

# **EarthCraft House™**

## **Incorporating HERS into a Green Renovation Program**

**Audience: HERS conference**  
**Short presentation: 75 minutes**  
**March 4, 2002**



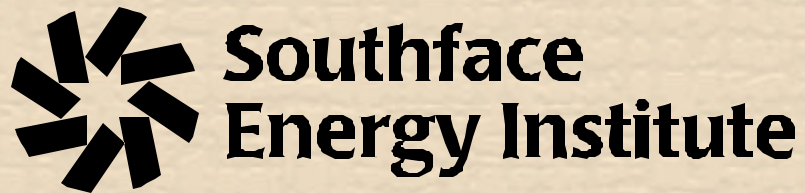
# **EarthCraft House<sup>TM</sup>**

## **Incorporating HERS into a Green Renovation Program**

Mark Newey     Mike Barcik  
Southface Energy Institute







- Non-profit organization founded in 1978
- HERS Training Provider
- EarthCraft House green builder program



*Promote sustainable homes, workplaces, and communities through education, research, and technical assistance*



# Southface Energy and Environmental Resource Center

- Reduces air and water pollution
- Conserves natural resources
- Provides a healthy indoor environment



An Energy Star building that uses 25% of the energy of a typical facility





# Sign of the Times

**Environmental**Design+Construction

[www.EDCmag.com](http://www.EDCmag.com)



## THE EARTHCRAFT HOUSE

A SPECIAL SECTION ON ATLANTA'S  
GREEN BUILDING PROGRAM





# Atlanta's Environmental Concerns

- Pollution of Chattahoochee
- Diminishing Water Supply
- Loss of Trees
- Heat Islands
- Urban Sprawl
- Ozone Days



# EarthCraft House™ Partnerships





# Industry & Government

Partners





# **True Cost of Homeownership**

**Affordability - Slight increase in first cost offset by lower utility bills and financing**

- **Mortgage payment and Insurance**
- **Operating Costs -water, energy, waste**
- **Maintenance -interior and exterior**
- **Repair and replacement**
- **Health related costs**





# Health

## Control of indoor moisture, mold, noise, dust, pollen



### GROUND BREAKERS



**"HOTLANTA" OPENING:** Sweltering fall weather didn't stop Jay Epstein (holding ribbon, right) from opening his Fairburn, Ga., subdivision of energy award-winning homes. From left, Dan Reicher, U.S. Department of Energy; Isaiah Tidwell, Wachovia Georgia Banking; Betsey Pettit, Building Science Consortium; Charlie James, Build America Consortium; Epstein; Zenda Bowie, American Lung Association of Georgia; and Archie Hill, Fannie Mae.

**BREATH EASIER:** The ad below is one of several that Jay Epstein and Martin Barnes, partners in Health-E-Community Enterprises, have run to advertise their energy-efficient, health-friendly homes. These homes use products with fewer emission gasses than traditional building products, helping to reduce asthma and allergy attacks.

**DOES CELLULOSE INSULATION REALLY MAKE A DIFFERENCE?**



### HEALTHY HOUSING

## Breathe Easy

*A Virginia builder won the Department of Energy's backing by building houses that use half the energy needed to heat and cool similarly sized homes.* **BY DANIEL WALKER GUIDO**

**J**AY EPSTEIN HAS ASTHMA. TWO OF his children have asthma. A builder by trade, he found that his work often made his condition flare up as he walked through new homes with a lot of off-gassing paint, carpets, and adhesives.

"It would get so bad I could barely breathe some days," says Epstein, president of Health-E-Community Enterprises, based in Newport News, Va. "I thought, 'Wouldn't it be nice to build a house that didn't make this condition worse?'"

But how could that possibly be accomplished without pricing first-time home buyers out of the market? The answer: by innovative use of products that have little or no effect on asthma sufferers.

