Pavement Rehabilitation
## Pavement Rehabilitation

<table>
<thead>
<tr>
<th>NO.</th>
<th>DATE</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PR-101</td>
<td>04-21-15</td>
<td>Full Depth Patch with 'EF' Joint in PCC</td>
</tr>
<tr>
<td>PR-102</td>
<td>04-21-20</td>
<td>Full Depth PCC Patch without Dowels</td>
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<td>PR-103</td>
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</tr>
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<tr>
<td>PR-202</td>
<td>10-21-14</td>
<td>Notches for Resurfacing (with or without Runout)</td>
</tr>
</tbody>
</table>
SECTION A-A
MODIFIED SUBBASE AND SUBDRAIN

PAVEMENT REMOVAL DETAILS

FULL ROADWAY WIDTH PATCH

TYPICAL HALF PLAN

DRAIN PLACEMENT

SECTION A-A
DOWELED PCC PAVEMENT

POSSIBLE CONTRACT ITEMS:
Joint Assembly, EF
Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

POSSIBLE TABULATION:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area

FULL DEPTH PATCH
WITH "EF" JOINT IN PCC

Break out concrete within 1/2" of saw cut with hand tools to ensure near vertical face with minimal undercut or protrusion. No need to remove protrusions smaller than 2 inches if uniformly tapered from bottom of saw cut to bottom of pavement. A step or ledge on this face will not be allowed.

12 inches Modified Subbase is required under Full Depth Patch with "EF" Joint. Retard Modified Subbase over longitudinal subdrain, if present.

Unless noted otherwise in the plans, depth of patch, T, is 12 inches regardless of existing pavement thickness.

If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place Patch Subdrain at low end(s) of patch.

Possible Contract Items:
Joint Assembly, EF
Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area

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Possible Contract Items:
Joint Assembly, EF
Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
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Joint Assembly, EF
Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
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Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area

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Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area

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Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area

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WITH "EF" JOINT IN PCC

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Patches, Full-Depth Repair
Patches by Count (Repair)
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Patch Subdrain
Subbase Patch with EF Joint

Possible Tabulation:
Subbase Patch with EF Joint
Patch Subdrain
Porous Backfill in length
Patches, Full-Depth Finish, by Count
Patches, Full-Depth Finish, by Area
Construct rectangular patches even when existing pavement joints are skewed.

1. Joint spacing 10 feet minimum, 17 feet maximum, 15 feet optimum.

2. The face of the patch should be near vertical. Protrusions less than 2 inches need not be removed if uniformly tapered from bottom of saw cut to bottom of patch. A step or ledge on this face will not be allowed.

3. If resurfacing is part of the contract, do not saw or seal joint after patching. If patch is not to be surfaced, then saw and seal according to PV-101.

4. If resurfacing is part of the contract, saw 'C' joints, but do not seal. If the patch is not to be resurfaced, then saw and seal according to PV-101.

5. Establish a new joint at approximate mid patch. This joint does not need to align with any existing joint or crack in adjacent pavement.

6. 'B' joint if end of patch does not match an existing joint or crack in the adjacent lane.

7. If one lane patch exceeds 50 feet, both lanes should be considered for patching.

8. Possible Subbase Patch, see PR-140.

9. If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place drain per PR-140.

10. Saw cut through overlay so that cut is 1/2 inches into original pavement.

Possible Contract Items:
- CT Joint
- Patches, Full-Depth Repair
- Patches by Count (Repair)
- Patches, Full-Depth Finish, by Count
- Patches, Full-Depth Finish, by Area
- Patches, Full-Depth Finish, by Area (50 feet or greater in length)

