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A MAGAZINE OF THE AMERICAN INSTITUTE OF ARCHITECTS

JANUARY · FEBRUARY 2011



## change by design

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leite and sergio palleroni  
catalyze communities to solve  
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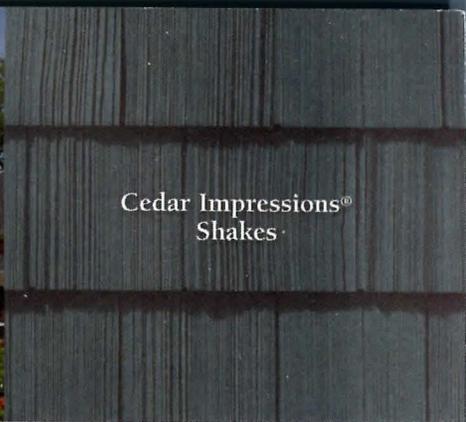
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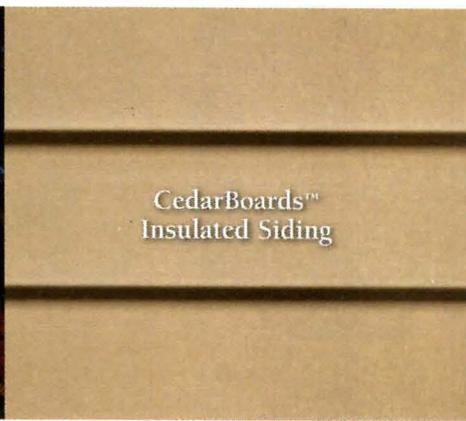
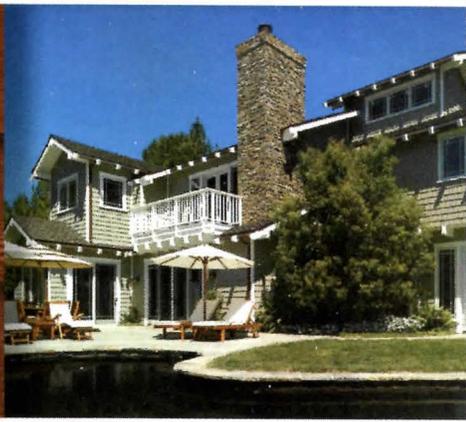
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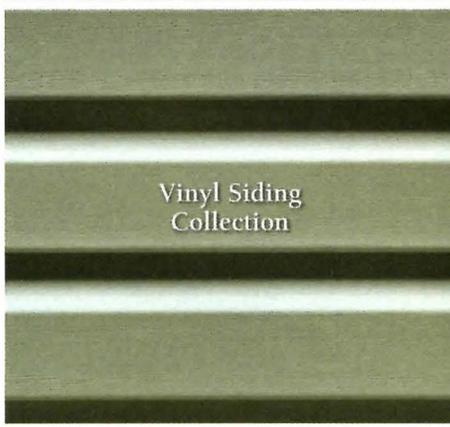
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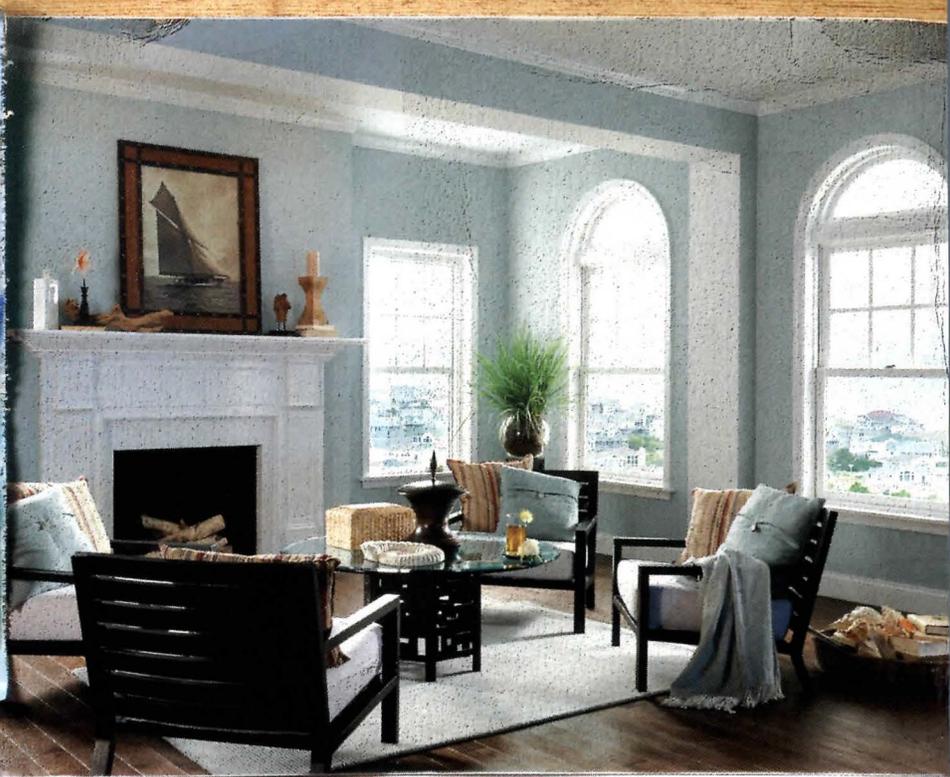
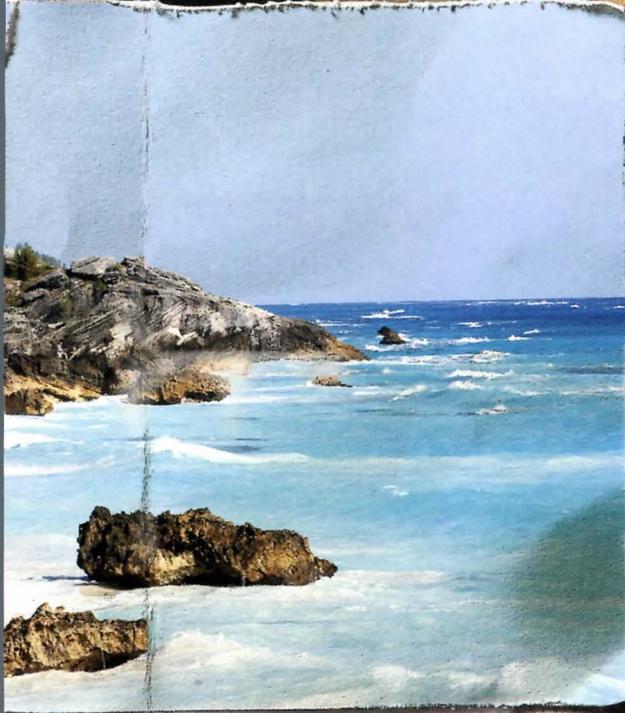
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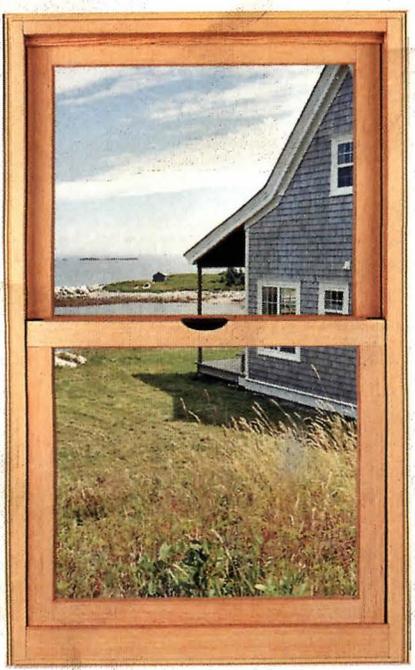
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Sergio Palleroni and Margarete Leite lead BaSiC Initiative, a design/build program that cultivates homegrown solutions to local conditions. This photo and cover photo: Ty Milford/Aurora Select

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## picking up the pieces

In a post-disaster situation, architecture has the power to change lives. Solid, simply constructed buildings fill needs and demonstrate the crucial role design can play when attempting to rebuild recovering communities.

*By Meghan Drueding*

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from the editor

# rescue housing

should we care about form when the need for function looms so large?

by s. claire conroy

**W**e held our most recent Reinvention design symposium in New Orleans. Reinvention always kicks off with a tour of local housing, typically the best and the brightest a town has to offer. I knew when planning the trip that we would have to go see the houses of Make It Right.

I also knew the stop would spark controversy. But to avoid the project and the discussion that naturally ensues is alien to the basic nature of this magazine. We try not to shy away from tough questions.

And Make It Right presents a tough question indeed. One that strikes at the very nerve of architects' perception of themselves and the public's view of the services they provide. Some architects on the tour thought the houses were the ultimate "emperor has no clothes" revelation of the design profession's self-absorption. Why on earth, they asked, would architects impose such bizarre design solutions on the victims of one of this country's worst natural disasters?

I have to admit, with apologies to our host for the tour, that I shared this impression of the project

before I visited it. I thought it potentially damaging to the architectural profession—a high-profile example of architects out of touch with ordinary people's needs and wants.

But after touring the project and learning more about how it works, I began to soften my opinion. Make It Right doesn't foist crazy architect designs on owners of Lower Ninth Ward lots; the owners are free to build anything they want on land they own. What the foundation does offer is steeply subsidized LEED construction and a choice of plans by nationally known and locally grown architects. It's frankly no surprise many residents are taking the deal—and it's a pretty good one at that. A shrewd investor might wager the houses will appreciate faster than other, more lackluster efforts. No matter what the potential market value of the homes is, the subsidies will translate as equity when the time comes to sell.

The deeper question of whether owners of the Brad Pitt houses are being twice victimized—once by the storm and once by hypermodern design—is worth considering. But there may be no immediate answer—not until



Mark Robert Halper

residents live in the houses for a long stretch and can speak for themselves about how the spaces feel and how they function. Yes, it's patronizing for architects to believe they know best how their clients should live, but it's equally patronizing to posit that poor people can't understand or enjoy progressive design. Especially when their new homes cost \$30 a month in power bills instead of \$200. Love it or hate it, this collection of houses adds to the interesting fabric of New Orleans—perhaps as notably as San Francisco's Painted Ladies. No doubt architectural historians will parse merits in the future.

In this issue, we address

subsequent architectural efforts at disaster housing. And many of the same debates arose about whether high design has any place at all when the need for function is so acute. But to me, that's like asking when your heart is failing if you still need a soul.

Also with this issue, we launch our new partnership with The American Institute of Architects. You'll find their section tailored just for you on pages 15–17. We welcome their attention to residential practitioners and look forward to a fruitful collaboration on your concerns. ra

Comments? E-mail: [cconroy@hanleywood.com](mailto:cconroy@hanleywood.com).

# home front

news from the leading edge of residential design.

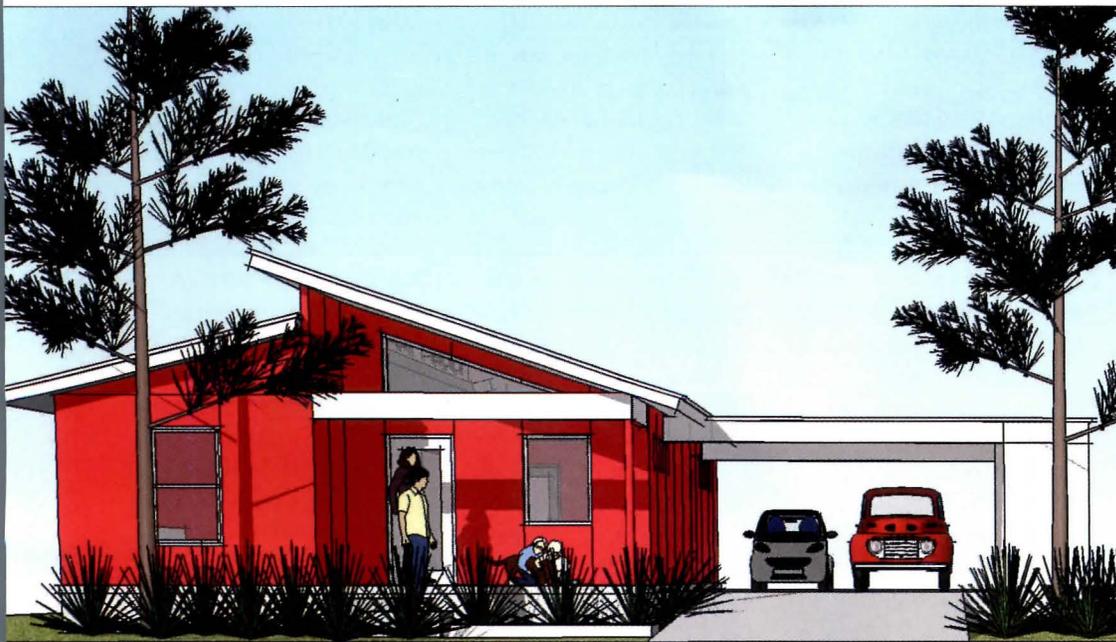
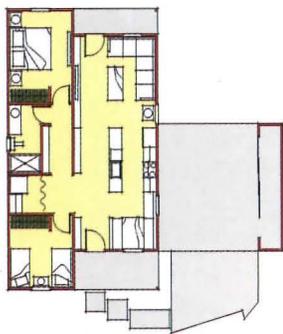
## small comfort

Ed Binkley, AIA, has been on a lifelong mission to make mass-market housing more affordable and attractive. So when the Oviedo, Fla.-based principal of Ed Binkley Design came up with a new line of small affordable houses that go a long way toward solving the affordable problem, it occurred to him that the structures also have a secondary application: disaster housing.

Offered by Cabin Fever, a Miami-based prefab manufacturer, Shelter Series is a col-

lection of component-based houses that can be ordered as a package and shipped out with all the necessary parts. "The intention of this concept is to bridge the gap between mass market housing and very low-end housing that often does not address the livability or design style factor," Binkley says.

Priced as low as \$50 per square foot, a Shelter Series home ranges in size from 530 square feet to about 1,000 square feet. The house is



Courtesy Ed Binkley Design

Shelter Series panelized homes are versatile enough for affordable housing but also can be used as disaster relief structures. Six plans are available.

shipped out with the panelized exterior and interior walls, appliances, cabinets, plumbing fixtures, and almost everything that it needs for construction—with the exception of the drywall, which will be locally sourced. Because they are shipped as a package and because the prefab components will reduce on-site labor costs, Binkley says the homes easily can be mobilized and shipped to an area that needs immediate disaster-relief housing.

“Depending on where the homes are needed, and for what period of time, the price could come down,” the architect says. “If they are used as temporary or transitional housing, we could also reduce some other costs such as full kitchens and some of the upgraded finishes.”

