CASE FILE #PL201600185

verizon

SITE NAME: MIN SOUTHTOWN SC1

SITE NUMBER: 20141029022

LOCATION CODE: 289036

SITE TYPE: SMALL CELL

POLE TYPE: REPLACEMENT LIGHT POLE

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.

APPLICABLE CODES

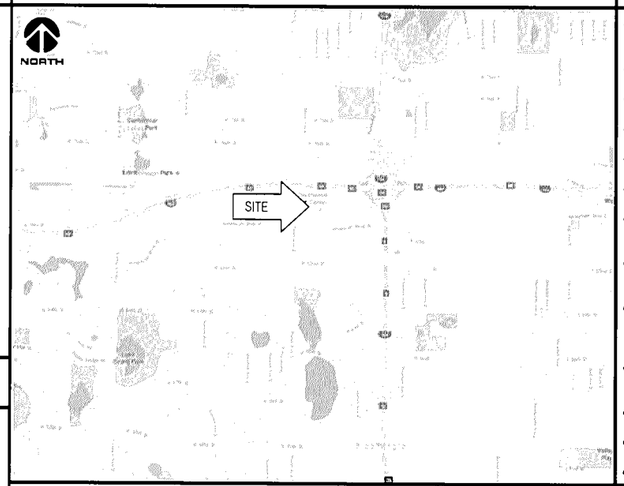
ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

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

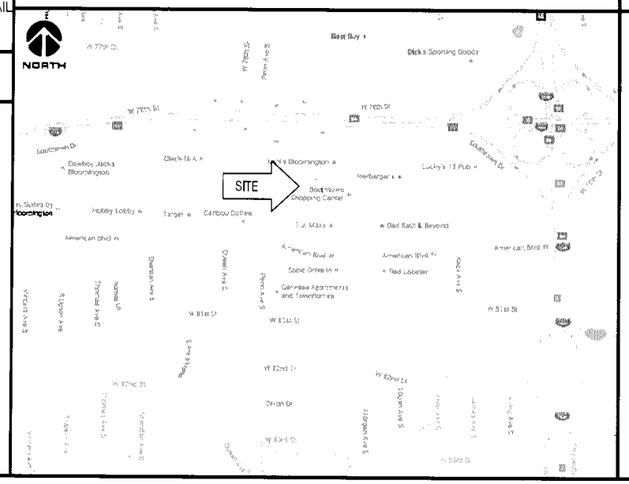
IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

LOCATION SCAN

AREA MAP



LOCATION 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

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

RF 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.

verizon

BUELL
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
0	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

OTTO G. DINGFELDER III
LICENSED PROFESSIONAL ENGINEER
49720
STATE OF MINNESOTA
10/11/2016

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
TITLE SHEET & PROJECT DATA

SHEET NUMBER
T-1

CASE FILE #PL201600185

AERIAL OVERVIEW

NORTH

PARKING LOT

PARKING LOT

PARKING LOT

APPROX. PUBLIC RIGHT OF WAY

PENN AVE.

MALL ACCESS RD.

EXISTING BUILDING

EXISTING BREAKER PANEL TO BE UTILIZED

EXISTING BUILDING PENETRATION TO BE UTILIZED

EXISTING BUILDING

EXISTING UNDERGROUND ELECTRIC CONDUIT TO LANDLORD POWER SOURCE. LANDLORD TO PROVIDE FINAL SOURCE AND ROUTE PRIOR TO CONSTRUCTION. (APPROX. 109'-0" IN LENGTH)

PROPOSED 6"X12" DOGHOUSE HAND HOLE, BY VERIZON. VERIFY FINAL LOCATION PRIOR TO CONSTRUCTION. TO BE PLACED OVER EXISTING ELECTRICAL CONDUIT

CAR CHARGING STATION

PROPOSED 2" SCH 40 FIBER OPTIC CONDUIT TO ROUTE TO PROPOSED PROVIDER MMHH, BY FIBER PROVIDER. VERIFY FINAL LOCATION AND ROUTE WITH PROVIDER.

REPLACEMENT LIGHT POLE

PROPOSED 2" SCH 40 CONDUIT FOR ELECTRICAL SERVICE. VERIFY FINAL SOURCE AND ROUTE PRIOR TO CONSTRUCTION. BY VERIZON. (APPROX. 180'-0"± IN LENGTH)

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.

PROPOSED HAND HOLE/DEMARC, BY FIBER PROVIDER. VERIFY FINAL LOCATION PRIOR TO CONSTRUCTION

25' 0' 25' 50'

SCALE: 11" x 17" - 1" = 50'
22" x 34" - 1" = 25'

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

SHEET TITLE

SITE PLAN

SHEET NUMBER

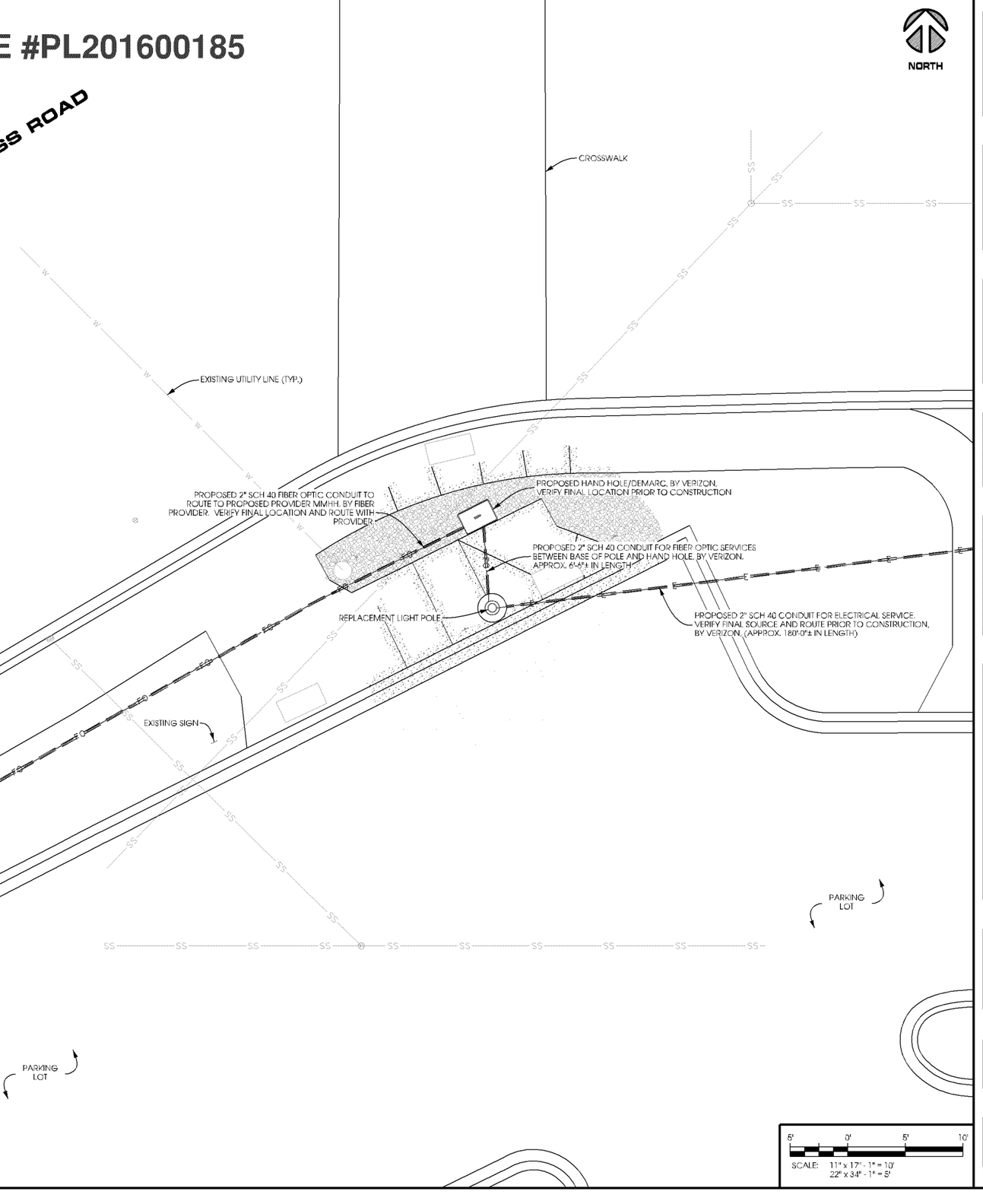
C-1

CASE FILE #PL201600185

AERIAL OVERVIEW

SITE OVERVIEW
[LOOKING NORTHEAST]

SITE OVERVIEW
[LOOKING SOUTHWEST]



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

SHEET TITLE

ENLARGED SITE PLAN

SHEET NUMBER

C-2

CASE FILE #PL201600185

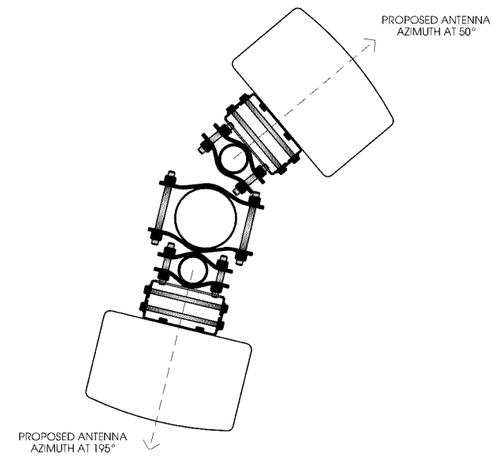
NODE INFO					RADIO					ANTENNA								
					Band	eNB ID	Model	DU#	DU Port#	AZIMUTH	POSITION	QTY	MFR.	MODEL	PORT	C/L	ADJ ELEC TILT	MECH TILT
PCI: TBD	Full Node Name: (Name SC1 Node#) SOUTHTOWN SC1									50	1.1	1	IMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
	Coordinates	DEG	MIN	SEC							1.2				-45			
	LATITUDE	44	51	37.12	AWS	TBD	RRUS32 B66A	1	TBD		1.3				+45			
	LONGITUDE	93	18	26.14							1.4				-45			
	Ground Elevation:		830		PCS	TBD	RRUS32 B2	1	TBD		1.5				+45			
											1.6				-45			
										195	1.1	1	IMA Wireless	X7CQAP-FRO-260-V	+45	25	0	0
											1.2				-45			
											1.3				+45			
											1.4				-45			
											1.5				+45			
											1.6				-45			
	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

Parking lot lighting must meet the requirements of Sec. 21.301.07 of the City Code. Photometric plans must be reviewed and approved prior to the issuance of a building permit.

