# CONCRETE POLISHING SPECIFICATION – NEW OR EXISTING CONCRETE

## PART 1 GENERAL

### 1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Section, apply to this Section.

### 1.2 SUMMARY

A. This Section included polished concrete finish for new or existing 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.

C. Applying cementitious concrete patch skim coat to problem areas.

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

### 1.3 REFERENCES

A. 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.

### 1.4 SUBMITTALS

A. Submit the following in accordance with Division 1 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.

C. Applicators qualification data.

D. Maintenance Procedures using the Cyclone Diamond Cleaning System. For Information, please contact a Sales and Technical Support Representative at C3SURFACE.com

1.4 QUALITY ASSURANCE

A. Basis of design: Polished Concrete using dry polishing method – Prosoco Consolideck

***This specification is based on an 8 to 9 step diamond polishing system. Shortened systems using light weight equipment/grinders will not be accepted. Grinding and polishing systems must begin with a 40 grit diamond and finish with a 3000 grit diamond. Gloss cannot be achieved by utilizing densification/guard materials and burnishing concrete.**

B. Certified Applicators:

1. C3SURFACE.COM

C. Pre Installation Conference: Conduct conference at project site to comply with requirements in Division 1, Section “Project Management and Coordination”.

D. Provide project names, addresses, contact names, phone number 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. Minim of 5 years

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. For new concrete, General Contractor to notify applicator 7 days prior to schedule finish of mock-up.

2. For new or existing concrete, 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 mock-up required, form should be clean and free from extraneous substance and be at least a 12'x12' 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 detail should be included in mock-up.

8. Approved mock-ups may become part of the completed work if undisturbed at time of substantial competition.

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 competition.

4. Finish Concrete area shall be closed ot traffic during finish floor application and after application, for the time as recommended by manufacturer.

J. Concrete Mix Design (new concrete):

1. Concrete Mixture shall be 3,500 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.

e. Al 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 on 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 slopping areas to within tolerances permitted by specification – ASTM E1155.

k. Slab shall be protected from indention and footprints during pour and curing.

## 2.1 POLISIHING MATERIALS

A. Three-phase 480 Volt generator and step down transformer.

B. 3 head or 4 head counter rotating variable speed approved floor grinder with at least 600 pounds down pressure. Floor Grinder must be planetary type. Non planetary type machines including Prep Master will not be allowed.

C. Dust extraction system, pre-separator, and squeegee attachments with minimum flow rating of 322 cubic feet per minute.

D. Grinding Heads:

1. Metal bonded diamonds 40, 60, 80, and 150 grits.

2. Resin bonded, phenolic diamonds, 100, 200, 400, 800, 1500 and 3000 grits.

E. Grinding Pads for Edges

1. 40, 60, 100, and 120 grits.

2. 200, 400, 800, 1500 and 3000 grits.

F. Hand Grinder with dust extraction attachment and pads.

G. Penetrating Liquid Sealer Hardener Densifying Impregnator or as specified by construction manager with the following performance criteria: chemically reactive, waterborne solution of inorganic silicate or siliconate materials and proprietary components; odorless; colorless which hardens and densified concrete surfaced to protect against abrasion, dusting, and absorption of liquids.

H. Cementitious Patching material compatible with polishing process.

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

1. Euclid Euco 700 semi-rigid 100% solids epoxy joint filler

Color TBD

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. Very 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. If new concrete, ensure floor cured to accept polishing application.

3.2 POLISHED CONCRETE APPLICATION (New or Existing Concrete Slabs)

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. If an existing floor covering is being removed, i.e. tile, carpet, sheet vinyl, all mastic adhesive residue must be removed prior to beginning the concrete polishing process.

C. Fill saw-cut construction joints with specified material to protect joints from damage during the metal bond grinding steps.

D. Grind the concrete floor to within 2-3 inches of walls with 40, 60, 80 and/or 150 grit, removing construction debris, floor slab imperfections and until there is a uniform scratch pattern with a strawberry finish or fine  sand aggregate exposure . Vacuum the floor thoroughly usig a squeegee vacuum attachment.

E. Bull float cementitious grout coat onto surface to fill all voids, cement grout to match (or contrast) color of concrete, allow to cure overnight.

F. Apply densifying impregnator undiluted at approximately 200 square feet per gallon using a stiff, 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 30 minutes. Squeegee excess material off the floor. Allow 12 to 24 hours for full cure.

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

H. Grind the edges with 40, 60, 120 and 200 grit grinding pads, removing all of the scratches from the previous grit. Vacuum the floor thoroughly after each grind, using a squeegee vacuum attachment.

I. Polish the floor with phenolic resin bonded diamond grits of 100, 400, and 800, 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 autoscrubber or a mop and a wet vacuum.

J. Polish the floor to desired sheen level with phenolic resin bonded diamond grits of 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 autoscrubber or a mop and a wet vacuum.

K. Apply LS Guard Lithium densifier to concrete using microfiber applicator. After densifier has dried, burnish floor using high speed burnisher and a diamond impregnated pad.

L. Upon Completion, the work shall be ready for final inspection and acceptance by the customer.

M. Cream finish/fine sand aggregate (photo Below )

3.3 PROTECITON

A. Protect the floors from damage until substantial completion.