

## Framework House

A prefabricated system, in three acts



To demonstrate the flexibility of the Framework system, the designers digitally placed an early version of the Framework House in different contexts, such as urban settings (above and opposite, right) and rural settings (opposite, left).

BY RAFAEL LONGORIA

**THOSE WHO ATTENDED** the University of Houston's fall architecture lectures last year received the equivalent of a graduate education in prefabricated architecture. The lecture series began with Margaret Culbertson's introduction to the history of catalogue houses, then followed with Rocio Romero, Ralf Becker, and Charlie Lazor discussing their work, and culminated with the unveiling of Houston's own entry into the prefabricated sweepstakes—the Framework House.

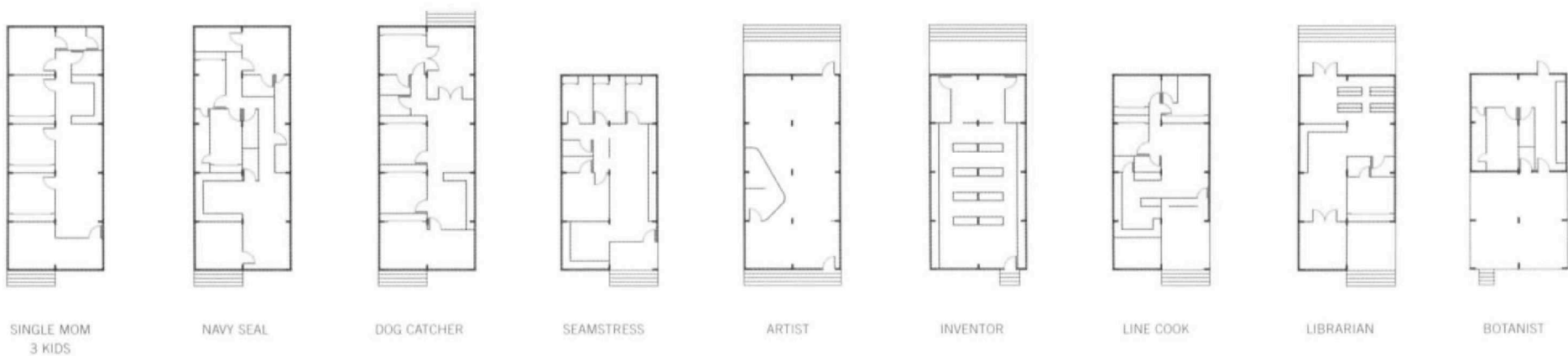
As fans of Sears-Roebuck catalogue houses know, prefabricated and mail-order buildings are far from new. In her talk, Culbertson, director of the Hirsch Library at The Museum of Fine Arts, Houston and the author of two books on catalogue houses, traced the rise and

fall of prefabrication in the U.S.<sup>1</sup> Her answer to the question of why mail-order houses lost popularity can be summarized in one word: Levittown. That legendary New York suburb epitomized the on-site, assembly-line-style production of single-family houses. The end of World War II brought with it enormous demand for suburban houses, as well as new and widely-available types of financing that favored the purchase of ready-to-occupy houses over the more cumbersome process of buying a plot of land and then arranging to build a house on it.

Over the years, some of the best minds in architecture, among them Buckminster Fuller, R.M. Schindler, Walter Gropius, and Konrad Wachsmann, developed prefabricated designs that

received varying degrees of critical acclaim, but no financial success. In the end, the most commercially successful examples of mass-produced, prefabricated dwellings in America have been mobile homes and “double-wide” manufactured houses, both of which bear the burden of being associated with marginal living conditions and an absence of aesthetic concerns.

Since the late 1990s, though, prefabrication has been stirring a great deal of interest among the design cognoscenti, with *Dwell* magazine taking a leading role in promoting the idea. The recent prefabrication movement has been about new models for practicing architecture as much as it has been about more efficient construction techniques. Before



In another attempt to illustrate the Framework system's adaptability, the designers created a series of floor plans, top, that they felt could reflect the different needs of potential residents.

creating FlatPak for the Lazor Office, a Minneapolis architecture firm whose prefabricated work has been widely published, Charlie Lazor was already a successful design entrepreneur. BluDot, the internet-based design business he co-founded, has a large following for the thoughtful furniture and objects it produces and sells. The BluDot business model greatly influenced the FlatPak prefabricated system, providing lessons about devising designs that flow from available manufacturing technologies and emphasize shipping efficiency. Lazor has also developed a clever graphic system for clients to communicate their programmatic and spatial desires. The handful of FlatPak houses produced so far are a testament to the adaptability of the system.

While providing a wide range of solutions to different sites and living arrangements, all share an elegant tautness reminiscent of Bauhaus projects.

