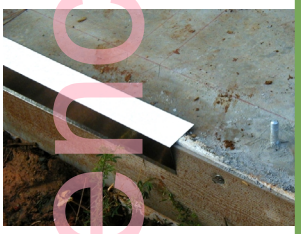
Fairburn – the first energy-efficient, healthy, affordable, community in metro Atlanta. All of the adjectives in this description are important to builder Jay Epstein of Health-E Enterprises. "I used to use these three terms to make up a triangle representing the way I build," says Epstein. "Working with Building America has changed my image to a diamond with the fourth critical element being systems engineering and design."

Epstein describes himself as a long-time "student of the power companies," using their programs for education and marketing energy efficiency. "What a relief to find the Building America program," says Epstein. "Building Science Corporation let me ask 'what about solar hot water?' or 'what about 12 instead of 10 SEER?', They were always right there with the analysis; and always came back with guidance, not mandates." BSC worked with Health-E Enterprises to reengineer their HVAC system (see Key Features) to develop the innovative termite-resistant perimeter slab insulation utilizing borate-treated expanded polystyrene (EPS) (see Houses that Work – Mixed Humid Climate for detail).



Epstein also swears by the Builder's Guide – Mixed Humid Climates. He uses it with his site super, subs, and all the builders that come knocking to see what Fairburn is all about. "It's also a great resource for overcoming language barriers on the job site—all those detailed drawings!" Epstein says with his trademark chuckle.

Epstein is always on the lookout for projects that need the "diamond" approach. He learned about the need for and challenges posed by Fairburn at the Greenprints conference in Atlanta a couple of years ago. There were lots of air-sealing details to be worked out (particularly given the garage-under design of the homes), as well as the details of moving ducts into conditioned space and incorporating mechanical ventilation and dehumidification. The results are impressive—a finely tuned home that heats and cools for about 75 cents a day, at about a break even total cost for the Building America changes.

But how do you market the pretty technical aspects of the Building America features? Epstein does not even hesitate: "You show them the energy guarantee, you have them listen for the jets overhead that they no longer hear inside their tight new home, and have the model home set up with plexiglass cutouts so that they can see what is normally hidden. The first time home buyer is open to and reassured by this attention to detail, this demystification of how their home should work." All Fairburn homes are performance tested, come with an energy guarantee, and are being supported by innovative forgivable soft-second mortgages and reduced up front mortgage costs.

Health-E Enterprises continues to learn as well—they have a new spray urethane foam detail to deal with the knotty issues of air sealing at the rim joist with open web floor trusses. And on a project in Virginia, Epstein is exploring the value engineering of structural panels. See the Fairburn Energy Analysis for more information about energy savings.

U.S. Department of Energy
Building America
Program Partner

Fairburn Atlanta, Georgia

Health-E Enterprises

1,400 - 2,100 sq. ft., 3 bedroom, 2 bath
$117,000 - 145,000 (including land)

Key Features

- Innovative termite-protected slab perimeter insulation
- Advanced framing
- Low-e spectrally selective windows
- Cellulose cavity insulation
- Carbon monoxide detectors
- Fully engineered HVAC system including all ducts sealed with mastic and in the conditioned space, correctly sized equipment, a simplified duct layout, transfer grilles for pressure relief, controlled mechanical ventilation and dehumidifier

Cost Summary for Building America Metrics

• Advanced framing	+ $ 250
• Insulating sheathing	+ $ 400
• Eliminate housewrap	- $ 400
• Controlled ventilation system	+ $ 150
• Downsize air conditioner, simple duct layout	- $ 750
• High performance windows	+ $ 250
• Dehumidifier	+ $ 175
• Slab edge insulation	+ $ 200
TOTAL PREMIUM	**- $ 25**

Key Partners/Products

- Perform Guard (www.branchrivier.com/perform.html)
- Huber (www.huberwood.com)
- Shaw Industries (www.shawinc.com/Welcome/products.htm)
- Sherwin Williams (www.sherwin-williams.com)
- Advanced Tech
- NCFI (www.ncfi.org)

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Builder Health – E Community Enterprises

Development Fairburn Commons (Fairburn, GA)

House Plan Names Anne, Clarke, Davis, Jordan, and Saville

Fairburn Commons Plans:

Five models were evaluated using the characteristics in the chart on the last page; the Anne, Clarke, Davis, Jordan, and Saville. If there were multiple plans of a model, the larger energy consumer was selected for evaluation.

