

4500000 PRECAST PRESTRESSED CONCRETE CONSTRUCTION  
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Steve Plotkin  
904-360-5501

Comments: (6-16-11)

1. Delete the word “the”.

**450-2.3 Product Certification:** Ensure the ~~Quality Control~~ inspector ~~makes a final inspection of~~ all completed products at the plant *not less than 24 hours* before shipment to verify that all Contract Documents requirements are met. *Perform a final inspection of the products, after they are loaded on the transportation truck or barge and prior to shipment to the project site, to ensure they were not damaged during loading. Do not stamp the damaged products.* Upon verification that all Contract Document requirements have been met and all.....

*Response: The second and third sentence have been deleted in response to other comments.*

2. Change “grinded” to “ground”.

**450-11.5 Trimming Strands and Bars:** Upon completion of the detensioning operation, cut the exposed strands to required length, using an oxygen flame or mechanical cutting device. On piles *and other products requiring flush cutting of strands and bars*, use only mechanical cutting, unless specifications require strand to be burned *or groundgrinded* below the pile surface. Do not use electric.....

*Response: Agree. Change made.*

3. Insert “until completely sealed” and “and disposition”.

**450-12.5.1 Classification and Treatment of Cracks:** Regardless of cause and for the purposes of ~~this Specification~~ *Section 450*, cracks in *precast* prestressed components, excluding piling, will be identified according to their surface appearance in accordance with the following classifications:

Cosmetic cracks are any cracks which are less than 0.006 inch wide and are *located* in non-critical locations on the product. *Based on the environmental classification of the site where the product will be located, treat cosmetic cracks as follows:*

*(1) Slightly or moderately aggressive environment: Do not treat cracks.*

*(2) Extremely aggressive environment: After detensioning, apply penetrant sealer in accordance with ~~Section 400 and~~ Section 413.*

Minor cracks are any cracks which are between 0.006 and 0.012 inch wide, inclusive, and are *located* in non-critical locations on products. *Based on the environmental classification of the site where the product will be located and the final elevation of the product on the site, treat cosmetic cracks as follows: Repair minor cracks after detensioning in accordance with ~~Section 400, and Section 411 or Section 413.~~*

*(1) Slightly aggressive environment: Do not treat the cracks.*

*(2) Moderately aggressive environment:*

*(a) For products that will be located at an elevation of more than 12-feet above the existing ground level or high water elevation: Do not treat cracks.*

*(b) For products that will be located at an elevation within 12 feet above the existing ground level or high water elevation: Apply a penetrant sealer on the cracks after detensioning in accordance with Section 413.*

(3) Extremely aggressive environment:

a. For products that will be located at an elevation of more than 12 feet above the existing ground level or high water elevation: Apply a penetrant sealer on the cracks after detensioning in accordance with Section 413.

b. For products that will be located at an elevation within 12 feet above the existing ground level or high water elevation: Inject epoxy into the cracks **until completely sealed** after detensioning in accordance with Section 411.

Major cracks are any cracks of any width which are located in critical locations on products or cracks in non-critical locations of the product, ~~which~~ *that* are greater than 0.012 inch wide. Major cracks require an engineering evaluation **and disposition**, including crack depth measurement ~~and disposition~~, in accordance with 450-14.

Response: Thank you for your comment; however, no changes are needed.

**(until completely sealed)**: Section 411 describes the sealing of cracks, there is no need to repeat the same information in this Section.

**(and disposition)**: For each major crack, the depth measurement and disposition of the crack must be included in the evaluation. Existing language is OK as it. No changes made.

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Gevin McDaniel  
414-4284

Comments: (6-22-11)

1. **450-2.1 General** (6<sup>th</sup> paragraph) Suggest the following highlighted language:

Limit sweep to 1/2 inch for U-Beams and Inverted-T Beams. The maximum allowable sweep for ~~AASHTO Beams, Florida I Beams and Florida Bulb~~ **T/ Beams** is 1/8 inch per 10 ~~foot~~ length, but not to exceed 1.5 inch. The maximum allowable sweep for piling is 1/8 inch per 10 ~~feet~~, but not to exceed 1.0 inch.

