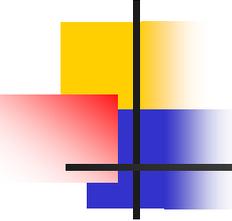


# Bob Ward Companies

- Energy Star Builder since 1997
- 2249 homes certified as Energy Star
- Numerous awards of Excellence
- 2007 Builder Partner of the year





# Why Energy Star

---

Set ourselves apart from the competition

Brand recognition

Marketing

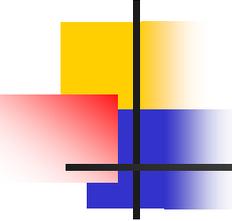
    this year 15 visitors to our web site  
    from Energy Star

Affordable housing is being regulated out of  
existence – we try to provide affordable  
living.

Third Party verification

# Bob Ward Companies

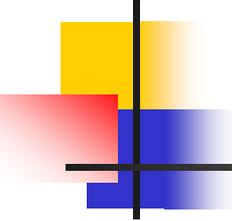




# Transition to Energy Star V3

---

- Cost will be dependent on the starting point
- Training is key
  - Supervisors
  - Sub Contractors
  - Sales team



Where did we start  
from??????

---

- Standard construction details

# Standard framing

- SIS + Sheathing
  - Provides continuous R-3 insulation on the outside of the wall
  - Meets structural requirements
  - Meets WRB requirements

Properly flashed  
windows and doors



# Not a Standard Detail

- House wrap or not



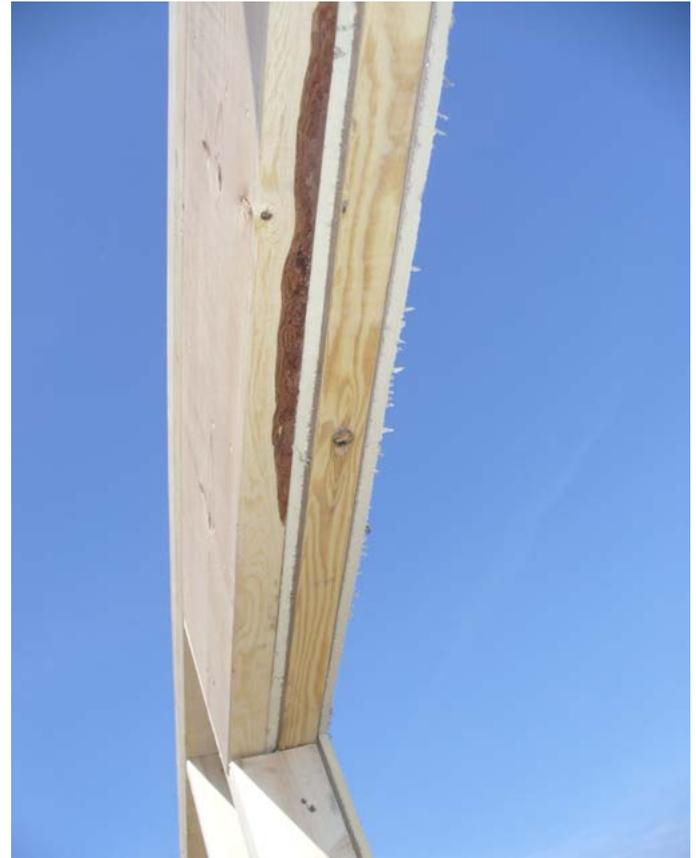
# Standard framing

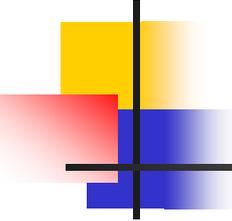
- Insulated Corners
- Ladder backers at intersecting walls



# Standard Framing

- Insulated Headers





# Standard Framing

---

- Raised heel roof trusses
- R-38 attic insulation

# Standard Details



- Air Barriers

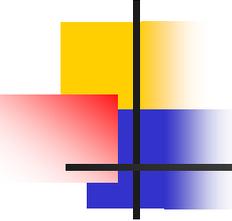


- Air sealing

# Right sized HVAC equipment

- (We hoped)





