ZONING COMMITTEE STAFF REPORT

FILE NAME: Verizon Wireless **FILE #** 17-006-742

APPLICANT: Verizon Wireless **HEARING DATE:** February 16, 2017

TYPE OF APPLICATION: Conditional Use Permit

LOCATION: 425 7th St W, NE corner at Douglas

PIN & LEGAL DESCRIPTION: 012823410141, Samuel Leeches Addition Subj To Esmts & Vac St Accruing The Fol; Lot 5 Of C L Lains Re & In Sd Samuel Leeches Addition; Ex N 90 Ft Of Lot 8 & Ex N 90 Ft Of W 3 Ft Of Lot 9; Lots 8 9 & 10 Blk 4 & Part Nw Of W 7th St Of Lots 6 & Lot 7 Blk 9

PLANNING DISTRICT: 9 **PRESENT ZONING:** B2

ZONING CODE REFERENCE: §65.310; §61.501; §66.431

STAFF REPORT DATE: February 9, 2017 **BY:** Bill Dermody

DATE RECEIVED: January 26, 2017 **60-DAY DEADLINE FOR ACTION:** March 27, 2017

A. **PURPOSE:** Conditional use permit for a new 31' high light pole with cellular telephone antennas.

B. **PARCEL SIZE:** 39,639 square feet

C. **EXISTING LAND USE:** Restaurant

D. **SURROUNDING LAND USE:**

Mix of commercial, institutional, and multi-family residential to the northeast and southwest along 7th Street West; mix of single-family and multi-family residential uses to the west and northwest.

E. **ZONING CODE CITATION:** §65.310 provides a definition and standards/conditions for cellular telephone antennas; §61.501 lists general conditions that must be met by all conditional uses; §66.431 provides dimensional standards for the B2 community business district.

F. **HISTORY/DISCUSSION:** There is no recent zoning history for the site.

G. **DISTRICT COUNCIL RECOMMENDATION:** As of this writing, the District 9 Council has not provided a recommendation.

H. **FINDINGS:**

1. The application requests conditional use permit approval to allow installation of a new 31' high light pole with cellular telephone antennas and associated equipment, including remote radio units (RRUs). The antennas are of a small cell canister design.
2. The proposed light pole would be placed in the parking lot of a restaurant at 425 7th Street West that is zoned B2.
3. §65.310 lists nine standards and conditions that apply to cellular telephone antennas, including the following that apply to the subject application:
   a. *In residential, traditional neighborhood and business districts, a conditional use permit is required for cellular telephone antennas on a building less than 45 feet high or on a freestanding pole, except for existing utility poles. In residential and traditional neighborhood districts, existing utility poles to which cellular telephone antennas are attached shall be at least 60 feet high. Conditional use permit review for such antennas will take into account not only the request made by the application, but also any future eligible facility modifications allowed under 47 CFR §1.4.0001, such as antennas of a more obtrusive design or placement than the subject application. A conditional use permit is not required for any eligible facility modification allowed under 47 CFR §1.4.0001.* This condition is met by the subject application and analysis included in the other findings. 47 CFR §1.4001 essentially allows any structure that supports cellular telephone antennas to be modified (regardless of zoning regulations) to accommodate additional future antennas and associated equipment so long as it does not constitute a "substantial change" in the structure's physical dimensions, and that it complies with conditions of the original antennas' siting approval. The regulation defines a "substantial change" as (applied to this case) a height increase of 20 feet plus the height of one additional antenna array, or a protrusion from the tower of more than 20 feet.

c. *For antennas proposed to be located on a building less than 45 feet high in residential, traditional neighborhood, and business districts, or on a new freestanding pole in residential, traditional neighborhood, and business districts, the applicant shall demonstrate that the proposed antennas cannot be accommodated on an existing freestanding pole or an existing structure at least 45 feet high within ½ mile radius of the proposed antennas due to one or more of the following reasons:*

   i. *The planned equipment would exceed the structural capacity of the existing pole or structure.*

   ii. *The planned equipment would cause interference with other existing or planned equipment on the pole or structure.*

   iii. *The planned equipment cannot be accommodated at a height necessary to function reasonably.*

   iv. *The owner of the existing pole, structure or building is unwilling to co-locate an antenna.*

   This condition is met. An application supplement states that the antennas need to be as close to the street as possible and that placement on structures taller than 45 feet would not allow the small cell technology to function reasonably.

d. *In residential, traditional neighborhood and business districts, cellular telephone antennas to be located on a new freestanding pole are subject to the following standards and conditions:*

   1. *The freestanding pole shall not exceed 75 feet in height, unless the applicant demonstrates that the surrounding topography, structures, or vegetation renders a 75-foot pole impractical. Freestanding poles may exceed the above height limit by 25 feet if the pole is designed to carry two (2) antennas.* This condition is met. The requested 31' high pole plus future additions allowed by 47 CFR §1.4.0001 would equal 51' plus antenna height.

   2. *Antennas shall not be located in a required front or side yard and shall be set back one (1) times the height of the antenna plus 38 feet from the nearest residential building.* This condition can be met. The minimum front and side yard setbacks in the B2 district are 0'. The nearest residential building is approximately 118' to the north, as compared to a height of 51' plus antenna height for the proposal plus future additions allowed by 47 CFR §1.4.0001.

   3. *The antennas shall be designed where possible to blend into the surrounding environment through concealment elements such as the use of color and camouflaging architectural treatment. Drawings or photographic perspectives showing the pole and antennas shall be provided to the planning commission to determine compliance with this provision.* This condition can be met so long as future additions are required to have a small cell canister design such as proposed by the subject application.

   4. *In residential and traditional neighborhood districts, the pole shall be on institutional use property at least one (1) acre in area. In the business districts, the zoning lot on which the pole is located shall be within contiguous property with OS or less restrictive zoning at least one (1) acre in area.* This condition is met. The subject site's zoning lot is contiguous with property to the southwest that is also zoned B2 and constitutes well over one (1) acre in area.

4. §61.501 lists five standards that all conditional uses must satisfy:

   (a) *The extent, location and intensity of the use will be in substantial compliance with the Saint Paul Comprehensive Plan and any applicable subarea plans which were approved by the city council.* This condition is met. There are no plan policies specific to this application.

   (b) *The use will provide adequate ingress and egress to minimize traffic congestion in the public streets.* This condition is met. The use produces very minimal traffic in the form of an occasional service truck that can be accommodated by existing ingress and egress.

(c) *The use will not be detrimental to the existing character of the development in the immediate neighborhood or endanger the public health, safety and general welfare.* This condition can be met if the design of the antennas (including any future additions) is small cell canister such as proposed.

(d) *The use will not impede the normal and orderly development and improvement of the surrounding property for uses permitted in the district.* This condition is met. The proposed pole will not impede the development and improvement of surrounding property.

(e) *The use shall, in all other respects, conform to the applicable regulations of the district in which it is located.* This condition is met. The proposal will conform to all other B2 regulations, as will be confirmed through building permit review and any site plan review.

I. **STAFF RECOMMENDATION:** Based on the above findings, staff recommends approval of the conditional use permit for a new 31' high light pole with cellular telephone antennas subject to the following additional condition(s):

1. Final plans approved by the Zoning Administrator for this use shall be in substantial compliance with the plan submitted and approved as part of this application.
2. Antennas shall be of a small cell canister design similar to that presented in the application materials.

Attachments:

1. Application materials
2. 47 CFR §1.4001
3. Streetview photos
4. Maps

CONDITIONAL USE PERMIT APPLICATION

Department of Planning and Economic Development
Zoning Section
1400 City Hall Annex
25 West Fourth Street
Saint Paul, MN 55102-1634
(651) 266-6589

Zoning office use only
File # 17-006742
Fee: 800.00
Tentative Hearing Date: 2-16-17

PD=9
# 012823410141

APPLICANT

Name Verizon Wireless
Address 10801 Bush Lake Rd
City Bloomington St. MN Zip 55438 Daytime Phone 952-288-8130
Name of Owner (if different) Jason M. Tschida
Contact Person (if different) Karyn O'Brien Phone 952-288-8130

PROPERTY LOCATION

Address / Location 425 7th Street West, St. Paul, MN 55102
Legal Description Please see attached sheet
Current Zoning T-1 B2
(attach additional sheet if necessary)

TYPE OF PERMIT: Application is hereby made for a Conditional Use Permit under provisions of Chapter 65, Section 310, Paragraph a-i of the Zoning Code.

SUPPORTING INFORMATION: Explain how the use will meet all of the applicable standards and conditions. If you are requesting modification of any special conditions or standards for a conditional use, explain why the modification is needed and how it meets the requirements for modification of special conditions in Section 61.502 of the Zoning Code. Attach additional sheets if necessary.

Verizon Wireless is proposing to install (1) 31-ft steel light pole and associated concrete foundation. The steel light pole would also hold a small-cell can antenna. The light pole would service the parking lot at 425 7th St. W. The proposal meets the requirements of Sec. 65.310 of the municipal code ordinances pertaining to antennas, and it is designed to blend in with the surrounding environment, per Sec. 65.310(c)(3).

RECEIVED
JAN 20 2017
By: City of St Paul DSI

☒ Required site plan is attached

Applicant's Signature [signature] Date 1/6/2017 City Agent JAN 20 2017

pdd 1-20-17

Application Supplement

RE: 65.310 (c)

Regarding the code provision, the reason small cell antennas cannot be accommodated on an existing freestanding pole or building within 1/2 mile and at least 45' in height is that the nature of small cells is to provide a much lower, street-level coverage and capacity to pedestrians and traffic. Anything higher or lower than the proposed heights would preclude Verizon from meeting the intended objective using this newer technology. The antennas are smaller and the radius/reach is much less than the larger-scale antennas for which most telecommunications codes were written. The radius for these antennas is only around 500', which is why we cannot affix to taller structures. They also need to be as close to the street as possible to alleviate the network bottlenecks that are caused by influx of traffic and pedestrians, especially during peak times. Therefore, the planned equipment cannot be accommodated at a height necessary to function reasonably.

verizon

SITE NAME: MIN SCALLOP STPL SC

SITE NUMBER: 20161452750

LOCATION CODE: 424700

SITE TYPE: SMALL CELL

POLE TYPE: PROPOSED 25' LIGHT POLE

SITE INFORMATION

APPROXIMATE ADDRESS:
425 7TH ST. W.
ST. PAUL, MN 55102
RAMSEY COUNTY

LATITUDE & LONGITUDE:
LAT: 44°-56'-20.34"N
LONG: 93°-06'-38.50"W
GROUND ELEVATION: 788' AMSL
(PER 1A CERTIFICATE)

POLE HEIGHT:
25'-0" T.O.C.

MAXIMUM APPURTENANCE HEIGHT:
31'-0" A.G.L.