Energy Comparison:

Energy Costs & Ratings

Comparison

Health - E Community Enterprises

	Yearly Total	Monthly Total	HERS Score
Anne, Standard Construction	$1,024	$85	78.5
Anne, Building America	$621	$52	87.9
Savings	**$403**	**$34**	
Clarke I, Standard Construction	$1,075	$90	77.5
Clarke I, Building America	$608	$51	87.9
Savings	**$467**	**$39**	
Davis, Standard Construction	$974	$81	80.7
Davis, Building America	$575	$48	89.0
Savings	**$399**	**$33**	
Jordan II, Standard Construction	$963	$80	78.5
Jordan II, Building America	$563	$47	88.1
Savings	**$400**	**$33**	
Saville II, Standard Construction	$1,154	$96	78.9
Saville II, Building America	$668	$56	88.4
Savings	**$486**	**$41**	

Standard Construction Energy Performance:

Energy Loads & Costs

Health - E Community Enterprises

Standard Construction

Anne, Standard Construction

[Mbtu=1,000,000 Btu] **HERS / Energy Star Score: 78.5**

Space Heating	22.8 Mbtu	$455
Space Cooling	9.6 Mbtu	$215
Domestic Hot water	16.9 Mbtu	$354

Design loads:	Heating	38.3	$1,024	Annual heating, cooling, and DHW cost
(kBtu/hr)	Cooling	28.7	**$85**	**Monthly heating, cooling, and DHW cost**

Clarke I, Standard Construction

[Mbtu=1,000,000 Btu] **HERS / Energy Star Score: 77.5**

Space Heating	26.6 Mbtu	$530
Space Cooling	10.7 Mbtu	$239
Domestic Hot water	14.7 MBtu	$306

Design loads:	Heating	42.9	$1,075	Annual heating, cooling, and DHW cost
(kBtu/hr)	Cooling	32.2	**$90**	**Monthly heating, cooling, and DHW cost**

Davis, Standard Construction

[Mbtu=1,000,000 Btu] **HERS / Energy Star Score: 80.7**

Space Heating	24.7 Mbtu	$493
Space Cooling	8.1 Mbtu	$177
Domestic Hot water	14.7 MBtu	$304

Design loads:	Heating	38.8	$974	Annual heating, cooling, and DHW cost
(kBtu/hr)	Cooling	26.2	**$81**	**Monthly heating, cooling, and DHW cost**

Jordan II, Standard Construction

[Mbtu=1,000,000 Btu] **HERS / Energy Star Score: 78.5**

Space Heating	23.2 Mbtu	$463
Space Cooling	8.8 Mbtu	$195
Domestic Hot water	14.7 MBtu	$305

Design loads:	Heating	38.0	$963	Annual heating, cooling, and DHW cost
(kBtu/hr)	Cooling	26.5	**$80**	**Monthly heating, cooling, and DHW cost**

Saville II, Standard Construction

[Mbtu=1,000,000 Btu] **HERS / Energy Star Score: 78.9**

Space Heating	28.2 Mbtu	$564
Space Cooling	10.5 Mbtu	$236
Domestic Hot water	16.9 MBtu	$354

Design loads:	Heating	45.2	$1,154	Annual heating, cooling, and DHW cost
(kBtu/hr)	Cooling	32.2	**$96**	**Monthly heating, cooling, and DHW cost**

Building America Energy Performance:

Energy Loads & Costs

Health - E Community Enterprises

Anne, Building America

	[Mbtu=1,000,000 Btu]		**HERS / Energy Star Score: 87.9**
Space Heating	6.7 Mbtu	$134	
Space Cooling	6.5 Mbtu	$143	
Domestic Hot water	16.5 Mbtu	$344	

