

## SECTION 030101 – MAINTENANCE OF CONCRETE FOR STEAM UTILITY DISTRIBUTION

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

#### 1.2 SUMMARY

- A. This section includes the furnishing and installation of formwork, reinforcement and concrete repair mortar and grout in the steam utility distribution system.

#### 1.3 REFERENCES

- A. Except as herein specified or as indicated on the Drawings, the work of this section shall comply with the following:

- 1. ASTM Standard Specifications, Test Methods and Classifications:

- a. ASTM A615 - Specification for Deformed and Plain Billet - Steel Bars for Concrete Reinforcement.
- b. ASTM A775 - Epoxy Coated Reinforcing Steel Bars.
- c. ASTM C33 - Specification for Concrete Aggregates.
- d. ASTM C309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- e. ASTM C1019 - Sampling and Testing Grout.

- 2. ACI - American Concrete Institute:

- a. ACI 301 - Specifications for Structural Concrete for Buildings.
- b. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.
- c. ACI 305R - Hot Weather Concreting.
- d. ACI 309R - Guide for Consolidation of Concrete.
- e. ACI 347R - Guide to Formwork for Concrete.

- 3. MDOT Publications: Standard Specifications for Construction.

#### 1.4 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Formwork: The design and construction of formwork shall be the responsibility of Contractor.

#### 1.5 QUALITY ASSURANCE

- A. Testing of concrete:

1. In accordance with ASTM C1019.
2. One sample of 3 specimens taken from representative mixes each day concrete is mixed and placed.
3. Samples shall be taken and tested by testing laboratory approved by Owner.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. Formwork

1. Form grade plywood or metal panels; no torn edges or worn plywood.
2. Form release agent nonstaining, nonemulsifiable type.
3. Provide chamfered strips or finished radiused edges at all exposed corners of concrete.

#### B. Reinforcing bars:

1. ASTM A615.
2. Yield stress:  $F_y = 60,000$  psi.

#### C. Epoxy coated reinforcement:

1. Bars:
  - a. Comply with ASTM A615 and ASTM A775.
  - b. Yield stress:  $F_y = 60,000$  psi, Grade 60.

#### D. Repair mortar:

1. Premixed repair mortar: Sikatop 111 Plus by Sika; no substitutions.
2. Aggregate: ASTM C33, 3/8-inch pea gravel.
3. Moist cure in accordance with manufacturer's recommendations.
4. Use for column bases (curb details) and maintenance pads.

#### E. Patch mortar:

1. Premix repair mortar: Sika Repair SHB by Sika, no substitutions.
2. Water: Clean, fresh and potable.
3. Moist cure in accordance with manufacturer's recommendations.
4. Use only for vertical and overhead applications.

#### F. Floor mortar:

1. Premix patching material: Sika Repair 222 by Sika, no substitutions.
2. Aggregate: ASTM C33, 3/8-inch pea gravel.
3. Use only for floor applications.

G. Grout:

1. Masterflow 928 by Master Builders, Inc.; no substitutions.
2. Use only for grouting of dowels and anchor bolts.

H. Zinc-rich paint: Nitoprime Zincrich, by Fosroc, Inc.; no substitutions.

2.2 CONCRETE MIX

A. Proportioning:

1. Repair mortar:
  - a. 42 pounds of saturated surface dry pea gravel per one mix unit of Sika 111 Plus.
  - b. No water shall be added.
2. Patch mortar:
  - a. Water: 3/4 gallon per 50 pound bag.
3. Floor mortar:
  - a. 35 pounds saturated surface dry pea graver per one 50 pound bag.
  - b. Water: 3/4 gallon per 50 pound bag.
4. Add only enough water to develop consistency for each specific application. The water to cement ratio should remain as low as possible.

2.3 SOURCE QUALITY CONTROL

A. Production and delivery:

1. Mix mortar by machine mixer, not by hand.
2. Keep mix components and mixing equipment cool.
3. Mix only as much mortar as can be placed at one time.

PART 3 - EXECUTION

3.1 ERECTION AND PLACEMENT

- A. Forms: Provide required forms and accessories in sufficient quantities so as not to delay the work.
- B. Environmental considerations: Comply with ACI 305R.
- C. Concrete repair mortar, patch mortar, and floor mortar:
  1. Preparation:

- a. Ensure that unsound concrete has been removed and that existing concrete edges are squared.
  - b. Surfaces against which repair mortar will be placed shall be left roughened.
  - c. Clean existing exposed reinforcing steel by wire brushing or sand blasting, as required, to bare metal. Thoroughly coat reinforcing steel with 2 coats of zinc rich paint.
  - d. Thoroughly prewet surface against which concrete will be placed.
  - e. Scrub bond coat of repair mortar paste into bond surface with stiff brush.
2. Placement:
- a. Place mortar immediately, before scrub coat dries.
  - b. Thoroughly rod and work mortar under and around new and existing components.
  - c. Repair mortar may be placed in a maximum of 9-inch lifts. Consult manufacturer for lift criteria for patch mortar and floor mortar.
3. Finishing and curing:
- a. After troweling exposed surface, wet cure with damp fabric for 3 days minimum.
  - b. Remove forms after one day and continue damp curing.
  - c. Do not permit damp fabric to dry.
  - d. Apply curing compound immediately upon removal of wet curing.
4. Install products in accordance with manufacturer's requirements.

END OF SECTION 030101