

722-B-307 CONCRETE BRIDGE DECK OVERLAYS

(Adopted 06-21-18)

The Standard Specifications are revised as follows:

SECTION 202, BEGIN LINE 157, DELETE AS FOLLOWS:

Hydrodemolition may be allowed for removal of portions of bridge structures as an alternate method to pneumatic hammers. Hydrodemolition for such removals may be accomplished either by use of a machine or a hand held device. Hydrodemolition shall otherwise be in accordance with 722.05(a)2.

SECTION 602, BEGIN LINE 9, DELETE AS FOLLOWS:

602.02 Materials

Materials shall be in accordance with the following:

Barrier Delineators	926.02(c)
Bridge Deck Overlay Materials	722.04

SECTION 710, BEGIN LINE 85, DELETE AND INSERT AS FOLLOWS:

Cavities of 1/2 in. depth or greater shall be filled with concrete or a packaged patching product. Cavities of less than 1/2 in. depth shall be filled with mortar or a packaged patching product. When using concrete or mortar patching materials, the surfaces of prepared cavities and all exposed reinforcement within the cavities shall be coated with an epoxy resin adhesive in accordance with 722.067(a)1. When packaged patching products are to be applied, all surface preparation and the use of bonding agents shall be as directed by the manufacturer. The surface shall be in saturated surface damp condition with no standing water on the surface unless otherwise directed by the manufacturer.

SECTION 722, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 722 - ~~LATEX MODIFIED~~ CONCRETE BRIDGE DECK OVERLAYS

722.01 Description

This work shall consist of the *surface preparation and* construction of a *bridge deck overlay consisting of latex modified portland cement concrete, ~~overlay~~ LMC, latex modified concrete very early strength, LMC-VE, or silica fume modified concrete, SFMC,* on an existing or new bridge deck, or it shall consist of patching an existing ~~latex modified portland cement~~ concrete overlay on a bridge deck in accordance with 105.03.

722.02 Quality Control

LMC-VE overlays shall be placed in accordance with the QCP, which shall be prepared and submitted in accordance with ITM 803. The QCP shall include the Contractor's experience placing LMC-VE overlays within the last three years. The QCP shall be submitted to the Engineer at least 14 days prior to commencing overlay operations. Approval of the QCP by the Department's Office of Materials Management is required.

722.023 Materials

Materials shall be in accordance with the following:

Admixtures	912.03
Coarse Aggregate, Class A or Higher, Size No. 11*	904
Epoxy Penetrating Sealer	909.09
Epoxy Resin Adhesive	909.11
Fine Aggregate	904
Fly Ash	901.02
Latex Modifier	912.04
PCC Sealer/Healer	901.06
Portland Cement.....	901.01(b)
<i>Rapid Hardening Hydraulic Cement</i> **	<i>ASTM C 1600</i>
<i>Silica Fume</i>	<i>901.04</i>
Water	913.01

* Crushed stone only

** *Cement shall be calcium sulfoaluminate, CSA, hydraulic cement type VRH except that the 3 h compressive strength shall be a minimum of 2,500 psi. Portland cement shall not be used.*

Evaporation retardant shall be a product that produces a monomolecular film. A Type D certification in accordance with 916 shall be furnished to the Engineer prior to use.

Citric acid shall be marked “food grade” on the packaging.

722.034 Storage and Handling of Materials

Fine and coarse aggregates shall be stored and handled avoiding contamination and maintaining uniform moisture content. Fine and coarse aggregates which are stored in piles or bins shall remain separated and shall be covered with a moisture proof material which prevents variations in moisture content of the aggregates. The maximum variation of moisture content in successive concrete batches shall be 0.5%.

~~Cement shall be shipped and stored in weatherproof enclosures which protect the cement from dampness in accordance with 702.04 and 901.01. Cement shall not have developed lumps.~~

The latex modifier, *liquid silica fume slurry*, and *dry condensed silica fume* shall be stored in accordance with the manufacturer’s recommendations. Latex modifier shall be strained to remove solid particles during transfer of the material from storage drums to the mobile mixer tank.

722.045 Proportioning

(a) Latex Modified Concrete

A mix design shall be submitted a minimum of 14 days prior to use and calibration of the mobile mixer in accordance with 722.09. The proportioning of the ingredients for the LMC shall be in accordance with 702.05 except as modified herein.

The amount of fine aggregate shall be 60% ± 5% by dry weight of the total aggregate and shall be considered as the amount of aggregate blend passing the No. 4

(4.75 mm) sieve. The coarse aggregate shall be No. 11, class A crushed stone. The cement content shall be a minimum of 658 lbs/cu yd of concrete. The same brand of cement shall be used throughout a bridge structure. The amount of latex modifier shall be 3.5 gal. per 94 lbs of cement. The net water added shall produce a slump of 5 in. \pm 1 in. at 4 to 5 minutes after discharge from the mixer. The moisture content of the aggregates shall be controlled such that the slump is within the specified limits. *The maximum water-cement ratio shall be 0.400 including the water in the latex.* The air content shall be a maximum of 6%, by volume, of the plastic mix.

The yield will be checked using the 1/4 cu yd box method as follows. The chute shall be cleaned and the box shall be positioned to receive the discharged concrete. The mixer shall be operated until the cement counter indicates that 1/4 cu yd of concrete has been produced. The contents of the box shall be consolidated and struck off. ~~If~~Where the box is not essentially full, the gates shall be adjusted and the procedure shall be repeated until the actual and calculated volumes of concrete agree. Yield tests shall be run on the first load of each truck and every third load per truck thereafter. Additional tests will be required after making any adjustments.

Slump and air content tests will be performed after each acceptable yield test. The slump test shall be in accordance with AASHTO T 119 and will be performed 4 to 5 minutes after the concrete is discharged from the mixer. The water flow meter reading will be recorded at the time the slump test is taken. The concrete shall not be disturbed during the waiting period for the slump test. The air content test shall be in accordance with 505. Any concrete mixture which is not properly proportioned or does not conform to the specified slump will be rejected.

Class F or class C fly ash may be used in the latex modified portland cement concrete. The maximum cement reduction shall be 15% and the minimum replacement ratio by weight of fly ash to cement shall be 1.25:1. ~~A concrete mix design shall be submitted in accordance with 702.05.~~ ~~If~~Where portland pozzolan cement, type IP is to be used in the concrete mix design, the cement content shall be increased by a multiplier of 1.06 times the specified cement content.