# Standard Details

---

- Sealed Ductwork
  - Joints taped
  - Low E windows

# V 3 Additional

---

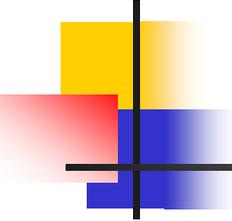
- Transfer Grilles above bedroom doors for more balanced air flow and reduced streaks in carpeting under the doors



# V3 Additional

- Broan Smart Sense bath fans for ventilation
- Fresh air intake with Cape Damper

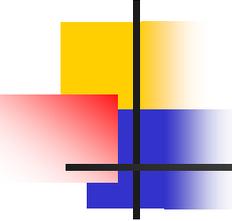




# V3 Additional

---

- Programmable Thermostat
- Energy Star light fixtures or CFL bulbs
- Recessed lights in the second floor ceiling are minimized.



## V3 Additional

---

- Gas filled Low E windows
- We went from a U value of .34 to .30
- More in keeping with an Energy Star rated window

# Checklists insure performance and quality of construction



## ENERGY STAR Qualified Homes, Version 3 (Rev. 01) Inspection Checklists

5. Whole-Building Delivered Ventilation			
5.1 Measured ventilation rate is within 100-120% of HVAC contractor design values <sup>8</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 In Warm-Humid climates, measured net exhaust flow < 7.5 CFM per 100 sq. ft. <sup>8, 9, 10</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3 In very cold climates (i.e., CZ 7-8), measured net supply flow < 7.5 CFM per 100 sq. ft. <sup>8, 10</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Controls			
6.1 Air flow is produced when central HVAC fan is energized (set thermostat to "fan")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2 Cool air flow is produced when the cooling cycle is energized (set thermostat to "cool")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3 Heated air flow is produced when the heating cycle is energized (set thermostat to "heat")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.4 Continuously-operating vent. & exhaust fans include readily accessible override controls.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.5 Ventilation controls labeled, unless function is obvious (e.g., bathroom exhaust fan).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Air Inlets & Ventilation Sources			
7.1 Air inlets located ≥ 10 ft. from contamination sources such as stack, vent, exhaust hood, or locations where vehicle exhaust may be present and ≥ 3 ft. from dryer exhausts and contamination sources exiting through the roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.2 Air inlets ≥ 2 ft. above grade or roof deck in Climate Zones 1-3 or ≥ 4 ft. above grade or roof deck in Climate Zones 4-8 and not obstructed by snow, plantings, or other material at time of inspection.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.3 Air inlets provided with mesh rodent / insect screen with mesh < 0.5 in.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7.4 Ventilation air comes directly from outdoors and not from adjacent dwelling units, garages, unconditioned crawlspaces, or attics.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Local Mechanical Exhaust			
In each kitchen and bathroom, system installed that exhausts directly to the outdoors and meets one of the following measured airflow standards: <sup>8, 11, 12</sup>			
Location	Continuous Rate	Intermittent Rate <sup>13</sup>	
8.1 Kitchen	> 5 ACH, based on kitchen volume	> 100 CFM <sup>14</sup>	<input type="checkbox"/>
8.2 Bathroom	> 20 CFM	> 50 CFM	<input type="checkbox"/>
8.3 If fans share common exhaust duct, back-draft dampers installed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.4 Common exhaust duct not shared by fans in separate dwellings. <sup>15</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.5 Clothes dryers vented directly to outdoors, except for ventless dryers equipped with a condensate drain.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Ventilation & Exhaust Fan Ratings (Exemptions for HVAC and Remote Mounted Fans)			
9.1 Intermittent supply & exhaust fans rated at ≤ 3 sones by mfr., unless rated flow > 400 CFM	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.2 Continuous supply & exhaust fans rated at ≤ 1 sone by manufacturer.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9.3 Bathroom fans used as part of a whole-house mechanical ventilation system shall be ENERGY STAR qualified, unless rated flow rate > 500 CFM.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Combustion Appliances			
10.1 Furnaces, boilers, and water heaters located within the home's pressure boundary are mechanically drafted or direct-vented to outdoors. As an exception, atmospherically vented equipment is allowed in Climate Zone 1-3. For atmospherically vented furnaces, boilers, and water heaters, the Rater has conducted BPI's combustion safety test procedure and determined that the CO test results are less than 25 ppm and the combustion appliance zone depressurization limit is not exceeded. <sup>17, 18, 19</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10.2 If atmospherically vented fireplaces are located inside the home's pressure boundary, total net rated exhaust flow of the two largest exhaust fans (excluding summer cooling fans) is < 15 CFM per 100 sq. ft. of occupiable space when at full capacity. <sup>10, 18, 20</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Filtration			
11.1 MERV 6 or better filter installed in ducted mechanical systems. <sup>21</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.2 All return air and mechanically supplied outdoor air pass through filter prior to conditioning.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.3 Filter located and installed so as to facilitate access and regular service by the owner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11.4 Filter access panel includes gasket or comparable sealing mechanism and fits snugly against the exposed edge of filter when closed to prevent bypass.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rater Name: _____ Date Checklist Inspected: _____			
Rater Signature: _____ Rater Company Name: _____			