Possible Tabulation:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Partial Lane Width Patch</td>
<td>3' min.</td>
</tr>
<tr>
<td>Partial Lane Width Patch</td>
<td>3' min.</td>
</tr>
<tr>
<td>Partial Lane Width Patch</td>
<td>6' min.</td>
</tr>
<tr>
<td>Partial Lane Width Patch</td>
<td>2' min.</td>
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<tr>
<td>ONE LANE WIDTH PATCH</td>
<td></td>
</tr>
<tr>
<td>ONE LANE WIDTH PATCH</td>
<td></td>
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<tr>
<td>ONE LANE WIDTH PATCH</td>
<td></td>
</tr>
<tr>
<td>ONE LANE WIDTH PATCH</td>
<td></td>
</tr>
<tr>
<td>FULL ROADWAY WIDTH PATCH</td>
<td>5' min.</td>
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<tr>
<td>FULL ROADWAY WIDTH PATCH</td>
<td>5' min.</td>
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<tr>
<td>FULL ROADWAY WIDTH PATCH</td>
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<tr>
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<td>5' min.</td>
</tr>
<tr>
<td>FULL ROADWAY WIDTH PATCH</td>
<td>5' min.</td>
</tr>
</tbody>
</table>

See PV-101 for joint and bar placement details.

- Joint spacing 10 feet minimum, 17 feet maximum, 15 feet optimum.
- The face of the patch should be near vertical. Protrusions less than 2 inches need not be removed if uniformly tapered from bottom of saw cut to bottom of patch. A step or ledge on this face will not be allowed.
- If resurfacing is part of the contract, do not saw or seal joint after patching. If patch is not to be surfaced, then saw and seal according to PV-101.
- If resurfacing is part of the contract, saw 'C' joints, but do not seal. If the patch is not to be resurfaced, then saw and seal according to PV-101.
- Establish a new joint at approximate mid patch. This joint does not need to align with any existing joint or crack in adjacent pavement.
- 'B' joint if end of patch does not match an existing joint or crack in the adjacent lane.
- If one lane patch exceeds 50 feet, both lanes should be considered for patching.
- Possible Subbase Patch, see PR-140.
- If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place drain per PR-140.
- Saw cut through overlay so that cut is 1/2 inches into original pavement.

Possible Contract Items:
- CT Joint
- Patches, Full-Depth Repair
- Patches by Count (Repair)
- Patches, Full-Depth Finish, by Count
- Patches, Full-Depth Finish, by Area
- Patches, Full-Depth Finish, by Area (50 feet or greater in length)

Possible Tabulation:

<table>
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<tr>
<th>Option</th>
<th>Description</th>
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<tr>
<td>CT Joint</td>
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<tr>
<td>Full-Depth Repair</td>
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</tr>
<tr>
<td>Count (Repair)</td>
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</tr>
<tr>
<td>Full-Depth Finish, Count</td>
<td></td>
</tr>
<tr>
<td>Full-Depth Finish, Area</td>
<td></td>
</tr>
<tr>
<td>Full-Depth Finish, Area</td>
<td></td>
</tr>
<tr>
<td>Total Feet</td>
<td></td>
</tr>
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</table>

Possible Tabulation:

<table>
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<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT Joint</td>
<td>3' min.</td>
</tr>
<tr>
<td>Full-Depth Repair</td>
<td>3' min.</td>
</tr>
<tr>
<td>Count (Repair)</td>
<td>3' min.</td>
</tr>
<tr>
<td>Full-Depth Finish, Count</td>
<td>3' min.</td>
</tr>
<tr>
<td>Full-Depth Finish, Area</td>
<td>3' min.</td>
</tr>
<tr>
<td>Total Feet</td>
<td>3' min.</td>
</tr>
</tbody>
</table>

See PV-101 for joint and bar placement details.
See PV-101 for joint and bar placement details.

Construct rectangular patches even when existing pavement joints are skewed.

1. Joint spacing 10 feet minimum, 17 feet maximum, 15 feet optimum.
2. If there is no existing joint or crack in the adjacent pavement, place a 'CT' joint. If there is an existing joint or crack in the adjacent pavement, place a 'CD' joint at the same transverse location. Saw but do not seal 'CT' joints.
3. New 'CD' joint must be a minimum 5 feet from the joint end.
4. Do not saw or seal the joint. Place 1 inch preformed joint material between patch and concrete in adjacent lane.
5. If one lane patch exceeds 50 feet, both lanes should be considered for patching.
6. Possible Subbase Patch, see PR-140.
7. If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place drain per PR-140.

