

CONCRETE POLISHING SYSTEM

July 1, 2009

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

1.02 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 cleaning and maintenance instructions for the installed floor system to the Owner's Representative.

1.03 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.

1.04 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 manufacturer's 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.

1.05 CONCRETE MIX DESIGN

- A. Concrete Mixture shall be 3500 PSI or higher, non-air entrained.
 1. Any admixtures, plasticizers, or anything taking the place of Portland-based cement shall be kept to a minimum.
 2. Confirm there is **NO Slag or Fly Ash in the mix** - as these materials will affect the polishing process.
 3. The cement shall be Portland Cement Type 1, conforming to ASTM C 150.
 4. 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.
 5. 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.
 6. 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.
 7. Wash out all drums before loading. Keep stumps consistent with a maximum of 5. Minimize driver added water maintaining a .45 water content ratio.
 8. 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 E1155.
 9. Floor Flatness (FF) 35 minimum - Floor Levelness (FL) 30 minimum. Slab shall be protected from indentation, contaminants and footprints during pour and curing.
 10. Prepare construction joints: joints saw cut spacing 30-35 times at slab thickness (4" slab would have cuts 10" - 12" on center). Cut $\frac{1}{8}$ " - $\frac{3}{16}$ " wide. Cut $\frac{1}{2}$ " the concrete thickness is ideal. If a softcut 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 control joints full depth with polyurea or equal.
 11. Expansion Joints: Use felt board with "Cap Strips" (see http://www.formteching.com/other_expansionjoint.htm) when pouring to establish joint width and for easy removal. Fill joint with closed cell backer rod at least 125% larger than joint width. Caulk with Pecora DynaFlex Urethane or equal. Joint sealant thickness to be $\frac{1}{2}$ " the width of the joint and tolled to be slightly concave. Slab shall be protected from indentation, contaminants and footprints during pour and curing.

1.06 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.
 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 cloths shall be placed under vehicles at all times.
 3. No pipe-cutting machine shall be used on the finish floor slab.
 4. Steel shall not be placed on the finish slab to avoid rusting.
 5. Acids and acidic detergents will not come in contact with 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.
- 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 enhance imperfections such as high and low spots resulting from placement and finishing. A minimum floor flatness rating of 35 and a minimum floor levelness of 30 is recommended on newly placed concrete.
- E. Block off areas to traffic for the duration of the system's installation.
- F. Ensure that adequate lighting has been installed to support surface preparation and application.

1.07 WARRANTY

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

PART 2 PRODUCTS / SYSTEM

2.01 SYSTEM PROVIDER

- A. **QuestMark Flooring, Div of Centimark Corporation**
12 Grandview Circle
Canonsburg, PA 15317
Contact: George Paxinos 404 915 8663
E-mail - George.Paxinos@centimark.com
Or Nora Paul at 1.800.423.5667 x 1674
E-mail - Nora.Paul@centimark.com
- B. **Perfect Polish**
P.O. Box 151
Norris, TN 37828
Contact: Jeff Yatese 865-494-7257 ext. 235
E-mail - jeff.yatese@perfectpolishonline.com
- C. **Titus Restoration Services, Inc.**
547 Toonigh Rd
Woodstock, GA 30188
Contact: Phil Evans 678-494-6893
E-mail - phil@titusrestoration.com
- D. **Substitutions: This is a closed specification, no substitutions allowed for system or materials provided by these vendors.**

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" 80-grit metal-bonded diamonds, (or equivalent)
 2. Concrete Polishing Solutions "MFL" 150-grit metal-bonded diamonds, (or equivalent)
- D. Diamond Tooling for Polishing Concrete:
 1. Concrete Polishing Solutions "GST" 100-grit resin-bonded diamonds, (or equivalent)
 2. Concrete Polishing Solutions "GST" 200-grit resin-bonded diamonds, (or equivalent)
 3. Concrete Polishing Solutions "GST" 400-grit resin-bonded diamonds, (or equivalent)
 4. Concrete Polishing Solutions "GST" 800-grit resin-bonded diamonds, (or equivalent)
 5. Concrete Polishing Solutions "GST" 1500-grit resin-bonded diamonds, (or equivalent)

- 6. Concrete Polishing Solutions "GST" 3000-grit resin-bonded diamonds, (or equivalent)

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. Concrete Sealer:
 1. Concrete Polishing Solutions "Armor Stain Shield MFL", (or equivalent)

PART 3 EXECUTION

3.01 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. Do not proceed until unsatisfactory conditions are corrected. Provide in writing to Owner a list of the conditions.
- 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.

3.02 PROTECTION

- A. Advise all other contractors, vendors and others working in the areas completed that the concrete slab surface is the 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 surface because damage can occur.
- C. Follow system manufacturer's instruction for cleaning to ensure proper protection from dirt and debris.