Version 3 (Rev. 01) - Effective 1/1/2011

Revised 10/18/2010

11



## ENERGY STAR Qualified Homes, Version 3 (Rev. 01) Thermal Enclosure System Rater Checklist

Home Address: <u>73 Misty Hill</u> city: <u>Peach Bottom</u> State: <u>PA</u>				
Inspection Guidelines	Must Correct	Builder Verified <sup>1</sup>	Rater Verified	N/A
<b>1. High-Performance Windows</b>				
1.1 Prescriptive Path: Windows shall meet or exceed ENERGY STAR window requirements <sup>2</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Performance Path: Windows shall meet or exceed 2009 IECC requirements <sup>3</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2. Quality-Installed Insulation</b>				
2.1 Ceiling, floor, and wall insulation levels shall meet or exceed 2009 IECC levels <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2 For Climate Zones 4 and higher, slab insulation shall meet or exceed 2009 IECC levels <sup>4</sup>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3 Insulation shall achieve RESNET-defined Grade I installation or, alternatively, Grade II for walls with insulated sheathing (see checklist item 4.3.1 for required insulation levels)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3. Fully-Aligned Air Barriers</b>				
At each location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows:				
• At interior surface of ceilings in all Climate Zones				
• At exterior surface of walls in all Climate Zones; and also at interior surface of walls for Climate Zones 4-8 <sup>5</sup>				
• At interior surface of floors in all Climate Zones, including supports to ensure permanent contact and blocking at exposed edges <sup>7</sup>				
<b>3.1 Walls</b>				
3.1.1 Walls behind showers and tubs	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.2 Walls behind fireplaces	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.3 Attic knee walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.4 Skylight shaft walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.1.5 Wall adjoining porch roof	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.1.6 Staircase walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.7 Double walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.1.8 Garage rim / band joist adjoining conditioned space	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1.9 All other exterior walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.2 Floors</b>				
3.2.1 Floor above garage	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.2 Cantilevered floor	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2.3 Floor above unconditioned basement or vented crawlspace	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>3.3 Ceilings</b>				
3.3.1 Dropped ceilings/soffit below unconditioned attic	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3.3.2 All insulated ceilings, including wind baffles installed at eaves in every bay or equivalent air barrier at edge of ceiling insulation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.3.3 Insulated attic slopes/walls	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>4. Reduced Thermal Bridging</b>				
4.1 Raised-heel truss or equivalent framing / insulation method used in the attic <sup>8</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.2 HVAC and other attic platforms installed to allow for full-depth insulation below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3 Reduced thermal bridging at walls using one of the following options:				
4.3.1 Continuous rigid insulation sheathing, insulated siding, or combination of the two; ≥ R-3 in Climate Zones 1-4, ≥ R-6 in Climate Zones 5-8 <sup>9, 10</sup> ; OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.2 Structural Insulated Panels (SIPs); OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.3 Insulated Concrete Forms (ICFs); OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.4 Double-wall framing <sup>11</sup> ; OR;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.5 Advanced framing, including all of the items below:				
4.3.5a All corners insulated ≥ R-6 to edge <sup>12</sup> ; AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.5b All headers above windows & doors insulated <sup>13</sup> ; AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.5c Framing limited at all windows & doors insulated <sup>14</sup> ; AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.5d All interior / exterior wall intersections insulated <sup>15</sup> ; AND;	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4.3.5e Minimum stud spacing of 16" for 2 x 4 framing and 24" for 2 x 6 framing unless construction documents specify other spacing is structurally required <sup>16</sup>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4 100% of slab edge insulated in Climate Zones 4 and higher	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Version 3 (Rev. 01) - Effective 1/1/2011

