Specialty Finishes for Concrete Slabs

by Dennis Golden

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Concrete is tough stuff: When it comes to walks, patios, and driveways, few materials are as durable. And when a custom finish is applied to this rugged material, the results can be impressive. In this article, I'll explain the techniques that can be used to change a dull, gray slab into an architectural asset.

Colorful Concrete

An impressive way to enhance the look of concrete is to add color. Attractive applications are limited only by imagination and taste. We've even poured colored slabs that served as the finished interior floor.

There are a number of ways to add color to concrete, and each method has both merits and drawbacks.

Delivered in Color

Whenever possible, I prefer to have the color "mixed in" at the supplier's batch plant. The finishing techniques used when working with integrally colored concrete are the same as those used for standard concrete, and most small placements will proceed without a hitch. You can expect to pay about 50% more for a colored batch of concrete.

If you're subbing out an integrally colored concrete project, always find out if there will be more than one load of concrete. With multiple loads, it's difficult for ready-mix companies to produce the same color consistently from load to load. You may get two or three trucks into the pour before a mismatched load arrives, but when it inevitably does, the conversations that follow will center around expensive solutions.

Colors, patterns, and textures can turn a dull slab into an architectural highlight

Good planning, good color. The time to take care of this possible problem is in the planning stages. Contact local ready-mix companies and ask for the location of large colored flatwork jobs they've supplied the concrete for. Visit the jobs and look closely at the color consistency. A quality-conscious supplier can produce

Figure 1. *With the "dry shake" method, a powdered dye is broadcast over the surface of the slab, then troweled in.*

Figure 2. *Surface stains, tooling, and polishing can give a concrete slab the look of expensive marble.*

L.M. SCHOFIELD INC.

consistent loads, but it requires time and concentrated effort. Ask to have a ready-mix company representative on site to approve all deliveries.

Once the mix has been accepted, it will be up to you or your sub to control the variables. The most important rule is to stay away from the water valve. The concrete should be delivered at a 4- to 5-inch slump, and water should *never* be added to the mix. A damp subbase is okay, but it should never be puddled with water.

Cold climate consideration. In colder climates, try to avoid the color black. Most black pigment will drastically decrease the amount of air that is entrained in the mix, and slabs exposed to freeze/thaw cycles will have a shortened life expectancy. I've also had finishers tell me that on hot, sunny days, dark-colored concrete will set up much more quickly than the lighter colors.

Shake It On, Finish It In

The "dry shake" method is another option to consider when coloring concrete. A powdered dye is broadcast over the concrete (see Figure 1) and troweled into the surface. There's a broader range of colors available than with integrally colored concrete; most concrete accessory supply houses have extensive color charts.

After the concrete has been screeded and bull-floated (and any joints tooled into the surface), about two-thirds of the required dye is carefully broadcast by hand over the surface. The joints are then retooled, and the rest of the dye powder is sprinkled carefully over the concrete and troweled into the surface. Once the colorant is worked into the surface, finishing operations return to normal.

Be aware that "overspray" is an important issue. You should have plenty of plastic on hand to cover anything nearby that you don't want colored — plants, curbs, and existing walls, for example. You might even want to make a special clothing allowance available to anyone responsible for handling the dry-shake dyes: Clothing worn by those involved in this procedure will be worthless at the end of the day. (The only two things that *might* remove powdered dye from where it doesn't belong are acid or dynamite.)

Staining Concrete

There are some beautiful concrete stains available for coloring cured slabs. These stains chemically bond with free lime in the concrete mix. Instead of one homogeneous color, the stain creates a mottled effect as it interacts with the varying amounts of lime available at the surface of the slab (Figure 2).

Colors are available primarily in earth tones, and you should expect to pay about $50 per gallon of stain. A two-coat application will require approximately 1 gallon per 100 square feet. The stain can be applied to both new and old slabs.

The surface to be stained must be perfectly clean; older slabs may need to be washed with a diluted solution of muriatic acid. The stain is applied with a hand-held sprayer, then scrubbed into the surface and left to soak. The process is repeated, then the slab is washed down with water. After the slab dries, a surface sealer is applied. L.M. Schofield Inc. (6533 Bandini Blvd., Los Angeles, CA 90040; 800/800-9900) manufactures both the stain and corresponding sealer.

A word of caution: Stain is not entirely predictable, and will vary from slab to slab. The only way to accurately predict what a certain stain will look like is to make a test patch in an inconspicuous area, and decide whether or not the result is acceptable.

Curing Colored Concrete

For a durable concrete finish, proper curing must take place. There is only

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Figure 3. *Repetitive patterns can be pressed into the surface of freshly poured concrete using stamps (left) or plastic templates (right).*

one curing method I'd recommend when working with colored concrete, and that's a spray-applied sealer. The sealer acts as a curing compound, preventing rapid moisture loss as the slab cures. It also provides a protective coating that discourages spills or stains from "wicking" into the surface of the slab.

There are tinted sealers available that closely match the color of the concrete, and these can sometimes be used to "even out" slight color variations between different loads of concrete. But unless there is a color variation problem, I prefer a clear sealer made by Davis Colors (3700 E. Olympic Blvd., Los Angeles, CA 98023; 800/638-4444 in eastern U.S., 800/356-4848 in western U.S.). It can be used to seal any color concrete, and overspray isn't as critical an issue as with a tinted sealer.

One thing's certain: Colored concrete should never be cured by ponding, fogging, or by covering it with plastic. These methods are guaranteed to discolor the surface.

