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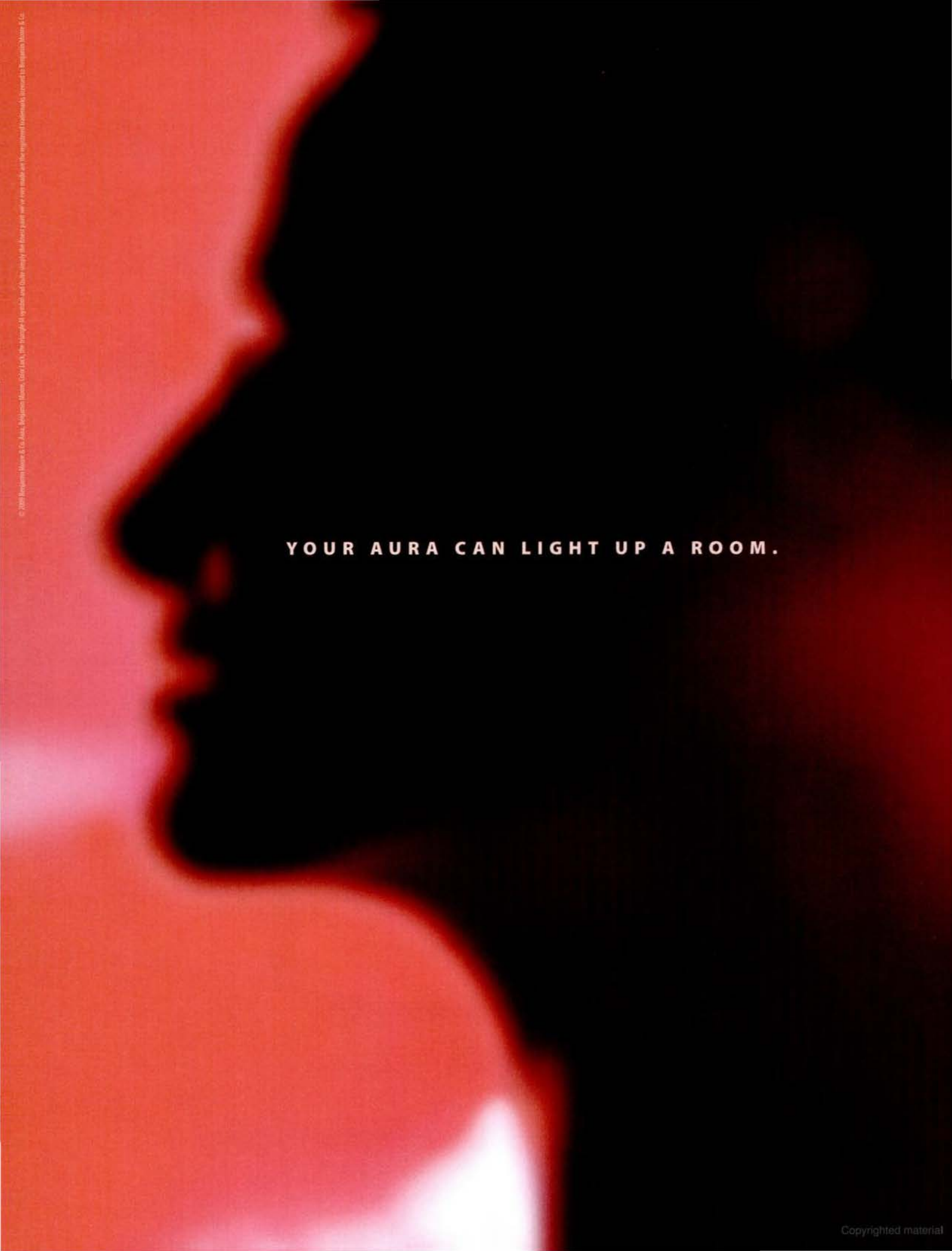

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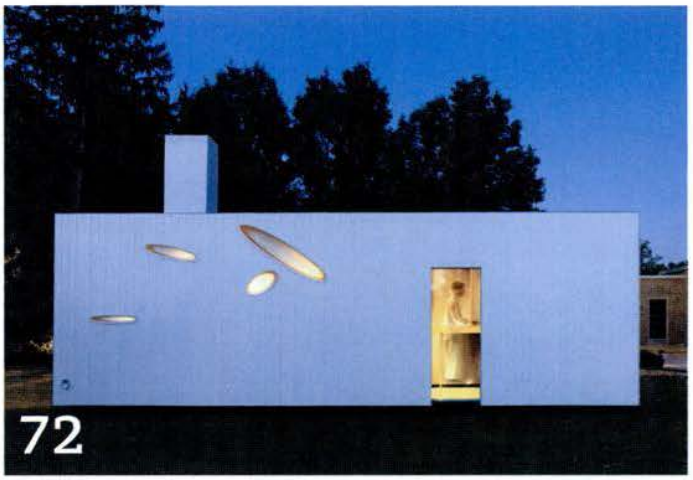
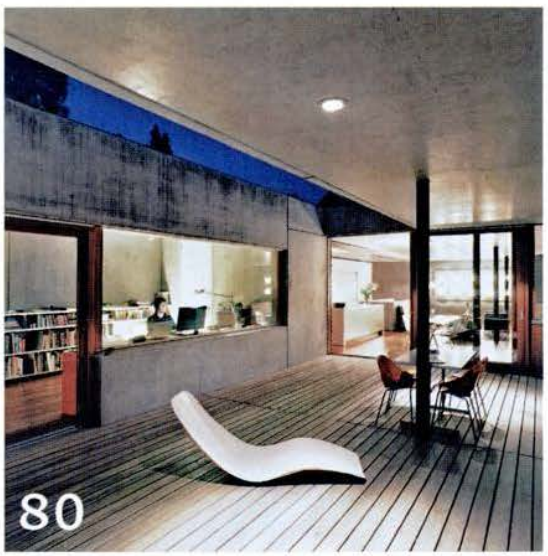
The Prefab Issue

February 2009





Cover: American House 08,
Bloomfield Hills, Michigan, page 72
Photo by Henrik Knudsen

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"Prefab houses are so ubiquitous in Sweden, and most of them are crappy architecture."

Mårten Claesson

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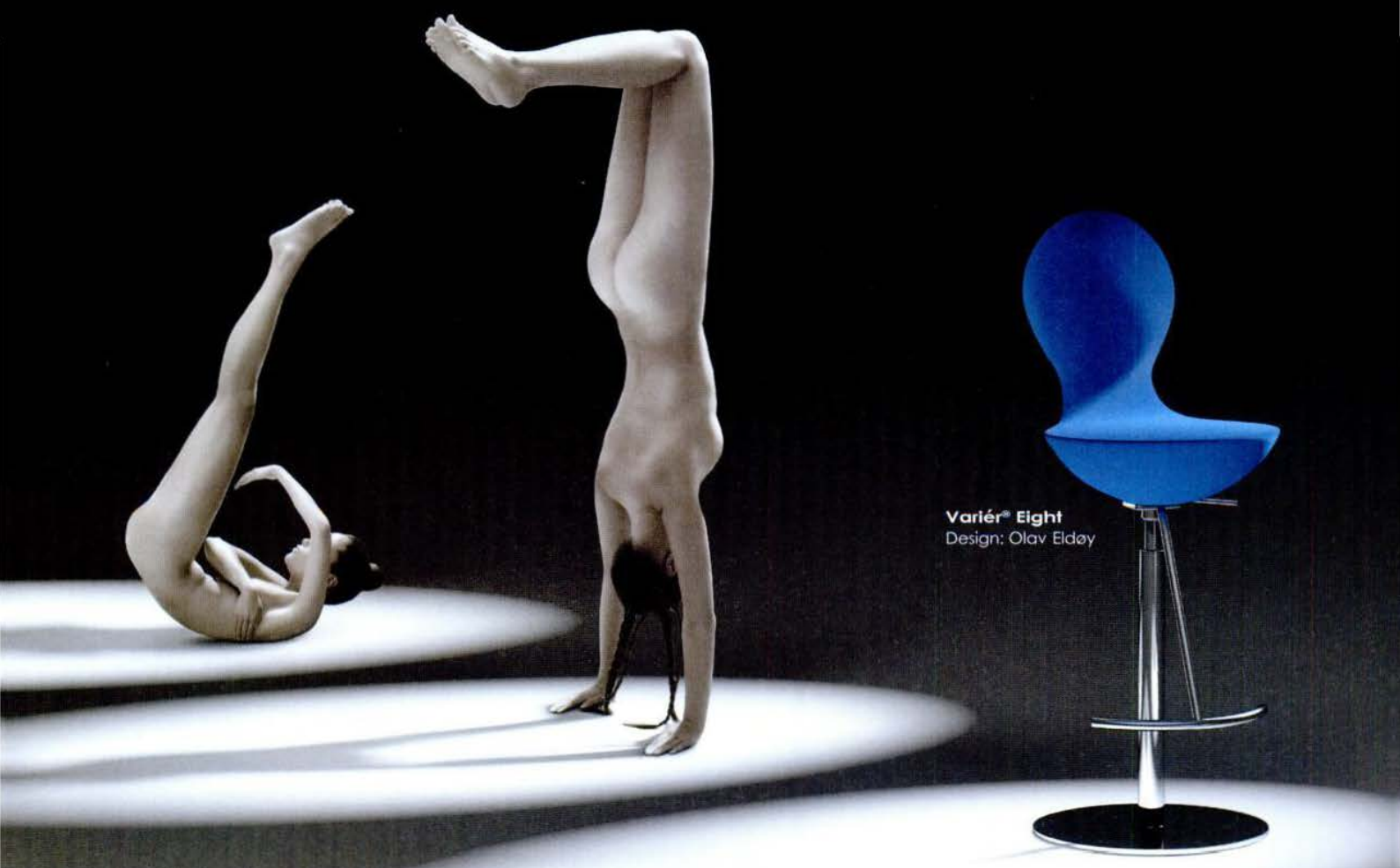

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Fab For?

Over Dwell's history, one topic has ignited our base like no other: prefab. Prefab is to Dwell as "Aqualung" is to Jethro Tull, Balki is to *Perfect Strangers*, and Dr is to Pepper. It all started in early 2001, when our fourth issue beckoned newsstand browsers with the snappy line "Prefab Is Pretty Fabulous." As a spunky modern architecture magazine brimming with millennial optimism, we suspected it was a perfect time to reopen the case file on modernism's biggest unsolved mystery, prefabrication.

Throughout the 20th century, architects hatched hundreds of schemes to bring better-designed, more affordable, easier to produce housing to the public, but with a dazzlingly decrepit success rate. Maybe in the 21st century things would be different. We found that prefab was indeed full of enticing potential, but that the small-scale victories were outweighed by a trailer-trashy industry that rightly deserved the stigma that it carried. We focused on the pretty fabulous, those rare examples where prefab was wed with good design, and the idea hit a sweet spot with our emerging audience.

The 2003 Dwell Home Invitational, in which 16 architects offered schemes for a $200,000 prefab house, marked the beginning of a crusade—we were no longer bystanders in this prefab revolution, we were going to lead the charge. With readers tracking the progress in our pages, the winning home by Resolution: 4 Architecture came together, and thousands made the trek to rural North Carolina for the open house. It wasn't long before three models of Dwell Homes by Empyrean were on the market, and everyone from *Wired* to *Cooking Light* was building a prefab show-home of their own.

Of course, being so closely associated with a singular pursuit has its downsides (just ask Bronson Pinchot). Prefab, of course, isn't the only answer for bringing well-designed homes to the masses—and its benefits aren't always as palpable as they are cracked up to be. When the MoMA exhibition *Home Delivery: Fabricating the Modern Dwelling* opened last summer a producer from the *Today Show* called to ask me about prefab. Was it cheaper? Not necessarily. Was it faster? Not necessarily. Was it greener? Not necessarily. Why prefab then? It was a good question. One I'd like to answer now by talking about something sweeter than houses: cake.

Imagine that you are planning a very special party, and for this party you must procure a cake. Granting for the sake of argument that you are unable to make this cake from scratch, here are your options: If you had all the money in the world, you could hire a master baker to craft an opulently decorated multitiered custom-designed cake with choice ingredients. If, on the other hand, your budget was more constrained, you could buy a generic premade cake from your local grocery chain, available in a limited array of flavors, shapes, and sizes, with lord-knows-what chemical ingredients keeping it yellow. Now imagine a third option somewhere between the two. Using the Internet you craft a virtual cake from a preordained list of ingredients and designs. After a few clicks and a credit-card transaction, a box containing everything you need for your virtual cake shows up at your door the very next day. This is the promise of prefab architecture, if not the reality.

With this issue we look at the diverse range of prefab avenues being explored by clever architects and smart business people. We hope to show that prefab can offer dynamic, livable homes that carry none of the stigma of manufactured housing, and that it is anything but a one-size-fits-all solution. Any discussion about prefab must also focus on the nuts and bolts of the building process itself—this is the fertile ground that designers must explore and exploit. This is the lesson offered by Konrad Wachsmann ("Archive," p. 98), who after the failure of his General Panel House venture spent the rest of his life on a quest for a universal joint—a mythical connector that would enable untold building possibilities. Although Wachsmann may have ultimately come up short, by focusing on the process instead of the end result he was ahead of his time. In her essay "The Prefab Decade" (p. 96), our founding editor Karrie Jacobs echoes this by correctly surmising that the popular success of prefab signals a shift, not so much in how our homes get built, but in the fundamental role of architects—from master bakers to ingredient aggregators with delicious recipes.

Sam Grawe, Editor-in-Chief
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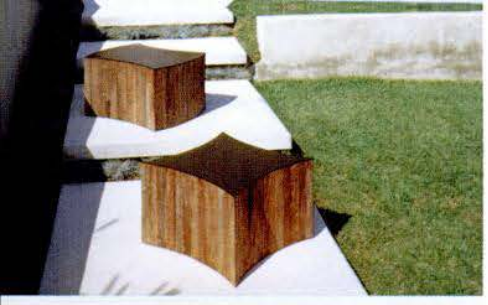

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Midwest
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South / Southeast
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214-660-9713, nuala@sbcglobal.net

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Modern Market / Dwell on Design
Manager / East
Lauren Dismuke Zivyak
917-941-1148, lauren@dwell.com
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The appeal of manufactured housing is, of course, that it is the least expensive form of a detached house. Its main disadvantage is that most units are in trailer parks ("Upwardly Mobile Homes," October 2008).

The fundamental problem with the trailer park is that it combines the disadvantages of renting with the disadvantages of owning. A person who owns a conventional house also owns the land on which it sits; the owner of a condominium unit shares ownership in the common areas and gets to vote for the board of directors. In either case, the residents own the land, either individually or collectively, and can make decisions accordingly.

Renters, of course, have no control over the property's future, but they also don't have any stake in the property: If it gets too run-down, if the rent gets too high, or if it gets turned into condos, they can simply move out.

But in most trailer parks the residents own their trailers while renting the land on which they sit, making them extremely vulnerable: They have neither the right as owners to control the land nor the freedom of renters to move out when the lease term ends. If the owner fails to maintain the property or sells it to a developer, the residents are usually stuck with expensive assets that are hard for them to relocate or sell.

Sound public policy could make a major contribution to the workforce housing issue by creating legal and tax incentives for creating trailer parks with a condominium ownership structure under which each resident owns an individual plot and they all collectively share ownership of the common areas.

Matthew Healy
Hamden, Connecticut

Having just returned from Honolulu, I enjoyed your photos of this city by the sea ("Detour," October 2008). But after reading the caption on page 196, I felt compelled to point out that coconut palms are not native to the Hawaiian Islands, which is important to mention since the islands are besieged by invasive, non-native plants and animals such as mongoose, rats, yellow jackets, and, yes, coconut palms. Many native species have been wiped out, and the swift pace of the loss of these plants and animals is of major concern there. Thanks for keeping up your ▶

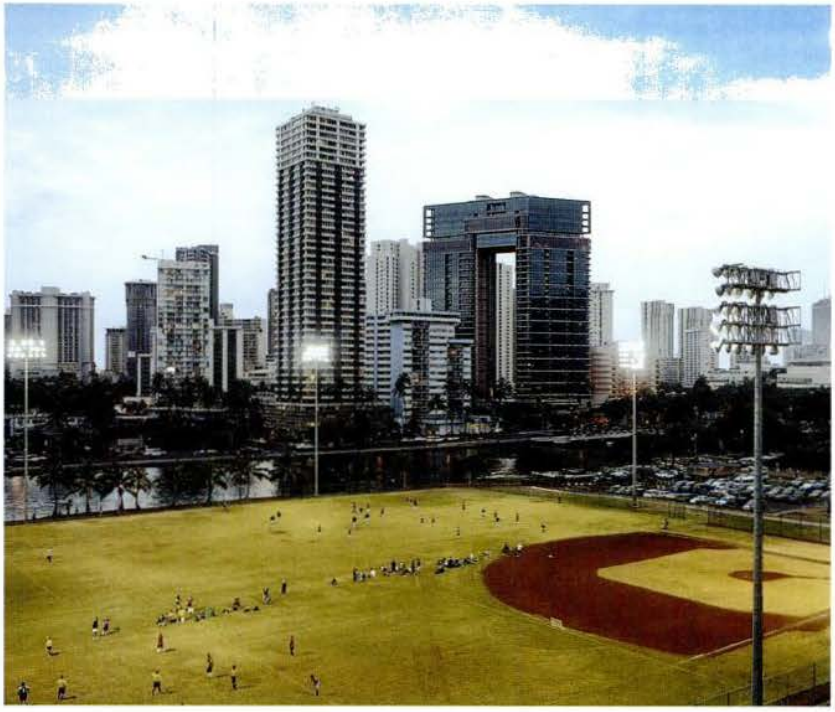

Photo by Dave Lauridsen

In the shadow of the condos, hotels, office buildings, and cranes that shape Waikiki's skyline, locals enjoy a twilight soccer game.

conservation mission, which should extend beyond beautiful buildings.

Melinda Page
Brooklyn, New York

Editors' Note: The Polynesians did, in fact, introduce the coconut palm to Hawaii when they arrived on the islands over a thousand years ago. We regret the error.

Thank you for including the "mahalo modernism" story ("Detour," October 2008). I was so excited to see the teaser on the cover and the fabulous pictures of some of the modern buildings in Hawaii. I rarely see articles in home and design magazines that showcase what the state has to offer. I grew up there but never knew which architects designed the buildings I saw every day. It was nice to learn when these buildings were built. The article was much appreciated. Mahalo!

Cherise Richards
Ashburn, Virginia

With great surprise I read your article "Oakland Aesthetics" (September 2008). I was the designer-builder of the Evans House, completed in 1956. At the time, I was 37 years old and without an architectural license—that came at the age of 56, by which time I had already designed a multitude of dwellings in Berkeley, Oakland, Orinda, and San Francisco. Since my licensing in 1975, my practice has ranged from work in Orcas Island and the San Juan Islands of Washington to the tip of Baja California, including my own house south of Todos Santos.

In 1960, I moved to Sonoma County to design countless country properties and the Matanzas Creek Winery. My passion remains and I have enjoyed your magazine, but I do little today since I am overwhelmed by the bureaucratic burdens of proof. At 90 years, maybe it's enough.

The Evans House cost $18,500. Don't blame the white trim on me.

Paul Hamilton
Santa Rosa, California

Editors' Note: We forwarded Hamilton's letter to the owners, who were thrilled to find the original architect of their home.

After venturing down to New York's Museum of Modern Art to catch the extraordinary architecture exhibit *Home Delivery: Fabricating the Modern Dwelling* I'm convinced that architecture has lost sight of its most basic tenet: designing shelter.

Too many architects have forgotten that they're designing for humans, vulnerable creatures that are subject to all kinds of injury and illness that impede normal functioning.

In the September 2008 issue you featured a house designed by Ray Kappe ("Level Best"). It's beautiful—but beware: The utter lack of stair rails is not only daunting, it's downright dangerous. No doubt Kappe was younger and in good shape when he designed the house, but what happens now if he or his wife gets the flu? They may find it impossible to descend those stairs while dizzy with a fever or nausea.

Then there are the free-floating balconies without rails. It's an exhilarating visual but terrifying to any parent of a toddler who might want to take a high dive onto the couch below.

Our population is exploding with residents ages 85 and up, for whom it's becoming an increasing challenge for architects to create houses designed with human error in mind. As a medical social worker, I have visited thousands of houses to evaluate safety and accessibility. Handicapped access doesn't stop with ramps: People who use wheelchairs often can't function in kitchens, where everything is kept in cabinets that are either too high or too low reach, or use closets, which are often to narrow to admit a wheelchair.

Green building is about respecting declining petrochemical resources and maximizing use of the free unlimited natural resources all around us. We need to broaden the idea of green architecture to meet human needs that change with aging. I propose that every architecture student take courses in human anatomy and physiology, child development, and gerontology. That would be a first step to creating an architecture that respects people as well as the planet.

Leslie Corin-Ash
Bedford, Massachusetts

"Rethinking the Material World" (July/August 2008) notes how the manufacturing process of concrete contributes to climate change by releasing large amounts of carbon dioxide into the atmosphere. But I remember seeing examples of green buildings made with precast concrete slabs. I'm confused: Is there a straight answer on whether we should define concrete as green?

Denise Kleinman
Sent via email

Editors' Note: Manufacturing standard concrete is incredibly energy intensive and environmentally destructive. However, there are new, more sustainable ways of making concrete. The process employed at Calera, featured in the story, captures carbon-dioxide emissions and transforms them into usable materials, resulting in net-zero emissions.

In the December/January 2008 issue, Carolann Rule wrote a great article on a couple in Vancouver and their home ("On the Level"). I fell in love with the Flexform sofa featured in this story on page 145 but have been incredibly frustrated in my search to identify the model and figure out where I can find a dealer in the United States.

Phyllis Belkin
Sent via email

Editors' Note: The sectional sofa is Groundpiece, designed by Antonio Citterio for Flexform in 2001. For more, visit flexform.it or call 866-FLEXSOFA.

Correction: We slipped in our October 2008 "My House" story by incorrectly reporting that corrugated metal panels can be purchased at Environmental Home Center, now ecohaus. We regret the error.

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Jeremy Berlin
During Jeremy Berlin's trip to the wilds of eastern West Virginia to meet the homeowners of this month's "My House" (p. 45), his burgeoning interest in prefab got an arcadian shot in the arm. It also prompted the Washington, DC–based writer and editor to rethink his recent housing decision: Was taking up residence in a fin-de-siècle Beaux Arts building the right one? The jury's still out.

Christine Berrie
Christine Berrie is a Scottish illustrator based in London, where she graduated from the Royal College of Art in 2002. She was tickled by the coincidence of discovering Dwell just before receiving our request to visually depict this month's "My House" Make It Yours tips (p. 45) with her colorful, hand-rendered images.

Amanda Friedman
While the rest of the world has switched to digital photography, Detroit native Amanda Friedman still shoots with the "real thing": large-format film with a 4 x 5 camera. The Los Angeles–based photographer leaped at the opportunity to get out of the concrete jungle and into nature for the "Dwell Reports" (p. 58) portrait of our backyard shed expert, Debra Prinzing. "The location in Agoura Hills was gorgeous, and it was nice to breathe some fresh air," she says.

Grant Gibson
Grant Gibson is an architecture writer living in Farnham, England. Leaving behind a cold, miserable day, Gibson found himself having an impromptu barbecue on the balcony of Christof Meili and Farzaneh Moinian's modern home outside Zurich, Switzerland ("Swiss Mix," p. 80). "It turns out I was a little overdressed," he reports. "I realized I wasn't going to require the wooly overcoat and heavy cords when Christof met me off the plane wearing a T-shirt and a pair of shorts."

David Hay
David Hay, a New York–based playwright who once lived in a house designed by Richard Neutra, has always been interested in how architects design homes that promote easy and comfortable social interaction ("Massie Produced," p. 72). He fondly recalls sitting in William Massie's house late last summer, surrounded by people old and young, as the conversation got funnier and more outrageous by the minute—a tribute to a design that puts humans, with all their wonderful foibles, first.

Jessica Hundley
Los Angeles–based filmmaker and writer Jessica Hundley recently took a break from conducting yet another celebrity interview to document the assembly of a Marmol Radziner Prefab home ("Process," p. 64). She is also cowriting the narration for an upcoming documentary about architectural photographer Julius Shulman and editing a book about actor-director-artist Dennis Hopper (Taschen Publications).

Karrie Jacobs
Karrie Jacobs served as the founding editor-in-chief of Dwell. She left in 2002 to enter the field of bunny racing but when that didn't pan out, she wrote the book *The Perfect $100,000 House* (Viking, 2006). Jacobs, who now lives in Brooklyn, is a contributing editor at *Metropolis* and *Travel + Leisure* and penned this month's "Essay" (p. 96). She finds freelance writing generally easier than coaxing bunnies to hop in a straight line.

Henrik Knudsen
Henrik Knudsen, who was born in Denmark but now divides his time between London and New York, studied mathematics and computer science before devoting his time to photography. Because of the thoughtful lighting employed in the Massie house ("Massie Produced," p. 72), Knudsen had just as much fun shooting it at night as during the day. "After dark it comes to life; it glows. Massie's claim that his houses are designed for cocktail hour makes complete sense."

Chris Mueller
On his first assignment for Dwell, New York–based photographer Chris Mueller ended up roped to a tree 30 feet aboveground while balancing on a ladder to capture the Lost River House at dusk ("My House," p. 45). The adventure—which also included homemade pizza, wine, amazing views, and three very cool kids—was "a testament to the imagination, ingenuity, and devotion that moved the Brown-Jackson family to build at Lost River in the first place," Mueller says.

Itohan Osayimwese-Sisson
Itohan Osayimwese-Sisson ("Archive," p. 98) is an architectural historian who credits an eccentric uncle for sparking a childhood interest in good design—for which she's searched ever since through Africa, Europe, the Caribbean, and both North and Central America. She designed bathrooms, garages, and even wainscoting between spells of graduate school and now teaches at the University of Washington, Seattle.

Michael Sylvester
Michael Sylvester is a writer who lives in both Los Angeles and an aisle seat, preferably in the exit row. On his pilgrimage to Dan Rockhill's Studio 804 in Lawrence, Kansas, to see its fabled prefab projects ("Prefab 101," p. 104), he was feeling a bit self-conscious being a Left Coast vegetarian in steak country. "In addition to their cool prefabs, there was a great vegan restaurant downtown. Who doesn't enjoy mixing good architecture with good food?" he says.

