CITY OF SAINT PAUL
HERITAGE PRESERVATION COMMISSION STAFF REPORT

FILE NAME: 1065 Summit Avenue
DATE OF APPLICATION: October 4, 2013
APPLICANT: Shannon West, Willin Consultants Inc. for Sprint
OWNER: St. Thomas More Catholic Community
DATE OF HEARING: October 24, 2013
HPC SITE/DISTRICT: Hill Historic Heritage Preservation District
CATEGORY: Non-contributing
CLASSIFICATION: building permit
STAFF INVESTIGATION AND REPORT: Christine Boulware
DATE: October 18, 2013

A. SITE DESCRIPTION:

St. Thomas More School (St. Luke's School) is part of a parochial complex that consists of a Romanesque Revival Style church, rectory, school, and convent that occupies the entire north side of the block of Summit Avenue between Oxford Street and Lexington Parkway. The three-story, Romanesque Revival Style school building has a smooth, cream-colored brick exterior and an offset entrance within a rounded arch. The truncated-hipped roof is clad with multi-color tile and has shallow overhanging eaves. The property is categorized as contributing to the Hill Historic District.

B. PROPOSED CHANGES:

The applicant proposes to:

1. Remove 6 existing Sprint antennas and install 3 new panel antennas (with cables) with 18 jumpers and 6 RRUs[1] directly behind or near the antennas. The new antennas will be housed in new sheet metal "smoke stacks" – total height from roof deck = 9 feet and 3.5 inches
2. Remove 1 antenna mount and install 2 new antenna mounts
3. Install 1 GPS[2] antenna
4. Install 3 hybrid cables to new antennas, one each

This application includes interior equipments upgrades that are not being reviewed by the HPC.

C. BACKGROUND:

On February 13, 1998, the HPC reviewed and conditionally approved File #3197 for wireless antennas on the rooftop and electrical equipment in the basement: "Plan Approved for phases I and II, as noted on plans, with a maximum of 12 antennas. Any antennas higher than approved require further HPC review."

- The rear/north antennas were to be light gray in color and the tops of the antennas were to be no taller than 7 feet from the roof deck.
- The south antennas were to be painted black to match the vents to which they were attached.

D. GUIDELINE CITATIONS:

Hill Historic District Design Review Guidelines

Sec. 74.64. - *Restoration and Rehabilitation*

(a) General Principles:

1. *Every reasonable effort shall be made to provide a compatible use for a property which requires minimal alteration of the building, structure, or site and its environment, or to use a*

1 Remote Radio Units
2 Global Positioning System

property for its originally intended purpose.

2. *The distinguishing original qualities or character of a building, structure, or site and its environment shall not be destroyed. The removal or alteration of any historic material or distinctive architectural features should be avoided when possible.*
3. *All buildings, structures, and sites shall be recognized as products of their own time. Alterations that have no historical basis and which seek to create an earlier appearance shall be discouraged.*
4. *Changes which may have taken place in the course of time are evidence of the history and development of a building, structure, or site and its environment. Theses changes may have acquired significance in their own right, and this significance shall be recognized and respected.*
5. *Distinctive stylistic features or examples of skilled craftsmanship which characterize a building, structure, or site shall be treated with sensitivity.*
6. *Deteriorated architectural features shall be repaired rather than replaced, whenever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historic, physical, or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other buildings or structures.*
7. *The surface cleaning of structures shall be undertaken with the gentlest means possible. Sandblasting and other cleaning methods that will damage the historic building materials shall not be undertaken.*
8. *Every reasonable effort shall be made to protect and preserve archaeological resources affected by, or adjacent to any project.*
9. *Contemporary design for alterations and additions to existing properties shall not be discouraged when such alterations and additions do not destroy significant historical, architectural or cultural material, and such design is compatible with the size, scale, color, material, and character of the property, neighborhood, or environment.*
10. *Wherever possible, new additions or alterations to structures shall be done in such a manner that if such alterations were to be removed in the future, the essential form and integrity of the structure would be unimpaired.*

(d) *Roofs:*

(1) Original roofing materials should be retained unless deteriorated. When partially reroofing, deteriorated roof coverings should be replaced with new materials that match the old in composition, size, shape and texture. When entirely reroofing, new materials which differ to such an extent from the old in composition, size, shape, color or texture that the appearance of the building is altered should not be used.

(2) Wood shingles in the nineteenth century were often dipped in creosote to preserve them, giving them a very dark brown color. Victorians often stained wood shingles deep red or dark green to complement rather than match the color of the house. When asphalt shingles began to be used in the 1890's, the most common colors were solid, uniform, deep red and solid, uniform, dark green. A weathered-wood color may be acceptable for new asphalt shingles because it is neutral and blends in. Black may be acceptable for Colonial Revival houses built after the 1920's, but it should be avoided for Victorian houses.

(3) The original roof type, slope and overhangs should be preserved. New dormers may be acceptable in some cases if compatible with the original design. Modern skylights are a simple way to alter a roof to admit light and air without disrupting its plane surface, are less noticeable than dormers, and may also be acceptable. Skylights should be flat and as close to the roof

plane as possible. They should not be placed on the front roof plane.

(Ord. No. 17815, § 3(II) 4-2-91)

Sec. 74.65. - New construction.

(a) *General Principles:* The basic principle for new construction in the Historic Hill District is to maintain the district's scale and quality of design. The Historic Hill District is architecturally diverse within an overall pattern of harmony and continuity. These guidelines for new construction focus on general rather than specific design elements in order to encourage architectural innovation and quality design while maintaining the harmony and continuity of the district. New construction should be compatible with the size, scale, massing, height, rhythm, setback, color, material, building elements, site design, and character of surrounding structures and the area.

(b) *Massing and Height:* New construction should conform to the massing, volume, height and scale of existing adjacent structures. Typical residential structures in the Historic Hill District are twenty-five (25) to forty (40) feet high. The height of new construction should be no lower than the average height of all buildings on both block faces; measurements should be made from street level to the highest point of the roofs. (This guideline does not supersede the city's zoning code height limitations.)

(c) *Rhythm and Directional Emphasis:* The existence of uniform narrow lots in the Historic Hill District naturally sets up a strong rhythm of buildings to open space. Historically any structure built on more than one (1) lot used vertical facade elements to maintain and vary the overall rhythm of the street rather than interrupting the rhythm with a long monotonous facade. The directional expression of new construction should relate to that of existing adjacent structures.

(d) *Material and Details:*

(1) Variety in the use of architectural materials and details adds to the intimacy and visual delight of the district. But there is also an overall thread of continuity provided by the range of materials commonly used by turn-of-the-century builders and by the way these materials were used. This thread of continuity is threatened by the introduction of new industrial materials and the aggressive exposure of earlier materials such as concrete block, metal framing and glass. The purpose of this section is to encourage the proper use of appropriate materials and details.

(2) The materials and details of new construction should relate to the materials and details of existing nearby buildings.

(3) Preferred roof materials are cedar shingles, slate and tile; asphalt shingles which match the approximate color and texture of the preferred materials are acceptable substitutes. Diagonal and vertical siding are generally unacceptable. Imitative materials such as asphalt siding, wood-textured metal or vinyl siding, artificial stone, and artificial brick veneer should not be used. Smooth four-inch lap vinyl, metal or hardboard siding, when well installed and carefully detailed, may be acceptable in some cases. Materials, including their colors, will be reviewed to determine their appropriate use in relation to the overall design of the structure as well as to surrounding structures.

(4) Color is a significant design element, and paint colors should relate to surrounding structures and the area as well as to the style of the new structure. Building permits are not required for painting and, although the heritage preservation commission may review and comment on paint color, paint color is not subject to commission approval.

(e) *Building Elements:* Individual elements of a building should be integrated into its composition

for a balanced and complete design. These elements of new instruction should compliment existing adjacent structures as well.

(1) *Roofs:*

a. There is a great variety of roof treatment in the Historic Hill District, but gable and hip roofs are most common. The skyline or profile of new construction should relate to the predominant roof shape of existing adjacent buildings.

b. Most houses in the Historic Hill District have a roof pitch of between 9:12 and 12:12 (rise-to-run ratio). Highly visible secondary structure roofs should match the roof pitch of the main structure, and generally should have a rise-to-run ratio of at least 9:12. A roof pitch of at least 8:12 should be used if it is somewhat visible from the street, and a 6:12 pitch may be acceptable in some cases for structures which are not visible from the street.

c. Roof hardware such as skylights, vents and metal pipe chimneys should not be placed on the front roof plane.

(2) *Windows and doors:*

c. Although not usually improving the appearance of building, the use of metal windows or doors need not necessarily ruin it. The important thing is that they should look like part of the building and not like raw metal appliances. Appropriately colored or bronze-toned aluminum is acceptable. Mill finish (silver) aluminum should be avoided.

(g) *Public infrastructure:*

(3) Electric, telephone and cable TV lines should be placed underground or along alleys, and meters should be placed where inconspicuous.

E. FINDINGS:

1. The property is located in both the National Register and local Hill Historic Districts and is categorized as pivotal.
2. On April 2, 1991, the Historic Hill Heritage Preservation District was established under Ordinance No. 17815, § 3(II). The Heritage Preservation Commission shall protect the architectural character of heritage preservation sites through review and approval or denial of applications for city permits for exterior work within designated heritage preservation sites §73.04.(4).
3. St. Thomas More School is located at the northwest corner of Summit Avenue and Oxford Street thus, the building has two primary elevations.
4. **Background:** On February 13, 1998, the HPC reviewed and conditionally approved File #3197 for wireless antennas on the rooftop and electrical equipment in the basement: "Plan Approved for phases I and II, as noted on plans, with a maximum of 12 antennas. Any antennas higher than approved require further HPC review." The rear/north antennas were to be light gray in color and the tops of the antennas were to be no taller than 7 feet from the roof deck. The south antennas were to be painted black to match the vents to which they were attached.
5. **Removal of Equipment: Sec. 74.64.(a)(2)** The removal of the existing antennas and installation of new antennas will not result in the *removal or alteration of any historic material or distinctive architectural features* and the *distinguishing original qualities or character of a building* will *not be destroyed.*
6. **Smoke Stack Design & Finish: Sec. 74.64.(a)(9)** The three "smoke stacks" are not *compatible with the size, scale, color, material, and character of the property, neighborhood, or environment.* There are some low, metal vents on the roof that are set back from the

parapet as well as a brick chimney. The stacks introduce a new element to the building that is not compatible with the design and materials, even if it is an improvement over uncamouflaged antennas. The finish on the sheet metal stacks was not provided. **Sec. 74.65.(e)(2)**c. The stacks should be *appropriately colored* (dark) *or bronze-toned*; *mill finish (silver)... should be avoided.*

7. **Attachment: Sec. 74.64.(a)(10)** The antennas and stacks will not be permanently attached to the roof of the building; the tri-pods that they sit on are non-penetrating (ballast). The antennas and stacks could be *removed in the future,* and *the essential form and integrity of the structure would be unimpaired.*
8. **Sector 1 and GPS Antenna: Sec. 74.65.(g)(3)** *Electric, telephone and cable TV lines should be placed underground or along alleys, and meters should be placed where inconspicuous.* The Sector 1 stack is located at the northern end of the north wing of the school. The GPS antenna is located on an existing mechanical shroud setback approximately 30 feet from the front (south) elevation of the building. These antennas will have little to no visibility from the public right-of-way as their placement is at non-primary elevations and inconspicuous. The proposed location of the Sectors 2 and 3 antennas will have a visual impact on the building, site, and its environment.
9. **Sectors 2 and 3: Sec. 74.65.(g)(3)** The building is 44 ft. tall and has a flat roof with a parapet that is approximately 2 ft. tall at the perimeter. The proposed stacks (Sector 2 & 3 antennas) are 9 feet 3.5 inches tall and placed closer to the two primary elevations with a 10 ft setback from the roof edge. This allows Sector 2 to be visible approximately 70 feet east from the base of the building and Sector 3 to be visible at approximately 70 feet south from the building. These points fall within the boulevards and yards along the north side of Summit Avenue and west side of Oxford Street. With the 10 foot setback, approximately 3.5 feet of the stacks will be visible from the curbs directly east and south of the property. These stacks are not inconspicuously sited. As proposed, the installation of the Sectors 2 and 3 antennas will have a negative visual impact on the building, site, and its environment. If setback an additional 10 feet, the visibility of the stacks from the right-of-way and immediately adjacent properties would be greatly reduced.
10. **Sectors 2 and 3:** The Hill District guidelines state, "roof hardware such as skylights, vents and metal pipe chimneys should not be placed on the front roof plane." **Sec. 74.65.(e)(1)c.** The intention of this guideline is to guide the placement of these types of features to non-primary and non-visible elevations of a roof. Moving Sectors 2 and 3 back from the parapets will meet the intent of this guideline.
11. A date for completion of the migration and removal on the old antennas was not supplied. The existing rooftop antennas are proposed to be removed as part of this project. The building permit submitted for this work shall include removal of the existing antennas and associated rooftop equipment and a removal completion date.
12. The proposal to remove antennas and install new antennas to be housed in stacks will not adversely affect the Program for the Preservation and architectural control of the Historic Hill Heritage Preservation District (Leg. Code §73.06 (e)) so long as the conditions are met.

F. STAFF RECOMMENDATION:

Based on the findings above, staff recommends approval of the proposal provided the following conditions are met:

1. The Sectors 2 and 3 antennas (stacks) shall be setback 20 feet from the southern and eastern roof edges so as to be minimally visible from the public right-of-way along Summit Avenue and Oxford Street.
2. The proposed stacks shall have a dark finish (such as bronze or black).
3. The building permit submitted for this work shall include removal of the existing rooftop antennas and associated rooftop equipment as well as a removal completion date.
4. Any revisions to the approved plans must be submitted to the HPC and/or staff for review.
5. The HPC stamped approved plans must be kept on site during the construction project.

G. ATTACHMENTS

1. HPC Application
2. Plans
3. Photo Simulations
4. SHPO Letters
    a. January 15, 2013
    b. February 27, 2013
    c. April 25, 2013
    d. July 31, 2013
5. Copy of File #3197

Saint Paul Heritage Preservation Commission
Department of Planning and Economic Development
25 Fourth Street West, Suite 1400
Saint Paul, MN 55102
Phone: (651) 266-9078

MS03XC670

HERITAGE PRESERVATION COMMISSION
DESIGN REVIEW APPLICATION

This application must be completed in addition to the appropriate city permit application if the affected property is an individually designated landmark or located within an historic district. For applications that must be reviewed by the Heritage Preservation Commission refer to the HPC Meeting schedule for meeting dates and deadlines.

1. CATEGORY

Please check the category that best describes the proposed work

☐ Repair/Rehabilitation
☐ Moving
☐ Demolition
☐ Sign/Awning
☐ Fence/Retaining Wall
☐ Other _____
☒ New Construction/Addition/ Alteration
☐ Pre-Application Review Only

2. PROJECT ADDRESS

Street and number: 1079 Summit Ave Zip Code: 55105

3. APPLICANT INFORMATION

Name of contact person: Shannon West

Company: Willin Consultants Inc.

Street and number: 889 Commerce Drive Ste A

City: Conyers State: GA Zip Code: 30094

Phone number: (404) 889-0359 e-mail: shannonwest@willinconsultants.com

4. PROPERTY OWNER(S) INFORMATION (If different from applicant)

Name: St Thomas Moore Catholic Community

Street and number: 1079 Summit Avenue

City: St Paul State: MN Zip Code: 55105

Phone number: (651) 227-7669 e-mail: _____

5. PROJECT ARCHITECT (If applicable) N/A

Contact person: _____

Company: _____

Street and number: _____

City: _____ State: _____ Zip Code: _____

Phone number: (____)_____ e-mail: _____

6. PROJECT DESCRIPTION

Completely describe ALL exterior changes being proposed for the property. Include changes to architectural details such as windows, doors, siding, railings, steps, trim, roof, foundation or porches. Attach specifications for doors, windows, lighting and other features, if applicable, including color and material samples.

- Remove (6) existing Sprint Antennas and install (3) new panel antennas with (18) jumpers and (6) RRU's directly behind or near the antennas.
- remove (1) antenna mount and install (2) new antenna mounts
- install (1) GPS Antenna
- install (3) hybrid cables to new antennas (1) each
- install (1) MMBS - BBU cabinet and (1) MMBS - battery cabinet
- remove (3) existing cabinets with all associated cabling after migration is completed

Attach additional sheets if necessary

7. ATTACHMENTS

Refer to the *Design Review Process sheet* for required information or attachments.
****INCOMPLETE APPLICATIONS WILL BE RETURNED****

ARE THE NECESSARY ATTACHMENTS AND INFORMATION INCLUDED?

X YES

Will any federal money be used in this project? **YES** ____ **NO** ✓
Are you applying for the Investment Tax Credits? **YES** ____ **NO** ✓

I, the undersigned, understand that the Design Review Application is limited to the aforementioned work to the affected property. I further understand that any additional exterior work to be done under my ownership must be submitted by application to the St. Paul Heritage Preservation Commission. Any unauthorized work will be required to be removed.

Signature of applicant: Shannon West **Date:** 8/6/13

Signature of owner: N/A **Date:** _____

FOR HPC OFFICE USE ONLY

Date received: 9.30.13 **FILE NO.** 14-004

District: HILL /Individual Site: _____

Contributing/Non-contributing/Pivotal/Supportive/:

Type of work: Minor/Moderate/Major

____ Requires staff review

Supporting data: **YES** **NO**
Complete application: **YES** **NO**

The following condition(s) must be met in order for application to conform to preservation program:

It has been determined that the work to be performed pursuant to the application does not adversely affect the program for preservation and architectural control of the heritage preservation district or site (Ch.73.06).

_____
HPC staff approval

Date _____

✓ Requires Commission review

Submitted:
- ❑ 3 Sets of Plans
- ❑ 15 Sets of Plans reduced to 8 ½" by 11" or 11" by 17"
- ❑ Photographs
- ❑ City Permit Application
- ❑ Complete HPC Design Review application

Hearing Date set for: 10.24.13

City Permit # ____ - _____

Building Facing Northeast, Antennas not visible from Street

Building Facing Northwest before new Smoke Stacks

Building Facing Northwest after new Smoke Stacks

Building Facing Southeast with Existing Sprint Antennas

Building Facing Southeast with replaced Smoke Stack

Building Facing West with Existing Sprint Antennas

Building Facing West with replaced Smoked Stack

Minnesota Historical Society

STATE HISTORIC PRESERVATION OFFICE

RECEIVED JAN 16 2013

January 15, 2013

Rebekah Fuller, Project Manager
RESCOM
3344 Jackson Road
Kingsley MI 49649

RE: MSO3XC670 Church of St. Luke
Replace and upgrade cellular antennae on roof of 1065 Summit Avenue
St. Paul, Ramsey County
SHPO Number: 2013-0933

Dear Ms Fuller:

Thank you for initiating consultation on the above project. It is being reviewed according to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and implementing federal regulations at 36 CFR 800, and the provisions of the nationwide programmatic agreement (PA) governing telecommunications facilities.

Your document states that the visual area of potential effect (APE) is 1,000 feet. Determination of the APE for projects like this, unless agreed upon in consultation with the SHPO, is guided by the nationwide PA, and is set at a quarter mile, not 1,000 feet. Please provide a map showing the full APE extent, in relation to the proposed site and potentially affected historic properties or districts.

In this case, we agree that the collocation site at St. Luke's School, at 1065 Summit Avenue, is a contributing element within the Historic Hill District and the project is located near the West Summit Avenue Historic District. Both these Districts are listed in the National Register of Historic Places, with a large number of contributing properties located within the quarter mile visual APE; more than noted in your report. We have reviewed the subject collocation site and the proposed equipment placement with consideration of this sensitive location, Unfortunately, several sheets in your review packet (pages we assume were intended to contain plans for the existing and proposed installation) came to us fully or partially blank, so it was impossible to review the visual effect of the existing or proposed installations. And only Photo 2 showed any part of the existing installation. Please provide complete existing and proposed installations plans for this project, so we can continue our review. Note: We have no record of any prior reviews at this location.

In addition, it would be helpful if FCC Form 621 were accurately filled out to indicate the presence of Register properties in the direct and visual APE, rather than having the incorrect or incomplete form continue to be in conflict with other sections of the report.

We look forward to receiving your revised submittal. Meanwhile, if you have any questions on our review, please contact me at (651) 259-3456.

Sincerely,

Mary Ann Heidemann, Manager
Government Programs and Compliance

cc: St. Paul Heritage Preservation Commission

Minnesota Historical Society

STATE HISTORIC PRESERVATION OFFICE

February 27, 2013

RECEIVED FEB 2 8 2013

Rebekah Fuller, Project Manager
RESCOM
3344 Jackson Road
Kingsley MI 49649

RE: MSO3XC670 Church of St. Luke
Replace and upgrade cellular antennae on roof of 1065 Summit Avenue
St. Paul, Ramsey County
SHPO Number: 2013-0933

Dear Ms Fuller:

Thank you for sending the construction plans we requested for the above project. The plans have been reviewed according to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and implementing federal regulations at 36 CFR 800, and the provisions of the nationwide programmatic agreement (PA) governing telecommunications facilities.

Because the subject property is located within and contributes to the National Register Historic Hill District and is located across the street from the National Register West Summit Avenue Historic District, the visual APE includes many historic properties. Due to the sensitivity of this location, I took time to visit the site. Contrary to statements in the submittal packet, I found the current antennae installation to be visible from many areas of both the Historic Hill District and the West Summit Avenue Historic District. Further, the existing installation (which was not reviewed by this office) has an adverse visual affect on the subject property itself. We believe that adding more tripod-mounted roof antennae in the same manner as the existing will only increase the adverse visual effect.

Based on our review of the plans, and the site visit, we request that the project be redesigned to reduce the visibility of the existing (unreviewed) and the proposed equipment installations. Because the subject property has an existing chimney elsewhere on the building, it may be possible to design a stealth chimney (or chimneys) that would mask the antennae while being compatible with the building's architectural design. Let us know what you think about that idea, or what other suggestions you may have to reduce the visual impact.

Please note that on the FCC Form 621 submitted for this project, questions 19 and 20 on page 4, as well as the Historic Properties sheet (page 7) state that there are no historic properties in either the direct or indirect Area of Potential Effect. These statements are not accurate and continue to be in conflict with other sections of the report. We requested a revised and corrected form, but did not receive it. Please submit a corrected page 4 and page 7 for Form 621.

We look forward to receiving alternative equipment placement designs. Meanwhile, if you have any questions on our review, please contact me at (651) 259-3456.

Sincerely,

Mary Ann Heidemann, Manager
Government Programs and Compliance

cc: St. Paul Heritage Preservation Commission

RECEIVED APR 2 9 2013

Minnesota Historical Society
STATE HISTORIC PRESERVATION OFFICE

April 25, 2013

Rebekah Fuller, Project Manager
RESCOM
3344 Jackson Road
Kingsley MI 49649

RE: MSO3XC670 Church of St. Luke
Replace and upgrade cellular antennae on roof of 1065 Summit Avenue
St. Paul, Ramsey County
SHPO Number: 2013-0933

Dear Ms Fuller:

Thank you for sending the revised construction plans we requested for the above project. The plans have been reviewed according to the responsibilities given the State Historic Preservation Officer by the National Historic Preservation Act of 1966 and implementing federal regulations at 36 CFR 800, and the provisions of the nationwide programmatic agreement (PA) governing telecommunications facilities.

As noted earlier, the subject property is located within and contributes to the National Register Historic Hill District and is located across the street from the National Register West Summit Avenue Historic District, the visual APE includes many historic properties. Further, the existing installation (which was not reviewed by this office) has an adverse visual affect on the subject property itself. We stated previously that adding more antennae in the same manner as the existing will only increase the adverse visual effect.

The stealth chimneys shown to mask antennae in Sector 2 and 3 are acceptable. However, the revised plans show no use of a stealth structure for the Sector 1 antennae and GPS. On the contrary, the plans show retaining the existing antennae frame, and mounting new antennae and GPS units on the existing frame. Again, in the photos you sent and in my own site visit, the existing antennae frame is quite visible, and we have no record that installation of that frame was ever reviewed by this office. Please consider alternatives to mounting new and/or replacement equipment on the antennae frame, to avoid adverse effects to the subject building, the Historic Hill District and the West Summit Avenue Historic District.

We look forward to receiving an alternative equipment placement design that eliminates or masks the current, un-reviewed antennae frame, antennae and GPS units in Sector 1. Meanwhile, if you have any questions on our review, please contact me at (651) 259-3456.

Sincerely,

Mary Ann Heidemann, Manager
Government Programs and Compliance

cc: St. Paul Heritage Preservation Commission

Sprint

SITE NAME: CHURCH OF ST. LUKE'S SCHOOL

SITE NUMBER: MS03XC670

SITE ADDRESS: 1079 SUMMIT AVE.
ST. PAUL, MN 55105

SITE TYPE: EXISTING 40'-9" HIGH ROOFTOP

SITE INFORMATION

SITE ADDRESS:
1079 SUMMIT AVE.
ST. PAUL, MN 55105

PROPERTY OWNER:
ST. THOMAS MOORE CATHOLIC COMMUNITY
1079 SUMMIT AVENUE
ST. PAUL, MN 55105

EQUIPMENT SUPPLIER:
SAMSUNG TELECOMMUNICATIONS AMERICA (STA)
1301 EAST LOOKOUT DRIVE
RICHARDSON, TX 75082-4124
(972) 761-7000

POWER COMPANY:
XCEL ENERGY

TELCO COMPANY:
CENTURYLINK

COUNTY:
RAMSEY

ZONING JURISDICTION:
CITY OF ST. PAUL

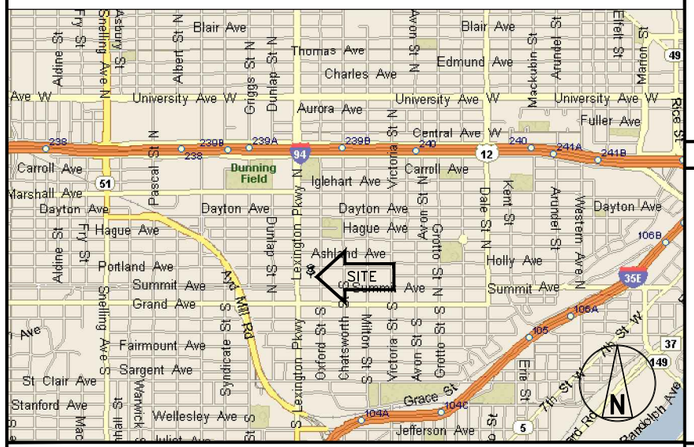
ZONING DISTRICT:
R2: ONE-FAMILY DISTRICT

LATITUDE (NAD83):
44° 56' 31.51" N
44.942086°

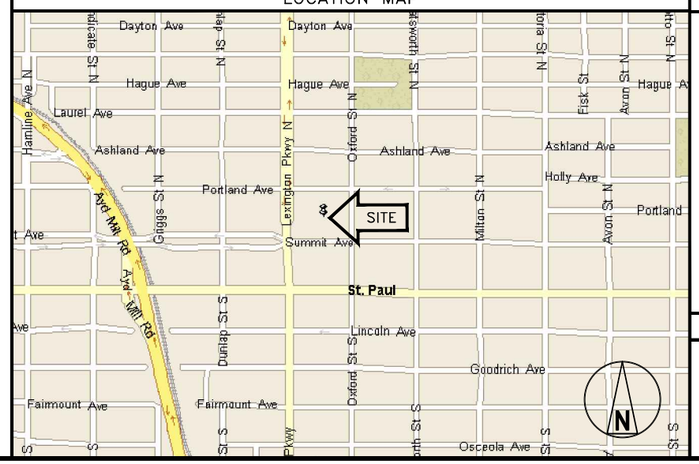
LONGITUDE (NAD83):
93° 08' 42.53" W
-93.145147°

ARCHITECT:

AREA MAP



LOCATION MAP



APPLICABLE CODES

ALL WORK SHALL COMPLY WITH THE FOLLOWING APPLICABLE CODES:

IBC 2006 (2007 MINNESOTA STATE BUILDING CODE)
2009 MINNESOTA PLUMBING CODE
IMC 2006 WITH AMENDMENTS
NEC 2011 ELECTRICAL CODE

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

PROJECT DESCRIPTION

SPRINT IS PROPOSING THE FOLLOWING STEPS TO COMPLETE EQUIPMENT UPGRADE:

- REMOVE (6) EXISTING SPRINT ANTENNAS AND INSTALL (3) NEW PANEL ANTENNAS WITH (18) JUMPERS AND (6) RRUS DIRECTLY BEHIND OR NEAR THE ANTENNAS
- REMOVE (1) ANTENNA MOUNT AND INSTALL (2) NEW ANTENNA MOUNTS
- INSTALL (1) GPS ANTENNA
- INSTALL (3) HYBRID CABLES TO NEW ANTENNAS (1) EACH
- INSTALL (1) MMBS-BBU CABINET AND (1) MMBS-BATTERY CABINET
- REMOVE (3) EXISTING CABINETS WITH ALL ASSOCIATED CABLING AFTER MIGRATION IS COMPLETED

811
Know what's **below.**
Call before you dig.

BEFORE ANY UNDERGROUND WORK IS STARTED YOU MUST HAVE ALL UNDERGROUND UTILITIES LOCATED. CALL 811 AS THE NATIONAL, TOLL FREE NUMBER FOR ALL LOCAL 'CALL BEFORE YOU DIG' PHONE CENTERS THROUGHOUT THE UNITED STATES. OR CALL GOPHER STATE ONE CALL AT 800- 252-1166.