~~Bridge deck patching concrete shall be composed of the following:~~

- ~~(a) Fine aggregate shall be 35% to 45% of the total weight of aggregate used.~~
- ~~(b) The cement shall be 564 lbs/cu yd of portland cement type III or type IIIA, or 846 lbs/cu yd of portland cement type I or type IA.~~
- ~~(c) Air entraining admixture shall be added to produce 5% to 8% entrained air.~~
- ~~(d) The net water added shall produce a slump of no more than 4 in.~~

(b) Latex Modified Concrete, Very Early Strength

Proportioning of ingredients for LMC-VE shall be in accordance with 722.05(a) except as follows:

Cement shall be a rapid hardening hydraulic cement. Fly ash or other pozzolonic materials shall not be used. Citric acid may be used as a retardant. The maximum content of citric acid shall be 1% of the cement weight. The minimum compressive strength shall be 2,500 psi at 3 h and 3,500 psi at 1 day. The net water added shall produce a minimum slump of 7 in. and maximum slump of 10 in. at 4 to 5 minutes after discharge from the mixer. The maximum water-cement ratio shall be 0.440 including the water in the latex.

1. Trial Batch Demonstration

A trial batch shall be produced to verify that the mix design complies with the physical properties specified, as well as, simulating the placement properties unique to the conditions of the contract such as profile grade, cross slope, delivery time, discharge rate, slump loss with time, air content and target compressive strength. All testing of the trial batch concrete shall be performed by an American Concrete Institute, ACI, certified concrete field testing technician, grade I.

The trial batch demonstration shall include a meeting between the Contractor, material suppliers, and Department to discuss LMC-VE, mixing, delivery, placement, finishing, curing and compressive testing. Representatives from the rapid hardening cement manufacturer shall be present for trial batch demonstrations and the start-up for initial bridge deck placement. The Office of Materials Management may waive the required attendance for these representatives where the Contractor provides sufficient evidence of adequate experience with producing and placing LMC-VE. The trial batch demonstration may be conducted in conjunction with calibration of the mobile mixer in accordance with 722.13.

2. Blank

(c) Silica Fume Modified Concrete

A concrete mix design submittal, CMDS, shall be submitted a minimum of 14 days prior to the trial batch utilizing the Department provided spreadsheet. The proportioning of ingredients for each batch of SFMC shall be in accordance with 702.05 except as modified below and shall meet the mix design, trial batch demonstration, and job-use requirements as specified.

The portland cement content shall be 658 lb/cu yd. Silica fume shall be added at 50 lb/cu yd.

The SFMC shall utilize an approved type F or G admixture to be combined with an air entraining admixture, AEA, a HRWR admixture system or a HRWRR admixture system shall be selected from the Department's list of approved PCC Admixtures and Admixture Systems.

The water/cement ratio shall be no less than 0.370 and shall not exceed 0.400. Portland cement and silica fume shall be included in the total amount of cementitious material.

The same brand of cement and silica fume shall be used throughout the structure. The HRWR or HRWRR admixture system shall not be changed during any individual contiguous pour.

The Contractor shall obtain a written statement from each admixture manufacturer stating the compatibility of the HRWR admixture system and satisfactory performance in SFMC.

The SFMC shall have a relative yield and air content in accordance with 702.05. The slump will be tested in accordance with AASHTO T 119 at the time of placement and shall be at least 4 1/2 in. but shall not exceed 7 1/2 in. The SFMC shall have a minimum compressive strength of 4,500 psi at 7 days and 5,500 psi at 28 days. The compressive strength shall be in accordance with 702.24.

1. Trial Batch Demonstration

A trial batch shall be produced to verify that the mix design complies with the physical properties specified, as well as, simulating the placement properties unique to the conditions of the contract such as profile grade, cross slope, delivery time, discharge rate, slump loss with time, air content and target compressive strength. All testing of the trial batch concrete shall be performed by an American Concrete Institute, ACI, certified concrete field-testing technician, grade I.

The trial batch demonstration shall include a meeting between the Contractor, material suppliers, and Department to discuss SFMC, batching, mixing, delivery, placement, finishing, curing and compressive testing. Representatives from the silica fume and chemical admixture manufacturer shall be present for trial batch demonstrations and the start-up for initial bridge deck placement. The Office of Materials Management may waive the required attendance for these representatives where the Contractor provides sufficient evidence of adequate experience with producing and placing SFMC.

2. Batching

Batching shall be in accordance with 702.06 except the minimum batch shall be 4 cu yd and the maximum shall not exceed 80% of the truck rated capacity. Dry condensed silica fume shall be either sacked or bulk and it shall be batched in accordance with the requirements for cement as specified in 702.06. However, no partial sack of dry condensed silica fume shall be used in a batch of SFMC. Dry condensed silica fume shall be typically added after the initial water and aggregates, with premixing prior to the addition of cement and fly ash, to facilitate dispersion. An alternate batching sequence will be allowed as recommended by the manufacturer of the silica fume and as approved by the Engineer. Liquid silica fume slurry shall be batched as required by the manufacturer and as approved by the Engineer. The AEA shall be added initially with either the first portion of mix water or the fine aggregate. Where a type A or D chemical admixture is used as part of the approved HRWR admixture system, it shall be added separately with a portion of the mix water, after the AEA is premixed in the concrete. A type F or G chemical admixture shall be added separately at the end of the batching sequence with some mix water held in reserve to aid dispersion.

A change in the sequence of batching may be approved if it is in accordance with the chemical admixture and silica fume manufacturer's recommendations, and is agreed to in writing prior to any trial batch demonstration.

722.056 Preparation of the Bridge Floor

(a) ~~Concrete Removal of Existing Concrete Overlay~~

When an existing deck overlay is to be removed, the removal shall be performed with a milling machine. Removal in areas that are inaccessible to the milling machine, shall be performed by chipping hammers or handchipping in accordance with 722.06(b)3.

~~1.(b) Deck Surface Preparation of Existing Concrete Deck~~

1. Surface Milling

The top 1/4 1/2 in. of the entire bridge deck surface shall be removed ~~if the overlay is to be placed on a bridge deck constructed under~~ after removal of any previous ~~contract~~ overlays. The surface removal operation shall be limited to that portion of the bridge deck that is closed to traffic at any one time. After this initial surface removal, an additional 1/4 in. of surface removal ~~milling~~ may be required ~~on part or all of the bridge deck~~ as directed.

Surface removal shall be performed with a power operated mechanical milling machine. The equipment shall uniformly remove the required depth of concrete surface in a satisfactory manner. Surface removal, which is in areas adjacent to the curb that are inaccessible to milling, shall be done by handchipping *in accordance with 722.06(b)3*. All surface removal residue, including water, dust and concrete, shall be immediately removed.

Where the milling operation results in the snagging of the top mat of steel reinforcing bars, the milling operation shall cease and the depth of removal adjusted. Damaged reinforcing bars shall be repaired as directed with no additional payment.

2. ~~Bridge Floor~~Hydrodemolition

When shown on the plans, removal of unsound concrete shall be performed by hydrodemolition. Following the ~~clean up~~ cleanup from the surface removal operation, areas of unsound concrete to be removed will be marked. ~~Removal of the unsound concrete shall be performed by handchipping or hydrodemolition.~~ The hydrodemolition equipment shall consist of a self-propelled computerized machine that utilizes a high pressure water jet stream capable of removing concrete as specified, as well as, removing rust and concrete particles from exposed reinforcing bars.