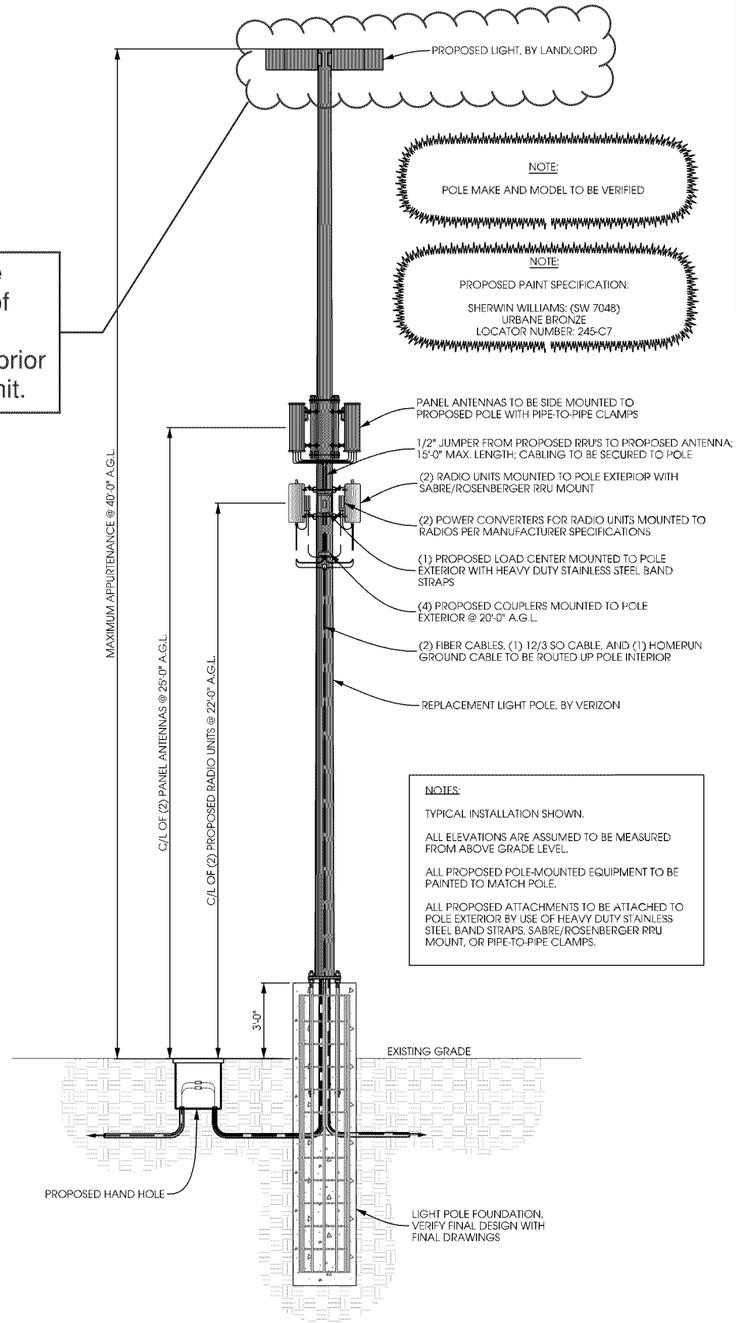
A ANTENNA AND COAX
SCALE: NTS

NORTH



B ANTENNA ORIENTATION
SCALE: NTS

LIGHT POLE ELEVATION



NOTES:

TYPICAL INSTALLATION SHOWN.

ALL ELEVATIONS ARE ASSUMED TO BE MEASURED FROM ABOVE GRADE LEVEL.

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

ALL PROPOSED ATTACHMENTS TO BE ATTACHED TO POLE EXTERIOR BY USE OF HEAVY DUTY STAINLESS STEEL BAND STRAPS, SABRE/ROSENBERGER RRU MOUNT, OR PIPE-TO-PIPE CLAMPS.

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

verizon

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

REV.	DATE	DESCRIPTION	
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0	08/30/2016	FINAL DWGS	TKB
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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
POLE ELEVATION

SHEET NUMBER
A-1

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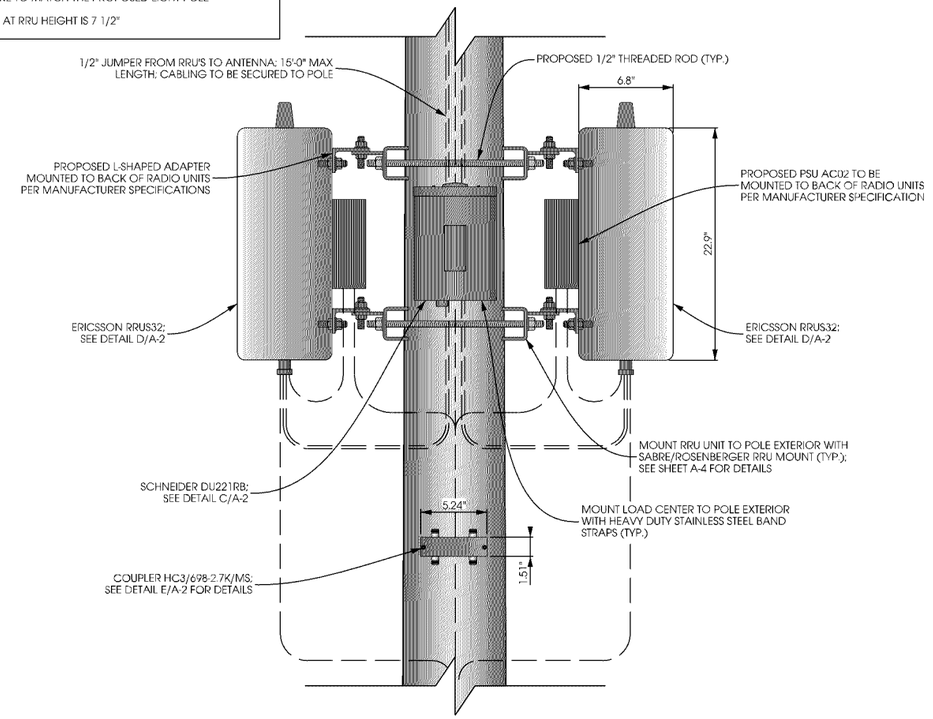
CASE FILE #PL201600185

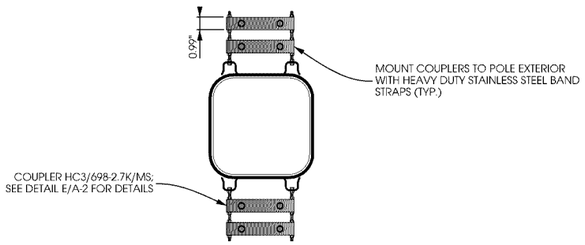
NOTE:

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

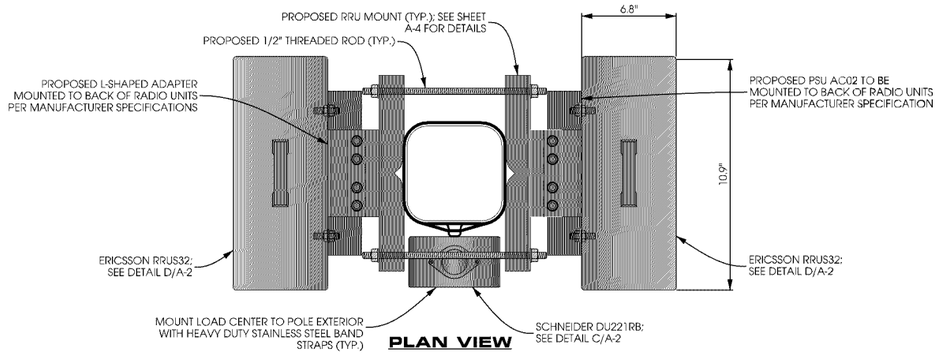
POLE SIZE AT RRU HEIGHT IS 7 1/2"



ELEVATION VIEW



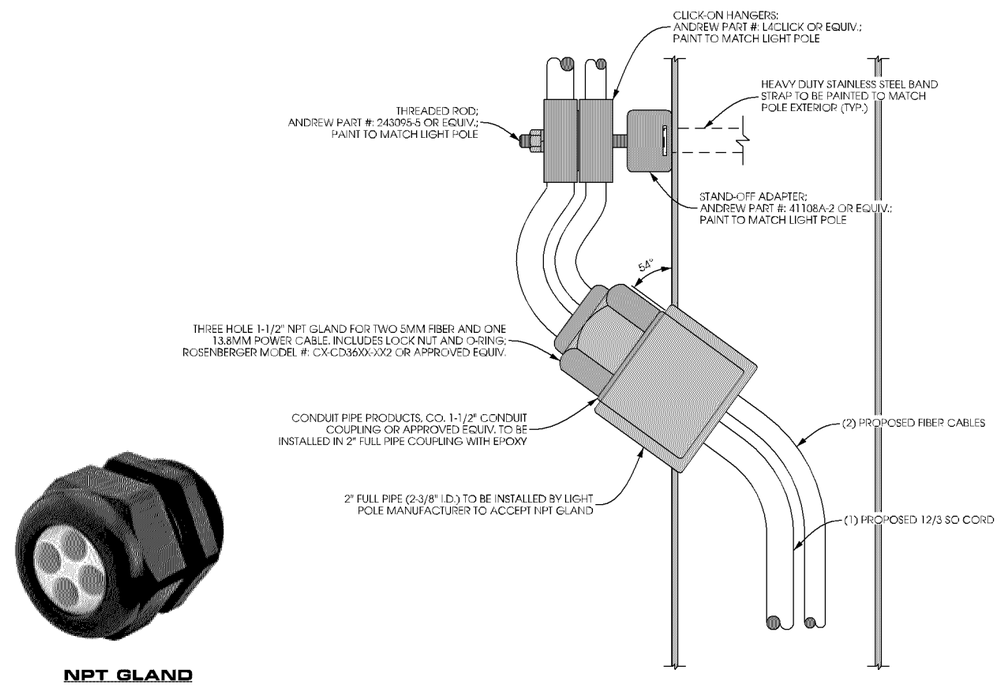
SPLITTER PLAN VIEW



PLAN VIEW

A EQUIPMENT MOUNTING DETAIL

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



NPT GLAND

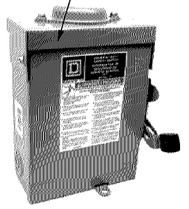
B PENETRATION DETAL

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 RRUS32

- 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)

*SHOWN WITH COVER

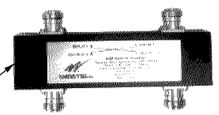
D RADIO DETAIL

SCALE: NTS

CLEARLINK HC3 COUPLER

- 200 WATTS AVG. POWER
- IP65 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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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

MOUNTING DETAILS

SHEET NUMBER

A-2

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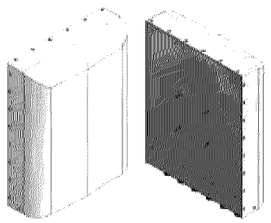
Antenna Systems Group

Header.jpg

JMA WIRELESS

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

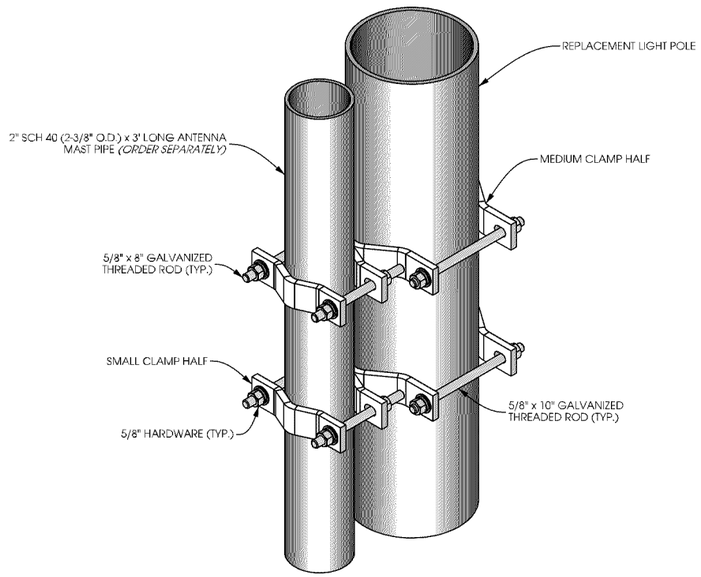
Frequency Band, MHz	698-824	824-896	1695-1850	1850-1990	1990-2180
Horizontal Beam Width, 3dB points	62°	57°	56°	54°	52°
Gain, dBi	10.9	11.5	14.2	14.6	15.0
Vertical Beam Width, 3dB points	42°	35°	17°	16.2°	15.4°
Front-to-Back at 180°, dB	> 30			> 30	
Polarization	+/-45°			2x +/-45°	
Electrical Downtilt	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	> 26			> 26	
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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MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
ANTENNA DETAILS

