## INDEX TO RAILROAD TYPICAL PLANS

<table>
<thead>
<tr>
<th>TYPICAL PLAN NO.</th>
<th>NO. OF SHEETS</th>
<th>TITLE</th>
<th>REVISION DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR-10</td>
<td>2</td>
<td>RAIL FLANGEWAY - HMA GRADE CROSSING</td>
<td>2/4/2019</td>
</tr>
<tr>
<td>RR-12</td>
<td>1</td>
<td>TEMPORARY PLANK GRADE CROSSING</td>
<td>5/12/2015</td>
</tr>
<tr>
<td>RR-13</td>
<td>1</td>
<td>TEMPORARY PLANK SIDEWALK CROSSING</td>
<td>4/19/2016</td>
</tr>
<tr>
<td>RR-20</td>
<td>2</td>
<td>LOCAL AGENCY GRADE CROSSING APPROACHES</td>
<td>2/4/2019</td>
</tr>
<tr>
<td>RR-25</td>
<td>1</td>
<td>BALLAST RETAINING WALLS</td>
<td>2/4/2019</td>
</tr>
<tr>
<td>RR-30</td>
<td>2</td>
<td>ROAD CLOSURE TEMPORARY SIGNING</td>
<td>4/5/2016</td>
</tr>
<tr>
<td>RR-40</td>
<td>1</td>
<td>RAIL SPIKING PATTERNS</td>
<td>4/19/2016</td>
</tr>
<tr>
<td>RR-41</td>
<td>2</td>
<td>TYPICAL TRACK AND STRUCTURE SECTION</td>
<td>2/20/2019</td>
</tr>
<tr>
<td>RR-42</td>
<td>2</td>
<td>RAIL ANCHORING</td>
<td>4/19/2016</td>
</tr>
<tr>
<td>RR-50</td>
<td>1</td>
<td>CULVERT INSTALLATION UNDER RAILROAD TRACK</td>
<td>4/19/2016</td>
</tr>
<tr>
<td>RR-62</td>
<td>1</td>
<td>CULVERT (CSP) EXTENSION</td>
<td>4/19/2016</td>
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<tr>
<td>RR-70</td>
<td>1</td>
<td>CHEMICAL VEGETATION CONTROL</td>
<td>4/5/2016</td>
</tr>
<tr>
<td>RR-90</td>
<td>2</td>
<td>SWITCH ROD INSULATION</td>
<td>4/19/2016</td>
</tr>
<tr>
<td>RR-91</td>
<td>1</td>
<td>GAGE PLATE INSULATION</td>
<td>4/19/2016</td>
</tr>
</tbody>
</table>
WHEEL FLANGE Voids INSIDE HEADS OF RUNNING RAILS SHALL BE 1.5 TO 2 INCHES WIDE AND 1.5 TO 2 INCHES DEEP.

MAX RAIL HEAD GAP DISTANCE AT SIDEWALKS: 3 INCHES.
MAX ELEV. DIFF. BETWEEN MUD RAIL AND RUNNING RAIL IS 1/4 INCH.

1/4 MAX DEPTH DEVIATION BETWEEN FLANGE AND RUNNING RAILS

SECTION A-A

12" MAX. WHEN EDGE DRAINS ARE SPECIFIED
FLANGE RAIL SPIKING PATTERN
(PUBLIC AND PRIVATE CROSSINGS)

TRIMMED PLATES FOR FLANGE RAILS (TYPICAL)

CUT PLATE CAN BE NO. 1 RELAY
TIE PLATES FIT UNDER RAIL MUST BE MATCHING

-SCREW LAGS SHALL BE 11/16" DIAMETER

-SCREW LAGS SHALL BE INSERTED INTO A PRE-DRILLED HOLE THAT IS 1/8" SMALLER THAN SCREW LAG

FULL TIE PLATE UNDER RUNNING RAIL

TIE PLATES TRIMMED TO FIT UNDER FLANGE RAILS

(SPIKES NOT SHOWN IN CROSS SECTION)

NOTES:

1) * = TRACK SPIKE HOLDING RUNNING RAIL
** = SCREW LAG

2) BORE HOLES FOR DRIVE SPIKES SHALL BE 9/16" DIAMETER.

3) ALL RAILS TO BE SAME SIZE.

