Pebble Stone Flooring Systems

General Information & Surface Preparation

I. CONCRETE

Surface preparation is as important as the selection of the correct coating or surfacer to be used. Two general conditions must be met for a successful application:

1. The concrete must be structurally sound and free of significant defects.
2. The surface must be free of contaminants that would interfere with adhesion.

A. There are many factors that can affect the strength and/or soundness of concrete. Some of these are: too little aggregate blend, too much water, excess retempering, too much air entraining agent, overworking the surface after the initial set has occurred and poor curing procedures. The results of some of these factors are not necessarily cause for concern when the concrete is not coated or when covered with a surfacer, but they become important when a protective surface is applied.

Overworking after the initial set can cause serious defects that are not obvious until a thick protection, such as glass mat reinforced liner, resin rich slurry coat, or aggregate filled surfacers using novolac resins as the binder is installed. Depending on the timing, such overwork can develop a weak strength line in the concrete from approximately 1/8 inch to ¾ inch below the surface. The thick protection systems shrink somewhat as they cure and place some tensile stress on the concrete. These stresses can fluctuate with large temperature swings. The tensile strength of concrete does not often exceed 350-400 psi, but this is more than enough strength to withstand the stresses described. However, the weak area caused by overworking can have strengths below 150-200 psi and failures can occur there.
To ensure a successful application, the surface strength, as measured by a pull-off test, should be at least 250 psi. The pull-off consists of isolating a controlled area of the surface, bonding that area to a measuring device, and deterring the force required to cause tensile failure.
An example of such instruments that can be used in the field is the PULL-OFF TESTER manufactured by PROCEQ, SA., of Zurich, Switzerland.

Failure in such a test, at the concrete surface with little or no concrete adhering to the adhesive indicates surface contamination. Failure with a thin line of cement and sand attached to the adhesive indicates low cement paste strength. Failure with significant amount of concrete attached to the adhesive, but at a level below 250 psi may indicate that overworking has occurred.

Any failure below 250 psi is cause for concern. The reason for the low figure must be determined and corrected before applying the protective system.

Other defects affecting the suitability of concrete to be coated are:

1. Poor compressive strength. A minimum of 3000 psi is usually adequate but unusual load factors may require higher values. Even if a surfacer has a compressive strength of 10,000-12,000 psi, failure can occur in the concrete below if its compression strength is not adequate for the service.
2. Delaminations. These occur for a variety of reasons. They can usually be detected by tapping the surface with a hammer or dragging a heavy chain across the surface. A “hollow” sound indicates delamination.
3. Protrusions such as, mortar spatter fins should be removed by grinding.
4. Spalled areas, pours areas, and voids such as “bird eyes” should be patched with a Portland cement based mortar or with a compatible polymeric patching compound.

Any concrete not meeting the above structurally sound condition must be replaced and properly cured before any protective system is applied.

When air entraining agents are used, long mixing times in the ready mix (long transit times or other “holds” on placement or excessive troweling can cause the entrained air bubbles to coalesce into voids or to collect at the surface to cause porous areas. These areas of porous concrete may require multiple coats of thin film protection to be applied.

They can also cause blisters if thick film protection is involved: air trapped wash in these areas under the surfacer of membrane, can expand before the protection cures.

Blisters can usually be controlled:

1. Seal the surface.
    a. Apply a heavy primer coat and allow it to at least partially cure before proceeding.
2. Apply the primer and the topcoat or surfacer in the usual manner but choose conditions that allow cure before the temperature rises.
    a. Shield the surface from direct sunlight.
    b. Install after the maximum daytime temperature has passed and the temperature of the concrete and air are both failing. This may require night-time installation.

B. Surfaces that are structurally sound must still be cleansed of all contaminants to achieve satisfactory performance from the protective coating or surfacer.

1. Abrasive blast cleaning is the preferred method. Several types of abrasive blast cleaning equipment are available that hold dust to a minimum by vacuum collecting the abrasive and the debris developed during blasting. Heavily contaminated areas may require as scabbler or scarifier to remove thick deposits and some of the structurally sound, but irretrievably contaminated, surface.
2. Where abrasive blast or mechanical cleaning is not feasible (or not permitted) cleaning can usually be accomplished by acid etching. Most often the acid because of its availability and rapid action, ACI (American Concrete Institute) recommends a less active, but safer, organic acid. Both acids can clean concrete well.

