**DRIVEWAY ENTRANCES NOTES:**

1. See Plans for Driveway Width (W) and Return Radius (R).  
2. See the Plans for drainage pipe size and length or as determined by the Engineer. The size will be no less than 15" diameter or equivalent.  
3. Stable material may be required for graded driveways to private property as directed by the Engineer in accordance with Specification 102-8.  
4. The driveway pavement requirement at graded connections may be waived for connections serving one or two homes or field entrances with less than 20 trips per day, or 5 trips per hour as approved by the Engineer, or when not shown in the Plans.  
5. Point of Connection:  
   a. Construct paved driveways for all paved connecting facilities. The connecting point will be determined by the Engineer.  
   b. Construct paved driveways for all business, commercial, industrial or high volume residential graded connecting facilities. Construct the connecting point 30'-0" from edge of travel way or at R/W line, whichever is less.  
   c. Construct paved driveways for all side road connections. The R/W is the connecting point.
**DRIVEWAY TYPES**

**TYPE I** - Typical Automobile Traffic

**TYPE II** - Typical Truck-Trailer Traffic

**AREAS FOR ONE 5' DEEP DRIVEWAY APRON (SY)**

<table>
<thead>
<tr>
<th>Drive Width (ft)</th>
<th>Intersection</th>
<th>Normal</th>
<th>Skewed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type I</td>
<td>Type II</td>
<td>Type I</td>
</tr>
<tr>
<td>12</td>
<td>28</td>
<td>31</td>
<td>31</td>
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</tr>
<tr>
<td>56</td>
<td>52</td>
<td>92</td>
<td>68</td>
</tr>
</tbody>
</table>

**RESURFACING EXISTING DRIVEWAY**

**GENERAL NOTES:**

1. Driveways are to be constructed or resurfaced for low volume (single family, duplex, farm, etc.) residential connections as directed by the Engineer.

2. Driveways construction is not required for low volume residential connections where roadway shoulders are paved.

3. Match existing paved shoulder widths of 4'. For all other shoulders conditions, construct at 5' wide.

4. Connections beyond the shoulder width are to be constructed as directed by the Engineer.

5. Construct Driveway Base in accordance with Specification 286.

6. Payment for structural course and friction course is to be included in roadway pavement pay item.
NOTES:
1. For joint seal dimensions see Sheet 2.
2. For slabs poured simultaneously, tie bars may be inserted in the plastic concrete by means approved by the Engineer.
3. For Longitudinal Joints:
   A. Tie bars are deformed #4 or #5 reinforcing steel bars meeting the requirements of Specification 931.
   B. Provide a standard load transfer tied joint with #4 bars 29" in length at 24" spacing or #3 bars 30" in length at 30" spacing.
4. Transverse joints are to be spaced at a maximum of 15'. Dowels are required at all transverse joints unless otherwise noted in the plans.
5. Expansion joints to be placed at street intersections and other locations as indicated in the Plans. For bridge expansion joints, see Index 370-001.
6. Punch clean holes in preformed joint filler greater than bar diameter.
7. Coat and lubricate plain steel dowel bars in accordance with Specification 350.

1. For joint seal dimensions see Sheet 2.
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3. For Longitudinal Joints:
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4. Transverse joints are to be spaced at a maximum of 15'. Dowels are required at all transverse joints unless otherwise noted in the plans.
5. Expansion joints to be placed at street intersections and other locations as indicated in the Plans. For bridge expansion joints, see Index 370-001.
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6. Punch clean holes in preformed joint filler greater than bar diameter.
7. Coat and lubricate plain steel dowel bars in accordance with Specification 350.
CONCRETE-CONCRETE JOINTS

CONCRETE-ASPHALT SHOULDER JOINTS

JOINT SEAL DIMENSIONS

BACKER ROD BOND BREAKER

TAPE BOND BREAKER

Note: Dimension w will be shown in the plans or established by the Engineer based on field conditions. Dimension d will be constructed so that the shape factor w/t has a maximum value of 2.0 and a minimum value of 1.6.
1. Longitudinal joints will not be required for single lane pavement 14' or less in width. For entrance and exit ramp joint details, see Sheet 4.

2. Arrangement of longitudinal joints are to be as directed by the Engineer.

3. All manholes, meter boxes and other projections into the pavement shall be boxed-in with ½" preformed expansion joint material.

ANCHOR BOLTS

Anchor bolts shall be Grade C in accordance with ASTM A 307. Threaded sleeves shall develop the full strength of the bolt and meet the material and thread requirements of ASTM A 563.

ALTERNATE KEYWAY AND HOOK BOLT

Steel Hook Bolt Assembly

Note: After the concrete has set to the extent that the Keyway will retain its shape, the hex bolt and plastic insert shall be removed. The remaining portion of the hook bolt assembly shall be installed immediately prior to placing of concrete in the adjacent lane.

