T-Mobile® stick together®

SITE NUMBER: ML53108

SITE NAME: CHRIST THE LIFE EVANGELICAL

SITE TYPE: 140' MONOPOLE

JURISDICTION: CITY OF WAUKESHA

CITY: WAUKESHA

COUNTY: WAUKESHA COUNTY

LOCATION MAP

AERIAL MAP

PROJECT DESCRIPTION

INSTALL T-MOBILE EQUIPMENT CABINET ON NEW CONCRETE PAD AT GRADE. NO NEW WATER OR SEWER IS REQUIRED AS FACILITY IS UNMANNED.

INITIAL BUILD OUT:

6 NEW ANTENNAS, 1 HCS, 2 COVP'S, 1 CABINET, 5 TOWER MODULES, 2 GROUND MODULES

PROJECT LOCATION

COORDINATES (NAD83):

LAT: 43.018814

LONG: -88.278211

AMSL: 884'

SITE ADDRESS:

3031 SUMMIT AVE.
WAUKESHA, WI 53188
WAUKESHA COUNTY

PROPERTY SUMMARY

PROPERTY ADDRESS:

3031 SUMMIT AVE.
WAUKESHA, WI 53188

ZONING:

WAUKESHA COUNTY, IL

ASSESSOR'S PARCEL NUMBER (APN):

TBD

APPLICABLE CODES

BUILDING CODE: INTERNATIONAL BUILDING CODE 2012 WITH AMENDMENTS
ELECTRICAL CODE: NATIONAL ELECTRICAL CODE 2011

DRIVING DIRECTIONS

DEPART T-MOBILE OFFICE [8550 W BRYN MAWR AVE, CHICAGO, IL 60631] ON W BRYN MAWR AVE (EAST) 0.3 MI. TURN LEFT (NORTH) ONTO IL-171 [N CUMBERLAND AVE] 0.4 MI. TAKE RAMP (RIGHT) ONTO I-90 [KENNEDY EXPY W] 0.8 MI. *TOLL ROAD* KEEP LEFT TO STAY ON I-90 [JANE ADDAMS MEMORIAL TOLLWAY] *TOLL ROAD* TAKE RAMP (RIGHT) ONTO I-294 [TRI-STATE TOLLWAY] 12.7 MI. *TOLL ROAD* MERGE ONTO I-94 [TRI-STATE TOLLWAY] 23.9 MI STAY ON I-94 [US-41] (NORTH) 33.4 MI. ENTERING WISCONSIN AT EXIT 316, TAKE RAMP (LEFT) ONTO I-43 [I-894] 5.2 MI. KEEP LEFT ONTO I-894 [ZOO FWY] 4.3 MI. AT EXIT 1B, TAKE RAMP (LEFT) ONTO I-94 1.3.1 MI. AT EXIT 291, TURN OFF ONTO RAMP 0.3 MI. ROAD NAME CHANGES TO LOCAL ROAD(S) 21 YDS. TURN LEFT (SOUTH) ONTO CR-TT [MEADOWBROOK RD] 2.0 MI. TURN LEFT (EAST) ONTO US-18 [SUMMIT AVE] 0.4 MI. TURN RIGHT (SOUTH) ONTO LOCAL ROAD(S) 164 YDS. ARRIVE ML53108-I CHRIST THE LIFE.

ISSUED FOR PERMIT

CONTACTS

APPLICANT

T-MOBILE USA
8550 BRYN MAWR AVE., SUITE 100
CHICAGO, ILLINOIS 60631
TEL: (773) 444-5400
CONTACT: TBD

PROPERTY OWNER CONTACT:

PROPERTY OWNER: CHRIST THE LIFE EVANGELICAL LUTHERN CHURCH
CONTACT: CARLTON MANSKE
3031 SUMMIT AVE.
WAUKESHA WI 53188
TEL: (262) 547-7232
ALTERNATE: (262) 547-7394 FAX

UTILITIES

ELECTRIC:

WE ENERGY
TEL: 414-221-2345
CONTACT: N/A

TELEPHONE:

AT&T
TEL: 855-327-0860
CONTACT: N/A

PROJECT TEAM

LEAD ENGINEER

JACOB GORALSKI, P.E.
IRISH TOWER, LLC
4603 BERMUDA DR.
SUGAR LAND, TX 77479

LEAD SITE ACQ.

CELLUSITE, LLC
103 WILSHIRE COURT,
NOBLESVILLE, IN 46062
TEL: (317) 507-4541
FAX: N/A

SHEET INDEX

SHEET NUMBER:	DESCRIPTION:
T-1	TITLE SHEET
T-2	GENERAL NOTES & SPECIFICATIONS
T-3	GENERAL NOTES & SPECIFICATIONS
SURV.	SITE SURVEY
C-1	OVERALL SITE PLAN
C-2	ENLARGED SITE PLANS
C-3	EQUIPMENT ELEVATION
C-4	ICE BRIDGE, GPS AND HYBRID CABLE DETAILS
C-5	PLATFORM ELEVATIONS
C-6	PLATFORM DETAILS
C-7	PLATFORM NOTES
C-8	FENCE DETAILS
A-1	TOWER ELEVATION
A-2	ANTENNA PLAN
A-3	EQUIPMENT SPECIFICATIONS
A-4	RF DATA SHEET
A-5	RISER DIAGRAM
A-6	ANTENNA CONFIGURATION SHEET
E-1	UTILITY PLANS
E-2	H-FRAME & UTILITY PLANS
E-3	UTILITY RISER DIAGRAM & PANEL SCHEDULE
GR-1	GROUNDING PLAN
GR-2	GROUNDING RISER
GR-3	GROUNDING DETAILS
REV	REVISIONS PAGE

APPROVALS

PENDING APPROVAL OF THE JURISDICTION, THE FOLLOWING PARTIES HAVE REVIEWED THE DESIGN WITHIN THEIR FUNCTIONAL RESPONSIBILITIES AND HAVE APPROVED THIS PROJECT FOR CONSTRUCTION. CONTRACTORS MAY NOT START CONSTRUCTION WITHOUT A NOTICE TO PROCEED (NTP) FROM T-MOBILE.

	PRINT NAME	SIGNATURE	DATE
LANDLORD			
PRECON. MGR			
DEVELOP. MGR			
CONST. INSP.			
A&E MGR			
RF ENGINEER			
OPERATIONS			
ZONING REP			
UTILITIES			

T-Mobile stick together
8550 BRYN MAWR AVENUE, SUITE 100
CHICAGO, ILLINOIS 60631

PLANS PREPARED FOR:

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

TITLE SHEET

SHEET NUMBER:

T-1

PLOT SCALE: 1:1 @ 11"x17"

CITY OF CHICAGO DEPARTMENT OF CONSTRUCTION AND PERMITS GENERAL BUILDING REQUIREMENTS PER CHICAGO ZONING ORDINANCE (CZO) AND CHICAGO BUILDING CODE (CBC) 2014 EDITION

ITEM	ISSUE	CHAPTER/ARTICLE	ORDINANCE REQUIREMENT	ACTUAL	REQUIREMENT N/A	LOCATION/ SHEET NO.	AGENCY/ TEST NO.	REMARKS
PART 1– ZONING REQUIREMENTS								
1.01	ZONING DISTRICT	CHAPTER 17-1-800	N/A	M1-2	N/A	N/A	N/A	
1.02	LOT AREA	N/A	N/A	N/A	N/A	N/A	N/A	
1.03	MAXIMUM FLOOR AREA RATIO	N/A	N/A	N/A	N/A	N/A	N/A	
1.04	TOTAL BUILDING AREA	N/A	N/A	N/A	N/A	N/A	N/A	
1.05	BUILDING HEIGHT-NO. OF FLOORS	N/A	N/A	N/A	N/A	N/A	N/A	
1.06	MINIMUM YARDS	N/A	N/A	N/A	N/A	N/A	N/A	
1.07	GRADE ELEVATION (CCD)	N/A	N/A	TBD	N/A	N/A	N/A	
1.08	OFF STREET LOADING	CHAPTER 17-10-1101	N/A	N/A	N/A	N/A	N/A	
1.09	OFF STREET PARKING	CHAPTER 17-10-0207	N/A	N/A	N/A	N/A	N/A	
1.10	LANDSCAPING	CHAPTER 17-11-0050	N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
			N/A	N/A	N/A	N/A	N/A	
PART 2– BUILDING REQUIREMENTS								
2.01	OCCUPANCY CLASSIFICATION	3 (13-56) PAGE 115	N/A	N/A	N/A	N/A	N/A	
2.02	HEIGHT AND AREA LIMITATIONS	5 (13-48) PAGE 323	N/A	N/A	N/A	N/A	N/A	
	A) EXCEPTIONS TO AREA LIMITATIONS	5 (13-48-090) PAGE 325	N/A	N/A	N/A	N/A	N/A	
	B) MIXED OCCUPANCY BUILDINGS	5 (13-48-100) PAGE 326	N/A	N/A	N/A	N/A	N/A	
2.03	TYPES OF CONSTRUCTION	6 (13-60) PAGE 329	N/A	N/A	N/A	N/A	N/A	
2.04	MIXED OCCUPANCY SEPARATIONS	3 (13-56-280) PAGE 118	N/A	N/A	N/A	N/A	N/A	
2.05	REQ. HRS OF FIRE RESISTANCE	6 (13-60-100) PAGE 330	N/A	N/A	N/A	N/A	N/A	
	EXTERIOR BEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	EXTERIOR-NONBEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	INTERIOR BEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	INTERIOR NONBEARING WALLS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	COLUMNS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	COLUMNS SUPPORTING ROOFS ONLY	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	BEAMS	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	BEAMS SUPPORTING ROOFS ONLY	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	FLOOR CONSTRUCTION	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
	ROOF CONSTRUCTION	TABLE 6 (13-60-100)	N/A	N/A	N/A	N/A	N/A	
2.06	ELEVATOR FRAMING	6 (13-60-130) PAGE 331	N/A	N/A	N/A	N/A	N/A	
2.07	MEZZANINE FLOORS	6 (13-60-160) PAGE 332	N/A	N/A	N/A	N/A	N/A	
2.08	BASEMENT CONSTRUCTION	6 (13-60-170) PAGE 332	N/A	N/A	N/A	N/A	N/A	
2.09	DRIVEWAYS AND LOADING SPACES	6 (13-60-210) PAGE 332	N/A	N/A	N/A	N/A	N/A	
2.10	FIRE-RESISTIVE REQUIREMENTS	7 (15-8) PAGE 335	N/A	N/A	N/A	N/A	N/A	
	A) FIRE WALLS-CONSTRUCTION	7 (15-8-010) PAGE 335	N/A	N/A	N/A	N/A	N/A	
	B) PARAPETS	7 (15-8-100) PAGE 335&336	N/A	N/A	N/A	N/A	N/A	
	C) STAIRWAY ENCLOSURES	7 (15-8-140) PAGE 337	N/A	N/A	N/A	N/A	N/A	
	D) ELEVATOR ENCLOSURES	7 (15-8-150) PAGE 337	N/A	N/A	N/A	N/A	N/A	
	E) ENCLOSURES OF HEATING ROOMS	7 (15-8-190) PAGE 338	N/A	N/A	N/A	N/A	N/A	
	F) ENCLOSURES OF WELLS & CHUTES	7 (15-8-170) PAGE 338	N/A	N/A	N/A	N/A	N/A	
	G) OTHER ENCLOSURES	7 (15-8-240) PAGE 339	N/A	N/A	N/A	N/A	N/A	
	H) INTERIOR WALL AND CLG. FINISHES	7 (15-8-380) PAGE 341	N/A	N/A	N/A	N/A	N/A	
	I) STORAGE ROOMS OVER 100SQ.FT	7 (15-8-240)(B) PAGE 339	N/A	N/A	N/A	N/A	N/A	
2.11	FIRE-RESISTIVE MATERIALS AND CONSTRUCTION	7 (15-12) PAGE 348	N/A	N/A	N/A	N/A	N/A	
2.12	ACCEPTED ENGINEERING PRACTICE RECOGNIZED AGENCIES	7 (15-12-050)	N/A	N/A	N/A	N/A	N/A	
2.13	FIRE PROTECTION EQUIPMENT	9 (15-16) PAGE 361	N/A	N/A	N/A	N/A	N/A	
	A) SPRINKLER SYSTEMS	9 (15-16-010) PAGE 362	N/A	N/A	N/A	N/A	N/A	
	B) SPECIAL REQUIREMENTS	9 (15-16-030) PAGE 362	N/A	N/A	N/A	N/A	N/A	
PART 3– EXIT REQUIREMENTS								
3.01	TYPES OF EXITS	10(13-160-040) PAGE 388	N/A	N/A	N/A	N/A	N/A	
3.02	MINIMUM NUMBER OF EXITS	10(13-160-050) PAGE 388	N/A	N/A	N/A	N/A	N/A	
3.03	TRAVEL DISTANCE TO EXITS	10(13-160-110) PAGE 389	N/A	N/A	N/A	N/A	N/A	
	A) INCREASES PERMITTED	10(13-160-150) PAGE 390	N/A	N/A	N/A	N/A	N/A	
	B) DEAD END CORRIDOR	10(13-160-160) PAGE 390	N/A	N/A	N/A	N/A	N/A	
3.04	CAPACITY OF EXITS	10(13-160-210) PAGE 390	N/A	N/A	N/A	N/A	N/A	
3.05	MINIMUM WIDTH OF EXITS	10(13-160-220) PAGE 391	N/A	N/A	N/A	N/A	N/A	
3.06	SWING OF EXIT DOORS	10(13-160-250) PAGE 391	N/A	N/A	N/A	N/A	N/A	
3.07	HARDWARE	10(13-160-260) PAGE 392	N/A	N/A	N/A	N/A	N/A	
3.08	REVOLVING DOORS	10(13-160-270) PAGE 393	N/A	N/A	N/A	N/A	N/A	
3.09	LANDINGS	10(13-160-310) PAGE 394	N/A	N/A	N/A	N/A	N/A	
3.10	HANDRAILS	10(13-160-320) PAGE 394	N/A	N/A	N/A	N/A	N/A	
3.11	CONSTRUCTION	10(13-160-330) PAGE 394	N/A	N/A	N/A	N/A	N/A	
3.12	ENCLOSURES	7 (15-8-140) PAGE 337	N/A	N/A	N/A	N/A	N/A	
3.13	HEAD ROOM	10(13-160-350) PAGE 394	N/A	N/A	N/A	N/A	N/A	

T··Mobile·
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8550 BRYN MAWR AVENUE, SUITE 100
CHICAGO, ILLINOIS 60631

PLANS PREPARED FOR:

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

CODE MATRIX SCHEDULE

SHEET NUMBER:

T-2

PLOT SCALE: 1:1 @ 11"x17"

GENERAL REQUIREMENTS:

1.1 INTENT

1. THESE SPECIFICATIONS AND CONSTRUCTION DRAWINGS ACCOMPANYING THEM DESCRIBE THE WORK TO BE DONE AND THE MATERIALS TO BE FURNISHED FOR CONSTRUCTION.

2. THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO BE FULLY EXPLANATORY AND SUPPLEMENTARY. HOWEVER, SHOULD ANYTHING BE SHOWN, INDICATED OR SPECIFIED ON ONE AND NOT THE OTHER, IT SHALL BE DONE THE SAME AS IF SHOWN, INDICATED OR SPECIFIED IN BOTH.

3. THE INTENTION OF THE DOCUMENTS IS TO INCLUDE ALL LABOR AND MATERIALS REASONABLY NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE WORK AS STIPULATED IN THE CONTRACT.

4. THE PURPOSE OF THE SPECIFICATIONS IS TO INTERPRET THE INTENT OF THE DRAWINGS AND TO DESIGNATE THE METHOD OF THE PROCEDURE, TYPE AND QUALITY OF MATERIALS REQUIRED TO COMPLETE THE WORK.

5. MINOR DEVIATIONS FROM THE DESIGN LAYOUT ARE ANTICIPATED AND SHALL BE CONSIDERED AS PART OF THE WORK. NO CHANGES THAT ALTER THE CHARACTER OF THE WORK WILL BE MADE OR PERMITTED BY THE OWNER WITHOUT ISSUING A CHANGE ORDER.

1.2 CONFLICTS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL MEASUREMENTS AT THE SITE BEFORE ORDERING ANY MATERIALS OR DOING ANY WORK. NO EXTRA CHARGE OR COMPENSATION SHALL BE ALLOWED DUE TO DIFFERENCE BETWEEN ACTUAL DIMENSIONS AND DIMENSIONS INDICATED ON THE CONSTRUCTION DRAWINGS. ANY SUCH DISCREPANCY IN DIMENSION WHICH MAY BE FOUND SHALL BE SUBMITTED TO THE OWNER FOR CONSIDERATION BEFORE THE CONTRACTOR PROCEEDS WITH THE WORK IN THE AFFECTED AREAS.

2. THE BIDDER, IF AWARDED THE CONTRACT, WILL NOT BE ALLOWED ANY EXTRA COMPENSATION BY REASON OF ANY MATTER OR THING CONCERNING WHICH SUCH BIDDER MIGHT HAVE FULLY INFORMED THEMSELVES PRIOR TO THE BIDDING.

3. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST, OR OF DIFFICULTIES OR CONDITIONS THAT MAY BE ENCOUNTERED OR OF ANY OTHER RELEVANT MATTER CONCERNING THE WORK TO BE PERFORMED IN THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONTRACT DOCUMENTS GOVERNING THE WORK.

1.3 CONTRACTS AND WARRANTIES

1. CONTRACTOR IS RESPONSIBLE FOR APPLICATION AND PAYMENT OF CONTRACTOR LICENSES AND BONDS.

1.4 STORAGE

1. ALL MATERIALS MUST BE STORED IN A LEVEL AND DRY FASHION AND IN A MANNER THAT DOES NOT NECESSARILY OBSTRUCT THE FLOW OF OTHER WORK. ANY STORAGE METHOD MUST MEET ALL RECOMMENDATIONS OF THE ASSOCIATED MANUFACTURER.

2. THE BTS MUST BE STORED INSIDE UNTIL THERE IS POWER ON SITE.

1.5 CLEAN UP

1. THE CONTRACTORS SHALL AT ALL TIMES KEEP THE SITE FREE FROM ACCUMULATION OF WASTE MATERIALS OR RUBBISH CAUSED BY THEIR EMPLOYEES AT WORK AND AT THE COMPLETION OF THE WORK, THEY SHALL REMOVE ALL RUBBISH FROM AND ABOUT THE BUILDING AREA, INCLUDING ALL THEIR TOOLS, SCAFFOLDING AND SURPLUS MATERIALS AND SHALL LEAVE THEIR WORK CLEAN AND READY FOR USE.

2. EXTERIOR: VISUALLY INSPECT EXTERIOR SURFACES AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER.

   A. REMOVE ALL TRACES OF SPLASHED MATERIALS FROM ADJACENT SURFACES.

   B. IF NECESSARY TO ACHIEVE A UNIFORM DEGREE OF CLEANLINESS, HOSE DOWN THE EXTERIOR OF THE STRUCTURE.

3. INTERIOR: VISUALLY INSPECT INTERIOR SURFACE AND REMOVE ALL TRACES OF SOIL, WASTE MATERIALS, SMUDGES AND OTHER FOREIGN MATTER FROM WALLS/FLOOR/CEILING.

   A. REMOVE ALL TRACES OF SPLASHED MATERIAL FROM ADJACENT SURFACES.

   B. REMOVE PAINT DROPPINGS, SPOTS, STAINS AND DIRT FROM FINISHED SURFACES.

1.6 CHANGE ORDER PROCEDURE

1. CHANGE ORDERS MAY BE INITIATED BY THE OWNER AND/OR THE CONTRACTOR INVOLVED. THE CONTRACTOR, UPON VERBAL REQUEST FROM THE OWNER SHALL PREPARE A WRITTEN PROPOSAL DESCRIBING THE CHANGE IN WORK OR MATERIALS AND ANY CHANGES IN THE CONTRACT AMOUNT AND PRESENT TO THE OWNER WITHIN 72 HRS FOR APPROVAL. SUBMIT REQUESTS FOR SUBSTITUTIONS IN THE FORM AND IN ACCORDANCE WITH PROCEDURES REQUIRED FOR CHANGE ORDER PROPOSALS. ANY CHANGES IN SCOPE OF WORK OR MATERIALS WHICH ARE PERFORMED BY THE CONTRACTOR WITHOUT A WRITTEN CHANGE ORDER AS DESCRIBED AND APPROVED BY THE OWNER SHALL PLACE FULL RESPONSIBILITY OF THESE ACTIONS ON THE CONTRACTOR.

1.7 RELATED DOCUMENTS AND COORDINATION

1. GENERAL CARPENTRY, ELECTRICAL AND ANTENNA DRAWINGS ARE INTERRELATED. IN PERFORMANCE OF THE WORK, THE CONTRACTOR MUST REFER TO ALL DRAWINGS. ALL COORDINATION TO BE THE RESPONSIBILITY OF THE CONTRACTOR.

1.8 SHOP DRAWINGS

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AS REQUIRED AND LISTED IN THESE SPECIFICATIONS TO THE OWNER FOR APPROVAL.

2. ALL SHOP DRAWINGS SHALL BE REVIEWED, CHECKED AND CORRECTED BY CONTRACTOR PRIOR TO SUBMITTAL TO THE OWNER.

1.9 PRODUCTS AND SUBSTITUTIONS

1. SUBMIT 3 COPIES OF EACH REQUEST FOR SUBSTITUTION. IN EACH REQUEST IDENTIFY THE PRODUCT OR FABRICATION OR INSTALLATION METHOD TO BE REPLACED BY THE SUBSTITUTION. INCLUDE RELATED SPECIFICATION SECTION AND DRAWING NUMBERS AND COMPLETE DOCUMENTATION SHOWING COMPLIANCE WITH THE REQUIREMENTS FOR SUBSTITUTIONS.

2. SUBMIT ALL NECESSARY PRODUCT DATA AND CUT SHEETS WHICH PROPERLY INDICATE AND DESCRIBE THE ITEMS, PRODUCTS AND MATERIALS BEING INSTALLED. THE CONTRACTOR SHALL, IF DEEMED NECESSARY BY THE OWNER SUBMIT ACTUAL SAMPLES TO THE OWNER FOR APPROVAL IN LIEU OF CUT SHEETS.

1.10 QUALITY ASSURANCE

1. ALL WORK SHALL BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS. THESE SHALL INCLUDE BUT NOT BE LIMITED TO THE LATEST VERSION OF THE COOK COUNTY BUILDING CODE.

1.11 ADMINISTRATION

1. BEFORE THE COMMENCEMENT OF ANY WORK, THE CONTRACTOR WILL ASSIGN A PROJECT MANAGER WHO WILL ACT AS A SINGLE POINT OF CONTACT FOR ALL PERSONNEL INVOLVED IN THIS PROJECT. THIS PROJECT MANAGER WILL DEVELOP A MASTER SCHEDULE FOR THE PROJECT WHICH WILL BE SUBMITTED TO THE OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.

