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Mark R. Johnson, FAIA, AIBD

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user typologies that could be translated from research to tangible kitchen designs (see map at right). The designers were assigned a scenario from the map and given free reign to design an optimal kitchen for the particular user. For example, the lower right quadrant defines an Emotional/ New Luxury typology that we dubbed the "Convivial Scenario."

Ziba Europe, a firm from Munich, Germany, embraced this scenario. Their design is titled, THEATRE. The user statement reads, "I'd like my kitchen to be a theatre...a stage on which the rituals of my domestic experience are

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residential architect / january . february 2005

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Jennifer Siegal's Eco-Ville comprises 40 stacked, staggered Portable Houses on a 21/2-acre lot. Rendering courtesy Office of Mobile Design. Cover, from left: Geoffrey Warner by John Nolter; Rob Luntz and Joe Tanney by Steven Freeman; Michelle Kaufmann by Robert Cardin; Ron Humble and Joel Egan by Brian Smale; Jennifer Siegal by Danny Turner.

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from the editor

the enemy within, part 2

is there really such a difference between designers of house and housing?

by s. claire conroy

n our last issue, I wrote about the divide between commercial architects and residential practitionersabout how the former sometimes regard the latter as the lesser professionals. Well, I'm afraid there's also a schism within the residential practice itself-between the custom architect and the production architect. This rift is even sharper, because it's a brother-against-brother conflict. Here, the custom folk discount the abilities and achievements of the mass market specialists.

Certainly I've railed against the state of mainstream residential design. But I've never attached the blame to the production practitioner. There's a tremendous amount of talent, knowledge, and good common sense within their ranks. You should see the houses they design for themselves; the work stands up with the best. But who couldn't do their best work for themselves-unedited, uncompromised, unadulterated?

The next best scenario for creative success is a single client with a single lot who's chosen you based on your portfolio of work. They've prescreened themselves to like what you do.

And only they need to enjoy your aesthetic sensibilityand perhaps their banker. The stakes are relatively low—just a few of you shimmying out on that limb. Still, even under the best of circumstances, few custom homes emerge intact from the head of the architect. Budgets, client tastes, limitations of the builder always drive changes. The outcome is never as perfect as you envision it. There are simply too many stars to align. So you make peace with yourself, and you take pleasure in the good work you managed to shepherd from start to finish. You hope your clients will live happily in their houses. And you're reasonably sure they're better off than if you hadn't guided them home.

This is exactly the journey of the production architect. Except the risks and the handicaps are exponentially greater. Their clients are building companies traded on the stock exchange. (When was the last time a custom-home client had to make a short-term profit on your design?) Their projects require the buy-in of the local public and officials. They must prioritize the housing on the land above the house on the site, designing neighborhoods



Mark Robert Halper

and communities. They work largely within the builder's spec book, turning sows' ears into silk purses. And then they watch as the least skilled labor in the home building industry assembles it all. Value engineering drains charm all along the way. Then you drive by and disparage what you see. But you should see the house as it was originally conceived, and you should imagine what would have happened if this architect had not been involved at all. I think we can be reasonably sure we're better off than if he hadn't guided this project home.

Production architects achieve against great odds; the progress is incremental and sometimes invisible to the outsider. We don't know they convinced the builder to do 14 houses to the acre instead of 18, or to align those interior site lines. Working from within and chipping away at the status quo aren't the easiest ways to do architecture. Sometimes the biggest success isn't making a house more beautiful, it's making a house more livable. But many times production architects prevail in doing both, there in the trenches, fighting the real enemy. ra

Comments? Call: 202.736. 3312; write: S. Claire Conroy, *residential architect*, One Thomas Circle, N.W., Suite 600, Washington, D.C. 20005; or e-mail: cconroy@hanleywood.com.

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letters exercise your right to write.

alien concept

hat planet are you living on that lets architects charge almost 14 percent (\$60,000) —for a 2,200-square-foot house ("Where's the Architect?" April 2004, page 11)? I must assume it's not this planet. Of course the client went to a design/build firm! Who could afford those kinds of fees?

Any architect knows that a 14 percent fee in most areas of the country, and especially in the highly competitive Chicago market, is unrealistic to even think of asking for. In many cases, the builder will not even make that much.

To be disparaging to the design/build firm is really unfair to them. Do you know if they had a licensed architect on staff? Or, as part of the design/build package, do they partner with an architect? Legally, design/build firms can work both ways. Perhaps that is what the client meant when he said that he had hired an architect but corrected himself. He hired a design/build firm with an architect on staff who prepares the drawings.

Michael J. McGee, AIA, ALA President MJ McGee and Associates Geneva, Ill.

here's the architect? Probably struggling to keep his/her business afloat while some builder makes a handsome profit by delivering another "blah" house to a client who thinks the way to save money is to eliminate the architect from the process entirely.

Your editorial all too accurately and sadly reflects a common scenario. The one thing I would take exception to is the \$60,000plus design fee. Here in bubba-builder land of central Texas, a fee like that is the stuff dreams are made of! The likely fee in this area, even for a highly detailed, steel-framed design and working drawings package would be in the neighborhood of 4 to 5 percent of construction costs-possibly less-plus engineering fees. Here we must compete directly with unlicensed building designers, stock plans, and a varied array of in-house or freelance drafters-all equipped with a computer, CAD program, and two or three community college or tech school courses in architectural drawing.

An important part of the solution must lie with educational and marketing efforts on the part of individual architects and firms, state registration boards, and the AIA. Realtors and developers have done a far better job getting their message across to the home buying/building public than has the architectural profession. I recall an AIA-sponsored TV ad series a few years ago, but the tone of those spots was somewhat lofty and vague.

It's time we made a serious effort to reach people "where they live." The stereotype of the expensive, snobbish ivory-tower architect doesn't appeal to most prospective custom-home clients and most certainly not to practical-minded builders. If the general public views architecture as an expensive and elitist profession, can we really blame them? That would indeed still seem to be the overriding philosophy of the AIA licensing boards, and many professional degree programs that downplay dimensional drawings.

It is time for us to present our services in a more accessible and informative manner. Both individual and builder clients are more likely to appreciate our services and pay what they are worth if they have a better understanding of what it is that we do and the advantages of hiring a design professional.

> Robert Margell Kingsland, Texas

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"Where's the Architect?"

feedback ("The Charge Brigade," August 2004, page 13). But isn't this derivative of the old art/business conundrum regarding architectural practice? That one's been debated since long before I entered the field 40 years ago.

Few practices can keep the light on indefinitely, waiting for that inspired design opportunity to show up, with the client ready to pay the fee. Work must be scaled to fit the economics of each commission, even if that means having another income source to pay the bills until one hits the big time.

Since the architecture profession hitched its star to the "art" side of the dynamic, less emphasis has gone into training for business-side mechanics. But, especially for single-family residential design, this emphasis conspires with project scale and real estate valuation norms to render the architect as overhead. In this computer world, design inspiration comes with the software; architects need more education on the art of this business deal than with the art of the building design.

> Chris Williams Middletown, Conn.

continued on page 22

ou hit the nail right on the head regarding a subject that our profession simply does not know how to deal with.

I have been in practice in Charleston, S.C., since 1979, and custom homes have always been part of my work. Most of these custom homes are located in the numerous planned resort communities along the South Carolina coast, such as Kiawah Island. And most require their property owners to hire registered architects. When I opened my office, there were fewer than 10 architects in Charleston, none of whom were any real competition as far as designing higherquality custom homes. Now there are nearly 90 architectural firms here, the majority focused on the residential market. Competition today is very stiff; there may be a half-dozen architects running full-page color ads in local or regional magazines almost every issue.

Over the years I have carefully studied what it costs for my firm to provide full architectural services for a real custom home and make a reasonable profit. We find we have to be in the 12 to 15 percent range. We do not have the celebrity necessary to command the 20 to 25 percent fees people like Robert Stern get. We've used this sort of fee structure for almost 25 years, and it has worked for us. I also have an office in Rhode Island and find the

market there to be similar.

The greatest variable in that time, other than the amount of competition, has been construction cost. In the late 1970s, you could build a good house at Kiawah Island for \$100 per square foot; today, the going rates are \$250 to \$350-plus anywhere along the South Carolina coast for anything of quality. In Rhode Island, we see similar costs for custom homes. For a client, the expectation is that anything that expensive has to be custom. You and I know that is not the case.

My custom residential market share has been slowly shrinking despite many projects being published and receiving awards. In addition to the increased number of architects in our market, I am finding the fees being charged by some of them are right in the range you quoted. An architect from Hilton Head, whom I didn't know, recently told me he charges 5 to 10 percent for full architectural services!

Then the real estate factor comes into play. In these planned communities, real estate agents are the power brokers. They recommend contractors and architects to their clients, and usually get referral fees of 3¹/₂ percent of the construction cost of the house from select contractors. I've never paid a referral fee, but they are increasingly out there and are a real marketing and fee consideration.

In addition to upscale

resort communities, in Charleston we have a couple of "in-town" planned neotraditional communities. One is I'on, and the other is Daniel Island. When you buy in these communities with their in-house real estate staffs, you pay a higher-than-normal real estate fee. In both cases these communities have a select list of contractors who are permitted to build there. In the case of I'on, you must start construction within a prescribed amount of time, and you must use one of their approved builders. The day your contractor starts construction of your house, he must give the real estate company another full fee on the value of the house construction as a referral fee, I suppose for being on the select list. The real estate company is double-dipping on fees. Both of these premier communities have lifted any requirement to have the houses designed by architects. In the case of I'on, we heard they are setting up their own design office to produce house plans for their clients. At Daniel Island, we hear that houses selling for \$1 million to \$2 million are being designed for less than \$10,000. Of course these are not full architectural services and usually with no services during the construction of the houses. This is a great business plan for the real estate developers and, I think, also for the select home builders. But what about the architects?

With the kind of formula design that we are seeing in many of these communities, architectural services are rapidly being marginalized to the point where they have little value in the marketplace.

The real problem is getting the client to understand and appreciate professional architectural services. Many people honestly do not understand the difference between the professional services we provide and getting a set of "house plans" from some other source. The real pity is that many architects are lowering their professionalism to the point where they cannot be distinguished from the so-called residential designers. We need to distinguish more clearly between what is really a custom house and what is just an upscale production house. The houses that I see being designed by architects who are charging 5 percent to 10 percent are really nothing more than glorified production houses.

R. Christian Schmitt, FAIA President Schmitt Walker Architects Charleston, S.C.

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Dennis K. Parsons, AIA Parsons Architects Hinsdale, Ill.

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1

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Circle no. 99

home front

news from the leading edge of residential design

is the future now?

Many homes designed for discriminating clients today contain aspects of green building: passive solar orientation, non-toxic materials and finishes, and sustainably harvested woods. But those features are one-off alternatives to conventional construction, not part of a package. Clever Homes aims to change that with the NowHouse, a panelized, digitally networked house that can be built at a predictably lower cost than stick-built construction. "It's a real grab bag of sustainable concepts, but all contained



in the same bag," says Toby Long, AIA, co-founder of Clever Homes (www.cleverhomes.net) and principal of tobylongdesign, in San Francisco.

Clever Homes spent six months working with manufacturers to build a common set of construction specs. The building blocks include engineered -lumber framing and structural insulat-

ed panels. Made of expanded polystyrene and laminated with oriented strand board, the wall panels can be left exposed as interior walls or finished off with recycled Sheetrock. The 6-inch-thick wall panels, 12-inch-thick floor panels, and 10-inch-thick roof panels are all made in 48-inch-wide modules, as are the 8-foot-tall windows. NowHouse comes with a fixed floor plan, the emphasis is on flexibility. Mix-and-match components allow for a variety of landscape conditions, and the inte-

Although the



rior walls are non-load-bearing, designed to be moved about at will and locked into place. The house can be one or two stories and contain up to five bedrooms. At \$48 per square foot for the shell materials (\$83 per square foot with finishes), it takes three to four months to build, including site prep.