Photo by Henrik Knudsen

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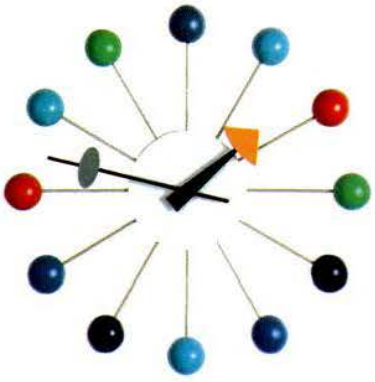
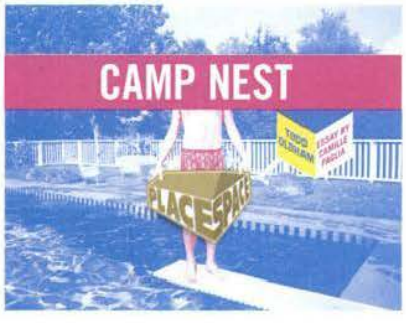
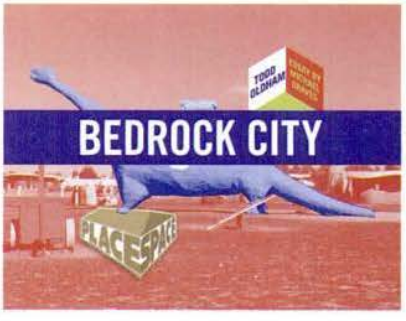
We're starting an ongoing contest series at Dwell.com, which means two things for you, dear reader: the opportunity to cast your vote for whatever enthralling and edifying new poll happens to be up that week, and the chance to win any number of desirable, elegant, and sometimes shiny prizes. So stand up, be heard, and try to get free stuff.
dwell.com/contests



Gift Guide

Valentine's Day is one of those awkward, middling holidays—so much pressure for grandeur, yet so much possibility for mediocrity. Never fear, we've put together his-and-her gift guides to assuage your yearly romantic obligation, allowing you to shift the focus to where it should be: on getting dinner reservations at the last minute.
dwell.com/slideshows





Clockwise: Nelson Ball clock, Eames house bird, and Campana Blow Up basket courtesy of Zwello; Place Space series from Ammo Books; Wine loop from Spectrum West.

FLAIR chair

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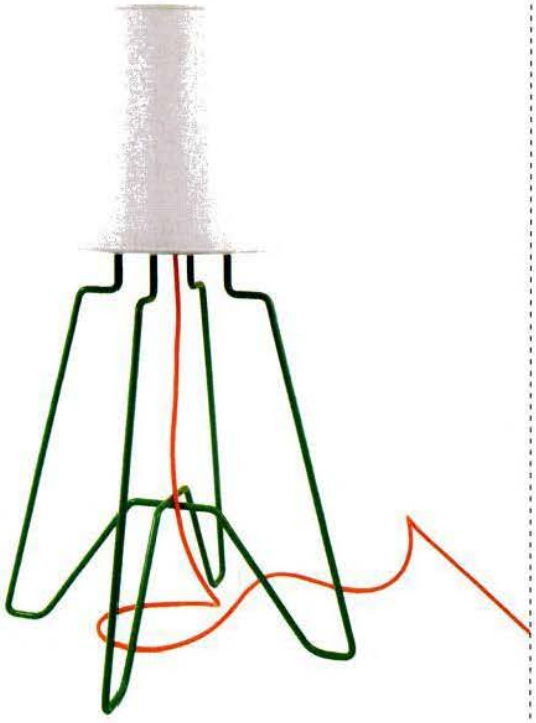
In the Modern World

Overflowing laundry hamper or the latest chair in designer Tom Price's Meltdown series? Bundled fleece sweaters culled from a charity shop form the body of this innovative seat, which was on display as part of London Design Festival's plastics-focused exhibition *From Now to Eternity*. londondesignfestival.com

February Calendar
Important dates in art and design, with architecture thrown in for good measure: Welcome to Dwell's timeline of the month.

February (2009)
Vertical Cities: Hong Kong/New York closes at the Skyscraper Museum, New York. skyscraper.org



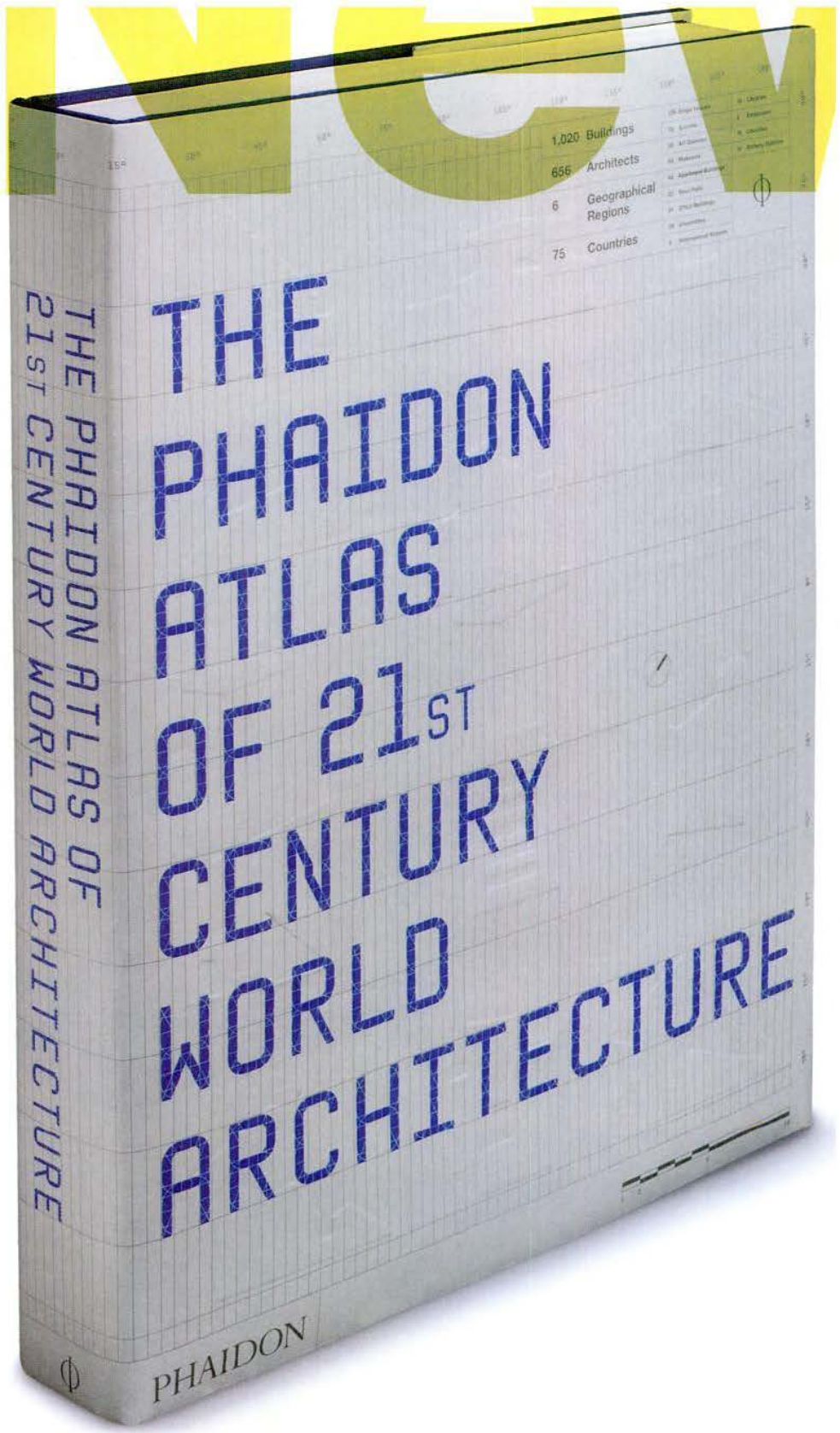
Wired lamp
By Mark Irlam
for Something from Nothing
something-from-nothing.co.uk
More an outline of a lamp than a lamp, the clean and green lines of this table light caught our fancy among the clutter at Tent London—the Brick Lane venue for all things up-and-coming. (*above*)

Now Isn't That Lovely #7
By Stephen Johnson
stephenjohnson.biz
Form usually follows function, and in the case of Johnson's designs, the function is "humor, escapism, and even disgust." When so much of design has devolved into a one-liner, we appreciate when a useless object admits to being just that.

Hepburn sofa
By Matthew Hilton
for De La Espada
matthewhilton.com
We're guessing this new modular sofa is named after an actress and not the town in Saskatchewan. Our assertion is further verified by the elegant and unusual X-patterned seams that crisscross the upholstery like an Oscar-worthy evening gown and the solid wood legs that elevate this seat like a pair of Salvatore Ferragamos.

February 3 (1898)
Finnish modernist Alvar Aalto, who once wrote: "God created paper for the purpose of drawing architecture on it," is born.

February 3 (2009)
Walker Evans and the Picture Postcard opens, displaying Evans's 9,000-postcard collection at the Met. metmuseum.org



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Hitoshe Abe, Architect

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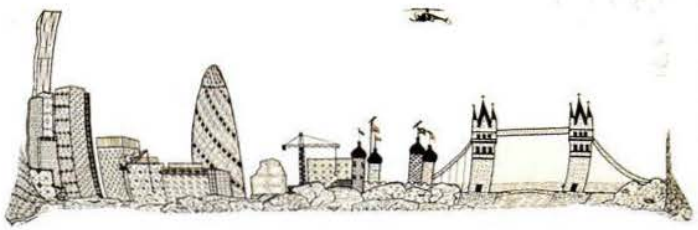
The Gherkin and Tower Bridge pillow
By Charlene Mullen
charlenemullen.com
Some people have a soft spot for puppies and kittens, but we melt when high-tech meets handmade. We swooned seeing the London skyline emblazoned on this hand-stitched bolster replete with Lord Norman Foster's new London icon.



Slat shelves
By Viable London
viablelondon.com
Painstakingly constructed from a single piece of FSC-certified pine, these angled shelves aim to minimize waste (which, incidentally, maximizes the use of small nails) during the construction process. Especially perfect for someone with hundreds of copies of the same tall, narrow book. *(right)*

Wood
By Ten
tenproject.wordpress.com
Developed by the Crafts Council and retailer Twentytwentyone, Ten's collection posits that sustainable design can be positive and beautiful through a series of charming small-scale household objects such as Héctor Serrano's Do Not Lose Me, Gita Gschwendter's Wedge Racer, and Tomoko Azumi's Transport lamp.

Urchin Softlight
By Molo
molodesign.com
Known for its expandable, almost magical seating made from paper, Molo now flexes into the lighting department, which we think suits the company's trademark posable material even better than scuffed-up seating.

February 3-6 (2009)
The World of Concrete expo in Las Vegas tells you all you need to know about concrete. worldofconcrete.com

February 10 (2009)
Submissions are due for Beirut's House of Arts and Culture design competition. darbayrut.org

Color Expression[09]

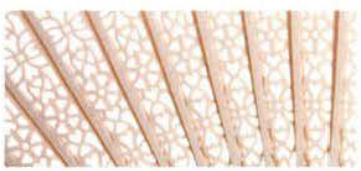
Black Rocks 4170

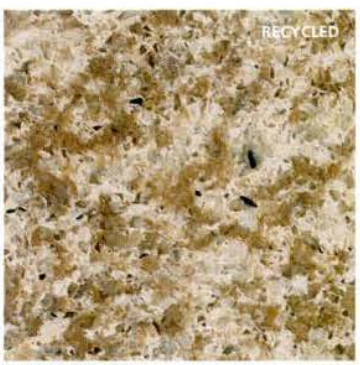
Basalt Black 6185T

Smoky Ash 6140

Dusty Stones 4040

Metallic Black 7185





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Renzo Piano

Renzo Piano was born into a family of builders, so it's no surprise that his studio is called the Renzo Piano Building Workshop. His 1970s collaboration with Richard Rogers for the Centre Pompidou in Paris launched Piano onto the international stage, and his sculptural, sustainable, and highly technical buildings have since earned him a Pritzker Prize, Sonning Prize, and AIA Gold Medal. In September 2008, Piano's California Academy of Sciences opened in San Francisco to great acclaim, with the expectation of becoming the largest LEED Platinum–certified public building in the world.

What is your favorite commission?
The one you love the most is always the last one, like with children, so I will say the California Academy of Sciences. I never liked Pompidou, but people always ask me to make pipes.

Who outside your field inspires you?
Growing up, my best friends were writers, filmmakers, or musicians. I like to stroll around in different fields.

What would you want to be if not an architect?
A musician. I played the trumpet when I was young but wasn't good enough. Music has the same need of order, precision, and geometry as architecture.

What's your ideal working environment?
The one I work in. It's global; it's local. I have very strong roots but I never sleep in the same place more than three nights.

Where do you see architecture in 20 years?
I hope the next generation of architects designs buildings that breathe with, work with, and make use of nature so that it's not just architecture-as-usual plus a bit of green on top.

rpbw.com

Kevin Slavin

Kevin Slavin, with Frank Lantz, is a cofounder of Area/Code, an immersive games-development and entertainment firm based in New York City. In their own words, Area/Code "takes advantage of today's environment of pervasive technologies and overlapping media to create new kinds of entertainment."

What's your dream commission?
We have two dream commissions in the shop right now. One is with Transport for London to design a game that changes how kids look at the streets around them; the other is in Dubai, collaborating on a theme park that opens in 2015. We're not working with NASA yet, but that would be fun.

What films have inspired your work?
I often reference John Carpenter's 1980s sci-fi flick *They Live* where Roddy Piper's character uses special sunglasses to see things as they really are—a kind of X-ray vision into the world around us.

What's your ideal working environment?
I travel about half the year, so my ideal working environment is defined by qualities rather than features. Ideally: good friends, low noise, strong coffee, free wi-fi. A cell signal. Alternating current. Sunlight. Everything else is up for grabs.

What specific object or experience changed how you think about design?
I studied with Hans Haacke at Cooper Union in the early 1990s. From him, I learned to see the world in terms of systems rather than artifacts. That changed everything—just as everything was changing.

Who outside your field inspires you?
Our field crosses so many boundaries it's hard to say who's outside it!

Where do you see your profession in 20 years?
In 2005 people thought we were crazy—so I hope that, by 2029, the world will be as crazy as we are, unable to say where area ends and code begins.

What will your last words be?
"No spoilers."

areacodeinc.com

Illustrations by Elisabeth Moch

Q & A

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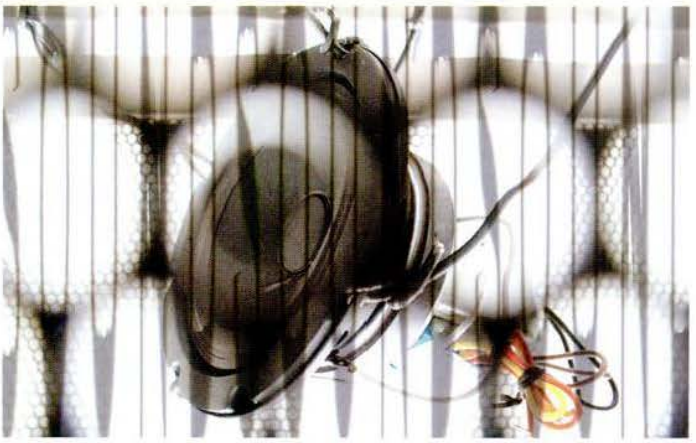
Atelier Bow-Wow
REDCAT, Los Angeles
January 31–March 29, 2009
redcat.org
The problem with architecture exhibitions might just be with exhibiting architecture. But can an exhibition transcend the gallery by weaving site-specific cues into the work on display? Yoshiharu Tsukamoto and Momoyo Kaijima of the Tokyo-based architecture studio Atelier Bow-Wow believe that consideration of a show's surroundings is essential in creating a "micro public space." Bow-Wow is thus able to capture an organic connection between architecture, sculpture, and design that is unique to each venue. During their residency at the Roy and Edna Disney/CalArts Theater (REDCAT), they plan to develop a keen understanding of Los Angeles, incorporating urban sprawl, ethnic diversity, and economic gentrification into the show. Their 2008 *Life Tunnel*, for instance, at London's Hayward Gallery, engaged the building's concrete tubing and the city's history with a warped passage that mirrored a person's progression from crawl to walk. The City of Angels, often (unjustly) decried for lacking substance and soul, provides Atelier Bow-Wow with an opportunity for a new act of spatial reinterpretion.

Shepard Fairey
Institute of Contemporary Art, Boston
February 6–August 16, 2009
icaboston.org
If the medium is the message, then street art—long the subversive territory of spry urban guerrillas wielding spray cans, posters, and industrial-strength glue—is communicating on a whole new level. Welcomed onto the gallery walls and out of the metropolitan fray, this exhibition explores Shepard Fairey's seminal contributions to the genre. First known for his stenciled visage of Andre the Giant—and now for his iconic depiction of Barack Obama—Fairey will complement these distinctive portraits of cultural heavyweights with original stickers, screenprints, and works on metal and wood.



Sound
Bass Museum of Art, Miami Beach
February 27–March 15, 2009
bassmuseum.org
Sound art brings its atonal booms, howls, and drones to the white cube under the artistic direction of Gustavo Matamoros and composer David Dunn. Already well known in musical circles for his study of "bioacoustics and the environment," including field recordings of rare forest insects, Dunn has chosen a variety of sound pieces for the show. Sonic interaction and musical overlaps among the works will be encouraged, guaranteeing you'll never hear the same thing twice. *Sound* promises to usher in a new space for acoustics in the world of visual art—but bring your earplugs in case things get heavy.

February 15 (2009)
Modern Times: The Untold Story of Modernism in Australia closes in Sydney.
powerhousemuseum.com

February 20 (1901)
Louis Kahn—architect of the Rollerblade-friendly Salk Institute in La Jolla, California—is born in Estonia.

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After

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Snowbound
Lisa M. Robinson
lisamrobinson.com
artbooksheidelberg.de
Snow is a dramatic equalizer, rendering landscapes devoid of color and stifling life under an expansive blanket of white. Lisa M. Robinson's stark collection of these frozen moments, excerpted here from the new book *Snowbound*, allows scant exposed glimpses of civilization. Forgotten since fall and forsaken until spring, trampolines and lake piers evoke sunnier times—but when you're snowbound, it's difficult to imagine the seasons ever turning.

Top to bottom, left to right: Emergence, Running Fence, Mirage, At Rest, Breathe, Reeds, Old Soul

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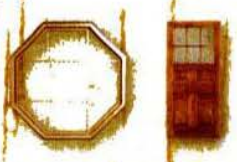

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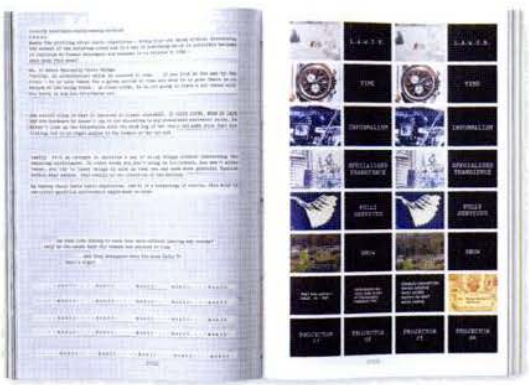
L.A.W.u.N. Project #19
David Greene and Samantha Hardingham
Architectural Association, $100
aaschool.ac.uk

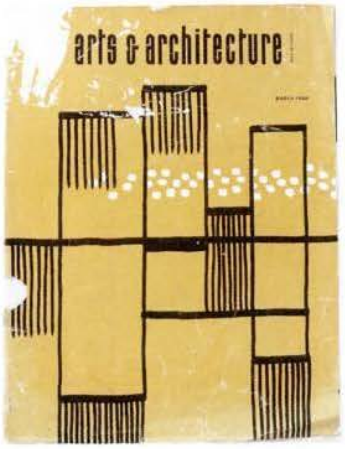
As one of the founders of Archigram, the legendary 1960s British supergroup of sci-fi-inflected bad-boy architects, David Greene could rest on his inflatable laurels. But as this beautifully produced collection of Greene's work shows, he remains a dynamic generator of ideas. Greene, now a visiting professor at London's University of Westminster, offers a larger-than-life imagination applied to the built environment, whether it's inventing artificial trees that double as electrical outlets or outlining surprisingly astute predictions of the 21st-century city as a culture gone mobile. The book itself is a fever dream of colored pages, fold-out posters, and slogans just this side of irony. At a steep $100, it might not find a place on everyone's coffee table—but it should.



Photos by Peter Belanger

February 28 (1929)
Pritzker Prize-winning architect and cardboard crumpler Frank Gehry is born Ephraim Owen Goldberg in Toronto.

February 28 (2009)
Emerging Architecture closes at the Royal Institute of British Architects, London. architecture.com



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Paul Blanchard / Santa Barbara CA

01 The Non Random lamp just delivered from YLighting
02 The radio that I listen to in my workshop
03 A desktop clock I received for fathers day
04 The Marc Newson flashlight that hangs in my kitchen
05 Three years worth of delivered newspapers
06 A recent purchase that lets me forget my age
07 Rubber vase from NYC that fit into my carry-on
08 Prized 1960 Art & Architecture from my collection
09 My grandfather's hammer
10 The cruiser that gets me to the coffee shop every day

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sou-fujimoto.com

p_House
Redondo Beach, California
ras-a, inc.
ras-a.com

Photos by Iwan Baan (House N), Robert A. Sweet (p_House)

Houses We Love

47°40'48"n/13°8'12"e House
Salzburg, Austria
Maria Flöckner and Hermann Schnöll
floecknerschnoell.com

Parr Residence
Shelter Island, New York
Michael P. Johnson Design Studio
mpjstudio.com

Photos by Zenzmaier Stefan (47°40'48"n/13°8'12"e), Bill Timmerman (Parr)

Houses We Love

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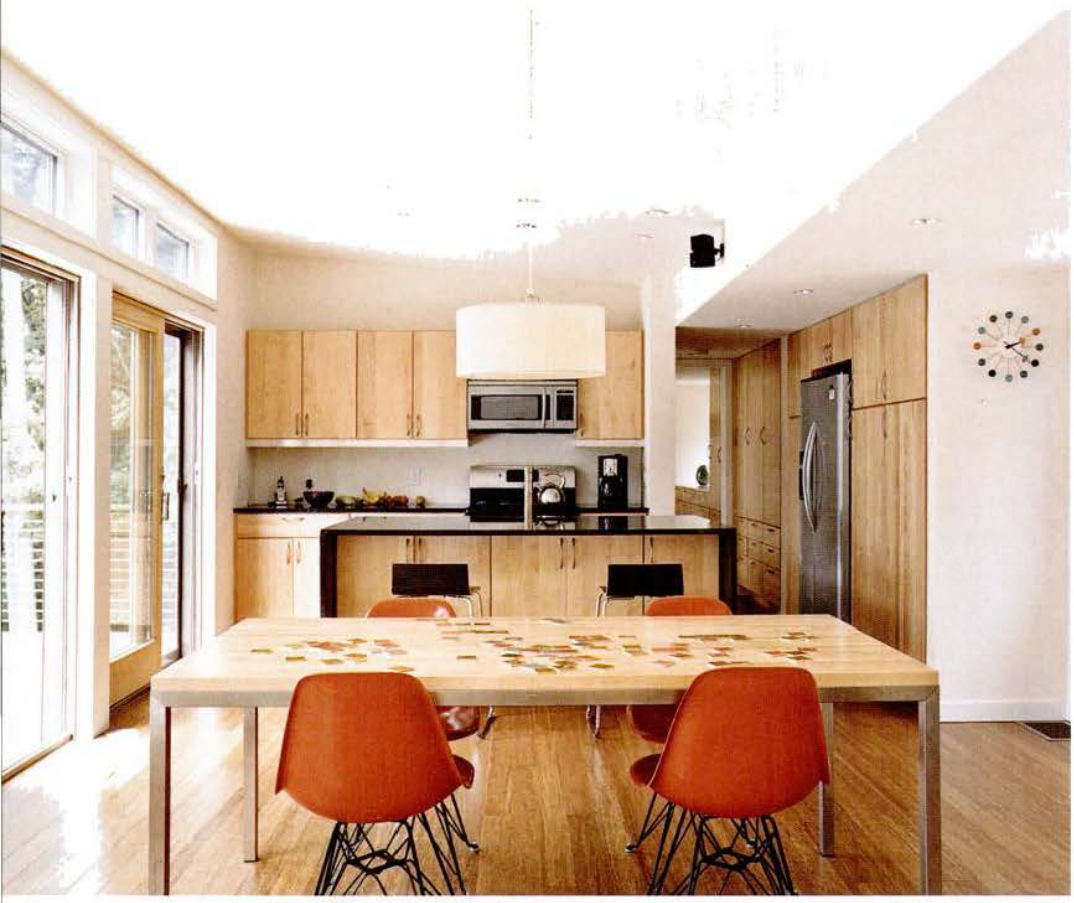
Take Me Home

A "tree house" of clean lines, ample glass, and thoughtful ingenuity lets a Washington, DC–area family and a stream of weekend guests enjoy prefab living in an unlikely locale: just outside Lost River, West Virginia.

"Recovering lawyer" Chris Brown and his wife, Sarah Johnson, knew what they wanted: a weekend getaway close to their home in the Washington, DC, area that could double as a by-the-night rental unit. They also wanted to have a hand in the design and construction—to go prefab without going broke. With a little bit of luck, a lot of practical acumen, and a heartening spirit of open-minded self-reliance, they got their wish: a 1,900-square-foot prefab cabin nestled in the sylvan foothills of West Virginia. Here's their story, as told by Chris Brown.

At the end of a steep driveway, off a road less graveled, await the happy innkeepers: Chris Brown, Sarah Johnson, and Michael and Joshua, two of their three sons.

As told to Jeremy Berlin
Photos by Chris Mueller
Illustrations by Christine Berrie



Two years ago, we sold the Georgetown condo we'd been renting out. The idea was to take that money and create something that we—Sarah and I and our three young sons—could enjoy whenever we wanted to and that would cover its own costs.

Around this time we stayed at Luminhaus, a gorgeous Virginia prefab vacation home that piqued our curiosity and became the business model for our place. But that was a kit house, which wasn't an option for us: It would take too long and we'd be living too far away from the site. Plus I'm a DIY novice—I know my limits.