### FEDERAL APPROVAL

Along the way, Epstein designed houses so energy efficient they won the U.S. Department of Energy (DOE) designation as the first affordable energy-efficient community

suburb of Atlanta, Epstein and his partner, Martin Barnes, are building 33 homes that will sell from \$117,000 to \$138,000. Fairburn Commons is southwest of Atlanta, near the airport. The two-story single-family

**Each home can be heated and cooled for less than 75 cents a day, an amazingly low figure that usually is achieved only in luxury housing.**

built in the metropolitan Atlanta area. Dan Reicher, assistant secretary for the DOE departments of Energy Efficiency and Renewable Energy, traveled to Atlanta this fall to proclaim Epstein's development part of the agency's Building America energy-efficient community program.

On a 10-acre plot in Fairburn, a close-in

homes feature fireplaces and garages, and many have vaulted or cathedral ceilings. All feature innovative touches that ensure proper air circulation, even if all the upstairs bedroom and bath doors are shut.

The kicker is that each home can be heated and cooled for less than 75 cents a day, an amazingly low figure (See page 78)



# "BECAUSE HE MATTERS MOST"



*I chose an EarthCraft home because indoor air quality is important to the health of my son, Drew. He has allergy related asthma and since we've lived in our new Hedgewood home, he's really improved. If I can buy a new home and get both great design and a healthier environment for my family, then it's the right choice for us.*

**Pam Carrington**  
Kingsboro Home Owner

It Has To Be  
**HEDGEWOOD**

**COMMITTED TO OUR BUYERS AND TO OUR ENVIRONMENT**  
*Our EarthCraft homes are healthier for your family, save energy, require less maintenance, AND are environmentally responsible.*





# History of the New Home Program

- Pilot Program launched Sept 1999
- First EarthCraft House constructed Nov 1999 (only home in 1999)
- Ten homes built in first five months of 2000
- 100 homes by end of 2000
- 500 homes by February 2001

*Growth attained at  
a manageable rate!*



This is a real estate advertisement for "Kingsboro" homes. At the top, it says "INTRODUCING The Smartest New Address In Town". Below this is a photograph of five different styles of houses. The word "KINGSBORO" is written in a large, elegant script font. To the right of the houses, there is a paragraph of text describing the homes as "Classic Southern architecture combined with innovative floorplans for today's families". Below this, there are several bullet points listing features like "Detailed trim, granite counter tops, custom built-ins, large master suite", "Convenient to Peachtree shopping, nightlife, MARTA and restaurants in walking distance", and "Prices from the \$700's". At the bottom, it says "Located one mile north of Lenox Mall at the corner of Kingsboro Road and Peachtree Road". On the right side, there is a section titled "FOR MORE INFORMATION CALL 404-459-8020" and "It Has To Be HEDGEWOOD" with the website "www.hedgewoodhomes.com". There are also small logos for "EARTH CRAFT HOUSE" and "HEDGEWOOD" in the bottom right corner.



# What's in it for the Builder? Builder Benefits

- Fewer callbacks and reduced liability
- Better subcontractor performance
- Increased revenues and profits
- Access to special mortgage programs
- Product differentiation
- Positive public image





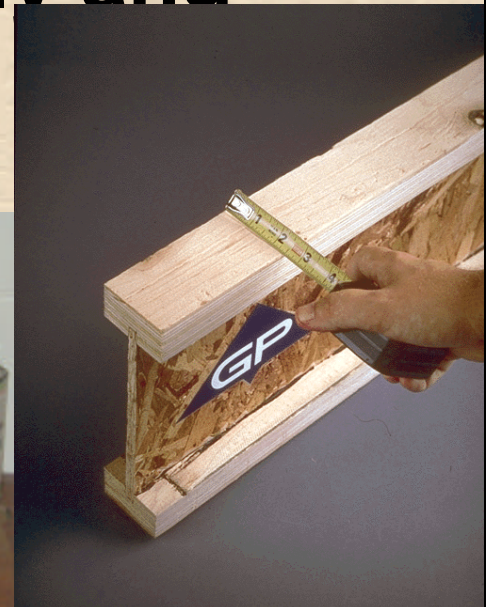
# How the New Home Program Works



**Minimum 150 points (at least 75 in energy)**

**Many standard building practices are environmental friendly and earn points**

**Builder flexibility**





# Environmental Categories

- Site Planning
- Indoor Air Quality
- Appliances/Lighting
- Waste Management
- Resource Efficient Design & Materials
- Building Envelope and Systems
- Water Conservation
- Homeowner Education
- Builder Operations
- B



