activity to minimize any disruption of Licensor's day-to-day activities. All removal or relocation of the existing Equipment shall be coordinated with Licensor in advance of the activity to minimize any disruption of Licensor's day-to-day activities. In no case may Licensee's activity jeopardize the safety or security of Licensor's activities.

Licensee agrees to contract with Dixon Engineering, Inc., to design and provide approved plans to Licensor to depict the installation of the Additional Equipment stated in Section

5 above, as amended. Upon completion of installation of the Additional Equipment, Dixon Engineering, Inc. will perform a final inspection of such installation, and submit a final inspection report to the Licensor and Licensee. All costs of these engineering design and inspection services will be solely the Licensee's responsibility.

4. **Section 9. Emergency Contact** is amended as follows:

9. Emergency Contact.

Each party shall identify one or more contacts as 24 hour, 7 days per week, 365 days per year, as an emergency contact. The contact information of either party must be updated immediately if it changes. Licensee also must send Licensor, to (a) City of Ann Arbor, Public Services Area Administrator, PO Box 8647, Ann Arbor, Michigan 48107-8647, and (b) Ann Arbor Downtown Development Authority, 150 South Fifth Avenue, Suite 301, Ann Arbor, MI 48104, written notice of its emergency contact information annually between July 1 and July 10. The current emergency contact information is:

For Licensor:

Republic Parking Systems, Inc.
324 Maynard
Ann Arbor, MI 48104
Attn: Art Low, Manager
(734) 761-7235 main (Monday - Saturday)
(734) 216-1390 cellular (Sunday)

Ann Arbor Downtown Development Authority
150 South Fifth Avenue, Suite 301
Ann Arbor, MI 48104
Attn: Joseph Morehouse
(734) 368-2126 (cellular)
(734) 994-6697 main (Monday-Friday)

For Licensee:

Sprint PCS Network Operations Control Center
15620 West 113th Street
Lenexa, KS 66219
888-850-1400

5. **Section 21. Notices and Payments** is amended as follows:

21. Notices and Payments.

All notices, demands, and payments required by this Agreement shall be delivered personally by overnight delivery service with receipt, or by United States mail, first class, postage pre-paid, and addressed to the appropriate party, with the respective address for each as indicated below. Any party to this agreement may change their addresses for notice by giving written notice of the change to the others in the manner prescribed by this Paragraph.

For Licensor:

Republic Parking Systems, Inc.
324 Maynard
Ann Arbor, MI 48104
Attn: Tony Bisesi, Manager
(734) 761-7235 main (Monday-Saturday)
(734) 216-1390 cellular (Sunday)

Ann Arbor Downtown Development Authority
150 South Fifth Avenue, Suite 301
Ann Arbor, MI 48104
Attn: Joseph Morehouse
(734) 368-2126 (cellular)
(734) 994-6697 (Monday-Friday)

With copies to:

City of Ann Arbor
Public Services Area Administrator
PO Box 8647
Ann Arbor, Michigan 48107-8647

and

City Attorney
City of Ann Arbor
PO Box 8647
Ann Arbor, Michigan 48107-8647

For Licensee:

Sprint National Lease Management
6391 Sprint Parkway
Mailstop KSOPHT0101-Z2650
Overland Park, KS 66251-2650

With a copy to:

Sprint Law Department
6391 Sprint Parkway
Mailstop KSOPHT0101-Z2020
Overland Park, KS 66251-2020
Attn: Real Estate Attorney

Notice to Licensee shall reference Sprint Site ID #DE03XC208.

6. The terms and conditions of the License Agreement and the Interim Addendum are incorporated herein by this reference, and capitalized terms used in this First Amendment shall have the same meanings such terms are given in the License Agreement. Except as specifically set forth herein, this First Amendment shall in no way modify, alter or amend the remaining terms of the License Agreement, all of which are ratified by both Licensor and Licensee and shall remain in full force and effect. To the extent there is any conflict or inconsistency between the terms and conditions of the License Agreement or the Interim Addendum and this First Amendment, the terms and conditions of this First Amendment will govern and control.

7. This First Amendment to the License Agreement between the parties shall be binding on the heirs, successors and assigns of the parties.

8. **Signatures.**

LICENSOR

THE CITY OF ANN ARBOR

By: _____
John Hieftje, its Mayor

By: _____
Jacqueline Beaudry, its City Clerk

Approved as to form:

Approved as to substance:

Stephen K. Postema, City Attorney

Steven D. Powers, City Administrator

Craig Hupy, Public Services Area
Administrator

LICENSEE

**SPRINT SPECTRUM L.P.,
a Delaware Limited Partnership**

By: _____

EXHIBIT #2A

LIST OF EQUIPMENT

The Additional Equipment covered by this First Amendment to License Agreement are identified on various pages of the Construction Drawings prepared by Powder River Development Services, LLC, dated December 10, 2013, and attached as Exhibit #3A to this First Amendment to License Agreement.

EXHIBIT #3A

SITE PLAN AND SPECIFICATIONS

See the Construction Drawings attached hereto, prepared by Powder River Development Services, LLC, dated December 10, 2013.



Know what's below.
Call before you dig.



THIS IS AN EXISTING SPRINT WIRELESS TELECOMMUNICATION FACILITY NETWORK VISION EQUIPMENT UPGRADE

NETWORK VISION MMBS LAUNCH

DOWNTOWN ANN ARBOR

DE03XC208

220 N ASHLEY STREET
ANN ARBOR, MI 48104
WASHTENAW COUNTY

LATITUDE: 42.283098 / 42° 16' 59.1528" (NAD 83) (GPS READING)
LONGITUDE: -83.749194 / -83° 44' 57.0984" (NAD 83) (GPS READING)

ROOFTOP

EAST MICHIGAN MARKET



GENERAL DYNAMICS
WIRELESS SERVICES



POWDER RIVER
Development Services, LLC
100 E. SHENANGO STREET
SHARPSVILLE, PA 16150
724.962.5999
www.powderriverdev.com

PROJECT INFORMATION:

NETWORK VISION MMBS LAUNCH
**DOWNTOWN
ANN ARBOR**

DE03XC208

220 N ASHLEY STREET
ANN ARBOR, MI 48104
WASHTENAW COUNTY

ISSUE DATE: 12-10-2013

ISSUED FOR: CONSTRUCTION DWGS

REVISIONS

REV.	DATE	DESCRIPTION	INITIALS
A	09/06/12	ISSUED FOR CDs 90%	SMM
B	09/26/12	ISSUED FOR CDs 100%	JED
C	10/01/12	ISSUED FOR CDs FINALS	JED
D	06/18/13	ISSUED FOR REVISED FINALS	JED
E	12/10/13	ISSUED FOR REVISED FINALS	JED

NOT FOR CONSTRUCTION UNLESS
LABELED AS CONSTRUCTION SET

LICENSURE:



SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

REVISION:

E

PRDS PROJ.NO.
2525-070312

MICHIGAN STATE CODE COMPLIANCE:

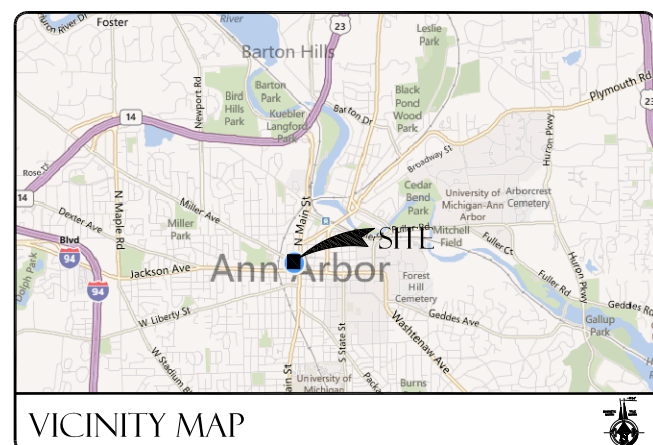
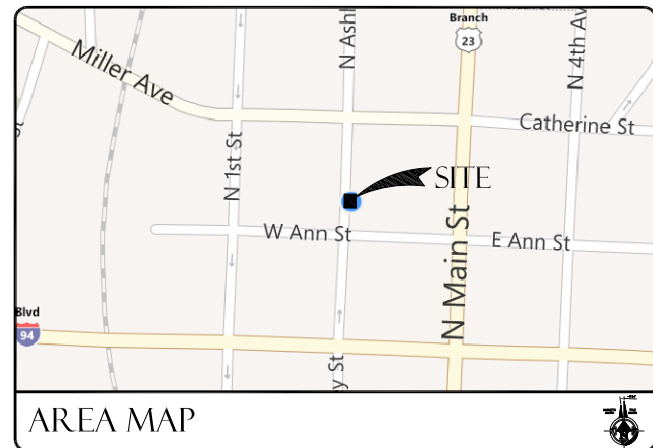
ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES.

- 2009 IBC, STANDARDS AND AMENDMENTS-WAC 51-50;
- 2009 IMC, STANDARDS AND AMENDMENTS-WAC 51-52;
- 2009 IFC, STANDARDS AND AMENDMENTS-WAC 51-54;
- 2009 IPC, STANDARDS AND AMENDMENTS-WAC 51-56; 51-57
- MIOSHA MICHIGAN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

ACCESSIBILITY REQUIREMENTS:

FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION. HANDICAPPED ACCESS REQUIREMENTS ARE NOT REQUIRED IN ACCORDANCE WITH THE 2009 IBC BUILDING CODE.

CODE BLOCK



DRIVING DIRECTIONS

FROM SPRINT OFFICE:
27007 HILLS TECH CT, FARMINGTON HILLS, MI 48331
DEPART HILLS TECH COURT TOWARD HILLS TECH DRIVE, TURN RIGHT ONTO HILLS TECH DRIVE, TURN LEFT ONTO W 12 MILE ROAD, TAKE RAMP RIGHT FOR I-275 SOUTH / I-96 EAST TOWARD DETROIT / TOLEDO, KEEP STRAIGHT ONTO I-275 SOUTH, KEEP STRAIGHT ONTO US-23 N / M-14 W, AT EXIT 45 TAKE RAMP LEFT FOR M-14 TOWARD ANN ARBOR, AT EXIT 3 TAKE RAMP RIGHT FOR US-23-BR TOWARD DOWNTOWN ANN ARBOR, KEEP STRAIGHT ONTO US-23-BR / N MAIN ST, TURN RIGHT ONTO W ANN ST, TURN RIGHT ONTO N ASHLEY ST, ARRIVE AT 42.283098, -83.749194 ON THE RIGHT.

SHEET	DESCRIPTION
T-1	TITLE SHEET
N-1	GENERAL NOTES
N-2	GENERAL NOTES
A-1	OVERALL SITE PLAN
A-2	ENLARGED SITE PLAN
A-3	ENLARGED EQUIPMENT PLANS
A-4	ANTENNA PLANS AND SCHEDULES
A-5	NEW SOUTH & EAST ELEVATIONS
A-6	EQUIPMENT DETAILS
A-7	EQUIPMENT DETAILS (OUTDOOR SPECIFICATIONS)
A-8	EQUIPMENT DETAILS
A-9	EQUIPMENT DETAILS
RF-1	ANTENNA AND CABLE COLOR CODING DETAILS
E-1	ONE-LINE DIAGRAM & POWER PANEL SCHEDULE
E-2	DC POWER ONE-LINE DIAGRAM
E-3	ELECTRICAL DETAILS (OUTDOOR SPECIFICATIONS)
E-4	CONDUIT ROUTING
E-5	GROUNDING PLAN
E-6	GROUNDING DETAILS
E-7	GROUNDING DETAILS

SHEET INDEX

APPLICANT:
GENERAL DYNAMICS WIRELESS SERVICES ON BEHALF OF SPRINT
27007 HILLS TECH CT
FARMINGTON HILLS, MI 48331
CONTACT: GREG BRUETT
PH: 781.726.0174

PROPERTY INFORMATION:
PROPERTY OWNER: CITY OF ANN ARBOR
ADDRESS: P.O.BOX 8647
ANN ARBOR, MI 48107
CONTACT: MOLLY ROBINSON
PH: (734) 794-6426
TOWER OWNER: CITY OF ANN ARBOR
SITE ID: DE03XC208

ZONING CLASSIFICATION: -
CONSTRUCTION TYPE: VB
OCCUPANCY: U
JURISDICTION: CITY OF ANN ARBOR
CURRENT USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY
NEW USE: UNMANNED WIRELESS TELECOMMUNICATIONS FACILITY

PARCEL NUMBER(S):
09-09-29-140-012

LEASE AREA:
10' x 20'

PROJECT SUMMARY

ARCHITECT & ELECTRICAL ENGINEER:
POWDER RIVER DEVELOPMENT SERVICES, LLC
100 EAST SHENANGO STREET
SHARPSVILLE, PA 16150
CONTACT: JASON DOCTER
PHONE: 724-977-2317
EMAIL: jason.docter@powderriverdev.com

STRUCTURAL ENGINEER:
T.B.D.

SITE ACQ. PROJECT MANAGER:
GENERAL DYNAMICS WIRELESS SERVICES
27007 HILLS TECH CT
FARMINGTON HILLS, MI 48331
CONTACT: ANDREW JEWELL
PH: 305.747.0532
EMAIL: andrew.jewell@gdit.com

CONSTRUCTION MANAGER:
GENERAL DYNAMICS WIRELESS SERVICES
27007 HILLS TECH CT.
FARMINGTON HILLS, MI 48331
CONTACT: JAMES SHIREY
PH: 810.618.0803
EMAIL: james.shirey@gdwireless.com

BUILDING DEPARTMENT:
CITY OF ANN ARBOR BUILDING DEPARTMENT
301 E. HURON STREET
ANN ARBOR, MI
CONTACT: AVAILABLE REP
PH: 734.794-6000

ELECTRICAL COMPANY:
DTE ENERGY
ONE ENERGY PLAZA
DETROIT, MI 48226
CONTACT: AVAILABLE REP.
PH: 734.302.4800

TELCO COMPANY:
T.B.D.

AAV MANAGER:
GENERAL DYNAMICS WIRELESS SERVICES
27007 HILLS TECH CT.
FARMINGTON HILLS, MI 48331
CONTACT: DENNIS SIKES
PH: 248.991.1502
EMAIL: dennis.sikes@gdit.com

RF ENGINEER:
STA NETWORKS SERVICES
27007 HILLS TECH CT.
FARMINGTON HILLS, MI 48331
CONTACT: RINA PATEL
PH: 248.996.4971
EMAIL: r.patel@sta.samsung.com

PROJECT TEAM

SPRINT PROPOSES TO MODIFY AN EXISTING UNMANNED TELECOMMUNICATIONS FACILITY

- REMOVE (3) EXISTING PANEL ANTENNAS (1 PER SECTOR)
- INSTALL (3) NEW PANEL ANTENNAS (1 PER SECTOR)
- REMOVE (2) POWER AND BATTERY CABINET
- REMOVE (0) MODCELL CABINETS
- INSTALL (1) NEW MMBS CABINET
- INSTALL (1) NEW BBU CABINET
- INSTALL (1) NEW FIBER JUNCTION BOX
- REMOVE ALL EXISTING SPRINT ANTENNA COAXIAL CABLES
- INSTALL (3) NEW HYBRIFLEX FIBER OPTIC CABLES USING EXISTING COAX ROUTE (1 PER SECTOR)
- INSTALL (6) NEW RRU'S

PROJECT DESCRIPTION

APPROVAL	SIGNATURE	DATE
SITE ACQUISITION MANAGER		
CONSTRUCTION MANAGER		
A&E MANAGER		
PLANNING CONSULTANT		
RF MANAGER		
RF ENGINEER		
PROPERTY OWNER		
SPRINT REPRESENTATIVE		
AAV MANAGER		

SIGNATURE BLOCK

GENERAL CONSTRUCTION NOTES

- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
- CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES (LATEST REVISION). THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
- CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE NEW WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITIONS.
- PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE WORK.
- DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
- CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
- CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
- CONTRACTOR SHALL COORDINATE HIS WORK WITH THE SUPERINTENDENT OF BUILDINGS & GROUNDS AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
- INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
- MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, PIPING ETC. AND IMMEDIATELY REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
- CONTRACTOR SHALL SUBMIT TO THE PROPERTY OWNER COPIES OF ALL PERMITS PRIOR TO INITIATING WORK ON SITE AND DOCUMENTATION THAT PERMITS WERE PROPERLY CLOSED UPON COMPLETION OF THE WORK.
- REPAIR ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACES.
- SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS.
- KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
- MINIMUM BEND RADIUS OF ANTENNA CABLES SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS RECOMMENDATIONS.
- NO PENETRATION/TAPPING/CUTTING OR SIMILAR DESTRUCTIVE WORK SHALL BE PERMITTED ON ANY STEEL OR CONCRETE ON SITE WHETHER STRUCTURAL OR NON-STRUCTURAL THAT IS NOT CLEARLY IDENTIFIED IN THE PLAN SET WITHOUT WRITTEN PERMISSION FROM THE PROPERTY OWNER.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION SHALL BE IN CONFORMANCE WITH JURISDICTIONAL OR STATE AND LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL AND COORDINATED WITH LOCAL REGULATORY AUTHORITIES.
- LIGHT SHADED LINES AND NOTES REPRESENT WORK PREVIOUSLY DONE. DARK SHADED LINES AND NOTES REPRESENT THE SCOPE OF WORK FOR THIS PROJECT. CONTRACTOR SHALL VERIFY IF EXISTING CONSTRUCTION IS COMPLETE. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
- CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND/OR WIRING CERTIFICATES REQUIRED FOR THE ELECTRICAL SERVICE UPGRADE. IN ADDITION, CONTRACTOR SHALL PROVIDE ALL NECESSARY COORDINATION AND SCHEDULING WITH THE SERVING ELECTRICAL UTILITY AND LOCAL INSPECTION AUTHORITIES.
- CONTRACTOR SHALL SUBMIT TO THE PROPERTY OWNER COPIES OF ALL PERMITS PRIOR TO INITIATING WORK ON SITE AND DOCUMENTATION THAT PERMITS WERE PROPERLY CLOSED UPON COMPLETION OF THE WORK.
- NO PENETRATION/TAPPING/CUTTING OR SIMILAR DESTRUCTIVE WORK SHALL BE PERMITTED ON ANY STEEL OR CONCRETE ON SITE WHETHER STRUCTURAL OR NON-STRUCTURAL THAT IS NOT CLEARLY IDENTIFIED IN THE PLAN SET WITHOUT WRITTEN PERMISSION FROM THE PROPERTY OWNER.

ELECTRICAL NOTES

- ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE W/DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
- ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTAL OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.
- ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDED BUT NOT BE LIMITED TO:
 - UL -- UNDERWRITERS LABORATORIES
 - NEC -- NATIONAL ELECTRICAL CODE
 - NEMA -- NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
 - OSHA -- OCCUPATIONAL SAFETY AND HEALTH ACT
 - IBC -- INTERNATIONAL BUILDING CODE
 - NFPA -- NATIONAL FIRE CODES

- DO NOT SCALE ELECTRICAL DRAWINGS, REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH 'CONSTRUCTION MANAGER' ANY SIZES AND AND LOCATIONS WHEN NEEDED.
- EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE GDIT AND PROPERTY OWNER.
- CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.
- THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
- CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC. ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
- MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION.
- OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
- IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
- ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATION, SET FORTH BY SPRINT.
- ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULL OPERATIVE AND SUBJECT TO REGULATORY INSPECTION AND APPROVAL BY CONSTRUCTION MANAGER.
- ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
- CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS OR A PERIOD OF NOT LESS THAN TWO YEARS FROM DATE OF CUSTOMER'S ACCEPTANCE.
- THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OF THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN WITHIN 48 HOURS.
- ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.
- PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.
- DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION AND BACKFILLING AND COMPACTION. REFER TO NOTES AND REQUIREMENTS, EXCAVATION, AND BACKFILLING.
- MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA AND IEEE.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURES CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
- ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.
- THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
- DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY-DUTY, QUICK-MAKE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
- ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND SUCH AS "NO-OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED -- NO SUBSTITUTIONS.
- REACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA T22 - 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS - 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL-6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRIT ZINC' OR 'GOLD CALV'.
- SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
- CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN INSULATION, 600 VOLT, COLOR CODED. USE SOLID CONDUCTORS FOR WIRE UP TO AND INCLUDING NO. 8 AWG. USE STRANDED CONDUCTORS FOR WIRE ABOVE NO. 8 AWG.
- CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST-ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
- SERVICE: 240/120V, SINGLE PHASE, 3 WIRE CONNECTIONS AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.
- TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH MULE TAPE AS INDICATED ON DRAWINGS.
- ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.
- CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOM".
- ALL BOLTS SHALL BE STAINLESS STEEL.

ANTENNA & COAX NOTES

- VERIFY EACH COAXIAL CABLE LENGTH, DIAMETER, ROUTING, COLOR CODING AND ALL APPURTENANCES WITH GDIT.
- THE MAXIMUM COAXIAL CABLE LENGTH AND CORRESPONDING COAXIAL CABLE DIAMETER IS SHOWN ON SHEET A-4. THIS CABLE LENGTH IS TO BE USED FOR FABRICATION OR CONSTRUCTION. ACTUAL ANTENNA CABLE LENGTH(S) MUST BE VERIFIED. COAXIAL CABLE SHALL BE PROVIDED BY GDIT.
- ALL COAX CABLES SHALL UTILIZE GROUND KITS, GROUNDED AS FOLLOWS:
 - NEAR ANTENNA RAD CENTER ELEVATION,
 - MIDDLE OF TOWER (MID-HEIGHT OF ANTENNA), IF CABLE RUN IS OVER 200',
 - BOTTOM OF TOWER,
 - AT MASTER GROUND BAR 3'-0" FROM MMBS-BBU CABINET

- ALL TOP JUMPERS SHALL BE LENGTHS AS SHOWN AND INSTALLED BY CONTRACTOR.
- ALL CABLES SHALL BE COLOR CODED AS SHOWN ON SHEET RF-1 AND IN ACCORDANCE WITH SPRINT SPECIFICATIONS.
- BANDING SHALL BE IN ACCORDANCE WITH SHEET A-4, RF-1 AND AS FOLLOWS:
 - MAIN LINE COLOR BANDS SHALL BE 2" WIDE, MAINTAIN 1" SPACING BETWEEN COLORS.
 - FREQUENCY COLOR BANDS SHALL BE 2" WIDE WITH NO SPACE BETWEEN COLORS.
 - JUMPER COLOR BANDS SHALL BE 1" WIDE WITH 1" SPACE.
 - START COLOR BANDS 2" BEYOND WEATHERPROOFING.
 - START SELECTOR COLOR NEXT TO END CONNECTORS.
- FINAL COAXIAL ANTENNA CABLE SIZES SHALL BE DETERMINED BY SAMSUNG RF ENGINEER. SEE ANTENNA SCHEDULE SHEET A-4, BASED ON FINAL CABLE RUN LENGTHS DETERMINED BY GD.
- SEE CONSTRUCTION MANAGER FOR ANTENNA SUPPORT ASSEMBLY TYPE.
- ALL COAXIAL CABLE WILL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE AT DISTANCES NOT TO EXCEED 3' OR THE CABLE MANUFACTURES SPECIFICATIONS WHICHEVER IS LESS, WITH HARDWARE SPECIFIED IN THE COAXIAL CABLE ROUTING DETAILS OF THE SUPPLIED STRUCTURAL REPORT.
- PROVIDE AT LEAST 6" OF SLACK IN THE MAIN COAXIAL CABLES AT THE ANTENNA MOUNTING ELEVATION TO PROVIDE FOR FUTURE CONNECTOR REPLACEMENT.

ANTENNA & HYBRID CABLE NOTES

- VERIFY EACH HYBRID CABLE LENGTH, ROUTING, DIAMETER, COLOR CODING AND ALL APPURTENANCES WITH GDIT.
- THE HYBRID CABLE AND DIAMETER LENGTH IS SHOWN ON A-4. EXCESS CABLE LENGTHS TO BE DRESSED IN A MANNER APPROVED BY GDIT. CABLES CANNOT BE CUT TO FIT.
- HYBRID CABLE INTERNAL GROUND WIRE TO BE GROUNDED AT TOP AND BOTTOM PER SAMUSUNG'S (SPRINT) SPECIFICATIONS.
- EXCESS TOP 15' HYBRID CABLE FIBER JUMPERS TO BE DRESSED IN A MANNER APPROVED BY GDIT, CANNOT BE COILED, MUST BE SECURED TO TOWER MOUNTS..
- ALL MAIN CABLES SHALL BE COLOR CODED AS SHOWN ON SHEET RF-1 & IN ACCORDANCE WITH SPRINT SPECIFICATIONS.
- BANDING SHALL BE IN ACCORDANCE WITH SHEET A-4, RF-1.
 - MAIN LINE COLOR BANDS SHALL BE 2" WIDE, MAINTAIN 1" SPACING BETWEEN.
 - JUMPER COLOR BANDS SHALL BE 1" WIDE WITH 1" SPACE.
 - START COLOR BANDS 2" BEFORE MAIN CABLE END.
- FINAL HYBRID CABLE SIZES SHALL BE DETERMINED BY SAMSUNG RF ENGINEER. SEE HYBRID CABLE SCHEDULE SHEET RF-1, BASED ON FINAL CABLE RUN LENGTHS DETERMINED BY GDIT.
- ALL HYBRID CABLE WILL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE AT DISTANCES NOT TO EXCEED 3' HORIZONTALLY OR 4' VERTICALLY OR THE CABLE MANUFACTURER'S SPECIFICATIONS WHICHEVER IS LESS, WITH HARDWARE SPECIFIED IN THE HYBRID CABLE ROUTING DETAILS OF THE SUPPLIED STRUCTURAL SUPPORT.

SITE WORK NOTES

- DO NOT EXCAVATE OR DISTURB BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS OTHERWISE NOTED.
- DO NOT SCALE BUILDING DIMENSIONS FROM DRAWING.
- SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.
- ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ENGINEER AND OWNER ASSUME NOT RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.
- CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE.
- CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.
- ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.
- GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.
- ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
- STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.
- NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.
- ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. THE LIFTS THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.
- ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.
- CONTRACTOR SHALL CLEAN ENTIRE SITE DAILY AFTER CONSTRUCTION SUCH THAT NO PAPERS, THRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.

15. ALL TREES AND SHRUBS SHALL BE PROTECTED BY THE GENERAL CONTRACTOR.

16. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY GENERAL CONTRACTOR WITH LOCAL UTILITY COMPANY, TELEPHONE COMPANY, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.

17. SITE SHALL BE RESTORED TO EXISTING CONDITION OR BETTER AT THE COMPLETION OF THE WORK.

18. CONTRACTOR SHALL SUBMIT A MINIMUM OF 20 DIGITAL PHOTOS OF THE SITE AND WORK AREAS PRIOR TO MOBILIZATION AND 20 DIGITAL PHOTOS OF THE SITE (FROM THE SAME VANTAGE POINTS) AT THE COMPLETION OF THE WORK PRIOR TO DEMOBILIZATION. PHOTOS SHALL BE SUBMITTED TO THE PROPERTY OWNER ON FLASH DRIVE OR CD.

