LOW VOC TRAFFIC-BEARING MEMBRANE FOR VEHICULAR DECKS

"THIS PRESENTATION IS MEANT TO ASSIST THE SPECIFIER WITH ALL PHASES OF A VEHICULAR DECK COATING AND REHABILITATION."

THE DECK COATING SYSTEM WE WILL PRESENT IS A 100 VOC SYSTEM, WHICH MEETS OR EXCEEDS THE SOUTHERN CALIFORNIA AIR QUALITY MANAGEMENT DISTRICT REQUIREMENTS.

WE WILL DISCUSS

1. DECK PREPARATION
2. COATING SELECTION
3. COATING APPLICATION
4. PLUS COSTS

THERE ARE FOUR SCENARIOS WHEN CONSIDERING COATING OF A VEHICULAR DECK

1. A new concrete deck that has not been coated
2. An old concrete deck that has been coated and requires removal of the elastomeric coating prior to rehabilitation
3. An old concrete deck coated with a cementitious coating
4. An old, uncoated concrete deck.

DECK PREPARATION

In Scenarios 2, 3 and 4, we recommend that an engineering firm be brought on board to chain drag the deck and locate all bad concrete spots. The removal of the bad concrete in the marked areas will involve penetrating the deck. These areas will be refilled with new high strength concrete (5,000 psi). Between the perimeter of the repair area and the new concrete, a cold joint will occur. This should be sealed with a one-part polyurethane sealant.

Deck Preparation continued:

The entire deck surface that is to receive traffic coating will be shot blasted. The profile should resemble a light broom finish.

All expansion joints will be examined for functionality, and any defective joints will be replaced.

All areas where verticals meet horizontals will be sealed with a one-part polyurethane sealant.

Deck Preparation continued:

In the area of the rehabilitated deck patches, prior to coating the entire area the patch is to be primed, then coated with base coat and allowed to cure before any deck coating of the entire area takes place.

Deck Preparation continued:

In Scenario 2, we have an old concrete deck that has been coated with an elastomeric coating. During the rehabilitation of the deck, this coating must be removed, unless it is firmly adhered to the substrate.

Removal can be accomplished by either hydro-blasting or scarifying.

Deck Preparation continued:

In Scenario 3, we have an old concrete deck coated with a cementitious coating. This coating, where it is loose, decayed or failing must be removed. Scarification is the method.

Deck Preparation continued:

In Scenario 4, we have an old, **uncoated** concrete deck. Rehabilitation will involve repairing bad concrete, shot blasting and cleaning any debris or stains prior to application of the coating system.

Deck Preparation continued:

In Scenario 1, we have a new concrete deck that will only require shot blasting prior to coating.

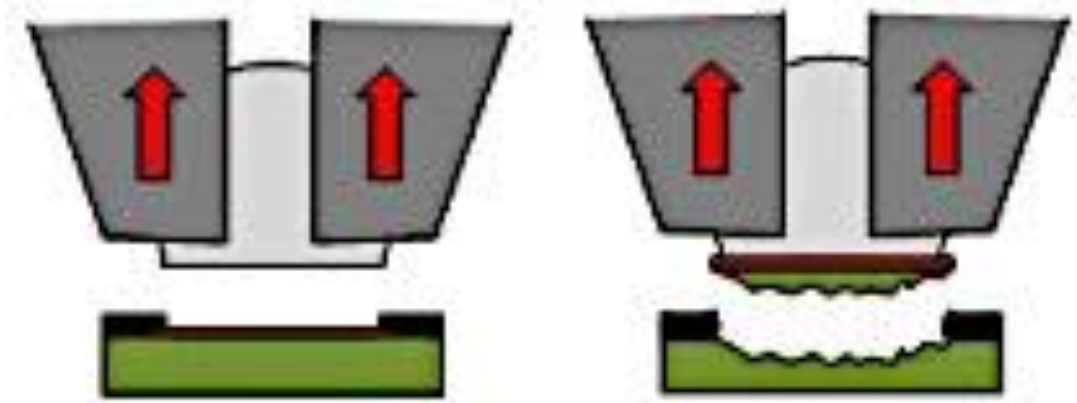
In all four Scenarios, the expansion joints must be treated and all sealant work must be complete prior to coating.