Still, we talked a lot with Jennifer Watson of Luminhaus. Her best piece of advice: Find a place where people won't tell you what you can and can't do. We settled on West Virginia, where the building and inspection codes are lax. We bought 30 acres near Lost River, a thriving second-home community that grew up around a gay-run B&B called the Guest House. There's a restaurant nearby that slings hash for hunters and truckers all week, then becomes a gay bar on Friday and Saturday nights. We loved that.

Anyway, the approval process was a breeze: I paid $250, got a building permit, the end. But we still had to figure out what to do, and with only $300,000. Again, prefab popped up.

On my birthday, we went to a colloquium at the National Building Museum. One of the presenters was Resolution: 4 Architecture. We started telling one of the owners about our

Whether the order of the day is tabling matters (bottom), bringing up baby (top), or palling around with boy's best friend (top right), an open floor plan—and an open mind about mix-and-match furnishings—makes the living easy. Keeping the home cozy in winter is as easy as snuggling up near the Rais stove (top) or the fluffy pooch.

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ideas for a "modern cabin in the woods." I expected him to hear our budget, smile politely, and walk away. But he was enthusiastic. Res:4 saw it as a challenge: They'd never dealt with such a low-cost project before.

The initial plan we worked out with Res:4 was just this 16-by-64-foot box. But we wondered and worried, would it be comfortable or claustrophobic? Luckily, at the same time, Res:4 was building a similar house on Long Island, and they let us walk through it. That reassured us. And the truth is, if our cabin were any wider, you'd lose the way things come through it—the light, the wind, the woods—and the feeling that you're up in the trees.

The whole idea here is to be remote but comfortable, to have a compact unit with a spaciousness that matches the surroundings. That's when it dawned on us: A walkout basement under the prefab box would let us double the size of the house for just 50 percent more money.

In the meantime, a company called Simplex, using Res:4's specs, assembled the prefab on their factory floor, then drove it out here. We'd installed utilities and built a driveway, which was easy. Getting the house up it? A bulldozer wound up doing the pulling. We stacked the box on the basement, then added a deck, which has doubled our living space upstairs and just made life here better—we spend half our time out there.

We also get to try things out that, living with kids, we'd never have in our house. Like the furniture: We wanted mid-century-modern style, and we found it all on Craigslist or at Ikea.

This is a cabin in the woods; it shouldn't need to be manicured. We have a landscape architect coming as a guest, and we've arranged a swap: advice in exchange for time here. We'll definitely put a Dutchtub somewhere on a crest above the house, though.

The way we did this made so much sense, given our aesthetics, experience, and budget. And even though we just opened, business has been great. The idea was to show the world—and ourselves—that this model, this idea, is possible. Every guest has been someone really interested in modern design, in prefab; a lot of them want to do this sort of thing themselves.

Besides, we can offer canary-in-a-coal-mine anecdotes on what it's like to do a prefab rural project. While unloading the house, a woman driving by stopped to stare, incredulous. "What's that?" she asked. "Some kind of double-wide trailer?" I just smiled and said, "Yes, it's a double-wide."

"The way we did this made so much sense, given our aesthetics, experience, and budget. And even though we just opened, business has been great."

An object lesson in waste not, want not: Brown's shed (top) was built of leftover siding and houses firewood culled from the site excavation. Small touches—an Oras wall mobile hanging over the headboard (bottom right) and a brightly striped shower curtain in an otherwise austere bathroom (bottom left)—make a big difference.

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Hide and Sleek
When workers installed the Lost River Modern's foundation, they used sturdy, but aesthetically assaulting, faux-brick-impressed concrete. Brown's cunning concealment on a retaining wall made use of HardiePanel siding, a clean-looking industrial walling that takes paint well and ably withstands weather. (He's also using it to build a multi-colored firewood shed nearby.)
jameshardie.com

All Brands on Deck
To take full advantage of their panoramic deck and its exceedingly verdant views, Brown and Johnson put out Loll Adirondack chairs year-round. The comfortable, clean lines of these cosmetically pleasing, weather-resistant loungers offer little incentive to come indoors. Also on the porch: a set of six authentic 1950s Krueger chairs purchased for a mere $170.
lolldesigns.com

Smooth Operators
To render the upstairs-downstairs segue seamless, Brown bought $10,000 worth of finishing materials—a toilet, a tub, fixtures, and more—from Simplex (the modular homebuilder, based in Scranton, Pennsylvania, that forged the prefab) to build out the basement and do the stairs, a feat he completed with his brother's help. Warns Brown: "There's no guardrail, though. We probably couldn't have gotten a certificate of occupancy in Virginia. A building inspector there would have had a heart attack."
simplexhomes.com

Warm and Fuzzy
The Lost River Modern is essentially two houses in one: a prefab top and a traditional walkout bottom. But that doesn't mean its dual heat sources—an efficient Rais wood-burning stove upstairs and radiant-heat flooring downstairs—are at odds. In fact, they work happily in warming harmony. Not that they need to: Either is enough to keep the cabin toasty on a midwinter's night.
rais.com

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Sweet Nothing

We're heading into an uncertain future, but two things are clear: Technology is getting better and the environment is getting worse. Fortunately, the former offers solutions for the latter, as zeroHouse sets out to prove. This prefab concept uses the tools of today to paint a digital picture of the house of tomorrow.

When Le Corbusier famously intro-duced the idea of a house as a "machine for living" in the early 1920s, few people could have imagined just how high-tech home design would be less than a century later. Though humans will probably always have the upper hand in the creativity department, computers may make our houses smarter than we are when it comes to sensing conditions, regulating comfort, and doing the dirty work necessary to reduce the impact of our lifestyles.

About a decade ago, before "clean tech" and "carbon neutral" were household terms, architect Scott Specht began developing a farsighted concept for a house that would use new technologies as a way to untether itself from the grid. From manufactured structural components to a computer-coded "brain" that reads and responds to indoor conditions, the suitably named zeroHouse would be a completely self-sufficient home. "It was a self-as-client project (every architect seems to have one)," says Specht. "I would work on it in the bits of free time between income-producing work."

A few years and many "expressionist" versions later, Specht was ready to make zeroHouse a full-fledged project of his firm Specht Harpman, which he runs with his partner, Louise Harpman. With the help of engineering consultants and some sleek marketing materials, they revealed the concept to the public. Though zeroHouse exists only in 3-D renderings and brochures, its striking appearance and "zero-impact" ambitions were enough to attract significant interest across the digital media world and beyond. The project was even noticed by DuPont, which made zeroHouse the poster child of a short-lived green ad campaign.

"They ran a series of ads in the *Wall Street Journal* featuring large pictures

Story by Sarah Rich
Illustrations by Raymond Biesinger

In the rendering for the zeroHouse, the building appears to be both a harmonious addition to the landscape and a harbinger of future architectural forms.

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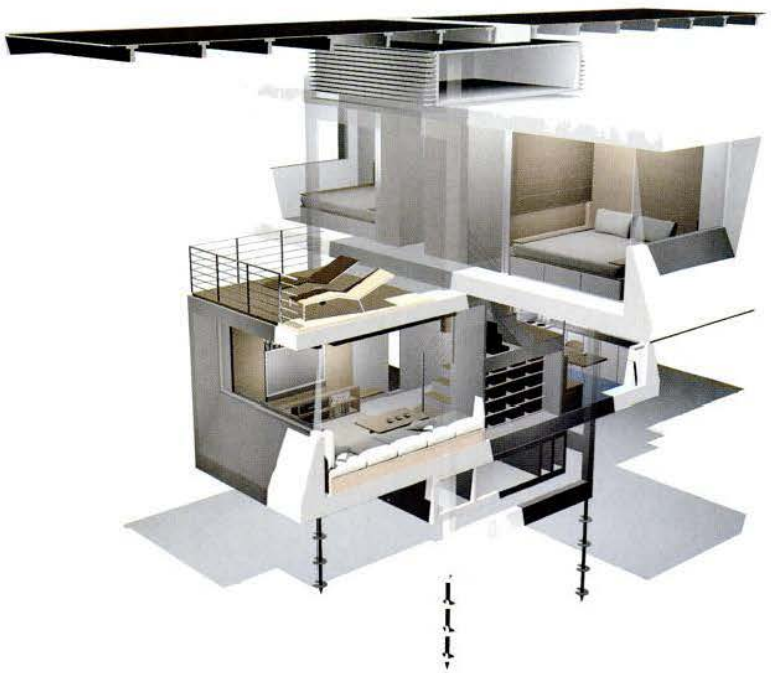


of the house," Specht recounts. "There was a lot of discussion about building a full-scale version. Ultimately, DuPont's campaign strategy changed, and they decided against pursuing the approach. Our belief in the project didn't end there, however, and we decided to take it further on our own."

Not surprisingly, the idea has retained the public's curiosity, riding the swell of popular interest in sustainability and design and appealing to a futuristic sensibility. ZeroHouse does not conceal its high-tech features with a quaint residential facade. The structure looks just like what it is: a hybrid of house and machine. Two identical modules, measuring 36 feet long and 12 feet wide (the maximum width legally permitted for interstate truck transport), are stacked perpendicular to one another, forming a cross when viewed from above. A giant solar array stretches across the top of the upper unit like the blades of a helicopter, performing triple duty as a channel for rainwater collection and a shade canopy for the two roof terraces.

This sort of integrated functionality is essential and intentional in the zeroHouse design, says Specht, who explains that most off-the-grid homes operate discrete systems to meet the various requirements of an independent structure. "Photovoltaic power generation, waste processing, water collection, and storage are not designed to work in conjunction with each other," he explains. "We find huge benefits in merging these systems."

Where possible, active features like heat-recovery technology are supplemented with passive approaches, such as gravity-fed water from overhead storage tanks, eliminating the need for pumps. In addition to rainwater collection, the house also captures, treats, and reuses graywater from sinks and washers. Food scraps and human waste go below the house into a composter that turns all but a small amount of "black water" into dry, nontoxic fertilizer that needs to be removed just twice each year.

In choosing to promote zeroHouse as a no-impact project, Specht Harpman had the challenge of considering not only the burden of the home's construction and operations but its eventual end-of-life scenario. Though they have not performed a full life-cycle assessment on the design, they prioritized features that will ensure longevity. Specht says that the easy transportability of the house gives owners the flexibility to relocate without incurring the huge energy expenditure of building a new home. The panelized wall modules can be switched out individually, keeping material use to a minimum when making repairs, and the entire home is free of paints and finishes that would require maintenance or off-gas and pollute.

Considering the $350,000 price tag, any prospective buyer would certainly hope that the compact home makes up for its price through its exceptional efficiency. Many sustainable purchases are justified as upfront investments for long-term savings, and this is no exception. "We are gearing the house toward first-adopter clients who are interested in the potential of a fully self-sufficient, environmentally clean, yet extremely comfortable, residence," says Specht. "If the sales figures are high enough, the costs will inevitably come down with quantity efficiencies."

With its eco-cachet and forward-looking functionality, the zeroHouse aspires to become the Prius of prefab. Like a hybrid car, it is a tool for lifestyle change that anticipates challenges and arms owners with solutions before the problems have fully taken hold. Owners get to feel both responsible and stylistically bold—a perfect formula for setting a trend.

Instead of a poured foundation, four helical anchors secure the structure to its site (top left), keeping its footprint slight and making it easy to uproot and transport.

Spatial efficiency is key in this compact home. In the living room (top right), built-ins maximize floor area while overhead the roof becomes a sundeck (above).

Dwell Community
Events & Promotions

Nothing from Nothing

Life-cycle assessment (LCA) is a quantitative measure of the environmental impacts associated with a product over its entire existence, including raw materials extraction and refining, fabrication, installation, use, and disposal. Current metrics include contributions to global warming, ozone depletion, air and water pollution, solid waste, and the energy required to create the product.

What does this mean for a builder or homeowner? Typically, people make decisions based on advertised attributes like "recycled content" or "rapidly renewable material." But this often neglects the extended effects of a product's creation. Is cladding shipped from overseas better than local hardwood siding? By including harvest, processing, transport, and replacement, LCA enables quantitative comparisons.

Currently, the biggest challenge with LCA is available data. In order to compare two products, we need the manufacturer to provide all the inputs and emissions. Fortunately, many companies now want to perform LCA because it can expose production inefficiencies. In addition, public databases are expanding as more industries recognize the value of LCA for compliance with new standards and regulations.

How far do you go? Do you include the energy used to make the steel for the backhoe that dug the coal for the electricity that powered the zeroHouse factory? No. But you would include the diesel fuel that burned to dig the coal.

One caveat of LCA is functional equivalence. Different materials have different structural and thermal properties, so it's not always an "apples-to-apples" comparison. You must determine the most important factors in your design, from a functional and an environmental perspective, and use LCA numbers to make choices from there.

Although it has been around since the 1960s, LCA is a developing science and the metrics are still being refined. As we create a more sustainable built environment we must evolve the very definition of sustainable building.

By Daniel Handeen

Facts & Figures

Some of the building statistics for energy used and emissions expelled are truly staggering, but it's not all bad news. The clarity provided through LCA has led to many positive changes.

Construction and demolition waste disposed of each year in the U.S.:
136 million tons

Percentage of total CO_2 emissions that came from buildings in 2006:
48 percent

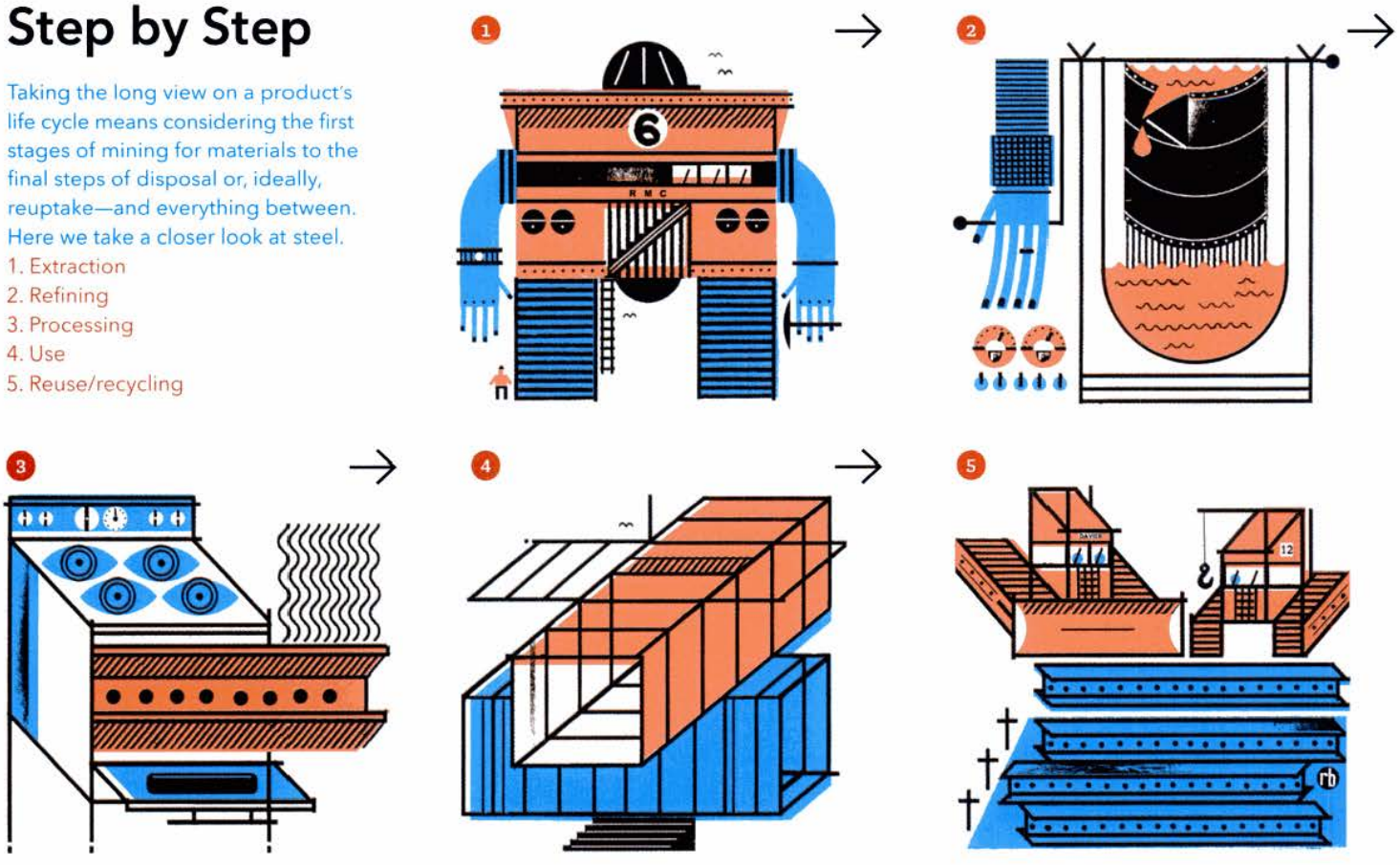
Percentage of structural steel recycled annually:
97 percent

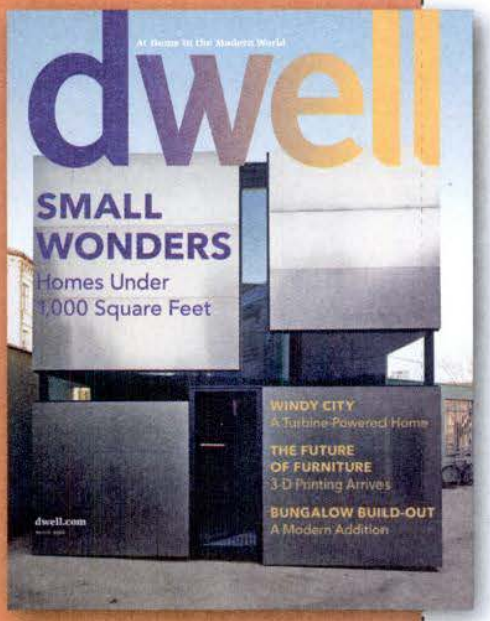
Tons of emissions that could be saved through a global switch to compact fluorescent lightbulbs:
518 million by 2010

Step by Step

Taking the long view on a product's life cycle means considering the first stages of mining for materials to the final steps of disposal or, ideally, reuptake—and everything between. Here we take a closer look at steel.

1. Extraction
2. Refining
3. Processing
4. Use
5. Reuse/recycling





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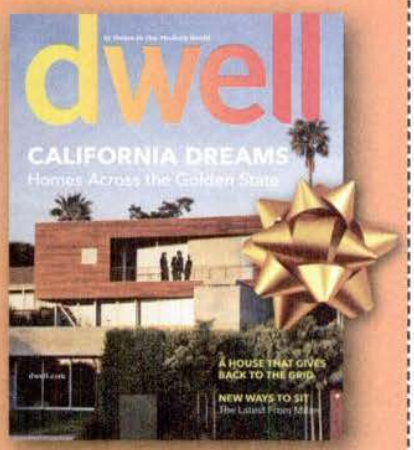

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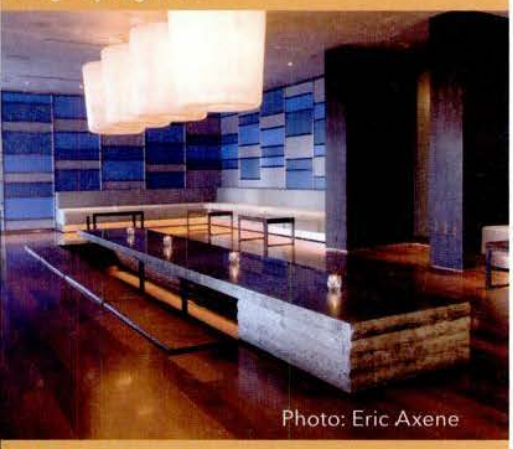
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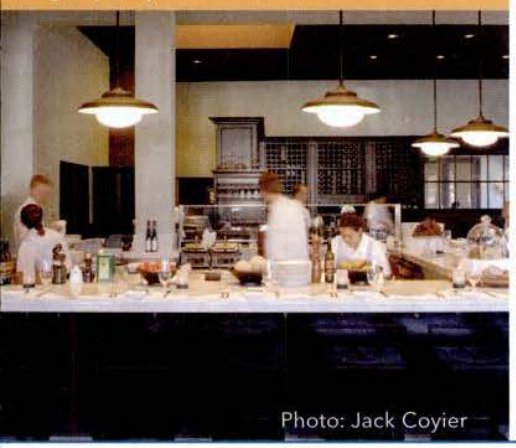
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From city slickers to country bumpkins, homeowners have always longed for a special place from which to escape the toils of day-to-day life. In 1783, Marie-Antoinette notoriously commissioned architect Richard Mique to design a Petit Hameau (Little Hamlet) of small buildings on the grounds of the Petit Trianon at the Palace of Versailles. Fleeing the scrutiny of the royal court, Marie and her attendants would run off to the mock farm, dressing up as milkmaids and shepherdesses and pretending to live "normal" peasant lives—which we can only assume involved eating cake.

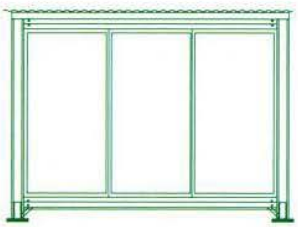
Nearly 150 years later, British author Virginia Woolf heralded the benefits of a private abode in her 1929 book *A Room of One's Own* with its famous phrase "a woman must have money and a room of her own if she is to write fiction."

A more modern, unisex version of backyard escapism comes in the form of miniature prefabricated outbuildings. "The traditional definition of a shed is a lean-to or stand-alone structure that provides shelter or storage," says Debra Prinzing, a freelance garden and design writer and our expert reviewer this month. "I tried to come up with a contemporary definition: a space that contains whatever you're passionate about."

We've rounded up five of the minimodulars that make the perfect homes (but not too far) away from home.

A Note on Our Expert:
While scouting backyards for *Seattle Homes & Lifestyles* in 2000, then-garden editor Debra Prinzing repeatedly stumbled upon sheds retrofitted for everything from potting plants to serving supper. The more she saw, the more obsessed she became, and she was soon crisscrossing the country in pursuit of outdoor abodes, now featured in her book *Stylish Sheds and Elegant Hideaways: Big Ideas for Small Backyard Destinations*, published in 2008. Now based in Los Angeles, Prinzing, a freelance writer who also blogs at ShedStyle.com, took a trip around town to help us find the best place to shack up.

Out Back



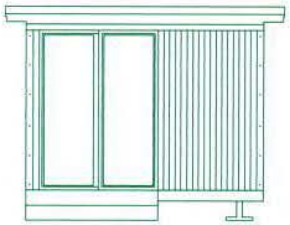
K3

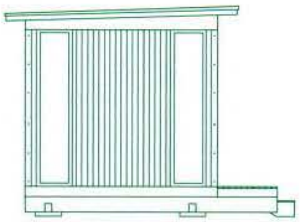
By Kithaus / 13' W x 8'9" D x 9'10" H / From $29,500 / kithaus.com

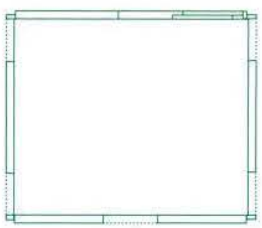
Expert Opinion: This shed is perfectly suited for a contemporary setting. I like the flexibility of rearranging doors, windows, and screens to provide privacy or ventilation; the configuration is very adaptable without having to be highly customized. My only reservation is that the deck, which is integral to the design because it extends the space and visually doubles the square footage, really jacks up the price.

What We Think: Form and function work beautifully together in the K3. The layered aluminum-slat walls, SIPs, and ipe flooring and siding mean the K3 is not only kind to the environment and easy on the eye but comes ready for you to hang everything from clocks to carpentry tools on its walls. (Plus, the optional solar package turns us on.)

Story by Miyoko Ohtake
Portrait by Amanda Friedman





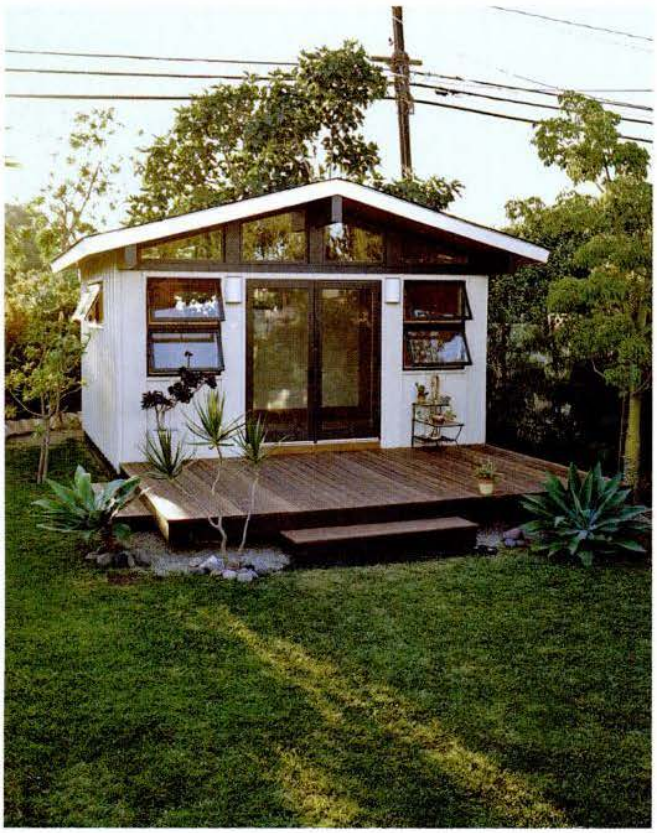


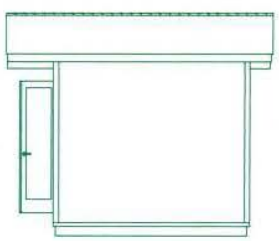
Standard Cabana

By Modern Cabana / 12' W x 10' D x 9' H / From $11,500 / moderncabana.com

Expert Opinion: This is the greenest prefab I've seen: They use FSC-certified lumber, recycled denim insulation, and low-VOC paints (where paint is used at all) and reduce waste in manufacturing and shipping. All that is really great, but the design is wonderful, too. It would look perfect next to a mid-century or ranch-style house.

What We Think: Modern Cabana's goal is to create spaces that are "simple and affordable yet look great." Check. Check. And check. With its eco-features, there's nothing standard about the Standard Cabana.





Type 03

By Neoshed / 14' W x 12' D x 11'4" H / From $25,000 / neoshed.com

Expert Opinion: The rectangular shape of the Neoshed is an appealing alternative to the squarish sheds you often see, and that makes it feel very open; it's like taking one room of a house and plopping it in the garden in terms of proportions. It feels very livable and could be the perfect guest room, office, or studio.

