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contents

from the editor...page 11
practice...page 13
What's in BIM for you?

cover story: residential architect
design awards 2008...page 28
by Meghan Drueding, Shelley D. Hutchins, Cheryl Weber, and Nigel F. Maynard

project of the year...page 29
blank studio for Xeros Residence

custom / 3,500 square feet or less...page 32
Grand: Stele Architects; SALMELA ARCHITECT
Merit: Aleks Instanbul Architects; Rockhill and Associates

custom / more than 3,500 square feet...page 38
Grand: Elliott + Associates Architects; Randy Brown Architects; Voorsanger Architects
Merit: Studio Dwell Architects; Turnbull Griffin Haesloop

renovation...page 50
Grand: Brian Pittman, AIA, and McCarty Holsaple McCarty; Fougeron Architecture
Merit: Höweler + Yoon Architecture; Miró Rivera Architects

adaptive reuse...page 60
Grand: Cho Benn Holback + Associates
Merit: Bonstra | Haesling Architects

multifamily...page 64
Grand: Circle West Architects; Office dA and Burt Hill
Merit: The Miller|Hull Partnership and Studio Dwell Architects; Edward M. Baum FAIA, Architect

single-family production / attached...page 72
Grand: Rogers Marvel Architects

single-family production / detached...page 74
Grand: Randy Brown Architects
Merit: Johnsen Schmaling Architects

campus housing...page 78
Grand: Machado and Silvetti Associates + Gould Evans, LLC

affordable...page 80
Grand: Kanner Architects
Merit: Faleide Architects

architectural interiors...page 85
Grand: Minarc
Merit: Desai/Chia Architecture; John Hubert Architects; Rockhill and Associates

bath...page 89
Grand: chadbourne + doss architects

outbuilding...page 91
Merit: Shipley Architects

architectural design detail...page 91
Merit: Hanawalt Architecture & Land Planning

on the boards...page 93
Merit: Visible Research Office; Office em

judges' award...page 104
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the big plume

does this blockbuster awards year signal the last blast of the housing boom?

by s. claire conroy

Our residential architect Design Awards program has grown stronger in quality and quantity every year. We started out nine years ago with a respectable 300 entries, and the number has climbed steadily ever since—until this year, when it made a big leap up. We shot from 886 last year to 1,346 this go-round. I had to extend deliberations by another day for our jury to get through them all. We were swamped by the response.

What happened? I think we just saw the big plume of smoke wafting up from the housing boom. If you consider that most of the entered projects had to be under way at least two years ago—at the very top of the home buying and building frenzy—this explanation makes the most sense. I’m curious to see what our entry total will amount to in the future. How many projects from the flush years are still making it through the pipeline?

We should all savor the winners in this issue because they may represent a vanishing golden age in home design. These last six years especially have seen the perfect confluence of ample budgets and admirable boldness from clients—the prime ingredients for turning a conventional house project into something approaching a work of art. Suddenly, dream jobs were everywhere and everyone was getting them.

Many of those dream jobs passed before our judges this January. Gorgeous project here, gorgeous project there. But as with a surfeit of chocolate, the jurors began to cloy at the predictable perfection of these confections. “Very competent” was a commonly heard quip before a project flew into the discard stack. “Very slick” was another. Really, how many architects wouldn’t love to have their work called “very competent and very slick” by an expert panel? Sounds like a pretty nice house!

Many very nice houses ended up on the cutting room floor, and I’d like to see quite a few of them try another run at future juries when the boom dust settles and real-world rules are back in force. Until then, we have this rare collection assembles for our pleasure. Said one of our judges, “The projects we’ve pushed to the top had a whole level of spirit that didn’t exist in the others.”

And yes, you’ll notice most of the winners are strikingly modern.

We discussed this at length during the judging. There was a consensus among jury members—several of whom design with traditional forms and materials—that the best classical work simply wasn’t entered in the program. Given how strenuous the standards were for the modern work, they argued, they could apply no different scale to the considerably fewer traditional entries.

So how do we achieve a more ecumenical mix of winners for this competition? Some judges suggested we have a separate category for such projects—or an entirely separate competition. I’m reluctant. The point here is to evaluate all residential work together, side by side. And to elevate and acknowledge excellence—no matter what the style.

I was gratified to see modern projects judged extremely rigorously this year—there were no free passes simply for doing them well. I know some very good traditional projects suffered a similar fate. But looking at our list of entrants, I also know our judges were right about this: Some of the best traditional architects are not entering the program.

And if you don’t enter, you can’t win, can you?

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connecting the dots

Building Information Modeling is poised to bundle a fragmented design and construction process.

by Cheryl Weber

It doesn't seem that long ago that computer-aided design was the new catchphrase—a magic bullet that transformed design from untold hours of manual drafting to drawings that morph with the click of a mouse. Now “BIM” has become the new buzzword. Building Information Modeling is an evolving concept, but the National Institute of Building Sciences (NIBS) describes it as a digital representation of both the physical and functional characteristics of a building. Although the technology has been around for a while in one form or another, BIM is hitting the mainstream as its capabilities—along with its ease of manipulation—improve.

Never before has a piece of software allowed architects to design and document a project with a single application, building electronically before they build physically. The simultaneous generation of a 3-D model from plans and elevations enables architects to instantly study their schemes from all angles, thus identifying problems early on and solving them before they become expensive change orders down the road. They can check for mechanical clashes (say, ductwork that conflicts with a structural beam), generate construction schedules, and attach Web-based manufacturer data (such as framing parameters or fire rating) for a wall—either downloaded directly or through embedded links. Accuracy, speed, and economy are improved, since changes to one type of drawing automatically update the others, reducing the chance for errors and waste.

Part of BIM’s sudden appeal, too, is driven by the industry-wide call to sharply reduce the carbon footprint of buildings, which are responsible for almost half of greenhouse gas emissions annually. Many architects are taking up the 2030 Challenge, a global effort to hit targets set for reducing fossil fuel consumption in new buildings (learn more about this in our next issue). What has many people excited is BIM’s potential for uploading early versions of models to energy consultants, who can extrapolate the building envelope’s R- and U-values and estimate what the utility bills might be. As architects tweak a building’s specs, massing, or orientation, they can quickly get a detailed analysis of how those changes affect energy performance.

Thus far, BIM’s market penetration has been fairly small. But some experts believe that’s about to change. “This year we’re turning the corner, in terms of percentages of people moving from kicking the tires to starting to use it,” says Dana K. “Deke” Smith, FAIA, executive director of the buildingSMART alliance at NIBS in Washington, D.C. “We went through multiple areas of the industry, looking continued on page 14

Gary Sawyer
practice

at how many designers, contractors, owners, and operators are using BIM, and came to the conclusion that 2008 is when the big difference is going to start to appear. You can’t go anywhere now and not get some introduction to BIM.”

exploring the possibilities
In its most sophisticated scheme, BIM is not only a design and delivery tool, but one that’s meant to be used by a building’s various stakeholders throughout its life cycle—what’s known as interoperability. A recent PowerPoint presentation by Smith included complex diagrams illustrating the mind-boggling array of data that theoretically can be attached to a single project’s building information model, from geospatial and environmental statistics to legal documents, operational and maintenance issues, and data for use in the building’s eventual renovation, recycling, and disposal.

As such, the payoffs are potentially huge for large institutional and public facilities. But Smith says BIM isn’t just for big, complicated buildings like Frank Gehry, FAIA’s Walt Disney Concert Hall. “The key is that you can go through and test a building, evaluating alternative energy uses and materials,” he explains. “You’re able to predict what it will cost the owner to operate the house.” Over time, “as we do more analysis and estimating, we can continually improve the products, so the reliability and quality of the numbers continues to get better.”

What’s more, BIM packages and preserves information for posterity. When it comes time to remodel, often plans don’t exist for a house; they have to be redrawn before design and approval can commence. “It costs money every time to go through those steps. It’s accepted as the way we do business and those costs are embedded, so people don’t really see that it’s a waste, but it’s non-value-added effort,” Smith says.

continued on page 16
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practice

KieranTimberlake Associates' Loblolly House on Maryland's Chesapeake Bay called attention to the fact that BIM could be used for houses. Designed in 2005, it was the firm's first foray into building information modeling and went on to win a 2007 AIA BIM Award. It also happens to be the weekend residence of partner Stephen Kieran, FAIA, so it provided a flexible schedule and the freedom to push the learning curve on design, fabrication, and procurement. Project architect Marilia Rodrigues and another KieranTimberlake (KTA) colleague enrolled in a class on how to use Autodesk's Revit, adding skills as the project progressed. What they were really testing was how BIM could be used to speedily and accurately deliver an innovative assembly system. Given the sensitive ecosystem and shortage of local labor, the architects created the entire house out of custom-prefabricated components, some of which incorporated preinstalled mechanical and electrical systems. These intricate factory-made boxes were then delivered to the site and connected to each other and an aluminum scaffolding framework with a wrench.

Rodrigues says the computer modeling allowed them to not only understand precisely how the parts would be fabricated but also how they would fit together on site. “Ninety-five percent of the job went together exactly as we pictured it,” she says. “When there was a problem, it was usually because we hadn’t taken the time to model it. On the aluminum frame, for example, which we spent a lot of time modeling to make sure the connections would go together perfectly, assembly was smooth.”

Since then, KTA has used BIM to design more conventional buildings—including two large dormitories and two dining halls for Cornell University—though not to its full potential. “At Cornell, they want our CAD drawings, not our Revit drawings,” Rodrigues says. “It’s a slow-moving movement. We use BIM internally for design...continued on page 18

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- Graham Downes, Architect and Developer
and construction documents, but we're not handing them off to a contractor yet. Our hope,” she adds, “is that things are moving that way, but there are contractual barriers—who owns the model, who owns the problems and errors within it? That was the beauty of Loblolly. We were able to take a lot of risks and test the possibilities. Our conclusion was that there are a lot of possibilities.”