SHEET NUMBER
A-3

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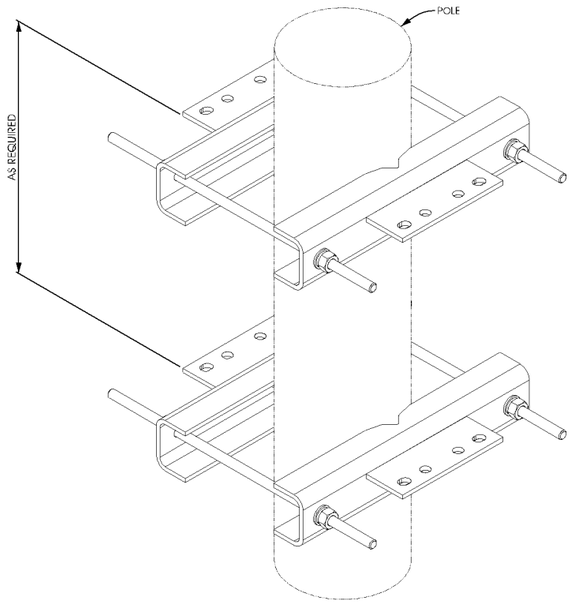
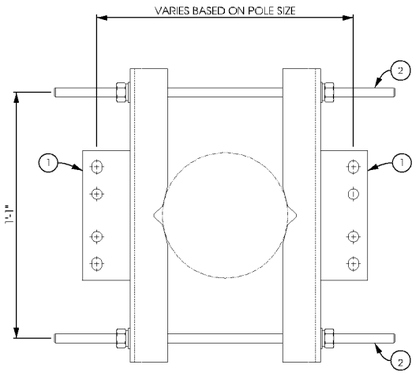
ITEM	QTY.		DESCRIPTION	
1	4	ZW02415	WELDMENT, RRU MOUNT	32
2	6	C40032026	THREADED ROD ASSEMBLY, 1/2" x 1'-6"	10
			TOTAL WEIGHT	42

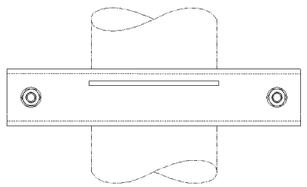
CASE FILE #PL201600185



ISOMETRIC VIEW



PLAN VIEW



ELEVATION VIEW

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

L:\1490\01490\CAD\Plot Preliminary\A-4.dgn

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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-20964-2	SRB-20964-2	2	.141"	¾"
RBR-10964-2	SRB-10964-2	2	.141"	¾"
RBR-134-2	SRB-134-2	2	.250"	¾"
RBR-10532-2	SRB-10532-2	2	.156"	¾"
RBR-10732-3	SRB-10732-2	2	.218"	¾"
RBR-103692-2	SRB-129932-2	2	.281"	¾"
RBR-1201764-2	SRB-201764-2	2	.265"	¾"
RBR-1201964-2	SRB-201964-2	2	.296"	¾"
RBR-1305-2	SRB-305-2	2	.312"	¾"
RBR-120732-2	SRB-2073-2	2	.218"	¾"
RBR-193-3	SRB-134-3	3	.250"	¾"
RBR-10532-3	SRB-10532-3	3	.156"	¾"
RBR-10732-3	SRB-10732-3	3	.218"	¾"
RBR-10933-3	SRB-10933	3	.281"	¾"
RBR-1201764-3	SRB-201764-3	3	.265"	¾"
RBR-120516-3	SRB-20516-3	3	.312"	¾"
RBR-10532-4	SRB-10532-4	4	.156"	¾"
RBR-1203-4	SRB-203-4	4	.187"	¾"
RBR-120732-4	SRB-20732-4	4	.218"	¾"
RBR-100-WUF1	SRB-100-UF1	1	OVAL .625 x .225	¾"
RBR-100-WUF2	SRB-100-UF2	1	OVAL .810 x .225	¾"
RBR-1964-5	SRB-964-5	5	.250"	¾"
RBR-210532-2	SRB-10532-2	2	.156"	¾"
RBR-210732-2	SRB-10732-2	2	.218"	¾"
RBR-210692-2	SRB-10692-2	2	.281"	¾"
RBR-201764-2	SRB-201764-2	2	.265"	¾"
RBR-201964-2	SRB-201964-2	2	.296"	¾"
RBR2201764-2	SRB-2201764-2	2	.308"	¾"
RBR1202164-2	SRB-202164-2	2	.308"	¾"
RBR-208-2	SRB-208-2	2	.312"	¾"
RBR-20732-2	SRB-20732-2	2	.218"	¾"
RBR-2301964-2	SRB-301964-2	2	.296"	¾"
RBR-2305-2	SRB-305-2	2	.375"	¾"
RBR-210332-3	SRB-10332-3	3	.156"	¾"

Part #	Bushing Spec	Number of Holes	Diameter Each Hole	Hub Size
RBR-210732-3	SRB-10732-3	3	.218"	¾"
RBR-210932-3	SRB-10932-3	3	.281"	¾"
RBR-201764-3	SRB-201764-3	3	.265"	¾"
RBR-20516-3	SRB-20516-3	3	.312"	¾"
RBR-20932-3	SRB-20932-3	3	.281"	¾"
RBR-120932-3	SRB-20932-3	3	.281"	¾"
RBR-2305-3	SRB-305-3	3	.312"	¾"
RBR-210532-4	SRB-10532-4	4	.156"	¾"
RBR-203-4	SRB-203-4	4	.187"	¾"
RBR-20732-4	SRB-20732-4	4	.218"	¾"
RBR-2301964-4	SRB-301964-4	4	.296"	¾"
RBR-2301964-5	SRB-301964-5	5	.296"	¾"
RBR-2304-5	SRB-304-5	5	.250"	¾"
RBR-301964-2	SRB-301964-2	2	.296"	1"
RBR-306-2	SRB-306-2	2	.375"	1"
RBR-305-3	SRB-305-3	3	.312"	1"
RBR-300-3SP1	SRB-303-3SP1	3	.500"	1"
RBR-300-3SP2	SRB-303-3SP2	3	.225"	1"
RBR-301964-4	SRB-301964-4	4	.296"	1"
RBR-300-4SP1	SRB-304-4SP1	4	.220"	1"
RBR-301964-5	SRB-303964-5	5	.296"	1"
RBR-304-5	SRB-304-5	5	.250"	1"
RBR-300-WUF1	SRB-300-F1	1	OVAL .890 x .225	1"
RBR-300-WUF2	SRB-300-F2	1	OVAL .709 x .225	1"
RBR-400-2	SRB-400-2	2	.500/.375	1¼"
RBR-408-2	SRB-408-2	2	0.5	1¼"
RBR-410-2	SRB-410-2	2	0.625	1¼"
RBR-406-3	SRB-406-3	3	0.375	1¼"
RBR-500-2	SRB-500-2	2	.500/.375	1½"
RBR-508-2	SRB-508-2	2	0.5	1½"
RBR-510-2	SRB-510-2	2	0.625	1½"
RBR-506-3	SRB-506-3	3	0.375	1½"

* Custom multiple hole bushings are available. Consult factory.

ACCESSORIES

These seals and locknuts can be used with all external conduit threads, except Pg and I.S.O. metric threads.

Seal O-Rings	Size	Steel Locknuts	Stainless Steel Locknuts
SOR-38	⅜"	LN-38	LNSS-38
SOR-1/4NT	¼"	LN-60	LNSS-60
SOR-2	½"	LN-75	LNSS-75
SOR-3	1"	LN-100	LNSS-100
SOR-4	1¼"	LN-125	LNSS-125
SOR-5	1½"	LN-150	LNSS-150
SOR-16	2"	LN-200	LNSS-200
	2½"	LN-250	LNSS-250
	3"	LN-300	LNSS-300

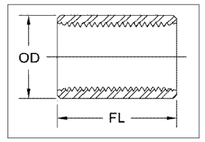
G

G-18

CONDUIT
pipe products, co.
A Member of The Phoenix Forge Group
1501 West Main Street
West Jefferson, OH 43162

Founded 1882 PHOENIX

Conduit Couplings



Size	Threads per inch	OD	Minimum Length Fl.
½	14	1.010	1-5/8
¾	14	1.250	1-41/64
1	11-1/2	1.525	1-31/32
1-¼	11-1/2	1.869	2-1/32
1-½	11-1/2	2.155	2-1/16
2	11-1/2	2.650	2-1/8
2-1/2	8	3.250	3-3/16
3	8	3.870	3-5/16
3-1/2	8	4.500	3-13/32
4	8	4.875	3-33/64
5	8	6.000	3-61/64
6	8	7.100	4-1/4

Material: Galvanized Steel, 304 Stainless and Aluminum Conduit Couplings meet requirements of both CSA and UL.
Aluminum Conduit Couplings are made from 6063 alloy with a maximum Copper content of 0.1%.

Notes: 304 Stainless Steel Conduit Couplings are available only up to 4" size.
O.D. of Stainless Steel Conduit Couplings may be larger than shown.

B CONDUIT ROUTING ATTACHMENTS
SCALE: NTS

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1360 Energy Park Drive, Suite 210
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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
0	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
EQUIPMENT DETAILS

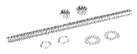
SHEET NUMBER
A-4

CASE FILE #PL201600185

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.



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®

POWERED BY ANDREW.

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®

POWERED BY ANDREW.

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

A **CABLE MOUNTING DETAILS**
SCALE: NTS

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1360 Energy Park Drive, Suite 210
St. Paul, MN 55108
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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
0	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

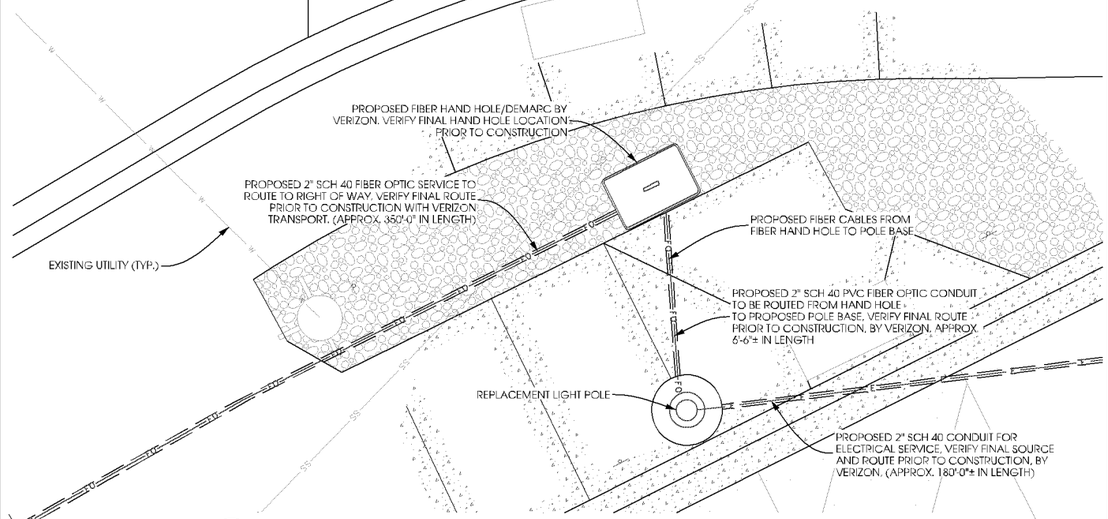
SHEET TITLE
CABLE MOUNTING DETAILS

SHEET NUMBER
A-5

NORTH

CASE FILE #PL201600185

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



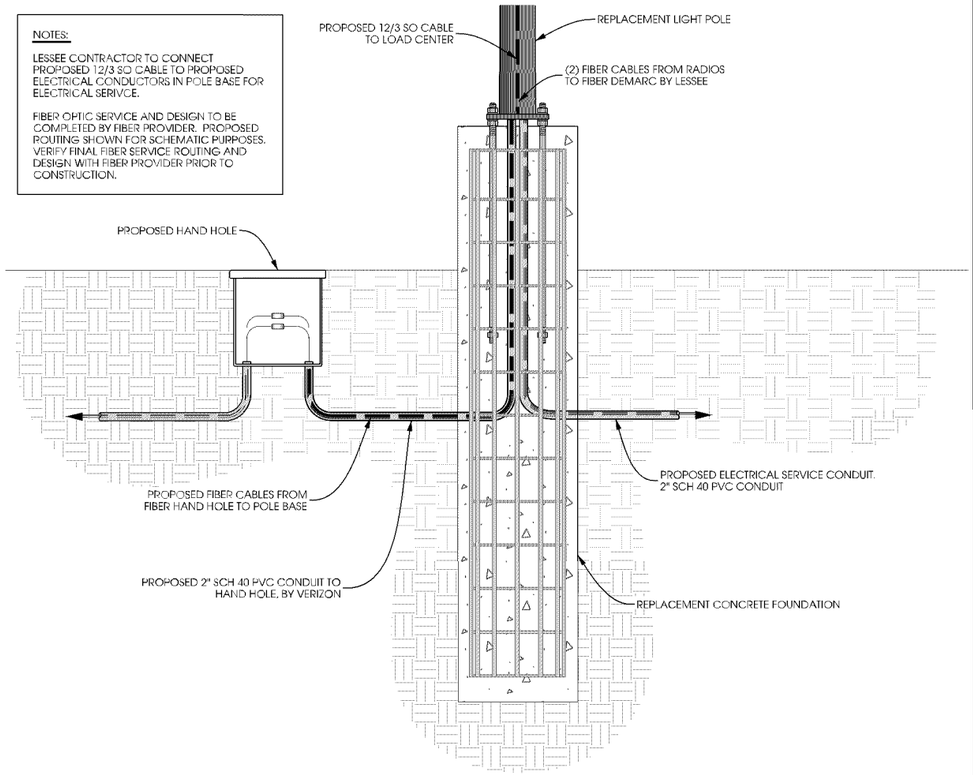
A PROPOSED CABLING DIAGRAM AT POLE BASE

SCALE: NTS

NOTES:

LESSEE CONTRACTOR TO CONNECT PROPOSED 12/3 SO 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.

