



**SITE NAME:** DUL MILLER HILL MALL SC

**SITE NUMBER:** 20181847133

**LOCATION CODE:** 504067

**SITE TYPE:** SMALL CELL

**INSTALLATION TYPE:** REPLACEMENT WOOD UTILITY POLE



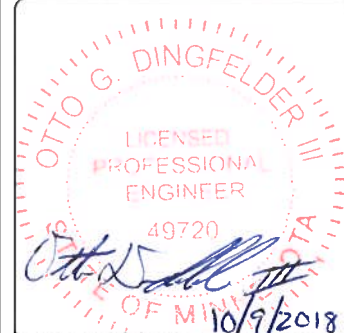
Jacobs Engineering Group, Inc  
2727 Patton Road  
Roseville, Minnesota 55113  
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2101 Highway 13 W  
Burnsville, MN 55337  
608.644.1449 voice  
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www.edgeconsult.com

PROJECT NO: 20181847133  
LOCATION CODE: 504067  
EDGE PROJECT NO: 20095  
CHECKED BY: OGD

REV.	DATE	DESCRIPTION	INT.
A	08/09/2018	PRELIM SMALL CELL DWGS	MWH
B	08/28/2018	PRELIM SMALL CELL DWGS	MWH
D	10/08/2018	FINAL SMALL CELL DWGS	JMK



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.

DUL MILLER HILL MALL SC  
DULUTH, MN  
REPLACEMENT WOOD UTILITY POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
**TITLE SHEET & PROJECT DATA**

