Florida Department of Transportation

RICK SCOTT
GOVERNOR

605 Suwannee Street
Tallahassee, FL 32399-0450

JIM BOXOLD
SECRETARY

December 21, 2015

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

Re: State Specifications Office
Section **930**
Proposed Specification: **9300600 Materials for Concrete Repair.**

Dear Mr. Nguyen:

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

The changes are proposed by Donnie Bagwell of the State Materials Office (SMO) to update the language for current Department and industry practice.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via email to 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/dt
Attachment
cc: Florida Transportation Builders' Assoc.
State Construction Engineer

MATERIALS FOR CONCRETE REPAIR.
(REV 11-5-15)

ARTICLE 930-6 is deleted and the following substituted:

930-6 Material for Repair of Concrete in High Stress Concentration Areas.

930-6.1 General: This material is intended to be used to repair block-outs and voids in post-tensioned elements, load bearing area of a beam, and other locations required by the Contract Documents. This material may be used for the repair of horizontal or vertical surfaces. Follow the manufacturer's recommendations for preparing the surfaces and for mixing, placing and curing the concrete. This material shall be a magnesium ammonium phosphate based concrete (MAPC) or a magnesium potassium phosphate based concrete (MPPC).

930-6.2 Physical Properties: The MAPC and MPPC materials shall meet or exceed physical properties stated in Table 3 as determined by the specified standard test methods.

Table 3 - Physical Properties of Repair Material in High Stress Areas

Requirement	Test Method	Test Value
Minimum Compressive Strength (at 28 days), psi	ASTM C109*	8,500
Minimum Flexural Strength (at 28 days), psi	ASTM C348*	600
Minimum Slant Shear Bond (at 14 days), psi	FM 5-587*	2,500
Time of Setting (Initial), minutes	ASTM C191**	15 to 60
Maximum Scaling Resistance	ASTM C672	No scaling
Maximum Length Change, %		
Allowable expansion at 28 days when water cured compared to length at one day	ASTM C157***	0.03
Allowable shrinkage at 28 days when air cured compared to length at one day		-0.03
Maximum Allowable Total Chlorides lbs/yd^3	FM 5-516	0.40

*The test methods for compressive strength (ASTM C109), flexural strength (ASTM C348), and Slant Shear Bond (FM 5-587) shall be modified so that the specimens are air cured instead of moist cured. All of these samples shall be air cured until the time of testing.
**Initial time of set for MAPC or MPPC will be tested in accordance with ASTM C191 with the following modification. The initial time of set shall be tested at 95° plus or minus 5°F.
***Make and cure the test specimens in accordance with ASTM C-157, except omit the curing period in Section 10.3; however both 11.1.1 and 11.1.2 shall apply for 28 day curing period.

930-6.3 ~~Specimen Requirements:~~

~~930-6.3.1~~ Curing of Compressive Strength, Flexural Strength and Slant Shear Bond Specimens: The test methods for compressive strength (ASTM C109), flexural strength (ASTM C348), and Slant Shear Bond (FM 5-587) shall be modified so that the specimens are air cured instead of moist cured. All of these samples shall be air cured until the time of testing.

~~**930-6.3.2 Time of Setting**: Initial time of set for MAPC will be tested in accordance with ASTM C191 with the following modification. The initial time of set shall be tested at 95°F, plus or minus 5°F.~~

MATERIALS FOR CONCRETE REPAIR.
(REV 11-5-15)

ARTICLE 930-6 is deleted and the following substituted:

930-6 Material for Repair of Concrete in High Stress Concentration Areas.

930-6.1 General: This material is intended to be used to repair block-outs and voids in post-tensioned elements, load bearing area of a beam, and other locations required by the Contract Documents. This material may be used for the repair of horizontal or vertical surfaces. Follow the manufacturer's recommendations for preparing the surfaces and for mixing, placing and curing the concrete. This material shall be a magnesium ammonium phosphate based concrete (MAPC) or a magnesium potassium phosphate based concrete (MPPC).

930-6.2 Physical Properties: The MAPC and MPPC materials shall meet or exceed physical properties stated in Table 3 as determined by the specified standard test methods.

Table 3 - Physical Properties of Repair Material in High Stress Areas

Requirement	Test Method	Test Value
Minimum Compressive Strength (at 28 days), psi	ASTM C109*	8,500
Minimum Flexural Strength (at 28 days), psi	ASTM C348*	600
Minimum Slant Shear Bond (at 14 days), psi	FM 5-587*	2,500
Time of Setting (Initial), minutes	ASTM C191**	15 to 60
Maximum Scaling Resistance	ASTM C672	No scaling
Maximum Length Change, %		
Allowable expansion at 28 days when water cured compared to length at one day	ASTM C157***	0.03
Allowable shrinkage at 28 days when air cured compared to length at one day		-0.03
Maximum Allowable Total Chlorides lbs/yd^3	FM 5-516	0.40

*The test methods for compressive strength (ASTM C109), flexural strength (ASTM C348), and Slant Shear Bond (FM 5-587) shall be modified so that the specimens are air cured instead of moist cured. All of these samples shall be air cured until the time of testing.
**Initial time of set for MAPC or MPPC will be tested in accordance with ASTM C191 with the following modification. The initial time of set shall be tested at 95° plus or minus 5°F.
***Make and cure the test specimens in accordance with ASTM C-157, except omit the curing period in Section 10.3; however both 11.1.1 and 11.1.2 shall apply for 28 day curing period.

930-6.3 Curing of Compressive Strength, Flexural Strength and Slant Shear Bond Specimens: The test methods for compressive strength (ASTM C109), flexural strength (ASTM C348), and Slant Shear Bond (FM 5-587) shall be modified so that the specimens are air cured instead of moist cured. All of these samples shall be air cured until the time of testing.