What We Think: The largest and most houselike structure in our roundup, the Type 3 was clearly inspired by California's mid-century Eichler homes, and it stands as a viable (if somewhat kitsch) Scrappy Doo to the original's Scooby. What's better than one Eichler? One and a half Eichlers.

Photos by Cody Pickens (Standard Cabana), Danny Zapalac (Type 03)

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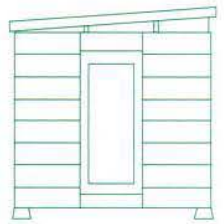
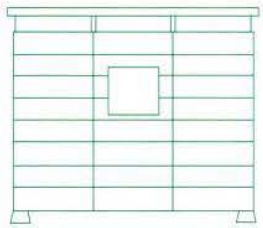
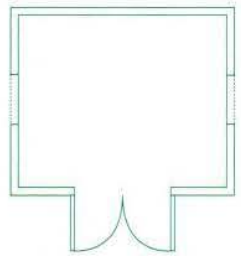




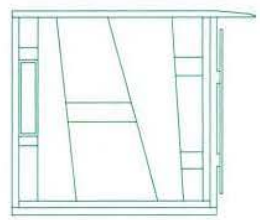


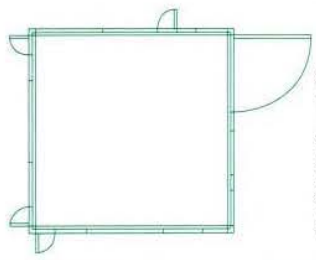
Studio Shed

By Modern-Shed / 10' W x 12' D x 10' H / From $15,110 / modern-shed.com

Expert Opinion: I love the clever simplicity of the design; it's the true shed shape. This structure is the most color-friendly; it's designed to be bright and bold. I also love the glass transom at the top, and the interior maple-veneer finish gives it more bang for your buck because it looks a lot more expensive than it really is.

What We Think: With its boxy form and small openings, the Studio Shed reads more as a single-use poolside cabana than a versatile backyard office, guest room, or playroom. The option of a green roof, however, spices things up—and cools them down: The overhead vegetation will help keep temperatures low on hot summer days.





Magic Box

By Magic Box Inc. / Each built with custom dimensions / $93,000 for 11' W x 11' D x 11' H model / magicboxincusa.com

Expert Opinion: This is the Lamborghini of sheds, reminding me of a sleek sports car with its powder-coated-steel finish. Its drama and scale, not to mention the cost, make the Magic Box ideal for a public space—gallery, studio, cafe—but it could easily land in a residential setting if budget allowed, on the rooftop of a warehouse loft, or in a cornfield as a modern counterpoint to nature.

What We Think: Forget the birdbath, and bring on OMA's Bird's Nest. The crisscrossing bands of Japanese designer Jun Ueno's Magic Box bring the look of Beijing's building boom to your backyard. This gets our gold—but in more ways than one.

Photo by Daniel Hennessy (Studio Shed)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Amid the industrial expanse of Vernon, California, Marmol Radziner Prefab's factory-built homes are pieced together in a process akin to the assembly lines made famous by Henry Ford. In just a couple short months, a single-module home is constructed on a circuit of 16 workstations, each designated a specialized task. Sliding along a horseshoe-shaped factory-floor track, the house begins as a set of rough steel frames and progresses step by step on the way to its site as a neatly shrink-wrapped, modern prefab home.

Story by Jessica Hundley

The Palms, built almost entirely at Marmol Radziner's factory in Vernon, California, is installed onsite in a Venice Beach neighborhood.

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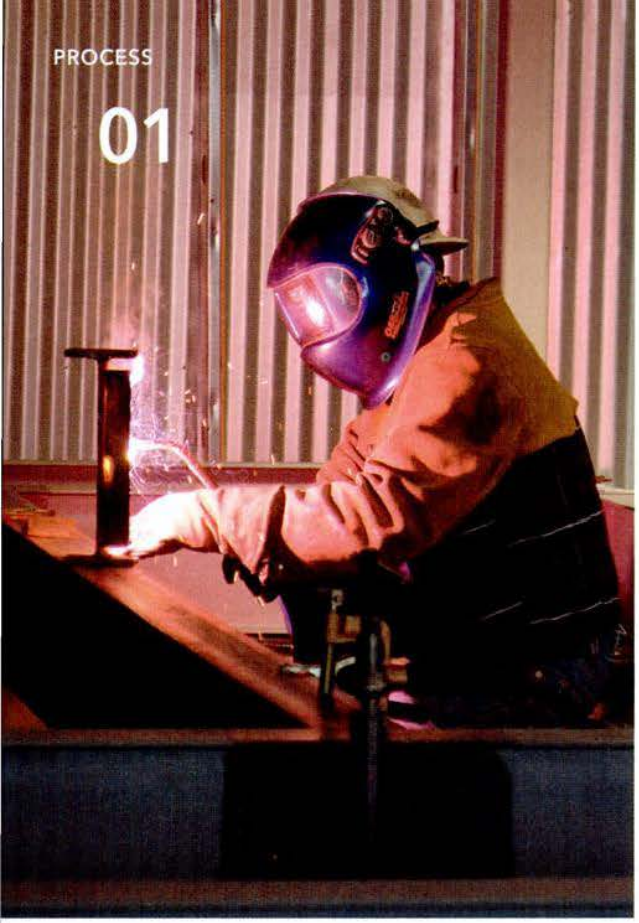
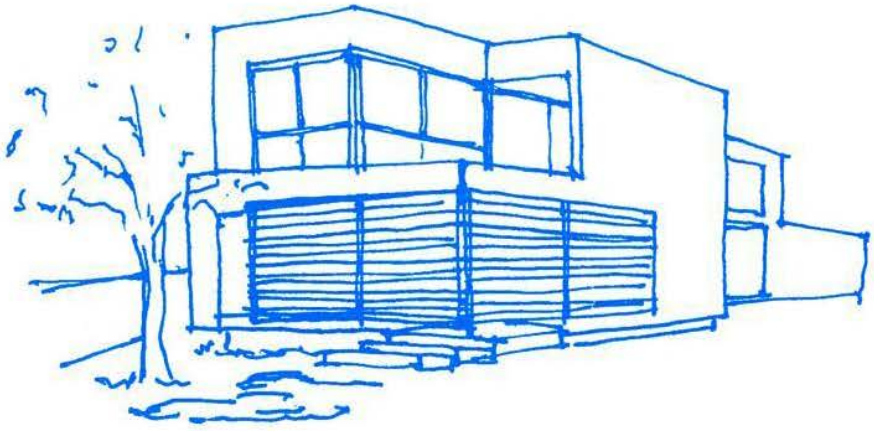


Structural Steel

The first workstation sits just outside the factory's rear entrance, where deliveries of recycled steel are deposited. Here, the steel is cut to length and constructed into each module's basic structural skeleton. Since completed homes are transported directly to the sites, sizes are strictly dictated by trucking regulations. The result lends the structure a kind of pleasing railcar feel—long, lean boxes that can be fit together in various configurations. "Our modules are typically two different widths and can be varying lengths," explains Todd Jerry, Marmol Radziner Prefab's chief operating officer. "Twelve feet is the widest module that you can fit on a truck without getting a special permit. The other width of module is eight feet, which we use typically if the house is going somewhere difficult to navigate—a tight access road or a hill site."

Once the frame is fabricated, it is then placed on a cart that rolls on tracks set into the factory floor. With the help of these ingenious tracks, the units glide easily through each workstation. The first stop for a completed steel frame is paint and prep, where the skeletons are cleaned of dirt and grease and given an application of water-based paint.



Rough Frame Construction

In the third stage of rough frame construction, after painting and prepping, structural insulated panels (SIPs) are dropped in from above and attached to grooves set within the basic frames in order to form the home's roof and flooring. "Typically we'll do two types of floor, either poured concrete or engineered hardwood," explains Jerry. Both of these are installed at the factory. For concrete, the floors will be poured at this stage in the process and smoothed at the factory. Other materials that need localized weather acclimation will be installed on the homesite.

"For the walls, we use a light-gauge steel-stud system," says Jerry. "We build all the wall panels offline on a table and pop them into place." This station is also where the rough electrical wiring and plumbing go in. For modules that feature outer decking, the frames are prepped for deck installation. "We basically build wood sleepers on pallets offline, then screw them to the frames from underneath so you don't see the fasteners," he continues. "A lot of our design incorporates indoor-outdoor living, so many of our houses have as much deck as interior."

Above: A worker at the Marmol Radziner factory welds together recycled steel, creating the building blocks for each module.

Below: Once the steel skeleton has been erected, the structure slides to another part of the factory for wall panels and flooring.

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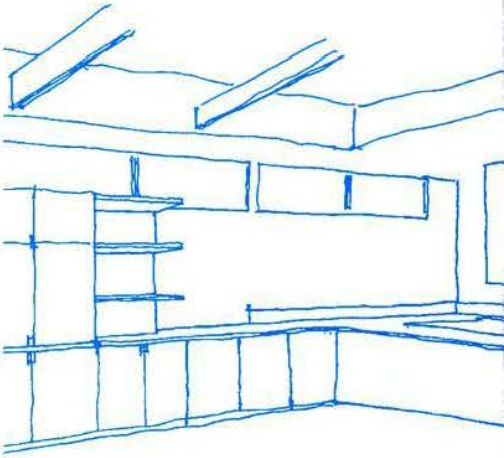
Finish Construction

Finish surfacing comes next—windows, drywall, cabinetry, ornamental metalwork, tiling, appliances, and fixtures are put into place. As the module makes its way to the finish line, the workstations focus on small details and refinements.

"We actually bend a lot of our own sheet metal to do the details around the windows, the flashing and trim," says Jerry. Because such a large portion of the modules' walls are glazed, great care is paid to creating a perfect edge on the windows and doors.

Roofing comes next. Hydraulic lifts raise the roof modules and set them into place. "We start setting the parapet cap down and bring the detail around that," explains Jerry. "We use a membrane roof, so it's just a thick sheet of rubber." Later, at the homesite, this membrane will be fully attached to the frame's roof, then sealed and seamed. The final step of the process is the exterior cladding, which includes exterior siding, insulation, and doors.

"We do built-in cabinetry, paneling, metal handrails, and also furniture," says Jerry. "In that way, we're vertically integrated and have the capability of doing everything ourselves. That's really driven by the need to deliver the high quality of finish."



Homesite Delivery

After completion at the factory, each home is shrink-wrapped and loaded onto a truck for direct site delivery. A crane drops the modules into their foundations, and the homes are ready for final detailing within a few days. "One huge advantage of prefab is you can also do your site work in parallel, so while the house is being fabricated you can prepare your site," says Jerry. The result is not only ease of construction, but quick, start-to-finish scheduling. This means less impact on the environment, less harassment for the neighbors, and most importantly, less stress for the homeowner. Marmol Radziner has found this to be particularly beneficial on sites where land is pricey or the neighborhood dense. "Depending on permitting and customization," says Jerry, "you can have the entire process done in less than a year." In building terms, this amounts to nearly instant gratification.

Above: With the exterior complete, it's time to build out the interior. Custom cabinetry is milled and installed in the factory.

Below: Dropped into a foundation almost entirely completed, the house is ready for move-in just a few days after delivery.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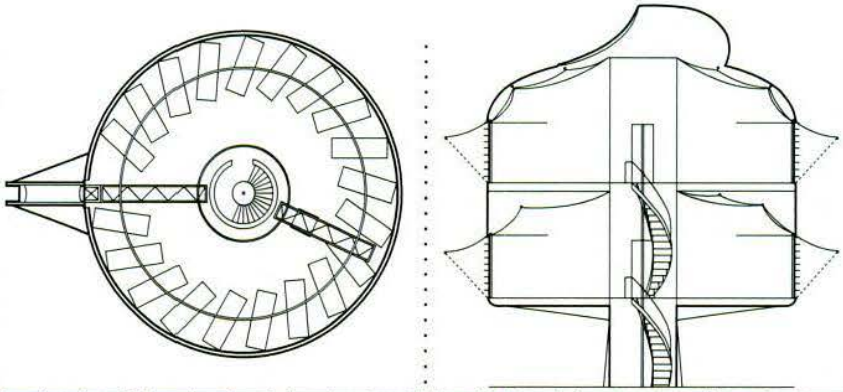
With the Dymaxion House, Buckminster Fuller was one of the first designers to harness industry to produce prefab architecture. His idea promised big—but failed to deliver.

MORE



FULLER

The Dymaxion House's built-in features and futuristic appearance all but guaranteed it a later cult following, but it also hampered the design's acceptance in its own time. The house's curved inner walls were a much-cited source of frustration, preventing the home from being personalized with photographs or traditional decorations. Nonetheless, the house remains an icon of prefab housing—and offers important lessons for architects practicing today.

Photos courtesy The Estate of R. Buckminster Fuller (interior), by John Phillips/Getty (exterior)

Buckminster Fuller believed in efficiency: the most efficient use of time, space, resources, and energy. Nothing should be wasted, nothing underestimated or overlooked. According to this now-legendary American inventor, whose voluminous writings have yet to be published in full, global human accomplishment would be limitless if only we could organize ourselves better. While this often took the form of a strangely Fordist fascination with new management techniques, Fuller, perhaps naively, preached a no-nonsense gospel of hard work and clear thinking. In another era, he might have been called a Puritan.

More than anything else, Fuller believed that it was possible to do more with less. His widely recognized geodesic dome is perhaps the most famous example of this philosophy: Capable of enclosing an enormous volume of space, and constructed from a mere skeleton of parts, the geodesic dome gave structural face to one of Fuller's most abstract ideals. It was a visually complex structure that was, in the end, quite simple.

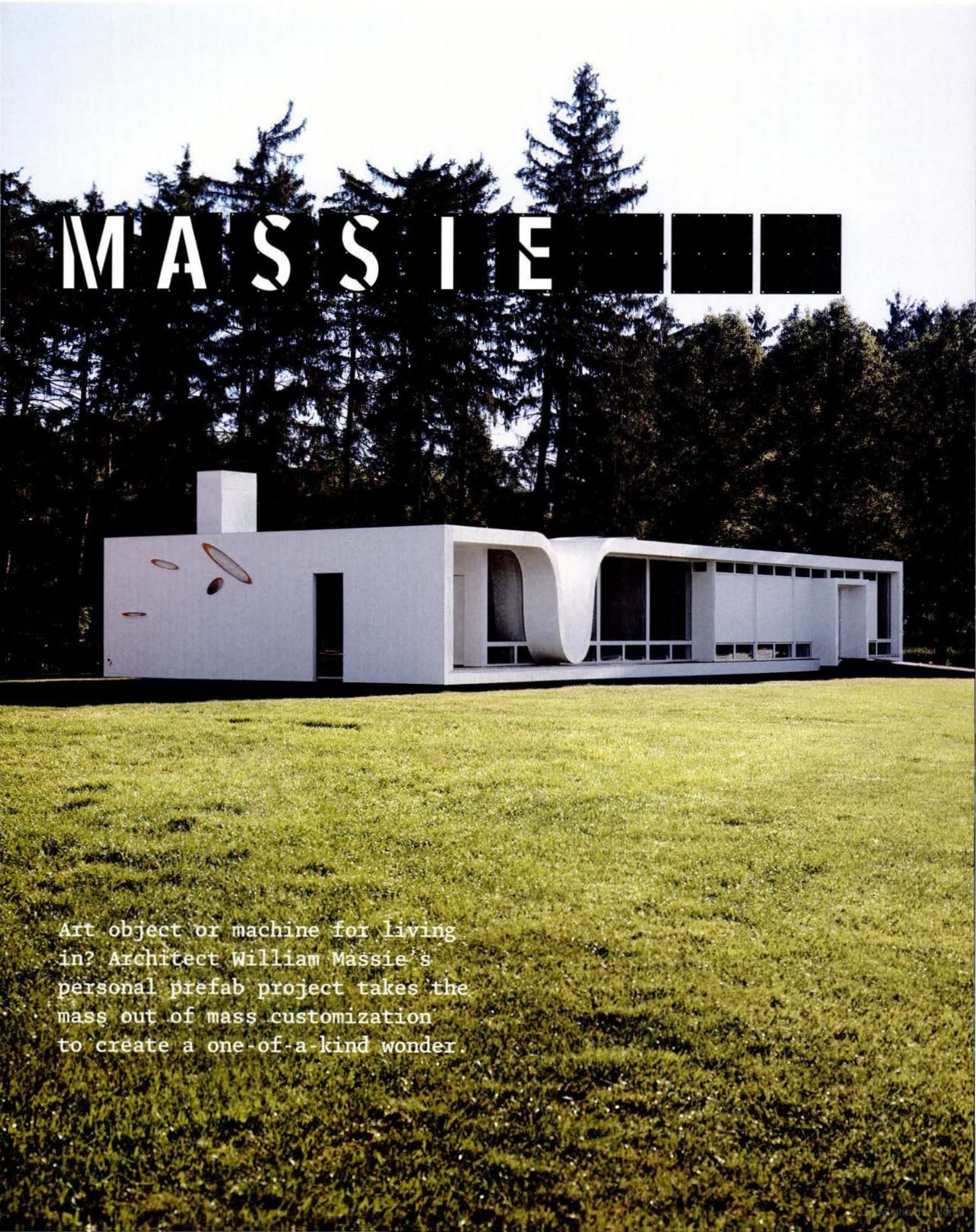
This was Fullerian thinking: Build something a little bit differently—a bit more efficiently—and the most complicated tasks could be easily solved.

When he first devised the Dymaxion House, nearly 80 years ago, it must have felt like a bomb going off. Of course, the Dymaxion House—a circular, prefabricated housing unit machined from aluminum panels—was merely one part of a whole network of Dymaxion thought. There would be new cars, maps of the earth's surface, and "mobile farming" units. But the house, portable, light on the ground, and easy to afford, was not some armchair philosopher's attempt at redefining American domesticity: It was an engineer's way to put the nation's postwar aircraft factories back to work, building houses for a new generation.

Of course, it would be absurd to deny that the Dymaxion House had flaws; from the standpoint of an industrial product, it failed miserably. Unable to attract key investors and seen by many as far too strange—even alien—a shape to make a satisfying home, the Dymaxion effectively went nowhere. But as a prototype for mass housing, assembled from prefabricated parts and universally available at a low cost, Bucky Fuller's Dymaxion House offers us a tantalizing glimpse of an architectural future that might have been.

The following three prefab homes implicitly continue Fuller's project. Proof that the prefab worldview is far from dead—that architects still dream of efficiently constructed housing, mass producible for all—these houses bridge the optimism of an earlier era to the technological promise of a world to come.

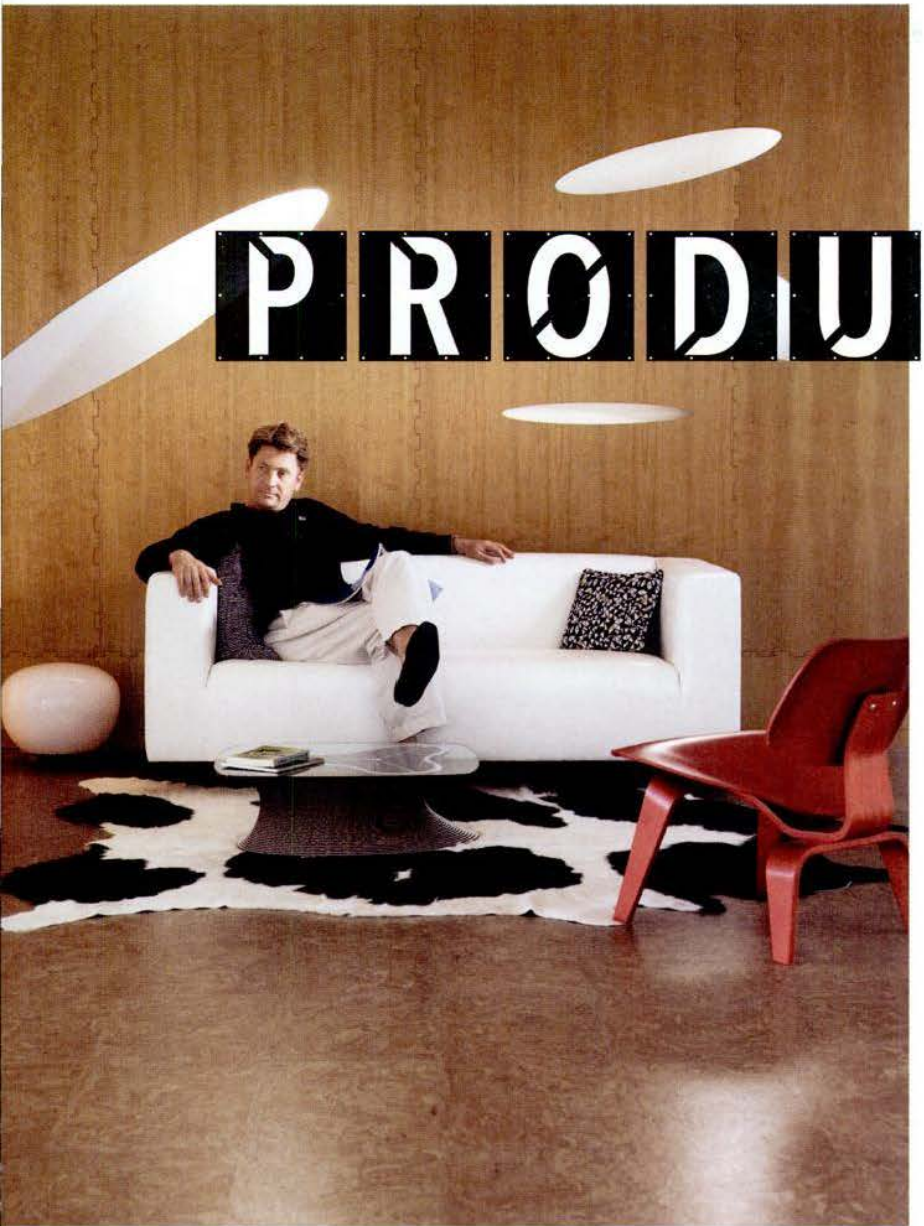
Story by Geoff Manaugh



MASSIE

Art object or machine for living in? Architect William Massie's personal prefab project takes the mass out of mass customization to create a one-of-a-kind wonder.

Project: America House 08
Architect: William Massie
Location: Bloomfield Hills, Michigan



William Massie (left) relaxes inside the utterly unique interior of his America House 08. The home's rectilinear profile flirts with normality—only to defy expectations with every last detail.

PRODUCED

Story by David Hay
Photos by Henrik Knudsen

William Massie always longed to live, work, and build in the same place. For most of his career, the charismatic architect, known for championing the latest design technologies, had to travel long distances in order to construct his experimental homes.

Then, in 2005, after becoming head of the architecture department at the Cranbrook Academy of Art in Bloomfield Hills, Michigan, Massie had less time to do even that. Shortly after relocating for the job, he came across a former tool-and-die factory that was for sale in nearby Pontiac. At 10,000 square feet, it was large enough to erect a house in. Massie snapped it up. Finally, he could work on his residential designs close to home and in his own time.

Last summer, the architect completed the first home to come off of his factory's highly idiosyncratic production line. An all-white, superbly elegant, 2,500-square-foot modernist box, the steel-framed house, which was built in sections, is easily recognizable for its roof line that parabolically plunges at one point to form a dimple.

The house, which Massie dubbed the American House 08, was built to move: No sooner was it completed **than the architect jumped behind the wheel of his dual-axle GMC truck and towed many of its components five miles along Woodward Avenue** to Cranbrook. The house was reassembled on a lawn outside the art museum, next to a towering sculpture by Mark DiSuvero. After the addition of cork flooring and newly plastered ceilings, the house, part of an exhibition on Massie's work, was opened to the public. But the 08 still faces a much longer and yet to be determined journey: to its eventual client.

For Massie, creating this "transportable" house proved inspirational. "It is the culmination of everything—the digital technology, the prefabrication techniques, and more formal architecture—that I have brought to my designs," he states. Walking inside, it is clear why. Massie's grasp of domestic space, honed by a reverence for early modernists like Richard Neutra and Rudolf Schindler—he once lived in a Neutra house in Bozeman, Montana—has been enhanced by the freedom that designing inside his factory allows.

At first, all he did was erect the steel frame. Abandoning the standard practice of deciding a house's layout before construction, Massie spent hours walking around inside to figure out, from the occupant's point of view, what it would be like to live there. "There was never a need to finalize beforehand where the bathroom wall should be or where the front door had to be placed," he recalls. For the

Massie's factory (opposite) was itself a spatial influence on the 08 project. The two main doors to the warehouse had originally been designed to allow a standard trailer to back inside. Thus, no section of the house could be wider than the trailer (12 feet). Although each section was designed with these dimensions in mind, getting them out proved tricky. In the end, Massie came up with a solution after building a test model. Milling technologies at various scales (below and right) helped give the house its unique textures and spaces. The result is as much a demonstration piece of domestic construction techniques as it is a place to live.

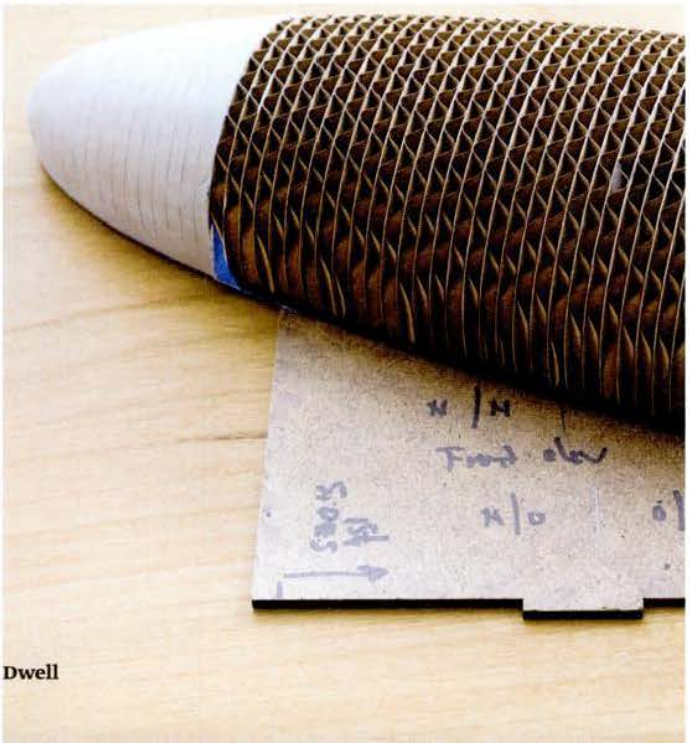
first time in his career, Massie found himself free of demanding clients. "They are not good coconspirators," this obsessive experimenter confesses. And experiment he did. Sometimes his search for different materials meant roaming up and down the aisles of Lowe's and Home Depot, both equidistant from his factory, on his Segway. At other times, he would simply sit in a chair and see that a certain window could be higher. "I was able to play constantly," the 46-year-old exults.

