SECTION 03 35 01

COLORED CONCRETE FINISHING

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ONLY APPROVED APPLICATORS MAY APPLY THE CONSOLIDECK® HIGH PERFORMANCE CONCRETE FLOOR SYSTEM. CONTACT PROSOCO, INC CUSTOMER CARE at 800-255-4255 FOR A LISTED APPLICATOR.

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**TIPS:**

To view non-printing **Editor's Notes** that provide guidance for editing, click on the Show/Hide button or Word 2010 offers a convenient keyboard shortcut; press the Ctrl+\* keystroke to toggle on/off. (Press the Ctrl key, Shift key, and the number 8 simultaneously).

**PART 1 GENERAL**

1.01 SUMMARY

* 1. Section Included
		1. Opening the slab surface to receive colored reactive, penetrating liquid hardener.
		2. Application of colored reactive, penetrating liquid hardener to interior concrete.
		3. Refining the interior concrete slab with a diamond-impregnated burnishing system.
		4. Application of protective surface treatment.
	2. Related Requirements
		1. Section 01 25 00- Substitution Procedures.
		2. Section 01 33 00- Submittal Procedures.
		3. Section 01 45 80- Testing Laboratory Services.
		4. Section 01 60 00- Product Requirements.
		5. Section 03 30 00- Cast-in-Place Concrete.
	3. REFERENCES
	4. The date of the standard is that in effect as the date of receipt of bids for the project.
	5. American Concrete Institute (ACI) – Specification for Polished Concrete Slab Finishes ACI 310.1-20.
	6. Living Building Challenge (LBC).
	7. Scientific Certification System (SCS) Indoor Air Quality Gold Certification.
	8. American National Standard Institute / National Floor Safety Institute:
		1. ANSI B101.1-Test Method for Measuring Wet SCOF of Common Hard-Surface Floor Materials.
		2. ANSI B101.3-Test Method for Measuring Wet DCOF of Common Hard-Surface Floor Materials.
	9. ASTM International (ASTM):
		1. C1028 - Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method.
		2. C1353- Standard Test Method for Abrasion Resistance of Dimension Stone Subject of Foot Traffic Using a Rotary Platform, Double-Head Abraser.
		3. D1308- Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
		4. D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers.
		5. E96/96M Method B (Water Method) - Standard Test Methods for Water Vapor Transmission of Materials.
		6. G154 -Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials.
	10. ADMINISTRATIVE REQUIREMENTS
1. Pre-Installation Meeting: Convene before the start of work on new concrete slabs, patching of existing concrete slabs and start of application of concrete finish system.
	* 1. Require attendance of parties directly affecting work of this Section, including the Owner’s Representative, Contractor, Architect, concrete installer, and applicator. Meeting should only convene when required parties are present.
		2. Review the following:
			+ 1. Physical requirements of completed concrete slab and slab finish.
				2. Locations and time of test areas.
				3. Protection of surfaces not scheduled for finish application.
				4. Surface preparation.
				5. Application procedure.
				6. Final appearance of dyed concrete.
				7. Quality control.
				8. Cleaning.
				9. Protection of finish system.
				10. Coordination with other work.
	1. SUBMITTALS
2. Product Data:
	* 1. Submit manufacturer’s product data sheets and tested physical and performance properties on products to be used for the work.
3. VOC Certification: Submit certification that products furnished comply with regulations controlling use of volatile organic compounds (VOC).
4. Certificates:
	1. Certificates by manufacturer stating that installer is listed applicator of special concrete finishes, and has completed the necessary training programs.
	2. Certificates by manufacturer stating that installer is listed applicator of special concrete finishes, and has completed the necessary training programs.
5. Floor Protection Plan.
	1. QUALITY ASSURANCE
6. Installer Qualifications:
	1. Concrete Polishing Council (CPC) Craftsman Supervisor or equivalent on site during work.
	2. Applicator to be familiar with the specified requirements and the methods needed for proper performance of work of this section. Applicator must have availability of proper equipment to perform work within scope of this project on a timely basis. Applicator should have successfully performed a minimum of 5 projects of similar scope and complexity.
7. Mock-up to take place on site, prior to the start of the interior concrete slab surface refinement system.
	1. Require attendance of parties directly affecting work of this Section, including the Contractor, Architect, applicator, and Owner’s Representative.
	2. Notify the above parties one week in advance of date and time when mock-up will be completed.
	3. Demonstrate the materials, equipment and application methods to be used for work specified herein in pre-approved location approximately 50 sq. ft. in area or as directed by the [Architect][ Owner’s Representative].
	4. Retain acceptable mock-up during construction as a standard for judging the completed work. Areas may remain as part of the completed work.
	5. DELIVERY, STORAGE AND HANDLING
		1. Deliver materials in original containers, with seals unbroken, bearing manufacturer labels indicating brand name and directions for storage.
		2. Store concrete hardener/densifier and surface protectant treatment in environment recommended on published manufacturer’s product data sheets.
8. Store containers upright in a cool, dry, well-ventilated place, out of the sun with temperature between 40 and 100 degrees F (4 and 38 degrees C).
9. Protect from freezing.
10. Store away from other chemicals and potential sources of contamination.
11. Keep lights, fire, sparks and heat away from containers.
12. Do not drop containers or slide across sharp objects.
13. Do not stack pallets more than three high.
14. Keep containers tightly closed when not in use.
	1. PROJECT CONDITIONS
15. Environmental limitations:
	1. Comply with manufacturer’s written instructions for substrate temperature and moisture content, ambient temperature and humidity, ventilation, and other conditions affecting topping performance.
16. Close areas to traffic during floor application and after application for time period recommended in writing by manufacturer.
17. Protect the completed slab to prevent damage by the other trades during floor completion.
18. Temperature Limitations:
	* + 1. Apply when surface and air temperature are between 40 degrees F (4 degrees C) and above 95 degrees F (35 degrees C) unless otherwise indicated by manufacturer’s written instructions.
			2. Apply when surface and air temperatures are expected to remain above 40 degrees F (4 degrees C) for a minimum of 8 hours after application, unless otherwise indicated by manufacturer’s written instructions.
19. Apply when air conditions are calm to minimize surface treatment contacting surface not intended to be finished.
20. Do not apply to frozen substrate. Allow adequate time for substrate to thaw, if freezing conditions exist before application.

