RURAL

STOP

ROUTE MARKER(S) (IF USED)

DESIGN "D" DELINEATOR (TYP.) (SEE DETL. DWG. NO. 619-34)

25' [7.6 m] TO 200' [60.0 m]

MARKED CROSSWALK

SIDEWALK

EDGES OF TRAFFIC LANE

EDGES OF SHOULDER

UNMARKED CROSSWALK

RURAL AND URBAN APPROACHES

NOTES:

1. 6' [1.8 m] MINIMUM; 50' [15.2 m] MAXIMUM.

2. PLACE R1-1 SIGN AT THE BEGINNING OF CURB RADIUS OR SHOULDER RADIUS, OR 4 FEET [1.2 m] IN ADVANCE OF THE MARKED OR UNMARKED CROSSWALK.

3. SEE PLANS FOR FINAL SIGNING AND PAVEMENT MARKING LOCATIONS.

4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
NOTES:
1. Conform all aluminum signs to Sections 619 and 704.
2. For signs 4'-0" (1200 mm) high by 6'-0" (1800 mm) long or less use a single sheet of aluminum.
3. Do not use horizontal joints in signs 6'-0" (1800 mm) in height and smaller. The minimum sheet width is 6'-0" (1800 mm).
4. Signs wider 6'-0" (1800 mm) high may have horizontal and vertical joints. The minimum sheet size is 6'-0" (1800 mm) wide by 1'-6" (450 mm) high.
5. Clean and dry post clip nuts, then torque to 225 inch pounds (25.4 Nm).
6. Do not use horizontal joints on signs 6'-0" (1800 mm) in height.
7. DO NOT USE SCREWS, BOLTS AND LOCKWASHERS MEETING THE REQUIREMENTS OF SECTION 704.
8. Use only aluminum rivets.
9. The maximum gap between individual sign panels at joints is 1/16" (1.6 mm) at any point.
10. The project manager may approve additional methods to prevent light leakage through sign panel seams.

METRIC BACKBRACING TABLE - ALUMINUM SIGNS

<table>
<thead>
<tr>
<th>MAXIMUM WIDTH &quot;B&quot; (mm)</th>
<th>2 POST</th>
<th>3 POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>7'-6&quot;</td>
<td>18'-0&quot;</td>
<td>22'-0&quot;</td>
</tr>
<tr>
<td>7'-0&quot;</td>
<td>17'-0&quot;</td>
<td>20'-0&quot;</td>
</tr>
<tr>
<td>6'-6&quot;</td>
<td>16'-0&quot;</td>
<td>19'-0&quot;</td>
</tr>
<tr>
<td>6'-0&quot;</td>
<td>15'-0&quot;</td>
<td>18'-0&quot;</td>
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**CONSTRUCTION DETAILS**

**DETAILED DRAWING**

**REFERENCE**

**Dwg. No.**

**Section** 619-24

**METRIC BACKBRACING TABLE - ALUMINUM SIGNS**

<table>
<thead>
<tr>
<th>SPACING 6 (INC)</th>
<th>2 POST</th>
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<td>1000</td>
</tr>
<tr>
<td>1000</td>
<td>1050</td>
<td>1100</td>
</tr>
</tbody>
</table>

**UNITS SHOWN IN BRACKETS / ANY METRIC UNITS ARE IN MILLIMETERS (MM) UNLESS OTHER UNITS ARE SHOWN**
USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

THE PLANS SPECIFY OTHERWISE FOR SPECIAL DESIGN SIGNS.

CONSTRUCT PLYWOOD SIGNS OF ONE PIECE OF PLYWOOD UNLESS HIGH.

THE MINIMUM SIZE PANEL IS 1'-6" [450] WIDE BY 4'-0" [1200] JOINT IN LIEU OF USING STANDARD LENGTH PANEL AS SHOWN. MAY BE OBTAINED WITH PANELS HAVING A FACTORY SCARFED JOINT FOR SIGNS OVER 10'-0" [3000] IN HEIGHT, THE FULL HEIGHT PANELS LESS THAN 4'-0" [1200] IN HEIGHT.

FOR SIGNS WITH WIDTHS THAT ARE NOT IN MULTIPLES OF 4'-0" [1200] IN HEIGHT, DO NOT USE HORIZONTAL JOINTS ON SIGNS LESS THAN 4'-0" [1200] IN HEIGHT.

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NOTE:
1. CONFORM ALL PLYWOOD SIGNS TO SECTIONS 619 AND 704
2. ON SIGNS 4'-0" [1200] HIGH AND GREATER, DO NOT USE ANY PANELS LESS THAN 4'-0" [1200] IN HEIGHT.
3. DO NOT USE HORIZONTAL JOINTS ON SIGNS LESS THAN 4'-0" [1200] IN HEIGHT.
4. FOR SIGNS WITH WIDTHS THAT ARE NOT IN MULTIPLES OF 4'-0" [1200], PLACE THE 4'-0" PANELS ON THE INSIDE EDGE.
5. FOR SIGNS OVER 10'-0" [3000] IN HEIGHT, THE FULL HEIGHT PANELS LESS THAN 4'-0" [1200] IN HEIGHT.
6. THE MINIMUM SIZE PANEL IS 1'-6" [450] WIDE BY 4'-0" [1200] IN HEIGHT.
7. CONSTRUCT PLYWOOD SIGNS OF ONE PIECE OF PLYWOOD UNLESS THE PLANS SPECIFY OTHERWISE FOR SPECIAL DESIGN SIGNS.
8. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

MATCH THE PLANS SPECIFIED FOR THE SIGNS (NO. 3 POST) UNLESS OTHERWISE SPECIFIED.

