**DESIGN A/E NOTE - GUIDE SPECIFICATION CONVENTIONS**

**Color-highlighted text**

**Yellow: Editor’s Notes. Comments inserted into the text are addressed to the A/E, not the Contractor. Editor’s Notes are formatted as hidden text. Editor’s Notes are not identified with an update. Do not print Editor’s Notes in issue for distribution to Bidders/Contractors.**

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**Red: Text updated in 1st quarter. April – June.**

**Strikethrough text and highlighting (not text) in previously issued quarters are deleted. Only 1st quarter highlighted updated text is indicated.**

**Turquoise: Text updated in 2nd quarter. July – September.**

**1st quarter updated text remains highlighted.**

**Pink: Text updated in 3rd quarter. October – December.**

**1st and 2nd quarter updated text remain highlighted.**

**Bright Green: Text updated in 4th quarter. January – March.**

**1st, 2nd and 3rd quarter updated text remains highlighted.**

**Text Editing**

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**IMPORTANT: Retain month and year under section title on first page indicating updated Guide Specification Section issue used.**

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NOTE, TURN THEM ON AS FOLLOWS.

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CORNER OF MENU BAR. CLICK ON WORD OPTIONS AT BOTTOM OF DROP DOWN. THEN CLICK

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SECTION 03 35 43.01

POLISHED CONCRETE FLOOR FINISHING FOR EXISTING FACILITIES

(DeCA June 2022 Design Criteria)

1. GENERAL
	* + 1. SECTION INCLUDES
				1. Installation of polished concrete floor system for existing interior concrete floors by ~~dry~~ grinding, application of concrete densifier and polishing with various size grit metal-bonded and resin-bonded diamonds to the scheduled specified minimum local and overall gloss values.
				2. Removal of existing flooring as indicated on drawings and all underlayment products.
			2. RELATED SECTIONS
				1. Section 03 30 00 – Cast-in-Place Concrete.
				2. Section 03 35 40 – Interior Concrete Slab Repairs and Joint Filler Replacement.
			3. REFERENCES
				1. ACI 310 – Guide to Decorative Concrete.
				2. ASTM D 523 – Standard Test Method for Specular Gloss.
				3. ~~Slip Testing – Floor testing to be completed per ASTM D-2047, ANSI B101.1 & B101.3.~~
			4. SUBMITTALS
				1. Product Data:

Provide manufacturer's equipment product data sheets for:

Planetary grinder polishing equipment.

Planetary grinder HEPA dust collection equipment.

Hand tools.

Hand tool dust collection equipment.

Diamond tooling.

High speed propane burnisher.

Manufacturer’s chemical and product data sheets for:

Liquid reactive surface densifier.

Liquid stain guard treatment.

Polishable overlay product.

Acrylic sealer if required.

* + - * 1. Installer Certification:

Provide list of 5 projects performed with last three years of similar type, size and complexity. Submit project names, addresses, contacts and phone numbers for each project. General Contractor is to validate references and polisher’s capabilities prior to submitting bid to the Contracting Officer.

Applicator Qualifications: Submit letter of certification from each of the following manufacturers of products and equipment specified herein, stating that the applicator is a certified applicator of the system and is familiar with proper procedures and installation methods as required by the manufacturer.

Planetary grinder system.

Liquid reactive surface densifier and stain guard treatment.

* + - * 1. Pre-Certified Installers:

Bidding Installers must complete certification for this project. Below is a list of pre-approved applicators.

|  |  |  |
| --- | --- | --- |
| *Company Name* | *Phone*  | *Contact* |
| American Concrete Concepts Inc | 877-775-0030 | Brent Schmiegelow |
| ~~Applied Flooring USA~~ | ~~517-712-0052~~ |  |
| Ambient Flooring | 201-941-8477 | Tom Stapleton |
| Budget Maintenance Concrete | 610-323-7702 | Bill O’Brian |
| ~~Concrete Floor Systems~~ | ~~303-495-5692~~ |  |
| Concrete Arts | 715-377-0904 | Tom Graf |
| Diama-Shield | 888-730-4075 | Chris Sibley |
| Industrial Applications | 901-794-4334 | Jay Thomason |
| Pacific Decorative Concrete | ~~916-725-9269~~ 888-776-1111 | David Stratton |
| ~~Perfect Polish Inc.~~ | ~~877-917-4463~~ |  |
| ~~Preferred Global~~ | ~~800-317-2450~~ |  |
| Premier Concrete Construction | 603-654-2471 | Eric Traffie |

\*\*Refer to specifications Division 1 for substitution qualifications. Any potential Installer substitution must have their complete submittal package submitted in writing through the General Contractor a **minimum of 10 days** prior to bid date to the Government’s Polishing Consultant for review and approval.