DRIVING DIRECTIONS FROM NEAREST MAJOR AIRPORT

DEPART MINNEAPOLIS/ST PAUL INTERNATIONAL AIRPORT ON LOCAL ROAD(S) (SOUTH); ROAD NAME CHANGES TO 34TH AVE S; TURN LEFT (EAST) ONTO E 70TH ST LINDBERGH TERMINAL / RENTAL CARS AND RETURNS; ROAD NAME CHANGES TO POST RD; TAKE RAMP (LEFT) ONTO SR-5 BEAR RIGHT (EAST) ONTO SR-5 [W 7TH ST]; TAKE RAMP (RIGHT) ONTO I-35E; AT EXIT 104A, TURN RIGHT ONTO RAMP RANDOLPH AVE TURN LEFT (WEST) ONTO CR-38 [RANDOLPH AVE]; TURN RIGHT (NORTH) ONTO (S) LEXINGTON PKWY (S); TURN RIGHT (EAST) ONTO SUMMIT AVE ARRIVE 1079 SUMMIT AVE, ST PAUL, MN 55105

DRAWING INDEX

SHEET NO:	SHEET TITLE
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NOTES:
DRAWING SCALES ARE FOR 24"x36" SHEETS AND HALF SCALE FOR 11"x17" SHEETS

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

SAMSUNG

TeleCAD Wireless
1961 NORTHPOINT BLVD., SUITE 130
HIXSON, TN 37343
PH: 423-843-9500 FAX: 423-843-9509

PROJECT NO: ----
DRAWN BY: JAE
CHECKED BY: SEH

REV	DATE	DESCRIPTION
0	6/19/13	ISSUED FOR CONSTRUCTION
A	6/18/13	ISSUED FOR 90% CD

STEPHEN E. HUNT
LICENSED PROFESSIONAL ENGINEER
47489
6/19/13
STATE OF MINNESOTA

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
TITLE SHEET & PROJECT DATA

SHEET NUMBER
T-1

GENERAL CONSTRUCTION NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE LOCAL BUILDING CODE, THE LATEST EDITION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL CONSTRUCT SITE IN ACCORDANCE WITH THESE DRAWINGS AND SPRINT INTEGRATED CONSTRUCTION STANDARDS FOR WIRELESS SITES (LATEST REVISION). THE SPECIFICATION IS THE RULING DOCUMENT AND ANY DISCREPANCIES BETWEEN THE SPECIFICATION AND THESE DRAWINGS SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
3. CONTRACTOR SHALL VISIT THE JOB SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. NO COMPENSATION WILL BE AWARDED BASED ON CLAIM OF LACK OF KNOWLEDGE OF FIELD CONDITIONS.
4. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT AND APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
5. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM AUTHORIZED REPRESENTATIVE OF THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
6. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
7. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
8. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
10. CONTRACTOR SHALL COORDINATE HIS WORK WITH THE SUPERINTENDENT OF BUILDINGS & GROUNDS AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
12. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS UNLESS SPECIFICALLY OTHERWISE INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
13. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, PIPING ETC. AND IMMEDIATELY REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
14. IN DRILLING HOLES INTO CONCRETE WHETHER FOR FASTENING OR ANCHORING PURPOSES, OR PENETRATIONS THROUGH THE FLOOR FOR CONDUIT RUNS, PIPE RUNS, ETC., MUST BE CLEARLY UNDERSTOOD THAT REINFORCING STEEL SHALL NOT BE DRILLED INTO, CUT OR DAMAGED UNDER ANY CIRCUMSTANCES (UNLESS NOTED OTHERWISE). LOCATIONS OF REINFORCING STEEL ARE NOT DEFINITELY KNOWN AND THEREFORE MUST BE SEARCHED FOR BY APPROPRIATE METHODS AND EQUIPMENT.
15. REPAIR ALL EXISTING WALL SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND IN WITH ADJACENT SURFACES.
16. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH U.L. LISTED AND FIRE CODE APPROVED MATERIALS.
17. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DIRT, DEBRIS, AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
18. MINIMUM BEND RADIUS OF ANTENNA CABLES SHALL BE IN ACCORDANCE WITH CABLE MANUFACTURERS RECOMMENDATIONS.
19. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF THE ENGINEER.
20. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION SHALL BE IN CONFORMANCE WITH JURISDICTIONAL OR STATE AND LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL AND COORDINATED WITH LOCAL REGULATORY AUTHORITIES.
21. LIGHT SHADED LINES AND NOTES REPRESENT WORK PREVIOUSLY DONE. DARK SHADED LINES AND NOTES REPRESENT THE SCOPE OF WORK FOR THIS PROJECT. CONTRACTOR SHALL VERIFY IF EXISTING CONSTRUCTION IS COMPLETE. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
22. CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND/OR WIRING CERTIFICATES REQUIRED FOR THE ELECTRICAL SERVICE UPGRADE. IN ADDITION, CONTRACTOR SHALL PROVIDE ALL NECESSARY COORDINATION AND SCHEDULING WITH THE SERVING ELECTRICAL UTILITY AND LOCAL INSPECTION AUTHORITIES.

ELECTRICAL NOTES

1. ELECTRICAL CONTRACTOR SHALL SUPPLY AND INSTALL ANY/ALL ELECTRICAL WORK INDICATED. ANY/ALL CONSTRUCTION SHALL BE IN ACCORDANCE W/DRAWINGS AND ANY/ALL APPLICABLE SPECIFICATIONS. IF ANY PROBLEMS ARE ENCOUNTERED BY COMPLYING WITH THESE REQUIREMENTS, CONTRACTOR SHALL NOTIFY 'CONSTRUCTION MANAGER' AS SOON AS POSSIBLE, AFTER THE DISCOVERY OF THE PROBLEMS, AND SHALL NOT PROCEED WITH THAT PORTION OF WORK, UNTIL THE 'CONSTRUCTION MANAGER' HAS DIRECTED THE CORRECTIVE ACTIONS TO BE TAKEN.
2. ELECTRICAL CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ANY/ALL CONDITIONS AFFECTING ELECTRICAL AND COMMUNICATION INSTALLATION AND MAKE PROVISIONS AS TO THE COST THEREOF. ALL EXISTING CONDITIONS OF ELECTRICAL EQUIP., LIGHT FIXTURES, ETC., THAT ARE PART OF THE FINAL SYSTEM, SHALL BE VERIFIED BY THE CONTRACTOR, PRIOR TO THE SUBMITTAL OF HIS BID. FAILURE TO COMPLY WITH THIS PARAGRAPH WILL IN NO WAY RELIEVE CONTRACTOR OF PERFORMING ALL WORK NECESSARY FOR A COMPLETE AND WORKING SYSTEM.
3. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST EDITION OF THE NEC AND ALL CODES AND LOCAL ORDINANCES OF THE LOCAL POWER & TELEPHONE COMPANIES HAVING JURISDICTION AND SHALL INCLUDE BUT NOT BE LIMITED TO:
   A. UL – UNDERWRITERS LABORATORIES
   B. NEC – NATIONAL ELECTRICAL CODE
   C. NEMA – NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
   D. OSHA – OCCUPATIONAL SAFETY AND HEALTH ACT
   E. SBC – STANDARD BUILDING CODE
   F. NFPA – NATIONAL FIRE CODES
4. DO NOT SCALE ELECTRICAL DRAWINGS, REFER TO SITE PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, AND CONFIRM WITH 'CONSTRUCTION MANAGER' ANY SIZES AND LOCATIONS WHEN NEEDED.
5. EXISTING SERVICES: CONTRACTOR SHALL NOT INTERRUPT EXISTING SERVICES WITHOUT WRITTEN PERMISSION OF THE OWNER.
6. CONTRACTOR SHALL PAY FOR ANY/ALL PERMITS, FEES, INSPECTIONS AND TESTING. CONTRACTOR IS TO OBTAIN PERMITS AND APPROVED SUBMITTALS PRIOR TO THE WORK BEGINNING OR ORDERING EQUIPMENT.
7. THE TERM "PROVIDE" USED IN CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, INDICATES THAT THE CONTRACTOR SHALL FURNISH AND INSTALL.
8. CONTRACTOR SHALL CONFIRM WITH LOCAL UTILITY COMPANY ANY/ALL REQUIREMENTS SUCH AS THE: LUG SIZE RESTRICTIONS, CONDUIT ENTRY, SIZE OF TRANSFORMERS, SCHEDULED DOWNTIME FOR THE OWNERS' CONFIRMATION, ETC. ANY/ALL CONFLICTS SHALL BE BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER, PRIOR TO BEGINNING ANY WORK.
9. MINIMUM WIRE SIZE SHALL BE #12 AWG, NOT INCLUDING CONTROL WIRING, UNLESS NOTED OTHERWISE. ALL CONDUCTORS SHALL BE COPPER WITH THWN INSULATION.
10. OUTLET BOXES SHALL BE PRESSED STEEL IN DRY LOCATIONS, CAST ALLOY WITH THREADED HUBS IN WET/DAMP LOCATIONS AND SPECIAL ENCLOSURES FOR OTHER CLASSIFIED AREAS.
11. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF THE CONSTRUCTION. CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM AND PROVIDE ALL REQUIREMENTS FOR THE EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER.
12. ELECTRICAL SYSTEM SHALL BE AS COMPLETELY AND EFFECTIVELY GROUNDED, AS REQUIRED BY SPECIFICATIONS, SET FORTH BY SPRINT.
13. ALL WORK SHALL BE PERFORMED BY A LICENSED ELECTRICAL CONTRACTOR IN A FIRST CLASS, WORKMANLIKE MANNER. THE COMPLETED SYSTEM SHALL BE FULLY OPERATIVE AND SUBJECT TO REGULATORY INSPECTION AND APPROVAL BY CONSTRUCTION MANAGER.
14. ALL WORK SHALL BE COORDINATED WITH OTHER TRADES TO AVOID INTERFERENCE WITH THE PROGRESS OF CONSTRUCTION.
15. CONTRACTOR SHALL GUARANTEE ANY/ALL MATERIALS AND WORK FREE FROM DEFECTS FOR A PERIOD OF NOT LESS THAN ONE YEAR FROM DATE OF ACCEPTANCE.
16. THE CORRECTION OF ANY DEFECTS SHALL BE COMPLETED WITHOUT ANY ADDITIONAL CHARGE AND SHALL INCLUDE THE REPLACEMENT OR THE REPAIR OF ANY OTHER PHASE OF THE INSTALLATION, WHICH MAY HAVE BEEN DAMAGED THEREIN.
17. ADEQUATE AND REQUIRED LIABILITY INSURANCE SHALL BE PROVIDED FOR PROTECTION AGAINST PUBLIC LOSS AND ANY/ALL PROPERTY DAMAGE FOR THE DURATION OF WORK.
18. PROVIDE AND INSTALL CONDUIT, CONDUCTORS, PULL WIRES, BOXES, COVER PLATES AND DEVICES FOR ALL OUTLETS AS INDICATED.
19. DITCHING AND BACK FILL: CONTRACTOR SHALL PROVIDE FOR ALL UNDERGROUND INSTALLED CONDUIT AND/OR CABLES INCLUDING EXCAVATION AND BACKFILLING AND COMPACTION. REFER TO NOTES AND REQUIREMENTS 'EXCAVATION, AND BACKFILLING.
20. MATERIALS, PRODUCTS AND EQUIPMENT, INCLUDING ALL COMPONENTS THEREOF, SHALL BE NEW AND SHALL APPEAR ON THE LIST OF U.L. APPROVED ITEMS AND SHALL MEET OR EXCEED THE REQUIREMENTS OF THE NEC, NEMA AND IEEE.
21. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR MANUFACTURES CATALOG INFORMATION OF ANY/ALL LIGHTING FIXTURES, SWITCHES AND ALL OTHER ELECTRICAL ITEMS FOR APPROVAL BY THE CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
22. ANY CUTTING OR PATCHING DEEMED NECESSARY FOR ELECTRICAL WORK IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY AND SHALL BE INCLUDED IN THE COST FOR WORK AND PERFORMED TO THE SATISFACTION OF THE 'CONSTRUCTION MANAGER' UPON FINAL ACCEPTANCE.
23. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL PANELS WITH ONLY TYPEWRITTEN DIRECTORIES. ALL ELECTRICAL WIRING SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.
24. DISCONNECT SWITCHES SHALL BE H.P. RATED HEAVY–DUTY, QUICK–MAKE AND QUICK–BREAK ENCLOSURES, AS REQUIRED BY EXPOSURE TYPE.
25. ALL CONNECTIONS SHALL BE MADE WITH A PROTECTIVE COATING OF AN ANTI–OXIDE COMPOUND SUCH AS "NO–OXIDE A" BY DEARBORNE CHEMICAL CO. COAT ALL WIRE SURFACES BEFORE CONNECTING. EXPOSED COPPER SURFACES, INCLUDING GROUND BARS, SHALL BE TREATED – NO SUBSTITUTIONS.
26. ALL EXTERIOR ABOVE GROUND CONDUIT SHALL BE RIGID UNLESS OTHERWISE SPECIFIED. ALL BURIED CONDUITS SHALL BE SCH 40 PVC UNLESS OTHERWISE SPECIFIED. ALL INTERIOR CONDUITS SHALL BE EMT UNLESS OTHERWISE SPECIFIED.
27. RACEWAYS: CONDUIT SHALL BE SCHEDULE 40 PVC MEETING OR EXCEEDING NEMA TC2 – 1990. CONTRACTOR SHALL PLUG AND CAP EACH END OF SPARE AND EMPTY CONDUITS AND PROVIDE TWO SEPARATE PULL STRINGS – 200 LBS TEST POLYETHYLENE CORD. ALL CONDUIT BENDS SHALL BE A MINIMUM OF 2 FT. RADIUS. RGS CONDUITS WHEN SPECIFIED, SHALL MEET UL–6 FOR GALVANIZED STEEL. ALL FITTINGS SHALL BE SUITABLE FOR USE WITH THREADED RIGID CONDUIT. COAT ALL THREADS WITH 'BRITE ZINC' OR 'GOLD GALV'.
28. SUPPORT OF ALL ELECTRICAL WORK SHALL BE AS REQUIRED BY NEC.
29. CONDUCTORS: CONTRACTOR SHALL USE 98% CONDUCTIVITY COPPER WITH TYPE THWN/THHN INSULATION, 600 VOLT, COLOR CODED. UNLESS SPECIFIED DIFFERENT ON DRAWINGS.
30. CONNECTORS FOR POWER CONDUCTORS: CONTRACTOR SHALL USE PRESSURE TYPE INSULATED TWIST–ON CONNECTORS FOR NO. 10 AWG AND SMALLER. USE SOLDERLESS MECHANICAL TERMINAL LUGS FOR NO. 8 AWG AND LARGER.
31. SERVICE: 240/120V, SINGLE PHASE, 3 WIRE CONNECTION AVAILABLE FROM UTILITY COMPANY. OWNER OR OWNERS AGENT WILL APPLY FOR POWER.
32. TELEPHONE SERVICE: CONTRACTOR SHALL PROVIDE EMPTY CONDUITS WITH PULL STRINGS AS INDICATED ON DRAWINGS.
33. ELECTRICAL AND TELCO RACEWAYS TO BE BURIED A MINIMUM OF 2' DEPTH.
34. CONTRACTOR SHALL PLACE TWO LENGTHS OF WARNING TAPE AT A DEPTH OF 12" BELOW GROUND AND DIRECTLY ABOVE ELECTRICAL AND TELCO SERVICE CONDUITS. CAUTIONS TAPE TO READ "CAUTION BURIED ELECTRIC" OR "BURIED TELECOM".
35. WHEN DIRECTIONAL BORING IS REQUIRED, CONTRACTOR SHALL INSTALL A LOOSE TONING WIRE WITHIN INSTALLED CONDUIT TO ALLOW FOR IDENTIFICATION OF UNDERGROUND CONDUITS.
36. ALL BOLTS SHALL BE STAINLESS STEEL.

ANTENNA & COAX NOTES

1. VERIFY EACH COAXIAL CABLE LENGTH, DIAMETER, ROUTING, COLOR CODING AND ALL APPURTENANCES WITH SAMSUNG.
2. THE MAXIMUM COAXIAL CABLE LENGTH AND CORRESPONDING COAXIAL CABLE DIAMETER HAS BEEN ESTIMATED ON SHEET A–4. THIS CABLE LENGTH IS APPROXIMATE, AND IS NOT TO BE USED FOR FABRICATION OR CONSTRUCTION. ACTUAL ANTENNA CABLE LENGTH(S) MAY VARY FROM ESTIMATED MAXIMUM LENGTH AND MUST BE VERIFIED. COAXIAL CABLE SHALL BE PROVIDED BY SAMSUNG.
3. ALL MAIN CABLES SHALL UTILIZE GROUND KITS, GROUNDED AS FOLLOWS:
   A. NEAR ANTENNA RAD CENTER ELEVATION,
   B. MIDDLE OF TOWER (MID–HEIGHT OF ANTENNA), IF CABLE RUN IS OVER 200',
   C. BOTTOM OF TOWER,
   D. AT MASTER GROUND BAR 3'–0" FROM MMBS–BBU CABINET.
4. ALL TOP JUMPERS SHALL BE LENGTHS AS SHOWN, SUPPLIED BY SAMSUNG, AND INSTALLED BY CONTRACTOR.
5. ALL MAIN CABLES SHALL BE COLOR CODED AS SHOWN ON SHEET RF–1 AND IN ACCORDANCE WITH SPRINT SPECIFICATIONS.
6. BANDING SHALL BE IN ACCORDANCE WITH SHEET RF–1 AND AS FOLLOWS:
   A. MAIN LINE COLOR BANDS SHALL BE 2" WIDE. MAINTAIN 1" SPACING BETWEEN COLORS.
   B. FREQUENCY COLOR BANDS SHALL BE 2" WIDE WITH NO SPACE BETWEEN COLORS.
   C. JUMPER COLOR BANDS SHALL BE 1" WIDE WITH 1" SPACE.
   D. START COLOR BANDS 2" BEYOND WEATHERPROOFING.
   E. START SELECTOR COLOR NEXT TO END CONNECTORS.
7. FINAL COAXIAL ANTENNA CABLE SIZES SHALL BE DETERMINED BY SAMSUNG RF ENGINEER. SEE ANTENNA SCHEDULE SHEET A–4.
8. SEE CONSTRUCTION MANAGER FOR ANTENNA SUPPORT ASSEMBLY TYPE.
9. ALL COAXIAL CABLE WILL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE AT DISTANCES NOT TO EXCEED 3' OR THE CABLE MANUFACTURES SPECIFICATIONS WHICHEVER IS LESS, WITH HARDWARE SPECIFIED IN THE COAXIAL CABLE ROUTING DETAILS OF THE SUPPLIED STRUCTURAL REPORT.
10. PROVIDE AT LEAST 6" OF SLACK IN THE MAIN COAXIAL CABLES AT THE ANTENNA MOUNTING ELEVATION TO PROVIDE FOR FUTURE CONNECTOR REPLACEMENT.

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

SAMSUNG

TeleCAD Wireless
1961 NORTHPOINT BLVD., SUITE 130
HIXSON, TN 37343
PH: 423-843-9500 FAX: 423-843-9509

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MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
GENERAL NOTES 1

SHEET NUMBER
GN-1

SITE WORK NOTES

1. DO NOT EXCAVATE OR DISTURB BEYOND THE PROPERTY LINES OR LEASE LINES, UNLESS OTHERWISE NOTED.
2. DO NOT SCALE BUILDING DIMENSIONS FROM DRAWING.
3. SIZE, LOCATION AND TYPE OF ANY UNDERGROUND UTILITIES OR IMPROVEMENTS SHALL BE ACCURATELY NOTED AND PLACED ON AS-BUILT DRAWINGS BY GENERAL CONTRACTOR AND ISSUED TO ARCHITECT/ENGINEER AT COMPLETION OF PROJECT.
4. ALL EXISTING UTILITIES, FACILITIES, CONDITIONS AND THEIR DIMENSIONS SHOWN ON PLANS HAVE BEEN PLOTTED FROM AVAILABLE RECORDS. THE ENGINEER AND OWNER ASSUME NO RESPONSIBILITY WHATSOEVER AS TO THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN ON THE PLANS OR THE MANNER OF THEIR REMOVAL OR ADJUSTMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL EXISTING UTILITIES AND FACILITIES PRIOR TO START OF CONSTRUCTION. CONTRACTOR SHALL ALSO OBTAIN FROM EACH UTILITY COMPANY DETAILED INFORMATION RELATIVE TO WORKING SCHEDULES AND METHODS OF REMOVING OR ADJUSTING EXISTING UTILITIES.
5. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES BOTH HORIZONTALLY AND VERTICALLY PRIOR TO START OF CONSTRUCTION. ANY DISCREPANCIES OR DOUBTS AS TO THE INTERPRETATION OF PLANS SHALL BE IMMEDIATELY REPORTED TO THE ARCHITECT/ENGINEER FOR RESOLUTION AND INSTRUCTION, AND NO FURTHER WORK SHALL BE PERFORMED UNTIL THE DISCREPANCY IS CHECKED AND CORRECTED BY THE ARCHITECT/ENGINEER. FAILURE TO SECURE SUCH INSTRUCTION MEANS CONTRACTOR WILL HAVE WORKED AT HIS/HER OWN RISK AND EXPENSE. CONTRACTOR SHALL CALL LOCAL DIGGER HOT LINE FOR UTILITY LOCATIONS 48 HOURS PRIOR TO START OF CONSTRUCTION.
6. ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS TO BE DISTURBED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISH ELEVATIONS PRIOR TO FINAL INSPECTION OF WORK.
7. GRADING OF THE SITE WORK AREA IS TO BE SMOOTH AND CONTINUOUS IN SLOPE AND IS TO FEATHER INTO EXISTING GRADES AT THE GRADING LIMITS.
8. ALL TEMPORARY EXCAVATIONS FOR THE INSTALLATION OF FOUNDATIONS, UTILITIES, ETC., SHALL BE PROPERLY LAID BACK OR BRACED IN ACCORDANCE WITH CORRECT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REQUIREMENTS.
9. STRUCTURAL FILLS SUPPORTING PAVEMENTS SHALL BE COMPACTED TO 95% OF MAXIMUM STANDARD PROCTOR DRY DENSITY.
10. NEW GRADES NOT IN BUILDING AND DRIVEWAY IMPROVEMENT AREA TO BE ACHIEVED BY FILLING WITH APPROVED CLEAN FILL AND COMPACTED TO 95% OF STANDARD PROCTOR DENSITY.
11. ALL FILL SHALL BE PLACED IN UNIFORM LIFTS. THE LIFTS THICKNESS SHOULD NOT EXCEED THAT WHICH CAN BE PROPERLY COMPACTED THROUGHOUT ITS ENTIRE DEPTH WITH THE EQUIPMENT AVAILABLE.
12. ANY FILLS PLACED ON EXISTING SLOPES THAT ARE STEEPER THAN 10 HORIZONTAL TO 1 VERTICAL SHALL BE PROPERLY BENCHED INTO THE EXISTING SLOPE AS DIRECTED BY A GEOTECHNICAL ENGINEER.
13. CONTRACTOR SHALL CLEAN ENTIRE SITE AFTER CONSTRUCTION SUCH THAT NO PAPERS, TRASH, WEEDS, BRUSH OR ANY OTHER DEPOSITS WILL REMAIN. ALL MATERIALS COLLECTED DURING CLEANING OPERATIONS SHALL BE DISPOSED OF OFF-SITE BY THE GENERAL CONTRACTOR.
14. ALL TREES AND SHRUBS WHICH ARE NOT IN DIRECT CONFLICT WITH THE IMPROVEMENTS SHALL BE PROTECTED BY THE GENERAL CONTRACTOR.
15. ALL SITE WORK SHALL BE CAREFULLY COORDINATED BY GENERAL CONTRACTOR WITH LOCAL UTILITY COMPANY, TELEPHONE COMPANY, AND ANY OTHER UTILITY COMPANIES HAVING JURISDICTION OVER THIS LOCATION.

ENVIRONMENTAL NOTES

1. ALL WORK PERFORMED SHALL BE DONE IN ACCORDANCE WITH ISSUED PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF FINES AND PROPER CLEAN UP FOR AREAS IN VIOLATION.
2. CONTRACTOR AND/OR DEVELOPER SHALL BE RESPONSIBLE FOR CONSTRUCTION AND MAINTENANCE OF EROSION AND SEDIMENTATION CONTROLS DURING CONSTRUCTION FOR PROTECTION OF ADJACENT PROPERTIES, ROADWAYS AND WATERWAYS AND SHALL BE MAINTAINED IN PLACE THROUGH FINAL JURISDICTIONAL INSPECTION & RELEASE OF SITE.
3. CONTRACTOR SHALL INSTALL/CONSTRUCT ALL NECESSARY SEDIMENT/SILT CONTROL FENCING AND PROTECTIVE MEASURES WITHIN THE LIMITS OF SITE DISTURBANCE PRIOR TO CONSTRUCTION.
4. NO SEDIMENT SHALL BE ALLOWED TO EXIT THE PROPERTY. THE CONTRACTOR IS RESPONSIBLE FOR TAKING ADEQUATE MEASURES FOR CONTROLLING EROSION. ADDITIONAL SEDIMENT CONTROL FENCING MAY BE REQUIRED IN ANY AREAS SUBJECT TO EROSION.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING POSITIVE DRAINAGE ON THE SITE AT ALL TIMES WITH SILT AND EROSION CONTROL MEASURES MAINTAINED ON THE DOWNSTREAM SIDE OF SITE DRAINAGE. ANY DAMAGE TO ADJACENT PROPERTY AS A RESULT OF EROSION WILL BE CORRECTED AT THE CONTRACTORS EXPENSE.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY INSPECTIONS AND ANY REPAIRS OF ALL SEDIMENT CONTROL MEASURES INCLUDING SEDIMENT REMOVAL AS NECESSARY.
7. CLEARING OF VEGETATION AND TREE REMOVAL SHALL BE ONLY AS PERMITTED AND BE HELD TO A MINIMUM. ONLY TREES NECESSARY FOR CONSTRUCTION OF THE FACILITIES SHALL BE REMOVED.
8. SEEDING AND MULCHING AND/OR SODDING OF THE SITE WILL BE ACCOMPLISHED AS SOON AS POSSIBLE AFTER COMPLETION OF THE PROJECT FACILITIES AFFECTING LAND DISTURBANCE.
9. CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED BY LOCAL, COUNTY AND STATE CODES AND ORDINANCES TO PROTECT EMBANKMENTS FROM SOIL LOSS AND TO PREVENT ACCUMULATION OF SOIL AND SILT IN STREAMS AND DRAINAGE PATHS LEAVING THE CONSTRUCTION AREA. THIS MAY INCLUDE SUCH MEASURES AS SILT FENCES, STRAW BALE SEDIMENT BARRIERS, AND CHECK DAMS.
10. RIP RAP OF SIZES INDICATED SHALL CONSIST OF CLEAN, HARD, SOUND, DURABLE, UNIFORM IN QUALITY STONE FREE OF ANY DETRIMENTAL QUANTITY OF SOFT, FRIABLE, THIN, ELONGATED OR LAMINATED PIECES, DISINTEGRATED MATERIAL, ORGANIC MATTER, OIL, ALKALI, OR OTHER DELETERIOUS SUBSTANCES.