MACHINE DRILL 5/16" [7.9] DIA. HOLE.

INSTALL REFLECTIVE SHEETING.

NUT FOR 1/4" DIA. [M6] BOLT.


1/4" [M6] MACHINE BOLT

1/4" [M6] LOCK WASHER

5/32" [4] BOLT (TYP.)

1 1/2" [37.5] SCREWS

SPACING "A"

MAXIMUM WIDTH "B"

BACKBRACING TABLE - PLYWOOD SIGNS

<table>
<thead>
<tr>
<th>Maximum Backbrace Spacing &quot;A&quot;</th>
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</thead>
<tbody>
<tr>
<td>2 Post (mm)</td>
<td>3 Post (mm)</td>
</tr>
<tr>
<td>1'-0&quot; [300]</td>
<td>8'-0&quot; [2400]</td>
</tr>
<tr>
<td>1'-10&quot;</td>
<td>14'-0&quot;</td>
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<tr>
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<td>26'-0&quot;</td>
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<td>32'-0&quot;</td>
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<tr>
<td>5'-0&quot;</td>
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MACHINE DRILL 5/16" [7.9] DIA. HOLE.

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1 1/2" [37.5] SCREWS

SPACING "A"

MAXIMUM WIDTH "B"

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SPACING "A"

MAXIMUM WIDTH "B"

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UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
NOTE:

1. MOUNTING SYSTEMS SHOWN ARE TYPICAL. OTHER SYSTEMS MAY BE APPROVED BY THE PROJECT MANAGER.

2. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

3. SEE THE SIGNING PLANS FOR THE TYPES OF POSTS AND FOUNDATIONS.


5. WOOD POLAR SUPPLEMENTAL SIGNS ADDED AFTER INITIAL SIGN INSTALLATION, FROM MAJOR SIGN PANELS OR BACKBRACING. ATTACHMENTS TO MULTIPLE POSTS/POLES IS NOT ALLOWED.

6. USE POST SPACING, POST SIZE AND BREAKAWAY DEVICES SPECIFIED IN THE PLANS AND IN THE SPECIFICATIONS. FOR INFORMATION REGARDING APPROPRIATE BREAKAWAY DEVICES FOR NEW INSTALLATIONS NOT SUPPORTED BY THE PLANS, CONTACT THE TRAFFIC UNIT.

7. IN INSTALLING SIGNS, AVOID ALUMINUM POSTS IN DITCH AREAS WHERE THEY WOULD IMPED DRAINAGE.

8. DIMENSIONS ARE SPECIFIED IN THE SIGNING PLANS.
**EXISTING SIGN FACE**

**SHEET ALUMINUM OVERLAY**

**EXISTING ALUMINUM SIGNS**

**EXISTING PLYWOOD SIGNS**

**FASTENER PATTERN**

**NOTES:**

1. **REMOVE ALL RAISED LETTERS, NUMERALS, SYMBOLS, BORDERS AND**
   **PREVIOUS SIGN OVERLAYS TO BE REPLACED, AND CLEAN SIGN FACE**
   **TO A SMOOTH SURFACE BEFORE OVERLAYING.**

2. **ALL LETTERS, NUMERALS, SYMBOLS AND BORDERS ARE TYPE “C”**
   **CUTOUT UNLESS OTHERWISE SPECIFIED, AND APPLIED TO THE BACK-**
   **GROUND SHEETING PRIOR TO FIELD APPLICATION OF THE SIGN.**

3. **THE SIZE OF ALL GUIDE SIGN OVERLAYS AND LEGENDS MUST BE**
   **VERIFIED BY THE PROJECT MANAGER PRIOR TO FABRICATION.**

4. **AN ADOBE-BACKED SHEETING MAY BE USED AS AN ALTERNATIVE**
   **ON SIGN WIDTHS OF 6'-0" (1800) OR LESS IF IT IS PREFABRICATED TO**
   **A MINIMUM THICKNESS OF 0.005" (.13) AND CONSTRUCTED OF**
   **PREAPPLIED REFLECTIVE SHEETING ON ADOBE-BACKED ALUMINUM.**
   **APPLY ADOBE-BACKED OVERLAY SHEETING WHEN AIR AND SURFACE**
   **TEMPERATURES ARE ABOVE 50°F (10°C). DO NOT USE THIS TYPE**
   **OF OVERLAY MATERIAL ON OVERHEAD SIGNS.**

5. **PROVIDE A MINIMUM REFLECTIVE SHEETING INTENSITY OF TYPE 4,**
   **MEETING THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS,**
   **UNLESS SPECIFIED OTHERWISE.**

