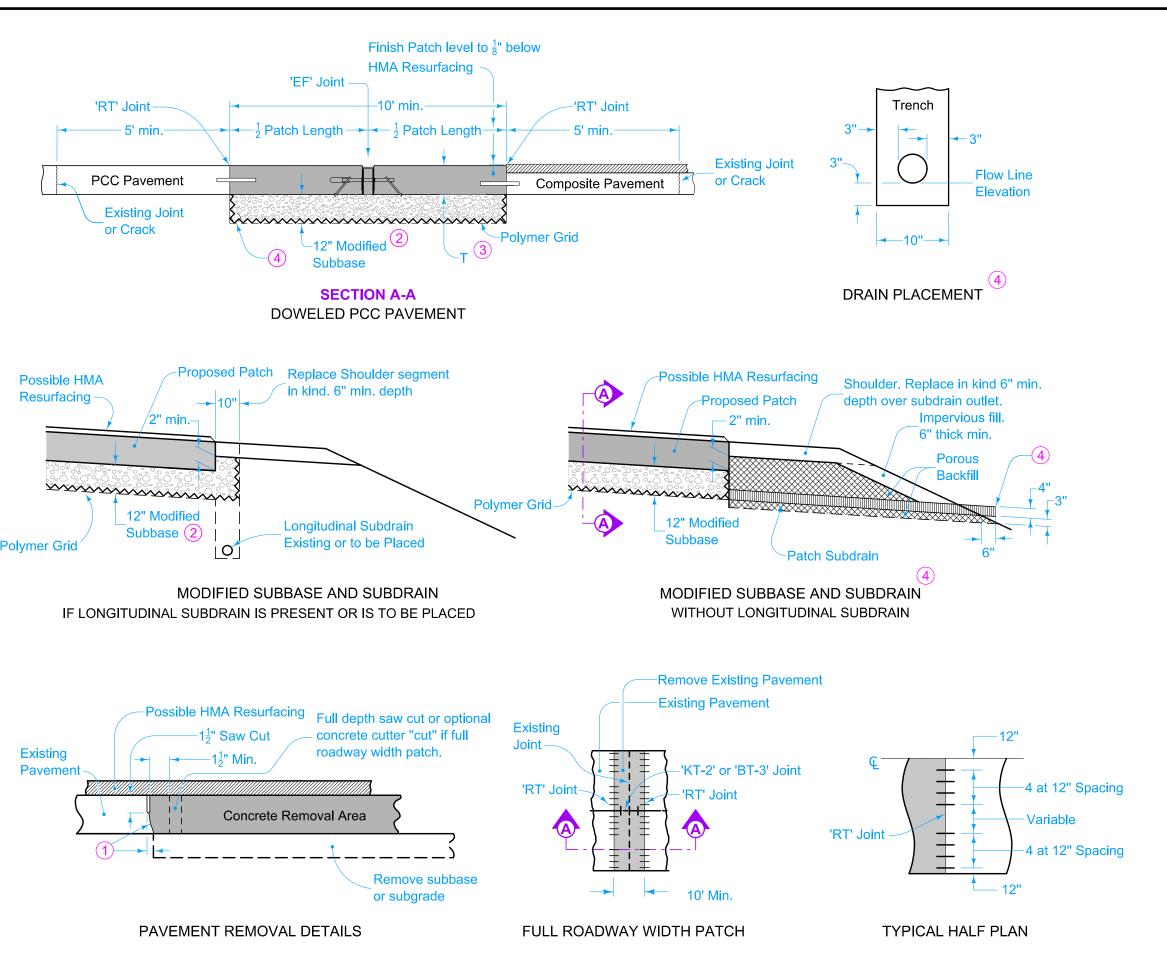
# Pavement Rehabilitation

PR

# **Pavement Rehabilitation**

NO.	DATE	TITLE
PR-101	04-21-15	Full Depth Patch with 'EF' Joint in PCC
PR-102	04-21-20	Full Depth PCC Patch without Dowels
PR-103	10-17-23	Full Depth PCC Patch with Dowels
PR-104	10-21-14	Full Depth Patch continuous Reinforced PCC Pavement
PR-105	10-17-23	Full Depth Ramp PCC Patch with Dowels
PR-107	10-16-18	Partial Depth PCC Finish Patches
PR-109	10-15-24	Cross Stitching of PCC Pavement
PR-110	10-21-14	PCC Crack and Joint Cleaning and Filling
PR-120	04-21-20	Double Reinforced Pavement Over Box Culverts
PR-121	04-21-20	Reinforced Concrete Panel at Box Culvert
PR-140	04-21-15	Subbase Patches
PR-201	10-21-14	Runouts for Resurfacing
PR-202	10-21-14	Notches for Resurfacing (with or without Runout)



Place Full Depth Patch with 'EF' Joint after the final lift of asphalt has been placed. Porous Backfill and Subdrain may be placed prior to construction of resurfacing of shoulders.

Place Full Depth Patch according to Full Depth Patch specifications and Standard Road Plan PR-103, except as noted on this sheet.

Place Full Depth Patch and 'EF' Joint full width of the roadway. If roadway has PCC shoulders, extend 'CF' joint across shoulder. Cost of placing 'CF' joint is incidental to 'EF' joint.

See PV-101 for joint and bar placement details.

- 1 Break out concrete within  $1\frac{1}{2}$  " 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.
- 2 12 inches Modified Subbase is required under Full Depth Patch with 'EF' Joint. Extend Modified Subbase over longitudinal subdrain, if present.
- 3 Unless noted otherwise in the plans, depth of patch, T, is 12 inches regardless of existing pavement thickness.
- 4 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