SHEET NUMBER  
**G-001**

SITE INFORMATION	REPLACEMENT POLE	PROJECT DESCRIPTION/SOW	SHEET INDEX																																																																								
<p><b>APPROXIMATE ADDRESS:</b> 3800 TRINITY RD DULUTH, MN 55806 ST. LOUIS COUNTY</p> <p><b>SITE COORDINATES:</b> LAT: 46°-48'-07.89" N LONG: 92°-09'-15.51" W GROUND ELEVATION: 1329.2' AMSL (PER 1A CERTIFICATE)</p>		<table border="1"> <thead> <tr> <th>WORK PRODUCT</th> <th>INSTALLED BY</th> <th>NO:</th> <th>SHEET TITLE</th> </tr> </thead> <tbody> <tr> <td>REPLACEMENT WOOD UTILITY POLE</td> <td>MN POWER</td> <td>G-001</td> <td>TITLE SHEET &amp; PROJECT DATA</td> </tr> <tr> <td>OVERHEAD ELECTRICAL SERVICE WIRE BETWEEN REPLACEMENT POLE AND POWER SOURCE</td> <td>MN POWER</td> <td>G-002</td> <td>GENERAL SPECIFICATIONS</td> </tr> <tr> <td>FIBER CONDUIT, BETWEEN HAND HOLE AND POLE BASE, TO BE TRENCHED/DIRECTIONALLY BORED BELOW GRADE</td> <td>FIBER PROVIDER</td> <td>G-003</td> <td>GENERAL SPECIFICATIONS</td> </tr> <tr> <td>FIBER CONDUIT, WITHIN RIGHT OF WAY, TO BE TRENCHED/DIRECTIONALLY BORED BELOW GRADE</td> <td>FIBER PROVIDER</td> <td>C-101</td> <td>SITE PLAN</td> </tr> <tr> <td>FIBER HAND HOLE AT POLE BASE</td> <td>FIBER PROVIDER</td> <td>T-201</td> <td>SITE ELEVATION</td> </tr> <tr> <td>DIPLEXERS</td> <td>VERIZON</td> <td>T-501</td> <td>ANTENNA DETAILS</td> </tr> <tr> <td>LOAD CENTER/DISCONNECT</td> <td>VERIZON</td> <td>T-502</td> <td>EQUIPMENT DETAILS</td> </tr> <tr> <td>ELECTRICAL METER</td> <td>VERIZON</td> <td>E-101</td> <td>UTILITY PLAN</td> </tr> <tr> <td>ERICSSON RRUS AND POWER CONVERTERS</td> <td>VERIZON</td> <td>E-102</td> <td>GROUNDING PLAN</td> </tr> <tr> <td>PANEL ANTENNA</td> <td>VERIZON</td> <td>E-501</td> <td>UTILITY DETAILS</td> </tr> <tr> <td></td> <td></td> <td>E-502</td> <td>GROUNDING DETAILS</td> </tr> </tbody> </table>	WORK PRODUCT	INSTALLED BY	NO:	SHEET TITLE	REPLACEMENT WOOD UTILITY POLE	MN POWER	G-001	TITLE SHEET & PROJECT DATA	OVERHEAD ELECTRICAL SERVICE WIRE BETWEEN REPLACEMENT POLE AND POWER SOURCE	MN POWER	G-002	GENERAL SPECIFICATIONS	FIBER CONDUIT, BETWEEN HAND HOLE AND POLE BASE, TO BE TRENCHED/DIRECTIONALLY BORED BELOW GRADE	FIBER PROVIDER	G-003	GENERAL SPECIFICATIONS	FIBER CONDUIT, WITHIN RIGHT OF WAY, TO BE TRENCHED/DIRECTIONALLY BORED BELOW GRADE	FIBER PROVIDER	C-101	SITE PLAN	FIBER HAND HOLE AT POLE BASE	FIBER PROVIDER	T-201	SITE ELEVATION	DIPLEXERS	VERIZON	T-501	ANTENNA DETAILS	LOAD CENTER/DISCONNECT	VERIZON	T-502	EQUIPMENT DETAILS	ELECTRICAL METER	VERIZON	E-101	UTILITY PLAN	ERICSSON RRUS AND POWER CONVERTERS	VERIZON	E-102	GROUNDING PLAN	PANEL ANTENNA	VERIZON	E-501	UTILITY DETAILS			E-502	GROUNDING DETAILS	<table border="1"> <thead> <tr> <th>NO:</th> <th>SHEET TITLE</th> </tr> </thead> <tbody> <tr><td>G-001</td><td>TITLE SHEET &amp; PROJECT DATA</td></tr> <tr><td>G-002</td><td>GENERAL SPECIFICATIONS</td></tr> <tr><td>G-003</td><td>GENERAL SPECIFICATIONS</td></tr> <tr><td>C-101</td><td>SITE PLAN</td></tr> <tr><td>T-201</td><td>SITE ELEVATION</td></tr> <tr><td>T-501</td><td>ANTENNA DETAILS</td></tr> <tr><td>T-502</td><td>EQUIPMENT DETAILS</td></tr> <tr><td>E-101</td><td>UTILITY PLAN</td></tr> <tr><td>E-102</td><td>GROUNDING PLAN</td></tr> <tr><td>E-501</td><td>UTILITY DETAILS</td></tr> <tr><td>E-502</td><td>GROUNDING DETAILS</td></tr> </tbody> </table>	NO:	SHEET TITLE	G-001	TITLE SHEET & PROJECT DATA	G-002	GENERAL SPECIFICATIONS	G-003	GENERAL SPECIFICATIONS	C-101	SITE PLAN	T-201	SITE ELEVATION	T-501	ANTENNA DETAILS	T-502	EQUIPMENT DETAILS	E-101	UTILITY PLAN	E-102	GROUNDING PLAN	E-501	UTILITY DETAILS	E-502	GROUNDING DETAILS
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<p><b>APPLICABLE CODES</b></p> <p>ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES: - 2012 INTERNATIONAL BUILDING CODE - 2014 NATIONAL ELECTRIC CODE - TIA/EIA-222-G OR LATEST EDITION</p> <p>IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL</p>	<p><b>LOCATION MAP</b></p>	<p><b>PROJECT DIRECTORY</b></p> <p><b>LESSEE:</b> VERIZON WIRELESS 10801 BUSH LAKE RD BLOOMINGTON, MN 55438 CONTACT: AMANDA TURNER PHONE: 952.946.4706</p> <p><b>LESSOR:</b> MN POWER 30 W SUPERIOR ST DULUTH, MN 55802 CONTACT: JAKE PATTON PHONE: 218.256.3763</p> <p><b>ENGINEERING COMPANY:</b> EDGE CONSULTING ENGINEERS, INC. 2101 HIGHWAY 13 W BURNSVILLE, MN 55337 CONTACT: OTTO DINGFELDER III PHONE: 608.644.1449</p> <p><b>RF ENGINEER:</b> VERIZON WIRELESS 10801 BUSH LAKE RD BLOOMINGTON, MN 55438 CONTACT: MICHAEL KOCH</p> <p><b>SITE ACQUISITION:</b> JACOBS ENGINEERING GROUP, INC. 2727 PATTON ROAD ROSEVILLE, MN 55113 CONTACT: AMY DRESCH PHONE: 952.831.1043</p>	<p><b>11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED</b></p> <p>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.</p> <p><b>ENGINEER OF RECORD</b></p> <p>EDGE CONSULTING ENGINEERS, INC. CONTACT: OTTO DINGFELDER III (PE # 49720 (MN)) PHONE: 608.644.1449</p> <p><b>STRUCTURAL REVIEW</b></p> <p>STRUCTURAL ANALYSIS COMPLETED BY OTHERS.</p> <p>CONTRACTOR TO REVIEW STRUCTURAL REPORT IN ITS ENTIRETY. ANY DISCREPANCIES OR DISAGREEMENTS BETWEEN THE REPORT AND THESE PLANS SHOULD BE RESOLVED PRIOR TO CONSTRUCTION.</p>																																																																								
<p><b>LOCATION SCAN</b></p>																																																																											

