POOL & SPA NEWS

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FEATURES

POOL DESIGNED AND BUILT BY SKIP PHILLIPS OF QUESTAR POOLS AND SPAS, IN CONJUNCTION WITH ISLAND ARCHITECTS AND BRUCE RUDD, LANDSCAPE ARCHITECT. PHOTO BY GARY CONAUGHTON PHOTOGRAPHY.

Circulation From the Inside

Pool inlet configuration can make a big difference in energy savings. Here, experts explain how to achieve maximum efficiency.

By Rebecca Robledo Pool builders can make large gains in energy efficiency with relatively small changes, including the placement of return fittings.

By tweaking the position of the returns, significant savings can be made possible, especially on larger commercial pools, says Michael Orr, executive director of the Foundation for Pool & Spa Industry Education. He experienced this firsthand while studying a set of swim-school pools near FPSIE's Sacramento, Calif. headquarters.

Proper return placement helps optimize circulation, allowing pool owners to take full advantage of the other energy-saving devices and strategies. "It sets up a condition where you can save the money," Orr says.

Below, read how professionals place return inlets to achieve maximum efficiency and other benefits.

PHOTO BY GARY CONAUGHTON PHOTOGRAPHY

The efficiency argument

Though returns have traditionally been placed 12 to 18 inches below the water's surface, more professionals are recommending that they be installed closer to the floor.

The idea started in the 1980s when rebel inventor Mark Urban created a floor jet specifically for the purpose of introducing heated water. The idea was common-sense — heat entering through the bottom of the pool will rise to the top, making the water temperature more consistent and eliminating temperature layering. The practice has been slow to catch on, but with the renewed emphasis being placed on energy efficiency, the concept of bottom inlets has more followers.

Lower returns also make for more efficient skimming and filtration, and may reduce the number of daily turnovers required, Orr says. Of course, skimmers pull water from the top few inches of the pool. When placed higher, returns send already-clean water almost directly to the skimmer so it will be refiltered, while the dirtier water below stays put and goes untreated. In certain pools today, it may be that only 60 to 70 percent of water going through the skimmer at each pass actually needs filtration, Orr says. In older systems, that number is probably lower. So while a "turnover" is defined as a cycle in which the total number of gallons in the pool has passed through the filter, the term may be deceptive if the same few gallons are just recycled.