The prototype house has already been sold. The company is now reaching out to more manufacturers to create downgrade and upgrade options. High-end construction, Long notes, is in need of as much change as the low-end market. "We want to position ourselves at what we see as the inevitable convergence of design and construction-process technology, and lifestyle and consumer technology," he says. -cheryl weber





Photos: Courtesy Clever Homes



The NowHouse is clad in a combination of concrete siding and powder-coated, recycled steel siding, and optional Kalwall. Inside, Clever Homes offers items from light fixtures to appliances and cabinetry made of bamboo over wheatbased agriboard.

"it's a real grab bag of sustainable concepts, but all contained in the same bag,"

-loby Long

home tomes

ccompanying the home building boom is a veritable bonanza of books about houses. The Taunton Press' books are actually written by residential architects, offering their hard-won insights on everything from farmhouses to building on a budget. And from assorted publishers



comes a new crop of books about prefabricated homes of every ilk—humble, hopeful, and audacious.

The Farmhouse (\$32, hardcover) celebrates some of the best recent examples of this quintessentially American style. Architect Jean Rehkamp Larson, AIA, shows readers how the farmhouse is being reinvented for the 21st century.

In *The Getaway Home* (\$30, hardcover), Dale Mulfinger, FAIA, invites readers into 24 houses designed and built for the pursuit of recreation. He explores the design requirements and possibilities dictated by activities, environment, and site.

Duo Dickinson, AIA, offers 19 case studies of unique and imaginative homes built to real-life budgets in *The House You Build* (\$34.95, hardcover). Good design, he asserts, doesn't have to break the bank.

And architect John Connell, AIA, founder of the Yestermorrow Design/Build School, takes readers on a journey through more than 20 homes in *Creating the Inspired House* (\$34.95, hardcover). His thesis: Successful, meaningful design comes from articulating the owners' personal passions.

Rocio Romero and Steven Holl are just some of the prefab practitioners profiled by Jill Herbers in *Prefab Modern* (\$39.95, Harper Collins, hardcover). Herbers covers a wealth of material to

show how beautifully and stylishly designed today's prefabs are. In *Prefab Home* (\$24.95, Gibbs Smith, softcover), interior designer Michael Buchanan tracks factorybuilt housing from its origins to its use today. As a recent example, he cites his own custom house, which was assembled from prefabricated modular components and mid-range, off-the-shelf products and materials.—*Stephen Sheikhli*

home front

kind of, sort of better

esidential architects care deeply about the dwellings they design, striving always to make them highly livable, well-crafted, and beautiful at the same time. But making those qualities available to custom clients with tight budgets or applying them to price- and market-sensitive production houses is a great challenge. We at *residential architect* are concerned with the problem of how to deliver better-designed houses to a wider audience. To explore the topic from the inside out, we gathered five very experienced residential architects for a roundtable discussion,



Event Digital Photography Inc.

excerpted here. They included (pictured, from left) Dan Phipps, AIA, Dan Phipps Architects, San Francisco;



Courtesy Andersen Windows

Ed Binkley, AIA, Bloodgood Sharp Buster Architects & Planners, Oviedo, Fla.; Dale Mulfinger, FAIA, SALA Architects, Minneapolis; Stephen J. Vanze, AIA, Barnes Vanze & Associates, Washington, D.C.; and Gary Furman, AIA, Gary Furman Architects, Austin. Thanks to our sponsor, Andersen Windows, we gathered at the company's "inHOME" idea house in Park City, Utah, designed by Michael Plautz, AIA, of RSP Architects in Minneapolis. The question that launched the discussion: *What is standing in the way of custom architects delivering high-level design to clients of more modest means?*

Stephen Vanze—"In our case, we've tailored our service for so many years to the higher end, it's hard for us to readjust ourselves and our service to the middle-income group that can't afford the amount of detailing we typically put into a set of drawings and the amount of thought, frankly, that goes into the designing of a house. It's very hard to make that work on a modest budget. The fees become such a big part of the project that we just tell people, you'll hate us. You won't hate us now, but you'll hate us in a year."

Dale Mulfinger-"I think most of what we as architects do is an added-value service. What we found fairly early on is there's a huge differential between the blueprint the production builder might be building from and the blueprint the architect tends to provide. The blueprint the builder typically uses is four pages, and the blueprint we all might turn out is 30. In that vast gap in between, there are lots of alternative services you can provide. You can provide 10 hours of service, a hundred hours of service, or a thousand hours of service to different people who want different levels of added value. And they are all willing to pay at the standard rate you charge. So if you charge \$120 an hour for your time or \$60 an hour for one of your junior assistants, you can still charge that—even if you're only doing 10 hours of service—because what you can do, at least if you've got some knowledge of the industry, is always added value. That's the way we have offered that much broader range of potential services—by charging an hourly rate and tailoring service.

"You know, it comes with the notion that you as an architect can accept what you're not going to do. You have to say, well, what was the probable outcome had you not been involved? And between that probable outcome and a little bit better outcome lies the possibility of a lot of architects serving the public. And so there's a huge potential out there for more work if more architects want to do 'not full-service.'"

Dan Phipps—"I see the need, but we've sort of trained ourselves to do a certain thing a certain way. And it's hard for us to break out of that mold. I mean, I've got somebody—if I give him a drawing, he's just going to sit there and detail the hell out of it, and I have to yank him away from the drawing board to have him stop, because he's trained to look at things ad infinitum. And that's what I want him to do, and that's what I want to do." Ed Binkley—"I'll give a little plug to Jack Bloodgood. His early philosophy was that all homeowners deserved a home designed by an architect. And that was a big driving force for him. It's difficult to do in this market. And I think one of our biggest challenges is how can we provide that service for everyone? Eyes are opening a bit among builders; they see what architects can bring to the table as a plus. They're tired of going the same old route too."

Gary Furman—"I was reading through *Architectural Record*'s story on Sam Mockbee, who received the AIA gold medal. He said that everyone, rich or poor, deserves a shelter for the soul. And it's true. How we get there, I don't know that I have the answer. But I think that somewhere we have to find the right match for potential clients. And it's a difficult process. It's hard for us to align ourselves sometimes because of the way we're trained."

Mulfinger—"Today we're blessed in the United States with an incredibly well-educated populace. And that populace wants more possibilities. And we're uniquely situated to begin to deliver that for a broader population. I just think we need methods. And we probably *continued on page 32*



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home front

need new educational models. We're all trained as kind of doctors, with a lot of education. And the only other sourcing person we have is somebody who has very little education, i.e. a draftsperson—and that might be akin to the Licensed Practical Nurse (LPN) in medicine. So we have doctors and we have LPNs. It seems to me that we're missing the Registered Nurses (RNs) in our industry. We need to educate other people who can also serve, but maybe at a lesser level, and fill these gaps in between. The market is there, and a tremendous number of people are willing to pay for it."

Vanze—"The only thing that makes it hard, though, is the liability issues. We are very reluctant to do a project where the owner wants us just to do some drawings and go away, because so many things can go wrong and it's so easy to fix them if you're there while it's being built. And if you're not there, a little mistake can become a big mistake, which is why we find it very scary to give partial services to people."

Mulfinger—"Another thing missing is the pattern book. You used to be able to build a nice house from plans-the Sears models, for instance. Today, everybody's building from a new pattern and tradespeople never really get used to it, never refine it. It doesn't get aesthetically better, technically better. They just go on to the next one. Something has changed the role of the home plan and its impact to produce good houses. You can drive the countryside and see a beautiful old farmhouse, and the windows are perfectly ordered and logical and it has a charm. And it's vacant. Sitting next to it is the ugliest two-story that's 15 years old and has no aesthetic understanding. Both of those came out of the same kind of cultural base. They're out in rural America. And, you ask, why did the rules change? How did the farmer originally know to get that really beautiful farmhouse? And how does the current farmer not appreciate that or seek or want that same level of knowledge?"

Furman—"It's always been said that it takes a good client to help produce a good house. If you have a client who's willing to explore different ideas about the way space can be arranged, is willing to look at different materials, then an architect with the right mindset can certainly design a much better house for the same price or maybe even a cheaper price. The problem is when somebody wants the typical house, or they're not willing to have a different model or a different relationship of rooms. It's hard for us to make that any cheaper than they would have gotten out on their own."



Courtesy Andersen Window

Mulfinger—"But many of the people who buy those want more and that's all they're being offered. They don't have the opportunity to find more because our profession isn't out everywhere like the builder is. We are available—and the number of residential architects is doubling every two years—but we're still a pretty tiny little group in the whole set of people serving this industry. I think the one thing that stands out about architects is they really are educated well in both aesthetics and general technological issues. So the question is can we put it to work?"

Furman—"There are quite a few architects in Austin that do design/build. They're having a great amount of success turning out buildings that are very interesting, at phenomenally cheap prices. Being the builder, they're able to go directly to a solution that is economical."

Mulfinger—"The principal advantage is they can shop for product. Once you become a builder, and if you're also the designer, then you can shop for product until you attain your value."

Binkley—"I think that's true. A lot of the enjoyment we had building our house was taking off-the-shelf materials and using them in slightly different ways. What are some more common things we can give uncommon uses to? That's part of what can we bring to the table with some builders."

Mulfinger—"Mortgage lenders are another big issue. They can't read charm in a plan. They can just read, oh, it's five bedrooms and three baths and it's 6,422 square feet with four garages. They know how to read that because it's quantitative. We've had success in either a) knowing the mortgage lender, so they know we do different things, or b) making sure the mortgage lender comes out at the end of the product.

"You know, one of the ways we manage the budget is to prioritize. We ask clients, what's the minimum you absolutely have to have until you'll say, oh, this isn't even worth doing? What's the next level of stuff you'd like to have above that? And then, if you could have the house you always wanted to live in, what are some absolute fantasy ideas you might have? Then we always pluck one of those fantasies and pull it into the base."

Vanze—"There's a real need for just making houses kind of, sort of, better. And I think kind of, sort of better lifts the boat. With a limited budget, there's only so much you can do but you can make it kind of, sort of better."

street talk

We commissioned a recent survey on design in the housing market. Conducted by The Farnsworth Group and sponsored by Andersen Windows, 448 architects, mostly custom, were interviewed. To provide a counterpoint, 150 consumers were also interviewed.

The architects:

■ 77% said their customers' understanding and appreciation of design has increased in the last five years.

53% responded that their customers came to them because they couldn't find the house they wanted anywhere else.

■ **71%** said their customers believe good design adds to the market value of their homes.

57% thought their clients would sacrifice square footage to improve the design quality of the house.

The largest percentage claimed labor and material costs were the greatest barriers to better design.

■ 67% were convinced that good design is on the increase in residential housing.

The consumers:

93% believe that good design adds to the market value of their home.

90% regard a good floor plan as integral to good design.

■ 47% said they would sacrifice high-end appliances and cabinetry, landscaping, and a media room to maintain the design quality of their house.

The largest percentage thought good floor plans and overall architectural design quality were what mattered most in their house.



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or years the unwillingness of the production housing industry to consider Modern design has irked Rodney Friedman, FAIA. He founded his San Francisco Bay area firm, Fisher Friedman Associates, in the 1960s, the heyday of popular Modernism. But since then, Bauhaus-influenced design has been reserved mostly for public buildings and custom homes, while spec homes have veered in a decidedly traditional direction. After many fruitless attempts to convince developers to think Modern, Friedman finally sunk a hole in one—on the golf course, of all places. "My golf pro, Al Hand, had a couple of lots he wanted to develop," says Friedman. "I convinced him there was a market for Modern housing."