Response: Agree. Change made.

2. **450-7.4 Debonded Strands** – Suggest the following highlighted language:

**450-7.4 Debonded Strands**: Extend the tubular debonding material (sheathing) through the header for debonded prestressing steel. Tie and tape the debonding material at the terminus located at the inside of the member. Seal openings between strand and sheathing for debonded strands with 100% silicone sealant within 48 hours of detensioning. *The sealing of openings between strand and sheathing is not required for beams that require flush cutting of exposed strands per 450-11.5 and strand protection per 450-11.6.* Use sheathing that is tubular non-slit, high-density plastic with a minimum wall thickness of 0.025 inch, and an inside diameter exceeding the maximum outside diameter of the pretensioning strand by 0.025 inch to 0.14 inch, which does not react with concrete, coating, or steel and prevents the intrusion of water or cement paste during concrete placement.

Do not use strands debonded over the full length of a product.

Response: Agree. Change made.

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Trevor Williams/Todd Womick  
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Comments: (7-14-11)

1. Sec. 450 – 10.6.3 – I suggest using the phrase “ take immediate **corrective** action”.

**Response: Agree. Change made.**

2. The last two sentences of this section seem unclear. If the intent is to reapply the blanket **after** taking corrective action to prevent further loss of concrete moisture. Then possibly the last sentence should state.....” After correction, continue use of curing blanket in place for the remainder of the curing period.

**Response: Agree. Change made.**

3. **Sec. 450.11.1 General (5<sup>th</sup> sentence):** Please rephrase the words “..... or fraction **of, of** given concrete.....” .

**Response: Changed to “.....for each individual mix or for each LOT, or fraction **thereof, of** given concrete mix.....”.**

4. **Sec. 450 – 13.1 In the Second paragraph, 1<sup>st</sup> sentence:** “ cure repaired surfaces for the full 72 hour curing time.....”. Is it **72** hours or **120** hours of curing time?

**Response: The length of curing time will not be modified. The 72 hour curing period will be reinstated in the entire specification. Changes made.**

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Comments: (7-21-11)

Ghulam Mujtaba has already relayed to you our concern regarding the proposed change to FDOT specification section 450 involving extending the 72 hour curing period to 120 hours. I would like to take a moment to explain our concerns. Our normal operating procedure involves letting items produced for the FDOT remain in the bed and under cover for the full 72 hours of curing. We do not strip product immediately and spray with curing compound. As noted in Standard Specification ACI 308.1-98, curing compound products “when applied as specified by ASTM, restrict the loss of water from the concrete surface, but may not prohibit moisture loss entirely”. Because curing compound “may not prohibit moisture loss entirely”, we believe that letting the product cure in the bed with steel forms and an insulated cover for the 72 hour cure period provides the optimum curing environment for both maximizing strength development and reducing the risk of plastic shrinkage cracks. As a result we generally plan our production around having a FDOT production run tie up a particular bed for the full curing time of 72 hours. Knowing that the bed will be tied up for curing, we generally have other production items for our crews to work on until the 72 hour cure period has elapsed. Only then do we strip the product from the bed and move it into storage.

If the FDOT changes the section 450 specification to require a 120 hour curing period we will no longer be able to afford this practice which I believe will detrimentally affect the quality of the product and increase costs associated with production. I cannot keep a bed out of

production for 5 days and have sufficient other production to keep the plant busy. As a result, I will be forced to strip the product and spray curing compound which will add additional costs for labor and material to the price of FDOT product while increasing the risk, in my opinion, of incurring moisture loss during this crucial curing period.

