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.
**Areas for One 5' Deep Driveway Apron (SY)**

### 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 ± 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.

### Driveway Types
- **Type I** - Typical Automobile Traffic
- **Type II** - Typical Truck-Trailer Traffic

### Material Types and Thicknesses for Paved Connections

<table>
<thead>
<tr>
<th>Course</th>
<th>Materials</th>
<th>Minimum Thickness (in)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Roadway*</td>
</tr>
<tr>
<td>Structural</td>
<td>Asphaltic Concrete</td>
<td>1 1/2&quot;, 1 1/2&quot;</td>
</tr>
<tr>
<td>Bases</td>
<td>Optional Base (See Specification 286)</td>
<td>0.6&quot;, 2, 0.6&quot;, 3</td>
</tr>
</tbody>
</table>

**Notes:**
1. Use same material for driveway structural course and roadway overbuild or structural course, except as approved by the Engineer for graded connections. Other Department-approved equivalent pavements may be used at the discretion of the Engineer.
2. Auxiliary lanes and their transition tapers shall be the same structure as the abutting travel way pavement thickness or any of the roadway structures tabulated above, whichever is thicker.
3. If an asphalt base course is used for a driveway, its thickness may be increased to match the edge of travel way pavement thickness in lieu of a separate structural course. 6" of Portland cement concrete will be acceptable in lieu of the asphalt base and structural courses. See Notes 4 and 5 below.
4. A structural course is required for flexible pavements when they are used for auxiliary lanes serving more than a single connection.
5. Use Class K5 concrete at least 6" thick for driveways paved with Portland Cement Concrete. Construct in accordance with Specifications 347, 350, and 522.
6. The Department may require other pavement criteria where local conditions warrant.

### Driveway Apron
- **Section AA - New Construction**
- **Section AA - Resurfacing**

---

**Paved Driveway Apron**

- **Detail "A"**
- **Friction Course (FC)**
- **Structural Course**
- **Existing Base**
- **Match Existing**
- **New Structural Course**
- **New Structural Course or Overbuild**

---

**New Driveway**

- **New Structural Course or Overbuild**
- **Friction Course (FC)**
- **Existing Structural Course**
- **Match Existing**
- **Existing Structural Course**
- **Structural Course**

---

**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 30" spacing or #3 bars 30" in length at 36" spacing.
4. Transverse joint 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.
8. Sheet metal bottom strips in accordance with Specification 931.

For Longitudinal Joints:
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.
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8. Sheet metal bottom strips in accordance with Specification 931.

METAL

DOWEL BARS CAPS

PLASTIC

DOWEL BAR LAYOUT

CONCRETE PAVEMENT JOINTS

INDEX

FY 2019-20
STANDARD PLANS
### Joint Sealant Material To Be As Specified In The Plans

- **Concrete-Congcrete Joints**
  - Joint Sealant Material To Be As Specified In The Plans
  - Tape Bond Breaker

- **Concrete-Asphalt Shoulder Joints**
  - Joint Sealant Material To Be As Specified In The Plans
  - Tape Bond Breaker
  - Backer Rod Bond Breaker

### Joint Dimensions (Inches)

<table>
<thead>
<tr>
<th>Joint Width</th>
<th>Sealant Bead Thickness</th>
<th>Backer Rod Dia.</th>
<th>Minimum Joint Depth</th>
<th>Backer Rod Placement Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>1/8</td>
<td>1/8</td>
<td>1/16</td>
<td>1/8</td>
</tr>
<tr>
<td>1/4</td>
<td>1/4</td>
<td>1/4</td>
<td>1/16</td>
<td>1/4</td>
</tr>
<tr>
<td>3/16</td>
<td>3/16</td>
<td>3/16</td>
<td>1/16</td>
<td>3/16</td>
</tr>
<tr>
<td>1/2</td>
<td>1/2</td>
<td>1/2</td>
<td>1/16</td>
<td>1/2</td>
</tr>
<tr>
<td>3/8</td>
<td>3/8</td>
<td>3/8</td>
<td>1/16</td>
<td>3/8</td>
</tr>
<tr>
<td>1/2</td>
<td>1/2</td>
<td>1/2</td>
<td>1/16</td>
<td>1/2</td>
</tr>
<tr>
<td>3/4</td>
<td>3/4</td>
<td>3/4</td>
<td>1/16</td>
<td>3/4</td>
</tr>
<tr>
<td>1</td>
<td>1/2</td>
<td>1/2</td>
<td>1/16</td>
<td>1/2</td>
</tr>
<tr>
<td>&gt;1</td>
<td>1/2</td>
<td>1/2</td>
<td>1/16</td>
<td>1/2</td>
</tr>
</tbody>
</table>

