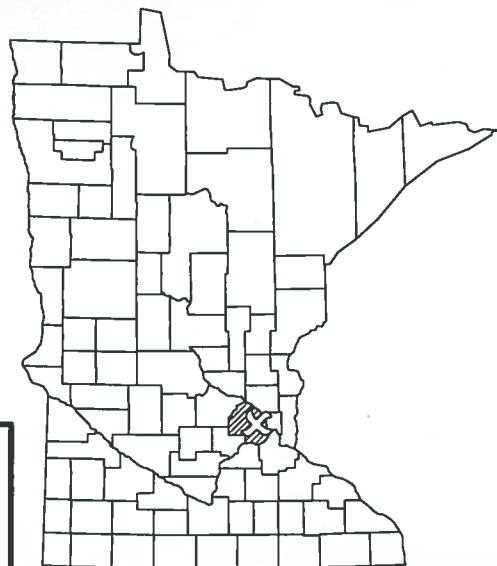




**SITE NAME: FREDDIES  
CASCADE ID: MS90XSU69-M  
MAPLE GROVE, MINNESOTA  
CONSTRUCTION DRAWINGS**



CONSULTANT:  
**Edge**  
Consulting Engineers, Inc.  
824 WATER STREET  
PRAIRIE DU SAC, WI 53578  
608.644.1449 VOICE  
608.644.1549 FAX  
www.edgeconsult.com

CLIENT:  
**zayo**  
5005 CHESHIRE PARKWAY  
SUITE 1  
PLYMOUTH, MN 55446  
952.230.9662 VOICE  
www.zayo.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: *Michael R. Muehrer*

TYPED OR PRINTED NAME: MICHAEL MUEHRER

LIS. NO. 55185 DATE: 5/6/2019

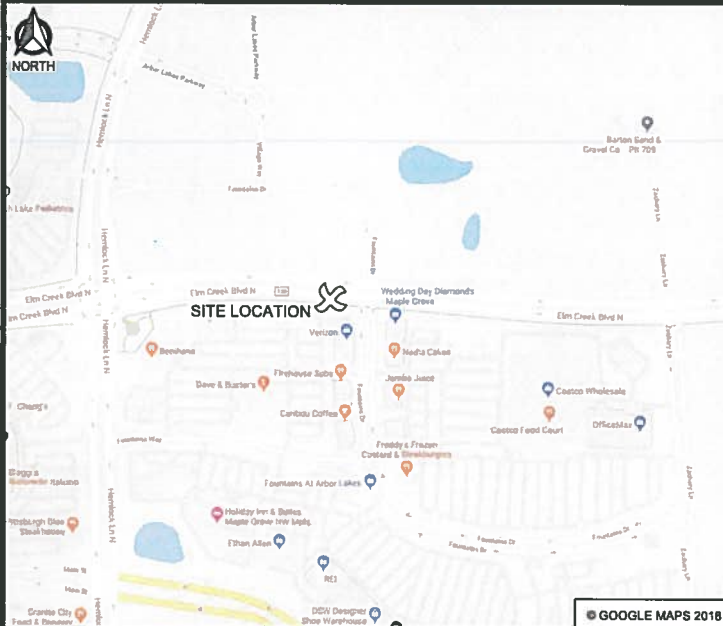
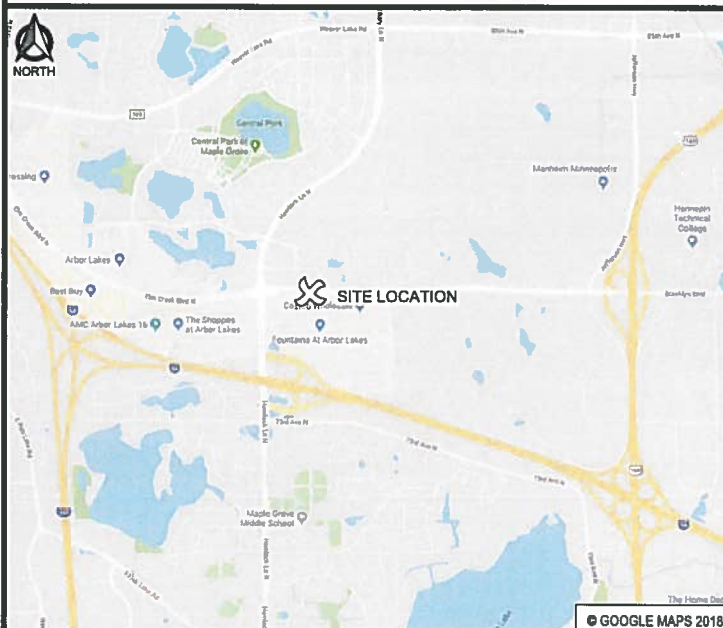
**TITLE SHEET  
SITE NAME: FREDDIES  
CASCADE ID: MS90XSU69-M  
MAPLE GROVE, MINNESOTA**

SHEET TITLE:

SUBMITTAL:		
INT.	DATE	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>G-001</b>

**SITE LOCATION MAPS**



**SHEET INDEX**

NO.:	SHEET TITLE
G-001	TITLE SHEET
G-002	GENERAL SPECIFICATIONS
G-003	GENERAL SPECIFICATIONS
G-004	GENERAL SPECIFICATIONS
-	SURVEY *
C-101	SITE PLAN
T-201	SITE ELEVATION
T-501	ANTENNA DETAILS
T-502	EQUIPMENT SPECIFICATIONS
T-503	EQUIPMENT MOUNTING
E-101	UTILITY PLAN
E-501	GROUNDING DETAILS
E-502	UTILITY DETAILS
E-503	METER UTILITY DETAILS
	* COMPLETED BY OTHERS

POLE TO BE PAINTED DARK BRONZE PER CITY'S REQUEST

CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS/CONDITIONS ON SITE. IMMEDIATELY NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO PERFORMING ANY WORK OR BE RESPONSIBLE FOR THE SAME.

**STRUCTURAL ANALYSIS**

STRUCTURAL ANALYSIS BY:  
EDGE CONSULTING ENGINEERS, INC.  
REPORT #: 17270  
DATED: 08/29/2018

CONTRACTOR TO REVIEW STRUCTURAL REPORT IN ITS ENTIRETY. ANY DISCREPANCIES OR DISAGREEMENTS BETWEEN THE REPORT AND THESE PLANS SHOULD BE RESOLVED PRIOR TO CONSTRUCTION.

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:  
- AASHTO LRFD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, 1ST EDITION  
IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

**DIRECTORY**

ENGINEERING COMPANY:  
EDGE CONSULTING ENGINEERS, INC.  
624 WATER STREET  
PRAIRIE DU SAC, WI 53578  
PROJECT MANAGER: MICHAEL MLINER  
PROJECT ENGINEER: MICHAEL MUEHRER  
PHONE: 608.644.1449  
FAX: 608.644.1549

CLIENT:  
ZAYO  
5005 CHESHIRE PARKWAY  
SUITE 1  
PLYMOUTH, MN 55446  
CONTACT: DAVID BUSHAW  
PHONE: 952.230.9662

SITE ACQUISITION:  
BUELL CONSULTING, INC.  
1360 ENERGY PARK DRIVE  
SUITE 210  
ST. PAUL, MN 55108  
CONTACT: SHELLEY TRAMPETTI  
PHONE: 651.895.6823

SURVEYOR:  
EGAN, FIELD & NOWAK, INC.  
1229 TYLER STREET N.E.  
MINNEAPOLIS, MN 55413  
CONTACT: KENNETH G. FAUCHER  
PHONE: 612.466.3363

POWER PROVIDER:  
WRIGHT - HENNEPIN COOPERATIVE ELECTRIC ASSOCIATION (WHE)  
6800 ELECTRIC DRIVE, P.O. BOX 330  
ROCKFORD, MN 55373  
CONTACT: RYAN DANIELS  
EMAIL: rdaniels@whe.org  
PHONE: 612.719.9811



TO OBTAIN LOCATION OF PARTICIPANTS' UNDERGROUND FACILITIES BEFORE YOU DIG IN MINNESOTA, CALL GOPHER STATE ONE CALL

TOLL FREE: 1-800-252-1166  
FAX A LOCATE: 1-800-236-4967

MN STATUTE REQUIRES MIN. OF 48 HOURS NOTICE BEFORE YOU EXCAVATE

ENGINEER SEAL:



I HEREBY CERTIFY THAT THIS PLAN SET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION OTHER THAN THE EXCEPTIONS NOTED IN THE SHEET INDEX, AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: *Michael R. Muehrer*

DATE: 5-6-2019

**GENERAL CONSTRUCTION NOTES:**

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST ADOPTED EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND LATEST ZAYO CONSTRUCTION STANDARDS. THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THE CONSTRUCTION DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER OR ZAYO CM PRIOR TO THE COMMENCEMENT OF WORK.
3. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE THEMSELVES WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH ALL CONTRACT DOCUMENTS, 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 ARCHITECT/ENGINEER OR ZAYO CM PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITIONS.
4. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. CONTRACTOR IS REQUIRED TO FURNISH AND INSTALL ANY/ALL ITEMS FOR A COMPLETE AND FULL FUNCTIONAL SYSTEM SUBJECT ONLY TO OWNER-SUPPLIED ITEMS. CONTRACTOR SHALL PROVIDE ANY/ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
5. 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. OWNER PROVIDED AND CONTRACTOR INSTALLED MATERIALS WILL INCLUDE THE FOLLOWING, UNLESS NOTED OTHERWISE:
  - A) TRANSMITTER
  - B) UHF ANTENNA AND MOUNTING BRACKETS, GPS ANTENNAS AND KU ANTENNAS
  - C) UHF COAX AND HANGERS
  - D) INTEGRATED LOAD CENTER
6. 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 REPORTING ANY DISCREPANCIES TO THE ATTENTION OF THE ZAYO CM, IN WRITING, PRIOR TO THE COMMENCEMENT OF WORK.
7. DETAILS PROVIDED ARE FOR THE PURPOSE OF SHOWING DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR SITE CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
8. CONTRACTOR SHALL PAY FOR APPLICABLE PERMITS, FEES, INSPECTIONS AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO ORDERING MATERIALS AND THE COMMENCEMENT OF WORK.
9. THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
10. 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.
11. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING ACCEPTED INDUSTRY-STANDARD 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.
12. 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.
13. CONTRACTOR SHALL COORDINATE THEIR WORK WITH THE ZAYO CM AND SCHEDULE THEIR ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.
14. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THEIR WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
15. CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
16. CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, PIPING ETC. AND IMMEDIATE REPAIR, TO NEW CONDITION, ANY DAMAGE THAT OCCURS DURING CONSTRUCTION AT THE SOLE COST OF THE CONTRACTOR.

17. IN DRILLING HOLES, OR CORING, INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., MUST BE CLEARLY UNDERSTOOD THAT REINFORCING STEEL SHALL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES (UNLESS NOTED OTHERWISE). LOCATIONS OF REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE LOCATED BY THE CONTRACTOR USING APPROPRIATE METHODS AND EQUIPMENT PRIOR TO ANY DRILLING OR CORING OPERATIONS IN EXISTING CONCRETE.
18. CONTRACTOR SHALL REPAIR, TO NEW CONDITION, ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACES.
19. CONTRACTOR SHALL SEAL PENETRATIONS THROUGH FIRE RATED ASSEMBLIES OR MATERIALS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS AND SYSTEMS THAT MEET OR EXCEED THE RATING OF THE ASSEMBLY IN WHICH THE NEW PENETRATION IS PLACED.
20. CONTRACTOR SHALL 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.
21. MINIMUM BEND RADIUS OF ANTENNA CABLES SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS RECOMMENDATIONS.
22. 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. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTENANCE OF ANY EROSION CONTROL MEASURES, RECORD-KEEPING, MONITORING, AND REPORTING TO THE OWNER AND REGULATORY AUTHORITIES.
23. ALL CONSTRUCTION WORK IS TO ADHERE TO APPLICANT'S INTEGRATED CONSTRUCTION STANDARDS UNLESS STATE OR LOCAL CODE IS MORE STRINGENT.
24. THE INTENT OF THE PLANS AND SPECIFICATIONS IS TO PERFORM THE CONSTRUCTION IN ACCORDANCE PER STATE BUILDING STANDARDS CODE AND STATE CODE OF REGULATIONS. SHOULD ANY CONDITIONS DEVELOP NOT COVERED BY THE APPROVED PLANS AND SPECIFICATIONS WHEREIN THE FINISHED WORK WILL NOT COMPLY PER STATE CODE OF REGULATIONS, A SCOPE OF WORK DETAILING AND SPECIFYING THE REQUIRED WORK SHALL BE SUBMITTED TO AND APPROVED BY THE JURISDICTION BEFORE PROCEEDING WITH THE WORK. A CHANGE ORDER FOR THAT SCOPE SHALL BE SUBMITTED TO THE ZAYO CM PRIOR TO PROCEEDING WITH THE WORK.
25. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED BY THE CONTRACTOR FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.
26. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE. ANY CORRECTIVE WORK SHALL BE COMPLETED AT THE SOLE COST OF THE CONTRACTOR.

**ELECTRICAL NOTES:**

1. 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 ZAYO CM AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE ZAYO CM HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
2. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE THEMSELVES WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTING OF THEIR BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.

3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC, ALL CODES AND ORDINANCES OF THE LOCAL JURISDICTION, AND POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT ARE NOT BE LIMITED TO:
  - A) UL - UNDERWRITERS LABORATORIES
  - B) NEC - NATIONAL ELECTRICAL CODE
  - C) NEMA - NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
  - D) OSHA - OCCUPATIONAL SAFETY AND HEALTH ACT
  - E) SBC - STANDARD BUILDING CODE
  - F) NFPA - NATIONAL FIRE PROTECTION AGENCY
  - G) ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE
  - H) IEEE - INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS
  - I) ASTM - AMERICAN SOCIETY FOR TESTING MATERIALS
4. REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH ZAYO CM ANY SIZES AND LOCATIONS WHEN NEEDED.
5. EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.
6. 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 ZAYO CM, PRIOR TO BEGINNING ANY WORK.
7. MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION, UNLESS OTHERWISE NOTED.
8. 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.
9. 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.
10. ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATIONS, SET FORTH BY APPLICANT.
11. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY FUNCTIONAL AND SHALL BE APPROVED BY THE ZAYO CM AND LOCAL JURISDICTION. ANY DEFICIENCIES SHALL BE CORRECTED BY AN ELECTRICAL CONTRACTOR AT THE SOLE COST OF THE CONTRACTOR.
12. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
13. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED BY THE CONTRACTOR WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.
14. CONTRACTOR SHALL PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.
15. 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.
16. 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 IECE.
17. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURER'S CATALOG INFORMATION OF ANY/ALL EQUIPMENT AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE ZAYO CM PRIOR TO INSTALLATION.
18. 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 ZAYO CM UPON FINAL ACCEPTANCE.
19. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

CONSULTANT:



624 WATER STREET  
PRAIRIE DU SAC, WI 53678  
608.644.1449 VOICE  
608.644.1549 FAX  
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CLIENT:



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SIGNATURE: *Neil J. Aul*

TYPED OR PRINTED NAME: MICHAEL MUEHRER

LIS. NO. 55185 DATE: 5/6/2019

**GENERAL SPECIFICATIONS**  
SITE NAME: FREDDIES  
CASCADE ID: MS90XSL69-M  
MAPLE GROVE, MINNESOTA

SHEET TITLE:

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
NAT	08/28/18	REV. A
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CHECKED BY:	MRM	
PLOT DATE:	5/6/2019	
PROJECT NUMBER:	17270	
SET TYPE:	FINAL CDs	
SHEET NUMBER:	<b>G-002</b>	