Prior to hydrodemolition, the equipment shall be calibrated on an area of sound original deck concrete as designated by the Engineer.

The initial settings shall be verified on an area of unsound concrete. The initial settings may need to be adjusted in order to achieve total removal of unsound concrete. Equipment shall be calibrated each day prior to operation. Where directed, equipment

shall be recalibrated to ensure removal of known areas of unsound concrete and to guard against removal of sound concrete. The Engineer shall be notified of the final equipment settings resulting from the calibration process.

After calibration of the equipment, concrete removal by hydrodemolition shall be performed on the bridge deck. The removal will be verified as necessary, every 30 ft along the cutting path. Handchipping shall be used in areas that are inaccessible to the hydrodemolition equipment. Handchipping tools may be hand-held or mechanically driven. The removal operation shall cease where it is determined that sound concrete is being removed. Equipment shall be recalibrated or agreed upon changes to equipment and methods shall be performed prior to resuming the removal operation.

The Contractor shall submit a waste water control and disposal plan for approval seven days prior to commencing hydrodemolition activities. The waste water control and disposal plan shall detail how all waste water generated by the hydrodemolition activities shall be contained, tested for pH, stored, and transported to a disposal facility in accordance with 202.

The Contractor shall provide sufficient shielding to ensure containment of all dislodged concrete during hydrodemolition operations and to prevent damage to surrounding property from flying debris, both on and under the work site.

Cleaning of the hydrodemolition debris and slurry shall be performed with a vacuum system equipped with fugitive dust control devices and capable of removing wet debris and water in the same pass. The vacuum equipment shall be capable of washing the deck with pressurized water during the vacuum operation to dislodge all debris and slurry from the bridge deck surface. Debris and slurry shall not be allowed to dry prior to vacuuming.

After hydrodemolition has been completed, the deck will undergo sounding to identify remaining areas of unsound concrete. Poned or standing water shall be removed from the deck prior to sounding.

Additional concrete removal of remaining unsound concrete, shall be as directed by the Engineer and shall be performed by handchipping or hydrodemolition.

3. Handchipping

When hydrodemolition is not shown on the plans, all removal of unsound concrete shall be performed by handchipping. Following the cleanup from the surface removal operation, areas of unsound concrete to be removed will be marked. Handchipping tools may be hand or mechanically driven. Jackhammers shall not be heavier than nominal 45 lb class and chipping hammers shall not be heavier than nominal 15 lb class. Only chipping hammers shall be used when removing concrete within 1 in. of reinforcing bars. Mechanically driven tools shall be operated at a maximum angle of 45° from the bridge floor surface.

~~*The hydrodemolition machine shall utilize a high pressure water jet system and shall be approved prior to use. Hydrodemolition equipment shall be calibrated to remove*~~

~~only unsound concrete. The pressure of the water jet shall be calibrated for each structure prior to use. All water used in the hydrodemolition operation shall be potable, and stream or lake water will not be allowed. Precautions shall be taken, during the hydrodemolition operations, to prevent damage to surrounding property and traffic. Waste water shall not be discharged into a stream.~~

Regardless of the method of removal, the removal operation shall ~~be stopped if~~ *cease where* it is determined that sound concrete is being removed. ~~Appropriate recalibration, or~~ *Agreed upon* changes in equipment and methods shall be performed prior to resuming the removal operation.

4. Additional Surface Preparation around Reinforcing Bars

Where reinforcing bars have been exposed ~~or for a length greater than 2.0 ft and~~ the bond between the existing concrete and reinforcing bars has been destroyed, the concrete adjacent to the bars shall be removed to a minimum clearance of 1 in. around the entire periphery of the exposed bars. ~~If the concrete is unsound down to the top layer of bottom reinforcing bars, all of the concrete within the marked area shall be removed and the cavity shall require full depth patching in accordance with 722.06(a).~~

5. Additional Construction Requirements

Regardless of the method used for unsound concrete removal, where the deck is unsound for more than 1/2 of its original depth, the concrete shall be removed full depth, except for limited areas as determined by the Engineer. Forms for areas of up to 4 sq ft may be suspended from wires attached to the reinforcing bars. For areas greater than 4 sq ft, the forms shall be supported from the structural members of the superstructure or by shoring from below.

Prepared cavities which are deeper than the level of the adjacent prepared deck surface, but are not full depth, shall require partial depth patching in accordance with 722.0607(b). Prepared partial depth cavities shall be made full depth when directed. Exposed reinforcing bars shall not be damaged by the removal operation. Any damaged reinforcing bars shall be repaired as directed with no additional payment.

The removal areas shall be thoroughly cleaned of all dirt, foreign materials and loose concrete to the extent necessary to produce a firm solid surface for adherence of the new concrete. A minimum 1 in. vertical surface shall remain, or be cut, 1 in. outside and around the entire periphery of each removal area after removal of all loose and unsound concrete. *The 1 in. vertical cut may be waived where it is determined that a cut will damage the reinforcing bars. Where hydrodemolition is utilized on the adjacent surface, the 1 in. vertical surface will not be required.*

(bc) Cleaning

After the concrete removal operation is completed and just prior to placing the patches or the overlay, the entire deck shall be heavily sandblasted to expose fine and coarse aggregates and to remove unsound concrete or laitance layers from the surface. Exposed reinforcing bars and the concrete under and around the exposed bars shall be thoroughly cleaned by sandblasting. The surface shall be then cleaned free of all dust, chips, water, and foreign material to the extent necessary to produce a firm, solid surface

for adherence of the new concrete. The air lines for sandblasting and air cleaning shall be equipped with oil traps.

When hydrodemolition is utilized, water blasting may be used in lieu of sandblasting. The sandblasting or water blasting shall be performed using two passes with the second pass being at a right angle to the first pass or a cross-blasting technique. The minimum pressure of the water blast shall be 6,000 psi.

722. 0607 Patching of the Bridge Floor

A vacuum device shall be used to remove all water from the prepared cavities.

(a) Full Depth Patching

The material used for full depth patching shall be either bridge deck patching concrete ~~or latex modified~~, overlay concrete, or concrete patching material from the Department's list of approved Rapid Setting Patch Materials. Full depth patching shall be performed prior to the overlay operation ~~unless otherwise requested and approved~~. The patching material shall be consolidated by internal vibration at the time of placement. Equipment shall not be operated on the repaired deck areas until the test beams indicate a minimum modulus of rupture of 550 psi. ~~Curing of the patch shall be as directed.~~

1. Patching with Bridge Deck Patching Concrete

Epoxy resin adhesive shall be used to coat the surfaces of the prepared cavities and all the exposed ~~reinforcement~~ reinforcing bars within the cavities. The epoxy coating shall be tacky at the time that the patching concrete is placed. ~~If~~ Where the epoxy coating has cured beyond the obvious tacky condition, it shall be re-applied prior to patching. The coated cavities shall then be filled with the patching concrete to the level of the adjacent deck surface. *Curing of the patching concrete shall be as directed.*

Bridge deck patching concrete shall be composed of the following:

- a. Fine aggregate shall be 35% to 45% of the total weight of aggregate used.*
- b. The cement shall be 564 lbs/cu yd of portland cement type III or type IIIA, or 846 lbs/cu yd of portland cement type I or type IA.*
- c. Air entraining admixture shall be added to produce 5% to 8% entrained air.*
- d. The net water added shall produce a slump of no more than 6 in. and a maximum water/cement ratio of 0.450.*

2. Patching with ~~Latex Modified~~ Overlay Concrete

The surfaces of the prepared cavities shall be coated with a bond coat in accordance with 722.0910. The cavities shall then be filled with the ~~latex modified~~ overlay concrete to the level of the adjacent deck surface.