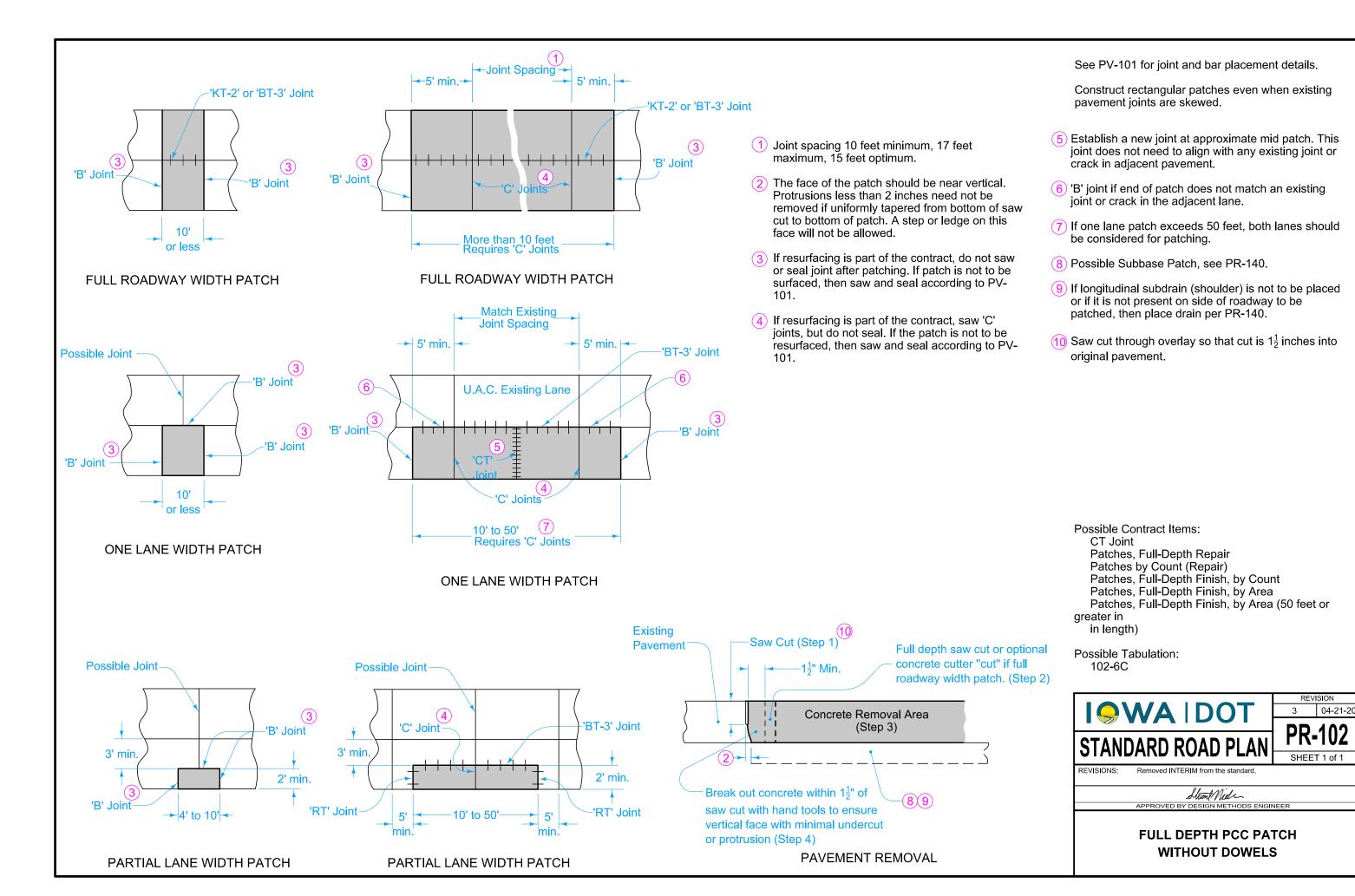
Patches, Full-Depth Finish, by Area (50 feet or areater in length)

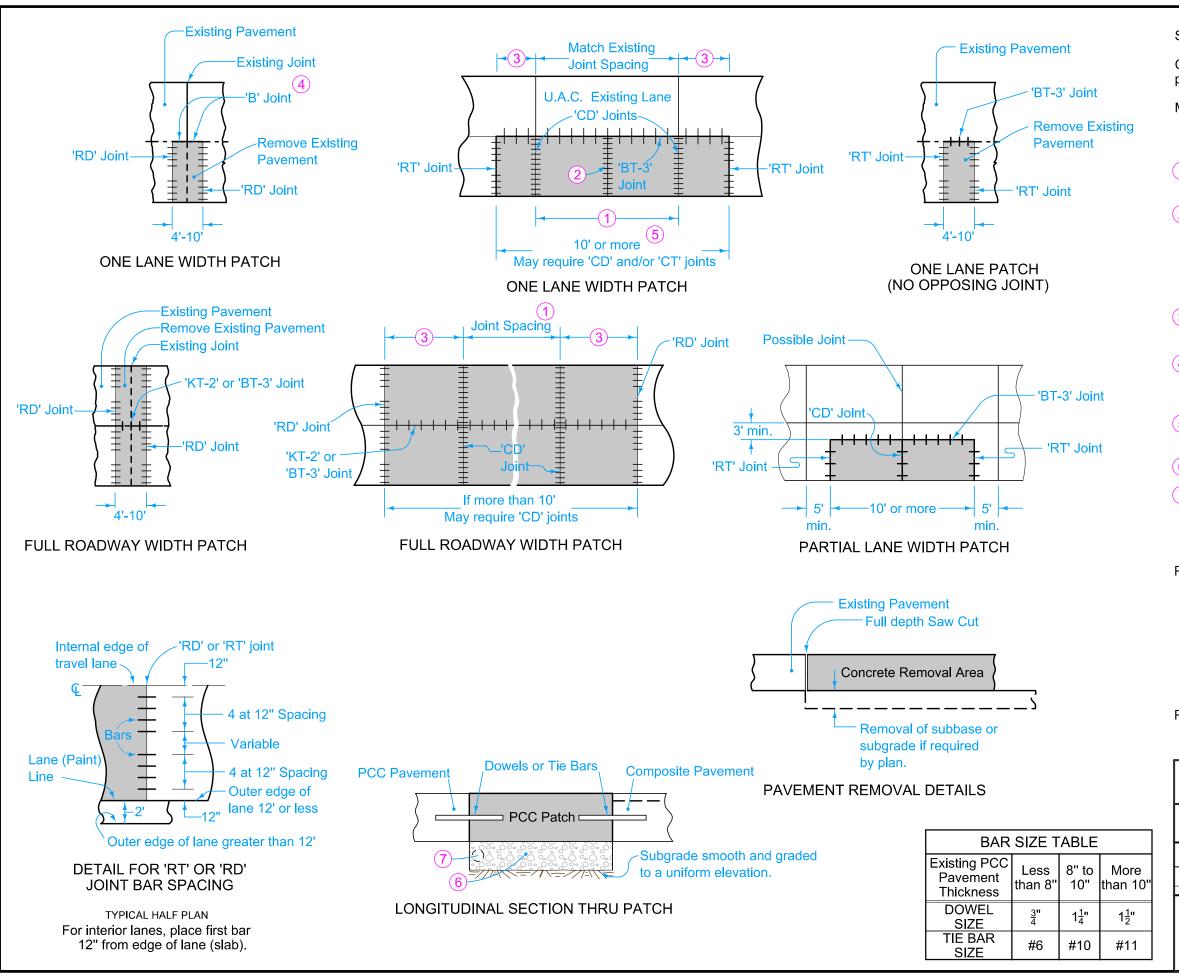
Patch Subdrain

Subbase Patch with EF Joint

Possible Tabulation: 102-6C







See PV-101 for joint and bar placement details.