6. **APPLY ALL MATERIALS IN ACCORDANCE WITH THE MANUFACTURER’S**
   **SPECIFICATIONS AND RECOMMENDATIONS.**

7. **USE ALUMINUM ALLOY TYPE 6061-T6 OR AA5052-H38. CONVERSION**
   **COAT ALL ALUMINUM WITH A PROCESS SUCH AS ALODINE 1200 (OR**
   **EQUAL), AND RINSE AND DRY THOROUGHLY. PROTECT IT FROM SOIL**
   **BY ACCEPTABLE METHODS.**

8. **SIGN OVERLAYS MAY REQUIRE REMOVAL OF THE SIGN FROM THE POSTS**
   **TO AVOID PROJECTING BOLT HEADS. DO NOT LEAVE WARNING AND**
   **REGULATORY SIGNS TO BE OVERLAYED UNDISPLAYED FOR MORE THAN**
   **ONE (1) HOUR DURING DAYLIGHT. DO NOT LEAVE GUIDE SIGNS**
   **UNDISPLAYED FOR MORE THAN TEN (10) HOURS DURING DAYLIGHT.**
   **INSURE SIGNS TO BE OVERLAYED ARE OPERATIONAL PRIOR TO**
   **DARKNESS.**

9. **OVERLAY SIGNS SMALLER THAN 4'-0" x 6'-0" (1200 x 1800) WITH**
   **ONE PANEL OF MATERIAL. FOR SEAMS IN LARGE OVERLAYS, USE**
   **RIVETS OR BOLTS SPACED AS SHOWN ON THIS DRAWING AND**
   **PLACE PARALLEL TO AND NO MORE THAN 3" (75) LATERAL**
   **FROM THE SEAM.**

10. **USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.**

**UNITS SHOWN IN BRACKETS [ ] ARE**

**METRIC AND ARE IN MILLIMETERS (mm)**

**UNLESS OTHER UNITS ARE SHOWN.**

---

**REFERENCE**

**STANDARD SPEC.**

**SECTION 619, 704**

**DWG. NO.**

**619-10**

**DETAILED DRAWING**

**SHEET ALUMINUM OVERLAY**

---

**MDT® MONTANA DEPARTMENT OF TRANSPORTATION**
**METRIC BASE CONNECTION DATA**

<table>
<thead>
<tr>
<th>NOMINAL PIPE DIA</th>
<th>BOLT SIZE</th>
<th>BOLT TENSILE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>T</th>
<th>Z</th>
<th>CUTTING LENGTH</th>
<th>CUTTING DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>M16 x 1.5</td>
<td>413 N/m²</td>
<td>4.1&quot;</td>
<td>7.1&quot;</td>
<td>2.1&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>5/16&quot;</td>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
<tr>
<td>1 1/4&quot;</td>
<td>M20 x 2.0</td>
<td>564 N/m²</td>
<td>5.1&quot;</td>
<td>8.1&quot;</td>
<td>2.9&quot;</td>
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<td>3/4&quot;</td>
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<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
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<tr>
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<td>9.1&quot;</td>
<td>3.5&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>5/16&quot;</td>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
<tr>
<td>2&quot;</td>
<td>M24 x 3.0</td>
<td>866 N/m²</td>
<td>7.1&quot;</td>
<td>11&quot;</td>
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<td>5/16&quot;</td>
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<td>10.5&quot;</td>
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**METRIC FOUNDATION**

<table>
<thead>
<tr>
<th>BOLT DIA</th>
<th>BOLT TENSILE</th>
<th>SCRIM DETAIL</th>
<th>FOUNDATION SHAFT DETAIL</th>
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</thead>
<tbody>
<tr>
<td>M16</td>
<td>413 N/m²</td>
<td>FURNISH TWO 2.5 (3.175) THICK AND TWO 1.2 (3.05) THICK SHEET METAL SHIMS FROM BRASS SHEET OR COPPER SHEET CONFORMING TO ASME B 16.5 WNM.</td>
<td>1 1/2&quot; STUB SHIM DETAIL</td>
</tr>
<tr>
<td>M20</td>
<td>564 N/m²</td>
<td>USE HARDWARE MEETING THE REQUIREMENTS OF SECTIONS 704. MANAGER'S APPROVAL.</td>
<td>1 1/4&quot; STUB SHIM DETAIL</td>
</tr>
<tr>
<td>M22</td>
<td>715 N/m²</td>
<td>USE 3/16&quot; DIA. WASHER AT SIGN FACE</td>
<td>1 1/2&quot; STUB SHIM DETAIL</td>
</tr>
<tr>
<td>M24</td>
<td>866 N/m²</td>
<td>MOUNTING ANGLE WITH HOLE PROVIDED TO ALLOW MOUNTING</td>
<td>2&quot; STUB SHIM DETAIL</td>
</tr>
</tbody>
</table>

**BASE CONNECTION DATA**

<table>
<thead>
<tr>
<th>NOMINAL PIPE DIA</th>
<th>BOLT SIZE</th>
<th>BOLT TENSILE</th>
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<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
</tbody>
</table>

