

Why **M O D U**

An affordable, custom home combines modular units with on-site construction,

BY CHRIS ERMIDES

It isn't often that the term *modular* is used to describe a custom-built home. And why would it? Modular homes are designed from stock plans and made of factory-built modules finished with limited options for windows, cabinets, and millwork. What's more, they rarely illustrate the mindful design and impeccable craftsmanship found in custom homes. The point is that most modular-built homes aren't custom anything.

Cookie-cutter drawbacks aside, modular construction does have some benefits worth paying attention to. For example, there's less waste because offcuts from one module end up as part of another project. And the house never sees a drop of rain until it's weathertight and finished. For these reasons and more, custom-home builders like Randy Lanou and his design/build firm BuildSense (www.buildsense.com) are finding ways to capitalize on the modular-built model without sacrificing design and construction integrity. Lanou calls the result a "hybrid" house: part modular, part site-built. This project in Durham, N.C., is a great example of how the two can come together in a way that benefits the builder and the homeowner.

Design starts with the limitations

House modules need to be transported via highway. Highway regulations in eastern North Carolina limit a module's size to 13 ft. 9 in. in width and 15 ft. 9 in. in height, a size, Lanou says, that can work for bedrooms, kitchens, and bathrooms, but not for large spaces with tall ceilings. Clients Scott and Vikki Metheny went to



L A R ?

shedding light on the strengths and weaknesses of factory-built homes



THERE'S GOOD REASON TO FRAME IN THE FACTORY AND TO FINISH ON-SITE

Lower costs Modules are built from plans offered by the manufacturer, which is equipped to streamline the process in a way that optimizes efficiency. When houses are built in a controlled environment, costs can be controlled as well. Modular companies can be extremely accurate in pricing their part of the project. Stripping away too many components offered by the factory can alter the cost benefit, however. For this house, all cabinetry, floors, and wall finishes were done by the builder on-site. The total cost for the house—about 2000 sq. ft., including the porches—came out to \$143 per sq. ft.

Save time Once manufacturers have code-approved plans in hand, modules can be built frame to finish in a few days. Site work and foundation work are done simultaneously. Customizing the modules slows the process. These modules didn't run through as rigorous a schedule, but there was still a time benefit. Due to a backlog with the manufacturer, the foundation was finished months before the modules were built. But once the modules arrived on-site, they were craned in place and tied together within six hours. From start to finish, the entire process took about five months to complete, four months less than if the house had been built conventionally.