Ghulam states in his email of 7/14/11 that:

“The 5-day curing time has been proposed to maintain further strength development of concrete and possibly eliminate the cracks that have exhibited during production of “some prestressed concrete products”. [emphasis added]

I take this statement to mean that the extended curing time may or may not eliminate cracks, and that these cracks have not been a problem with all prestressed concrete products, and possibly not with all producers. This statement unfortunately gives the impression that the FDOT is contemplating a specification change in order to provide a solution to a problem when the cause of the problem has not yet been determined. As a result, the proposed change may or may not fix problems other producers seem to be having with plastic shrinkage cracks. If the cracking is caused by anything other than curing, this specification change will not achieve anything except to create additional production problems for plants like mine which chooses to use a curing option that does not involve the use of curing compound.

I understand that the FDOT has concerns about shipping product before full strength development has been achieved through a proper curing period. These concerns seems to be a result of a specification change to section 455-7.3.1 which reduced the required time before driving pile from 7 days to the curing period specified in section 450, as long as 28 day strength had been achieved. With the use of high strength mixes predominant in the prestressed concrete industry, this change has resulted in pile being able to be shipped in as little as 72 hours from the time of casting. It seems that an investigation is currently under way regarding some pile damaged during driving, perhaps to determine if this shortened time requirement is responsible for the damage. I would consider it premature to change the 450 specification prior to the completion of this investigation since we do not know if lack of sufficient extended curing played any part in the damage to pile during driving.

Please note that the earlier requirement in section 455 of a 7 day period before driving pile did not affect the curing period specified in section 450. Therefore, our practice of curing for 72 hours in the bed, stripping, and then waiting an additional 4 days before allowing pile to ship and be driven seems to have resulted in product which generated no complaints about breakage or cracking. This would lead me to believe that the required strength development and elimination of cracks can be achieved through use of the current requirement of a 72 hour curing period supplemented by a 2 to 4 day extension of time before allowing shipment of any prestressed concrete product. I would not have a problem if the FDOT wishes to change section 450 to require such an extension of time before shipping as long as it is not an extension of the specific curing period, with its attendant requirements, as outlined in section 450.

I appreciate you taking the time to review my comments and concerns regarding the proposed specification change to section 450. Please feel free to call me to discuss any questions you may have about the issues I've addressed.

**Response: Agree .The length of curing time will not be modified. The 72 hour curing period**

will be reinstated in the entire specification. Changes made.

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Comments: (7-21-11)

**1. 450-2.3**

The currently proposed entry is “Perform a final inspection of the products, after they are loaded on the transportation truck or barge and prior to shipment to the project site, to ensure they were not damaged during loading.”

We suggest the following: “Perform a final visual inspection of the products after they are loaded on the transportation truck or barge, and prior to shipment to the project site, to ensure that they were not damaged in storage or during loading.”

Clarification would be helpful with respect to the terminology of final inspection. Our producer believes the intent is to NOT stamp products in storage until after they are loaded.

Response: Agree that the terminology “final inspection” will cause confusion. Therefore, the following proposed sentences are deleted. “Perform a final inspection of the products, after they are loaded on the transportation truck or barge and prior to shipment to the project site, to ensure they were not damaged during loading. Do not stamp damaged products.” Changes made.

**2. 450-10.1.1**

And “For piles and other members with a minimum section dimension of 12 inches or more.”

And, with respect to the section dimension, we feel that this description is unclear. Would this apply to ITBs, Bulb-Tees, Double Tees, Deck Slabs, etc?

Response: We disagree about ‘minimum section dimension’. This terminology is used by ACI specifications. No changes made.

**3. 450-11.1**

a. The current entry is “For products cured using accelerated curing, release the prestressing force immediately after terminating curing.”

We suggest the following: “For products cured using accelerated curing, release the prestressing force immediately after terminating the accelerated curing process. After the detensioning operation is completed, continue the 120 hour curing period using one of the methods listed in 450-10.6.”

Response: Agree. Changes made. (120 hour will be changed to 72 hour.)

b. The currently proposed entry is “For products cured using methods other than accelerated curing, release the prestressing force within a detensioning time limit, not to

exceed five calendar days.”