*Unless otherwise indicated on the plans the joint width for new construction will be 1/8 for construction joints, 1/4 for all other joints.*

*For rehabilitation projects the joint width will be shown on the plans or established by the Engineer based on field conditions.*

---

**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 1.0.
**CONCRETE PAVEMENT JOINTS**

**ALTERNATE KEYWAY AND HOOK BOLT**

**STEEL HOOK BOLT ASSEMBLY**

**NOTES**

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 1/2" preformed expansion joint material.

**JOINT ARRANGEMENT**

**CONTRACTION ASSEMBLY**

**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.
12' Wide Over 3 Slabs

Transition From 13' to 12' Wide Over 3 Slabs

CONCRETE PAVEMENT JOINTS

2-THRU Lanes with single lane entrance ramp

Entrance ramp with added lane

2-THRU Lanes with single lane exit ramp

3-THRU lanes with auxiliary lane and 2-lane exit ramp

Joint layout at entrance and exit ramp terminals

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.
**GENERAL NOTES**

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>Longitudinal</td>
<td>Light: &lt;1/8&quot; no faulting, spalling &lt;1/2&quot; wide</td>
<td>None</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td></td>
<td>Moderate: 1/8&quot; - 1/2&quot; width, spalling &lt;1&quot; wide</td>
<td>Clean and Seal</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td></td>
<td>Severe: width &gt;1/8&quot;, spalling &gt;1&quot; faulting &gt;1/2&quot;</td>
<td>Replace</td>
<td>Figure 10.3</td>
</tr>
<tr>
<td>Transverse</td>
<td>Light: &lt;1/8&quot; no faulting, spalling &lt;1/2&quot; wide</td>
<td>None</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td></td>
<td>Moderate: 1/8&quot; - 1/2&quot; width, spalling &lt;1&quot; wide</td>
<td>Clean and Seal</td>
<td>Figure 10.2</td>
</tr>
<tr>
<td></td>
<td>Severe: width &gt;1/8&quot;, spalling &gt;1&quot; faulting &gt;1/2&quot;</td>
<td>Replace</td>
<td>Figure 10.3, 10.4 and 10.5</td>
</tr>
<tr>
<td>Corner Breaks</td>
<td>A corner of the slab is separated by a crack that intersects the adjacent longitudinal and transverse joint, describing an approximate 45° angle with the direction of traffic.</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td>Intersecting Random Cracks (Shattered Slab)</td>
<td>Cracking patterns that divide the slab into three or more segments.</td>
<td>Full Depth</td>
<td>Figure 10.3 and 10.4</td>
</tr>
<tr>
<td><strong>Joint Deficiencies</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spall Nonwheel Path</td>
<td>Light: spall width &lt;1/16&quot;, &lt; 1/2 slab depth, &lt;12&quot; in length</td>
<td>None</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td></td>
<td>Moderate: 1/16&quot; &lt;spall width &lt;3&quot;, &lt; 1/2 slab depth, &lt;12&quot; in length</td>
<td>None</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td></td>
<td>Severe: 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>Spall Wheel Path</td>
<td>Light: spall width &lt;1/16&quot;, &lt;1/2 slab depth, &lt;12&quot; in length</td>
<td>None</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td></td>
<td>Moderate: 1/16&quot; &lt;spall width &lt;3&quot;, &lt; 1/2 slab depth, &lt;12&quot; in length</td>
<td>Full Depth</td>
<td>Figure 10.4 and 10.5</td>
</tr>
<tr>
<td></td>
<td>Severe: 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>
<td></td>
<td></td>
</tr>
<tr>
<td>Pop Outs Nonwheel Path</td>
<td>Light: Not deemed to be a traffic hazard</td>
<td>Keep under observation</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td></td>
<td>Severe: Flying debris deemed a traffic hazard</td>
<td>Full Depth</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td>Pop Outs Wheel Path</td>
<td>Light: Deemed to be a traffic hazard</td>
<td>Full Depth</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td></td>
<td>Severe: 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>
<td></td>
<td></td>
</tr>
<tr>
<td>Faulting</td>
<td>Light: Faulting &lt;4/32&quot;</td>
<td>None</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td></td>
<td>Moderate: 4/32&quot; &lt;Faulting &lt;16/32&quot;</td>
<td>Grind</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td></td>
<td>Severe: Faulting &gt;16/32&quot;</td>
<td>Grind</td>
<td>Figure 10.4</td>
</tr>
<tr>
<td>Lane To Shoulder Drop Off</td>
<td>Light: 0 &lt;drop-off &lt;1&quot;</td>
<td>None</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Moderate: 1&quot; &lt;drop-off &lt;3&quot;</td>
<td>Build Up</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Severe: drop-off &gt;3&quot;</td>
<td>Build Up</td>
<td>N/A</td>
</tr>
<tr>
<td>Water Bleeding Or Pumping</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>Blowups</td>
<td>Upward movement at transverse joints or cracks often accompanied by shattering of the concrete.</td>
<td>Full Depth</td>
<td>Figure 10.3 and 10.4</td>
</tr>
</tbody>
</table>
**3.** For rehabilitation projects, the designer must indicate in the plans the number of slabs to be removed, the number of subslabs to be constructed/reconstructed, and the location of expansion joints.