FOUNDATION, EXCAVATION AND BACKFILL NOTES

1. ALL FINAL GRADED SLOPES SHALL BE A MAXIMUM OF 3 HORIZONTAL TO 1 VERTICAL.
2. ALL EXCAVATIONS PREPARED FOR PLACEMENT OF CONCRETE SHALL BE OF UNDISTURBED SOILS, SUBSTANTIALLY HORIZONTAL AND FREE FROM ANY LOOSE, UNSUITABLE MATERIAL OR FROZEN SOILS, AND WITHOUT THE PRESENCE OF POUNDING WATER. DEWATERING FOR EXCESS GROUND WATER SHALL BE PROVIDED WHEN REQUIRED. COMPACTION OF SOILS UNDER CONCRETE PAD FOUNDATIONS SHALL NOT BE LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR THE SOIL IN ACCORDANCE WITH ASTM D1557.
3. CONCRETE FOUNDATIONS SHALL NOT BE PLACED ON ORGANIC OR UNSUITABLE MATERIAL. IF INADEQUATE BEARING CAPACITY IS REACHED AT THE DESIGNED EXCAVATION DEPTH, THE UNSATISFACTORY SOIL SHALL BE EXCAVATED TO ITS FULL DEPTH AND EITHER BE REPLACED WITH MECHANICALLY COMPACTED GRANULAR MATERIAL OR THE EXCAVATION SHALL BE FILLED WITH CONCRETE OF THE SAME TYPE SPECIFIED FOR THE FOUNDATION. CRUSHED STONE MAY BE USED TO STABILIZE THE BOTTOM OF THE EXCAVATION. ANY STONE SUB BASE MATERIAL, IF USED, SHALL NOT SUBSTITUTE FOR REQUIRED THICKNESS OF CONCRETE.
4. ALL EXCAVATIONS SHALL BE CLEAN OF UNSUITABLE MATERIAL SUCH AS VEGETATION, TRASH, DEBRIS, AND SO FORTH PRIOR TO BACK FILLING. BACK FILL SHALL CONSIST OF APPROVED MATERIALS SUCH AS EARTH, LOAM, SANDY CLAY, SAND AND GRAVEL, OR SOFT SHALE, FREE FROM CLODS OR LARGE STONES OVER 2 1/2" MAX DIMENSIONS. ALL BACK FILL SHALL BE PLACED IN COMPACTED LAYERS.
5. ALL FILL MATERIALS AND FOUNDATION BACK FILL SHALL BE PLACED IN MAXIMUM 6" THICK LIFTS BEFORE COMPACTION. EACH LIFT SHALL BE WETTED IF REQUIRED AND COMPACTED TO NOT LESS THAN 95% OF THE MODIFIED PROCTOR MAXIMUM DRY DENSITY FOR SOIL IN ACCORDANCE WITH ASTM D1557.
6. NEWLY PLACED CONCRETE FOUNDATIONS SHALL CURE A MINIMUM OF 72 HRS PRIOR TO BACK FILLING.
7. FINISHED GRADING SHALL BE SLOPED TO PROVIDE POSITIVE DRAINAGE AND PREVENT STANDING WATER. THE FINAL (FINISH) ELEVATION OF SLAB FOUNDATIONS SHALL SLOPE AWAY IN ALL DIRECTIONS FROM THE CENTER. FINISH GRADE OF CONCRETE PADS SHALL BE A MAXIMUM OF 4" ABOVE FINAL FINISH GRADE ELEVATIONS. PROVIDE SURFACE FILL GRAVEL TO ESTABLISH SPECIFIED ELEVATIONS WHERE REQUIRED.
8. NEWLY GRADED SURFACE AREAS TO RECEIVE GRAVEL SHALL BE COVERED WITH GEOTEXTILE FABRIC TYPE: TYPAR-3401 AS MANUFACTURED BY "CONSTRUCTION MATERIAL 1-800-239-3841" OR AN APPROVED EQUIVALENT, SHOWN ON PLANS. THE GEOTEXTILE FABRIC SHALL BE BLACK IN COLOR TO CONTROL THE RECURRENCE OF VEGETATIVE GROWTH AND EXTEND TO WITHIN 1 FOOT OUTSIDE THE SITE FENCING OR ELECTRICAL GROUNDING SYSTEM PERIMETER WHICH EVER IS GREATER. ALL FABRIC SHALL BE COVERED WITH A MINIMUM OF 4" DEEP COMPACTED STONE OR GRAVEL AS SPECIFIED. I.E. FDOT TYPE No. 57 FOR FENCED COMPOUND; FDOT TYPE No. 67 FOR ACCESS DRIVE AREA.
9. IN ALL AREAS TO RECEIVE FILL, REMOVE ALL VEGETATION, TOPSOIL, DEBRIS, WET AND UNSATISFACTORY SOIL MATERIALS, OBSTRUCTIONS, AND DELETERIOUS MATERIALS FROM GROUND SURFACE. PLOW STRIP OR BREAK UP SLOPED SURFACES STEEPER THAN 1 VERTICAL TO 4 HORIZONTAL SUCH THAT FILL MATERIAL WILL BIND WITH EXISTING/PREPARED SOIL SURFACE.
10. WHEN SUB GRADE OR PREPARED GROUND SURFACE HAS A DENSITY LESS THAN THAT REQUIRED FOR THE FILL MATERIAL, SCARIFY THE GROUND SURFACE TO DEPTH REQUIRED, PULVERIZE, MOISTURE-CONDITION AND/OR AERATE THE SOILS AND RECOMPACT TO THE REQUIRED DENSITY PRIOR TO PLACEMENT OF FILLS.
11. IN AREAS WHICH EXISTING GRAVEL SURFACING IS REMOVED OR DISTURBED DURING CONSTRUCTION OPERATIONS, REPLACE GRAVEL SURFACING TO MATCH ADJACENT GRAVEL SURFACING AND RESTORED TO THE SAME THICKNESS AND COMPACTION AS SPECIFIED. ALL RESTORED GRAVEL SURFACING SHALL BE FREE FROM CORRUGATIONS AND WAVES.
12. EXISTING GRAVEL SURFACING MAY BE EXCAVATED SEPARATELY AND REUSED WITH THE CONDITION THAT ANY UNFAVORABLE AMOUNTS OF ORGANIC MATTER, OR OTHER DELETERIOUS MATERIALS ARE REMOVED PRIOR TO REUSE. FURNISH ANY ADDITIONAL GRAVEL RESURFACING MATERIAL AS NEEDED TO PROVIDE A FULL DEPTH COMPACTED SURFACE THROUGHOUT SITE.
13. GRAVEL SUB SURFACE SHALL BE PREPARED TO REQUIRED COMPACTION AND SUB GRADE ELEVATIONS BEFORE GRAVEL SURFACING IS PLACED AND/OR RESTORED. ANY LOOSE OR DISTURBED MATERIALS SHALL BE THOROUGHLY COMPACTED AND ANY DEPRESSIONS IN THE SUB GRADE SHALL BE FILLED AND COMPACTED WITH APPROVED SELECTED MATERIAL. GRAVEL SURFACING MATERIAL SHALL NOT BE USED FOR FILLING DEPRESSIONS IN THE SUB GRADE.
14. PROTECT EXISTING GRAVEL SURFACING AND SUB GRADE IN AREAS WHERE EQUIPMENT LOADS WILL OPERATE. USE PLANKING 'MATTS' OR OTHER SUITABLE PROTECTION DESIGNED TO SPREAD EQUIPMENT LOADS AS MAY BE NECESSARY. REPAIR ANY DAMAGE TO EXISTING GRAVEL SURFACING OR SUB GRADE WHERE SUCH DAMAGE IS DUE TO THE CONTRACTORS OPERATIONS.
15. DAMAGE TO EXISTING STRUCTURES AND/OR UTILITIES RESULTING FROM CONTRACTORS NEGLIGENCE SHALL BE REPAIRED AND/OR REPLACED TO THE OWNERS SATISFACTION AT NO ADDITIONAL COST TO THE CONTRACT.
16. ALL SUITABLE BORROW MATERIAL FOR BACK FILL OF THE SITE SHALL BE INCLUDED IN THE BID. EXCESS TOPSOIL AND UNSUITABLE MATERIAL SHALL BE DISPOSED OF OFF SITE AT LOCATIONS APPROVED BY GOVERNING AGENCIES AT NO ADDITIONAL COST TO THE CONTRACT.

STRUCTURAL STEEL NOTES

1. ALL STEEL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION. STEEL SECTIONS SHALL BE IN ACCORDANCE WITH ASTM AS INDICATED BELOW:

   W-SHAPES: ASTM A992, 50 KSI
   ANGLES, BARS CHANNELS: ASTM A36, 36 KSI
   HSS SECTIONS: ASTM 500, 46 KSI
   PIPE SECTIONS: ASTM A53-E, 35 KSI
2. ALL EXTERIOR EXPOSED STEEL AND HARDWARE SHALL BE HOT DIPPED GALVANIZED.
3. ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
4. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
5. NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
6. FIELD MODIFICATIONS ARE TO BE COATED WITH ZINC ENRICHED PAINT.

CONCRETE MASONRY NOTES

1. CONCRETE MASONRY UNITS SHALL BE MEDIUM WEIGHT UNITS CONFORMING TO ASTM C90, GRADE N-1, (F'M=1,500 PS). MEDIUM WEIGHT (115 PCF).
2. MORTAR SHALL BE TYPE "S" (MINIMUM 1,800 PSI AT 28 DAYS).
3. GROUT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS.
4. ALL CELLS CONTAINING REINFORCING STEEL OR EMBEDDED ITEMS AND ALL CELLS IN RETAINING WALLS AND WALLS BELOW GRADE SHALL BE SOLID GROUTED.
5. ALL HORIZONTAL REINFORCEMENT SHALL BE PLACED IN BOND BEAM OR LINTEL BEAM UNITS.
6. WHEN GROUTING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE GROUT POUR 1-1/2" BELOW TOP OF THE UPPERMOST UNIT.
7. ALL BOND BEAM BLOCK SHALL BE "DEEP CUT" UNITS.
8. PROVIDE INSPECTION AND CLEAN-OUT HOLES AT BASE OF VERTICAL CELLS HAVING GROUT LIFTS IN EXCESS OF 4'-0" OF HEIGHT.
9. ALL GROUT SHALL BE CONSOLIDATED WITH A MECHANICAL VIBRATOR.
10. CEMENT SHALL BE AS SPECIFIED FOR CONCRETE.
11. REINFORCING BARS - SEE NOTES UNDER "STRUCTURAL CONCRETE NOTES" FOR REQUIREMENTS.
12. PROVIDE ONE BAR DIAMETER (A MINIMUM OF 1/2") GROUT BETWEEN MAIN REINFORCING AND MASONRY UNITS.
13. LOW LIFT CONSTRUCTION, MAXIMUM GROUT POUR HEIGHT IS 4 FEET.
14. HIGH LIFT GROUTED CONSTRUCTION MAY BE USED IN CONFORMANCE WITH PROJECT SPECIFICATIONS AND SECTION 2104.6.1. OF U.B.C.
15. ALL CELLS IN CONCRETE BLOCKS SHALL BE FILLED SOLID WITH GROUT, EXCEPT AS NOTED IN THE DRAWINGS OR SPECIFICATIONS.
16. CELLS SHALL BE IN VERTICAL ALIGNMENT, DOWELS IN FOOTINGS SHALL BE SET TO ALIGN WITH CORES CONTAINING REINFORCING STEEL.
17. REFER TO ARCHITECTURAL DRAWINGS FOR SURFACE AND HEIGHT OF UNITS, LAYING PATTERN AND JOINT TYPE.
18. SAND SHALL BE CLEAN, SHARP AND WELL GRADED, FREE FROM INJURIOUS AMOUNTS OF DUST, LUMPS, SHALE, ALKAU OR ORGANIC MATERIAL.
19. BRICK SHALL CONFORM TO ASTM C-62 AND SHALL BE GRADE MW OR BETTER.

STRUCTURAL CONCRETE NOTES

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301-05, ACI 318-05 AND THE SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH fc'=3,000 PSI AT 28 DAYS UNLESS NOTED OTHERWISE.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES CLASS "B" AND ALL HOOKS SHALL BE STANDARD UNLESS NOTED OTHERWISE.
4. THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:

   CONCRETE CAST AGAINST EARTH.....3 IN.

   CONCRETE EXPOSED TO EARTH OR WEATHER:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF .....1-1/2 IN.

   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALL .....3/4 IN.
   BEAMS AND COLUMNS.....1-1/2 IN.
5. A 3/4" CHAMFER SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE U.N.O. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
6. HOLES TO RECEIVE EXPANSION/WEDGE ANCHORS SHALL BE 1/8" LARGER IN DIAMETER THAN THE ANCHOR BOLT, DOWEL OR ROD AND SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. LOCATE AND AVOID CUTTING EXISTING REBAR WHEN DRILLING HOLES IN ELEVATED CONCRETE SLABS.
7. USE AND INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER ICBO & MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURES.

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OVERLAND PARK, KANSAS 66251

SAMSUNG

TeleCAD Wireless
1961 NORTHPOINT BLVD., SUITE 130
HIXSON, TN 37343
PH: 423-843-9500 FAX: 423-843-9509

PROJECT NO:	----
DRAWN BY:	JAE
CHECKED BY:	SEH

REV	DATE	DESCRIPTION
0	6/19/13	ISSUED FOR CONSTRUCTION
A	6/18/13	ISSUED FOR 90% CD

STEPHEN E. HUNT
LICENSED PROFESSIONAL ENGINEER
47489
STATE OF MINNESOTA
6/19/13

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
GENERAL NOTES 2

SHEET NUMBER
GN-2

PORTLAND AVE.

EXISTING RESIDENTIAL AREA

EXISTING PARKING LOT

EXISTING RESIDENTIAL AREA

EXISTING PARKING LOT

EXISTING BUILDING

LEXINGTON PKWY S

EXISTING ACCESS DRIVE

EXISTING PROPERTY LINE

EXISTING PARKING LOT

EXISTING SPRINT ANTENNA TRIPOD MOUNTS ON TOP OF EXISTING ROOF DECK

EXISTING PARKING LOT

A A-2

B A-4

EXISTING CHURCH

EXISTING BUILDING

EXISTING PROPERTY LINE

EXISTING ROOFTOP

EXISTING TELCO AREA

EXISTING SPRINT 15'-0" X 20'-0" EQUIPMENT ROOM IN BASEMENT

PROPOSED SPRINT ANTENNA NON-PENETRATING TRIPOD MOUNTS ON TOP OF EXISTING ROOF DECK

EXISTING PROPERTY LINE

EXISTING PROPERTY LINE

N OXFORD ST.

EXISTING RESIDENTIAL AREA

SUMMIT AVE.

A A-4

EXISTING RESIDENTIAL AREA

N

0 20' 40' 80'

SCALE: 1" = 40'-0"

OVERALL SITE PLAN

SCALE: 1"=40'-0"

A

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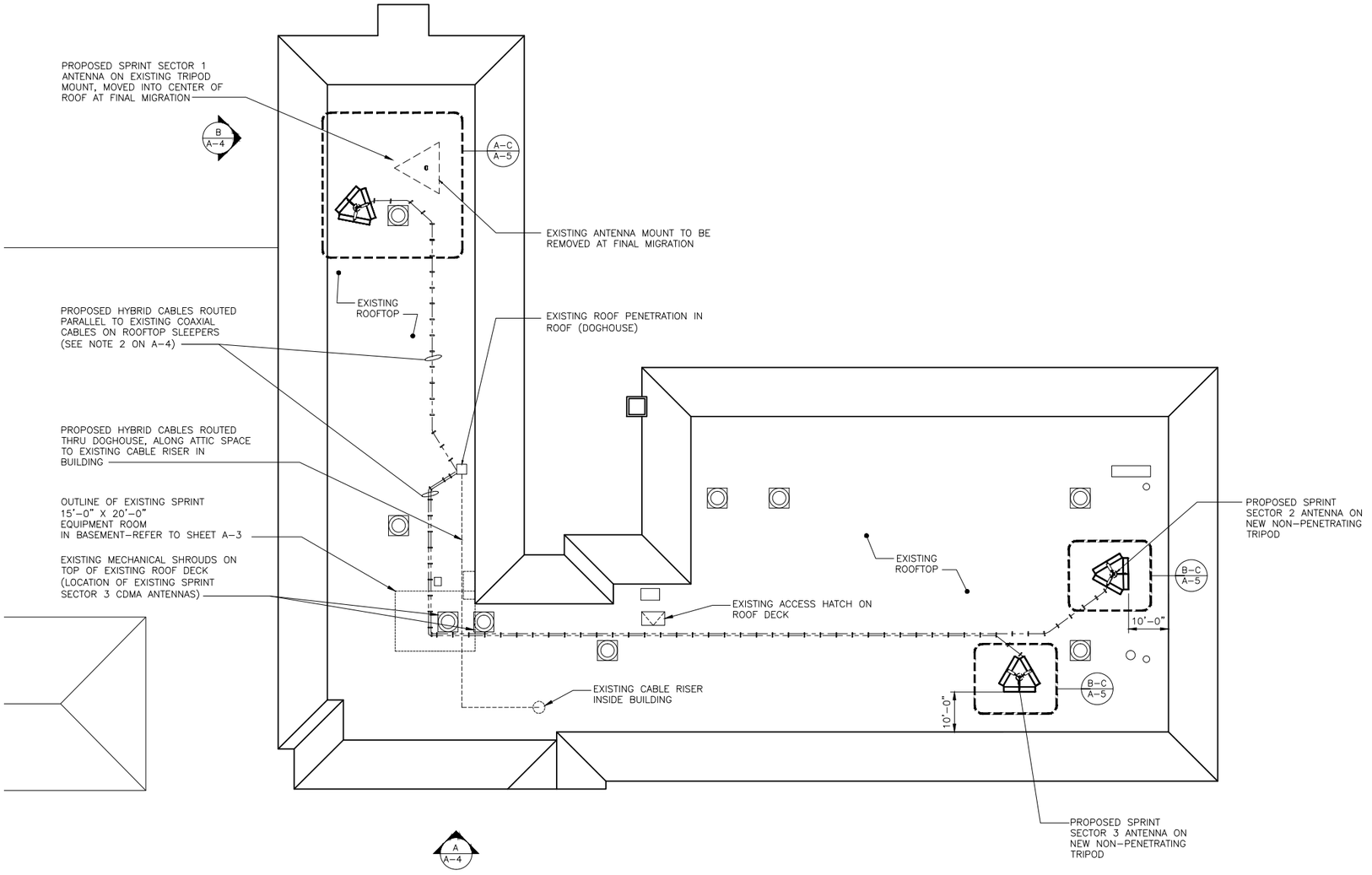
SHEET TITLE
OVERALL SITE PLAN

SHEET NUMBER
A-1



N

0 2' 4' 8' 16'
SCALE: 1/8" = 1'-0"

ENLARGED ROOF PLAN

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

A

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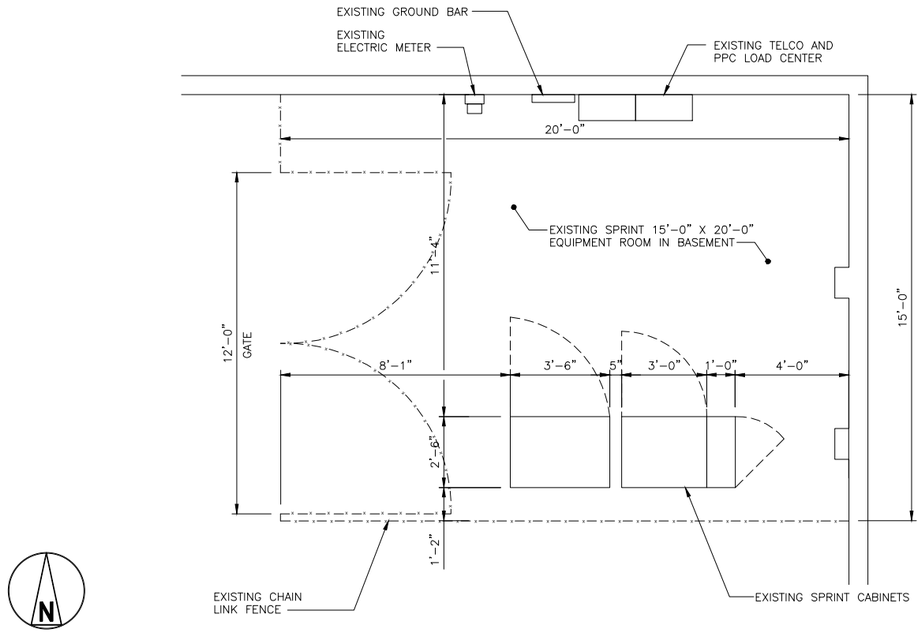
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

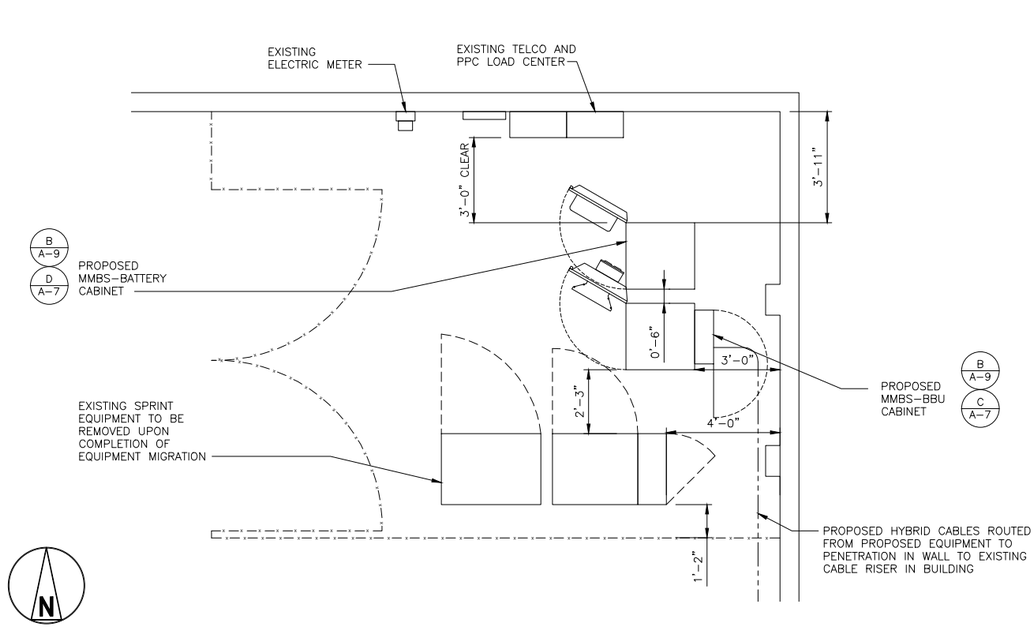
SHEET TITLE
ENLARGED ROOF PLAN

SHEET NUMBER
A-2



EXISTING EQUIPMENT LAYOUT

SCALE: 3/8"=1'-0" | A

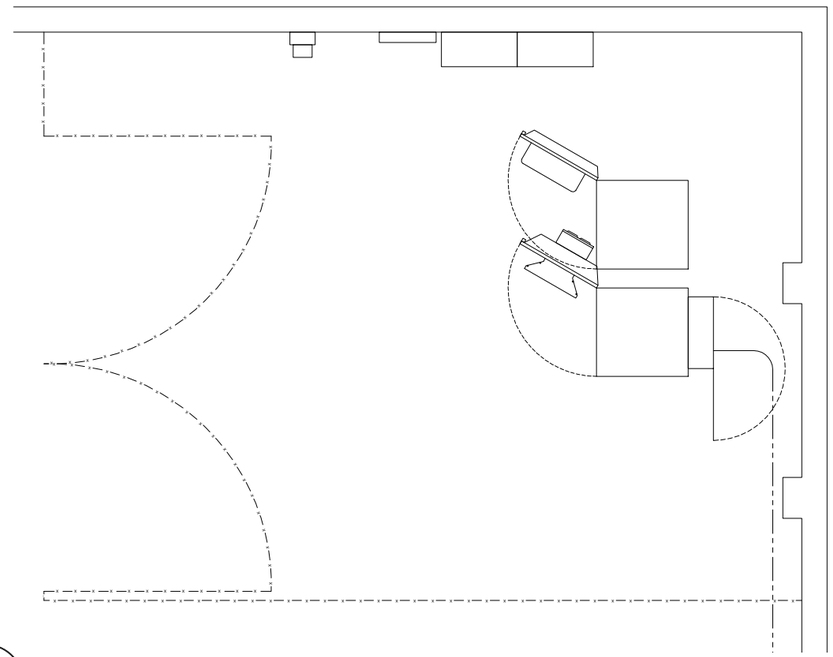


INTERIM EQUIPMENT LAYOUT

SCALE: 3/8"=1'-0" | B

NOTES

1. PROPOSED CABINET LOCATIONS ARE APPROXIMATE AND IN RELATION TO EXISTING AND PROPOSED STRUCTURES. CONTRACTOR SHALL FIELD VERIFY EXISTING AND PROPOSED CLEARANCES, CONNECTIONS, ETC., AND SHALL VERIFY EQUIPMENT MOUNTING DIMENSIONS, PER MANUFACTURER'S DRAWINGS, PRIOR TO INSTALLATION.
2. CABINETS TO BE ANCHORED TO EXISTING STEEL PLATFORM USING 3/8" DIA. BOLTS. SEE MMBS CABINET ANCHOR BOLT PATTERN DETAIL B, SHEET A-6.



FINAL EQUIPMENT LAYOUT

SCALE: 1/2"=1'-0" | C

FENCE:	FIBER:	ICE BRIDGE:	
LEASE AREA:	POWER:	CABLE TRAY:	
WOOD/IRON FENCE:	TELCO:	WALL/PARTITION:	

GRAPHICS LEGEND

BBU:	BASEBAND UNIT	MMBS:	MULTI MODAL BASE STATION
CDMA:	CODE DIVISION MULTIPLE ACCESS	PPC:	POWER PROTECTION UNIT
CMU:	CONCRETE MASONRY UNIT	RET:	REMOTE ELECTRICAL TILT
GPS:	GLOBAL POSITIONING SYSTEM	RF:	RADIO FREQUENCY
HVAC:	HEATING VENTILATION AIR CONDITIONING	RRU:	REMOTE RADIO UNIT

ACRONYM LEGEND

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6/19/13

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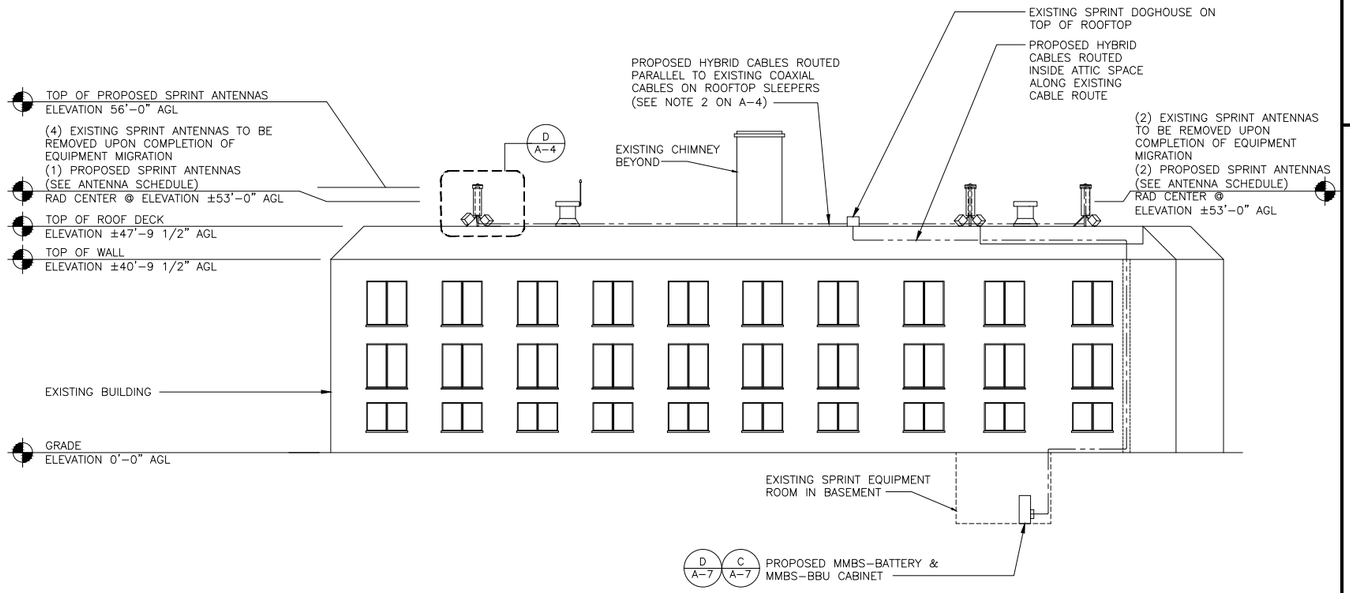
ST. PAUL, MN 55105

SHEET TITLE
EQUIPMENT LAYOUTS

SHEET NUMBER
A-3

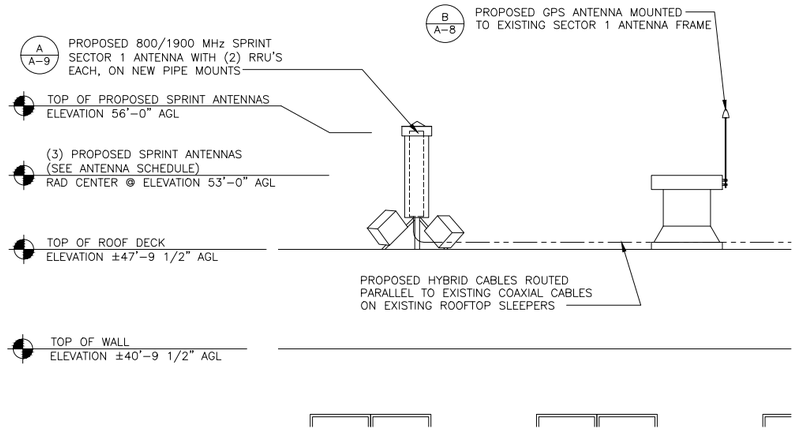


WEST ELEVATION — SCALE: 1/16"=1'-0" — B

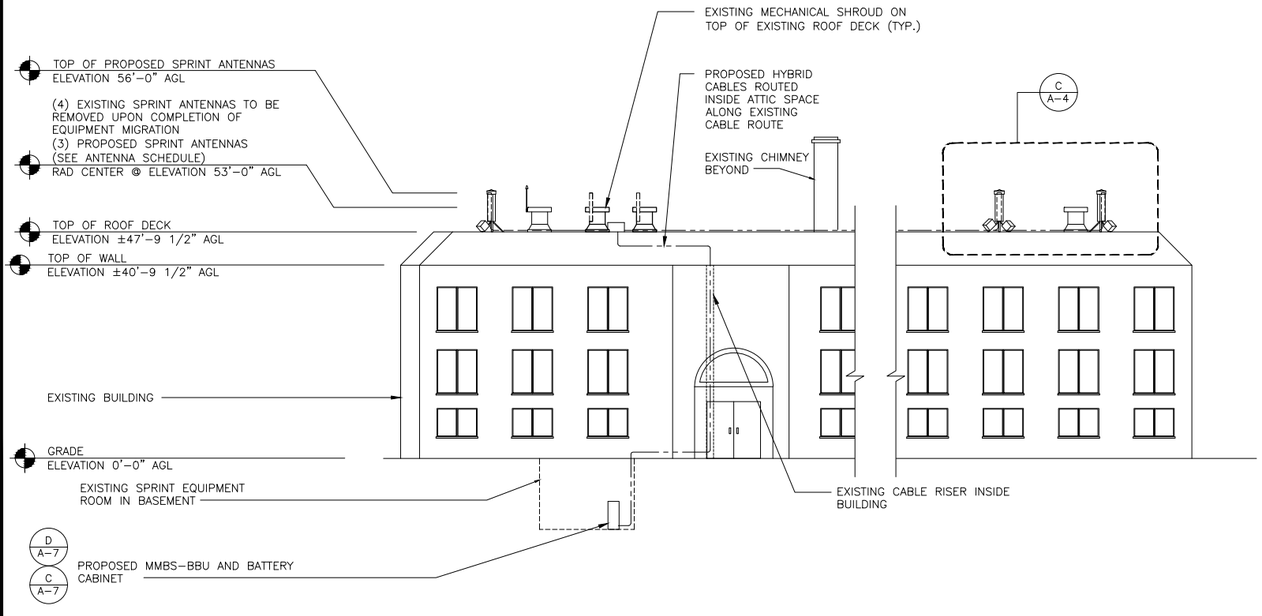
NOTES

1. STRUCTURAL ANALYSIS IS BEING PERFORMED BY OTHERS. SPRINT NETWORK VISION INSTALLATION SHALL NOT START UNTIL ENGINEER RECEIVES COPY OF APPROVED STRUCTURAL ANALYSIS OR ASSESSMENT.
2. CONTRACTOR SHALL INSTALL HYBRID CABLE SUPPORTS BASED ON FOLLOWING ROOFTOP CABLE MOUNT TYPES:

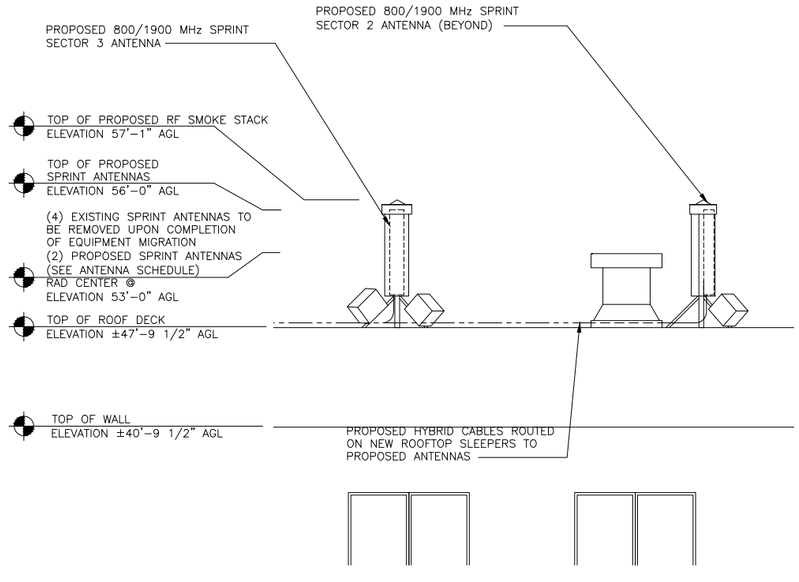
MOUNTING INSTALLATION	HARDWARE
WALL/VERTICAL UNISTRUT MOUNTED:	BUTTERFLY HANGERS OR STACKABLE SNAP-IN HANGERS (VALMONT #BUG12, 12SS-A OR APPROVED EQUIVALENT FOR EXTERIOR SUPPORTS). USE STAINLESS STEEL HARDWARE FOR WALL MOUNT AND CONNECTIONS.
ROOF SLEEPER MOUNT:	BUTTERFLY HANGERS AS REQUIRED (VALMONT #BUG12) OR APPROVED EQUIVALENT. USE STAINLESS STEEL HARDWARE FOR WALL MOUNT AND CONNECTIONS.



