

CASE FILE #PL201600185



SITE NAME: MIN SOUTHTOWN SC1

SITE NUMBER: 20141029022

LOCATION CODE: 289036

SITE TYPE: SMALL CELL

POLE TYPE: REPLACEMENT LIGHT POLE



1360 Energy Park Drive, Suite 210
St. Paul, MN 55108
651.225.0793 voice
www.buellconsulting.com



17645 Juniper Path, Suite 105
Lakeville, MN 55044
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

SITE INFORMATION

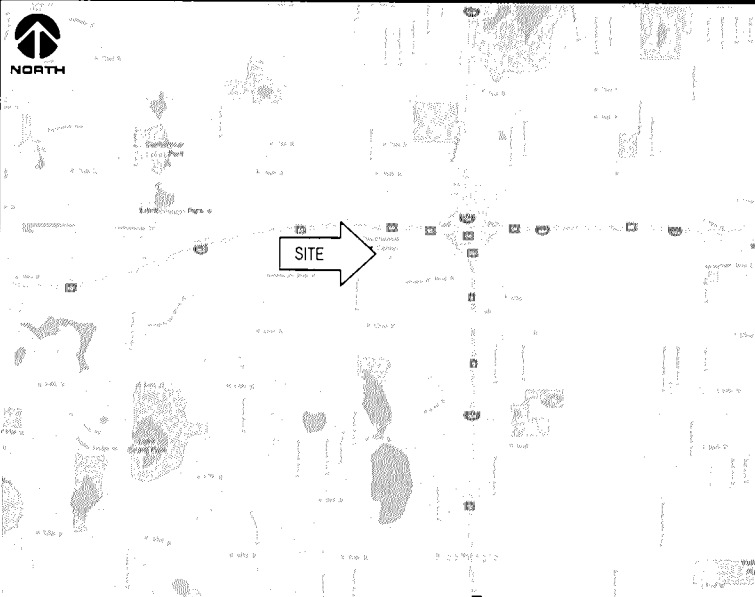
APPROXIMATE ADDRESS:
7803 PENN AVE.
BLOOMINGTON, MN 55431
HENNEPIN COUNTY

LATITUDE & LONGITUDE:
LAT: 44°-51'-37.12"N
LONG: 93°-18'-26.14"W
GROUND ELEVATION: 830' AMSL
(PER 1A CERTIFICATE)

POLE HEIGHT:
36'-9" T.O.C.

MAXIMUM APPURTENANCE HEIGHT:
40'-0" A.G.L.

AREA MAP



PROJECT DESCRIPTION/SOW

- INSTALL (1) REPLACEMENT 36-FT 9-IN STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF PANEL ANTENNAS
- INSTALLATION OF ERICSSON RRU'S AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER/BREAKER BOX
- INSTALLATION OF (4) COUPLERS
- INSTALLATION OF HAND HOLE FOR FIBER AT POLE BASE, BY VERIZON
- INSTALLATION OF HAND HOLE FOR ELECTRIC TO UTILIZE EXISTING CONDUIT, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND POLE BASE (APPROX. 6'-6"), TO BE DIRECTIONALLY BORED BELOW GRADE, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND ROW, (APPROX. 350'-0" IN LENGTH) TO BE DIRECTIONALLY BORED BELOW GRADE, BY VERIZON
- INSTALLATION OF CONDUIT FOR ELECTRIC BETWEEN HAND HOLE AND POLE BASE (APPROX. 180'-0"), TO BE DIRECTIONALLY BORED BELOW GRADE, BY VERIZON
- EXISTING ELECTRIC CONDUIT TO BE UTILIZED
- INSTALLATION OF GROUND RING AROUND POLE FOUNDATION
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS

SHEET INDEX

NO: SHEET TITLE

T-1	TITLE SHEET & PROJECT DATA
C-1	SITE PLAN
C-2	ENLARGED SITE PLAN
A-1	POLE ELEVATION
A-2	MOUNTING DETAILS
A-3	ANTENNA DETAILS
A-4	EQUIPMENT DETAILS
A-5	CABLE MOUNTING DETAILS
E-1	CABLING DETAILS
E-2	ELECTRICAL NOTES
G-1	GROUNDING PLAN
G-2	GROUNDING DETAILS

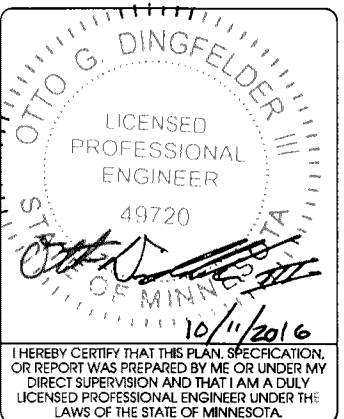
PROJECT NO: 20141029022

EDGE PROJECT NO: 14969

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
0	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT



MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
TITLE SHEET &
PROJECT DATA

SHEET NUMBER
T-1

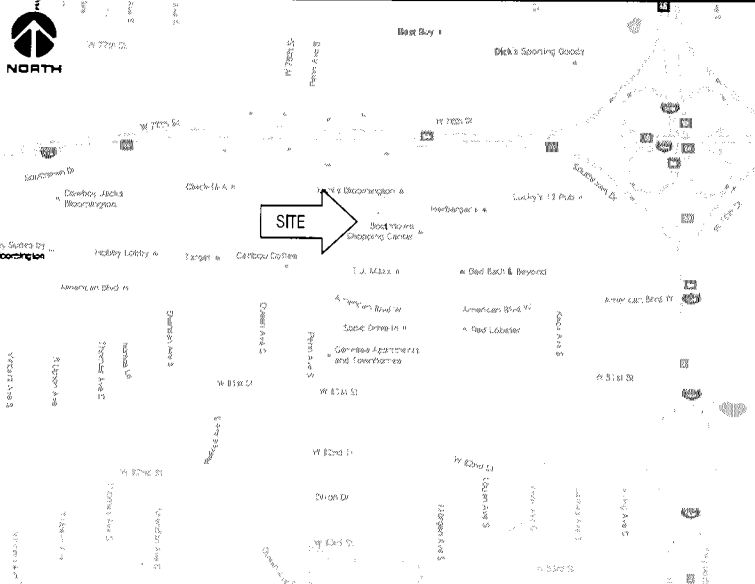
APPLICABLE CODES

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



PROJECT DIRECTORY

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

LESSOR:
KRAUS-ANDERSON INC.
523 8TH ST. S.
MINNEAPOLIS, MN 55404
PHONE: 612.332.7281

ENGINEERING COMPANY:
EDGE CONSULTING ENGINEERS, INC.
17645 JUNIPER PATH
SUITE 105
LAKEVILLE, MN 55044
CONTACT: OTTO DINGFELDER III, P.E.
PHONE: 608.644.1449

RE ENGINEER:
VERIZON WIRELESS
10801 BUSH LAKE RD
BLOOMINGTON, MN 55438
CONTACT: MIHAELA OXLEY

SITE ACQUISITION:
BUELL CONSULTING, INC.
1360 ENERGY PARK DRIVE
SUITE 210
ST. PAUL, MN 55108
CONTACT: ROB VIERA
PHONE: 651.225.0792

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

THESE SITE PLANS ADHERE TO ALL OF THE REQUIREMENTS CALLED OUT IN THE JURISDICTION PLANNING AND ZONING FOR ANTENNAS AND SUPPORT STRUCTURES WHERE SITE IS LOCATED.

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

LIGHT POLE STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS.

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

LOCATION SCAN





AERIAL OVERVIEW

CASE FILE #PL201600185



verizon



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PROJECT NO:	20141029022
EDGE PROJECT NO:	14969
DRAWN BY:	NBT
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
U	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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 SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

SITE PLAN

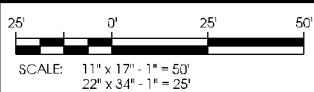
SHEET NUMBER

C-1

PENN AVE.

Use caution at crossing of 36" PCCP Trunk water main. Pothole and maintain 2 ft. vertical separation.

Field Locate and survey all existing underground utilities and show accurately on plans. Realign proposed structures and boring alignments to maintain proper separation distances from water main, valves, hydrants and storm facilities.





AERIAL OVERVIEW



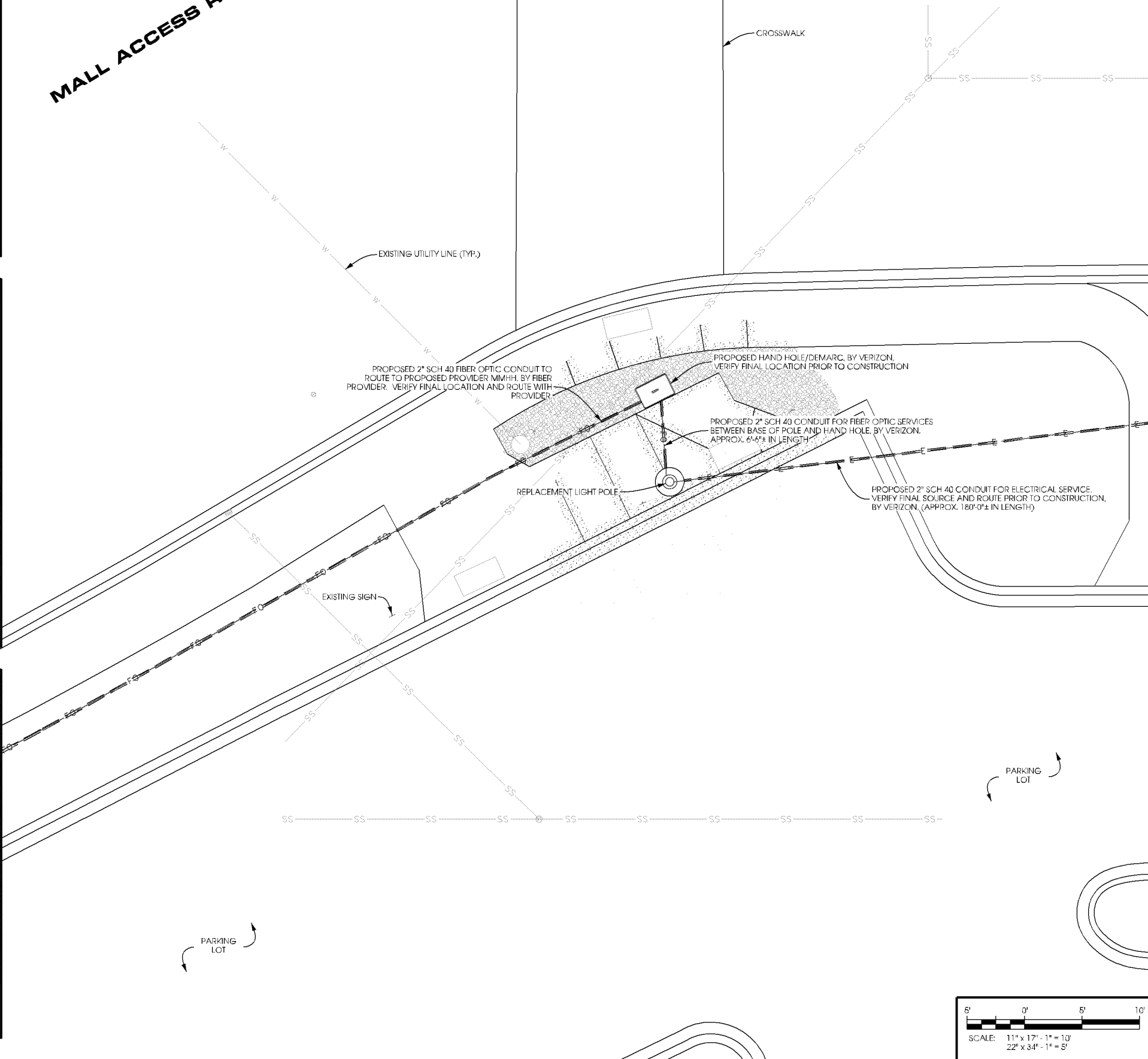
SITE OVERVIEW
[LOOKING NORTHEAST]



SITE OVERVIEW
[LOOKING SOUTHWEST]

CASE FILE #PL201600185

MALL ACCESS ROAD



verizon



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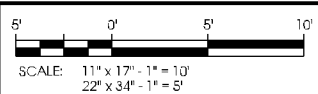
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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
**ENLARGED SITE
PLAN**

SHEET NUMBER

C-2



L:\14900\14969\CAD\Plot\ Preliminary\A-1.dgn

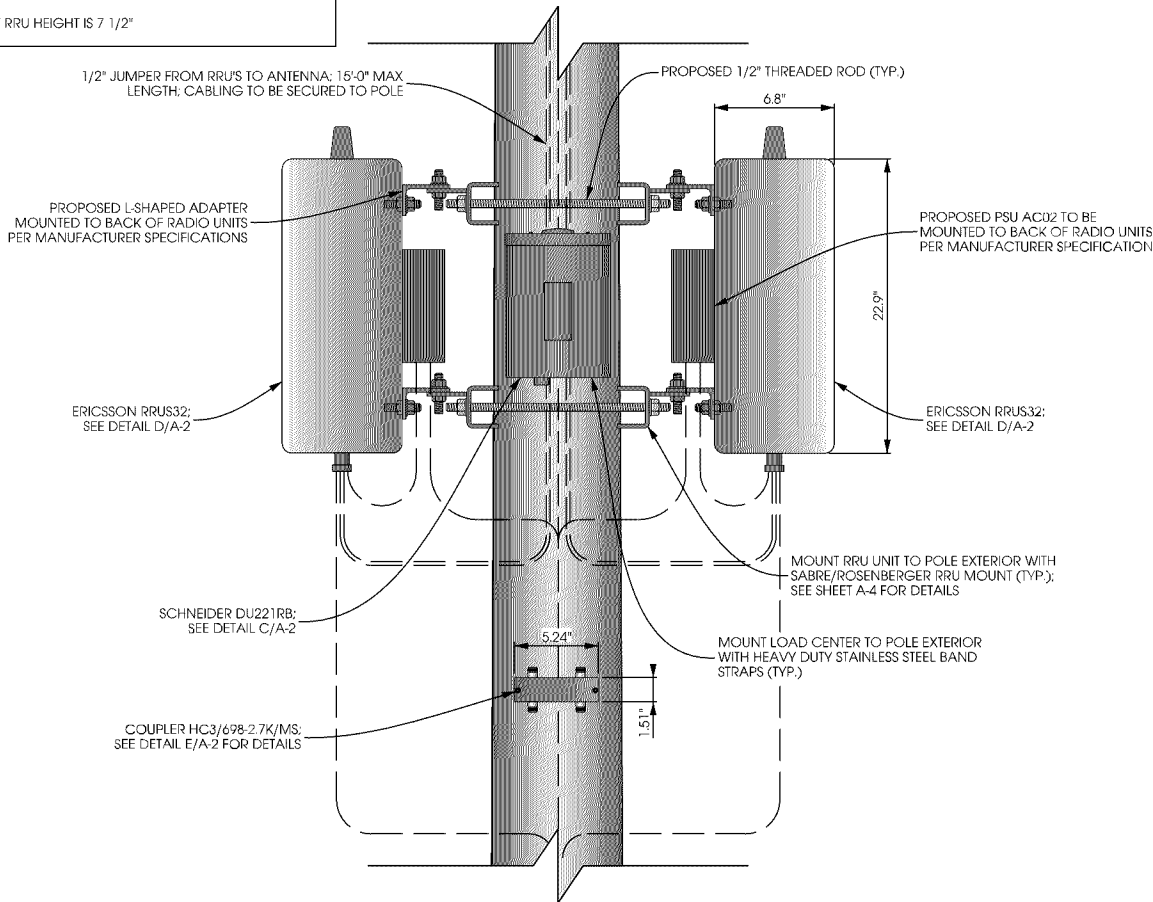
NODE INFO						RADIO				ANTENNA									
						Band	eNB ID	Model	DU#	DU Port#	AZIMUTH	POSITION	QTY	MFR.	MODEL	PORT	C/L	ADJ ELEC TILT	MECH TILT
PCI:	Full Node Name: (Name SC1 Node#) SOUTHTOWN SC1					AWS	TBD	RRUS32 B66A	1	TBD	50	1.1	1	JMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
												1.2							
TBD	Coordinates					AWS	TBD	RRUS32 B66A	1	TBD	50	1.3	1	JMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
												1.4							
LATITUDE						AWS	TBD	RRUS32 B2	1	TBD	50	1.5	1	JMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
												1.6							
LONGITUDE						AWS	TBD	RRUS32 B2	1	TBD	50	1.1	1	JMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
												1.2							
Ground Elevation:						AWS	TBD	RRUS32 B2	1	TBD	50	1.3	1	JMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
												1.4							
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												1.6							
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						AWS	TBD	RR											

NOTE:

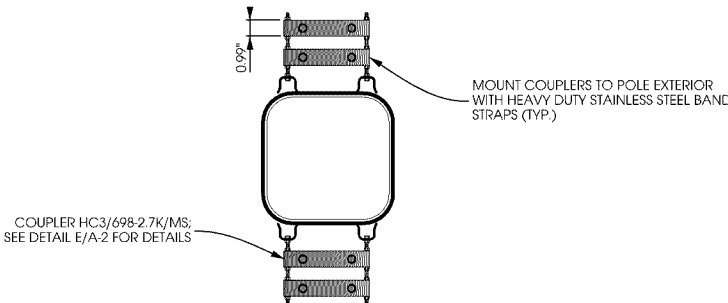
PAINT ALL ANTENNAS, OUTDOOR EQUIPMENT, AND MOUNTING HARDWARE TO MATCH THE PROPOSED LIGHT POLE

POLE SIZE AT RRU HEIGHT IS 7 1/2"

