

## RESEARCH AND IDEAS

## With Quality Like This, No Advertising Is Needed

Long before it was fashionable for home builders to even talk about energy efficiency, Jim Smith was beefing up the insulation in his walls, investigating various air-sealing methods, and installing high-efficiency air conditioning. That was way back in 1978!

Today, his reputation as a quality, energy-efficient builder is so well established along the Gulf Coast of Mississippi that he has no need for advertising. Word of mouth does it for him. His latest project is a nifty 1,855-ft<sup>2</sup> (173-m<sup>2</sup>) home built in Diamondhead, Mississippi, which recently earned a five-star Energy Star rating (see Figure 3 and Spec Sheet).

"My greatest source of gratification is knowing that I do all I can to keep power bills low," says Smith, who builds 8-12 custom homes a year and also does some consulting work for other builders. He says that the all-electric house in Diamondhead will probably have a monthly power bill of about \$85. "We have about seven months of cooling here, three months of heating, and two months when we can get away with nothing," he explains.

*For the Love of Trees*

One of the hallmarks of Smith's work — dating back almost 30 years — is the effort he puts into saving trees on the site so that the homeowner can benefit from their passive cooling and beauty. "My philosophy is to position the house to save all the trees you can, especially deciduous trees," he says. "In fact, I think preserving the shade trees, to keep the sun off the roof and windows, is more important here on the Mississippi coast than the orientation of the house." Smith tells *EDU* that he seldom has to pay extra for site work and excavation to save trees, but that it frequently does cost him more for concrete and foundation work. "Having trees in close to the house sometimes means that the concrete truck can't get in close for the pour," he says. "When that happens, we have to hire a pump truck — at about \$1,000 extra."

A thousand dollars extra to save a few trees? What do his clients say about that? "I explain to them that those trees are going to be worth their weight in gold over the life of the house, in terms of cooling and beauty,"

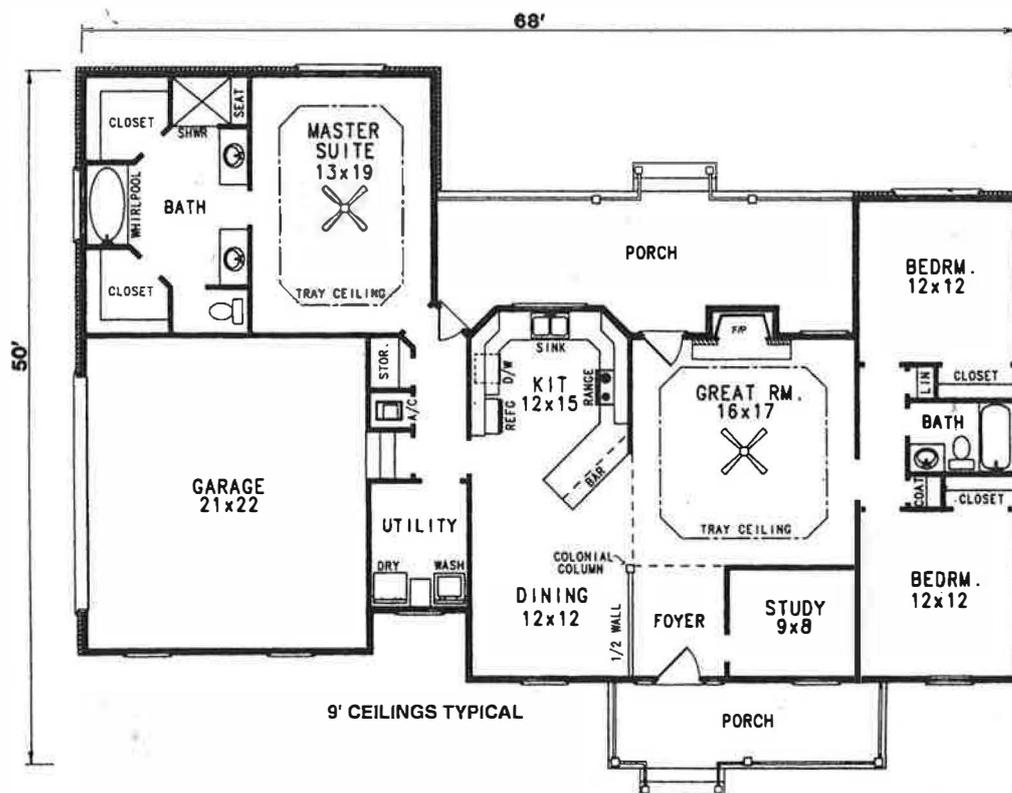


Figure 3 — Jim Smith's new three-bedroom home in Diamondhead, Mississippi, was carefully sited among the white oaks to benefit from their cooling and beauty. The house offers 1,855 ft<sup>2</sup> (173 m<sup>2</sup>) of conditioned space, a 120-ft<sup>2</sup> (11-m<sup>2</sup>) front porch, and a 280-ft<sup>2</sup> (26-m<sup>2</sup>) screened back porch. The house features ceiling fans in the great room, master bedroom, and screened porch.