Revised 10/18/2010

2

Moisture management and indoor air quality added

# Training is Key

- Field supervisors
- Sub Contractors
- Sales Team



# HVAC Contractors

- Have the toughest adjustment
- Checklists required should have been filled out previously but were not
- Performance of the system is now verified and tested
- Training is needed

**ENERGY STAR Qualified Homes  
HVAC System Quality Installation Contractor Checklist<sup>1</sup>**

Home Address: 73 Muddy Hill Drive City: Delta State: VA

**1. Whole-Building Mechanical Ventilation Design<sup>2</sup>**

1.1 Ventilation system designed to meet ASHRAE 62.2-2007 requirements<sup>3</sup>  Contractor Approved  
 1.2 Ventilation system does not utilize an intake duct to the return side of the HVAC system unless coupled with a motorized damper and control system  Contractor Approved  
 1.3 Documentation is attached with ventilation system type, location and design rate  Contractor Approved  
 1.4 If present, continuously-operating ventilation and exhaust fans designed to operate during all occupiable hours  Contractor Approved  N/A  
 1.5 If present, intermittently-operating whole-house ventilation system designed to automatically operate at least once per day and at least 10% of every 24 hours  Contractor Approved  N/A

**2. Heating & Cooling System Design<sup>4</sup>** The following design parameters shall be used in the design calculations:  
 A. Outdoor design temp.; comply with procedure listed below. D. Insulation levels and window U-values/SiC values, as called here.  
 B. Indoor temp. setpoints = 70°F for heating; 75°F for cooling. E. Airflow accounts for MERV 6 air filter.  
 C. Infiltration rate = 1.01<sup>5</sup> l/s; or equivalent rate. F. ASHRAE 62.2 ventilation load accounted for.

2.1 Heat Loss / Gain Method:  Manual J v8  ASHRAE 2005  Other: \_\_\_\_\_  
 2.2 Duct Design Method:  Manual D  Other: \_\_\_\_\_  
 2.3 Equipment Selection Method:  Manual S  OEM Recommended  Other: \_\_\_\_\_  
 2.4 Outdoor Design Temperatures Used: 1%: 0 °F 99%: 91 °F  
 2.5 Design Latent Heat Gain: 4756 BTU/h  
 2.6 Design Sensible Heat Gain: 31057 BTU/h  
 2.7 Design Total Heat Gain: 35813 BTU/h  
 2.8 Design Sensible Heat Ratio (SHR): 4756 (Value 2.6 ÷ Value 2.7)  
 2.9 Design Total Heat Loss: 61,609 BTU/h  
 2.10 Design Airflow: 1550 CFM  
 2.11 Design Dust Static Pressure: 1.11 IWC  
 2.12 Copy of load calculations attached?  yes  no  Contractor Approved

**3. Selected Cooling Equipment, If Cooling Equipment to be Installed**

3.1 Condenser Manufacturer & Model: Trane - HTW63042A1000B6  
 3.2 Condenser Serial #: 602230220000110718DF4F  
 3.3 Evaporator Manufacturer & Model: ACB17A212 101015  
 3.4 Evaporator Serial #: 370-00X20719  
 3.5 AHRI Reference #: 3195125  N/A  
 3.6 Listed Efficiency: 11.50 EER 14 SEER  
 3.7 Metering Device Type:  TXV  Fixed orifice  Other: \_\_\_\_\_  
 R-22  R-410a  Other: \_\_\_\_\_  
 3.8 Refrigerant Type:  Fixed  Variable (ECM/CIM)  Other: \_\_\_\_\_  
 3.9 Fan Speed Type:  Fixed  Variable (ECM/CIM)  Other: \_\_\_\_\_  
 3.10 Selected Latent Capacity at Design Cond.: 4756 BTU/h  
 3.11 Selected Sensible Capacity at Design Cond.: 31057 BTU/h  
 3.12 Selected Total Capacity at Design Cond.: 35813 BTU/h  
 3.13 Selected Sensible Heat Ratio (SHR): 3.11 (Value 3.11 ÷ Value 3.12)  
 3.14 Selected SHR (Value 3.13) ÷ Design SHR (Value 2.8)  Contractor Approved  No  
 3.15 If No, ENERGY STAR qualified dehumidifier installed?  Contractor Approved  N/A  
 3.16 Capacity (Value 3.12) is 95-115% of Design Heat Gain (Value 2.7) or next nom. size  Contractor Approved  N/A  
 Or for Heat Pumps in Climate Zones 4-8, 95-125% or next nominal size  Contractor Approved  
 3.17 AHRI Certificate Attached?  yes  no