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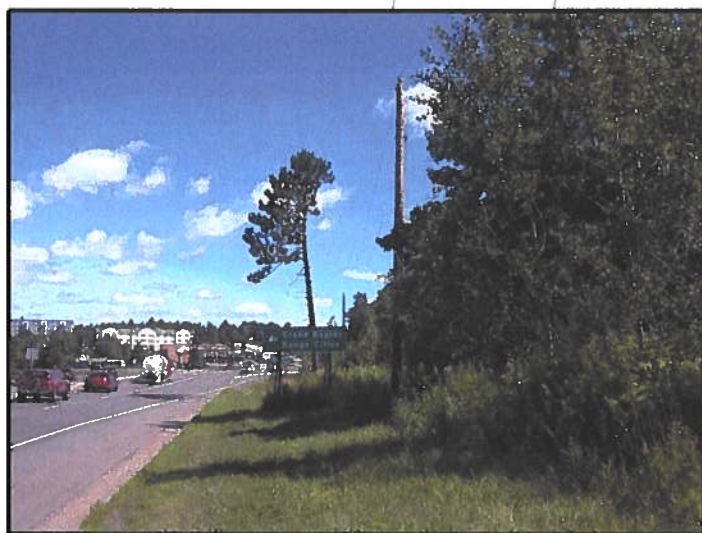
A