Executives at Cabin Fever agree. “As you might imagine, being a prefab builder in Miami, we have had a lot of interest in our buildings for post-earthquake Haiti,” says Andrew Kelly, president of the company. “We have developed several designs in response to requests for affordable housing solutions, and working with Ed Binkley will allow us to add quality, family-oriented homes to our domestic and international portfolio which, along with our smaller structures, are perfect for the long-term rebuild of Haiti.”—*nigel f. maynard*



Courtesy The American Institute of Architects

Jiyoun Kim's Woven Shelter tied for first place in the AIA Young Architects Forum Ideas Competition.

## extended relief

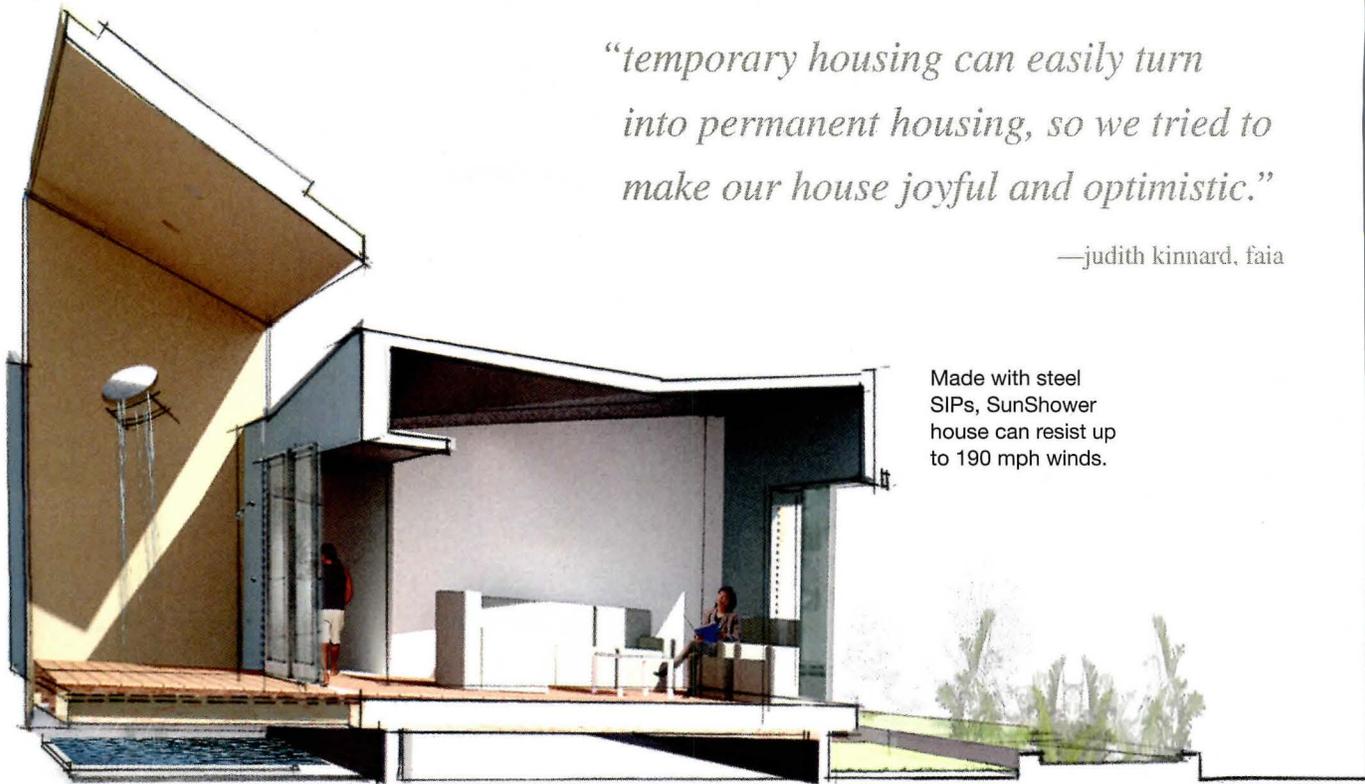
**b**ecause recent disasters, such as Hurricane Katrina and the earthquake in Haiti, raised emergency housing (or the lack of adequate options) as a topic of concern, the AIA Young Architects Forum and the AIA Committee on Design asked architects, students, and other design professionals to produce improved models for temporary housing. Their directive was simple: explore the issue of temporary relief housing that could have a permanent function. Here are the top three contenders:

Gene Kaufman, AIA, who tied for first place, conceived Free as lightweight, prefabricated modules that condense to 8 feet by 16 feet for storage and transport but expand 250 percent on site. Easily assembled by untrained labor, the modules are adaptable to varying terrain and climates, making them viable for long-term use.

Jiyoun Kim's Woven Shelter also tied for first. Improving on the tent, Kim's design features a string of fabric doughnut-shaped elements that would be filled with local materials. The panels are then woven into a self-supporting structure.

In third, Eric Polite's Community Unit uses plastic molding and trailer units to build modules that look like a section of a space station. The units screw together in six steps and can be assembled in five hours.—*n.f.m.*

## home front



*“temporary housing can easily turn into permanent housing, so we tried to make our house joyful and optimistic.”*

—judith kinnard, faia

Made with steel SIPs, SunShower house can resist up to 190 mph winds.

## home safe

In July 2010, the SunShower SSIP house by architect Judith Kinnard, FAIA, and project architect Tiffany Lin won the Reose Sustainable Building Design Competition. It was selected because it matched the criteria for a sustainable, energy-independent house that can withstand severe environmental conditions. The duo, however, has bigger plans for the winning design.

“From the beginning, we thought about the house’s potential use,” says

Kinnard, principal of Judith Kinnard Architect in New Orleans and professor at the Tulane School of Architecture. She and Lin are trying to register the house with the Federal Emergency Management Agency.

Reose is a sustainable kit-home manufacturer formed by steel SIPs maker OceanSafe and education consortium The Regen Group. The competition challenged eight New Orleans-based architecture firms to build a disaster-resistant house using OceanSafe’s steel SIPs. Made from galvalume and expanded polystyrene, the energy-efficient panels can construct a house strong enough to resist hurricane-force winds. This makes SunShower the ideal structure for disaster housing, its supporters believe.

“We designed the house for a generic site, but it could be shipped and used



Courtesy Judith Kinnard Architect

anywhere in the world,” Kinnard says. “It’s very energy-efficient, produces its own power, and we designed it with few windows to manage the thermal envelope.” The house is loaded with eco-features such as a water collection system, photovoltaic panels, solar hot water, and a wind turbine.

Despite its potential use, Kinnard and Lin used thoughtful exterior detailing, such as shaped SIPs cutouts, sliding polycarbonate panels, and casement windows. “Temporary housing can easily turn into permanent housing so we tried to make our house joyful and optimistic,” Kinnard says.

The SunShower demonstration house is slated for construction this year in New Orleans.—*n.f.m.*



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## AIA VOICES

INTERVIEW WITH STACEY MCMAHAN AS TOLD TO ELIZABETH EVITTS DICKINSON

*Last summer, Stacey McMahan, AIA, LEED AP, became the first-ever Architecture for Humanity (AFH) Sustainable Design Fellow sponsored by the American Institute of Architects and the U.S. Green Building Council (USGBC). She left her position as a partner/principal at South Dakota's Koch Hazard Architects for one year to work directly with the Haitian community on rebuilding efforts.*

**SM** I arrived on Aug. 9 and didn't look past the skyline for days. The landscape is as CNN and others have depicted—still. I am staying in a house AFH is renting for volunteers in Pétionville, a suburb 30 minutes outside of Port-au-Prince. I've always wanted to do some kind of mission work, but never took the opportunity. I would not be here now without the fellowship provided by the AIA and USGBC, so I'm very grateful.

If I have a specialty, it's figuring out how to work with local materials in school construction, or how to better work with local laborers out in the rural areas. We're exploring using different types of construction depending on location and are currently working on six or seven projects, some accessible only by foot or donkey.

There are an estimated 1.3 million people still in tents. I know a lot of architects have been thinking about rescue housing here and in other disaster locations. It's important to consider how materials could be put together so that they will be reusable or transitioned into permanent housing. Is the design flexible enough so that the people can change it in meaningful ways to fit their lifestyles and their culture? We did a study on temporary shelters. About 20 different types have been put up here.

The study found that only a few were built with other design considerations in mind, such as natural ventilation, flooring, and pre-wiring for electricity where available.

As architects, we are accustomed to operating within a set of orderly rules. There are literally no rules here. We are practicing architecture in extreme circumstances. We are designing to international standards for hurricanes and seismic zone 4 within a disorganized structure. We cannot assume anything regarding construction quality or labor skill. It's necessary to have someone on the project site daily and to hold pre-construction training for each step of the way. Our conundrum is that we are all here to help; we want to put our skills to good use because the situation in Haiti is really an architectural disaster. But if we design safe and attractive buildings—only to find the documents are not followed in the field—we are wasting our time.

The most effective work we can do here is translate our knowledge of safe construction detailing into training and construction practice, invent innovative ways to use local materials, which can be used in remote areas, then build demonstration projects using local labor. We live, work, and play here, and that's critical to our understanding of the culture and how things are done. It doesn't help to import knowledge without transferring that knowledge, so we are practicing alongside our Haitian counterparts: the builders, engineers, and architects. We're learning and innovating from our experiences here, and, as a friend told me, "You're building a bridge as you walk across it." **AIA**



PHOTO: WILL CROCKER

## All the Right Moves

KieranTimberlake hopes to transform New Orleans' Ninth Ward—and the prefab industry—with an AIA award-winning housing prototype.

WILLIAM RICHARDS

**THERE ISN'T A LOT THAT SPECIAL NO. 9 HOUSE DOESN'T** represent in progressive residential architecture. Designed by Philadelphia-based firm KieranTimberlake for the Barnes family (who lost their home in Hurricane Katrina) and the Make It Right Foundation (founded in 2007 to prompt sustainable and rapid redevelopment in New Orleans' Lower Ninth Ward), the home takes every advantage of solar orientation, rainwater collection, and site exigencies to make the most of its 1,520 square feet, the average lot size of first-generation Make It

Right homes. Exterior shading, optimized natural ventilation, integrated photovoltaics, non-solvent-based adhesives, and low- or no-VOC paints keep the subtropical house cool and self-sustaining. For all of these reasons, the house holds a 2010 AIA/COTE Top Ten Green Project designation and LEED Platinum certification. What also makes Special No. 9 House so, well, special is its potential for ecologically driven prefab housing that answers both the needs of the homeowner and the home's physical location.

Situated in the center of a slightly trapezoidal lot and anchored in the clay soil by 35-foot piers, Special No. 9 House hovers over a ground-level car park. The shotgun-style living space favors sleeping quarters over common areas, with four bedrooms and three bathrooms; a long central hallway creates the interior's dominant axis, but not at the expense of making the living and dining area feel like a stop along the steady march of rooms from front to back. Set off to the side, across from the kitchen, the living and dining areas open onto a raised front porch, creating a multipurpose space apart from the primary circulation areas of entry and hall.

The design solution was born out of the particular needs of homeowners Melba Leggett and Baxter Barnes. Melba, a school cafeteria worker, has a disabled brother who requires round-the-clock care. There's also her half-brother's mother, who



needs an elevator. “We have 21 different designs for homes here, and each homeowner will tell you that theirs is the best,” says Taylor Royle, communications director for *Make It Right*. “We experiment with different ways of building, from stick to modular to SIPs houses, but we always try to do whatever is the most sustainable and the most cost-effective,” she adds.

Facing east to the street, the house appears as two proportional volumes enveloped by a south-side trellis that supports photovoltaic panels and shelters the roof deck, accessible from a rear porch. Running the length of the house, the roof deck quadruples the amount of common space.

Like all of the first-generation houses completed in 2008 for *Make It Right*, Special No. 9 House was stick-built expediently on site. The home’s design went on to function as a KieranTimberlake prototype for a series of second-generation prefabricated homes, of which four have been built. Each of these second-generation homes was created with owner specifications in mind. As such, the homes attempt to improve on the tradition of prefabrication, which often favors design expediency and efficiency over placemaking and customization. By definition, prefabrication is a placeless practice. Largely designed and fabricated outside of the community where they ultimately reside, the homes can be disconnected from local labor and building economies.

KieranTimberlake took a different approach. The firm designed homes for New Orleanians with real climate and site conditions in mind. They also aimed to bolster the local economy, according to design partner James Timberlake, FAIA. He contends that building a scalable local industry around component manufacturing would provide much-needed jobs for the region.

Timberlake worries that the housing industry in general is missing an opportunity. “[They] are responding to choices surrounding appearance and lifestyle, not choices about lifecycle or operating costs for the homeowner,” he says. “It flabbergasts me that the industry in this flat economy did not use this situation to morph to an off-site strategy. They’re still relying on non-scalable building sets,” he adds.

*Make It Right* stands foremost behind a distinct and targeted goal for the Ninth Ward’s revitalization. Timberlake believes *Make It Right* also is providing the leverage to transform chatter about the benefits of prefabrication into an actionable model that honors placemaking. Working on a 25- or 30-year time frame, he hopes to help establish infill strategies for the Lower Ninth that take the long view about bolstering a sense of place in concordance with local memory and more holistic notions of sustainability.

Since 2008, all *Make It Right* homes have been built to LEED Platinum standards, and the organization expects that each of its additional 150 homes will follow suit. “Our whole goal is to build homes that are well-designed, sustainable, energy-efficient, and safe, at a price that a working family can afford,” Royle says. “We want to help families here, but we also want to change the building industry.”

*Make It Right* is optimistic that its homes can serve as models for other regions, distressed or not. Timberlake agrees. “We’ll get to a point where we can take a *Make It Right* house and tune it to a very, very specific local environmental circumstance for southern Georgia or North Dakota,” Timberlake says. “This is at our fingertips.” **AIA**

## AIA PERSPECTIVE

THE FUTURE OF THE PROFESSION



PHOTO: RON SOLOMON

Clark D. Manus, FAIA, President

### THE ECONOMY HAS TANKED AND TAKEN HOUSING WITH IT.

Yet even in this environment, architects who practice design are adapting every day to the challenges of a punishing market. They’re finding new ways to deliver what they’ve always done: provide real and lasting value to their clients while pushing the boundaries of creativity. In many areas—building materials, new construction techniques, manufactured housing, technology, green design, and more—they lead the profession. And your AIA is committed at every level to hearing the expanding discourse.

Some readers may think the AIA is all about big firms. Not true. That’s why the institute and many AIA chapters support housing committees. These committees are a place for architects to share knowledge of best practices and support innovation, especially when it comes to the most challenging issues of our time—such as health, an aging population, affordable housing, transportation, and sustainability, among a growing list.