Rocio Romero is another major player in the prefabrication movement, and her fall lecture at the University of Houston, "Making Modern Architecture Affordable," made her priorities clear. The various house models she produces from her base in Perryville, Missouri, are put together with carefully detailed interlocking panels clad in corrugated metal. She pays particular attention to hiding gutters and downspouts, resulting in a house with a strikingly clean and refined exterior for a relatively moderate price. Ralf Becker of Salzburg, Austria, on the other hand, is working within the much different eco-

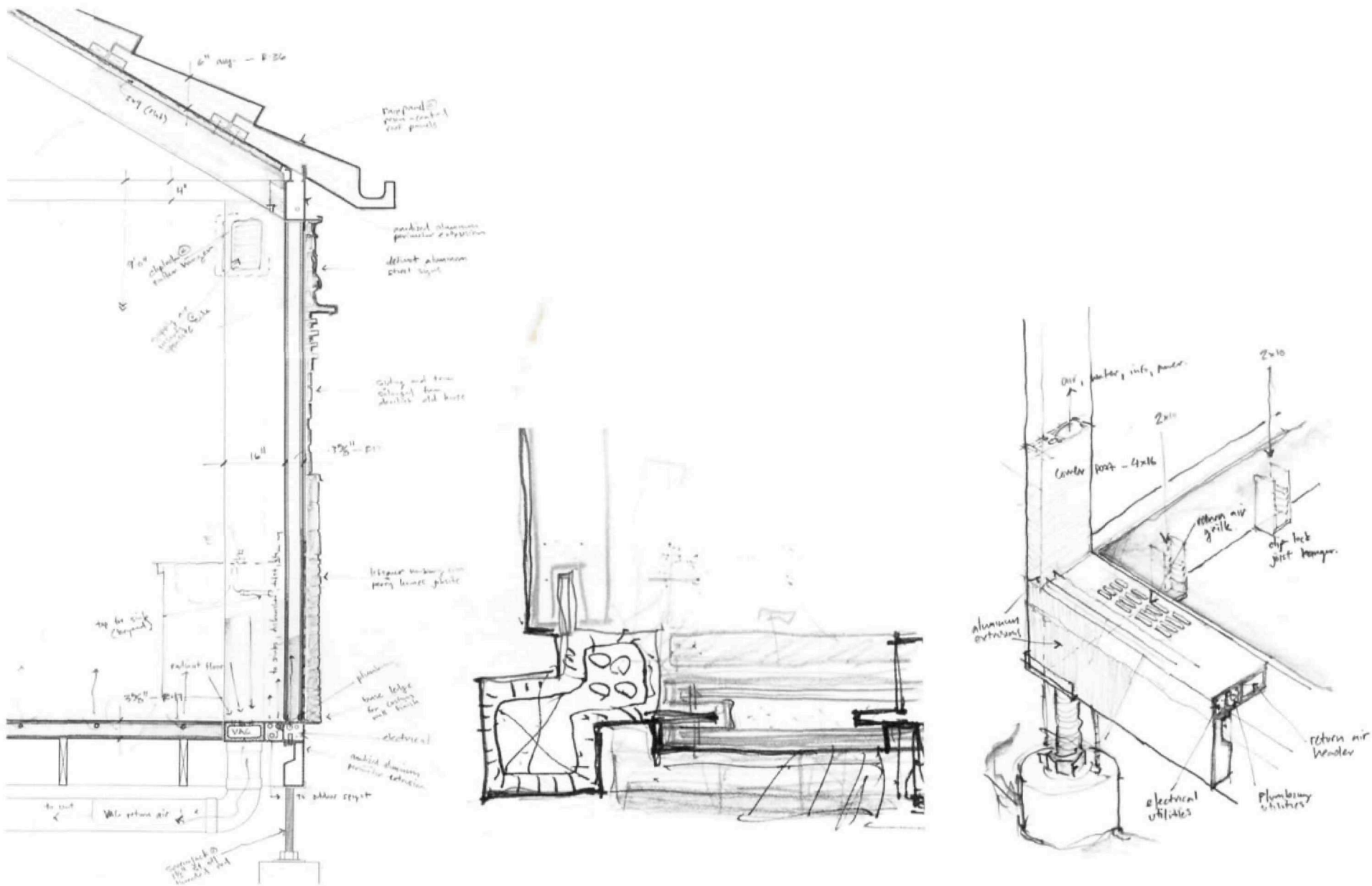
nomie context of the European Union. His painstakingly crafted Espace Mobile house is delivered complete on-site by a truck, and can be relocated with relative ease. It is as pricey as it is beautiful. The financial logic Becker presents is based on high land prices, as well as tax policies that make it more feasible for young professionals in the European Union to rent land rather than own it.

