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Concrete slab densification and polishing with color application

PART 1 GENERAL

1.01 SUMMARY

- A. This section includes the following.
 - 1. Applying Lythic Densifier and polishing concrete to specified finish level.
- B. Related Work:
 - 1. Section 03300 Cast-In-Place Concrete

1.02 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM-C501, Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces
- B. American Concrete Institute
 - 1. ACI 302. 1R-89, Guide for Concrete Floor and Slab Construction
- C. Other Test:
 - 1. Reflectivity

1.03 SUBMITTALS

- A. Comply with pertinent provisions of Section 01600- Product Requirements:
 - 1. Provide submittal information within 35 calendar days after the contractor has received the owner's notice to proceed.
- B. Product data:
 - 1. Submit special concrete finishes manufacturer's specifications and test data.
 - 2. Submit special concrete finishes describing product to be provided, giving manufacturer's name and product name for the specified material proposed to be provided under this section.



3. Submit special concrete finishes manufacturer's recommended installation procedures; which when approved by the Architect, will become the basis for accepting or rejecting actual installation procedures used on the work.
 4. Submit special concrete finishes technical data sheet giving descriptive data, curing time, and application requirements.
 5. Submit special concrete finishes manufacturer's Material Safety Data Sheet (MSDS) and other safety requirements.
 6. Follow all special concrete finishes published manufacturer's installation instructions.
- C. Test Reports:
1. Provide certified test reports, prepared by an independent testing laboratory, confirming compliance with specified performance criteria.
- D. Samples:
1. Each floor has its own unique appearance when completed. Manufacturer's lab samples are supplied only to show a smooth shiny surface. The final appearance of the finished floor cannot be guaranteed to match a sample due to the natural variations in concrete.
- E. Product Variations:
1. The variegated colors produced are unique to each concrete surface and depend on the chemical composition, mix design, porosity, age, texture, and color of the concrete substrate. Mottling and wide variations in color and intensity may occur. If contaminants remain on the surface, the penetration of Lythic Densifier and colors may be blocked. Concrete from different loads or pours, and in patched in areas, may appear significantly different in color than adjacent areas, when treated with acid stains, dyes and densified.

1.04 QUALITY ASSURANCE

- A. Installer Qualifications:
1. Use a certified installer and an adequate number of skilled workmen who are thoroughly trained and experienced in the necessary craft.
 2. The special concrete finish manufacturer shall certify applicator.
 3. Applicator shall 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 at least 5000 square feet each.



- B. Manufacturer's Certification:
 - 1. Provide letter of certification from concrete finish manufacturer stating that installer is certified applicator of special concrete finishes, and is familiar with proper procedures and installation requirements required by the manufacturer.

- C. Mock-ups:
 - 1. Apply mock-ups of each type finish, to demonstrate typical joints, surface finish, color variation (if any), and standard of workmanship.
 - a. Build mock-ups approximately 20 square feet in the location indicated or if not indicated, as directed by the Architect or Owner Representative.
 - b. Notify Architect or Owner Representative seven days in advance of dates and times when mock-ups will be constructed when practical.
 - c. Obtain from the Architect or Owner Representative approval of mock-ups before starting construction.
 - d. If the Architect or Owner Representative determines that mock-ups do not meet requirements, demolish and remove them from the site and cast others until mock-ups are approved.
 - e. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work.
 - f. Approved mock-ups may become part of the completed work if undisturbed at time of substantial completion.

- D. Protection
 - 1. No satisfactory chemical or cleaning procedure is available to remove petroleum stains from the concrete surface. Prevention is therefore essential.
 - a. All hydraulic powered equipment must be diapered to avoid staining of the concrete.
 - b. No trade will park vehicles on the inside slab. If necessary to complete their scope of work, drop cloths will be placed under vehicles at all times.
 - c. No pipe cutting machine will be used on the inside floor slab.
 - d. Steel will not be placed on interior slab to avoid rust staining.
 - e. All equipment must be equipped with non-marking tires.

- E. Pre-Installation Conference:
 - 1. Conduct conference at project site to comply with requirements in Division 1 Section "Project Management and Coordination"

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original containers, with seals unbroken, bearing manufacturer labels indicating brand name and directions for storage.



- B. Dispense special concrete finish material from factory numbered and sealed containers. Maintain record of container numbers.

1.06 PROJECT CONDITIONS

- A. 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.
 - a. Concrete must have a Floor Flatness rating of at least 40.
 - b. Concrete must have a Floor Levelness rating of at least 40.
 - c. Concrete must be cured a minimum of 28 days or as directed by the manufacturer before application of Lythic Densifier can begin.
 - d. Application of Lythic Densifier shall take place 10 days prior to installation of equipment and substantial completion, thus providing a complete, uninhibited concrete slab for application.
- B. Close areas to traffic during floor application and after application, for time period recommended in writing by manufacturer.