**ELECTRICAL NOTES (CONTINUED):**

20. DISCONNECT SWITCHES SHALL BE UL-RATED, H.P. RATED HEAVY-DUTY, QUICK-MAKE AND QUICK-BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
21. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI-OXIDE COMPOUND KNOWN 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.
22. RACEWAYS: CONDUIT SHALL BE SCHEDULE 80 PVC MEETING OR EXCEEDING NEMA TC2 - 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 'BRITZ ZINC' OR 'COLD GALV'.
23. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
24. CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN INSULATION, UNLESS OTHERWISE NOTED, 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.
25. 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.
26. SERVICE: AS SPECIFIED ON THE DRAWINGS. OWNER OR OWNER'S AGENT WILL APPLY FOR POWER. ALL PROVISIONS FOR TEMPORARY POWER WILL BE OBTAINED BY THE CONTRACTOR.
27. TELEPHONE OR FIBER SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH PULL STRINGS AS INDICATED ON DRAWINGS.
28. ELECTRICAL AND TELCO/FIBER RACEWAYS TO BE BURIED A MINIMUM DEPTH OF 30", UNLESS OTHERWISE NOTED.
29. CONTRACTOR SHALL PLACE 6" WIDE DETECTABLE WARNING TAPE AT A DEPTH OF 6" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOM".
30. ALL BOLTS SHALL BE 3-16 STAINLESS STEEL

**GROUNDING NOTES:**

1. ALL HARDWARE SHALL BE 3-16 STAINLESS STEEL, INCLUDING LOCK WASHERS. COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND, AS SPECIFIED, BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR SIZED TO MATCH COMPONENTS OR LOG SIZE.
2. 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.
3. ALL STEEL CONDUIT SHALL BE BONDED AT BOTH ENDS WITH GROUNDING BUSHING.
4. ALL ELECTRICAL AND GROUNDING AT THE POLE SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER.
5. ALL DETAILS ARE SHOWN IN GENERAL TERMS. ACTUAL GROUNDING INSTALLATION AND CONSTRUCTION MAY VARY DUE TO SITE SPECIFIC CONDITIONS.
6. GROUND ALL ANTENNA BASES, FRAMES, CABLE RUNS, AND OTHER METALLIC COMPONENTS USING #6 GROUND WIRES. FOLLOW ANTENNA AND BTS MANUFACTURER'S PRACTICES FOR GROUNDING REQUIREMENTS.
7. ALL GROUND CONNECTIONS SHALL BE #6 AWG, UNLESS OTHERWISE NOTED. USE SOLID COPPER, BLACK JACKETED WIRE ON NON WOOD POLES AND SOLID TINNED COPPER, BARE (NO JACKET) WIRES ON WOOD POLES. BLACK WIRES WILL USE A SINGLE STRIPE OF GREEN ELECTRICAL TAPE WITHING 12" OF THE CONNECTION POINTS TO IDENTIFY AS GROUNDING WIRE.
8. NOTIFY ARCHITECT/ENGINEER IF THERE ARE ANY DIFFICULTIES INSTALLING GROUNDING SYSTEM DUE TO SITE SOIL CONDITIONS.
9. ALL HORIZONTALLY RUN GROUNDING CONDUCTORS SHALL BE INSTALLED A MINIMUM OF 30" BELOW GRADE/ 6" BELOW FROST-LINE IN TRENCH, UNLESS OTHERWISE NOTED. BACK FILL SHALL BE COMPACTED AS REQUIRED BY ARCHITECT/ENGINEER.
10. ALL GROUND CONDUCTORS SHALL BE RUN AS STRAIGHT AND SHORT AS POSSIBLE, WITH A MINIMUM 12" BENDING RADIUS NOT LESS THAN 90 DEGREES.
11. ACCEPTABLE CONNECTIONS FOR GROUNDING SYSTEM SHALL BE:
  - A. BURNDY, HY-GRADE U.L. LISTED CONNECTORS FOR OUTDOOR USE OR AS APPROVED BY APPLICANT PROJECT MANAGER.
  - B. CADWELD, EXOTHERMIC WELDS (WELDED CONNECTIONS).
  - C. ONE (1) OR (2) HOLES TINNED COPPER COMPRESSION (LONG BARREL) FITTINGS.

12. ALL CRIMPED CONNECTIONS SHALL HAVE EMBOSSED MANUFACTURER'S DIEMARK VISIBLE AT THE CRIMP (RESULTING FROM USE OF PROPER CRIMPING DEVICES) AND WEATHER-PROOFED WITH HEAT SHRINK.
13. ALL CONNECTION HARDWARE SHALL BE TYPE 3-16 STAINLESS STEEL (NOT ATTRACTED TO MAGNETS).
14. ELECTRICAL SERVICE EQUIPMENT GROUNDING SHALL COMPLY WITH NEC, ARTICLE 250-82 AND SHALL BOND ALL EXISTING AND NEW GROUNDING ELECTRODES. NEW GROUNDING ELECTRODE SHALL INCLUDE BUT NOT LIMITED TO GROUND RODS.

**TESTING AND EQUIPMENT TURN UP REQUIREMENTS:**

1. RF CABLE, DATA CABLE, RADIO EQUIPMENT AND BACK HAUL EQUIPMENT TESTING WILL COMPLY WITH CURRENT INDUSTRY STANDARDS AND OR THOSE STANDARDS OF THE EQUIPMENT MANUFACTURER OR PROVIDED TO THE CONTRACTOR PRIOR TO TESTING.
2. CONTRACTOR WILL USE THE APPROPRIATE CALIBRATED TESTING EQUIPMENT IN THE TESTING OF RF CABLE, DATA CABLE, RADIO EQUIPMENT AND BACK HAUL EQUIPMENT THAT MEET INDUSTRY STANDARDS OF THE MANUFACTURER OR THOSE STANDARDS PROVIDED TO THE CONTRACTOR PRIOR TO TESTING.
3. CONTRACTOR TO VERIFY AND RECORD ALL TEST RESULTS AND PROVIDE THESE RESULTS WITHIN THE FINAL CLOSE OUT PACKAGE.
4. ALL PERSONNEL INVOLVED IN THE TESTING OF RF CABLE, DATA CABLE, RADIO EQUIPMENT AND BACK HAUL EQUIPMENT WILL BE REQUIRED TO HAVE BEEN TRAINED AND OR CERTIFIED IN THE PROPER TESTING OF RF CABLE, DATA CABLE, RADIO EQUIPMENT AND BACK HAUL EQUIPMENT.
5. ALL TEST RESULTS SHALL BE TIME STAMPED, RECORDED AND PRESENTED PRIOR TO ENERGIZING AND TURN UP OF ANY EQUIPMENT.
6. GPS EQUIPMENT (WHEN REQUIRED) IS NOT TO BE TESTED OR ATTACHED TO ANY CABLING DURING TESTING, DOING SO WILL DAMAGE THE GPS UNIT.
7. PRIOR TO TESTING IF THE CONTRACTOR HAS ANY QUESTIONS ABOUT THE TESTING PROCEDURES THEY ARE TO CALL AND OBTAIN ASSISTANCE FROM A QUALIFIED DESIGNATED TESTING REPRESENTATIVE.
8. EQUIPMENT IS NOT TO BE ENERGIZED UNTIL ALL TESTING HAS BEEN COMPLETED, APPROVED AND THE APPROPRIATE AUTHORITY HAS BEEN NOTIFIED AND GIVES APPROVAL TO ENERGIZE THE EQUIPMENT.

**SITE WORK NOTES:**

1. DO NOT EXCAVATE OR DISTURB BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS OTHERWISE NOTED.
2. 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.
3. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ENGINEER AND OWNER ASSUME NO 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.
4. 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 OR ZAYO CM 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 THEIR OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL UTILITY LOCATE HOT LINE, SUCH AS 811, FOR UTILITY LOCATIONS A MINIMUM OF 48 HOURS PRIOR TO START OF CONSTRUCTION.
5. 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. ANY COST RELATED TO ADJUSTING EXISTING STRUCTURES SHALL BE BORNE SOLELY BY THE CONTRACTOR.
6. 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.
7. 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.
8. STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY, UNLESS OTHERWISE NOTED.
9. 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.

10. 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.
11. 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.
12. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO DEBRIS, PAPER, TRASH, WEEDS, BRUSH, EXCESS FILL, OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.
13. ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE PROTECTED BY THE GENERAL CONTRACTOR.
14. 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.

**ENVIRONMENTAL NOTES:**

1. 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.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS. ALL EROSION AND SEDIMENTATION CONTROLS SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.
3. CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES AS REQUIRED BY THE LOCAL JURISDICTION WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.
4. 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.
5. 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.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.
7. CLEARING OF VEGETATION AND TREE REMOVAL SHALL BE ONLY AS PERMITTED AND BE HELD TO A MINIMUM. ONLY TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED.
8. SEEDING AND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.
9. 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, BUT IS NOT LIMITED TO SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.
10. 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.
11. GC TO PLACE FILTER MATERIAL AT ALL CATCH BASINS ADJACENT TO CONSTRUCTION SITE TO PREVENT SOLID WASTE CONTAMINATION FROM ENTERING SEWER SYSTEM.

CONSULTANT:



624 WATER STREET  
PRAIRIE DU SAC, WI 53678  
608.644.1449 VOICE  
608.644.1549 FAX  
www.edgeconsult.com

CLIENT:



5005 CHESHIRE PARKWAY  
SUITE 1  
PLYMOUTH, MN 55446  
952.230.9662 VOICE  
www.zayo.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNATURE: *Michael Muehrer*

TYPED OR PRINTED NAME: MICHAEL MUEHRER

LIS. NO. 55185 DATE: 5/6/2019

**GENERAL SPECIFICATIONS**  
 SITE NAME: FREDRIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

SHEET TITLE:

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>G-003</b>

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**FOUNDATION, EXCAVATION AND BACKFILL NOTES:**

1. ALL FINAL GRADED SLOPES SHALL BE A MAXIMUM OF 3 HORIZONTAL TO 1 VERTICAL, UNLESS OTHERWISE NOTED.
2. BACKFILL OF POLE SHALL BE PERFORMED IN ONE OF TWO OPTIONS:
  - A. PREFERRED: RAINBOW INDUSTRIES POLE SETTING FOAM SHALL BE INSTALLED PER MANUFACTURER SPECS. FOAM SHALL ALWAYS BE USED FOR POOR SOILS.
  - B. SECONDARY: CONCRETE (REQUIRES ZAYO CM WRITTEN APPROVAL) ALLOWABLE SOIL PRESSURE = 2500 PSF (ASSUMED). NON-NATIVE SOILS SHALL BE REMOVE FROM BORE AREA AND SHALL NOT BE REUSED FOR BACKFILL
3. 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.
4. CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC OR UNSUITABLE MATERIAL. IF ADEQUATE BEARING CAPACITY IS NOT ACHIEVED 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 LIME STONE #57 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.
5. 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.
6. ALL FILL MATERIALS AND FOUNDATION BACK FILL SHALL BE PLACED IN 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.
7. NEWLY PLACED CONCRETE FOUNDATIONS SHALL CURE A MINIMUM OF 72 HRS PRIOR TO BACK FILLING.
8. 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.
9. NEWLY GRADED GRAVEL SURFACE AREAS TO RECEIVE GRAVEL SHALL BE COVERED WITH GEOTEXTILE FABRIC TYPE: TYPAR-3401 AS MANUFACTURED BY TYPAR GEOSYNTHETICS 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, UNLESS OTHERWISE NOTED.
10. 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 (E)PREPARED SOIL SURFACE.
11. 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 RECOMPACT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OF FILLS.
12. 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.
13. EXISTING GRAVEL SURFACING MAY NOT BE REUSED.
14. 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.

15. PROTECT EXISTING GRAVEL SURFACING AND SUB GRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE. USE PLANKING 'MATTS' OR OTHER SUITABLE PROTECTION DESIGNED TO SPREAD EQUIPMENT LOADS AS MAY BE NECESSARY. REPAIR ANY DAMAGE TO EXISTING GRAVEL SURFACING OR SUB GRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTORS OPERATIONS.
16. 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.
17. 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.

**CONCRETE AND STEEL REINFORCEMENT**

1. CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH ASTM C94. CONCRETE SHALL BE 6 BAG MIX HAVING A 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI, MAXIMUM AGGREGATE SIZE OF 1", MAXIMUM WATER CEMENT RATIO OF 0.45, AIR ENTRAINMENT OF 6% +/- 1%, AND SLUMP OF 3" +/- 1". DEVIATIONS FROM THE MIX MUST BE APPROVED BY U.S. CELLULAR PRIOR TO USE.
2. CONCRETE CONSTRUCTION SHALL BE COMPLETED IN ACCORDANCE WITH THE MOST STRINGENT OF: PROJECT PLANS, SPECIAL PROVISIONS, OR THE AMERICAN CONCRETE INSTITUTE (ACI) PUBLICATIONS. CONCRETE WORK FOR TOWER FOUNDATIONS SHALL BE COMPLETED IN ACCORDANCE WITH PLANS AND SPECIFICATIONS PROVIDED BY THE TOWER VENDOR.
3. FORM MATERIALS WILL COMPLY WITH ACI 301. PLYWOOD FORMS SHALL BE APA B-B PLYFORM CLASS I SOUND SHEETS. LUMBER SHALL BE SPRUCE-PINE-FIR SPECIES #2 OR BETTER GRADE. TUBULAR COLUMN FORMS MAY BE SPIRALLY WOUND LAMINATED FIBER MATERIAL. FORM TIES SHALL BE REMOVABLE OR SNAP-OFF METAL TYPE.
4. CONCRETE SHALL BE MADE OF CEMENT MEETING THE REQUIREMENTS OF ASTM C150, NORMAL, TYPE I PORTLAND. FINE AND COARSE AGGREGATES FOR CONCRETE SHALL MEET THE REQUIREMENTS OF ASTM C33.
5. PLACE, SUPPORT AND SECURE REINFORCEMENT STEEL AT LOCATIONS SHOWN ON PLANS. REINFORCING STEEL SHALL BE PLACED IN ACCORDANCE WITH ACI 315. REBAR YIELD STRENGTH = 60,000 PSI.
6. AIR ENTRAINING ADMIXTURES SHALL MEET THE REQUIREMENTS OF ASTM C260; WATER REDUCING ADMIXTURES SHALL MEET THE REQUIREMENTS OF ASTM C494, TYPE A. ALL OTHER ADMIXTURES ARE PROHIBITED WITHOUT PRIOR APPROVAL BY U.S. CELLULAR.
7. CURING COMPOUND SHALL MEET THE REQUIREMENTS OF ASTM C309.
8. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
9. ALL CONSTRUCTION AND EXPANSION JOINTS SHALL BE INSTALLED PER THE DRAWINGS.
10. ALL EXPOSED CORNERS OF CONCRETE WORK SHALL BE CHAMFERED 3/4 " UNLESS NOTED OTHERWISE.
11. PLACE, SUPPORT AND SECURE REINFORCEMENT STEEL PER STRUCTURAL ANALYSIS. REINFORCING STEEL SHALL BE PLACED IN ACCORDANCE WITH ACI 315.
12. ALL FORM WORK SHALL BE RIGID, TIGHT, LEVEL, PLUMB AND SUFFICIENTLY SHORED TO RESIST CONSTRUCTION LOAD CONDITIONS. COAT FORMS WITH RELEASE AGENT PRIOR TO PLACING REINFORCING STEEL.
13. PREPARE SUBGRADE FOR CONCRETE IN ACCORDANCE WITH PROJECT PLANS AND SPECIAL PROVISION. DO NOT PLACE CONCRETE ON FROZEN SUBGRADE.
14. UTILIZE CHUTES, TROUGHS OR CONVEYORS TO PLACE CONCRETE SO THAT HANDLING OF CONCRETE IS MINIMIZED. AVOID SEGREGATION OF THE AGGREGATE AND DISTURBING REINFORCING STEEL.
15. UNIFORMLY CONSOLIDATE CONCRETE USING HAND TOOLS OR MECHANICAL VIBRATORS. THOROUGHLY CONSOLIDATE EACH LAYER PRIOR TO PLACING SUBSEQUENT LAYERS.
16. WHEN PLACING OPERATIONS ARE TEMPORARILY SUSPENDED, THE UNFINISHED FACE OF THE POUR SHALL BE COVERED WITH WET BURLAP UNTIL PLACING OPERATIONS ARE RESUMED. WHEN PLACING OPERATIONS ARE SUSPENDED FOR MORE THAN 30 MINUTES, PROVIDE AN BONDING AGENT TO CONSTRUCTION JOINT.
17. TROWEL FINISH SURFACES UNLESS OTHERWISE DIRECTED ON THE PLANS.
18. AFTER FINAL FINISHING, PROVIDE POLYETHYLENE VAPOR BARRIER OR CURING COMPOUND TO MAINTAIN MOISTURE AND TEMPERATURE OF CONCRETE.
19. IN EXTREME WEATHER PLACE AND CURE CONCRETE IN ACCORDANCE WITH EITHER ACI 306R-89 FOR COLD WEATHER OR ACI 305R-89 FOR HOT WEATHER.
20. REMOVE FORMS IN A MANNER THAT DOES NOT DAMAGE THE CONCRETE. FILL AND PATCH POCKETS OR HOLES ON EXPOSED SURFACES USING MORTAR MIXTURE.
21. PROVIDE TEST CYLINDERS AS FOLLOWS:
  - A. EQUIPMENT ENCLOSURE:
    - 1 CYLINDER AT 7 DAYS.
    - 1 CYLINDER AT 14 DAYS.
    - 2 CYLINDERS AT 28 DAYS.