**AERIAL OVERVIEW**



B

**SITE OVERVIEW**

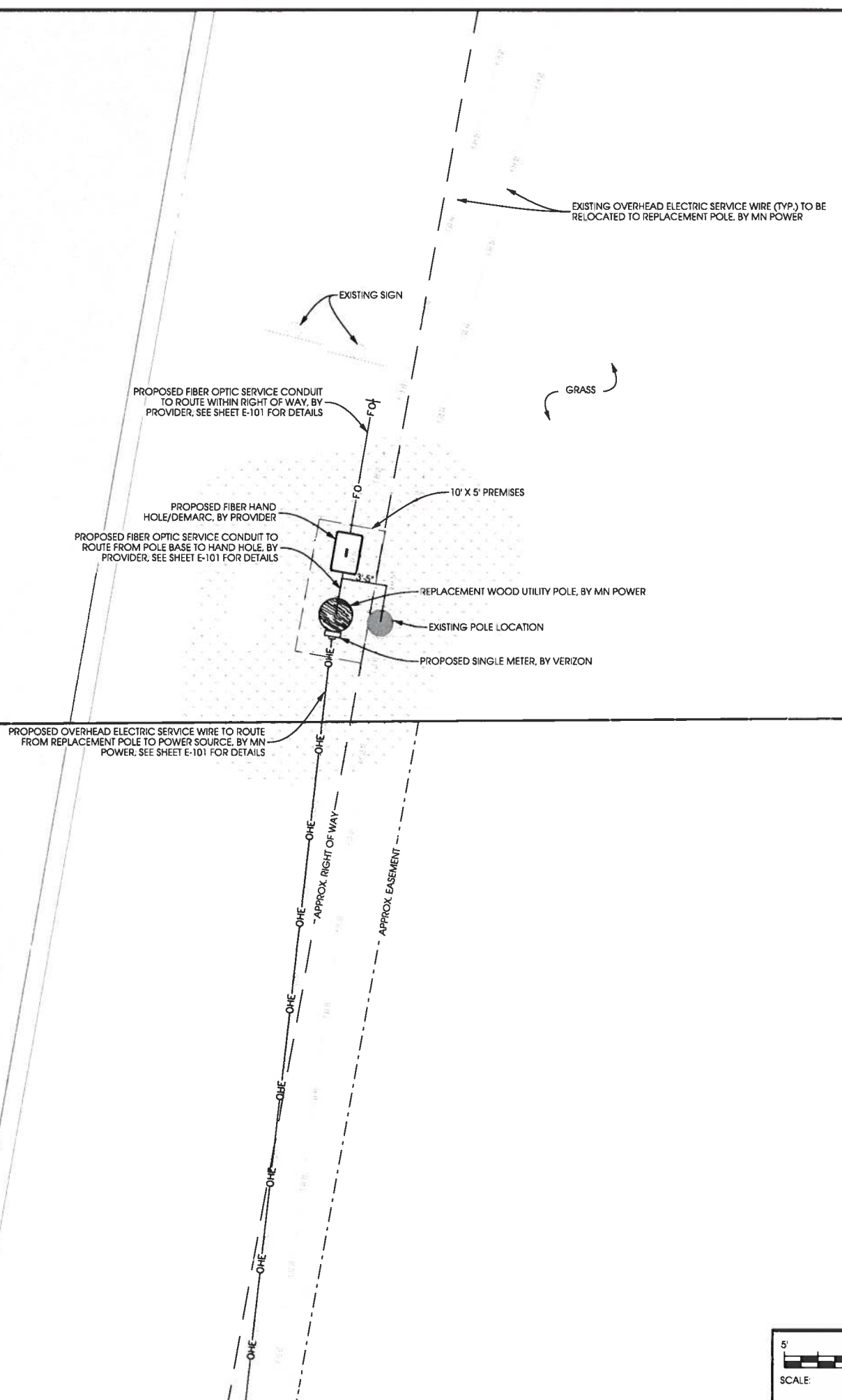


C

**SITE OVERVIEW**

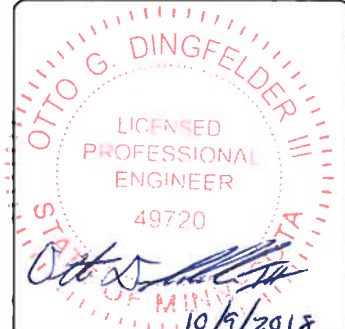
**POWER AND FIBER ROUTING NOTE:**  
 THE PROPOSED POWER AND FIBER ROUTES ARE PRELIMINARY, AND WILL BE CONFIRMED WITH THE LANDLORD AND FIBER PROVIDER PRIOR TO CONSTRUCTION. IF THE GENERAL CONTRACTOR NOTICES ANY DISCREPANCIES BETWEEN THESE PLANS AND THE ACTUAL SOURCES OF POWER AND FIBER, THE VERIZON CONSTRUCTION ENGINEER AND PROJECT ENGINEER ARE TO BE NOTIFIED PRIOR TO COMMENCING WORK.