3.03 INSPECTION

- A. Request acceptance by Owner's Representative for the finished floor.
- B. Correct all unacceptable work to the satisfaction of the Owner's Representative.

3.04 EXAMINATION

- A. Examine floor to receive polished concrete floor system.
- B. Notify Architect or FDS Representative of conditions that would adversely affect installation or subsequent use.
- C. If during the examination a divit is found use a stainless steel brush with water to clean out the divit, while the divit is still damp pour in the Rockite (this is an expanding, anchoring cement. www.rockite.com)
- D. Do not begin surface preparation or installation until unacceptable conditions are corrected.
- E. Verify the Following for New Concrete Floors:
 1. Floor Finish:
 - a. Slabs and flatwork shall be placed and finished monolithically.
 - b. Strike off and laser screed slabs to true, plane surfaces at required elevations.
 - c. Thoroughly compact concrete with vibrators, floats, and tampers to force coarse aggregate below the surface.
 - d. Power trowel with no hand finishing.
 - e. Pan float.
 - f. Steel finish.
 - g. Surface should not be burned due to excessive toveling.
 - h. Imprints are not acceptable (i.e. boots, foreign objects dropped into concrete).
 2. Floor and Joints:
 - a. Free of debris and excessive dirt, dust, clay, and mud.
 - b. Dry.
 3. Floor Surface Profile:
 - a. Floor Flatness Number (FF): 35 (minimum).
 - b. Floor Levelness Number (FL): 30 (minimum).
 4. Concrete Compressive Strength: 3,500 psi to 5,000 psi.
 5. Lightweight Concrete: Not allowed if aggregate exposure is required.
 6. Concrete Curing: Minimum 8 days water cured or dissipating curing compound applied.
 7. Concrete Adjacent to Floor Penetrations: Troweled flat and level with surrounding concrete.
 8. Concrete Adjacent to Drains, clean-outs, etc.: Finish level to the top of the structure.

3.05 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.