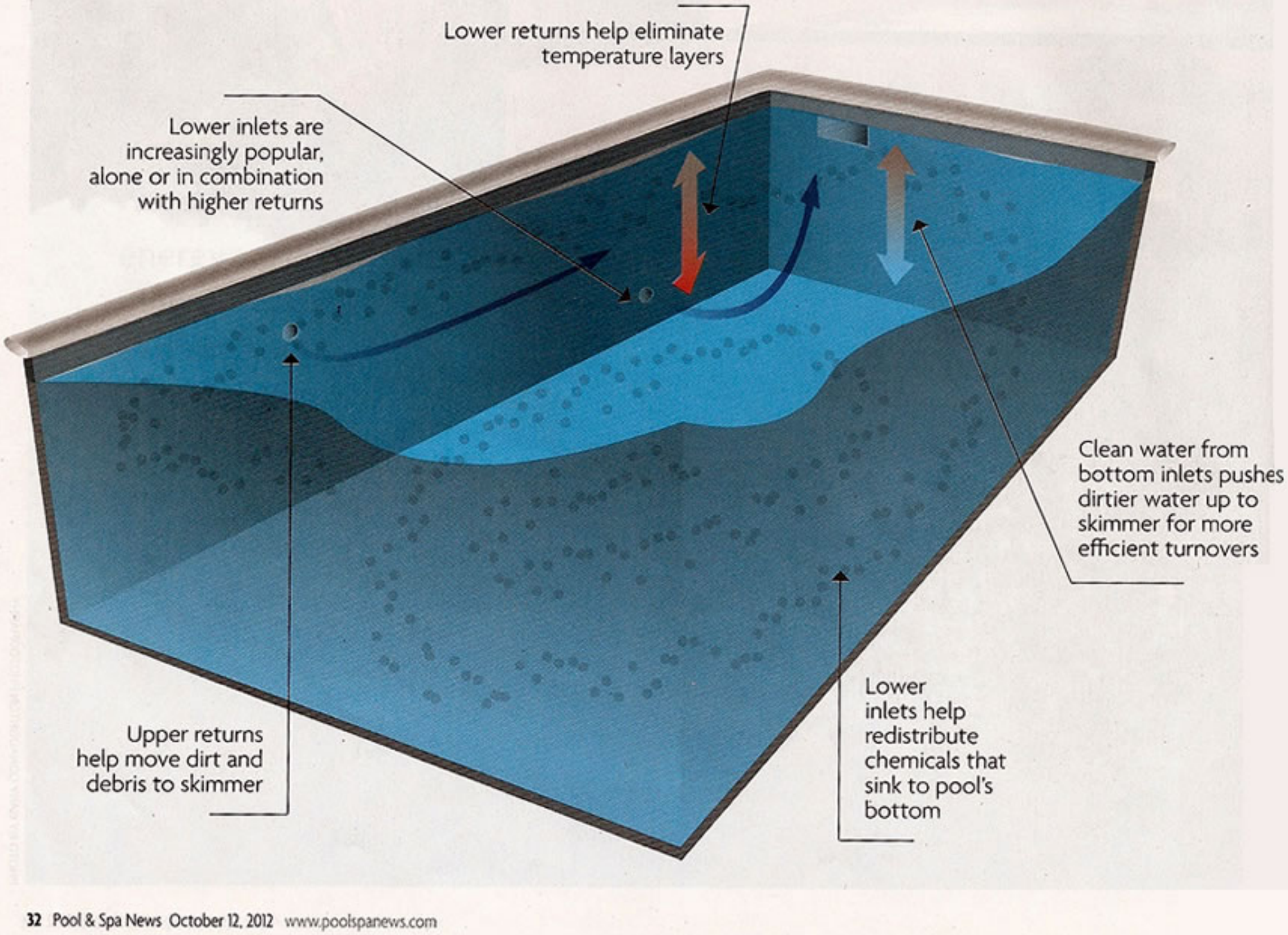
More professionals are recommending returns be installed closer to the pool or spa floor.

Placing the inlets near the floor can actually help send dirty water toward the skimmer. As clean water enters toward the bottom, it pushes the dirtier water up. "Eventually that water will spiral up, as new water keeps coming in to take its place," Orr says. "That way we're sort of stacking the water, if you will. We make everyone take a turn in line to get into the skimmer."

In renovations, improvements can be made even by pointing existing top returns toward the floor, as Orr and his team did with the test pool described earlier. Previously, only about 40 percent of the water passing through the filter at each

POOL INLET CONFIGURATION

Return inlets placed nearer to the top of the pool help push dirt and debris toward the skimmer. But lower inlets have many benefits as well, including better heat and chemical distribution, and more efficient turnovers.



turnover actually needed treatment.

"Looking at the dye test that we did, we're probably up [to] 80 percent in one turnover," Orr says. "So instead of a pool needing four turnovers a day, we should be able to get away with maybe 1-1/2 or two. Do you know how much energy that will save? Big. Especially if we're talking of large [commercial] pools, we're talking hundreds of thousands of dollars in electricity."

Hybrid solution

But a purist approach isn't necessary. That's why some professionals recommend a combination of top and bottom inlets. This allows the pool to benefit from the strengths of each strategy, creating a movement from bottom to top to aid in chemical and heat distribution, while creating a more direct current sending debris into the skimmers.

Builder Barry Justus, for instance, will place one insulated 3-inch line in the floor of the deep end to send out heated water, then augment that with returns closer to the surface. "We'll put a couple returns at the top, sometimes pointing directly at a skimmer, like bouncing it off a corner and into a skimmer, just to get a little more actual surface circulation," says the president of Poolscape Inc. in Burlington, Ontario, Canada.

