

## ZONING COMMITTEE STAFF REPORT

1. **FILE NAME:** Verizon Wireless **FILE #** 17-017-620
  2. **APPLICANT:** Verizon Wireless **HEARING DATE:** March 30, 2017
  3. **TYPE OF APPLICATION:** Conditional Use Permit
  4. **LOCATION:** 1605 Grand Ave, Macalester College Campus
  5. **PIN & LEGAL DESCRIPTION:** 042823440101, Macalester Park All Of Vac Macalester St Lying Bet Nl Of St Clair Ave & S Of Ext Sl Of E-w Alley In Blk 7 Macalester Park All Of Vac Alley In Blk 8 Macalester Park & All Of Vac Alley In Blk 7 Sd Add Lying S Of Ext Sl Of Lot 8 Sd Blk 7 & The Fol Subj To Sts; The E 1/4 Of Se 1/4 Of Sec 4 Tn 28 Rn 23 & In Sd Macalester Park Vac Alley Adj & The S 16 Ft Of Lot 5 Blk 7 & All Of Lots 6,7,8,9 & 10 Blk 7 & Ex W 107 Ft; Lot 16 & All Of Lots 1 Thru Lot 6 Blk 8
  6. **PLANNING DISTRICT:** 14 **PRESENT ZONING:** R3
  7. **ZONING CODE REFERENCE:** §65.310; §61.501, §66.231
  8. **STAFF REPORT DATE:** March 23, 2017 **BY:** Bill Dermody
  9. **DATE RECEIVED:** March 8, 2017 **60-DAY DEADLINE FOR ACTION:** May 7, 2017
- 

- A. **PURPOSE:** Conditional use permit for small cell canister antennas on 3 light poles (total heights: 41', 22', and 43' 9") and rooftop panel cell antennas on Kagin Commons
- B. **PARCEL SIZE:** 40.83 acres
- C. **EXISTING LAND USE:** College campus
- D. **SURROUNDING LAND USE:**

Mixed uses along Grand Avenue to the east and west and across Snelling Avenue near Grand; otherwise single-family residential surrounding the campus in all directions
- 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; §66.231 provides dimensional standards for the R3 one-family district.
- F. **HISTORY/DISCUSSION:** There is no recent zoning history for the site.
- G. **DISTRICT COUNCIL RECOMMENDATION:** As of this writing, the District 14 Council has not provided a recommendation.
- H. **FINDINGS:**
  1. The application requests conditional use permit approval to allow installation of 3 light poles with cellular telephone antennas and associated equipment, including remote radio units, as well as 6 sets of cellular telephone antennas and associated equipment upon the roof of Kagin Commons. The light pole antennas are of a small cell canister design, and the rooftop antennas are ballast-mounted panel antennas.
  2. The proposed installations are located on the Macalester College campus in four different specific locations: Kagin Commons (6 sets), a new 40' high light pole near Snelling Ave. across from Lincoln Ave., a replacement 43'-9" high light pole west of the parking lot located west of the Snelling/Osceola intersection, and a replacement 22' high light pole in the parking lot west of the Wallace Fine Arts Center at 130 S. Macalester St. These installations are referred to in the application materials as "MIN KAGIN", "MIN STRICKER", "MIN SCOTS", and "MIN NEILL", respectively.
  3. The Kagin Commons height to top of parapet is generally 32'. The tops of the proposed antennas on Kagin Commons are approximately 5' above the parapet heights, for total heights from grade of approximately 37'.
  4. §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 the light poles in 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; or (applied to the rooftop installations) a height increase of 10 feet above the building height or a protrusion from the building of more than six 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. The application states that the small cell antennas need to be located near the street level, rather than on taller buildings, in order function reasonably given the technology and the coverage objectives.
- 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 41', 22', and 43'-9" high poles plus future additions allowed by 47 CFR §1.4.0001 would equal 61', 42', and 63'-9" plus antenna height. (This condition does not apply to the rooftop installations.)*
  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 is met. The minimum front yard setback in the R3 district is 25'. The nearest residential building to any of the light pole installations is a Macalester College-owned duplex approximately 77' to the southwest of the parking lot installation near the Wallace Fine Arts Center, as compared to a height of 42' plus antenna height for the proposal plus future additions allowed by 47 CFR §1.4.0001. The other light pole installations are approximately 428' and 415' from the nearest residential buildings. (This condition does not apply to the rooftop installations.)*
  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.*  
Given the institutional and athletics fields setting and distance from the street and

residential uses, this condition can be met so long as future additions to the light pole installations are required to have a small cell canister design, such as proposed by the subject application. (This condition does not apply to the rooftop installations.)

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 is an institutional use property of 40.83 acres. (This condition does not apply to the rooftop installations.)

1. §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 light pole antennas (including any future additions) are of a small cell canister design such as proposed, and if the rooftop antennas (including any future additions) are set back from the roof edge by at least 10' (which would appear to require that the westernmost set of antennas be moved away from the building edge by approximately 2' or 3'). There is no need to condition that the antennas be colored to blend with the Kagin Commons building because of the diverse architectural materials (i.e. glass, red brick, cream-colored block, unfinished metal on both rooftop equipment and around the glass) present – nearly any antenna colors would blend with one element or another.
- (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 R3 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 small cell canister antennas on 3 light poles (total heights: 41', 22', and 43' 9") and rooftop panel cell antennas on Kagin Commons 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. The light pole-mounted antennas shall be of a small cell canister design similar to that presented in the application materials.
3. The rooftop antennas shall be set back at least 10' from the building edge.

#### **Attachments**

1. Application
2. Drawings & Photosimulations for each site
3. 47 CFR §1.40001
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 #	
Fee	800.00
Tentative Hearing Date	3-30-17

PD = 14

# 042823440101

**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) Macalester College

Contact Person (if different) Karyn O'Brien Phone 952-288-8130

**PROPERTY LOCATION**

Address / Location Multiple locations, see attached (1577 Osceola)

Legal Description Multiple descriptions, see attached

Current Zoning \_\_\_\_\_

(attach additional sheet if necessary)

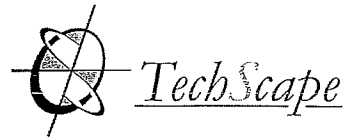
**TYPE OF PERMIT:** Application is hereby made for a Conditional Use Permit under provisions of Chapter \_\_\_\_\_, Section 65, Paragraph 310 of the Zoning Code.

**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.

Please refer to attached cover letter which identifies adherence to Sec. 65.310 to the zoning code, as well as deviating from the standards of the provisions due to inapplicability of code for the proposed technology.

Required site plan is attached

Applicant's Signature [Signature] Date 2/3/17 City Agent [Signature]



323 North Cedar Street  
Chaska, MN 55318

February 8, 2017

City of Saint Paul  
Department of Planning & Economic Development / Zoning Section  
Attn: Bill Dermody  
1400 City Hall Annex  
25 West Fourth Street  
Saint Paul, MN 55102-1634

RE: CUP Application for Verizon Wireless Small Cell Proposal – Macalester Campus

Dear Mr. Dermody,

Enclosed please find a Conditional Use Permit Application with applicable materials on behalf of Verizon Wireless. Verizon is planning to install five (5) small cell nodes located at the Macalester College. The five nodes with their assigned names are as follows:

- MIN STRICKER
  - Proposed 43'9" AGL light pole
  - Approximate address: 79 Snelling Avenue South
- MIN SCOTS
  - Replacement 41'-0" AGL light pole
  - Approximate address: 1577 Osceola Avenue
- MIN NEILL
  - Replacement 17' light pole
  - Approximate address: 130 South Macalester Street
- MIN KAGIN
  - Proposed rooftop panel antennas
  - Approximate address: 1576 Summit Avenue
- ~~MIN GRAND 4~~
  - ~~Replacement 30' light pole~~
  - ~~Approximate address: 1679 Grand Avenue~~

Included with this application you will find two (2) copies of each of the following per node:

- Construction drawings
- Legal description with sketch plan
- Photo simulation
- Structural analysis



323 North Cedar Street  
Chaska, MN 55318

Also included with this packet are:

- Conditional Use Permit Application Form
- A check in the amount of \$800.00 for the CUP application fee, per the City's fee schedule.
- Two (2) copies of a letter of no adverse effect from Minnesota State Historic Preservation Office (MN SHPO)

Regarding Sect. 65.310 (c) of the zoning code of ordinances which requires the applicant to demonstrate the proposed antennas cannot be accommodated on an existing freestanding pole or structure at least 45 feet in height and within ½ mile radius of proposed antennas, an explanation of circumstances is below:

The small cell antennas cannot be accommodated on an existing freestanding pole or building within 1/2 mile and at least 45 feet in height due to:

- The nature, purpose and function of small cells, which are to provide much lower, street-level coverage and capacity for pedestrians and traffic. Placing the antennas higher than an approximate 30-foot antenna centerline would preclude Verizon from meeting the intended objective using this newer technology.
- The antennas are smaller and the distance of their radius/reach is much smaller 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 or meet the ½ mile search area required by code—the code, once again, was written with larger-scale antennas in mind, which was the standard technology available at the time it was codified.
- The antennas must 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.
- Aside from the taller buildings on the college campus, we could not identify any existing structures at least 45 feet in height within a ½ mile radius that either a) exist and/or b) placed where needed to service intended areas. Therefore, the planned equipment cannot be accommodated at a height necessary to function reasonably.

My understanding is the above items suffice to complete the application, and if there is anything else needed to aid in review please contact me at your earliest convenience.

Very sincerely,

Karyn O'Brien  
kobrien@techscapewireless.com  
952.288.8130

**SITE NAME:** MIN STRICKER STPL SC  
**SITE NUMBER:** 20161387092  
**LOCATION CODE:** 414791  
**SITE TYPE:** SMALL CELL  
**POLE TYPE:** PROPOSED 40' POLE



PROJECT NO:	20161387092
EDGE PROJECT NO:	14301
DRAWN BY:	NBT
CHECKED BY:	OSG

REV	DATE	DESCRIPTION
A	08/20/2016	PRELIM SMALL CELL DVG/PER
B	07/12/2016	PRELIM SMALL CELL DVG/PER
C	11/07/2016	FINAL DRAWINGS
D	11/07/2016	FINAL DRAWINGS
E	12/09/2016	FINAL DRAWINGS

PROFESSIONAL ENGINEER  
 I HEARBY CERTIFY THE PLAN WAS PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 PRINTED NAME: *Osma*  
 SIGNATURE: *Osma*  
 DATE: 12/14/2016 LICENSE #: 48220

MIN STRICKER STPL SC  
 ST. PAUL, MINNESOTA  
 PROPOSED POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**TITLE SHEET & PROJECT DATA**

SHEET NUMBER  
**T-1**

NO:	SHEET TITLE
T-1	TITLE SHEET & PROJECT DATA
C-1	SITE PLAN
C-2	ENLARGED SITE PLAN
A-1	POLE ELEVATION
A-2	ANTENNA DETAILS
A-3	EQUIPMENT DETAILS
A-4	CABLE MOUNTING DETAILS
A-5	CABLEING DETAILS
E-1	ELECTRICAL NOTES
E-2	GROUNDING PLAN
G-1	GROUNDING DETAILS
G-2	

**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: 652.268.1449

**STRUCTURAL REVIEW**  
 LIGHT POLE STRUCTURAL ANALYSIS COMPLETED BY EDGE CONSULTING ENGINEERS, INC.  
 PROJECT #: 14301  
 DATE: 08/02/2016  
 CONTRACTOR TO REVIEW STRUCTURAL REPORT IN ITS ENTIRETY. ANY DISCREPANCIES OR DISAGREEMENTS BETWEEN THE REPORT AND THESE PLANS SHOULD BE RESOLVED PRIOR TO CONSTRUCTION.

**PROJECT DESCRIPTION / SOW**

- INSTALL (1) PROPOSED 40-FT STEEL POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF CAN ANTENNA
- INSTALLATION OF ERICSSON RRP8 AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER/BREAKER BOX
- INSTALLATION OF HAND HOLE FOR FIBER AT POLE BASE BY VERIZON
- INSTALLATION OF HAND HOLE FOR FIBER IN ROW, BY PROVIDER
- 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 AT POLE BASE AND HAND HOLE IN ROW (APPROX. 28'-0"), TO BE DIRECTIONALLY BORED BELOW GRADE BY VERIZON
- INSTALLATION OF CONDUIT FOR ELECTRIC BETWEEN POLE BASE AND POWER SOURCE (APPROX. 50'-0"), TO BE TRENCHED/DIRECTIONALLY BORED BELOW GRADE BY VERIZON
- INSTALLATION OF GROUND RING AROUND POLE FOUNDATION
- BUILDING PENETRATION REQUIRED FOR ELECTRICAL SERVICE
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS

**PROJECT DIRECTORY**

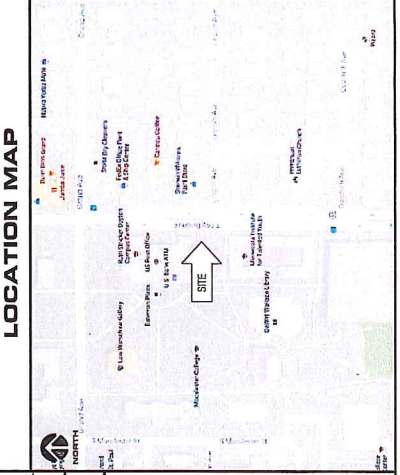
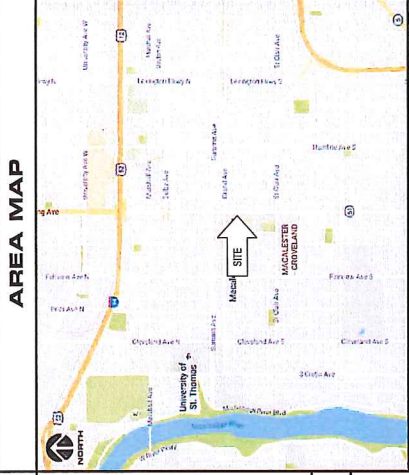
LESSOR:  
 MACALESTER COLLEGE  
 1600 GRAND AVE  
 ST. PAUL, MN 55104  
 PHONE: 651.695.6000

LESSEE:  
 VERIZON WIRELESS  
 10901 BUSH LAKE RD  
 BLOOMINGTON, MN 55438  
 PHONE: 952.244.4494

RE ENGINEER:  
 VERIZON WIRELESS  
 10901 BUSH LAKE RD  
 BLOOMINGTON, MN 55438  
 CONTACT: JOHN MULLINS

ENGINEERING COMPANY:  
 EDGE CONSULTING ENGINEERS, INC.  
 SUITE 105  
 1745 JUMPER PATH  
 BLOOMINGTON, MN 55438  
 CONTACT: OTTO DINGFELDER III, P.E.  
 PHONE: 652.268.1449

SITE ACQUISITION:  
 KGI  
 855 LAS CIMAS PKWY  
 BUILDING THREE, SUITE 370  
 BLOOMINGTON, MN 55438  
 CONTACT: KARYN O'BRIEN  
 PHONE: 952.268.8130



**SITE INFORMATION**

APPROXIMATE ADDRESS:  
 79 SHELING AVE S  
 ST. PAUL, MN 55105  
 RAMSEY COUNTY

LATITUDE & LONGITUDE:  
 LAT: 44°56'20.88"N  
 LONG: 93°10'02.29"W  
 GROUND ELEVATION: 933' AMSL  
 (PER IA CERTIFICATE)

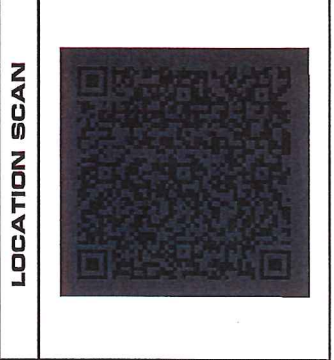
POLE HEIGHT:  
 40'-0" T.O.C.

MAXIMUM APPURTENANCE HEIGHT:  
 49'-9" A.G.L.

**APPLICABLE CODES**

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:  
 - 2012 INTERNATIONAL BUILDING CODE  
 - 2010 INTERNATIONAL PLUMBING CODE  
 - IBC/IPC/UPC 2010 LATEST EDITION

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





850 Los Chinos Parkway, Building Three, Suite 370  
 Austin, TX 78749  
 www.kgiwireless.com



**Edge Consulting Engineers, Inc.**  
 17465 Langer Park, Suite 105  
 Austin, TX 78749  
 512.834.1590 fax  
 www.edgeconsulting.com

PROJECT NO: 20161887092  
 EDGE PROJECT NO: 14301  
 DRAWN BY: NBT  
 CHECKED BY: OPD

REV.	DATE	DESCRIPTION
A	08/29/2016	ISSUE FOR CELL CHANGES
B	09/17/2016	FINAL SMALL CELL DRAWINGS
C	11/07/2016	FINAL DRAWINGS
D	11/08/2016	FINAL DRAWINGS
E	12/04/2016	FINAL DRAWINGS

APPROVED

THESE CERTIFY THAT THIS PLAN, SPECIFICATION, DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

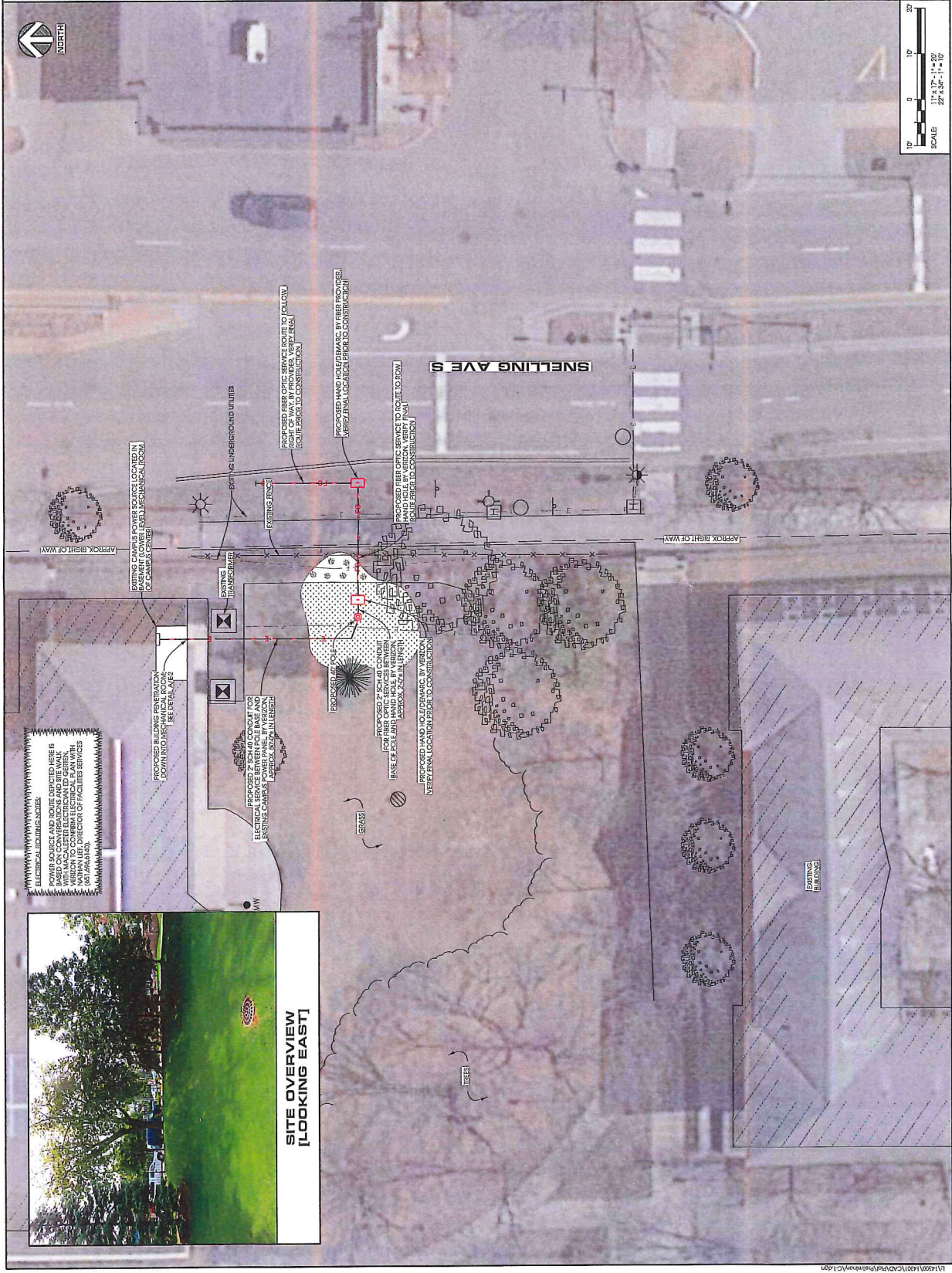
MIN STRICKER STPL SC  
 ST. PAUL, MINNESOTA  
 PROPOSED POLE  
 SMALL CELL DRAWINGS

SHEET TITLE

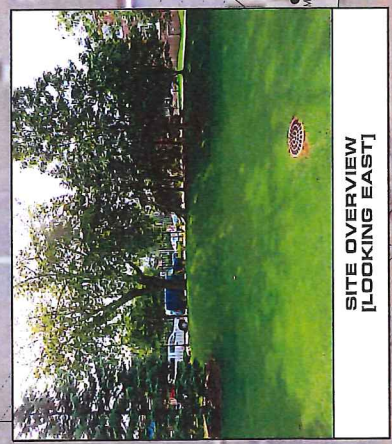
SITE PLAN

SHEET NUMBER

C-1



**ELECTRICAL LAYOUT NOTES:**  
 POWER SOURCE AND ROUTE DEPICTED HERE IS WITH HAZELBETTER ELECTRICAL AND SYSTEMS, A DIVISION OF VERIZON WIRELESS. ALL WORK SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND THE NATIONAL FIRE ALARM CODE (NFPA 72).



SITE OVERVIEW (LOOKING EAST)



**verizon**



823 East Chisler Parkway, Building Three, Suite 370  
 St. Paul, MN 55127-2700  
 www.kgi.net



1746 Juniper Park, Suite 105  
 St. Paul, MN 55116  
 www.edgeconsulting.com

PROJECT NO:	20161387092
EDGE PROJECT NO:	14381
DRAWN BY:	NBT
CHECKED BY:	OSD

REV	DATE	DESCRIPTION
A	08/05/2016	PRELIM SMALL CELL DWGS PER
B	09/12/2016	PRELIM SMALL CELL DWGS PER
0	11/07/2016	FINAL DRAWINGS: I/M/M
1	11/08/2016	FINAL DRAWINGS: I/M/M
2	12/04/2016	FINAL DRAWINGS: PER

APPROVED

DESIGNER'S RESPONSIBILITY: THE DESIGNER HAS PREPARED THESE DRAWINGS UNDER THE DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER IN THE STATE OF MINNESOTA.