Friedman agreed to help design two spec houses for the Sonoma, Calif., lots, working as a freelance consultant to save Hand from paying the firm's higher fees. The endeavor became a family affair when Alison Steppan, Friedman's daughter, and her husband, Mark Steppan, AIA, executive vice president of Fisher Friedman, signed on as project designers. The trio came up with a pair of distinctly different, very high-end houses-one whiteplaster-clad and inspired by the International Style, and the other a shingled, vaulted-roof affair with a glass-and-plaster link connecting its two wings. "They give people an opportunity to get something they can't get with other production housing," says Mark Steppan. The 2,700-square-foot homes are currently under construction, and Hand plans to market them for \$1.4 million to \$1.6 million apiece.

Now that he's gotten this project going, Friedman hopes it's just the beginning of a new wave of Modern spec houses. "I keep thinking there's an unserved market out there for all these young people who buy furniture at Ikea," he says. "Lofts and condos are contemporary, but not single-family houses. If this can be established as a successful way to build, it's a win-win deal." He benefits in the short-term, too. In return for his services, he's received an unlimited supply of free golf lessons.—*meghan drueding*







Partners; site plan courtesy Matthew Gaber

Rodney Friedman, FAIA, relished the freedom that developer AI Hand gave him to create two Modern spec houses in Sonoma, Calif. Friedman's daughter and son-in-law, Alison and Mark Steppan, AIA, served as his co-designers on the project.
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home front

calendar

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spring through winter

january 7-february 19 MAK center for art and architecture, west hollywood, calif.

Photographer Amir Zaki documents modernist homes that have been refaced and restructured due to multiple earthquakes, renovations, or redecoration, photographing the extreme underbelly of these once

Amir Zaki

idyllic but now ominous and monstrous structures. He digitally alters these suburban landscapes into fantastical and impossible architectonic structures and presents his investigations in a suite of photographs of swimming pools, fireplaces, and cantilevered buildings. For more details, call 323.651.1510 or visit www.makcenter.org.

open: new designs for public spaces

january 15–may 15 national building museum, washington, d.c.



Aljosa Brajdic, Damir Fabiujanic, 3LHD

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tea table, coffee table

february 25-june 12 milwaukee art museum

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John Gemblin

developments of two familiar furniture forms. The three-legged tea table was introduced to the U.S. in the 1720s by immigrant British craftsmen. The coffee table arrived some 200 years later and inspired the creation of a new type of literature: the coffee-table book. Prime examples of the tables will be on display. Shown: Coffee Table (1944–50) by Paul T. Frankl. Call 414.224.3200 or visit www.mam.org for more details.

emerging voices

works in progress march 3–april 16 museum of design, atlanta



This exhibition marks the

culmination of a yearlong process that began with a search for Atlanta's brightest emerging architectural talents. After a juried selection, winners will have their work displayed in the Jensen Gallery and will have the chance to present a lecture and to give a tour of one of their local building sites. Shown: Nam June Paik Museum (2004) by Jean Wu. For museum hours, call 404.688.2467 or visit www.atlantainternationalmuseum.org.

building energy 2005

march 15–17 boston world trade center

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-shelley d. hutchins

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Circle no. 236

k+b studio

kitchen: plane view

How do you transform a 5,000-square-foot industrial space into a comfortable residence without losing that sought-after urban loft feel? Winka Dubbledam used tactile surfaces, varied floor textures, and dipped ceilings to create warm public and private zones within the free-flowing loft. "Planes are introduced as connective membranes," she says, "not only by means of translucency, but also by the slicing of these planes, separating them into suspended, floating, and pivoting elements."

Such connective membranes include translucent glass panels around a U-shaped master bath, signifying the transition from public to private areas, and a 10-foot-long



The elongated, open kitchen is positioned at the geographic and soulful center of the loft. pivoting breakfast bar that swings out for guests or tucks neatly underneath a similarly cantilevered worksurface. The partitions physically separate and visually unite. By the slicing of these planes, says Dubbledam, "conventional domestic elements are transformed."

The loft's entrance is the elevator, so the kitchen was constructed as a freestanding wall that doesn't quite meet in the middle. This slice of air offers visitors a

hint of the surprises to come. The wall folds around necessary culinary appurtenances and exposes the kitchen to the rest of the living spaces. Dubbledam's idea "was that the client could cook and still be part of the whole apartment." A band of extruded aluminum and frosted glass cabinets are suspended above a bank of stainless drawers. The drawers surround the oven, dishwasher, and "completely invisible" refrigerator. Heralded only by a discreet door at the end of the wall, a narrow pantry stores bulky items and things, Dubbledam says, you just don't want to see.

project continued on page 44





Paul Warchol

Existing structural columns were left exposed and unfinished as a gritty foil to the sleek kitchen surfaces. One of the brawny poles supports the dual cantilevered islands.



William Geddes, beateworks.com



Paul Warchol

k+b studio

bath: meditation in blue

Dubbledam's concept of overlapping zones and spatial connectivity is most apparent in the master bath. "I took everything a bathroom needs and wrapped a low surface around all of those—two sinks, tub, toilet." The Aegean blue topographic form is made of a light wood frame wrapped in fiberglass and



coated in a thin layer of waterproof structural cement plaster. The unit was built upside down like a boat, then inverted into place. The floor is also coated in the same waterproof plaster to accommodate a freestanding shower.

Lighted niches of pale green glass tile pierce the blue surface. Stainless steel sinks and an institutional steel toilet preserve the loft's industrial edge. "I really like the shape of prison toilets, plus they're made to keep people from hurting



Contrasting the master bath's rhapsody in blue, the powder room is a symphony in stainless steel.

themselves," chuckles Dubbledam. An existing rough wood column supports an oblong mirror and warms the layers of cool surfaces. Sumi glass, a Japanese glass with an interior film that can be specified in various levels of translucency, constitutes the bath's three-sided partition. The floating glass divider turns up again to encapsulate a private library and two guest bedrooms.

The whole bath is kind of a meditation, Dubbledam says. "I was thinking of an airplane at night with low intimate lighting. Flick off the bright ceiling fixtures and a glow emanates from the lighted niches, a soothing flight of fancy." —*shelley d. hutchins*



architect: Archi-Tectonics, New York City

general contractor: A.J. Greenwich Contracting, New York; glass walls: United Aluminum, New York; plaster: Art in Construction, New York; pivoting bar: Habitat Design, New York; structural engineer: Severud Associates, New York.

resources: kitchen cabinets: Boffi; cooktop, oven, and dishwasher: Miele; refrigerator: Sub-Zero; faucets: Kroin; toilets: Metcraft.



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perspective

urban acupuncture

a san diego firm sees new possibilities for healing the housing crisis.

by teddy cruz

fter decades of absence from the main spheres of architectural discourse, the phenomenon of the metropolis as a site for research and experimentation is beginning to recapture the imagination of architects. This renewed attention our profession is giving to the socio-cultural, political, and economic forces at stake in the city could redefine the operational processes of architecture itself, as well as the role of architects in the context of city development. Certain practices in contemporary architecture and urbanism are generating the re-evaluation of notions we have perpetuated as immutable in describing certain typologies and concepts in our field.

In the context of this paradigm shift, it is clear that one of the most important issues we need to question is housing and its relationship to the urbanism it occupies. Conventional ideas of housing-in government, financial, and academic institutions, for example-generally define it as an equation, a number. In the same way, density has been understood solely in terms of building size and mass. Both concepts



Courtesy estudio teddy cruz

At "Living Rooms at the Border," estudio teddy cruz will weave 12 affordable housing units across a concrete framework. The open space underneath will function as a marketplace, among other uses.

need to be redefined as sets of relationships within a broader framework to promote new types of density and land uses. Housing and density need to be seen not as an amount of units but as dwelling in relationship to the larger infrastructure of the city, which includes transportation, ecological networks, the politics and economics of land use, and particular cultural idiosyncrasies of place.

new view

In fact, the political and cultural dimensions of urban housing and density as tools for social integration have been the central inspiration for our work in San Diego. We're proposing that fragments, voids, and leftover urban spaces be transformed to support hybrid and layered programs for flexible, affordable housing, civic and commercial uses, and public spaces. These are the ideas fueling the social housing projects we are designing on both sides of the San Diego-Tijuana border. The goal has been to achieve maximum effect with minimal gestures, to take existing patterns of use as a point of departure, and to develop urban solutions with enough persuasive force to change obsolete planning policy and zoning regulations.

"Living Rooms at the Border" is a small project that anticipates San Diego's needed densities and mixed uses. It has also become a political instrument for its nonprofit developer, Casa Familiar, to transform zoning regulations for the border community of San Ysidro, Calif. Casa Familiar's role as choreographer of a triangulation between community, architectural practice, and government agencies suggests that the most experimental work in housing in the United States lies in the hands of progressive, community-based nonprofit organizations, and within small communities such as continued on page 52

perspective

San Ysidro. The agencies that engage the social dynamics of these unique neighborhoods daily can mediate between their histories and identities and the planning policies that shape their destiny. Also, these nonprofits' socio-cultural agendas translate into unique organizational strategies, inclusive of the specificity of individual communities and places.

The objective of "Living Rooms at the Border" has been to distill the essence of this community's patterns of use, and to let these patterns become the basis for incremental design solutions with a catalytic effect on the urban fabric. Such a tactical approach generates prototypical solutions, and perhaps paradigms for densification in other cities. In a parcel where existing zoning allows only three units of housing, the project proposes (through negotiated density bonuses and by sharing kitchens) 12 affordable housing units, a community center resulting from the adaptive reuse of an existing 1927 church, offices for Casa Familiar in the church's new attic, and a garden underpinning the community's nonconforming micro-economies, such as street markets and kiosks. In a place where

> "the goal has been to achieve maximum effect with minimal gestures."

current regulation allows only one use, we propose five different uses that support each other. This suggests a model of social sustainability for San Diego, one that conveys density not as bulk but as social choreography.

living framework

Our "Manufactured Site" project in Tijuana, Mexico, is a very different investigation of the same issue, the notion of housing emerging out of community interaction. It explores how the area's informal settlements grow faster than the urban cores they surround, creating a different set of rules for development and blurring the distinctions between urban, suburban, and rural. These startup communities gradually evolve, or violently explode out of conditions of social emergency, and are defined by the negotiation of territorial boundaries, the ingenious recycling of materials, and human resourcefulness. For the "Manufactured Site," we are proposing a prefabricated building frame that can act as a hinge mechanism to support the multiplicity of recycled materials and systems that residents bring from San Diego and reassemble in Tijuana to create makeshift dwellings.



Courtesy estudio teddy cruz



The "Manufactured Site" in Tijuana, Mexico, consists of a prefabricated metal frame that reinforces residents' makeshift dwellings without disturbing their traditional, community-based building process.

These structures are fragile, as is the topography of the land they occupy. The frame could be the first step in the construction of a larger scaffolding that would help strengthen the otherwise precarious terrain, without compromising the temporal dynamics of these self-made environments.

We want to give the layered complexities of these sites primacy over the singularity of the object. In our view, housing is less about a collection of objects and more about participatory community processes and the resourcefulness and organization of people. By bridging between the planned and the unplanned, the legal and the illegal, the object and the ground, as well as man-made and factory processes of construction, the "Manufactured Site" questions the meaning of manufacturing and of housing in the context of building community.

Together, these two projects represent the range of issues that define our work, allowing our practice to straddle both sides of the San Diego-Tijuana border. They have ignited real processes of intervention within the multiple forces that shape this divided territory. They have also challenged the incremental homogenization of architectural styles and exclusionary planning and zoning practices that oppose the forces arising out of the continually changing and expanding "border condition." This situation has prompted our search for a participatory political process advocating, instead, an urbanism of juxtaposition, inclusive of sociocultural patterns of use that can promote alternative housing prototypes.

