CASE FILE #PL201700223

verizon

SITE NAME: MIN LR 28TH AVE SC1

SITE NUMBER: 20161462527

LOCATION CODE: 425930

SITE TYPE: SMALL CELL

INSTALLATION TYPE: REPLACEMENT 30' LIGHT POLE

SITE INFORMATION

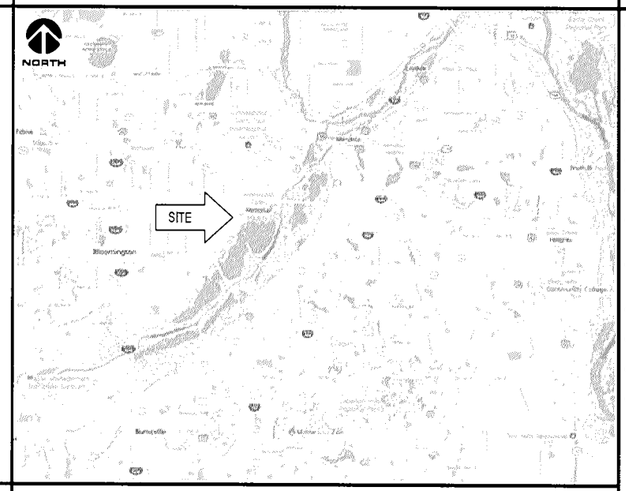
APPROXIMATE ADDRESS:
28TH AVENUE SOUTH AND
EAST 82ND STREET
BLOOMINGTON, MINNESOTA 55425
HENNEPIN COUNTY

SITE COORDINATES:
LAT: 44°-51'-18.75"N
LONG: 93°-13'-54.27"W
GROUND ELEVATION: 813.0' AMSL
(PER 1A CERTIFICATE)

POLE HEIGHT:
30'-0" T.O.C.

MAXIMUM APPURTENANCE HEIGHT:
32'-0" A.G.L.

AREA MAP



PROJECT DESCRIPTION/SOW

- INSTALL (1) REPLACEMENT 30-FT STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF (2) PANEL ANTENNAS
- INSTALLATION OF ERICSSON RRU'S AND POWER CONVERTERS
- INSTALLATION OF (1) LOAD CENTER
- INSTALLATION OF (4) HYBRID COUPLERS
- INSTALLATION OF HAND HOLE FOR FIBER AT POLE BASE BY PROVIDER
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND POLE BASE BELOW GRADE BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND ROW BELOW GRADE BY PROVIDER
- INSTALLATION OF GROUND RODS AROUND POLE FOUNDATION
- INSTALLATION OF CONDUIT FOR NEW ELECTRIC SERVICES BY VERIZON
- INSTALLATION OF PROPOSED ELECTRICAL METER BY VERIZON
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS

SHEET INDEX

NO:	SHEET TITLE
G-001	TITLE SHEET & PROJECT DATA
G-002	GENERAL SPECIFICATIONS
G-003	GENERAL SPECIFICATIONS
G-004	METRO TRANSIT SITE REQUIREMENTS*
G-005	METRO TRANSIT SITE REQUIREMENTS*
C-101	SITE PLAN
C-102	ENLARGED SITE PLAN
T-201	SITE ELEVATION
T-501	ANTENNA DETAILS
T-502	EQUIPMENT DETAILS
S-001	STRUCTURAL NOTES **
S-501	STRUCTURAL DETAILS **
E-101	UTILITY PLAN
E-102	GROUNDING PLAN
E-601	UTILITY DETAILS
E-602	UTILITY DETAILS
E-603	GROUNDING DETAILS

* COMPLETED BY OTHERS
** REVIEWED AND APPROVED BY STRUCTURAL ENGINEER

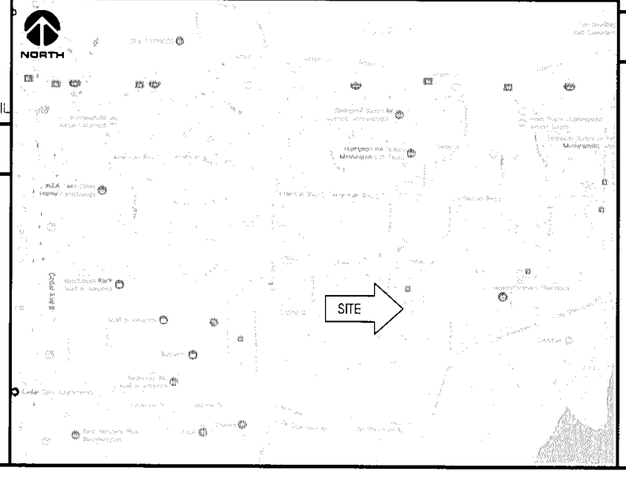
APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

- 2012 INTERNATIONAL BUILDING CODE
- 2014 NATIONAL ELECTRIC CODE
- TIA/EIA-222-G OR LATEST EDITION

IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL.

LOCATION MAP



LOCATION SCAN

PROJECT DIRECTORY

LESSEE:
VERIZON WIRELESS
10801 BUSH LAKE RD
BLOOMINGTON, MN 55438
CONTACT: COURTNEY BEDNARZ
PHONE: 952.946.4694

SITE ACQUISITION:
KE CONSULTING, LLC
3101 GRANDVIEW BLVD
MADISON, WI 53713
CONTACT: KIM A. EGAN
PHONE: 608.516.0233

LESSOR:
METRO TRANSIT
560 SIXTH AVENUE NORTH
MINNEAPOLIS, MN 55411
PHONE: 612.373.3333

RF ENGINEER:
VERIZON WIRELESS
10801 BUSH LAKE RD
BLOOMINGTON, MN 55438
CONTACT: JOHN MULLINS
PHONE: 612.791.1710

ENGINEERING COMPANY:
EDGE CONSULTING ENGINEERS, INC.
2101 HIGHWAY 13 W
BURNSVILLE, MN 55337
CONTACT: OTTO DINGFELDER III, P.E.
PHONE: 608.644.1449

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

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.

ENGINEER OF RECORD

EDGE CONSULTING ENGINEERS, INC.
CONTACT: OTTO DINGFELDER III (PE # 49720 (MN))
PHONE: 608.644.1449

STRUCTURAL REVIEW

COMPLETED BY:
EDGE CONSULTING ENGINEERS, INC.
PROJECT #: 14967
DATE: 09/19/2017

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

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

OTTO G. DINGFELDER III
LICENSED PROFESSIONAL ENGINEER
49720
STATE OF MINNESOTA
9/20/2017

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.

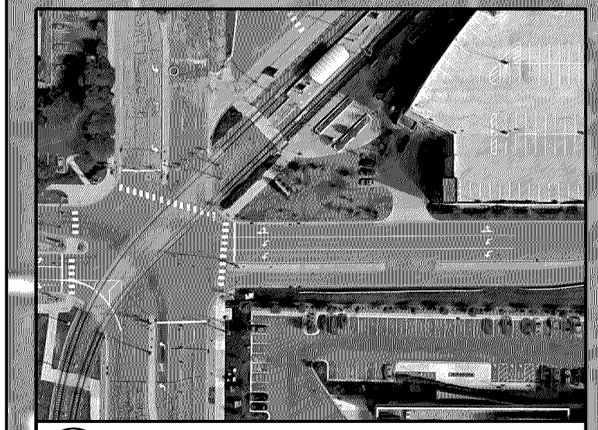
MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
TITLE SHEET & PROJECT DATA

SHEET NUMBER
G-001

L:\14900\14967\CAD\Plot\CON\G-001.dgn

CASE FILE #PL201700223



A **AERIAL OVERVIEW**

B **SITE OVERVIEW [LOOKING NORTHWEST]**

C **EXISTING POWER SOURCE**

NORTH

Mark the rest of the Utility line crossings on these plans (based upon field locates) to protect those lines from damage and to provide for an Engineer designed route meeting all the City code requirements.

Move pole west to provide code required 10' separation between outside edges of foundation and water pipe.

REPLACEMENT 30' LIGHT POLE

PROPOSED FIBER OPTIC SERVICE ROUTE TO FOLLOW RIGHT OF WAY BY PROVIDER. SEE SHEET E-101 FOR DETAILS

PROPOSED ELECTRICAL SERVICE ROUTE TO FOLLOW RIGHT OF WAY BY VERIZON. SEE SHEET E-101 FOR DETAILS

28TH AVE SOUTH

Not 28th Ave S

This FO route doesn't match Zayo Plan. Please correct whichever plan is wrong.

RIGHT OF WAY

RIGHT OF WAY

RIGHT OF WAY

No less than 5' Horizontal Separation from outside edge of watermain Per Code

EASEMENT

EASEMENT

EXISTING XCEL ENERGY SINGLE PHASE TRANSFORMER ON CONCRETE PLATFORM. PROPOSED ELECTRICAL SERVICE SOURCE

10' 0 10' 20'

SCALE: 11" x 17" - 1" = 20'
22" x 34" - 1" = 10'

L:\14960\14967\CAD\Plot\CDA\C-101.dgn

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

SITE PLAN

SHEET NUMBER

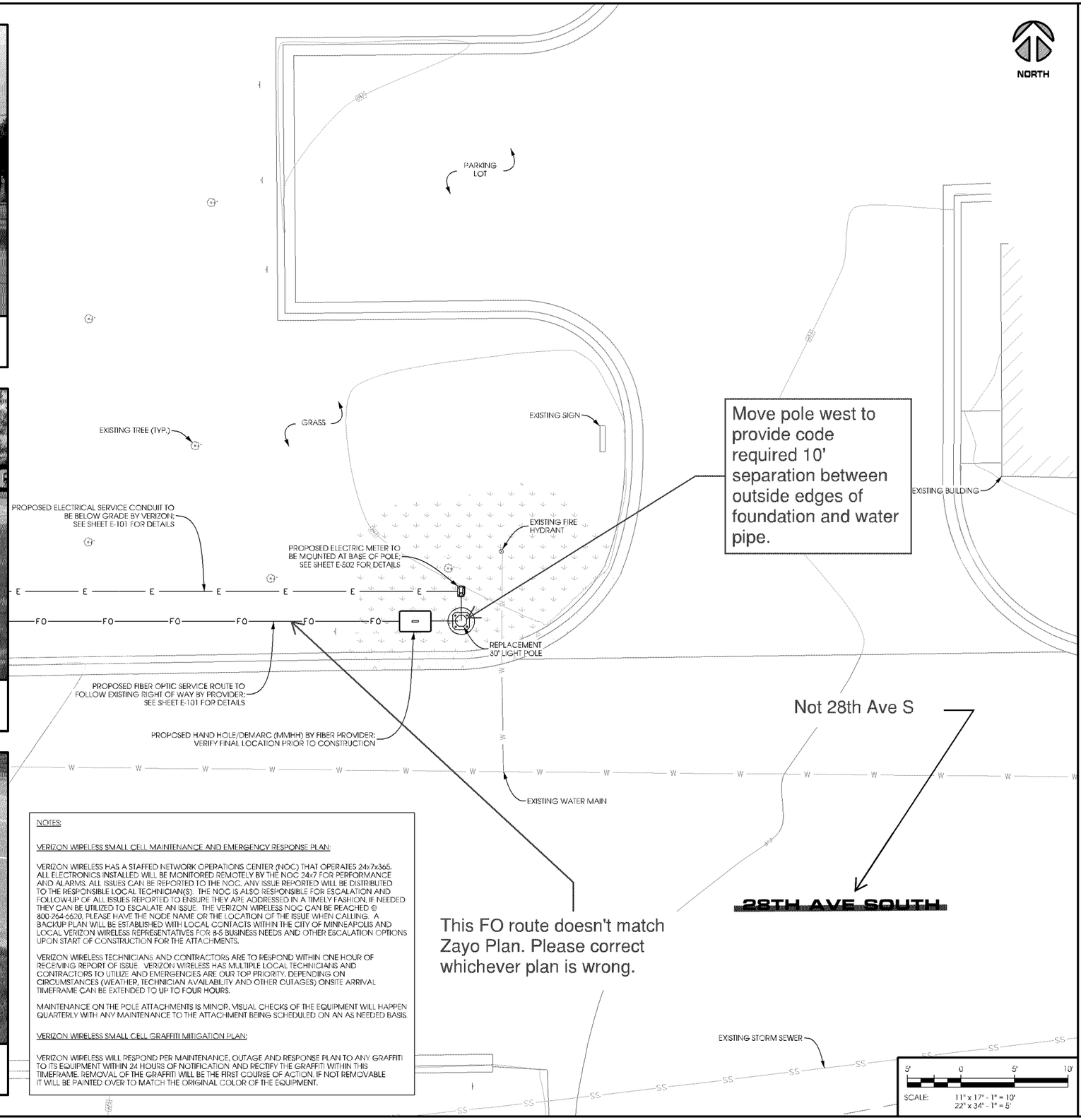
C-101

CASE FILE #PL201700223

A **SITE OVERVIEW [LOOKING NORTHWEST]**

B **SITE OVERVIEW [LOOKING SOUTHWEST]**

C **PROPOSED HAND HOLE LOCATION**



NOTES:

VERIZON WIRELESS SMALL CELL MAINTENANCE AND EMERGENCY RESPONSE PLAN:

VERIZON WIRELESS HAS A STAFFED NETWORK OPERATIONS CENTER (NOC) THAT OPERATES 24x7x365. ALL ELECTRONICS INSTALLED WILL BE MONITORED REMOTELY BY THE NOC 24x7 FOR PERFORMANCE AND ALARMS. ALL ISSUES CAN BE REPORTED TO THE NOC, ANY ISSUE REPORTED WILL BE DISTRIBUTED TO THE RESPONSIBLE LOCAL TECHNICIAN(S). THE NOC IS ALSO RESPONSIBLE FOR ESCALATION AND FOLLOW-UP OF ALL ISSUES REPORTED TO ENSURE THEY ARE ADDRESSED IN A TIMELY FASHION. IF NEEDED THEY CAN BE UTILIZED TO ESCALATE AN ISSUE. THE VERIZON WIRELESS NOC CAN BE REACHED @ 800-264-6620. PLEASE HAVE THE NODE NAME OR THE LOCATION OF THE ISSUE WHEN CALLING. A BACKUP PLAN WILL BE ESTABLISHED WITH LOCAL CONTACTS WITHIN THE CITY OF MINNEAPOLIS AND LOCAL VERIZON WIRELESS REPRESENTATIVES FOR 8-5 BUSINESS NEEDS AND OTHER ESCALATION OPTIONS UPON START OF CONSTRUCTION FOR THE ATTACHMENTS.

VERIZON WIRELESS TECHNICIANS AND CONTRACTORS ARE TO RESPOND WITHIN ONE HOUR OF RECEIVING REPORT OF ISSUE. VERIZON WIRELESS HAS MULTIPLE LOCAL TECHNICIANS AND CONTRACTORS TO UTILIZE AND EMERGENCIES ARE OUR TOP PRIORITY, DEPENDING ON CIRCUMSTANCES (WEATHER, TECHNICIAN AVAILABILITY AND OTHER OUTAGES) ONSITE ARRIVAL TIMEFRAME CAN BE EXTENDED TO UP TO FOUR HOURS.

MAINTENANCE ON THE POLE ATTACHMENTS IS MINOR, VISUAL CHECKS OF THE EQUIPMENT WILL HAPPEN QUARTERLY WITH ANY MAINTENANCE TO THE ATTACHMENT BEING SCHEDULED ON AN AS NEEDED BASIS.

VERIZON WIRELESS SMALL CELL GRAFFITI MITIGATION PLAN:

VERIZON WIRELESS WILL RESPOND PER MAINTENANCE, OUTAGE AND RESPONSE PLAN TO ANY GRAFFITI TO ITS EQUIPMENT WITHIN 24 HOURS OF NOTIFICATION AND RECTIFY THE GRAFFITI WITHIN THIS TIMEFRAME. REMOVAL OF THE GRAFFITI WILL BE THE FIRST COURSE OF ACTION. IF NOT REMOVABLE IT WILL BE PAINTED OVER TO MATCH THE ORIGINAL COLOR OF THE EQUIPMENT.

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
ENLARGED SITE PLAN

SHEET NUMBER
C-102

L:\14900\14967\CAD\PlotCDs\C-102.dgn

CASE FILE #PL201700223

NOTES:

30' SQUARE POLE DESIGN SHOWN. PROPOSED LIGHT POLE TO BE SUPPLIED BY AND PURCHASED BY VERIZON. THE LIGHT POLE TO BE SET BY VERIZON CONTRACTOR AND COORDINATED WITH METRO TRANSIT. PROPOSED POLE TO BE RETROFITTED WITH PROPOSED LIGHT POLE PENETRATION, AND INSTALLED BY CERTIFIED WELDER.

SALVAGE EXISTING POLE AND DELIVER TO METRO TRANSIT. LOCATION TO BE DETERMINED.

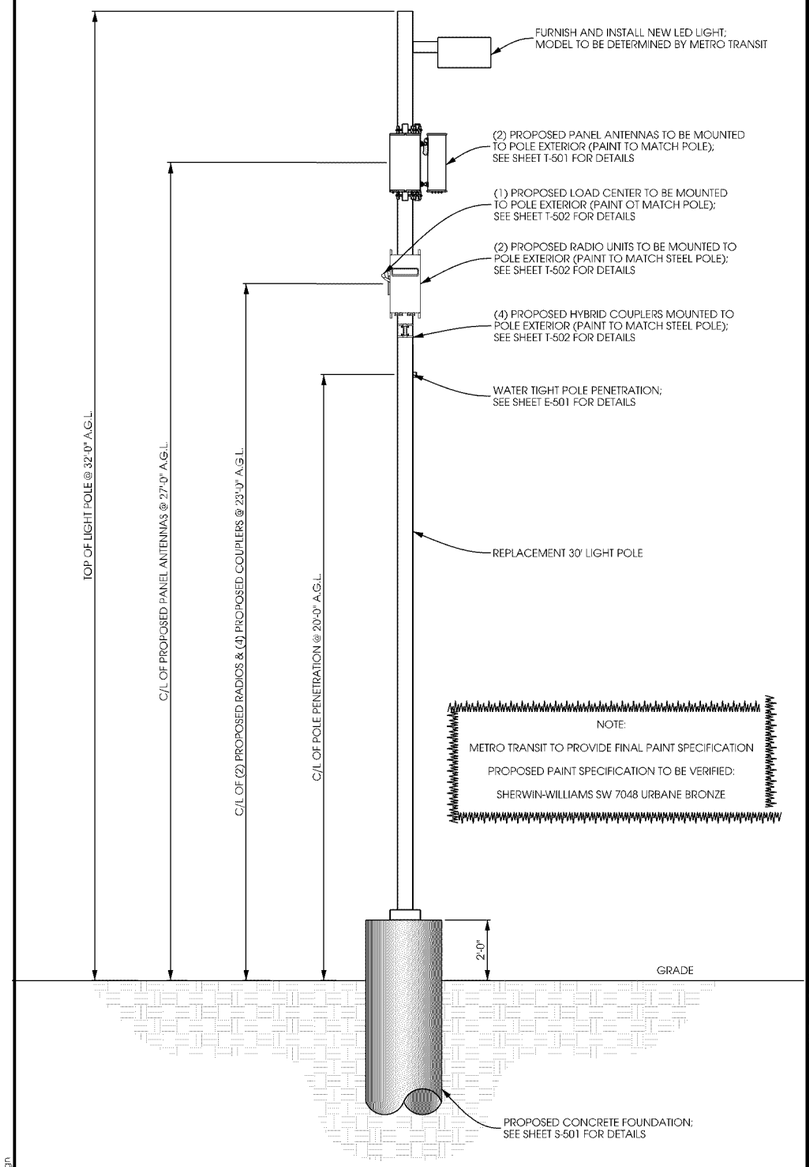
NOTES:

TYPICAL INSTALLATION SHOWN.

ALL PROPOSED POLE MOUNTED EQUIPMENT TO BE PAINTED TO MATCH POLE.

ALL POLE PENETRATIONS FOR ANTENNA AND RRU CABLE ROUTING TO BE MINIMIZED.

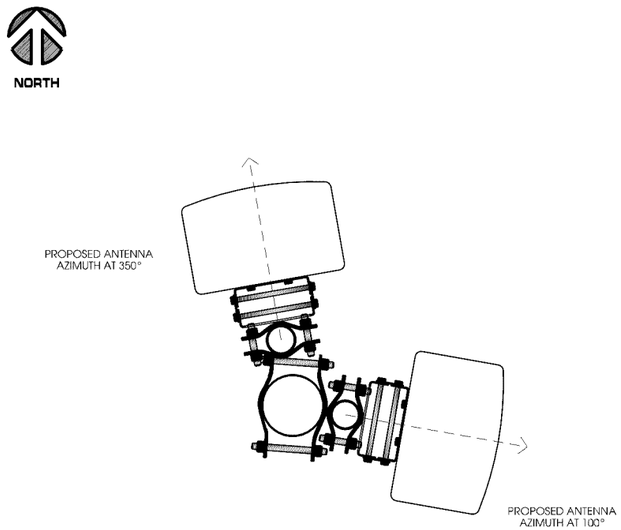
ALL PROPOSED ELEVATIONS ARE SHOWN ABOVE GROUND LEVEL.



A **POLE ELEVATION**

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

B **SITE ELEVATION**



C **ANTENNA ORIENTATION**

SCALE: NTS

ANTENNAS				
QUANTITY	MAKE	MODEL	CENTERLINE	AZIMUTH
1	COMMSCOPE	HBXX-6513DS-A2M	27'	100°
1	COMMSCOPE	HBXX-6513DS-A2M	27'	350°

EQUIPMENT			
QUANTITY	TYPE	MAKE	MODEL
1	RRU	ERICSSON	RRUS32 B66
1	RRU	ERICSSON	RRUS32 B2
4	COUPLER	CLEARLINK	HC3/698-2.7K/MS/4310

CABLING				
QUANTITY	TYPE	MAKE	MODEL	DIAMETER
16	JUMPER	COMMSCOPE	LFD4-50	1/2"

D **ANTENNA AND CABLING**

SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

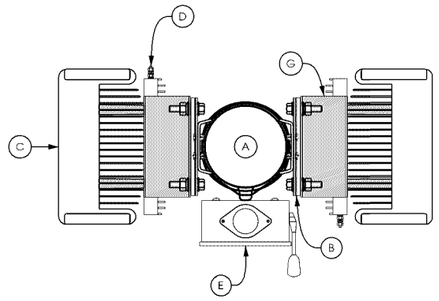
SITE ELEVATION

SHEET NUMBER

T-201

L:\14960\14967\CAD\Plot\CDRs\T-201.dgn

CASE FILE #PL201700223



TOP VIEW

NOTE:

PAINT ALL ANTENNAS, OUTDOOR EQUIPMENT, CABLING, AND MOUNTING HARDWARE TO MATCH THE POLE

KEYED NOTES:

A. UP TO 8" DIA. POLE

B. REMOTE RADIO UNIT MOUNT (TYP. OF 2); SEE DETAIL B THIS SHEET

C. REMOTE RADIO UNIT (TYP. OF 2); SEE DETAIL C THIS SHEET

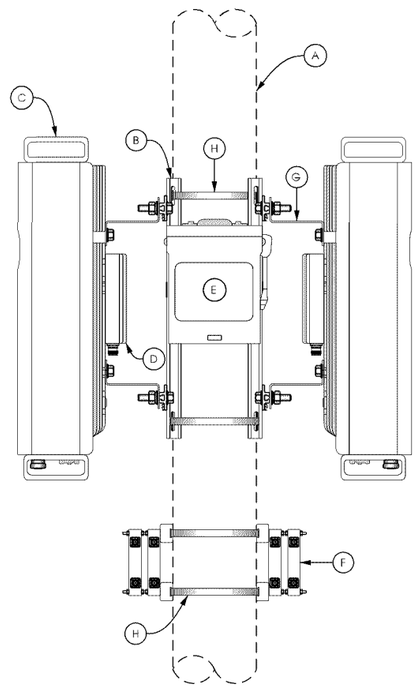
D. POWER SUPPLY UNIT SECURED TO BACK OF REMOTE RADIO UNIT (TYP. OF 2); SEE DETAIL D THIS SHEET

E. LOAD CENTER SECURED WITH HEAVY DUTY STAINLESS STEEL BAND STRAP; SEE DETAIL E THIS SHEET

F. DIPLEXER SECURED WITH HEAVY DUTY STAINLESS STEEL BAND STRAP (TYP. OF 2); SEE DETAIL F THIS SHEET

G. ANGLE ADAPTER MOUNTED TO BACK OF REMOTE RADIO UNIT PER MANUFACTURER'S SPECIFICATIONS (TYP.)

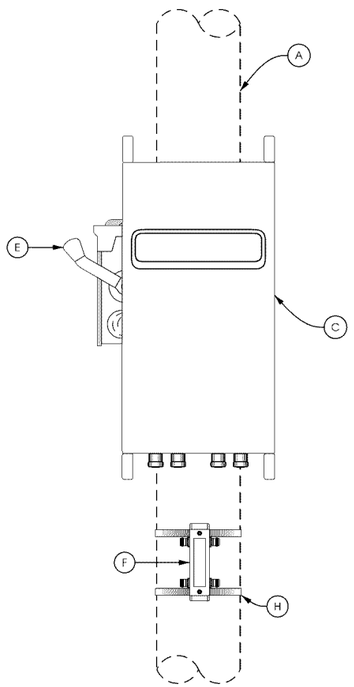
H. HEAVY DUTY STAINLESS STEEL BAND STRAP (TYP.)

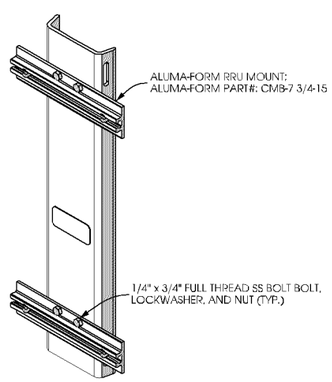


SIDE VIEW

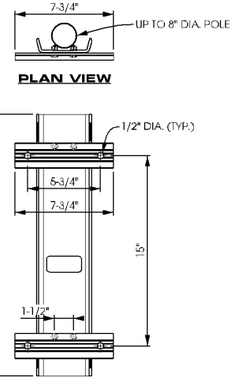
A POLE ELEVATION

SCALE: 11" x 17" - 1/4" = 1'-0"
22" x 34" - 1/2" = 1'-0"





ISOMETRIC VIEW

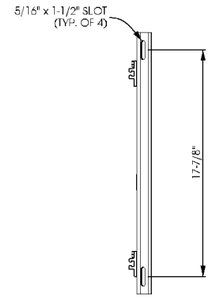


PLAN VIEW

FRONT VIEW

NOTE:

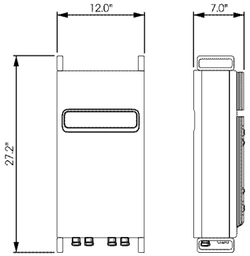
FOR RRU MOUNT AND (2) 3/4" BANDSTRAPS ORDER: ALUMA-FORM PART#: CMB-7 3/4-15 KIT



ELEVATION VIEW

B EQUIPMENT MOUNTING

SCALE: NTS



REMOTE RADIO UNIT :

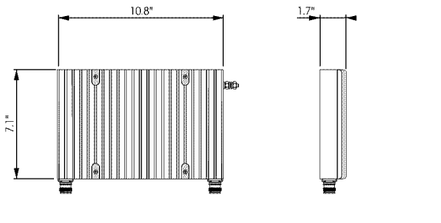
ERICSSON PART # RRUS32

DIMENSIONS: 27.2" x 12.0" x 7.0" (H x W x D)

WEIGHT: 60 LBS

C REMOTE RADIO UNIT

SCALE: NTS



POWER SUPPY UNIT :

ERICSSON PART #: PSU AC-08

DIMENSIONS: 10.8" x 7.1" x 1.9" (H x W x D)

WEIGHT: 11.5 LBS

D POWER SUPPLY UNIT

SCALE: NTS

MANUFACTURER: SCHNEIDER ELECTRIC
MODEL #: SQUARE D DU221RB

NUMBER OF POLES: 2

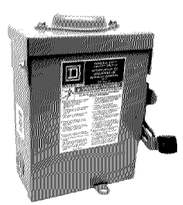
MAX. CURRENT RATING: 30 A

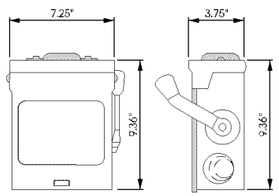
VOLTAGE RATING: 240 VAC

DIMENSIONS: 9.36" x 7.25" x 3.75"

WEIGHT: 4.62 lbs

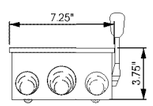
CONTRACTOR TO INSTALL LED LIGHT





FRONT VIEW

SIDE VIEW



BOTTOM VIEW

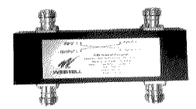
E LOAD CENTER

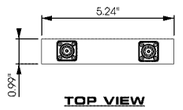
SCALE: NTS

MANUFACTURER: WESTELL
MODEL #: CLEARLINK-HC3/698-2.7K/MS/4310

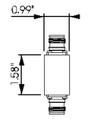
LOW PIM HYBRID COUPLER FEATURES VERY LOW INSERTION LOSS AND POWER HANDLING CAPABILITY FOR 200 WATTS AVERAGE POWER. COUPLED PORTS ARE 90° OUT OF PHASE AND THE ISOLATED PORT HELPS PROTECT AGAINST MISMATCHED LOADS ON THE COUPLED PORTS.

DIMENSIONS: 5.4" X 1.58" X 0.99"

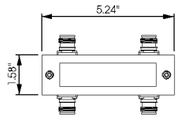




TOP VIEW



SIDE VIEW



FRONT VIEW

F DIPLEXER

SCALE: NTS

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

T-502

LV14991\14967\CAD\Plot\CDs\T-502.dgn

CASE FILE #PL201700223

GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS, AND CONDITIONS PRIOR TO COMMENCING ANY WORK. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR THE PROPER FIT AND CLEARANCE IN THE FIELD. CONTACT EDGE CONSULTING ENGINEERS, INC. IF ANY DISCREPANCIES EXIST.

   DO NOT SCALE DRAWINGS.

2. THIS DRAWING IS NOT VALID IF LOADS OTHER THAN THOSE CONSIDERED IN THE STRUCTURAL ANALYSIS ARE ADDED TO OR REMOVED FROM THE STRUCTURE UNLESS APPROVED IN WRITING BY EDGE CONSULTING ENGINEERS, INC.
3. THE DRAWINGS REPRESENT THE FINISHED STRUCTURE UNLESS NOTED OTHERWISE. THE DRAWINGS DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION PROCEDURES AND PRACTICES.
4. THE DRAWINGS DO NOT INCLUDE THE NECESSARY COMPONENTS OR EQUIPMENT FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR STRUCTURAL STABILITY DURING CONSTRUCTION. THIS INCLUDES, BUT IS NOT LIMITED TO, ERECTION PROCEDURES AND SEQUENCE, SHORING, BRACING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS TO SAFELY PERFORM THE WORK SHOWN ON THE DRAWINGS.
5. BEFORE PROCEEDING WITH ANY WORK ADJACENT TO OR WITHIN THE EXISTING STRUCTURE, THE CONTRACTOR SHALL BECOME FAMILIAR WITH EXISTING CONDITIONS. DURING THE PROCESS OF CONSTRUCTION, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF THE EXISTING STRUCTURE WHERE THE EXISTING STRUCTURE IS MODIFIED TO ACCOMMODATE NEW CONSTPUCTION AND FOR PROTECTING FROM DAMAGE THOSE PORTIONS OF THE EXISTING STRUCTURE WHICH ARE TO REMAIN.
6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ON-SITE SAFETY ASSOCIATED WITH THE WORK TO BE PERFORMED. ALL SAFETY REQUIREMENTS AS DICTATED BY OSHA AND THE LOCAL JURISDICTION'S SHALL BE FOLLOWED.
7. IT SHOULD BE UNDERSTOOD THAT THE CONRACTOR IS THE GUARANTOR OF ALL WORK AND RESPONSIBLE TO CONSTRUCT THE TOWER SITE ACCORDING TO APPLICABLE PLANS, SPECIFICATIONS AND STANDARDS.
8. SECTIONS, DETAILS, AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR CONDITIONS ELSEWHERE, UNLESS OTHERWISE SHOWN.
9. ALL MATERIALS, WORKMANSHIP, AND DETAILS SHALL CONFORM TO THE LATEST EDITION OF THE BUILDING CODE.
10. ALL PROPOSED INSTALLATIONS SHALL NOT DENY OR INTERFERE WITH AND ACCESS TO ANY OPERATIONAL OR SAFETY EQUIPMENT/APPURTENANCES

METRO TRANSIT REQUIREMENTS

1. METRO TRANSIT TO RECEIVE A COPY OF STRUCTURAL ANALYSIS.
2. POLE TO BE HOT DIP GALVANIZED BASE WITH COLOR TOP COAT TO MATCH EXISTING.