Deck Preparation continued:

It is important to determine the adhesion of the specified deck coating on the concrete in Scenarios 2, 3 and 4 prior to coating. Several one square foot samples of the coating should be applied at various places on the deck after shot blasting is complete. These test areas should be tested for adhesion to the concrete utilizing an Elcometer Adhesion Tester.

Deck Preparation continued:

The failure should be cohesive, leaving the epoxy firmly adhered to the coating. The passing point for the test should be 100 psi.



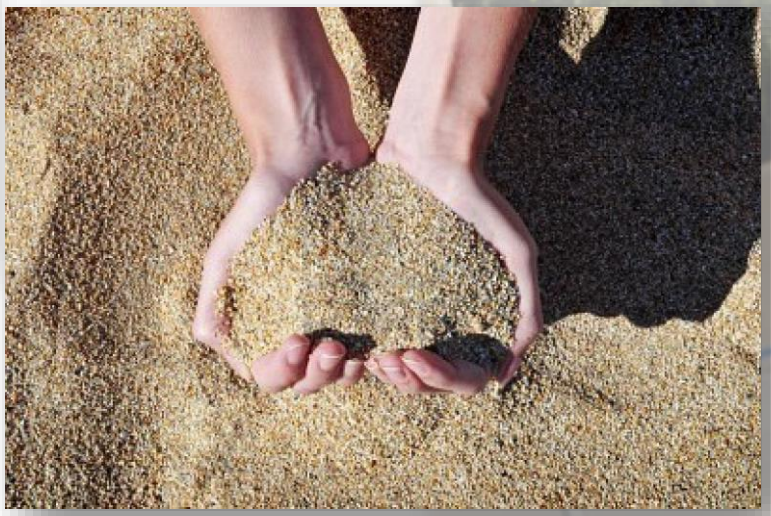
Failure mode

Coating Selection & Application

The governing specification for this presentation is Elastomeric Waterproofing Traffic-Bearing Membrane ASTM C957. Prior to applying the system, a 100 square foot mock-up must be constructed on the project site in order to set the application and receive approval of the color and aggregate distribution.

Coating Selection & Application continued…

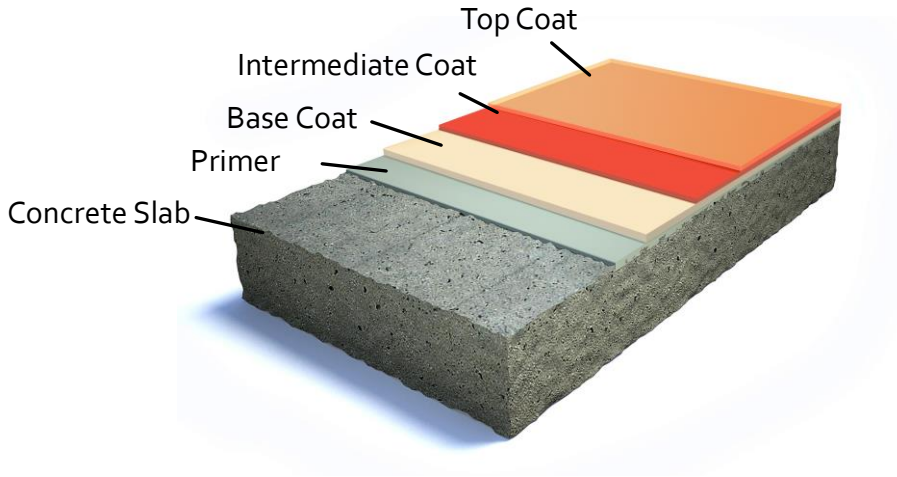
Aggregate selection is extremely important and we recommend 16/20 mesh in order to minimize slipping and falling of pedestrians. This mock-up must be preserved for the duration of the project.