CONSULTANT:



624 WATER STREET  
 PRAIRIE DU SAC, WI 53678  
 608.644.1449 VOICE  
 608.644.1549 FAX  
 www.edgeconsult.com

CLIENT:



5005 CHESHIRE PARKWAY  
 SUITE 1  
 PLYMOUTH, MN 55446  
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SIGNATURE: *Michael Muehrer*

TYPED OR PRINTED NAME: MICHAEL MUEHRER

LIS. NO. 55185 DATE: 5/6/2019

**GENERAL SPECIFICATIONS**  
 SITE NAME: FREDDIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

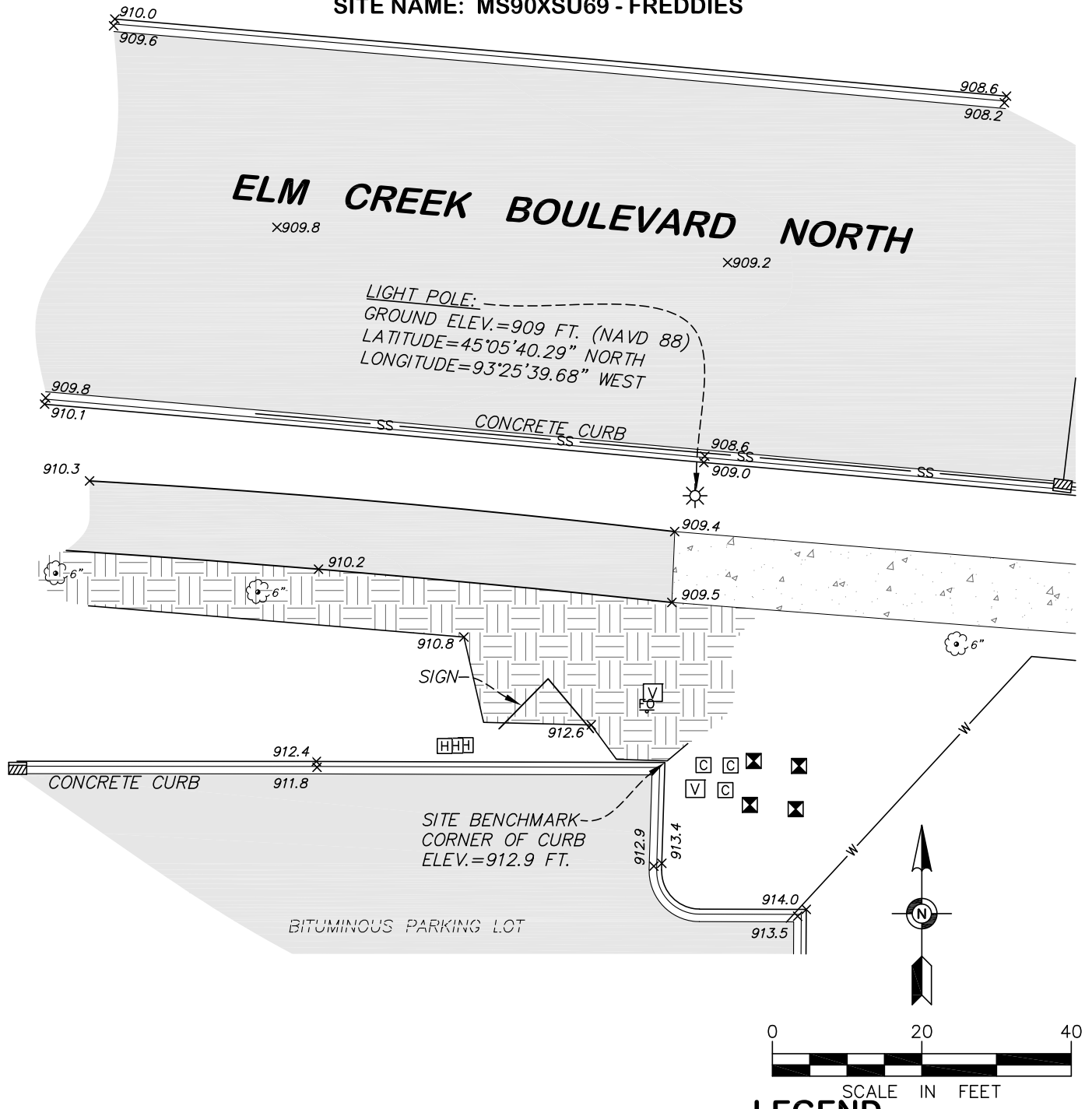
SHEET TITLE:

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>G-004</b>

**SITE LOCATION EXHIBIT FOR:  
EDGE CONSULTING ENGINEERS, INC.**

**SITE LOCATION: Elm Creek Boulevard North and Fountains Drive, Maple Grove, Minnesota  
SITE NAME: MS90XSU69 - FREDDIES**



SCALE IN FEET

**LEGEND**

- LIGHT POLE
- ELECTRIC BOX
- COMMUNICATION BOX
- VAULT
- HANDHOLE
- CATCH BASIN
- FIBER OPTIC SIGN
- TREE
- STORM SEWER
- WATERMAIN
- SPOT ELEVATION
- EXISTING CONTOUR LINE
- BITUMINOUS SURFACE
- CONCRETE SURFACE
- LANDSCAPED SURFACE

**NOTES:**

1. The orientation of this survey is based on the Hennepin County, Minnesota Coordinate Grid, NAD 83-96 Adjustment.
2. Elevations shown hereon are based on the MNDOT VRS Network, Adjusted Vertical Datum of 1988 (NAVD 88).
3. No boundary work was performed in the preparation of this exhibit.
4. Existing utilities, services and underground structures shown hereon were located based upon observed evidence. In addition to field markings by Gopher One, per ticket no. 182332652. Verification and location of all utilities and services should be obtained from the owners of the respective utilities prior to any design, planning or excavation.

SITE LOCATION EXHIBIT FOR:

**EDGE CONSULTING ENGINEERS, INC.**

SITE LOCATION: Elm Creek Boulevard North and Fountains Drive, Maple Grove, Minnesota



**Egan, Field & Nowak, Inc.**

land surveyors since 1872

1229 Tyler Street NE, Suite 100  
Minneapolis, Minnesota 55413  
PHONE: (612) 466-3300  
FAX: (612) 466-3383  
WWW.EFNSURVEY.COM

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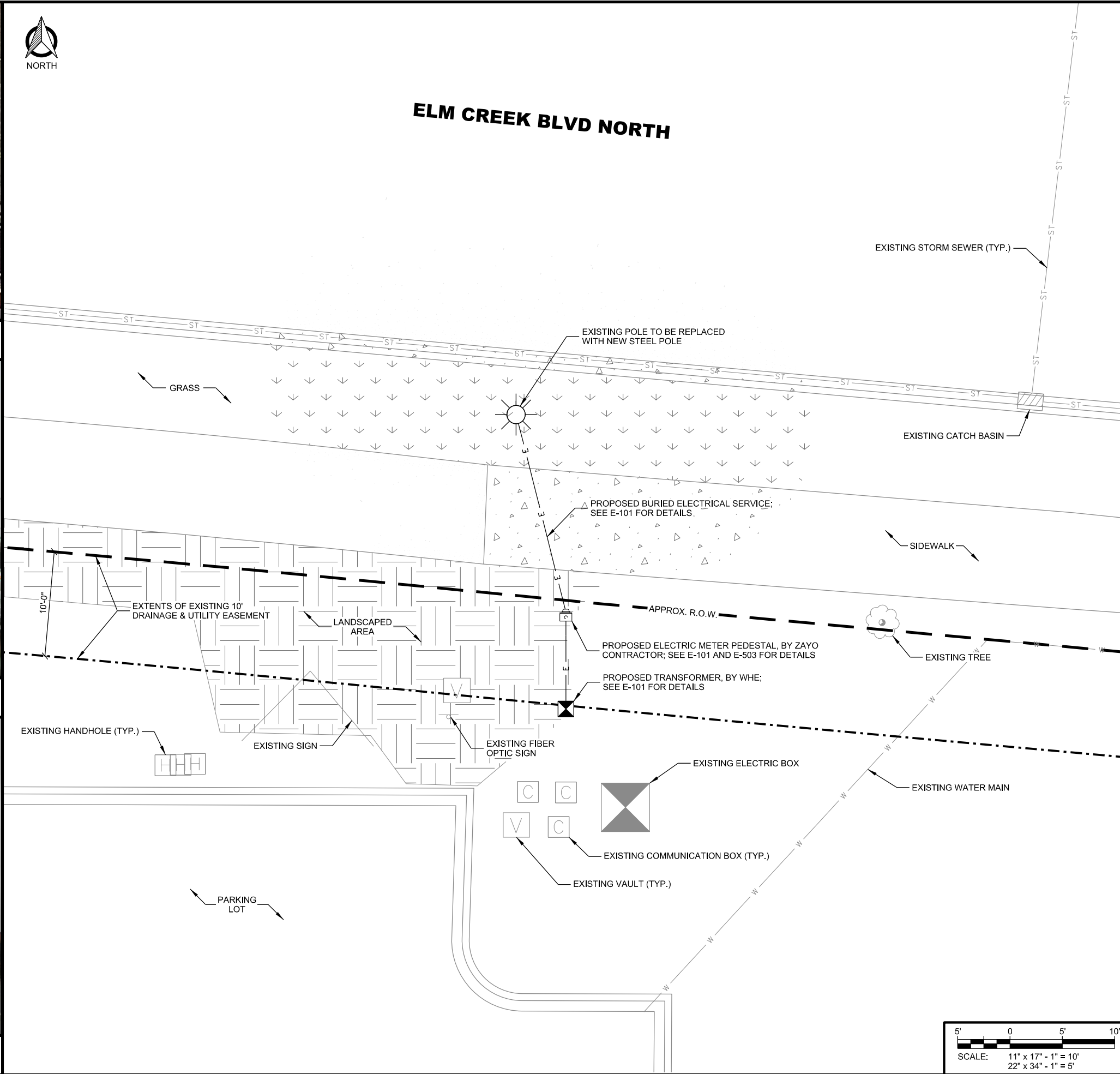
**A** AERIAL OVERVIEW OF SITE



**B** OVERVIEW OF SITE



**C** OVERVIEW OF SITE



CONSULTANT:  
**Edge**  
 Consulting Engineers, Inc.  
 624 WATER STREET  
 PRAIRIE DU SAC, WI 53678  
 608.644.1449 VOICE  
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 5005 CHESHIRE PARKWAY  
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 SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

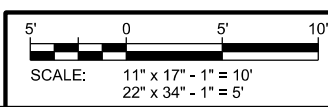
**SITE PLAN**  
**SITE NAME: FREDDIES**  
**CASCADE ID: MS90XSL69-M**  
**MAPLE GROVE, MINNESOTA**

SHEET TITLE:

INT.	DATE	DESCRIPTION:
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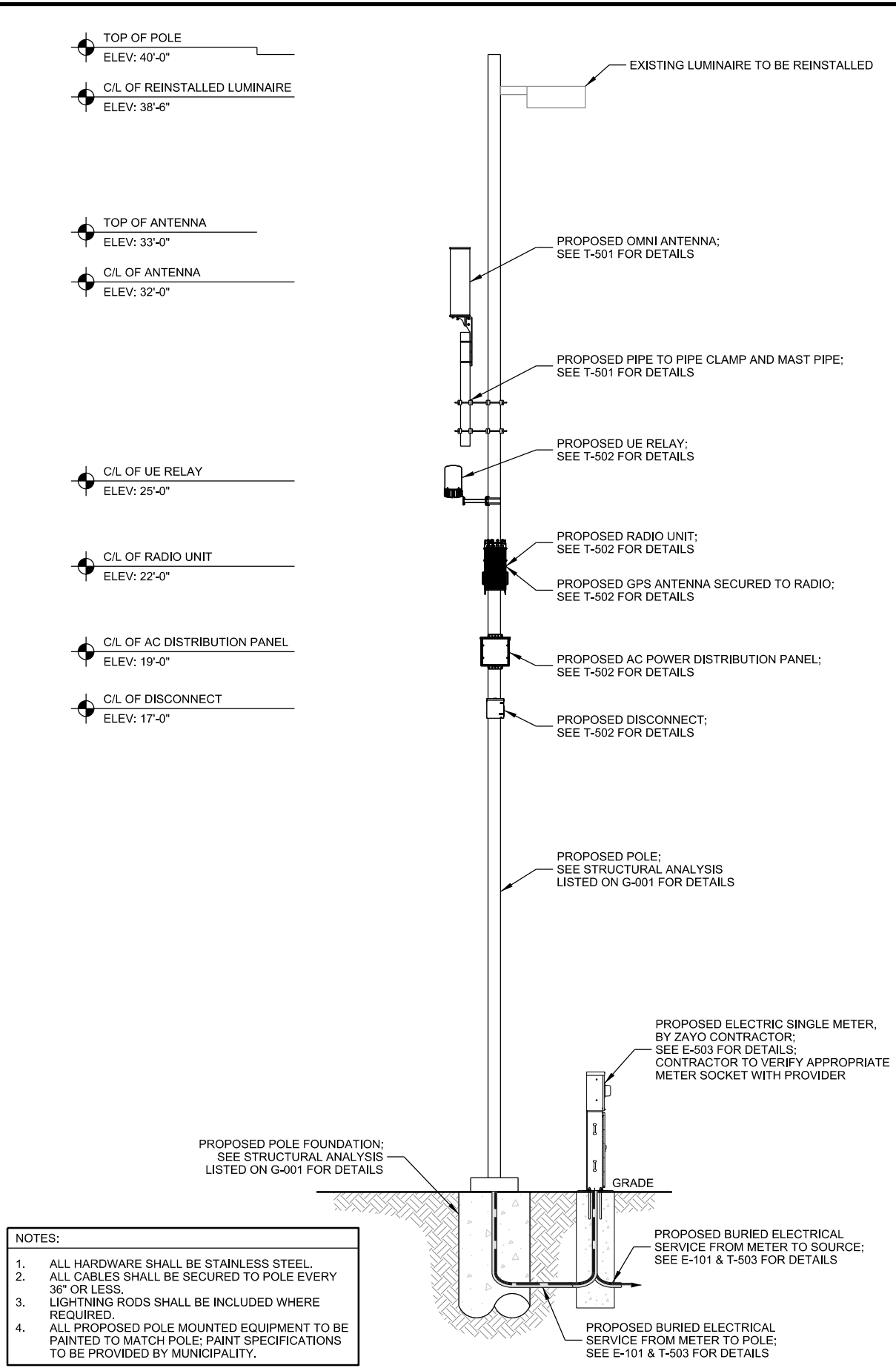
SHEET NUMBER  
**C-101**



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**A** EXISTING SITE ELEVATION



- NOTES:
1. ALL HARDWARE SHALL BE STAINLESS STEEL.
  2. ALL CABLES SHALL BE SECURED TO POLE EVERY 36" OR LESS.
  3. LIGHTNING RODS SHALL BE INCLUDED WHERE REQUIRED.
  4. ALL PROPOSED POLE MOUNTED EQUIPMENT TO BE PAINTED TO MATCH POLE; PAINT SPECIFICATIONS TO BE PROVIDED BY MUNICIPALITY.