EARTHWORK

1. ALL SUBTERRANEAN STRUCTURES, UTILITIES, PIPING, ETC. IN THE AREA OF EXCAVATIONS SHALL BE LOCATED AND MARKED BY CONTRACTOR PRIOR TO EARTH REMOVAL WORK. CONTRACTOR SHALL MAINTAIN MARKERS UNTIL EXCAVATION ACTIVITIES HAVE CEASED. IF UNDERGROUND UTILITY CONFLICTS ARE DISCOVERED BEFORE OR ENCOUNTERED DURING EXCAVATION, NOTIFY THE ENGINEER IMMEDIATELY.
2. BEFORE PLACING FOOTINGS, FOUNDATIONS OR SLAB-ON-GRADE, THE SUB-GRADE SHALL BE PREPARED AND INSPECTED AS REQUIRED.
3. WHERE STRUCTURES DERIVE SUPPORT FROM FILL-SUPPORTED FOUNDATIONS AND AT SLAB-ON-GRADE, FILL SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY (ASTM 1557).
4. NO FILL SHALL BE PLACED OVER FROZEN, MUDDY, OR OTHER DELETERIOUS MATERIAL. NO FILL SHALL BE PLACED OVER A PREVIOUS LIFT THAT HAS NOT BEEN ADEQUATELY COMPACTED.
5. BACKFILL AGAINST FOUNDATION/ANCHORS SHALL BE COMPLETED BEFORE ERECTION/MODIFICATION OF THE TOWER BEGINS.
6. BACKFILL SHALL BE COMPACTED UNIFORMLY AROUND THE FOUNDATION IN LIFTS TO MINIMUM 90% COMPACTION.
7. BACKFILL SHALL BE NATIVE SOIL; IMPORTED FILL SHALL BE VERIFIED WITH THE GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER PRIOR TO BACKFILLING.

CONCRETE & REINFORCING STEEL

MATERIAL PROPERTIES (U.N.O.)
SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE: f'c = 4500 PSI
SPECIFIED YIELD STRENGTH OF CONCRETE REINFORCEMENT: fy = 60 KSI (A615 GR 60)

1. ALL BAR LAPS SHALL CONFORM TO ACI 318 CLASS "B" SPLICE CRITERIA. USE TOP BAR LAP LENGTHS FOR TOP BARS IN SLABS AND BEAMS OVER 14" DEEP.

   MINIMUM BAR LAPS AS FOLLOWS U.N.O.:

   #3:1'-4" #4:1'-4" #5:1'-10" #6:2'-7" #7:4'-2"
   #8:5'-2" #9:6'-4" #10:7'-8" #11:9'-0"

   FOR EPOXY COATED BARS, PROVIDE 1.5 TIMES THE INDICATED LAP LENGTH.
   FOR TOP BARS PROVIDE 1.3 TIMES THE INDICATED LAP LENGTH.

2. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON SHOP DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.
3. REINFORCING SHALL BE EPOXY COATED AND DETAILED IN ACCORDANCE WITH ACI 315.
4. ALL REINFORCEMENT BARS SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST CRSI MANUAL OF STANDARD PRACTICE AND SHALL BE CLEAN AND FREE OF GREASE AND SCALING RUST.
5. PROVIDE HOT/COLD WEATHER PROCEDURES AND PROTECTION IN ACCORDANCE WITH ACI RECOMMENDATIONS AND PROJECT SPECIFICATIONS.
6. CONCRETE REINFORCEMENT PROTECTION/CLEAR COVER, U.N.O.:

   FOOTINGS: ALL SIDES 3"

   PIERS: ALL SIDES 3"

7. EXTEND ALL PIER STEEL TO PROVIDE STD. HOOK UNDER FOOTING REINFORCEMENT, UNLESS NOTED OTHERWISE.
8. ALL CONCRETE SHALL BE NORMAL WEIGHT (145 PCF) UNLESS NOTED OTHERWISE. ALL CONCRETE SHALL BE COMPOSED OF PORTLAND CEMENT, TYPE I/II, IN CONFORMANCE WITH ASTM C 150, FINE AND COARSE AGGREGATE IN CONFORMANCE WITH ASTM C 33, AND WATER IN CONFORMANCE WITH ASTM C 94. EXPOSED EXTERIOR CONCRETE SHALL BE AIR ENTRAINED WITH 6% AIR CONTENT. CONCRETE SHALL HAVE A MEASURED SLUMP OF 4" (CONTRACTOR SHALL PERFORM SLUMP TESTS). IF AN ALTERNATIVE MIX DESIGN IS DESIRED, MIX DESIGN SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
9. ALL CONCRETE SHALL BE CONSOLIDATED BY MECHANICAL VIBRATION, SPADING OR RODDING TO ENSURE THAT CONCRETE IS THOROUGHLY AND UNIFORMLY DISTRIBUTED WITHIN FORMWORK AND AROUND REINFORCEMENT AND EMBEDDED ITEMS.
10. ALL FORMED CONCRETE SURFACES EXPOSED TO VIEW SHALL HAVE A SURFACE FINISH SF-2.0 IN ACCORDANCE WITH ACI 301.
11. ALL CONCRETE MIXING, TRANSPORTING, PLACING AND CURING SHALL CONFORM WITH THE LOCAL BUILDING CODE REQUIREMENTS AND THOSE OF THE FOLLOWING STANDARDS (LATEST EDITION):

    "ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONC."
    "ACI 315, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
    "ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BLDGS."
    "ACI 307, RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"

12. ALUMINUM CONDUIT IS NOT PERMITTED TO BE EMBEDDED IN CONCRETE.
13. ALL DOWELS INTO EXISTING CONCRETE OR SOLID MASONRY TO BE EPOXY ANCHORED WITH HILTI HITHY200 ADHESIVE OR APPROVED EQUIVALENT, (UNLESS NOTED OTHERWISE)
14. UNLESS NOTED OTHERWISE, ANY EXISTING CONCRETE SURFACE IS TO BE CLEANED AND INTENTIONALLY ROUGHED TO A 1/4" AMPLITUDE AND WETTED PRIOR TO FRESH CONCRETE BEING POURED AGAINST SURFACE.

STRUCTURAL STEEL

1. STRUCTURAL STEEL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH THE AISC 13TH EDITION STEEL CONSTRUCTION MANUAL.
2. MATERIAL PROPERTIES ARE TO BE AS INDICATED BELOW UNLESS NOTED OTHERWISE.

   W-SHAPES Fy = 50 KSI (A992 OR A572 Gr 50)
   C-SHAPES & ANGLES Fy = 36 KSI (A36)
   PLATES & BARS Fy = 36 KSI (A36)
   SQUARE TUBES Fy = 46 KSI (A500 Gr B)
   ROUND TUBES Fy = 35 KSI (A53 TYPE S, Gr B)
   RODS Fy = 36 KSI (A36)
   ANCHOR RODS Fy = 36 KSI (F1554-Gr 36)

3. STEEL BEAMS WITH RESIDUAL CAMBER RESULTING FROM MILL FABRICATION OR ROLLING SHALL BE SHOP FABRICATED AND ERECTED SUCH THAT THIS RESIDUAL CAMBER COUNTERACTS GRAVITY LOAD DEFLECTION.
4. MINIMUM BOLT EDGE DISTANCES ARE TO BE THE LARGER OF THE EXISTING CONDITION OR THE TABLE PROVIDED BELOW UNLESS APPROVED BY THE ENGINEER.

BOLT DIAMETER (IN)	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	> 1 1/4
MIN. EDGE DISTANCE	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1.25 x d

5. ALL CONNECTION BOLTING IS TO BE WITH A-325N BOLTS UNLESS NOTED OTHERWISE. BOLTS NEED ONLY BE TIGHTENED TO THE SNUG-TIGHT CONDITION. SNUG-TIGHT IS DEFINED AS THE TIGHTNESS OBTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A PERSON USING AN ORDINARY SPUD WRENCH.
6. U.N.O., POST INSTALLED ANCHORS ARE TO BE HILTI HIT HY 200 ADHESIVE ANCHORS FOR SOLID BASE MATERIAL AS MANUFACTURED BY HILTI FASTENING SYSTEMS OF TULSA, OKLAHOMA OR APPROVED EQUAL. INSTALL ANCHORS WITH EMBEDMENT DEPTHS INDICATED.
7. U.N.O., NON-SHRINK GROUT SHALL BE A NON-METALLIC PREMIXED FORMULATION EQUIVALENT TO MASTERFLOW 713 PLUS BY DEGUSSA BUILDING SYSTEMS. BEAM AND LINTEL PLATES SHALL BE FULLY GROUTED WITH A MINIMUM 1/2" NON-SHRINK GROUT. COLUMN BASE PLATES SHALL BE FULLY GROUTED WITH A MINIMUM OF 1 1/2" NON-SHRINK GROUT.
8. ALL STEEL FRAMING MEMBERS, CONNECTION PLATES, FASTENERS AND ANCHOR BOLTS EXPOSED TO EARTH OR WEATHER TO HAVE HOT-DIP GALVANIZED FINISH UNLESS OTHERWISE SPECIFIED. APPLY COATING BY THE HOT-DIP PROCESS FOR GALVANIZING ACCORDING TO ASTM A123 OR ASTM A153.
9. ALL DINGS, SCRAPES, MARS AND WELDS IN THE GALVANIZED AREA SHALL BE COATED WITH A ZINC-RICH PAINT, APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
10. AFTER ZINC-RICH PAINT IS DRY, OVERCOAT WITH AN APPROPRIATE PAINT WITH THE SAME COLOR AS THE EXISTING.
11. ALL WELDING OF NEW STEEL IS TO BE WITH E70XX ELECTRODES, U.N.O. WELDING SHALL BE IN ACCORDANCE WITH THE LATEST AWS SPECIFICATIONS BY CERTIFIED WELDERS AND INSPECTED BY AN AWS CERTIFIED WELDING INSPECTOR.
12. WHEN FIELD WELDING TO EXISTING STEEL, ADJUST WELDING PROCEDURES AS REQUIRED TO BE COMPATIBLE WITH THE NEW AND EXISTING STEEL.
13. ALL WELDING OF GALVANIZED MATERIAL SHALL BE PERFORMED IN SUCH A MANOR AS TO SATISFY ALL OSHA AND AWS REQUIREMENTS. ALL FIELD WELDED LOCATIONS SHALL BE PREPARED AND PRIMED WITH A ZINC RICH PRIMER PRIOR TO PAINTING PER THE MANUFACTURES RECOMMENDATIONS. THE SPECIFIC PRIMER TO BE USED SHALL BE TNEMEC SERIES 90-97 Tnema-Zinc @ 3.0-4.0 mils DFT OR APPROVED EQUAL.
14. SUBMIT SHOP DRAWINGS DETAILING FABRICATION OF STRUCTURAL STEEL COMPONENTS.
15. METAL BAR GRATING SHALL BE FURNISHED AND INSTALLED ACCORDING TO ANSI/NAAMM MBG 531-00 METAL BAR GRATING MANUAL. METAL BAR GRATING SHALL BE WELDED STEEL GRATING FABRICATED FROM CARBON STEEL WITH MINIMUM BENDING STRESS OF FY=18,000 PSI AND E=29,000,000 PSI. THE MANUFACTURER SHALL SUBMIT (4) SETS OF PANEL FABRICATION DRAWINGS WITH ERECTION PLANS IDENTIFYING EACH PANEL WITH A MARK NUMBER AND PANEL DIMENSIONS. SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED PRIOR TO FABRICATION AND SHIPMENT OF GRATING. ALL GRATING PANELS SHALL BE CUT TO SIZE AND BANDED. GRATING SHALL BE FINISHED ACCORDING TO THE BID OPTION SELECTED. EACH GRATING PANEL SHALL BE TAGGED WITH THE ORDER NUMBER AND MARK NUMBER CORRESPONDING TO THE ERECTION PLAN. FIELD CUTTING OF GRATING IS NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER. GRADING MAY BE FASTENED TO STRUCTURE BY WELDS OR CLIPS ACCORDING NAAMM STANDARDS.

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR
ENGINEER SEAL

I HEREBY CERTIFY THAT THIS PLAN, SPECFICATION, 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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

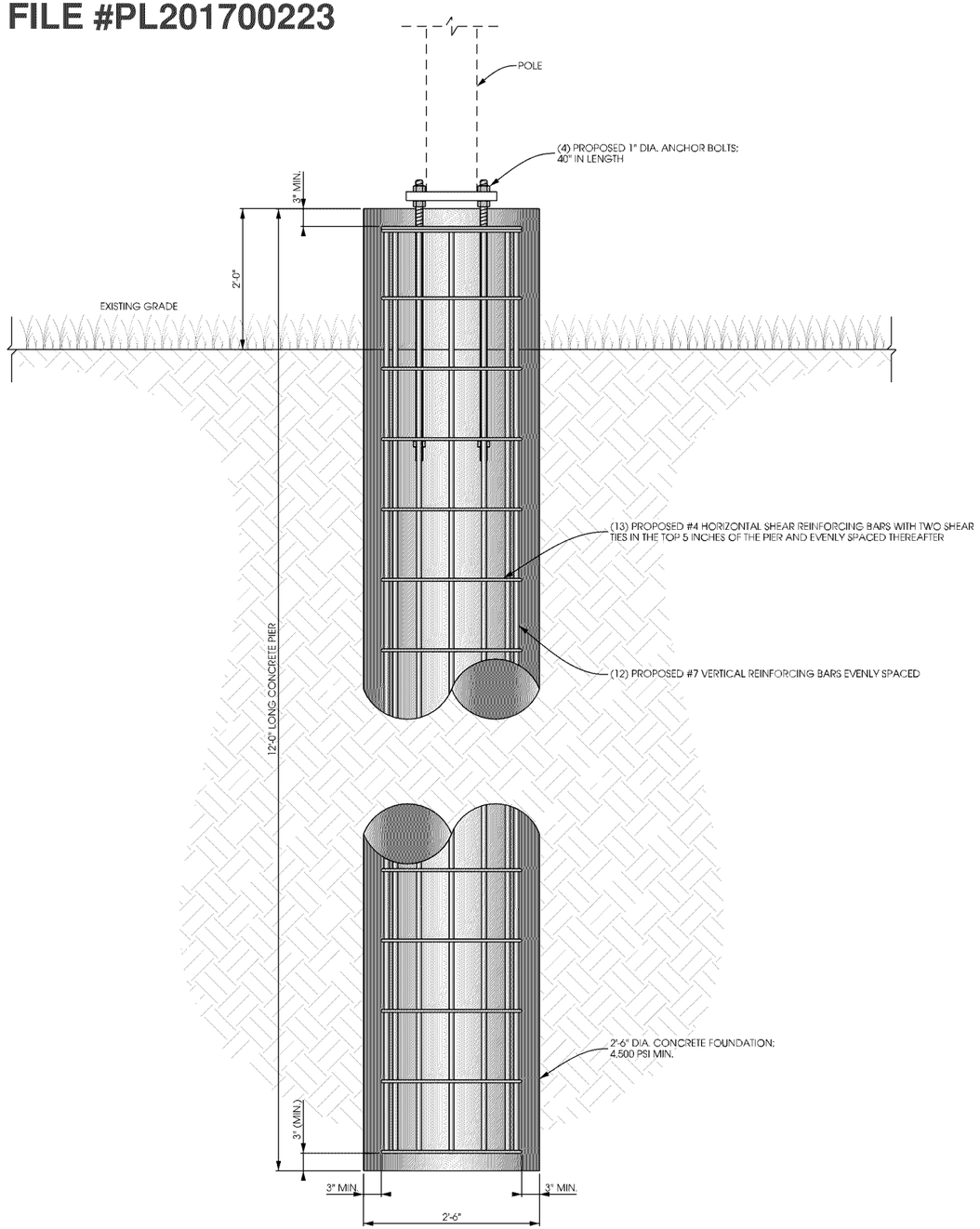
SHEET TITLE
STRUCTURAL NOTES

SHEET NUMBER
S-001

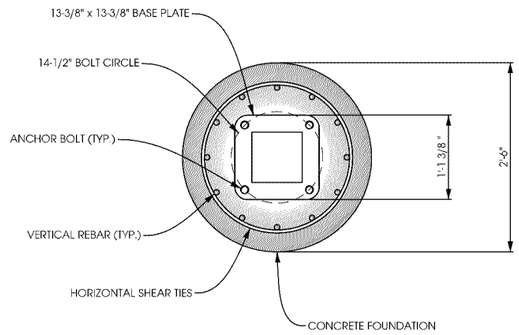
CASE FILE #PL201700223

NOTE:

VERIFY WITH STRUCTURAL ANALYSIS LISTED ON SHEET G-001



ELEVATION VIEW



PLAN VIEW

A FOUNDATION DETAIL

SCALE: NTS

L:\14967\14967\CAD\Plot\CDPLS 501.dgn

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

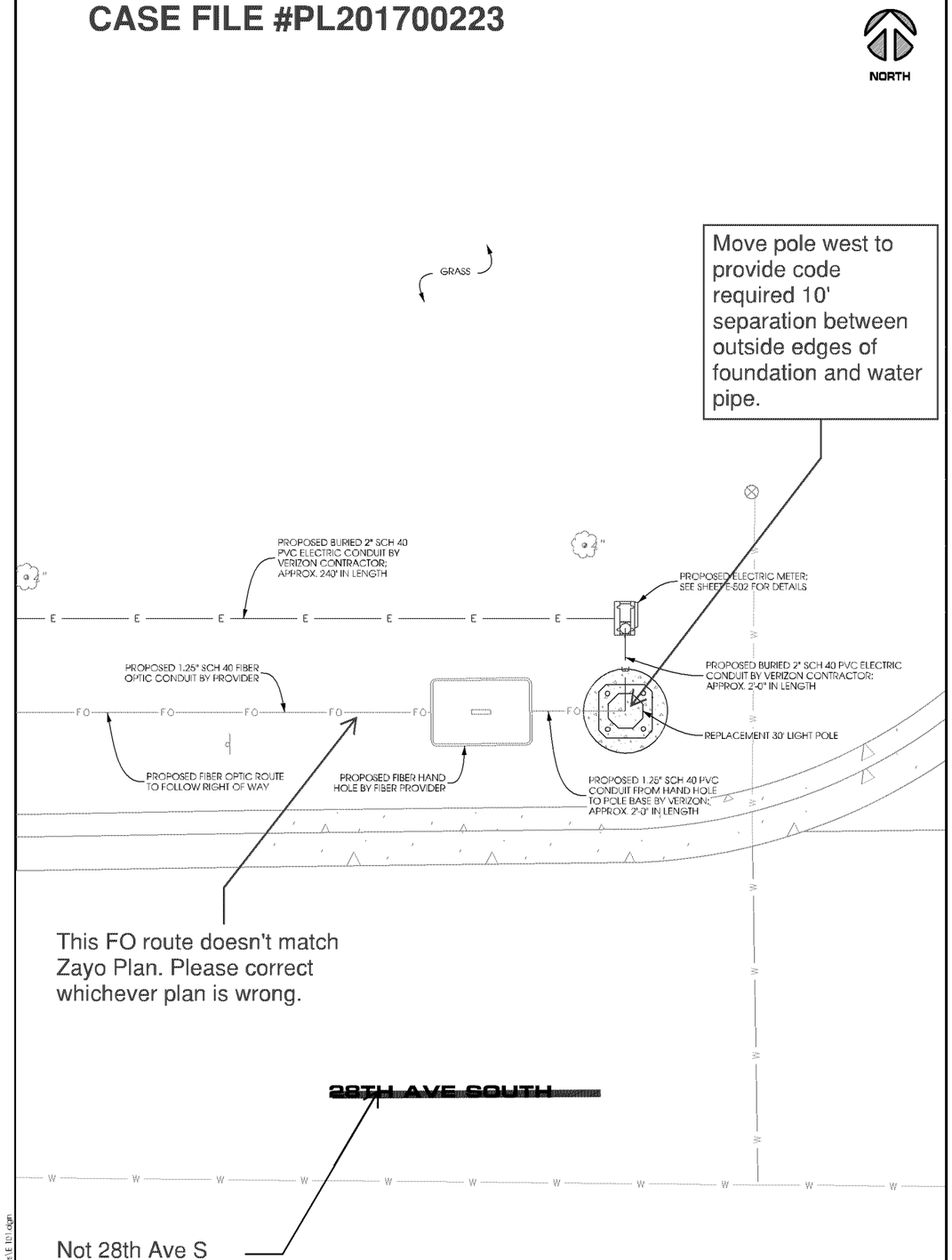
SHEET TITLE

STRUCTURAL DETAILS

SHEET NUMBER

S-501

CASE FILE #PL201700223



A **UTILITY PLAN**

4'-0" 0 2'-0" 4'-0"

SCALE: 11" x 17" - 1" = 4'-0"
22" x 34" - 1" = 2'-0"

L:\14900\14967\CAD\Plot\ CRALE 101.dgn

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 ANSI, 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, UPONWRITTEN 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 RFQ.

GENERAL ELECTRICAL NOTES

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

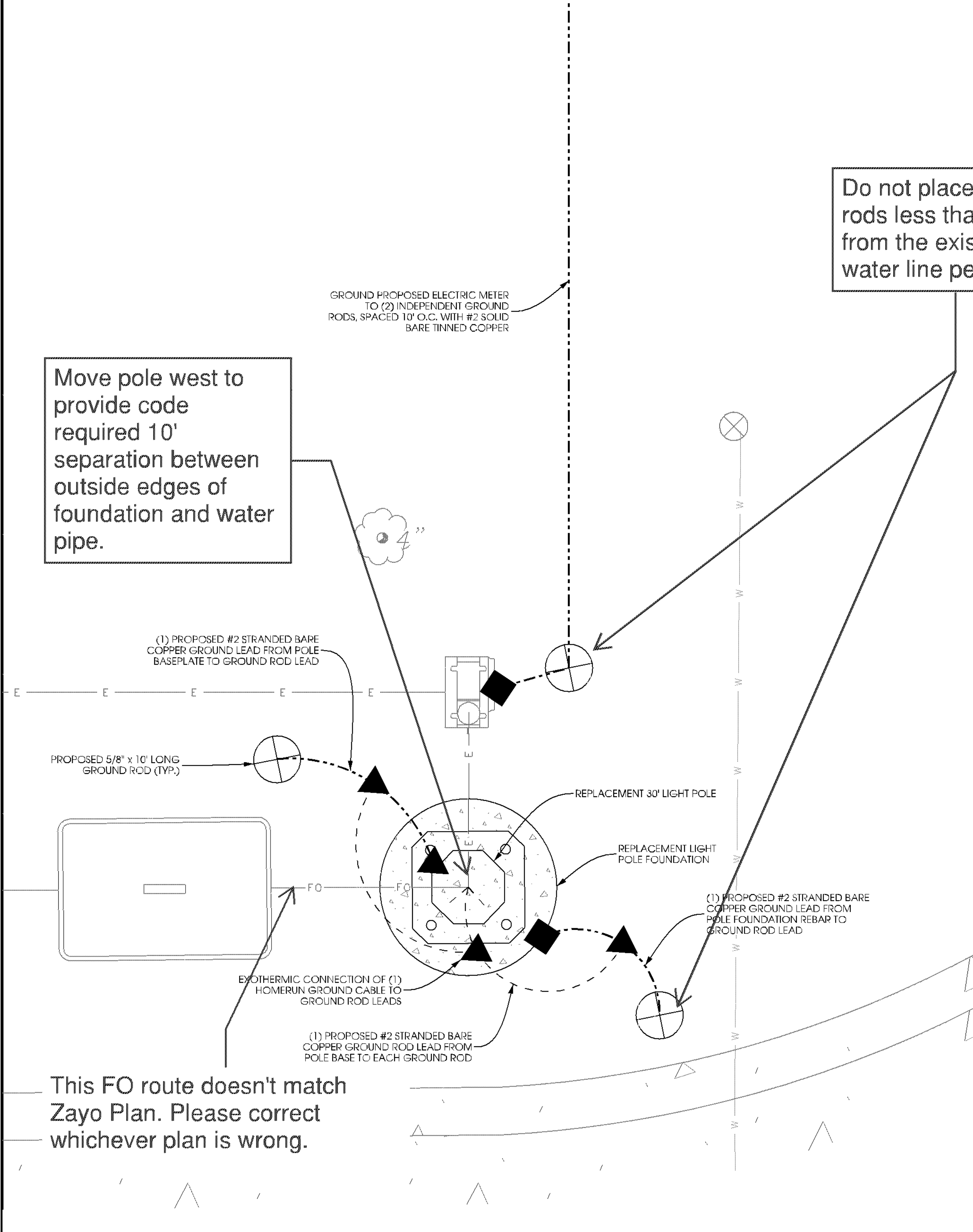
SHEET TITLE
UTILITY PLAN

SHEET NUMBER
E-101

CASE FILE #PL201700223

NOTE:

TYPICAL GROUNDING PLAN DEPICTED. HOWEVER, DUE TO SMALL GROUNDING FOOTPRINT, 5 OHMS RESISTANCE MAY NOT BE ACHIEVED. CONTRACTOR TO PERFORM GROUND RESISTANCE TEST AFTER COMPLETION OF CONSTRUCTION. PROJECT MANAGER TO REVIEW AND APPROVE GROUND RESISTANCE RESULTS. ADDITIONAL GROUNDING IMPROVEMENTS MAY BE NECESSARY.



A GROUNDING PLAN

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

GENERAL GROUNDING NOTES

1. SCOPE:

THIS SECTION COVERS THE SPECIFICATIONS FOR CELL SITE GROUNDING. THE AREAS OF FOCUS ARE: TOWER, POLE, BUILDING, AND INSTALLATION METHODS.

2. GENERAL:

2.1 ALL GROUND RODS SHALL BE 5/8" COPPER CLAD STEEL 10 FT. LONG. GROUND RODS SHALL BE EQUALLY SPACED AT 10 FT. INTERVALS. REFER TO SITE GROUNDING PLAN FOR DETAILS AND PLACEMENT WITH GROUNDING.

2.2 GROUNDING A SYSTEM SHALL BE MEGGAR TESTED TO ASSURE SATISFYING 5 OHMS OR LESS RESISTANCE.

2.3 ALL CADWELD CONNECTIONS TO GALVANIZED MATERIAL SHALL BE PROPERLY PREPARED TO ASSURE A SATISFACTORY CADWELD. THE CADWELD CONNECTION SHALL BE COATED WITH A COLD GALVANIZING SPRAY .

2.4 CONTRACTOR SHALL PROVIDE PHOTO DOCUMENTATION OF THE GROUND SYSTEM BY PROVIDING A CD TO VERIZON.
REQUIRED PHOTOS SHALL INCLUDE:
* ALL BUSS BARS AND CABLE GROUND CONNECTIONS.
* TOWER/POLE COUNTERPOISE.
* BUILDING COUNTERPOISE.* CONNECTIONS TO POWER, TELCO, A.C., FENCING *(IF APPLICABLE)* AND ICE BRIDGE *(IF APPLICABLE)*.
* CONNECTIONS TO POWER, TELCO, A.C., FENCING *(IF APPLICABLE)* AND ICE BRIDGE *(IF APPLICABLE)*.

2.5 CONTRACTOR SHALL PROVIDE AS-BUILT PLANS SHOWING LOCATION AND DIMENSIONS OF BELOW GRADE GROUNDING FEATURES.

3. INSTALLATION:

3.1 ALL EXTERIOR ABOVE AND BELOW GROUND CONNECTIONS SHALL BE CADWELD. NO ALUMINUM CONNECTORS SHALL BE USED UNLESS SPECIFIED OTHERWISE ON PLANS.

3.2 NO RIGHT-ANGLE CADWELD CONNECTION (OTHER THAN GROUND RODS TO GROUND RING CONNECTION) SHALL BE USED. ALL WIRE-TO-WIRE CONNECTIONS SHALL UTILIZE "Y-TYPE" CONNECTIONS.

3.3 ALL VERTICAL JUMPERS SHALL NOT BE WELDED WITHIN TWO (2) FT. OF THE GROUND ROD.

3.4 KOPR SHIELD REQUIRED FOR ALL MECHANICAL CONNECTIONS.

3.5 ALL CADWELDS FINISHED WITH COLD GALVANIZED SHIELD.

4. TOWER:

4.1 A #2 SOLID BARE COPPER WIRE SHALL BE BURIED A MINIMUM FOUR (4) FT. UNDERGROUND AND ENCIRCLE TOWER FOUNDATION TWO (2) FT. FROM THE FOUNDATION. THIS GROUNDING SYSTEM SHALL BE CONNECTED TO THE TOWER GROUND RING IN TWO (2) PLACES USING CADWELD CONNECTIONS. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

4.2 THREE (3) #2 SOLID BARE COPPER WIRES SHALL BE RUN FROM THE TOWER GROUND RING TO THE TOWER. THESE WIRES SHALL BE CONNECTED TO THE TOWER USING A CADWELD CONNECTION. NO SHARP BENDS SHALL BE PLACED IN THESE GROUND LEADS.

4.3 GROUND SYSTEM SHALL INCLUDE THE INSTALLATION OF AN ISOLATED LIGHTNING ROD AT THE TOP OF THE TOWER ABOVE THE HIGHEST ANTENNA. A #2 INSULATED COPPER WIRE SHALL BE CONNECTED TO THE TOWER LIGHTNING ROD USING AN APPROVED MECHANICAL CONNECTOR, OR CADWELDED, TO TOWER STEEL.

5. BUILDING:

5.1 A #2 SOLID BARE COPPER WIRE SHALL BE BURIED A MINIMUM OF FOUR (4) FT. UNDERGROUND AND ENCIRCLE BUILDING FOUNDATION TWO (2) FEET FROM THE FOUNDATION. GROUND RING CORNERS SHALL BE INSTALLED WITH A MINIMUM TWO FOOT RADIUS (NO SHARP RIGHT ANGLE BENDS).

5.2 A #2 SOLID BARE COPPER WIRE SHALL BE INSTALLED FROM THE BUILDING GROUND RING AND CONNECTED TO THE COPPER BUS BAR LOCATED ON THE OUTSIDE OF BUILDING WITH A MINIMUM NINE (9) INCHES RADIUS. A "Y-TYPE" OR "PARALLEL-TYPE" CADWELD CONNECTION SHALL BE USED FOR ALL CONNECTIONS TO THE GROUND RING.

