



SPECIFICATION for Polished Concrete Application

SECTION 033500

ARCHITECTURAL CAST-IN-PLACE POLISHED CONCRETE for POLISHEDCRETE SYSTEMS and the POLISHEDCRETE POLISHED CONCRETE SYSTEM TO DIAMOND POLISH CONCRETE SURFACES: See PolishedCrete Recommended Concrete Slab Placement Guidelines.

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Provisions established within the General and Supplementary Conditions of the Concrete Division Requirements Special Finishes, and the Drawings are collectively applicable to this Section. Specifically, areas deemed “Polished Concrete” and the related Concrete Topping Slab or Concrete Slab on Grade or Structural Concrete slab.

1.2 SECTION INCLUDES

- A. Special requirements for PolishedCrete Polished Concrete Process, PolishedCrete, 5637 La Ribera Street, Suite B, Livermore, California 94550. 1-855-879-7654.
- B. Special requirements for plain gray or integrally colored architectural cast-in-place concrete areas to receive the PolishedCrete polished final concrete finish.
- C. Special requirements for chemically stained or dyed concrete and subsequent curing operations, if specified, are integral to the success of the entire process. Concrete slab installation contractor is responsible to coordinate curing compounds and process, with the PolishedCrete polished concrete finish installing contractor, in advance of the slab placement, for optimum results.

1.3 RELATED SECTIONS

- A. - Concrete Formwork.
- B. - Concrete Reinforcement.
- C. - Cast-in-place Concrete.
- D. – Structural Concrete.

1.4 SUBMITTALS

- A. Submit under provisions of Quality Control Section – Concrete Finishes and Polished Concrete Finishes.
- B. Indicate the arrangement of saw cut joints or scored joints or expansion joints along with the type of joints, and all related joint fillers. Be sure to have in installing concrete slab installation contractor to install an example of all joint types and details into the 10’x10’ Mock-up.

C. Samples:

1. Submit initial 12-inch by 12-inch samples showing required PolishedCrete finish on standard concrete to simulate intended finish. Once approved for direction of general finish – INSTALL 10'x10' Site Sample Mockup – using actual concrete mix design and joint details as placed by the original concrete installer on site in a sacrificial location.
 2. Sample will be approved for appearance, color, and texture. This will be representative of approximately 75% of the actual polished concrete surface. Do not destroy site 10'x10' mock up sample until project has been installed and approved, unless directed in writing by architect.
- D. Related: The installing concrete contractor for slab must transmit two (2) copies of design mixes and cylinder break certifications for each type of concrete to Architect for review at least ten (10) days prior to actual concrete placement.
- E. Forward all submittals for approved PolishedCrete diamond polishing system, to architect and GC at least 10 days prior to Polished Concrete installation and after Mock-up approval.

1.5 FIELD SAMPLES

- A. Prepare field samples under Quality Control provisions and coordinate with Section 03300. Locate where directed in a single sacrificial 10'x10' size. Desired flatness of a high-quality floor finish during the placement of all concrete slab locations to be polished is recommended to be FF of 30+ FL of 25+. Greater values are always better in final appearance and will show less “waviness” in final polished concrete floor finish.
- B. Alternatively, a field 10'x10' Mock up panel may be utilized in existing concrete floor slab to indicate special treatment or finish required and to provide a fair representation of a general sub section of the gray matrix field paving areas and associated aggregate / sand tip / cream finish reveal. See PolishedCrete detail literature (part of this specification) for clarity of choice.
- C. Installing concrete slab contractor is to use the approved specified concrete mix design.
- D. Obtain acceptance of surface finish. Sample shall attempt to site replicate 75% minimum, of the desired and approved look. Specify a level 1 (cream finish with some sand exposure), Level 2 (Salt n pepper finish with some cream pockets), or Level 3 finish (larger aggregate rock exposure and sand tip exposure). Specify Sheen Level – High Gloss, Medium Gloss, Low Gloss. See PolishedCrete detail literature (part of this specification) for clarity of choice.
- E. Remove site sample when directed ONLY in writing by architect and not before actual polished concrete scope has started.

