PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Installing dowel bars into existing pavement requires sound concrete. In practice, this has led to additional removal to find intact concrete, increasing the length of patching in the field, and leading to overruns on contracts. New transverse joints were allowed to be offset from the existing joint, which allowed early sympathy cracking to occur. Removal of concrete required chipping at corners, which increased time required and led to damage to the concrete that remained in place.

PROPOSED SOLUTION: The key changes include:

- Allow oversawing in both the transverse and longitudinal directions to facilitate easier removal of existing concrete and reduce the need for manual chipping.
- Use deformed bars at the end of longer patches instead of placing dowel bars
- Match transverse joint locations with those in adjacent pavement

APPLICABLE STANDARD SPECIFICATIONS: 506

APPLICABLE STANDARD DRAWING: 506-CCPP with corresponding changes to terminology in 503-CCPJ-02

APPLICABLE DESIGN MANUAL CHAPTER: 603

APPLICABLE SECTION OF GIFE: Section 9

APPLICABLE RECURRING SPECIAL PROVISION OR PLAN DETAILS: N/A

PAY ITEMS AFFECTED: 506-06333 PCCP PATCHING, FULL DEPTH

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad-hoc including Sipes, Scott; Laracuente, Luis A; Novak, Josep; Fegan, Roland; Nantung, Tommy; Cosenza, Nicholas; Lowther, Jason

IF APPROVED AS RECURRING SPECIAL PROVISION OR PLAN DETAILS, PROPOSED BASIS FOR USE: If a contract includes pay item, 506-06333 PCCP PATCHING, FULL DEPTH

IMPACT ANALYSIS (attach report): Completed, see Attached

Submitted By: Nick Cosenza on behalf of Kumar Dave

Title: Pavement Design Engineer

Division: Highway Engineering

E-mail: ncosenza@indot.in.gov

Date: 3/3/26

IMPACT ANALYSIS REPORT CHECKLIST

Explain the business case as to why this item should be presented to the Standards Committee for approval. Answer the following questions with Yes, No or N/A.

Does this item appear in any other specification sections? No
Will approval of this item affect the Qualified Products List (QPL)? No
Will this proposal improve:

- Construction costs? Yes
- Construction time? Yes
- Customer satisfaction? Yes
- Congestion/travel time? Yes
- Ride quality? Yes

Will this proposal reduce operational costs or maintenance effort? Yes

Will this item improve safety:

- For motorists? Yes
- For construction workers? Yes

Will this proposal improve quality for:

- Construction procedures/processes? Yes
- Asset preservation? Yes
- Design process? Yes

Will this change provide the contractor more flexibility? Yes

Will this proposal provide clarification for the Contractor and field personnel? Yes

Can this item improve/reduce the number of potential change orders? Yes

Is this proposal needed for compliance with:

- Federal or State regulations? N/A
- AASHTO or other design code? N/A

Is this item editorial? No

Provide any further information as to why this proposal should be placed on the Standards Committee meeting Agenda: N/A

(**Note:** Proposed changes shown highlighted gray)

The Standard Specifications are revised as follows:

SECTION 506, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 506 – PCCP PATCHING

506.01 Description

This work shall consist of the removal and replacement of jointed plain PCCP or jointed reinforced PCCP in accordance with 105.03.

MATERIALS

506.02 Materials

Materials shall be in accordance with the following:

Admixtures	912.03
Calcium Chloride, Type L	913.02
Chemical Anchor System	901.05
Coarse Aggregate, Class A or Higher, Size No. 11	904.03
Concrete Coarse Aggregate, Class AP	904.03, ITM 226
Dowel Bar Assemblies	503.04
Dowel Bars	910.01(b)10
Fine Aggregate, Size No. 23	904.02
Coal Ash	901.02
Joint Fillers	906.01[A]
Joint Sealing Materials	906.02(a)2
Portland Cement	901.01(b)
Rapid Hardening Hydraulic Cement	901.01(d)
Silica Fume	901.04
Slag Cement	901.03
Water	913.01

[A] A flexible foam expansion joint material meeting the requirements of ASTM D5249, Type 2 may also be used for the ~~retrofit pressure relief~~*expansion* joint. If the flexible foam expansion joint is used, the basis for use will be a Type C certification in accordance with 916.

Coarse aggregate for partial depth patching shall be size No. 11. Coarse aggregate for full depth patching shall be size No. 8. Coarse aggregate for patches shall be dolomite, limestone, or gravel.

Retrofitted tie bars *along the longitudinal joint* shall be No. 5 or No. 6 epoxy coated reinforcing bars in accordance with 910.01(b)9.

SECTION 506, BEGIN LINE 158, DELETE AND INSERT AS FOLLOWS:

(a) Patches Less than or Equal to ~~15~~*20* ft in Length

SECTION 506, BEGIN LINE 218, DELETE AND INSERT AS FOLLOWS:

(b) Patches Greater than ~~15~~*20* ft in Length

SECTION 506, BEGIN LINE 351, DELETE AND INSERT AS FOLLOWS:

506.07 General

Patch areas shown on the plans or marked by the Engineer as greater than ~~15~~*20* ft in length may be subdivided. If a patch is subdivided, concrete mix in accordance with 506.04(b) shall be used in all portions of the patch and the requirements for opening to traffic will be in accordance with 506.12(b).

506.08 PCCP Removal

PCCP removal areas will be marked. The Contractor may saw cut the patch areas prior to removing the patch. When the lane is subject to intermittent closures, the saw cutting shall occur no more than 24 h prior to removing the patch.

Vertical saw cuts around the perimeter of the removal areas shall be made in the PCCP and shall be full depth. Transverse cuts that define the ends of the patch shall be straight and perpendicular to the centerline. ~~In no case shall the transverse joint be over-cut into the adjacent pavement~~*Tolerance of the saw cut into adjacent panels shall be as shown on the plans. Saw cuts into adjacent panels shall be sealed with hot pour joint sealant in accordance with 503.05.* Following the saw cutting, the concrete that remains in the corners of the patch area shall be removed by pneumatic hammers that do not damage the adjacent PCCP or shoulders. Pneumatic hammers shall not exceed 45 lb.

PCCP removal areas shall not remain open overnight. Shoulders or adjacent PCCP damaged during the removal shall be repaired as directed.

SECTION 506, BEGIN LINE 397, DELETE AND INSERT AS FOLLOWS:

(b) Full Depth Removal

After the full depth saw cut is completed, vehicle mounted removal equipment may be used to remove the concrete provided this equipment does not damage the adjacent sound concrete.

Removal areas in the same lane which are closer than 10 ft shall require the PCCP between these areas to be removed and replaced. If a transverse joint is located within the removal area, the limits of removal shall be as shown on the plans.

Full depth saw cutting and removal shall be extended at the direction of the Engineer until sound PCCP is encountered to allow the drilling and installation of ~~dowel~~ *tie* bars for load transfer. Removal operations shall not damage the existing PCCP that is sound and is to remain in place.

Existing subbase shall be completely removed. Before removing any type of asphalt

treated, cement treated, or concrete subbase, the Contractor shall saw cut the outline of the removal area using a power-driven saw with a diamond blade. The Contractor shall cut the asphalt treated subbase at least 2 in. deep on a neat line perpendicular to the subbase surface. The Contractor shall cut the cement treated subbase or concrete subbase full depth.

506.09 Concrete Mixing and Transportation

(a) For Patches Less than or Equal to ~~15~~*20* ft in Length

SECTION 506, BEGIN LINE 440, DELETE AND INSERT AS FOLLOWS:

(b) For Patches Greater than ~~15~~*20* ft in Length

For patches containing portland cement, the mixing and transportation shall be in accordance with 502.10. If concrete containing CSA cement is used, it may be batched and mixed in a mobile volumetric mixer meeting the requirements of 722.09, regardless of the patch length. Calibration of the mobile mixer shall be in accordance with 722.13. Alternatively, a mixer from a CSA cement supplier may be used, if approved by the Engineer.

SECTION 506, BEGIN LINE 487, DELETE AND INSERT AS FOLLOWS:

(b) Full Depth

Subgrade treatment and subbase shall be constructed as shown on the plans.

