

CONCRETE POLISHING SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Work in this section applies to polishing concrete floor surfaces to a desired finish with the incorporation of concrete densifier(s).

B. Related Work:
1. Section Cast in Place Concrete
2. Section Concrete Hardening/Sealing

1.2 SUBMITTALS

A. Submittal Package: Prior to commencement of work submit all product data sheets and M.S.D.S.

B. Contract Closeout Submittals: Provide 2 copies of the recommended leaning and maintenance instructions for the installed floor system to the Owner's Representative.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Installer shall be an established company regularly engaged in the installation of densified concrete floor system with a minimum of three (3) years' experience. Contractor shall furnish documentation regarding the successful completion of projects of similar magnitude and complexity.

B. Single Source Responsibility: All required materials and Installation personnel to be provided by the same company.

C. The system manufacturer shall certify applicator.

1.4 DELIVERY, STORAGE AND HANDLING OF PRODUCT

A. Delivered materials to the site shall be in factory-sealed containers, clearly labeled and marked with manufacturer's name, address, batch number, and date of manufacture. Material Safety Data Sheets must accompany materials upon arrival.

B. Store materials in accordance with manufacturers printed instructions. Furthermore, materials to be used in conjunction with the application of this system shall be stored indoors, protected from damage and maintained at a temperature no lower than 55 degrees.

1.5 CONCRETE MIX DESIGN

A. Concrete Mixture shall be 3500 PSI or higher, non-air entrained.

- Any admixtures, plasticizers, or anything taking the place of Portland-based cement shall be kept to a minimum
- Confirm there is **NO Slag or Fly Ash in the mix** as these materials will affect the polishing process.
- The cement shall be Portland Cement Type 1, conforming to ASTM C 150.
- Maintain concrete temperature below 85 degrees. Keep concrete as cool and moist for as long as possible. In essence, decrease rate of hydration and drying to minimize cracking.
- Wet cures are most suitable, but if this cannot be achieved, use a dissipating cure and seal - keep in mind - if this has not dissipated before grinding has begun - **extra cost may be added for its removal.**
- Use one source for cement, aggregates and pozzolans throughout the job. Monitor and control incoming material consistency. Do not use calcium chloride-based admixtures. Non-chloride admixtures may be used.
- Wash out all drums before loading. Keep slumps consistent with a maximum of 5. Minimize driver added water maintaining a .45 water content ratio.
- Place 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 on sloping areas to within tolerances permitted by specification - ASTM E 1155.
- Floor Flatness (FF) 40 +/- 5 - Floor Levelness (FL) 35 +/- 5.
10. Prepare construction joints: Joints saw cut spacing 30-35 at slab thickness (4" slab would have cuts 10' - 12' on center). Cuts 1/8" - 3/16" wide. Cut 1/3 the concrete thickness is ideal. If a soft cut saw or an "early entry saw" is used the same day then 25% is typically adequate. If the cuts are done the next day then the full third is recommended. To leave concrete undamaged from sawing, conventional saw cutting must be delayed, usually 4 to 12 hours but not so long that uncontrolled cracking of concrete could occur. Fill all joints full depth with polyurea or equal.
- Expansion joints: Use felt board with "Cap Strips" (see http://www.formtechinc.com/other_expansionjoint.htm) when pouring to establish joint width and for easy removal. Fill joints with closed cell backer rod at least 125% larger than joint width. Caulk with Pectora DynaFlex Urethane or equal. Joint sealant thickness to be 1/4 the width of the joint and tooled to be slightly concave.
- Slab shall be protected from indentions, contaminates, and footprints during pour and curing of slab.
- The pouring of the slab shall be from left or right corner of building and pour back to rear opposite corner of original starting point. Close concentration should be made to the storefront entrance doors.

1.6 PROJECT/SITE CONDITIONS

A. Floor areas to be polished are to be free and clear of all obstacles including racking, fixtures and temporary equipment and materials in order to provide an open and uninhibited concrete slab.

B. Protection: General Contractor shall protect areas to receive 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.

- All hydraulic powered equipment shall be diapered to avoid staining of concrete.
- All vehicle parking shall be prohibited on the finish slab area. If necessary to complete their scope of work, drop cloths shall be placed under vehicles at all times.
- No pipe cutting machine shall be used on the finish floor slab.
- Steel shall not be placed on the finish slab to avoid rusting.
- Acids and acidic detergents will not come in contact with slab.
- All painters will use drop cloths on the concrete. If paint gets on the concrete, it must be immediately removed.
- All trades will be informed that the slab must be protected at all times.

