Surface Preparation

It cannot be said too often, no matter how good a floor protection system is, if the floor surface is not properly prepared, the coating will fail. All contamination must be removed, including efflorescence, dirt, paints and coatings, hardeners, sealers, grease, and oil.

Too often, the floors are prepared only by mechanical means because many contractors are reluctant to pay the cost or take the time to perform additional and necessary chemical cleaning. Often an owner or engineer specifies only mechanical cleaning, or a narrow time frame is allotted for the floor to be cleaned, coated and put into service, leaving only enough time for one surface preparation method.

In many cases, mechanical scarification is the best, first procedure for removing a thick build up of contaminants that have been ground into the concrete by vehicle traffic. In extreme cases, this buildup can be as thick as 3/8". Scarifiers have round, pointed teeth mounted on a rotating drum that can cut through the thick buildup.

Shotblasting the floor is an excellent way to roughen the surface and open the pores of the concrete. If the floor contaminants contain little oil or grease, the floor may be ready for coating after shotblasting.

However, when a concrete floor has been exposed to any type of oil or grease, chemical-cleaning methods must be used. This is the only way to remove oil and grease from the pores of the concrete. If the floor contains only a light saturation of oil and grease, scarifying is not recommended, but we do recommend shotblasting to provide a surface on which the chemical cleaners will perform better.

Chemical Cleaning

In extreme cases, the buildup of contaminants is so hard and compacted that you may want to use a cleaning solvent to soften the contaminants before scarifying the floor. Pour a thin layer of solvent on the floor, scrub it into heavily soiled areas, and allow to sit for five minutes before removing with a wet vacuum.

After scarifying and shotblasting the floor and removing all dust and debris, degrease the floor with a caustic solution. This solution penetrates the pores of the concrete and emulsifies the oils. Mix one part, 50% liquid caustic soda with two parts water. Use hot water if it's available. Pour the solution onto the floor and spread it with a squeegee. The coverage rate depends on the amount of contaminants on the floor, but 100-300 s/f per gallon is usually suitable. Use a rotary scrubber to work the solution into the concrete. Allow 10-15 minutes for the solution to emulsify the oils before flushing the surface with water and removing the solution with a wet vacuum.

Next, acid etching of the concrete floor is required. The acid not only boils contaminants from the pores of the concrete, but also neutralizes any of the caustic soda solution that may be on the floor. Mix one part of 20 muriatic acid with four parts water. Always add the acid to the water; never add water to the acid. Adding water to the acid generates too much heat. Pour the solution onto the floor and spread it with a squeegee. A coverage rate of 100 s/f per gallon should be adequate. When bubbling of the acid stops, flush the floor surface with clean water and remove the solution with a wet vacuum.

If working where food may be subjected to the vapors of muriatic acid or where the acid may come in contact with metal, use a solution of one part 85% food grade phosphoric acid instead of muriatic acid and mix it with two part clean, potable water. Follow the same procedure that is used with the muriatic acid.

Following the acid wash, remove the remaining water with a squeegee or wet vacuum. If hot water or steam cleaning has been used throughout, the floor should be clean. However, if there are areas of the floor where contaminants have not been removed or where water continues to bead, repeat the caustic soda and acid wash procedures. If the problem persists, propane torching of the areas may be needed. Propane torching requires special equipment that draws oils and other impurities to the surface and incinerates them. When using this equipment, take all the precautions necessary when working with open flames, including having a fire extinguisher near by. After propane torching the area, spot clean the area by repeating the caustic soda and muriatic acid cleaning procedures.

The last step is to neutralize the remaining acid with a diluted liquid industrial detergent. Thoroughly scrub the detergent into the surface, then flush the floor with clean water and remove the solution with a wet vacuum.