~~Dowel bars,~~*A retrofit transfer joint, consisting of epoxy coated tie bars in accordance with 910.01(b)9,* shall be installed to provide load transfer from the adjoining PCCP to the patch. *The tie bars shall be installed in accordance with 503.03(g) and as shown on the plans.* The diameter of the drilled holes shall be no more than 1/8 in. greater than the diameter of the ~~dowel~~*tie* bar. ~~Dowel~~*Tie* bars shall be placed parallel to the pavement surface and to the longitudinal joint. ~~Dowel~~*Tie* bar alignment tolerances shall be as shown on the plans.

~~Dowel~~*The* holes shall be drilled using hydraulic, electric, or pneumatic percussion drills without spalling or damaging the existing concrete. Drills shall be capable of independent adjustment of each drill shaft in the horizontal and vertical direction. ~~The device used to drill dowel holes shall be slab-riding and be capable of drilling a minimum of three holes at a time.~~ The drilled holes shall be free of dust, moisture, and grease prior to installation of the ~~dowel~~*tie* bars. The chemical anchor system shall be injected to the back of the hole to eliminate air pockets prior to inserting the ~~dowel~~*tie* bar.

The quantity of material injected shall be sufficient to disperse the chemical anchor material along the entire length of the dowel bar and completely fill all voids around the bar. Application of the chemical anchor system by buttering it onto the ~~dowel~~*tie* bar will not be allowed.

After the anchor system has been injected, the ~~dowel~~*tie* bar shall be fully inserted in the hole using a back-and-forth twisting motion, leaving the proper length exposed. If it

is necessary to use a hammer to seat the ~~dowel~~*tie* bar, the exposed end shall be protected with a wood block.

~~A lightweight plastic, clear or semi-transparent grout retention ring shall be installed after each dowel bar is inserted into the hole. The grout retention ring shall be pushed flush to the vertically sawn concrete surface and shall be used to help retain the chemical anchor system in the dowel hole.~~

Retrofit tie bars *along the longitudinal joint shall be installed when the length of the patch exceeds 100 ft. The retrofit tie bars shall be installed* in accordance with 503 and as shown on the plans. The tolerance for horizontal and vertical translation shall be the same as for ~~dowel~~*tie* bars *for the retrofit transverse joint.*

~~Joint filler and grout retention rings shall be placed and installed at the pressure relief joint as shown on the plans. Oversized holes shall be drilled in the joint filler no more than 1/2 in. over the dowel bar diameter and at a spacing to match the installed dowel bars. The oversized holes are to allow a tolerance for ease of installation of the joint filler up against the sawed face without interference with the dowel bars. The joint filler shall be attached to the sawed face without wrinkles or buckling.~~

~~Joint filler material with vertical slits or cuts will be rejected. Grout retention discs shall be installed to make the annular space between the dowel and the oversized hole mortar-tight. The joint material may be spliced along vertical joints that are joined and sealed with tape. The joint material shall not be spliced in the horizontal direction. An alternate method of installing a joint filler that has a mortar tight seal around the dowel bar may be used if approved by the Engineer~~.

All patches ~~longer than 15 ft~~ shall be placed in accordance with 502.12~~ and shall have joints in accordance with 503~~. *When required, joints shall be in accordance with 503.* Dowel bars *and assemblies for D-1 contraction joints* shall be installed within the boundaries of the patch at a spacing as shown on the plans or as approved by the Engineer.

Patches longer than ~~15~~*20* ft shall be finished in accordance with 504. Patches ~~longer than 15 ft~~ constructed with concrete containing portland cement, shall be cured in accordance with 504.04(a) unless ambient air and concrete temperatures warrant following the requirements in 506.11.

Patches constructed in accordance with 506.04(b) and containing CSA cement shall be water cured in accordance with 702.22(a)1 except that soaker hoses will not be required. Water curing shall be initiated after finishing and as soon as the concrete patch can support the wet covering. Water curing shall be maintained for a minimum of 1 1/2 h and shall be removed no sooner than 1 h before the patch is opened to traffic.

Concrete shall be placed around manholes or similar structures in accordance with 720.

Sawing and sealing of transverse joints may be omitted when the existing PCCP is to be overlaid as part of the contract.

506.12 Opening to Traffic

For purposes of this section, traffic shall include construction vehicles, construction equipment, and all non-construction vehicles. Any construction vehicle or equipment that may damage the PCCP shall not be used on the PCCP unless adequate protection is provided. Joint cutting saws may be operated on the PCCP as determined by the Contractor.

(a) For Patches Less than or Equal to ~~15~~*20* ft in Length

SECTION 506, BEGIN LINE 580, DELETE AND INSERT AS FOLLOWS:

(b) For Patches Greater than ~~15~~*20* ft in Length

Traffic shall not be allowed on the PCCP until a modulus of rupture from flexural strength testing in accordance with the appropriate value in the table below is achieved. The modulus of rupture will be determined by averaging two beams.

Concrete Mix in accordance with:	Minimum Modulus of Rupture, psi
502.04(a)	550
506.04(b)	425

506.13 Method of Measurement

Partial depth patching and full depth patching will be measured by the square yard.

D-1 contraction joints and retrofitted tie bars*, along the longitudinal joint,* used in PCCP patching will be measured in accordance with 503.07.

When subgrade treatment is specified, it will be measured in accordance with 207.05.

New subbase will be measured in accordance with 302.08 *or 309.07*.

PCCP removal, subbase removal, concrete, finishing, curing, and sawing and sealing of joints will not be measured for payment.

~~Retrofit pressure relief joints, retrofit contraction joints,~~*Retrofit transverse joints,* non-vapor barrier bonding agent, anchored ~~dowel~~*tie* bars installed at the beginning and end of the patch, individual ~~dowel~~*tie* bars, joint fillers, joint materials, drilling holes for ~~dowel~~*tie* bars, ~~grout retention rings,~~ and chemical anchor systems will not be measured for payment.

506.14 Basis of Payment

PCCP patching will be paid for at the contract unit price per square yard for the

type of patching required.

D-1 contraction joints and retrofitted tie bars *placed along the longitudinal joint* used in PCCP patching will be paid for in accordance with 503.08.

Subgrade treatment will be paid for in accordance with 207.06.

New subbase will be paid for in accordance with 302.09 *or 309.08*.

Partial depth patches which have been directed to be full depth will be paid for at the contract unit price per square yard for PCCP patching, partial depth, plus 80% of the contract unit price per square yard for PCCP patching, full depth.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
PCCP Patching, Full Depth	SYS
PCCP Patching, Partial Depth	SYS

The cost of PCCP removal, subbase removal, concrete, finishing, curing, and sawing and sealing of joints shall be included in the cost of PCCP patching.

The cost of ~~retrofit pressure relief joints, retrofit contraction joints,~~*retrofit transverse joints,* non-vapor barrier bonding agent, anchored ~~dowel~~*tie* bars installed at the beginning and end of the patch, individual ~~dowel~~*tie* bars, joint fillers, joint materials, drilling holes for ~~dowel~~*tie* bars, ~~grout retention rings,~~ and chemical anchor systems shall be included in the cost of PCCP patching.

The cost of corrections for pavement smoothness and retexturing shall be included in the cost of PCCP patching.