APPLICABLE CODES

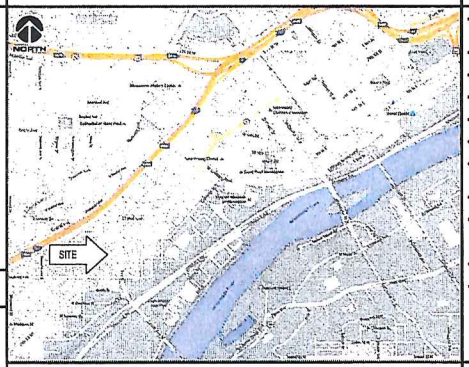
ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

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

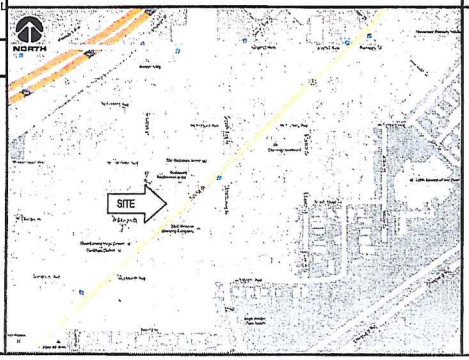
IN THE EVENT OF CONFLICT, THE MOST RESTRICTIVE CODE SHALL PREVAIL

LOCATION SCAN

AREA MAP



LOCATION MAP



PROJECT DESCRIPTION/SOW

- INSTALL (1) PROPOSED 25-FT STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF CAN ANTENNA
- INSTALLATION OF ERICSSON RRU'S AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER/BREAKER BOX
- INSTALLATION OF (4) CONCRETE BOLLARDS
- INSTALLATION OF HAND HOLE FOR FIBER IN ROW, BY FIBER PROVIDER
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND POLE BASE (APPROX. 55'-0"), TO BE DIRECTIONALLY BORED BELOW GRADE, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER IN ROW
- INSTALLATION OF CONDUIT FOR ELECTRIC BETWEEN POLE BASE AND EXISTING PEDESTAL(APPROX. 50'-0"), TO BE DIRECTIONALLY BORED BELOW GRADE, BY VERIZON.
- 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:
JASON M. TSCHIDA
2450 BRIDGEVIEW COURT
MENDOTA HEIGHTS, MN 55120
PHONE: 651.291.7105 EXT. 0

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: JOHN MULLINS

SITE ACQUISITION:
KGI
805 LAS CIMAS PKWY
BUILDING THREE, SUITE 370
AUSTIN, TX 78746
CONTACT: KARYN O'BRIEN
PHONE: 952.288.8130

SHEET INDEX

NO:	SHEET TITLE
T-1	TITLE SHEET & PROJECT DATA
C-1	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 COMPLETED BY EDGE CONSULTING ENGINEERS, INC.
PROJECT #: 14860
DATE: 08/18/2016

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

KGI
805 Las Cimas Parkway, Building Three, Suite 370
Austin, TX 78746
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www.kgiwireless.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:	20161452750
EDGE PROJECT NO:	14860
DRAWN BY:	TKB
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/18/2016	PRELIM SMALL CELL DWGS	TKB
B	08/23/2016	PRELIM SMALL CELL DWGS	NAT
0	10/12/2016	FINAL DRAWINGS	MJM
1	01/09/2017	FINAL DRAWINGS	TKB

OTTO G. DINGFELDER III
LICENSED PROFESSIONAL ENGINEER
49720
STATE OF MINNESOTA
1/9/2017

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

MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

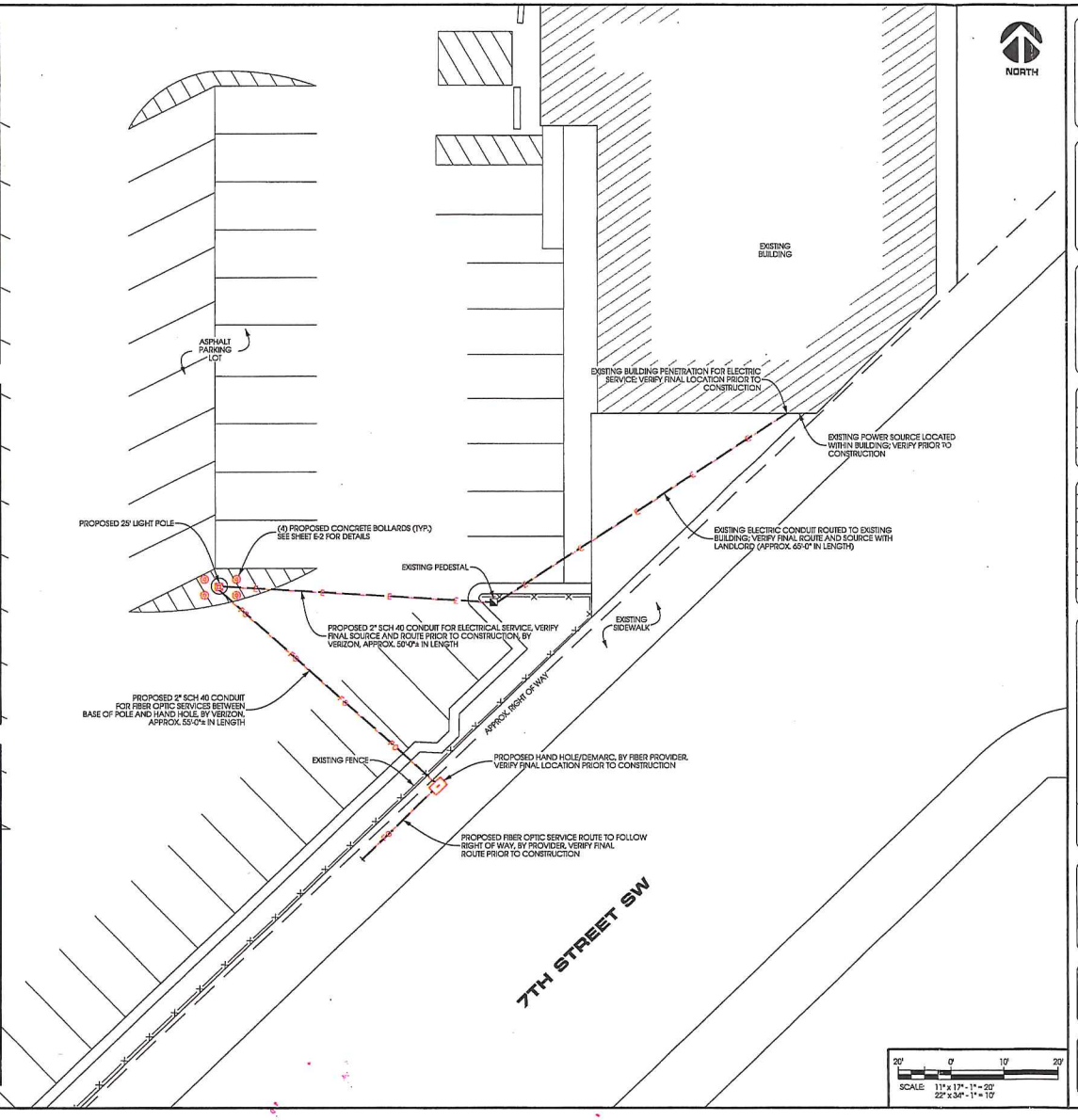
SHEET TITLE
TITLE SHEET & PROJECT DATA

SHEET NUMBER
T-1

AERIAL OVERVIEW

SITE OVERVIEW
[LOOKING WEST]

SITE OVERVIEW
[LOOKING SOUTHWEST]



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Lakeville, MN 55044
608.644.1449 voice
608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161452750
EDGE PROJECT NO:	14860
DRAWN BY:	TKB
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/18/2016	PRELIM SMALL CELL DWGS	TKB
B	08/23/2016	PRELIM SMALL CELL DWGS	NAT
0	10/12/2016	FINAL DRAWINGS	MJM
1	01/09/2017	FINAL DRAWINGS	TKB

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 SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
SITE SKETCH

SHEET NUMBER
C-1

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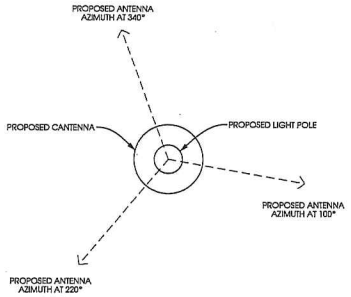
NODE INFO				RADIO			ANTENNA							
				Band	eNB ID	Model	AZIMUTH	POSITION	QTY	MFR.	MODEL	PORT	C/L	ADJ ELEC TILT	MECH TILT
MIN SCALLOP STPL SC				AWS		RRUS12	340/100/220	1.1	1	Commscope	CYL-QAP-2-C	+45	30	0	0
Coordinates	DEG	MIN	SEC					1.2				-45			
				PCS		RRUS12		1.3				+45			
								1.4				-45			

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

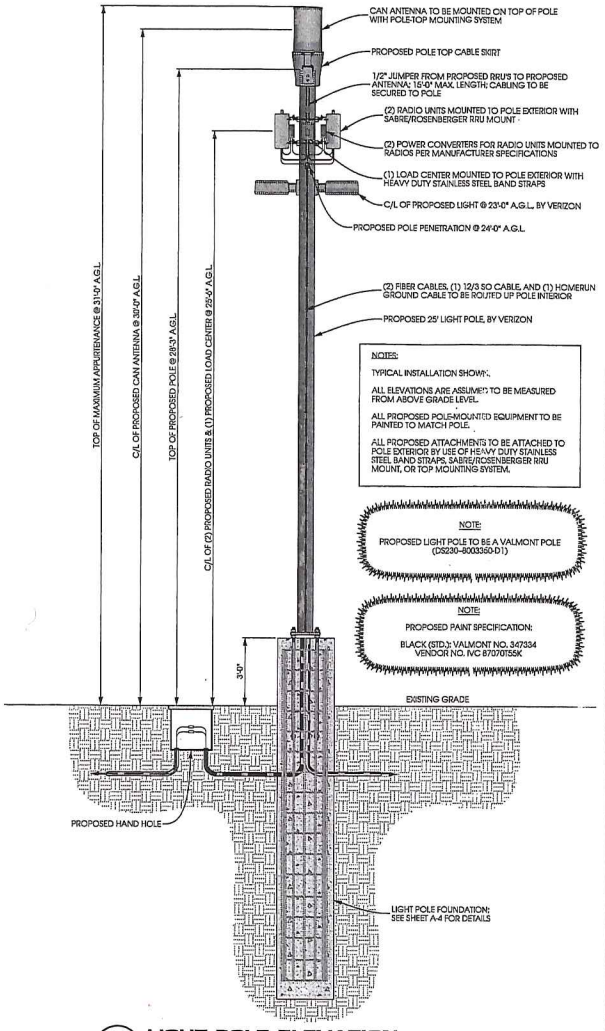
A ANTENNA AND COAX
SCALE: NTS

NORTH



B ANTENNA ORIENTATION
SCALE: NTS

PROPOSED LIGHT POLE LOCATION



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

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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
POLE ELEVATION