One possibility BIM offers is the chance to improve design by exchanging modeling files quickly and efficiently with experts anywhere in the world. This idea was tested last January in an event called BIMStorm LAX, a 24-hour virtual charrette in which building industry professionals designed some 30 Los Angeles city blocks without leaving their own offices. By uploading 3-D models generated from his ArchiCAD Graphisoft program to a central BIMStorm server, participant Michael Scarmack, AIA, of Lancaster, Ohio, got instant feedback on his multifamily housing scheme from a green roof expert in Boston, a structural engineer in Hawaii, and cost estimators at Pennsylvania State University. “It was exciting to be able to incorporate disciplines I never considered using, like a real estate appraiser and GIS mapping,” Scarmack says. “My first phone call on a project is always to the zoning office, and there were links and uploaded maps available. Imagine a world where we have instant access to that information. A practice like mine may not need all those features—maybe only ones that ensure I get a LEED-certified building, if that’s the goal.”

Rob Glisson, AIA, NCARB, principal of Tampa, Fla.-based rojo Architecture, who also participated in BIMStorm, spent about $1,300 on a VectorWorks package several years ago for his 13-member firm. Although he uses it for basic checks such as mechanical conflicts and interior lighting studies, he says manufacturers, consultants, and contractors have a lot of catching up to do before BIM becomes continued on page 20
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an industry standard. “BIMStorm was a mountain to create,” he says. “You can see it, touch it, make it happen, but it’s a lot of extra work, and there’s not as much material to incorporate as you’d think listening to the marketing machine that goes on behind it. The sooner manufacturers provide 3-D models and attach information to them, the sooner we’ll be able to do the modeling.

“Our position has always been that we don’t want to be on the cutting edge of technology, because it’s so expensive,” he continues. “When the market decides which way it will go, we’ll follow closely.” That sentiment seems to be shared by the roughly 200 respondents to a recent “AIA Work-on-the-Boards Survey.” Only 19 percent of firms with a residential specialty reported using BIM on billable projects, and 44 percent had no plans to acquire the software. Still, nearly half expect BIM to become an industry standard in the next three years.

a matter of education
Smith, who helped write the first national CAD standard, now in its fourth edition, was recently involved in publishing the first national BIM standard for software makers and building material manufacturers that will allow everyone to communicate in a common language and data model. NIBS completed phase one last December, and by June it expects to publish a Specifier Product continued on page 22
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Set outlining the basic pieces of information and terminology needed to compare building products. The organization is also working to ensure that the files are Industry Foundation Class (IFC)-based for seamless exchange among manufacturers, consultants, and construction and facilities managers.

"BIMStorm proved that much of the work could be done through IFC data models," Smith says. "It's not the technology or just vendor training that's holding us back at this point, it's education. Everyone is teaching BIM, but there's no coordination. I'm working with colleges now trying to put together compendiums that teach the concepts behind it, why they're doing it, and what the overall potential is."

For residential firms testing the waters, the struggle—reminiscent of CAD—is getting staff up to speed. Often the choice is between hiring BIM-ready recent graduates with limited knowledge about how buildings go together and hiring experienced architects who will have to learn the technology. David Hertz Architects—Studio of Environmental Architecture in Santa Monica, Calif., specializes in climate-responsive residential and commercial buildings. According to principal David Hertz, FAIA, LEED AP, all 10 of the firm's employees are trained in building information modeling. "I've tended to look for people who have building experience, and BIM becomes part of their education. While we've been successful, it's a more painful investment" than hiring from the young, tech-savvy set, he says. The fact that most of its consultants work only in the 2-D world doesn't stop the firm from using 3-D as a design tool. Early models are uploaded to Green Building Studio, a Web-based company providing energy and carbon analysis; others might be sent to contractors to help them understand a building condition.

In Kansas City, Mo., BNIM Architects is also embracing BIM. It purchased the software seven years ago and since 2005 has been modeling 85 percent of its projects (including condos and single-family homes)—all but those in which it partners with larger firms who aren't using BIM. Early tracking showed that it took a team fully trained in AutoCAD the same amount of time to produce design and construction drawings as beginners using Revit. "Once a team has Revit under its belt, the return on investment is fairly apparent," says associate Eddy Krygiel, AIA, LEED AP. Most of the time savings occurs in the documentation phase, when construction drawings and schedules are spun off from a fully resolved model. "It's changed how we do design," Krygiel explains. "We'll spend more time on schematics, working out spaces and connections. Historically we'd still be redesigning a curtain wall or roof connection in the construction documents phase. We're able to find those issues sooner, when the design is more malleable."

As impressive as BIM's powers are, it has limits, like any technology. Kevin M. Shertz, AIA, the sole proprietor of a three-year-old firm in Chestertown, Md., says one design challenge is judging when to defer to the software versus doing a time-consuming workaround. That's true not only on details but in choosing products—does he pop in the software's default window brand or manually set up specs for another? "It's like the movie The Matrix," Shertz says. "You can bend and break some of the rules, but there are still rules. When are you willing to work with the boundaries of the software, and at what point does design integrity require you to find another way?"

That's a question more and more architects will face if, indeed, BIM is here to stay. Smith, for one, is convinced it is. "I've heard people say BIM constrains your creativity, but then I say, look at what Frank Gehry has done with it," he says. "I'm really confident we're heading in the right direction; things are improving every day."

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### Project of the Year
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<thead>
<tr>
<th>Category</th>
<th>Winner</th>
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<tbody>
<tr>
<td>Single-family production / detached</td>
<td>Randy Brown Architects</td>
<td>Grand</td>
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<tr>
<td></td>
<td>Johnsen Schmaling Architects</td>
<td>Merit</td>
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<tr>
<td>Custom home / 3,500 square feet or less</td>
<td>Salmela Architect</td>
<td>Grand</td>
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<td></td>
<td>Stelle Architects</td>
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<td>Aleks Istanbulbullu Architects</td>
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<td>Rockhill and Associates</td>
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<tr>
<td>Custom home / more than 3,500 square feet</td>
<td>Elliott + Associates Architects</td>
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<td>Randy Brown Architects</td>
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<td>Voorsanger Architects</td>
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<td>Studio Dwell Architects</td>
<td>Merit</td>
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<td>Turnbull Griffin Haesloop</td>
<td>Merit</td>
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<tr>
<td>Renovation</td>
<td>Fougeron Architecture</td>
<td>Grand</td>
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<td>McCarty Holsaple McCarty</td>
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<td>Höweler + Yoon Architecture</td>
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<td>Miro Rivera Architects</td>
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<td>MultiFamily</td>
<td>Circle West Architects</td>
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<td>Office dA and Burt Hill</td>
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<td></td>
<td>Edward M. Baum FAIA, Architect</td>
<td>Merit</td>
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<td></td>
<td>The Millier-Hull Partnership and Studio Dwell Architects</td>
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### Single-family Production / Attached
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<td>Rogers Marvel Architects</td>
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### Affordable Housing
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<tr>
<td>Kanner Architects</td>
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<td>Faleside Architects</td>
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### Adaptive Reuse
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### Campus Housing
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<tr>
<td>Machado and Silvetti</td>
<td>Grand</td>
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<td>Elliott + Associates</td>
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### Architectural Interiors
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<td>Minarc</td>
<td>Grand</td>
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<td>Desai/Chia Architecture</td>
<td>Merit</td>
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<td>John Hubert Architects</td>
<td>Merit</td>
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<td>Rockhill and Associates</td>
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### Outbuilding
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<tr>
<td>Shipley Architects</td>
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### Bath
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### Architectural Design Detail
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<td>Hanawalt Architecture &amp; Land Planning</td>
<td>Merit</td>
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### On the Boards
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<td>Visible Research Office</td>
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### Judges' Award
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<td>John Malick &amp; Associates</td>
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"the global spread of good design starts to show itself first in the house," said a juror for our ninth annual residential architect Design Awards. Judging by our collection of winners this year, our future buildings will not disappoint.

For this competition, we received a staggering 1,300-plus entries. With such numbers, there was much beauty cast aside in the search for something greater. Just 36 projects earned a spot in this final group, making RADA the most competitive residential architecture awards program in the country.

The jury comprised six accomplished architects, including Louise Braverman, FAIA, Louise Braverman, Architect, New York City; Ralph Cunningham, AIA, Cunningham + Quill Architects, Washington, D.C.; Allison Ewing, AIA, LEED AP, Hays + Ewing Design Studio, Charlottesville, Va.; Paul Mankins, FAIA, LEED AP, substance, Des Moines, Iowa; Joeb Moore, AIA, Kaehler/Moore Architects, Greenwich, Conn.; and James G. Thomas, AIA, Thomas and Denzinger Architects, Charleston, S.C. In all, they bestowed one Judges' award, 18 Merit awards, 16 Grand awards, and one Project of the Year.

What distinguished the winners from such an already outstanding collection of competitors? "It was that next level of authenticity," said the jury. "They had freshness and originality that transcended the dogma of architectural language."
residential architect's Project of the Year exhibits a startling originality that elevated it above the rest of the winners. "There's stuff in here I've never seen before," marveled a judge, and the other jurors agreed. "It brilliantly reinvents the everyday," added another. Architect Matthew G. Trzebiatowski, AIA, designed the project as his own house and studio in Phoenix. He reimagined the typical live/work paradigm, sinking a two-level office space into the ground and topping it with a loft for himself and his wife, Lisa, a psychologist. No internal connection between home and studio exists; instead, an exterior stair leads from the residence down into a shaded courtyard. From there you enter the office's mezzanine level, where you descend a coiled steel stairway into the main work area. "There's something very comforting about having that big separation between the live and work space," Trzebiatowski says.

