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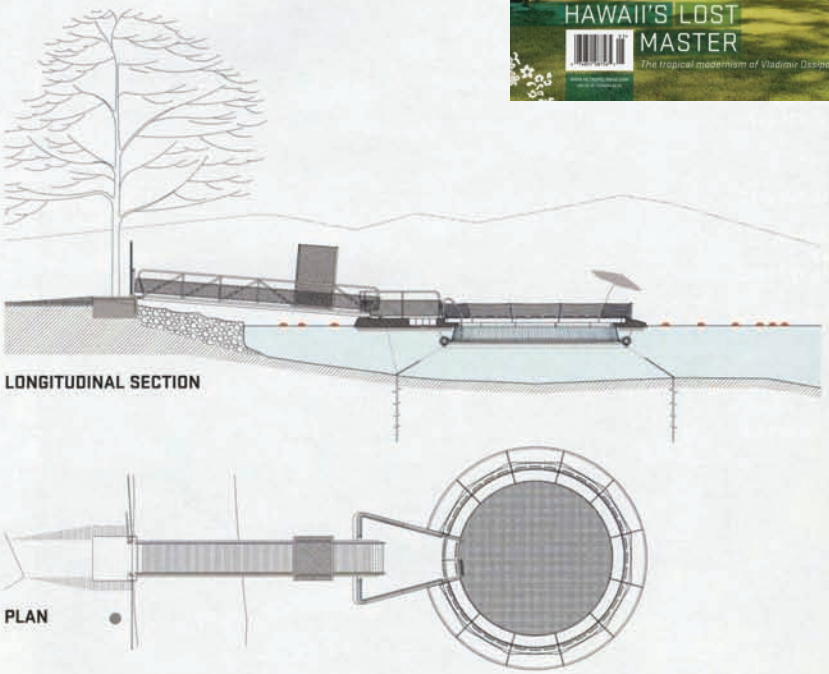
Come on in, th

A River Runs Through It

It was four years in development, but this summer an idea for a pool on the Hudson finally comes to life.

Flow-through pools—installed in rivers and filled by their currents—lined the perimeter of Manhattan at the turn of the last century, but those static wooden structures, largely used as bathing facilities for the immigrant community, were not sanitary or habitat friendly. The intent of the 20-foot River Pool, which will officially open this summer in Beacon, New York, is entirely different. As architect Meta Brunzema says, "This pool design was something that had never been done before." A safe place for young children to swim, it is also a means of inexpensive river access, a lesson in river stewardship, an experimental prototype for a larger design, and finally a model that can be adapted by other river communities around the country. Some 35 years after the passage of the Clean Water Act, the Hudson River is once again fit for swimming, and the message is, Come on in, the water's fine.

Brunzema's original design, a collapsible floating pool intended to spring into form upon opening was a Metropolis Next Generation finalist in 2004. When installed this June, however, the River Pool will tell a story about how an idea is shaped by the realities of regulatory criteria, environmental conditions, material considerations, and budget. The forces of tides and currents; safety, stability, and durability requirements; and the need to protect fish from entrapment while warding off invasive species, such as water continued on page 110



The longitudinal section shows just how lightly the design actually sits on the river, while the plan illustrates what is visible above the water.

During the summers of 2006 and 2007, people were invited to use the River Pool, a testing period that allowed architect Brunzema to make critical refinements to the design.

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continued from page 108 chestnuts, all shaped the design as it traveled from the studio to the Hudson. Add to that the fact that the end result needed to be easy for members of the volunteer-run client organization River Pool at Beacon to assemble and disassemble, and nearly every facet of the original concept was reconsidered.

River Pool came into being after musician and environmental activist Pete Seeger saw one of Brunzema's early proposals. "I thought, The more people swim in the river, the more people would be pushing to clean it," he has said of the idea. Seeger, mechanical engineeer Alan Zollner, marine ecologist Cindy Cowden, and WNYC newsroom editor and Hudson Valley resident Karen Frillmann were early board members who collaborated with Brunzema on research and development. By July 2003, when a proposal was formally submitted to the New York State Department of Environmental Conservation (DEC) for a permit, Brunzema's concept had already been reconfigured as a wading pool. Determining that a sizable innovative construction of untested materials would pose too many environmental risks, the DEC had asked for a scaled-back prototype that would allow regulatory agencies to evaluate the impact on aquatic fauna. In addition, and perhaps more significantly, it had always been important to Seeger to bring children to the river to teach them ecology and stewardship at a young age. A smaller, shallower pool answered both needs.