5.3 ONE (1) ADDITIONAL #2 SOLID BARE GROUND WIRE LEAD SHALL BE INSTALLED DIRECTLY BELOW THE ELECTRICAL SERVICE ENTRANCE PORT (GROUND LUG ON THE MAIN DISCONNECT INSIDE THE BUILDING). THIS WIRE SHALL BE CONNECTED TO THE BUILDING GROUND RING USING "Y-TYPE" CADWELD CONNECTION.

5.4 ONE (1) ADDITIONAL #2 SOLID BARE COPPER GROUND WIRE LEAD SHALL BE INSTALLED DIRECTLY BELOW EACH HVAC UNIT *(IF APPLICABLE)*.

6. POLE:

6.1 FOR POLES LOCATED IN GRASS OR GRAVEL A #2 SOLID BARE COPPER WIRE SHALL BE BURIED A MINIMUM FOUR (4) FT. UNDERGROUND AND ENCIRCLE POLE FOUNDATION TWO (2) FT. FROM THE FOUNDATION. THIS GROUNDING SYSTEM SHALL BE CONNECTED TO THE POLE GROUND RING IN ONE (1) PLACE USING #2 SOLID BARE COPPER WIRE.

6.2 FOR POLES LOCATED IN CONCRETE OR ASPHALT A #2 SOLID BARE COPPER WIRE SHALL BE CONNECTED USING A CADWELDED TO A 5/8" COPPER CLAD STEEL 10 FT. LONG GROUND ROD. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

6.3 POLE FOUNDATION REBAR SHALL BE CONNECTED TO THE POLE GROUND RING OR GROUND ROD IN ONE (1) PLACE USING #2 SOLID BARE COPPER WIRE. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

6.4 FOR POLES CONSTRUCTED OF STEEL OR WITH STEEL BASEPLATE, GROUND WIRE FROM GROUND RING OR GROUND ROD SHALL BE CONNECTED TO THE POLE USING A CADWELD CONNECTION. NO SHARP BENDS SHALL BE PLACED IN THESE GROUND LEADS. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

6.5 FOR POLES CONSTRUCTED OF ALUMINUM, GROUND WIRE FROM GROUND RING OR GROUND ROD SHALL BE CONNECTED TO THE POLE USING A MECHANICAL CONNECTION. NO SHARP BENDS SHALL BE PLACED IN THESE GROUND LEADS.

7. FENCING *(IF APPLICABLE)*:

7.1 A #2 SOLID BARE COPPER GROUND WIRE SHALL BE INSTALLED FROM THE FENCE CORNER POSTS TO THE GROUND RING AND SHALL BE BURIED A MINIMUM FOUR (4) FT. UNDERGROUND. THESE RUNS SHALL INCLUDE GROUND RODS EQUALLY SPACED AT 10 FT. INTERVALS. THESE RUNS SHALL BE BROUGHT ABOVE GROUND LEVEL AND SUPPORTED ABOVE GROUND WITH TEMPORARY POSTS UNTIL PERMANENT FENCING IS INSTALLED. GROUND WIRE SHALL BE CONNECTED TO THE FENCE POSTS USING CADWELD TYPE CONNECTIONS.

8. EXISTING GROUND SYSTEMS:

8.1 CONTRACTOR SHALL PROVIDE CONNECTIONS TO ALL EXISTING GROUND SYSTEMS AT THE SITE (SCADA, TELEMETRY, ETC.).

9. COMPLIANCE:

9.1 ELECTRICAL CODE COMPLIANCE

COMPLY WITH APPLICABLE LOCAL ELECTRICAL CODES REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION, AND NEC AS APPLICABLE TO ELECTRICAL GROUNDING AND BONDING, PERTAINING TO SYSTEMS, CIRCUITS AND EQUIPMENT.

9.2 UL COMPLIANCE

COMPLY WITH APPLICABLE REQUIREMENTS OF UL467, 486A AND 869 PERTAINING TO GROUNDING AND BONDING OF SYSTEMS, CIRCUITS AND EQUIPMENT. USE GROUNDING AND BONDING PRODUCTS WHICH ARE UL-LISTED AND LABELED FOR THEIR INTENDED USAGE.

9.3 IEEE COMPLIANCE

COMPLY WITH APPLICABLE REQUIREMENTS OF RECOMMENDED INSTALLATION PRACTICES OF IEEE STANDARDS 80, 81, 141 AND 142 PERTAINING TO GROUNDING AND BONDING OF SYSTEMS, CIRCUITS AND EQUIPMENT.

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED - SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

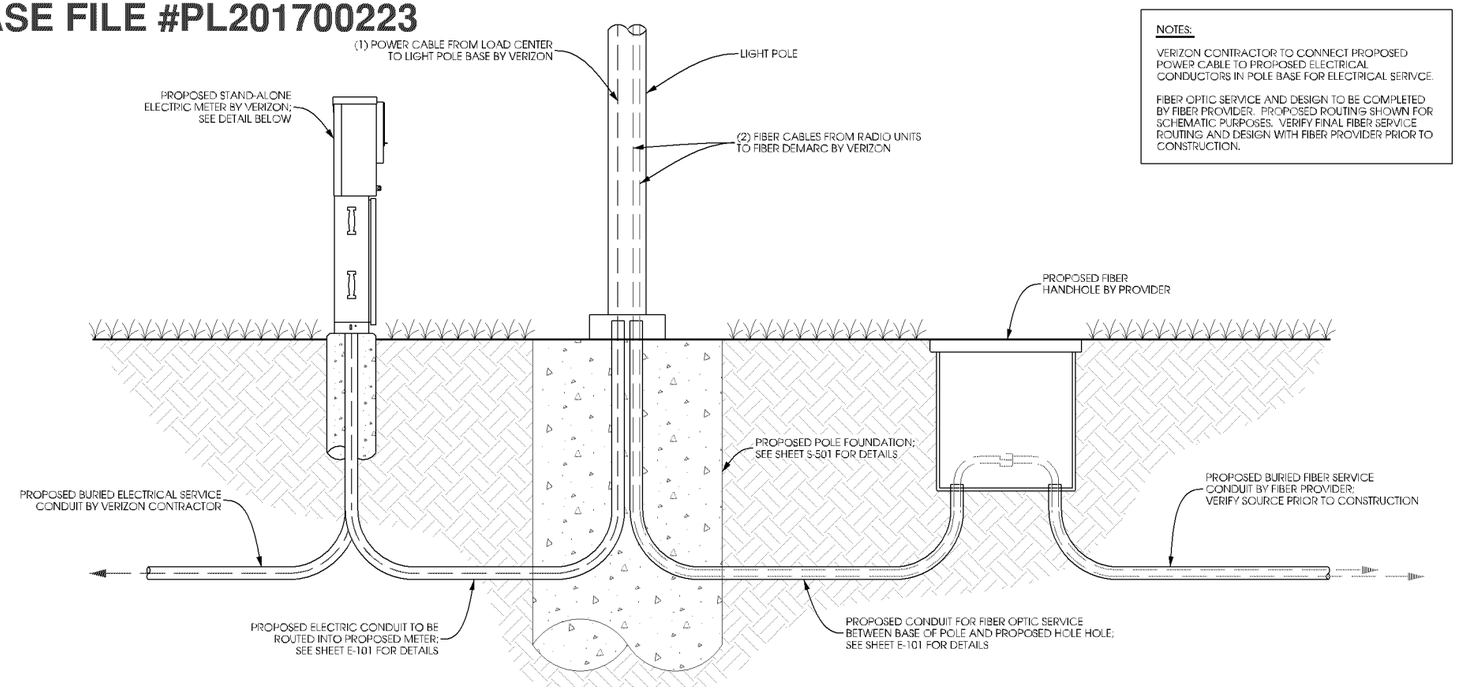
SHEET TITLE

GROUNDING PLAN

SHEET NUMBER

E-102

CASE FILE #PL201700223



NOTES:

VERIZON CONTRACTOR TO CONNECT PROPOSED POWER CABLE TO PROPOSED ELECTRICAL CONDUCTORS IN POLE BASE FOR ELECTRICAL SERIVCE.

FIBER OPTIC SERVICE AND DESIGN TO BE COMPLETED BY FIBER PROVIDER. PROPOSED ROUTING SHOWN FOR SCHEMATIC PURPOSES. VERIFY FINAL FIBER SERVICE ROUTING AND DESIGN WITH FIBER PROVIDER PRIOR TO CONSTRUCTION.

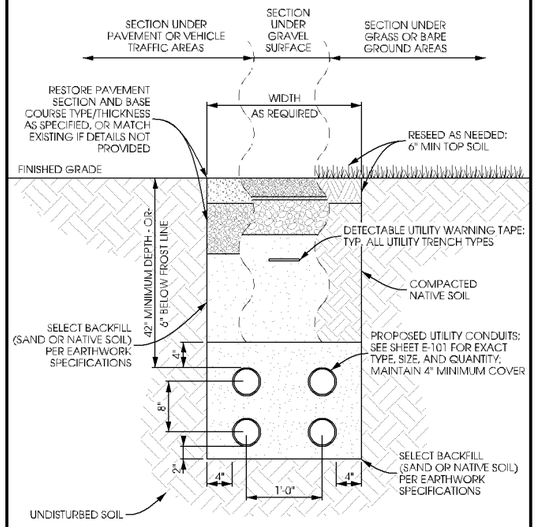
A POWER AND FIBER ROUTING AT FOUNDATION

SCALE: NTS

NOTES:

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

CONDUIT TYPE, SIZE, AND QUANTITY SHOWN ON SHEET E-101.

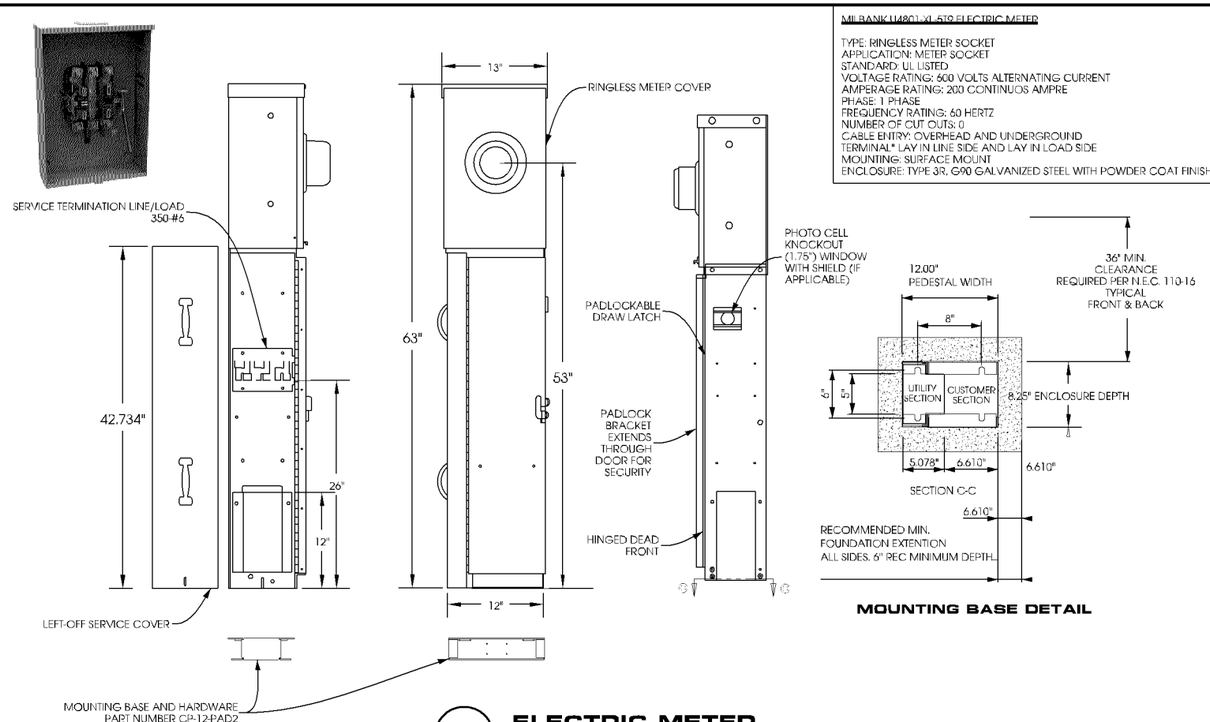


B UTILITY TRENCH DETAIL

SCALE: NTS

MILBANK U4801-XL-579 ELECTRIC METER

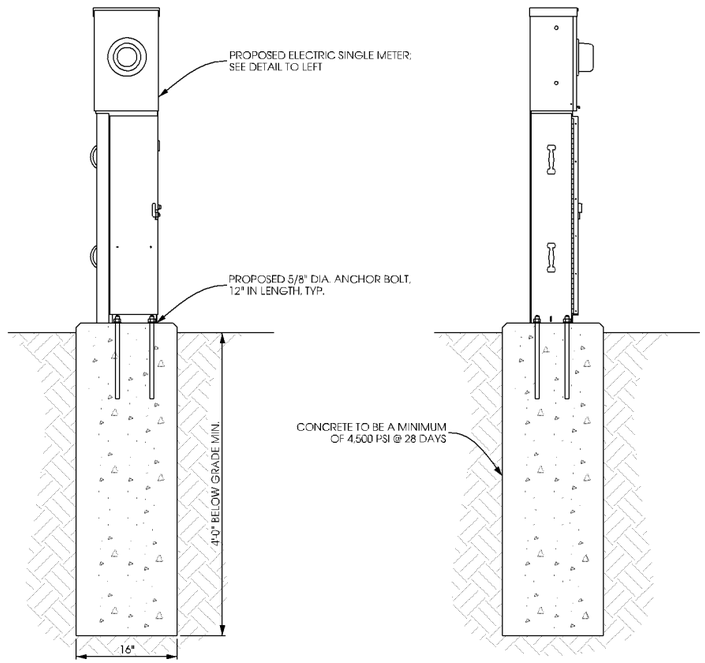
TYPE: RINGLESS METER SOCKET
APPLICATION: METER SOCKET
STANDARD: UL LISTED
VOLTAGE RATING: 600 VOLTS ALTERNATING CURRENT
AMPERAGE RATING: 200 CONTINUOS AMPRE
PHASE: 1 PHASE
FREQUENCY RATING: 60 HERTZ
NUMBER OF CUT OUTS: 0
CABLE ENTRY: OVERHEAD AND UNDERGROUND
TERMINAL* LAY IN LINE SIDE AND LAY IN LOAD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



MOUNTING BASE DETAIL

C ELECTRIC METER

SCALE: NTS



D ELECTRIC METER FOUNDATION

SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

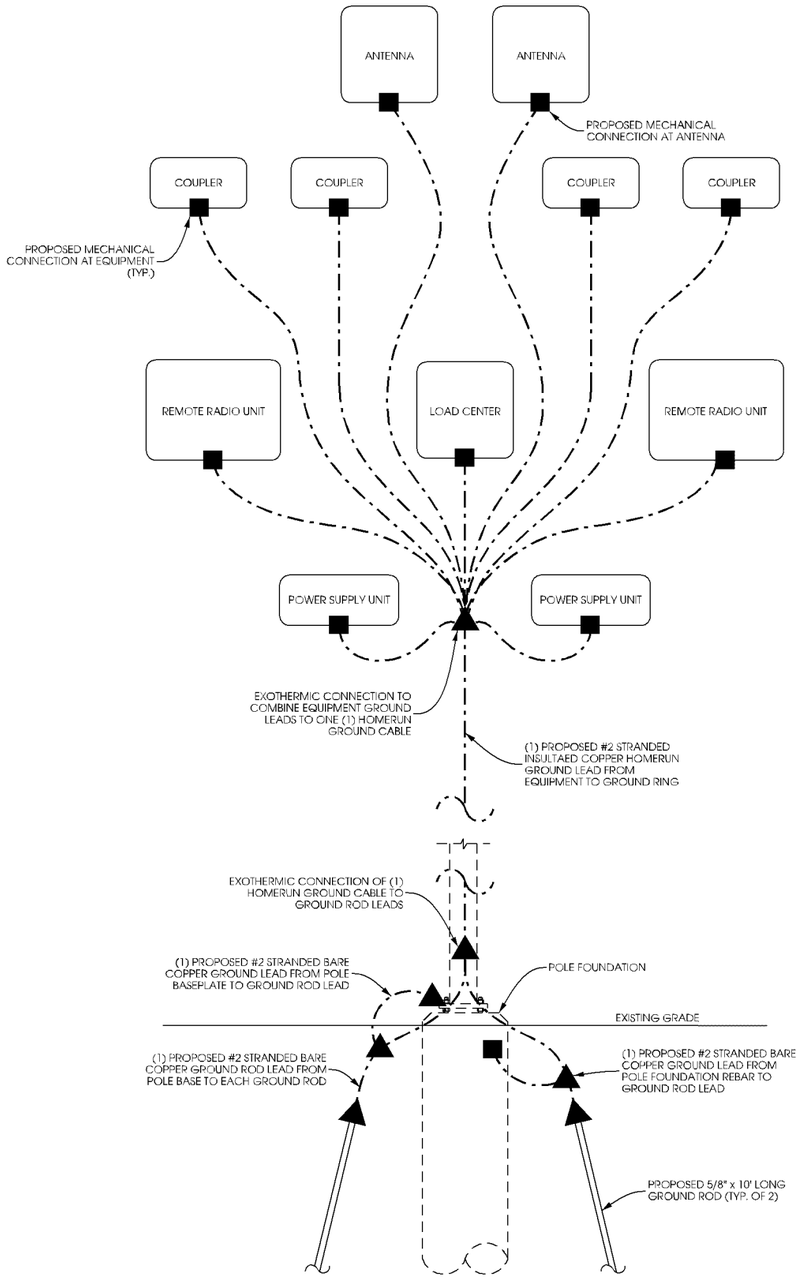
UTILITY DETAILS

SHEET NUMBER

E-502

L:\14900\14967\CAD\Plot\ COs\E E02.dgn

CASE FILE #PL201700223



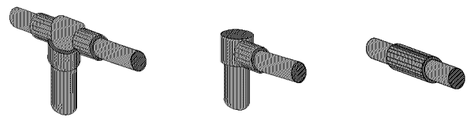
A GROUNDING SCHEMATIC

SCALE: NTS

NOTES:

CADWELD "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF CADWELDS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

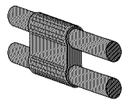
CONTRACTOR TO PROVIDE ALL REQUIRED CADWELD CONNECTIONS.



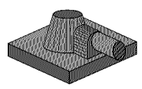
TYPE TA
* NOT PERMITTED *

TYPE GR

TYPE SV



TYPE PH



TYPE KA

TYPE VS

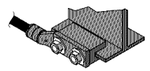
B CADWELD CONNECTIONS

SCALE: NTS

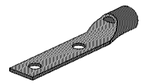
NOTES:

BURNDY "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF BURNDY CONNECTIONS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

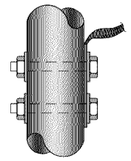
CONTRACTOR TO PROVIDE ALL REQUIRED BURNDY CONNECTIONS.



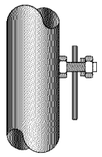
TYPE YGIBS



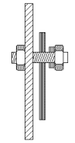
TYPE YA3CL-2TC38



TYPE BD18G92



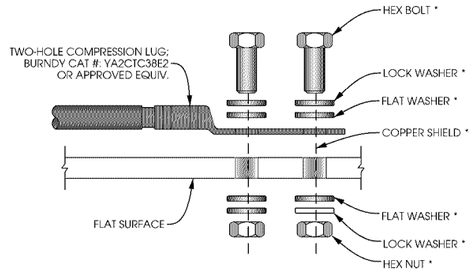
TYPE KC TO PIPE



TYPE KC
* TO FLAT SURFACE *

C MECHANICAL CONNECTIONS

SCALE: NTS



* USE 1/4" FOR ATTACHMENT TO METAL ENCLOSURES AND 3/8" FOR ATTACHMENT TO GROUND BARS

INSTALLATION NOTES:

- BOLTS, WASHERS, AND NUTS SHALL BE STAINLESS STEEL.
- SELECT BOLT LENGTH TO PROVIDE A MINIMUM OF TWO EXPOSED THREADS.
- BURNISH MOUNTING SURFACE TO REMOVE PAINT IN THE AREA OF LUG CONTACT.
- APPLY COPPER-SHIELD COMPOUND TO MATING SURFACE OF LUG AND WIPE CLEAN EXCESS COMPOUND.
- PAINTED METAL SURFACES MUST HAVE SMALL SECTION OF PAINT REMOVED BEFORE INSTALLATION, AND SHALL BE SPRAYED LIGHTLY WITH CLEAR COAT LACQUER FINISH.
- NO-OX-ID "A" TO BE ADDED UNDER ALL GROUND LUG CONNECTIONS.

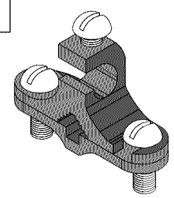
D GROUND TO FLAT SURFACE

SCALE: NTS

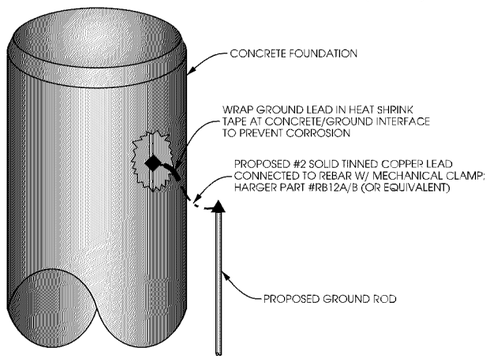
NOTES:

FOUNDATION SHOWN IS TYPICAL.

GROUNDING CONNECTIONS TO BE COVERED BY A MINIMUM OF 3" CONCRETE.



HARGER P/N: RB12A/B
"A" - PARALLEL MOUNT
"B" - PERP. MOUNT (SHOWN)



E REBAR CONNECTION

SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462527
LOCATION CODE:	425930
EDGE PROJECT NO:	14967
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-503

L:\14967\A14967CADD\Plot\CDs\E503.dgn

CASE FILE #PL201700223

verizon

SITE NAME:	**MIN LR 28TH AVE SC2**
SITE NUMBER:	**20161462529**
LOCATION CODE:	**425932**
SITE TYPE:	**SMALL CELL**
INSTALLATION TYPE:	**REPLACEMENT 30' LIGHT POLE**

SITE INFORMATION

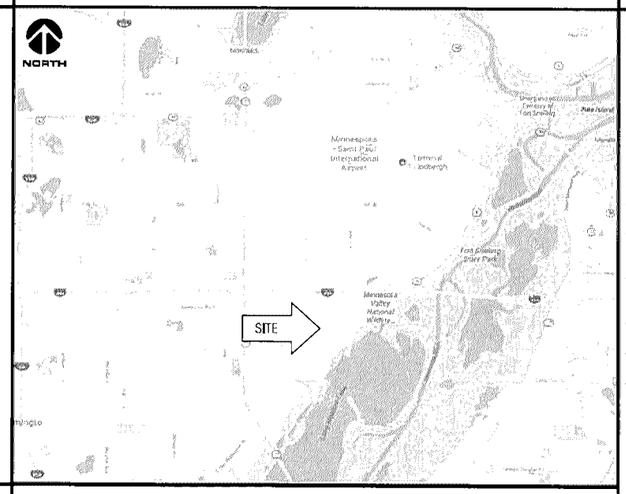
APPROXIMATE ADDRESS:
30TH AVENUE SOUTH AND
LINDAU LANE
BLOOMINGTON, MINNESOTA 55425
HENNEPIN COUNTY

SITE COORDINATES:
LAT: 44°-51'-22.69"N
LONG: 93°-13'-48.51"W
GROUND ELEVATION: 817.0' AMSL
(PER 1A CERTIFICATE)

POLE HEIGHT:
30'-0" T.O.C.

MAXIMUM APPURTENANCE HEIGHT:
30'-0" A.G.L.

AREA MAP



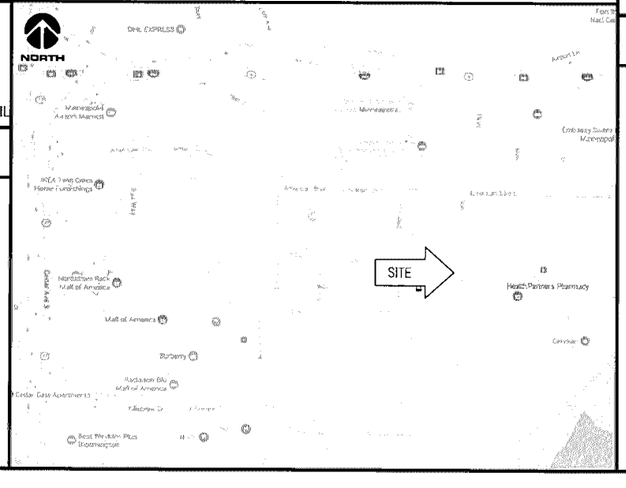
APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

- 2012 INTERNATIONAL BUILDING CODE
- 2014 NATIONAL ELECTRIC CODE
- TIA/EIA-222-G OR LATEST EDITION

IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

LOCATION MAP



LOCATION SCAN

PROJECT DESCRIPTION/SOW

- INSTALL (1) REPLACEMENT 30-FT STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF PANEL ANTENNAS
- INSTALLATION OF ERICSSON RRU'S AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER
- INSTALLATION OF HYBRID COUPLERS
- INSTALLATION OF HAND HOLE FOR FIBER NEAR POLE BASE BY PROVIDER
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND POLE BASE BELOW GRADE BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND ROW BELOW GRADE BY PROVIDER
- INSTALLATION OF GROUND RODS AROUND POLE FOUNDATION
- INSTALLATION OF CONDUIT FOR NEW ELECTRIC SERVICE BY VERIZON
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS

PROJECT DIRECTORY

LESSEE:
VERIZON WIRELESS
10801 BUSH LAKE RD
BLOOMINGTON, MN 55438
CONTACT: COURTNEY BEDNARZ
PHONE: 952.946.4694

SITE ACQUISITION:
KE CONSULTING, LLC
3101 GRANDVIEW BLVD
MADISON, WI 53713
CONTACT: KIM A. EGAN
PHONE: 608.516.0233

LESSOR:
METRO TRANSIT
560 SIXTH AVENUE NORTH
MINNEAPOLIS, MN 55411
PHONE: 612.373.3333

RF ENGINEER:
VERIZON WIRELESS
10801 BUSH LAKE RD
BLOOMINGTON, MN 55438
CONTACT: JOHN MULLINS
PHONE: 612.791.1710

ENGINEERING COMPANY:
EDGE CONSULTING ENGINEERS, INC.
2101 HIGHWAY 13 W
BURNSVILLE, MN 55337
CONTACT: OTTO DINGFELDER III, P.E.
PHONE: 608.644.1449

SHEET INDEX

NO:	SHEET TITLE
G-001	TITLE SHEET & PROJECT DATA
G-002	GENERAL SPECIFICATIONS
G-003	GENERAL SPECIFICATIONS
G-004	METRO TRANSIT SITE REQUIREMENTS*
G-005	METRO TRANSIT SITE REQUIREMENTS*
C-101	SITE PLAN
C-102	ENLARGED SITE PLAN
T-201	SITE ELEVATION
T-501	ANTENNA DETAILS
T-502	EQUIPMENT DETAILS
S-001	STRUCTURAL NOTES **
S-501	STRUCTURAL DETAILS **
E-101	UTILITY PLAN
E-102	GROUNDING PLAN
E-501	UTILITY DETAILS
E-502	UTILITY DETAILS
E-503	GROUNDING DETAILS

* COMPLETED BY OTHERS
** REVIEWED AND APPROVED BY STRUCTURAL ENGINEER

11"x17" PLOT WILL BE HALF SCALE UNLESS OTHERWISE NOTED

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.

ENGINEER OF RECORD

EDGE CONSULTING ENGINEERS, INC.
CONTACT: OTTO DINGFELDER III (PE # 49720 (MN))
PHONE: 608.644.1449

STRUCTURAL REVIEW

COMPLETED BY:
EDGE CONSULTING ENGINEERS, INC.
PROJECT #: 15116
DATE: 09/19/2017

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

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

OTTO G. DINGFELDER III
LICENSED PROFESSIONAL ENGINEER
49720
STATE OF MINNESOTA
9/20/2017

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
TITLE SHEET & PROJECT DATA

SHEET NUMBER
G-001

L:\15100\15116 CAD\PDs\CDs\G-001.dgn

GENERAL

THE CONSTRUCTION DRAWINGS AND SPECIFICATIONS ARE INTERRELATED WHEN PERFORMING THE WORK. EACH CONTRACTOR MUST REFER TO ALL DRAWINGS. COORDINATION IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR.

DIVISION 1: GENERAL REQUIREMENTS

SECTION 01700 - PROJECT CLOSEOUT

PART 1 - GENERAL

A. OBTAIN AND SUBMIT RELEASES ENABLING THE OWNER UNRESTRICTED USE OF THE WORK AND ACCESS TO SERVICES AND UTILITIES. INCLUDE OCCUPANCY PERMITS, OPERATING CERTIFICATES, AND SIMILAR RELEASES.

B. SUBMIT RECORD DRAWINGS, DAMAGE, OR SETTLEMENT SURVEY, PROPERTY SURVEY, AND SIMILAR FINAL RECORD INFORMATION.

C. COMPLETE FINAL CLEAN-UP REQUIREMENTS, INCLUDING TOUCH-UP PAINTING. TOUCH-UP AND OTHERWISE REPAIR AND RESTORED MARRED EXPOSED FINISHES.

PART 2 - FINAL CLEANING/PROJECT CLOSEOUT

1. COMPLETE THE FOLLOWING OPERATIONS BEFORE REQUESTING INSPECTION FOR CERTIFICATE OF COMPLETION:

   A. CLEAN THE PROJECT SITE, YARD AND GROUNDS IN AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, INCLUDING LANDSCAPE DEVELOPMENT, AREAS OF RUBBISH, WASTE MATERIALS, LITTER AND FOREIGN SUBSTANCES. SWEEP PAVED AREAS BROOM CLEAN. REMOVE PETRO-CHEMICAL SPILLS, STAINS AND OTHER FOREIGN DEPOSITS. RAKE GROUNDS THAT ARE NEITHER PLANTED NOR PAVED TO A SMOOTH, EVEN-TEXTURED SURFACE.

   B. REMOVE TOOLS, CONSTRUCTION EQUIPMENT, MACHINERY, AND SURPLUS MATERIAL FROM THE SITE.

   C. REMOVE SNOW AND ICE TO PROVIDE SAFE ACCESS TO THE SITE AND EQUIPMENT BUILDING.

   D. CLEAN EXPOSED EXTERIOR AND INTERIOR HARD-SURFACED FINISHES TO A DIRT-FREE CONDITION, FREE OF STAINS, FILMS AND SIMILAR FOREIGN SUBSTANCES. AVOID DISTURBING NATURAL WEATHERING OF EXTERIOR SURFACES.

   E. REMOVE DEBRIS FROM LIMITED ACCESS SPACES, INCLUDING ROOFS, EQUIPMENT BUILDING, MANHOLES AND SIMILAR SPACES.

   F. REMOVE LABELS THAT ARE NOT PERMANENT LABELS.

   G. TOUCH-UP AND OTHERWISE REPAIR AND RESTORE MARRED EXPOSED FINISHES AND SURFACES. REPLACE FINISHES AND SURFACES THAT CAN NOT BE SATISFACTORILY BE REPAIRED OR RESTORED, OR THAT SHOW EVIDENCE OF REPAIR OR RESTORATION. DO NO PAINT OVER "UL" AND SIMILAR LABELS, INCLUDING ELECTRICAL NAME PLATES.

