912-M-050 SYNTHETIC FIBERS FOR USE IN PCC

(Adopted 07-18-19)

The Standard Specifications are revised as follows:

SECTION 912, AFTER LINE 175, INSERT AS FOLLOWS:

912.06 Synthetic Fibers for Use in PCC

(a) General

Synthetic, non-metallic, fibers are used for concrete three-dimensional reinforcement to promote post-crack control, and improve the long-term performance of PCC. Synthetic fibers shall be introduced into PCC mixtures at a minimum dosage rate of 4.0 lb/cu yd at the batching plant or a ready-mix truck.

(b) Acceptance

Synthetic fibers for use in PCC shall be selected from the Department's list of approved materials. A list of approved Synthetic Fibers will be maintained by the Department. Hybrid fibers which include a combination of macro and micro fibers will be accepted. Synthetic fibers may be added to the approved list by completing the requirements in ITM 806, Procedure F.

(c) Requirements

Synthetic fibers shall be Type III in accordance with ASTM C 1116 and ASTM D 7508 with the following exceptions:

1. Aspect Ratio – Length/Equivalent Diameter,
minimum.....70
maximum.....100
2. Length (macro fiber).....1 1/2 to 2 1/4 in.
3. Tensile Breaking Strength, min.....70,000 psi
4. Modulus of Elasticity, min. .....800,000 psi

(d) Acceptance Testing of Hardened Fiber-Reinforced Concrete

Testing shall be in accordance with ASTM C 1579 and ASTM C 1609, using roller supports meeting the requirements of ASTM C 1812.

Testing of fiber-reinforced concrete shall be performed by a recognized independent commercial laboratory, regularly inspected by the CCRL for PCC materials, to ensure that the properties of the fiber-reinforced concrete are in accordance with the following:

Required Hardened Fiber-Reinforced Concrete Properties		
Physical Test	*Specification*	*Requirement*
Equivalent Residual Flexural Strength ($f^{150}_{T,150}$ or f_{e3}), min.*	*ASTM C 1609*	*150 psi*
Equivalent Flexural Strength Ratio ($R^{150}_{T,150}$ or R_{e3}), min.*	*ASTM C 1609*	*25%*
Crack Reduction Ratio, (CRR), min. reduction	*ASTM C 1579*	*>85%*
**The specimens shall be tested when the concrete ultimate flexural strength at peak stress (f_p) is a minimum of 650 psi. For 6 by 6 by 20 in. FRC beam the maximum required net deflection value of 1/150 of the 18 in. span length is 0.12 in.*		