

SECTION 03360 - SPECIAL CONCRETE FLOOR FINISHES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division _____ Specification Section, apply to this Section.

1.2 SUMMARY

A. This Section includes polished concrete finish in accordance with Hardscapes™ concept for interior concrete flatwork. Polished concrete finishes for precast concrete, vertical cast-in-place concrete, and exterior concrete are specified in the sections for those types of concrete.

B. Furnish all labor, material, equipment and services necessary for the dry diamond grinding and polishing of concrete floors in accordance with the Hardscapes™ concept.

C. Applying densifying impregnator/sealer and polishing to specified sheen level and aggregate exposure.

D. Concrete must be cured a minimum of 28 days prior to polishing.

1.3 REFERENCES

A. American Concrete Institute (ACI):

1. ACI302.1R-89, Guide for Concrete Floor and Slab Construction.

B. American Society for Testing and Materials:

1. ASTM C779, Standard Test Method for Abrasion of Horizontal Concrete Surfaces.
2. ASTM C805, Impact Strength.
3. ASTM G23-81, Ultraviolet Light & Water Spray.
4. ASTM 1028, Co-efficient of Friction.
5. ASTM C 150, Type I, II Portland cement conformity, depending on soil conditions.

6. ASTM C 33, Aggregate conformity.

C. Other Tests:

1. Reflectivity. Measured in candle power.
2. Gloss reading.

1.4 SUBMITTALS

A. Submit the following in accordance with Division _____ Section “Submittal Procedures”.

B. Product data for each grinding machine, including all types of grinding heads, dust extraction system, joint filler, concrete densifying impregnator, penetrating sealer, and any other chemicals used in the process.

C. Applicators qualification data.

D. Polished concrete samples: size _12 SqFt_____, for each Polished Concrete finish required.

1.4 QUALITY ASSURANCE

A. Basis of design: Hardscapes™, manufactured by Global Polishing for Sherwin Williams.

B. Approved Applicators:

1. __David Martel_____
2. _____
3. _____

C. Pre Installation Conference: Conduct conference at project site to comply with requirements in Division _____, Section “Project Management and Coordination”.

D. Provide project names, addresses, contact names, phone numbers of at least (3) three projects of similar scope completed by the installer.

E. Installer/applicator shall be certified by concrete finish equipment and chemical manufacturer and shall provide adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.

F. Manufacturer's Certification: Provide a letter of certification from both the equipment and chemical manufacturer stating that the installer is a certified applicator and is familiar with proper procedures and installation requirements recommended by the manufacturer.

G. Mock-ups:

1. General Contractor to notify applicator 7 days prior to pour to schedule finish of mock- up.
2. Reserve 100 square feet for each color and finish at location adjacent to floor that will receive polish, but will be covered with another flooring material. Mock-up floor shall be placed on the same day, preferably the same pour as the floors to receive polish.
3. Install mock-ups to verify selections made under sample submittal and to demonstrate methods and workmanship proposed for the project. If mock-up not possible, submitted samples will be accepted as demonstrated methods & workmanship.
4. Aggregate selected must be tested to ensure it will accept polish.
5. If stand alone mockup required, form should be clean and free from extraneous substance and be at least a 12' x 12' with a level plywood bottom on level ground with unobstructed access around all four sides.
6. Control joints should be included in mock-up. Sawing performed by General Contractor can begin as soon as the surface is firm enough not to displace any of the aggregate.
7. Edges should be included in mock-up.
8. Approved mock-ups may become part of the completed work if undisturbed at time of substantial completion.

H. 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 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.

I. Environmental Limitations

1. Comply with manufacturers written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation and other conditions affecting chemical performance.
2. Flatness and levelness
 - a. Finish Concrete shall have a minimum Floor Flatness rating of at least 40.
 - b. Finish Concrete shall have a minimum Floor Levelness rating of at least 30.
 - c. Finish Concrete shall be cured a minimum of 28 days or at which point equipment can be put on the slab and does not displace aggregate.
3. Application of finish system shall take place a minimum of 21 days prior to fixture & trim installation and/or substantial completion.
4. Finish Concrete area shall be closed to traffic during finish floor application and after application, for the time as recommended by manufacturer.

J. Concrete Mix Design:

1. Concrete Mixture shall be 3500 PSI or higher, non air entrained.
 - a. Any admixtures, plasticizers, 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, 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 hydration and drying to minimize cracking.
- d. Wet cures are most suitable, but if this cannot be achieved, use a penetrating, dissipating or wax based cure and seal. Do not use a densifier/Hardener material due to the grinding of the floor after 6 days. **All Cure and Seal must be ground off. Chemical stripping is not an acceptable method of removal.**
- e. All mix designs must be approved by Architect. Send all approved mix designs to Applicator.
- f. The Engineer/Architect shall determine the saw cut patterns, color and layout.
- g. Color loads for integral color should never be smaller than 3 cubic yards.
- h. 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.
- i. Wash out all drums before loading. Keep slumps consistent with a maximum of 4. Minimize driver added water maintaining a .45 water content ratio.
- j. 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.
- k. Slab shall be protected from indentation and footprints during pour and curing.