Construct rectangular patches even when existing pavement joints are skewed.

Min. length of patches on interstate project is 6 feet.

- 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.
- On not saw or seal the joint. Place  $\frac{1}{2}$  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

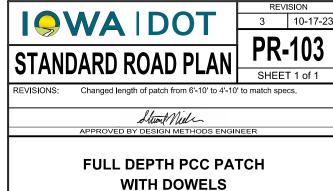
Patches, Full-Depth Finish, by Count

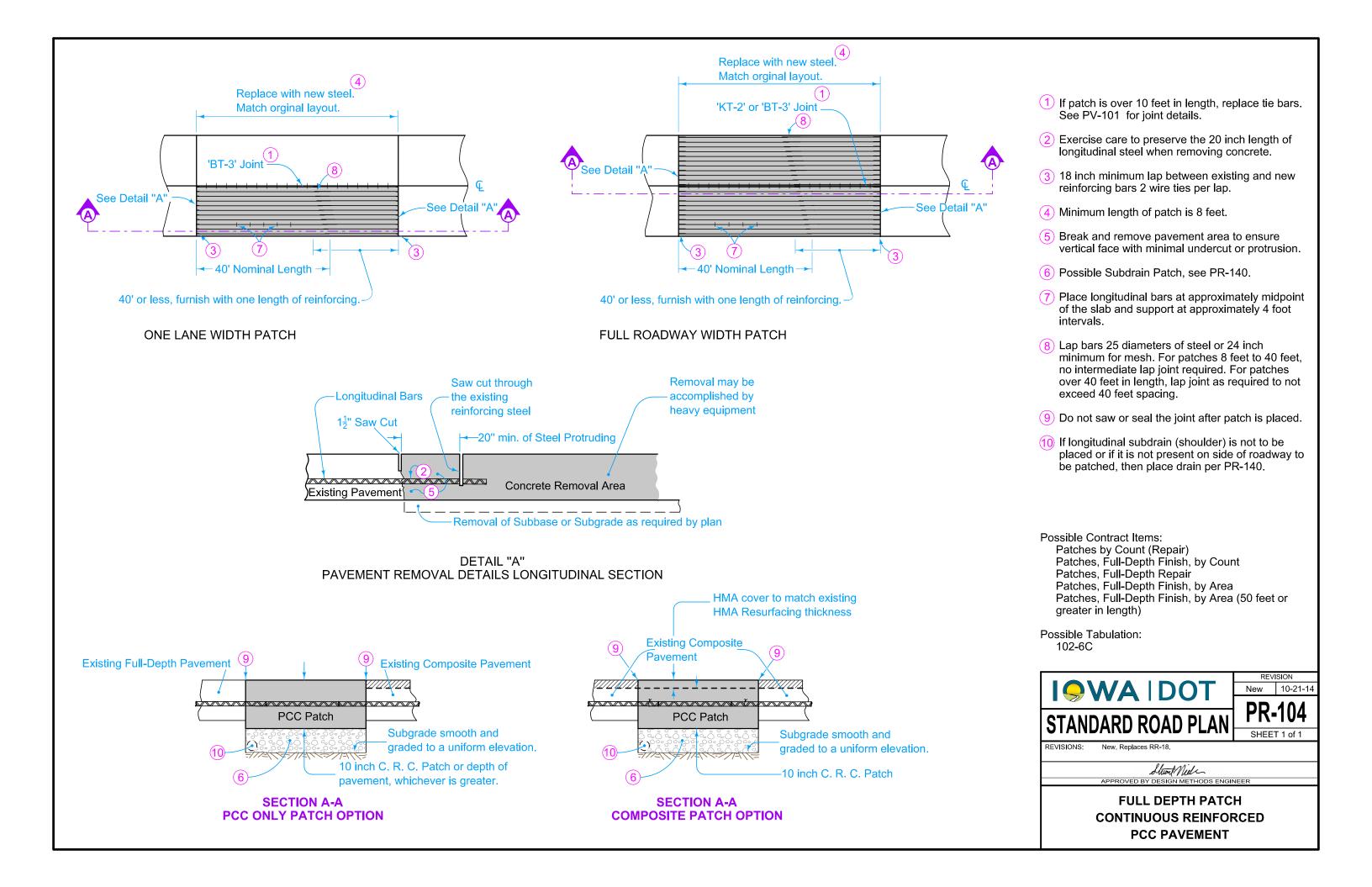
Patches, Full Depth Finish, by Area (50 feet in

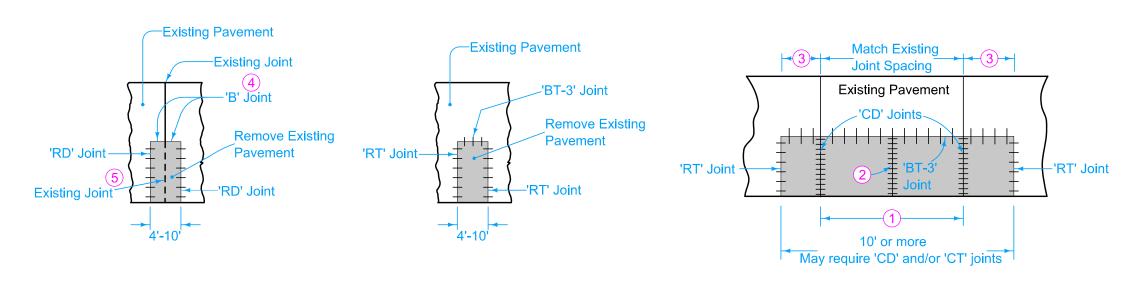
length or greater)