4) SCREW LAG RUNNING RAIL EVERY TIE, USING 2 SPIKES PER RAIL.

5) PLACE TIE PLATES UNDER FLANGE RAILS ON ONE END OF EACH TIE, TRIM TIES PLATES FOR FLANGE RAILS TO FIT, RETAINING SHOULDER SECTION OF PLATE.

FLANGE RAIL END TREATMENT

REMOVE 12" SECTION OF RAIL WEB AND BEND RAIL HEAD TO BASE OF RAIL (SEE DETAIL ABOVE).

MDOT
OFFICE OF RAIL
MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
RAIL FLANGEWAY - HMA GRADE CROSSING

APPROVED BY: JIM D'LAMATER
RAILROAD INFRASTRUCTURE ENGINEER-MANAGER

REVISION DATE 2/4/2019
RR-10 SHEET 2 of 2
INSTALL 4 WASHER HEAD TIMBER DRIVE SPIKES MIN. PER 10' PLANK OR 3 WASHER HEAD TIMBER DRIVE SPIKES MIN. PER 8' PLANK. STAGGER WASHER HEAD TIMBER DRIVE SPIKES LONGITUDINALLY ALONG PLANKS. INSTALL OUTSIDE WASHER HEAD TIMBER DRIVE SPIKES 6" FROM ENDS OF PLANKS. DRILL 1/2" DIA. HOLE FOR 5/8" DIA. WASHER HEAD TIMBER DRIVE SPIKES. COUNTER BORE 2 1/2" DIA. AND 1 7/8" DEEP.

SHIMMED DETAIL

NOTE: TOP OF PLANK ELEVATION SHALL EQUAL TOP OF RAIL ELEVATION, PLUS OR MINUS 1/4.

TEMPORARY PLANK GRADE CROSSING MAY BE CONSTRUCTED WITH EITHER SHIMMED OR NON-SHIMMED DETAIL.

NON-SHIMMED DETAIL
INSTALL 4 WASHER HEAD TIMBER DRIVE SPIKES MIN. PER 10' PLANK OR 3 SPIKES MIN. PER 8' PLANK. STAGGER SPIKES LONGITUDINALLY ALONG PLANKS NOT LESS THAN 3' FROM EDGES. INSTALL OUTSIDE SPIKES NOT LESS THAN 6' FROM ENDS OF PLANKS. DRILL 1/2" DIA. HOLE FOR 3/4" DIA. SPIKES. COUNTER BORE 2 1/2" DIA. AND 1 1/4" DEEP.

EXISTING SIDEWALK

5" MIN.
21/2" FLANGEWAY 2" DEPTH

TIE PLATE
ASHFALT SIDEWALK APPROACH
2 1/2 MIN THICKNESS

CROSSTIE
SHIMS

THE COST OF EXCAVATION REQUIRED TO ATTAIN 3 1/2" THICKNESS IS INCLUDED IN THE COST OF THE HMA.

SHIMMED DETAIL

NOTE: WIDTH OF PROPOSED HMA SIDEWALK TO MATCH WIDTH OF EXISTING SIDEWALK. LENGTH OF PROPOSED HMA SIDEWALK WILL BE AS PRESCRIBED IN THE PROJECT PLANS OR AS DIRECTED BY THE F.O.I OR ENGINEER.

FILL WITH HMA OR OTHER APPROVED MATERIAL.

10" TYP.
21/2" FLANGEWAY 2" DEPTH

CROSSTIE

NON-SHIMMED DETAIL

NOTE: TOP OF PLANK ELEVATION SHALL EQUAL TOP OF RAIL ELEVATION, PLUS OR MINUS 1/4.

TIMBER PLANK SIDEWALK CROSSING MAY BE CONSTRUCTED WITH EITHER SHIMMED OR NON-SHIMMED DETAIL.
**TYPE I**

*Type I* is used when the existing road is HMA pavement.

Note: The cost of saw cutting, removing and disposing of existing HMA pavement outside of the renew or rebuild grade crossing limits, and the preparation of the subbase for the HMA approaches are included in the pay item "HMA".

For MDOT routes, reference MDOT STD PLAN R-121

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**TYPE II**

*Type II* is used when the existing road is gravel.