Possible Contract Items:
- CD Joint Assembly
- CT Joint
- Patches by Count (Repair)
- Patches, Full-Depth Finish, by Area
- Patches, Full-Depth Finish, by Count
- Patches, Full Depth Finish, by Area (50 feet in length or greater)
- Patches, Full-Depth Repair

Possible Tabulation:

**FULL DEPTH PCC PATCH WITH DOWELS**

**BAR SIZE TABLE**

<table>
<thead>
<tr>
<th>BAR SIZE</th>
<th>沖</th>
<th>冲</th>
<th>冲</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWEL SIZE</td>
<td>冲</td>
<td>冲</td>
<td>冲</td>
</tr>
<tr>
<td>TIE BAR SIZE</td>
<td>冲</td>
<td>冲</td>
<td>冲</td>
</tr>
</tbody>
</table>

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DETAIL FOR 'RT' OR 'RD' JOINT BAR SPACING

TYPICAL HALF PLAN

For interior lanes, place first bar 12" from edge of lane (slab).

LONGITUDINAL SECTION THRU PATCH

Pavement smooth and graded to a uniform elevation.

PAVEMENT REMOVAL DETAILS

**FULL ROADWAY WIDTH PATCH**

**ONE LANE WIDTH PATCH**

**PARTIAL LANE WIDTH PATCH**

**SHOW IS 1 OF 1**

REVISION: 2 04-21-20

APPROVED BY DESIGN METHODS ENGINEER

STANDARD ROAD PLAN

PR-103

REVISIONS: Removed INTERIM from the standard

PV-101

**Possible Tabulation:**

- **Patches, Full-Depth Finish, by Area (50 feet or greater in length)**
- **Patches, Full-Depth Repair**
- **Patches, Full-Depth Finish, by Count**
- **Patches by Count (Repair)**

**Possible Contrast Items:**
- PR-140
- PV-101
- PR-104

**Possible Subdrain Patch, see PR-140:**

1. If patch is over 10 feet in length, replace tie bars. See PV-101 for joint details.
2. Exercise care to preserve the 29 inch length of longitudinal steel when removing concrete.
3. 18 inch minimum lap between existing and new reinforcing bars 24 inch minimum for mesh. For patches 8 feet to 40 feet, no intermediate lap joint required. For patches over 40 feet in length, lap joint as required to not exceed 40 feet spacing.
4. Do not saw or seal the joint after patch is placed.
5. If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place drain per PR-140.

**New. Replaces RR-18.**

**APPROVED BY DESIGN METHODS ENGINEER**

**STANDARD ROAD PLAN**

**FULL DEPTH PATCH**

**CONTINUOUS REINFORCED PCC PAVEMENT**
See PV-101 for joint and bar placement details.

1. Joint spacing 10 feet minimum, 17 feet maximum, 15 feet optimum.
2. If there is no existing joint or crack in the adjacent pavement, place a 'CT' joint. If there is an existing joint or crack in the adjacent pavement, place a 'CD' joint at the same transverse location. Saw but do not seal 'CT' joints.
3. New 'CD' joint must be a minimum 5 feet from the patch end.
4. Do not saw or seal the joint. Place 1/8 inch preformed joint material between patch and concrete in adjacent lane.
5. Do not saw a new joint.

Possible Tabulation:

- Patches, Full-Depth Finish, by Area
- Patches, Full Depth Finish, by Count
- Patches, Full Depth Finish, by Area (50 feet in length or greater)
- Patches, Full-Depth Repair

Possible Contract Items:
- CD Joint Assembly
- CT Joint
- Patches, Full-Depth Finish, by Area
- Patches, Full Depth Finish, by Count
- Patches, Full Depth Finish, by Area (50 feet in length or greater)
- Patches, Full-Depth Repair

**PARTIAL RAMP WIDTH PATCHES**

(NO EXISTING LONGITUDINAL JOINT)
FULL RAMP WIDTH PATCHES
(NO EXISTING LONGITUDINAL JOINT)

FULL RAMP WIDTH PATCHES
(EXISTING LONGITUDINAL JOINT)

1. Joint spacing 10 feet minimum, 20 feet maximum, 15 feet optimum.
2. New "CD" joint must be a minimum 5 feet from the patch end.
3. Do not saw a new joint.

