

**COMPILATION OF APPROVED SPECIFICATIONS**

**RHODE ISLAND DEPARTMENT OF TRANSPORTATION  
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION**

**REVISIONS  
SUPPLEMENTAL SPECIFICATIONS  
SPECIAL PROVISIONS**

**SUPPLEMENT NO. 11**

**MAY 2011**

**TABLE OF CONTENTS**

<b><u>Code</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
403	Asphalt Emulsion Tack Coat.....	AC11-1
601	Portland Cement Concrete.....	AC11-3
604	Class HP(AE) Portland Cement Concrete.....	AC11-8
605	Concrete with Calcium Nitrite Based Corrosion Inhibitor.....	AC11-9
813	Waterproofing and Dampproofing.....	AC11-10
918	Rural Mailboxes Postmaster Approved.....	AC11-15
943.0200	Training Provisions.....	AC11-16
M.12.02.3	Cold Applied Liquid Membrane.....	AC11-20

Remove **Section 403; Asphalt Emulsion Tack Coat**, pages 4-23 and 4-24 of the RI Standard Specifications for Road and Bridge Construction in its entirety and replace with the following.

## **SECTION 403**

### **ASPHALT EMULSION TACK COAT**

**403.01 DESCRIPTION.** This work consists of furnishing, delivering, and placing a liquid asphalt tack coat on bituminous concrete or Portland cement concrete, prior to the placement of a bituminous concrete overlay, all in accordance with these Specifications.

**403.02 MATERIALS.** The asphalt emulsion shall be RS-1.

#### **403.03 CONSTRUCTION METHODS.**

**403.03.1 Equipment.** Application of the asphalt emulsion tack coat shall be by means of a pressure distributor capable of producing a uniform continuous fine spray, through multiple nozzles, resulting in a uniform continuous coat of asphalt emulsion over the entire section to be treated. Any puddles of tack coat shall be squeegeed or broomed out or corrected by whatever means chosen by the Contractor which will achieve the required surface treatment. Any areas not receiving the specified coverage of tack coat shall be corrected and brought into compliance.

#### **403.03.2 Application of Bituminous Material.**

**a. Application Rates.** The asphalt emulsion shall be uniformly applied at the following rates over the entire existing surface to be overlaid:

**1. Old Pavement.** The application rate shall be 0.08 gallons per square yard, plus-or-minus 0.02 gallons per square yard.

**2. New Pavement.**

(a) For new pavements at least thirty days old or has been opened to traffic: The application rate shall be 0.06 gallons per square yard, plus-or-minus 0.02 gallons per square yard.

(b) For new pavements less than thirty days old which have not been opened to traffic tack coat is not required.

**b. Nozzle Settings.** Tack coat shall be applied using the proper nozzle settings and the “double coverage” or “triple coverage” techniques as outlined in Chapter 5 of Asphalt Institute Publication MS-22, “Construction of Hot Mix Asphalt Pavements.”

**c. Additional Requirements.** The newly placed tack coat shall be allowed to break and set prior to paving. This process is defined as the separation of the asphalt from the water from within the emulsion which is signified by a change in color of the material from brown to black, the evaporation or removal of the resultant surface water and the adherence of the tack material to the underlying pavement.

NOTE: The Contractor will be required to wait for this process to complete for up to one hour. At the end of this specified period, if the tack coat has not fully transformed as defined herein (break and set), the

Contractor may by his choice proceed to pave over the tacked area. Nevertheless, in any case the Contractor shall ensure that should any material be picked up by his equipment, that it be removed by whatever means, prior to its falling onto or affecting the newly placed pavement layer in any way. Special care shall be taken to eliminate or minimize equipment passage over tacked surfaces so as not to hinder or negate the tack's effectiveness in the pavement bonding process. Furthermore, attention shall be given to gore areas to ensure that asphalt emulsion is not sprayed or tracked onto precast gore markers. This shall be accomplished by placing a covering, to be anchored in place, to prevent any movement, over the gore markers. Additionally, the Contractor shall not proceed to pave over any tacked surface until approval from the Engineer is given. Sections not approved by the Engineer shall be corrected and subsequently receive the Engineer's approval prior to paving. Should there be multiple rejections of tack coat, the Engineer reserves the right to suspend paving and require the Contractor to submit a detailed action plan outlining those steps to be taken to ensure proper application of tack coat prior to the commencement of further paving operations.

**403.04 METHOD OF MEASUREMENT.** "Asphalt Emulsion Tack Coat" will be measured by the number of square yards actually spread in the designated area(s) and at the specified rate, all in accordance with the Plans and/or as directed by the Engineer.

**403.05 BASIS OF PAYMENT.** The accepted quantity of "Asphalt Emulsion Tack Coat" will be paid for at the contract unit price per square yard as listed in the Proposal. The price so-stated constitutes full and complete compensation for all labor, materials, and equipment, and all other incidentals required to finish the work, complete and accepted by the Engineer.

**403.06 FAILURE TO COMPLY.** Should the Contractor fail to comply with any portion of this provision, a penalty will be imposed for each tacked subsection not in compliance with these requirements. The penalty for a subsection will be five percent (5%) of the combined contract cost for asphalt and asphalt emulsion tack coat for the particular subsection in noncompliance. The total penalty for a day/night's paving will be the combined fines from all noncompliant subsections or \$2500.00, whichever is greater. A tacked subsection will be defined as that area covered with tack coat, the width of a single paving machine's actual asphalt placement, extending to the end of that particular pass of tack coat but not to exceed 0.2 (two-tenths) miles in length. This means that if the Contractor tacks in excess of 0.2 mile on a pass then there would exist multiple tacked subsections each subject to the terms and conditions of this provision.