   H. LEAVE THE PROJECT CLEAN AND READY FOR OCCUPANCY.

   I. DUST OFF ALL EQUIPMENT, INCLUDING BATTERY PACKS, WITHIN EQUIPMENT BUILDING.

   J. GENERAL CONTRACTOR TO CLEAN AND APPLY STATIC-FREE WAX TO THE FLOORS ONCE FINAL SHELTER EQUIPMENT AND ACCESSORIES ARE COMPLETED.

2. REMOVAL OF PROTECTION

   REMOVE TEMPORARY PROTECTION AND FACILITIES INSTALLED DURING CONSTRUCTION TO PROTECT PREVIOUSLY COMPLETED INSTALLATIONS DURING THE REMAINDER OF THE CONSTRUCTION PERIOD.

DIVISION 2: SITE WORK

SECTION 02200 - EARTHWORK AND DRAINAGE

PART 1 - GENERAL

1. WORK INCLUDED - SEE SITE PLAN

2. DESCRIPTIONS

   LEASE AREAS AND UNDERGROUND UTILITY EASEMENTS ARE TO BE CONSTRUCTED TO PROVIDE A WELL-DRAINED, EASILY MAINTAINED, EVEN SURFACE.

3. QUALITY ASSURANCE

   A. APPLY SOIL STERILIZER IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS (AS NEEDED).

   B. APPLY AND MAINTAIN GRASS SEED AS RECOMMENDED BY THE SEED PRODUCER (AS NEEDED).

   C. PLACE AND MAINTAIN VEGETATION LANDSCAPING, IF INCLUDED WITHIN THE CONTRACT, AS RECOMMENDED BY NURSERY INDUSTRY STANDARDS.

4. SUBMITTALS

   A. BEFORE CONSTRUCTION
   IF LANDSCAPING IS APPLICABLE TO THE CONTRACT, SUBMIT TWO (2) COPIES OF THE LANDSCAPE PLAN UNDER NURSERY LETTERHEAD. IF LANDSCAPE ALLOWANCE WAS INCLUDED IN THE CONTRACT, PROVIDE AN ITEMIZED LISTING OF PROPOSED COSTS ON NURSERY LETTERHEAD. REFER TO PLANS FOR LANDSCAPING REQUIREMENTS.

   B. AFTER CONSTRUCTION

      1. MANUFACTURER'S DESCRIPTION OF PRODUCT AND WARRANTY STATEMENT ON SOIL STERILIZED.

      2. MANUFACTURER'S DESCRIPTION OF PRODUCT ON GRASS SEED AND FERTILIZER.

      3. LANDSCAPING WARRANTY STATEMENT.

6. WARRANTY

   A. IN ADDITION TO THE WARRANTY ON ALL CONSTRUCTION COVERED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REPAIR ALL DAMAGE AND RESTORE AREA AS CLOSE TO ORIGINAL CONDITION AS POSSIBLE AT SITE AND SURROUNDINGS.

   B. SOIL STERILIZATION APPLICATION TO GUARANTEE VEGETATION FREE ROAD AND SITE AREAS FOR ONE YEAR FOM DATE OF FINAL INSPECTION.

   C. DISTURBED AREAS WILL REFLECT GROWTH OF NEW GRASS PRIOR TO FINAL INSPECTION.

   D. LANDSCAPING, IF INCLUDED WITHIN THE SCOPE OF THE CONTRACT, WILL BE GUARANTEED FOR ONE YEAR FROM THE DATE OF FINAL INSPECTION.

PART 2 - EXECUTION

1. INSPECTIONS

   LOCAL BUILDING INSPECTORS SHALL BE NOTIFIED NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS, UNLESS OTHERWISE SPECIFIED BY THE LOCAL JURISDICTION.

2. PREPARATION

   A. CLEAR TREES, BRUSH AND DEBRIS FROM LEASE AREA AND UNDERGROUND UTILITY EASEMENTS AS REQUIRED FOR CONSTRUCTION.

   B. PRIOR TO OTHER EXCAVATION AND CONSTRUCTION, GRUB ORGANIC MATERIAL TO A MINIMUM OF SIX (6) INCHES BELOW GRADE.

   C. UNLESS OTHERWISE INSTRUCTED BY LEASEE, TRANSPORT ALL REMOVED TREES, BRUSH AND DEBRIS FROM THE PROPERTY TO AN AUTHORIZED LANDFILL.

   D. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, ROLL THE SOIL.

   E. WHERE UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED, LINE THE AREAS WITH A STABILIZED MAT PRIOR TO PLACEMENT OF FILL OR BASE MATERIAL.

   F. PRIOR TO PLACEMENT OF FILL OR BASE MATERIALS, REMOVE SOFT SPOTS, PLACE SELECT FILL, AND COMPACT TO 95% MODIFIED PROCTOR.

3. INSTALLATION

   A. GRADE OR FILL THE LEASE AREA AS REQUIRED IN ORDER THAT UPON DISTRIBUTION OF SPOILS RESULTING FROM EXCAVATIONS, THE RESULTING GRADE WILL CORRESPOND WITH SAID SUB-BASE COURSE. ELEVATIONS ARE TO BE CALCULATED FROM BENCHMARK, FINISHED GRADES, OR INDICATED SLOPES.

   B. CLEAR EXCESS SPOILS, IF ANY, FROM JOB SITE AND DO NOT SPREAD BEYOND THE LIMITS OF PROJECT AREA UNLESS AUTHORIZED BY PROJECT MANAGER AND AGREED TO BY LANDOWNER.

   C. AVOID CREATING DEPRESSIONS WHERE WATER MAY POND.

   D. THE CONTRACT SHALL INCLUDE GRADING, BANKING, AND DITCHING, UNLESS OTHERWISE NOTED.

   E. NO SLOPES ARE TO BE GREATER THAN 3:1.

   F. UNDER NO CIRCUMSTANCES WILL DITCHES, SWALES, OR CULVERTS BE PLACED SO THAT THEY DIRECT WATER TOWARDS, OR PERMIT STANDING WATER IMMEDIATELY ADJACENT TO SHELTER OR EQUIPMENT. IF DESIGNS OR ELEVATIONS ARE IN CONFLICT WITH THIS, ADVISE CONSTRUCTION MANAGER IMMEDIATELY.

   G. APPLY SEED AND FERTILIZER TO SURFACE CONDITIONS WHICH WILL ENCOURAGE ROOTING. RAKE AREAS TO BE SEEDED TO EVEN THE SURFACE AND LOOSEN THE SOIL.

   H. SOW SEED IN TWO DIRECTIONS IN TWICE THE QUANTITY RECOMMENDED BY THE SEED PRODUCER.

   I. ENSURE GROWTH OF SEEDED AND LANDSCAPED AREAS BY WATERING UP TO THE POINT OF RELEASE FROM THE CONTRACT. CONTINUE TO REWORK THE BARE AREAS UNTIL COMPLETE COVERAGE IS OBTAINED.

4. FIELD QUALITY CONTROL

   COMPACT SOILS TO MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D-1557. AREAS OF SETTLEMENT WILL BE EXCAVATED AND REFILLED AT CONTRACTOR'S EXPENSE. INDICATE PERCENTAGE OF COMPACTION ACHIEVED ON AS-BUILT DRAWINGS.

5. PROTECTION

   A. PROTECT SEEDED AREAS FROM EROSION BY SPREADING STRAW TO A UNIFORM LOOSE DEPTH OF 1-2 INCHES, STAKE AND TIE DOWN AS REQUIRED. USE OF EROSION CONTROL MESH OR MULCH NET WILL BE AN ACCEPTABLE ALTERNATE.

   B. ALL TREES PLACED IN CONJUNCTION WITH A LANDSCAPE CONTRACT WILL BE WRAPPED, TIED WITH HOSE PROTECTED WIRE, AND SECURED TO 2" x 2" x 4' - 0" WOODEN STAKES EXTENDING TWO-FEET INTO THE GROUND ON FOUR SIDES OF THE TREE.

   C. PROTECT ALL EXPOSED AREAS AGAINST WASHOUTS AND SOIL EROSION. ALL EROSION CONTROL METHODS SHALL CONFORM TO APPLICABLE BUILDING CODE REQUIREMENTS.

SECTION 02830 - CHAIN-LINK FENCING AND GATE(S)

PART 1 - GENERAL

1. WORK INCLUDED

   SEE PLAN FOR SITE AND LOCATION OF FENCE AND GATE(S).

2. QUALITY ASSURANCE

   ALL STEEL MATERIALS UTILIZED IN CONJUNCTION WITH THIS SPECIFICATION WILL BE GALVANIZED OR STAINLESS STEEL.

3. SUBMITTALS

   A. MANUFACTURER'S DESCRIPTIVE LITERATURE.

   B. CERTIFICATE OR STATEMENT OF COMPLIANCE WITH THE SPECIFICATIONS.

PART 2 - PRODUCTS

1. FENCE MATERIAL

   A. ALL FABRIC WIRE, RAILS, HARDWARE, AND OTHER STEEL MATERIALS SHALL BE HOT-DIPPED GALVANIZED.

   B. FABRIC SHALL BE 9 GAUGE. THE FABRIC SHALL HAVE A KNUCKLED FINISH FOR THE TOP SELVAGES. FABRIC SHALL CONFORM TO THE SPECIFICATIONS OF ASTM A-392 CLASS 1.

   C. BARBED WIRE SHALL BE DOUBLE-STRAND, 12-1/2 GAUGE TWISTED WIRE, WITH 14-GAUGE, 4-POINT ROUND BARBS SPACED ON FIVE (5) INCH CENTERS.

   D. ALL POSTS SHALL BE SCHEDULE - 40 MECHANICAL SERVICE PIPE AND SHALL BE PER ASTM-F1083 AND OF THE FOLLOWING ACTUAL OUTER DIAMETERS:

      LINE: 2.375" O.D. SCHEDULE 40

      CORNER: 2.875" O.D. SCHEDULE 40 (FOR FENCE FABRIC HEIGHT OF 6' OR LESS)
      3.5" O.D. SCHEDULE 40 (FOR FENCE FABRIC HEIGHT OF 8' OR LESS)

      GATE: 4" O.D. SCHEDULE 40

   E. GATE POSTS SHALL BE EXTENDED TWELVE (12) INCHES, INCLUDING DOME CAP, TO PROVIDE FOR ATTACHMENT OF BARBED WIRE.

   F. ALL TOP AND BRACE RAILS SHALL BE 1.66" O.D. SCHEDULE - 40 MECHANICAL- SERVICE PIPE.

   G. GATE FRAMES AND BRACES SHALL BE 1.9" O.D. SCHEDULE 40 MECHANICAL-SERVICE PIPE. FRAMES SHALL HAVE WELDED CORNERS.

   H. GATE FRAMES SHALL HAVE A FULL-HEIGHT VERTICAL BRACE, AND A FULL-WIDTH HORIZONTAL BRACE, SECURED IN PLACE BY USE OF GATE BRACE CLAMPS.

   I. GATE HINGES SHALL BE MERCHANTS METAL MODEL 64386 HINGE ADAPTER WITH MODEL 6409, 180-DEGREE ATTACHMENT.

   J. THE GUIDE (LATCH ASSEMBLY) SHALL BE HEAVY INDUSTRIAL DOUBLE GATE LATCH. SEE DETAIL(S).

   K. LATCHES AND STOPS SHALL BE PROVIDED FOR ALL GATES.

   L. PLUNGER ROD COMPLETE WITH RECEPTOR TO BE PROVIDED AT THE INACTIVE LEAF OF ALL DOUBLE GATE INSTALLATIONS.

   M. ALL STOPS SHALL HAVE KEEPERS CAPABLE OF HOLDING THE GATE LEAF IN THE OPEN POSITION.

   N. A 9 GAUGE ALUMINUM TENSION WIRE SHALL BE USED AT THE BOTTOM OF THE FABRIC, TERMINATED WITH BAND CLIPS AT CORNER AND GATE POSTS.

   O. A SIX (6) INCH BY 1/2 INCH DIAMETER EYEBOLT TO HOLD TENSION WIRE SHALL BE PLACED AT LINE POSTS. (WHEN APPLICABLE)

   P. STRETCHER BARS SHALL BE 3/16 INCH BY 3/4 INCH OR HAVE EQUIVALENT CROSS-SECTIONAL AREA.

   Q. ALL CORNER GATE AND PANELS SHALL HAVE A 3/8 INCH TRUSS ROD WITH TURNBUCKLES.

   R. ALL POSTS EXCEPT GATE POSTS SHALL HAVE A COMBINATION CAP AND BARBED WIRE SUPPORTING ARM. GATE POSTS SHALL HAVE A DOME CAP.

   S. OTHER HARDWARE INCLUDES, BUT MAY NOT BE LIMITED TO, TIE CLIPS, BAND CLIPS AND TENSION BAND CLIPS.

   T. BARBED WIRE GATE GUARDS SHALL BE FITTED WITH DOME CAPS.

   U. BARBED WIRE SUPPORT ARMS SHALL BE PRESSED STEEL COMPLETE WITH SET BOLT AND LOCK WIRE IN THE ARM.

   V. ALL CAPS SHALL BE MALLEABLE IRON, DOME OR ACORN SHAPED AS REQUIRED BY PIPE SIZE.

   W. WHERE THE USE OF CONCERTINA HAS BEEN SPECIFIED, 24-INCH DIAMETERS COIL, BARBED TAPE, STAINLESS STEEL, CYCLONE FENCE MODEL G8P TO TYPE III SHALL BE FURNISHED. IT SHALL BE SUPPORTED ABOVE THE TOP RAIL BY USE OF SIX (6) WIRE BARBED WIRE ARMS POSITIONED ATOP EACH LINE/CORNER POST.

PART 3 - EXECUTION

1. INSPECTION

   TO CONFIRM PROPER DEPTH AND DIAMETER OF POST HOLE EXCAVATIONS. ALL POST HOLES WILL BE EXCAVATED AS PER CONSTRUCTION DOCUMENTS.

2. INSTALLATION

   A. FOUNDATIONS SHALL HAVE A MINIMUM SIX (6) INCH CONCRETE COVER UNDER POST.

   B. ALL FENCE POSTS SHALL BE VERTICALLY PLUMB WITHIN ONE QUARTER (1/4) INCH.

   C. FABRIC SHALL BE TENSIONED PER MANUFACTURER'S RECOMMENDATIONS TO PRESENT A NEAT APPEARANCE.

   D. AT CORNER POSTS, GATE POSTS, AND SIDES OF GATE FRAME, FABRIC SHALL BE ATTACHED WITH STRETCHER AND TENSION BAND-CLIPS AT FIFTEEN (15) INCH INTERVALS.

   E. AT LINE POSTS, FABRIC SHALL BE ATTACHED WITH BAND-CLIPS AT FIFTEEN (15) INCH INTERVALS.

   F. FABRIC SHALL BE ATTACHED TO BRACE RAILS, TENSION WIRE AND TRUSS RODS WITH TIE-CLIPS AT TWO (2) FOOT INTERVALS.

   G. A MAXIMUM GAP OF ONE (1) INCH WILL BE PERMITTED BETWEEN TIE CHAIN LINE FABRIC AND THE FINAL GRADE.

   H. GATE SHALL BE INSTALLED SO LOCKS ARE ACCESSIBLE FROM BOTH SIDES.

   I. GATE HINGE BOLTS SHALL HAVE THEIR THREADS PEENED OR WELDED TO PREVENT UNAUTHORIZED REMOVAL.

   J. GATE POSTS SHALL NOT BE SHARED AS A CORNER POST.

   K. CONCRETE TO BE A MINIMUM OF 3,000 PSI AT 28 DAYS. CEMENT SHALL EXCEED ASTM C150, TYPE IIIA.

3. PROTECTION

   UPON COMPLETION OF ERECTION, INSPECT FENCE MATERIAL AND PAINT FIELD CUTS OR GALVANIZING BREAKS WITH ZINC-BASED PAINT, COLOR TO MATCH THE GALVANIZED METAL.

   APPLICABLE STANDARDS:

   ASTM-A53 SPECIFICATION FOR PIPE, STEEL BLACK AND HOT-DIPPED ZINC COATED (GALVANIZED) WELDED AND SEAMLESS, FOR ORDINARY USES.

   ASTM-A123 ZINC (HOT-DIP GALVANIZED) COATING ON IRON AND STEEL PRODUCTS.

   ASTM-A153 STANDARD SPECIFICATION FOR ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE.

   ASTM-A392 SPECIFICATION FOR ZINC-COATED STEEL CHAIN LINK FENCE FABRIC.

   ASTM-A491 SPECIFICATION FOR ALUMINUM-COATED STEEL CHAIN LINK FENCE FABRIC

   ASTM-A525 STANDARD SPECIFICATION FOR STEEL SHEET ZINC COATED (GALVANIZED) BY THE HOT-DIPPED PROCESS.

   ASTM-A570 SPECIFICATION FOR HOT-ROLLED CARBON STEEL SHEET AND STRIP, STRUCTURAL QUALITY.

   ASTM-A535 SPECIFICATION FOR ALUMINUM COATED STEEL BARBED WIRE. FEDERAL SPECIFICATION RR-F-191- FENCING, WIRE AND POST METAL AND GATES, CHAIN LINK FENCE FABRIC, AND ACCESSORIES.

   ASTM-F1083 SPECIFICATION FOR PIPE, STEEL HOT-DIPPED ZINC-COATED (GALVANIZED) WELDED, FOR FENCE STRUCTURES.

DIVISION 3: CONCRETE

SECTION 03000 - BASIC CONCRETE MATERIALS AND METHODS

PART 1 - GENERAL

1. WORK INCLUDED

   FORMWORK, REINFORCEMENT, ACCESSORIES, CAST-IN-PLACE CONCRETE, FINISHING, AND CURING.

2. INSPECTIONS

   A. CONTRACTOR IS RESPONSIBLE FOR SCHEDULING BUILDING DEPARTMENT INSPECTIONS REQUIRED FOR HIS SCOPE OF WORK.

   B. ALL REINFORCING STEEL SHALL BE INSPECTED AND APPROVED BY THE LESSEE CONSTRUCTION MANAGER PRIOR TO PLACEMENT OF CONCRETE.

   C. THE LESSEE CONSTRUCTION MANAGER SHALL BE NOTIFIED NO LESS THAN 48 HOURS IN ADVANCE OF CONCRETE POURS.

3. QUALITY ASSURANCE

   A. CONSTRUCT AND ERECT CONCRETE FORMWORK IN ACCORDANCE WITH ACI 301 AND ACI 318.

   B. PERFORM CONCRETE REINFORCING WORK IN ACCORDANCE WITH ACI 301, ACI 318, AND ASTM A184.

   C. PERFORM CAST-IN-PLACE CONCRETE WORK IN ACCORDANCE WITH ACI 301, ACI 318, AND ACI 117-90.

   D. OPEN FOUNDATION TRENCHES SHALL BE INSPECTED PRIOR TO CONCRETE INSTALLATION.

4. SUBMITTALS

   SUBMIT CONCRETE MIX AND REINFORCING STEEL SHOP DRAWINGS FOR APPROVAL BY LESSEE CONSTRUCTION MANAGER/ENGINEER. THE SHOP DRAWINGS SHALL BE SUBMITTED IN THE FORM OF TWO (2) CONCRETE MIX DESIGN INFORMATION SHEETS AND TWO (2) BLUELINE DRAWINGS FOR REINFORCING STEEL.

PART 2 - PRODUCTS

1. REINFORCEMENT MATERIALS - EPOXY COATED

   A. REINFORCEMENT STEEL; ASTM A615, 60 KSI YIELD GRADE, DEFORMED BILLET STEEL BARS, PLAIN FINISH.

   B. WELDED STEEL WIRE FABRIC: ASTM A185 PLAIN TYPE, IN FLAT SHEETS, PLAIN FINISH.

   C. CHAIRS, BOLSTERS, BAR SUPPORTS, SPACERS. SIZED AND SHAPED TO SUPPORT REINFORCING.

   D. FABRICATE CONCRETE REINFORCING IN ACCORDANCE WITH ACI 315, ACI 318, ASTM A184.

2. CONCRETE MATERIALS

   A. CEMENT: ASTM C150, PORTLAND TYPE

   B. FINE AND COURSE AGGREGATES: ASTM C33 - MAXIMUM SIZE OF CONCRETE AGGREGATE SHALL NOT EXCEED ONE (1) INCH SIZE SUITABLE FOR INSTALLATION METHOD UTILIZED OR ONE-THIRD (1/3) CLEAR DISTANCE BEHIND OR BETWEEN REINFORCING.

   C. WATER: CLEAN AND NOT DETRIMENTAL TO CONCRETE.

   D. AIR ENTRAINING ADMIXTURE: ASTM C260.

   E. BONDING AGENT: LATEX EMULSION FOR BONDING NEW TO OLD CONCRETE AS MANUFACTURED BY DAYTON SUPERIOR.

   F. NON-SHRINK GROUT: PREMIXED COMPOUND CONSISTING OF NONMETALLIC AGGREGATE. CEMENT, WATER REDUCING AND PLASTICISING AGENTS.

3. CONCRETE MIX

   A. CONCRETE MATERIALS SHALL CONFORM TO THE APPROPRIATE A.C.I. REQUIREMENTS FOR EXPOSED STRUCTURAL CONCRETE.

   B. MIX AND DELIVER CONCRETE IN ACCORDANCE WITH ASTM C94, ALT. 3.

   C. PROPORTIONS OF CONCRETE MATERIALS SHALL BE SUITABLE FOR THE INSTALLATION METHOD UTILIZED AND SHALL RESULT IN DURABLE CONCRETE FOR LOCAL ANTICIPATED AGGRESSIVE ACTIONS. THE DURABILITY REQUIREMENTS OF ACI 318 CHAPTER 4 SHALL BE SATISFIED BASED ON THE CONDITIONS EXPECTED AT THE SITE. PROVIDE CONCRETE AS FOLLOWS:

      1. COMPRESSIVE STRENGTH:
      SIDEWALK: 3000 PSI AT 28 DAYS.
      FOUNDATION: 4500 PSI AT 28 DAYS (MIN. OR AS SPECIFIED IN STRUCTURAL DRAWINGS)

      2. SLUMP: 4 INCHES

      3. AIR ENTRAINMENT: 6%

PART 3 - EXECUTION

1. INSERTS, EMBEDDED COMPONENTS AND OPENINGS

   A. THE CONTRACTOR SHALL COORDINATE AND CROSS-CHECK ARCHITECTURAL, BUILDING & ELECTRICAL DRAWINGS FOR OPENINGS, SLEEVES, ANCHORS, HANGERS, AND OTHER ITEMS RELATED TO CONCRETE WORK AND SHALL ASSUME FULL RESPONSIBILITY FOR THE PROPER LOCATION BEFORE PLACING CONCRETE.

   B. PROVIDE FORMED OPENINGS WHERE REQUIRED FOR WORK TO BE EMBEDDED IN AND PASSING THROUGH CONCRETE MEMBERS.

   C. COORDINATE WORK OF OTHER SECTIONS IN FORMING AND SETTING OPENING, SLOTS, RECESSES, CHASES, SLEEVES, BOLTS, ANCHORS, AND OTHER INSERTS.

   D. INSTALL CONCRETE ACCESSORIES STRAIGHT, LEVEL AND PLUMB.

2. REINFORCEMENT PLACEMENT

   A. PLACE REINFORCEMENT, SUPPORTED AND SECURED AGAINST DISPLACEMENT.

   B. ENSURE REINFORCING IS CLEAN, FREE OF LOOSE SCALE, DIRT, OR OTHER FOREIGN COATINGS.

   C. WELDING IS PROHIBITED ON REINFORCING STEEL AND EMBEDMENTS.

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED - SEE SHEET G-001 FOR ENGINEER SEAL

I HEREBY CERTIFY THAT THIS PLAN, SPECFICATION, 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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

GENERAL SPECIFICATIONS

SHEET NUMBER

G-002

D. MINIMUM CONCRETE COVER FOR REINFORCING SHALL BE THREE (3) INCHES UNLESS OTHERWISE NOTED.

E. CONCRETE COVER FROM TOP OF FOUNDATION TO ENDS OF VERTICAL REINFORCEMENT SHALL NOT EXCEED THREE (3) INCHES NOR BE LESS THAN TWO (2) INCHES.

3. PLACING CONCRETE

A. VIBRATE ALL CONCRETE.

B. ALL CONCRETE WORK SHALL ADHERE TO THE LATEST A.C.I. STANDARDS FOR WINTER POURING AND CURING PROCEDURES IF SEASONAL CONDITIONS APPLY.

4. CURING

A. AFTER PLACEMENT, PROTECT CONCRETE FROM PREMATURE DRYING.

B. MAINTAIN CONCRETE WITH MINIMAL MOISTURE LOSS AT RELATIVELY CONSTANT TEMPERATURE FOR A PERIOD NECESSARY FOR HYDRATION OF CEMENT AND HARDENING OF CONCRETE.

5. PROVIDE HAND RUBBED SMOOTH FINISH TO ALL EXPOSED VERTICAL FORMED CONCRETE SURFACES.

6. FIELD QUALITY CONTROL

A. SUBMIT THREE (3) CONCRETE TEST CYLINDERS - TAKEN FOR EVERY FIFTEEN (15) CUBIC YARD OR LESS. SUBMIT CONCRETE TESTS TO THE PROJECT MANAGER IN ACCORDANCE WITH ASTM , C-31 AND C-39.

B. SUBMIT ONE (1) ADDITIONAL TEST CYLINDER - TAKEN DURING COLD WEATHER POURS, AND CURED ON JOB SITE UNDER SAME CONDITIONS AS CONCRETE IT REPRESENTS.

C. SUBMIT ONE (1) SLUMP TEST - TAKEN FOR EACH SET OF TEST CYLINDERS TAKEN.

7. DEFECTIVE CONCRETE

MODIFY OR REPLACE CONCRETE NOT CONFORMING TO REQUIRED LINES, DETAILS OR ELEVATIONS AT COST OF GC, AS DIRECTED BY ARCHITECT/ENGINEER.

DIVISION 5: METALS

SECTION 05000 - METALS

PART 1 - GENERAL

1. SECTION INCLUDES

STRUCTURAL STEEL FRAMING MEMBERS, BASE PLATES, PLATES, BARS AND GROUTING UNDER BASE PLATES.

2. SUBMITTALS

SHOP DRAWINGS: INDICATE SIZES, SPACING, AND LOCATIONS OF STRUCTURAL MEMBERS, OPENINGS, CONNECTIONS, CAMBERS.

3. QUALITY ASSURANCE

A. FABRICATE STRUCTURAL STEEL MEMBERS IN ACCORDANCE WITH AISC SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS.

B. PERFORM DESIGN UNDER DIRECT SUPERVISION OF A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE.

PART 2 - PRODUCTS

1. MATERIALS:

A. STRUCTURAL STEEL MEMBERS:	ASTM A572, GRADE 50
B. STRUCTURAL TUBING:	ASTM A500, GRADE B
C. PIPE:	ASTM A53, TYPE E OR S, GRADE B
D. BOLTS, NUTS, AND WASHERS:	ASTM A325
E. ANCHOR BOLTS:	ASTM A307
F. WELDING MATERIALS:	AWS D1.1, TYPE REQUIRED FOR MATERIALS BEING WELDED
G. GROUT:	NON-SHRINK TYPE, PREMIXED COMPOUND CONSISTING OF NONMETALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICISING ADDITIVES, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 7000 PSI AT 28 DAYS.
H. SHOP AND TOUCH-UP PRIMER:	SSPC 15, TYPE 1, RED OXIDE
I. TOUCH-UP PRIMER FOR GALV. SURFACES:	ZINC RICH TYPE

2. FABRICATION: CONTINUOUSLY SEAL JOINTED MEMBERS BY CONTINUOUS WELDS. GRIND EXPOSED WELDS SMOOTH.

3. FINISH

A. PREPARE STRUCTURAL COMPONENT SURFACES IN ACCORDANCE WITH SSPC SP-1 TO SP-10 PROCEDURES.

B. STRUCTURAL STEEL MEMBERS SHALL BE HOT DIPPED GALVANIZED.

PART 3 - EXECUTION

1. EXAMINATION AND PREPARATION

VERIFY THAT THE FIELD CONDITIONS ARE ACCEPTABLE.

2. ERECTION:

A. ALLOW FOR ERECTION LOADS. PROVIDE TEMPORARY BRACING TO MAINTAIN FRAMING IN ALIGNMENT UNTIL COMPLETION OF ERECTION AND INSTALLATION OF PERMANENT BRIDGING AND BRACING.

B. FIELD WELD COMPONENTS INDICATED ON SHOP DRAWINGS.

C. DO NOT FIELD CUT OR ALTER STRUCTURAL MEMBERS WITHOUT APPROVAL OF THE ARCHITECT/ENGINEER.

D. AFTER ERECTION, TOUCH-UP WELDS, ABRASIONS, AND SURFACES NOT SHOP PRIMED OR GALVANIZED WITH TOUCH-UP PRIMERS AS SPECIFIED UNDER SECTION 05000 - METALS, PART 2 - PRODUCTS, H & I. SURFACES TO BE IN CONTACT WITH CONCRETE NOT INCLUDED.

3. FIELD QUALITY CONTROL

FIELD INSPECTION OF MEMBERS, CONNECTIONS, WELDS AND TORQUING.

DIVISION 16: ELECTRICAL

SECTION 16050 - BASIC ELECTRICAL MATERIALS AND METHODS

1. CONTRACTOR SHALL REVIEW THE CONTRACT DOCUMENTS PRIOR TO ORDERING THE ELECTRICAL EQUIPMENT AND STARTING THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT/ENGINEER LISTING ANY DISCREPANCIES OR CONFLICTING INFORMATION.

2. ELECTRICAL PLANS, DETAILS AND DIAGRAMS ARE DIAGRAMMATIC ONLY. VERIFY EXACT LOCATIONS AND MOUNTING HEIGHTS OF ELECTRICAL EQUIPMENT WITH OWNER PRIOR TO INSTALLATION.

3. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANELBOARD, PULLBOX, JUNCTION BOX, SWITCH BOX, ETC. THE TYPE OF TAGGING METHODS SHALL BE IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A.).

4. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN GOOD WORKING 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 "U" WHERE APPLICABLE. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA, NBFU AND "UL" LISTED.

5. ALL CONDUIT SHALL HAVE A PULL CORD.

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

7. 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.

8. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY UBC, NEC AND ALL APPLICABLE CODES.

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

10. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD-8 LIFT COVERPLATES.

SECTION 16400 - SERVICE AND DISTRIBUTION

1. WIRE AND CABLE CONDUCTORS SHALL BE COPPER, 600V, TYPE THHN OR THWN, WITH A MIN. SIZE OF #12 AWG, COLOR CODED. ALL RECTIFIER DROPS SHALL BE STRANDED TO ACCEPT CRIMP CONNECTORS.

2. ALL CHEMICAL GROUND RODS SHALL BE "UL" APPROVED.

3. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS. MANUFACTURED BY MILBANK

4. CONDUIT

A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH GALVANIZED 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.

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. ALL FLEXIBLE CONDUITS SHALL HAVE FULL LENGTH GROUND WIRE.

D. ALL UNDERGROUND CONDUIT SHALL BE AS NOTED ON THE DRAWINGS AT A MINIMUM DEPTH OF 42" BELOW GRADE. IT IS REQUIRED AND WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO NOTIFY THE STATE "ONE-CALL" SYSTEM AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO DIGGING OR AS REQUIRED BY LOCATOR.

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

6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS WITH WHITE ON BLUE BACKGROUND LETTERING (MINIMUM LETTER HEIGHT SHALL BE 1/4-INCH). NAMEPLATES SHALL BE FASTENED WITH STAINLESS STEEL SCREWS, NOT ADHESIVE.

7. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL POTENTIAL GROUNDING TESTS BY AN INDEPENDENT TESTING SERVICE ENGAGED BY THE CONTRACTOR. SUBMIT TEST REPORTS TO PROJECT MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.