Patches, Full-Depth Repair

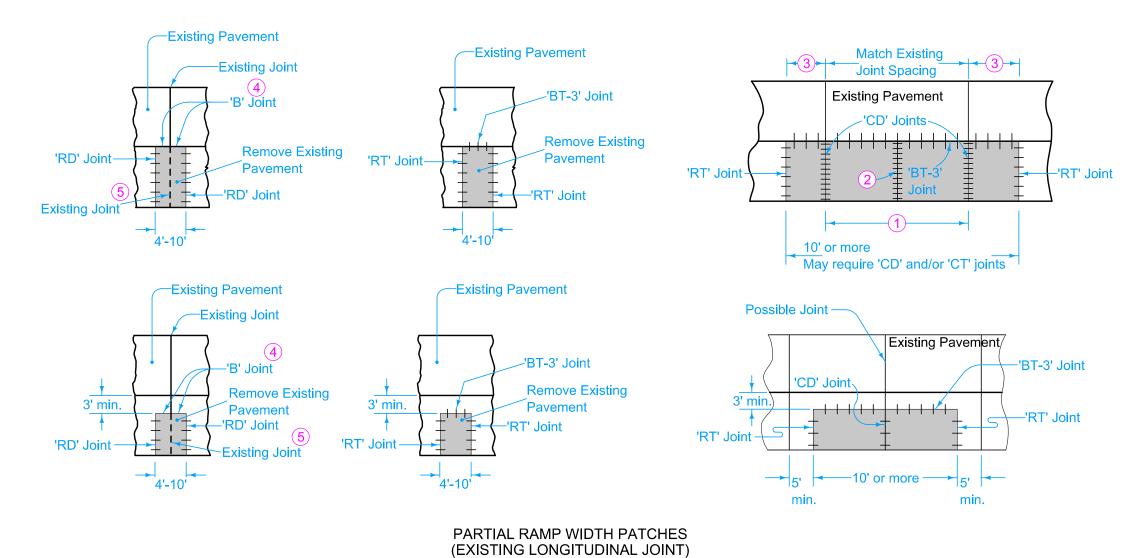
Possible Tabulation: 102-6C







PARTIAL RAMP WIDTH PATCHES (NO EXISTING LONGITUDINAL JOINT)



See PV-101 for joint and bar placement details.

Min. length for patches on interstate projects is 6 feet.

- Joint spacing 10 feet minimum, 17 feet maximum, 15 feet optimum.
- 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'
- New 'CD' joint must be a minimum 5 feet from the patch end.
- Do not saw or seal the joint. Place  $\frac{1}{2}$  inch preformed joint material between patch and concrete in adjacent lane.
- Do not saw a new joint.

Possible Contract Items:

CD Joint Assembly

CT Joint

Patches by Count (Repair)

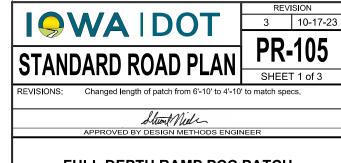
Patches, Full-Depth Finish, by Area

Patches, Full-Depth Finish, by Count

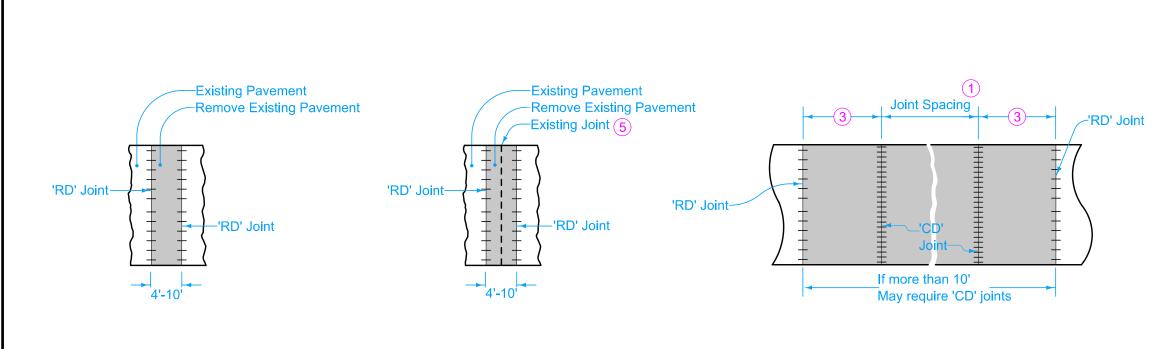
Patches, Full Depth Finish, by Area (50 feet in

length or greater)
Patches, Full-Depth Repair

Possible Tabulation: 102-6C

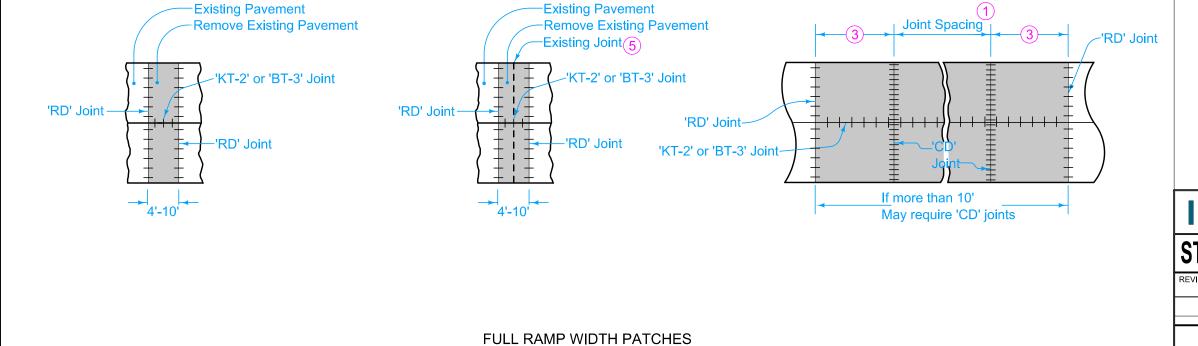


**FULL DEPTH RAMP PCC PATCH WITH DOWELS** 



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

FULL RAMP WIDTH PATCHES (NO EXISTING LONGITUDINAL JOINT)



(EXISTING LONGITUDINAL JOINT)

TEVISION 3 10-17-23

PR-105

STANDARD ROAD PLAN

REVISION

3 10-17-23

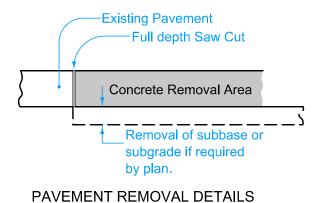
PR-105

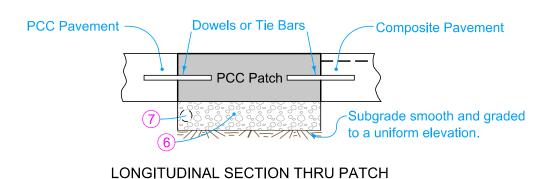
SHEET 2 of 3

REVISIONS: Changed length of patch from 6'-10' to 4'-10' to match specs.