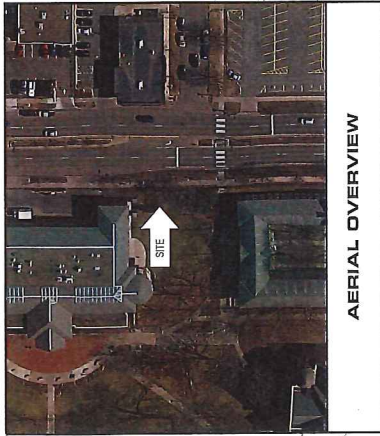
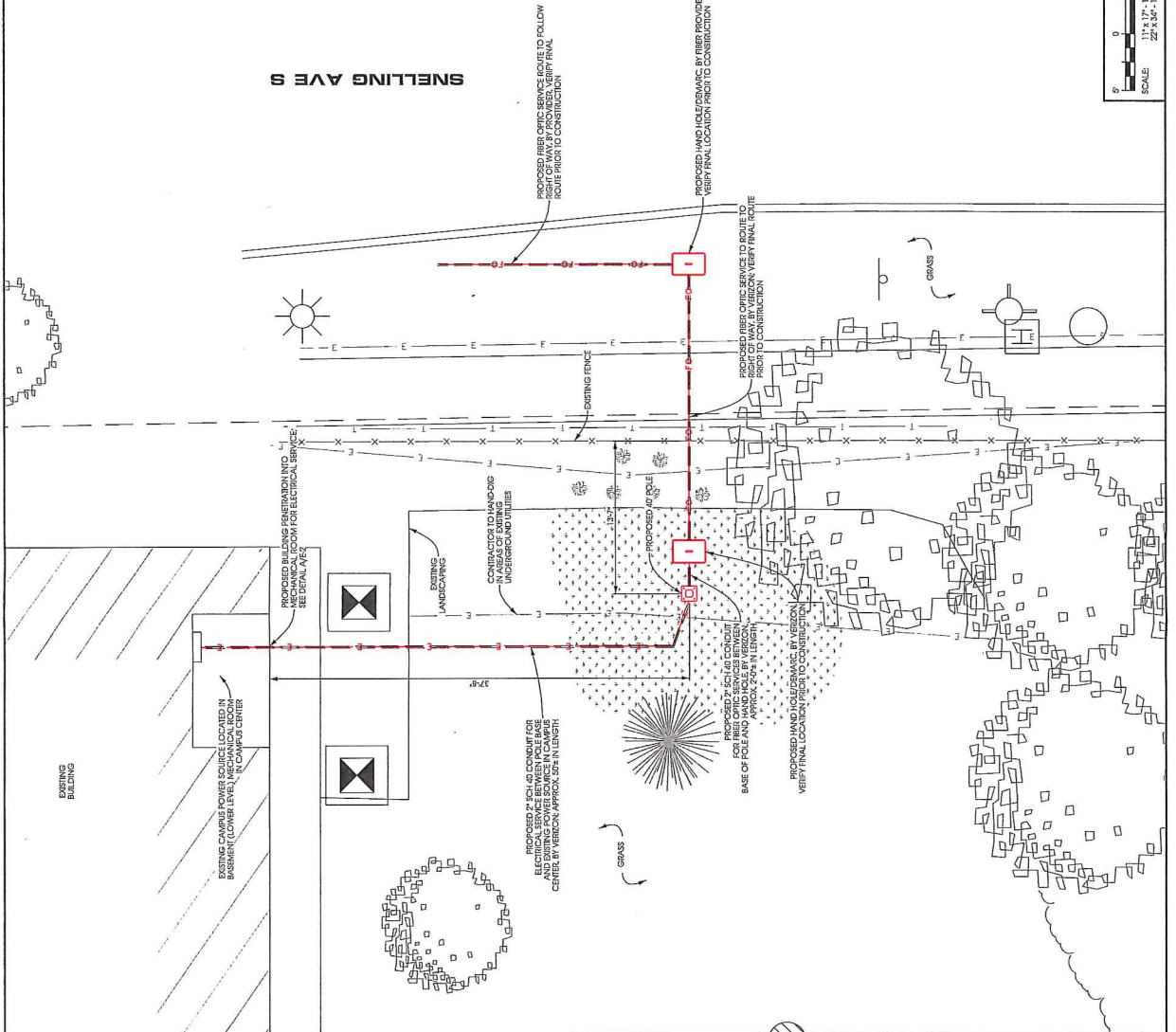
MIN STRICKER STPL SC  
 ST. PAUL, MINNESOTA  
 PROPOSED POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**ENLARGED  
 SITE PLAN**

SHEET NUMBER  
**C-2**



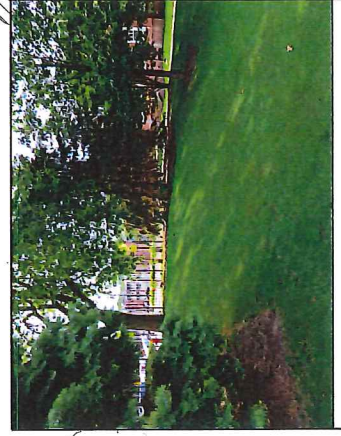
SNELLING AVE S



**AERIAL OVERVIEW**



**SITE OVERVIEW  
 [LOOKING NORTHEAST]**



**SITE OVERVIEW  
 [LOOKING SOUTHEAST]**



860 Los Cien Parkway, Building Three, St. Paul, MN 55108  
 651.779.2426  
 www.kgi.com



17445 Juniper Park, Suite 105  
 St. Paul, MN 55124  
 651.441.4400  
 www.edgeconsulting.com

PROJECT NO: 20161387092  
 EDGE PROJECT NO: 14301  
 DRAWN BY: NBT  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION
A	08/17/2016	ISSUE FOR PERMIT
B	09/12/2016	PRELIMINARY CELL DINGS PER NBT
0	11/07/2016	FINAL DRAWINGS
1	11/08/2016	FINAL DRAWINGS
2	12/01/2016	FINAL DRAWINGS

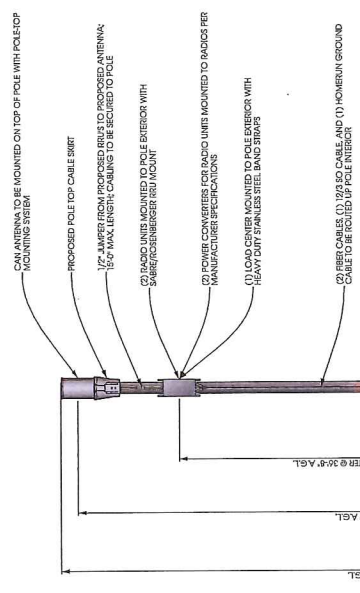
APPROVED

THESE CELL DINGS ARE SUBJECT TO THE PLAN SPECIFICATION, DIRECT EXEMPTION AND THAT I AM A DAILY LICENSEE OF THE STATE OF MINNESOTA.

MIN STRICKER STPL SC  
 ST. PAUL, MINNESOTA  
 PROPOSED POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**POLE ELEVATION**

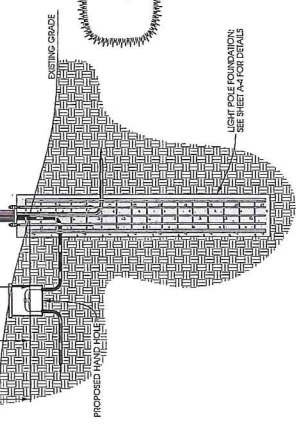
SHEET NUMBER  
**A-1**



NOTES  
 TYPICAL INSTALLATION SHOWN  
 ALL ELEVATIONS ARE REARDED 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 WITH HEAVY DUTY STAINLESS STEEL BAND STRAPS, SUBSEQUENT TO RIBS MOUNT, OR PRE-SLOTTED CLAMPS

SIZE  
 LIGHT POLE TO BE A SQUARE STEEL VALUANT POLE (SEE SHEET A-1 FOR DETAILS)  
 DESIGN PER (D) 11/4/2016

SIZE  
 PROPOSED PAINT SPECIFICATION:  
 BLACK (STD); VALUANT NO. 349334  
 VERICOA NO. VC 8201515K



**C LIGHT POLE ELEVATION**  
 SCALE 1" = 17'-1" = 7'-0"  
 22" x 36" - 1" = 3'-0"

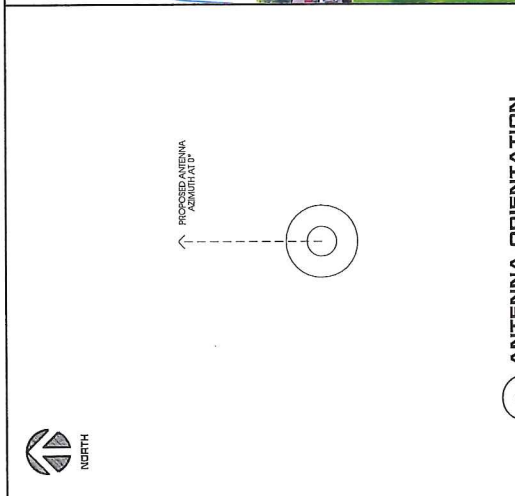
SIZE (W/D)	BASE	ANSI D	MODEL	DU PORT	ANTENNA	PORT	CL	ADJ	ELECT	MESH	TIT
STRICKER STPL SC	AVS	RRUS	1X700P-2-CND	JMA	0	+45	40	0	0	0	0
COORDINATES	MIN	PCS				+45					
LATITUDE	44	56	20771			+45					
LONGITUDE	-93	01	2277			-45					
Ground Elevation:			961								

QTY	TYPE	MFR.	MODEL	DESCRIPTION	QTY	UNIT
1	Antenna	Comcast	104-50	Antenna	1	104
1	Antenna	Comcast	104-50	Antenna	1	104
1	Antenna	Comcast	104-50	Antenna	1	104

**A ANTENNA AND COAX**  
 SCALE: NIS



**PROPOSED POLE LOCATION**



**C ANTENNA ORIENTATION**  
 SCALE: NIS



601 Los Chinos Parkway, Building Three, Suite 370  
 St. Paul, MN 55108  
 651.776.7376  
 www.kgi.com



1748 Juniper Park, Suite 105  
 St. Paul, MN 55108  
 651.441.4500  
 www.edgeconsult.com

PROJECT NO: 20161387092  
 EDGE PROJECT NO: 14801  
 DRAWN BY: NBT  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION
A	08/02/2016	PRELIM SMALL CELL DRAWING PER
B	07/12/2016	PRELIM SMALL CELL DRAWING NBT
C	11/07/2016	FINAL DRAWINGS MAM
D	11/08/2016	FINAL DRAWINGS MAM
E	12/04/2016	FINAL DRAWINGS PER

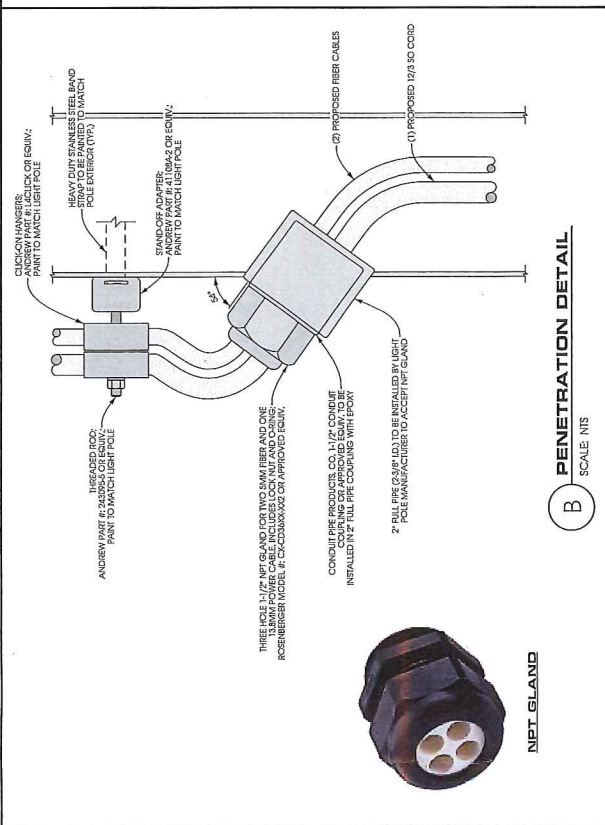
APPROVED

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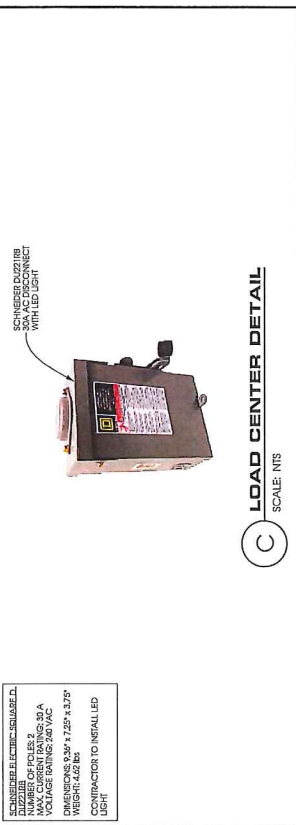
MIN STRICKER STPL SC  
 ST. PAUL, MINNESOTA  
 PROPOSED POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
 MOUNTING DETAILS

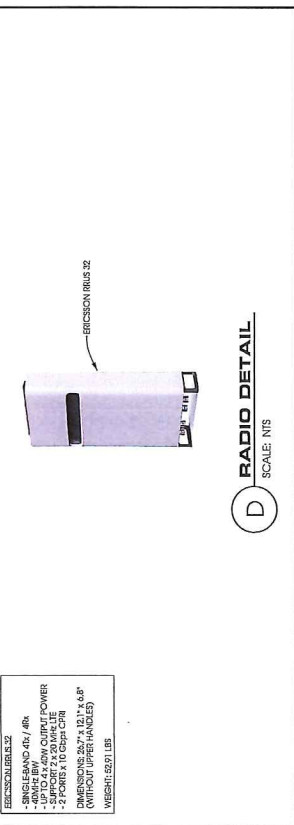
SHEET NUMBER  
 A-2



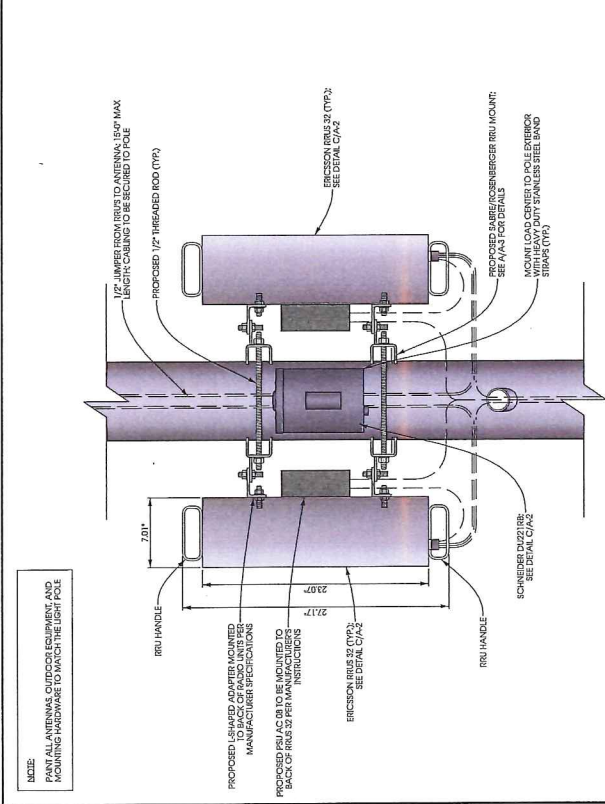
**B PENETRATION DETAIL**  
 SCALE: NTS



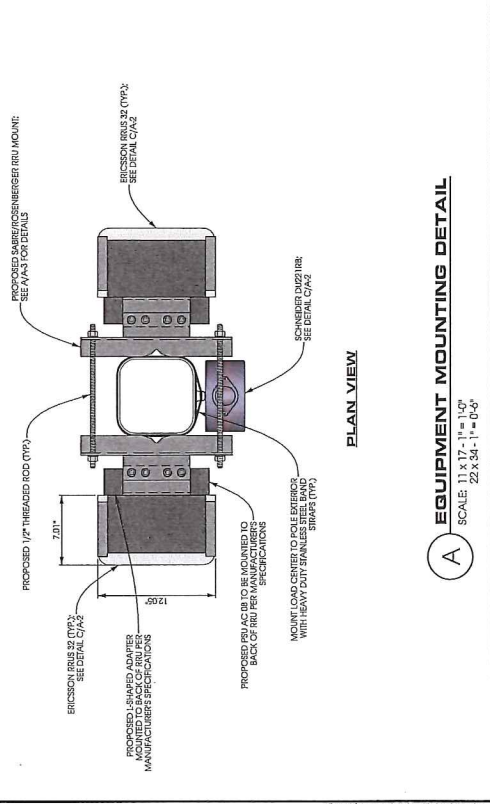
**C LOAD CENTER DETAIL**  
 SCALE: NTS



**D RADIO DETAIL**  
 SCALE: NTS



**ELEVATION VIEW**

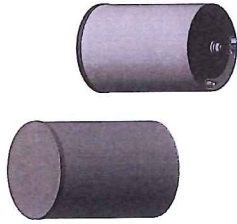


**A EQUIPMENT MOUNTING DETAIL**  
 SCALE: 1" = 12", 1/4" = 6", 2/32" = 1" = 0"

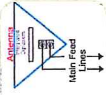


## CYL-X7CAP-2

Small Cell Cantenna X-Pol, 698-896/1710-2170MHz, 2FT



- X-Pol Small Cell
- Internally Duplexed
- Suitable for Pole or Building mount
- Dual Broadband Radiators
- Internal Beam Combining
- Integrated Global Position System (GPS) option



Includes Integrated Duplexers  
Requires half the number of feeder cables

### Electrical Specifications

Frequency Band, MHz	698-824	824-896	1710-1880	1850-1990	1920-2170
Vertical Beamwidth, 3dB points	32.7	27.8	16.4	15.3	14.2
Electrical Down tilt	+/-45°	0°	+/-45°	+/-45°	0°
VSWR/Return Loss, dB, Maximum	1.7:1/11.7	1.7:1/11.7	1.7:1/11.7	1.7:1/11.7	1.7:1/11.7
Isolation Between Ports, dB, Minimum	-25	-25	-25	-25	-25
Intermodulation (2x2Bw), IM3, dBc, Maximum	-150	-150	-150	-150	-150
Impedance, Ohms	50	50	50	50	50
Maximum Power Per Connector, CW	250	250	250	250	125

### Electrical Specifications based on Antenna Configuration

Antenna Model	No of Beams	698-824		1710-1880		1920-2170	
		Beamwidth	Gain,dBi	Beamwidth	Gain,dBi	Beamwidth	Gain,dBi
CYL-X7CAP-2-C	1	*560°	6.1	*560°	5.1	*560°	9.7
CYL-X7CAP-2-H	1	*240°	7.1	*240°	11.2	*240°	11.6
CYL-X7CAP-2-P	3	*180°	7.1	*180°	11.2	*180°	11.8
CYL-X7CAP-2-T	3	70°	10.6	62°	14	59°	24.5
CYL-X7CAP-2-B	2	70°	10.6	62°	14	59°	24.5

\* Beamwidth represented for functional purposes only. See pattern diagram for beam shape

www.cssantenna.com  
410-612-0380  
customer.service@cssantenna.com

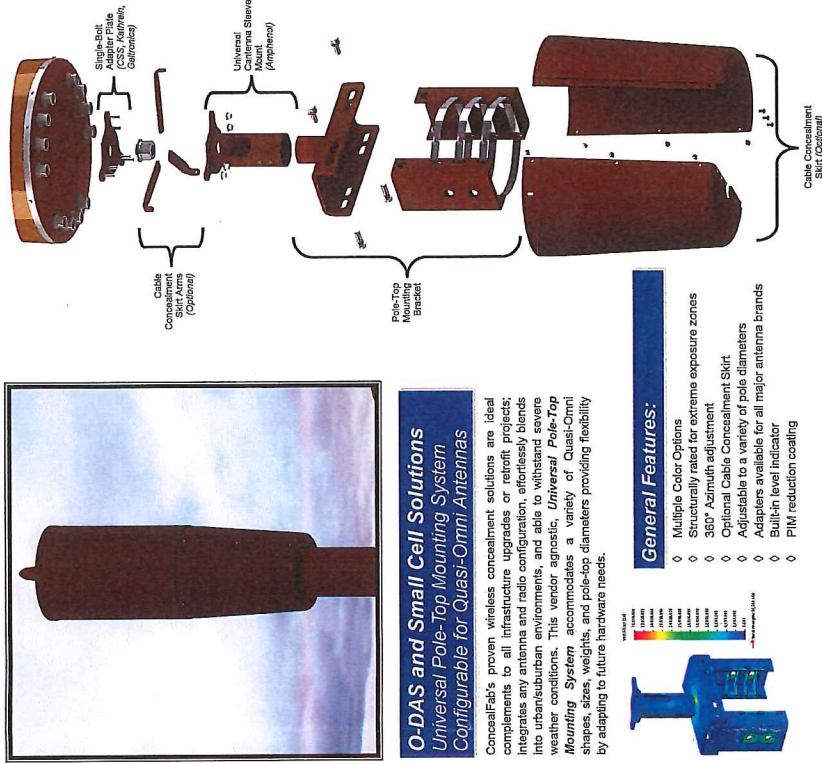
Page 1 of 5  
10/7/2013

All specifications are subject to change.  
Refer to www.cssantenna.com for the most current information

A ANTENNA SPECIFICATIONS  
SCALE: NTS

## CONCEALFAB® UNIVERSAL POLE-TOP MOUNTING SYSTEM

Configurable for all Major Quasi-Omni Antennas



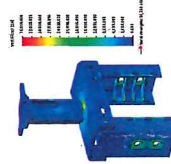
### O-DAS and Small Cell Solutions

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 end 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



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

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B ANTENNA MOUNTING DETAIL  
SCALE: NTS



853 Las China Parkway, Building Three, Suite 370  
Aurora, CO 80016  
www.kgi.com



17465 Juniper Park, Suite 105  
Denver, CO 80241  
www.edge-engineers.com

PROJECT NO:	2016187092
EDGE PROJECT NO:	14801
DRAWN BY:	NBT
CHECKED BY:	OGD

REV	DATE	DESCRIPTION
B	10/12/2013	RELIUM SMALL CELL DWGS-NET
0	11/07/2015	FINAL DRAWINGS
1	11/08/2015	FINAL DRAWINGS
2	12/05/2015	FINAL DRAWINGS

APPROVED

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MIN STRICKER STPL SC  
ST. PAUL, MINNESOTA  
PROPOSED POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
ANTENNA DETAILS

SHEET NUMBER  
A-3

**verizon**



851 1st China Parkway, Building Three, Suite 370  
Austin, TX 78716  
512.441.4477 ext. 400  
www.kgiwireless.com

**Edge**  
Consulting Engineers, Inc.  
1749 Juniper Park, Suite 105  
Austin, TX 78744  
512.441.4477 ext. 400  
www.edgeinc.com

PROJECT NO: 20161887092  
EDGE PROJECT NO: 14301  
DRAWN BY: NBT  
CHECKED BY: OSD

REV	DATE	DESCRIPTION
B	10/12/2016	PRELIM SMALL CELL DWS/NET
0	11/07/2016	FINAL DRAWINGS
1	11/08/2016	FINAL DRAWINGS
2	12/06/2016	FINAL DRAWINGS