8. GROUNDING ELECTRODE SYSTEM

A. PREPARATION

1. SURFACE PREPARATION ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FIELD INSPECTED AND MODIFIED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A AGENT APPLIED PRIOR TO INSTALLATION.

2. GROUND BAR PREPARATION ALL COPPER GROUND BARS SHALL BE CLEANED, POLISHED AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.

3. SLEEVES ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.

B. GROUND BARS

1. ALL GROUND BARS SHALL BE 1/4-INCH THICK TINNED COPPER PLATE AND OF SIZE INDICATED ON DRAWINGS.
2. ALL CONNECTIONS TO THE GROUND BAR SHALL OBSERVE THE FOLLOWING SEQUENCE
   A. BOLT-HEAD
   B. 2-HOLE LUG
   C. TINNED COPPER BUSS BAR
   D. STAR WASHER
   E. NUT

C. EXTERNAL CONNECTIONS

1. ALL BURIED GROUNDING CONNECTIONS SHALL BE MADE BY THE EXOTHERMIC WELD PROCESS. CONNECTIONS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, TEES, CROSSES, ETC. ALL CABLE TO GROUND RODS, GROUND ROD SPLICES AND LIGHTNING PROTECTION SYSTEMS ARE TO BE AS INDICATED. ALL MATERIALS USED (MOLDS, WELDING METAL, TOOLS, ETC.) SHALL BE BY "CADWELD" AND INSTALLED PER MANUFACTURER'S RECOMMENDED PROCEDURES.

2. ALL ABOVE GRADE GROUNDING AND BONDING CONDUCTORS SHALL BE CONNECTED BY TWO HOLE CRIMP TYPE (COMPRESSION) CONNECTIONS (EXCEPT FOR THE ACEG AND GROUND ROD) MECHANICAL CONNECTIONS, FITTINGS OR CONNECTIONS THAT DEPEND SOLELY ON SOLDER SHALL NOT BE USED. ALL CABLE TO CABLE CONNECTIONS SHALL BE HIGH PRESSURE DOUBLE CRIMP TYPE CONNECTIONS.

D. GROUND RODS ALL GROUND RODS SHALL BE 5/8-INCH DIAMETER x 10'-0" LONG "COPPERWELD" OR APPROVED EQUAL, OF THE NUMBER AND LOCATIONS INDICATED. GROUND RODS SHALL BE DRIVEN FULL LENGTH VERTICAL IN UNDISTURBED EARTH.

E. GROUND CONDUCTORS

ALL GROUND CONDUCTORS SHALL BE STANDARD TINNED SOLID BARE COPPER ANNEALED, AND OF SIZE INDICATED ON DRAWINGS UNLESS NOTED OTHERWISE.

F. LUGS

1. LUGS SHALL BE 2-HOLE, LONG BARREL, STRAND COPPER UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS. LUGS SHALL BE THOMAS AND BETTS SERIES #548 OR EQUIVALENT
   BENDING.

A.	535 MCM DLO	54880BE
B.	262 MCM DLO	54872BE
C.	#1/0 DLO	54862BE
D.	#4/0 THWN AND BARE	54866BE
E.	#2/0 THWN	54862BE
F.	#2 THHN	54207BE
G.	#6 DLO	54205BE

2. WHEN THE DIRECTION OF THE CONDUCTOR MUST CHANGE, IT SHALL BE DONE GRADUALLY. THE CURVATURE OF THE TURN SHALL BE DONE IN ACCORDANCE WITH THE FOLLOWING CHART:

GROUNDING CONDUCTOR SIZE	RADIUS TO INSIDE EDGE
NO. 6 AWG TO NO. 4 AWG	6 INCHES
NO. 2 AWG TO NO. 1/0 AWG	8 INCHES
NO. 2/0 AWG TO 4/0 MCM	12 INCHES
250 MCM TO 750 MCM	24 INCHES

G. GROUND RING

1. THE EXTERNAL GROUND RING ENCIRCLING THE TOWER/POLE (IF APPLICABLE) AND THE EQUIPMENT SHELTER SHALL BE MINIMUM NO. 2 A.W.G. SOLID TINNED BARE COPPER CONDUCTOR IN DIRECT CONTACT WITH THE EARTH AT THE DEPTH INDICATED ON THE DRAWINGS. CONDUCTOR BENDS SHALL HAVE A MINIMUM BENDING RADIUS OF EIGHT (8) INCHES.

2. ALL EXTERNAL GROUND RINGS ARE TO BE JOINED TOGETHER AND ALL CONNECTIONS MUST BE CADWELDED. NO LUGS OR CLAMPS WILL BE ACCEPTED.

H. FENCE/GATE (IF APPLICABLE)
GROUND EACH GATE POST, CORNER POST AND GATE AS INDICATED ON THE DRAWINGS. GROUND CONNECTIONS TO FENCE POSTS AND ALL OTHER CONNECTIONS FOR THE GROUND GRID SYSTEM SHALL BE MADE BY EXOTHERMIC WELD PROCESS, AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND PROCEDURES, AND SPRAYED WITH COLD-GALVANIZED PAINT.

THIS SPACE INTENTIONALLY LEFT BLANK

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

GENERAL SPECIFICATIONS

SHEET NUMBER

G-003

L:\15100\15116\CAD\Plot\CDs\G-003.dgn

SECTION 01 1000 SUMMARY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. LOCATION OF THE WORK.

B. SUMMARY OF THE WORK.

C. COMPLIANCE WITH CODES, RULES AND REGULATIONS.

D. CONSTRUCTION SCHEDULE MILESTONES AND COORDINATION.

E. CONSTRUCTION SEQUENCING LIMITATIONS

F. SITE SEQUENCING LIMITATIONS.

G. LIMITS OF CONSTRUCTION, LIMITS OF RIGHTS-OF-WAY, RIGHTS-OF-WAY EASEMENTS.

H. COORDINATION WITH THE COUNCIL.

I. CONTRACTOR'S ACCESS TO THE SITE.

J. CONTRACTOR'S USE OF THE SITE.

K. SITE ACCESS BY OTHERS.

L. TRAINING

M. CONTRACTOR EMERGENCY RESPONSE

N. PRE-CONSTRUCTION MEETING SUBMITTALS.

O. SUBSTANTIAL COMPLETION.

P. FINAL COMPLETION.

Q. LIQUIDATED DAMAGES.

1.2 SUMMARY OF THE WORK

A. THE WORK FOR THIS PROJECT INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. CONTRACTOR SHALL PROTECT PLATFORM AND TRACK.

2. CONTRACTOR SHALL PROVIDE CONCRETE TOPPING.

3. CONTRACTOR SHALL PROVIDE A QUALIFIED INDEPENDENT TESTING AGENCY TO PERFORM MATERIAL EVALUATION TESTS.

4. CONTRACTOR SHALL CLEAN AND SWEEP PLATFORM CLEAR OF DEBRIS BEFORE PUBLIC USE.

5. CONTRACTOR /INSTALLER SHALL COORDINATE WORK WITH THE COUNCIL'S AUTHORIZED REPRESENTATIVE (CAR).

6. CONTRACTOR SHALL COORDINATE PROJECT SCHEDULE AND TIMING WITH CAR. INTENT IS TO MINIMIZE DISRUPTION OF TRANSIT PATRONS AND TO WORK DURING SCHEDULED SHUTDOWN DATES.

B. THE CONTRACTOR IS NOT ALLOWED TO USE ANY PERSONAL ELECTRONIC DEVICE WHEN WITHIN THE HIAWATHA LIGHT RAIL RIGHT-OF-WAY. THE RIGHT-OF-WAY IS DEFINED AS 12 FEET FROM ANY TRACK. CONTRACTORS AND EMPLOYEES WHO HAVE A WORK CELL PHONE MAY HAVE IT ON, BUT MAY NOT ACKNOWLEDGE OR ANSWER IT WHILE FOULING ANY TRACK; THEY MUST STEP OUT OF THE RIGHT-OF-WAY TO USE THE DEVICE.

1.3 COMPLIANCE WITH CODES, RULES AND REGULATIONS

A. ALL WORK MUST COMPLY AND BE ACCOMPLISHED WITH ALL FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS INCLUDING, BUT NOT LIMITED TO OSHA REGULATIONS 29CFR1910, 29CFR1926 IDENTIFIED IN THESE CONTRACT DOCUMENTS AND ALL APPLICABLE CODES, RULES AND REGULATIONS OF ALL LOCAL, STATE AND FEDERAL REGULATION AGENCIES.

B. CONTRACTOR SHALL FURNISH THE NAME AND CONTACT INFORMATION FOR THE CONTRACTOR'S DESIGNATED COMPETENT PERSON TO THE CAR.

1.4 CONSTRUCTION SCHEDULE MILESTONES COORDINATION

A. CONTRACTOR SHALL COMPLETE THE MAJORITY OF THE WORK ASSOCIATED WITH THE INSTALLATION OF THE RAILING FROM THE SIDEWALK SIDE OF THE CURB. PEDESTRIAN ACCESS MUST BE MAINTAINED WHILE UNDER CONSTRUCTION. THE CONTRACTOR SHALL COORDINATE WITH CAR TO WORK BETWEEN 12-4 AM (MONDAY FRIDAY) TO ACCESS THE TRACK SIDE OF THE CURB DURING INSTALLATION. ALL REQUESTS MUST BE APPROVED BY THE CAR.

A. THE CATENARY SYSTEM WILL REMAIN ELECTRIFIED. THE CONTRACTOR WILL NOT BE ALLOWED TO USE ANY EQUIPMENT THAT CAN POTENTIALLY BE WITHIN 10' OF THE POWER LINES.

B. ALL WORK MUST ALSO BE SCHEDULED WITH THE CAR SO THAT METRO TRANSIT CAN SCHEDULE A DESIGNATED LOOKOUT DURING CONSTRUCTION ACTIVITIES. WORK MUST NOT AFFECT METRO TRANSIT OPERATIONS.

B. IN ADDITION TO THE SUBSTANTIAL COMPLETION DATE AND THE FULL AND FINAL COMPLETION DATE IDENTIFIED IN DOCUMENT 00520 CONTRACT AGREEMENT, THE FOLLOWING CONSTRUCTION SCHEDULE DATES ARE PROVIDED FOR INFORMATION. THE SUBSTANTIAL AND FINAL COMPLETION MILESTONES WHICH MUST BE MET BY THIS CONTRACTOR ARE NOTED:

A. FAILURE TO COMPLY WITH THE MILESTONE DATES INDICATED ABOVE MAY RESULT IN LIQUIDATED DAMAGES AS DETAILED IN DOCUMENT 00520 CONTRACT AGREEMENT.

B. THE CONSTRUCTION SCHEDULE MILESTONES IDENTIFIED ABOVE MUST BE REFLECTED IN THE CONTRACTOR'S PROJECT SCHEDULE.

1.5 CONSTRUCTION SEQUENCING LIMITATIONS

A. IN ORDER FOR THE COUNCIL AND/OR THE OWNER OF THE SITE TO CONTINUE TO PROVIDE A LEVEL OF SERVICE SUFFICIENT TO MEET THE NEEDS OF THE PUBLIC, THE CONTRACTOR MUST ADHERE TO THE FOLLOWING CONSTRUCTION SEQUENCING CONSTRAINTS:

1. WORK ALONG THE BLUE LINE CAN OCCUR 24 HOURS A DAY, WITHIN THE GUIDELINES OUTLINED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR COMPLYING WITH ALL LOCAL, STATE AND FEDERAL CODES, STATUTES, AND REGULATIONS.

2. CONTRACTOR SHALL PLAN FOR AND PERFORM ALL WORK IN A MANNER WHICH LIMITS IMPACT TO METRO TRANSIT RAIL OPERATIONS, BUSSING OPERATIONS, AND ACTIVE PLATFORMS, AND ABIDES BY ALL METRO TRANSIT RAIL SAFETY REQUIREMENTS.

3. ALL WORK PERFORMED WITHIN THE COUNCIL RIGHT-OF-WAY WILL REQUIRE WORK RESTRICTIONS AND SPECIFIC SAFETY MEASURES. SPECIFIC REQUIREMENTS SHALL BE AS FOLLOWS:

A. RAIL WORK ZONES: WORK THAT HAS THE POTENTIAL TO DELAY OR PREVENT THE SAFE PASSAGE OF A TRAIN MAY REQUIRE A WORK ZONE. THE PRIMARY PURPOSE OF A WORK ZONE IS TO PUT PERSONNEL AND SAFETY MEASURES IN PLACE AT THE LOCATION OF SIGNIFICANT CONSTRUCTION ACTIVITIES WHICH COULD LIKELY FOUL THE TRACK AND PREVENT THE SAFE PASSAGE OF A TRAIN. WORK ZONES WILL BE SET UP AND STAFFED BY METRO TRANSIT PERSONNEL (MOVEMENT COORDINATORS) AT NO COST TO THE CONTRACTOR. CONTRACTOR MUST OBEY ALL DIRECTION GIVEN BY THE MOVEMENT COORDINATORS. THE DATES FOR WORK ZONES MUST BE COORDINATED WITH AND APPROVED BY THE CAR. CONTRACTOR SHALL COMMUNICATE THE NEED FOR A WORK ZONE IN WRITING TO THE CAR AND RAIL OPERATIONS IN WRITING AT LEAST SEVEN (7) DAYS PRIOR TO THE DATE THE WORK ZONE IS NEEDED. WORK REQUIRING A WORK ZONE THAT IS ATTEMPTED WITHOUT A WORK ZONE BEING ESTABLISHED WILL BE IMMEDIATELY STOPPED AT NO COST TO THE COUNCIL OR CHANGE IN PROJECT SCHEDULE REQUIREMENTS. SEE PARAGRAPH 1.7.A.4 OF THIS SPECIFICATION SECTION FOR APPROXIMATE TRAIN HEADWAY TIMES.

B. CONSTRUCTION ACTIVITIES WITHIN 12' OF CL RAIL (NO BARRIER): FOR CONSTRUCTION ACTIVITIES WITHIN 12' OF THE CL RAIL WHICH CAN BE MOMENTARILY STOPPED TO ALLOW SAFE TRAIN PASSAGE, NO WORK ZONE IS REQUIRED. IN THIS SITUATION, WHEN WORKING WITHOUT A BARRIER BETWEEN THE CONSTRUCTION ACTIVITY AND THE TRACKS, A DESIGNATED LOOK OUT (DLO) WILL BE REQUIRED TO MONITOR THE WORK BEING PERFORMED AND POTENTIALLY BE IN CONTACT VIA RADIO WITH THE RAIL CONTROL CENTER. THE DLO SHALL BE THE CONTRACTOR'S EMPLOYEE AND SHALL HAVE BEEN TRAINED BY METRO TRANSIT TO PERFORM AS A DLO. THE DLO MUST BE CAPABLE OF MONITORING ALL CONSTRUCTION ACTIVITIES WITHIN 12'OF THE CL OF RAIL, TO MAKE SURE THOSE ACTIVITIES WILL NOT IMPACT ACTIVE RAIL WHEN A TRAIN IS APPROACHING, AND DIRECTING THE CONSTRUCTION ACTIVITIES TO CEASE OR MOVE, AS APPROPRIATE. THE DLO SHALL NOT PERFORM CONSTRUCTION ACTIVITIES WHILE IN SERVING AS A DLO. THE COST FOR PROVIDING THE DLO IS TO BE INCLUDED IN THE CONTRACTOR'S BASE BID. SEE PARAGRAPH 1.7.A.4 OF THIS SPECIFICATION SECTION FOR APPROXIMATE TRAIN HEADWAY TIMES.

C. CONSTRUCTION ACTIVITIES WITHIN 12' OF CL OF RAIL (WITH BARRIER): FOR CONSTRUCTION ACTIVITIES THAT CANNOT FOUL THE TRACK, OR WHEN A CONSTRUCTION FENCE CAN BE ESTABLISHED BETWEEN THE TRACKS AND THE CONSTRUCTION ZONE, A DESIGNATED LOOK OUT (DLO) IS NOT REQUIRED. CONTRACTOR SHALL BE AWARE THAT THE USE OF EQUIPMENT WHICH COULD REACH OR FALL OVER THE FENCE, FOULING THE TRACK, WILL REQUIRE THE USE OF A DLO.

4. CONTRACTOR SHALL ASSUME THE FOLLOWING APPROXIMATE TRAIN HEADWAYS WILL BE MAINTAINED AT ALL TIMES WHEN TRACK IS IN OPERATION. IT SHOULD BE NOTED THAT THESE HEADWAYS WILL BE MAINTAINED FOR BOTH TRACKS, THOUGH TRAINS MAY PASS AT DIFFERENT TIMES. THE TIMES (IN MILITARY TIME) ARE AS FOLLOWS:

BLUE LINE:

HEADWAY	TIME PERIOD
5 Minutes	0400 - 1930
7 Minutes	1930 - 2245
15 Minutes	2245 - 0100
60 Minutes	0100 – 0210 0300 on Friday and Saturday Only

GREEN LINE

HEADWAY Westbound	TIME PERIOD
16-20 Minutes	0300 - 0500
10 Minutes	0500 - 2100
6 trains anywhere from 12 minutes to 29 minutes	2100 - 0015
60 Minutes	0015 - 0300
HEADWAY Eastbound	**TIME PERIOD**
30 Minutes	0445-0550
12-20 Minutes	0550-0654
10 Minutes 15 Minutes	0654-2237 2237-0034
20 Minutes	0054 0200
60 Minutes	0200-0400

5. NIGHT TIME WORK RESTRICTIONS: IT WILL BE NECESSARY FOR CERTAIN WORK ACTIVITIES TO BE PERFORMED AT NIGHT, WHEN THE LIGHT RAIL IS NOT ACTIVE. IT IS ANTICIPATED THAT CONSTRUCTION ACTIVITIES HAVING SIGNIFICANT IMPACT TO RAIL OPERATIONS WHICH CANNOT BE PERFORMED DURING THE DAY WILL BE PERFORMED AT NIGHT. CONTRACTOR SHALL NOTIFY CAR IN WRITING SEVEN (7) DAYS PRIOR TO WORKING DURING THE NIGHT.

6. FOR ACTIVITIES REQUIRING LIGHT RAIL VEHICLE (LRV) CLEARANCE TESTS (EG. TACTILE WARNING EDGE), CONTRACTOR SHALL CONTACT METRO TRANSIT RAIL OPERATIONS A MINIMUM OF 1 HOUR PRIOR TO CLEARANCE TESTS. CONTRACTOR SHALL COORDINATE AND SCHEDULE THE CLEARANCE TEST WITH THE CAR. ADDITIONAL WEEKEND CLOSURES WILL INCUR LIQUIDATED DAMAGES, AND WILL ONLY BE ALLOWED UPON APPROVAL OF THE COUNCIL. SEE PARAGRAPH 1.19 FOR LIQUIDATED DAMAGES.

7. EXISTING UTILITY INTERRUPTIONS: DO NOT INTERRUPT ANY UTILITIES UNLESS PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER PROVIDING TEMPORARY UTILITY SERVICES ACCORDING TO REQUIREMENTS INDICATED:

A. NOTIFY CAR NOT LESS THAN TWO DAYS IN ADVANCE OF PROPOSED UTILITY INTERRUPTIONS.

B. OBTAIN CAR'S WRITTEN PERMISSION BEFORE PROCEEDING WITH UTILITY INTERRUPTIONS.

C. NOTIFY NECESSARY LOCAL PUBLIC AGENCIES OF ANTICIPATED IMPACT TO UTILITIES, AND OBTAIN ALL REQUIRED PERMITS.

D. OBTAIN WRITTEN PERMISSION FOR THE INTERRUPTION FROM THE UTILITY OWNER.

8. NOISE, VIBRATION, DUST, AND ODORS: COORDINATE OPERATIONS THAT MAY RESULT IN HIGH LEVELS OF NOISE AND VIBRATION, ODORS, OR OTHER DISRUPTION WITH THE CAR.

A. NOTIFY THE CAR NOT LESS THAN TWO DAYS IN ADVANCE OF PROPOSED DISRUPTIVE OPERATIONS.

B. NOTIFY THE CAR NOT LESS THAN TWO DAYS IN ADVANCE OF PROPOSED DISRUPTIVE OPERATIONS.

9. SMOKING IS NOT PERMITTED WITHIN 100' OF ALL LIGHT RAIL PLATFORMS. ALL CONTRACTOR PERSONNEL SHALL FOLLOW COUNCIL REQUIREMENTS AND LOCAL MUNICIPAL LAWS REGARDING SMOKING.

10. THE CONTRACTOR AND ALL ITS SUBCONTRACTORS THAT WILL BE WORKING ON THE RIGHT-OF-WAY ARE REQUIRED TO APPLY FOR A WEEKLY TRACK ACCESS PERMIT BY NOON ON THE THURSDAY PROCEEDING THE WEEK THE WORK WILL BE PERFORMED. THIS IS A FREE PERMIT ISSUED BY METRO TRANSIT. CONTACT JACOB ROONEY AT 612-341-5687 TO APPLY FOR THIS PERMIT.

B. THE CONTRACTOR SHALL ARRANGE ITS CONSTRUCTION SCHEDULE AND MEANS, METHODS, AND TECHNIQUES TO ENSURE THAT THE SITE SEQUENCING LIMITATIONS, THE IDENTIFIED MILESTONE DATES, THE SUBSTANTIAL COMPLETION DATE, AND THE FULL AND FINAL COMPLETION DATE ARE ADHERED TO.

C. THE CONTRACTOR SHALL MEET WITH THE CAR AND OTHER COUNCIL REPRESENTATIVES, AS NECESSARY, TO DISCUSS SITE LIMITATIONS AND SEQUENCING LIMITATIONS TO ENSURE THE SITE IS KEPT AVAILABLE AND ACCESSIBLE AS NEEDED.

D. THE SITE SEQUENCING LIMITATIONS IDENTIFIED ABOVE MUST BE REFLECTED IN THE CONTRACTOR'S PROJECT SCHEDULE.

1.6 SITE SEQUENCING LIMITATIONS

A. VARIOUS PORTIONS OF THE SITE MUST BE KEPT AVAILABLE AND ACCESSIBLE TO THE OWNER OF THE SITE, THE PUBLIC, AND/OR THE COUNCIL AT ALL TIMES AS DETAILED FOLLOWING:

1. GENERAL: CONTRACTOR SHALL HAVE LIMITED USE OF PROJECT SITE FOR CONSTRUCTION OPERATIONS AS INDICATED BY REQUIREMENTS OF THIS SECTION.

2. DRIVEWAYS, WALKWAYS, SIDEWALKS AND ENTRANCES: KEEP DRIVEWAYS, SIDEWALKS, WALKWAYS, AND ENTRANCES SERVING ADJACENT PREMISES CLEAR AND AVAILABLE TO THE GENERAL PUBLIC, THE PARTICULAR PROPERTY OWNERS, AND EMERGENCY VEHICLES AT ALL TIMES. DO NOT USE THESE AREAS FOR PARKING OR STORAGE OF MATERIALS, UNLESS APPROVED BY THE CAR.

3. SCHEDULE DELIVERIES TO MINIMIZE USE OF DRIVEWAYS, SIDEWALKS, ROADWAYS, AND ENTRANCES BY CONSTRUCTION OPERATIONS.

4. SCHEDULE DELIVERIES TO MINIMIZE SPACE AND TIME REQUIREMENTS FOR STORAGE OF MATERIALS AND EQUIPMENT ON-SITE.

5. ALL ONSITE CONSTRUCTION MATERIALS AND EQUIPMENT LEFT OVERNIGHT WITHOUT SUPERVISION SHALL BE KEPT INSIDE THE FENCED CONSTRUCTION STAGING AREA. CONTRACTOR SHALL NOT STORE MATERIALS WITHIN 10 FEET OF THE CL OF TRACKS.

6. ALL DELIVERIES AND REMOVAL ACTIVITIES FROM THE SITE WILL NEED TO DIRECT TRAFFIC. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY FLAGGING AND TRAFFIC CONTROL.

7. ONLY ONE PLATFORM ACCESS MAY BE CLOSED AT ANY TIME DURING WORK THAT DOES NOT OCCUR DURING STATION SHUT DOWN. COORDINATE CLOSURES WITH THE CAR.

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED - SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
METRO TRANSIT SITE REQUIREMENTS

SHEET NUMBER
G-004

CASE FILE #PL201700223

B. THE CONTRACTOR SHALL ARRANGE ITS CONSTRUCTION SCHEDULE AND MEANS, METHODS, AND TECHNIQUES TO ENSURE THAT THE SITE SEQUENCING LIMITATIONS, THE IDENTIFIED MILESTONE DATES, THE SUBSTANTIAL COMPLETION DATE, AND THE FULL AND FINAL COMPLETION DATE ARE ADHERED TO.

C. THE CONTRACTOR SHALL MEET WITH THE CAR AND OTHER COUNCIL REPRESENTATIVES, AS NECESSARY, TO DISCUSS SITE LIMITATIONS AND SEQUENCING LIMITATIONS TO ENSURE THE SITE IS KEPT AVAILABLE AND ACCESSIBLE AS NEEDED.

D. THE SITE SEQUENCING LIMITATIONS IDENTIFIED ABOVE MUST BE REFLECTED IN THE CONTRACTOR'S PROJECT SCHEDULE.

1.7 LIMITS OF CONSTRUCTION; LIMITS OF RIGHTS-OF-WAY; EASEMENTS

A. THE LIMITS OF CONSTRUCTION, THE LIMITS OF RIGHTS-OF-WAY, AND THE LIMITS OF CONSTRUCTION EASEMENTS AND TEMPORARY EASEMENTS SHALL BE COORDINATED WITH THE CAR AT THE SITE SEQUENCING MEETINGS.

1.8 COORDINATION WITH THE COUNCIL

A. THE CONTRACTOR SHALL COOPERATE FULLY WITH COUNCIL STAFF WHEN WORKING ON EXISTING COUNCIL FACILITIES.

B. THE CONTRACTOR SHALL COORDINATE ALL WORK AND ACTIONS WITH THE CAR.

C. NOTIFY CAR OF WORK AFFECTING THE OPERATION OF EXISTING FACILITIES PRIOR TO ITS START. DO NOT BEGIN THIS WORK WITHOUT CAR'S AUTHORIZATION.

D. THE CONTRACTOR SHALL COORDINATE ACTIVITIES WITH THE COUNCIL TO ENSURE THAT THE COUNCIL'S CONCERNS REGARDING ACCESS, LANE CLOSURES, EGRESS, CONSTRUCTION SCHEDULES, AND OTHER MATTERS OF IMPORTANCE TO THE COUNCIL ARE ACCOUNTED FOR DURING THE DURATION OF THE PROJECT.

1.9 CONTRACTOR'S ACCESS TO THE SITE

A. ACCESS TO THE SITE FOR THE CONTRACTOR, ITS SUB-CONTRACTORS, VENDORS, MATERIALS SUPPLIERS, AND OTHERS PROVIDING GOODS OR LABOR FOR THIS PROJECT, SHALL BE ONLY WHERE COORDINATED WITH THE CAR.

B. CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENFORCEMENT OF THIS REQUIREMENT.

C. CONTRACTOR MAY ESTABLISH OTHER ACCESS/EGRESS POINTS TO THE SITE UPON WRITTEN APPROVAL FROM THE CAR.

1.10 CONTRACTOR'S USE OF THE SITE

A. DO NOT INTERRUPT ANY EXISTING OPERATION EXCEPT AS AUTHORIZED BY THE CAR.

B. CONFINE WORK OPERATIONS TO AREAS PERMITTED UNDER THE CONTRACT.

C. KEEP EXISTING DRIVEWAYS, SIDEWALKS AND ENTRANCES CLEAR AND AVAILABLE EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT DOCUMENTS.

D. LOCATE STAGING AREAS, PRODUCT STOCKPILES AND TEMPORARY FACILITIES IN AREAS APPROVED BY THE CAR.

E. IF ADDITIONAL SPACE IS NEEDED FOR STAGING AREAS, PRODUCT STOCKPILES, MATERIALS STORAGE, AND/OR TEMPORARY FACILITIES, THE CONTRACTOR SHALL OBTAIN AND PAY FOR SUCH SPACE OFF SITE.

F. DO NOT PERMIT CONTRACTOR'S OR SUBCONTRACTORS' EMPLOYEES TO RESIDE AT THE PROJECT SITE.

G. CONTRACTOR'S AND SUBCONTRACTORS' EMPLOYEES SHALL PARK ONLY IN AREAS DESIGNATED BY THE CAR. CONTRACTOR'S AND SUBCONTRACTORS' EMPLOYEES ARE RESPONSIBLE FOR FULLY COMPLYING WITH ALL LAWS WHEN PARKING OFF SITE.

H. CONTRACTOR WILL BE ALLOWED TO MOBILIZE ON THE EMBEDDED TRACK SECTION AS NEEDED FOR OPERATIONS AND AS APPROVED BY CAR.

I. CONTRACTOR WILL KEEP PLATFORM ELECTRICAL SHUT OFF KEYS ON SITE AND IN HAND AT ALL TIMES. CONTRACTOR WILL INFORM METRO TRANSIT WHEN SUPERVISORS EXCHANGE KEYS.

1.11 SITE ACCESS BY OTHERS

A. CONTRACTOR SHALL AFFORD OTHER CONTRACTORS, UTILITY OWNERS, REGULATORY AGENCY REPRESENTATIVES, COUNCIL STAFF AND VISITORS AUTHORIZED BY THE CAR ACCESS TO THE SITE.

1.12 TRAINING

A. THE EMPLOYEES OF THE CONTRACTOR AND ALL ITS SUBCONTRACTORS WHO WILL BE WORKING ON OR PERFORMING INSPECTIONS OF ANY WORK ON THE EXISTING METRO TRANSIT LIGHT RAIL RIGHT OF WAY MUST COMPLETE OUR "ON-TRACK SAFETY" TRAINING.

B. METRO TRANSIT WILL OFFER ON-TRACK SAFETY TRAINING ON TUESDAY MORNINGS AT 9:00AM AT THE OPERATIONS AND MAINTENANCE FACILITY (1810 EAST FRANKLIN AVE., MINNEAPOLIS, MN). ATTENDEES MUST BE ON TIME AND ATTEND THE ENTIRE CLASS. TO SCHEDULE PERSONNEL TO ATTEND, SEND AN E-MAIL TO CONTRACTORTRAINING@METROTRANSIT.ORG. THE COURSE, INCLUDING TEST, TAKES LESS THAN ONE HOUR AND THIS TRAINING IS PROVIDED AT NO COST.

C. PERSONS COMPLETING THE CLASS WILL BE ISSUED A CERTIFICATE OF COMPLETION. EMPLOYEES WILL BE REQUIRED TO CARRY THE CERTIFICATE AS PROOF OF QUALIFICATION. THIS CERTIFICATION IS VALID FOR THREE (3) YEARS FROM DATE OF ISSUE AND MUST BE RENEWED AT EXPIRATION IF THAT EMPLOYEE WILL CONTINUE TO WORK ON OUR PROPERTY.

1.13 CONTRACTOR EMERGENCY RESPONSE

A. CONTRACTOR SHALL SUPPLY THE NAMES AND PHONE NUMBERS OF TWO (2) PRIMARY CONTACTS WHO WILL BE AVAILABLE 24/7 AND ON SITE WITHIN ONE HOUR OF NOTIFICATION OF AN EMERGENCY. EMERGENCY IS DEFINED AS ANY FAILURES DUE TO INFRASTRUCTURE CONSTRUCTION/MODIFICATIONS DURING THE COURSE OF PROJECT THAT DIRECTLY IMPACT THE ABILITY OF COUNCIL TO MAINTAIN SERVICE SCHEDULES IN A SAFE, EFFICIENT AND RELIABLE MANNER. THIS INCLUDES, BUT IS NOT LIMITED TO, VANDALISM, EQUIPMENT MALFUNCTIONS AND HARDWARE/SOFTWARE FAILURES.

