



Florida Department of Transportation

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Tallahassee, FL 32399-0450

KEVIN J. THIBAUT, P.E.
SECRETARY

July 8, 2021

Khoa Nguyen
Director, Office of Technical Services
Federal Highway Administration
3500 Financial Plaza, Suite 400
Tallahassee, Florida 32312

Re: State Specifications Office
Section: **450**
Proposed Specification: **4500203 Precast Prestressed Concrete Construction.**

Dear Mr. Nguyen:

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

The changes are proposed by Thomas Frank from the State Materials Office to clarify camber tolerances, the length of exposed strand between adjacent ends of products vs. length of exposed strand between end header and stressing anchorage.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to daniel.strickland@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 Strickland, P.E.
State Specifications Engineer

DS/ra

Attachment

cc: Florida Transportation Builders' Assoc.
State Construction Engineer

PRECAST PRESTRESSED CONCRETE CONSTRUCTION
(REV 5-3-21)

SUBARTICLE 450-2.3 is deleted and the following substituted:

450-2.3 Tolerances:

Inspect all prestressed concrete products within five working days of detensioning to ensure their dimensions (other than sweep and camber) conform to the specified tolerances and to determine if there are any deficiencies.

Inspect the product for conformance with the product dimension tolerances shown in Appendix B of PCI Manual MNL-116, 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-Beams, when inspecting the product for conformance with dimension tolerances.

For Florida U-Beam diaphragms, the tolerances are:

1. Plus 1 inch and minus 1/2 inch for the thickness of intermediate diaphragms.
2. Plus or minus 3 inches for the location of intermediate diaphragms, relative to design plan positions.
3. Plus 3 inches and minus 1/2 inch for the thickness of the end diaphragms.

The tolerance for beam strand sheathing is plus or minus 2 inches.

Ensure the tolerance on all miscellaneous shaping including, but not limited to, chamfers, miters, bevels, keys, tapers, radii, holes, inserts, and block outs is within plus or minus 1/8 inch of the control dimension of the shape.

The tolerances represent the total allowable tolerance that will be accepted in the finished product. Do not apply tolerances shown for the overall dimensions of a member to violate the tolerances shown for positions of reinforcing and prestressing steel or FRP. Apply the tolerances during and after the fabrication of prestressed products. Do not reduce the concrete cover for reinforcing steel, FRP reinforcing, prestressing steel, FRP prestressing strands, or any other metallic or polymeric objects specified in the Plans more than 1/4 inch. Do not reduce the concrete cover for reinforcing steel, FRP reinforcing, prestressing steel, FRP prestressing strands, or any other metallic or polymeric objects when the cover specified in the Plans is minimum cover.

Limit sweep to 1/2 inch for U-Beams and Inverted T-Beams.

The maximum allowable sweep for I-Beams and piles is 1/8 inch for every 10 feet, and will be determined by the following equation:

$$\text{Sweep (in)} = (0.0125 \text{ in/ft}) \times \text{Length (ft) of beam or pile}$$

Measure and record the sweep and camber of the beams immediately after detensioning and monthly. Keep the measurement records on file for review upon request by the Engineer.

Notify the Engineer immediately when the sweep or camber exceeds the specified tolerances.

If the actual camber is less than 50% of the predicted camber at release provided by the Plans, move the dunnage towards the center of the beam to a maximum of 5% of the total length at each end to induce camber.

If the camber ~~exceeds by 1 inch~~ **is outside** of the design camber shown in the Plans **by plus or minus 1 inch**, take appropriate actions ~~in accordance with 400 7.13.1~~ to accommodate the product in the structure.

If the sweep exceeds the tolerance specified, immediately propose measures to the Engineer to bring the sweep of the product back to within tolerance. Special storage conditions for the purpose of removing excessive sweep will not be restricted by requirements of this Section.

SUBARTICLE 450-6.4.1 is deleted and the following substituted:

450-6.4 End Header Locations:

450-6.4.1 General: Provide a minimum of 18 inches of exposed strands from the end header to the stressing anchorage **for all products. Provide a minimum of 18 inches of exposed strands** ~~and~~ between adjacent ends of all products except 24_-inches square and smaller piles. Provide a minimum of 6 inches of exposed strands between adjacent ends of 24_-inches square and smaller piles.

ARTICLE 450-13 is deleted and the following substituted:

450-13 Repair Methods and Materials.

450-13.1 General: Before beginning the repairs of bug holes, spalls, chips, surface porosity, and honeycomb, remove all laitance, loose material, form oil, curing compound and any other deleterious matter from the repair area. Repair cosmetic or minor deficiencies by methods specified herein. Submit alternative repair methods as needed.