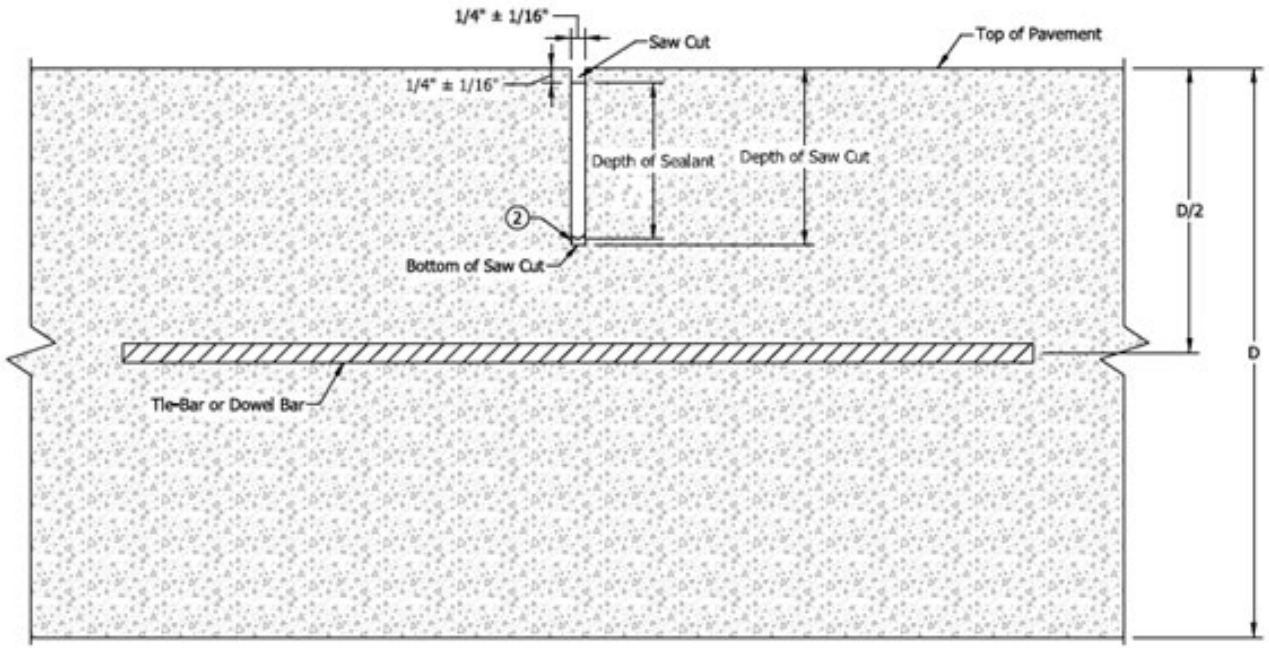
Repair or replacement of adjacent PCCP or shoulder damaged by the Contractor shall be made at no additional cost to the Department.

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 503-CCPJ-02 SAWED JOINTS AND JOINT SEALANT (WITH SHOWN MARKUPS)

TYPE OF JOINT	DEPTH OF SAW CUT	DEPTH OF SEALANT
Longitudinal Joint	D/3	2" (min.)
D-1 Contraction Joint	D/3	2" (min.)
Retrofit Contraction Joint (3)	1"	Bottom of Saw Cut
Retrofit Pressure Relief Joint (3)	1"	Bottom of Saw Cut
Transverse Construction Joint	1"	Bottom of Saw Cut
Longitudinal Construction Joint	1"	Bottom of Saw Cut

Retrofit Transverse Joint



TRANSVERSE AND LONGITUDINAL
SAW CUT WITH HOT POURED SEALANT

NOTES:

1. Multiple passes of sealant may be required.
2. Backer rod shall not be installed.
3. For retrofit contraction joint and pressure relief joint details, see Standard Drawing Series E 506-CCPP.

Retrofit Transverse Joint

D = PCCP Thickness

INDIANA DEPARTMENT OF TRANSPORTATION

SAWED JOINTS
AND
JOINT SEALANT
SEPTEMBER 2020 2026

STANDARD DRAWING NO. E 503-CCPJ-02

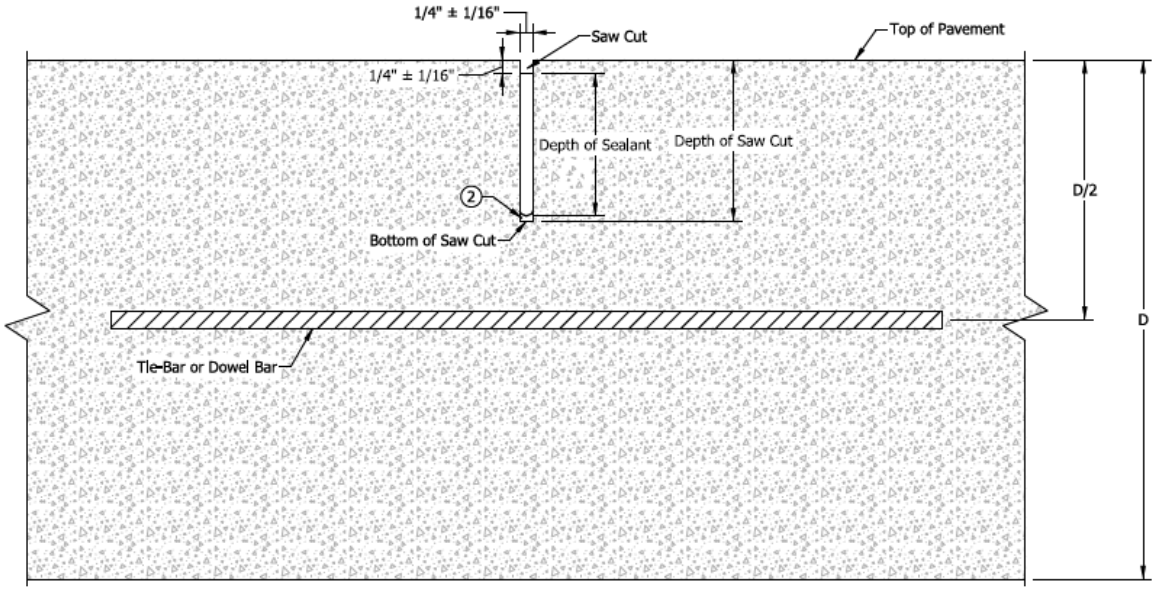
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

05/08/20
CHIEF ENGINEER DATE

E 503-CCPJ-02 SAWED JOINTS AND JOINT SEALANT (PROPOSED DRAFT)

TYPE OF JOINT	DEPTH OF SAW CUT	DEPTH OF SEALANT
Longitudinal Joint	D/3	2" (min.)
D-1 Contraction Joint	D/3	2" (min.)
Retrofit Transverse Joint (3)	1"	Bottom of Saw Cut
Transverse Construction Joint	1"	Bottom of Saw Cut
Longitudinal Construction Joint	1"	Bottom of Saw Cut



TRANSVERSE AND LONGITUDINAL
SAW CUT WITH HOT POURED SEALANT

NOTES:

1. Multiple passes of sealant may be required.
2. Backer rod shall not be installed.
3. For Retrofit Contraction Joint details, see Standard Drawing Series E 506-CCPP.

D = PCCP Thickness

INDIANA DEPARTMENT OF TRANSPORTATION

SAWED JOINTS
AND
JOINT SEALANT
SEPTEMBER 2020

STANDARD DRAWING NO. E 503-CCPJ-02

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-01 CONCRETE PAVEMENT PATCHING INDEX AND GENERAL NOTES (WITH SHOWN MARKUPS)

INDEX	
SHEET NO.	SUBJECT
1	Concrete Pavement Patching Index and General Notes
2	~~Joint Details~~ Tie Bar Alignment and Sawcut Tolerances
3	~~Joint Placement~~ Sawcut Removal Details
4	~~Patch Length ≥ 6' and ≤ 15'~~ Retrofit Transverse Joint Details
5	~~Patch Length > 15' and ≤ 60'~~ Patch Length >6' ≤ 20 ft
6	Patch Length ~~>~~ ~~60'~~ 20'
~~7~~	~~Dowel Alignment and Saw Cut Tolerances~~

GENERAL NOTES:

1. Dowel bars shall be epoxy coated.
2. Tie-bars shall be epoxy coated.
3. Additional preparation of existing subgrade will be determined by the Engineer.
4. See Standard Drawing E 503-CCPJ-02 for sawed joint and joint sealant details.
5. See Standard Drawing E 503-CCPJ-03 for D-1 contraction joint details.
6. See Standard Drawing E 503-CCPJ-05 for retrofitted tie-bar details.
7. The minimum patch length shall be 6 ft.