19. CONTRACTOR SHALL CONDUCT A PUNCH LIST WALK THROUGH WITH THE PROPERTY OWNER PRIOR TO DEMOBILIZATION AND SHALL ADDRESS ALL PUNCH LIST ITEMS WITHIN 7 CALENDAR DAYS OF RECEIVING THE PUNCH LIST.

20. ALL DISTURBED LAWN AREAS SHALL BE SCARIFIED, TOP SOILED, AND HYDROSEEDED.

Sprint

SAMSUNG

GENERAL DYNAMICS
WIRELESS SERVICES



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NETWORK VISION MMBS LAUNCH

DOWNTOWN

ANN ARBOR

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WASHTENAW COUNTY

ISSUE DATE: 06-18-2013

ISSUED FOR: CONSTRUCTION DWGS

REVISIONS

REV.	DATE	DESCRIPTION	INITIALS
A	09/06/12	ISSUED FOR CDs 90%	SMM
B	09/26/12	ISSUED FOR CDs 100%	JED
C	10/01/12	ISSUED FOR CDs FINALS	JED
D	06/18/13	ISSUED FOR REVISED FINALS	JED

NOT FOR CONSTRUCTION UNLESS
LABELED AS CONSTRUCTION SET

LICENSURE:



SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

N-1

REVISION:

D

PRDS PROJ. NO.
2525-070312

FOUNDATION, EXCAVATION AND BACKFILL NOTES

- ALL FINAL GRADED SLOPES SHALL BE A MAXIMUM OF 3 HORIZONTAL TO 1 VERTICAL.
- ALL EXCAVATIONS PREPARED FOR PLACEMENT OF CONCRETE SHALL BE OF UNDISTURBED SOILS, SUBSTANTIALLY HORIZONTAL AND FREE FROM ANY LOOSE, UNSUITABLE MATERIAL OR FROZEN SOILS, AND WITHOUT THE PRESENCE OF POUNDING WATER. DEWATERING FOR EXCESS GROUND WATER SHALL BE PROVIDED WHEN REQUIRED. COMPACTION OF SOILS UNDER CONCRETE PAD FOUNDATIONS SHALL NOT BE LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR THE SOIL IN ACCORDANCE WITH ASTM D1557.
- CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC OR UNSUITABLE MATERIAL. IF INADEQUATE BEARING CAPACITY IS REACHED AT THE DESIGNED EXCAVATION DEPTH, THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION SHALL BE FILLED WITH CONCRETE OF THE SAME TYPE SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. ANY STONE SUB BASE MATERIAL, IF USED, SHALL NOT SUBSTITUTE FOR REQUIRED THICKNESS OF CONCRETE.
- ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL SUCH AS VEGETATION, TRASH, DEBRIS, AND SO FORTH PRIOR TO BACK FILLING; BACK FILL SHALL CONSIST OF APPROVED MATERIALS SUCH AS EARTH, LOAM SANDY CLAY, SAND AND GRAVEL, OR SOFT SHALE, FREE FROM CLODS OR LARGE STONES OVER 2 1/2" MAX DIMENSIONS. ALL BACK FILL SHALL BE PLACED IN COMPACTED LAYERS.
- ALL FILL MATERIALS AND FOUNDATION BACK FILL SHALL BE PLACED MAXIMUM 6" THICK LIFTS BEFORE COMPACTION. EACH LIFT SHALL BE WETTED IF REQUIRED AND COMPACTED TO NOT LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR SOIL IN ACCORDANCE WITH ASTM D1557.
- NEWLY PLACED CONCRETE FOUNDATIONS SHALL CURE A MINIMUM OF 72 HRS PRIOR TO BACK FILLING.
- FINISHED GRADING SHALL BE SLOPED TO PROVIDE POSITIVE DRAINAGE AND PREVENT STANDING WATER. THE FINAL (FINISH) ELEVATION OF SLAB FOUNDATIONS SHALL SLOPE AWAY IN ALL DIRECTIONS FROM THE CENTER. FINISH GRADE OF CONCRETE PADS SHALL BE A MAXIMUM OF 4 INCHES ABOVE FINAL FINISH GRADE ELEVATIONS. PROVIDE SURFACE FILL GRAVEL TO ESTABLISH SPECIFIED ELEVATIONS WHERE REQUIRED.
- NEWLY GRADED SURFACE AREAS TO RECEIVE GRAVEL SHALL BE COVERED WITH GEOTEXTILE FABRIC TYPE: TYPAR-3401 AS MANUFACTURED BY "CONSTRUCTION MATERIAL 1-800-239-3841" OR AN APPROVED EQUIVALENT, SHOWN ON PLANS. THE GEOTEXTILE FABRIC SHALL BE BLACK IN COLOR TO CONTROL THE RECURRENCE OF VEGETATIVE GROWTH AND EXTEND TO WITHIN 1 FOOT OUTSIDE THE SITE FENCING OR ELECTRICAL GROUNDING SYSTEM PERIMETER WHICH EVER IS GREATER. ALL FABRIC SHALL BE COVERED WITH A MINIMUM OF 4" DEEP COMPACTED STONE OR GRAVEL AS SPECIFIED. I.E. FDOT TYPE No. 57 FOR FENCED COMPOUND; FDOT TYPE No. 67 FOR ACCESS DRIVE AREA.
- IN ALL AREAS TO RECEIVE FILL, REMOVE ALL VEGETATION, TOPSOIL, DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE. PLOW STRIP OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SUCH THAT FILL MATERIAL WILL BIND WITH EXISTING/PREPARED SOIL SURFACE.
- WHEN SUB GRADE OR PREPARED GROUND SURFACE HAS A DENSITY LESS THAN THAT REQUIRED FOR THE FILL MATERIAL, SCARIFY THE GROUND SURFACE TO DEPTH REQUIRED, PULVERIZE, MOISTURE-CONDITION AND/OR AERATE THE SOILS AND RE-COMPACT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OF FILLS.
- IN AREAS WHICH EXISTING GRAVEL SURFACING IS REMOVED OR DISTURBED DURING CONSTRUCTION OPERATIONS, REPLACE GRAVEL SURFACING TO MATCH ADJACENT GRAVEL SURFACING AND RESTORED TO THE SAME THICKNESS AND COMPACTION AS SPECIFIED. ALL RESTORED GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES.
- EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED WITH THE CONDITION THAT ANY UNFAVORABLE AMOUNTS OF ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ANY ADDITIONAL GRAVEL RESURFACING MATERIAL AS NEEDED TO PROVIDE A FULL DEPTH COMPACTED SURFACE THROUGHOUT SITE.
- GRAVEL SUB SURFACE SHALL BE PREPARED TO REQUIRED COMPACTION AND SUB GRADE ELEVATIONS BEFORE GRAVEL SURFACING IS PLACED AND/OR RESTORED. ANY LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED AND ANY DEPRESSIONS IN THE SUB GRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUB GRADE.
- PROTECT EXISTING GRAVEL SURFACING AND SUB GRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE.
- DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED AND/OR REPLACED TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST TO THE CONTRACT.
- ALL SUITABLE BORROW MATERIAL FOR BACK FILL OF THE SITE SHALL BE INCLUDED IN THE BID. EXCESS TOPSOIL AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF SITE AT LOCATIONS APPROVED BY GOVERNING AGENCIES AT NO ADDITIONAL COST TO THE CONTRACT.

ENVIRONMENTAL NOTES

- ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.
- CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.
- CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.
- NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE ON THE SITE AT ALL TIMES WITH SILT AND EROSION CONTROL MEASURES MAINTAINED ON THE DOWNSTREAM SIDE OF SITE DRAINAGE. ANY DAMAGE TO ADJACENT PROPERTY AS A RESULT OF EROSION WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.
- CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.
- CLEARING OF VEGETATION AND TREE REMOVAL SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE PROPERTY OWNER.
- SEEDING SAND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.
- CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.
- RIP RAP OF SIZES INDICATED SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES.

STRUCTURAL STEEL NOTES

- ALL STEEL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION. STEEL SECTIONS SHALL BE IN ACCORDANCE WITH ASTM AS INDICATED BELOW:
W-SHAPES: ASTM A992, 50 KSI
ANGLES, BARS CHANNELS: ASTM A36, 36 KSI
HSS SECTIONS: ASTM 500, 46 KSI
PIPE SECTIONS: ASTM A53-E, 35 KSI
- ALL EXTERIOR EXPOSED STEEL AND HARDWARE SHALL BE HOT DIPPED GALVANIZED.
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
- NON-STURCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"Ø ASTM A 307 BOLTS UNLESS NOTED OTHERWISE..
- FIELD MODIFICATIONS ARE TO BE COATED WITH ZINC ENRICHED PAINT.
- NO WELDING TO STRUCTURAL OR NON-STRUCTURAL STEEL IS PERMITTED WITHOUT WRITTEN PERMISSION FROM THE PROPERTY OWNER

CONCRETE MASONRY NOTES

- CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT UNITS CONFORMING TO ASTM C90, GRADE N-1, (F'M=1,500 PS). MEDIUM WEIGHT (115 PCF).
- MORTAR SHALL BE TYPE "S" (MINIMUM 1,800 PSI AT 28 DAYS).
- GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
- ALL CELLS CONTAINING REINFORCING STEEL OR EMBEDDED ITEMS AND ALL CELLS IN RETAINING WALLS AND WALLS BELOW GRADE SHALL BE SOLID GROUTED.
- ALL HORIZONTAL REINFORCEMENT SHALL BE PLACED IN BOND BEAM OR LINTEL BEAM UNITS.
- WHEN GROUTING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE GROUT POUR 1-1/2" BELOW TOP OF THE UPPERMOST UNIT.
- ALL BOND BEAM BLOCK SHALL BE "DEEP CUT" UNITS.
- PROVIDE INSPECTION AND CLEAN-OUT HOLES AT BASE OF VERTICAL CELLS HAVING GROUT LIFTS IN EXCESS OF 4'-0" OF HEIGHT.
- ALL GROUT SHALL BE CONSOLIDATED WITH A MECHANICAL VIBRATOR.
- CEMENT SHALL BE AS SPECIFIED FOR CONCRETE.
- REINFORCING BARS - SEE NOTES UNDER "STRUCTURAL CONCRETE NOTES" FOR REQUIREMENTS.
- PROVIDE ONE BAR DIAMETER (A MINIMUM OF 1/2") GROUT BETWEEN MAIN REINFORCING AND MASONRY UNITS.
- LOW LIFT CONSTRUCTION, MAXIMUM GROUT POUR HEIGHT IS 4 FEET.
- HIGH LIFT GROUTED CONSTRUCTION MAY BE USED IN CONFORMANCE WITH PROJECT SPECIFICATIONS AND SECTION 2104.6.1 OF U.B.C.
- ALL CELLS IN CONCRETE BLOCKS SHALL BE FILLED SOLID WITH GROUT, EXCEPT AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
- CELLS SHALL BE IN VERTICAL ALIGNMENT, DOWELS IN FOOTINGS SHALL BE SET TO ALIGN WITH CORES CONTAINING REINFORCING STEEL.
- REFER TO ARCHITECTURAL DRAWINGS FOR SURFACE AND HEIGHT OF UNITS, LAYING PATTERN AND JOINT TYPE.
- SAND SHALL BE CLEAN, SHARP AND WELL GRADED, FREE FROM INJURIOUS AMOUNTS OF DUST, LUMPS, SHALE, ALKALI OR ORGANIC MATERIAL.
- BRICK SHALL CONFORM TO ASTM C-62 AND SHALL BE GRADE MW OR BETTER.

STRUCTURAL CONCRETE NOTES

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301-05, ACI 318-05 AND THE SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH $f_c' = 3,000$ PSI AT 28 DAYS UNLESS NOTED OTHERWISE.
- REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES CLASS "B" AND ALL HOOKS SHALL BE STANDARD UNLESS NOTED OTHERWISE.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST EARTH.....3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:
#6 AND LARGER.....2 IN.
#5 AND SMALLER & WWF.....1 1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
SLAB AND WALL.....3/4 IN.
BEAMS AND COLUMNS.....1 1/2 IN.
- A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE U.N.O. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4
- HOLES TO RECEIVE EXPANSION/WEDGE ANCHORS SHALL BE 1/8" LARGER IN DIAMETER THAN THE ANCHOR BOLT, DOWEL OR ROD AND SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. LOCATE AND AVOID CUTTING EXISTING REBAR WHEN DRILLING HOLES IN ELEVATED CONCRETE SLABS.
- USE AND INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER ICBO & MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURES.

WEATHERPROOFING NOTES

- STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES
- WEATHERPROOFING CONNECTORS AND GROUND KITS:
 - ALL CONNECTORS AND GROUND KITS SHALL BE WEATHERPROOFED USING BUTYL RUBBER WEATHERPROOFING AND TAPE. THIS INSTALLATION MUST BE DONE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATION OR AS SHOWN ON THE CONSTRUCTION DRAWINGS (WHICHEVER IS GREATER). IF NO DIRECTION IS PROVIDED, WEATHERPROOFING MUST BE DONE PER THE FOLLOWING INSTRUCTIONS.
 - THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE ENCOMPASSED INTO COLD SHRINK AND COMPLETELY WRAPPED WITH 2 INCH WIDE ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY 1/4" AND EXTENDING PAST THE CONNECTION BY TWO INCHES AS DISCUSSED BELOW; OR
 - THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH LAYERS OF ELECTRICAL/BUTYL RUBBER/ELECTRICAL TAPE AS DISCUSSED BELOW; OR
 - THE COAXIAL CABLE CONNECTION OR GROUND KIT CAN BE WRAPPED WITH TWO LAYERS OF 1.5 INCH WIDE SELF-AMALGAMATING TAPE COVERED WITH TWO LAYERS OF ELECTRICAL TAPE AS DISCUSSED BELOW.
 - COLD SHRINK INSTALLATION PROCEDURE:
 - REQUIRED MATERIAL: COLD SHRINK TUBE, SPACERS AS NEEDED, BLACK ELECTRICAL TAPE-2 INCHES WIDE
 - REQUIRED TOOLS: KNIFE AND TAPE MEASURE
 - WEATHERPROOFING CONNECTORS AND GROUND KITS:
 - REQUIRED MATERIAL: COLD SHRINK TUBE, SPACERS AS NEEDED, BLACK ELECTRICAL TAPE-2 INCHES WIDE
 - REQUIRED TOOLS: KNIFE AND TAPE MEASURE
- STEP 1: THOROUGHLY CLEAN AND DRY THE SURFACE OF COAXIAL CABLE AND CONNECTOR TO REMOVE ALL GREASE AND DIRT. MARK THE MAIN FEED (LARGER DIAMETER) COAXIAL CABLE AT LEAST TWO INCHES ABOVE THE CONNECTION AS THE SPECIFIED START DIMENSION FOR THE COLD SHRINK.
- STEP 2: SLIDE THE COLD SHRINK TUBE OVER THE PRE-CONNECTORIZED END OF THE LARGER DIAMETER COAXIAL CABLE PRIOR TO MATING CONNECTOR INTERFACES. MAKE THE CONNECTION.
- STEP 3: REMOVE WAX PAPER FROM A SPACER HALF AND PRESS ONTO COAXIAL CABLE DIRECTLY BEHIND THE CONNECTOR. REMOVE THE WAX PAPER FROM THE OTHER SPACER HALF AND ALIGN THE TWO SPACER HALVES WITH ADHESIVE PORTIONS FACING EACH OTHER. PRESS THE SPACER HALVES TOGETHER. THE SPACER WILL BE PLACED NEXT TO THE CONNECTOR ON THE SMALLER DIAMETER COAXIAL CABLE SIDE.
- STEP 4: SLIDE THE COLD SHRINK TUBE OVER THE CONNECTION TO THE SPECIFIED START DIMENSION MARK. HOLD THE COLD SHRINK TUBE AND COAXIAL CABLE IN ONE HAND SO THAT THE EDGE OF COLD SHRINK TUBE IS IN LINE WITH THE MARK.
- STEP 5: WITH YOUR FREE HAND, BEGIN REMOVING COLD SHRINK TUBE CORE. THE CORE WILL BE REMOVED BY UNWINDING IN A COUNTERCLOCKWISE DIRECTION WHILE LIGHTLY PULLING THE ATTACHED CORD AWAY FROM THE TUBE.
- STEP 6: USE BOTH HANDS TO CONTINUE THE UNWINDING PROCESS AS THE COLD SHRINK TUBE BEGINS TO COLLAPSE INTO POSITION. CONTINUE THE UNWINDING PROCESS UNTIL THE CORE IS COMPLETELY REMOVED AND THE COLD SHRINK TUBE IS INSTALLED.
- STEP 7: EXCESS COLD SHRINK TUBE EXTENDING TWO INCHES BEYOND THE SPACER HALVES CAN BE REMOVED OR LEFT IN PLACE. EXCESS COLD SHRINK TUBE CAN BE CAREFULLY CUT OFF WITH A KNIFE.
- STEP 8: WRAP OVER THE COLD SHRINK TUBE WITH ONE LAYER OF BLACK ELECTRICAL TAPE 2 INCH WIDTH OVERLAPPING EACH ROW BY 1/2 INCH. THIS TOP LAYER MUST BE WRAPPED USING A SHINGLED EFFECT. THE LAYER SHALL BE WRAPPED SO THAT THE ENDS ARE IN THE UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE SO WATER WILL BE REPELLED AND NOT ALLOWED TO COLLECT AND POOL. THIS TOP LAYER OF ELECTRICAL TAPE MUST EXTEND TWO INCHES (THE TAPE WIDTH) PAST THE COLD SHRINK TUBE ONTO THE UNDERLYING CABLE. TAPE SHALL BE WRAPPED SO THAT NO VOIDS OR AIR PACKETS ARE PRESENT. TAPE SHALL BE CUT WITH A SHARP KNIFE.
- BUTYL RUBBER TAPE INSTALLATION PROCEDURE:
- REQUIRED MATERIAL: BLACK ELECTRICAL TAPE-2 INCH WIDE AND BUTYL RUBBER TAPE 2 TO 3 INCHES WIDE.
 - REQUIRED TOOLS: KNIFE OR SCISSORS.
- STEP 1: THOROUGHLY CLEAN AND DRY THE SURFACE OF COAXIAL CABLE AND CONNECTOR TO REMOVE ALL GREASE AND DIRT. WRAP CONNECTOR/GROUND KIT WITH TWO LAYERS OF BLACK ELECTRICAL TAPE-2 INCH WIDTH OVERLAPPING EACH ROW BY APPROXIMATELY 1/2 INCH. THESE LAYERS OF TAPE MUST EXTEND ONE INCH PAST THE CONNECTOR/GROUND KIT ON EACH SIDE. TWO ROWS SHALL BE APPLIED, ONE IN EACH DIRECTION, WITH THE TOP ROW SHINGLED TO PROMOTE WATER RUNOFF.
- STEP 2: WRAP CONNECTOR/GROUND KIT WITH ONE LAYER OF BUTYL RUBBER TAPE (2 TO 3 INCHES WIDTH) OVER THE BLACK ELECTRICAL TAPE OVERLAPPING EACH ROW BY APPROXIMATELY 1/2 INCH. THE BUTYL RUBBER TAPE MUST EXTEND 2 TO 3 INCHES (THE TAPE WIDTH) PAST THE ELECTRICAL TAPE AND COME IN GOOD CONTACT WITH THE UNDERLYING CABLE. ON CONNECTORS, WHEN WEATHERPROOFING FROM THE MAIN LINE TO THE JUMPER, BUILD UP THIS AREA WITH EXTRA BUTYL RUBBER TAPE TO INSURE A SMOOTH TRANSITION FREE OF VOIDS AND AIR PACKETS DOWN TO THE SMALLER DIAMETER CABLE.
- STEP 3: WRAP CONNECTOR/GROUND KIT WITH TWO LAYERS OF BLACK ELECTRICAL TAPE 2 INCH WIDTH OVERLAPPING EACH ROW BY 1 INCH. THESE LAST TWO LAYERS MUST BE WRAPPED USING A SHINGLED EFFECT. THE TOP LAYER SHALL BE WRAPPED SO THAT THE ENDS ARE IN THE UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE SO WATER WILL BE REPELLED AND NOT ALLOWED TO COLLECT AND POOL. THESE TOP LAYERS OF ELECTRICAL TAPE MUST EXTEND TWO INCHES (THE TAPE WIDTH) PAST THE BUTYL RUBBER TAPE ONTO THE UNDERLYING CABLE. ALL LAYERS OF TAPE SHALL BE WRAPPED SO THAT NO VOIDS OR AIR PACKETS ARE PRESENT. THE LAST WRAP OF TAPE SHALL NOT BE PULLED OR STRETCHED. ALL TAPE SHALL BE CUT WITH A SHARP KNIFE OR SCISSORS.
- STEP 4: CONTINUE WRAPPING THE CABLE AND CONNECTOR/GROUND KIT USING HALF OVERLAP (0.75 INCH WIDE) LAYERS.
- STEP 5: WRAP OVER AND PAST THE CONNECTOR/GROUND KIT AT LEAST 2 INCHES.
- STEP 6: TO TERMINATE THE SELF-AMALGAMATING TAPE, WRAP THE TAPE AT LEAST ONE FULL ROUND OVER THE CABLE STRETCHING THE TAPE TIGHT. CUT THE TAPE USING KNIFE OR SCISSORS AND APPLY THE LOOSE END TO THE UNDERLYING SELF-AMALGAMATING TAPE USING THUMB PRESSURE.
- STEP 7: TWO ROWS OF SELF-AMALGAMATING TAPE SHALL BE APPLIED IN THIS MANNER, IN ALTERNATING DIRECTIONS. THE TOP LAYER SHALL BE WRAPPED SO THAT THE ENDS ARE IN AN UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE SO WATER WILL BE REPELLED.
- STEP 8: WRAP OVER SELF-AMALGAMATING TAPE WITH TWO LAYERS OF BLACK ELECTRICAL TAPE- 2 INCH WIDTH OVERLAPPING EACH ROW BY 1 INCH. THESE TOP TWO LAYERS MUST ALSO BE WRAPPED USING A SHINGLED EFFECT. THE LAYERS SHALL BE WRAPPED SO THAT THE ENDS ARE IN THE UPWARD DIRECTION CREATING A SHINGLED EFFECT WITH THE TAPE SO WATER WILL BE REPELLED AND NOT ALLOWED TO COLLECT AND POOL. THESE TOP LAYERS OF ELECTRICAL TAPE MUST EXTEND TWO INCHES (THE TAPE WIDTH) PAST THE SELF-AMALGAMATING TAPE ONTO THE UNDERLYING CABLE. ALL LAYERS OF TAPE SHALL BE WRAPPED SO THAT NO VOIDS OR AIR PACKETS ARE PRESENT. THE LAST WRAP OF TAPE SHALL NOT BE PULLED OR STRETCHED. ALL TAPE SHALL BE CUT WITH A SHARP KNIFE OR SCISSORS.
- E. ALL PENETRATIONS SHALL BE PROPERLY SEALED AND BOOTED. EXPANSION FOAM AROUND COAX CABLES IS NOT AN ACCEPTABLE MEANS OF SEALING/WEATHERPROOFING."

NOTES

- NEW ANTENNAS AND STEEL ON THE EXTERIOR OF THE WATER TOWERS SHALL BE PAINTED TO MATCH. THE PROPERTY OWNER CAN PROVIDE THE PANTONE COLORS IF NEEDED.
- COATINGS SHALL BE COMPATIBLE WITH THE COATING SYSTEM ON THE WATER TOWERS. THE PROPERTY OWNER CAN PROVIDE THE COATING SYSTEM IF NEEDED.
- IN THE CASE WHERE STEEL PIPE AND/OR SUPPORTS MAY CONTACT THE EXTERIOR PAINT OF THE WATER TOWER, DIELECTRICS SHALL BE PROVIDED TO PREVENT CORROSION.

Sprint

SAMSUNG

GENERAL DYNAMICS
WIRELESS SERVICES



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PROJECT INFORMATION:

NETWORK VISION MMBS LAUNCH

DOWNTOWN
ANN ARBOR

DE03XC208

220 N ASHLEY STREET
ANN ARBOR, MI 48104
WASHTENAW COUNTY

ISSUE DATE: 06-18-2013

ISSUED FOR: CONSTRUCTION DWGS

REVISIONS

REV.	DATE	DESCRIPTION	INITIALS
A	09/06/12	ISSUED FOR CDs 90%	SMM
B	09/26/12	ISSUED FOR CDs 100%	JED
C	10/01/12	ISSUED FOR CDs FINALS	JED
D	06/18/13	ISSUED FOR REVISED FINALS	JED

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LABELED AS CONSTRUCTION SET

LICENSURE:



SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

N-2

REVISION:

D

PRDS PROJ.NO.
2525-070312

GENERAL NOTES

THIS IS NOT A SITE SURVEY.
ALL PROPERTY BOUNDARIES, ORIENTATION OF TRUE NORTH AND STREET HALF-WIDTHS HAVE BEEN OBTAINED FROM A TAX PARCEL MAP AND ARE APPROXIMATE.



