Why Switch to Modular?

by David Dobbs

Dana Patterson has been building houses in and around Merrimack, N.H., for 31 years. In that time he has become one of southern New Hampshire's larger builder/developers, heading a company that at its busiest a few years ago did over $5 million in business, 90% of it residential. While he is primarily a stick-builder, he has been using modulars for selected projects since the early 1960s.

We recently talked with Patterson in his Merrimack office to get his views on the business pros and cons of building with modular.

Builder Dana Paterson in his Merrimack, N.H., office.

When the market is hot and good labor's scarce, modular starts making business sense

JLC: *The big question most people wonder about: On a given house, do you really save money with modular?*

Patterson: It depends on circumstances. We're already in business, so we have a fixed overhead. If we can sell more products than we can stick-build, modulars let us increase our volume without increasing our overhead. This increases our sales, which will hopefully increase our profit. But if sales are a little slow, I don't see any financial little slow, I don't see any financial advantage to us in going modular.

JLC: *So the claim that you can save money with modulars is questionable?*

Patterson: Let's call it a matter of opinion. And circumstances. I have been a builder for 30 years. I know what costs are and I know what product I want. If I buy modular it's not to save money but to meet some other need.

But if I were not a builder already, and I wanted to put up ten homes, I would not become a builder. I would become a [modular] dealer, buy those ten homes, put them on my lot, and sell them.

JLC: *One place the industry claims you save money is in financing: the project goes up faster, so you borrow for a shorter period of time and pay less interest. Have you found that significant?*

Patterson: We figure all our interest as general overhead rather than on a per-project basis, so I can't answer that precisely. I suppose you do save money there, but for us it hasn't been a factor in our decision-making.

JLC: *When a contractor first starts building modulars, is he likely to hit any major snags?*

Patterson: I can't imagine what they'd be. If you have any idea what you're doing, there's no added expense. There are no special tools other than a couple of clamps that cost maybe $1,500. Site costs run the same as in a stick-built project, so we know what they will be.

JLC: *Do you do your own button-up?*

Patterson: We do. We know exactly what's involved, and we haven't run into any surprises. We usually do all our own siding, since you have to do the gable ends anyway. Button-up costs don't vary by more than 5% from job to job. Anything that repetitive is completely predictable.

JLC: *Do you find modular's predictability a big advantage?*

Patterson: I don't find it that great an advantage over stick-building, because if you know what you're doing in stick-building you also have predictability. A few years ago we had a framing crew of three people that could completely frame a 24x40 ranch in 72 man-hours -- from the foundation to the roof, siding on, windows on, completely dried in. And the quality was there. Of course, you can't always get that kind of help.

JLC: *If you're in an area where good labor is expensive and turnover is high, is that a good reason to consider modular?*

Patterson: If you had a lot of turnover, that would make modular more attractive. In terms of labor, for us it's been more a matter of quality than cost as far as what makes us go modular in busy times. Labor costs are high here, but they're high where we buy our modulars too. When things expand quickly you can have trouble finding quality help, and then modular can be a good idea.

Codes

JLC: *Another big concern is code approval. Have you met much resistance from building inspectors on code approval?*

Patterson: That seems to be a local thing. A lot depends on the building inspector and his feelings about modulars. We've only built in three different towns, and we know the inspectors there and what they are looking for. In two cases we took the inspectors to the plant. That gave them an idea of how the buildings were put together and it alleviated any doubts they had. But we've never had a problem, probably because the building inspectors know us well and know our product.

JLC: *How does it work logistically?*

Patterson: You submit your plans and specs to the building inspector before you get your building permit. It's the same as with stick-built. However, with modulars there's also a third-party inspection, a private company that has toured the plant, that okays the plant's procedures, and that is accepted by the local inspectors. The plans themselves don't have to go by the third-party inspector, just the local inspector.

JLC: *How long do the plan approvals with the local inspector take?*

Patterson: About three weeks. Same as for stick-built.

JLC: *Are on-site inspections any different with modular?*

Patterson: About the same. The house is completed. The inspector checks the circuit breakers, water temperature, checks for leaks, proper grounding. The usual things.