ENLARGED ANTENNA ELEVATION — SCALE: 3/16"=1'-0" — D



SOUTH ELEVATION — SCALE: 1/16"=1'-0" — A



ENLARGED ANTENNA ELEVATION — SCALE: 3/16"=1'-0" — C

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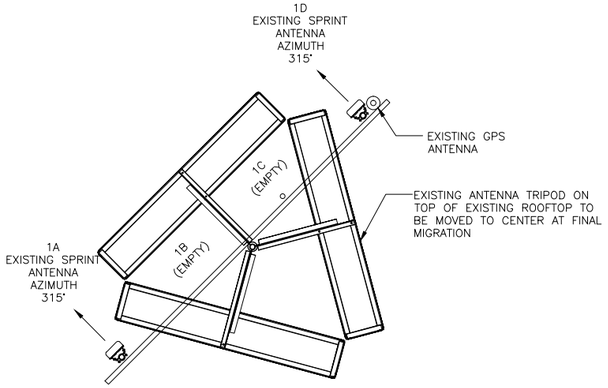
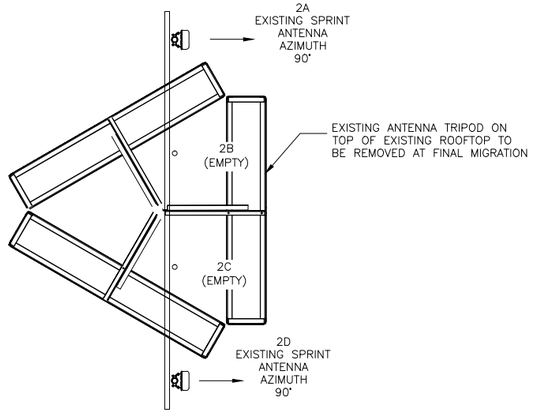
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
BUILDING ELEVATIONS

SHEET NUMBER
A-4



SECTOR 1



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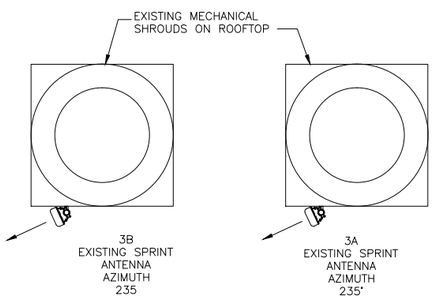

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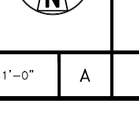
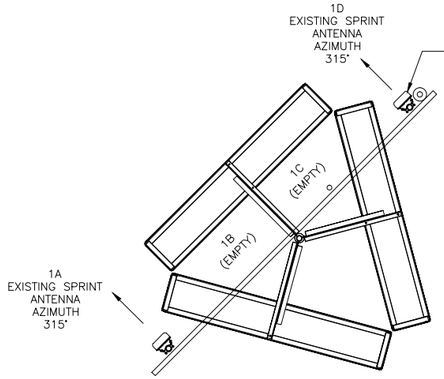
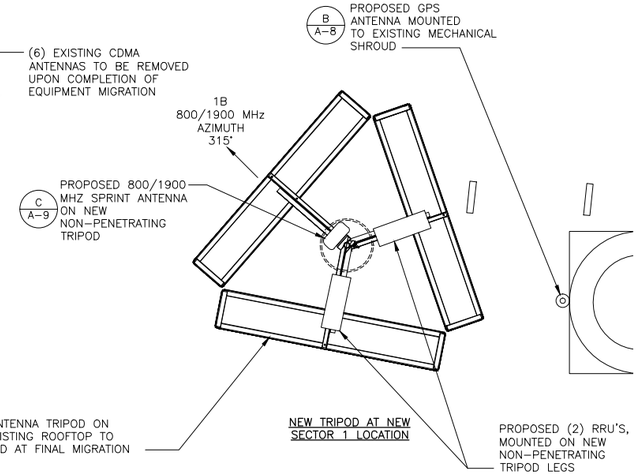


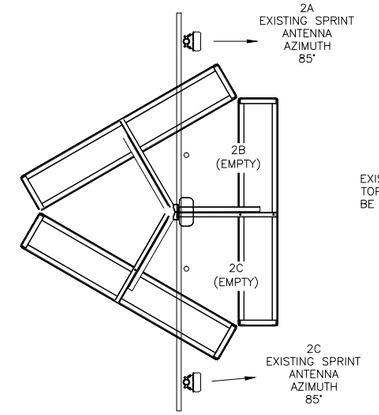
EXISTING ANTENNA LAYOUT | SCALE: 3/8"=1'-0" | A



SECTOR 1

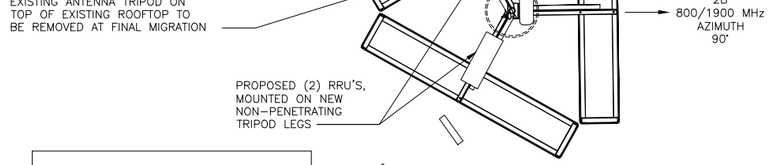


NEW TRIPOD AT NEW
SECTOR 1 LOCATION

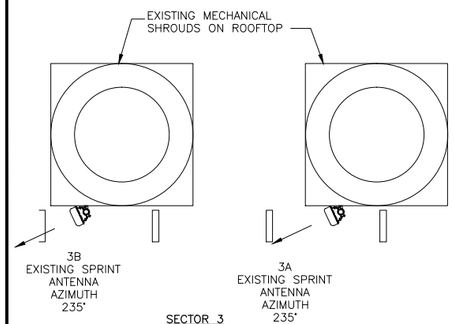


SECTOR 2

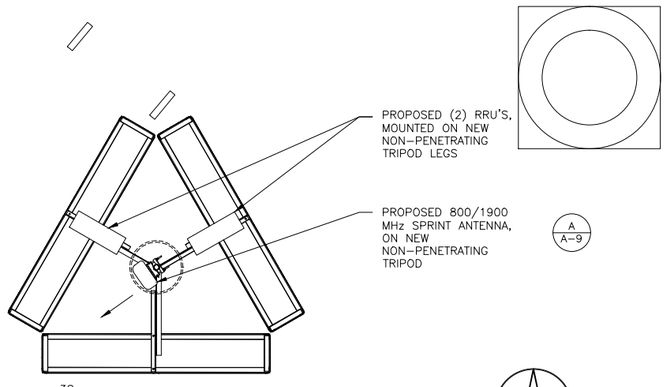
NOTES:
1. NEW TRIPODS: CONTRACTOR TO PROVIDE BALLAST AS REQUIRED BY THE STRUCTURAL ANALYSIS
2. CONTRACTOR TO VERIFY ANTENNA MOUNT MODEL WITH STRUCTURAL ANALYSIS



NEW TRIPOD AT NEW
SECTOR 2 LOCATION



SECTOR 3



NEW TRIPOD AT NEW
SECTOR 3 LOCATION

INTERIM ANTENNA LAYOUT | SCALE: 3/8"=1'-0" | B

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

SAMSUNG

TeleCAD Wireless
1961 NORTHPOINT BLVD., SUITE 130
HIXSON, TN 37343
PH: 423-843-9500 FAX: 423-843-9509

PROJECT NO:	----
DRAWN BY:	JAE
CHECKED BY:	SEH

REV	DATE	DESCRIPTION
0	6/19/13	ISSUED FOR CONSTRUCTION
A	6/18/13	ISSUED FOR 90% CD

STEPHEN E. HUNT
LICENSED
PROFESSIONAL
ENGINEER
47489
6/19/13
STATE OF MINNESOTA

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
ANTENNA LAYOUTS

SHEET NUMBER
A-5

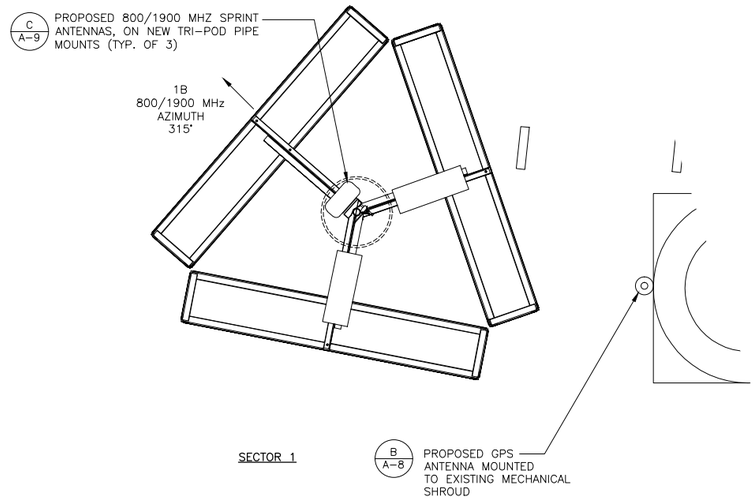
PROPOSED ANTENNA SCHEDULE

SECTOR	ANTENNA NUMBER	ANTENNA MANUFACTURER	ANTENNA MODEL	NUMBER OF HYBRID CABLES	AZIMUTH	RAD CENTER	ANTENNA GAIN	ELECT D-TILT	MECH TILT	EFF D-TILT	RRU MODEL	RRU FILTER	HYBRID CABLE LENGTH	JUMPER SIZE	JUMPER LENGTH	RET LENGTH	RET CABLE MANUFACTURER	RET CABLE MODEL NUMBER
1B	800/1900 MHz	KMW	ET-X-TS-70-15-62-18-iR-RD	SAMSUNG HFC 1 (PER SECTOR)	315°	53'	13.4/15.9	4/4	0/0	4/4	RRH-C2A & RRH-P4	(1) 800 MHz FILTER	285'	1/2"	6'	9.8'	COMMSCOPE	ATCB-B01-003
2B	800/1900 MHz	KMW	ET-X-TS-70-15-62-18-iR-RD	SAMSUNG HFC 1 (PER SECTOR)	90°	53'	13.4/15.9	8/2	0/0	8/2	RRH-C2A & RRH-P4	(1) 800 MHz FILTER	375'	1/2"	6'	9.8'	COMMSCOPE	ATCB-B01-003
3C	800/1900 MHz	KMW	ET-X-TS-70-15-62-18-iR-RD	SAMSUNG HFC 1 (PER SECTOR)	235°	53'	13.4/15.9	7/3	0/0	7/3	RRH-C2A & RRH-P4	(1) 800 MHz FILTER	375'	1/2"	6'	9.8'	COMMSCOPE	ATCB-B01-003
-	GPS	PCTEL	GPS-TMG-HR-26NCM	-	-	-	-	-	-		-	-	-	1/2" (PCTEL LMR-400)	10'	-	-	-

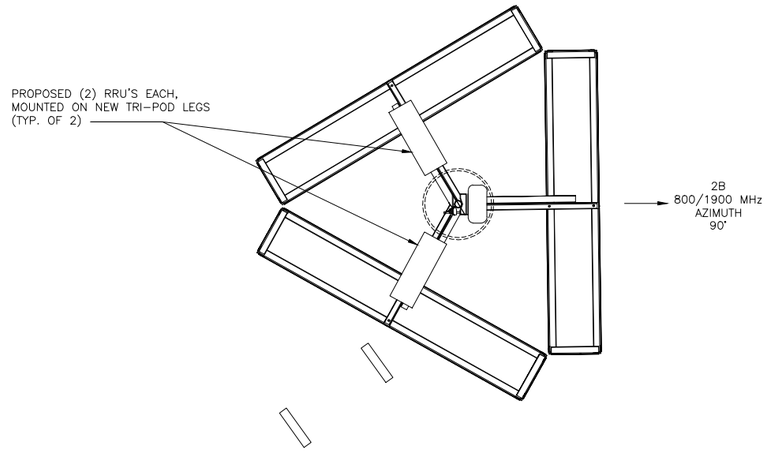
NOTES

1. EXISTING ANTENNAS ARE CDMA UNLESS NOTED OTHERWISE.
2. DIMENSIONS OF EXISTING ANTENNAS SPACING OR PLATFORMS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY PRIOR TO START OF CONSTRUCTION (SEE GENERAL NOTES, SHEETS GN-1 AND GN-2).
3. PROPOSED SPRINT ANTENNAS INCLUDE RESPECTIVE RRU'S WHICH SHALL BE MOUNTED ON THE PIPE BEHIND THE ANTENNA SIMILAR TO THAT SHOWN ON DETAIL A, SHEET A-9.
4. FIELD TO VERIFY EXISTING AZIMUTH BEFORE RELOCATING THE ANTENNA, IF REQUIRED. PRIOR APPROVAL FROM SPRINT TO BE GRANTED BEFORE RELOCATION OF ANTENNAS.
5. FOR HYBRID CABLE DIAMETER REFER TO HYBRID CABLE TYPE DETAIL ON SHEET E-2, DETAIL C. SIZE WILL VARY BASED ON LENGTH OF RUN.
6. EFFECTIVE TILT = ELECTRICAL TILT + MECHANICAL TILT.

ANTENNA SCHEDULE

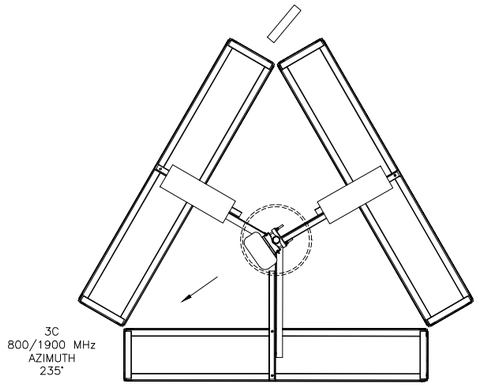


SECTOR 1



SECTOR 2

NOTES:
1. NEW TRIPODS: CONTRACTOR TO PROVIDE BALLAST AS REQUIRED BY THE STRUCTURAL ANALYSIS
2. CONTRACTOR TO VERIFY ANTENNA MOUNT MODEL WITH STRUCTURAL ANALYSIS



SECTOR 3

FINAL ANTENNA LAYOUT

SCALE: 1/2"=1'-0"

A

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47489
6/19/13
STATE OF MINNESOTA

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
ANTENNA SCHEDULE & LAYOUT

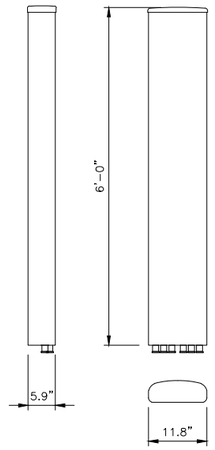
SHEET NUMBER
A-5.1

KMW ANTENNA ET-X-TS-70-15-62-18-iR-RD

DIMENSIONS, HxWxD: 1875x300x150mm (73.8"x11.8"x5.9")

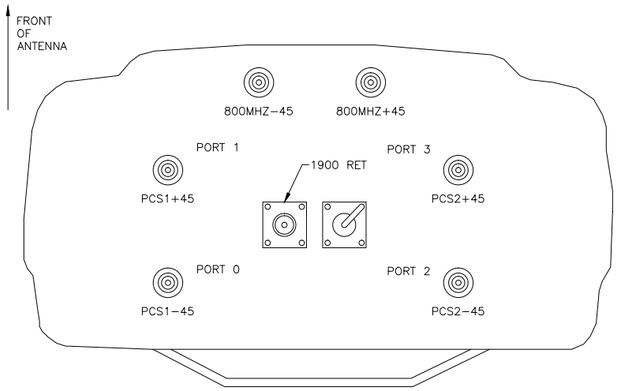
WEIGHT, W/O CLAMP: 41.9 lbs

CONNECTOR: (6) 7/16 DIN FEMALE

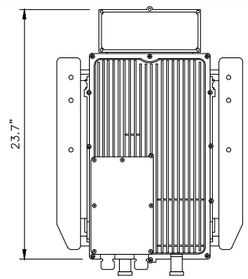


PROPOSED ANTENNA SPECIFICATIONS | NO SCALE | A

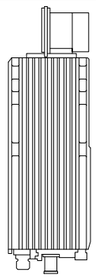
NOT USED | NO SCALE | B



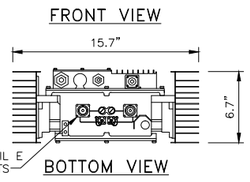
800/1900 MHz KMW ANTENNA PORT CONFIGURATION | NO SCALE | C



FRONT VIEW



SIDE VIEW

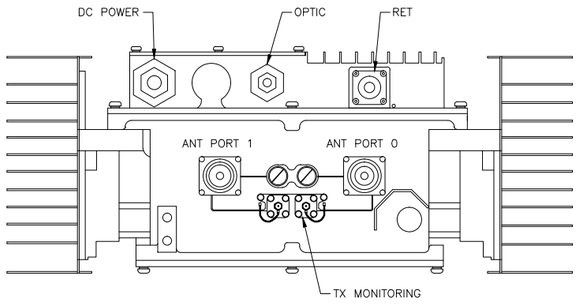


BOTTOM VIEW

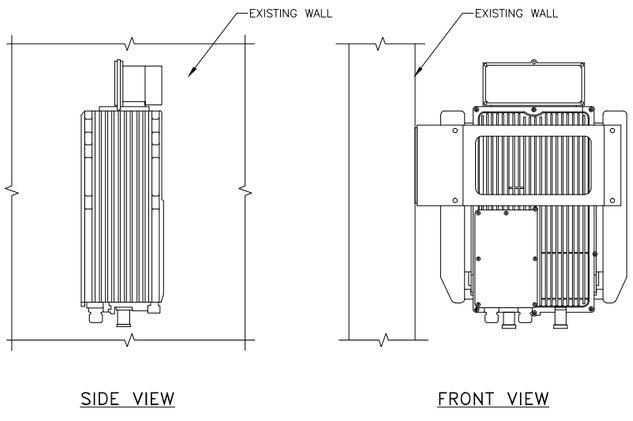
DIMENSIONS
HxWxD: 400x171x601.7mm (15.7"x6.7"x23.7")

WEIGHT, W/FILTER: 56 lbs

800 MHz RRU MECHANICAL SPECIFICATIONS | NO SCALE | D



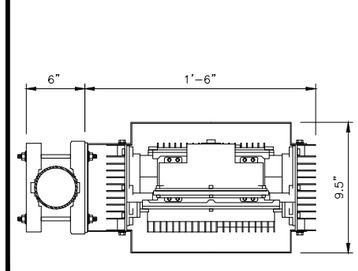
800 MHz RRU BOTTOM VIEW | NO SCALE | E

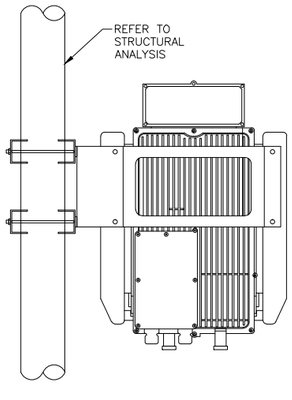


SIDE VIEW

FRONT VIEW

800 MHz RRU WALL MOUNT INSTALLATION DETAIL | NO SCALE | F

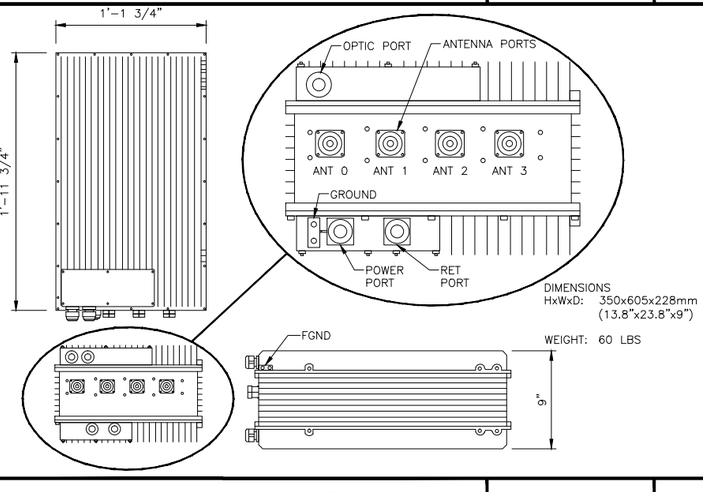




TOP VIEW

FRONT VIEW

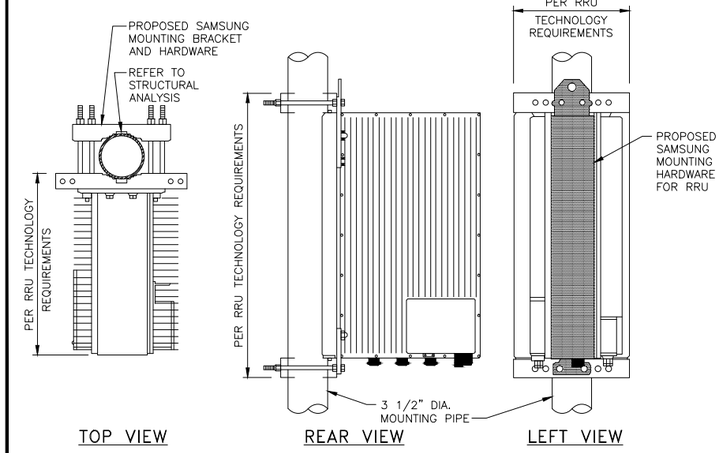
800 MHz RRU POLE MOUNT INSTALLATION DETAIL | NO SCALE | G



DIMENSIONS
HxWxD: 350x605x228mm (13.8"x23.8"x9")

WEIGHT: 60 LBS

1900 MHz RRU MECHANICAL SPECIFICATIONS | NO SCALE | H



TOP VIEW

REAR VIEW

LEFT VIEW

1900 MHz RRU POLE MOUNT INSTALLATION DETAIL | NO SCALE | I

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OVERLAND PARK, KANSAS 66251

SAMSUNG

TeleCAD Wireless
1961 NORTHPOINT BLVD., SUITE 130
HIXSON, TN 37343
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STEPHEN E. HUNT
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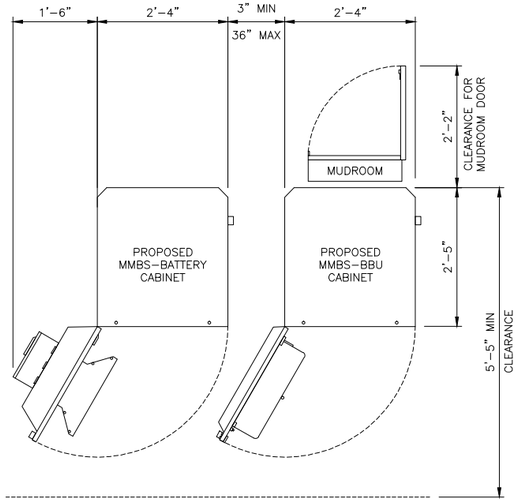
47489
STATE OF MINNESOTA
6/19/13

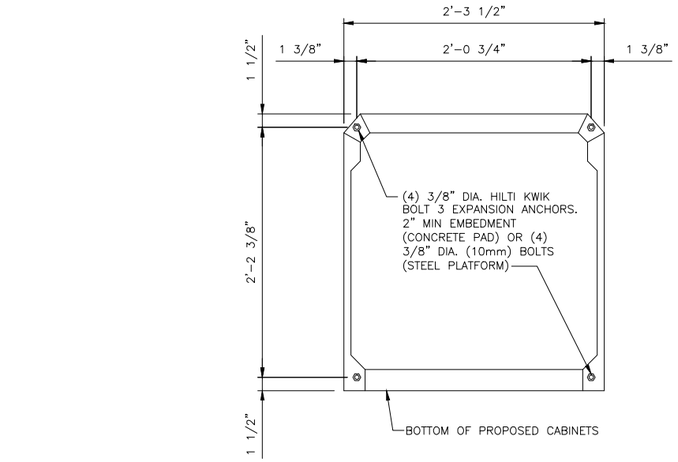
MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
EQUIPMENT DETAILS

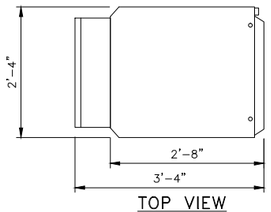
SHEET NUMBER
A-6



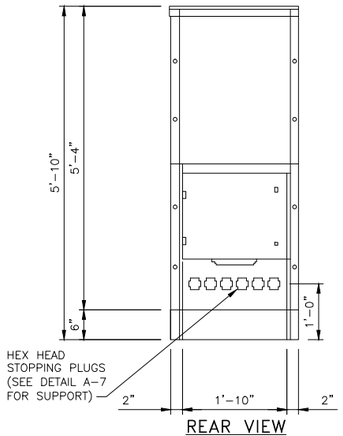
MMBS TYPICAL FLOOR PLAN | NO SCALE | A



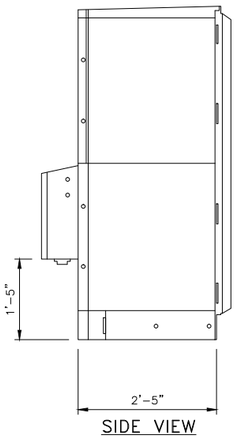
MMBS CABINET ANCHOR BOLT PATTERN DETAIL | NO SCALE | B



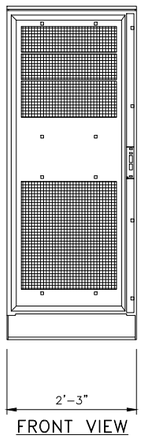
TOP VIEW



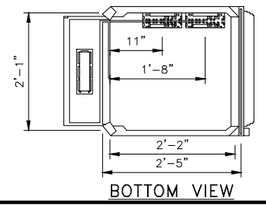
REAR VIEW



SIDE VIEW

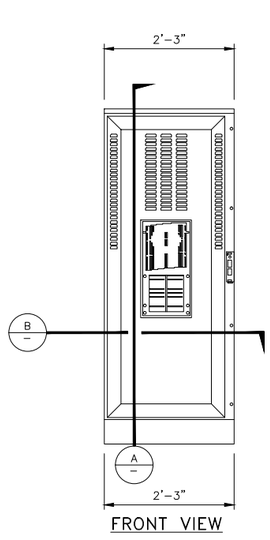


FRONT VIEW

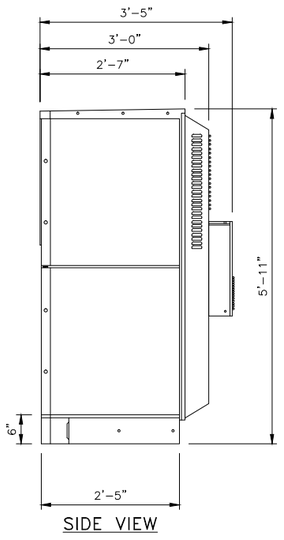


BOTTOM VIEW

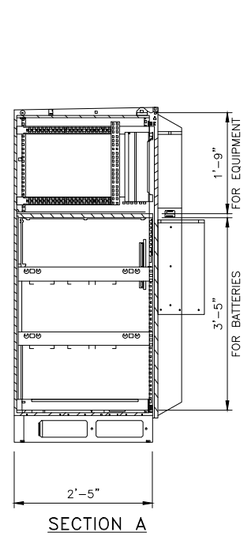
MMBS-BBU MECHANICAL SPECIFICATIONS | NO SCALE | C



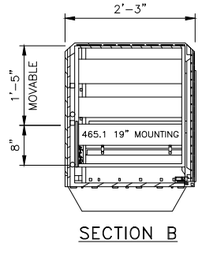
FRONT VIEW



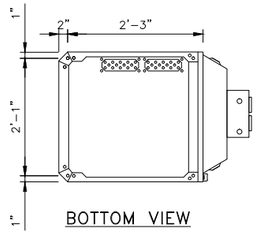
SIDE VIEW



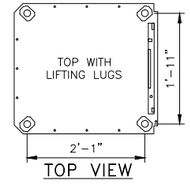
SECTION A



SECTION B



BOTTOM VIEW



TOP VIEW

MMBS-BATTERY CABINET | NO SCALE | D

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SAMSUNG

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1079 SUMMIT AVE.
ST. PAUL, MN 55105

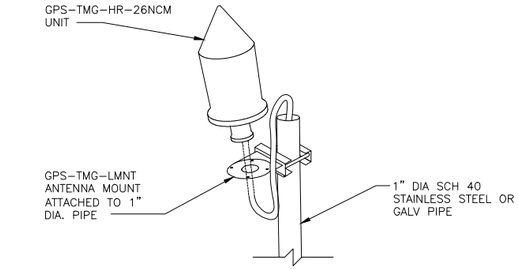
SHEET TITLE
EQUIPMENT DETAILS

SHEET NUMBER
A-7

DETAIL NOT USED

NO SCALE

A



GPS UNIT PIPE MOUNT

NO SCALE

B

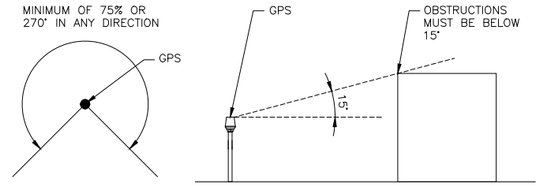
NOTES

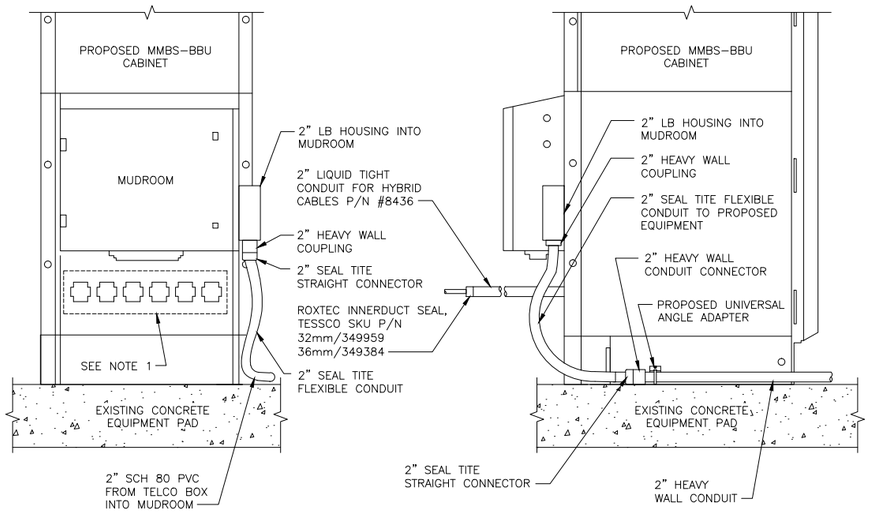
1. THE GPS ANTENNA MOUNT IS DESIGNED TO FASTEN TO A STANDARD 1" DIAMETER, SCHEDULE 40, GALVANIZED STEEL OR STAINLESS STEEL PIPE. THE PIPE MUST NOT BE THREADED AT THE ANTENNA MOUNT END.
   THE PIPE SHALL BE CUT TO THE REQUIRED LENGTH (MINIMUM OF 18 INCHES, 8'-0" IF MOUNTING TO PROPOSED MMBS-BBU) AND ASSURE A SMOOTH AND PERPENDICULAR CUT. THE CUT PIPE END SHALL BE DEBURRED.
2. IT IS CRITICAL THAT THE GPS ANTENNA IS MOUNTED SUCH THAT IT IS WITHIN 2 DEGREES OF VERTICAL AND THE BASE OF THE ANTENNA IS WITHIN 2 DEGREES OF LEVEL.
3. DO NOT SWEEP TEST GPS ANTENNA.
4. ATTACH GPS MOUNTING PIPE TO EXISTING ANTENNA FRAME USING (4) 8MMx15MM SS BOLTS AND (4) 1" PIPE STRAPS. GPS TO BE MOUNTED A MINIMUM OF 2'-0" ABOVE PROPOSED ANTENNA FRAME.