**TRINITY RD/US HWY 53**



PROJECT NO:	20181847133
LOCATION CODE:	504067
EDGE PROJECT NO:	20095
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	08/09/2018	PRELIM SMALL CELL DWGS	MWH
B	08/28/2018	PRELIM SMALL CELL DWGS	MWH
0	10/08/2018	FINAL SMALL CELL DWGS	JMK

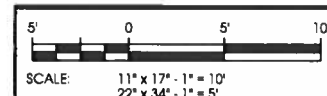


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DUL MILLER HILL MALL SC  
 DULUTH, MN  
 REPLACEMENT WOOD UTILITY POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**SITE PLAN**

SHEET NUMBER  
**C-101**



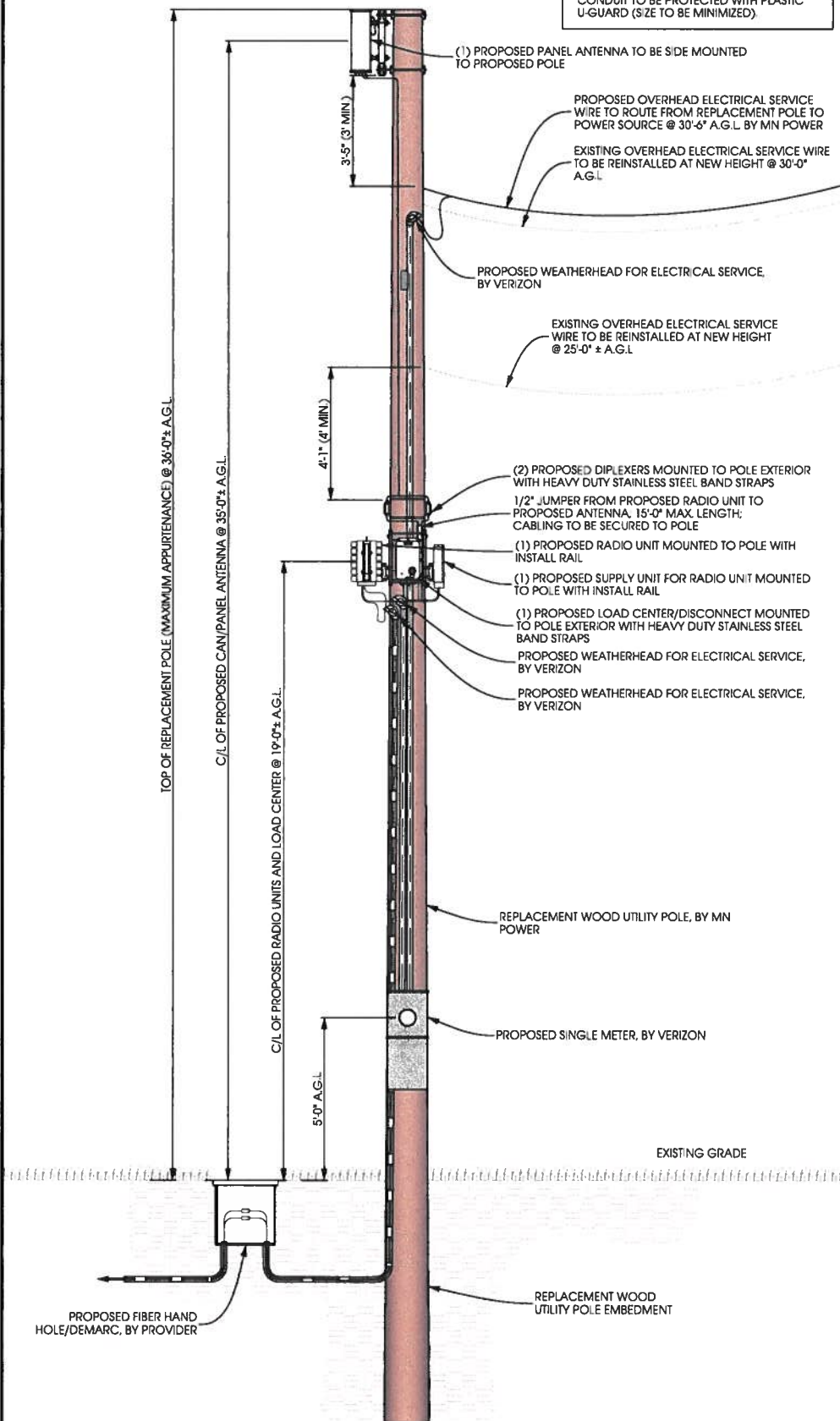
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EXISTING POLE	
POLE HEIGHT:	33'-5" A.G.L.
MAXIMUM APPURTENANCE HEIGHT:	34'-2" A.G.L.