Using the border zone as a laboratory has encouraged us to observe thriving conditions in existing neighborhoods, focusing on the dormant potentialities of under-utilized elements, spaces, and urban infrastructure. Many lessons can still be learned from the "great bi-national metropolis" stretching from San Diego to Tijuana, where radically different economic and cultural spheres clash and overlap as they embrace recurring waves of immigrants from around the world. A different notion of housing can emerge out of this geography, pregnant with the promise of generating an urbanism that admits the full spectrum of social and spatial possibility. ra

teddy cruz is principal of estudio teddy cruz in san diego, calif.





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the case for architects in residential design.

by cheryl weber

he act of design is an intangible concept that eludes most people. They might know good design when they see it, when they get something they can lay their hands on or walk through. But they have a hard time grasping the intellectual work that goes into making something as complex as a house. Unfortunately, that gap creates a catch-22 for architects. Part logical, part magical, a good house looks inevitable, like the obvious fit for a client and site, and so people underestimate the effort required to design and build it. And until they live in a house made for them, they can't fully appreciate how it will enhance their lives. Even veteran architects struggle to explain the dynamics of success. "Good architecture, in the end, is greater than the models and drawings," says architect David Salmela, Duluth, Minn. "We don't know the secret to making good architecture; it surprises us."

That being the case, homeowners could be forgiven for feeling a bit squirrelly about hiring an architect. At a time when modifiable stock plans are a mouse click away, spending



Illustration: Hadley Hooper. "Value" house inspired by the Push-Pull House by David Jameson, David Jameson Architect.

countless hours and tens of thousands of dollars in design fees for personalized architecture is a risk, particularly so for people of modest means. But to put things into perspective, it's not so different from hiring a financial planner, Salmela says: "Yes, architecture is hard, but everything is hard. It's hard to give a financial planner \$50,000 and tell him to make it grow when you're watching the stock market go up and down. You have to do your research on whom to trust."

The problem is that when it comes to design services, most people don't know what they're shopping for. Programs such as The Learning Channel's *Trading* Spaces and HGTV's Extreme Homes have raised the public's awareness that design matters. But because the popular media focuses more on cosmetic fixes than on space planning, it does a poor job of showing people how and why design works. Left to their own devices, homeowners will compare continued on page 60

practice

real estate prices or square footage costs.

"You hear stories about how architects are valued [in other countries]," says Richard Williams, AIA, Richard Williams Architects, Washington, D.C. "I'm afraid here we're seen as a kind of handmaiden to the construction industry. We have to justify the value of what we do." A polished portfolio helps potential clients "get" what architects do. But it often takes more than that to close six- and seven-figure deals. Many architects are sharpening up their sales pitch by spelling out the value they bring to residential design. Some are also taking a second look at their services, this time with an entrepreneurial eye. A 15 percent design fee makes sense to people building a \$1 million project, but it shocks those who want a \$300,000 house. So an increasing number of architects are focusing their efforts to capture a broader share of the market without sacrificing precious profits.

design tutorial

Fortunately, the notion that a smaller, smarter, higherquality house is better than a big mediocre one is starting to take hold across America. Clever economy is sound design, pure and simple, and it's one of the best arguments for hiring an architect. (This might be a good time for *Super Size Me 2*, written and directed by an architect.) Most clients will buy into the idea that they can get jewel-like spaces that are tailored to fit them, and that they can afford the design fees because they haven't built an enormous house that isn't well thought-out. "At the end of the day we can usually provide a great project in a small footprint for the volume, and it puts us in the mainstream of what was always good work," says Williams, whose fees range from 15 to 18 percent of hard costs. "It's a way of getting back to a tradition we've lost as a culture. We talk about this at great length in our interviews, and it's a matter of negotiating a process that most people see as being unnecessarily expensive."

The Los Angeles architecture firm Fung + Blatt also spends a great deal of time helping clients think outside the box. Instead of reaching for square-foot prescriptions, Alice Fung and Michael Blatt look for ways to double up on room functions and create vistas that make a house feel expansive. And they can keep costs in check by specing architecturally expressive materials that are easy to install but that aren't in the vocabulary of most builders. The 1,650square-foot house they built for themselves and their two daughters in the hilly Mount Washington section of Los Angeles has shown their middle-class community that site-specific design improves everyday life. Neighbors often request bythe-hour consulting sessions. "We give broad-stroke ideas

the 10 best reasons for hiring a residential architect

1. The house can be tailored to fit the current and future needs of its occupants.

2. A space-efficient, smart house is better than a big dumb one.

3. Architects are inventive with materials and details.

4. An architect safeguards a home investment by observing its construction.

5. A one-of-a-kind house plays up the best qualities of its environment and culture.

6. Sensitive siting saves energy and resources.

7. It's a way to explore many different design options quickly.

8. There's greater potential for the house to increase in market value.

9. The house's owners get to live in an original piece of art.

10. Building a house should be fun.

so they know there are possibilities beyond the most obvious," says Alice Fung. "We have an incentive to take on that kind of work as a way of improving the fabric of the neighborhood."

Fung and Blatt make sure clients understand they're not just pulling the design out of a hat. And although each design is unique to the site, the owners, and the program, design fees account for less than 50 percent of their work; the rest is figuring out ways to execute it. The architects explain their services from sketches through construction checkups, giving specific examples of what they provide at each phase. "When clients understand the

amount of work that's involved, they realize the money they spend on our fee is well placed," Fung says.

Indeed, Ed Hord, FAIA, chair of the AIA's housing committee and a partner at Hord Coplan Masht, in Baltimore, Md., points out that in addition to getting an artful design that will live well and appreciate over time, hiring an architect is a way for clients to safeguard their investment. "People pay a lot of money for insurance over time and don't think about it," Hord says. "If an architect is doing his job, clients will save money by having a professional who looks out for their interests."

continued on page 62

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practice

Although it's possible to get a house built from basic drawings, a set of detailed specs is an insurance policy against confusion and even contractor fraud. With those blueprints in hand, clients can be sure they're getting quality materials, and they can compare apples to apples when the bids come in.

architecture a la carte

Lots of clients are already converts to this way of thinking. But other obstacles get in the way. Many people are highly sophisticated aesthetically but can't afford to pay for full services. Intellectually, those are often the best clients, and even extremely high-end firms accept such projects from time to time. At the other end of the spectrum, wealthy clients may bring a different sort of baggage. Often they're instinctively distrustful and expect to be taken advantage of financially. Both types of client fear losing control over the budget and the process. That's why John Connell, AIA, Warren, Vt., who is the founder of Yestermorrow, a design/build school, offers buy-as-you-go services. He says it helps clients economize if they need to, while taking the edge off of the uncertainty.

"a house offers an opportunity to be extremely site-specific. that's where a talented architect can make a huge difference.

-david arkin, aia

Connell shows clients the AIA-approved schedule of services, giving them the option of doing some of the legwork themselves. He charges a flat fee for the schematic design and an hourly rate thereafter. "I understand why a lot of people don't want to pay for construction supervision or certain other aspects of full design service," he says. "So I explain everything that can go wrong and right. If they choose to omit some part of my services, I explain the precautions we should take so they can navigate without me. Basically, it's all about education."

The biggest problem continued on page 64



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practice

with a la carte fees is that people usually start to economize at the wrong time-during construction observation. "When things start to go wrong, they're embarrassed to see what a mess they've allowed it to become," Connell says, "and so they don't call until a lot of damage is done." To guard against such chaos, he charges \$150 per hour for design development and construction documentation, with the agreement that he will make periodic site visits on his own schedule at no extra charge. If the clients request additional meetings during construction, they pay a reduced hourly fee of \$100 per hour. "I'm making sure that all the work I put into this design will be followed through on during construction," Connell says. "Otherwise, clients will inadvertently compromise the project's quality."

It's not hard to convince people that houses are most successful when they're designed down to the doorknobs. But if a homeowner has to choose, what is the greatest value architects provide? "I think it resides in the most fundamental moves—how we understand the landscape in terms of siting, and figuring out the program and the massing of a house," Williams says. "Those things can achieve 75 percent of the real value of what we bring. The quality of our work doesn't hinge on every single detail, although it's certainly reinforced by that." He adds, "It's rare that we've simply done the front-end work and then walked away. In the couple of instances it's happened, the people have still gotten a great project, and they usually come back later to tell us how much they appreciated what we did do. You could

wrestle with that as the basis for a practice."

shades of green

David Arkin, AIA, Arkin Tilt Architects, Berkeley, Calif., agrees. "A house offers an opportunity to be extremely site-specific. That's where a talented architect can make a huge difference," says Arkin, who is also president of Architects, Designers, and Planners for Social Responsibility. He and his wife, Anni Tilt, have built a practice around energy- and resource-efficient design that is highly sensitive to the landscape and climate. continued on page 66

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The firm's knowledge of alternative building methods, such as rammed earth and straw bale construction, also appeals to a growing subset of potential clients. After completing a straw bale house on a relatively flat site, Arkin and Tilt modified the plan and offered it for sale on www .healthyhomedesigns.com. "We are very clear about

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For more information, log on to www.bilco.com, or call (800) 854-9724 Circle no. 206 which way the house needs to be pointed in order to work properly," Arkin says. "I'm a big believer in the ability of straw bale construction to create energyefficient and beautiful homes, so we're hoping to embark on a series of modest, affordable straw bale designs. It's our belief that you shouldn't have to be ultra-wealthy to build an exciting shelter."

Concord, N.H., architect Dennis McNeal, AIA, who also specializes in sustainable design, is sometimes asked to tweak stock plans from mainstream sources. Usually he can satisfy the clients' needs with less square footage. "I tell them, 'Had you built the mail-order plan, it would have cost you this much above the cost we came up with. Instead, you'll pay my fee and get an earthfriendly house that fits you now and 20 years down the road," says McNeal, who charges roughly 8 percent for design. "They need to look at my fee long-range, amortized over 30 years."

model behavior

There's no getting around the fact that one-of-a-kind architecture takes a lot of time. At some point, architects tire of defending and massaging their fees: Either clients get it, or they don't. They can pay for it, or they can't. But another way to satisfy the architectural soul of middle-class America is to offer architecture en masse. Five years ago, *continued on page 68*



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INSULATION



practice

Vetter Denk Architects, Milwaukee, diversified into development so that it could touch people in the \$150,000 to \$400,000 price range (and on up). Through density, efficiency, and repetition, the firm can omit the high design fees while still offering some degree of customization and sitespecific architecture.

"We struggled with it for many years—this huge group of people who see the value in architecture but can't fit it into their budget," says partner John Vetter, AIA. "Being our own developer was the most logical solution we could see, rather than cutting our fees to provide architecture, or providing half a service. We're becoming our own largest client."

The firm brings 20 years of residential programming experience to the urban condominiums, row houses, and single-family homes it's been building in Milwaukee and, most recently, on the Fox River waterfront in Green Bay, Wisc. But it hasn't abandoned individuality. The architects are offering everything from raw to ready-made. For example, at Park Terrace-21 row houses and 17 singlefamily homes in Milwaukee's Beerline neighborhoodclients can purchase one of three palettes that take the guesswork out of interior design. Buyers may upgrade the level of finishes in each package, tweak the floor plan, or wipe the slate clean and pay an hourly fee for custom work.

Sound familiar? Maybe, but it far exceeds the design rigor and level of customization that most home builders offer.

"There's an affordable shell; it's spatially interesting, takes advantage of sunlight, prioritizes views, and really thinks about cross-ventilation," Vetter says. "Right there it starts to exceed the production model." A fully custom floor plan is still less timeconsuming than starting from scratch. The firm worked with one client to incorporate an elevator lift and penthouse artist studio. "It's a unique floor plan that only worked for them," Vetter says. On the other hand, "someone can say, 'I love your base package,' and doesn't have to

spend a penny more."