The project's live/work arrangement eliminates a gas-consuming commute—quite an achievement in car-centered Phoenix. But that's just one aspect of a comprehensive sustainable strategy that, according to Trzebiatowski, took precedence during the design process. "The house explores ideas of sustainability first and foremost, with aesthetics not far behind," he says. He and Lisa chose to build in an existing neighborhood with infrastructure already in place, so as not to use up raw land. They dubbed the house "Xeros Residence," after the Greek word for...
"dry," in a tribute to its desert setting. The couple demolished the old 20-foot-square house on the property, which Trzebiatowski admits wasn’t necessarily a green act. "We’re not going to say it’s perfect," he acknowledges. They reused much of the existing foundation and designed just 1,650 square feet of conditioned space for both the home and the studio. And, in a bold move the judges appreciated, they sheathed much of the exterior glass in a steel mesh that cuts heat gain by 50 percent.

The mesh screening exemplifies a level of material ingenuity that amazed the judges. “Just unbelievable,” said one. Walls and ceilings of gypsum plaster are coated with a mixture of beeswax and carnauba wax and then buffed to achieve a textured look and gentle sheen. By planing the OSB that envelops much of the studio space, Trzebiatowski turned it into a richly mottled design element. He covered the upstairs floors in plywood concrete forms with a thermal-resin surface. And the dramatic steel office stair was custom-fabricated at a shop that makes industrial storage tanks—and then corkscrewed through the only opening on the entire house that could accommodate its 4½-foot diameter.

Trzebiatowski also deployed color in a sophisticated, almost radical way, interspersing green- and blue-tinted glass, blue and red fluorescent cove lighting, and a bright red shower stall into the project’s otherwise earthy palette. “This could be a cartoon, but it’s not—it’s beautifully executed,” said one judge. “It takes the desert site and the neon of Las Vegas and marries them in a really poetic way.”—m.d.
Even in spots without the sun-shading mesh, the residence's glazing and overhangs work to frame mountain views but shun direct midday rays. The master lav is defined by a blue pop-out (below). A splash of tomato red brightens a shower on the mezzanine level (opposite, far left). And a sumptuously curving stairway serves as the studio's grand flourish (opposite, middle).
red Stelle, AIA, has boldly done what few architects dare to do—he's designed a house that plays second fiddle to its Long Island, N.Y., waterfront site. A lovely duet ensues.

The jury unanimously praised Stelle for creating experiential architecture that directs attention to the untamed splendor of its setting. Seeking to capture views to the north and crucial natural light to the south, Stelle created a 90-foot-long glass box. The building's core, where the kitchen lies, opens up, transforming it and two adjacent decks into an outdoor room.

The house “responds to codes and does so remarkably,” said the judges, by engaging the landscape at every level—from beneath the house with a protected terrace to above it with an elevated, disappearing-edge pool that slices into the sea-meets-sky horizon. And before they even reach such pleasures, guests must get out of their cars at a distance and follow a boardwalk (anchored with steel rods to withstand regular flooding) to the house. “In these waterfront sites, it's not only about trying to intervene as little as possible, but also about capturing the spirit of the place,” says Stelle, a veteran of building on Long Island. “The house really does understand indoor-outdoor spaces,” said one judge, and “engages the landscape through both time and space.”—s.d.h.

principal in charge: Frederick Stelle, AIA, Stelle Architects; project designers: Michael Lomont and Greg Tietjen, Stelle Architects; general contractor: Richard Shumway, Atlantic Collaborative Construction Co., Bridgehampton; landscape designer: Michael Blake, UBH, Sag Harbor, N.Y.; project size: 2,600 square feet; site size: 5.12 acres; construction cost: $750 per square foot; photography: Jeff Healey. Please visit www.residentialarchitect.com for product information.
Fred Stelle wanted to capture the magic of being down in the dunes, so he created a terrace (left and below) where the boardwalk passes beneath the house.
custom / 3,500 square feet or less grand
the streeter house, deephaven, minn.
salmela architect
duluth, minn.

The design of this house nestled between pond and marsh is all about controlling views. The site looks remote, but the hitherto “unbuildable” lot is actually wedged into a cluster of homes ringing a communal pond. A dark plinth, made from custom-fabricated oversized concrete blocks, anchors two ethereal white boxes to the ground. Despite the apparent heft of the structure, says David Salmela, FAIA, what he's designed is essentially a glass house.

There are windows everywhere, he explains, worked in around the concrete block and glulam columns. And they’re strategic—glazed end pieces use vertical wood slats to subtly obscure views. Where necessary, the view is blocked entirely—Galvalume-clad walls on the building’s long axis provide privacy from a too-close neighbor. Our judges praised this dance of solid and void for its “halting, mysterious quality. It’s not about the tectonics, it's about the Scandinavian aura of light.”

The architecture may be bold, but Salmela wanted the structure to rest humbly on its verdant site. Only one tree was sacrificed, despite a footprint that spans setbacks from edge to edge. Eco-conscious materials—concrete block with flyash, SIPs, reclaimed cypress, and insulated glass—create a simple kit of parts elegantly assembled. Inside, golden-hued wood floors and trim imbue the minimalist space with welcoming warmth.

Salmela credits Minnesota’s Scandinavian roots for the ready acceptance of contemporary designs such as his. “Architecture should have a purity and cleanliness to it, but it doesn’t need to be cool,” he says.—s.d.h.
"In a way, it's a horizontal tower house—you rise above the site and experience the ephemeral quality of being above the trees," said one judge. "It finds and draws out diversity in the landscape."
So many projects are serious, and this one is fun,” enthused a judge. He was referring to the strangely clad cube that rises up on the edge of a wide canyon. Its swaying, variegated green stripes evoke the movement of canyon grasses while also making a playful statement about sustainability.

The jury appreciated the subversive humor. “It merges with the site, and then it doesn’t,” said one member. “I like the blasphemous quality of it, setting up a dialogue between the natural and the artificial.”

One of the owners, a graphic artist, spent weeks custom-mixing the paint palette to match leaves that Aleks Istanbullu, AIA, had stripped from a nearby tree. “I had to convince them to do this odd color pattern, but she made it come home,” he says. “We had an owner who cared about what she ended up with and a builder who was meticulous.”—c.w.

principal in charge:
Aleks Istanbullu, AIA,
Aleks Istanbullu Architects;
project architect: John Heglin, AIA, Aleks Istanbullu Architects;
project manager: Sanjiv Bajaj,
Aleks Istanbullu Architects;
general contractor:
Tom Hinerfeld, Hinerfeld-Ward, Los Angeles;
project size: 855 square feet; site size: 1.1 acres;
construction cost:
$675 per square foot;
his retirement house in rural Arkansas is unlike anything you’ll see in Florida or Arizona, but for the homeowners it makes perfect sense. “They had a strong appreciation for what we do,” says principal in charge Dan Rockhill, “and felt they could live with something different.”

Faced with a limited budget, Rockhill and project architect David Sain used off-site steel prefabrication as much as possible and filled in with site work. The clients, who are avid bird watchers, wanted to live in the trees, so the house rests on thin steel pilings and features large glass panels to bring the outside in. The glass faces east, but because it’s placed high in the trees, solar heat gain is not an issue, Rockhill says.

To meet budget, the design keeps the material palette straightforward. A woodburning stove provides warmth when necessary, and ceiling fans temper summer heat. Siding from locally grown oak is installed as a rainscreen, and corrugated metal roofs protect the outside. Said one judge appreciatively, “The structure is refined in an un-self-conscious way.”—n.f.m.

principal in charge / general contractor: Dan Rockhill, Rockhill and Associates; project architect: David Sain, Rockhill and Associates; project size: 1,280 square feet; site size: 8 acres; construction cost: Withheld; photography: Aaron Dougherty. Please visit www.residentialarchitect.com for product information.
custom / more than 3,500 square feet
grand
222 residence, oklahoma
elliott + associates architects
oklahoma city

asked to design a home around a client’s art collection, Elliott + Associates Architects also made the outdoors a dominant and ever-changing part of the installation. The team accomplished it with a long, linear house that seems to push up from the ground. Its mild steel skin was sprayed with salt water during construction so it would corrode in a uniform way, blending with the land’s deep-red soil. “I love the way it reaches out into the landscape. It looks like a home even though it has museum-quality art, and that’s a fine line,” said one judge.

Rand Elliott, FAIA, agrees the challenge was to make the house feel domestic and comfortable but also showcase the art. “Scale was really important—determining the correct proportion of the room to accept the art,” he says. The plan consists of a series of spaces that expand and contract as one moves through, framing the art and the landscape. One of the house’s covered indentations holds a surprise garden made from ground recycled glass. “Critters rearrange it, and then it gets raked and piled up,” he explains.

The judges appreciated that the house was not about bravado, but about texture and connection to the land.—c.w.

principal in charge: Rand Elliott, FAIA, Elliott + Associates Architects; project architect: Mihos Kolliopoulos, AIA, Elliott + Associates Architects; general contractor: Stan Lingo, Lingo Construction Services, Yukon, Okla.; landscape architect / interior designer: Elliott + Associates Architects; project size: 4,308 square feet (including 840-square-foot garage); site size: 5 acres; construction cost: Withheld; photography: Shimer @ Hedrick Blessing. Please visit www.residentialarchitect.com for product information.
When Randy Brown, FAIA, bought a 10-acre property and old house in the farm country of Omaha, Neb., he intended it to be a laboratory for experiments in how to design something so connected to the land that it looks both natural and manmade, and in how to create defined spaces open to the larger whole. The additions were built in phases and by hand—his own and those of his students', who for the last four summers have come from universities across the Midwest to work with Brown.

Those ideas took shape as canted walls, a polycarbonate catwalk, mezzanines, and stairs that seem to fly. "We did have a basic set of construction drawings to get permits, but as soon as we started building, we pretty much threw the plans out," Brown says. The material palette—hot-rolled rusted steel, concrete floors, and thousands of 1x2 poplar slats from The Home Depot—ties the project to the neighboring barns and abandoned farm implements. Also included are green roofs, high-efficiency heat pumps, and plumbing and wiring for future solar panels and a geothermal system.