NEW INTERIM Joint

Joint Spacing

May require "CD" joints

EXISTING LONGITUDINAL JOINT

FULL DEPTH RAMP PCC PATCH
WITH DOWELS
**PD** or **RT** joint

**Existing Pavement**
- Full depth Saw Cut
- Removal of subbase or subgrade as required by plan.

**Before**

- **Concrete Removal Area**
- **Removal of subbase or subgrade** if required by plan.

**After**

- **PCC Pavement**
- **Dowels or Tie Bars**
- **Composite Pavement**
- Subgrade smooth and graded to a uniform elevation.

**Bar Size Table**

<table>
<thead>
<tr>
<th>Size</th>
<th>#6</th>
<th>#10</th>
<th>#11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pav</td>
<td>2&quot;</td>
<td>3&quot;</td>
<td>4&quot;</td>
</tr>
</tbody>
</table>

**Details for **'RT'** or **'RD'** Joint Bar Spacing**

**Typical Half Plan**

**Longitudinal Section Thru Patch**

**Notes:**
1. Possible Subbase Patch, see PR-140.
2. If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place drain per PR-140.
Possible Patch Locations:
- Partial Depth PCC Joint and Crack Repair Patches
- Partial Depth PCC Finish Patches
- Overdepth Patches

Possible Contract Items:
- Finish Patches
- Joint and Crack Repair Patches
- Partial Depth
- Overdepth

TYPICAL SECTION

PARTIAL DEPTH PATCH

OVERDEPTH PATCH

Possible Joint or Crack

1. One per panel.
2. If joint or crack is within patch area, construct bottom edge of patch at least 3 inches beyond crack or joint.

See PV-101 for jointing.

Pay limits for PV-101 for jointing.
**CLASS I CRACK**
Random Crack Less Than \( \frac{3}{4} \) in Width

**CLASS II CRACK**
Random Crack \( \frac{3}{4} \) To \( \frac{1}{2} \)

**CLASS III JOINT**
Existing Joint \( \frac{3}{8} \) Wide Or Less

**CLASS IV JOINT**
Existing Width \( \frac{1}{2} \) To \( \frac{3}{4} \)

**CLASS V CRACK OR JOINT**
Existing Width \( \frac{3}{4} \) To 3"

---

**ALTERNATE BOND BREAKER FOR**
CLASS II CRACK
CLASS IV JOINT
CLASS V CRACK OR JOINT

---

**GREATER THAN 3" OPENING**

**BACKER ROD PLACEMENT DETAIL**

- **X** = \( \frac{1}{8} \) Minimum when width is 1" or less
- **2:1 (Width:Depth)** when width is greater than 1"
- Minimum diameter of one nominal size larger than the existing crack or joint

---

**Notes:**
- Center saw cut over the crack
- Note: Center saw cut over existing joint
- Examples: tape, backer rod, or tongue depressor used as dam to prevent loss of sealant
- Sand or other material used for backer rod
- Bond breaker (approx. depth needed for backer rod)
- Depth of cut
- Pavement
- Shoulder
- Sealant
- Backer Rod

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**Cleaning and Filling PCC Crack and Joint**

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**Revisions:**

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**Approval:**
Design Methods Engineer

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**Revision:**
10-21-14

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**Standard Road Plan**
PR-110
Sheet 1 of 1

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**PR-110**
PCC Crack and Joint Cleaning and Filling
Price bid for standard pavement of the specified thickness is full compensation for constructing the pavement as detailed hereon and elsewhere in the plans, including all necessary reinforcement and expansion joints as required on this project.

See PV-101 for joint details.

Provide minimum 2 inches clearance for all reinforcement.

Construction Joints will be allowed if:
A. Joint is located at center of culvert.
B. Joint is a minimum of 8 feet from edge of culvert.
C. Two joints may be used if condition B is met and center panel is a minimum of 10 feet in length.

 Refer to typical sections elsewhere in the plans for pavement thickness.

Existing Pavement Joints:
A. When joints are 'C'; use 'B' joint.
B. When joints are 'CD'; use 'RD' joint.
C. If existing pavement is HMA or Composite (HMA over PCC), use 'B' joint.