SHEET NUMBER
A-1

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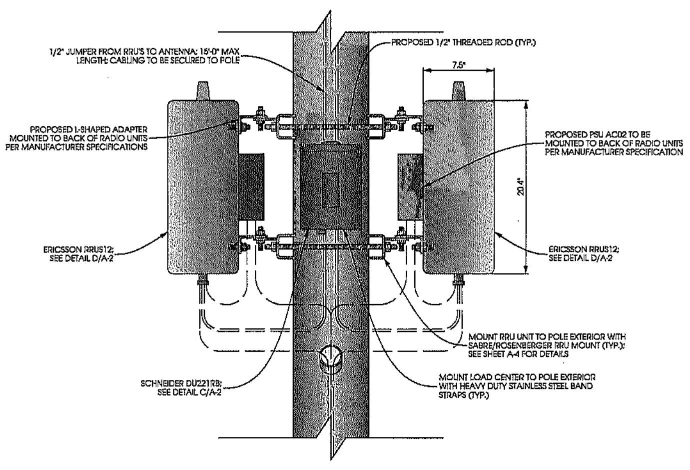
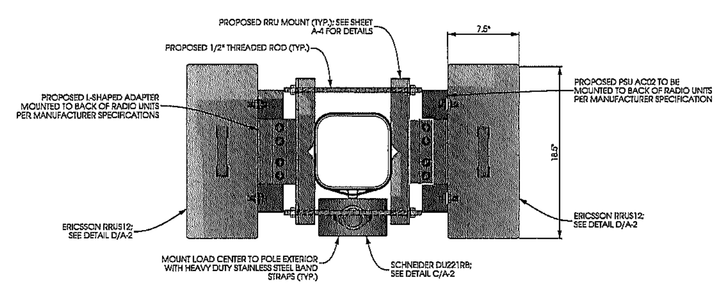
NOTE:

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


1/2" JUMPER FROM RRU'S TO ANTENNA; 15'-0" MAX LENGTH; CABLING TO BE SECURED TO POLE
PROPOSED 1/2" THREADED ROD (TYP.)
7.5"
PROPOSED L-SHAPED ADAPTER MOUNTED TO BACK OF RADIO UNITS PER MANUFACTURER SPECIFICATIONS
PROPOSED PSU AC02 TO BE MOUNTED TO BACK OF RADIO UNITS PER MANUFACTURER SPECIFICATION
20.4"
ERICSSON RRUS12; SEE DETAIL D/A-2
ERICSSON RRUS12; SEE DETAIL D/A-2
MOUNT RRU UNIT TO POLE EXTERIOR WITH SABRE/ROSENBERGER RRU MOUNT (TYP.); SEE SHEET A-4 FOR DETAILS
SCHNEIDER DU221RB; SEE DETAIL C/A-2
MOUNT LOAD CENTER TO POLE EXTERIOR WITH HEAVY DUTY STAINLESS STEEL BAND STRAPS (TYP.)

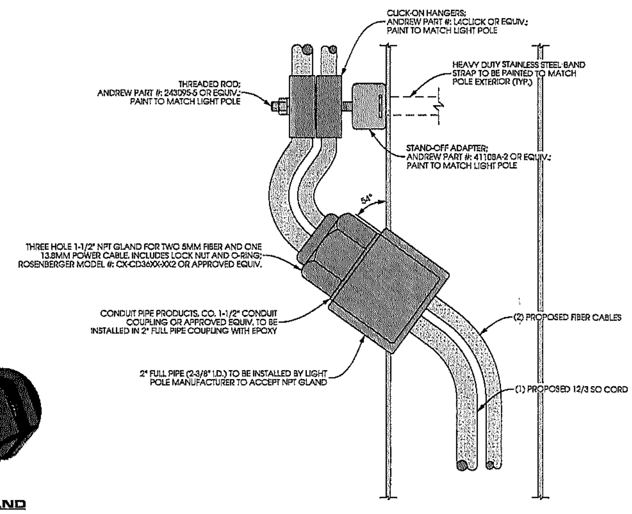
ELEVATION VIEW

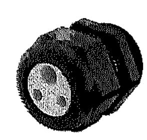

PROPOSED RRU MOUNT (TYP.); SEE SHEET A-4 FOR DETAILS
PROPOSED 1/2" THREADED ROD (TYP.)
7.5"
PROPOSED L-SHAPED ADAPTER MOUNTED TO BACK OF RADIO UNITS PER MANUFACTURER SPECIFICATIONS
PROPOSED PSU AC02 TO BE MOUNTED TO BACK OF RADIO UNITS PER MANUFACTURER SPECIFICATION
18.5"
ERICSSON RRUS12; SEE DETAIL D/A-2
ERICSSON RRUS12; SEE DETAIL D/A-2
MOUNT LOAD CENTER TO POLE EXTERIOR WITH HEAVY DUTY STAINLESS STEEL BAND STRAPS (TYP.)
SCHNEIDER DU221RB; SEE DETAIL C/A-2

PLAN VIEW

(A) EQUIPMENT MOUNTING DETAIL

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


CLICK-ON HANGERS; ANDREW PART #: L4CLICK OR EQUIV.; PAINT TO MATCH LIGHT POLE
HEAVY DUTY STAINLESS STEEL BAND STRAP TO BE PAINTED TO MATCH POLE EXTERIOR (TYP.)
THREADED ROD; ANDREW PART #: 243095-5 OR EQUIV.; PAINT TO MATCH LIGHT POLE
STAND-OFF ADAPTER; ANDREW PART #: 41108A-2 OR EQUIV.; PAINT TO MATCH LIGHT POLE
54°
THREE HOLE 1-1/2" NPT GLAND FOR TWO 5MM FIBER AND ONE 13.8MM POWER CABLE, INCLUDES LOCK NUT AND O-RING; ROSENBERGER MODEL #: CX-CD36XX-XX2 OR APPROVED EQUIV.
CONDUIT PIPE PRODUCTS, CO. 1-1/2" CONDUIT COUPLING OR APPROVED EQUIV. TO BE INSTALLED IN 2" FULL PIPE COUPLING WITH EPOXY
(2) PROPOSED FIBER CABLES
2" FULL PIPE (2-3/8" I.D.) TO BE INSTALLED BY LIGHT POLE MANUFACTURER TO ACCEPT NPT GLAND
(1) PROPOSED 12/3 SO CORD



NPT GLAND

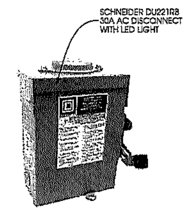
(B) PENETRATION DETAIL

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

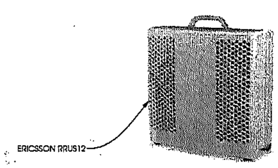
SCALE: NTS

ERICSSON RRUS12

- GSM, WCDMA, LTE
- 6 CARRIERS OVER 40 MHz IBW
- 4 CARRIERS WCDMA, LTE
- UP TO 20 MHz LTE
- UP TO 2 x 60 W
- IBW = UP TO 40 MHz

DIMENSIONS: 20.4" x 18.5" x 7.5"

WEIGHT: 58 LBS



(D) RADIO DETAIL

SCALE: NTS

verizon

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Austin, TX 78746
512.345.9595 voice
www.kgiwireless.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:	20161452750
EDGE PROJECT NO:	14860
DRAWN BY:	TKB
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/18/2016	PRELIM SMALL CELL DWGS	TKB
B	08/23/2016	PRELIM SMALL CELL DWGS	NAT
0	10/12/2016	FINAL DRAWINGS	MJM
1	01/09/2017	FINAL DRAWINGS	TKB

APPROVED

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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
MOUNTING DETAILS

SHEET NUMBER
A-2

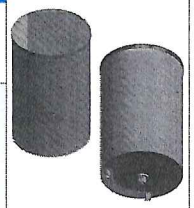
Antenna Systems Group

JMA WIRELESS

Preliminary

CYL-QAP-2

Small Cell Cantenna, Quad 1695-2180MHz, 2FT



- X-Pol Small Cell
- Suitable for Pole or Building mount
- Broadband Radiators (AWS-3)
- Internal Beam combining
- Integrated Global Position System (GPS) option

ELECTRICAL SPECIFICATIONS

Frequency Band, MHz	**2x 1695-2180**
Polarization	+/-45°
Electrical Down Tilt	0°
VSWR/Return Loss, dB, Maximum (Non-Duplexed)	1.5:1/14.0
Isolation Between Ports, dB, Minimum	28
Intermodulation (2x20w), IM3, dBc, Maximum	-153
Impedance, ohms	50
Maximum Power Per Connector, CW (w)	125

MECHANICAL SPECIFICATIONS

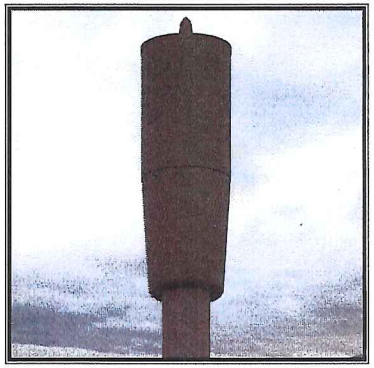
Dimensions, Height/Diameter	24.2/15.1 in (615/384 mm)
Antenna RF Connector Type	7/16 DIN Female
Antenna RF Connector Torque	DIN 220-265 lbf-in (23-30 N-m)
GPS Connector Type	Mini DIN Female (4.1-9.5 per IEC 61169-4)
GPS Connector Torque	Mini-DIN 88.5 lbf-in (10 Nm)
Connector Location	Bottom
Radome Material	PVC
Wind Survival	150 mph (241 km/h)
Front Wind Load	45.9 lbf (204.18N) @100mph
Equivalent Flat Plate	0.91 sq-ft (c=2) @ 100mph

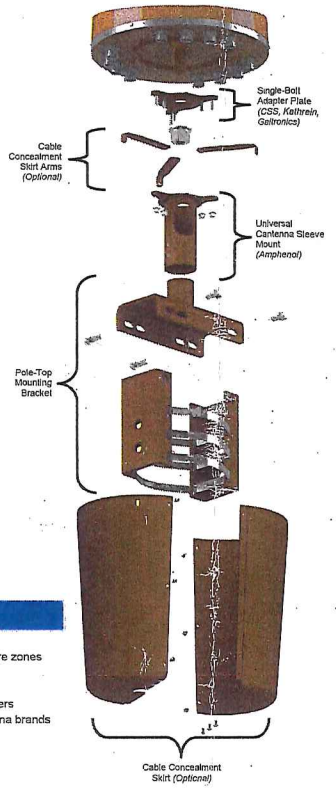
All Specifications are subject to change.
Refer to www.jmawireless.com for the most current information
2/24/2016 CYL-QAP-2_v1

www.jmawireless.com
+1 315-431-7100 | customerservice@jmawireless.com

A **ANTENNA SPECIFICATIONS**
SCALE: NTS

CONCEALFAB® UNIVERSAL POLE-TOP MOUNTING SYSTEM
Configurable for all Major Quasi-Omni Antennas





O-DAS and Small Cell Solutions
Universal Pole-Top Mounting System
Configurable for Quasi-Omni Antennas

ConcealFab's proven wireless concealment solutions are ideal complements to all infrastructure upgrades or retrofit projects; integrates any antenna and radio configuration, effortlessly blends into urban/suburban environments, and able to withstand severe weather conditions. This vendor agnostic, ***Universal Pole-Top Mounting System*** accommodates a variety of Quasi-Omni shapes, sizes, weights, and pole-top diameters providing flexibility by adapting to future hardware needs.