CONTRACTION ASSEMBLY

Joint Arrangement

JOINT LAYOUT

At Thru Intersection

At 'T' Intersections

EXPANSION ASSEMBLY

Note: Proprietary contraction and expansion assemblies may be used. Products shall be introduced to the State Construction Office in accordance with section (C) of the Product Evaluation Procedure.
**CONCRETE PAVEMENT JOINTS**

**DESCRIPTION:**

**REVISION:** Standard Plans - FY 2020-21

**INDEX:** 350-001

**SHEET:** 4 of 4

**LAST REVISION:** 01/01/18

**ENTRANCE TAPER WITH AUXILIARY LANE**

- Contraction Joint (Typ.)
- Longitudinal Joint

**EXIT TAPER WITH AUXILIARY LANE**

- Contraction Joint (Typ.)
- Longitudinal Joint

**JOINT LAYOUT AT ENTRANCE AND EXIT RAMP TERMINALS**

- Transition From 12' to 13' Wide Over 3 Slabs
- Transition From 13' to 12' Wide Over 3 Slabs
- Transition From 13' to 12' Wide Over 3 Slabs

**2-THRU LANES WITH SINGLE LANE ENTRANCE RAMP**

- Contraction Joint (Typ.)
- Longitudinal Joint

**2-THRU LANES WITH SINGLE LANE EXIT RAMP**

- Contraction Joint (Typ.)
- Longitudinal Joint

**3-THRU LANES WITH AUXILIARY LANE AND 2-LANE EXIT RAMP**

- Contraction Joint (Typ.)
- Longitudinal Joint

Note: Transverse joint spacing should not exceed 15-ft or twenty-four times the slab thickness, whichever is less. If a lane exceeds 15-ft width, such as single lane ramps and weigh stations, longitudinal joint to be constructed in centerline of lane.
1. For Repair and Replacement Criteria see Sheet 2.

2. Full depth repairs consist of removing and replacing at least a portion of the existing slab to the bottom of the concrete.

3. Repair boundaries shall be sawed full-depth with diamond saw blades. On hot days, it may not be possible to make this cut without first making a wide, pressure relief cut within the repair boundaries. A carbide-tipped wheel saw may be used for this purpose, but the wheel saw must not intrude on the adjacent lane, unless the lane is slated for repair. The wheel saw cuts produce a ragged edge that promotes excessive spalling along joints. Hence, if wheel saw cuts are made, diamond saw cuts must be made 18 in. outside the wheel saw cuts. To prevent damage to the base, the wheel saw must not be allowed to penetrate more than 0.5 in. into the base.

4. No additional base or subgrade material shall be added and all loose base or subgrade material shall be removed prior to placement of the new concrete slab. The concrete slab shall be placed to the full depth of the material removed. No additional compensation will be allowed for additional concrete required to bring proposed concrete slab up to finished grade.

5. Removal of the damaged concrete pavement shall be by lifting. Any good concrete pavement which is damaged during removal of damaged areas shall be removed and replaced by the contractor at his expense.

6. If the roadway contract includes grinding, then the slab replacement shall be performed first.

7. During slab replacement operations, fill any saw cut overrun into adjacent slabs with epoxy.

8. Install tie bars at longitudinal joints when two full adjacent or multiple replaced slabs.
### SLAB REPAIR AND REPLACEMENT CRITERIA

