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<th>COUNTY S.A.P. XXX-XXX-XXX</th>
<th>FEDERAL S.P. XXXX-XX</th>
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TYPICAL CABINET INTERSECTION LAYOUT

1. F & E GROUNDING ELECTRODE SYSTEM FOR CAST-IN-PLACE AND Precast pad in accordance with Standard Plate 8106 Equipment Pad B - GROUNDING ELECTRODE SYSTEM and 2565.3.F.3 Equipment Pad.
2. Use the anchor rods, nuts, and washers supplied with the cabinets for a cast-in-place pad. Place anchor rods as shown, ensure anchor rods meet the requirements as detailed. F & E anchor rods for a precast pad as shown if using a precast pad.
3. Use 3-10 x 10 long-leaf flaxwood or 3-10 x 10 long-leaf flaxwood with a 10 x 10 full-threaded 7/8 inch galvanized anchor rod. Use 3-10 x 10 long-leaf flaxwood for a precast pad if using a precast pad.
4. Use 5/8 inch galvanized anchor rods supplied with the cabinet.
5. Place anchor rods as shown for cast-in-place or precast concrete equipment pad.
6. Place 12 x 12 and 12 x 15 openings in the pad as shown for the precast equipment pad.
7. Fill the openings with a material approved by the engineer and the conductors and ground rods have been placed.
8. Use the anchor rods, nuts, and washers supplied with the cabinets for a cast-in-place pad. Use the manufacturer's instructions to drill 7/8 inch holes as specified by the manufacturer's instructions. Use 3-10 x 10 long-leaf flaxwood for a precast pad as shown if using a precast pad.
9. Do not place the conduit run below the concrete pad when both ends of a conduit run terminate within the pad.
10. Place 1/2 inch radius on formed edges of the pad.
11. Place 12 x 12 and 12 x 15 openings in the pad as shown for the precast equipment pad.
12. Use the anchor rods, nuts, and washers supplied with the cabinets for a cast-in-place pad.
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1. Use 3 lb/ft stub posts; shall conform to MNDOT 3401.
2. Use 2.5 lb/ft riser posts, stringers, knee braces and lateral braces, all shall conform to MNDOT 3401.
3. See sign data sheets for number of posts, knee braces, post lengths and spacings, as determined from TEM charts 6.3 and 6.4.
4. If more than two posts are needed, the minimum spacing shall be 45° between posts.
5. Type D sign panels shall be bolted to stringers at 24" maximum intervals in accordance with the type D stringer and panel joint detail (see MNDOT standard signs and markings manual).
6. Mounting (punch code) for type C sign panels shall be as indicated in the MNDOT standard signs and markings manual unless otherwise specified.
7. All riser (vertical) U posts shall be spliced. driven stub posts shall be at least 7' long.
8. Use stainless steel 9/16" bolts, washers and nylon insert lock nuts as shown for all ground mounted and overhead mounted signs.
9. Stainless steel washer with same dimensions shall be provided between all nylon washers and bolt heads.
10. Bracing stubs shall be no more than 4" above ground and embedded at least 42".
11. A-frame bracket shall be steel conforming to MNDOT 3306 and galvanized in accordance with MNDOT 3394.
12. Collars shall be used to shim overlays and leg components away from panel where interference with bolt heads is encountered. MNDOT 3352.2A6.
13. 2 post type C signs shall be reinforced with at least one lateral brace; installations where the total panel height is 60" or more shall have two lateral braces located approximately at the quarter points.
14. Where 2 single post type C signs are installed side by side, they shall be reinforced laterally by at least 2 braces, bolted at each post and located approximately at the quarter points.
15. Where 3 or more type C signs are installed side by side, they shall be reinforced laterally by at least 2 braces bolted at each post and approximately at the quarter points as shown in modified type C installation.