3.06 INSTALLATION

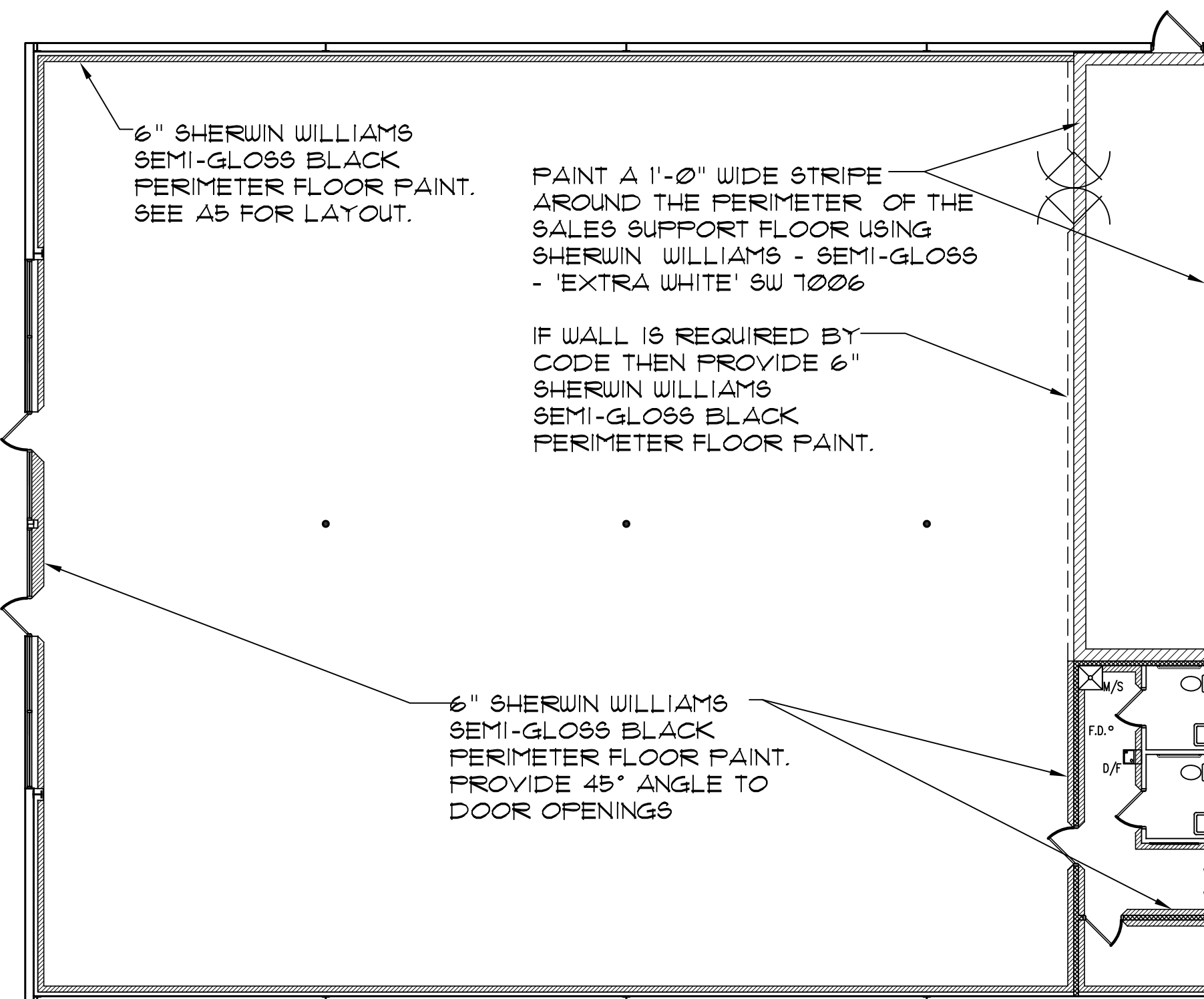
- A. Install polished concrete floor system in accordance with installer's instructions at locations indicated on the Drawings.
- B. Aggregate Exposure:
 1. Cream Aggregate: Minimal to no coarse aggregate exposure.
- C. Polished Concrete Floor System: IPCI Sheen Level 4 - Glossy Shine.
 1. Preparation Step:
 - a. Remove existing floor coatings and level floor by grinding with 80-grit metal-bonded diamonds.
 2. Apply concrete densifier to deeply saturate floor.
 3. Remove residue of concrete densifier dried on floor surface by grinding with 150-grit metal-bonded diamonds.
 4. Floor Closure Polishing:
 - a. Remove 150-grit metal-bonded diamond scratches by grinding with 100-grit resin-bonded diamonds.
 - b. Remove 150-grit metal-bonded and 100-grit resin-bonded diamond scratches by grinding with 200-grit resin-bonded diamonds.
 - c. Prepare floor for polishing by grinding with 400-grit resin-bonded diamonds.
 - d. Achieve light-reflective finish when viewed from a distance of 30 feet by grinding with 800-grit resin-bonded diamonds.
 - e. Perimeter polishing:
 - Maintain a 6" unfinished perimeter around Sales Floor, Vestibule and Office. When completed with polishing, paint 6" strip semi-gloss low VOC black by Sherwin Williams.
 - Maintain a 12" unfinished perimeter around Sales Support area floor.
 - See FLOOR PAINT plans this sheet for locations of paint.
 5. Final Polish: Surface sheen gives off wet and shiny appearance with "lake-like" mirror effect reflecting surrounding objects above it.
 - a. Start final polish by grinding with 1500-grit resin-bonded diamonds.
 - b. Complete final polish by grinding with 3000-grit resin-bonded diamonds.
 6. Apply concrete sealer.

3.07 FIELD QUALITY CONTROL

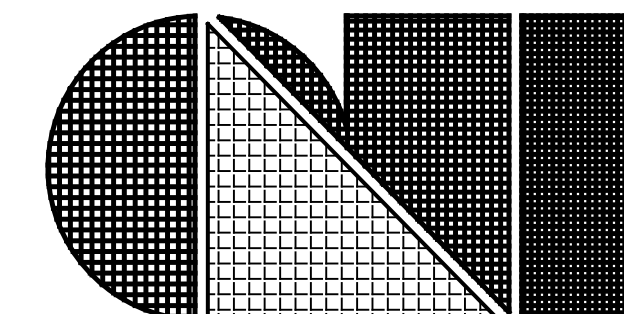
- A. Inspect completed polished concrete floor system with Owner, Contractor, Architect (as-needed), and Installer.
- B. Review procedures with Architect (as-needed) to correct unacceptable areas of completed polished concrete floor system.

3.08 PROTECTION

- A. Protect completed polished concrete floor system from damage until Substantial Completion.
 1. Do not allow vehicle and pedestrian traffic on unprotected floor.
 2. Do not allow construction materials, equipment, and tools on unprotected floor.
- B. Immediately remove mortar splatter, spilled liquids, oil, grease, paint, coatings, and other surface contaminants which could adversely affect completed polished concrete floor system.
- C. Repair damaged areas of completed polished concrete floor system to satisfaction of Owner or Architect (as-needed).



4 80X100 FLOOR PAINT
SCALE = 3/32" = 1'-0"



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ARCHITECT'S PROJECT • 0917?

Project #
**FAMILY DOLLAR
FOR
BOOS DEVELOPMENT GROUP, INC**
STATE ROUTE 89
MILTON, FLORIDA
DESIGN BASED ON 2009-04 FD PROTOTYPE

Sheet Description #
POLISHED FLOOR SPEC

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Revisions :

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Date :
12/22/09

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