We suggest leaving this portion of the specification intact. Our producers have already commented on this change and understand the proposal allowing them to regularly detension products five days after attaining detension strength. The design handbook recommends that detensioning strengths not exceed the lesser of 0.8 F’C or 6,000 PSI.

Response: We disagree with the suggestion to leave the specification intact. Currently, during the Thanksgiving holidays it will be 5 days. In lieu of mentioning weekends and holidays, the proposed specification mentions 5 days.

The design handbook provides instruction to the designer related to specified release strength. It does not indicate that the strength cannot exceed 6000 psi.

No changes made.

4. **450-11.6**

The currently proposed entry requires the use of Type F-1 epoxy. Could the specification also allow the use of epoxy mortar?

Response: No, epoxy mortar is not appropriate for protection of strands. No changes made.

5. **450-13-1**

The currently proposed entry requires repaired surfaces to be cured “for the full 72 hour curing time.” Should this be changed to 120 hours to be consistent with the other changes?

Response: No, the 72 hour curing time will not be modified. No changes made.

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Comments: (7-27-11)

As per our discussions at the July 21, 2011 FPCA-FDOT Meeting, attached is the response of the Producer Members of FPCA to the pending changes to the FDOT 450 Specification. The Producer’s changes are highlighted in yellow for easier identification. Those revisions not commented on by us should be considered acceptable to all of our Producer Members who work with FDOT.

After our final review, we felt no part of the document need to be "set aside" for later review as was an option discussed in our July 21 meeting.

We have attached a copy in PDF Format and an identical version in MS Word format to facilitate your review.

Upon the appropriate review by FDOT please forward to FPCA your comments.

Our members greatly appreciate the opportunity to work with FDOT on this revision and hope that our quick response demonstrates our commitment to work with FDOT for the benefit of the industry.

1. 450-2.1 General, 4<sup>th</sup> paragraph: Add the highlighted text.

Inspect the product for conformance with the product dimension tolerances shown in Appendix B of PCI Manual MNL-116 (Manual for Quality Control for Plants and Production of Structural Precast Concrete Products), except as modified herein. Apply the tolerances with respect to the theoretical positions and dimensions shown in the plans. Apply the same tolerances for U-Beams as those specified for I-girders, excluding sweep tolerance, when inspecting the product for conformance with dimension tolerances. *For Florida U-Beam diaphragms, the tolerance for the thickness of the intermediate diaphragms is plus 1 inch and minus 1/2 inch, and the location of intermediate diaphragms, relative to design plan positions, is plus or minus 3 inches. The tolerance of the thickness of end diaphragms shall be plus 6 inches and minus 1/2 inch.*

Response: We agree with the added language; however we will change “6 inches” to “3 inches”. A 6 inch tolerance seems excessive and could have the following effects:

- Possible increase in dead load on the substructure and bearings which the engineer will not be accounting for
- Possible 8 inches of unreinforced concrete which is not detrimental because it serves no purpose, but may initiate a field review and unnecessary reports if shrinkage cracks develop.

When initially determining reasonable tolerances, the Department consulted a FUB fabricator who stated their block-out of “tub forms” are adjustable and their tolerances were typically within a half inch.

It seems reasonable to allow a plus “3 inch” tolerance on the end diaphragms. This would only leave a maximum of 5 inches of unreinforced concrete in the diaphragm. This would also reduce the amount of additional dead load in half when compared to a plus 6 inch tolerance.

Change made.

## 2. 450-7.4 Debonded Strands: Delete/Add the highlighted text.

**450-7.4 Debonded Strands:** Extend the tubular debonding material (sheathing) through the header for debonded prestressing steel. Tie and tape the debonding material at the terminus located at the inside of the member. Seal openings between strand and sheathing for debonded strands with 100% silicone sealant within 48 hours of detensioning. *The sealing of openings between strand and sheathing is not required for beams that require flush cutting of exposed strands are to be encased in permanent concrete diaphragms.* Use sheathing that is tubular non-slit, high-density plastic with a minimum wall thickness of 0.025 inch, and an inside diameter exceeding the maximum outside diameter of the pretensioning strand by 0.025 inch to 0.14 inch, which does not react with concrete, coating, or steel and prevents the intrusion of water or cement paste during concrete placement.