Coating Selection & Application continued…

For this presentation, we are presenting a polyurethane system consisting of:

1. A primer, which is a two-part epoxy
2. Base coat, a one-part polyurethane
3. Intermediate coat, one-part polyurethane
4. Top coat, a one-part aliphatic polyurethane



The reason for the selection of this one-part system is that it eliminates any mixing error, with the exception of the primer.

Coating Selection & Application continued…

Primer: The primer should be two-component epoxy primer. Part A and Part B are equal volume. The primer should be applied by spray or roller at the rate of 200-300 square feet per gallon.

Coating Selection & Application continued…

Base Coat: The base coat is a one-part aromatic polyurethane coating. The material is applied with a notched squeegee at the rate of 1.5 gallons per 100 square feet, then back-rolled.

Coating Selection & Application continued…

Intermediate Coat: The intermediate coat is a one-part aromatic coating that is applied by notched squeegee at the rate of one gallon per 100 square feet. The sand is broadcast into the wet coating at the rate of 15 lbs. per 100 square feet, then back-rolled.

Coating Selection & Application continued…

Top Coat: The top coat is a one-part aliphatic coating that is applied by notched squeegee at the rate of one gallon per 100 square feet, then back-rolled.

All coating will be packaged in 5 gallon pails (19L), with a net 5 gallons in each.

Coating Selection & Application continued…

The following are the various physical property charts for primer, base coat, intermediate coat and top coat.

Technical Data for Primer:

Coverage Rate	1 gal/200-300 sq.ft.
Dry Film Thickness per Coat	3-5 mils
Pot Life at 75°F., 50% R.H.	60-90 min.
Specific Gravity, Part-A Part-B	 1.30 1.89
Total Solids by Weight, ASTM D-2369	90%
Total Solids by Volume, ASTM D-2697	84%
Viscosity at 75° F. Part-A & B combined	 1200 cps
Volatile Organic Compounds, ASTM D-2369-81	 0.83 lb/gal

Technical Data for Base Coat:

Coverage Rate	1.5 gal/100 sq.ft.
Dry Film Thickness per Coat	19 mils
Hardness, ASTM D-2240	70+/-5 Shore A
Tear Resistance, Die C, ASTM D-624	175 pli
Tensile Strength, ASTM D-412	900 psi
Ultimate Elongation, ASTM D-412	475 ± 50%
Specific Gravity	1.29
Total Solids by Weight, ASTM D-2369	85
Total Solids by Volume, ASTM D-2697	81
Viscosity at 75° F.	9000 ± 3000 cps
Volatile Organic Compounds, ASTM D-2369-81	0.75 lb/gal

Technical Data for Intermediate Coat:

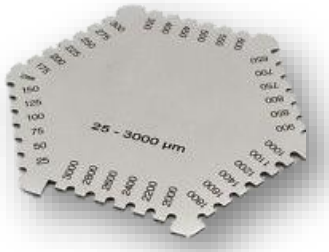
Coverage Rate	1 gal/100 sq.ft.
Dry Film Thickness per Coat (exclusive of aggregate)	14 mils
Hardness, ASTM D-2240	85 Shore A
Tear Resistance, Die C, ASTM D-624	300 ± 50 pli
Tensile Strength, ASTM D-412	2500 ± 300 psi
Ultimate Elongation, ASTM D-412	500 ± 50%
Specific Gravity	1.197
Total Solids by Weight, ASTM D-2369	92.5%
Total Solids by Volume, ASTM D-2697	88.1%
Viscosity at 75° F.	4000 ± 2000 cps
Volatile Organic Compounds, ASTM D-2369-81	0.74 lb/gal