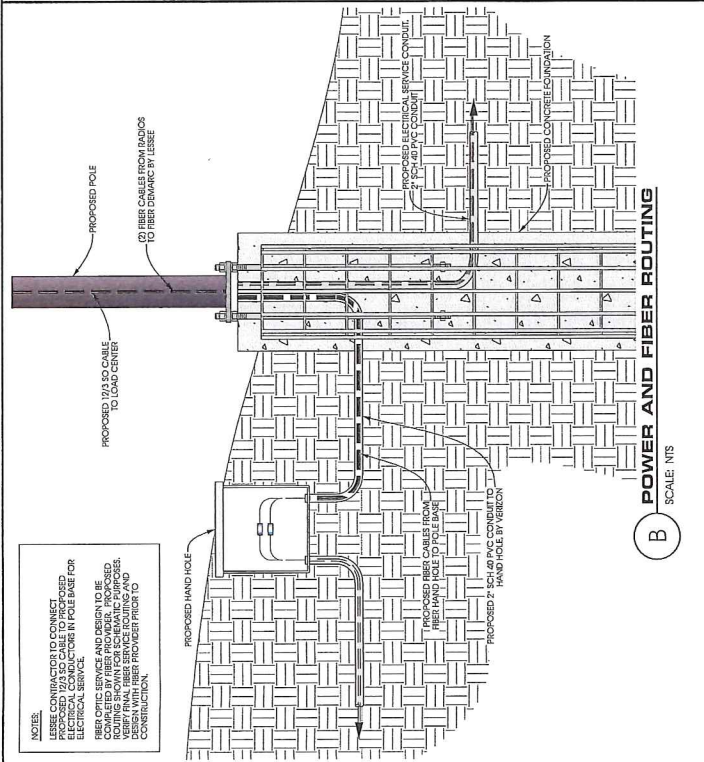
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MIN STRICKER STPL SC  
ST. PAUL, MINNESOTA  
PROPOSED POLE  
SMALL CELL DRAWINGS

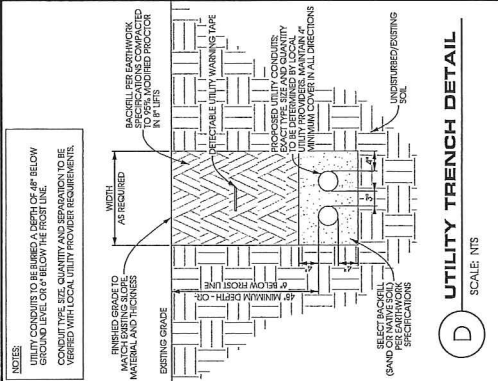
SHEET TITLE  
CABLING DETAILS

SHEET NUMBER  
E-1

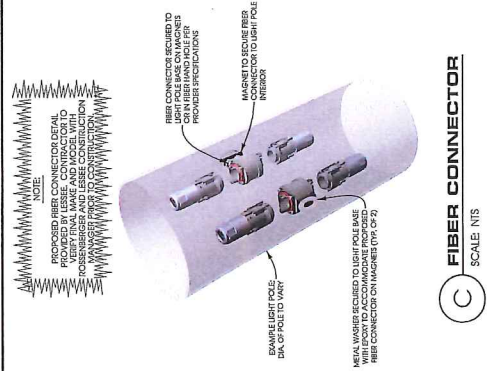


**B** POWER AND FIBER ROUTING  
SCALE: NTS

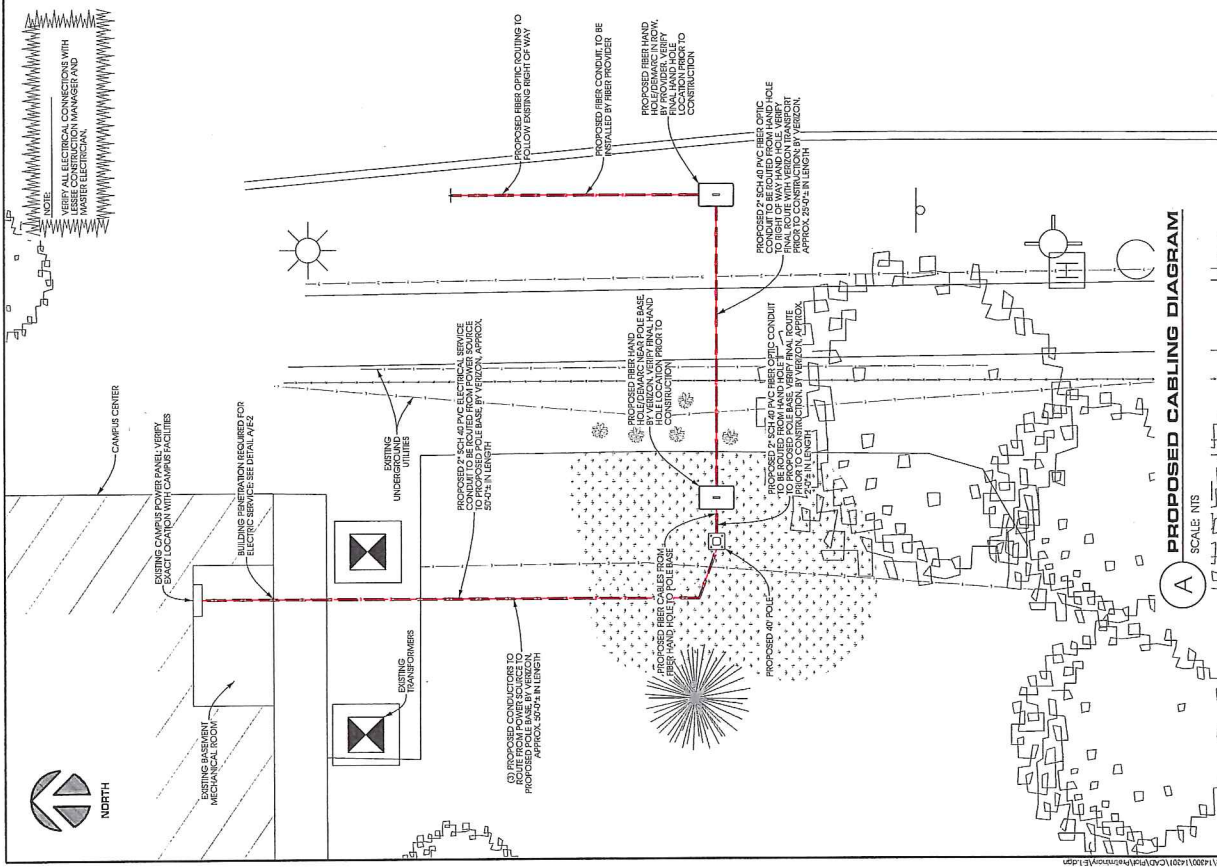
NOTE:  
LESSEE CONTRACTOR TO CONNECT FIBER OPTIC SERVICE TO ALL ELECTRICAL LOADS AND TO PROVIDE ELECTRICAL SERVICE TO THE FIBER OPTIC SERVICE AND DESIGN TO BE Routed SHOWN FOR SCHEMATIC PURPOSES. DESIGN WITH FIBER PROVIDER PRIOR TO CONSTRUCTION.



**D** UTILITY TRENCH DETAIL  
SCALE: NTS



**C** FIBER CONNECTOR  
SCALE: NTS



**A** PROPOSED CABLING DIAGRAM  
SCALE: NTS

**NOTES**  
 1. CONTRACTOR TO ENSURE WATER RESISTANCE AT ALL WALL AND FLOOR PENETRATIONS.  
 2. CONTRACTOR TO ACHIEVE SHORTER FIRE RATING TO ACHIEVE SHORTER FIRE RATING.

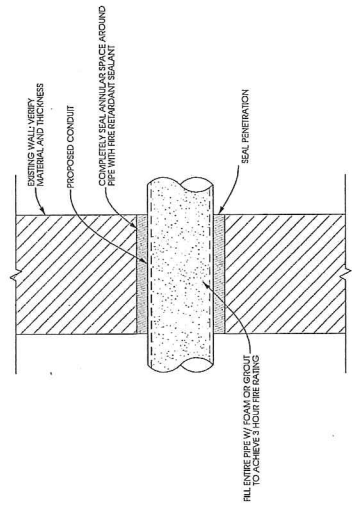
**GENERAL ELECTRICAL NOTES**

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS AWARE OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THE CONTRACT.
2. CONTRACTOR SHALL APPROVE ALL WORK PRIOR TO OBSERVATION BY THE ARCHITECT AND SHALL BE RESPONSIBLE FOR THE DETERMINATION OF THE ARCHITECT LISTING ALL MANUFACTURERS, EQUIPMENT, MATERIALS, AND BRANDS. A WRITTEN NOTICE OF ALL INDUSTRY TO THE ARCHITECT LISTING ALL MANUFACTURERS, EQUIPMENT, MATERIALS, AND BRANDS IS REQUIRED.
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 LOAD, PUSHBOX, JBOX, SWITCH BOX, ETC. IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
6. CONTRACTOR SHALL PROVIDE LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSULATION, CONSTRUCTION TOOLS, DRAWINGS, AS SPECIFIED HEREIN AND COX, AS ORDERED, 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 CASE OR GROUP OF EQUIPMENT. MATERIALS AND EQUIPMENT SHALL BE APPROVED BY THE ARCHITECT. CONTRACTOR SHALL SUBMIT ALL MATERIALS AND EQUIPMENT TO THE ARCHITECT FOR APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE OWNER, INDUSTRIAL SAFETY AND ALL GOVERNING REGULATIONS. ALL EQUIPMENT SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA, AND NETA.
8. CONTRACTOR SHALL CARRY OUT HIS WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND OSHA.
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. CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE WORK AND SHALL BE RESPONSIBLE FOR THE CORRECTION OF ANY UNWRITTEN NOTIFICATION AT THE EXPENSE OF THE CONTRACTOR.
11. ALL CONDUIT ONLY (C/O) SHALL HAVE A PULL WIRE OR ROPE.
12. PROVIDE CONDUCTOR SCHEDULE WITH ONE SET OF COMPLETE ELECTRICAL AS INSTALLED DRAWINGS AT THE COMPLETION OF THE JOB SHOWING ACTUAL DIMENSIONS, NOTINGS, AND CIRCUITS.
13. ALL BROCHURES, OPERATING MANUALS, CATALOGS, SHOP DRAWINGS, ETC. SHALL BE TURNED OVER TO OWNER AT JOB COMPLETION.
14. USE TAPP CONNECTIONS ON ALL MULTICORE 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 THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECT, AND A MINIMUM OF 10,000 A.C.
17. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES AND DRAWINGS.
18. RECEPTACLES SHALL BE 20 AMPERE, 120 VOLT A.C. WIRE AS REQUIRED BY THE ARCHITECT OR APPROVED EQUAL.
19. WALL SWITCHES SHALL BE SINGLE-HOLE, HUBBELL # 1201 OR EQUIVALENT, WHITE AS REQUIRED BY THE ARCHITECT.
20. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANDED OUTLETS, SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE (RACO) MKD, 1/2" RIMMED WORK COVER.
21. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM, NO BX OR ROMEX CABLE IF PERMITTED UNLESS SPECIFICALLY NOTED OTHERWISE ON DRAWINGS.
22. GROUND RODS SHALL BE AS SPECIFIED ON THE GROUNDING DRAWINGS.
23. REFER TO SCHEDULE FOR DIMENSIONS OF PANELS AND CONDUITS. DIMENSIONS SHALL BE AS SHOWN UNLESS OTHERWISE SPECIFIED IN THE CONTRACT. CONDUIT SHALL BE IN CONTACT WITH EACH BEND SHALL BE 1/2" LAP WRAPPED WITH THIS PROCESSOR'S 3" EXTENDING MIN. 1/2" ABOVE GRADE.
24. ALL MATERIALS SHALL BE UL LISTED.
25. CONDUIT:
  - A. CONDUIT TO BE USED SHALL BE RIGID POLYETHYLENE, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT.
  - B. RIGID POLYETHYLENE SHALL BE USED FOR ALL CONDUIT UNLESS OTHERWISE SPECIFIED IN THE CONTRACT.
  - C. FIBERGLASS METALLIC CONDUIT SHALL HAVE UL LISTED LABEL AND MUST BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE ASSE OR SUGGESTED TYPE, UNLESS OTHERWISE SPECIFIED IN THE CONTRACT.
  - D. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
26. PATCH, REPAIR AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
27. PENETRATIONS IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH SECTION 712, PENETRATIONS.
28. WALLS OR CEILING JOISTS OR CONCEALED WALLS OR CEILING JOISTS SHALL BE LAID OUT AS PER ARCHITECT'S DIMENSIONS. CONDUIT SHALL BE LAID OUT AS PER ARCHITECT'S DIMENSIONS. WALLS OR CEILING JOISTS SHALL BE LAID OUT AS PER ARCHITECT'S DIMENSIONS. CONDUIT SHALL BE LAID OUT AS PER ARCHITECT'S DIMENSIONS. WALLS OR CEILING JOISTS SHALL BE LAID OUT AS PER ARCHITECT'S DIMENSIONS.
29. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FULL POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO CONTRACTOR ENGINEER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK AREA COMPLETE AND UNIMPAIRED CONDITION.
30. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY TOWER LIGHTING SYSTEM DESCRIBED IN THE RFP.

**ELECTRICAL NOTES**



**PROPOSED BUILDING PENETRATION LOCATION**



**A BUILDING PENETRATION DETAIL**  
 SCALE: NTS

**verizon**

**KGI**  
 8801 East Center Parkway, Building Three, Suite 370  
 Austin, TX 78726  
 512.441.4400  
 www.kgiwireless.com

**Edge Consulting Engineers, Inc.**  
 17405 Juniper Park, Suite 105  
 59344-1467  
 402.481.4400  
 www.edgeconsulting.com

**PROJECT NO:** 20161387092  
**EDGE PROJECT NO:** 14381  
**DRAWN BY:** NBT  
**CHECKED BY:** OSD

REV	DATE	DESCRIPTION
B	10/12/2016	REVISION SMALL CELL DOWNSHIP
A	11/07/2016	RNAL DRAWINGS
1	11/09/2016	RNAL DRAWINGS
2	12/04/2016	RNAL DRAWINGS

APPROVED

THESE DRAWINGS HAVE BEEN PREPARED BY THE CONSULTOR UNDER THE DIRECT SUPERVISION AND CONTROL OF A PROFESSIONAL ENGINEER LICENSED UNDER THE LAWS OF THE STATE OF MINNESOTA.

MIN STRICKER STPL SC  
 ST. PAUL - MINNESOTA  
 PROPOSED POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**ELECTRICAL NOTES**

SHEET NUMBER  
**E-2**



608 La Cima Parkway, Building Three, Suite 370  
 St. Paul, MN 55126  
 612.542.1676 voice  
 www.kgiwifi.com



**Edge Consulting Engineers, Inc.**  
 1946 Juniper Park, Suite 105  
 St. Paul, MN 55116  
 651.441.1493 voice  
 www.edgece.com

PROJECT NO: 20161387092  
 EDGE PROJECT NO: 14801  
 DRAWN BY: KJG  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION	KJG
1	04/27/2016	PHOTO SIMULATION	KJG

**PRELIMINARY -  
 NOT FOR CONSTRUCTION**

I HEREBY CERTIFY THAT THE PLAN, SPECIFICATION, AND CALCULATIONS CONTAINED HEREON WERE PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND THAT I AM A FULLY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MIN STRICKER STPL SC  
 ST. PAUL, MN  
 PROPOSED LIGHT POLE  
 PHOTO SIMULATION

SHEET TITLE  
**PHOTO SIM 1**

SHEET NUMBER  
**PS-1**



**PHOTO SIMULATION OF NEW INSTALLATION**

**ACTUAL PHOTOGRAPH BEFORE SIMULATION**



**SITE NAME:** MIN SCOTS STPL SC  
**SITE NUMBER:** 20161387090  
**LOCATION CODE:** 414789  
**SITE TYPE:** SMALL CELL  
**POLE TYPE:** REPLACEMENT 35' LIGHT POLE



805 Las Cimias Parkway, Building Three, Suite 370  
 Austin, TX 78745  
 512.545.9272 ext. 300  
 www.kgiengineers.com



**PROJECT NO.:** 20161387090  
**EDGE PROJECT NO.:** 14299  
**DRAWN BY:** NBT  
**CHECKED BY:** OGD

REV.	DATE	DESCRIPTION
A	06/03/2016	PRELIM SMALL CELL DWGS INB
B	06/03/2016	PRELIM SMALL CELL DWGS INT
0	11/07/2016	FINAL SMALL CELL DWGS MAIN
1	12/09/2016	FINAL SMALL CELL DWGS PER

**PROFESSIONAL ENGINEER**  
 I HEREBY CERTIFY THIS PLAN WAS PREPARED BY ME OR UNDER MY CLOSE PERSONAL SUPERVISION AND I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
**PRINTED NAME:** *Chad E. Miller*  
**SIGNATURE:** *Chad E. Miller*  
**DATE:** 06/04/16 LICENSE #: 40220

**LESSOR:** CITY OF ST. PAUL  
 15 W. KELLOGG BLVD  
 ST. PAUL, MN 55102  
 CONTACT: JOHN BEZANIZ  
 PHONE: 651.266.6989

**ENGINEERING COMPANY:** VERIZON WIRELESS  
 17645 JUNIPER PATH  
 SUITE 105  
 AUSTIN, TX 78754  
 CONTACT: KARYN OBRIEN  
 PHONE: 952.288.4130

**ENGINEER OF RECORD:** EDGE CONSULTING ENGINEERS, INC.  
 CONTACT: OTTO DINGFELDER II  
 PHONE: 688.6441.1449

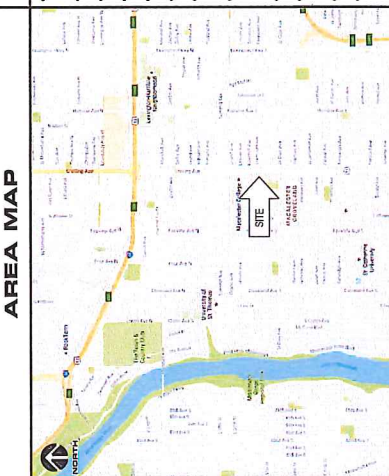
**SHEET TITLE:** MIN SCOTS STPL SC  
**TITLE SHEET & PROJECT DATA:** REPLACEMENT LIGHT POLE SMALL CELL DRAWINGS

**SHEET NUMBER:** T-1

NO.	SHEET TITLE
T-1	TITLE SHEET & PROJECT DATA
C-1	SITE PLAN
C-2	FOUNDED SITE PLAN
A-1	INSTALLATION DETAILS
A-2	ANCHORING DETAILS
A-3	ANTENNA DETAILS
A-4	EQUIPMENT DETAILS
A-5	CABLE MOUNTING DETAILS
E-1	CABLEING DETAILS
E-2	ELECTRICAL NOTES
G-1	GROUNDING PLAN
G-2	GROUNDING DETAILS

**PROJECT DESCRIPTION / SOW**

- INSTALL (O) REPLACEMENT 35-FT STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF CAN ANTENNA
- INSTALLATION OF ERICSSON RRUS AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER/BREAKER BOX
- INSTALLATION OF HAND HOLE FOR FIBER AT POLE BASE BY VERIZON
- INSTALLATION OF HAND HOLE FOR FIBER IN ROW, BY PROVIDER
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AND POLE BASE (APPROX. 30"Ø) TO BE TRENCHED BELOW GRADE, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE AT POLE BASE AND HAND HOLE IN ROW (APPROX. 246"Ø), TO BE DIRECTIONALLY BORED BELOW GRADE, BY PROVIDER
- INSTALLATION OF CONDUIT FOR FIBER IN ROW, BY PROVIDER
- INSTALLATION OF ELECTRICAL CONDUCTORS IN EXISTING CONDUIT TO CAMPUS POWER SOURCE BY VERIZON
- INSTALLATION OF GROUND RING AROUND POLE FOUNDATION
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS



**SITE INFORMATION**

APPROXIMATE ADDRESS:  
 8177 OSCOLA AVE  
 ST. PAUL, MN 55103  
 RAMSEY COUNTY

LATITUDE & LONGITUDE:  
 LAT: 44°58'11.59"N  
 LONG: 93°10'05.08"W  
 GROUND ELEVATION: 549' AMSL  
 (PER I.A. CERTIFICATE)

POLE HEIGHT:  
 35'-0" T.O.C.

MAXIMUM APPURTEANCE HEIGHT:  
 41'-0" A.S.L.

**APPLICABLE CODES**

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:  
 - 2012 INTERNATIONAL BUILDING CODE  
 - IBC 1901.3  
 - IBC 1901.3.1  
 - IBC 1901.3.2

**PROJECT DIRECTORY**

**LESSOR:** CITY OF ST. PAUL  
 15 W. KELLOGG BLVD  
 ST. PAUL, MN 55102  
 CONTACT: JOHN BEZANIZ  
 PHONE: 651.266.6989

**ENGINEERING COMPANY:** VERIZON WIRELESS  
 17645 JUNIPER PATH  
 SUITE 105  
 AUSTIN, TX 78754  
 CONTACT: KARYN OBRIEN  
 PHONE: 952.288.4130

**ENGINEER OF RECORD:** EDGE CONSULTING ENGINEERS, INC.  
 CONTACT: OTTO DINGFELDER II  
 PHONE: 688.6441.1449

**STRUCTURAL ANALYSIS COMPLETED BY EDGE CONSULTING ENGINEERS, INC.**  
 PROJECT #: 14299  
 DATE: 07/27/2016

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



**LOCATION SCAN**

**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 THE 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 II (PE # 49720 (MN))  
 PHONE: 688.6441.1449

**STRUCTURAL REVIEW**

LIGHT POLE STRUCTURAL ANALYSIS COMPLETED BY EDGE CONSULTING ENGINEERS, INC.  
 PROJECT #: 14299  
 DATE: 07/27/2016

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

**APPLICABLE CODES**

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 - 2012 INTERNATIONAL BUILDING CODE  
 - IBC 1901.3  
 - IBC 1901.3.1  
 - IBC 1901.3.2



verizon



605 East Central Parkway, Building Three, Suite 370  
Aurora, IL 60005  
www.kgi.com



Edge Consulting Engineers, Inc.  
17445 Juniper Park, Suite 105  
Northbrook, IL 60062  
630.441.1400 ext. 200  
630.441.1569 fax  
www.edgeconsulting.com

PROJECT NO: 20161387090  
EDGE PROJECT NO: 142979  
DRAWN BY: NBT  
CHECKED BY: OSD

REV	DATE	DESCRIPTION
0	11/07/2014	FINAL SMALL CELL DWGS IMX
1	12/05/2014	FINAL SMALL CELL DWGS PER
2	03/11/2015	FINAL SMALL CELL DWGS PER
3	07/14/2015	FINAL SMALL CELL DWGS PER
4	07/14/2015	FINAL SMALL CELL DWGS PER

