



# INDIANA DEPARTMENT OF TRANSPORTATION

*Driving Indiana's Economic Growth*

## Design Memorandum No. 18-17 Technical Advisory

August 6, 2018

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

**FROM:** /s/Elizabeth W. Phillips  
Elizabeth W. Phillips  
Manager, Office of Standards and Policy  
Bridge Design Division

**SUBJECT:** Bridge Deck Overlays

**EFFECTIVE:** Lettings on or after December 1, 2018  
Lettings on or after September 1, 2019

This memo has been revised to reflect revisions to RSP 722-B-307, Concrete Bridge Deck Overlays. Revisions include two new pay items to better define how work is measured and paid for when the bridge has an existing overlay and when it does not.

When the bridge has an existing overlay, the work associated with surface milling the original deck surface is included in the overlay removal pay item. This applies whether milling is completed in a single pass at the same time as the overlay removal or in a separate pass after the overlay has already been removed. See items 5, 5A, 6, and 7 for additional information.

These new pay items take effect starting with the September 2019 letting when RSP 722-B-307 replaces section 722 in the 2020 *Standard Specifications*.

This memo has been revised to update pay item information. Pay item 722-51846 will revert to its original description, Bridge Deck Overlay, Additional. A new pay item has been created for Bridge Deck Overlay, Additional LMC. This change allows optional bid LMC/SFMC overlay contracts to continue to use a single pay item for Bridge Deck Overlay, Additional until the 722-B-307 RSP takes effect in December.

Effective with lettings on or after December 1, 2018, *Standard Specifications* section 722 Latex Modified Concrete Bridge Deck Overlays will be superseded in its entirety by RSP 722-B-307, Concrete Bridge Deck Overlays.

The RSP combines and updates the following three documents into a single provision:

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1. *Standard Specifications* Section 722
2. RSP 736-B-104, Silica Fume Modified Structural Concrete Bridge Deck Overlay
3. USP Existing Overlay Removal, Hydrodemolition and Latex Modified Concrete Overlay for Bridge Decks, currently on the USP samples index

Pay items used in conjunction with the RSP are described in individual sections below. A complete list of pay items is included on the last page of this memo.

### 1. Latex Modified Concrete (LMC) and Silica Fume Modified (SFMC) Overlays

Pay Item	Pay Item Description	Unit
722-51842*	BRIDGE DECK OVERLAY, LATEX MODIFIED	SYS
722-01061	BRIDGE DECK OVERLAY, SILICA FUME MODIFIED	SYS
722-12397**	BRIDGE DECK OVERLAY, ADDITIONAL LMC	CYS
722-96912**	BRIDGE DECK OVERLAY, ADDITIONAL SILICA FUME MODIFIED	CYS

\* Renamed. Bid history for BRIDGE DECK OVERLAY carried forward

\*\* Individual pay item not included in estimate. Established unit costs created.

**Designers:** Designers should continue the practice of providing both overlay materials in contract documents as optional bid items where appropriate. See [Bridge Design Aid 412-02](#) for specific details on including optional bid items.

The need to specify only LMC or SFMC should be coordinated at the initial field check with Bridge Design, the district Bridge Asset Engineer, and district Construction Management personnel.

2. **Very Early Strength Latex Modified Concrete (LMC-VE) Overlay.** Specifications for Very Early Strength Latex Modified Concrete (LMC-VE) for use in bridge deck overlays have been incorporated in the provision. LMC-VE has a 3-hour cure requirement and is intended for use only on projects where significant cost savings can be realized by limiting the traffic closure.

Pay Item	Pay Item Description	Unit
722-12381	BRIDGE DECK OVERLAY, LMC-VE	SYS
722-12383**	BRIDGE DECK OVERLAY, ADDITIONAL LMC-VE	CYS

\*\* Individual pay item not included in estimate. Established unit price created.

**Designers:** The potential use of LMC-VE should be discussed at the initial field check. Bridge Design, the district Bridge Asset Engineer, district Construction Management,

and the designer should come to a consensus on the cost-effectiveness of specifying LMC-VE.

If LMC-VE is selected for the project, the designer should detail the maintenance of traffic in accordance with the closures or restrictions agreed upon with the district Traffic Engineer. This may include the use of short term lane closures utilizing truck mounted attenuators. Approximately one lane, 200 ft long can be completed in an overnight lane closure. A typical 3-lane interstate bridge less than 200 ft long can be completed in a full weekend closure.

When LMC-VE is utilized, no optional bid items should be included in the contract for any of the other overlay types.

- 3. Transverse Grooving.** The RSP eliminates tining as a method for texturing the overlay surface. The concrete bridge deck overlay surface will be mechanically grooved perpendicular to the centerline (transverse grooving) and after the curing period is complete.