## Spec Sheet: Jim Smith's Diamondhead, Mississippi, Home



### GENERAL

**Size:** 1855 ft<sup>2</sup> (173 m<sup>2</sup>)

**Garage:** 506 ft<sup>2</sup> (47 m<sup>2</sup>)

**Style:** Southern Living

**Location:** Diamondhead, Mississippi

**Lot size:** 110 x 125 ft

**Price:** \$166,900

### ENVELOPE

**Foundation:** Raised-chainwall slab

**Floor:** Concrete subfloor

**Walls:** 2x4 stud frame; fiberglass batt (R-15); ½-inch R-Board sheathing (R-3); housewrap; ¼-inch sheathing with foil one side (R-3)

**Attic:** Blown fiberglass (R-38)

**Roof:** 2x6 rafters with ½-inch OSB decking, roofing felt, and dimensional, 25-year fiberglass shingles

**Windows:** Kel-Star aluminum with insulated glass

**Siding:** Vinyl and brick

**Exterior doors:** Steel, insulated; side lites and transom on entry door are insulated glass

**Air sealing:** Dow Sill-Seal under sole plates; all wall penetrations sealed with expanding foam

**Interior partitions:** 2x4 with acoustic insulation used around bathrooms and laundry

### HVAC

**Heating and cooling:** Coleman Heat Pump (14 SEER) sized per Manual J; ceiling fans

**Ductwork:** Sized per Manual D, sealed with mastic

**Water heating:** Two high-efficiency Rheem electric water heaters (40 and 52 gallon)

**Ventilation:** Natural with bathroom exhaust

**Air filtration:** Minimum EPA Energy Star standard

### OTHER FEATURES

**Landscaping:** Deciduous trees left in close proximity to house to provide shade in summer and passive solar in winter

**Lighting:** Energy-efficient custom lighting fixtures

**Appliances:** All energy-efficient

**Attic vent:** Thermostatically controlled to come on when attic air temperature hits 105°F (41°C)

**Energy Star rating:** Five Star

Smith explains. "The owners generally agree, and often come around and thank me for them later."

On sloped lots, like the one in Diamondhead, Smith likes to use a raised-chainwall slab, because he can put it in within five feet of a full-grown tree. As shown in Figure 4, concrete blocks with special cutouts are used as the forms for a slab. As the concrete is poured, it flows into the cavities of the block wall with vertical reinforcement every 32 inches on center. "We may have to cut the roots back on one side of the tree to make room for the foundation," Smith notes, "but so long as you only do it on one side, the tree almost always survives in good shape."

### Improvements Ahead

As good as Smith's houses are, he's contemplating some interesting changes ahead. One would be to change the way that the attic space is cooled. Currently, he installs a thermostatically controlled exhaust fan that turns on whenever the attic temperature hits 105°F (41°C). The fan draws air in through the continuous soffit vents and exhausts hot attic air out through the roof. "On a future project, I may do without the fan but add a ridge vent and radiant barrier in the attic," he explains.

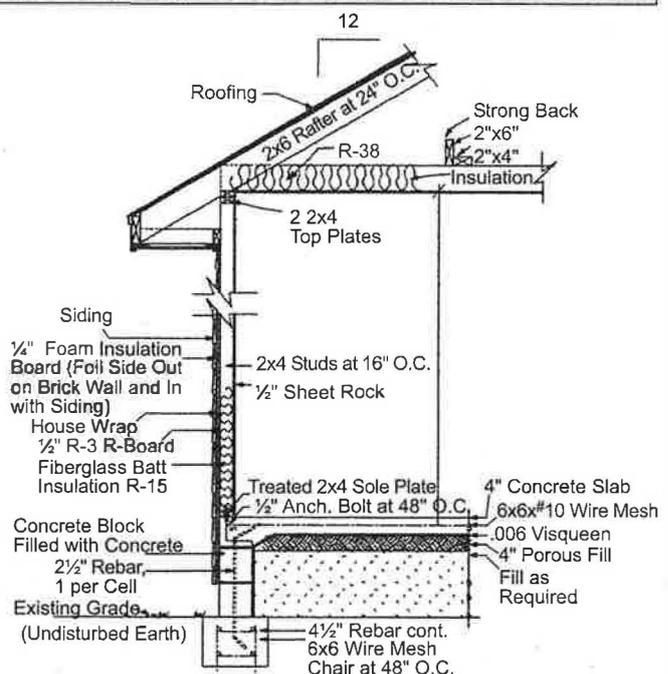


Figure 4 — Smith adds an extra layer of insulating sheathing to the exterior walls to create R-21, which is uncommonly high for homes along the Gulf Coast. Note the details on the raised-chainwall slab.

