



INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 21-12

April 13, 2021

TO: All Design, Operations, and District Personnel, and Consultants

FROM: /s/ Stephanie J. Wagner
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SUBJECT: Surface Seal

REVISES: *Indiana Design Manual (IDM) Chapter 17, Section 17-5.01(03),
Figure 17-5A(0)*
Indiana Design Manual (IDM) Chapter 404, Section 404-2.01

EFFECTIVE: Lettings on or after August 11, 2021

Surface seal is no longer required to be applied to newly constructed bridge decks or reinforced concrete approach slabs. Recurring Special Provision 702-R-691, which will be incorporated into the 2022 INDOT *Standard Specifications*, requires the use of pozzolans in all bridge decks and reinforced concrete bridge approach slabs. These pozzolans reduce the permeability of the concrete, which reduces the need to surface seal these elements during initial construction. Another benefit of using pozzolans in lieu of surface seal is the potential of opening the bridge to traffic earlier, since silane sealers can only be applied to completely dry concrete that is at least 28 days old.

For contracts letting prior to August 11, 2021 surface seal on bridge decks and approach slabs should be eliminated, if practical.

IDM [Chapter 17](#), Quantity Estimating, and [Chapter 404](#), Bridge Deck, have been updated to reflect updates concerning surface seal. An excerpt of the changes is shown at the end of this memo.

For questions related to this design memo, please contact the Bridge Engineering Division at Bridgedesignoffice@indot.in.gov.

Chapter 17 Revisions

17-5.01(03) Surface Seal [Rev. April 2021]

The limits of surface seal should be shown on the plans, and the pay quantity of surface seal should be determined based on the total area of surfaces to be sealed. The concrete surfaces of pier and bent caps, front face of mudwalls, and concrete bridge railings should be sealed. Concrete bridge decks and approach slabs contain pozzolans that reduce permeability, so it is not necessary to seal these elements during initial construction. Sealers approved for use require the concrete to be completely dry and at least 28 days old prior to application. Therefore, the use of surface sealers on newly constructed bridge decks and approach slabs may delay opening to traffic. The quantity in square feet (square meters) should be shown where appropriate on the Bridge Summary of Quantities.

For a bridge with concrete structural members, the tops of all such members, and the outside faces of the fascia members should also be surface sealed. This quantity is included in the concrete-structural-member quantities. It should not be calculated, nor included in the surface-seal quantity shown on the Bridge Summary of Quantities.

Chapter 404 Revisions

404-2.01 General Requirements [Rev. Apr. 2021]

1. Load Modifier, η . Due to the conservative deck design produced by the strip method, the η value for a deck should be 1.
2. Thickness. The depth of a reinforced-concrete deck should not be less than 8 in.
3. Reinforcement. The bottom-reinforcement cover should be 1 in. The top-reinforcement cover should be 2½ in. The primary reinforcement should be on the outside and should be a #5 bar or larger.
4. Maximum Bar Spacing. The maximum bar spacing for primary, distribution, and temperature reinforcement is 8 in. This maximum bar spacing is used to control cracking.
5. Sacrificial Wearing Surface. The top ½ in. of the bridge deck should be considered sacrificial and should not be included in the structural design or as part of the composite section.
6. Class of Concrete. Class C concrete should be used.

7. Concrete Strength. The specified 28-day compressive strength of concrete shall not be less than 4 ksi.
8. Reinforcing-Steel Strength. The specified yield strength shall not be less than 60 ksi.
9. Epoxy Coating. All reinforcing steel in both top and bottom layers shall be epoxy coated for a bridge deck supported on beams.
10. Sealing. All exposed surfaces of concrete bridge railings should be sealed. Concrete bridge decks and approach slabs contain pozzolans that reduce permeability, so it is not necessary to seal these elements during initial construction. Sealers approved for use require the concrete to be completely dry and at least 28 days old prior to application. Therefore, the use of surface sealers on newly constructed bridge decks may delay opening to traffic.
11. Length of Reinforcing Steel. The maximum length of individual reinforcing bars shall be 40 ft. All reinforcing-bar splice lengths shall be shown on the plans.
12. Truss Bars. Truss bars shall not be used in a concrete deck supported on longitudinal stringers or beams.