ITEM 584.33010002  OVERLAY CONCRETE, LATEX MODIFIED CONCRETE-
TYPE 1 FRICTION
ITEM 584.33020002  OVERLAY CONCRETE, LATEX MODIFIED CONCRETE-
TYPE 2 FRICTION
ITEM 584.33030002  OVERLAY CONCRETE, LATEX MODIFIED CONCRETE-
TYPE 3 FRICTION
ITEM 584.33040002  OVERLAY CONCRETE, LATEX MODIFIED CONCRETE-
TYPE 9 FRICTION
ITEM 584.34000002  SLAB RECONSTRUCTION CONCRETE, LATEX

DESCRIPTION
The work shall consist of furnishing and placing latex modified concrete on top of a structural slab. Slab reconstruction concrete shall be placed integrally with the latex modified concrete overlay.

Scope. Concrete removal work will be paid under the appropriate item(s). Minimum thickness of the latex overlay is 1½ inches. Separate payment will be made for integrally placed slab reconstruction concrete materials.

The mixture and cement type selected shall be done so to achieve a compressive strength of 2,500 psi prior to opening to traffic and 3000 psi at 28 days. Cement type selection shall be as follows:

1. Type I: 4 days total curing
2. Type III: 2 days total curing
3. Rapid hardening cement: 4 hours total curing

MATERIALS
All materials to be used in the manufacture of the latex modified concrete overlay shall meet the requirements of §501-2.02 with the following:

Cement. The cement type used shall be Type I or Type III, meeting the requirements of §701-01. Rapid Hardening cement shall meet the requirements of §701-13 and supplied in bulk only.

Latex Admixture. The latex admixture shall be a non-hazardous, film forming polymeric emulsion to which all stabilizers have been added at the point of manufacture. It shall be homogenous, uniform in composition and have less than 1000 ppm of total chloride ions. When tested in accordance with the Department’s test method for Total Weight Percent Solids in the Latex, the admixture shall have a minimum solids content of 46%. The latex shall be accepted at the work site provided it meets all the following requirements:

1. A sample of the product to be used shall be submitted to the Director, Material Bureau, for approval a minimum of thirty days prior to placement. Only one brand shall be supplied.
2. Manufacturer’s written certification that the material supplied is identical in composition to the prequalified sample. This certification shall also list particle size, surface tension, and infra red fingerprint information for the lot supplied.
3. Daily Sampling of the latex admixture will be required. The sample size will be one quart of latex for each day’s placement. The latex shall be taken from a bypass valve in the latex feed line on the mobile mixer, and placed in a Department approved one quart plastic jar. The sample will be sent to the Materials Bureau for testing.

4. The latex admixture shall be agitated as necessary to prevent separation of the emulsion. It shall be maintained in storage within the temperature range of 32°F to 85°F. Admixture exposed to temperatures outside the foregoing limits shall be removed and replaced at no cost to the Department.

Manufacture of Latex Modified Concrete.

A. Proportioning. The initial ingredient proportions except for non-latex admixtures are in the following table:

<table>
<thead>
<tr>
<th>MIX CRITERIA– LATEX MODIFIED CONCRETE (Note a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cement Content for Type I (lb/yd³) (Note b)</td>
</tr>
<tr>
<td>Cement Content for Type III (lb/yd³) (Note b)</td>
</tr>
<tr>
<td>Cement Content for Rapid Hardening Cement (lb/yd³) (Note b)</td>
</tr>
<tr>
<td>Sand Percent total Aggregate (% total aggregate by volume)</td>
</tr>
<tr>
<td>Latex Admixture (gallons)</td>
</tr>
<tr>
<td>Water to Cement Ratio</td>
</tr>
<tr>
<td>Air Content (%)</td>
</tr>
<tr>
<td>Slump (in) (Note d)</td>
</tr>
<tr>
<td>Type of Coarse Aggregate Gradation</td>
</tr>
</tbody>
</table>

NOTE (a): The criteria are given for design information and the data is based on a fine aggregate modulus of 2.80 and a CA1 coarse aggregate gradation. Adjust the mixture proportions using actual fineness modulus and bulk specific gravities (saturated surface dry for aggregates). Compute the adjustments according to Department instructions.

NOTE (b): The type of cement selected shall be to achieve the desired strength gain and opening to traffic in 4 days, 2 days, or 4 hours from completion of the placement and curing. Contractor shall submit the final mix design, including all batch weights, admixtures, and
equipment to be used to the Regional Materials Engineer a minimum of (30) days prior to placement. Contractor shall provide mix design adjustments to achieve yield.

NOTE (c): The amount of added water shall be adjusted to provide slump that is within the specification limits.

NOTE (d): Concrete for the slump test shall be deposited in a clean container and allowed to stand uncovered without disturbance for 5 minutes prior to performing the slump test. Care shall be taken during the test to exclude the effects of vibrations caused by traffic and concrete placement operations.