Do not use strands debonded over the full length of a product.

Response: We disagree with the suggested changes. The proposed change is not related to permanent concrete diaphragms. For clarification the sentence has been modified to read: *The sealing of openings between strand and sheathing is not required for beams that require flush cutting of exposed strands, with ends not to be encased in permanent concrete diaphragms per 450-11.5 and strand protection per 450-11.6.*

Changes made.

3. 450-10.1.1 Cold Weather Concreting: Keep/Delete/Add the highlighted text.

~~450-10.1.1 Cool/Cold Weather Placement~~**Concreting**: When the temperature of the surrounding air is expected to be below 40°F within 24 hours after placing concrete, the temperature of the plastic concrete as placed must be 55°F or greater. Maintain the temperature of the concrete after placement *at or above 55°F for the first 24 hours or until detensioning, whichever comes first, then maintain the temperature at or above 50°F* until the prestressing steel is detensioned. *For piles and other members with a minimum section dimension of 12 inches or more, maintain the concrete temperature at or above 50°F for the first 24 hours or until detensioning, then maintain the temperature at or above 40°F until the prestressing steel is detensioned.* Make arrangements for heating, covering, insulating or housing the concrete work in advance of placement and maintain the required temperature without injury due to concentration of heat. Do not use direct fired heaters during the first 24 hours after concrete placement, unless actions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide. Continuously monitor the temperature of the concrete *or the ambient air around the product* until the product is detensioned. Monitor by the use of thermocouples located in the product cross-section *or temperature recording devices located under the enclosure*. Provide one thermocouple *or temperature recording device* for each 200 feet of bed length or part thereof. Locate the thermocouples within the product's cross-section as shown in the Quality Control Plan or as approved by the Engineer. Record the *monitored* temperatures determined by each thermocouple. *Review the recorded temperatures to ensure that they are within the specified limits* *or* *temperature recording device. Review the recorded temperatures to ensure that they are within the specified limits.* ~~If the temperature of the ambient air is monitored, maintain the air temperature above 60°F to ensure that the concrete temperature is above 55°F.~~ Initially calibrate *recording devices or* thermometers ~~couples~~ and recalibrate them at least annually in accordance with the manufacturer's recommendations.

Response: Agree. Changes made.

4. 450-10.6 Curing, 1<sup>st</sup> paragraph: Do not change the 72 hour curing period.

**450-10.6 Curing**: Cure prestressed concrete as required for a minimum duration of ~~72~~*12072* hours. If forms are loosened or removed before the ~~72~~*12072* -hour curing period is complete, expand the curing to cover the newly exposed surfaces by either coating with curing compound or extending the continuous moist cure area. Maintain concrete surface moisture at all times until curing is begun. If a water sheen is not present, apply supplemental moisture by fog misting or prevent water sheen loss on flat work by use of an evaporation retarder.

Response: Agree. 72 hour curing period will not be revised.

5. 450-10.6.1 Continuous Moisture: Do not change the 72 hour curing period.

**450-10.6.1 Continuous Moisture**: Place burlap on the surface and keep it continuously saturated for the curing period by means of soil soakers, leaking pipes, or automatic sprinklers. Do not apply moisture manually. If side forms are removed during the curing period, extend the burlap to completely shield the sides of the product. Water flow may be metered to cycle repetitively for five minutes on and five minutes off during the ~~72~~*12072* hour curing period. When it is not practical to apply moisture or curing compound

inside the voided piles, cover their ends with wet burlap to prevent moisture loss.

Response: Agree. 72 hour curing period will not be revised.

6. 450-10.8 Curing Requirements for Silica Fume Concrete: Do not change the 72 hour curing period.