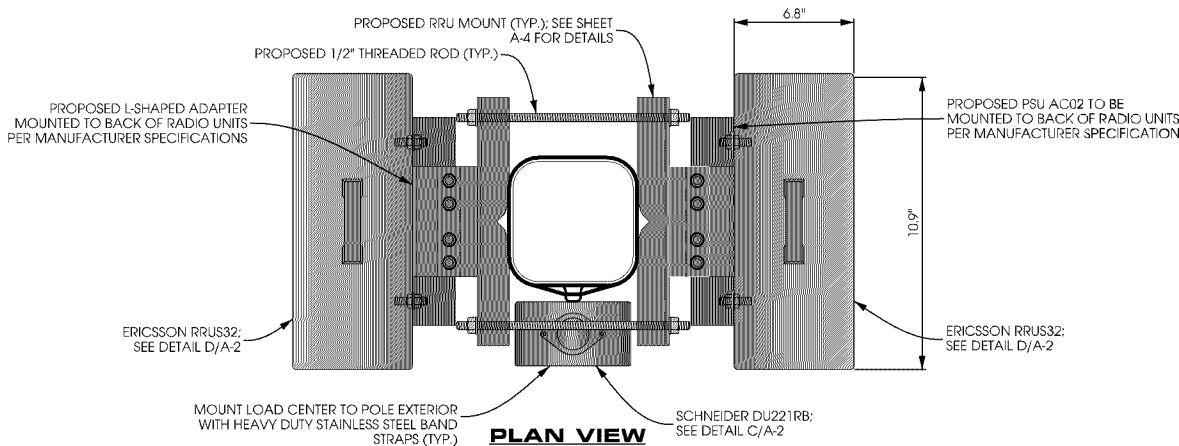
CASE FILE #PL201600185



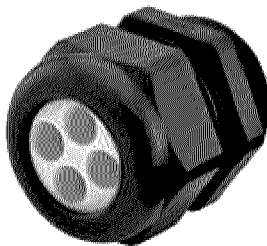
ELEVATION VIEW



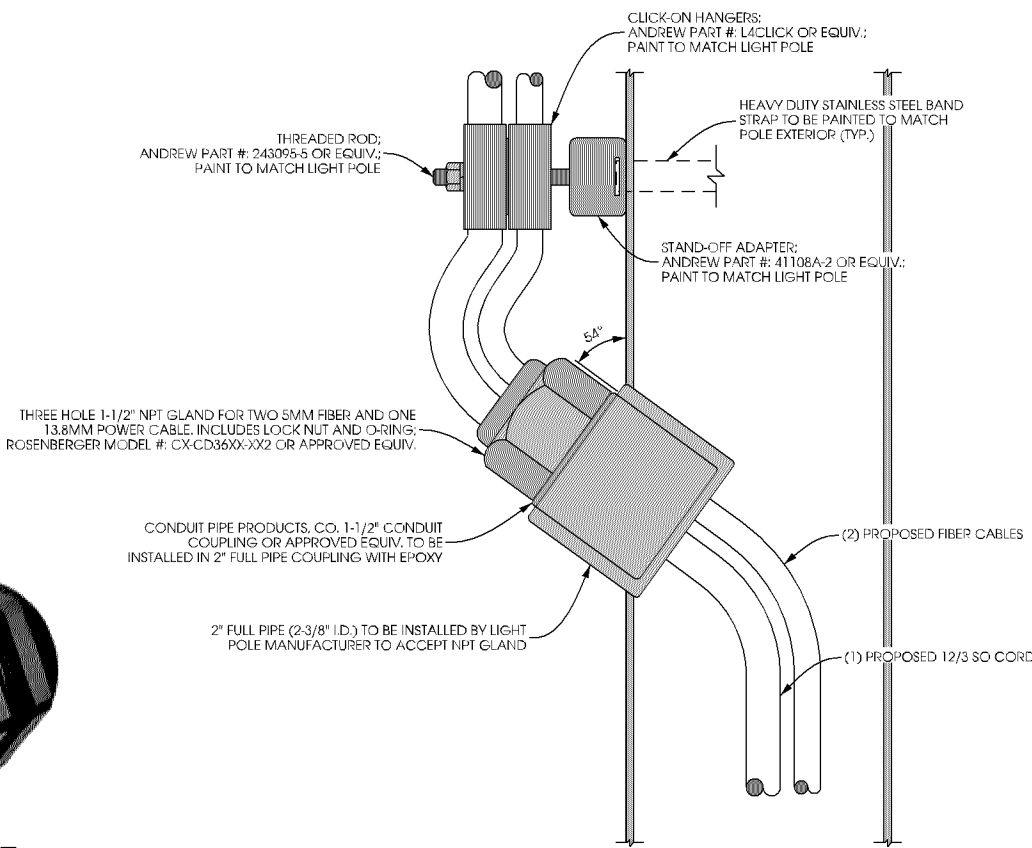
SPLITTER PLAN VIEW



A EQUIPMENT MOUNTING DETAIL
SCALE: 11 x 17 - 1" = 1'-0"
22 x 34 - 1" = 0'-6"

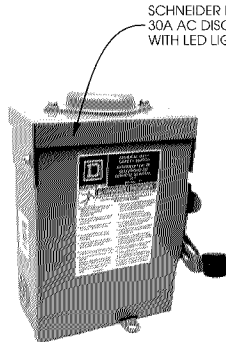


NPT GLAND



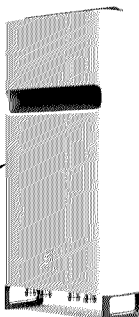
B PENETRATION DETAIL
SCALE: NTS

SCHNEIDER ELECTRIC 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



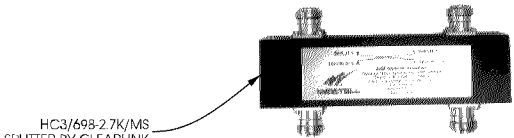
C LOAD CENTER DETAIL
SCALE: NTS

ERICSSON RRU32
- SINGLE-BAND 4Tx/4Rx
- 40MHz ISW
- UP TO 4 x 40W OUTPUT POWER
- SUPPORT 2 x 20MHz LTE
- 2 PORTS x 10 Gbps CPRI
DIMENSIONS: 22.9" x 10.9" x 6.3"
(W/OUT COVER)
WEIGHT: 46.3 LBS
(W/OUT COVER)



D RADIO DETAIL
SCALE: NTS

CLEARLINK HC3 COUPLER
- 200 WATTS AVG. POWER
- 1P45 COMPLIANT
- RoHS COMPLIANT
- 698-2700 MHz FREQUENCY RANGE
DIMENSIONS: 5.24" x 1.58" x 0.99"



E COUPLER DETAIL
SCALE: NTS

verizon



1360 Energy Park Drive, Suite 210
St. Paul, MN 55108
651.225.0793 voice
www.buellconsulting.com

Edge Consulting Engineers, Inc.

17645 Juniper Path, Suite 105
Lakeville, MN 55044
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20141029022
EDGE PROJECT NO:	14969
DRAWN BY:	NBT
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
C	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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 SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
MOUNTING DETAILS

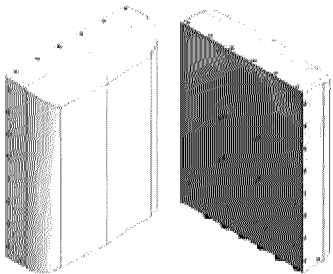
SHEET NUMBER

A-2

X7CQAP-FRO-260

+/-45° Polanzation, (1) 698-896MHz & (2) 1695-2180 MHz antennas, 24" Length, Fast Roll Off 60° Horizontal Pattern, Fixed E-tilt

- Fast Roll Off (FRO) improves Intra and Inter- cell SINR
- Separate housing and reflector construction optimizes RF performance while maximizing mechanical strength
- Good Passive Intermodulation (PIM) performance reduces harmful interference
- Suitable for LTE/CDMA/UMTS/GSM
- Optional wall mount kit available
- Optional multi position stadium mount bracket accommodates most mounting surfaces



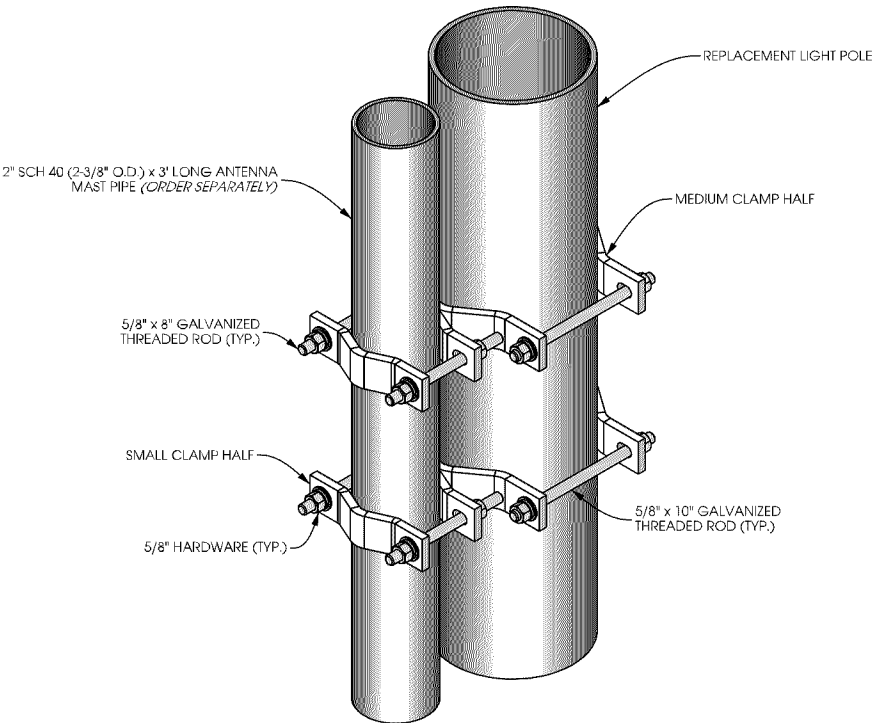
ELECTRICAL SPECIFICATIONS

Frequency Band, MHz	698-824	824-896	1695-1850	1850-1990	1990-2180
Horizontal Beam Width, 3dB points	62°	57°	56°	54°	52°
Gain, dBi	10.9	11.5	14.2	14.6	15.0
Vertical Beam Width, 3dB points	42°	35°	17°	16.2°	15.4°
Front-to-Back at 180°, dB	> 30		> 30		
Polarization	+/-45°		2x +/-45°		
Electrical Downtilt	0°		0°		
VSWR/Return Loss, dB, Maximum	1.5:1/14.0		1.5:1/14.0		
Isolation Between Ports, dB, Minimum	>26		>26		
Co-Polar Isolation Inter Antenna	> 28		> 28		
Intermodulation (2x20w), IM3, dBc	-153		-153		
Impedance, ohms	50		50		
Maximum Power Per Connector, CW (w)	250		125		

MECHANICAL SPECIFICATIONS

Dimensions, Length/Width/Depth	24.1 x 18.8 x 6.3 (612 x 479 x 160 mm)
Connector (Quantity) Type	(6 Total: 2 Low Band, 4 High Band) 7-16 DIN Female
Connector Torque	216-238 lbf-in (25-27 N-m)
Connector Location	Bottom
Antenna Weight	15 lbs (6.82Kg)
Bracket Weight (not included in antenna weight)	14 lbs (6.36Kg)
Standard Bracket Kit	919017
Mechanical Downtilt Range	0°-21°
Radome Material	High Strength Luran, UV Stabilized, ASTM D1925
Wind Survival	150 mph (241 km/h)
Front Wind Load @100mph	112 lbf (501 N)
Equivalent Flat Plate @ 100mph	2.25 sq-ft (c=2) @100 mph

CASE FILE #PL201600185



verizon



1360 Energy Park Drive, Suite 210
St. Paul, MN 55108
651.225.0793 voice
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17645 Juniper Path, Suite 105
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608.644.1549 fax
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PROJECT NO:	20141029022
EDGE PROJECT NO:	14969
DRAWN BY:	NBT
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
U	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

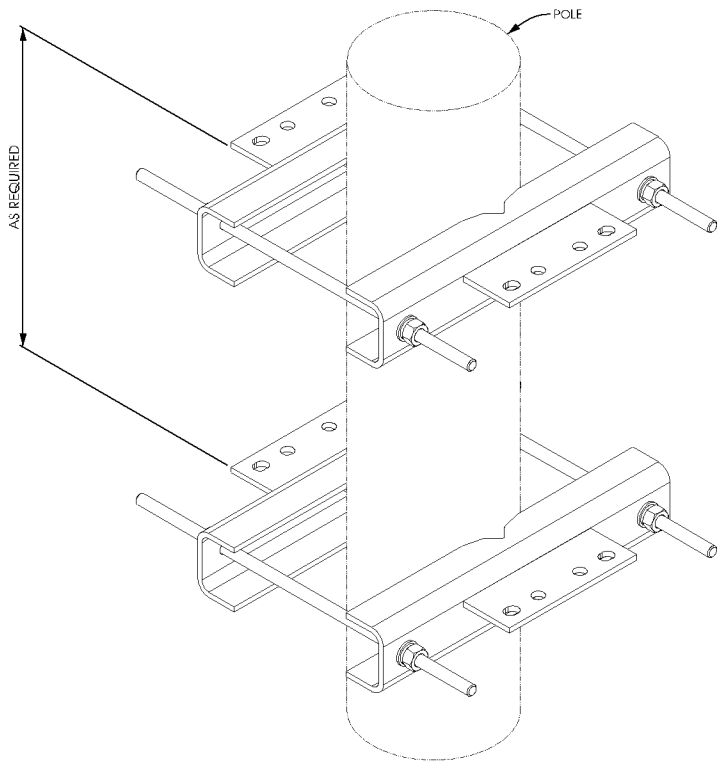
SHEET TITLE
ANTENNA DETAILS

SHEET NUMBER

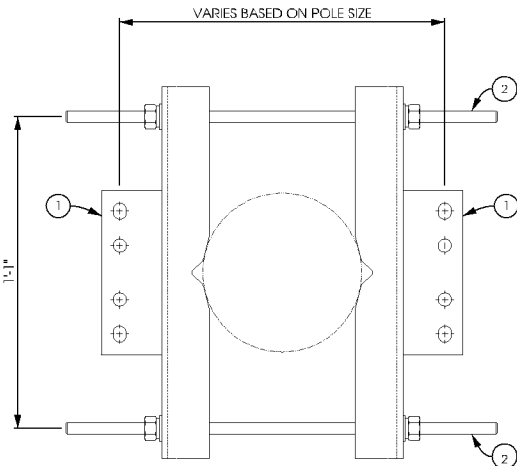
A-3

ITEM	QTY.	DESCRIPTION	
1	4	ZW02M15 WELDMENT, RUU MOUNT	32
2	6	C40032026 THREADED ROD ASSEMBLY, 1/2" x 1'-6"	10
TOTAL WEIGHT			42

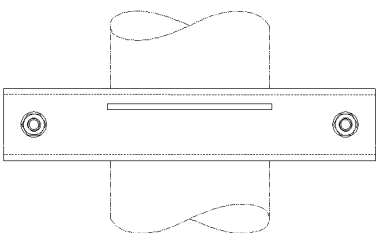
CASE FILE #PL201600185



ISOMETRIC VIEW



PLAN VIEW



ELEVATION VIEW

A **RADIO UNIT MOUNTING DETAIL**
SCALE: NTS
SABRE INDUSTRIES PART #: C10123108

elecDirect
Selection, Service & Quality Solutions
Lanham, MD

Toll Free 1-800-701-0975
Fax 1-800-892-6360

REMKE

TUFF-SEAL™

MULTIPLE HOLE BUSHINGS

The Tuff Seal family of Multiple Hole Bushings are ideal for use when multiple conductors need to be terminated into one fitting. Standard bushings are made from Neoprene but optional materials include silicone for high-temperature applications and Viton® for enhanced corrosion resistance.

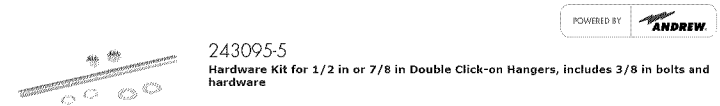
Remke Multiple Hole Bushings can be made to fit into cord connectors made from aluminum, nickel-plated aluminum, steel and stainless steel, nylon or Valox™.