Customizing and Changes

JLC: *Is it economical to customize a modular, or are you limited to a manufacturer's stock plans?*

Patterson: We don't use their stock plans. We go to them with our plans and the specs that we want, and they build them for us. In other words, we don't modify their designs, we give them ours. They redraw them to adapt them to their production process. The design fee is incorporated into the price.

All that involves is sitting down a few times and bouncing things back and forth. The trickiest part is usually maintaining proper heights and stairways on two-story projects. But we have had no serious problems. When the product comes out of the plant it's right. And price-wise, this process comes out about the same as generating a design and then building it stick.

JLC: *How many units do you have to buy to make that process cost-effective?*

Patterson: We do it that way whether it's one house or forty, and either way, the price is comparable to stick-built.

JLC: *You mentioned that you once had a problem with windows. What happened there?*

Patterson: We specced a bunch of houses with an aluminum combination window -- call it X unit -- and we started getting these Y units, $5 or $10 cheaper to the manufacturer. But it was a piece of junk -- something you wouldn't want on your house.

JLC: *How did that end up?*

Patterson: They changed them.

Another problem we had once was when we ordered a certain heating system and got another one. We always overdesign our heat systems, because we feel you can't have people cold when they're supposed to be warm.

But the manufacturer decided he'd have his man design them, and he put the minimum in there. Fortunately, we found it in the first couple of units they delivered, and they were able to change it.

JLC: *Was the change in the specs, or did it just show up in the units?*

Patterson: We hadn't seen any revised specs, so we didn't know about it until we got the first couple of units. I think that was the same time as the windows, and we sat down and had a very serious discussion about it.

Marketing

JLC: *Are there particular types of clients who would be either right or wrong for modular?*

On-Site Coordination

by Dave Sitrin

On-site work in this Connecticut modular development included pouring concrete foundations and finishing the siding and roof.

Two years ago, Connecticut's building boom made it hard to find contractors. Because our development company was new to the area, we didn't have a list of capable stick builders, and there was a shortage of labor. So, we decided to try modular construction for a 90-home development.

To keep our end of the project simple, we chose two styles - Cape Cod and raised ranch. We varied the exteriors by offering our buyers the option of an attached one- or two-car garage and an unfinished 10x20-foot breezeway, both stick-built on site. About half the buyers opted for a garage, and this varied the house style enough so that every house was not identical from the street.

Buyers who wanted to change room arrangements had a tough time. Making substantial changes was expensive for the manufacturer because the modulars' plans had to be approved by the state building code officials before construction. Any changes meant drawings had to be resubmitted for approval. We found that it was more cost effective to stick build any additions or changes.

The factory agreed to provide three houses per week. Their responsibility ended when we took delivery, so we checked the modules carefully when they arrived and noted any defects. An overpass clipping a corner or snagging the roof could mean a major repair. But even minor mishaps, such as wind pulling the siding loose, made extra repair work. On a few units, the vibration during shipping and handling loosened ceiling drywall or misaligned kitchen cabinets. We went over each house with a magnifying glass, looking for broken rollers on kitchen cabinets and making sure we had enough door knobs and ceiling light fixtures to finish the job.

Missing items or goods damaged in transit delayed completion of some units, and I found this one of the most annoying aspects of the job. The shingle colors, hardware, and faucets were not available locally, so we had to go back to the company for replacements.

Foundation Work

To prepare our site, which was uneven and rocky, we had to do a lot of blasting. Because we were doing a whole development, we did our own site planning, obtained soil tests, and set grades. Our foundations were done in the usual way, with 4-inch perforated pipe, reinforced footings, asphalt dampproofing, trenched utilities, and 10-inch-thick concrete walls. The raised ranch house required a basement because it was designed to have a lower story, but the Cape Cod could have been built on a crawlspace. Modulars typically are not installed on slab foundations because of the difficulty making the plumbing hook-up.

We hired our own excavating and foundation contractors. They used diagonal measurements to make sure the foundation was square to within 1/8 inch and used a transit to level the foundation to within 1/4 inch. We let the foundations set a week before placing the modules.

The raised ranches required some additional foundation preparation. They had 4-foot-high concrete foundations with 4-foot-high 2x6 kneewalls above them. The modular units rested on the kneewall. Essentially, we were providing two floors of living space on these units, with the first floor partially in the ground. The downstairs area, part of which was a garage, could be completed for an additional charge by the finish crew, or the owner could finish it later.