One judge likened the multifaceted project to a Rubik's Cube: "They took all these cubes—architecture, landscape, sustainability—and aligned them perfectly. Its integration into the landscape is brilliant."—c.w.

principal in charge / project architect / general contractor: Randy Brown, FAIA, Randy Brown Architects; project designer: Dirk Henke, New York City; project size: 5,100 square feet; site size: 10 acres; construction cost: $97 per square foot; photography: Assassi®2008. Please visit www.residentialarchitect.com for product information.
During the improvisational design and construction process, the lofty entertaining pod (above and opposite) became known as the Big Tube. Canted poplar slats define a first-floor corridor (right). At the entryway, a perforated-metal staircase preserves openness and light (opposite, far left). Most of the roofs are planted with native grasses.
custom / more than 3,500 square feet
grand
wildcat ridge residence, snowmass, colo.
voorsanger architects
new york city

Bartholomew Voorsanger, FAIA, says this 200-acre site in Snowmass, Colo., is "easily one of the most spectacular I've worked on." So he felt considerable pressure to do it justice. Our judges agreed that he did. "You move through the spaces and the landscape, and the building unfolds over time and space," said one.

Designed to accommodate a large family, the house is 200 feet long on its north/south axis, with public spaces oriented to the west and private rooms to the east. Separating those public spaces is a massive stone wall, using pieces as large as 3 feet by 5 feet. With ceilings as high as 24 feet in some areas, the wall anchors the interiors and contributes a sense of scale. Voorsanger arranged the spaces to ensure privacy and spaced plenty of wood for warmth. "It was important to make it feel like a house and not a hotel," he explains.

Abundant glass walls frame views of the nearby mountain range. But the windows’ energy demand is answered by 60 geothermal wells, which provide 100 percent cooling and 95 percent heating for the home. The whole structure is topped by a copper-clad folded-plate roof that echoes the forms of the mountain range in the distance. Said a judge: "This architect really understood the power of the mountains."—n.f.m.

The copper roof is a mere 6 inches thick, but its folded-plate design allows long spans and eliminates the need for columns (below). Black walnut and travertine dominate the interior, as does a moss-rock wall that bisects the home. Generous glazing preserves views of the surrounding mountains.
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custom / more than 3,500 square feet
merit
2041 w. cortland, chicago
studio dwell architects
chicago

This Chicago custom home wowed the judges with its strong sense of place and its sensitive relationship to the urban streetscape. "It really seems like Chicago to me," said one. Architect Mark Peters, AIA, recessed much of the three-story house's top level to help it blend in with the surrounding buildings. "It was important to us to maintain the scale and proportion of the neighborhood," he says.

Peters clustered private spaces in the project's masonry portion, while public rooms occupy an adjoining cedar-and-glass cube. "We tried to create the transparent cube so the house would be more inviting to the street," he explains. "You're able to see through the building to the back and see how the materials wrap around it." The white ground-face masonry blocks cladding the private wing, for example, also cover the double-height living room wall. And the cedar cladding continues inside on the second-floor ceilings, then outside again to form a backyard canopy.—m.d.

principal in charge / project architect: Mark Peters, AIA, Studio Dwell Architects; general contractor: Owners, Chicago; project size: 6,500 square feet; site size: 0.1 acre; construction cost: Withheld; photography: Marty Peters. Please visit www.residentialarchitect.com for product information.
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Circle no. 303
The clients' memories of their Catskills cabin inspired the design of this summer compound. Eric Haesloop, AIA, and Mary Griffin, FAIA, took their idea several steps further, reinventing the log cabin vernacular with a main house and guest cabins that evoke a summer camp. "You wouldn't just put up a cabin in the middle of Carmel Valley," Haesloop says. "But we wanted to capture the qualities of those camps—their walkways, porches, and indoor-outdoor connections."

The main structure—made of sprayed earth from the site, recycled cedar siding, and certified lumber—is linked to the hillside cabins with an exterior arcade. "As you move up the steps, the walkway frames the oaks and connects your experience of being there to the larger landscape," Griffin explains. "This is well-done regionalism, beautifully rooted in the site," a judge said. "The way it steps down the hill is amazing. Really, really moving."—c.w.

**principals in charge:** Eric Haesloop, AIA, and Mary Griffin, FAIA, Turnbull Griffin Haesloop; **project architect:** Stefan Hastrep, AIA, Turnbull Griffin Haesloop; **general contractor:** Brian Groza, Groza Construction, Monterey, Calif.; **project size:** 4,399 square feet; **site size:** 3.52 acres; **construction cost:** Withheld; **photography:** Matthew Millman. Please visit [www.residentialarchitect.com](http://www.residentialarchitect.com) for product information.

Sited to take advantage of the transition from open to wooded landscape, the main house/dining hall (above) overlooks ranches in the valley below; in back, a log arcade connects it to the cabins in the woods. The durable zinc roof satisfies the local requirement for a nonreflective material, and thick pisé walls, ceiling fans, and operable windows supply natural air conditioning.
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The Sound of LiVing.
Those lucky enough to possess a vacation residence often become emotionally attached to it. But for Paul and Jeannine Weeks, who own this 1950s A-frame on a Tennessee lake, the connection goes even further: Paul’s late father, architect Felder Weeks, designed the original house for himself and his family. Growing up, Paul and his siblings spent every summer sheltered under the building’s massive wooden beams. So when he and his wife decided to renovate and live in the house full time, they weren’t looking for drastic design changes. “They just wanted to honor his dad’s work and this house that the family cherishes like a diamond,” says architect Brian Pittman, AIA.

The couple initially brought the project to Bruce McCarty, FAIA, founding principal of McCarty Holsaple McCarty in Knoxville, Tenn. He passed the job to Pittman, an architect at the firm, who designed the remodel on his own time with McCarty acting as an adviser. Pittman shared the clients’ love of the home’s artful simplicity, drawing all the renovation plans by hand out of respect for the original. After gutting most of the house, he updated the kitchen and baths, added a laundry room and mudroom, and created a guesthouse connected to the main residence by a breezeway. He also removed a more recent greenhouse addition, using that square footage to enlarge the living room. Throughout the project he replaced old materials and systems with more refined ones, never deviating from the spirit of the place.

“Buildings of this era are really hard to bring back,” said a judge. “They did it beautifully.” — m.d.

principal in charge: Bruce McCarty, FAIA, McCarty Holsaple McCarty; project architect: Brian Pittman, AIA, McCarty Holsaple McCarty; general contractor: Gerald Jenkins, Gerald Jenkins Construction, Knoxville; lighting designer: Michelle Clodfelter, Lighting Trends, Knoxville; project size: 3,200 square feet; site size: 1 acre; construction cost: Withheld; photography: Robert Batey Photography, except where noted. (Note: Presentation drawings were unavailable at press time.) Please visit www.residentialarchitect.com for product information.
The original A-frame house (opposite, far left, shown after preparation for renovation) was designed by Felder Weeks and much loved by its owners. Architect Brian Pittman ushered it into the 21st century with a sure and gentle hand. His remodel included a skillful interior make-over; a new guesthouse attached to the main house by a breezeway (opposite, bottom); and cleaned-up and redefined outdoor rooms. The former summer residence now serves as a comfortable home for year-round living.
faced with a square concrete warehouse and only one wall of north-facing windows, Anne Fougeron, AIA, worked magic by adding a grasshopperlike penthouse bedroom that alights on the building’s surface, opening the entire loft to the sun. “We wanted something in keeping with the kind of architecture you see on the roofs of buildings in these slightly eccentric shapes, pitched for stairs or mechanical space,” Fougeron explains. The judges raved about the resulting “intangible quality of light and air and livability.” The penthouse “captures what it means to be near the sky,” said one.

Fougeron interwove layers of light and space, starting on the commercial ground floor, where a private lobby opens onto a sculptural steel staircase. Without walls to attach to, the treads cantilever off a main stringer that floats up three stories. The second-floor living areas benefit from skylights and an airy courtyard cut from the steel plate. But the pièce de résistance is the diaphanous master suite, where a bent window at the top of the stairs scoops light deep into the living areas below.

“The project shows its own acts of construction without being overly obsessive about it,” one judge observed. “When I look at these photos, all I see is space.”—c.w.

principal in charge: Anne Fougeron, AIA, Fougeron Architecture; project designer: Todd Aranaz, Fougeron Architecture; general contractor: Bill Johnstone, Johnstone McAuliffe Construction, Pacifica, Calif.; project size: 4,800 square feet; site size: 0.1 acre; construction cost: Withheld; photography: Richard Barnes.

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A floating staircase, with triangulated treads for strength, rises from the ground-floor office to a transparent penthouse and deck (opposite, bottom). On the main living level, 8-foot-tall cabinetry in the kitchen, baths, and storage areas become the lofty interior. Fougeron adapted the warehouse with sustainability in mind too. The kitchen’s sliding glass doors open to an interior courtyard that supplies fresh air (below and opposite, top), and radiant heat in the concrete floors, abundant daylighting, and dimmable fixtures help to reduce energy loads.
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Circle no. 277
The opportunity to purchase side-by-side apartments on the top floor of a Chinatown building allowed these clients to build the light-filled loft they really wanted. Although a structural partition between the two units had to stay, Höweler + Yoon Architecture made abstract interjections that open the core to the elements.

Large skylights illuminate a bathtub and a shower, translucent room dividers disperse the natural light, and a clever interior courtyard invites the owners and their two children outside for morning coffee, moonlight conversation, or water fights. The 8-foot-by-8-foot courtyard is lined in red South American mahogany slats that slip inside on the adjacent kitchen wall. Opposite sets of sliding glass doors create an open-air thoroughfare. “At one point it’s a cube, at another point it’s a corridor,” says Eric Höweler, AIA.

One judge cited the courtyard as “a fabulous example of how an economic insertion reprograms the whole space. It’s exquisitely detailed and achieves a level of poetry.”—c.w.

Principals in charge: Eric Höweler, AIA, and J. Meejin Yoon, Höweler + Yoon Architecture; project designer: Carl Solander, Höweler + Yoon Architecture; general contractor: John Benjamin, Benjamin Construction, Boston; project size: 2,200 square feet; construction cost: $200 per square foot; photography: Courtesy Höweler + Yoon Architecture. Please visit www.residentialarchitect.com for product information.