APPROVED

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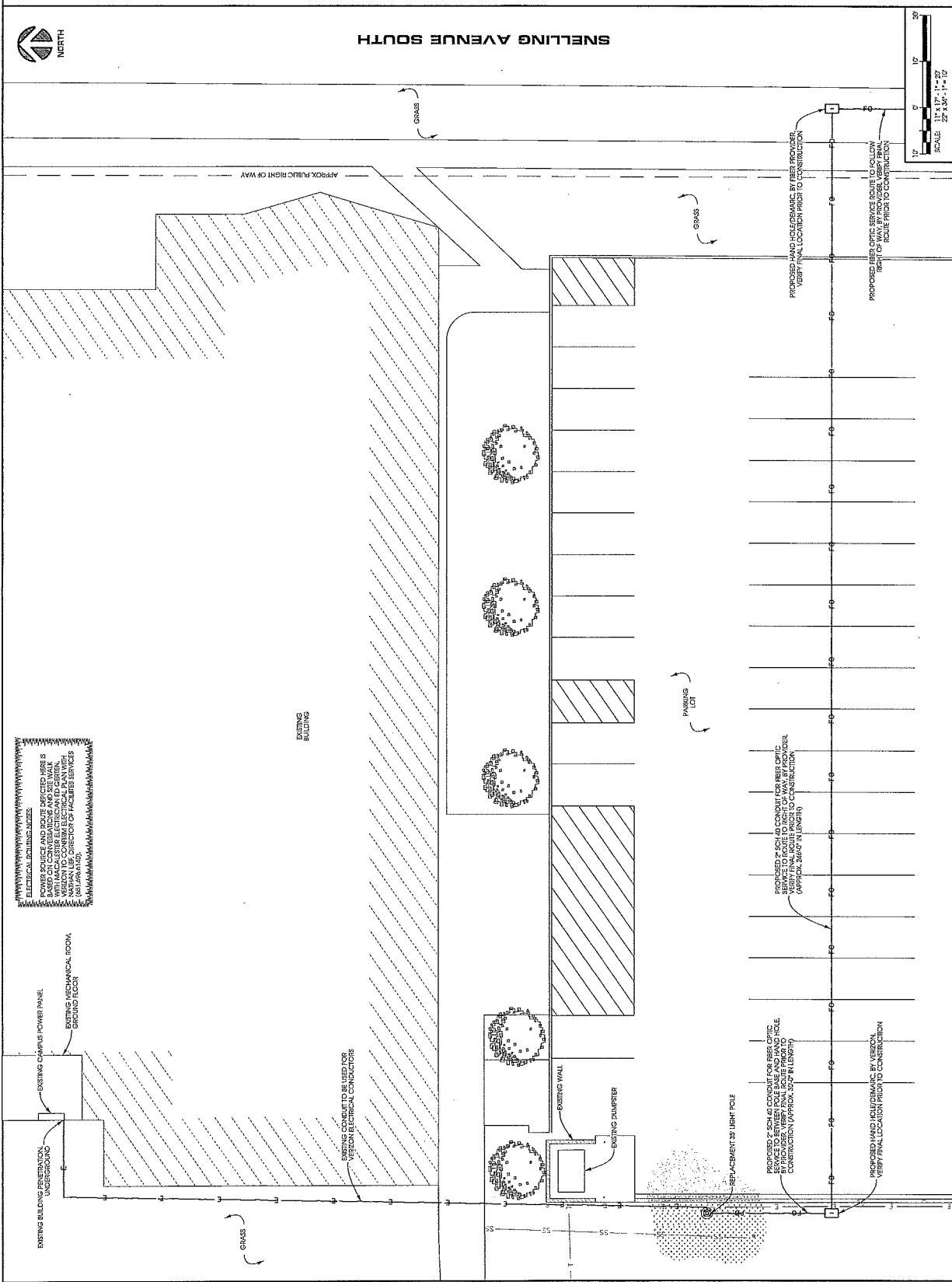
MIN SCOTS STL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE

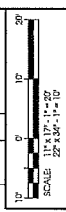
SITE PLAN

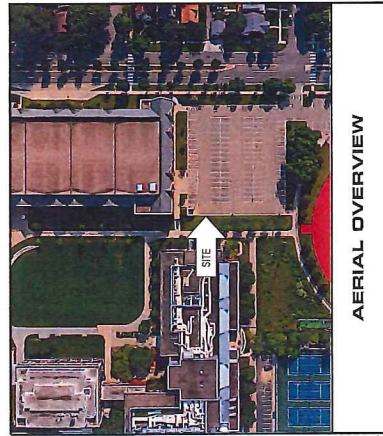
SHEET NUMBER

C-1



SNELLING AVENUE SOUTH

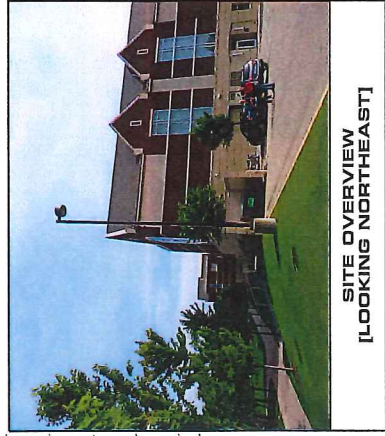




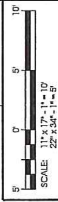
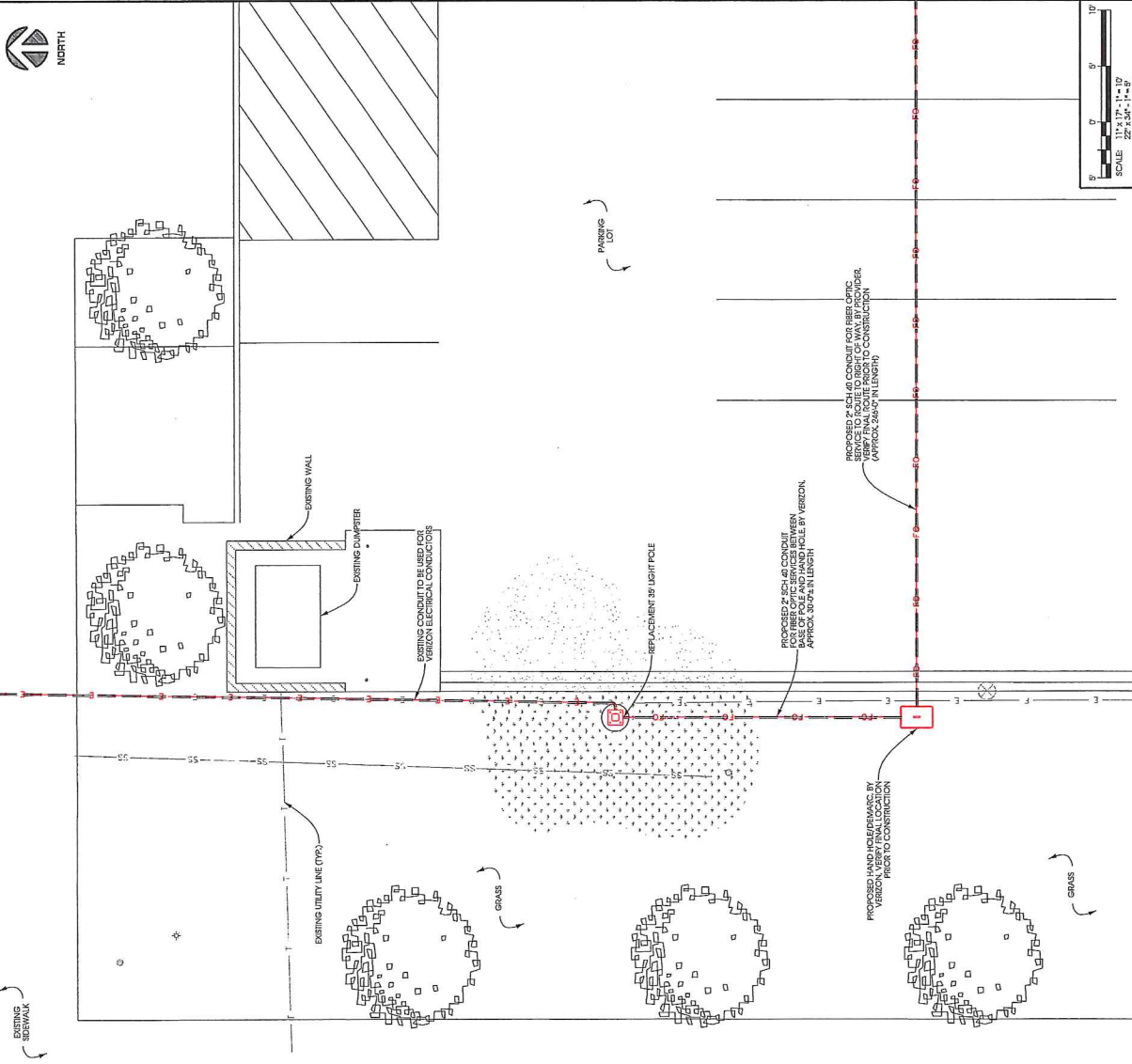
**AERIAL OVERVIEW**



**SITE OVERVIEW  
[LOOKING NORTHWEST]**



**SITE OVERVIEW  
[LOOKING NORTHEAST]**



851 East China Parkway, Building Three, Suite 370  
St. Paul, MN 55112  
www.kgiengineers.com



1746 Juniper Park, Suite 105  
St. Paul, MN 55112  
www.edgeconsulting.com

PROJECT NO: 20161387090  
EDGE PROJECT NO: 14299  
DRAWN BY: NBT  
CHECKED BY: OGD

REV	DATE	DESCRIPTION
A	08/20/2014	PRELIM SMALL CELL DWGS (R)
B	07/12/2014	PRELIM SMALL CELL DWGS (R)
C	11/07/2014	FINAL SMALL CELL DWGS (MAM)
D	12/05/2014	FINAL SMALL CELL DWGS (PER)

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MIN SCOTS STL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
**ENLARGED  
SITE PLAN**

SHEET NUMBER  
**C-2**



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Austin, TX 78726  
www.kgiwireless.com



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Austin, TX 78758  
www.edgeconsulting.com

PROJECT NO: 20161387090  
EDGE PROJECT NO: 14279  
DRAWN BY: NBT  
CHECKED BY: OSD

REV	DATE	DESCRIPTION
0	11/07/2016	FINAL SMALL CELL DWGS (M)
1	12/09/2016	FINAL SMALL CELL DWGS (M)
2	12/09/2016	FINAL SMALL CELL DWGS (M)

APPROVED

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, AND DRAWING 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.

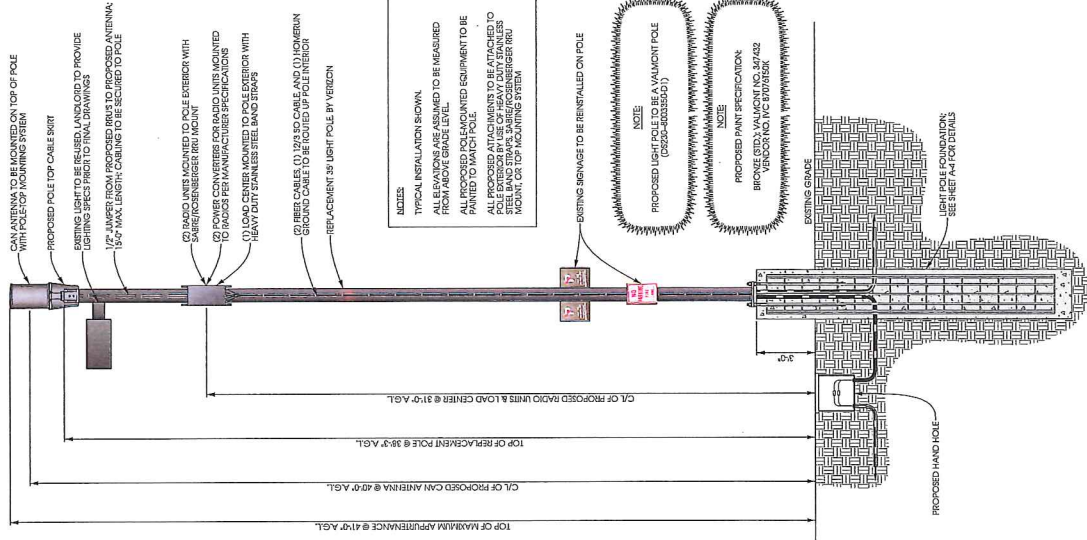
MIN SCOTS SIPPL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE

POLE ELEVATION

SHEET NUMBER

A-1



(C) LIGHT POLE ELEVATION

SCALE: 1 1/4" = 17'-1" = 6'-0"  
2 1/2" x 3 1/2" = 1" = 3'-0"

NODE INFO		RADIO		ANTENNA		PORT		C/L		ADD/EXC/DEL		MENTAL			
Full Node Name (Name GC Node#)	Node ID	Band	Model	Height	DUP	DP Power	Azimuth	Position	Qty	MFR	Model	Port	C/L	Add/Exc/Del	Mental
AWS								1.1	1	JMA	CH1070A-2-L-ND	-45	40	0	0
PCS								1.3				-45			
								1.4				-45			

COAX		TYPE		MFR		MODEL		HEIGHT		DIA.		RUN	
Qty	Run	Type	Mfr	Model	Height	Dia.	Run	Qty	Run	Type	Mfr	Model	Height
1	1	Jumper	Commisscope	LF04-50	Foam	27"	TBD						
1	1	Jumper	Commisscope	LF04-50	Foam	27"	TBD						
1	1	Jumper	Commisscope	LF04-50	Foam	27"	TBD						

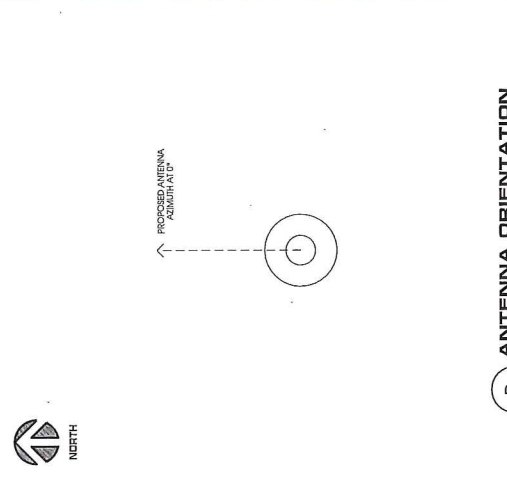
(A) ANTENNA AND COAX

SCALE: NIS



(B) ANTENNA ORIENTATION

SCALE: NIS



(B) ANTENNA ORIENTATION

SCALE: NIS



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 52105-0055, Mankato  
 www.kgiengineers.com



1745 Juniper Park, Suite 105  
 56104-1409, Mankato  
 www.edgeconsulting.com

PROJECT NO: 20161387090  
 EDGE PROJECT NO: 14299  
 DRAWN BY: NBT  
 CHECKED BY: OGD

REV	DATE	DESCRIPTION
A	06/20/2016	PRELIM SMALL CELL DWGS FOR
B	07/12/2016	PRELIM SMALL CELL DWGS FOR
0	11/07/2016	FINAL SMALL CELL DWGS (M.A.M.)
1	12/05/2016	FINAL SMALL CELL DWGS (PER

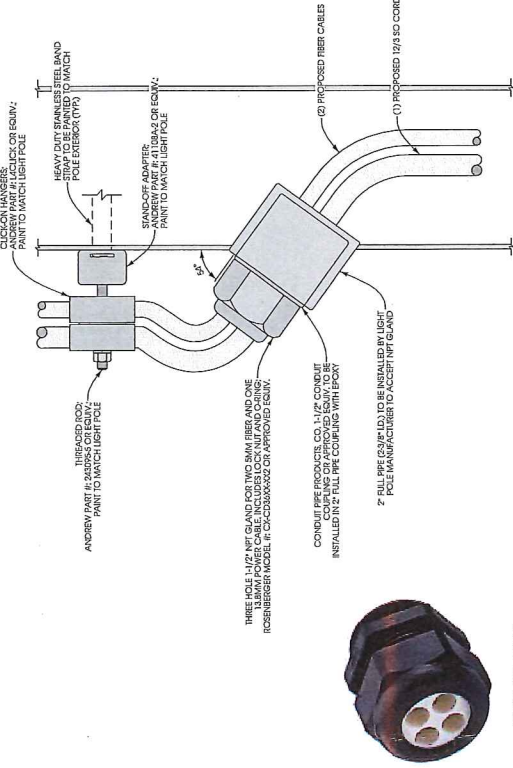
APPROVED

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MIN SCOTS STL SC  
 ST. PAUL, MINNESOTA  
 REPLACEMENT LIGHT POLE  
 SMALL CELL DRAWINGS

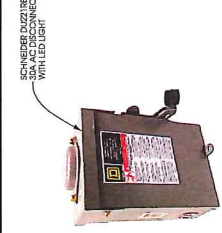
SHEET TITLE

SHEET NUMBER  
**A-2**



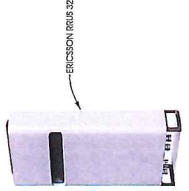
**B PENETRATION DETAIL**  
 SCALE: NTS

**SCANNERS ELEC/DU22 IRR**  
 - 2 POLES  
 - MAX CURRENT RATING: 30 A  
 - VOLTAGE RINGS: 240 VAC  
 - WEIGHT: 29.7 LB  
 - DIMENSIONS: 29" x 7.25" x 3.75"  
 CONTRACTOR TO INSTALL LED LIGHT

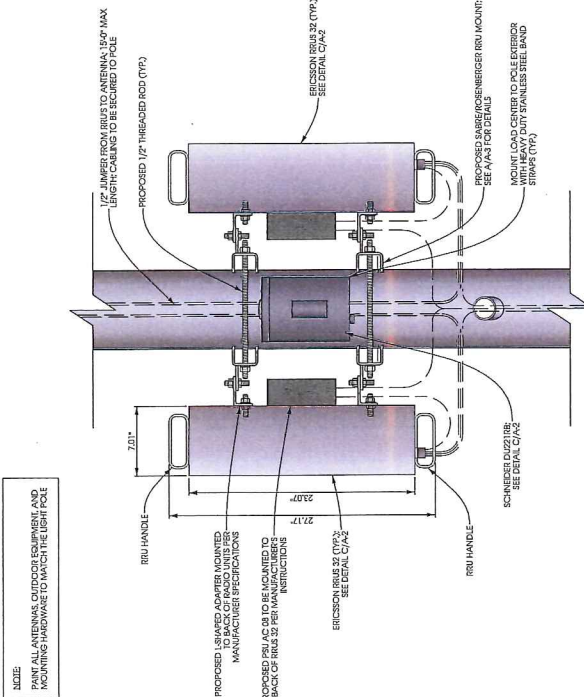


**C LOAD CENTER DETAIL**  
 SCALE: NTS

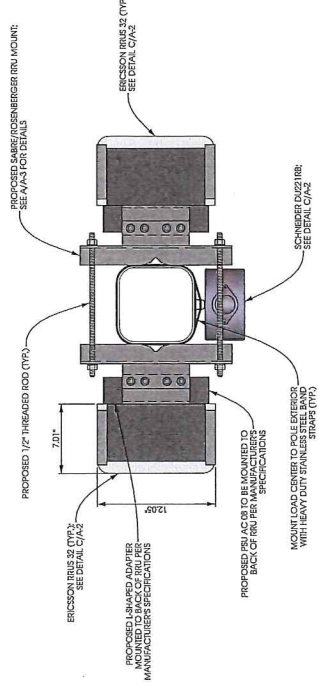
**ERICSSON RIBS 32**  
 - SINGLE BAND 4X / 8X  
 - ADJ. SW. 100 W  
 - 2 PORTS x 10 GHz CPRI  
 DIMENSIONS: 20.7" x 12.7" x 6.4"  
 (WITHOUT UPPER HANDLE)  
 WEIGHT: 52.7 LB



**D RADIO DETAIL**  
 SCALE: NTS



**ELEVATION VIEW**



**PLAN VIEW**

**A EQUIPMENT MOUNTING DETAIL**  
 SCALE: 1/2" = 1'-0"

**Antenna Systems Group**

**JMA WIRELESS**

**CYL-X7CAP-2**

Small Cell Antenna, 688-895/1695-2180MHz, 2FT

- X-Pro Small Cell
- Internally Duplexed option
- Suitable for Pole or Building mount
- Broadband Radiators (AMS-3)
- Internal Beam conditioning
- Integrated Global Position System (GPS) option

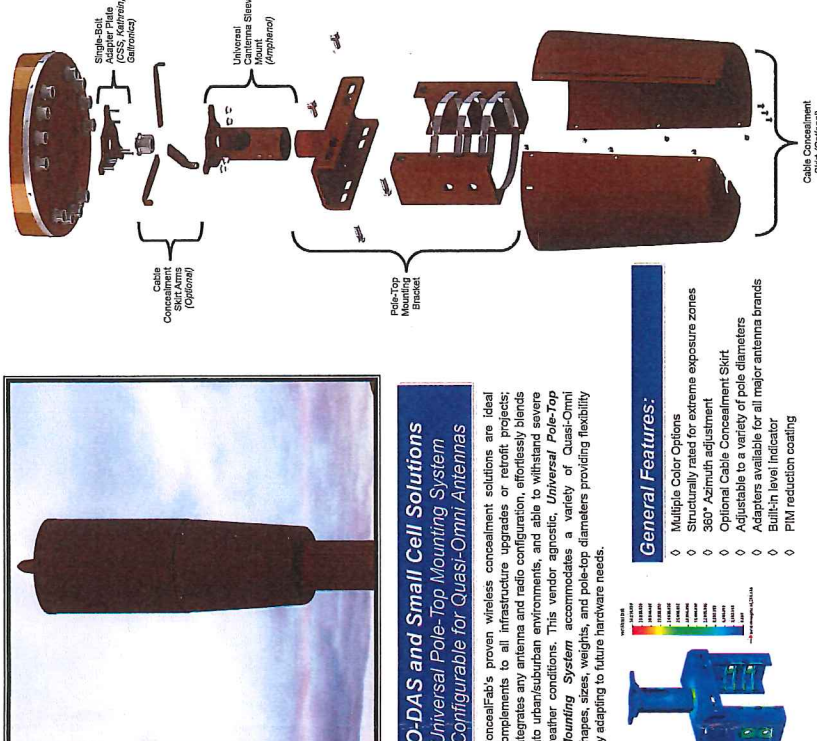
**Integrated Duplexers**  
Requires half the number of feeder cables

ELECTRICAL SPECIFICATIONS	
Frequency Band, MHz	688-895 +/-4C*
Electric Down Tilt	0°
VSWR Return Loss, dB, Maximum (Non-Duplexed)	1.5:1@14.0
VSWR Return Loss, dB, Maximum (Duplexed)	1.6:1@12.8
Isolation Between Ports, dB, Minimum	24
Impedance, ohms	-450
Maximum Power FEM Connector, CW (W)	250
<b>MECHANICAL SPECIFICATIONS</b>	
Dimensions, Height/Diameter	24.2/16.1 in (615/411 mm)
Antenna RF Connector Type	7/16 DIN Female
Antenna RF Connector Torque	DIN 220-265 (30-30 N-m)
GPS Connector Type	Mini DIN Female (4-1/2 per IEC 61169-4)
GPS Connector Torque	Mini DIN 88.5 (9.8-10 Nm)
Connector Location	Bottom
Radiation Material	PVC
Wind Survival	150 mph (241 km/h)
Front Wind Load	45.9 lb (204.18N) @ 100mph
Equivalent Flat Plate	0.91 sq-ft (0.2) @ 100mph

ELECTRICAL SPECIFICATIONS (based on Antenna configuration)						
Antenna Model	688-824	688-835	688-880	688-890	688-930	688-950
No. of Beams	1	2	2	2	2	2
VSWR	1.5:1	1.6:1	1.6:1	1.6:1	1.6:1	1.6:1
Isolation	24 dB	24 dB	24 dB	24 dB	24 dB	24 dB
Impedance	-450 ohms	-450 ohms	-450 ohms	-450 ohms	-450 ohms	-450 ohms
Power	250 W	250 W	250 W	250 W	250 W	250 W
<b>MECHANICAL SPECIFICATIONS (based on Antenna configuration)</b>						
Antenna Model	CYL-X7CAP-2-C	CYL-X7CAP-2-C-ND				
Beam Configuration	Omni Clover	Clover with 4 DIN connectors				
Connector Type	7/16 DIN	7/16 DIN				
Antenna Weight	2.0 lbs (0.9 kg)	2.0 lbs (0.9 kg)				

**ANTENNA SPECIFICATIONS**  
SCALE: NTS

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



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

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**ANTENNA MOUNTING DETAIL**  
SCALE: NTS

**ANTENNA DETAILS**  
SHEET NUMBER  
**A-3**

**verizon**

**KGI**  
8531 Los Olivos Parkway, Building Three, Suite 370  
Austin, TX 78745  
www.kgiwireless.com

**Edge**  
Consulting Engineers, Inc.  
17465 Juniper Park, Suite 105  
Houston, TX 77057  
www.edgeconsulting.com

PROJECT NO:	20161387090
EDGE PROJECT NO:	14299
DRAWN BY:	NBT
CHECKED BY:	OPD

REV.	DATE	DESCRIPTION
A	10/20/2016	PRELIM SMALL CELL DWGS FOR
B	10/17/2016	PRELIM SMALL CELL DWGS FOR
0	11/07/2016	FINAL SMALL CELL DWGS (MAM)
1	12/05/2016	FINAL SMALL CELL DWGS (PER)

USER COMMENTS: PROJECT APPROVED BY CONCEALFAB CORPORATION. CONCEALFAB CORPORATION HAS BEEN ADVISED BY THE USER OF THE DIRECT SUPERVISION AND THAT I AM A DAILY EMPLOYEE OF THE STATE OF MINNESOTA.