3. Patching with Rapid Setting Patch Materials

Concrete patching materials shall be as approved by the overlay supplier for compatibility with the overlay material. Concrete patching materials shall be placed and cured in accordance with the manufacturer's recommendations.

(b) Partial Depth Patching

The material used for partial depth patching shall be either bridge deck patching concrete, ~~or latex modified concrete overlay~~, or concrete patching material from the Department's list of approved Rapid Setting Patch Materials. The patching material shall be consolidated by internal vibration at the time of placement. ~~Curing of the patch shall be as directed.~~

1. Patching with Bridge Deck Patching Concrete

Partial depth patching with bridge deck patching concrete shall be in accordance with 722.0607(a) and 722.0607(a)1. *Curing of the patching concrete shall be as directed.*

2. Patching with ~~Latex Modified~~ Overlay Concrete

The surfaces of the prepared cavities shall be coated with a bond coat in accordance with 722.0910 *except where hydrodemolition is utilized*. The cavities shall ~~then~~ be filled with the ~~latex modified~~ overlay concrete at the time that the overlay is placed. *Concrete overlay material used for patching shall be cured in accordance with 722.12.*

3. Patching with Rapid Setting Patch Materials

Concrete patching materials shall be as approved by the overlay supplier for compatibility with the overlay material. Concrete patching materials shall be placed and cured in accordance with the manufacturer's recommendations.

722.0708 Overlay Dam

An overlay dam shall consist of the removal of existing concrete from the bridge floor and replacing it with new concrete as shown on the plans or as otherwise directed. Overlay dam material shall be in accordance with 722.0405.

The existing concrete shall be removed as required in accordance with 722.05(a)06(b). Exposed ~~reinforcement~~ reinforcing bars shall not be cut or otherwise damaged.

Power driven hand tools for removal by handchipping will be allowed. Pneumatic hammers with a maximum weight of 69 lbs may be used for the tops of mudwalls. ~~If~~ *Where*, during the removal process, the tools or methods being used appear to cause damage such as cracks or spalling on the concrete which is to remain, the work shall cease immediately and ~~shall not resume until the Engineer is assured the tools or methods being used will not cause further damage~~ *agreed upon changes in equipment and methods shall be performed prior to resuming the removal operation.*

The surface to be repaired, the reinforcing bars, and the concrete under and around the bars shall be ~~thoroughly~~ cleaned in accordance with 722.05(b)06(c). The cavity shall be ~~epoxy~~ coated with an epoxy resin adhesive in accordance with 722.0607(a)1, then filled with class AC concrete in accordance with 702.

722.0809 Mixing

(a) Latex Modified Concrete and Latex Modified Concrete, Very Early Strength

Proportioning and mixing of the latex modified concrete shall be performed in a self-contained, self-propelled continuous mixer. The mixer shall be calibrated to accurately proportion the specified mix prior to starting the work. The calibration shall be in accordance with 722.1213. Sufficient mixing capacity or mixers shall be provided to enable the intended pour to be placed without interruption. The mixer shall carry sufficient quantities of unmixed ingredients to produce at least 6 cu yd of latex modified concrete at the site.

The mixer shall measure and control the flow of ingredients being introduced into the mix and shall record these quantities on an approved visible recording meter equipped with a ticket printer. Water flow shall be readily adjustable to compensate for minor variations in aggregate moisture content, and shall be displayed by an approved flow meter. The flow of the latex modifier shall also be displayed by an approved flow meter. The manufacturer's inspection plate shall clearly show the serial number, proper operating revolutions per minute, and the approximate number of counts on the cement meter to deliver 94 lbs of cement.

The mixer shall automatically proportion and blend simultaneously all the ingredients of the specified mix on a continuous or intermittent basis as required by the finishing operation. The latex modified concrete shall be discharged through a conventional chute directly in front of the finishing machine. The surface ahead of the deposited mixture shall be kept damp by spraying it with water. ~~If~~Where the water is applied by the mixer, it shall be dispensed ahead of the water flow meter.

(b) Silica Fume Modified Concrete

Mixing shall be in accordance with 702.09(a), 702.09(b), and 702.09(c), except mixing time shall be a minimum of 84 s. Retempering SFMC by adding water or by other means will not be allowed after 30 minutes from initial batching and mixing. When concrete is delivered in transit mixers, additional water may be allowed to increase a marginally low slump. Water shall not be added once 10% of the load has been discharged. Additional mixing shall be performed as directed and all operations completed within the time limits in accordance with 702.09(c). The amount of water shall be determined accurately and noted on the batch ticket. Such addition of water will not be allowed as a continuing operation. The total of all water included in the mix shall not exceed the maximum allowable water/cement ratio.

722.0910 Placing and Finishing

Existing expansion joints shall be maintained throughout the overlayment *unless otherwise shown on the plans*. A construction dam or bulkhead, equal in thickness to the joint width, shall be installed to the required grade and profile prior to placing the overlay. Screed rails for the finishing machine shall be placed to the required profile, and stably anchored vertically and horizontally. Screed rails shall not be treated with a bond breaking compound.

The overlay shall ~~not~~ be placed ~~unless~~ *only when* the ambient temperature is 45°F and rising, unless otherwise approved *by the Department* in writing. ~~Placement may be required during early morning hours, at night, or during other limited work periods if the prevailing daytime~~ *The maximum allowable ambient temperature exceeds during placement is 85°F.* The overlay shall not be placed if rain is expected *within 4 h.* Adequate precautions shall be taken to protect freshly placed overlay material from sudden or unexpected rain. Damaged material shall be removed and replaced with no additional payment. A construction dam or bulkhead shall be installed in case of a delay in placement of 1 h or more. During delays of less than 1 h, the end of the placed overlay material shall be protected from drying with layers of wet burlap.