**B** PROPOSED SITE ELEVATION

SCALE: 11" x 17" - 1" = 5'-0"  
 22" x 34" - 1" = 2'-6"

CONSULTANT:  
**Edge**  
 Consulting Engineers, Inc.  
 624 WATER STREET  
 PRAIRIE DU SAC, WI 53678  
 608.644.1449 VOICE  
 608.644.1549 FAX  
 www.edgeconsult.com

CLIENT:  
**zayo**  
 5005 CHESHIRE PARKWAY  
 SUITE 1  
 PLYMOUTH, MN 55446  
 952.230.9662 VOICE  
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 SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

**SITE ELEVATION**  
**SITE NAME: FREDDIES**  
**CASCADE ID: MS90XSL69-M**  
**MAPLE GROVE, MINNESOTA**

SHEET TITLE:

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY:	MRM
PLOT DATE:	5/6/2019
PROJECT NUMBER:	17270
SET TYPE:	FINAL CDs
SHEET NUMBER:	<b>T-201</b>

I:\172001\17270\CAD\Construction\_Drawings\PlatT-201.dgn

# AW3613-S1-G Data Sheet



## 2496 -2690MHz Omni Antenna

(Quad Port, Omni, +/-45° Polarisation, 6 x MET) with integrated GPS

\*The parameters in this specification follow the definitions and recommendations per NGMN P-Basta, Release 9.6

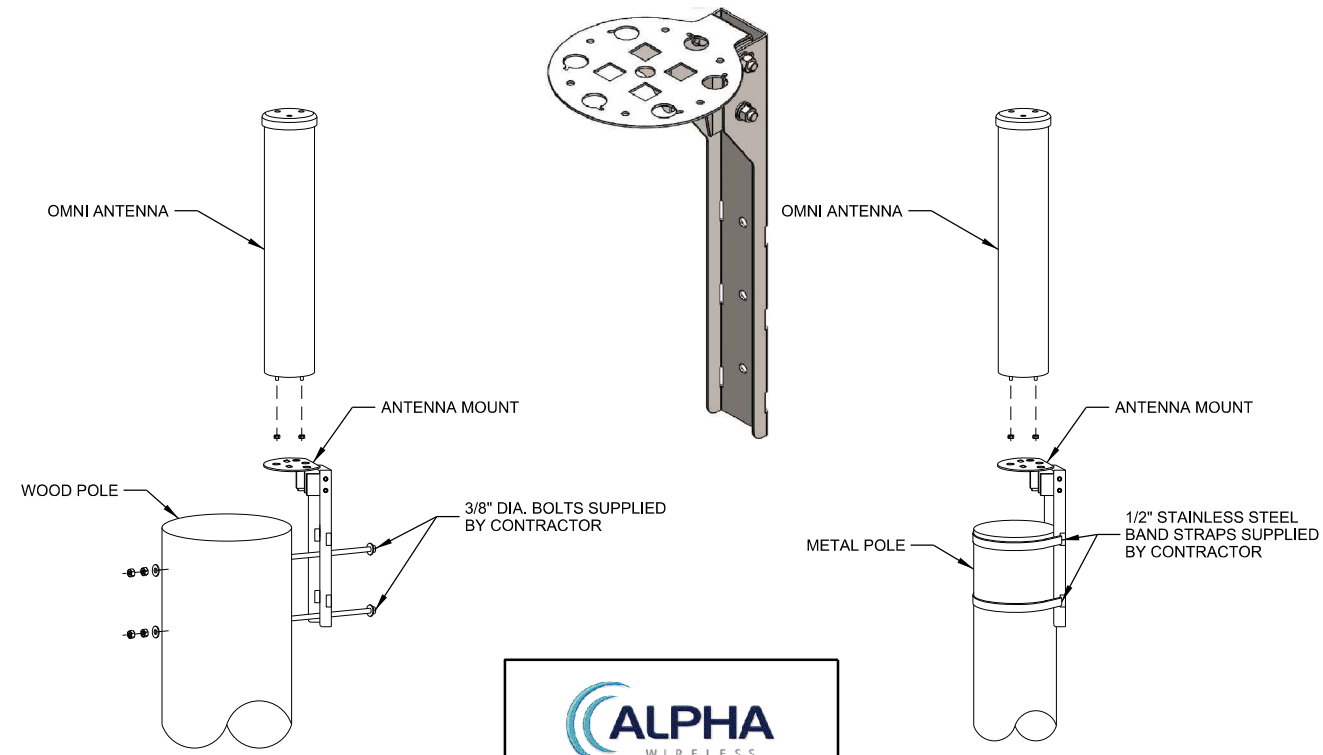
### RF Specifications

Frequency Range per Input	MHz	2496 - 2690
Polarisation:	NA	+/-45° Slant Linear
Gain		
Over all Tilts	dBi	8.5
Azimuth Beamwidth	Degree	360
Elevation Beamwidth	Degree	12
Electrical Downtilt:	Degree	T0° -T14°
Electrical Downtilt Deviation	Degree <	1
Impedance	Ohms	50
VSWR	NA <	1.4
Return Loss:	dB >	15
Isolation	dB >	28
Passive Intermodulation	dBc <	-150
Upper Sidelobe Suppression, Peak to 20°	dB >	18
Cross Polar Discrimination at Sector	dB >	12
Maximum Effective Power Per Port	W	50

### Mechanical Specifications

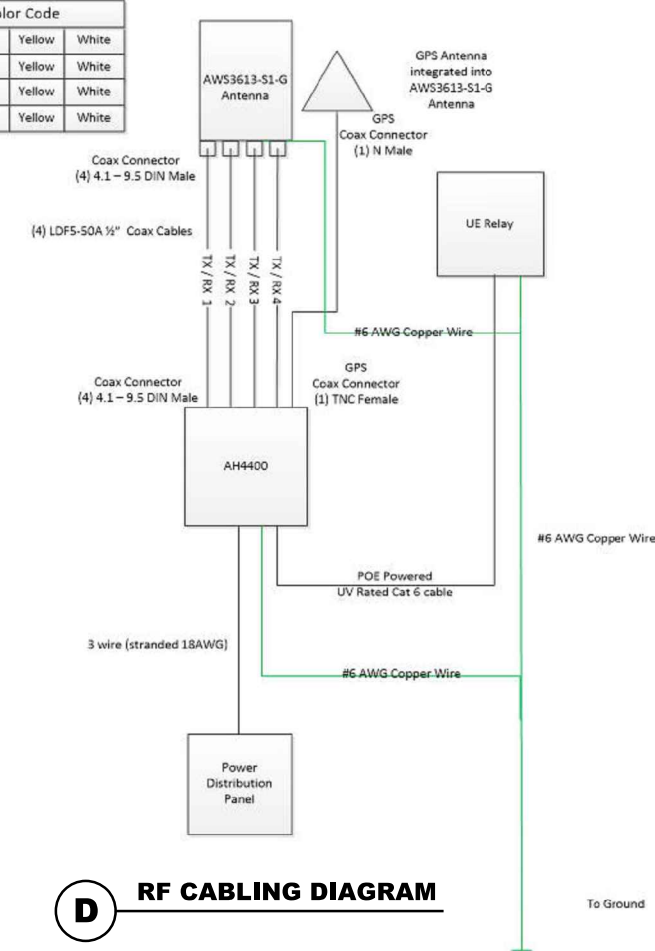
Dimensions (LxØ) mm (in)	mm (in)	720 (28.3) x 220 (8.6)
Packing Size (LxWxD)	mm (in)	880 (34.6) x 250 (9.8) x 250 (9.8)
Net Weight (antenna)	kg (lb)	7 (15.4)
Net Weight (mount)	kg (lb)	0.5 (1.1)
Shipping Weight	kg (lb)	7.5 (16.5)
Connector Quantity	NA	4 x 4.3-10
Connector Position	NA	Bottom
Windload calculation	km/h	$F=1/2 \cdot \rho \cdot (Cdp \cdot A) \cdot v^2 \cdot A$
Windload Frontal	N	315
Survival Wind Speed	km/h	200 (125)
Radome Material	NA	UV-Stabilised PVC
Radome Colour	RAL	7035
Product Compliance Environmental	NA	RoHS
Lightening Protection	NA	DC Grounded
Cold Temperature Survival	Celsius	-40
Hot Temperature Survival	Celsius	+70

**A ANTENNA SPECIFICATIONS**

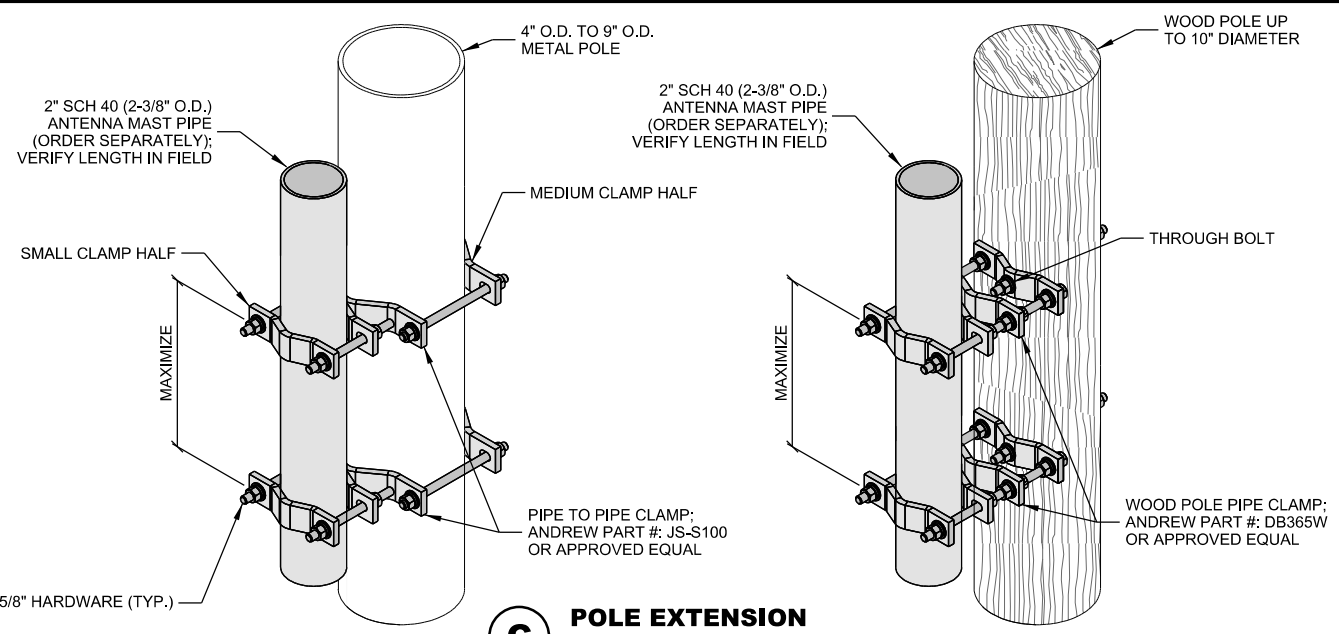


**B ANTENNA MOUNTING**

Coax Cable Color Code			
TX / RX 1	Blue	Yellow	White
TX / RX 2	Green	Yellow	White
TX / RX 3	Red	Yellow	White
TX / RX 4	White	Yellow	White



**D RF CABLING DIAGRAM**



**C POLE EXTENSION**

CONSULTANT:  
**Edge**  
 Consulting Engineers, Inc.  
 624 WATER STREET  
 PRAIRIE DU SAC, WI 53678  
 608.644.1449 VOICE  
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SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

**ANTENNA DETAILS**  
 SITE NAME: FREDDIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

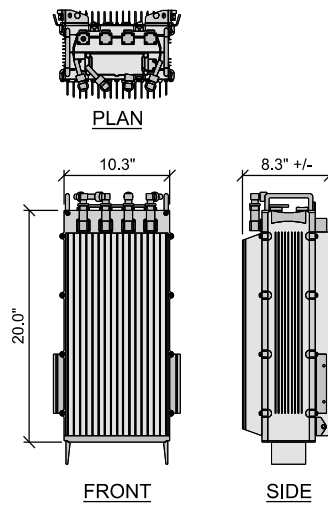
SHEET TITLE:

SUBMITTAL:		
INT.	DATE	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>T-501</b>

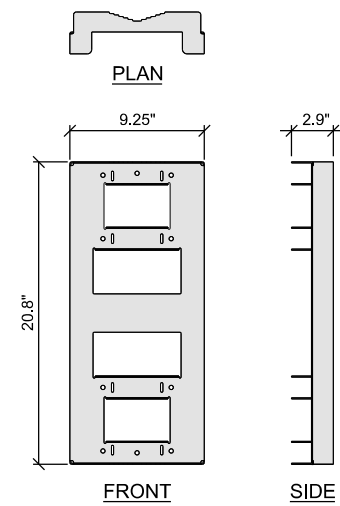
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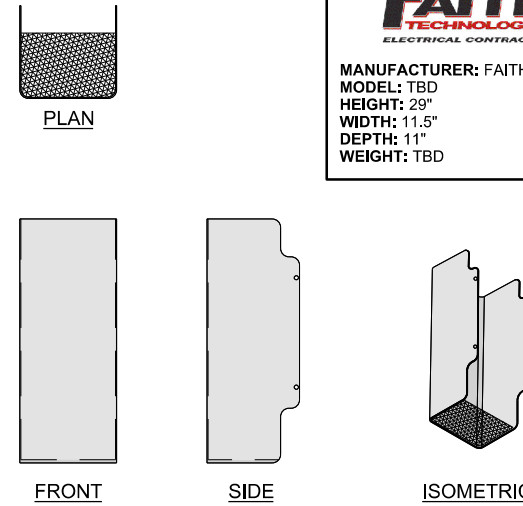
**AIRSPAN**  
 MANUFACTURER: AIRSPAN  
 MODEL: AIRHARMONY 4400  
 HAR44-EF-U41-B06AP (B41)  
 HEIGHT: 20.0"  
 WIDTH: 10.3"  
 DEPTH: 8.3"  
 WEIGHT: 52.9 LBS.

**A RADIO UNIT**



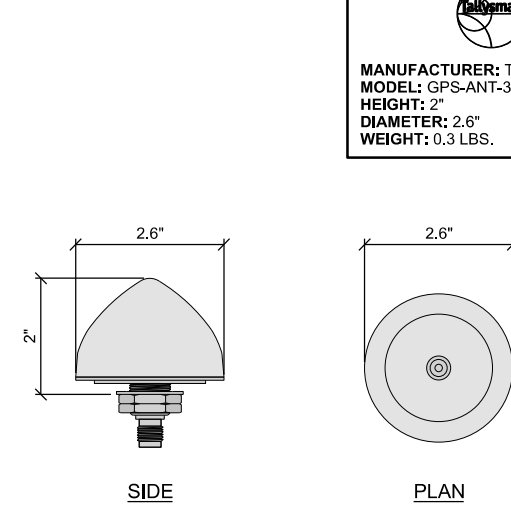
**AIRSPAN**  
 MANUFACTURER: AIRSPAN  
 MODEL: TBD  
 HEIGHT: 20.8"  
 WIDTH: 9.25"  
 DEPTH: 2.9"  
 WEIGHT: 6.6 LBS.