PROPOSED POLE	
POLE HEIGHT:	36'-0" A.G.L.
ANTENNA TIP HEIGHT:	36'-0" A.G.L.
MAXIMUM APPURTENANCE HEIGHT:	36'-0" A.G.L.

**NOTES:**  
 PROPOSED POWER AND FIBER RISE CONDUITS TO BE GROUPED TOGETHER TO MAXIMIZE AVAILABLE FREE SPACE ON POLE.  
 PROPOSED POWER AND FIBER RISE CONDUIT SIZES TO BE MINIMIZED WHERE POSSIBLE.  
 ALL PROPOSED JUMPER CABLES NOT IN CONDUIT TO BE PROTECTED WITH PLASTIC U-GUARD (SIZE TO BE MINIMIZED).



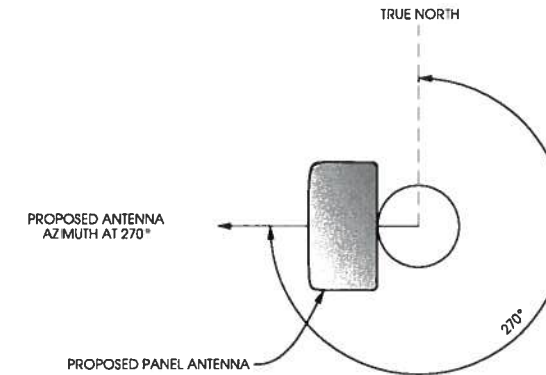
**A POLE ELEVATION**  
 SCALE: 11" x 17" - 1" = 5'-0"  
 22" x 34" - 1" = 2'-6"



