Doing enclosures right

I'm sure I enjoy the benefits of the modern Western lifestyle at least as much as the next guy. I've got a large comfortable home equipped with all the conveniences and an above-average selection of toys ranging from electronic gadgets and cameras to boats, campers, and sports cars, and including my personal weaknesses, more tools than I need and (according to She Who Shall Not Be Named) way too many bicycles. At the same time, I'm quite aware that inhabitants of this earth surely can't keep up this level of consumption indefinitely. Am I living high on the hog at the expense of my grandchildren and great-grandchildren?

Much of what makes this lifestyle possible is derived from petroleum and other finite, irreplaceable resources, often at great energy cost or damage to the environment. I applaud when I look around and see exploration of alternatives to practices which are harmful, cost-ineffective, or wasteful. There are many examples of ways we could change our consumption habits; some of these involve a return to an old, low-tech method that has been forgotten as we rush to embrace high-tech products backed by slick advertising claims.

In the timber frame industry, we have our own set of assumptions and standard practices developed over recent years. I'd like to look at an alternative to the industry standard of enclosing frames with foam core panels. The foam core is derived from highly processed petrochemicals, and materials that enter the waste stream are unfriendly to the environment. Panel materials are expensive, but today's high-priced professional labor costs are minimized. By contrast, the practice of assembling building components from straw-clay is labor-intensive but relies on readily available low-cost materials.

For thousands of years, clay has been a staple building material, often supplemented and reinforced with fiber such as straw. Birds have used the same material for their homes for much longer, I'm sure. The materials are available in most parts of the world and ready for the industrious to put to use, at little or no cost. Not for the faint of heart or weak of back, this system has its own set of disadvantages, not least of which is the amount of time and degree of effort that goes into completing the project.

While my involvement in straw-clay projects has been minimal, I've followed the rediscovery of the ancient techniques with interest. I had the chance to take part in them, though, in a house being built in nearby Angelica, N.Y., by Richard Drachenberg and his wife, Patty

O'Connor. Started ten years ago, it's a fairly straightforward timber frame, with 4-ft.-wide roof overhangs providing extra weather protection. The walls are composed of straw mixed with a creamy liquid clay, packed tight between temporary forms to create a 12-in.-thick wall. The clay serves several purposes in addition to bonding the materials into a substantial assembly. Perhaps most important, its hygroscopic nature assists in wicking away the moisture that inevitably enters the wall and which would promote rot or mold if allowed to remain. It adds protection against unwelcome inhabitants such as mice or insects, and it gives a great deal of fire resistance to an otherwise flammable material. The clay's thermal mass also evens out temperature extremes and stores heat.

The long hollow stems of the straw intertwine to reinforce the walls and create a multitude of air spaces, making it an effective insulator. The assembled wall very slowly breathes, which provides a healthy exchange of air and, unlike a great number of manufactured building materials, neither contains nor outgases toxic chemicals or other unhealthful components.

The roof insulation is also unconventional. The rafters are 16-in. truss-joists (wooden I-beams) to accommodate the 14-in. thickness of straw-clay and allow 2 in. of air space for ventilation. The inner surface of the rafters was sheathed and the straw-clay mix was packed loosely in place by hand. The proportion of clay in this mixture is less because it doesn't need to be structural, and greater volume of air space equals greater insulation value.

Because of the severity of the weather to which the house will be exposed, Richard decided to apply wooden siding to the exterior rather than the natural plaster or stucco-like finish that's popular in many parts of the country. The interior, however, is finished with a very attractive hand-troweled plaster that emphasizes the way the walls are beveled alongside window openings to accentuate their thickness and mass. Cherry windowsills are wide enough for window seats. Further accenting the interior are an assortment of fine woods, most notably book-matched curly-maple panels at the kitchen partition and a long wide curly-maple slab at an opening in the partition, inlaid with butterfly keys and hand-planed from a very solid thickness at the center to a delicate inch or so at both ends. Another personal touch accenting the Vermont slate floor of the main circulation area is an inlaid hand-cut stone shamrock. As Richard says, there should be no doubt that an Irishwoman lives here!

Richard and Patty are justifiably proud of the fact that they have done (or at least actively participated in) most of the work on their house themselves, without outside funding, proceeding as their available money allowed. Others going down this road may find that they'll have to search for a flexible, innovative financing institution, as this construction method is far from mainstream.

As we discussed the long-term nature of this building process in relation to sustainability, Richard joked that the hardest thing has been sustaining themselves through the process. It's obvious, however, that by investing their time and selves into the project, they will have something of much more worth to them than if they had built a conventional structure by conventional means.

—Leon Buckwalter

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