Part #	Bushing Spec.	Number of Holes	Diameter Each Hole	Hub Size
RBR-10064-2	SRB-10064-2	2	.141" 1/4"	1/2"
RBR-10064-2	SRB-10064-2	2	.141" 1/4"	1/2"
RBR-104-2	SRB-104-2	2	.250" 1"	1/2"
RBR-10532-2	SRB-10532-2	2	.190" 3/4"	1/2"
RBR-10732-2	SRB-10732-2	2	.210" 3/4"	1/2"
RBR-10932-2	SRB-10932-2	2	.231" 1"	1/2"
RBR-1201764-2	SRB-201764-2	2	.280" 1 1/4"	1"
RBR-1201964-3	SRB-201964-3	3	.290" 1 1/4"	1"
RBR-1205-2	SRB-205-2	2	.312" 1 1/4"	1"
RBR-120732-2	SRB-20732-2	2	.210" 3/4"	1/2"
RBR-120-3	SRB-120-3	3	.250" 1"	1/2"
RBR-12032-3	SRB-1032-3	3	.190" 3/4"	1/2"
RBR-10732-3	SRB-10732-3	3	.210" 3/4"	1/2"
RBR-10932-3	SRB-10932-3	3	.231" 1"	1/2"
RBR-1201764-3	SRB-201764-3	3	.280" 1 1/4"	1"
RBR-1201964-3	SRB-201964-3	3	.290" 1 1/4"	1"
RBR-1205-3	SRB-205-3	3	.312" 1 1/4"	1"
RBR-120732-3	SRB-20732-3	3	.210" 3/4"	1/2"
RBR-120-4	SRB-120-4	4	.250" 1"	1/2"
RBR-12032-4	SRB-1032-4	4	.190" 3/4"	1/2"
RBR-10732-4	SRB-10732-4	4	.210" 3/4"	1/2"
RBR-10932-4	SRB-10932-4	4	.231" 1"	1/2"
RBR-1201764-4	SRB-201764-4	4	.280" 1 1/4"	1"
RBR-1201964-4	SRB-201964-4	4	.290" 1 1/4"	1"
RBR-1205-4	SRB-205-4	4	.312" 1 1/4"	1"
RBR-120732-4	SRB-20732-4	4	.210" 3/4"	1/2"
RBR-120-5	SRB-120-5	5	.250" 1"	1/2"
RBR-12032-5	SRB-1032-5	5	.190" 3/4"	1/2"
RBR-10732-5	SRB-10732-5	5	.210" 3/4"	1/2"
RBR-10932-5	SRB-10932-5	5	.231" 1"	1/2"
RBR-1201764-5	SRB-201764-5	5	.280" 1 1/4"	1"
RBR-1201964-5	SRB-201964-5	5	.290" 1 1/4"	1"
RBR-1205-5	SRB-205-5	5	.312" 1 1/4"	1"
RBR-120732-5	SRB-20732-5	5	.210" 3/4"	1/2"
RBR-120-6	SRB-120-6	6	.250" 1"	1/2"
RBR-12032-6	SRB-1032-6	6	.190" 3/4"	1/2"
RBR-10732-6	SRB-10732-6	6	.210" 3/4"	1/2"
RBR-10932-6	SRB-10932-6	6	.231" 1"	1/2"
RBR-1201764-6	SRB-201764-6	6	.280" 1 1/4"	1"
RBR-1201964-6	SRB-201964-6	6	.290" 1 1/4"	1"
RBR-1205-6	SRB-205-6	6	.312" 1 1/4"	1"
RBR-120732-6	SRB-20732-6	6	.210" 3/4"	1/2"
RBR-120-7	SRB-120-7	7	.250" 1"	1/2"
RBR-12032-7	SRB-1032-7	7	.190" 3/4"	1/2"
RBR-10732-7	SRB-10732-7	7	.210" 3/4"	1/2"
RBR-10932-7	SRB-10932-7	7	.231" 1"	1/2"
RBR-1201764-7	SRB-201764-7	7	.280" 1 1/4"	1"
RBR-1201964-7	SRB-201964-7	7	.290" 1 1/4"	1"
RBR-1205-7	SRB-205-7	7	.312" 1 1/4"	1"
RBR-120732-7	SRB-20732-7	7	.210" 3/4"	1/2"
RBR-120-8	SRB-120-8	8	.250" 1"	1/2"
RBR-12032-8	SRB-1032-8	8	.190" 3/4"	1/2"
RBR-10732-8	SRB-10732-8	8	.210" 3/4"	1/2"
RBR-10932-8	SRB-10932-8	8	.231" 1"	1/2"
RBR-1201764-8	SRB-201764-8	8	.280" 1 1/4"	1"
RBR-1201964-8	SRB-201964-8	8	.290" 1 1/4"	1"
RBR-1205-8	SRB-205-8	8	.312" 1 1/4"	1"
RBR-120732-8	SRB-20732-8	8	.210" 3/4"	1/2"
RBR-120-9	SRB-120-9	9	.250" 1"	1/2"
RBR-12032-9	SRB-1032-9	9	.190" 3/4"	1/2"
RBR-10732-9	SRB-10732-9	9	.210" 3/4"	1/2"
RBR-10932-9	SRB-10932-9	9	.231" 1"	1/2"
RBR-1201764-9	SRB-201764-9	9	.280" 1 1/4"	1"
RBR-1201964-9	SRB-201964-9	9	.290" 1 1/4"	1"
RBR-1205-9	SRB-205-9	9	.312" 1 1/4"	1"
RBR-120732-9	SRB-20732-9	9	.210" 3/4"	1/2"
RBR-120-10	SRB-120-10	10	.250" 1"	1/2"
RBR-12032-10	SRB-1032-10	10	.190" 3/4"	1/2"
RBR-10732-10	SRB-10732-10	10	.210" 3/4"	1/2"
RBR-10932-10	SRB-10932-10	10	.231" 1"	1/2"
RBR-1201764-10	SRB-201764-10	10	.280" 1 1/4"	1"
RBR-1201964-10	SRB-201964-10	10	.290" 1 1/4"	1"
RBR-1205-10	SRB-205-10	10	.312" 1 1/4"	1"
RBR-120732-10	SRB-20732-10	10	.210" 3/4"	1/2"
RBR-120-11	SRB-120-11	11	.250" 1"	1/2"
RBR-12032-11	SRB-1032-11	11	.190" 3/4"	1/2"
RBR-10732-11	SRB-10732-11	11	.210" 3/4"	1/2"
RBR-10932-11	SRB-10932-11	11	.231" 1"	1/2"
RBR-1201764-11	SRB-201764-11	11	.280" 1 1/4"	1"
RBR-1201964-11	SRB-201964-11	11	.290" 1 1/4"	1"
RBR-1205-11	SRB-205-11	11	.312" 1 1/4"	1"
RBR-120732-11	SRB-20732-11	11	.210" 3/4"	1/2"
RBR-120-12	SRB-120-12	12	.250" 1"	1/2"
RBR-12032-12	SRB-1032-12	12	.190" 3/4"	1/2"
RBR-10732-12	SRB-10732-12	12	.210" 3/4"	1/2"
RBR-10932-12	SRB-10932-12	12	.231" 1"	1/2"
RBR-1201764-12	SRB-201764-12	12	.280" 1 1/4"	1"
RBR-1201964-12	SRB-201964-12	12	.290" 1 1/4"	1"
RBR-1205-12	SRB-205-12	12	.312" 1 1/4"	1"
RBR-120732-12	SRB-20732-12	12	.210" 3/4"	1/2"
RBR-120-13	SRB-120-13	13	.250" 1"	1/2"
RBR-12032-13	SRB-1032-13	13	.190" 3/4"	1/2"
RBR-10732-13	SRB-10732-13	13	.210" 3/4"	1/2"
RBR-10932-13	SRB-10932-13	13	.231" 1"	1/2"
RBR-1201764-13	SRB-201764-13	13	.280" 1 1/4"	1"
RBR-1201964-13	SRB-201964-13	13	.290" 1 1/4"	1"
RBR-1205-13	SRB-205-13	13	.312" 1 1/4"	1"
RBR-120732-13	SRB-20732-13	13	.210" 3/4"	1/2"
RBR-120-14	SRB-120-14	14	.250" 1"	1/2"
RBR-12032-14	SRB-1032-14	14	.190" 3/4"	1/2"
RBR-10732-14	SRB-10732-14	14	.210" 3/4"	1/2"
RBR-10932-14	SRB-10932-14	14	.231" 1"	1/2"
RBR-1201764-14	SRB-201764-14	14	.280" 1 1/4"	1"
RBR-1201964-14	SRB-201964-14	14	.290" 1 1/4"	1"
RBR-1205-14	SRB-205-14	14	.312" 1 1/4"	1"
RBR-120732-14	SRB-20732-14	14	.210" 3/4"	1/2"
RBR-120-15	SRB-120-15	15	.250" 1"	1/2"
RBR-12032-15	SRB-1032-15	15	.190" 3/4"	1/2"
RBR-10732-15	SRB-10732-15	15	.210" 3/4"	1/2"
RBR-10932-15	SRB-10932-15	15	.231" 1"	1/2"
RBR-1201764-15	SRB-201764-15	15	.280" 1 1/4"	1"
RBR-1201964-15	SRB-201964-15	15	.290" 1 1/4"	1"
RBR-1205-15	SRB-205-15	15	.312" 1 1/4"	1"
RBR-120732-15	SRB-20732-15	15	.210" 3/4"	1/2"
RBR-120-16	SRB-120-16	16	.250" 1"	1/2"
RBR-12032-16	SRB-1032-16	16	.190" 3/4"	1/2"
RBR-10732-16	SRB-10732-16	16	.210" 3/4"	1/2"
RBR-10932-16	SRB-10932-16	16	.231" 1"	1/2"
RBR-1201764-16	SRB-201764-16	16	.280" 1 1/4"	1"
RBR-1201964-16	SRB-201964-16	16	.290" 1 1/4"	1"
RBR-1205-16	SRB-205-16	16	.312" 1 1/4"	1"
RBR-120732-16	SRB-20732-16	16	.210" 3/4"	1/2"
RBR-120-17	SRB-120-17	17	.250" 1"	1/2"
RBR-12032-17	SRB-1032-17	17	.190" 3/4"	1/2"
RBR-10732-17	SRB-10732-17	17	.210" 3/4"	1/2"
RBR-10932-17	SRB-10932-17	17	.231" 1"	1/2"
RBR-1201764-17	SRB-201764-17	17	.280" 1 1/4"	1"
RBR-1201964-17	SRB-201964-17	17	.290" 1 1/4"	1"
RBR-1205-17	SRB-205-17	17	.312" 1 1/4"	1"
RBR-120732-17	SRB-20732-17	17	.210" 3/4"	1/2"
RBR-120-18	SRB-120-18	18	.250" 1"	1/2"
RBR-12032-18	SRB-1032-18	18	.190" 3/4"	1/2"
RBR-10732-18	SRB-10732-18	18	.210" 3/4"	1/2"
RBR-10932-18	SRB-10932-18	18	.231" 1"	1/2"
RBR-1201764-18	SRB-201764-18	18	.280" 1 1/4"	1"
RBR-1201964-18	SRB-201964-18	18	.290" 1 1/4"	1"
RBR-1205-18	SRB-205-18	18	.312" 1 1/4"	1"
RBR-120732-18	SRB-20732-18	18	.210" 3/4"	1/2"
RBR-120-19	SRB-120-19	19	.250" 1"	1/2"
RBR-12032-19	SRB-1032-19	19	.190" 3/4"	1/2"
RBR-10732-19	SRB-10732-19	19	.210" 3/4"	1/2"
RBR-10932-19	SRB-10932-19	19	.231" 1"	1/2"
RBR-1201764-19	SRB-201764-19	19	.280" 1 1/4"	1"
RBR-1201964-19	SRB-201964-19	19	.290" 1 1/4"	1"
RBR-1205-19	SRB-205-19	19	.312" 1 1/4"	1"
RBR-120732-19	SRB-20732-19	19	.210" 3/4"	1/2"
RBR-120-20	SRB-120-20	20	.250" 1"	1/2"
RBR-12032-20	SRB-1032-20	20	.190" 3/4"	1/2"
RBR-10732-20	SRB-10732-20	20	.210" 3/4"	1/2"
RBR-10932-20	SRB-10932-20	20	.231" 1"	1/2"
RBR-1201764-20	SRB-201764-20	20	.280" 1 1/4"	1"
RBR-1201964-20	SRB-201964-20	20	.290" 1 1/4"	1"
RBR-1205-20	SRB-205-20	20	.312" 1 1/4"	1"
RBR-120732-20	SRB-20732-20	20	.210" 3/4"	1/2"
RBR-120-21	SRB-120-21	21	.250" 1"	1/2"
RBR-12032-21	SRB-1032-21	21	.190" 3/4"	1/2"
RBR-10732-21	SRB-10732-21	21	.210" 3/4"	1/2"
RBR-10932-21	SRB-10932-21	21	.231" 1"	1/2"
RBR-1201764-21	SRB-201764-21	21	.280" 1 1/4"	1"
RBR-1201964-21	SRB-201964-21	21	.290" 1 1/4"	1"
RBR-1205-21	SRB-205-21	21	.312" 1 1/4"	1"
RBR-120732-21	SRB-20732-21	21	.210" 3/4"	1/2"
RBR-120-22	SRB-120-22	22	.250" 1"	1/2"
RBR-12032-22	SRB-1032-22	22	.190" 3/4"	1/2"
RBR-10732-22	SRB-10732-22	22	.210" 3/4"	1/2"
RBR-10932-22	SRB-10932-22	22	.231" 1"	1/2"
RBR-1201764-22	SRB-201764-22	22	.280" 1 1/4"	1"
RBR-1201964-22	SRB-201964-22	22	.290" 1 1/4"	1"
RBR-1205-22	SRB-205-22	22	.312" 1 1/4"	1"
RBR-120732-22	SRB-20732-22	22	.210" 3/4"	1/2"
RBR-120-23	SRB-120-23	23	.250" 1"	1/2"
RBR-12032-23	SRB-1032-23	23	.190" 3/4"	1/2"
RBR-10732-23	SRB-10732-23	23	.210" 3/4"	1/2"
RBR-10932-23	SRB-10932-23	23	.231" 1"	1/2"
RBR-1201764-23	SRB-201764-23	23	.280" 1 1/4"	1"
RBR-1201964-23	SRB-201964-23	23	.290" 1 1/4"	1"
RBR-1205-23	SRB-205-23	23	.312" 1 1/4"	1"
RBR-120732-23	SRB-20732-23	23	.210" 3/4"	1/2"
RBR-120-24	SRB-120-24	24	.250" 1"	1/2"
RBR-12032-24	SRB-1032-24	24	.190" 3/4"	1/2"
RBR-10732-24	SRB-10732-24	24	.210" 3/4"	1/2"
RBR-10932-24	SRB-10932-24	24	.231" 1"	1/2"
RBR-1201764-24	SRB-201764-24	24	.280" 1 1/4"	1"
RBR-1201964-24	SRB-201964-24	24	.290" 1 1/4"	1"
RBR-1205-24	SRB-205-24	24	.312" 1 1/4"	1"
RBR-120732-24	SRB-20732-24	24	.210" 3/4"	1/2"
RBR-120-25	SRB-120-25	25	.250" 1"	1/2"
RBR-12032-25	SRB-1032-25	25	.190" 3/4"	1/2"
RBR-10732-25	SRB-10732-25	25	.210" 3/4"	1/2"
RBR-10932-25	SRB-10932-25	25	.231" 1"	1/2"
RBR-1201764-25	SRB-201764-25	25	.280" 1 1/4"	1"
RBR-1201964-25	SRB-201964-25	25	.290" 1 1/4"	1"
RBR-1205-25	SRB-205-25	25	.312" 1 1/4"	1"
RBR-120732-25	SRB-20732-25	25	.210" 3/4"	1/2"
RBR-120-26	SRB-120-26	26	.250" 1"	1/2"
RBR-12032-26	SRB-1032-26	26	.190" 3/4"	1/2"
RBR-10732-26	SRB-10732-26	26	.210" 3/4"	1/2"
RBR-10932-26	SRB-10932-26	26	.231" 1"	1/2"
RBR-1201764-26	SRB-201764-26	26	.280" 1 1/4"	1"
RBR-1201964-26	SRB-201964-26	26	.290" 1 1/4"	1"
RBR-1205-26	SRB-205-26	26	.312" 1 1/4"	1"

Product Specifications

COMMScope®



243095-5
Hardware Kit for 1/2 in or 7/8 in Double Click-on Hangers, includes 3/8 in bolts and hardware

Dimensions

Nominal Size	1/2 in 7/8 in
Length	137.16 mm 5.40 in

General Specifications

Includes	Forty flat washers Forty lock washers Ten 3/8 in threaded rods Twenty hex nuts
Maximum Stack Height	2
Ordering Note	CommScope® standard product in the United States and Canada
Package Quantity	10

Mechanical Specifications

Thread Size	3/8 in
-------------	--------

Packed Dimensions

Height	14.9 cm 5.9 in
Length	6.4 cm 2.5 in
Shipping Weight	1.13 kg 2.50 lb
Width	6.4 cm 2.5 in

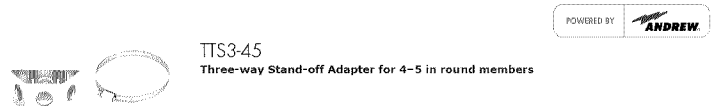
Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
China RoHS SJ/T 11364-2006	Below Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



Product Specifications

COMMScope®



TTS3-45
Three-way Stand-off Adapter for 4-5 in round members

General Specifications

Adapter Type	Stand-off adapter
Material Type	Stainless steel
Ordering Note	CommScope® non-standard product
Package Quantity	10

Mechanical Specifications

Material Thickness	2.591 mm 0.102 in
Maximum Loading	Double stack, 1-5/8 in cable
Mounting	3/4 in through hole

Packed Dimensions

Height	12.0 cm 4.7 in
Length	1.0 cm 0.4 in
Shipping Weight	0.58 kg 1.28 lb
Width	11.0 cm 4.3 in

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

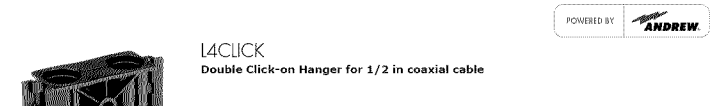
UAAI — Universal Angle Adapter Insert

SA-38 — Universal Stand-off Adapter

31670-4 — Round Member Adapter for 4-5 in round members

Product Specifications

COMMScope®



L4CLICK
Double Click-on Hanger for 1/2 in coaxial cable

Dimensions

Nominal Size	1/2 in
Compatible Diameter, maximum	16.256 mm 0.640 in
Compatible Diameter, minimum	15.240 mm 0.600 in
Height	51.00 mm 2.01 in
Length	89.00 mm 3.50 in
Width	45.00 mm 1.77 in

Electrical Specifications

DTF Effect	0.1 dB
Return Loss Effect	0.1 dB

General Specifications

Hanger Type	Click-on hanger
Cables per Hanger	2
Color	Black
Material Type	Engineered plastic
Maximum Stack Height	3
Ordering Note	CommScope® standard product in the United States and Canada
Package Quantity	10

Mechanical Specifications

Mounting	Mounting hole clearance for 3/8, 16 UNC or M10 threaded rod
Operating Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
UV Resistance, minimum with no degradation	=100 hours exposure in accelerated UV life chamber
Vibration Survival	=4 hours at resonant frequency
Environmental Strength Capability	Double cable weight

Packed Dimensions

Height	19.0 cm 7.5 in
Length	17.0 cm 6.7 in
Shipping Weight	0.26 kg 0.57 lb
Width	8.0 cm 3.1 in

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



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PROJECT NO: 20141029022

EDGE PROJECT NO: 14969

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
U	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

