<table>
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<tr>
<th>TYPICAL PLAN NO.</th>
<th>NO. OF SHEETS</th>
<th>TITLE</th>
<th>REVISION DATE</th>
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<tbody>
<tr>
<td>RR-10</td>
<td>2</td>
<td>RAIL FLANGEWAY - BITUMINOUS GRADE CROSSING</td>
<td>1-26-05</td>
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<tr>
<td>RR-11</td>
<td>1</td>
<td>Crosstie Flangeay - Bit. &amp; Hardwood Plank-Bit./Gravel</td>
<td>1-26-05</td>
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<tr>
<td>RR-12</td>
<td>1</td>
<td>Temporary Plank Grade Crossing</td>
<td>1-26-05</td>
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<tr>
<td>RR-13</td>
<td>1</td>
<td>Timber Plank Sidewalk Crossing</td>
<td>1-26-05</td>
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<td>RR-20</td>
<td>2</td>
<td>Grade Crossing Approaches</td>
<td>2-26-05</td>
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<td>RR-30</td>
<td>4</td>
<td>Road Closure</td>
<td>1-20-05</td>
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<td>RR-40</td>
<td>1</td>
<td>Rail Spiking Patterns</td>
<td>3-19-05</td>
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<td>RR-41</td>
<td>1</td>
<td>Typical Track Structure Section</td>
<td>1-26-05</td>
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<td>RR-42</td>
<td>2</td>
<td>Rail Anchoring</td>
<td>1-20-05</td>
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<tr>
<td>RR-50</td>
<td>1</td>
<td>Culvert Installation Under RR Track</td>
<td>1-24-05</td>
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<tr>
<td>RR-62</td>
<td>1</td>
<td>Culvert (CSP) Extension</td>
<td>1-24-05</td>
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<tr>
<td>RR-90</td>
<td>2</td>
<td>Switch-Rod Insulation</td>
<td>1-26-05</td>
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<tr>
<td>RR-91</td>
<td>1</td>
<td>Gage Plate Insulation</td>
<td>1-24-05</td>
</tr>
</tbody>
</table>
PLAN

WHEEL FLANGE Voids inside heads of running rails shall be 1.5 to 2 inches wide and 1.5 to 2 inches deep.

SECTION A-A

*12' MAX. WHEN EDGE DRAINS ARE SPECIFIED

4" PVC SIGNAL CONDUIT (WHEN SPECIFIED ONE SIDE ONLY)

4" MAX.

3" MAX.

SAWCUT BOTH SIDES

CROSSTIES 19" C. TO C.

EDGDrain, 4" WITH RODENT SCREENS. (TYPICAL BOTH SIDES WHEN SPECIFIED)

4" MIN. (REBUILD)

10" MIN. (NEW)

NO. 4 BALLAST

GEOTEXTILE FABRIC

13"

8"

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
RAIL FLANGEWAY - BITUMINOUS
GRADE CROSSING

William C. Homrich
PROJECT DEVELOPMENT-ENGINEER

David O. Whaley
CONSTRUCTION & MAINTENACE-SUPERVISOR

1-26-05
REVISION DATE

RR-10 SHEET 1 OF 2
FLANGE RAIL SPIKING PATTERN

TRIMMED PLATES FOR FLANGE RAILS (TYPICAL)

TIE PLATES TRIMMED TO FIT UNDER FLANGE RAILS

FULL TIE PLATE UNDER RUNNING RAIL

(SPIKES NOT SHOWN IN CROSS SECTION)

NOTES:
1) • TRACK SPIKE HOLDING RUNNING RAIL
   • DRIVE SPIKE
2) BORE HOLES FOR DRIVE SPIKES SHALL BE 1/2" DIAMETER.
3) ALL RAILS TO BE SAME SIZE.
4) SPIKE RUNNING RAIL EVERY TIE, USING 2 SPIKES PER RAIL.
5) PLACE TIE PLATES UNDER FLANGE RAILS ON ONE END OF EACH TIE, TRIM TIE PLATES FOR FLANGE RAILS TO FIT, RETAINING SHOULDER SECTION OF PLATE.
6) DRIVE SPIKES MAY BE REPLACED WITH TRACK SPIKES IN ALL PRIVATE CROSSINGS.

FLANGE RAIL END TREATMENT

REMOVE 12" SECTION OF RAIL WEB AND BEND RAIL HEAD TO BASE OF RAIL, SEE DETAIL ABOVE.
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 1/6" 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.
INSTALL 4 WASHER HEAD TIMBER DRIVE SPIKES MIN. PER 10' PLANK OR 3 SPIKES MIN. PER 8' PLANK. STAGGER SPIKES LONGITUEDINALY 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 5/8" DIA. SPIKES. COUNTER BORE 21/2" DIA. AND 11/8" DEEP.

SHIMMED DETAIL

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

FILL WITH ASPHALT MATERIAL OR OTHER APPROVED MATERIAL.

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.