Note: The cost of removing and disposing of existing HMA or gravel approaches outside of the renew or rebuild grade crossing limits, the preparation of subbase for the HMA approaches, and grading of existing gravel approaches is included in the pay item "HMA".

Ends of HMA paving shall be perpendicular to roadway lanes.
NOTE: THE COST OF REMOVING AND DISPOSING OF EXISTING APPROACH MATERIAL OUTSIDE OF THE RENEW GRADE CROSSING LIMITS, THE PREPARATION OF SUBBASE FOR THE CLASS II APPROACHES, AND THE GRADING OF EXISTING APPROACH MATERIAL IS INCLUDED IN THE PAY ITEM "Approaches, Class II".

TYPE III
TYPE III IS USED AT PRIVATE CROSSING.
PROFILE VIEW

TOP OF RAIL SHALL BE FLUSH WITH TOP OF RETAINING WALL, TOP EDGE SHALL HAVE SMOOTH SURFACE.

RUNNING RAIL

MIN 2' OVERLAP

HEIGHT OF WALL TO BE ELEVATION SUFFICIENT TO MAINTAIN STANDARD RAILROAD CROSS SECTION, PLUS 3"

MIN. 85° SCRAP RAIL

MIN. DEPTH OF POST EMBEDMENT 1.5 TIMES HEIGHT OF WALL

EXISTING GROUND

RWT=RETAINING WALL TIMBER

6' MAX ON CENTER

FINISHED GRADE

2 ROWS MIN. BELOW FINISHED GRADE

CROSS SECTION

REBAR PLACED 1/2 WIDTH OF CROSSTIE

MIN 3 INCHES FROM TOP OF BALLAST TO TOP OF TIMBER

*SHOULDER WIDTH PER MDOT STANDARD

DRIFT PIN DETAIL

APPROX. 2' FROM END

PIN DEPTH=5 IN.

*MIN TIE LENGTH IS 4'

1' FROM END

ALL DRIFT PINS ARE TO BE COVERED BY EPOXY

EACH LAYERED TIMBER SHALL HAVE 2 PINS PLACED INTO LOWER TIMBER

MINIMUM TIE THICKNESS IS 6'

WALL TO BE CONSIDERED ON 1:12 BATTER
TYPICAL SIGNING REQUIREMENTS
(MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES)

TEMPORARY SIGNING SPECIFICATIONS

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<th>TYPE</th>
<th>DIMENSIONS</th>
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<td>24&quot; X 12&quot;</td>
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<td>B</td>
<td>30&quot; X 24&quot;</td>
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<td>M4-10</td>
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<td>48&quot; X 30&quot;</td>
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<td>R11-4</td>
<td>B</td>
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<tr>
<td></td>
<td>B</td>
<td>48&quot; X 60&quot;</td>
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NOTES:

* LIMITED STREET ACCESS SHALL BE UTILIZED WHEN RESIDENTIAL AND/OR COMMERCIAL ACCESS DRIVES EXIST BETWEEN THE ROAD CLOSURE AND THE RAILROAD CROSSING.

** NO STREET ACCESS SHALL BE UTILIZED WHEN NO RESIDENTIAL OR COMMERCIAL ACCESS DRIVES EXIST BETWEEN THE ROAD CLOSURE AND THE RAILROAD CROSSING.

SEE MDOT STANDARD PLAN W2D-125 FOR BARRICADE REQUIREMENTS.

PLACEMENT OF TRAFFIC CONTROL DEVICES AS SHOWN ON PLANS OR AS DIRECTED BY ENGINEER.
TYPICAL SIGNING REQUIREMENTS
(MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES)

* TEMPORARY ACCESS ROAD SHALL BE CONSTRUCTED AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

* TEMPORARY ACCESS ROAD
* TEMPORARY CROSSBUCKS

RR CROSSING OVER DEAD-END STREET

TEMPORARY SIGNING SPECIFICATIONS

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NOTES:
* IF REQUIRED

SEE MDOT STANDARD PLAN W7D-125 FOR BARRICADE REQUIREMENTS

PLACEMENT OF TRAFFIC CONTROL DEVICES AS SHOWN ON PLANS OR AS DIRECTED BY ENGINEER.
SPIKING PATTERNS

TANGENT OR LOW RAIL

HIGH RAIL

TWO SPIKES  THREE SPIKES  FOUR SPIKES

√ DRIVEN HOLES
■ USE WHEN ANCHOR SPIKE HOLES ARE NOT AVAILABLE

MINIMUM NUMBER OF SPIKES PER TIE PLATE

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<tr>
<th>ALIGNMENT</th>
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<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
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<td>4</td>
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TYPICAL TRACK STRUCTURE SECTION