Pay Item	Pay Item Description	Unit
722-12382	TRANSVERSE GROOVING	SYS

Until a bid history is established, \$9/SYS may be used as a unit cost for Transverse Grooving.

**Designers:** Designers should include the Transverse Grooving pay item in each the contract, regardless of the concrete overlay material. Typically, the quantity for grooving should match the quantity for Bridge Deck Overlay, [Material]. Where the approach slab is replaced or resurfaced in conjunction with the overlay, add the approach slab area to the grooving quantity. Do not reduce the area for locations where grooving is not required (per the RSP), e.g., adjacent to bridge railing and within 6 in. of steel nosed expansion joints.

The designer should discuss the need for very limited full closures to complete the grooving operation with the district Traffic Engineer. The grooving operation should be completed in full width passes after all phases of construction are complete. The initial agreed upon closure should be included in the contract documents as a provision when possible.

- 4. Bridge Deck Overlay Budget. Bridge Deck Overlay, Additional [Material]. Bridge Deck Overlay, Additional Surface Prep.** Bridge Deck Overlay Budget (DOL) is a new pay item intended to capture the fixed costs of both the Bridge Deck Overlay, Additional [Material] and Bridge Deck Overlay, Additional Surface Prep (LFT).

Bridge Deck Overlay, Additional [Material] (CYS) are new pay items that reflect the specific concrete material. Established unit prices have been created for these items and the total cost will be included in the Bridge Deck Overlay, Budget pay item.

Bridge Deck Overlay, Additional Surface Preparation (LFT) is a new pay item intended to capture the cost of chipping around reinforcing bars that have an exposed length of at least two feet and are debonded from the original deck. Established unit prices have been created and the total cost will be included in the Bridge Deck Overlay, Budget pay item.

Pay Item	Pay Item Description	Unit	Quantity
722-12380	BRIDGE DECK OVERLAY, BUDGET	DOL	Sum of estimated costs

Pay Item	Pay Item Description	Unit	Est. Price
722-12397**	BRIDGE DECK OVERLAY, ADDITIONAL LMC	CYS	\$ 550
722-12383**	BRIDGE DECK OVERLAY, ADDITIONAL LMC-VE	CYS	\$ 650
722-96912**	BRIDGE DECK OVERLAY, ADDITIONAL SILICA FUME MODIFIED	CYS	\$ 200
722-12384**	BRIDGE DECK OVERLAY, ADDITIONAL SURFACE PREP	LFT	\$ 15

\*\* Individual pay item not included in estimate.

**Designers:** Designers should estimate the quantity for Bridge Deck Overlay, Additional [Material] and for Bridge Deck Overlay, Additional Surface Prep. Show the estimated quantities on the plans, but *do not include individual pay items in the estimate.*

Estimate the cost associated with each item using the established unit prices, not bid history. Sum the estimated costs and enter the total amount as the quantity for Bridge Deck Overlay, Budget. Use the LMC established price for LMC/SMFC optional bids.

See IDM Section 412-3.02(08) for guidance on estimating Bridge Deck Overlay, Additional quantities.

The following equation may be used to estimate Additional Surface Preparation quantities:

$$\text{Additional Surface Prep (LFT)} = \text{Total Deck Area (SqFt)} \times 3\% \times 3 \text{ Lft/SqFt}$$

- 3% represents an estimate deck area needing additional removal around the bars for a first overlay. This number may need to be inflated for second overlays.
- 3 Lft/SqFt of deck represents the length of bars

The approximate method for estimating additional surface preparation will be refined as necessary in the future.

5. **Bridge Deck Overlay, Remove Existing and Hydrodemolition.** A 722 pay item for Bridge Deck Overlay, Remove Existing and Hydrodemolition has been created. Bid history from previous 202 pay items has been carried forward. The pay items Bridge Deck Overlay, Remove Existing has been deleted. See 5A.

Pay Item	Pay Item Description	Unit
722-51822*	BRIDGE DECK OVERLAY, REMOVE EXISTING	SYS
722-01066**	HYDRODEMOLITION	SYS

\* Renamed, renumbered. Bid history for 202-51822 BRIDGE DECK OVERLAY, REMOVE carried forward

\*\* Renamed, renumbered. Bid history for 202-01066 HYDRO-DEMOLITION carried forward

**5A. Removal of Existing Overlay and Removal of Existing Bridge Deck Surface.** New pay items for Bridge Deck, Remove Existing Concrete Overlay and Bridge Deck, Remove Existing Concrete Surface have been created.