General Features:

- ◊ Multiple Color Options
- ◊ Structurally rated for extreme exposure zones
- ◊ 360° Azimuth adjustment
- ◊ Optional Cable Concealment Skirt
- ◊ Adjustable to a variety of pole diameters
- ◊ Adapters available for all major antenna brands
- ◊ Built-in level Indicator
- ◊ PIM reduction coating

ConcealFab Corporation
WWW.CONCEALFAB.COM PH:719.599.3400 SALES@CONCEALFAB.COM

B **ANTENNA MOUNTING DETAIL**
SCALE: NTS

verizon

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805 Las Cimas Parkway, Building Three, Suite 370
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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
ANTENNA DETAILS

SHEET NUMBER
A-3

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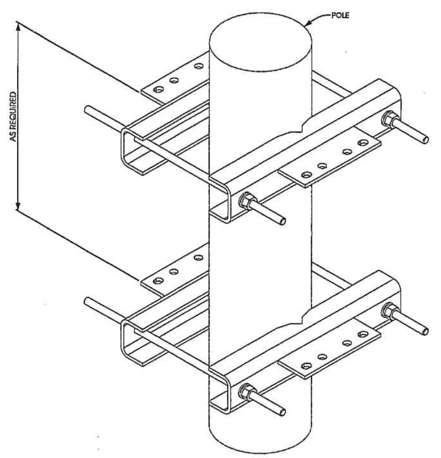
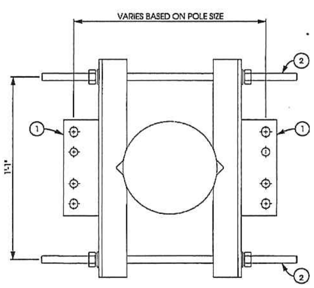
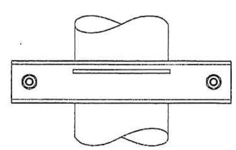
ITEM	QTY.		DESCRIPTION	
1	4	2V1D2415	WELDMENT, PRU MOUNT	32
2	8	C40032026	THREADED ROD ASSEMBLY, 1/2" x 1'-6"	15
			TOTAL WEIGHT	47



ISOMETRIC VIEW

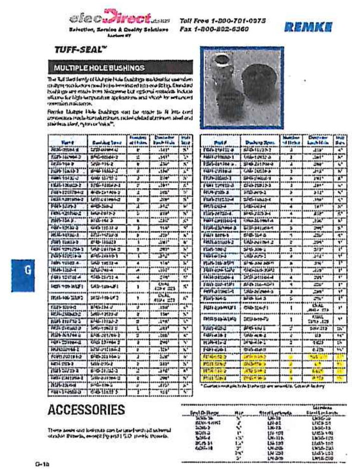


PLAN VIEW

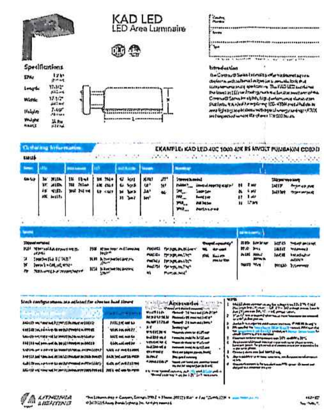


ELEVATION VIEW

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

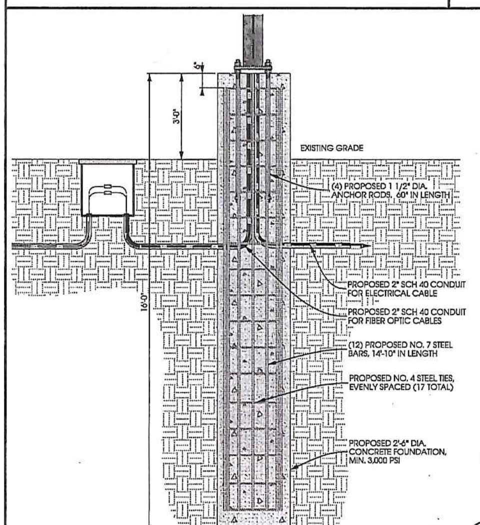


(B) CONDUIT ROUTING ATTACHMENTS
SCALE: NTS



*NOTE: PROPOSED LIGHT AND LIGHT INSTALLATION BY VERIZON.

(C) LIGHT SPEC DETAILS
SCALE: NTS



CONCRETE AND REINFORCING NOTES:

1.) ALL CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH LOCAL BUILDING CODE REQUIREMENTS AND MOST CURRENT VERSION OF ACI STANDARDS.

2.) CONCRETE FINISH TO BE CLASS A TOLERANCE.

3.) ALL CONCRETE UNLESS SPECIFICALLY NOTED SHALL BE NORMAL WEIGHT (145 PCF) AND SHALL ACHIEVE A 28-DAY COMPRESSIVE STRENGTH (f'c) OF 4,000 PSI. EXPOSED EXTERIOR CONCRETE TO BE AIR ENTRAINED WITH 6% AIR CONTENT. CONTRACTOR TO PERFORM CONCRETE SLUMP TEST (5" MAX SLUMP). NO WATER TO BE ADDED AFTER SLUMP HAS BEEN MEASURED.

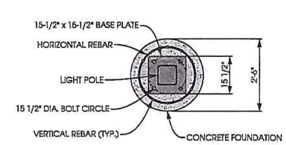
4.) ALL CONCRETE REINFORCING SHALL BE ASTM A615 GRADE 60 AND PLACED IN ACCORDANCE WITH ACI STANDARDS W/ 3" MIN. COVERAGE.

5.) REMOVE ALL ORGANIC MATERIAL, SOFT AREAS, AND POOR SOILS BENEATH FOUNDATION.

6.) FOUNDATION NOT SUITABLE AT SITES WITH ORGANIC SOIL, UNCOMPACTED FILL, EXPANSIVE SOIL, OR SOILS SUSCEPTABLE TO FROST HEAVE.

7.) CONTRACTOR TO ENSURE POSITIVE DRAINAGE FROM ALL FOUNDATIONS.

8.) FOUNDATION DESIGN BASED ON INFORMATION PROVIDED IN SDF (ANTENNA LOAD, RADIO LOAD, ETC.). CONTRACTOR TO VERIFY PRIOR TO CONSTRUCTION.



(D) FOUNDATION DETAIL
SCALE: NTS

verizon

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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-4

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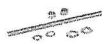
Product Specifications

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	3
Ordering Note	CommScope® standard product in the United States and Canada
Package Quantity	10

Mechanical Specifications

Thread Size	7/8 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 | 1.29 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

UNAI — Universal Angle Adapter Insert

SA-36 — 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	13.240 mm | 0.600 in
Height	51.08 mm | 2.01 in
Length	88.90 mm | 3.50 in
Width	45.09 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 125 °C (-40 °F to +185 °F)
UV Resistance, minimum with no degradation	>10k 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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ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
CABLE MOUNTING DETAILS

SHEET NUMBER
A-5

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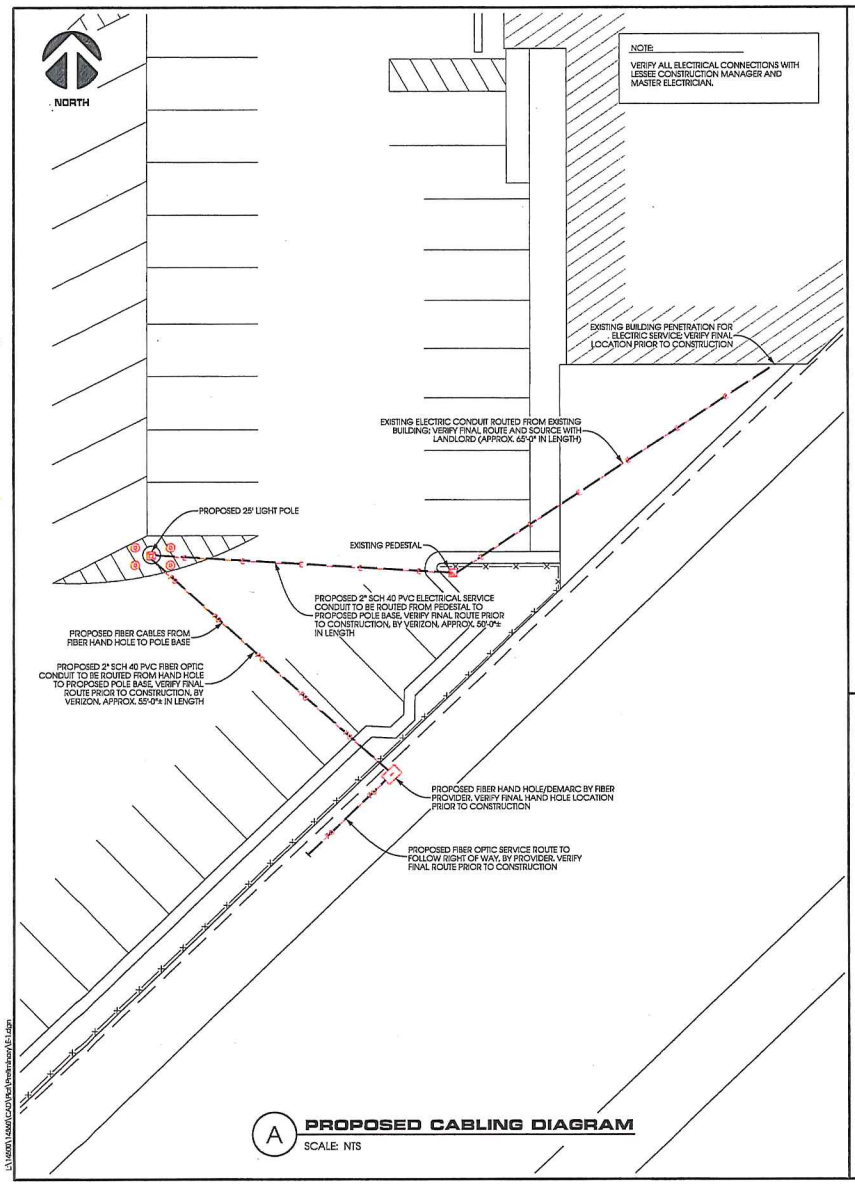
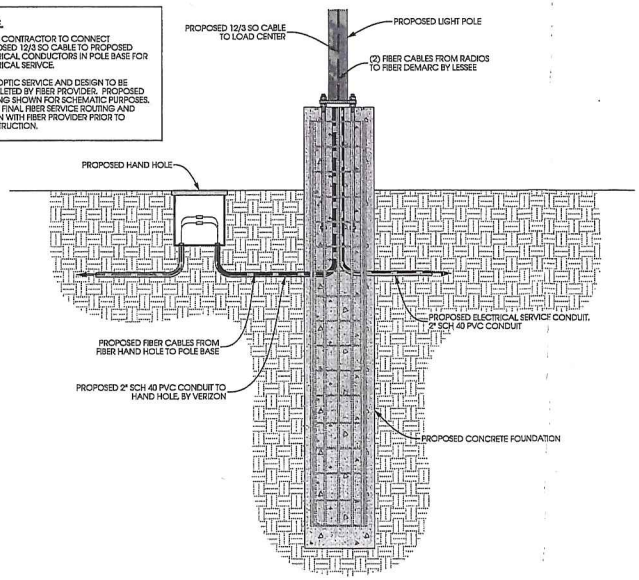


