### SIGN PANELS TYPE C

<table>
<thead>
<tr>
<th>SIGN NO</th>
<th>QTY</th>
<th>POSTS</th>
<th>KNEE BRACES (1)</th>
<th>LEG</th>
<th>PANEL</th>
<th>TOTAL AREA</th>
<th>CODE NO</th>
<th>PANEL LEGEND</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>15</td>
<td>7</td>
<td>48 x 48 16,00</td>
<td>32.00</td>
<td>11-3</td>
<td>(2)</td>
</tr>
</tbody>
</table>

**TOTAL:** 32.00

**SPECIFIC NOTES:**
1. Mounting height is minimum, see sheet 17 for typical mounting.

**GENERAL NOTES:**
1. Post lengths are approximate and include embayment but do not include additional length required for splice.
2. See standard signs manual for punching code, and detailed drawings of type C sign panels.
3. Furnish and install on 3.75x75 FT post (MN/DOT 3401).
4. For punching and mounting details, see sheet 8.
MANAGEMENT STATION FRAME DETAIL

NOTES:
ALL ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR, UNLESS NOTED OTHERWISE.
Dimensions in inches

Dimensions Are Approximate
TYPE C POST

2-5/8" STAINLESS STEEL BOLTS WITH NYLON INSERT LOCK NUTS PLACED IN TOP AND BOTTOM HOLES.

STAINLESS STEEL WASHER AND NYLON WASHER (1-1/32" MIN., 1.0-.5/8" MAX., 0.0-.7/8" MAX.)

STAINLESS STEEL U-BOLT

LATERAL BRACE

ACTIVE SIGN ASSEMBLY CONDUIT

ACTIVE SIGN ASSEMBLY CONNECTION
(TWO PER SIGN)

NOTES:
ALL ITEMS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
ATTACH SPLIT 24" DIA. P.V.C. COVER SUPPORT RING WITH FOUR 3/8" DIAL X 2" LONG BOLTS AND NUTS AT 90° APART.

TWO TYPE 2 SHOULDER EYEBOLTS, 3/8" DIA. X 1 1/4" SHANK LENGTH, WITH HEX. NUTS AT 180° APART (FOR LIFTING HANDHOLES AND SUPPORTING ELECTRICAL CABLES).

FOUR 1/4" X 1 1/4" LONG GALVANIZED LAG SCREWS.

ATTACH SPLIT 24" DIA. PVC EXTENSION RING WITH FOUR 3/8" DIA. X 2" LONG BOLTS AT 90° APART. THE BOLTS & NUTS COMPLY WITH MIL-DOT 3391.2E, THE OTHER HARDWARE WITH 3392.

COMPACT COARSE FILTER AGGREGATE COMPLYING WITH MIL-DOT 3149.2H TO A 12" DEPTH.

CONDUIT ENTRANCES IN THE BARREL ARE SIZED 1.0" LARGER THAN THE CONDUIT USED.

PLUG HANDHOLE AT CONDUIT INSTALLATION, PROVIDING A WATER TIGHT SEAL.

THE PVC PIPE COMPLIES WITH ASME F 91-1.

INSTALL ORANGE LOCATOR BALL WITH TIE WRAP TO EYE BOLT.

MINIMUM CONDUIT DEPTH FOR LOOP WIRES SHALL BE 1.5'.

F & I CONDUIT NO SHARPER THAN 125 DEG. FOR INSTALLATIONS OF CONDUIT WHERE FIBER WILL PASS THRU.

F & I CONDUIT WITH FIBER PASSING THRU 30° DEPTH THRU HANDBOLES; TRANSITION TO/FROM STANDARD 36" FIBER DEPTH OR PULL DEPTH OUTSIDE HANDBOLES. NOTE: PROVIDE 36" CONDUIT STUB OUT FOR DIRECT BURIED FIBER PASSING THRU HANDBOLES.
GENERAL NOTES:

1. SEE SPECIAL PROVISIONS FOR REQUIRED LOOP DETECTOR CONDUCTOR SPLICE KIT.

2. THE LOOP DETECTOR HEAD SHALL BE 5/8" O.D. POLYPROPYLENE CONDUIT AND SHALL BE INJECTED WITH NOT RUBBERIZED ASPHALT AFTER CONDUCTOR PLACEMENT TO ENSURE THE WIRE AND PROVIDE A MOISTURE BARRIER.