TANGENT TRACK

* FOR CONSTRUCTION AND REHABILITATION, FRONTSLOPES SHALL BE CONSISTANT WITH EXISTING SLOPES.
TYPICAL TRACK STRUCTURE SECTION

TANGENT TRACK

* FOR CONSTRUCTION AND REHABILITATION, FRONT SLOPES SHALL BE CONSISTANT WITH EXISTING SLOPES.

**NO PERMANENT FACILITIES SHALL BE INSTALLED WITHIN THE RAILROAD RIGHT-OF-WAY WITHIN THIS AREA.
ANCHOR LOCATIONS IN TRACK

RAIL TRAFFIC ABOUT THE SAME IN BOTH DIRECTIONS

32 ANCHORS PER 39 FOOT LENGTH OF TRACK
16 ANCHORS PER RAIL PLACED TO RESIST
MOVEMENT IN EACH DIRECTION.

NOTES:

TRACK GRADES
- ANCHOR PATTERN MAY BE ADJUSTED FOR GRADES
- NUMBER OF ANCHORS MAY INCREASE FOR GRADES

BRIDGES
- RAIL ON BRIDGES WILL NOT BE ANCHORED IF DIRECT
FIXATION OR OPEN DECK. BALLASTED DECKS GET
ANCHORED AS PER PATTERN SHOWN ABOVE.
- APPROACHES TO BRIDGES WILL BE BOX ANCHORED EVERY
OTHER TIE FOR 200' IN BOTH DIRECTIONS FROM THE BRIDGE.

ROAD CROSSINGS
- RAIL IN CROSSINGS WILL NOT BE ANCHORED
- APPROACHES TO CROSSINGS WILL BE BOX ANCHORED EVERY
TIE FOR 50' IN BOTH DIRECTIONS FROM THE CROSSING.

PRIVATE CROSSINGS
- ANCHOR APPROACHES AND CROSSINGS AS PER
TRACK PATTERN SHOWN ABOVE.

TURNOUTS
- APPROACHES TO TURNOUTS WILL BE BOX ANCHORED
EVERY OTHER TIE FOR 200' IN BOTH DIRECTIONS
FROM THE TURNOUT.
- RAIL WITHIN THE TURNOUT WILL BE BOX ANCHORED EVERY
OTHER TIE ON RAIL THAT CAN RECEIVE ANCHORS
EXCLUDING THE SWITCH.
- THE ANCHORING WILL CONTINUE THROUGH THE LAST
LONG TIE OF THE TURNOUT
- 160 ANCHORS WITHIN #8 TURNOUT
- 184 ANCHORS WITHIN #10 TURNOUT
ANCHOR LOCATIONS IN TRACK
RAIL TRAFFIC ABOUT THE SAME IN BOTH DIRECTIONS

32 ANCHORS PER 39 FOOT LENGTH OF TRACK
16 ANCHORS PER RAIL PLACED TO RESIST
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  OTHER TIE ON RAIL THAT CAN RECEIVE ANCHORS,
  EXCLUDING THE SWITCH.
- THE ANCHORING WILL CONTINUE THROUGH THE LAST
  LONG TIE OF THE TURNOUT
- 160 ANCHORS WITHIN #8 TURNOUT
- 184 ANCHORS WITHIN #10 TURNOUT
TRENCH DETAIL