**APPROVED**

MIN SCOTS SPTL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE



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 St. Paul, MN 55126  
 612.441.4444  
 www.kgi.com



1740 Juniper Park, Suite 105  
 St. Paul, MN 55116  
 612.441.4444  
 www.edge-engineers.com

PROJECT NO: 20161387000  
 EDGE PROJECT NO: 14279  
 DRAWN BY: NBT  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION
A	10/20/2016	PRELIM SMALL CELL DWGS I&E
B	10/21/2016	PRELIM SMALL CELL DWGS NET
0	11/07/2016	FINAL SMALL CELL DWGS I&E
1	12/05/2016	FINAL SMALL CELL DWGS PER

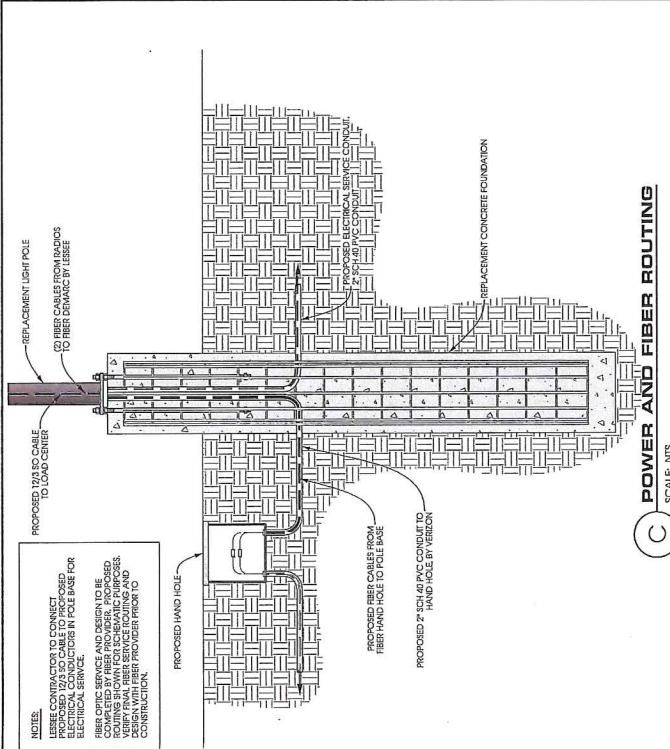
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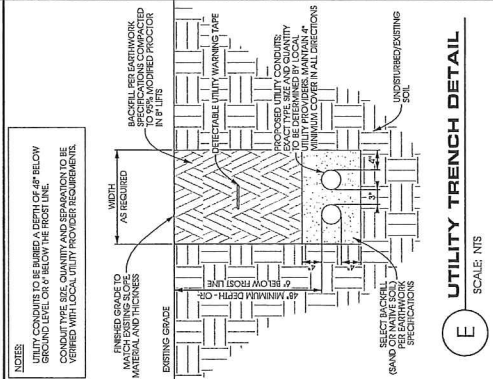
MIN SCOTS STL SC  
 ST. PAUL, MINNESOTA  
 REPLACEMENT LIGHT POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**CABLING DETAILS**

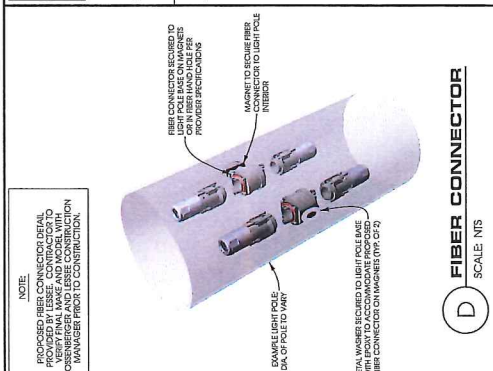
SHEET NUMBER  
**E-1**



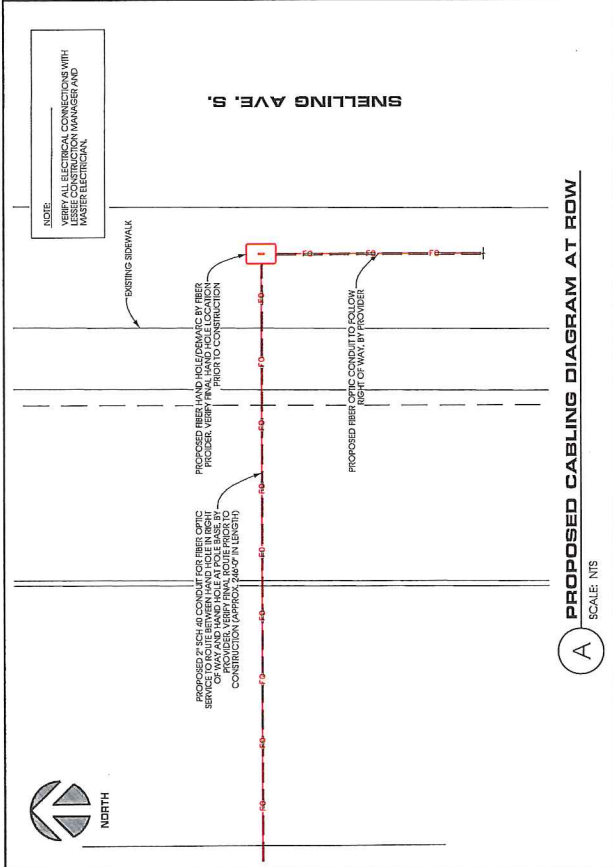
**C POWER AND FIBER ROUTING**  
 SCALE: NTS



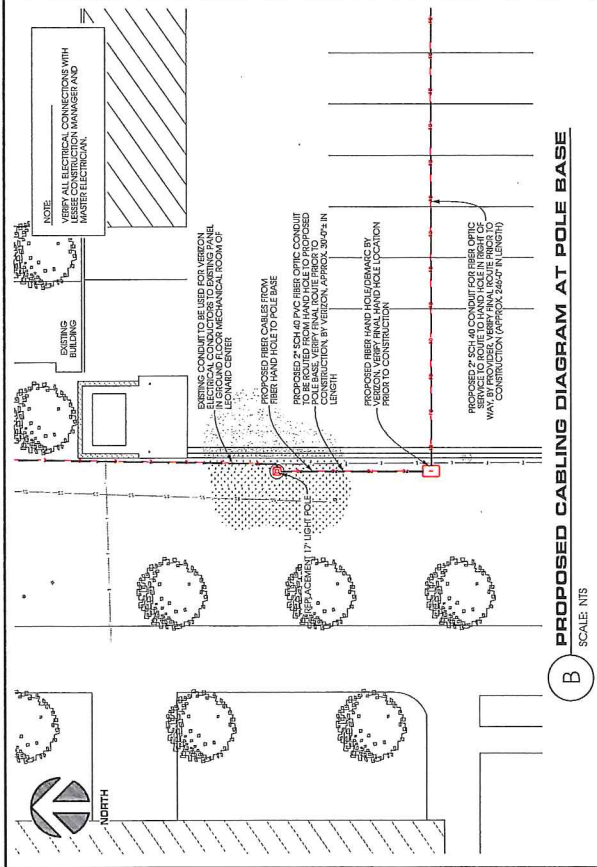
**E UTILITY TRENCH DETAIL**  
 SCALE: NTS



**D FIBER CONNECTOR**  
 SCALE: NTS



**A PROPOSED CABLING DIAGRAM AT ROW**  
 SCALE: NTS



**B PROPOSED CABLING DIAGRAM AT POLE BASE**  
 SCALE: NTS

**GENERAL ELECTRICAL NOTES**

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS AWARE OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THE CONTRACT.
2. CONTRACTOR SHALL VERIFY ALL MATERIALS, EQUIPMENT, METHODS AND WORKMANSHIP WITH THE DESIGNER, OWNER, ARCHITECT AND ALL AFFECTED AGENCIES PRIOR TO CONSTRUCTION. CONTRACTOR SHALL SUBMIT 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 DIAGNOSTIC ONLY. FOLLOW AS CLOSELY AS POSSIBLE.
5. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, JBOX, SWITCH BOX, ETC. IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
6. CONTRACTOR SHALL PROVIDE LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONNECTION TOOLS, DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED. SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS.
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 CASE OR GROUP OF EQUIPMENT. MATERIALS SHALL BE APPROVED BY THE DESIGNER. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING REGULATIONS. MATERIALS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA, AND NETA.
8. CONTRACTOR SHALL CARRY OUT THE WORK IN ACCORDANCE WITH ALL GOVERNING STATE, COUNTY AND LOCAL CODES AND OSHA.
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. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DEFECTS THAT PERIOD SHALL BE CORRECTED AT ONCE.
11. ALL CONDUIT ONLY (CO) SHALL HAVE A PULL WIRE OR ROPE.
12. PROVIDE CONNECTION INQUIRIES WITH ONE SET OF COMPLETE ELECTRICAL AS REPAIRED 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 TAP CONNECTIONS ON ALL MULTICIRCUITS 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 THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 1000I AIC.
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 BLOWER OUTLETS, SHALL HAVE ENGRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE RAINCO #80A, 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. METS CODES AND OSHA REGULATIONS SHALL BE STRICTLY OBSERVED. ALL ELECTRICAL WORK SHALL BE COMPLETED BY EXISTING SERVICE BARRIER SHALL BE OF THE 10' OR 16' TYPE.
24. ALL MATERIALS SHALL BE U.L. LISTED.
25. CONDUIT:
  - A. CONDUIT SHALL BE RIGID PVC OR GALVANNEED STEEL UNLESS OTHERWISE NOTED. CONDUIT SHALL BE USED IN UNDERGROUND ROADWAYS AND LOCATIONS SUBJECT TO CASUAL IMPACTS. BENDS SHALL BE MADE USING WIDE SWEEP (1/4" RADIUS) BEND FITTINGS. ANY CONDUIT RUNS TO BE INSTALLED SHALL BE U.L. LABEL GALVANNEED INSIDE AND OUTSIDE. CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ALL APPLICABLE CODES. CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2" LAMINATED WITH HUNG 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 CONNECTION TYPE.
  - C. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE SPARK AND FLAME RESISTANT.
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. PENETRATION IN FIRE RATED WALLS SHALL BE FIRE STOPPED IN ACCORDANCE WITH SECTION 7.12. PENETRATION -
  - A. PENETRATION THROUGH CONCRETE SHALL BE MADE BY CASTING CONCRETE WALKS OUT FLOORS, HARBERS FOR EXISTING OR ADDITIONAL SERVICES. REQUIRED THAT TENDONS OR PENETRATING STEEL MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT (X-RAY DAMAGED UNDER ANY CIRCUMSTANCES.
  - B. UPON COMPLETION OF WORK, CONDUIT CONTINUITY, SHORT CIRCUIT AND FAULT 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 UNIMPAIRED CONDITION.
  - C. CONTRACTOR SHALL PROVIDE TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL WORKING COSTS TO BE PAID BY CONTRACTOR.
29. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY POWER LIGHTING SYSTEM DESCRIBED IN THE RFP.

**ELECTRICAL NOTES**



**REPLACEMENT LIGHT POLE LOCATION**



**REPLACEMENT LIGHT POLE LOCATION**



851 East Chippewa Parkway, Building Three, Suite 279  
St. Paul, MN 55126  
651.941.1609  
www.kgi-electric.com



Edge Consulting Engineers, Inc.  
1745 Juniper Park, Suite 105  
St. Paul, MN 55126  
651.941.1609  
www.edgeconsulting.com

PROJECT NO:	20161987000
EDGE PROJECT NO:	14299
DRAWN BY:	NBT
CHECKED BY:	OSD

REV.	DATE	DESCRIPTION
1	10/12/2016	PRELIMINARY SMALL CELL DRAWING
2	10/12/2016	PRELIMINARY SMALL CELL DRAWING
3	11/07/2016	FINAL SMALL CELL DWGS
4	12/05/2016	FINAL SMALL CELL DWGS

APPROVED

THESEY CERTIFY THAT THIS PLAN SPECIFICATION, DRAWING, AND/OR CALCULATION IS A TRUE AND CORRECT REPRESENTATION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MIN SCOTS STPL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
ELECTRICAL  
NOTES

SHEET NUMBER  
E-2



805 East Grand Parkway, Building Three, Suite 370  
 St. Paul, MN 55126  
 651.441.1568  
 www.kgi.com



**Edge**  
 Consulting Engineers, Inc.  
 17445 Juniper Point, Suite 105  
 Minneapolis, MN 55425  
 651.441.1568  
 www.edgeconsult.com

PROJECT NO: 20161387090  
 EDGE PROJECT NO: 14299  
 DRAWN BY: KJG  
 CHECKED BY: OGD

REV	DATE	DESCRIPTION	BY
A	18/23/2016	PHOTO SIMULATION	KJG

PRELIMINARY -  
 NOT FOR CONSTRUCTION

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

MINI SCOTS STRL 8C  
 ST. PAUL MN  
 REPLACEMENT LIGHT POLE  
 PHOTO SIMULATION

SHEET TITLE  
**PHOTO SIM 1**

SHEET NUMBER  
**PS-1**



ACTUAL PHOTOGRAPH BEFORE SIMULATION



PHOTO SIMULATION OF NEW INSTALLATION



**SITE NAME:** MIN NEILL STPL SC

**SITE NUMBER:** 20161387086

**LOCATION CODE:** 414785

**SITE TYPE:** SMALL CELL

**POLE TYPE:** REPLACEMENT 17' LIGHT POLE



833 Las Cimvas Parkway, Building Three, Suite 370  
St. Paul, MN 55108  
Phone: 651.255.2700  
www.kgiengineers.com



1745 Juniper Park, Suite 105  
St. Paul, MN 55108  
Phone: 651.447.1020  
www.kgiengineers.com

PROJECT NO:	20161387086	
EDGE PROJECT NO:	14295	
DRAWN BY:	NBT	
CHECKED BY:	OSD	
REV	DATE	DESCRIPTION
A	06/20/2016	PRELIM SMALL CELL DWS/INT
B	06/15/2016	PRELIM SMALL CELL DWS/INT
0	11/04/2016	FINAL SMALL CELL DWS/INT
1	12/05/2016	FINAL SMALL CELL DWS/INT

PROFESSIONAL ENGINEER  
I HEAVY CERTIFY THIS PLAN WAS  
PREPARED BY ME OR UNDER MY  
SUPERVISION AND THAT I AM A DULY  
LICENSED PROFESSIONAL ENGINEER  
UNDER THE LAWS OF THE STATE OF  
MINNESOTA.  
PRINTED NAME: *Otha D. Diefel*  
SIGNATURE: *[Signature]*  
DATE: 12/14/16  
KGI ENGINEER # 6020

MIN NEILL STPL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
**TITLE SHEET & PROJECT DATA**

SHEET NUMBER  
**T-1**



**SITE INFORMATION**

APPROXIMATE ADDRESS:  
130 S. MACON LESTER ST.  
ST. PAUL, MN 55108  
RAMSEY COUNTY

LATITUDE & LONGITUDE  
LAT: 44° 56' 14.88" N  
LONG: 93° 10' 14.29" W  
GROUND ELEVATION: 245' AMSL  
(PER 1A CERTIFICATE)

POLE HEIGHT:  
17.5' T.O.C.

MAXIMUM APPEARANCE HEIGHT:  
22.5' A.G.L.

**APPLICABLE CODES**

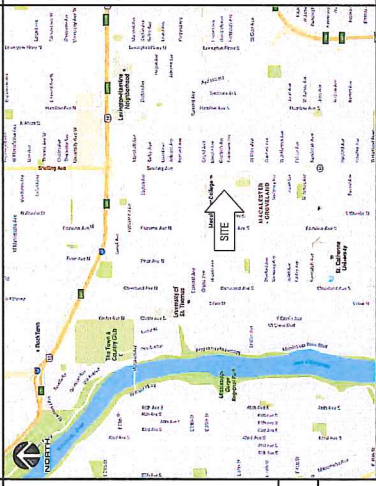
ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:  
- 2012 INTERNATIONAL BUILDING CODE  
- 2010 INTERNATIONAL ELECTRICAL CODE  
- IAWA 222.8 OR LATEST EDITION

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

**LOCATION SCAN**



**AREA MAP**



**LOCATION MAP**



**PROJECT DESCRIPTION/SOW**

- INSTALL (C) REPLACEMENT 17 FT STEEL LIGHT POLE AND ASSOCIATED CONCRETE FOUNDATION
- INSTALLATION OF CAN ANTENNA
- INSTALLATION OF ERICSSON IRIS AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER/BREAKER BOX
- INSTALLATION OF HAND HOLE FOR FIBER AT POLE BASE BY VERIZON
- INSTALLATION OF HAND HOLE FOR FIBER IN ROW, BY PROVIDER
- 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 AT POLE BASE AND HAND HOLE IN ROW (APPROX. 18'0") TO BE DIRECTIONALLY BORED BELOW GRADE BY PROVIDER
- INSTALLATION OF CONDUIT FOR FIBER IN ROW, BY PROVIDER
- INSTALLATION OF ELECTRICAL CONDUCTORS IN EXISTING CONDUIT TO CAMPUS POWER SOURCE BY VERIZON
- INSTALLATION OF GROUND RING AROUND POLE FOUNDATION
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS

**PROJECT DIRECTORY**

**LESSOR:**  
VERIZON WIRELESS  
10801 BUSH LAKE RD  
ST. PAUL, MN 55102  
CONTACT: COLIN W. BEHNZ  
PHONE: 952.746.6674

**LESSEE:**  
10801 BUSH LAKE RD  
ST. PAUL, MN 55102  
PHONE: 651.266.8989

**ENGINEERING COMPANY:**  
EDGE CONSULTING ENGINEERS, INC.  
1745 JUMPER PATH  
SUITE 105  
LAKELAND, MN 55124  
CONTACT: OTTO DINGFELDER III, P.E.  
PHONE: 651.447.1447

**ENGINEER:**  
VERIZON WIRELESS  
10801 BUSH LAKE RD  
BLOOMINGTON, MN 55438  
CONTACT: JOHN MULLINS

**SITE ACQUISITION:**  
KGI  
805 LAS CIMVAS PKWY  
BUILDING THREE, SUITE 370  
ST. PAUL, MN 55108  
CONTACT: KARYN COBREN  
PHONE: 952.288.6130

**SHEET INDEX**

NO:	SHEET TITLE
T-1	TITLE SHEET & PROJECT DATA
C-1	ENLARGED SITE PLAN
C-2	POLE ELEVATION
A-1	FOUNDING DETAILS
A-2	FOUNDING DETAILS
A-3	EQUIPMENT DETAILS
A-4	EQUIPMENT DETAILS
A-5	CABLE MOUNTING DETAILS
E-1	CABLEING 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 ASHORE 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 P.E. 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 (P.E. # 49720 (MN))  
PHONE: 651.447.1449

**STRUCTURAL REVIEW**

LIGHT POLE STRUCTURAL ANALYSIS COMPLETED BY EDGE CONSULTING ENGINEERS, INC.  
DATE: 07/25/2016

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



853 Los Chapo Parkway, Building Three, Suite 370  
St. Paul, MN 55102-2524  
www.kgiengineers.com



1745 Juniper Park, Suite 105  
St. Paul, MN 55104-1499  
www.edgeconsulting.com

PROJECT NO: 20161387089  
EDGE PROJECT NO: 14295  
DRAWN BY: NBT  
CHECKED BY: OGD

REV	DATE	DESCRIPTION
A	08/20/2016	PRELIM SMALL CELL DWGS (N)
B	09/12/2016	PRELIM SMALL CELL DWGS (N)
0	11/04/2016	FINAL SMALL CELL DWGS (MAM)
1	12/05/2016	FINAL SMALL CELL DWGS (MAM)

APPROVED

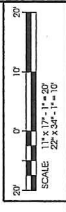
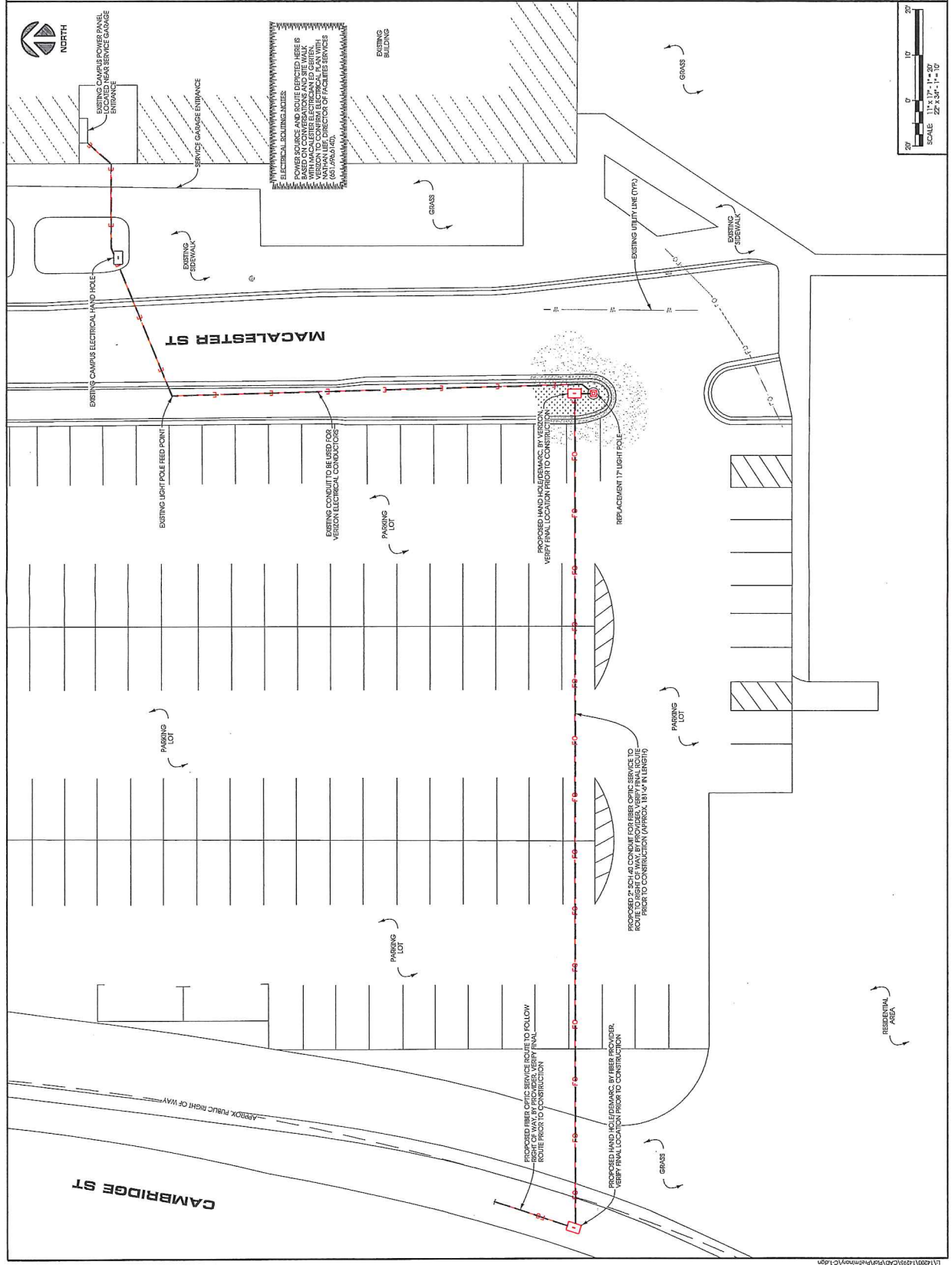
VERIZON CANNOT BE HELD RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED HEREIN. VERIZON'S DIRECT SUPERVISION AND THAT I AM A DRAFTSMAN UNDER THE LAWS OF THE STATE OF MINNESOTA.