The result of this approach (Massie refers to it as "subtly improvisational") is an interior that responds immediately, albeit quietly, to an occupant's needs. Massie lowered the ceiling, creating space between the ceiling and the roof and making the house feel less like a solid block. He then made sure that the views from the master bedroom both to the living area and to the outside spoke directly to the choices offered by the house: Is it time to go outside to the lawn or return to the main space?

Some decisions were straightforward. In keeping with modernist tradition, skylights and floor-to-ceiling windows in the living room invite natural light inside; the question for Massie, as he wandered around inside his frame of a house, was simply how to use that light. He soon decided that shade, even darkness, would make the master suite feel more separate, so he inserted a 34-foot-long panel to bisect the wall of glass. The darkened room thus feels apart from the rest of the house and, appropriately to Massie's original idea, more private.

When Massie attended Columbia University back in the late 1980s, he and his classmates believed that the computer would revolutionize design. For many, that ended up meaning greater dexterity with programs like AutoCAD. Massie, however, was determined to use this new technology in the construction process itself, not merely as a design tool.

For over a decade, attaching his computer to a laser cutter, he learned how to draw intricate shapes—such as jigsaw patterns for wood paneling—and have the machine cut them out seamlessly. He then bought his own computer numerically controlled (CNC) milling machine, which could ▶



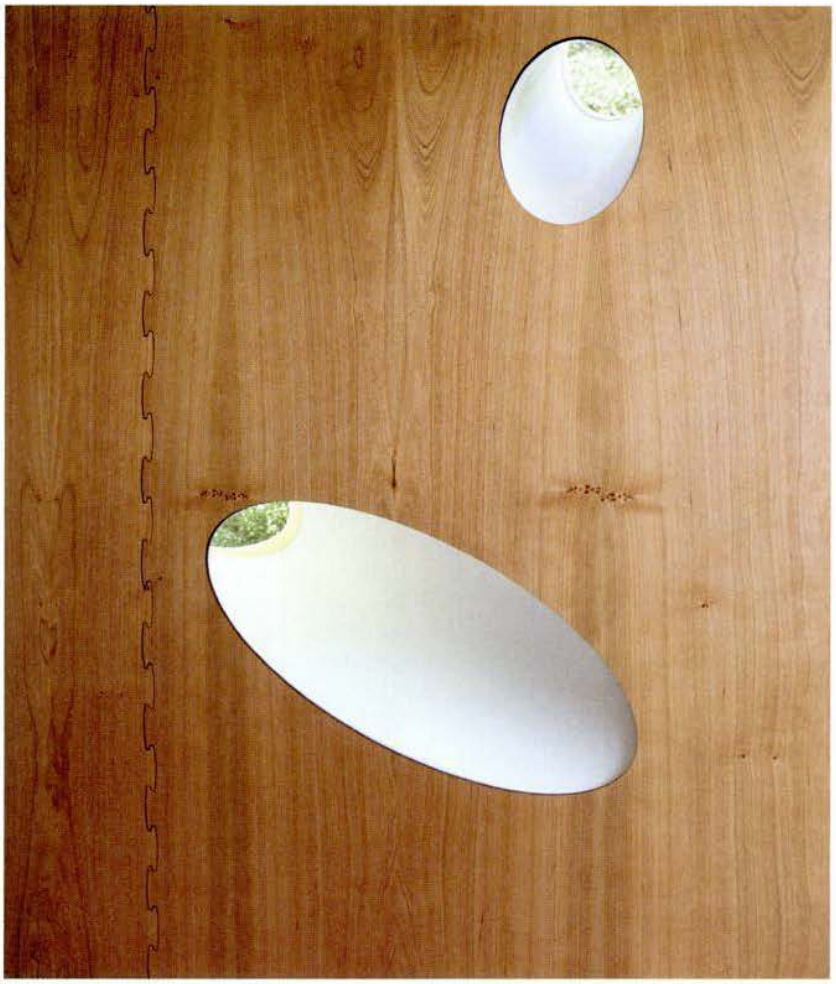
drill down into a material to create molds. He was thus able to redefine how standard materials such as concrete, wood, and even rubber were used. They no longer had to be flat or rectangular—they could become sculptural forms.

As soon as one steps inside the 08, the results of these battle-tested skills are evident. Two sculpted pods dominate the living room. One is the reverse of the roof dimple while the other houses a large stand-alone bath and shower. Both are made from the same structural insulated panels (SIPs) that in-fill the exterior, but, thanks to the laser cutter, these panels were sliced into even smaller pieces and pushed into dramatic shapes.

Massie's computer-design wizardry is not confined to grandiose gestures. The cabinets—which look like thin sponges—are simply whiteboard sculpted out by the laser cutter according to a pattern set up on the computer (when viewed at the right vantage point the varying ellipses all condense to form perfect circles). In the master suite, two small rectangular sections of the walls have been filled with translucent rubber cubes also cut on this machine. "They allow light through as well as some exciting shadowy movement," Massie says.

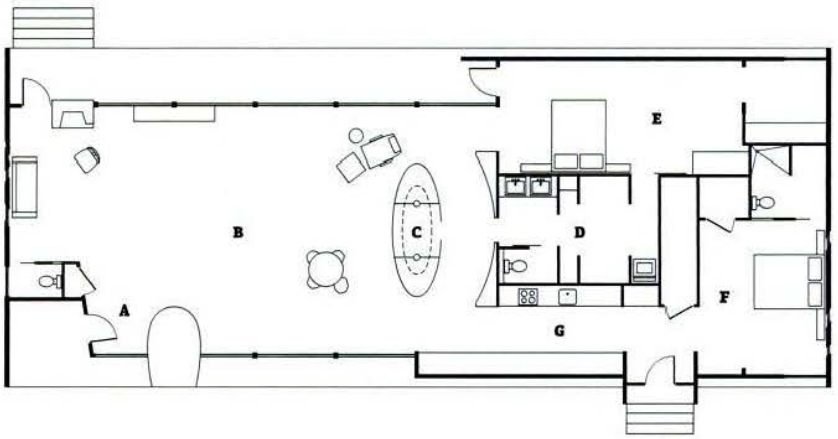
Sometimes there seems no end to these flourishes. Orange rubber molds fill in the elliptical recesses on the house's solid end walls; from certain angles the torqued shapes flatten out to form perfect circles. The bathroom sinks are made from the same colorful material. Surprisingly, though, the house does not feel self-conscious. "I don't like design to be fetishized," he says flatly.

The 08 seems to amplify Massie's own freewheeling spirit. During my visit he invited friends and family in for drinks. A built-in projector shone an episode of *Twin Peaks* onto the wall of the sculptured shower pod. LEDs in the floor beamed different colors onto each side of the dimple. With the rest of the living room subtly lit, it became a New York cocktail lounge. Those inside soon forgot, if they ever knew

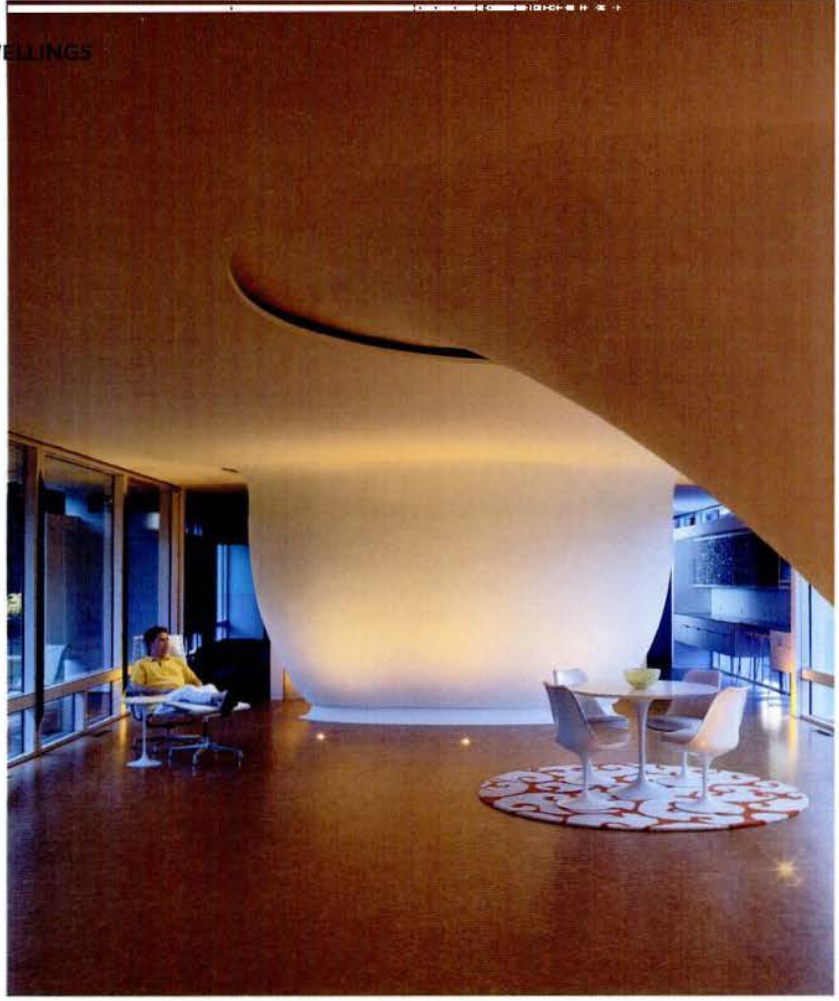


American House 08
Floor Plan

A Entry
B Living/Dining Area
C Master Shower
D Master Bathroom/Closet
E Master Bedroom
F Bedroom
G Kitchen



Irregular milled perforations (opposite) form intriguing light wells in the skin of the house. Seen from outside, the angular slits offer tantalizing glimpses of the home's interior. The curving, bulbous walls of the bath and shower (right) reveal an unexpected secondary role as a screen for film projections, giving the house a sci-fi glow.



that what they were sitting in had been prefabricated in sections, transported to the site, and then bolted one to the other. Of course, this is the way Massie wants it. This architect came to the idea of transportability to satisfy his own design ambitions, not because he was obsessed with prefab.

When the house is moved again, some interior surfaces, such as the plaster ceilings, will, in Massie's words, "have to be sacrificed." Redoing them, and reinstalling the floor, will cost about $20,000. The total transport cost, apart from any work to connect the house to the site, will be nearly $45,000. The cost of the house itself? $750,000. But the new owner will be getting something unlike any other prefab: a one-of-a-kind house by William Massie.

The architect is asking the buyer to view the 08 as a work of art. To that end, he has contemplated putting it up for auction on eBay. Like many of Massie's ideas, this seems outlandish. Then again, so did buying an abandoned factory in suburban Detroit. The architect would have it no other way. ■

The inner dimple, not far from the front door (opposite, top left), separates the entrance from the living space. The curving exterior of the podlike bath and shower cuts an elegant form at the other end of the room. Up close (opposite, bottom left), the dimple forms a voluptuous hallway. The bedroom is a comfortable show of geometric regularity.

SWISS

Built for a young family of Spartan-minded clients, architect Felix Oesch's spare, concrete prefab outside of Zurich is a marvel of clean living.

The rear of the house looks onto a lush backyard. The rough, industrial prefabricated concrete panels by the German manufacturer Syspro are the building blocks of the home. The house is located on the busy Schaffhauserstrasse (below), which links Switzerland to Germany, and therefore part of Oesch's brief was to reduce noise and orient the building toward the nearby Rhine.

MIX

Story by Grant Gibson
Photos by Hertha Hurnaus

Project: Moinian & Meili Residence
Architect: Felix Oesch
Location: Eglisau, Switzerland

For a nation of only 7.5 million, Switzerland has always punched well above its weight in terms of design. During the interwar years, the "Swiss Style" played a pioneering role in contemporary graphic design; today Swiss furniture manufacturer Vitra leads the pack, and the likes of Herzog & de Meuron and Peter Zumthor reside at architecture's bleeding edge. Of course, the country was also the birthplace of Charles-Édouard Jeanneret, or Le Corbusier, as he's better known.

It's impossible not to think of Corbu as I step out of the car and on to the driveway of Christof Meili and Farzaneh Moinian's home. Although only two years old, it owes a significant debt to the godfather of modernism, as its architect, Felix Oesch, is happy enough to confess. "There was never a discussion about style," he tells me. "When Christof and Farzaneh told me one day that they'd seen the Petite Maison, then for me it was clear. My design would fit."

The house is a short walk from the center of Eglisau, a small town 20 minutes from Zurich Airport, on a slope between the bustling Schaffhauserstrasse, which links Switzerland to Germany, and the Rhine. The manner in which the house functions is largely dictated by its locale. The architect's job was to reduce the noise from the road and orient the building south toward the beautiful, almost emerald green river. However, its look was a more personal choice and perhaps betrays the couple's roots in design and architecture. Meili trained as an urban planner before becoming an IT consultant, and Moinian is an industrial designer, working on projects such as the Transrapid system for Deutsche Bahn and interiors for Swiss International Air Lines when not looking after their 14-month-old daughter, Anaïs. The pair, who met when their companies shared an office space, commissioned Oesch after seeing one of his houses in a Swiss design magazine.

As all four of us sit down for an impromptu barbecue, it's plain that aesthetically both architect and clients

sing from the same hymn sheet. "We were really lucky," confirms Meili, "because Farzaneh and I have the same taste. We both wanted a modern, minimal concrete house." Handy, because that's precisely what they got.

Descend a flight of steps from the parking area and open the heavy larch timber entrance door, and you arrive into a huge kitchen, dining, and living space that Oesch describes as "a strange kind of church," and which provides a panoramic view of the Rhine and neighboring woods. The link is a partially covered deck, where we're currently sitting, that allows the family to eat outside even when it's raining.

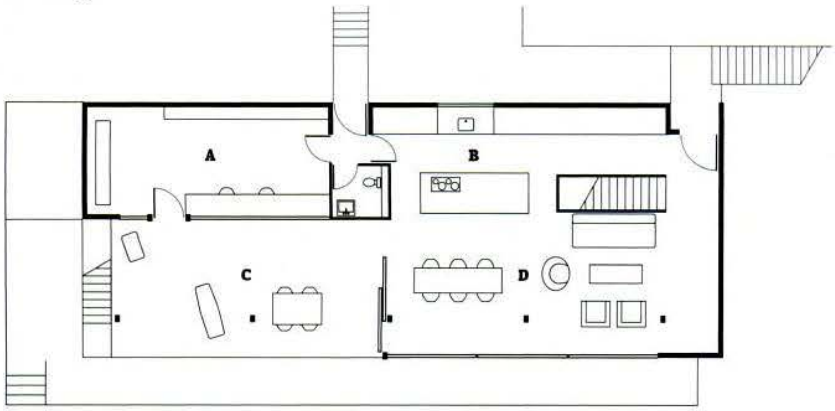
Down the banisterless stairs, there is a second living room as well as two decent-size bedrooms—one for Anaïs, the other presently spare—and a rather intriguing bathroom, intriguing because it's a mirror image of itself: A pair of toilets sit side by side, and there are two sinks and a pair of showers. It can be left as one linear space or divided by a sliding door, presumably for when their daughter begins to demand some privacy. "We wanted it to have the feeling of the length of the house," says Meili. Natural light comes in via a letterbox-shaped window that runs the length of the outside wall and another slot window that allows you to look out into the garden as you're having a bath. It's a nice touch. Last, but by no means least, is an understated master bedroom furnished with a storage cupboard, a double futon bed, a mirror, and not much else.

Though the house is pristine, the garden, somewhat surprisingly, has a rougher feel to it. Judging from the couple's taste in cool minimalism one might be forgiven for expecting their lawn to resemble the 18th green at Augusta. However, this is a family that enjoys the outdoors. They regularly swim in the Rhine after work (which explains the outdoor shower) and the kayaks hanging by the log pile allude to Meili's competitive background in the sport. So perhaps their slightly unusual agreement with a local farmer makes sense: When the grass is ready and the wildflowers

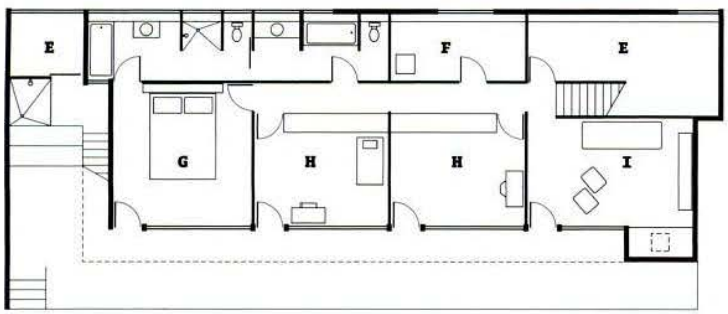
After walking through the front door visitors enter directly into the enormous kitchen and living space (opposite). The interior is minimal, using predominantly timber and concrete. It also provides some spectacular views across the river. Meili and Anaïs lounge on a Transform sofa by Moroso (opposite, bottom). The couple are also avid collectors of contemporary furniture. Their office (bottom) includes the Living Tower designed by Vernon Panton for Vitra. Meili (top) makes tea in the kitchen.

Moinian & Meili Residence
Floor Plans

A Office
B Kitchen
C Deck
D Living/Dining Area
E Storage
F Laundry/Utility
G Master Bedroom
H Bedroom
I Family/Living Room



Upper Floor



Lower Floor

are out, he brings a flock of his sheep to graze, and the gardening is thus done easily and organically. Oesch explains the reasoning behind this: "I didn't want to change the landscape. I wanted the house to look like it's always been here."

Which of course it hasn't. In fact, it took nine months to build the house using a prefabricated panel system developed by the German manufacturer Syspro that's more commonly used for building cellars rather than entire houses. Each panel is made up of two outer layers of 2.4-inch-thick concrete, which act as the bread of the sandwich. Inside there's a core layer of concrete as well as seven inches of insulation. This means the panels, which arrived onsite with all the holes cut for the fixtures and fittings, are relatively light and easy to maneuver. Subsequently, construction was a question of fitting them all together like pieces of Lego.

For Oesch the benefits of the process are obvious. "I like prefab because you've got all the control in your office. You have most of the control working on the plan and not working onsite. I don't really like working onsite—I don't like to scream at people. When I know it's right, I know it's right. I don't need to discuss it."

The house is also hugely efficient. Geothermal energy for hot water and under-floor heating (which negates the need for ugly radiators) is provided by a pair of 300-foot-deep boreholes that transfer warmth from the ground to the house through a heat pump. Meanwhile, used air is taken out from the bathroom and kitchen and pumped back into the earth, effectively storing its energy for a later date. Heating and cooling air is pumped into every other living area of the house. Elsewhere, the concrete flume on a fireplace in the downstairs living room provides some thermal mass for the whole house. All told, this is a remarkably inexpensive house to heat. In fact, the architect jokes that the huge light sculpture, made up of two rows of bulbs, hanging from one of the walls in the main living space uses as much energy as the rest of the house put together.

The couple do their outdoor lolling on Willy Guhl's concrete Loop chair (near grating) and Superieur's Divan lounge (near the table), both Swiss products. The office looks out on the spacious deck (opposite).

Wandering around, two things are instantly clear: This is a couple who loathe clutter and have a passion for contemporary furniture. The house is littered with design classics—Verner Panton being a particular favorite. Even the miniature furniture in their daughter's bedroom, which has been in the family for two generations, has a touch of Jean Prouvé about it. And there's absolutely no mess. To live like this takes a good deal of rigor and plenty of storage. Look around and everything has crisp, clean lines. In the kitchen, for instance, the stove's extractor hood is hidden, only popping up from the counter when it's required.

Naturally, I'm intrigued by how the relatively recent addition of Anaïs has changed the way they live. Is it possible to have a young child and maintain this level of super-tidy minimalism? "Life is just different in general," shrugs Moinian, seemingly unfazed, "and I'm not working all the time now so that's different as well." "I think we won't have a big playing area," Meili chips in. "We really like a minimal space." And while they'll almost certainly have to make adaptations when their daughter starts toddling, I'm inclined to believe them.

The relationship between architect and client can be extremely fraught in a major building project, yet if there were any problems during this process then it's almost impossible to detect as our meal draws to a close and we go for a walk around the chocolate box-beautiful town. In fact it would seem the scheme has turned clients and architect into firm friends.

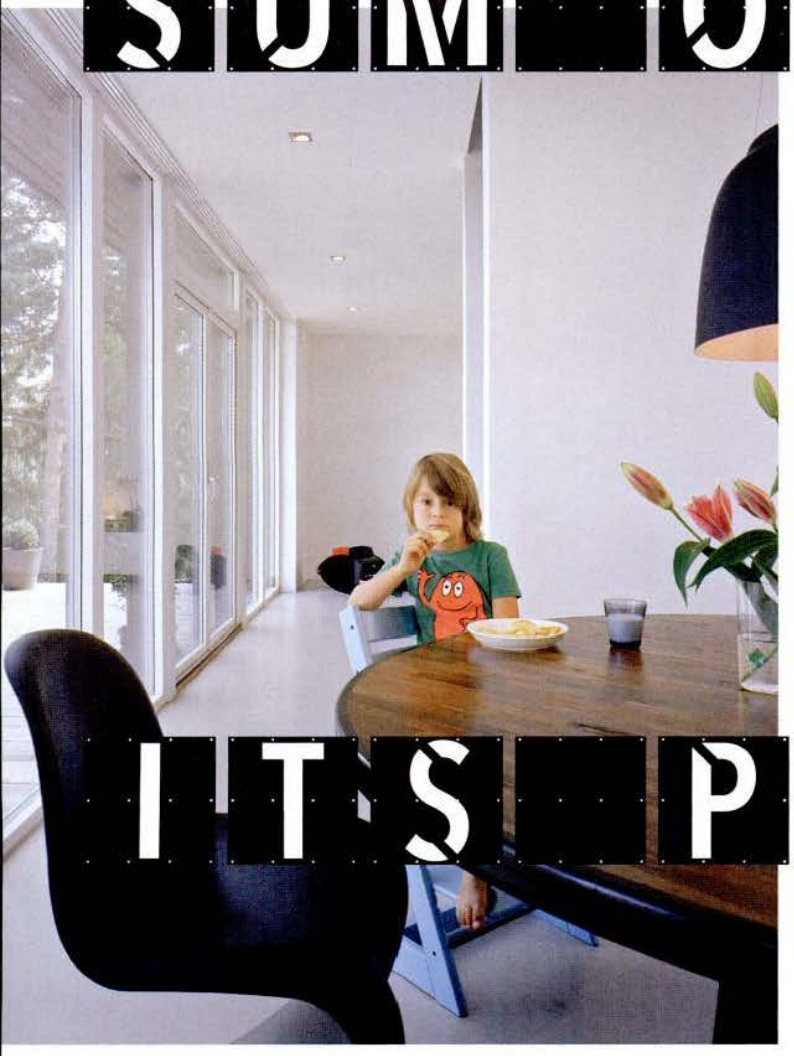
As I make my way back to Zurich airport in Oesch's pickup truck, it strikes me that for all the concrete and iron discipline, the neat trick they've pulled off is giving a house that in the wrong hands might have turned into a museum piece a sense of warmth.

The bathroom (opposite, top) is a long, linear space with a letterbox window to provide natural light. There are two toilets, a pair of sinks, and two showers. The master bedroom (opposite, below) is equally Spartan.

At the bottom of the stairs is a second living space that includes a fireplace. The couple couldn't find a television that didn't clutter the cool minimalism so they prefer to use a projector to watch movies. The sofa was designed by Barber-Osgerby for Cappellini, and the Djinn chair is by Olivier Morgue.

Taking cues from traditional Swedish rooflines but rejecting the precedent of subpar prefab, Claesson Koivisto Rune bring light and style to their "site-generic" design.

SUM OF ITS PARTS



Story by Virginia Gardiner
Photos by Åke E:son Lindman

PROJECT: Plus House
ARCHITECT: Claesson Koivisto Rune (CKR)
LOCATION: Vendelsö, Sweden

Claesson Koivisto Rune's Plus House took 40 days to build: 20 in the factory and 20 onsite. CKR's mode of prefabrication is about not building modules but panels: Girders, walls and trusses are assembled before delivery. Finding a vacant lot in Stockholm isn't easy; though not so central, this plot has fresh air and estuary views.

It takes 20 minutes to drive from central Stockholm to Vendelsö, one of many villages that define a wet and woodsy urban fabric. Two million people inhabit this convoluted archipelago; the bright city center, big-box stores, and cookie-cutter housing clusters are interspersed with plenty of seawater, lakes, granite, and conifers. Mårten Claesson is behind the wheel, and we are en route from his office to his architecture firm's first completed prefabricated house.

The Plus House—named for the perpendicular trajectories of light and air that pass through on the top and bottom floors—is one in a series of architect-designed homes commissioned by Arkitekthus, a development company founded five years ago with a pledge to improve the quality of prefab architecture. The company offers 12 models from four acclaimed Swedish architects: Thomas Sandell, Tham & Videgard Hansson, Gert Wingårdh, and Claesson Koivisto Rune (CKR). Almost all of the models are now in production, and Arkitekthus has sold more than 60 units.

"You could argue that it's not true architecture," says Claesson of the Plus House, "because true architecture has to be specific to a site. But prefab houses are so ubiquitous in Sweden, and most of them are crappy. When we found out there was a market for improving the aesthetic, we were happy to contribute."

Whereas in the United States prefab can sound rather exotic (with the important exception of trailers and tract houses), in Sweden it's a way of life, comprising 70 percent of the single-family housing market. And it isn't some high-tech method where rooms descend onto steel frames like pods—it's just a way of building that has developed since the postwar years because finishing components in the factory saves resources and time. "Kit" or "catalog" are more oft-used adjectives for these houses than prefab. Companies tend to offer several models with various sizes, floor plans, and details.