Technical Data for Top Coat 100 VOC

Coverage Rate	1.0 gal/100 sq.ft.
Dry Film Thickness per Coat (exclusive of aggregate)	12 mils
Hardness, ASTM D-2240	95 Shore A
Tear Resistance, Die C, ASTM D-624	500 ± 50 pli
Tensile Strength, ASTM D-412	3500 ± 300 psi
Ultimate Elongation, ASTM D-412	200 ± 25%
Specific Gravity	1.31
Total Solids by Weight, ASTM D-2369	75.6
Total Solids by Volume, ASTM D-2697	73.4
Viscosity at 75° F.	2000 ± 500 cps
Volatile Organic Compounds, ASTM D-2369-81	.82 lb/gal

Application

This is one of the **most important screens** in the presentation. The application of the coating system determines the mil thickness of each coat. We will rely on gridding the deck, plus the use of wet mil gauges.



Primer

The primer is a two-part, equal volume primer. Part A is black, part B is white. They should first be mixed individually, then combined to insure a homogenous product. They should <u>not</u> be mixed with an up and down motion.

The primer application should occur with a small paint dispensing type sprayer or a thin nap roller, and the rate of application should be 200-300 sq. ft. per gallon.

The primer will take at least three hours to become thumb print tacky.

Base coat

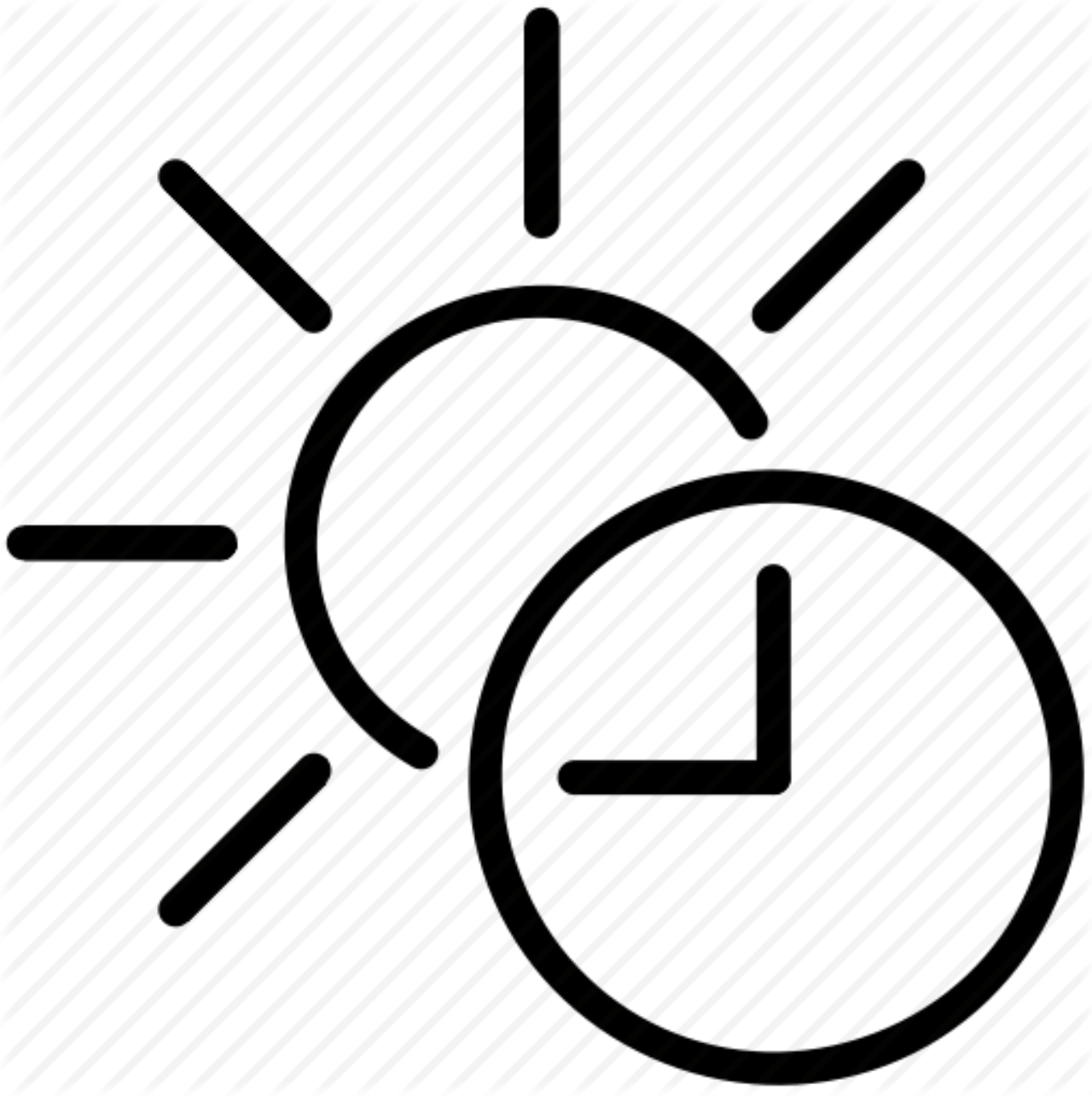
The base coat is a one-part polyurethane material and should be applied at the rate of 1.5 gallons per 100 sq. Ft. On a gridded deck.
One 5 gallon pail with 5 gallons net product will cover 330 sq. Ft. **Rubber traffic cones** should be used to mark gridded area.