Not far away, David Salmela is offering something similar for suburbanites. Working closely with a developer and a landscape architect, he's designing a community of freestanding homes at Jackson Meadow in St. Croix, Minn., and Mayo Woodlands, in Rochester, Minn., ranging in price from \$250,000 to several million. Each house is designed for an individual client, yet they all share common materials and proportions that are rooted in the local culture. "The biggest impact is what people see as they drive in," Salmela says. "Everything is in harmony, but nothing is duplicated. It's like one family where you have a lot of kids. They all come out of the same gene, and it cuts the design fee in half." The homes have predictable costs, and they've grown in value because they're well designed. Homes built for \$350,000 four years ago now appraise at \$650,000.

Yes, good architecture is ambitious, but most of all it's optimistic. "It's the broadminded people who realize what we're trying to do, and they're the ones who come in and buy," Salmela says of his clients at Jackson Meadow and Mayo Woodlands. "When we're done, everyone will want to be here." ra

cheryl weber is a contributing writer in severna park, md.



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new visions

by meghan drueding, nigel f. maynard, and shelley d. hutchins



At *residential architect*, we've been carefully keeping tabs on the new wave

of Modern prefab housing. Mindful of the way like-minded movements have sputtered out in the past, we've had our doubts about the power of prefab to fundamentally change the housing industry. So we consulted established architects, educators,

and other experts on the front lines of the battle to improve the built environment. And we investigated a cross-section of prefab-focused firms—some relatively experienced, others just getting their feet wet. Our research convinced us that prefabricated building methods have a

real shot at becoming more than a flash in the pan. If the current crop of prefab architects can find a way to control quality, cost, and timing issues, they just might provide

a fresh answer to the constant question of how to mass-produce high-quality housing.







From top: Courtesy Office of Mobile Design; courtesy Resolution: 4 Architecture; courtesy Michelle Kaufmann Designs; Geoffrey Warner; Robert Humble





jennifer siegal office of mobile design venice, calif. vision: control the factory process

> Jennifer Siegal has worked on a kibbutz in Israel, traveled throughout Southeast Asia observing nomadic structures, and lived at the remote Chinati Foundation in Marfa, Texas. But the most important trip she takes these days is to prosaic Rancho Cucamonga, Calif., where production of her prefab designs takes place. Unlike many of her prefab peers, she works exclusively with one factory. "The facility I use builds one-off things for clients like NASA and Disney," she says. "I went to them when I realized the manufactured housing industry was not open to change." Siegal has always followed her own path. She started thinking seriously

about mobile homes while teaching in North Carolina in 1996 and

'97, at a time when few architects thought of a trailer as an intentionally designed object. "I noticed all the bad mobile design around me," she said. "It seemed nobody had been rethinking trailers. I started using them in my classes, having students take old trailers and manufactured housing and rework them." The concept of movable, flexible structures took hold of her, and it wouldn't let go. The SCI-Arc graduate moved back to Los Angeles in 1997 and started her firm, Office of Mobile Design, the next year.

> OMD designs some stick-built projects as well as truly mobile structures such as the interactive, collapsible ice-cream kiosk it did for Häagen-Dazs. With housing, though, its main focus falls somewhere in between. The two prefab prototypes the

firm designs and sells, the Portable House and the Swellhouse, both sit on permanent foundations. They bridge the gap between the site-built and the mobile, harnessing the construction quality of the former and the mass production capabilities of the latter.

The modular Portable House is completely assembled at the factory and arrives ready to install. Buyers can choose from 10 floor plans and two sizes, depending on their needs and budget; a 12-foot-by-40-foot unit costs \$79,000, and a 12-foot-by-60-foot unit goes for \$125,000. The Swellhouse, on the other hand, is a customizable residence made up of panelized walls on a steel frame—components are shipped and assembled on site. It costs about \$180 to \$200 per square foot to build the Swellhouse in the L.A. area, but costs vary depending on the location and the client's choice of materials.

Both models took Siegal years to develop. "It's a lot more complicated than just putting together a kit of parts," she says. Her determination to make her prototypes into viable products extends well beyond their design and fabrication. She's also done much of her customers' logistical legwork, establishing





The Swellhouse, the firm's customizable prefab prototype (above and right) consists of structural insulated panels wrapped around a pre-engineered steel I-beam frame. The frame's S shape allows for uninterrupted loft-like spaces and large expanses of glass.

"it's a lot more complicated than

Danny Turner



Office of Mobile Design's watchword is flexibility. Its modular option, the corrugatedmetal-and-translucentinsulated-plastic-clad Portable House (left) can be permanently stacked or joined with other Portable Houses to create a variety of living spaces.



Because its plan and materials are adaptable according to the client's wishes and budget, the Swellhouse can fit any site and climate condition.

just putting together a kit of parts."-jennifer siegal

residential architect / january · february 2005

prefab confab

factory-built houses are the new darlings of the media and the architectural community, but can prefab really bring high design to mainstream housing? leaders in architectural practice and theory speak out.

Martin Moeller

Senior vice president for special projects National Building Museum Washington, D.C

"Sustainability issues are causing many architects to re-examine fundamental assumptions about how we build, and prefab does offer the potential for bringing 'high design' to a greater number of people. I think we'll find, however, that it is still just a drop in the bucket of the housing market. The vast majority of people still seem to want detached housing that is increasingly large and fulfills certain images about how to live comfortably. Many people will continue to have negative associations with prefab housing, even if that prefabrication is not immediately evident in the finished house."

Randy Brown, AIA

Randy Brown Architects Omaha, Neb.

"It beats the hell out of tract housing. In colder climates, it's an opportunity to build indoors. There are efficiencies that could translate into more architecture for less money, and it could compete with tract housing as a much higherquality product."

Peter Bohlin, FAIA

Bohlin Cywinski Jackson Wilkes-Barre, Pa.

"It's inevitable. The future holds a good deal of factory-built housing of one sort or another. I'd want to see prefab housing that is well-conceived and well-detailed, and that can take many forms, from trailers to prefab parts that are assembled on site. Prefabrication is a way for architects to reach a much larger audience and to serve society well."

Hugh Jacobsen, FAIA

Hugh Newell Jacobsen, Architect Washington, D.C.

"The front line of architecture has always been reasonable and low-cost housing. There's no question prefab is the right way to go, and we've never done it. The problem is that the manufacturer, let alone the designer, rarely takes into consideration proportion and scale. The house is designed to accommodate the machine and budget costs. I am suspect."

continued on page 81

new visions

relationships with real estate agents and financial consultants who are open to the concept of prefab. Her cover-all-the-bases strategy seems to be working: Since the homes became available to the public in 2003 (Portable House) and 2004 (Swellhouse), OMD has sold eight of the former and five of the latter. It's also designing an L.A. artists live/work community of 40 Portable Houses, as well as two low-income housing projects, each of which will contain a combination of 40 to 60 Portable Houses and/or Swellhouses.

In addition to exploring both panelized and modular construction, Siegal has also investigated the potential of using shipping containers as prefab building components. In 2003 she and her firm finished work on the Seatrain House, a 3,000-square-foot custom home in downtown L.A., built from containers and structural steel. "I learned a lot from that project," she says. "I usually don't recommend containers, mostly because you can't get a permit for them in L.A. But the idea of using seagoing refuse is really interesting." Other notable projects include the master plan for an on-the-boards development of Modern prefab houses in Joshua Tree, Calif.; the Eco-Skate House, a custom modular residence for a professional skateboarder in Malibu, Calif.; and the Hydra House, an unbuilt underwater dwelling the firm designed in two different versions for *Popular Science* and *Wallpaper* magazines.

The Hydra House's futuristic skin and interiors signal another one of Siegal's fascinations: ultra-high-tech, high-performance building materials. She devoted much of her 2002–03 Loeb Fellowship at Harvard's Graduate School of Design to studying them, and is writing a subscription-only publication for Princeton Architectural Press, to debut this month, called *Materials Monthly*. "Subscribers get a box with samples of three materials and a book explaining them," she says. "The only way that this stuff will get out into the world is if architects use it in their practices."

Yes, Siegal is a busy woman. And her biggest production yet is in the pipeline: Inhabitable Art, a collection of prefab house designs by 10 well-known architects, will be built in a new, fully automated manufacturing facility she's building in Riverside, Calif. (OMD will release more information on Inhabitable Art later this year.) When she needs a break from designing, running her six-person firm, writing, and public speaking, Siegal leaves her Venice, Calif., house and goes mobile in her 1972 Airstream down to her trailer in Baja California, Mexico. Siegal clearly has a personal stake in the future of prefabricated structures, and her motives for believing in them are as big-picture as they are practical. "Economics is definitely one reason, although prefab is not always cheap," she says. "And the tolerances are very tight and precise. But one thing I've realized over the years is that too many choices overwhelm people. They want things whittled down because time is a factor." If she has her way, a well-designed and well-built house will be the only choice there is. -m.d.





The office's one attempt to date at working with shipping containers as building modules yielded this custom home in Los Angeles (above, center, and far right), finished in 2003. Among its imaginative container-made features are a koi pond and lap pool.



Siegal's vision extends well past single-family houses. She's working on multifamily projects, including the Eco-Ville, an artists live/work project in downtown Los Angeles made up of 40 stacked, staggered Portable Houses on a 2¹/₂-acre lot.

Photos: Undine Pröhl; renderings courtesy Office of Mobile Design







The future of housing may not be limited to land. Siegal's theoretical proposal for a fully submerged house (left), designed in different versions for two magazines, desalinizes its own water.

Russell Versaci, AIA Versaci Neumann & Partners Washington, D.C.

"I'm convinced that creating plan books for houses that are shop-built as a kit of parts is a very good way to produce traditional architecture. It's not the highest-quality way to build, but 'good' has to become acceptable so more people can fulfill their dream of a well-designed traditional home. The housing industry builds 4,000 houses a day. There's no way architects can service that number of people without finding better means to deliver what we do."

Adele Chang, AIA

Lim Chang Rohling & Associates Pasadena, Calif.

"Prefabrication is one solution among many to the housing crisis. I don't think we have the will to do high-density prefab housing in the U.S. The American dream of a little plot of land is still strong. But it's time for prefab's stigma to be broken. There's a lot of design opportunity there."

Sarah Susanka, AIA

Susanka Studios

Raleigh, N.C.

"It's an idea whose time has come. Today's technologies allow people to actually experience what good design can be, so there's finally a large enough audience that wants to buy it. People are willing to spend a little more per square foot for a well-designed house. They want it in a timely manner and don't want to have to reinvent the wheel. However, the pressure to make things cheaply is unbelievable. Architects have a role to play in making sure prefab doesn't go to the lowest common denominator again."

Peggy Deamer

Assistant dean at Yale School of Architecture and author of *The Millennium House* New Haven, Conn.

