

PN 463 - 04/20/2007 - JOINT REPAIR USING RAPID STRENGTH CONCRETE WITH MATURITY TESTING

Conform to C&MS Item 255 and the following modifications;

A. Revise 255.02 as follows:

Delete the line:

Concrete, Class C. S. FS or MS..... 499

Add after the last paragraph:

Rapid Repair Concrete Mix (RRCM) for full depth replacement.

Provide RRCM for this project conforming to 499.05 and as follows:

Provide a RRCM mix design that will achieve a flexural strength of 400 psi (2.8 MPa) in not less than 4 hours and not more than 6 hours.

In the RRCM mix design use cement conforming to 701.02, 701.04 or 701.05; use a fine aggregate conforming to 703.02.A; use coarse aggregate conforming to 703.02B and 703.13.

Demonstrate the developed RRCM mix's shrinkage is equal to or less than the concrete shrinkage of a standard Class C mix, use an established rapid repair concrete mix system including:

1. 4 x 4 concrete system by BASF
2. Rapid-1 by Sika
3. Or approved equal accepted by the Director

If a calcium chloride or accelerating admixture is used, determine dosage rate and dosage sequence as part of mix design.

Shrinkage testing for the proposed mix design may be waived if the admixture producer can provide shrinkage data on mixes similar to the designed mix.

During testing of the RRCM mix design develop the RRCM mix's maturity curve according to Supplement 1098 using the materials that will be used for the project and perform the testing during the placement according to Supplement 1098.

Document the mix design results that show the design achieves the minimum 400 psi (2.8 MPa) strength requirement by testing 6" x 6" (150 mm x 150 mm) beams according to ASTM C293 at the mix's highest established Water/Cementitious content.

Provide the design mix proportions, quality control requirements, test results of the mix, and maturity curve results to the Engineer. The Engineer will determine if the mix design meets the specification requirements.

B. Add the following to 255.06:

Install the sensors to measure maturity for each day's placement according to Supplement 1098. If the RRCM placement is stopped for more than 1 hour, treat that concrete placement as a day's placement. When the RRCM placement restarts, treat it as a new day's placement and install sensors according to Supplement 1098.

Ensure the batch tickets indicate the delivered concrete conforms to the approved mix design including:

1. The water/cement ratio is not exceeded
2. Admixtures are the same brand and type as the approved design
3. The aggregates and cementitious materials sources match the approved design
4. The air content is within the specified range.

C. Replace 255.08 with the following:

Open the RRCM pavement to traffic only after the concrete's maturity test results for the in-place RRCM indicate 400 psi (2.8 MPa) flexural strength has been obtained.

D. Replace the first paragraph of 255.10 with the following:

Payment is full compensation for furnishing all materials, including paint; removing pavement by any method; concrete mix design development; removing subbase for undercut replacement; compacting subbase and subgrade; placing rigid pavement, including RRCM necessary to replace removed subbase or subgrade; furnishing and placing dowels, tiebars, and mesh; placing, maintaining, maturity testing, removing, and disposing of temporary patches, and restoring the shoulders.

Designer Note

This proposal note may be used for night paving projects where item 255 is required. This note is also intended to replace 499 FS concrete and is recommended where item 255 has a critical time limit but the repair is intended to have long life.

If there are questions on its use or application contact the Office of Construction Administration (614-644-6622)