For each project, maintain the record of deficiencies and their repair methods. Ensure the record includes information about product description, unit serial number, date cast, defect description including dimensions, repair method and materials, defect discovery date, and signature of producer's QC Manager indicating concurrence with the information.

Cure repaired surfaces for the full 72 hour curing time or for the curing time as recommended by recommendations from the manufacturer of the repair material. Ensure the repaired surfaces have a surface texture, finish and color which matches the appearance of the unaffected surrounding area of the product.

450-13.1.1 Product Acceptance on the Project: Use only non-shrink grout **and/or epoxy** that is listed on the Approved Product List (APL).

450-13.2 Cosmetic Surface Filling: Repair areas to be filled with an approved high-strength, non-metallic, non-shrink grout meeting the requirements of Section 934. Mix, apply and cure the grout in accordance with the manufacturer's recommendations. Coating of the prepared surface with epoxy bonding agent before grout placement is not required.

450-13.3 Surface Restoration: Maintain the surface continuously wet for a minimum of three hours before application of repair material. Repair areas to be restored with a mortar mix consisting by volume of one part cement, 2.5 parts sand that will pass a No. 16 sieve, and

sufficient water to produce a viscous slurry mix or repair areas to be restored with an approved high-strength, non-metallic, non-shrink grout meeting the requirements of Section 934. Mix, apply and cure the grout in accordance with the manufacturer's recommendations. Cure areas repaired with a mortar mix in accordance with 450-10.6. Coating of the prepared surface with epoxy bonding agent before grout placement is not required.

450-13.4 Cutting and Filling: Carefully cut all feathered edges of the area to be repaired back perpendicular to (or slightly undercut from) the surface to the depth of sound concrete or to a minimum depth of 1/2 inch, whichever is deeper. Coat the prepared surface with an approved epoxy bonding agent applied in accordance with the manufacturer's recommendations. Fill the cutout area with an approved high-strength, non-metallic, non-shrink grout mixed and applied in accordance with the manufacturer's recommendations. Firmly consolidate the grout mix in the cutout area.

450-13.5 Restoration of Surfaces and Edges: When reinforcing steel or prestressing strand is exposed, remove concrete from around the items to provide a 1-inch clearance all around. When less than one-half the reinforcement diameter is exposed, a positive connection utilizing anchor screws may be proposed in lieu of 1-inch clearance all around. Do not damage the reinforcement. Form surfaces and edges to the original dimensions and shape of the product. Coat the prepared surface with an approved epoxy bonding agent applied in accordance with the manufacturer's recommendations. Restore surfaces and edges with an approved high-strength, non-metallic, non-shrink grout mixed and applied in accordance with the manufacturer's recommendations. An epoxy mortar meeting the requirements of Section 926, Type F may be used as an alternative to non-shrink grout. Firmly consolidate the grout or epoxy mortar mix in the area to be repaired. Restore surfaces and edges to the original dimensions and shape of the product.

450-13.6 Removal and Restoration of Unsound Concrete: Carefully cut the area of unsound concrete to be repaired back perpendicular to (or slightly undercut from) the surface and to the depth of sound concrete or to a minimum depth of 1 inch, whichever is deeper. When reinforcing bars, prestressing strand, inserts or weldments are exposed, remove the concrete from around the items to provide a 1-inch clearance all around. When less than one-half the reinforcement diameter is exposed, a positive connection utilizing anchor screws may be proposed in lieu of 1-inch clearance all around. Do not damage the reinforcement. Coat the prepared surface with an approved epoxy bonding agent applied in accordance with the manufacturer's recommendations and then filled with an approved high-strength, non-metallic, non-shrink grout mixed and applied in accordance with the manufacturer's recommendations. An epoxy mortar meeting the requirements of Section 926, Type F may be used as an alternative to non-shrink grout. Firmly consolidate the grout or epoxy mortar mix in the area to be repaired. Restore surfaces and edges to the original dimensions and shape of the product.

450-13.7 Surface Grinding: Grind off misshaped formed surfaces with an abrasive stone. Apply two coats of penetrant sealer in accordance with the requirements of Section 413, to any surfaces which are not subsequently encased in concrete, immediately after grinding has been accepted. Do not apply a penetrant sealer to any surfaces to be subsequently encased in concrete.

450-13.8 Treatment of Cracks: Treat cracks in accordance with 450-12.3.6.

PRECAST PRESTRESSED CONCRETE CONSTRUCTION**(REV 5-3-21)**

SUBARTICLE 450-2.3 is deleted and the following substituted:

450-2.3 Tolerances:

Inspect all prestressed concrete products within five working days of detensioning to ensure their dimensions (other than sweep and camber) conform to the specified tolerances and to determine if there are any deficiencies.