2. SUBMIT A BAR TYPE PROGRESS CHART NOT MORE THAN 3 DAYS AFTER THE DATE ESTABLISHED FOR COMMENCEMENT OF THE WORK ON THE SCHEDULE, INDICATING A TIME BAR FOR EACH MAJOR CATEGORY OR UNIT OF WORK TO BE PERFORMED AT SITE, PROPERLY SEQUENCED AND COORDINATED WITH OTHER ELEMENTS OF WORK AND SHOWING COMPLETION OF THE WORK SUFFICIENTLY IN ADVANCE OF THE DATE ESTABLISHED FOR SUBSTANTIAL COMPLETION OF THE WORK.

3. PRIOR TO COMMENCING CONSTRUCTION, THE OWNER SHALL SCHEDULE AN ON-SITE MEETING WITH ALL MAJOR PARTIES. THIS WOULD INCLUDE (THOUGH NOT LIMITED TO) THE OWNER, PROJECT MANAGER, CONTRACTOR, LAND OWNER REPRESENTATIVE, LOCAL TELEPHONE COMPANY, TOWER ERECTION FOREMAN (IF SUBCONTRACTED).

4. CONTRACTOR SHALL BE EQUIPPED WITH SOME MEANS OF CONSTANT COMMUNICATIONS, SUCH AS A MOBILE PHONE OR A BEEPER. THIS EQUIPMENT WILL NOT BE SUPPLIED BY THE OWNER, NOR WILL WIRELESS SERVICE BE ARRANGED.

5. DURING CONSTRUCTION, CONTRACTOR MUST ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES. CONTRACTOR WILL COMPLY WITH ALL SAFETY REQUIREMENTS IN THEIR AGREEMENT.

6. PROVIDE WRITTEN DAILY UPDATES ON SITE PROGRESS TO THE OWNER.

7. COMPLETE INVENTORY OF CONSTRUCTION MATERIALS AND EQUIPMENT IS REQUIRED PRIOR TO START OF CONSTRUCTION.

8. NOTIFY THE OWNER / PROJECT MANAGER IN WRITING NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, TOWER ERECTIONS, AND EQUIPMENT CABINET PLACEMENTS.

1.12 INSURANCE AND BONDS

1. CONTRACTOR SHALL AT THEIR OWN EXPENSE CARRY AND MAINTAIN FOR THE DURATION OF THE PROJECT ALL INSURANCE AS REQUIRED AND LISTED AND SHALL NOT COMMENCE WITH THEIR WORK UNTIL THEY HAVE PRESENTED AN ORIGINAL CERTIFICATE OF INSURANCE STATING ALL COVERAGES TO THE OWNER. REFER TO THE MASTER AGREEMENT FOR REQUIRED INSURANCE LIMITS.

2. THE OWNER SHALL BE NAMED AS AN ADDITIONAL INSURED ON ALL POLICIES.

3. CONTRACTOR MUST PROVIDE PROOF OF INSURANCE.

TOWER & ANTENNA INSTALLATION:

1.1 WORK INCLUDED

1. IF REQUIRED, ERECT FURNISHED TOWER.

2. GROUND TOWER TEMPORARILY DURING ERECTION. GROUNDING SHALL INCLUDE BASE(S) AND ANCHORS.

3. IF REQUIRED, INSTALL THREE (3) SIDE ARMS, CONSISTING OF THREE (3) 6'-0" AS INDICATED ON DRAWINGS – CONFIRM WITH OWNER REPRESENTATIVE.

4. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND OWNER SPECIFICATIONS.

5. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

6. INSTALL FURNISHED GALVANIZED STEEL WAVEGUIDE LADDER.

7. INSTALL WAVEGUIDE BRIDGE AS INDICATED ON DRAWING.

8. SUPPLY AND INSTALL ONE INSULATED GROUND BAR AT EQUIPMENT CABINET.

9. SUPPLY AND INSTALL GROUNDING STRAP KITS WITH LONG BARREL COMPRESSION LUGS (SIM. TO ANDREW-223700TBD OR APPROVED EQUAL) ATOP TOWER BASE BEFORE ENTERING THE EQUIPMENT. GROUNDING STRAPS TO BE CONNECTED TO INSULATED GROUND BAR.

10. ASSIST OWNER TECHNICIANS IN PERFORMING SWEEP TEST OF INSTALLED COAX.

11. CONCRETE PIERS FOR FOUNDATIONS SHALL BE DRILLED AND POURED ON THE SAME DAY.

1.2 REQUIREMENTS OF REGULATOR AGENCIES

1. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE, INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

2. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

   A. TIA – TELECOMMUNICATIONS INDUSTRY ASSOCIATION TIA-222-G. STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

   B. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-IH, OBSTRUCTION MARKING AND LIGHTING.

   C. FCC – FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

   D. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

   E. NEC – NATIONAL ELECTRICAL CODE – ON TOWER LIGHTING KITS.

   F. UL – UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

   G. IN ALL CASES, PART 77 OR THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

   H. 2012 LIFE SAFETY CODE NFPA -101.

GENERAL ELECTRIC PROVISION:

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS COGNIZANT OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.

2. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATIONS TEST, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.

3. HEIGHTS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.

4. THESE PLANS ARE DIAGRAMMATIC ONLY, FOLLOW AS CLOSELY AS POSSIBLE.

5. ELECTRICAL SERVICE 120 / 208 VAC 3-PHASE 4-WIRE 100 AMP SERVICE 120 / 240 VAC SINGLE PHASE 3-WIRE 200 AMP SERVICE

6. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULL BOX, J-BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.).

7. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.

8. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.

9. ALL CONDUIT INSTALLED SHALL BE SURFACE MOUNTED OR DIRECT BURIAL UNLESS OTHERWISE NOTED.

10. CONTRACTOR SHALL CARRY OUT THEIR WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND O.S.H.A.

11. CONTRACTOR TO OBTAIN ALL PERMITS, PAY PERMIT FEES, AND BE RESPONSIBLE FOR SCHEDULING INSPECTIONS.

12. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.

13. ALL CONDUIT SHALL HAVE A PULL WIRE OR ROPE.

14. PROVIDE PROJECT MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS AND CIRCUITS.

15. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC., SHALL BE TURNED OVER TO THE OWNER AT JOB COMPLETION.

16. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.

17. ALL CONDUCTORS SHALL BE COPPER.

18. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.

19. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.

20. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.

21. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH APPLICABLE LOCAL BUILDING CODES.

22. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.

23. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER UNLESS OTHERWISE NOTED.

24. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS, MANUFACTURED BY "SQUARE D COMPANY", OR APPROVED EQUAL.

25. ALL MATERIALS SHALL BE U.L. LISTED.

26. CONDUIT

   A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAPPED WRAPPED WITH HUNTS WRAP PROCESS NO. 3

   B. ELECTRICAL METALLIC TUBING SHALL HAVE U.L. LABEL, FITTING SHALL BE GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.

   C. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT SHALL HAVE FULL SIZE EQUIPMENT GROUND WIRE.

   D. CONDUIT RUNS SHALL BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH THE OWNER PRIOR TO INSTALLING. NO HORIZONTAL CONDUITS SHALL BE BELOW 7'-6" A.F.F. NO BX OR ROMEX CABLE IS PERMITTED.

   E. PARALLEL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 30" BELOW GRADE – STACKED UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 (UNLESS NOTED OTHERWISE) AT A MINIMUM DEPTH OF 24" BELOW GRADE.

   F. ABOVE GROUND CONDUIT SHALL BE P.V.C. SCHEDULE 80 (UNLESS NOTED OTHERWISE).

27. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.

28. CONTRACTOR TO PROVIDE DAILY UPDATES TO PM UNTIL FINAL ELECTRICAL SERVICE IS EFFECTED.

29. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUND TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO PROJECT MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.

30. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.

GROUNDING STANDARDS:

1.0 DEFINITIONS

AGB:	ANTENNA GROUND BAR
AWG:	AMERICAN WIRE GAUGE
CADWELDING:	AN EXOTHERMIC WELDING PROCESS WHICH CREATES POSITIVE CONTACT OF POSITIVE CONTACT OF GROUNDING CONDUCTORS
EMT:	ELECTRICAL METAL TUBING (LIGHT GAUGE METALLIC CONDUIT)
MGB:	MASTER GROUND BAR
PVC:	POLYVINYL CHLORIDE CONDUIT
RFI:	RADIO FREQUENCY INTERFERENCE
TGB:	TOWER GROUND BAR
THWN:	LETTER TYPE DESIGNATION FOR CONDUCTOR INSULATION THAT IS A MOISTURE AND HEAT RESISTANT THERMOPLASTIC WITH A MAXIMUM OPERATING TEMPERATURE OF 75 DEGREES CELSIUS OR 167 DEGREES FAHRENHEIT
T/I:	TENANT IMPROVEMENT

2.0 BACKGROUND

2.1 AREAS OF CONCERN: WHEN DESIGNING A GROUNDING SYSTEM FOR A MOBILE RADIO FACILITY THERE ARE FOUR INTERRELATED AREAS OF CONCERN. THE BASIC OBJECTIVE FOR EACH IS:

1. LIGHTNING PROTECTION –TO MAINTAIN ALL EQUIPMENT AT THE SAME POTENTIAL DURING A LIGHTNING IMPULSE.

2. RFI FOR NOISE INDUCTION CONTROL –TO ESTABLISH THE LOWEST POSSIBLE IMPEDANCE AMONG ALL EQUIPMENT.

3. ELECTROSTATIC CONTROL –TO REDUCE ELECTROSTATIC DISCHARGE PROBLEMS.

4. PERSONNEL SAFETY –TO MAINTAIN A MINIMUM VOLTAGE DIFFERENCE BETWEEN ANY TWO METALLIC OBJECTS WHICH PERSONNEL MIGHT CONTACT SIMULTANEOUSLY.

2.2 A/C GROUNDING: IN THIS GROUNDING SYSTEM THE A/C SERVICE GROUND SHALL BE KEPT ISOLATED FROM THE EQUIPMENT FRAME WORK AND LIGHTNING PROTECTION GROUND SYSTEMS EXCEPT FOR ONE SPECIFIC POINT. THIS POINT IS THE MAIN GROUNDING POINT OF THE SYSTEM. THIS WOULD TYPICALLY BE CONNECTING THE A/C SERVICE GROUND AT THE COMMERCIAL POWER RISER POLE DISCONNECT/METER BASE TO THE EXTERNAL GROUND RING. ALL GROUNDING CONNECTIONS INSIDE OF CABINETS SHALL BE SCRAPED TO BARE METAL AND COATED WITH NOALOX.

2.3 LIGHTNING CONSIDERATIONS: LIGHTNING DAMAGE OCCURS FROM EITHER INDUCTION OR FROM AN ACTUAL DIRECT STRIKE TO THE BUILDING, USUALLY TAKEN THROUGH THE TOWER AND/OR ANTENNAS, STRIKES TO OTHER NEARBY OBJECTS INDUCE HIGH ENERGY INTO POWER OR TELEPHONE CABLES ENTERING THE BUILDING. THIS TYPE OF EFFECT HISTORICALLY CAUSES MOST OF THE DAMAGE TO THE BUILDING AND ITS CONTENTS.

3.0 STATION GROUNDING SYSTEM

3.1 MATERIALS:

1. #2 AWG, BARE SOLID TINNED COPPER WIRE, FOR ALL EXTERIOR CONDUCTORS AND TOWER GROUND BAR CONDUCTORS OR AS OTHERWISE SPECIFIED. GROUNDS TO THE LNAS SHALL BE NO. 6 STANDARD GREEN INSULATED JUMPERS. THE GROUND WIRE TO THE MGB SHALL BE GREEN JACKETED STRANDED #2 TINNED WIRE BURNDY CONNECTED TO THE BUSS BAR AND CONNECTED TO THE GROUND RING ON A GROUND ROD.

2. #2 AWG, INSULATED STRANDED COPPER CABLE IS ACCEPTABLE FOR INTERIOR GROUND BAR CONDUCTORS ON TENANT IMPROVEMENT SITES.

3. 5/8" X 10" GROUND RODS OF SOLID COPPER, STAINLESS STEEL OR COPPER CLAD HIGH STRENGTH STEEL.

4. ABOVE GRADE CONNECTIONS SHALL BE BURNDY HYGROUND COMPRESSION. BELOW GRADE CONNECTIONS SHALL BE CAD WELD OR OTHER APPROVED EXOTHERMIC WELDING SYSTEM FOR BONDING AS SPECIFIED.

5. XIT OR ADVANCED GROUNDING ELECTRODE (AGE), ALL CHEMICAL GROUND RODS SHALL BE UL APPROVED.

6. SOLID COPPER PLATES OF MINIMUM 3'X3'X1/4" SIZE AS SPECIFIED.

7. NOALOX OR APPROVED EQUAL CONDUCTIVE MEDIUM MATERIAL SHALL BE USED IN ALL MECHANICAL CONNECTIONS.

8. #2 AWG STRANDED INSULATED (GREEN) FOR ALL INTERNAL EQUIPMENT GROUNDING.

9. MECHANICAL FASTENERS (I.E., DOUBLE LUGS, SPLIT BOLTS PARALLEL CONNECTORS) SHALL BE BRONZE, BRASS, COPPER OR STAINLESS STEEL AND HAVE NOALOX BETWEEN CONDUCTOR AND CONNECTION.

10. BOLTS, NUTS AND SCREWS USED TO FASTEN MECHANICAL CONNECTORS SHALL BE STAINLESS STEEL WITH STAR TYPE STAINLESS STEEL LOCK WASHERS.

11. ALL LUG TUBE FASTENERS SHALL PROVIDE TWO HOLES TO ALLOW A DOUBLE BOLT CONNECTION.

3.2 MASTER GROUND BAR (MGB): THE PURPOSE OF THE MASTER GROUND BAR IS TO GROUND THE BTS AND ANY OTHER METALLIC OBJECTS AROUND THE BTS. IF AN MGB IS NOT PROVIDED WITH THE BTS, THE MGB SHALL BE AS FOLLOWS: THE MGB IS A COPPER BAR MEASURING 4"W X 24"L X 1/4" LOCATED AS CLOSE TO THE BTS AS POSSIBLE. THE MGB SHALL HAVE A MINIMUM NUMBER OF (28) 3/8" HOLES. GROUND BAR SHALL BE SUPPORTED BY MOUNTING BRACKETS WITH INSULATOR STANDOFFS. (2) #2 TINNED SHALL BE MECHANICALLY ATTACHED (2-HOLE COMPRESSION LUG 3/8" HOLES, 1" CENTER TO CENTER SPACING) TO THE MGB AND DOWN LEADS THEN TAKEN THROUGH CONDUIT TO THE GROUND RING. THIS CONDUCTOR SHALL BE KEPT SEPARATE AND ISOLATED UNTIL TERMINATING AT THE MAIN GROUNDING POINT, (I.E. EXTERIOR GROUND RING OR BUILDING STEEL).

3.3 ANTENNA GROUND BAR (AGB): THE PURPOSE OF THE ANTENNA GROUND BAR IS PRIMARILY FOR LIGHTNING PROTECTION. COAXIAL CABLE IS USUALLY THE ONLY ITEM GROUNDED TO THIS BAR. HOWEVER IT IS ACCEPTABLE TO BOND EXTERIOR; CABLE TRAY, WAVE GUIDE PORTS AND CANTILEVERED WAVE GUIDE BRIDGES TO THE AGB. THE AGB IS A COPPER BAR MEASURING 4"W X 24"L X 1/4". THERE SHALL BE TWO AGBS, ONE LOCATED AT THE TOP OF THE TOWER AT THE START OF THE VERTICAL RUN OF COAX, THE OTHER AT THE BOTTOM OF THE VERTICAL RUN OF COAX BEFORE IT MAKES ITS BEND. (IF THE TOWER IS OVER 200' THERE SHALL BE A THIRD AGB LOCATED AT HE MIDDLE OF THE TOWER).THE AGB SHALL HAVE A MINIMUM OF (28) 3/8" HOLES. GROUND BARS SHALL BE SUPPORTED BY MOUNTING BRACKETS WITH INSULATOR STANDOFFS. USE #2 AWG SOLID TINNED WIRE W/ 2-HOLE SHORT BARREL COMPRESSION LUGS 3/8" HOLES, 1" CENTER TO CENTER SPACING). THIS CONDUCTOR SHALL BE KEPT SEPARATE AND ISOLATED UNTIL TERMINATING AT THE MAIN GROUNDING POINT (I.E. EXTERIOR GROUND RING, OR BUILDING STEEL.)

T-Mobile
stick together
8550 BRYN MAWR AVENUE, SUITE 100
CHICAGO, ILLINOIS 60631

PLANS PREPARED FOR:
Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC
www.cellusite.net
QUESTO OPTIMUS SOLUTO

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
GENERAL NOTES & SPECIFICATIONS

SHEET NUMBER:
T-2

PLOT SCALE: 1:1 @ 11"x17"

GROUNDING STANDARDS (CONT.):

3.4 SURGE ARRESTOR GROUND BAR: THE PURPOSE OF THE SURGE ARRESTOR GROUND BAR IS FOR LIGHTING PROTECTION. THE SURGE ARRESTOR GROUND BAR IS A BENT (3" X 3") X 1/4" X 24" COPPER BAR. IT IS LOCATED ON THE WAVEGUIDE BRIDGE SUPPORT CLOSEST TO THE EQUIPMENT. ONE FACE OF THE BAR SHALL HAVE A MINIMUM OF (28) 3/8" DIA. HOLES. HOLES SHALL BE IN PAIRS THAT ARE 1" CENTER TO CENTER. THE OTHER FACE SHALL HAVE 3/8" DIA. HOLES AS REQUIRED TO ATTACH AND GROUND COAXIAL SURGE ARRESTORS. THE GROUND BAR SHALL BE SUPPORTED BY MOUNTING BRACKETS WITH INSULATOR STANDOFFS.

3.5 GROUND ROD AND GROUND RING PLACEMENT: THE OUTSIDE GROUND RING SHALL BE PLACED AROUND THE BTS AT A DISTANCE OF TWO (2) FEET FROM THE BTS AT A DEPTH OF 2'-6" OR 6" BELOW THE FROST LINE, WHICHEVER IS DEEPER. RODS SHALL BE DRIVEN TO A DEPTH SUCH THAT THE TOP OF THE RODS IS AT THE LEVEL OF THE GROUND RING CONDUCTOR. THE RODS SHALL BE PLACED MINIMALLY ALONG THE RING AT THE FOLLOWING LOCATIONS:

A. BELOW THE AREA OF THE INTERNAL MASTER GROUND BAR FOR CONNECTION TO THE MGB.

B. BELOW THE UTILITY RACK FOR CONNECTION TO THE MAIN BUILDING COMMERCIAL POWER DISCONNECT.

C. BELOW THE CORNERS OF THE BTS.

D. AS REQUIRED TO ACHIEVE A RECOMMENDED SPACING OF TWENTY (20) FEET BETWEEN GROUND RODS ALONG THE RING PERIMETER.

E. AS REQUIRED ALONG THE RING PERIMETER TO ACHIEVE 5 OHMS OR LESS RESISTANCE WHEN TESTED.

F. TWO RODS LOCATED ON OPPOSITE SIDES AT EACH TOWER LEG OR MONOPOLE.

G. ONE ROD LOCATED BENEATH EACH END OF THE WAVE GUIDE BRIDGE OR CABLE TRAY.

H. ONE ROD LOCATED ADJACENT TO THE STANDBY GENERATOR, AND IF SEPARATED BY MORE THAN TEN (10) FEET, ONE LOCATED ADJACENT TO THE FUEL TANK.

I. ONE ROD LOCATED AT THE BASE OF THE TOWER FOR THE TGB.

3.6 TOWER GROUNDING: ALL MONOPOLES SHALL HAVE TWO GROUND RODS (MINIMUM). ALL OTHER TOWERS SHALL HAVE TWO GROUND RODS PLACED AT THE BASE OF EACH TOWER LEG. EACH MONOPOLE OR TOWER LEG SHALL BE BONDED TO THE SYSTEM VIA TWO #2 BARE TINNED SOLID COPPER CONDUCTORS. BURNDY CONNECT THE CONDUCTORS TO ONLY STRUCTURAL BASE PLATES OR LUGS OR EARS AS MAY BE PROVIDED. NO BURNDY CONNECTIONS SHALL BE MADE TO THE VERTICAL WALLS OF THE STRUCTURE. NEVER GROUND TO HOLLOW LEG MEMBERS.

3.7 ANTENNA GROUNDING: EACH ANTENNA COAXIAL CABLE SHALL TYPICALLY BE GROUNDED AT THREE POINTS USING A HARD-SHELL COAXIAL CABLE KIT FROM THE MANUFACTURER OFTHE ANTENNA CABLE. A TYPICAL INSTALLATION SHALL BE AS FOLLOWS:

A. THE FIRST GROUND CONNECTION SHALL OCCUR AS CLOSE TO THE ANTENNA AS POSSIBLE, BELOW THE FIRST POINT THE COAX CABLE BEGINS TO RUN VERTICAL DOWN THE TOWER. THIS GROUND SHALL TERMINATE DIRECT TO THE TOP AGB. ON A T/I, GROUND TO THE AGB AT THE ANTENNA MOUNTS.

B. THE SECOND GROUND SHALL BE MADE AT THE BOTTOM OF THE VERTICAL RUN OF THE COAXIAL CABLE AS IT TURNS OUT AWAY FROM THE TOWER TOWARDS THE BTS. THIS GROUND SHALL BE TERMINATED AT THE TGB. THE TGB SHALL HAVE TWO (2) LEADS OF #2 AWG BARE TINNED SOLID COPPER WIRE, AND SHALL TERMINATE AT THE TOWER GROUND RING. THESE SHALL BE ENCASED IN PVC PIPE.

C. THE THIRD GROUND SHALL BE ON THE SURGE ARRESTOR. GROUND TO BE ATTACHED TO THE CABLE ON STRAIGHT RUNS (NOT WITHIN BENDS) AND BE WEATHERPROOFED PER THE MANUFACTURER'S SPECIFICATIONS. THE SURGE ARRESTORS SHALL BE GROUNDED TO THE GROUND BAR. THE SAGB SHALL HAVE TWO (2) LEADS OF #2 AWG BARE TINNED SOLID COPPER WIRE, AND SHALL TERMINATE AT THE TOWER GROUND RING. THESE SHALL BE ENCASED IN PVC PIPE.

3.8 PERIMETER FENCE GROUNDING:

A. ALL FENCE CORNER AND END POSTS (MINIMUM OF TWO) SHALL HAVE ONE #2 SOLID TINNED COPPER GROUND WIRE CONNECTED TO A 5/8" X 10' SOLID COPPER CLAD GROUND ROD NEXT TO THE POST. THESE POSTS SHALL BE CONNECTED TO THE GROUND RING WITH A #2 SOLID TINNED COPPER GROUND WIRE AND INTERMEDIATE GROUND RODS IF THE DISTANCE FROM THE POST TO THE GROUND RING EXCEEDS 10 FEET. IN NO CASE SHALL ANY PORTION OF THE SAME FENCE REMAIN DISCONNECTED FROM THE GROUND RING.