**BASE PLATE DETAIL**

<table>
<thead>
<tr>
<th>BASE PLATE SIZE</th>
<th>BOLT SIZE</th>
<th>BOLT TENSILE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>T</th>
<th>Z</th>
<th>CUTTING LENGTH</th>
<th>CUTTING DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot;</td>
<td>M16 x 1.5</td>
<td>413 N/m²</td>
<td>4.1&quot;</td>
<td>7.1&quot;</td>
<td>2.1&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>5/16&quot;</td>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>M18 x 2.0</td>
<td>564 N/m²</td>
<td>5.1&quot;</td>
<td>8.1&quot;</td>
<td>2.9&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>5/16&quot;</td>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
<tr>
<td>14&quot;</td>
<td>M20 x 2.5</td>
<td>715 N/m²</td>
<td>6.1&quot;</td>
<td>9.1&quot;</td>
<td>3.5&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>5/16&quot;</td>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>M22 x 3.0</td>
<td>866 N/m²</td>
<td>7.1&quot;</td>
<td>11&quot;</td>
<td>4.1&quot;</td>
<td>3/4&quot;</td>
<td>3/4&quot;</td>
<td>5/16&quot;</td>
<td>1/4&quot;</td>
<td>5/32&quot;</td>
<td>12.5&quot;</td>
<td>10.5&quot;</td>
</tr>
</tbody>
</table>

**METRIC TABLE OF WEIGHTS**

<table>
<thead>
<tr>
<th>NORMAL PIPE DIA</th>
<th>NORMAL WEIGHT</th>
<th>WEIGHT OF BASE PLATE &amp; STUB POST</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&quot;</td>
<td>28.23 kg/m</td>
<td>1&quot; DIA. WASHER AT SIGN FACE</td>
</tr>
</tbody>
</table>
TELESCEDED SQUARE TUBES SIGN
POST INSTALLATION ON SLIP BASE
AS NOTED BY THE STAR SYMBOL
ON THE LOCATION AND SPECIFICATION SHEETS.

**SUPPORT AND ANCHOR COMPONENT UNIT WEIGHT**

<table>
<thead>
<tr>
<th>TUBE SIZE</th>
<th>WEIGHT</th>
<th>MAX THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; (51)</td>
<td>2.77 lb/ft</td>
<td>0.105&quot; (12 gauge)</td>
</tr>
<tr>
<td>2.25&quot; (57)</td>
<td>3.14 lb/ft</td>
<td>0.105&quot; (12 gauge)</td>
</tr>
<tr>
<td>2.5&quot; (64)</td>
<td>3.75 lb/ft</td>
<td>0.105&quot; (12 gauge)</td>
</tr>
</tbody>
</table>

NOTES:

1. SUPPORT DEVICES MUST BE LISTED ON THE DEPARTMENT’S QUALIFIED PRODUCTS LIST.
2. USE CLASS GENERAL CONCRETE WITH 0.405" (12 GAUGE) THICKNESS.
3. SINGLE PIECE ANCHOR BASE WITH SINGLE HEAVY DUTY 3" SQUARE FLANGE ON TOP.
4. USE SINGLE PIECE ANCHOR BASE WITH SINGLE HEAVY DUTY 3" SQUARE FLANGE ON TOP.
5. SINGLE SQUARE TUBE SIGN TO SUPPORT AND ANCHOR COMPONENT UNIT WEIGHS.

**NOTES:**

1. TELESCEDED SQUARE TUBING.
2. POST LENGTH IS MEASURED FROM POINT OF SECTION 704.
3. USE HARDWARE MEETING THE REQUIREMENTS AND ALL INCIDENTALS ARE INCLUDED IN THE UNIT WEIGHT ACCORDING TO "SUPPORT AND ANCHOR COMPONENT UNIT WEIGHT" TABLE.
4. BREAKAWAY DEVICES MUST BE LISTED ON THE DEPARTMENT’S QUALIFIED PRODUCTS LIST.
5. BREAKAWAY DEVICES MUST BE LISTED ON THE DEPARTMENT’S QUALIFIED PRODUCTS LIST.
6. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 710.
7. POST LENGTH IS MEASURED FROM POINT OF SECTION 710.
8. BREAKAWAY DEVICES MUST BE LISTED ON THE DEPARTMENT’S QUALIFIED PRODUCTS LIST.
9. SUPPORT DEVICES MUST BE LISTED ON THE DEPARTMENT’S QUALIFIED PRODUCTS LIST.