Top and bottom returns can be combined and valved, with one set used for heating and the other for circulating. In this scenario, the top and bottom sets would be plumbed separately.

"The best design would [have] a valve that would rotate," says Ben Honadel, owner of Pools by Ben in Santa Clarita, Calif. "So when you heat the pool or spa, the actuator will automatically turn and send water to the bottom of the pool. Then, when the heater shuts off, the actuator would turn back and water would go to the top of the pool and make the water move [around the pool]."

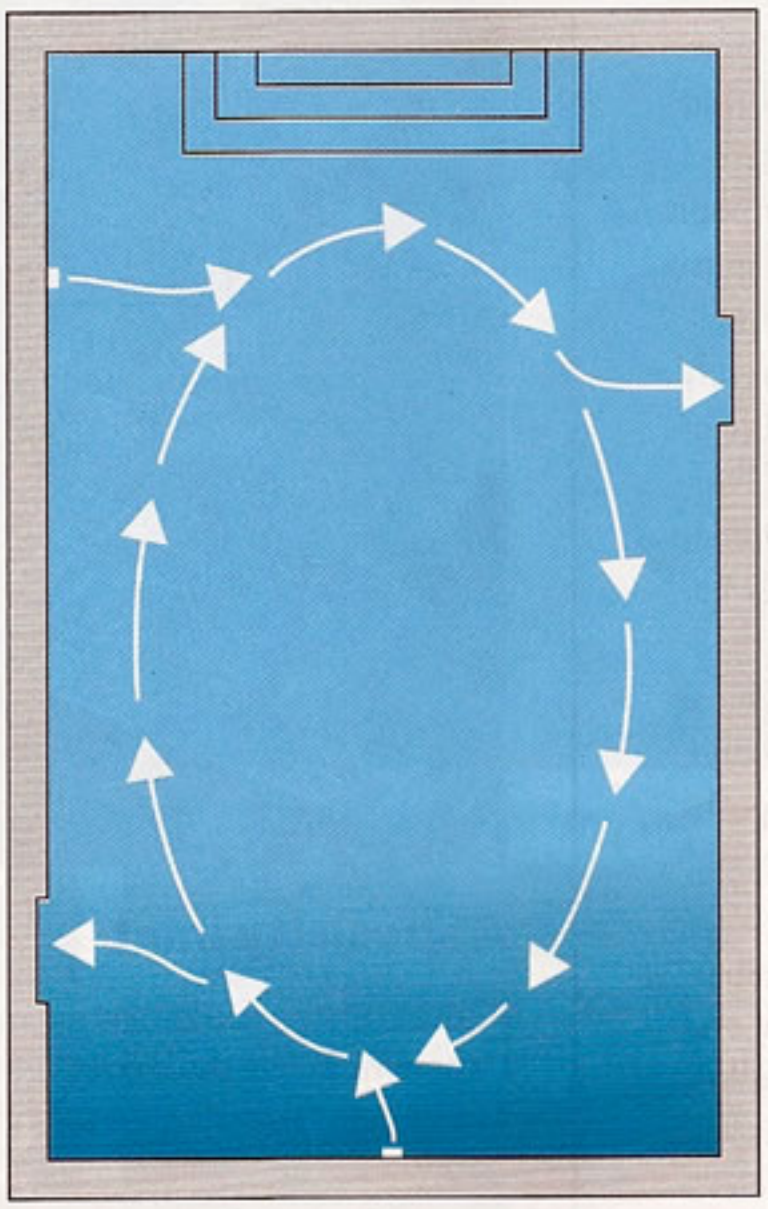
Valve actuators run off of 24 volts, and most heaters have a 24-volt power supply inside, Honadel says, so his strategy can be done with a $5 relay.

Returns also can be placed near or on the floor in spas, as long as the returns and hydrotherapy jets are run by separate pumps. (Insulating the line from the heater to the spa floor will increase the energy savings.)