PART 2 PRODUCTS

2.1 POLISHING MATERIALS

A. 2, 3 or 4 head counter rotating variable speed Hardscapes™ Approved Floor Grinder with at least 600 pounds down pressure.

B. Hardscapes™ approved dust extraction system, pre-separator, and squeegee attachments with minimum flow rating of 322 cubic feet per minute.

D. Grinding Heads:

1. Hardscapes™ Metal bonded 16, 25, 40, 80, 150 and/or 300 grits.
2. Hardscapes™ Resin bonded diamonds, 100, 200, 400, 800, 1500 and 3000 grits.

E. Grinding Pads for Edges

1. 40, 60, and 120 grits.
2. 100, 200, 400, 800, 1500 and 3000 grits.

F. Hand Grinder with dust extraction attachment and pads.

G. Sher-Crete™ Concrete Hardener: No Substitutions

H. Control Joint and Saw Cut Filler, two part filler or polyurea as specified by construction manager.

PART 3 EXECUTION

3.1 PREPARATION

A. Installer shall examine and approve concrete substrate for conditions affecting performance of finish. General Contractor shall correct conditions that are found to be out of compliance with the requirements of this section. Repairs are not acceptable unless specifically approved on a case-by-case basis by the Architect.

B. Verify that base slab meet finish and surface profile requirements listed in Division 3, Section "Cast in Place Concrete".

C. Provide floor clean of materials and debris.

D. Protect adjacent surfaces as required to prevent damage by the concrete polishing procedure.

E. Setup grinding machine, dust extraction system, tooling, and generator.

F. Ensure floor cured to accept polishing application.

3.2 POLISHED CONCRETE APPLICATION

A. Applicator shall examine the areas and conditions under which work of this section will be provided and the General Contractor shall correct conditions detrimental to the timely and proper completion of the work and the Applicator shall not proceed until unsatisfactory conditions are resolved.

B. Grind the concrete floor to within 2 -3 inches of walls with 16, 25, 40 and 80 grit removing construction debris, floor slab imperfections and until there is a uniform scratch pattern and desired concrete aggregate exposure is achieved. Vacuum the floor thoroughly using a squeegee vacuum attachment.

C. Apply material approved by architect for color effects in accordance with the architectural drawings and the manufacturers recommended guidelines.

D. Fill construction joints and cracks with filler products as specified in accordance with manufacturers instructions colored to match (or contrast) with concrete color as specified by architect.

E. (If specified) Bull float cementations grout coat onto surface to fill all voids, cement grout to match (or contrast) color of concrete, allow to cure overnight. (If specified) Apply epoxy grout coat onto surface; allow curing overnight, as specified by architect or construction manager.

F. Grind the floor to within 2 - 3 inches of walls with metal bonded diamond grits of 150 and/or 300, grinding 90 degrees from each previous grind and removing all the scratches from the previous grit. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.

G. (If specified) Grind the edges with 40, 60 and 120 grit grinding pads, removing all of the scratches from the previous grit. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.

H. Polish the floor, to desired sheen level, with Hardscapes™ resin bonded diamond grits of 100, Apply Sher-Crete Concrete Hardener™ undiluted at approximately 400-600 square feet per gallon using a soft, long bristled broom. Cover the entire work area liberally and allow to sit for 10 minutes. Apply again to areas where the densifying impregnator has soaked in and allow to sit for an additional 20 minutes. Allow material to dry. Do not remove any of the Sher-Crete Concrete Hardener™ from the floor 200, 400, 800, 1500 and 3000, first polishing the edges (If specified) with pads of the same grit and then the field of the floor, removing all scratches from the previous grit. After each polish, clean the floor thoroughly using clean water and an auto scrubber or a mop and a wet vacuum.

I. (If specified) Apply Sherwin Williams Sher-Crete™ Concrete Hardener™ Sher-Crete Sealer™ for stained or polished concrete, buff with Black Thickline Strip Pad.

J. Upon completion, the work shall be ready for final inspection and acceptance by the customer.

3.3 PROTECTION

A. Protect the floors from damage until substantial completion.

PART 4 SCHEDULES

4.1 SHEEN

A. Polished Concrete Level 1:

1. At a distance of 100 feet, the floor will reflect images from side lighting.

B. Polished Concrete Level 2:

1. At a distance of 30 to 50 feet, the floor will clearly reflect from side and overhead lighting.

C. Polished Concrete Level 3:

1. Looking straight down, the floor will clearly reflect overhead and side light, with the appearance of the floor looking wet.

4.2 EXPOSED AGGREGATE

A. Exposure rate per Architect/Owner selection.

4.3 EDGES

A. Painted

B. Honed

C. Polished

D. Graphic

E. Other

4.4 TRANSITIONS

A. Inside

B. Outside

C. Center

D. Other