The order of cleaning steps is important as some steps are ineffective if the previous steps have not been performed.

    a. Blow off dust and debris with oil free compressed air.
    b. Remove water-soluble chemicals, oils, and some animal fats by scrubbing with a strong alkaline detergent such as sodium metasilicate or tri-sodium phosphate solution, follow by flushing with high pressure water. Heavy layers of oil, grease, asphalt, dirt or other contaminants should be removed by scraping before the detergent is applied. Animal fats are especially hard to remove. Best results are obtained by scrubbing with a 10% caustic solution in water followed by flushing with high-pressure potable water.
    c. Acid etch, using 1 volume muriatic acid mixed with 3-4 volumes of water at a rate of 2-21/2 gallons per 100 square feet. Scrub the acid solution into the concrete surface making sure not leave areas not scrubbed. The action of the acid will be evidenced by extensive bubbling and the formation of a scum. This action should be continued for 3-5 minutes before stopping. Do not allow the surface to dry: Flush with large volumes of potable water while scrubbing to help remove the scum and any loose particles.
    d. If acid etching does not produce bubbling action over the entire surface, some contamination is present that will almost certainly interfere with adhesion. This may be a curing compound, a clear seal coat or some similar material. It must be removed. Some type of paint remover may be required.

Not all of the above steps are always required. The action required depends upon what kind and how much contaminant is present. However, whatever steps are taken, they should be in the order shown above.

The acid, caustic and alkaline detergents described above present hazards to skin and eyes. Wear goggles, rubber gloves and body covering clothes when using them. Read the supplier's instructions carefully before beginning.

C. After the surface has been acid etched and rinsed, blow off the excess water with oil free compressed air and allow to dry. The surface should have the texture of rough sandpaper.

A final test after preparation is to place a small amount of potable water on the dry surface. The water should spread quickly and uniformly. If it beads or spreads in a non-uniform manner, further preparation is required.

In all cases of doubt as adequate surface preparation, a test patch of approximately 2ft. x 2ft. should be installed, allowed to cure, and tested for adhesion before proceeding.

D. Several common failure modes are related to

Vinyl tile should be cleansed thoroughly with a wax

properties of the concrete and not directly to the protective system:

1. Cracks: When properly applied, a protective system is strongly bonded to the concrete. Any cracks that develop in the concrete will be reflected in the coating or surfacer.
2. Joints: Control joints and expansion joints are used because some movement of the concrete is expected. Thick film protection such as surfacers should have a joint at every joint in the concrete.
3. Blisters and Delaminations: Water in the concrete can cause these failures. Liquid water can become vapor as the temperature rises and the resulting pressure can cause blisters if the protective system has not cured enough to resist this pressure. Water collecting at the interface between the concrete and the protective system, after cure, can cause delamination.

The source of this water can be water taken-up in porous areas during cleaning, water remaining in partially cured concrete or ground water percolating upward through the concrete.

A relatively simple test for moisture content of concrete consists of placing a 2ft. x 2ft. sheet of plastic, such as polyethylene or PVC over the surface to be tested, secure the edges and leave for 24 hours. If an objectionable level of moisture is present, condensed moisture is present, condensed moisture is visible. However, at temperatures below 40F, the passage of moisture effective when the slab temperature is at least 40 degrees Fahrenheit.

The moisture content of concrete to be protected by epoxy and polyester products must be no greater than 8% for satisfactory performance. This will vary for polymer modified cementitious products and for water based systems: refer to specific instructions for these items.

E. Determining when adequate preparations have been done, whether the concrete is sound enough for a specific installation or whether too much water will cause a failure is best accomplished with experience in making such decisions; there is no substitute.