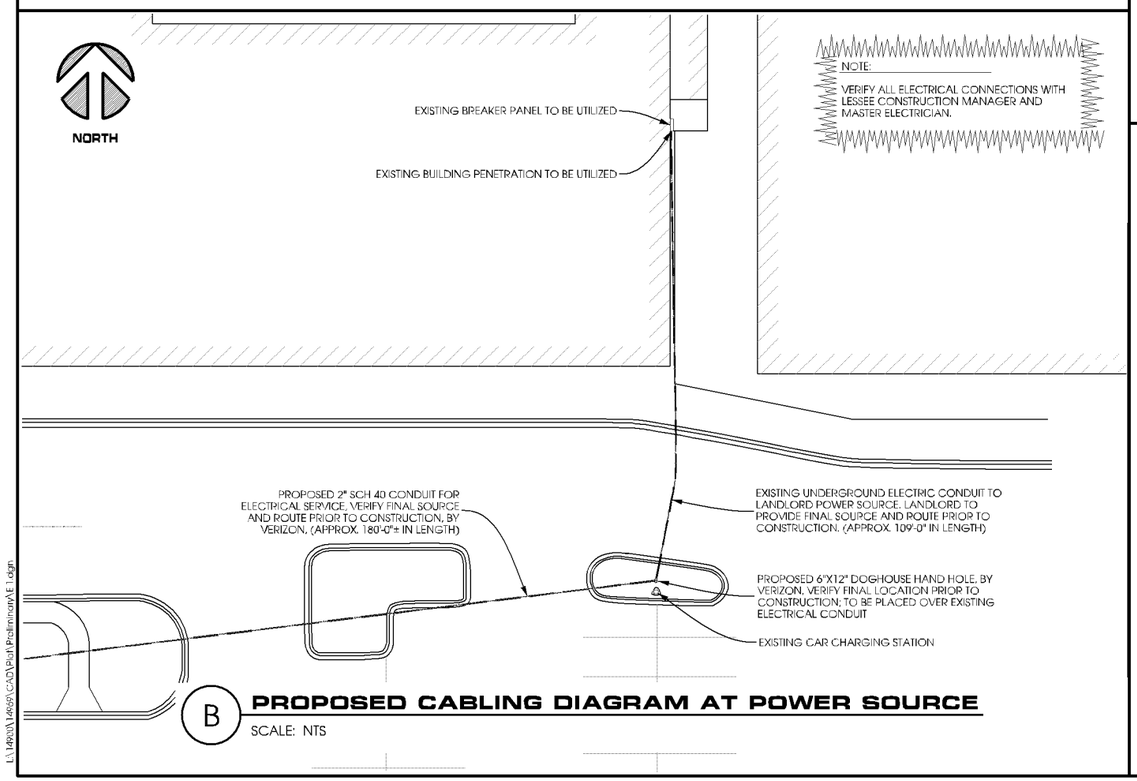


C POWER AND FIBER ROUTING

SCALE: NTS

NORTH

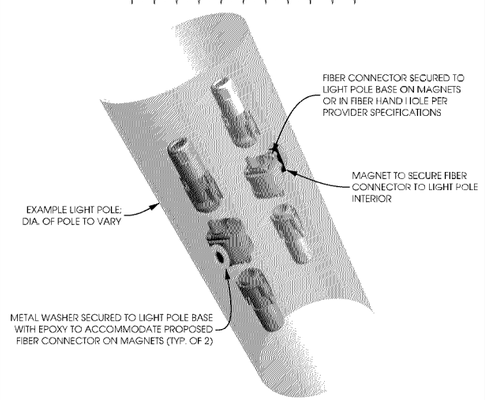
NOTE:
VERIFY ALL ELECTRICAL CONNECTIONS WITH LESSEE CONSTRUCTION MANAGER AND MASTER ELECTRICIAN.



B PROPOSED CABLING DIAGRAM AT POWER SOURCE

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.



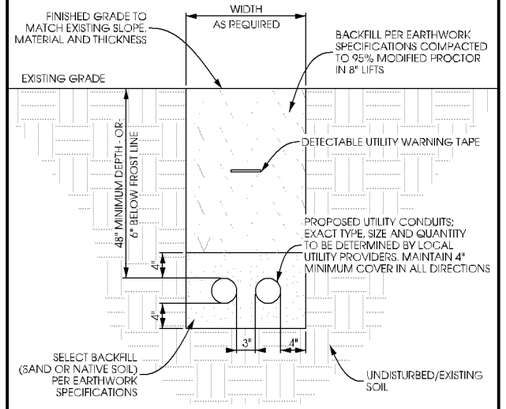
D FIBER CONNECTOR

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

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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 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.

L:\14900\14969\CAD\Plot\Preliminary\E 2.dgn

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
0	08/30/2016	FINAL DWGS	TKB
1	10/11/2016	FINAL DWGS	NBT

APPROVED

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.

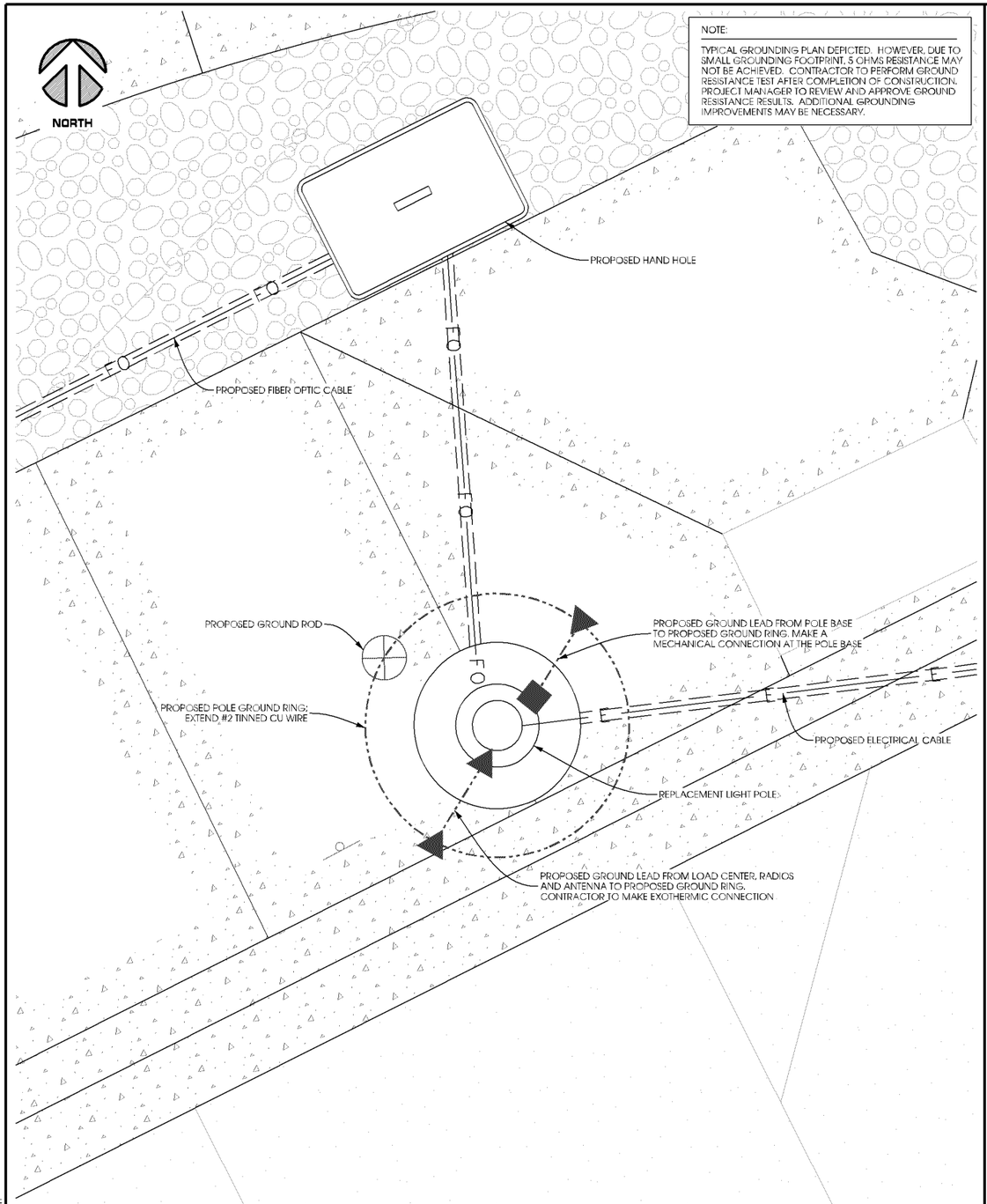
MIN SOUTHTOWN SC1
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

ELECTRICAL NOTES

SHEET NUMBER

E-2



A **PROPOSED GROUNDING DIAGRAM**

SCALE: NTS

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 ENCIRCLE 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 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 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.

GROUNDING NOTES

verizon

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

SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
G-1

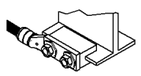
L:\14969\14969 CAD\Plot Preliminary G-1.dgn

CASE FILE #PL201600185

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.



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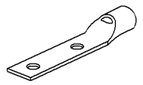

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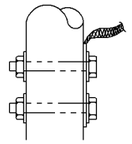

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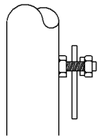
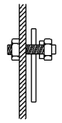


TYPE KC TO PIPE



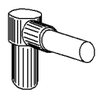
TYPE KC
TO FLAT SURFACE

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.