"The notion of creating a sophisticated prefab house as the perfect country dwelling for middleclass intellectuals is interesting, but it's too narrow a market. The way it's being promoted now—with the assumption that you can afford a gorgeous piece of property, and then you're going to put a prefab unit on it—creates a mixed picture of that economic bracket. I think we need to pick up on this but deploy it in a different way. Prefab needs to expand into areas *continued on page 83*

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rob luntz and joe tanney resolution: 4 architecture new york city vision: customize modular typologies

It all started with a loft. Dozens of lofts, actually. For 15 years, the New York City firm Resolution: 4 Architecture has relied on a steady diet of loft renovations. "Doing a lot of high-end residential work in New York, we've learned to maximize each and every inch of space," says co-founder Joseph Tanney, AIA. Hearing his loft clients bemoan the lack of Modern housing options outside the city gave him and partner Robert Luntz, AIA, some food for thought. If they could design a minimal box within an existing building, they reasoned, why couldn't they do the same thing on its own—a free-standing loft? And, for that matter, why couldn't they repeat the module

over and over again, offering home buyers an affordable Modern housing option? "It's a natural extension of our work to be designing within a box," Tanney says. "We've been doing this since we started." Tanney and Luntz, whose combined resumes include stints with

Gwathmey Siegal, Peter Eisenman, FAIA, and Perkins & Will, knew they weren't the first to imagine mass-produced Modern housing. "Most architects over the age of 40 will say they've been interested in it at some point," Tanney says. For several years the idea was just that to them-an interest, rather than something they actually pursued. But around 2002 the revitalized prefab movement caught the attention of the media, and the deluge of press spurred Tanney and Luntz to stop dreaming. After researching all aspects of the prefabricated housing business, they decided to focus on modular designs. And they came up with an angle most of their failed predecessors hadn't tried: working within the system, rather than trying to change it from the outside. Instead of expecting manufacturers to adapt to their ideas, they decided to design houses that could be built using established factory procedures. Since the industry wasn't seeking out Modern designs, they'd bring

Modernism to the industry.



The next test for Resolution: 4 will be the completion of 20 or so prefab homes it's now designing, including the House for Fire Island (above), whose modules will be delivered by barge.

"it's a natural extension of our work to be designing within a box."—joe tanney



The key to the firm's modular program lies in its site specificity. The Hawk Ridge Residence will contain a customized central dining porch that opens up to the outdoors.









Each modular home by Tanney and Luntz's office represents an adaptation of their modular typologies. The Mountain Retreat (above) is a cross between the Lifted Bar and Two-Story Bar, and the Retreat House (left) is a customized blend of the Offset T, 3-Bar Bridge, and Two-Bar Slip. where it can fill a functional niche and doesn't rely so much on its aesthetic appeal. England has some remarkable prefab housing projects that work within a tight economic bracket and look good, but have a conservative aesthetic. Ikea in Sweden is marketing a prefab housing complex called BoKlok, which aims at a market I think is important for the U.S.—newlyweds, recently divorced, mixed and transitional families, single parents—people who can only afford a communal situation. I think that's pretty smart."

Allison Ewing, AIA

William McDonough + Partners Charlottesville, Va.

"Modularization can tip the scale toward massproducing building materials that can be disassembled and turned into something else. If you start to do something at a certain volume, the potential for controlling the process is increased, whether it's construction waste management, getting the HFCs out of the Styrofoam, or finding sources for sustainably harvested woods."

James Cutler, FAIA

Cutler Anderson Architects Bainbridge Island, Wash.

"High design is not as important to me as the question of whether we can achieve a benign relationship to the landscape and a clear expression of materials through prefab housing. We've embarked on a journey with Lindal Cedar Homes' house kits. Our best work being a 10, we're getting about a seven on the use of materials and the fit with the land. Most buildings out there rank two or three, so there's some level of success. But the jury is still out."

Larry Scarpa, AIA

Pugh + Scarpa Architecture Santa Monica, Calif.

"There is nothing more cost-effective than local/regional technologies and local labor. Despite the renewed interest in prefab, it's still very difficult to make it affordable. Prefab homes work because they have a system, a plan, and a dimension. But I don't think there's a homeowner who doesn't want to have a say in what his house looks like."

Kevin Culhan, AIA

Vice president of architecture Donald A. Gardner Architects Greenville, S.C.

"We've seen an increased interest in panelized construction but are not aware of a renewed interest in prefab housing. High design will always require a level of craftsmanship and uniqueness that a standardized system will not be able to offer, although aspects of prefabrication will surely

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"architecture needs to be site specific. you can't just plop down mcdonald's everywhere." —joe tanney

Once the pair had established their course of action, they designed a series of six modular housing typologies. Several variations exist within each typology, and each one can be customized and combined with other modules to create a house tailored to its site and client. For example, the Dwell Home, Resolution: 4's winning entry in *dwell* magazine's 2003 prefab invitational, is a modification of the Two-Bar Bridge, a subset of the Standard Bar typology. And the firm based a just completed 2,500-square-foot home in Annapolis, Md., on the Z Series typology, adapting it to fit a narrow site, channel waterfront views, and save an existing tree. The system refutes the notion that prefab doesn't take the site into account, a subject Tanney feels strongly about. "Architecture needs to be site-specific," he says. "You can't just plop down McDonald's everywhere. We're not interested in perpetuating the complacency of American suburbs."

Such mass customization doesn't exactly come cheap, but as a rule it costs significantly less than pure custom, site-built projects, which still account for half the firm's work. As a point of comparison, take two houses it's doing within a few hours of each other in New York state. One, a customized modular residence, costs \$175 to \$200 per square foot. The other, a site-built custom home, tops out at \$300 to \$350 per square foot, nearly twice as much. And the price of Resolution: 4's modular homes could decrease as time goes on. According to Tanney, 60 to 80 percent of each module is built at a factory. The remaining 20 to 40 percent of construction—which can range from finish flooring and tile work to cabinetry and roofing, depending on the client's preferences—happens on site, and this variable drives up the home's overall cost. The more the architects can figure out how to do at the factory, the more affordable the final price tag will be.

Tanney admits his and Luntz's 10-person firm isn't yet making a profit from prefab, though it's getting close. Finding modular housing factories to collaborate with has proved difficult, due to the prevailing industry attitude that Modern houses are ugly and hard to sell. That may be changing, though. "Since all the buzz about prefab started, a number of the manufacturers have done focus groups and come back to us saying yes, there is a market," he says. A couple of panelized housing companies also have approached Resolution: 4 about designing prefab prototypes for possible production down the line. So the firm's future just might include panelized construction, as well as the modular system it's worked so hard to implement.

Its immediate goal, though, is to get the 20-plus modular homes it's working on (including a seven-to-11-unit artists' community) successfully built and occupied. "We're trying to hunker down and build," says Tanney. Has their considerable investment of time, money, and effort in prefab been worth it? "Hell, yeah," he says. "It's exhilarating. We're in this for the long haul."-m.d.





Cranes place Resolution: 4's second built modular house, in Annapolis, Md., onto its site (above). The firm' modular typologies (below) offer buyers a wide selection



The floor plan and window placement at this conventionally constructed house in Kent, N.Y., help bring in lake and forest views.





Photos courtesy Resolution: 4 Architecture

The Dwell Home, in

Pittsboro, N.C., (left and below) garnered a boat-

load of publicity both for

prefab housing in general.

Resolution: 4 and for

filter into mainstream housing. You can purchase the same automobile model as your neighbor's but get something more customized to your taste. The same level of fit and finish will be required for prefab to be accepted in the marketplace."

Allison Arieff

Editor of *dwell* magazine and author of *Prefab* San Francisco

"There's a much stronger national consciousness of design now, helped along by Ikea and Target; it's no longer an elitist movement. I'm seeing people who are frustrated by the experience of buying a home, and architects who are motivated to make a system that works for those buyers. Houses with enough options for personalization avoid the stigma of being bland. You see this business model in BMW's Mini Cooper, where people are buying into a brand but taking ownership of that brand by being able to make a different kind of roof. I'm also seeing a savvier group of architects who are taking a holistic approach to business, making the connection with financing and developers."

Dan Rockhill

Professor of Architecture University of Kansas, Lawrence, Kan.

"Yes! I do think it's a way to bring design to the broader public that cannot afford an architect. Increasingly, the entry-level home buyer is hip, went to college, likes the urban life, and has a clear disdain for suburbia. The best analogy to prefab houses is the Mini Cooper—mass produced but with enough options to let the owners feel they have a custom automobile. This will be the appeal of prefab, a little something for everyone at an affordable price."

Witold Rybczynski, Honorary FAIA Meyerson professor of urbanism

University of Pennsylvania, Philadelphia "Any prefabricated system that limits the appearance of a house will fail right away. A lot of the architecturally motivated houses are very different looking, and the market for them could fit on the head of a pin. People interested in prefab should look at panelized building technology as it currently exists. Unlike sectional homes, which have to be a box, these prefab walls can take on any shape you want. They're successful precisely because they don't dictate the appearance of the house."

Barry Berkus, AIA B3 Architects

Santa Barbara, Calif.

"I'm high on the idea. Prefab offers great opportunities, whether it's panels and modular components or entire houses made in a factory, and it's receiving a great deal more design

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michelle kaufmann michelle kaufmann designs novato, calif. vision: outsource sales and marketing

Architect Michelle Kaufmann and her contractor husband, Kevin Cullen, are conducting the ultimate prefab experiment. They're building their own Modern, site-built house in Marin County, Calif., while Kaufman sells the same design as a modular house she calls the Glidehouse. So far, there's not much of a contest as to which one she prefers. "It's costing us 50 to 60 percent more to have the house site-built, and after 11 months it's still not finished," she says. "I'd do it as a prefab in a heartbeat."

Kaufmann's personal and professional experiences make her an effective spokesperson for prefab. She spent five years working for Frank

Gehry, FAIA, serving as the project architect on such buildings as the Condé Nast Cafeteria in New York City and, in Sarajevo, the rebuilt National Library of Bosnia. When she left Gehry's office and moved to San Francisco's Bay area in 2002, she and Cullen were shocked by the cost of housing in the area. "It was just so painful," she says. "Since my husband is a builder, we decided to build a house for ourselves instead. Our friends and colleagues liked the drawings and started asking if they could have one too."

And so the idea of the Glidehouse was born. After much searching, Kaufmann convinced two Canadian modular housing factories, one in Vancouver, B.C., and one in Toronto, to produce her design. She lined up a well-established modular project management company, Construction Resource Group (CRG), out of Seattle, Wash., to oversee the factory process, shipping, and installation. Marketing consultant Marshall Mayer signed on to handle sales through his Web site, LiveModern.com. In February 2004 the Glidehouse went on sale, ready to be snapped up by eager young buyers.

> Or not-so-young, as it turns out. The variation in age and income level of her 20-and-counting Glidehouse customers has surprised Kaufmann. "I thought it would be younger people and first-time buyers," she says. "It is, but it's also people later in life who aren't so much interested in affordability as in living lightly on the land." The prototype comes in four standard sizes ranging from 672 to 2,016 square feet and has a base cost of \$120 per square foot, not including shipping, site work, and upgrades. Its simple Modern form reminds her of the rusted agricultural buildings she admired during her Iowa childhood. "They were designed not for how they look but

for how they function," she says. Some clients buy the smallest unit to use as a guesthouse or an



"there's less waste when a house is built in a factory. ... any extra pieces can be used on the next house."—michelle kaufmann



The Glidehouse adapts well to different sites and climates. The buyers of the original Menlo Park version had it shipped to Lake Chelan, Wash., where it now resides permanently.

Robert Cardin



Sustainable features permeate the Glidehouse, first built at *Sunset Magazine*'s Menlo Park, Calif., headquarters in spring 2004. Sliding glass doors and clerestories provide natural ventilation (below left) and strategically placed windows allow for ample daylighting (below).





Kaufmann saves

some time for site-built

curve- and angle-filled custom home (left) in

work, including this

Marin County, Calif.



Photos and rendering courtesy Michelle Kaufmann Designs

attention now than it did in the past—it may be the preferred way to build in the future. The strength is that you can create architecture that's flexible, from affordable to luxury housing. It gives you the ability to deal with someone who makes a house for you, almost like dealing with a car manufacturer. You can send pieces back and get new pieces sent to you."

Gary Lapera, AIA

Michael Graves & Associates Princeton, N.J.

"It depends on who's doing the prefab. Companies who've addressed not only the design but also the production and execution are farther ahead. Kit-home companies such as Lindal Cedar Homes have the best process because they manufacture a good product and they have a builder network to deliver it—that's 70 percent of the battle. But their products are expensive. The most promise I see for affordability is in modular components, particularly for use in urban markets, but it is such a fragmented industry. When people like Warren Buffet start buying into the prefab industry, they may have a significant impact."