A prominent local architect recently told me that he opposes the concept of prefabricated architecture because it lacks the all-important response to specific sites and programmatic conditions. But unlike Becker's Espace Mobile example, the current prefabricated movement in the U.S. is not really about ready-made architecture. Instead, it is about mass customization.

With their homes, Lazor and Romero play a significant role in site positioning, space planning, and elevation design. But they work with a pre-determined palette of details and building components, which significantly lowers design and production time and, therefore, cost. Houston's own entry into the prefabrication sweepstakes, the Framework House—which was the subject of an exhibition at the Gerald D. Hines College of Architecture Gallery at the University of Houston last November—is a good example of this approach.

#### **Act 1: Metalab**

Upon arriving in Houston in 1997 as a graduate student at the Rice School of Architecture, Joe Meppelink started a



Illustrations this and facing page courtesy Joe Meppelink



Onezieme Mouton's prefabricated pavilion installed (above) and stacked on top of his car in the Anderson Hall courtyard at Rice University (top).

metal fabrication company to help cover the costs of college. He named his business Metalab, and taking advantage of the wide availability of inexpensive warehouses near downtown he set up a well-equipped workshop that became a celebrated hangout for Rice architecture students. Kindred spirits were allowed to use the shop's equipment and to experiment freely with materials and techniques.

This remarkable act of entrepreneurship and hands-on romanticism perfectly captured—or maybe even anticipated—the prevailing spirit in American architecture schools. All over the country, interest in design/build, digital fabrication, entrepreneurship, prefabrication, mass production, affordable housing, and sustainable materials and methods has been in full ferment for the past decade among architecture students and faculty.

The national leadership of the American Institute of Architecture Students has repeatedly cited the reluctance to become a “CAD monkey”—i.e., an architecture graduate as a glorified computer draftsman—as a prime motivator in the movement to seek

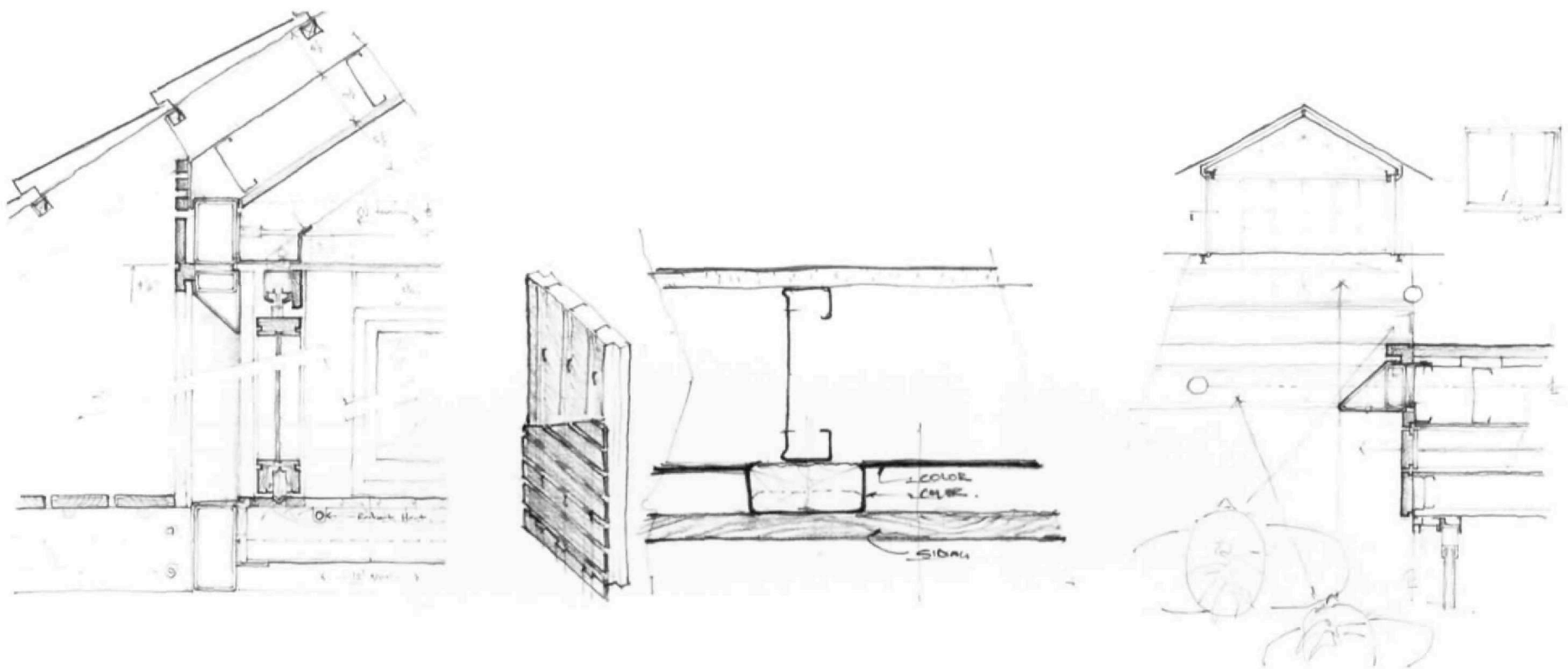
alternate ways of practicing architecture. Academics even have a couple of terms for the broader phenomenon: projective architecture and post-critical thought.<sup>2</sup>