A circuit of lithe, airy living spaces wraps the edges of the newly combined apartments. Natural light permeates a skylighted shower with etched-glass walls (top and above, left). The south-facing, open-air cube can be used as a private courtyard or a corridor between the kitchen and family room.
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Circle no. 256
A recent renovation of this 1980s house only highlighted its remaining architectural flaws. For phase two, the owners envisioned a bolder entryway, a larger living room, and a better connection to the backyard pool. “There was no hierarchy of space relating to the lot and the size of the house,” says Miguel Rivera, AIA. While changing the roofline was out of the question, the architects borrowed interior volume for the living room from a covered second-story deck and part of the second floor, adding clerestories and a wall of sliding glass doors. A travertine terrace steps down to the pool under a light-filtering aluminum trellis, banishing the deck and guardrail and opening the house to hill-country views. In front, an elegant vestibule replaces the wedge-shaped dining room. The front door is clad in thin copper pipe, which foreshadows the fireplace's new floor-to-ceiling copper panels.

The project’s design and exquisite detailing pleased the jury. “I love the way they opened up that wedge,” said one judge.—C.W.

**principals in charge:** Juan Miró, AIA, and Miguel Rivera, AIA, Miró Rivera Architects; **project designers:** Ken Jones and Mary Elizabeth Liggio, Miró Rivera Architects; **general contractor:** Peter Sproul, Four Corners Construction, West Lake Hills, Texas; **project size:** 2,041 square feet (renovation only); **site size:** 2.3 acres; **construction cost:** Withheld; **photography:** Paul Finkel/Piston Design. Please visit [www.residentialarchitect.com](http://www.residentialarchitect.com) for product information.
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So many urban loft conversions all but obliterate the building's sense of history. This one celebrates it as a ruin, rough edges and all. Built circa 1890, this part of the historic mill complex had been slowly disintegrating when a fire burned the roof off, leaving only a masonry-and-steel shell. In an effort that David Benn, AIA, likens to putting a ship in a bottle, the design team inserted a ground-level concrete plinth that houses office space. Above are two floors of two-level loft units that align with the existing double-height arched windows. Light filters into the commercial core through pyramid skylights cut into a second-story open-air courtyard. Lit at night, they glow upward like jewels.

The architects opened another three-story light well that exposes a basement-level stream. "We cut an opening into the stream, so theoretically you could be sending a fishing line down," Benn explains, "but it looks more like the sewers of Paris, with a cobbled bottom." To make living there even more fun, a hike-and-bike greenway also runs through the renovated building.

The jury applauded the firm for preserving a sense of the original shell. "These buildings are being demolished so fast, and to keep this is great," said one judge.—c.w.

**principal in charge:** David Benn, AIA, Cho Benn Holback + Associates; **project architects:** Davin Hong and Robert Lyon, Cho Benn Holback + Associates; **developer / general contractor:** Tim Pula, Struever Bros. Eccles & Rouse, Baltimore; **project size:** 62,794 square feet; **site size:** 17 acres; **construction cost:** $125 per square foot; **rental price:** $1,240 to $2,040 per unit per month; **units in project:** 36; **photography:** Patrick Ross Photography, except where noted. Please visit [www.residentialarchitect.com](http://www.residentialarchitect.com) for product information.
The architects used as much of the ruined building as they could.
Large arched windows dictated double-height apartments (top,
right), which are tucked into the steel trusses of the old mill (left).
Wall remnants and flat roofs within the complex defined areas
for multitered courtyards (above, right). Corrugated metal, bright
colors, and the old crane—now fixed in place—preserve the
industrial flavor (opposite).
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It seems every city these days has defunct brick factories that have been modified for residential use. However, this former laundry plant is rare in the nation’s capital, as were adaptive reuse projects in its Petworth neighborhood. Bonstra | Haresign’s subtle redesign perked up a cheerless façade and set a precedent that other developers have since followed.

The design team zeroed in on the building’s 1950s-era eyebrows, grafting on balconies and glassy bays in a playful zigzagging rhythm. Explains William Bonstra, AIA, LEED AP: “The owner’s program was to increase the outside space as much as possible. On the sides, we cut balconies into the building because we couldn’t project them.”

The judges praised the design’s spareness and nonaggressive, “gentle pulsation.” Said one: “It reminds me of these modernist Soviet-style buildings in Mexico City that artists are painting. The juxtaposition between mechanical and materialistic is provocative.”

principal in charge: William J. Bonstra, AIA, LEED AP, Bonstra | Haresign Architects; project designer: Julian Piperov, Bonstra | Haresign Architects; developer: Adrian G. Washington, Neighborhood Development Co., Washington, D.C.; general contractor: Juan H. Powell, NDC Builders, Washington, D.C.; interior designer: Brian Forehand, Bonstra | Haresign Architects; project size: 50,849 square feet; site size: 0.26 acre; construction cost: $175 per square foot; sales price: $250,000 to $900,000 per unit; units in project: 38; photography: Boris Feldblyum, except where noted. Please visit www.residentialarchitect.com for product information.

Alternating bays animate the formerly utilitarian façade. The architects cut through a 12-inch-thick floor slab to add a mechanical penthouse and communal terrace on top (left). In addition, spiral stairs lead from each top-floor unit to a private deck and hot tub.
These townhouses contribute vibrancy to a mixed neighborhood of light-industrial structures and multifamily residential buildings of the clay tile-and-stucco variety. Our judges praised the project's "remarkable color" and "beautiful elevations"; one noted it "has multiple layers from the curb to the door."

Wedged between a parking lot and other residential buildings, the lot measures an ungainly 83 feet by 300 feet. But Circle West Architects used the idiosyncratic shape to advantage, rotating the units and locating the parking circulation to the east and the pedestrian area to the west. "We wanted to create privacy and security, but we also wanted to embrace community, so we were able to create a strong pedestrian element," says Peter M. Koliopoulos, AIA. Owners enter their units through a landscaped courtyard and walk into a ground-floor flex space.

Koliopoulos and project designer Sean Mortenson specified large glass openings for transparency, and they used red-painted metal fences and yellow metal siding to present a friendly face to the neighbors. "The idea is that you would have a vibrant identity day or night," Koliopoulos says.

The units, which measure 16 feet wide and 36 feet deep, feature modest interiors with water-conserving fixtures, low-VOC paints, and a shading element along the west-facing windows. "It's a great achievement for the cost per square foot," said one judge.—n.f.m.

principal in charge: Peter M. Koliopoulos, AIA, Circle West Architects; project designer: Sean Mortenson, Circle West Architects; developer: Nicole Roberts, Context Development, Victoria, British Columbia; general contractor: Andy Byrnes, The Construction Zone, Phoenix; landscape architect: Michael Dollin, ASLA, Urban Earth Design, Phoenix; project size: 1,334 square feet per unit; site size: 0.59 acre; construction cost: $115 per square foot; sales price: $379,000 per unit; units in project: 8; photography: www.jesserieser.com.

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To hear Office dA’s Nader Tehrani tell it, it’s a small miracle that the Macallen condo building in Boston’s South End became a reality. “It was built under the most difficult circumstances,” says Tehrani, whose firm acted as design architect on the project. “Everyone was against the building,” and consequently, it needed approval from the mayor’s office down to neighborhood groups—and many others in between.

Office dA and firm of record Burt Hill assuaged fears with a building that’s sensitive to its site and its context. With a highway and Boston’s skyline to the west, the 144-unit building soars to its maximum allowable height limit, but it gradually descends in scale to meet the quiet residential street on the east side. Bronze and aluminum panels on the north side reference the neighborhood’s industrial heritage, while house-friendly brick fronts the east elevation.

Seeking LEED Gold certification, the design team included strong sustainable components, such as a sloped green roof, recycled-content insulation, low-VOC products, and rapidly renewable materials. In addition to a variety of unit types, including live/work options, the building has underground parking for 274 cars, a hybrid community car, ground-floor retail, and other amenities that support urban living.

The judges overwhelmingly approved, with one calling the project “an unbelievable achievement for this building type.”—n.f.m.
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Circle no. 388
designed by The MillerHull Partnership, with Studio Dwell serving as local architect, this project references Chicago’s much-admired early modern steel buildings. One judge called the result “balanced” and “well-ordered.”

The client wanted a contemporary aesthetic with raw forms, so “the challenge was how the project could [coexist] with adjacent brick and stone buildings,” says MillerHull principal David Miller, FAIA. The firm used a concrete base and erected a steel-frame structural bay enclosed in glass, with cantilevered balconies for each unit. Expressed as a cross-brace, the framing and balconies help the building appear taller than its 120-foot height, holding its own among the steeper structures nearby.

Units span the entire width of the building and feature 10½-foot ceilings and polished concrete floors. “It’s a pretty smart parti that results in magnificent spaces,” said a judge. “It fits beautifully into the urban context.”—n.f.m.

principal in charge: David Miller, FAIA, The MillerHull Partnership; project architect: Brian Court, AIA, The MillerHull Partnership; project manager: Kurt Stolle, AIA, The MillerHull Partnership; local architect: Mark Peters, AIA, Studio Dwell Architects; developer: Bob Ranquist, Ranquist Development, Chicago; general contractor: Mark Skender, Skender Construction, Palos Hills, Ill.; project size: 900 square feet to 2,750 square feet per unit; site size: 0.1 acre; construction cost: $260 per square foot; sales price: $340,000 to $1.7 million per unit; number of units: 11; photography: Nic Lehoux. Please visit www.residentialarchitect.com for product information.
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Circle no. 365
Edward M. Baum, FAIA, says the design for this prototype duplex housing is a creative solution to the 50-foot-by-150-foot infill sites common in Dallas, and he's optimistic it can be adapted to other cities. Instead of a conventional single-family house or a low-rise multifamily building, "these smaller homes fit more gracefully on a site," he says.