**B RADIO UNIT MOUNT**



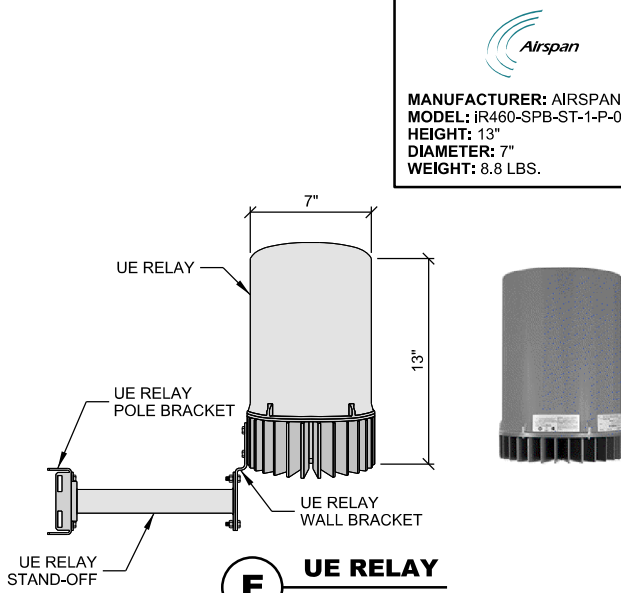
**FAITH TECHNOLOGIES ELECTRICAL CONTRACTOR**  
 MANUFACTURER: FAITH  
 MODEL: TBD  
 HEIGHT: 29"  
 WIDTH: 11.5"  
 DEPTH: 11"  
 WEIGHT: TBD

**C RADIO UNIT SUNSHIELD**



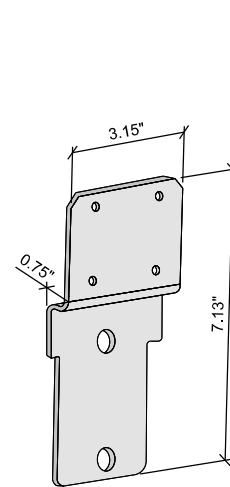
**Tallysman**  
 MANUFACTURER: TALLYSMAN  
 MODEL: GPS-ANT-3  
 HEIGHT: 2"  
 DIAMETER: 2.6"  
 WEIGHT: 0.3 LBS.

**D GPS ANTENNA**



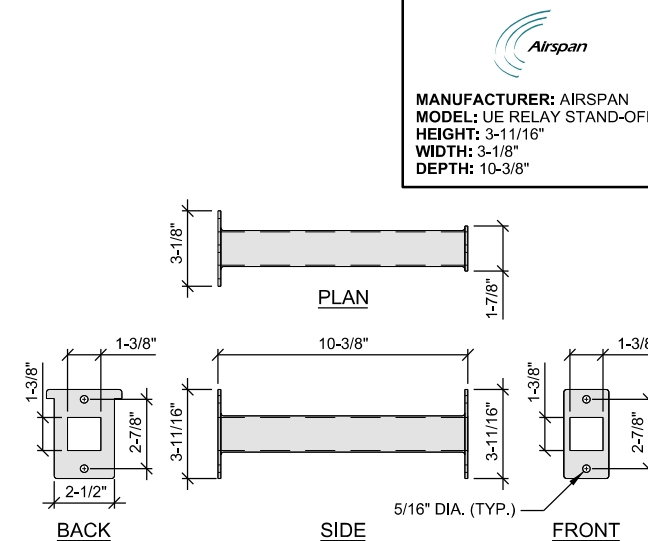
**AIRSPAN**  
 MANUFACTURER: AIRSPAN  
 MODEL: iR460-SPB-ST-1-P-0  
 HEIGHT: 13"  
 DIAMETER: 7"  
 WEIGHT: 8.8 LBS.

**E UE RELAY**



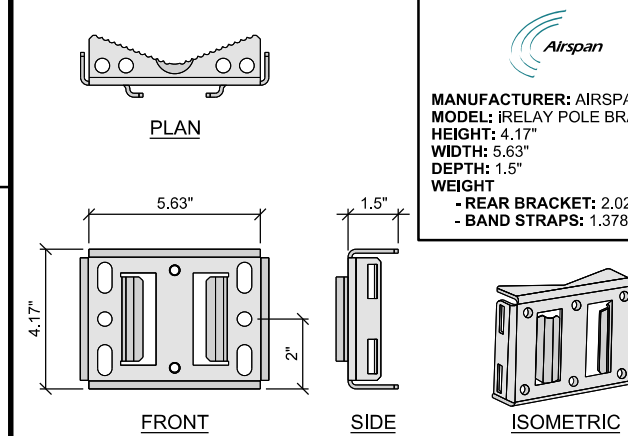
**AIRSPAN**  
 MANUFACTURER: AIRSPAN  
 MODEL: iRELAY WALL BRACKET  
 HEIGHT: 7.13"  
 WIDTH: 3.15"  
 DEPTH: 0.75"  
 WEIGHT: 0.95 LBS.

**F UE RELAY WALL BRACKET**



**AIRSPAN**  
 MANUFACTURER: AIRSPAN  
 MODEL: UE RELAY STAND-OFF  
 HEIGHT: 3-1/16"  
 WIDTH: 3-1/8"  
 DEPTH: 10-3/8"

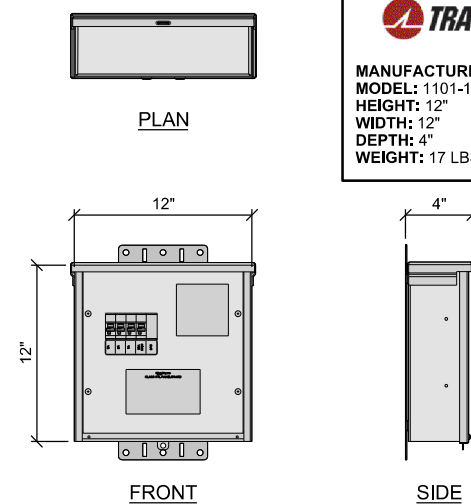
**G UE RELAY STAND-OFF**



**AIRSPAN**  
 MANUFACTURER: AIRSPAN  
 MODEL: iRELAY POLE BRACKET  
 HEIGHT: 4.17"  
 WIDTH: 5.63"  
 DEPTH: 1.5"  
 WEIGHT:  
 - REAR BRACKET: 2.02 LBS.  
 - BAND STRAPS: 1.378 LBS.

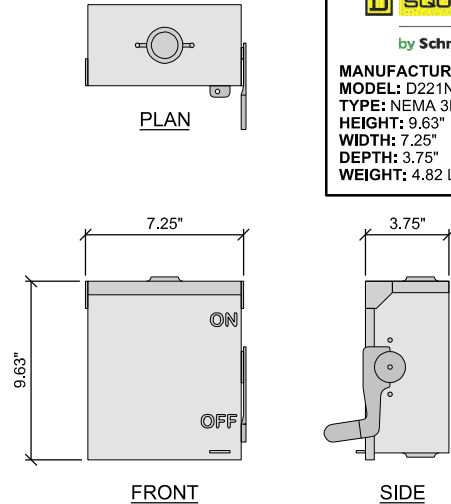
NOTES:  
 1. POLES UP TO 3.7" DIA. USE REAR BRACKET.  
 2. POLES OVER 3.8" DIA. USE BAND STRAPS.

**H UE RELAY POLE BRACKET**



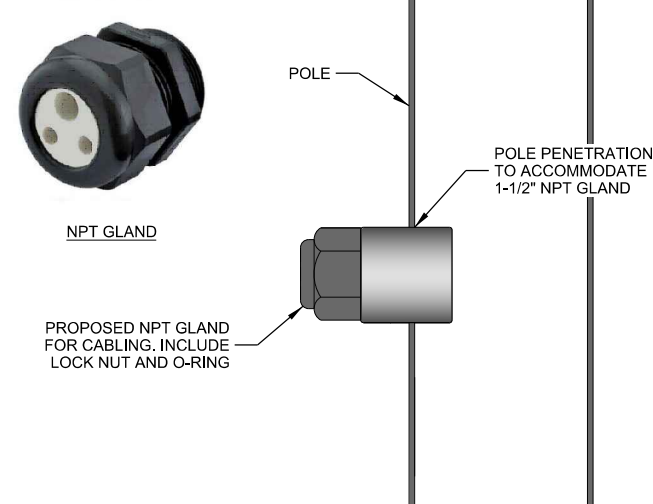
**TRANSECTOR**  
 MANUFACTURER: TRANSECTOR  
 MODEL: 1101-1207-1012  
 HEIGHT: 12"  
 WIDTH: 12"  
 DEPTH: 4"  
 WEIGHT: 17 LBS.

**I AC DISTRIBUTION PANEL**



**SQUARE D by Schneider Electric**  
 MANUFACTURER: SQUARE D  
 MODEL: D221NRB  
 TYPE: NEMA 3R DISCONNECT  
 HEIGHT: 9.63"  
 WIDTH: 7.25"  
 DEPTH: 3.75"  
 WEIGHT: 4.82 LBS.

**J DISCONNECT**



**K PENETRATION DETAIL**

CONSULTANT:  
**Edge Consulting Engineers, Inc.**  
 624 WATER STREET  
 PRAIRIE DU SAC, WI 53678  
 608.644.1449 VOICE  
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SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

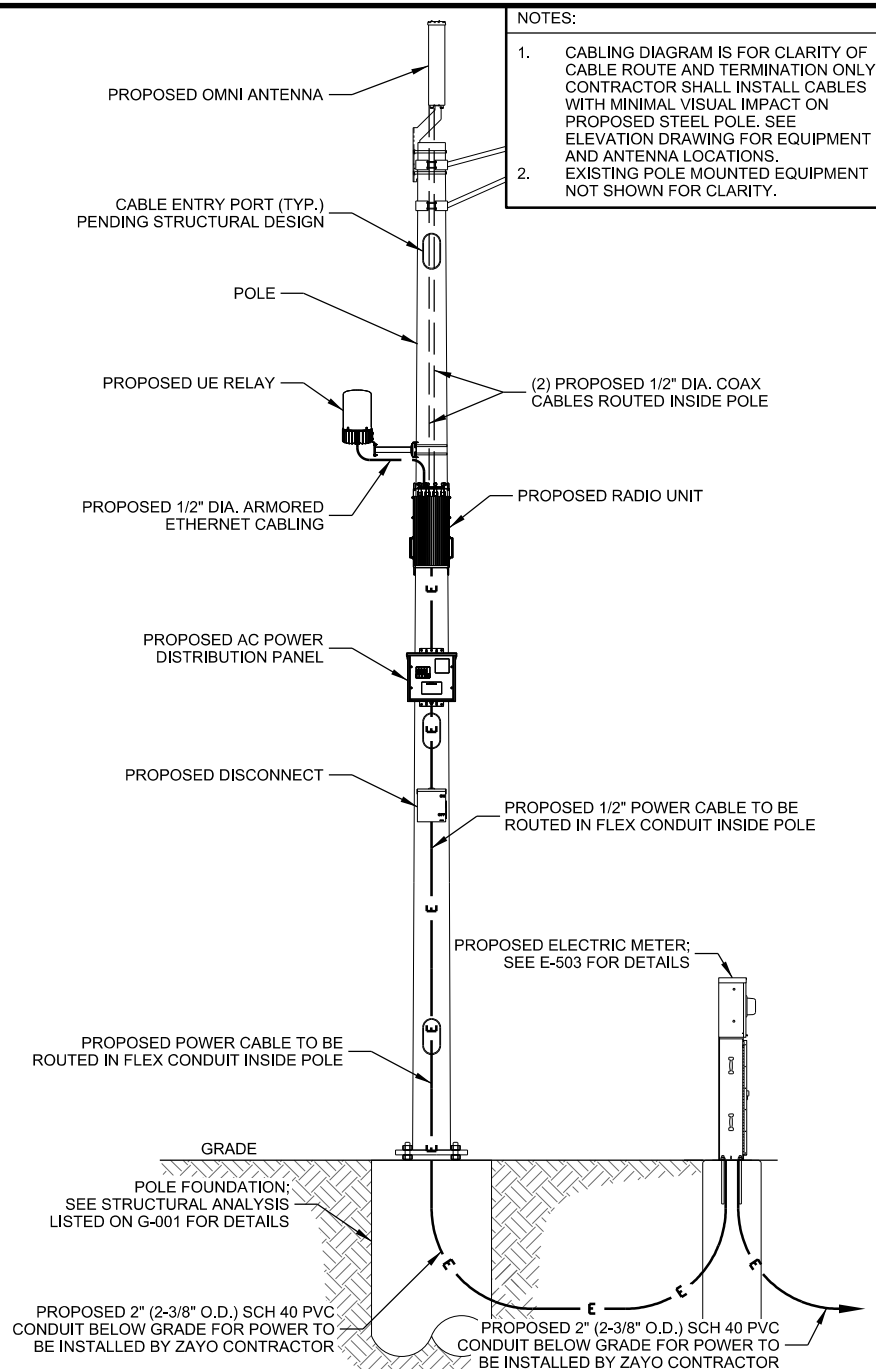
**EQUIPMENT SPECIFICATIONS**  
 SITE NAME: FREDRIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

SHEET TITLE:

INT.	DATE	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>T-502</b>

**THIS SPACE INTENTIONALLY LEFT BLANK**



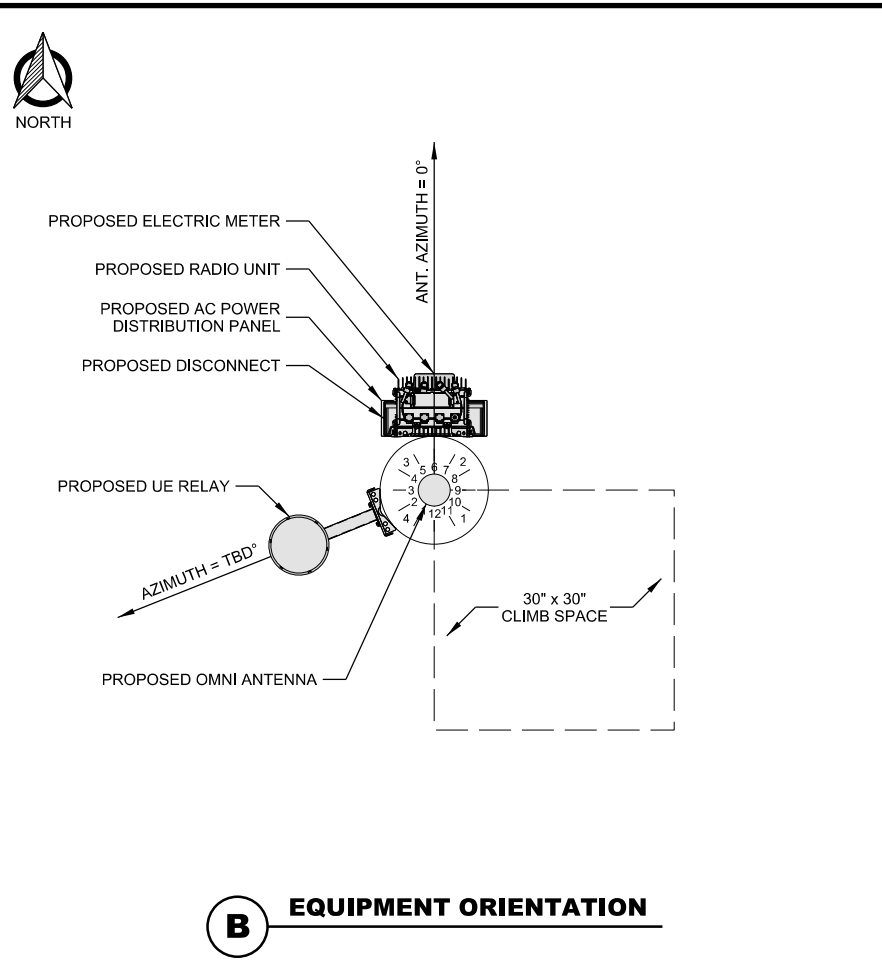
**NOTES:**

1. CABLING DIAGRAM IS FOR CLARITY OF CABLE ROUTE AND TERMINATION ONLY. CONTRACTOR SHALL INSTALL CABLES WITH MINIMAL VISUAL IMPACT ON PROPOSED STEEL POLE. SEE ELEVATION DRAWING FOR EQUIPMENT AND ANTENNA LOCATIONS. EXISTING POLE MOUNTED EQUIPMENT NOT SHOWN FOR CLARITY.
- 2.