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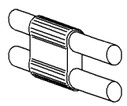

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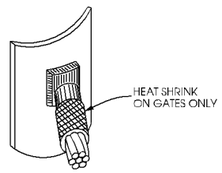

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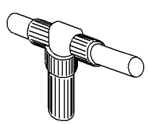
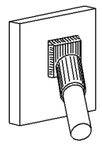
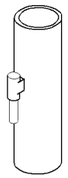


TYPE GT



TYPE VB
(TOWER GROUND TAB)



TYPE VT

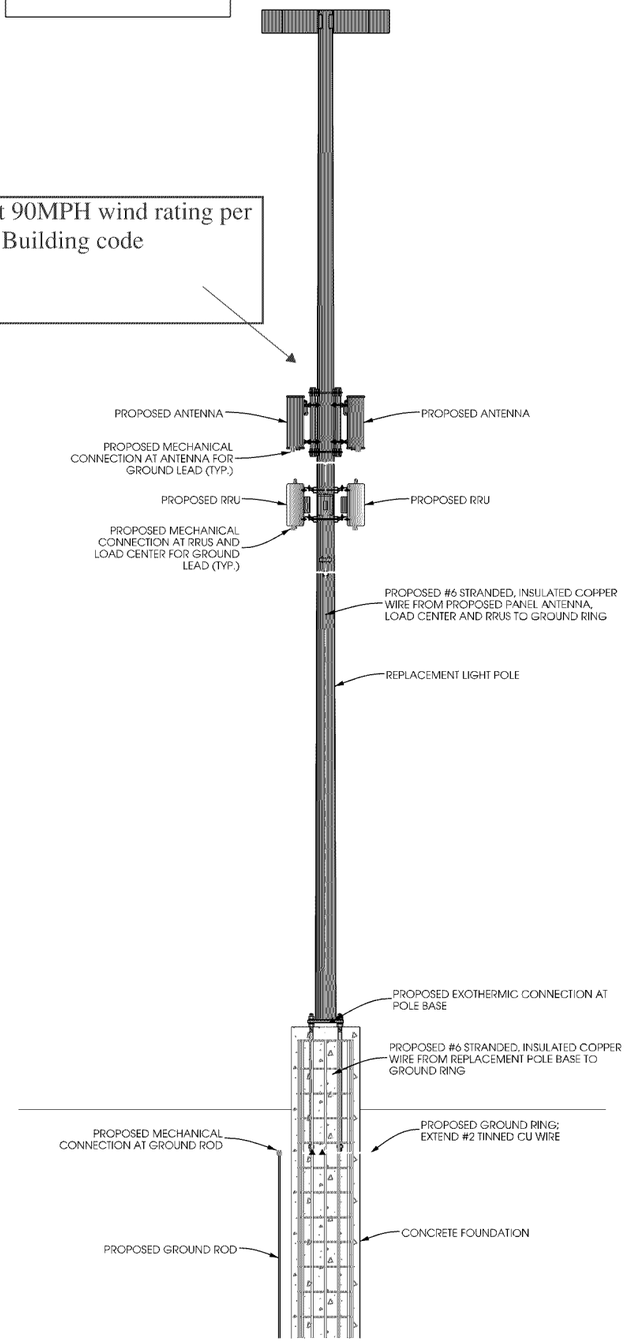
SOLID COPPER WIRE TO POST CONNECTION
- FENCE LEAD TO FENCE POST
- LEADS TO UTILITY RACK & ICE BRIDGE POSTS

B **CADWELD DETAILS**
SCALE: NTS

GROUNDING CONNECTION LEGEND:

- EXOTHERMIC
- MECHANICAL

Must meet 90MPH wind rating per MN State Building code



C **TYPICAL GROUNDING SCHEMATIC**
SCALE: NTS

verizon

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

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

L:\14900\14969\CAD\Full Preliminary\G-2.dgn

CASE FILE #PL201600185

verizon

SITE NAME: MIN SOUTHTOWN SC2

SITE NUMBER: 20151187111

LOCATION CODE: 320992

SITE TYPE: SMALL CELL

POLE TYPE: REPLACEMENT LIGHT POLE

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" T.O.C.

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

APPLICABLE CODES

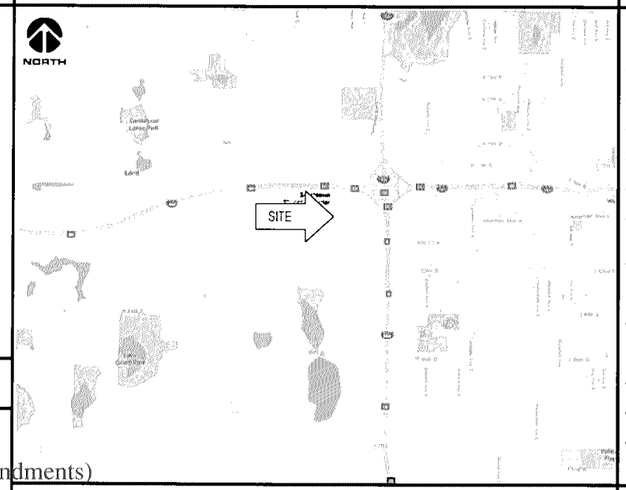
ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

- 2012 INTERNATIONAL BUILDING CODE (w/2015 MN Amendments)
- 2014 NATIONAL ELECTRIC CODE
- TIA/EIA-222-G OR LATEST EDITION

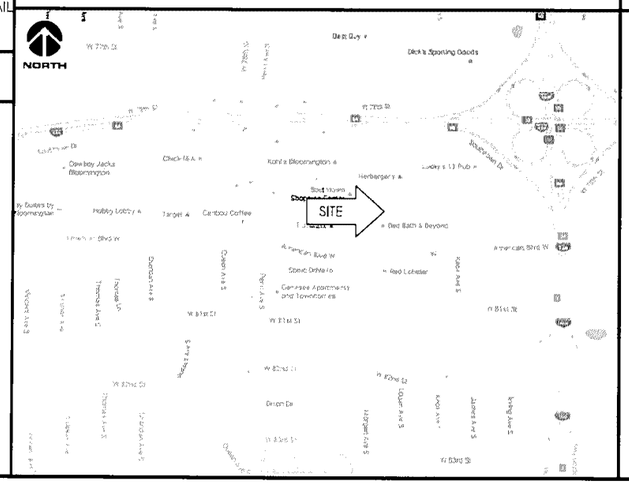
IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

LOCATION SCAN

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION/SOW

- INSTALL (1) REPLACEMENT 36-FT 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 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

RF ENGINEER:
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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.

verizon

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www.buellconsulting.com

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608.644.1549 fax
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CHECKED BY:	OGD

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1	10/11/2016	FINAL DWGS	NBT

OTTO G. DINGFELDER III
LICENSED PROFESSIONAL ENGINEER
49720
STATE OF MINNESOTA
10/11/2016

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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

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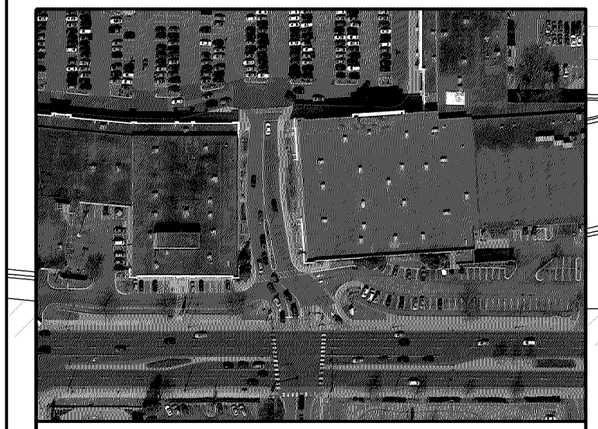

AERIAL OVERVIEW

CASE FILE #PL201600185

PROPOSED 2" SCH 40 CONDUIT FOR ELECTRICAL SERVICE. VERIFY FINAL SOURCE AND ROUTE PRIOR TO CONSTRUCTION. BY VERIZON. APPROX. 502'-0"± IN LENGTH

PROPOSED 2" SCH 40 FIBER OPTIC CONDUIT TO ROUTE TO PROPOSED PROVIDER MH/HH. BY FIBER PROVIDER. VERIFY FINAL LOCATION AND ROUTE WITH PROVIDER.

REPLACEMENT LIGHT POLE

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.

MALL ACCESS RD.

EXISTING BUILDING

EXISTING BUILDING

EXISTING BREAKER PANEL TO BE UTILIZED

PROPOSED BUILDING PENETRATION. SEE SHEET E-2 FOR DETAILS

PARKING LOT

PARKING LOT

PROPOSED HAND HOLE/DEMARC. BY FIBER PROVIDER. VERIFY FINAL LOCATION PRIOR TO CONSTRUCTION

APPROX. PUBLIC RIGHT OF WAY

APPROX. PUBLIC RIGHT OF WAY

AMERICAN BLVD.

NORTH

20' 0' 20' 40'

SCALE: 11" x 17" - 1" = 40'
22" x 34" - 1" = 20'

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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:	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

SITE PLAN

SHEET NUMBER

C-1

AERIAL OVERVIEW

SITE OVERVIEW [LOOKING WEST]

SITE OVERVIEW [LOOKING NORTH]

CASE FILE #PL201600185

10' 0' 10' 20'
SCALE: 11" x 17" - 1" = 20'
22" x 34" - 1" = 10'

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

SHEET TITLE
ENLARGED SITE PLAN

SHEET NUMBER
C-2

L:\14900\14970\CAD\Plot Planning\A1-2.dgn

CASE FILE #PL201600185

NODE INFO				
PCI:	Full Node Name: (Name SC2 Node#)			
TBD	SOUTHTOWN SC2			
	Coordinates	DEG	MIN	SEC
	LATITUDE	44	51	34.77
	LONGITUDE	93	18	15.72
	Ground Elevation:		834	
	1A Coordinates 08-01-2016			

RADIO				
Band	eNB ID	Model	DU#	DU Port#
AWS	TBD	RRUS32 B66A	1	TBD
PCS	TBD	RRUS32 B2	1	TBD

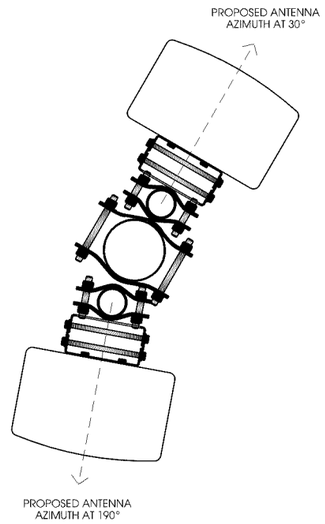
RF Splitter: (4) ClearLink-HC3/698-2.7K/MS

ANTENNA									
AZIMUTH	POSITION	QTY	MFR.	MODEL	PORT	C/L	ADJ ELEC TILT	MECH TILT
30	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			
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			

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

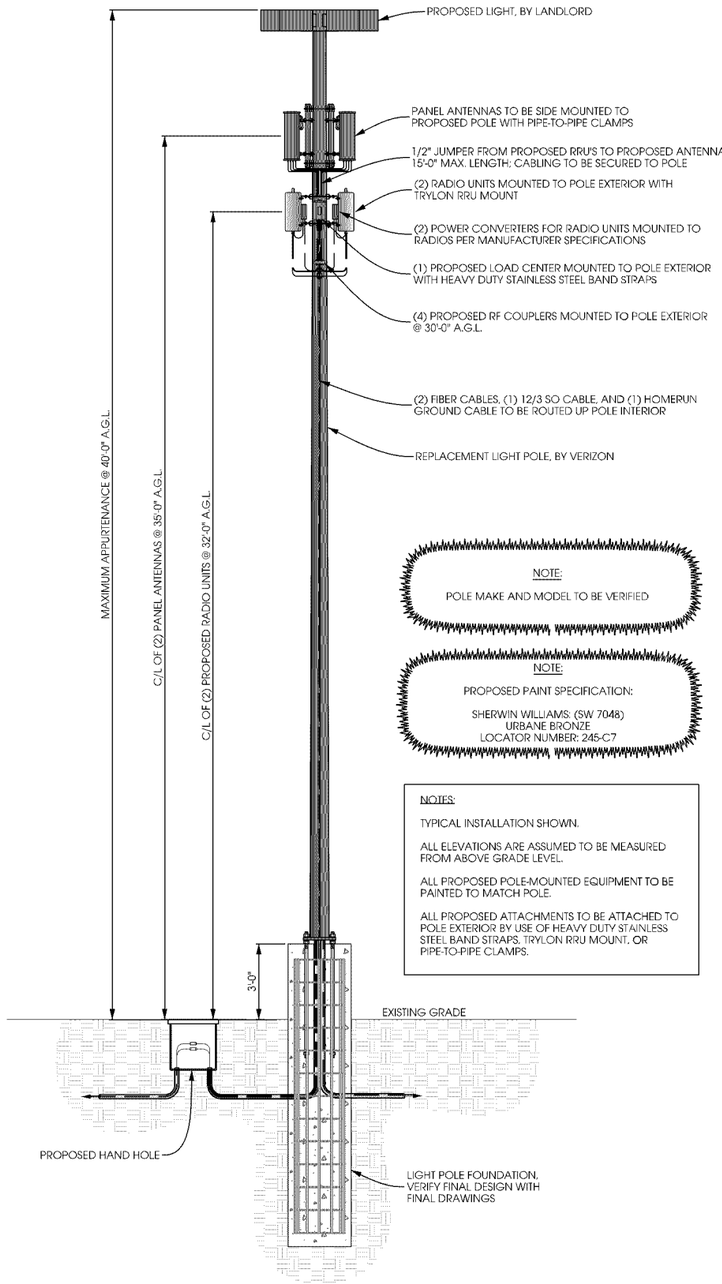
A **ANTENNA AND COAX**
SCALE: NTS

NORTH



B **ANTENNA ORIENTATION**
SCALE: NTS

LIGHT POLE ELEVATION



NOTE:
POLE MAKE AND MODEL TO BE VERIFIED

NOTE:
PROPOSED PAINT SPECIFICATION:
SHERWIN WILLIAMS: (SW 7048)
URBANE BRONZE
LOCATOR NUMBER: 245-C7

NOTES:
TYPICAL INSTALLATION SHOWN.
ALL ELEVATIONS ARE ASSUMED TO BE MEASURED FROM ABOVE GRADE LEVEL.
ALL PROPOSED POLE-MOUNTED EQUIPMENT TO BE PAINTED TO MATCH POLE.
ALL PROPOSED ATTACHMENTS TO BE ATTACHED TO POLE EXTERIOR BY USE OF HEAVY DUTY STAINLESS STEEL BAND STRAPS, TRYLON RRU MOUNT, OR PIPE-TO-PIPE CLAMPS.