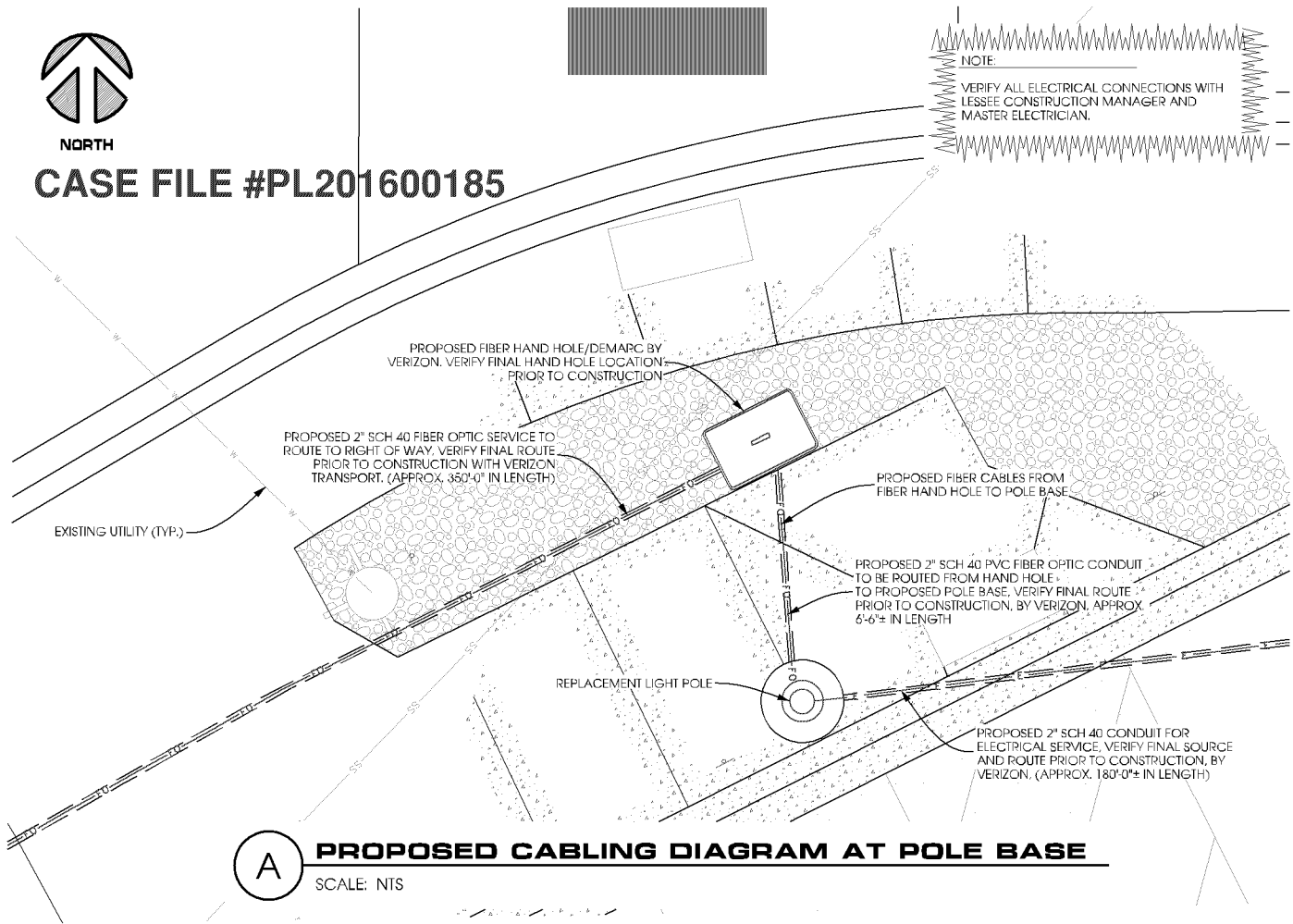
SHEET TITLE
**CABLE MOUNTING
DETAILS**

SHEET NUMBER

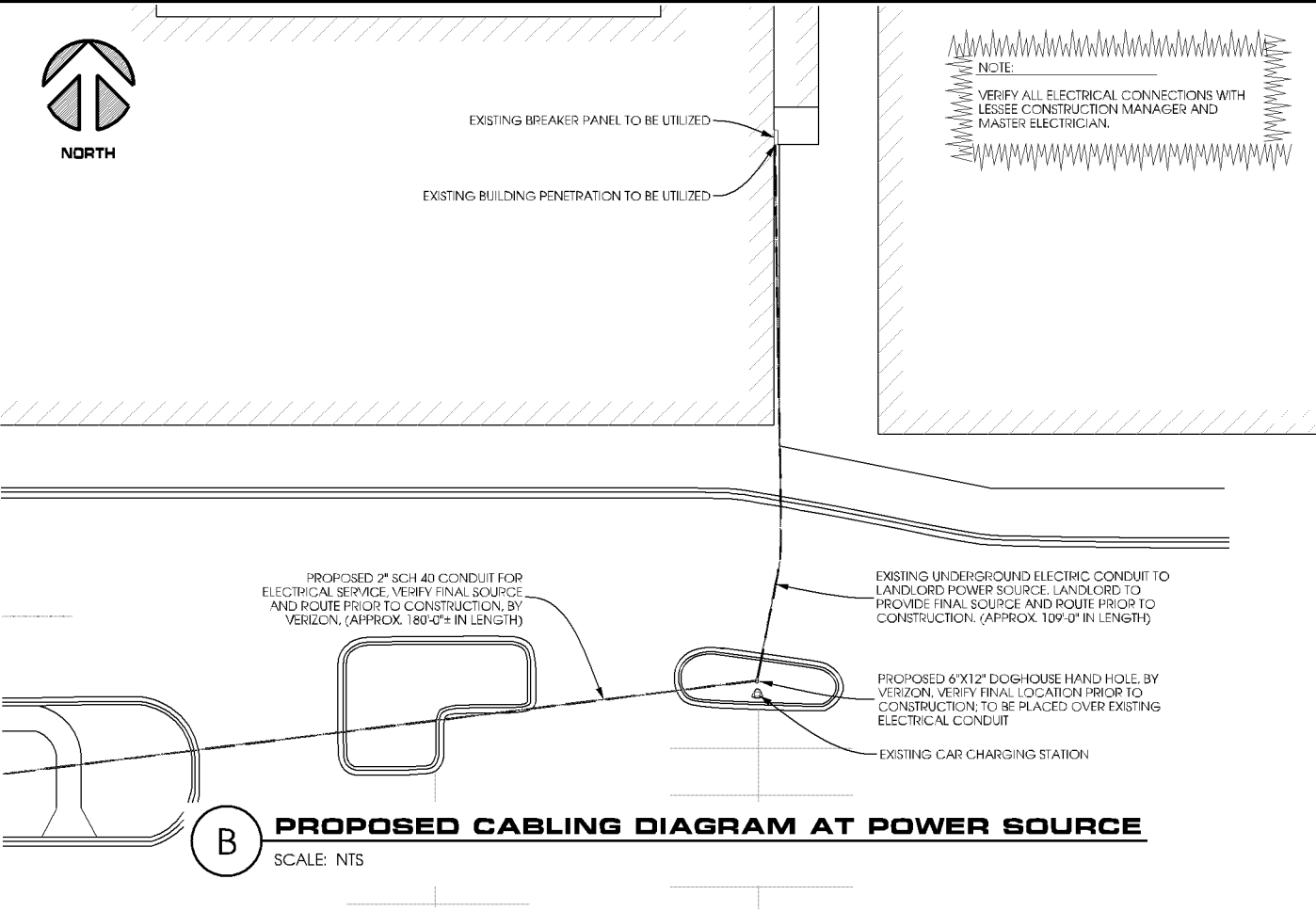
A-5



CASE FILE #PL201600185

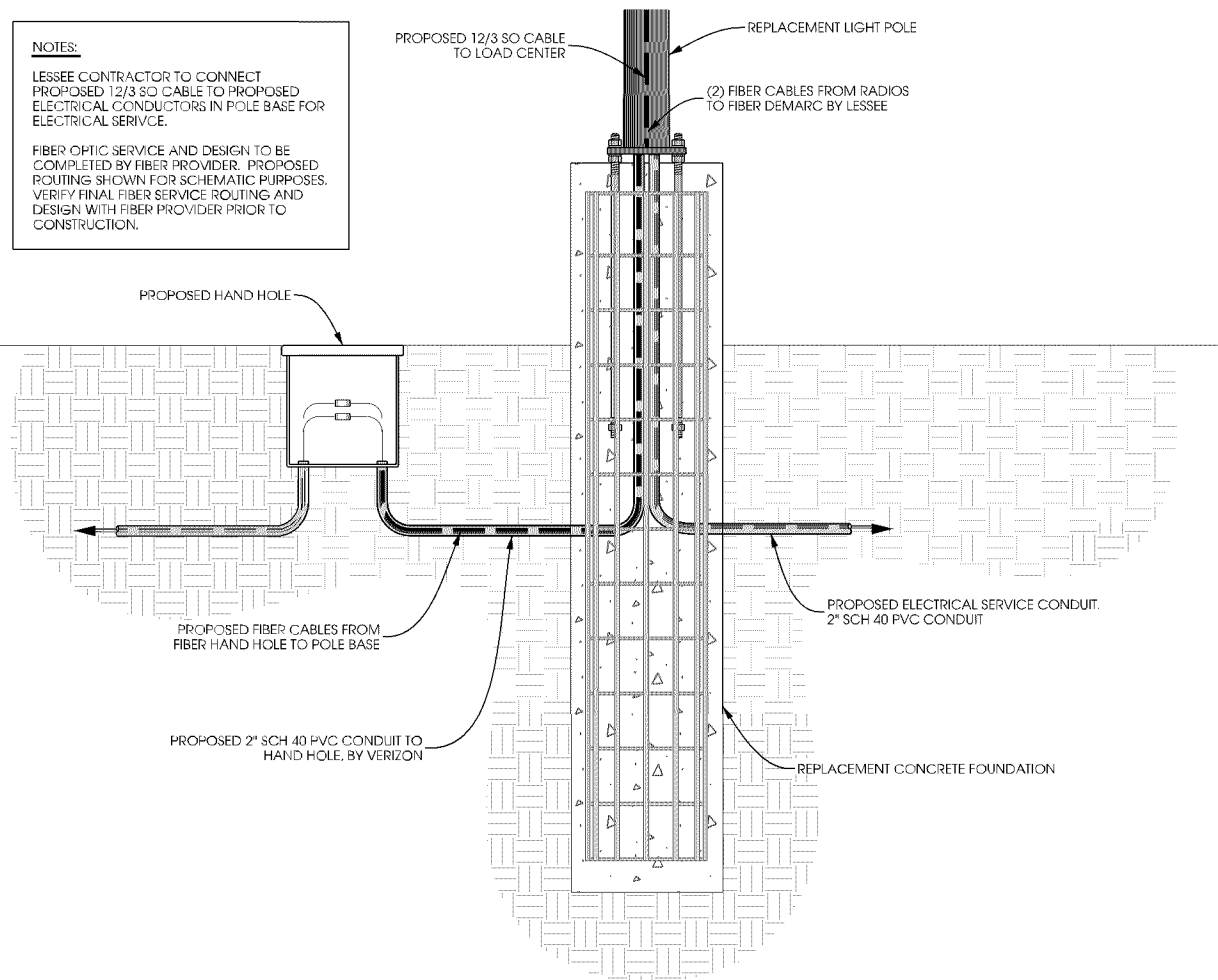


A PROPOSED CABLING DIAGRAM AT POLE BASE
SCALE: NTS



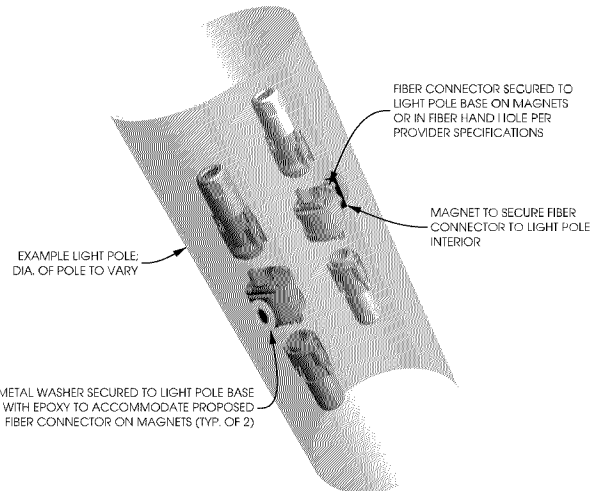
B PROPOSED CABLING DIAGRAM AT POWER SOURCE
SCALE: NTS

NOTES:
LESSEE CONTRACTOR TO CONNECT PROPOSED 12/3 SO CABLE TO PROPOSED ELECTRICAL CONDUCTORS IN POLE BASE FOR ELECTRICAL SERVICE.
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.



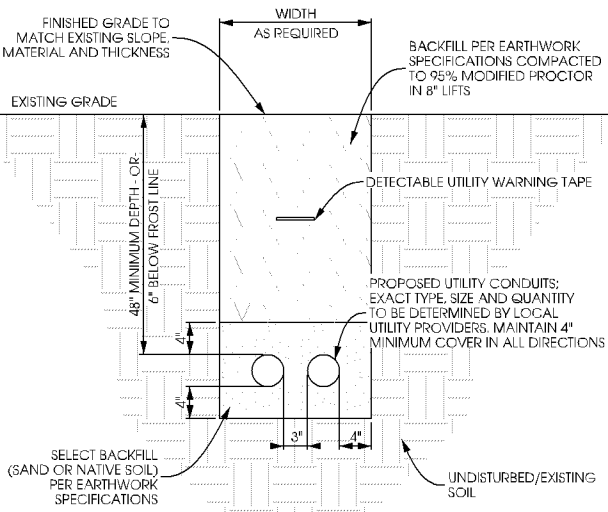
C POWER AND FIBER ROUTING
SCALE: NTS

NOTE:
PROPOSED FIBER CONNECTOR DETAIL PROVIDED BY LESSEE. CONTRACTOR TO VERIFY FINAL MAKE AND MODEL WITH ROSSENBERGER AND LESSEE CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.



D FIBER CONNECTOR
SCALE: NTS

NOTES:
UTILITY CONDUITS TO BE BURIED A DEPTH OF 48" BELOW GROUND LEVEL OR 6" BELOW THE FROST LINE.
CONDUIT TYPE, SIZE, QUANTITY AND SEPARATION TO BE VERIFIED WITH LOCAL UTILITY PROVIDER REQUIREMENTS.



E UTILITY TRENCH DETAIL
SCALE: NTS

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PROJECT NO: 20141029022
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REV.	DATE	DESCRIPTION	
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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
CABLING DETAILS

SHEET NUMBER
E-1

CASE FILE #PL201600185

GENERAL ELECTRICAL NOTES

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 "I" 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, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
11. ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE.
12. PROVIDE CONSTRUCTION ENGINEER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
13. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
14. USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR.
15. ALL CONDUCTORS SHALL BE COPPER.
16. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
17. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES AND DRAWINGS.
18. RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT A.C., WHITE AS REQUIRED BY THE ARCHITECT OR APPROVED EQUAL.
19. WALL SWITCHES SHALL BE SINGLE-POLE, HUBBELL #1201 OR EQUIVALENT, WHITE AS REQUIRED BY THE ARCHITECT.
20. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE RACO #800, 1/2" RAISED WORK COVERS.
21. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM. NO BX OR ROMEX CABLE IS PERMITTED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
22. GROUND RODS SHALL BE AS SPECIFIED ON THE GROUNDING DRAWINGS.
23. METER SOCKET AMPERES, VOLTAGE, NUMBER OF PHASES SHALL BE AS NOTED ON THE DRAWINGS. MANUFACTURED BY SQUARE D COMPANY OR APPROVED EQUAL. IF HOST FACILITY REQUIRES THE NEW SERVICE TO BE SUB-METERED FROM THE EXISTING SERVICE, SUB-METER SHALL BE OF THE 10x OR 16x TYPE.
24. ALL MATERIALS SHALL BE U.L. LISTED.
25. CONDUIT:
A. SERVICE CONDUITS SHALL BE GRAY SCH.40 PVC BURIED MIN. 36", EXCEPT THAT SCH.80 SHALL BE USED UNDER ROADWAYS AND IN LOCATIONS SUBJECT TO CASUAL IMPACTS. BENDS SHALL BE MADE USING "WIDE SWEEP" (12" MIN. RADIUS) ELBOW FITTINGS. ANY CODE-REQUIRED RIGID STEEL CONDUIT SHALL BE U.L. LABEL, GALVANIZED INSIDE AND OUTSIDE. CONDUIT SHALL EXTEND MIN. 36" BELOW GRADE, WITH "SWEEP" ELBOWS (12" R. MIN.) ENDING IN PVC TRANSITION FITTINGS. RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2 LAP-WRAPPED WITH HUNTS PROCESS NO. 3 EXTENDING MIN. 12" ABOVE GRADE.
B. INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING HAVING U.L. LABEL, FITTINGS SHALL BE GLAND RING COMPRESSION TYPE.
C. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. NO SUCH CONDUIT SHALL EXCEED SIX FEET IN LENGTH.
26. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
27. PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
28. PENETRATIONS IN FIRE PATED 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-PAY OR OTHER DEVICE) THAT CAN ACCURATELY LOCATE THEM. TENDONS OR REINFORCING MUST NOT BE DRILLED, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES.
30. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO CONSTRUCTION ENGINEER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
31. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF BOTH TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
32. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY TOWER LIGHTING SYSTEM DESCRIBED IN THE RFG.