3. PREFORMED LOOP DETECTORS ARE VARIABLE SIZED DEPENDING ON ROADWAY LOCATION AND SHALL BE INSTALLED IN THE CENTER OF THE LANE. PAVEMENT JOINTS FOR CONCRETE PAVING SHALL BE ESTABLISHED BEFORE LOOP PLACEMENT TO MAINTAIN A MIN. OF 3.0' FROM GROOVE MARKING PLACEMENT.

4. THE LOOP DETECTOR CONDUIT 15/32" NO. 16 STRANDED COPPER, WITH XHHW INSULATION.

5. THE PROTECTED LEAD PORTION OF LOOP SHALL EXTEND FROM THE CONDUIT CONNECTOR, ENDING A MIN. OF 1.0' INSIDE THE HANDBOARD.

6. THE LOOP DETECTOR CONDUITS SHALL BE TUBED THREE TURNS PER FOOT FROM THE LOOP CONDUIT CONNECTOR TO THE HANDBOARD.

7. EACH LOOP DETECTOR CONDUIT TO THE HANDBOARD SHALL BE SLOPED TOWARDS THE HANDBOARD.

8. THE LOOP DETECTOR CONDUCTORS SHALL END IN THE HANDBOARD.

9. NO SPLICES ALLOWED IN LOOP CONDUCTOR EXCEPT AT HANDBOARD.

10. SEE SPECIAL PROVISIONS FOR TESTING REQUIREMENTS OF LOOP DETECTORS.

11. THE LOOP DETECTOR CONDUCTORS AND THE LOOP DETECTOR LEAD-IN CABLE CONDUCTORS SHALL BE PROPERLY PREPARED AND CLEANED BEFORE SPLICING, SOLDER THE LOOP CONDUCTOR TO LEAD-IN CONDUCTORS, THEN PLACE IT INTO THE HANDBOARD.

12. INSTALL THE SPLICE IN A PLASTIC TUBE WITH END CAPS THAT FUNCTION AS SPOUTS, USE A TWO PART INSULATING RESIN CONE PLACED IN A TUBE, THAT TURNS BLACK WHEN MIXED AND BECOMES HARD WHEN CURLED.

13. THE LOOP INSULATION RESISTANCE MUST BE GREATER THAN 100 MEG OHM.

14. "NEVER FAIL LOOP SYSTEM" DETECTOR-MODEL A WITH THE MNDOT PART NUMBER NOTED BELOW HAS MET THESE REQUIREMENTS.

<table>
<thead>
<tr>
<th>MODEL A</th>
<th>6' LENGTH</th>
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<tbody>
<tr>
<td>5' PROTECTED LEAD</td>
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**EXAMPLE**

- 3 LOOPS TO ONE HANDBOARD

**EXAMPLE**

- 2 LOOPS TO ONE HANDBOARD

MAINLINE DETECTORS

PART NUMBER INFORMATION

TYPICAL PREFORMED LOOP DETECTOR DETAIL

TMS "PREFORMED" LOOP DETECTOR-PART ONE

SHEET NO. 12 OF 20 SHEETS
CUT & REMOVE DRAIN WIRE

STAGGER SOLDERED BUTT SPLICE

PLACE IN ENCAPSULATOR

TAPE WIRE TOGETHER BEFORE SPLICE

PLACE WIRE NUT IN ONE END TO BLOCK OPENING

TAPE

FILL ENCAPSULATOR COMPLETELY ALLOW FINISHED SPLICE TO CURE SO EPOXY DOES NOT RUN OUT

LOOP DETECTOR SPLICE FOR SAWCUT AND PREFORMED LOOPS

NOTE:
LOOP DETECTOR FUNCTION DESIGNATIONS

LABEL THE LEAD-IN CABLE AT THE CABINET WITH THE FOLLOWING INFORMATION:
INDEX NO., ABBREVIATED FUNCTION
(SEE PLANS FOR INDEX NO.)
EXAMPLE: [INDEX NO.]
APPLY THE LABEL APPROXIMATELY 6" FROM THE TERMINAL BLOCK ON STRIP

LABEL BOTH THE LEAD-IN CABLE AND LOOP WIRE AT THE HANDHOLE WITH THE FOLLOWING INFORMATION:
INDEX NO., ABBREVIATED FUNCTION
(SEE PLANS FOR INDEX NO.)
EXAMPLE: [INDEX NO.]
APPLY THE LABELS APPROXIMATELY 6" FROM THE SPLICE

LOOP DETECTOR CABLE LABELING
1. Use 3 lb/ft stub posts, riser posts, stringers, knee braces, lateral braces and knee brace stub posts. All shall conform to Mn/DOT 3401.