2. Pay quantity of expansion joint to be calculated across pavement at right angles to the centerline of the roadway. Shoulder pavement joint included.

**GENERAL NOTES**

1. The centerline of roadway and the centerline of bridge do not necessarily coincide. Prior to the placement of the expansion joint, the centerline of the roadway pavement shall be determined.

2. For information on other types of concrete pavement joints see Index 350-001.

3. 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 shall be 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.

**SECTION AA**

**EXPANSION JOINT**

---

**REINFORCING STEEL**

<table>
<thead>
<tr>
<th>Mark</th>
<th>Size</th>
<th>Dia.</th>
<th>No. Req'd</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>5/16</td>
<td>1</td>
<td>10</td>
<td>5'-0&quot;</td>
</tr>
<tr>
<td>D</td>
<td>5/16</td>
<td>1</td>
<td>10</td>
<td>W Minus 3&quot;</td>
</tr>
</tbody>
</table>

---

**OPTIONAL SEALS**

- Polychloroprene Compression Seal Installed As Per Manufacturer's Specifications.
- Note: All contacting surfaces between the compression seal and concrete shall be thoroughly coated with a lubricant-adhesive.

**JOINT DIMENSIONS**

**COMPRESSION SEAL DETAIL**

---

**DETAILED SHOWING SHEET METAL STRIP**

---

**WITH RIGID SHOULD PAVEMENT**

---

**WITH GRASSED SHOULDER OR FLEXIBLE SHOULDER PAVEMENT**

---

**DESIGN NOTES**

1. Expansion Joints Shall Be Constructed Parallel To The Existing Transverse Pavement Joints On Rehabilitation Projects, And Parallel To The Standard Transverse Pavement Joints Shown In The Plans For New Construction.

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**PLAN**

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**CONCRETE PAVEMENT**

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**BRIDGE APPROACH EXPANSION JOINT**

---

**CONCRETE PAVEMENT**

---

**INDEX**

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**SHEET**

---

**FOR INFORMATION ON OTHER TYPES OF CONCRETE PAVEMENT JOINTS SEE INDEX 350-001.**