INDIANA DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT PATCHING
INDEX AND GENERAL NOTES

SEPTEMBER ~~2020~~ 2026

STANDARD DRAWING NO. E 506-CCPP-01

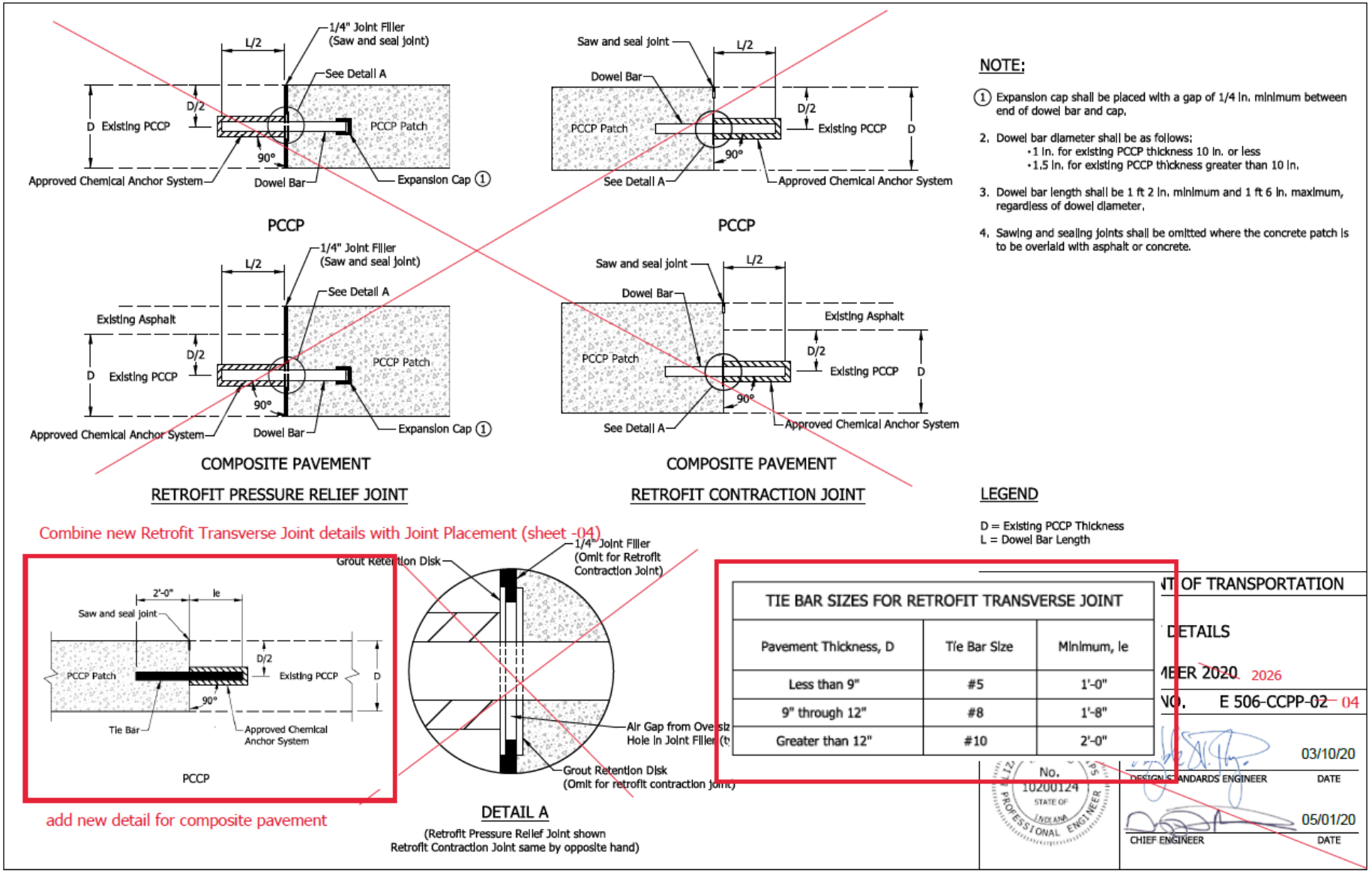
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

05/01/20
CHIEF ENGINEER DATE

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-02 JOINT DETAILS (WITH SHOWN MARKUPS)

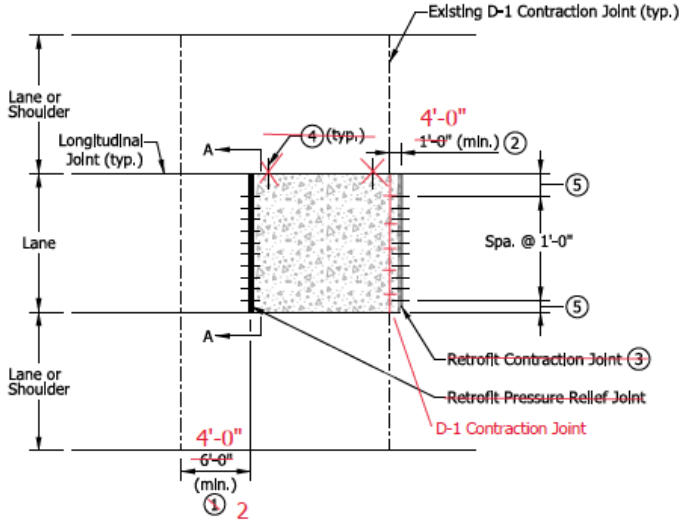


REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

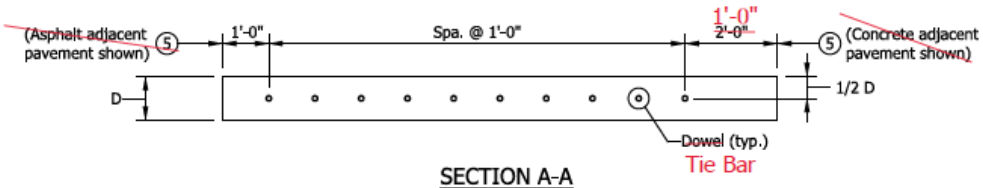
E 506-CCPP-03 JOINT PLACEMENT (WITH SHOWN MARKUPS)

Add new detail for sawcut removal (sheet -03)

Combine these details with new Retrofit Transverse Joint details (sheet -04)



PLAN



SECTION A-A

NOTES:

1. Retrofit pressure relief joints and retrofit contraction joints shall be placed a minimum of 6 ft from an existing D-1 contraction joint located in the same lane as the patch.
2. Retrofit pressure relief joints and retrofit contraction joints shall be placed a minimum of 1 ft from an existing D-1 contraction joint located in a lane adjacent to the patch.
3. Where the total patch length exceeds 60 ft, a retrofit pressure relief joint shall be used in lieu of the retrofit contraction joint.
4. Retrofitted tie-bars as required for patches greater than 15 ft.
5. Distance to first dowel shall be as follows:
   - 1 ft 0 in. where adjacent pavement is asphalt
   - 2 ft 0 in. where adjacent pavement is concrete

1. Retrofit Transverse Joint shall be placed at each end of the patch.
2. Retrofit Transverse Joints shall be placed a minimum of 4 ft from an existing D-1 Contraction Joint.
3. Sawing and sealing joints shall be omitted where the concrete patch is to be overlaid with asphalt or concrete.
4. Tie bar size and embedment (le) shall be as shown on table this sheet.