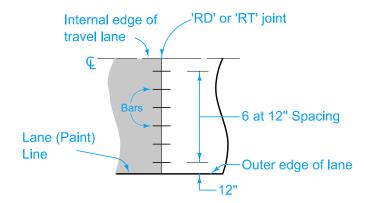
APPROVED BY DESIGN METHODS ENGINEER

FULL DEPTH RAMP PCC PATCH WITH DOWELS



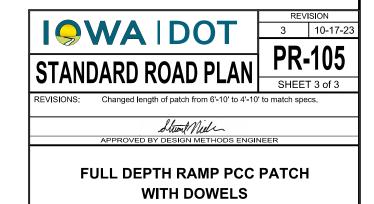


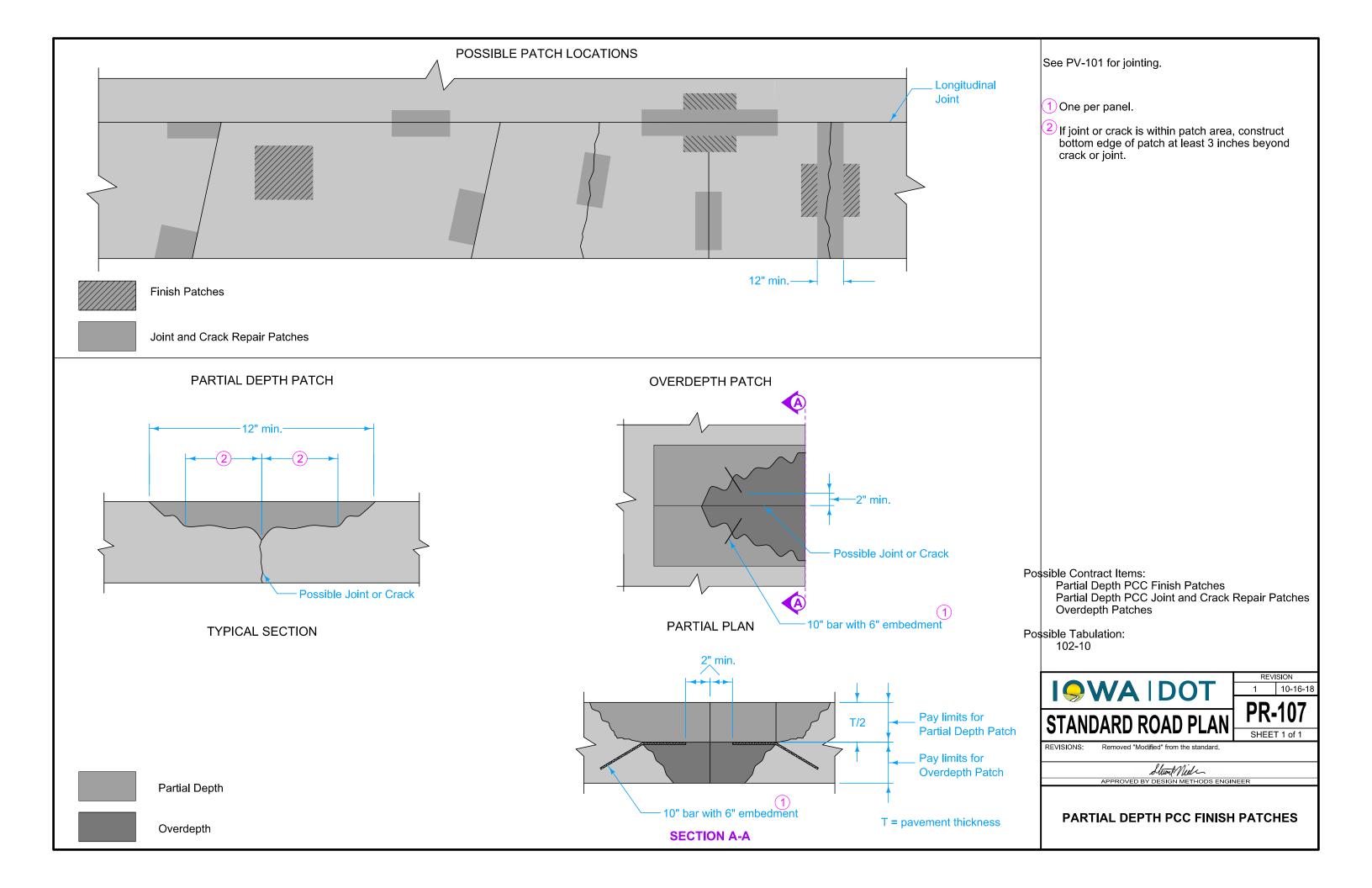
- 6 Possible Subbase Patch, see PR-140.
- If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place drain per PR-140.

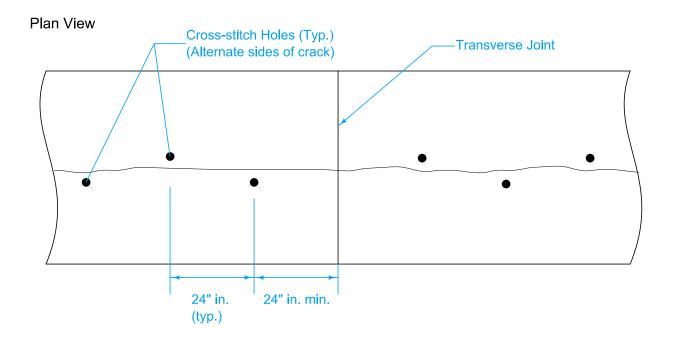


DETAIL FOR 'RT' OR 'RD' JOINT BAR SPACING TYPICAL HALF PLAN

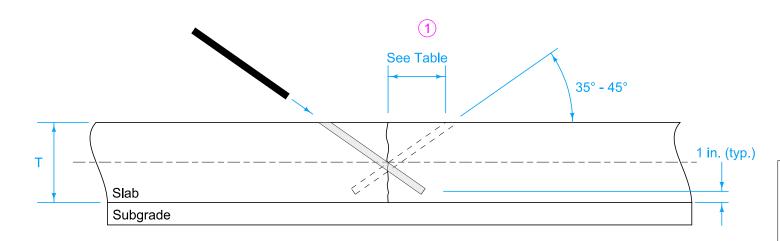
BAR SIZE TABLE					
Existing PCC Pavement Thickness	Less than 8"	8" to 10"	More than 10"		
DOWEL SIZE	<u>3</u> " 4	1 <del>1</del> "	1 <del>1</del> "		
TIE BAR SIZE	#6	#10	#11		







**Cross-Sectional View** 



# Cross-Stitching Bar Dimensions and Hole Locations

	Slab Thickness (In.)					
	8	9	10	11	12	
	Distance to Hole (In.)					
35°	5.75	6.50	7.25	7.75	8.50	
40°	-	-	-	6.50	7.25	
45°	-	-	-	-	6.00	
	Length of Bar (In.)					
35°	9.50	11.00	12.50	14.50	16.00	
40°	-	-	-	12.50	14.50	
45°	-	_	-		12.00	
	Diameter of Bar (In.)					
	0.75	0.75	0.75	0.75	0.75	

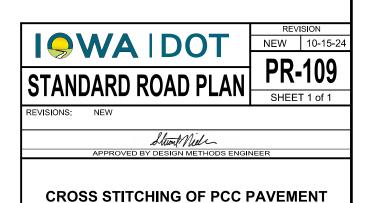
Epoxy deformed bar into hole. Length shown in table provide 1 inch cover at surface.