C. A minimum of 28 days of cure on new concrete should be provided before system installation is initiated.

D. The best degree of concrete floor flatness and levelness should be strived for since the floor finish may have low spots resulting from placement & finishing. A floor flatness rating of 40 +/- 5 is level concrete.

Block off areas to traffic for the duration of the system's installation.

E. Ensure that adequate lighting has been installed to support surface preparation and application.

1.7 WARRANTY

A. The Installer shall furnish a SINGLE SOURCE warranty for their system for a period of one year minimum.

PART 2 PRODUCTS / SYSTEMS

2.1 SYSTEM PROVIDER (4 Providers)

2.2

A. Retroplate Corporate Accounts Concrete Polishing
1203 West Spring Creek Place
Springville, Utah 84663
Contact: Michael Clarke 770-862-6238
E-mail - mclarka@cprconcrete.com

B. Perfect Polish
P.O. Box 151
Norris, TN 37828
Contact: Brad Delano 865-494-7257 x 298
E-mail - brad.delano@perfectpolishonline.com

C. Titus Restoration Services, Inc.
547 Toonigh Rd
Woodstock, GA 30188
Contact: Melinda Evans 678-494-6893 x 224
E-mail - melinda@titusrestoration.com

D. QuestMark Flooring, Div of Centimark Corporation
12 Grandview Circle
Canonsburg, PA 15317
Contact: Brian M. Cerilli 724-413-2152
E-mail - brian.cerilli@centimark.com

Substitutions: This is a closed specification, no substitutions allowed for system or materials provided by these vendors. Vendor contact names could possibly change, if so, ask for new contact for Family Dollar account.

2.02 EQUIPMENT TO BE USED FOR INSTALLATION

A. Floor Grinder:
1. Model: Concrete Polishing Solutions "G-320". (or equivalent)
2. Type: Multi-orbital, planetary-action, opposing-rotational, diamond-headed floor grinder.
3. Weight: 850 pounds.
4. Grinding Pressure: 675 pounds.
5. Grinding Width: 32 inches.
6. Motor: 15 HP.
7. Maximum RPM: 1,750.
8. Head: 3-head system contours to floor surface.

B. Vacuum System:
1. Model: Concrete Polishing Solutions "CAT 5 Dust Extractor". (or equivalent)
2. Filtration: Direct-connect, HEPA filtration system.

C. Diamond Tooling for Coating Removal, Initial Grinding, and Preparing Floor for Polishing:
1. Concrete Polishing Solutions "MFL" BO-grit metal-bonded diamonds depending on the existing flooring conditions. (or (a) equivalent) Multiple passes may be required.

D. Diamond Tooling for Polishing Concrete:
1. Concrete Polishing Solutions "GST" 100-grit resin-bonded diamonds. (or equivalent) Multiple passes may be required.
2. Concrete Polishing Solutions "GST" 400-grit resin-bonded diamonds. (or equivalent) Multiple passes may be required.
3. Concrete Polishing Solutions "GST" BOO-grit resin-bonded diamonds. (or equivalent) Multiple passes may be required.
4. Concrete Polishing Solutions "GST" 1500-grit diamond pad. (or equivalent) Multiple passes may be required.

2.03 MATERIALS

A. Concrete Densifier:
1. Concrete Polishing Solutions "Armor Densifier MFL". (or equivalent)
2. Permanent sealing, densifying, and hardening compound for concrete.
3. Odorless.
4. VOC: 0

B. Joint Filler:
1. Euclid Chemical "Euco QWIKjoint UVR". (or equivalent)

PART 3 EXECUTION

3.1 INITIAL EXAMINATION

A. Verification of Conditions: Examine surfaces scheduled to receive the work of this section for defects that will adversely affect the execution and quality of the work. Ensure attendance at a pre-installation meeting will be attended by at least the Landlord or Developer, General Contractor and Installer so they agree to the condition of the existing slab prior to performing the work. Do not proceed until unsatisfactory conditions are corrected. Provide in writing to Owner a list of the conditions, if any.

B. New Concrete: Confirm that a minimum of 28 days has elapsed before installation can begin. Also confirm if curing agents or hardening agents have been applied.

C. Prior to application, the installer will need to verify that the site is clear of all debris and with acceptance will hold sole responsibility for the specification for the floor finish.

3.2 PROTECTION

A. Advise all other contractors, vendors and others working in the areas completed that the concrete slab is finished floor and is to be protected accordingly.

B. Do not allow chemical spills, cutting of materials or sliding of steel to occur on the finished floor because damage can occur.
C. Follow system manufacturer's instruction for cleaning to ensure proper protection from dirt and debris.