The applicators, using **notched squeegees**, will spread the base coat in the gridded area by working perpendicular to the horizontal stripes of base coat. This application technique makes the spreading of the base coat much faster. The applicators then back roll the gridded area using 18” rollers.

THE BASE COAT SHOULD BE ALLOWED TO CURE OVERNIGHT.

Ramps, turn radiuses and heavy traffic areas should receive an additional coat of the base coat at the rate of one gallon per 100 sq.Ft. Utilizing the same method as described before. In addition, 16/20 aggregate should be spread in the wet base coat as the rate of 10-15 lbs. Per 100 sq. Ft., Then back rolled.

This should be allowed to cure overnight before proceeding to intermediate coat.

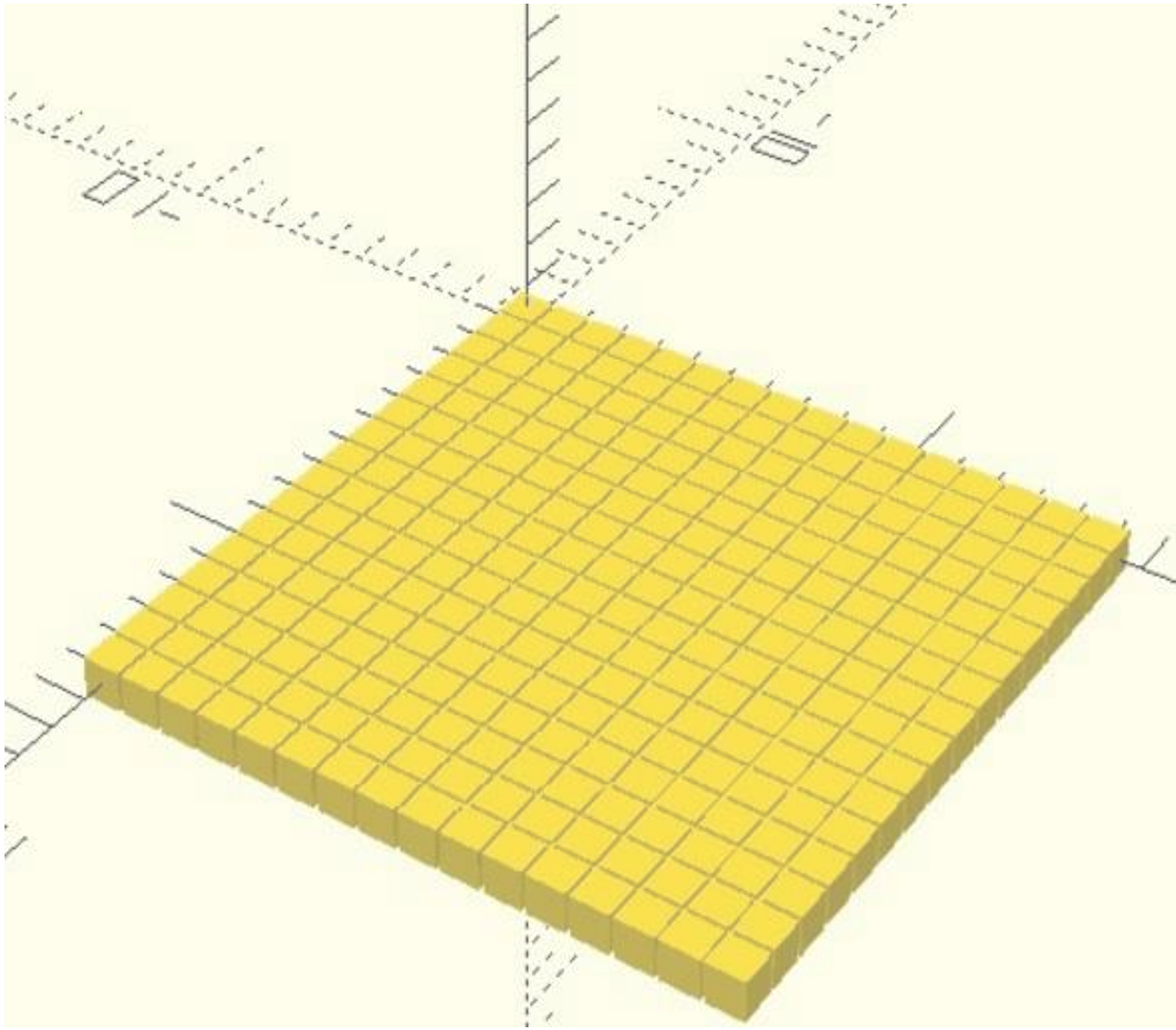


Intermediate coat

The **intermediate coat,** a one-part material, is applied at the rate of one gallon per 100 sq. Ft.