Yes, the most immediate issue is jobs. Here, too, the AIA is engaged 24/7 with government at all levels to free up credit, support small businesses, provide tax incentives, and rebuild our nation’s critical infrastructure. Those are just some of the ways the AIA’s advocacy efforts are working for you.

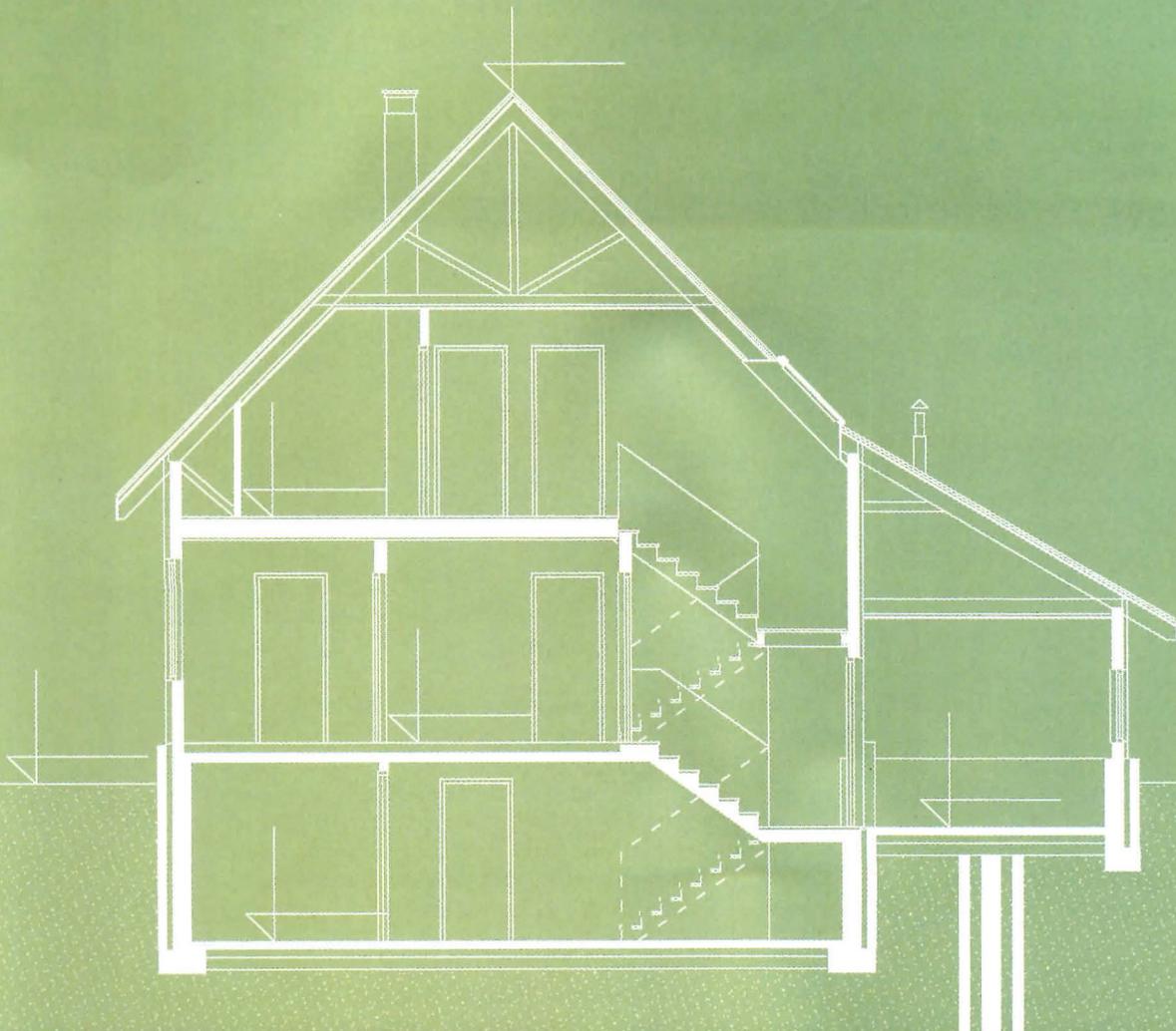
And have you had a chance to look at the latest AIA Contract Documents software release, such as the B107-2010 agreement between developer-builder and architect for single-family project prototypes, or the B109-2010, which deals with details and challenges related to multifamily residential development? These documents were created by teams of lawyers and architects familiar with the unique challenges of residential design.

That’s an introduction to how the AIA works on behalf of architects like you—knowledge sharing, advocacy, promotion of the value of the profession, contract documents, and much more. What can the AIA learn from you, the readers of *residential architect*? A lot.

No professional relationship is more intimate than that between residential architects and the clients who commission them. No practice is more open to experimentation and innovation.

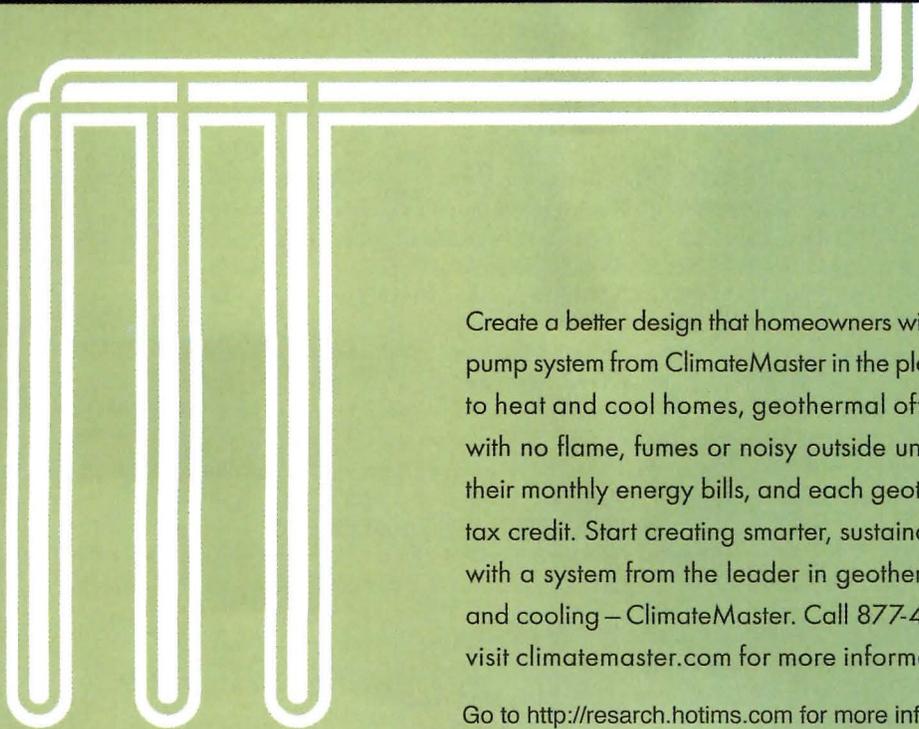
The new AIA/Hanley Wood partnership, which begins with this issue, is a great opportunity for all of us to become better acquainted. We’ve achieved a lot on our own. Imagine what we can do together to build more productive, livable, and sustainable communities. That’s what we’ll be exploring in the months ahead. **AIA**

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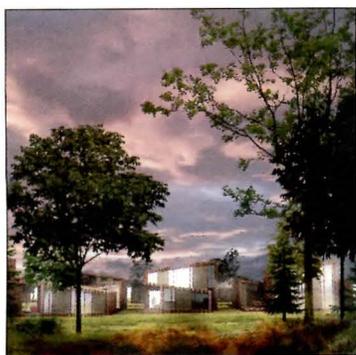
green piece

# north light

a swedish neighborhood puts the human element in sustainability.

In its sustainable development work, the Rotterdam, Netherlands, firm ArchitectenConsort concerns itself not only with energy use and water consumption, but also with the subtler matter of what makes a dwelling or neighborhood last. The durability of materials and details is part of the answer, says senior architect Edgar Bosman, but so are the ways in which people interact with the buildings, the site, and each other. Truly sustainable houses and communities function well enough that people will value and maintain them. “For us, social cohesion is a really important part of the design,”

Clustered to create common open space, the 21 single-family houses of this planned development sacrifice individual yards in exchange for a sense of community. Green roofs and unfinished wood siding allow the buildings to recede into the landscape.



Bosman says. The firm’s new housing development in southern Sweden reflects that philosophy.

Designed for Netherlands-based developer ScanParks, the neighborhood will be in Ljusstaden, a 500-unit planned suburb of the Baltic seaport city of Kalmar. The 3.2-acre property is surrounded by dedicated open land, an advantage the architects amplify by blurring distinctions between developed and undeveloped areas, between neighboring properties, and between the structures and landscape. Green roofs will cap the 21 single-family dwellings, which will front on a common open space that includes public gathering areas and an entry drive surfaced with permeable pavers. The buildings will



Renderings: Courtesy ArchitectenConsort

be clad in locally sourced softwood siding, thermally treated so that it requires no finish. “It’s really important for us,” Bosman says, “because we don’t want to use toxic materials or other ways of treating wood.”

Window size and placement optimize winter passive heating and obviate the need for air conditioning in the warmer months. The development will rely on grid electricity, but if soil conditions allow, a central geothermal heat pump plant will supply

in-floor hydronic heat to all the units. All stormwater will be handled on site, with rainwater stored for flushing toilets. Because the site plan devotes open space primarily to common use, each floor plan includes either four or five private outdoor terraces. The houses, which range in size from roughly 1,200 to 1,500 square feet, are aimed at middle-class buyers, with prices from 3 million to 4 million Swedish kronor (approximately \$440,000 to \$580,000).—*bruce d. snider*

# k + b studio

## kitchen: culinary craft

A major addition was planned for this dark, claustrophobic 1950s ranch house near Seattle. But when the budget forced a choice between square footage and highly crafted interiors, the clients chose the latter. Architect Nils C. Finne, AIA, added glass and borrowed space from a storage area, turning a dated kitchen into a generously proportioned place to cook, eat, and enjoy the view.

It feels like a new kitchen, although you can trace the bones of the old one. The hemlock ceilings are original, but Finne exposed a steel beam that had been boxed out and inserted a roof monitor, spanning the dining and living areas, with motorized operators that allow for venting. The slightly expanded footprint meant patching in new sections of terrazzo floor. “We started off thinking we’d match the existing terrazzo, but that stone and cement matrix was no longer available,” Finne explains. “I shifted gears and said, rather than be close, let’s have a contrast.” The new rectangle of espresso-colored terrazzo anchors the open kitchen. It’s also a foil for the pale cherry cabinetry, which Finne designed. Some of the panels are smooth resin inset with natural grasses, others have a CNC-milled texture like woven wood.

Custom-fabricated surfaces are a feast for the senses. A 30-foot-long wall is clad in umber-colored steel panels that bend around the wall’s undulations, and the bar’s 1-inch-thick cast glass, lit from below, adds sparkle to the room’s muted hues. “The intensity of the detailing adds a whole new level to the house,” Finne says.—*cheryl weber, lead ap*

**project:** Lake Forest Park Renovation, Lake Forest Park, Wash.

**architect:** Finne Architects, Seattle

**builder:** Schultz Miller, Seattle

**resources:** backsplash: Ann Sacks; cabinets (custom): Taylor Made Furniture; cooktop: Gaggenau; countertops: GlassWorks, Silestone; dishwasher, oven, refrigerator: Miele; flooring: General Terrazzo & Tile; paints/stains: Daly’s, Devine Color; plumbing fittings: Hansgrohe; windows: Eagle



Photos: Benjamin Benschneider

New clerestories bring natural light into the kitchen, and radiant-heated terrazzo floors provide even warmth. Many components were custom-fabricated, such as the resin and CNC-milled cabinets; cast-glass bar counter; hand-blown light fixtures; and steel wall panels, which were left outside to weather for three months. The resin panels are wired for LED backlighting.

*project continued on page 22*



## bath: boundary issues

Like a refined tree house, the bath in this renovated ranch house seems to float in a thicket of trees. “The bath was intended to feel like an outdoor space,” says architect Nils C. Finne, AIA. “You feel like you’ve returned to some primeval bathing experience.”

Finne took full advantage of the site—a large wooded property without close neighbors—to create a bath that visually dissolves into nature. The room projects into the landscape, bounded on three sides by glass walls. In the southwest corner, an oval tub sits in a steel frame with a laser-cut pattern resembling vine runners, which is repeated on the valances. Other custom fabrications add dimension to the simple, neutral space. The twisted steel towel bars are a



The bathtub niche soaks up nature’s views. Laser-cut valances are repeated in the tub’s steel frame.

Finne signature, part of his bath accessory line called Zri, which means “twist” in Norwegian. He also hand-drew an opaque pattern for the glass wall separating the bath and master bedroom. The pattern was transferred as a film to the glass, an economical alternative to etching. “The film can be easily pulled off—it’s a safety valve,” he says, “but the clients happen to really like it.”

With its new gabled fir ceiling, cherry cabinets, and limestone floors and countertop, the bath plays off its natural setting. Over the sinks Finne added large mirrors, suspended in thin steel frames, that reflect patterns and light from the continuous windows behind them. They contribute a moment of glamour to an otherwise restrained room, and they do sway, underscoring the sense of hovering lightly in space. These details add up to what Finne calls crafted modernism, “the notion that modernism must embody the care of making, the enduring value of craftsmanship, to acquire lasting value and meaning.”—c.w.



Photos: Benjamin Benschneider

Mirrors suspended in thin steel frames refract the scene from opposite windows. CNC-milled cabinetry panels abstract the wooded surroundings.

**resources:** cabinets (custom): Taylor Made Furniture; countertops and flooring: Quarry SE; paints/stains: Daly’s, Devine Color; plumbing fittings: California Faucets, Dornbracht, Hansgrohe; plumbing fixtures: Duravit, Toto USA, Zuma; windows: Eagle

## products

### good egg

The Cone Egg Pendant by jGoodDesign is hand-blown and sandblasted to add both character and light to the room. The pendant lamp is available in custom sizes and shapes as well as a variety of colors. jGoodDesign, 212.475.0479; [www.jgooddesign.com](http://www.jgooddesign.com).



### french impression

The Marron Glace cabinetry line, cut from walnut and accented with glass shelves, is named after a French delicacy: glazed chestnuts. Eran Chen designed the latest cabinets from Bazzo to appear to float within glass cubes. Crafted from reclaimed wood and finished with a nontoxic water-based stain, the cabinets are U.S.-made and can contribute toward LEED points, according to the manufacturer. Bazzo, 212.206.7400; [www.bazzo.com](http://www.bazzo.com).