Revise **Section 601; Portland Cement Concrete**; pages 6-1 through 6-25 of the RI Standard Specifications for Road and Bridge Construction as follows.

**SECTION 601**  
**PORTLAND CEMENT CONCRETE**

- **Replace Table 2 and associated footnotes in Subsection 601.03.1(a); Proportioning, with the following.**

**Table 2**

<b>Class<sup>1</sup></b>	<b>B</b>	<b>A</b>	<b>XX</b>	<b>HP</b>	<b>MC<sup>2</sup></b>	<b>Z</b>
Minimum Cementitious Content, lb/yd <sup>3</sup>	400	400	500	500	500	500
Maximum Cementitious Content, lb/yd <sup>3</sup>	700	700	700	700 <sup>5</sup>	600	700
Maximum w/cm	0.55	0.45	0.42	0.40	0.40	0.42
<b>Acceptance Criteria</b>						
Consistency Range <sup>3</sup> , AASHTO T119 Slump, in.	2-4	2-4	2-4	2-4	2-4	<1
AASHTO T23 Minimum Compressive Strength, psi						
28 days	3000	3000	4000	5000	3500	5000
56 days	----	----	----	----	5000	----
Air Content Range, AASHTO T152, %	5-9	5-9	5-9	5-9	5-9	6-9
<b>Prequalification Criteria</b>						
Chloride permeability, AASHTO T277, coulomb						
28-day standard cure				≤2000	≤3000	
28-day accelerated cure				≤1000	≤1500	
Maximum 28-day drying shrinkage, ASTM C157, %				-0.040	-0.045	
Maximum Adiabatic temperature rise, degree F <sup>4</sup>					75	

Table 2 Footnotes:

1. A single concrete mixture may be used for multiple classifications if performance and prequalification criteria are satisfied.
2. Class MC concrete may have a total supplementary cementitious content of 75 percent by weight of total cementitious material when using either ground-granulated blast-furnace slag meeting the requirements of AASHTO M 302, or combinations of slag and other supplementary cementitious materials. Maximum cement replacement by fly ash or other pozzolan meeting requirements of AASHTO M 295 is 30 percent by weight. Maximum cement replacement by silica fume meeting the requirements of AASHTO M 307 is 7 percent by weight.
3. Slump range measured at the point of discharge. The Contractor shall submit for approval by the Engineer, the target slump range for each element. Slump shall not exceed 4 inches for surfaces sloped greater than 4 percent. If additional workability is desired the Engineer may allow an increase of the maximum specified slump to 6 inches if an AASHTO M 194 Type A - Water Reducing Admixture is used, or an increase of up to 9 inches if an AASHTO M 194 Type F or G - High Range Water Reducing admixture is used.  
  
AASHTO M 194 Type F or G - High Range Water Reducing Admixture is required when concrete is to be placed by pumping equipment. Admixtures must be used in accordance with manufacturers' recommended dosages.
4. Maximum concrete temperature rise measured in Section 607 mockup trial with cube insulated with curing blankets, or prequalification calorimetry tests.
5. The maximum cementitious content for Class HP may be exceeded for the fabrication of precast/prestressed concrete structures as approved by the Engineer. Class HP concrete shall replace all references to Class X in RIDOT's standard specifications.

[Remainder of Subsection is unchanged]

- **Replace the last paragraph of Subsection 601.03.1(b); Design and Approval of Concrete Mixtures, with the following.**

No changes in the sources or character of the materials shall be made without approval of the Engineer. New materials shall not be used until a revised mixture design and new proportions based on laboratory tests and a minimum 3 cubic yard trial batch is approved by the Engineer. Trial batch testing shall be conducted by an AASHTO Accredited laboratory at the Contractor's expense. Testing requirements are as follows:

1. No testing is required for changes in admixture dose provided the proposed dose does not exceed manufacturer recommendations and the admixture does not retard or accelerate setting characteristics.
2. Trial batches for the proposed mixture(s) and a control batch of the existing approved concrete mixture shall be conducted on the same day for comparison. All required tests shall be conducted for both the approved and proposed mixtures.
3. Slump, air content, concrete temperature and unit weight is required for all modifications.
4. 28 day compressive strength is required for all modifications.

5. AASHTO T277 testing is required for any change to aggregate source, cementitious material source, cementitious material content, or water content for concrete classes HP and MC. T277 testing is not required for admixture modifications.

6. AASHTO T160 Shrinkage testing is required for concrete classes HP and MC as determined by the Engineer. Testing is required for changes to coarse aggregate source, size, or content greater than 300 lb/yd<sup>3</sup>, cementitious material source, cementitious material proportions, or water content. Shrinkage testing is not required for admixture-only modifications.

7. Heat development, as determined by Adiabatic Temperature Rise or calorimetry, is required for any change in cementitious material content or source for Class MC concrete.

8. AASHTO T197 Time of set is required for any admixture addition that may accelerate or retard setting characteristics for pavement or bridge deck concrete mixtures.