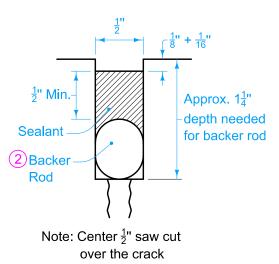
Do not drill hole completely through slab. Stop drilling so epoxy/grout will not run out of the bottom while backfilling.

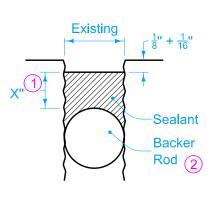
Use a low impact hydraulic drill, mounted on a guide that will assure the hole is drilled at proper angle. Pneumatic drills will not be permitted.

Epoxy grout shall meet the requirements of Materials I.M. 491.11, Appendix A.

Air blast hole free of drill residue will oil free air. Place epoxy grout in hole in a quantity that will fill hole within one quarter inch of pavement surface when bar is inserted. Pavement can be opened to construction or public traffic when grout is tack free.



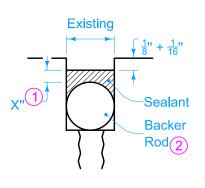




**CLASS II CRACK** 

Random Crack  $\frac{1}{2}$ " To  $1\frac{1}{2}$ "

Sealant 1<u>1</u>" Min. Note: Center saw cut



**CLASS IV JOINT** 

Existing Width  $>\frac{1}{2}$ " To  $1\frac{1}{2}$ "

CLASS V **CRACK OR JOINT** Existing Width  $1\frac{1}{2}$ " To 3"

**CLASS I CRACK** Random Crack Less Than  $\frac{1}{2}$ " In Width

Proposed Sealant

Existing Sealant

ALTERNATE BOND BREAKER

FOR

**CLASS II CRACK** 

**CLASS IV JOINT** 

**CLASS V CRACK OR JOINT** 

or incompressibles

 $\frac{1}{4}$ " Bond breaker (approx.)

approved by the Engineer

sand or other material

over existing joint **CLASS III JOINT Existing Joint** <sup>1</sup>/<sub>2</sub>" Wide Or Less

Examples: tape, backer rod, or tongue depressor used as dam to prevent loss of sealant 3"+ Depth Minimum 3" surface Sealant of cut patch Backer Rod Shoulder  $\frac{1}{4}$ " to  $\frac{1}{2}$ " from edge and at centerline Existing Sealant or incompressibles **GREATER THAN** Pavement 3" OPENING

1 X" =  $\frac{1}{2}$ " Minimum when width is 1" or less 2:1 (Width:Depth) when width is greater than 1"

Sealant

Backer

Rod(2)