B. GATE POSTS SHALL BE GROUNDED TO EACH OTHER TO ENSURE THE ENTIRE FENCE HAS ELECTRICAL CONTINUITY. CONNECTIONS SHALL BE DRILL AND TAP WITH BURNDY TYPE KC22 TO THE POST WITH A #2 AWG BARE SOLID TINNED COPPER WIRE.

C. GATES SHALL BE BONDED TO GATE POSTS WITH A 18" BRAIDED STRAP TYPE BD18G92. THE CONNECTIONS SHALL BE BURNDY 2-HOLE LUGS (3/8" HOLES, 1" CENTER TO CENTER) BOLTED THROUGH EACH POST.

D. ALL DOWN LEADS TO EARTH WILL BE ENCASED IN 3/4 INCH PVC NON-METALLIC AND SEALED WITH SILICONE.

3.9 GENERATOR FUEL TANK GROUNDING: THE GENERATOR FUEL TANK, IF REQUIRED, SHALL BE CONNECTED IN AT LEAST ONE PLACE TO THE MAIN EXTERIOR GROUND RING. #2 AWG BARE SOLID TINNED COPPER WIRE SHALL BE BURNDY CONNECTED TO ONE SUPPORT LEG OF THE FUEL TANK AND CAD WELD TO THE NEAREST EXTERIOR GROUND RING/GROUND ROD.

3.10 EQUIPMENT ROOM GROUNDING: THE MASTER GROUND BAR (MGB) SERVES AS THE COLLECTION POINT FOR THE BTS AS WELL AS ALL INTERIOR NON-ELECTRICAL GROUNDED METAL MATERIALS (HVAC GRILLS, DOOR FRAMES/DOORS, TELCO BOARD, UNISTRUTS, CABLE TRAYS, ALARM JUNCTION BOX, ETC.,) SHALL BE GROUNDED WITH #6 AWG STRANDED (GREEN) GROUND WIRES WITH INDIVIDUAL RUNS BACK TO THE MGB. (THE CABLE TRAY, DOOR/FRAME AND UNISTRUT MAY BE JUMPERED TOGETHER AND HAVE A SINGLE GROUND WIRE CONNECTION TO THE MGB.)

3.11 WALL PENETRATIONS SLEEVES: INSTALL PER CONSTRUCTION DRAWINGS.

3.12 A/C COMMERCIAL POWER GROUNDING CONNECTIONS: AT THE ON-SITE RISER POLE LOCATION OR UNDERGROUND SERVICE ENTRANCE LOCATION, THE A/C SERVICE SHALL BE MECHANICALLY BONDED TO THE A/C SERVICE ENTRANCE GROUND AS SPECIFIED BY THE NATIONAL ELECTRIC CODE, ARTICLE 250, AND/OR APPROPRIATE LOCAL CODES. A SEPARATE GROUND ROD SHALL BE PROVIDED AT THIS POINT, AND SHALL BE CONNECTED TO THE EXTERIOR GROUND RING. A SEPARATE A/C SERVICE GROUND AND NEUTRAL SHALL THEN BE ROUTED TO AND CONNECTED TO THE MAIN DISCONNECT INSIDE THE BUILDING OR AS REQUIRED BY LOCAL AUTHORITY.

3.13 GENERATOR RECEPTACLE GROUNDING: THE GENERATOR RECEPTACLE (HUBBLE PLUG) SHALL BE GROUNDED TO THE EGR.

3.14 COAX BRIDGE / CABLE TRAY GROUNDING : BOND THE COAX BRIDGE OR CABLE TRAY TO THE AGB WITH #2 SOLID TINNED GROUND WIRE. THESE CONNECTIONS SHALL BE DOUBLE LUG BOLTED / SCREWED MECHANICAL CONNECTIONS WITH STAR LOCK WASHERS AND NOALOX. ALL BRIDGE SPLICES SHALL HAVE JUMPERS OF #2 SOLID WITH COMPRESSION LUGS.

3.15 CAD WELD & BURNDY CONNECTION:
CAD WELDS (EXOTHERMIC WELDS) AND BURNDY CONNECTIONS SHALL BOND ALL UNDERGROUND AND DAMP LOCATION CONNECTIONS, SHELTER SKID GROUNDS, TOWER OR MONOPOLE GROUNDS, FENCING CORNER AND GATE POSTS, ANTENNA GROUND BARS, (AGB) SURGE ARRESTER GROUND BAR, AND THE MASTER GROUND BAR (MGB). MECHANICAL CONNECTIONS SHALL BE TYPICALLY USED TO BOND ALL INTERIOR EQUIPMENT, COAX CABLE BRIDGES AND COAXIAL CABLE GROUND KITS. ALL LUG TYPE MECHANICAL CONNECTORS TO THE MGB OR AGB SHALL BE TWO HOLE TYPE CONNECTED WITH STAINLESS STEEL BOLTS AND NUTS WITH STAINLESS STEEL LOCK WASHERS AND NOALOX ON EITHER SIDE OF THE BUSS BAR.

3.16 CHEMICAL GROUND RODS: CHEMICAL GROUND RODS SHALL NOT BE INSTALLED ON GROUND RING INSTALLATIONS WITH NORMAL SOIL. CHEMICAL GROUND RODS SHALL BE INSTALLED ONLY FOR SPECIAL DESIGN APPLICATIONS THAT REQUIRE SINGLE POINT GROUNDING DUE TO SPECIFIC SITE CONDITIONS.

3.17 TENANT IMPROVEMENT SITE GROUNDING: FOR ROOF TOP ANTENNA INSTALLATIONS ADDITIONAL ANTENNA GROUND BARS MAY HAVE TO BE INSTALLED AT EACH ANTENNA MOUNT LOCATION. ALL ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 AWG CONDUCTOR CONNECTED TO THE NEAREST BUILDING STEEL OR THE AGB INSTALLED AT THE MOUNT. ALL BUSS BARS, BOTH MGB AND AGB(S), SHALL BE INDEPENDENTLY TIED TO THE NEAREST BUILDING STEEL OR DESIGNATED GROUNDING SYSTEM. AGB(S) MAY BE HOME RUN BACK TO THE MGB WHERE NO BUILDING STEEL IS AVAILABLE.

3.18 LIMITS OF BEND RADIUS: IT IS IMPORTANT THAT THE GROUNDING CONDUCTOR CONNECTING THE INSIDE AND OUTSIDE GROUND SYSTEMS BE AS STRAIGHT AS POSSIBLE, WITH NO TURN OR BEND SHORTER THAN ONE FOOT RADIUS WITH A THREE FOOT RADIUS PREFERRED. NO RIGHT ANGLE OR SHARP BENDS SHALL BE ALLOWED.

3.19 BONDING PREPARATION & FINISH: ALL SURFACES REQUIRE PREPARATION PRIOR TO BONDING OF EITHER CAD WELD OR BURNDY FASTENERS. GALVANIZED SURFACES SHALL BE GROUND OR SANDED TO THE POINT OF EXPOSING THE STEEL SURFACE BELOW, PRIOR TO BONDING THE GROUND CONDUCTOR. FOR OTHER SURFACES INCLUDING COPPER BUSS BARS ALL PAINT, RUST TARNISH AND GREASE SHALL BE REMOVED PRIOR TO BONDING THE GROUND CONDUCTOR. CAD WELD TYPE BONDS SHALL BE FINISHED WITH THE APPLICATION OF COLD GALVANIZATION AND WHEN APPLICABLE, FINISH PAINTED WITH AN APPROPRIATE COLOR AS REQUIRED. MECHANICAL TYPE BONDS ON BUSS BARS SHALL BE FINISHED WITH THE APPLICATION OF NOALOX OR OTHER APPROVED CONDUCTIVE MEDIUM MATERIAL BETWEEN CONNECTOR AND BUSS BAR. MECHANICAL TYPE BONDS ON ALL OTHER SURFACES SHALL BE FINISHED WITH THE APPLICATION OF COLD GALVANIZATION AND/OR THE APPROPRIATE PAINT TO MATCH AS REQUIRED.

3.20 TESTING: THE OUTSIDE GROUND RING SHALL BE TESTED AFTER INSTALLATION BUT PRIOR TO BACKFILLING THE GROUND RING TRENCH. THE GROUND FIELD RESISTANCE SHALL MEASURE 5 OHMS OR LESS TO GROUND. ANY DIFFICULTY IN ACHIEVING THIS LEVEL OF RESISTANCE MUST BE BROUGHT TO THE ATTENTION OF THE PROJECT MANAGER. THE RESISTANCE TO GROUND SHALL BE MEASURED USING THE FALL OF POTENTIAL METHOD. TESTING SHALL BE PERFORMED BY AN OWNER PROVIDED INDEPENDENT TESTING LABORATORY FROM WHICH A WRITTEN REPORT SHALL BE PRODUCED FOR REVIEW BY THE PROJECT MANAGER.

3.21 SPECIAL CONDITIONS: WHEN SOIL CONDITIONS EXIST (I.E., NON-COMPACTABLE ROCK, GRAVEL, SHALE, ETC.) THAT PREVENTS THE INSTALLATION OF THE STANDARD GROUNDING SYSTEM AND PROCEDURES, THEN VERBAL PROCEDURES SHALL BE REQUESTED BY THE PM.

3.22 EXTERNAL GROUND RING: THE EXTERNAL GROUND RING SHALL EXTEND TO THE MAXIMUM ALLOWABLE DEPTH IN 95% COMPACTED SOIL

3.23 GROUND RODS (REPLACEMENT): WHEN GROUND RODS CANNOT BE DRIVEN INTO THE SOIL VERTICALLY TO A DEPTH DESCRIBED IN PARAGRAPH 3.5, AND REMAIN IN 95% COMPACTACTED SOIL, THEN THE FOLLOWING METHODS OF SUBSTITUTION MAY BE USED. THESE ARE SUGGESTED METHODS ONLY, AND EACH CASE SHOULD BE REVIEWED BY THE T-MOBILE PROJECT MANAGER. THE PURPOSE IS TO ACHIEVE THE LOWEST IMPEDANCE TO GROUND, IN ANY CASE, EQUAL TO OR LESS THAN 5 OHMS.

3.24 ROCK WITH SOME OR NO SOIL COVER: FOR SITES WHICH HAVE SOIL CONDITIONS WHICH CONSIST OF SOLID OR SEMI SOLID ROCK BELOW ABOUT THREE FEET OF COMPATIBLE SOIL, A COMBINATION OF METHODS MAY BE USED:

A. A COMBINATION OF SHORT GROUND RODS MAY BE USED WITH 3' BSQUARE 1/4" COPPER PLATES. A MINIMUM OF TWO PLATES SHOULD BE USED AND SHOULD REPLACE GROUND RODS ON AN EQUIVALENCY OF TWO GROUND ROD LENGTHS PER COPPER PLATE. THE COPPER PLATE SHOULD BE PLACED IN A MINIMUM 3" BENTONITE BASE AND COVERED WITH 3" OF BENTONITE FILL PRIOR TO BACKFILL.

B. AN ACTIVE TYPE CHEMICAL ROD SYSTEM MAY BE USED. THIS IS AN ENGINEERING JUDGMENT AND SHOULD BE USED ONLY WHERE NECESSARY, DUE TO EXPENSE. IN ALL CASES, THE STANDARD PRACTICES OUTLINED IN THIS DOCUMENT SHOULD BE FOLLOWED TO THE EXTENT THAT IS APPLICABLE, AND SHOULD BE MODIFIED AS TO THE QUANTITY OF GROUND RODS AND CONDUCTOR SIZE ONLY AS RECOMMENDED BY THE MANUFACTURER OF THE GROUND ROD SYSTEM.

C. A SYSTEM UTILIZING CORED SHAFTS, STANDARD GROUND RODS ON A TYPICAL LAYOUT, WITH A BENTONITE (CLAY) BACKFILL. IN THIS CASE EACH GROUND ROD SHOULD BE TESTED INDIVIDUALLY, AND EACH ROD SHOULD HAVE AN ACCESS BOX PLACED FOR FUTURE TESTING.

3.24 HIGH RISE BUILDING:

A. HIGH RISE BUILDINGS PRESENT A UNIQUE PROBLEM IN GROUNDING. A FACILITY INVESTIGATION SHOULD BE MADE INTO THE STRUCTURE OF THE BUILDING, AND AS TO THE POSSIBLE PRESENCE OF AN EXISTING LIGHTNING PROTECTION SYSTEM. IF ONE IS IN PLACE AND APPEARS ADEQUATE IN DESIGN, IT MAY BE NECESSARY TO CONNECT THE ANTENNA SYSTEM TO THE EXISTING SYSTEM, WITH A TEST TO THE SYSTEM AFTER INSTALLATION TO ENSURE THAT IT HAS NOT CAUSED THE SYSTEM TO EXCEED 5 OHMS.

B. STRUCTURAL STEEL BUILDINGS: IF THE BUILDING IS BUILT OF STRUCTURAL STEEL, IT MAY BE POSSIBLE TO GROUND THE ANTENNAS TO THE BUILDING SITE. IT IS PREFERABLE TO GROUND THE ANTENNAS AND THE SITE TO A DIRECT EARTH CONNECTION, BY USE OF SEPARATE DOWN LEADS OF CONSIDERABLE SIZE (250 MCM OR LARGER) COMING FROM GROUND BUSS BARS TO COLLECT THE GROUND INPUT, AND RUN DOWN A VERTICAL SHAFT OR STAIRWELL TO A PATTERN OF NO LESS THAN FOUR GROUND RODS. WHERE PRACTICAL, THE BUILDING STEEL SHOULD BE BONDED TO THE GROUND RING WITH A SEPARATE LEAD TO THE GROUND ROD FIELD.

C. A SYSTEM STRUCTURAL CONCRETE BUILDINGS ARE MORE DIFFICULT TO GROUND PROPERLY. THE ANTENNAS SHOULD BE GROUNDED TO A SEPARATE BUSS BAR AND DOWN LEAD WHERE THE COAXIAL CABLES ENTER THE BUILDING. THE DOWN LEAD SHOULD BE RUN IN A SIMILAR FASHION AS IN THE STRUCTURAL STEEL EQUIPMENT ROOM. THE DOWN LEADS SHOULD BE PROTECTED IN CONDUIT AND SHOULD BE INSTALLED AS FAR APART AS IS PRACTICAL FROM EACH OTHER. THE SEPARATE DOWN LEADS SHOULD NOT CONTACT EACH OTHER UNTIL CONNECTION WITH THE FIRST GROUND ROD

811 Know what's **below.** **Call** before you dig.

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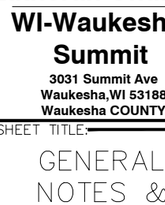


ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
GENERAL NOTES & SPECIFICATIONS

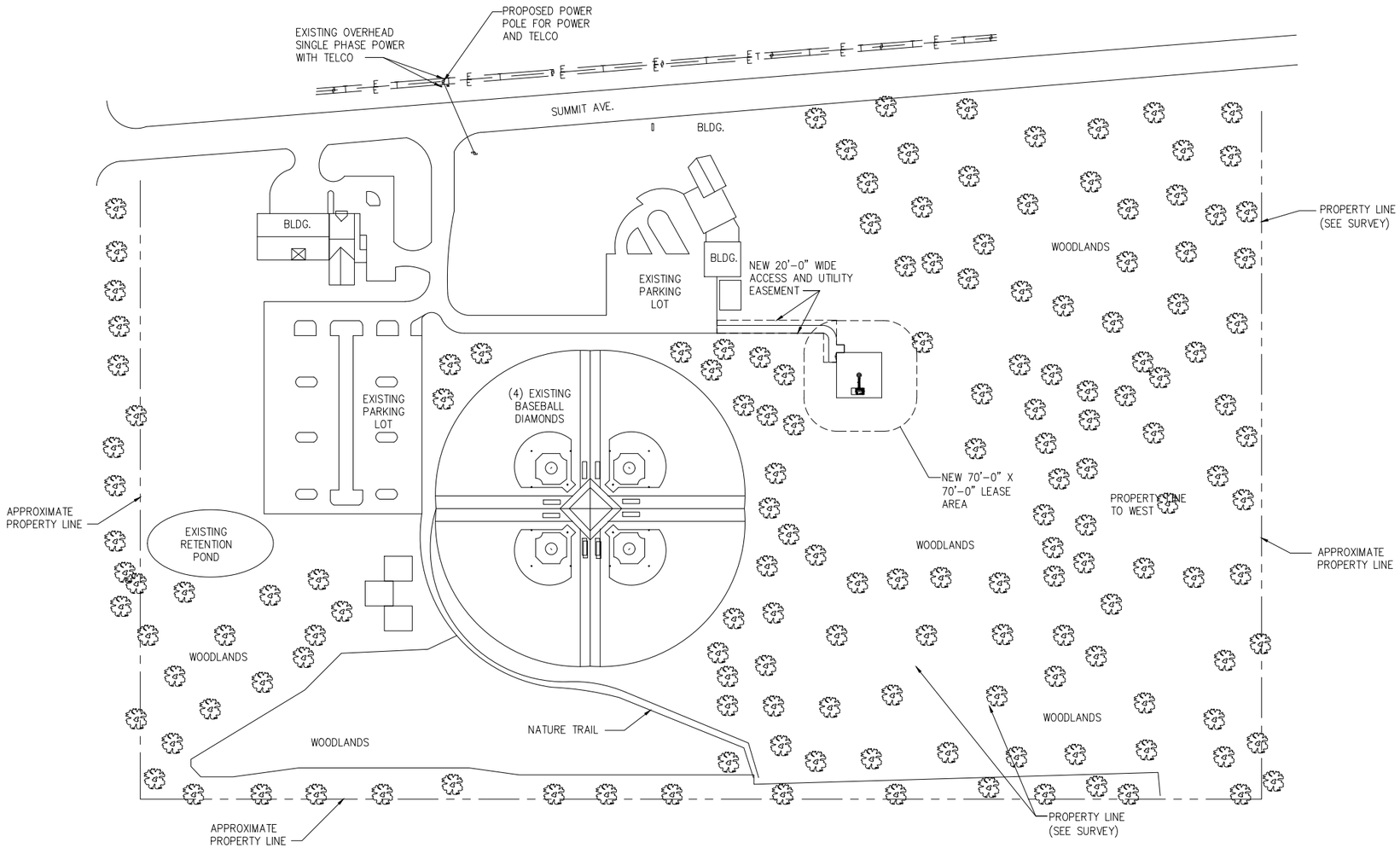
SHEET NUMBER:
T-3

PLOT SCALE: 1:1 @ 11"x17"

IMPORTANT SITE NOTES:

1. GENERAL CONTRACTOR WILL NOT START CONSTRUCTION UNTIL AFTER THEY HAVE RECEIVED THE PRE-CON PACKAGE AND HAVE A PRE-CON WALK WITH THE PROJECT MANAGER.
2. GENERAL CONTRACTOR TO HIRE PUBLIC (811) AND PRIVATE LOCATING SERVICE IN ORDER TO LOCATE AND PROTECT ALL SURFACE UTILITIES. DO NOT SCALE OFF THESE PLANS FOR ANY BELOW GRADE UTILITIES
3. CONTRACTOR SHALL VERIFY ALL EXISTING BURIED AND OVERHEAD UTILITIES PRIOR TO EXCAVATION. CONTRACTOR SHALL REPAIR ALL DAMAGED UTILITIES AT HIS OWN COST AND COORDINATE ANY REPAIRS WITH RESPECTIVE UTILITY COMPANY.
4. CONTRACTOR TO VERIFY ALL HEIGHTS AND AZIMUTHS IN FIELD PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY T-MOBILE AND ENGINEERING FIRM OF ANY DISCREPANCIES BEFORE PROCEEDING.
5. CONTRACTOR SHALL RESTORE AND REPAIR ANY DAMAGED AREAS CAUSED BY CONSTRUCTION

SETBACK DIMENSIONS TO PROPERTY LINES



N

OVERALL SITE PLAN

SCALE: 1"=80'-0"

1

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Waukesha COUNTY

SHEET TITLE:

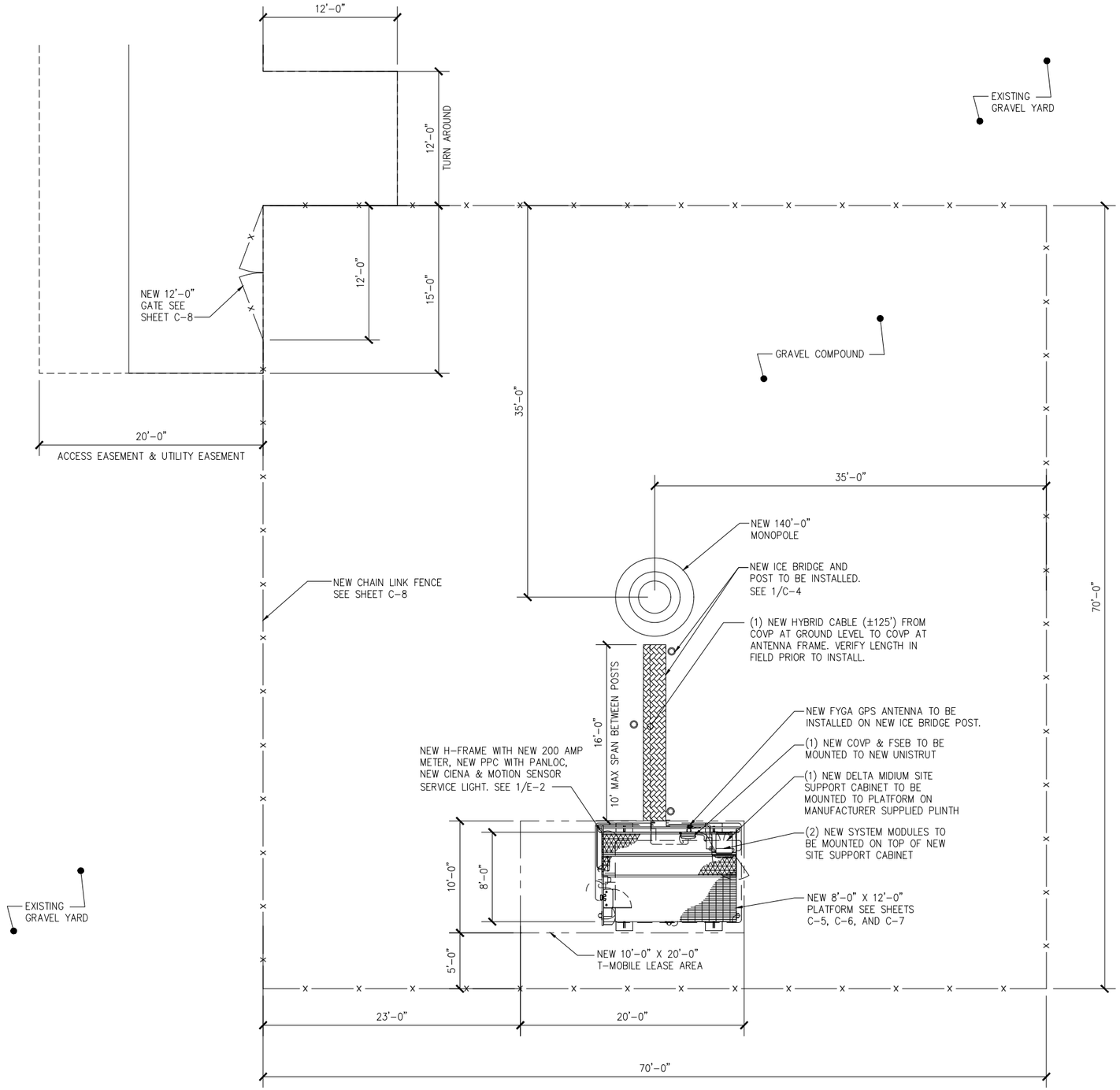
OVERALL SITE PLAN

SHEET NUMBER:

C-1

PLOT SCALE: 1:1 @ 11"x17"

NOTE:
ALL UNISTRUT, FASTENERS, HARDWARE, ETC, ARE TO BE EITHER HOT-DIPPED GALVANIZED OR STAINLESS STEEL. GENERAL CONTRACTOR IS NOT TO USE ZINC-PLATED OR PRE-GALVANIZED.