Goin' round and round

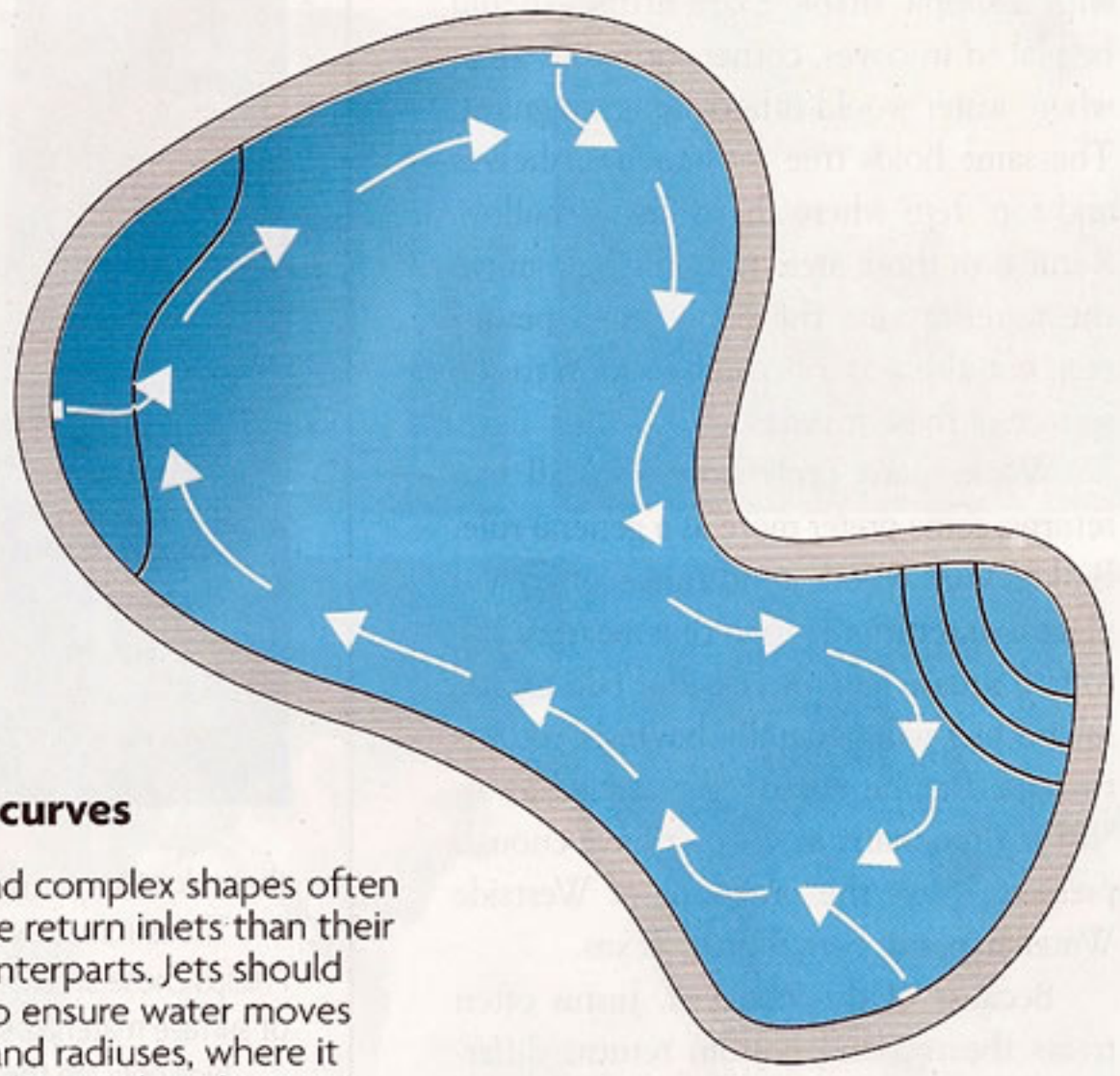
Whether placing return inlets near the floor or in the top few inches, the goal is to

GETTING AROUND



Simple rectangle

When placing return inlets on virtually any pool or spa, the goal is to move the water completely around the vessel. For a smaller rectangular pool, the job is easily done with at least two well-placed returns and two skimmers. Medium- and larger-sized rectangles will need more returns and skimmers.