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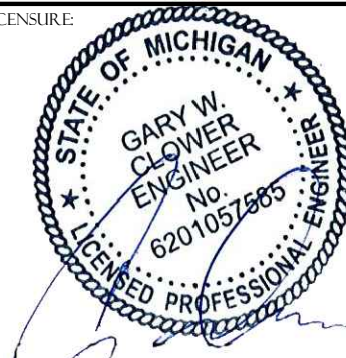
ISSUED FOR: CONSTRUCTION DWGS

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LICENSURE:



SHEET TITLE:

OVERALL SITE PLAN

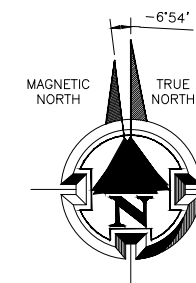
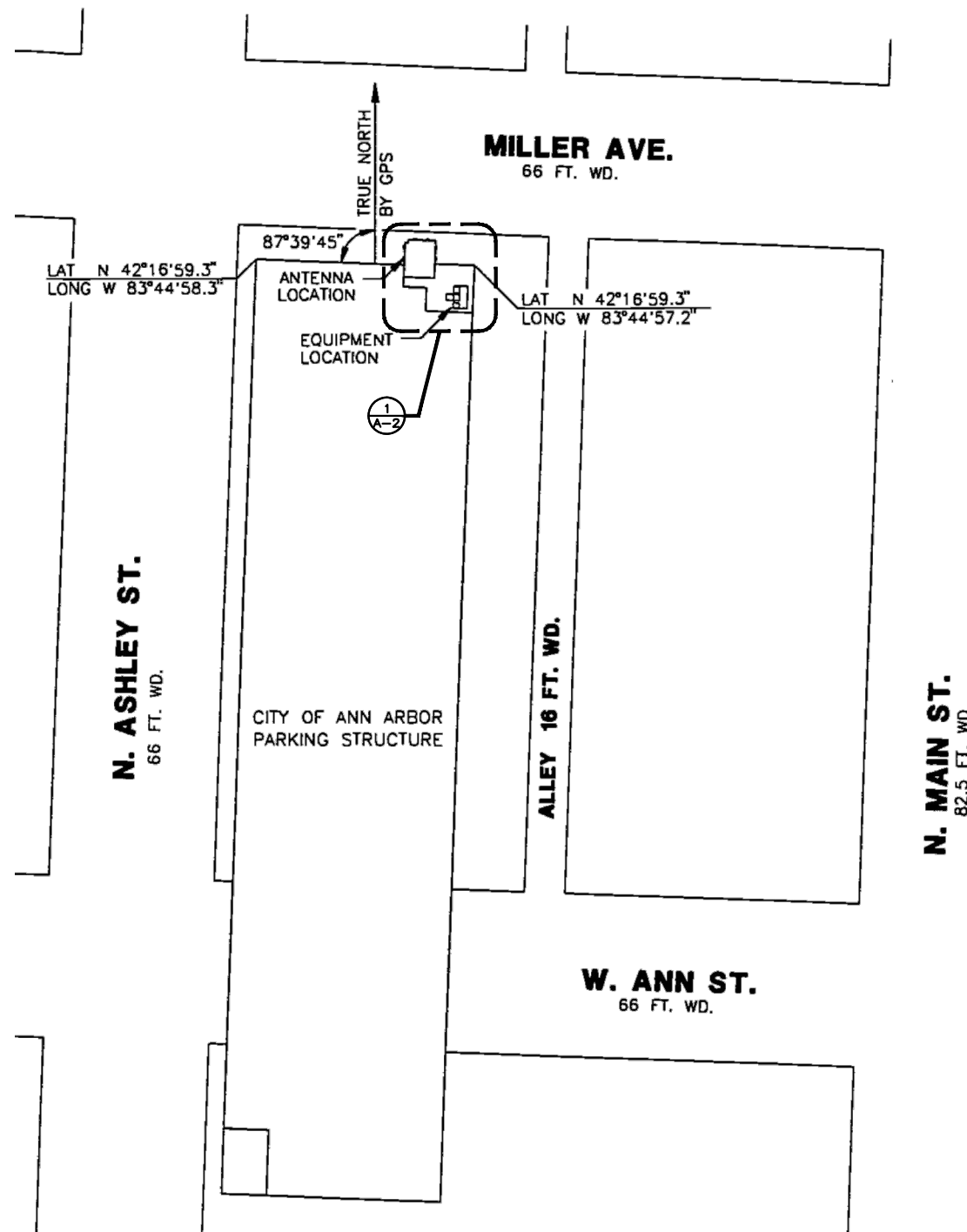
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A-1

REVISION:

D

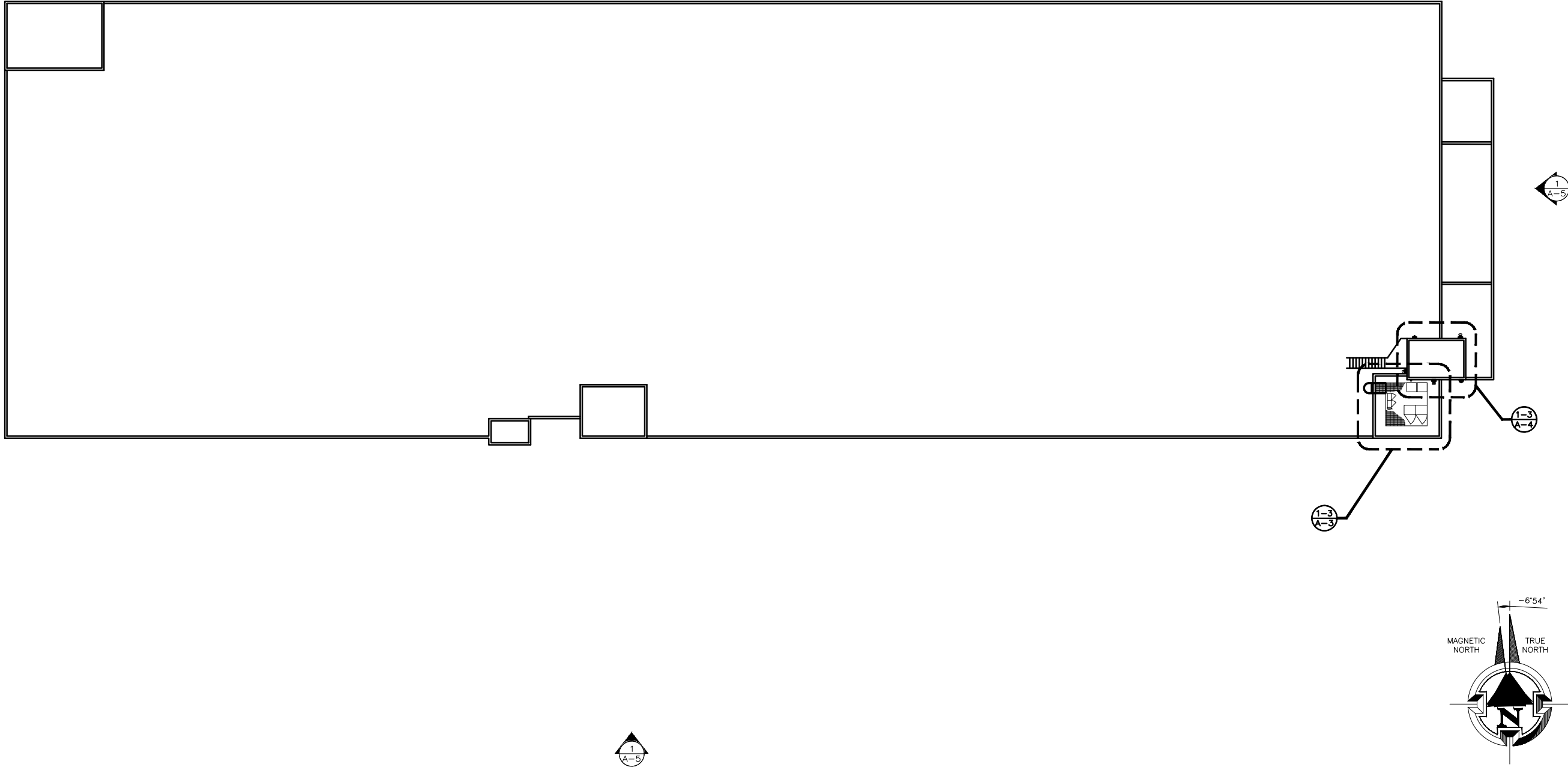
PRDS PROJ. NO.
2525-070312



22"x34" SCALE: 1" = 50'-0"
11"x17" SCALE: 1" = 100'-0"

OVERALL SITE PLAN | 1

NOTE: STRUCTURAL ANALYSIS MUST BE PERFORMED ON ALL ROOFTOPS, FLAGPOLES AND TOWER SITES BEFORE INSTALLATION OF NEW ANTENNAS, NEW RRUS, & NEW CABINETS/TEMPORARY PLATFORMS. STRUCTURAL ANALYSIS PROVIDED BY GENERAL DYNAMICS.



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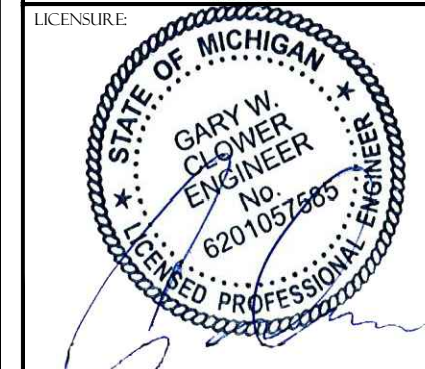
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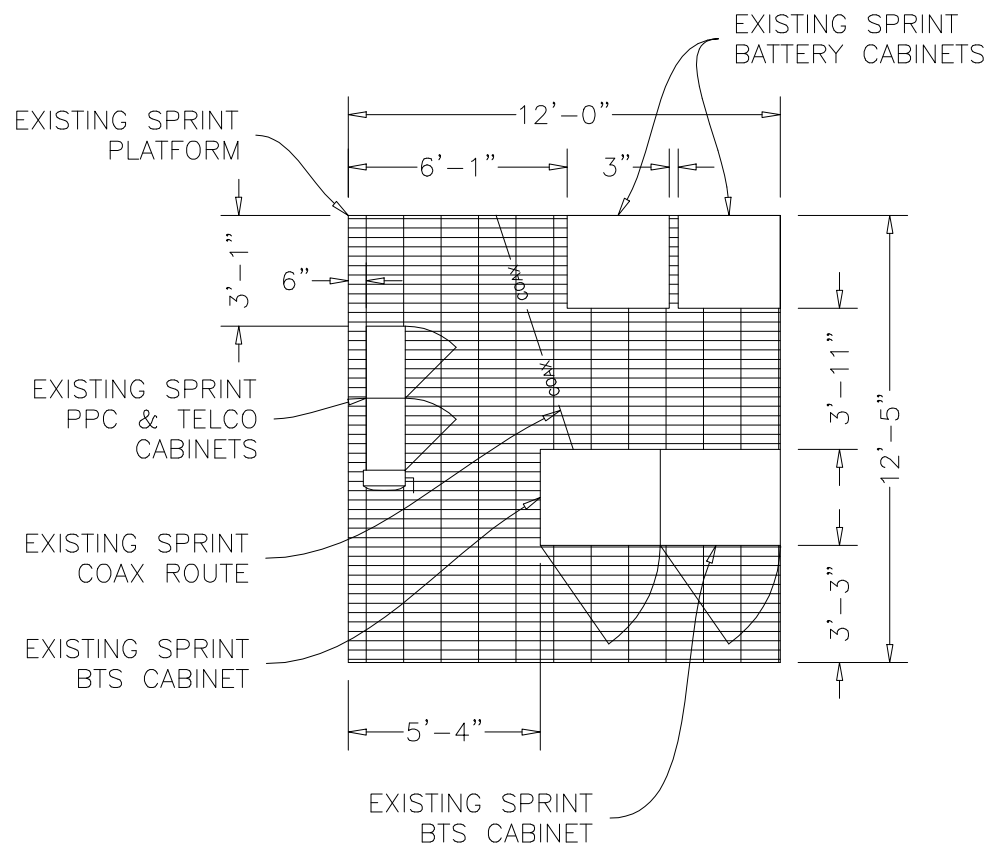


SHEET TITLE:
ENLARGED SITE PLAN

SHEET NUMBER: **A-2** REVISION: **D**
PRDS PROJ. NO. 2525-070312

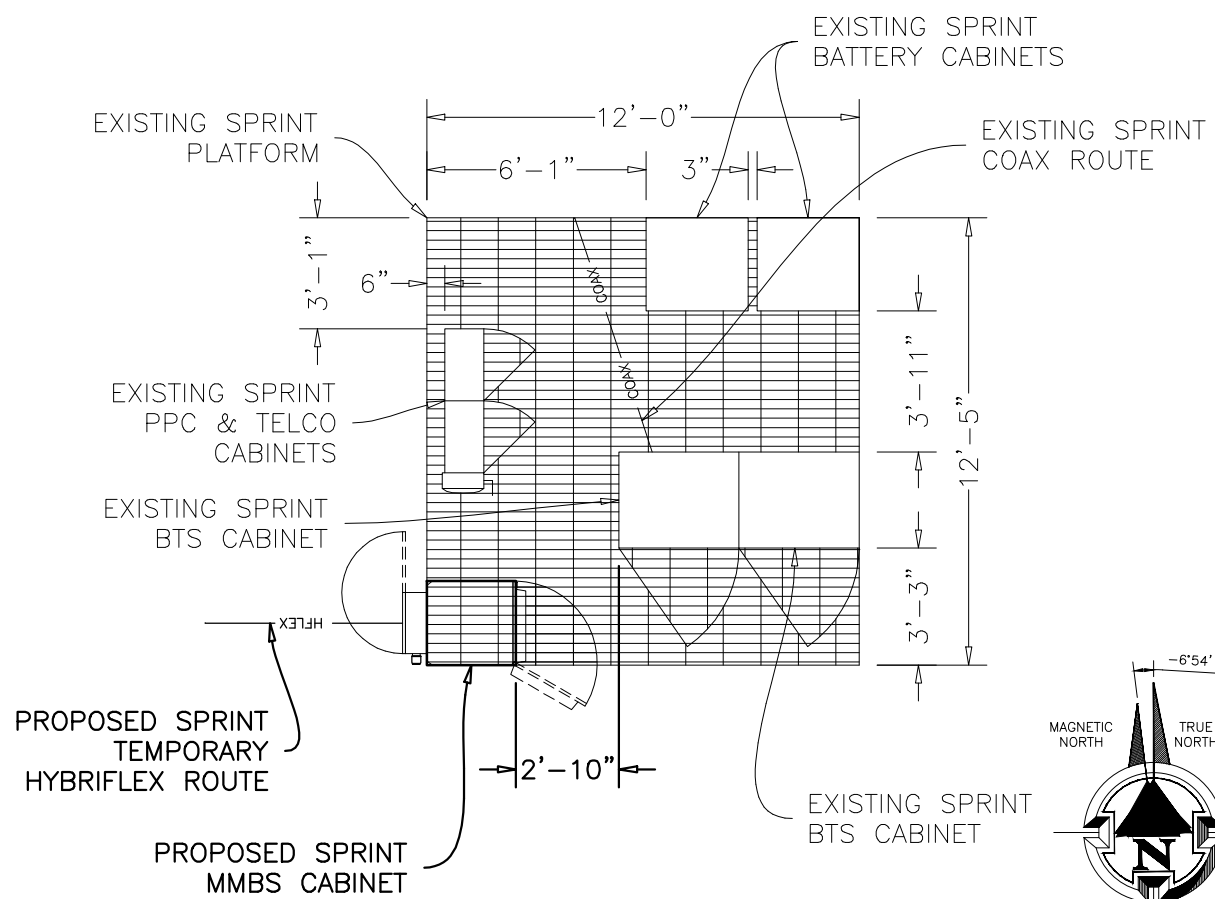
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11"x17" SCALE: 1" = 400'-0"
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ENLARGED SITE PLAN 1



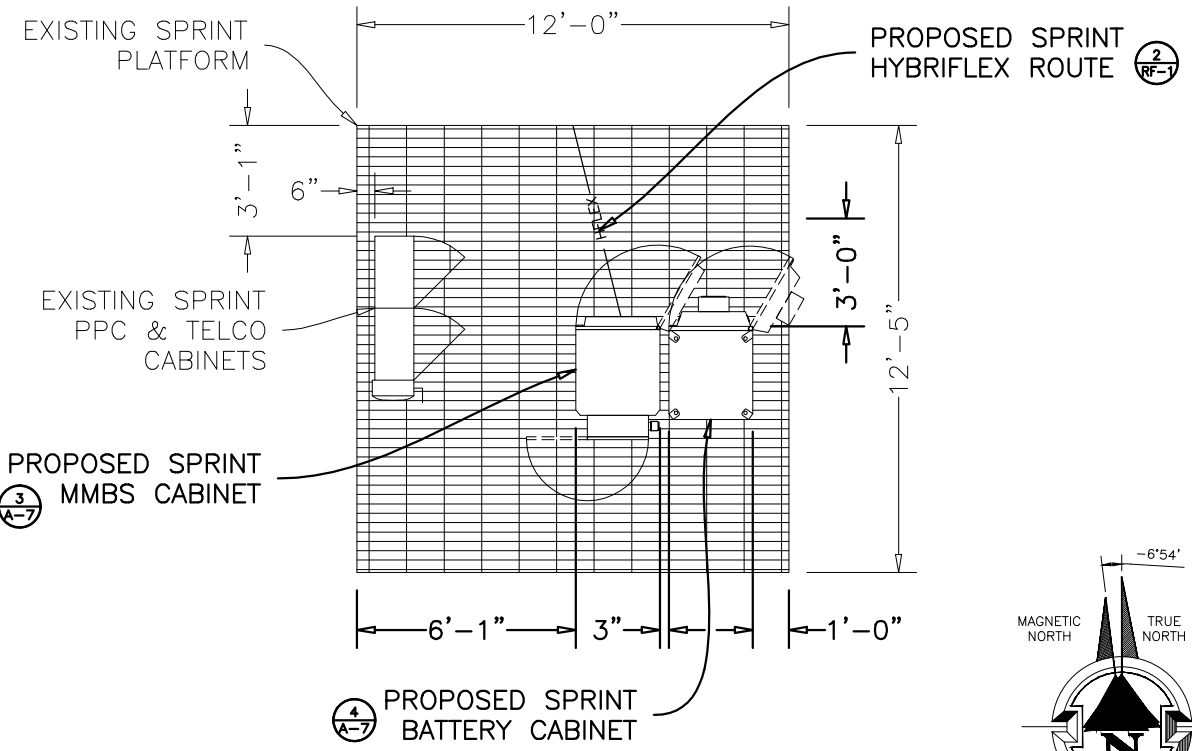
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11"x17" SCALE: 3/16" = 1'-0"

EXISTING EQUIPMENT PLAN 1



22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

NEW TEMP. EQUIPMENT PLAN (INTERIM) 2



22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

NEW EQUIPMENT PLAN (FINAL) 3

NOTE: STRUCTURAL ANALYSIS MUST BE PERFORMED ON ALL ROOFTOPS, FLAGPOLES AND TOWER SITES BEFORE INSTALLATION OF NEW ANTENNAS, NEW RRUS, & NEW CABINETS/TEMPORARY PLATFORMS. STRUCTURAL ANALYSIS PROVIDED BY GENERAL DYNAMICS.

EXISTING ITEMS TO BE REMOVED	
CDMA ANTENNA	(3 TOTAL, 1 PER SECTOR)
CDMA CABINET	0
BBU CABINET	2
MICROWAVE CABINET	0
COAX CABLE	(6 TOTAL, 2 PER SECTOR)

HYBRIFLEX TO FOLLOW EXISTING COAX CABLE ROUTE, AND USE EXISTING CABLE MOUNTS.



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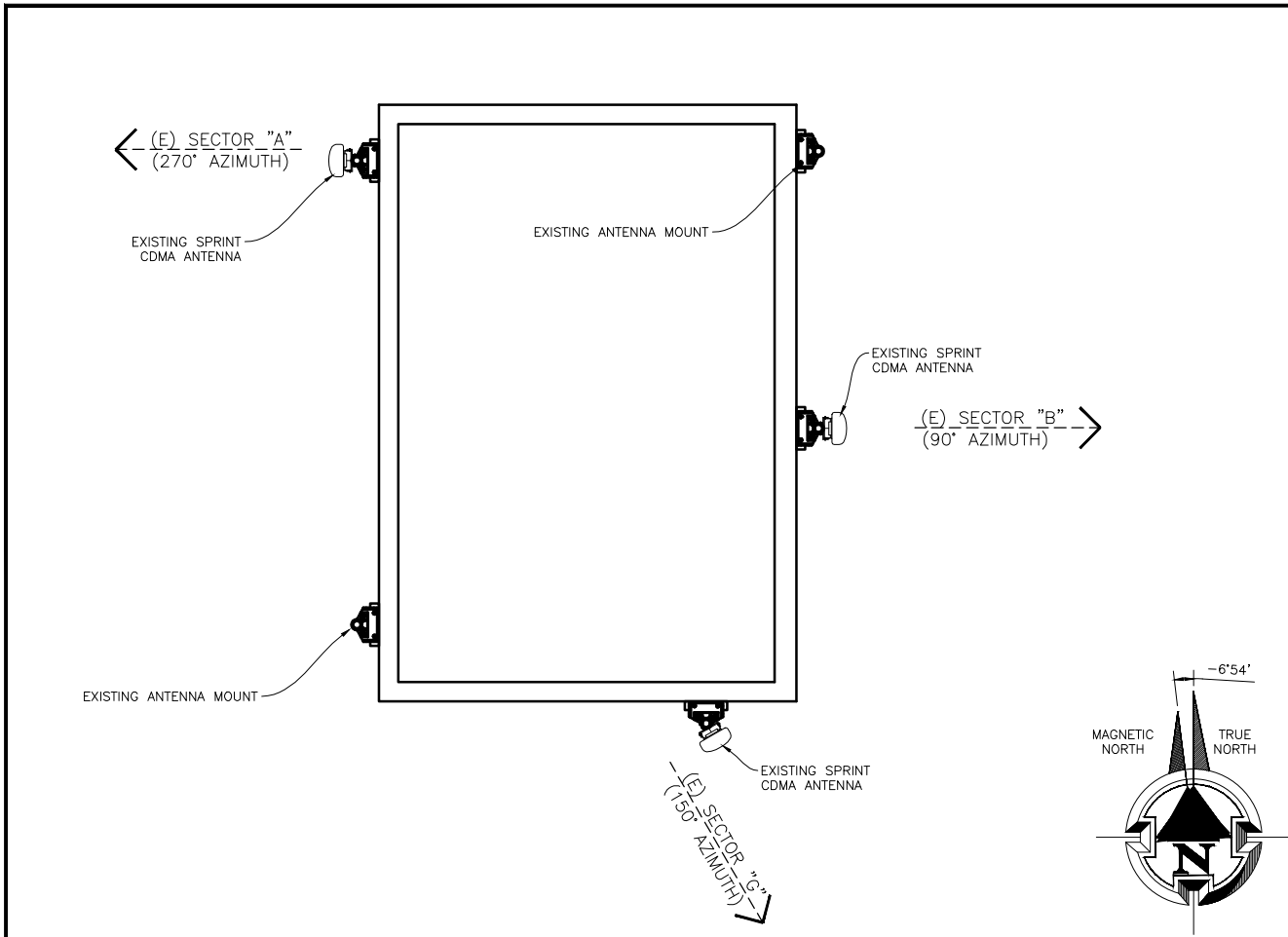
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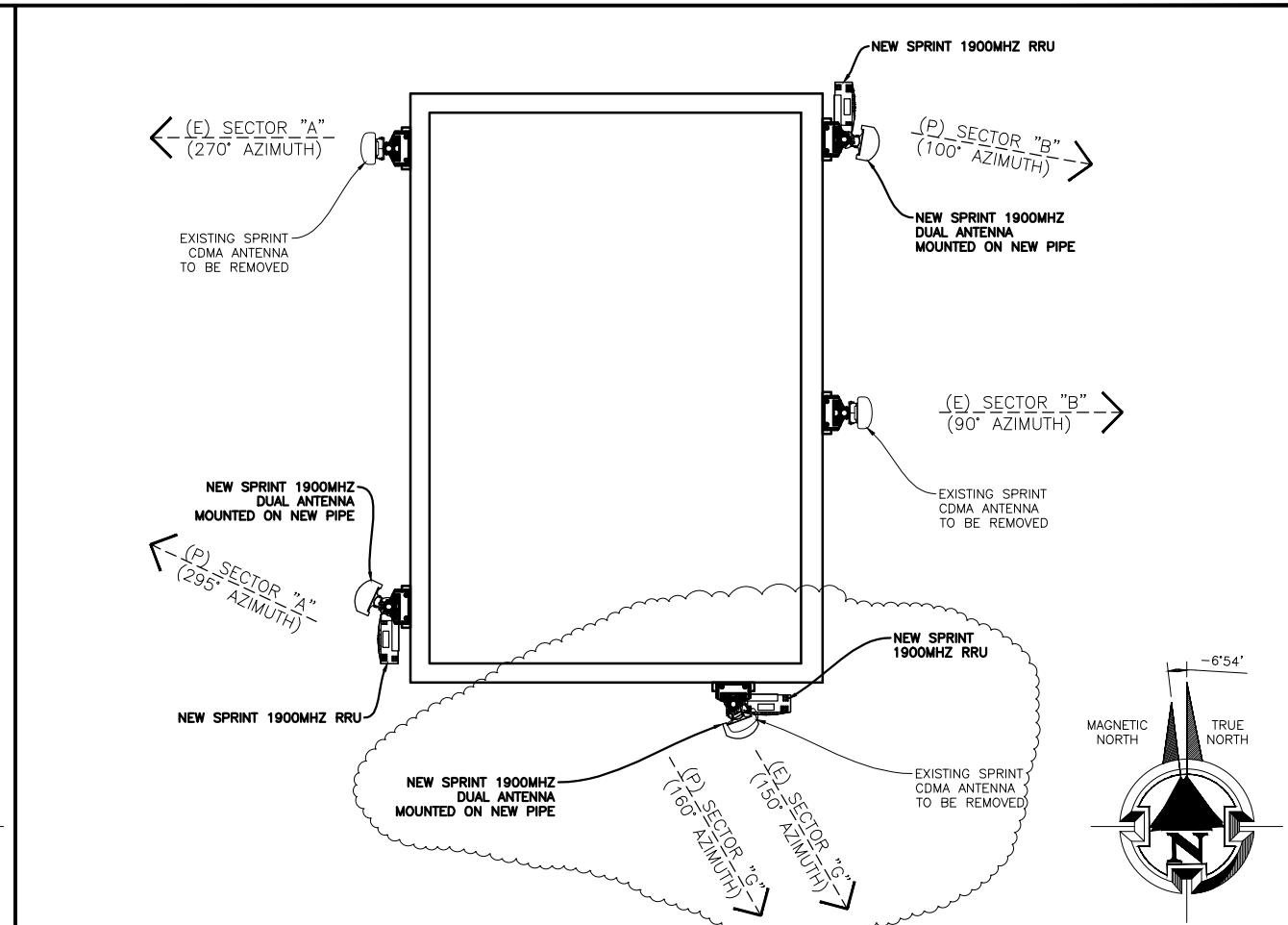
SHEET TITLE:
**ENLARGED
EQUIPMENT PLANS**

SHEET NUMBER: **A-3** REVISION: **D**
PRDS PROJ. NO. 2525-070312



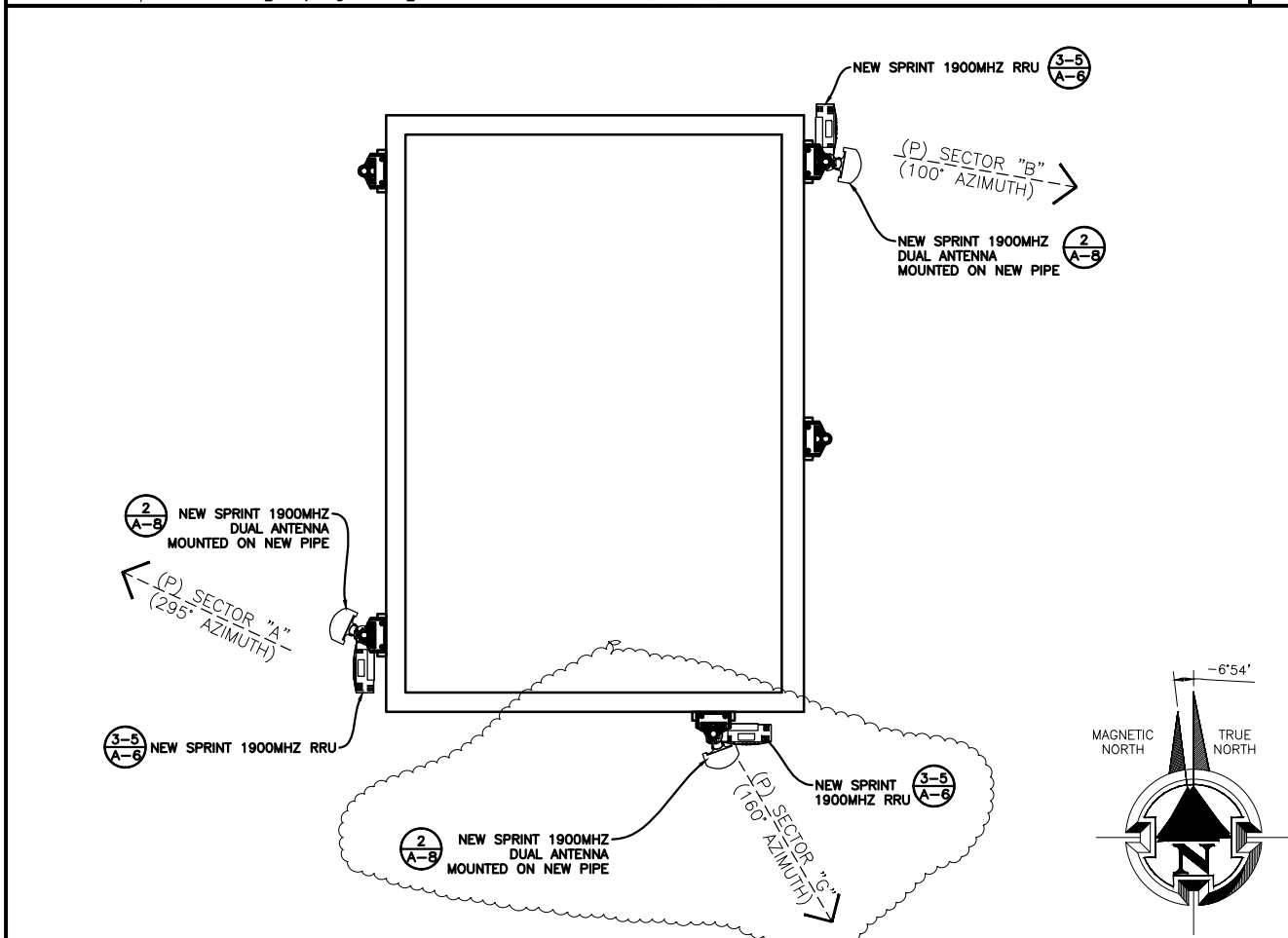
22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

EXISTING ANTENNA PLAN 1



22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

NEW TEMP. ANTENNA PLAN (INTERIM) 2



22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

NEW ANTENNA PLAN (FINAL) 3

NOTE:
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NOTE:
EXISTING ANTENNAS ARE CDMA UNLESS NOTED OTHERWISE.

