

SECTION 033510 - POLISHED CONCRETE FINISHING - ALTERNATE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes

1. Dyed and polished concrete.

1.2 REFERENCES

A. American Concrete Institute (ACI):

1. ACI 302.1R Guide for Concrete Floor and Slab Construction.

B. ASTM International:

1. ASTM C309 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
2. ASTM C171 Standard Specification for Sheet Materials for Curing Concrete.
3. ASTM C779 Standard Test Method for Abrasion Resistance of Horizontal Concrete Surfaces.

C. Reunion Internationale des Laboratoires D'Essais et de Recherches sur les Materiaux et les Constructions (RILEM):

1. Rilem Test Method 11.4 Standard Measurement of Reduction of Moisture Penetration Through Horizontal Concrete Surfaces.

D. National Floor Safety Institute (NFSI):

1. NFSI Test Method 101-A Standard for Evaluating High-Traction Flooring Materials, Coatings, and Finishes.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: Provide polished flooring that has been selected, manufactured and installed to achieve the following:

1. Abrasion Resistance: ASTM C779, Method A, high resistance, no more than 0.008 inch (0.20 mm) wear in 30 minutes.
2. Reflectivity: Increase of 35% as determined by standard gloss meter.
3. Waterproof Properties: Rilem Test Method 11.4, 70% or greater reduction in absorption.
4. High Traction Rating: NFSI 101-A, non-slip properties.

B. Design Requirements:

1. Hardened Concrete Properties:

- a. Minimum Concrete Compressive Strength: 3500 psi (24 MPa).
- b. Normal Weight Concrete: No lightweight aggregate.
- c. Non-air entrained.

2. Placement Properties:

- a. Natural concrete slump of 4 1/2 inches - 5 inches (114 - 127 mm). Admixtures may be used.
- b. Flatness Requirements:
  - 1) Overall FF 40.
  - 2) Local FF 20.

3. Hard-Steel Troweled (3 passes) Concrete: No burn marks. Finish to ACI 302.1R, Class 5 floor.
  - a. Class 6 floors, special colored mineral aggregate hardener with repeated hard steel trowel finish.
4. Curing Options:
  - a. Membrane forming curing compounds (ASTM C309, Type 1, Class B, all resin, dissipating cure).
    - 1) Acrylic curing and sealing compounds not recommended.
  - b. Sheet membrane (ASTM C171); polyethylene film not recommended.
  - c. Damp Curing: Seven day cure.

#### 1.4 SUBMITTALS

- A. Shop Drawings: Indicate information on shop drawings as follows:
  1. Typical layout including dimensions and floor grinding schedule.
  2. Plan view of floor and joint pattern layout.
  3. Areas to receive colored surface treatment.
  4. Hardener, sealer, densifier in notes.
- B. Product Data: Submit product data, including manufacturers SPEC-DATA® product sheet, for specified products.
  1. Material Safety Data Sheets (MSDS).
  2. Preparation and concrete grinding procedures.
  3. Colored Concrete Surface, Dye Selection Guides.
- C. Quality Assurance:
  1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties as cited in 1.03 Performance Requirements.
  2. Certificates:
    - a. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
    - b. Letter of certification from the National Floor Safety Institute confirming the system has been tested and passed phase Two Level of certification when tested by Method 101-A.
    - c. Current contractors certificate signed by manufacturer declaring contractor as an approved installer of polishing system.
  3. Manufacturers Instructions: Manufacturers installation instructions.
- D. Warranty: Submit warranty documents specified.
- E. Operation and Maintenance Data: Submit operation and maintenance data for installed products in accordance with Division 01 Section Project Closeout.
  1. Manufacturers instructions on maintenance renewal of applied treatments.
  2. Protocols and product specifications for joint filing, crack repair and/or surface repair.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
2. Installer trained and holding current certification for FGS PermaShine installation.
3. Manufacturer Qualifications: Manufacturer capable of providing field service representation during construction and approving application method.

B. Regulatory Requirements.

1. NFSI Test Method 101-A Phase Two Level High Traction Material.

C. Mock-Ups:

1. Construct mock-ups in accordance with Division 01 Quality Requirements.
2. Mock-Up Size: 100 sq. ft. (9.3 sq. m) sample panel at jobsite at location as directed under conditions similar to those which will exist during actual placement.
3. Mock-up will be used to judge workmanship, concrete substrate preparation, operation of equipment, material application, color selection and shine.
4. Allow 72 hours for inspection of mock-up before proceeding with work.
5. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Remove mock-up and dispose of materials when no longer required and when directed by Owners Representative .}

D. Pre-Installation Meetings: Conduct a pre-installation meeting to verify project requirements, manufacturers installation instructions and manufacturers warranty requirements. Comply with Division 01 Section Project Management and Coordination. Review the following:

1. Environmental requirements.
2. Scheduling and phasing of work.
3. Coordinating with other work and personnel.
4. Protection of adjacent surfaces.
5. Surface preparation.
6. Repair of defects and defective work prior to installation.
7. Cleaning.
8. Installation of polished floor finishes.
9. Application of liquid hardener, densifier.
10. Protection of finished surfaces after installation.