1.6 QUALITY ASSURANCE

- A. Installing concrete slab placement contractor shall perform work in accordance with ACI 301, 303, 304, 305, 306, and 309.
- B. Slab installer shall obtain concrete, aggregate and all mix matrix materials from same source throughout project.
- C. Bay Area Concretes, Inc. is an approved installer for specified PolishedCrete Polished Concrete Surface Finishes along with PolishedCrete. Bay Area Concretes, Inc. is also the recommended concrete slab installation contractor if complete uniformity of communication and installation quality is to be achieved with a single source.
- D. Batch plant shall be able to show a minimum of five (5) years experience in batching specialty concrete. If required, plant shall furnish a list of similar sized jobs or special condition jobs performed during the last two (2) years.
- E. Concrete Diamond Polishing contractor must prove 15 years' experience and showcase their installation of like projects, to the architect's approval. The installer must be certified and Approved by PolishedCrete, and show written proof as provided to the architect. Do not proceed with an alternate polished concrete contractor or polishing system without written approval from the architect and the end use client. If alternate concrete or polished concrete contractors or polishing systems are used without written approval from the architect and the end use client, this will be grounds for complete demolition and removal of existing surfaces, at the installing general contractor's sole expense, and replacement by a certified PolishedCrete contractor.
- F. PolishedCrete installer must also be a C-8 licensed contractor unless approved in writing by PolishedCrete. A commercial flooring contractor is not allowed as an installer for the high-quality expectations of the architect, as they do not possess the required knowledge of concrete placement and quality control and inherent knowledge of concrete slabs and related polished concrete surface finishes.

1.7 REGULATORY REQUIREMENTS

Conform to applicable building codes.

1.8 TESTS

Testing, monitoring, and analysis of concrete will be performed under provisions of the related Specification Section, if required by the architect.

1.9 COORDINATION

- A. The pouring concrete installation contractor shall notify appropriate trades of concrete pour and obtain the polishing schedules, from the GC, in order to allow adequate time for installation of any complementary trade work and provide similar timelines to the approved project mock up to maximize quality control measure for the final polished concrete finish.
- B. The installing concrete slab contractor shall obtain from material supplier all anchor bolts / other steel imbeds to be cast into concrete, and alert the polished concrete contractor of these elements, for collaboration on quality control issues.
- C. Pre-Construction Meeting is required at minimum 30 days prior to concrete placement for areas to be polished and 30 days prior to scheduled concrete diamond polished application of PolishedCrete.

1.10 DELIVERY, STORAGE AND HANDLING OF CONCRETE MATERIALS

- A. Deliver, store and handle materials in accordance with the requirements of Specification.
- B. Mix and deliver concrete to project ready-mixed in accordance with ASTM C94.
- C. Schedule delivery so that continuity of any pour will not be interrupted for over 45 minutes.
- B. Place concrete on site within 60 minutes after proportioning materials at batch plant.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS FOR CONCRETE PLACEMENT

- A. Cement:
 - 1. ASTM C150, Type I or III (as determined by project conditions), grey color.
 - 2. Use only one brand, type and source of cement for entire Project.
- B. Aggregate: TBD determined in mix design, by architect 90 days minimum in advance of pour date.
 - 1. General:
 - a. Provide clean / washed fine and coarse aggregate for each type finish from one source for entire Project.
 - b. Provide clean / washed fine and coarse aggregate of exotic color range and gradation to match approved samples.
 - 2. Fine washed and clean aggregate: ASTM C33.
 - a. Manufactured sands from coarse aggregate or dust-free, silt-free, salt-free natural sand.
 - b. Restrict deleterious reactive materials with alkalis in cement per ASTM C33.
 - 3. Coarse clean aggregate:
 - a. Normal weight aggregate: ASTM C33.
 - b. Lightweight aggregate (if desired): ASTM C330.
 - c. Provide special mix, gradation, and Integral color[s] if desired, as follows:
- C. Water: clean, fresh and potable.
- D. Admixtures: See Section 033000

1. Only use admixtures, which have been tested and accepted in, mix designs.
 2. Air Entrainment: ASTM C260.
- E. Integral Coloring Admixture or Surface Dye Application:
1. Integral Color only provided in a high-quality manufacturer format. Integral color provider to be determined by Architect.
 2. Calcium chloride and admixtures containing chloride ions or other salts are not permitted.
 3. Surface PolishedCrete Dye Technology to be provided by and installed by PolishedCrete contractor. NO DYE or STAIN may be installed by installing concrete slab placement contractor. Standard Dye color range. Reactive stain is also an option, but is more unpredictable in final color traits and saturation.