2 Minimum diameter of one nominal size larger than the existing crack or joint

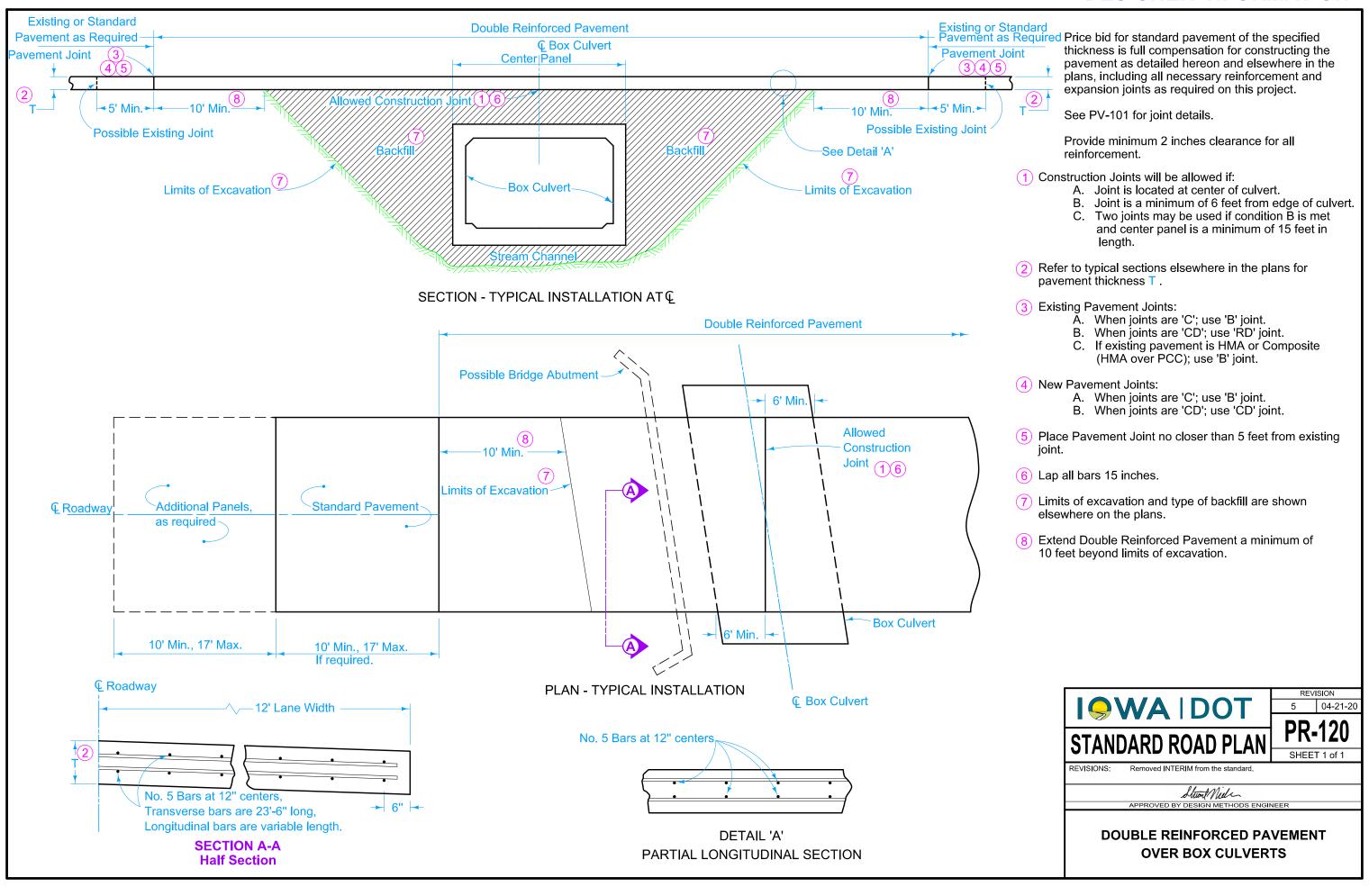


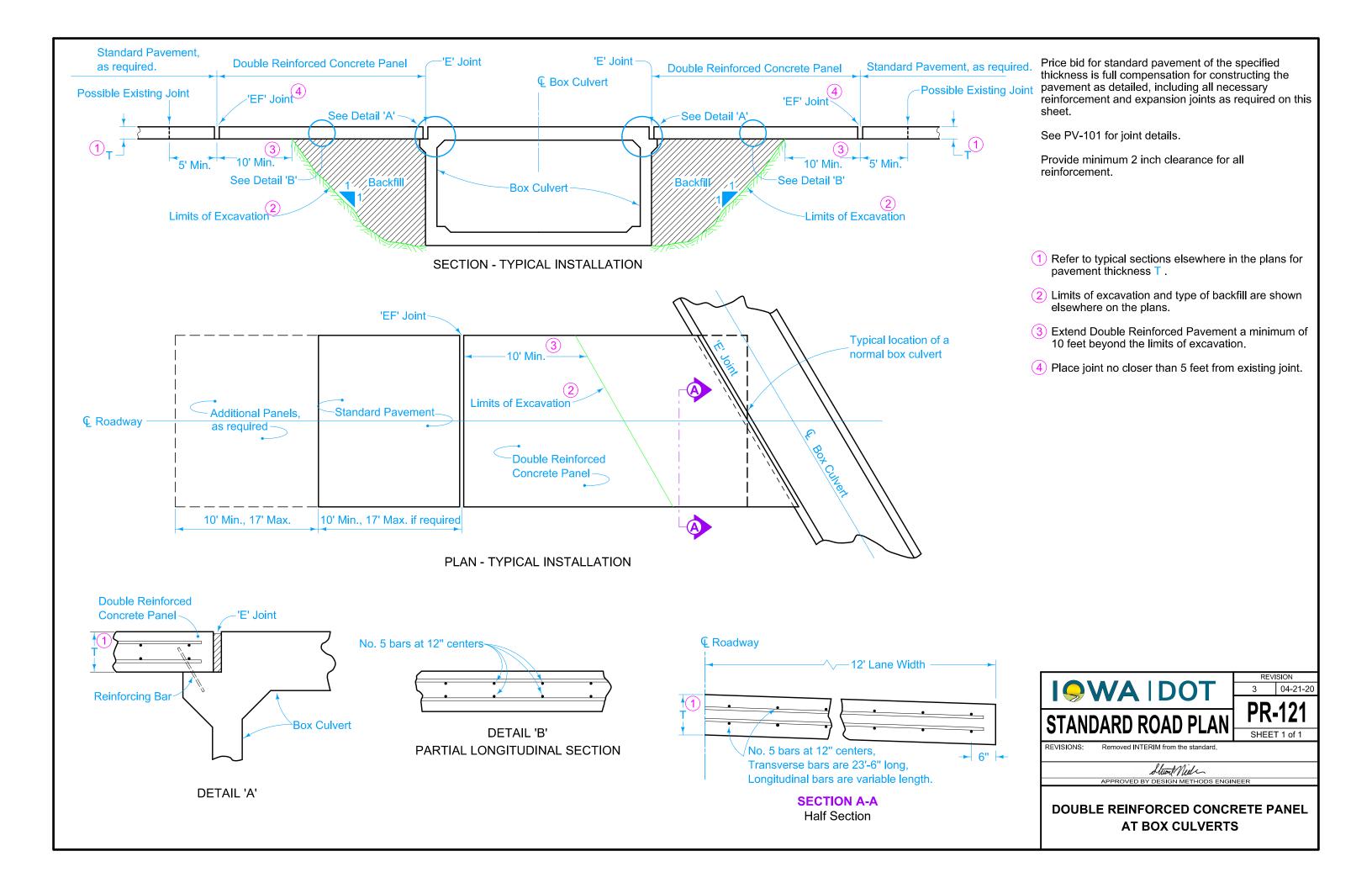
REVISION I WA | DOT New 10-21-14 STANDARD ROAD PLAN SHEET 1 of 1 New. Replaces RR-21. REVISIONS: Stant Mills
APPROVED BY DESIGN METHODS ENGINEER **PCC CRACK AND JOINT** 

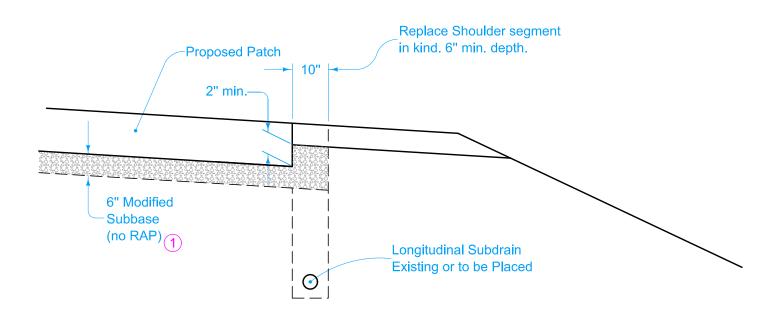
**CLEANING AND FILLING** 

**BACKER ROD** PLACEMENT DETAIL

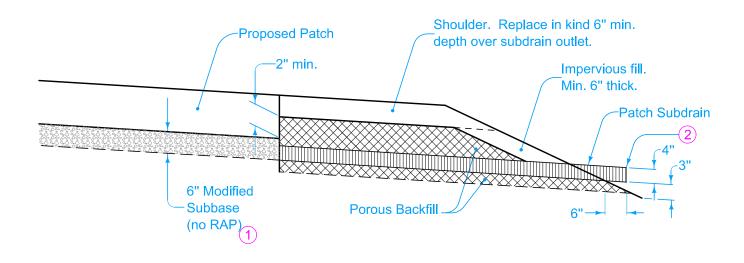
### **DESIGNER INFORMATION**



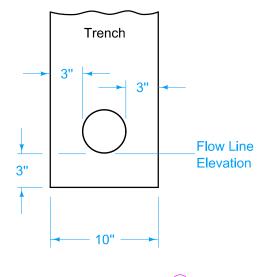




MODIFIED SUBBASE AND SUBDRAIN
IF LONGITUDINAL SUBDRAIN IS PRESENT OR IS TO BE PLACED



MODIFIED SUBBASE AND SUBDRAIN WITHOUT LONGITUDINAL SUBDRAIN



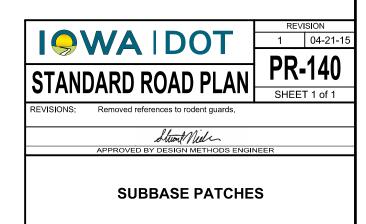
DRAIN PLACEMENT (2)

