TECHNICAL BULLETIN #9

VEHICULAR DECK COATINGS

INTRODUCTION

1. This bulletin deals with liquid-applied waterproofing systems that by design are to be installed on horizontal or sloped decks subject to vehicular traffic.

2. These membranes are typically derived from urethane rubbers or epoxy materials and cure to form a solid, monolithic membrane to waterproof and protect the substrate.

3. Vehicular deck coating systems are also formulated to accommodate various ranges of movement in the substrate. Vehicular deck coatings can typically bridge substrate cracks that common paints and deck enamels cannot.

4. Applied at varying thickness, a typical system may consist of a primer, one or more waterproof basecoats and a traffic-bearing wear surface with aggregate.

FEATURES AND BENEFITS

1. These systems are primarily designed to waterproof the substrate and reduce damage caused by water intrusion, including:

- Damage to interior finishes
- Chloride intrusion and contamination
- Deterioration of the reinforcing steel
- Freeze-thaw damage
- Efflorescence
- Concrete spalling
- Other moisture-related failures

2. With varying degrees of elasticity the installed systems can bridge existing cracks, as well as new cracks that occur after the installation. Refer to the manufacturer's data sheets for specific properties.

3. By incorporating an aggregate in accordance with the system manufacturer's recommendations these membranes also provide a skid-resistant finish.

4. Liquid-applied systems provide a seamless installation.

5. By waterproofing the substrate these membranes protect the structure, thereby extending the service-life of the structure.

6. Waterproof coatings may enhance the appearance of the structure through the use of multiple colors or multi-colored aggregates in a clear topcoat.

7. Liquid-applied systems are readily repairable and recoatable to provide extended servicelife beyond the initial warranty term.

8. Most systems can be cleaned with commercial detergents and this can be incorporated into a maintenance agreement with the applicator of the system to ensure that it is properly maintained and repaired as necessary.

APPLICATIONS

1. Designed for interior and exterior concrete decks, including ramps, helixes and other horizontal or sloped surfaces designed for vehicular traffic by automobiles, carts, and service vehicles of all types with the exception of some snow removal equipment.

2. Common uses include parking garages, stadiums, heliports, driveways, mechanical rooms and plaza decks.

3. These systems are recommended for abovegrade or elevated decks and may not perform well in slab-on-grade situations.

DESIGN CONSIDERATIONS

1. Different systems have varying degrees of ozone resistance, chemical resistance and UV stability.

2. The availability of experienced and qualified applicators for the selected system should be confirmed in advance.

3. Moisture vapor transmission of vehicular deck coatings varies from one system to the next and should be considered based on the installation. Many systems are not designed for secondary slab (topping slab) applications or on-grade applications.

4. Different service uses may require different tensile strength and tear strength properties, which also vary from system to system.

5. Not all systems are volatile organic compound (VOC) compliant, however most manufacturers have VOC compliant systems available on request. Be sure to select the right one for the location of the installation.

6. Some aggregates are not readily available in all locations. Select a system that will perform well with locally available aggregate to prevent failures and help control installation costs.

7. Be sure to select the proper size and amount of aggregate to provide the desired level of skidresistance. More aggregate makes cleaning more difficult so there is a trade off in that regard. Also, round aggregate will not break out of most coatings as easily as angular aggregate, which will affect maintenance and skid resistance.

8. The color of the membrane should also be considered regarding tire marks and the appearance of the structure.

9. Installation time can vary by a few days between systems and should considered in advance. Select a system that will perform while also being most beneficial in regard to downtime of the structure during installation.

10. Specific deck coating systems can only accommodate a certain temperature range based on their formulation. Be sure to select a system compatible with the local climate and temperature swings.

11. Associated waterproofing items also require consideration. This may include sealant joints, flashings, deck-to-wall transitions, drains, penetrations and terminations.

12. Tire chains or metal-studded tires may damage some systems as will metal blades and buckets used for snow removal.

13. For parking decks, heliports and driveways, ensure that a compatible striping and linepainting material is available and acceptable to the deck coating system manufacturer.