ELECTRICAL NOTES



REPLACEMENT LIGHT POLE LOCATION



EXISTING BUILDING PENETRATION

verizon



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PROJECT NO: 20141029022

EDGE PROJECT NO: 14969

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
U	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

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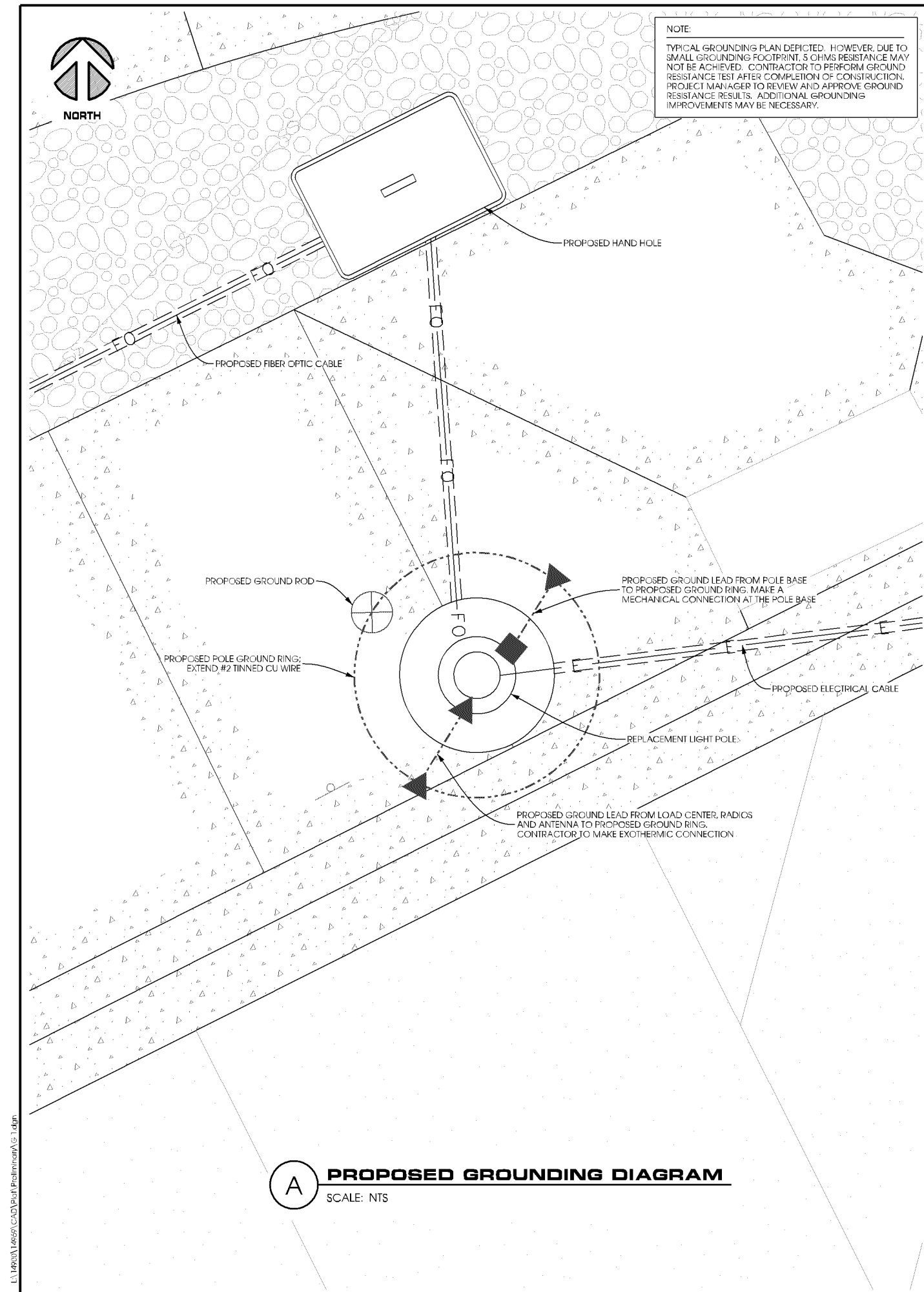
MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

ELECTRICAL
NOTES

SHEET NUMBER

E-2



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CASE FILE #PL201600185

GROUNDING SYSTEM NOTES

1. SCOPE:

THIS SECTION COVERS THE SPECIFICATIONS FOR CELL SITE GROUNDING. THE AREAS OF FOCUS ARE: TOWER, 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 COAX GROUND CONNECTIONS.
- * TOWER COUNTERPOISE.
- * "BUILDING COUNTERPOISE" CONNECTIONS TO POWER, TELCO, A.C., FENCING AND ICE BRIDGE.
- * CONNECTIONS TO POWER, TELCO, A.C., FENCING AND ICE BRIDGE.

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 ENIRCLE TOWER FOUNDATION TWO (2) FT. FROM THE FOUNDATION. THIS GROUNDING SYSTEM SHALL BE CONNECTED TO THE BUILDING 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 ENIRCLE 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 UNDER THE WAVEGUIDE PORT 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.

6. FENCING:

6.1 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.

7. EXISTING GROUND SYSTEMS:

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

8. COMPLIANCE:

8.1 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.

8.2 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.

8.3 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.

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1	10/11/2016	FINAL DWGS	NBT

APPROVED

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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
GROUNDING PLAN

SHEET NUMBER

G-1

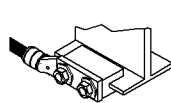
GROUNDING NOTES

NOTES:

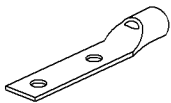
BURNDY "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF BURNDY CONNECTIONS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

CONTRACTOR TO PROVIDE ALL REQUIRED BURNDY CONNECTIONS.

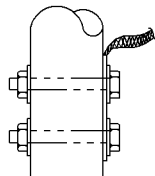
CASE FILE #PL201600185



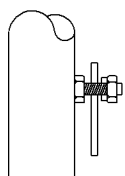
TYPE YGIBS



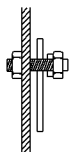
TYPE YA3CL-2TC38



TYPE BD18G92



TYPE KC TO PIPE



TYPE KC
TO FLAT SURFACE



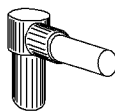
BURNDY DETAILS

SCALE: NTS

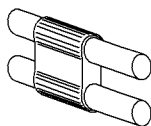
NOTES:

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.

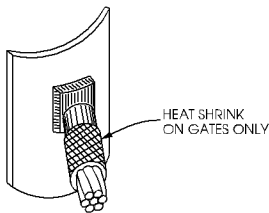
CONTRACTOR TO PROVIDE ALL REQUIRED CADWELD CONNECTIONS.



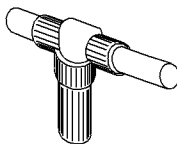
TYPE GR



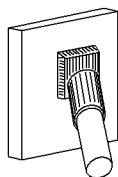
TYPE PT



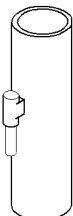
TYPE VBC



TYPE GT



TYPE VB
(TOWER GROUND TAB)



TYPE VT

SOLID COPPER WIRE TO POST CONNECTION
- FENCE LEAD TO FENCE POST
- LEADS TO UTILITY RACK & ICE BRIDGE POSTS



CADWELD DETAILS

SCALE: NTS

GROUNDING CONNECTION LEGEND:

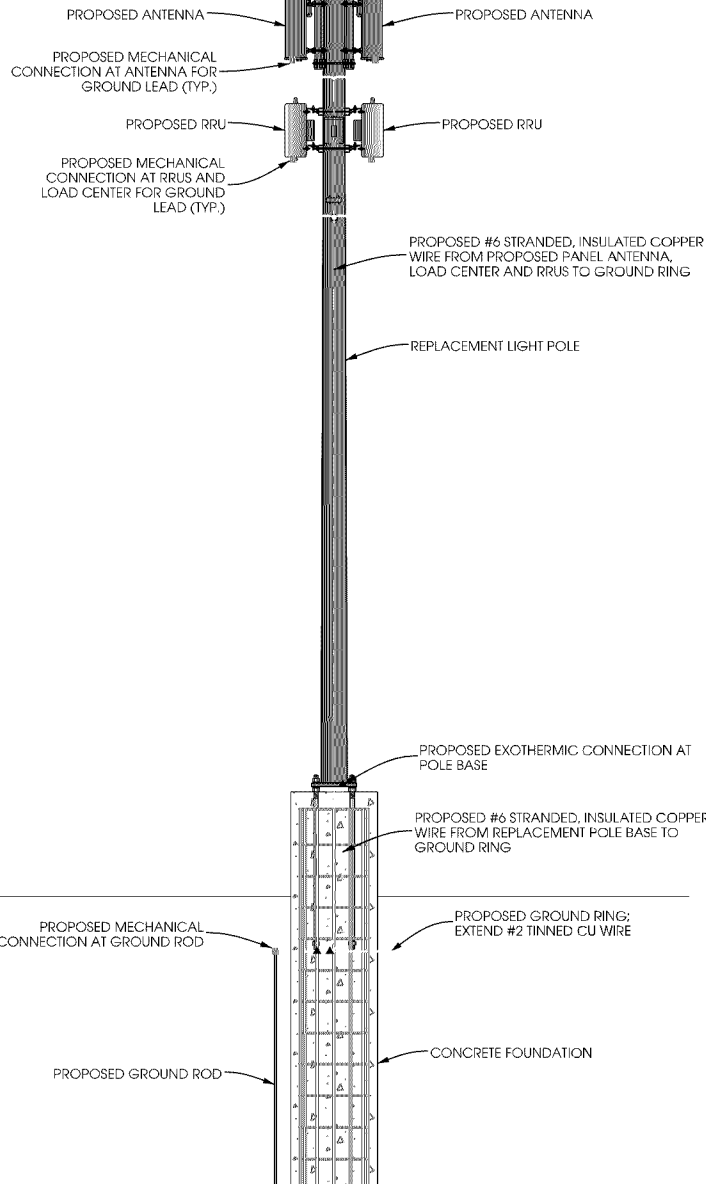


EXOTHERMIC



MECHANICAL

Must meet 90MPH wind rating per MN State Building code



TYPICAL GROUNDING SCHEMATIC

SCALE: NTS

verizon



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651.225.0793 voice
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Edge
Consulting Engineers, Inc.

17645 Juniper Path, Suite 105
Lakeville, MN 55044
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO: 20141029022

EDGE PROJECT NO: 14969

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
U	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

**GROUNDING
DETAILS**

SHEET NUMBER

G-2

CASE FILE #PL201600185



SITE NAME:

MIN SOUTHTOWN SC2

SITE NUMBER:

20151187111

LOCATION CODE:

320992

SITE TYPE:

SMALL CELL

POLE TYPE:

REPLACEMENT LIGHT POLE



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SITE INFORMATION

APPROXIMATE ADDRESS:
7803 PENN AVE.
BLOOMINGTON, MN 55431
HENNEPIN COUNTY

LATITUDE & LONGITUDE:
LAT: 44°-51'-34.77"N
LONG: 93°-18'-15.72"W
GROUND ELEVATION: 834' AMSL
(PER 1A CERTIFICATE)

POLE HEIGHT:
36'-9" I.O.C.

MAXIMUM APPURTENANCE HEIGHT:
40'-0" A.G.L.

APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:
- 2012 INTERNATIONAL BUILDING CODE (w/2015 MN Amendments)
- 2014 NATIONAL ELECTRIC CODE
- TIA/EIA-222-G OR LATEST EDITION

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

LOCATION SCAN



AREA MAP



LOCATION MAP



PROJECT DESCRIPTION/SOW

- INSTALL (1) REPLACEMENT 36-FT 94IN STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF PANEL ANTENNAS
- INSTALLATION OF ERICSSON RRU'S AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER/BREAKER BOX
- INSTALLATION OF (4) COUPLERS
- INSTALLATION OF HAND HOLE FOR FIBER AT POLE BASE, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND POLE BASE (APPROX. 2'-0"). TO BE TRENCHED BELOW GRADE, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND ROW, (APPROX. 533'-0" IN LENGTH) TO BE DIRECTIONALLY BORED BELOW GRADE, BY PROVIDER
- INSTALLATION OF CONDUIT FOR ELECTRIC BETWEEN POLE BASE AND POWER SOURCE, (APPROX. 502'-0" IN LENGTH) TO BE DIRECTIONALLY BORED BELOW GRADE, BY VERIZON
- INSTALLATION OF GROUND RING AROUND POLE FOUNDATION
- BUILDING PENETRATION REQUIRED FOR ELECTRIC SERVICE
- 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

LESSOR:
KRAUS-ANDERSON INC.
523 8TH ST. S.
MINNEAPOLIS, MN 55404
PHONE: 612.332.7281

ENGINEERING COMPANY:
EDGE CONSULTING ENGINEERS, INC.
17645 JUNIPER PATH
SUITE 105
LAKEVILLE, MN 55044
CONTACT: OTTO DINGFELDER III, P.E.
PHONE: 608.644.1449

RE ENGINEER:
VERIZON WIRELESS
10801 BUSH LAKE RD
BLOOMINGTON, MN 55438
CONTACT: MIHAELA OXLEY

SITE ACQUISITION:
BUELL CONSULTING, INC.
1360 ENERGY PARK DRIVE
SUITE 210
ST. PAUL, MN 55108
CONTACT: ROB VIERA
PHONE: 651.225.0792

SHEET INDEX

NO: SHEET TITLE

T-1	TITLE SHEET & PROJECT DATA
C-1	SITE PLAN
C-2	ENLARGED SITE PLAN
A-1	POLE ELEVATION
A-2	MOUNTING DETAILS
A-3	ANTENNA DETAILS
A-4	EQUIPMENT DETAILS
A-5	CABLE MOUNTING DETAILS
E-1	CABLING DETAILS
E-2	ELECTRICAL NOTES
G-1	GROUNDING PLAN
G-2	GROUNDING DETAILS

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

THESE SITE PLANS ADHERE TO ALL OF THE REQUIREMENTS CALLED OUT IN THE JURISDICTION PLANNING AND ZONING FOR ANTENNAS AND SUPPORT STRUCTURES WHERE SITE IS LOCATED.

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

LIGHT POLE STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS.

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

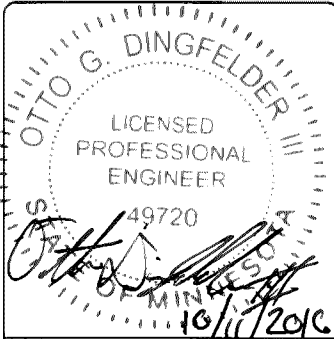
PROJECT NO: 20151187111

EDGE PROJECT NO: 14970

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
0	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT



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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
TITLE SHEET &
PROJECT DATA

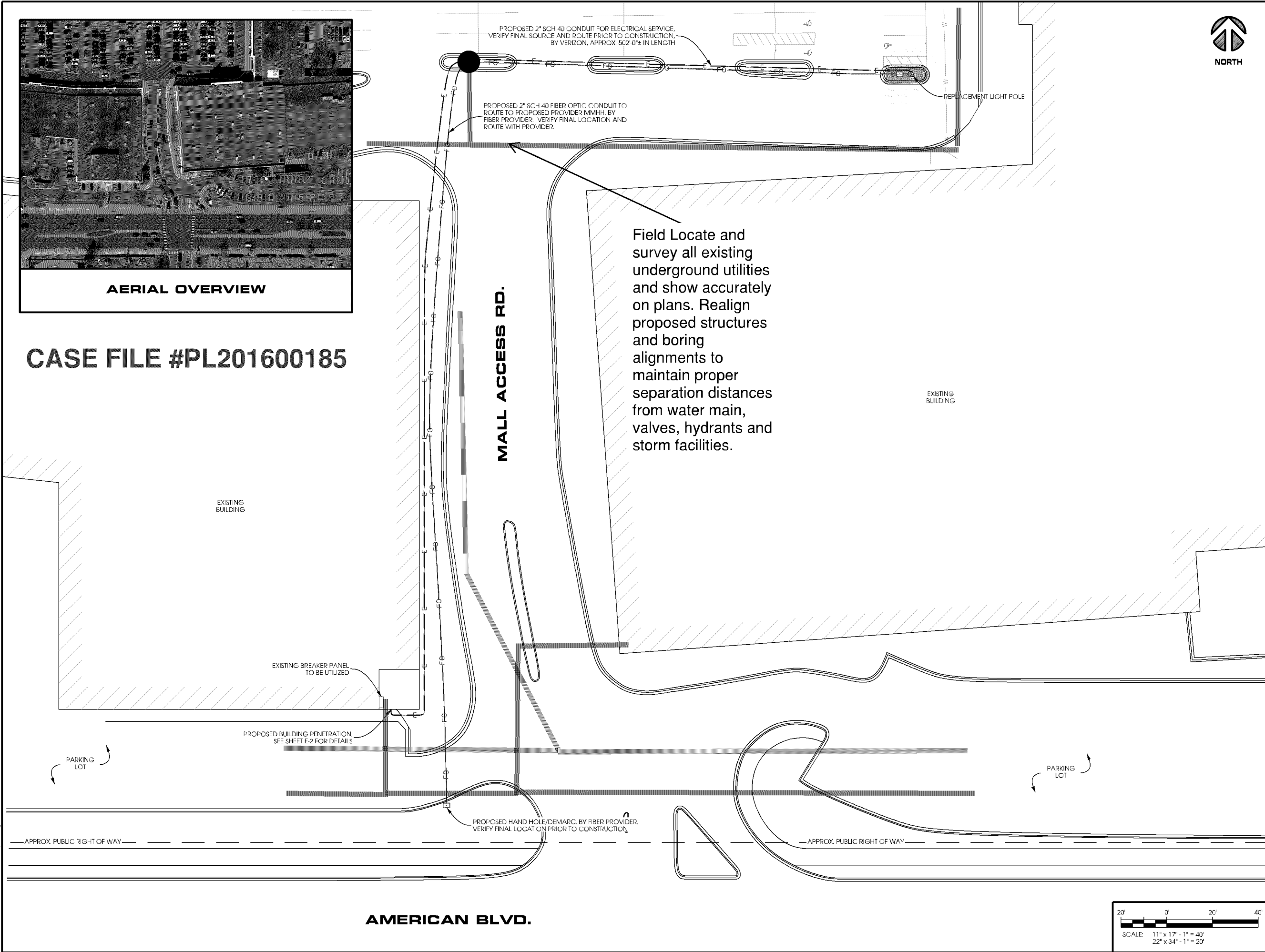
SHEET NUMBER

T-1



AERIAL OVERVIEW

CASE FILE #PL201600185



verizon



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EDGE PROJECT NO:	14970
DRAWN BY:	NBT
CHECKED BY:	OGD

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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