One Rice student who took advantage of Metalab's generosity to carry out design work was Onezieme Mouton. His thesis project, a full-scale, portable metal-frame pavilion with translucent panels, was built at the workshop and carried on the roof of his Volkswagen to Rice's Anderson Hall for his final jury. This pavilion—which made it to the cover of *Sallyport*, the Rice alumni magazine—formed the conceptual basis for what became the Framework House.

**Act 2: Competition Triumphs**

Metalab closed its doors in 2001 when Meppelink finished school and began developing a professional practice. But in the spirit of Metalab, Meppelink's practice was organized around a shifting set of collaborations under the name of FRAMEwork. Mouton, Wyatt Frantom, and Adam Janusz joined Meppelink to work on a prefabricated house prototype. Working at night and around their other obligations, the four developed the

Photos courtesy Joe Meppelink



**Opposite Page:** Detail sketches from a competition winning Framework design, showing a wall section with salvaged facing and integrated gutters (left), a corner detail (middle), and the Smartframe system with adjustable piers (right).

**Below:** Details from the latest version of the Framework House, showing the revised wall section (left), the rain screen wall assembly (center), and the James Turrell-inspired corner detail (right).

Framework House concept to submit to some of the affordable house competitions being organized at that time around the country.

In 2003 their design was selected as a winner of both the Florida-based ET Foundation design competition and the HOME House Project competition organized by North Carolina's Southeastern Center for Contemporary Art. Excerpts from the text prepared by the team for the Southeastern Center competition entry underline their project's emphasis on ease of construction, flexibility, and consumer choice:

"FRAMEWORK provides a clean minimal structural system of anodized aluminum framing and painted SIPs (structural insulated panels), with a customized flair of colored automotive-finished roof forms, and anodized aluminum finish on the frame. The house could be quickly assembled by trained technicians, and could also be built using unskilled volunteer labor due to its simple components and minimal need of power tool use. Flanges are also provided on the exterior perimeter extrusions that allow for addition of finish materials, which

further customize and project the will of the owners and their abilities and aesthetic choices, and also create a beneficial rain-screen system which will even further improve R-values in the walls and extend the life of the exterior envelope."<sup>3</sup>

"An uncle who is a mason, a desire to recycle aluminum cans, a derelict house nearby, leftover paint and building materials from other projects—all can be appropriated into the super flexible context of each FRAMEWORK house."<sup>4</sup>

Their design was artfully presented in a variety of urban and rural contexts, and in an array of plan configurations cleverly titled by the potential inhabitants' occupations. More than prototype, the Framework House was conceived as a multi-layered system of choices. It is a kit-of-parts for grownups, from which, with the coaching of an insightful group of designers, they can design their own houses using a well worked-out set of details and elements. The proprietary details developed for the competition version of the Framework House include an eye-catching SIP roofing system with integrated gutters, clever money-saving foundations to deal with difficult Gulf

Coast soil conditions, and the refined Smartframe, "a multi-cellular aluminum extrusion which carries cold air, hot and cold water, electrical, and data utilities within its profiles."<sup>5</sup>

### Act 3: Back to the Dogtrot

In 2006, real estate investor Jason Dunn joined the Framework team to help move the project from idea to reality. This new collaboration resulted in a regional marketing strategy that targeted turnkey delivery of weekend country houses. This strategy takes advantage of the Framework system's ease of assemblage by as few as two people without the need of heavy machinery or specialized equipment (a particularly appealing feature when building far away from cities), while at the same time implying a clientele prosperous enough to own a second house.