William C. Homrich
PROJECT DEVELOPMENT-ENGINEER

David O. Whaley
CONSTRUCTION & MAINTENANCE-SUPERVISOR

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
TIMBER PLANK SIDEWALK CROSSING

RR-13 1 SHEET OF 1
**TYPE I**

TYPE I is used when the existing road is bituminous pavement.

**TYPE II**

TYPE II is used when the existing road is gravel.


**TYPE III**
TYPE III IS USED AT PRIVATE CROSSING.
TYPICAL SIGNING REQUIREMENTS
(MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES)

NOTES:
SEE MDOT STANDARD PLAN R-125-A FOR BARRICADE REQUIREMENTS
PLACEMENT OF TRAFFIC CONTROL DEVICES AS DIRECTED BY THE ENGINEER.

CODE | TYPE | DIMENSIONS
--- | --- | ---
M4-10 | C | 18" X 48"
R11-3 | B | 30" X 60"
W20-3 | B | 48" X 48"
R11-2 | B | 30" X 48"

FACE MATERIAL TYPE | BACKGROUND | LEGEND
--- | --- | ---
A | REFLECTORIZED | REFLECTORIZED
B | REFLECTORIZED | NON-REFLECTORIZED
C | NON-REFLECTORIZED | REFLECTORIZED
D | NON-REFLECTORIZED | NON-REFLECTORIZED

William C. Hornich
PROJECT DEVELOPMENT ENGINEER

David O. Whaley
CONSTRUCTION & MAINTENANCE SUPERVISOR

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
ROAD CLOSURE

1-20-05
REVISION DATE
RR-50 SHEET 1 OF 4
TYPICAL SIGNING REQUIREMENTS
(MICHIGAN MANUAL OF UNIFORM
TRAFFIC CONTROL Devices)

TYPE III BARRICADES
LIGHTED, OPERATED

R11-2
ROAD CLOSED
M4-10L ← DETOUR

R11-2
ROAD CLOSED
M4-10R ← DETOUR

TYPE B ROAD CLOSURE

NOTES:
SEE MDOT STANDARD PLAN R-125-A
FOR BARRICADE REQUIREMENTS
PLACEMENT OF TRAFFIC CONTROL
DEVICES AS DIRECTED BY THE
ENGINEER.

<table>
<thead>
<tr>
<th>CODE</th>
<th>TYPE</th>
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<td>C</td>
<td>18&quot; X 48&quot;</td>
</tr>
<tr>
<td>R11-2</td>
<td>B</td>
<td>30&quot; X 48&quot;</td>
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<th>BACKGROUND</th>
<th>LEGEND</th>
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</thead>
<tbody>
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<td>REFLECTORIZED</td>
</tr>
<tr>
<td>B</td>
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<td>NON-REFLECTORIZED</td>
</tr>
<tr>
<td>C</td>
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</tr>
<tr>
<td>D</td>
<td>NON-REFLECTORIZED</td>
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William C. Homrich
PROJECT DEVELOPMENT ENGINEER

David O. Whaley
CONSTRUCTION & MAINTENANCE SUPERVISOR
TYPICAL SIGNING REQUIREMENTS
(MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES)

TYPE III BARRICADES LIGHTED, OPERATED

R11-2
ROAD CLOSED

R11-4 (MODIFIED)
ROAD CLOSED AT RAILROAD

TYPE C ROAD CLOSURE

NOTES:
SEE MDOT STANDARD PLAN R-125-A FOR BARRICADE REQUIREMENTS
PLACEMENT OF TRAFFIC CONTROL DEVICES AS DIRECTED BY THE ENGINEER.

<table>
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<tr>
<th>CODE</th>
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<tbody>
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<td>.30&quot; X 48&quot;</td>
</tr>
<tr>
<td>R11-4</td>
<td>B</td>
<td>.30&quot; X 60&quot;</td>
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<td>NON-REFLECTORIZED</td>
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<tr>
<td>C</td>
<td>NON-REFLECTORIZED</td>
<td>REFLECTORIZED</td>
</tr>
<tr>
<td>D</td>
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MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
ROAD CLOSURE

1-20-05
RR-30
TYPICAL SIGNING REQUIREMENTS  
(MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES)

TYPE III BARRICADES LIGHTED, OPERATED

R11-2 ROAD CLOSED

TYPE III BARRICADES LIGHTED, OPERATED

R11-4 (MODIFIED) ROAD CLOSED AT RAILROAD

---

TYPE D ROAD CLOSURE

NOTES:
- SEE MDOT STANDARD PLAN R-125-A FOR BARRICADE REQUIREMENTS
- PLACEMENT OF TRAFFIC CONTROL DEVICES AS DIRECTED BY THE ENGINEER.