# HERS and EarthCraft House

- Energy Star homes score 90 points in the energy category
- Maximum of 85 points for non-Energy Star homes
- Bonus points for exceeding Energy Star





# Keys to Success -Environmental Checklist-



## EarthCraft House<sup>SM</sup> Sensibly Built for the Environment

### FINAL WORKSHEET

Builder: must submit a Final Worksheet for each EarthCraft House<sup>SM</sup>. The Worksheet column provides a tracking area for targeting the points you want to score. The Final column represents the specific measures you pledge to include for this house. An EarthCraft House<sup>SM</sup> certification requires 150 points.

The EarthCraft House<sup>SM</sup> program is sponsored by the Greater Atlanta Home Builders Association in cooperation with private industry and government. Submit this form to: EarthCraft House, 241 Pine St., Atlanta, GA 30306, fax: 404/832-5009, email: earthcraft@earthcrafthouse.com. For information, contact EarthCraft House<sup>SM</sup> at 404/832-3549 ext. 116.

Builder: \_\_\_\_\_

Company: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

EarthCraft House<sup>SM</sup> address or lot number: \_\_\_\_\_

Builder: By accepting the EarthCraft House<sup>SM</sup> program, I pledge that this house will be constructed to the standards listed on the Final Worksheet. Home Owner: I have reviewed the EarthCraft House<sup>SM</sup> measures with the home builder representative.

Builder's signature \_\_\_\_\_ date \_\_\_\_\_ Home Owner's signature (required only for purchase) \_\_\_\_\_ date \_\_\_\_\_

EarthCraft House<sup>SM</sup> project ID: \_\_\_\_\_ address \_\_\_\_\_

Inspector's signature \_\_\_\_\_ date \_\_\_\_\_

	POINTS	WORKSPACE	FINAL
erosion control site plan	8		
workshop on erosion and sediment control	2		
topsoil preservation	5		
grind stumps and limbs to mulch	3		
mulch around logs	2		
<b>Building With Trees (NAHB program)</b>	<b>25</b>		
builder may choose to certify house meets Building With Trees program OR earn points for individual tree protection and planting measures			
<b>Tree Protection and Planting Measures</b>			
tree preservation plan	5		
no trenching through tree root zone (per tree)	1		
no soil compaction of tree root zone	2		
urds banded areas	1		
tree planting	4		
wildlife habitat	2		
<b>SITE PLANNING SUBTOTAL</b>			



# Recycle Construction Waste

- Posted waste management plan (min. 75% of 3 materials)

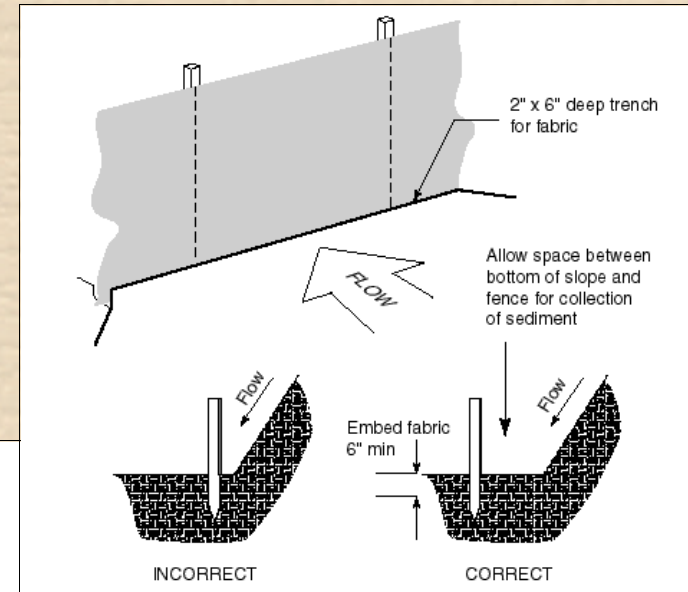
- wood
- metal
- plastics
- cardboard
- drywall
- shingles



