## INDEX TO RAILROAD TYPICAL PLANS

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<td>4/19/2016</td>
</tr>
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</table>
SHAPE AND COMPACT SHOULDERS AND APPROACHES AS REQUIRED USING CLASS 23A MATERIAL. LOW SHOULDERS MUST BE ADDRESSED ACCORDINGLY.

ALL FLANGERAIL ENDS: REMOVE 12" SECTION OF RAIL WEB AND BEND RAIL HEAD TO BASE OF RAIL, SEE DETAIL SHEET 2 OF 2.

WHEEL FLANGE VOIDS INSIDE HEADS OF RUNNING RAILS SHALL BE 1.5 TO 2 INCHES WIDE AND 1.5 TO 2 INCHES DEEP.

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

4" MIX (SPECIFIED)

SAYCUT BOTH SIDES

CROSSTIES 19" C. TO C.

4" SUBBALLAST OR HARPAN

10" MIN.

4" MIN. (REBUILD)

10" MIN. (NEW)

GEOTEXTILE FABRIC (NEW CROSSINGS ONLY)

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

1/4" MAX DEPTH DEVIATION BETWEEN FLANGE AND RUNNING RAILS

SECTION A-A

*12" MAX. WHEN EDGE DRAINS ARE SPECIFIED
FLANGE RAIL SPIKING PATTERN

NOTES:

1) ■ = TRACK SPIKE HOLDING RUNNING RAIL
   • = SCREW LAG

2) BORE HOLES FOR DRIVE SPIKES SHALL BE 1/2" 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.

6) SCREW LAGS SHALL BE USED 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 7/8" DEEP.

SHIMMED DETAIL

NON-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 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 5/8” DIA. SPIKES. COUNTER BORE 2 1/2” DIA. AND 1 1/2” DEEP.

EXISTING SIDEWALK

21/2" FLANGEWAY 2" DEPTH

TIE PLATE

SHIMS

ASPHALT SIDEWALK APPROACH

2 1/2” MIN. THICKNESS

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

EXISTING SIDEWALK

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.D.I. OR ENGINEER.

FILL WITH HMA OR OTHER APPROVED MATERIAL.

10” TYP.

MIN. 5 1/2”

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.

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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".

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.

TYPE III

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

TEMPORARY SIGNING SPECIFICATIONS

<table>
<thead>
<tr>
<th>CODE</th>
<th>TYPE</th>
<th>DIMENSIONS</th>
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<tbody>
<tr>
<td>M4-8a</td>
<td>B</td>
<td>24&quot; X 12&quot;</td>
</tr>
<tr>
<td>M4-9</td>
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<td>M4-10</td>
<td>B</td>
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<td>48&quot; X 30&quot;</td>
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<tr>
<td>R11-4</td>
<td>B</td>
<td>60&quot; X 30&quot;</td>
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<tr>
<td>TYPE III BARRICADE</td>
<td></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 WZD-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 CROSSBUCKS

* Z-029

* I-020

NO OUTLET

END WORK ZONE

G20-2 *

TYPE III BARRICADES LIGHTED, FURNISHED, OPERATED

ROAD CLOSED

R11-2

BEGIN WORK ZONE

G20-1 *

ROAD CLOSED AT RAILROAD

R11-4

RR CROSSING OVER DEAD-END STREET

TEMPORARY SIGNING SPECIFICATIONS

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<td>W20-3</td>
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NOTES:
* IF REQUIRED

SEE MDOT STANDARD PLAN WZD-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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<thead>
<tr>
<th>ALIGNMENT</th>
<th>SPEED IN MPH FOR TERRITORY</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
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<th>40</th>
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<td>2</td>
<td>2</td>
<td>4</td>
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<td>GREATER THAN OR EQUAL TO</td>
<td>BUT LESS THAN</td>
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<td>15</td>
<td>20</td>
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<tr>
<td>10° AND OVER</td>
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<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
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MDOT OFFICE OF RAIL