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

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PROJECT NO:	20151187111
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DRAWN BY:	NBT
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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
POLE ELEVATION

SHEET NUMBER
A-1

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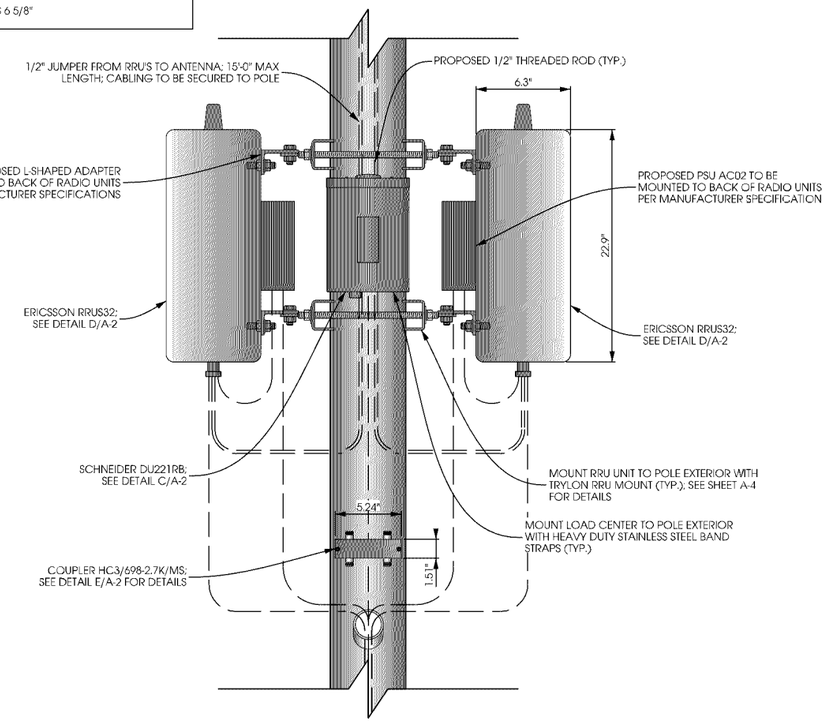
NOTE:

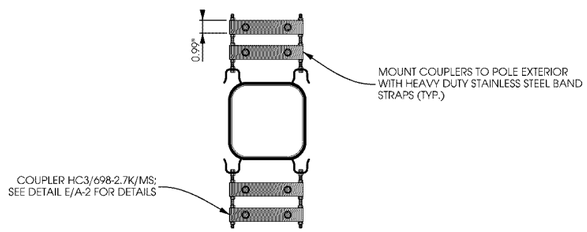
PAINT ALL ANTENNAS, OUTDOOR EQUIPMENT, AND MOUNTING HARDWARE TO MATCH THE PROPOSED LIGHT POLE

POLE SIZE AT RRU HEIGHT IS 6 5/8"

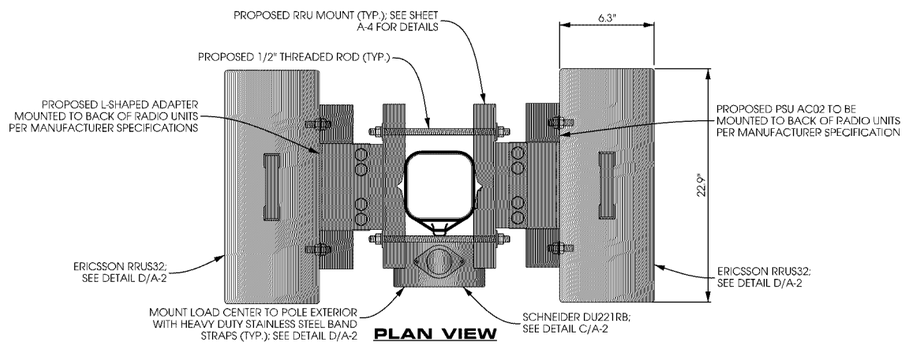
CASE FILE #PL201600185



ELEVATION VIEW



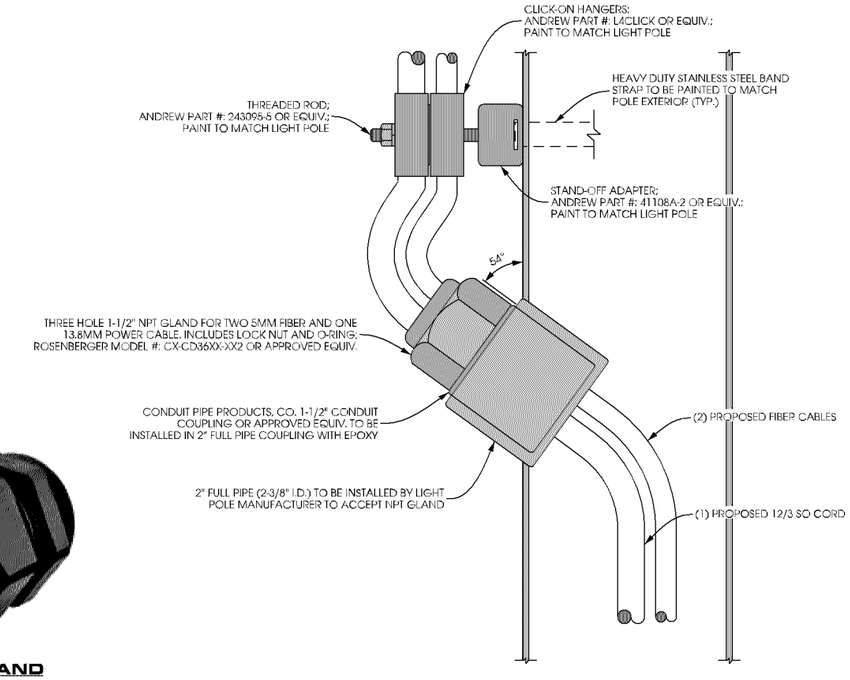
SPLITTER PLAN VIEW

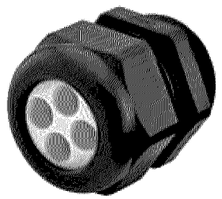


PLAN VIEW

A EQUIPMENT MOUNTING DETAIL

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





NPT GLAND

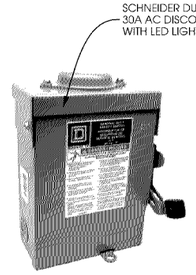
B PENETRATION DETAL

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

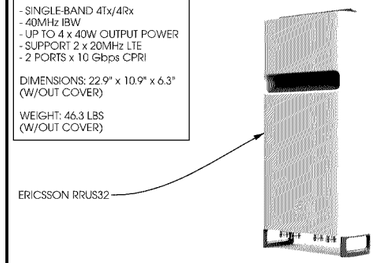
SCALE: NTS

ERICSSON RRUS32

- 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)



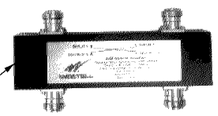
D RADIO DETAIL

SCALE: NTS

CLEARLINK HC3 SPLITTER

- 200 WATTS AVG. POWER
- IP65 COMPLIANT
- RoHS COMPLIANT
- 698-2700 MHz fREQUENCY RANGE

DIMENSIONS: 5.24" x 1.58" x 0.99"



E COUPLER DETAIL

SCALE: NTS

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

SHEET TITLE

MOUNTING DETAILS

SHEET NUMBER

A-2

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CASE FILE #PL201600185

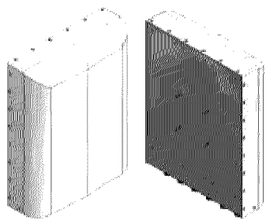
Antenna Systems Group

Header.jpg

JMA WIRELESS

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

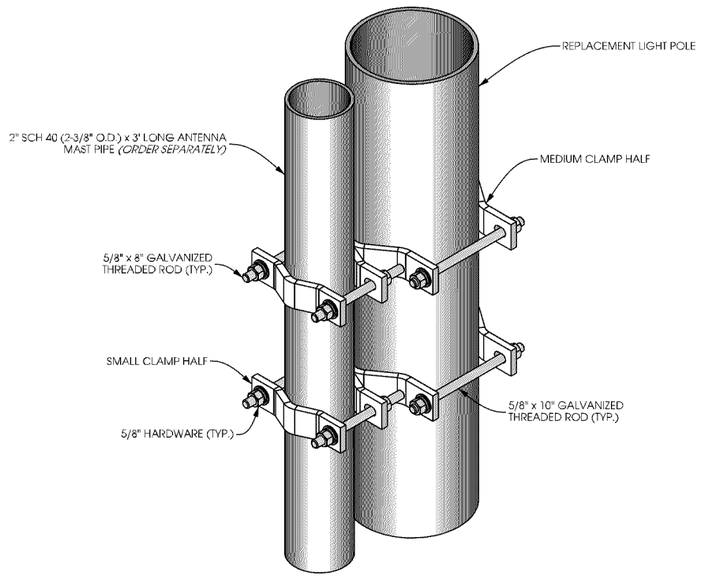
ELECTRICAL SPECIFICATIONS

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	> 26			> 26	
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



B **PIPE TO PIPE CLAMP**
SCALE: NTS ANDREW PART #: JS-S100 OR EQUIV.

verizon

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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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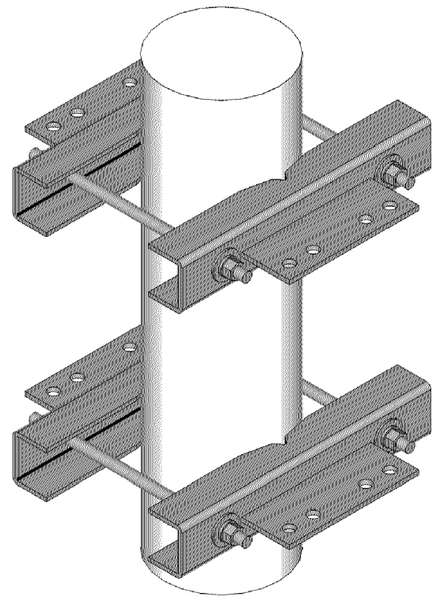
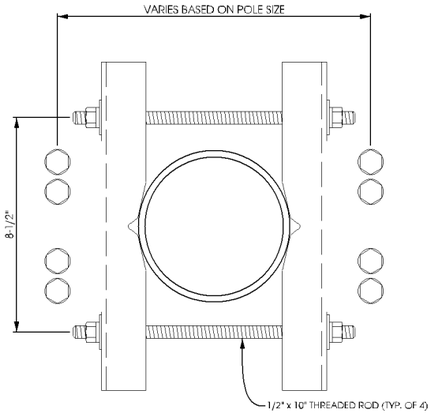
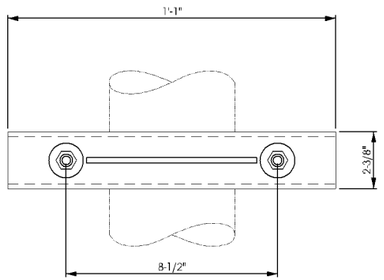
CASE FILE #PL201600185