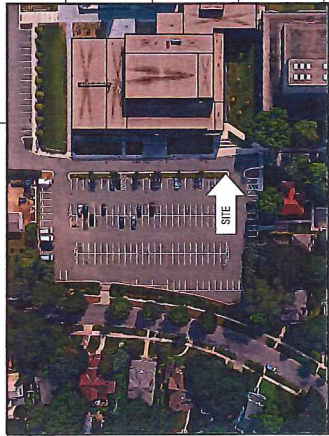
MIN NELL STPL SC  
ST PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
SITE PLAN

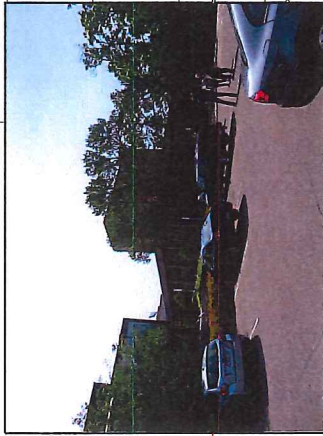
SHEET NUMBER  
C-1

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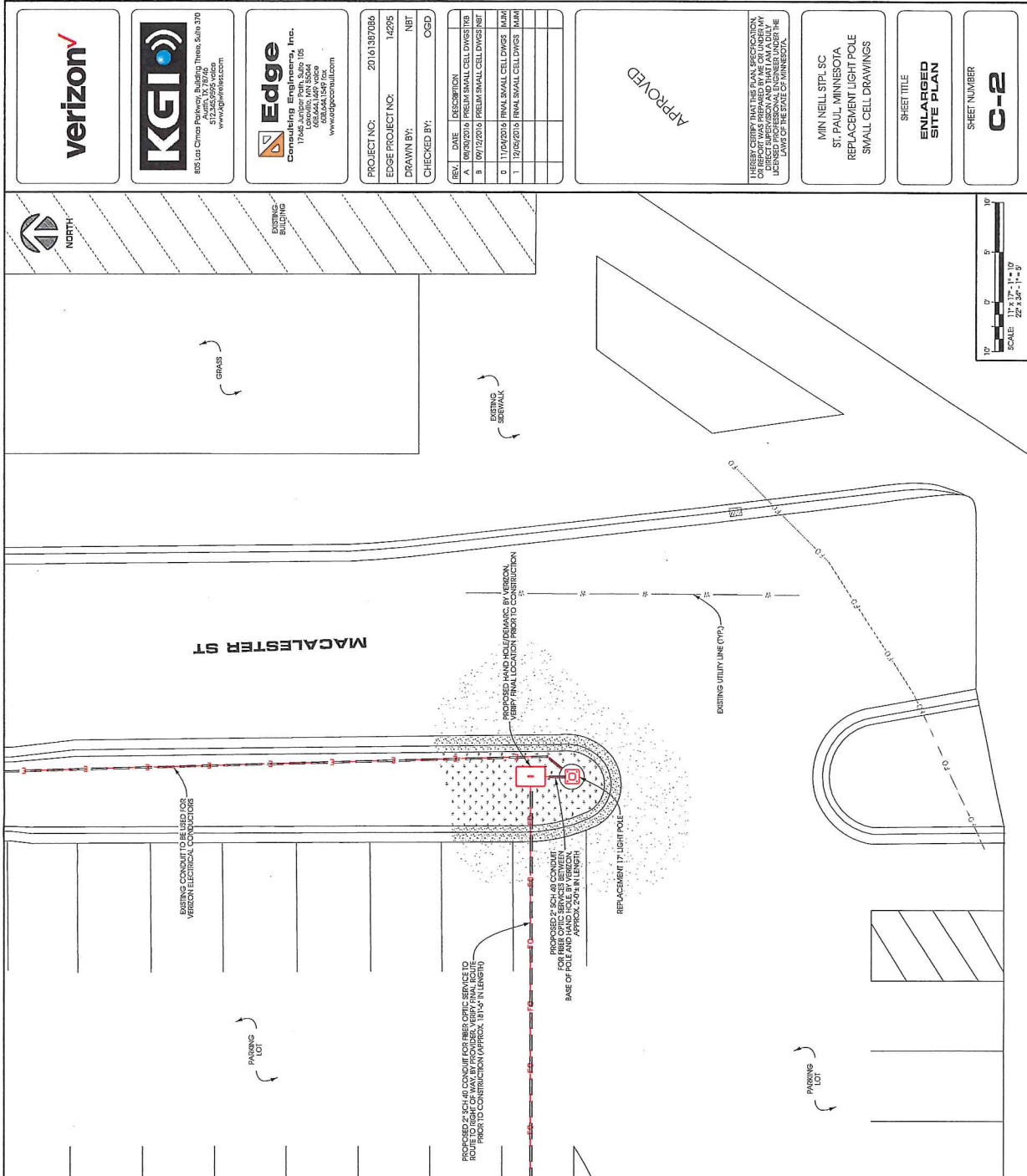
**AERIAL OVERVIEW**



**SITE OVERVIEW  
[LOOKING SOUTHEAST]**



**SITE OVERVIEW  
[LOOKING NORTHWEST]**



PROJECT NO: 20161387086  
 EDGE PROJECT NO: 14295  
 DRAWN BY: NBT  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION
0	11/04/2014	RIVAL SMALL CELL DWGS - MARK
1	12/05/2014	RIVAL SMALL CELL DWGS - MARK

APPROVED

MIN NELL SPL SC  
 ST. PAUL, MINNESOTA  
 REPLACEMENT LIGHT POLE  
 SMALL CELL DRAWINGS

SHEET TITLE  
**ENLARGED  
 SITE PLAN**

SHEET NUMBER  
**C-2**

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8531 Loc China Parkway, Building Three, Suite 370  
 St. Paul, MN 55125  
 www.kgiwireless.com



1745 Juniper Park, Suite 105  
 St. Paul, MN 55116  
 www.edgeconsulting.com

PROJECT NO: 20161587856  
 EDGE PROJECT NO: 14295  
 DRAWN BY: NBT  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION
A	08/20/2016	PRELIM SMALL CELL DWGS (M)
B	10/12/2016	PRELIM SMALL CELL DWGS (N)
0	11/04/2016	FINAL SMALL CELL DWGS (M,M)
1	12/29/2016	FINAL SMALL CELL DWGS (M,M)

APPROVED

MIN NEILL STPL SC  
 ST. PAUL - MINNESOTA  
 REPLACEMENT LIGHT POLE  
 SMALL CELL DRAWINGS

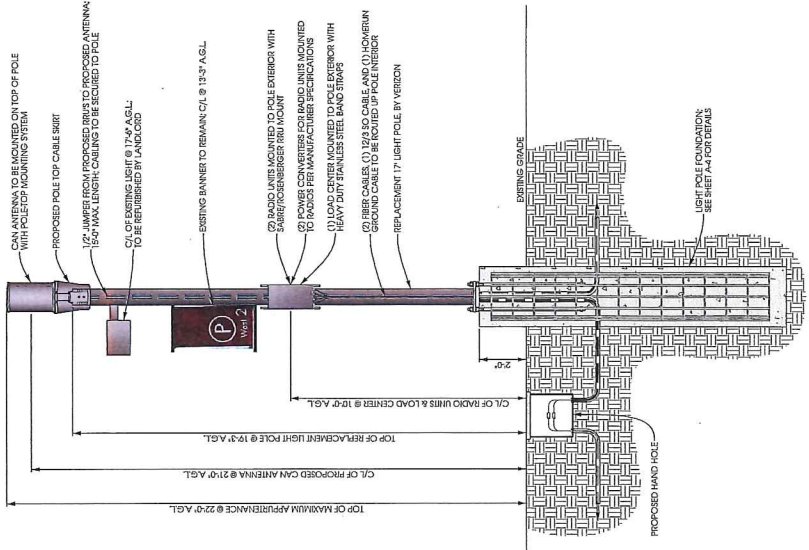
SHEET TITLE  
**POLE ELEVATION**

SHEET NUMBER  
**A-1**

**NOTE**  
 PROPOSED LIGHT POLE TO BE A VALUANT POLE  
 (03228-803355-01)

**NOTE**  
 PROPOSED PAINT SPECIFICATION:  
 BROWN (RUST) (MIL-COT-17070) (2016)

**NOTES**  
 TYPICAL INSTALLATION SHOWN.  
 ALL DIMENSIONS TO BE MEASURED  
 FROM THE CENTER OF THE  
 POLE TO THE CENTER OF THE  
 EQUIPMENT TO BE ATTACHED TO  
 THE POLE. ALL DIMENSIONS  
 SHALL BE TO THE CENTER OF THE  
 EQUIPMENT UNLESS OTHERWISE  
 NOTED. ALL DIMENSIONS SHALL  
 BE TO THE CENTER OF THE  
 EQUIPMENT UNLESS OTHERWISE  
 NOTED. ALL DIMENSIONS SHALL  
 BE TO THE CENTER OF THE  
 EQUIPMENT UNLESS OTHERWISE  
 NOTED.



**C LIGHT POLE ELEVATION**  
 SCALE: 1" = 10', 1" = 8'-0"  
 2" = 3'-0", 1" = 2'-0"

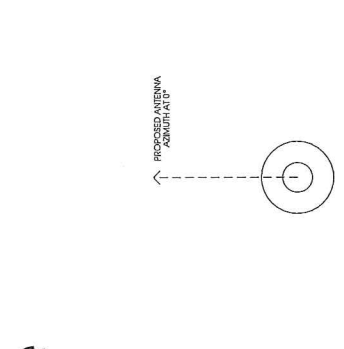
NODE INFO		RADIO		ANTENNA		POLE		MECHANICAL	
Node Name (Name - 427 - 11444)	Node ID	Brand	Model	Qty	Position	Height	Model	Height	Material
MIN NEILL STPL SC	44	AMS	0	1	1.1	45	01-1000-2-C-40	0	0
Coordinate	44	PCS	0	1	1.2	45	MA	0	0
Latitude	44	PCS	0	1	1.3	45		0	0
Longitude	44	PCS	0	1	1.4	45		0	0
Ground Elevation	44	PCS	0	1	1.4	45		0	0

QTY	TYPE	MFR.	MODEL	ELECTRIC	DL	FIN
1	Jumper	Commscope	LF94-50	Foam	3/2"	TBD
1	Jumper	Commscope	LF94-50	Foam	3/2"	TBD
1	Jumper	Commscope	LF94-50	Foam	3/2"	TBD

**A ANTENNA AND COAX**  
 SCALE: NTS



**LIGHT POLE ELEVATION**



**B ANTENNA ORIENTATION**  
 SCALE: NTS



851 East China Parkway, Building Three, Suite 370  
 St. Paul, MN 55116  
 612.755.8746  
 www.kgiwireless.com



1745 Juniper Park, Suite 105  
 St. Paul, MN 55116  
 612.444.4474  
 www.edgeconsulting.com

PROJECT NO: 20161387086  
 EDGE PROJECT NO: 14295  
 DRAWN BY: NBT  
 CHECKED BY: OGD

REV	DATE	DESCRIPTION
A	08/29/2016	PRELIM SMALL CELL DWGS (NBT)
B	09/12/2016	PRELIM SMALL CELL DWGS (NBT)
0	11/04/2016	FINAL SMALL CELL DWGS (MAM)
1	12/09/2016	FINAL SMALL CELL DWGS (MAM)

APPROVED

DESIGNER CERTAINS THAT THE INFORMATION CONTAINED HEREIN IS ACCURATE AND COMPLETE TO THE BEST OF HIS KNOWLEDGE AND THAT HE HAS PREPARED THE SAME IN ACCORDANCE WITH THE PROFESSIONAL ENGINEERING ACT AND THE RULES OF THE BOARD OF PROFESSIONAL ENGINEERS OF THE STATE OF MINNESOTA.

MIN NELL STPL SC  
 ST. PAUL, MINNESOTA  
 REPLACEMENT LIGHT POLE  
 SMALL CELL DRAWINGS

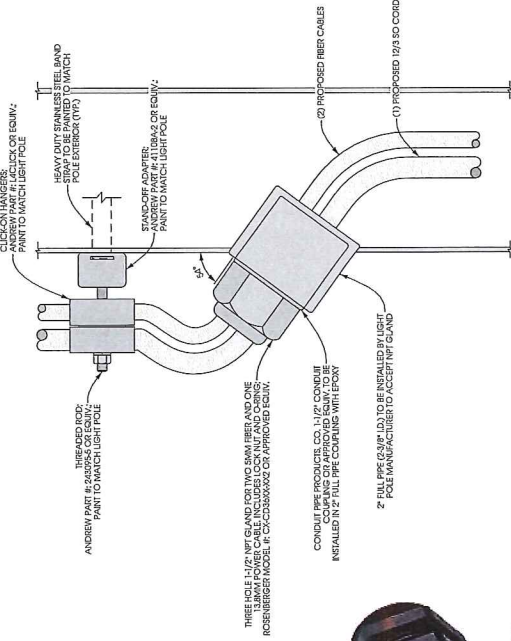
SHEET TITLE

MOUNTING DETAILS

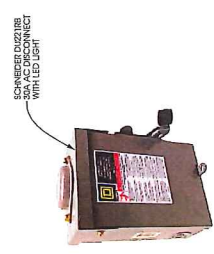
SHEET NUMBER

A-2

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**B PENETRATION DETAIL**  
 SCALE: NTS



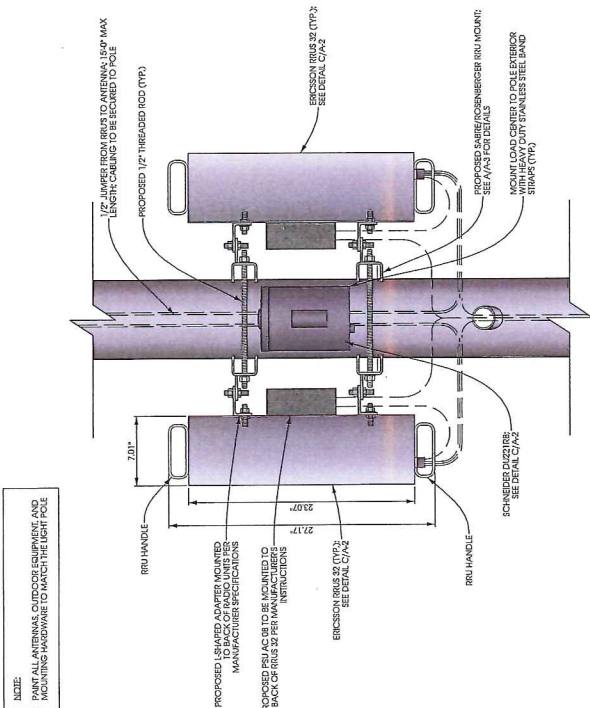
**C LOAD CENTER DETAIL**  
 SCALE: NTS



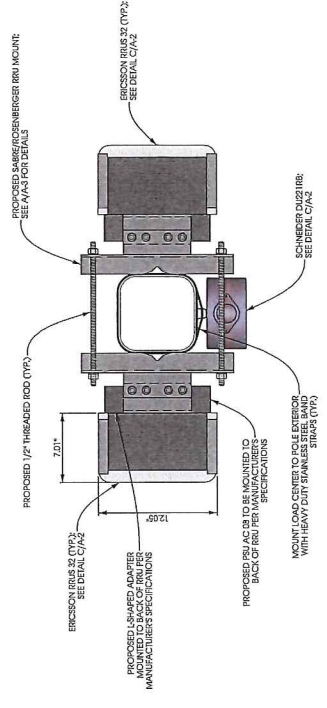
**D RADIO DETAIL**  
 SCALE: NTS

SCHERMER RADIO 32  
 DIMENSIONS: 10.5" x 10.5" x 10.5"  
 MAX CURRENT DRAWING: 30 A  
 VOLTAGE RATING: 240 VAC  
 DIMENSIONS: 8.5" x 7.25" x 3.75"  
 WEIGHT: 1.5 LBS  
 CONTRACTOR TO INSTALL LED LIGHT

ERICSSON RRU 32  
 DIMENSIONS: 12.5" x 12.5" x 12.5"  
 WEIGHT: 2.2 LBS



**ELEVATION VIEW**



**PLAN VIEW**

**A EQUIPMENT MOUNTING DETAIL**  
 SCALE: 1/4" = 1'-0"  
 2X 3/4" = 1'-0"

1745 JUNIPER PARK, SUITE 105, ST. PAUL, MN 55116

**Antenna Systems Group**

**JMA WIRELESS**

**CYL-X7CAP-2**

Small Cell Antenna, 698-895/1665-2180MHz, 2FT

- X-Pol Small Cell
- Internally Duplexed option
- Suitable for Pole or Building mount
- Broadband Radiators (AW5-3)
- Internal Beam combining
- Integrated Global Position System (GPS) option

**Interrelated Duplexers**  
Requires half the number of feeder cables

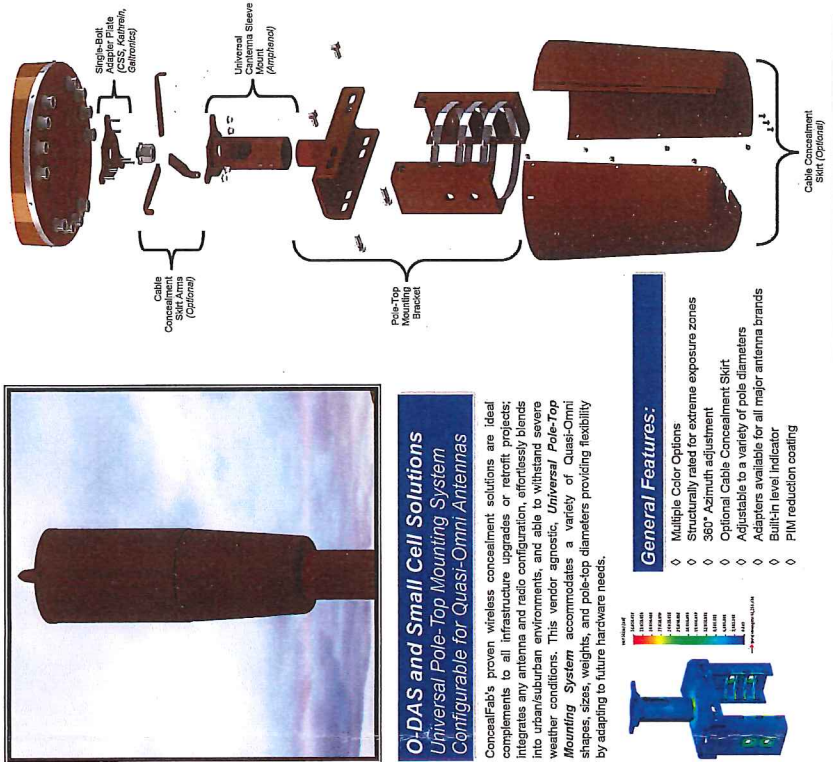
Frequency Band, MHz	698-895	1665-2180
Frequency Band, MHz	698-895	1665-2180
Physical Height	44.4"	44.4"
Element Down Tilt	0°	0°
VSWR Return Loss, dB, Maximum (Non-Duplexed)	1.5:1 @ 14.0	1.5:1 @ 14.0
VSWR Return Loss, dB, Maximum (Duplexed)	1.6:1 @ 12.8	1.6:1 @ 12.8
Isolation Between Ports, dB, Minimum	24	25
Impedance, ohms	-150	-150
Maximum Power Per Connector, CW (W)	50	50
	250	125

ELECTRICAL SPECIFICATIONS		MECHANICAL SPECIFICATIONS	
Dimensions, Height/Width	24.2/15.1 in (615/384 mm)	Dimensions, Height/Width	24.2/15.1 in (615/384 mm)
Antenna RF Connector Type	7/16 DIN Female	Antenna RF Connector Torque	DIN 226262 (0.6in) (25-30 N-m)
GPS Connector Type	Mini DIN Female (4:1:2.5 per IEC 61169-4)	GPS Connector Torque	Mini DIN Female (4:1:2.5 per IEC 61169-4)
Connector Location	Bottom	Connector Location	Bottom
Radome Material	PVC	Radome Material	PVC
Wind Survival	150 mph (241 km/h)	Wind Survival	150 mph (241 km/h)
Front Wind Load	45.9 lbf (204.18N) @ 10mph	Front Wind Load	45.9 lbf (204.18N) @ 10mph
Equivalent Flat Plate	0.1 sq ft (0.2) @ 100mph	Equivalent Flat Plate	0.1 sq ft (0.2) @ 100mph

ELECTRICAL SPECIFICATIONS (based on Antenna configuration)		MECHANICAL SPECIFICATIONS (based on Antenna configuration)	
Antenna Model	698-824	698-824	1665-1880
No. of Elements	4	4	4
Horizontal Beamwidth	100°	100°	100°
Vertical Beamwidth	10°	10°	10°
Gain (dBi)	10.5	10.5	10.5
VSWR	1.5	1.5	1.5
Return Loss	15.0	15.0	15.0
Isolation	24	24	24
Impedance	50	50	50
Power	50	50	50
Weight	2.5	2.5	2.5

**A ANTENNA SPECIFICATIONS**  
SCALE: NIS

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



**ConcealFab Corporation**  
WWW.CONCEALFAB.COM PH: 719.599.3400 SALES@CONCEALFAB.COM  
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Content and specifications are typical and subject to change without notice

**B ANTENNA MOUNTING DETAIL**  
SCALE: NIS



PROJECT NO:	20161897054
EDGE PROJECT NO:	14295
DRAWN BY:	NET
CHECKED BY:	OSD

REV	DATE	DESCRIPTION
1	10/12/2016	PROVIDE SMALL CELL DWGS NET
2	10/12/2016	PROVIDE SMALL CELL DWGS NET
3	11/04/2016	FINAL SMALL CELL DWGS (MAM)
4	12/02/2016	FINAL SMALL CELL DWGS (MAM)



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MIN NELL STPL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
**ANTENNA DETAILS**