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

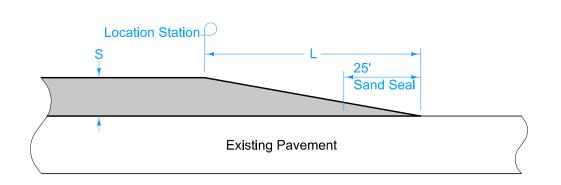
If longitudinal subdrain (shoulder) is not to be placed or if it is not present on side of roadway to be patched, then place Patch Subdrain at low end(s) of patch.

Possible Contract Items: Subbase (Patches) Patch Subdrain

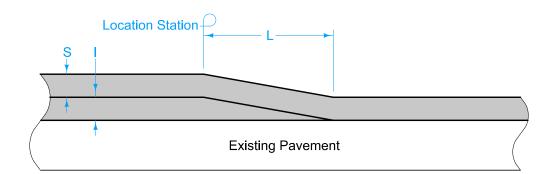
Possible Tabulation: 102-6C



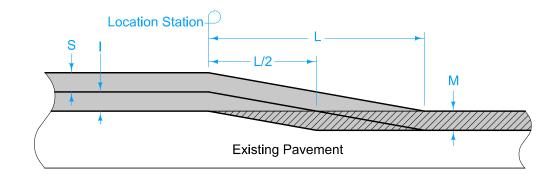
## **DESIGNER INFORMATION**



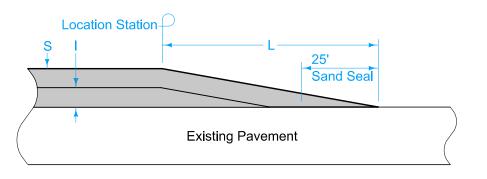
TYPE 'R1'
SURFACE RUNOUT FOR
SINGLE COURSE RESURFACING



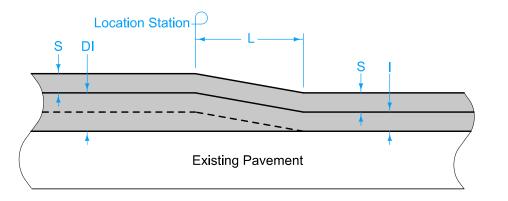
TYPE 'R3'
INTERMEDIATE COURSE
RUNOUT TRANSITION



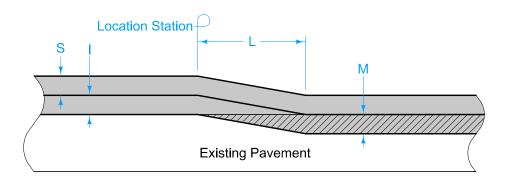
TYPE 'R5'
INTERMEDIATE COURSE RUNOUT FOR TRANSITION
FROM DOUBLE COURSE NON-MILLED RESURFACING
TO SINGLE COURSE MILLED RESURFACING



TYPE 'R2'
SURFACE RUNOUT - INTERMEDIATE
RUNOUT FOR DOUBLE COURSE RESURFACING



TYPE 'R4'
DOUBLE INTERMEDIATE
COURSE RUNOUT TRANSITION



TYPE 'R6'
TRANSITION FROM
DOUBLE COURSE RESURFACING IN
NON-MILLED TO MILLED AREAS

S Surface Course

Intermediate Course

DI Double Intermediate Course

L Runout Length

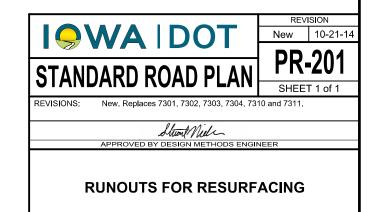
M Milling

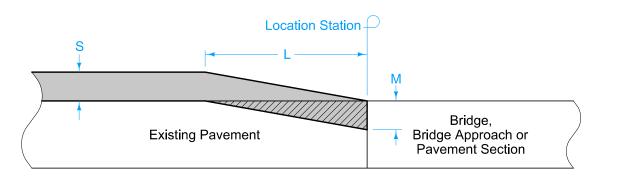
Posted	Runout	
Speed Limit	Ratio	
(mph)	(ft per inch)	
Over 40	50	
20 to 40	25	
Under 20	10*	

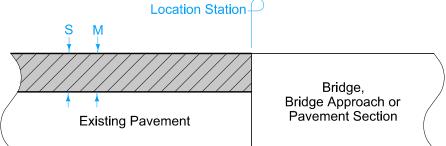
\* Based on turning maneuvers at side roads and intersections.

Possible Contract Item:
Pavement Scarification

Possible Tabulations: 100-25 102-16

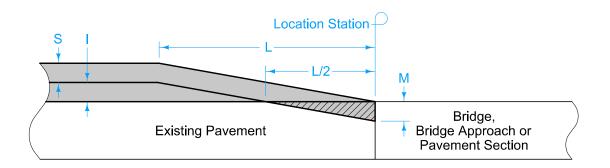


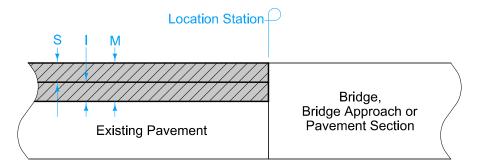




# TYPE 'N1' SURFACE NOTCH FOR SINGLE COURSE RESURFACING

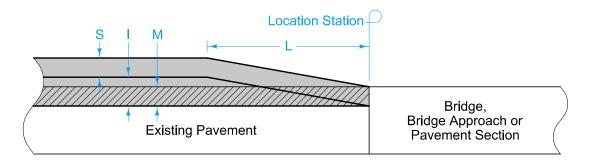
TYPE 'N2' SINGLE COURSE RESURFACING OF MILLED AREAS





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

- S Surface Course
- Intermediate Course
- L Runout Length
- M Milling

Posted	Runout	
Speed Limit	Ratio	
(mph)	(ft per inch)	
Over 40	50	
20 to 40	25	
Under 20	10*	

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

Possible Contract Item: Pavement Scarification

Possible Tabulations: 100-25 102-16

