



*Florida Department of Transportation*

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June 30, 2015

Khoa Nguyen  
Director, Office of Technical Services  
Federal Highway Administration  
545 John Knox Road, Suite 200  
Tallahassee, Florida 32303

Re: State Specifications Office  
Section **400**  
Proposed Specification: **4001604 Concrete Structures**

Dear Mr. Nguyen:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

The changes are proposed by John Westphal of the State Construction Office to clarify the treatment of approach slab as bridge deck under Curing Concrete, Protection of Concrete and Approach Slabs.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to [daniel.scheer@dot.state.fl.us](mailto:daniel.scheer@dot.state.fl.us).

If you have any questions relating to this specification change, please call me at 414-4130.

Sincerely,

Signature on file

Daniel Scheer, P.E.  
State Specifications Engineer

DS/ot

Attachment

cc: Florida Transportation Builders' Assoc.  
State Construction Engineer

**CONCRETE STRUCTURES.****(REV ~~5-15266-29-15~~)**

SUBARTICLE 400-16.4 is deleted and the following substituted:

**400-16.4 Bridge Decks *and Approach Slabs*:** Cure bridge decks *and approach slabs* for a duration of seven days. Apply a membrane curing compound to the ~~deck~~ top surface in accordance with 400-16.2 using a compressor driven sprayer. In general, apply curing compound ~~to a concrete deck~~ when the surface is damp and after all pooled water has evaporated. For Short bridges, begin applying curing compound immediately after the initially placed concrete has been floated, straightedged, textured and a damp surface condition exists and continue applying compound as concrete placement progresses with as little interruption as possible until the entire ~~top deck~~ surface has been coated with compound. For Long bridges, begin applying curing compound to the initially placed concrete as soon as a damp surface condition exists and continue applying compound as concrete placement progresses with as little interruption as possible until the entire ~~top deck~~ surface has been coated with compound. ~~However, f~~For ~~both~~ *all Short and Long* bridges, the elapsed time between the initial placement of deck *or approach slab* concrete and the completed application of curing compound must not exceed 120 minutes. The 120 minute limit may be extended by the Engineer if project specific factors (cool temperatures, high humidity, retarding admixtures, etc.) ~~are prolonging~~ wet surface conditions.

Prior to the first deck *or approach slab* placement, submit to the Engineer the method that will be used to periodically measure the rate of application of curing compound in, gallons/~~sq~~ *square foot* as the ~~deck concrete~~ placement progresses. Prior to the placement of each deck *or approach slab*, submit to the Engineer the anticipated quantity of curing compound in gallons along with the corresponding square feet of ~~deck concrete~~ to be covered to meet the coverage rate in 400-16.2. Compute the actual quantity of curing compound applied at the conclusion of each ~~concrete deck~~ placement and submit the quantity to the Engineer. Apply the curing compound from a work platform.

Place curing blankets on all exposed surfaces which are not formed as soon as possible with minimal effect on the surface texture. Place the curing blankets with sufficient overlapping seams to form an effective moisture seal. Before using curing blankets, mend tears, splits, or other damage that would make them unsuitable. Discard curing blankets that are not repairable. Wet all curing blankets immediately after satisfactorily placing them and maintain them in a saturated condition throughout the seven day curing period. Supply sufficient quantity of water meeting the requirements of Section 923 at the job site for wetting the blankets.

Where a bridge deck *or approach* slab is to be subjected to walking, wheeling or other approved construction traffic within the seven day curing period, protect the curing blankets and the ~~concrete slab~~ surface from damage by placing wooden sheeting, plywood or other approved protective material in the travel areas.

When the ends of the curing blankets are rolled back to permit screeding of adjacent ~~concrete bridge deck slabs~~, keep the exposed surfaces wet throughout the period of exposure.

~~Removal of b~~Bridge deck bottom and side forms *may be removed* after 72 hours ~~is acceptable upon~~ *in* upon compliance with 400-14. *Approach slab side forms may be removed after 72-hours.* Apply membrane curing compound to all surfaces stripped of forms within one hour of loosening. Apply curing compound according to 400-16.2.

ARTICLE 400-17 is deleted and the following substituted:

#### **400-17 Protection of Concrete.**

**400-17.1 Opening to Traffic:** ~~Do not open~~ ~~Close~~ concrete bridge decks, *approach slabs*, ~~and or~~ culverts to traffic for ~~a period of~~ at least 14 days after *concrete* ~~placement and for such additional times as deemed advisable.~~ ~~In the operation of placing~~ *During placement operations*, ~~the Contractor~~ *concrete* may ~~be~~ *wheeled* ~~concrete~~ across previously ~~poured~~ *placed* slabs after they have set for 24 hours ~~and, provided~~ plank runways are used to keep the loads over the beams.