LEGEND

D = Existing PCCP Thickness

INDIANA DEPARTMENT OF TRANSPORTATION

JOINT PLACEMENT

SEPTEMBER 2020 2026

STANDARD DRAWING NO. E 506-CCPP-03 04

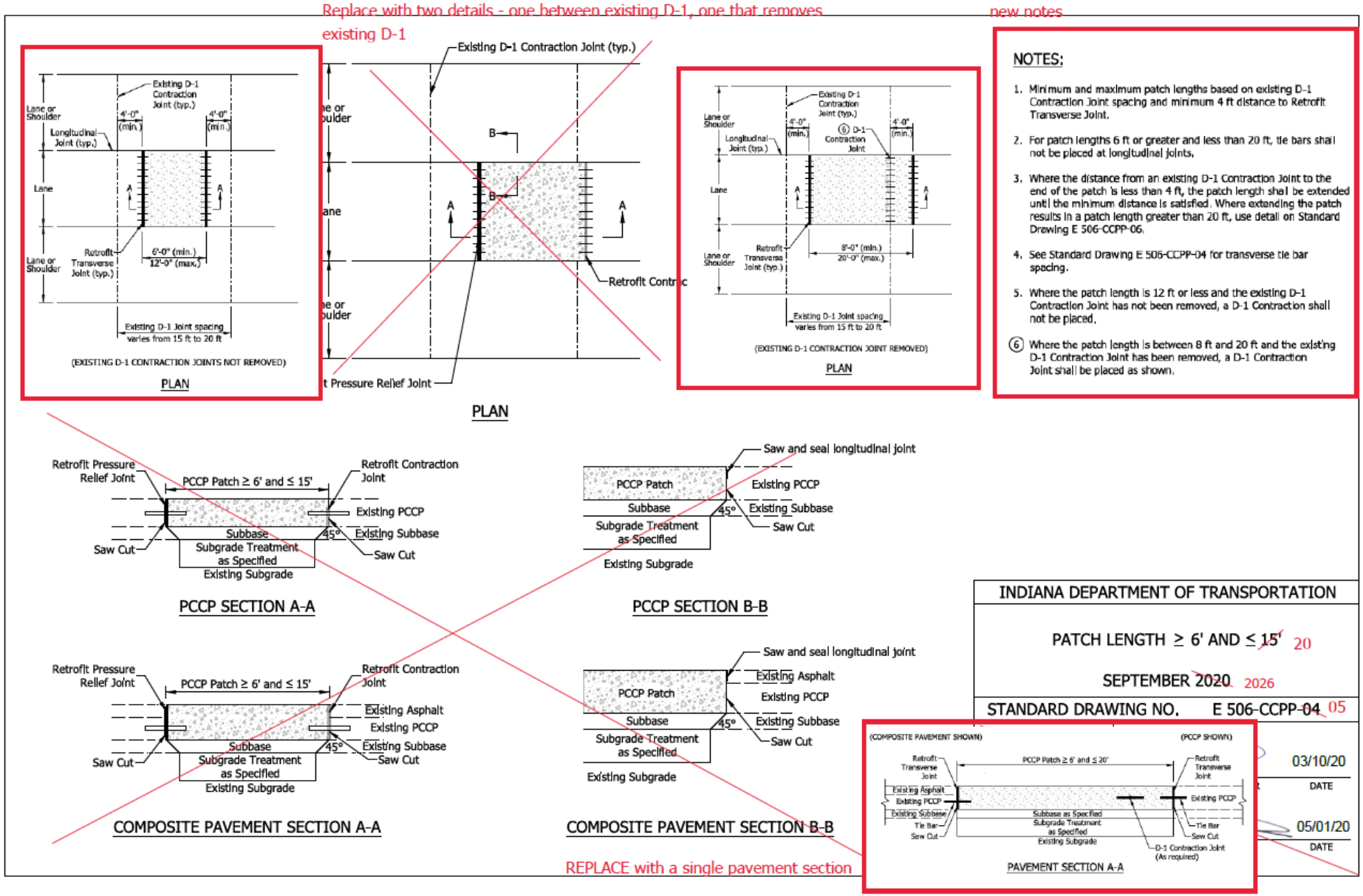
ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

05/01/20
CHIEF ENGINEER DATE

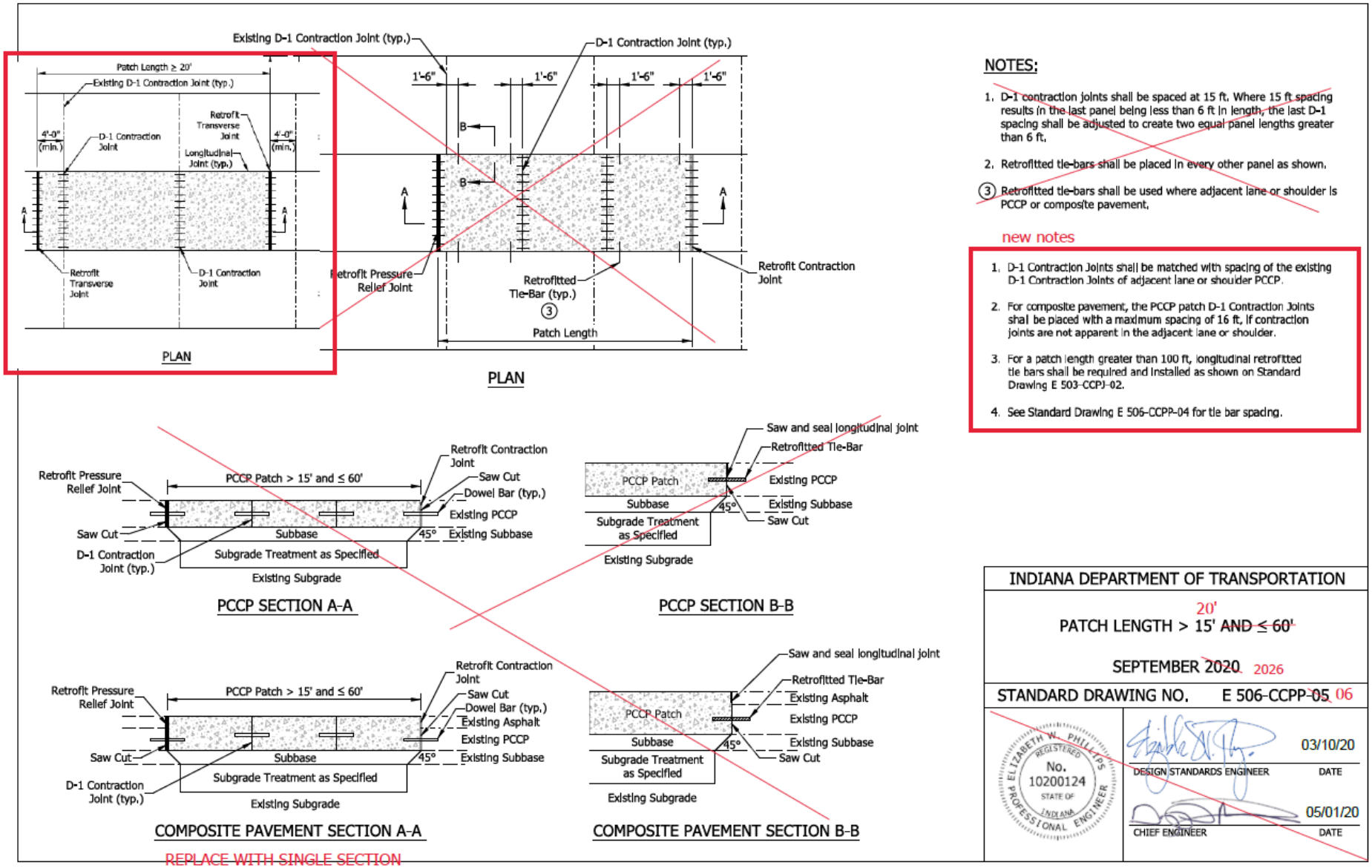
REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-04 PATCH LENGTH (WITH SHOWN MARKUPS)



REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

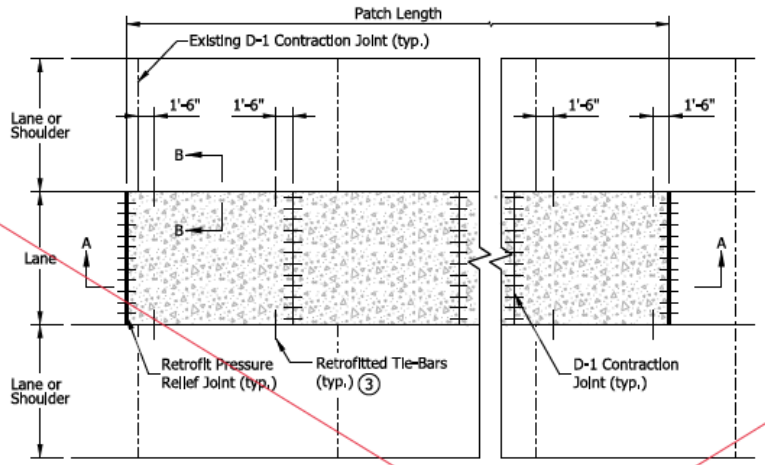
E 506-CCPP-05 PATCH LENGTH (WITH SHOWN MARKUPS)



REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-06 PATCH LENGTH (WITH SHOWN MARKUPS)