[Remainder of Subsection is unchanged]

• **Insert the following new Subsection 601.03.1(c); Concrete Durability Requirements.**

**c. Concrete Durability Requirements.** All concrete mixtures shall be proportioned to meet or exceed minimum durability requirements for the application by the Contractor. At his expense, the Contractor shall conduct prequalification trial batches for durability properties using the materials proposed for the project. Trial batch testing shall be performed by an AASHTO accredited laboratory. The Contractor shall submit complete mixture proportions and durability test results of all plastic and hardened concrete properties listed in **Subsection 601.03.1(b)** and **Table 2** to the Engineer for review. The Engineer reserves the right to perform acceptance testing for any of the durability properties specified.

**a.** Concrete mixtures shall have an AASHTO T277 coulomb rating less than or equal to the value listed in Table 2 for the class of concrete.

A minimum of two specimens shall be reported for both the standard and accelerated curing for AASHTO T277 testing.

Accelerated curing shall be accomplished by moist curing cast concrete cylinders at 70 degree F for the first seven (7) days, followed by twenty-one (21) days of moist curing at 100 degrees F in a saturated lime water bath.

Prequalification testing for coulomb rating shall be performed by the Contractor. Neither process control nor Engineer acceptance testing is required.

**b.** Concrete mixtures shall have a 28-day drying shrinkage value less than the value listed in Table 2 for the class of concrete. Drying shrinkage shall be determined in accordance with the procedure described in AASHTO T160 with the following clarifications. Specimens shall be 3 x 3 x 11.25 in. prisms. All specimens shall be moist cured in a saturated lime water bath for seven (7) days prior to exposure to the drying environment. The specimen length shall be taken upon demolding after the curing period, and weekly for 28 days while placed in the drying environment. The shrinkage value shall be calculated after 28-days of drying as the percent change in length from the time the specimen is removed from curing.

Prequalification testing for drying shrinkage shall be performed by the Contractor. Neither process control nor Engineer acceptance testing is required.

- **Replace Subsection 601.03.3(c); Discharge in its entirety with the following.**

**c. Discharge.**

**1. Time and Rate.** The time elapsing from the time water is added to the mix until concrete is discharged into the forms at the site of work shall not exceed 90 minutes when hauled in truck-mixers or truck agitators, or 30 minutes when concrete is hauled by non-agitating equipment. Concrete not discharged into its final place within 90 minutes (30 minutes when using non-agitating equipment) after batching shall be wasted at no additional expense to the State.

The rate of discharge of mixed concrete from transit mixers or agitators shall be controlled by the speed of rotation of the drum in the discharge direction with the discharge gate fully open. These limits shall not be exceeded.

If the discharge of concrete is accomplished by tilting the transportation device, the surface of the load shall be restrained by a suitable baffle to prevent segregation.

Approved set-control admixtures may be used to extend the maximum time of discharge for ready-mixed concrete delivered in truck mixers to 120 minutes provided the Contractor submits trial mix data subject to the following conditions:

(a) The concrete mixture proportions and prequalification test results have been approved in accordance with **Section 601.03.1(b)**.

(b) Set-control admixture usage shall be in strict accordance with admixture manufacturer instructions and guidelines.

(c) Trial batches of the concrete mixture without the admixture (control) and additional batches covering the anticipated range of admixture doses are conducted by the contractor. Trial batch volume shall be a minimum of 3 cubic yards, and trial batches shall be conducted at the maximum water content for the approved mixture.

(d) For the control batch, only sample after initial mixing.

(e) For batches containing the set-control admixture, sample after initial mixing, and after 30, 60, 90, and 120 minutes. The truck mixer shall be kept in motion between sampling intervals.

(f) Data for each trial batch shall include plastic properties (slump, air content, unit weight, and temperature) after initial mixing, and after 30, 60, 90, and 120 minutes of slow mixing. The number of drum rotations at each sampling interval shall be reported.

(g) If plastic properties fall outside specification limits at any time interval, retesting after high speed mixing for up to 5 minutes will be allowed.

(h) Data for each trial batch shall include 7 and 28-day compressive strength results sampled after initial batching for the control; and after initial batching and 120 minutes of slow mixing for batches containing the set-control admixture.

(i) Trial batch test results shall indicate the concrete properties of mixtures containing the set-control admixture meet specification requirements after 120 minutes of slow mixing.

**2. Retempering.** Retempering shall be defined as adjusting concrete properties by addition of water or chemical admixtures after initial batching. Retempering concrete by adding water or other means may be permitted 1) only after concrete arrival and initial testing on the jobsite, 2) only when delivered in truck mixers, and 3) only if permitted by the Engineer. When authorized, additional water or chemical admixtures may be added to the batch materials with additional mixing to increase slump or air entrainment to meet the specified requirements, provided that:

- (a) The maximum water-cementitious materials ratio is not exceeded.
- (b) The admixture doses do not exceed manufacturer's recommendations.
- (c) All retempering and retesting operations are completed at least 30 minutes prior to the maximum allowable discharge time limit.

All admixtures shall be added at the plant. The engineer may approve addition of withheld mixing water, water-reducing admixture adjustments, or air entrainment admixture adjustments at the jobsite by means of a metered pressurized wand. No admixture shall be added during retempering that is not present in the approved mixture. All other admixtures, (eg. mineral, set control, corrosion-inhibiting, defoaming, or other specialty admixtures) may only be added at the plant. The manufacturer's recommended dose shall not be exceeded.