After the surface has been cleaned, and immediately before placing the overlay material, the surface shall be thoroughly soaked *and covered with plastic sheeting* for a period of 1 h. The surface shall not be allowed to dry before placing the overlay material and there shall be no standing water at the time of placement. The surface shall then be thoroughly and evenly coated with a brush applied bond coat of ~~latex modified concrete overlay concrete~~, *except a bond coat shall not be applied to surfaces where the removal was performed by hydrodemolition.* The progress of the bond coat application shall be controlled to ensure that the bond coat does not dry before the overlay is placed to the required grade. Aggregate segregated in the brush application of the bond coat shall be removed before the overlay is placed. Surface irregularities shall be filled to approximately three-quarters of their depth sufficiently ahead of the overlay operation to allow the material to stiffen and resist rolling back during the finishing.

Following the bond coat application and partial filling of any surface irregularities, the ~~latex modified~~ concrete overlay shall be placed to an elevation approximately 1/2 in. above final grade. The mix shall then be consolidated and machine finished to the required grade. The machine finishing shall be to within 12 in. of the curb line or coping line unless otherwise directed. Supplemental hand finishing with a wood float shall be performed as needed to produce the required tight, uniform surface.

The finishing machine shall be self-propelled and capable of positively controlled forward and reverse motion. The machine shall be equipped with at least two finishing devices. The first finishing device shall be a vibrating mechanism, such as a vibrating pan, for consolidating the deposited mix. The vibrating pan shall be metal and of sufficient dimensions to ensure proper consolidation. The second finishing device shall be either a rotating cylindrical drum, at least 45 in. in length, or a vibrating oscillating metal faced screed of 4 in. minimum in width. The vertical position of the finishing devices shall be positively controlled and the devices shall be raised clear of the finished surface when the machine is operated in the reverse direction. The vibration frequency of any vibrating finishing device shall be variable, with positive control between 3,000 and 6,000 vibrations per minute. Alternate finishing machines may be considered for approval subject to a written request.

Screed rails and construction dams shall be separated from the newly finished overlay by passing a pointing trowel along the rail-to-overlay and dam-to-overlay interfaces after the overlay has sufficiently set such that it does not flow back. This trowel

cut shall be made for the entire length and depth of the rail or dam. The rails may be removed ~~anytime~~ *any time* after the overlay has initially set. Adequate precautions shall be taken during and subsequent to the rail removal to protect the edge of the new overlay from damage. ~~The finished surface shall be in accordance with 504.03.~~

Protection shall be provided to prevent rapid drying of concrete. The rate of water evaporation shall be determined both prior to placement based on forecasted conditions and during placement based on actual conditions in accordance with ACI 308, section 5.2.1 or the following equation:

$$E = (T_c^{2.5} - rT_a^{2.5})(1 + 0.4V) \times 10^{-6}$$

where:

- E = Evaporation rate, lb/sq ft/h*
- T_c = Concrete mix temperature, °F*
- T_a = Ambient temperature, °F*
- r = (Percent of Relative Humidity)/100*
- V = Wind velocity, mph*

Measurement of T_a, r, and V shall be obtained from readings made by the local weather bureau or Contractor's measurements made on site. Measurement of T_c shall be determined from the concrete on site at the point of placement. Fog misting shall be performed after the finishing operation and prior to the wet cure, where the evaporation rate exceeds or is expected to exceed 0.05 lb/sq ft/h. Fog misting shall keep the environment above the concrete surface at high humidity to protect against plastic shrinkage cracks and shall not be used to apply water directly to the surface to facilitate finishing. Evaporation retardants shall not be substituted for fog misting where the evaporation rate exceeds 0.05 lb/sq ft/h.

An evaporation retardant may be applied in a fine mist immediately after the screeding to ensure that the surface remains wet until covered. The evaporation retardant shall be used as such and not as a finishing aid. Excessive amounts of evaporation retardant shall not be applied and the product shall not be worked into the overlay surface.

722.1011 Texturing

~~Immediately after the finishing is complete and before the surface film has formed, the surface of the overlay shall be textured by transverse grooving. The grooves may be formed by mechanized equipment using a vibrating beam roller, a series of discs or other approved device. Manual tools such as fluted floats, spring steel tined rakes, or finned floats with a single row of fins may be used. The grooves shall be relatively uniform and smooth and shall be formed without tearing the surface or bringing coarse aggregate to the top. The grooves shall be in accordance with 504.03. The grooves shall be terminated approximately 18 in. from vertical faces such as curbs and concrete railing.~~

~~All areas of hardened grooved overlay which do not conform to these requirements due to either a deficiency in the grooving or a rough open textured surface~~

~~shall be corrected with no additional payment. Corrections shall be made by cutting transverse grooves in the hardened overlay with an approved cutting machine or by sealing with an approved mixture and retexturing to a satisfactory finish as directed.~~

The overlay surface shall be textured with a double thickness burlap drag or a minimum 4 ft wide turf drag immediately following the placement of the overlay material. Areas where the texture is disturbed by other finishing operations shall be immediately restored to a burlap drag finish.

Grooving or tining in the plastic concrete of the concrete overlay will not be allowed. Transverse grooving, when specified, shall not commence until the curing requirements have been met in accordance with 722.12. Grooves shall be cut into the hardened concrete surfaces perpendicular to the centerline using a mechanical cutting device. For curved bridges, grooves shall be cut transverse to the curve chord within the spans. Grooving shall be done before traffic is allowed on the surface except at follows:

The Contractor shall have the option of cutting the transverse grooves at the end of each phase of construction or waiting until all phases have been completed. If the Contractor elects to delay the grooving process until completion of all phases, the concrete overlay surface for any phase opened to traffic shall receive an interim coarse broom finish during placement.

The completion of the grooving process shall be within 30 days of completion of the last phase of construction. Any additional maintenance of traffic operations required for the grooving process shall be included in the cost of Maintaining Traffic. The interim broom finish shall not be allowed as a surface texture when opened to traffic over a winter season. If the coarse broom texture is present and the Contractor is not in a position to finish all phases of the project, transverse grooving shall be placed into the hardened concrete in order to establish an acceptable driving surface texture for the winter season.

Each groove shall be 1/8 in. +/- 1/64 in. in width, 3/16 in. +/- 1/16 in. in depth. The grooves shall be uniformly spaced at 3/4 in. intervals measured from the center of groove to center of groove or randomly spaced at intervals between 5/8 in. to 1 1/4 in. from center of groove to center of groove with an average spacing of 7/8 in. Grooving shall not be within the area approximately 2 ft adjacent to the curbs. The grooving shall terminate approximately 6 in. from any expansion joints with steel nosing. Stair stepped ends in grooving will be allowed for skewed bridge decks. When a new reinforced concrete approach slab is placed adjacent to the overlay, the grooving shall extend across the reinforced concrete approach slab. Grooving shall terminate approximately 6 in. from the interface with the roadway pavement.

The Contractor shall submit a waste water control and disposal plan for approval seven days prior to commencing grooving activities. The waste water control and disposal plan shall detail how all waste water generated by the grooving activities shall be contained, tested for pH, stored and transported to a disposal facility in accordance with 202.