Complex curves

Freeform and complex shapes often require more return inlets than their simpler counterparts. Jets should be placed to ensure water moves into coves and radiuses, where it could easily get stuck and stagnate. Returns located near benches, swim-outs and other such features also help keep those areas clean.

move the water around the entire vessel.

"If you have a rubber ducky sitting on the surface of the water, when the filtration pump's on, it should gradually kind of cruise all the way around the pool," Honadel says. "That'll take all the debris that lands on the surface and ... move it past the skimmers and naturally keep your pool cleaner. The entire body of water is spinning so it's impossible to have a dead spot."

Achieving this pattern is relatively easy in a rectangular pool. Start with at least two returns and position them basically opposite each other, with a skimmer installed in each of the two intervals between returns.

"If you had a rectangular pool, I'd have one [return] on the wall at the deep end, then one in the shallow end that's pushing across the short direction of the pool," Honadel says. "So the one in the deep end's going to push all the water toward the shallow end and the one in the shallow end is then going to push it across the shallow end, and the movement of those two will cause the entire pool to move in a circle."

This requires a minimum of two return inlets, but that's in a small pool or spa with a simple shape. Extra fittings should be placed in coves, corners or radius areas where water would otherwise go stagnant. The same holds true for benches, shelves and top steps where the water is shallow. Returns in those areas not only help move the water around the pool's inner perimeter, but also add a sweeping action to the surface of these features.

While many professionals install two returns, some prefer more as a general rule. Builder Guy Wood, for instance, often will place four returns in pools that measure 250 to 600 square feet. A vessel of 600 to 800 square feet will generally have six returns to start. But he doesn't get carried away. "If I put too many in, I won't have enough pressure," says the president of Westside Watershapes in Fort Worth, Texas.

Because of this concern, Justus often treats the top and bottom returns differently. To ensure uniform heat distribution toward the bottom of the pool, he will loop the lower inlets. But he'll plumb the upper returns independently and valve them so the flow can be fine-tuned to move water at an effective rate.

PHOTO BY ROBERTO CHOJNIAK, MOSAIC STORE, INC.

A specialty inlet

For Skip Phillips, suction and return fittings not only were laced with safety and sanitation concerns, but he also didn't like the way they interfered with the sleek look of his vessels. As a specialist in creating the smooth, glassy look of vanishing-edge and perimeter-overflow designs, he took this issue to heart.

PHOTO BY QUESTAR POOLS AND SPAS

"It made no sense to continue down this road, where we're increasing the number of ugly fittings, when the solution that I could see would be cosmetically and functionally superior," says the Genesis 3 co-founder and president of Questar Pools and Spas in Escondido, Calif.

He changed this by inventing a new drain cover, which he also miniaturized for return fittings. "We've tried to minimize the visual impact of both the fittings and the results of what happens when the water is received by the pool," Phillips says.

The fitting is rectangle-shaped and measures approximately 18-by-36 inches for drains and 6-by-6 inches for returns. The only opening is a narrow slot around the perimeter of the fitting where water leaves or enters.

The material used for the pool's interior finish is placed in the center to blend with the rest of the surface. "So we have these pipes with a little slot, and the water is emitted through these slots, so you don't see the pool returns at all," Phillips says.

The units are made of stainless steel with a plastic type coating to help resist corrosion. Phillips chose steel because other materials might flex, which could compromise the ability of surface materials such as tile or pebble to stay in place during application.

Not only are the designs visually non-obtrusive but, in the case of the drain cover, it meets safety concerns, as it is too long to be blocked by an adult male. They also allow very slow flow rates, increasing safety and eliminating any surface disturbance from the returns.

These low flows also keep the returns from disturbing the water's surface.

Phillips has invested four years into the design and fine-tuning of the product and had it stamped by an engineer. He has no plans to mass produce them or sell the design to a vendor, but will continue to have units custom-fabricated for each of his own clients. —R.R.