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Notify the Engineer immediately when the sweep or camber exceeds the specified tolerances.

If the actual camber is less than 50% of the predicted camber at release provided by the Plans, move the dunnage towards the center of the beam to a maximum of 5% of the total length at each end to induce camber.

If the camber is outside of the design camber shown in the Plans by plus or minus 1 inch, take appropriate actions to accommodate the product in the structure.

If the sweep exceeds the tolerance specified, immediately propose measures to the Engineer to bring the sweep of the product back to within tolerance. Special storage conditions for the purpose of removing excessive sweep will not be restricted by requirements of this Section.

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For each project, maintain the record of deficiencies and their repair methods. Ensure the record includes information about product description, unit serial number, date cast, defect description including dimensions, repair method and materials, defect discovery date, and signature of producer's QC Manager indicating concurrence with the information.

Cure repaired surfaces for the full 72 hour curing time or for the curing time as recommended by recommendations from the manufacturer of the repair material. Ensure the repaired surfaces have a surface texture, finish and color which matches the appearance of the unaffected surrounding area of the product.

450-13.1.1 Product Acceptance on the Project: Use only non-shrink grout and/or epoxy that is listed on the Approved Product List (APL).

450-13.2 Cosmetic Surface Filling: Repair areas to be filled with an approved high-strength, non-metallic, non-shrink grout meeting the requirements of Section 934. Mix, apply and cure the grout in accordance with the manufacturer's recommendations. Coating of the prepared surface with epoxy bonding agent before grout placement is not required.

450-13.3 Surface Restoration: Maintain the surface continuously wet for a minimum of three hours before application of repair material. Repair areas to be restored with a mortar mix consisting by volume of one part cement, 2.5 parts sand that will pass a No. 16 sieve, and sufficient water to produce a viscous slurry mix or repair areas to be restored with an approved

high-strength, non-metallic, non-shrink grout meeting the requirements of Section 934. Mix, apply and cure the grout in accordance with the manufacturer's recommendations. Cure areas repaired with a mortar mix in accordance with 450-10.6. Coating of the prepared surface with epoxy bonding agent before grout placement is not required.

450-13.4 Cutting and Filling: Carefully cut all feathered edges of the area to be repaired back perpendicular to (or slightly undercut from) the surface to the depth of sound concrete or to a minimum depth of 1/2 inch, whichever is deeper. Coat the prepared surface with an approved epoxy bonding agent applied in accordance with the manufacturer's recommendations. Fill the cutout area with an approved high-strength, non-metallic, non-shrink grout mixed and applied in accordance with the manufacturer's recommendations. Firmly consolidate the grout mix in the cutout area.

450-13.5 Restoration of Surfaces and Edges: When reinforcement is exposed, remove concrete from around the items to provide a 1-inch clearance all around. When less than one-half the reinforcement diameter is exposed, a positive connection utilizing anchor screws may be proposed in lieu of 1-inch clearance all around. Do not damage the reinforcement. Form surfaces and edges to the original dimensions and shape of the product. Coat the prepared surface with an approved epoxy bonding agent applied in accordance with the manufacturer's recommendations. Restore surfaces and edges with an approved high-strength, non-metallic, non-shrink grout mixed and applied in accordance with the manufacturer's recommendations. An epoxy mortar meeting the requirements of Section 926, Type F may be used as an alternative to non-shrink grout. Firmly consolidate the grout or epoxy mortar in the area to be repaired. Restore surfaces and edges to the original dimensions and shape of the product.

450-13.6 Removal and Restoration of Unsound Concrete: Carefully cut the area of unsound concrete to be repaired back perpendicular to (or slightly undercut from) the surface and to the depth of sound concrete or to a minimum depth of 1 inch, whichever is deeper. When reinforcement is exposed, remove the concrete from around the items to provide a 1-inch clearance all around. When less than one-half the reinforcement diameter is exposed, a positive connection utilizing anchor screws may be proposed in lieu of 1-inch clearance all around. Do not damage the reinforcement. Coat the prepared surface with an approved epoxy bonding agent applied in accordance with the manufacturer's recommendations and then filled with an approved high-strength, non-metallic, non-shrink grout mixed and applied in accordance with the manufacturer's recommendations. An epoxy mortar meeting the requirements of Section 926, Type F may be used as an alternative to non-shrink grout. Firmly consolidate the grout or epoxy mortar in the area to be repaired. Restore surfaces and edges to the original dimensions and shape of the product.

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450-13.8 Treatment of Cracks: Treat cracks in accordance with 450-12.3.6.