3.3 INSPECTION

A. Request acceptance by owner's representative for finished floor.

B. Correct all unacceptable work to the satisfaction of the Owner's representative.

EXAMINATION

A. Examine floor to receive polished concrete floor system.

B. Notify Architect or Family Dollar representative of conditions that would adversely affect installation or subsequent use.

C. If during examination a divot is found use a standard steel brush with water to clean out the divot. While the divot is still damp pour in The Rockite (expanding, anchoring cement) Go to www.rockite.com for more information on product.

D. Do not begin surface preparation or installation until unacceptable conditions are corrected.
E. Verify the following for New Concrete Floors:

- Floor Finish:
 - Slabs and flatwork shall be placed and finished monolithically.
 - Strike off and laser screed slabs to true, plane surfaces at required elevations.
 - Thoroughly compact concrete with vibrators, floats, and tampers to force coarse aggregate below the surface.
 - Power trowel with no hand finishing.
 - Pan flat.
 - Surface should not be burned due to excessive toweling.
 - Imprints are not acceptable (i.e. boots, foreign objects dropped into concrete).
- Floor and Joints:
 - Free of debris and excessive dirt, dust, clay, and mud.
 - Dry.
- Floor Surface Profile:
 - Floor Flatness Number (FF): 40 +/- 5.
 - Floor Levelness Number (FL): 35 +/- 5.
 - Concrete Compressive Strength: 3,500 psi to 5,000 psi.
 - Lightweight Concrete: Not allowed if aggregate exposure required.
 - Concrete Curing: Minimum 8 days water cured or dissipating curing compound applied.
 - Concrete Adjacent to Floor Penetrations: Troweled flat and level with surrounding concrete.
 - Concrete Adjacent to Drains, clean-outs, etc: Finish level to the top of the structure.

3.5 SURFACE PREPARATION

A. Protection: Protect surrounding areas and adjacent surfaces from the following:
1. Minimal accumulation of dust from grinding and polishing.
2. Contact with overspray of concrete densifier.
3. Contact with overspray of concrete sealer.

B. Surface Preparation: Prepare surfaces in accordance with installer's instructions.

C. Clean Surfaces: Remove dirt, dust, debris, oil, grease, curing agents, bond breakers, paint, coatings, and other surface contaminants which could adversely affect installation of polished concrete floor system.

3.6 INSTALLATION

A. Install polished concrete floor system in accordance with installer's instructions at locations indicated on the Drawings.

B. Aggregate Exposure:
1. Cream Aggregate: Minimal to no coarse aggregate exposure.

C. Infill Joints with Joint filler.

D. Polished Concrete Floor System: IPCI Sheen Level 4 - Glossy Shine.
Preparation Step

a. Remove existing floor coatings and level floor by grinding with BO-grit metal-bonded diamonds. Depending on the existing flooring conditions, multiple passes may be required.
2. Apply concrete densifier to deeply saturate floor.
3. Floor Closure Polishing:

- Remove 80-grit metal-bonded diamond scratches by grinding 100-grit resin-bonded diamonds. Multiple passes may be required.
- Remove 100-grit resin-bonded diamond scratches by grinding 400-grit resin-bonded diamonds. Multiple passes may be required.
- Achieve light-reflective finish when viewed from a distance of 30 feet by grinding with 800-grit resin-bonded diamonds. Multiple passes may be required.

4. Perimeter Polishing:

- Maintain a 6" unfinished perimeter around Sales Floor. When completed with polishing, paint 6" strip semi-glass Low V.O.C. Black by Benjamin Moore.
- Maintain a 12" unfinished perimeter around Sales Support Area Floor. When completed with polishing, paint 12" strip semi-glass Low V.O.C. White by Benjamin Moore.
- See detailed area A-3.01 (typical for all Foot prints).

5. Final Polish: Surface sheen gives off wet and shiny appearance with "lake-like" mirror effect reflecting surrounding objects above it.

- Complete final polish by burnishing with 1500-grit diamond pads. Multiple passes may be required.

A. Inspect completed polished concrete floor system with Owner, Contractor, Architect (as-needed), and installer.

B. Review Procedures with Architect (as needed) to correct unacceptable areas of completed polished floor system.

3.08 PROTECTION

A. Protect completed polished concrete floor system from damage until substantial completion.

- Do not allow vehicle and pedestrian traffic on unprotected floor.
- Do not allow construction materials, equipment, or tools on unprotected floor

B. Immediately remove mortar spatter, spilled liquids, oil, grease, paint, coatings, and other surface contaminants which could adversely affect the completed polished concrete floor system.

C. Repair Damaged areas of completed polished concrete floor system to the satisfaction of Owner or Architect (as needed)