A **PROPOSED CABLING DIAGRAM**
SCALE: NTS

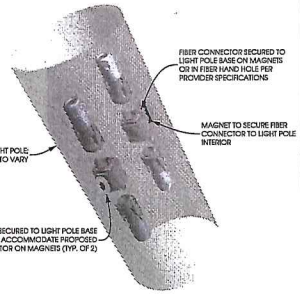
NOTES:
LESSEE CONTRACTOR TO CONNECT PROPOSED 12/3 SO CABLE TO PROPOSED ELECTRICAL CONDUCTORS IN POLE BASE FOR ELECTRICAL SERVICE.

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.



B **POWER AND FIBER ROUTING**
SCALE: NTS

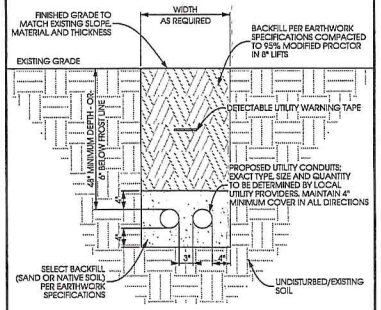
NOTE:
PROPOSED FIBER CONNECTOR DETAIL PROVIDED BY LESSEE. CONTRACTOR TO VERIFY FINAL MAKE AND MODEL WITH ROSSENBERGER AND LESSEE CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.



C **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.



D **UTILITY TRENCH DETAIL**
SCALE: NTS

verizon

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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
CABLING DETAILS

SHEET NUMBER
E-1

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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 UNDERWRITERS LABORATORY AND SHALL BEAR THE INSPECTION LABEL "L" 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 NEPU.

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 15x TYPE.

24. ALL MATERIALS SHALL BE U.L. LISTED.

25. CONDUIT:

A. SERVICE CONDUITS SHALL BE GRAY SCH.40 PVC BURIED MIN. 24", 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. 24" 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.

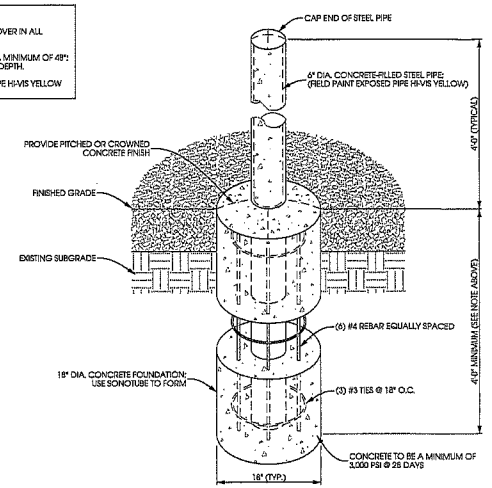
ELECTRICAL NOTES

NOTES:

MAINTAIN 3" MINIMUM REBAR COVER IN ALL DIRECTIONS.

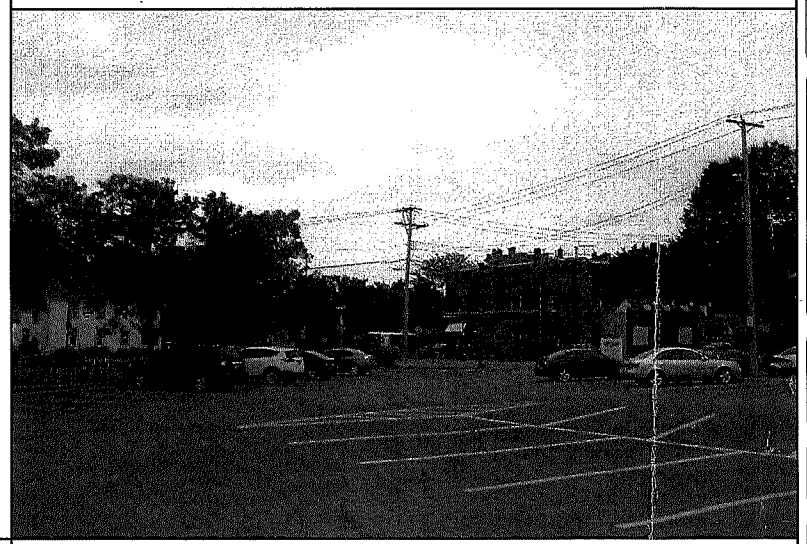
PIER FOUNDATION DEPTH TO BE A MINIMUM OF 48": DEPTH TO EXCEED LOCAL FROST DEPTH.

PAINT CONCRETE FILLED STEEL PIPE HI-VIS YELLOW



A **PIPE BOLLARD DETAIL**

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



PROPOSED LIGHT POLE LOCATION

verizon

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608.644.1549 fax
www.edgeconsult.com

PROJECT NO:	20161452750
EDGE PROJECT NO:	14860
DRAWN BY:	TKB
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/18/2016	PRELIM SMALL CELL DWGS	TKB
B	08/25/2016	PRELIM SMALL CELL DWGS	NAT
0	10/12/2016	FINAL DRAWINGS	MJM
1	01/09/2017	FINAL DRAWINGS	TKB

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 SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
ELECTRICAL NOTES

SHEET NUMBER
E-2

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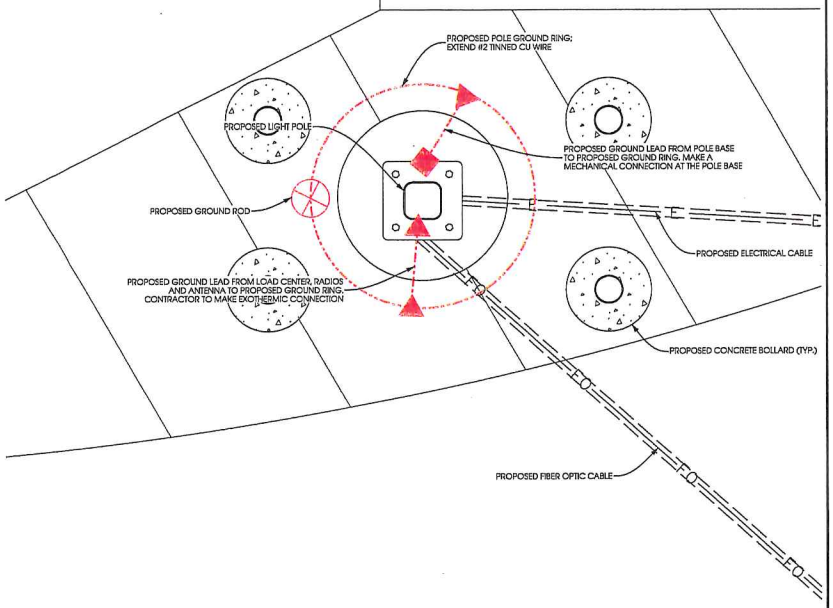
NORTH

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 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:	20161452750
EDGE PROJECT NO:	14860
DRAWN BY:	TKB
CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	
A	08/18/2016	PRELIM SMALL CELL DWGS	TKB
B	08/23/2016	PRELIM SMALL CELL DWGS	NAT
0	10/12/2016	FINAL DRAWINGS	MJM
1	01/09/2017	FINAL DRAWINGS	TKB

APPROVED

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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
GROUNDING PLAN

SHEET NUMBER
G-1

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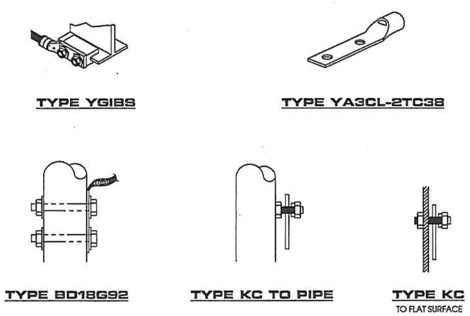
NOTES:

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.



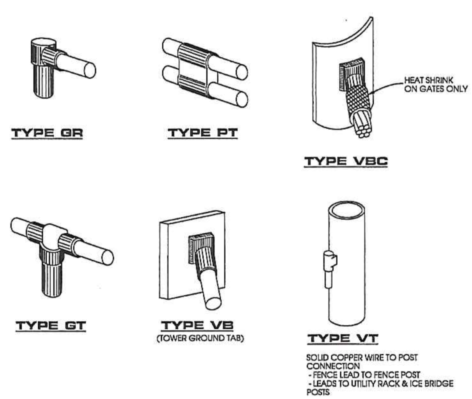
(A) BURNDY DETAILS

SCALE: NTS

NOTES:

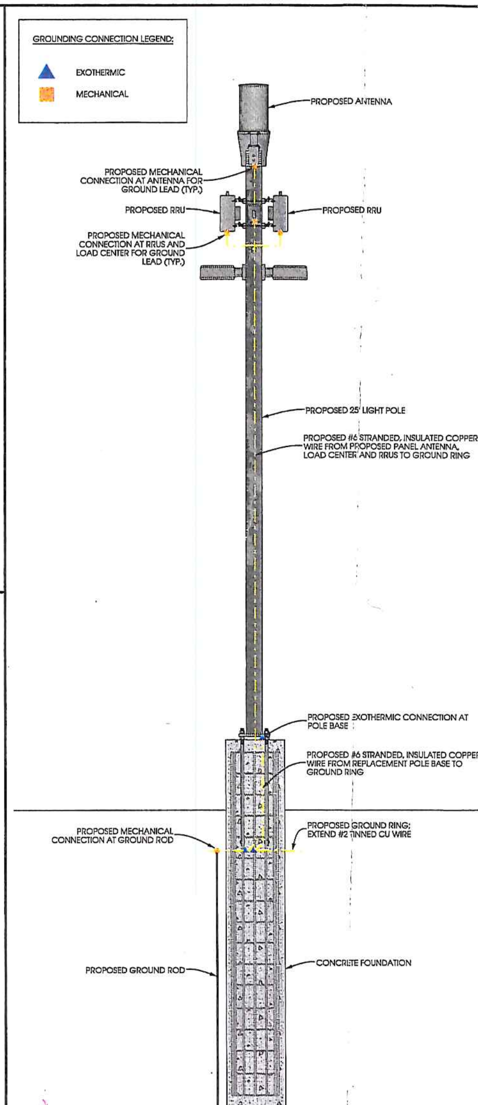
CADWELD "TYPES" SHOWN ARE EXAMPLES. CONSULT WITH PROJECT MANAGER FOR OTHER POSSIBLE TYPES OF CADWELDS THAT CAN BE USED IN STANDARD OR SPECIALLY DESIGNED GROUNDING PLANS.