The linear-shaped, two-bedroom units are aimed at smaller households or live/work arrangements, without sacrificing the precious amenities of a single-family house. Owners use garage doors to enter their units, passing through inviting crushed-rock courtyards. "This really does reconsider how you enter the house," said one judge. "And it's handled in a beautiful and pragmatic way. When you open the door, it's a fantastic experience."

Inside, the main public space consists of a combination kitchen/living/dining room; a narrow gallery leads to the private rooms and additional outdoor spaces. Baum designed the homes for affordable construction using typical lumberyard materials, such as painted 2x12 rafters, waxed concrete floors, and drywall. Even the roof—tapered rigid foam insulation installed on the outside—is a typical commercial spec. "The only custom products are the windows," Baum says. Our judges admired the project's modesty and praised its "elegant, simple moves."—n.f.m.

principal in charge / project architect: Edward M. Baum, FAIA, Edward M. Baum FAIA, Architect; developer: Diane Cheatham, Urban Edge Developers, Dallas; general contractor: Diane Cheatham, CCM Group, Dallas; project size: 1,660 square feet per unit; site size: 0.34 acre; construction cost: $101 per square foot; sales price: $275,000 to $290,000 per unit; units in project: 4; photography: Hester + Hardaway.

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architects Robert Rogers, FAIA, and Jonathan Marvel, AIA, set an ambitious goal when designing this 14-unit townhouse project in Brooklyn, N.Y. “What we wanted to achieve was a row of individual single-family houses that had the character of brownstone Brooklyn and were also interesting on their own as a unit,” says Rogers. Given the iconic nature of Brooklyn brownstones, this was no easy task, but the jury agreed that he and Marvel succeeded. “The project belongs to the context without passively mimicking it,” said one judge.

The architects employed façade cutouts, copper window bays, and three different brick colors to create a pleasingly varied composition. And they looked to neighboring historic buildings for guidance on building height, window proportions, stoop dimensions, and brick quality, spinning their own modern-day interpretations of each element. For example, they recessed windows deep into the building frame, as in 19th-century townhomes, but replaced traditional trim with naturally occurring shadow lines. And the rectangular cutouts at the top of some units’ front elevations allude to old-fashioned cornices. “These kinds of details are more of a recall than a recreation,” Marvel says. He and Rogers also worked hard to curb the project’s energy consumption, super-insulating each residence and specing high-efficiency HVAC systems.

The project marked their first commission from a residential developer, and it won’t be their last: They’re already designing another row of townhouses nearby.—m.d.

principals in charge: Robert Rogers, FAIA, and Jonathan Marvel, AIA, Rogers Marvel Architects; project architect: Scott Demel, LEED AP, Rogers Marvel Architects; project designer: Nebil Gokcebay, Rogers Marvel Architects; consulting architect: Willis DeLaCour, AIA, DeLaCour & Ferrara Architects, Brooklyn, N.Y.; developer: Abby Hamlin, HS Townhouse Development Partners, New York City; general contractor: David Wong, B2B Associates, Flashing, N.Y.; project size: 3,200 square feet to 4,400 square feet per unit; site size: 0.7 acre; construction cost: $203 per square foot; sales price: $2.6 million to $2.9 million per unit; units in project: 14; photography: Nathan Sayers, except where noted. Please visit www.residentialarchitect.com for product information.
The architects skillfully played with shadows and sunlight on the project's street façade, emphasizing its deep window recesses, copper bays, and top-floor cutouts. Various colored sand-cast brick possesses a light-catching texture. The 18-foot-wide townhomes contain spacious, spare interiors that look out onto private, landscaped rear yards.
The judges marveled at the craftsmanship of the Crabapple model at Hidden Creek, a community of 12 modern houses in Omaha, Neb. “It’s interesting that we’re talking about craft relating to production technologies,” mused one. Architect Randy Brown, FAIA, is one of the project’s developers. He and his staff built the 3,000-square-foot house themselves, placing 10-foot-by-20-foot modules atop a poured-in-place concrete foundation. “With the modules, we can grow the house if we want to, and the garage can be adapted,” Brown explains.

Crabapple includes eco-friendly features such as native landscaping, compact fluorescent lighting, and insulated glass windows. Red-painted fiber-cement boards clad its exterior, and bamboo and polished concrete floors reflect natural light throughout the interiors. Brown left the wood ceiling beams exposed in some areas, adding warmth to the space. He also took great pains to open the house to the nature preserve directly behind it, using an aluminum storefront window system to achieve unbroken views to the outdoors.

One judge compared Crabapple and the rest of Hidden Creek to the mid-century Eichler developments built in California: “Forty to 50 years from now, people will proudly say, ‘I live in one of those,’ the way they do with an Eichler house.” —m.d.

principal in charge / general contractor: Randy Brown, FAIA, Randy Brown Architects; project manager: Brandon Schunnacher, Randy Brown Architects; developers: Randy Brown, FAIA, Paul Brown, Scott Brown, and Rob Luellen, Quantum Quality Real Estate, Omaha; project size: 1,300 square feet to 4,000 square feet per unit; site size: 2.5 acres; construction cost: $80 per square foot; sales price: $200,000 to $600,000 per unit; units in project: 12; photography: Assassi @ 2008. Please visit www.residentialarchitect.com for product information.
The Crabapple model at Hidden Creek blurs the line between indoors and outdoors with floor-to-ceiling windows and front and back terraces. Architect, builder, and co-developer Randy Brown selected long-lasting materials with green leanings, such as bamboo flooring and fiber-cement siding.
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The Case Study Houses of the mid-20th century continue to serve as architectural touchstones, even in settings utterly unlike their original sun-drenched sites. In Milwaukee, they've helped inspire a series of moderately priced infill houses designed by Brian Johnsen, AIA, and Sebastian Schmaling, AIA. "We're trying to reinterpret the Case Study homes' exploration of materials and of creating space, but in a more urban context," Johnsen explains.

The second home in the series, Urban Infill 02, consists of an interlocking two-story cube and one-story bar unified by a steel second-floor trellis. The architects used a standard 2-foot module to cut costs and minimize construction waste, and they specified inexpensive materials such as okoume plywood cladding for the cube and concrete block for the bar. Placement of the home's windows and fiber-cement louvers can vary according to site conditions, and the horizontal bar can be extended or moved, depending on the buyer's preference.

"This project uses restraint," one judge noted. "Its elegant proportions are to the scale of the human body."—m.d.

The architects intend Urban Infill 02 to help reknit the fabric of declining urban neighborhoods. The home's floor plan and window locations can adapt to different sites, allowing considerable flexibility. Vertical plywood cladding emphasizes the height of the project's two-story cube. And smoothing over the vertical masonry joints on the concrete block bar (left) serves to highlight that form's horizontal nature.
The judges loved the shocks of color that distinguish the three courtyards at this campus housing complex in Tempe, Ariz. The Arizona State University project, known as Hassayampa Academic Village, provides accommodations for 1,928 students, as well as classrooms, computer labs, dining facilities, and retail space.

Architectural firms Machado and Silvetti Associates and Gould Evans, LLC divided the program into a series of five main buildings. The structures are connected by bright-walled courtyards, each one painted a different shade to assert its own identity. "The surprise is that you have this masonry exterior and inside you have these bursts of color that define the space," said a judge.

The architects enlivened that masonry façade by introducing unexpected shifts in window and concrete masonry unit patterns. "We were trying to be mindful of the budget, so we decided to use very simple and conventional materials in unanticipated ways," says Derek Johnson, LEED AP, of Machado and Silvetti. Environmental concerns were addressed through strategies such as native landscaping, passive cooling, low-flow fixtures, and ample daylighting. "The desert has an abundance of light, and we wanted to take advantage of that," says Gould Evans' Krista Shepherd, NCARB, LEED AP.—m.d.

principals in charge: Rodolfo Machado, Machado and Silvetti Associates, and David Evans, AIA, Gould Evans, LLC; project architects: Krista Shepherd, NCARB, LEED AP, and Tom Chinnock, Gould Evans, LLC, and Peter Lofgren, AIA, Machado and Silvetti Associates; project designers: Michael Yusum, Derek Johnson, LEED AP, and Michael LeBlanc, Machado and Silvetti Associates, and Jose Pombo, Gould Evans, LLC; owner: Arizona Capital Facilities Finance Corp., Tempe; manager/operator: E.L. Cortez, Arizona State University, Tempe; general contractors: Jim Jacobs, Marshall Witzig, and Mark Murphy, CORE Construction, Phoenix; landscape architects: Michael Boucher, ASLA, and Jeff Pelletier, Michael Boucher Landscape Architecture, Freeport, Maine; project size: 585,000 square feet; site size: 7.1 acres; construction cost: $130 per square foot (residential component only), $160 per square foot total; units in project: 480; photography: Anton Grassl/Esto. Please visit www.residentialarchitect.com for product information.
Color-coded courtyards, inviting landscaping, and double-height student lounges foster a sense of community and an approachable scale within this large campus housing project at Arizona State University. Shaded outdoor hallways and balconies provide opportunities to be outside, and vertical fins along the short ends of the buildings add texture and visual interest.
After scrutinizing 26th Street, a judge offered the highest praise an architect of low-income housing could hope to hear: "It's one of the best projects we've seen, period, and the fact that it's affordable is amazing." The judges applauded the way the large, bold façade breaks down to human scale. The warm brown clapboard siding, checkerboard pattern of shaded balconies, and colorful side walls make all residents feel like they have their own house.

To qualify for state tax credits, the entire project had to be designated residential, leaving Stephen Kanner, FAIA, with the task of figuring out how to buffer the ground-floor units facing a busy intersection. The solution was to give each street-edge apartment a private entry courtyard and wood-slat fencing. "The contractor cut cementitious panels into strips and screwed them to wood posts," Kanner says. "This means they'll really last—they're very rigid and won't require endless maintenance."