—by evelyn royer

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# interior monologues

deciding to remodel or rebuild means looking inward and asking what both the house and the client want.

by cheryl weber, leed ap

**W**hen Alan Dynerman's clients outgrew their small 1890s Virginia farmhouse, he urged them to tear it down and build something new. They resisted, so he followed their wishes, adding living space almost double the size of the house and remodeling the old part. It wasn't until the project was finished that the owners told him they regretted not taking his advice. "The wife wanted something old and rustic—that was her romance," says Dynerman, FAIA, principal of Dynerman Architects in Washington, D.C. "But what they were saving had no merit; it was just old. The new part we did was more rustic, simple, and elegant than the old thing."

Whether to raze or remodel is a question architects routinely address. They're weighing several pressures: money, time, resource efficiency. But clients often need more clarity these days, since that decision bumps up against increased environmental consciousness and financial caution. Psychology is a factor at play, too. Clients may idealize a home's historic value, or resist tear-



Mark McGinnis/Munro Campagna

ing down a place filled with memories or where they've invested a chunk of money. Others want the slate wiped clean. They're determined, at all cost, to have a house designed from scratch.

From an architect's perspective, a tabula rasa has huge appeal: The only conceptual dialogue you're having is with yourself. Remodeling is a far messier

choice. No one knows for certain what lurks behind the walls until the demolition crew arrives. It also forces other difficult decisions, such as where to draw the line between old and new. You don't want to leave something clients will regret. On the other hand, remodeling preserves some of a building's embodied energy. It is more disci-

plined and nuanced, and it sets up a conversation across time. You're digging into a past mindset and trying on new ideas, forms, and materials.

## happy hybrids

Most architects enjoy grappling with a range of challenges, and they take the question seriously. "I take a  
*continued on page 26*

## practice

lot of pride in the fact that our houses look brand new, but are not,” says David Jameson, FAIA, Alexandria, Va., who designs modernist homes on the bones of the Washington, D.C.-area’s aging housing stock. “Our inclination is not necessarily to show up and take the house out.” Practically speaking, he notes, it’s hard to scrape off a house on an urban lot. And while a gut remodel may not end up being less costly than ground-up construction, it might let you build something that zoning would not allow new.

It’s often speedier, too. “The first guy on the job is not the excavator, it’s the framer,” Jameson says.

“Many framing guys do the selective demo work these days, because they have to tie the new part back into the old. It’s not the bull-in-a-china-shop mentality anymore.”

Artistically, a hybrid approach can result in an interesting “situational aesthetic,” Jameson says. When the existing footprint and the new program mesh, he relishes the opportunity to reinvent what’s there. An example is his award-winning Black White residence, originally a rambler with a hodgepodge of additions. He left the entire footprint intact, spent \$15,000 to increase the load-bearing capacity,

*continued on page 28*

## home economics

Not all clients have the forethought to buy a house with future remodeling in mind. If they did, they could avoid the wasted money and embodied energy inherent in knocking down to build new, says architect and real estate curator John Brown, RAIC, founder of housebrand in Calgary, Alberta. With post-crash consumers opening up to an intelligent, utilitarian design approach, Brown’s goal is to help people achieve a high-quality home at a reasonable cost. He believes it rarely makes economic sense to demolish a house unless it’s small and broken down. If you’re spending \$300,000 to \$400,000 on a 50-year-old house, for instance, almost all the value is in the land, he says, and you’re buying the excavation, foundation, and framing in 1960s dollars.

“We have a lot of people come to us and say, I talked to a builder and he told me to rip it down. That’s the mentality of the trades,” Brown says. “The general perception is that you have to take the house down. We’re showing that you don’t.” Working with an integrated design/build business model, the firm’s gut renovations clock in at \$125 to \$150

*continued on page 28*



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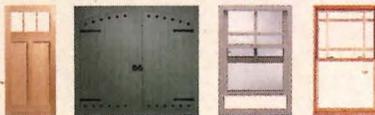
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## practice

per square foot, compared with \$250 to \$300 per square foot for its new homes.

Some houses are easier to renovate than others. “Two parties, plus housebrand, come to an architecture project: one is the client and what they want, the other is the house and what it wants,” Brown says. “You can turn a sow’s ear into a silk purse, but it’s expensive if you don’t start with something halfway there.”

He helps clients evaluate the raw ingredients from a size, structural, and layout perspective: Is the house oriented to take advantage of views, breezes, and the sun’s angles? If an outdoor connection is desired, where is the kitchen? And are there bedrooms along the back of house that will have to be removed? “If the task is to make dessert, there’s no point in starting with meat and potatoes,” he says.

Size is the biggest issue affecting economic efficiency. The footprint is discounted because of its age, and as soon as you expand it you’re paying a premium—essentially building another house, even if it’s just 200 square feet, Brown explains. “That’s the strength of having an architect participate in the purchase,” he adds. “The design process starts when we go out the door to look for a property.”—c.w.

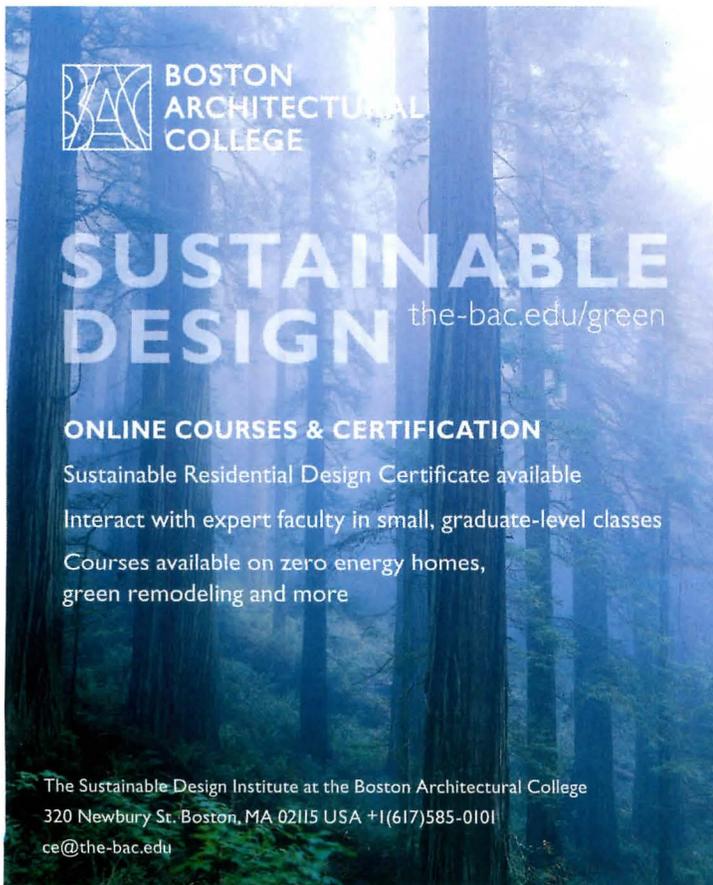
and added a second floor half the size of the first. “It allowed us to juxtapose a white stucco plinth with a glass volume and apertures of light that erupt out of it,” Jameson says, “and it created nice interstitial spaces. Reusing what’s there allows you to contemplate the house in a less efficient but more unique way.”

Robert Swatt, FAIA, agrees. His firm, Swatt | Miers Architects in Emeryville, Calif., transformed a tired 1970s house in San Francisco’s South Bay area while reusing the foundation and two-thirds of the framing, including the pitched roofs. While out-of-character for the modernist firm, the angled

roofs worked well for the new solar panels, he says, and the combination of pitched and flat roofs added up to something fresh. “By putting our own architectural language with an older language, we created something we never would have come up with had we started from scratch. It was a happy surprise,” Swatt says. “It cost a lot of money, but for the owner it was an ethical issue, not a cost issue.”

Other clients cling to shreds of familiarity, making the decision easy. One couple Jameson worked with spent \$1.5 million reworking the awkward interior of a developer

*continued on page 30*



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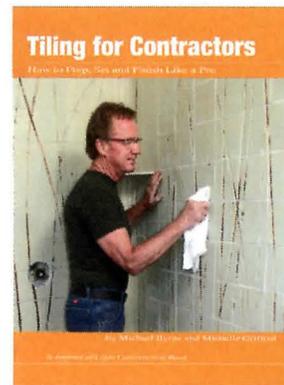
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## practice

McMansion. Although they could have built a one-of-a-kind home for the same cost, the owners were attached to the place they'd inhabited for 20-some years. "All of a sudden the soul of the house would have been different," Jameson says. "Some houses fight like crazy the idea of being renovated; others are very welcoming to it. Houses have their own voices."

Boston architect Jeremiah Eck, FAIA, has

approach this," says Eck, founding principal of Eck | MacNeely Architects. "You can't get away with it anymore; clients are laser-focused on this stuff."

But, in his view, a house has to be worth saving. That means stoutly built, and with good siting, massing, proportion, and detailing. Nineteenth- and early 20th-century houses often fulfill those requirements, Eck notes, but all bets are off on

*"you can get a good gut feeling for the house's condition if you start at the bottom, looking at the foundation for damage and water infiltration."*

—sebastian schmalig, aia

similar feelings in regard to houses. "There's a kind of spirituality to a house that remains if you save it," he says. "On occasion, we've done heart surgery on houses. I think when you're done it feels better, like you've respected the historic nature of the place."

Beyond that sixth sense, the world is looking at value in a new way, Eck says. People are focusing harder on what they have. And if money was the driving force in the old economy, it's also the driving force in the new one. "In the old days there was more leeway about how you

more recent structures. "In about 20 years we'll have a huge stock of houses that will require forensic architecture" when it's time to remodel. "We'll be fixing things rather than starting with a unique slate."

### cut and paste

Austin, Texas, already faces this dilemma. It's a city that never attracted much money, and even architecture with provenance tends to be thinly built. David Webber, AIA, principal of Austin-based Webber + Studio Architects, found himself fighting on the wrong side

*continued on page 32*

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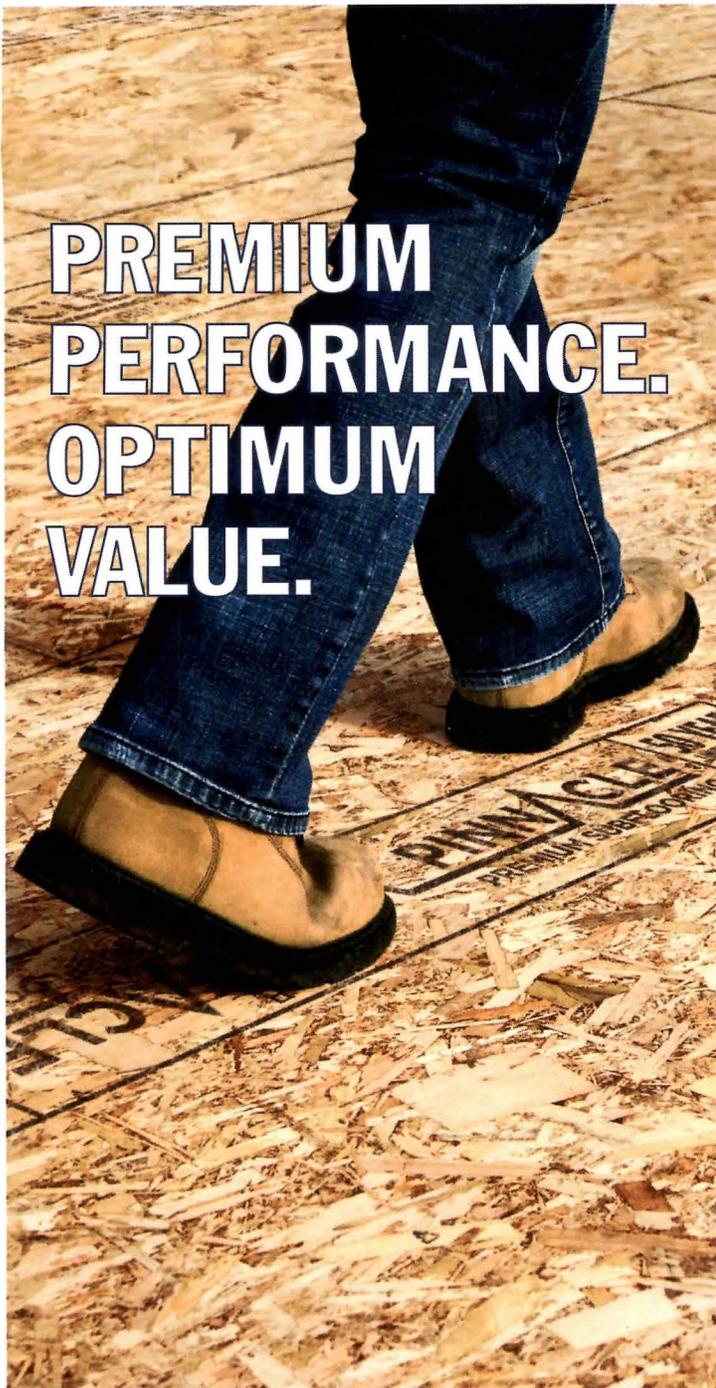
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practice

of the issue a few years ago when a bungalow he was trying to save from demolition turned out to have single-walled construction. "There were no studs, so if you removed the wood siding the house would fall down," Webber says. The owners subsequently tore down the house, and a local architect designed a new one on the lot. "The house that replaced it will have

than to enlarge. Contractors often aren't studying the details early enough in the process to give clients accurate information, according to Webber, and they're focused on the easiest way to get the job done. "With the foundation of an average house costing around \$40,000 and the framing \$60,000, it's rare that it makes sense to start over completely," he says.

*"some houses fight like crazy the idea of being renovated; others are very welcoming to it. houses have their own voices."*

—david jameson. faia

more historic value in the long run," he says.

In a complicated endeavor, every now and then a clean solution presents itself. When Webber designed a large addition to a house a few years ago, the contractor counseled that it would be cheaper to tear down and rebuild. Webber disagreed. The issue was neatly resolved, however, when the house was sold and moved off the lot, clearing the way to build his design as a new house. The clients were thrilled to avoid dealing with the problems of adding to an old house, Webber says, or the guilt of throwing it away.

That house did end up costing more to build new

"Even if the construction is poor, you can use the foundation."

Milwaukee-based Johnsen Schmalig Architects saved roughly 25 percent of construction costs by taking that approach to a 1970s bilevel tract house a few years ago. The owners didn't need more space, just more light, storage, and outdoor connections. Principals Sebastian Schmalig, AIA, and Brian Johnsen, AIA, uncluttered the floor plan, added window walls, inserted two cantilevered storage volumes, and popped up the roof with a dramatic clerestory, all while using its boxy footprint,

*continued on page 34*

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## practice

plumbing core, and main perimeter walls.

"You can get a good gut feeling for the house's condition if you start at the bottom, looking at the foundation for damage and water infiltration," Schmaling says. "Then you move up to the wood frame, checking for mold and rodent damage. Once you're above ground, everything is game. All

joists," he says. "We found a beautiful white-washed oak floor that is the same ephemeral light color of concrete. You just need to find alternatives."