ENLARGED SITE PLAN
SCALE: 3/16"=1'-0"
1

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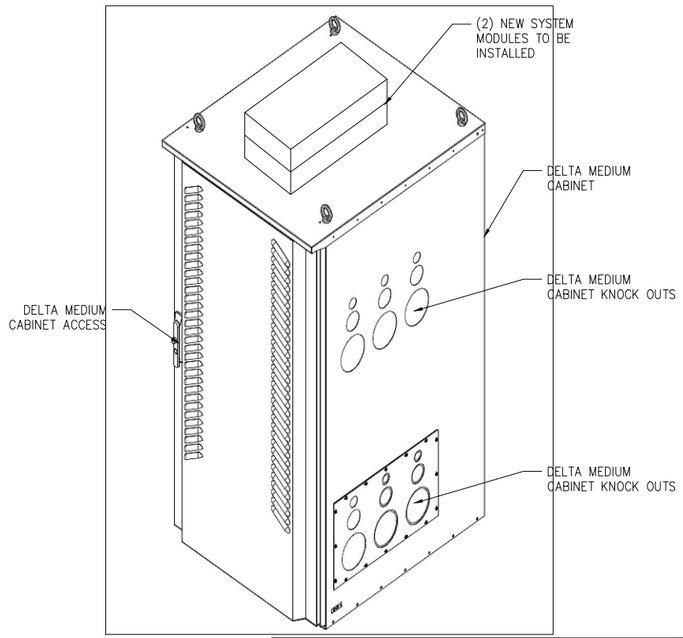
Waukesha COUNTY

SHEET TITLE:
ENLARGED SITE PLAN

SHEET NUMBER:
C-2

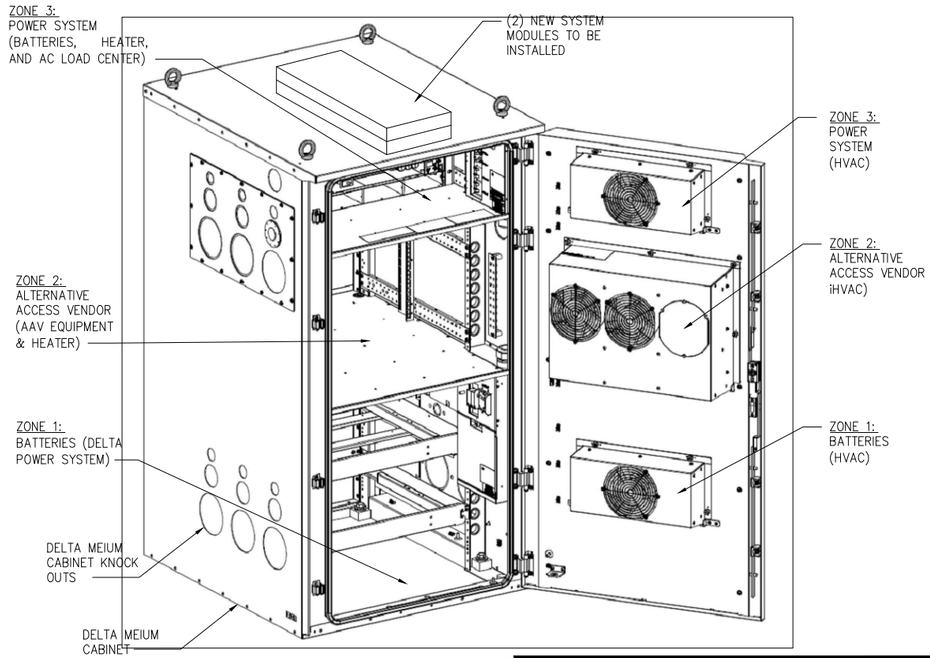
PLOT SCALE: 1:1 @ 11"x17"



ISOMETRIC EQUIPMENT VIEW

SCALE: NOT TO SCALE

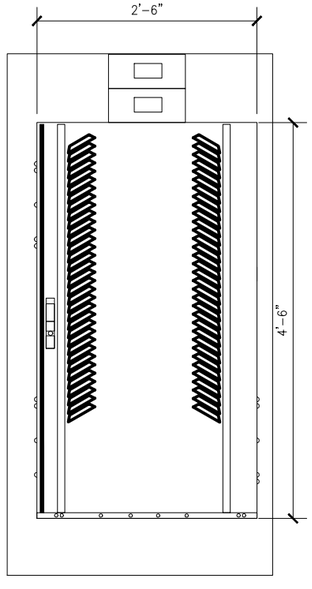
1



ISOMETRIC EQUIPMENT VIEW

SCALE: NOT TO SCALE

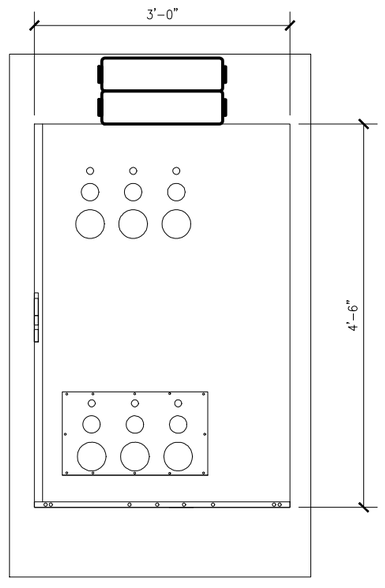
2



FRONT EQUIPMENT VIEW

SCALE: NOT TO SCALE

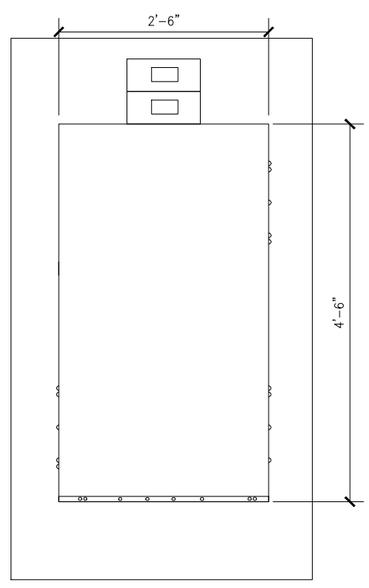
3



RIGHT EQUIPMENT VIEW

SCALE: NOT TO SCALE

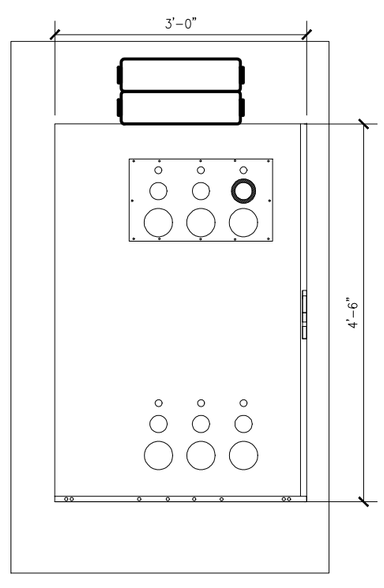
4



BACK EQUIPMENT VIEW

SCALE: NOT TO SCALE

5



LEFT EQUIPMENT VIEW

SCALE: NOT TO SCALE

6

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Waukesha COUNTY

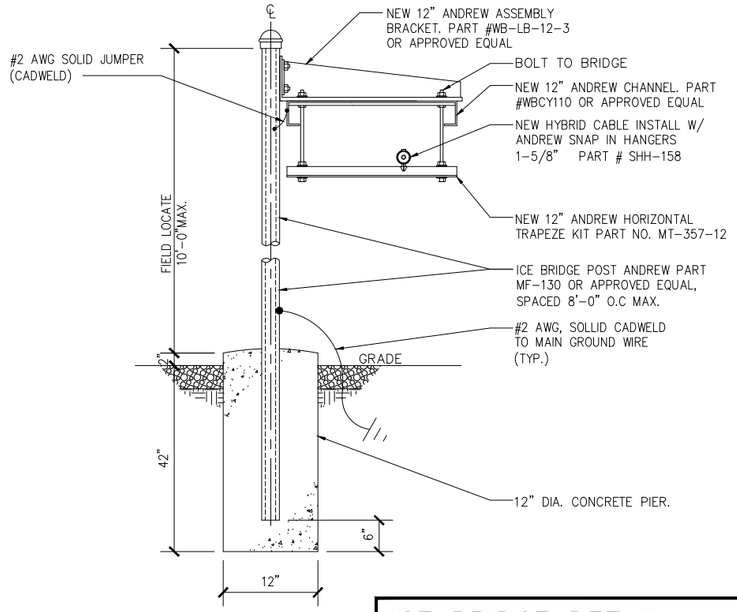
SHEET TITLE:

EQUIPMENT ELEVATION

SHEET NUMBER:

C-3

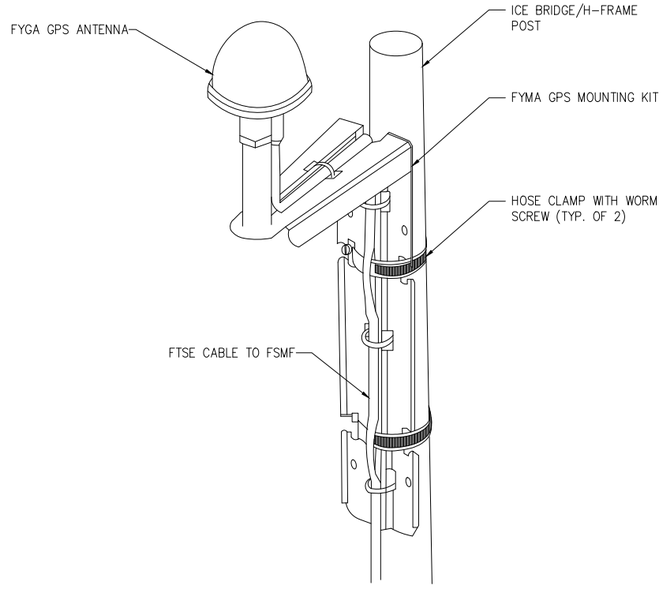
PLOT SCALE: 1:1 @ 11"x17"



ICE BRIDGE DETAIL

SCALE: NONE

1



FYGA GPS ANTENNA DETAIL

SCALE: NONE

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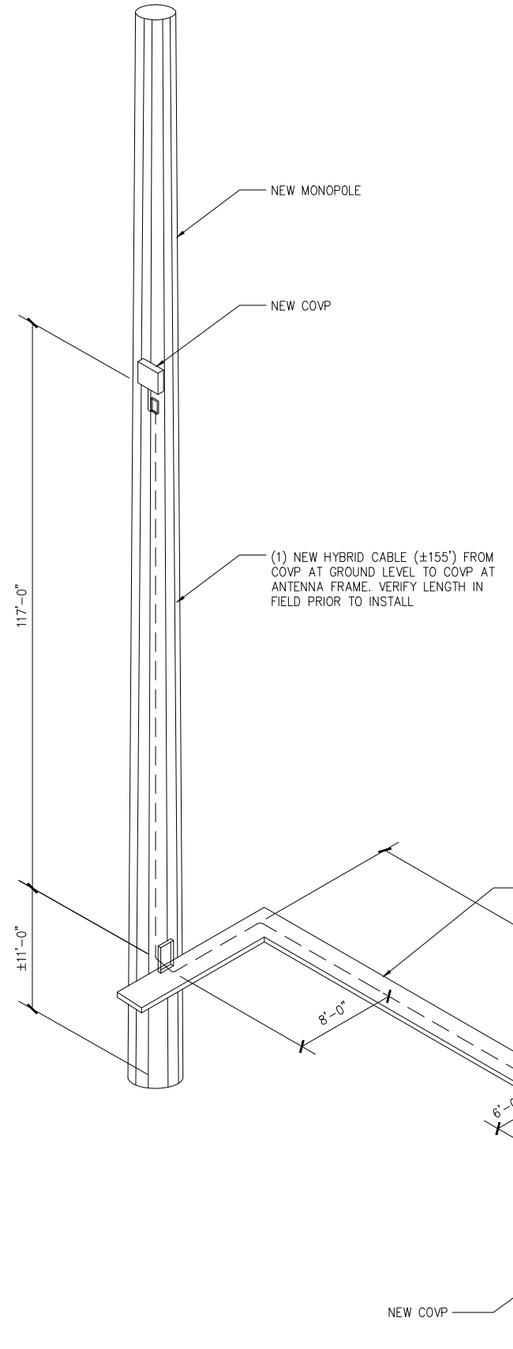

HYBRID CABLE ISO RISER DIAGRAM

SCALE: NONE

3

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Waukesha COUNTY

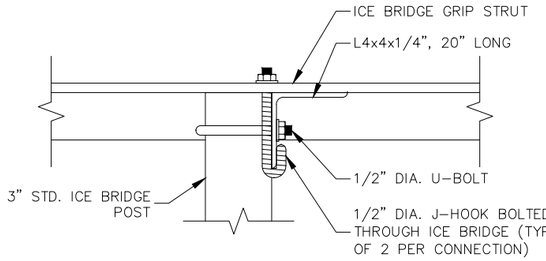
SHEET TITLE:

ICE BRIDGE, GPS AND HYBRID CABLE DETAILS

SHEET NUMBER:

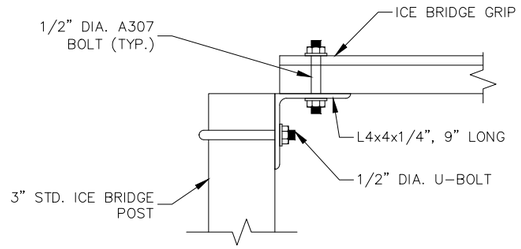
C-4

PLOT SCALE: 1:1 @ 11"x17"



CONNECTION DETAIL 2

SCALE: 1 1/2" = 1'-0"

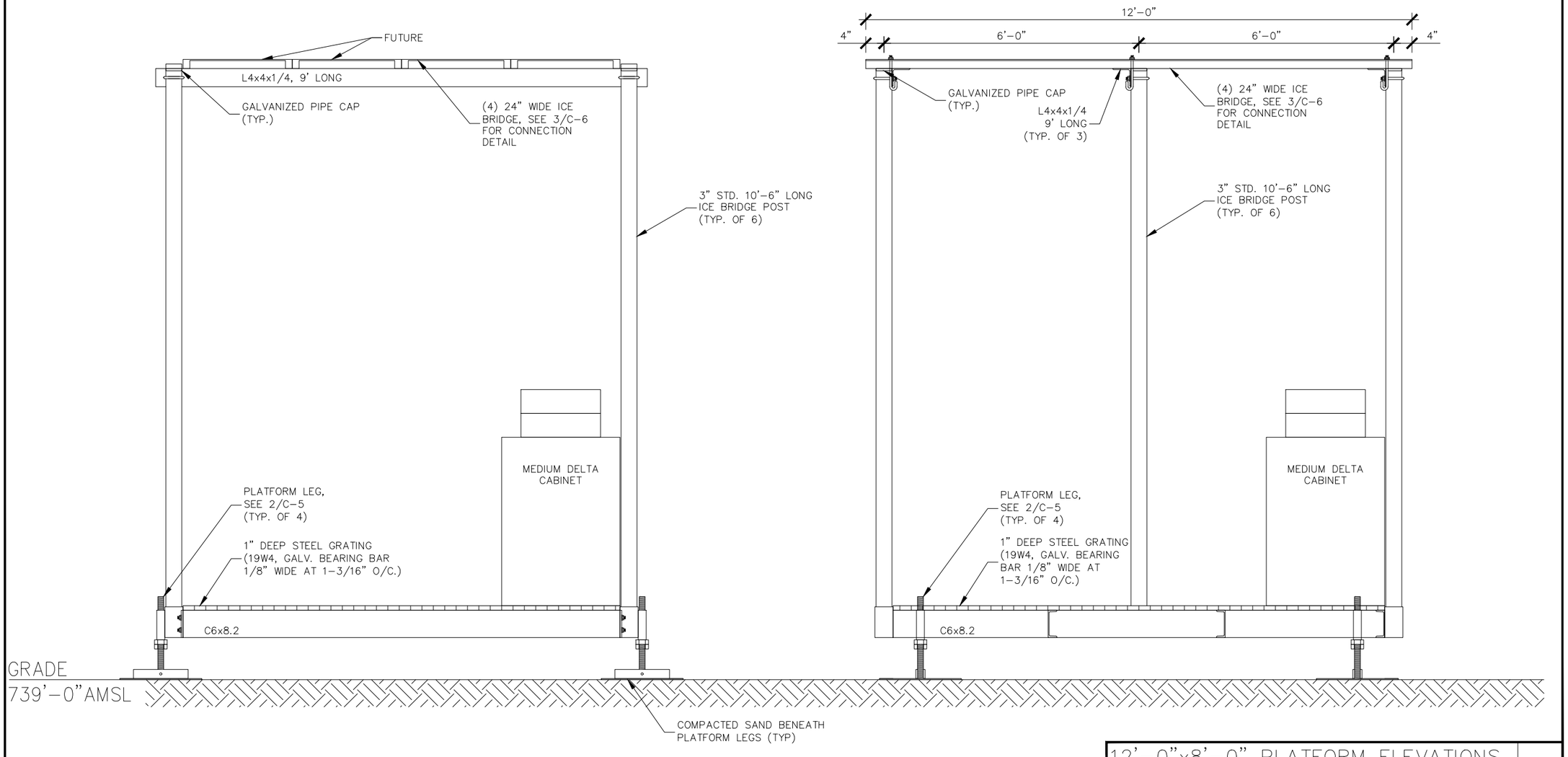


CONNECTION DETAIL 3

SCALE: 1 1/2" = 1'-0"

NOTES:

1. EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED IN FIELD BY THE CONTRACTOR PRIOR TO FABRICATION AND INSTALLATION. IF SIGNIFICANT DEVIATIONS OR DETERIORATION ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION, A REPAIR PERMIT SHALL BE OBTAINED AND CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER IMMEDIATELY.
2. FOUNDATIONS ARE DESIGNED FOR AN ASSUMED MINIMUM NET ALLOWABLE SOIL BEARING CAPACITY OF 2000 PSF. IT IS RECOMMENDED THAT A GEOTECHNICAL INVESTIGATION BE COMPLETED PRIOR TO CONSTRUCTION. IF SOIL BEARING CAPACITY IS LESS THAN WHAT IS SPECIFIED HERE, CONTACT ARCHITECT/ENGINEER FOR A REDESIGN.
3. DO NOT SCALE DRAWINGS.



