

WHAT WE LEARNED BY



Two Identical 2,600 sq. ft. homes
One Framed Conventionally
One Built with Engineered Components



THE PROJECT

WTCA, in cooperation with the Building Systems Council of NAHB, sponsored the Framing the American Dream® project to better understand wood framing. It was the first time two identical house plans were completely framed using two different methods—one stick-built, and the other with wood trusses (components). Here's what we learned:

CRAFTSMANSHIP THROUGH ENGINEERING

- Every building is an engineered structure. The moment a nail is driven into two boards, load transfers from one board to the other, so designing and engineering all structures is important. A house using components is fully engineered.
- Each component is designed specifically for your building.
- Each component location is defined, making components easy to use in the field.
- All the loads go where they belong. You won't have uneven floors, or windows and doors that don't close properly—no surprises!
- Engineering with computer software makes craftsmanship easy with components, and gives you design flexibility.

CRAFTSMANSHIP THROUGH MANUFACTURING

- A manufacturing facility creates quality components, often starting with computer-controlled saws, which make accurate compound cuts simple. All component joints fit together tightly in precision jigs. Manufacturing can also be computer-controlled, for faster setup times and efficient production.
- Weather is not a factor. Production can continue day and night, providing consistent quality.
- Material shortage delays are less likely, since the entire system is supplied in one package.
- Callbacks are reduced. Components made with dry lumber are less likely to shrink, warp, and twist.
- Components are rarely stolen from the jobsite.

ENVIRONMENTAL RESPONSIBILITY

- Nearly five million trees are planted every day. Wood is the only renewable building material.
- Wasting wood is costly. In a factory, cut-offs and short lengths can be used to the maximum, which reduces waste. Most waste wood is ground up and sold, so less goes to the landfill.

FLOOR TRUSS FRAMING

- Floor trusses can be manufactured in long spans, reducing or eliminating the need for intermediate bearing walls, beams, columns or footings.
- The open webs allow for easy passage of ducts, plumbing and electrical wires within the system. No cutting of webs is required and you don't need to fur down to hide mechanicals.
- Special bearing, cantilever and balcony details are easily built in.
- Stiffness can be designed into the floor truss, creating a more solid floor.
- Labor costs for mechanical contractors are lower.
- The 3½" width allows for quick gluing and accurate nailing or screwing.
- Cold air returns can be eliminated by using the open web system as a plenum for air distribution.

WHAT WE LEARNED ABOUT FLOOR FRAMING

	STICK FRAME	COMPONENT
MAN-HOURS TO FRAME	38 HOURS	12 HOURS
QUANTITY OF LUMBER	4,256 BD. FT.	3,147 BD. FT.

SAVINGS: 26 HOURS • 1,109 BD. FT.

"In working with contemporary homes, building with components holds your dimensions plumb, square and true, ensuring a dimensionally accurate home, reducing call-backs."

*-John Teschky,
Teschky, Inc.,
Glenview, IL*

**What We
LEARNED
about
WOOD WASTE
at Jobsite:**

**STICK FRAME
13 yards**

**COMPONENT
3 yards**

**SAVINGS
10 yards**



ROOF TRUSS FRAMING

"Building with components, I went from having 25 men to 8 men on the jobsite, and I doubled my dollar volume. Every hour I take out of the field decreases my liability, overhead, and workers' compensation. There's no trash to pick up. A clean jobsite makes a safe jobsite. I was a firm believer in stick framing for years, but I'll never go back."

-Rick Thompson, Rick Thompson & Sons, Princeton, IL

- Complex roof and ceiling profiles are easy to design with today's software.
- Hip and valley roof systems are much easier to build using trusses than with conventional framing.
- Trusses can be used with a variety of on-center spacings, to optimize strength and lumber resources.
- Long clear spans are easy to create, reducing or eliminating the need for interior bearing walls, beams and columns.
- Structures are dried in more quickly, saving time and avoiding weather-related delays.
- Your imagination is the only limit when you design with trusses.



