

SECTION 03 35 53

POLISHED CONCRETE FINISHING

Note to Specifier: This guide specification describes a dry method of polishing concrete floors, and application of densifiers, dyes, and sealers. These products are manufactured by Clemons Concrete Coatings of Nashville, Tennessee, www.ccc-usa.com.

Specification Section numbers are based on 2004 MasterFormat published by Construction Specifications Institute. Verify actual section numbers used for submittals and substitutions.

Remove all Notes to Specifier from the final document.

Polished concrete is still a young industry, with little consensus regarding methods and results. It is also a visual industry that depends on two factors; the condition of the concrete and the skill of the operator.

Professional installers undergo rigorous and thorough training through companies such as Braxton Bragg Corp, of Knoxville, Tennessee. Installers may or may not be certified..

During the concrete polishing procedure the inherent protective layer or troweled surface known as the cream, is removed. The second layer which contains tiny aggregates known as salt and pepper is also removed, which exposes the large aggregates of many different shapes and sizes.

Many factors can affect the final outcome with regard to sheen, color, and tone. Those factors include porosity of the concrete and chemicals, waxes and coatings that have been applied. Once the surface is removed, other imperfections that have been there since the concrete was cast, may appear. Discoloration, crazing and cracking could have resulted from the way it was cured. When specifying polished concrete, remember that no two floors are alike, and anticipate wide variation from one portion of the concrete slab to another.

Application of densifiers, dyes and guards (sealer) act together to rebuild the protection of a troweled surface. Super Hard (densifier) recrystallizes and retightens the surface. Super Colors (dyes) penetrate deeper in to the floor, and Super Guard (sealer) repels moisture, salts and oils.

Inspect existing concrete floors to determine it is suitable for applying polished concrete finish. Concrete must be sound. Look for signs of repairs, chemical stains, check levelness, perform Mohs scratch tests, and record field notes. Useful tools include flashlight, hammer, rebound hammer, grinder, gridded note pad, and camera.

Require a segment of the floor to be polished to the desired finish. Choose a location that will show the widest variation in surface conditions, including repairs. This mockup can be used to make everyone aware of what to expect.

Specify new concrete in Section 03 30 00 Cast-in-place Concrete. New concrete must be a minimum of 28 days old; and have reached the majority of its compressive strength. Longer curing time can improve success.

Polished concrete can be enhanced with a variety of options, saw cuts, divider strips, engraving, stencils, logos, dyes and integral colors, and special aggregates.
Polished concrete is not suitable where subject to acids.

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes densifiers, dyes and sealers used during the process of polishing concrete floors.

Note to Specifier: Verify section numbers shown below.

- B. Related Sections:
 - 1. Section 01 25 00 - Substitution Procedures
 - 2. Section 01 33 00 - Submittal Procedures
 - 3. Section 03 00 00 - Cast-in-place Concrete

1.2 SUBMITTALS

- A. Submit under provisions of Section 01 33 00.
 - 1. Product Data: Submit manufacturer's data sheets for each product specified; densifier, dye and sealer.
 - a. Submit color charts for initial color selection
 - 2. Samples: Submit samples of dyes for color selection and for mockup.
 - 3. Submit LEED information if applicable.
- B. Operation and Maintenance Data – Submit manufacturer's recommendations for cleaning and maintaining polished concrete floors.
- C. Submit list of project completed by the installer. Include name and location of projects within 100 mile radius of project, completed within the last three years. Identify Architect of record, and provide contact information for Architect and Owner.

1.3 QUALITY ASSURANCE

- A. Installers Qualifications: Provide personnel who have been trained by polishing equipment manufacturers, and have three years documented experience.

Note to Specifier: An effective way to ensure satisfactory results is to create a mockup on the actual surface to be polished. Require a mockup of sufficient size, and select a portion of the floor that will demonstrate the widest variety of conditions. Make everyone aware of variations that could occur in color, surface spots, cracks and crazing.

- B. Mockup: Provide mockups to illustrate desired finish, relationship with other materials and aesthetic effects.
 - 1. Locate Mockup where directed by the Architect.
 - 2. When approved, mockup will become the standard by which the remaining Work will be judged and may become part of the Work.
 - 3. Do not proceed until approved by the Architect.
 - 4. Mockup Size: [4 x 8 feet] [4 x 10 feet]
- C. Pre-Installation Conference: Conduct a pre-installation conference five weeks before scheduled date to begin installation. Discuss the following;
 - 1. Access
 - 2. Temporary power
 - 3. Graphics
 - 4. Protection of adjacent areas
 - 5. Protection of finished floor upon completion

- D. Single Source: Provide chemical products including densifier, dye and sealer from a Clemons Concrete Coatings.

1.4 PROJECT CONDITIONS

- A. Maintain environmental conditions during storage and application that complies with manufacturer's recommendations.

1.5 EXTRA MATERIALS

Note to Specifier: Manufacturer recommends sealer be applied to traffic areas every six month. Suggest the contractor provide sufficient quantity for one year maintenance.

- A. Extra Materials: Provide [one] [two] gallon(s) container of Super Guard for owner's maintenance program.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Provide products manufactured by Clemons Concrete Coatings of Nashville, Tennessee;
Telephone: 615-872-9099
www.ccc-usa.com
 - 1. Substitutions: [Not Permitted] [Under provisions of Section 01 25 00].