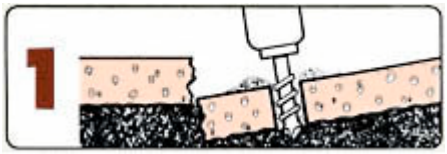
How to Mud Jack or Slab Jack a slab

Certain concrete areas become uneven due to the poor substrates, wash outs due to poor drainage, or shrinkage of the soil underneath.

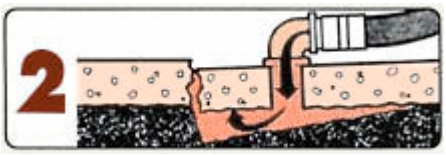
If you encounter an uneven slab, you may want to consider Mud Jacking or Slab Jacking a concrete area back to even. This process replaces the substrate with a concrete material under the slab, raises the uneven area during the process, and creates a more stable area in the long term.

The process involves three steps.

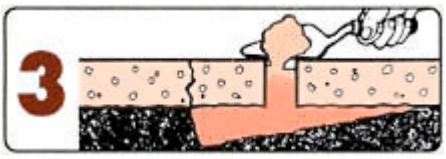
Step one: A pattern of holes is drilled into the uneven area.



Step two: A concrete mixture is pumped into the holes and under the concrete area. This raises the area and provides a much stronger substrate for the slab to rest on.



Step Three: The holes area repaired with a concrete mixture. Once this is dry, the CTI System can be installed as usual.



Due to the incremental damage that can occur to landscaping, the structure, etc. during the replacement of a concrete area, slab jacking may provide a more cost effective alternative when you are faced with uneven concrete. The equipment for slab jacking is expensive, so we recommend finding a contractor that specializes in this operation and using him as a sub for the projects where needed.

Preparing a Surface with Kool Deck

Another top coating that is an inexpensive alternative for many builders is Kool Deck. Kool Deck is a trinity white cement and sand that is ideally applied over concrete that is 3-5 days old. The stark white appearance of the Kool Deck keeps a concrete surface cooler due to the reflectivity of its color. Unfortunately, Kool Deck relies solely on a mechanical bond with the concrete and can only achieve this bond completely if the original concrete is new or green. Many customers have had Kool Deck installed after their 3-5 day window has passed.

With this in mind, the main challenge Kool Deck poses in the installation of the CTI System is the development of hollow areas where the Kool Deck surface has pulled away from the existing concrete. The procedure for finding these hollow areas is to "sound" the surface using a metal chain or piece or re-bar. To sound a deck, either drag the chain randomly across the entire deck or tap the re-bar randomly across the entire deck. You will hear distinct differences in the sound of the deck if you come across a hollow area. If an area is hollow, you will need to remove the Kool Deck from the area and fill with CTI's 105 Grout and 111 Modifier combination (4 ½ quarts per bag of grout) or use the High Density Mortar if the area is greater than ½" deep. Removal is done by using a sledge hammer, regular hammer and chisel. Demolish the Kool Deck in the hollow area until you come to the edge where it is no longer hollow. Once you have reached this area, use the hammer and chisel to remove any smaller, hollow areas.

If you discover that more than 25% of the deck has become hollow, removal of the entire Kool Deck surface is recommended. This is done mechanically by use of a Cango hammer or pneumatic chisel (see illustration to the right) for larger areas. These pieces of equipment can be rented at an industrial equipment rental store.

Once the hollow areas have been removed and filled according to the instructions above or the entire surface removed, the CTI System can be installed as usual.

Carpet Glue Removal

Carpet glue, like paint, can be removed both chemically and mechanically depending on the situation. Once you have removed the carpet, examine the glue underneath. If the glue appears old and brittle, mechanically grinding the surface with the 9" grinder (G23SC2) and the cup grinding wheel (PW6CH) can be used to remove the brittle glue along with a thin top layer of the concrete. If the glue is in an elastic state, use of the grinding method is not recommended as the flexible glue will gum up the grinding wheel and removal will not be complete.

