

SECTION 03 05 55

Concrete Flatwork Finishes

PART 1 - GENERAL

1.00 GENERAL REQUIREMENTS

- A. Drawings and general provisions of the Contract, including General and other Conditions and other Division 1 – General Requirements sections, apply to the work specified in this Section.

1.01 RELATED DOCUMENTS AND SECTIONS:

- A. Section 032222

1.02 DESCRIPTION OF WORK

- A. Work of this section includes but is not limited to:
 - 1. Exterior concrete sidewalks; and
 - 2. Surface finishing.

1.03 CONSTRUCTION STANDARDS

- A. All work pertaining to this Section shall be in conformance, except as modified herein with the latest edition of the Uniform Building Code for cast-in-place concrete construction, herein referred to as the standard specification.
- B. All codes referenced herein, shall include but not be limited to the following:

Federal Standards:

PS1 Construction and Industrial Plywood

PS 20 American Softwood Lumber Standard

Commercial Standards:

Standard Construction Specifications of Oregon Chapter of American Public Works Association, Latest Edition, Division 2

ACI 214 Recommended Practice for Evaluation of Strength Tests
Results of Concrete

ACI 301 Details and Detailing of Concrete Reinforcement

CONCRETE WALKWAY FINISHES

- ACI 305 Recommended Practices for Cold Weather Concreting
- ACI 306 Recommended Practices for Hot Weather Concreting
- ACI 308 Standard Practice for Curing Concrete
- ACI 347 Recommended Practice for Concrete Formwork
- ASTM A 185 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- ASTM C 33 Specification for Concrete Aggregates
- ASTM C 39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
- ASTM C 94 Specification for Ready-Mix Concrete
- ASTM C 136 Method for Sieve Analysis of Fine and Coarse Aggregate
- ASTM C 143 Test Method for Slump of Portland Concrete Cement
- ASTM C 150 Specification for Portland Cement
- ASTM C 260 Air-Entraining Admixtures for Concrete
- ASTM C 309 Liquid Membrane-Forming Compounds for Curing Concrete.
- ASTM C 494 Chemical Admixtures for Concrete.
- ASTM A 615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- ASTM D 1751 Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)
- NRMCA National Ready Mix Concrete Association, latest revision: 'Certificate of Conformance for Concrete Production Facilities'

1.04 CONFLICTING REQUIREMENTS

- A. In the event of conflict between pertinent codes, regulations, or structural notes, and requirements, of the referenced standards of these Specifications, the provisions of the more stringent shall govern.
- B. Contractor shall notify COR if specified treatments, admixtures, or procedures conflict with proper concrete construction. Submit for approval, alternate conditions to remedy conflicts prior to commencement of construction. Do not proceed until all conflicts have been approved and corrected.

1.05 QUALITY ASSURANCE

- A. Obtain materials from same source throughout.
- B. Perform work in public right of way in accordance with requirements of governing authority.
- C. All on-site work must comply with technical requirements of Local jurisdiction or city having authority.

1.06 SUBMITTALS

- A. Submit product data as required by the Contract Documents.
- B. Contractor shall supply and prepare and maintain on site a 4' wide x 4' long x 4" thick square completed test section of each finish application. Each test application shall be sufficiently complete for inspection by C.O. for approval prior to commencement of construction. Approved test samples shall be retained on site and protected from damage for duration of project.
- C. Contractor shall submit samples of the following aggregates to C.O. for approval prior to start of work: Fine Seeded Exposed Aggregate, Medium Seeded Exposed Aggregate, and Coarse Seeded Exposed Aggregate. Minimum sample size one cubic foot.

PART 2 PRODUCTS

2.01 AGGREGATES FOR EXPOSED AGGREGATE FINISHES (General Categories)

- A. Fine Seeded Exposed Aggregate Finish "A": 00 - 1/4"
- B. Medium Seeded Exposed Aggregate Finish "B": 1/4"-7/16"
- C. Coarse Seeded Exposed Aggregate Finish "C": 1/2' - 3/4"

2.02 CURING COMPOUND (Omit where retarders are used)

- A. Liquid membrane-forming curing compound shall be suitable for spray application and shall conform to ASTM C309, Type 1, clear.

1. Acceptable Compounds: Spartan-Cote by the Burke Company, J-21 Acrylic Cure Seal and Dustproofers 19 by Dayton Superior, Clear Seal 150 by A.C. Horn, Master Seal by Master Builders, Kure-N-Seal by Sonneborn or equal.
- 2.02 Concrete Finish Retarder
- A. Spray applied, film forming, water based top surface retarder, calibrated for specific sized aggregate and finish requirements.
 1. Acceptable Materials: "Top Cast" by Grace Construction Products or equal
 - B. Spray applied film forming protective coating for surfaces adjacent to retarded finish surfaces.
 1. Acceptable Materials: "Face Off" by Grace Construction Products or equal.