Another possibility for the future would be low-e glass. While many energy-efficient builders see low-e as a no-brainer, Smith has yet to be convinced that it would pay off in the houses he builds. "If you go out of your way to keep the trees so they shade the windows, you're not going to get a lot out of low-e glass," he maintains.

"Also, they're still charging quite a bit extra for low-e in this area. Even so, I'm willing to give it another look."

For more information, contact Jim Smith, Building Consultant, 102 Trautman Avenue, Long Beach, MS 39560. Tel and Fax: (800) 533-6490; E-mail: jimnay2@cs.com.

## NEW PRODUCTS

### Enerjee's New Radiant Floor Heating Control

Enerjee (Morrisville, Pennsylvania) has introduced a new electronic heating control system for radiant floor heating and new or retrofit radiator or fin-tube base-board applications. The AUTOMIX 20 has a built-in night setback function and is designed to actuate 3- or 4-way TERMOMIX valves.

Company President John Engelberger says that AUTOMIX 20 includes adjustments for minimum and maximum supply water temperatures and a freeze protection feature (see Table 3). All essential settings are adjustable.

**Table 3 — AUTOMIX 20 Specifications**

Type of control	PI microprocessor control
Voltage	110-VAC, 60-Hz adapter
Power consumption	3 VA
Min. supply water limiter	+41°F ... +86°F
Max. supply water limiter	+68°F ... +176°F
Room temperature setting	Stepless 41°F ... 79°F
Time setting for night setback	Zero, 7 or 9 hours
Night setback	2°F, 4°F, or 6°F
Freeze protection	Adjustable +41°F ... + 86°F
Torque	5 Nm
Manual operation	Yes, in case of power failure
Thermostat dimensions	1.18x2.75x2.75 inches
Weight	1.75 lb

As shown in Figure 5, the control is delivered factory-wired and ready for mounting to a TERMOMIX valve. Engelberger says the plug-in connections on the power supply and all sensors are easily integrated into existing heating systems so that contractors can reduce installation time. The compact control is adjusted in much the same way as conventional thermostats.

For additional information contact Enerjee, 24 South Lafayette Avenue, Morrisville, PA 19067. Tel: (215) 295-0557; Fax (215) 736-2328; E-mail: enerjee@enerjee.com.

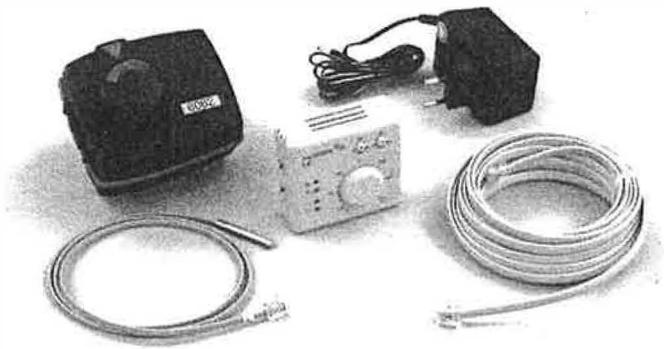


Figure 5 — The AUTOMIX 20 heating control system includes an AM-20 programmable thermostat, 24 VAC valve motor, supply water sensor with 3 feet of wire, 40 feet of main wire, and a 110 VAC adapter.

### A Fresh Angle on Clothes Dryer Vents

Recognizing that there can be serious efficiency and safety problems with conventional clothes dryer vents, Rick Harpenau, president of In-O-Vate Technologies (Tequesta, Florida), has brought a solution to market. Like most good ideas, the Dryerbox is admirably simple, consisting of an aluminized steel receptacle that installs between 2x6 studs (12 or 16 inches on center) directly behind the clothes dryer (see Figure 6). The installer can vent the dryer to a roof jack, sidewall, or down and out to a crawlspace or floor joist system. (Editor's note: We stress that the terminal exhaust point on clothes dryers should *always* be outdoors.)

"The recessed connection allows the clothes dryer to be installed right up against the wall, which makes

installation easier, saves a square foot of living area (5 x 28 inches), and makes the laundry room appear larger," Harpenau says. "But more importantly, it eliminates bends in the flex exhaust hose that accelerate lint accumulation and can really hurt the efficiency of the dryer and — worse yet — create a fire hazard."

Harpenau tells *EDU* that zigzags in the exhaust hose and the accompanying lint buildup can substantially increase dryer run time. "Our inhouse tests, comparing similar loads of clothes, which were weighed for moisture content after each test, showed that the drying time was 11% longer when the exhaust hose was bent and partially obstructed," he says. "We estimate that a typical household could save as much as \$60 a year in