INSTALLATION / SPECIFICATION DATA

TUFFLEX SYSTEM "PED-ON-CONCRETE"

HIGH PERFORMANCE, PEDESTRIAN WATERPROOFING SYSTEM

1. GENERAL

1.1 Scope: This specification covers the installation of a durable, abrasion resistant Polyurea-Polyurethane Pedestrian Deck Overlay for Concrete. It is a monolithic system, designed to positively waterproof concrete surfaces by excluding moisture penetration during low temperature freeze-thaw cycling or high temperature, high humidity thermal cycling. This waterproofing system has outstanding adhesion, puncture resistance and abrasion resistance, while exhibiting superior flexibility and weather resistance.

1.2 Work included: Install waterproofing consisting of caulking and flashing reinforcement for joints, TUFF-POXY Epoxy Primer, TUFFLEX "TUFF" Elastomeric Base Membrane, Reinforcing Rubber Granules, Texturing Aggregate and TUFFLEX COLORCOAT AL-Ester Aliphatic Top Coats. Apply in accordance with these specifications and latest general instructions supplied by TUFFLEX Polymers (TUFFLEX).

1.3 Work Not Included: Work under this section shall not include installation, finishing and corrective work in connection with the surfaces to receive the liquid-applied waterproofing system. Nor does it include furnishing and installation of metal flashing, drains, vents, ducts, curbs or any other penetration through the deck.

1.4 Condition of Concrete Surfaces:

1.41 The concrete surfaces shall be of sound structural grade (2,500 psi compressive strength recommended), a minimum thickness of 3 inches and shall have a steel-toweled followed by a fine broom finish, free of fins, ridges, voids or air-entrained holes.
1.42 Concrete shall preferably be cured by the water curing method. If curing agents are used, they shall be of pure sodium silicate base only.
1.43 Concrete shall be cured at least 28 days and until completely dry. Concrete shall be sloped for proper drainage.
1.44 Saw-cut control joints and/or expansion joints shall have been properly installed at strategic points throughout the field of the deck to control cracking caused by deflection and shrinkage.
1.45 Voids, rock pockets and excessively rough surfaces shall be finished with an epoxy grout or sand/cement/acrylic-latex smoothing coat.
1.46 When metal decking is used as the concrete form, it shall be of the 'ventilating type'.
1.47 All concrete decks poured over precast "T's", planks or slabs, shall have control joints placed directly over all corresponding joints or openings in the precast units.

1.5 Job Conditions:

1.51 Before any waterproofing work is started the waterproofing applicator shall thoroughly examine all surfaces for any deficiencies. Should any deficiencies exist, the architect, owner, or general contractor shall be notified in writing and corrections made.
1.52 Do not proceed with application of materials when deck temperature is less that 40°F or if precipitation is imminent.
1.53 Warn personnel against breathing of vapors and contact of material with skin or eyes. In confined areas without adequate ventilation, workmen shall wear approved respiratory protective gear and protective clothing.
1.54 All gas flames and electrical apparatus shall be shut down prior to the start of and during coating application and curing.

2. QUALIFICATIONS

2.1 Professional Installer:

2.11 Shall be experienced in successfully applying the same or similar materials and shall be specifically approved as an authorized applicator in writing by TUFFLEX.
2.12 Shall be financially responsible and be ready and able to submit payment bonds and project guarantees as required.
2.13 Shall submit to the general contractor and the building owner the required certificates of insurance prior to starting the project.

2.2 Sample Submittals: Submit samples not less than 4" x 3" in size, showing the approximate applied thickness, texture and color and the type and size of texturing aggregate. The submittal shall also include the manufacturer's application – specification sheet and a list of materials to be used on this project in order to demonstrate compliance with these specifications.

3. MATERIALS

The materials shall be delivered to the job site in the original sealed containers bearing the product name, color, manufacturer's lot number, directions for use and precautionary labels. All products listed are manufactured or supplied by TUFFLEX.
3.1 Caulking Compound: Shall be a TUFFLEX approved one-component, high adhesion, moisture cured, non-staining polyurethane compound.

3.2 Flashing Reinforcement: Shall be TUFFLEX woven reinforcing fabric, or as recommended by the waterproofing membrane manufacturer.