1.14 PRE-CONSTRUCTION MEETING SUBMITTALS

A. SUBMIT 3 HARD COPIES AND 1 ELECTRONIC COPY OF EACH OF THE FOLLOWING ITEMS 3 DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING:

1. IDENTIFICATION OF CONTRACTOR'S INDIVIDUAL(S) AUTHORIZED TO ACT ON BEHALF OF THE CONTRACTOR, INCLUDING NAME(S), WORK ADDRESSES, AND HOME, WORK, AND CELL PHONE NUMBERS.
2. IDENTIFICATION OF CONTRACTOR'S PRINCIPAL STAFF INFORMATION, INCLUDING NAMES, WORK ADDRESSES, AND WORK, AND CELL PHONE NUMBERS.
3. IDENTIFICATION OF CONTRACTOR'S SITE REPRESENTATIVE INCLUDING NAME, WORK ADDRESSES, AND HOME, WORK, AND CELL PHONE NUMBERS.
4. A PRELIMINARY PROGRESS SCHEDULE.
5. A PROPOSED SCHEDULE OF SUBMITTALS INCLUDING SPACE FOR THE FOLLOWING INFORMATION IN A FORMAT ACCEPTABLE TO THE COUNCIL:
   A. DATE, CONTRACTOR'S NAME, PROJECT NAME AND NUMBER, AND CONTRACT NUMBER.
   B. NAMES OF SUBCONTRACTORS AND SUPPLIERS INVOLVED WITH THE SUBMITTAL.
   C. REFERENCE TO PERTINENT DRAWING SHEETS AND SPECIFICATION SECTIONS.
6. CONTRACTOR WILL PROVIDE A TESTING AGENCY REPRESENTATIVE.

1.15 SUBSTANTIAL COMPLETION

A. THE DEFINITION OF SUBSTANTIAL COMPLETION: THE WORK (OR A SPECIFIED PORTION THEREOF) HAS PROGRESSED TO THE POINT WHERE, IN THE OPINION OF COUNCIL, IT IS SUFFICIENTLY COMPLETE, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, SO THAT THE WORK (OR SPECIFIED PORTION) CAN BE UTILIZED FOR THE PURPOSES FOR WHICH IT IS INTENDED. THE TERMS "SUBSTANTIALLY COMPLETE" AND "SUBSTANTIALLY COMPLETED", "SUBSTANTIAL PERFORMANCE" AND "SUBSTANTIALLY PERFORMED", AS APPLIED TO ALL OR PORTION OF THE WORK REFER TO SUBSTANTIAL COMPLETION THEREOF.

B. THE FOLLOWING DESCRIPTION IS INTENDED TO ASSIST THE CONTRACTOR IN UNDERSTANDING THE BASIC REQUIREMENTS FOR THE COUNCIL TO CONSIDER THE WORK AS "SUBSTANTIALLY COMPLETE":

1. WORK ON BOTH PLATFORMS IS COMPLETE AND READY FOR COUNCIL OCCUPANCY AND USE BY THE PUBLIC AS OF 3:30 AM ON THE LAST DAY OF THE SHUTDOWN. SUBSTANTIAL COMPLETION MUST OCCUR 2:30 AM ON THE LAST DAY OF THE SHUTDOWN.
2. CONTRACTOR IS RESPONSIBLE FOR SWEEPING AND CLEANING PLATFORM OF DEBRIS BEFORE PUBLIC USE.

C. THE CONTRACTOR MUST COORDINATE WITH THE CAR TO CLEARLY IDENTIFY ALL REQUIREMENTS FOR SUBSTANTIAL COMPLETION. THE CAR WILL BE THE SOLE DETERMINANT OF SUBSTANTIAL COMPLETION.

1.16 FINAL COMPLETION

A. DEFINITION OF FINAL COMPLETION: FINAL COMPLETION SHALL INCLUDE FINISHING ITEMS WHICH ARE INCLUDED ON FINAL WALK-THRU PUNCH LIST.

B. FINAL COMPLETION FOR THE PLATFORM MUST OCCUR ON OR BEFORE 45 DAYS AFTER PLATFORM SHUTDOWN.

1.17 LIQUIDATED DAMAGES

A. REFER TO SECTION 00520 CONTRACT AGREEMENT.

END OF SECTION 01 1000

THIS SPACE INTENTIONALLY LEFT BLANK

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
METRO TRANSIT SITE REQUIREMENTS

SHEET NUMBER
G-005

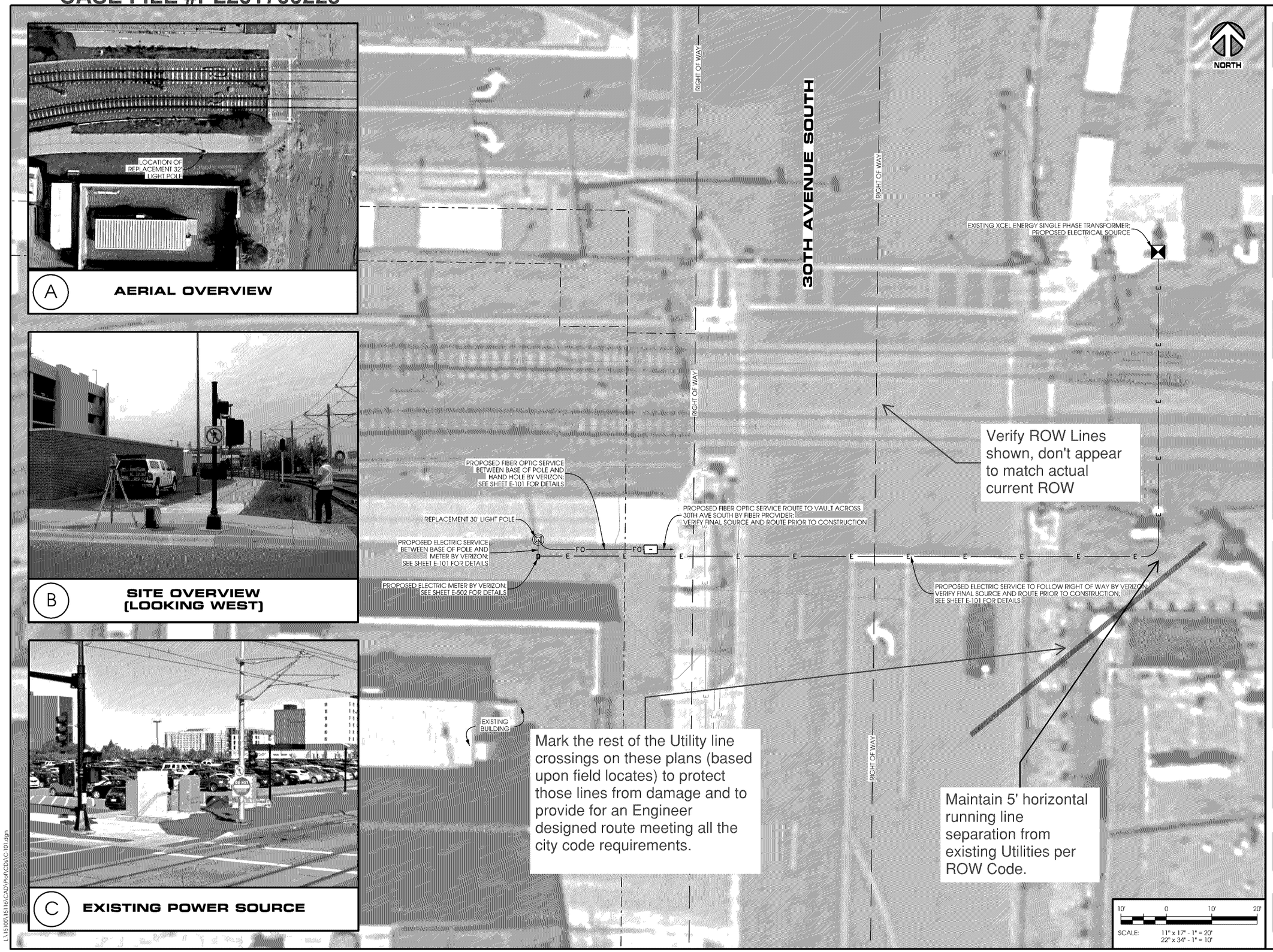
L:\15100\15116\CAD\Plot\G05\G005.dgn

CASE FILE #PL201700223

A **AERIAL OVERVIEW**

B **SITE OVERVIEW (LOOKING WEST)**

C **EXISTING POWER SOURCE**



verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
SITE PLAN

SHEET NUMBER
C-101

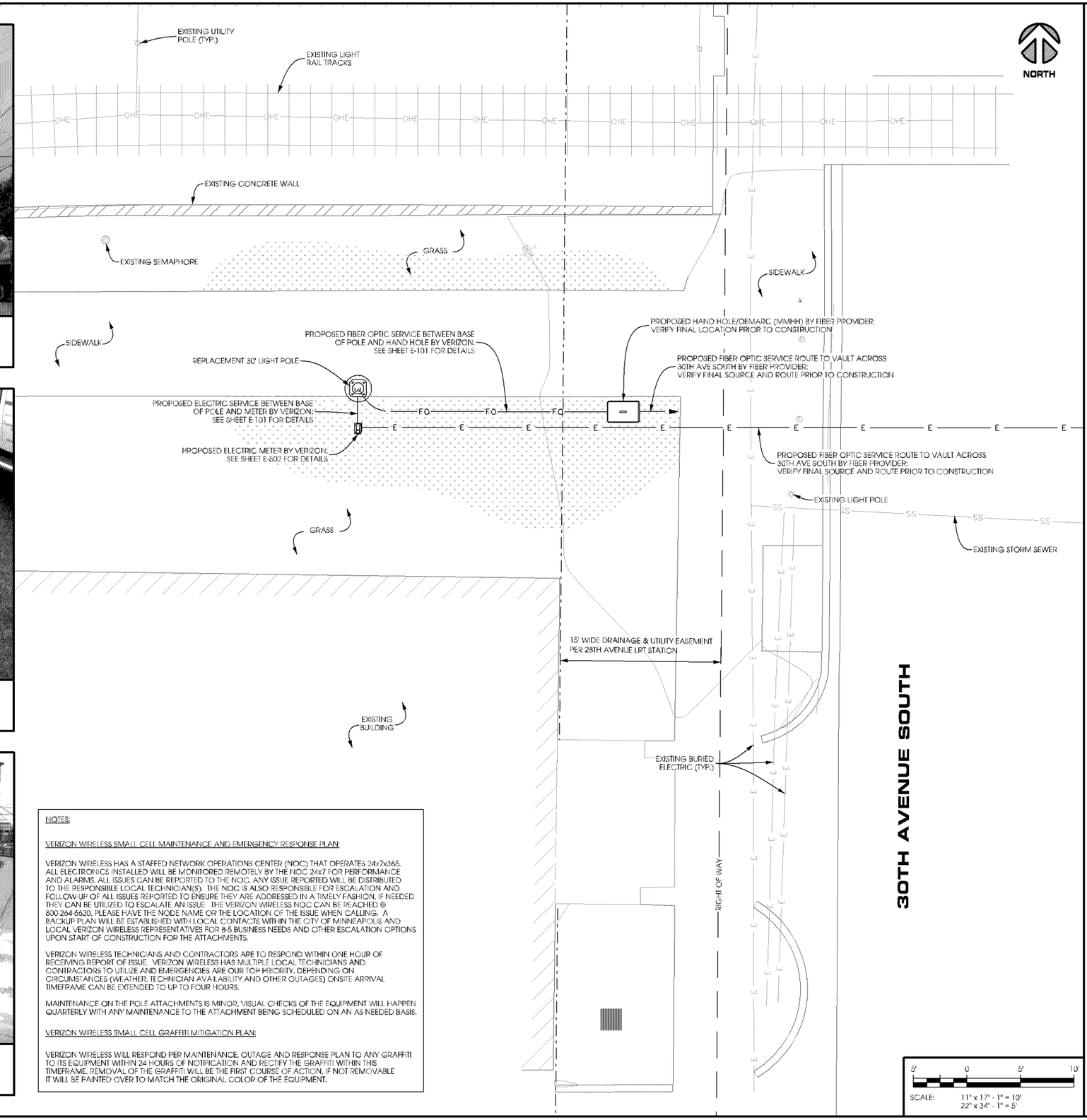
L:\15100\16116\CAD\Pdf\CDs\C-101.dgn

CASE FILE #PL201700223

A **SITE OVERVIEW [LOOKING WEST]**

B **SITE OVERVIEW [LOOKING EAST]**

C **PROPOSED HAND HOLE LOCATION**



NOTES:

VERIZON WIRELESS SMALL CELL MAINTENANCE AND EMERGENCY RESPONSE PLAN:

VERIZON WIRELESS HAS A STAFFED NETWORK OPERATIONS CENTER (NOC) THAT OPERATES 24x7x365. ALL ELECTRONICS INSTALLED WILL BE MONITORED REMOTELY BY THE NOC 24x7 FOR PERFORMANCE AND ALARMS. ALL ISSUES CAN BE REPORTED TO THE NOC. ANY ISSUE REPORTED WILL BE DISTRIBUTED TO THE RESPONSIBLE LOCAL TECHNICIAN(S). THE NOC IS ALSO RESPONSIBLE FOR ESCALATION AND FOLLOW-UP OF ALL ISSUES REPORTED TO ENSURE THEY ARE ADDRESSED IN A TIMELY FASHION. IF NEEDED THEY CAN BE UTILIZED TO ESCALATE AN ISSUE. THE VERIZON WIRELESS NOC CAN BE REACHED @ 800.264.6620. PLEASE HAVE THE NODE NAME OR THE LOCATION OF THE ISSUE WHEN CALLING. A BACKUP PLAN WILL BE ESTABLISHED WITH LOCAL CONTACTS WITHIN THE CITY OF MINNEAPOLIS AND LOCAL VERIZON WIRELESS REPRESENTATIVES FOR 8-5 BUSINESS NEEDS AND OTHER ESCALATION OPTIONS UPON START OF CONSTRUCTION FOR THE ATTACHMENTS.

VERIZON WIRELESS TECHNICIANS AND CONTRACTORS ARE TO RESPOND WITHIN ONE HOUR OF RECEIVING REPORT OF ISSUE. VERIZON WIRELESS HAS MULTIPLE LOCAL TECHNICIANS AND CONTRACTORS TO UTILIZE AND EMERGENCIES ARE OUR TOP PRIORITY. DEPENDING ON CIRCUMSTANCES (WEATHER, TECHNICIAN AVAILABILITY AND OTHER OUTAGES) ONSITE ARRIVAL TIMEFRAME CAN BE EXTENDED TO UP TO FOUR HOURS.

MAINTENANCE ON THE POLE ATTACHMENTS IS MINOR, VISUAL CHECKS OF THE EQUIPMENT WILL HAPPEN QUARTERLY WITH ANY MAINTENANCE TO THE ATTACHMENT BEING SCHEDULED ON AN AS NEEDED BASIS.

VERIZON WIRELESS SMALL CELL GRAFFITI MITIGATION PLAN:

VERIZON WIRELESS WILL RESPOND PER MAINTENANCE, OUTAGE AND RESPONSE PLAN TO ANY GRAFFITI TO ITS EQUIPMENT WITHIN 24 HOURS OF NOTIFICATION AND RECTIFY THE GRAFFITI WITHIN THIS TIMEFRAME. REMOVAL OF THE GRAFFITI WILL BE THE FIRST COURSE OF ACTION, IF NOT REMOVABLE IT WILL BE PAINTED OVER TO MATCH THE ORIGINAL COLOR OF THE EQUIPMENT.

5' 0 5' 10'

SCALE: 11" x 17" - 1" = 10'
22" x 34" - 1" = 5'

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

ENLARGED SITE PLAN

SHEET NUMBER

C-102

L:\15100\15116\CAD\Plot\C102.dgn

CASE FILE #PL201700223

NOTES:

30' SQUARE POLE DESIGN SHOWN. PROPOSED LIGHT POLE TO BE SUPPLIED BY AND PURCHASED BY VERIZON. THE LIGHT POLE TO BE SET BY VERIZON CONTRACTOR AND COORDINATED WITH METRO TRANSIT. PROPOSED POLE TO BE RETROFITTED WITH PROPOSED LIGHT POLE PENETRATION, AND INSTALLED BY CERTIFIED WELDER.

SALVAGE EXISTING POLE AND DELIVER TO METRO TRANSIT. LOCATION TO BE DETERMINED.

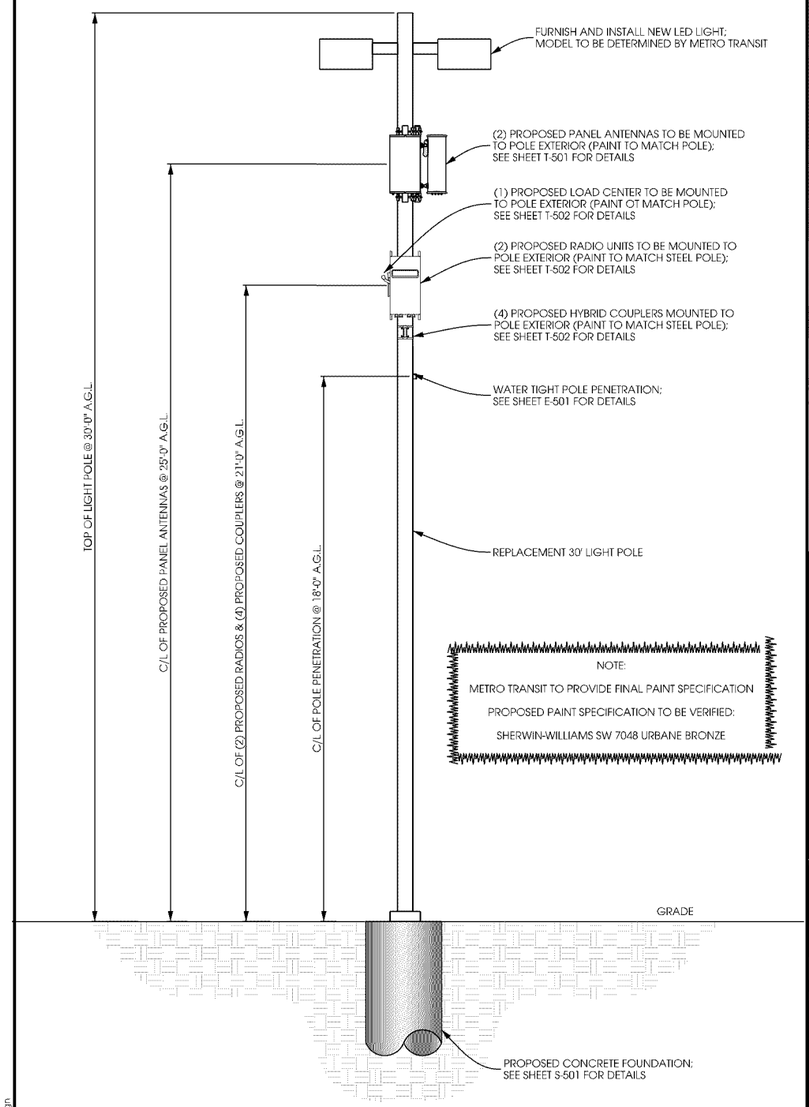
NOTES:

TYPICAL INSTALLATION SHOWN.

ALL PROPOSED POLE MOUNTED EQUIPMENT TO BE PAINTED TO MATCH POLE.

ALL POLE PENETRATIONS FOR ANTENNA AND RRU CABLE ROUTING TO BE MINIMIZED.

ALL PROPOSED ELEVATIONS ARE SHOWN ABOVE GROUND LEVEL.

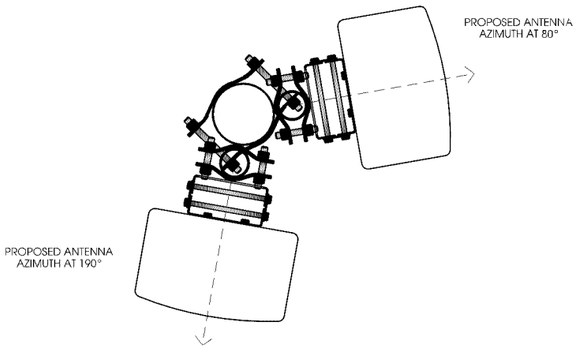


NOTE:
METRO TRANSIT TO PROVIDE FINAL PAINT SPECIFICATION
PROPOSED PAINT SPECIFICATION TO BE VERIFIED:
SHERWIN-WILLIAMS SW 7048 URBANE BRONZE

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

B **SITE ELEVATION**

NORTH



C **ANTENNA ORIENTATION**
SCALE: NTS

ANTENNAS				
QUANTITY	MAKE	MODEL	CENTERLINE	AZIMUTH
1	COMMSCOPE	HBXX-6513DS-A2M	25'	80°
1	COMMSCOPE	HBXX-6513DS-A2M	25'	190°

EQUIPMENT			
QUANTITY	TYPE	MAKE	MODEL
1	RRU	ERICSSON	RRUS32 B66
1	RRU	ERICSSON	RRUS32 B2
4	COUPLER	CLEARLINK	HC3-698-2.7K/MS/4310

CABLING				
QUANTITY	TYPE	MAKE	MODEL	DIAMETER
16	JUMPER	COMMSCOPE	LFD4-50	1/2"

D **ANTENNA AND CABLING**
SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
SITE ELEVATION

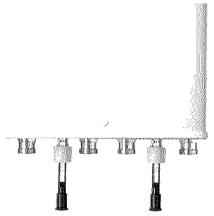
SHEET NUMBER
T-201

L:\15100\16116\CAD\PCA\CDA\T-201.dgn

CASE FILE #PL201700223

Product Specifications

COMMSCOPE®



HBXX-6513DS-VTM | HBXX-6513DS-A2M

Single Band Quad Port Antenna, 1710–2170 MHz, 65° horizontal beamwidth, RET compatible

- Two DualPol® antennas under one radome
- Each antenna is independently capable of field adjustable electrical tilt
- Continuous wideband operation

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2170**
Gain, dBi	14.5	14.6	14.9
Beamwidth, Horizontal, degrees	67	66	64
Beamwidth, Vertical, degrees	14.8	14.0	13.4
Beam Tilt, degrees	0–12	0–12	0–12
USLS (First Lobe), dB	15	15	15
Front-to-Back Ratio at 180°, dB	30	30	30
Front-to-Back Total Power at 180° ± 30°, dB	26	27	27
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	7	8	8
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-150	-150	-150
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

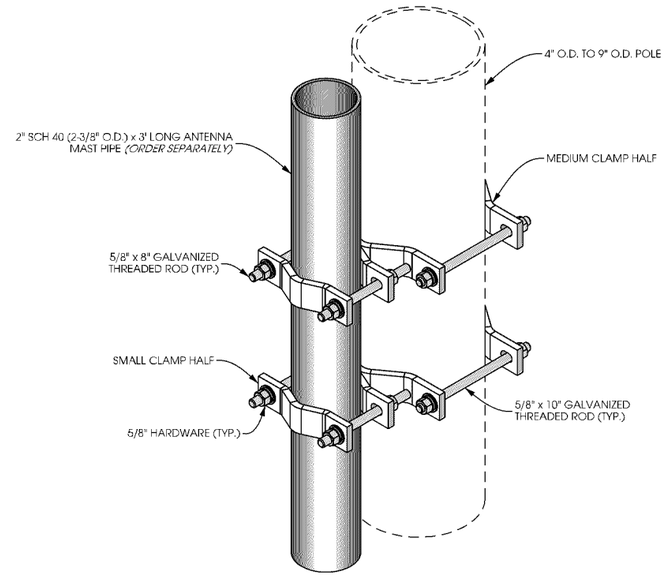
Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2170**
Gain by all Beam Tilts, average, dBi	14.2	14.3	14.6
Gain by all Beam Tilts Tolerance, dB	±0.8	±0.7	±0.7
Gain by Beam Tilt, average, dBi	0 ° | 14.6 6 ° | 14.4 12 ° | 13.5	0 ° | 14.7 6 ° | 14.5 12 ° | 13.7	0 ° | 15.0 6 ° | 14.7 12 ° | 13.8
Beamwidth, Horizontal Tolerance, degrees	±3.7	±3.3	±3.5
Beamwidth, Vertical Tolerance, degrees	±1.4	±0.9	±1.1
USLS, beampeak to 20° above beampeak, dB	15	15	16
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	7	8	8

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

General Specifications

Operating Frequency Band	1710 – 2170 MHz
Antenna Type	Sector
Band	Single band
Performance Note	Outdoor usage

A **ANTENNA SPECIFICATIONS**
SCALE: NTS



B **ANTENNA MOUNTING**
SCALE: NTS ANDREW PART #: JS-S100 OR EQUIV.

THIS SPACE INTENTIONALLY LEFT BLANK

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
ANTENNA DETAILS

SHEET NUMBER
T-501

L:\15116\V15116\CAD\Plot\CD\T501.dgn

CASE FILE #PL201700223

NOTE:

PAINT ALL ANTENNAS, OUTDOOR EQUIPMENT, CABLING, AND MOUNTING HARDWARE TO MATCH THE POLE

KEYED NOTES:

A. UP TO 8" DIA. POLE

B. REMOTE RADIO UNIT MOUNT (TYP. OF 2); SEE DETAIL B THIS SHEET

C. REMOTE RADIO UNIT (TYP. OF 2); SEE DETAIL C THIS SHEET

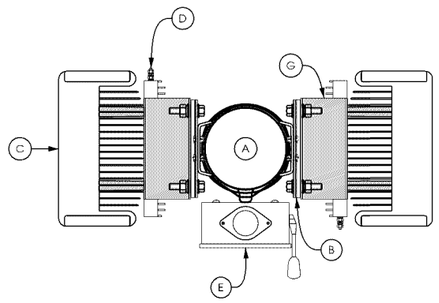
D. POWER SUPPLY UNIT SECURED TO BACK OF REMOTE RADIO UNIT (TYP. OF 2); SEE DETAIL D THIS SHEET

E. LOAD CENTER SECURED WITH HEAVY DUTY STAINLESS STEEL BAND STRAP; SEE DETAIL E THIS SHEET

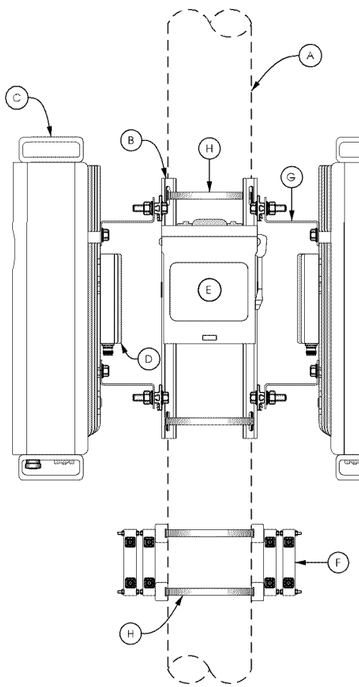
F. DIPLEXER SECURED WITH HEAVY DUTY STAINLESS STEEL BAND STRAP (TYP. OF 2); SEE DETAIL F THIS SHEET

G. ANGLE ADAPTER MOUNTED TO BACK OF REMOTE RADIO UNIT PER MANUFACTURER'S SPECIFICATIONS (TYP.)

H. HEAVY DUTY STAINLESS STEEL BAND STRAP (TYP.)



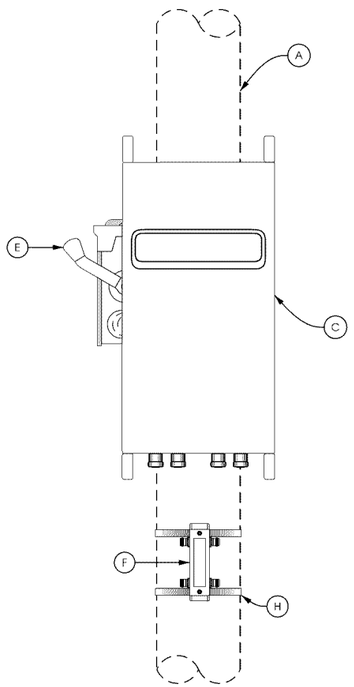
TOP VIEW

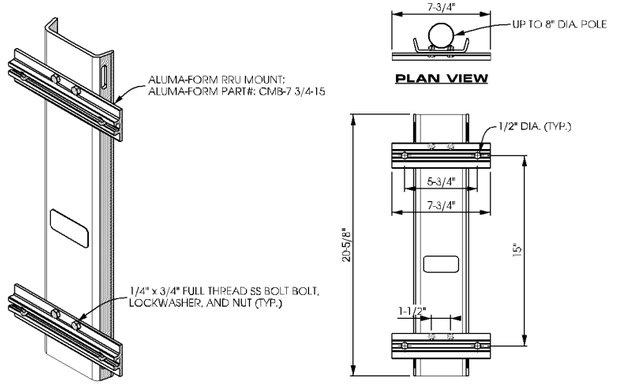


SIDE VIEW

A POLE ELEVATION

SCALE: 11" x 17" - 1/4" = 1'-0"
22" x 34" - 1/2" = 1'-0"





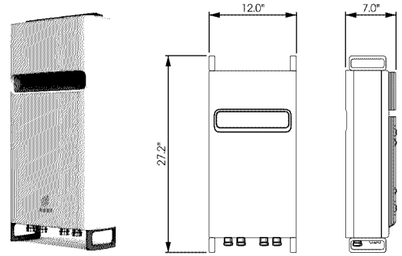
ISOMETRIC VIEW | PLAN VIEW | FRONT VIEW | ELEVATION VIEW

NOTE:

FOR RRU MOUNT AND (2) 3/4" BANDSTRAPS ORDER: ALUMA-FORM PART#: CMB-7 3/4-15 KIT

B EQUIPMENT MOUNTING

SCALE: NTS



REMOTE RADIO UNIT :

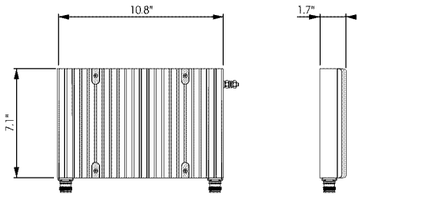
ERICSSON PART # RRUS32

DIMENSIONS: 27.2" x 12.0" x 7.0" (H x W x D)

WEIGHT: 60 LBS

C REMOTE RADIO UNIT

SCALE: NTS



POWER SUPPY UNIT :

ERICSSON PART #: PSU AC-08

DIMENSIONS: 10.8" x 7.1" x 1.9" (H x W x D)

WEIGHT: 11.5 LBS

D POWER SUPPLY UNIT

SCALE: NTS

MANUFACTURER: SCHNEIDER ELECTRIC
MODEL #: SQUARE D DU221RB

NUMBER OF POLES: 2

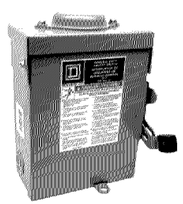
MAX. CURRENT RATING: 30 A

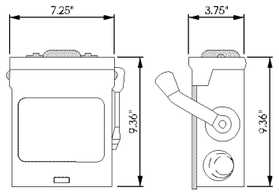
VOLTAGE RATING: 240 VAC

DIMENSIONS: 9.36" x 7.25" x 3.75"

WEIGHT: 4.62 lbs

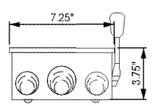
CONTRACTOR TO INSTALL LED LIGHT





FRONT VIEW

SIDE VIEW



BOTTOM VIEW

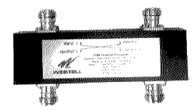
E LOAD CENTER

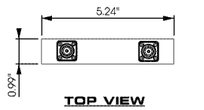
SCALE: NTS

MANUFACTURER: WESTELL
MODEL #: CLEARLINK-HC3/698-2.7K/MS/4310

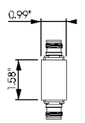
LOW PIM HYBRID COUPLER FEATURES VERY LOW INSERTION LOSS AND POWER HANDLING CAPABILITY FOR 200 WATTS AVERAGE POWER. COUPLED PORTS ARE 90° OUT OF PHASE AND THE ISOLATED PORT HELPS PROTECT AGAINST MISMATCHED LOADS ON THE COUPLED PORTS.