2.2 CONCRETE POLISHING MATERIALS

- A. Polishing / Hardening / Densifier agent: PolishedCrete PC-Densifier and PC Polish-Guard, no known equal. Available through PolishedCrete via Bay Area Concretes, 5637 La Ribera Street, Suite B, Livermore, California 94550. (800) 350.6021. Attn: Michael Price
- B. Finish / Stain Resist agent: PC Polished Guard, no known equals. Available through PolishedCrete via Bay Area Concretes, 5637 La Ribera Street, Suite B, Livermore, California 94550. (800) 350.6021.
- C. Diamond Pads for Proprietary PolishedCrete Process: Grit levels to be utilized in this 3-8 step process may involve the following depending on condition and matrix of the existing concrete slab and the intent of the architect for desired final finish and effect: #30, #40, #60, #80, #100, #120, #150, #220, #400, #800 maximum, as conditions dictate. Also potential for 1,000Grit to 3,000grit Diamond polish pads to complete potential high sheen finishes to replicate a mirror like surface – This PolishedCrete Product Process is an additional step finish and is called PolishedCrete-Pro and comes with a 10 year limited warranty. Available through PolishedCrete via Bay Area Concretes, 5637 La Ribera Street, Suite B, Livermore, CA 94550. (800) 350.6021.
- D. Optional joint filler installation prior to PolishedCrete System – To Be Determined by architect as specified in addition to this specification, if desired. Standard gray color Poly Urea or Ardex CP material is recommended – TBD during Mock-up. Multiple colors of Poly Urea are available and should be specified herein if required.

2.3 CONCRETE DYE - STAINING MATERIAL: As recommended by the PolishedCrete System only when dictated by the architect. Custom color(s) may be available upon request. PolishedCrete approved dye systems or similar is recommended.

PART 3 EXECUTION

3.01 CONCRETE PLACEMENT BY CONCRETE INSTALLER

- A. Concrete should be batched and placed in accordance with ACI standards.

- B. Concrete should be hard-steel-troweled finished to a flat smooth surface. FF 30+ and FL of 25+ minimum or better. The higher the FF and FL the better the floor polish end results and light reflection. **If concrete installer and the diamond polished PolishedCrete installer are not the same firm, a preconstruction meeting is required prior to the pour to include Owner, Architect, General Contractor, Concrete Contractor and PolishedCrete Diamond Polished Concrete Contractor.**
- C. Maintain a recommended consistent water to cement ratio at preferably .45, within a tolerance range of .02 and within a practicality of placement given site conditions and variables.
- D. Ensure slump remains consistent and does not exceed five (4-5) inches.
- E. Use a wood float as magnesium floats can entrap bleed water.
- F. Finish edges first, and finish all surfaces within the same approximate time frame.
- G. Care should be taken not to overwork or trowel-burn edges or field surface. Avoid installation of both high spots and low spots in the finished slab surface See Item B above in 3.01. These finish traits will be noticeable in the final polished concrete finish.
- H. Do not topically apply water during finishing, as it will weaken the surface and can cause a washed-out appearance in final finish polished surface.
- I. Do not over-apply curing compound, as a milky appearance will result. Dissipating Cure Compound is recommended for use – do not using curing membranes, blankets nor plastic sheeting curing systems as they will leave cure marks and coloration blemishes in the final finish. Use of the dissipating curing compound or non-staining waterproof cure paper should always be considered. Ideally the slab may be polished within 7 days of placement and the densification and polishing process used as part of the curing procedure. Slabs can be polished at any point of the slab ageing after the first several days unless the architect uses a related curing system to the PolishedCrete system.
- J. Do not use cure wax, acrylic, silicone or petroleum-based curing compounds for concrete that shall be diamond polished.

****DO NOT USE FIBERMESH REINFORCING IN CONCRETE MATRIX MIX – Unless you want to see the byproduct in the final polished surface finish****

3.02 CONCRETE FINISHING GUIDELINE FOR CONCRETE INSTALLER

- A. Care must be taken during concrete finishing to avoid over-working, surface watering, chatter marks, and application of non-approved curing compounds that will blemish and / or weaken the surface.
- B. It is paramount to maintain consistent placement and finishing techniques throughout the pour, without adding water to the surface as cloudiness, inconsistent strength and non-uniform appearance may result.
- C. It is recommended that a concrete floor with an FL of 25+ or better be installed as this will provide a more regular surface finish in some applications. FF of 30+ is preferable, if possible, in construction specific application. High FF's usually deliver a higher quality final polished concrete surface along with a higher price point.