SHEET NUMBER  
**A-3**

**GENERAL ELECTRICAL NOTES**

1. SUBMITTAL OF BID INDICATES CONTRACTOR IS AWARE OF ALL JOB SITE CONDITIONS AND WORK TO BE PERFORMED UNDER THE CONTRACT.
2. CONTRACTOR SHALL VERIFY ALL INFORMATION, OBSERVATION, TESTS, AND DRAWINGS WORK PRIOR TO THE COMMENCEMENT OF ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL OBTAIN A WRITTEN NOTICE OF ALL FINDINGS TO THE ARCHITECT LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
3. IDENTIFIERS 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, JBOX, SWITCH BOX, ETC. IN COMPLIANCE WITH OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
6. CONTRACTOR SHALL PROVIDE LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION LOGS, 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 QUALITY AVAILABLE. CONTRACTOR SHALL OBTAIN APPROVAL FROM ARCHITECT AND OWNER PRIOR TO THE INSTALLATION OF SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF THE DIVISION OF INDUSTRIAL SAFETY AND ALL GOVERNING REGULATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING UTILITIES AND APPROVED APPROACHES ESTABLISHED BY ABE, NEDA, AND NREL.
8. CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS.
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. UNWRITTEN NOTIFICATION, AT THE DISCRETION OF THE CONTRACTOR.
11. ALL CONDUIT ONLY (CO) 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 TAP CONNECTIONS ON ALL MULTICIRCUITS 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 THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY ARE TO BE SUBJECTED, AND A MINIMUM OF 1000 AIC.
17. THE WIRING ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES AND DRAWINGS.
18. RECEPTACLES SHALL BE 20 AMPERE, 125 VOLT A.C., WHILE AS REQUIRED BY THE ARCHITECT OR APPROVED EQUAL.
19. WALL SWITCHES SHALL BE SINGLE-POLE, HUBBELL #101 OR EQUIVALENT, WHITE AS REQUIRED BY THE ARCHITECT.
20. PLASTIC PLATES FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, SHALL HAVE EMBRAVED LETTERING WHERE INDICATED ON THE DRAWINGS. WEATHERPROOF RECEPTACLES SHALL HAVE RAINCO HOLES, 1/2" ABOVE WORK COVER.
21. WIRE AND CONDUIT CONNECTIONS SHALL BE COPPER #12 AWG MINIMUM, NO BX OR ROMEX CABLE IS PERMITTED UNLESS COMBINATION TYPE.
22. GROUND RODS SHALL BE AS SPECIFIED ON THE GROUNDING DRAWINGS.
23. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE JURISDICTIONS. MANAGERS OWNERS BY SQUARE COMPANY OR APPROVED EQUAL FOR THE HOT FACILITY REQUIRES THE RAW SERVICE TO BE SUBMITTED FROM THE EXISTING SERVICE SUBMETER SHALL BE OF THE TOL FOR 100 AMP.
24. ALL MATERIALS SHALL BE UL LISTED.
25. CONDUIT: CONDUIT SHALL BE CONDUIT RATED FOR USE UNDER ALL CONDITIONS. CONDUIT SHALL BE USED UNDER ROADWAYS AND ALL CONDITIONS SUBJECT TO CASUAL IMPACTS. BENDS SHALL BE MADE USING WIDE EYELET (1/2" MIN. RADII) BENDS. CONDUIT SHALL BE INSTALLED IN CONDUIT RIGS, WITH STEEL BUNDLES (12" MIN. LENGTHS IN A CIRCULAR FITTING). RIGID CONDUIT IN CONTACT WITH EARTH SHALL BE 1/2" LAMINATED WITH THIN PROCESS NO. 3 EXTENDING MIN. 12" ABOVE GRADE.
26. INTERIOR CONDUITS SHALL BE ELECTRICAL METAL TUBING HAVING UL LABEL. FITTINGS SHALL BE GROUND RING COMPRESSION TYPE.
27. CONDUITS SHALL BE UL LISTED. ALL WIRING SHALL BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE CLAMP OR VOLTAGE-TYPE SEAL, LIGHT FLUORESCENT CONDUIT. NO SUCH CONDUIT SHALL EXCEED SIX FEET IN LENGTH.
28. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
29. PATCH, REPAIR, AND PAINT ANY AREA THAT HAS BEEN DAMAGED IN THE COURSE OF THE ELECTRICAL WORK.
30. PENETRATIONS THROUGH ROOF SHALL BE FIRE STOPPED IN ACCORDANCE WITH SECTION 7.12, PENETRATIONS-INTERNATIONAL BUILDING CODE (IBC).
31. DRILLING OR CORING HOLES IN CONCRETE WALLS OR FLOORS, WHETHER FOR FASTENING OR ANCHORING PURPOSES, REQUIRES THAT TENDONS OR REINFORCING STEEL MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT (X-RAY OR GROUND PENETRATING RADAR) PRIOR TO DRILLING. LOOKING THROUGH TENDONS OR REINFORCING MUST NOT BE DRILLED FOR OR DAMAGED UNDER ANY CIRCUMSTANCES.
32. UPON COMPLETION OF WORK, CONTRACTOR SHALL SHORT CIRCUIT AND FALL POTENTIAL GROUNDING TESTS FOR ALL WIRING. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE JURISDICTIONS. MANAGERS OWNERS BY SQUARE COMPANY OR APPROVED EQUAL FOR THE HOT FACILITY REQUIRES THE RAW SERVICE TO BE SUBMITTED FROM THE EXISTING SERVICE SUBMETER SHALL BE OF THE TOL FOR 100 AMP.
33. CONTRACTOR TO COORDINATE WITH UTILITY COMPANY FOR CONNECTION OF BOTH TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL GROUP COSTS TO BE PAID BY CONTRACTOR.
34. CONTRACTOR SHALL PROVIDE LABOR AND MATERIALS AS NECESSARY TO COMPLETE THE INSTALLATION OF ANY TOWER LIGHTING SYSTEM DESCRIBED IN THE I&E.

**ELECTRICAL NOTES**



**REPLACEMENT LIGHT POLE LOCATION**



**REPLACEMENT LIGHT POLE LOCATION**



**Edge**  
Consulting Engineers, Inc.  
1740 Junior Park, Suite 105  
St. Paul, MN 55108  
612.544.1697 for  
www.edgecorp.com

PROJECT NO: 20161897084  
EDGE PROJECT NO: 14295  
DRAWN BY: NBT  
CHECKED BY: OSD

REV.	DATE	DESCRIPTION
B	10/12/2014	PRELIM SMALL CELL DWGS TPL
0	11/20/2014	FINAL SMALL CELL DWGS (M.M)
1	12/05/2014	FINAL SMALL CELL DWGS (M.M)

APPROVED

THESE CERTS ARE THIS PLAN SPECIFICALLY FOR THE DIRECT SUPERVISION AND THAT I AM A DULY LICENSED ENGINEER UNDER THE PROFESSIONAL LAWS OF THE STATE OF MINNESOTA.

MIN NELL STPL SC  
ST. PAUL, MINNESOTA  
REPLACEMENT LIGHT POLE  
SMALL CELL DRAWINGS

SHEET TITLE  
**ELECTRICAL NOTES**

SHEET NUMBER  
**E-2**



886 East Campus Parkway, Building Three, Suite 370  
 67845-0924, KS  
 www.kgiwireless.com



**Edge**  
 Consulting Engineers, Inc.  
 1766 Juniper Park, Suite 105  
 67844-1460, KS  
 www.edgeconsulting.com

PROJECT NO: 20161387086  
 EDGE PROJECT NO: 14295  
 DRAWN BY: KJS  
 CHECKED BY: OSD

REV	DATE	DESCRIPTION	BY
1	10/20/2016	PHOTO SIMULATION	KJS

PRELIMINARY -  
 NOT FOR CONSTRUCTION

WE HEREBY CERTIFY THAT THIS PLAN SPECIFICATION, CALCULATIONS AND DRAWINGS WERE PREPARED BY OR UNDER THE DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MISSOURI.

MINI NEILL STPL SC  
 ST. PAUL, MN  
 REPLACEMENT LIGHT POLE  
 PHOTO SIMULATION

SHEET TITLE  
**PHOTO SIM 1**

SHEET NUMBER  
**PS-1**



PHOTO SIMULATION OF NEW INSTALLATION

ACTUAL PHOTOGRAPH BEFORE SIMULATION





**SITE NAME:** MIN KAGIN STPL SC  
**SITE NUMBER:** 20161387082  
**LOCATION CODE:** 415786  
**SITE TYPE:** SMALL CELL  
**POLE TYPE:** PROPOSED ROOFTOP BALLAST FRAMES



653 Las Cimias Parkway, Building Three, Suite 370  
 Austin, TX 78746  
 512.441.1549  
 www.kgi.com



**Edge**  
 Consulting Engineers, Inc.  
 11111 Highway 100  
 Loveland, CO 80534  
 970.441.1549  
 www.edgeconsulting.com

**SITE INFORMATION**

APPROXIMATE ADDRESS:  
 1574 SUMMIT AVE  
 ST. PAUL, MN 55105  
 RAMSEY COUNTY

N.W. LATITUDE & LONGITUDE:  
 LAT: 44° 58' 27.00"N  
 LONG: 93° 10' 02.92"W  
 GROUND ELEVATION: 943' AMSL  
 (PER 1A CERTIFICATE)

N. LATITUDE & LONGITUDE:  
 LAT: 44° 58' 27.00"N  
 LONG: 93° 10' 02.92"W  
 GROUND ELEVATION: 945' AMSL  
 (PER 1A CERTIFICATE)

S. LATITUDE & LONGITUDE:  
 LAT: 44° 58' 26.10"N  
 LONG: 93° 10' 02.92"W  
 GROUND ELEVATION: 945' AMSL  
 (PER 1A CERTIFICATE)

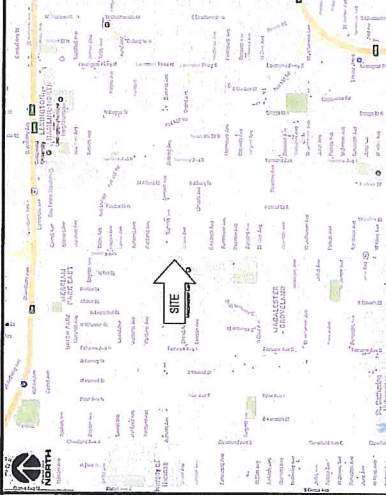
STRUCTURE HEIGHT:  
 40'± A.G.L.

MAXIMUM APPURTENANCE HEIGHT:  
 45'± A.G.L.

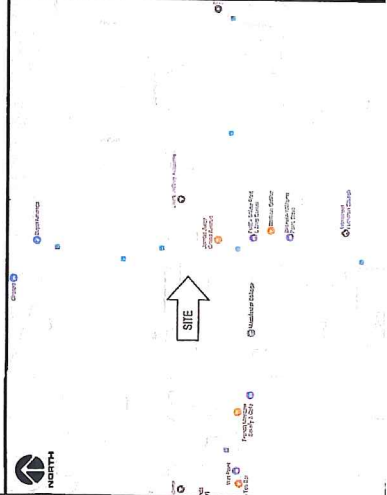
**LOCATION SCAN**



**AREA MAP**



**LOCATION MAP**



**PROJECT DESCRIPTION/SOW**

- INSTALL (9) EQUIPMENT BALLAST FRAMES
- INSTALLATION OF PANEL ANTENNAS
- INSTALLATION OF ERICSSON RRUS AND POWER CONVERTERS
- INSTALLATION OF LOAD CENTER
- INSTALLATION OF FIBER BOX
- INSTALLATION OF HAND HOLE FOR FIBER IN ROW, BY FIBER PROVIDER
- INSTALLATION OF HAND HOLE FOR FIBER AT BASE OF BUILDING, BY VERIZON
- INSTALLATION OF CONDUIT FOR FIBER BETWEEN HAND HOLE IN ROW AND PROPOSED EQUIPMENT, BY VERIZON
- INSTALLATION OF CONDUIT FOR ELECTRIC BETWEEN PROPOSED EQUIPMENT AND POWER SOURCE WITHIN BUILDING
- INSTALLATION OF GROUNDING CABLES AND BUS BARS FOR PROPOSED EQUIPMENT
- ALL OTHER CONSTRUCTION RELATED ACTIVITIES TO BE COMPLETED BY OTHERS

**PROJECT DIRECTORY**

**LESSOR:**  
 MACALESTER COLLEGE  
 1600 GRAND AVE.  
 ST. PAUL, MN 55105  
 PHONE: 651.695.4000

**LESSEE:**  
 VERIZON WIRELESS  
 10801 BUSH LAKE RD  
 BLOOMINGTON, MN 55438  
 CONTACT: COURTNEY BEDNARZ  
 PHONE: 952.749.4594

**ENGINEERING COMPANY:**  
 EDGE CONSULTING ENGINEERS, INC.  
 11111 HIGHWAY 100  
 SUITE 105  
 LAKEVILLE, MN 55044  
 CONTACT: OTTO DINGFELDER III, P.E.  
 PHONE: 656.6441.1449

**BE ENGINEER:**  
 TAYLOR ENGINEERS  
 10801 BUSH LAKE RD  
 BLOOMINGTON, MN 55438  
 CONTACT: JOHN MULLINS

**SITE ACQUISITION:**  
 KGI LAS CIMIAS PARKWAY  
 BUILDING THREE, SUITE 370  
 AUSTIN, TX 78746  
 CONTACT: CARYN O'BRIEN  
 PHONE: 952.286.8130

**SHEET INDEX**

NO:	SHEET TITLE
01	SITE PLAN
A1	POLE ELEVATION
A2	MOUNTING DETAILS
A3	EQUIPMENT DETAILS
A4	GROUNDING DETAILS
B1	GROUNDING CABLE
B2	GROUNDING DETAILS

**1"=17' 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 OR DISAGREEMENTS. NO WORK OR BE RESPONSIBLE FOR THE SAME.

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

**ENGINEER OF RECORD**

EDGE CONSULTING ENGINEERS, INC.  
 CONTACT: OTTO DINGFELDER III (PE # 49720 (MN))  
 PHONE: 656.6441.1449

**STRUCTURAL REVIEW**

STRUCTURAL ANALYSIS COMPLETED BY EDGE CONSULTING ENGINEERS, INC.  
 PROJECT # 14291  
 DATE: 12/15/2016  
 CONTRACTOR TO REVIEW STRUCTURAL REPORT IN ITS ENTIRETY. ANY DISCREPANCIES OR DISAGREEMENTS BETWEEN THE REPORT AND THESE PLANS SHOULD BE RESOLVED PRIOR TO CONSTRUCTION.

PROJECT NO:	20161387082	
EDGE PROJECT NO:	14291	
DRAWN BY:	TKB	
CHECKED BY:	OSD	
REV.	DATE	DESCRIPTION
A	12/29/2016	PRELIMINARY CELL DWGS (NO)
B	12/29/2016	PRELIMINARY CELL DWGS (NO)
C	1/29/2016	PRELIMINARY CELL DWGS (NO)



I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR CONTRACT 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 KAGIN STPL SC  
 ST. PAUL, MN  
 SMALL CELL DRAWINGS

SHEET TITLE  
**TITLE SHEET & PROJECT DATA**

SHEET NUMBER  
**T-1**



605 East Chimes Parkway, Building Three, Suite 370  
Austin, TX 78746  
737.265.7600  
www.kgi.com



Edge Consulting Engineers, Inc.  
17000 Katy Road, Suite 105  
Lubbock, TX 79424  
806.764.1400  
www.edgeconsulting.com

PROJECT NO: 20161387082  
EDGE PROJECT NO: 142971  
DRAWN BY: TKB  
CHECKED BY: OGD

REV.	DATE	DESCRIPTION
A	12/15/2016	PRELIM SMALL CELL DWG/FIBER
B	12/27/2016	PRELIM SMALL CELL DWG/FIBER
C	1/9/2017	PRELIM SMALL CELL DWG/FIBER

APPROVED

I HEREBY CERTIFY THAT THE PLAN SPECIFICATION, CALCULATIONS AND DESIGN DRAWINGS AND ALL WORK SHOWN HEREON WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF TEXAS.

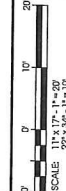
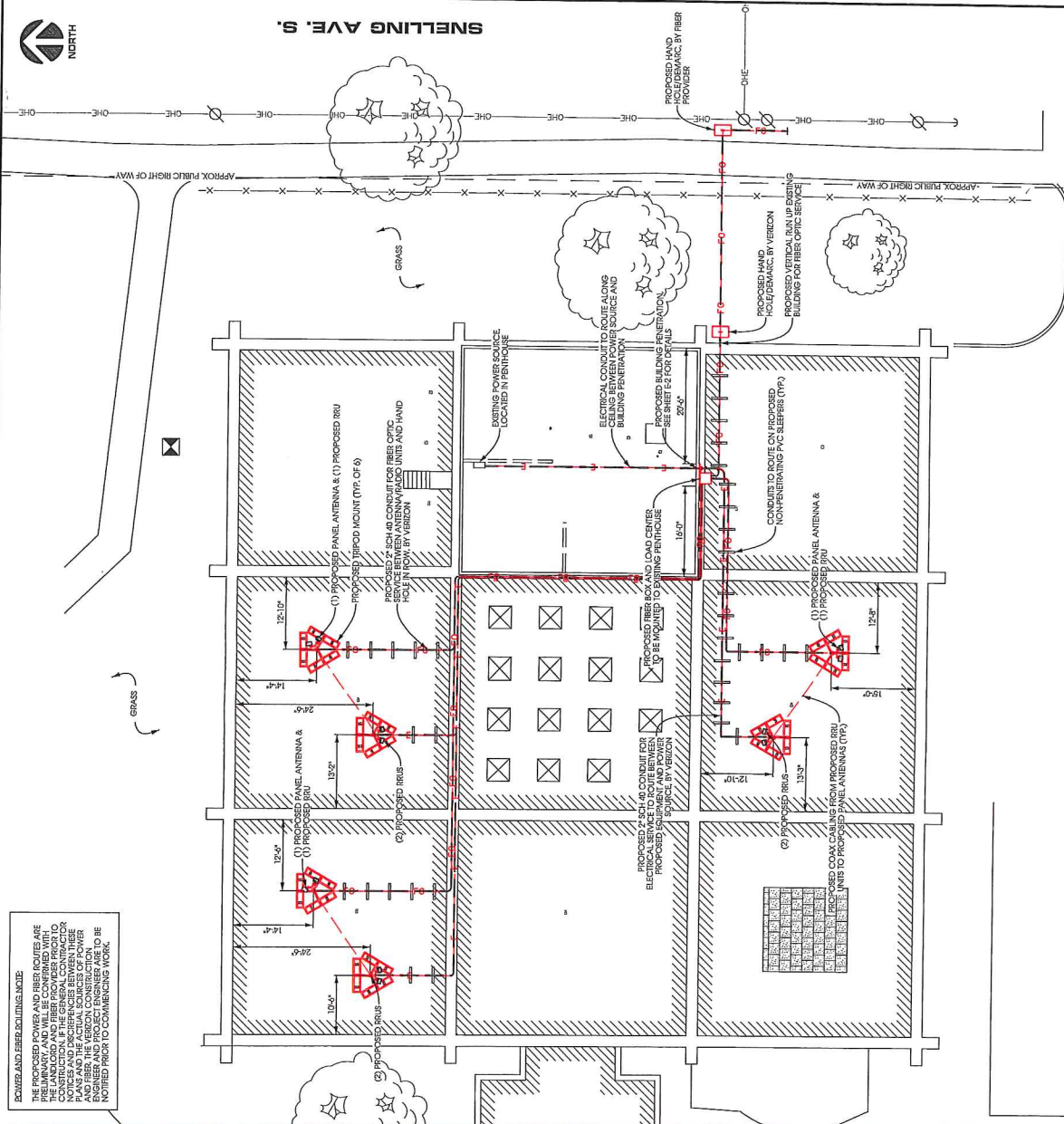
MIN: KAGIN STPL SC  
ST: PAUL, MN  
PROPOSED ROOFTOP BALLAST FRAME  
SMALL CELL DRAWINGS

SHEET TITLE  
SITE PLAN

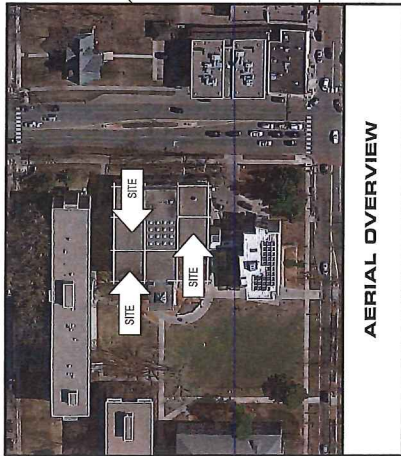
SHEET NUMBER  
C-1



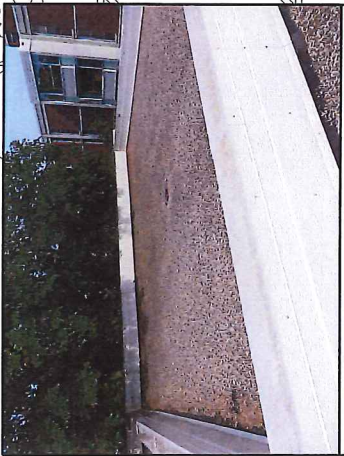
SNELLING AVE. S.



**POWER AND FIBER BUILDING NOTE:**  
THE PROPOSED POWER AND FIBER ROUTES ARE PRELIMINARY AND WILL BE CONFIRMED WITH THE LANDLORD AND FIBER PROVIDER PRIOR TO CONSTRUCTION. ANY DISCREPANCIES BETWEEN THESE NOTICES AND DISCREPANCIES BETWEEN THESE NOTICES AND THE VERIZON CONSTRUCTION AND FIBER THE VERIZON CONSTRUCTION ENGINEER AND PROJECT ENGINEER ARE TO BE FORWARDED PRIOR TO COMMENCEMENT OF WORK.



