# GUIDE SPECIFICATION FOR FUTURA®-15 ONE-COMPONENT, SELF-CONSOLIDATING, VERY RAPID-HARDENING, CEMENTITIOUS HORIZONTAL REPAIR MORTAR

SECTION 32 01 29

PARTIAL DEPTH PATCHING OF RIGID PAVEMENT

Specifier Notes: This guide specification is written according to the Construction Specifications Institute (CSI) format. The section must be carefully reviewed and edited by the architect or engineer to meet the requirements of the project. Coordinate this section with other specification sections and drawings.

Specifier Notes: W. R. MEADOWS® FUTURA-15 is a one-component, cementitious, very rapid hardening structural repair mortar designed for horizontal applications. FUTURA-15 is composed of selected cements, graded sands and chemical additives. This proprietary blend produces a very rapid-setting structural repair mortar, even in cold weather conditions, without the aid of chloride- or gypsum-based accelerators.

FUTURA-15 is ideal for structural patching of concrete pavements, bridges, parking decks, airport runways and taxiways. FUTURA-15 is also designed for repair of industrial floors, expansion joint nosings, sidewalks and general commercial applications, along with grouting keyways.

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. This section specifies a one-component, self-consolidating, very rapid hardening & setting, trowel-applied. shrinkage-compensated, cement-based, horizontal structural repair mortar.

C. This product is specifically designed for repairing horizontal structural concrete at a minimum repair depth of ¼” (6.35mm) up to 2” (50.8 mm) without the use of aggregate extension. The use of aggregate extended, 3/8” (9.25 mm) to ½” (12.75 mm) graded, washed and dry aggregate, will allow for patching up to 6” (152.4 mm).

1.02 RELATED SECTIONS

Specifier Notes: Edit the list of related sections as required for the project. List other sections dealing with work directly related to this section.

A. Section 03 01 30 – Maintenance of Cast-In-Place Concrete.

B. Section 03 10 40 – Maintenance of Precast Concrete.

D. Section 32 16 00 – Concrete Curbs and Gutters.

1.03 REFERENCES

A. ASTM C109/C109M-99: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.

B. ASTM C348-97: Standard Test Method for Flexural Strength of Hydraulic Cement Mortars.

C. ASTM C157/C157M-99: Standard Test Method for Length Change of Hardened Hydraulic Cement Mortar and Concrete.

D. ASTM C469-94: Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression

E. ASTM C666-97: Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing.

F. ASTM C882-99 : Standard Test Method for Bond Strength of Epoxy-Resin Systems used with Concrete by Slant Shear – Modified (No Epoxy Bonding Agent).

1.04 SUBMITTALS

A. Comply with Section 01330 [XXXX] - Submittal Procedures.

B. Submit manufacturer's product data and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Store materials in a clean, dry area in accordance with manufacturer's instructions.

C. Protect materials during handling and application to prevent damage or contamination.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not apply if ambient or surface temperatures are below 20° F (-6.7° C) or if ambient or surface temperatures drop below 20° F (-6.7° C) within 24 hours of placement.

B. Do not apply if rain is imminent.

C. Protect from conditions that may cause early water loss: high winds, low humidity, high temperature and direct sunlight.

D. Follow manufacturer's recommendations regarding additional installation information (Standard on Hot Weather Concreting, ACI 305-R89 or Standard on Cold Weather Concreting", ACI 306-R88).

PART 2 PRODUCTS

2.01 MANUFACTURER

A. W. R. MEADOWS, INC., PO Box 338, Hampshire, Illinois 60140-0338. (800) 342-5976. (847) 683-4500. Fax (847) 683-4544. Web Site www.wrmeadows.com.