**450-10.8 Curing Requirements for Silica Fume Concrete:** Use either a ~~72~~ hour continuous moisture curing or a (12-24)- hour low-pressure steam curing in accordance with 450-10.7. Upon completion of the low-pressure steam curing, continue curing for the remaining part of the ~~72~~ hour curing period by application of the curing compound, continuous moisture curing, or use of the curing blankets.

If ~~72~~ hour continuous moisture is used, begin curing silica fume concrete immediately after the finishing operation is complete and keep a film of water on the surface by fogging until the curing blankets are in place. No substitution of alternative methods nor reduction in the time period is allowed. After completion of the ~~72~~ hour curing period, apply a membrane curing compound to all concrete surfaces. Apply curing compound according to 450-10.6.

Response: Agree. 72 hour curing period will not be revised.

7. 450-11.1 General: Keep/Add the highlighted text.

450-11.1 General: The required concrete strength at which the prestressing force may be transferred to the concrete in a product will be a minimum of 4,000 psi, unless specified otherwise in the plans. Verify the release strength by compressive strength cylinder tests or other approved means, no later than 24 hours after casting and every 24 hours thereafter until release strength is developed. In lieu of every 24 hour testing, *the* contractor is permitted to estimate the strength development of concrete by the maturity method in accordance with ASTM C 1074, *the* pulse velocity method in accordance with ASTM C 597, or any other nondestructive test method acceptable to *the* Engineer, until the time of the detensioning. Before detensioning, verify the concrete release strength by testing the compressive strength test cylinders. Make a minimum of two compressive strength release test cylinders daily for each individual mix, or for each LOT of 50 *cubic yard*, or fraction of, *of* given concrete mix design where the daily consumption exceeds this volume or when non-continuous batching or dissimilar curing is used. The release strength test, representing the LOT, is the average compressive strength of two test cylinders, which are cured under ~~the~~ conditions similar to the product or match-cured test specimens, which are match cured until the time of release. For products cured using accelerated curing, release the prestressing force immediately after terminating curing. For products cured using methods other than accelerated curing, release the prestressing force within *a detensioning time limit, not to exceed five calendar days after the 24 hours of* ~~verifying~~ *ication of* release strength by compressive strength cylinder test or other approved strength gain monitoring system, *unless the required time for release occurs on a weekend or holiday. When the required time for release occurs on a weekend or holiday, cover the products and exposed strand with curing blankets or other similar materials, or detension the products. Detension the products immediately on the first workday after the weekend or holiday. For all products in a casting line, use the same test method for determining their release strengths.* Cure concrete cylinders used for detensioning strength tests in the same manner and location as the prestressed concrete products.

Response: Disagree. In accordance with suggested changes, it is possible to delay the detensioning schedule to 10 days. This requires that the plants should plan for detensioning in advance during the holidays. No changes made.

8. 450-12.1 General, 2<sup>nd</sup> paragraph: Delete/Add the highlighted text.

The ~~Quality Control~~ Manager, *or QC inspectors under his/her direction*, will examine all deficiencies *within the time limit specified in ~~the QC Plan~~450-2.1 and 450-2.3* to determine the applicable provisions and requirements of this Article and which course of action is appropriate. If the ~~Quality Control~~ Manager determines that a deficiency is a cosmetic or minor defect, appropriate repairs may be executed immediately in accordance with 450-13. Perform and complete cosmetic and minor defect repairs to the satisfaction of the ~~Quality Control~~ Manager. If the ~~Quality Control~~ Manager determines that a deficiency is a major deficiency, requiring an engineering evaluation, submit a repair proposal to the Engineer in accordance with 450-14. Make all repairs that require a repair proposal under the observation of and to the satisfaction of the ~~Quality Control~~ Manager.

Response: Agree. Changes made.

9. 450-12.5.1(3)(b) Classification and Treatments of Cracks: Add the highlighted text.