1.6 DELIVERY, STORAGE & HANDLING

A. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.

B. Delivery: Deliver materials in manufacturer's original packaging with identification labels and seals intact.

C. Storage and Protection:

1. Store materials protected from exposure to harmful weather conditions

- and at temperature conditions recommended by manufacturer.
2. Protect concrete slab.
    - a. Protect from petroleum stains during construction.
    - b. Diaper hydraulic power equipment.
    - c. Restrict vehicular parking.
    - d. Restrict use of pipe cutting machinery.
    - e. Restrict placement of reinforcing steel on slab.
    - f. Restrict use of acids or acidic detergents on slab.

## PART 2 - PRODUCTS

### 2.1 POLISHED CONCRETE FINISHING PRODUCTS

- A. Basis-of-Design Manufacturer: L & M Construction Chemicals, Inc, or equal.
- B. Hardener, Sealer, Densifier: Water based, odorless liquid, VOC compliant, environmentally safe chemical hardening solution leaving no surface film.
  1. Basis-of-Design Material: FGS Hardener Plus by L & M Construction Chemicals, Inc, or equal.
- C. Concrete Dyes: Fast-drying dye, packaged in premeasured units ready for mixing with VOC exempt solvent; formulated for application to polished cementitious surfaces.
  1. Basis-of-Design Material: Vivid Concrete Dyes by L & M Construction Chemicals, Inc, or equal.
- D. Finish: Standard Medium gloss (MG-2), 800 grit.
  1. Color: As selected by Architect from manufacturers full range of colors .

### 2.2 SOURCE QUALITY CONTROL

- A. Provide concrete finishing components and materials are from single manufacturer.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Site Verification of Conditions: Verify that concrete substrate conditions, which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of concrete finishing materials.
- B. Verify Concrete Slab Performance Requirements:
  1. Verify concrete is cured to 3500 psi (24 MPa) strength.
  2. Verify concrete surfaces received a hard steel-trowel finish (3 passes) during placement.

### 3.2 PREPARATION

- A. Ensure surfaces are clean and free of dirt and other foreign matter harmful to performance of concrete finishing materials.
- B. Examine surface to determine soundness of concrete for polishing.
- C. Remove surface contamination.

### 3.3 INSTALLATION

#### A. Floor Surface Polishing and Treatment:

1. Provide polished concrete floor treatment in entirety of slab indicated by Drawings. Provide consistent finish in all contiguous areas.
2. Apply floor finish prior to installation of fixtures and accessories.
3. Diamond polish concrete floor surfaces with power disc machine recommended by floor finish manufacturer. Sequence with coarse to fine grit using dry method.
  - a. Comply with manufacturer's recommended polishing grits for each sequence to achieve desired finish level. Level of sheen shall match that of approved mock-up.
  - b. Expose aggregate in concrete surface only as determined by approved mock-up.
  - c. All concrete surfaces shall be as uniform in appearance as possible.
4. Dyed and Polished Concrete :
  - a. Locate demarcation line between dyed surfaces and other finishes.
  - b. Polish concrete to final finish level.
  - c. Apply diluted dyes to polished concrete surface.
  - d. Allow dye to dry.
  - e. Remove residue with dry buffer; reapply as necessary for desired result.
5. Apply hardener and densifier in accordance with recommendations of polished concrete floor finishing product manufacturer.
6. Remove defects and repolish defective areas.
7. Finish edges of floor finish adjoining other materials in a clean and sharp manner.

### 3.4 ADJUSTMENTS

- A. Polish to higher gloss those areas not meeting specified gloss levels per mock-up.
- B. Fill joints flush to surface.
- C. Mechanically scrub treated floors for seven days with soft to medium pads with approved cleaning solution.
- D. Upon completion, remove surplus and excess materials, rubbish, tools and equipment.

### 3.5 PROTECTION

- A. Protect installed product from damage during construction in accordance polished concrete finishing product manufacturer's recommendations.

END OF SECTION 033510