Seattle architect Nils C. Finne, AIA, is working on a new 4,500-square-foot house in Boston where the rough framing bid is close to \$100,000. So from a purely financial perspective, it's smart to

*"on occasion, we've done heart surgery on houses. i think when you're done it feels better, like you've respected the historic nature of the place."*

—jeremiah eck, faia

four sides are load-bearing so we open it up as much as we want to." The firm has performed these major interventions several times. Even with builder fees inflated to work around existing conditions, costs typically have been 25 percent lower on gut remodels than starting from scratch, Schmaling says. Invariably, though, there are trade-offs. On a similar project under way in Ann Arbor, Mich., the clients wanted exposed concrete floors. "We had to tell them that the existing floor framing would not support the additional weight of the concrete, and we couldn't reframe economically with stiffer

start with the viable parts of a house's skeleton, if you can. With a specialty in highly crafted furniture and interiors, Finne urges remodeling clients to rein in footprint creep because there's more freedom to invent when you're not struggling with the budget. "We're working on three new houses at the moment, and I'm fighting for my cabinet and tile budgets," he says. "A lot of the renovation work is different from that point of view."

One of the hardest jobs architects have is helping clients visualize what they're buying. In Finne's experience, remodeling also helps clients clear that conceptual hurdle. "I think

residential architect / an aia magazine

it's somewhat easier when you can walk through the spaces and wave your hands around," he says. And while a renovation can be more design-intensive than new construction, the difference isn't significant for Finne. "We go in beforehand and cut holes in the ceiling, peer up with flashlights, trying to figure out what's going on as best we can," he says. "It generally bears out what we think, although sometimes we have to do pretty intensive revisions."

### clean slate

Indeed, there's a tipping point on every ambitious project. Architects are weighing the limits of what exists against what they want to achieve. And the minute they start fiddling with bits and pieces, it often makes sense to take the building down. Berkeley, Calif., designer Fu-Tung Cheng once wasted five months trying to make a sprawling, cheaply built house with complex roof lines work with the clients' program. "After awhile you're pushing it uphill," he says. Cheng has learned to call a spade a spade. "I have torn down parts of houses and saved just one area that was remodeled 10 years ago, and lived to regret it. It was like a gnat you couldn't get rid of." Sometimes, he believes, conservation is best served by reusing the materials to build something people respect.

Other circumstances conspire against a house's long-term survival—a deeper understanding of environmental context, for instance. Asked to add 1,000 square feet to a 2,500-square-foot house on Little Round Bay near Annapolis, Md., Dyrnerman dismantled it and designed a new one farther from the water's edge, a move that helped reduce runoff into the Chesapeake Bay for decades to come. The old house also happened to be poorly planned, along the lines of, "What were they thinking?" Only the utility room had a water view, Dyrnerman says.

In the remodel-or-rebuild puzzle, the starting point is always the question, "Can we make this work?" Compatibility to program and context is the equation that needs to be solved. But when clients really want brand-new, Dirk Denison, FAIA, principal of Chicago-based Dirk Denison Architects, advises them to sell their perfectly nice house and buy a suitable lot or a small house with low intrinsic value. The same is true when, say, they're hoping to save the updated kitchen in a structurally mediocre dwelling. "I suggest selling the house. Then you don't have the inconvenience of renovating a house you're living in, and you can recoup the cost," he says. "That should always be on the table." *ra*

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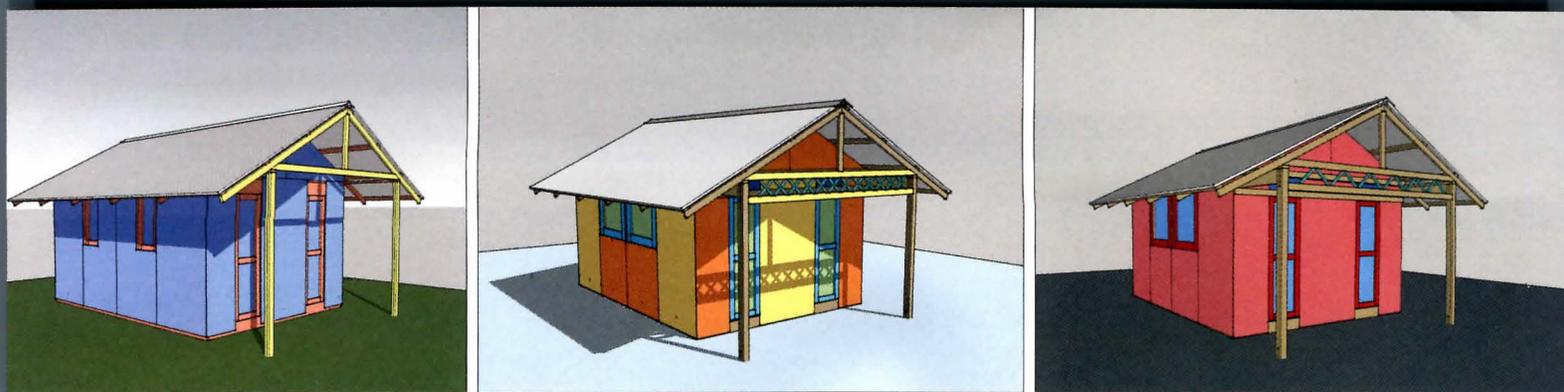
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Courtesy Mike Stoneking, Building Goodness Foundation

# *picking up the pieces*

in disaster zones all over the world,  
architects help rebuild communities.

*f* For someone who's experienced a serious natural disaster, an 8-by-12-foot shed can be a lifeline to normalcy. Just ask the residents of Pearlinton, Miss. After Hurricane Katrina in 2005, a nonprofit called Building Goodness Foundation (BGF) traveled to the Gulf Coast town to help, and noticed that its flood-stricken residents had nowhere to store the few possessions they'd been able to salvage. The Charlottesville, Va.-based organization, mostly made up of local builders and architects, designed a simple shed and began building dozens of them—about 140, in total. Some residents temporarily lived in

the structures, while others used them to shelter their things. "It gave people a real shining star of hope after such a devastating event," says Mississippi local county supervisor Rocky Pullman.

BGF chose not to make the design proprietary, which allowed other organizations to come to Pearlinton and build more sheds using its basic model. Today, the sheds are still used for storage, albeit of a less emergency nature. "They're still there, but now they're painted to match the new houses the residents built," says Charlottesville architect Mike Stoneking, AIA, BGF's vice president and a board member.

The Charlottesville, Va.-based nonprofit Building Goodness Foundation is constructing panelized, 12-by-16-foot permanent dwellings in Haiti (top), designed by Mike Stoneking, AIA.

by meghan drueding

## *picking up the pieces*

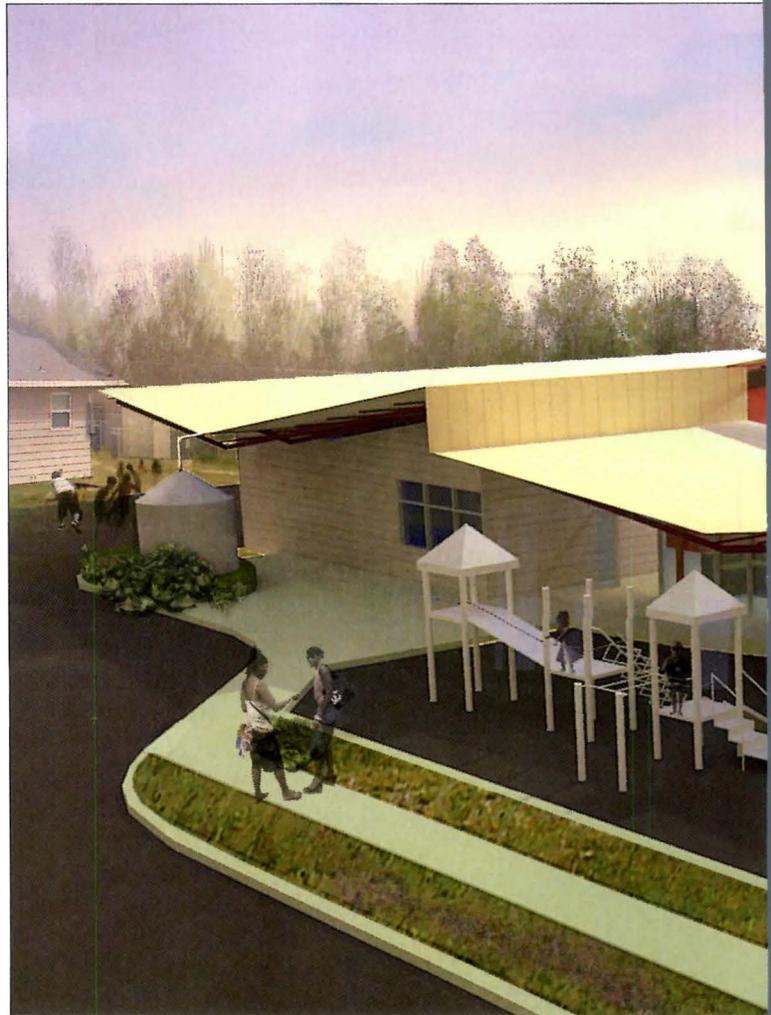
The Pearlington sheds perfectly exemplify the power of architecture to improve a post-disaster situation. They're not glamorous or high-design, just solid, easy-to-construct buildings that fill a very specific need. And they demonstrate the crucial role design can play in the reordering of lives scattered by events beyond their control.

### hands-on help

Many disaster recovery experts are beginning to see what architects have long known: Good design is never more important than in an emergency or post-emergency situation. "Design matters, and when you're designing a small space it really matters," says Dana Bres, a research engineer at HUD who worked on the Federal Emergency Management Agency's post-Katrina Alternative Housing Pilot Program. And architect Sergio Palleroni, a Portland State University professor and a senior fellow at the school's Institute for Sustainable Solutions, observes that design can unite strangers thrown together by circumstance. He and his wife and partner, architect Margarette Leite, are finishing up the design phase of a Houston community center for families who were permanently displaced from different parts of New Orleans by Katrina. "It serves the need for activities for kids after school, and for cultural events and gatherings that will keep the community cohesive," he says. "It addresses a typical problem, which is, how do you set up strategies for survival that also create community?" (See page 39 for more on Palleroni and Leite.)

Perhaps even more significant than actual buildings are the knowledge-based offerings architects can supply, such as construction training and building manuals. "Typically, the first thing we do is a manual, specific to disaster mitigation," says Kate Stohr, co-founder of the nonprofit Architecture for Humanity (AFH). "It gives people a tangible way to move ahead." In addition to its downloadable, 32-page Haiti Rebuilding 101 manual, her organization has been providing CAD and Revit training to Haitian architects and engineers. The training takes place in AFH's recently completed Rebuilding Center

*continued on page 40*



Courtesy Portland State University

spotlight:  
 basic initiative /  
 palleroni leite  
 design partnership

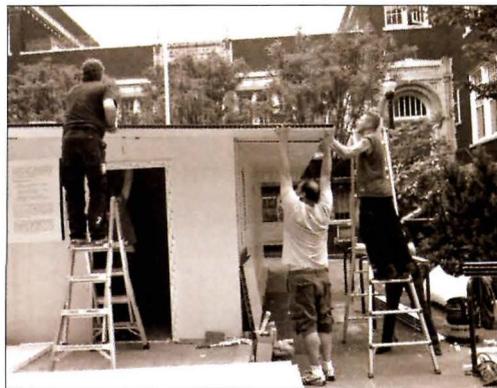
Sergio Palleroni is no stranger to post-disaster reconstruction. As a freshly minted architecture school graduate in the early 1980s, he jumped on an opportunity to help with rebuilding efforts in earthquake-damaged Nicaragua. A few years later, he moved to Mexico City to assist with recovery work after the 1985 earthquake. “That was one of the two best reconstruction efforts ever, the other one being [post-1945] Japan,” he remembers. “In Mexico City, 250,000 housing units were built in two years.”

These and other early experiences with underserved communities led Palleroni to notice a void in American architectural education. In 1995, he co-founded a design/build program at the University of Washington called BaSiC Initiative, along with Steve Badanes and David Riley. BaSiC now works all over the world to improve local conditions through design and construction. The program is currently housed at both Portland State University (PSU) in Oregon, where Palleroni is an architecture professor and a senior fellow at the Institute for Sustainable Solutions, and the University of Texas-Austin. It has helped dozens of in-need communities, including the Gulf Coast region after Hurricane Katrina. Among its undertakings there were the Katrina Furniture Project, which transformed building materials salvaged from post-Katrina wreckage into furniture, and A House for Patty, one of the first homes built in Biloxi, Miss., after the storm. More recent BaSiC projects include Druk White Lotus School in India (which sustained damage from this

*continued on page 41*



Courtesy Palleroni Leite Design Partnership



Photos: Courtesy Portland State University

In June 2010, Leite's students built a 700-square-foot house using cellulose-and-resin SwissCell panels (above and opposite). Palleroni Leite Design Partnership's Angel Lane Community Center in Houston (top) will anchor a Habitat for Humanity development for Hurricane Katrina survivors.

## *picking up the pieces*

in Port-au-Prince, which is designed to act as a support hub for local construction-related activities. (For more information on Architecture for Humanity, see pages 46-47.)

Other groups also are helping to bolster building skills among both tradespeople and non-professional builders in Haiti. In 2010, dozens of architects, engineers, and reconstruction experts came together via the online Haiti Rewired forum to adapt an existing confined masonry manual for the country's post-earthquake situation. (The confined masonry building method has long enjoyed popularity in Haiti, but a widespread lack of understanding of its structural principles there led to thousands of earthquake-related deaths.) Among several key players on this project were Architects Without Borders' Oregon chapter, the Palleroni-led student design-build program BaSiC Initiative (see page 39), and volunteers from the engineering firm KPFF.

In addition to rebuilding Haitian homes and schools, Building Goodness Foundation currently is raising funds to build a trade school in Thomassin, Haiti, that will offer training for construction jobs and other in-demand professional positions. And Architects Without Borders' Seattle chapter sent groups of architects and engineers to Haiti in April and August 2010 to assess the safety of structures in the towns of Léogâne and Petit-Goâve. They evaluated about 750 buildings, mostly residences, and found about 30 percent to be ready for reoccupation.