12'-0"x8'-0" PLATFORM ELEVATIONS 1

SCALE: 1/2" = 1'-0"

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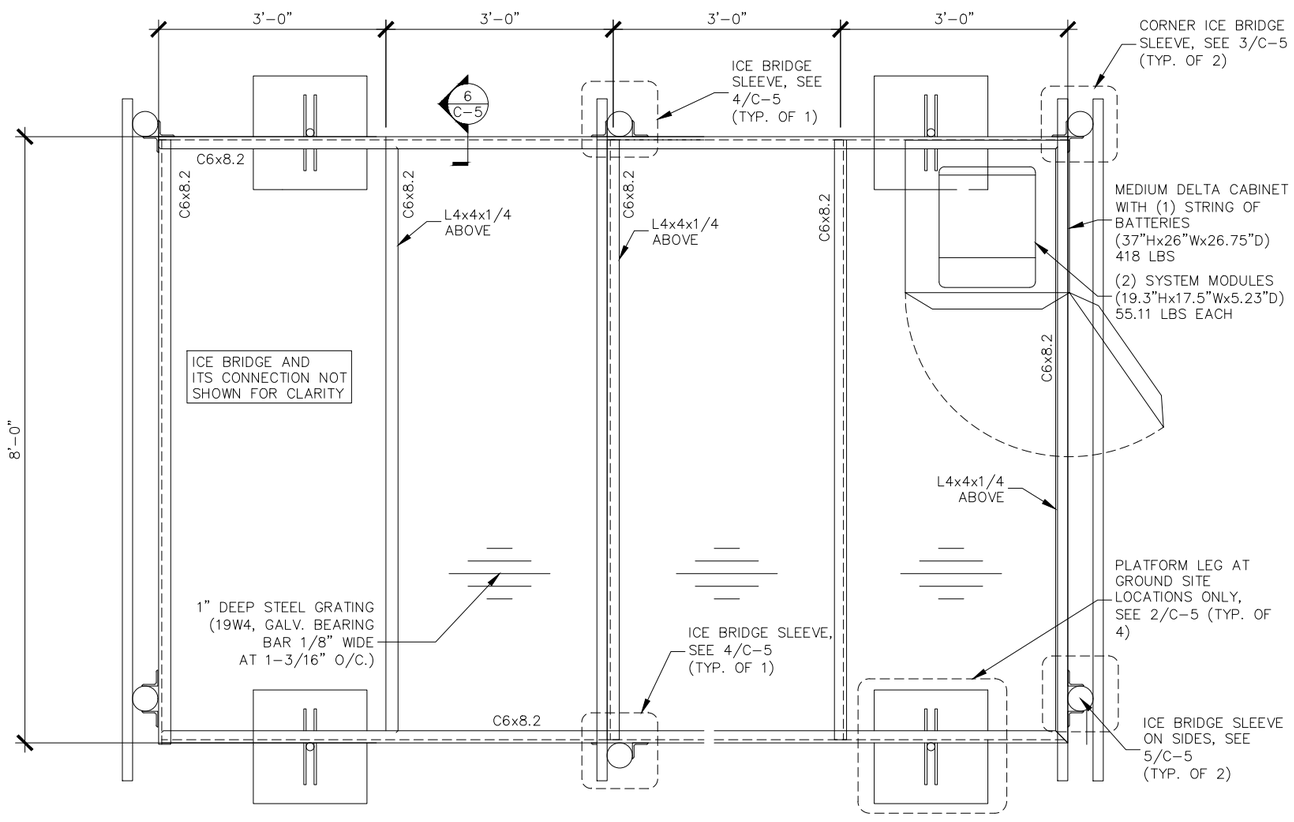
SHEET TITLE:

PLATFORM ELEVATIONS

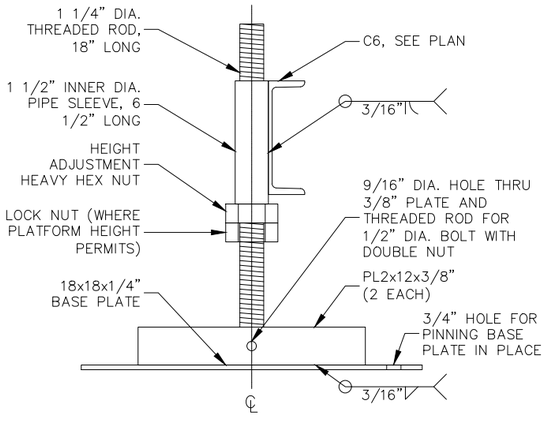
SHEET NUMBER:

C-5

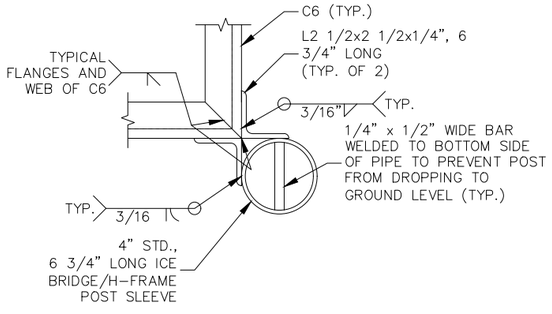
PLOT SCALE: 1:1 @ 11"x17"



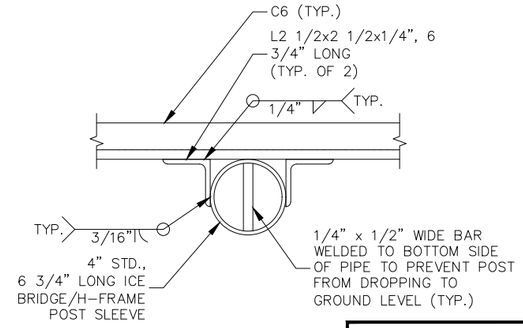
12'-0"x8'-0" PLATFORM PLAN | 1
SCALE: 1/2" = 1'-0"



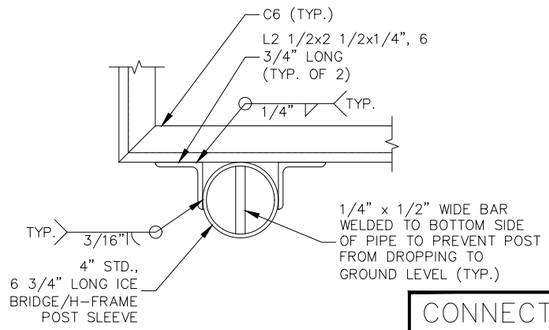
PLATFORM LEG DETAIL | 2
SCALE: 1 1/2" = 1'-0"



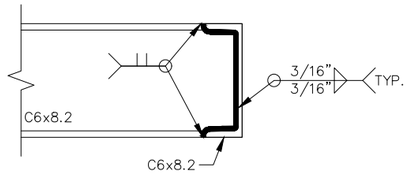
CONNECTION DETAIL | 3
SCALE: 1 1/2" = 1'-0"



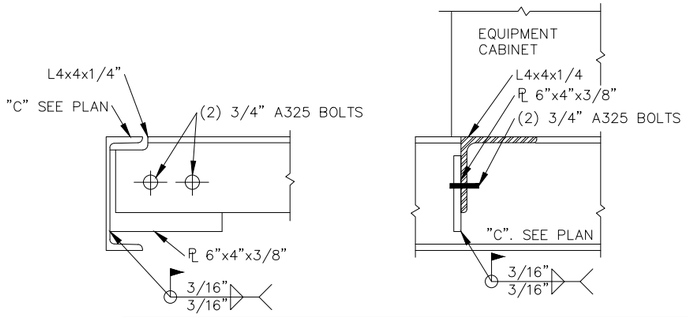
CONNECTION DETAIL | 4
SCALE: 1 1/2" = 1'-0"



CONNECTION DETAIL | 5
SCALE: 1 1/2" = 1'-0"



CONNECTION DETAIL | 6
SCALE: 1 1/2" = 1'-0"



CABINET SUPPORT CONNECTION DETAIL | 7
SCALE: 1 1/2" = 1'-0"

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Waukesha COUNTY

SHEET TITLE:
PLATFORM DETAILS

SHEET NUMBER:
C-6

PLOT SCALE: 1:1 @ 11"x17"

GENERAL STRUCTURAL NOTES

1.0 GENERAL CONDITIONS

1.1 DESIGN AND CONSTRUCTION OF WORK SHALL CONFORM TO 2012 INTERNATIONAL BUILDING CODE, ACI 318-11, AISC/ASD 14TH EDITION, ASCE 7-10, TIA/EIA-222-G. IN CASE OF CONFLICT BETWEEN THE CODES, STANDARDS, REGULATIONS, SPECIFICATIONS, GENERAL NOTES AND/OR MANUFACTURER'S REQUIREMENTS USE THE MOST STRINGENT PROVISION.

1.2 IT IS THE EXPRESS INTENT OF THE PARTIES INVOLVED IN THIS PROJECT THAT THE CONTRACTOR OR SUBCONTRACTOR OR INDEPENDENT CONTRACTOR OR THEIR RESPECTIVE EMPLOYEES SHALL EXCULPATE THE ARCHITECT, THE ENGINEER, THE CONSTRUCTION MANAGER, THE OWNER, AND THEIR AGENTS, FROM ANY LIABILITY WHATSOEVER AND HOLD THEM HARMLESS AGAINST LOSS, DAMAGES, LIABILITY OR ANY EXPENSE ARISING IN ANY MATTER FROM THE WRONGFUL OR NEGLIGENT ACT, OR FAILURE TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, OR THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OR FAILURE TO CONFORM TO THE STATE SCAFFOLDING ACT IN CONNECTION WITH THE WORK.

1.3 DO NOT SCALE DRAWINGS.

1.4 VERIFY ALL EQUIPMENT MOUNTING DIMENSIONS PER MANUFACTURER DRAWINGS.

1.5 SUBMIT ONE COPY OF ALL STRUCTURAL SHOP DRAWINGS FOR REVIEW.

1.6 DESIGN LOADS ARE:

A. EQUIPMENT LOAD
-(1) NEW MEDIUM DELTA CABINET (54"Hx30"Wx36"D).....200 LBS
(MEDIUM CABINET WEIGHS 200 LBS. WITHOUT EQUIPMENT OR BATTERIES
-(2) NEW SYSTEM MODULE (19.3"Hx17.5"Wx5.23"D).....55.11 LBS
-(1) NEW FCOA CABINET (61"Hx30.3"Wx30.3"D).....789 LBS
-(2) FUTURE FCOA CABINET (61"Hx30.3"Wx30.3"D).....789 LBS

B. PLATFORM LOADS
-LIVE LOAD: 100 PSF
-PLATFORM DEAD LOAD: 15 PSF

2.0 EXISTING CONDITIONS

2.1 CONTRACTOR SHALL FIELD VERIFY THAT THE EXISTING CONSTRUCTION ADJACENT TO THIS CONSTRUCTION, OR TO WHICH THIS CONSTRUCTION SHALL BE CONNECTED, IS AS INDICATED ON THIS DRAWING.

2.2 EXISTING CONDITIONS WILL BE CHECKED AND VERIFIED IN FIELD. IF SIGNIFICANT DEVIATIONS OR DETERIORATION ARE ENCOUNTERED AT THE TIME OF CONSTRUCTION A REPAIR PERMIT WILL BE OBTAINED AND CONTRACTOR SHALL NOTIFY STRUCTURAL ENGINEER IMMEDIATELY.

3.0 STEEL NOTES

3.1 MEET OR EXCEED THE FOLLOWING CODES & STANDARDS EXCEPT AS NOTED:

A. STRUCTURAL STEEL.....	AISC SPECIFICATION ALLOWABLE STRESS DESIGN, 14TH EDITION
-W SHAPES & CHANNELS.....	ASTM A992 - 50KSI
-SHAPES AND PLATES.....	ASTM A36
-PLATES BENT OR COLD FORMED.....	ASTM A 283, GRADE C
-PIPES.....	ASTM A 500, GRADE B - 42 KSI
-TUBES.....	ASTM A 500, Fy= 46 KSI
-STRUCTURAL SHEETS, HOT ROLLED.....	ASTM A 570
-COLD-FORMED STEEL TUBING.....	ASTM A 500, GRADE B
-BOLTS, NUTS & WASHERS FOR FRAMING MEMBERS AND BRACINGS.....	ASTM A 325-X
-BOLTS, NUTS & WASHERS FOR ANCHOR BOLTS AND SECONDARY CONNECTIONS.....	ASTM A 307
B. WELDS.....	AWS E 70XX

EXCEPTION IS TAKEN TO AISC CODE OF STANDARD PRACTICE PARAGRAPH

3.2.1 REGARDING OWNERS AND FABRICATOR'S RESPONSIBILITY FOR CONNECTION DESIGN AND ADEQUACY OF SHOP DRAWINGS. COMPLIANCE WITH THE REQUIREMENTS SHOWN ON DRAWINGS AND/OR SPECIFICATIONS, CONNECTION DESIGN AND DETAILING IS THE CONTRACTOR'S RESPONSIBILITY. ENGINEER'S REVIEW OF SHOP DRAWINGS IS FOR GENERAL CONSIDERATIONS ONLY AND DOES NOT CONSTITUTE AN ACCEPTANCE OF THESE RESPONSIBILITY BY THE OWNER AND/OR ENGINEER.

3.2.2 ALL UNISTRUT, FASTENERS, HARDWARE, ETC. SHALL BE HOT DIPPED GALVANIZED OR SHALL BE STAINLESS STEEL. ZINC PLATED MATERIAL SHALL NOT BE USED

3.2.3 ALL STRUCTURAL STEEL, SHAPES, PLATES, SHALL BE GALVANIZED PER ASTM 123

4.0 GEOTECHNICAL NOTES

4.1 ALL FOOTINGS SHALL BE CONSTRUCTED UPON UNDISTURBED, NATURAL SUBGRADE OR COMPACTED GRANULAR FILL WITH A MINIMUM NET ALLOWABLE BEARING CAPACITY OF 2000 PSF.

4.2 THE SOIL SUBGRADE FOR ALL FOOTINGS AND SLABS SHALL BE INSPECTED AND APPROVED BY THE OWNER'S TESTING AGENCY IMMEDIATELY PRIOR TO PLACING FOUNDATION CONCRETE OR CONCRETE MUD SLABS.

4.3 ALL ORGANIC AND / OR OTHER UNSUITABLE MATERIAL SHALL BE REMOVED FROM FOUNDATION AND SLAB SUBGRADE AND BACKFILL AREAS, AND THEN BACKFILLED WITH ACCEPTABLE GRANULAR FILL COMPACTED TO 95 PERCENT OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT (ASTM D1557).

4.4 NO FOOTINGS OR STRUCTURAL SLABS SHALL BE PLACED INTO OR AGAINST SUBGRADES CONTAINING FREE WATER, FROST OR ICE. SHOULD WATER OR FROST ENTER A FOOTING/MUD SLAB/STRUCTURAL SLAB EXCAVATION AFTER SUBGRADE APPROVAL, THE SUBGRADE SHALL BE REINSPECTED BY THE OWNER'S SOIL TESTING LABORATORY AFTER REMOVAL OF WATER, FROST, OR ICE.

4.5 THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY WATER, FROST, OR ICE FROM PENETRATING ANY FOOTING OR STRUCTURAL/ MUD SLAB SUBGRADE BEFORE AND AFTER PLACING OF CONCRETE, AND UNTIL SUCH SUBGRADES ARE FULLY PROTECTED BY THE PERMANENT BUILDING STRUCTURE.

4.6 ALL FOOTING MUD SLABS SHALL BE THOROUGHLY CLEANED IMMEDIATELY PRIOR TO CONCRETE PLACEMENT.

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CHICAGO, ILLINOIS 60631

PLANS PREPARED FOR:
Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC

ENGINEERING LICENSE:

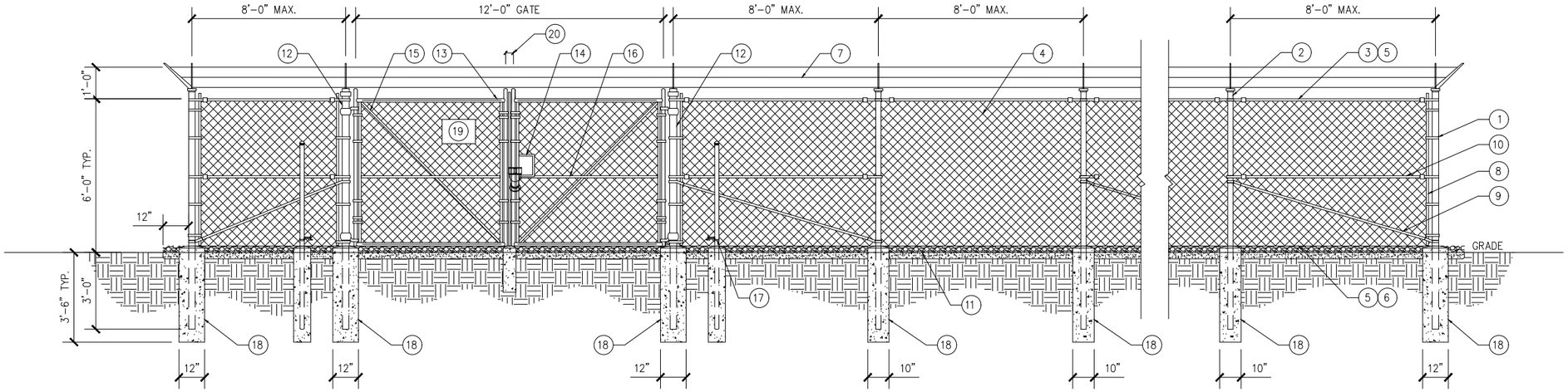
DATE:	DESCRIPTION:	BY:	REV:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:
ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
PLATFORM NOTES

SHEET NUMBER:
C-7

PLOT SCALE: 1:1 @ 11"x17"



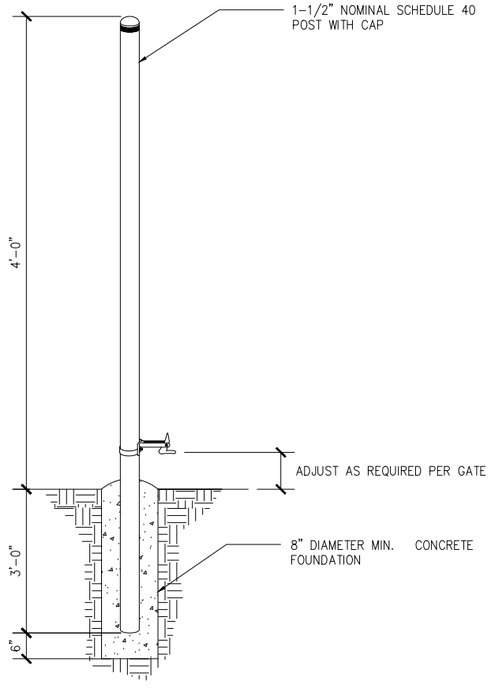
FENCE ELEVATION

SCALE: NOT TO SCALE

1

REFERENCE NOTES:

1. CORNER, END OR PULL POST: 3" NOMINAL SCHEDULE 40 PIPE.
2. LINE POST: 2-1/2" NOMINAL SCHEDULE 40 PIPE, PER ASTM F1083. LINE POSTS SHALL BE EQUALLY SPACED AT MAXIMUM 8'-0" O.C. (2-7/8" O.D.)
3. TOP RAIL & BRACE RAIL: 1-1/2" NOMINAL PIPE, PER ASTM F1083.
4. FABRIC: 9 GAUGE CORE WIRE SIZE 2" MESH, CONFORMING TO ASTM A392. GROUND CLEARANCE TO BE 2" MAX.
5. TIE WIRE: MINIMUM 11 GAUGE GALVANIZED STEEL. A SINGLE WRAP OF FABRIC TIE AT POSTS AND RAILS. BY HOG RINGS SPACED MAXIMUM 24" INTERVALS AT TENSION WIRE .
6. TENSION WIRE: 9 GAUGE GALVANIZED STEEL.
7. BARBED WIRE: DOUBLE STRAND 12 GAUGE TWISTED WIRE TO MATCH WITH FABRIC. 14 GAUGE 4 POINT BARBS SPACED APPROXIMATELY 5" ON CENTER. 45 DEGREE ARM ANGLED OUTWARD.
8. STRETCHER BAR: 3/16" X 3/4" X HEIGHT OF FENCE.
9. 3/8" DIAGONAL ROD WITH GALVANIZED STEEL TURNBUCKLE OR DIAGONAL THREADED ROD.
10. CORNER POST BRACE: 1-1/4" NOMINAL PIPE EACH CORNER EACH WAY.
11. FINISH GRADE SHALL BE UNIFORM, LEVEL AND EXTEND 12" BEYOND FENCE BOUNDARY.
12. GATE POST: 3-1/2" NOMINAL SCHEDULE 40 PIPE, FOR GATE WIDTHS UP THRU 10 FEET OR 20 FEET FOR DOUBLE SWING GATE, PER ASTM F1083.
13. GATE FRAME: 1-1/2" NOMINAL PIPE, PER ASTM F1083.
14. 4" X 6" HANDHOLE WITH 3/4" CHAIN AND LOCKS. WELD CHAIN TO THE GATE LEAF WITHOUT THE HANDHOLE.
15. GATE DIAGONAL: GALVANIZED STEEL 1-1/2" NOMINAL PIPE.
16. GATE FRAME BRACE: 1-5/8" NOMINAL PIPE.
17. DUCK BILL OPEN GATE HOLDER. VERIFY LOCATION IN FIELD PRIOR TO INSTALLATION.
18. POST CONCRETE FOUNDATION (2000 PSI).
19. SIGNAGE PROVIDED BY OWNER.
20. GAP BETWEEN GATES: 1" MIN. / 3" MAX.



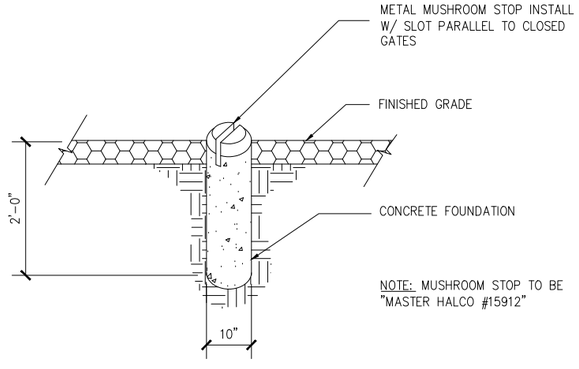
DUCKBILL GATE STOP

SCALE: NOT TO SCALE

2

GENERAL NOTES:

1. INSTALL FENCING PER ASTM F567.
2. INSTALL SWING GATES PER ASTM F900.
3. COMPLY WITH LOCAL ORDINANCE OF BARBED WIRE PERMIT REQUIREMENT, IF REQUIRED.
4. POST & GATE PIPE SIZES ARE INDUSTRY STANDARDS. ALL PIPE TO BE 1-1/4" NOMINAL SCHEDULE 40 GALVANIZED MINIMUM (HOT DIP, ASTM F1083 GRADE "A" STEEL). ALL GATE FRAMES SHALL BE WELDED. ALL WELDING SHALL BE COATED WITH (3) COATS OF COLD GALVANIZING (OR EQUAL).
5. ALL OPEN POSTS SHALL HAVE END-CAPS.
6. USE GALVANIZED HOG-RING WIRE TO MOUNT ALL SIGNS.
7. ALL SIGNS MUST BE MOUNTED ON INSIDE OF FENCE FABRIC.



MUSHROOM GATE STOP

SCALE: NOT TO SCALE

3

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PLANS PREPARED FOR:

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

QUESTO OPTIMUS SOLUTIO

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

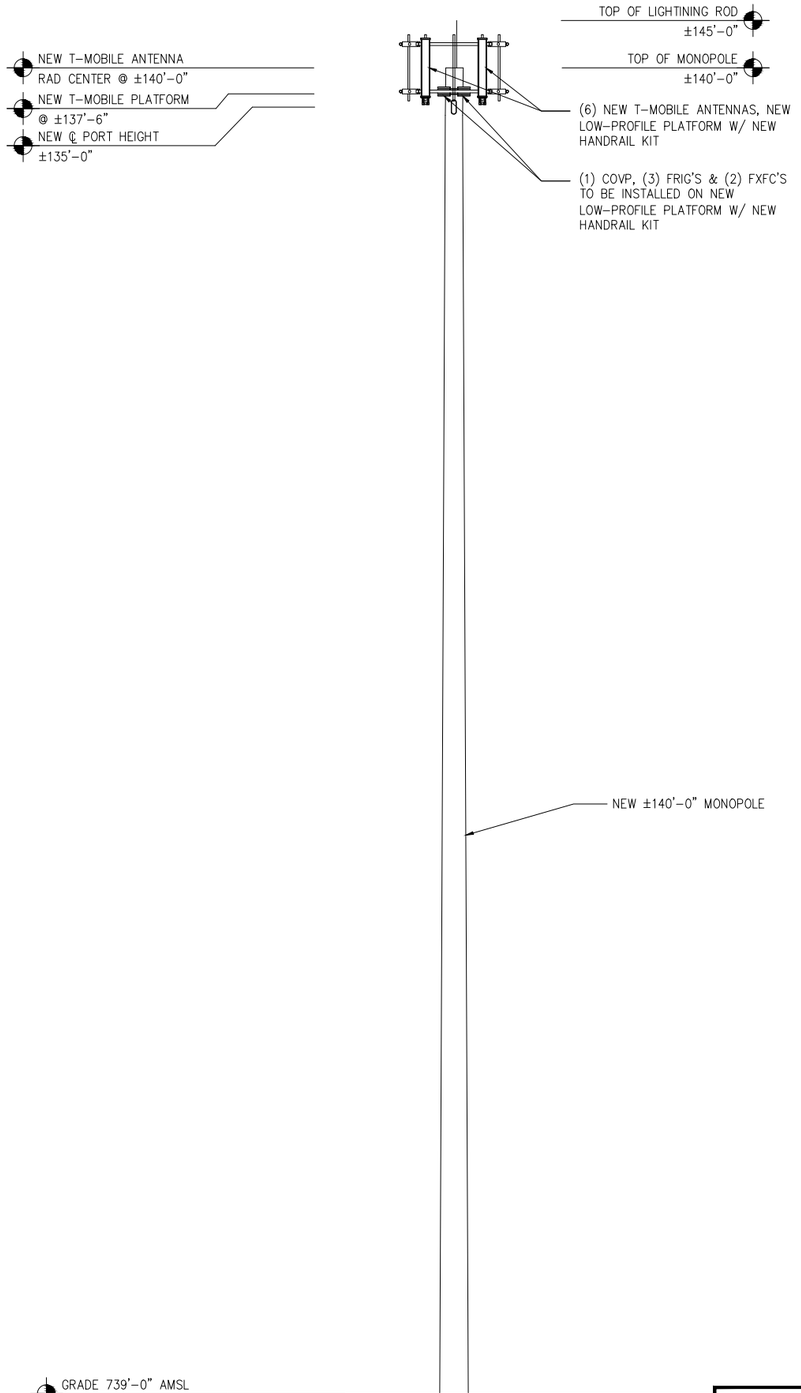
SHEET TITLE:

FENCE DETAILS

SHEET NUMBER:

C-8

PLOT SCALE: 1:1 @ 11"x17"



NOTE:
CELLUSITE'S SCOPE OF WORK DOES NOT INCLUDE A STRUCTURAL EVALUATION OF THIS TOWER OR STRUCTURE. NEW ANTENNAS AND EQUIPMENT SHOWN ON THIS PLAN HAVE NOT BEEN EVALUATED TO VERIFY THE TOWER OR STRUCTURE HAS THE CAPACITY TO ADEQUATELY SUPPORT THESE ANTENNAS. PRIOR TO ANY ANTENNA OR EQUIPMENT INSTALLATION, A STRUCTURAL EVALUATION OF THE TOWER OR STRUCTURE, INCLUDING ALL ANTENNA MOUNTING SYSTEMS & HARDWARE SHOULD BE PERFORMED.