CONTRACTOR TO PROVIDE ALL REQUIRED CADWELD CONNECTIONS.



(B) CADWELD DETAILS

SCALE: NTS



GROUNDING CONNECTION LEGEND:
EXOTHERMIC
MECHANICAL
PROPOSED ANTENNA
PROPOSED MECHANICAL CONNECTION AT ANTENNA FOR GROUND LEAD (TYP.)
PROPOSED RRU
PROPOSED RRU
PROPOSED MECHANICAL CONNECTION AT RRUS AND LOAD CENTER FOR GROUND LEAD (TYP.)
PROPOSED 25' LIGHT POLE
PROPOSED #6 STRANDED, INSULATED COPPER WIRE FROM PROPOSED PANEL ANTENNA, LOAD CENTER AND RRUS TO GROUND RING
PROPOSED EXOTHERMIC CONNECTION AT POLE BASE
PROPOSED #6 STRANDED, INSULATED COPPER WIRE FROM REPLACEMENT POLE BASE TO GROUND RING
PROPOSED MECHANICAL CONNECTION AT GROUND ROD
PROPOSED GROUND RING; EXTEND #2 TINNED CU WIRE
PROPOSED GROUND ROD
CONCRETE FOUNDATION

(C) TYPICAL GROUNDING SCHEMATIC

SCALE: NTS

verizon

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MIN SCALLOP STPL SC
ST. PAUL, MN
PROPOSED LIGHT POLE
SMALL CELL DRAWINGS

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-2

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verizon

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PROJECT NO:	20161452750
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CHECKED BY:	OGD

REV.	DATE	DESCRIPTION	INT.
A	07/13/2016	PHOTO SIMULATIONS	DGS

PRELIMINARY - NOT FOR CONSTRUCTION

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 SCALLOP STPL SC
ST. PAUL, MN
SMALL CELL DRAWINGS

SHEET TITLE
PHOTO SIM 1

SHEET NUMBER
PS-1

(*iii*) Comparable equipment from pre-existing wireless deployments on the structure;

(*3*) The deployment will involve no new ground disturbance; and

(*4*) The deployment would otherwise require the preparation of an EA under paragraph (a)(4)(i) of this section solely because of the age of the structure; or

(B) The mounting of antennas (including associated equipment such as wiring, cabling, cabinets, or backup-power) on buildings or other non-tower structures where the deployment meets the following conditions:

(*1*) There is an existing antenna on the building or structure;

(*2*) One of the following criteria is met:

(*i*) *Non-Visible Antennas.* The new antenna is not visible from any adjacent streets or surrounding public spaces and is added in the same vicinity as a pre-existing antenna;

(*ii*) *Visible Replacement Antennas.* The new antenna is visible from adjacent streets or surrounding public spaces, provided that

(*A*) It is a replacement for a pre-existing antenna,

(*B*) The new antenna will be located in the same vicinity as the pre-existing antenna,

(*C*) The new antenna will be visible only from adjacent streets and surrounding public spaces that also afford views of the pre-existing antenna,

(*D*) The new antenna is not more than 3 feet larger in height or width (including all protuberances) than the pre-existing antenna, and

(*E*) No new equipment cabinets are visible from the adjacent streets or surrounding public spaces; or

(*iii*) *Other Visible Antennas.* The new antenna is visible from adjacent streets or surrounding public spaces, provided that

(*A*) It is located in the same vicinity as a pre-existing antenna,

(*B*) The new antenna will be visible only from adjacent streets and surrounding public spaces that also afford views of the pre-existing antenna,

(*C*) The pre-existing antenna was not deployed pursuant to the exclusion in this subsection (§ 1.1307(a)(4)(ii)(B)(*2*)(*iii*)),

(*D*) The new antenna is not more than three feet larger in height or width (including all protuberances) than the pre-existing antenna, and

(*E*) No new equipment cabinets are visible from the adjacent streets or surrounding public spaces;

(*3*) The new antenna complies with all zoning conditions and historic preservation conditions applicable to existing antennas in the same vicinity that directly mitigate or prevent effects, such as camouflage or concealment requirements;

(*4*) The deployment of the new antenna involves no new ground disturbance; and

(*5*) The deployment would otherwise require the preparation of an EA under paragraph (a)(4) of this section solely because of the age of the structure.

Note to paragraph (a)(4)(ii): A non-visible new antenna is in the "same vicinity" as a pre-existing antenna if it will be collocated on the same rooftop, façade or other surface. A visible new antenna is in the "same vicinity" as a pre-existing antenna if it is on the same rooftop, façade, or other surface and the centerpoint of the new antenna is within ten feet of the centerpoint of the pre-existing antenna. A deployment causes no new ground disturbance when the depth and width of previous disturbance exceeds the proposed construction depth and width by at least two feet.

* * * * *

■ 4. Add Subpart CC to part 1 to read as follows:

Subpart CC—State and Local Review of Applications for Wireless Service Facility Modification

§ 1.40001 Wireless Facility Modifications.

(a) *Purpose.* These rules implement section 6409 of the Spectrum Act (codified at 47 U.S.C. 1455), which requires a State or local government to approve any eligible facilities request for a modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station.

(b) *Definitions.* Terms used in this section have the following meanings.

(1) *Base station.* A structure or equipment at a fixed location that enables Commission-licensed or authorized wireless communications between user equipment and a communications network. The term does not encompass a tower as defined in this subpart or any equipment associated with a tower.

(i) The term includes, but is not limited to, equipment associated with wireless communications services such as private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.

(ii) The term includes, but is not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, regular and backup power supplies, and comparable equipment, regardless of technological configuration (including Distributed Antenna Systems and small-cell networks).

(iii) The term includes any structure other than a tower that, at the time the relevant application is filed with the State or local government under this section, supports or houses equipment described in paragraphs (b)(1)(i) through (ii) of this section that has been reviewed and approved under the applicable zoning or siting process, or under another State or local regulatory review process, even if the structure was not built for the sole or primary purpose of providing such support.

(iv) The term does not include any structure that, at the time the relevant application is filed with the State or local government under this section, does not support or house equipment described in paragraphs (b)(1)(i)–(ii) of this section.

(2) *Collocation.* The mounting or installation of transmission equipment on an eligible support structure for the purpose of transmitting and/or receiving radio frequency signals for communications purposes.

(3) *Eligible facilities request.* Any request for modification of an existing tower or base station that does not substantially change the physical dimensions of such tower or base station, involving:

(i) Collocation of new transmission equipment;

(ii) Removal of transmission equipment; or

(iii) Replacement of transmission equipment.

(4) *Eligible support structure.* Any tower or base station as defined in this section, provided that it is existing at the time the relevant application is filed with the State or local government under this section.

(5) *Existing.* A constructed tower or base station is existing for purposes of this section if it has been reviewed and approved under the applicable zoning or siting process, or under another State or local regulatory review process, provided that a tower that has not been reviewed and approved because it was not in a zoned area when it was built, but was lawfully constructed, is existing for purposes of this definition.

(6) *Site.* For towers other than towers in the public rights-of-way, the current boundaries of the leased or owned property surrounding the tower and any access or utility easements currently related to the site, and, for other eligible support structures, further restricted to that area in proximity to the structure and to other transmission equipment already deployed on the ground.

(7) *Substantial change.* A modification substantially changes the physical dimensions of an eligible

support structure if it meets any of the following criteria:

(i) For towers other than towers in the public rights-of-way, it increases the height of the tower by more than 10% or by the height of one additional antenna array with separation from the nearest existing antenna not to exceed twenty feet, whichever is greater; for other eligible support structures, it increases the height of the structure by more than 10% or more than ten feet, whichever is greater;

(A) Changes in height should be measured from the original support structure in cases where deployments are or will be separated horizontally, such as on buildings' rooftops; in other circumstances, changes in height should be measured from the dimensions of the tower or base station, inclusive of originally approved appurtenances and any modifications that were approved prior to the passage of the Spectrum Act.

(ii) For towers other than towers in the public rights-of-way, it involves adding an appurtenance to the body of the tower that would protrude from the edge of the tower more than twenty feet, or more than the width of the tower structure at the level of the appurtenance, whichever is greater; for other eligible support structures, it involves adding an appurtenance to the body of the structure that would protrude from the edge of the structure by more than six feet;

(iii) For any eligible support structure, it involves installation of more than the standard number of new equipment cabinets for the technology involved, but not to exceed four cabinets; or, for towers in the public rights-of-way and base stations, it involves installation of any new equipment cabinets on the ground if there are no pre-existing ground cabinets associated with the structure, or else involves installation of ground cabinets that are more than 10% larger in height or overall volume than any other ground cabinets associated with the structure;

(iv) It entails any excavation or deployment outside the current site;

(v) It would defeat the concealment elements of the eligible support structure; or

(vi) It does not comply with conditions associated with the siting approval of the construction or modification of the eligible support structure or base station equipment, provided however that this limitation does not apply to any modification that is non-compliant only in a manner that would not exceed the thresholds identified in § 1.40001(b)(7)(i) through (iv).

(8) *Transmission equipment.* Equipment that facilitates transmission for any Commission-licensed or authorized wireless communication service, including, but not limited to, radio transceivers, antennas, coaxial or fiber-optic cable, and regular and backup power supply. The term includes equipment associated with wireless communications services including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul.

(9) *Tower.* Any structure built for the sole or primary purpose of supporting any Commission-licensed or authorized antennas and their associated facilities, including structures that are constructed for wireless communications services including, but not limited to, private, broadcast, and public safety services, as well as unlicensed wireless services and fixed wireless services such as microwave backhaul, and the associated site.

(c) *Review of applications.* A State or local government may not deny and shall approve any eligible facilities request for modification of an eligible support structure that does not substantially change the physical dimensions of such structure.

(1) *Documentation requirement for review.* When an applicant asserts in writing that a request for modification is covered by this section, a State or local government may require the applicant to provide documentation or information only to the extent reasonably related to determining whether the request meets the requirements of this section. A State or local government may not require an applicant to submit any other documentation, including but not limited to documentation intended to illustrate the need for such wireless facilities or to justify the business decision to modify such wireless facilities.

(2) *Timeframe for review.* Within 60 days of the date on which an applicant submits a request seeking approval under this section, the State or local government shall approve the application unless it determines that the application is not covered by this section.