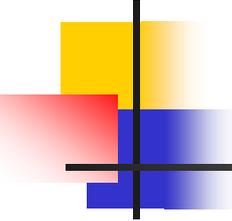
**4. Selected Heat Pump Equipment, If Heat Pump to be Installed**

4.1 AHRI Listed Efficiency: 62.0 HSPF  
 4.2 Performance at 17°F: Capacity: 21,300 BTU/h Efficiency: \_\_\_\_\_ COP  
 4.3 Performance at 47°F: Capacity: 39,000 BTU/h Efficiency: \_\_\_\_\_ COP

**5. Selected Furnace, If Furnace to be Installed**

5.1 Furnace Manufacturer & Model: Trane - TUC18100A494IND  
 5.2 Furnace Serial #: 10518AT176  
 5.3 Listed Efficiency: 92.1 AFUE  
 5.4 Selected Gross Capacity: 42,000 BTU/h  
 5.5 Gross capacity (Value 5.4) is 100-140% of design heat loss (Value 2.9) or next nom. size  Contractor Approved

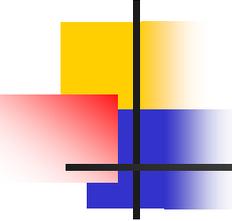
Effective 1/1/2011 Revised 4/8/2010



# Duct Design

---

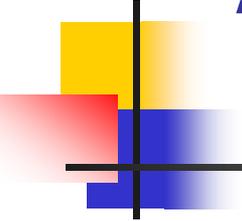
- Now has to be done up front
- No longer using panned framing spaces as ducts
- More mastic used and less tape
- Duct runs are not as leaky
- Air gets to where it was designed to go



# Problems with Implementation

---

- Cost vs. ROI
  - No value given for energy efficiency by banks appraisers or the real estate community
  - Code changes are driving up the price to remain Energy Star



# Another Problem

---

- Buyers don't realize the benefits of energy efficiency until it is too late
- Buying based on the base price not the cost to live
- We need to be able to explain not only PITI but PITI+Utilities

# Even when given the figures buyers still doubt the savings

## The PowerHouse: Financial Incentives

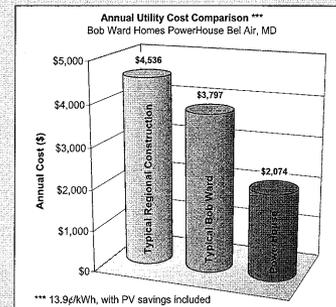
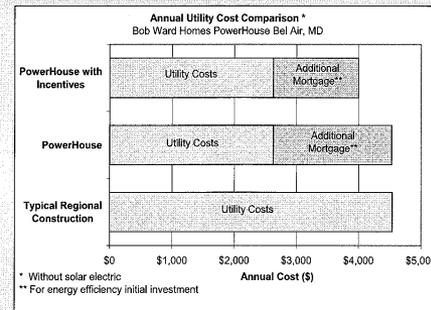
*Investment in energy efficiency can be offset by the monthly energy cost savings*

### Utility Bills and Additional Mortgage Payments:

- Lower monthly utility bills enable the initial increased investment in energy efficient technologies
- With available incentives, investment in energy efficiency saves about \$530/year or about \$44/month by lowering utility bills
- Return on Investment (ROI) is about 8%
- Additional savings include financial incentives and mortgage interest tax deductions
- Investment in energy efficiency assures more stable household expenses as future energy prices rise