GPS MINIMUM SKY VIEW REQUIREMENTS

NO SCALE

C





REAR VIEW

SIDE VIEW

NOTE

1. REFER TO LOCAL JURISDICTION FOR CONDUIT ROUTING REQUIREMENTS.

HYBRID AND TELCO LINE SUPPORT DETAIL

NO SCALE

D

DETAIL NOT USED

NO SCALE

E

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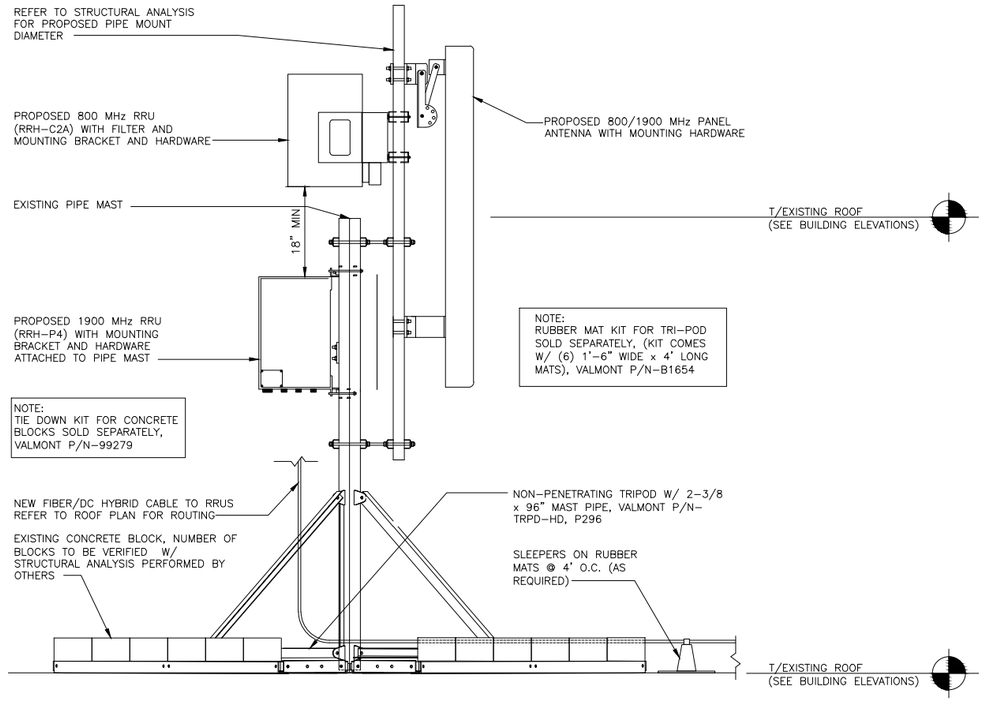
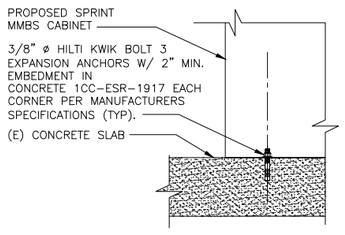
SHEET TITLE
EQUIPMENT DETAILS

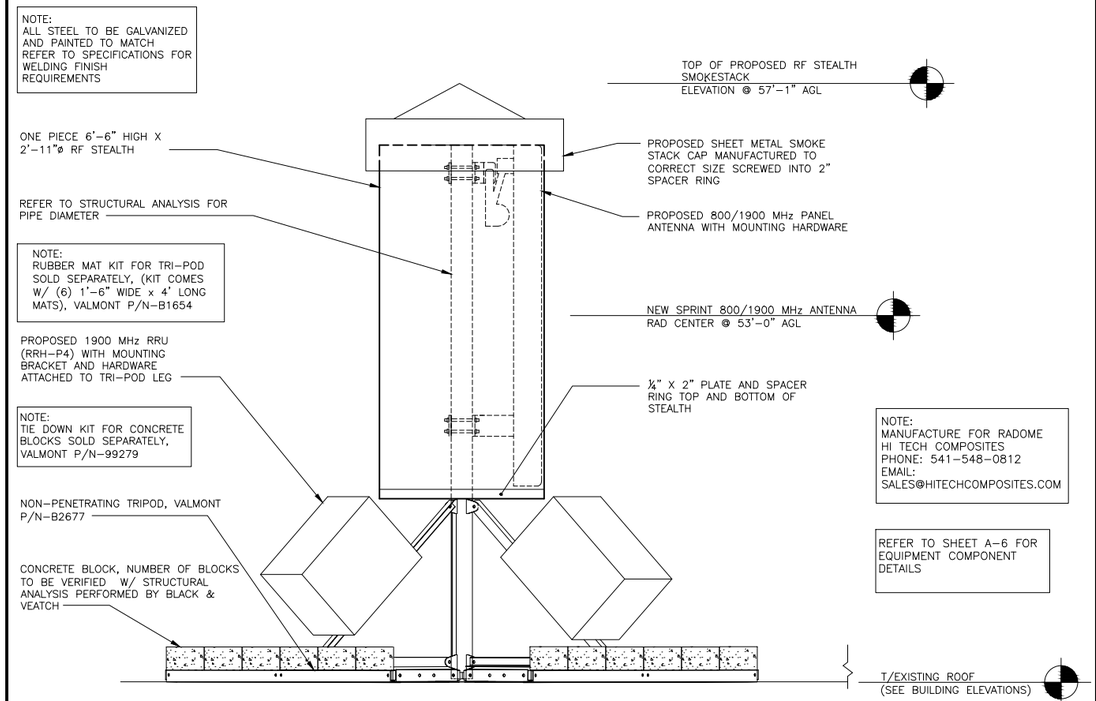
SHEET NUMBER
A-8



800/1900 MHz ANTENNA EXISTING TRIPOD MOUNTING/HYBRID CABLE ROUTING DETAIL | SCALE: 3/4" = 1'–0" | C



CABINET MOUNTING DETAIL | NO SCALE | B



800/1900 MHz ANTENNA PROPOSED TRIPOD MOUNTING/HYBRID CABLE ROUTING DETAIL | SCALE: 3/4" = 1'–0" | A

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EQUIPMENT DETAILS

SHEET NUMBER
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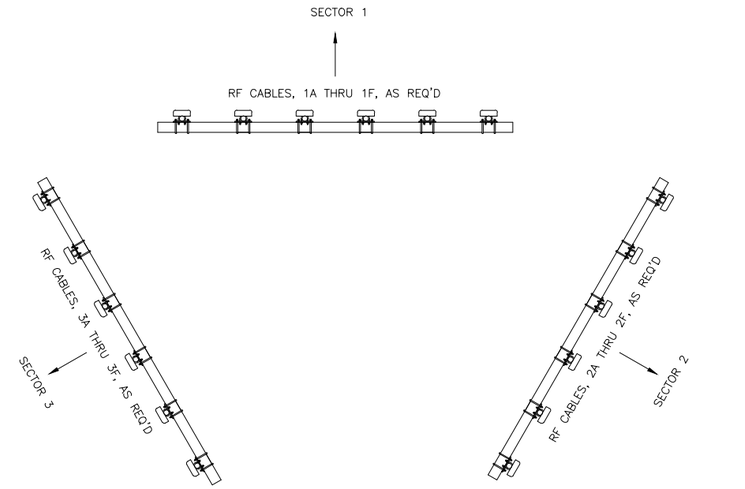
FREQUENCY COLOR CODE FOR DC PAIRS AND FIBER CABLES WITHIN HYBRID CABLE		
FREQUENCY	1ST TAPE RING	2ND TAPE RING
800 MHz	YELLOW	GREEN
1900 MHz #1	YELLOW	RED
1900 MHz #2	YELLOW	BROWN

TYPICAL HYBRID CABLE COLOR CODE					
	SECTOR	1ST TAPE RING	2ND TAPE RING	3RD TAPE RING	4TH TAPE RING
1ST HYBRID CABLE	1	GREEN	N/A	N/A	N/A
	2	GREEN	GREEN	N/A	N/A
	3	GREEN	GREEN	GREEN	N/A
	4	GREEN	GREEN	GREEN	GREEN
2ND HYBRID CABLE	1	BLUE	N/A	N/A	N/A
	2	BLUE	BLUE	N/A	N/A
	3	BLUE	BLUE	BLUE	N/A
	4	BLUE	BLUE	BLUE	BLUE

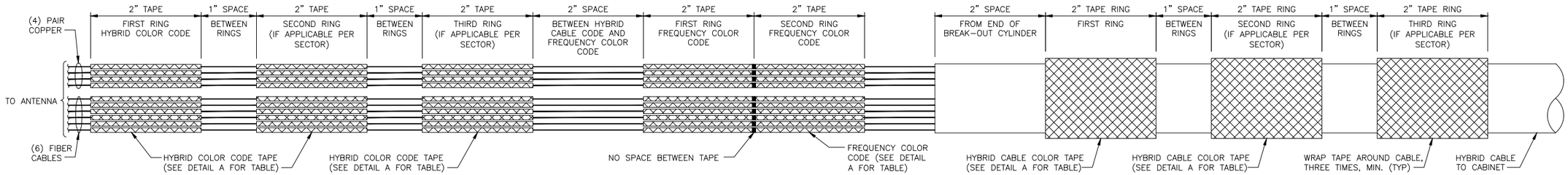
TYPICAL COAXIAL JUMPER CABLE COLOR CODE						
FREQUENCY	ANTENNA PORT	RRU PORT	SECTOR 1	SECTOR 2	SECTOR 3	SECTOR 4
800 MHz	RET	RET	N/A	N/A	N/A	N/A
	800 MHz −45°	ANT 0	GREEN/YELLOW/GREEN	GREEN/GREEN/YELLOW/GREEN	GREEN/GREEN/GREEN/YELLOW/GREEN	GREEN/GREEN/GREEN/GREEN/YELLOW/GREEN
	800 MHz +45°	ANT 1	BLUE/YELLOW/GREEN	BLUE/BLUE/YELLOW/GREEN	BLUE/BLUE/BLUE/YELLOW/GREEN	BLUE/BLUE/BLUE/BLUE/YELLOW/GREEN
1900 MHz #1	RET	RET	N/A	N/A	N/A	N/A
	PCS1 −45°	ANT 0	GREEN/YELLOW/RED	GREEN/GREEN/YELLOW/RED	GREEN/GREEN/GREEN/YELLOW/RED	GREEN/GREEN/GREEN/GREEN/YELLOW/RED
	PCS1 +45°	ANT 1	BLUE/YELLOW/RED	BLUE/BLUE/YELLOW/RED	BLUE/BLUE/BLUE/YELLOW/RED	BLUE/BLUE/BLUE/BLUE/YELLOW/RED
	PCS2 −45°	ANT 2	BROWN/YELLOW/RED	BROWN/BROWN/YELLOW/RED	BROWN/BROWN/BROWN/YELLOW/RED	BROWN/BROWN/BROWN/BROWN/YELLOW/RED
	PCS2 +45°	ANT 3	WHITE/YELLOW/RED	WHITE/WHITE/YELLOW/RED	WHITE/WHITE/WHITE/YELLOW/RED	WHITE/WHITE/WHITE/WHITE/YELLOW/RED
1900 MHz #2 (HIGH CAPACITY)	RET	RET	N/A	N/A	N/A	N/A
	PCS1 −45°	ANT 0	GREEN/YELLOW/BROWN	GREEN/GREEN/YELLOW/BROWN	GREEN/GREEN/GREEN/YELLOW/BROWN	GREEN/GREEN/GREEN/GREEN/YELLOW/BROWN
	PCS1 +45°	ANT 1	BLUE/YELLOW/BROWN	BLUE/BLUE/YELLOW/BROWN	BLUE/BLUE/BLUE/YELLOW/BROWN	BLUE/BLUE/BLUE/BLUE/YELLOW/BROWN
	PCS2 −45°	ANT 2	BROWN/YELLOW/BROWN	BROWN/BROWN/YELLOW/BROWN	BROWN/BROWN/BROWN/YELLOW/BROWN	BROWN/BROWN/BROWN/BROWN/YELLOW/BROWN
	PCS2 +45°	ANT 3	WHITE/YELLOW/BROWN	WHITE/WHITE/YELLOW/BROWN	WHITE/WHITE/WHITE/YELLOW/BROWN	WHITE/WHITE/WHITE/WHITE/YELLOW/BROWN

HYBRID AND JUMPER CABLES COLOR CODING | NO SCALE | A

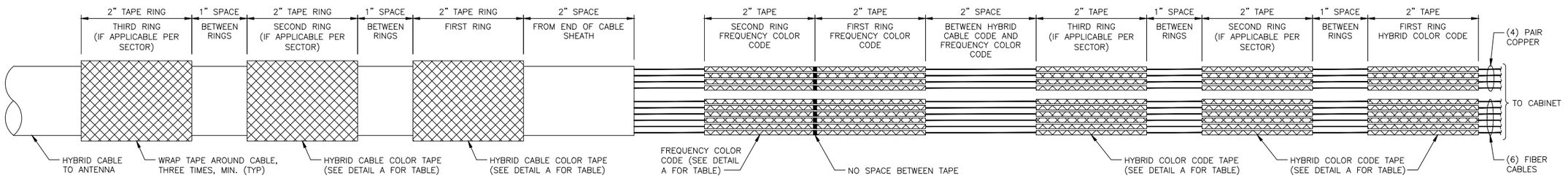


TOP VIEW

ANTENNA SECTOR AND CABLE COLOR DEFINITION DETAIL | NO SCALE | B



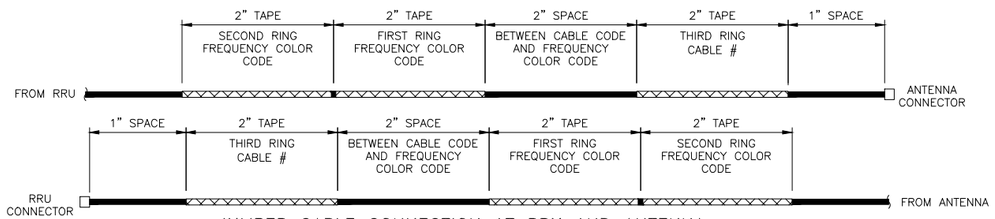
HYBRID CABLE CONNECTION AT ANTENNA



NOTES

1. ALL CABLES SHALL BE MARKED AT THE TOP AND BOTTOM WITH 2" COLORED TAPE OR STENCIL TAG. COLOR TAPE SHALL BE OBTAINED FROM GRAYBAR ELECTRIC.
2. THE FIRST RING SHALL BE CLOSEST TO THE END OF THE CABLE AND SPACED APPROXIMATELY 2" FROM AN END CONNECTOR, WEATHERPROOFING, OR BREAK-OUT CYLINDER, WITH 1" SPACE BETWEEN EACH RING.
3. THE HYBRID CABLE COLOR SHALL BE APPLIED IN ACCORDANCE WITH THE "TYPICAL HYBRID CABLE COLOR CODE" TABLE ABOVE FOR THE RESPECTIVE SECTOR.
4. INDIVIDUAL POWER PAIRS AND FIBER CABLES SHALL BE LABELED WITH BOTH THE HYBRID CABLE COLOR FOR THE RESPECTIVE SECTOR AND A FREQUENCY COLOR CODE IN ACCORDANCE WITH THE "FREQUENCY COLOR CODE FOR PAIRS AND FIBER CABLES OF HYBRID CABLE" TABLE ABOVE.
5. A 2" GAP SHALL SEPARATE THE HYBRID CABLE COLOR CODE FROM THE FREQUENCY COLOR CODE.
6. THE 2" COLOR RINGS FOR THE FREQUENCY CODE SHALL BE PLACED NEXT TO EACH OTHER WITH NO SPACES.
7. THE 2" COLORED TAPE(S) SHALL EACH BE WRAPPED A MINIMUM OF 3 TIMES AROUND THE HYBRID CABLE OR INDIVIDUAL CABLES, AND THE TAPE SHALL BE KEPT IN THE SAME LOCATION AS MUCH AS POSSIBLE.
8. COLOR BAND ON JUMPERS SHALL BE 1" WIDE WITH A 1" SPACE.

HYBRID CABLE CONNECTION AT CABINET



JUMPER CABLE CONNECTION AT RRU AND ANTENNA

HYBRID CABLE COLOR SCHEME DETAIL | NO SCALE | C

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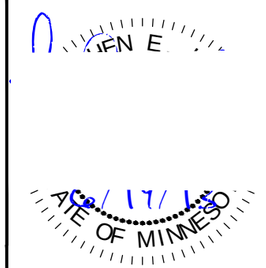
CHECKED BY:	SEH

REV	DATE	DESCRIPTION
0	6/19/13	ISSUED FOR CONSTRUCTION
A	6/18/13	ISSUED FOR 90% CD



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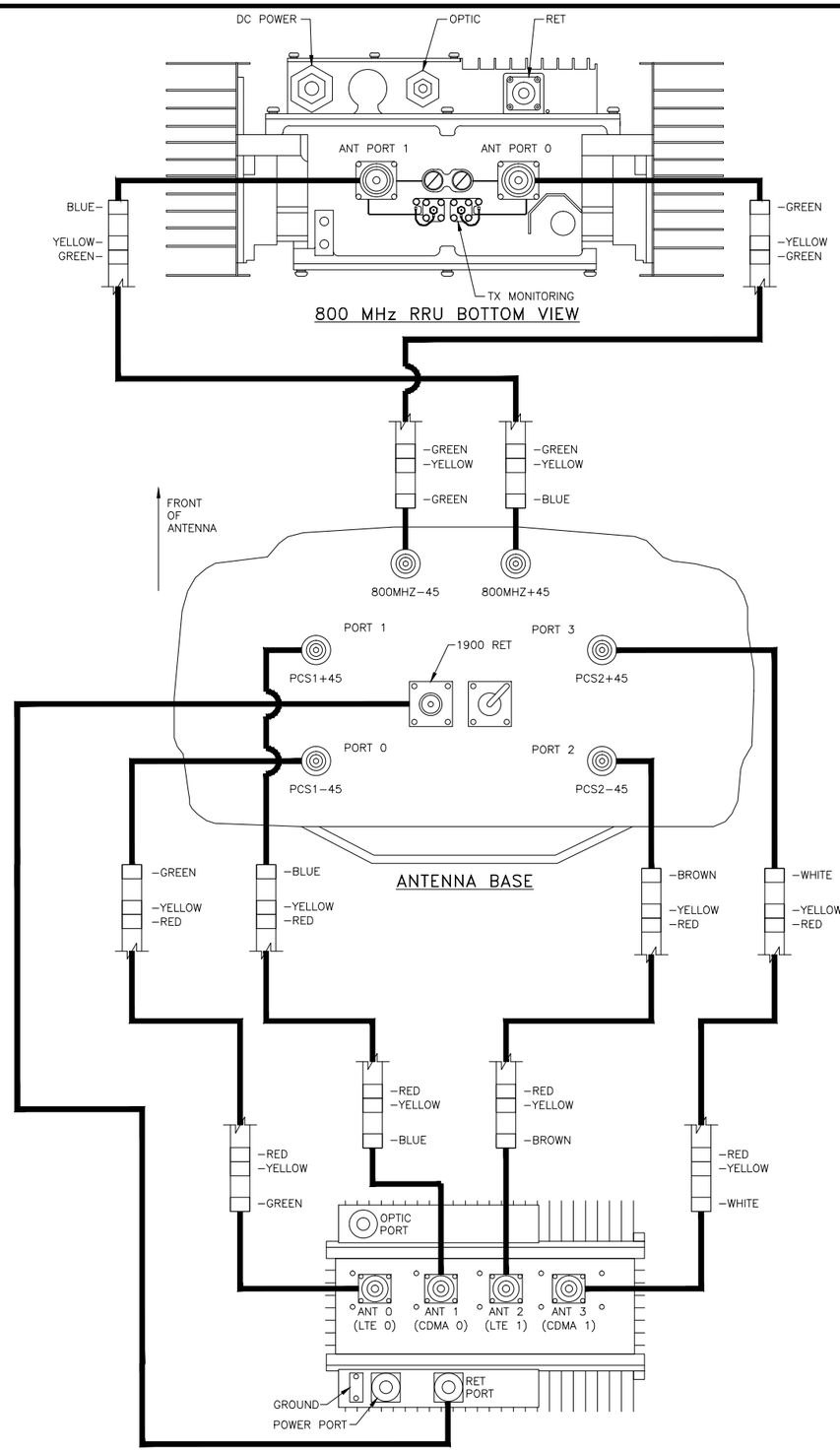
SHEET TITLE
ANTENNA & CABLE COLOR CODING DETAILS

SHEET NUMBER
RF-1



SECTORS 1-3 – KMW ANTENNA/RRU JUMPER SCHEMATIC

NO SCALE

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LICENSED ARCHITECT
STATE OF MINNESOTA

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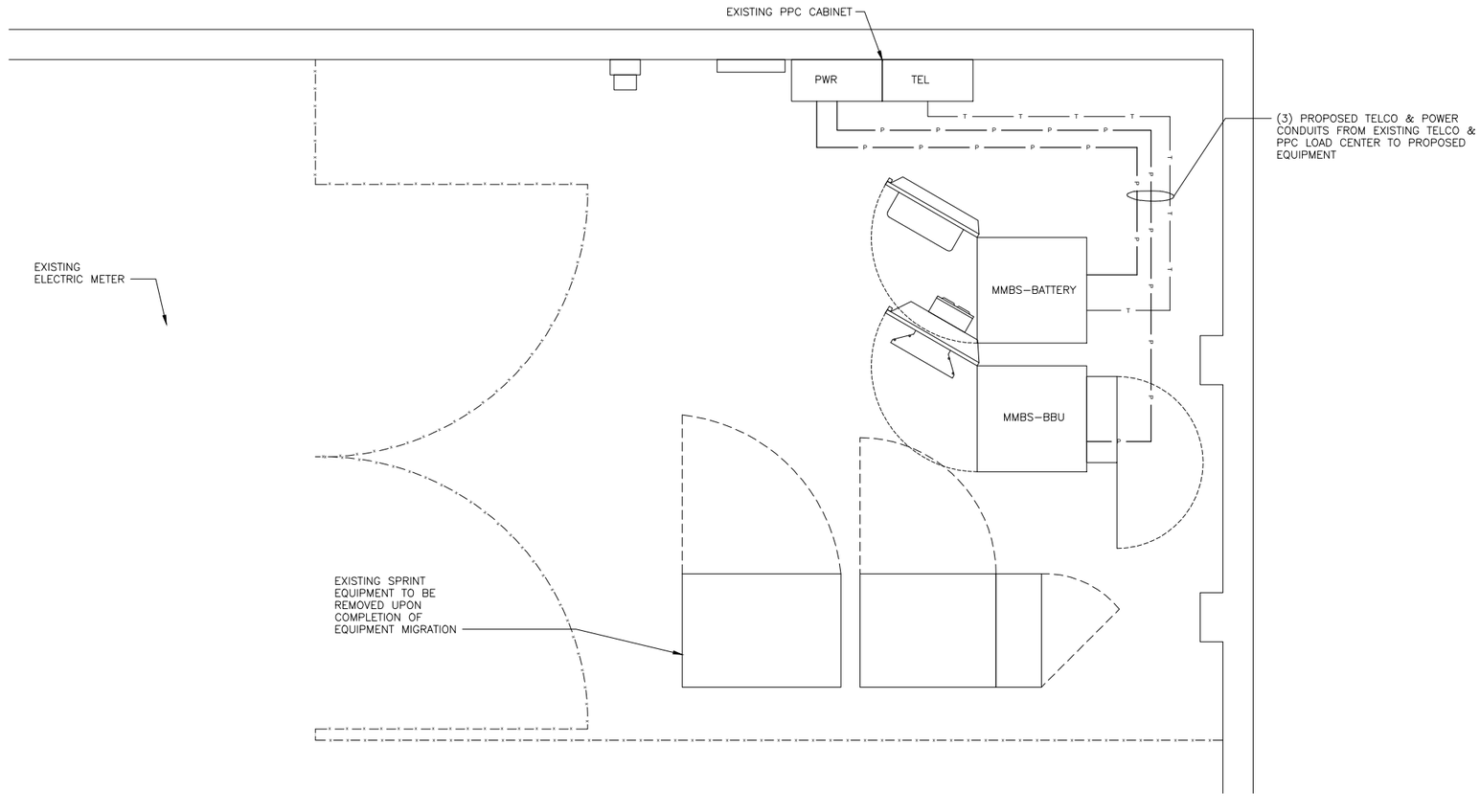
ST. PAUL, MN 55105

SHEET TITLE
ANTENNA/RRU JUMPER SCHEMATIC

SHEET NUMBER
RF-2

NOTES

1. CONDUIT ROUTING IS DIAGRAMMATICALLY SHOWN ON PLANS AND ARE ONLY APPROXIMATIONS. THE EXACT LOCATION AND ROUTING SHALL BE FIELD VERIFIED. 2" LIQUIDTIGHT FLEXIBLE NONMETALLIC CONDUIT (LFNC) MAY BE USED TO PROTECT HYBRID CABLES FROM PHYSICAL DAMAGE IN LIEU OF ICE BRIDGE UNLESS NOTED OTHERWISE.
2. ALL ELECTRICAL EQUIPMENT AND CONTROLLING DEVICES SHALL BE PROVIDED WITH LAMICOID NAMEPLATES, INDICATING THE CIRCUITS ORIGINATION AND ALL EQUIPMENT TERMINATIONS.
3. CONTRACTOR SHALL SUPPLY BREAKERS, CONDUITS AND CIRCUIT CONDUCTORS, AS REQUIRED FOR A COMPLETED SYSTEM AND SHALL BE IN COMPLIANCE WITH MANUFACTURER SPECIFICATIONS.
4. CONTRACTOR SHALL FIELD VERIFY EXISTING TELCO, POWER, AND COAX CONDUIT CONTINUITY AND PATH. CONTRACTOR SHALL INSTALL JUNCTION BOXES AT STUB LOCATIONS WHERE APPLICABLE TO ROUTE CIRCUITS TO THEIR DESIRED LOCATIONS.