2.02 MATERIALS

A. Performance Based Specifications: Cementitious Repair Mortar shall be a self-consolidating, very rapid-hardening & setting, non-polymer modified, shrinkage - compensated repair mortar suitable for horizontal applications and when cured produces the following properties:

| | | |
|---|---|---|
| 1. | Compressive Strength (ASTM C 109): (@75.0$^0$ F, 23.9$^0$ C) | 1-hour 2,000 psi (14 MPa)<br>2-hour 3,500 psi (24 MPa)<br>3-hour 4,400 psi (30 MPa)<br>1-day 6,000 psi (41.0 MPa);<br>7-day 8,500 psi (59.0 MPa);<br>28-day 9,500 psi (65.0 MPa) |

2. Length Change (ASTM C 928)
   Drying Shrinkage — Maximum, -0.11%
   Wet Expansion — Maximum, 0.08%
3. Slant Shear Bond Strength (ASTM C 882 modified): 1-day 2,370 psi (16.0 MPa); 28-day 3,910 psi (27 MPa)
4. Modulus of Elasticity (ASTM C 469): Maximum 5.16 x $10^6$psi (35.5 GPa) @ 28 days
5. Freeze Thaw Resistance (ASTM C 666, Proc. A, 300 cycles): Minimum RDF 100%.
6. Scaling Resistance (ASTM 672 @ 25 Cycles)
   Visual Rating — 0 Rating – No Scaling
   Mass Loss — 0.00 – No Mass Loss

B. Proprietary Based Specification:
   1. FUTURA-15 by W. R. MEADOWS.

2.03 ACCESSORIES

A. Concrete Curing Compound: 1100-CLEAR CURING COMPOUND, 1220-WHITE PIGMENTED CURING COMPOUND or VOCOMP®-20 CURING AND SEALING COMPOUND.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine surfaces to receive repair mortar. Notify engineer if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

3.02 SURFACE PREPARATION

A. Mechanically remove unsound concrete to the limits indicated on the drawings.

B. Remove existing concrete facing as required to expose aggregate and remove all deteriorated concrete. Substrate should have minimum amplitude of ¼" (6 mm).

C. Conform to the requirements of ICRI Technical Guidelines NO. 03730. If using a chipping hammer, limit the size to 15 lb. (6.8 kg) to reduce micro fractures.

D. Square cut or under cut perimeter of the area to be repaired a minimum depth of ¼" (6 mm). Do not cut existing steel reinforcement.

E. Where reinforcing steel with active corrosion is encountered, comply with the following.
   1. Abrasive blast reinforcing steel to remove rust and contaminants.
   2. When one-half or greater of the diameter of the reinforcing steel is exposed, chip out behind the reinforcing to a ¾" (20 mm) minimum depth.
   3. Splice new reinforcing steel to existing steel where corrosion has depleted the cross-section area by 25%, as directed by the architect or engineer.

F. Thoroughly abrade the roughened surface and exposed reinforcement by abrasive or water-blasting to remove all bond-inhibiting materials, such as rust, dirt, loose chips and dust.

G. Ensure that the profile is open and porous as to allow for penetration of the repair material into the existing substrate.

H. Pre-dampen substrate prior to application of repair mortar.

I. Maintain substrate in a saturated, surface-dry condition through application of repair mortar.

J. Do not exceed 2:1 length to width ratio.

3.03 MIXING

A. Comply with mortar manufacturer's recommendations for water quantity and mixing procedures.

B. For repairs:
1. Greater than 2" (51 mm) in depth, extend repair mortar with 12.5 lb. (5.68 kg) of aggregate.
2. Greater than 4" (102 mm) in depth, extend repair mortar with 25 lb. (11.36 kg) of aggregate.
3. The aggregate shall be a minimum of 3/8" (9 mm) in size, saturated but surface dry condition.

C. Always add the mixing water prior to the addition of the repair mortar.

D. The use of larger size extender aggregate shall be approved prior to jobsite use.

3.04 APPLICATION

A. Apply the first layer by hand or trowel ensuring compaction into the properly prepared substrate.

B. Apply repair mortar horizontally in thickness from ¼" (6.35 mm) up to 6" (152 mm), depending on configuration and application.

3.05 FINISHING

A. Level surface of repair mortar using a wood or steel trowel, sponge float or screed.

B. Do not vibrate, chain or over-work surface.

C. Apply final finish when mortar has begun to stiffen.

3.06 CURING

A. Cure repair mortar immediately following application using a suitable curing compound or in accordance with ACI 308.

B. On large patches, cure repair zone as work proceeds. Wet curing for a minimum of one day, followed by a suitable curing compound, helps minimize shrinkage.

END OF SECTION