**PART 2 PRODUCTS**

* 1. MANUFACTURERS
		1. Substitutions: [No Substitutions] [In accordance with Section 01 25 00 – Substitution Procedures].
	2. MATERIALS
		1. Concrete Cleaner: Provide appropriate cleaner to ensure slab surface is free of oil, grease, dirt, and curing compounds, as recommended by colored concrete hardener/densifier manufacturer.
			1. Products: Subject to surface conditions, provide the following concrete cleaners:
				1. Consolideck Cleaner/Degreaser manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, [www.prosoco.com](http://www.prosoco.com).
				2. Consolideck Wax & Cure Remover manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
				3. Consolideck Cure & Seal Remover manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
		2. Non-fuming Concrete Cleaner and Surface Preparation Product: Provide non-fuming cleaner to prep surface for application of colored concrete hardener/densifier.
			+ 1. Consolideck SafEtch manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
		3. Color Concentrate for use with Reactive Penetrating Liquid Hardener/Densifier: Water-reducible formulation that penetrates and colors cementitious surfaces.
			1. Product: Consolideck ColorHard manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
				1. Color: [Architect to complete].
			2. Subject to compliance with the following requirements:
				1. Living Building Challenge 2.0/2.1/3.1 Red List Compliant.
				2. Recipient of Scientific Certification System (SCS) Indoor Air Quality Gold Certification.
				3. Comply with national, state and district AIM VOC regulations.
		4. Clear, Reactive, Penetrating Liquid Hardener
			1. Product: Consolideck LS/CS, manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
			2. Subject to compliance with the following requirements:
				1. Living Building Challenge 2.0/2.1/3.1 Red List Compliant.
				2. Recipient of Scientific Certification System (SCS) Indoor Air Quality Gold Certification.
				3. Comply with national, state and district AIM VOC regulations and be 50 g/L or less.
				4. Abrasion Resistance: Greater than 50 percent improvement over untreated samples when tested in accordance with ASTM C1353.
				5. Achieve ‘High Traction Range’ readings when tested in accordance with ANSI B101.1 and ANSI B101.3.
				6. Coefficient of Friction: Greater than 0.60 dry, Greater than 0.60 wet when tested in accordance with ASTM C1028.
				7. Adhesion: Greater than 10 percent increase in pull-off strength when compared to an untreated sample when tested in accordance with ASTM D4541.
				8. Water Vapor Transmission: 100 percent retained when compared to untreated samples when tested in accordance with ASTM E96/96M Method B (Water Method).
				9. UV Stability: No degradation or yellowing of material when tested in accordance with ASTM G154.
		5. Interior Concrete Protective Treatments:

Retain subparagraph below if a general purpose, high gloss protective treatment is required. Use to improve the surface sheen, and surface hardness.