Cleaning of the grooving debris and slurry shall be performed with a vacuum system equipped with fugitive dust control devices and capable of removing wet debris and water in the same pass. The vacuum equipment shall be capable of washing the deck with pressurized water during the vacuum operation to dislodge all debris and slurry from the bridge deck surface. Debris and slurry shall not be allowed to dry prior to vacuuming.

722.112 Curing

~~When fly ash is used, the requirement for additional wet or dry curing time will~~ shall be determined based on the relative initial, and final time of set and a comparison of strength versus age using control concrete strengths at conventional cure period ages as the reference. ~~Unless otherwise directed, 702.22 shall apply except that the membrane forming curing compound shall not be used to cure the bridge deck overlay.~~ The additional curing requirements shall be as approved by the Engineer.

~~The~~ For LMC overlays the minimum curing period shall be 2448 h of wet cure followed by 7248 h of dry cure. An LMC overlaid bridge deck may be opened to traffic during the ~~minimum~~ dry curing duration when the compressive strength of test cylinders is 4,000 psi or greater. ~~The strength requirements, and the making and curing of the cylinders, shall be in accordance with 702.24.~~

For SFMC overlays the minimum curing period shall be seven calendar days consisting of 120 h of wet cure followed by 48 h dry cure. The deck shall remain completely covered during the dry cure period. An SFMC overlaid bridge deck may be opened to traffic after the dry cure period when the compressive strength of cylinders is 4,500 psi or greater.

For LMC-VE concrete overlays the minimum curing period shall be 3 h of wet cure. An LMC-VE overlaid bridge deck may be opened to traffic after the wet curing period when the compressive strength of cylinders is a minimum of 2,500 psi.

The wet cure period for all overlay types is not controlled by strength and shall not be reduced. Membrane forming curing compound shall not be used to cure the bridge deck overlay. All cylinders shall be 6 in. by 12 in. and compressive strength shall be determined from the average of a minimum of two cylinders. For LMC and SFMC, cylinders shall be made and standard cured in accordance with 702.24. For LMC-VE cylinders shall be made and field cured at the jobsite under the same conditions as the LMC-VE overlay.

~~After texturing,~~ The plastic film which forms on the surface of the overlay shall be protected from shrinkage cracking with a single layer of well drained wet burlap. This layer of wet burlap shall be placed as soon as the overlay surface will support it without deformation. Approximately 1 h after placing the first layer of wet burlap, a second layer shall be placed and the entire covering shall be maintained in a saturated wet condition ~~for a minimum of 24 h~~ during the wet cure period. A network of soaker hoses shall be used during the wet cure period for LMC and silica fume overlays. ~~Polyethylene film~~ Plastic sheeting may be used in lieu of the second layer of wet burlap. ~~If the polyethylene film is used for the second covering, then the burlap already in place shall~~

~~be wetted just before placing the polyethylene film and shall be maintained in a wet condition. After the 24 h elapse, all layers of covering material shall be removed.~~

~~Where~~ the ambient temperature falls below 50°F during either the wet or dry curing periods, the time that the temperature is below 50°F shall not be considered as part of the total ~~96 h~~ curing period. ~~Where~~ there is sufficient rain to wet the surface of the overlay for 1 h or more during the dry cure period, this number of hours shall not be considered as part of the ~~72 h~~ dry cure period.

Immediately upon the start of the dry cure period *or opening to traffic*, the surface shall be checked for cracks. *Upon request, the Contractor shall flood the deck with water to facilitate inspection for cracks and distress.* ~~Where~~ cracks exist, a thorough investigation will be conducted prior to sealing cracks. Cores may be required to determine the actual crack depth. Surface cracks not exceeding 3/8 in. in depth shall be sealed with an *approved epoxy penetrating sealer/healer* followed by an application of an approved sand. ~~The sealing and sand application shall be repeated as needed to ensure that the voids remain completely filled. Alternate methods of surface crack sealing may be used if approved.~~ Cracks exceeding 3/8 in. in depth shall not be sealed at this time. Corrective procedures for repairing cracks exceeding 3/8 in. in depth will be determined after further investigation which may include additional cores. *The Office of Materials Management will be contacted and the Engineer will determine the method of repair shall be as directed in writing and may include including possible removal and replacement or complete filling with an approved sealer/healer and a sand application on the surface.* ~~The Department will maintain a list of approved Sealer/Healers.~~

Where the area of shallow cracking exceeds 5% of the deck area, then the method of repair shall be the same as for cracks exceeding 3/8 in. The shallow crack area will be calculated by multiplying the total combined linear feet of all cracks less than 3/8 in. deep by a tributary width of 1 linear foot. The percentage of deck area will be the shallow crack area divided by the total deck area and multiplied by 100.

~~Where~~ it is determined by sounding or coring that adequate bonding between the overlay and the bridge deck has not been attained, the deficient areas shall be removed and replaced as directed.

722.1213 Calibration of Continuous Mixers

(a) Frequency

A complete calibration shall be performed for each mixer prior to each pour unless the initial calibration was made within the previous 10 calendar days. A mixer that has been calibrated within the previous 10 calendar days may be approved for use providing that the mixer operator is in possession of the completed, signed, certified and dated Department calibration form for that mixer. A complete calibration of a mixer may be required at any time as directed. All mixers which are calibrated within the 10 day limit but are changing aggregate sources shall have an aggregate blend test performed.

(b) Equipment

All special equipment required for calibration shall be furnished. It shall include but not be limited to suitable material containers, buckets, stop watches and a set of balance beam platform scales graduated in at least 1/4 lb intervals with a minimum capacity of 500 lbs. Samples shall be obtained and handled by the Contractor. Normal testing equipment such as aggregate sieves and containers shall also be furnished.

(c) Pre-calibration

The aggregate bin shall be clean and the bin vibrators shall be in good working order. The mixer shall be equipped with a grounding strap. The cement meter feeder, the fins and all pockets shall be clean and free of any accumulated cement. The aeration system shall be equipped with a gauge or indicator to verify that the system is operating. The main belts and the latex strainer shall be clean and free of any accumulated material.

(d) Calibration**1. Cement Meter**

The mixer manufacturer's mix setting chart shall determine the specified operating revolutions per minute and the approximate number of counts required on the cement meter to deliver 94 lbs of cement. At least 3,760 lbs of cement shall be placed in the cement bin.

The mixing unit shall rest on a level surface. The engine throttle shall be adjusted to obtain the required revolutions per minute. The unit discharging the cement shall be operated until the belt has made one complete revolution. ~~The unit~~ shall then be stopped and the cement meter shall be reset to zero.

A suitable container shall be positioned to catch the cement and at least 90 lbs of cement shall be discharged. The time required to discharge the cement shall be measured with a stop watch, the number of counts on the cement meter shall be recorded, and the weight of the discharged cement shall be determined. This process shall be repeated a total of three times. The cement counter shall be reset to zero before each repetition.

