SECTION 09671

CHEMICAL RESISTANT FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Related Sections:
   1. Section 01355 – Environmental Project Procedures: Indoor air quality procedures.
   2. Section 03300 - Concrete: Subfloor finishing.
   3. Section 07260 - Vapor Retarders: Vapor barrier for slab on grade.
   4. Section 07920 - Joint Sealants: Sealants for expansion joints.

1.2 SYSTEM DESCRIPTION

A. Design Requirements: Manufacturer is responsible for designing system, including necessary modifications to meet specified requirements.
   1. Take into account substrate peculiarities, and expansion and contraction movements so there is no possibility of loosening, weakening, or fracturing connection between flooring and substrate.

1.3 SUBMITTALS

A. General: Submit in accordance with Section 01330.
   1. Submit submittals for Division 9 Sections involving exposed interior finishes with color, texture, pattern, etc. selections simultaneously with submittals for this section.

B. Product Data: Submit for each product.
   1. Include data to indicate chemical, solvent, and detergent resistance.
   2. Include information for primer, sealants, accessories, and other required components.
   3. Include color charts for finish indicating manufacturer's colors available for selection.
   4. Include sample of warranty customized for this Project.

C. Samples: Submit samples 4 by 4 inch in size illustrating color, texture, and thickness.

D. Informational Submittals: Submit following packaged separately from other submittals:
   1. Certifications specified in Quality Assurance article.
   2. Qualification Data: Manufacturer's and applicator's qualification data.
   3. Manufacturer's instructions.

E. Closeout Submittals: Submit following in accordance with Section 01780.
   1. Maintenance data.
   2. Warranty: Submit specified warranty.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Furnish products from one manufacturer for entire Project, unless otherwise acceptable to Architect.

B. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section.

C. Applicator Qualifications: Acceptable to manufacturer with experience on at least five projects of similar nature.

D. Testing: Section 01451. Employ independent testing agency to conduct moisture vapor transmission testing.

E. Certifications: Submit following:
   1. Manufacturer's certification that products furnished for Project meet or exceed specified requirements.
   2. Installer and manufacturer's written acceptance of substrate.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with Section 01600.
   1. Deliver materials in manner to prevent damage to containers and bags.
   2. Store materials in accordance with manufacturer's instructions in clean and dry location with temperature between 60 F and 90 F.
   3. Keep products away from fire or open flame.

1.6 PROJECT CONDITIONS

A. Environmental Requirements: Do not install flooring when slab temperature is below 55 F or above 90 F.
   1. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of flooring.
   2. Ventilate area where flooring is being installed.
   3. Indoor Air Quality Procedures: Ventilate in accordance with Section 01355.

1.7 WARRANTY

A. Special Warranty: Prepare and submit in accordance with Section 01780. Provide written warranty signed by manufacturer warranting work to be free from defective materials and workmanship, and agreeing to replace components which fail within two years. Failed materials and workmanship includes spalling, cracking, and delamination.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Crossfield Products Corp., Compton, CA.
   2. General Polymers Corp., Cincinnati, OH.
   3. ThermalChem, Inc., Chicago, IL.
   4. Epoxy Systems Inc.
   5. Accepted Substitute in accordance with Section 01600.

2.2 CHEMICAL RESISTANT RESINOUS FLOORING (Autopsy Rooms)

A. Quartz Aggregate Epoxy Flooring: Self-leveling epoxy and broadcast quartz aggregate floor surfacing system.
   1. Thickness: 1/8 inch.
   2. Color: As selected from manufacturer's standard.
   3. Sheen: Low.
   4. Surface Texture: Slip resistant, MIL-D-3134.
   5. Primer: Epoxy primer, manufacturer's standard.
   6. Base: Self leveling epoxy.
   7. Aggregate: Color quartz.
   8. Seal Coat: Manufacturer's standard epoxy or urethane.
   9. Physical Requirements:
      a. Compressive Strength: 9,000 PSI, ASTM C579.

b. Tensile Strength: 1,600 PSI, ASTM C307.
c. Flexural Strength: 4,500 PSI, ASTM C580.
d. Hardness: 80-85, ASTM D2240/Shore D Durometer.
e. Bond Strength: 400 PSI (100 percent concrete failure), ACI Committee No. 503
f. Indentation: 7 percent maximum, MIL-D-3134.
g. Abrasion Resistance: 0.10 g max. weight loss, ASTM D4060, Taber Abrader CS-17 wheel, 1000 g load, 1000 cycles.
h. Flexural Modulus of Elasticity: 1.0 x 106 PSI, ASTM D790.
i. Flammability: Class B [A], ASTM E84.
   1) Self Extinguishing. Extent of burning 0.25 inches maximum, ASTM D635.

