

Section 03551
MASTERTOP® 300 ANVIL-TOP®
Heavy-Duty Metallic Aggregate Floor Topping

NOTE TO SPECIFIERS

The purpose of this suggested specification is to assist the specifier while developing a specification for the use of Master Builders MASTERTOP 300 ANVIL-TOP. This specification has been prepared to be part of a complete project specification. It has not been prepared to be a “stand alone” item. This document is not intended to be copied directly into project specifications.

PART 1 - GENERAL

1.01 Related Documents

- A. Drawings and General provisions of the Contract, including General and Supplementary Conditions, apply to this section.
- B. Provisions of Section 03300, Cast-In-Place Concrete, apply to this Section.

1.02 Description of Work

Extra heavy-duty processed iron aggregate topping surfaces shown on finish schedule, noted on working drawings, and specified in this section.

Work includes providing premixed, processed iron topping, proportioned, blended, packaged at the factory and delivered to the jobsite ready to apply, with the addition of potable water; placing, finishing and curing specified in this section.

1.03 References

Comply with the following guides, codes, standards and specifications.

ACI 301-89	“Specification for Structural Concrete for Buildings”
ACI 302.1R-89	“Guide for Concrete Floor and Slab Construction”
ACI 304R-89	“Guide for Measuring, Mixing, Transporting, and Placing Concrete”
ACI 305R-91	“Hot Weather Concreting”
ACI 306R-88	“Cold Weather Concreting”
ACI 503R-80	“Use of Epoxy Compounds with Concrete”
ACI 503.5R-92	“Selection of Polymer Adhesives with Concrete”
ASTM C309-89	“Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.”
ASTM D4259-83	“Standard Practice for Abrading Concrete”
ASTM D4263-83	“Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method”

1.04 Quality Assurance

- A. Job Mock-Up: In a location designated by the Architect/Engineer, place a minimum 100 ft² (10 m²) floor mock-up using materials and procedures proposed for use in the project. Revise materials and procedures as directed by the Architect/Engineer to obtain acceptable finish surface.
1. Maintain the same controls and procedures used in the acceptable mock-up throughout the project.
- B. Installer Qualifications: Engage an experienced installer who has specialized in the application of floor finishes similar to that required for this project.
- C. Contractor, applying processed iron aggregate topping, shall have a minimum of five years experience placing heavy-duty metallic floor toppings. Contractor shall provide documentation of jobs, including addresses of projects.

1.05 Owners Sample

Samples of material and acceptable finish are available for review during bidding and before starting work. Coordinate procurement and selection of materials with owner to obtain acceptable quality of materials and finish in completed work.

A minimum of ten days notice shall be given by the Contractor to the Manufacturer to arrange a pre-job conference, related to application procedures, and a minimum of three days notice shall be given prior to initial use of the product.

1.06 Submittals

Coordinate this work with requirements for submittals specified in section 03300.

1.07 Purchase Order

Furnish copies of purchase orders for written approval of specified materials, to Owner, prior to delivery.

Any submittal other than material specified, shall be bid as an alternate product, on a separate bid during the bidding period. Allow 30 days for approval process by the Architect/Engineer.

(Note: All savings, resulting from a substitution, shall revert to the Owner.)

1.08 Manufacturer's Certifications

Submittals for an alternate product shall contain the following:

That the manufacturer has a minimum of 20 years of experience in manufacturing iron aggregate floor toppings, and can document successful use over this period.

Material has been formulated and processed under stringent quality control, free from non-ferrous particles, rust and material used to disguise rust.

Material shall consist of specially processed iron aggregate, of optimum gradation to provide a dense wearing surface for maximum toughness, impact and abrasion resistance.

Material shall meet the following performance parameters, when mixed to a 5 to 7 inch slump consistency, to reflect field placement conditions:

1.08 Manufacturer's Certifications continued

Compressive Strength, psi

Age 2 in. (50mm) cubes, ASTM C 109

1 day 6000

7 day 8000

28 day 12050

Abrasion Resistance - ASTM C 779 Procedure "A", 60 minutes of abrasion not to exceed .010 in. at 28 days of age under proper cure conditions.

Impact Resistance - ASTM C 131 Modified Los Angeles Rattler Test 2000 cycles, not to exceed 35% material loss (by volume).

Rilem Surface Absorption, Maximum 1.5 percent at 96 hours (28 days) under proper cure conditions.

PART 2 - PRODUCTS

2.01 Materials

- A. Concrete: Provide concrete materials complying with requirements of Section 03300.
- B. Extra Heavy-Duty Iron Aggregate Topping: MASTERTOP 300 ANVIL-TOP, manufactured by Master Builders, Inc. shall consist of specially processed graded iron aggregate, tested cement and technical components. Material has been formulated and processed under stringent quality control, free from non-ferrous particles, rust and material used to disguise rust.
- C. Bonding Agent: ANVIL-BOND™ as manufactured by Master Builders, Inc.
- D. Curing Compound: MASTERKURE®, MASTERKURE® 200W and MB-429 as manufactured by Master Builders, Inc. Apply uniformly at a specified rate of coverage.
- E. Control Joint Sealer: MASTERFILL® 300, a two component, 100% solids, semi rigid epoxy sealer.
- F. Evaporation Retardant and Finishing Aid: CONFILM®, a monomolecular film as recommended by ACI 305, used to aid in the maintaining of topping moisture.