### **shaping the future**

While some of today's architects already are working on disaster recovery and rebuilding projects, a greater number of experienced hands will be needed in the years ahead. Climate change, overdevelopment, and other factors both natural and manmade are contributing to an exponential increase in hurricanes and flooding. "I learned in the field, but we want the next generation to be better prepared," says Palleroni, who also teaches graduate courses in international humanitarian action through Erasmus Mundus, an academic cooperative run by the European Union. "It's becoming an increas-

*continued on page 42*





Photos: Courtesy BaSiC Initiative

One of BaSiC Initiative's Gulf Coast projects, A House for Patty, features interiors free of paints and other manmade finishes, at the request of the owner. BaSiC lifted the house 14 feet off the ground to meet flooding regulations, and opened it up in the middle to take advantage of naturally cooling breezes. Many of the materials are salvaged from hurricane-damaged buildings in the region.



basic initiative /  
palleroni leite design  
partnership

past summer's floods but is still operational); a solar-powered bakery in Tunisia; and contributions to the Haiti Rewired construction manual. (More information on BaSiC can be found at [www.basicinitiative.com](http://www.basicinitiative.com) or [www.basicinitiative.org](http://www.basicinitiative.org).)

Palleroni's wife, architect Margarete Leite, is a BaSiC Initiative instructor, as well as a professor in the architecture program at PSU. She also serves as his partner in their Portland-based firm, Palleroni Leite Design Partnership (PLDP). One of PLDP's latest projects is a community center for a neighborhood of families displaced from New Orleans by Katrina. The residents have made new lives in a Habitat for Humanity development in Houston, and Habitat hired PLDP to design a gathering place and activity hub for both adults and children.



Ty Milford/Aurora Select

Sergio Palleroni and Margarete Leite of Palleroni Leite Design Partnership.

In all of their work, Leite and Palleroni embark on a mission to thoroughly understand the cultural needs of the building's end user. "It's important to us that people explain to us what they've lost," Palleroni says. "Telling us their stories acknowledges that need for normality. It's a huge step for the architects to step into the lives of other people and find out what was most important and resolve that formally. I think the programming—the deep conversation with the client—is one of the two to three most important things you do in disaster relief."

*continued on page 43*

## *picking up the pieces*

ingly important part of professional lives in the future.” Clearly, design schools are beginning to agree. This fall, Harvard’s Graduate School of Design will debut a new area of concentration in its Master in Design Studies program called “Anticipatory Spatial Practice.” It will focus on helping students develop the skills to create pre-emptive solutions to post-disaster situations. And the College of Architecture, Art, + Design at Mississippi State University has instituted a certificate program in public design, which incorporates courses taught through the university’s Gulf Coast Community Design Studio in Biloxi, Miss. Programs like these will give more architects the tools they need to be of real service to nonprofit relief organizations.

While teaching design and building skills, such classes also will no doubt educate students about the importance of social capital to the efficiency of a rebuilding program. Stohr compares AFH’s experience working in Biloxi, Miss., with trying to get projects done in New Orleans or Port-au-Prince. “Biloxi is a very stable, coherent community; we talked to the building department all the time,” she says. “Versus New Orleans or Port-au-Prince, where there are inherent tensions. That makes it very difficult to build trust.” A measure of political and social stability also makes it possible to institute pre-disaster planning, which is a must, according to Palleroni. “Imagine if Haiti had an emergency plan before the earthquake,” he says. “Pre-disaster planning is essential for a quick transition.”

One way architects can gauge and leverage a community’s social capital is to try to gain more than a superficial understanding of its culture. “If we’re committed as a profession to serving populations that are underserved, we have to be able to go to responsibly work for cultures that are different from our own,” says John Peterson, AIA, founder of the nonprofit Public Architecture. “You have to go beyond the client, to local tradespeople, NGO’s, other design professionals, whatever it takes.” Often, he points out, local religious or political leaders can act as key sources of cultural information.

Failure to comprehend the housing culture of a place before repairing or redeveloping it can

*continued on page 44*





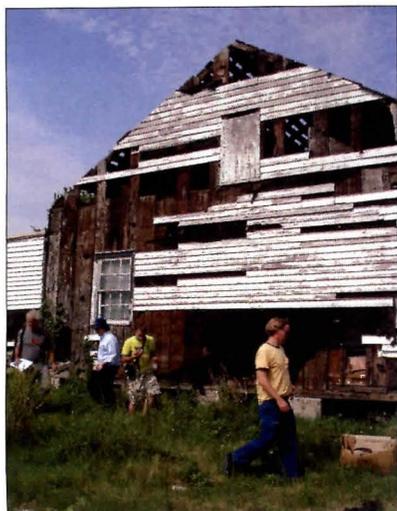
Photos: Courtesy BaSiC Initiative

basic initiative /  
palleroni leite design  
partnership

This type of in-depth research also makes up a crucial element of BaSiC Initiative's projects. And it informs Palleroni's teaching both at PSU and in courses on international humanitarian action through Erasmus Mundus, a graduate program overseen by the European Union. He emphasizes real-life, in-the-field experience, and encourages students to spend extra time understanding their clients' needs. "I had this weird training that happened where I was, when I was," he observes of his disaster rebuilding background. "How do we create that kind of training? We all realize it's a growing need."

*"pre-disaster  
planning  
is essential  
for a quick  
transition."*

—sergio palleroni



The Katrina Furniture Project involved the Gulf Coast community in an effort to make furniture out of materials retrieved from the aftermath of Hurricane Katrina (left). Among the finished products were sturdy, attractive tables and shelving units. BaSiC Initiative participants in the program included Jim Adamson, Peter Spruance, Sandor Pratt, and BaSiC director Sergio Palleroni (opposite, from left).

In her academic work, Leite is particularly interested in tectonics and building materials. In June 2010, she and her students teamed with local company Pacific Green Innovations to build a 700-square-foot demonstration home using SwissCell cellulose-and-resin panels. She and Palleroni believe the lightweight material could be a good fit for disaster relief housing in Haiti and beyond.

Like Palleroni, Leite focuses on helping her students consider alternative career trajectories. "Rather than having architects always doing museums and libraries, we're bringing in the idea that design can go much further than that," she says. "We're trying to get students to look at potential career paths where we can have a greater impact on all people, not just the wealthy."—*m.d.*

## *picking up the pieces*

negatively impact its social system; if people don't feel comfortable with the way a house looks or is laid out, they won't want to live in it. "Reconstruction is more than building houses," Jennifer Duyne Barenstein, head of Switzerland's World Habitat Research Centre, told an audience at Swissnex's "Rebuilding After Disaster" conference in November. "It's restoring a whole habitat, or as much of it as possible." And AFH's Stohr emphasizes the additional importance of understanding a population's emotional state. "Don't get ahead of the community," she says. "You may want to do prefab or other quick projects, but they are grieving. Try to focus on giving support." Particularly in Haiti, the need for pre-construction services such as rubble clearing, safety assessments, and land title establishment has been so great that in most areas the actual implementation of reconstruction plans has yet to begin.

### **the long view**

Speedy shelter solutions are useful and necessary in first-responder situations. Tents and tarps form a crucial first step in keeping people dry and sheltered. But often temporary housing solutions end up becoming more permanent ones. Over a year after the Haiti quake, for example, more than a million Haitians are still living in tents. The sometimes-fuzzy distinctions between temporary, semi-permanent, and permanent housing are undergoing a thorough re-examination. "It's such an interesting challenge with emergency housing," Peterson points out. "How do you prepare for this to be used long-term? Or, how do you prepare for it to not be able to be misused past a certain point?"

Potential (though mostly untested) solutions abound, and many experts hope to see more of a relationship between temporary and long-term shelter. The funding for each tends to come from a different source and on a different timeline, which complicates matters. "Can the world really afford not to have them linked?" Palleroni asks. "There has to be some coordination between the two."

The Mississippi Alternative Housing Program contains a possible option. Some of its tempo-  
*continued on page 46*

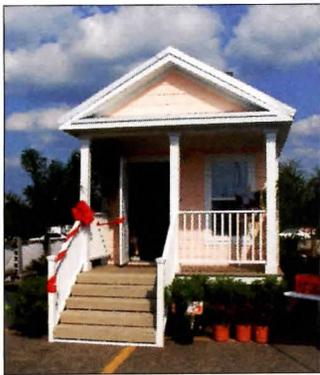


Images: Courtesy Mississippi Emergency Management Agency



Conceived as an alternative to trailer- and mobile home-based transitional housing, the Mississippi Cottage is a temporary dwelling that can become a permanent home (top and right). Built like a modular home but delivered on a wheeled chassis, it comes in two- and three-bedroom versions. Its Gulf Coast vernacular design has made it the basis for a number of successful permanent neighborhoods (above).





Developed, like its larger siblings, by the Mississippi Alternative Housing Program, the 400-square-foot Park Model shares its basic configuration with the popular Katrina Cottage. With its front porch, stick-built structure, and regional vernacular design, it represents a vast improvement in livability over the much-maligned FEMA trailer.

## spotlight: mississippi alternative housing program

At the peak of the effort to house those displaced by Hurricane Katrina, some 40,000 families had found refuge in trailers and mobile homes provided by the Federal Emergency Management Agency (FEMA). Despite the health problems associated with the trailers' construction, that remains a considerable achievement. For disaster victims needing three to six months to repair their homes, Mississippi Emergency Management Agency (MEMA) director Mike Womack says, "that model works pretty well." Unfortunately, he adds, "it would take years to rebuild housing on the Mississippi Gulf Coast." Working with a \$281 million federal grant, the state of Mississippi produced what may be a better model: transitional housing sturdy and livable enough to become permanent.

Starting in April 2007, MEMA's Mississippi Alternative Housing Program ([www.msccottage.org](http://www.msccottage.org)) offered residents the option of swapping their FEMA units for one of three models of modular, stick-built dwellings that they later would have the opportunity to buy. Inspired in part by architect Marianne Cusato's Katrina Cottage and designed with input from the School of Architecture at Mississippi State University and the architecture and planning firm Looney Ricks Kiss (LRK), the dwellings range from the 400-square-foot "Park Model" to an 832-square-foot, three-bedroom "Mississippi Cottage." "It's basically a modular home on a mobile home foundation," Womack explains, with insulated 2x6 walls, fiber cement clapboard siding, and gypsum board interior finishes. With procurement

costs running from \$34,269 to \$51,130 per unit, Womack notes, "rather than spending \$30,000 to \$50,000 on a temporary unit ... it makes more sense to give these families a permanent home."

LRK drew on its expertise in modular construction to produce designs "that could be put into production quickly with the manufacturers that were waiting on the sidelines," says firm principal Michael Sullivan, AIA. With their peaked roofs, front porches, and "shotgun" floor plans, the buildings reflect a traditional Gulf Coast residential style "to bring back the idea of home in an emergency housing form," Sullivan adds.

Produced on a small-lot bid basis by seven separate manufacturers, the buildings roll to their sites on a mobile home-like steel chassis and rest on a temporary stacked concrete block foundation. After 18 months, they are offered to their occupants for purchase at an income-adjusted price as low as \$450 or "decommissioned" and hauled away. "We've transferred ownership of 894," Womack reports, most of which were then set on permanent foundations. "We've donated 500 units to various nonprofits," including Habitat for Humanity. Another 350 have been sold as surplus. "We would love to hold onto some units, but there is a cost to maintain them," says Womack, who lacks the funding to mothball units until the next disaster. But having successfully produced and deployed 3,000 dwellings, he is confident that his agency can resume production "within 90 days." And without the oversight required in the first go-round, he estimates that "the cost would go down by a quarter or a third."—*bruce d. snider*

## *picking up the pieces*

rary modular cottages can be transformed into permanent homes by changing the way they meet the ground (see pages 44-45 for more on the cottages.) Those that aren't made permanent can be redeployed in a future emergency. This type of flexible design could enable long-term cost savings because it reduces the need for a separate permanent housing project.

Ideas for emergency housing can be explored through design competitions, but many architects question their effectiveness. Plenty of well-intentioned contests produce interesting, good-looking models that never come close to getting built. Peterson, for one, cites their often-shallow grasp of the problems at hand. "One of the reasons I think competitions are so vulnerable for failure is that while they're great at developing clever ideas, they're terrible at understanding local conditions," he notes.

Design competitions do have their fans, though. Like many of his peers, Anselmo Canfora, assistant professor at the University of Virginia School of Architecture and founder of the Initiative reCOVER design-build program there, believes competitions raise much-needed awareness of disaster sites. "They help bring attention to the issue in mainstream society," he says. A proposal by Canfora and his students has been named one of 140 finalists in the Building Back Better Communities (BBBC) competition held by the Haitian government's Ministry of Tourism. The country's political and economic chaos sidelined the BBBC for months, but according to the organizers a plan is now in place to build or assemble the finalists on a site north of Port-au-Prince, and to eventually construct a community for 125 families using the competition's highest-placing designs.

Canfora brings up a good point. Regardless of whether competitions are the right way to gain attention, rebuilding organizations need sustained engagement from the public, not only just after a disaster hits but for years afterward. With so many causes competing for dollars, volunteers, and media coverage, it's not always easy to garner support. Yet the architects and designers involved in recovery projects continue to work their way through the ruins, buoyed by the promise of a more resilient future. *ra*



Photos: Stacey McMahan (above); Schendy Kernizan (below)

At Architecture for Humanity's Rebuilding Center in Port-au-Prince, Haiti (top, above, and right), volunteers and staff members engage in training, design, and other recovery-related activities. Two of the nonprofit's planned projects in Haiti are the Accessible House for Odeline (opposite) and the Accessible House for Marie (opposite, bottom).





Courtesy Architecture for Humanity Haiti



Renderings: Nick Martin

## spotlight: architecture for humanity

Since the January 2010 earthquake, Architecture for Humanity's (AFH) Haiti outpost has highlighted the importance of education—in two major ways. The San Francisco-based nonprofit and its partners have thrown themselves into rebuilding schools, with one finished, seven more under construction, and five in development. "Our first and primary focus is on getting the schools back and running," says Kate Stohr, who co-founded AFH in 1999 with designer Cameron Sinclair. "Otherwise, parents can't get back to work. Also, schools are the hub of the community."

Additionally, AFH ([www.architectureforhumanity.org](http://www.architectureforhumanity.org)) is providing training in CAD and Revit at its newly completed Rebuilding Center in Port-au-Prince, Haiti. The space serves as a resource for the local design and building communities, as well as the many nonprofits and universities who are working to rebuild the country. And the organization hopes to establish more construction training programs over the year ahead. This emphasis on knowledge exchange is something of a departure from the typical AFH project, but Stohr, Sinclair, and their 10-person staff in Haiti felt it made the most sense for the situation. "There is no enforcement of building codes in Haiti at the moment," says Stohr, who before starting AFH was a journalist and documentary filmmaker. "We're making sure the rebuilding community knows we will help them. It's been a different working environment for us—normally we focus on implementation—but it will save lives in the long run."

Other recent Haiti undertakings include the design of homes for individual families, and a peer-reviewed, illustrated Haiti Rebuilding 101 manual with versions in Creole, English, French, and Spanish. The manual can be downloaded for free from [www.openarchitecturenetwork.org](http://www.openarchitecturenetwork.org). AFH also teamed with Habitat for Humanity in 2010 to analyze the effectiveness and longevity of several emergency housing types in Haiti. Soon Stohr and Sinclair plan to launch Bati Byen, an ambitious public information campaign to help Haitians understand the basic principles behind structurally safe buildings.