ELECTRICAL & TELCO PLAN ELECTRICAL & TELCO PLAN

SCALE: 5/8"=1'-0" | C

GRAPHICS LEGEND

FENCE:	FIBER:	ICE BRIDGE:	
LEASE AREA:	POWER:	CABLE TRAY:	
WOOD/IRON FENCE:	TELCO:	WALL/PARTITION:	

ACRONYM LEGEND

BBU:	BASEBAND UNIT
CDMA:	CODE DIVISION MULTIPLE ACCESS
CMU:	CONCRETE MASONRY UNIT
GPS:	GLOBAL POSITIONING SYSTEM
HVAC:	HEATING VENTILATION AIR CONDITIONING
MMBS:	MULTI MODAL BASE STATION
PPC:	POWER PROTECTION UNIT
RET:	REMOTE ELECTRICAL TILT
RF:	RADIO FREQUENCY
RRU:	REMOTE RADIO UNIT

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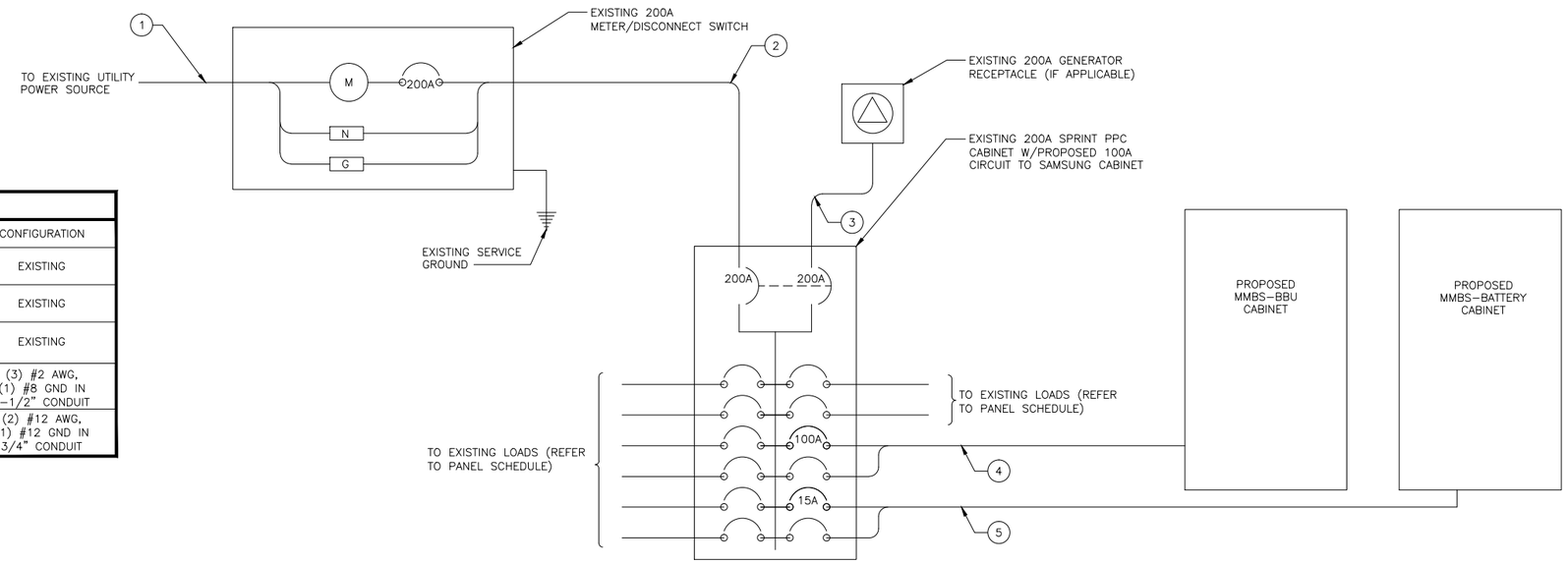
STEPHEN E. HUNT
LICENSED PROFESSIONAL ENGINEER
47489
STATE OF MINNESOTA
6/19/13

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
ELECTRICAL & TELCO PLAN

SHEET NUMBER
E-0

CIRCUIT SCHEDULE			
NO	FROM	TO	CONFIGURATION
1	UTILITY SOURCE	METER/DISCONNECT	EXISTING
2	METER/DISCONNECT	TRANSFER & LOAD CENTER	EXISTING
3	TRANSFER & LOAD CENTER	GENERATOR RECEPTACLE	EXISTING
4	TRANSFER & LOAD CENTER	PROPOSED MMBS–BBU CABINET	(3) #2 AWG, (1) #8 GND IN 1–1/2" CONDUIT
5	TRANSFER & LOAD CENTER	PROPOSED MMBS–BATTERY CABINET	(2) #12 AWG, (1) #12 GND IN 3/4" CONDUIT



ELECTRICAL ONE–LINE DIAGRAM

NO SCALE | A

ELECTRICAL NOTES

1. ALL ELECTRICAL WORK SHALL BE DONE IN ACCORDANCE WITH CURRENT NATIONAL ELECTRICAL CODES AND ALL LOCAL AND STATE CODE, LAWS, AND ORDINANCES. PROVIDE ALL COMPONENTS AND WIRING SIZES AS REQUIRED TO MEET NEC STANDARDS.
2. CONTRACTOR SHALL COORDINATE WITH LOCAL POWER COMPANY FOR REQUIREMENTS OF POWER SERVICE LINE TO THE METER BASE. POWER SERVICE REQUIREMENT IS COMMERCIAL AC NOMINAL 120/208 VOLT OR 120/240 VOLT, SINGLE PHASE WITH 200 AMP RATING.
3. CONTRACTOR SHALL COORDINATE WITH LOCAL TELEPHONE COMPANY FOR REQUIREMENTS OF "T1" SERVICE LINE TO TERMINATE AT THE PPC CABINET.
4. UNDERGROUND POWER AND TELCO SERVICE LINES SHALL BE ROUTED IN A COMMON TRENCH. ALL UNDERGROUND CONDUIT SHALL BE PVC SCHEDULE 40 AND CONDUIT EXPOSED ABOVE GROUND SHALL BE RIGID GALVANIZED STEEL UNLESS OTHERWISE INDICATED.
5. ALL TELCO CONDUIT LINES SHALL BE 4" SCH. 40 PVC CONDUIT UNLESS OTHERWISE INDICATED. THE TELCO CONDUIT FROM THE PPC SHALL BE ROUTED AND TERMINATED AT DESIGNATED TELCO DEMARCATION OR 2–FEET OUTSIDE FENCED AREA, NEAR UTILITY POLE (IN FENCED AREA), OR END CAP OFF AND PROVIDE MARKER STAKE PAINTED BRIGHT ORANGE WITH DESIGNATION FOR TELCO SERVICE.
6. CONDUITS INSTALLED AT PCS EQUIPMENT ENDS PRIOR TO THE EQUIPMENT INSTALLATION SHALL BE STUBBED AND CAPPED AT 6" ABOVE GRADE OR PLATFORM. IF SERVICE LINES CAN'T BE INSTALLED INITIALLY, PROVIDE NYLON PULL CORD IN CONDUITS.
7. THE SPRINT CABINET, INCLUDING 200 AMP LOAD PANEL AND TELCO PANEL, SHALL BE PROVIDED BY OWNER AND INSTALLED BY THE CONTRACTOR. CONTRACTOR IS TO INSTALL BREAKER(S) NOT PROVIDED BY MANUFACTURER. SEE PANEL SCHEDULE ON THIS SHEET FOR BREAKER REQUIREMENTS.
8. LOCATION OF ELECTRIC METER AND DISCONNECT SWITCH TO BE COORDINATED BY ELECTRICAL CONTRACTOR AND FIELD CONSTRUCTION MANAGER.
9. #2 WIRE TO BE UTILIZED IN ELECTRIC SERVICE RUNS EXCEEDING 100'.
10. CONTRACTOR SHALL INSPECT THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID. ANY QUESTIONS ARISING DURING THE BID PERIOD IN REGARDS TO THE CONTRACTORS FUNCTIONS, THE SCOPE OF WORK, OR ANY OTHER ISSUE RELATED TO THIS PROJECT SHALL BE BROUGHT UP DURING THE BID PERIOD WITH THE PROJECT MANAGER FOR CLARIFICATION, NOT AFTER THE CONTRACT HAS BEEN AWARDED.
11. LOCATION OF EQUIPMENT, CONDUIT AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND SHALL BE COORDINATED WITH FIELD CONDITIONS PRIOR TO ROUGH–IN.

ELECTRICAL NOTES (CON'T)

12. THE CONDUIT RUNS AS SHOWN ON THE PLANS ARE APPROXIMATE. EXACT LOCATION AND ROUTING SHALL BE PER EXISTING FIELD CONDITIONS.
13. PROVIDE PULL BOXES AND JUNCTION BOXES WHERE SHOWN OR REQUIRED BY NEC.
14. ALL CONDUITS SHALL BE MET WITH BENDS MADE IN ACCORDANCE WITH NEC TABLE 346–10. NO RIGHT ANGLE DEVICE OTHER THAN STANDARD CONDUIT ELBOWS WITH 12" MINIMUM INSIDE SWEEPS FOR ALL CONDUITS 2" OR LARGER.
15. ALL CONDUIT TERMINATIONS SHALL BE PROVIDED WITH PLASTIC THROAT INSULATING GROUNDING BUSHINGS.
16. ALL WIRE SHALL BE TYPE THWN, SOLID, ANNEALED COPPER UP TO SIZE #10 AWG (#8 AND LARGER SHALL BE CONCENTRIC STRANDED) 75 DEGREE C, (167 DEGREES F), 98% CONDUCTIVITY, MINIMUM #12.
17. ALL WIRES SHALL BE TAGGED AT ALL PULL BOXES, J–BOXES, EQUIPMENT BOXES AND CABINETS WITH APPROVED PLASTIC TAGS, ACTION CRAFT, BRADY, OR APPROVED EQUAL.
18. ALL NEW MATERIAL SHALL HAVE A U.L. LABEL.
19. CONDUIT ROUGH–IN SHALL BE COORDINATED WITH THE MECHANICAL EQUIPMENT TO AVOID LOCATION TO CONFLICTS. VERIFY WITH MECHANICAL CONTRACTOR AND COMPLY AS REQUIRED.
20. ALL PANEL DIRECTORIES SHALL BE TYPEWRITTEN NOT HAND WRITTEN.
21. INSTALL AN EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS PER THE SPECIFICATIONS AND NEC. THE EQUIPMENT GROUNDING CONDUCTORS SHALL BE BONDED AT ALL JUNCTION BOXES, PULL BOXES, AND ALL DISCONNECT SWITCHES, STARTERS, AND EQUIPMENT CABINETS.
22. THE CONTRACTOR SHALL PREPARE AS–BUILT DRAWINGS, DOCUMENT ANY AND ALL WIRING AND EQUIPMENT CONDITIONS AND CHANGES WHILE COMPLETING THIS CONTRACT. SUBMIT AT SUBSTANTIAL COMPLETION.
23. ALL DISCONNECT SWITCHES AND OTHER CONTROLLING DEVICES SHALL BE PROVIDED WITH ENGRAVED PHENOLIC NAMEPLATES INDICATING EQUIPMENT CONTROLLED, BRANCH CIRCUITS INSTALLED ON, AND PANEL FIELD LOCATIONS FED FROM (NO EXCEPTIONS.)
24. ALL ELECTRICAL DEVICES AND INSTALLATIONS OF THE DEVICES SHALL COMPLY WITH (ADA) AMERICANS WITH DISABILITIES ACT AS ADOPTED BY THE APPLICABLE STATE.
25. PROVIDE CORE DRILLING AS NECESSARY FOR PENETRATIONS OR RISERS THROUGH BUILDING. DO NOT PENETRATE STRUCTURAL MEMBERS WITHOUT CONSTRUCTION MANAGERS APPROVAL. SLEEVES AND/OR PENETRATIONS IN FIRE RATED CONSTRUCTION SHALL BE PACKED WITH FIRE RATED MATERIAL WHICH SHALL MAINTAIN THE FIRE RATING OF THE WALL OR STRUCTURE. FILL FOR FLOOR PENETRATIONS SHALL PREVENT PASSAGE OF WATER, SMOKE, FIRE AND FUMES. ALL MATERIAL SHALL BE UL APPROVED FOR THIS PURPOSE.
26. ELECTRICAL CHARACTERISTICS OF ALL EQUIPMENT (NEW AND EXISTING) SHALL BE FIELD VERIFIED WITH THE OWNER'S REPRESENTATIVE AND EQUIPMENT SUPPLIER PRIOR TO ROUGH–IN OF CONDUIT AND WIRE. ALL EQUIPMENT SHALL BE PROPERLY CONNECTED ACCORDING TO THE NAMEPLATE DATA FURNISHED ON THE EQUIPMENT (THE DESIGN OF THESE PLANS ARE BASED UPON BEST AVAILABLE INFORMATION AT THE TIME OF DESIGN AND SOME EQUIPMENT CHARACTERISTICS MAY VARY FROM DESIGN AS SHOWN ON THESE DRAWINGS).
27. LOCATION OF ALL OUTLET, BOXES, ETC., AND THE TYPE OF CONNECTION (PLUG OR DIRECT) SHALL BE CONFIRMED WITH THE OWNER'S REPRESENTATIVE PRIOR TO ROUGH–IN.
28. SPLIT BREAKERS SHALL BE USED ON 120V LOADS IN THE EVENT THAT ADDITIONAL CIRCUIT SPACE IS REQUIRED FOR PROPOSED EQUIPMENT.
29. PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENT ON E–1 REFLECTS MIGRATION PERIOD CIRCUMSTANCES. REFER TO E–4 FOR POST–MIGRATION PANEL SCHEDULE LOADING AND CIRCUIT ARRANGEMENT IN WHICH EXISTING LEGACY EQUIPMENT HAS BEEN REMOVED.

SITE NUMBER:		MS03XC670				MODEL NUMBER:	TBD								
VOLTAGE:		240V/120				PHASE:	1		WIRE:			3			
MAIN BREAKER:		200 AMP				BUSS RATING:	200 AMPS		AIC:			TBD			
MOUNT:		SURFACE				NEUTRAL BAR:	YES		GROUND BAR:			TBD			
ENCLOSURE TYPE:		NEMA 3R				N to GROUND BOND	TBD								
PANEL STATUS:		EXISTING				INTERNAL TVSS:	TBD								
CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD VA	USAGE FACTOR	PHASE A VA	PHASE B VA	USAGE FACTOR	SERVICE LOAD VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	SAMSUNG MMBS	100	2	NEW	2736	1.25	3420		1.00	0	ON	2	60	TVSS	7
2	---	---	---	NEW	2736	1.25		3420	1.00	0	ON	---	---	---	8
3	MMBS BATTERY	15	2	NEW	400	1.00	4900		1.25	3600	ON	2	100	METRO CELL	9
4	---	---	---	NEW	400	1.00		4900	1.25	3600	ON	---	---	---	10
5	LIGHTS	20	1	ON	500	1.00	680		1.00	180	ON	1	20	TELCO GFI	11
6	TELCO FAN	10	1	ON	200	1.00		200	0.00	0	N/A	---	---	NOT LABELED	12
							9000	8520	VA			TOTAL KVA	17.52		
	MIGRATION PERIOD LOADING											AMPS	73.00	< 160 AMPS PER NEC	

NOTE: VERIFY PANEL SERVICE AND BREAKER AVAILABILITY IN FIELD. SERVICE LOAD (VA) OF EXISTING AND PROPOSED EQUIPMENT ARE APPROXIMATE. CONTRACTOR TO CONFIRM AND VERIFY ACTUAL LOADS OF EXISTING AND PROPOSED EQUIPMENT.

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STEPHEN E. HUNT
LICENSED PROFESSIONAL ENGINEER
47489
6/19/13
STATE OF MINNESOTA

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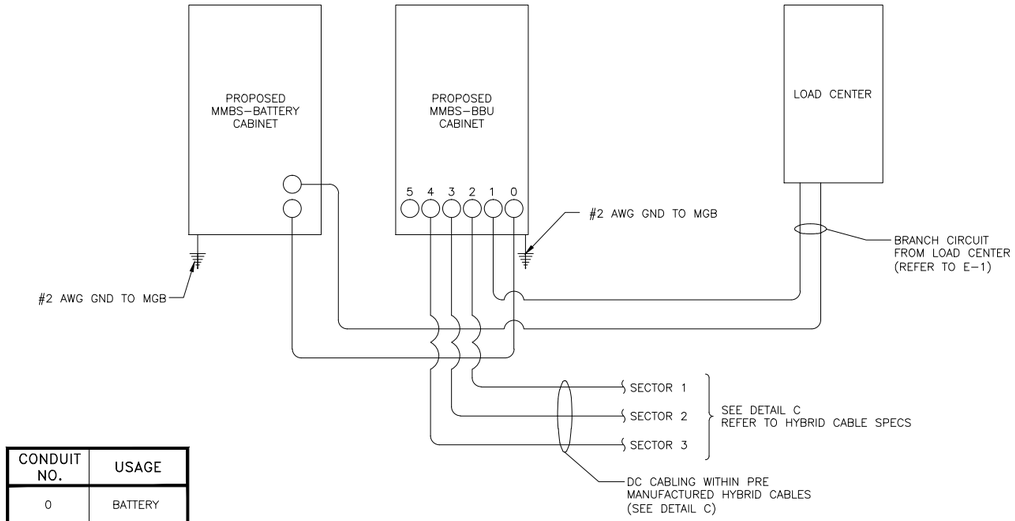
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
ELECTRICAL ONE–LINE & POWER PANEL SCHEDULE

SHEET NUMBER
E-1

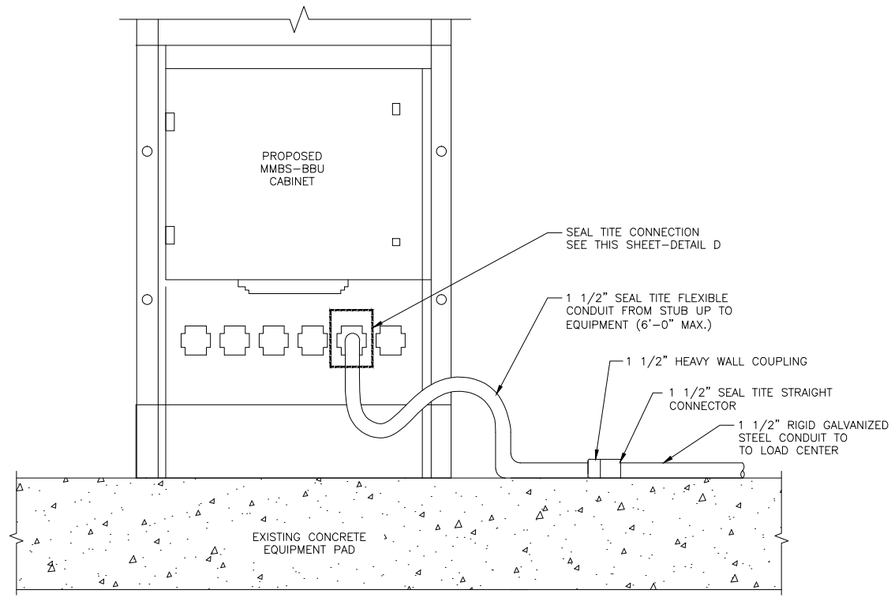


CONDUIT NO.	USAGE
0	BATTERY
1	AC/GROUND
2	RRU SECTOR 1
3	RRU SECTOR 2
4	RRU SECTOR 3
5	BATTERY

DC POWER ELECTRICAL NOTES

1. MINIMUM CABLE LENGTH BETWEEN THE DU AND BATTERY IS 70MM (2.75 in).
2. MAXIMUM CABLE LENGTH DISTANCE IS 900mm (35.43" in).
3. ROUTE DC CONDUCTORS IN CONDUITS TO PROPOSED MMBS–BBU CABINET 48VDC POWER DISTRIBUTION PANEL TO AND FROM PROPOSED MMBS–BATTERY CABINET.
4. –48 VDC CABLES BETWEEN PROPOSED MMBS–BBU CABINET & RRU'S ARE FACTORY ASSEMBLED AND EQUIPPED WITH ONE PRE–TERMINATED END.
5. ALL FIELD INSTALLED DC CABLING SHALL BE TYPE RHH/RHW AND SHALL BE UL THERMOSET INSULATED.

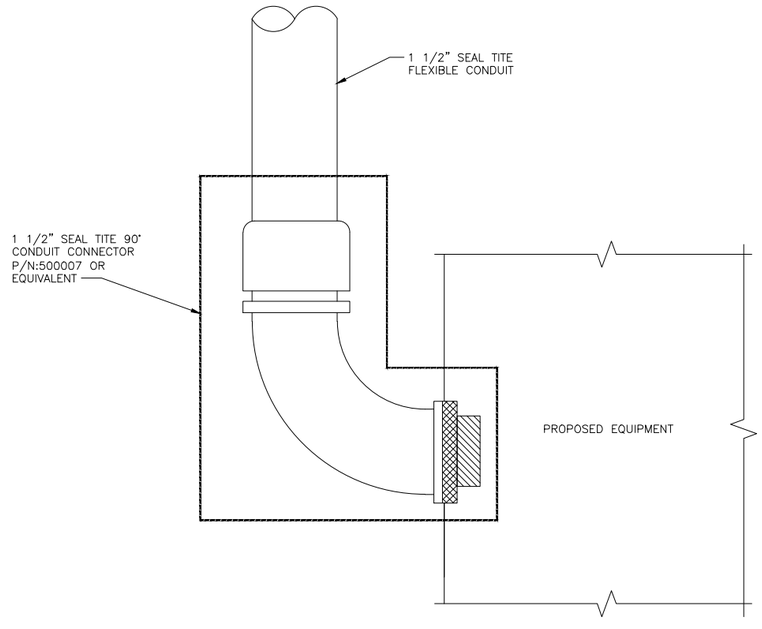
DC POWER DIAGRAM | NO SCALE | A



EQUIPMENT POWER CONDUIT CONNECTIONS | NO SCALE | B

	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5
TOTAL LENGTH	~ 40m (~152')	~ 60m (~197')	~ 75m (~246')	~ 90m (~295')	~110m (~ 361')
HYBRID POWER CABLE CONFIGURATION	AWG 10, 1 PAIR AWG 12, 3 PAIR	AWG 8, 1 PAIR AWG 10, 3 PAIR	AWG 6, 1 PAIR AWG 8, 1 PAIR AWG 10, 2 PAIR	AWG 6, 1 PAIR AWG 8, 3 PAIR	AWG 4, 1 PAIR AWG 6, 3 PAIR
CABLE DIAMETER	25mm (0.98")	27mm (1.06")	30mm (1.18")	30/32mm (1.26")	32mm (1.26")
BENDING RADIUS	300mm (11.81")	330mm (12.99")	390mm (15.35")	450mm (17.72")	450mm (17.72")
OPTIC CABLE	LC/PC–TO–LC/PC, SINGLE MODE				
MMBS–BBU CABINET (POWER CABLE TERMINAL MAX SIZE AWG 4)	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE				
RRU POWER CABLE SPEC	AWG 8, 15.7mm (0.62") AWG 10, 12.2mm (0.48")				
NON USE POWER AND OPTIC CABLE PROTECTION	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	2 PAIR POWER AND OPTIC CABLE WITH PE PIPE	

HYBRID CABLE TYPE | NO SCALE | C



SEAL TITE POWER CONDUIT CONNECTION TO PROPOSED EQUIPMENT DETAIL | NO SCALE | D

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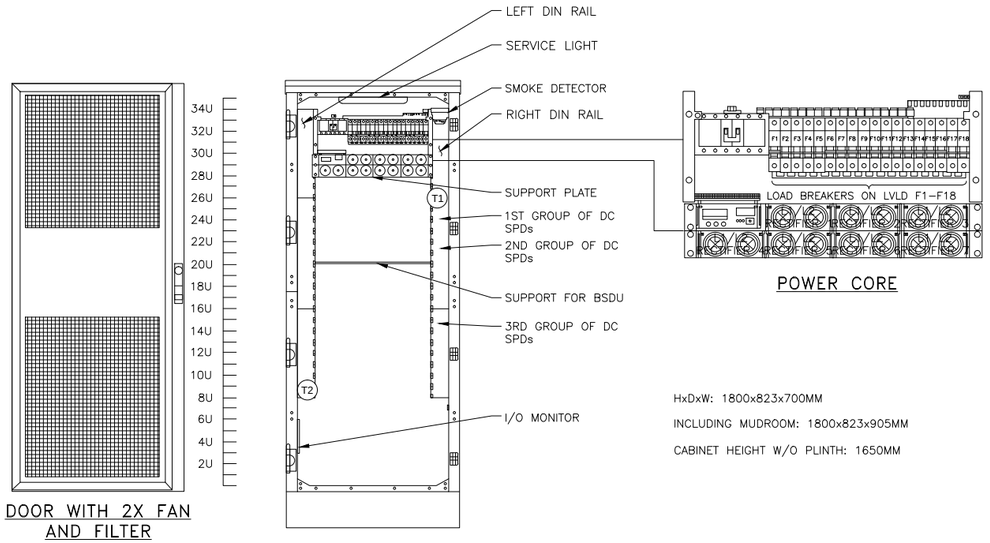
LICENSED PROFESSIONAL ENGINEER
47489
STATE OF MINNESOTA
6/19/13

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
DC POWER ONE–LINE & DETAILS

SHEET NUMBER
E-2



DOOR WITH 2X FAN AND FILTER

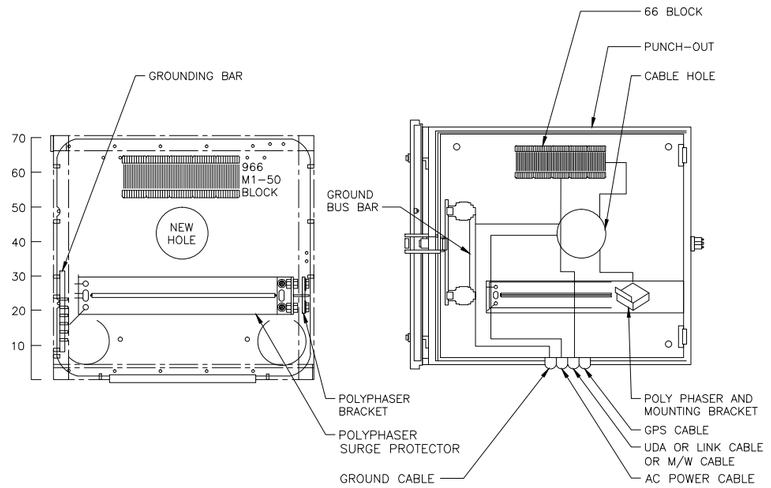
POWER CORE

HxDxW: 1800x823x700MM

INCLUDING MUDROOM: 1800x823x905MM

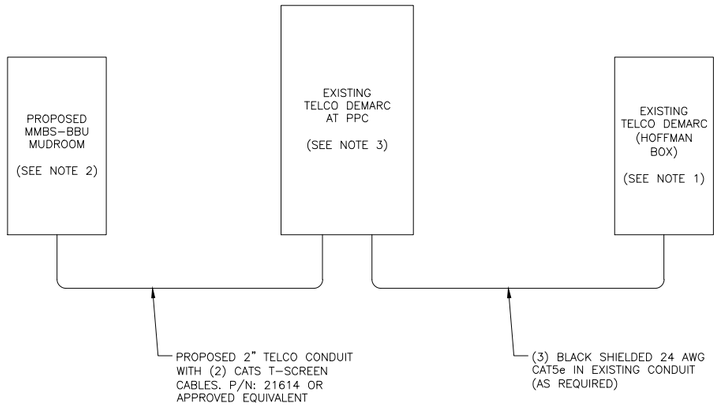
CABINET HEIGHT W/O PLINTH: 1650MM

MMBS-BBU ELECTRICAL DETAIL | NO SCALE | A



MUDROOM ELECTRICAL DETAIL | NO SCALE | B

DETAIL NOT USED | NO SCALE | C



NOTES

1. CONTRACTOR TO INSTALL NEW 66 BLOCK IN EXISTING HOFFMAN BOX AT SITES MAIN TELCO DEMARC.
2. CONTRACTOR SHALL INSTALL RJ-45 ENDS ON ALL RUNS OF CAT5e INTO MMBS-BBU MUDROOM.
3. CONTRACTOR TO INSTALL NEW 66 BLOCK IN EXISTING TELCO BOX NEXT TO EXISTING PPC CABINET.