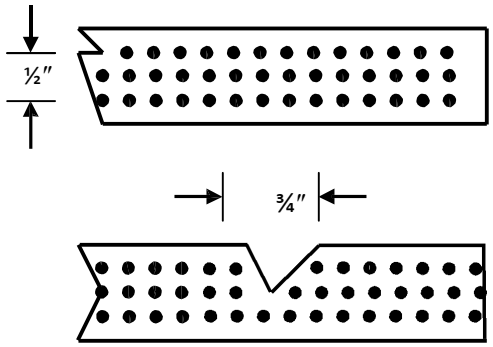
F. Aged epoxy surfaces should have the gloss removed by sanding, screening or shot blast and wiping with an aggressive compatible solvent such an N-methyl pyrollidone (Mpyrole or equivalent).

removing compound. Because of the wide variety of tile compositions, a test application is recommended before coating a large area.

Wood should be sanded and all debris removed.
Because of wide variations in porosity and grain raising, consult PebbleStone for guidance.

1. SAWCUT SLAB AT EXTENT OF FLOOR

Sawcut slab at all floor perimeters where surfacer will not abut vertical surface. Sawcut should be at a 90 degree angle to floor, maintaining a ½" depth.

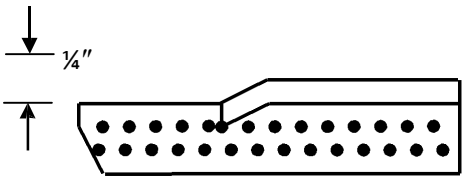


2. CHIP OUT CONCRETE

Chip out concrete with a chipping hammer. Chip toward saw cut. Vacuum debris. Width of chase should be no less than ¾", and no more then 1 ½".

3. INSTALL SURFACER

Prime and trowel surfacer into chase along with rest of floor.



COVE BASE DETAIL

1. PREPARE FLOOR AND WALLS

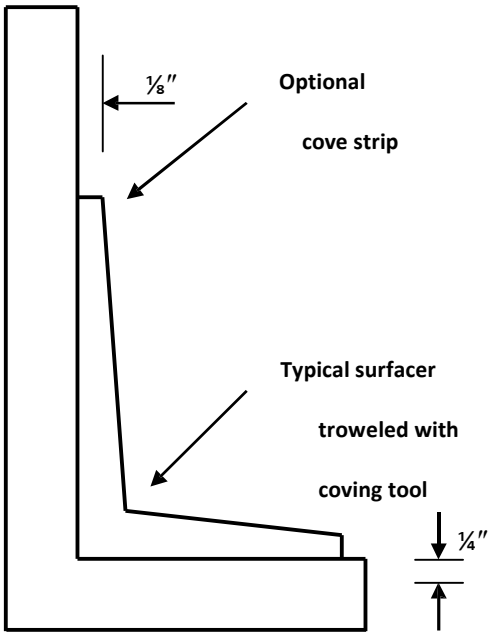
Prepare floor area and walls. Refer to Polymerica Technical Bulletin SP-C.

2. PRIME FLOOR AND WALLS

Snap a line along wall at desired height (2", 4", 6"). Apply tape above chalk line to ensure a neat edge. Cove strips can be specified to improved appearance of top edge. (see detail) Apply primer according to directions.

3. INTEGRAL MATERIAL APPLICATION

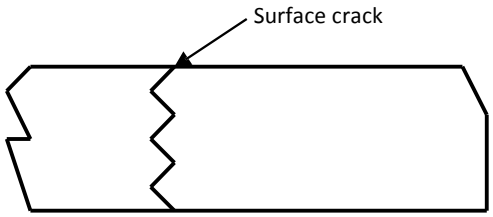
Apply surfacing material to wall and floor in one step using a coving tool. Remove tape before access to area is restricted by floor installation.



CRACK REPAIR

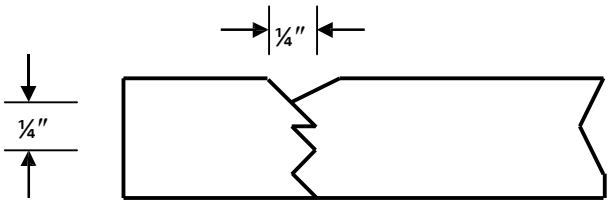
1. LOCATE CRACKS IN CONCRETE

Cracks larger than a 'hairline' and any cracks which are indicative of structural movement should be selected for routing. Cracks which are actually joints in the slab are dealt with later in this document.