(3) *Tolling of the timeframe for review.* The 60-day period begins to run when the application is filed, and may be tolled only by mutual agreement or in cases where the reviewing State or local government determines that the application is incomplete. The timeframe for review is not tolled by a moratorium on the review of applications.

(i) To toll the timeframe for incompleteness, the reviewing State or local government must provide written notice to the applicant within 30 days of receipt of the application, clearly and specifically delineating all missing documents or information. Such delineated information is limited to documents or information meeting the standard under paragraph (c)(1) of this section.

(ii) The timeframe for review begins running again when the applicant makes a supplemental submission in response to the State or local government's notice of incompleteness.

(iii) Following a supplemental submission, the State or local government will have 10 days to notify the applicant that the supplemental submission did not provide the information identified in the original notice delineating missing information. The timeframe is tolled in the case of second or subsequent notices pursuant to the procedures identified in this paragraph (c)(3). Second or subsequent notices of incompleteness may not specify missing documents or information that were not delineated in the original notice of incompleteness.

(4) *Failure to act.* In the event the reviewing State or local government fails to approve or deny a request seeking approval under this section within the timeframe for review (accounting for any tolling), the request shall be deemed granted. The deemed grant does not become effective until the applicant notifies the applicable reviewing authority in writing after the review period has expired (accounting for any tolling) that the application has been deemed granted.

(5) *Remedies.* Applicants and reviewing authorities may bring claims related to Section 6409(a) to any court of competent jurisdiction.

PART 17—CONSTRUCTION, MARKING, AND LIGHTING OF ANTENNA STRUCTURES

■ 5. The authority citation for part 17 continues to read as follows:

Authority: Sections 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply sections 301, 309, 48 Stat. 1081, 1085 as amended; 47 U.S.C. 301, 309.

■ 6. Amend § 17.4 by revising paragraphs (c)(1)(v) and (c)(1)(vi), and adding paragraph (c)(1)(vii) to read as follows:

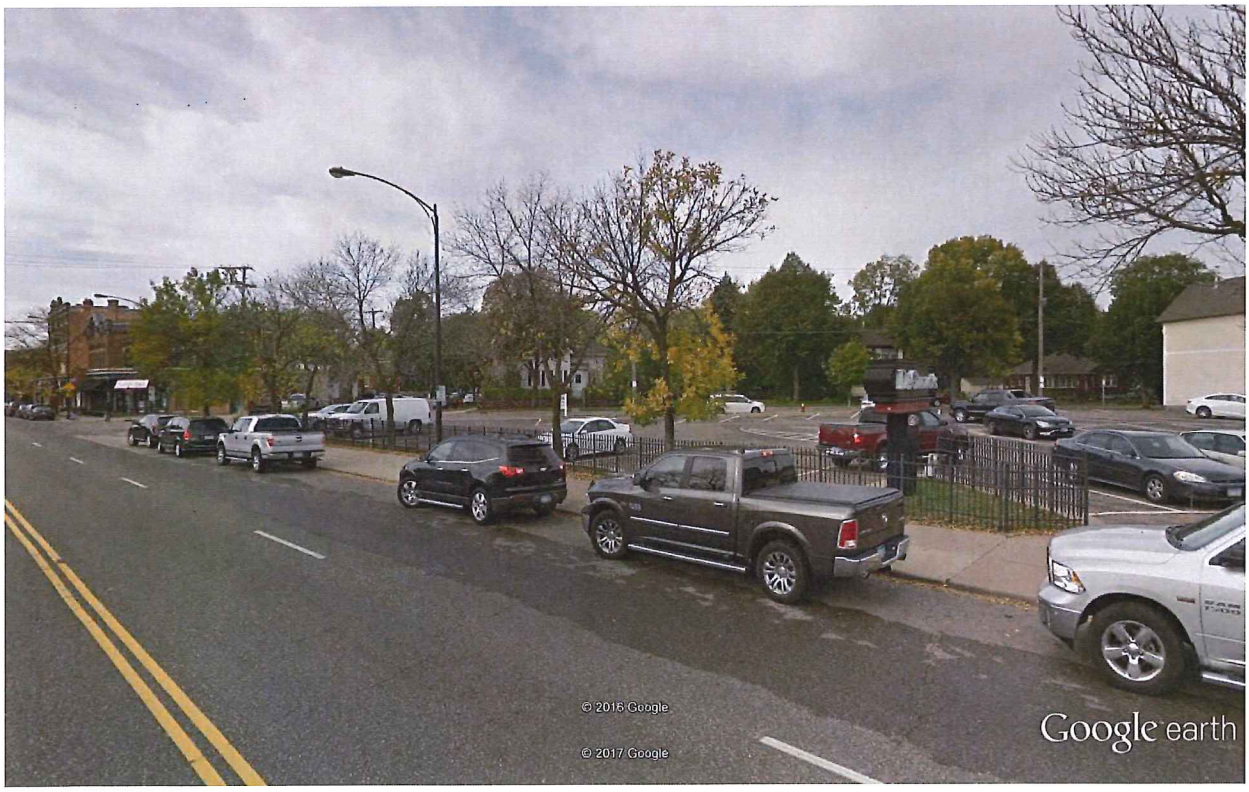
§ 17.4 Antenna structure registration.