NEW SPRINT ANTENNAS INCLUDE RESPECTIVE RRU'S WHICH SHALL BE MOUNTED ON THE PIPE BEHIND THE ANTENNA SIMILAR TO THAT SHOWN ON DETAIL 1, SHEET A-6.

FIELD VERIFY EXISTING AZIMUTH BEFORE RELOCATING THE ANTENNA, IF REQUIRED. PRIOR APPROVAL FROM SPRINT TO BE GRANTED BEFORE RELOCATION OF ANTENNAS.

NOTES:
ALL AZIMUTHS ARE TO BE ESTABLISHED CLOCKWISE FROM THE TRUE NORTH HEADING. CONTRACTOR SHALL VERIFY NEW ANTENNA RAD CENTER AND ORIENTATIONS WITH SPRINT PCS PRIOR TO INSTALLATION OF ANTENNAS. PRIOR TO ATTACHING ANTENNAS AND MOUNTING SECTIONS, EXISTING TOWER AND TOWER FOUNDATION MUST BE ANALYZED BY A LICENSED STRUCTURAL ENGINEER TO VERIFY TOWER IS CAPABLE OF SUPPORTING THE NEW LOADS. REFER TO STRUCTURAL ANALYSIS BY OTHERS. CONTRACTOR SHALL REFER TO TOWER STRUCTURAL CALCULATIONS FOR ADDITIONAL LOADS. NO ERECTION OF MODIFICATION OF TOWER SHALL BE MADE WITHOUT APPROVAL OF STRUCTURAL ENGINEER.

RRU / HYBRID CABLE SCHEDULE									
SECTOR	RRU MODEL	RRU FREQUENCY	HYBRID CABLE LENGTH	HYBRID CABLE DIAMETER	JUMPER SIZE	JUMPER LENGTH	RET LENGTH	RET CABLE MANUFACTURER	RET CABLE MODEL NUMBER
ALPHA	RRH-P4	(1)1900MHz	180'	N/A	1/2"	6'	9.8'	COMMSCOPE	IRET AISGv1.1
BETA	RRH-P4	(1)1900MHz	60'	N/A	1/2"	6'	9.8'	COMMSCOPE	IRET AISGv1.1
GAMMA	RRH-P4	(1)1900MHz	75'	N/A	1/2"	6'	9.8'	COMMSCOPE	IRET AISGv1.1

1900 EQUIPMENT ONLY

ANTENNA SCHEDULE									
SECTOR	ANTENNA FREQUENCY	ANTENNA MFR.	ANTENNA MODEL	ANTENNA QUANTITY	AZIMUTH	RAD CENTER	ANT. SIZE	ELECT TILT	MECH TILT
ALPHA	1900 MHz	ANDREW	ADFD1820-33B-A2M	1 (PER SECTOR)	100°	75'-0"	6'-0"	2°	0°
BETA	1900 MHz	RFS	APXVRR13-C-A20	1 (PER SECTOR)	160°	75'-0"	4'-6"	6°	0°
GAMMA	1900 MHz	RFS	APXVRR13-C-A20	1 (PER SECTOR)	295°	75'-0"	4'-6"	6°	0°

NOTES & ANTENNA SCHEDULE 4

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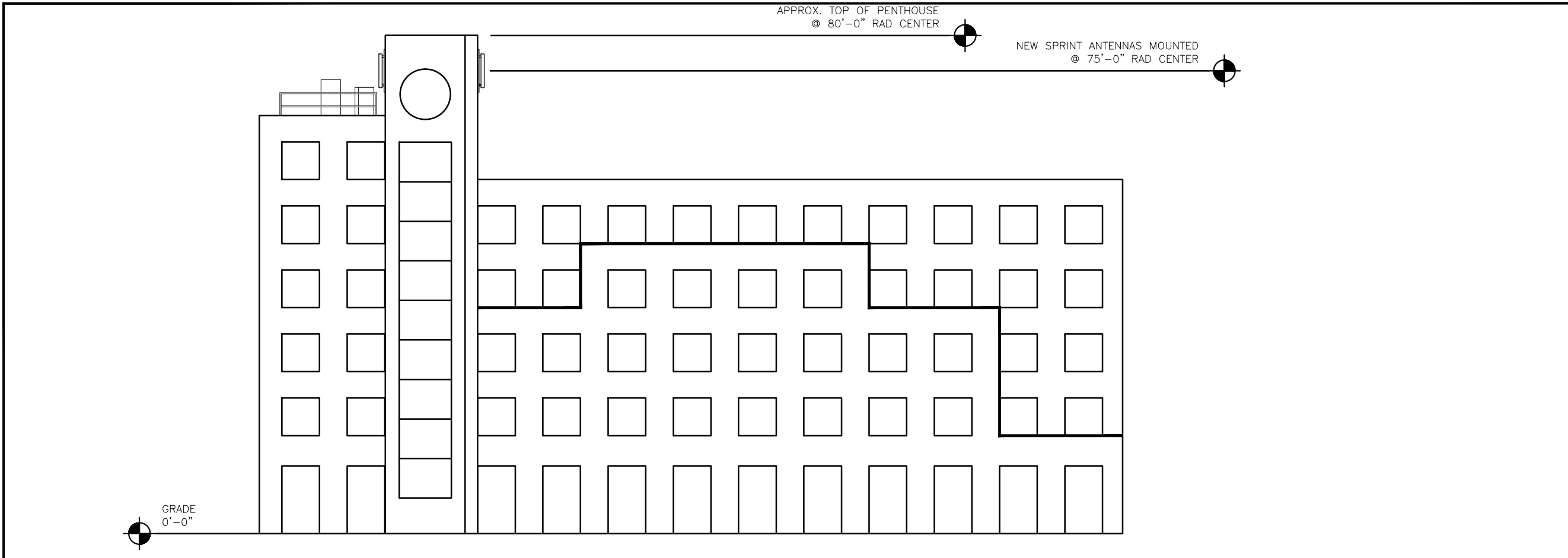
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LICENSURE:

SHEET TITLE:
ANTENNA PLANS & SCHEDULES

SHEET NUMBER: **A-4** REVISION: **D**

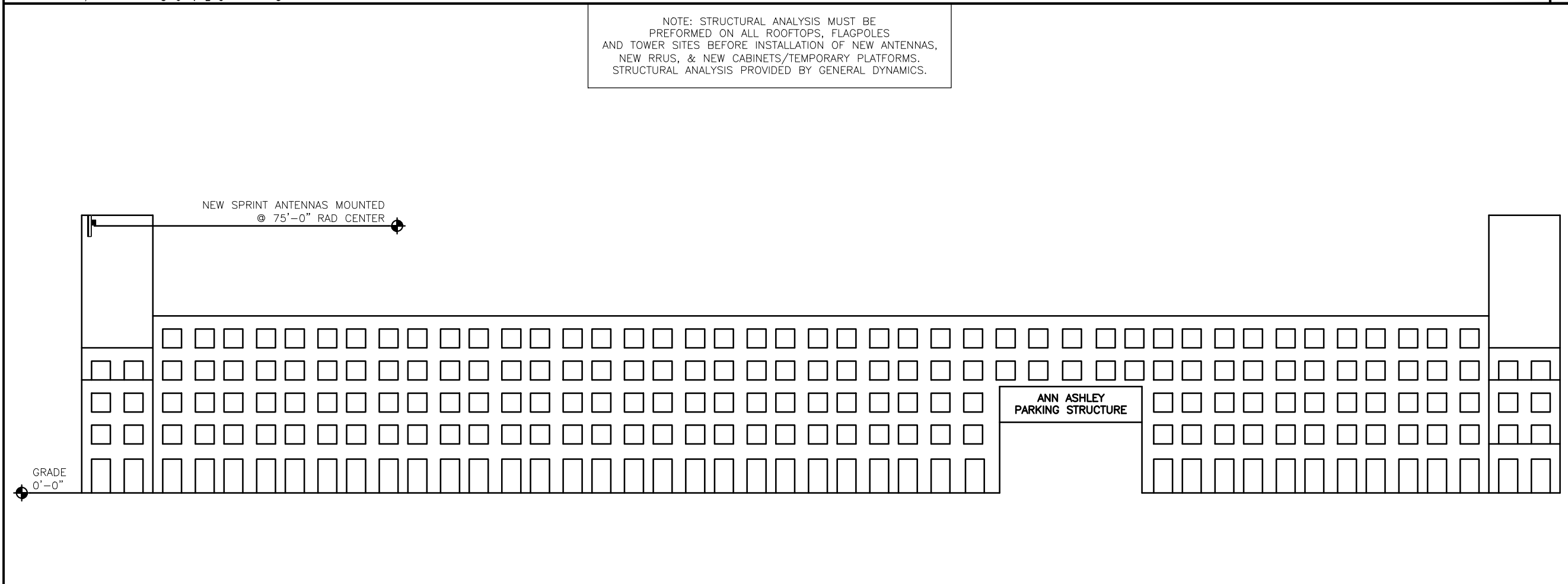
PRDS PROJ. NO. 2525-070312



22"x34" SCALE: 1/8" = 1'-0"
 11"x17" SCALE: 1/16" = 1'-0"
 8' 6' 4' 2' 0' 8'

NEW NORTH ELEVATION 2

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22"x34" SCALE: 1/16" = 1'-0"
 11"x17" SCALE: 1/32" = 1'-0"
 16' 12' 8' 4' 0' 16'

NEW WEST ELEVATION 1



GENERAL DYNAMICS
 WIRELESS SERVICES



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 DE03XC208
 220 N ASHLEY STREET
 ANN ARBOR, MI 48104
 WASHTENAW COUNTY

ISSUE DATE: 06-18-2013

ISSUED FOR: CONSTRUCTION DWGS

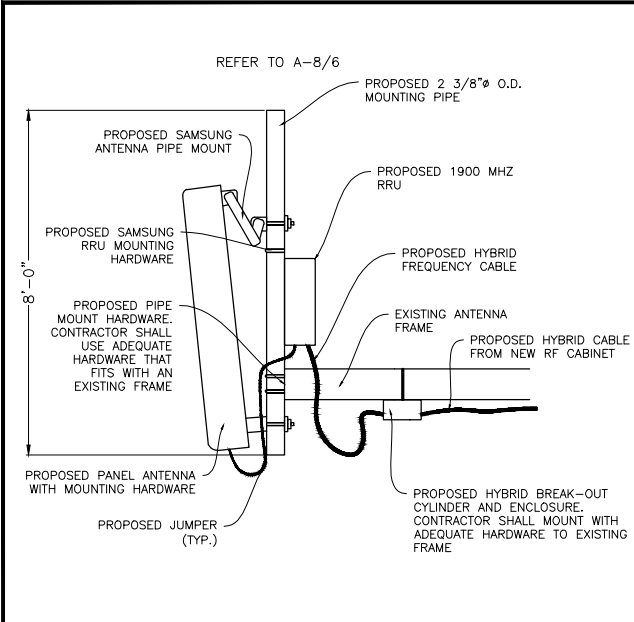
REVISIONS			
REV.	DATE	DESCRIPTION	INITIALS
A	09/06/12	ISSUED FOR CDs 90%	SMM
B	09/26/12	ISSUED FOR CDs 100%	JED
C	10/01/12	ISSUED FOR CDs FINALS	JED
D	06/18/13	ISSUED FOR REVISED FINALS	JED

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET



SHEET TITLE:
NEW NORTH & WEST
ELEVATIONS

SHEET NUMBER: **A-5** REVISION: **D**
PRDS PROJ. NO. 2525-070312

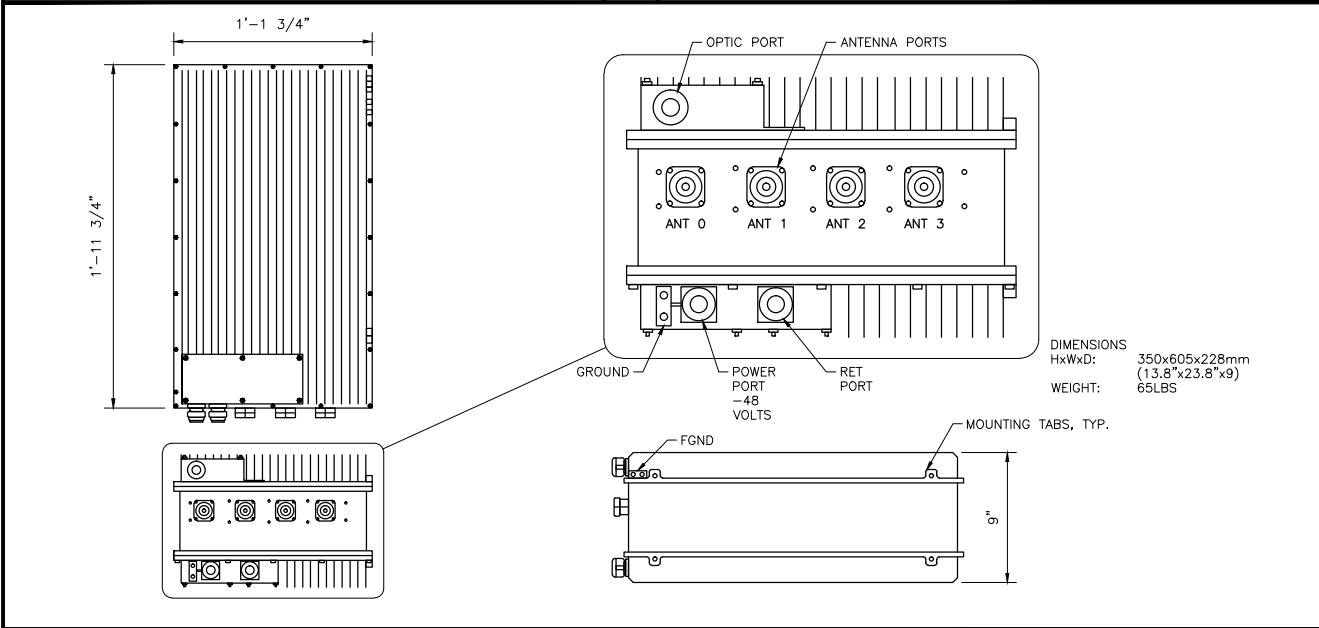


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11"x17" SCALE: NOT TO SCALE

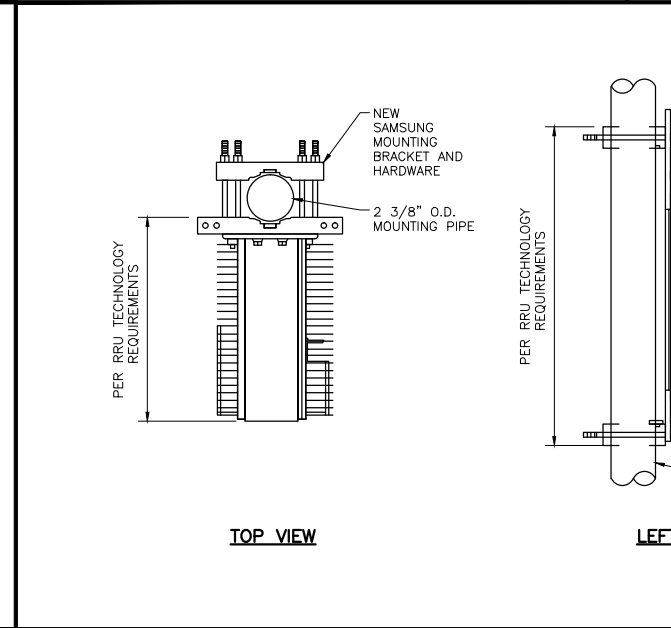
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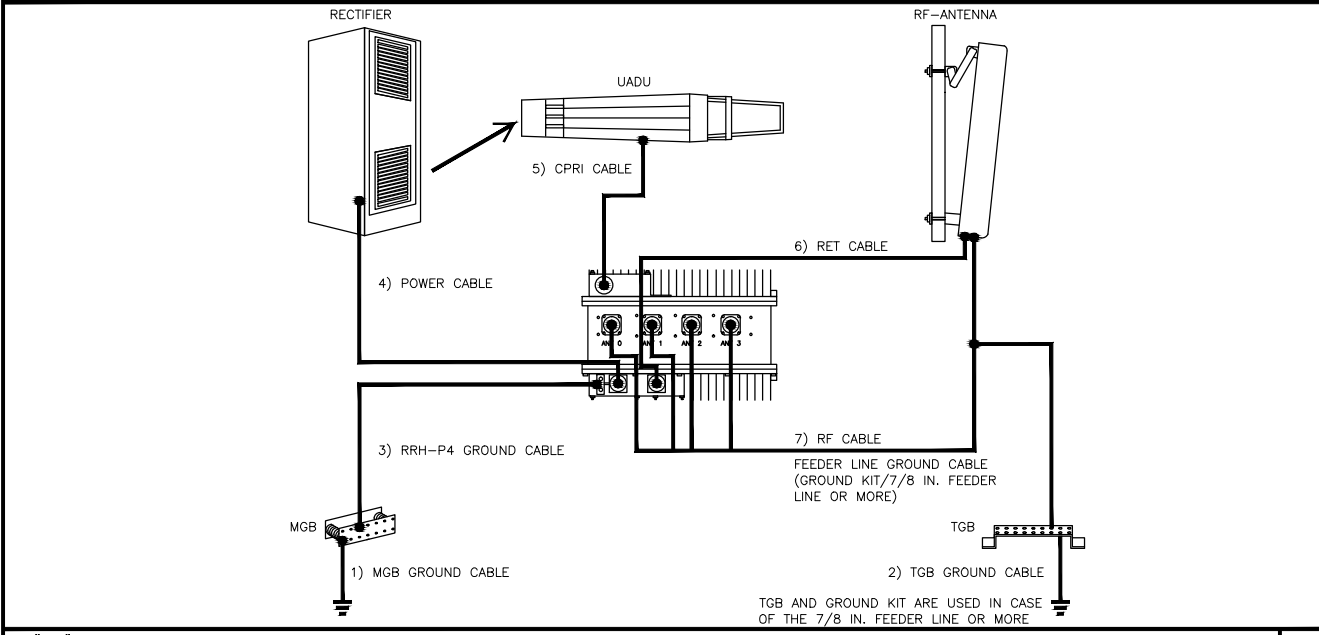


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GENERAL DYNAMICS
WIRELESS SERVICES



POWDER RIVER
Development Services, LLC
100 E. SHENANGO STREET
SHARPSVILLE, PA 16150
724.962.5999
www.powderriverdev.com

PROJECT INFORMATION:
NETWORK VISION MMBS LAUNCH
**DOWNTOWN
ANN ARBOR**
DE03XC208
220 N ASHLEY STREET
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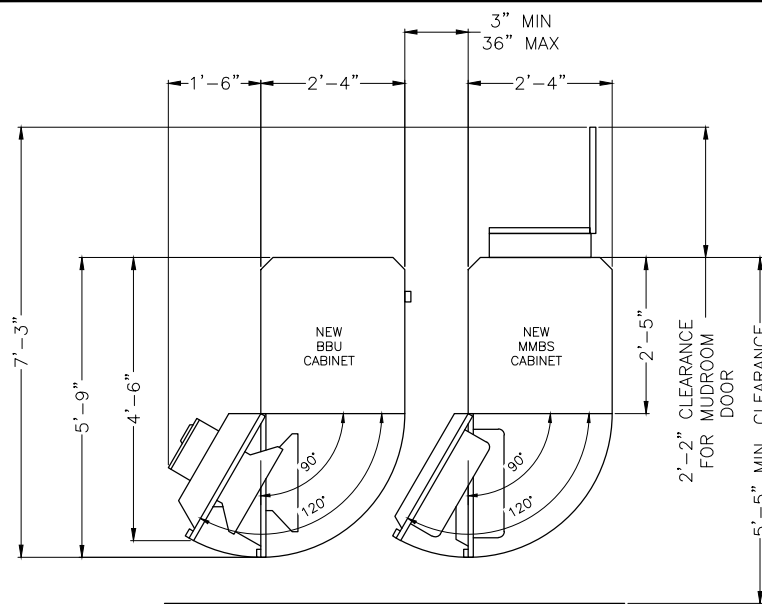


SHEET TITLE:
EQUIPMENT DETAILS

SHEET NUMBER: **A-6**

REVISION: **D**

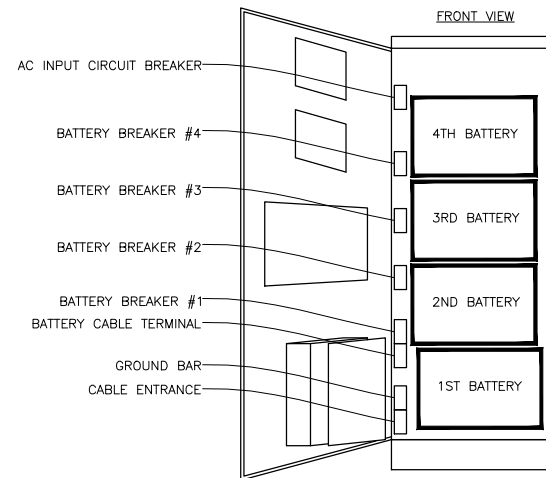
PRDS PROJ. NO. 2525-070312



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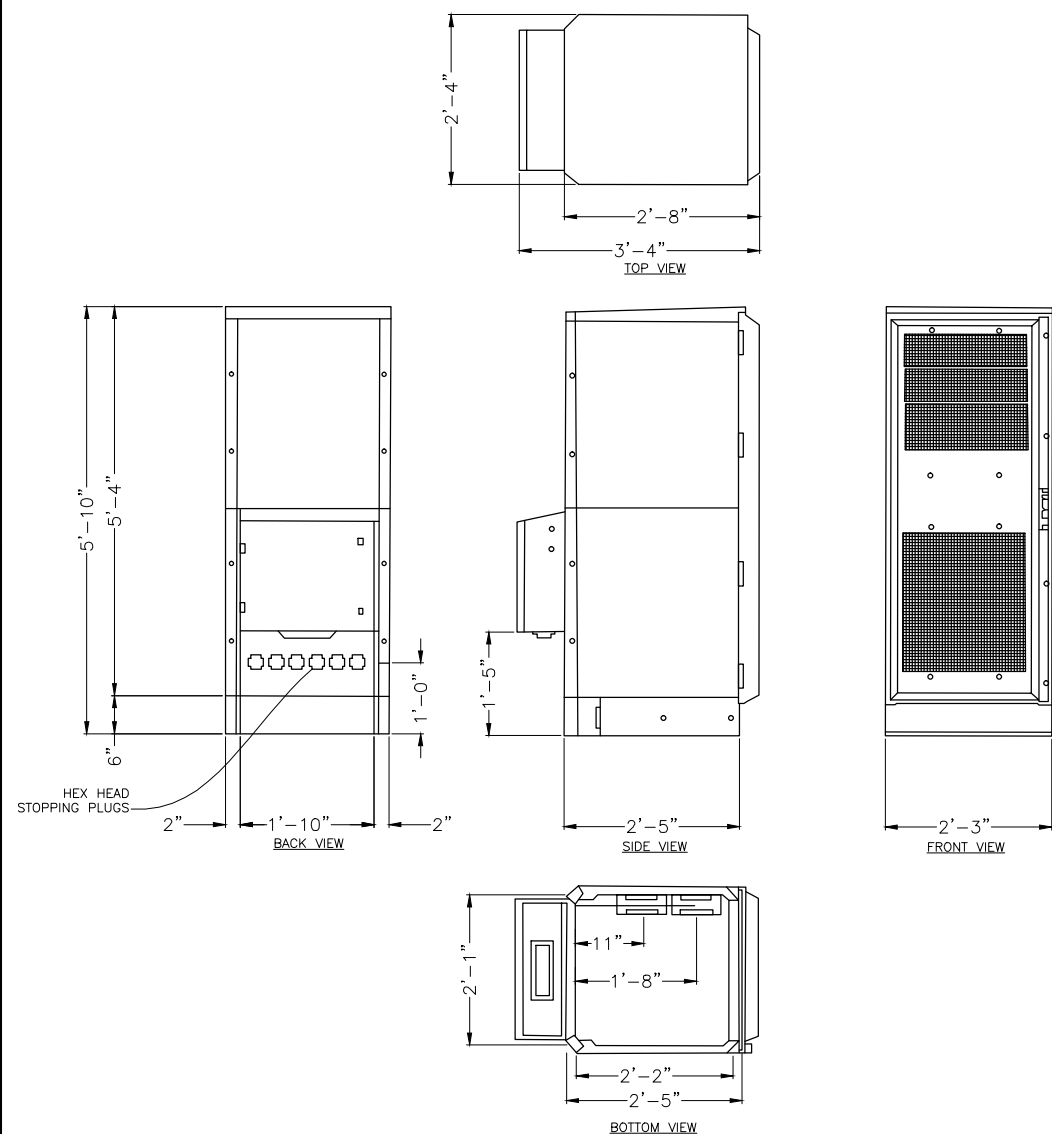
MMBS & BBU TYPICAL LAYOUT 1