WHAT WE LEARNED ABOUT ROOF FRAMING

		STICK FRAME	COMPONENT	SAVINGS
<i>Second Floor</i>	MAN-HOURS TO FRAME	142½ HOURS	59½ HOURS	83 HOURS
	QUANTITY OF LUMBER	7,210 BD. FT.	4,875 BD. FT.	2,335 BD. FT.
<i>Great Room</i>	MAN-HOURS TO FRAME	104 HOURS	35½ HOURS	68½ HOURS
	QUANTITY OF LUMBER	3,641 BD. FT.	2,116 BD. FT.	1,525 BD. FT.
<i>Valley Framing</i>	MAN-HOURS TO FRAME	9½ HOURS	4½ HOURS	5 HOURS
	QUANTITY OF LUMBER	692 BD. FT.	362 BD. FT.	330 BD. FT.

WHAT WE LEARNED BY FRAMING THE AMERICAN DREAM®

	STICK	TRUSSES	SAVINGS
TOTAL JOBSITE MAN-HOURS TO ERECT	294	112	183
TOTAL JOBSITE MAN-HOUR COST @ \$20/HOUR FOR AVERAGE FRAMING CREW LABOR (COMPONENTS USED CRANE @ \$500)	\$5,880	\$2,730	\$3,150
TOTAL BD. FT. LUMBER (SHEATHING PANELS SAME FOR BOTH)	15,799	10,500	5,299
TOTAL COST OF LUMBER @ \$450/1,000 BD. FT. AND COMPONENTS @ TRUSS MANUFACTURER'S SELLING PRICE	\$7,110	\$7,496	(\$386)
TOTAL LUMBER AND PANEL SCRAP GENERATED	13 YARDS	3 YARDS	10 YARDS
TOTAL SCRAP COST @ \$15/YD. DUMPSTER COST AND MAN-HOUR COST TO PICK UP	\$329	\$77	\$252
TOTAL COST FOR THIS 2,600 SQ. FT. HOUSE	\$13,319	\$10,303	\$3,015

- Use of floor and roof trusses resulted in a 23 percent savings in total labor and material costs.
- Apply local lumber, labor and dumpster costs to make your area's cost comparisons.

FRAMING THE AMERICAN DREAM[®] PROVIDED THE FOLLOWING BENEFITS TO:

THE DESIGNER:

- Greater flexibility to use open spans.
- Consultation available in the planning and preliminary design stage to optimize design efficiency.
- Liability reduction, due to proper design and analysis of building structural components.
- Less problems routing ducts, plumbing and electrical systems.
- Design acceptance of code and building agencies.

THE BUILDER:

- Better plan flexibility and use of space.
- Fewer call backs due to structural problems.
- Less pilferage at the jobsite.
- Better framing crew and subcontractor utilization.
- Reduced waste and waste removal costs.
- 23 percent increase in total volume output.
- Less exposure to builders' risk, workers' compensation and liability insurance costs due to shorter framing time.
- More satisfied homeowner.

THE FRAMING CREW:

- One hundred eighty three (183) hours of crew work saved.
- Less insurance expense on individual job due to shorter framing time.
- Reduced chance of structural problems and thus fewer call backs and expensive repairs.
- Use of crane at jobsite for ease of installation as well as large labor and costs savings.
- Less clean-up and waste removal required.

THE HOMEOWNER:

- Engineered components are custom designed for your home.
- Reduced chance of future structural problems.
- Structural systems that are in code compliance whether your home is inspected or not.
- Greater flexibility in the design of open rooms to optimize space.
- Environmentally responsible—use of engineered components in a 2,600 square foot home resulted in a savings of 5,299 board feet of lumber or enough material for half of the roof and floor trusses in another home of the same square footage.

"You have to look at your bottom line, and the bottom line is that you save money with components. You pay more for a truss, but you can put it in so much faster.

"Time and man power are very difficult to come by. Using components, you can take the same man power and do so much more work."

—Roy Wilder, Wilder Construction, Middlesboro, KY



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