A slippery slope: with no codes dedicated to slides, builders must exercise caution before they plunge into creating their own designs

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In many parts of the country, more clients than ever are asking for slides This makes some builders nervous.

Due to liability issues, many contractors only build slides when the customer insists. However, slides add an element safe fun to the pod if they're designed correctly, says Wally James, president of leisure-industry consultant Con-Serv Associates in Powder Springs, Ga.

"In the residential market, that slide should be given the same respect as a diving board," says James, former chairman of the World Waterpark Association who recently retired after serving 20 years as chairman of WWA's safety committee.

Several factors determine if a slide is safe or not, whether you design your own or install a manufactured one. By following the right design and installation guidelines, or choosing a properly manufactured slide, you can minimize your clients' chances of injury.

Cause for anxiety

A number of variables determine how a slide performs. For example, its slope, number and degree of curves, surface material, and amount of water on the slide enter into the equation. And each variable affects the others. As these products become more complicated, so does figuring out the right design equation for safety.

"Think of the theory of slides: You have to climb a ladder with wet hands and feet, raise one foot onto the slide first, meaning you're on the ladder with one foot and two arms that are wet," says Ran Atlas, president of Paragon Aquatech in Wheeling, Ill.

Although you may build the safest slides imaginable, you still cannot baby-sit the users. "I've seen people jump off slides and try to catch a ball in the air," Atlas says. "They become daredevils on these slides."

Standards exist for the manufacture and installation of traditional pool slides, but none are in place for custom-made concrete slides or water slides. Because of this, many experts caution against building your own slide. Instead, they say to stick with pre-manufactured units and carefully follow installation instructions.

"I'm not saying you can't build slides out of gunite," says Alison Osinski, president of Aquatic Consulting Services in San Diego. "You can, and there are some great ones out there. But from a safety or liability point of view, I'd sure not want to be the one who's explaining where you came up with [the design] in court when somebody's seriously injured."

Typically, the manufacturer will package the slide with steps or a ladder, handrails, a water connection and instructions on how and where the slide should be placed. In the case of some high-end slides, the manufacturer may provide metal frames for you to pour concrete steps, or require you to purchase fiberglass steps.

"Manufactured" does not have to mean boring. These days, manufacturers will custom-fabricate just about anything. In the case of open slides, suppliers will even coat them with custom colors to match their surroundings. Many manufacturers will review your plans for placing and laying out the slide to make sure they're safe, says Craig Bagin, vice president of B&B Pool and Spa Center in Chesmut Ridge, N.Y

Not all manufactured slides are created equal. To secure the safest slides available, experts suggest the following:

* Only use slides that have been made specifically for water applications.

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* Never install a regular backyard or playground slide onto a pool.

* Find out if the slide complies with playground safety standards, advises Osinski.

* See if the product complies with standards issued by the American Society for Testing & Materials (ASTM) and the U.S. Consumer Product Safety Commission.

* Research the company's testing methods.

* Look for manufacturers who provide signage and the most specific instructions for installation and use, including age, height and weight restrictions.

* Look for slides with high walls and steps rather than ladders, Atlas says.

It's crucial that you follow all manufacturer guidelines, especially regarding the sensitive issues listed below. If you choose to design your own slide, try to seek input from a consultant with water-slide experience. Pay extra attention to these risk areas and consider our pointers on how to mitigate them.

* Steps leading to the slide

Experts such as Atlas prefer installing slides with steps rather than ladders because they aren't as steep. Choose steps that meet building codes and playground standards for rise and run dimensions. Of course, give the stairs a slip-resistant finish.

Some builders go even farther. If the stairway gets particularly long, these builders consider breaking it up with a landing or two. That way, if someone fails, they will drop a shorter distance without knocking down people coming up behind them, says Kevin Kraft, president of Ozzie Kraft Enterprises in Las Vegas.

Wildwood Aquatech uses ramps rather than stairs when space permits, says Mark Machado, project manager at the company's Carmel Valley, Calif., office.

Either way, Machado likes to design longer paths to the slides to help prevent collisions in the pool. He says it takes more time to get out of the pool and back up the slide, which staggers the time between users.

* Sidewalls

Many builders prefer to install a pre-manufactured tube slide. It can be costly, but it's popular because the slide takes hairpin turns. Added benefit: People don't fall out of them because they're enclosed.

In the absence of a tube, high sidewalls can be a viable option. The higher the sidewall, the less chance someone has of fairing or getting thrown off the slide. Higher walls also prevent users from sticking their hands out of the slide, reducing the chance of scrapes or broken anus.

* Slope, curves, twists and turns

A slope that's too steep is a really bad idea. Manufactured slides have clear guidelines for slopes and curves--guidelines that should be followed to a T.

When creating their own slides, builders should design a conservative slope and minimum number of curves to prevent users from falling out. It's wise to research standards pertaining to slopes as well as discuss the topic with a consultant.

Always make sure you have enough space in the backyard for the slide to slope appropriately.

