

Journal of

Architectural Coatings

Volume 1 / Number 3

July 2005

**SPECIAL REPORT:
BEAUTIFYING AND
PROTECTING CONCRETE**

**COATING SYSTEMS
FOR SCHOOLS**

**FINISHES FOR
WOOD SUBSTRATES**



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July 2005

une into an episode of "CSI: Miami" or "The O.C.," flip open a copy of *Dwell* magazine, or browse through any of the home and entertainment cable networks and you may begin to experience a sense of déjà vu.

It's that house.

That unusual house with the exposed fir timbers and mahogany doors.

That house that seems to flow simultaneously from the outside in and the inside out.

That house, in fact, is the McKinley Residence, which I designed as a kind of laboratory for experimenting with materials and coatings—and which, coincidentally, has become a favorite setting for art directors and videographers.

Situated on the street that gave the house its

name in Venice Beach, CA, the residence was built in two phases. I constructed the initial home 10 years ago on a vacant lot. Recently, I completed an addition that extends the house over two lots with four structures connected by three bridges.

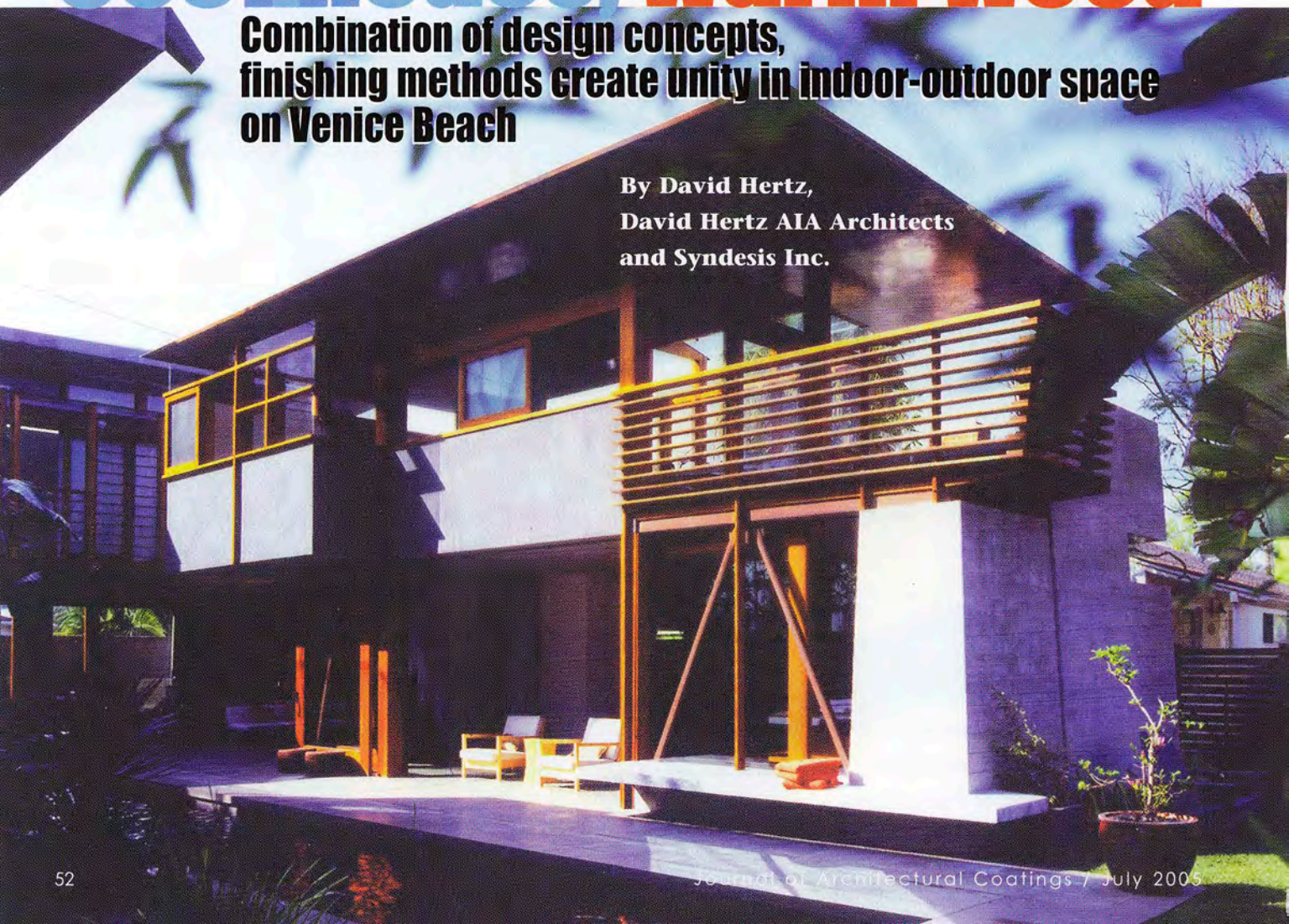
This addition creates a compound of indoor and exterior space that's exemplary of indoor-outdoor living. It also serves as a living laboratory for my environmental concepts used to help understand environmental systems, methods, and materials, and to see how they perform.

The McKinley Residence, constructed along the lines of the organic school of architecture originated by Frank Lloyd Wright, seems to evolve naturally from the site, its surroundings,

Cool house, warm wood

Combination of design concepts, finishing methods create unity in indoor-outdoor space on Venice Beach

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and the local materials used in its construction. It also has been called “organic modern,” or sometimes “Bali modern,” due to its tropical feel.