Michael Pyatok, FAIA

Pyatok Architects Berkeley, Calif.

"The quest by architects to find a technological silver bullet that will solve the affordable-housing problem is often naive. As long as housing is treated as a commodity in a capitalist system, the technological advances that occur more often help the production end rather than the consumer end, and when they help both, it usually means a portion of the labor market somewhere has been hurt. If we do not look at the larger structure of our economy, then we will be blinded by the promises of technology as applied to housing production."

Mark Simon, FAIA

Centerbrook Architects and Planners Essex, Conn.

"This is an issue of class and perception. I don't think the current 'high design' will appeal to people who now use modular housing. As for upper-middle-class buyers, they are interested in many other issues beyond design—status, security, maintenance, convenience, ease of purchase, resale value. If a manufacturer could come up with a well-designed, superbly engineered modular home system, well then, yes, it might appeal to a few of the people who build custom homes now, just as exotic cars do. But I am not convinced it would be a great success across our culture."

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new visions

addition to an existing house—one is adding a Glidehouse onto his Eichler home in Palo Alto, Calif.

Most buyers opt for some level of customization, whether they're purchasing the Glidehouse or the Glidehouse 2, a two-story version that came on the market in June 2004. By outsourcing sales and some construction management, Kaufmann has given herself time to labor over individual design changes and upgrades. In addition to the Glidehouse, she also does all-custom prefab homes, with 10 under contract so far. And she's got a new modular model, which she developed in partnership with *Sunset Magazine*, debuting this month.

Sustainability ranks high on her list of priorities; it's part of what attracted her to prefab in the first place. "There's less waste when a house is built in a factory," she says. "They use a computer to cut members, and any extra pieces can be used on the next house." The Glidehouse's namesake wall of gliding glass doors promotes daylighting and, along with the clerestory windows on the opposite wall, helps passively cool the interiors. Green items such as bamboo floors and recycled-paper countertops come standard, and buyers can also choose environmentally sound extras including solar panels wind turbines, and geothermal heat.

Kaufmann hopes her business model will be sustainable too. And it's looking that way at the moment. She employs two architects at Marin Countybased Michelle Kaufmann Designs and hopes to add another this month. She's also enticed two modular housing factory veterans to join her as inhouse project managers. They'll supervise production on custom prefab jobs, while CRG will still manage the Glidehouse and Glidehouse 2. She's finalizing deals with factories in Idaho and Southern California and negotiating with several others. "Getting factories to see the potential of prefab was one of the hardest things," she says. "It's still a challenge, but it's getting better." As with any startup business, her cash flow has also taken a hit. "That's been the toughest part," she says. "We've kept our profits so low, in order to make the houses affordable, that in the beginning it doesn't pay off." But she has faith in the future of prefab. "If the Sears house were happening now, it would be very different," she says. "The technology is there now. A lot of the coordination that was never sorted out before can be done using FTP sites, live databases, and e-mail."

A small percentage of Kaufmann's time goes to site-built custom projects, houses filled with curves and billows influenced by the work of a certain deconstructivist. But she doesn't regret leaving the world of "architecture with a big A," as she calls the kind of projects she did at Gehry's office, to concentrate on prefab. "I'm definitely one of the strongest believers in a beautiful museum that thousands of people pass through every day," she says. "But this is affecting people's lives too, in a different way."—m.d.



In addition to its standard prototypes, the firm also des custom modular buildings. A beach house in Manhatta Calif, contains decks and a floating roof for optimal vie a hillside house (right) in Marin County, Calif., squeeze levels of living onto a narrow lot.





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Renderings and drawings courtesy Michelle Kaufmann Designs

"if the sears house were happening now, it would be very different."—michelle kaufmann



Among the several standard Glidehouse plans are the four-bedroom courtyard (above), the two-bedroom open with neighbors (above left), and the three-bedroom with view (left).

residential architect / january · february 2005

Taal Safdie

Safdie Rabines Architects San Diego

"The advantages of prefab for multifamily dwellings are the opportunity to provide more affordable housing and to use interesting materials in large quantities. But the disadvantage is the difficulty of capturing the essence of a place and responding to the vernacular architecture. Customized prefab can only go so far, and so far it has not been inexpensive to build. Unless you have a flat piece of land, there will have to be a lot of parts to make a single-family house work. On the other hand, there is a need for affordable housing, and sometimes you have to give up that kind of specificity to create better places for people to live."

David Baker, FAIA

David Baker Architects San Francisco

"I'd compare the percentage of people who want a modernist prefab house to vegetarians or even vegans. It's great to have a good vegetarian restaurant, but the percentage of restaurants that are vegetarian is pretty small. So as a solution, prefab is not earth-shattering. Prefab techniques are not well adapted to high-density housing, and that's where the future is going. When housing is spread out, the infrastructure costs get very high. Single-family homes become very expensive when you start to pay those costs directly."

Ray Kappe, FAIA

Kappe Architects Planners Pacific Palisades, Calif.

"I've been a proponent of prefabrication since the early part of my career in the 1950s and 1960s, and I think the interest that exists today is positive. What I was always after was getting more diversity from modular components. They shouldn't be fixed between a floor and a ceiling, but have the potential to be opened up and have rooms working over rooms, to be more site-appropriate. But the method is not as important as the quantity. You need high demand to make the cost of construction cheaper, and with higher demand, building quickly has more advantage for the builder. I'm hoping that this time we'll have some success, but it becomes a question mark."

Doug Buster

BSB Architects and Planners Chicago

"The modular industry has already hit the scenario of Mr. and Mrs. Smith wanting to buy their dream home and put it on two acres. That part of the business is a no-brainer. The issue that needs to be solved is how to do large-scale development with modular housing. The problem isn't public acceptance. Rather, it's a legislative issue in terms

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weehouse alchemy architects minneapolis, minn. vision: adapt custom design to prefab techniques

Like many architects, Geoffrey Warner welcomes change. Years ago, the St. Paul, Minn.–based architect quit his job at a big commercial firm in search of something missing from his professional life: the hands-on nuts-and-bolts of construction. "When you graduate from architecture school, you don't know anything about how to put real buildings together," he says. "So I started doing furniture and interiors and construction." The experience serves Warner well in his current practice, Alchemy Architects. In fact, it came in very handy when designing and building one of his firm's most popular works to date, the weeHouse—a modular project first designed as a custom home in Minneapolis.

The client wanted a small, well-built cabin retreat, pure in form and light in cost. She placed priority on the beauty and quality of the built space and was less concerned about conventional amenities. Warner initially designed a traditional stick-frame house but then decided a modular house would best meet the architectural requirements of the project, as well as its \$45,000 budget. "We looked at [structural insulated panels], but then we grabbed on to the idea of doing a steel moment frame and building around that," Warner says. Prefab gave the architect control over the process and allowed him and friends Lucas Alm, who trained as an architect and helped design the house, and Scott McGlasson to put together the building in a warehouse, with no weather or contractor delays. And assemble it they did—with their own hands.

Warner then turned the weeHouse into a line of factory-built modular homes ranging from a 336square-foot, \$49,500 model to a 728-square-foot, \$89,500 version. Because the house was not originally designed for prefab, the architects adapted stick framing to a factory situation and selected products that facilitate construction. For example, specing the ceiling height at 8 feet and matching it to 8-foot patio doors eliminated the need for trim, and keeping the building's width to 14 feet made it transportable.

Warner considers the weeHouse a success but learned some hard lessons in prefab. "A shipping network is the biggest problem," he says. "You can only work within a certain area." Architects must consider when to use prefab components or when site-built sections work better, he adds. Flexibility as a designer is important too. Avoid flourishes that "hold up an assembly line," he says. "You need to be smart about what you want to do and in what time span."

The firm has three weeHouses in development and others in the wings. Many are vacation homes because, says Warner, early adopters take bigger risks with occasional houses. But he sees broader appeal and great potential for prefab. What intrigues him is the promise of factory-built houses to make good design "more affordable and accessible." -n.f.m.



"a shipping network is the biggest problem [with prefab]. you can only work within a certain area." – geoffrey warner

John Nolter





<image>



This \$45,000

custom modular

cabin (above) by

turned into the

weeHouse line

of prefab houses, which can be

shipped to the West

Upper Midwest, and

Ontario, Alberta, and

Coast, Southwest,

British Columbia.

The house comes

with standard offer-

ings, but customers

can modify such

elements as roof

overhangs and

interior cladding.

Alchemy Architects

The steel-and-wood-framed "tube" has an oxidized steel exterior, Douglas fir interior, and large sliding doors.

of getting governing bodies to approve those kinds of communities. What codes do they need to meet? Whose jurisdiction do they fall under? If the building industry could solve those issues, the public would accept modular housing."

Donald Rattner, AIA

Studio for Civil Architecture New York City

"At only about 3 percent of the residential market, it is unlikely that prefabricated housing will substantially revolutionize how we build homes in the near future, for several reasons. Building culture changes slowly. There's a culture gap between the prefab industry and the architectural community that needs to be bridged. And prefab's advantages are mitigated in low-cost regions and when applied to one-off designs, as evidenced by several recently published projects. Still, the interest in exploring its possibilities is invaluable, because it will continue to advance the industrialization of construction that has been ongoing since the 19th century.

Julie Eizenberg, AIA

Koning Eizenberg Architecture Santa Monica, Calif.

"Prefab will not automatically generate high design. Construction methodology is not the determinant there is plenty of traditionally styled prefab out there. The connection may be that prefab's costeffectiveness makes high design affordable to an as-yet-untapped younger, design-conscious market."

Adele Naude Santos, FAIA

Dean, MIT School of Architecture and Planning Cambridge, Mass.

"Advanced technology lets us rethink this whole issue. Prefab used to be the same parts assembled with the same choices; now we can change the parts themselves and do something entirely different. The key is making prefab work for high-density housing, but it will require a technologically sophisticated set of studies. All attempts have failed miserably in the past, for different reasons. It's weird we can massproduce a car but haven't been able to crack the housing system. It's a very fertile area for research and something I'd like our school to be working on."

George Petrides

Petrides Homes New York City

"There's a sub-niche of people who are buying a Modernist prefab house because of what it is, but most people are trying to get a high-quality home at a reasonable cost and don't give a hoot how it was made. Architects generally aren't aware of panelized systems, and that's a lost opportunity. As two-dimensional components, they allow more design freedom than the typical 3-D box, and building with them can save clients up to 20 days

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robert humble and joel egan cargotecture—team hybrid seattle vision: transform containers into housing

> The iMac proved that consumers crave high design within economic reach. Architect Michael Graves achieved household-name status selling teakettles at Target. So when Robert Humble, AIA, and Joel Egan, Associate AIA, insist that prefab is about to take off because the public is demanding design sophistication in their housing as well as their shoes and MP3 players, it's hard to argue. "We see an opportunity to potentially influence design for the next century, and we mean to do it right," says Egan.

> So the two architects founded Team HyBrid, a collective of architects and artists providing what they call cargotecture—prefab housing that uses cargo containers as building modules. Humble praises prefab as an opportu-

nity to improve cost, efficiency, and quality, whereas traditional construction requires a sacrifice of one component to better the other two. "What piqued my interest in prefab is that the process is controlled," he says. "It provides a consistent result and removes the random peculiarities of traditional construction." Flexibility and portability increase the

concept's cachet as well.

Team HyBrid already has deals in place to use their cargo prototype for global housing relief. A client in war-torn Sri Lanka wants units to use as orphanages, while one in Siberia has an order in for ecotourism base camp housing. Even Egan's parents have caught the cargo bug and are considering having one built as their vacation home.