In back, a spacious courtyard and artsy staircase tower create a welcoming portal for the other residents. Each unit enjoys cross-breezes, eliminating the need for air conditioning. And the building is a good neighbor: subterranean parking keeps cars off the street, dry wells collect and disperse rainwater, and the mural—a public art piece—gives it a human face.—c.w.

principal in charge / project architect: Stephen Kanner, FAIA, Kanner Architects; developer: Joan Ling, Community Corp. of Santa Monica, Santa Monica; general contractor: Louis Laxineta, Alpha Construction Co., Van Nuys, Calif.; project size: 950 square feet to 1,350 square feet per unit; site size: 0.3 acre; construction cost: $200 per square foot; rental price: $422 to $1,059 per unit per month; units in project: 44; photography: johnlindenphotographs.com. Please visit www.residentialarchitect.com for product information.
Details such as the stair’s perforated-metal screen (opposite), brown-painted aluminum louvers (top), and colorful balconies (right) contribute low-cost luxury. The only splurge was a commercial storefront system with operable windows.
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Sometimes limitations can produce poetic results. Take Del Norte, Colo., affordable senior housing community Casas de Rio Grande, where Ron Faleide, AIA, used budget constraints as a framework for the building's clever floor plan. "The cheapest building you can make is a box with a hallway in the middle," he says. So he designed one. Then he split the box lengthwise and shifted the halves in opposite directions along the building's axis, allowing units that would have faced each other to face the outdoors instead.

As a result of this simple move, every apartment opens onto a sunny, window-lined corridor rather than a dark, double-loaded one. And Faleide specified exterior door and window frames and fiber-cement walls for the units' glassed-in front elevations, heightening the hallway's resemblance to a street. "People put their outdoor furniture and plants outside their doors," he says. "They sit there when they want to be part of a community."

The judges admired the design's encouragement of social interaction. "This is a terrific building," said one.—m.d.

principal in charge: Ron Faleide, AIA, Faleide Architects; project designer: Patrick Lee, Assoc. AIA, Faleide Architects; developer: Al Gold, Colorado Rural Housing Development Corp., Westminster, Colo.; general contractor: Chuck Scherrer, Southern Colorado Construction, Pueblo, Colo.; project size: 530 square feet per unit; site size: 1 acre; construction cost: $110 per square foot; rental price: 30 percent of adjusted gross income per unit per month; units in project: 28; photography: Tectograph. Please visit www.residentialarchitect.com for product information.

The floor plan at Casas de Rio Grande places each unit along a sunlit corridor with plenty of outdoor views. Strong colors and borrowed natural light (left) add appeal to the interior spaces without compromising the budget.
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Iceland natives Erla Dógg Ingjaldsdóttir, AIA, Assoc. IIDA, and Tryggvi Thorsteinsson, Assoc. AIA, used their country's green heritage and love of new materials to transform their 1950s home into this 2,400-square-foot gem. The idea "was to create a modern home that was comfortable and open so we could watch the kids play," Ingjaldsdóttir says. Sustainability was a major goal, so to grab maximum daylight and cut electrical costs, the pair used large doors and generous amounts of glass. They sited the home to catch maximum breezes, eliminating the need for air conditioning.

The heart of the home is an open kitchen anchored by an orange solid-surface island with an innovative storage system for seven stools. "This is a way to have stools and have them be beautiful," one judge said. The island is clad in recycled rubber for durability. Other sustainable specs include radiant heat concrete flooring over foam insulation, recycled-content cement board siding, and recycled silicon rubber bath sinks and stair treads.—n.f.m.

This highly sustainable house takes advantage of natural daylight, passive cooling, and recycled-content materials. The large island anchoring the main living area conceals seven stools (left and above); its recycled rubber cladding is a durable, kid-safe surface.
FRUSTRATIONS OF A SCENT STICK

Being modern isn’t as easy as it used to be. My friends and I used to qualify. I mean, our form meets our function, right? But no, that’s not enough anymore. Now you’re expected to last longer than the style movement you belong to. And you’re not stylish unless you can help the environment. You’re basically asked to be more modern than modern. Which grammatically I didn’t think was possible.

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esai/Chia's build-out of this "cavernous space with no light in the back" introduces both light and logic with permeable partition walls. Vertical wood planks capped by bands of clear glass enclose private rooms and define open living areas. Light filters through the offset boards and the glass bands at night, emphasizing the high ceilings.

Said one smitten juror: "I like the way the wood and glass vibrate back and forth between each other." —s.d.h.

**principal in charge / project architect:** Katherine Chia, AIA, Desai/Chia Architecture; **general contractor:** David Giovannitti, Giovannitti Inc., Yonkers, N.Y.; **project size:** 4,000 square feet; **construction cost:** Withheld; **photography:** Paul Warchol Photography. Please visit www.residentialarchitect.com for product information.

**architectural interiors**

**merit**

**madison square, new york city**

**desai/chia architecture**

**new york city**

Given a raw space of exposed masonry and timber framing, John Hubert, AIA, decided to leave well enough alone—mostly. The space—in the former and aptly named Triangle Theater—was challenging in its shape but possessed 11-foot ceilings and abundant natural light.

To preserve the loft's felicitous openness, the architect carefully inserted freestanding elements to differentiate functional zones. He painted the ceilings white for added brightness but dropped their height over the new kitchen/gathering area to "better define the space." And a new elevated "sleeping box" plays with the experience of solid and void.

The judges praised the architect's restraint and the "beautiful job" he did with the plan.—n.f.m.

**principal in charge / project architect:** John Hubert, AIA, John Hubert Architects; **general contractor:** John Hubert, AIA, John Hubert Associates, Wynco te, Pa.; **project size:** 1,380 square feet; **construction cost:** Approximately $57 per square foot; **photography:** Halkin Photography. Please visit www.residentialarchitect.com for product information.
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Circle no. 381
The young owners of this house wanted a flexible and hip building within a modest footprint and budget. Dan Rockhill willingly took on the challenge.

Within a 77-foot-long-by-24-foot-deep plan, he inserted seven symmetrical bays to contain everything but the open living/dining space. And he divided the bays from the public space with four 11-foot-wide frosted glass sliding doors set on a continuous track. Rockhill jokes that his clients can configure the house for "a Ping-Pong tournament or an intimate dinner."

But the jury was seriously taken by Rockhill’s use of sliding doors as a modulation device, which, they said, resulted in "remarkable" and "enigmatic" spaces. —s.d.h.

Poetic and transformative” is how the jury described this bathroom. The 8-foot-by-8-foot cube elevates the discussion of what this necessary room should and can be, they said. Placed inside a historic warehouse formerly used for repairing and storing fishing nets, the cube is constructed of Douglas fir salvaged from an old dock on the property. Gaps left between the feather-butted planks honor the old warehouse building, which seasonally shows cracks in its weathered exterior.

Inside the bathroom, a hole in the floor architect Daren Doss, AIA, calls a “river light” reveals views of the water below. At night, he says, the salmon are attracted to the bathroom light and congregate beneath the hole. The rest of the floor, the wet wall, and the vanity are fabricated of brushed aluminum. Acrylic panels line the wood skin for acoustical privacy, while letting the light shine through.

“We wanted to express the materials as poetry,” Doss says, “by letting them be raw but using them in unusual ways.” —s.d.h.
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pizza porch, dallas
shipley architects
dallas

His pizza porch attached to a mid-century modern house in Dallas couldn’t be more straightforward. “It’s elemental and it works,” noted a judge. The 16-foot-by-16-foot porch sits atop four board-formed concrete piers, with an exposed steel frame and a floor of 2-foot-wide ipe boards. A brick chimney surrounds a simple clay pizza oven, while a FinnForm roof deck shelters the space. Metal candleholders attached to the floor beams outline the porch’s edges. “We were just trying to keep the lines as clean as possible,” says architect Dan Shipley, FAIA.—m.d.

principal in charge / project architect: Dan Shipley, FAIA, Shipley Architects; general contractors: DSA, Dallas, with Mark Huss, Duncanville, Texas; landscape architect: David Rolston, David Rolston Landscape Architects, Dallas; project size: 256 square feet; site size: 1 acre; construction cost: $200 per square foot; photography: Charles Davis Smith. Please visit www.residentialarchitect.com for product information.

architectural design detail
merit

model ‘t’ rolling bed, suttons bay, mich.
hanawalt architecture & land planning
suttons bay

When his client asked for an outdoor bed for this Lake Michigan weekend house, David Hanawalt’s first thought was moldy sheets. But then the architect had another idea. “I was researching lift mechanisms for sliding doors,” he explains, “and it made me think that we could apply a similar technique to a bed.”

And so Hanawalt, AIA, worked with cabinetmakers to devise a manual rolling system that allows the master suite’s built-in bed to glide outside. Snap-in bridges for the roller tracks prevent glitches crossing the threshold, and the wenge-veneered headboard angles back for comfortable viewing of the lake. Hanawalt says the bed is a smash hit with the newlywed owners.

Our judges were equally enamored: “I want one of these!” said one.—s.d.h.

principal in charge / project architect: David T. Hanawalt, AIA, Hanawalt Architecture & Land Planning; cabinetmakers: Jim Benedict and Tim Thompson, Woodbine, Suttons Bay; construction cost: $24,000 (for bed fabrication and installation); photography: Peter Tata Photography. Please visit www.residentialarchitect.com for product information.
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Aerial photos after the California fires showed homes with metal roofs that survived the flames, while nearby the earth was scorched and neighboring homes lay smoldering. The reasons are clear. Unlike tile or shingles, metal offers no opening and no fuel for falling embers.

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on the boards

merit
torqued house, los altos hills, calif.
visible research office
san francisco

The site for this northern California house begins in a meadow and continues up a wooded hill. To engage both of these aspects, architect Mark L. Donohue, AIA, divided the copper mesh-covered home into three stepped pavilions that torque to take in various views. "The house twists as it goes up and over the hill, like a pole-vaulter," he says.

The judges admired the integration of the project’s massing and mesh skin into its bucolic setting. Said one: “It’s appealing the way they’ve morphed the landscape into the building.”—m.d.


on the boards

merit
glass-road house, simi valley, calif.
office em
los angeles

Each level is successful in different ways,” one judge said of this live/work project. Edmund M. Einy, AIA, was thrilled to hear such praise, because his design evolved into distinct layers—each one with a specific relationship to the surrounding trees.