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
RAIL SPIKING PATTERNS

APPROVED BY: JIM D'LANMATER
RAILROAD INFRASTRUCTURE ENGINEER MANAGER

REVISION DATE 4/19/2016
RR-40 SHEET 1 OF 1
TYPICAL TRACK STRUCTURE SECTION

TANGENT TRACK

* FOR CONSTRUCTION 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

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
**Trench Detail**

**Remove and Reinstall Track**

---

**Earth Excavation**

**Culvert Bedding**

**Class III Backfill**

**Width of Culvert Bedding Material Below Pipe**

**Table:**

<table>
<thead>
<tr>
<th>D</th>
<th>d</th>
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<tbody>
<tr>
<td>27' &amp; SMALLER</td>
<td>6&quot;</td>
</tr>
<tr>
<td>30' TO 60&quot;</td>
<td>9&quot;</td>
</tr>
<tr>
<td>60' &amp; LARGER</td>
<td>12&quot;</td>
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**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

---

**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

EXCAVATION LIMITS

1' 1'

CULVERT BEDDING, MDOT 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

3

CULVERT BEDDING

D + 12"

EXCAVATION LIMITS

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

MICHIGAN DEPARTMENT OF TRANSPORTATION
RAILROAD TYPICAL PLAN FOR
CULVERT (CSP) EXTENSION

APPROVED BY:
JIM D'LAMATER
RAILROAD INFRASTRUCTURE ENGINEER MANAGER

REVISION DATE
4/19/2016
RR-62 SHEET 1 OF 1
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.

LIMITS OF PAY ITEM "Brush Spray"

LIMITS OF PAY ITEM "Weed Spray"

15' BRUSH SPRAY TARGET AREA
15' BRUSH SPRAY TARGET AREA

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
YARD/SIDING WEED AND BRUSH SPRAY
MULTIPLE TRACK

DISTANCE VARIES
WEED SPRAY ENTIRE AREA BETWEEN TRACKS

TYPICAL
CLEAR VISION BRUSH SPRAYING AT INTERSECTIONS

ADDITIONAL BRUSH SPRAY AREA

CLEAR VISION AREAS

ROAD CROSSING

ROW LINE

WIDTH VARIES
23' (TYP.)

ROW LINE

WIDTH VARIES
23' (TYP.)

ROW LINE

WIDTH VARIES
23' (TYP.)

ROW LINE

WIDTH VARIES
23' (TYP.)

ROW LINE

500'

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".

MDOT
OFFICE OF RAIL

CHEMICAL VEGETATION CONTROL

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
1½" HOLES

1"  2½"  2½"  2½"  1"
3½"

INSULATED SPLICE PLATE, 3M SCOTCHPLY MATERIAL OR APPROVED EQUAL

1" DIA. BOLTS 3½" LONG FOR 3½" SWITCH ROD
1" DIA. BOLTS 3½" LONG FOR 1¼" SWITCH ROD
1" DIA. BOLTS 3½" 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

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= 31/2" FOR 3/4" SWITCH ROD  
10554, L= 1 1/2" FOR 1" SWITCH ROD  
10557, L= 1 1/2" FOR 1 1/4" SWITCH ROD

3/4" DIA. BOLTS 3 1/2" LONG FOR 3/4" SWITCH ROD
3/4" DIA. BOLTS 3 1/2" LONG FOR 1" SWITCH ROD
3/4" DIA. BOLTS 3 3/4" LONG FOR 1 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 3/4" SWITCH ROD
10556 INSULATION COMPL. FOR 1" SWITCH ROD
10558 INSULATION COMPL. FOR 1 1/4" SWITCH ROD

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

\[ \frac{3}{4} \times 10 \times 3 \frac{3}{4} \text{" BOLT FOR } \frac{3}{4} \text{" PLATE} \\
\frac{3}{4} \times 10 \times 4 \frac{1}{2} \text{" BOLT FOR 1" PLATE} \\
\frac{3}{4} \times 10 \times 4 \frac{1}{2} \text{" BOLT FOR 1\frac{1}{4}" PLATE} \]

WITH HEAVY SQ. NUT AND SPRING LOCK WASHER

138009 INSULATION COMPL. FOR 3\frac{3}{4}" PLATE
138020 INSULATION COMPL. FOR 1" PLATE
138011 INSULATION COMPL. FOR 1\frac{1}{4}" PLATE

1\frac{1}{32}" HOLES

8\frac{1}{4}"

13803 INSULATION ANGLE PIECE FIBRE

1\frac{1}{32}" HOLES

8\frac{1}{4}"

13805 INSULATION END POST FIBRE

2\frac{3}{32}" HOLES

8"

13807 STRAP WASHER, STEEL

MAY BE MADE FROM COMMERCIAL ANGLE 2\frac{3}{4}" X 1\frac{1}{4}" X 3\frac{1}{16}"

1\frac{1}{16}" CHAMFER