10. Chemical Resistance: Test specimens of cured flooring according to ASTM 1308 with listed reagents for not less than seven days. Test reagents should have no effect.
    a. Acetic Acid 5 percent.
    b. Acetone.
    c. Ammonium Hydroxide 40 percent.
    d. Ammonium Nitrate 50 percent.
    e. Benzene.
    f. Butyl Alcohol.
    g. Calcium Chloride 50 percent.
    h. Carbon Tetrachloride.
    i. Caustic Acid 10 percent.
    j. Chromic Acid 10 percent.
    k. Citric Acid 10 percent.
    l. Coffee.
    m. Cola.
    n. Detergent Solution, Heavy-duty.
    o. Diethyl Ether.
    p. Ethyl Alcohol 50 percent.
    q. Ethylene Glycol.
    r. Ferric Chloride 10 percent.
    s. Formaldehyde 10 percent.
    t. Formic Acid 10 percent.
    u. Gasoline.
    v. Germicidal Solution.
    w. Glycerine.
    x. Hydraulic Fluid.
    y. Hydrochloric Acid 20 percent.
    z. Hydrofluoric Acid 15 percent.
    aa. Hydrogen Peroxide Solution 10 percent.
    bb. Isopropyl Alcohol.
    cc. Jet Fuel.
    dd. Kerosene.
    ee. Lactic Acid 25 percent.
    ff. Merthiolate.
    gg. Mineral Oil.
    hh. Mineral Spirits.
    ii. Mustard.
    jj. Nitric Acid 30 percent.

kk. Oil, motor.
ll. Oil, Transformer.
mm. Phosphoric Acid 70 percent.
nn. Salad Oil.
oo. Silver Nitrate 10 percent.
pp. Sodium Carbonate.
qq. Sodium Chloride.
rr. Sodium Hydroxide 50 percent.
ss. Sodium Hypochlorite.
tt. Sulfuric Acid 70 percent.
uu. Syrup.
vv. Toluene.
ww. Trichlor Ethylene.
xx. Urine.
yy. Xylene.

11. Acceptable Products and Manufacturers:
    a. Dex-O-Tex Decor-Flor, Crossfield Products Corp.
    b. Ceramic Carpet No. 425, General Polymers Corp.
    c. Deco-Quartz, ThermalChem, Inc.
    d. Product 15, Epoxy Systems Inc.

2.3 ACCESSORIES

A. Joint Sealant Materials: Manufacturer's recommended sealant compatible with resinous flooring system for type of service and joint condition indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions and proceed with work in accordance with Section 01400.
    1. Examine areas to receive flooring for:
        a. Defects in substrate that may affect proper execution of flooring work.
        b. Deviations beyond allowable tolerance for concrete slab work.
        c. Surface curing agents or sealers that would inhibit bond.
        d. Surface defects such as cracks that could transfer through to finished flooring surface if not corrected.
    2. Do not begin flooring work until concrete substrate has cured for minimum of 30 days.
    3. Do not begin work until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare Substrate: Tests concrete substrate for pH and contaminants in accordance with manufacturer's recommendations. Ensure concrete is within manufacturers recommended limits prior to installation.

B. Remove ridges and bumps. Fill depressions, low spots, cracks, joints, holes, indentations, and other defects with leveling and patching compounds.
    1. Mechanically abrade or shot-blast existing concrete flooring to remove inappropriate curing agents and to open pores of concrete surfaces to allow proper application of bonding agent, primer, or adhesive. Completely remove cleaning residue. Acid washing is not acceptable.

2. Repair cracks, divots and surface imperfections according to manufacturer's instructions. Rout out cracks and joints and fill with Control Joint Filler specified in Section 03300.
3. Clean substrate to remove paint, dirt, oil, grease, sealers, release agents, hardening compounds, residual adhesives, and substances which could impair performance of adhesive materials.
4. Broom clean and vacuum surfaces to remove dust and debris.

C. Moisture Vapor Transmission Test: ASTM E1907. Perform by independent testing laboratory to determine suitability of concrete subfloor for receiving flooring with regard to moisture content and curing compounds. Ensure concrete is within floor manufacturer's recommended limits prior to installation.
1. ASTM E1907 Qualitative Anhydrous Calcium Chloride Test: For substrates with moisture vapor permeance in excess of 3 pounds water vapor per 1000 square feet per 24 hour period, use floor coating manufacturer's suggested remedy. Do not proceed with flooring application until condition is corrected.

3.3 CHEMICAL RESISTANT FLOORING APPLICATION

A. General: Apply flooring in accordance with manufacturer's printed instructions.
1. Provide uniform monolithic wearing surface uninterrupted except where indicated or required.

B. Primer: Mix and apply primer over prepared substrate at manufacturer's recommended spreading rate.
1. Coordinate applying primer with membrane to ensure optimum adhesion between flooring materials and substrate.

C. Self-Leveling Epoxy Flooring: Apply epoxy mixture at specified thickness onto surface and broadcast color quartz aggregate into wet epoxy matrix.
1. After matrix cures, remove excess aggregate and vacuum.
2. Apply clear finish coats to provide required properties.

D. Cove Base: Apply cove base mix to wall surfaces at locations shown to form cove base height of 4 inches with 3/8 inch radius unless otherwise indicated.
1. Round interior and external corners.
2. Follow manufacturer's printed instructions and details including taping, mixing, priming, troweling, sanding, and top-coating of cove base.

E. Joints: Where substrate is interrupted by expansion or control joints, provide joint in resinous flooring to comply with details indicated or as recommended by resinous flooring manufacturer.

F. Curing: Cure flooring materials according to manufacturer's directions, taking care to prevent contamination during application stages and before completing curing process.
1. Indoor Air Quality Procedures: Ventilate in accordance with Section 01355.

3.4 FIELD QUALITY CONTROL

A. General: Comply with requirements of Section 01451.

3.5 CLEANING AND PROTECTION

A. Cleaning: Comply with Section 01740. Clean as recommended by manufacturer. Do not use materials or methods which may damage surface or surrounding construction.
1. Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by flooring manufacturer.
2. Do not permit traffic over finished flooring surfaces.

B. Protection: Protect finished work in accordance with Section 01500.

1. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application.

END OF SECTION