ITEM	SPECIFICATIONS
CAPACITY	MAX. 4 BATTERY STRINGS
COOLING	AIR-CONDITIONER/COOLING WITH FAN FOR EMERGENCY MODE (MCLEAN T20 HVAC)
SOUND LEVEL	65BA @1.5m
SIZE	71(H) x 41.25(D) x 27.6(W) INCH 1800(H) x 1048(D) x 700(W) mm
CABINET WEIGHT	370 LBS
PER BATTERY STRING WEIGHT	529 LBS
BATTERY	NARADA 190AH (12NDT190) AGM TYPE (VRLA)
AC POWER	220VAC, 3.5AMP TYP. 14.4AMP STARTING
DC POWER	10A MAX @48DVC



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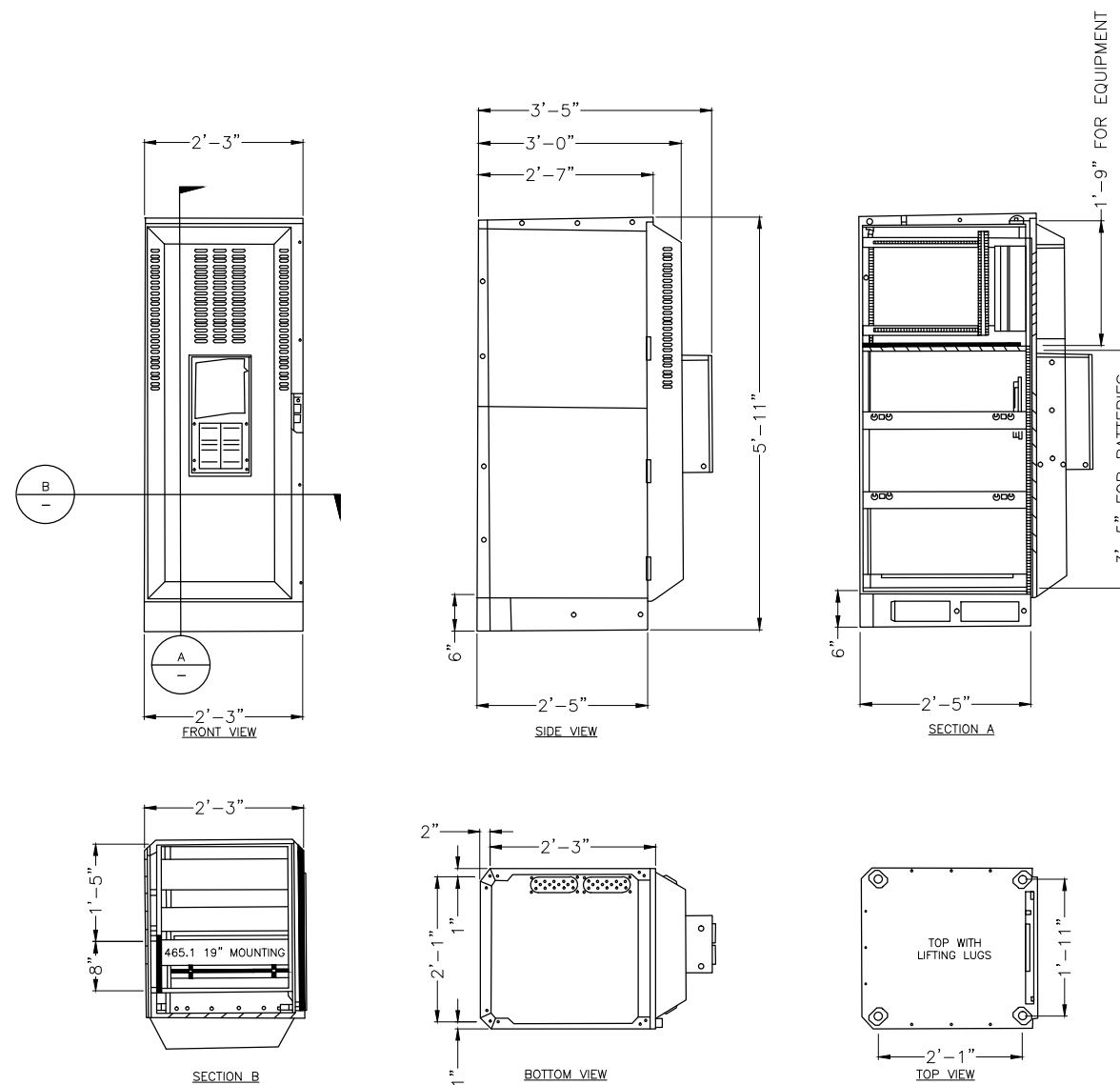
BBU CABINET 2



22"x34" SCALE: NOT TO SCALE
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MMBS MECHANICAL SPECIFICATIONS 3

MMBS EQUIPMENT WEIGHT & DIMENSIONS			
MMBS CABINET	1800x700x1018(820)mm/70.8in x 29.5in x 40.1(37.0)in		
MMBS CABINET	251kg (553lbs) W/O DU SHELF	300kg W/4 DU SHELF	



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BBU MECHANICAL SPECIFICATIONS 4

BBU EQUIPMENT WEIGHT & DIMENSIONS			
BBU CABINET	1800x700x1018(820)mm/70.8in x 29.5in x 40.1(37.0)in		
BBU CABINET	168kg (370lbs) W/O BATTERY	1136kg WITH BATTERY	



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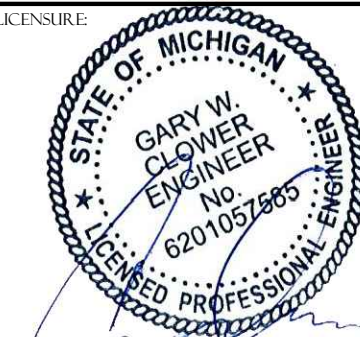
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LICENSURE:



SHEET TITLE:

EQUIPMENT DETAILS
OUTDOOR SPECIFICATIONS

SHEET NUMBER:

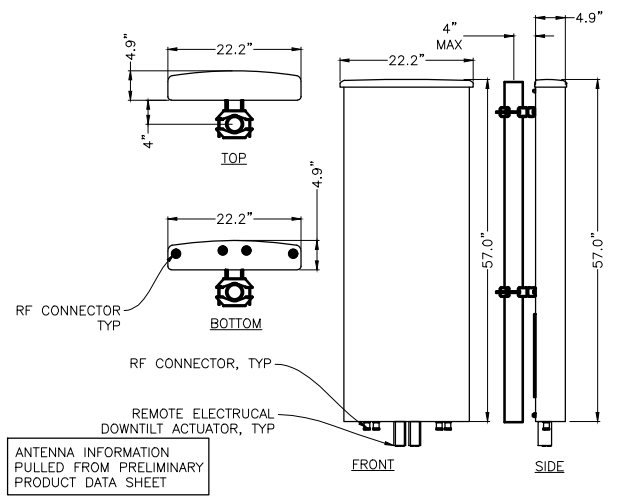
A-7

REVISION:

D

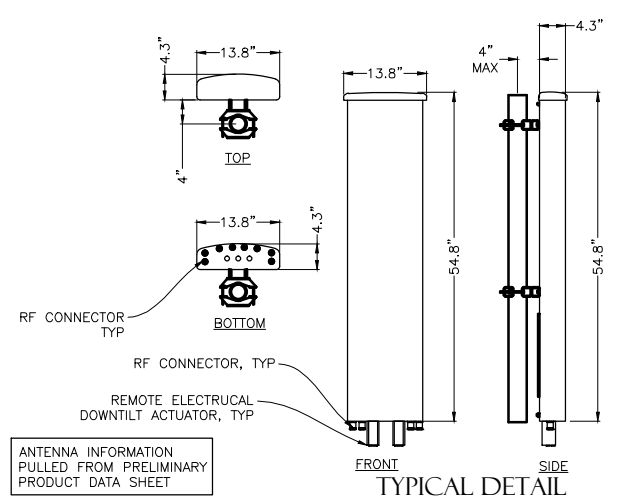
PRDS PROJ. NO.
2525-070312

MANUFACTURER: ANDREW
 MODEL: ADFD1820-33B-A2M
 WEIGHT: 38.1 LBS
 DIMENSIONS: 57.0" X 22.2" X 4.9"
 FREQUENCY: REFER TO RF DATA SHEET

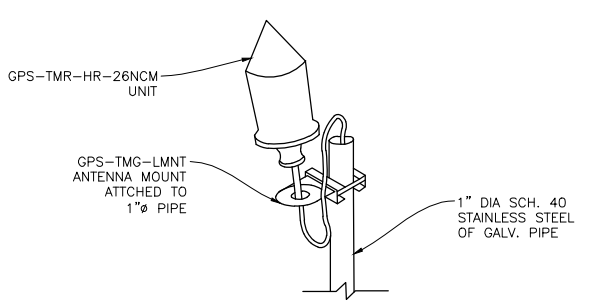


22"x34" SCALE: NOT TO SCALE
 11"x17" SCALE: NOT TO SCALE
1900 ANTENNA DETAIL 1

MANUFACTURER: RFS
 MODEL: APXVRR13-A20
 WEIGHT: 32.0 LBS
 DIMENSIONS: 54.8" X 13.8" X 4.3"
 FREQUENCY: REFER TO RF DATA SHEET



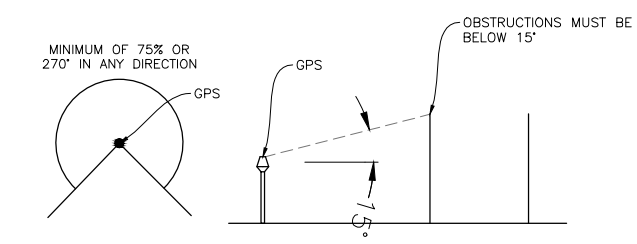
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 11"x17" SCALE: NOT TO SCALE
1900 ANTENNA DETAIL 2



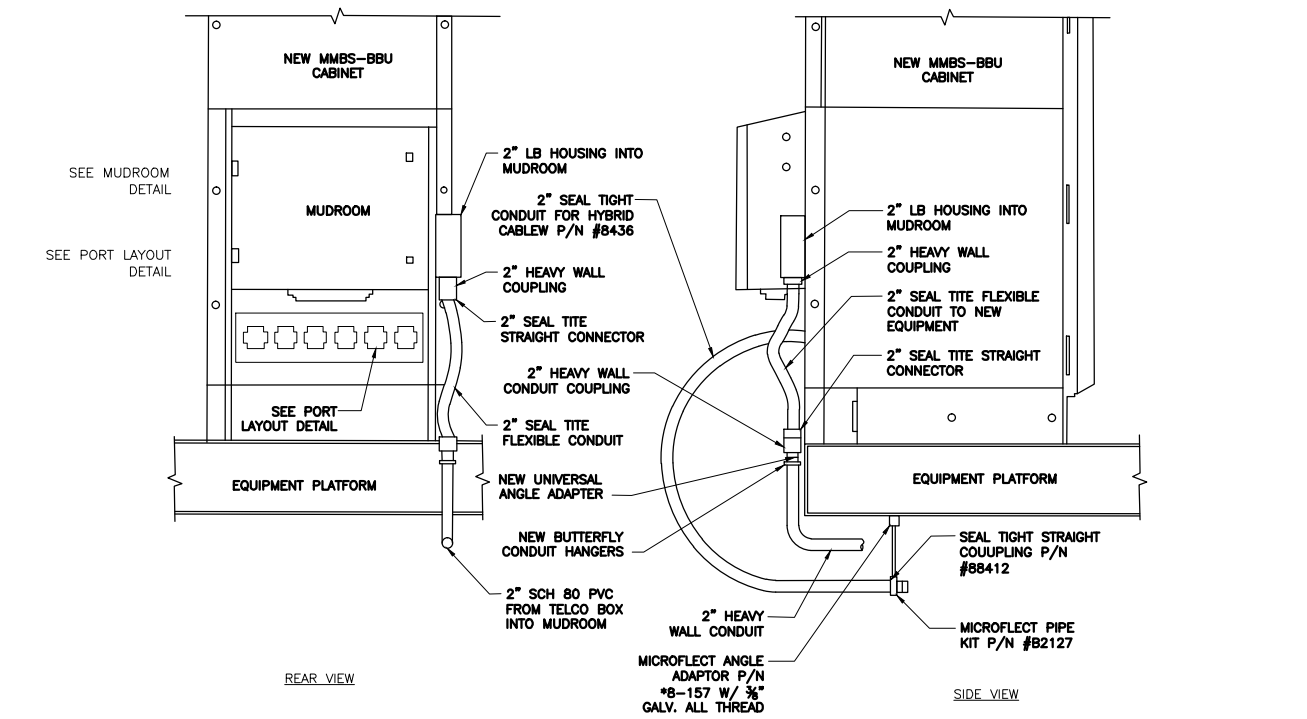
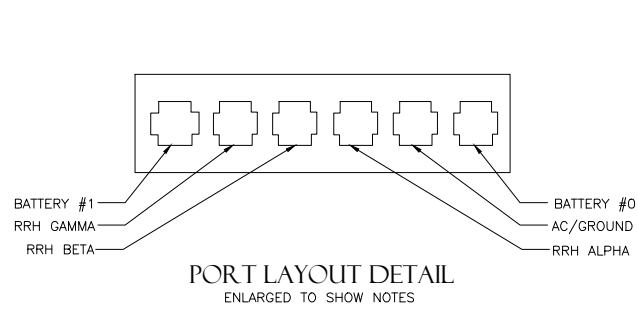
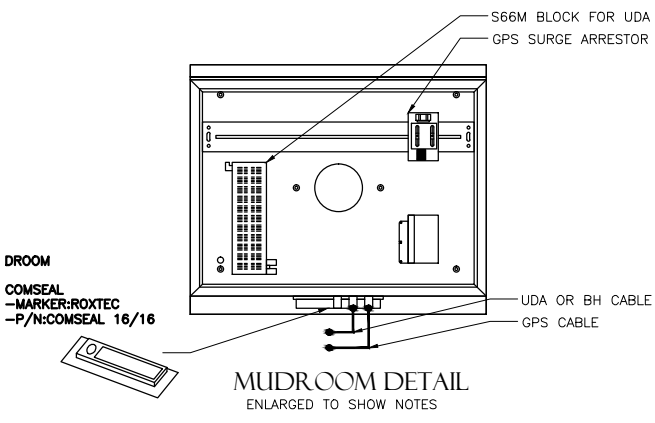
NOTES

1. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1", SCH. 40, GALVANIZED STEEL OF STAINLESS STEEL PIPE. THE PIPE MUST NOT BETHREADED AT THE ANTENNA MOUNT END. THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MIN. OF 18", 8'-0" IF MOUNTING TO NEW MMBS-BBU) USING A HAND OR ROTARY PIPE CUTTER TO ASSURE A SMOOTH AND PERPENDICULAR CUT. A HACK SAW SHALL NOT BE USED. THE CUT PIPE END SHALL BE DEBURRED.
2. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2" OF LEVEL.
3. DO NOT SWEEP TEST GPS ANTENNA
4. ATTACH GPS MOUNTING PIPE TO NEW MMBS-BBU USING (4) 8MMx15MM SS BOLTS AND (4) 1" PIPE STRAPS. GPS TO BE MOUNTED A MIN. OF 2'-0" ABOVE MMBS-BBU CABINET.

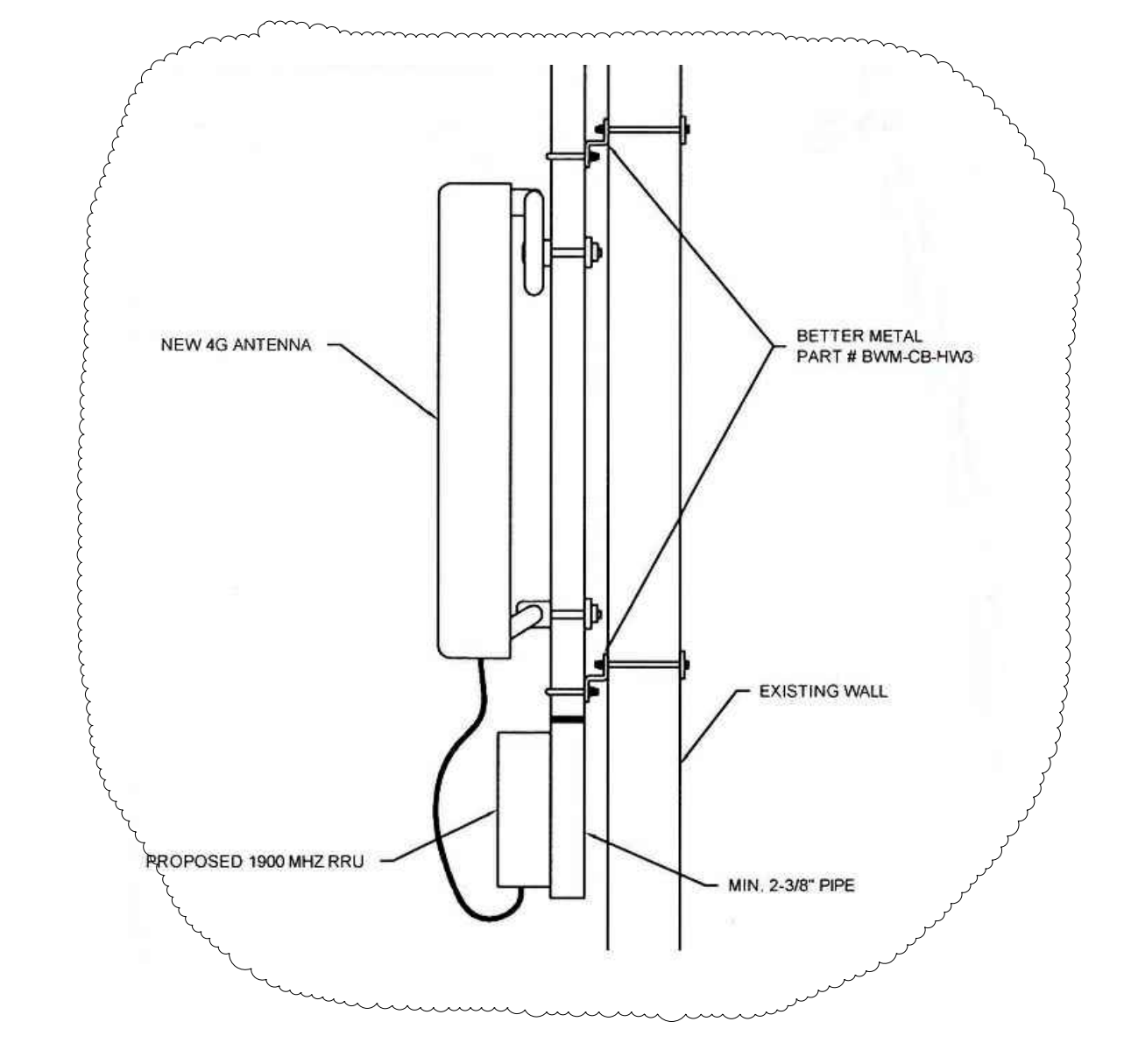
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 11"x17" SCALE: NOT TO SCALE
GPS UNIT PIPE MOUNT 3



22"x34" SCALE: NOT TO SCALE
 11"x17" SCALE: NOT TO SCALE
GPS REQUIREMENTS 4



22"x34" SCALE: NOT TO SCALE
 11"x17" SCALE: NOT TO SCALE
HYBRID AND TELCO LINE SUPPORT DETAIL 5



22"x34" SCALE: NOT TO SCALE
 11"x17" SCALE: NOT TO SCALE
HOLLOW WALL MOUNT DETAIL 6



GENERAL DYNAMICS WIRELESS SERVICES



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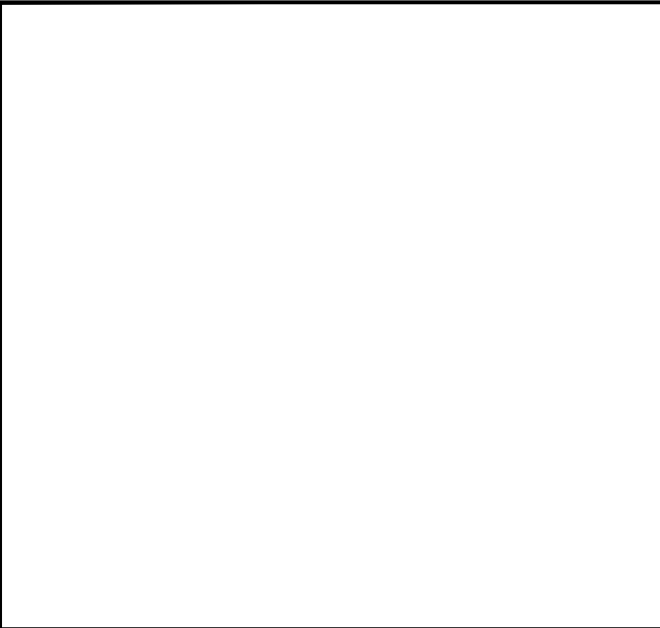
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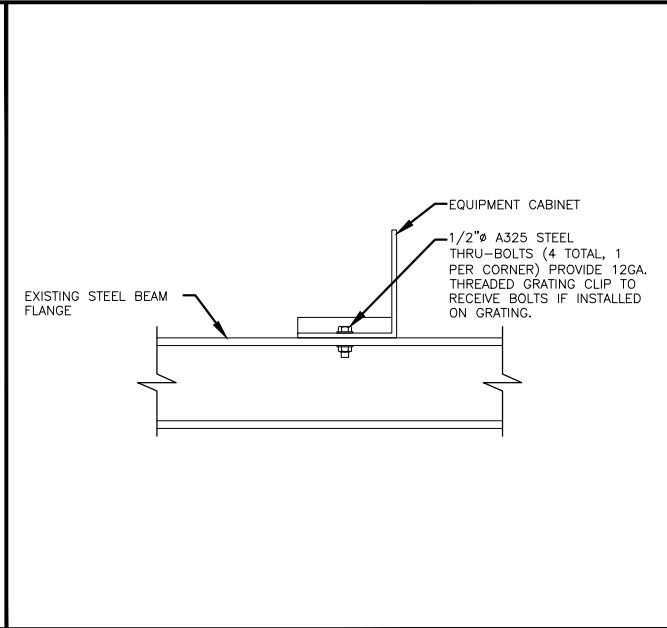
SHEET TITLE:
EQUIPMENT DETAILS

SHEET NUMBER: **A-8**
 REVISION: **D**
PRDS PROJ. NO. 2525-070312



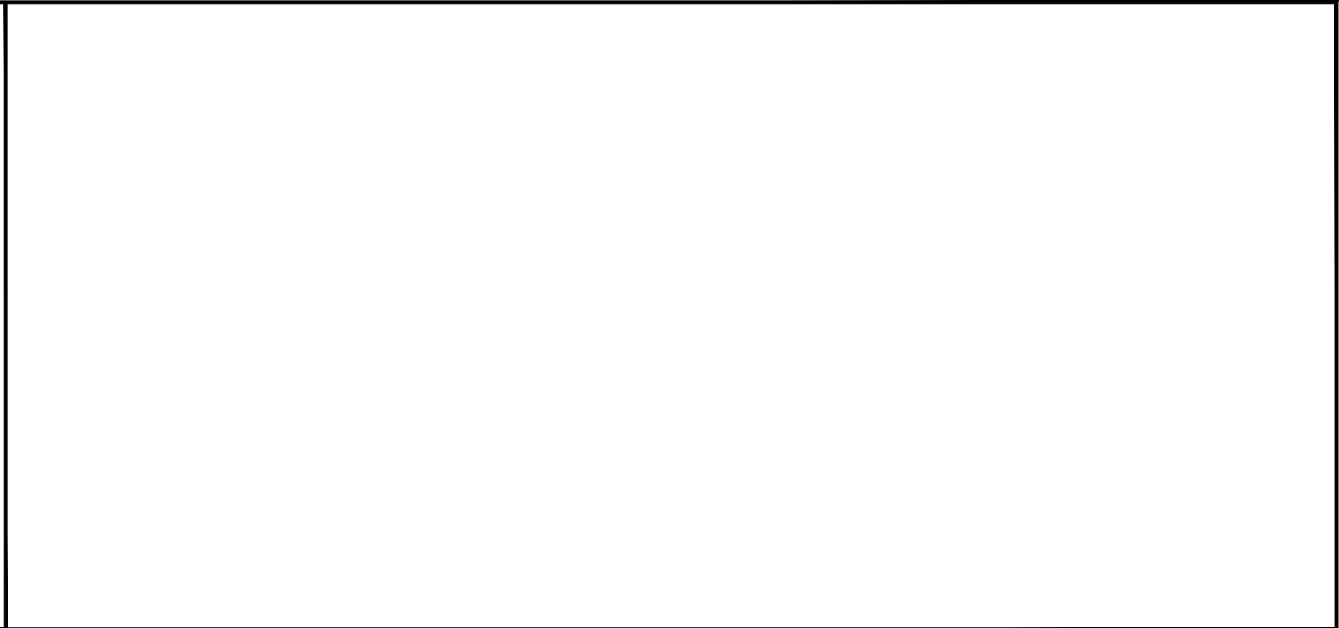
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UTILITY TRENCH DETAIL 1



22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

CABINET ANCHOR DETAIL 2



22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 3

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

ICE BRIDGE DETAIL 4



GENERAL DYNAMICS
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SHEET TITLE:
EQUIPMENT DETAILS

SHEET NUMBER: **A-9** REVISION: **D**
PRDS PROJ. NO. 2525-070312

SECTOR	FIRST RING	SECOND RING	THIRD RING
A	GREEN	NO TAPE	NO TAPE
B	GREEN	GREEN	NO TAPE
G	GREEN	GREEN	GREEN

FREQUENCY COLOR CODE FOR PAIRS AND FIBER CABLES OF HYBRID CABLE		
FREQUENCY COLOR CODE	FIRST RING	SECOND RING
1900 MHz	YELLOW	RED