2. CHIP OUT CONCRETE

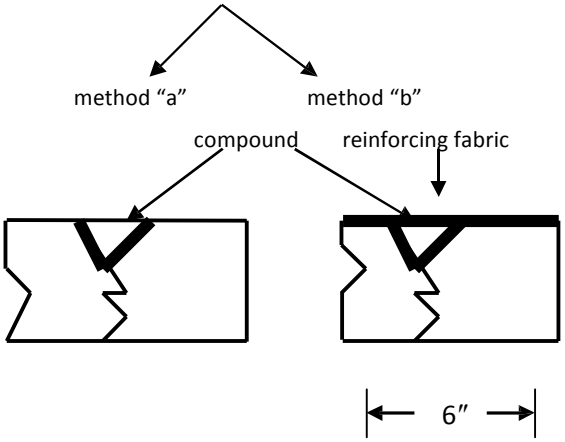
Method a) Chip out concrete with chipping hammer. Chip toward crack. Vacuum debris. Width and depth of chamfer should be no less than ¼".



3. FILL CRACKS WITH COMPOUND

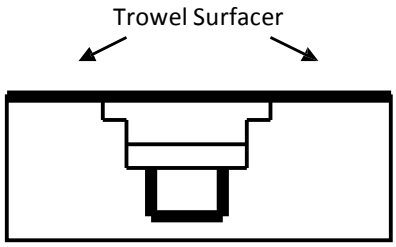
Method a) Mix according to directions. Pour neat into the chamfer level just below the surface of adjacent sides. If the floor is to be overlaid with a mortar system, fill chamfer to top as shown.

Method b) Mix according to directions. Pour neat to fill chamfer, continue pouring out a bead 6" wide over top of chamfer, with a thickness of 30-60 mils. Feather edges while it is still wet, set reinforcing fabric into compound.

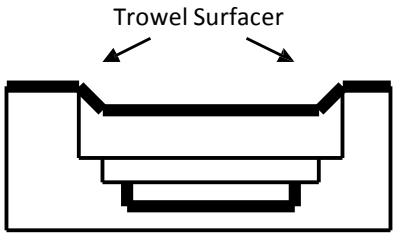


*not to scale

FLOOR DRAIN DETAIL



New Construction Detail

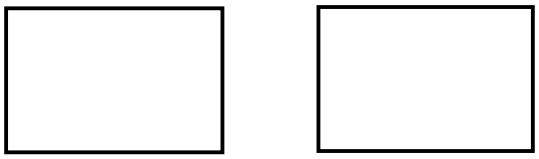


Retrofit Detail

JOINT DETAIL

1. LOCATE JOINTS IN CONCRETE

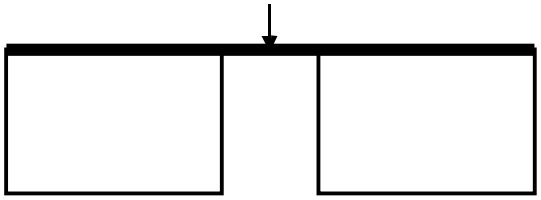
Locate all joints to be overlaid. Mark both ends of each joint location on walls, columns, or vertical abutment.



Slab cross section with joint

2. APPLY OVERLAYMENT OVER JOINT

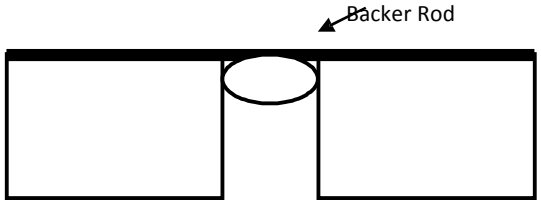
Apply seamless flooring system over entire surface in accordance with directions. Allow floor to cure out.