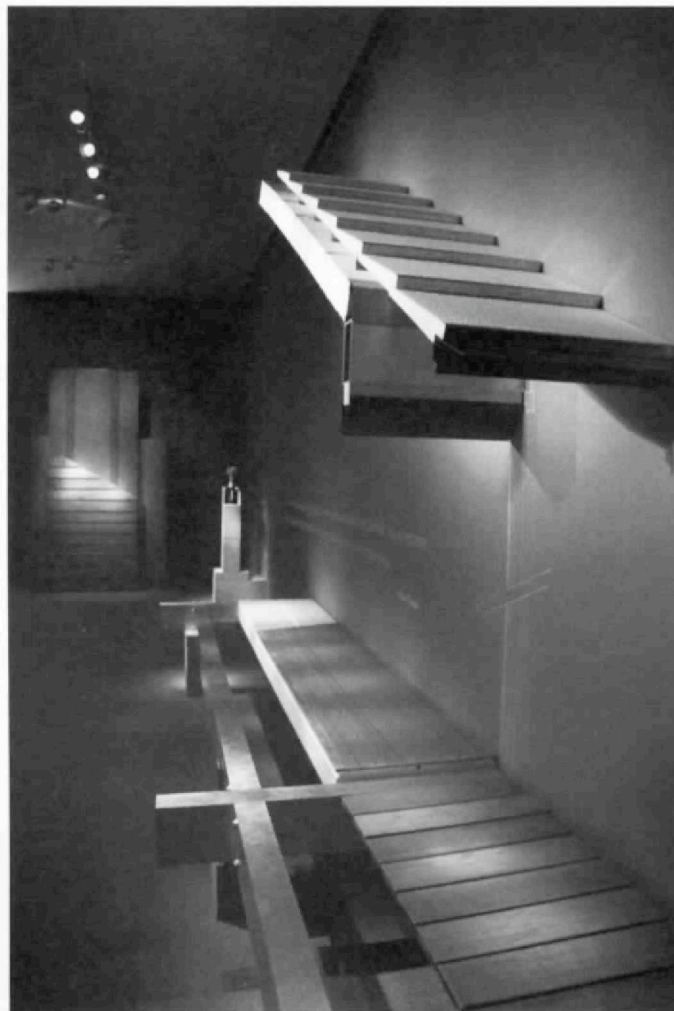
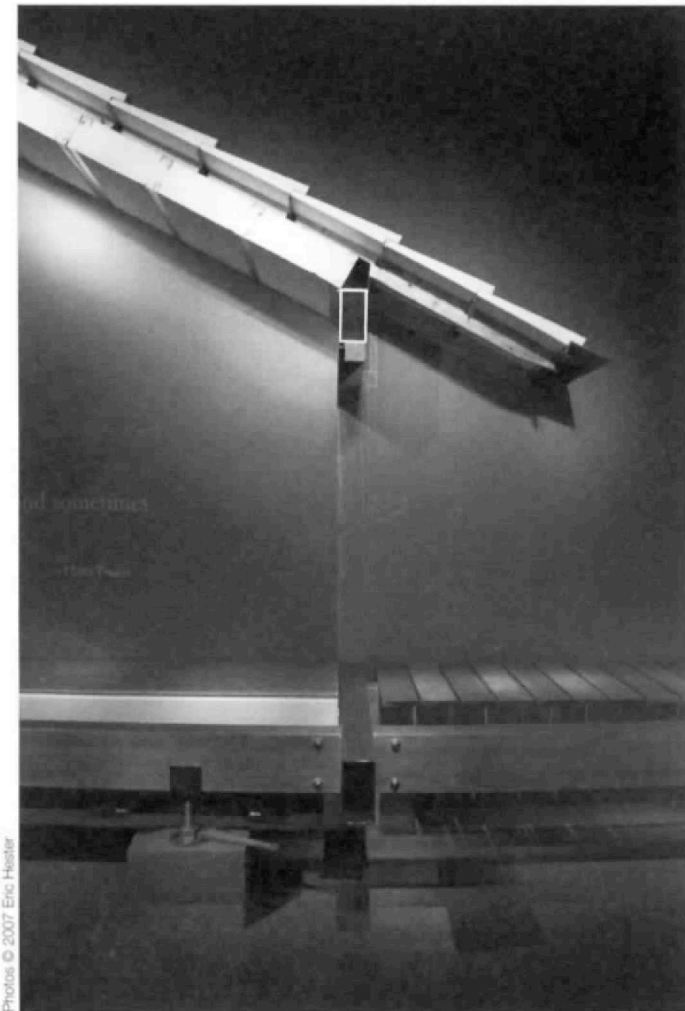
From the very beginning the design team drew inspiration from vernacular house types when demonstrating the flexibility of the Framework system. Steven Holl's pamphlet, *Urban and Rural House Types*, was an important reference in the design process.<sup>6</sup> The dogtrot house, where two cabins are joined by a continu-

ous pitched roof forming a breezeway in between, was a natural choice for a country house prototype in the vicinity of Houston. Dogtrot houses are one of the earliest Anglo-American building types in Texas; they are perfectly suited to climates with hot and humid summers and moderate winters. The iconic breezeway of the dogtrot house is a flexible space that, when the weather is nice, can double the living area of the house. The dogtrot works best with generous amounts of land around it, where the breezeway can be more easily calibrated to the prevailing winds. When viewed perpendicular to the ridge of the roof, the dogtrot is a powerful device to frame the landscape, transforming the simplest of buildings into an architectural act. Of course, siting a dogtrot to take advantage of such a view is easier to achieve in the countryside than on a crowded urban lot.