The containers have advantages over standard modular structures, says Egan. "The hobgoblin of prefab is at the joints. We start with a structure that is 3D, so we solve a lot of the problems." Adds Humble: "The cargo is already a waterproof box that is readily available, with an infrastructure in place to transport it." -s.d.h. ra





HyBrid Scott Melbourne

Cargotown, a proposed development for Portland, Ore., and Seattle, creates multifamily housing that can be moved or shifted along with the city's changing needs.



A nonprofit organization has asked Team HyBrid to come up with housing for eco-tourists building a hiking trail through Siberia. The units can be transported along the trail as each section is completed.

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Brian Smale



Team HyBrid explodes the box at an on-the-boards residence and guest house in Jacksonville, Fla., (left and below) by cutting away sections of containers and crisscrossing, stacking, and joining them with glass connectors.





"[prefab] provides a consistent result and removes the random peculiarities of traditional construction,"—robert humble



Renderings: Robert Humble, except where noted

of construction time. The panels also offer green benefits—less production waste, and the higher R-value results in energy savings over time."

Jonathan Segal, FAIA San Diego

"There's a huge market for hip, modern housing here. But prefab offers no assistance whatsoever if you're trying to do urban high-density housing. If you used modular components, you'd have to tear up half of the building to put the infrastructure inside, and you'd give up precious inches on the footprint. How would you seismically stabilize the modules to meet earthquake codes? Urban architecture is still site-specific. There are buildings across the street that you need to relate to scale-wise. That doesn't mean it can't happen. I haven't figured out how to do it."

Walt Richardson, FAIA

RNM Architects and Planners Newport Beach, Calif.

"There's a place for prefab, particularly in isolated locations where you don't have the trades to build mass housing. But I can't see prefab happening in Southern California or in urban areas. The houses that are so popular here have courtyards and atriums, and those spaces can be difficult to create with modular components, particularly on 40-footwide lots. You need the freedom to make things any size and width that works."

Kenneth Frampton

Ware professor of architecture at Columbia University Graduate School of Architecture and Planning, New York City

"Prefab is a positive thing, in terms of rising costs and the difficulty of providing standards for sustainability. The only question mark I have is its reception from the powerful home building and real estate industries. They produce and sell houses with certain kinds of associations that are not modern, and the choices are more limited than we'd like to think. The whole issue is marketing. Between mortgage companies, banks, the building industry, and the real estate industry, local bylaws are stacked against prefab. If that's not changed, housing will continue to be a fixed market."

Frank Harmon, FAIA

Frank Harmon Architect Raleigh, N.C.

"The real challenge of good home design is not the house but how it relates to everything around it. Prefab houses offer a great opportunity, but unless they fit the site and go with the other houses, what have you got? Just another Levittown. You have to invest \$30 million to \$50 million in the development of a really sophisticated prefab system, and right now house building is a fragmented industry."



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by nigel f. maynard

ong before mid-century Modernists sang the praises of concrete, early pioneers recognized its practicality, strength, and versatility. Few building materials have such a storied past. As far back as 3000 B.C., the Egyptians used gypsum and lime mortar to build the pyramids; in 300 B.C., the Romans used pozzalana cement, animal fat, milk, and blood to build the Coliseum and the Pantheon.

A good idea is still a good idea, which is why concrete, masonry blocks, and bricks continue to find themselves in residential architecture today. Among the most common building materials in the world, concrete has a reputation as a tried and true product and its popularity is only on the rise. Why? Because "it is energy efficient and provides disaster resistance," says Jim Niehoff, residential promotion manager of the Portland Cement Association (PCA) in Skokie, Ill. What's more, he adds, "it gives you a quiet environment and eliminates squeaky floors."

Architect Theresa Rosano likes concrete for those reasons too, but adds that the material also satisfies the special requirements of her Southwest climate. "We have an abundance of termites, so it's a good choice," says the principal of Ibarra Rosano Design Architects in Tucson, Ariz. "It is very economical and very durable. Aesthetically, it works really well in the desert."

Perhaps because of their ubiquity, concrete and masonry have attracted little attention (except for concrete's emergence as a decorative interior spec), despite the fact that both have quietly made substantial advances. Through this April, an exhibit at the National Building Museum in Washington, D.C., highlights some of the most compelling developments. "Liquid Stone: New Architecture in Concrete" presents nearly 30 projects that use concrete in exciting ways and display the material's latent and emerging design potential.

light load

One such product is LiTra-Con, a see-through concrete developed in 2001 by Hungarian architect Aron Losonczi. LiTraCon is a concrete block with embedded glass fibers that enable it to conduct light, says Andreas Bittis, LiTraCon's representative in Aachen,



For his own house and studio, architect Wendell Burnette used Integra Wall, an engineered post tension system consisting of open-cell blocks that reduce thermal bridging. The finished wall may be filled with foam insulation for an R-28 wall.

Germany. The company theorizes that a wall structure created out of LiTraCon blocks would maintain its transparency in thicknesses up to 2 meters. The blocks are load-bearing and convey the same effect with both natural and artificial light, the maker says. Currently being tested in Europe, the material was expected to begin production at the end of 2004.

Meanwhile, Houstonbased architect Bill Price is developing his own version of light-emitting concrete that he hopes will transform

Photos: Bill Timmerman



concrete into a more elegant spec. "I was research and development director at Oma/Rem Koolhaas and we were working on a concert hall in Porto [Portugal]," says Price, who is also an assistant professor at the University of Houston. "The building was to be all white concrete, and Rem asked if we could introduce more translucency. I later

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Created by Hungarian architect Aron Losonczi, LiTraCon (above and right) is a translucent concrete block that uses glass fibers running side by side to transmit light between the two main surfaces in each unit.



came up with the term 'transparent concrete.'" Among the potential benefits he envisions with the material is "that we could dissolve the joints/gaskets usually associated with capturing light." In other words, architects may be able to rid themselves of using as many windows to capture light.

"I think [translucent concrete] is an exciting material," says Phoenix architect Wendell Burnette, who is following the development of the product. "It could have a lot of application potential." Burnette, who uses a variety of concrete techniques for his residential and commercial projects, says, for example, that you could have a desert house with walls that store heat in the day and radiate it at night, while also transmitting light.

new recipes

Lafarge North America in Herndon, Va., is manufacturing a new product called Ductal that gives concrete a whole new dimension. Ductal is the trademark name for a variety of ultra-highperformance concretes combined with high-carbon metallic or polyvinyl alcohol fibers. Unlike traditional concrete, which becomes brittle with twists, turns, and deformations, Ductal concrete products have the unique ability to bend and carry large loads without breaking or sudden failure, the company says. The maker claims the ductile failure of Ductal more closely approximates resilient steel than concrete.

Even concrete wall systems have undergone some changes. Ontario, Canada– based Durisol Inc. makes an insulated concrete forming system that contains no foam or polystyrenes. It is fabricated from recycled waste wood that's been neutralized, mineralized, and then bonded together with Portland cement. Hardened Durisol is lightweight, porous, and durable, the manufacturer says.

One product that Rosano and Burnette often use in their respective practices is Integra Wall by Integra Wall System in Phoenix. An engineered and posttension masonry system, Integra blocks are open at both ends and have a small center web to reduce thermal bridging. "They look like regular concrete blocks, but they're installed a little differently than ICFs," Rosano says. The masonry units require steel post tension rods, anchor bolts, steel plates, and couplers for installation. Burnette, who uses the 8-inch blocks, likes the product because it decreases thermal bridging, but also because you can pump polyurethane foam in between the blocks for an R-28 wall.

The mundane concrete block also has undergone changes in recent years. Canton, Ohio-based U.S. Technology Corp. recently introduced what it calls a "green, water-resistant block that raises the standard for masonry units." The company says its Seal-Tech concrete block, made from 10 percent recycled content, is lighter, stronger, and better looking than standard units, and its nonporous surface has built-in water resistance. It comes in smooth or split-faced textures, three sizes, and 16 colors.

smart science

Although still early in development, a better brick may be around the corner too. Two years ago, the University of Illinois Center for Nanoscale Science and Technology announced it had created a Smart Brick, containing sensors and other electronic components. Scientists at the university combined sensor fusion, signal processing, wireless technology, and basic construction material into a package that can report building conditions to a remote operator. Built into a wall, this brick could monitor a building's temperature, vibration, and movement.

More developments are already working their way into the mainstream. For example, John Melander, director of product standards at PCA, reports that high-performance concrete with PSI ratings as high as 20,000 is now being used in commercial projects such as the Shawnessy Light Rail Transit Station in Calgary, Alberta; typical concrete has PSI ratings of about 4,000. "This gives you higher strength, so you can have thinner members in a building," he says.

Although many of these innovations are still in the pre-production stage or brand new to market, residential pros are encouraged by the advancements they see in their favorite specs. Who wouldn't be dazzled to see these stalwarts beaming light, bending like steel, or supporting the weight of the world? But even in their Clark Kent guise, concrete, brick, and block are far from dull functionaries. Says Rosano, "The truth is that the products don't necessarily have to be utilitarian or reserved for an industrial project." ra

With some acquisitions, it's hard to know who is ultimately the winner. For this one, might we suggest a mirror?





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bowled over

When it comes to toilet bowls, Konyk favors TOTO's Ultimate for its "nice form and great suction." This low-consumption, one-piece unit features a power gravity flushing system and an elongated bowl with a SoftClose seat. A computer-designed 2¹/₈-inch glazed trap and a 3-inch valve ensure proper function every time, the manufacturer says. The unit is available in cotton, conial white, bone, beige, gray, and ebony with polished chrome fittings and push button. TOTO USA, 800.350.8686; www.totousa.com.

konyk architecture



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white sheets

Corian acrylic-based solid surface is a durable, maintenancefree product that offers a variety of design possibilities. Konyk likes it for its seamless, smooth matte finish and

because it is "the most luxurious plastic you will ever find," he says. The product can be cut, routed, drilled, or worked like wood and is offered in matte, semigloss, or high-gloss finishes. It comes in more than 100 colors, but Konyk favors arctic white. DuPont, 800.426.7426; www.corian.com.

color blocking

One way Konyk adds color to his projects is with lighttransmitting Plexiglas panels called LightBlocks. They have "such amazing color effects and truly allow you to put color in the most unusual places," the architect says. Suitable for partitions, doors, and lighting fixtures, the product is made from biodegradable plastic sheets that can be returned to the manufacturer for recycling



when a project is being renovated or remodeled. Panels are available in thicknesses of up to 3 inches and in any color. MB Wellington Studio, 603.889.1115; www.lightblocks.com.

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deco the walls

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for a ¹/4-inch projection. Oil-rubbed bronze or brushed nickel finishes come standard. Atlas Homewares, 800.799.6755; www.atlashomewares.com.



fresh faucet

With its F1 line, Bloomingdale, Ill.-based Grohe America boosts faucet design to new heights. The fresh-looking F1 has a cone-shaped base that flows

continuously into its spindle-like handles and rounded spout. The faucet also features the company's new ALU-XT smooth aluminum finish and a cartridge with a combination clockwork-type gear movement and durable ceramic disk. Grohe America, 630.582.7711; www.groheamerica.com.



penny wise

The Pacific is an update of the classic freestanding soaking tub. Featuring seamless corners and brass overflow and waste assemblies, the copper unit measures 60 inches long, 26 inches wide, and 33 inches high. Eugene, Ore.–based Oregon Copper Bowl Co. makes just a few of these handcrafted units each year, at prices ranging from \$47,500 to \$57,500, depending on the finish. Choose from four copper or brass finishes and satin nickel, or work with the manufacturer to combine finishes. Oregon Copper Bowl Co., 541.485.9845; www.oregoncopperbowl.com.

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mood swings

The Interaktiv line of plumbing fixtures boasts ceramic valve engineering, solid brass construction, anti-scald



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ikea idea

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-shelley d. hutchins

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