**400-17.2 Storing Materials on Bridge Slabs:** Do not store heavy equipment or material, other than light forms or tools, on concrete bridge slabs ~~or approach slabs~~ until 14 days after they have been ~~poured~~ *placed*. ~~For all stockpiles, tools, and equipment stored on bridge slabs at any time, obtain prior approval by the Department, and from the Engineer prior to storing materials, tools or equipment on bridge decks at any time. will require any such stored materials or equipment to be dispersed any such loads in order to avoid overloading any structural part the structure.~~

**400-17.3 Time of Placing Superstructure:** ~~In the case of piers or bents with concrete caps, do not place the weight of the superstructure or of beams on the caps concrete substructure elements for at least 10 days after placement until they have reached the age of 10 days.~~

**400-17.4 Alternate Procedure:** As an ~~alternate alternative to procedure, in lieu of~~ 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. test beams or cylinders may be cast from representative concrete and cured identically with the concrete in the corresponding structural component. Make the test beams in accordance with ASTM C31 and test them in accordance with ASTM C78. When the cylinder test results indicate a minimum flexural strength of 550 psi for beams or 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. Provide signed and sealed calculations, prepared by a Specialty Engineer, to the Engineer for approval demonstrating that the concrete caps can safely support the weight of the girders for the current concrete strength to the Engineer for approval.*

~~However, regardless of beam or cylinder break results the procedure used~~ *In any event, fully comply with the bridge deck curing provisions of 400-16.4, including the requirement for curing blankets to remain in place for seven days.*

ARTICLE 400-20 is deleted and the following substituted:

#### **400-20 Approach Slabs.**

Construct approach slabs at the bridge ends in accordance with the applicable requirements of Section 350 using Class II (Bridge Deck) concrete. Place the reinforcement as specified in 350-7 and Section 415.

~~————The approach slab may be opened to traffic, vehicular or construction equipment, 14 days after concrete placement or after the prescribed curing period has elapsed and the concrete has attained the required 28 day cylinder strength.~~

**CONCRETE STRUCTURES.****(REV 6-29-15)**

SUBARTICLE 400-16.4 is deleted and the following substituted:

**400-16.4 Bridge Decks and Approach Slabs:** Cure bridge decks and approach slabs for a duration of seven days. Apply a membrane curing compound to the top surface in accordance with 400-16.2 using a compressor driven sprayer. In general, apply curing compound when the surface is damp and after all pooled water has evaporated. For Short bridges, begin applying curing compound immediately after the initially placed concrete has been floated, straightedged, textured and a damp surface condition exists and continue applying compound as concrete placement progresses with as little interruption as possible until the entire top surface has been coated with compound. For Long bridges, begin applying curing compound to the initially placed concrete as soon as a damp surface condition exists and continue applying compound as concrete placement progresses with as little interruption as possible until the entire top surface has been coated with compound. For all bridges, the elapsed time between the initial placement of deck or approach slab concrete and the completed application of curing compound must not exceed 120 minutes. The 120 minute limit may be extended by the Engineer if project specific factors (cool temperatures, high humidity, retarding admixtures, etc.) prolong wet surface conditions.

Prior to the first deck or approach slab placement, submit to the Engineer the method that will be used to periodically measure the rate of application of curing compound in, gallons/square foot as the concrete placement progresses. Prior to the placement of each deck or approach slab, submit to the Engineer the anticipated quantity of curing compound in gallons along with the corresponding square feet of concrete to be covered to meet the coverage rate in 400-16.2. Compute the actual quantity of curing compound applied at the conclusion of each concrete placement and submit the quantity to the Engineer. Apply the curing compound from a work platform.

Place curing blankets on all exposed surfaces which are not formed as soon as possible with minimal effect on the surface texture. Place the curing blankets with sufficient overlapping seams to form an effective moisture seal. Before using curing blankets, mend tears, splits, or other damage that would make them unsuitable. Discard curing blankets that are not repairable. Wet all curing blankets immediately after satisfactorily placing them and maintain them in a saturated condition throughout the seven day curing period. Supply sufficient quantity of water meeting the requirements of Section 923 at the job site for wetting the blankets.

Where a bridge deck or approach slab is to be subjected to walking, wheeling or other approved construction traffic within the seven day curing period, protect the curing blankets and the concrete surface from damage by placing wooden sheeting, plywood or other approved protective material in the travel areas.

When the ends of the curing blankets are rolled back to permit screeding of adjacent concrete, keep the exposed surfaces wet throughout the period of exposure.

Bridge deck bottom and side forms may be removed after 72 hours upon compliance with 400-14. Approach slab side forms may be removed after 72 hours. Apply membrane curing compound to all surfaces stripped of forms within one hour of loosening. Apply curing compound according to 400-16.2.

ARTICLE 400-17 is deleted and the following substituted:

**400-17 Protection of Concrete.**

**400-17.1 Opening to Traffic:** Do not open concrete bridge decks, approach slabs, or culverts to traffic for at least 14 days after concrete placement. During placement operations, concrete may be wheeled across previously placed slabs after they have set for 24 hours and plank runways are used to keep the loads over the beams.

**400-17.2 Storing Materials on Bridge Slabs:** Do not store heavy equipment or material, other than light forms or tools, on concrete bridge slabs or approach slabs until 14 days after they have been placed. Obtain approval from the Engineer prior to storing materials, tools or equipment on bridge decks at any time. Disperse any such loads to avoid overloading the structure.

**400-17.3 Time of Placing Superstructure:** Do not place the weight of the superstructure or beams on concrete substructure elements for at least 10 days after placement.

**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. Provide 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.

ARTICLE 400-20 is deleted and the following substituted:

**400-20 Approach Slabs.**

Construct approach slabs at the bridge ends in accordance with the applicable requirements of Section 350 using Class II (Bridge Deck) concrete. Place the reinforcement as specified in 350-7 and Section 415.