TYPICAL JUMPER CABLE COLOR CODE			
FREQUENCY	ANTENNA PORT	RRU PORT	CABLE COLOR
1900 MHz	PCS1 -45°	ANT 0	BLUE
	PCS1 +45°	ANT 1	WHITE
	PCS2 -45°	ANT 2	GREEN
	PCS2 +45°	ANT 3	BROWN
	RET	RET	RED

SUPPLIER	SAMSUNG FIBEROPTICS					ASIA TAI		
	LENGTH (FT)	TOTAL (KG)	WEIGHT (LBS)	WEIGHT/LF (KG)	WEIGHT/LF (LBS)	TOTAL (KG)	TOTAL (LBS)	WEIGHT/LF (KG)
TYPE 1	60	13	28	0.2	0.5	19	41	0.3
	75	16	35	0.2	0.5	22	49	0.3
	90	19	42	0.2	0.5	26	57	0.3
	105	30	66	0.3	0.6	29	65	0.3
	120	34	75	0.3	0.6	33	73	0.3
TYPE 2	135	38	85	0.3	0.6	46	101	0.3
	150	43	94	0.3	0.6	51	112	0.3
	165	47	104	0.3	0.6	55	122	0.3
	180	69	151	0.4	0.8	72	160	0.3
TYPE 3	195	75	164	0.4	0.8	78	173	0.3
	210	80	177	0.4	0.8	85	187	0.3
	225	89	196	0.4	0.9	102	224	0.3
TYPE 4	240	95	209	0.4	0.9	109	239	0.3
	255	101	222	0.4	0.9	115	254	0.3
	270	133	293	0.5	1.1	122	270	0.3
TYPE 5	285	141	310	0.5	1.1	152	335	0.3
	300	148	326	0.5	1.1	160	353	0.3
	315	155	342	0.5	1.1	168	371	0.3
	330	163	359	0.5	1.1	176	388	0.3

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7
TOTAL LENGTH	~114'-9.95"	~180'-5.35"	~213'-3.05"	~262'-5.60"	~328'-1"	~420'-0"	~550'-0"
HYBRID POWER CABLE CONFIGURATION	AWG 10 1 PAIR, AWG 12 3 PAIR	AWG 8 1 PAIR, AWG 10 3 PAIR	AWG 6 1 PAIR, AWG 8 1 PAIR, AWG 10 2 PAIR	AWG 6 1 PAIR, AWG 8 3 PAIR	AWG 4 1 PAIR, AWG 6 1 PAIR, AWG 8 2 PAIR	AWG 4 1 PAIR, AWG 6 3 PAIR	AWG 2 1 PAIR, AWG 4 3 PAIR
CABLE DIAMETER	0.98"	1.06"	1.18"	1.18"/1.25"	1.25"	1.56"	1.69"
BENDING RADIUS	11.81"	12.99"	15.35"	17.71"	17.71"	18.00"/30.00"	21.00"/35.00"
OPTIC CABLE	LC/PC-to-LC/PC, SINGLE MODE						
DU CABINET (POWER CABLE TERMINAL MAX SIZE AWG 4)	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE						
RRU POWER CABLE SPEC	AWG 8, 0.57"-0.60" AWG 10, 0.45"-0.48"					8 AWG CABLES 4 PAIRS	
NON USE POWER AND OPTIC CABLE PROTECTION	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE

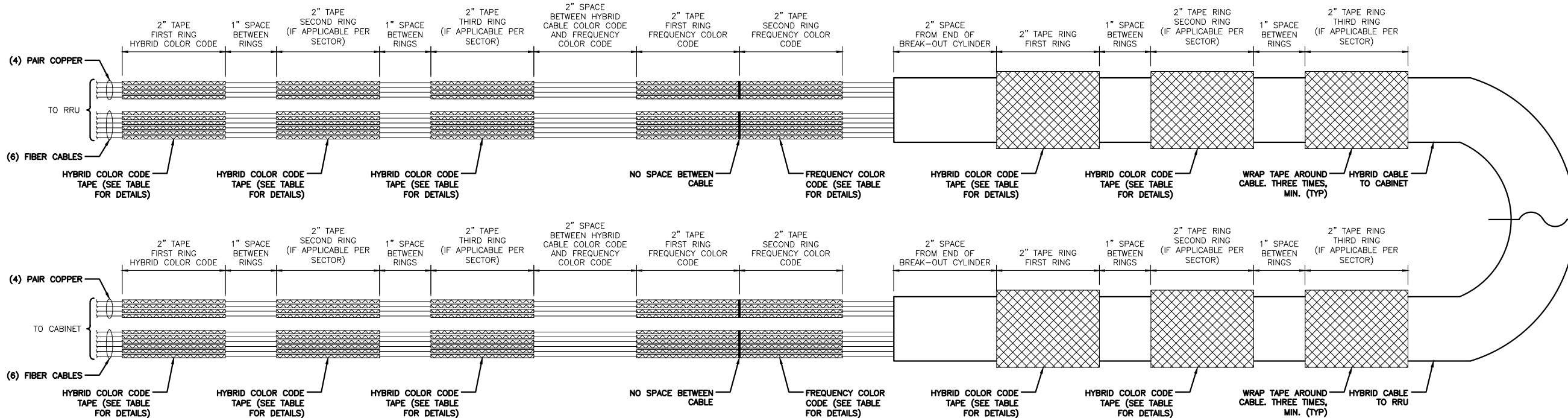
SUPPLIER	TESSCO	
TYPE	LENGTH (FT)	TOTAL WEIGHT (KG) (LBS)
TYPE 6	1000	732 1613
	420	402 887
TYPE 7	1	1 2.2
	550	553 1220

NOTES:
ON HIGH CAPACITY SITES OR ON FOUR-SECTOR SITES NEEDING AN ADDITIONAL LINE AND RRU CONTACT GDOT SITE SUPERVISOR FOR COLOR CODE INFORMATION ON ADDITIONAL LINES.

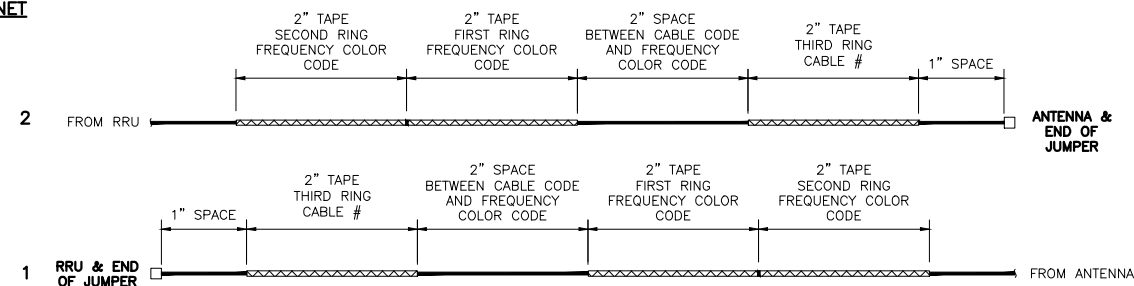
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HYBRID CABLE TYPES 2



HYBRID CABLE CONNECTION AT CABINET



JUMPER CABLE CONNECTION AT RRU AND ANTENNA

NOTE:

- ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE OR STENCIL TAG. COLOR TAPE SHALL BE OBTAINED FROM GRAYBAR ELECTRIC.
- THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM AN END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER, WITH 1" SPACE BETWEEN EACH RING.
- THE HYBRID CABLE COLOR SHALL BE APPLIED IN ACCORDANCE WITH THE "TYPICAL HYBRID CABLE COLOR CODE" TABLE ABOVE FOR THE RESPECTIVE SECTOR.
- INDIVIDUAL POWER PAIRS AND FIBER CABLES SHALL BE LABELED WITH BOTH THE HYBRID CABLE COLOR FOR THE RESPECTIVE SECTOR AND A FREQUENCY COLOR CODE IN ACCORDANCE WITH THE "FREQUENCY COLOR CODE FOR PAIRS AND FIBER CABLES OF HYBRID CABLE" TABLE ABOVE.
- A 2" GAP SHALL SEPARATE THE HYBRID CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.
- THE 2" GAP SHALL SEPARATE THE HYBRID CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.
- THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE HYBRID CABLE OR INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
- COLOR BAND ON JUMPERS SHALL BE 2" WIDE WITH A 2" SPACE.

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HYBRID CABLE COLOR SCHEME DETAIL 3



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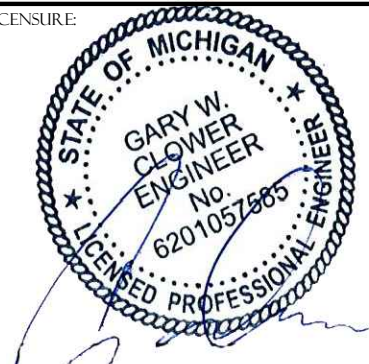
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LICENSURE:



SHEET TITLE:

ANTENNA AND CABLE
COLOR CODING DETAILS

SHEET NUMBER:

RF-1

REVISION:

D

PRDS PROJ. NO.
2525-070312

ELECTRICAL NOTES

- ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL LOCAL AND STATE CODE, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
- CONTRACTOR SHALL COORDINATE WITH LOCAL POWER COMPANY FOR REQUIREMENTS OF POWER SERVICE LINE TO THE METER BASE, WHEN REQUIRED. POWER SERVICE REQUIREMENT IS COMMERCIAL. AC NOMINAL 120/208 VOLT OR 120/240 VOLT, SINGLE PHASE WITH 200 AMP RATING.
- CONTRACTOR SHALL COORDINATE WITH LOCAL TELEPHONE COMPANY FOR SERVICE LINE REQUIREMENTS TO TERMINATE AT THE PPC CABINET.
- CONTRACTOR SHALL FURNISH AND INSTALL ELECTRIC METER BASE AND 200A DISCONNECT SWITCH PER SITE PLAN DETAIL DRAWINGS AND PER LOCAL UTILITY COMPANIES SPECIFICATION, WHEN REQUIRED. THE METER BASE SHOULD BE LOCATED IN A MANNER WHERE ACCESSIBLE BY THE LOCAL POWER COMPANY.
- LOCAL POWER COMPANY SHALL PROVIDE 200 AMP ELECTRIC METER. CONTRACTOR SHALL COORDINATE INSTALLATION OF METER WITH LOCAL POWER COMPANY.
- UNDERGROUND POWER AND TELCO SERVICE LINES SHALL BE ROUTED IN A COMMON TRENCH. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 AND CONDUIT EXPOSED ABOVE GROUND SHALL BE GALVANIZED RIGID STEEL TUBING UNLESS OTHERWISE INDICATED.
- ALL TELCO CONDUIT LINES SHALL BE 4" SCH. 40 PVC CONDUIT UNLESS OTHERWISE INDICATED. THE TELCO CONDUIT FROM THE PPC SHALL BE ROUTED AND TERMINATED AT DESIGNATED TELCO DEMARCATION OR 2-FOOT OUTSIDE FENCED AREA, NEAR UTILITY POLE (IN FENCED AREA), OR END CAP OFF AND PROVIDE MARKER STAKE PAINTED BRIGHT ORANGE WITH DESIGNATION FOR TELCO SERVICE.
- CONDUITS INSTALLED AT PCS EQUIPMENT ENDS PRIOR TO THE EQUIPMENT INSTALLATION SHALL BE STUBBED AND CAPPED AT 6" ABOVE GRADE OR PLATFORM. IF SERVICE LINES CAN'T BE INSTALLED INITIALLY, PROVIDE NYLON PULL CORD IN CONDUITS.
- THE SPRINT CABINET, INCLUDING 200 AMP LOAD PANEL AND TELCO PANEL, SHALL BE PROVIDED BY OWNER AND INSTALLED BY THE CONTRACTOR. CONTRACTOR IS TO INSTALL BREAKER(S) NOT PROVIDED BY MANUFACTURER. SEE PANEL SCHEDULE ON THIS SHEET FOR BREAKER REQUIREMENTS.
- LOCATION OF ELECTRIC METER AND DISCONNECT SWITCH TO BE PROVIDED BY GENERAL CONTRACTOR.
- CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTOR'S FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
- LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO ROUGH-IN.
- THE CONDUIT RUNS AS SHOWN ON THE PLANS ARE APPROXIMATE. EXACT LOCATION AND ROUTING SHALL BE PER EXISTING FIELD CONDITIONS.
- PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.

ELECTRICAL NOTES (CON'T)

- ALL CONDUITS SHALL BE MET WITH BENDS MADE IN ACCORDANCE WITH NEC TABLE 346-10. NO RIGHT ANGLE DEVICE OTHER THAN STANDARD CONDUIT ELBOWS WITH 12" MINIMUM INSIDE SWEEPS FOR ALL CONDUITS 2" OR LARGER.
- ALL CONDUIT TERMINATIONS SHALL BE PROVIDED WITH PLASTIC THROAT INSULATING GROUNDING BUSHINGS.
- ALL WIRE SHALL BE "TYPE THWN, SOLID, ANNEALED COPPER UP TO SIZE 1/10 AWG (18 AND LARGER SHALL BE CONCENTRIC STRANDED) 75 DEGREE C, (167 DEGREES F), 98" CONDUCTIVITY. MINIMUM #12.
- ALL WIRES SHALL BE TAGGED AT ALL PULL BOXES, J-BOXES, EQUIPMENT BOXES AND CABINETS WITH APPROVED PLASTIC TAGS, ACTION CRAFT, BRADY, OR APPROVED EQUAL.
- ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
- CONDUIT ROUGH-IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION TO CONFLICTS. VERIFY WITH MECHANICAL CONTRACTOR AND COMPLY AS REQUIRED.
- ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN NOT HAND WRITTEN.
- INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULLBOXES, AND ALL DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
- THE CONTRACTOR SHALL PREPARE AS-BUILT DRAWINGS. DOCUMENT ANY AND ALL WIRING AND EQUIPMENT CONDITIONS AND CHANGES WHILE COMPLETING THIS CONTRACT. SUBMIT AT SUBSTANTIAL COMPLETION.
- ALL DISCONNECT SWITCHES AND OTHER CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM (NO EXCEPTIONS.) PROVIDE SAMPLE FOR CONSTRUCTION MANAGER'S APPROVAL.
- ALL ELECTRICAL DEVICES AND INSTALLATIONS OF THE DEVICES SHALL COMPLY WITH (ADA) AMERICANS WITH DISABILITIES ACT AS ADOPTED BY THE APPLICABLE STATE.
- PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT CONSTRUCTION MANAGERS AND THE PROPERTY OWNER'S APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
- ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN AND SOME EQUIPMENT CHARACTERISTICS MAY VARY FROM DESIGN AS SHOWN ON THESE DRAWINGS).
- LOCATION OF ALL OUTLET, BOXES, ETC., AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH-IN.

SITE NUMBER:	T.B.D.	MODEL NUMBER:	TBD	WIRE:	3
VOLTAGE:	240V/120	PHASE:	1	A/C:	YES
MAIN BREAKER:	200 AMP	BUSS RATING:	200 AMPS	GROUND BAR:	FIELD VERIFY
MOUNT:	SURFACE	NEUTRAL BAR:	YES		
ENCLOSURE TYPE:	NEMA 3R	N to GROUND BOND:	FIELD VERIFY		
PANEL STATUS:	EXISTING	INTERNAL TVSS:	YES		

CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	BTS	100	2	ON	ON	2	60	SURGE PROTECTION	2
3	--	--	--	ON	ON	--	--	--	4
5	BLANK	--	--	N/A	N/A	1	10	TELCO FAN	6
7	SAMSUNG MMBS CABINET	100	2	NEW	ON	1	20	GFCI	8
9	--	--	--	NEW	ON	1	20	LIGHT	10
11	SAMSUNG BBU CABINET	15	1	NEW	N/A	--	--	BLANK	12
13	BLANK	--	--	N/A	N/A	--	--	BLANK	14
15	BLANK	--	--	N/A	N/A	--	--	BLANK	16
17	BLANK	--	--	N/A	N/A	--	--	BLANK	18
19	BLANK	--	--	N/A	N/A	--	--	BLANK	20
21	BLANK	--	--	N/A	N/A	--	--	BLANK	22
23	BLANK	--	--	N/A	N/A	--	--	BLANK	24

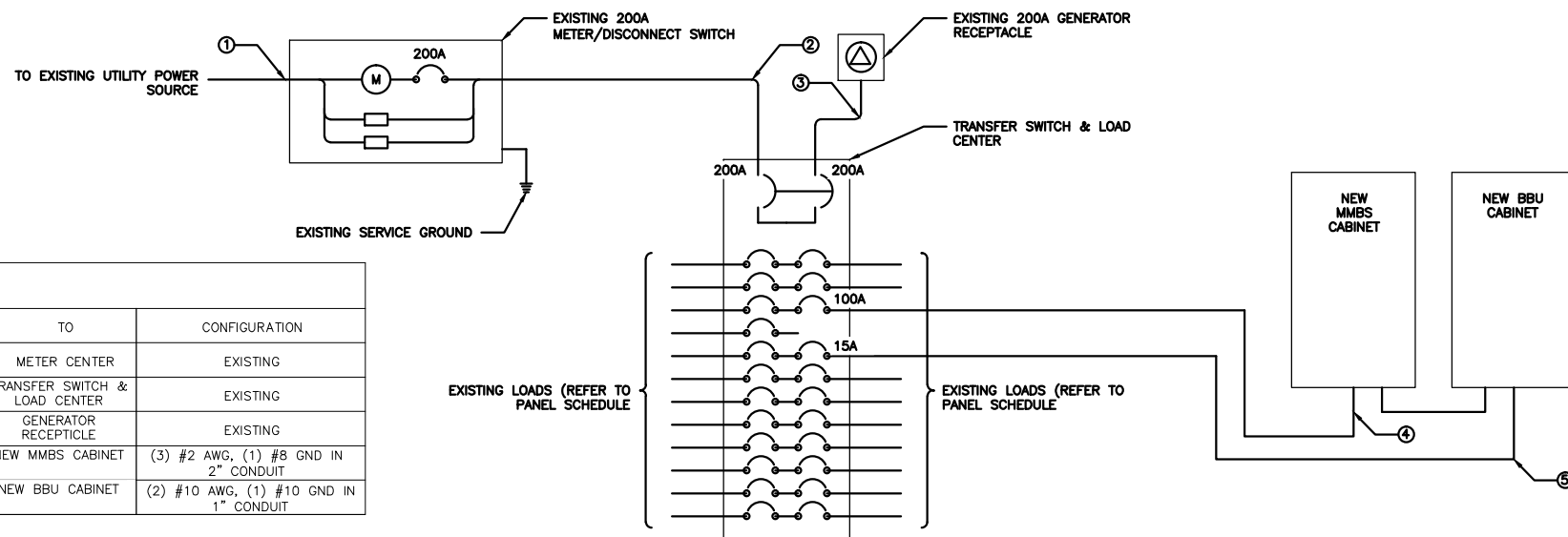
NOTES

GENERAL CONTRACTOR TO CHECK REQUIREMENTS WITH LOCAL POWER COMPANY AND JURISDICTION. ADDITIONAL SUB PANEL OFF THE PPC CABINET MIGHT BE REQUIRED TO FEED NEW NETWORK VISION EQUIPMENT.

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

ELECTRICAL NOTES 1

ELECTRICAL PANEL SCHEDULE 2



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ELECTRICAL ONE-LINE DIAGRAM 3



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DOWNTOWN ANN ARBOR
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220 N ASHLEY STREET
ANN ARBOR, MI 48104
WASHTENAW COUNTY

ISSUE DATE: 06-18-2013

ISSUED FOR: CONSTRUCTION DWGS

REVISIONS

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LICENSURE:



SHEET TITLE:

ONE-LINE DIAGRAM & POWER PANEL SCHED.

SHEET NUMBER:

E-1

REVISION:

D

PRDS PROJ. NO. 2525-070312



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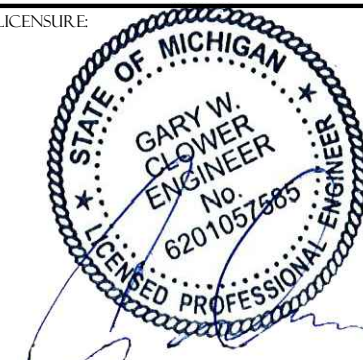
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LICENSURE:



SHEET TITLE:

DC POWER ONE-LINE
DIAGRAM

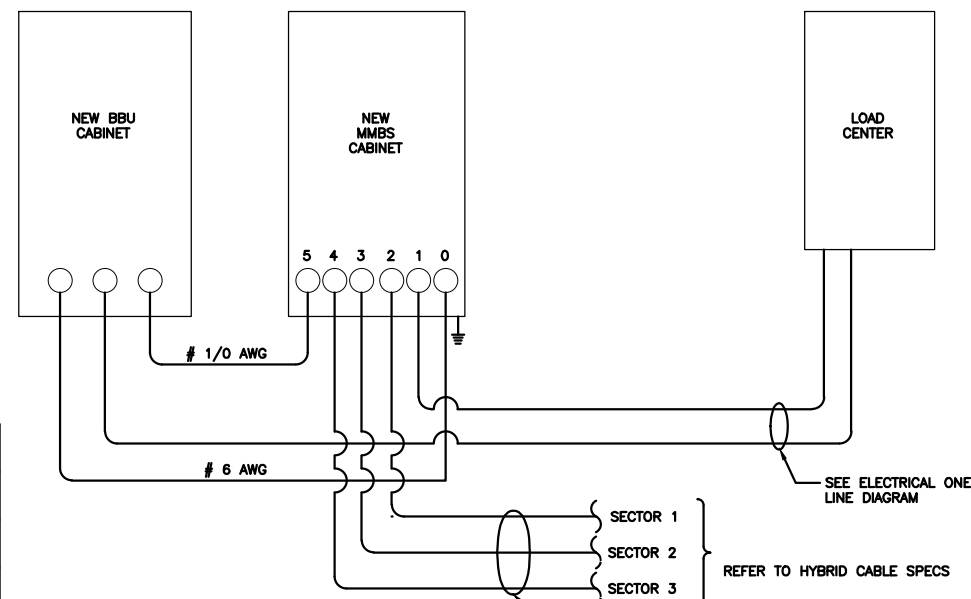
SHEET NUMBER:

E-2

REVISION:

D

PRDS PROJ NO.
2525-070312



MMBS PORT LAYOUT

CONDUIT NO.	USAGE
0	BATTERY
1	AC/GROUND
2	RRU SECTOR 1
3	RRU SECTOR 2
4	RRU SECTOR 3
5	BATTERY

DC POWER ELECTRICAL NOTES:

1. MINIMUM CABLE LENGTH BETWEEN THE OU AND BATTERY IS 70MM (2.75 in)
2. MAXIMUM CABLE LENGTH DISTANCE IS 900mm (35.43 in). WEATHER PROOFING SHALL INCORPORATE PPC WEATHERPROOFING TAPE KIT, COLD SHRINK SHALL NOT BE USED.
3. ROUTE DC CONDUCTORS IN CONDUITS TO NEW MMBS CABINET 48VDC POWER DISTRIBUTION PANEL TO AND FROM NEW BBU CABINET.
4. -48 VDC CABLES BETWEEN NEW MMBS CABINET & RRU'S ARE FACTORY ASSEMBLED AND EQUIPED WITH ONE PRE-TERMINATED END.
5. ALL FIELD INSTALLED DC CABLING SHALL BE TYPE RHH/RHW AND SHALL BE UL THERMOSET INSULATED.