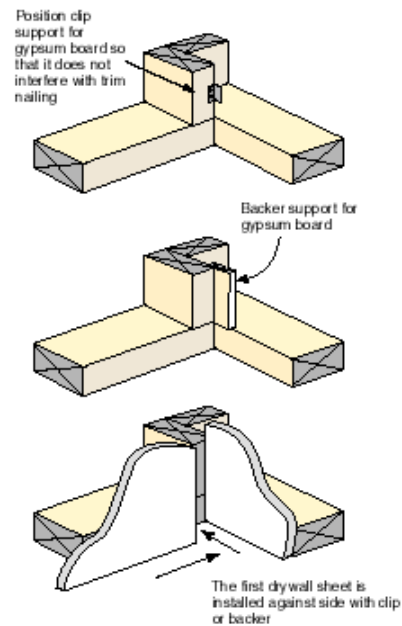


# -Technical Guidelines-

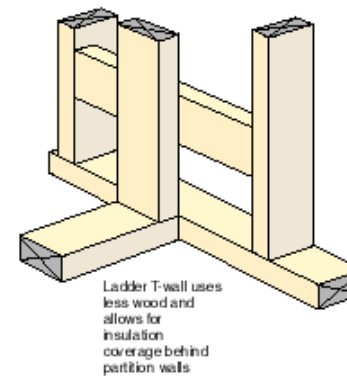
- Support Document for Checklist



### Two-stud corner



### Ladder "T"-wall





# Certifying an EarthCraft House™

A builder must:

- Join the Greater Atlanta HBA
- Join the EarthCraft House program
- Attend the builder training
- Schedule a design review
- Schedule a pre-drywall walkthrough
- Submit a Scoring Worksheet
- Schedule and pass a final inspection



Every home to be certified  
must be inspected by an  
EarthCraft House Inspector



# Lessons Learned

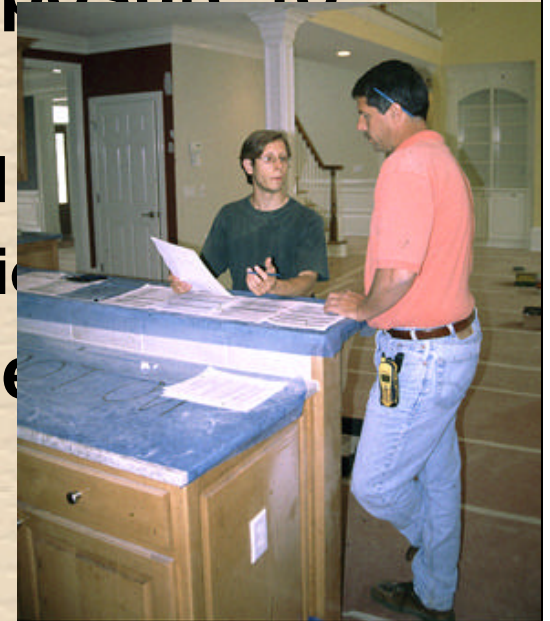
- Builders only take the program as seriously as we do - no sliding through, no compromises
  - Financial incentive to pass on first attempt
  - Inspection consistency = quality and respect
  - Solid builder / inspector relationship
- Clear wording of Checklist and Tech Guidelines
- Opportunity for builders to take course and then decide to join the program
- Design review and walkthrough





# Mandatory Design Review and Walkthrough

- **Personal attention for builders**
  - What products to use
  - Reinforce concepts e.g., “building envelope”
  - Establish Southface as a resource
- **Site supervisor’s first exposure to program**
  - learn concepts in the field
  - when to schedule inspection
- **Education for other parties**
  - subcontractors
  - architects / designers





# Inspector Classification

- **Class I**
  - Blower Door and Duct Blaster testing
- **Class II**
  - Class I abilities
  - Worksheet knowledge and ability to sign off
  - Completed HERS training
- **Class III**
  - Class I and II abilities
  - Design review and other technical capabilities (load calcs, etc.)
  - Apprentice Class I





