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

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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.**

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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 44

**POLISHED CONCRETE OVERLAY**

(DeCA June 2022 Design Criteria)

1. GENERAL
   * + 1. SECTION INCLUDES
          1. Installation of a polished concrete floor system for existing interior concrete floors utilizing a thin, polishable, overlay over the existing concrete substrate and dry grinding, application of concrete densifier, ~~dye,~~ and polishing with various size grit diamonds to achieve 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. ICRI – ICRI-03732 Technical Guidelines.
          4. ~~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:

Floor preparation equipment

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:

Cementous polishable overlay system

Bonding primer for selected overlay system

Liquid reactive surface densifier

Liquid stain guard treatment

Grout material as required by selected overlay manufacturer

Substrate penetrating epoxy repair material as approved by overlay manufacturer

Acrylic sealer if required

* + - * 1. Installer Certification:

Provide list of 3 projects performed with last two 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.

Cementous overlay system manufacturer

Planetary grinder system

Liquid reactive surface densifier and stain guard treatment

* + - * 1. Pre-Certified Installers:

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 Contracting Officer for review and approval prior to the GC accepting a bid from said potential installer.

* + - * 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:

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 overlay flooring system. Notify Contracting Officer a minimum of (21) twenty-one days in advance of meeting date.

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

General Contractor.

Polishing Subcontractor, including Project Manager and Foreman.

Overlay System Manufacturer Technical Representative

Contracting Officer and/or 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-upof Cementous Overlay Placement and Special Concrete Floor Finish System to verify finish indicated and to demonstrate aesthetic effects and set quality standards for materials, placement and execution including mirrored control joints, surface finish gloss level, color variation (if any), and standard of workmanship.
         2. Provide overlay placement and polished concrete floor finish mock-up, a minimum of 250 square feet, illustrating completed finish including dye, all specified liquid surface treatments and specified gloss levels.
         3. Mock-up shall include properly installed joint treatment in any color for the purpose of judging workmanship.
         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. Coordinate location of mock-up with Government Authorized Technical Representative.
         7. If the Contracting Officer determines that mock-up does not meet requirements, re-finish floor sample 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 overlay placement and concrete polishing after completion of other construction activities that would be damaging to the completed 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 Concrete Overlay Placement and Special Concrete Floor Finish System where materials fail within period of one year from the date of Substantial Completion of the project

Overlay Manufacturer and Installation Contractor shall provide a 5 year product and labor warranty against delamination from the date of Substantial Completion of the project.

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 Preparation Equipment:~~

~~As approved by the Overlay Manufacturer to provide a CSP 3-4.~~

* + - * 1. Floor Grinder:

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

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

Weight: 650 pounds or more.

Grinding Pressure: 400 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:

Per Manufacturer’s recommendations.

* + - * 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: Per Manufacturer’s instructions.

* + - * 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:

Per Manufacturer’s Recommendations

* + - 1. MATERIALS
         1. Polishable Overlay Topping Manufacturer:

Products:

Ultratop PC by Mapei Cements

~~Tru PC by CTS Cement~~

K 521 by Ardex

No substitutions.

* + - * 1. All system chemicals per Manufacturer’s written installation instructions.
        2. ~~Solvent Based Dye:~~

~~AmeriPolish Classic Dye; Color: Caramel~~

~~No substitutions.~~

1. EXECUTION
   * + 1. EXAMINATION
          1. Examine floor to receive cementitious overlay and polished concrete floor system.
          2. Notify the Contracting Officer of conditions that would adversely affect installation or subsequent use prior to commencement of preparation for overlay placement.
          3. Do not begin surface preparation or installation until completion of slab repairs per manufacturer’s instructions.
       2. SURFACE PREPARATION
          1. Perform Mohs hardness testing on any areas where the concrete appears to be soft, chalky, sandy or overly porous. If the Mohs hardness testing shows a 4.5 or less perform internal hardening procedures using a high viscosity penetrating epoxy or polyurethane product per manufacturer’s recommendations prior to profiling the surface. If the Mohs hardness is 5 or higher internal hardening is not required.
          2. Provide a minimum surface profile ~~of CSP 4 prior to installation of the system bonding primer. Method for profiling is to be~~ per manufacturers written instructions ~~but no less than a CSP 4~~.
          3. Repair all holes, spalls, broken joints and cracks per manufacturer’s instruction.
          4. Protection: Protect surrounding areas and adjacent surfaces from the following:

Damage caused during the floor preparation.

Contact with the bonding epoxy.

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.

Contact with dye.

* + - * 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 system bonding epoxy.
        3. Prior to installation of the bonding primer epoxy, a manufacturer’s rep must review the site and verify that the substrate is clean, free of all foreign material, meets CSP requirements and all other requirements. Agreement of this will be provided in writing by manufacturer’s rep to general contractor and contracting officer to be included in the project records.
      1. INSTALLATION
         1. Install cementitious polished concrete overlay system where indicated on drawings and per manufacturers installation instructions.
         2. Install polished concrete floor system in accordance with manufacturer’s instructions at locations indicated on the Drawings.

Ensure that the manufacturer’s required minimum thickness is closely monitored throughout the installation. DeCA reserves the right to verify thickness at any location of the project to ensure that manufacturer’s requirements are closely followed.

* + - * 1. Aggregate Exposure:

Fine Aggregate: Per overlay system samples provide a mottled salt-and-pepper aggregate exposure.

* + - * 1. Polished Concrete Floor System

Remove surface paste as required to provide a uniform final polish and remove any application marks grind the surface per manufacturer’s instructions.

Variations to the color, application process, precise grinding, densifying, polishing and stain guard application are anticipated.

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

Honor all control joints from the substrate slab. If required add additional control joint cuts to ensure that no single area spans larger than a 20 foot by 20 foot area without control joints. The only time this is not required is if the substrate slab was placed as a post tension slab.

Grind the overlay per manufacturer’s specific steps to provide a smooth, easily maintainable surface.

Joint filler shall be flush with surface after grinding steps.

~~Apply Dye~~

~~Concrete surfaces shall be dry and properly prepared as described above. Protect surrounding areas from over-spray, run-off and tracking. Divide surfaces into small work sections using wall, joint lines, or other stationary breaks as natural stopping points.~~

~~Apply initial dye application at the coverage rate recommended by the manufacturer and use application equipment described in the manufacturer’s recommendations.~~

~~Drying time depends on concrete porosity, temperature, and humidity levels.~~

~~The color of the liquid dye is not necessarily indicative of the final color produced on the concrete substrate as the dye is translucent and final color achieved will be influenced by the color of the concrete floor slab onto which the dye is applied.~~

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

Floor Polishing:

Per manufacturer’s specific instructions to provide a smooth, well-polished, high gloss and easily maintainable finish.

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 overlay placement and polished concrete floor system with the Government Authorized Technical Representative for compliance and comparison with mock-up. Correct any deficiencies noted by TI.
         2. Contracting Officer or his Consultant 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~~ 45 prior to applying protective surface treatment, SOGV = ~~60~~ 50 after applying protective surface treatment, Minimum Local Gloss Value (MLGV) = ~~40~~ 35 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 per 20,000 square feet, 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