REMOVE AND REINSTALL TRACK

TIE

RAIL

BALLAST AREA

SUBBALLAST AREA

EARTH EXCAVATION

CLASS III BACKFILL

1

1

1

1

W

WIDTH OF CULVERT BEDDING MATERIAL BELOW PIPE

1

1

BC/4

D

D

d

BC = OUTSIDE DIAMETER

W = BC + 8" OR 1 1/2 X BC (WHICHEVER IS GREATER)

d = DEPTH OF BEDDING MATERIAL BELOW PIPE

D = INSIDE DIAMETER

h = DEPTH OF EXCAVATION BELOW BALLAST

<table>
<thead>
<tr>
<th>D</th>
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<td>27&quot; &amp; SMALLER</td>
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</tr>
<tr>
<td>30&quot; TO 60&quot;</td>
<td>9&quot;</td>
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<tr>
<td>60&quot; &amp; LARGER</td>
<td>12&quot;</td>
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NOTE: PLACE AND COMPACT CULVERT BEDDING TO THE LEVEL OF d PLUS 1/4 THE OUTSIDE DIAMETER OF THE PIPE CULVERT (d+BC/4) AND THEN EXCAVATE AND SHAPE A TRENCH TO FIT THE PIPE. AFTER PLACING CULVERT, CONTINUE FILLING WITH CLASS III BACKFILL.

CULVERT BEDDING SHALL BE CLASS III BACKFILL EXCEPT WHEN CLASS II CULVERT BEDDING IS NOTED ON THE PLANS.

CLASS II CULVERT BEDDING AND CLASS III BACKFILL SHALL BE PLACED AND COMPACTED IN 9" MAXIMUM LAYERS, UNLESS OTHERWISE NOTED. COMPACTION SHALL REACH A MINIMUM DENSITY OF 95% OF THE MAXIMUM UNIT WEIGHT OF THE MATERIAL BEING COMPACTED.
SLOPE OF EXTENSION SHALL MATCH SLOPE OF EXISTING CULVERT.

2" MIN CLEARANCE

MALE OR FEMALE END

TYPE II GROUT

CULV, CIA, CSP, _ inch

GEOTEXTILE FABRIC

RIPRAP, PLAIN

1' 1'

EXCAVATION LIMITS

2" MIN CLEARANCE

SHIMS

CULVERT BEDDING, WOT CLASS II MATERIAL

EXCAVATE AND DISPOSE OF UNDERLYING MATERIAL

12" MINIMUM CULV. BEDDING COMPACT TO 95 PERCENT MAX. UNIT WEIGHT

D = NOMINAL DIAMETER OF EXISTING PIPE

d = NOMINAL DIAMETER OF EXTENSION PIPE

EMBANKMENT (CIP OR LM) TO BE PLACED FOLLOWING THE CULVERT EXTENSION WORK

D + 12"
**TYPICAL**

**MAINLINE WEED AND BRUSH SPRAY**

**SINGLE TRACK**

- **LIMITS OF PAY ITEM “Brush Spray”**
- **LIMITS OF PAY ITEM “Weed Spray”**
- **15’ BRUSH SPRAY TARGET AREA**
- **24’ WEED SPRAY TARGET AREA**

**SINGLE TRACK TERRITORY NOTE:**

- “Weed Spray” shall be paid once per track mile. Payment includes weed spray activities on both sides of track.
- “Brush Spray” shall be paid by the roadbed mile. Payment includes brush spray activities on all sides of track.

---

**TYPICAL**

**YARD/SIDING WEED AND BRUSH SPRAY**

**MULTIPLE TRACK**

- **LIMITS OF PAY ITEM “Brush Spray”**
- **LIMITS OF PAY ITEM “Weed Spray”**
- **15’ BRUSH SPRAY TARGET AREA**
- **12’**
- **WEED SPRAY ENTIRE AREA BETWEEN TRACKS**

**MULTIPLE TRACK TERRITORY NOTE:**

- “Weed Spray” shall be paid per track mile along the % of each track and shall be paid separately for each track in areas with multiple parallel tracks. Payment includes weed spray activities on both sides of each track.
- “Brush Spray” shall be paid by the roadbed mile. Payment includes brush spray activities on all sides of all tracks.