"You need surfaces!" says Claesson, extolling the wide stretches of wall that counterbalance the extensive windows and offer storage opportunities. Laminated-MDF cabinetry helps to hide clutter in the kitchen (below), and a long, low credenza in the living room (opposite) keeps the space feeling open and airy.

Claesson's critiques refer to Sweden's most popular sort of single-family catalog house, with a pitched roof, lots of small windows, and clapboard cladding, often painted red—an archetype Americans might associate with New England. Their look is willfully old-fashioned, like a PT Cruiser. "I'm provoked by that," Claesson says of consumers' tendency to choose such houses. "Would those people want to drive a Model T? No! But they want their house to look that old."

Nonetheless, rolling up the driveway to the Plus House's hilltop lot, the first thing one notices is a pitched roof atop classic old-fashioned proportions. "Normally we do everything we can to avoid a pitched roof," says Claesson, "but this time we decided to try for a new interpretation of the typical old form."

Mikael Bossel, who owns the house with his wife, Suzana, switches off his lawn mower to greet us. Looking across the lawn, you can see through the house: The long walls of the ground floor are completely glazed. Suzana is inside with their children, Molly and Jake, aged four and six.

Moments later we are all standing on the spruce deck, gazing up and down the facade. Claesson explains how the spruce panels that coat the second-floor exterior will fade in tandem with the gradual dulling of the zinc-coated steel that rims the glazed doors and windows, eventually winding up the same color. "They will go gray like we do," he says with a hint of jubilance. The natural finishes are a striking departure from the typical kit house.

The Bossel family moved into their home a year ago from an apartment in central Stockholm that was half the size. "We needed more space for the kids," Suzana says. "The tricky part was finding a plot that we liked and could afford. When we saw this place we fell in love at once."

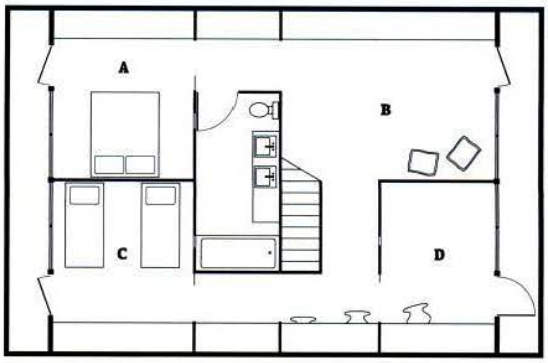
Molly and Jake love it too, especially the ground-floor layout, with its central box-shaped wall around the stairwell—perfect for running around in a perpetual game of tag.

You could argue that it's not true architecture because true architecture has to be specific to a site.

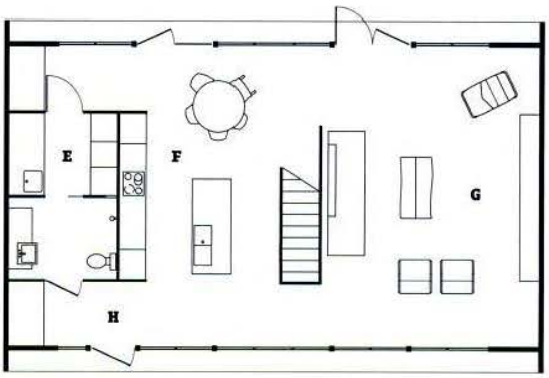
Mårten Claesson

Plus House
Floor Plans

A Master Bedroom
B Family Room
C Bedroom
D Playroom/Study
E Laundry Room
F Kitchen/Dining Area
G Living Room
H Entry



Upper Floor



Ground Floor

Sight lines are crucial to offering a sense of space, so Mikael's desk (right) has views outside in both directions. Molly and Jake watch TV (below) with the balcony door ajar. The pitched facade (opposite) has a sculptural play of spruce siding and triple-glazed windows that reflect the surrounding treetops. Arkitekthus charges a little extra for the see-through staircase; the basic house has under-staircase storage, which is more practical but less beautiful.

The family has begun to add touches to make the Plus House their own: an Oriental rug and giant poufs in the TV room, mini Panton chairs for the kids' playroom, and a vintage dining table by the kitchen. Claesson's vision for furnishings might have been more austere, but he isn't bothered. "I don't want to be like Frank Lloyd Wright," he says. "I don't need that amount of control."

Mikael has embraced the freedom to add characterizing details to the house. In front, he's been working on a Japanese-style garden. "Before we moved in the plan was to have sand or gravel, maybe raked in nice patterns. But with two kids in the house, grass is better to play on, and I don't have to freak out every time my Zen pattern is destroyed," he says in jest, as he watches a portly construction worker approach from a neighboring lot that's being excavated, hauling several big, lichen-covered rocks on a forklift. After placing the decorative rocks on the lawn, he leaves, carrying a bottle of Glenfiddich given to him by Mikael.

The addition of the Bossels' personalities and the lived-in quality brought about by two young children is welcome seasoning for a house that was designed on spec. When developing the Plus House, CKR had no site—nor did they have a client, per se. They were creating the house for Arkitekthus, but the developers did not plan to live there, and they gave such an open brief that the architects took several months to find a workable approach to the design. "Creativity needs boundaries," says Claesson. "Often our clients give us too much freedom because they think making requests will inhibit our creativity. But for us it's quite the opposite."

So CKR made their own constraints: They decided to embrace zoning regulations and market demands by building a pitch-roofed, two-story, typically proportioned house that still looked modern. Rather than site-specific, their approach was more site-generic, emulating a form descended from barn houses and ubiquitous to the Swedish landscape.

The Plus House nevertheless takes on a radical appearance, because on each story two whole walls are glass—the long sides of the ground floor and, on the second floor, the triangular walls beneath the roof.

The orientation of the house, which is symmetrical in plan, exemplifies the non-site-specific design, as no single wall is intended for sun or shade. On all sides, the architects drew the windows in from the facade, so however the house is sited, a three-foot overhang adds some shade when summer sun streams in.

Buyers of Arkitekthus houses pay a premium for architecture, which might equal the royalty fee that CKR receives for each one—though the company did not divulge all the details of its business strategy. Nonetheless, the premium isn't huge: Sköna Hus, the manufacturer for Arkitekthus, usually charges 3 million Swedish Krona, about $475,000, for a 2,150-square-foot house for one of the other development companies for whom it manufactures homes. At 1,750 square feet, the Plus House costs nearly the same, relative to size.

Despite actually comprising 400 feet fewer, the Plus House appears larger to most people who visit, because its open glass walls create a sense of expansiveness. Sight lines throughout the house lead straight into the woods or across the nearby estuary, and the architects added details to maximize this effect. On the second floor the doors slide, rather than swing, which means that they can remain open without taking up space, and the gaps between each step in the stairwell provide a view to the outdoors on the way upstairs.

"The first time it snowed," Suzana remembers, "with all the whiteness, you just felt the floor extending."

Claesson puts it a little differently: "Normal houses are just smaller, even if they're not."

Despite long sight lines, the architects consider the Plus House an exercise in compartmentalization: "This is not the Farnsworth House," says Claesson, "but what we've learned from modernism is that you need to provide an alternative to the open space. People need privacy but not too much. We tried to make a hybrid." The master bathroom (left) is one of few spaces that lacks windows, but it opens onto the brilliantly daylit master bedroom (below). On the wide deck (opposite), the family enjoys some peace and quiet.

The Prefab Decade

Back in 1999, I applied for a position as the editor of a new magazine. As part of the application process, I had to dream up the contents of a sample issue. "Let's say the issue's theme is Mass Production," I wrote in my proposal. "The premise is that the notion of manufactured housing keeps coming back. It is the ultimate modernist fantasy. It's an idea that has intrigued (and more or less defeated) Walter Gropius, Frank Lloyd Wright, Buckminster Fuller, and other less illustrious characters." I outlined a series of features that would open with a photo taken inside a mobile-home manufacturing facility or a shot of a double-wide rolling down the highway on the back of a truck. "We accompany that image with a brief essay that asks why the dream of mass-produced housing always turns into a nightmare," I wrote. "Why don't the factories that turn out Alessi products, or, for that matter, Airstream trailers, make good houses?"

The new magazine, of course, was Dwell. And in the fourth issue, dated April 2001, I executed the scheme I'd outlined. It was the first prefab issue, kicking off a long love affair between this magazine and one particular strategy for making good, modern architecture more accessible to the American home buyer.

That Dwell became the progenitor of a new American prefab movement (something that mostly happened after I left in 2002) can be attributed to an accident of timing. Shortly before the Dwell vetting process kicked into high gear, I'd had a conversation with a pair of New York architects, Sulan Kolatan and Bill MacDonald, who showed me a design for a house in Connecticut. Typical of the late 1990s, the form of the house was a weird, amorphous, computer-generated blob. The most unusual thing about it, though, was the architects' theory about how it would be built: They planned to fabricate it from curvilinear fiberglass modules that would be supplied by a boat manufacturer. Cooler still, the architects' goal was to use this house as a prototype, the first in a series of digitally designed, factory-made, affordable homes. It sounded great. But a year or so later, when I called the architects to find out how the house was coming along and whether Dwell could publish it, I learned that the project had never gotten off the ground. The idea of piecing together a house from boat hulls, as clever as it was, turned out to be wildly impractical.

This bedazzlement, the fairy dust that's kicked up when architects dream of mass production, is the typical story of residential prefab in this country. It's certainly the tale told by *Home Delivery: Fabricating the Modern Dwelling*, a landmark exhibition at the Museum of Modern Art in New York last year. *Home Delivery* was a fascinating historical pageant, stretching from Thomas Edison's early-20th-century scheme to build a "single pour" concrete house, to the little pitched-roof cottages Walter Gropius designed for a German copper manufacturer, to the precast concrete boxes of Moshe Safdie's Habitat 67, built for Montreal's Expo '67, to the myriad contemporary experiments that will be familiar to regular readers of this magazine.

Photo by Matthew Monteith (Habitat 67)

Most of the examples on display achieved, at best, limited success. Edison built 100 of his concrete houses in Union, New Jersey. Approximately 14 of the Gropius-inspired copper houses were erected in Palestine in the 1930s as homes for Jewish settlers. Safdie's Habitat is a true landmark, still lived in today, but is also one-of-a-kind. On the museum walls, I kept reading variations on the same phrase: "Yet none of them were commercially successful." "Despite numerous efforts, the system never took off." "Just under 2,500 houses were produced before the company went bankrupt in 1951."

The story told by the MoMA exhibit is one of thrilling creativity and innovation that ultimately leads nowhere. A century of dead ends. And this sense that the prefab approach to housing is a recurring novelty is reinforced by curator Barry Bergdoll's choice of contemporary projects. Adam Kalkin's fetching little buildings made from shipping containers get a generous slice of wall space, as does Teddy Cruz's admirable—and quite beautiful—Maquiladora structural system, intended to help residents of Tijuana better use waste materials in their building projects. Both are intriguing, but neither is likely to have much real impact on the ways that most Americans buy and build homes.

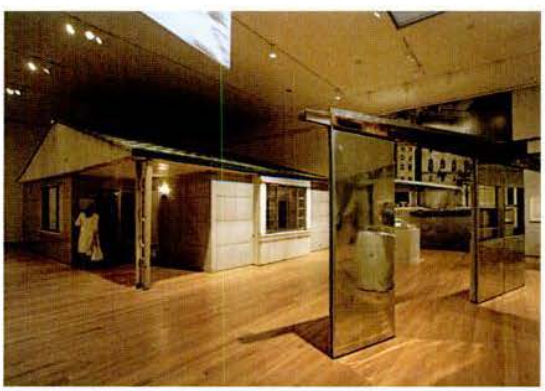
Story by Karrie Jacobs

Inventor Thomas Edison stands next to a model of a "single-pour" concrete home (left), a progenitor of today's prefab. The boxes of Moshe Safdie's Habitat 67 (right) were precast in concrete before being joined together onsite. Originally made for Montreal's Expo in 1967, the apartment building is still very much in use.

Outside, in the vacant lot next door to the museum, the most impressive of five full-size houses on display was the Cellophane House, by Philadelphia-based firm KieranTimberlake. It's a transparent four-story stack of minimalist modules framed with an off-the-shelf aluminum scaffolding system by Bosch Rexroth and partially clad in a plastic film the architects call NextGen SmartWrap™. This is a project designed specifically for *Home Delivery*, not to be confused with the KieranTimberlake design that is now being marketed by the California-based modular home builder LivingHomes. Likewise, the stripped-down System3 house, a sleek shoe box of a house designed by Austrian firm Kaufmann/Ruf Architects, and Burst*008, the wildly complex and computer-generated beach house by Jeremy Edmiston and Douglas Gauthier, were designed and handcrafted specifically for the exhibition. By commissioning these houses, the exhibit's curators ensured that MoMA would feature one-of-a-kind artifacts that could be seen nowhere else. But prefab isn't about one-of-a-kind. On the contrary, the whole point is to generate multiples.

You could easily walk away from the MoMA show without realizing that there is a growing number of firms, mostly headed by architects, that are marketing prefabricated homes. None of these commercially available models was on display at MoMA. Of course, the prefab architects in this country are not exactly engaged in mass production. Mostly they build their houses under a roof, rather than outdoors, and they tend to sell their houses in relatively small quantities. But I've come to realize that the prefab movement is actually not about mass production. It may not even be about production. The most significant accomplishment of the prefab architects is not how many houses they've built, but how they've transformed the culture of architecture. Traditionally, architects are trained to think of each building as a one-off. Indeed, the American Institute of Architecture argues, "Society is best served by public building designs that meet the unique and specific requirements inherent in each individual project." Though I understand the importance of site-specific design, this bias is one of the things that have alienated architects from the home-building industry. The prefab movement is a signal that a new generation of architects is comfortable with designs that can be used again and again.

If I were doing the same exercise now that I did in 1999, the theme of my proposed magazine issue wouldn't be mass production, or even the trendier mass customization. Rather, it would be about the dissemination of architecture as pure information. The fascinating thing about the Cellophane House, for example, is that KieranTimberlake did an end run around an absence of manufacturing capability by sourcing off-the-shelf materials. It's an exercise in transforming home building by developing not a factory but a sophisticated shopping list. The firm's strategy is similar to what Brett Zamore of Zamore Homes in Houston is trying to accomplish: Instead of building his own factory, he has contracted with a network of home manufacturers and suppliers around the country who will execute his plans. Additionally, the same sorts of entrepreneurial spirits who embraced prefabrication are now looking closely at another, historically more successful, strategy: selling architecture in the form of stock plans. It's another way of reducing the cost of a distinctive home by distributing the architect's fee among many buyers.

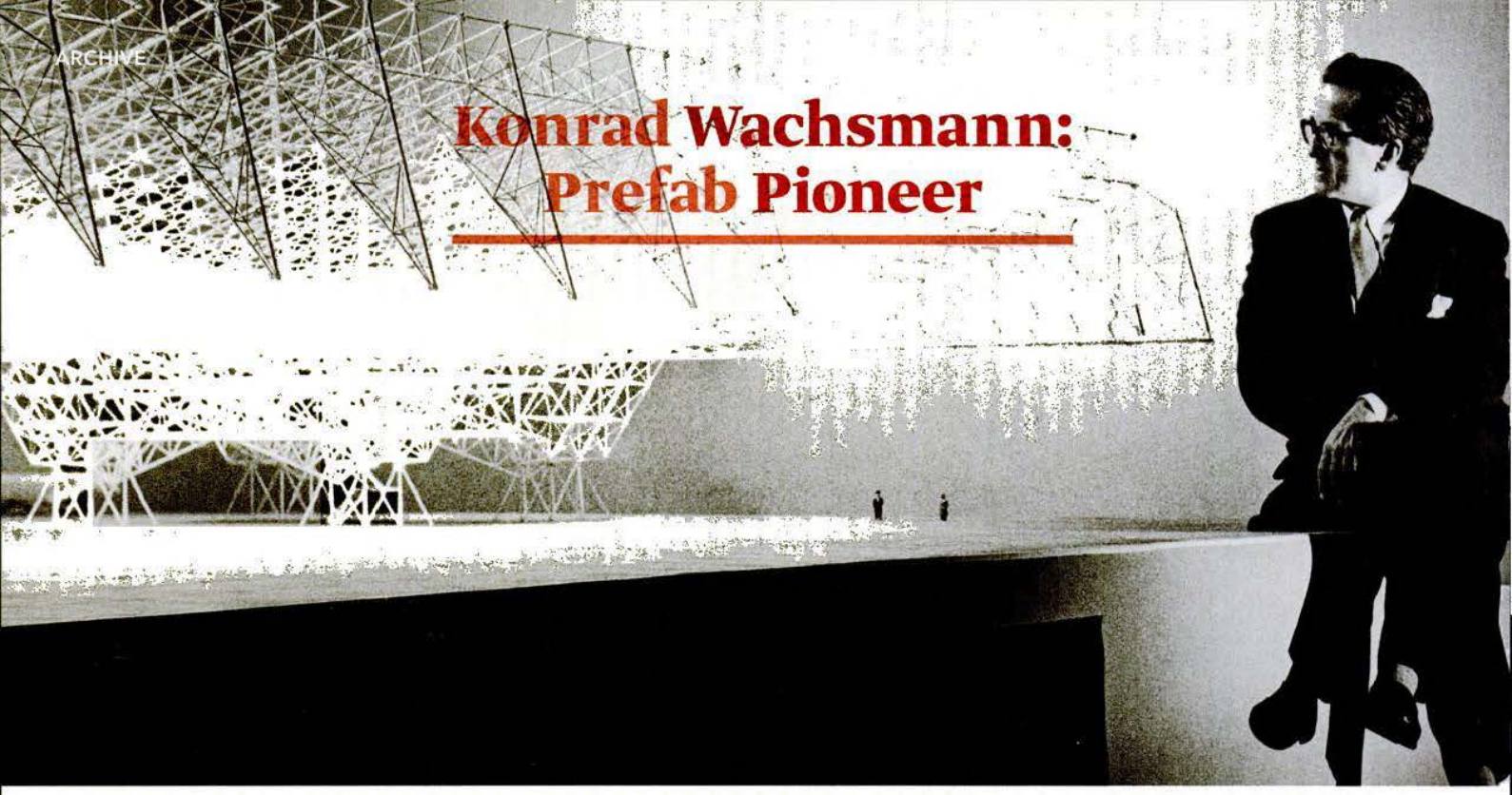


Architects who have long operated like the bespoke tailors of Savile Row, enjoying complex one-on-one relationships with their clients, are lately becoming more like brands. It's a trend you'll see most clearly in ads for luxury condos. But maybe this isn't such a bad thing. As the MoMA show demonstrates, high-overhead manufacturing schemes can easily go belly-up, but an architectural idea marketed and distributed as if it were Pinkberry might survive long enough to change the world.

Photos by Richard Barnes

The Micro Compact Home (top right, foreground) and KieranTimberlake's Cellophane House (top left) were two of five prefabs that were fully constructed in an empty lot adjacent to the MoMA. Inside, on the exhibition floor, museumgoers check out a Lustron Home (bottom).

Konrad Wachsmann: Prefab Pioneer



Pondering, working, and then reworking the promises of prefabrication, Konrad Wachsmann touched each step of the nascent process, first as a carpenter and finally as a theorist.

References to the émigré architect, engineer, thinker, and teacher Konrad Wachsmann are redolent of hyperbole. John Entenza, instigator of the Case Study Houses, captured Wachsmann's character in mythical terms in his introduction to a 1966 lecture given by the architect: "And so I bring you this old friend, this aging wunderkind, this concoction, this mixture of Loki and Apollonius of Tyana—this Konrad Wachsmann."

By then, Wachsmann had transformed himself from an inauspicious beginning as a high school dropout into a renowned thinker and holder of more than 100 patents. Like many prominent American architects of the period, Wachsmann emigrated from Germany, where he was born in 1901. After training as a carpenter, he apprenticed with architects Hans Poelzig and Heinrich Tessenow. These experiences ended badly when Wachsmann quit abruptly to embark on what would become a single-minded quest: "I wanted to build, and I wanted to build in the modern way."

In 1926 he found himself working at Christoph & Unmack, a maker of prefabricated wood buildings in the rural Niesky, Germany. There he expected to "drink milk, eat meat, and find tranquility," but the company proved to be sufficiently more urbane than he had anticipated. "Full of distress, I had recently sought my way in Paris," Wachsmann recalled. "Here, in the middle of the country [Niesky], I found its first traces. The world of machines, of technology, the beginning of industrial building opened up to me in the wooden halls of this factory."

The firm, which was affiliated with a sect involved in missionary work, had exported prefabricated buildings worldwide since the 1880s. Projects like a 1926 hotel on the island of Curaçao, built in Niesky from Christoph & Unmack's patented panels, transformed Wachsmann's early thinking.

Another break came in 1929, when he won the commission to design Albert Einstein's house near Berlin. Charisma and self-confidence—and the jet-black suits and stark white ties that were his trademark—helped him secure this high-profile project. Wachsmann juxtaposed a cubic volume and a hipped roof in a rather ▶

Photo courtesy *Building the Wooden House*/Birkhauser (exterior), All others Akademie der Künste/Berlin/Heinrich-Mann-Archiv/No.420

Story by Itohan Osayimwese

Konrad Wachsmann (top) in front of a large-scale model of his proposed U.S. Air Force hangar from 1959. In his designs for the office building for the Berlin Public Transportation Authority (bottom) from 1928, Wachsmann deliberately placed the windows off center to draw attention to the modern possibilities of wood.

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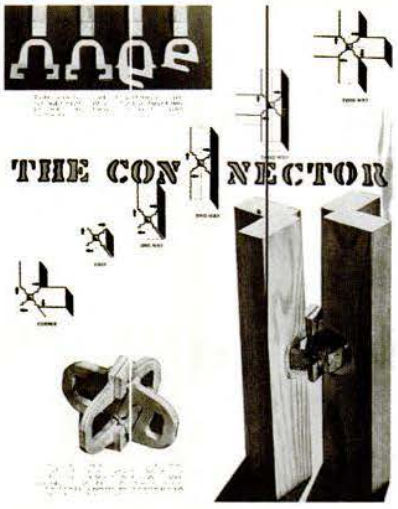
literal illustration of compromise: Einstein had specified "small, white French windows" and an "overhanging red tile roof," but Wachsmann yearned to experiment with large openings, wide spans, and flat roofs in wood.

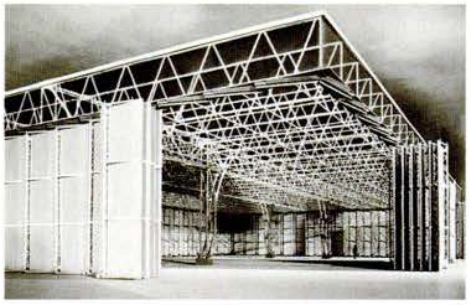
After coming to the United States in 1941, Wachsmann partnered with Walter Gropius, whom he had met in Europe before the war. With his assistance, Wachsmann developed a revolutionary prefabricated building system from 1941 to 1952 that led to the design and construction of prototypes for the General Panel House. It consisted of standardized composite wood panels that could be used in any position when joined with a patented universal metal "wedge connector." Like an Erector Set, panels could be assembled in an infinite range of scales and configurations. Great fanfare surrounded the construction of test houses in Boston and New York, causing Wachsmann to rhapsodize, "It had become possible to ship a whole house overnight from the factory to any site, however isolated, within a radius of 300 miles, and for that house to be erected on a previously prepared foundation by five unskilled workers in one day."

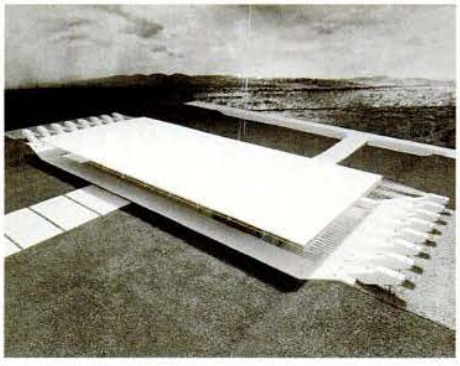
Yet the "dream of the factory-made house" was never fulfilled. Because of financial difficulties; ideological differences between Wachsmann, Gropius, and their backers; and a conservative market, no more than 150 were built.

Developed at the same time as his General Panel House, the Mobilar Structure is Wachsmann's best-known work. Using tubular steel and a proprietary joining system, Wachsmann created space frames that formed soaring volumes in the sublime spirit of bygone eras. The Mobilar was similar in principle to Buckminster Fuller's tetrahedral structures, and the two visionaries compared notes when they became fast friends in Chicago in the 1950s.

Increasingly obsessed with the connectors that served as linchpins to the Mobilar Structure and the General Panel House, Wachsmann had become more interested in the process of development than in the end product itself. Critics like his colleague Serge Chermayeff charged him with a "panaceatic myopia that focuses only on a mythical universal joint." This shift further demonstrated a change in Wachsmann's work from doing to thinking.







The transformation from carpenter-architect to engineer-philosopher was complete when Wachsmann recreated himself as a professor at the Illinois Institute of Technology and later at the University of Southern California. To achieve his goal of modernizing building, he replaced the paradigm of individual artistic genius with anonymous interdisciplinary collaboration. Student teams worked on contract projects that involved system analysis, standardization, mechanized production, and assembly. Soon enough Wachsmann would no longer need concrete building problems. Purely theoretical exercises like his infinitely extensible "three-legged, wishbone-like" structural member from 1953, suggesting the strangely spindly carapace of an alien life form, were suddenly part of the discussion.

In his 1959 book *The Turning Point of Building*, Wachsmann shares his epiphany about the industrial future of architecture: Gothic cathedrals led to Joseph Paxton's Crystal Palace and would culminate in Wachsmann's own inventions. Though committed to transforming building with technology, Wachsmann still held his work to the high standards of art, believing that buildings in the new mode must communicate their technologically determined essences.

Brilliant, inventive, and recalcitrant, like the shape-shifting Loki of Norse mythology, Wachsmann was a superstar to droves of architecture students. His work remains vital long after his death in 1980, and when it comes to questions of industrialization, prefabrication, and architecture, each subsequent generation is apt to discover Wachsmann's fingerprints, the undersung marks of a designer well ahead of his time.

The metal universal connector (top) for the General Panel House became an object of fascination for Wachsmann. The Mobilar Structure (center top) consisted of tubular steel space frames that could span massive spaces. Walter Gropius and Wachsmann (center bottom) confer during the construction of a prototype of the General Panel House. The floating roof for the California City Civic Center (bottom) combined high-tension cables and stressed-skin fiberglass panels set between heavy abutments.