**NOTES:**

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**TYPE C & D SIGN**

**STRUCTURAL DETAILS**

TYPICAL TYPE C INSTALLATION

TYPICAL TYPE D INSTALLATION

MODIFIED TYPE C INSTALLATION

U POST BREAKAWAY SPLICE

U POST MOUNTING TYPE C SIGNS

RICHMOND, MN

STEARNS COUNTY

T.H. XX AT C.R. YY

RICHS SAMPLE PLAN

T.H. XX AT C.R. YY

RICHMOND, MN

STEARNS COUNTY

S.P. XXXX-XXXX (T.H. XX)

SHEET NO. 4 OF 16 SHEETS

REVISED: 5-5-2017
**LIGHTING DETAILS**

**ROADWAY**

**SHOULDER**

**STRENGTH AND DESIGN**

- **TYPE 9-40**
- **LIGHTING UNIT**
  - **MOUNTING HEIGHT LED LUMINAIRE WITH WIRE HOLDER**
  - **LIGHT FOUNDATION DESIGN E**
  - **STANDARD PLATE 8127**
  - **TRANSFORMER BASE**
  - **ALUMINUM HIGH BASE**
  - **STAINLESS STEEL TRANSFORMER BASE**

**RADIUS CHART (ENGLISH)**

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<td>8</td>
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**PLACEMENT LIGHTING UNIT TYPE 9-40**

- **FILL AROUND FOUNDATION TOP WITH EXCAVATED DIRT, GRADE DIRT LEVEL WITH BOTTOM OF CONCRETE CHAMFER.**

**RADIUS CHART (ENGLISH)**

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<td>12</td>
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**RADIUS CHART (ENGLISH)**

- **MAST ARM LENGTH**
  - **RADIUS**
    - **6**
    - **9**
    - **12**

**LIGHTING UNIT TYPE 9-40**

**BREAKAWAY**

**USE THE MAXIMUM DISTANCE WHENEVER POSSIBLE. IF THE MINIMUM DISTANCE CANNOT BE OBTAINED CONTACT THE DISTRICT/DIVISION TRAFFIC ENGINEER. LIGHT FOUNDATIONS SHALL BE PLACED IN ACCORDANCE WITH 2545.3F2. DISTANCES SHALL BE MEASURED FROM THE EDGE OF DRIVING LANE OR TURN LANE.**

**DESIGNER:**

**CHECKED BY:**

**REVISIONS NO.**

**DATE:**

**ENGINEER NAME:**

**SHEET NO.**

**OF 16 SHEETS**

**RICHS SAMPLE PLAN**

**T.H. XX AT C.R. YY**

**RICHDON, MN**

**STEAMNS COUNTY**

**S.P. XXXX-XXXX (T.H. XX) SHEET NO. 7 OF 16 SHEETS**
NOTES:
1) The exact location of handholes, flashers/signs, roadways detectors, and cabinets pad shall be field verified by the engineer and nodt district personnel.
2) See special provisions for state furnished materials.
3) Coordinate service connection with the power company (and with engineer) is responsible for coordinating the connection of the power for the new flasher systems.
4) See details for further information regarding flasher installations.
5) This plan specifies conduit sizes, types, and general locations, the exact locations will be determined in the field. Conduits under existing roadways and culverts will require boring.
6) Contractor shall maintain 50 foot spacing between new signs and existing signs on trunk highways, unless otherwise directed by the engineer.
7) Devices shall be furnished and installed at distances listed from the intersections.
8) See signing details for typical mounting and sign placement.
9) New handholes to be furnished and installed by the contractor shall be in accordance with the most approved/preferred products list. Maximum spacing of handholes allowed is 400 feet.
10) All new conduit shall be PVC-Schedule 80 or HDPE of handholes allowed is 400 feet.
11) All wires listed are an American wire gauge.
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NOTE: THIS PLAN SHEET IS THE SAME AS SHEET 8, EXCEPT THAT PLAN HAS BEEN ENLARGED TO SHOW THE INTERSECTION IN GREATER DETAIL.
NOTES ARE PROJECT SPECIFIC AND NEED TO BE VERIFIED

NOTES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UTILIZE THE ONE CALL EXCAVATION NOTICE SYSTEM/TELEPHONE NUMBER 651-454-0002. THIS IS REQUIRED BY MINNESOTA STAGE 2000.