ISOMETRIC VIEW



PLAN VIEW



ELEVATION VIEW

A **RADIO UNIT MOUNTING DETAIL**
SCALE: NTS TRYLON KIT #: 4.927.0063.001

elecDirect.com
Selection, Service & Quality Solutions
Sandusky, OH
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-20964-2	SRB-20964-2	2	.141"	¾"
RBR-10964-2	SRB-10964-2	2	.141"	¾"
RBR-134-2	SRB-134-2	2	.250"	½"
RBR-10532-2	SRB-10532-2	2	.156"	½"
RBR-10732-2	SRB-10732-2	2	.218"	¾"
RBR-120902-2	SRB-120902-2	2	.281"	¾"
RBR-1201764-2	SRB-201764-2	2	.265"	¾"
RBR-1201964-2	SRB-201964-2	2	.296"	¾"
RBR-1205-2	SRB-205-2	2	.313"	¾"
RBR-120732-2	SRB-20732-2	2	.218"	¾"
RBR-134-3	SRB-134-3	3	.250"	½"
RBR-10532-3	SRB-10532-3	3	.156"	½"
RBR-10732-3	SRB-10732-3	3	.218"	¾"
RBR-10932-3	SRB-109323	3	.281"	¾"
RBR-1201764-3	SRB-201764-3	3	.265"	¾"
RBR-120516-3	SRB-20516-3	3	.312"	¾"
RBR-10532-4	SRB-10532-4	4	.156"	½"
RBR-1203-4	SRB-203-4	4	.187"	½"
RBR-120732-4	SRB-20732-4	4	.218"	¾"
RBR-100-WUF1	SRB-100-UF1	1	OVAL .625 x .225	¾"
RBR-100-WUF2	SRB-100-UF2	1	OVAL .610 x .225	¾"
RBR-1204-2	SRB-204-2	2	.250"	¾"
RBR-210532-2	SRB-10532-2	2	.156"	½"
RBR-210732-2	SRB-10732-2	2	.218"	¾"
RBR-210932-2	SRB-10932-2	2	.281"	¾"
RBR-201764-2	SRB-201764-2	2	.265"	¾"
RBR-201964-2	SRB-201964-2	2	.296"	¾"
RBR2201764-2	SRB-201764-2	2	.328"	¾"
RBR1201764-2	SRB-201764-2	2	.328"	¾"
RBR-205-2	SRB-205-2	2	.312"	¾"
RBR-20732-2	SRB-20732-2	2	.218"	¾"
RBR-2301964-2	SRB-301964-2	2	.296"	¾"
RBR-2305-2	SRB-305-2	2	.375"	¾"
RBR-210332-3	SRB-10332-3	3	.156"	½"

Part #	Bushing Spec	Number of Holes	Diameter Each Hole	Hub Size
RBR-210732-3	SRB-10732-3	5	.218"	¾"
RBR-210932-3	SRB-10932-3	3	.281"	¾"
RBR-201764-3	SRB-201764-3	3	.265"	¾"
RBR-20516-3	SRB-20516-3	5	.312"	¾"
RBR-20932-3	SRB-20932-3	3	.281"	¾"
RBR-120932-3	SRB-20932-3	3	.281"	¾"
RBR-2305-3	SRB-305-3	3	.312"	¾"
RBR-210532-4	SRB-10532-4	4	.156"	½"
RBR-203-4	SRB-203-4	4	.187"	½"
RBR-20732-4	SRB-20732-4	4	.218"	¾"
RBR-2301964-4	SRB-301964-4	4	.296"	¾"
RBR-2301964-5	SRB-301964-5	5	.296"	¾"
RBR-2304-5	SRB-304-5	5	.250"	½"
RBR-301964-2	SRB-301964-2	2	.296"	1"
RBR-306-2	SRB-306-2	2	.375"	1"
RBR-305-3	SRB-305-3	3	.312"	1"
RBR-300-3SP1	SRB-309-3SP1	3	.500"	1"
RBR-300-3SP2	SRB-300-3SP2	5	.229"	1"
RBR-301964-4	SRB-301964-4	4	.296"	1"
RBR-300-4SP1	SRB-300-4SP1	4	.220"	1"
RBR-301964-5	SRB-303964-5	5	.296"	1"
RBR-304-5	SRB-304-5	5	.250"	1"
RBR-300-WUF1	SRB-300-F1	1	OVAL .880 x .275	1"
RBR-300-WUF2	SRB-300-F2	1	OVAL .700 x .225	1"
RBR-400-2	SRB-400-2	2	.500/.375	1¼"
RBR-408-2	SRB-408-2	2	0.5	1¼"
RBR-410-2	SRB-410-2	2	0.625	1¼"
RBR-406-3	SRB-406-3	3	0.375	1¼"
RBR-500-2	SRB-500-2	2	.500/.375	1½"
RBR-508-2	SRB-508-2	2	0.5	1½"
RBR-510-2	SRB-510-2	2	0.625	1½"
RBR-506-3	SRB-506-3	3	0.375	1½"

* Custom multiple hole bushings are available. Consult factory.

ACCESSORIES

These seals and locknuts can be used with all external conduit threads, except Pg and I.S.O. metric threads.

Seal O-Rings	Size	Steel Locknuts	Stainless Steel Locknuts
SOR-38	⅜"	LN-38	LNSS-38
SOR-1-VNT	½"	LN-50	LNSS-50
SOR-2	¾"	LN-75	LNSS-75
SOR-3	1"	LN-100	LNSS-100
SOR-4	1¼"	LN-125	LNSS-125
SOR-51	1½"	LN-150	LNSS-150
SOR-16	2"	LN-200	LNSS-200
	2½"	LN-250	LNSS-250
	3"	LN-300	LNSS-300

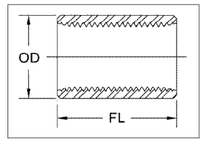
G

G-18

CONDUIT
pipe products, co.
A Member of The Phoenix Forge Group
1501 West Main Street
West Jefferson, OH 43162

Founded 1852 PHOENIX

Conduit Couplings



Size	Threads per inch	OD	Minimum Length FL
1/2	14	1.010	1-5/8
3/4	14	1.250	1-41/64
1	11-1/2	1.525	1-31/32
1-1/4	11-1/2	1.869	2-1/32
1-1/2	11-1/2	2.155	2-1/16
2	11-1/2	2.650	2-1/8
2-1/2	8	3.250	3-3/16
3	8	3.870	3-5/16
3-1/2	8	4.500	3-13/32
4	8	4.875	3-33/64
5	8	6.000	3-61/64
6	8	7.100	4-1/4

Material: Galvanized Steel, 304 Stainless and Aluminum Conduit Couplings meet requirements of both CSA and UL.
Aluminum Conduit Couplings are made from 6063 alloy with a maximum Copper content of 0.1%.

Notes: 304 Stainless Steel Conduit Couplings are available only up to 4" size.
O.D. of Stainless Steel Conduit Couplings may be larger than shown.

B **CONDUIT ROUTING ATTACHMENTS**
SCALE: NTS

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verizon

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Edge
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608.644.1549 fax
www.edgeconsult.com

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
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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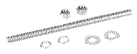
CASE FILE #PL201600185

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.



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®

POWERED BY ANDREW.

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

UAA! — Universal Angle Adapter Insert

SA-38 — Universal Stand-off Adapter

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

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

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

A **CABLE MOUNTING DETAILS**
SCALE: NTS

verizon

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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

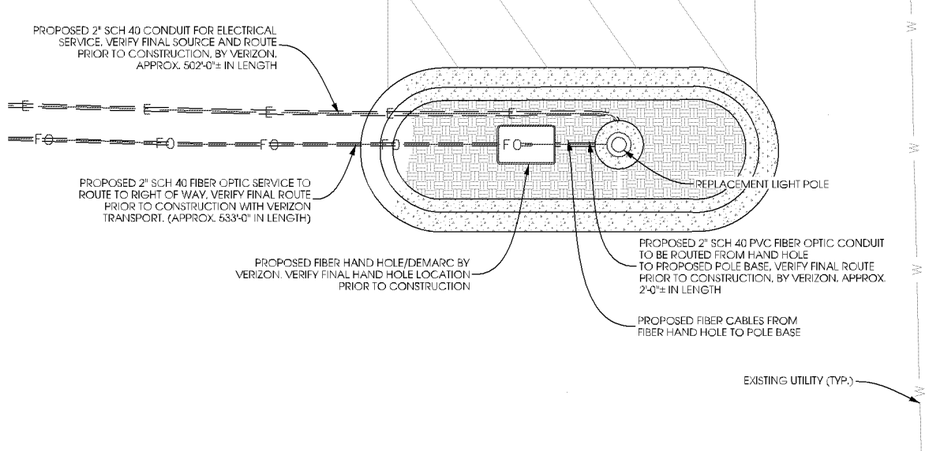
L:\14970\14970 CAD\Put\Preliminary\14 Edgin

CASE FILE #PL201600185

NORTH

NOTE:

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



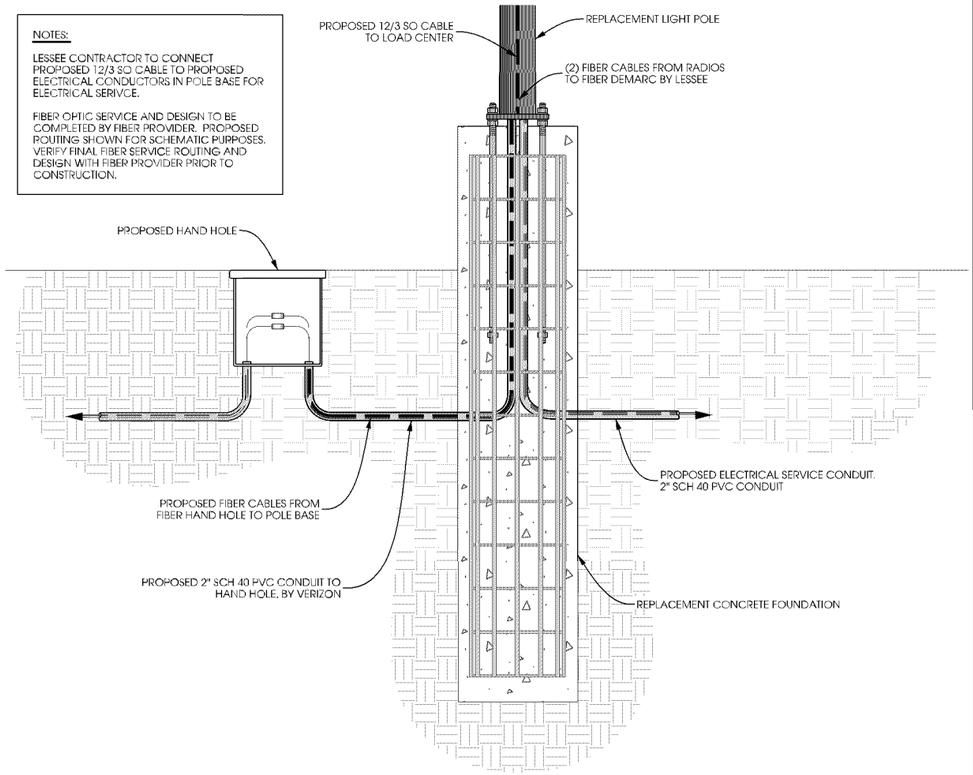
A PROPOSED CABLING DIAGRAM AT POLE BASE

SCALE: NTS

NOTES:

LESSEE CONTRACTOR TO CONNECT PROPOSED 12/3 SO 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.