The following formulas shall be used to calculate the number of counts per 94 lbs of cement and the time required to discharge 94 lbs of cement.

$$94 \div \frac{A}{B} = \text{Counts per 94 lbs of cement}$$

$$94 \div \frac{A}{C} = \text{Time in seconds per 94 lbs of cement}$$

A = Total weight of cement in pounds for three trials

B = Total number of counts on the cement meter for three trials

C = Total time in seconds for three trials.

2. Water Flow Meter

The accuracy of the water flow meter shall be verified by adjusting the flow to 2 gal. per minute. With the equipment operating at the required revolutions per minute, the water discharged during a one minute interval shall be collected and weighed. The weight in pounds of the discharged water shall be divided by 8.33 to determine the number of gallons. This procedure shall be repeated with the flow meter adjusted to 3 gal. per minute.

3. Aggregate Bin Gates

The gate opening shall be adjusted to provide the required amount of aggregate to produce a cubic yard of the designated mix. The ratio of fine aggregate to total aggregate shall be verified by stopping the cement discharge and collecting the aggregate discharged in a container. A representative sample of the discharged aggregate shall be selected and separated on a No. 4 (4.75 mm) sieve. The fine aggregate will be considered as the amount passing the No. 4 (4.75 mm) sieve. The percentage shall be computed on a dry weight basis.

4. Latex Throttling Valve

The latex strainer shall be unobstructed. The latex throttling valve shall be adjusted to deliver the required amount of latex emulsion admixture for each 94 lbs of cement. With the unit operating at the required revolutions per minute for the calculated time in seconds per 94 lbs of cement, the latex shall be discharged into a container. The weight of the latex shall be determined and, if necessary, the valve shall be adjusted such that the amount of latex discharged is within 1/2 lb of the amount required for each 94 lbs of cement. One verification shall be performed to check the accuracy of the valve setting.

5. Admixture Dispensers

This equipment shall be calibrated in accordance with the manufacturer's instructions for the specific materials and quantities involved.

722.1314 Patching an Existing Bridge Deck Overlay

(a) Materials

Materials shall be in accordance with ~~722.0203~~.

(b) Storage and Handling of Materials

Storage and handling of materials shall be in accordance with ~~722.0304~~.

(c) Proportioning

Proportioning shall be in accordance with ~~722.0405~~.

(d) Preparation of the Bridge Floor

Preparation of the bridge floor shall be in accordance with the applicable provisions of ~~722.0506~~.

(e) Patching

Patching shall be in accordance with ~~722.0607~~ except as modified herein. ~~If~~Where no new overlay is planned, bridge deck patching concrete used in patching the bridge

floor shall be placed to the level of the original deck. The remainder of each cavity shall be patched with the same material as the existing overlay.

(f) Mixing

Mixing shall be in accordance with the applicable provisions of 722.0809.

(g) Placing and Finishing

Placing and finishing shall be in accordance with the applicable provisions of 722.0910. Machine finishing shall be required when directed.

(h) Texturing

~~Texturing shall be in accordance with 722.10. In addition~~ The surface texturing shall match the pattern of the adjacent overlay- *and shall be in accordance with the following:*

Immediately after the finishing is complete and before the surface film has formed, the surface of the overlay patch shall be textured by grooving in the same direction as the existing overlay. The grooves may be formed by mechanized equipment using a vibrating beam roller, a series of discs or other approved device. Manual tools such as fluted floats, spring steel tined rakes, or finned floats with a single row of fins may be used. The grooves shall be relatively uniform and smooth and shall be formed without tearing the surface or bringing coarse aggregate to the top. The grooves shall be in accordance with 504.03. The grooves shall be terminated the same distance from the vertical faces of railings as the existing grooves in the adjacent existing overlay surface.

All areas of hardened grooved overlay patch which do not conform to these requirements due to either a deficiency in the grooving or a rough open textured surface shall be corrected with no additional payment. Corrections shall be made by cutting transverse grooves in the hardened overlay with an approved cutting machine or by sealing with an approved mixture and retexturing to a satisfactory finish as directed.

(i) Curing

Curing shall be in accordance with 722.412.

(j) Calibration of Continuous Mixers

Calibration shall be in accordance with 722.4213.

722.1415 Method of Measurement

Removal of the existing overlay will be measured by the square yard of deck area regardless of the number of passes with the milling machine.

Surface milling will be measured by the square yard for the initial ~~1/4~~ 1/2 in. depth. Additional surface removal required below the initial ~~1/4~~ 1/2 in. depth will be measured by the square yard for each required 1/4 in. depth. ~~Only the portion of the bridge deck which is to remain in place will be measured for payment. The undefined areas requiring full depth deck removal will be measured for payment.~~ The areas of the bridge floor which are shown on the plans to be removed, *except for undefined full depth patching areas*, will not be measured for payment.

~~Full depth patching will be measured by the square foot. The patching material used in full depth patching will not be measured for payment.~~

Hydrodemolition of the bridge deck will be measured by the square yard. Additional surface preparation will be measured by the linear foot of exposed reinforcing bar. Reinforcing bar repair will not be measured for payment.

~~Partial~~ When hydrodemolition is not shown on the plans, partial depth patching will be measured by the square foot.

The measurement of bridge deck patching concrete ~~used in for~~ partial depth ~~patching~~ ~~cavities created by handchipping or hydrodemolition~~ will be based on a theoretical quantity determined by multiplying the area of the appropriate partial depth ~~patches~~ ~~cavities~~ by an assumed average depth of 2 in. and converting the resulting volume into cubic yards. Overlay material used in a partial depth ~~patching~~ ~~cavity~~ will be measured by the cubic yard. The quantities of patching material used in a partial depth ~~patching~~ ~~cavity~~ will be included in the measurement of additional bridge deck overlay.

Overlay material used to fill surface irregularities will be measured by the cubic yard. ~~Such quantity~~ and will be included in the measurement of additional bridge deck overlay.

Full depth patching will be measured by the square foot. The patching material used in full depth patching will not be measured for payment.

Bridge deck overlay will be measured by the square yard for the specified thickness. ~~If~~ Where there is no specified thickness shown on the plans, the specified thickness shall be 1-3/4 in.

Overlay dams and patching an existing overlay will be measured by the square foot.

Transverse grooving will be measured by the square yard. No deduction in measurement will be made for areas where grooving is terminated or not required.

Epoxy resin adhesive and bond coat will not be measured for payment. Blasting, cleaning, finishing, texturing *other than the transverse grooving*, and curing will not be measured for payment.

722.1516 Basis of Payment

Removal of the existing overlay will be paid for at the contract unit price per square yard of bridge deck overlay, remove.

Milling of the initial 1/4-1/2 in. depth of surface will be paid for at the contract unit price per square yard for surface milling. Additional surface removal below the

initial ~~1/4~~1/2 in. depth will be paid for at the contract unit price per square yard for surface milling for each required 1/4 in. depth.

Hydrodemolition of the bridge deck will be paid for at the contract unit price per square yard. When hydrodemolition is shown on the plans, additional surface preparation will be paid for at the established price shown per linear foot for bridge deck overlay, additional surface prep.

