HABITAT FOR HUMANITY
SUSTAINABLE DESIGN HOME
AT ARTHURTOWN

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OUTLINE OF TALK

• OBJECTIVE
• HABITAT LOCAL CHAPTER
• SURVEY AND ANALYSIS
• LOCATION OF HOME
• NEW HOUSE DESIGN
• BUILDING MATERIALS
OUTLINE OF TALK (cont.)

• MORE DESIGN CHANGES
• BUILDING RECOMMENDATIONS
• COMMUNITY MODEL
• CONCLUSION
• ACKNOWLEDGEMENTS
OBJECTIVE

To enhance the sustainability of a Central SC Habitat for Humanity Home, balancing economical, environmental, and social factors
LOCAL CHAPTER

• J. Austin Watson, D. Min.  
  Executive Director

• J. Lyle Hutter  
  Operations Manager

• Roy Kramer  
  Construction Manager

• Stacey Lee Oehler  
  Family Relations Coordinator

• Cynthia Rahal  
  Volunteer Coordinator
• Central SC Habitat for Humanity
  – Since 1985, have helped over 81 families become homeowners in Columbia
  – Houses available with 20-year mortgages, on a no-profit, no-interest basis
  – On-going project is Habitat Community being built at Arthurtown
• Electric bills
• Water usage
• Social dynamics
• Time spent outside
• Interest in Sustainability
SUMMARY OF SURVEY

• Avg. Electric Bill = $89
• Avg. Water Bill = $28
• Households visit with neighbors = 20
• Households spend time outside = 29
• Interest in Sustainability = 24

• # of Surveys Returned = 33/64
NEW HOUSE DESIGN

• Sustainable
• Energy-Efficient
• Cost-Comparable
• Life-Cycle Payback
• Environmentally-Friendly
• Promote Social Development
LOCATION OF HOME

• Factors Included:
  – Sun’s position in the sky
  – View of the park & neighborhood
  – Utilization of the existing landscaping
  – Space for neighborhood garden
LANDSCAPING

- Xeriscape
- Low maintenance
- Native, drought-resistant trees and plants
- Attracts local wildlife
- Community garden area
BUILDING MATERIALS
POLYSTEEL FORMS

• Cost-effective
• No energy losses
• Lightweight
• Fire retardant
• Moisture resistant
• Bullet resistant
• No future maintenance costs
• Durable
Framing

Steel Construction

- Recyclable material
- Weather-resistant & long-lasting
- Cost-effective
- No future Maintenance Cost
- Energy-efficient
- Easy installation
ROOFING
STEEL ROOFING

• Recyclable material
• Weather resistant
• Fire retardant
• Maintenance free
• Superior insulation
• Long-lasting
• Looks great
PATIO DECKING
RECYCLED PLASTIC

- Made from recycled plastic
- No future maintenance costs
- Weather resistant
- Variety of colors and sizes
- Recyclable material
- Impervious to disease and insect infestations
EXTERIOR SIDING
VINYL SIDING

• Long-lasting
• No harmful emissions
• Easy installation
• No future maintenance costs
• Cost-effective
DOORS

VINYL & WOOD

• Maintenance free
• No/Low energy Losses.
• Recyclable material
• Reinforced for added protection
• Sliding back door uses reinforced fiberglass for added safety and low energy losses
CARPETING

RECYCLED PLASTIC

• Wear and stain resistant
• Static resistant
• Made from recycled plastic
• Cost effective
• Long-lasting
• Production displaces the consumption of crude oil
PAINT

GLIDDEN LIFEMASTER

- No VOC’s
- Washable/Scrubable
- Quick drying
- Superior hiding power
- Stain resistant
- Easy application
- Low odor
TILE FLOORING

SUMMITVILLE

- Long-lasting
- Made from industrial waste product which reduces landfill loads
- Attractive/functional
- Cost effective
- Energy efficient
- Wide variety
• Uses 40% less water than conventional washers
• Tumbles continuously to remove tough stains
• Electronic dry system
• Includes end-of-cycle signal with on/off control
• Larger load capacity
APPLIANCES

REFRIGERATOR

• Energy-efficient
• “Spillsaver” shelves
• Humidity controlled crisper
• Deep-storage door shelves
• Long-run money savings
LIGHTING

COMPACT FLUORESCENT

• Uses 1/4 the energy of standard bulbs
• Lasts 10-13 times longer
• Reduces lighting costs by 75%
• Reduces air pollution (by decreasing energy production needs)
LIGHTING
SOLATUBE

- Lights more than 150 square feet of living space with natural light
- Airtight = No energy losses
- Maintenance Free
- Weather resistance
- Burglar proof
MANSFIELD WATERSAVER

- 1.6 gallons/flush
- Metering bucket to ensure water savings and flushing efficiency
- Large water spot to promote cleaner and better performance
- Solid construction
WATER HEATER

ENVIRO-TEMP

- 40 gallon tank
- Energy Factor (EF) = 0.93
- Insulated Tank
- Recyclable Material
SOLAR WATER HEATER

PROGRESSIVTUBE

- Preheats water entering water heater using solar energy
- Self-contained solar collector and storage tank
- Closed cell foam insulation
- Double glazing for increased heat retention
- Copper tubing flow pattern
COTTON INSULATION

• Made from recycled textile fibers
• Completely biodegradable
• Good thermal resistance
• Good acoustical properties
• Reduces landfill space
• Doesn’t irritate your skin
• Easy installation
• Double-hung with screen
• Double-pane (7/8”) with argon gas filler
• Low-e coating
• Urethane foam insulation
• Vinyl clad frame construction
• Easy cleaning
• Lifetime warranty
WINDOWS

BETTER-BILT

- Allows light, air and sunlight into the room
- Glazed with 1/2” insulated glass
- Recyclable Aluminum framing
- Houses plants which improve the air quality
- Top venting
- Maintenance free
HVAC

TEMPSTAR

• 1.5 Ton split system high efficiency Heat Pump

• Cooling
  – SEER = 12.0

• Heating
  – HSPF = 7.60
  – COP = 3.24
MORE DESIGN CHANGES

• Ceiling Fans
  – Bedrooms and Living Room Area

• Attic Fan

• Increase roof overhang from 1’ to 2’

• Gravel Driveway

• Walkway made from existing used bricks
MORE DESIGN CHANGES

• Increased Ventilation of Attic
• Cathedral Ceiling
• Increased Porch Sizes
• Removal of partition wall between Kitchen and Dining Room
• Caulking
  – Between flooring and wall frames
  – Between window frames and wall frames

• Weatherstripping
  – Around all window and door frames

• Collect and re-use all scrap material at the job-site each day
• **Densify and Diversify**
  
  – homes closer together, facing inward toward central green space (like a community park)

  – alter zoning restrictions to include small, locally owned shops and restaurants within walking distance (cutting down on car trips)
COMMUNITY MODEL

• Connect
  – Link neighborhood with a network of walk/bike ways all flowing into a central community park area
  – Community area should be visible from each house and easily accessible for everyone, especially children
  – Slow incoming traffic with narrower, more winding streets (unpaved roads also help)
COMMUNITY MODEL

• Keep it Green
  – Maintain and restore native vegetation in each yard and throughout the community
  – Community park should be well shaded and attractively landscaped including playground area, picnic tables, and benches
  – Having more people outside, interacting with their neighbors increases Sense-of-Place; decreases likelihood of crime
CONCLUSION

• Survey and Analysis
• Researched and Selected Sustainable Building Materials
• Additional Design Changes
• Building Recommendations
• Community Model Design
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ONE EARTH

RESPECT IT!