

AMMENDED FROM SECTION 03510

RIVERBED CONCRETE INC. POLISHED CONCRETE FINISHING

PART 1: GENERAL

1.01 SECTION INCLUDES

- A. This Section specifies dyed and polished concrete.

1.02 RELATED SECTIONS

- A. Section 03300 - Cast-in-Place Concrete.
- B. Section 07900 - Joint Sealers.

1.03 REFERENCES

- A. ACI 302.1R Guide for Concrete Floor and Slab Construction; American Concrete Institute (ACI).
- B. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
- C. ASTM C779 Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.
- D. RILEM Test Method 11.4 Standard Measurement of Reduction of Moisture Penetration Through Horizontal Concrete Surfaces; Reunion Internationale des Laboratoires D'Essais et de Recherches sur les Materiaux et les Constructions (RILEM):

1.04 PERFORMANCE REQUIREMENTS

- A. Reflectivity: Increase of 35% as determined by standard gloss meter.
- B. Waterproof Properties: Rilem Test Method 11.4, 70% or greater reduction in absorption.

1.05 SUBMITTALS

- A. See Section 01300 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.
 - 1. Material Safety Data Sheets (MSDS).
 - 2. Preparation and concrete grinding procedures.
 - 3. Colored Concrete Surface, Dye Selection Guides.
- C. Sample Panels: Prepare minimum 6' X 6' sample panels of all proposed concrete finishes, colors, etc. until approved by Architect. Panels may be placed in areas where they remain after selection, however this is not guaranteed.
- D. Certificates:
 - 1. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
 - 2. Manufacturer's Instructions: Manufacturer's installation instructions.

1.06 QUALITY ASSURANCE

- A. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- B. Installer trained and holding current certification for product installation.
- C. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method. Ensure manufacturer has minimum 5 years experience in manufacturing components similar to or exceeding requirements of project.

C. Applicator Qualifications: Company specializing in performing the work of this section.

1.07 DESIGN REQUIREMENTS: Mix designs should be approved by Engineer/Architect

A. Hardened Concrete Properties

1. Minimum concrete compressive strength: 3000 psi
2. Normal weight concrete. No lightweight aggregate
3. Non-air entrained

B. Placement Properties

1. Natural concrete slump of 4"-6". Admixtures may be used at a minimum.
2. Flatness Requirements:
 - a. Flatness 40
 - b. Level 30

C. Hard-Steel troweled (3 passes) concrete. No burn marks. Finish to ACI 302.1R, Class 5 floor

D. Curing Option

1. Acrylic curing and sealing compounds not recommended
2. Damp Curing: Seven day cure
3. Shepler's Performance Products: Shep Cure 309 Rez All
4. L & M Construction Chemicals, Inc: www.LMCC.com, Cure R
5. LM Scofield Co.: www.scofield.com, Lithochrome Colorwax

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Maintain temperature and humidity recommended by the manufacturer during and after installation.
- B. See Additional Requirements; Environmental Requirements (pg. 6 of this document)

1.09 COORDINATION

- A. Coordinate the work with all sections referencing this section.
- B. See Additional Requirements; Mock-Ups (pg. 6 of this document)

1.10 WARRANTY

- A. See Section 01780 - Closeout Submittals, for additional warranty requirements.
- B. Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and does not limit, other rights Owner may have under Contract Documents

PART 2: PRODUCTS

2.01 MANUFACTURERS – POLISHED CONCRETE FINISHING PRODUCTS

- A. Retro Plate Systems: www.retroplatesystem.com
- B. L & M Construction Chemicals, Inc: www.LMCC.com
- C. W. R. Meadows: www.wrmeadows.com
- D. Prosoco, Inc.: www.prosoco.com
- E. LM Scofield Co.: www.scofield.com
- F. Substitutions: See Section 01600 - Product Requirements.