**SINGLE SQUARE TUBE SIGN TO POST INSTALLATION ON SLIP BASE AS NOTED BY THE CIRCLE SYMBOL ON THE LOCATION AND SPECIFICATION SHEETS.**

**SINGLE SQUARE TUBE SIGN TO POST INSTALLATION ON SLIP BASE AS NOTED BY THE CIRCLE SYMBOL ON THE LOCATION AND SPECIFICATION SHEETS.**
NOTES:

1. SEE THE PLANS FOR BACKBRACING REQUIREMENTS.

2. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAIL DRAWING

REFERENCE DWG. NO.
STANDARD SPEC. 619-19
SECTION 619.704

STRUCTURAL STEEL POST
SIGN MOUNTING DETAILS

MDT® MONTANA DEPARTMENT OF TRANSPORTATION
STOP

LN
DR
SHEDHORN
HUFFINE

A
B
C

GAIN

CLASS 4
CLASS 3
CLASS 2
CLASS 1

A
B
C

EMBEDMENT

3'-0"
3'-0"
3'-6"
4'-0"
5'-0"
5'-6"
6'-0"
6'-6"

GAIN

SIGN PANEL

3" TOP DIA.
4" TOP DIA.
5" TOP DIA.
6" TOP DIA.

GAIN

3" TOP DIA.
4" TOP DIA.
5" TOP DIA.
6" TOP DIA.

GAIN

SIGN MOUNTING DETAIL

TOP END TREATMENT

STREET NAME SIGN INSTALLATION

SIGN MOUNTING AND TREATED WOOD POLE

NOTE:
- Conform all wood poles to the requirements of Section 704.
- Gain all poles on the side of the street the minimum width shown in the table for half the length of each pole.
- Breakaway details are standard for all wood poles listed in the figure, on single and multiple sign supports.
- Use hardware meeting the requirements of Section 704.
- Gain all poles on the side of the street the minimum width shown in the table for half the length of each pole. (See Note)

FOOTING DETAILS

D-3 SIGNS MOUNTED ON POST BACK TO BACK D-3 STREET NAME SIGN TYPICAL LAYOUT.

REFER TO FHWA'S "STANDARD HIGHWAY SIGNS" FOR IN OTHER BID ITEMS OF THE CONTRACT.

THE COST FOR MOUNTING D-3 SIGNS IS ABSORBED IN OTHER BID ITEMS OF THE CONTRACT.

NOTE:
- Conform all wood poles to the requirements of Section 704.
NOTE:

1. SIGNS OF THESE SIZES AND LARGER REQUIRE WOOD BACKBRACING.
2. SMALLER SIGNS MAY REQUIRE BACKBRACING IF THE CONDITIONS WARRANT (SEE SIGNING PLANS).
   IN THIS CASE, THE CONTRACTOR HAS THE OPTION OF USING WOOD OR STEEL BACKBRACING (SEE DTL. DWG. NO. 619-22).

WOOD BACKBRACE INSTALLATIONS

1. CONFORM ALL WOOD POLES TO THE REQUIREMENTS OF SECTION 704.
2. GAIN ALL POLES ON THE SIGN SIDE THE MINIMUM WIDTH SHOWN IN THE TABLE ON DTL. DWG. NO. 619-20, FOR HALF THE LENGTH OF EACH POLE.
3. USE TREATED 2" x 4" (50 x 100) S4S LUMBER FOR ALL WOOD BACKBRACING, CONFORMING TO THE REQUIREMENTS OF SECTION 704.
4. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.
5. SEE DTL. DWG. NO. 619-20 FOR BREAKAWAY AND SUPPORT DETAILS.

SIGN MOUNTING DETAIL

1. SEE DTL. DWG. NO. 619-20 FOR THE MIN. GAIN WIDTH
2. 1/2" [12.5] CHAMFER

MEASUREMENTS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
WARNING SIGNS

NO PASSING PENNANTS

REGULATORY SIGNS

STEEL BACKBRACE INSTALLATIONS

<table>
<thead>
<tr>
<th>POLE DIA.</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>3' [91.4]</td>
<td>2 1/8' [54.0]</td>
<td>2 1/8' [54.0]</td>
<td>3 3/4' [95.3]</td>
</tr>
<tr>
<td>4' [121.9]</td>
<td>3 3/4' [95.3]</td>
<td>3 3/4' [95.3]</td>
<td>4 1/4' [108.0]</td>
</tr>
<tr>
<td>5' [152.4]</td>
<td>4 1/4' [108.0]</td>
<td>4 1/4' [108.0]</td>
<td></td>
</tr>
</tbody>
</table>
### CHEVRON MOUNTING DETAILS

**STEEL PIPE MOUNTING**

- **X** 2 CHEVRON SIGNS ON EACH POST WITH EACH PANEL ADJUSTED TO APPROXIMATE RIGHT ANGLE TO ROADWAY CENTERLINE. EXACT LOCATION AND ANGLE TO BE DETERMINED BY THE PROJECT MANAGER.