New Pavement Joints:
A. When joints are 'C'; use 'B' joint.
B. When joints are 'CD'; use 'RD' joint.

Place Pavement Joint no closer than 5 feet from existing joint.

Lap all bars 15 inches.

Limits of excavation and type of backfill are shown elsewhere on the plans.

Extend Double Reinforced Pavement a minimum of 10 feet beyond limits of excavation.

No. 5 Bars at 12-inch centers. Transverse bars are 24'-6" long. Longitudinal bars are variable length.
Price bid for standard pavement of the specified thickness is full compensation for constructing the pavement as detailed, including all necessary reinforcement and expansion joints as required on this sheet. See PV-101 for joint details.

Provide minimum 2 inch clearance for all reinforcement.

1. Refer to typical sections elsewhere in the plans for pavement thickness [1].
2. Limits of excavation and type of backfill are shown elsewhere on the plans.
3. Extend Double Reinforced Pavement a minimum of 10 feet beyond the limits of excavation.
4. Place joint no closer than 5 feet from existing joint.

Additional Panels, as required

Concrete Panel
Double Reinforced

Reinforcing Bar

Possible Existing Joint

Limits of Excavation

Roadway

SECTION - TYPICAL INSTALLATION

PLAN - TYPICAL INSTALLATION

DETAIL 'B'

PARTIAL LONGITUDINAL SECTION

DETAIL 'A'

SECTION A-A

Half Section
MODIFIED SUBBASE AND SUBDRAIN

IF LONGITUDINAL SUBDRAIN IS PRESENT OR IS TO BE PLACED

1. 6 inches Modified Subbase (no RAP) if required by plan. When placed, extend Modified Subbase (no RAP) over longitudinal subdrain, if present.

2. If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place Patch Subdrain at low end(s) of patch.

MODIFIED SUBBASE AND SUBDRAIN

WITHOUT LONGITUDINAL SUBDRAIN

3. Longitudinal Subdrain
   Existing or to be Placed

4. Proposed Patch

   Replace Shoulder segment
   in kind, 6" min. depth.

5. Shoulder. Replace in kind 6" min.
   depth over subdrain outlet.

6. Impervious fill
   Min. 6" thick.

7. Patch Subdrain

   Porous Backfill

   6" Modified Subbase (no RAP)
### Table of Runout Ratios

<table>
<thead>
<tr>
<th>Posted Speed Limit (mph)</th>
<th>Runout Ratio (ft per inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 40</td>
<td>50</td>
</tr>
<tr>
<td>20 to 40</td>
<td>25</td>
</tr>
<tr>
<td>Under 20</td>
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</tbody>
</table>

*Based on turning maneuvers at side roads and intersections.*

**Possible Contract Item:** Pavement Scarification

**Possible Tabulations:**
- 100-25
- 102-16

**New**
- Replaces 7301, 7302, 7303, 7304, 7310 and 7311.

APPROVED BY DESIGN METHODS ENGINEER

**DESIGNER INFORMATION**

**STANDARD ROAD PLAN**

**PR-201**

**REVISIONS:**
- New
- 10-21-14

**RUNOUTS FOR RESURFACING**
RESURFACING OF MILLED AREAS

TYPE 'N1'
SURFACE NOTCH FOR SINGLE COURSE RESURFACING

TYPE 'N2'
SINGLE COURSE RESURFACING OF MILLED AREAS

TYPE 'N3'
SURFACE NOTCH - INTERMEDIATE RUNOUT FOR DOUBLE COURSE RESURFACING

TYPE 'N4'
DOUBLE COURSE RESURFACING OF MILLED AREAS

TYPE 'N5'
SURFACE NOTCH - INTERMEDIATE RUNOUT FOR RESURFACING OF MILLED AREAS

Possible Contract Item:
Pavement Scarification

Possible Tabulations:
100-25
102-16

* Based on turning maneuvers at side roads and intersections.

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New. Replaces 7305, 7306, 7307, 7308 and 7309.

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NOTCHES FOR RESURFACING
(WITH OR WITHOUT RUNOUT)