DIMENSIONS: 5.4" X 1.58" X 0.99"

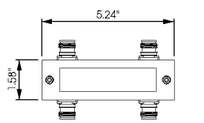




TOP VIEW



SIDE VIEW



FRONT VIEW

F DIPLEXER

SCALE: NTS

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

EQUIPMENT DETAILS

SHEET NUMBER

T-502

L:\15109\16116\CAD\Plot\CDs\T-502.dgn

CASE FILE #PL201700223

GENERAL

1. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS, AND CONDITIONS PRIOR TO COMMENCING ANY WORK. THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR THE PROPER FIT AND CLEARANCE IN THE FIELD. CONTACT EDGE CONSULTING ENGINEERS, INC. IF ANY DISCREPANCIES EXIST.

   DO NOT SCALE DRAWINGS.

2. THIS DRAWING IS NOT VALID IF LOADS OTHER THAN THOSE CONSIDERED IN THE STRUCTURAL ANALYSIS ARE ADDED TO OR REMOVED FROM THE STRUCTURE UNLESS APPROVED IN WRITING BY EDGE CONSULTING ENGINEERS, INC.
3. THE DRAWINGS REPRESENT THE FINISHED STRUCTURE UNLESS NOTED OTHERWISE. THE DRAWINGS DO NOT INDICATE THE MEANS OR METHODS OF CONSTRUCTION. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION PROCEDURES AND PRACTICES.
4. THE DRAWINGS DO NOT INCLUDE THE NECESSARY COMPONENTS OR EQUIPMENT FOR THE STABILITY OF THE STRUCTURE DURING CONSTRUCTION UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR STRUCTURAL STABILITY DURING CONSTRUCTION. THIS INCLUDES, BUT IS NOT LIMITED TO, ERECTION PROCEDURES AND SEQUENCE, SHORING, BRACING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK AIDS TO SAFELY PERFORM THE WORK SHOWN ON THE DRAWINGS.
5. BEFORE PROCEEDING WITH ANY WORK ADJACENT TO OR WITHIN THE EXISTING STRUCTURE, THE CONTRACTOR SHALL BECOME FAMILIAR WITH EXISTING CONDITIONS. DURING THE PROCESS OF CONSTRUCTION, THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF THE EXISTING STRUCTURE WHERE THE EXISTING STRUCTURE IS MODIFIED TO ACCOMMODATE NEW CONSTPUCTION AND FOR PROTECTING FROM DAMAGE THOSE PORTIONS OF THE EXISTING STRUCTURE WHICH ARE TO REMAIN.
6. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE ON-SITE SAFETY ASSOCIATED WITH THE WORK TO BE PERFORMED. ALL SAFETY REQUIREMENTS AS DICTATED BY OSHA AND THE LOCAL JURISDICTION'S SHALL BE FOLLOWED.
7. IT SHOULD BE UNDERSTOOD THAT THE CONRACTOR IS THE GUARANTOR OF ALL WORK AND RESPONSIBLE TO CONSTRUCT THE TOWER SITE ACCORDING TO APPLICABLE PLANS, SPECIFICATIONS AND STANDARDS.
8. SECTIONS, DETAILS, AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR CONDITIONS ELSEWHERE, UNLESS OTHERWISE SHOWN.
9. ALL MATERIALS, WORKMANSHIP, AND DETAILS SHALL CONFORM TO THE LATEST EDITION OF THE BUILDING CODE.
10. ALL PROPOSED INSTALLATIONS SHALL NOT DENY OR INTERFERE WITH AND ACCESS TO ANY OPERATIONAL OR SAFETY EQUIPMENT/APPURTENANCES

METRO TRANSIT REQUIREMENTS

1. METRO TRANSIT TO RECEIVE A COPY OF STRUCTURAL ANALYSIS.
2. POLE TO BE HOT DIP GALVANIZED BASE WITH COLOR TOP COAT TO MATCH EXISTING.

EARTHWORK

1. ALL SUBTERRANEAN STRUCTURES, UTILITIES, PIPING, ETC. IN THE AREA OF EXCAVATIONS SHALL BE LOCATED AND MARKED BY CONTRACTOR PRIOR TO EARTH REMOVAL WORK. CONTRACTOR SHALL MAINTAIN MARKERS UNTIL EXCAVATION ACTIVITIES HAVE CEASED. IF UNDERGROUND UTILITY CONFLICTS ARE DISCOVERED BEFORE OR ENCOUNTERED DURING EXCAVATION, NOTIFY THE ENGINEER IMMEDIATELY.
2. BEFORE PLACING FOOTINGS, FOUNDATIONS OR SLAB-ON-GRADE, THE SUB-GRADE SHALL BE PREPARED AND INSPECTED AS REQUIRED.
3. WHERE STRUCTURES DERIVE SUPPORT FROM FILL-SUPPORTED FOUNDATIONS AND AT SLAB-ON-GRADE, FILL SHALL BE COMPACTED TO 95% OF MODIFIED PROCTOR MAXIMUM DRY DENSITY (ASTM 1557).
4. NO FILL SHALL BE PLACED OVER FROZEN, MUDDY, OR OTHER DELETERIOUS MATERIAL. NO FILL SHALL BE PLACED OVER A PREVIOUS LIFT THAT HAS NOT BEEN ADEQUATELY COMPACTED.
5. BACKFILL AGAINST FOUNDATION/ANCHORS SHALL BE COMPLETED BEFORE ERECTION/MODIFICATION OF THE TOWER BEGINS.
6. BACKFILL SHALL BE COMPACTED UNIFORMLY AROUND THE FOUNDATION IN LIFTS TO MINIMUM 90% COMPACTION.
7. BACKFILL SHALL BE NATIVE SOIL; IMPORTED FILL SHALL BE VERIFIED WITH THE GEOTECHNICAL ENGINEER AND STRUCTURAL ENGINEER PRIOR TO BACKFILLING.

CONCRETE & REINFORCING STEEL

MATERIAL PROPERTIES (U.N.O.)
SPECIFIED COMPRESSIVE STRENGTH OF CONCRETE: f'c = 4500 PSI
SPECIFIED YIELD STRENGTH OF CONCRETE REINFORCEMENT: fy = 60 KSI (A615 GR 60)

1. ALL BAR LAPS SHALL CONFORM TO ACI 318 CLASS "B" SPLICE CRITERIA. USE TOP BAR LAP LENGTHS FOR TOP BARS IN SLABS AND BEAMS OVER 14" DEEP.

   MINIMUM BAR LAPS AS FOLLOWS U.N.O.:

   #3:1'-4" #4:1'-4" #5:1'-10" #6:2'-7" #7:4'-2"
   #8:5'-2" #9:6'-4" #10:7'-8" #11:9'-0"

   FOR EPOXY COATED BARS, PROVIDE 1.5 TIMES THE INDICATED LAP LENGTH.
   FOR TOP BARS PROVIDE 1.3 TIMES THE INDICATED LAP LENGTH.

2. LAP LENGTH SHALL BE SPECIFICALLY NOTED ON SHOP DRAWINGS WHERE MORE THAN ONE BAR MAKES UP A CONTINUOUS STRING.
3. REINFORCING SHALL BE EPOXY COATED AND DETAILED IN ACCORDANCE WITH ACI 315.
4. ALL REINFORCEMENT BARS SHALL BE FABRICATED IN ACCORDANCE WITH THE LATEST CRSI MANUAL OF STANDARD PRACTICE AND SHALL BE CLEAN AND FREE OF GREASE AND SCALING RUST.
5. PROVIDE HOT/COLD WEATHER PROCEDURES AND PROTECTION IN ACCORDANCE WITH ACI RECOMMENDATIONS AND PROJECT SPECIFICATIONS.
6. CONCRETE REINFORCEMENT PROTECTION/CLEAR COVER, U.N.O.:

   FOOTINGS: ALL SIDES 3"

   PIERS: ALL SIDES 3"

7. EXTEND ALL PIER STEEL TO PROVIDE STD. HOOK UNDER FOOTING REINFORCEMENT, UNLESS NOTED OTHERWISE.
8. ALL CONCRETE SHALL BE NORMAL WEIGHT (145 PCF) UNLESS NOTED OTHERWISE. ALL CONCRETE SHALL BE COMPOSED OF PORTLAND CEMENT, TYPE I/II, IN CONFORMANCE WITH ASTM C 150, FINE AND COARSE AGGREGATE IN CONFORMANCE WITH ASTM C 33, AND WATER IN CONFORMANCE WITH ASTM C 94. EXPOSED EXTERIOR CONCRETE SHALL BE AIR ENTRAINED WITH 6% AIR CONTENT. CONCRETE SHALL HAVE A MEASURED SLUMP OF 4" (CONTRACTOR SHALL PERFORM SLUMP TESTS). IF AN ALTERNATIVE MIX DESIGN IS DESIRED, MIX DESIGN SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
9. ALL CONCRETE SHALL BE CONSOLIDATED BY MECHANICAL VIBRATION, SPADING OR RODDING TO ENSURE THAT CONCRETE IS THOROUGHLY AND UNIFORMLY DISTRIBUTED WITHIN FORMWORK AND AROUND REINFORCEMENT AND EMBEDDED ITEMS.
10. ALL FORMED CONCRETE SURFACES EXPOSED TO VIEW SHALL HAVE A SURFACE FINISH SF-2.0 IN ACCORDANCE WITH ACI 301.
11. ALL CONCRETE MIXING, TRANSPORTING, PLACING AND CURING SHALL CONFORM WITH THE LOCAL BUILDING CODE REQUIREMENTS AND THOSE OF THE FOLLOWING STANDARDS (LATEST EDITION):

    "ACI 318, BUILDING CODE REQUIREMENTS FOR REINFORCED CONC."
    "ACI 315, DETAILS AND DETAILING OF CONCRETE REINFORCEMENT"
    "ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BLDGS."
    "ACI 307, RECOMMENDED PRACTICE FOR CONCRETE FORM WORK"

12. ALUMINUM CONDUIT IS NOT PERMITTED TO BE EMBEDDED IN CONCRETE.
13. ALL DOWELS INTO EXISTING CONCRETE OR SOLID MASONRY TO BE EPOXY ANCHORED WITH HILTI HITHY200 ADHESIVE OR APPROVED EQUIVALENT, (UNLESS NOTED OTHERWISE)
14. UNLESS NOTED OTHERWISE, ANY EXISTING CONCRETE SURFACE IS TO BE CLEANED AND INTENTIONALLY ROUGHED TO A 1/4" AMPLITUDE AND WETTED PRIOR TO FRESH CONCRETE BEING POURED AGAINST SURFACE.

STRUCTURAL STEEL

1. STRUCTURAL STEEL DESIGN AND FABRICATION SHALL BE IN ACCORDANCE WITH THE AISC 13TH EDITION STEEL CONSTRUCTION MANUAL.
2. MATERIAL PROPERTIES ARE TO BE AS INDICATED BELOW UNLESS NOTED OTHERWISE.

   W-SHAPES Fy = 50 KSI (A992 OR A572 Gr 50)
   C-SHAPES & ANGLES Fy = 36 KSI (A36)
   PLATES & BARS Fy = 36 KSI (A36)
   SQUARE TUBES Fy = 46 KSI (A500 Gr B)
   ROUND TUBES Fy = 35 KSI (A53 TYPE S, Gr B)
   RODS Fy = 36 KSI (A36)
   ANCHOR RODS Fy = 36 KSI (F1554-Gr 36)

3. STEEL BEAMS WITH RESIDUAL CAMBER RESULTING FROM MILL FABRICATION OR ROLLING SHALL BE SHOP FABRICATED AND ERECTED SUCH THAT THIS RESIDUAL CAMBER COUNTERACTS GRAVITY LOAD DEFLECTION.
4. MINIMUM BOLT EDGE DISTANCES ARE TO BE THE LARGER OF THE EXISTING CONDITION OR THE TABLE PROVIDED BELOW UNLESS APPROVED BY THE ENGINEER.

BOLT DIAMETER (IN)	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	> 1 1/4
MIN. EDGE DISTANCE	3/4	7/8	1	1 1/8	1 1/4	1 1/2	1 5/8	1.25 x d

5. ALL CONNECTION BOLTING IS TO BE WITH A-325N BOLTS UNLESS NOTED OTHERWISE. BOLTS NEED ONLY BE TIGHTENED TO THE SNUG-TIGHT CONDITION. SNUG-TIGHT IS DEFINED AS THE TIGHTNESS OBTAINED BY A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF A PERSON USING AN ORDINARY SPUD WRENCH.
6. U.N.O., POST INSTALLED ANCHORS ARE TO BE HILTI HIT HY 200 ADHESIVE ANCHORS FOR SOLID BASE MATERIAL AS MANUFACTURED BY HILTI FASTENING SYSTEMS OF TULSA, OKLAHOMA OR APPROVED EQUAL. INSTALL ANCHORS WITH EMBEDMENT DEPTHS INDICATED.
7. U.N.O., NON-SHRINK GROUT SHALL BE A NON-METALLIC PREMIXED FORMULATION EQUIVALENT TO MASTERFLOW 713 PLUS BY DEGUSSA BUILDING SYSTEMS. BEAM AND LINTEL PLATES SHALL BE FULLY GROUTED WITH A MINIMUM 1/2" NON-SHRINK GROUT. COLUMN BASE PLATES SHALL BE FULLY GROUTED WITH A MINIMUM OF 1 1/2" NON-SHRINK GROUT.
8. ALL STEEL FRAMING MEMBERS, CONNECTION PLATES, FASTENERS AND ANCHOR BOLTS EXPOSED TO EARTH OR WEATHER TO HAVE HOT-DIP GALVANIZED FINISH UNLESS OTHERWISE SPECIFIED. APPLY COATING BY THE HOT-DIP PROCESS FOR GALVANIZING ACCORDING TO ASTM A123 OR ASTM A153.
9. ALL DINGS, SCRAPES, MARS AND WELDS IN THE GALVANIZED AREA SHALL BE COATED WITH A ZINC-RICH PAINT, APPLIED IN STRICT ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
10. AFTER ZINC-RICH PAINT IS DRY, OVERCOAT WITH AN APPROPRIATE PAINT WITH THE SAME COLOR AS THE EXISTING.
11. ALL WELDING OF NEW STEEL IS TO BE WITH E70XX ELECTRODES, U.N.O. WELDING SHALL BE IN ACCORDANCE WITH THE LATEST AWS SPECIFICATIONS BY CERTIFIED WELDERS AND INSPECTED BY AN AWS CERTIFIED WELDING INSPECTOR.
12. WHEN FIELD WELDING TO EXISTING STEEL, ADJUST WELDING PROCEDURES AS REQUIRED TO BE COMPATIBLE WITH THE NEW AND EXISTING STEEL.
13. ALL WELDING OF GALVANIZED MATERIAL SHALL BE PERFORMED IN SUCH A MANOR AS TO SATISFY ALL OSHA AND AWS REQUIREMENTS. ALL FIELD WELDED LOCATIONS SHALL BE PREPARED AND PRIMED WITH A ZINC RICH PRIMER PRIOR TO PAINTING PER THE MANUFACTURES RECOMMENDATIONS. THE SPECIFIC PRIMER TO BE USED SHALL BE TNEMEC SERIES 90-97 Tnema-Zinc @ 3.0-4.0 mils DFT OR APPROVED EQUAL.
14. SUBMIT SHOP DRAWINGS DETAILING FABRICATION OF STRUCTURAL STEEL COMPONENTS.
15. METAL BAR GRATING SHALL BE FURNISHED AND INSTALLED ACCORDING TO ANSI/NAAMM MBG 531-00 METAL BAR GRATING MANUAL. METAL BAR GRATING SHALL BE WELDED STEEL GRATING FABRICATED FROM CARBON STEEL WITH MINIMUM BENDING STRESS OF FY=18,000 PSI AND E=29,000,000 PSI. THE MANUFACTURER SHALL SUBMIT (4) SETS OF PANEL FABRICATION DRAWINGS WITH ERECTION PLANS IDENTIFYING EACH PANEL WITH A MARK NUMBER AND PANEL DIMENSIONS. SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED PRIOR TO FABRICATION AND SHIPMENT OF GRATING. ALL GRATING PANELS SHALL BE CUT TO SIZE AND BANDED. GRATING SHALL BE FINISHED ACCORDING TO THE BID OPTION SELECTED. EACH GRATING PANEL SHALL BE TAGGED WITH THE ORDER NUMBER AND MARK NUMBER CORRESPONDING TO THE ERECTION PLAN. FIELD CUTTING OF GRATING IS NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER. GRADING MAY BE FASTENED TO STRUCTURE BY WELDS OR CLIPS ACCORDING NAAMM STANDARDS.

L:\15100\15116\CAD\Plot\CDs\S 001.dgn

verizon

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED - SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

STRUCTURAL NOTES

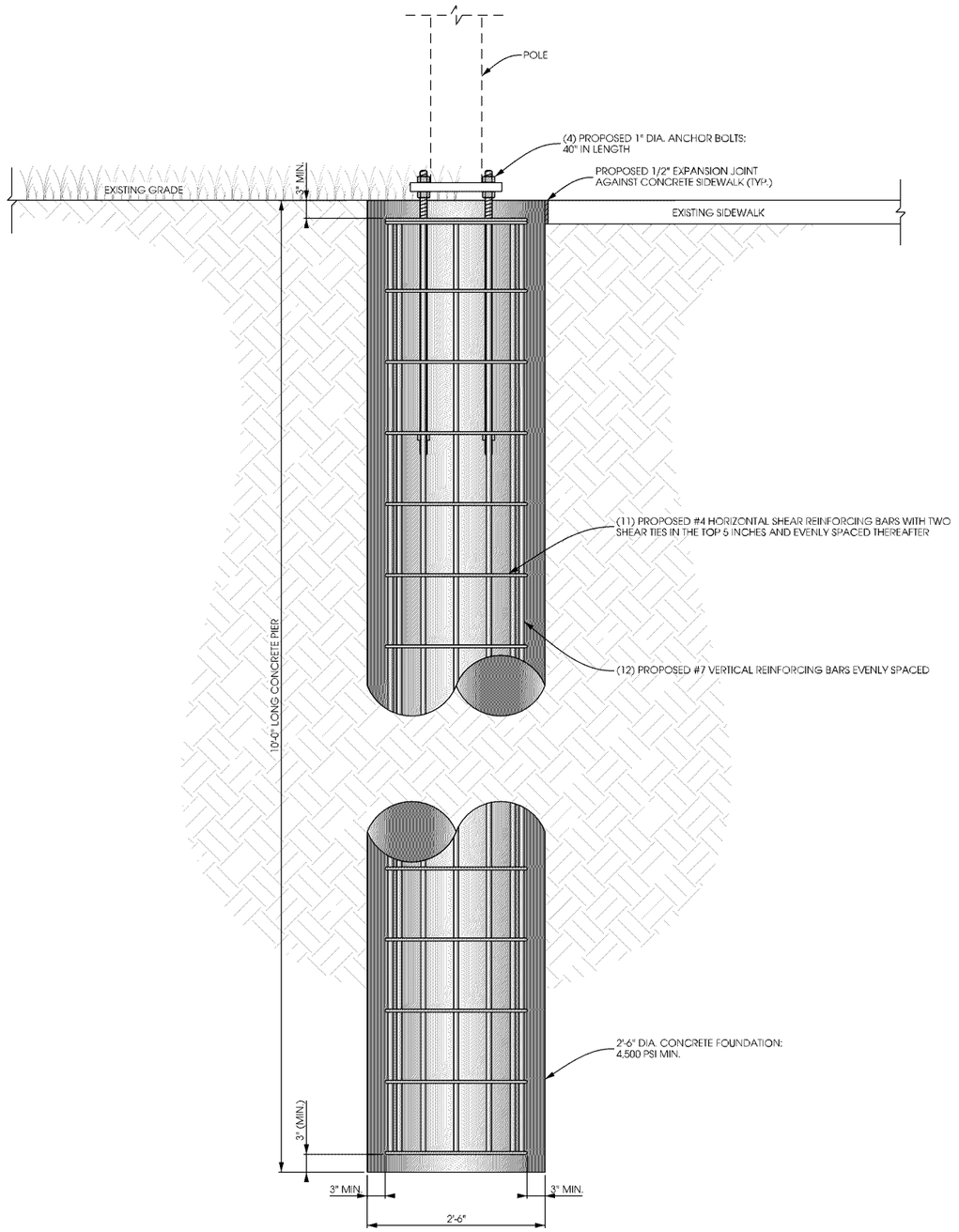
SHEET NUMBER

S-001

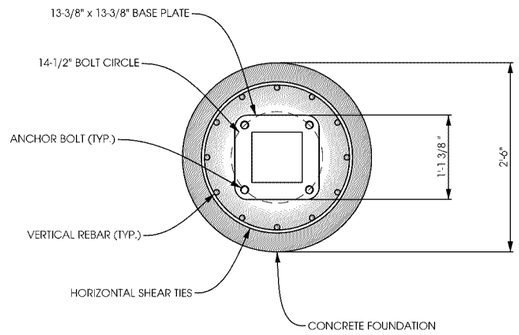
CASE FILE #PL201700223

NOTE:

VERIFY WITH STRUCTURAL ANALYSIS NOTED ON SHEET G-001



ELEVATION VIEW



PLAN VIEW

A FOUNDATION DETAIL

SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

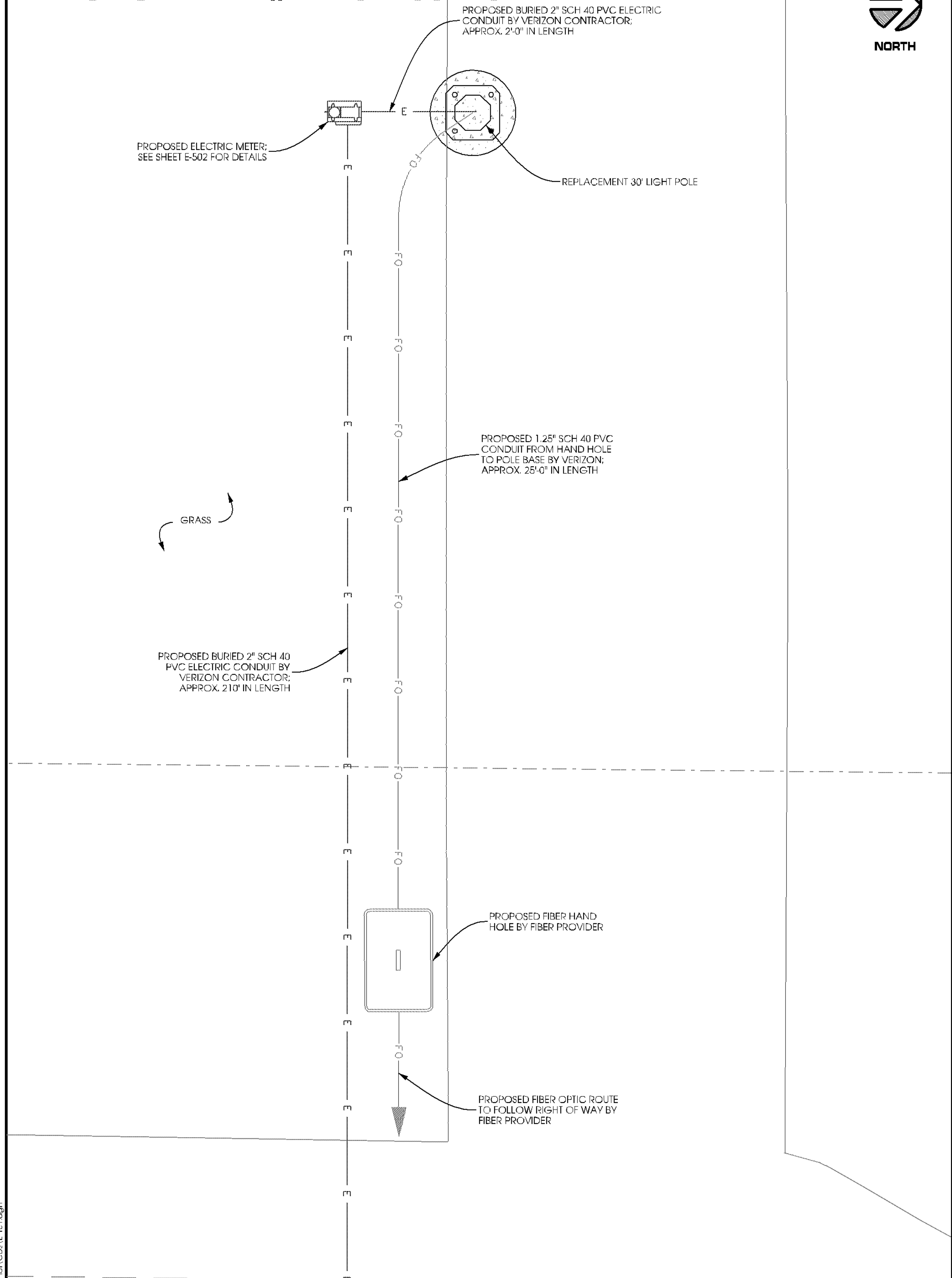
STRUCTURAL DETAILS

SHEET NUMBER

S-501

L:\15161\16116\CAD\Pdf\CDs\S-501.dgn

CASE FILE #PL201700223



A UTILITY PLAN

4'-0" 0 2'-0" 4'-0"

SCALE: 11" x 17" - 1" = 4'-0"
22" x 34" - 1" = 2'-0"

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 ELECRTICAL 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 "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.

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, UPONWRITTEN 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 RFQ.

GENERAL ELECTRICAL NOTES

verizon✓

ke consulting LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED - SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

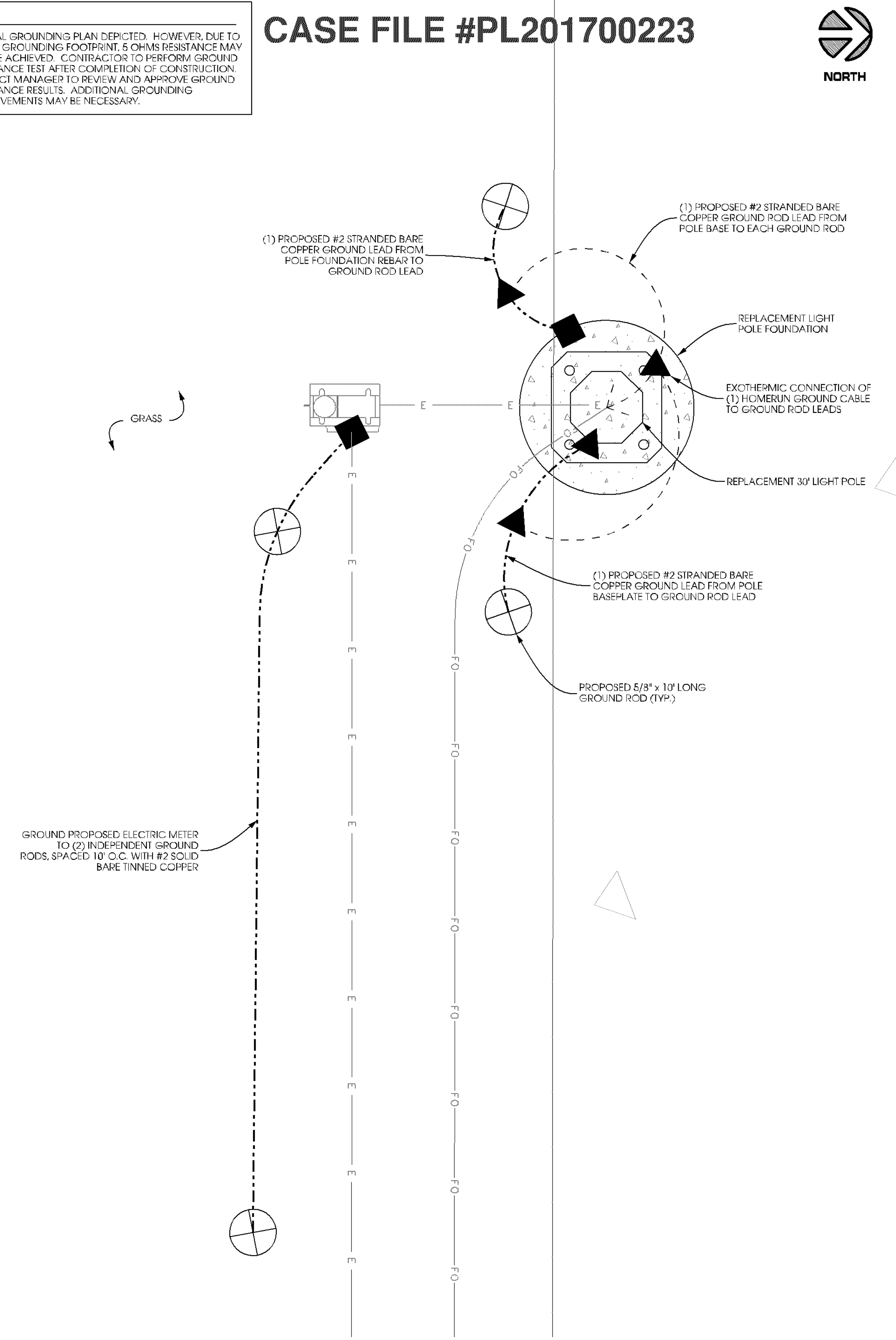
SHEET TITLE
UTILITY PLAN

SHEET NUMBER
E-101

NOTE:

TYPICAL GROUNDING PLAN DEPICTED. HOWEVER, DUE TO SMALL GROUNDING FOOTPRINT, 5 OHMS RESISTANCE MAY NOT BE ACHIEVED. CONTRACTOR TO PERFORM GROUND RESISTANCE TEST AFTER COMPLETION OF CONSTRUCTION. PROJECT MANAGER TO REVIEW AND APPROVE GROUND RESISTANCE RESULTS. ADDITIONAL GROUNDING IMPROVEMENTS MAY BE NECESSARY.

CASE FILE #PL201700223



A GROUNDING PLAN

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

1. SCOPE:

THIS SECTION COVERS THE SPECIFICATIONS FOR CELL SITE GROUNDING. THE AREAS OF FOCUS ARE: TOWER, POLE, BUILDING, AND INSTALLATION METHODS.

2. GENERAL:

2.1 ALL GROUND RODS SHALL BE 5/8" COPPER CLAD STEEL 10 FT. LONG. GROUND RODS SHALL BE EQUALLY SPACED AT 10 FT. INTERVALS. REFER TO SITE GROUNDING PLAN FOR DETAILS AND PLACEMENT WITH GROUNDING.

2.2 GROUNDING A SYSTEM SHALL BE MEGGAR TESTED TO ASSURE SATISFYING 5 OHMS OR LESS RESISTANCE.

2.3 ALL CADWELD CONNECTIONS TO GALVANIZED MATERIAL SHALL BE PROPERLY PREPARED TO ASSURE A SATISFACTORY CADWELD. THE CADWELD CONNECTION SHALL BE COATED WITH A COLD GALVANIZING SPRAY .