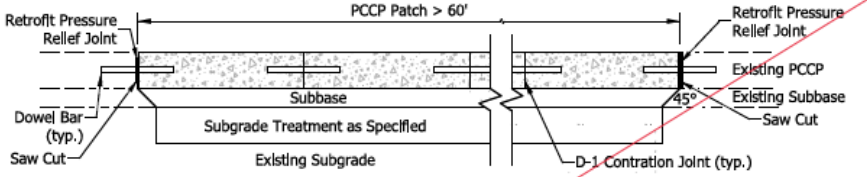
DELETE SHEET



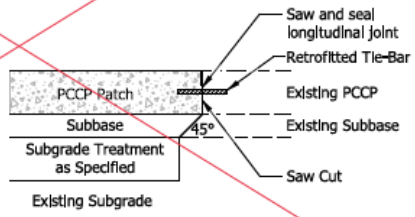
PLAN

NOTES:

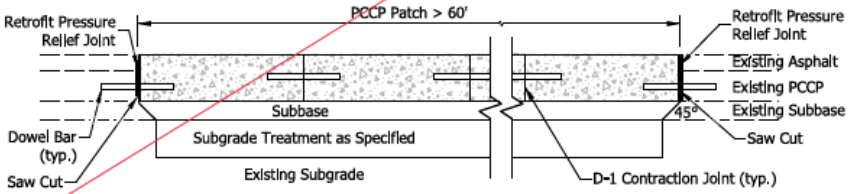
1. D-1 contraction joints shall be spaced at 15 ft. Where 15 ft spacing results in the last panel being less than 6 ft in length, the last D-1 spacing shall be adjusted to create two equal panel lengths greater than 6 ft.
2. Retrofitted tie-bars shall be placed in every other panel as shown.
3. Retrofitted tie-bars shall be used where adjacent lane or shoulder is PCCP or composite pavement.



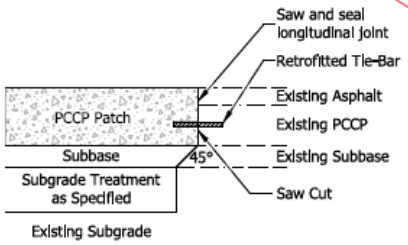
PCCP SECTION A-A



PCCP SECTION B-B



COMPOSITE PAVEMENT SECTION A-A



COMPOSITE PAVEMENT SECTION B-B

INDIANA DEPARTMENT OF TRANSPORTATION

PATCH LENGTH > 60'

SEPTEMBER 2020 2026

STANDARD DRAWING NO. E 506-CCPP-06

ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

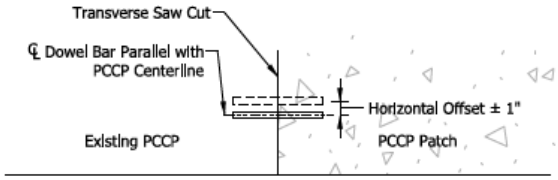
03/10/20
DESIGN STANDARDS ENGINEER DATE

05/01/20
CHIEF ENGINEER DATE

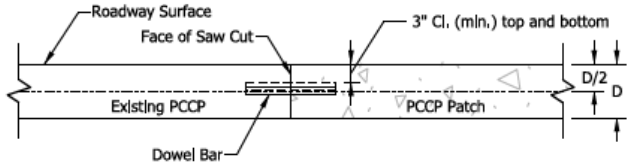
REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-07 DOWEL ALIGNMENT AND SAWCUT TOLERANCES (WITH SHOWN MARKUPS)

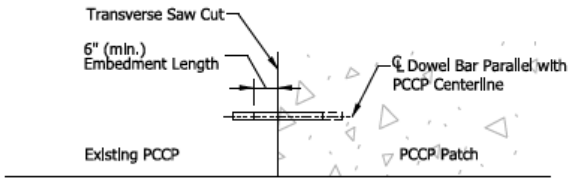
Move contents to Sheet -02



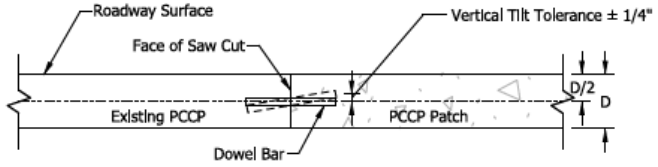
PLAN HORIZONTAL TRANSLATION



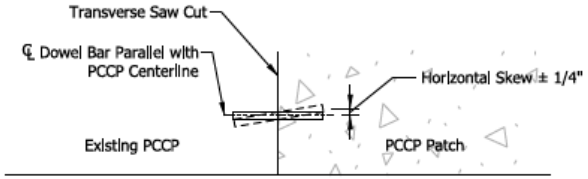
ELEVATION VERTICAL TRANSLATION



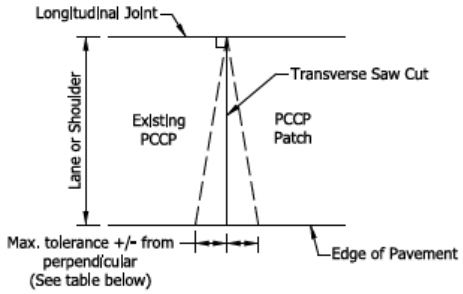
PLAN LONGTITUDINAL TRANSLATION



ELEVATION VERTICAL TILT



PLAN HORIZONTAL SKEW



WIDTH OF LANE OR SHOULDER	MAX. TOLERANCE
10'	1 5/8"
12'	2"
14'	2 5/16"

PLAN SAW CUT

LEGEND

D = Existing PCCP Thickness
Mis-Aligned Dowel Bar
Properly Aligned Dowel Bar

INDIANA DEPARTMENT OF TRANSPORTATION

DOWEL ALIGNMENT AND SAWCUT TOLERANCES

SEPTEMBER ~~2020~~ 2026

STANDARD DRAWING NO. E 506-CCPP-~~07~~ 02

ELIZABETH W. PHILLIPS REGISTERED No. 10200124 STATE OF INDIANA PROFESSIONAL ENGINEER

03/10/20
DESIGN STANDARDS ENGINEER DATE

05/01/20
CHIEF ENGINEER DATE

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-01 CONCRETE PAVEMENT PATCHING INDEX AND GENERAL NOTES (PROPOSED DRAFT)

INDEX	
SHEET NO.	SUBJECT
1	Concrete Pavement Patching Index and General Notes
2	Tie Bar Alignment and Saw Cut Tolerances
3	Saw Cut Removal Details
4	Retrofit Transverse Joint Details
5	Patch Length ≥ 6' and ≤ 20'
6	Patch Length > 20'

GENERAL NOTES:

1. Tie-bars shall be epoxy coated.
2. Additional preparation of existing subgrade will be determined by the Engineer.
3. See Standard Drawing E 503-CCPJ-02 for sawed joint and joint sealant details.
4. See Standard Drawing E 503-CCPJ-03 for D-1 Contraction Joint details.
5. See Standard Drawing E 503-CCPJ-05 for retrofitted tie bar details.
6. The minimum patch length shall be 6 ft.

INDIANA DEPARTMENT OF TRANSPORTATION

CONCRETE PAVEMENT PATCHING
INDEX AND GENERAL NOTES

SEPTEMBER 2026

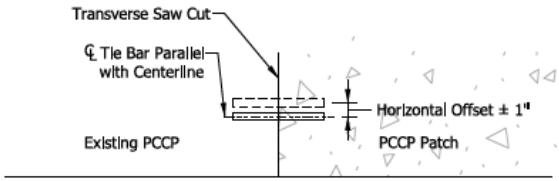
STANDARD DRAWING NO. E 506-CCPP-01

DESIGN STANDARDS ENGINEER DATE

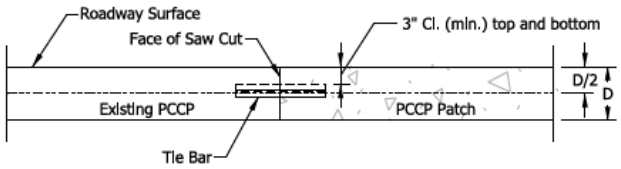
CHIEF ENGINEER DATE

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

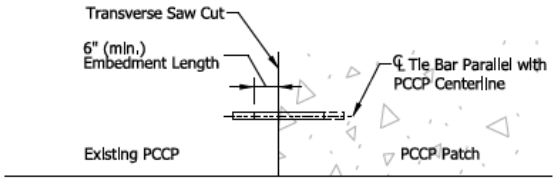
E 506-CCPP-02 TIE BAR ALIGNMENT AND SAWCUT TOLERANCES (PROPOSED DRAFT)