Prior to allowing retempering with water-reducing admixtures on the project, trial batches shall be conducted to simulate the impact of delayed addition as follows:

- (a) Both the control and retempered batch shall contain the same plant-added admixture dose.
- (b) The retempered batch shall have the second dose of admixture added at least 30 minutes prior to the maximum discharge time.
- (c) The combination of plant added admixture dose and retempered admixture dose shall not exceed the maximum manufacturer recommended dose.
- (d) Plastic properties shall be sampled initially, at the time of retempering, and maximum discharge time.
- (e) Specimens for strength and time of set for both the control and retempered mixture shall be sampled at the maximum allowed discharge time.

No trial batches are required for retempering with air entrainment admixtures.

If additional water is to be incorporated into the concrete, the drum shall be revolved not less than 30 revolutions at mixing speed immediately after retempering the concrete and before discharge is commenced.

If additional admixtures are incorporated into the concrete, the drum shall be revolved between 30 to 60 revolutions at mixing speed immediately after retempering the concrete and before discharge is commenced.

Concrete that is not within the specified slump or air content limits at the time of placement shall not be used. The Contractor shall assume the responsibility for any concrete retempering at the site as permitted by the Engineer. Retempering with admixtures will be permitted only with the approval of the Engineer or when specifically provided for in the Contract.

Delete **Section 604; Class HP(AE) Portland Cement Concrete**, pages 6-32 to 6-34 of the RI Standard Specifications for Road and Bridge Construction in its entirety.

**SECTION 604**

**CLASS HP(AE) PORTLAND CEMENT CONCRETE**

**[SECTION DELETED]**

Revise **Section 605; Concrete With Calcium Nitrite Based Corrosion Inhibitor**, pages 6-34 and 6-35 of the RI Standard Specifications for Road and Bridge Construction as follows.

## **SECTION 605**

### **CONCRETE WITH CALCIUM NITRITE BASED CORROSION INHIBITOR**

- **Replace Subsection 605.02.2(a); Concrete Mix Design Approval Process – Rate, with the following.**

#### **605.02.2 Concrete Mix Design Approval Process.**

**a. Rate.** Calcium nitrite based corrosion inhibitor shall be added at a rate specified in the Contract Documents per cubic yard with a tolerance of +/- 1 percent.

- **Delete Subsection 605.03.1; Sampling of Calcium Nitrite Based Corrosion Inhibitor.**

**605.03.1; Sampling of Calcium Nitrite Based Corrosion Inhibitor.** [Deleted]

Remove **Section 813; Waterproofing and Dampproofing**, pages 8-88 through 8-93 of the RI Standard Specifications for Road and Bridge Construction in its entirety and replace with the following:

## **SECTION 813**

### **WATERPROOFING AND DAMPPROOFING**

**813.01 DESCRIPTION.** This work consists of providing dampproofing and waterproofing systems on concrete bridge decks and other surfaces at the locations indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

#### **813.01.1 Systems.**

**a. Dampproofing** shall consist of mopped applications of approved bituminous materials.

**b. Waterproofing** shall consist of the application of a preformed membrane; a rubberized liquid asphalt membrane, or a cold applied liquid membrane, all as set forth below.

**813.01.2 Dampproofing.** This type of dampproofing consists of a prime coat and two mopped applications of an approved bituminous material.

**813.01.3 Preformed Waterproofing Membrane.** This type of waterproofing system consists of applying a preformed bituminous membrane of approved manufacture to concrete surfaces in strict compliance with the manufacturer's recommendations.

**813.01.4 Rubberized Liquid Asphalt Membrane.** This type of waterproofing system consists of applying a hot, liquid asphalt membrane of approved manufacture to concrete surfaces in strict compliance with the manufacturer's recommendations.

**813.01.5 Cold Applied Liquid Membrane.** This type of waterproofing system consists of applying a spray applied plural component resin based elastomeric membrane of approved manufacture to concrete surfaces in strict compliance with the manufacturer's recommendations.

#### **813.02 MATERIALS.**

**813.02.1 General.** Materials for dampproofing and waterproofing systems shall be delivered in original, tightly sealed containers or unopened packages, clearly labeled with manufacturer's name, brand name and number, and batch number of the material where appropriate. Prior to delivery, the manufacturer shall submit to the Engineer a notarized certificate attesting that the material conforms to these Specifications in every respect.

#### **813.02.2 Dampproofing.**

**a. Prime Coat.** The prime coat shall conform to the requirements of **Subsection M.12.01.1** of these Specifications.

**b. Mop Coats.** The mop coats shall conform to the requirements of **Subsection M.12.01.2** of these Specifications.

**813.02.3 Preformed Waterproofing Membrane.** The primer and sheet membrane materials of this system shall conform to the respective requirements of **Subsection M.12.02.2** of these Specifications.

**813.02.4 Rubberized Liquid Asphalt Membrane.** The surface conditioner, membrane, and protective sheet materials of this system shall conform to the respective requirements of **Subsection M.12.02.1** of these Specifications.

**813.02.5 Cold Applied Liquid Membrane.** The primer and membrane materials of this system shall conform to the respective requirements of **Subsection M.12.02.3** of these Specifications.

### **813.03 CONSTRUCTION METHODS.**

**813.03.1 Surface Preparation for All Types.** New concrete shall have cured a minimum of 7 days in accordance with ACI-308. New or existing surfaces shall be free of oil, grease, curing compounds, algae, moss, laitance, friable matter, bituminous products and previous waterproofing membranes. If required, degreasing shall be performed with detergent washing in accordance with ASTM D4258. Concrete surfaces shall be abrasively cleaned in accordance with ASTM D4258 and all spalls repaired with concrete patch materials per the Engineer's and Manufacturer's recommendations. Voids and blowholes on vertical surfaces shall be repaired in the same manner.