* + - 1. General Purpose high-gloss film forming premium sealer, lithium silicate hardener/densifier.
				1. Product: Consolideck LSGuard, manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
				2. Subject to compliance with the following requirements:
				3. Living Building Challenge 2.0/2.1/3.1 Red List Compliant.
				4. Recipient of Scientific Certification System (SCS) Indoor Air Quality Gold Certification.
				5. Comply with national, state and district AIM VOC regulations.
				6. Registered as an approved NSF International/Nonfood Compound Registration.
				7. Achieve ‘High Traction Range’ readings when tested in accordance with ANSI B101.1.
				8. Coefficient of Friction: Greater than 0.60 dry, Greater than 0.60 wet when tested in accordance with ASTM C1028.
				9. Adhesion: Greater than 10 percent increase in pull-off strength when compared to an untreated sample when tested in accordance with ASTM D4541.
				10. UV Stability: No degradation or yellowing of material when tested in accordance with ASTM G154.

Retain subparagraph below if a general purpose, medium gloss protective treatment is required. Use to treat surfaces to increase resistance damage from water, staining and abrasion.

* + - 1. General Purpose medium gloss, film forming sealer
				1. Product: Consolideck PolishGuard, manufactured by PROSOCO, Inc., Lawrence, KS, (800) 255-4255, www.prosoco.com.
				2. Subject to compliance with the following requirements:

Living Building Challenge 2.0/2.1/3.1 Red List Compliant.

Recipient of Scientific Certification System (SCS) Indoor Air Quality Gold Certification.

Comply with national, state and district AIM VOC regulations.

Achieve ‘High Traction Range’ readings when tested in accordance with ANSI B101.1 and ANSI B101.3.

Coefficient of Friction: Greater than 0.60 dry, Greater than 0.60 wet when tested in accordance with ASTM C1028.

Stain Resistance: Achieve limited or no adverse effects when tested in accordance with ASTM D1308.

UV Stability: No degradation or yellowing of material when tested in accordance with ASTM G154.

* 1. EQUIPMENT
		1. Auto Scrubber Machine: For cleaning operations.
		2. Interior Concrete Slab Surface Refinement System:
			1. Burnishing Machine and Diamond Impregnated Burnishing Pads to produce specified results.
				1. Burnishing Machine: High speed burnisher, generating pad speeds of 1,500 RPM or higher, as recommended by diamond impregnated burnishing system manufacturer. Dust skirt must be installed at time of work.
				2. Diamond Impregnated Burnishing Pads:
				3. Resin Diamond Pad Grit Sizes: 200, 400, 800, 1500 or 3000 grit.

**PART 3 EXECUTION**

* 1. EXAMINATION
1. Examine substrate with installer present for conditions affecting performance of finish. Correct conditions detrimental to timely and proper work. Notify the [Architect][ Owner’s Representative] in writing of conditions detrimental to the proper and timely completion of the work.
2. Do not begin installation until unsatisfactory conditions are resolved. Beginning work constitutes acceptance of site conditions and responsibility for defective installation caused by prior observable conditions.
	1. PREPARATION
3. Clean dirt, dust, oil, grease and other contaminants that interfere with penetration or performance of specified product from surfaces.
	1. Use appropriate concrete cleaners approved by the concrete surface treatment manufacturer where necessary to strip contaminants.
	2. Neutralize and rinse thoroughly using approved cleaner/degreaser as approved by the concrete surface treatment manufacturer to remove residue. Allow surfaces to dry completely before application of product.
4. Repair, patch and fill cracks, voids, defects and damaged areas in surface as approved by the Architect. Allow repair materials to cure completely before application of product.
5. Variations in substrate texture and color will affect final appearance and should be corrected prior to application of sealer/hardener system and the polishing steps.
6. Protect surrounding areas prior to application. If product is accidentally misapplied to adjacent surfaces, flush with water immediately before material dries.
7. Avoid contact in areas not to be treated. Avoid contact with metal, glass and painted surfaces.
8. Do not proceed until unsatisfactory conditions have been corrected.
	1. INTERIOR CONCRETE SLAB SURFACE REFINEMENT SYSTEM
9. Sequential progression of surface refinement shall be required and limited to no more than double the grit value of the previous diamond grit used.
10. Overlap adjacent burnishing passes by 25 percent
11. Perform each pass perpendicular to the other pass north/south then east/west; multiple passes may be needed.
12. Progressively refine surface utilizing approved diamond impregnated burnishing system, to produce Finishing Requirements.
	1. Apply non-fuming concrete cleaner and surface preparation product on concrete to open the surface pores and ensure uniform color per concrete surface treatment manufacturer prior to 200 grit diamond pad.
	2. Rinse thoroughly.
	3. APPLICATION OF COLOR DENSIFICATION
13. Areas to be treated:
	1. Interior Concrete, where shown on drawings to be colored.
14. Clean slab after opening up the slab with approved non-fuming concrete cleaner and diamond impregnated burnishing pads prior to application of Color Concentrate for reactive, penetrating liquid hardener.
15. Using low-pressure spray and a conical spray tip, apply enough pre-mixed, ready-to-use Color Concentrate with reactive, penetrating liquid hardener to wet the surface without producing puddles, per manufacturer’s published instructions. Do not over apply. Do not atomize. Mix product well and often during application.
16. Spread the product. Do not overwork or spread once drying begins. For a more mottled appearance, spray-apply without spreading.
17. On smooth surfaces, spread with a clean microfiber pad prewet with prepared Color Concentrate with reactive, penetrating liquid hardener. Apply in a smooth, irregular pattern to minimize streaks.
18. Allow the floor to dry for at least one hour. Stay off wet surfaces.
19. Repeat above steps for increased color intensity and surface hardening.
20. After drying and final application of color concentrate, burnish slab surface to remove excess color and enhance surface sheen.
	1. APPLICATION OF CONCRETE PROTECTIVE SURFACE TREATMENT
21. Areas to be treated:
	1. Interior Concrete, where shown on drawings to be colored.