2.4 CONTRACTOR SHALL PROVIDE PHOTO DOCUMENTATION OF THE GROUND SYSTEM BY PROVIDING A CD TO VERIZON.
REQUIRED PHOTOS SHALL INCLUDE:
* ALL BUSS BARS AND CABLE GROUND CONNECTIONS.
* TOWER/POLE COUNTERPOISE.
* BUILDING COUNTERPOISE.* CONNECTIONS TO POWER, TELCO, A.C., FENCING *(IF APPLICABLE)* AND ICE BRIDGE *(IF APPLICABLE)*.
* CONNECTIONS TO POWER, TELCO, A.C., FENCING *(IF APPLICABLE)* AND ICE BRIDGE *(IF APPLICABLE)*.

2.5 CONTRACTOR SHALL PROVIDE AS-BUILT PLANS SHOWING LOCATION AND DIMENSIONS OF BELOW GRADE GROUNDING FEATURES.

3. INSTALLATION:

3.1 ALL EXTERIOR ABOVE AND BELOW GROUND CONNECTIONS SHALL BE CADWELD. NO ALUMINUM CONNECTORS SHALL BE USED UNLESS SPECIFIED OTHERWISE ON PLANS.

3.2 NO RIGHT-ANGLE CADWELD CONNECTION (OTHER THAN GROUND RODS TO GROUND RING CONNECTION) SHALL BE USED. ALL WIRE-TO-WIRE CONNECTIONS SHALL UTILIZE "Y-TYPE" CONNECTIONS.

3.3 ALL VERTICAL JUMPERS SHALL NOT BE WELDED WITHIN TWO (2) FT. OF THE GROUND ROD.

3.4 KOPR SHIELD REQUIRED FOR ALL MECHANICAL CONNECTIONS.

3.5 ALL CADWELDS FINISHED WITH COLD GALVANIZED SHIELD.

4. TOWER:

4.1 A #2 SOLID BARE COPPER WIRE SHALL BE BURIED A MINIMUM FOUR (4) FT. UNDERGROUND AND ENCIRCLE TOWER FOUNDATION TWO (2) FT. FROM THE FOUNDATION. THIS GROUNDING SYSTEM SHALL BE CONNECTED TO THE TOWER GROUND RING IN TWO (2) PLACES USING CADWELD CONNECTIONS. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

4.2 THREE (3) #2 SOLID BARE COPPER WIRES SHALL BE RUN FROM THE TOWER GROUND RING TO THE TOWER. THESE WIRES SHALL BE CONNECTED TO THE TOWER USING A CADWELD CONNECTION. NO SHARP BENDS SHALL BE PLACED IN THESE GROUND LEADS.

4.3 GROUND SYSTEM SHALL INCLUDE THE INSTALLATION OF AN ISOLATED LIGHTNING ROD AT THE TOP OF THE TOWER ABOVE THE HIGHEST ANTENNA. A #2 INSULATED COPPER WIRE SHALL BE CONNECTED TO THE TOWER LIGHTNING ROD USING AN APPROVED MECHANICAL CONNECTOR, OR CADWELDED, TO TOWER STEEL.

5. BUILDING:

5.1 A #2 SOLID BARE COPPER WIRE SHALL BE BURIED A MINIMUM OF FOUR (4) FT. UNDERGROUND AND ENCIRCLE BUILDING FOUNDATION TWO (2) FEET FROM THE FOUNDATION. GROUND RING CORNERS SHALL BE INSTALLED WITH A MINIMUM TWO FOOT RADIUS (NO SHARP RIGHT ANGLE BENDS).

5.2 A #2 SOLID BARE COPPER WIRE SHALL BE INSTALLED FROM THE BUILDING GROUND RING AND CONNECTED TO THE COPPER BUS BAR LOCATED ON THE OUTSIDE OF BUILDING WITH A MINIMUM NINE (9) INCHES RADIUS. A "Y-TYPE" OR "PARALLEL-TYPE" CADWELD CONNECTION SHALL BE USED FOR ALL CONNECTIONS TO THE GROUND RING.

5.3 ONE (1) ADDITIONAL #2 SOLID BARE GROUND WIRE LEAD SHALL BE INSTALLED DIRECTLY BELOW THE ELECTRICAL SERVICE ENTRANCE PORT (GROUND LUG ON THE MAIN DISCONNECT INSIDE THE BUILDING). THIS WIRE SHALL BE CONNECTED TO THE BUILDING GROUND RING USING "Y-TYPE" CADWELD CONNECTION.

5.4 ONE (1) ADDITIONAL #2 SOLID BARE COPPER GROUND WIRE LEAD SHALL BE INSTALLED DIRECTLY BELOW EACH HVAC UNIT *(IF APPLICABLE)*.

6. POLE:

6.1 FOR POLES LOCATED IN GRASS OR GRAVEL A #2 SOLID BARE COPPER WIRE SHALL BE BURIED A MINIMUM FOUR (4) FT. UNDERGROUND AND ENCIRCLE POLE FOUNDATION TWO (2) FT. FROM THE FOUNDATION. THIS GROUNDING SYSTEM SHALL BE CONNECTED TO THE POLE GROUND RING IN ONE (1) PLACE USING #2 SOLID BARE COPPER WIRE.

6.2 FOR POLES LOCATED IN CONCRETE OR ASPHALT A #2 SOLID BARE COPPER WIRE SHALL BE CONNECTED USING A CADWELDED TO A 5/8" COPPER CLAD STEEL 10 FT. LONG GROUND ROD. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

6.3 POLE FOUNDATION REBAR SHALL BE CONNECTED TO THE POLE GROUND RING OR GROUND ROD IN ONE (1) PLACE USING #2 SOLID BARE COPPER WIRE. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

6.4 FOR POLES CONSTRUCTED OF STEEL OR WITH STEEL BASEPLATE, GROUND WIRE FROM GROUND RING OR GROUND ROD SHALL BE CONNECTED TO THE POLE USING A CADWELD CONNECTION. NO SHARP BENDS SHALL BE PLACED IN THESE GROUND LEADS. SUCH CONNECTIONS SHALL BE "Y-TYPE" CADWELD CONNECTIONS.

6.5 FOR POLES CONSTRUCTED OF ALUMINUM, GROUND WIRE FROM GROUND RING OR GROUND ROD SHALL BE CONNECTED TO THE POLE USING A MECHANICAL CONNECTION. NO SHARP BENDS SHALL BE PLACED IN THESE GROUND LEADS.

7. FENCING *(IF APPLICABLE)*:

7.1 A #2 SOLID BARE COPPER GROUND WIRE SHALL BE INSTALLED FROM THE FENCE CORNER POSTS TO THE GROUND RING AND SHALL BE BURIED A MINIMUM FOUR (4) FT. UNDERGROUND. THESE RUNS SHALL INCLUDE GROUND RODS EQUALLY SPACED AT 10 FT. INTERVALS. THESE RUNS SHALL BE BROUGHT ABOVE GROUND LEVEL AND SUPPORTED ABOVE GROUND WITH TEMPORARY POSTS UNTIL PERMANENT FENCING IS INSTALLED. GROUND WIRE SHALL BE CONNECTED TO THE FENCE POSTS USING CADWELD TYPE CONNECTIONS.

8. EXISTING GROUND SYSTEMS:

8.1 CONTRACTOR SHALL PROVIDE CONNECTIONS TO ALL EXISTING GROUND SYSTEMS AT THE SITE (SCADA, TELEMETRY, ETC.).

9. COMPLIANCE:

9.1 ELECTRICAL CODE COMPLIANCE

COMPLY WITH APPLICABLE LOCAL ELECTRICAL CODES REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION, AND NEC AS APPLICABLE TO ELECTRICAL GROUNDING AND BONDING, PERTAINING TO SYSTEMS, CIRCUITS AND EQUIPMENT.

9.2 UL COMPLIANCE

COMPLY WITH APPLICABLE REQUIREMENTS OF UL467, 486A AND 869 PERTAINING TO GROUNDING AND BONDING OF SYSTEMS, CIRCUITS AND EQUIPMENT. USE GROUNDING AND BONDING PRODUCTS WHICH ARE UL-LISTED AND LABELED FOR THEIR INTENDED USAGE.

9.3 IEEE COMPLIANCE

COMPLY WITH APPLICABLE REQUIREMENTS OF RECOMMENDED INSTALLATION PRACTICES OF IEEE STANDARDS 80, 81, 141 AND 142 PERTAINING TO GROUNDING AND BONDING OF SYSTEMS, CIRCUITS AND EQUIPMENT.

GENERAL GROUNDING NOTES

verizon

ke consulting
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
0	09/19/2017	FINAL DWGS	DGS

- APPROVED - SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
E-102

CASE FILE #PL201700223

KEYED NOTES:

A. (1) 12/3 SO CORD FROM POLE BASE TO LOAD CENTER THROUGH POLE PENETRATION

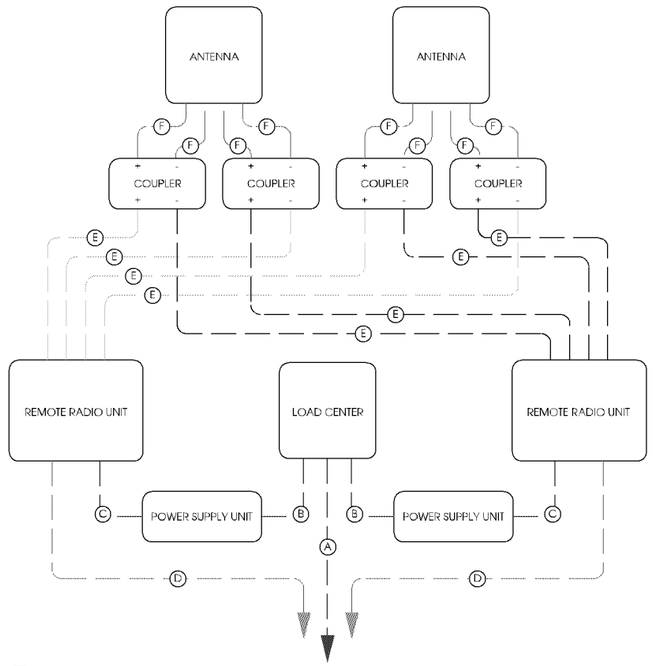
B. (1) POWER JUMPER FROM LOAD CENTER TO EACH POWER SUPPLY UNIT (2 TOTAL)

C. (1) POWER JUMPER FROM POWER SUPPLY UNIT TO CORRESPONDING REMOTE RADIO UNIT (2 TOTAL)

D. (1) FIBER CABLE FROM LIGHT POLE BASE TO EACH REMOTE RADIO UNIT (2 TOTAL)

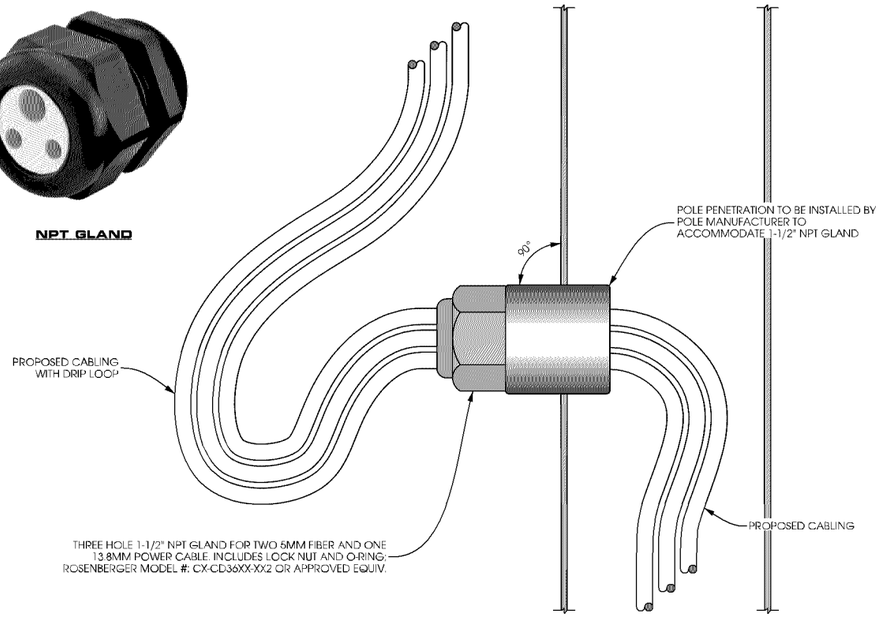
E. (4) 1/2" COAX FROM EACH REMOTE RADIO UNIT TO COUPLER (8 TOTAL)

F. (2) 1/2" COAX FROM EACH COUPLER TO PANEL ANTENNA (8 TOTAL)

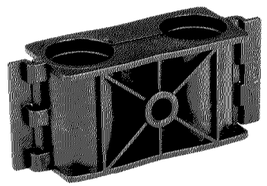


A **PLUMBING DIAGRAM**
SCALE: NTS

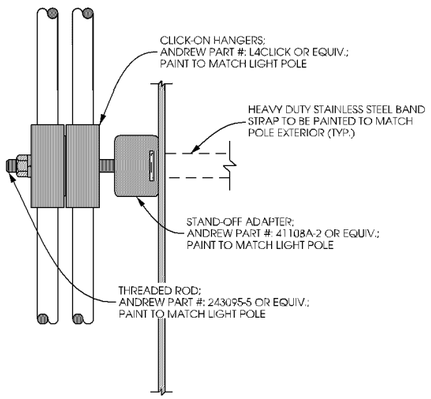
NPT GLAND



B **PENETRATION DETAIL**
SCALE: NTS



CABLE HANGER



C **CABLE MOUNTING**
SCALE: NTS

THIS SPACE INTENTIONALLY LEFT BLANK

L:\15100\16116\CAD\Plot\CDs\E501.dgn

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

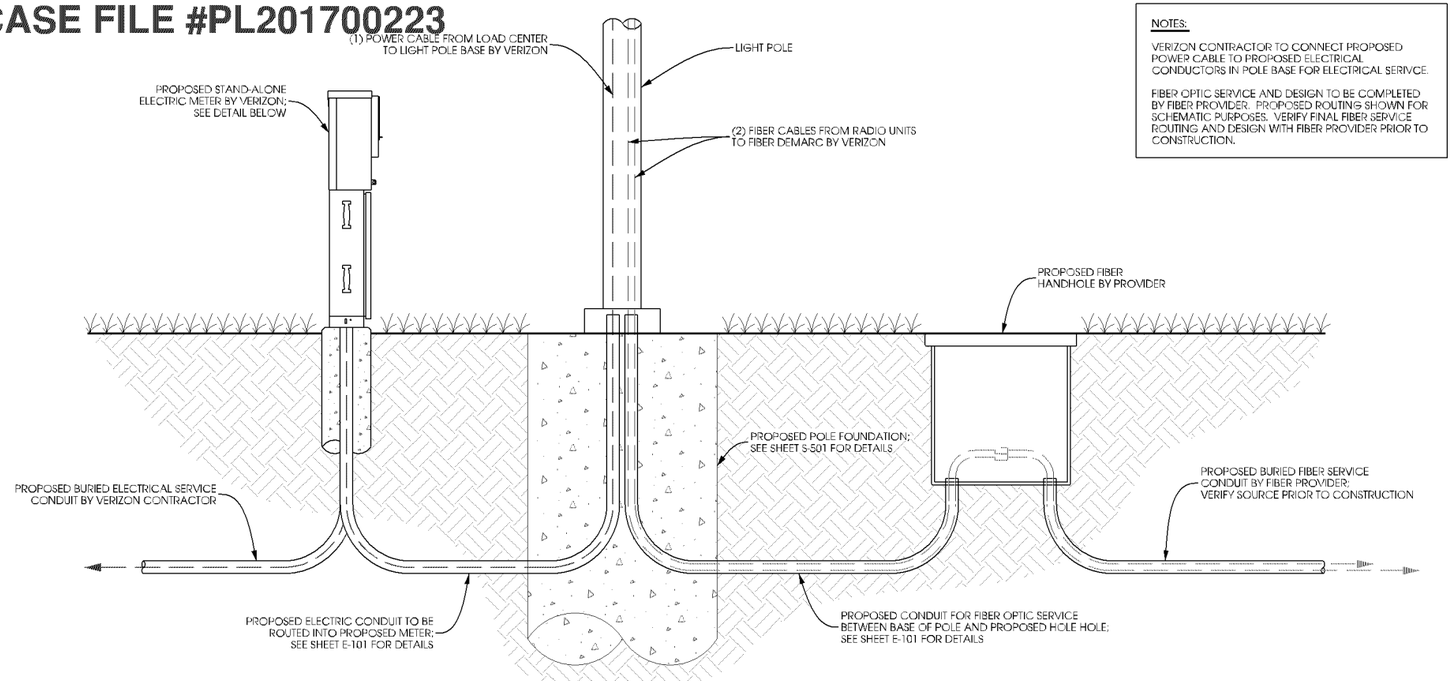
I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
UTILITY DETAILS

SHEET NUMBER
E-501

CASE FILE #PL201700223



NOTES:

VERIZON CONTRACTOR TO CONNECT PROPOSED POWER CABLE TO PROPOSED ELECTRICAL CONDUCTORS IN POLE BASE FOR ELECTRICAL SERIVCE.

FIBER OPTIC SERVICE AND DESIGN TO BE COMPLETED BY FIBER PROVIDER. PROPOSED ROUTING SHOWN FOR SCHEMATIC PURPOSES. VERIFY FINAL FIBER SERVICE ROUTING AND DESIGN WITH FIBER PROVIDER PRIOR TO CONSTRUCTION.

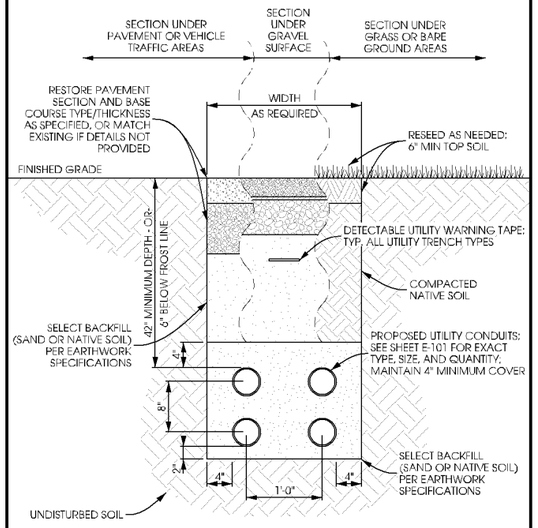
A POWER AND FIBER ROUTING AT FOUNDATION

SCALE: NTS

NOTES:

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

CONDUIT TYPE, SIZE, AND QUANTITY SHOWN ON SHEET E-101.

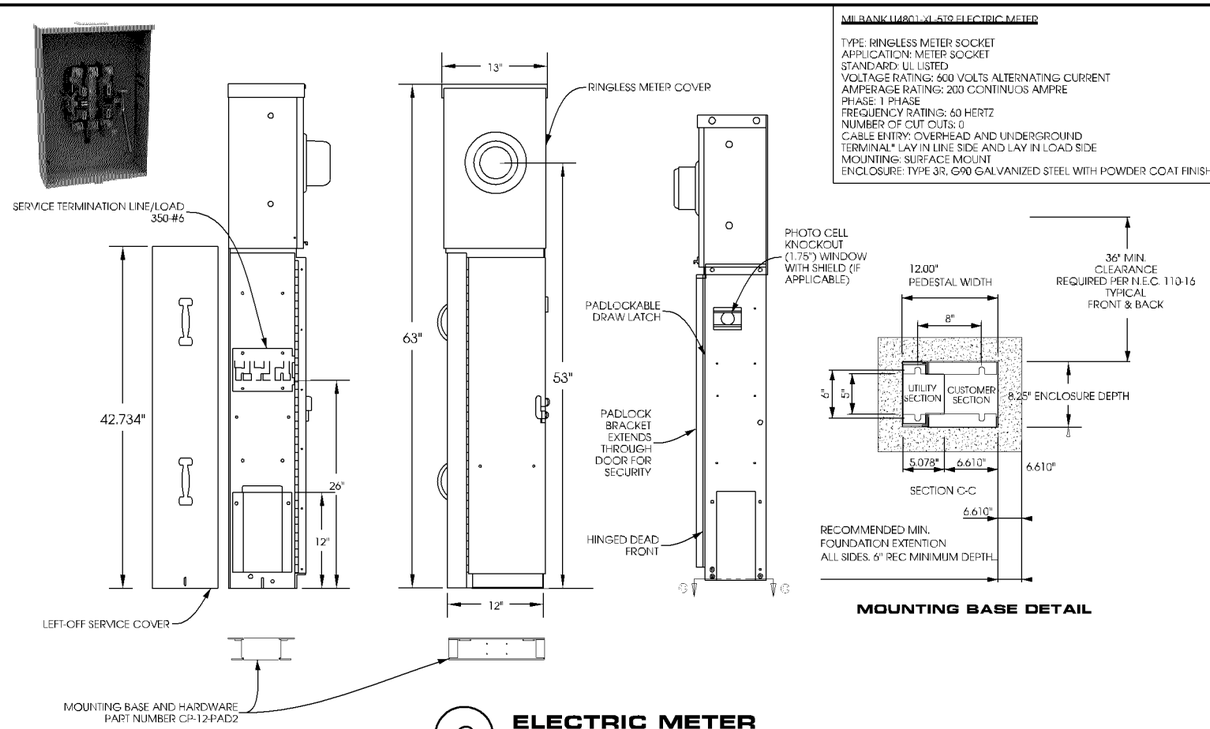


B UTILITY TRENCH DETAIL

SCALE: NTS

MILBANK U4801-XL-579 ELECTRIC METER

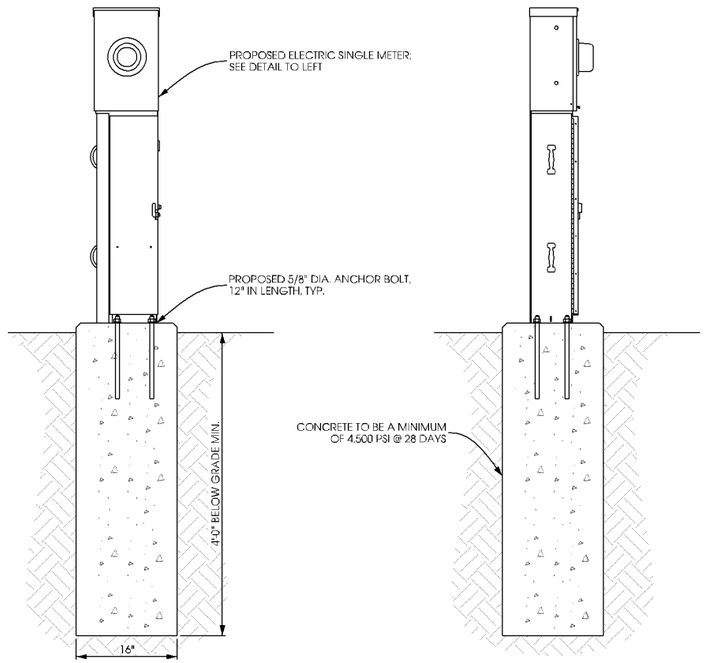
TYPE: RINGLESS METER SOCKET
APPLICATION: METER SOCKET
STANDARD: UL LISTED
VOLTAGE RATING: 600 VOLTS ALTERNATING CURRENT
AMPERAGE RATING: 200 CONTINUOS AMPRE
PHASE: 1 PHASE
FREQUENCY RATING: 60 HERTZ
NUMBER OF CUT OUTS: 0
CABLE ENTRY: OVERHEAD AND UNDERGROUND
TERMINAL* LAY IN LINE SIDE AND LAY IN LOAD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



MOUNTING BASE DETAIL

C ELECTRIC METER

SCALE: NTS



D ELECTRIC METER FOUNDATION

SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

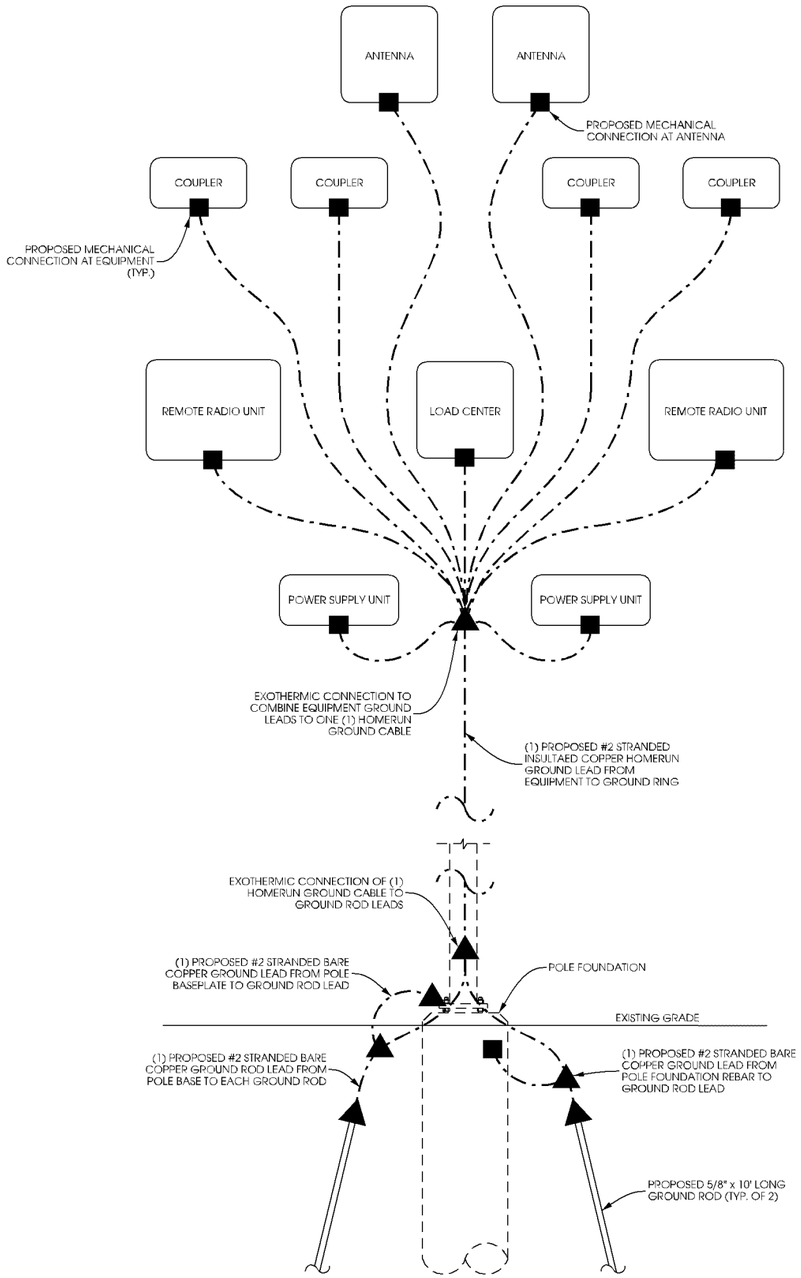
UTILITY DETAILS

SHEET NUMBER

E-502

L:\15100\16116\CAD\Plot\ COs\E 502.dgn

CASE FILE #PL201700223



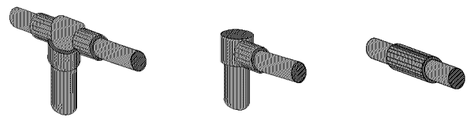
A GROUNDING SCHEMATIC

SCALE: NTS

NOTES:

CADWELD "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF CADWELDS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

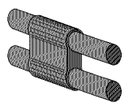
CONTRACTOR TO PROVIDE ALL REQUIRED CADWELD CONNECTIONS.



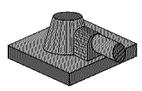
TYPE TA
* NOT PERMITTED *

TYPE GR

TYPE SV



TYPE PH



TYPE KA

TYPE VS

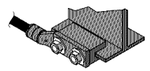
B CADWELD CONNECTIONS

SCALE: NTS

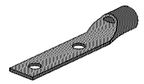
NOTES:

BURNDY "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF BURNDY CONNECTIONS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

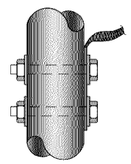
CONTRACTOR TO PROVIDE ALL REQUIRED BURNDY CONNECTIONS.



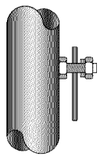
TYPE YGIBS



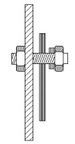
TYPE YA3CL-2TC38



TYPE BD18G92



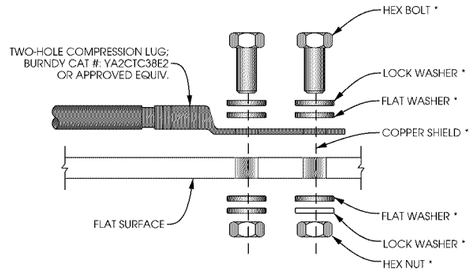
TYPE KC TO PIPE



TYPE KC
* TO FLAT SURFACE *

C MECHANICAL CONNECTIONS

SCALE: NTS



* USE 1/4" FOR ATTACHMENT TO METAL ENCLOSURES AND 3/8" FOR ATTACHMENT TO GROUND BARS

INSTALLATION NOTES:

- BOLTS, WASHERS, AND NUTS SHALL BE STAINLESS STEEL.
- SELECT BOLT LENGTH TO PROVIDE A MINIMUM OF TWO EXPOSED THREADS.
- BURNISH MOUNTING SURFACE TO REMOVE PAINT IN THE AREA OF LUG CONTACT.
- APPLY COPPER-SHIELD COMPOUND TO MATING SURFACE OF LUG AND WIPE CLEAN EXCESS COMPOUND.
- PAINTED METAL SURFACES MUST HAVE SMALL SECTION OF PAINT REMOVED BEFORE INSTALLATION, AND SHALL BE SPRAYED LIGHTLY WITH CLEAR COAT LACQUER FINISH.
- NO-OX-ID "A" TO BE ADDED UNDER ALL GROUND LUG CONNECTIONS.

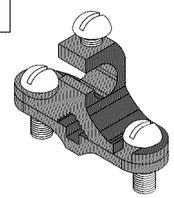
D GROUND TO FLAT SURFACE

SCALE: NTS

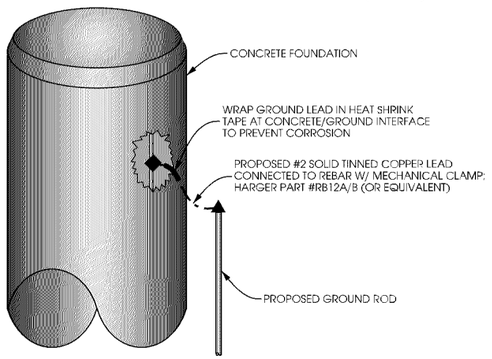
NOTES:

FOUNDATION SHOWN IS TYPICAL.

GROUNDING CONNECTIONS TO BE COVERED BY A MINIMUM OF 3" CONCRETE.



HARGER P/N: RB12A/B
"A" - PARALLEL MOUNT
"B" - PERP. MOUNT (SHOWN)



E REBAR CONNECTION

SCALE: NTS

verizon

ke consulting, LLC
3101 Grandview Blvd
Madison, WI 53713
608.516.0233

Edge
Consulting Engineers, Inc.
2101 Highway 13 W
Burnsville, MN 55337
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161462529
LOCATION CODE:	425932
EDGE PROJECT NO:	15116
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	06/22/2017	PRELIM SMALL CELL DWGS	NAT
B	08/01/2017	PRELIM SMALL CELL DWGS	TTB
C	08/17/2017	PRELIM SMALL CELL DWGS	TTB
D	09/19/2017	FINAL DWGS	DGS

- APPROVED -
SEE SHEET G-001 FOR ENGINEER SEAL

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.

MIN LR 28TH AVE SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
E-503

L:\15100\15116\CAD\Plot\CDs\E503.dgn