SITE PLAN

SHEET NUMBER

C-1



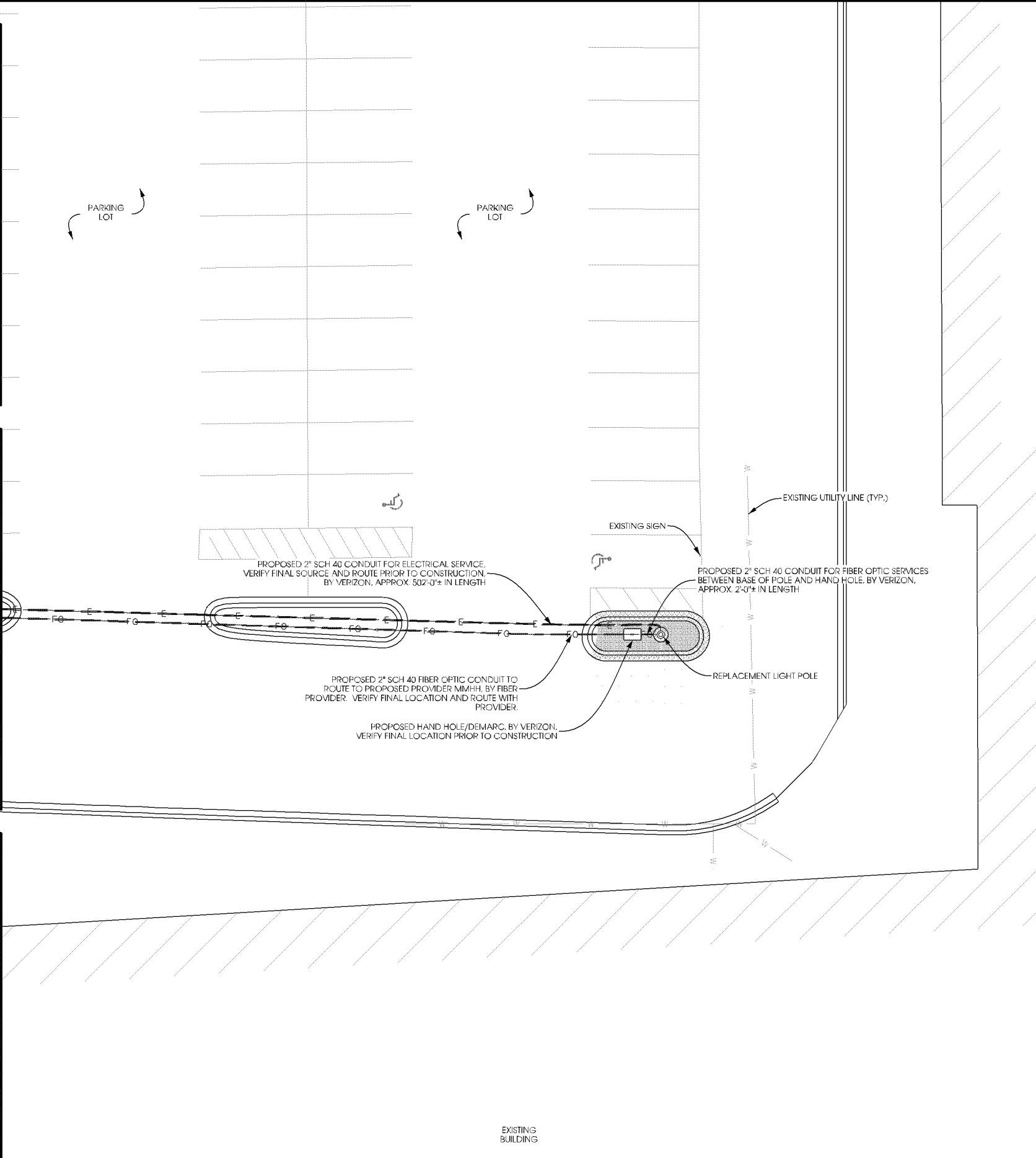
AERIAL OVERVIEW



SITE OVERVIEW
[LOOKING WEST]



SITE OVERVIEW
[LOOKING NORTH]



EXISTING
BUILDING

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1	10/11/2016	FINAL DWGS	NBT

APPROVED

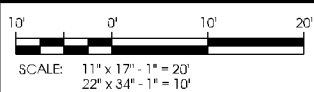
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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
**ENLARGED SITE
PLAN**

SHEET NUMBER

C-2



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

CASE FILE #PL201600185

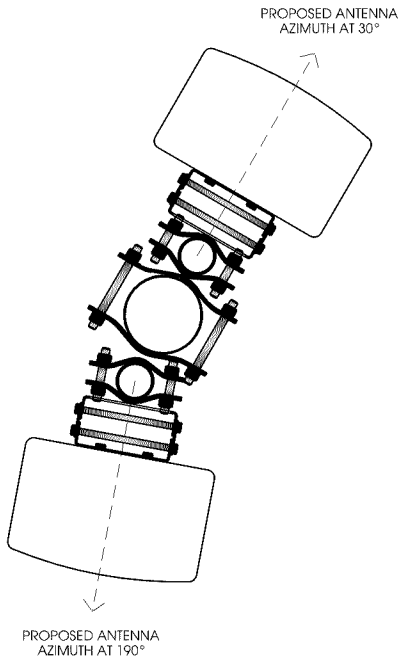
CASE FILE #PL201600185

NODE INFO					RADIO					ANTENNA								
		Band	eNB ID	Model	DU#	DU Port#	AZ/MUTH	POSITION	QTY	MFR.	MODEL	PORT	C/L	ADJ ELEC TILT	MECH TILT			
PCI:	Full Node Name: (Name SC2 Node#) SOUTHTOWN SC2				AWS	TBD	RRUS32 B66A	1	TBD	30	1.1	1	JMA Wireless	X7CQAP-FRO-260-V	+45	35	0	0
TBD										1.2	-45							
	1.3	+45																
	1.4	-45																
	1.5	+45																
	1.6	-45																
	190	1.1	1	JMA Wireless		X7CQAP-FRO-260-V	+45	35	0	0								
		1.2	-45															
		1.3	+45															
		1.4	-45															
		1.5	+45															
		1.6	-45															
					RF Splitter: (4) ClearLink-HC3/698-2.7K/MS													
Ground Elevation: 834																		
1A Coordinates 08-01-2016																		

RF Splitter: (4) ClearLink-HC3/698-2.7K/MS

COAX						
QTY	TYPE	MFR.	MODEL	DIELECTRIC	DIA.	RUN
TERMINATE PORTS						
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
TERMINATE PORTS						
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD
1	Jumper	Commscope	LFD4-50	Foam	1/2"	TBD

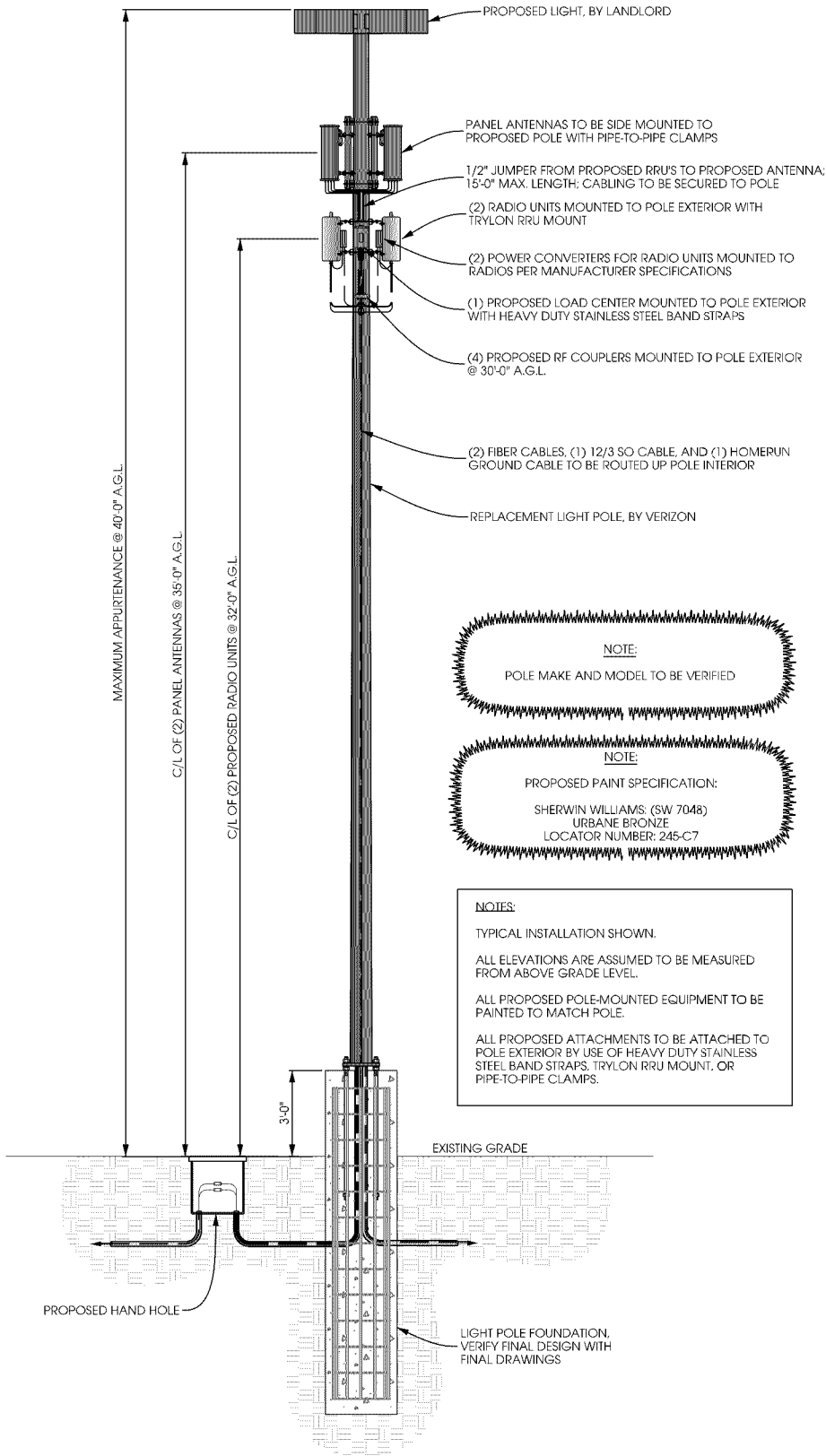
A ANTENNA AND COAX
SCALE: NTS



B ANTENNA ORIENTATION
SCALE: NTS



LIGHT POLE ELEVATION



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



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PROJECT NO:	20151187111
EDGE PROJECT NO:	14970
DRAWN BY:	NBT
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
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U	08/30/2016	FINAL DWGS	TKB
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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
POLE ELEVATION

SHEET NUMBER

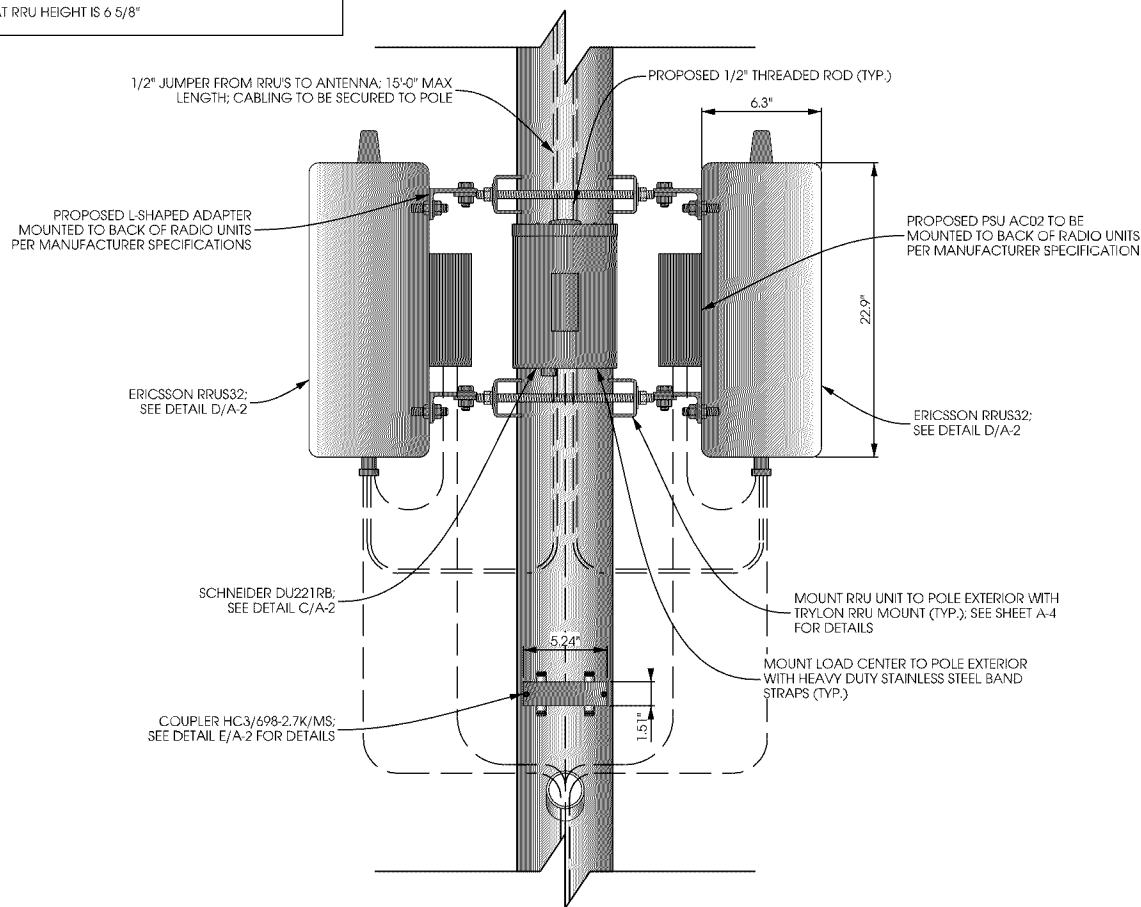
A-1

NOTE:

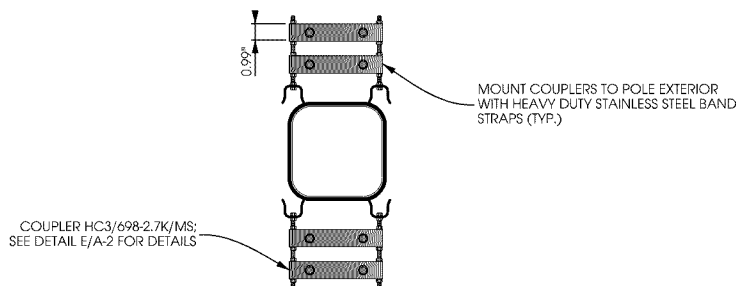
PAINT ALL ANTENNAS, OUTDOOR EQUIPMENT, AND MOUNTING HARDWARE TO MATCH THE PROPOSED LIGHT POLE

POLE SIZE AT RRU HEIGHT IS 6 5/8"

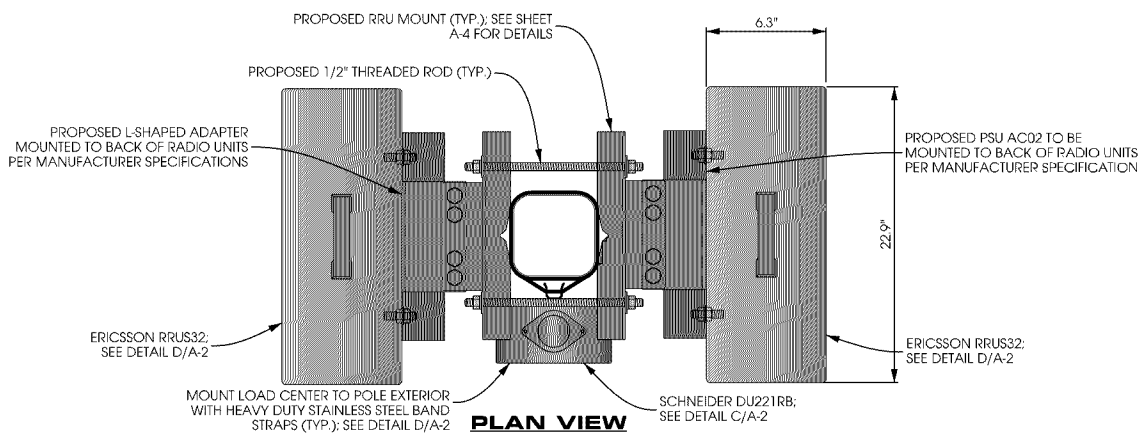
CASE FILE #PL201600185



ELEVATION VIEW

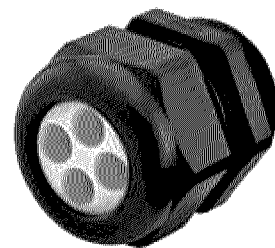


SPLITTER PLAN VIEW

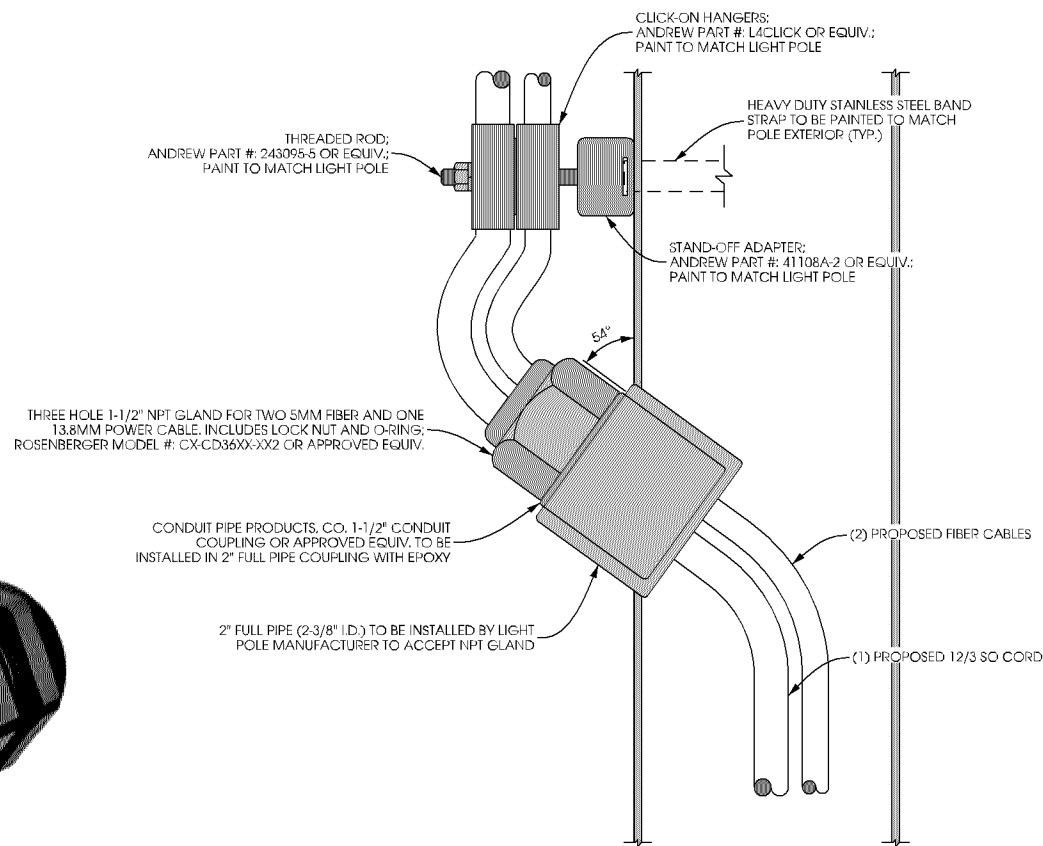


A EQUIPMENT MOUNTING DETAIL

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



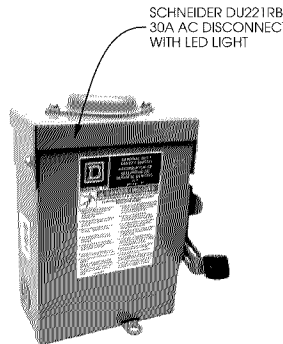
NPT GLAND



B PENETRATION DETAIL

SCALE: NTS

SCHNEIDER ELECTRIC 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



C LOAD CENTER DETAIL

SCALE: NTS

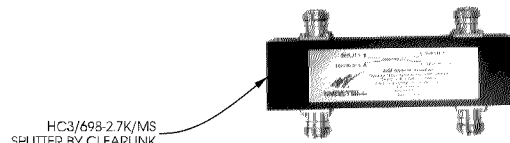
ERICSSON RRU32
- SINGLE-BAND 4Tx/4Rx
- 40MHz IBW
- UP TO 4 x 40W OUTPUT POWER
- SUPPORT 2 x 20MHz LTE
- 2 PORTS x 10 Gbps CPRI
DIMENSIONS: 22.9" x 10.9" x 6.3"
(W/OUT COVER)
WEIGHT: 46.3 LBS
(W/OUT COVER)