Green, inside and out

The house is considered to be one of the most environmentally friendly homes in America, but one that reflects a high-design aesthetic along with environmental consciousness. It was constructed with recycled materials and coated with zero-VOC paint on the interior and has polished concrete floors instead of carpet. All the floor surfaces are warmed by circulating water; the water is heated by solar panels. The home contains no air conditioning or ducting. Electric windows and skylights open automatically on thermostats and humidistats for ventilation. About 90 percent of the home’s

heating is solar generated, and about 70 percent of its electric usage comes from an array of photovoltaic solar cells.

Beyond its environmental aspects, the McKinley Residence displays several remarkable architectural features. A quite dramatic folded staircase is made of a series of 1-by-6, very dense boards bolted through one another to form steps, with no additional support. The steps are fashioned from Ipe, also known as ironwood. This very dark brown, extremely dense wood is Forest Steward Council-certified, sustainably harvested hardwood from South America.

Another feature is the very large indoor and outdoor mahogany lift-slide doors. The house is notable for its connection between outside and inside; some of these doors are 12 feet wide and 10 feet tall, but they slide back into pock-

ets into the structure so the building becomes an outdoor pavilion.

Twenty years ago, I developed a construction material called Syndecrete, an advanced cement-based composite that consists of lightweight precast concrete and 40 percent recycled materials. This material is used as a high-end architectural finish for countertops, sink basins, vanities, showers, even pool decks. In testing Syndecrete and other architectural elements, I acquired an extensive knowledge of coatings; and for the McKinley Residence, I specified Sikkens-brand stains for all wood surfaces.

Creative approaches enhance wood elements

One of the things people comment on is that my house conveys a contemporary but warm impression, and that warmth is derived primarily from the use of exposed wood. With the use of the stains, I was able to retain the natural appearance of the woods.

I found that the best way to find how to preserve timbers that are subjected to the elements is through experimentation. I sealed blocks of wood with many different coating products and weighed each of them. Then I soaked them in water and weighed them again, calculating the amount of water absorbed from the change in weight. Those blocks that absorbed the most water would likely be most affected by the damp, foggy, ocean-shore elements of Venice Beach. Upon review, I selected the coatings that showed the lowest rate of absorption of the materials tested.

For the timbers that extend from the inside of the house to the outside, I specified a natural translucent base with a topcoat. I found with the Douglas fir, in particular, that the translucent base brought out the grain and warm orange color of the wood. The basecoat I selected for exterior and interior wood, Cetol® SRD 250, is a high-solids alkyd that is specially

formulated to meet California's VOC requirements. This microporous, water-repellant stain produces a matte finish with one coat and a satin finish with three coats. It protects wood with a durable, UV-resistant barrier.

I used similar coatings for a wide variety of applications inside and outside the house, including exterior woodwork and windows, interior woodwork and windows, stairs, fir cabinetry, apple-wood ply cabinets, birch plywood, and mahogany in the new addition.

Prior to the addition, the doors of the original house were all fir. I wanted to upgrade the material, and since the price of fir is now close to that of mahogany—a denser wood—I went with mahogany for doors and windows. I bought units of raw mahogany that, again, were certified sustainable wood by the Forest Stewardship Council, a third-party testing agency. The large doors I built are 2½ inches thick and provide a real sense of seeing the wood—large boards of wood. I used the same “breathable” translucent basecoat and topcoat on the mahogany, as well as on the fir and on Ipe railings, fence, decking, and solar screens.

For interior windows, cabinets, and some of the beams, I wanted to use an interior clear coat over an exterior base. I like the color of the exterior base and wanted it to match inside, but also wanted to avoid the off-gassing of volatile compounds from the basecoat. So I put a transparent topcoat of Cetol® BL Interior Clear over the basecoat. The acrylic urethane clear is a water-borne, transparent finish that seals and helps protect against scratches.

For most of my coating projects, I prefer to start with a translucent base coat, then apply a topcoat that affords extra UV protection. For some applications, such as fences and decks, I'll use three or four coats of the base coat only. I find



that maintenance and refinishing is easier with this approach in the areas that are subject to heavy traffic and contact.

I also have observed an unusual characteristic in the translucent coatings. They create a unification among different woods, casting a very warm color but still conveying a discernable difference between mahogany and fir. The resulting colors become more variegated shades in the wood grain, a subtlety between different woods. This understated, unifying nature of the stain became apparent as I placed Ipe up against mahogany and fir.

I'm especially pleased with the durability of the coatings selected. We just went through the worst winter in our recorded history in Southern California, and there weren't any noticeable differences in the coating. I've found that even on a house on the Oregon coast exposed to 130-mph, wind-driven rain, the coatings have borne up well for several years.

In Venice Beach, with high humidity and salt water causing considerable condensation, the McKinley residence

beams routinely will be dripping wet and then burn off in the blaring sun. We get repeated cycling of wet and drying. But the finishes are holding up well.

It's important to realize that labor cost is considerably more than the cost of materials, so if you can save yourself time in the exterior finish and buy yourself another year with a coating that costs more per gallon, it's still a good investment.

In addition to working with a variety of woods, I'm continuing to work on innovative applications of coatings. For example, I've applied wood coatings to steel braces, columns, and hardware connections in situations where they were located next to wooden columns. I painted the steel the same color as the wood and used the wood coating to create a translucent finish that seems to have worked.

I know that we'll always have to maintain the wood. I just need to convince my kids to do the refinishing at some point.

JAC