TELCO RISER DETAIL | NO SCALE | D

Sprint
6580 SPRINT PARKWAY
OVERLAND PARK, KANSAS 66251

SAMSUNG

TeleCAD Wireless
1961 NORTHPOINT BLVD., SUITE 130
HIXSON, TN 37343
PH: 423-843-9500 FAX: 423-843-9509

PROJECT NO:	----
DRAWN BY:	JAE
CHECKED BY:	SEH

REV	DATE	DESCRIPTION
0	6/19/13	ISSUED FOR CONSTRUCTION
A	6/18/13	ISSUED FOR 90% CD

STEPHEN E. HUNT
LICENSED PROFESSIONAL ENGINEER
47489
STATE OF MINNESOTA
6/19/13

MS03XC670
CHURCH OF ST. LUKE'S SCHOOL
1079 SUMMIT AVE.
ST. PAUL, MN 55105

SHEET TITLE
POWER & TELCO DETAILS

SHEET NUMBER
E-3

SITE NUMBER:	MS03XC670				MODEL NUMBER:	TBD								
VOLTAGE:	240V/120				PHASE:	1		WIRE:			3			
MAIN BREAKER:	200 AMP				BUSS RATING:	200 AMPS		AIC:			TBD			
MOUNT:	SURFACE				NEUTRAL BAR:	YES		GROUND BAR:			TBD			
ENCLOSURE TYPE:	NEMA 3R				N to GROUND BOND	TBD								
PANEL STATUS:	EXISTING				INTERNAL TVSS:	TBD								

CKT	LOAD DESCRIPTION	BREAKER AMPS	BREAKER POLES	BREAKER STATUS	SERVICE LOAD VA	USAGE FACTOR	PHASE A VA	PHASE B VA	USAGE FACTOR	SERVICE LOAD VA	BREAKER STATUS	BREAKER POLES	BREAKER AMPS	LOAD DESCRIPTION	CKT
1	SAMSUNG MMBS	100	2	NEW	7000	1.25	8750		1.00	0	ON	2	60	TVSS	7
2	---	---	---	NEW	7000	1.25		8750	1.00	0	ON	---	---	---	8
3	MMBS BATTERY	15	2	NEW	400	1.00	400		0.00	3600	OFF	2	100	SPARE	9
4	---	---	---	NEW	400	1.00		400	0.00	3600	OFF	---	---	---	10
5	LIGHTS	20	1	ON	500	1.00	680		1.00	180	ON	1	20	TELCO GFI	11
6	TELCO FAN	10	1	ON	200	1.00		200	0.00	0	N/A	---	---	NOT LABELED	12
							9830	9350	VA			TOTAL KVA	19.18		
	POST-MIGRATION PERIOD LOADING											AMPS	79.92		

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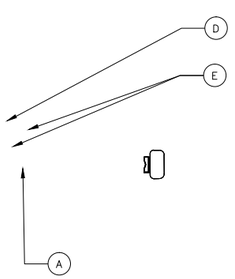
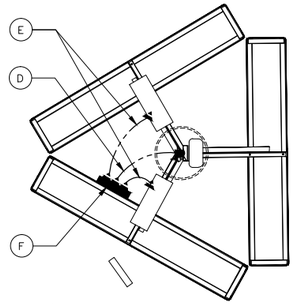
ST. PAUL, MN 55105

SHEET TITLE
POST-MIGRATION PANEL SCHEDULE

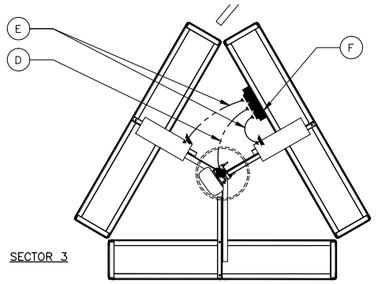
SHEET NUMBER
E-4

SECTOR 1





SECTOR 2

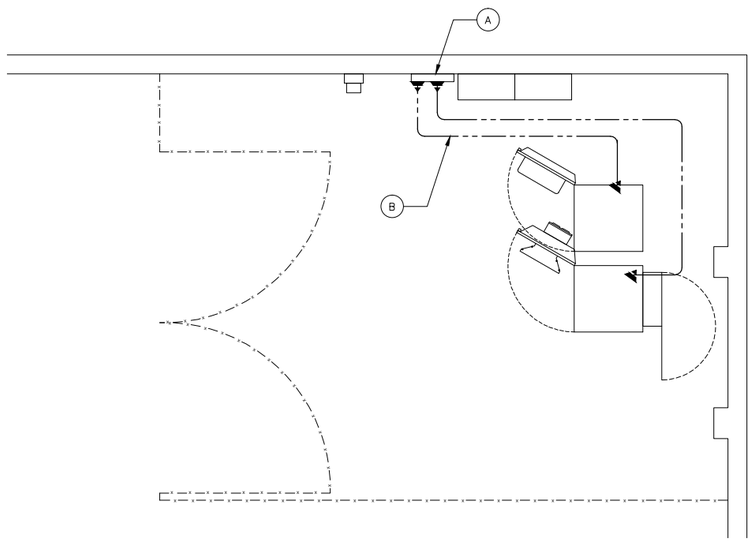


SECTOR 3

INTERIM EQUIPMENT GROUNDING PLAN

SCALE: 3/8"=1'-0"

A



INTERIM/FINAL EQUIPMENT GROUNDING PLAN

SCALE: 3/8"=1'-0"

A

GROUNDING NOTES

1. ALL ELECTRICAL AND GROUNDING AT THE CELL SITE SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE (NEC), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) 780 (LATEST EDITION), AND MANUFACTURER SPECIFICATION.
2. IF THE AC PANEL IN THE POWER CABINET IS WIRED AS SERVICE ENTRANCE, THE AC SERVICE GROUND CONDUCTOR SHALL BE CONNECTED TO GROUND ELECTRODE SYSTEM. WHEN THE AC PANEL IN THE POWER CABINET IS CONSIDERED A SUB-PANEL, THE GROUND WIRE SHALL BE INSTALLED IN THE AC POWER CONDUIT. THE INSTALLATION SHALL BE PER LOCAL AND NATIONAL ELECTRIC CODE (NFPA-70).
3. EXOTHERMIC WELDING IS RECOMMENDED FOR GROUNDING CONNECTION WHERE PRACTICAL. OTHERWISE, THE CONNECTION SHALL BE MADE USING COMPRESSION TYPE-2 HOLES. LONG BARREL LUGS OR DOUBLE CRIMP CLAMP "C" CLAMP. THE COPPER CABLES SHALL BE COATED WITH ANTIOXIDANT (COPPER SHIELD) BEFORE MAKING THE CONNECTIONS. THE MANUFACTURER'S TORQUING RECOMMENDATIONS ON THE BOLT ASSEMBLY TO SECURE CONNECTIONS SHALL BE FOLLOWED.
4. THE ANTENNA CABLES SHALL BE GROUNDED AT THE TOP AND BOTTOM OF THE VERTICAL RUN FOR LIGHTING PROTECTION. THE ANTENNA CABLE SHIELD SHALL BE BONDED TO A COPPER GROUND BUSS AT THE LOWER MOST POINT OF A VERTICAL RUN JUST BEFORE IT BEGINS TO BEND TOWARD THE HORIZONTAL PLANE. WIRE RUNS TO GROUND SHALL BE KEPT AS STRAIGHT AND SHORT AS POSSIBLE. ANTENNA CABLE SHIELD SHALL BE GROUNDED JUST BEFORE ENTERING THE CELL CABINET. ANY ANTENNA CABLES OVER 200 FEET IN LENGTH SHALL ALSO BE EQUIPPED WITH ADDITIONAL GROUNDING AT MID-POINT.
5. ALL GROUNDING CONDUCTORS INSIDE THE BUILDING SHALL BE RUN IN CONDUIT RACEWAY SYSTEM, AND SHALL BE INSTALLED AS STRAIGHT AS PRACTICAL WITH MINOR BENDS TO AVOID OBSTRUCTIONS. THE BENDING RADIUS OF ANY #2 GROUNDING CONDUCTOR IS 8". PVC RACEWAY MAY BE FLEXIBLE OR RIGID PER THE FIELD CONDITIONS. GROUNDING CONDUCTORS SHALL NOT MAKE CONTACT WITH ANY METALLIC CONDUITS, SURFACES OR EQUIPMENT.
6. PROVIDE PVC SLEEVES WHERE GROUNDING CONDUCTORS PASS THROUGH THE BUILDING WALLS AND /OR CEILINGS.
7. INSTALL GROUND BUSHINGS ON ALL METALLIC CONDUITS AND BOND TO THE EQUIPMENT GROUND BUSS IN THE PANEL BOARD.
8. GROUND ANTENNA BASES, FRAMES, CABLE RACKS AND OTHER METALLIC COMPONENTS WITH #2 GROUNDING CONDUCTORS AND CONNECT TO INSULATED SURFACE MOUNTED GROUND BARS. CONNECTION DETAILS SHALL FOLLOW MANUFACTURER'S SPECIFICATIONS FOR GROUNDING.
9. ALL PROPOSED GROUNDING CONDUCTORS SHALL BE ROUTED AND CONNECTED TO THE MAIN GROUND BAR OR EXISTING GROUND RING.

GROUNDING LEGEND

(A) EXISTING COLLECTOR OR MASTER GROUND BAR. FIELD DETERMINE EXACT LOCATION.

(B) SPRINT EQUIPMENT CABINET GROUNDING, TYP OF 2, SEE DETAIL C / SHEET G-3

(C) GPS GROUNDING, SEE DETAIL D / SHEET G-3

(D) SPRINT ANTENNA GROUNDING, SEE DETAIL E / SHEET G-3

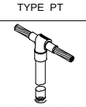
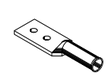
(E) SPRINT RRU GROUNDING, SEE DETAIL E / SHEET G-3

(F) PROPOSED GROUND BAR. FIELD DETERMINE EXACT LOACTION

EXISTING GROUND RING

MECHANICAL CONNECTION

CADWELD CONNECTION

CADWELD CONNECTIONS OR APPROVED EQUAL		BURNDY CONNECTIONS OR APPROVED EQUAL
 PARALLEL HORIZONTAL CONDUCTORS PARALLEL THROUGH CONNECTION OF HORIZONTAL CABLES TYPE PT	 HORIZONTAL STEEL SURFACE TO FLAT STEEL SURFACE OR HORIZONTAL PIPE TYPE HS	 BOND JUMPER FIELD FABRICATED GREEN STRANDED INSULATED TYPE 2-YA-2
 THROUGH CABLE TO GROUND ROD THROUGH CABLE TO TOP OF GROUND ROD TYPE GT	 VERTICAL STEEL SURFACE CABLE DOWN AT 45° TO VERTICAL STEEL SURFACE INCLUDING PIPE TYPE VS	 COPPER LUGS TWO HOLE - LONG BARREL LENGTH TYPE YA-2
 VERTICAL PIPE CABLE DOWN AT 45° TO RANGE OF VERTICAL PIPES TYPE VS		

TYPICAL CADWELD TYPE CONNECTIONS

NO SCALE

Sprint

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OVERLAND PARK, KANSAS 66251

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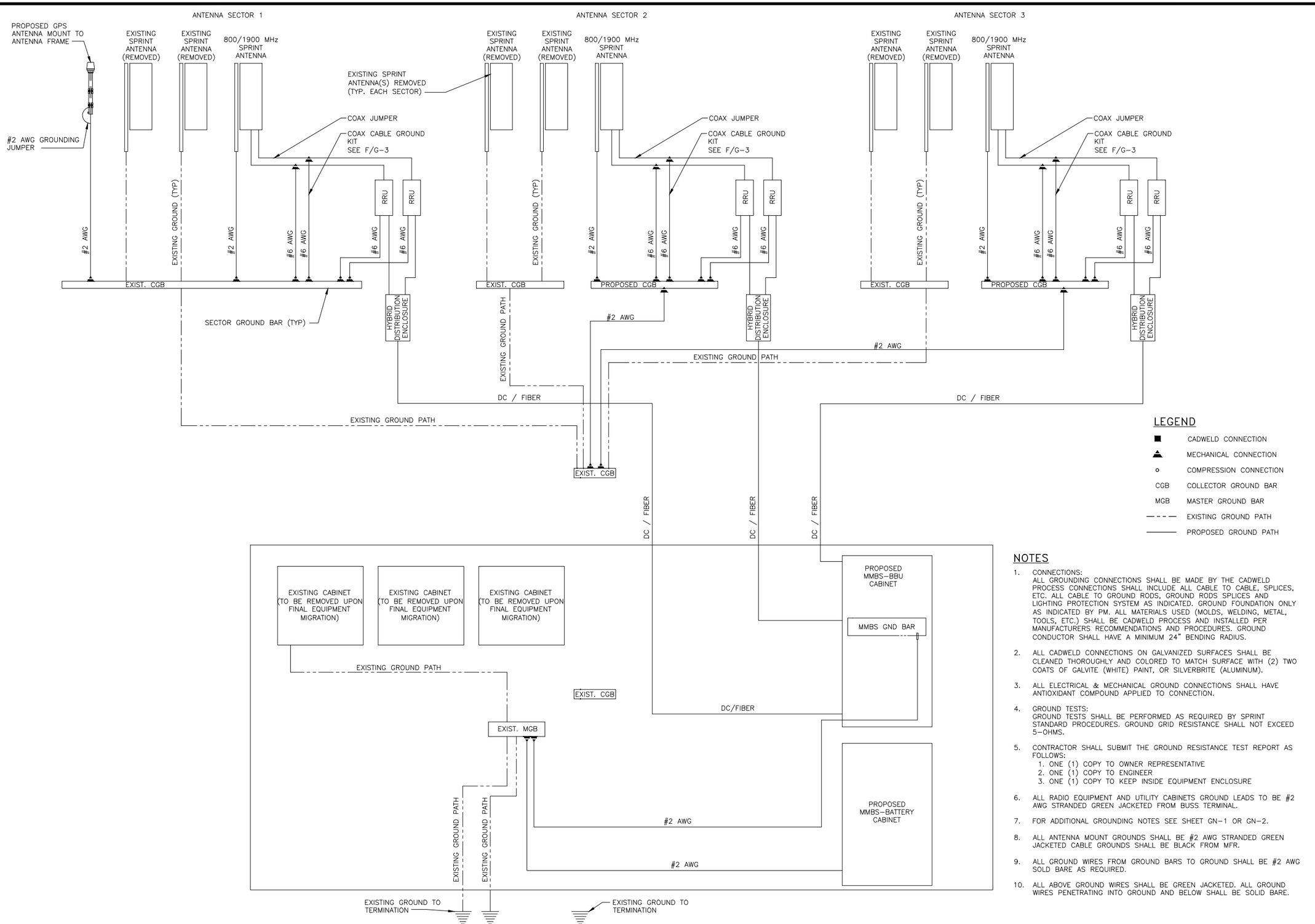
ST. PAUL, MN 55105

SHEET TITLE

GROUNDING PLAN & NOTES

SHEET NUMBER

G-1



LEGEND

■	CADWELD CONNECTION
▲	MECHANICAL CONNECTION
○	COMPRESSION CONNECTION
CGB	COLLECTOR GROUND BAR
MGB	MASTER GROUND BAR
- - - -	EXISTING GROUND PATH
———	PROPOSED GROUND PATH

NOTES

1. CONNECTIONS:
   ALL GROUNDING CONNECTIONS SHALL BE MADE BY THE CADWELD PROCESS CONNECTIONS SHALL INCLUDE ALL CABLE TO CABLE, SPLICES, ETC. ALL CABLE TO GROUND RODS, GROUND RODS SPLICES AND LIGHTING PROTECTION SYSTEM AS INDICATED. GROUND FOUNDATION ONLY AS INDICATED BY PM. ALL MATERIALS USED (MOLDS, WELDING, METAL, TOOLS, ETC.) SHALL BE CADWELD PROCESS AND INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND PROCEDURES. GROUND CONDUCTOR SHALL HAVE A MINIMUM 24" BENDING RADIUS.
2. ALL CADWELD CONNECTIONS ON GALVANIZED SURFACES SHALL BE CLEANED THOROUGHLY AND COLORED TO MATCH SURFACE WITH (2) TWO COATS OF GALVITE (WHITE) PAINT, OR SILVERBRITE (ALUMINUM).
3. ALL ELECTRICAL & MECHANICAL GROUND CONNECTIONS SHALL HAVE ANTIOXIDANT COMPOUND APPLIED TO CONNECTION.
4. GROUND TESTS:
   GROUND TESTS SHALL BE PERFORMED AS REQUIRED BY SPRINT STANDARD PROCEDURES. GROUND GRID RESISTANCE SHALL NOT EXCEED 5-OHMS.
5. CONTRACTOR SHALL SUBMIT THE GROUND RESISTANCE TEST REPORT AS FOLLOWS:
   1. ONE (1) COPY TO OWNER REPRESENTATIVE
   2. ONE (1) COPY TO ENGINEER
   3. ONE (1) COPY TO KEEP INSIDE EQUIPMENT ENCLOSURE
6. ALL RADIO EQUIPMENT AND UTILITY CABINETS GROUND LEADS TO BE #2 AWG STRANDED GREEN JACKETED FROM BUSS TERMINAL.
7. FOR ADDITIONAL GROUNDING NOTES SEE SHEET GN-1 OR GN-2.
8. ALL ANTENNA MOUNT GROUNDS SHALL BE #2 AWG STRANDED GREEN JACKETED CABLE GROUNDS SHALL BE BLACK FROM MFR.
9. ALL GROUND WIRES FROM GROUND BARS TO GROUND SHALL BE #2 AWG SOLD BARE AS REQUIRED.
10. ALL ABOVE GROUND WIRES SHALL BE GREEN JACKETED. ALL GROUND WIRES PENETRATING INTO GROUND AND BELOW SHALL BE SOLID BARE.

INSTALLATION AND GROUNDING DETAILS

NO SCALE

A

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6/19/13
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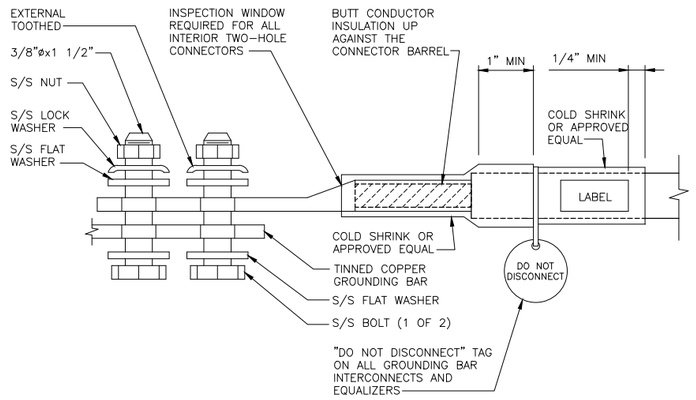
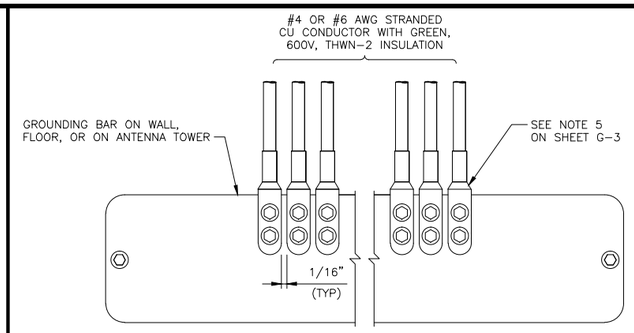
ST. PAUL, MN 55105

SHEET TITLE
FINAL INSTALLATION & GROUNDING DETAILS

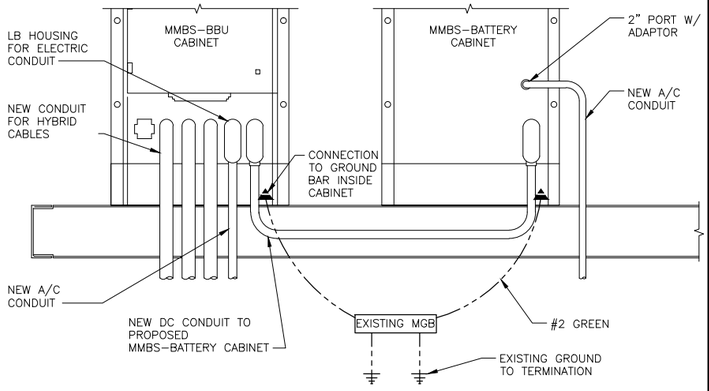
SHEET NUMBER
G-2



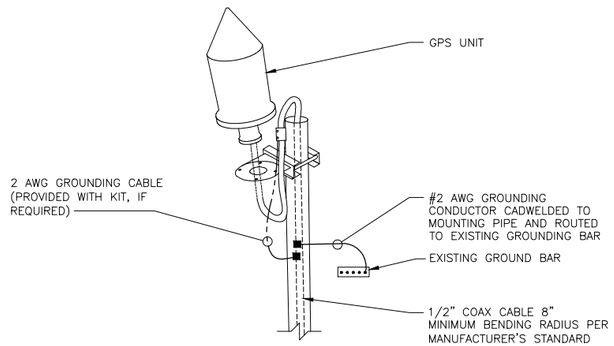
TWO HOLE LUG | NO SCALE | A



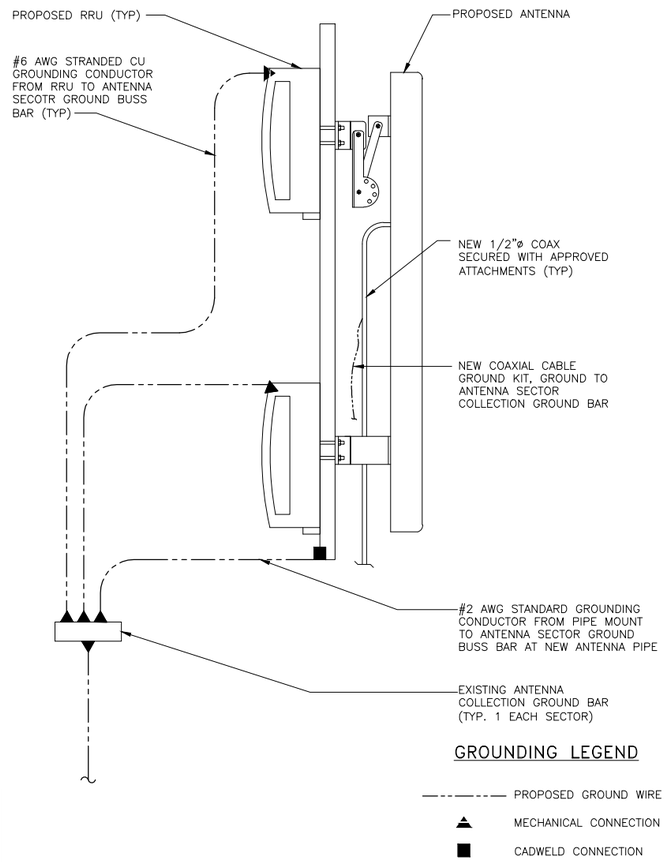
INSTALLATION OF GROUNDING CONDUCTOR TO GROUNDING BAR | NO SCALE | B



CABINET GROUNDING SCHEMATIC | NO SCALE | C



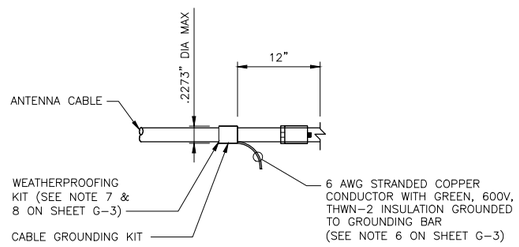
GPS GROUNDING | NO SCALE | D



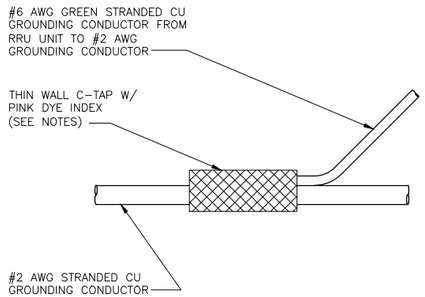
GROUNDING LEGEND

- PROPOSED GROUND WIRE
- MECHANICAL CONNECTION
- CADWELD CONNECTION

ANTENNA GROUNDING SCHEMATIC | NO SCALE | E



CONNECTION OF CABLE GROUNDING KIT TO ANTENNA CABLE | NO SCALE | F



NOTE

CONTRACTOR TO SURROUND COMPLETED CONNECTION W/ WEATHER PROOFING TAPE TO ENSURE WEATHER PROOF CONNECTION.

C-TAP CONNECTION | NO SCALE | G

1. COMPRESSION CONNECTIONS (2), 2 AWG BARE TINNED SOLID COPPER CONDUCTORS TO GROUNDING BAR. ROUTE CONDUCTORS TO BURIED GROUNDING RING AND PROVIDE PARALLEL EXOTHERMIC WELD.
2. EC SHALL USE PERMANENT MARKER TO DRAW THE LINES BETWEEN EACH SECTION AND LABEL EACH SECTION ("P", "A", "N", "I") WITH 1" HIGH LETTERS.
3. ALL HARDWARE 18-8 STAINLESS STEEL, INCLUDING LOCK WASHERS, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING. ALL HARDWARE SHALL BE STAINLESS STEEL 3/8 INCH DIAMETER OR LARGER.
4. FOR GROUND BOND TO STEEL ONLY: INSERT A CADMIUM FLAT WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH AN ANTI-OXIDANT COMPOUND BEFORE MATING.
5. NUT & WASHER SHALL BE PLACED ON THE FRONT SIDE OF THE GROUNDING BAR AND BOLTED ON THE BACK SIDE. INSTALL BLACK COLD SHRINK MATERIAL OR APPROVED EQUAL, 600 VOLT INSULATION, ON ALL GROUNDING TERMINATIONS. THE INTENT IS TO WEATHERPROOF THE COMPRESSION CONNECTION.
6. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE ANTENNA LOCATION, AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
7. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
8. WEATHERPROOFING SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
9. SUPPLIED AND INSTALLED BY CONTRACTOR.
10. WHEN THE SCOPE OF WORK REQUIRES THE ADDITION OF A GROUNDING BAR TO AN THE STRUCTURE, THE SUBCONTRACTOR SHALL OBTAIN APPROVAL FROM THE STRUCTURE OWNER PRIOR TO MOUNTING THE GROUNDING BAR.
11. NUMBER OF GROUNDING BARS MAY VARY DEPENDING ON THE TYPE OF STRUCTURE, ANTENNA LOCATION, AND CONNECTION ORIENTATION. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ADDITIONAL GROUNDING BARS AS REQUIRED, PROVIDING 50% SPARE CONNECTION POINTS.

GROUNDING NOTES | NO SCALE | H

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ST. PAUL, MN 55105

SHEET TITLE
GROUNDING DETAILS

SHEET NUMBER
G-3

SSLP

MINNEAPOLIS MTA

SPRINT SPECTRUM LIMITED PARTNERSHIP

TOWER / EQUIPMENT DATA

STRUCTURAL TYPE: ——— BUILDING
HEIGHT: ——— 48 FEET
FOUNDATION TYPE: ——— N/A
LIGHTING CONFIGURATION: ——— XXXX
GROUNDING: ——— PER SPECIFICATION
COORDINATES: ——— 44° 56' 31" LAT, 93° 08' 40" LONG

TOWER MANUFACTURER: ——— XXXX
CONTACT: ——— XXXX
PHONE NO: ——— XXXX

GENERAL CONTRACTOR: ——— XXXX
ADDRESS: ——— XXXX

CONTACT: ——— XXXX
PHONE NO: ——— XXXX

TRANSCEIVER STATION:

EQUIPMENT MANUFACTURER: ——— XXXX
MODEL NO: ——— XXXX
QUANTITY: ——— XXXX
MOUNTING: ——— XXXX
ELECTRICAL REQUIREMENTS: ——— XXXX
GROUNDING: ——— XXXX

PCS POWER & TELEPHONE CABINET:

NORTHERN TECHNOLOGIES, INC. ——— XXXX
MODEL NO: ——— XXXX
QUANTITY: ——— XXXX
MOUNTING: ——— XXXX
ELECTRICAL REQUIREMENTS: ——— XXXX
GROUNDING: ——— XXXX

RADIO FREQUENCY FRONT END (RFFE) UNIT:

EQUIPMENT MANUFACTURER: ——— XXXX
MODEL NO: ——— XXXX
QUANTITY: ——— XXXX
MOUNTING: ——— XXXX
ELECTRICAL REQUIREMENTS: ——— XXXX
GROUNDING: ——— XXXX

SITE INDEX

SITE NAME: ——— CHURCH OF ST. LUKE'S SCHOOL
ADDRESS: ——— 1079 SUMMIT AVENUE
CITY: ——— ST. PAUL
STATE: ——— MINNESOTA
COUNTY: ——— RAMSEY
CELL NUMBER: ——— MS03XC670

SIZE OF PROPERTY: ——— XXXX
PROPERTY OWNER: ——— CHURCH OF ST. LUKE
ADDRESS: ——— 1079 SUMMIT AVENUE
ST. PAUL, MN, 55105
PHONE NO: ——— (612)-227-7669

ELECTRIC UTILITY: ——— NORTHERN STATES POWER
CONTACT: ——— XXXX
PHONE NO: ——— XXXX

TELEPHONE COMPANY: ——— US WEST
CONTACT: ——— XXXX
PHONE NO: ——— XXXX

PROJECT ENGINEERING: ——— AEC ENGINEERING
STREET: ——— 400 FIRST AVENUE N., SUITE 400
CITY, ST ZIP: ——— MINNEAPOLIS, MN 55401
CONTACT: ——— JEFF KIELB
PHONE NO: ——— (612)-332-8905
FAX. (612)-334-3101

SSLP IMPLEMENTATION MANAGER: ——— BRENDA HEIER
SSLP IMPLEMENTATION ENGINEER: ——— GLEN BYERS
STREET: ——— 2900 LONE OAK PKWY, SUITE 140
CITY, ST ZIP: ——— EAGAN, MN., 55121
PHONE NO: ——— (612)-686-2600
PROJECT NUMBER: ——— MS03XC670V5

NORTEL PROJECT MANAGER: ——— JOHN O'BRIEN
STREET: ——— 1750 YANKEE DOODLE RD., SUITE 208
CITY, ST ZIP: ——— EAGAN, MN., 55121
PHONE NO: ——— (612)-452-7268

SITE CONSTRUCTION MANAGER: ——— XXXX
STREET: ——— XXXX
CITY, ST ZIP: ——— XXXX

CONTACT: ——— XXXX
PHONE NO: ——— XXXX

RADIO EQUIPMENT

BASE TRANSCEIVER STATION (BTS)

APPROXIMATE DIMENSIONS 76"W x 40"D x 64"H
APPROXIMATE WEIGHT (WITH BATTERIES) 3000 LBS

RADIO FREQUENCY FRONT END (RFFE)

APPROXIMATE DIMENSIONS 18"W x 12"D x 27"H
APPROXIMATE WEIGHT 80 LBS

rear/north
ANTENNAS (TX, RX) (light grey color)

APPROXIMATE DIMENSIONS 6"W x 2"D x 64"H (42"H AR)
APPROXIMATE WEIGHT 9 LBS
top of rear antennas - 7' from roof deck

COAX CABLES

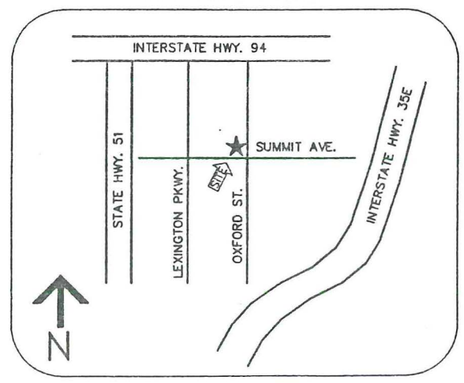
DIAMETER (LATER)

South antennas - painted black to match vents to which they are attached.