### Savings with 3.0 kW AC Solar Electric (PV) System:

- Saves an additional 4,000 kWh per year above efficiency savings
- Additional energy and cost savings of 11%
- Total PowerHouse energy savings of 54% from typical regional standard



### RENEWABLE AND EFFICIENCY FINANCIAL INCENTIVES \*\*\*\*

#### Home Owner Incentives:

- Solar water heating: for a system costing \$5,000, the incentives can be up to \$2,200
- Residential PV: for a system costing \$30,000, the incentives can be up to \$5,000

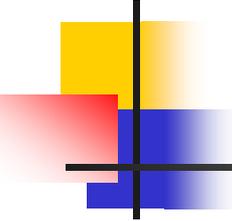
#### Builder Incentives:

- \$2,000 builder incentive if energy consumption for space heating and cooling is reduced by 50%

\*\*\*For more information visit [www.dsireusa.org](http://www.dsireusa.org)

The PowerHouse





# Going Forward

---

- Lobby for a standardized energy rating system
- Help the mortgage and real estate industry understand the difference and benefits of energy efficient construction

# MPG Rating for Energy Efficiency

## Home Energy Rating Certificate



### Uniform Energy Rating System

1 Star	1 Star Plus	2 Stars	2 Stars Plus	3 Stars	3 Stars Plus	4 Stars	4 Stars Plus	5 Stars	5 Stars Plus
500-401	400-301	300-251	250-201	200-151	150-101	100-91	90-86	85-71	70 or Less

### Energy Efficient

HERS Index: **66**

### General Information

Conditioned Area: 2288 sq. ft. House Type: Townhouse, inside unit  
 Conditioned Volume: 32252 cubic ft. Foundation: Conditioned basement  
 Bedrooms: 3

### Mechanical Systems Features

Heating: Fuel-fired air distribution, Natural gas, 92.0 AFUE.  
 Cooling: Air conditioner, Electric, 13.0 SEER.  
 Water Heating: Conventional, Electric, 0.93 EF, 40.0 Gal.  
 Duct Leakage to Outside: 50.00 CFM.  
 Ventilation System: Exhaust Only: 40 cfm, 15.0 watts.  
 Programmable Thermostat: Heating: Yes Cooling: Yes

### Building Shell Features

Ceiling Flat: R-38 Exposed Floor: R-38  
 Vaulted Ceiling: R-38 Window Type: U:.30,SHGC:.29  
 Above Grade Walls: R-16, R-13 Infiltration:  
 Foundation Walls: R-11.0 Rate: Htg: 1500 Clg: 1500 CFM50  
 Slab: R-10.0 Edge, R-0.0 Under Method: Blower door test

### Lights and Appliance Features

Percent Fluorescent Pin-Based: 10.00 Clothes Dryer Fuel: Electric  
 Percent Fluorescent CFL: 80.00 Range/Oven Fuel: Electric  
 Refrigerator (kWh/yr): 775.00 Ceiling Fan (cfm/Watt): 0.00  
 Dishwasher Energy Factor: 0.46

The Home Energy Rating Standard Disclosure for this home is available from the rating provider.

REM/Rate - Residential Energy Analysis and Rating Software v12.93

This information does not constitute any warranty of energy cost or savings.

© 1985-2011 Architectural Energy Corporation, Boulder, Colorado.

### Rating Number:

Certified Energy Rater: Thomas H. Marston

Rating Date: 1/2011

Rating Ordered For:

### Estimated Annual Energy Cost

Based On Plans

Use	MMBtu	Cost	Percent
Heating	34.8	\$545	23%
Cooling	4.3	\$174	7%
Hot Water	11.9	\$489	21%
Lights/Appliances	24.2	\$994	43%
Photovoltaics	-0.0	\$-0	-0%
Service Charges		\$120	5%
<b>Total</b>		<b>\$2323</b>	<b>100%</b>

This home meets or exceeds the minimum  
criteria for all of the following:

### TITLE

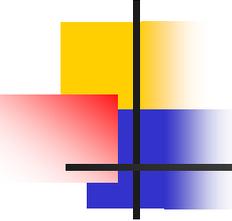
Company

Address

City, State, Zip

Phone #

Fax #



# Training needed

---

- For Builders
- Contractors
- Sales

# Bob Ward Companies