* + - * 1. Submittal List:

 Reference Submittal Item Quantity Action

1.4A Product Data X R

1.4B Installer Certification X R

1.4C Pre-Certified Installers X R

 X Submit quantity specified in Division 01 Section Administrative Requirements.

 R Review each submittal, mark to indicate action taken, and return.

 I Submittal is for information or record purposes only. No action will be taken*.*

* + - 1. QUALITY ASSURANCE
				1. Regulatory Requirements:

Accessibility Requirements: Comply with applicable requirements of the Architectural Barriers Act for Buildings and Facilities; Final Guidelines, revisions, and updates for static coefficient of friction for walkway surfaces.

Environmental Requirements: Comply with current Federal and local toxicity and air quality regulations and with Federal requirements on content of lead, mercury, and other heavy metals. Do not use solvents in floor polish products that contribute to air pollution or impact food quality.

* + - * 1. Manufacturer Qualifications:

A firm with a minimum of 5 years experience in manufacturing concrete floor polishing product systems.

Firm shall have completed work similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance

* + - * 1. Government reserves the right to engage the services of a Consultant to review, observe, and inspect the work in progress
				2. Pre-installation Meeting:

General contractor shall schedule and convene a pre-installation meeting at the project site before start of installation of polished concrete floor system. Notify Contracting Officer a minimum of (21) twenty-one days in advance of meeting date.

Meeting shall occur after review and approval of required submittals and completion of test panel mock-up, including specified grinding, polishing, joint filling, spall and crack repairs, and specified overall gloss values.

Attendance of parties directly affecting work of this section shall include:

General Contractor.

Polishing Subcontractor, including Project Manager and Foreman.

Contracting Officer

Government Authorized Technical Representative

Government’s Polishing Consultant.

Meeting agenda shall include (but not limited to): Review of existing conditions, surface preparation, system installations, field quality control, protection, environmental requirements, coordination with other work, controls to limit damage from dust and field quality control methods and reporting.

* + - 1. MOCK-UP
				1. Provide benchmark mock-up to verify finish indicated and to demonstrate aesthetic effects and set quality standards for materials and execution, i.e., typical joints, surface finish, color variation (if any), and standard of workmanship.
				2. Polished concrete floor finish mock-up, shall be a minimum of 250 square feet, illustrating completed finish including all specified liquid surface treatments and specified gloss levels.
				3. Mock-up shall include properly installed joint treatment and correctly repaired surface spalls in any color for the purpose of judging workmanship. Colors for repair material (section 033540) shall be reviewed, selected and approved with review of mock-up.
				4. For color testing purposes, half of the sample area shall include completed stain guard application and half shall not include stain guard application.
				5. The sample shall include edge finishing treatments, as specified, for the purpose of review.
				6. Locate mock-up where directed by Contracting Officer and Government’s Polishing Consultant.
				7. If Government’s Polishing Consultant determines that mock-up does not meet requirements, re-finish floor sample in new location until mock-up is approved.
				8. Accepted mock-up will serve as standard to judge quality and workmanship of completed polished concrete floor finish.
				9. Accepted mock-up shall remain as part of finished product.
			2. DELIVERY, STORAGE AND HANDLING
				1. Deliver materials in original containers, with seals unbroken, bearing manufacturer labels indicating brand name and directions for storage. Dispense special concrete finish material from factory numbered and sealed containers. Maintain record of container numbers.
			3. PROJECT CONDITIONS
				1. Sequence application of concrete polishing after completion of other construction activities that would be damaging to the completed polished concrete finish.
				2. Close areas to traffic during and after floor application for time period recommended in writing by manufacturer.
			4. WARRANTY
				1. Special Warranty:

Manufacturer's standard form in which manufacturer agrees to repair or replace Special Concrete Floor Finish System that fails in materials or workmanship within 1 year from the date of Substantial Completion of the project.

Densifier manufacturer to provide a 10 year product and labor warranty against dusting.

1. PRODUCTS
	* + 1. MANUFACTURERS
				1. Basis‑of‑Design Products: To establish the significant qualities related to type, function, dimension, in‑service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of other manufacturers, a specific manufacturer's products and system are named and accompanied by the words "basis of design," including make or model number or other designation. Subject to compliance with requirements, provide either the named products or equal products.
			2. INSTALLATION EQUIPMENT
				1. Floor Grinder:

Basis of Design: Machinery manufacturer will be HTC, SASE, Husqvarna, Concrete Polishing Solutions, ~~Diamatic~~ or PrepMaster.