In the latest version of the Framework House, the construction system has evolved with a pragmatic redesign that favors cost efficiency and marketability over daring design. The clever foundation that does away with the need for drilling equipment is unchanged, but the metal



Part of a step-by-step construction sequence illustrating the Framework system.

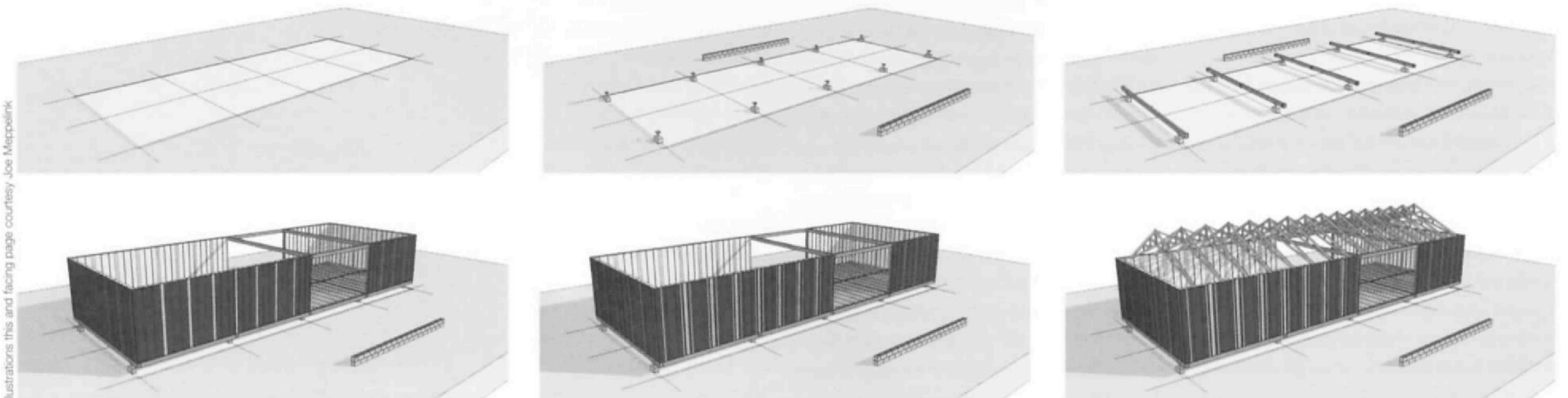


Above and right: Full-scale mockups of the Framework system, as seen in an exhibit last fall at the University of Houston's College of Architecture Gallery.

frame no longer uses extruded aluminum profiles with integrated utility chases. Instead, clients are now offered a range of tubular frames. The anodized aluminum tubes used in the prototype sections that were displayed last fall at the UH College of Architecture Gallery are strikingly beautiful, and light enough to be carried by two people, even in 24-foot lengths. A super lightweight structural insulated panel already being produced in Austin has been adopted for the wall system. But it has been weatherproofed and modified with a clever wooden handle that allows it to be used in a rain-screen assembly, while at the same time making it easier to carry during construction. Folding wooden trusses (again, easy to transport and handle) now support a double layer, vented roof whose outside layer is built with surfboard technology.

While the lively colored roof that helped distinguish the earlier renderings is gone in this version, there is nothing in the chosen technology that rules out its reintroduction. The most seductive new feature shown in the prototypes displayed at the Architecture Gallery is a breeze-way corner detailing inspired by James Turrell's installations. Like the roof hole of Houston's Live Oak Friends Meeting House, the sharp edges of the dogtrot opening have a surreal flattening effect.

Construction on the first of the Framework Houses is expected to begin this spring. Since this is not an off-the-shelf product, but a flexible system for users to assemble their ideal house, the price varies considerably depending on the clients' choices. The projected cost for a basic dogtrot model of approximately 1,620 square feet (including breezeway) is



As shown in this sequence of drawings, the Framework House grows quickly in simple, easy-to-assemble sections.