DRAWING INDEX

SHEET	TITLE
T1	COVER SHEET
A1	ROOF PLAN
A2	ELEVATIONS
D1	DETAILS
D2	DETAILS
E1	ELECTRICAL DETAILS
S1	STRUCTURAL SECTIONS & DETAILS

VICINITY MAP



PLAN APPROVED
Heritage Preservation Commission
City of St. Paul
File # 3197
1065 Summit
Date 2-13-98 Signed A. Rubenstein
Any alterations from this plan must be approved by the Heritage Preservation Commission.

→ for phases I and II as noted on plans, with a maximum of 12 antennas. Any antennas higher than approved require further HPC review.

JEFFREY A. KIELB
REGISTERED PROFESSIONAL ENGINEER
25094
STATE OF MINNESOTA

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SIGNED
DATE 12/17/97 REG NO. 25094

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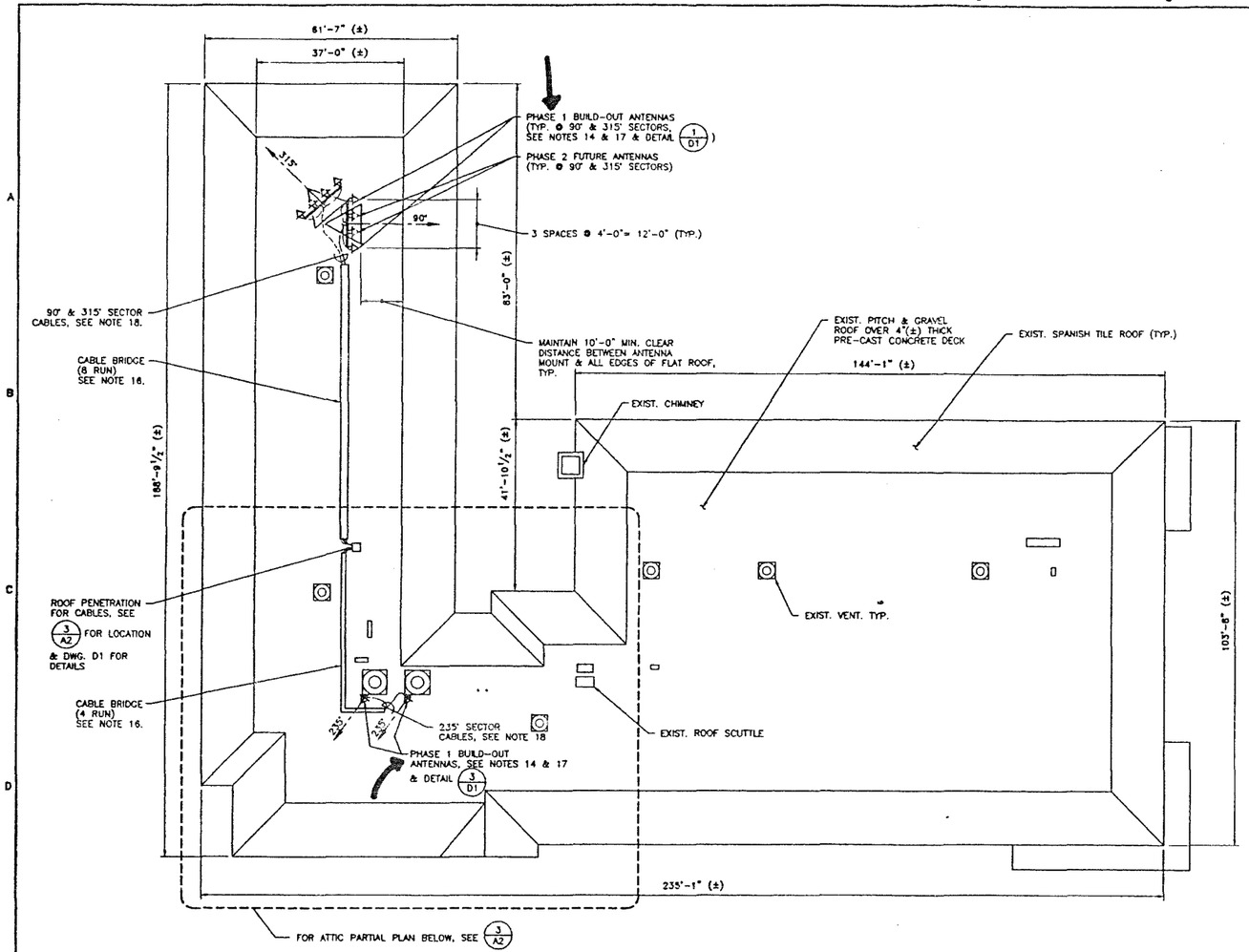
DR.	NS	DATE	12/8/97
CK.	LP	DATE	12/17/97
APP.	JAK	DATE	12/17/97

AEC ENGINEERING
Minneapolis, Minnesota
Birmingham, Alabama
Richmond, Virginia

SPRINT SPECTRUM
COVER SHEET
CHURCH OF ST. LUKE'S SCHOOL
MINNEAPOLIS MTA SITE 670

Sprint

CAD FILE NAME: G:\DWG\SPRINT\97501\1750\670T1
SITE I.D. NO.: MS03XC670V5
DRAWING NO. MSC670T1 REV 0



GENERAL NOTES:

1. ALL CONSTRUCTION SHALL COMPLY WITH PROJECT SPECIFICATIONS AND DRAWINGS. THE GENERAL NOTES ARE INTENDED TO AUGMENT THE SPECIFICATIONS AND DRAWINGS. SHOULD CONFLICTS EXIST BETWEEN THE SPECIFICATIONS, GENERAL NOTES AND DRAWINGS, THE STRICTEST PROVISIONS SHALL GOVERN.
2. ALL CONSTRUCTION SHALL COMPLY FULLY WITH THE APPLICABLE PROVISIONS OF OSHA AND ALL GOVERNING BUILDING CODES, LATEST EDITION, AND ALL REQUIREMENTS SPECIFIED IN THE CODE SHALL BE ADHERED TO AS IF THEY WERE CALLED FOR OR SHOWN ON THE DRAWINGS.
3. THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH THE EXISTING CONDITIONS.
4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE STARTING WORK AND THE ENGINEER NOTIFIED OF ANY DISCREPANCIES FOUND.
5. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF ALL EXISTING UTILITIES AND COORDINATE THE INSTALLATION OF NEW UTILITIES.
6. THE CONTRACTOR SHALL PROVIDE COMPLETE ELECTRICAL AND TELEPHONE SERVICE AS SHOWN ON THE DRAWINGS.
7. NO EXISTING SERVICE SHALL BE INTERRUPTED AT ANY TIME WITHOUT APPROVAL BY THE OWNER.
8. NOTIFY AND COORDINATE WITH THE PROPERTY OWNER THE START DATE AND LOCATION OF THE STAGING AREA WELL IN ADVANCE OF THE CONSTRUCTION START DATE.
9. CONFINE CONSTRUCTION WITHIN CONTRACT LIMITS AS SHOWN ON THE DRAWINGS.
10. THE CONTRACTOR SHALL PROTECT THE EXISTING FACILITIES AND BE RESPONSIBLE FOR REPAIRING ANY DAMAGE CAUSED BY CONSTRUCTION.
11. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
12. LOCATIONS OF EQUIPMENT SHOWN ON DRAWINGS SHALL NOT BE VARIED WITHOUT APPROVAL FROM THE ENGINEER.
13. FIELD ROUTE ELECTRIC, TELEPHONE AND EQUIPMENT CABLE/CONDUIT AS DIRECTED BY SPRINT ENGINEER.
14. ALL ANTENNA ELEVATIONS ARE TO THE CENTERLINE OF THE ANTENNA PANEL, SEE DWG. A2. ANTENNAS ARE TO BE ORIENTED AT 90°, 235°, AND 315° WITH RESPECT TO TRUE NORTH (0°).
15. INSTALL GROUNDING CONDUCTORS BETWEEN THE BTS, RFFES, COAX CABLES, ANTENNAS AND THE BUILDING LIGHTNING PROTECTION SYSTEM PER THE PROJECT SPECIFICATIONS.
16. SEE DWG. D1 FOR ANTENNA MOUNT DETAILS. SEE DWG. D2 FOR HORIZONTAL COAX CABLE SUPPORT DETAILS.
17. PAINT ANTENNAS AND ANTENNA MOUNTS WITH NON-METALLIC PAINT TO MATCH EXISTING BUILDING COLORS AS DIRECTED BY SPRINT ENGINEER.
18. APPROXIMATE COAX CABLE LENGTH FROM RFFE TO ANTENNA ARE AS FOLLOWS:
    TWO 120 FT. CABLES AT 90° SECTOR
    TWO 120 FT. CABLES AT 315° SECTOR
    TWO 80 FT. CABLES AT 235° SECTOR
19. THE EXISTING BUILDING CONSTRUCTION CONTAINS ASBESTOS. PRIOR TO MAKING MODIFICATIONS TO EXISTING BUILDING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY IF ASBESTOS IS PRESENT. IF ASBESTOS WILL BE DISTURBED, THE CONTRACTOR SHALL PROVIDE CONTAINMENT AND DISPOSAL PER LOCAL, STATE AND FEDERAL REGULATIONS.

DESIGN DATA:

1. GOVERNING BUILDING CODE – UBC 1994.
2. DESIGN WIND SPEED = 80 MPH.
3. ROOF LIVE LOAD (SNOW) = 40 PSF.

ROOF PLAN

1/A1 SCALE: 1/16"= 1'-0"

JEFFREY A. KIEFER REGISTERED PROFESSIONAL ENGINEER 25094 STATE OF MINNESOTA

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AEC ENGINEERING
Minneapolis, Minnesota
Birmingham, Alabama
Richmond, Virginia

SPRINT SPECTRUM
ROOF PLAN
CHURCH OF ST. LUKE'S SCHOOL
MINNEAPOLIS MTA SITE 670

Sprint.

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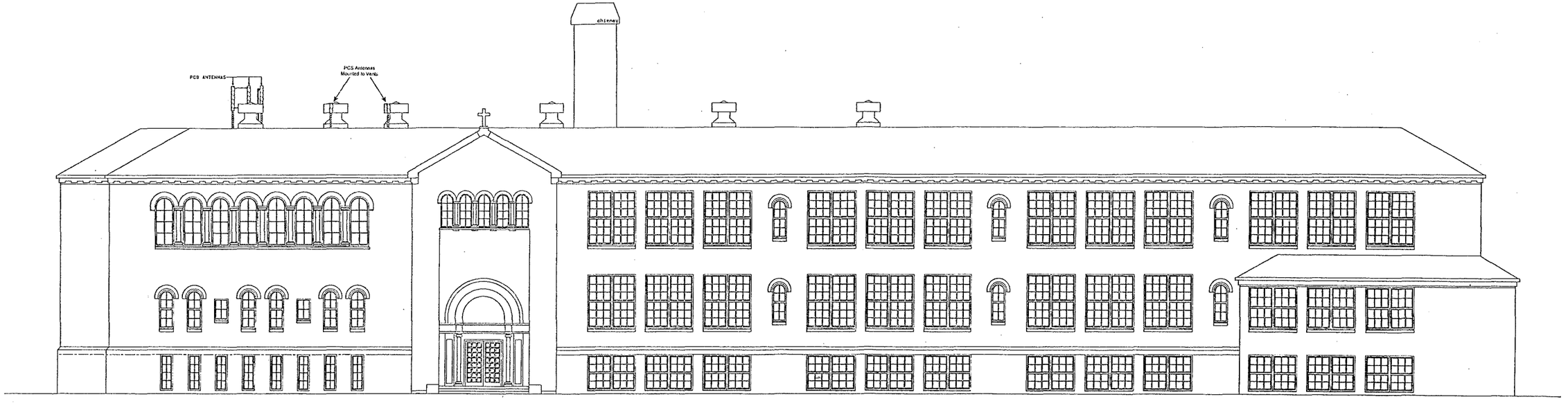
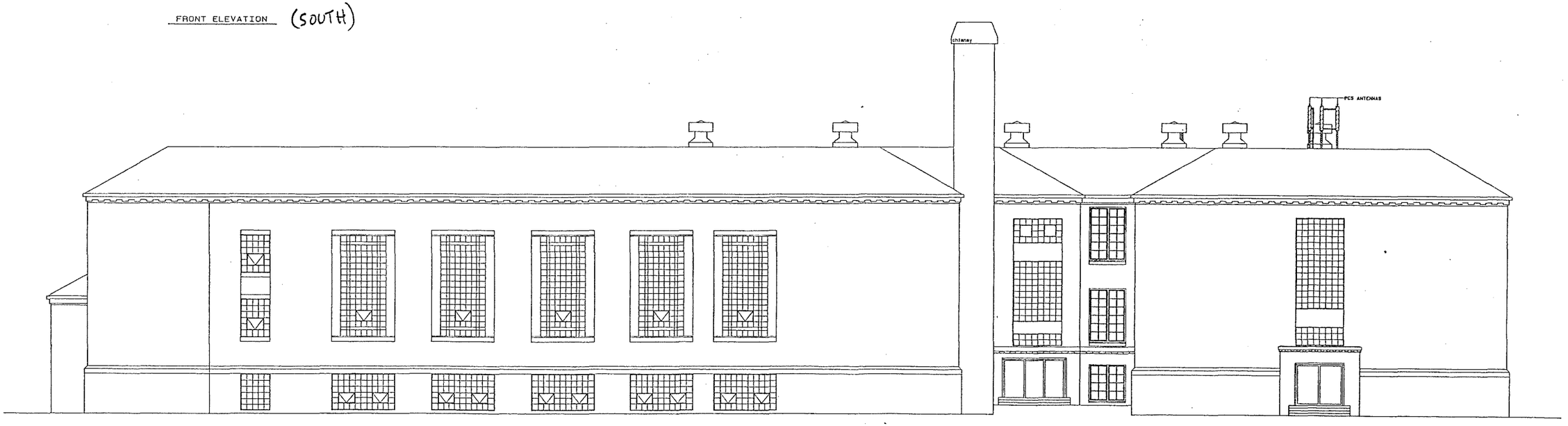


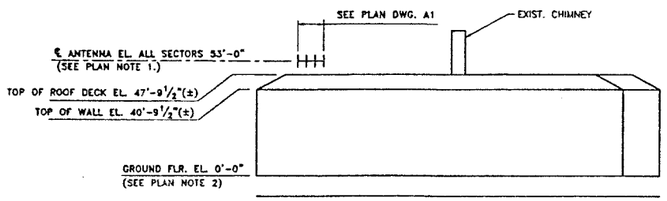
FRONT ELEVATION (SOUTH)



REAR ELEVATION (NORTH)

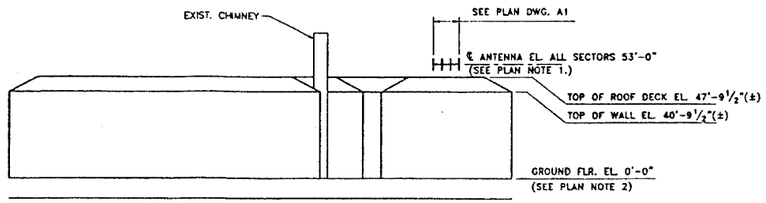
CHURCH OF ST. LUKE'S SCHOOL - PROPOSED ANTENNA LOCATIONS

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



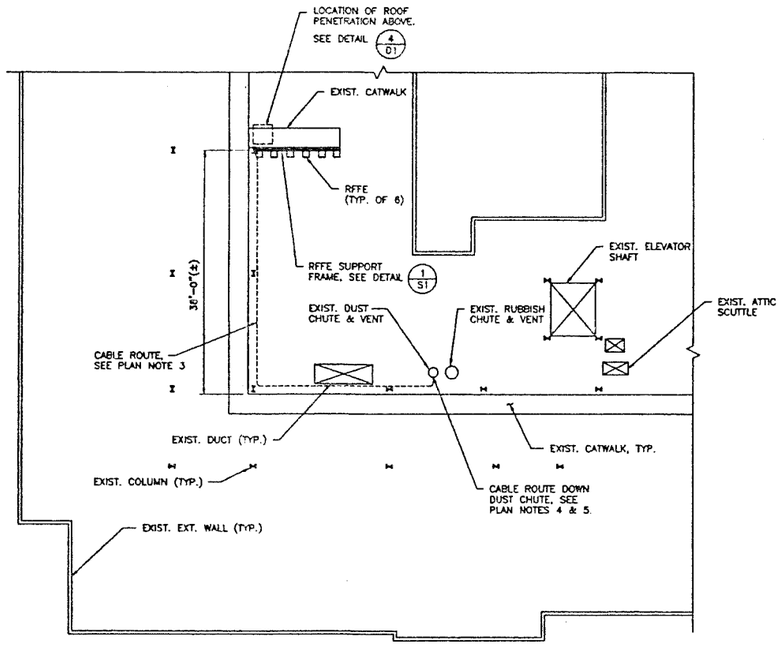
WEST ELEVATION

(1/A2) SCALE: 1/32"= 1'-0"



NORTH ELEVATION

(2/A2) SCALE: 1/32"= 1'-0"



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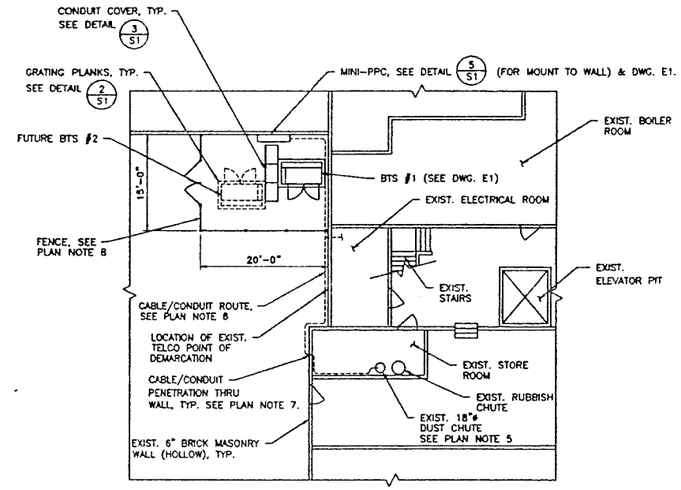
PARTIAL ATTIC PLAN

(3/A2) SCALE: 3/32"= 1'-0"

NOTES:
1. EXIST. ROOF & CATWALK FRAMING, NOT SHOWN FOR CLARITY.
2. EXIST. MECHANICAL & ELECTRICAL EQUIPMENT & PIPING NOT SHOWN FOR CLARITY.
3. SEE (4/A2) FOR PARTIAL BASEMENT PLAN BELOW.



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PARTIAL BASEMENT PLAN

(4/A2) SCALE: 3/32"= 1'-0"

NOTES:
1. EXIST. MECHANICAL, ELECTRICAL & PIPING EQUIPMENT NOT SHOWN FOR CLARITY.

PLAN NOTES:

1. THE CONTRACTOR SHALL MEASURE THE VERTICAL DISTANCE BETWEEN THE ANTENNA CENTERLINE AND THE GROUND. THIS DISTANCE SHALL BE RECORDED FOR AS-BUILT DRAWINGS. CONFIRM ANTENNA ELEVATION WITH NORTEL & SPRINT RF ENGINEER.
2. THE ROOF TOP AND PARAPET ELEVATION SHOWN IS DERIVED FROM ELEVATIONS SHOWN ON BUILDING ARCHITECTURAL DRAWINGS FURNISHED BY OTHERS. ELEVATIONS ARE BASED ON A GROUND REFERENCE ELEVATION OF 0'-0".
3. ROUTE AND SUPPORT CABLES FROM ROOF PENETRATION TO THE RFFE'S AND FROM THE RFFE'S TO THE EXISTING DUST CHUTE USING THE EXISTING STEEL ROOF / CATWALK FRAMING MEMBERS OR THE EXISTING ROOF DRAIN PIPE. SELECT CABLE SUPPORT DETAILS FROM THOSE SHOWN ON DRAWING D2.
4. SUPPORT CABLES ABOVE THE EXISTING DUST CHUTE USING MICROFLECT HOISTING GRIPS (OR APPROVED EQUAL) AND UNIVERSAL CLAMP TO THE EXISTING BEAM FLANGE. BUNDLE CABLES USING NYLON WIRE TIES AS REQUIRED.
5. ROUTE THE CABLES DOWN THE EXISTING DUST CHUTE BY CUTTING THROUGH THE EXISTING SECOND FLOOR CEILING AND THE TOP OF THE EXISTING DUST CHUTE COVER AS REQUIRED. NOTE, THE TOP OF THE DUST CHUTE CONTAINS A SPRINKLER HEAD AND A WATER WASH PIPE. SEE NOTE 19 ON DRAWING A1.
6. ROUTE CABLES / CONDUIT FROM THE BTS TO THE RFFE'S AS REQUIRED BY THE ELECTRICAL CODE. SUPPORT THE CABLES/ CONDUIT FROM THE EXISTING BUILDING WALLS USING THE DETAIL SHOWN ON DRAWING D2. BUNDLE CABLES USING NYLON WIRE TIES AS REQUIRED.
7. CORE DRILL THROUGH THE EXISTING HOLLOW BLOCK WALL AS REQUIRED TO ROUTE THE CABLES / CONDUIT.
8. INSTALL A 6-FOOT HIGH RESIDENTIAL TYPE GALVANIZED STEEL FENCE (CHAIN LINK) WITH A 10-FOOT WIDE DOUBLE SWING GATE AND LOCK PER PROJECT SPECIFICATIONS. SEE DRAWING S1 FOR FENCE BASE POST CONNECTION TO EXISTING SLAB ON GRADE.

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25094
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MINNEAPOLIS MTA SITE 670

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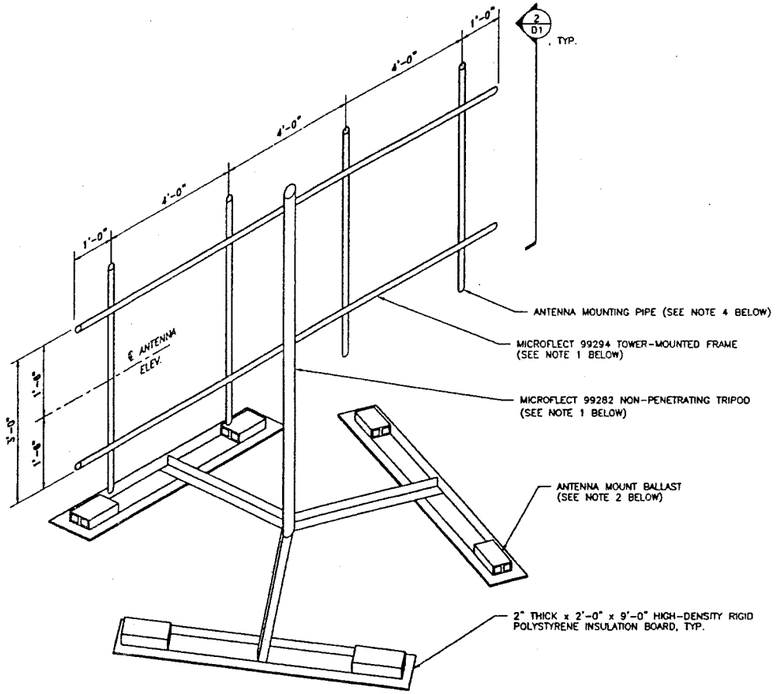
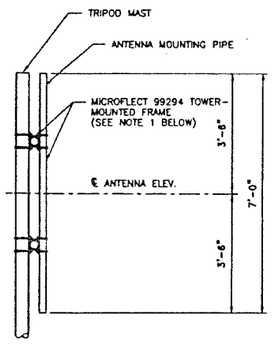


ANTENNA MOUNT DETAIL

1/D1 SCALE: 1"= 1'-0" (TYP. @ 90° & 315° SECTORS)

NOTES:

1. INSTALL TRIPOD & MOUNTING FRAME PER MANUFACTURER'S RECOMMENDATIONS.
2. TOTAL BALLAST REQUIRED= 1080 LBS., 360 LBS. EVENLY DISTRIBUTION ON EACH OF (3) SIDES OF THE TRIPOD. USE 4"x8"x16" (NOMINAL) SOLID CONCRETE BLOCKS (CMU) FOR BALLAST.
3. ANTENNAS NOT SHOWN FOR CLARITY. SEE NOTES 14 & 17 ON DWG. A1.
4. INSTALL ADDITIONAL ANTENNA MOUNTING PIPE (2"ø SCH. 40 PIPE, FIELD VERIFY LENGTH) FOR GPS ANTENNA PER DIRECTION OF SPRINT ENGINEER.

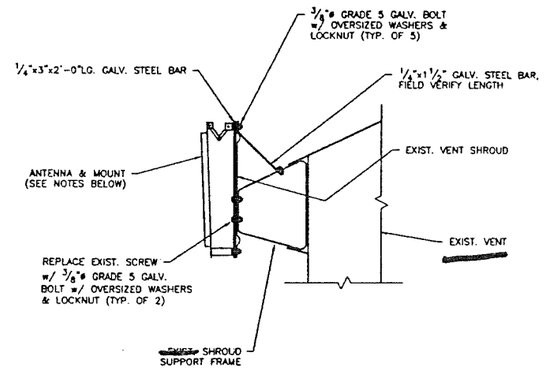


SECTION

2/D1 SCALE: 1"= 1'-0"

NOTES:

1. INSTALL MOUNTING FRAME PER MANUFACTURER'S RECOMMENDATIONS.
2. ANTENNAS NOT SHOWN FOR CLARITY.
3. ALL ANTENNAS TO BE INSTALLED WITH 2° MECHANICAL DOWN-TILT.

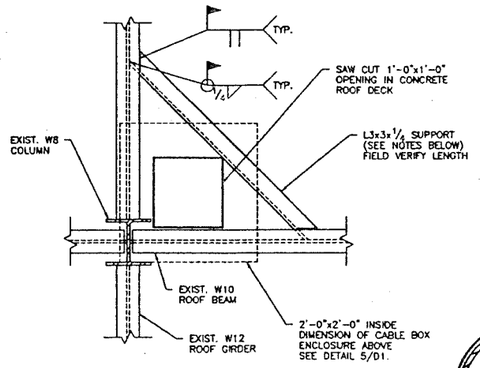


MOUNT DETAIL @ 235° SECTOR

3/D1 SCALE: 1"= 1'-0" (TYP. OF 2)

NOTES:

1. MOUNT ANTENNA WITH 2° MECHANICAL DOWN-TILT USING SCALA AMC-1 MOUNTING KIT AND TB-10 TILT KIT.
2. FIELD VERIFY LOCATION OF ALL NEW BOLTS IN 7/16"ø DRILLED HOLES.
3. SEE NOTE 17 ON DWG. A1.



DETAIL @ ROOF PENETRATION

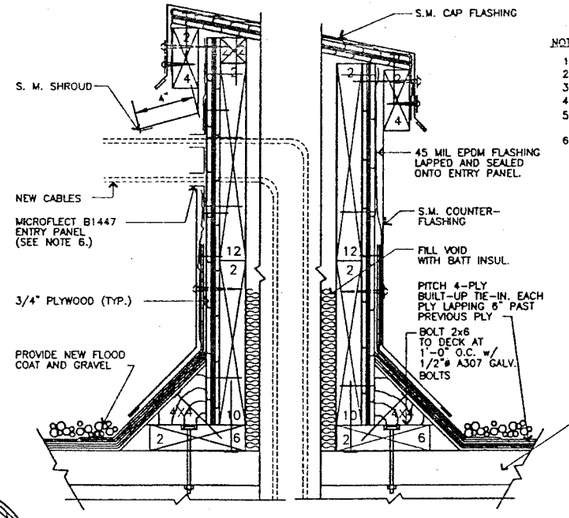
4/D1 SCALE: 1"= 1'-0"

NOTES:

1. INSTALL SUPPORT ANGLE PRIOR TO MAKING SAW CUT IN CONCRETE ROOF DECK.
2. COPE TOP LEG OF ANGLE AT EACH END SO TOP LEG WILL BE IN CONTACT WITH CONCRETE ROOF DECK.

N

JEFFREY A. KIELB REGISTERED PROFESSIONAL ENGINEER 25094 STATE OF MINNESOTA



SECTION @ CABLE BOX ENCLOSURE

5/D1 SCALE: NONE

NOTES:

1. CONSTRUCT CABLE BOX ENCLOSURE WITH 2'-0" x 2'-0" INSIDE DIMENSIONS.
2. CONSTRUCT CABLE BOX ENCLOSURE AND REPAIR ROOFING PER PROJECT SPECIFICATIONS.
3. PROTECT SURROUNDING ROOF FROM DAMAGE.
4. MAINTAIN MIN. 8" FLASHING HEIGHT BELOW NEW CABLES.
5. CABLE BOX ENCLOSURE TO BE PAINTED WITH NON-METALLIC PAINT TO MATCH EXISTING ROOF VENT COLOR.
6. INSTALL AND SEAL THE MICROFLECT B1447 ENTRY PANEL PER MANUFACTURER'S INSTRUCTIONS. SEAL THE CABLES AT THE ENTRY PANEL WITH MICROFLECT ENTRY PORT BOOTS. SELECT BOOT BASED ON CABLE SIZE AS FOLLOWS:

NOMINAL CABLE DIAMETER	MICROFLECT BOOT NO.
7/8"ø	B537A
1 1/4"ø	B1152A
1 5/8"ø	B535A

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