PART 3 EXECUTION

3.01 EXCAVATION AND BACKFILL

- A. Excavation and backfill are included in Earthwork Section.

3.02 EXPOSED AGGREGATE CONCRETE FINISHING

- A. Fine Seeded Exposed Aggregate:
 1. Immediately after the surface of the concrete has been screeded and floated to ¼" in 10 (ten) feet of tolerance and surface water has been removed, hand-spread the aggregate mixture uniformly over the surface to provide uniform maximum coverage.
 2. The aggregate mix shall be embedded into the surface by light tamping or rolling. The surface shall then be lightly floated until the embedded mixture is coated lightly with mortar and the overall surface has been brought to a true plane within ¼" in 10 (ten) feet tolerance in any direction. **DO NOT OVERTROWEL THE CONCRETE SURFACE PRIOR TO SURFACE RETARDER APPLICATION.**
 3. Finish shall match approved site sample.

B. Medium Seeded Exposed Aggregate:

1. Immediately after the surface of the concrete has been screeded and floated to ¼” in 10 (ten) feet of tolerance and surface water has been removed, hand-spread the aggregate mixture uniformly over the surface to provide uniform maximum coverage.
2. The spread of aggregate mix shall be embedded into the surface by light tamping or floating until the embedded mixture is coated with mortar and the overall surface has been brought to a true plane within ¼” in 10 (ten) feet tolerance in any direction.
3. Finish shall match approved site sample.

C. Coarse Seeded Exposed Aggregate:

1. Immediately after the surface of the concrete has been screeded and floated to ¼” in 10 (ten) feet of tolerance and surface water has been removed, hand-seed the aggregate mixture uniformly in the concrete surface to provide uniform maximum coverage.
2. The aggregate mix shall be lightly hand-tamped to a point where a minimum of the aggregate is embedded below the concrete surface. The final aggregate surface plane shall be brought to a true plane within ¼” in 10 (ten) feet tolerance in any direction.
3. Finish shall match approved site sample.

3.02A Concrete Retarder Application

A. Preparation and Application

1. Protect all curbs, borders, adjacent stones, pavers, etc. that are not to receive retarded finish prior to application of retarders. Use Protector Face Off by Grace Construction Products or equal.
2. Pour concrete, seed aggregates where called for, float and lightly trowel finish where required. [***Do Not Delay The Application of The Surface Retarder Beyond the Loss of the Initial Bleed Water Especially in Warmer Temperatures for Best Results.***]
3. Apply Top Cast Retarders with a low-pressure sprayer at a rate of 250-350 sq.ft./ gal. Per manufacturers’ requirements. Material is colored to allow for verification of even and complete coverage.
4. Once dry (1-2 hours), Top Cast provides protection against intermittent rain or hot, windy conditions and requires no additional covering.

B. Retarder Selection Guidelines

Number Code	Etch/Aggregate Size to Expose*	Coverage	Color
3	Acid Etch Finish	250/350 S.F. / Gal.	Lt. Blue Violet
5	Lt. Sandblast Finish	"	Lt. Blue
15	Up to 1/4"	"	Yellow
25	1/8" to 1/4"	"	Beige
50	1/8" to 3/8"	"	Canary Green
75	1/8" to 3/8"	"	Blue
100	3/8" to 1/2"	"	Gray
125	3/8" to 5/8"	"	Pink
150	3/8" to 5/8"	"	Green
200	5/8" to 1"	"	Salmon
250	1" to 1-1/2"	"	Orange

* Values listed are for standard 6-sack mix. Always test to verify the appropriate grade for specific mix designs

C. Finishing

1. Wash with water rinse/light broom or pressure wash with power equipment within 6 – 24 hours after the retarder is applied. Retarder removal intervals depend on strength of mix, exposed aggregate size and desired washing techniques. Earlier washing for light etch finishes may be necessary. Verify in test panels.
 - a. **Do not over-finish and/or delay application beyond the initial bleeding on the light finishes.**

3.06 CONCRETE PLACEMENT

- A. Curing and Protection: Immediately following placement, concrete shall be protected from premature drying, hot and cold temperatures, rain, flowing water and mechanical injury. The COR shall approve materials and methods for curing. Final curing shall continue for not less than seven days. Approved methods include; ponding, continuously wet mats, and liquid membrane curing compounds.
- B. Upon completion of the curing period, but not before 7 days has elapsed since pouring the concrete, remove all concrete spills, overflows, and debris.

END OF SECTION