Type: Multi-orbital, planetary-action, opposing-rotational, 3 or 4 diamond-headed floor grinders.

Weight: 850 pounds or more.

Grinding Pressure: 600 pounds minimum.

* + - * 1. Dust Extraction System and Pre-Separator for Grinding/Polishing:

Heavy-duty industrial HEPA filtration vacuum system, suitable for extracting and containing large quantities of fine concrete dust (minimum 350 CFM air flow) in conjunction with manufacturer recommended pre-separator.

~~HTC 86D~~

T18000 by Husqvarna

T8600 by Pullman Ermator Inc.

Bull 1250 by SASE Company

Approved equal.

* + - * 1. Diamond Tooling for Initial Grinding and Preparing Floor for Polishing:

Metal Bonded Diamonds: Grit Size: 40, 80, and 150.

* + - * 1. Diamond Tooling for Polishing Concrete:

Resin Bonded, Phenolic Diamonds: Grit Size:100, 200, 400, 800, and 1500 or equivalent.

* + - * 1. Grinding / Polishing Pads for Edges:

Grit Size: 80, 100, 120, 200, 400, 800, 1500, and 3000.

* + - * 1. Hand Grinder with dust extraction attachment and pads.
				2. High speed propane burnisher.

Minimum 27-inch head generating pad speeds of 2,500 RPM or higher.

* + - * 1. Diamond Impregnated Burnisher Pads \*\*800 Grit Only.

Diamond Cleaning System Pads by Twister

Diamond Polishing Pads by Norton

SpinFlex Diamond Polishing Pads by CPS

* + - 1. MATERIALS
				1. Penetrating Hardener/Densifier: Clear liquid reactive ~~lithium-~~silicate based.

Products:

RetroPlate 99 by Advanced Floor Products

Consolideck LS by Prosoco

~~FGS Permashine by L&M Construction Chemicals~~

3D HS Densifier by Ameripolish

Substitutions by Approval Only

* + - * 1. Protective Surface Treatment (Stain Guard)

Products:

SR2 Stain Protector by Ameripolish

SPR3 by SASE Company

RetroPel by RetroPlate

PETROTEX by Laticrete

Substitutions by Approval Only

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine floor to receive polished concrete floor system.
				2. Notify the Contracting Officer of conditions that would adversely affect installation or subsequent use prior to commencement of polishing.
				3. Do not begin surface preparation or installation until completion of slab repairs and joint fillers per section 033540.
			2. SURFACE PREPARATION
				1. Protection: Protect surrounding areas and adjacent surfaces from the following:

Minimal accumulation of dust from grinding and polishing.

Contact with overspray of penetrating hardener / densifier.

Contact with overspray of protective surface treatment (stain guard).

Contact with joint filler, crack or spall repair materials.

* + - * 1. Completely remove existing mastics, adhesives, self-leveling underlayment fillers and other foreign matter.
				2. 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.
			1. INSTALLATION
				1. Install polished concrete floor system in accordance with manufacturer’s instructions at locations indicated on Drawings.
				2. When multiple phases are indicated by the drawings allow for 3 feet of overlap between the phases to allow the polished concrete to be blended from one phase to the next.
				3. Aggregate Exposure

Fine Aggregate: Mottled salt-and-pepper aggregate exposure.

* + - * 1. Polished Concrete Floor System

Open Slab Surface

To provide a uniform final polish begin grinding with 40-grit metal bond. Expose coarse concrete aggregate when required to reach lows spots within floor surface.

Review condition of floor with Contracting Officer and Government’s Polishing Consultant. Obtain approval from Contracting Officer if large coarse aggregate is required to be exposed to correct slab deficiencies. Variations to the precise grinding, densifying, polishing and stain guard application are anticipated, but must be discussed and approved in writing by the Contracting Officer prior to executing the work.

Progressive edge grinding will be necessary with 1/2” of all vertical abutments, including walls, cases, columns, posts and racking systems.

Remove metal-bonded diamond scratches by grinding with progressively finer metal-bonded diamonds, up to metal bond 80-grit.

Remove metal-bonded diamond scratches by grinding with progressively finer metal-bonded diamonds, up to metal bond 150-grit.

Joint filler shall be flush with surface after grinding steps. Additional passes along curled joints may be necessary to even the surfaces and remove joint filler chatter.