2. For type D sign posts lengths and spacings, see sign data sheet.

3. 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 standard signs manual).

4. Mounting (punch code) for type C sign panels shall be as indicated in the standard signs manual unless otherwise specified.

5. All riser verticals/U posts shall be spliced. Driven stub posts shall be at least 1" long.

6. Use stainless steel 5/8" bolts, washers and nylon insert lock nuts as shown for all ground mounted and overhead mounted signs.

7. Stainless steel washer with same dimensions shall be provided between all nylon washers and bolt heads.

8. Bracing stubs shall be no more than 4" above ground and embedded at least 3/4'.

9. A-frame bracket shall be steel conforming to Mn/DOT 3306 and galvanized in accordance with Mn/DOT 3394.

10. Collars shall be used to shim overlays and demountable legend away from panel where interference with bolt heads is encountered. Mn/DOT 3352.24.

11. 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.

12. 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.

13. 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 post section and located approximately at the quarter points as shown in modified type C installation.

**Type C & D Sign**

**Structural Details**

**Sheet No. 14 of 20 Sheets**
LATERAL BRACE OR STRINGER SPIKE DETAIL (EXPLODED VIEW)

SECTION A-A

3/8" STAINLESS STEEL BOLTS WITH NYLON INSERT LOCK NUTS

VERTICAL POST

STRINGER

KNEE BRACE

SECTION B-B

VERTICAL POST

3/16" STAINLESS STEEL BOLT WITH NYLON INSERT LOCK NUT

VERTICAL POST

STUB POST

KNEE BRACE

ONE SPICE REQUIRED

LATERAL BRACE

TYPICAL "A-FRAME" INSTALLATION

TYPE "D" SIGNS

TYPICAL MOUNTING

OFFSET STUB POST 12" TOWARD ROADWAY RELATIVE TO VERTICAL POST. ATTACH STUB POST AND KNEE BRACE BACK TO BACK.

TYPICAL "A-FRAME" INSTALLATION

TYPE "C" SIGNS

KNEE BRACE SPLICE

STEEL MN/DOT 3306 GALVANIZED PLR MN/DOT 3394
GORE PLACEMENT

ROADSIDE PLACEMENT

ROUTE MARKER, REGULATORY & WARNING SIGNS - TYPE C
MINOR GUIDE SIGNS - TYPE D

MAJOR GUIDE SIGN - TYPE A

NOTES:
1. IF A SECONDARY SIGN IS MOUNTED BELOW A MAJOR SIGN, THE MAJOR SIGN SHALL BE AT LEAST 8' ABOVE THE PAVEMENT EDGE AND THE SECONDARY SIGN AT LEAST 5'.
2. ALL ROUTE MARKERS, WARNING AND REGULATORY SIGNS SHALL BE AT LEAST 7' ABOVE PAVEMENT EDGE.
3. SIGN FACES SHALL BE VERTICAL.
4. OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.
5. TO AVOID SPECULAR GLARE, A SIGN SHALL BE APPROXIMATELY 97° FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF PAVEMENT AND APPROXIMATELY 92° FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF PAVEMENT. THIS APPLIES TO SIGNS TYPE A, C, & D AND INCLUDES SIGNS IN THE GORE.
6. "Y" IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'.
7. WHERE "X" IS LESS THAN 30', "H" SHALL BE 7'-16". WHERE "X" IS 30' OR GREATER, MINIMUM AND PREPARED "H" IS 5'.
8. LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.

SPECIFIC NOTES:

(1) EXIT SIGNS
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 WHO WILL CONSULT WITH THE STATE SIGNING ENGINEER.

(2) MERGE SIGNS
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 WHO WILL CONSULT WITH THE STATE SIGNING ENGINEER.