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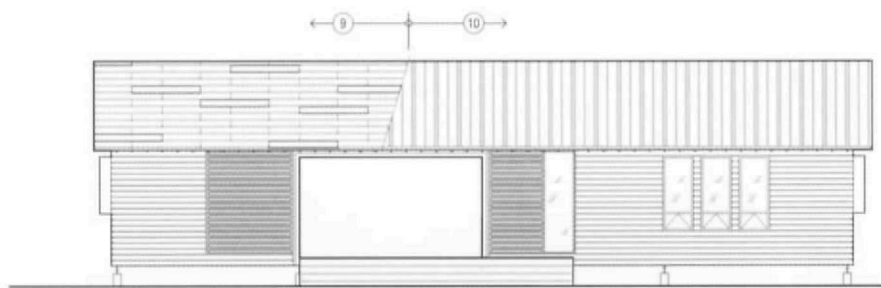
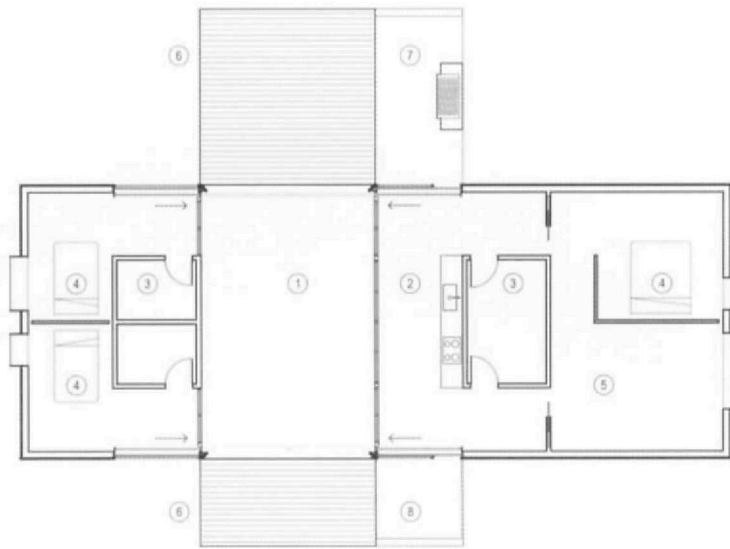
\$139,000. A "shell-only" version, where the client would be responsible for interior finishes and fixtures could go for as little as \$89,000.

Cost has been the Achilles' heel of the contemporary prefabrication movement, particularly when dealing with prototypes, or a handful of orders rather than mass production. At its current prices, the Framework system is quite competitive with conventional construction. But it is clearly not yet meant for affordable housing, as defined by the federal government. Rather, it is an example of mass customization, taking advantage of available manufacturing, communication, and marketing technologies to make quality architect-designed homes affordable to a wider audience. ■

For more information on the Framework House, go to [www.framework-ad.com](http://www.framework-ad.com).