**B SITE ELEVATION**



**NOTES:**  
 VERIZON TO PROVIDE FINAL RF CONFIGURATION



**C ANTENNA ORIENTATION**  
 SCALE: NTS

ANTENNAS					
QUANTITY	MAKE	MODEL	CENTERLINE	TIP HEIGHT	AZIMUTH
1	ANDREW	HBXX-6513DS-A2M	35'-0" AGL	36'-0" AGL	270°

EQUIPMENT			
QUANTITY	TYPE	MAKE	MODEL
1	RRU	ERICSSON	RRUS8843
1	PSU	ERICSSON	PSU 6302
2	DIPLEXER	COMMSCOPE	CBC1293T-4310

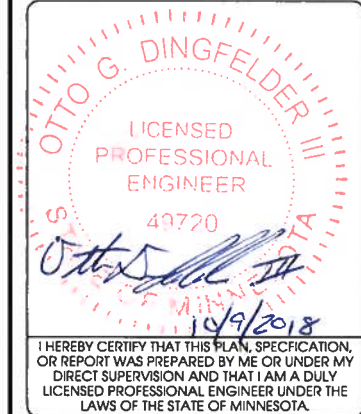
CABLING			
QUANTITY	TYPE	MAKE	MODEL
12	COAX	COMMSCOPE	F4-HMDM-1M-D

**D ANTENNA AND CABLING**  
 SCALE: NTS



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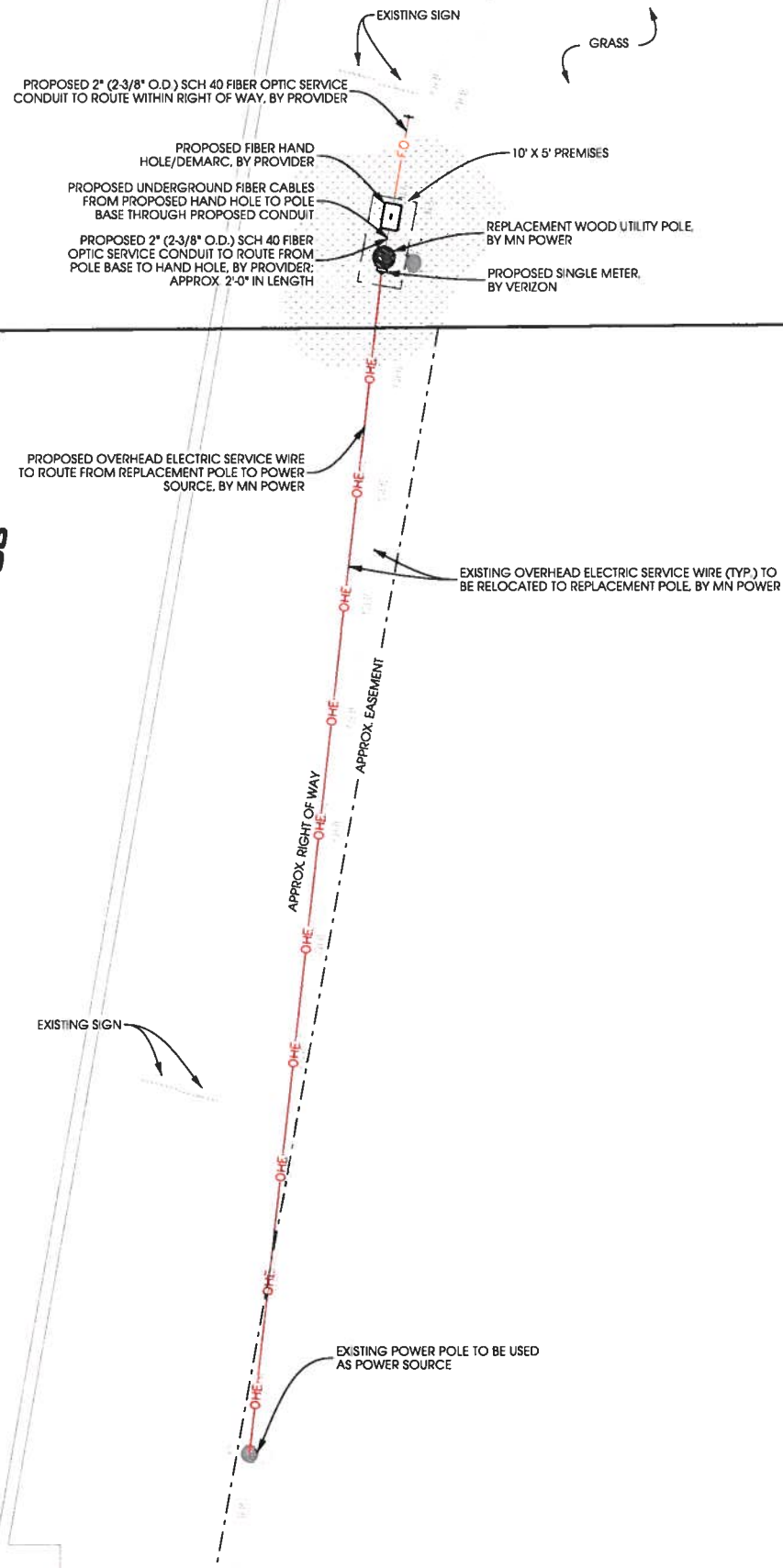


DUL MILLER HILL MALL SC  
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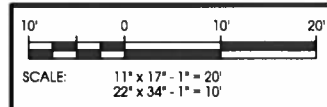
SHEET TITLE  
**SITE ELEVATION**

SHEET NUMBER  
**T-201**

**POWER AND FIBER ROUTING NOTE:**  
 THE PROPOSED POWER AND FIBER ROUTES ARE PRELIMINARY, AND WILL BE CONFIRMED WITH THE LANDLORD AND FIBER PROVIDER PRIOR TO CONSTRUCTION. IF THE GENERAL CONTRACTOR NOTICES ANY DISCREPANCIES BETWEEN THESE PLANS AND THE ACTUAL SOURCES OF POWER AND FIBER, THE VERIZON CONSTRUCTION ENGINEER AND PROJECT ENGINEER ARE TO BE NOTIFIED PRIOR TO COMMENCING WORK.