* * * * *

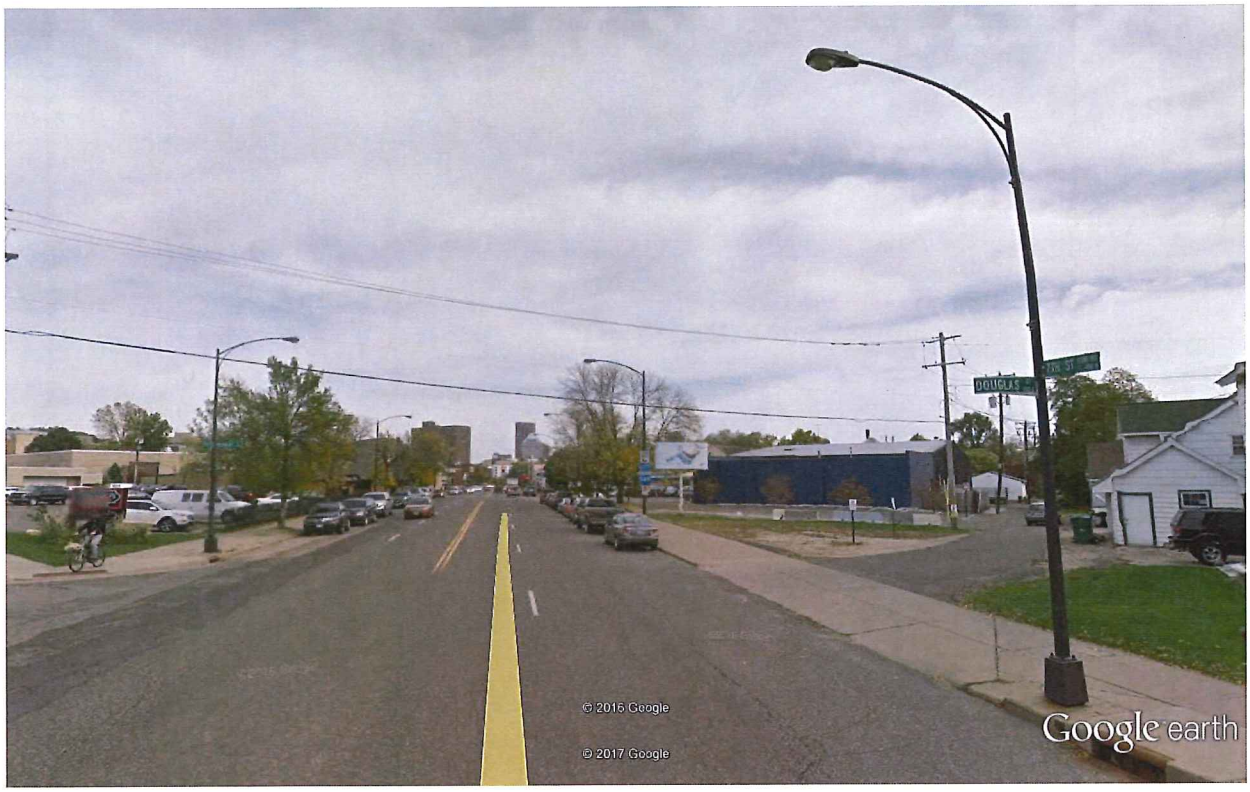
(c) * * *

Staff-provided Streetview Photos

Facing north

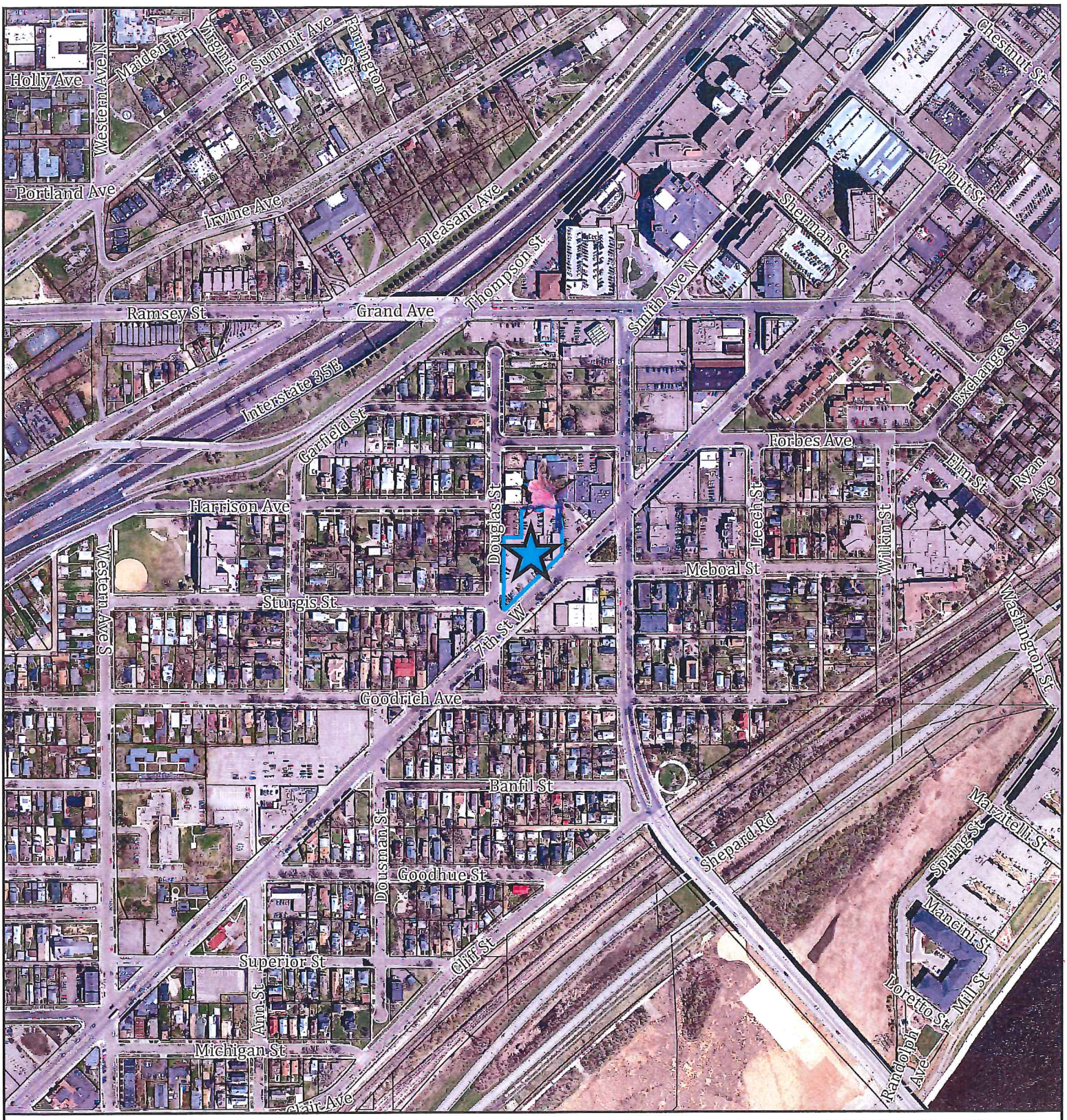


Facing northwest



Facing northeast

Facing southeast



0 82.5 165 330 495 660 Feet

FILE NAME: Verizon Wireless

APPLICATION TYPE: CUP

FILE #: 17-006742 DATE: 1/26/2017

PLANNING DISTRICT: 9

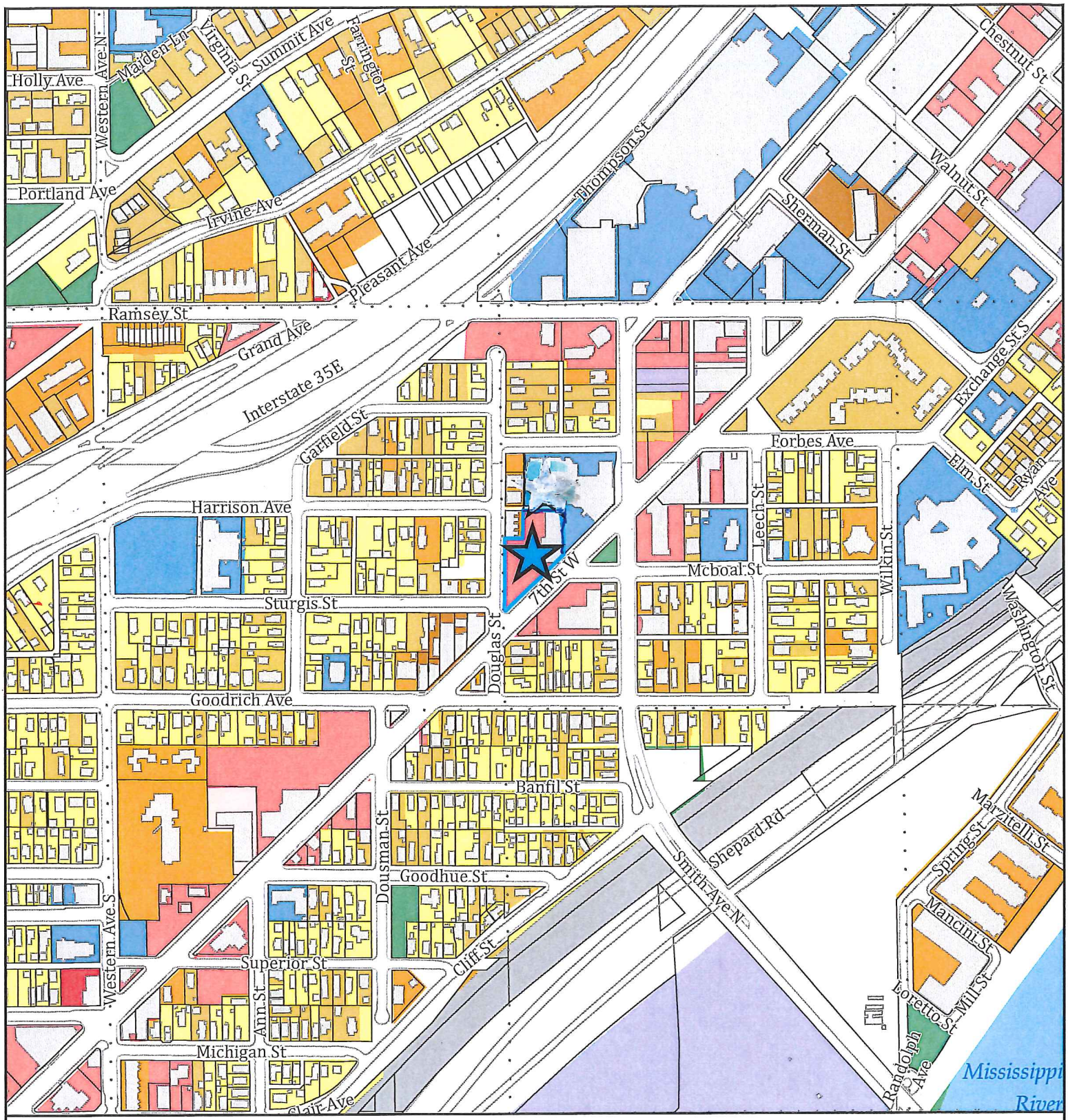
ZONING PANEL: 15

Aerial

Subject Parcels

N W E S

Saint Paul Department of Planning and Economic Development and Ramsey County



0 82.5 165 330 495 660 Feet

FILE NAME: Verizon Wireless

APPLICATION TYPE: CUP

FILE #: 17-006742 DATE: 1/26/2017

PLANNING DISTRICT: 9

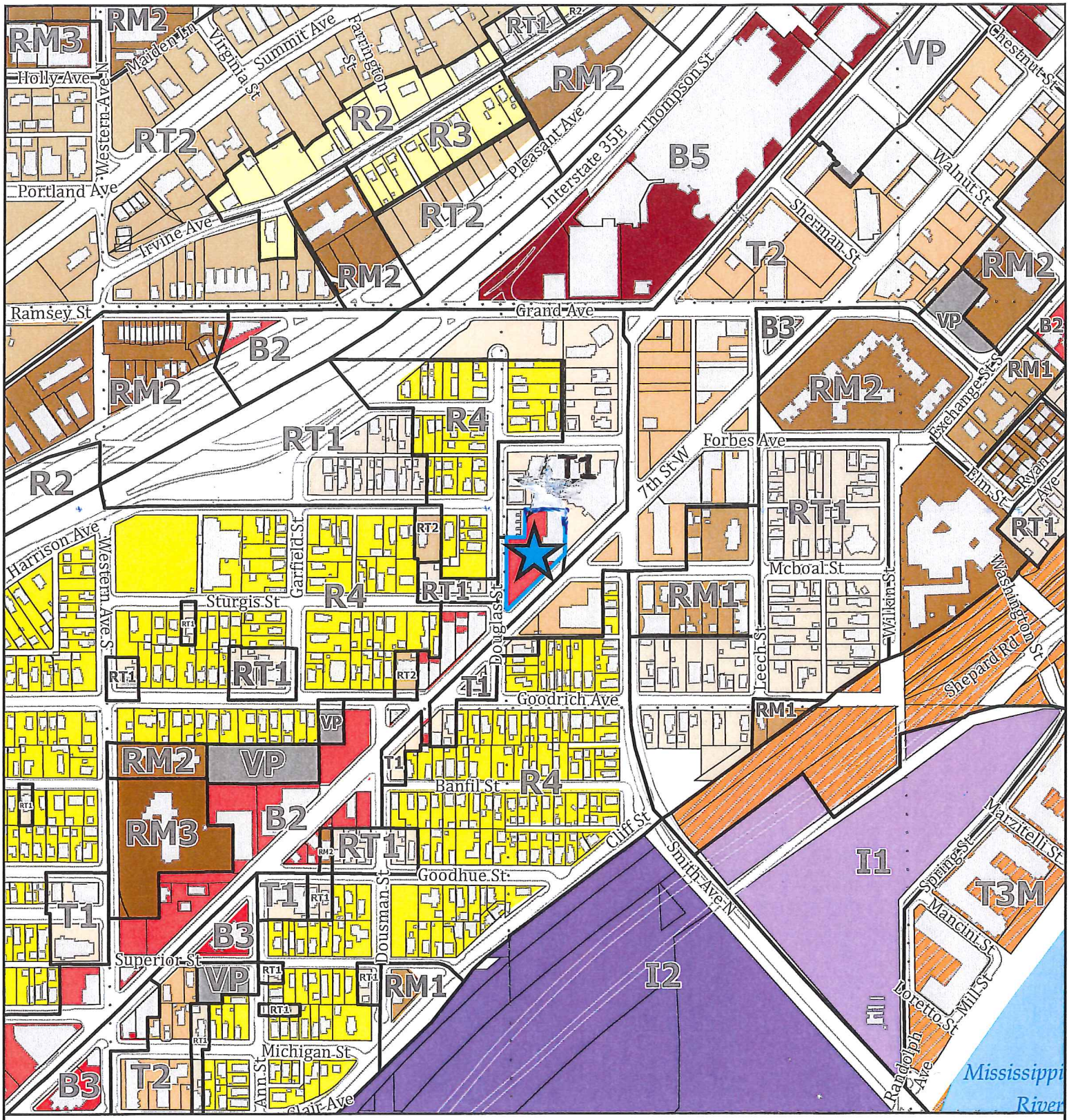
ZONING PANEL: 15

Saint Paul Department of Planning and Economic Development and Ramsey County

Land Use

- Single Family Detached
- Single Family Attached
- Multifamily
- Office
- Retail and Other Commercial
- Mixed Use Residential
- Mixed Use Commercial and Other
- Industrial and Utility
- Institutional
- Park, Recreational or Preserve
- Railway
- Undeveloped
- Water
- Subject Parcels
- Section Lines

N W E S



FILE NAME: Verizon Wireless

APPLICATION TYPE: CUP

FILE #: 17-006742 DATE: 1/26/2017

PLANNING DISTRICT: 9

ZONING PANEL: 15

Zoning

- Subject Parcels
- Section Lines
- R2 One-Family
- R3 One-Family
- R4 One-Family
- RT1 Two-Family
- RT2 Townhouse
- RM1 Multiple-Family
- RM2 Multiple-Family
- RM3 Multiple-Family
- T1 Traditional Neighborhood
- T2 Traditional Neighborhood
- T3M T3 with Master Plan
- B2 Community Business
- B3 General Business
- B5 Central Business Service
- I1 Light Industrial
- I2 General Industrial
- VP Vehicular Parking

N W E S

Saint Paul Department of Planning and Economic Development and Ramsey County