Areas of minor surface deterioration or depression of 0.5-inch and greater in depth shall be brought to grade with an approved patching mortar. Cracks and joints shall be treated in accordance with the manufacturer's recommendations as approved or directed by the Engineer.

The applicator shall be responsible for the protection of equipment and adjacent areas from overspray or other contamination that may be caused by application of the dampproofing or waterproofing.

#### **813.03.2 Dampproofing.**

**a. Limitations.** No dampproofing shall be applied in wet weather, nor when the temperature is below 35°F. Should the surface of the concrete become temporarily damp, it shall be covered with a 2-inch layer of hot sand, which shall be allowed to remain in place long enough to produce a warm and dry condition. The sand shall be swept back, uncovering sufficient area for commencing work. The operation may be repeated as the work progresses.

**b. Prime Coat.** Immediately after the surface is prepared and in order to insure a proper bond between the dampproofing material and the concrete, a prime coat shall be applied. The primer shall be sprayed or brushed on the surface at a rate of approximately 1/10 of a gallon per square yard so as to cover it completely and uniformly. The quality of the primer and the method of application shall be approved by the Engineer.

**c. Application.** Concrete or other surfaces which are to be protected by dampproofing shall be mopped or brushed with two coats of an approved bituminous material for absorptive treatment. The bituminous material shall be heated to a temperature between 300°F and 350°F. The material shall be stirred frequently to avoid localized overheating. The heating kettle shall be equipped with thermometers. The bituminous material shall be applied with suitable mops or brushes. Each coat shall be mopped over the surface, completely covering same with a continuous heavy film. When any breaks or thin spots show in the dampproofed surface after drying, they shall be retouched to secure an even impervious coating. The interval between successive applications shall not be less than 18 hours. The completed dampproofing shall be protected by the Contractor from damage by subsequent construction operations.

**813.03.3 Preformed Waterproofing Membrane.** Concrete surfaces that are to receive this type of waterproofing shall have a wood float or trowelled finish.

**a. Manufacturer's Representative.** The Contractor shall furnish the services of a competent field representative of the approved manufacturer to be present at the work site prior to any use of materials. The representative shall instruct the Contractor and the Engineer on installation and inspection procedures and to inspect the condition of the prepared surfaces. The representative shall be present at the job site until the completion of the work.

**b. Application.** The prime coat is to be applied only to areas that will be covered with membrane within the following 24 hours. Any areas not covered within 24 hours must be reprimed. The primer material and rate of coverage shall meet the specifications of the manufacturer. The primer shall be allowed to dry one hour or until tack free before placing the membrane. The membrane shall not be applied at temperatures below 40°F. All corners such as at curbs shall be double covered by using an initial strip of 12-inch minimum width, placed along the axis of the corner. Inside corners shall be finished with a fillet, and outside corners shall be rounded. Areas around drains or other protrusions shall be double covered with the membrane for a minimum of 6 inches in each direction, then liberally coated with an approved mastic. The membrane shall be laid from the low point to the high point with the membrane overlapped a minimum of 4 inches. Misaligned or inadequately lapped seams must be repaired. The wearing surface shall be placed as soon as possible after application of the membrane. A careful inspection must be made before covering the membrane, and any tears or holes must be repaired with necessary patches.

**813.03.4 Rubberized Liquid Asphalt Membrane.**

**a. Manufacturer's Representative.** The requirements for the Manufacturer's Representative are the same as set forth above in **Para. a** of **Subsection 813.03.3**.

**b. Sample Area.** At the option of the Engineer, the Contractor shall apply the liquid membrane on a sample area not less than 10 square feet in size. When approved, the sample area shall serve as a standard of acceptance for all membrane work.

**c. Mixing.** All mixing and application of the liquid membrane system shall be done in strict accordance with the printed instructions of the approved manufacturer and as directed by the Engineer. The Contractor shall submit evidence to the Engineer indicating that the proposed membrane applicator subcontractor is fully qualified to perform the work, and any proposed subcontractor found not qualified shall, at the written request of the Engineer, be removed forthwith by the Contractor.

**d. Application.** The surface conditioner shall be applied evenly, using a low pressure sprayer, to all surfaces at a rate not exceeding one gallon per 300 square feet or not less than one gallon per 600 square feet, depending on the concrete surface. The conditioner shall be allowed to dry before application of the membrane.

Cakes of membrane shall be melted in an approved double shell melter under continuous agitation until the material can be drawn free-flowing and lump-free at a temperature not exceeding 425°F. Membrane shall be applied evenly at the rate of one pound per square foot to provide a continuous coating not less than 1/8-inch thick and averaging 3/16-inch thick. The areas to be waterproofed will be inspected during application of the liquid membrane system by the Engineer to ensure that the membrane thickness is in accordance with the paragraph directly above. Any deficiencies shall be repaired at the expense of the Contractor.

**e. Protection.** Immediately following application of the membrane, and before it cools and before

vehicular or foot traffic is allowed on the membrane, the entire waterproofed bridge deck shall be covered with rolled asphalt sheets. Protective sheets shall be laid parallel to the center line of the bridge roadway. The protective sheets should not be allowed to overlap at either the longitudinal or transverse joints. The joint shall be a tight butt type. The maximum allowable space between sheets is 1/4-inch. The entire application of protective sheets shall be free of wrinkles, bubbles, fishmouths or other defects. Following placement of the protective sheet, a bead of hot membrane shall be placed along the joint where the sheet terminates at the face of the curb. The bead shall be continuous to prevent water from entering between the protective sheet and membrane.