Patterned Concrete

In the hands of an experienced finisher, concrete can be persuaded to mimic cobblestone, tile, brick, flagstone, and other building materials. The range of patterned surfaces is limited only by the imagination.

To produce a first-rate patterning job, you need an experienced crew with the proper equipment. When choosing a subcontractor for patterned work, always ask to see examples of their work. The work of an inexperienced sub will contain easily recognizable flaws — pattern lines that aren't straight and simulated "joints" that aren't uniform in depth are a few examples. The work of a seasoned pro will be just as easy to discern. The entire job will look clean and crisp, and the patterning will be consistent.

Repetitive patterns, like brick and cobblestone, are often produced using plastic templates or metal pattern stamps (Figure 3). As a variation, placing a sheet of plastic over the concrete before using a brick stamp will produce something more akin to adobe than brick. The stamped joints can be grouted to mimic the look of mortar. Another technique uses rollers to simulate pavers or a stone texture (Figure 4).

Small Loads Make a Big Difference

A successful patterning job relies on the ability of the concrete contractor to produce a consistent and uniform pattern. An important key is the amount of concrete delivered to the site. If the concrete contractor chooses the proper size load and his timing is right, it will be impossible to tell where one load of concrete ran out and the next load started. But when integrally colored concrete is used in conjunction with a patterned finish, it's a Catch-22. Smaller loads help produce a more uniform pattern, but the additional deliveries increase the risk of a color mismatch.

It's no wonder that quality patterned concrete often costs two to three times as much as smooth concrete. If you're sur-

Figure 4. *Pattern rollers can create the look of smooth pavers or natural stone. Here, the stone texture on the surface of the concrete is matched on the edges of the steps by using molded rubber form liners (inset).*

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Figure 5. *It takes two people to expose the aggregate in a slab. A broom is used to "pull off" the cement paste that accumulates ahead of the spray.*

prised at this cost, consider the expense of removing and replacing a pour that doesn't produce the desired results.

Doing It Yourself

If you and your crew are considering pouring a patterned slab, you might want to practice the technique in a sandbox first. You'll be able to work at a leisurely pace, and you'll get a feel for how your stamps go together without the stress brought on by rapidly hardening concrete or the gaze of an apprehensive customer.

The next step might be to set up some test forms and pour an uncolored sample of the mix you intend to use. Pour the test slab like any typical non-patterned slab. After the surface has been floated the first time, start the stamping process as soon as the concrete will bear your weight.

EXPOSED AGGREGATE

An exposed aggregate finish has a lot going for it. The uniformly exposed stone surface is attractive, the finish is relatively easy to produce, and the cost is often comparable to that of a standard slab.

The Mix

The appearance of an exposed aggregate slab depends entirely on the stone chosen for the concrete mix. Different concrete producers get their stones from different sources, and the variation in color can be significant. The size of the stones will also affect the finished appearance — the larger the stones, the coarser the texture. Most concrete producers offer aggregate in sizes from 3/8 to 1 1/2 inches, and an exposed aggregate mix typically has 5% to 10% more stone than a standard mix.

Before agreeing to provide an exposed aggregate finish, you should discuss the appearance of the aggregate with your clients, and note any preferences they may have. If it's important that their slab looks like the one next door or matches existing work, make sure you know the size and source of the stone.

Seeding Is an Option

An alternative to using the "straight" mix from the local concrete company is to augment the mix with stones of your own choosing. If your customer wants a particular type or size of stone incorporated in the finish, they can be "seeded" into the concrete surface. The stones are tossed out on the freshly poured slab, floated into the surface, and then re-exposed when the concrete starts to set. Seeding is a tricky procedure and requires a finisher with a good eye as well as a steady arm.

Timing Is Everything

An exposed aggregate slab is poured and floated in the same manner as standard slab. After the final floating, the procedures change. Using an ordinary spray can, a retarder is sprayed evenly over the entire surface, the same way a curing compound is sprayed. This slows the set at the surface of the slab. A sugar water solution of 4 ounces of sugar for every gallon of water makes an acceptable retarder.

The concrete below the surface is unaffected by the retarder and sets at a normal pace. When it's time to wash away the surface cement and expose the aggregate, the firmer concrete below will hold its own against the water spray.

The slab is ripe for exposure when a 16-penny nail will no longer penetrate the surface (apply the same pressure as when writing with a pencil).

Exposing the aggregate is a two-person operation. Starting at the high side of the slab, a hose set to a fine spray is held a few feet off the slab, and the surface layer of cement is washed away. A second person gently brooms back the sand and cement that accumulates in front of the spray (Figure 5).

A Sealer Enhances Appearance

It's a good idea to apply an acrylic sealer to an exposed aggregate finish. The sealer will enhance the appearance of the exposed stones (it creates a "wet" look), and prevent the slab from absorbing moisture (important in frost-prone climates). The sealer, available from W.R. Meadows (P.O. Box 543, Elgin, IL 6012; 800/342-5976), costs between $16 and $20 per gallon and can be applied with a hand sprayer. Coverage is approximately 200 square feet per gallon. The sealer should be reapplied every year.

Plan for Runoff

Runoff water from an exposed slab project is nasty stuff. When handled improperly, the diluted cement paste can "burn" vegetation, instantly discolor a blacktop driveway, and get you in big trouble with the downhill neighbors. If necessary, the wash water can be contained with dirt or sand dams, and the mess can be mucked into a wheelbarrow for on-site or off-site disposal. Just be sure you have the necessary materials on hand *before* the pour. ■

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