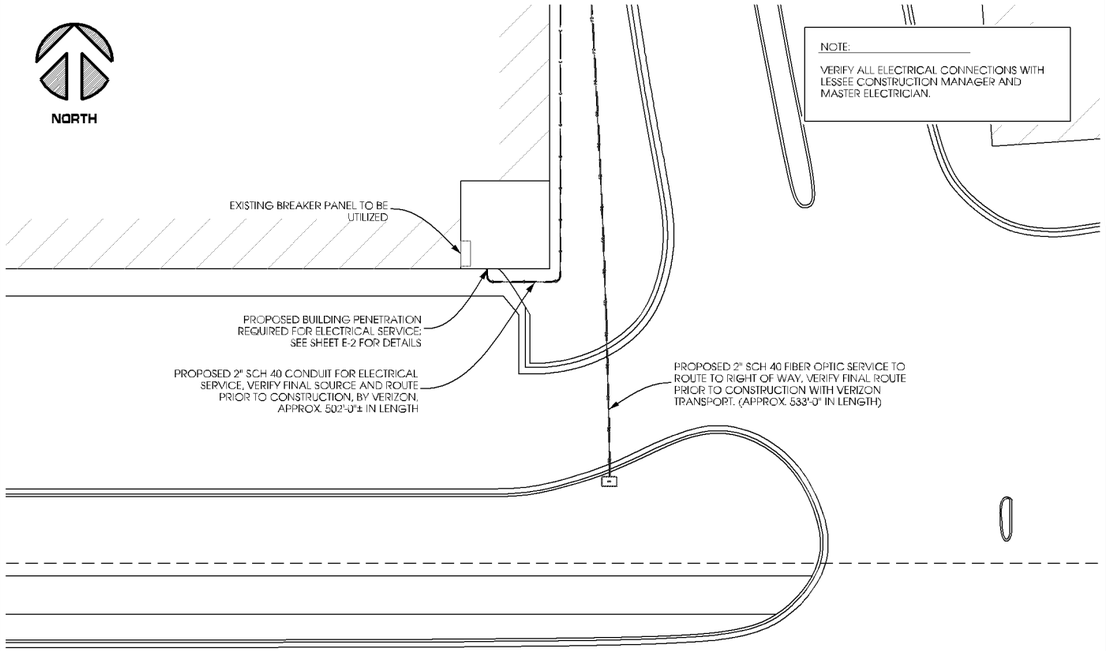


C POWER AND FIBER ROUTING

SCALE: NTS

NOTE:

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

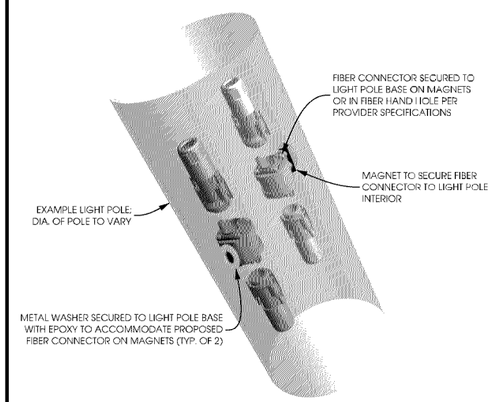


B PROPOSED CABLING DIAGRAM AT POWER SOURCE

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.



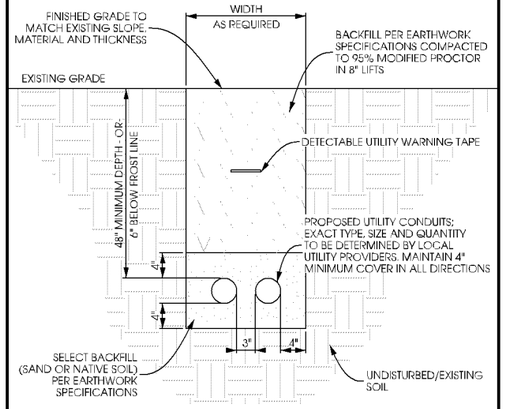
D FIBER CONNECTOR

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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DRAWN BY:	NBT
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MIN SOUTHTOWN SC2
BLOOMINGTON, MN
REPLACEMENT LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE

CABLING DETAILS

SHEET NUMBER

E-1

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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 "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.

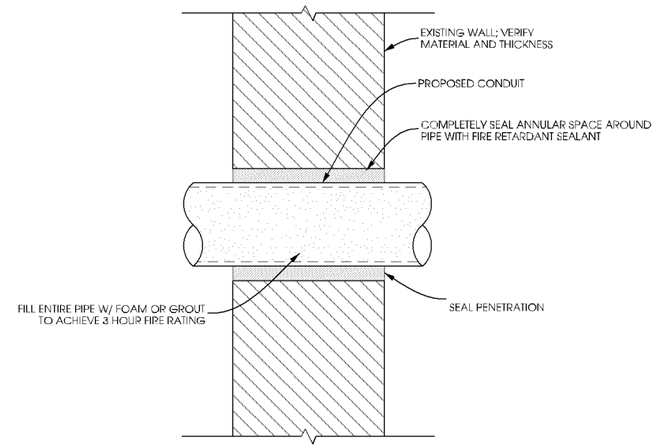
32. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY TOWER LIGHTING SYSTEM DESCRIBED IN THE RFQ.

ELECTRICAL NOTES

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

REPLACEMENT LIGHT POLE LOCATION

verizon

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

SHEET TITLE

ELECTRICAL NOTES

SHEET NUMBER

E-2

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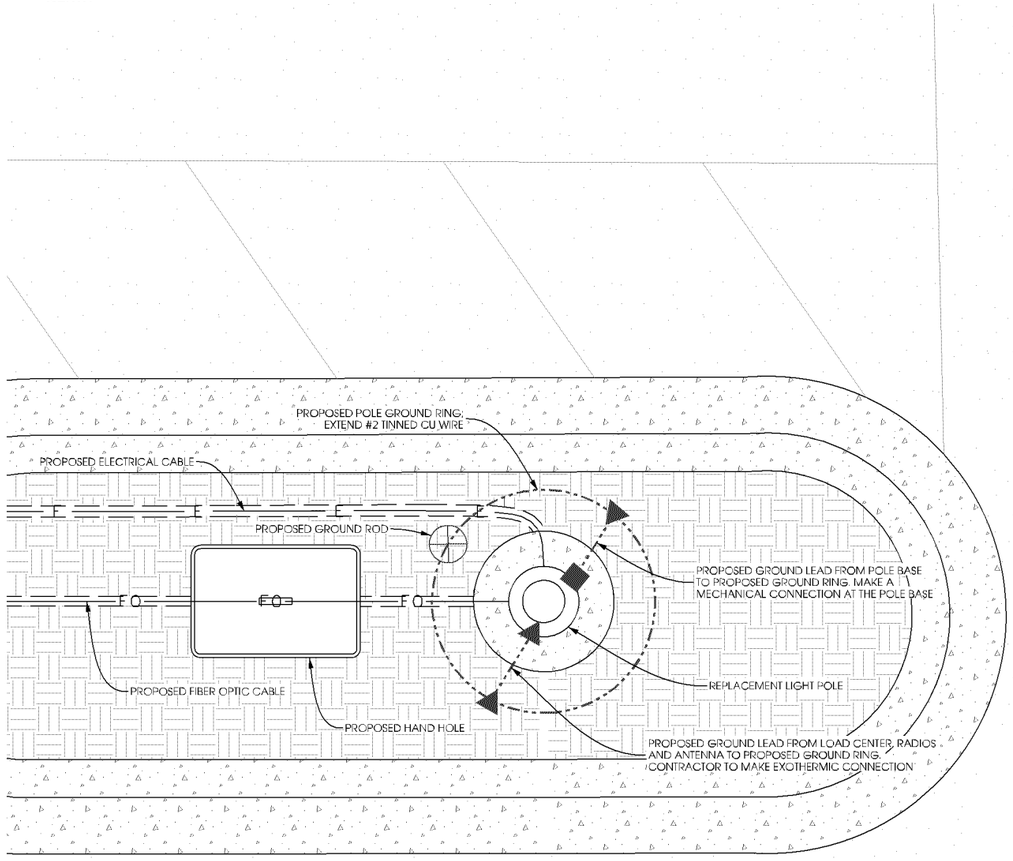
CASE FILE #PL201600185

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.

NORTH



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 ENCIRCLE 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 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 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.

GROUNDING NOTES

verizon

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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

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

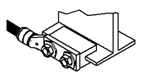
L:\14900\14970\CAD\Plot Preliminary\G-1.dgn

CASE FILE #PL201600185

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.



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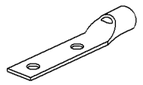

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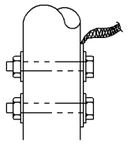

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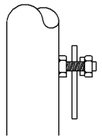
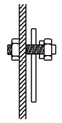


TYPE KC TO PIPE



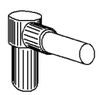
TYPE KC
TO FLAT SURFACE

A **BURNDY DETAILS**
SCALE: NTS

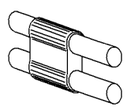
NOTES:

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



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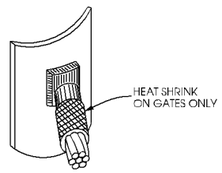
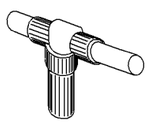
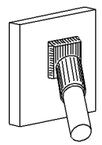


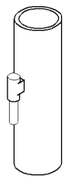
TYPE VBC



TYPE GT



TYPE VB
(TOWER GROUND TAB)



TYPE VT

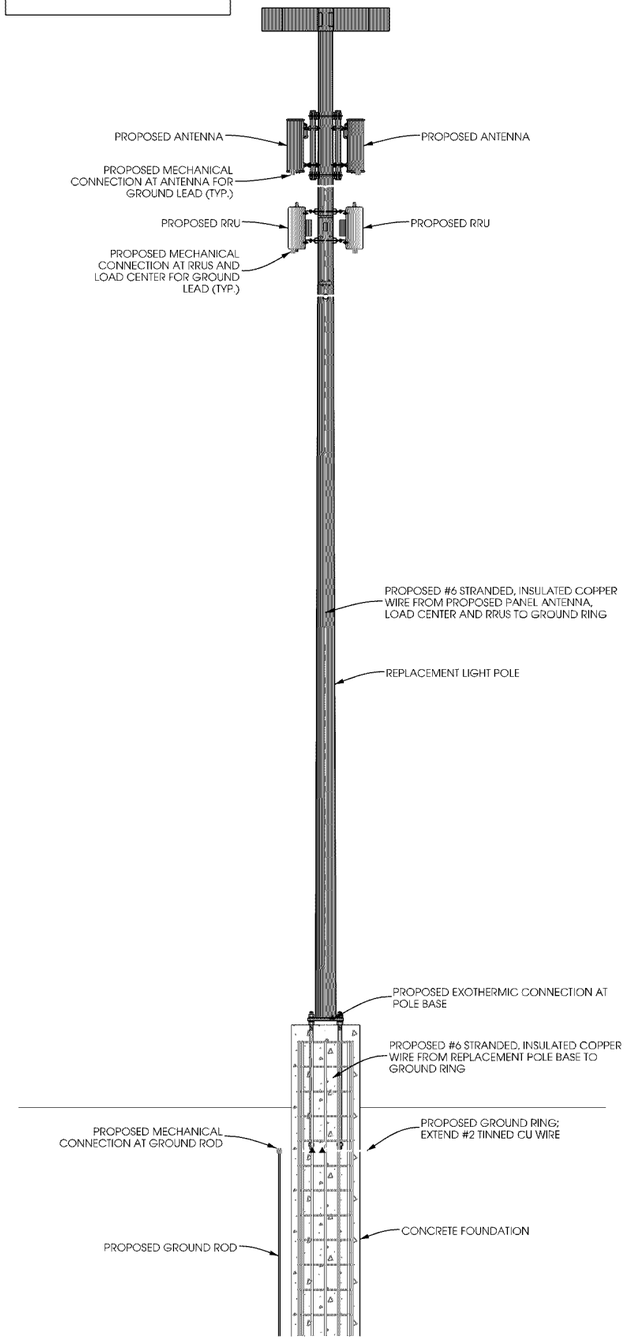
SOLID COPPER WIRE TO POST CONNECTION
- FENCE LEAD TO FENCE POST
- LEADS TO UTILITY RACK & ICE BRIDGE POSTS

B **CADWELD DETAILS**
SCALE: NTS

GROUNDING CONNECTION LEGEND:

▲ EXOTHERMIC

▨ MECHANICAL



C **TYPICAL GROUNDING SCHEMATIC**
SCALE: NTS

verizon

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www.edgeconsult.com

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
GROUNDING DETAILS

SHEET NUMBER
G-2

L:\14970\(14970) CAD\Plot Preliminary\G-2.dgn