**METRIC DIMENSIONS (mm)**

<table>
<thead>
<tr>
<th>SIGN SIZE (mm)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>450 x 600</td>
<td>6 x 50 x 580</td>
<td>380</td>
<td>275</td>
<td>450</td>
<td>450</td>
</tr>
<tr>
<td>600 x 750</td>
<td>6 x 50 x 655</td>
<td>455</td>
<td>300</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>750 x 900</td>
<td>6 x 50 x 735</td>
<td>535</td>
<td>375</td>
<td>750</td>
<td>750</td>
</tr>
<tr>
<td>900 x 1200</td>
<td>6 x 50 x 810</td>
<td>610</td>
<td>450</td>
<td>900</td>
<td>900</td>
</tr>
</tbody>
</table>

**WOOD POST MOUNTING**

- **THREADED OR WELDED WATER TIGHT CAP**
- **2" x 2" x 1/4" [5] x 3 [1.6] MOUNTING ANGLE WITH 5/16" DIA. [M8] WASHER AT SIGN FACE**
- **STANDARD SPEC. 619-24**

### DETAILS

- **STEEL PIPE MOUNTING**
  - **PIPE SIGN POST**
  - **STEEL STRAP (A)**
  - **M16 DIA. [M8] BOLT, LOCK-WASHER AND NUT**
  - **1/4" [6] POST CLIP PL.**

### NOTES:

1. **INSTALL CHEVRONS WITH A MINIMUM 10'-0" [3.1 m] HORIZONTAL CLEARANCE AND A 5'-0" [1.5 m] VERTICAL MOUNTING HEIGHT.**
2. **SPACING FOR DESIGN PURPOSES IS DOUBLE THE SPACING SHOWN IN THE TABLE ON DTL DWG. NO. 619-26, UP TO A MAXIMUM CHEVRON SPACING OF 200' [60 m]. A MINIMUM OF 3 VISIBLE CHEVRONS ARE REQUIRED THROUGH A CURVE.**
3. **FIELD INSPECT THE CHEVRONS AT NIGHT AND ADJUST THEIR LOCATIONS TO ACHIEVE 500' [150 m] OF VISIBILITY.**
4. **USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.**

**UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.**
**MAJOR SIGN PANEL**

**CLOSED**

**OPEN**

Notes:

1. See signs and signing materials catalog for complete listing of signs and sign sizes. Designs are available from the traffic engineering signs unit for signs unique to Montana.
2. The sign panel consists of 3/4" (19) high density plywood or 0.125" (3.2) aluminum sheet metal as specified on the plans. The hinged panel consists of 0.100" (2.5) sheet aluminum.
3. Paint all hardware visible on the sign face or cover with retro-reflective sheeting; the same color as the sign.
4. Submit shop drawings for approval prior to fabrication.
5. Supplemental sign panel below major sign panel must have retro-reflective sheering and background machine colors of major panel.
6. The minimum mounting height to the bottom of the secondary panel is 2'-0" (610 mm).

Use hardware meeting the requirements of Section 704.
DESIGN A USAGE:
USE FOR CONTINUOUS DELINEATION AND RT. SHOULDER OF ALL INTERSTATE RAMPS AND AUTHORIZED VEHICLE ONLY CROSSROADS.

DESIGN B USAGE:
USE FOR CONTINUOUS DELINEATION OF INTERSTATE RAMPS AND STOP OR YIELD SIGNS.

DESIGN C USAGE:
USE ON RT. SHOULDER OF INTERSTATE ROUTES.

DESIGN D USAGE:
USE FOR TRUCK ESCAPE RAMPS AND CROSSROADS. USE AT INTERSECTION OF NON-INTERSTATE ROUTES: STOP OR YIELD SIGNS.

DESIGN E USAGE:
USE FOR INTERSTATE RAMPS AND CROSSROADS. USE AT APPROACHES WITH RADII GREATER THAN 573' [170 m]; 1433' [450 m] RADII.

DESIGN F USAGE:
USE FOR CURVES WITH RADII GREATER THAN 573' [170 m]; 1433' [450 m].

DESIGN G USAGE:
USE FOR CONTINUOUS DELINEATION OF RT. SHOULDER OF INTERSTATE RAMPS AND RT. SHOULDER OF ALL INTERSTATE ROUTES.

DESIGN H USAGE:
USE FOR CONTINUOUS DELINEATION AND RT. SHOULDER OF ALL INTERSTATE RAMPS AND AUTHORIZED VEHICLE ONLY CROSSROADS.

DESIGN J USAGE:
USE FOR CURVES WITH RADII GREATER THAN 573' [170 m] BUT NOT EXCEEDING 764' [230 m].

REQUIREMENTS OF SECTION 704.
USE HARDWARE MEETING THE MUTCD FOR SPECIFIC GUIDANCE.

NOTES:
1. SOME TYPICAL USES ARE SHOWN.
2. GORE LT & RT FOR WRONG WAY TRAVELERS.
3. INTERCHANGE OFF RAMPS FROM MID-POINT TO USE FOR TRUCK ESCAPE RAMPS AND CROSSROADS.
4. USE ON RT. SHOULDER OF INTERSTATE ROUTES.
5. USE ON LT. SHOULDER OF INTERSTATE ROUTES.
6. USE FOR CONTINUOUS DELINEATION AND RT. SHOULDER OF INTERSTATE RAMPS.
7. USE FOR TRUCK ESCAPE RAMPS AND INTERCHANGE OFF RAMPS FROM MID-POINT TO USE FOR RT. & RT. SHOULDER OF CURVE.
8. U-CHANNEL - SEE DETAILED DRAWINGS.
9. SNOWPOLE DELINEATOR NOTES:
   - 1/4" x 1" [6 x 25] BOLT
   - 1/4" x 3" [6 x 75] BOLT
   - 5/16" [8] FLAT WASHER
   - 5/16" [8] HEX NUT
   - 5/16" [8] DRILL
   - * = MATCH SNOWPOLE DELINEATOR WITH ROADWAY DELINEATOR.
12. USE DUAL BOLT INSTALLATION PER DESIGN "GJ" AND "BJ".
13. (SHOP BEND) 160°
14. SNOWPOLE DELINEATOR DETAIL