D RADIO DETAIL

SCALE: NTS

CLEARLINK HC3 SPLITTER
- 200 WATTS AVG. POWER
- 1P45 COMPLIANT
- RoHS COMPLIANT
- 698-2700 MHz FREQUENCY RANGE
DIMENSIONS: 5.24" x 1.58" x 0.99"



E COUPLER DETAIL

SCALE: NTS

verizon



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PROJECT NO:	20151187111
EDGE PROJECT NO:	14970
DRAWN BY:	NBT
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

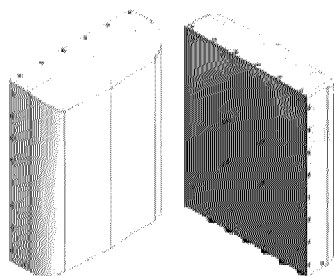
SHEET TITLE
MOUNTING DETAILS

SHEET NUMBER
A-2

X7CQAP-FRO-260

+/-45° Polarization, (1) 698-896MHz & (2) 1695-2180 MHz antennas, 24" Length, Fast Roll Off 60° Horizontal Pattern, Fixed E-tilt

- Fast Roll Off (FRO) improves Intra and Inter-cell SINR
- Separate housing and reflector construction optimizes RF performance while maximizing mechanical strength
- Good Passive Intermodulation (PIM) performance reduces harmful interference
- Suitable for LTE/CDMA/UMTS/GSM
- Optional wall mount kit available
- Optional multi position stadium mount bracket accommodates most mounting surfaces

**ELECTRICAL SPECIFICATIONS**

Frequency Band, MHz	698-824	824-896	1695-1850	1850-1990	1990-2180
Horizontal Beam Width, 3dB points	62°	57°	56°	54°	52°
Gain, dBi	10.9	11.5	14.2	14.6	15.0
Vertical Beam Width, 3dB points	42°	35°	17°	16.2°	15.4°
Front-to-Back at 180°, dB	> 30		> 30		
Polarization	+/-45°		2x +/-45°		
Electrical Downtilt	0°		0°		
VSWR/Return Loss, dB, Maximum	1.5:1/14.0		1.5:1/14.0		
Isolation Between Ports, dB, Minimum	>26		>26		
Co-Polar Isolation Inter Antenna	> 28		> 28		
Intermodulation (2x20w), IM3, dBc	-153		-153		
Impedance, ohms	50		50		
Maximum Power Per Connector, CW (w)	250		125		

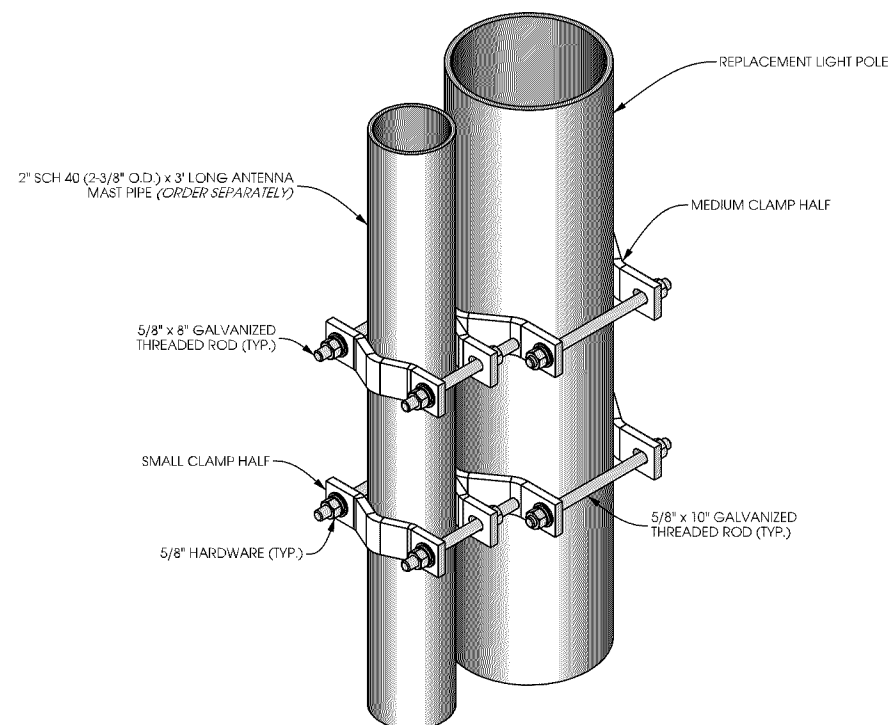
MECHANICAL SPECIFICATIONS

Dimensions, Length/Width/Depth	24.1 x 18.8 x 6.3 (612 x 479 x 160 mm)
Connector (Quantity) Type	(6 Total: 2 Low Band, 4 High Band) 7-16 DIN Female
Connector Torque	216-238 lbf-in (25-27 N-m)
Connector Location	Bottom
Antenna Weight	15 lbs (6.82Kg)
Bracket Weight (not included in antenna weight)	14 lbs (6.36Kg)
Standard Bracket Kit	919017
Mechanical Downtilt Range	0°-21°
Radome Material	High Strength Luran, UV Stabilized, ASTM D1925
Wind Survival	150 mph (241 km/h)
Front Wind Load @100mph	112 lbf (501 N)
Equivalent Flat Plate @ 100mph	2.25 sq-ft (c=2) @100 mph

A

ANTENNA SPECIFICATIONS

SCALE: NTS

CASE FILE #PL201600185

B

PIPE TO PIPE CLAMP

SCALE: NTS ANDREW PART #: JS-S100 OR EQUIV.

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PROJECT NO: 20151187111

EDGE PROJECT NO: 14970

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
0	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

ANTENNA DETAILS

SHEET NUMBER

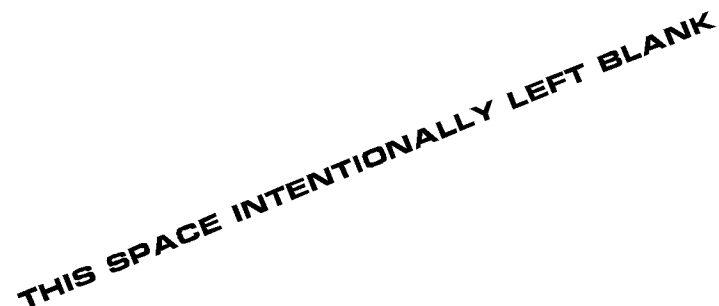
A-3

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RADIO UNIT MOUNTING DETAIL

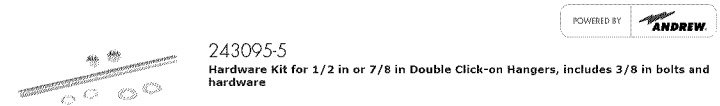
TRYLON KIT #: 4.927.0063.001



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Product Specifications

COMMSCOPE®



243095-5
Hardware Kit for 1/2 in or 7/8 in Double Click-on Hangers, includes 3/8 in bolts and hardware

Dimensions

Nominal Size	1/2 in 7/8 in
Length	137.16 mm 5.40 in

General Specifications

Includes	Forty flat washers Forty lock washers Ten 3/8 in threaded rods Twenty hex nuts
Maximum Stack Height	2
Ordering Note	CommScope® standard product in the United States and Canada
Package Quantity	10

Mechanical Specifications

Thread Size	3/8 in
-------------	--------

Packed Dimensions

Height	14.9 cm 5.9 in
Length	6.4 cm 2.5 in
Shipping Weight	1.13 kg 2.50 lb
Width	6.4 cm 2.5 in

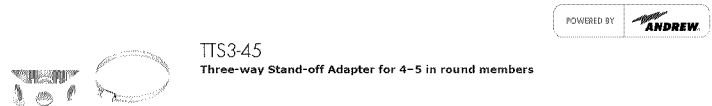
Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant
China RoHS SJ/T 11364-2006	Below Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system



Product Specifications

COMMSCOPE®



TTS3-45
Three-way Stand-off Adapter for 4-5 in round members

General Specifications

Adapter Type	Stand-off adapter
Material Type	Stainless steel
Ordering Note	CommScope® non-standard product
Package Quantity	10

Mechanical Specifications

Material Thickness	2.591 mm 0.102 in
Maximum Loading	Double stack, 1-5/8 in cable
Mounting	3/4 in through hole

Packed Dimensions

Height	12.0 cm 4.7 in
Length	1.0 cm 0.4 in
Shipping Weight	0.58 kg 1.28 lb
Width	11.0 cm 4.3 in

Regulatory Compliance/Certifications

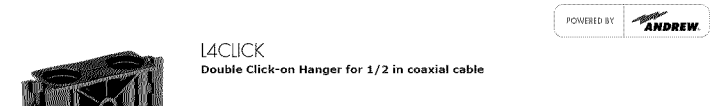
Agency	Classification
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

- UAAI — Universal Angle Adapter Insert
- SA-38 — Universal Stand-off Adapter
- 31670-4 — Round Member Adapter for 4-5 in round members

Product Specifications

COMMSCOPE®



L4CLICK
Double Click-on Hanger for 1/2 in coaxial cable

Dimensions

Nominal Size	1/2 in
Compatible Diameter, maximum	16.256 mm 0.640 in
Compatible Diameter, minimum	15.240 mm 0.600 in
Height	51.00 mm 2.01 in
Length	89.00 mm 3.50 in
Width	45.00 mm 1.77 in

Electrical Specifications

DTF Effect	0.1 dB
Return Loss Effect	0.1 dB

General Specifications

Hanger Type	Click-on hanger
Cables per Hanger	2
Color	Black
Material Type	Engineered plastic
Maximum Stack Height	3
Ordering Note	CommScope® standard product in the United States and Canada
Package Quantity	10

Mechanical Specifications

Mounting	Mounting hole clearance for 3/8, 16 UNC or M10 threaded rod
Operating Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
UV Resistance, minimum with no degradation	=100 hours exposure in accelerated UV life chamber
Vibration Survival	=4 hours at resonant frequency
Environmental Strength Capability	Double cable weight

Packed Dimensions

Height	19.0 cm 7.5 in
Length	17.0 cm 6.7 in
Shipping Weight	0.26 kg 0.57 lb
Width	8.0 cm 3.1 in

Regulatory Compliance/Certifications

Agency	Classification
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

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PROJECT NO: 20151187111

EDGE PROJECT NO: 14970

DRAWN BY: NBT

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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
**CABLE MOUNTING
DETAILS**

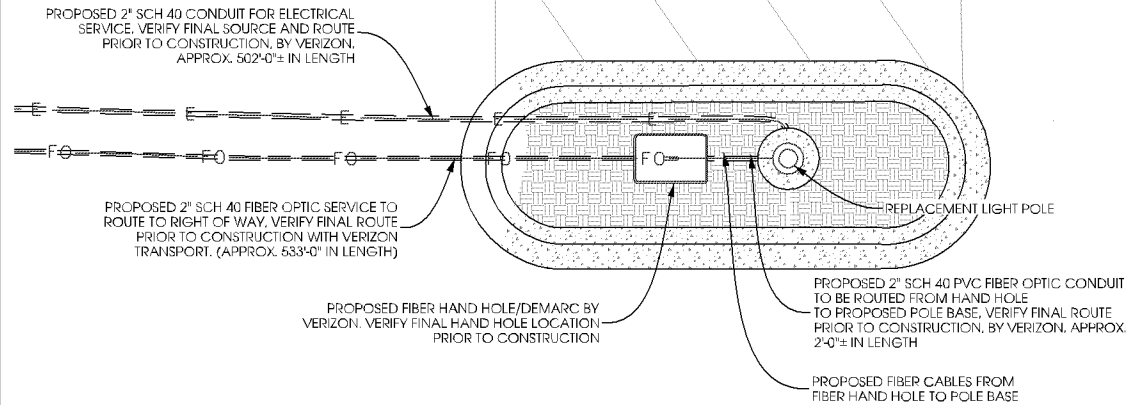
SHEET NUMBER

A-5



CASE FILE #PL201600185

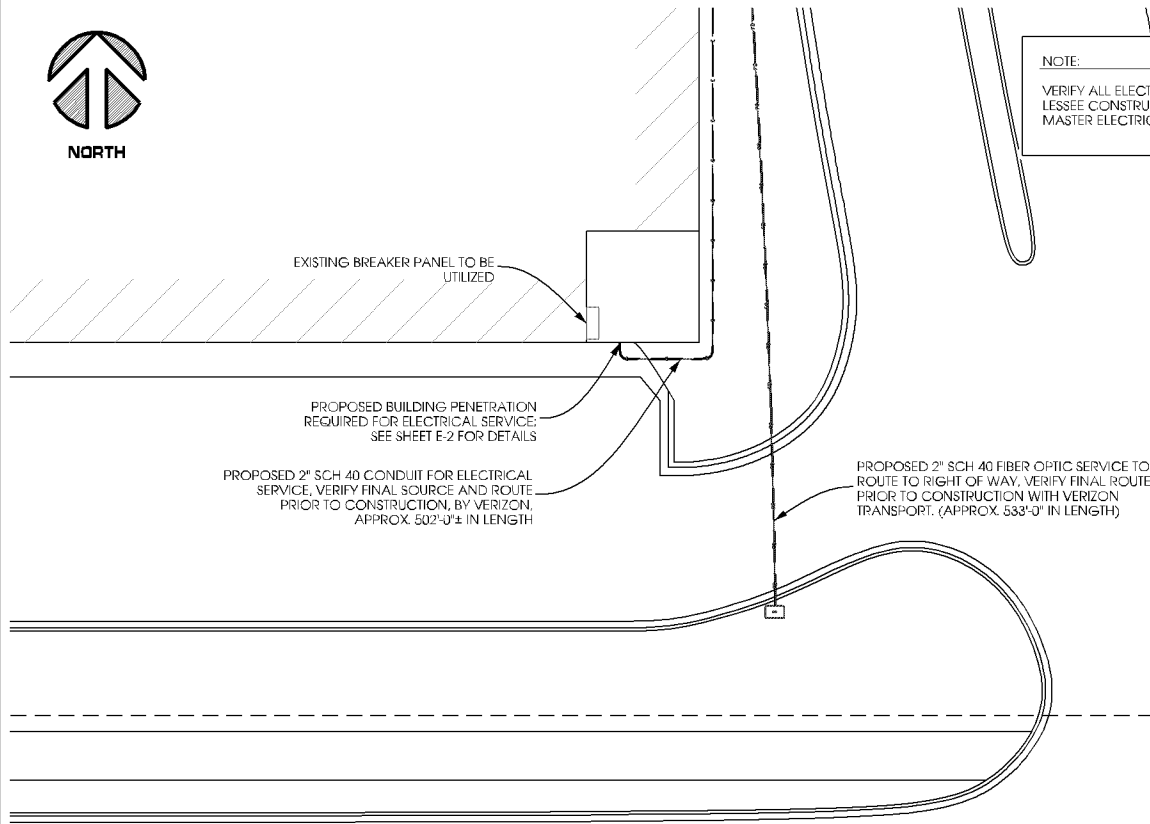
NOTE:
VERIFY ALL ELECTRICAL CONNECTIONS WITH
LESSEE CONSTRUCTION MANAGER AND
MASTER ELECTRICIAN.



