

## Pool Decks with Concrete Pavers

Backyard and public pools attract concrete pavers they reduce glare while providing a safe, slip resistant surface.

n 2002, over 70% of the concrete pavers sold in North America graced residential walks, patios, and driveways. Swimming pools are seeing an increasing number of pavers around them. They can be installed as part of a new pool or used to rehabilitate the deck around an existing one. There are thousands of backyard pools with concrete pavers. Besides residential settings, there are countless public pools with concrete pavers at country clubs, swim clubs, apartments, condominiums, homeowner associations, hotels, theme parks, and municipalities.

Health officials sometimes question the extent of mold or bacteria in the surface or joints of concrete pavers around public swimming pools. Experience has shown that these are not a concern if there is adequate slope to the deck (at least 1.5%) and the surface and joints receive a sealer. This article offers some additional design and construction guidance to help ensure long-lasting, safe, and sanitary installations.

## **Advantages of Pavers**

Why use concrete pavers around pools? Besides their unmatched beauty compared to other deck surfaces, colored concrete pavers reduce the glare often associated with cast-in-place concrete pools decks. Almost every paver pool deck in Florida consists of beige, coral, or buff colors that reduce glare from the sun. Because the units have joints, each unit has some opportunity to release heat faster than a monolithic concrete deck. Therefore, the units can be cooler underfoot than other surfaces. Concrete pavers can be removed and reinstated with no ugly patches should there be a need to repair underground pipes or drains common to pool areas. The units have high resistance to chlorine, as well as to freeze and thaw cycles. Concrete pavers offer a slip-resistant surface even when sealed.

In-ground pools typically are backfilled with loose soil outside their walls. There is often no attempt to compact the backfill soil or measure the density of each lift. Some pools walls can't withstand compaction equipment close to them, or the structure of the walls themselves makes it practically impossible to fit



Figure 1. Bull-nose coping with mortared joints can be anchored to the pool wall with an adhesive or metal lath and mortar.

compaction equipment next to them.

Achieving dense backfill soil is not practical in most pool applications. Therefore, concrete pavers on an aggregate base over such backfill soil will likely result in settlement. For this reason, a concrete deck is recommended over the backfill around new pool decks prior to placing concrete pavers. A concrete deck or base should maintain a smooth surface throughout the life of the pool and the concrete pavers. The deck should slope away from the pool at least 1.5% so that the water drains from the surface of the pavers.

Rehabilitating existing concrete pool decks with an overlay of concrete pavers is less expensive than removing and replacing the concrete deck. To qualify for an overlay, the concrete should not be heaving or faulted, as this often indicates severe settlement of the soil beneath or expansive clay soils. In these cases, it is probably a good idea to install subsurface drains to remove excess water from the soil, or treat expansive soils with lime after demolishing the concrete deck and before pouring a new one. The advice of a professional civil engineer familiar with the local soils should be obtained in such situations.

Cracks in the existing concrete base can be filled with a cement-based patch to prevent migration of bedding sand into them. The junction of the concrete slab with the pool wall should be sealed with a poured rubber/neoprene or urethane sealant (often applied with a caulking gun). This keeps water from getting behind the pool wall and reducing support from saturated soil.

## Coping with pool coping

There are a few ways of installing concrete pavers and coping around an existing pool deck. For existing decks, the existing pool coping is removed and replaced with coping made with concrete pavers in most cases. Sometimes special coping "bull nose" shapes with rounded edges are used. These shapes are provided by some ICPI member paver manufacturers. Figure 1 illustrates this type of coping.

Bull nose coping is often thicker (taller) than the old coping so its surface matches the finish elevation of the concrete pavers placed over the existing concrete deck. Besides adjusting for the new height, the advantage of using bull nose coping (or pavers) supplied by ICPI paver manufacturers is the coping color and texture can match (or contrast with) the new concrete paver



Figure 2. Large paving units are secured to the pool wall and fit against an aluminum face plate (shown in white).

pool deck. Figure 2 shows large, thick paving units with a smooth texture placed against aluminum face place fastened to the pool's edge. The joints between the units should be filled with mortar or a sealant to prevent ingress of water behind the pool wall.

For existing and new pools, coping is typically applied to the top of steel or concrete pool walls with a polymer adhesive or with a metal lath and a mortar bed. The joints facing into the pool can be sealed with a high grade caulk to prevent water from infiltrating under the coping. The coping units are typically spaced about <sup>3</sup>/8 in. (10 mm) apart and are filled with high grade mortar. The mortar is precisely applied with a large caulking gun or a large bag similar to that squeezed by bakers in decorating a cake. The joints are filled and tooled smooth. Wet mortar is immediately wiped from the surface of the coping to prevent stains. Any excess mortar protruding above the joint slightly is removed after curing with a carborundum stone. This renders a smooth-to-thetouch surface with no risk of scratching users.

The pool wall and its coping will move differently than the deck. Therefore, the joint between the coping and the edge of the paver field should be filled with a rubber or urethane sealant typically used in pools. Prior to placing the sealant, foam expansion joint filler is placed into the joint. The foam supports the sealant. There should be a gap of about 3/8 in. (10 mm) between the coping and the edge pavers so it can receive the foam and the sealant. Figure 3 illustrates this construction detail.

The purpose of sealing this joint is to prevent water from



Figure 3. The gap between the pool coping and the edge pavers requires a foam expansion joint filler and a sealant to prevent ingress of water behind the pool wall. This also minimizes risk of damage from expansion due to freeze-thaw cycles.

draining behind the pool wall and weakening the supporting soil, not to mention possible damage from freeze and thaw.

The pavers can be placed on a thin layer of bedding sand, typically  $\frac{1}{4}$  to  $\frac{3}{4}$  in. (7 to 13 mm).

There will need to be edge restraints at the outer edge of the pool deck. Some contractors apply pavers with polymer adhesives directly to the edge of the concrete deck underneath. The units can be thicker than those in the field of pavers to compensate for the thickness of the bedding sand. A 12 in. (300 mm) wide layer of geotextile is placed around and turned up against the edge pavers after the polymer adhesive has cured. (Most adhesives cure in a few hours.)

The geotextile contains the bedding sand, keeping it from being lost through the joints between the edge pavers.

The bedding sand is spread and screeded smooth, and the pavers are installed. The concrete pavers are compacted into the bedding sand with small plate compactor making a few passes. The joints are filled with sand and the units are compacted again. After a thorough sweeping or blowing clean of the surface, sealer or joint sand stabilizer is applied to secure the joint sand and further protect the pavers from spills and chlorine. These are recommended in all pool deck applications.

An installation technique popular in Florida (and other non-freezing areas) is applying thin concrete tile pavers directly over a concrete deck. This approach has been used on countless private and public pools to spare the expense of removing and replacing the existing concrete deck. Thin tile pavers typically range between 1 to  $1\frac{1}{2}$  in. (25 and 40 mm) thick and are about 4 in. (100 mm) wide by 8 in. (200 mm) long. They are directly applied to the existing concrete deck whose cracks have been patched. Edge pavers are secured with a polymer adhesive or mortar. Fine sand is swept and washed into the joints until they are full.

After the surface is completely dry (usually 24 hours), it receives a coating of sealer to hold the sand in the joints. The sealer is typically reapplied



Figure 4. This pool has a cast-in-place concrete deck covering the backfilled area adjacent to the pool. The concrete pavers, bedding sand, and compacted aggregate base are placed over unexcavated, undisturbed soil.

every three to five years to maintain the sand in the joints and protect the surface. The combined rehabilitation and maintenance costs are considerably less expensive than replacing the entire concrete deck.  $\hat{\mathbf{v}}$