UNITED STATES DEPARTMENT OF TRANSPORTATION
MONTANA DEPARTMENT OF TRANSPORTATION

DELINEATOR DETAILS

SNOWPOLE DELINEATOR NOTES:
- 1/4" x 1" [6 x 25] BOLT
- 1/4" x 3" [6 x 75] BOLT
- 5/16" [8] FLAT WASHER
- 5/16" [8] HEX NUT
- 5/16" [8] DRILL
- * = MATCH SNOWPOLE DELINEATOR WITH ROADWAY DELINEATOR.

DESIGN E (WHITE)
DESIGN F (WHITE)
DESIGN G (WHITE)
DESIGN H (WHITE)
DESIGN J (RED)
DESIGN "BJ"
DESIGN "GJ"

DELINEATOR LEGEND

REFERENCE
Dwg. No.
Section 619-74
619-34

DELINEATOR DETAILS
HORIZONTAL CURVE SPACING TABLE

<table>
<thead>
<tr>
<th>RADIUS</th>
<th>SPACING ON CURVE</th>
<th>SPACING ON BOTH APPROACH TANGENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>5730' &amp; UP</td>
<td>300'</td>
<td>400'</td>
</tr>
<tr>
<td>2865' - 5729</td>
<td>225'</td>
<td>400'</td>
</tr>
<tr>
<td>1910' - 2864</td>
<td>160'</td>
<td>220'</td>
</tr>
<tr>
<td>1433' - 1909</td>
<td>130'</td>
<td>260'</td>
</tr>
<tr>
<td>955' - 1432</td>
<td>110'</td>
<td>220'</td>
</tr>
<tr>
<td>716' - 954</td>
<td>90</td>
<td>165'</td>
</tr>
<tr>
<td>479' - 715</td>
<td>75</td>
<td>150'</td>
</tr>
<tr>
<td>287' - 477</td>
<td>50</td>
<td>125'</td>
</tr>
<tr>
<td>0' - 286</td>
<td>45</td>
<td>90</td>
</tr>
</tbody>
</table>

METRIC HORIZONTAL CURVE SPACING TABLE

<table>
<thead>
<tr>
<th>RADIUS (m)</th>
<th>SPACING ON CURVE (m)</th>
<th>SPACING ON BOTH APPROACH TANGENTS (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1750 &amp; UP</td>
<td>90</td>
<td>120</td>
</tr>
<tr>
<td>900 - 1749</td>
<td>65</td>
<td>120</td>
</tr>
<tr>
<td>600 - 899</td>
<td>50</td>
<td>95</td>
</tr>
<tr>
<td>450 - 599</td>
<td>40</td>
<td>75</td>
</tr>
<tr>
<td>300 - 449</td>
<td>35</td>
<td>65</td>
</tr>
<tr>
<td>200 - 299</td>
<td>25</td>
<td>55</td>
</tr>
<tr>
<td>150 - 199</td>
<td>20</td>
<td>45</td>
</tr>
<tr>
<td>100 - 149</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>0' - 99</td>
<td>15</td>
<td>25</td>
</tr>
</tbody>
</table>

NOTES:

1. Furnish retro-reflective sheeting according to the standard specifications for retro-reflective sheeting B (High Intensity). Position delineator faces perpendicular to the tangent to curve centerline as shown in Figure B.

2. Mount delineators on metal U-posts (1.12 lb./ft. [1.7 kg/m] min., and 2 lb./ft. [3 kg/m] max.) with 3/16" [5] dia. cadmium plated bolts. Drill or punch twelve 3/8" [9.5] maximum diameter holes on 1 inch (25) centers measured from the top of the post. 1/4" [6.4] square holes may be used. If square holes are used, use a large headed bolt or an appropriate washer. Jam threads after tightening the nut to prevent removal.

3. Place delineators at a constant clearance distance from the edge of the pavement except where guardrail or other obstructions interfere. Align the delineators with the inside edge of the obstruction. Clearance for delineators is 6' 0" (1.8 m) on interstate highways, 2' 6" to 6' 0" (0.8 m to 1.8 m) on primary and secondary highways or as determined by the project manager. The standard mounting height is 4' 0" (1.2 m) to the top of the post. Supply post lengths to maintain the proper mounting height and a minimum of 18" (0.45 m) embedment.

4. Space delineators according to the distances found in the table above or as specified in the plans. In Figure A, if "F" is greater than 20' (6 m) add one regular delineator in at "A" spacing. Under normal spacing, should a delineator fall within a crossroad or approach, it may be moved in either direction a distance not to exceed one quarter of the normal spacing. Eliminate delineators still falling in such areas.