*b. For products that will be located at an elevation within 12 feet above the existing ground level or high water elevation: For cracks greater than 0.008 inch wide, inject epoxy into the cracks after detensioning in accordance with Section 411. For cracks less than 0.008 inch wide, apply a penetrant sealer after detensioning in accordance with Section 413.*

Response: Disagree. It would be inconsistent with 400-21, which actually specifies 4 to 8 mils with epoxy injection. This was investigated during development of 400-21. There are various agencies that claim that they can inject 4 mil cracks.

10. 450-14.2(5) Submittal of Proposal for Engineering Evaluation, 1<sup>st</sup> paragraph: Add the highlighted text.

5. Any other supportive information, pictures and ~~sketches~~ drawings. *For cracked elements, show on a drawing the location, average width, depth, length, and termination points of each crack along the surfaces. Provide the distance from each termination point to a fixed reference point on the component, such as beam end or edge of flange.* The description of the proposed repair and/or the structural and durability evaluation of the product must be prepared by or under the direct supervision of the Contractor's Engineer of Record and must bear his/her signature and seal.

Response: Agree. Change made.

11. 450-16.2 Storage, 5<sup>th</sup> paragraph: Do not change the 72 hour curing period.

Continuous application of water during the initial ~~seventy-two~~ 72/2072 hour moist curing period may be interrupted for a maximum of one hour to allow relocation of precast/prestressed concrete elements within the manufacturing facility. Keep the moist burlap in place during relocation of the element.

Response: Agree. 72 hour curing period will not be revised.

12. 450-16.3 Shipping, 1<sup>st</sup> sentence: Keep/Delete/Add the highlighted text.

**450-16.3 Shipping:** Do not ship precast prestressed *concrete* products *to the project site prior to the completion of the 120-hour curing period before the concrete and attainment of* the required 28-day strength.

Response: Agree. Change made.

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Comments: (7-29-11)

1. First Paragraph of 450-2.3 Product Certification –

Recommend that the inspection not be less than 24 hours before shipment. State explicitly that this is before loading. Recommend also requiring the stamping of the products not less than 24 hours before loading for shipment. Recommend elaborating on the sentence about not stamping damaged products. A final inspection is performed after loading, but the products should have already been stamped once they met all requirements of the Contract Documents. If damaged during loading, the stamp should then be removed and the product not shipped. Recommend rearranging this paragraph to correspond with chronological occurrences.

Response: We agree that the proposed addition “Perform a final inspection of the products, after they are loaded on the transportation truck or barge and prior to shipment to the project site, to ensure they were not damaged during loading. Do not stamp damaged products” will cause confusion. FPCA has suggested deletion of proposed change and we concur. Changes made.

2. Third Sentence of 450-7.4 Debonded Strands and 450-11.6 Protecting Ends of Strands –

Recommend the two Specification requirements be consistent in terms of the length of time given to seal the strands.

Response: Agree. The 48 hours will be changed to 7 calendar days. Changes made.

3. First Sentence of 450-9.2.1.2 Corrosion Protection –

Recommend clarifying this sentence. The word construction causes some confusion. This sentence pertains to embedded devices that remain after construction of the product, not after construction on a project. Construction of the product is production.

Response: The intent is after construction of the project. No changes made.

4. 450-10.6.3 Curing Blankets –

Recommend moving the last sentence to after the third sentence. It makes sense to direct that the curing blankets remain in place for the entire curing period after directing the producer to provide a tight seal. It doesn’t make sense to state this after indicating what to do if the system fails.

Response: Agree. Changes made.

5. Fifth Sentence of 450-11.1 General –

Recommend removing the LOT size definition of 50 cubic yards or fraction of. If a producer is in 100 cubic yard LOTs, there should be the same allowance for reduced frequency of testing release strengths.

Response: Agree. Changed made.