2.2 ACCESSORIES

- A. Densifier: Provide Super Hard L, as manufactured by Clemons Concrete Coatings, with the following characteristics:
 - 1. Prime ingredient: Lithium silicate
 - 2. Dustproofer, increases wear resistance of concrete, and will not peel, scratch or erode
 - 3. VOC Standard: 350 g/l
 - 4. Flammability: 0
- B. Dye: Provide Super Dye as manufactured by Clemons Concrete Coatings, with the following characteristics:
 - 1. Can be mixed with water or acetone
 - 2. VOC: 15 G/L
 - 3. Flash Point: 150 degrees
- C. Sealer: Provide Super Guard as manufactured by Clemons Concrete Coatings, with the following characteristics:
 - 1. Type; Water-based acrylic co-polymer
 - 2. Scuff and mar resistant
 - 3. Abrasion resistant
 - 4. Non-yellowing
 - 5. Allows use of strippable floor polishes

2.3 EQUIPMENT

- A. Primary Equipment: Professional grade floor grinding machines, equipped with rotating heads and planetary rotating heads, capable of operating metal bonded diamond, and resin bonded diamond grinding pads.
- B. Other Equipment: Edge grinders and dry vacuums.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate is ready to receive concrete polishing. Do not begin until deficiencies have been corrected.
- B. Verify that necessary repairs have been completed prior to start of grinding and polishing procedure.

3.2 PREPARATION

Notes to Specifier: Removal of coatings is not necessary, initial grinding will remove coatings.

- A. Protect adjacent surfaces to prevent damage by concrete polishing procedure.
- B. Preparation for Densifier: ensure the surface is free of dirt, wax, grease or other contaminants.
- C. Preparation for Dyeing: Mask adjacent columns, walls, and floors with painter's tape plastic sheeting. If using acetone, turn off pilot light ignition systems.

3.3 APPLICATION

Note to Specifier: The term grinding is used to describe the initial steps from 120 grit metal bonded diamond pad to 50 grit resin bonded diamond pad.

- A. Grinding:
 1. Initial grind with 120 grit metal bonded diamond. Grind entire area to consistent appearance, before starting the next step.
 2. Vacuum to remove dust after each step, do not introduce water.

Note to Specifier: Initial grind removes the cream, or troweled top surface of the concrete slab, which is typically 1/16 inch thick.

- 3. Change to 50 grit resin bonded diamond pad, and regrind. Grind entire area to consistent appearance before starting the next step. Vacuum the floor thoroughly after each grind.
- B. Apply Super Hard L, densifier according to manufacturer's directions. Apply test spot; before proceeding with remainder. Apply in two or more coats.

Note to Specifier: Steps, from 100 grit to 800 grit are known as honing. Honing exposes the large aggregates, and leaves a smooth matte surface.

- C. Change pad to and 100 grit pad.hone the entire area to consistent appearance before starting the next step. Vacuum the floor thoroughly after each step.
- D. Change pad to and 200 grit pad. Hone the entire area to consistent appearance before starting the next step. Vacuum the floor thoroughly after each step.
- E. Apply Super Dye. Follow manufacture's r recommendation for transferring residue to spray equipment. Apply Super Dye uniformly; avoid bleed lines, with random circular

motions. Apply Super Dye in minimum of two coats. Determine need for additional coats before proceeding.

Note to Specifier: Honed finish between 400 grit and 800 grit pads can be left at this stage.

- F. Continue Honing with 400 grit and 800 grit pads. Grind the entire area to consistent appearance before stating the next step. Vacuum the floor thoroughly after each grind.

Note to Specifier: Depending on hardness of concrete and judgment of installer and additional coat of densifier (Super Hard) may be needed after the 800 grit.

- G. Upon completion of 800 grit, and in the judgment of the operator, apply an additional coat of densifier (Super Hard) if needed.

- H. Continue polishing with 1,800 grit pad. Polish the entire area to consistent appearance before starting the next step. Vacuum the floor thoroughly after each step.

Note to Specifier: 3000 grit pad is the final step in polishing process.

- I. Continue the final step of polishing with 3,000 grit pad. Polish the entire area to consistent appearance before starting the next step. Vacuum the floor thoroughly after each step.

- J. Obtain Architect approval before applying sealer.

- K. Sealer: Apply Super Guard: Apply according to manufacturer's guidelines. Apply in two to three coats, using recommended tools; allow sufficient drying time between coats.

3.4 FIELD QUALITY CONTROL

- A. Inspection: Inspect polished concrete floors prior to application of sealer. Compare to approved mockup.

3.5 PROTECT AND CLEAN

- A. Protect polished concrete floors from foot and wheeled traffic for the remainder of the construction period.
- B. If cleaning becomes necessary, follow sealer manufacturer's guidelines. Use only cleaning agent identified in the data sheet. Do not use detergents or abrasives.

3.6 SCHEDULES

Note to Specifier: Delete unused options below.

- A. Provide the following sheen levels prior to application of sealer.

Note to Specifier: 400 grit is considered a honed finish, similar to that used for natural stone. It is typically the lowest gloss used in the United States. This is a very dull finish.

1. Low Gloss: 400 grit (honed finish)

Note to Specifier: 800 grit is also considered a honed finish, similar to that used for natural stone. This level has a dull shine visible from the side, exhibiting a degree of refraction.

2. Medium Gloss: 800 Grit (honed finish)

Note to Specifier: 3,000 grit is the highest level of polished concrete finish. This level produces a mirror like finish, and exhibits the highest degree of reflectivity.

3. High Gloss: 3, 000 Grit (mirror-like polished finish)

END OF SECTION