NOTE:
CONTRACTOR TO VERIFY ALL HEIGHTS AND AZIMUTHS IN FIELD PRIOR TO CONSTRUCTION. CONTRACTOR SHALL NOTIFY T-MOBILE AND ENGINEERING FIRM OF ANY DISCREPANCIES BEFORE PROCEEDING.

NOTE:
CONTRACTOR TO USE PROPER TORQUE WRENCH WHEN INSTALLING AND TIGHTENING CONNECTORS TO INSURE PROPER FIT.

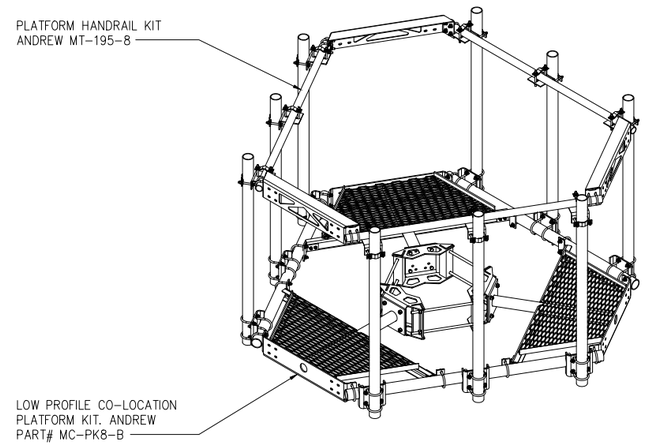
NOTE:
CONTRACTOR TO ARRANGE NEW MODULES/EQUIPMENT TO AVOID INTERFERING WITH SAFETY CLIMB.

NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING FINAL RF CONFIGURATION AND NOTIFY T-MOBILE AND ENGINEERING FIRM WITH ANY DISCREPANCIES.

NOTE:
CONTRACTOR SHALL VERIFY ALL FINAL CONNECTION LOCATIONS WITH T-MOBILE ENGINEER, RF ENGINEER, AND NET-OPS PRIOR TO INSTALLATION.

TOWER ELEVATION
SCALE: 3/16 = 1'-0"

1



ANTENNA PLATFORM W/ HANDRAIL KIT
SCALE: NOT TO SCALE

2

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CelluSite, LLC

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05/09/15	REVIEW CD	BMW	CD

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3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
TOWER ELEVATION

SHEET NUMBER:
A-1

PLOT SCALE: 1:1 @ 11"x17"

ANTENNA & CABLE SCHEDULE

SECTOR	ALPHA		BETA		GAMMA		DELTA	
LOCATION	A-2	A-1	B-2	B-1	C-2	C-1		
TECHNOLOGY	LTE	UMTS	LTE	UMTS	LTE	UMTS		
AZIMUTH	45°		140°		270°			
RAD CENTER	±140'-0"		±140'-0"		±140'-0"			
COLOR CODING	RED (5-8)	RED (1-4)	GREEN (5-8)	GREEN (1-4)	BLUE (5-8)	BLUE (1-4)		
MODEL #	ANDREW TMBXX-6516-A2M	ANDREW TMBXX-6516-A2M	ANDREW TMBXX-6516-A2M	ANDREW TMBXX-6516-A2M	ANDREW TMBXX-6516-A2M	ANDREW TMBXX-6516-A2M		
MECHANICAL DOWNTILT	0	0	0	0	0	X		
ELECTRICAL DOWNTILT	3	3	3	3	3	3		
RRU TYPE	FRIG	(2) FXFC'S	FRIG	SHARED FXFC	FRIG	SHARED FXFC		
HCS DIA. & TYPE	1.584" HIGH CAPACITY	–	–	–	–	–		
HCS ACTUAL LENGTH	±155'-0"	–	–	–	–	–		
HCS FACTORY LENGTH	175'-0"	–	–	–	–	–		
FIBER JUMPER LENGTH	15'-0"	15'-0"	15'-0"	–	15'-0"	–		
RF JUMPER LENGTH	6'-0"	12'-0"	6'-0"	20'-0"	6'-0"	6'-0"		

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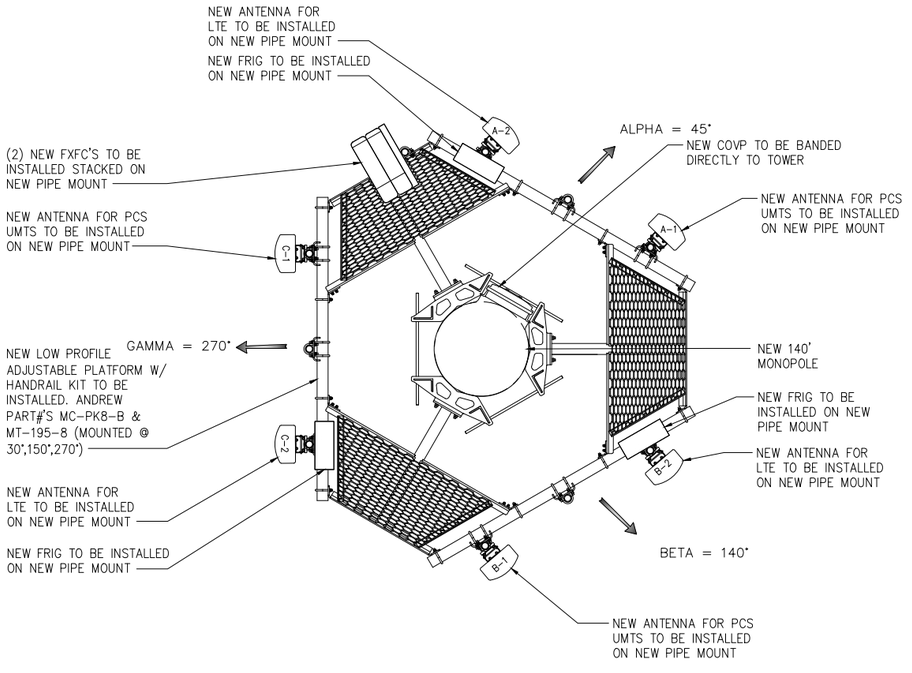
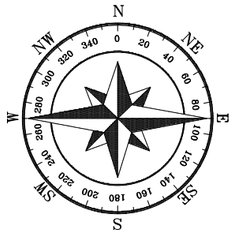
NOTE:
ANTENNA INFORMATION OBTAINED FROM T-MOBILE RF DATA CONFIGURATION SHEET DATED 11/20/14



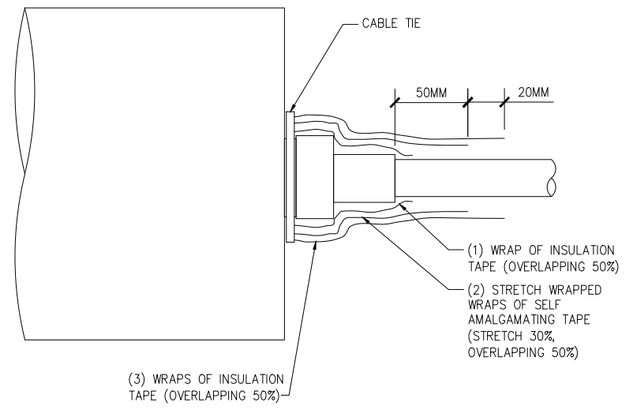


ANTENNA PLAN

SCALE: 1/4"=1'-0"

1

JUMPERS TO BE TORQUED TO 221.27 IN/LBS



RF JUMPER CONNECTION DETAIL

SCALE: NOT TO SCALE

2

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PLANS PREPARED FOR:
Parallel INFRASTRUCTURE

PLANS PREPARED BY:
CelluSite, LLC
www.cellusite.net
QUESTO OPTIMUS SOLUTIO

ENGINEERING LICENSE:

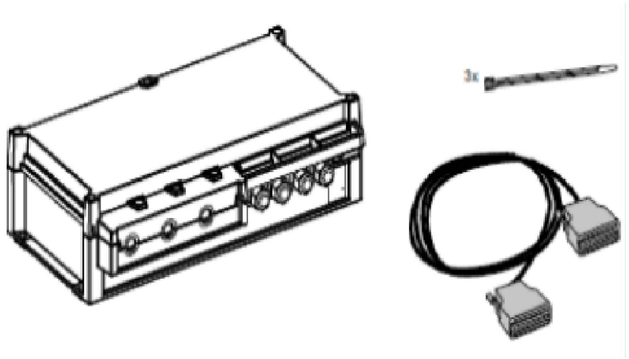
DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:
ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:
ANTENNA PLAN

SHEET NUMBER:
A-2

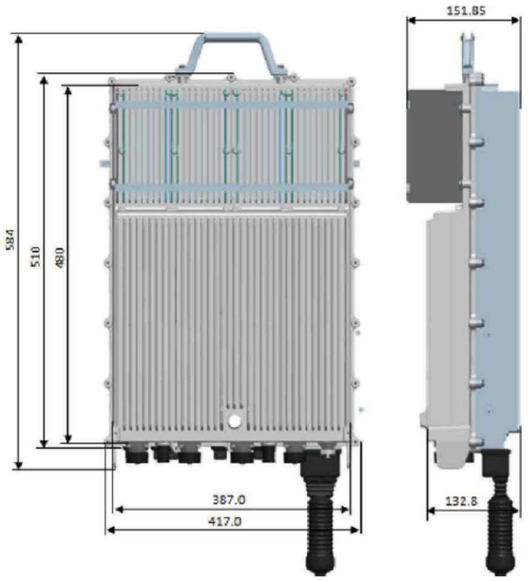
PLOT SCALE: 1:1 @ 11"x17"



FSEB

SCALE: NOT TO SCALE

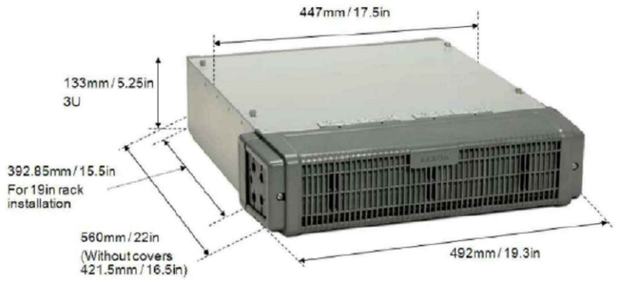
1



FRIG

SCALE: NOT TO SCALE

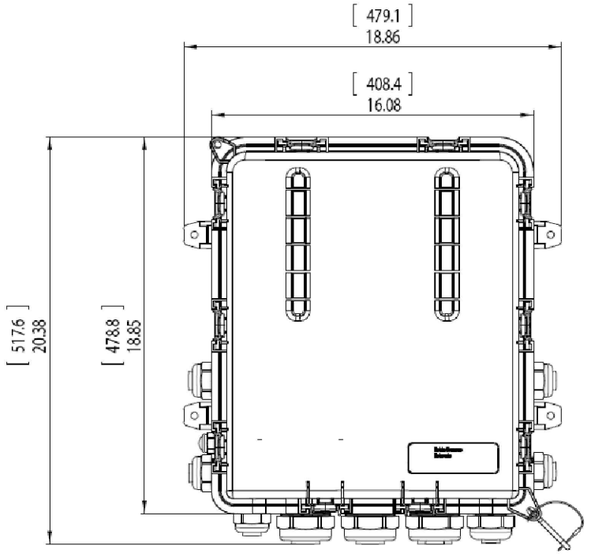
2



FSMF

SCALE: NOT TO SCALE

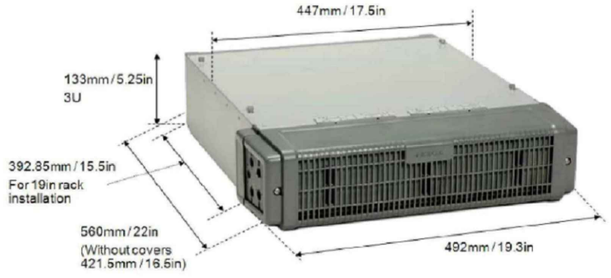
2

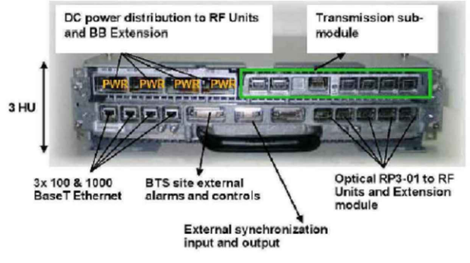


COVP

SCALE: NOT TO SCALE

4

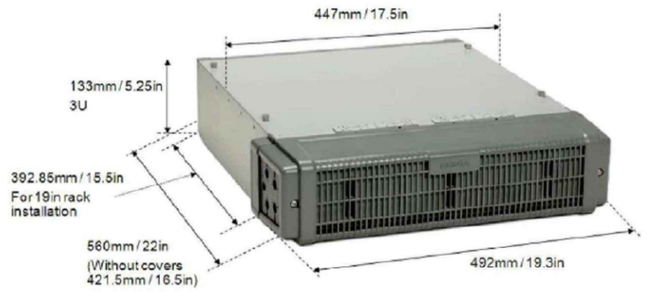


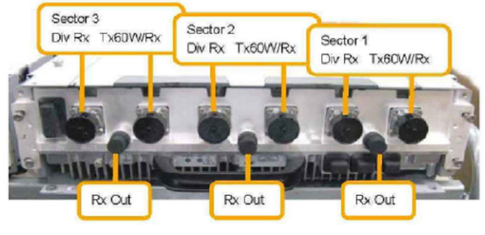


FSME

SCALE: NOT TO SCALE

5





FXFC

SCALE: NOT TO SCALE

6

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8550 BRYN MAWR AVENUE, SUITE 100
CHICAGO, ILLINOIS 60631

PLANS PREPARED FOR:

Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

SHEET TITLE:

EQUIPMENT SPECIFICATIONS

SHEET NUMBER:

A–3

PLOT SCALE: 1:1 @ 11"x17"

E						
F						
Sector Level	A	B	C	D	E	
Combiner/Duplexer Model:						
Combiner/Duplexer Qty:						

Antenna Fiber / Coax Solution (Site level)

Use HCS (Yes/No)? Yes | Use NSN Fiber and OVP for Rooftop (Yes/No)? No | Use Coax Cable (Yes/No)? No

Hybrid Cable Configuration

Site Level | Hybrid Cable Type? High Capacity HCS - 1.684 | Hybrid Cable Length 150 | Hybrid Cable Qty? 1

	A	B	C	D	E
HCS run between Sectors (e.g. Rooftop/ Watertank etc.)					
Hybrid Cable Length (ft):					

COVP Configuration (Site Level)

COVP Type & Qty (1)? Large COVP | 2 | COVP Type & Qty (2)?

Coax Configuration	A	B	C	D	E
Existing Coax Qty & Size					
Re-use existing Coax for TDOA (Yes/No)?					
Qty of excess coax lines to remove?					
New Coax Type					
New Coax Length/Line					
New Coax Qty					
RET Home-Run Cable:					
RET Home-Run Cable length(ft):					

System Modules (Site Level)

	System Mod Type (1)	Sytem Mod Qty (1)	Sytem Mod Type (2)	Sytem Mod Qty (2)	Sytem Sub Mod Type	Sytem
PCS UMTS	FSMF	1				
LTE	FSMF	1				

RF Modules (Site Level)

	RF Module Type (1)	RF Module Qty (1)	RF Module Type (2)	RF Module Qty (2)
PCS UMTS	FXFC	2		
L2100	FRIG	3		

Sector/BTS/Node-B (Site Level)

	Sector Count	BTS/Node-B Count
PCS UMTS	3	1
L2100	3	1

Comments

Comments:

RF DATA SHEET PAGE 1 | 1

SCALE: NOT TO SCALE

RF DATA SHEET PAGE 2 | 2

SCALE: NOT TO SCALE

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Waukesha,WI 53188
Waukesha COUNTY

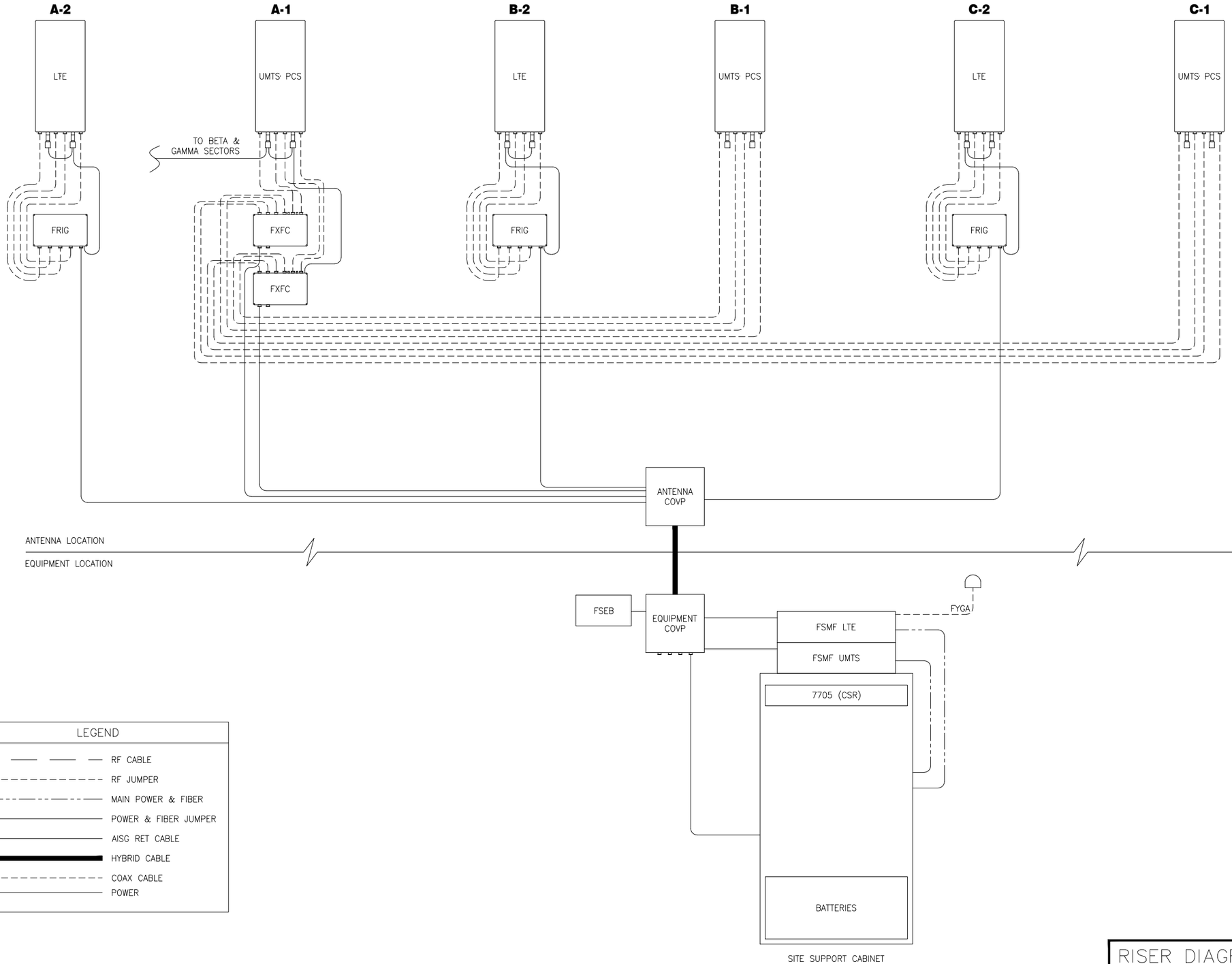
SHEET TITLE:

RF DATA SHEET

SHEET NUMBER:

A-4

PLOT SCALE: 1:1 @ 11"x17"



LEGEND

- RF CABLE
- RF JUMPER
- MAIN POWER & FIBER
- POWER & FIBER JUMPER
- AISG RET CABLE
- HYBRID CABLE
- COAX CABLE
- POWER

RISER DIAGRAM

SCALE: NOT TO SCALE

1

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Waukesha COUNTY

SHEET TITLE:

RISER DIAGRAM

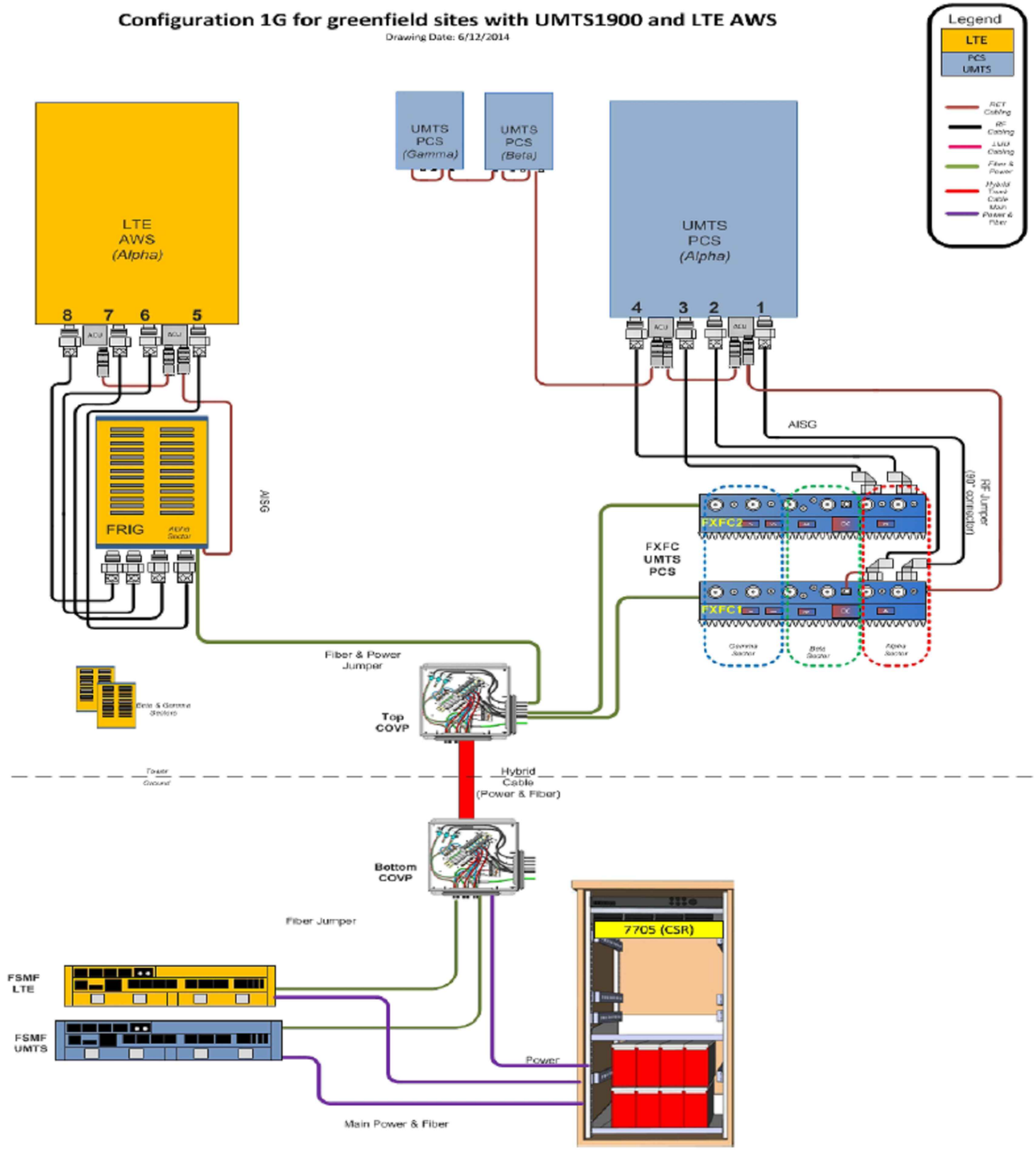
SHEET NUMBER:

A-5

PLOT SCALE: 1:1 @ 11"x17"

Configuration 1G for greenfield sites with UMTS1900 and LTE AWS

Drawing Date: 6/12/2014



ANTENNA CONFIGURATION SHEET | 1

SCALE: NOT TO SCALE

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SHEET TITLE:

ANTENNA CONFIGURATION SHEET

SHEET NUMBER:

A-6

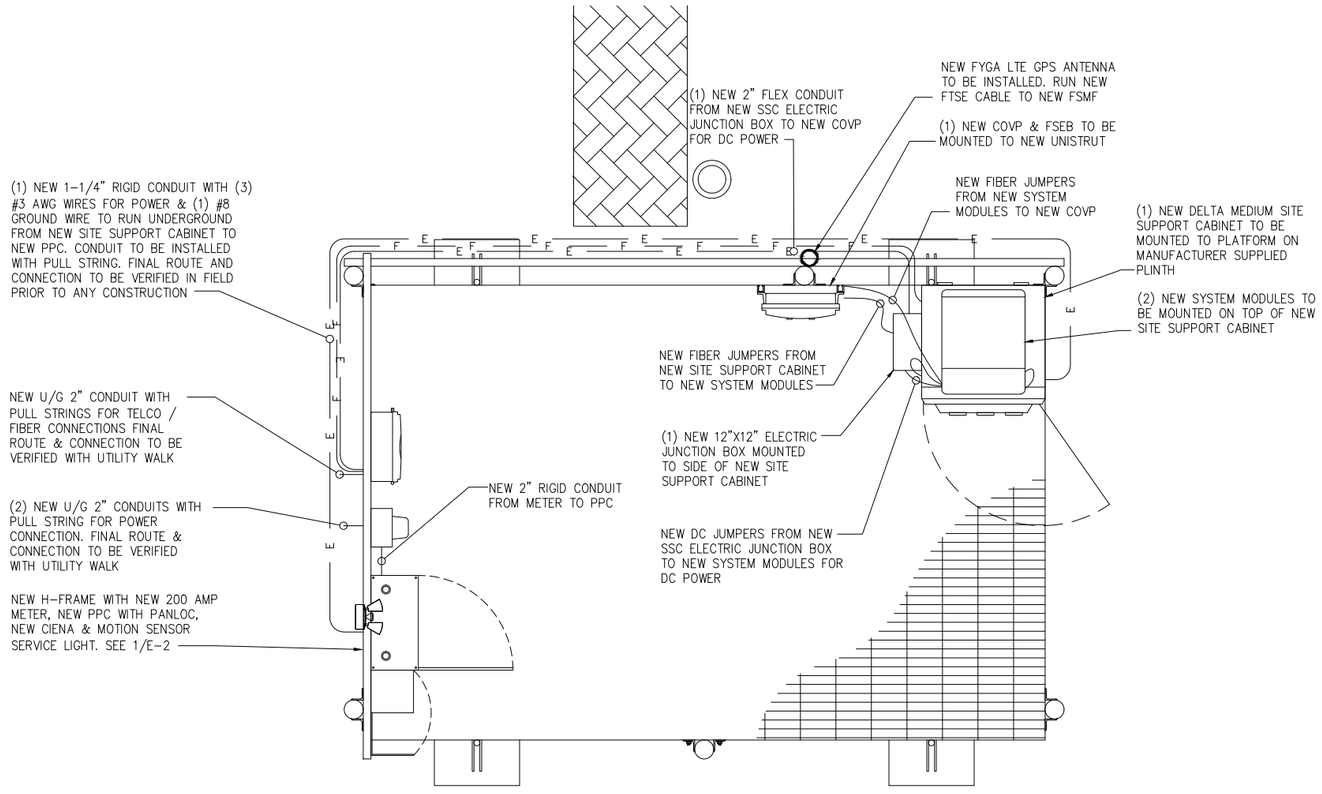
PLOT SCALE: 1:1 @ 11"x17"

LEGEND

FIBER LINE ——— F ———

ELECTRIC LINE ——— E ———

NOTE:
ALL UNISTRUT, FASTENERS, HARDWARE, ETC, ARE TO BE EITHER HOT-DIPPED GALVANIZED OR STAINLESS STEEL. GENERAL CONTRACTOR IS NOT TO USE ZINC-PLATED OR PRE-GALVANIZED.

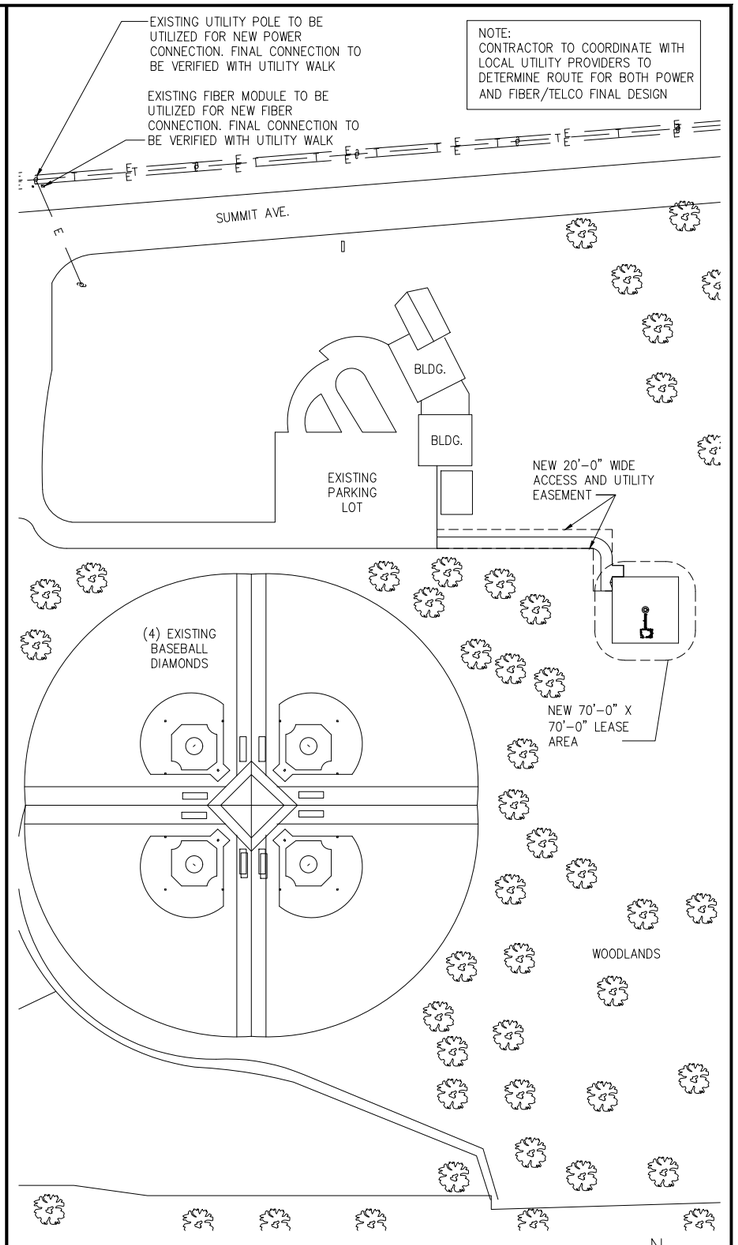


N

ENLARGED UTILITY PLAN | 1

SCALE: 1"=1'-0"

NOTE:
CONTRACTOR TO COORDINATE WITH LOCAL UTILITY PROVIDERS TO DETERMINE ROUTE FOR BOTH POWER AND FIBER/TELCO FINAL DESIGN



N

OVERALL UTILITY PLAN | 2

SCALE: 1"=80'-0"

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CHICAGO, ILLINOIS 60631

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Parallel INFRASTRUCTURE

PLANS PREPARED BY:

CelluSite, LLC

ENGINEERING LICENSE:

DATE:	DESCRIPTION:	BY:	REV.:
05/09/15	REVIEW CD	BMW	CD

SITE INFORMATION:

ML53108I
Christ the Life Evangelical Lutheran Church
WI-Waukesha-Summit
3031 Summit Ave
Waukesha,WI 53188
Waukesha COUNTY

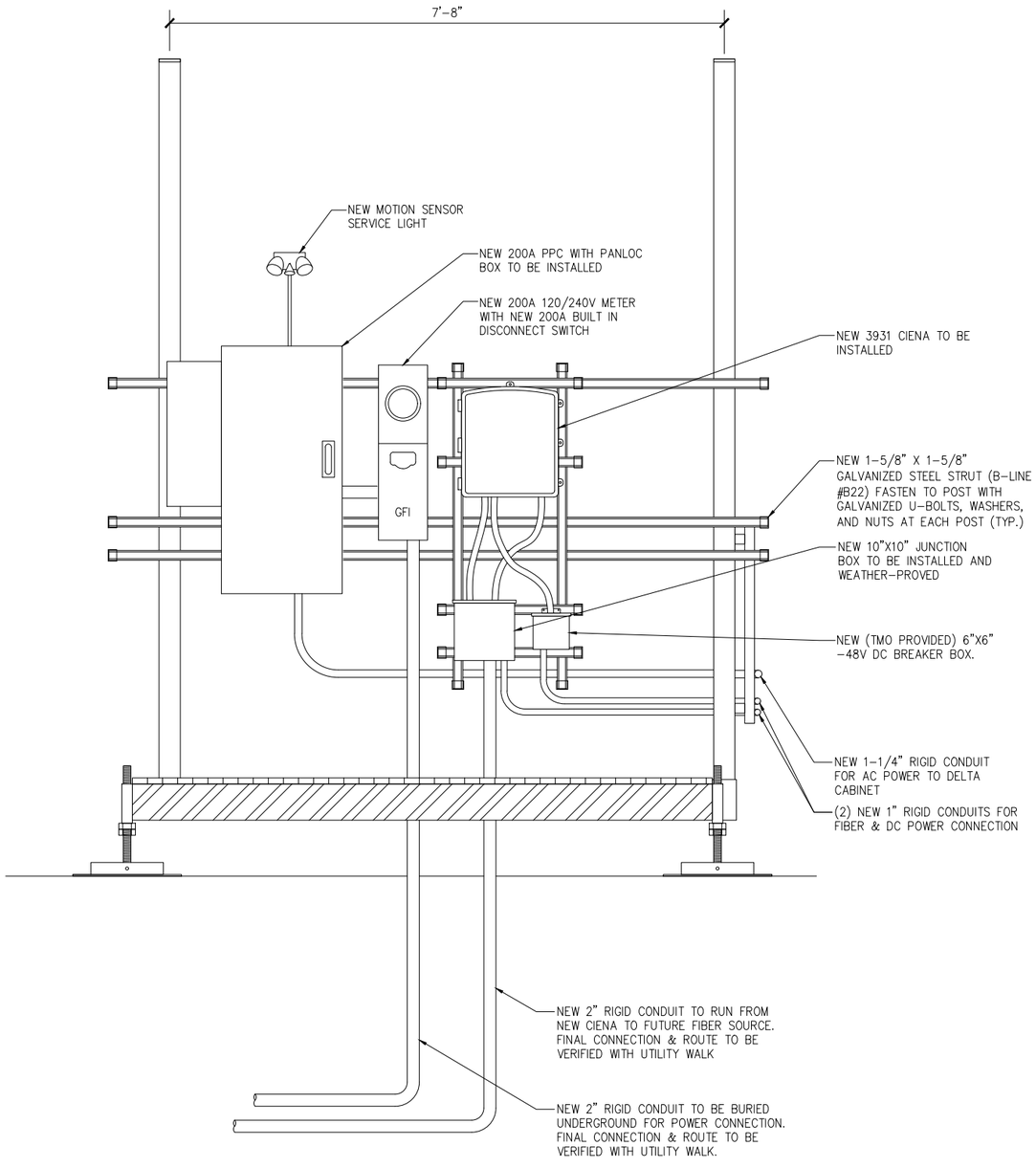
SHEET TITLE:

UTILITY PLANS

SHEET NUMBER:

E-1

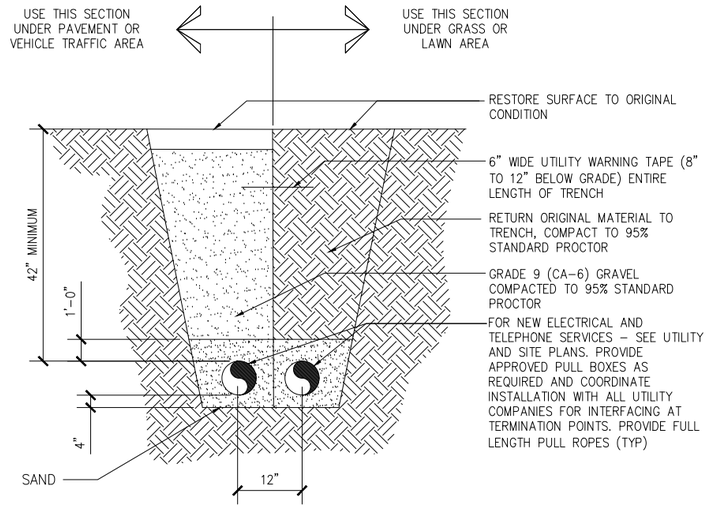
PLOT SCALE: 1:1 @ 11"x17"



H-FRAME DETAIL

SCALE: NOT TO SCALE

1



BURIED CONDUIT DETAIL

SCALE: NOT TO SCALE

2

T-Mobile
stick together
8550 BRYN MAWR AVENUE, SUITE 100
CHICAGO, ILLINOIS 60631

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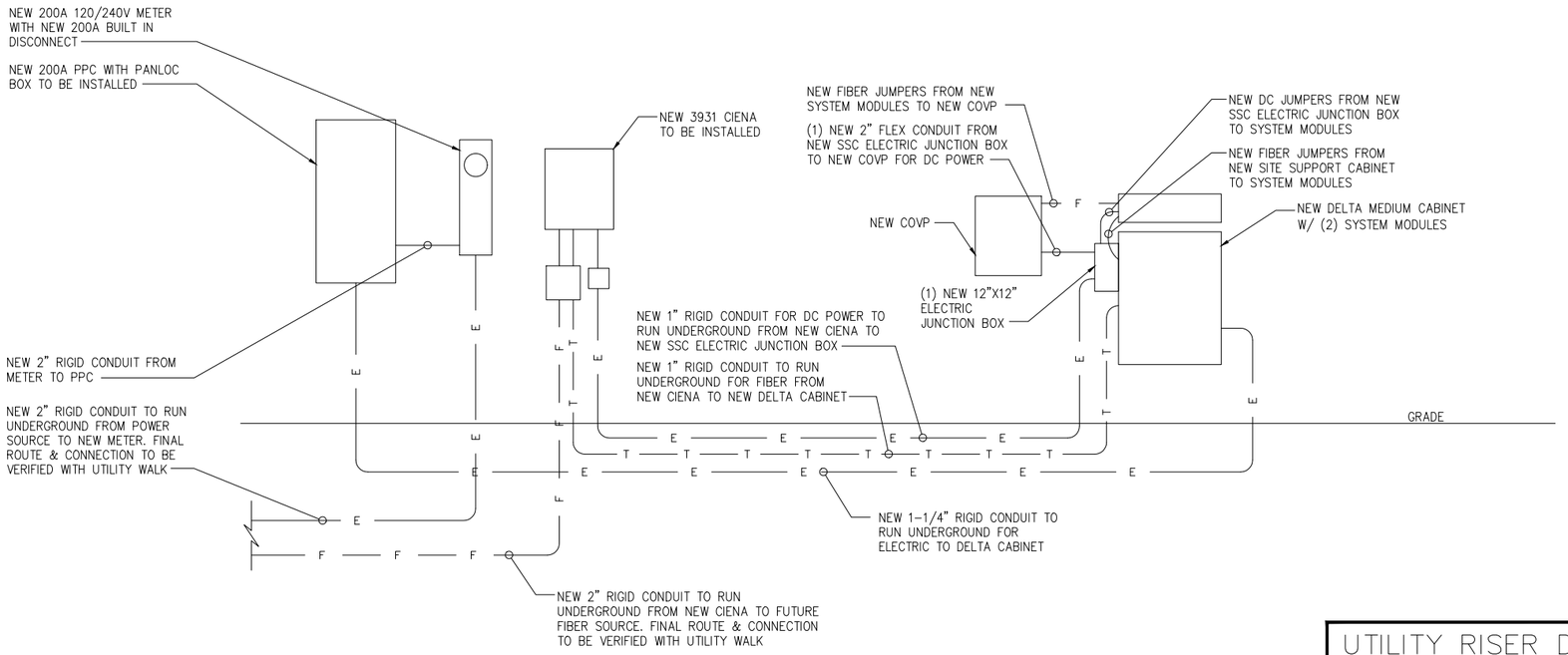
SHEET TITLE:

H-FRAME & UTILITY DETAILS

SHEET NUMBER:

E-2

PLOT SCALE: 1:1 @ 11"x17"



UTILITY RISER DIAGRAM

SCALE: NOT TO SCALE

1

T-MOBILE PROJECT NAME:		NSD				MODEL NUMBER:		TBD						
VOLTAGE:		240V/120				PHASE:		1		WIRE:		3		
MAIN BREAKER:		200 AMP				BUSS RATING:		200 AMPS		AIC:		22,000		
MOUNT:		H-FRAME				NEUTRAL BAR:		YES		GROUND BAR:		YES		
ENCLOSURE TYPE:		NEMA 3R				N to GROUND BOND		YES						
PANEL STATUS:		NEW				INTERNAL TVSS:		YES						
CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD VA	USAGE FACTOR	PHASE A VA	PHASE B VA	USAGE FACTOR	SERVICE LOAD VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	SITE SUPPORT CABINET	100	2	ON	4200	1.25	5250		0.00	0	N/A	---	---	---	2
3	---	---	---	ON	4200	1.25		5250	0.00	0	N/A	---	---	---	4
5	SERVICE LIGHT	20	1	ON	500	1.00	500		0.00	0	N/A	---	---	---	6
7	---	---	---	N/A	0	0.00		0	0.00	0	N/A	---	---	---	8
9	---	---	---	N/A	0	0.00	0		0.00	0	N/A	---	---	---	10
11	---	---	---	N/A	0	0.00		0	0.00	0	N/A	---	---	---	12
13	---	---	---	N/A	0	0.00	0		0.00	0	N/A	---	---	---	14
15	---	---	---	N/A	0	0.00		0	0.00	0	N/A	---	---	---	16
17	---	---	---	N/A	0	0.00	0		0.00	0	N/A	---	---	---	18
19	---	---	---	N/A	0	0.00		0	0.00	0	N/A	---	---	---	20
21	---	---	---	N/A	0	0.00	0		0.00	0	N/A	---	---	---	22
23	GFCI OUTLET	20	1	ON	180	1.00		180	0.00	0	N/A	---	---	---	24
							5750	5430	VA			TOTAL KVA	11.18		
												AMPS	46.58		