Design loads: Heating	15.1	$621	Annual heating, cooling, and DHW cost
(kBtu/hr) Cooling	16.3	**$52**	**Monthly heating, cooling, and DHW cost**

Reduced carbon emissions by 7565 pounds per year

Clarke I, Building America

	[Mbtu=1,000,000 Btu]		**HERS / Energy Star Score: 87.9**
Space Heating	7.9 Mbtu	$158	
Space Cooling	7.0 Mbtu	$154	
Domestic Hot water	14.3 Mbtu	$296	

Design loads: Heating	16.4	$608	Annual heating, cooling, and DHW cost
(kBtu/hr) Cooling	17.3	**$51**	**Monthly heating, cooling, and DHW cost**

Reduced carbon emissions by 7949 pounds per year

Davis, Building America

	[Mbtu=1,000,000 Btu]		**HERS / Energy Star Score: 89**
Space Heating	7.7 Mbtu	$153	
Space Cooling	5.8 Mbtu	$127	
Domestic Hot water	14.3 Mbtu	$295	

Design loads: Heating	15.3	$575	Annual heating, cooling, and DHW cost
(kBtu/hr) Cooling	15.0	**$48**	**Monthly heating, cooling, and DHW cost**

Reduced carbon emissions by 9297 pounds per year

Jordan II, Building America

	[Mbtu=1,000,000 Btu]		**HERS / Energy Star Score: 88.1**
Space Heating	7.0 Mbtu	$140	
Space Cooling	5.9 Mbtu	$128	
Domestic Hot water	14.3 Mbtu	$295	

Design loads: Heating	14.8	$563	Annual heating, cooling, and DHW cost
(kBtu/hr) Cooling	14.4	**$47**	**Monthly heating, cooling, and DHW cost**

Reduced carbon emissions by 7365 pounds per year

Saville II, Building America

	[Mbtu=1,000,000 Btu]		**HERS / Energy Star Score: 88.4**
Space Heating	8.6 Mbtu	$171	
Space Cooling	6.9 Mbtu	$153	
Domestic Hot water	16.5 Mbtu	$344	

Design loads: Heating	17.7	$668	Annual heating, cooling, and DHW cost
(kBtu/hr) Cooling	17.7	**$56**	**Monthly heating, cooling, and DHW cost**

Reduced carbon emissions by 9195 pounds per year

Building Characteristics:

	Building America	Standard Construction
Building envelope		
Ceiling	R-38 cellulose flat attic vented	R-30 flat attic vented
Walls	R-19 24" o.c. w. R-4 Dow XPS 3/4"	R-11 2x4 16" o.c.
Slab	R-4 Perimeter Insulation	Uninsulated slab
Frame floors	R-28 cellulose + R-4 XPS joist bay insulation	R-15 joist bay insulation
Windows	Vinyl frame double glazed low-E argon filled U=0.33, SHGC=0.45	Metal Frame single glazed U=1.31, SHGC=0.80
Infiltration	2.5 sq in leakage area per 100 sf envelope	12 ACH 50
Mechanical systems		
Heat	Air source heat pump 7 HSPF in cond. Spc.	Air source heat pump 7 HSPF in attic
Cooling	Air source heat pump 10 SEER	Air source heat pump 10 SEER
DHW	Marathon Electric 0.93 EF, 0.98 RE	Electric tank 0.91 EF
Ducts	R-5 flex duct in conditioned space	R-5 flex duct; half in attic, half in cond. spc.
Leakage	none (to outside)	20% of high speed flow
Ventilation	40-50 CFM continuous (133 W) Fresh air supply system with AirCycler™	none

Utility Rates

Electricity	City of Fairburn	Monthly fee: $8.75/month 0 – 750 kWh: $0.06812 / kWh 750 + kWh Oct – May: $0.06812 / kWh 750 + kWh Jun – Sep: $0.0879 / kWh

Monthly base charges are not included in the costs below.