A PROPOSED CABLING DIAGRAM AT POLE BASE
SCALE: NTS

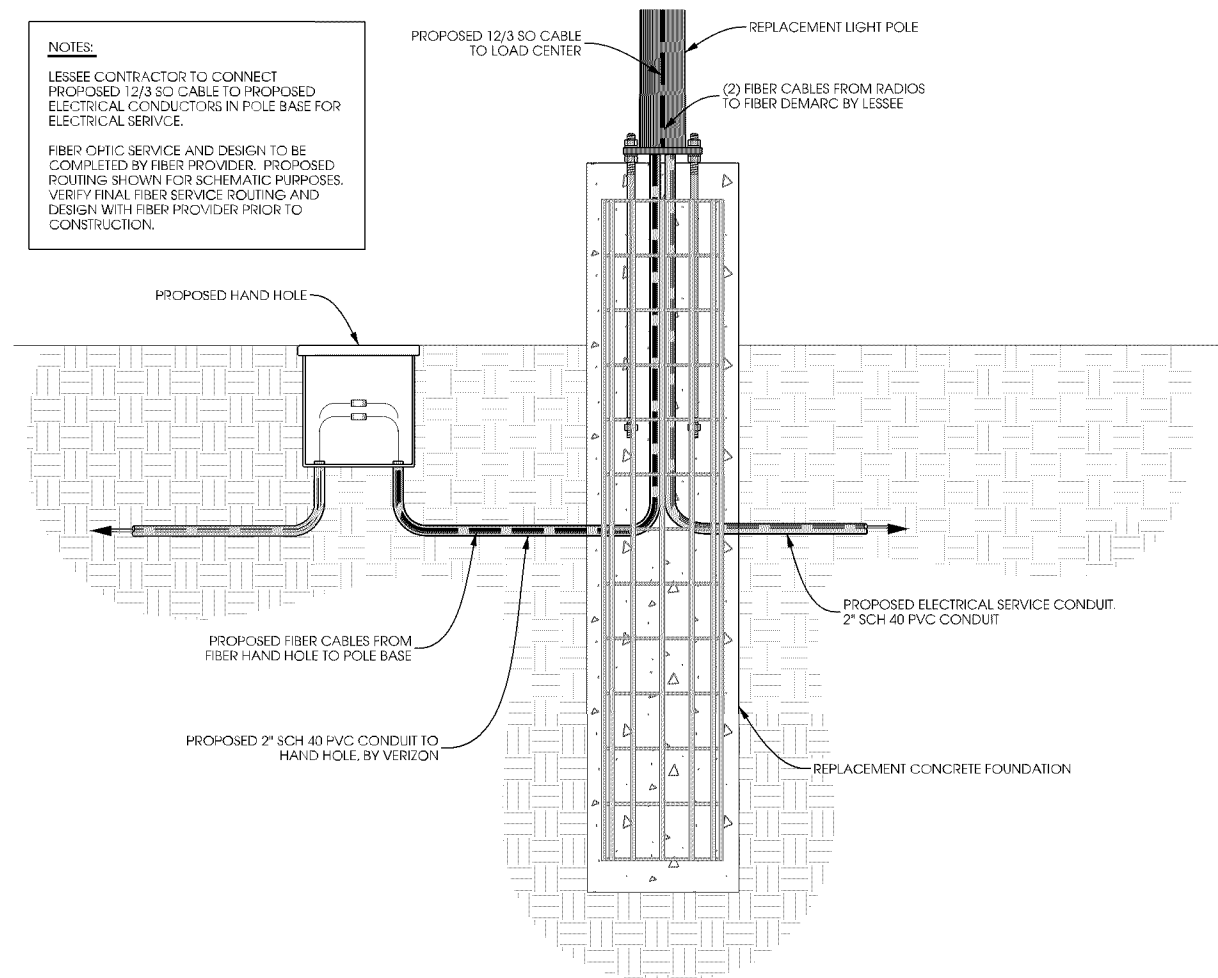


NOTE:
VERIFY ALL ELECTRICAL CONNECTIONS WITH
LESSEE CONSTRUCTION MANAGER AND
MASTER ELECTRICIAN.



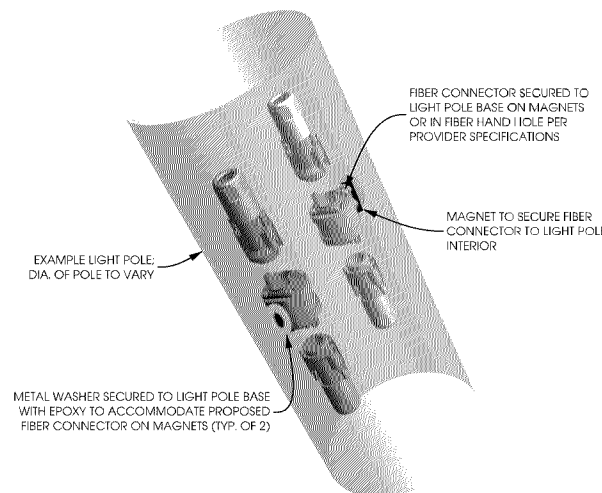
B PROPOSED CABLING DIAGRAM AT POWER SOURCE
SCALE: NTS

NOTES:
LESSEE CONTRACTOR TO CONNECT
PROPOSED 12/3 SO CABLE TO PROPOSED
ELECTRICAL CONDUCTORS IN POLE BASE FOR
ELECTRICAL SERVICE.
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.



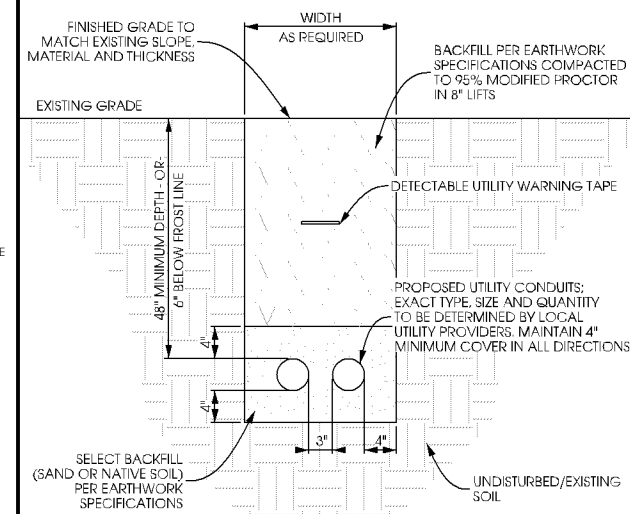
C POWER AND FIBER ROUTING
SCALE: NTS

NOTE:
PROPOSED FIBER CONNECTOR DETAIL
PROVIDED BY LESSEE. CONTRACTOR TO
VERIFY FINAL MAKE AND MODEL WITH
ROSSENBERGER AND LESSEE CONSTRUCTION
MANAGER PRIOR TO CONSTRUCTION.



D FIBER CONNECTOR
SCALE: NTS

NOTES:
UTILITY CONDUITS TO BE BURIED A DEPTH OF 48" BELOW
GROUND LEVEL OR 6" BELOW THE FROST LINE.
CONDUIT TYPE, SIZE, QUANTITY AND SEPARATION TO BE
VERIFIED WITH LOCAL UTILITY PROVIDER REQUIREMENTS.



E UTILITY TRENCH DETAIL
SCALE: NTS

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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
CABLING DETAILS

SHEET NUMBER
E-1

CASE FILE #PL201600185

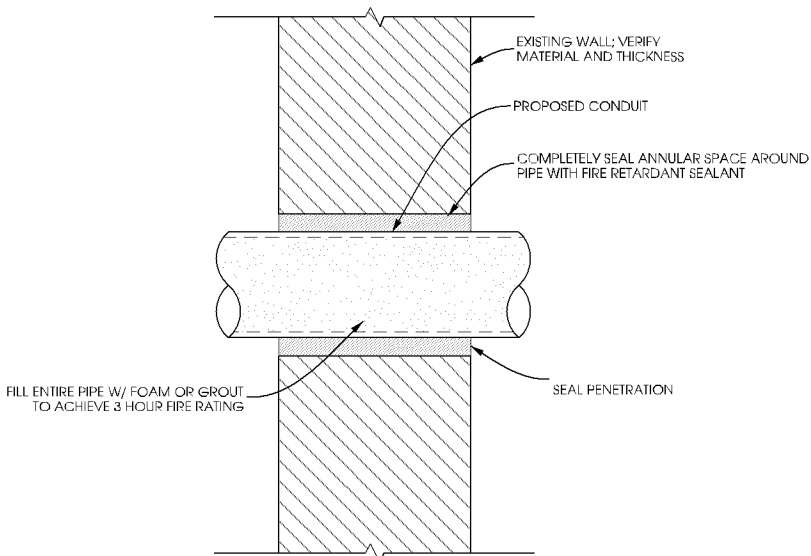
GENERAL ELECTRICAL NOTES

- SUBMITTAL OF BID INDICATES CONTRACTOR IS AWARE OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THIS CONTRACT.
- 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.
- HEIGHTS SHALL BE VERIFIED WITH OWNER PRIOR TO INSTALLATION.
- THESE PLANS ARE DIAGRAMMATIC ONLY. FOLLOW AS CLOSELY AS POSSIBLE.
- 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.)
- 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.
- 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 "I" 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.
- CONTRACTOR SHALL CARRY OUT HIS WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND O.S.H.A.
- CONTRACTOR SHALL SECURE ALL NECESSARY BUILDING PERMITS.
- COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER THE DATE OF JOB ACCEPTANCE BY OWNER. ANY WORK, MATERIAL OR EQUIPMENT FOUND TO BE FAULTY DURING THAT PERIOD SHALL BE CORRECTED AT ONCE, UPON WRITTEN NOTIFICATION, AT THE EXPENSE OF THE CONTRACTOR.
- ALL CONDUIT ONLY (C.O.) SHALL HAVE A PULL WIRE OR ROPE.
- PROVIDE CONSTRUCTION ENGINEER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
- ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
- USE T-TAP CONNECTIONS ON ALL MULTI-CIRCUITS WITH COMMON NEUTRAL CONDUCTOR.
- ALL CONDUCTORS SHALL BE COPPER.
- 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.
- THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES AND DRAWINGS.
- RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT A.C., WHITE AS REQUIRED BY THE ARCHITECT OR APPROVED EQUAL.
- WALL SWITCHES SHALL BE SINGLE-POLE, HUBBELL #1201 OR EQUIVALENT, WHITE AS REQUIRED BY THE ARCHITECT.
- 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.
- WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM. NO BX OR ROMEX CABLE IS PERMITTED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
- GROUND RODS SHALL BE AS SPECIFIED ON THE GROUNDING DRAWINGS.
- 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.
- ALL MATERIALS SHALL BE U.L. LISTED.
- CONDUIT:
 - 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.
 - INTERIOR CONDUITS SHALL BE ELECTRICAL METALLIC TUBING HAVING U.L. LABEL, FITTINGS SHALL BE GLAND RING COMPRESSION TYPE.
 - 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.
- ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
- PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
- PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH SECTION 712, PENETRATIONS - INTERNATIONAL BUILDING CODE (IBC)
- 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.
- 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.
- 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.
- CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY TOWER LIGHTING SYSTEM DESCRIBED IN THE RFG.

NOTES:

CONTRACTOR TO ENSURE WATER TIGHTNESS AT ALL WALL AND FLOOR PENETRATIONS.

GROUT & FIRE RETARDANT SEAL TO ACHIEVE 3-HOUR FIRE RATING



A BUILDING PENETRATION DETAIL

SCALE: NTS



ELECTRICAL NOTES

REPLACEMENT LIGHT POLE LOCATION

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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

**ELECTRICAL
NOTES**

SHEET NUMBER

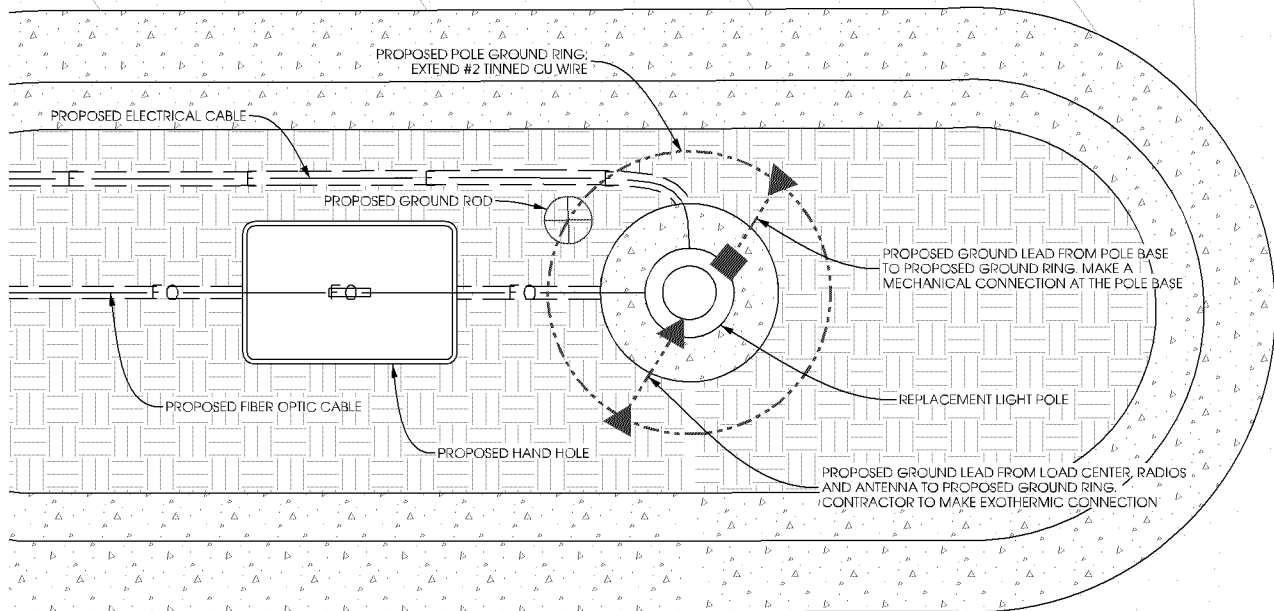
E-2



CASE FILE #PL201600185

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

PROPOSED GROUNDING DIAGRAM

SCALE: NTS

GROUNDING SYSTEM NOTES

1. SCOPE:

THIS SECTION COVERS THE SPECIFICATIONS FOR CELL SITE GROUNDING. THE AREAS OF FOCUS ARE: TOWER, 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 COAX GROUND CONNECTIONS.
- * TOWER COUNTERPOISE.
- * BUILDING COUNTERPOISE.
- * CONNECTIONS TO POWER, TELCO, A.C., FENCING AND ICE BRIDGE.
- * CONNECTIONS TO POWER, TELCO, A.C., FENCING AND ICE BRIDGE.

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 ENIRCLE TOWER FOUNDATION TWO (2) FT. FROM THE FOUNDATION. THIS GROUNDING SYSTEM SHALL BE CONNECTED TO THE BUILDING 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 ENIRCLE 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 UNDER THE WAVEGUIDE PORT 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.

6. FENCING:

6.1 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.

7. EXISTING GROUND SYSTEMS:

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

8. COMPLIANCE:

8.1 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.

8.2 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.

8.3 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.

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Edge

Consulting Engineers, Inc.

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PROJECT NO: 20151187111

EDGE PROJECT NO: 14970

DRAWN BY: NBT

CHECKED BY: OGD

REV.	DATE	DESCRIPTION	
A	08/15/2016	PRELIM SMALL CELL DWGS	TKB
U	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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 SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

GROUNDING PLAN

SHEET NUMBER

G-1

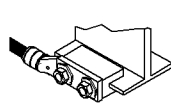
GROUNDING NOTES

NOTES:

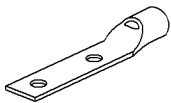
BURNDY "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF BURNDY CONNECTIONS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

CONTRACTOR TO PROVIDE ALL REQUIRED BURNDY CONNECTIONS.

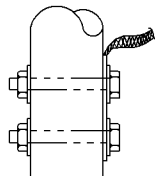
CASE FILE #PL201600185



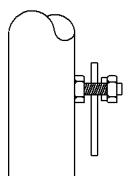
TYPE YGIBS



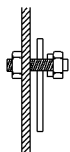
TYPE YA3CL-2TC38



TYPE BD18G92



TYPE KC TO PIPE



TYPE KC
TO FLAT SURFACE

A

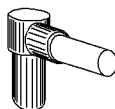
BURNDY DETAILS

SCALE: NTS

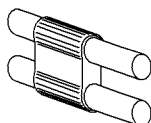
NOTES:

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.

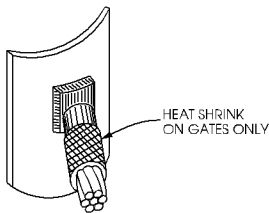
CONTRACTOR TO PROVIDE ALL REQUIRED CADWELD CONNECTIONS.



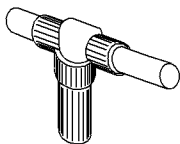
TYPE GR



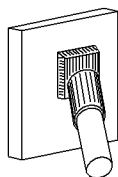
TYPE PT



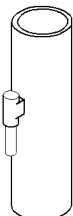
TYPE VBC



TYPE GT



TYPE VB
(TOWER GROUND TAB)



TYPE VT

SOLID COPPER WIRE TO POST CONNECTION
- FENCE LEAD TO FENCE POST
- LEADS TO UTILITY RACK & ICE BRIDGE POSTS

B

CADWELD DETAILS

SCALE: NTS

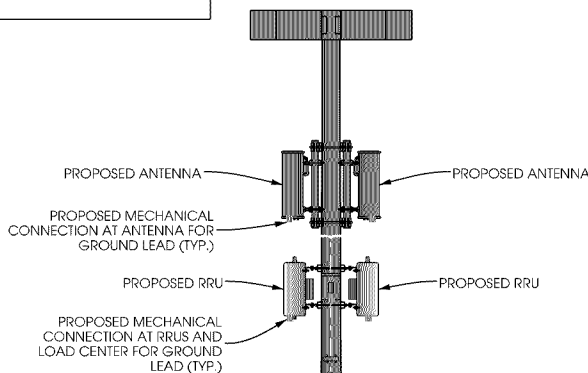
GROUNDING CONNECTION LEGEND:



EXOTHERMIC



MECHANICAL



C

TYPICAL GROUNDING SCHEMATIC

SCALE: NTS

verizon



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SHEET TITLE

**GROUNDING
DETAILS**

SHEET NUMBER

G-2