14. Review the manufacturer's warranty with the material representative to understand its applications, requirements for maintenance and limitations.

APPLICATION CONSIDERATIONS

1. The ambient conditions, including temperature, humidity and forecast precipitation, should be considered prior to application.

2. The substrate must be sound, clean and dry in accordance with the manufacturer's written recommendations.

3. Oil, grease, dust and other contaminants must be removed prior to application.

4. Existing static and dynamic cracks should be detailed in accordance with the manufacturer's written recommendations, and existing bug holes filled flush with an appropriate grout or patching material.

5. These systems do not adhere well to smooth or steel-troweled concrete and an acceptable surface profile should be created by either chemical or mechanical means (i.e. acid-etching, shotblasting, scarifying, etc.).

6. Many concrete curing compounds contain materials that adversely affect the adhesion and must be removed in advance.

7. Ventilation is a concern with all systems being applied indoors, as well as many outdoor applications, depending on the proximity of occupied buildings and air intakes, etc.

8. The surface profile can greatly affect the coverage rates necessary to achieve the desired film thickness and the manufacturer's data sheets should only be used as a guide.

9. Follow manufacturer's recommendations regarding the use of primer and/or coating systems prior to application of the new material. Poorly adhered membranes should always be removed prior to a new application and even well adhered systems should be tested prior to proceeding.

10. The work should be staged such that the owner experiences the least amount of inconvenience in downtime and the rerouting of traffic.

11. Where the coating system is to be terminated without a joint, wall or other appropriate break, a minimum 1/4 inch by 1/4 inch keyway should be cut in the deck and treated as a dynamic crack per the manufacturer's details.

APPLICATION PROCEDURES

1. All preparatory work should be completed in advance of the coating application.

2. Integral copper or sheet metal flashing should be caulked or soldered and watertight.

3. The substrate should be tested for acceptable moisture content.

4. The manufacturer should be consulted in regard to the necessity of a primer.

5. It is quite common for terminations and details to receive a pretreatment prior to the system application. Consult the data sheets for specific recommendations.

6. Squeegee, power roller, airless spray or combinations are used to apply most systems.

7. A mock-up should be installed to confirm coverage rates and acceptance of the finish.

8. A grid pattern should be established to ensure a uniform application once the coverage rates are established.

9. Two-component products should be mixed and applied in strict accordance with the manufacturer's recommendations.

10. Most basecoats need to be applied on the same day as the primer, so do not prime more deck than can be coated on the same day.

11. Intermediate coats may also have specific intercoat windows and you should strictly adhere to the manufacturer's recommendations.

12. Pinholes may result from ambient conditions and/or outgassing from the substrate and the coating manufacturer should be consulted if the condition persists.

13. Substrate temperature during installation is typically required to be between 40 degrees and 90 degrees for most systems.

14. Aggregate systems are typically achieved by two methods: either broadcasting to refusal and sweeping away the excess or by backrolling the aggregate into the topcoat of the system. Consult the manufacturer for the desired method.

15. Ticket booths, turning lanes, ramps and other high traffic areas typically require additional coats and aggregate in order to meet warranty requirements.

16. On large decks it may be necessary to box materials in order to ensure a consistent color throughout the deck. Boxing, or mixing material that may not be from the same batch, will even out the pigment and provide a more uniform appearance.

17. Neither pedestrian nor vehicular traffic is allowed on coatings before they are cured. This will require careful planning to provide safe access for the public and facility occupants.

18. Refer to manufacturer's data sheets and material safety data sheets for any necessary precautions regarding exposure to all materials comprising the system.

19. Clean up the site daily and follow government regulations regarding disposal of excess materials and empty containers.

Other valuable resources available from the Sealant, Waterproofing & Restoration Institute

SWR Institute *Applicator*, a technical journal

Applying Liquid Sealants: An Applicator Training Program

Below Grade Waterproofing Manual

Clear Water Repellent Handbook

A Practical Guide to Waterproofing Exterior Walls

Sealants: The Professional's Guide