- D. Contractors shall be advised that the concrete slab **is** the finished floor. No known chemical process or cleaning system will completely remove petroleum stains from concrete surfaces, along with paints or other foreign contaminants. Prevention of spills is essential.
- E. DO NOT allow trades to park vehicles on the slab without applying protection, such as plastic or non-absorbent drop clothes, under the vehicles.
- F. DIAPER any hydraulic equipment used on the floor during the construction process.
- G. NO pipefitting / cutting will take place on the floor slab.
- H. DO NOT place steel on the slab without protection beneath.
- I. DO NOT protect floor after pour and placement with plastic, visqueen or plywood, as you will see curing deformities in the floor's final polished finish.

REMEMBER – THIS SLAB WILL BECOME THE FINISHED FLOOR – install and protect with caution and care.

3.03 CONCRETE POLISHING GUIDELINES – *PolishedCrete* System and Specification.

POLISHEDCRETE CONCRETE POLISHING MATERIALS

- A. Polishing / Hardening / Densifyer agent: PolishedCrete PC-Densifyer, no known equal. [Available through PolishedCrete]. PolishedCrete installing contractor may use an alternate densifier and guard chemicals as it relates to the actual floor requirements for refinement and quality. The chemicals **MUST** be approved during the mock up procedure by both the architect and the Owner's Representative.
- B. Densifyer and Guard: PolishedCrete PC-Densifyer and the PolishedGuard final PC Guard finish, no known equal. [Available through PolishedCrete 855-879-7654]. If required, a concrete dye, may be used to enhance color, in the final concrete diamond polished finish. PolishedCrete Certified installer may recommend a different system given site specific conditions, but PolishedCrete must approve this system of chemicals / diamonds, prior to installation, in writing, if not PolishedCrete labeled.
- C. Diamond Pads: #30, #40, #60, #80, #100, #120, #220, #400, #800, and 1000grit – 3000grit diamond pads and beyond as conditions or required finish dictates, or equal process and procedure. [Available through PolishedCrete / Bay Area Concretes, Inc. 925-245-8900 www.polishedcrete.com and www.bayareaconcretes.com].
- D. Polishing Equipment shall **ONLY** be installed using PolishedCrete approved grinding and polishing machines and vacuum systems. Alternate equipment types must only be used if approved in writing from PolishedCrete.
- E. Optional Poly Urea or alternet joint fillers must be installed prior to Diamond Polish operations. This item is at the discretion of the design agent, architect or owner and must be specified in addition to this specification – if desired. All options must be sampled in advance of actual installation, with a sacrificial 10'x10' site mock-up.
- F. Additional cost will be associated with the project if patching compounds, self-levelers, and floor fillers are used because of poor slab conditions in the final concrete surface presented for polish, unless Bay Area Concretes Inc is the concrete slab installer and the slab was properly protected by the GC and has not experienced trade damages after placement and prior to PolishedCrete scope start.

SPECIAL Quality Assurance NOTE: All concrete floor surface designated to be polished shall be polished using the PolishedCrete Polishing System and Procedures or a PolishedCrete recommended alternative ONLY, as PolishedCrete is a contractor proprietary method of polishing poured-in-place concrete, with no known equal. Contact PolishedCrete for further information: 1-855-879-7654. www.polishedcrete.com. Or Bay Area Concretes, Inc. www.bayareaconcretes.com 925-245-8900.

- A. Equal Systems of Diamond Polishing MUST be approved in writing by the Owner. There is No Known equal to the contractor inspired system for chemicals, diamonds, equipment, process, and means & methods of the PolishedCrete system and PolishedCrete installer network. The slab installation contractor is paramount to the final polished concrete finish and Bay Area Concretes, Inc. is a recommend installer for the actual concrete slab placement if a turn-key process is desired.

END OF SECTION

For technical assistance, contact: PolishedCrete or Bay Area Concretes, 5637 La Ribera Street, Suite B, Livermore, CA 94550 or 1-855-879-7654 or 925.245.8900. – Michael Price