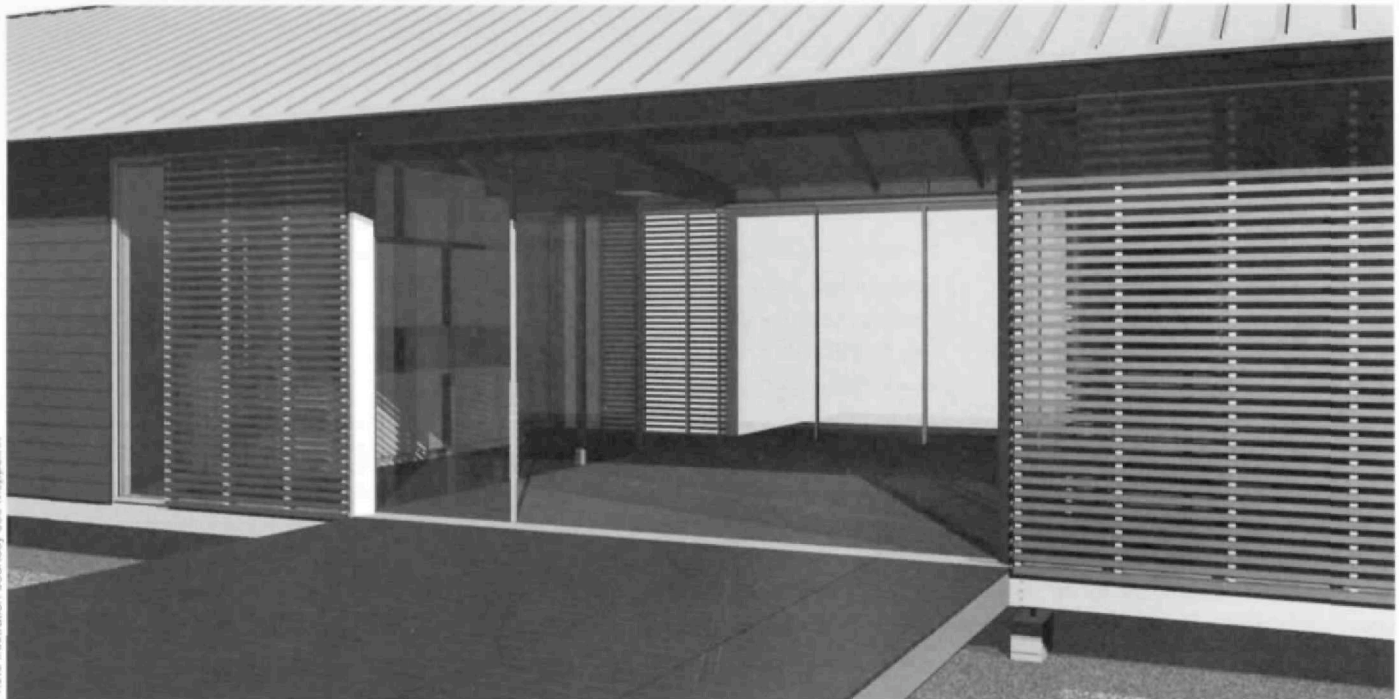
NOTES

1. See Margaret Culbertson's *Texas Houses Built by the Book: The Use of Published Designs, 1850-1925*, Texas A&M University Press, 1999, and her *American House Designs: An Index to Popular and Trade Periodicals, 1850-1915*, Greenwood Press, 1994.
2. Kazys Varnelis, "History & Theory: Looking Beyond Post-Criticality," *Architecture*, September 2006, p. 78.
3. David J. Brown, editor, *The HOME House Project: The Future of Affordable Housing*, MIT Press/Southeastern Center for Contemporary Art, 2004, p. 64.
4. *Ibid.*, p. 65.
5. *Ibid.*, p. 64.
6. Steven Holl, *Pamphlet Architecture #9: Urban and Rural House Types*, Pamphlet Architecture/William Stout Architectural Books, 1982.



Plan and section courtesy Joe Meppelink

- FLOOR PLAN
1. BREEZEWAY
  2. GALLEY KITCHEN
  3. PREFABRICATED TOILET / STORAGE CORE
  4. BEDROOM
  5. LIVING ROOM / STUDY
  6. EXTERIOR DECK
  7. BBQ PIT
  8. OUTDOOR SHOWER / MUDROOM
- ELEVATION
9. RAINPANEL ROOF SYSTEM
  10. GALVALUME METAL ROOF



View of breezeway in Dogtrot version of the Framework House.

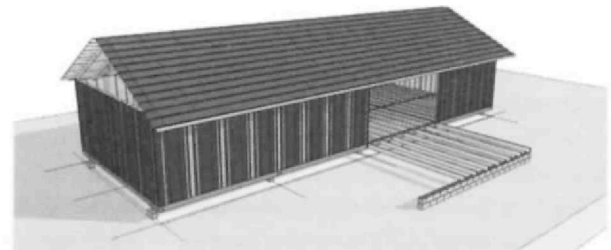
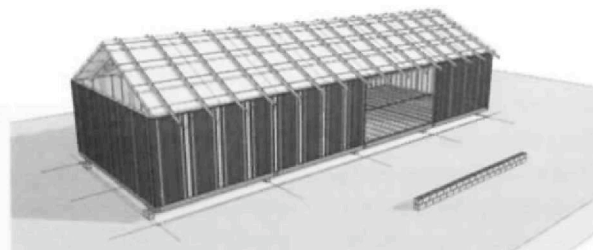
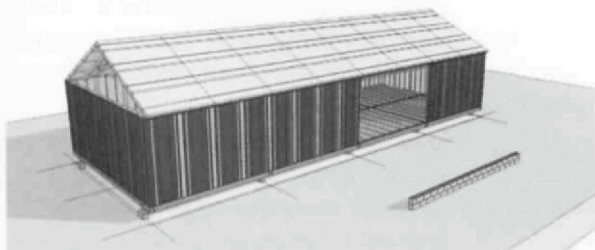
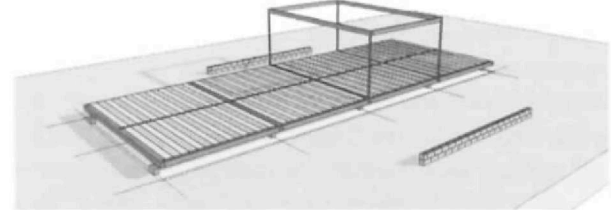
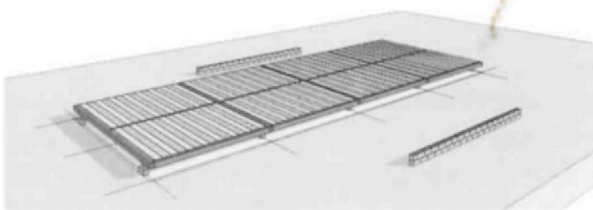
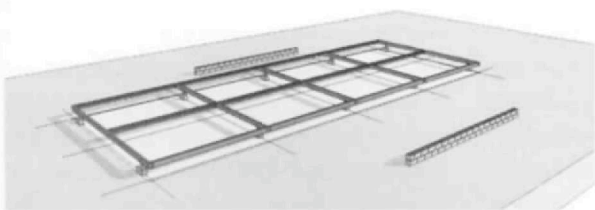


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