PANEL SCHEDULE

SCALE: NOT TO SCALE

2

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Waukesha COUNTY

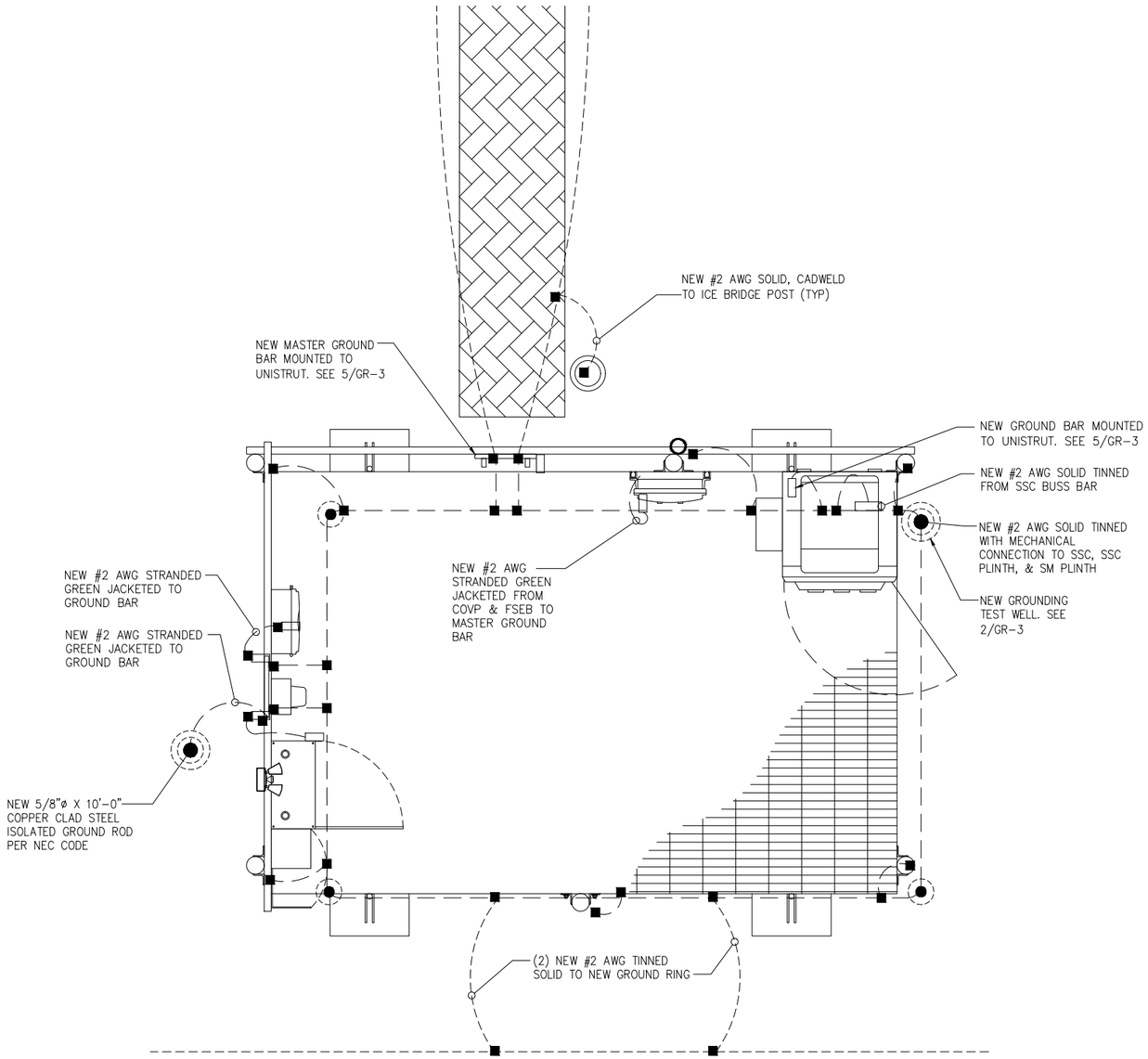
SHEET TITLE:

UTILITY RISER DIAGRAM & PANEL SCHEDULE

SHEET NUMBER:

E-3

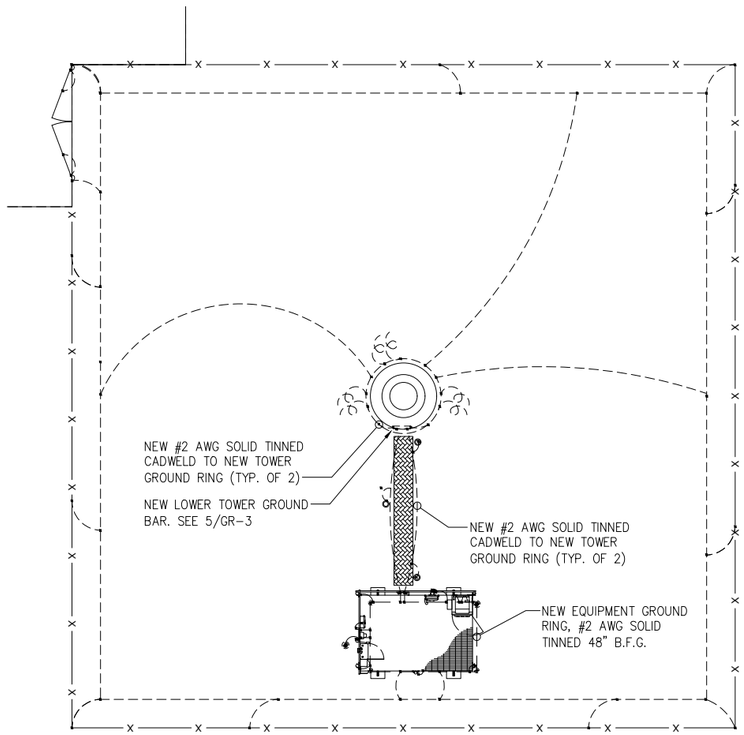
PLOT SCALE: 1:1 @ 11"x17"



ENLARGED GROUNDING PLAN

SCALE: 3/4"=1'-0"

1



OVERALL GROUNDING PLAN

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

2

LEGEND

- ■ CADWELD
- ▯ MECHANICAL CONNECTION
- ▲ COMPRESSION FITTING

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Waukesha COUNTY

SHEET TITLE:

GROUNDING PLAN

SHEET NUMBER:

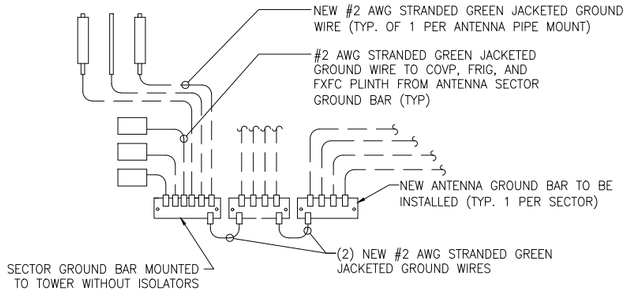
GR-1

PLOT SCALE: 1:1 @ 11"x17"

NOTES:

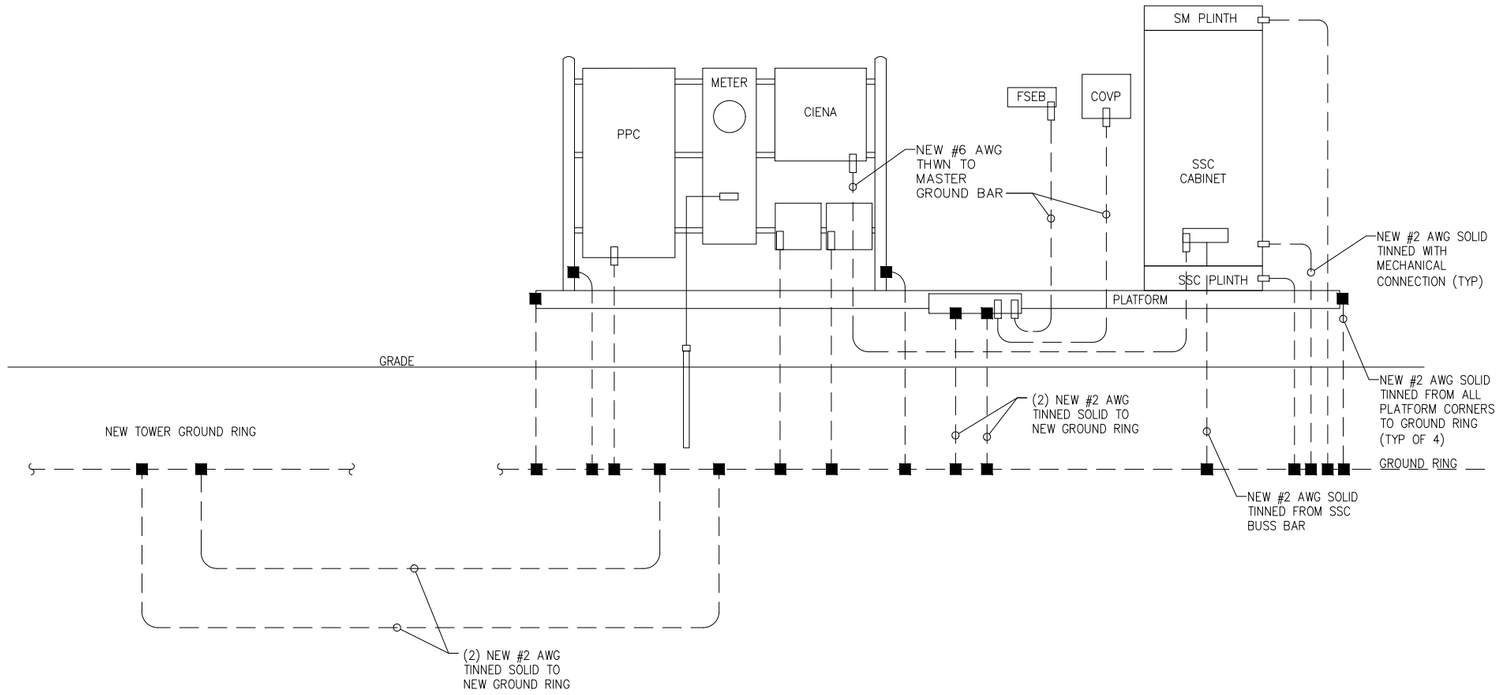
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (EDITION ADOPTED BY LOCAL JURISDICTION) AND APPLICABLE LOCAL CODES.
2. GROUNDING SHALL COMPLY WITH ARTICLE 250 OF THE NATIONAL ELECTRICAL CODE.
3. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED.
4. WIRES AND CABLES FOR POWER AND LIGHTING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THHN INSULATION. SOLID CONDUCTORS FOR #10 AWG AND SMALLER, STRANDED FOR LARGER THAN #10 AWG. MINIMUM SIZE #12 AWG.
5. WIRES AND CABLES FOR POWER SHALL BE INSTALLED IN GALVANIZED RIGID STEEL CONDUIT OR FLEXIBLE LIQUID TIGHT CONDUIT AS INDICATED ON DRAWING.
6. CONTRACTOR TO OBTAIN ALL PERMITS, PAY PERMIT FEES, AND BE RESPONSIBLE FOR SCHEDULING INSPECTIONS.
7. COORDINATE WITH UTILITY COMPANIES SERVICE ENTRANCE REQUIREMENTS.
8. PROVIDE ALL LABOR AND MATERIAL DESCRIBED ON THIS DRAWING, AND ALL ITEMS INCIDENTAL TO COMPLETING AND PRESENTING THIS PROJECT AS FULLY OPERATIONAL.
9. GROUNDING CONNECTIONS SHALL BE EXOTHERMIC TYPE ("CADWELD") TO ANTENNA MASTS, AND THE GROUND BARS. REMAINING GROUNDING CONNECTIONS SHALL BE COMPRESSION FITTINGS.
10. GROUND COAXIAL CABLE SHIELDS AT BOTH ENDS WITH COAX CABLE GROUNDING KITS & INSTALL WEATHER PROOFING KIT AT EACH CONNECTION.
11. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AT RIGHT ANGLE, ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY.
12. CONTRACTOR TO PROVIDE GROUND RING AS SHOWN ON GROUNDING SITE PLAN AND GROUNDING RISER DIAGRAM. CONTRACTOR SHALL TEST AND VERIFY THAT THE IMPEDANCE DOES NOT EXCEED 5 OHMS TO GROUND BY MEANS OF A BIDDLE–MEGGER TESTER. GROUNDING AND OTHER OPERATIONAL TESTING SHALL SHALL BE WITNESSED BY THE OWNER'S REPRESENTATIVE.
13. CONTRACTOR TO PROVIDE TELEPHONE CONDUIT AS SHOWN ON PLANS.
14. CONTRACTOR TO PROVIDE ELECTRIC CONDUIT AS SHOWN ON PLANS.
15. NOTIFY LOCAL UTILITY SERVICE PRIOR TO ANY INSTALLATION.
16. ALL EQUIPMENT FURNISHED BY OTHERS SHALL BE PROVIDED WITH PROPER MOTOR STARTERS, DISCONNECTS, CONTROLS, ETC. BY THE ELECTRICAL CONTRACTOR UNLESS SPECIFICALLY NOTED OTHERWISE. THE ELECTRICAL CONTRACTOR SHALL INSTALL AND COMPLETELY WIRE ALL ASSOCIATED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S WIRE DIAGRAMS AND AS REQUIRED FOR A COMPLETE OPERATING INSTALLATION. ELECTRICAL CONTRACTOR SHALL VERIFY AND COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF EQUIPMENT PRIOR TO ROUGH–IN OF CONDUIT AND WIRING TO AVOID CONFLICTS WHERE APPLICABLE.
17. GROUNDING CONDUCTORS SHALL BE COPPER OR SOLID TINNED COPPER. ALL CONNECTIONS MADE BELOW GRADE SHALL BE SOLID TINNED COPPER. ALL CONNECTIONS ABOVE GRADE STRANDED IS PERMITTED.
18. ALL CADWELDS ABOVE FINISHED GRADE SHALL BE PAINTED WITH CO–GALVANIZED ZINC ENRICHED PAINT TO MATCH COLOR OBJECT BONDED TO.
19. CONNECT COAX GROUND KITS TO MASTER GROUND BAR AT BASE OF TOWER.
20. CONNECT COAX GROUND KITS TO GROUND BUS AT TOP OF TOWER.
21. CONNECT LNA GROUND TO GROUND BUS AT TOP OF TOWER.
22. ALL GROUNDING CONNECTIONS TO BE MADE USING EXOTHERMIC WELD PROCESS UNLESS OTHERWISE APPROVED BY DESIGNER.
23. ELECTRICAL CONTRACTOR TO PULL BONDING JUMPER @ PURCELL ONLY IF DISCONNECT GROUND IS TIED TO GROUND FIELD INSTEAD OF SEPARATE GROUND ROD.
24. PLAN DRAWINGS SHOWN HEREIN DO NOT NECESSARILY DEPICT ELECTRICAL REQUIREMENTS OF INDIVIDUAL EQUIPMENT AND DEVICES SUCH AS THE EQUIPMENT GROUNDING REQUIREMENTS, POWER REQUIREMENTS AND TELCO RACEWAY REQUIREMENTS.
25. PLAN DRAWINGS SHOWN HEREIN ARE DIAGRAMMATIC AND DO NOT NECESSARILY DEPICT THE EXACT EQUIPMENT QUANTITIES, LOCATION, LAYOUT AND CONFIGURATION. REFER TO ARCHITECTURAL PLANS FOR EXACT EQUIPMENT LOCATION, LAYOUT AND CONFIGURATION.
26. REFER TO ARCHITECTURAL PLANS FOR THE LOCATION OF POWER AND TELCO POINT OF CONNECTIONS, THE DISTANCE OF THE RUN, AND THE SUGGESTED CONDUIT ROUTING. FIELD VERIFY EXISTING CONDITIONS SPECIFICALLY FOR CONDUIT ROUTING PRIOR TO BID.
27. NUMBER OF ANTENNAS REPRESENTED IN THIS DETAIL ARE FOR SHOWING CLARITY OF GROUND SYSTEM REQUIREMENTS ONLY. SEE RF INFO FOR ANTENNA QUANTITY.
28. CONTRACTOR TO 'NOALOX' ALL CONNECTIONS TO GROUND BARS.
29. ALL GROUND WIRES ENTERING GROUND SHALL HAVE PVC SLEEVE.

TYPICAL ANTENNA SECTOR



LEGEND

- GROUNDING WIRE
- EXOTHERMIC CONNECTION (CADWELD)
- MECHANICAL CONNECTION/DOUBLE HOLE LUG TYPE CONNECTION
- BOND TO TOWER



GROUNDING RISER

SCALE: NONE

1

T-Mobile
stick together
8550 BRYN MAWR AVENUE, SUITE 100
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Waukesha COUNTY

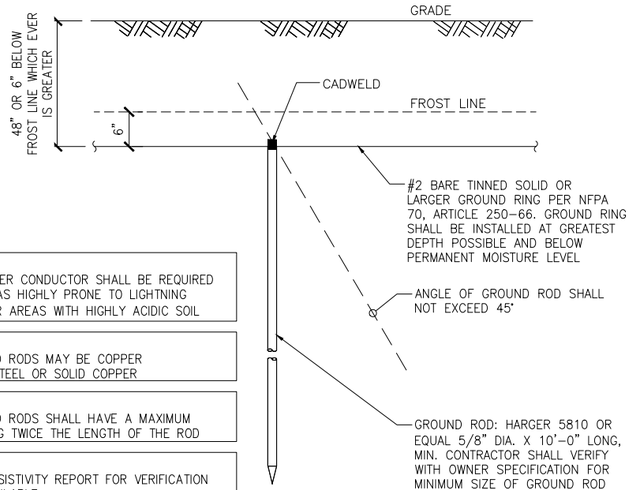
SHEET TITLE:

GROUNDING RISER

SHEET NUMBER:

GR–2

PLOT SCALE: 1:1 @ 11"x17"



NOTE:
A LARGER CONDUCTOR SHALL BE REQUIRED IN AREAS HIGHLY PRONE TO LIGHTNING AND/OR AREAS WITH HIGHLY ACIDIC SOIL

NOTE:
GROUND RODS MAY BE COPPER CLAD STEEL OR SOLID COPPER

NOTE:
GROUND RODS SHALL HAVE A MAXIMUM SPACING TWICE THE LENGTH OF THE ROD

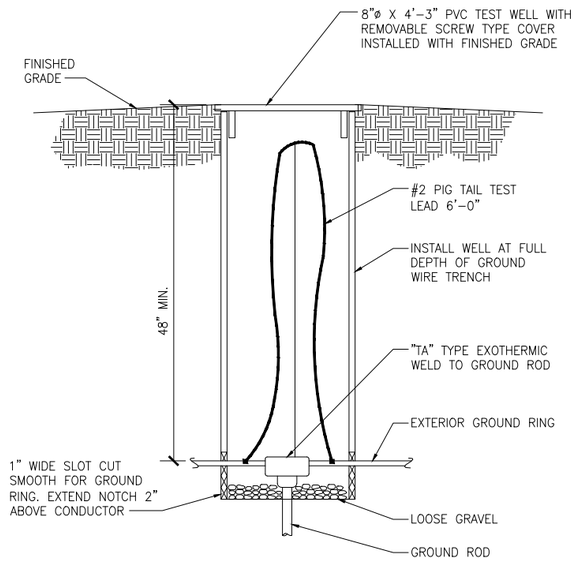
NOTE:
SEE RESISTIVITY REPORT FOR VERIFICATION AS AVAILABLE

NOTE:
GROUND RODS INSTALLED WITHIN CLOSE PROXIMITY TO TOWER OR WHEN SOIL IS AT OR BELOW 2,000 OHM-CM, SHALL BE GALVANIZED TO PREVENT GALVANIC CORROSION OF TOWER, (SEE ANSI/TIA-EIA-222)

GROUND ROD DETAIL

SCALE: NOT TO SCALE

1

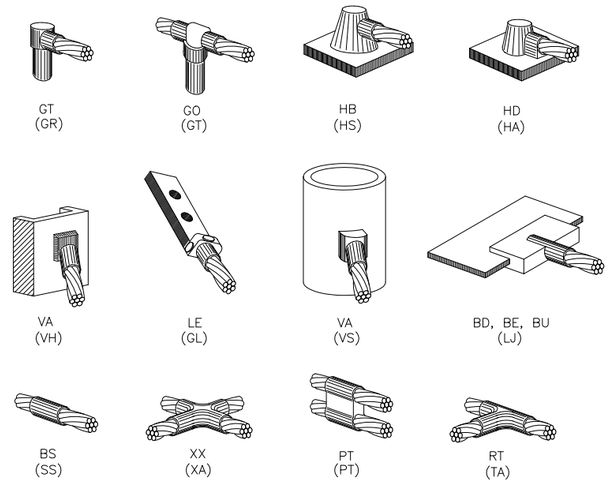


TEST WELL DETAIL

SCALE: NOT TO SCALE

2

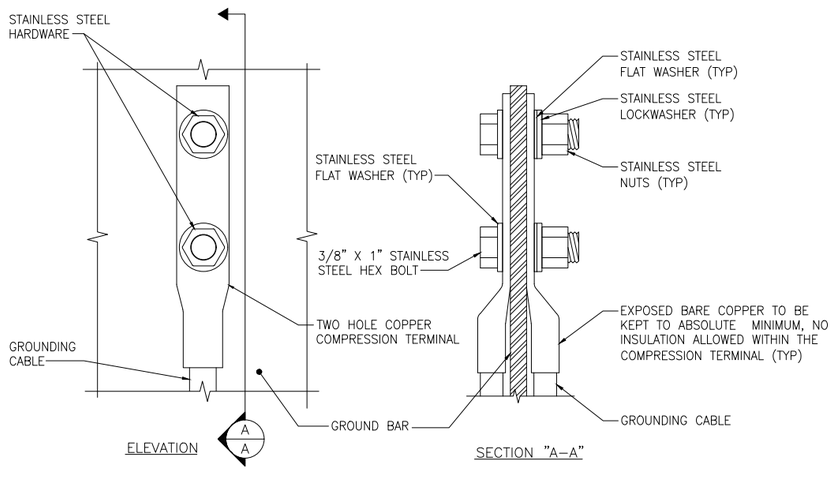
NOTE:
THE FOLLOWING SYMBOLS SHOWN ARE HARGER ULTRAWELD EXOTHERMIC CONNECTIONS WITH PART NUMBERS BELOW. THESE CONNECTIONS MAY BE CROSS-REFERENCED WITH CADWELD CONNECTIONS WHICH ARE SHOWN.



EXOTHERMIC WELD TYPES

SCALE: NOT TO SCALE

3

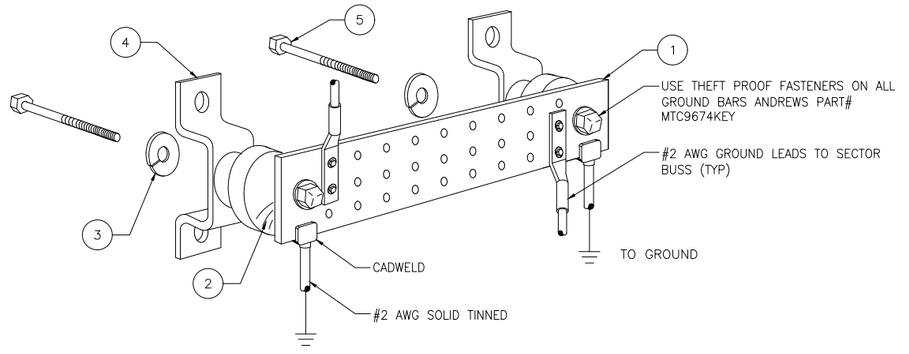


1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS
2. NO CRIMPING OF SOLID #2. USE CADWELD ONLY

GROUND BAR CONNECTION DETAIL

SCALE: NOT TO SCALE

4



KEY NOTES

1. 1/4" THK ELECTRICAL TINNED GROUND BAR HARGER OR APPROVED EQUAL HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION
2. INSULATORS
3. 3/8" STAINLESS STEEL LOCKWASHERS
4. WALL MOUNTING BRACKET
5. 3/8" STAINLESS STEEL BNLF BOLTS

NOTE:
HARDWARE SHALL BE STAINLESS STEEL

NOTE:
CONTRACTOR SHALL GROUP INCOMING WIRES

NOTE:
CONTRACTOR TO APPLY 'KOPR-SHIELD' TO ALL CONNECTIONS

GROUND BAR DETAIL

SCALE: NOT TO SCALE

5

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GR-3

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