The globally active organization also worked in Gaza last year, among other places, creating and distributing a repair manual for damaged structures. And its Karachi, Pakistan-based chapter conducted flood assessments and aid activities in the wake of this past summer's disastrous rainstorms. Though the settings vary, AFH's general approach seems to be remarkably consistent: It connects with other organizations and with locals to try to improve whatever the situation is on the ground. "At the end of the day, the focus is on helping professionals give back in their communities," Stohr says.—*m.d.*

*"Don't get ahead of the community... try to focus on giving support."*

—kate stohr

# THE DANGER OF NOT ASKING WHAT IF?



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# a new order

envisioning a simpler, more sophisticated process for customizable residential design.

The sight of typical tract housing pains architects Matthew Berman, Assoc. AIA, and Andrew Kotchen, Assoc. AIA. “We have every American architect’s frustration at what is going on in this country, visually,” Berman says. He and Kotchen, principals of New York-based firm workshop/apd, are taking action by developing RightFrame, an online home design system intended to give homeowners and builders an alternative to current single-family housing options.

In 2006, Berman and

Kotchen won Global Green’s international competition to design affordable housing in New Orleans. Experienced in high-end, custom residential work, they gained a new understanding of the countless decisions the average homeowner must make while building a house. “The Global Green project was really about aligning good design, green design, and affordability,” Berman explains. Combining the knowledge gained from this project with their subsequent research, the pair created the RightFrame platform.

RightFrame makes the process of buying a new house similar to that of purchasing a car, with pre-edited design options and cost information clearly presented in a user-friendly, online format. Buyers can choose from eight different massing options in a sleek “modern” or more traditional “classic” style. Multiple floor plans exist within each massing selection, and available sizes range from 800 to 3,300 square feet. Three levels of exterior and interior finishes allow for room-by-room cost control.

Currently, RightFrame is still in the beta testing stage. Berman and Kotchen



Renderings: Courtesy workshop/apd



RightFrame’s online users can test multiple options for styles, layouts, and finishes. Above, the same kitchen configuration in two different styles, Modern and Classic (top).

plan to add more pricing and environmental impact information, as well as additional design options. They envision the system as a link between builders and homeowners, and they hope to assemble a lineup of builders to serve as exclusive RightFrame vendors. Says Berman: “We’re giving you the tools to make an informed decision and giving the builder the tools to build the house.” Visit [www.rightframehome.com](http://www.rightframehome.com) for more information on the system.—*meghan drueding*

With a click of the mouse, buyers can see what one of eight standard massing options would look like with various cladding materials and in different styles. For example, one massing option is rendered in Classic style with two separate materials packages (top and above, left) and also in Modern style (above, right).

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# choice cuts

is panelization the future of residential construction?

by nigel f. maynard

**d**espite the construction industry's best efforts, home building remains a wasteful business. According to the Illinois Sustainable Technology Center in Champaign, Ill., the U.S. generates "enough construction and demolition debris each year to fill a typical city street 4 feet tall with trash and run that wall from New York to Los Angeles six times—an estimated 136 million tons annually."

Numerous critics believe the industry has access to a not-so-secret weapon that can help reduce a large portion of such waste: panelized construction.

Panelization is a catch-all term that includes many techniques and systems, but it generally "refers to a construction method where housing components are prefabricated in a climate-controlled facility before being shipped to a home site," says the Panelized Building Systems Council (PBSC), a branch of the Washington, D.C.-based NAHB.

From a resource conservation and labor perspective, panels are exceptional. One study by the PBSC and the Wood Truss Council of America (now

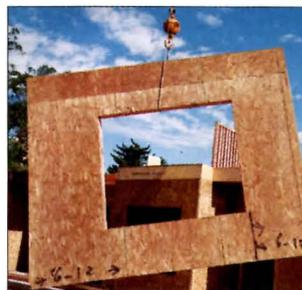
the Structural Building Components Association) found that construction of a 2,600-square-foot home with trusses and panels used 26 percent less lumber, generated 76 percent less waste, and was constructed with 37 percent of the man hours of a similar, stick-built home. But that's just the beginning. Panelization also provides more consistent quality; offers precise construction; results in a stronger house; and reduces construction time.

Most homes are already built with a type of panelized system—factory-made floor and roof trusses. But there has been a renewed call for more panelization to reduce waste, increase construction efficiency, and produce better houses.

Factory-made trusses and joists may be the most common forms of panelized components, but Federal Way, Wash.-based iLevel by Weyerhaeuser took the practice to new heights in 2005 when it introduced NextPhase Site Solutions. "Weyerhaeuser created the iLevel business as a way to work more closely with our customers to simplify home construction," says Brian Greber, vice president of marketing and technology for iLevel. "Services under iLevel NextPhase Site Solu-



Courtesy Premier Building Systems (above) and Weyerhaeuser



Panelized construction systems, such as the structural insulated panels from Premier Building Systems (above) and this wall from Weyerhaeuser's iLevel business (left), allow architects and builders to cut construction time, lower labor costs, and reduce waste. Pricing compared with on-site stick framing, however, depends on many factors.

tions deliver on that promise by enabling dealers to provide builders with more efficient and cost-effective structural framing."

Program manager Bill Parsons says NextPhase offers three levels of services: one streamlines production by offering precut floor materials, reducing waste and cycle time; another uses software to custom fabricate and preassemble entire sections of floor panels; and the third fully incorporates design, manufacturing, delivery, and site assembly for a total integrated structure.

Using NextPhase, architects can build houses faster than with site framing, and also get waste reduction and quality. But manufacturers of SIPs—another

form of panelization—say architects and builders get the same benefits plus an energy-efficient building envelope that is strong and immediately weather tight.

## the rise of sips

Bill Wachtler, executive director of the Gig Harbor, Wash.-based Structural Insulated Panel Association, says rising energy prices and the green movement have made SIPs more popular than ever. Though market share hovers near only 2 percent of total new construction, the category has been holding steady in the recession. "SIPs give architects and builders an easy way to create an airtight building envelope that will

*continued on page 52*

improve the energy efficiency and durability of any home or light commercial building," he says.

Architect Toby Long, AIA, tends to agree. Long often looks to panelized options such as prefab and modular, but he has a weakness for SIPs. "SIPs is a pretty cool building technology from a construction and resource conservation perspective and from a long-term energy-conservation perspective," says Long, principal of Toby Long Design and owner of Clever Homes in San Francisco. He adds that clients "tell us that they have been amazingly satisfied with the performance of the panels."

With SIPs, the building envelope is so tight and the R-value so high "that the house stays at a more constant temperature," Long says. As such, inhabitants are more comfortable, they save money on utilities, and air conditioners run less.

Camille Urban Jobe, AIA, has been a believer in the panels since 2004 when she built her first SIPs house. "I wasn't so familiar with it, but the contractor had used it and liked it a lot," says Jobe, principal of Urban Jobe Architecture in Austin, Texas. She now uses the panelized system whenever the opportunity arises.

SIPs technology also has been endorsed by the people whose job it is to assess the merits of a technology and its relevance to

the construction industry. Oakridge National Laboratories in Oak Ridge, Tenn., for example, has confirmed that SIPs have a higher whole-wall insulation value and R-value than a conventional framed stud wall.

This kind of performance is important to In Site:Architecture in Perry, N.Y. When it was looking at a current LEED project and wanted the best thermal envelope, the firm chose a hybrid system of insulated concrete forms and SIPs. "It had the best R-value for the money," says project architect Dave Matthews, AIA, LEED AP. "The areas where you would typically have heat loss were minimized." He says the firm's considering panelized systems for other projects to see how they might affect construction, labor, insulation value, and energy performance.

### panel upgrades

Most SIPs are made with oriented strand board skins, but manufacturers are branching out with new developments. New Orleans-based Oceansafe, says it has created the next generation of SIPs. "Our panels are made with 26-gauge Galvalume skins, so they are structural but lighter in weight," says vice president Robert Fusco.

Oceansafe's products feature expanded polystyrene cores but are assembled with a "snap-together" system that makes them



Courtesy Premier Building Systems

Modern-style buildings with their angular planes and simple construction lend themselves nicely to panelized systems, manufacturers say.

highly resistant to the traditional destructive forces of nature," the company says. The panels are screwed together at 6 inches on center, and can be wind-rated for 156 to 220 mph winds.

InnoVida Holdings in Miami Beach, Fla., has gone even further with its panelized system. The company's Fiber Composite Panel is a load-bearing insulating foam system whose skins are made from fiber fabrics impregnated with a fire-resistant polymeric epoxy resin. In addition to exterior walls, InnoVida also offers interior walls, beams, columns, profiles, and roofing panels so you could build an entire house with the products.

Panelized systems are easy for architects to incorporate into their work. James Hodgson, general manager for Premier Building Systems in Fife, Wash., says panels allow archi-

itects to push the envelope. "Architects love precision and they love to play with longer spans," he says. "The panels are true and straight and they support heavier loads." In most cases, the panel supplier will translate plans into a buildable format, Fusco says.

But that's not to say panels don't have limitations. Contemporary houses are easier to build, but complex roof lines can be tricky. Also, the cost between on-site framing and panels depend on factors such as labor market, design of the home, and region of the country. Many times, Fusco says, panels cost a bit less but usually on-site framing and panels are about the same price.

Still, Weyerhaeuser's Parsons says panels solve problems and can benefit architects. "Panels have evolved to the point where they can build anything." ra

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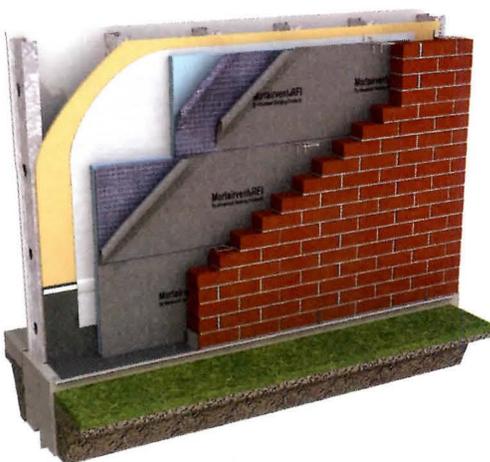


The Interactive Green Community

by nigel f. maynard

### veneer vent

Intended for masonry cavity wall installations with stucco, stone, and brick veneers, Mortairvent RFI is made from the manufacturer's non-woven, mortar deflection fabric adhered to rigid foam insulation panels. The 16-inch-width product—available in several thicknesses—is fitted between the brick ties in full cavity wall applications and allows the space to breathe and stay dry. Advanced Building Products, 800.252.2306; [www.mortairvent.com](http://www.mortairvent.com).



### light fare

This new hybrid bulb from GE combines the instant brightness of halogen technology with the energy efficiency of a compact fluorescent. The manufacturer says the product offers eight times the life of a standard incandescent and is made with low levels of mercury. A halogen capsule inside the product comes on instantly and allows the bulb to operate noticeably brighter in less than half a second. GE Appliances & Lighting, 800.435.4448; [www.gelighting.com](http://www.gelighting.com).

### industrial revolution

Inspired by mid-century gate valves and garden hoses that used to be prevalent in New York City, the Brooklyn Collection represents true industrial chic. Designed by Incorporated NY Architecture & Design, the line is made from solid brass and features ceramic disk cartridges. It's available in a full offering of bath faucets and accessories and 35 finishes. Watermark Designs, 718.257.2800; [www.watermark-designs.com](http://www.watermark-designs.com).



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## flat line

Conoflat is no ordinary shower tray. The product from Ahlen, Germany-based Kaldewei is made from 3.5 millimeter enamel steel and has an extra-shallow design that allows the pan to sit flush with the finished bathroom floor. Designed by Sottsass Associati in Milan, the tray also features a square, enameled cover that furthers the unit's architectural look. It's available in 17 dimensions and three colors. Kaldewei USA, 317.774.3226; [www.kaldewei.com](http://www.kaldewei.com).



## birth of the cool

These environmentally friendly bricks are made with a new manufacturing process that eliminates the need for firing. As a result, they require 85 percent less energy than clay bricks and emit 85 percent less CO<sub>2</sub>, the company claims. In addition, the company uses 40 percent post-industrial recycled flyash material as the binder. The bricks come in eight colors and two sizes. CalStar Products, 877.700.9501; [www.calstarproducts.com](http://www.calstarproducts.com).



## new perspective

ColorTouch is a multifunctional touchscreen thermostat that allows custom background wallpapers, slideshows, and screensavers. Easy to install and program, the unit has five menu items, automatically changes temperature and mode up to four times per day, and allows homeowners to customize faceplates and update software and firmware.

Venstar, 818.812.9930; [www.venstar.com](http://www.venstar.com).

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## Natural Day Lighting in Residential Spaces

George Middleton, AIA, CSI, LEED AP and Lisa Pierce, LEED AP BD + C



When discussing the importance of natural day lighting in residential spaces you must look at what natural day lighting is all about, how it can contribute to energy efficiency and why exposure to natural light is so important to people.

Homes are built to provide comfortable living environments. Any home that can enhance the quality of life for its occupants is inherently more valuable. Architects, contractors, builders and home owners should strive to learn how their design decisions, construction methods and use of the home, respectively, can be more supportive of health, comfort and societal productivity.

Energy is consumed to support the purposes of the home's occupants. It is generally accepted as a "social good" to use energy as efficiently as possible, but not at the expense of the basic purposes of the home. We can design and construct homes with energy systems that can positively impact the quality of life of the occupants. Many design experts agree that the overall benefits of providing natural day lighting in a home are to:

- Minimize the amount of artificial light required in the home
- Reduce electricity consumption and costs
- Reduce HVAC costs (both first, and operating costs) since electrical lighting produces a lot of heat
- Support reduction of the home's footprint and human impact on the environment
- Enhance overall human health and comfort within the home
- Enhance the aesthetics and value of the home

The current state of the economy is pushing homeowners to stretch their operating budgets. At the same time, concerns over climate change and environmental stewardship have made sustainability a high priority for many organizations and families. With these factors in mind, people are looking to implement "environmental" strategies such as recycling, reduced-impact transportation alternatives and building upgrades that will

### LEARNING OBJECTIVES

After reading this article, you should be able to:

- Describe how residential windows and doors impact home energy performance.
- Describe the importance of managing undesirable glare and heat in day lit spaces.
- Be aware of how day lighting can contribute to sustainably designed homes and certification.
- Describe the importance of natural day lighting in residential architectural spaces as it relates to overall human health.



#### CONTINUING EDUCATION

Use the learning objectives to the right to focus your study as you read *Natural Day Lighting in Residential Spaces*.

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allow them to save money and show a positive commitment to the environment.