6. Second and Eighth Sentence of 450-11.1 General –

Recommend keeping the language about covering and protecting the exposed strands and products when the detensioning time is extended. Recommend clarifying what is required over the weekend or on a holiday. The second sentence requires tests for release strength 24 hours after casting and every 24 hours thereafter. By removing the weekend and holiday allowance, the proposed specification now requires release strength tests on weekends and holidays. Was this the intent? If this wasn't the intent, the Specification change needs to be clarified. If the clarification requires testing be done on the first morning back at work, the maximum five days to detension should not be given from this date.

Response: The intent is to test the concrete as described, whether it is holiday or weekend or regular work day. No changes made.

7. Last Sentence of 450-11.5 Trimming Strands and Bars AND 450-11.6 Protecting Ends of Strands –

Proposed change requires strands to be cut a minimum of 1/8 inch below the concrete surface. Flush or protruding metal lifting devices are required to be cut back to a minimum depth of 1 inch below the concrete surface. Recommend increasing the 1/8 inch requirement. The cover that this provides doesn't seem like a sufficient amount in terms of corrosion protection.

Response: After checking with corrosion experts, it was agreed that a minimum of 1/8 inch cover provides sufficient amount cover in terms of corrosion protection. No changes made.

8. First Paragraph of 450-12.5.1 Classification and Treatment of Cracks –

Recommend clarifying that this section is only applicable when cracks are found and repaired at the prestressed yard (if that is the intent). Since 450-14 discusses deficiencies found and repaired at the project site, stating “for the purposes of Section 450” does not clearly indicate that this Specification only applies to cracks found at the prestressed yard. Recommend also considering the degree of cracking when cracks are found at the yard.

Response: Article 400-21.1 provides description of the disposition of cracked concrete prior to and after installation of precast products. There is no need to repeat the same information in 450. No changes made.

9. 450-12.5.1 Classification and Treatment of Cracks –

Recommend changing the references from “high water elevation” to “above mean high water elevation.”

Response: Agree. Change made.

10. 450-12.5.1 Classification and Treatment of Cracks –  
Recommend referencing Section 413 when requiring the sealing of cracks with high molecular weight methacrylate. Recommend also adding methacrylate to Section 450-3 Materials. It currently lists Penetrant Sealer as having to meet Section 413. It should also list Methacrylate.

Response: Agree. Changes made.

11. 450-12.5.2 Locations of Cracks –  
Recommend clarifying that this section is only applicable when cracks are found and repaired at the prestressed yard (if that is the intent). Since 450-14 discusses deficiencies found and repaired at the project site, stating “for the purposes of this Specification” does not clearly indicate that this Specification only applies to cracks found at the prestressed yard. Recommend also considering location of cracks as critical or non-critical as defined in this Section when cracks are found at the project.

Response: Article 400-21.1 provides description of the disposition of cracked concrete prior to and after installation of precast products. There is no need to repeat the same information in 450. No changes made.

12. 450-12.5.3.2 Simple Span Prestressed Concrete Beams –  
Recommend removing the phrase “before detensioning” from the description of “Mid-span region (between end zones).” Crack measurements are taken after detensioning. The way the Specification is currently written does not address cracks found in these locations after detensioning.

Response: Agree. Changes made in 450-12.5.3.2 and 450-12.5.3.3 to delete “before detensioning”.

13. 450-12.5.3.2 Simple Span Prestressed Concrete Beams –  
Recommend adding a definition for non-critical locations of cracks in end diaphragms. 450-12.5.1 defines major and minor cracks in connection to how 450-12.5.3 defines non-critical locations.

Response: In accordance with current specification, cracks at end diaphragms do not belong to the category of non-critical. They require the submittal of proposal and engineering evaluation. No changes made.

14. 450-12.5.3.3 Simple Span Double-T Beams –  
Recommend removing the phrase “before detensioning” from the description of “Mid-span region (between end zones).” Crack measurements are taken after detensioning. The way the Specification is currently written does not address cracks found in these locations after detensioning.

Response: Agree. Changes made in 450-12.5.3.2 and 450-12.5.3.3 to delete “before detensioning”.

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