# Future Goals and Considerations

- More redesign of plans / reengineering
- Additional inspection before drywall
- Tighten restrictions on combustion equipment and ventilation - raise the bar
- Specialized training
  - Architects / designers
  - HVAC and other subcontractors
- Process all paperwork electronically
  - Subdivision template email





# Development of the Renovation Program

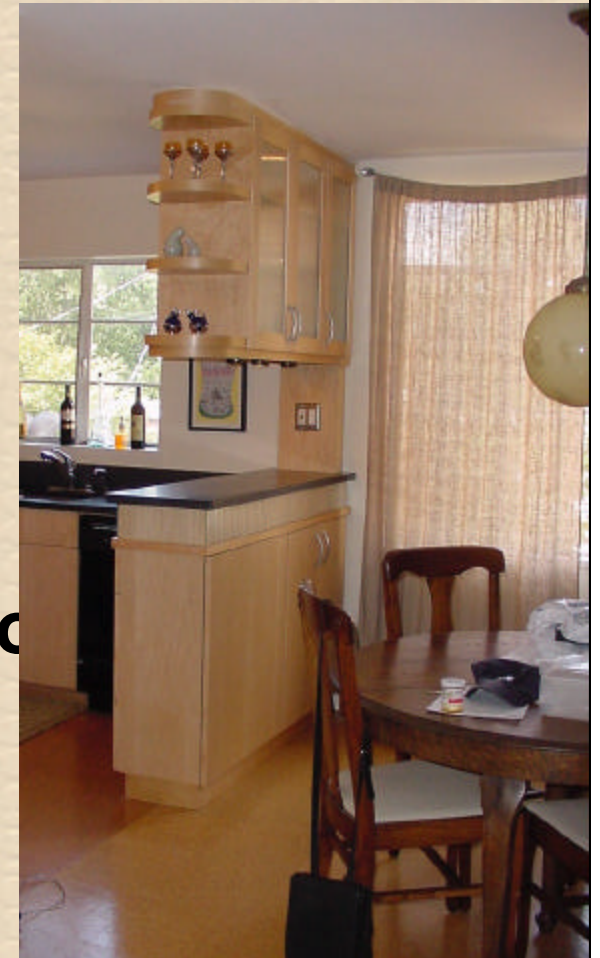
- Homeowners and renovators requested EarthCraft House for existing homes
- Committee of renovators, Southface technical staff, and others began development in mid-2001
- Different types of renovation identified
- EarthCraft House categories assessed for applicability





# Different Types of Renovations

- Gut rehab
- Finishing an attic or basement
- Building an addition
- Energy upgrade only
- New kitchen
- Redesign of existing space
- Use of existing foundation versus changing the home's footprint





# Scope of the Program

- Renovation must affect whole-house energy performance
- A degree of energy improvement is mandatory
- Credit for green practices and products
- Certain renovations would not apply (i.e., kitchen makeover, cosmetic improvements)





# The Breakthrough!

**Renovators agreed that every home must receive a Home Energy Rating and show improvement to qualify**

- **An initial HERS rating establishes energy baseline prior to renovation**
- **An improvement analysis is used to make recommendations that affect the renovator's work plan**
- **Follow-up rating is performed at conclusion of**





# Percentage-Based Scoring System

- Different categories apply to different renovations
- Homes must qualify for 80% of the points available in the relevant categories
- Bonus points are available for improving the existing structure





# EarthCraft House Renovation Categories

## Mandatory categories:

- Project planning
- Design
- Indoor Air Quality
- Waste Management



## Conditional categories:

### Site

- New slab foundation
- New vented crawl
- New sealed crawl
- New basement walls
- Attic - insulated roofline
- Attic - insulated ceiling
- New exterior walls

- Existing walls stripped to framing
- Exterior cladding
- Interior walls
- Walls between attic and conditioned space
- Heating & cooling systems
- Kitchen
- Bathroom
- Finishes & fixtures





# EarthCraft House™

## Sensibly Built for the Environment



*A new concept  
in home  
construction  
that's  
naturally better.*

