

ORIGNATION FORM

THE INFORMATION BELOW IS TO BE PROVIDED BY THE ORIGINATOR

Specification: 400
Subject: Removal of Forms
Origination date: April 27, 2010
Originator: Tom Malerk
Office/Phone: State Materials Office/352-955-6620

Problem statement: Current specification language in 346 for mass concrete determines the removal time for forms. Section 400 does not address mass concrete. In the mass concrete temperature control plans, Section 400 is referenced for form removal. This action should be determined by temperature, not strength for mass concrete.

Proposed solution: The proposed change clarifies that this subarticle does not apply to mass concrete.

Information source: No other FDOT office was consulted or involved in this change. For more information, please contact Mike Bergin, 352-955-6666.

Recommended Usage Note: All contracts

Estimated fiscal impact, if implemented: No fiscal impact. This requirement is enforced on a case by case basis with mass concrete. This change merely clarifies that this is not permitted to be used to determine form removal for mass concrete.

Implementation of these changes, if and when approved, will begin with the January 2011 letting.



Florida Department of Transportation

CHARLIE CRIST
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STEPHANIE KOPELOUSOS
SECRETARY

MEMORANDUM

DATE: June 22, 2010

TO: Specification Review Distribution List

FROM: Rudy Powell, Jr., P.E., State Specifications Engineer

SUBJECT: Proposed Specification: 4001400 Concrete Structures – Removal of Forms.

In accordance with Specification Development Procedures, we are sending you a copy of a proposed specification change. This change was proposed by Susan Blazo of the State Materials Office to reference subarticle 346-3.3 for forms removal for mass concrete.

Please share this proposal with others within your responsibility. Review comments are due within four weeks and should be sent to Mail Station 75 or to my attention via e-mail at ST986RP or rudy.powell@dot.state.fl.us. Comments received after **July 20, 2010** may not be considered. Your input is encouraged.

RP/cah
Attachment

CONCRETE STRUCTURES.
(REV 6-14-10)

ARTICLE 400-14 (Page 394- 395) is deleted and the following substituted:

400-14 Removal of Forms.

Use the table below as the criterion for minimum time or compressive strength required before removal of forms or supports.

When using the time period criterion, include in the time period all days except days in which the temperature falls below 40°F.

Use the specified 28-day minimum compressive strength value as stated in 346-3.1 for each Class of Concrete utilized.

Location of Concrete Placement	Minimum Time for Form Removal for any Strength Concrete*	Minimum (%) of 28-day Compressive Strength for Form Removal
(1) Deck slabs, top slabs of culverts and bottom of caps, forms under sidewalks, and safety curb overhangs extending more than 2 feet		
(a) Class II (Bridge Deck)	7 days**	75**
(b) Class II (Other than Bridge Deck)	7 days	75
(c) Class III	7 days	70
(d) Class IV	7 days	60
(e) Class V	7 days	50
(2) Walls, piers, columns, sides of beams and other vertical surfaces	24 hours***	50***
(3) Front face form of curbs	6 hours	70
* Removal of formwork for mass concrete, remove forms must be performed in accordance with 346-3.3		
** Reference 400-16.4		
*** Do not place additional load on the section until 70% of the specified 28-day concrete strength is attained. Also, refer to 400-7.4.		

When using the percent of required strength, cast test cylinders for each mix for compressive strength determination or develop a curing concrete strength versus time curve (S/T Curve) which can be used in lieu of multiple test cylinders to determine when percent of required strength has been met.

Prior to curve use; obtain the Engineer's approval of the S/T Curve and its supporting data. An approved testing laboratory may be used to provide this information with approval of the Engineer. Plot S/T Curves using at least three different elapsed times that begin once test cylinders are cast; however, one of the elapsed times must be prior to the Contractor's intended form removal. Each elapsed time plotted must have a corresponding compressive strength computed by averaging the compressive strength of two test cylinders.

Cure such test cylinders as nearly as practical in the same manner as the concrete in the corresponding structural component, and test them in accordance with ASTM C 39 and ASTM C 31. Perform cylinder casting, curing, and testing at no expense to the Department and under the observation of the Engineer. When the S/T Curve indicates a compressive strength equal to or greater than the percentage of specified strength shown in the table above for form

removal, the Contractor may remove the forms. When the ambient air temperature falls 15°F or more below the ambient air temperature that existed during development of a S/T Curve, use a S/T Curve that corresponds to the lower temperature and that is developed in accordance with this section.

Do not remove forms at any time without the consent of the Engineer. Even when the Engineer provides consent to remove the forms, the Contractor is responsible for the work.