In the situation where the glue is in an elastic state, chemical strippers such as Strip All, Dad's Strip Ease, etc. is recommended first to eliminate all the surface glue. Once you have applied the stripper per the manufacturer's instructions, scrape as much of the excess glue from the surface as possible. Once this is done, mechanically grind the area with the 9" grinder and cup grinding wheel to remove the glue that exists in the pores of the concrete.

Failure to remove all glue from the surface may cause de-lamination or for the glue to "wick" back through the product and cause a stain underneath the sealer once the sealer coat has been applied.

Working with a Radiant Heat Concrete Surface

Radiant heat flooring is a situation you may encounter if you live in a colder climate. Radiant heating is the process of embedding tubing in a concrete surface (i.e. interior floors for room heating and exterior slabs to melt snow and ice) and then having hot water or electric heating transmit through this tubing to warm the concrete slab.

The challenge posed by radiant heat flooring is that of not harming the tubing during the preparation stages. Since the floor has tubing running approximately 2" down throughout the floor, you cannot cut the floor for tension relief.

Preparation of a radiant heat floor must be mechanical. Use of acid on a radiant heat slab may cause damage to the tubing. Crack repair procedures can be utilized by forming a small "V" channel in the slab along the crack line and injecting the Crack Weld 240. Once the mechanical preparation and crack repair is done, the installation of the CTI System can proceed as normal.

Once the CTI System has been installed, it is recommended that the radiant heat unit not be used for a minimum of 30 days. This allows the CTI System to cure and so the rapid heating of the concrete caused by the radiant heating doesn't damage the surface.

Epoxy River Rock stone removal

A top coat that was popular in many areas of the United States in the 70's and 80's is an epoxy river rock top coat that is troweled over an existing concrete area.

This type of top coat relies solely on a mechanical bond with the existing concrete and has a tendency to pull loose from the original concrete as it breaks down from UV rays.

With this in mind, removal of a river rock surface is always recommended. Removal is done by using a Cango hammer or pneumatic chisel. This type of equipment can be rented by most industrial rental stores. The purpose is to remove the river rock top coat from the original concrete and leave a bare concrete surface. The pneumatic chisel will break the top coat apart and allow for easier removal. Once the river rock coating has been demolished, disposal is needed by loading it onto a truck and disposing of it in a dump.

Once the river rock coating has been demolished and carried away, examine the deck. If an epoxy residue is present, you will need to grind a thin top layer of the concrete off to remove this epoxy residue. Once this is done, a thorough acid etching and pressure washing is needed to eliminate the remaining epoxy from the surface. Once these procedures are complete, installation of the CTI System can proceed as normal.

Placing or Replacing Zip Strips or Deco Strips

Many concrete areas have white, plastic strips placed into the joints and cuts of the concrete. These strips provide a more aesthetically pleasing alternative to an open joint. In situations where the strips are placed over an existing coating (i.e. river rock), removal of the strips is required due to the strip being higher than the rest of the deck once the existing coating has been removed.

When confronted with these types of strips already in place, removal of these strips is required. This is done by cutting a "V" groove or channel under the zip strip using the 4 ½" grinder (G12SA) and the 4" diamond blade (DIA004SC), and pulling the strip free from the concrete. Once this is done, a channel will be present in the deck. This channel is cleaned out by acid etching and power washing it along with the rest of the deck during the preparation stage. Once this is done, a new zip strip is placed in the area by laying the strip in the channel and tapping the strip into place using a rubber mallet. Make sure the strip is even with the rest of the concrete slab.

Once the strip is in place, a mixture of the 105 grout and 111 modifier is used to set the strip in place. This is done by pouring the mixture into the channel around the strip and troweling smooth. Once this is dry, you can skim the deck and install the CTI System as usual.

If zip strips or deco strips are present and are even with the slab already, you do not need to replace the strip. Simply cover the strip with pattern tape during the installation of the CTI System and proceed as usual.