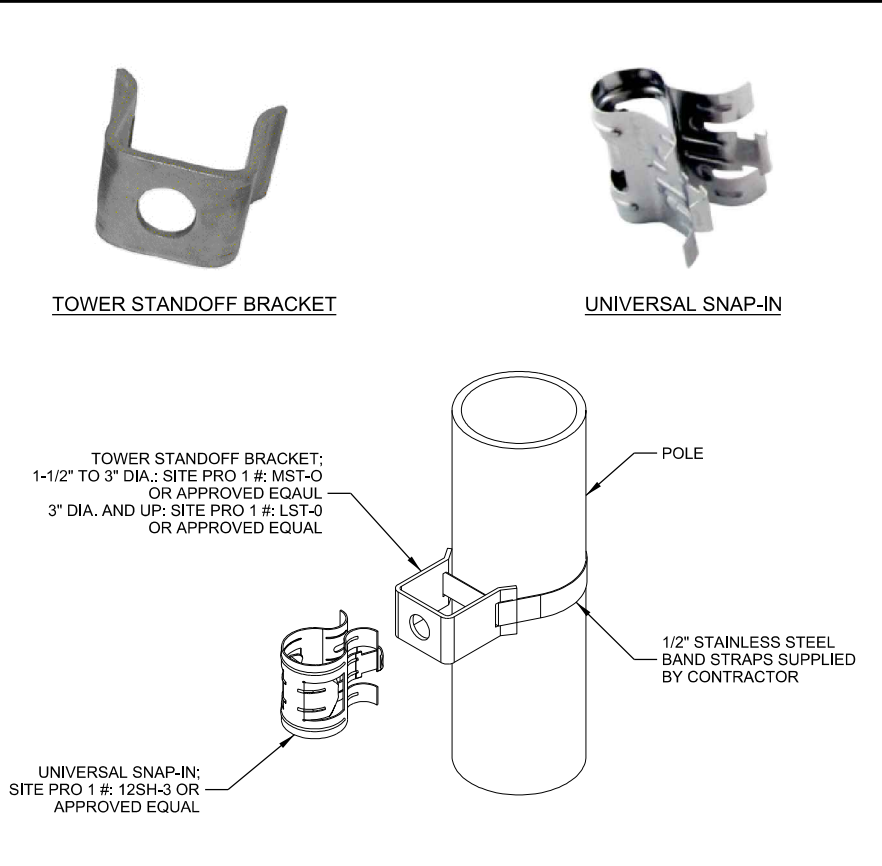
**CABLING NOTES:**

1. WOOD, CONCRETE AND EXISTING METALLIC POLES
  - A. FROM GRADE LINE TO 11'-0" ABOVE GRADE. ALL CABLES/CONDUCTORS EXCEPT GROUNDING CONDUCTOR MUST RUN IN RIGID GALVANIZED STEEL CONDUIT (RGS)
  - B. GROUNDING CONDUCTORS IN EXPOSED LOCATIONS MUST BE INSTALLED IN PVC.
  - C. IN EARTH INSTALL PVC CONDUIT FOR BACKHAUL AND ELECTRICAL SERVICE. TRANSITION TO RGS AT GRADE LINE.
  - D. ABOVE 11'-0" ALL CABLES (POWER, ETHERNET, COAXIAL) MUST RUN IN PVC UTILITY POLE RISER.
    - I. AT MAJOR EQUIPMENT, EXTEND UTILITY DUCT IMMEDIATELY ADJACENT TO THE EQUIPMENT. INSTALL CABLES IN THE UTILITY POLE RISER CREATING CABLE DRIP LOOPS NOT LESS THAN THE CABLE BENDING RADIUS.
    - II. INSIDE THE UTILITY POLE RISER, UTILIZE 1/2" COAX BLOCKS WITH LAG SCREWS TO SUPPORT COAX, RADIO AND MW POWER, RF COAX, AND ETHERNET CABLES TO WITHIN 12" OF THE EQUIPMENT BEING SERVED AND ON INTERVALS NOT TO EXCEED 4'.
  - E. FOR UNDERGROUND HFC/PUBLIC BACKHAUL, ROUTE ETHERNET CABLE IN CONDUIT UP THE POLE AND ENTER THE UTILITY POLE RISER. SEAL EXPOSED END OF CONDUIT WITH A CABLE TERMINATION FITTING.
  - F. BY APPROVAL IN SELECT CASES LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LFMC) MAY BE USED IN LENGTHS NOT TO EXCEED 36" TO EXTEND THE ELECTRICAL SERVICE CONDUIT TO THE AC DISTRIBUTION BOX. EXAMPLE: UTILITY-REQUIRED DISCONNECT ON POLE W/ AC DISTRIBUTION BOX ON OPPOSITE SIDE OF POLE. NOT REQUIRED FOR COAX.
2. NEW METALLIC POLES
  - A. PROCURE NEW POLES WITH SUITABLE HAND HOLES SUCH THAT HAND HOLES EXIST AT ALL EQUIPMENT LOCATIONS.
  - B. WHERE REQUIRED, INSTALL POLE BASE SUCH THAT THE ELECTRICAL FEED AND BACKHAUL (IF UNDERGROUND) CIRCUIT ENTER THE POLE THROUGH THE POLE BASE.

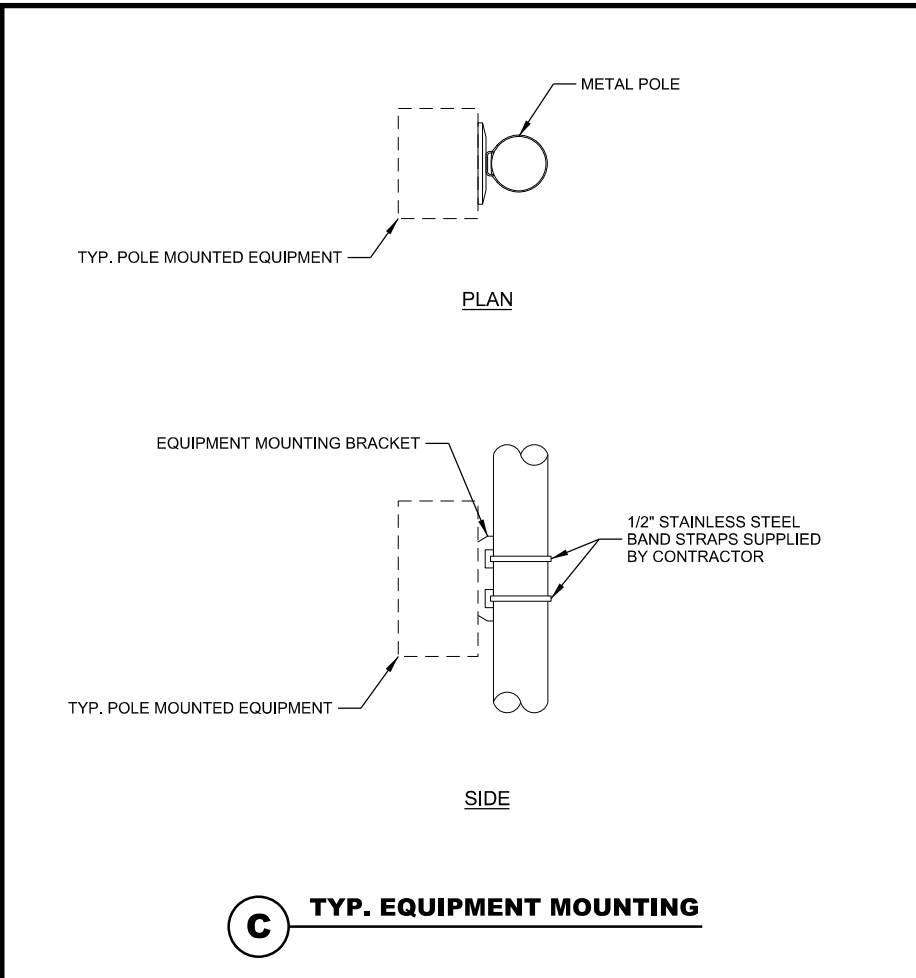
**A PLUMBING DIAGRAM**



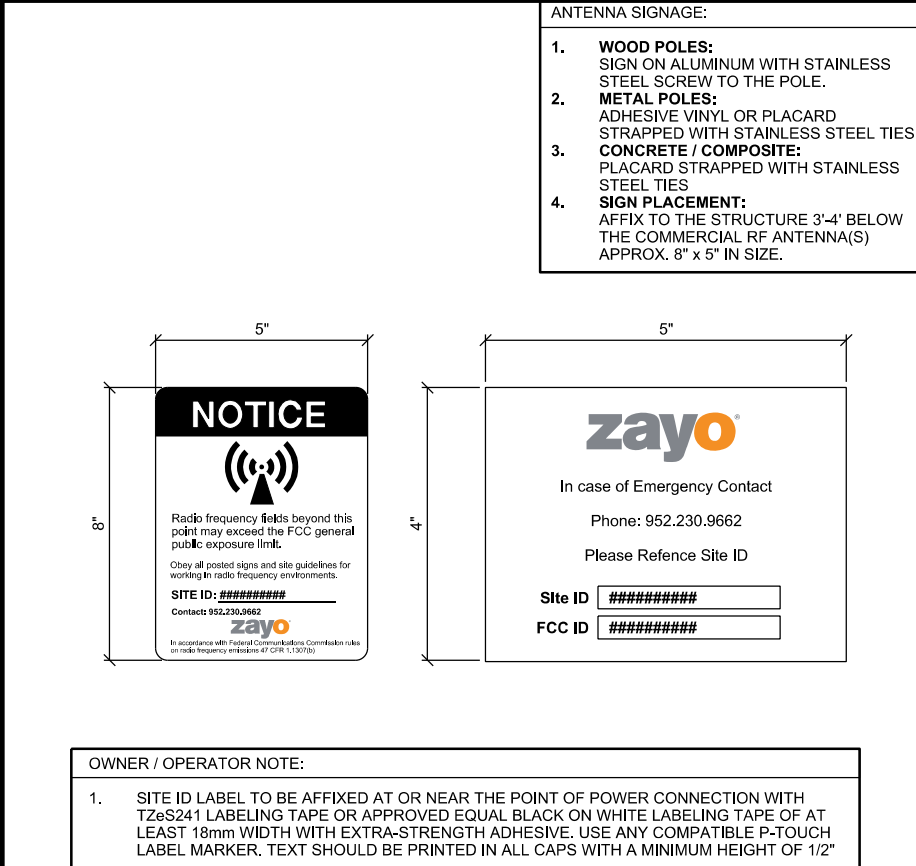
**B EQUIPMENT ORIENTATION**



**D TYP. CABLE MANAGEMENT**



**C TYP. EQUIPMENT MOUNTING**



**E POLE MOUNTED SIGNAGE**

**OWNER / OPERATOR NOTE:**

1. SITE ID LABEL TO BE AFFIXED AT OR NEAR THE POINT OF POWER CONNECTION WITH TZeS241 LABELING TAPE OR APPROVED EQUAL BLACK ON WHITE LABELING TAPE OF AT LEAST 18mm WIDTH WITH EXTRA-STRENGTH ADHESIVE. USE ANY COMPATIBLE P-TOUCH LABEL MARKER. TEXT SHOULD BE PRINTED IN ALL CAPS WITH A MINIMUM HEIGHT OF 1/2"

**CONSULTANT:**  
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 624 WATER STREET  
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**zayo**  
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 SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

**EQUIPMENT MOUNTING**  
**SITE NAME: FREDRIES**  
**CASCADE ID: MS90XSL69-M**  
**MAPLE GROVE, MINNESOTA**

SHEET TITLE: EQUIPMENT MOUNTING

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY:	MRM
PLOT DATE:	5/6/2019
PROJECT NUMBER:	17270
SET TYPE:	FINAL CDs
SHEET NUMBER:	<b>T-503</b>

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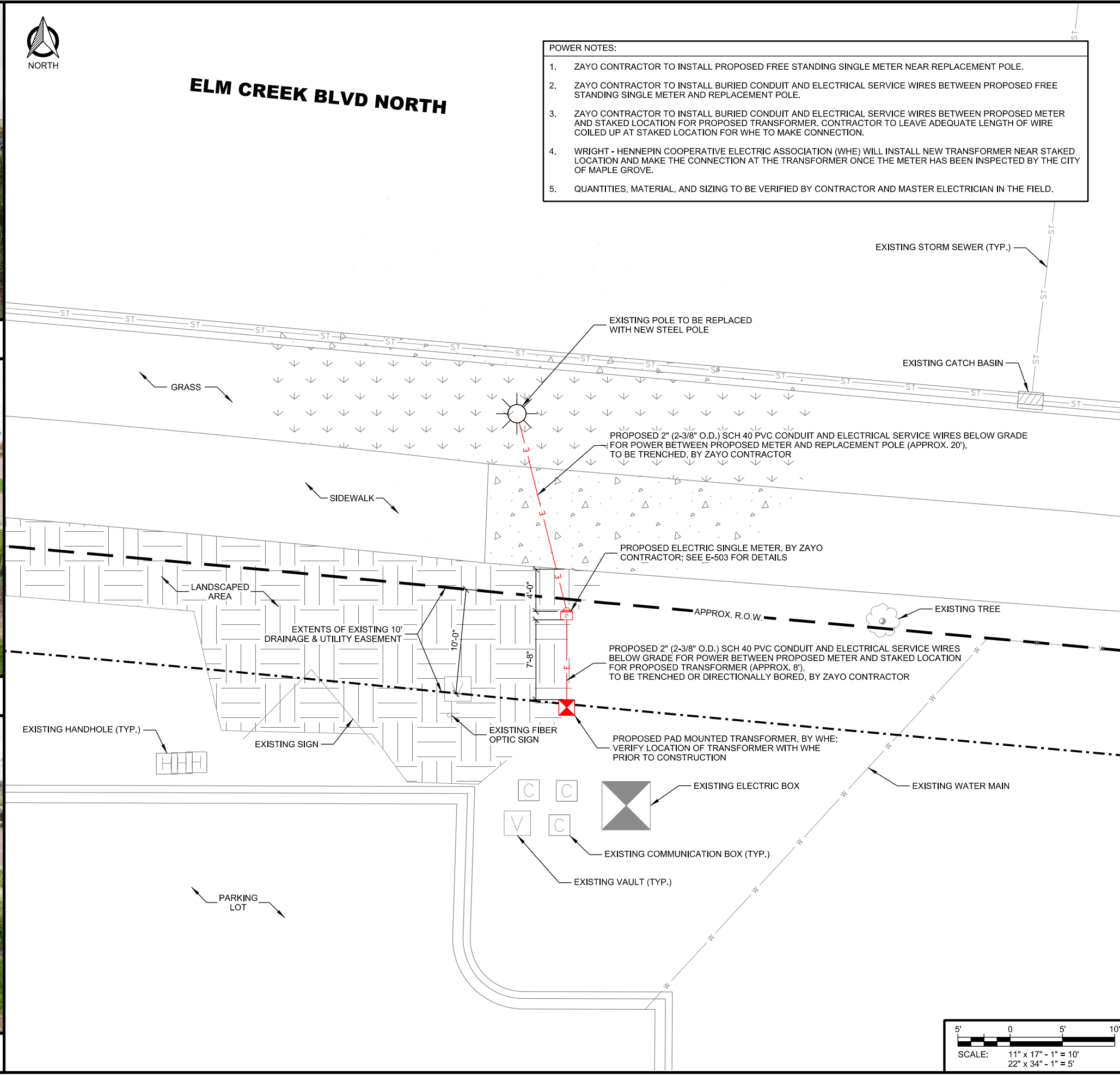
**A** PROPOSED TRANSFORMER LOCATION



**B** PROPOSED TRANSFORMER LOCATION



**C** PROPOSED ELECTRICAL ROUTE



- POWER NOTES:**
1. ZAYO CONTRACTOR TO INSTALL PROPOSED FREE STANDING SINGLE METER NEAR REPLACEMENT POLE.
  2. ZAYO CONTRACTOR TO INSTALL BURIED CONDUIT AND ELECTRICAL SERVICE WIRES BETWEEN PROPOSED FREE STANDING SINGLE METER AND REPLACEMENT POLE.
  3. ZAYO CONTRACTOR TO INSTALL BURIED CONDUIT AND ELECTRICAL SERVICE WIRES BETWEEN PROPOSED METER AND STAKED LOCATION FOR PROPOSED TRANSFORMER. CONTRACTOR TO LEAVE ADEQUATE LENGTH OF WIRE COILED UP AT STAKED LOCATION FOR WHE TO MAKE CONNECTION.
  4. WRIGHT - HENNEPIN COOPERATIVE ELECTRIC ASSOCIATION (WHE) WILL INSTALL NEW TRANSFORMER NEAR STAKED LOCATION AND MAKE THE CONNECTION AT THE TRANSFORMER ONCE THE METER HAS BEEN INSPECTED BY THE CITY OF MAPLE GROVE.
  5. QUANTITIES, MATERIAL, AND SIZING TO BE VERIFIED BY CONTRACTOR AND MASTER ELECTRICIAN IN THE FIELD.