<table>
<thead>
<tr>
<th>DISTRESS PATTERN</th>
<th>SEVERITY/DESCRIPTION</th>
<th>REPAIR METHOD</th>
<th>REFERENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CRACKING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Longitudinal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>&lt;1/16&quot; no faulting, spalling &lt;1/2&quot; wide</td>
<td>None</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>1/16&quot; - 1/8&quot; width, spalling 0 - 6&quot; wide</td>
<td>Clean and Seal</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td>Severe</td>
<td>&gt;1/8&quot; width, spalling &gt;6&quot; faulting &gt;1/2&quot;</td>
<td>Replace</td>
<td>Figure 10.3</td>
</tr>
<tr>
<td><strong>Transverse</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>&lt;1/16&quot; no faulting, spalling &lt;1/2&quot; wide</td>
<td>None</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td>Moderate</td>
<td>1/16&quot; - 1/8&quot; width, spalling 0 - 6&quot; wide</td>
<td>Clean and Seal</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td>Severe</td>
<td>&gt;1/8&quot; width, spalling &gt;6&quot; faulting &gt;1/2&quot;</td>
<td>Replace</td>
<td>Figure 10.3</td>
</tr>
<tr>
<td><strong>Corner Breaks</strong></td>
<td></td>
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</tr>
<tr>
<td>Light</td>
<td>A corner of the slab is separated by a crack that intersects the adjacent longitudinal and transverse joint, describing an approximate 90° angle with the direction of traffic.</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>Intersecting Random Cracks (Shattered Slab)</strong></td>
<td>Cracking patterns that divide the slab into three or more segments.</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td><strong>JOINT DEFICIENCIES</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Spall Nonwheel Path</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>spall width &lt;1/16&quot;, &lt; 1/8&quot; slab depth, &lt;12&quot; in length</td>
<td>None</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td>Moderate</td>
<td>1/16&quot; &lt;spall width &lt;3&quot;, &lt; 1/8&quot; slab depth, &lt;12&quot; in length</td>
<td>None</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td>Severe</td>
<td>spall width &gt;3&quot; or length &gt;12&quot;</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td><strong>Spall Wheel Path</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>spall width &lt;1/16&quot;, &lt; than 1/8&quot; slab depth, &lt;12&quot; in length</td>
<td>None</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td>Moderate</td>
<td>1/16&quot; &lt;spall width &lt;3&quot;, &lt; 1/8&quot; slab depth, &lt;12&quot; in length</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td>Severe</td>
<td>spall width &gt;3&quot; or length &gt;12&quot;</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td><strong>SURFACE DETERIORATION</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>Pop Outs Nonwheel Path</strong></td>
<td>Small pieces of surface pavement broken loose, normally ranging from 1 to 4 in. diameter and 1/8 to 2 in. in depth.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>Not deemed to be a traffic hazard</td>
<td>Keep under observation</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td>Severe</td>
<td>Flying debris deemed a traffic hazard</td>
<td>Full Depth</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td><strong>Pop Outs Wheel Path</strong></td>
<td>Small pieces of surface pavement broken loose, normally &gt;3&quot; diameter and 2&quot; in depth.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>Deemed to be a traffic hazard</td>
<td>Full Depth</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td>Severe</td>
<td>Flying debris deemed a traffic hazard</td>
<td>Full Depth</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td><strong>MISCELLANEOUS DISTRESS</strong></td>
<td></td>
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<tr>
<td><strong>Faulting</strong></td>
<td>Elevation differences across joints or cracks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light</td>
<td>Faulting &lt;4/32&quot;</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>4 &lt;Faulting &lt;16/32&quot;</td>
<td>Grind</td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>Faulting &gt;16/32&quot;</td>
<td>Grind</td>
<td></td>
</tr>
<tr>
<td><strong>Lane To Shoulder Drop Off</strong></td>
<td>0 &lt;width &lt;1&quot;</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td>Moderate</td>
<td>1&quot; &lt;drop-off &lt;3&quot;</td>
<td>Build Up</td>
<td>N/A</td>
</tr>
<tr>
<td>Severe</td>
<td>drop-off &gt;3&quot;</td>
<td>Build Up</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Water Bleeding Or Pumping</strong></td>
<td>Seeping or ejection of water through joints or cracks.</td>
<td>Install appropriate drainage, edge drain, permeable subbase, reseal joints, etc.</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Blowups</strong></td>
<td>Upward movement at transverse joints or cracks often accompanied by shaking of the concrete.</td>
<td>Full Depth</td>
<td>Figure 10.3 and 10.4</td>
</tr>
</tbody>
</table>
REVISION DESCRIPTION:
LAST REVISION
01/01/19
STANDARD PLANS
FY 2020-21
BRIDGE APPROACH EXPANSION JOINT CONCRETE PAVEMENT WITH SPECIAL SELECT SOIL BASE
INDEX 370-001
1 of 1

GENERAL NOTES:
1. For asphalt base, use four expansion joints per Index 350-001.
2. The centerline of roadway and the centerline of bridge do not necessarily coincide. Determine the centerline of the roadway pavement prior to the placement of the expansion joint.
3. For information on other types of concrete pavement joints see Index 350-001.
4. Pay quantity for expansion joint is the length of joint to be constructed across the roadway and shoulder pavements, measured at right angles to the centerline of the roadway. Payment for expansion joint is full compensation for joint construction, including reinforced concrete subslab, sheet metal strip and compression seal, but, not including roadway pavement reconstruction associated with joint replacement or reconstruction. Expansion joint to be paid for under the contract unit price for Bridge Approach Expansion Joint, LF.

Sheet Metal Strip Details

Joint Dimensions

Compression Seal Details

Rigid Shoulder Pavement

Sodded Shoulder or Flexible Shoulder Pavement

Notes:
1. Immediately prior to placing the seal, thoroughly clean the joint of all foreign material. Immediately after the seal is placed, bend up the sheet metal strip against the pavement edge.
2. Use a minimum 16 gauge steel, 12" wide sheet metal strip, Galvanized in accordance with ASTM A-526, Coating Designation G90.
3. Finish surface smooth. Cure with heavy coating of wax base white pigmented curing compound. Apply second application immediately prior to placing pavement.
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