

SECTION 03 35 00

(AM0006) POLISHED CONCRETE
05/14

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE (ACI)

- ACI 301 (2016) Specifications for Structural Concrete
- ACI 302.1R (2015) Guide for Concrete Floor and Slab Construction

ASTM INTERNATIONAL (ASTM)

- ASTM C171 (2020) Standard Specification for Sheet Materials for Curing Concrete
- ASTM C309 (2019) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
- ASTM C779/C779M (2012) Abrasion Resistance of Horizontal Concrete Surfaces
- ASTM C1028 (2006) Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method
- ASTM D523 (2014; R 2018) Standard Test Method for Specular Gloss
- ASTM E1155 (2020) Standard Test Method for Determining Floor Flatness and Floor Levelness Numbers

NATIONAL FLOOR SAFETY INSTITUTE (NFSI)

- NFSI B101.1 (2020) Test Method for Measuring the Wet SCOF of Hard-Surface Walkways

REUNION INTERNATIONALE DES LABORATOIRES D'ESSAIS ET DE RECHERCHES SUR LES CONSTRUCTIONS (RILEM)

- RILEM Test Method 11.4 (1987) Measurement of Water Absorption Under Low Pressure

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Polished Concrete Installer Qualifications; G

SD-03 Product Data

Concrete Polishing Materials; G

Polished Concrete Manufacturer's Warranty

Curing Materials; G

SD-04 Samples

Field Test Panels

Slab Panels

SD-06 Test Reports

Floor Surface Flatness and Levelness; G

SD-08 Manufacturer's Instructions

Polished Concrete Maintenance Manual; G

1.3 QUALITY ASSURANCE

1.3.1 Polished Concrete Installer Qualifications

Submit references demonstrating a minimum of two years of experience, including a list of at least three successfully completed polished concrete floor system projects with location, name of Architect/Engineer, and type and quantity of polished concrete floor system installed.

1.3.2 Preinstallation Conference

Conduct conference at Project site before first concrete floor slab placement. Require attendance of parties directly affecting Work of this section, including Contractor, Contracting Officer's Representative, polished concrete installer, and polished concrete manufacturer's representative. Review environmental requirements, scheduling and phasing of Work, coordinating with other Work and personnel, protection of adjacent surfaces, repair of defects and defective Work prior to installation, application and decorative saw cuts, cleaning, surface preparation, field quality control, installation of polished floor finishes, curing methods, and protection of finished surfaces after installation.

1.3.3 Coordination

Coordinate concrete placement, finishing, curing, and cleaning with polished concrete installer to provide surface acceptable for polishing.

Schedule joint sealant installation at a time when it will not be detrimental to the polishing process.

1.3.4 Polished Concrete Samples

Submit samples prior to constructing field test panels, size 8 inches by 8 inches or as otherwise approved by Contracting Officer.

1.3.5 Field Test Panels

Construct field test panels prior to beginning of work using the materials and procedures proposed for use on the job, to demonstrate the results to be attained. The quality and appearance of each panel is subject to the approval of the Contracting Officer, and, if not judged satisfactory, construct additional panels until approval is attained. Formed or finished surfaces in the completed structure must match the quality and appearance of the approved field example.

1.3.5.1 Slab Panels

Construct a slab panel at least 8 feet by 8 feet and 8 inches thick to demonstrate polished concrete slab finish. Locate panels where approved by Contracting Officer, in an area to be covered later by another floor finish. Each panel must have a full length sawcut joint line and include all colors, finishes, and colored silicone sealants.

1.3.6 Polished Concrete Maintenance Manual

Submit installer's maintenance manual, including maintenance and cleaning instructions for polished concrete floor system.

1.3.7 Polished Concrete Manufacturer's Warranty

Submit manufacturer's standard warranty document executed by authorized company official.

1.4 POLISHED CONCRETE PERFORMANCE REQUIREMENTS

1.4.1 Abrasion Resistance

ASTM C779/C779M, Method A, high resistance, no more than 0.008 inch wear in 30 minutes.

1.4.2 Reflectivity

Increase of 35 percent as determined by standard gloss meter.

1.4.3 Moisture Penetration Resistance

RILEM Test Method 11.4, 70 percent or greater reduction in absorption.

1.4.4 Traction Rating

NFSI B101.1, High Traction.

1.5 DELIVERY, STORAGE AND HANDLING

Deliver concrete polishing materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product

name and manufacturer. Store materials in clean, dry area indoors in accordance with manufacturer's instructions. Keep materials from freezing. Protect materials during handling and application to prevent contamination or damage.

PART 2 PRODUCTS

2.1 CONCRETE POLISHING EQUIPMENT

2.1.1 Floor Grinder

Polishing must be a dry diamond method, not wet, utilizing metal bonded diamond/resin bonded diamond multi orbital planetary action opposing rotational diamond headed machine with approximate grinding pressure of 675 pounds or more.

2.1.2 Vacuum System

Vacuum system must be directly connected to floor grinder to reduce amount of dust exposure. HEPA filtration system is required.