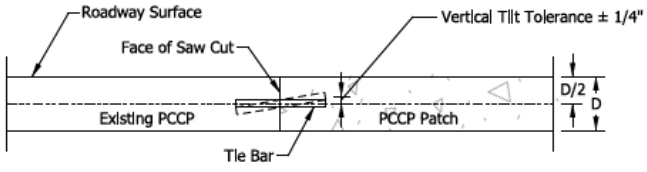
PLAN - HORIZONTAL TRANSLATION



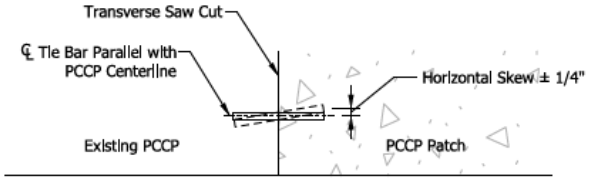
ELEVATION - VERTICAL TRANSLATION



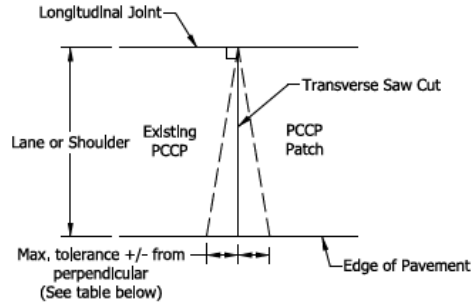
PLAN - LONGTITUDINAL TRANSLATION



ELEVATION - VERTICAL TILT



PLAN - HORIZONTAL SKEW



WIDTH OF LANE OR SHOULDER	MAX. TOLERANCE
10'	1 5/8"
12'	2"
14'	2 5/16"

PLAN - SAW CUT

NOTES:

1. Tie bar alignment and saw cut shall be as shown.

LEGEND

D = Existing PCCP Thickness
Mis-Aligned Tie Bar
Properly Aligned Tie Bar

INDIANA DEPARTMENT OF TRANSPORTATION

TIE BAR ALIGNMENT AND SAWCUT TOLERANCES

SEPTEMBER 2026

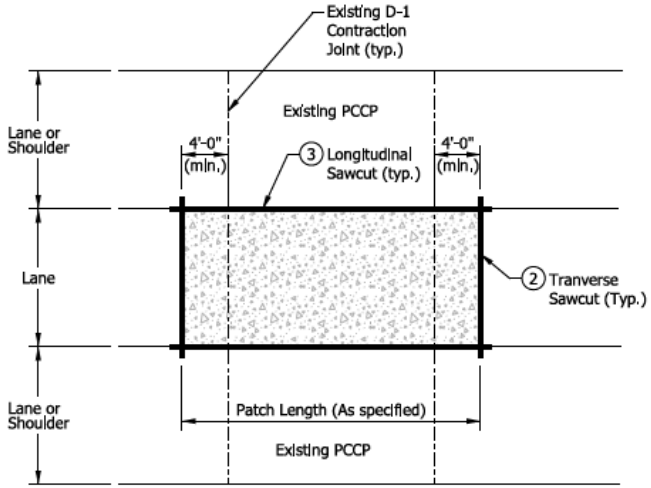
STANDARD DRAWING NO. E 506-CCPP-02

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-03 SAWCUT REMOVAL DETAILS (PROPOSED DRAFT)



PLAN

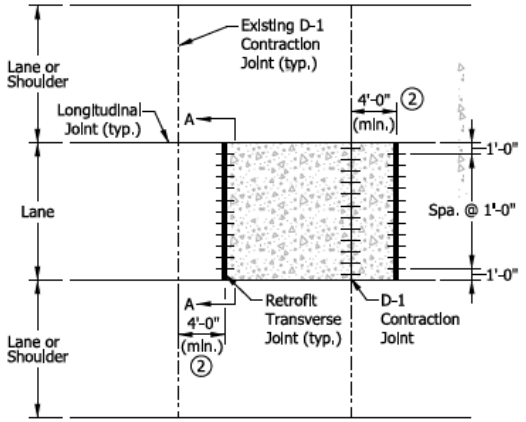
NOTES:

1. The portion of the sawcut that extends into an adjacent lane or shoulder that will remain in place shall be cleaned and sealed with hot-poured joint sealant.
2. Extend transverse sawcut into adjacent PCCP lane or shoulder, maximum 12 in.
3. Extend longitudinal sawcut beyond the patch, maximum 12 in.
4. D-1 Contraction Joint placement and Retrofit Transverse Joint details not shown for clarity.

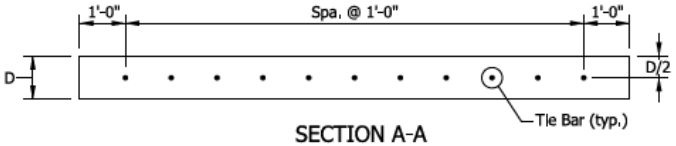
INDIANA DEPARTMENT OF TRANSPORTATION	
SAWCUT REMOVAL DETAILS SEPTEMBER 2026	
STANDARD DRAWING NO. E 506-CCPP-03	
	DESIGN STANDARDS ENGINEER DATE CHIEF ENGINEER DATE

E 506-CCPP-04 RETROFIT TRANSVERSE JOINT DETAILS (PROPOSED DRAFT)

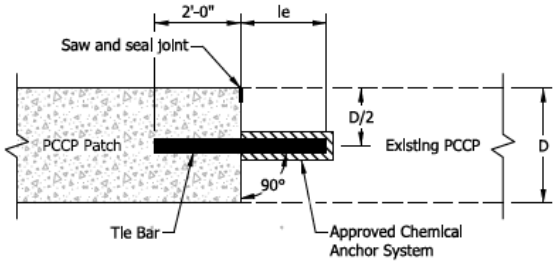
TIE BAR SIZES FOR RETROFIT TRANSVERSE JOINT		
Pavement Thickness, D	Tie Bar Size	Minimum, le
Less than 9"	#5	1'-0"
9" through 12"	#8	1'-8"
Greater than 12"	#10	2'-0"



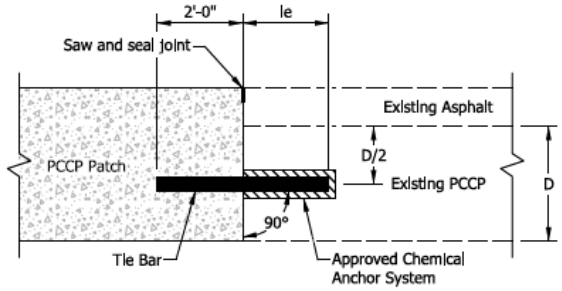
PLAN



SECTION A-A



PCCP



COMPOSITE PAVEMENT

RETROFIT TRANSVERSE JOINT

NOTES:

1. Retrofit Transverse Joint shall be placed at each end of the patch.
2. Retrofit Transverse Joints shall be placed a minimum of 4 ft from an existing D-1 Contraction Joint.
3. Sawing and sealing joints shall be omitted where the concrete patch is to be overlaid with asphalt or concrete.
4. Tie bar size and embedment (le) shall be as shown on table this sheet.