CONSULTANT:  
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 Consulting Engineers, Inc.  
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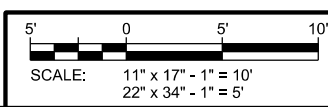
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

**UTILITY PLAN**  
 SITE NAME: FREDDIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

SHEET TITLE:

SUBMITTAL:		
INT.	DATE:	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
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MJM	04/15/19	PERMIT SUBMITTAL
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MJM	05/06/19	PERMIT SUBMITTAL

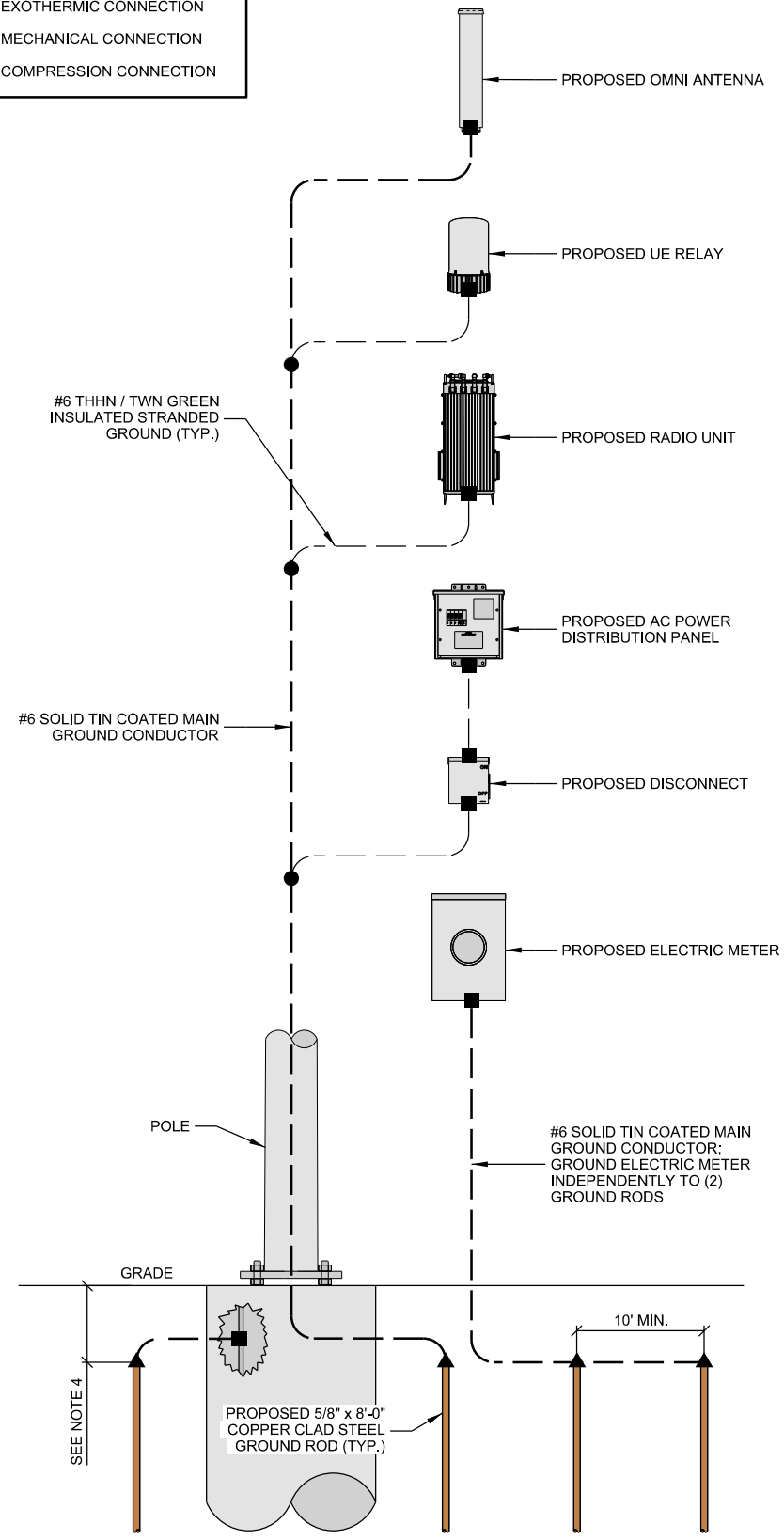
CHECKED BY:	MRM
PLOT DATE:	5/6/2019
PROJECT NUMBER:	17270
SET TYPE:	FINAL CDs
SHEET NUMBER:	<b>E-101</b>



I:\172001\17270\CAD\Construction\_Drawings\Plan\E-101.dgn

LEGEND: (THIS SHEET)

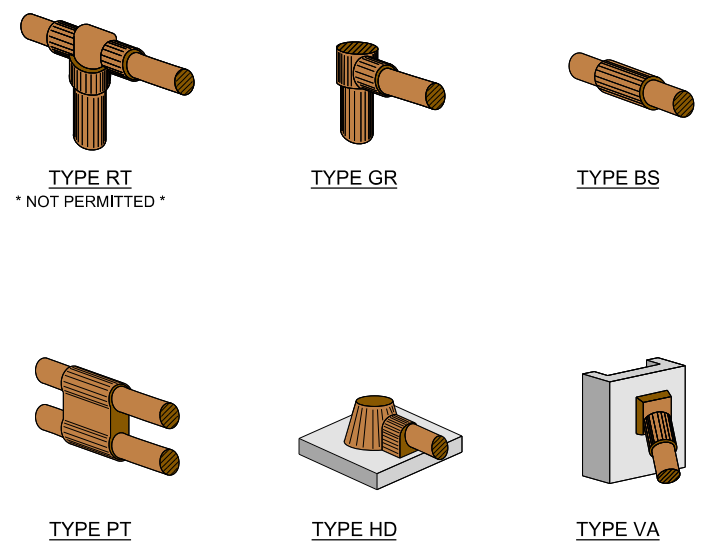
- ▲ EXOTHERMIC CONNECTION
- MECHANICAL CONNECTION
- COMPRESSION CONNECTION



NOTES:

- GROUNDING RISER FOR DIAGRAMMATIC PURPOSES ONLY. SEE ELEVATION DRAWINGS FOR EQUIPMENT AND ANTENNA LOCATIONS.
- ALL RIGID GALV. STEEL TO BE GROUNDED AT BOTH ENDS USING GROUNDING BUSHINGS.
- GROUND WIRE TO BE RUN WITHIN 1/2" SCH. 40 PVC.
- DRIVE GROUND RODS TO A MINIMUM DEPTH OF 30" OR 6" BELOW FROST LINE

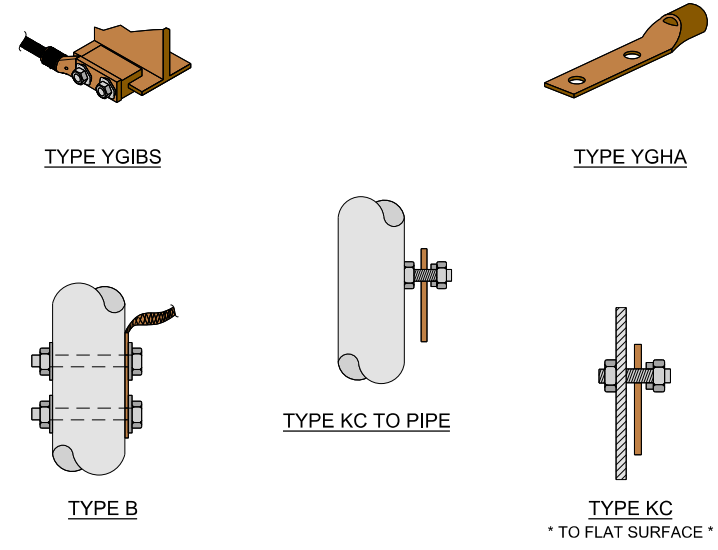
**A GROUNDING RISER DIAGRAM**



NOTES:

- EXOTHERMIC "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF EXOTHERMIC CONNECTIONS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.
- CONTRACTOR TO PROVIDE ALL REQUIRED EXOTHERMIC CONNECTIONS.

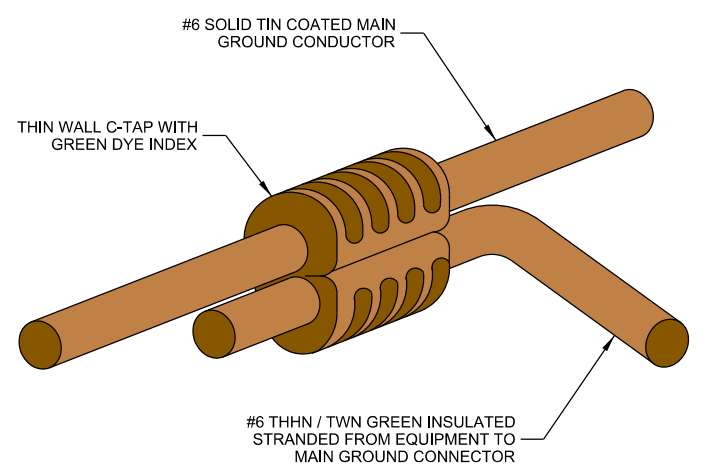
**B EXOTHERMIC CONNECTIONS**



NOTES:

- MECHANICAL "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF MECHANICAL CONNECTIONS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.
- CONTRACTOR TO PROVIDE ALL REQUIRED MECHANICAL CONNECTIONS.

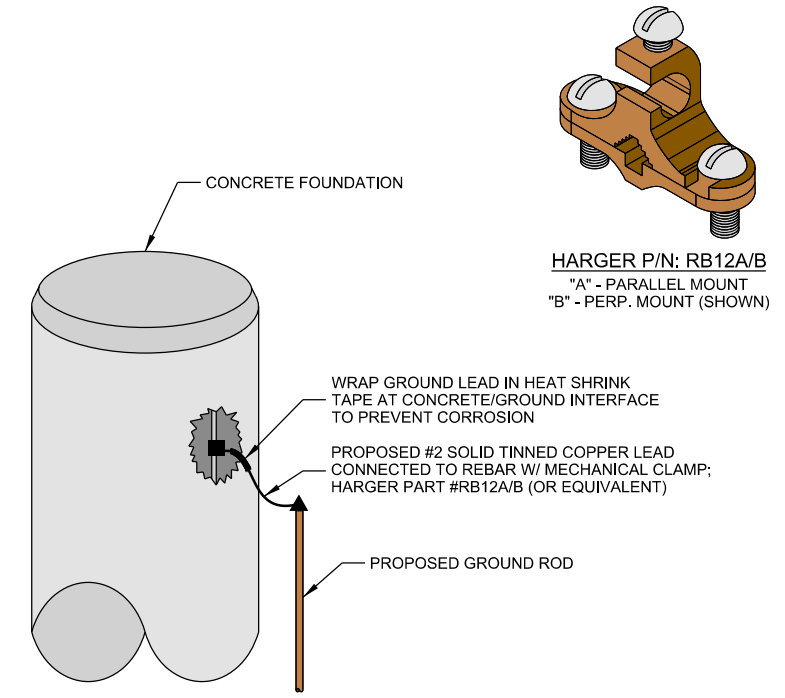
**C MECHANICAL CONNECTIONS**



NOTES:

- CONTRACTOR TO SURROUND COMPLETED CONNECTION WITH HEAT-SHRINK TUBING TO ENSURE WEATHER PROOF CONNECTION.
- CONTRACTOR TO PROVIDE ALL REQUIRED COMPRESSION CONNECTIONS.

**D COMPRESSION CONNECTION**



NOTES:

- FOUNDATION SHOWN IS TYPICAL.
- GROUNDING CONNECTIONS TO BE COVERED BY A MINIMUM OF 3" CONCRETE.
- CONTRACTOR TO PROVIDE ALL REQUIRED COMPRESSION CONNECTIONS.

**E REBAR CONNECTION**

CONSULTANT:  
**Edge**  
 Consulting Engineers, Inc.  
 624 WATER STREET  
 PRAIRIE DU SAC, WI 53678  
 608.644.1449 VOICE  
 608.644.1549 FAX  
 www.edgeconsult.com

CLIENT:  
**zayo**  
 5005 CHESHIRE PARKWAY  
 SUITE 1  
 PLYMOUTH, MN 55446  
 952.230.9662 VOICE  
 www.zayo.com

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 SIGNATURE: *Michael Muehrer*  
 TYPED OR PRINTED NAME: MICHAEL MUEHRER  
 LIS. NO. 55185 DATE: 5/6/2019