<table>
<thead>
<tr>
<th>CODE</th>
<th>TYPE</th>
<th>DIMENSIONS</th>
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<tbody>
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<td>B</td>
<td>30&quot; X 48&quot;</td>
</tr>
<tr>
<td>R11-4</td>
<td>B</td>
<td>30&quot; X 60&quot;</td>
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<th>BACKGROUND</th>
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</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
<td>B</td>
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<td>C</td>
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<tr>
<td>D</td>
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William C. Homrich  
PROJECT DEVELOPMENT-ENGINEER

David O. Whaley  
CONSTRUCTION & MAINTENANCE-SUPERVISOR

MICHIGAN DEPARTMENT OF TRANSPORTATION  
RAILROAD TYPICAL PLAN FOR  
ROAD CLOSURE

1-20-05  
REVISION DATE  
RR-30  
SHEET 4 OF 4
SPIKING PATTERNS

TANGENT OR LOW RAIL

HIGH RAIL

TWO SPIKES
THREE SPIKES
FOUR SPIKES

- USE WHEN ANCHOR SPIKE HOLES ARE NOT AVAILABLE.

MINIMUM NUMBER OF SPIKES PER TIE PLATE

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<tr>
<th>ALIGNMENT</th>
<th>SPEED IN MPH FOR TERRITORY</th>
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<tr>
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<td>10</td>
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<tr>
<td>TANGENTS</td>
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<tr>
<td>CURVES</td>
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</tr>
<tr>
<td>GREATER THAN OR EQUAL TO</td>
<td>BUT LESS THAN</td>
</tr>
<tr>
<td>0°</td>
<td>2</td>
</tr>
<tr>
<td>2°</td>
<td>2</td>
</tr>
<tr>
<td>5°</td>
<td>2</td>
</tr>
<tr>
<td>8°</td>
<td>2</td>
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<tr>
<td>10° AND OVER</td>
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MICHIGAN DEPARTMENT OF TRANSPORTATION RAILROAD TYPICAL PLAN FOR

RAIL SPIKING PATTERNS

1-19-05 REVISION DATE  RR-40 SHEET 1 OF 1
TYPICAL TRACK STRUCTURE SECTION

TANGENT TRACK

* FOR RECONSTRUCTION AND REHABILITATION, FRONTSLOPES SHALL BE CONSISTANT WITH EXISTING SLOPES.
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

*6 ANCHORS PER 39 FOOT LENGTH OF TRACK
8 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
**TRENCH DETAIL**

**REMOVE AND REINSTALL TRACK**

**TIE**

**RAIL**

**BALLAST AREA**

**EXCAVATE**

**CLASS III BACKFILL**

**BEDDING**

**DEPTH OF BEDDING MATERIAL BELOW PIPE**

<table>
<thead>
<tr>
<th>D</th>
<th>d</th>
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<tr>
<td>27&quot; &amp; SMALLER</td>
<td>6&quot;</td>
</tr>
<tr>
<td>30&quot; TO 60&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>60&quot; &amp; LARGER</td>
<td>12&quot;</td>
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Bc = OUTSIDE DIAMETER  
W = Bc + 8" OR 1/2 X Bc  
(WHICHEVER IS GREATER)  
d = DEPTH OF BEDDING MATERIAL BELOW PIPE  
D = INSIDE DIAMETER  
h = DEPTH OF EXCAVATION BELOW BALLAST

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.
1/16" HOLES

INSULATED SPLICE PLATE, 3M SCOTCHPLY MATERIAL OR APPROVED EQUAL

1" DIA. BOLTS 3/4" LONG FOR 3/4" SWITCH ROD
1" DIA. BOLTS 3/2" LONG FOR 1" SWITCH ROD
1" DIA. BOLTS 3/4" LONG FOR 1/4" SWITCH ROD WITH A.S.A. REG. SQ. HEADS, A.S.A.
HEAVY SQ. NUTS, SPRING WASHERS AND COTTER PINS.

TYPE I
SWITCH ROD INSULATION

NOTE: DIMENSIONS WILL REQUIRE MODIFICATION IF EXISTING SWITCH ROD IS NOT AN A.R.E.M.A. STANDARD DESIGN.
10551 SPLICE PLATE, STEEL

10552 INSULATION PLATE, FIBRE

10553, L = 3/32" FOR 3/4" SWITCH ROD
10554, L = 1/32" FOR 1" SWITCH ROD
10557, L = 1/8" FOR 1/4" SWITCH ROD

INSULATION BUSHING, FIBRE

1/4" DIA. BOLTS 3/4" LONG FOR 3/4" SWITCH ROD
3/4" DIA. BOLTS 3/2" LONG FOR 1" SWITCH ROD
3/4" DIA. BOLTS 3/4" LONG FOR 1/4" SWITCH ROD WITH A.S.A. REG. SQ. HEADS, A.S.A.
HEAVY SQ. NUTS, SPRING WASHERS AND COTTER PINS

TYPE 2

SWITCH ROD INSULATION

10555 INSULATION COMPL. FOR 3/4" SWITCH ROD
10556 INSULATION COMPL. FOR 1" SWITCH ROD
10558 INSULATION COMPL. FOR 1/4" SWITCH ROD

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

SNG. SEC.
1055E
MODIFIED

William C. Homrich
PROJECT DEVELOPMENT-ENGINEER

David O. Whaley
CONSTRUCTION & MAINTENANCE-SUPERVISOR

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
SWITCH ROD INSULATION

1-30-05
REVISED DATE

RR-90 SHEET 2 OF 2