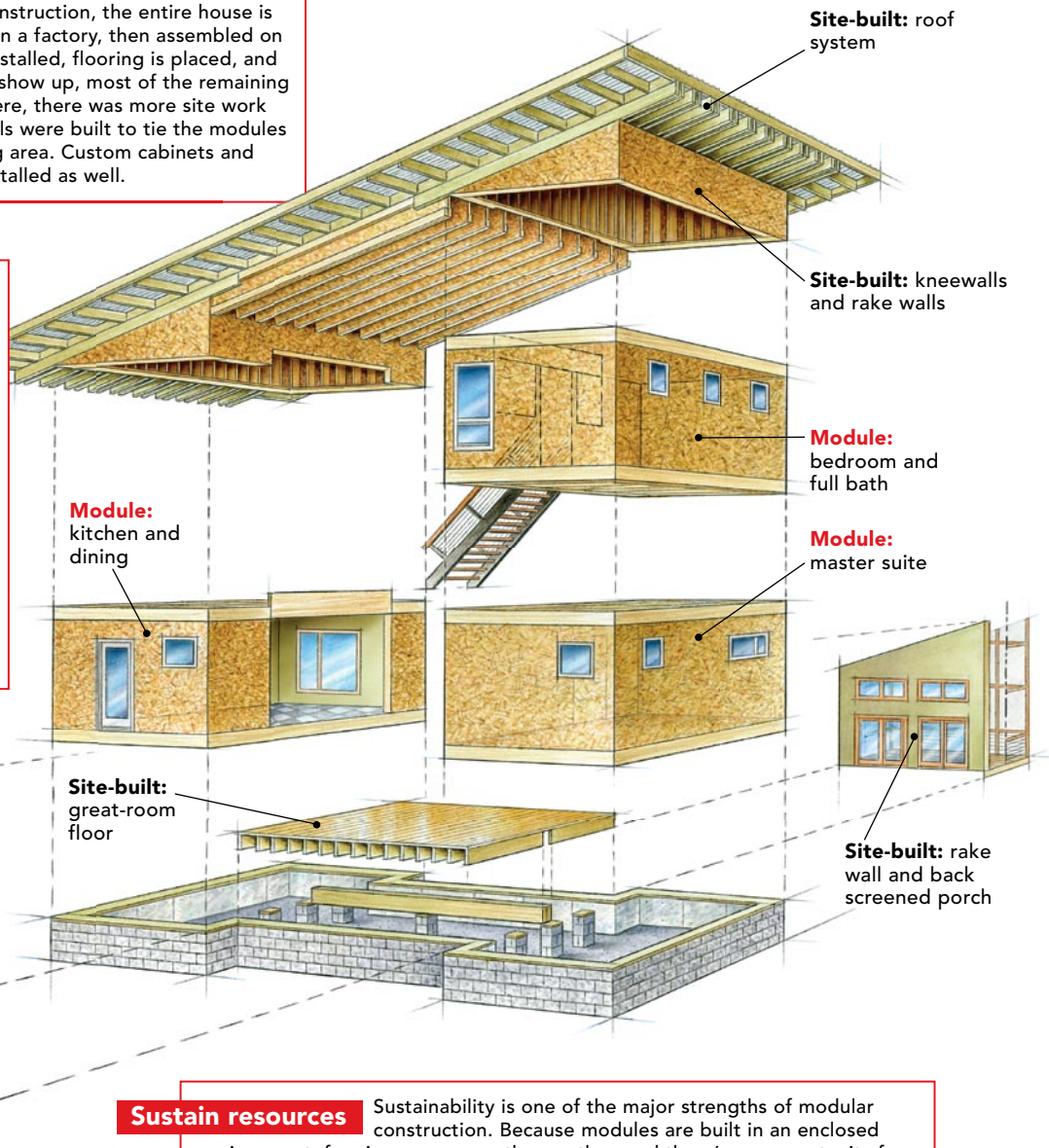
CUSTOM HYBRID: THREE MODULES STITCHED TOGETHER ON SITE

Control quality

In typical modular construction, the entire house is framed and finished in a factory, then assembled on site. Walls are painted, cabinets are installed, flooring is placed, and the roof is put on. Once the modules show up, most of the remaining work involves tying them together. Here, there was more site work to complete. A shed roof and two walls were built to tie the modules together and to create the large living area. Custom cabinets and the stairs to the second floor were installed as well.

Help subcontractors

Plumbing and electrical work (from rough-in to finish) is done in the factory. Wiring and piping are left long to make connections in the field. Modules come equipped with access panels to allow plumbers and electricians to make these connections. HVAC systems are installed on site after the modules are set. The process didn't change for this hybrid approach. Small problems can arise from the factory, but they aren't common. On this project, the plumber found a leak in the vent stack during inspection, but it was easily fixed.



Site-built: rake wall and front porch

Module: kitchen and dining

Site-built: great-room floor

Site-built: roof system

Site-built: kneewalls and rake walls

Module: bedroom and full bath

Module: master suite

Site-built: rake wall and back screened porch

Sustain resources

Sustainability is one of the major strengths of modular construction. Because modules are built in an enclosed environment, framing never sees the weather, and there's no opportunity for mold. Some argue that because laborers aren't fighting the elements as they build, their work is better, as is the result. Workers aren't driving as far or as often to a site, so less fossil fuel is burned. There's also little waste because scraps from one project become blocking, cripples, and other pieces for the next project. That means less material goes in the landfill, and it also means high profit margins for the manufacturer.

BuildSense looking for a custom home that was affordable, efficient, and modern. (Scott, a skilled carpenter, later joined Lanou's crew and became the contractor on record.) They wanted a large living room, a master suite, two additional bedrooms, ample daylight, and easy outdoor access.

Achieving these goals would be a challenge. With size restrictions in mind, Lanou used three modules, each for a separate part of the home. Kitchen, dining, half-bath, and

laundry made up one module; the master suite and office alcove made up another. Two bedrooms and a full bath comprised the third. Lanou arranged the modules and stitched them together with a floor and roof to give the Methenys the large living room they were looking for.

Customizing can be a challenge

Modular manufacturers rely on Henry Ford's assembly-line model for their success. Each

module moves down a line where stations are set up for specific parts of the process. Unlike custom homes, though, the modules moving along the line don't vary much from one another in terms of design. It's all about efficiency of labor and materials.

The rub in all of this is that most modular companies are adamant about working with their own plans drawn by their own team of draftspersons. Interrupting the staff designers' normal workflow can create problems.



In between modules there's room for a large, bright living space. The site-built floor, roof, and exterior walls complete the structure and yield a grand living space that connects the modules. Orienting the home properly on-site and incorporating high-performance windows not only add ample daylight but also contribute to the house's efficiency. Electricity bills, which include heat, total \$50 a month.



For BuildSense and the Methenys, this meant there were some discrepancies between the original drawings and the ones created at the factory. Before anything was approved, both builder and client reviewed each draft and made appropriate changes.

Small details can be missed. For example, no one noticed that a wall in the kitchen had been moved until the module was delivered. The mistake had to be corrected because custom cabinets already had been built.

Once the final plans were agreed on by all parties, the modular manufacturer was able to provide a specific and detailed price. Both Lanou and Metheny agree that the financial consideration is one of the most beneficial aspects of modular construction. You know what the price is, and you know exactly where you'll stand in the process once the modules arrive on-site.

All in all, both builder and client were happy with the process and the outcome.

Their advice to anyone looking to use modules as part of their next project is twofold. As a start, take a tour of the factory, and pay attention to the products as they're being built. Second, understand the fabricator's process, the materials, the details, and the limits of transportation, and work with these parameters rather than against them. □

Chris Ermides is an associate editor. Photos courtesy of Randy Lanou.