

# Matrix

## Division 4: Masonry

Trowel applied cementitious repair mortar, formulated to be compatible with the color and physical properties of parent material.

### SECTION 040120.91 – UNIT MASONRY RESTORATION

#### PART 1 GENERAL

##### 1.1 SUMMARY

Provide labor, materials, equipment and supervision necessary to complete the application of product to existing substrate.

##### 1.2 SYSTEM DESCRIPTION

The products shall meet or exceed the following performance standards:

Base		Portland cement		
pH	Wet Mix	>12		
Water/dry material ratio	Wet mix	0.20		
Dry bulk density	ASTM C188	92 pounds per cubic foot		
Setting time by vicat needle	ASTM C191	240 minutes		
Percent air – pressure method	ASTM C231	4 percent		
Water absorption	ASTM C140	11 percent		
Water vapor transmission	ASTM E96	5.2 perms		
Length change	ASTM C157	<500 $\mu$ strains at 28 days		
Modulus of elasticity	ASTM C469	2.6 x 10 <sup>6</sup>		
Slant shear bond strength – epoxy	ASTM C882	1800 psi		
		7 Days	14 Days	28 Days
Compressive strength – psi	ASTM C109	2900		3000
Tensile strength – psi	ASTM C307	400	480	560

##### 1.3 SUBMITTALS

- A. Manufacturer's current product data bulletin.
- B. The Matrix Certified Applicator shall prepare a test panel of the repair installed on the actual structure as a submittal for approval of proper application and adhesion.
- C. The Matrix Certified Applicator shall submit to the specifier a list of five projects that he has completed within the last five years, exhibiting the applicator's skills. The list shall include project name, location, and description of work and completion date.

##### 1.4 QUALITY ASSURANCE

Products shall be installed by a trained applicator with a minimum of five years' experience and meet the requirements of the specifier.

##### 1.5 DELIVERY, STORAGE & HANDLING

- A. Deliver all products and all accessories in original labeled, sealed, and undamaged containers or bundles.

- B. Store all products in accordance with manufacturer's printed instructions.
- C. Handle products in accordance with manufacturer's printed instructions.

## 1.6 PROJECT/SITE CONDITIONS

All products shall be applied at substrate and ambient temperatures of 40 degrees F or above. A minimum temperature of 40 degrees F shall be maintained 24 hours after completion of work. Protect products from weather and other damage for a period of 24 hours after installation. Do not apply products to frozen surfaces.

## 1.7 SCHEDULING

The work requires close coordination with related sections and trades.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

The following manufacturers are approved for the project.  
Conproco

### 2.2 MATERIALS

Matrix: A colored cement-based repair mortar formulated to match the appearance and physical characteristics of the masonry substrate. Designed for use on substrates like brownstone, sandstone, brick, limestone, terracotta and cast stone.

## PART 3 EXECUTION

### 3.1 EXAMINATION

- A. Installation shall be performed strictly in accordance with manufacturer's current product data bulletin.
- B. Examine substrates and conditions under which materials will be installed. Do not proceed with installation until unsatisfactory conditions are corrected.
- C. Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas and landscaping from contact due to mixing, handling, and application of materials.

### 3.2 SURFACE PREPARATION

- A. Prior to application of the product, inspect the substrate for proper cleaning and treatment of structural cracks, texture differences, damage, etc. Work shall not proceed until unsatisfactory conditions are corrected.
- B. Remove loose and deteriorated material, laitance, dirt, dust, oil and any surface contaminants that will inhibit proper bond.
- C. Saw cut edges with a diamond blade at a 90 degree angle to eliminate feather edging. Avoid polishing the edges, as this will inhibit bond.
- D. Avoid bruising or micro cracking during surface preparation. Refer to ICRI Surface Preparation Guide 03732.

- E. Repair zone must be a minimum of 1/2 inch deep, of simple geometry, with no complex edge conditions.
- F. Avoid long, narrow repairs, these have a greater tendency to crack.
- G. Apply Conpro Start where a consolidant is of benefit.
- H. Remove all scaling rust from embedded metal and steel and apply ECB anti-corrosion coating.
- I. Saturate substrate with clean water (Saturated Surface Dry/SSD), with no standing water during Priming or Application.

### 3.3 APPLICATION

#### A. Priming

1. Prime prepared substrate including all edges with a bond coat of Matrix. Work the bond coat into the substrate to ensure intimate contact and establish bond. The repair mortar must be applied into the plastic bond coat. If the bond coat dries, remove and re-apply.

#### B. Mixing

1. Measure Matrix powder and water to achieve a 4 to 4.5 parts powder to 1 part water ratio (or approximately 1 gallon per 50 lb unit of Matrix).
2. Pour measured water into a clean container suitable for mixing.
3. Place ½ of measured Matrix into mixing container with water and mix until uniform. Add remaining ½ Matrix to the mixing container and mix until fully blended to a uniform, lump free consistency.
4. Mechanically mix using a low speed drill (400 – 600 rpm) and mixing paddle or mortar mixer.
5. Additional water may be added to achieve desired consistency for placement of the Matrix. Over watering the mix will affect final color.
6. For multiple batches, the additional water should be added in a uniform fashion to avoid color shift.
7. Insufficient water will not hydrate the material and it will not achieve full strength. Mix only as much material as can be placed in 15 – 20 minutes.
8. Do not overmix, as this will entrain excess air.
9. Do not retemper, this will affect final color.

#### C. APPLICATION

1. At time of application surfaces must be saturated surface dry but hold no standing water.
2. Follow instructions for Priming.
3. Force Matrix against the edges of the repair, working from right to left or left to right.

4. Over-build repair zone by  $\frac{1}{4}$  inch.
5. Shave to final form with Mitre Rod up to 2 hours (longer in cold temperature) after application.
6. Do not overwork the finish.

#### D. CURING

1. Ensure repair zone stays properly hydrated. This may vary depending on ambient conditions. If hydration is not maintained, the repair may flash dry and not achieve full strength. Refer to ACI 308R-01 for detailed curing recommendations. If repair is inaccessible, tape polyethylene over the area to retain moisture. Do not allow polyethylene to contact the Matrix.
2. Protect repair from direct sunlight, wind, precipitation and frost during curing period.

#### 3.4 CLEANING

- A. Material left over at the job site by the approved applicator shall be removed.
- B. All adjacent surfaces and materials shall be cleaned.
- C. Clean tools and equipment immediately after use. Cured material must be removed mechanically.

END OF SECTION 040120.91