After the foundation was in, our on-site carpenter installed sill sealer and 2x6 treated sill plates. Because our sites were hilly, we also had him frame in basement walk-outs for single or double doors.

We dampproofed the foundation with asphalt coating and installed perforated pipe. Then the excavating contractor backfilled around the foundation wall and scraped out a level area for the crane. The crane had to sit on a level area within 20 feet of the foundation so that it was close enough to maneuver the modules.

Setting 'Em Up

The modules for the Cape Cod home were 40x24 feet, and raised ranch modules were 44x26 feet. The hinged roofs folded down during transport, and attic kneewalls, dormers, or stairs were shipped on the trucks with the modules. To protect the modules from weather, each module was wrapped in plastic.

We tried to set the homes within one or two days of delivery, but sometimes we had to wait two or three weeks. Bad weather slowed down our foundation construction and altered the delivery schedule. We couldn't set modules in the rain because we had to unwrap them, and it took a day to make the house weather-tight.

We hired a setting company to place the modules on the foundations and button them up. The setting company sent three guys plus a crane and operator. Our excavating contractor helped move the modules into position so the crane could lift them.

Joining the Modules

The setting company put nylon straps around the modules and lifted them onto the foundation with the crane. Once the modules were in place, the crane operator unfolded the roof which was hinged so the module could be shipped flat. Since the roof was hinged in one or two sections, the manufacturer provided a kneewall to support the bottom section of the roof below the hinge. The kneewall was placed in the attic at the factory, and the crew tilted it up while the crane held the roof.

The roof trusses interlocked once the roof was raised. Each half-roof truss the roof was raised. Each half-roof truss butted into a 2x4 that ran the length of the ridge. One side of the roof had a 2x2 ledger just below the ridge, and the crew unfolded this section first. The 2x4 on the other half of the roof rested on the ledger, which helped the setting crew align the ridge. When the ridge lined up, the setting crew nailed the 2x4s together. This setting contractor also placed the triangular gable ends.

To securely fasten the modules together, the crew installed metal straps on the outside where modules met, strapped across doorways, and bolted through girders along the ``marriage wall'' (the wall where modules join). Occasionally, they had to place shims along the center girder to get the two halves of the home to line up.

Even though we save about two weeks per house on our schedule by going with modular, I find it easier to coordinate stick-built jobs.

Hooking up Utilities

Once the modules were set, we hooked up utilities. The plumber took the PVC waste pipe and the copper water lines that are stubbed off between the floor joists and connected them to the water and sewer lines that had been run in through the foundation. The factory sets toilets and sinks, but the plumber checked them to make sure they didn't leak. The plumber also assembled all basement gas lines, checked appliances, and brought the main gas line through the foundation to the outside. Then I called the gas company to run the gas line in and set the

(Continued on next page.)

Cape Cod modulars sat under plastic (top) until a local roofing contractor could finish the roofs. Some units have a site-built breezeway and garage added as an option (bottom).

On-Site Coordinaton (continued)

meter. The plumber had a full two days of work to get everything connected.

The electrical work arrived more complete, but there was still a full day's work for the electrician. The panel arrived stuffed up between the floor joists. The electrician pulled it down, mounted it on the basement wall, and ran underground service entrance (USE) cable from the meter can to the panel box. He checked the breakers and installed any light fixtures that were not installed in the factory.

Finishing Up

Because the setting crew was responsible for making the home weathertight, they had to complete the roofing before leaving the job. Finishing the 5/12 roofs on the raised ranch units presented no problems, but the Cape Cod roofs proved a bit trickier. These roofs have a 12/12 pitch and fold twice. Shingles only come half way up the roof as it's delivered. The units also had dormers, which had been framed in the factory, but needed to be installed on the job.

We found that there was extra work in getting a good looking roofing job. The setting crew put in the dormers, but the factory didn't send us quite enough shingles to cut in around them. Local materials didn't match, so the roof looked as though it had been patched. We ended up having Cape Cod units shipped without roofing, and we hired a local roofing contractor who removed the hinges (for a smoother roof) and who knew how to flash the dormers (see photo).