2. NO UTILITIES ARE ANTICIPATED TO BE AFFECTED BY THIS PROJECT.

3. THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL 'D'. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 3802, ENTIRED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA.*

**UTILITY OWNERSHIP**

<table>
<thead>
<tr>
<th>BURIED TV, TEL</th>
<th>FIRST COMMUNICATIONS SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERHEAD POWER</td>
<td>SECOND ELECTRIC COOPERATIVE</td>
</tr>
<tr>
<td>THIRD ENERGY</td>
<td></td>
</tr>
</tbody>
</table>

**LEGEND**

- ✨ POWER POLE

**NOTES**:

- **INPLACE UTILITIES**

**UTILITY DATA**

**ENGINEER NAME**

**STEARNS COUNTY**

**T.H. XX AT C.R. YY**

**S.P. XXXX-XXXX (T.H. XX) SHEET NO. 12 OF 16 SHEETS**
PERMANENT PAVEMENT MARKING PLAN

NOTES & GUIDELINES

GENERAL INFORMATION:

The Engineer's involvement in the application of the material shall be limited to field consultation and inspection. The Contractor will place necessary spotting at appropriate points to provide horizontal control, for striping and to determine necessary starting and cutoff points. Perpendicular joints, pavement edges, and existing markings may serve as horizontal control when so directed.

Edge lines and lane lines are to be broken only at intersections with public roads and at private entrances if they are controlled by an agency placed yield sign, stop sign or traffic signal. The break point is to be at the start of the radius for the intersection or at marked stop lines or crosswalks.

A tolerance of 1/4 inch under or 1/4 inch over the specified width will be allowed for striping provided the variation is gradual and does not detract from the general appearance. Broken line segments may vary up to 3 inches from the specified lengths provided the over and under variations are reasonably compensatory. Alignment deviations from the control guide shall not exceed 1 inch. Material shall not be applied over longitudinal joints. Establishment of application tolerances shall not relieve the contractor of their responsibility to comply as closely as practicable with the planned dimensions.

Just prior to the placement of permanent markings the road surface shall be cleaned and free of contamination as recommended by the material manufacturer. The road surface shall be cleaned to remove any surface treatments and/or laitance. Apply all pavement markings as recommended by the material manufacturer.

Pavement markings shall not be placed over temporary tape markings. The filling of tanks, pouring of materials or cleaning of equipment shall not be performed on unprotected pavement surfaces unless adequate provisions are made to prevent spillage of material.

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SIGNING AND STRIPING PLAN

T.H. XX (65 MPH) AT C.R. YY
RICHMOND, MN
STEARNS COUNTY
S.P. XXXX-XXXX (T.H. XX) SHEET NO. 14 OF 16 SHEETS
NOTES:
1. REMOVE SIGN TYPE C
2. INSTALL
3. LOCATION OF FLICKING BEACON SYSTEM

LOCATION OF FLICKING BEACON SYSTEM

ENGINEER:

SIGNING AND STRIPING PLAN

SHEET NO. 15 OF 16 SHEETS
**NOTES:**

1. **SIGN FACES SHALL BE VERTICAL.**
2. **OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.**
3. **TO AVOID SPECULAR GLARE, \( \alpha \) SHALL BE APPROXIMATELY 93° FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF THRU LANE AND APPROXIMATELY 92° FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF THRU LANE. THIS APPLIES TO SIGNS TYPE A, C, & D AND INCLUDES SIGNS IN THE GORE.
4. **WHERE "X" IS LESS THAN 30', "H" SHALL BE 7'. WHERE "X" IS 30' OR GREATER, MINIMUM AND PREFERRED "H" IS 5'.
5. **"Y" IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'**.
6. **LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.**

**SPECIFIC NOTES:**

**1. EXIT SIGN**

   If these offsets cannot be attained within 100 feet of the paved gore, a 4 foot offset is acceptable. If the 4 foot offsets cannot be attained within 100 feet of the paved gore, contact the Project Engineer.

**2. MERGE OR ADD LANE SIGN**

   If these offsets cannot be attained within 200 feet of the paved gore, a 4 foot offset is acceptable. If the 4 foot offsets cannot be attained within 200 feet of the paved gore, contact the Project Engineer.