PART 2 – PRODUCTS

2.01 MATERIALS AND MANUFACTURERS

- A. Densifying and Sealing Agents
 - 1. Lythic Densifier,
Lythic Protector or Lythic SPD Protector
manufactured by:
Lythic Solutions, Inc., Vancouver, WA
Brad Sleeper, V.P., Sales and Marketing
888 598 4421
 - a. Performance Criteria:
 - i. Abrasion Resistance: ASTM C501
 - 2. Certified Applicator:
- B. Solvent/Water Based Concrete Dye



1. Colors to be chosen and approved by architect.

2.02 RELATED MATERIALS

- A. Water:
 1. Potable

PART 3- EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine substrate, with installer present, for conditions affecting performance of finish. Correct conditions detrimental to timely and proper work. Do not proceed until unsatisfactory conditions are corrected.
- B. Verify that base slab meet finish and surface profile requirements in Division 3 Section "Cast-In-Place Concrete," and Project Conditions above.
- C. Prior to application, verify that floor surfaces are free of laitance and construction materials.
- D. Concrete must be in place a minimum of 28 days or as directed by the manufacturer before application can begin.

3.02 PROCESSING OF FLOORS

- A. Floor surfaces shall be ground to remove surface contamination and (select from the following: minimize aggregate exposure to provide cream finish, expose fine aggregate for salt & pepper finish, expose large aggregate).
- B. Floor surfaces shall be polished to an average minimum gloss meter reading of (Select from the following or adjust as needed 50 matte finish (typically 200-400 grit), 65 medium gloss (typically 800 grit) , 80 high gloss (typically 1500 grit)
- C. Edges shall be polished to match floor area to within 1/8" of wall.
- D. Sealing, Hardening and Polishing of Concrete Surface
 1. Application is to take place at least 10 days prior to racking and other in-store accessory installation, thus providing a complete, uninhibited concrete slab for application



2. Only a certified applicator shall apply Lythic Densifier. Applicable procedures must be followed as recommended by the product manufacturer and as required to match approved test sample.
3. Achieve hardening, dust-proofing, and abrasion resistance of the surface without changing the natural appearance of the concrete, except for the sheen.
4. Finish to within ½” of vertical surfaces where practical.
5. Polish to pre-determined level based on test sample.

C. Dyed Concrete Finish

1. Apply 2 applications of dye where indicated, in accordance with manufacturer’s instructions

D. Sealer

1. Apply “Lythic Protector” (or Lythic SPD Protector where true stain prevention is required) by Lythic Solutions, Inc. on the entire floor as a final finish of the polished concrete. Follow application directions and burnish with the recommended pad for final sheen.

E. Final Protection of Dye Colored Polished Concrete

1. Following completion of the final polishing, surface must be covered to protect from other trades. Cover with breathable product, such as kraft paper or thin curing blanket. DO NOT COVER WITH MASONITE, PLYWOOD OR VISQUINE.

3.03 WORKMANSHIP AND CLEANING

- A. The premises shall be kept clean and free of debris at all times.
- B. Remove spatter from adjoining surfaces, as necessary.
- C. Repair damages to surface caused by cleaning operations.
- D. Remove debris from jobsite
 1. Dispose of materials in separate, closed containers as provided by the owner, and in accordance with local regulations.

3.04 SPECIFIC QUALIFICATIONS / EXCLUSIONS (NOTE: This section, though not mandatory, will greatly improve the understanding of necessary procedures for performing this work properly.)



- A. Any unforeseen or hidden conditions requiring repair will be billed at time and materials basis.
- B. Assumption that there is adequate access to electrical and water, and that adequate lighting is provided. 3 Phase, 50 amp service required.
- C. It is the responsibility of the owner to provide adequate waste slurry disposal.
- D. That the floor has not been exposed to the elements. If weather damage has occurred, additional grinding will be at time and materials.
- E. Removal of contamination of the slab by soil, foot prints, drag marks, welding marks, hydraulic fluids, or any other outside contaminant will be at time and materials, and will be performed to the best of ability, but without guarantee of removal.
- F. NOTE: Part of the cleaning and sealing of concrete is a wet process and could damage adjacent surfaces, on the immediate floor area, or even the floor levels below. The applicator will endeavor to tape and protect areas adjacent to their work areas to the best of their abilities, but in no case will they be held liable for water damage that occurs to electrical equipment, ceiling tiles, light fixtures, or other adjacent finishes.
- G. No other trades will be allowed in the area being worked on due to possible safety and floor contamination issues.
- H. The areas to receive Lythic Densifier will be delivered to the applicator in clean and swept condition. All equipment and supplies will be removed prior to turning the space over to the applicator. If the applicator is required to clean the space, and/or move other's supplies, staging and equipment, it will be done at time and materials.
- I. If a curing agent establishes a bond barrier and requires removal prior to the application of the densifier/hardener, this will be done at time and material.
- J. PROTECTION OF THE FLOOR IS THE RESPONSIBILITY OF THE OWNER.

3.05 PROTECTION

- A. Protect finished work until fully cured in accordance with manufacturer's recommendations.
- B. If finished at 120 grit level, General Contractor shall protect finished areas from excessive water for a period of 30 days (i.e. standing water.)

END OF SPECIFICATION