10′ x 10′ =

100′Sqft



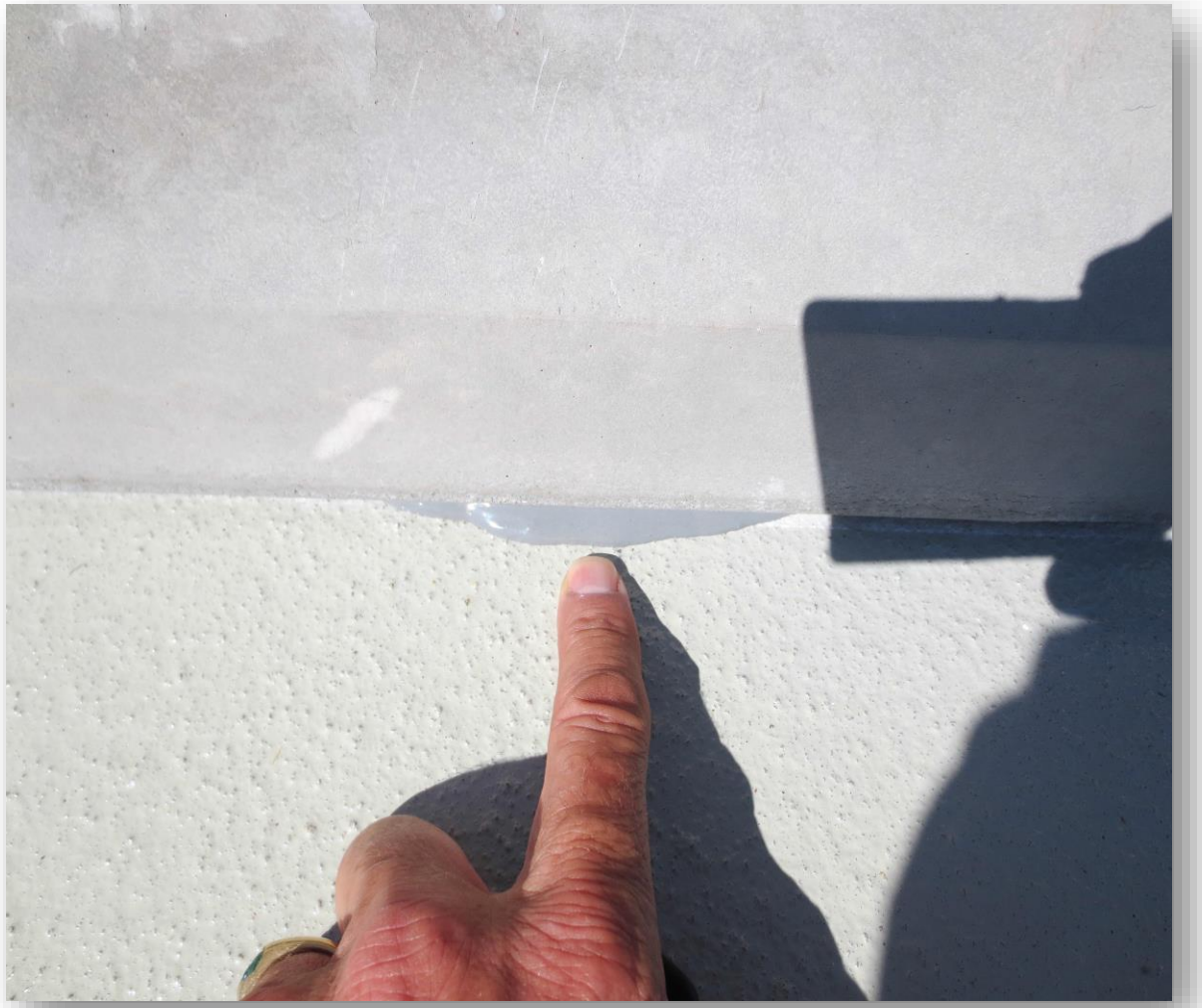
Using the same technique as base coat, the material will be dispensed from a 5 gallon pail, similar as the base coat. Spreading will occur by notched squeegee, then back-rolling will occur using 18” rollers.

Aggregate will be spread in the wet intermediate coat at the rate of 15 lbs. Per 100 sq.ft. We recommend disbursement with a **sandblast pot**. The aggregate should be 16/20 mesh. The coating should still be wet before disbursement. The intermediate coat should be allowed to cure overnight.

Top coat

The top coat is applied at the rate of one gallon per 100 sq. Ft., Using the same application method.

The material is then spread with a notched squeegee and back-rolled with an 18” roller. The deck should be allowed to cure 24-72 hours before traffic is allowed.



Maintenance

The deck should be inspected **annually** for any damage that has occurred, and repairs made where required.

Striping should be accomplished with epoxy or any approved striping paint.


9252
Metro Rapid
M
Medicare
+ Medi-Cal together.
L.A. Care


STOP
RIGHT TURN ONLY
13 M

All snow removal equipment should have polyurethane or rubber protection on the blades in order to protect the deck.

Cost

Many specifiers are curious as to the actual costs of the deck repairs when they are contemplating the rehabilitation of an old deck, or planning to coat a new deck.

THIS CONCLUDES THE AIA PROGRAM.

THANK YOU.