Pay Item	Pay Item Description	Unit
722-12463*	BRIDGE DECK, REMOVE EXISTING CONCRETE OVERLAY	SYS
722-12464**	BRIDGE DECK, REMOVE EXISTING CONCRETE SURFACE	SYS

\* Renamed, renumbered. Bid history for 202-51822/722-51822 BRIDGE DECK OVERLAY, REMOVE carried forward

\*\* Renamed, renumbered. Bid history for 722-60824 SURFACE MILLING carried forward

**Designers:** When the bridge has an existing overlay, the removal of the existing overlay and the additional surface milling into the original deck is included in the cost of Bridge Deck, Remove Existing Concrete Overlay. When the bridge does not have an existing overlay, the surface milling into the deck surface is paid for as Bridge Deck, Remove Existing Concrete Surface.

Because surface milling is included in the cost of removing the overlay, these two pay items typically should not be used together on the same bridge. Designers should increase the unit cost of Bridge Deck, Remove Existing Concrete Overlay to account for surface milling, until there is bid history that reflects the additional work.

6. **Existing Pay Items.** Pay items for partial depth patching, full depth patching, overlay dam, and surface milling are unchanged. The pay item for surface milling has been deleted.

Pay Item	Pay Item Description	Unit
722-51401	BRIDGE DECK PATCHING, FULL DEPTH	SFT
722-51852	BRIDGE DECK PATCHING, PARTIAL DEPTH	SFT
722-51874	OVERLAY DAM	SFT
<del>722-60824</del>	<del>SURFACE MILLING</del>	<del>SYS</del>
722-97116	BRIDGE DECK OVERLAY, PATCHING	SFT

**Designers:** Reminders

- Partial Depth Patching should not be included in contracts for bridges with a Hydrodemolition pay item. The cost of partial depth patching is included in the cost of hydrodemolition.
- All bridge deck overlay contracts should have at least a minimal quantity of Full Depth Patching included in the estimate.

- Surface milling is now included in the cost of Bridge Deck, Remove Existing Concrete Overlay and Bridge Deck, Remove Existing Concrete Surface.

**7. Supplemental Descriptions.** Designers working on contracts with multiple overlays should utilize RSP 101-B-042 Bridge Numbers for Pay Items and supplemental descriptions with structure numbers for pay items specific to a limited number of bridges in a bundle. Previously, this provision was only used for items paid as a lump sum. To prevent confusion in the field with bundled contracts, designers should also utilize this RSP for the following items when necessary:

Pay Item	Pay Item Description	Unit
722-12463	BRIDGE DECK, REMOVE EXISTING CONCRETE OVERLAY	SYS
722-12464	BRIDGE DECK, REMOVE EXISTING CONCRETE SURFACE	SYS
722-51852	BRIDGE DECK PATCHING, PARTIAL DEPTH	SFT

**Designers: Bundling Examples**

- Partial Depth Patching pay item should not be included for bridges having a Hydrodemolition pay item, but is necessary for each bridge receiving a polymeric overlay.
- Bridge Deck, Remove Existing Concrete Overlay and Bridge Deck, Remove Existing Concrete Surface should not be included for the same bridge, but both may be included in the same contract if there are bridges with existing overlays as well as bridges without existing overlays.

**Summary of Concrete Bridge Deck Overlay Pay Items**

Pay Item	Pay Item Description	Unit
722-12380	BRIDGE DECK OVERLAY, BUDGET	DOL
722-51842*	BRIDGE DECK OVERLAY, LATEX MODIFIED	SYS
722-12381	BRIDGE DECK OVERLAY, LMC-VE	SYS
722-97116	BRIDGE DECK OVERLAY, PATCHING	SFT
722-51822*	BRIDGE DECK OVERLAY, REMOVE EXISTING	SYS
722-01061	BRIDGE DECK OVERLAY, SILICA FUME MODIFIED	SYS
722-51401	BRIDGE DECK PATCHING, FULL DEPTH	SFT
722-51852	BRIDGE DECK PATCHING, PARTIAL DEPTH	SFT
722-12463*	BRIDGE DECK, REMOVE EXISTING CONCRETE OVERLAY	SYS
722-12464*	BRIDGE DECK, REMOVE EXISTING CONCRETE SURFACE	SYS
722-01066*	HYDRODEMOLITION	SYS
722-12382	TRANSVERSE GROOVING	SYS
722-51874	OVERLAY DAM	SFT
722-60824	SURFACE MILLING	SYS

\* Bid history carried forward from previous pay item

The following pay items are included in the Bridge Deck Overlay, Budget pay item.

Pay Item	Pay Item Description	Unit	Est. Price
722-12397**	BRIDGE DECK OVERLAY, ADDITIONAL LMC	CYS	\$ 550
722-12383**	BRIDGE DECK OVERLAY, ADDITIONAL LMC-VE	CYS	\$ 650
722-96912**	BRIDGE DECK OVERLAY, ADDITIONAL SILICA FUME MODIFIED	CYS	\$ 200
722-12384**	BRIDGE DECK OVERLAY, ADDITIONAL SURFACE PREP	LFT	\$ 15

\*\* Individual pay item not included in estimate. Established unit price created.