CELEBRATE MODERN HOMES AT PORTLAND'S STREET OF EAMES TOUR

Portland will be celebrating modern design this spring with its fourth annual modern home tour called "Street of Eames." A mix of seven distinctive mid-century and contemporary modern homes will be open for one day to raise money for after-school enrichment programs for homeless students at two Portland public elementary schools.

Advance tickets with donation on sale now. General admission tickets on sale February 16, 2009. Tickets are only available online.

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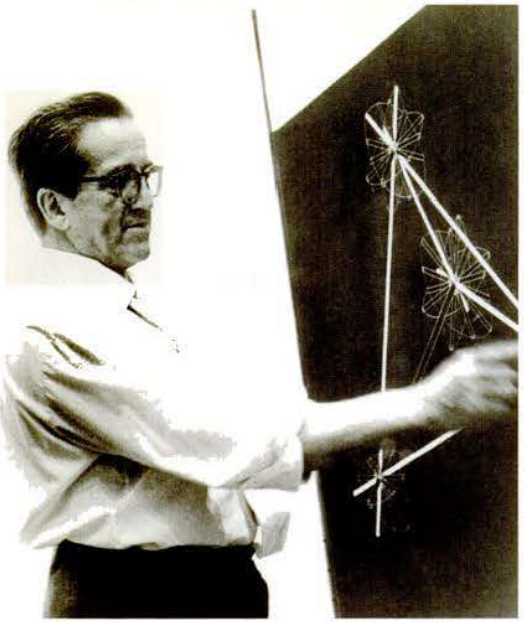
10 things you should know about Konrad Wachsmann



1. Glimpsing Wachsmann's calculations for his house, Albert Einstein insisted, "I'd rather recalculate [the foundation load] myself for the safety of my family and future guests." Einstein's numbers turned out to be wrong and Wachsmann's right.

2. While in Italy, a bellicose Wachsmann challenged Arno Breker, soon to be Hitler's favorite sculptor, to a pistol duel over National Socialism.

3. Aldous Huxley, whom Wachsmann considered one of the prophets of the 20th century, invested in the General Panel House.

4. As a refugee in France in the 1930s, Wachsmann survived by building rabbit stalls for breeders.

5. Wachsmann dreamed up his two most important inventions—the Mobilar Structure and the General Panel system—while in a French internment camp.

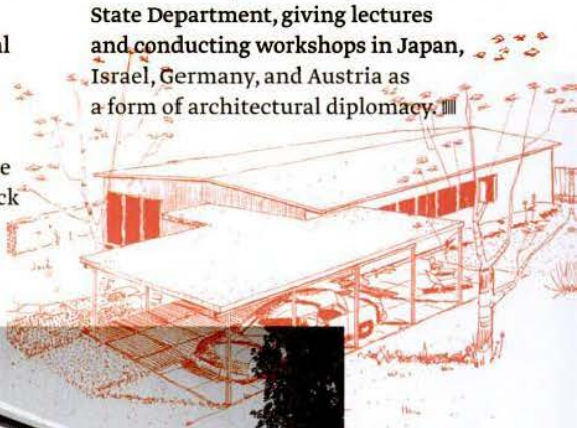
6. Wachsmann volunteered for the U.S. Army five days after the attack on Pearl Harbor.

7. Despite his impressive portfolio, Wachsmann's 1944 application for membership to the American Institute of Architects was rejected. He was granted an honorary membership in 1976.

8. Wachsmann named his only child, a daughter, after his close friend and fellow designer Ray Eames.

9. Wachsmann and Le Corbusier were featured in an exhibition in Rome in 1959. Remembering meeting Le Corbusier before the war, Wachsmann said, "Had someone told me then that our names would one day be the title for exhibitions and newspaper articles, I would have declared them crazy."

10. In 1955, Wachsmann went on a world tour sponsored by the U.S. State Department, giving lectures and conducting workshops in Japan, Israel, Germany, and Austria as a form of architectural diplomacy.



Konrad Wachsmann (top), wearing his signature white tie, illustrates the 3-D principles of tetrahedral structures. Though Wachsmann and Gropius did not promote a particular style, this California home (bottom) was built in keeping with the flat roofs, smooth planes, and rectilinear volumes of modern architecture.

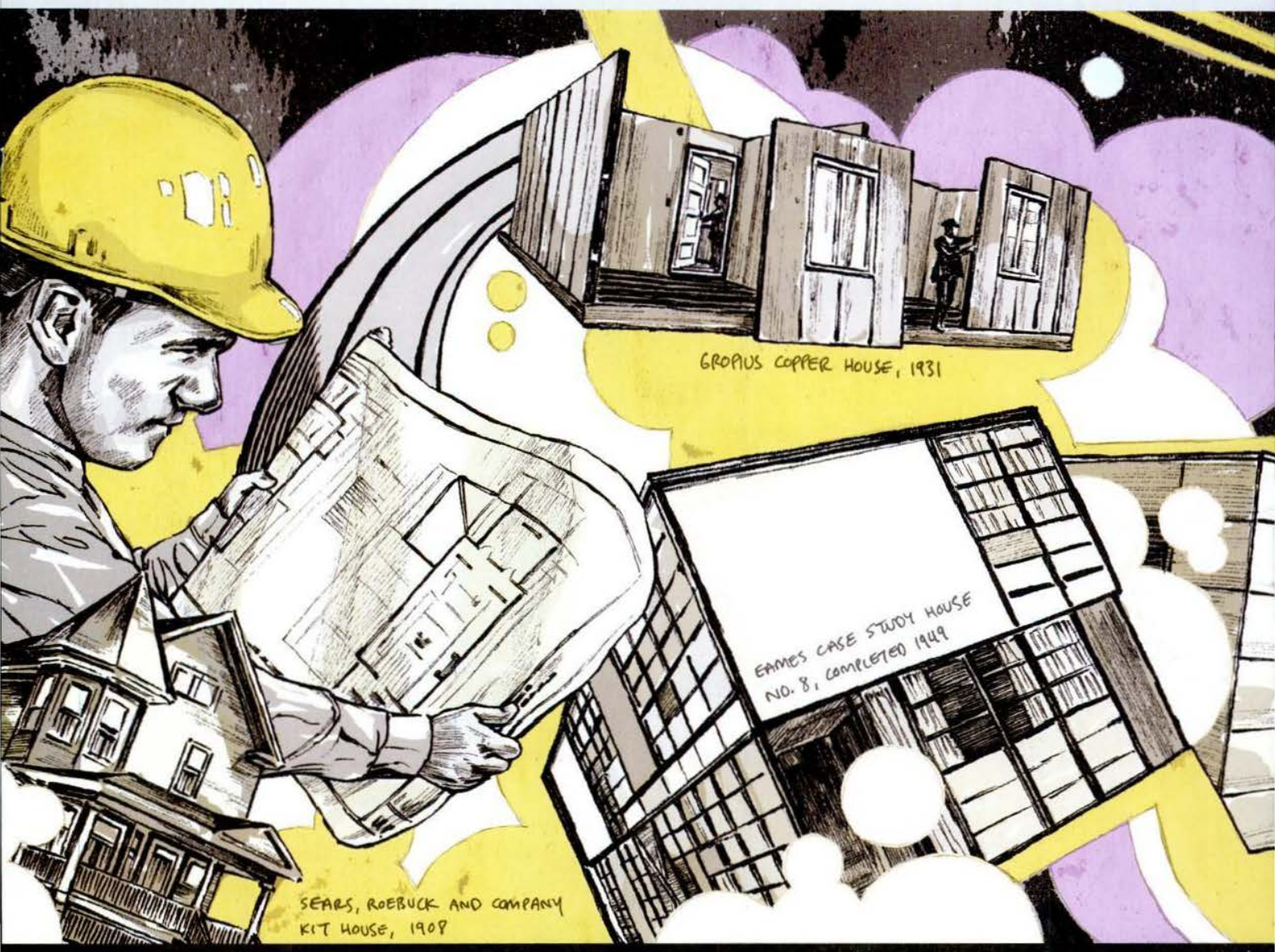
An Introduction to Prefab

The basic principle of prefab, whereby a home is fabricated in one location and then delivered to another, has been around for at least a few hundred years. An early example, the Manning Portable Colonial Cottage, provided the means for reliable shelter in British colonial outposts located far from anything that might have resembled a Victorian-era Home Depot.

Between 1908 and 1940, Sears, Roebuck, and Company sold over 70,000 prefabricated house kits by mail to enterprising do-it-yourselfers across North America. These ready-to-assemble homes featured precut wooden components cross-referenced to a blueprint. Thanks to robust engineering, durable materials, and some good craftsmanship, many of these homes are still in use.

After World War II the United States faced a severe housing shortage, and several ventures attempted to use industrialized factory-built housing to solve the crisis, including Lustron Homes and the General Panel Corporation. The Eames House, in Pacific Palisades, California (1949), explored the idea that a home could be constructed from off-the-shelf industrial parts and harness economies of scale for ready-made components.

In the 1970s the U.S. Department of Housing and Urban Development (HUD) sponsored Operation Breakthrough, which advocated the use of factory-based industrialization and



Story by Michael Sylvester
Illustration by Tim Tomkinson

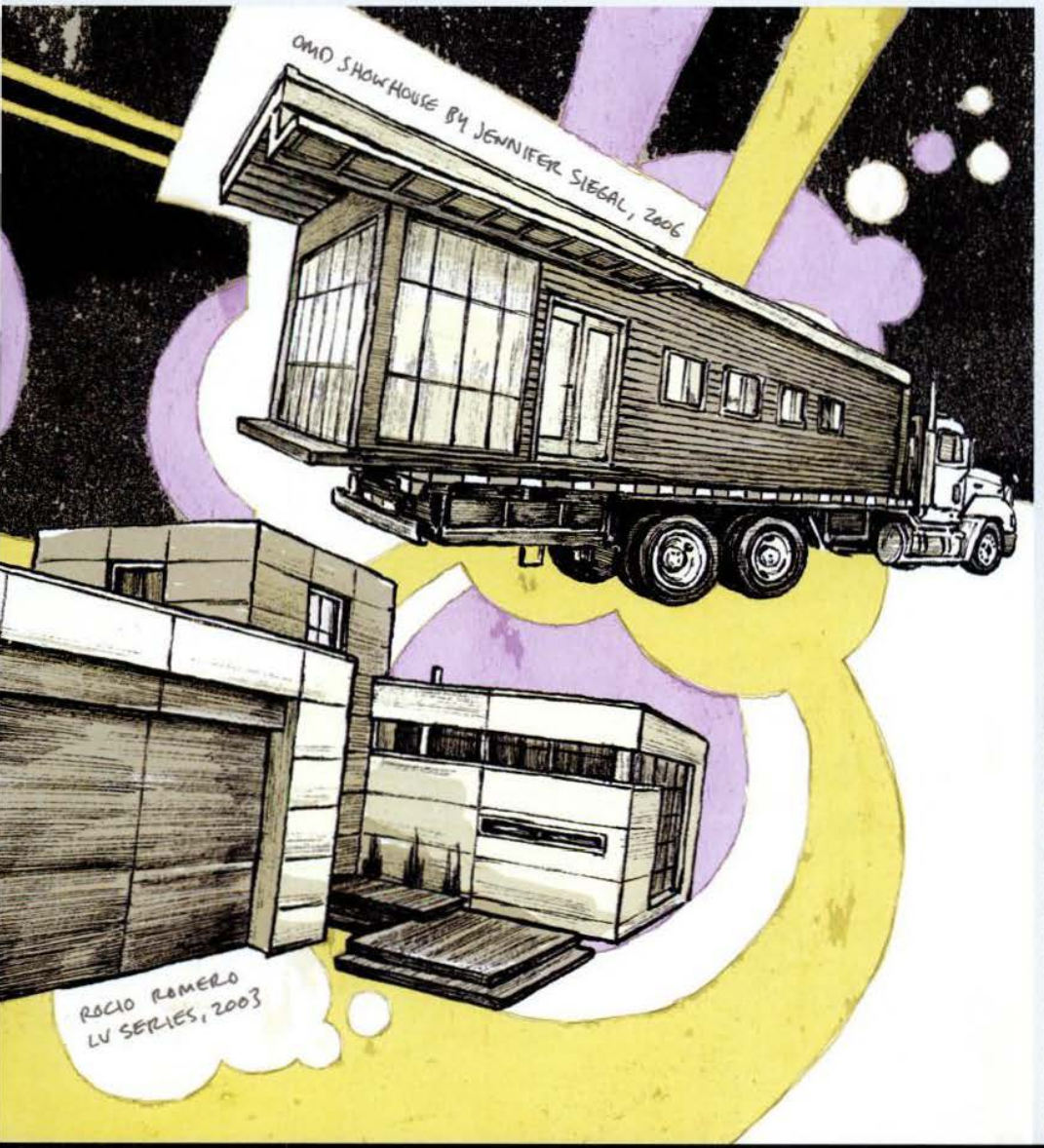
Prefab in Your Daily Life:
Much of our built environment is at least partially prefabricated. We've dug up some facts on the oft-overlooked matter.

mass production in the national home-building industry as a way to drive down costs and make housing more affordable. Unfortunately, Operation Breakthrough did not break through, and the entrenched method of site-building homes remained in place.

Throughout the 20th century, the promise of prefab captivated architects and designers. Luminaries like Frank Lloyd Wright, Walter Gropius, and Buckminster Fuller were among many who experimented with prototypes intended for mass production—a goal none of them achieved.

The last decade has seen a resurgence of interest in prefab as entrepreneurial architects redefine the architect-client relationship around a product-based business rather than a service-based practice. Most of today's models are manufactured in small quantities to the same codes and with similar materials to site-built houses.

The most widely cited benefit of prefab is economy of scale, as components or entire homes can be produced in large quantities. But this is not a prerequisite for success. There's value in faster project schedules, fewer weather delays, and more efficient use of materials thanks to optimization and quality control. One of the primary benefits for the buyer is predictability: Predefined design details and construction processes give the client a degree of surety about the outcome that is often absent in custom projects.



❶ Sears Modern Homes were shipped via boxcar and came with a 75-page instruction book. Each kit contained up to 30,000 pieces, not counting nails and screws.

❷ Most states require special permits for transporting oversized modular homes. In California, a police escort is required for anything over 14 feet wide.

The Future of Prefab

Joel Turkel, Principal, Turkel Design

The future of prefab is an increasingly nonarchitectural problem. Traditionally, architects have tried to design things to be prefabricated using either existing or new means, as opposed to designing functional and integrated delivery methods. Prefab will continue to be a niche approach until we can add to the understanding of what is possible. This means recognizing that design is only one of many imperatives in the prefab question.

Real development for the industry will come from young designers who are able to approach the problem from a more globalized vantage point. This group is able to think in terms of complete front-to-back business models. They are aware of the needs and limits of manufacturing processes but also are versed in new technologies, entrepreneurial methods, how capital works, strategic partnerships, and the importance of marketing and branding. This group will not design buildings but rather solutions for distributed delivery methods like those promoted by Kent Larson at MIT, who is leading the way toward rationalized industry-wide changes to benefit us all, rather than just promoting an individual vision or aesthetic.

Pretty Fabulous

In order to fairly evaluate the pros and cons of today's prefab design, we broke it down according to various criteria. Here are just a few examples of the benefits prefab has to offer.

Affordable
The sticker price is not the only sign of affordability. Rocio Romero's prefab homes come in kit form, allowing the buyer to decide how much to participate in the onsite assembly process. A buyer can hire a contractor or work with some generous friends and a bit of gumption to build the house him or herself. Subsidizing the cost of the house through the provision of labor makes home ownership attainable for some people, creating sweat equity along the way.

Mobile
Want to take your home with you? If so, your prefab will need a chassis and some wheels, making it a close cousin of the mobile home (or "manufactured home," in building industry parlance). The HOM product from KAA Design Group in Los Angeles is an example of a relocatable architecture product, as is the miniHome from Sustain Design Studio. Although technically related to the trailer home, these sharp-looking houses are from a very different part of the family tree.

Reconfigurable
The KT line from KieranTimberlake and LivingHomes is designed to fit easily on urban infill lots. A reconfigurable design allows you to add rooms and entire floors as your living needs change. One model features 19-foot ceilings in the family room.

Transportable
While only mobile homes actually have wheels attached, many prefabs are designed to be transportable, though some can be relocated more easily than others. System 3 by Oskar Leo Kaufmann and Albert Rüf features modules and components that fit perfectly inside a cargo container, which acts like a steel shipping sleeve. The modules are combined with Austrian precision, resulting in a structure that almost resembles fine furniture.

Completely Custom
Some prefabs feature fixed floor plans while others are customizable, designed for a specific client and utilizing a defined methodology, such as steel- or timber-frame modular construction. Custom projects are usually more expensive, but the final design is unique. These homes are available from many companies, including Hive Modular, Marmol Radziner Prefab, and Resolution: 4 Architecture.


1

Recycled
Many architects now specify materials derived from recycled products, such as insulation made with discarded denim. Logical Homes use repurposed cargo containers as steel-frame modules, thus combining the benefits of recycling and prefab. A customizable skin system keeps the container surfaces under wraps, for those who don't want to feel at sea when at home.

Responsible
Prefab home factories produce far less waste than traditional job sites, making prefab lower impact by definition. Several prefab companies, including Michelle Kaufmann Designs, are now raising the bar above and beyond the inherent sustainability of the process, using renewable materials and integrating efficient technologies.

Completely Digital
In Japan, digital design and automated fabrication is employed at Toyota Home (yes, Toyota also makes homes), Matsushita's PanaHome division, and Sekisui House, offering high levels of dimensional accuracy. The homes vary in style from modern interpretations of classic forms to sleek shelter products that resemble the style of Muji—another company that markets prefab homes in Japan.


2


3

1. MUJI.net Co., Ltd., Mado no ie
2. Resolution: 4 Architecture, Bronx Box
3. KAA Design Group, HOM Escape in Style

Photo by Karyn Millet (HOM Design Group)

❸ Renting a crane for positioning a module costs $750 to $5,000 per day. City permit fees for closing a street during delivery sometimes cost more than the crane rental.

❹ Shipping containers were introduced in the 1950s and sizes were standardized in the 1960s. The most common size is 8 feet wide by 8 feet high by 20 feet long.

Taking Care of Business

A look back through the history of prefab reveals a few failures that proved to be great opportunities for learning and improvement.

The history of prefab has offered us some ingenious architecture and engineering. The Dymaxion House by Buckminster Fuller was made of aluminum and featured an efficient heating and passive air-conditioning system based on the physical properties of the round structure. From 1948 to 1950, Lustron Corporation made steel houses with porcelain-enamel-coated panels that could be cleaned with a garden hose. The kitchen featured an unusual combination dishwasher-kitchen sink-washing machine appliance. The Packaged House, devised in the 1940s by Walter Gropius and Konrad Wachsmann for General Panel Corporation, could be erected or dismantled in a single day.

Consumer interest in these design innovations was high, with over 60,000 people touring a Lustron show home in New York City in 1948, and a single advertisement in *Life* magazine generating more than 150,000 inquiries. The problem was that none of them succeeded commercially. This is prefab at its worst: a host of engineering marvels and a litany of business failures.

There are several recurring flaws of failed prefab companies. Financial problems often include inadequate or unsuitable business capitalization. Lustron Homes, for example, although very well funded, was saddled with debt payments before any significant income was achieved. Common management problems include overoptimism about sales figures and fundamental strategic errors, such as assuming that the incumbent forces of the construction industry would reorganize to allow a new idea to succeed.

From the home buyer's perspective, too many architects and engineers have assumed that the self-evident genius of a construction system will compel buyers to purchase the product. The truth is that home buyers are more interested in the features of the finished home, its durability, and its resale value than in the building system that delivered the house.

The prevalence of unrealized ideas is even greater today given that architects can quickly conjure up a photorealistic image of a concept using CAD software and post it online for millions of people to see. Configuring an efficient fabrication and fulfillment system is not as much fun as designing eye candy, but it's necessary if an idea is to avoid the prefab scrap heap.

1. Lustron Prefab House
2. Carl G. Strandlund, Lustron Corporation President

Photos by Martha Holmes/Getty Images (exterior), Robert Kelley/Getty Images (portrait)

THE FUTURE OF PREFAB

Peter DeMaria, Principal Architect, Logical Homes
Some people assume that yet-to-be-invented high-tech materials and systems will be the saviors of our construction industry. New technology can be great, but some of the answers to our building challenges are right in front of us. We need to look more closely at existing materials and systems from commercial construction and other industries and ask how they might be adapted, adjusted, or recycled to meet our domestic architecture needs. It's less glamorous than creating renderings of new home designs, but we need to look at how to design efficient processes that leverage the economies of scale inherent in existing industrial components and systems. Within this framework, a good architect can create more affordable housing and yet still have design freedoms.

Leo Marmol, Marmol Radziner Prefab
More and more people are coming to us informed about the complete benefits of prefab construction. In the beginning, the focus was always on the cost savings related to the process. Now people are more interested in the green benefits. Potential homeowners are looking for ways to reduce their impact on the planet and want to surround their families with safe, eco-friendly materials. People are also starting to grasp how prefab can save them time and reduce the burden associated with the building process. It's exciting. The general public is starting to understand that prefab can help reduce their impact on the planet and streamline their lives without forcing them to sacrifice on design. We feel this is only the beginning.

5 Mobile homes within 1,500 feet of the coast in hurricane-areas are called "D-sticker homes" for the American Society of Civil Engineers code 7-88 exposure D criteria.

6 Log homes are one form of prefab kit home. There are more than 500,000 log homes in the United States. As of 2003, more than 25,000 were sold annually.

The Big Easy

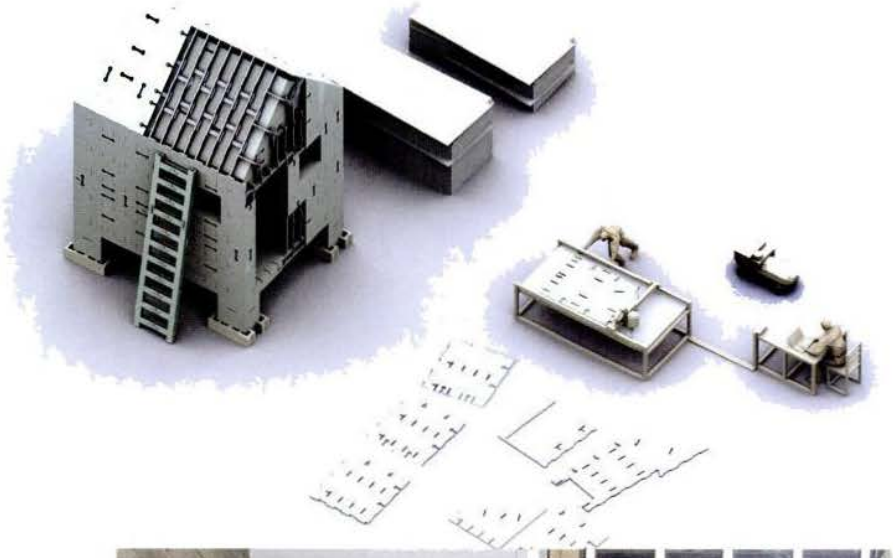
Most prefab manufacturing facilities house loads of heavy machinery, but not every design must be constructed on the factory line.

The construction of most houses requires large-scale equipment, power tools, and thousands of screws, but Larry Sass, an assistant professor at the Massachusetts Institute of Technology, contends that all you really need in order to build a sound structure is a rubber mallet.

Sass is director of the Digital Design Fabrication Group in the Department of Architecture at MIT. His research, which focuses broadly on computer modeling and prototyping, recently yielded a design and fabrication system based on the extensive use of computer numerically controlled (CNC) milling machines. It sounds complex, but the product looks like an oversized doll house.

A built example of this system, called Digitally Fabricated Housing for New Orleans, was recently displayed at the Museum of Modern Art in New York. The house was made with plywood panels, precut with joints and notches. The precision-cut, friction-fit components come as a kit that completely eliminates the need for mechanical fasteners like screws and nails. In simple terms, the assembly instructions for the house are "Insert tab A into slot B. Hammer with a mallet."

This marriage of high-tech fabrication with low-tech assembly has potential applications for humanitarian projects such as low-income and disaster-relief housing. The system demonstrates the potential of digital technology to scale a simple idea into a viable shelter. At just $2,500 (with furniture built in), the one-room cabin could be a real solution where housing and resources are scarce.



Photos by Richard [illegible]

❼ In 2004, 42,700 modular homes were constructed in the United States. From 1992 to 2002, modular housing production increased 48 percent nationally.

❽ While the cost of building materials changes constantly, it is generally true that a home built from steel is more expensive than a home built from wood. In a 2002 study by the National Association of Home Builders Research Center, a steel-framed home cost 14.2 percent more to build than an identical wood home.

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Bookshelf

At Home with Tomorrow
Carl Koch with Andy Lewis
Rinehart, 1958
An out-of-print look at experiments in industrialized home building by the designer of the Techbuilt House, which was created to meet postwar housing needs in the U.S.

Loblolly House: Elements of a New Architecture
Stephen Kieran and James Timberlake
Princeton Architectural Press, 2008
An in-depth look at the design, fabrication, and assembly of Stephen Kieran's own award-winning summer house.

The Lustron Home: The History of a Postwar Prefabricated Housing Experiment
Thomas T. Fetters and Vincent Kohler
McFarland & Company, Inc., 2006
If you think prefab is something new or easy, this account of the trials and tribulations at Lustron Home will change your mind.

Prefab
Bryan Burkhart and Allison Arieff
Gibbs Smith, 2002
Helping reawaken interest in prefab among both architects and homebuyers, *Prefab* is more than a coffee-table book—it's a good primer.

Prefab Prototypes: Site-Specific Design for Offsite Construction
Mark and Peter Anderson
Princeton Architectural Press, 2006
A detailed guide to six different prefab systems, weighing the pros and cons of each and explaining how they work.

The Prefabricated Home
Colin Davies
Reaktion Books, 2005
If you read only one book on prefab, this well-researched, very readable tome by an architect-academic should be it.

Refabricating Architecture: How Manufacturing Methodologies Are Poised to Transform Building Construction
Stephen Kieran and James Timberlake
McGraw-Hill Professional, 2003
This book compares the construction process of buildings to those of the automobile, shipbuilding, and aerospace industries. The coolest idea in the book? "Chunking."