DC CABLING WITHIN PRE
MANUFACTURED HYBRID CABLES

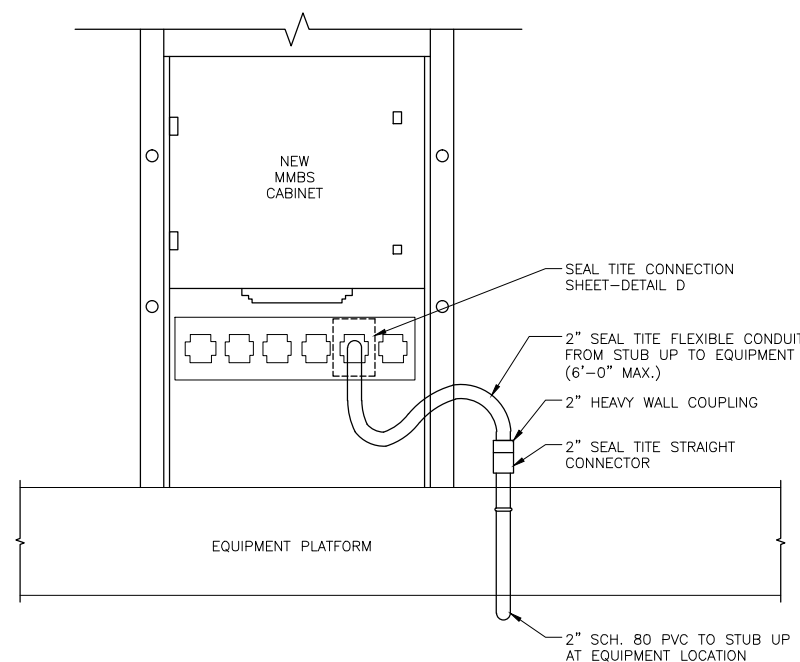
REFER TO HYBRID CABLE SPECS

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

DC POWER DIAGRAM 1

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 2



22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

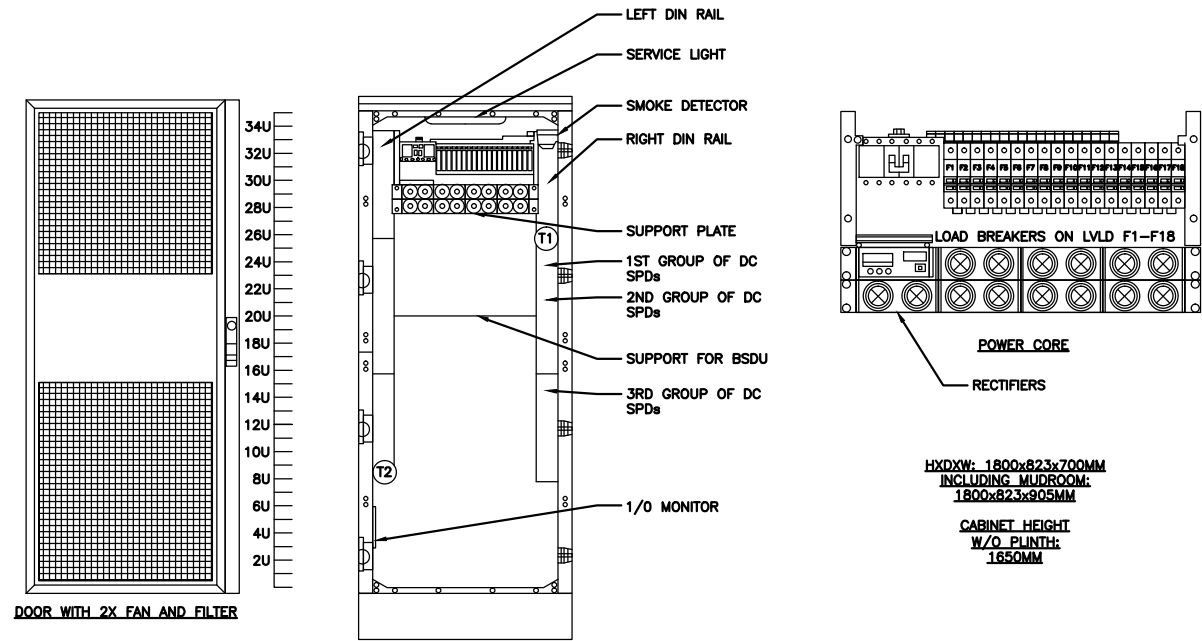
EQUIP. POWER CONDUIT CONNECTIONS 3

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

SEAL TITE POWER CONDUIT CONNECTION 4

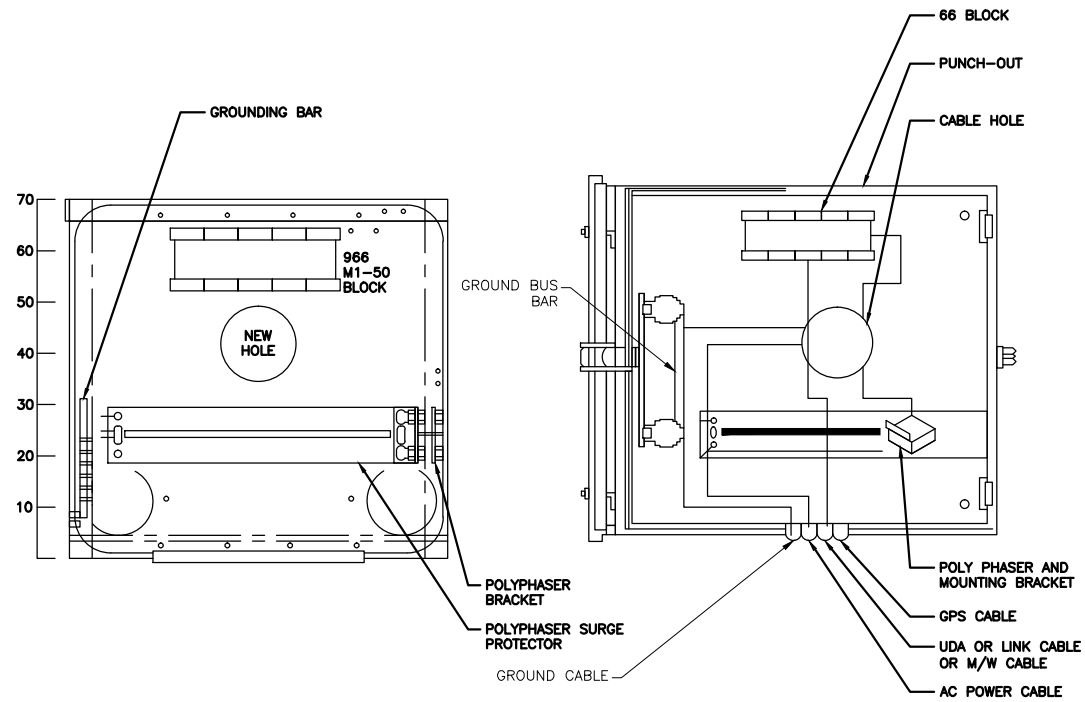
22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 5



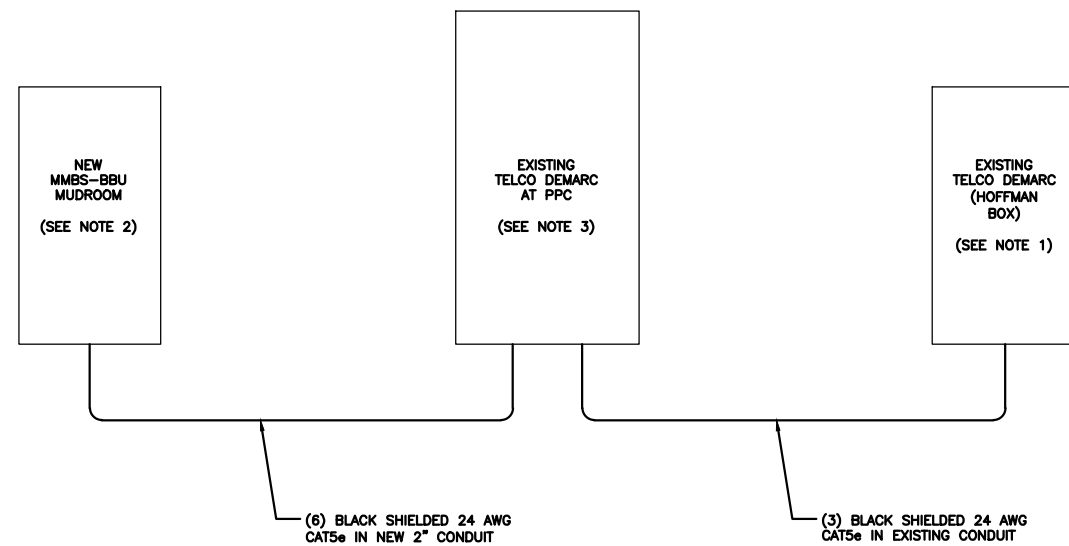
22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

MMBS-BBU ELECTRICAL DETAILS 1



22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

MUDROOM ELECTRICAL DETAIL 2



NOTES:

1. CONTRACTOR TO INSTALL NEW 66 BLOCK IN EXISTING HOFFMAN BOX AT SITES MAIN TELCO DEMARC.
2. CONTRACTOR SHALL INSTALL RJ-45 ENDS ON ALL (6) RUNS OF CAT5e INTO MMBS-BBU MUDROOM.
3. CONTRACTOR TO INSTALL NEW 66 BLOCK IN EXISTING TELCO BOX NEXT TO EXISTING PPC CABINET.

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

TELCO RISER DETAIL 3

22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

NOT USED 4



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LICENSURE:



SHEET TITLE:

ELECTRICAL DETAILS
OUTDOOR SPECIFICATIONS

SHEET NUMBER:

E-3

REVISION:

D

PRDS PROJ. NO.
2525-070312



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SHEET TITLE:

CONDUIT ROUTING

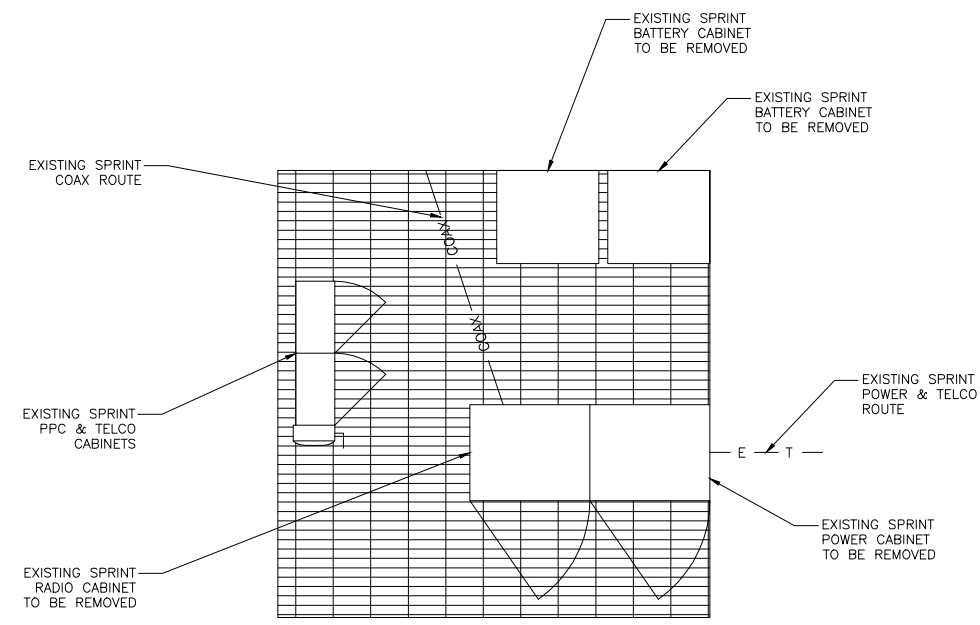
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E-4

REVISION:

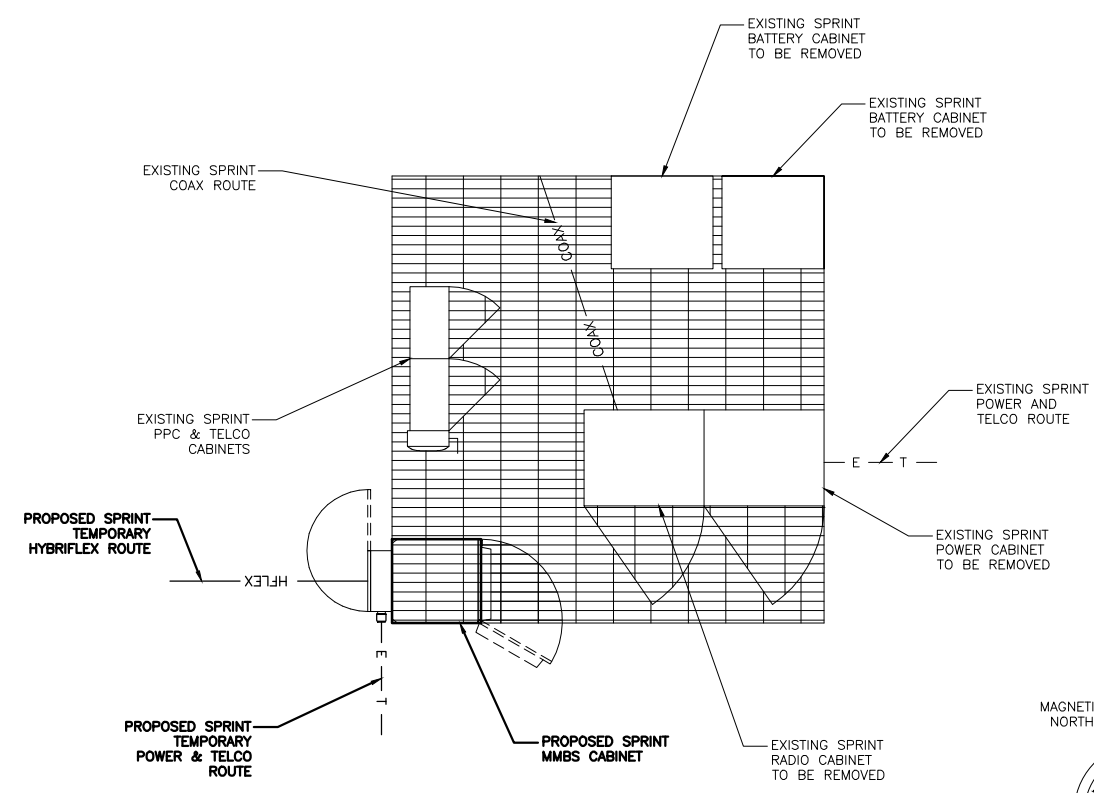
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2525-070312



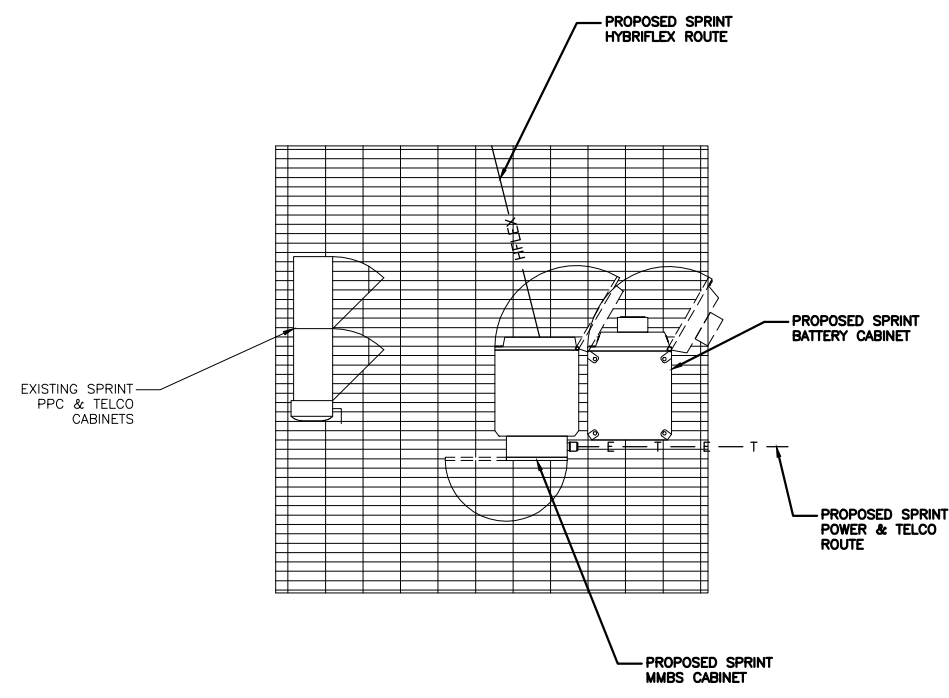
22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

EXISTING ROUTING PLAN 1



22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

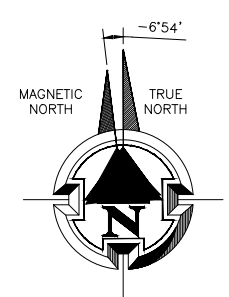
NEW TEMP. ROUTING PLAN (INTERIM) 2



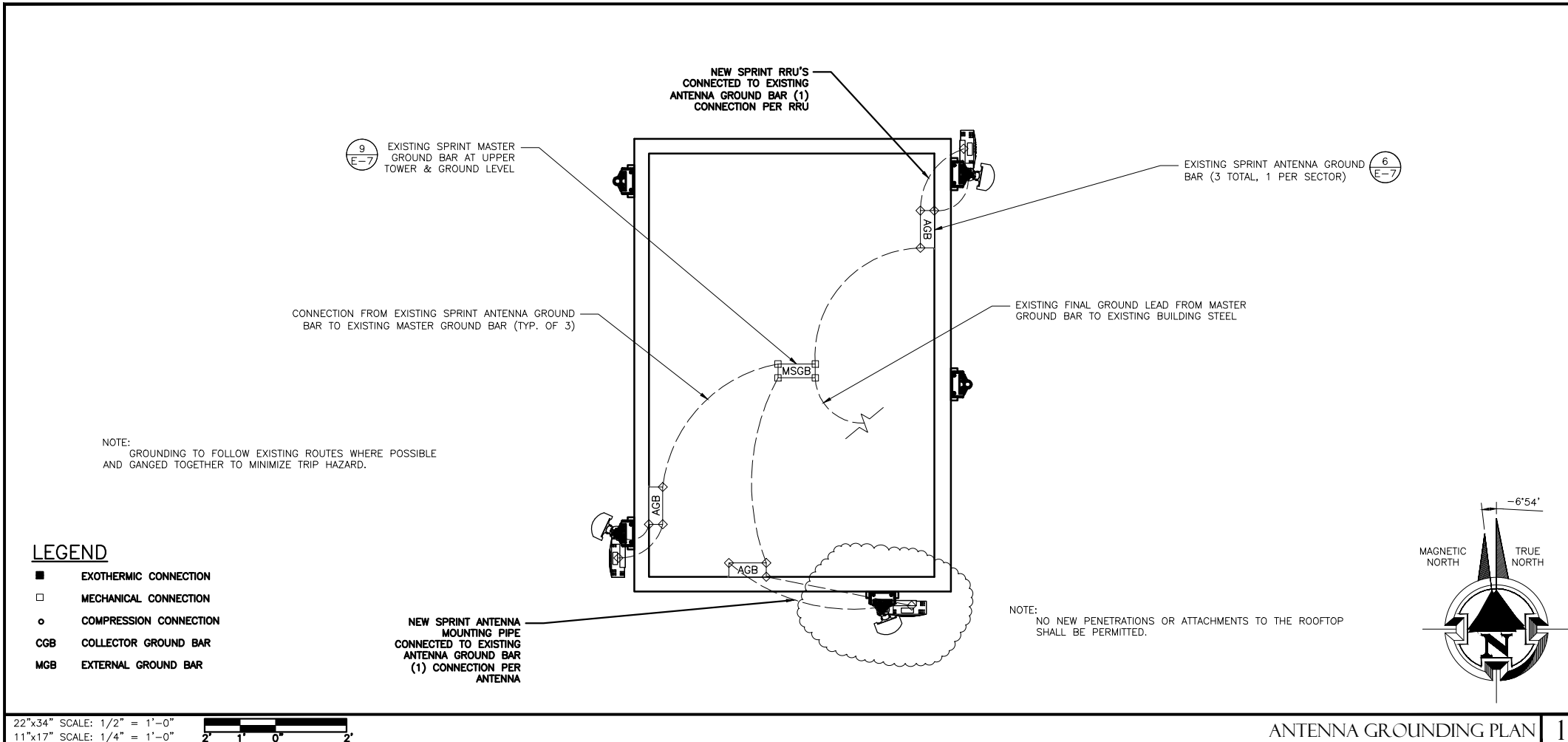
22"x34" SCALE: 3/8" = 1'-0"
11"x17" SCALE: 3/16" = 1'-0"

NEW ROUTING PLAN (FINAL) 3

NOTE: STRUCTURAL ANALYSIS MUST BE
PERFORMED ON ALL ROOFTOPS, FLAGPOLES
AND TOWER SITES BEFORE INSTALLATION OF NEW ANTENNAS,
NEW RRUS, & NEW CABINETS/TEMPORARY PLATFORMS.
STRUCTURAL ANALYSIS PROVIDED BY GENERAL DYNAMICS.



NOT USED 4

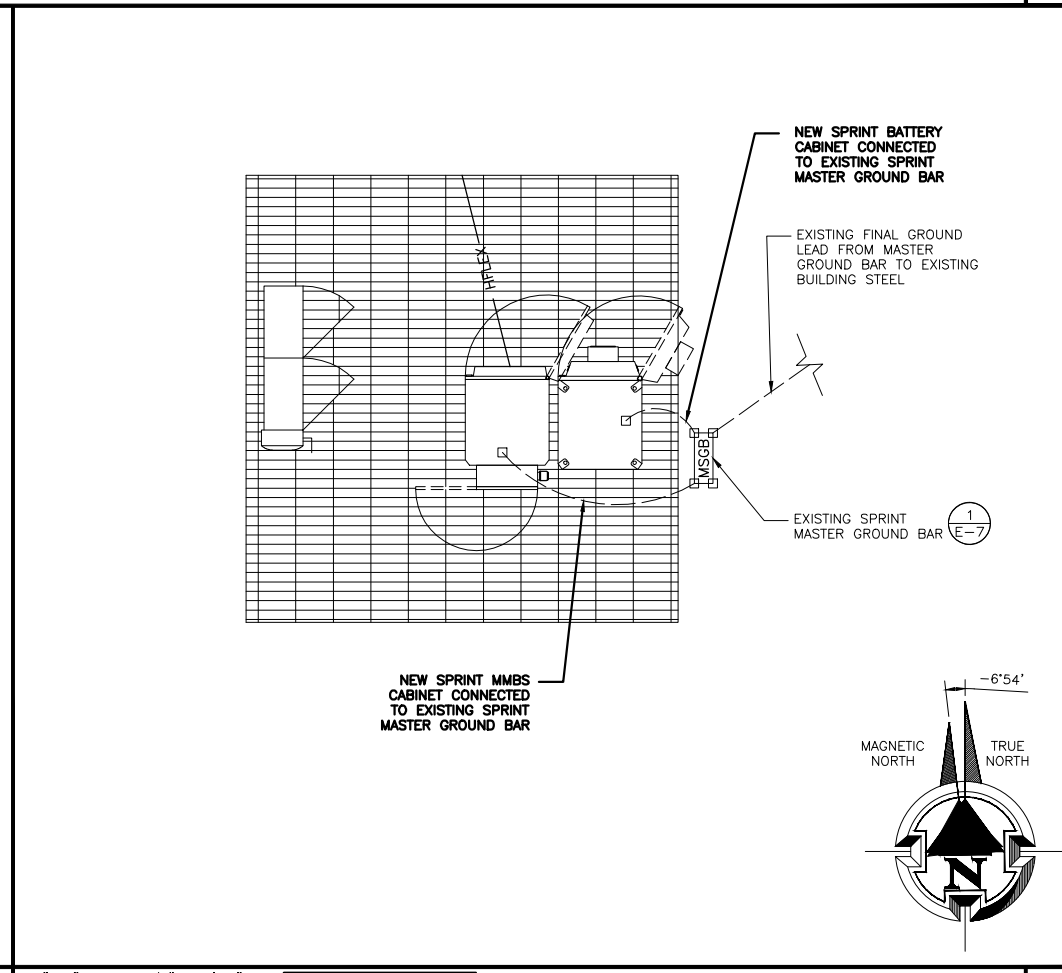
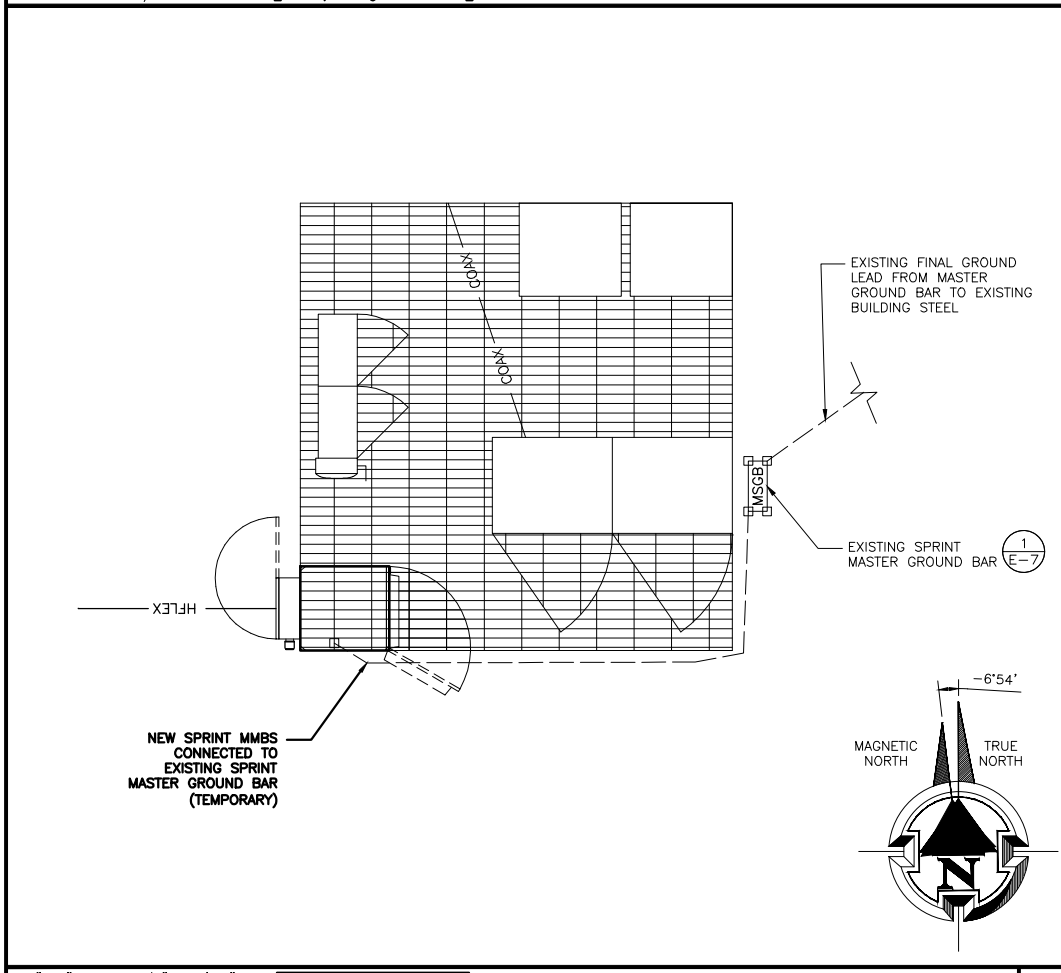


1. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
2. GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING GROUND WIRES AND CONNECT TO SURFACE MOUNTED BUS BARS. FOLLOW ANTENNA AND BTS MANUFACTURERS PRACTICES FOR GROUNDING REQUIREMENTS. GROUND COAX SHIELD AT BOTH ENDS AND EXIT FROM TOWER OR POLE USING MFR'S PRACTICES.
3. ALL GROUND CONNECTIONS SHALL BE EXOTHERMIC. ALL WIRES SHALL BE COPPER THHN/THWN. ALL GROUND WIRE SHALL BE GREEN INSULATED WIRE ABOVE GROUND.
4. CONTRACTOR TO VERIFY AND TEST GROUND TO SOURCE. GROUNDING AND OTHER OPERATIONAL TESTING WILL BE WITNESSED BY SPRINT WIRELESS, LLC. REPRESENTATIVE.
5. REFER TO DIVISION 16 GENERAL ELECTRIC; GENERAL ELECTRICAL PROVISION AND COMPLY WITH ALL REQUIREMENTS OF GROUNDING STANDARDS.
6. ELECTRICAL CONTRACTOR TO PROVIDE DETAILED DESIGN OF GROUNDING SYSTEM PER SPRINT STANDARD GROUNDING METHOD, AND RECEIVE APPROVAL OF DESIGN BY AUTHORIZED SPRINT MOBILITY REPRESENTATIVE, PRIOR TO INSTALLATION OF GROUNDING SYSTEM. PHOTO DOCUMENT ALL EXOTHERMIC AND GROUND RING
7. NOTIFY CONSTRUCTION MANAGER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.
8. ALL EXISTING GROUND BARS, WIRES & CONNECTIONS SHALL BE FIELD VERIFIED. ANY DEFICIENT ITEMS SHALL BE REPLACED AS REQUIRED TO ACHIEVE ADEQUATE GROUNDING REQUIRED BY SPRINT.

GENERAL GROUNDING NOTES

GROUNDING NOTES

1. EXOTHERMIC WELDS (2). 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.
3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK HEAT-SHRINKING TUBE, 600 VOLT INSULATION ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
7. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
8. WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
9. SUPPLIED AND INSTALLED BY CONTRACTOR.
10. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN EXISTING TOWER, THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE TOWER OWNER PRIOR TO MOUNTING THE GROUNDING BAR TO THE TOWER.
11. EXTEND TWO (2) 2 AWG TINNED CU CONDUCTOR FROM BURIED GROUNDING RING AND CONNECT TO THE NEW TOWER. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR GROUNDING CONNECTIONS TO THE TOWER. (APPLICABLE TO NEW TOWERS ONLY.)
12. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, ANTENNA LOCATION, AND CONNECTION ORIENTATION. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BARS AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.
13. EXPOSED GROUND WIRES TO BE NON METALLIC LIQUID TIGHT.