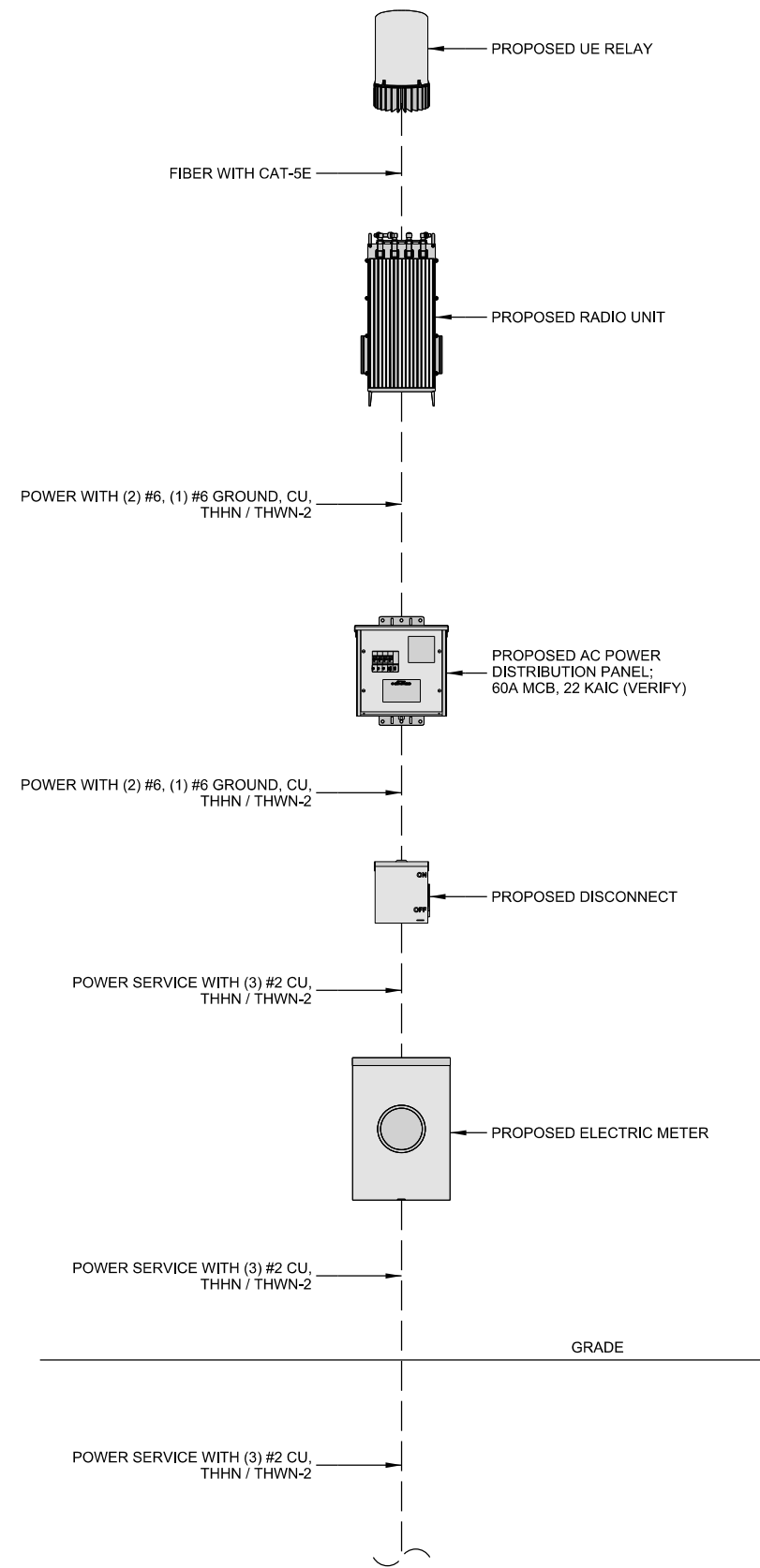
**GROUNDING DETAILS**  
 SITE NAME: FREDRIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

SHEET TITLE:

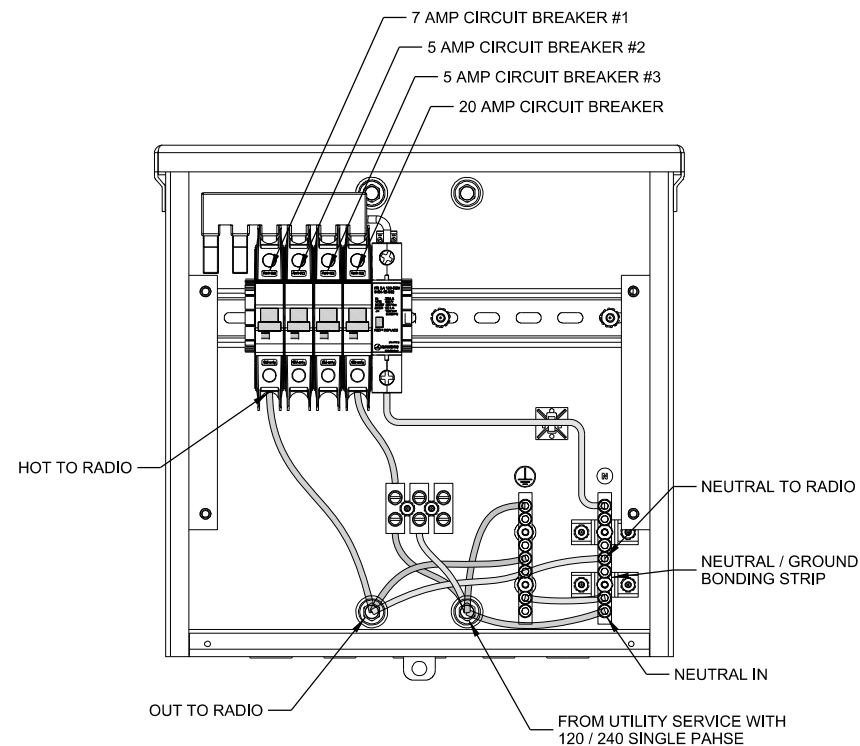
INT.	DATE	DESCRIPTION:
NAT	08/28/18	REV. A
RJK	09/12/18	REV. 0
NAT	10/17/18	REV. 1
MJM	03/08/19	REV. 2
MJM	04/15/19	PERMIT SUBMITTAL
MJM	04/22/19	PERMIT SUBMITTAL
MJM	05/06/19	PERMIT SUBMITTAL

CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>E-501</b>

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**A ONE-LINE DIAGRAM**



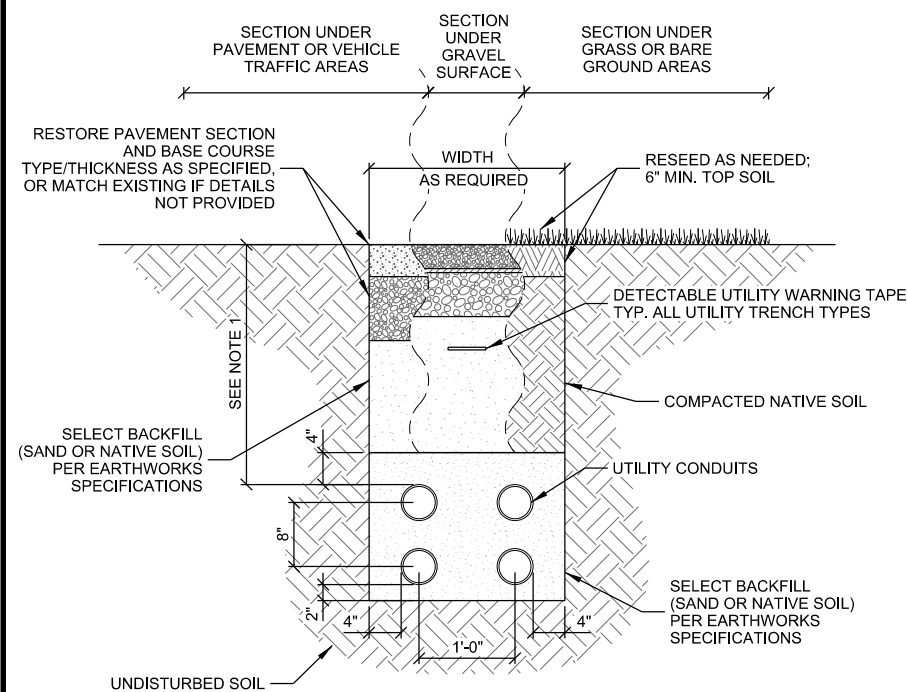
NOTE:  
1. NEUTRAL GROUND REQUIRED TO UTILITY SERVICE.

**B BREAKER SCHEDULE**

UNIT	AIRSPAN AH4400	AIRSPAN IR460	TOTAL
SUB DESCRIPTION	LTE BASE STATION	UE RELAY	N/A
MAX POWER (W)	504	N/A	540
MAX CURRENT (A)	4.50	N/A	4.50
KVA	0.54	N/A	0.54
kWh/Yr	4730.4	N/A	4730.4

NOTES:  
1. NOMINAL POWER IS CALCULATED AS 80% OF O.E.M. DOCUMENTED MAXIMUM POWER.  
2. KVA IS CALCULATED FROM THE CONSUMPTION VALUE ASSUMING A PF=1. MAXIMUM POWER WAS USED FOR KVA. WHERE MAXIMUM WAS NOTED BY THE O.E.M. THE QUOTED FIGURE WAS USED. WHERE AVERAGE/NOMINAL POWER WAS NOTED BY THE O.E.M. MAXIMUM POWER WAS CALCULATED BY INCREASING AVERAGE/NOMINAL POWER BY A FACTOR OF 50%.

**C LOAD CALCULATIONS**



NOTES:  
1. UTILITY CONDUITS TO BE BURIED A MINIMUM DEPTH OF 42" BELOW GROUND LEVEL OR 6" BELOW THE FROST LINE.

**D UTILITY TRENCH**

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LIS. NO. 55185 DATE: 5/6/2019

UTILITY DETAILS  
SITE NAME: FREDDIES  
CASCADE ID: MS90XSL69-M  
MAPLE GROVE, MINNESOTA

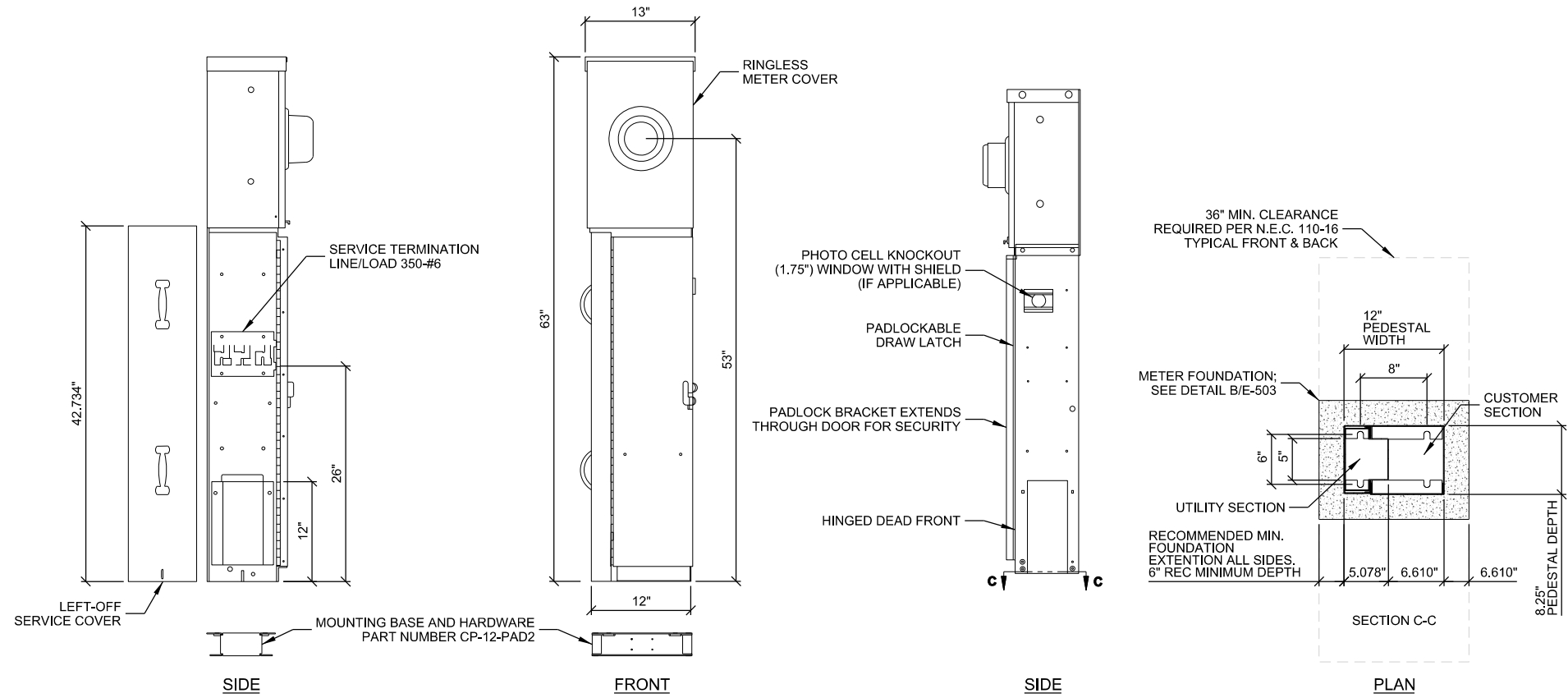
SHEET TITLE:

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RJK	09/12/18	REV. 0
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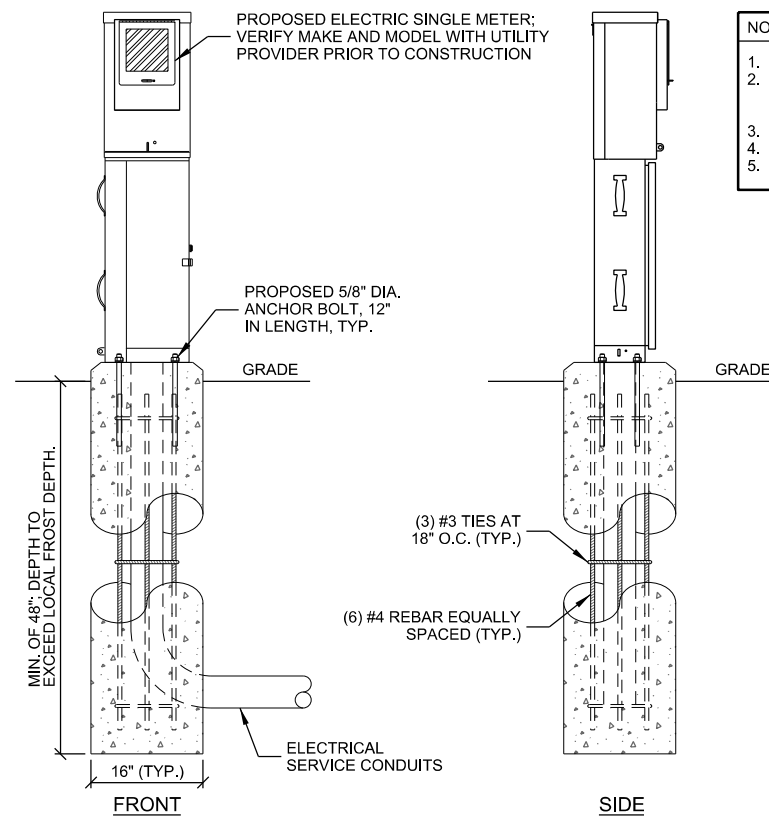
CHECKED BY	MRM
PLOT DATE	5/6/2019
PROJECT NUMBER	17270
SET TYPE	FINAL CDs
SHEET NUMBER	<b>E-502</b>

**MI BANK U4801-XI-5T9 ELECTRIC METER**

TYPE: RINGLESS METER SOCKET  
 APPLICATION: METER SOCKET  
 STANDARD: UL LISTED  
 VOLTAGE RATING: 600 VOLTS ALTERNATING CURRENT  
 AMPERAGE RATING: 200 CONTINUOUS AMPRE  
 PHASE: 1 PHASE  
 FREQUENCY RATING: 60 HERTZ  
 NUMBER OF CUT OUTS: 0  
 CABLE ENTRY: OVERHEAD AND UNDERGROUND  
 TERMINAL LAY IN LINE SIDE AND LAY IN LOAD SIDE  
 MOUNTING: SURFACE MOUNT  
 ENCLOSURE: TYPE 3R, G90 GALVANIZED STEEL WITH POWDER COAT FINISH



**A ELECTRIC METER**



- NOTES:
1. CONTRACTOR TO INSTALL PVC CONDUITS FOR SERVICE LATERAL CONNECTION TO UTILITY. CONTRACTOR TO EXTEND CONDUITS UNDERGROUND TO TRANSFORMER. CAP ENDS (NO DUCT TAPE ALLOWED) AND STAKE, EQUIP WITH PULL CORD, VERIFY REQUIREMENTS W/UTILITY PROVIDER.
  2. CONCRETE FOR FOUNDATION TO BE A MINIMUM OF 4,000 PSI AT 28 DAYS.
  3. MAINTAIN 3" MINIMUM REBAR COVER IN ALL DIRECTIONS.
  4. PIER FOUNDATION DEPTH TO BE A MINIMUM OF 48"; DEPTH TO EXCEED LOCAL FROST DEPTH.

**B ELECTRIC METER FOUNDATION**

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METER UTILITY DETAILS  
 SITE NAME: FREDRIES  
 CASCADE ID: MS90XSL69-M  
 MAPLE GROVE, MINNESOTA

SHEET TITLE:

SUBMITTAL:		
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PLOT DATE:	5/6/2019
PROJECT NUMBER:	17270
SET TYPE:	FINAL CDs
SHEET NUMBER:	<b>E-503</b>

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