**f. Testing.** During the waterproofing work, field samples of the membrane material may be taken for evaluation by the Engineer. Tests shall include penetration, flow, low temperature flexibility and adhesion and elasticity, all as specified herein.

### **813.03.5 Cold Applied Liquid Membrane.**

**a. Manufacturer's Representative.** The requirements for the manufacturer's representative are the same as set forth above in **Para. a** of **Subsection 813.03.3**.

**b. Surface Preparation.** In addition to the requirements of **Subsection 813.03.1**, all steel surfaces shall be prepared to a near white metal finish per SSPC-10 and overcoated with primer within 4 hours.

**c. Testing.** Random tests for adequate tensile bond strength shall be conducted on the substrate by the applicator on site using an Elcometer Adhesion Tester Model 106 or similar at a minimum frequency of three tests per 5,000 square feet. Smaller areas shall receive a minimum of three tests. Should the tensile bond strengths be lower than 100 psi on concrete (or failure within the concrete) or 290 psi on steel, the Engineer may request further surface preparation.

**d. Application.** Application shall only proceed while air and substrate temperature are between 32°F and 104°F providing the substrate is above the dew point. Outside these temperatures the manufacturer shall be consulted. Work shall not proceed without written documentation from the manufacturer approving the modified acceptable substrate temperature. All components of the system shall be measured and mixed strictly in accordance with the manufacturer's recommendations. Mixing shall be done with either an air driven high-speed paddle or an explosion proof mixer. Prior to the application of any materials, the surface must be clean and free from loose debris, moisture, oil, grease or other contaminants.

**1. Primer.** A single coat of spray, roller or brush applied primer is required for all steel and concrete surfaces. This primer shall cure tack free before application of the waterproofing membrane.

**2. Membrane.** The waterproofing membrane shall be spray applied with suitable equipment, approved by the manufacturer. The membrane system shall pass ASTM C 836 Crack Bridging Test at 80 mils, or the thickness applied shall be at least equal to the thickness used by the manufacturer for the ASTM C836 Crack Bridging Test. Perform film thickness tests in accordance with SSPC-PA2 Measurement of Dry Coating Thickness, using 1/8 inch thick (minimum) steel coupons sprayed during the deck application so as to accurately represent the application procedure. The membrane shall cure between coats and before application of the tack coat.

**3. Tack Coat.** A tack coat, supplied by the same manufacturer, shall be applied directly to the waterproofing membrane prior to surfacing.

**e. Repairs.**

**1. Patching.** If an area is left untreated or the membrane becomes damaged, a patch repair shall be carried out to restore the integrity of the system. The damaged area shall be cut back to sound material and wiped with solvent (e.g., acetone) up to a width of at least 4 inches on the periphery, removing tack coat and any contaminants. The substrate shall be primed, if necessary, followed by the application of membrane. A continuous layer shall be obtained over the substrate with a 4-inch overlap onto the existing membrane.

**2. Overlapping.** Where the membrane is to be joined to existing cured material and at day joints, the new application shall overlap the existing one by at least 4 inches. No preparation shall be necessary unless the existing materials are contaminated with tack coat or dirt in which case the repair/overlap area shall first be wiped with solvent (e.g., acetone).

**f. Protection.** During all stages of application, the membrane shall be protected by the Contractor from damage by construction operations.

**g. Final Review.** The Engineer and the applicator shall jointly review the deck area(s) in which the completed system has been installed, prior to surfacing. Any irregularities or other items which do not meet the requirements of the Engineer shall be addressed at this time.

**813.04 METHOD OF MEASUREMENT.** "Dampproofing," "Preformed Waterproofing Membrane," "Rubberized Liquid Asphalt Membrane," and "Cold Applied Liquid Membrane," will be measured by the number of square yards of each system actually placed in accordance with the Plans and as directed by the Engineer.

**813.05 BASIS OF PAYMENT.** The accepted quantities of "Dampproofing," "Preformed Waterproofing Membrane," "Rubberized Liquid Asphalt Membrane," and "Cold Applied Liquid Membrane," will be paid for at their respective contract unit prices per square yard as listed in the Proposal. The prices so-stated constitute full and complete compensation for all labor, materials, equipment, and all other incidentals required to finish the work, complete and accepted by the Engineer.

Replace **Section 918; Rural Mailboxes Postmaster Approved**, page 9-35 of the RI Standard Specifications for Road and Bridge Construction in its entirety with the following.

## **SECTION 918**

### **RURAL MAIL BOXES POSTMASTER APPROVED**

**918.01 DESCRIPTION.** This work consists of replacing existing rural mail boxes with new 2-door mail boxes when said existing mail boxes do not conform to the specifications of the U.S. Postal Service, in accordance with these Specifications.

**918.02 MATERIALS.** New rural mail boxes shall conform to the standards established by the U.S. Postal Service for materials, coatings, and paint. The doors of the new mail boxes must have embossed thereon the following inscriptions: "U.S. MAIL," and "APPROVED BY THE POSTMASTER GENERAL."

