

# EXPECTED IMPLEMENTATION JULY 2016

## **400 CONCRETE STRUCTURES.** **(REV 10-26-15) (FA 1-11-16) (7-16)**

SUBARTICLE 400-4.1 is deleted and the following substituted:

**400-4.1 Plans:** At the Engineer's request, submit detailed plans for falsework or centering to the Department. The Contractor is responsible for results obtained by using these plans.

SUBARTICLE 400-5.7.3.3 is deleted and the following substituted:

**400-5.7.3.3 Certification:** Submit a written certification from the manufacturer stating the product meets the requirements of this specification along with the delivery of the coated forms to the jobsite. Ensure that the certification conforms to the requirements of Section 6. Ensure that the manufacturer has a quality control program conforming to ISO 9001 2000 standards.

SUBARTICLE 400-5.7.3.4 is deleted and the following substituted:

**400-5.7.3.4 Polystyrene Foam:** Use polystyrene foam comprised of expanded polystyrene manufactured from virgin resin of sufficient density to support the weight of concrete without deformation. Extrude the polystyrene foam to match the geometry of the flutes and provide a snug fit. Use polystyrene foam that has a density of not less than 0.8 pounds per cubic foot. Use polystyrene foam that has water absorption of less than 2.6% when tested according to ASTM C272. Submit a written certification from the manufacturer stating the product meets the requirements of this Specification along with the delivery of the product.

SUBARTICLE 400-15.2.6.2 is deleted and the following substituted:

**400-15.2.6.2 Material:** For the coating material, use a commercial product designed specifically for this purpose. Use only coating material that is manufactured by one manufacturer and delivered to the job site in sealed containers bearing the manufacturer's original labels. Submit the manufacturer's written instructions to the Engineer.

SUBARTICLE 400-15.2.6.4 is deleted and the following substituted:

**400-15.2.6.4 Application:** Apply the finish coating utilizing a method recommended by the manufacturer. When applying the finish coating by spraying, supply heavy duty spray equipment capable of maintaining a constant pressure necessary for proper application. Mix and cure all coating materials in accordance with the manufacturer's written instructions. Apply the finished coating at a rate of 50, plus or minus 10 square feet per gallon.

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SUBARTICLE 400-15.2.6.6 is deleted and the following substituted:

**400-15.2.6.6 Material Tests and Certification:** Before any portion of any shipment of finish coating is applied on the project, submit to the Engineer a certificate from the manufacturer attesting that the commercial product furnished conforms to the same formula as that previously subjected to the tests specified in Section 975. In addition, submit the following product analysis, obtained from the manufacturer, for each batch of the material used:

1. Weight per gallon.
2. Consistency (Krebs Units).
3. Weight percent pigment.
4. Weight percent vehicle solids.
5. Infra-red spectra of vehicle solution.

SUBARTICLE 400-17.4 is deleted and the following substituted:

**400-17.4 Alternate Procedure:** As an alternative to the time delay periods set forth in 400-17.1 and 400-17.3, test cylinders may be prepared and tested by the Contractor in accordance with 346-5 and a determination made using one of the following methods:

1. When the cylinder test results indicate the minimum 28 day compressive strength shown in the Plans, concrete bridge decks, approach slabs, and culverts may be opened to traffic or the superstructure and beams may be placed on caps.
2. Submit signed and sealed calculations, prepared by a Specialty Engineer, demonstrating that the concrete caps can safely support the weight of the girders for the current concrete strength to the Engineer for approval.

In any event, comply with the curing provisions of 400-16.

SUBARTICLE 400-21.5 is deleted and the following substituted:

**400-21.5 Repair Method:** Repair or remove and replace cracked concrete as directed by the Engineer. Additional compensation or a time extension will not be approved for repair or removal and replacement of cracked concrete when the Engineer determines the cause to be the responsibility of the Contractor.

**400-21.5.1 Nonstructural Cracks:** Repair each crack using the method as determined by the Engineer for each LOT in accordance with Table 1 or 2. When further investigation is required to determine repair or rejection, either remove and replace the cracked concrete or submit a structural evaluation signed and sealed by the Contractor's Engineer of Record that includes recommended repair methods and a determination of structural capacity and durability to the Engineer. Upon approval by the Engineer, repair the cracked concrete. Upon approval by the Engineer use epoxy injection in accordance with Section 411 to repair cracks in a member inside a dry cofferdam prior to flooding of the cofferdam. "Reject and Replace" in Table 1 or 2 means there is no acceptable repair method.

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$0.004 < x \leq 0.008$	N T	NT	NT	NT	NT	EI/M	NT	EI/ M	EI/M			
$0.008 < x \leq 0.012$	N T	NT	EI/ M	NT	NT	EI/M	EI/ M	EI/ M				
$0.012 < x \leq 0.016$	N T	NT	EI/ M	NT	EI/ M							
$0.016 < x \leq 0.020$	N T	EI/ M	EI	EI/ M		Investigate to Determine Appropriate Repair <sup>(4, 5)</sup> or Rejection						
$0.020 < x \leq 0.024$	N T	EI/ M	EI								Reject and Replace	
$0.024 < x \leq 0.028$	N T	EI/ M										
$x > 0.028$												

Key of Abbreviations and Footnotes for Tables 1 and 2		
Type Abbreviation	Abbreviation	Definition
Repair Method	EI	Epoxy Injection
	M	Methacrylate
	NT	No Treatment Required
	PS	Penetrant Sealer
Environment Category	EA	Extremely Aggressive
	MA	Moderately Aggressive
	SA	Slightly Aggressive
Reference Elevation	AMHW	Above Mean High Water
<u>Footnotes</u>		
(1) Cracking Significance Range is determined by computing the ratio of Total Cracked Surface Area (TCSA) to Total Surface Area (TSA) per LOT in percent $[(TCSA/TSA) \times 100]$ then by identifying the Cracking Significance Range in which that value falls. TCSA is the sum of the surface areas of the individual cracks in the LOT. The surface area of an individual crack is determined by taking width measurements of the crack at 3 representative locations and then computing their average which is then multiplied by the crack length.		
(2) Crack Width Range is determined by computing the width of an individual crack as computed in (1) above and then identifying the range in which that individual crack width falls.		
(3) When the Engineer determines that a crack in the 0.004 inch to 0.008 inch width range cannot be injected then for Table 1 use penetrant sealer unless the surface is horizontal, in which case, use methacrylate if the manufacturer's recommendations allow it to be used and if it can be applied effectively as determined by the Engineer.		
(4) (a) Perform epoxy injection of cracks in accordance with Section 411. Seal cracks with penetrant sealer or methacrylate as per Section 413. (b) Use only methacrylate or penetrant sealer that is compatible, according to manufacturer's recommendations, with previously applied materials such as curing compound or paint or remove such materials prior to application.		
(5) When possible, prior to final acceptance of the project, seal cracks only after it has been determined that no additional growth will occur.		
(6) Methacrylate shall be used on horizontal surfaces in lieu of penetrant sealer if the manufacturer's recommendations allow it to be used and if it can be applied effectively as determined by the Engineer.		
(7) Unless directed otherwise by the Engineer, repair cracks in bridge decks only after the grinding and grooving required by 400-15.2.5 is fully complete.		