Day lighting is one environmentally responsible way to save money and make a positive environmental impact. But many home owners only have a limited knowledge of its advantages and how to best implement a comprehensive program. Doing so starts with an understanding of what day lighting is.

### UNDERSTANDING NATURAL DAY LIGHTING

Day lighting is simply the practice of using natural light to illuminate interior spaces. Instead of relying on electric lighting during the day, this method brings indirect natural light into a building. Day lighting reduces the need for electric lighting and may create a healthier and more productive environment because it connects people to the outdoors. While most home owners understand that day

lighting involves natural light, not all understand that an effective day lighting plan can involve some fairly simple design strategies including the use of windows and skylights in the home. Executed correctly, day lighting is one of the most cost-effective ways to reduce artificial light consumption in residential homes; poorly executed day lighting strategies can produce unwanted heat gain and glare. It's best to plan your day lighting strategy during the design phase of any project.

When you're planning a home, you can add a window in every room, as that is the simplest way to incorporate daylight into the home. The number, size and type of window you should specify will depend on the location of the home and the orientation of the home. In the United States, glazing recommendations vary by climate and this will greatly impact your specification. Also consider the balance

between light, heat gain and ventilation, as well as views and aesthetics.

The Efficient Windows Collaborative recommends the following performance characteristics for windows based on geographic location in the country (see figures 1 and 2).

### DON'T MAKE DAY LIGHTING MORE COMPLICATED THAN IT NEEDS TO BE

Whether your design includes only windows or a combination of windows, doors, skylights or even light tubes, in most locations you can follow the same basic design plan: incorporate a long south-facing wall with glazed windows and plan the main living areas in the home along that south facing wall. In the cooler months of the year this will provide ample daylight but can also contribute to beneficial passive solar heat gain. In the summer, over hangs and other shading devices can block hot, direct summer sun, preventing heat gain, while still providing ample daylight into the living space.

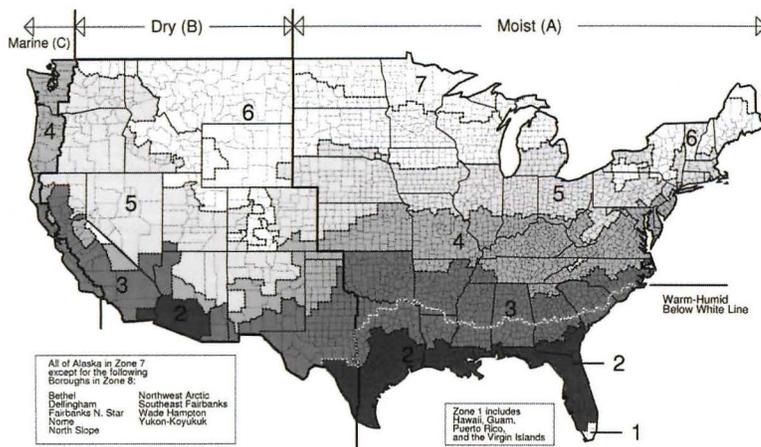
If you have the benefit of working directly with the homeowner during the design phase of your plans, talk to the homeowner and ask where they would prefer the primary living spaces be located along the south wall. Conversely, less-used rooms should be located in the northern half of the home.

FIGURE 1: PRESCRIPTIVE WINDOW REQUIREMENTS IN THE 2009 IECC

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC
1	1.2	0.75	0.30
2	0.65*	0.75	0.30
3	0.50*	0.65	0.30
4-8	0.35	0.60	No Requirement

\*impact rated fenestration has a maximum U-factor of 0.75 in Zone 2 and 0.65 in Zone 3

FIGURE 2: 2009 IECC CLIMATE ZONE MAP



Excerpted from the 2009 IECC Climate Zone Map, 1st Edition, Copyright 2009. Washington, D.C.: International Code Council. Reproduced with permission. All rights reserved. www.ICCSAFE.org

### OVERCOMING GLARE AND HEAT

One important challenge associated with day lighting architectural spaces is controlling glare. Proper orientation of windows and skylights can admit direct and diffused daylight, producing the best combination of light for a building while also reducing glare. Selection and placement of windows and skylights should be determined by the amount of light needed and be based upon climate and the design of the building. One important consideration in this regard is direct sunlight penetration in residential spaces, classrooms and offices often produces unpleasant glare on work surfaces. This may make it difficult to socialize, work or simply view a television or computer screen.

Another important day lighting challenge is controlling the amount of solar

heat that is allowed to enter the home. Sunlight is a powerful energy source to light buildings, but it also produces tremendous amounts of heat. If not planned properly, using natural lighting can result in undesirable heat gain. Window treatments, films and glazing can shade a window or diffuse direct sunlight passing through it, minimizing heat gain. This can reduce overall cooling requirements, thereby eliminating the need for larger cooling systems and resulting in additional energy savings and reduced equipment costs.

Too much light and too much heat are not the only issues associated with day lighting strategies. Some architectural features, such as the home's roof, or it's angles can obstruct daylight, preventing the effective illumination of spaces within the home. To prevent daylight obstruction, wall openings should be strategically placed within the space. For example if elements that can potentially block daylight are located high up in the space, they should be as far from wall openings as possible. In a plan that features both open and enclosed spaces, the open space areas should be close to the wall openings. This maximizes the effect of daylight, reflecting light deeper into the space.

One strategy is to include a row of clerestory windows that will allow diffused light to enter high into the interior space. In combination with a light colored roof, ceiling and walls, clerestories can provide natural overhead light similar to light that would be provided by ceiling-mounted fixtures.

#### HOW WINDOWS AND DOORS CAN IMPACT CLIMATE CHANGE

Since day lighting strategies for buildings almost always involves the installation of glazed window and door assemblies, these building elements are an important aspect of building design. *Any conversation* about building energy efficiency immediately turns to the effect doors and windows have on the outcome of intended energy use strategies.

The facts surrounding energy use and climate change are persuasive and the opportunity to react to this situation using day lighting and well-designed products is enormous. At this point in time eleven U.S. states do not have a building energy



code and only twelve states enforce a current version of the 2006 residential model energy code as it relates to windows and doors. Twenty-three years after commercialization, only 58 percent of residential windows and doors sold in the United States contain energy-efficient low-emissivity (low-e) glass.

Second generation products (sometimes referred to as "low-e squared") are now commonly available in every state. There is already adequate industry production of "low-e squared" windows to handle 100 percent of the nation's window demand. Glass manufactured using this technology contains two layers of silver, which selectively transmit visible light and at the same time reflect solar heat and infrared light, making it efficient in both hot and cold climates.

The cost to incorporate this technology is minimal. Efficient second-generation windows cost about \$15 more per window than clear double-pane windows, on average. Builders experience an additional cost of about \$350 in an average house of 2,500 square feet of floor area and 22 windows for these energy-efficient window products. But with proper engineering, builders would save up to \$1,000 in first-time HVAC costs.

The potential energy savings are huge. Currently, the 58 percent of residential

windows and doors sold with energy-efficient glass are reducing peak energy demand enough to eliminate the need for eight new 200 megawatt coal-fired power plants each year. If the remaining 42 percent of inefficient windows and doors sold each year were required to have second generation low-e glass, peak U.S. energy demand could be reduced sufficiently to eliminate the need to construct six additional new 200 megawatt coal-fired power plants each year. Greenhouse gas emissions (carbon dioxide) from heating and cooling U.S. homes would be reduced by 2.5 million tons each year.

More than 50 percent of all windows manufactured in the United States are installed as remodeling or replacement windows in older homes. If the replacement windows installed are energy-efficient windows, the improved energy performance would lead to actual reductions in U.S. energy consumption. But the future appears even brighter.

The third generation of low-e window and door products (sometimes referred to as "low-e cubed") is now entering the market. These products incorporate a triple layer of silver with still more efficient solar selectivity. If all windows and patio doors in the U.S. were required to use this third generation of low-e products, greenhouse gas emissions from

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heating and cooling U.S. homes would be reduced by 7.0 million tons each year. This would be equivalent to eliminating two new coal-fired power plants per year, or a total elimination of eight new coal-fired power plants per year.

## DAYLIGHT'S IMPACT ON OVERALL HUMAN HEALTH

Daylight has been shown to be vital to many aspects of healthy living. It has a profound effect on stimulation and regulation of the human body. The human eye turns daylight into electrical impulses, triggering the release of the chemical serotonin. Serotonin is essential for emotional well-being. Long known in gray northern climates, a lack of daylight can lead to a condition known as Seasonal Affective Disorder (SAD). Natural day lighting also improves the body's physical health. Ultraviolet light from the sun creates Vitamin D through the skin. Vitamin D produces calcium for healthy bones and teeth.

Beyond these physical benefits, numerous studies have shown positive mental and emotional effects from daylight in classroom settings, workplaces and retail stores. In schools, students tend to perform

better in classrooms that have views and natural light: test scores increase, student and teacher fatigue is reduced and absences are reduced. In workplaces workers are more productive, report less fatigue and fewer sick days are taken. In retail settings, sales can be improved in locations with day light.

So in the home, it's not a far stretch to see that daylight will also be mentally and emotionally beneficial. Daylight does not distort colors the way that artificial lights can, natural light and views create a relaxing mood in a room and people will be more comfortable and happier in their homes.

In addition, recent studies have linked environmental cues, such as lighting, with human performance and health. Light is the major environmental time cue that resets the human circadian pacemaker, an internal clock in the hypothalamus of the brain that controls the timing of many 24-hour rhythms in physiology and behavior. Insufficient or inappropriate light exposure can disrupt these normal "circadian rhythms" which may result in adverse consequences for human performance, health and safety. This relatively new area of investigation is known to researchers as photobiology. Studies

within this field are typically designed to address the problems associated with analysis of building architecture for circadian stimulus potential. They are translated into goals for simulation and ultimately for building design. In particular, a climate-based daylight metric can simulate the probabilistic and temporal potential of daylight for human health needs.

Outcomes of photobiology research are used to define threshold values for illumination in terms of spectrum, intensity, and timing of light at the human eye. Intensity is a standard design tool frequently used in illuminating engineering. Standards have long existed to prescribe levels of illumination using foot candles as the measure. Timing and spectrum are not common considerations, so analysis often proposes tools to quantitatively describe these additional requirements.

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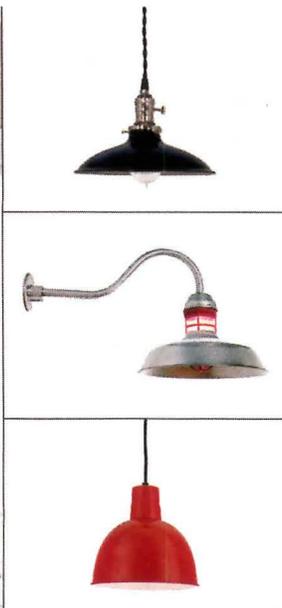
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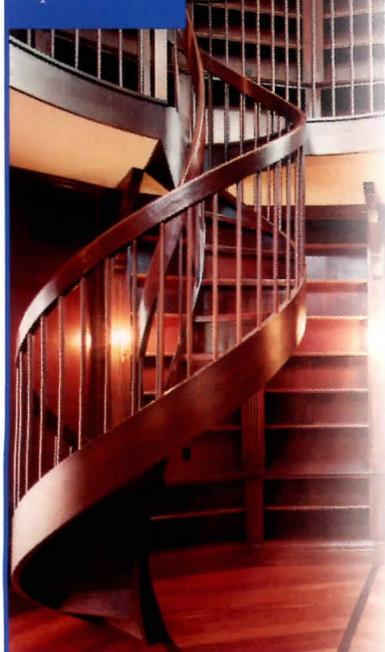


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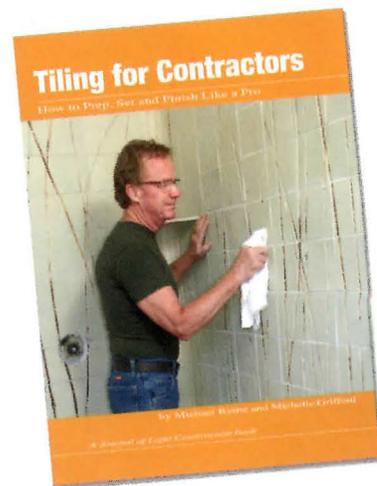
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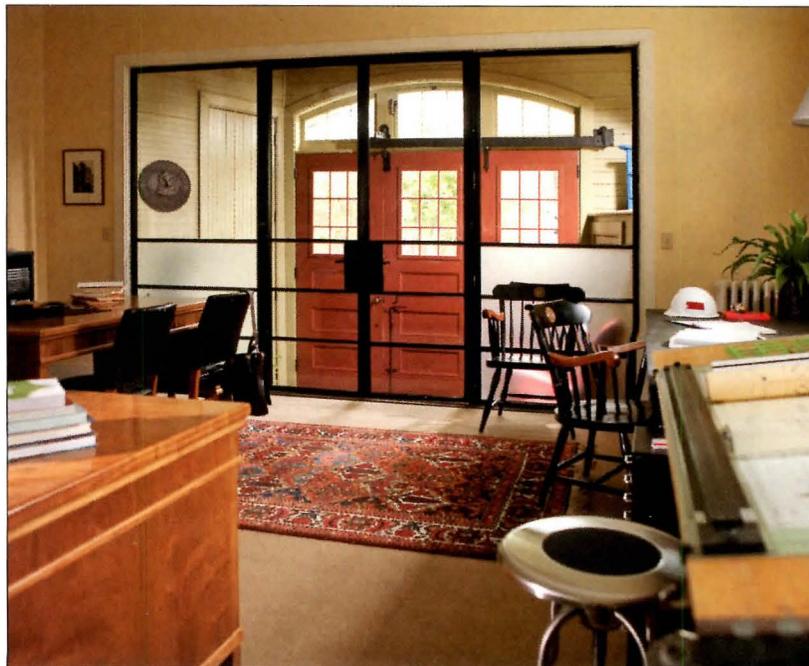
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It's possible that architect Carol De Tine, AIA, works in one of the most architecturally interesting home offices in her neighborhood. Her workplace, which occupies the lower level of a 6,000-square-foot 1854 brick and sandstone carriage house, is a former stable and workshop for building and maintaining lobster traps. But now it gleams with De Tine's interventions.



Elements such as salvaged wood and stone preserve the historic character of the space, but steel and glass doors add a modern touch and create a mini vestibule to the office. "I wanted to create a sense of entry and a sense of separation," De Tine says. She kept the 25-foot-by-18-foot room open and raised the floor 2 feet to gain more light from the high windows, which makes the space feel bright and airy. Other pieces, such as the salvaged slate desk, are a nod to the past. "When you work from home, it's hard to create an image for yourself," De Tine explains, "but it's more important to create one."—*nigel f. maynard*



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