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2.02 POLISHED CONCRETE FINISHING PRODUCTS

- A. Hardener, Sealer, Densifier: Proprietary, water based, odorless liquid, VOC compliant, environmentally safe chemical hardening solution leaving no surface film.
1. Advanced Floor Products, Inc.: www.retroplatesystem.com, Retro-Plate 99.
 2. L & M Construction Chemicals, Inc: www.LMCC.com, FGS Hardener Plus.
 3. W. R. Meadows: www.wrmeadows.com, Liqui-Hard.
 4. Prosoco, Inc.: www.prosoco.com, Consolideck, LS.
 5. LM Scofield Co.: www.scofield.com, Formula One Lithium Densifier MP.
 5. Substitutions: See Section 01600 - Product Requirements.
- B. Joint Filler: Semi-rigid, 2-component, self-leveling, 100% solids, rapid curing, polyurea control joint and crack filler with Shore A 80 or higher hardness.
1. Advanced Floor Products, Inc.: www.retroplatesystem.com, CreteFill Pro 85 (MI)
 2. Metzger McGuire: www.metzgermcguire.com, Spal-Pro RS 88.
 3. L & M Construction Chemicals, Inc: www.LMCC.com, Joint Tite 750.
 4. Substitutions: See Section 01600 - Product Requirements.
- C. Oil Repellent Sealer: Ready to use, silane, siloxane and fluoropolymers blended water based solution sealer, quick drying, low-odor, oil and water repellent, VOC compliant and compatible with chemically hardened floors.
1. Advanced Floor Products, Inc.: www.retroplatesystem.com, RetroPel.
 2. L & M Construction Chemicals, Inc: www.LMCC.com, Petrotex.
 2. Substitutions: See Section 01600 - Product Requirements.
- D. Surface Protection System. (Guard / Stain Guard) Quick drying, low odor, water based solution containing a new generation of organic, cross linking, low molecular weight polymers that penetrate and leave a non-darkening film that effectively protects concrete surfaces from oil drippings, food stains and urine. This product is compatible with and recommended for use with chemically hardened and densified concrete floors.
1. Advanced Floor Products, Inc.: www.retroplatesystem.com, RetroGuard.
 2. L & M Construction Chemicals, Inc: www.LMCC.com, PermaGuard SPS
 3. W. R. Meadows: www.wrmeadows.com, Bellatrix.
 4. Substitutions: See Section 01600 - Product Requirements.
- E. Concrete Dyes (optional): Fast-drying dye, packaged in premeasured units ready for mixing with VOC exempt solvent; formulated for application to polished cementitious surfaces.
1. Advanced Floor Products, Inc.: www.retroplatesystem.com, Helix Color Systems.
 2. L & M Construction Chemicals, Inc: www.LMCC.com, Vivid Concrete Dyes.
 2. Chem-Coat Industries, Inc.: www.chem-coat.com: Cemdyes Concrete Dyes.
 3. Substitutions: See Section 01600 - Product Requirements.
- F. Cleaning Solution: Proprietary, mild, highly concentrated liquid concrete cleaner and conditioner containing wetting and emulsifying agents; biodegradable, environmentally safe and certified High Traction by National Floor Safety Institute (NFSI).
1. Riverbed Concrete Inc.: www.riverbedconcrete.com, General Cleaner.
 2. Advanced Floor Products, Inc.: www.retroplatesystem.com, CreteClean Plus w/SG.
 3. L & M Construction Chemicals, Inc: www.LMCC.com, FGS Concrete Conditioner.
 4. Riverbed Concrete Inc.: www.riverbedconcrete.com, Conditioner.
 5. Substitutions: See Section 01600 - Product Requirements.

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- G. Finish: Standard Medium gloss (MG-2), 800 grit; Standard High gloss (HG-1), 1500 grit; Standard Very High gloss (VGH-3), 3000 grit (installation as per approved mock up)

PART 3: EXECUTION

3.01 EXAMINATION

- A. Site Verification of Conditions.
 - 1. G.C. to verify that concrete substrate conditions, which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of concrete finishing materials.

