

Research–Demonstration House Development and Evaluation

An interdepartmental team from Haywood Community College in Clyde, North Carolina, is designing a research and demonstration house for construction on campus. The study is a cooperative undertaking of the Advanced Housing Research Center of the USDA Forest Service Forest Products Laboratory (FPL) and Haywood Community College (HCC). The purpose of this study is to acquire and disseminate knowledge regarding design, construction, and performance of a single-family residential building offering alternatives to marketplace standards in the forest-typical and climatic region that includes Haywood County, North Carolina.

Background

The traditional regional prototype for single-family homes predominantly employed a building shell of mid-century forest products—dimensional lumber framing and plywood—on strip foundations with wood, plywood, plaster and drywall, and stone or brick masonry finishes. This prototype emerged at a time when land, fuel, forest products, and labor were relatively cheap in the region and the pool of skilled workers in the building trades was relatively large.

The current “prototype” is an amalgam of mobile homes, modular construction, and a partially evolved version of the mid-century type. These new types incorporate more petroleum-based and other synthetic materials, more applied chemical compounds, more machine-fastened components, lighter weight materials, and greater across-the-board standardization of materials and methods. Material sources are more

diverse than in the past. On the other hand, site-development practices have remained much the same, tending toward massive site alterations, in defiance of rising costs, both direct and environmental.

The engine driving these changes appears to have been almost purely cost based, with little apparent consideration for value beyond the notion that more is better with respect to building area and volume. Changes in building practices have more often been reactive to regulation or liability than positively responsive to the increasing awareness of environmental impacts.

Objective

The objective of this study is to demonstrate that greater value can accrue to both owner and community when principles of affordability, sustainability, and responsiveness to local and regional environment drive design decisions and construction practices. An approach to homebuilding that emphasizes value and is grounded in pursuing opportunity can produce houses that are more livable, more responsive to universal and regional environment, and more frugal with respect to available resources than those resulting from current practices.

Approach

The team will begin with a set of guiding parameters to be applied to design and construction decisions. The influence of these parameters may not always be in the same direction, and no attempt will be made to apply them quantitatively. Rather, they will be benchmarks against which to test decisions.

- Regionalism—Do building decisions respond to factors of material availability, regional climate and physical environment, history of regional success, and to a lesser but still important extent, regional culture?
- Sustainability—Are decisions in concert with known and developing principles of sustainability?
- Affordability—Although the needs of a single research and demonstration project and the marketplace may diverge, are decisions in the long-term interest of affordability?
- Opportunity—Are decisions reactive and accepting, or is there an opportunity for inventiveness?
- Value—Will decisions lead to a demonstration of value that may persuade changes to current practices?

The team will be supplemented by local consultants and will have input of an advisory board that includes building professionals, construction industry representatives, and a local code official. Students of HCC's Construction Technology Department typically work on live projects to facilitate learning of the construction process and during relevant class times will perform all work involved in each trade throughout construction of the research-demonstration house.

Expected Outcomes

The team's intention is to produce a demonstration house that will serve as a vehicle for HCC and FPL

research, a teaching tool for the HCC Building Technology Program, and the centerpiece of programs that will display fruitful alternatives in building to builders, educators and students, lenders, appraisers, realtors, developers, and prospective homeowners.

Timeline

The design phase will be completed by spring 2006, and the building process will begin during spring semester 2006. Historically, the entire construction process for a residence has taken five to seven semesters, so we expect the building to be completed by spring 2008.

Cooperators

Haywood Community College
USDA Forest Service, Forest Products Laboratory

Contact Information

Thomas Clements
Applied Technology Division
Haywood Community College
Clyde, North Carolina
(828) 627-4636, tclements@haywood.edu