A separate siding crew finished the siding, putting on five to six squares of siding on the gable ends and knee-walls. Moving at a good pace, the on-site crew took about a day and a half to finish the exterior work.

We hired local contractors for the interior finish work. When units were sent from the factory, the carpet was covered with protective plastic and rolled back at the edges where the modules joined, so we needed a local carpet installer to stretch and seam it.

Our finish crew did the rest of the interior trim, hanging a couple of doors and drywalling the arch where units joined. On the raised ranch, the factory sent a platform and two sets of steps, but for the Cape Cod we did the stairs ourselves. The factory had framed in the opening for the stairs, however, so we didn't have any structural work. The contractor doing this patchwork readjusted cabinets that were slightly out of alignment and used touch-up paint on last minute nicks.

Modular or Stick?

Even though we saved about two weeks per house on our schedule by go<HH>ing with modular, I find it easier to coordinate stick-built jobs. If you do choose modular, I suggest that you select a factory close by and that you pay attention to the quality of their materials. If you do so and are able to adjust to the differences in coordinating the site work, modular construction can work in your favor.

Dave Sitrin is on-site supervisor for K&F Associates, Middletown, Conn. The project he describes was developed by Lemark Associates, Ronkonkoma, Long Island, N.Y.

Patterson: No. Ninety percent of the people wouldn't know the difference.
JLC: *Don't many people still carry prejudices against modular?*
Patterson: I don't think that's a major problem anymore. I think 40 years ago it was, and I think it was even 20 years ago. But I don't think there's any problem today.
JLC: *For troublesome clients - the kind you know from the first meeting will be difficult -- do you think going with modular is a plus or a minus?*
Patterson: I think it would be a plus. There aren't that many of those people. But those types, they're on the site, bothering the help. Plus they have an opportunity, as they see the building go up, to change this or that, and with modular that's not an option. It gets to the site, it's there, they ordered it, they pay for it. Given all that, it would be much easier if it were a modular project.
JLC: *Would you hesitate to market a modular home to a more upscale client?*
Patterson: No. A more upscale client might have a broader knowledge of things, and he would probably understand that a modular is as good or better than a stick-built. Plus if he's coming to me he's probably familiar with my reputation, and he'll put some faith in that.

Why Modular?

JLC: *Business-wise, what's the best reason for going into modular?*
Patterson: Convenience. Quickness. You don't have to establish a bunch of crews and overhead. When we use modular it's for internal business reasons. Mostly it depends on our workload and whether we can sell more units than we can produce ourselves. A few times we've built modulars for people who requested them. And if we had to put up a home more than 25 miles away from our shop, we would probably build modular to save the expense of shuttling crews and materials back and forth.
JLC: *Can you think of other circumstances in which you would build modular?*
Patterson: If I didn't have a crew and an office and a building company, I would never start one. I would not start a stick-building company today if I were starting out.

A lot depends on how big you want to get. If you want to build 10 or 12 houses a year, modulars are a nice way to go. You don't have to have a crew, you don't have to worry about laying people off, hiring people, snowstorms. When it gets slow, you just order fewer houses.

It's a matter of what you want out of life and your business. If you want to build a five- or ten-million-dollar-a-year company, you probably won't do it with modular homes. But if you want to make a good, comfortable living and have the time to enjoy life, spend a few weeks in Florida, some time skiing or fishing, modular homes are a fairly simple way to run a building business.
JLC: *In general, do you feel modular tends to present fewer business and logistical headaches than stick-building does?*
Patterson: Definitely. But you're paying for it by paying the manufacturer's overhead and profit. That's money I could be taking in if I built it stick.
JLC: *What advice would you give a friend who was thinking of going into modular?*
Patterson: First, know what you want. I expect joints to fit, that the air's not going to blow in around the door, that the house is framed properly and everything is square and plumb.

You also have to make sure you get a reputable manufacturer. When you consider quality, the credibility and reputation of the manufacturer is all-important, because the manufacturer ensures that quality.

Finally, you should know enough about the business so you can spec the product you want and know it when you see it. Know your own business; keep everybody straightforward and following the specs you establish. ■