

Advanced Framing/Energy-Efficient Technology Transfer Demonstration Home

Changes in residential energy codes are driving builders and residential designers to seek new wall assemblies in their designs. Some residential builders are using nonstructural insulating sheathing products to replace traditional 2×4 stud walls sheathed with plywood or OSB. Other wall assemblies that can meet more stringent energy codes are constructed with 2×6 studs, which allow for more insulation in the cavity of the walls, and using wood wall sheathing products to maintain the structural integrity of the frame. However, the perception of added cost of converting from 2×4 to 2×6 walls has been an obstacle for many builders.

Background

A previous cooperative program of the Forest Products Laboratory's Advanced Housing Research Center and APA—The Engineered Wood Association, "Residential Construction Carbon Challenge—Tech Transfer and Builder Support," provided education on methods to build 2×6 walls with wood wall sheathing more cost effectively through a business-to-business campaign. This has raised awareness of solutions such as 2×6 advanced framing. The need existed to demonstrate the techniques in a home where builders and designers can be part of the planning and framing process in order to identify with the advantages of 2×6 advanced framing.

Objective

The project objective is to educate residential home-builders, designers, and building code officials in the Chicago metro area and nationally on how to cost-effectively and efficiently construct an energy-efficient house with 2×6 advanced framed walls.



Beechen and Dill's 2,880-square-foot Keystone model will be used for the project.

Approach

This technology will be transferred through the construction of a demonstration house in the Chicago metropolitan area. The demonstration house will be used for training and education. These technology transfer activities are intended to advance the use of wood wall systems in a way that promotes efficient use of wood resources. Technology transfer will be through seminars and open houses at the jobsite, articles in construction trade magazines, and educational videos promoted to the construction industry through the APA website and social media.

This project involves three stages:

- Planning—The planning stage involves selecting project partners (including builder, energy efficiency consultants, trade publicity agency, events managers,

and building designer) and coordination of building design, construction timeline, and roles of project partners. This phase of the project is critical and requires that suppliers, designers, and subcontractors (such as architect, engineer, energy rater, HVAC designer, framing contractor, component suppliers) all integrate their areas of expertise with the building design. A hygrothermal analysis of the wall assembly will be performed during this stage to help verify good moisture performance of the design.

- **Framing**—The framing stage will involve education of the framing crew and construction superintendent on proper and efficient integration of new advanced framing techniques. This will take place before and during the actual framing process. Construction video will be captured during this stage.
- **Education**—When the building has been “roughed-in,” education events will be conducted at the jobsite over a three-week period, after which the builder will resume construction. The open house events will be promoted in advance to Chicago-area builders, designers, and code officials. During this three-week period, the builder also plans to host their own events at the jobsite for realtors. Education will continue after construction resumes with the development of articles and how-to videos.

Expected Outcomes

Outcomes of this project will include education of residential homebuilders, engineers, architects, and building code officials on the cost-saving, environmental, and energy efficiency benefits of wood-frame homes with advanced framing techniques. Educational videos and trade magazine articles on the topic will be produced and distributed through social media. A cost comparison of advanced framing versus traditional framing (with non-wood wall sheathing) and a hygrothermal model of the wall assembly design will be produced.

Timeline

The project was initiated in June 2014 with a planned completion date of December 2015. The builder for the project was selected in the fall of 2014, and coordination began shortly thereafter on timing of project construction. The demonstration house will be built in spring or summer of 2015, pending the builder’s production schedule.

Cooperators

APA—The Engineered Wood Association
USDA Forest Service, Forest Products Laboratory

Contact Information

Tom Kositzky
APA—The Engineered Wood Association
Tacoma, Washington
(253) 620-7423; tom.kositzky@apawood.org

Karen L. Martinson
USDA Forest Service, Forest Products Laboratory
Madison, Wisconsin
(608) 231-9450; klmartinson@fs.fed.us