Apply Densifier

Apply densifier at a rate of **200 square feet per gallon** to ensure complete acceptance of the densifier product at the recommended step per manufacturer’s recommendations. If dye is called for apply densifier after dye application.

Floor Polishing

Remove 150-grit metal-bonded diamond scratches by grinding with a transitional diamond per manufacturers recommendation.

Remove transitional resin-bonded diamond scratches by grinding with 100-grit resin-bonded diamonds.

Remove 100-grit resin-bonded diamond scratches by grinding with 200-grit resin-bonded diamonds.

Remove 200-grit resin-bonded diamond scratches by grinding with 400-grit resin-bonded diamonds.

Remove 400-grit resin-bonded diamond scratches by grinding with 800-grit resin-bonded diamonds.

Remove 800-grit resin-bonded diamond scratches by grinding with 1500-grit resin-bonded diamonds.

Apply Stain Guard

Apply in accordance with manufacturer’s published instructions.

Apply first coat per manufacturer’s recommendation (DO NOT OVER APPLY).

Use applicator pad, pre-wetted with stain guard, to pull material out to create a thin film prior to drying.

Remove product completely from areas of over application, as evidenced by surface streaking, and replace with unused stain guard.

Apply second coat of stain guard.

High Speed Burnishing

After each application of stain guard is dry, burnish surface.

Burnish using approved pads, at a slow movement pace using high speed machine with an 800-grit diamond impregnated pads as required to achieve specified gloss requirements.

Burnish with several passes. Make each progressive pass at 90 degrees from previous pass.

~~Burnishing, pad type, and pace of forward movement shall combine to develop a minimum floor surface temperature of 98-degrees F directly below the burnishing pad as continuously measured by the operator during installation.~~

Floor shall meet specular gloss requirements per section 3.4 C.

* + - 1. FIELD QUALITY CONTROL
				1. For phased construction, inspect each portion (phase) of completed polished concrete floor system with Government Representative for compliance and comparison with mock-up. Correct any deficiencies noted.
				2. Government Representative may, at any time, visit site to review all or portions of concrete finishing. Adjust method and/or materials for remaining work per Government provided requirements.
				3. Specular Gloss/Reflectance, ASTM D 523:

Perform polishing and burnishing work necessary to produce a Specified Overall Gloss Value (SOGV) = 50 prior to applying protective surface treatment, SOGV = ~~60~~ 55 after applying protective surface treatment, Minimum Local Gloss Value (MLGV) = 40 after applying protective surface treatment as measured using a Horiba IG-320 60 Degree Gloss Checker.

Gloss shall be considered as a quantitative value that expresses the degree of reflection when light hits the concrete floor surface. Gloss measurements will be taken independent of ambient lighting and will be taken within a sealed measurement window located beneath the test unit.

Collects 12 readings minimum, throw out low and high measurements and average remaining measurements. Average shall exceed SOGV. No single measurement shall be less than MLGV.

* + - * 1. ~~Slip testing shall be performed on the completed polished concrete flooring. A certified walkway auditor shall use an approved Tribometer to provide DeCA with testing per ASTM D-2047 and ANSI B101.1 and B101.3. Testing to be provided to the Contracting Officer prior to final acceptance of the polished concrete flooring.~~
			1. PROTECTION
				1. Protect completed polished concrete floor system from damage until current phase is turned over to Government.

Do not allow vehicle and pedestrian traffic on unprotected floor.

Do not allow construction materials, equipment, and tools on unprotected floor.

Prohibit parking of vehicles on concrete slab.

If construction equipment must be used for application, diaper components that might drip oil, hydraulic fluid, or other liquids.

No tire embedments (rocks, nails, screws, etc.) that will scratch or pit slab surface. All lifts on site must use canvas tire bags to prohibit screws and nails from penetrating the rubber tires.

Prohibit pipe cutting or threading using machinery on concrete slab.

Prohibit temporary placement and storage of steel members on concrete slab.

Prohibit acids and acidic detergents from contacting concrete surfaces.

Cover concrete floors with drop cloths or use breathable drop cloths during painting. If paint is spilled on concrete floor, remove paint immediately.

protect completed polished concrete surface from standing moisture for 72 hours to prevent re-emulsification of surface treatment prior to cure

* + - * 1. Immediately remove mortar splatter, spilled liquids, oil, grease, paint, coatings, and other surface contaminants which could adversely affect completed polished concrete floor system.
				2. Repair damaged areas of completed polished concrete floor system to satisfaction of Contracting Officer.

END OF SECTION