**918.03 CONSTRUCTION METHODS.** Mounting of new rural mail boxes on posts shall conform to the requirements of **Subsection 917.03.2, Para. c; Mounting of Mail Boxes**, of these Specifications.

**918.04 METHOD OF MEASUREMENT.** "Rural Mail Boxes" of the various types indicated on the Plans will be measured by the number of such boxes actually installed in accordance with the Plans and/or as directed by the Engineer.

**918.05 BASIS OF PAYMENT.** The accepted quantities of "Rural Mail Boxes" of the various types indicated on the Plans will be paid for at their respective contract unit prices per each such box as listed in the Proposal. The prices so-stated constitute full and complete compensation for all labor, materials and equipment including removal of existing rural mail boxes, hardware and other incidentals required to finish the work, complete and accepted by the Engineer.

Replace **Code 943.0100; Training Provisions**, pages AC-127 to AC-129 of the January 2011 Compilation of Approved Specifications in its entirety with the following.

**CODE 943.0200**

**ON-THE-JOB TRAINING**

**(Job-Specific)**

This On-the-Job Training Specification conforms to the requirements of 23 U.S.C. 140(a).

As part of the contractor's equal employment opportunity and affirmative action programs, training shall be provided as follows:

A. The contractor shall provide on-the-job training aimed at developing full journey worker status in the type of trade or job classification involved.

B. The number of training hours assigned to this contract per this specification will be xxx hours. The specific number of trainees shall be determined by the Contractor during the post qualification process.

C. In the event that a contractor subcontracts a portion of the contract work, he shall determine how many, if any, of the trainees are to be trained by the subcontractor, provided, however, that the contractor shall retain the primary responsibility for meeting the training requirements of this specification. The contractor shall also insure that this specification is made applicable to such subcontract. Where feasible, 25 percent of apprentices or trainees in each occupation shall be in their first year of apprenticeship or training.

D. The number of trainees shall be distributed among the work classifications on the basis of the contractor's needs and the availability of journey workers in the various classifications within a reasonable area of recruitment. Prior to commencing construction, the contractor shall submit to RIDOT for approval the number of trainees to be trained in each selected classification and training program to be used. Furthermore, the contractor shall specify the starting time for training in each of the classifications. The contractor will be credited for each trainee employed by him on the contract work that is currently enrolled or becomes enrolled in an approved program, and will be reimbursed for such trainees as provided hereinafter.

**GOOD FAITH EFFORTS**

Training and upgrading of minorities and women toward journey worker status is a primary objective of this Specification. Accordingly, the contractor shall make every effort to enroll minority trainees and women (e.g., by conducting systematic and direct recruitment through public and private sources likely to yield minority and women trainees) to the extent that such persons are available within a reasonable area of recruitment. The contractor will be responsible for demonstrating the steps that he has taken in pursuance thereof, prior to a determination as to whether the contractor is in compliance with this Specification. This training commitment is not intended, and shall not be used, to discriminate against any applicant for training, whether a member of a minority group or not.

No employee shall be employed as a trainee in any classification in which he has successfully completed a training course leading to journey worker status, or in which he/she has been employed as a

journey worker. The contractor may satisfy this requirement by including appropriate questions in the employee application, or by other suitable means. Regardless of the method used, the contractor's records shall document the findings in each case.

### **ACCEPTABLE TRAINING**

The minimum length and type of training for each classification shall be as established in the training program selected by the contractor and approved by RIDOT and the Federal Highway Administration. RIDOT and the Federal Highway Administration will approve a program if it is reasonably calculated to meet the equal employment opportunity obligations of the contractor and to qualify the trainee(s) for journey worker status in the classification concerned by the end of the training period. Furthermore, apprenticeship programs registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training, or with the Rhode Island apprenticeship agency recognized by the Bureau, and training programs approved but not necessarily sponsored by the U.S. Department of Labor, Manpower Administration, and Bureau of Apprenticeship are acceptable for the purposes of this specification.

Training will be considered acceptable provided it is being administered in a manner consistent with the equal employment obligations of Federal-aid highway construction contracts. Approval or acceptance of a training program shall be obtained from RIDOT prior to commencing work on the classification covered by the program. It is the intention of this specification that training is to be provided in the construction crafts rather than clerk-typists or secretarial-type positions. Training is permissible in lower level management positions such as office engineers, estimators, timekeepers, etc., where the training is oriented toward construction applications. Training in the laborer classification will be permitted provided that significant and meaningful training is provided and is approved by the division office of the FHWA. Some offsite training is permissible as long as the training is an integral part of an approved training program and does not comprise a significant part of the overall training.

### **REIMBURSEMENT**

Except as otherwise noted below, the contractor will be reimbursed at a rate of \$6.00 per hour of training provided to each trainee in accordance with an approved training program. This reimbursement will be made even if the contractor receives additional training program funds from other sources, provided such other does not specifically prohibit the contractor from receiving other reimbursement.

Reimbursement for offsite training will not be made to the contractor. However credit for offsite training will be granted if the contractor; contributes to the cost of the training, provides the instruction to the trainee or pays the trainee's wages during the offsite training period, or the trainees are concurrently employed on another Federal-aid project.

No payment will be made to the contractor if either the failure to provide the required training, or the failure to hire the trainee as a journey worker, is caused by the contractor and evidences a lack of good faith on the part of the contractor in meeting the requirements of this Specification. It is normally expected that a trainee will begin training on the project as soon as feasible after start of work, utilizing the skill(s) involved, and remain on the project as long as training opportunities exist in the work classification or until the trainee has completed the training program. It is not required that all trainees be employed as such for the entire length of the contract. A contractor will have fulfilled his responsibilities under this Specification if he has provided acceptable training to the number of trainees specified. The number trained shall be determined on the basis of the total number enrolled on the contract for a significant period.