3. FILL JOINT

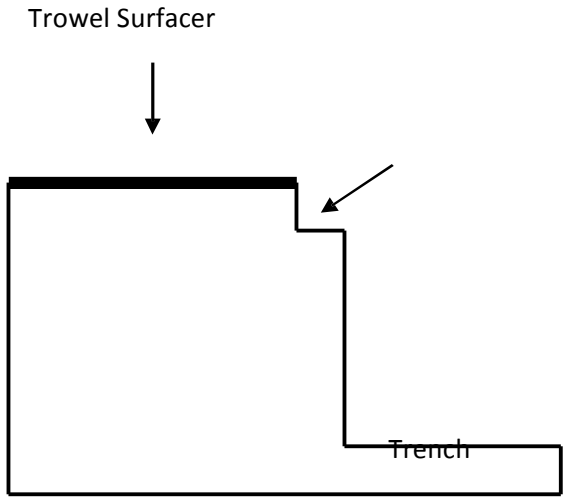
Using the marks as a guide snap lines over joints, and sawcut through overlayment into original joint. Install backer rod (generally at a depth equal to half the joint width) to contain compound. Mix joint compound according to directions. Pour neat into the joint to level just below the surface of adjacent sides.

For non-working or control joints, backer rod is generally not used. Pour joint compound neat into the joint to level just below the surface of adjacent sides.

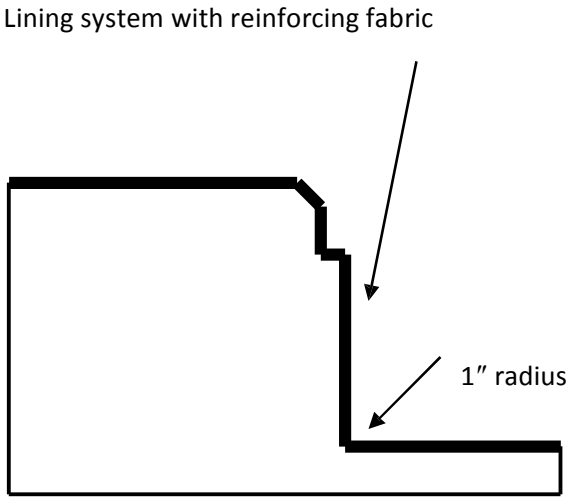


NOTE: Proper joint design is the responsibility of the facility engineer or architect. Please consult current ACI standard 504R for necessary guidance.