---

**TYPICAL**

**CLEAR VISION BRUSH SPRAYING AT INTERSECTIONS**

- **ADDITIONAL BRUSH SPRAY AREA**
- **CLEAR VISION AREAS**
- **ROAD CROSSING**

**BRUSH SPRAY TO RIGHT-OF-WAY LINE ON BOTH SIDES OF TRACK WITHIN 500’ OF ALL PUBLIC INTERSECTIONS. THE ADDITIONAL BRUSH SPRAY OF CLEAR VISION AREAS AT INTERSECTIONS SHALL NOT BE PAID FOR SEPARATELY. ADDITIONAL BRUSH SPRAY OF CLEAR VISION AREAS SHALL BE INCLUDED IN THE PAY ITEM “Brush Spray.”**

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**MDOT**

**OFFICE OF RAIL**

**CHEMICAL VEGETATION CONTROL**

**APPROVED BY:**

**JIM D’LAMATER**

**RAILROAD INFRASTRUCTURE ENGINEER MANAGER**

**REVISION DATE**

4/5/2016

**RR-70**

**SHEET 1 of 1**
INSULATED SPLICE PLATE, 3M SCOTCHPLY MATERIAL OR APPROVED EQUAL

1 in. DIA. BOLTS 3½ in. LONG FOR 3¼ SWITCH ROD
1 in. DIA. BOLTS 3½ in. LONG FOR 1 in. SWITCH ROD
1 in. DIA. BOLTS 3¾ in. LONG FOR 1½ SWITCH ROD
WITH A.S.A. REG. SQ. HEADS, A.S.A.
HEAVY SQ. NUTS, SPRING WASHERS AND COTTER PINS.

INSULATED SPLICE PLATE

NOTE: DIMENSIONS WILL REQUIRE MODIFICATION IF EXISTING SWITCH ROD IS NOT AN A.R.E.M.A. STANDARD DESIGN.

TYPE I
SWITCH ROD INSULATION
**10551 SPlice PLATe, STEEL**

**10552 SPlice PLATe, FIBRE**

10553, L= 3\(\frac{1}{2}\)" FOR 3\(\frac{1}{4}\)" SWITCH ROD
10554, L= 1\(\frac{1}{2}\)" FOR 1" SWITCH ROD
10557, L= 1\(\frac{1}{8}\)" FOR 1\(\frac{1}{4}\)" SWITCH ROD

3\(\frac{1}{4}\)" DIA. BOLTS 3\(\frac{1}{4}\)" LONG FOR 3\(\frac{1}{4}\)" SWITCH ROD
3\(\frac{1}{4}\)" DIA. BOLTS 3\(\frac{1}{2}\)" LONG FOR 1" SWITCH ROD
3\(\frac{1}{4}\)" DIA. BOLTS 3\(\frac{3}{4}\)" LONG FOR 1\(\frac{1}{4}\)" SWITCH ROD
WITH A.S.A. REG. SO. HEADS, A.S.A.
HEAVY SO. NUTS, SPRING WASHERS
AND COTTER PINS.

**TYPE 2 SWITCH ROD INSTALLATION**

10555 INSULATION COMPL. FOR 3\(\frac{1}{4}\)" SWITCH ROD
10556 INSULATION COMPL. FOR 1" SWITCH ROD
10558 INSULATION COMPL. FOR 1\(\frac{1}{4}\)" SWITCH ROD

NOTE: DIMENSIONS WILL REQUIRE MODIFICATION
IF EXISTING SWITCH ROD IS NOT AN
A.R.E.M.A. STANDARD DESIGN.
3M SCOTCHPLYP MATERIAL OR APPROVED EQUAL

3/8" - 10 x 3"
3/8" - 10 x 4 1/2"
3/8" - 10 x 4 1/2"

WITH HEAVY SQ. NUT AND SPRING LOCK WASHER
138009 INSULATION COMPL. FOR 3/8" PLATE
138020 INSULATION COMP. FOR 1" PLATE
138011 INSULATION COMPL. FOR 1 1/2" PLATE

1 1/2" HOLES
2 3/4" - 2 3/4"

8 1/4"
13803 INSULATION ANGLE PIECE FIBRE

1 1/2" HOLES
2 3/4" - 2 3/4"

8 1/4"
13805 INSULATION END POST FIBRE

2 3/8" HOLES
2 3/4" - 2 3/4"

8"
13807 STRAP WASHER, STEEL

MAY BE MADE FROM COMMERCIAL ANGLE 2 3/4" X 1 1/2" X 3/16"
1/16" CHAMFER

MDOT
OFFICE OF RAIL

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
GAGE PLATE INSULATION

APPROVED BY: JIM D'LAMATER
BUREAU OF TRANSPORTATION ENGINEER MANAGER

REVISION DATE 4/19/2016 RR-91 SHEET 1 OF 1