5. All delineator reflectors have 3/4" (18.75) corner radii except design "E".

6. Mount the delineator reflector 1" [25] below the top of the metal U-post.

7. Use hardware meeting the requirements of Section 704.
**TYPE 1**

**K3-2**

**Type 1 Object Markers**

Object markers are a yellow panel of the same size. If used as end-of-road markers, alternate design for type 2 object markers is a yellow retro-reflectORIZED panel of the same size.

**Placement Details for Obstructions**

**ADJACENT TO OR WITHIN HIGHWAYS**

**OBJECT MARKER DESIGN AND**

**OBJECT NEAREST TRAVELED WAY.**

**PLACE POST AND PANEL(S) SO THAT PANEL(S) ARE DIRECTLY ADJACENT TO INNER-MOST EDGE OF THOSE PANEL(S) ARE DIRECTLY PLACE POST AND PANEL(S) SO THAT**

**NOTE:**

**TYPICAL USE AND PLACEMENT**

**TYPICAL USE AND PLACEMENT**

**TYPICAL USE AND PLACEMENT**

**TYPICAL USE AND PLACEMENT**

**GENERAL NOTES:**

**USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.**

**OBJECT MARKER DESIGN AND PLACEMENT DETAILS FOR OBSTRUCTIONS ADJACENT TO OR WITHIN HIGHWAYS**

**UNITS SHOWN IN BRACKETS [ ] ARE méthode AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.**

**REFERENCE**

**DWG. NO.**

**SECTION**

**STANDARD SPEC.**

**DETAILED DRAWING**

**MONTANA DEPARTMENT OF TRANSPORTATION**

**MDTX**

**DWG. NO.**

**SECTION 6.5.29M**

**OBJECT MARKER DESIGN AND PLACEMENT DETAILS FOR OBSTRUCTIONS ADJACENT TO OR WITHIN HIGHWAYS**

**OBJECT MARKER DESIGN AND PLACEMENT DETAILS FOR OBSTRUCTIONS ADJACENT TO OR WITHIN HIGHWAYS**
TYPICAL USE AND PLACEMENT

FLEXIBLE SURFACE-MOUNTED DELINEATORS

DETAILS ARE REPRESENTATIVE ONLY. ACTUAL DESIGN USED/SPECIFIED MAY VARY (SEE PLANS).

FLEXIBLE DRIVABLE DELINEATORS

DETAILS ARE REPRESENTATIVE ONLY. ACTUAL DESIGN USED/SPECIFIED MAY VARY (SEE PLANS).

NOTES:

1. MOUNT OR DRIVE FLEXIBLE DELINEATORS TO THE MANUFACTURER'S SPECIFICATIONS.
2. THE EXACT LOCATION AND PLACEMENT OF THE FLEXIBLE DELINEATORS ARE SHOWN IN THE SIGNING PLANS.
3. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS () ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.
UP TO $250 FINE AND / OR 60 DAYS IMPRISONMENT FOR INJURY TO OR POSSESSION OF THIS SIGN

INSTALLED 2010
SIGN FABRICATOR’S NAME HERE

DATE TAG DETAIL

DATE TAG COLOR SEQUENCE
DATE TAG COLOR CORRESPONDS TO THE LAST DIGIT OF THE INSTALLATION YEAR AS FOLLOWS:

0 - YELLOW
1 - WHITE
2 - LIGHT BLUE
3 - LIGHT GREEN
4 - GREEN
5 - RED
6 - PURPLE
7 - ORANGE
8 - BLUE
9 - LIGHT GREEN

DATE TAG DETAIL

PLACEMENT DETAILS

NOTES:

1. FURNISH AND PLACE INSTALLATION DATE TAGS ON ALL SIGNS PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
2. THE TAGS DISPLAY THE YEARS IN WHICH THE SIGNS WERE INSTALLED. SEE THE COLOR SEQUENCE TABLE SHOWN ON THIS DRAWING FOR THE APPROPRIATE COLORS. DATE TAGS ARE TO BE RETRO-REFLECTIVE.
3. PLACE A TAG ON THE BACK OF EACH SIGN, LOCATED NEAR THE LOWER CORNER OF THE SIGN NEAREST THE EDGE OF ROADWAY, TO BE VISIBLE FROM THE ROADWAY AS SHOWN IN THE EXAMPLES ABOVE.
4. PLACE TAGS ON ANY NEW SIGN INSTALLED IN THE FIELD AS ROUTINE MAINTENANCE BY MDT FORCES. MAINTENANCE DESIGN DATE TAGS CAN BE ORDERED FROM THE SIGN SHOP IN HELENA.
5. USE HARDWARE MEETING THE REQUIREMENTS OF SECTION 704.

UNITS SHOWN IN BRACKETS [ ] ARE METRIC AND ARE IN MILLIMETERS (mm) UNLESS OTHER UNITS ARE SHOWN.

DETAILED DRAWING
REFERENCE STANDARD SPEC
SECTION 619.704
DWG. NO. 619-44
INSTALLATION DATE TAGS

MONTANA DEPARTMENT OF TRANSPORTATION