CONCRETE TRENCH DETAIL

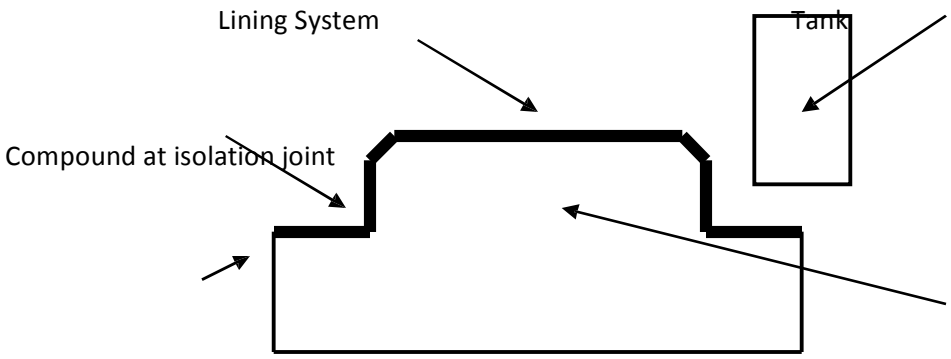


Unlined trench



Lined trench

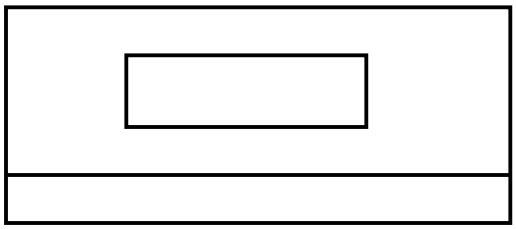
VERTICAL LINING TERMINATION



SMALL FLOOR PATCH DETAIL

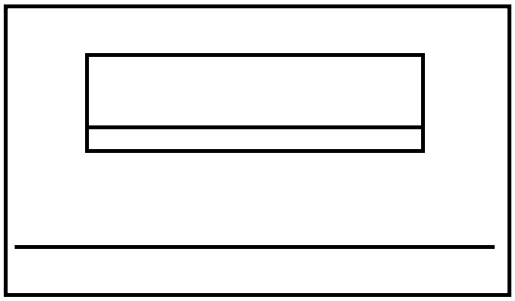
1. SAWCUT AREA PERIMETER

Snap a chalk line around area to be patched. If possible, make the area rectangular in shape, so that the finished patch will be more aesthetically pleasing. Make saw cuts into the flooring between ¼" to ½".



2. CHIP OUT BAD CONCRETE

Using a chisel or a chipping hammer, remove the affected material. Start approximately 2" inside of the saw cut, and chip towards outer edge. Working in from the saw cute might damage straight edge. Remove as much substrate as necessary to obtain ¼" to ½".



3. INSTALL SURFACE

Mix and apply trowel patching material according to directions. Screed top of surface to that it is level with adjacent surface, and finish trowel. Allow to cure. If sealing is desired, apply duct tape just outside the extent of the surface.

BEAN-e-doo Mastic Remover Tip Sheet

For nearly a decade, BEAN-e-doo® Mastic Remover has been replacing older mastic removers, usually made from petroleum based chemistry. The older removers evaporate very quickly, resulting in often offensive odors, and significantly contribute to air pollution and global warming. BEAN e doo Mastic Remover evaporates very slowly, has a very low, non-offensive odor, and does not contribute to global warming. BEAN-e-doo Mastic Remover's advancements in mastic removal techniques sometimes requires a different approach to cleaning up. These tips are designed to help people evaluate which techniques will work best for their project.

BEAN-e-doo Mastic Remover should not be used on wood surfaces. Using BEAN-e-doo might slightly darken a concrete surface.

The condition of the concrete, its surface, age, even the environment are factors that contribute to the simplicity, or complexity of mastic removal. The on-site user of BEAN-e-doo Mastic Remover is in the best position to determine these factors. The tips offered below range from the simple (tight, undamaged, fairly non-porous) concrete to the more complex (porous to very porous, highly cracked, extremely absorbent).

APPLICATION:
Pour BEAN-e-doo Mastic Remover undiluted directly on the concrete surface. Do not exceed the recommended coverage. Applying too much BEAN-e-doo does not increase removal time, but does contribute to impeding the complete removal of residue.

Where there are wide cracks or seals, fill with a commercial absorbent like diatomaceous clay (e.g. OilDry™), saw dust, or synthetic absorbent, before pouring BEAN-e-doo on the surface.

Use a long handled brush or broom to ensure BEAN-e-doo covers all the mastic trowel ridges.

Allow BEAN-e-doo to dwell until mastic softens (generally 45 to 60 minutes for asbestos mastic. Dwell time for vinyl and acrylic mastics is longer, in some cases up to 4 hours.)

CLEAN UP:
Use a long handled scraper or squeegee to remove softened mastic and excess BEAN•e•doo®. Generally, black mastic will dissolve into a liquid the consistency of very old engine oil, and can be scraped into a puddle. Fill the puddle with a commercial absorbent, and then shovel into receptacle. All other mastics tend to lift as more solid than liquid and can be scrapped into a pile that can be picked up with a shovel.

After picking up the dissolved/lifted mastic, there will still be a slippery, film residue remaining. In most cases, mopping the floor with Franmar Chemical's Emerge™ will remove the residue. For best results for cleanup, after removing softened mastic, cover floor with a commercial absorbent, sweep up and then follow with a mop rinse using Emerge™. * Testing surface for residues after floor has been mopped: Apply water to various small spots on the substrate. If water turns cloudy white, indicates there is BEAN•e•doo® Mastic Remover on the surface. Remop using a degreaser is recommended. Then retest. Let surface dry before applying new mastic or coating.

In all cases, care should be taken not to over saturate the floor by using too much water.