**A UTILITY PLAN**



1. SUBMITTAL OF BID INDICATES CONTRACTOR IS AWARE OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
2. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINE 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. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J-BOX, SWITCH BOX, ETC. IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
6. CONTRACTOR SHALL PROVIDE 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.
7. 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 AND APPROVED BY THE UNDERWRITER'S LABORATORY AND SHALL BEAR THE INSPECTION LABEL 'U' 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 ANS, NEMA, AND NBFU.
8. CONTRACTOR SHALL CARRY OUT HIS WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND O.S.H.A.
9. CONTRACTOR SHALL SECURE ALL NECESSARY BUILDING PERMITS.
10. 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.
11. ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE.
12. PROVIDE CONSTRUCTION ENGINEER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
13. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
14. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR.
15. ALL CONDUCTORS SHALL BE COPPER.
16. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
17. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES AND DRAWINGS.
18. RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT A.C., WHITE AS REQUIRED BY THE ARCHITECT OR APPROVED EQUAL.
19. WALL SWITCHES SHALL BE SINGLE-POLE, HUBBELL #1201 OR EQUIVALENT, WHITE AS REQUIRED BY THE ARCHITECT.
20. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE RACO #800, 1/2" RAISED WORK COVERS.
21. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM, NO BX OR ROMEX CABLE IS PERMITTED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
22. GROUND RODS SHALL BE AS SPECIFIED ON THE GROUNDING DRAWINGS.
23. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS. MANUFACTURED BY SQUARE D COMPANY OR APPROVED EQUAL. IF HOST FACILITY REQUIRES THE NEW SERVICE TO BE SUB-METERED FROM THE EXISTING SERVICE, SUB-METER SHALL BE OF THE 10x OR 16x TYPE.
24. ALL MATERIALS SHALL BE U.L. LISTED.
25. CONDUIT:
  - A. SERVICE CONDUITS SHALL BE GRAY SCH 40 PVC BURIED MIN. 36", EXCEPT THAT SCH 80 SHALL BE USED UNDER ROADWAYS AND IN LOCATIONS SUBJECT TO CASUAL IMPACTS. BENDS SHALL BE MADE USING "WIDE SWEEP" (12" MIN. RADIUS) ELBOW FITTINGS. ANY CODE-REQUIRED RIGID STEEL CONDUIT SHALL BE U.L. LABEL GALVANIZED INSIDE AND OUTSIDE. CONDUIT SHALL EXTEND MIN. 36" BELOW GRADE, WITH "SWEEP" ELBOWS (12" R. MIN.) ENDING IN PVC TRANSITION FITTINGS. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAP-WRAPPED WITH HUNTS PROCESS NO. 3 EXTENDING MIN. 12" ABOVE GRADE.
  - B. INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING HAVING U.L. LABEL, FITTINGS SHALL BE GLAND RING COMPRESSION TYPE.
  - 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. NO SUCH CONDUIT SHALL EXCEED SIX FEET IN LENGTH.
26. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
27. PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
28. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH SECTION 712, PENETRATIONS - INTERNATIONAL BUILDING CODE (IBC)
29. DRILLING OR CORING HOLES IN CONCRETE WALLS OR DECKS, WHETHER FOR FASTENING OR ANCHORING PURPOSES, REQUIRES THAT TENDONS OR REINFORCING STEEL MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT (X-RAY OR OTHER DEVICE) THAT CAN ACCURATELY LOCATE THEM. TENDONS OR REINFORCING MUST NOT BE DRILLED, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES.
30. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO CONSTRUCTION ENGINEER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
31. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF BOTH TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
32. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY TOWER LIGHTING SYSTEM DESCRIBED IN THE RFG.

**GENERAL ELECTRICAL NOTES**



**JACOBS**  
 Jacobs Engineering Group, Inc.  
 2727 Patton Road  
 Roseville, Minnesota 55113  
 www.jacobs.com

**Edge**  
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 2101 Highway 13 W  
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OTTO G. DINGFELDER III  
 LICENSED PROFESSIONAL ENGINEER  
 49720  
 10/9/2018  
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 REPLACEMENT WOOD UTILITY POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**UTILITY PLAN**

SHEET NUMBER  
**E-101**