AERIAL OVERVIEW



NORTHWEST EQUIPMENT LOCATION [LOOKING NORTHWEST]



SOUTH EQUIPMENT LOCATION [LOOKING NORTH]



PROJECT NO: 20161387/082  
 EDGE PROJECT NO: 14291  
 DRAWN BY: TKB  
 CHECKED BY: OGD

REV.	DATE	DESCRIPTION
8	12/27/2016	PREAM SMALL CELL DWGS/TRE
9	12/27/2016	PREAM SMALL CELL DWGS/TRE
0	1/9/2016	PREAM SMALL CELL DWGS/TRE

APPROVED

THEBY, CERTIFY THAT THE PLAN, SPECIFICATION, CONTRACT DOCUMENTS AND ALL WORK DIRECT SUPERVISION AND THAT I AM A duly LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

MIN KAGIN STPL SC  
 ST. PAUL, MN  
 PROPOSED ROOF TOP BALLAST FRAME  
 SMALL CELL DRAWINGS

SHEET TITLE  
**BUILDING ELEVATION**

SHEET NUMBER  
**A-1**



**BUILDING ELEVATION**

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

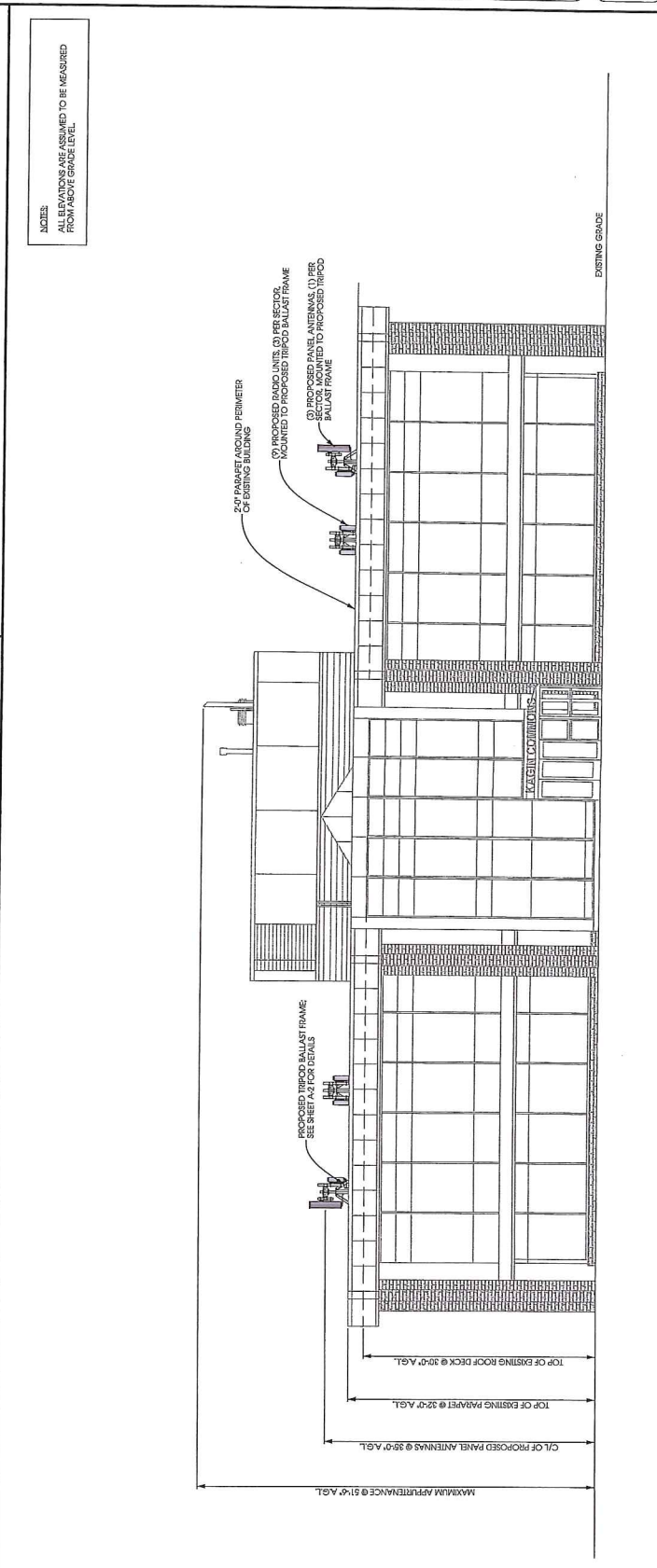
ANTENNA	TYPE	QTY	HEIGHT	MODEL	HEIGHT	HEIGHT	HEIGHT
1	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
2	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
3	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
4	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
5	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
6	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
7	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
8	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
9	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
10	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
11	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
12	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
13	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
14	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
15	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
16	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
17	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
18	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
19	COMMERCIAL	1	45	SEMI-HOLO	45	45	45
20	COMMERCIAL	1	45	SEMI-HOLO	45	45	45

**ANTENNA AND COAX**

SCALE: NIS

QTY	TYPE	BRAND	MODEL	LENGTH	UNIT
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
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1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD
1	Jumper	Comcast	154500	12'	TRD

**ANTENNA AND COAX**

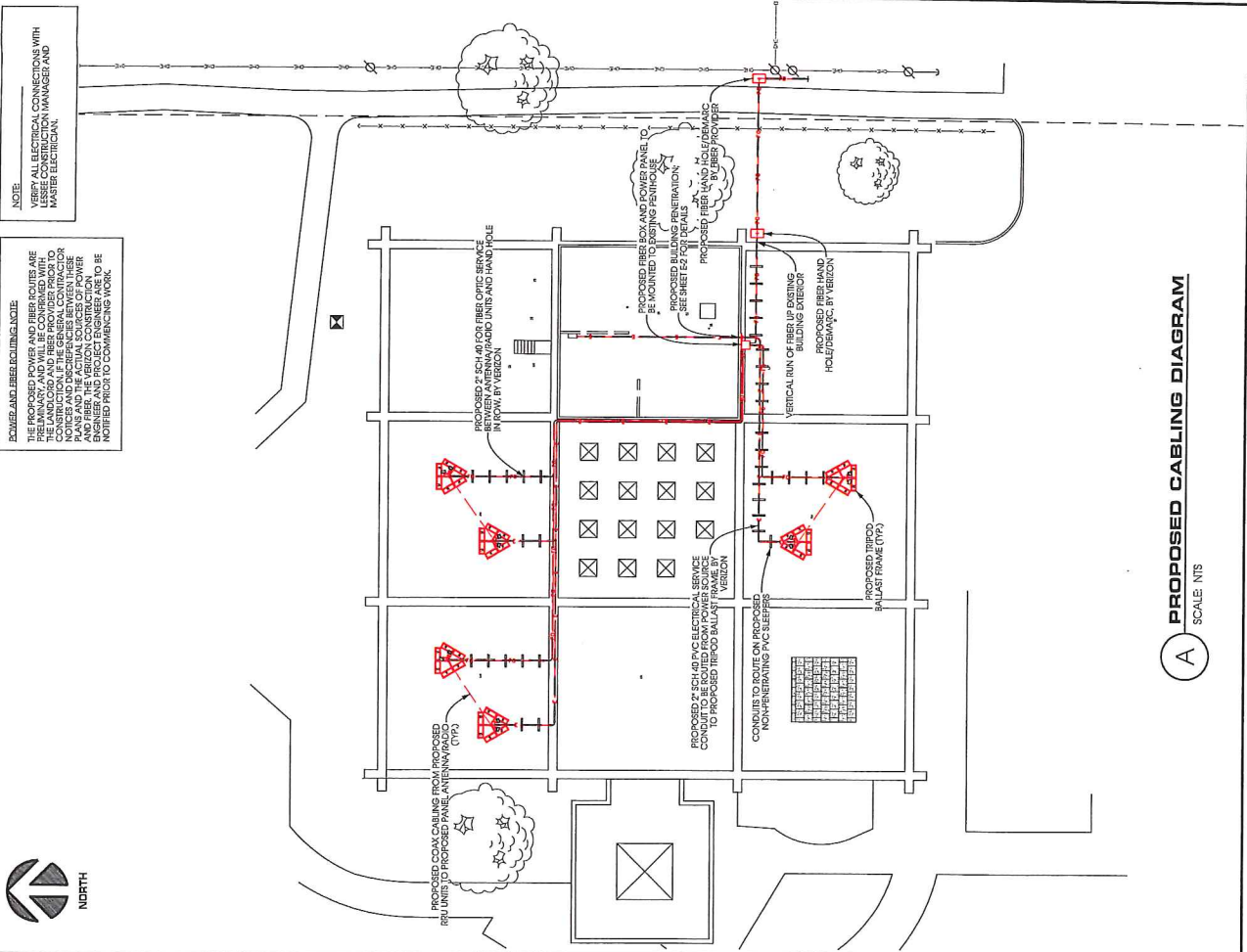


**B BUILDING ELEVATION [WEST ELEVATION]**

SCALE: 1/4" = 1'-0"  
 1/8" = 1'-0"

**B**

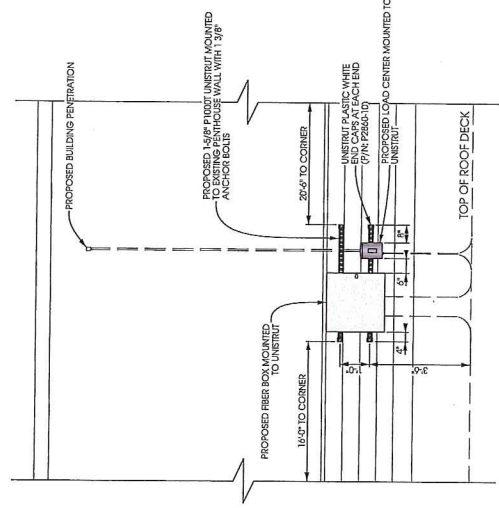




**POWER AND FIBER ROUTING NOTE:**  
 THE PROPOSED POWER AND FIBER ROUTES ARE PRELIMINARY AND WILL BE CORRECTED WITH CONSTRUCTION. THE GENERAL CONTRACTOR SHALL VERIFY THE EXISTING POWER AND FIBER ROUTES AND THE ACTUAL CABLE ROUTES FOR POWER AND FIBER. THE VERICON CONSTRUCTION SHALL BE NOTIFIED PRIOR TO COMMENCING WORK.

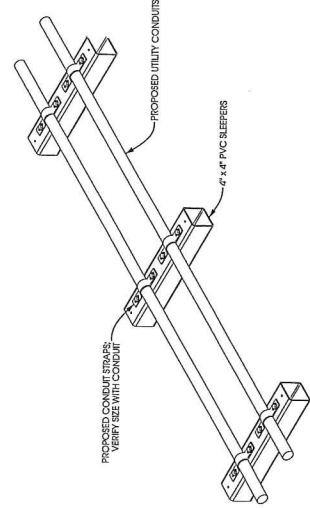
**NOTE:**  
 VERIFY ALL ELECTRICAL CONNECTIONS WITH LESSEE CONSTRUCTION MANAGER AND MASTER ELECTRICAL.

**A PROPOSED CABLING DIAGRAM**  
 SCALE: NTS



**B EQUIPMENT MOUNTING DETAIL**  
 SCALE: NTS

**SEE PRO 1 PVC BOTTOMS SLEEPS:**  
 #518R  
 (4) 3/4\"/>



**C ROOFTOP CONDUIT ROUTING**  
 SCALE: NTS

805 East China Parkway, Building Three, Suite 370  
 Austin, TX 78749  
 www.kgiwireless.com

7700 West Loop West, Suite 105  
 Houston, TX 77036  
 www.edgeconsulting.com

PROJECT NO: 20161387082  
 EDGE PROJECT NO: 14291  
 DRAWN BY: TKB  
 CHECKED BY: OGD

REV.	DATE	DESCRIPTION
A	12/19/2016	PRELIM SMALL CELL DWGS TKB
B	12/22/2016	PRELIM SMALL CELL DWGS TKB
C	1/9/2017	PRELIM SMALL CELL DWGS TKB

APPROVED

WE HEREBY CERTIFY THAT THIS PLAN SPECIFICATION, DRAWING, AND/OR REPORT WAS PREPARED BY A LICENSED PROFESSIONAL ENGINEER AND THAT I AM A QUALIFIED ENGINEER UNDER THE LAWS OF THE STATE OF TEXAS.

MINI KAGIN STPL SC  
 ST. PAUL, MN  
 PROPOSED ROOFTOP BALLAST FRAME  
 SMALL CELL DRAWINGS

SHEET TITLE  
**CABLING DETAILS**

SHEET NUMBER  
**E-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:

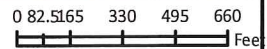
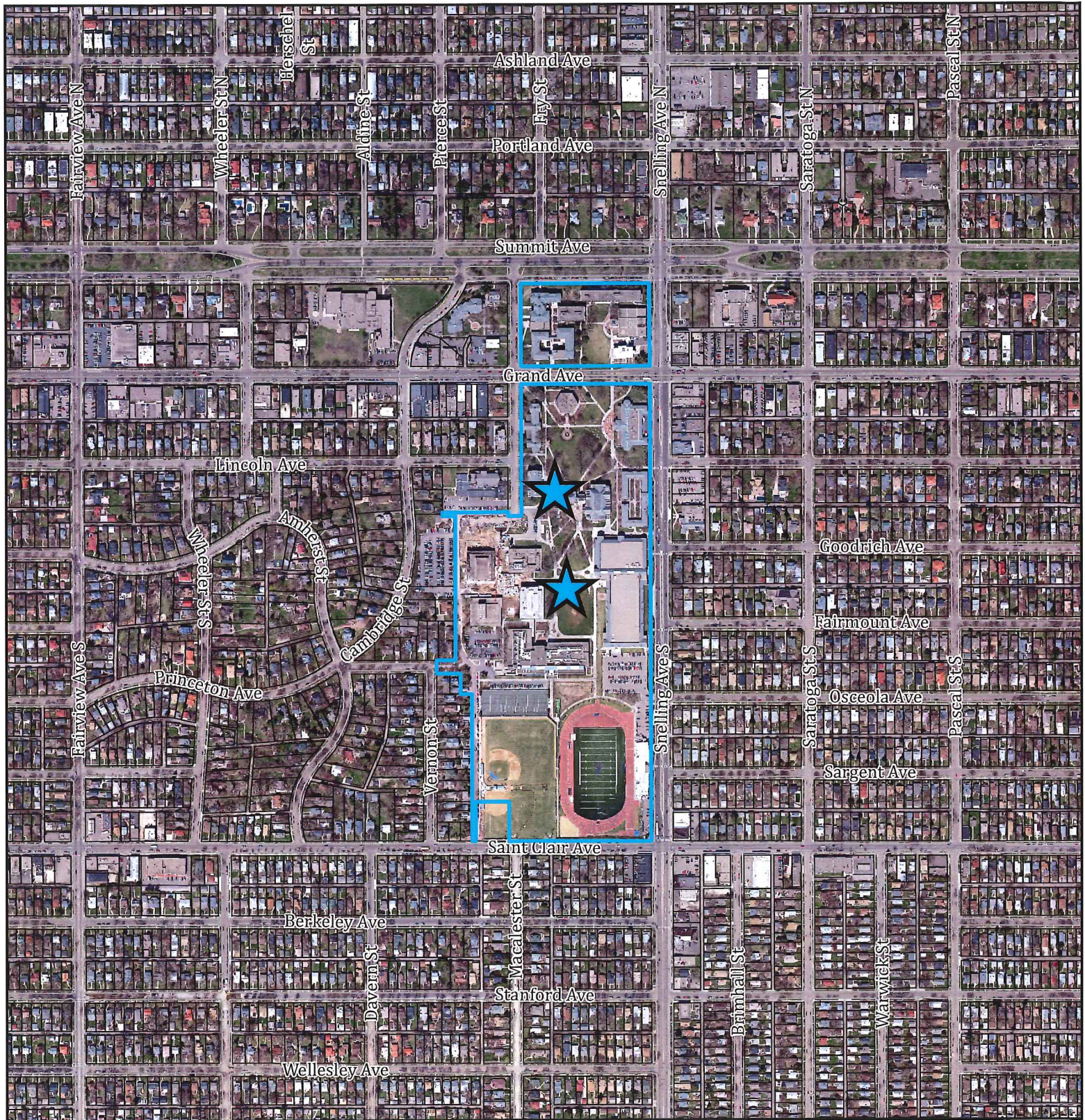
**Authority:** Sections 4, 303, 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply sections 301, 309, 48 Stat. 1081, 1085 as amended; 47 U.S.C. 301, 309.

■ 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) \* \* \*



FILE NAME: Verizon Wireless

**Aerial**

APPLICATION TYPE: CUP

 Subject Parcels

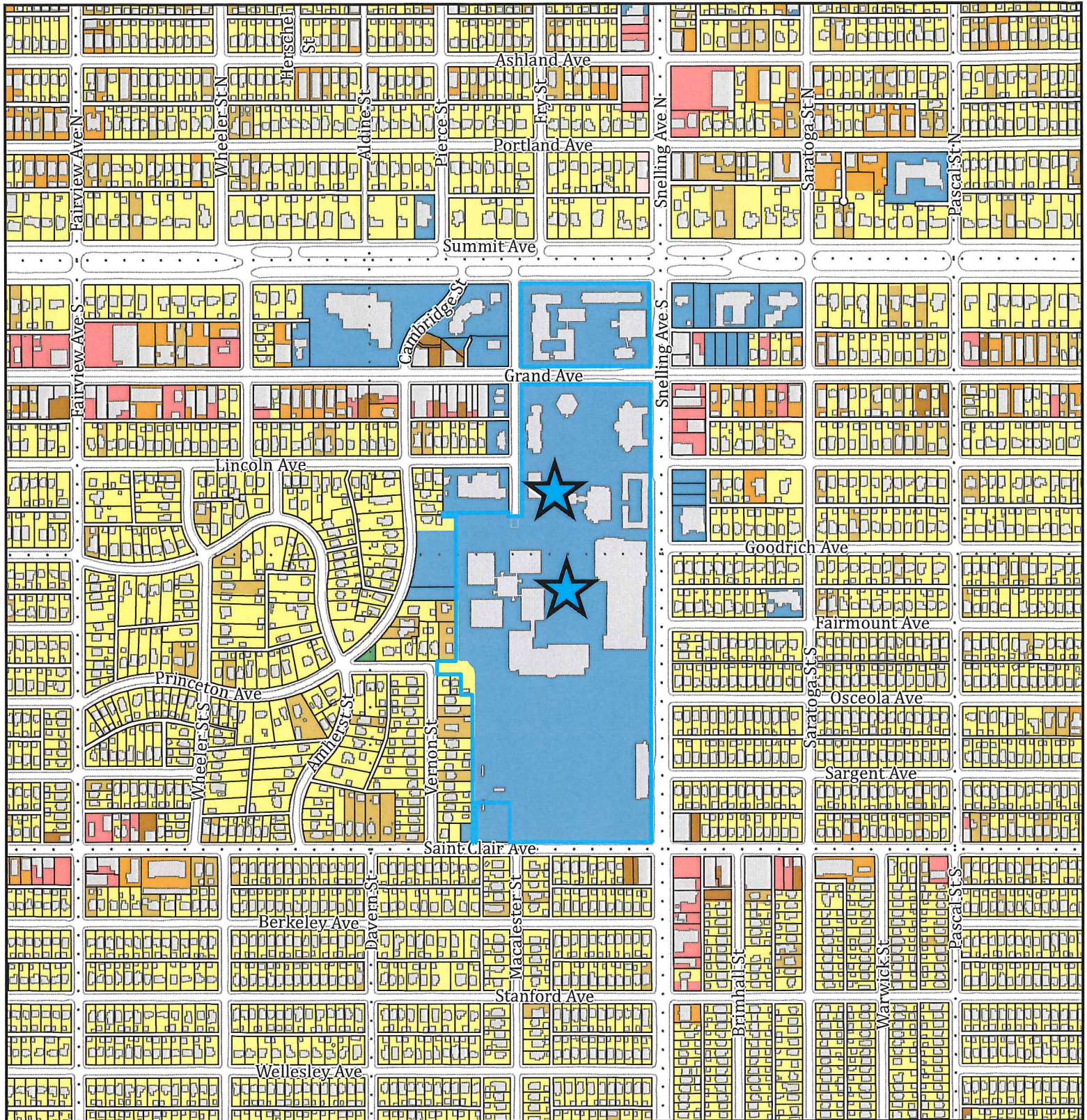
FILE #: 17-017620      DATE: 3/8/2017

PLANNING DISTRICT: 14

ZONING PANEL: 20







FILE NAME: Verizon Wireless

APPLICATION TYPE: CUP

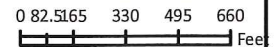
FILE #: 17-017620      DATE: 3/8/2017

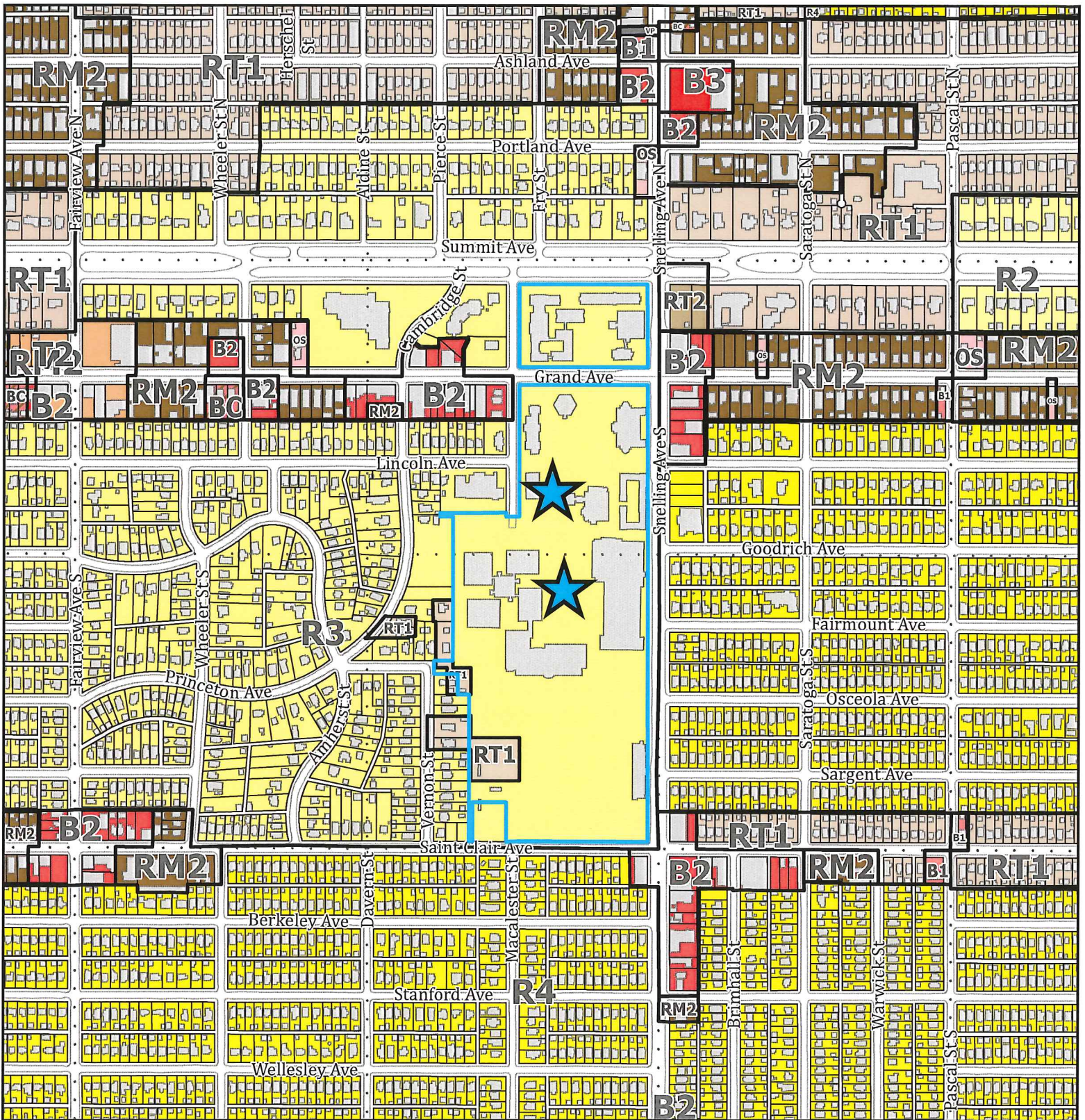
PLANNING DISTRICT: 14

ZONING PANEL: 20

**Land Use**

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





FILE NAME: Verizon Wireless

APPLICATION TYPE: CUP

FILE #: 17-017620

DATE: 3/8/2017

PLANNING DISTRICT: 14

ZONING PANEL: 20

**Zoning**

- Subject Parcels
- Section Lines
- R2 One-Family
- R3 One-Family
- R4 One-Family
- RT1 Two-Family
- RT2 Townhouse
- RM2 Multiple-Family
- T2 Traditional Neighborhood
- OS Office-Service
- B1 Local Business
- BC Community Business (converted)
- B2 Community Business
- B3 General Business
- VP Vehicular Parking