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SHEET TITLE: **GROUNDING PLAN**

SHEET NUMBER: **E-5** REVISION: **D**
PRDS PROJ. NO. 2525-070312



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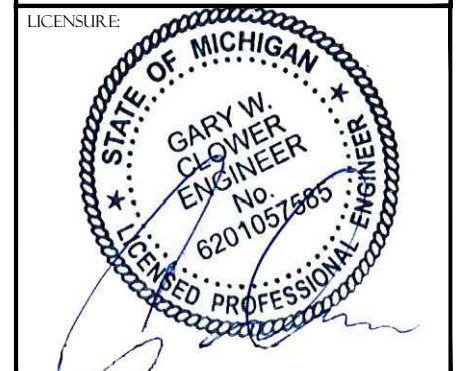
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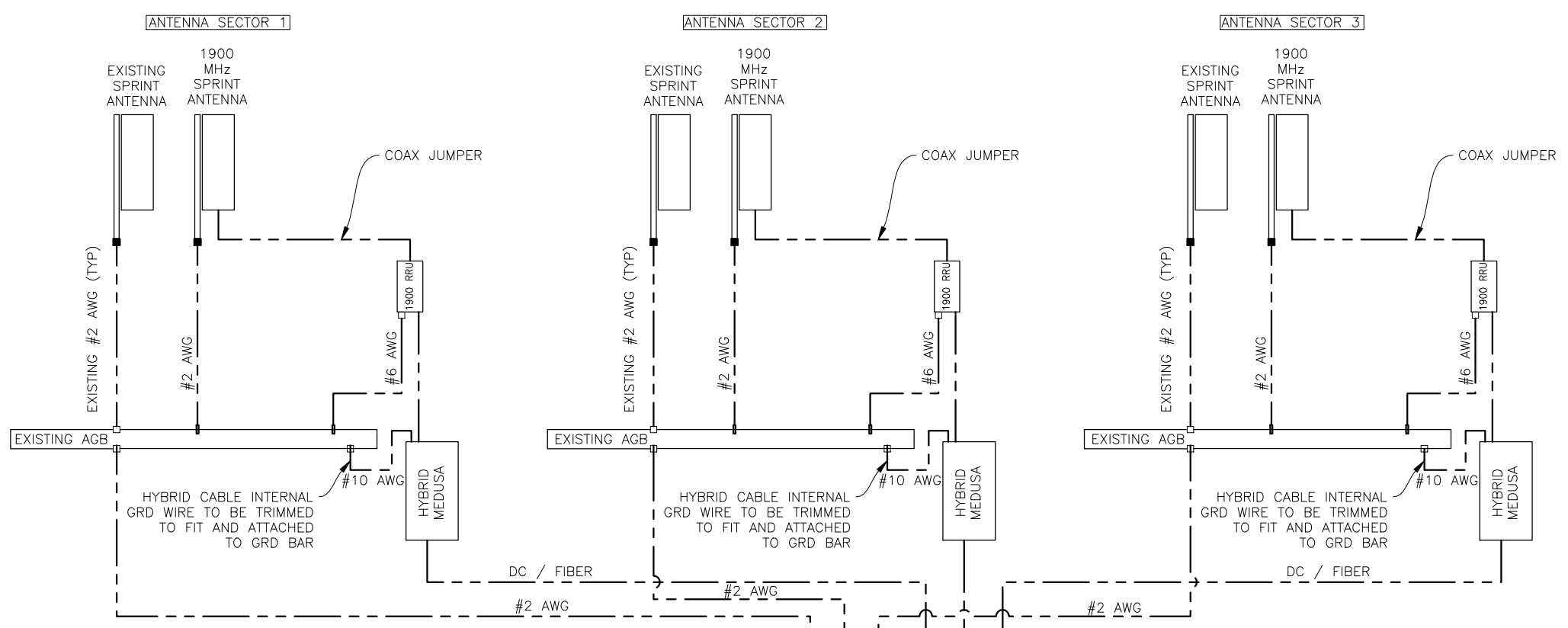


SHEET TITLE:

GROUNDING DETAILS

SHEET NUMBER: E-6 REVISION: D

PRDS PROJ. NO. 2525-070312

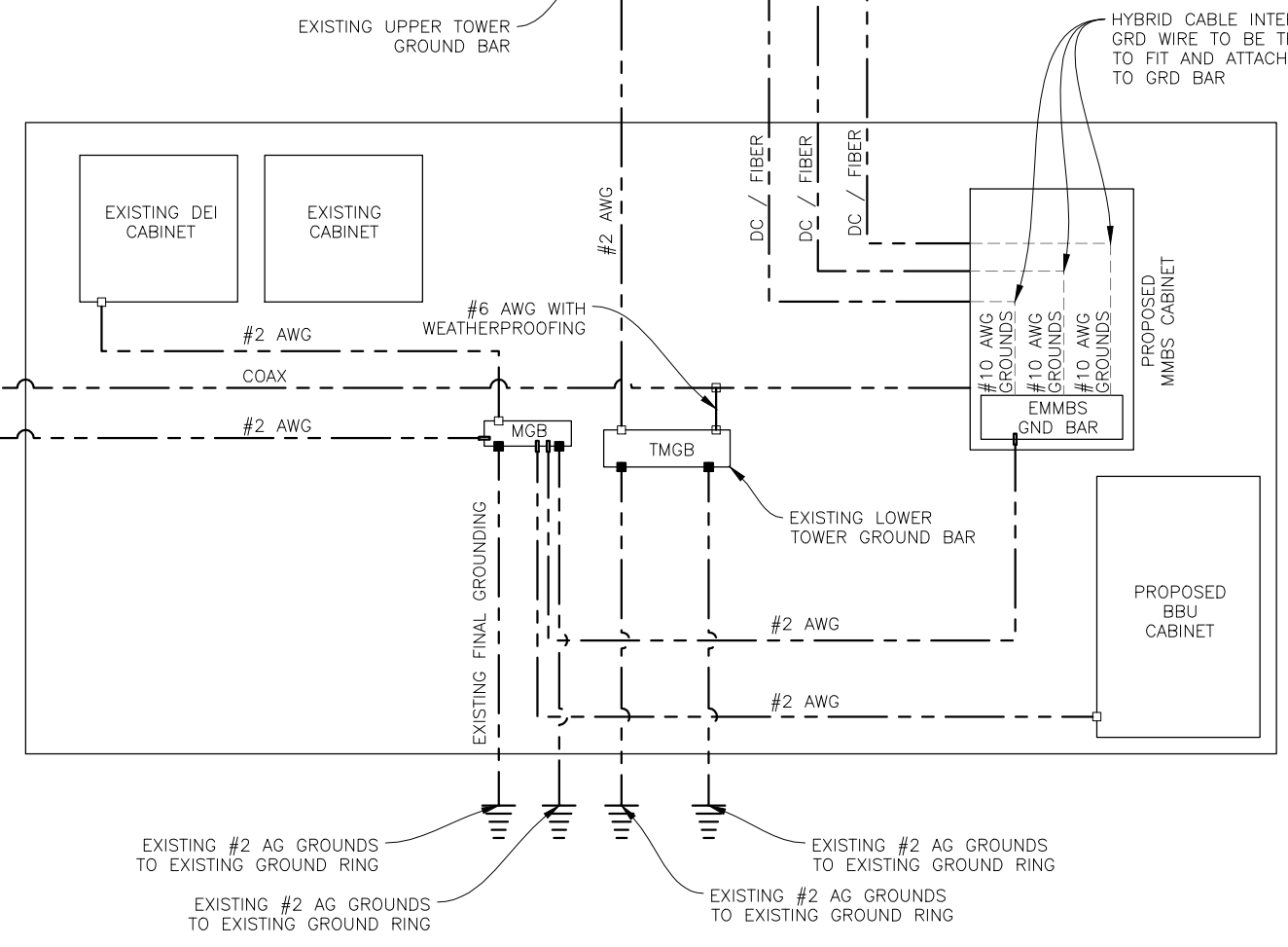


GROUNDING NOTES

- ALL BELOW GRADE CONNECTIONS SHALL BE MADE BY EXOTHERMIC WELDS. EXOTHERMIC WELDS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, ETC. ALL CABLE TO GROUND RODS, GROUND RODS SPLICES AND LIGHTING PROTECTIONS SYSTEM AS INDICATED. GROUND FOUNDATION ONLY AS INDICATED BY PM. ALL MATERIALS USED (MOLDS, WELDING, METAL, TOOLS, ETC.) SHALL BE EXOTHERMIC WELDED AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND PROCEDURES. GROUND CONDUCTOR SHALL HAVE A MINIMUM 24" BENDING RADIUS.
- ALL EXOTHERMIC WELD CONNECTIONS ON GALVANIZED SURFACES SHALL BE CLEANED THOROUGHLY AND COLORED TO MATCH SURFACE WITH (2) TWO COATS OF GALVITE (WHITE) PAINT. OR SILVERBRITE (ALUMINUM).
- ALL ELECTRICAL & MECHANICAL GROUND CONNECTIONS SHALL HAVE ANTIOXIDANT COMPOUND APPLIED TO CONNECTION.
- GROUND TESTS SHALL BE PERFORMED AS REQUIRED BY SPRINT STANDARD PROCEDURES. GROUND GRID RESISTANCE SHALL NOT EXCEED 5-OHMS.
- CONTRACTOR SHALL SUBMIT THE GROUND RESISTANCE TEXT REPORT AS FOLLOW:
 - ONE (1) COPY TO OWNER REPRESENTATIVE
 - ONE (1) COPY TO ENGINEER
 - ONE (1) COPY TO KEEP INSIDE EQUIPMENT INCLOSURE
- ALL RADIO EQUIPMENT AND UTILITY CABINETS GROUNDS LEADS TO BE #2 AWG STRANDED GREEN JACKETED FROM BUSS TERMINAL.
- FOR ADDITIONAL GROUNDING NOTES SEE N-1 OR N-2.
- ALL ANTENNA MOUNT GROUNDS SHALL BE #2 AWG SOLID GREEN JACKETED CABLE GROUNDS SHALL BE BLACK FROM MFR.
- ALL GROUND WIRES FROM GROUND BARS TO GROUND SHALL BE #2 AWG SOLID BARE AS REQUIRED.
- ALL ABOVE GROUND WIRES SHALL BE GREEN JACKETED. ALL GROUND WIRES PENETRATING INTO GROUND AND BELOW SHALL BE SOLID BARE.

LEGEND

- EXOTHERMIC CONNECTION
- ⊔ MECHANICAL CONNECTION
- COMPRESSION CONNECTION
- AGB ANTENNA GROUND BAR
- MGB EXTERNAL GROUND BAR
- TMGB TOWER MASTER GROUND BAR



22"x34" SCALE: NOT TO SCALE
11"x17" SCALE: NOT TO SCALE

GROUNDING RISER DIAGRAM 1



POWDER RIVER
Development Services, LLC
100 E. SHENANGO STREET
SHARPSVILLE, PA 16150
724.962.5999
www.powderriverdev.com

PROJECT INFORMATION:
NETWORK VISION MMBS LAUNCH

DOWNTOWN ANN ARBOR

DE03XC208
220 N ASHLEY STREET
ANN ARBOR, MI 48104
WASHTENAW COUNTY

ISSUE DATE: 06-18-2013

ISSUED FOR: CONSTRUCTION DWGS

REVISIONS

REV.	DATE	DESCRIPTION	INITIALS
A	09/06/12	ISSUED FOR CDs 90%	SMM
B	09/26/12	ISSUED FOR CDs 100%	JED
C	10/01/12	ISSUED FOR CDs FINALS	JED
D	06/18/13	ISSUED FOR REVISED FINALS	JED

NOT FOR CONSTRUCTION UNLESS LABELED AS CONSTRUCTION SET

LICENSURE:



SHEET TITLE:

GROUNDING DETAILS

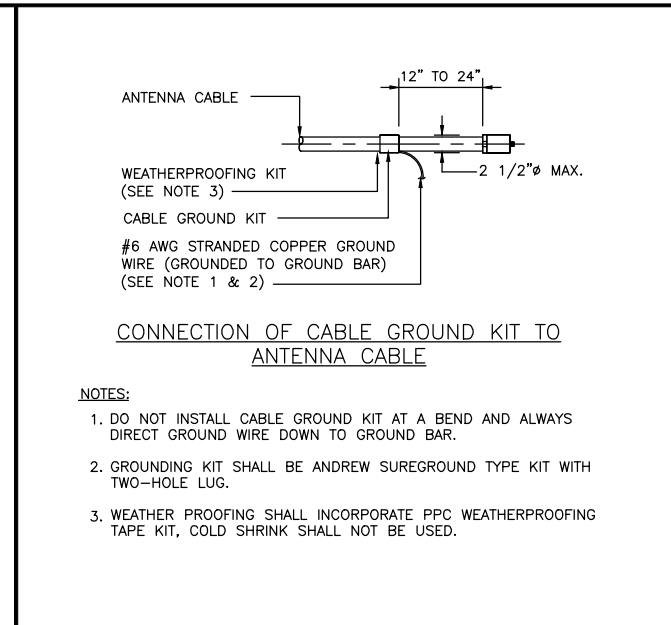
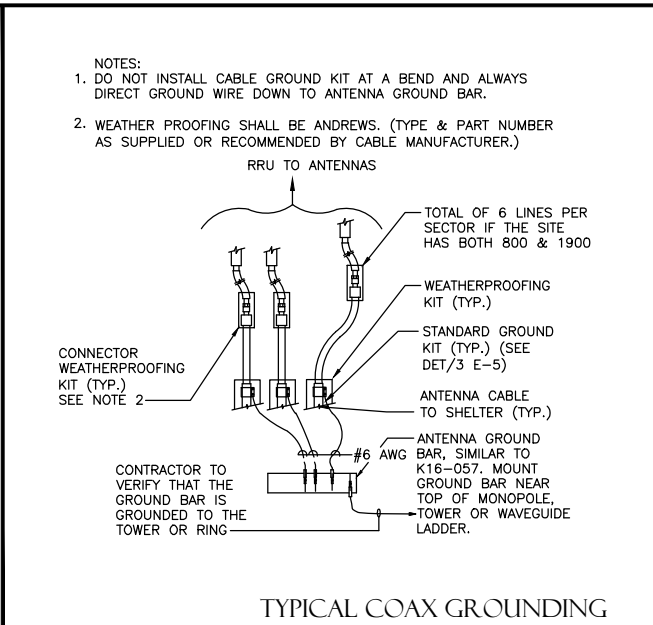
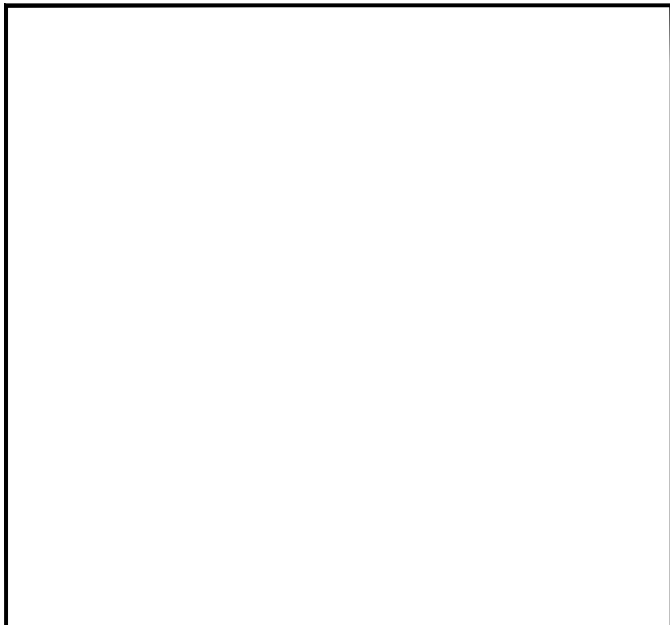
SHEET NUMBER:

E-7

REVISION:

D

PRDS PROJ. NO. 2525-070312

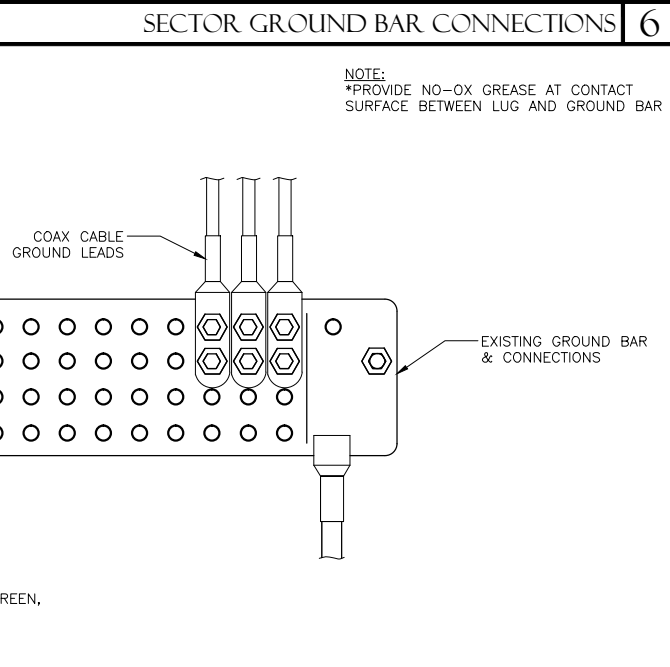
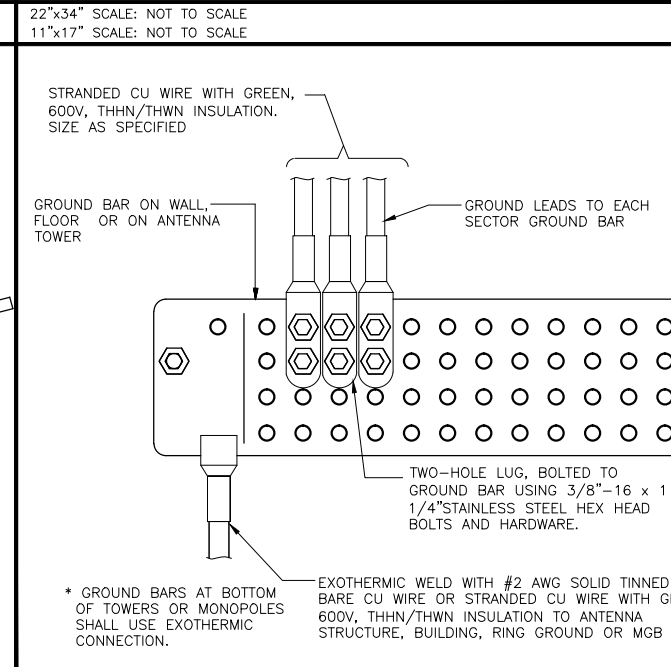
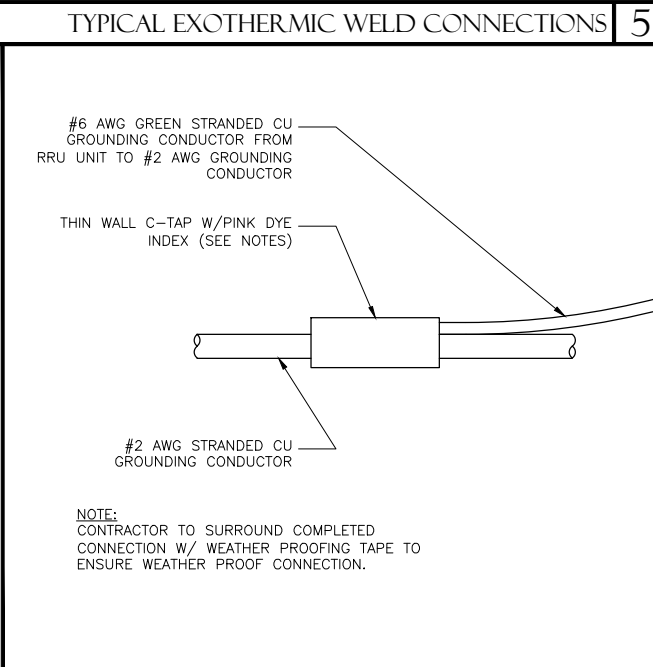
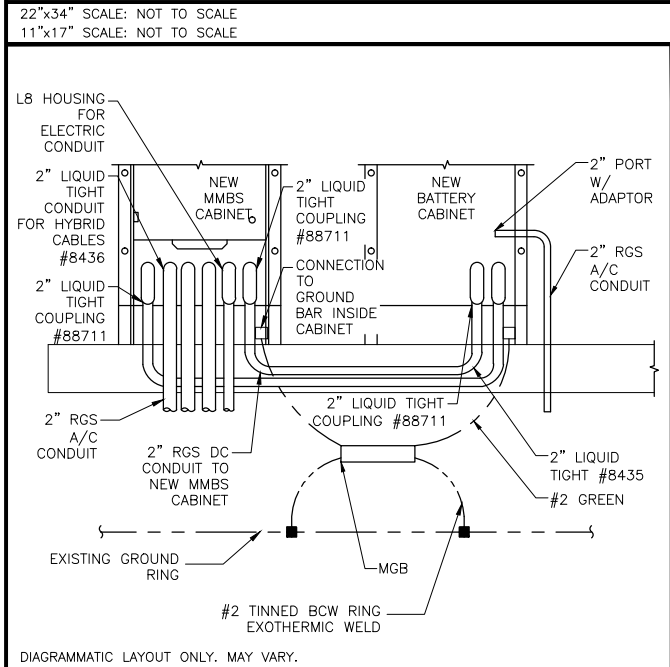
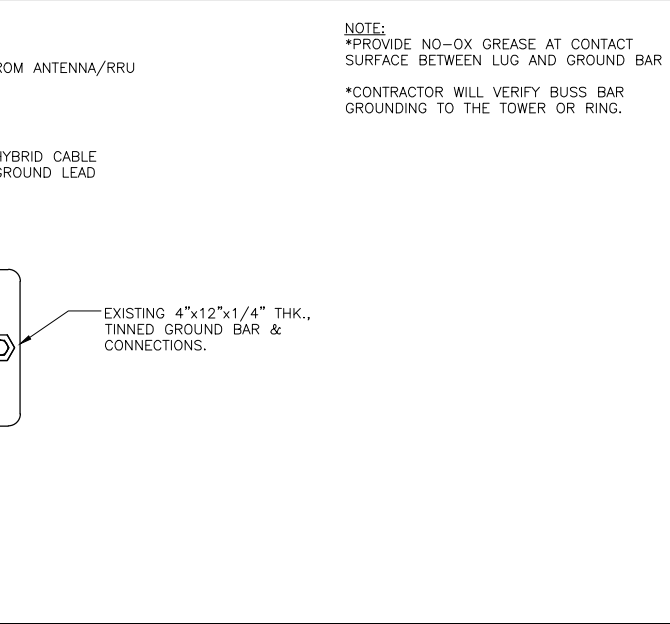
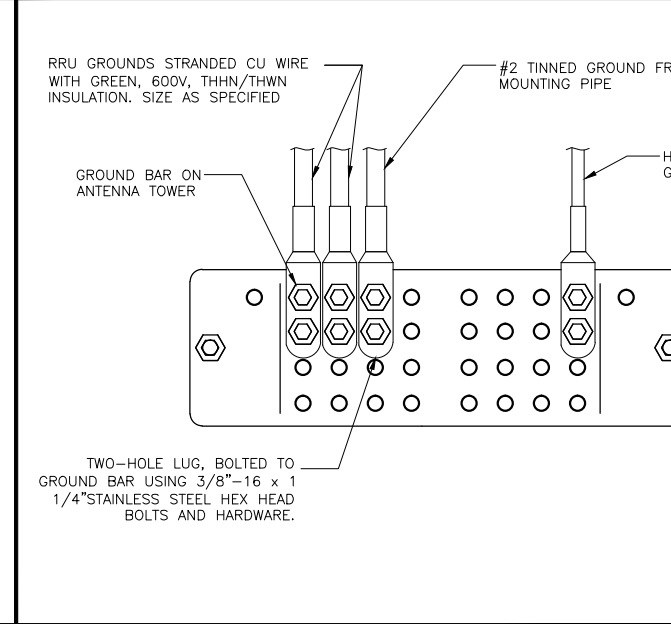
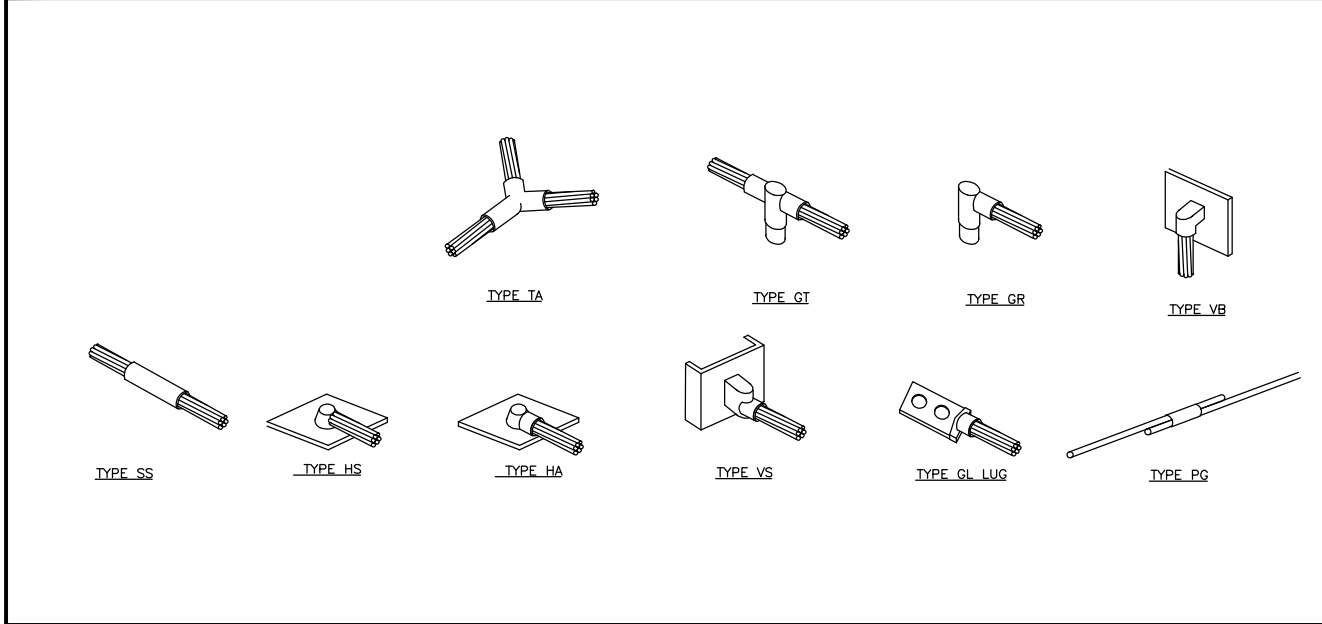


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