3.3 Primer: Shall be TUFF-POXY Primer #2 (solvent based) or Primer #3 (low VOC) Epoxy-Polyamine, low viscosity, two-component primer/sealer.

3.4 Elastomeric Base Membrane: Shall be TUFFLEX "TUFF" water catalyzed, solvent free, high strength Polyurea-Polyurethane membrane and shall meet or exceed the following typical properties:

TUFFLEX "TUFF" BASE COAT

PROPERTY	VALUE	TEST METHOD
Hardness, Shore A	65 ± 5	ASTM D-2240
Tensile Strength	1100 ± 150psi	ASTM D-412
Ultimate Elongation, %	650 ± 100%	ASTM D-412
Tear Resistance	200 ± 25pli	ASTM D-1004
Pot Life, @77°F	20-25 minutes	
Gel Time, @77°F	45-60 minutes	
Low Temperature Brittleness @-50°F	Passes	ASTM D-746
Flash Points, Mixed Material	Above 200°F	ASTM D-3278
Water Absorption, 1 month @77°F (% weight gained)	3% typical	ASTM D-471

***3.5 Abrasion-Resistant Top Coat*:** Shall be **TUFFLEX COLORCOAT AL-Ester** single component, high tensile strength, abrasion resistant and weather-resistant aliphatic polyurethane coating and shall meet or exceed the following typical performance properties:

COLORCOAT AL-ESTER TOP COAT

PROPERTY	*TYPICAL VALUE*	*TEST METHOD*
Composition	Aliphatic, Polyester Polyurethane	
Weight Solids	80 ± 2%	
VOC Content	250 gm/l or 100 g/l	
Hardness, Shore A	90 ± 5	ASTM D-2240
Tensile Strength	3300 ± 300 psi	ASTM D-412
Ultimate Elongation	250 ± 50%	ASTM D-412
Tear Resistance	350 ± 50 lb./in.	ASTM D-1004
Water Permeability	Less than 0.1 Perm	ASTM E-96
Weather Resistance	No Chalking @ 2000 hours	ASTM-D-822
Abrasion Resistance	Negligible Change, CS-17 wheels,1000 cycles, 1000 gm. load	ASTM C-501

TUFFLEX POLYMERS ♦ 10880 Poplar Avenue ♦ Fontana, California 92337
Phone: (909) 349-2016 ♦ Fax: (909) 823-6309

***3.6 Reinforcing Rubber Granules*:** Reinforcing Rubber Granules shall be EPDM or equivalent performing, non-dusting, 20 to 30 mesh rubber granules.

3.7 Texturizing Aggregate: Shall be rounded, non-angular, blended 16 mesh, 20 mesh or 30 mesh flint shot silica, Monterey aggregate, colored quartz aggregate or equivalent in quality and size, washed and kiln dried aggregate.

4. SUBSTRATE PREPARATION

4.1 Concrete Surfaces:

4.11 The concrete surface must be thoroughly clean, dry and free from any surface contaminates or cleaning residue.
4.12 All cracks over 1/16 inch in width and all moving cracks under 1/16 inch in width shall be routed out to ¼ inch minimum in width and depth and filled flushed with a TUFFLEX approved, high adhesion, non-staining polyurethane elastomeric sealant.
4.13 All cracks shall be striped-coated with 25 mils of TUFFLEX Elastomeric Base Membrane coating for a distance extending to 2 inches on either side of the crack.
4.14 Any expansion and contraction joints shall be cleaned, primed, fitted with a backing rod and caulked with a TUFFLEX approved elastomeric polyurethane sealant.

4.2 Flashing:

4.21 All required joint reinforcement, flashing reinforcement and metal to deck reinforcement shall be installed at this time.
4.22 All metal shall be delivered shop primed and then be field primed with TUFF-POXY Primer (for metal surfaces which may exhibit adhesion difficulties, first prime with a zinc chromate, marine-grade epoxy primer).

5. APPLICATION OF MEMBRANE

5.1 Preparation: Prior to commencing with the application, all surfaces to be coated shall be dry and free from any surface contaminates or cleaning residues.