When hydrodemolition is not shown on the plans, partial depth patching will be paid for at the contract unit price per square foot for bridge deck patching, partial depth.

When partial depth cavities are subsequently directed to be made full depth, additional payment will be made at 80 % of the contract unit price per square foot for bridge deck patching, full depth.

Full depth patching will be paid for at the contract unit price per square foot for bridge deck patching, full depth.

~~Partial depth patching will be paid for at the contract unit price per square foot for bridge deck patching, partial depth.~~

~~Prepared partial depth cavities exceeding 2 in. in average depth, which are subsequently directed to be made full depth, will be paid for at the contract unit price per square foot for bridge deck patching, partial depth. Additional payment will be made at 80% of the contract unit price per square foot for bridge deck patching, full depth.~~

~~Prepared partial depth cavities of 2 in. or less in average depth, which are subsequently directed to be made full depth, will be paid for at the contract unit price per square foot for bridge deck patching, full depth.~~

~~Patching material used for partial depth patching cavities will be paid for at the contract unit established price of \$550 shown per cubic yard for bridge deck overlay, additional for the type of overlay material placed.~~

~~Overlay material used to fill surface irregularities will be paid for at the contract unit established price of \$550 shown per cubic yard for bridge deck overlay, additional for the type of overlay material placed.~~

Bridge deck overlay will be paid for at the contract unit price per square yard, for the type of overlay material specified.

Patching an existing bridge deck overlay will be paid for at the contract unit price per square foot for bridge deck overlay patching.

Overlay dam will be paid for at the contract unit price per square foot, complete in place.

Transverse grooving will be paid for at the contract unit price per square yard.

The Department will include the pay item Bridge Deck Overlay Budget, with an established dollar amount in the proposal to pay for additional surface preparation completed after hydrodemolition and bridge deck overlay additional used to fill irregularities and partial depth cavities. This established amount is the Department’s estimate of the total cost of the work required to be performed for the contract. The established amount shown in the proposal is included in the total bid amount. The Department will pay for those items installed and listed with established prices for the quantities installed as directed by the Engineer. Where the work exceeds the Department’s estimated amount, the additional quantities will be reviewed for acceptance in accordance with 104.03 except that the additional surface preparation and bridge deck overlay additional will be paid at the pre-determined established prices shown.

Payment will be made under:

Pay Item	Pay Unit Symbol
Bridge Deck Overlay.....	SYS
Bridge Deck Overlay, Additional.....	CYS
Bridge Deck Overlay Budget	DOL
Bridge Deck Overlay, Latex Modified	SYS
Bridge Deck Overlay, LMC-VE	SYS
Bridge Deck Overlay, Patching.....	SFT
Bridge Deck Overlay, Remove Existing	SYS
Bridge Deck Overlay, Silica Fume Modified	SYS
Bridge Deck Patching, Full Depth	SFT
Bridge Deck Patching, Partial Depth	SFT
Hydrodemolition	SYS
Transverse Grooving.....	SYS
Overlay Dam	SFT
Surface Milling.....	SYS

Items shown with an established price will be paid at the prices shown. Where any of the following items are shown in the schedule of pay items the bid item and price will prevail over the established prices shown.

Pay Item	Pay Unit Symbol	Established Price
Bridge Deck Overlay, Additional LMC.....	CYS.....	\$550
Bridge Deck Overlay, Additional LMC-VE	CYS.....	\$650
Bridge Deck Overlay, Additional Silica Fume Modified	CYS.....	\$200
Bridge Deck Overlay, Additional Surface Prep.....	LFT.....	\$15

~~The cost of milling, handchipping, removing debris and water, and necessary incidentals shall be included in the cost of surface milling.~~

~~The cost of removal of unsound concrete, preparation of cavity surfaces, furnishing and applying bond coat or epoxy resin adhesive as required, furnishing and placing patching material, and necessary incidentals shall be included in the cost of bridge deck patching, full depth, or bridge deck patching, partial depth.~~

The cost of overlay removal by handchipping in areas adjacent to the curb or otherwise inaccessible to the power-operated mechanical milling machine shall be included in the cost of bridge deck overlay, remove. The cost of disposing of overlay removal residue, including water, dust, concrete and incidentals shall be included in the cost of bridge deck overlay, remove.

The cost of deck surface preparation by handchipping in areas adjacent to the curb or otherwise inaccessible to the power-operated mechanical milling machine shall be included in the cost of surface milling. The removal of surface milling residue, including water, dust, concrete and incidentals shall be included in the cost of surface milling.

The cost of the waste water control and disposal plan, waste water containment, testing, storing, transporting and disposal, and any incidentals related to the carrying out of the plan shall be included in the cost of hydrodemolition. If the waste water is found to have a pH of 12.5 or higher and thereby classified as hazardous, the additional costs associated with this classification will be paid for in accordance with 109.05.

The initial equipment calibration, any re-calibration, equipment shielding, handchipping curb areas, handchipping unsound concrete, cleaning of debris and slurry, compressed air cleaning, water blasting, and sandblasting shall be included in the cost of hydrodemolition.

When hydrodemolition is shown on the plans, the cost of removal of unsound concrete shall be included in the cost of hydrodemolition. Preparation of cavity surfaces, furnishing and applying bond coat or epoxy resin adhesive as required in handchipped locations, furnishing and placing patching material, and necessary incidentals shall be included in the cost of bridge deck overlay for the type of overlay material specified. Additional concrete removal required around exposed bars shall be included in the cost of additional surface preparation.

When hydrodemolition is not shown on the plans, the cost of removal of unsound concrete, preparation of cavity surfaces, furnishing and applying bond coat or epoxy resin adhesive as required, furnishing and placing patching material, and necessary incidentals shall be included in the cost of bridge deck patching, full depth, or bridge deck patching, partial depth.

The cost of patching material used for full depth patching shall be included in the cost of bridge deck patching, full depth. The cost of texturing patched areas will not be paid for separately, but shall be included in the cost of the patch.

The cost of furnishing and placing patching material in partial depth cavities and necessary incidentals shall be included in the cost of bridge deck overlay, additional.

The cost of removing the existing concrete; furnishing, hauling, and placing all materials including the epoxy; preparing the surface; and all necessary incidentals shall be included in the cost of overlay dam.

~~The cost of blasting, deck cleaning, furnishing, and applying epoxy resin adhesive or bond coat shall be included in the cost of other pay items.~~

The cost of removing and disposing of the slurry created during the transverse grooving shall be included in the cost of transverse grooving.

Coring of the bridge deck, patching core holes, and all corrective measures required in accordance with 722.412 shall be performed ~~with~~ *at* no additional ~~payment~~ *cost to the Department.*

~~The cost of bond coat, furnishing and placing the overlay material, and necessary incidentals shall be included in the cost of bridge deck overlay or bridge deck overlay patching.~~