* Speed

Traveling speed will depend partially on the slide's surface. If you're building it out of gunite, check standards for concrete waterslides (see "Designing concrete water slides" sidebar) to find the best coating for the slide's configuration.

The amount of water that is introduced on the surface also affects the user's speed. Barely wetting the surface makes it slick, but when water flow reaches 150 gallons per minute, there's a sudden decrease in slider speed, according to Osinski. Then slider velocity gradually increases until the 600 gpm mark. The surface

becomes gradually slower as flow moves from 600 and 1,500 gpm. At 1,500 gpm, the slider moves at the same speed as the water.

If you're installing a manufactured slide, the instructions will tell you how to introduce water.

* Angle and height of the slide's last few feet

Slides should flatten out, or even draw slightly up, for the last few feet, says James. This way, sliders slow down rather than drop sharply into the water.

Waterpark designers often end slides at or just below water level. This level provides the safest landing, with the water completely breaking sliders' falls, say aquatics experts. "The momentum should be zero when they hit the water," Osinski says.

On the other hand, if there's a drop from the end of the slide to the water, users have a greater chance of hitting the water incorrectly or hydroplaning and bumping their heads on the slide.

* Landing pool configuration

If the slide ends at the surface of the water, then waterpark designers usually make the landing area at least 42 inches deep, according to Osinski. When the slide ends a foot or two above the water, as most traditional sliding boards do, common practice has the water at least 5 feet deep, says James.

Osinski doesn't like to see a slide that ends above the water. But if it does, she recommends at least 2 meters of depth, or 6 feet, 7 inches.

* Width of landing area

If you are designing the slide, you won't have the important benefit of manufacturer recommendations for sizing the landing area. If you choose this route, always err on the side of caution. Walls across from the slide's terminus should be at least 25 feet away, says Osinski. Obstructions such as benches and steps, or an upward slope on the floor, should be at least 20 feet away from the end of the slide. If the pool includes a diving board or a second slide, the two landing envelopes cannot overlap.

Try to design the landing area as a separate cove so swimmers won't veer off into that space, suggests Kraft.

* Protrusions within reach

Many upscale builders conceal their slides with rock. But you don't want sliders to bump their hands or arms on these rocks on their way down. Keep rocks and other distractions out of reach of the slide path.

* Positioning to go

Users shouldn't start moving until they know the slide and landing area are free and clear. To help them make this determination, keep the top and bottom of the slide within view of each other.

It's also safer if users have a small pad with handrails at the top of the slide, so they can position themselves, says Machado. He adds that when you include such an area, it should be finished with a slip-resistant material.

* Signage

You may provide your clients with the information they need, but you won't be there to educate the next owners if they decide to sell the house.

Post signage in the area that explains the right and wrong ways to use the slide. This signage should discourage horseplay. If the warnings can be permanently affixed to the slide or area, all the better, says Osinski. Most manufacturers don't provide this signage, Atlas says, so installers must purchase it separately.

Designing concrete water slides

No codes exist for designing concrete water slides. However, you can consult various guidelines to help you in certain aspects of the design. Sections that pertain to water slides can be found in several documents:

* The Centers for Disease Control and Prevention recommendations regarding recreational water flume design, called "Suggested Health and Safety Guidelines for Recreational Water Slide Flumes."

* ASTM's Standard on Amusement Rides and Devices

* Playground Standards from the National Recreation and Park Association, and the World Waterpark Association's "Considerations for Operating Safety."

Properly worded warnings

You can't control how people use the slides you build and install. However, to protect your company from liability, builders suggest instructing clients on proper behavior and having them sign a waiver stating that they've received these instructions. Always consult with an attorney to assure these warnings are worded correctly.

* No sliding headfirst. Unless the slide is specifically designed for such sliding by the manufacturer, consultant or other expert, users should not engage in this action.

* Only one person on the slide at a time. The exception would be if the product is specifically designed by a manufacturer or designer to accommodate more. Just one person should be on the slide's entry point or riding on the slide. Horsing around at the entry could result in someone getting pushed off. More than one person sliding at a time can result in someone falling off or the slide collapsing. If an individual starts sliding before another one finishes, they could collide in the landing pool.

* Don't use inner tubes or similar devices on the slide. Again, the exception is if it's been designed for that purpose. Users must go alone unless a slide is designed by an expert or manufacturer to accommodate inner tubes or other devices. These items will change the dynamic of the trip down the slide.

* Users should leave the landing area as soon as they complete the slide. People shouldn't congregate around the slide's terminus. Just as much damage has been done from bodies colliding as it has from bodies colliding with the wall.

* No jumping or horseplay around the slide. Behavior such as jumping off the slide or trying to walk up and down is dangerous, regardless of how the slide is designed.

* The European Committee for Standardization has published a standard pertaining to water slides, called European. Standard Waterslides of 2M Height and More and coded "prEN1069-1"

* Consult with any state codes or guidelines if available

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