5.2 Primer: Apply the TUFF-POXY Primer #2 or Primer #3 at the approximate rate of 250-350 square feet per gallon. In certain situations 60 mesh or 30 mesh bonded aggregate must be broadcast into the wet primer. Allow primer to dry until it is tack free and firm. Within 8 hours of application of the primer, the TUFFLEX "TUFF" Elastomeric Base Membrane must be applied. If the membrane will not be applied within 8 hours then a full broadcast of bonding aggregate must be applied into the wet TUFF-POXY Primer.

5.3 Mixing: The properly mixed and properly catalyzed TUFFLEX "TUFF" Base Membrane Mixture (BMM) shall be trowel or squeegee applied, followed by backrolling, in one uniform coat at the minimum rate of 3 gallons per 100 square feet in order to obtain a minimum wet film thickness of 48 mils. If it is desired to use the optional rubber granule reinforcing then refer to paragraph 5.4 otherwise proceed to paragraph 5.5. Allow this installation of base membrane to cure 16-24 hours before proceeding to next step. Do not apply this waterproofing system over working or control joints greater than 1/2 inch wide.

5.4 Optional Reinforcing Rubber Granules: For additional sound deadening properties rubber granules may be selected for use on a project. After the application of the TUFFLEX "TUFF" Base Membrane, let it briefly stand until the membrane has slightly jelled. Then broadcast the rubber granules over the entire surface until refusal. While the coating is still fluid, spiked shoes may be used in order to walk out onto the wet membrane and broadcast the rubber granules while keeping clear of the application wet edge. Proceed to step 5.5 for the application of the Aggregate Binding Top Coat.

5.5 Aggregate Binding Top Coat: Thoroughly mix one pail of TUFFLEX COLORCOAT AL-ESTER and dump the entire mix onto the deck surface and spread uniformly with a notched trowel or squeegee. Backroll with a short to medium nap roller. Apply at the minimum rate of 100 square feet per gallon in order to obtain an average topcoat thickness of 16 wet mils. Immediately and uniformly broadcast the 30, 20 or 16 mesh texturizing aggregate to refusal into the wet top coat at the rate of 40 to 45 lbs. per 100 square feet. *Note:* It is always recommended that the proper quantity and proper size of aggregate is applied

5.6 Aggregate Locking Top Coat: After a 16 to 24 hour cure remove all excess or unbounded aggregate. Apply a second application of TUFFLEX COLORCOAT AL-ESTER Top Coat by thoroughly mixing one pail and dumping the entire mix onto the deck surface and spread uniformly with a notched trowel or squeegee. Apply at the minimum rate of 100 square feet per gallon in order to obtain an average topcoat thickness of 16 wet mils. Backroll with a short to medium nap roller.

5.7 Curing: Allow the top coat to cure 24-36 hours at 75° F before subjecting the floor to light traffic. For a rapid cure add COLORCOAT Accelerator to the Top Coat before installation.

6. THICKNESS

The dry film thickness of the completed waterproofing system, excluding aggregate and reinforcing rubber granules, shall average 64 mils.

7. MAINTENANCE

The waterproofing system should be cleaned with a free-rinsing, non-abrasive mild detergent as often as necessary following recommended practices of the maintenance industry. Tar, chemical or mineral deposits and scuff marks should be removed by wiping with isopropyl alcohol or a mild commercial grade water-based cleaner. Greater slip-resisting characteristics can be obtained by increasing the size of the aggregate. However, increasing the textured qualities of the waterproofing system also increases the maintenance efforts to remove dirt and film residue.

8. GUARANTEE / WARRANTY

When this Elastomeric Coating System is installed by a Factory Qualified Applicator, is inspected and approved in accordance with these specifications, and after receipt of the final payment, the Factory Qualified Applicator shall issue the Applicator's standard and customary installation guarantee covering defects in material and workmanship.

TUFFLEX Polymers (TUFFLEX) warrants its products to be free of defects in workmanship and materials only at the time of shipment from our factory. If any TUFFLEX materials prove to contain manufacturing defects that substantially affect their performance TUFFLEX will, at its option, replace the material or refund the purchase price.

The dollar value of TUFFLEX'S liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the TUFFLEX materials in question.

TUFFLEX POLYMERS ♦ 10880 Poplar Avenue ♦ Fontana, California 92337
Phone: (909) 349-2016 ♦ Fax: (909) 823-6309