2.2 CONCRETE POLISHING MATERIALS

2.2.1 Concrete Densifier

Clear, odorless liquid form of a lithium silicate to permanently seal, densify, dustproof and harden concrete surfaces and provide abrasion resistance by penetrating into concrete pores and chemically reacting. Products must conform and meet minimum performance characteristics as described herein.

2.2.2 Concrete Sealer

Clear, highly concentrated, quick drying penetrating water and oil repellent sealer specifically designed to deeply impregnate the surface pores and chemically bond with the concrete floor to increase durability.

2.2.3 Penetrating Dye

Solvent-based, Ameripolish "Color Perfect" or approved equal.

2.3 CURING MATERIALS

Membrane curing compounds must be ASTM C309, Type 1, Class B, all resin, dissipating cure; do not use acrylic. Sheet membrane must be ASTM C171; do not use polyethylene film. Damp curing must be for a minimum of seven days.

PART 3 EXECUTION

3.1 FINISHING

3.1.1 Trowel Finish

Provide steel-troweled finish in accordance with ACI 301, Section 5 as third operation with a minimum of three passes to achieve ACI 302.1R Class 5 floor for subsequent polished concrete finish.

3.1.1.1 Floor Surface Flatness and Levelness

Achieve the following tolerances according to ASTM E1155 for a floor surface subject to random traffic, as measured within 48 hours of trowel finishing: Overall values of flatness Ff=45 and levelness Fl=35, with minimum local values of flatness Ff=30 and levelness Fl=24.

3.2 POLISHED CONCRETE FINISH

3.2.1 Examination

Examine floors to receive polished concrete floor system. Notify Contracting Officer of conditions that would adversely affect installation or subsequent use. Do not begin surface preparation until unacceptable conditions are corrected.

3.2.2 Surface Preparation

Protect surrounding areas and adjacent surfaces from accumulation of dust due to grinding and polishing, contact with overspray of concrete densifier, and contact with overspray of concrete sealer. Prepare surfaces in accordance with manufacturer's instructions. 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.

3.2.3 Installation

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

3.2.3.1 Aggregate Exposure

Medium, Mixed with Salt and Pepper, understood per leveling floor slab.

3.2.3.2 Polished Concrete Floor System

IPCI Sheen Level 3 - Median Gloss.

3.2.3.3 Preparation

Begin aggregate exposure by grinding with 40-grit metal-bonded diamonds. Open-up concrete to accept concrete densifier by grinding with 80-grit metal-bonded diamonds. Apply concrete densifier to deeply saturate floor. Remove residue of concrete densifier dried on floor surface by grinding with 150-grit metal-bonded diamonds.

3.2.3.4 Floor Closure Polishing

Remove 150-grit metal-bonded diamond scratches by grinding with 100-grit resin-bonded diamonds. Remove 150-grit metal-bonded and 100-grit resin-bonded diamond scratches by grinding with 200-grit resin-bonded diamonds. Prepare floor for polishing by grinding with 400-grit resin-bonded diamonds. Achieve light-reflective finish when viewed from a distance of 30 feet by grinding with 800-grit resin-bonded diamonds. Achieve medium-reflective finish by grinding with 1500-grit resin-bonded diamonds for all Lobby, Corridor, and Vestibule Locations.

3.2.3.5 Finishing

Apply concrete sealer. Finish edges of floor finish adjoining other materials in a clean and sharp manner.

3.2.3.6 Hand Tooling

Where applicable, utilize similar grinding and polishing process to blend the edges of all perimeter areas where obstructions lie with a variable speed polisher.

3.2.4 Field Quality Control

Inspect completed polished concrete floor system with Contracting Officer, Contractor, and Installer. Review procedures to correct unacceptable areas. Test the following:

3.2.4.1 Static Coefficient of Friction

ASTM C1028, dry surface and wet surface.

3.2.4.2 Specular Gloss/Reflectance

ASTM D523.

3.2.4.3 Floor Surface Profiles

ASTM E1155. Compare test results from tests performed before and after installation of polished concrete floor system.

3.2.5 Final Cleaning

Mechanically scrub treated floors for seven days with soft to medium pads with approved cleaning solution.

3.2.6 Protection

Protect completed polished concrete floor system from damage until Substantial Completion. All hydraulic powered equipment must be diapered to avoid staining of concrete. Vehicle parking on polished concrete slab is prohibited. If necessary to complete Work, place drop cloths under vehicles. Do not use a pipe cutting machine on the finished floor slab. Steel must not be placed on the finish slab to avoid rusting. Acids and acid detergents must not be used nor come in contact with the slab. All painters must use drop clothes on finished slab. If spilled, paint must be immediately removed. Provide masonite over landscape fabric taped at all edges and seams to protect the slab from marring, denting, and staining. Inform all trades that the slab must be protected at all times. Coordinate appropriate locations and means for protecting the work. Repair damaged areas of completed polished concrete floor system to satisfaction of the Contracting Officer.

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