3.02 PREPARATION

- A. Ensure surfaces are clean and free of dirt and other foreign matter harmful to performance of concrete finishing materials.
- B. Examine surface to determine soundness of concrete for polishing.

3.02 INSTALLATION

- A. Floor Surface Polishing and Treatment: Coordinate installation with the manufacturer's written installation details and instructions.
 - 1. Provide polished concrete floor treatment in entirety of slab indicated by drawings. Provide consistent finish in all contiguous areas.
 - 2. Apply floor finish prior to installation of fixtures, walls, and accessories.
 - 3. Diamond polish concrete floor surfaces with power disc machine recommended by floor finish manufacturer. Sequence with coarse to fine grit using dry method.
 - a. Comply with manufacturer's recommended polishing grits for each sequence to achieve desired finish level. Level of sheen shall match that of approved mock-up.
 - b. Expose aggregate in concrete surface only as determined by approved mock-up.
 - c. All concrete surfaces shall be as uniform in appearance as possible.
 - 4. Dyed and Polished Concrete (option):
 - a. Locate demarcation line between dyed surfaces and other finishes.
 - b. Polish concrete to final finish level.
 - c. Apply diluted dyes to polished concrete surface.
 - d. Allow dye to dry.
 - e. Remove residue with dry buffer.
 - 5. Apply as per manufacturer instructions.

3.02 CLEANING

- A. Mechanically scrub treated floors with soft to medium pads with approved cleaning solution.
- B. Upon completion, remove surplus and excess materials, rubbish, tools and equipment.

3.02 PROTECTION

- A. Protect installed product from damage during construction.

END OF SECTION



POLISHED CONCRETE FINISHING

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Additional Requirements

A. Mock Ups:

1. General contractor to notify Riverbed Concrete (RBC) prior to the pour to schedule installation of a mock up
2. Reserve 100 square feet for each color and finish (grit and shine level) at location adjacent to floor that will receive polishing. The concrete consisting of the mock up floor shall be placed on the same day, preferably the same pour as the concrete for the floors to be polished. Mock up should be placed in an area to give RBC an unobstructed work environment that is accessible to water and electrical requirements.
3. Install mock ups to verify selection made and to demonstrate methods and workmanship proposed for the project. If mock up is not possible, submitted samples from the RBC showroom will be accepted as demonstrating methods and workmanship but not the final finish.
4. Aggregate selected must be tested or proven to ensure it will accept a polish.
5. If stand alone mock up is required, form should be clean and free from extraneous substances and be at least a 10'x10' surface area with a level bottom on level ground with unobstructed access around all four sides. Stand alone mock up should be placed in an area to give RBC an unobstructed work environment that is accessible to water and electrical requirements.
6. Control joints should be included in mock up. Sawing performed by general contractor can begin as soon as the surface is firm enough to not displace any of the aggregate or ravel the edge.
7. Edge should be included in mock up.
8. Approved mock ups may become part of the completed work.

B. Protection: General contractor shall protect areas to receive polished concrete finish at all times during construction to prevent oils, dirt, metal, excessive water and other potentially damaging materials from affecting the finished concrete surface. Protection measures listed below shall begin immediately after the concrete slab is poured:

1. All hydraulic powered equipment shall be diapered to avoid staining of the concrete.
2. All vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop clothes shall be placed under vehicles at all times.
3. No pipe cutting machines shall be used on the finish floor slab
4. Steel shall not be placed on the finish slab to avoid rusting. Lumber and other building materials should not be stored on the concrete slab for any length of time.
5. Acids and acidic detergents will not come in contact with the slab.
6. All painters will use drop cloths on the concrete. If paint gets on the concrete, it must be immediately removed.
7. All trades will be informed that the slab must be protected at all times.
8. Refrain from using silicone chalks (Red and yellow chalks consist of permanent dyes that will negatively affect the final outcome of the project. Blue is preferred.)
9. It is imperative that wood, sheet goods, sections of framing and the like not lay on the slab for long periods of time. They can transfer resins and tannins that can alter the moisture content in the slab and leave a permanent likeness in the finished floor.
10. Protect the slab from the following: red and yellow chalk, foam insulation, curing compounds, oils, grease, polyurethane, adhesive, flux, gas, muriatic acid, PVC primer, diesel, wood or other colorants/stains, etc.