2.02 Bonding over a Fully Cured Concrete Slab

Use a bonding adhesive specifically designed to bond fresh concrete to old concrete.

2.03 Bonding over a Green Concrete Slab

Use a cement slurry mixed with water.

PART 3 - EXECUTION

3.01 Application Over Existing Fully Cured Concrete Slab

For proper bond, the surface should show a 1/4 inch amplitude. Extensive coarse aggregate shall be revealed. The surface shall be free of chemical contaminants, rough to the touch, dry, clean (free of dust/loose materials), and structurally sound.

Test the surface per manufacturers recommendations, to determine substrate surface tensile strength after preparation for bonding. The minimum tensile bond pulloff strength shall not be less than 250 psi. The surface must comply with Section 4.2 of ACI 503.5R-92.

3.01 Application Over Existing Fully Cured Concrete Slab, continued . . .

Square cut the perimeter of the repair area to a depth of repair and remove concrete as shown on the plan. In areas where concrete is not removed, shot-blasting, with heavy media shall be required to expose a properly prepared surface. If shot-blasting cannot achieve such a surface, additional chipping may be required.

Clean roughened concrete thoroughly, using oil-free compressed air or water blast and allow to thoroughly dry. Moisture content of the concrete shall be tested according to the manufacturers recommendations. Surface shall be tested for moisture in concrete per ASTM D4263.

Use an epoxy bonding agent to bond the topping to the existing concrete. Mix according to label instructions and brush or roll onto the concrete surface. If the bonding agent has set, brush additional bonding agent over the hardened material. **DO NOT ATTEMPT** to retemper with solvents. Cover only enough surface that can be topped with the topping while the epoxy is still tacky.

To minimize curling at the edges, anchors should be placed into the concrete or key cuts used in place of nails.

3.02 Application Over Recently Placed Concrete (less than three days old)

Base concrete should have a minimum design compressive strength of 4000 psi at 28 days (per ACI 302) and be poured at a maximum slump of 4 in. (101 mm).

(Note: Discuss with your Master Builders representative suggestions on concrete compressive strength.)

While plastic, roughen the base concrete by nail raking in one direction to create a mechanical bond for the topping according to the manufacturers recommendations. Alternatively, apply a chemical texturing agent to provide needed profile without dislodging the coarse aggregate in the base slab. **(Note:** Discuss this application with your Master Builders representative.)

Wet cure and protect the concrete until topping application. Apply topping to concrete at two to three days of age. Install bonding slurry according to manufacturers instructions. If slurry dries before it can be covered by the topping do not re-temper, but reapply fresh slurry.

3.03 Continuous Two-Course Application Over Fresh Concrete

The concrete shall have a minimum of 4000 psi at 28 days as per ACI 302 recommendations.

After the concrete has been placed and the water sheen has disappeared, just prior to initial set (when a finisher with knee boards can leave an approximate 1/4 in. impression) float the concrete with a machine fitted with float shoes. Hand float the edges with wood floats. Give special attention to the corners.

Under severe or rapid drying conditions, apply evaporation reducer to both the concrete sub-base and topping.

If free bleed water exists on the surface of the slab, remove it just prior to the floating. After floating the edges, insert headed textured steel anchors securely into the concrete. This should prevent the topping from curling up from the edges. *Immediately after floating*, place the topping.

Note: Extreme skill is necessary for this type of application to achieve an integral bond between the topping and concrete. If other placement options are available, this method of placement should not be used. Base (substrate) slab placement and topping placement must occur simultaneously during the concrete operation, and personnel coordination and equipment coordination make this a very risky method of application.

3.04 Mixing

Thoroughly mix, according to manufacturers recommendation, to a 5 to 7 in. slump consistency.

3.05 Placing and Finishing

Discharge topping for immediate placing and screeding according to manufacturers recommendations.

1. Apply material at a minimum rate of 18 lbs/ft² at one inch thick.
2. Minimum thickness is not to be less than one inch.
3. For the Solid Waste Industry, minimum thickness on tipping floors shall not be less than 1.5 inches thick.

3.06 Floating

Immediately after screeding, float the surface with a magnesium bullfloat. Obtain a void-free level surface with this operation. As soon as the topping will support an operator and machine without disturbing the level or working up excessive fines, float the surface with a mechanical float machine.

NOTE: For all types of topping installations, evaporation retardant should be used according to manufacturers instructions.

3.07 Finishing

Provide a hard or burnished troweled finish for maximum consolidation of the topping. Use care in regard to the blade angle during early trowelling to avoid blistering.

3.08 Curing and Protection

Wet cure for 7 days, minimum 96 hours, ensuring that the topping is not allowed to dry out with special attention given to the edges of the work area.

Following wet cure, two coats of a liquid membrane forming curing compound shall be applied at manufacturers recommended coverage rate.

3.09 Control Joints

Form or saw cut control joints as soon as the surface permits the weight of the saw and without causing the topping edges to ravel.

Spacing of the control joints should mirror the existing joints of the base concrete slab. The distance between joints shall not exceed twenty feet.

Seal joints with a two component control joint sealer. This shall be done according to the manufacturers recommendations, once the topping is fully cured.

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