Click on It

FabPrefab
An online clearinghouse for prefab information.
fabprefab.com

Inhabitat
Regular updates on what's happening in sustainable technology, design, and architecture, including a special weekly feature called Prefab Friday.
inhabitat.com

Jetson Green
A broad look at green building, regularly featuring new sustainable prefab systems.
jetsongreen.com/prefab

Open Architecture Network
An online community for architects and designers to share ideas and arrange collaborations. Focused on humanitarian projects, it includes lots of prefab.
openarchitecturenetwork.org

Big Words

Building code: A law containing a set of rules related to the construction and occupancy of buildings that specify the minimum acceptable level of safety in order to protect public health and general welfare. Building codes can vary by jurisdiction.

CNC-based fabrication: A method of materials cutting featuring a computer controller that drives an automated machine tool, resulting in great dimensional accuracy.

Fixed-plan home: A prefab home with a floor plan that cannot be altered. This differs from custom prefab, which has a floor plan developed for a specific client and site, a process that adds to the time and cost of a project.

HUD-code home: A type of home colloquially known as a mobile or trailer home that adheres to a specific building code set by the U.S. Department of Housing and Urban Development. The correct name for these homes is "manufactured housing." A common misunderstanding about prefab homes is that they are all HUD-code homes.

Kit home: Also known as a precut package, a form of prefab where components of differing shapes, sizes, and materials are shipped as a kit and assembled onsite. Imagine the biggest Ikea box in the world containing pieces of a house.

Model home: A display version of a house used to demonstrate the available features and options. Some home marketers use tricks to make model homes appear larger than they are, like using small furniture and removing internal doors from door frames.

Modular construction system: A building system composed of 3-D modules, usually rectangular in shape, made from timber or steel, and typically between 12 and 16 feet wide and up to 60 feet long. If you've seen a truck with a large piece of house on the back, then you've likely seen a module.

Panelized construction system: A building system composed of wall panels, typically timber or steel framed, that are joined with other materials onsite.

Parametric modeling: A design process that uses a complex set of equations to model the characteristics of a building and measure the impact when certain variables are changed. Parametric design software allows an architect to manipulate designs and see the impact on the bill of materials and the energy performance of the building.

State-certified factory-built housing: A program in some states whereby factory-built homes can be inspected and approved in the factory, and thus do not require a visit by local building inspectors upon delivery to the home site. This can be advantageous because the prefab can be shipped in a more complete state.

Stick frame: The most common form of construction in North America. It's based on structural members called studs, which provide a frame to which wall coverings are attached, with a roof typically composed of horizontal ceiling joists and sloping rafters. Studs are usually made from timber "sticks," but can also be steel.

Structural insulated panels (SIPs): Building panels typically made by sandwiching a core of rigid foam plastic insulation between two structural skins of oriented strand board (OSB). SIPs are used in floors, walls, and roofs for residential and light commercial buildings.

Prefab is more efficient than stick-built construction. The National Association of Homebuilders and Wood Truss Council of America found that a 2,600-square-foot home with trusses and panels used 26 percent less lumber, generated 76 percent less waste, and was constructed in 37 percent of the labor hours of a similar stick-built home.

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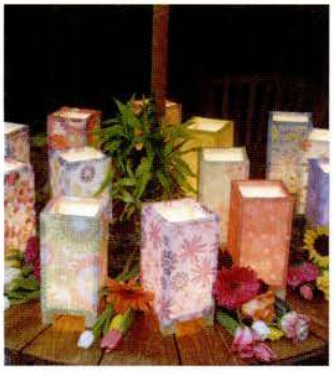

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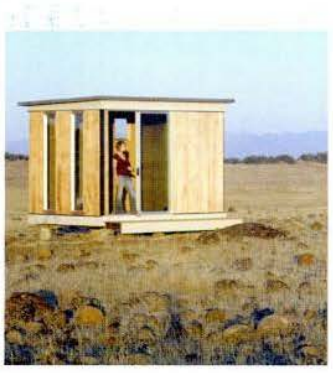

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woodia la piccolo

Bringing a classic concept into the modern living space, Woodia La Piccolo introduces the modern porch swing. This unique indoor and outdoor piece is artist-designed and handcrafted using the highest quality eco-friendly materials. Please call or visit us online.

Toll-free 866-930-6099
woodialapiccolo.com
modernporchswing.com

Calvin Klein Home

Calvin Klein Home introduces the new furniture collection for Spring 2009 and continues to offer modern essentials for bedding, bath, down, tabletop, gifts, table linens, and rugs.

For furniture inquiries, call 888-822-5846.

calvinklein.com

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Modern furniture.

Natural materials.

Custom designs.

Reclaimed–refined.

Shown: Willie dog dish.

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Eye-candy for grown-ups.

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LBCLighting.com

Moooi preserves the balance in its collection between unique objects, icons, and functional products for everyday use.

View our Moooi collection, inspired and sparkling in innovative designs and featuring the magical translucent Dancelion pendant, Fringe pendant, Random pendant, Rabbit table lamp, and Light shade floor lamp.

Visit our website at LBCLighting.com for more lighting selections from Moooi and other brands.

Volume discount. Free shipping. Price-match guarantee.

Toll-free 800-522-0407
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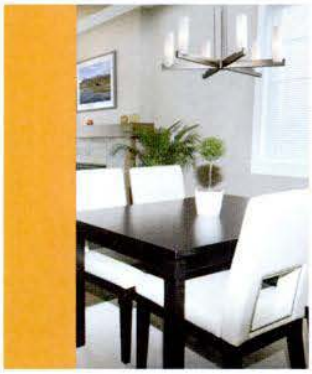

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Shown: Elf Chandelier, designed by Stephen Blackman for Illuminating Experiences.

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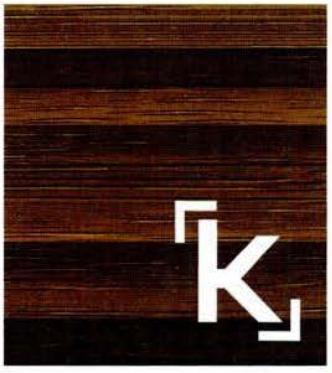
photowow.com



KIREI BAMBOO

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Kirei Bamboo (featured)
Kirei WheatBoard
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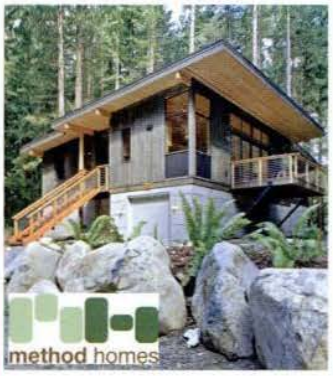
lizaphillipsdesign.com



method homes

down to earth prefab

Currently offering two lines of sustainable, innovative, prefab homes.

The Method Cabin Series by Balance Associates Architects blends seamlessly with the surroundings and features five models in many configurations. The Urban Series by Skylab Architecture is a complete prefab system that provides smart design solutions for everyday living.

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methodhomes.net

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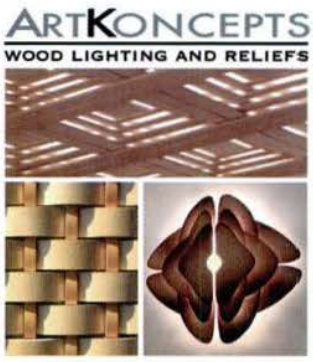

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From YLighting comes Zwello, your source for museum-worthy modern furnishings. Inspired by an American folk art bird collected by Charles and Ray Eames, this authorized design by Vitra is crafted of lacquered solid alder and steel.

Shown: Eames House Bird by Vitra.

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zwello.com

Inhabit

New modern bedding designs from Inhabit. Surround yourself with modern bedding collections, pillows, art and accessories, lighting, and award-winning embossed wall coverings. Well thought-out selection, affordably priced, free shipping on orders over $200.

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An elegant look.

Precast concrete Long-Span Closed Riser Steptreads are available in a variety of colors and finishes. The Steptread product line is ideal for architects who have the time intensive task of designing steps. The Steptread System includes complete design specifications that can be downloaded in PDF or CAD formats. ADA compliant.

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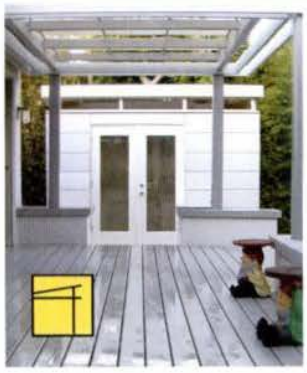
Modern Market



Modern-Shed

Small Prefab Structures

A small, owner-run company located in Seattle, WA, we strive to offer an affordable solution for the growing needs of eco-conscious individuals and families. Creative solutions with a smaller footprint.

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Introducing "Space," a kitchen concept that's the best of all worlds. European drawer systems guaranteed for life (154-pound capacity). Sustainable: unique woods, glass, and Italian laminates. Custom-designed for any space. Made in a 100 percent solar-powered facility in California. Free CAD drawings for architects.

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Modern Kitchen Architecture
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sozostudio.com

John Kelly Furniture

For over 20 years, John Kelly has been traveling the world presenting his extensive collection of signature designs. View his entire collection of sustainable, contemporary furnishings. Over 300 standard products in stock for immediate delivery.

Shown: Perseus with K2 Garden Settee.

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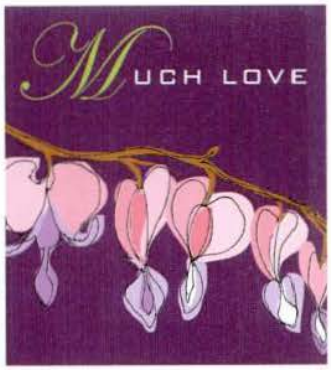
g2art.com



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Shown (clockwise from top left):
Extrapiano sofa by Swan,
VIP chair by Moooi,
Pardis bed by e15,
Lim 04 table by MDF Italia,
Flipt chair by Baleri Italia.

When you're in San Diego, please stop by our 8,500-square-foot showroom.

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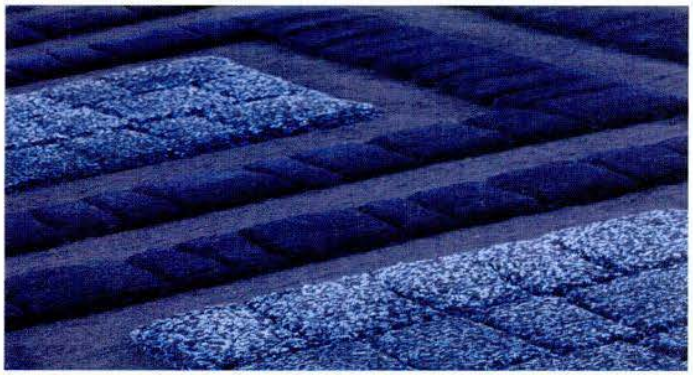
mixturehome.com



Mat the Basics

Textures You Have to Touch

The production of handmade carpets has a long tradition on the banks of the Ganges River—for generations distinctive works have been created there. This is also true of Mat the Basics, a family business dating back a half-century. The company pioneers a new type of rug—by combining materials and weaving techniques, it is able to create structures and textures that are new and exciting. RugMark-certified creations made entirely by hand by skilled weavers, using the best materials.

Shown: Bergamo Blue.

info@matcointl.com
mat-thebasics.com

Bauhaus-Style Dog Sofa

Dogs love this gorgeous sofa that pays tribute to classic Le Corbusier seating. Choose vinyl, leather, or pony-style fabrics that are waterproof, washable, and removable. Quality steel frames. Four sizes. From $210. Made in Italy and available exclusively at dogbar.com.

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We help create wondrous residential and commercial outdoor settings. Furniture that is perfect for hotels, restaurants, parks, institutions, and all manner of public spaces—also exquisitely suited for residential applications.

Made in the U.S.A., short lead times, environmentally conscious materials.

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Poliform

New finishes and accessories from Poliform: Senzafine wardrobe system (shown above in Canaletto Walnut with leather accessories). Poliform is the leading Italian manufacturer of high-end kitchens, wardrobes, wall units, beds, dining-room furniture, and complements since 1942. Experience the best wardrobe-design specialists in the country.

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We design and build custom doors inspired by the American mid-century. Each design is catalogued and geometrically perfected using classic proportions. Purchase online or request a quote. Can't decide? Pick the one that makes you happy.

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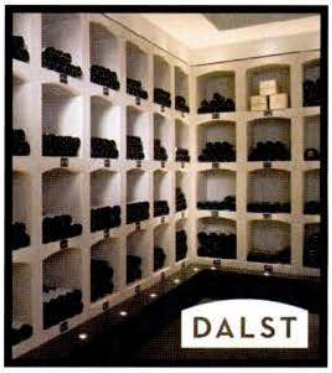
info@crestviewdoors.com



Dalst Stone Wine Cellars

Modern Wine Cellars—For Modern People

Recycled cast-limestone wine alcoves offer an inert thermal mass that absorbs the earth's geothermal coolness. This temperature is then reradiated down through the bottles, creating an undisturbed "cold chamber" for your wine to age.

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Shown: Lush® Blend "Metropol."

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md-canvas.com

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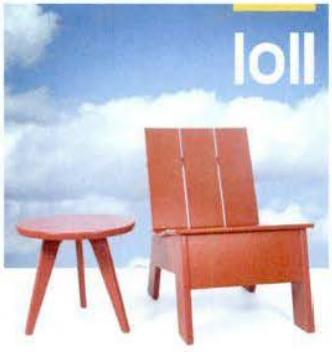

Loll Designs

Outdoor Furniture for the Modern Lollygagger

Efficient in stature yet overstated in comfort, Loll introduces the Napoleon Series.

Loll products are durable and maintenance free. Made in the U.S.A. using recycled materials.

Shown: Napoleon Single with Satellite Side Table.

lolldesigns.com

Acme Made

Modern Things for a Modern Lifestyle

Acme Made designs a complete line of stylish yet protective bags, cases, and accessories for the creative professional. Available online and through select retailers worldwide.

Shown: The Designer Slim in Massive Paisley.

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acmemade.com

MoMA Design Store

Derived from the Japanese phrase "mujirushi ryohin," meaning "no brand quality goods," MUJI's simple, inventive, well-designed daily objects have gained a worldwide following since the opening of its first store in Japan in 1983. Relying on high-quality but inexpensive raw materials, including remnants and otherwise disposable materials, MUJI products are economical and environmentally friendly.

Discover more than 250 MUJI items at MoMA Design Store locations in New York, or shop North America's largest online selection of MUJI products at MoMAstore.org.

Shown: LED Aluminum Flashlight, $35.

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momastore.org

urban

During the summer of 2006, one of the oldest elm trees in West Seattle died. Urban Hardwoods was there to save her for a second life. The dining room is waiting for a table from the tree that grew less than 20 feet away. Finally the time has come.

hardwoods

Had Urban Hardwoods not been involved, this elm would have met the same fate too many historic trees in Seattle endure—the landfill. Instead, thoughtfully milled and carefully stacked in our green room, the 130-year-old elm dried slowly and naturally for two more years.

the art of conservation

It took 132 years to make this table.

Discover your table of a lifetime at Urban Hardwoods.

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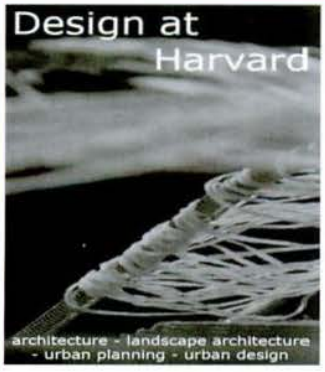

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For people considering career changes or choices.

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Shown: Z-Bar® High Power in red.

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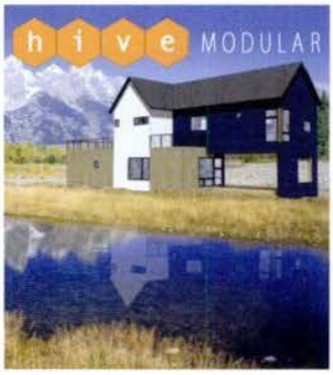
Modern Market



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Space-saving stainless steel toilet and wash basin combination fixture. Built-in towel rack and side cabinet with adjustable shelves designed for ideal storage. Several configurations are available to best suit individual bathroom needs.

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The modern, all-new NextHouse is designed and manufactured by Empyrean International. Please check our website for homes under construction or call to speak with a client-service director.

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Modular Screen System

A modern, expandable screen system, made from lightweight synthetic material. This decorative screen allows the opportunity to reconfigure residential and office spaces. MODULARI's unique linking system allows for a variety of color solutions with easy assembly.

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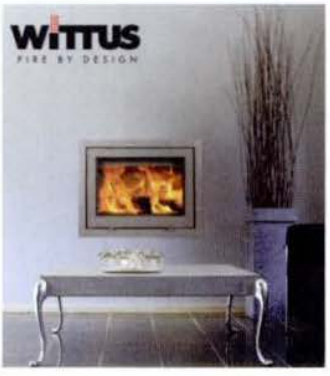
modulariscreen.com



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Strong Flames and Heartwarming

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In matte black or gray.

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Menlo Designs

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Love to cook, but hate hard kitchen floors? As seen on HGTV, Fine Living, and Food Network, GelPro® mats are filled with a soft gel material that makes standing on even the hardest floor a pleasure. Designer colors in traditional and exotic textures. Available in many sizes, and all mats are stain-resistant and easy to clean. Proudly made in the U.S.A. Makes a great gift for any cook, especially those with back pain or arthritis.

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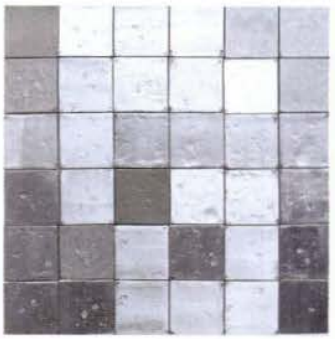
Modern—Inspired—Ready to Hang

Modern fine art photography for any space, any size. See what collectors worldwide are talking about.

Visit Modern Editions online to browse, buy, and enjoy.

Shown: Image from Flowers series.

moderneditions.com



Recycled Aluminum Tile

Mix modern metal mosaics with character and texture. Explore our galleries of bamboo, cork, stone, linoleum, and recycled-glass tiles and order samples online. Shipping nationwide.

Shown: 2" x 2" mixed finishes, $35 per square foot.

Eco-Friendly Flooring
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Hook and Go

The Smart Cart

"It is the most functional cart available for anyone who regularly shops at farmers' markets. Simple, easy to assemble and store, ideal for shoppers on the go," says Dexter Carmichael of the Ferry Plaza Farmers' Market. Transport up to 70 pounds, or eight shopping bags, with ease and convenience. Folds compactly, minimal assembly, just 6½ pounds.

"My customers love how easy the Hook and Go's can be set up, broken down, and they take up little space in their cars."

—Greta Dunlap, Farmers' Market Manager, Beverly Hills Recreation and Parks

Photo: Dennis Anderson

Bay Crossings
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Stûv 21

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To purchase the coffee and to find out about helping the people of Aleta Wondo, please visit **www.aletawondo.com**.

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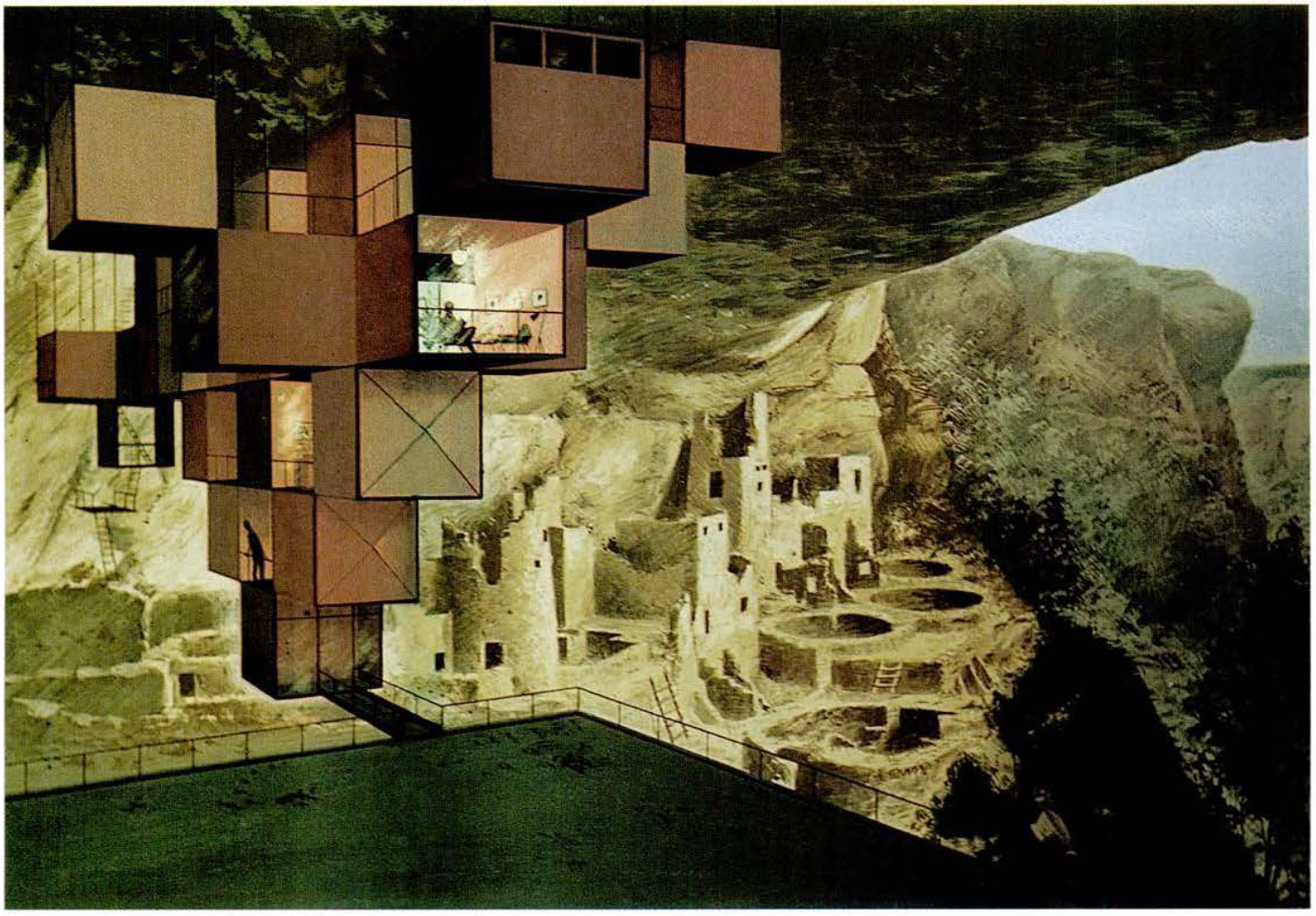

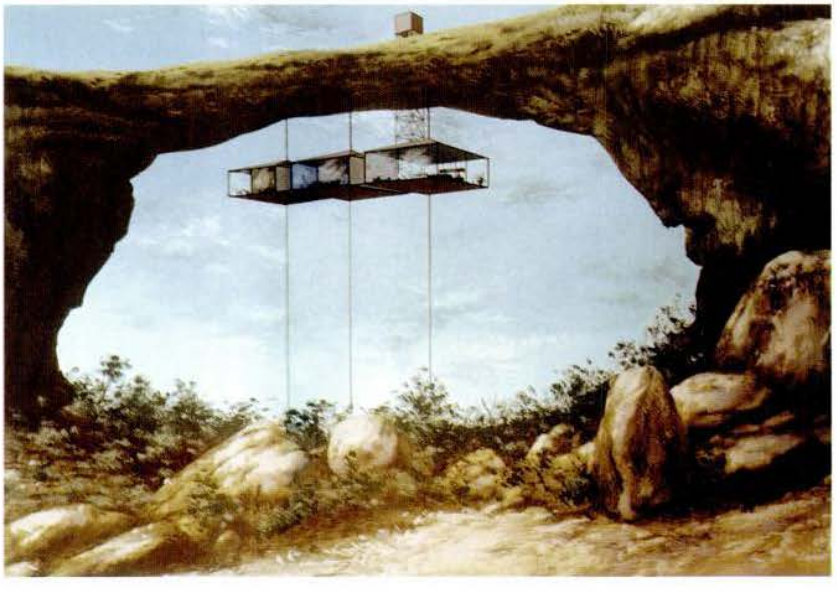

Charles Harper painted homes designed by Rudy Hermes as photomontage backdrops to introduce the 1960 Fords in November 1959's *Ford Times* magazine. Prefab plastic units deliver "cliff-dweller modern" to Mesa Verde (top). A wasp's nest-inspired home hangs from Utah's Landscape Arch (right), and a spherical home (left) suspended above the Gunnison River achieves "the ultimate in prefabrication since it has no footings or foundation." Who said prefab architecture couldn't be about context?

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Breakthrough Leads to Windows That Produce Energy

CAMBRIDGE Mass.—University scientists have developed windows that collect solar energy. A major advancement, the windows use a special coating to absorb sunlight and then re-emit the energy into the glass, which conducts it to solar cells.

'Guerilla Gardeners' Take Initiative to Beautify Urban Areas

LOS ANGELES—People all over the world are reaching for rakes and shovels in an effort to transform neglected public spaces. And they're not waiting for permission from city officials. It's a grassroots movement that's growing. Literally. On any given Saturday night in cities from L.A. to London, you can find ordinary citizens pulling weeds alongside freeway off-ramps. Or planting flowers in vacant lots. And it's almost always done anonymously. In most cities, getting approval to beautify public property is nearly impossible. Not because anyone objects to the idea, but because bureaucracy often gets in the way. As a result, "guerilla gardeners" are quietly taking it upon themselves, donating time and resources to help change the face of their neighborhoods.

New Plastics Biodegrade in Just Four Months

ROLLA, Mo. — A team of researchers is creating new types of biodegradable plastic that will help reduce the amount of landfill-clogging waste Americans produce each year. The material, which modifies several bio-based, oil-based and natural polymers, could go a long way toward minimizing the size of landfills. Ultimately, the team hopes to develop a variety of applications for the plastic, including bags, bottles and product packaging.

Pact Protects 2,400 Square Miles of Amazon

GEORGETOWN, Guyana — With the support of a U.S.-based conservation organization, leaders from Guyana's Wai Wai tribe are working to protect their section of the rainforest from commercial loggers. The 2,400-square-mile Wai Wai-controlled section helps make up a vital area called the Guyana Shield, which includes approximately 25 percent of the tropical rainforests left in the world. It's also home to several rare animals, including the jaguar.