In extreme cases, and/or for especially difficult floors, scrape up softened mastic, then pick up filmy residue with steam vacuum. Cover floor with a commercial absorbent, sweep up and then follow a mop rinse using Emerge. Let dry before applying new mastic or coating.

* Use of rotary cleaning machines for cleanup are not recommended unless an area has been tested first.

Revision Date 2/1/2006

SOY-Gel Product Data Sheet For General and Restoration

SOY•Gel™ is an industrial strength and consumer friendly paint, varnish, and urethane remover made with 100% American grown soybeans. The low evaporation rate of SOY-Gel and its gel formulation make it possible to remove several layers of paint in one application. During the removal of lead based paint, lead becomes encapsulated in the gel, preventing airborne lead particles, allowing for safe and easy disposal. SOY-Gel contains no methylene chloride, is not an alkaline based stripper and cleans up easily with water. Unlike more traditional paint strippers SOY-Gel lets you work without the odor. Indoors or outdoors, you can be guaranteed a safe restoration process with SOY-Gel.

APPLICATION:

SOY-Gel is safe to use on wood, brick, stone, metal, plaster, concrete, and many other surfaces. Do not use on plastic, PVC, rubber or dry wall. SOY•Gel may be used indoors or outdoors. When used outdoors, protect plant and vegetation with a plastic drop cloth. SOY Gel may be used on vertical as well as horizontal projects.

Apply a thick, even layer of SOYGel, generally between 1/16 and 1/8 inch to the coating to be removed by using pouring, brushing, or airless sprayer (piston pumped with tip of 519 or similar). If applying with brush, do not apply as you would paint. Don't brush or scrape the surface until the stripper has had time to work. Check the progress of the stripping action by using a scraper to see if the coating is softened down to the surface. If not, wait longer and recheck. SOY-Gel will remain wet and working for several hours. Longer is better. Let the stripper do the work. If SOY-Gel is left to sit outdoors, cover with a light plastic drop cloth to prolong the stripper's wet time. Once the coating is softened, remove it with a scraper, industrial wet vacuum, or other stripping tool. Reapply stripper, if necessary. Repeat steps above. After use, clean remaining thin residue with water, using a scrub brush and/or mop or power washer. Ensure to scrape or vacuum excess removed coating and SOY-Gel before using a power washer for final cleaning. Always use care to prevent over spray from getting on surfaces other than the one being prepped. Allow surface to dry before further preparations.

- Flash Point: Above 200°F
- pH Level: 6.80 pH of 1/10 wt/wt solution in soft water.
- Vapor Pressure: Not determined
- Odor: Mild Odor
- Conditions to avoid: Strong oxidizing agents.
- Health Hazards: May cause moderate eye irritation. May cause delayed skin irritation. May be harmful if swallowed in large amounts.
- Packaged: Quart, Gallon, 2 1/2 Gallon, Five Gallon, 55 Gallon Drum
- Coverage:

Horizontal - Up to 200 sq. ft. per gallon
Vertical - Up to 130 sq. ft. per gallon

Common Uses

- Lead-based paint removal
- Latex paint removal
- Enamel paint removal
- Single and Two part epoxies (two part solid count must be lower than 40%)
- Urethane removal
- Varnish removal
- Concrete sealer removal

Revision Date 12/11/2006

Floor Care Recommendations

Epoxy and Urethane Systems

The following cleaning recommendations should be practiced weekly or more frequently as needed.

IMPORTANT! Only warm water should be used to clean within the first week.

- After the first week use only a non-chlorine cleaner diluted in water.
- Sanitizing detergents that contain chlorine or hypochlorite should **never** be used.
- Spills must be removed and rinsed at the first opportunity.
- Sweep or vacuum loose dirt or debris.

McKrete and Deck Coat Overlay

The following cleaning recommendations should be practiced weekly or more frequently as needed.

- Hose the deck or patio frequently
- Clean with a mild detergent
- Spills must be removed and rinsed at the first opportunity.

Things NOT to do:

- Do **not** use muriatic acid to clean this flooring system
- Do **not** use any solvent or ammonia based cleaner to clean the flooring system
- Do **not** allow animal fats from a grill or stove to come in contact with the floor. Place a mat under the grill to protect the finish.