Trainees will be paid the appropriate rates approved by the Departments of Labor or Transportation.

Trainees will be paid at least 60 percent of the appropriate minimum journeyman's rate specified in the contract for the first half of the training period, 75 percent for the third quarter of the training period, and 90 percent for the last quarter of the training period, unless apprentices or trainees in an approved existing program are enrolled as trainees on this project. In that case, the appropriate rates approved by the Departments of Labor or Transportation in connection with the existing program shall apply to all trainees being trained for the same classification covered by this Specification.

The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

The contractor will provide for the maintenance of records and furnish periodic reports documenting his performance under this Specification.

### **CONTRACTORS' PROCEDURES**

#### **Pre-award:**

A. Before beginning any federal aid project, the Contractor must have his or her Affirmative Action Plan in place and on file with the Department of Administration/EEO Office.

B. Prior to any award, the Contractor must submit to the Office of Business and Community Resources' (OBCR) OJT Compliance Officer for review and approval, a specific plan that includes the following: the RIDOT OJT ANNUAL Training PLAN, which includes a listing of all current projects (FAP and Non-FAP), Trainee Registration Form and the OJT Acknowledgment and Statement of Intent.

C. The Contractor must either use a US or RI DOL approved program or an approved training program of a recognized labor organization or trades council.

#### **Post-award:**

A. Proposed On-the-Job trainees are to be listed on the Trainee Registration enrollment form for each trainee to be employed and submitted to OBCR's OJT Compliance Officer for approval. Trainees may not begin training until the Trainee Plan is approved by RIDOT.

B. The Contractor orients the training foreman, superintendent and the On-the-Job Training trainee(s) to their respective responsibilities in the program and provides copies of the training guidelines for the training job classification being used.

C. The Contractor shall provide a certified payroll weekly to the Resident Engineer. This payroll should distinguish clearly the trainee's training hours from regular hours worked for each On-the-Job trainee.

D. The Contractor will monitor and submit monthly reports (called Monthly Report) for all trainees in the program, for progress, any problems or training issues to the OJT Compliance Officer.

E. The Contractor must notify the Resident Engineer and the OJT Compliance Officer verbally within 5 working days of any trainee termination or trainee resignations. The Contractor must also submit termination forms/documentation to the Resident Engineer and the OJT Compliance Officer within 10 working days after the termination. Subsequent to any trainee's termination or resignation, the OJT Compliance Officer will make a good faith effort determination (regarding the contractor's best efforts to replace the trainee as to whether this training position needs to be filled.

F. Contractors who assign training position(s) to subcontractors must be sure the subcontractor has an approved On-The-Job Training Plan on file with the OBCR. The Prime Contractor shall retain the responsibility for full compliance with OJT training requirements of the project.

G. The contractor shall furnish the trainee a copy of the program he will follow in providing the training. The contractor shall provide each trainee with a certification showing the type and length of training satisfactorily completed.

H. The contractor will provide for the maintenance of record and furnish periodic reports documenting his performance under this Specification.

Remove **Subsection M.12.02.3; Cold Applied Liquid Membrane**, pages M-47 and M-48 of the RI Standard Specifications in its entirety and replace with the following:

**SECTION M.12**

**WATERPROOFING, DAMPPROOFING AND SEALERS  
(CONCRETE PROTECTIVE SYSTEMS)**

**M.12.02.3 Cold Applied Liquid Membrane.** This membrane shall be used when any one of the following conditions apply: grade greater than five percent, high braking areas (i.e., intersections), super elevated decks (greater than 1/4 in./ft.), low radius curves (less than or equal to 1000 feet), or history of asphalt shoving.

**a. Primer.** Primer shall be a 100-percent reactive, monomer or polymer-based, two-component resin.

**b. Membrane.** The coating system shall be a spray applied, 100% solids, fast cure, high build monomer or polymer system. Primer is required. The membrane system shall pass ASTM C 836 Crack Bridging Test at 80 mils, or the thickness applied shall be at least equal to the thickness used by the manufacturer for the ASTM C 836 Crack Bridging Test. Apply aggregate broadcast into membrane applied at 30 – 40 mils if conditions warrant. A manufacturer-approved tack coat shall be included for overlays on the waterproofing membrane. In addition the membrane shall meet or exceed the following properties, submitted with a Certificate of Compliance, as related to laboratory prepared samples.

<b>Test Method Required Results</b>		
<b>Test</b>	<b>Method</b>	<b>Required Results</b>
Initial Cure Time	N/A	30 Minutes
Water Vapor Transmission	ASTM E 96	0.026 gr./ft <sup>2</sup> /hr (0.18 g/m <sup>2</sup> /hr)
Adhesion to Concrete	ASTM D 4541	>100 psi
Adhesion to Steel	ASTM D 4541	>290 psi
Tensile Strength, Method A, Die C	ASTM D 638	>435 psi
Elongation at Break, Method A, Die C	ASTM D 638	>100%
Low Temperature	1/4" (6.35mm) mandrel @ -13°F (-25°C)	Pass
Crack Bridging	ASTM C 836	Pass @ 10 cycles, 0.0625 in, -15°F (1.6mm, -26°C)