The Contractor shall provide qualified personnel (ACI Concrete Field Testing Technician Grade I, or equivalent) for Quality Control testing of the latex modified concrete mixture (i.e. slump and air testing) in order to demonstrate the specified mix proportioning and characteristics are achieved, prior to incorporating material into project work and during placement, as directed by the Engineer. Department representatives shall perform all Quality Assurance testing to be used for acceptance purposes. Quality Assurance testing will only progress after the Contractor has completed initial Quality Control and any mixture adjustments to produce concrete meeting the specified proportioning and characteristic requirements. Under no circumstances shall the Contractor’s testing results be used for acceptance or payment purposes.

B. **Batching and Mixing Equipment.** The requirements of §501.2.04 C shall apply with the following:

The mobile mixer shall include the following:

1. Delivery capacity of at least 6 yd³/h
2. A meter with a printout to measure and record cement dosage
3. A water hose and nozzle for spraying the concrete surface before placing overlay

All mobile concrete mixing units shall be scheduled for calibration with the Regional Materials Engineer a minimum of 14 days prior to placement.

C. **Equipment.** The requirements of 584-2.04 C shall apply.
CONSTRUCTION DETAILS
The requirements of §584-3 shall apply with the following:

Pre-Placement Wetting. The requirements of §584-3.03 shall apply with the following:

After pre-placement wetting, remove any remaining standing water in depressions and areas of concrete removal with oil-free compressed air and vacuuming as necessary, prior to concrete placement. The existing concrete surface shall remain in a saturated surface dry condition upon placement of the latex modified concrete overlay.

For latex modified concrete placements which utilize Rapid Hardening Cement, thoroughly wet the structural slab and all porous surfaces to be in contact with new concrete for a minimum of one hour immediately prior to placement.

Handling and Placing of Concrete. The requirements of §584-3.05 shall apply with the following:

A technical representative of the concrete supplier shall be present at the pre-placement meeting and at all placement operations. The representative shall be knowledgeable in all aspects of latex modified concrete and latex modified concrete placement and shall advise the contractor as necessary.

Place concrete only when the ambient air temperature and deck surface temperature (after wetting) will be below 77°F during the entire placement.

The contractor shall perform the placement and finishing during nighttime operations, the cost shall be included in the bid price for the various 584 items and the provisions of §619-3.19 Nighttime Operations shall apply.

Contamination of the pre-wetted deck by construction equipment or from any other source shall be prevented by placement of a clean 4-mil minimum thick polyethylene sheet (or any other covering as approved by the Engineer) on the surface of the prepared deck.

The use of a fog sprayer(s) approved by the Engineer will be required. The spray is not to be directed at the deck. The fog sprayer shall be positioned between the finishing machine and the burlap placement operation. The spray shall be directed upwards such that it does not cause water to accumulate on the fresh concrete surface or drip from equipment onto the fresh concrete.
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**Finishing and Curing.** The requirements of §584-3.06 B shall apply with the following:

All slab reconstruction concrete shall be placed integrally with the latex modified slab reconstruction and overlay in all areas inaccessible to the finish machine, in all variable depth areas, and along all joints.

Use a finishing machine meeting the requirements of §557-3.07 with the following additional requirement:

> A wet burlap drag shall be mounted on the finishing machine after the pan float. The drag shall be kept moistened throughout the pour.

Surface Texturing: After finishing, the surface shall be given a suitable texture with a stiff bristle broom finish.

A layer of 20 mil thick white polyethylene film shall be placed over the wet burlap immediately following burlap placement. Care shall be exercised to ensure the burlap remains saturated for the wet cure period, both before and after placement of polyethylene film. Plastic coated fiber blankets may be substituted for the polyethylene film, but shall not replace the initial wet burlap. After the wet cure, the polyethylene film and burlap shall be removed and the concrete shall be air cured. Rainfall during this air cure period will have no detrimental effect. The overlay shall then be cured as follows:

1. Type I Cement: Cured 48 hours wet, followed by 48 hours air dry.
2. Type III Cement: Cured 24 hours wet, followed by 24 hours air dry.
3. Rapid Hardening Cement: cured 4 hours wet.

**METHOD OF MEASUREMENT**

The overlay concrete shall be measured as the number of square yards of latex modified concrete overlay placed for the ½ inch depth overlay, using a placement volume of 0.0417 cubic yards per square yard, to determine the placement volume. The slab reconstruction concrete shall be measured as the number of cubic yards of concrete placed determined by subtracting the volume of overlay concrete at a uniform ½ inch thickness from the delivered and used total quantity.

**BASIS OF PAYMENT**

The unit bid price for latex modified concrete shall include the cost of all labor, materials, and equipment necessary to complete the work. The unit bid price for latex slab reconstruction concrete shall cover material and delivery cost only.