Building America
Technical Assistance to Habitat for Humanity
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BAIHP Technical Assistance to Affiliates

BAIHP Site Builder Partners

Climate Zones
- Hot-Humid
- Mixed-Humid
- Hot-Dry
- Mixed-Dry
- Cold
- Very Cold
- Marine

- Habitat Affiliates
- Site Builders
- Community Scale Site Builders
- Other Affordable Housing Site Builders
DOE Building America and Habitat for Humanity Shared Goals

• Affordability
  – Affordable to Build.
  – Affordable to Buy.
  – Affordable to Live In.

• Decent Homes
  – Safe and Healthy

• Overcome Poverty
  – Durable Houses That Last For Generations

• All Embodied in the new HFHI Construction Standards
  – 2006 – Gulf Coast (Hot-Humid zone)
  – Coming to your climate zone in 2007
BA Recommendations to HFH Affiliates

Franklin, West Virginia

- Health/Safety (combustion)
- IAQ
- Durability
- Energy efficiency
- Comfort

- All works together
- Improves Quality
- Extends Life of House
Franklin, West Virginia
Keep our NEW houses habitable for longer

• Poverty Level Housing
  – Decay/rot
  – Poor IAQ
    • Combustion byproducts
    • High infiltration
    • Poor pest control
      (allergen/asthma triggers)
  – Energy intense
    • Expensive
    • Uncomfortable

Franklin, West Virginia
Affordable, Healthy, Durable, and Comfortable Homes
Energy, IAQ, Durability, Comfort

See anything related to Energy, IAQ, Durability, or Comfort?

See anything related to Controlling Water, Air, and Heat?
Movement of Water, Air, and Heat

Building Enclosure & Mechanical Systems Control… Movement of Water, Air, and Heat
Controlling Water, Air, and Heat

Building Enclosure

Boundary between INDOOR Climate and the OUTDOOR Climate
Controlling Water, Air, and Heat

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Allows for INDOOR Climate
Controlling Water, Air, and Heat

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Allows for INDOOR Climate
Movement of Water, Air, and Heat

**Water:**
- Dry Materials
- Continuous Drainage Plane
- Flashing
- Assemblies that Dry
- Exhaust wet air

**Air:**
- Continuous Air Barrier &
- Sealed Duct System

**Heat:**
- As Continuous As Possible
- Layer of Insulation
Controlling **Water, Air, and Heat**

Siding and Shingles are the primary drainage plane – it is wise to include a secondary

- Tar Paper (Felt)
- House Wrap
- Rigid Insulation
All these materials are drainage planes. Which are also air barriers?

Tar Paper (Felt)  House Wrap  Rigid Insulation

Is NOT an Air Barrier  IS an Air Barrier  IS an Air Barrier
Controlling Water, Air, and Heat

Air Barrier:
- Continuous Air Barrier around the conditioned space and air distribution system (sealed duct system)

- Interior or Exterior or both as long as one is permeable (drywall, tar paper, house wrap)
Controlling Water, Air, and Heat

Water:
• Dry Materials
• Continuous Drainage Plane
• Flashing
• Assemblies that Dry (vapor permeable on one side)

Air:
• Continuous Air Barrier (OK to have double) &
• Sealed Duct System

Heat:
• As Continuous As Possible Layer of Insulation
Energy, IAQ, Durability, Comfort

See anything related to Energy, IAQ, Durability, or Comfort?

See anything related to Controlling Water, Air, and Heat?
Photo: Gregg Pachkowski
BAIHP Habitat Partner

- Lakeland (FL) Habitat
- 30% BA Benchmark savings
- Outside Air Ventilation
- Mastic Sealed and Tested *Interior* Ducts
- High efficiency AC
- Energy Star Windows
- Homeowner reports 75% utility savings over *previous* home
- 7-10 homes/year
BAIHP Habitat Partner

• Houston (TX) Habitat
• 10% over Energy Star
• Outside Air Ventilation
• High Efficiency H/AC
• Energy Star Windows
• Multiple building systems
• Energy Star Builder and FSEC Partner since ’96
• 20-30 homes/year
BAIHP Habitat Partner

• Broward County (FL)
• All Energy Star homes
• High Efficiency H/AC
• Low-E Windows
• Sealed and tested *interior* duct system
• ~$500 utility rebate on each home
• 20-30 homes/year