The semi-subterranean level is the “roots” of the family-owned and -operated orchard with offices, equipment space, and a tractor ramp. Ground-level living spaces serve as a “trunk” defined in glass, supporting private rooms above. The roof has an open grid of photovoltaic panels to convert the sun into energy, much as a tree canopy would do. “The panels,” Einy explains, “will create small-scale shadows, like dappled shade from leaves.”—s.d.h.

principal in charge / land planner / interior designer: Edmund M. Einy, AIA, Office em; project designer: Devan Mitchell, Office em; landscape architect: Calvin Abe, FASLA, ah‘bê landscape architects, Culver City, Calif.; project size: 8,200 square feet; site size: 3.5 acres; construction cost: Projected $420 per square foot; photography: Adrian Velicescu Photography.
Specifying the proper window is no less critical than installing it properly. Architects should be familiar with proper installation methods and installation problems in order to aid them in the selection process.

PHILOSOPHY OF GREEN BUILDING
Building "green" is an industry direction. Originally focused on commercial buildings, the trend is increasingly expanding into residential projects. Green building takes into account materials used, design methods and construction techniques, and the impact a building will have on the environment. Site orientation, indoor health and air quality, waste removal and reduction, use of recycled or sustainable materials, landscaping, and more are all considered in the planning, design, and execution of a green project. The green-built philosophy is one that considers renewability, energy and resource efficiency, life-cycle assessment, and environmental impact.

Between 1997 and 2007, the number of U.S. cities with green building programs grew to over 90 and is expected to reach 120 by the end of 2008. In 2007, spending on sustainable construction reached $1200 billion — up 2200% from $53 billion in 1995. Architects and builders are not the only ones aware of the importance of green building principles — 88% of builders working on sustainably designed projects said that they were being pushed to do so by consumers who were seeking more efficient, healthier homes.

RESIDENTIAL ARCHITECT MAGAZINE CONTINUING EDUCATION
This course requires supplemental online reading in addition to the following article. For details on accessing the supplemental reading and to learn how to take the test, please see page 97.

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Between 1997 and 2007, the number of U.S. cities with green building programs grew from just a handful to more than 90; that number is expected to reach 120 by the end of 2008. In 2007, spending on sustainable construction reached $1200 billion — up 2200% from $53 billion in 1995. Architects and builders are not the only ones aware of the importance of green building principles — 88% of builders working on sustainably designed projects said that they were being pushed to do so by consumers who were seeking more efficient, healthier homes.

U.S Cities with Green Building Programs

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<td>2008</td>
<td>120</td>
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Source: American Institute of Architects

Why build green? Green buildings are, by their own nature, good design. A green building is designed to provide a healthy and comfortable, cost-effective, and visually pleasing environment. The term "green" is

LEARNING OBJECTIVES
The learner will:
• Outline the importance of green building design and sustainability in product choices.
• Identify and outline examples of each of the five pillars of sustainable construction.
• Compare primary types of window and door framing materials and identify how they can help with green building certification.
Between 1995 and 2000, spending on sustainable construction increased by only $150 billion. Since 2005, spending on sustainable construction has grown to over $1,200 billion in 2007.

Source: organicARCHITECT

The term “sustainability” is getting its fair share of attention today. It is defined by the National Council for Interior Design Qualification (NCIDQ) as “a use of materials that is capable of being continued with minimal long-term effect on the environment.” Sustainable construction requires a combined effort between the architect, builder and owner that can result in the greatest performance of a design’s potential. The green-built philosophy is a set of guiding principles that assist in the design and construction of sustainable buildings and communities.

THE FIVE PILLARS
(courtesy: Peter Pfeiffer, Pfeiffer Architects, Austin, TX)

There are five guidelines or pillars that direct the intent of green building: energy efficiency, materials use, water conservation, indoor environmental quality, and durability. Each pillar helps guide the green building process to help produce an environmentally responsible building.

1. INCREASING ENERGY EFFICIENCY
Buildings consume 48% of all energy in the United States (76% of all electricity) and are responsible for almost half of all greenhouse gas emissions. Homes are responsible for more than one-fifth of all energy consumed annually in the United States. Green building guidelines aim to incorporate energy efficiency into building plans, to reduce the burden of homes on the environment. Improving energy efficiency, by definition, is to provide the same energy output while reducing the amount of energy, resources, and materials used.

By increasing energy efficiency, building owners and homeowners save on utility costs. Programs such as ENERGY STAR help consumers identify energy efficient products. The ENERGY STAR program helped American families save enough energy in 2006 to shave $14 billion from their utility bills.

Sustainably built homes often include improved insulation, radiant barrier sheathing, improved duct sealing, efficient HVAC units, and advanced window glazing, which all help improve thermal efficiency and effectiveness. When considering energy efficiency, it is necessary to consider which materials or products you use or specify. That is why the second pillar of green building is Appropriate Materials Use.

90% of what makes a project green is the first 10%, the design.

2. APPROPRIATE MATERIALS USE
Products do not qualify for green-building certification. Rather, they help contribute points towards building certification. For example, windows and doors can earn points for energy efficiency if they are ENERGY STAR certified. Products that have low volatile organic compound (VOC) emissions may contribute towards indoor air quality. Recycled products can contribute towards the materials and resources category.
GREEN BUILDING: AN INTEGRATED APPROACH TO CONSTRUCTION

Materials that are recycled, reused, renewable, locally produced, or third-party certified are preferred. Common examples of these include composite decking (recycled plastic and wood fiber), engineered lumber, and certified wood products. Certified wood products are those which have a third-party chain of custody certification from a sustainable forestry organization such as SFI, FSC, or SCS.

3. WATER CONSERVATION

Even though 70% of the Earth’s surface is water, it is still a finite resource; only about 1% of water is available for human use. Further, according to the U.S. Environmental Protection Agency, at least 36 states in the United States are predicting water shortages by 2013. We need to take advantage of current technologies that allow us to consume water more efficiently.

To help reduce consumption and conserve water, we can utilize on-demand tankless water heaters, waterless urinals, low-flow plumbing fixtures, foot-pedal faucets, and region-appropriate landscaping with drought resistant plants, among other strategies. Not only do such measures reduce the risk of water shortages, they also reduce the amount of energy required to supply water to American homes. Running a faucet for five minutes uses about as much energy as a 60 watt light bulb that is on for 14 hours. The U.S. EPA has developed WaterSense, a program similar to ENERGY STAR that will help consumers become aware of the importance of water conservation as well as help them identify efficient products.

4. INDOOR ENVIRONMENTAL QUALITY

As we are spending more time indoors than ever before, we need to be aware of the quality of the air we breathe indoors, as well as out. VOC content is up to 10 times more concentrated indoors than out. VOCs can cause health issues such as upper respiratory and sinus problems, eye and skin irritations and asthma. Asthma rates among children have more than doubled between 1980 and 2001. This may be a result of deteriorating indoor air quality.

Green building guidelines incorporate the use of building materials that help reduce off-gassing of VOCs during manufacturing and application. VOCs are commonly found in paints, stains, carpeting, sealants, cleaners, adhesives, and caulks. HVAC equipment can help reduce VOC content indoors.

Indoor environmental quality is not just about the air we breathe. Studies have shown that people are healthier and more productive under natural light than artificial light. Daylighting is a simple way to improve indoor environmental health and is an important component of green building.

5. DURABILITY

Products or processes that will not require significant remining, remanufacturing or reharvesting of materials should be incorporated into green building designs. Life-Cycle Assessments (LCAs) are used to analyze a product’s environmental impact throughout its cradle-to-grave life span. LCAs include materials used, energy consumed, environmental impact at various stages of its manufacture, usage, and disposal.

Sustainable designs should incorporate durable, environmentally friendly products and processes. Specification of products that are resistant to rot, water absorption, and termite damage is one way to incorporate sustainability into project designs. Products that outlast their application and can be recycled or reused are considered preferable in green built projects.
5. On average, a window’s frame accounts for _____ of the total window area.
   a. one quarter
   b. one fifth
   c. one eighth
   d. one third

6. Vinyl frames are durable and resistant to rot and decay, but in large sizes may require _____.
   a. lots of maintenance
   b. special coating for exterior use
   c. metal reinforcement
   d. extra insulation

7. Wood window frames are the most common frames in residential projects because wood _____.
   a. has a high insulation value
   b. is renewable and has virtually unlimited finishing options
   c. is generally not vulnerable to fungal decay
   d. A and B only
   e. All of the above

8. Wood is typically treated with a _____ treatment process, but a new process provides improved protection.
   a. Water-based, oil-based
   b. Petroleum/mineral, water-based
   c. “dipped,” petroleum/mineral
   d. oil-based, “dipped
   e. All of the above

9. In addition to better protection of the wood from surface to core, the water-based treatment process virtually eliminates _____.
   a. VOCs
   b. the need for maintenance
   c. the risk of termite and/or water damage
   d. A and C only
   e. All of the above

10. EPA Method 24 measures which of the following?
    a. The penetration of a finishing coat into the wood
    b. The termite resistance of a wood frame material
    c. The weather resistance of a window frame material
    d. All of the above
    e. The VOC content in coatings and inks

Green Building: An Integrated Approach to Construction

You have the option of taking the test online free of charge or you may mail your test along with a check in the amount of $10. A score of 80% or higher earns 1 AIA/CES HSW LU credit hour. Certificates of completion are available upon request and delivered by email.

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Architects John Malick and Betsy Goodman strove for exactly this reaction. While adhering to the building’s stylistic vocabulary, the pair opened up small, dark rooms and strengthened their ties to the outdoors. They didn’t eliminate walls completely; instead, they made new openings framed by arches or columns. Each new piece maintained the proportions, detailing, and quality of the original, thanks in part to a top-notch team of artisans and craftspeople. “The challenge,” Goodman says, “was getting light inside and giving rooms open connection while respecting the integrity of the original house.”—s.d.h.

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