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Brunzema refashioned the design as a modular circle of 11 fiberglass seats and an entry platform held together by pieces of rubber. "The critical challenge," she explains, "was to design a cohesive structure rigid enough to hold together but also flexible enough to adapt to the motion of the waves—which we achieved with the supple rubber connectors joining the seats together." A below-surface fence, allowing water and fish to pass through, would fasten the floating seats to a submerged round tube that in turn was to frame the floor. Ropes moored to helix anchors screwed into the riverbed would keep the pool in place.

Throughout fabrication and installation—the pool was tested in place for several weeks in the summers of 2006 and 2007—design changes were constant. River Pool members participated by trying out materials and technical ideas, observing the effect of the river on the structure, and writing a report on the pool's potential environmental impact on protected species. "This was an iterative design process that required constant modification as we learned new things about the river, the endangered species, the behavior of materials, continued on page 112

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continued from page 110 and the regulatory criteria," Brunzema explains. And it's not a stretch to say that the Hudson's connective powers also played a part. "When people hold something like this river so dear to them," Cowden says, "it's not business as usual."

To keep costs down and adhere to River Pool's conservationist ethos, Brunzema opted for existing products whenever possible, beginning with the floor. The steel she had specified was rejected for being too heavy and corrosive. Manhattan consultancy Material ConneXion recommended netting made from Dyneema, a polyethylene filament commonly used in ballistic vests and rock-climbing ropes. "There was an overall effort here to keep materials simple," Brunzema says. "But interestingly enough, a very highly engineered product ended up being versatile enough to suit a variety of purposes *and* cost-effective." Fifteen times stronger than steel by weight, noncorrosive, bacteria-resistant, and lightweight, it addressed a host of environmental and logistical concerns.

Getting the tension right was equally problematic. "This was not a rigid structure," Cowden points out. "When one thing was redesigned, nearly everything else had to be rethought too." The orange inflatable perimeter tube they started out with, filled partially with water, was a customized version of those used to lay fiber-optic cable across the ocean. Installed in the summer of 2006, it twisted and failed to provide adequate tautness. The following summer they substituted it with a rigid black polyethylene ordinarily used to form aqua-farming enclosures.

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Settling on the makeup of the sunken fence was another challenge: metal corrodes and acrylic cracks. "As in any research project," says Cowden, whose scientific background came into play here, "you don't get attached to any one idea. You follow what works." Since Dyneema was succeeding for the floor, it made sense to try it for the sides as well. Straps of the technical fiber, encased within fiberglass tubes originally developed for industrial applications, were stretched vertically to attach the seats to the submerged floor. Three-inch spacing between the tubes allows fish to float through and kids to stay in.

The hollow fiberglass seats—filled with air and flotation foam—are sloped and rounded so there are no harmful edges or corners. However, their buoyancy varied, disrupting the circle of the pool, and the rubber connectors that fastened them together proved inadequate. Apart from the appearance of misaligned seats, safety was a concern: little fingers might get caught between them. To address those issues simultaneously, the team laser-cut environmentally friendly closed-cell polyethylene foam into two-inch-thick slabs that could be strapped in layers to the bottom of the seats to join them and add to their buoyancy. Full disclosure: I am a River Pool board member, and when it became clear that the foam—otherwise known as "the miracle material"—worked, something in the sight of that finally unbroken circle spoke to the success of the enterprise in form and spirit alike.

Brunzema and River Pool had considered an elegant white marine finish for the seats, but the rainbow colors suggested by Seeger reflected the inclusive spirit of the pool and earned easy consensus. "There are many different ways of inventing something," Brunzema says. "In this case the solution required many people."

During the five weeks that the pool was open to the public in the summer of 2007, there were no injuries and no misuse. "It's like walking on water," Brunzema says of stepping through the river on the Dyneema floor. While perhaps not a miracle of the biblical order, the pool exceeded many of its original objectives—and in doing so it brought into being something that had never before existed.