C. Environmental Limitations

1. Comply with manufactures written instructions for substrate temperatures and moisture content, ambient temperature and humidity, ventilation and other conditions affecting chemical performance.
2. Flatness and levelness
 - a. Finished concrete shall have a minimum floor flatness rating of at least 40
 - b. Finished concrete shall have a minimum floor levelness rating of at least 30.
 - c. Finished concrete shall be cured a minimum of 28 days or at which point polishing equipment can be used on the slab and does not displace fines or aggregate.
3. Application of finish system shall take place prior to fixture, cabinets, walls, and trim installation.
4. Polished concrete area shall be closed to traffic during polished flooring installation and protected from damage by GC after installation for the time recommended by the manufacturer.
5. It is important that the concrete be thoroughly finished with hand tools around plumbing, risers, floor outlets, or any other element which is not accessible to the concrete finishing machine.
6. Framers should brace the wall to the outside and not the slab. Doorplates should be cut away immediately.

D. Concrete Mix Design:

1. Concrete mixture shall be 3000 psi or higher, non air entrained.
 - a. Any admixtures, pasticizers, slag, fly ash or anything taking the place of Portland based cement shall be kept to a minimum.
 - b. The cement shall be Portland Cement Type I-2, conforming to ASTM C 150
 - c. Maintain concrete temperature below 85 degrees. Keep concrete as cool and moist for as long as possible. In essence, decrease rate of de-hydration and drying to minimize cracking.
 - d. Wet cures are most suitable, but if this cannot be achieved, use Resin Cure (See #1.07D), applied to manufactures instruction.
 - e. All mix designs must be approved by the Architect / Engineer. Send all approved mix designs to Riverbed Concrete Inc.
 - f. The Engineer/Architect shall determine the saw cut patterns, color and layout.
 - g. Use same source for cement, aggregate and pozzolans throughout the job. Monitor and control incoming material consistency. Do not use calcium chloride-based admixtures. Non-Cholride admixtures may be used.
 - h. Wash out all drums before loading. Keep slumps consistent with a max of 4"-6" slump. Minimize driver added water maintaining a .45 water content ratio, or lower.
 - i. Place the concrete to achieve as true and smooth a top surface as possible. Mounds or dips are not acceptable. GC shall control overall flatness and levelness, including sloping areas to within tolerances permitted by specification – ASTM E1155.
 - j. Slab shall be protected from indention and footprints during pour and curing.

E. Installation:

1. Riverbed Concrete will require sole access to the contracted application area.
2. Scheduling: Riverbed Concrete should be scheduled for a mobilization start date no later than 3-4 weeks from start date.
3. Sample to be applied and approved on first day of scheduled grinding / polishing of the actual job. Unless otherwise stated, sampling happens the first day Riverbed Concrete is scheduled onsite.
4. Scheduling:
 - a. Grinding – prior to interior framing (Confirm with RbC for sequencing).
 - b. Polishing – prior to sheetrock, when fully dried in (Confirm with RbC for sequencing).
5. GC to protect finished product unless otherwise stated by RbC paperwork.
6. Water: Access to water source in nearby location required. If not available, please notify RbC prior to mobilization.
7. Electrical: RbC provides its own power which it brings onsite via truck (30') which supplies power requirements. Truck needs access adjacent to slab.
8. Access: Trailer access is necessary with trailer being able to back directly to slab for offloading.
9. Slurry: Access to park slurry pit is required adjacent to and touching slab.