LEGEND

D = Existing PCCP Thickness

INDIANA DEPARTMENT OF TRANSPORTATION

RETROFIT TRANSVERSE JOINT DETAILS

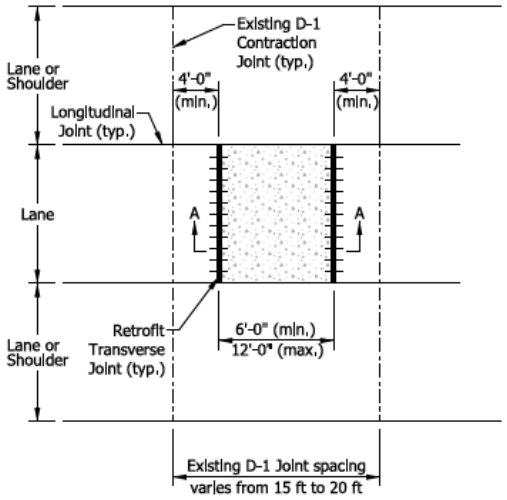
SEPTEMBER 2026

STANDARD DRAWING NO. E 506-CCPP-04

DESIGN STANDARDS ENGINEER DATE

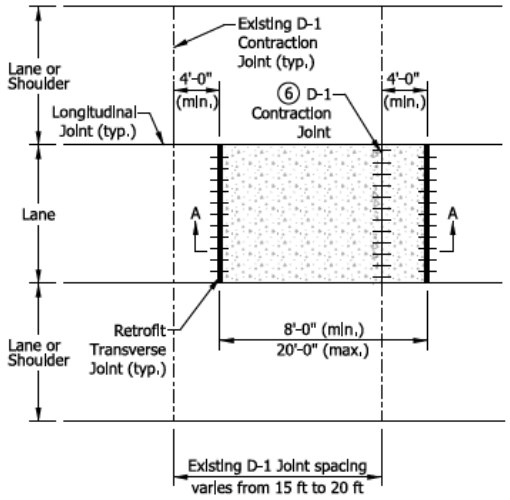
CHIEF ENGINEER DATE

E 506-CCPP-05 PATCH LENGTH≥ 6' AND ≤ 20' (PROPOSED DRAFT)



(EXISTING D-1 CONTRACTION JOINTS NOT REMOVED)

PLAN



(EXISTING D-1 CONTRACTION JOINT REMOVED)

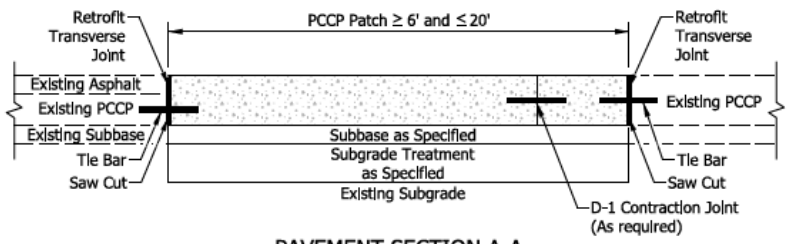
PLAN

NOTES:

1. Minimum and maximum patch lengths based on existing D-1 Contraction Joint spacing and minimum 4 ft distance to Retrofit Transverse Joint.
2. For patch lengths 6 ft or greater and less than 20 ft, tie bars shall not be placed at longitudinal joints.
3. Where the distance from an existing D-1 Contraction Joint to the end of the patch is less than 4 ft, the patch length shall be extended until the minimum distance is satisfied. Where extending the patch results in a patch length greater than 20 ft, use detail on Standard Drawing E 506-CCPP-06.
4. See Standard Drawing E 506-CCPP-04 for transverse tie bar spacing.
5. Where the patch length is 12 ft or less and the existing D-1 Contraction Joint has not been removed, a D-1 Contraction shall not be placed.

⑥ Where the patch length is between 8 ft and 20 ft and the existing D-1 Contraction Joint has been removed, a D-1 Contraction Joint shall be placed as shown.

(COMPOSITE PAVEMENT SHOWN) (PCCP SHOWN)

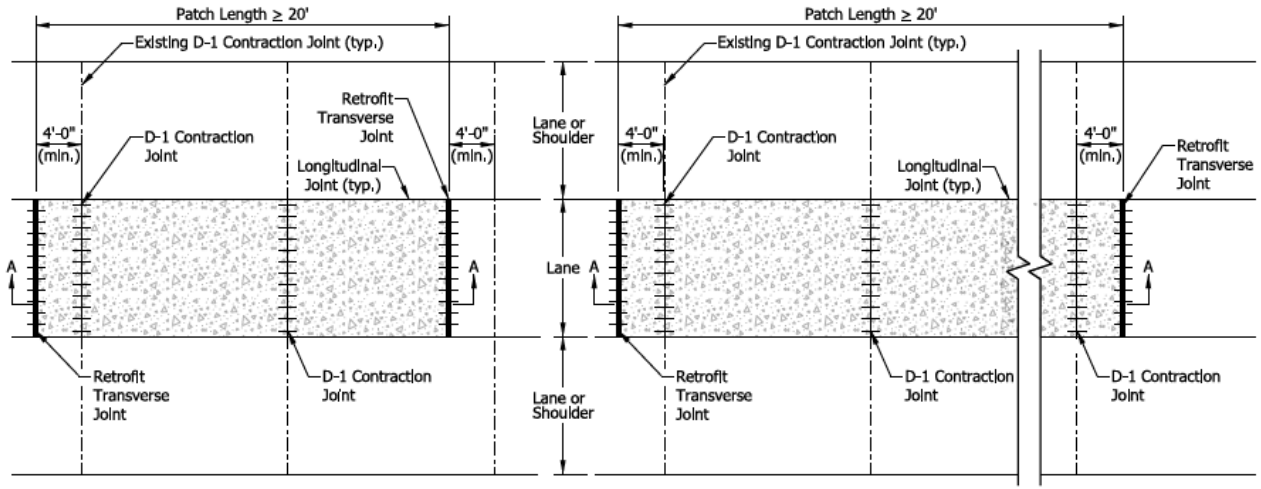


PAVEMENT SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION	
PATCH LENGTH ≥ 6' AND ≤ 20'	
SEPTEMBER 2026	
STANDARD DRAWING NO. E 506-CCPP-05	
	DESIGN STANDARDS ENGINEER DATE
	CHIEF ENGINEER DATE

REVISION TO 2026 STANDARD SPECIFICATIONS and STANDARD DRAWINGS

E 506-CCPP-05 PATCH LENGTH > 20' (PROPOSED DRAFT)

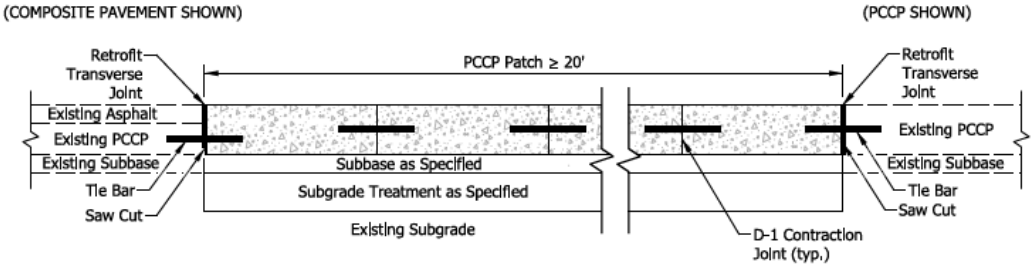


PLAN

PLAN

NOTES:

1. D-1 Contraction Joints shall be matched with spacing of the existing D-1 Contraction Joints of adjacent lane or shoulder PCCP.
2. For composite pavement, the PCCP patch D-1 Contraction Joints shall be placed with a maximum spacing of 16 ft, if contraction joints are not apparent in the adjacent lane or shoulder.
3. For a patch length greater than 100 ft, longitudinal retrofitted tie bars shall be required and installed as shown on Standard Drawing E 503-CCPJ-02.
4. See Standard Drawing E 506-CCPP-04 for tie bar spacing.



PAVEMENT SECTION A-A

INDIANA DEPARTMENT OF TRANSPORTATION

PATCH LENGTH > 20'

SEPTEMBER 2026

STANDARD DRAWING NO. E 506-CCPP-06

DESIGN STANDARDS ENGINEER DATE

CHIEF ENGINEER DATE

COMMENTS AND ACTION

SECTION 506 – PCCP PATCHING
E 503-CCPJ-02 SAWED JOINTS AND JOINT SEALANT
E 506-CCPP series

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval:	**Action:** ___ Passed as Submitted ___ Passed as Revised ___ Withdrawn
2026 Standard Specifications Sections: 506 pp. 451 - 465. Recurring Special Provisions or Plan Details: NONE Standard Drawing affected: E 503-CCPJ-02 and E 506-CCPP series Design Manual Chapter: Chapter 603 GIFE Section: Section 9	___ 2028 Standard Specifications ___ Revise Pay Items List ___ Notification to Designers if change is not addressed by RSP ___ Create RSP (No.___) Effective: ___ Revise RSP (No.___) Effective: ___ Standard Drawing Effective: ___ Create RPD (No. ___) Effective: ___ GIFE Update ___ Frequency Manual Update ___ SiteManager Update