Retain paragraph below if a general purpose, high gloss protective treatment is required.

1. Application of general purpose, high gloss protective treatment:
	* + 1. Apply per manufacturer’s published recommendations to clean, dry slab after color densification to the slab surface.
			2. Lightly wet a clean microfiber pad with concrete protective treatment and wring out excess, leaving the pad damp.
			3. Working from one control joint to another, apply a light, fine spray of concrete protective treatment to a small section of the floor using a clean, pump-up sprayer fitted with a 0.5 gpm spray tip , at an estimated coverage rate of 2000 to 3000 square feet per gallon.
			4. Using the damp microfiber pad and firm downward pressure, immediately spread the protective treatment to produce a thin, even coating. Spread the product as far as possible while maintaining a wet edge. Properly applied, protective treatment dries quickly. Stop spreading once drying begins. Avoid overlapping.
			5. Allow to dry tack free, typically 20 to 60 minutes.
			6. Once dry, high- speed burnish slab surface fitted with burnishing pad to increase gloss and to help the treatment fuse and bond with the concrete for increased durability and longevity. Surface temperatures immediately behind the burnisher must achieve 90.5 degrees Fahrenheit. (Burnish between coats if multiple applications are desired.)
			7. Repeat above steps 1 through 6, as necessary for additional applications of protective treatment, to achieve desired final finish (Maximum 3 coats).

Retain paragraph below if a general purpose, medium gloss protective treatment is required.

1. Application of general purpose, medium gloss protective treatment:
	* + 1. Apply per manufacturer’s published recommendations to clean, dry slab after the color densification to the slab surface.
			2. Lightly wet a clean microfiber pad with PolishGuard and wring out excess, leaving the pad damp.
			3. Spray-apply protective treatment using a clean, pump-up sprayer fitted with a 0.5 gpm conical or fan spray tip at an estimated coverage rate of 400 to 800 square feet per gallon. Work from one control joint to another.
			4. Spread with the damp microfiber pad. Maintain a thin, even coating and wet edge. Stop spreading once drying begins. Do not overlap. Repeat steps 1 through 4. Two coats are recommended for maximum protection.
	1. SLAB PROTECTION
2. Protect finished floors to prevent damage including staining, gouges and scratching by construction traffic and activities until possession.
3. Do not drag or drop equipment or material across the slab which will scratch or chip it.
4. Inspect tires for debris prior to use on slab. Remove embedded items which may cause damage to floor slab.
5. Clean up spills on slab immediately. Provide cleaning chemicals and absorptive materials.
6. Develop a concrete protection procedure which addresses the following procedures:
	1. Communication of protection plan to subcontractors and vendors.
	2. Procedures for cleaning up slab spills, including use of and availability of cleaning chemicals and absorptive materials at Site.
7. Provide a clean slab using concrete maintenance cleaner within an auto scrubber, equipped with soft nylon brushes, in accordance with manufacturer's recommendations.
	1. FINISHING REQUIREMENTS
8. Appearance: Interior slab areas must consist of the following:
	1. Slab surface must meet the desired sheen and color, as discussed in Pre-Installation meeting and be consistent with approved Mock-up.

END OF SECTION