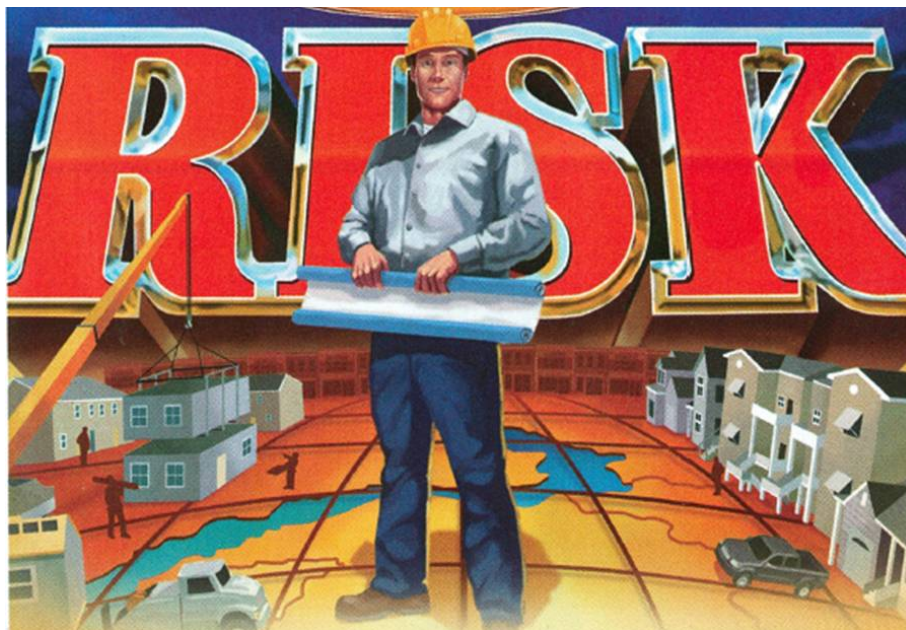


# Reducing Business Risk with the ENERGY STAR Indoor Air Package



Eric Werling, U.S. EPA  
February 20, 2008

IAQ -  
Is it **Green** or is it  
Gray?

# What is Indoor Air Quality (IAQ)?

## 3. DEFINITIONS

***acceptable indoor air quality:*** air toward which a substantial majority of occupants express no dissatisfaction with respect to odor and sensory irritation and in which there are not likely to be contaminants at concentrations that are known to pose a health risk.

ASHRAE Standard 62.2-2004

# *What Contaminants Are “Known to Pose a **Health Risk**”?*

- *Radon, ETS, Formaldehyde, & Benzene exposure can cause cancer*
- *Indoor dampness linked to respiratory illness*
- *Many known indoor asthma triggers*
- *Many VOC's linked to adverse health effects*
- *CO kills at high levels; other effects at low levels*
- *Pesticides linked to acute & chronic health effects*
- *PM linked to respiratory illness & heart disease*
- *Indoor air typically has 2 to 5 times more chemical contaminants than outdoor air*

# Indoor Air Quality (IAQ) is

## 3. DEFINITIONS

***acceptable indoor air quality:*** air ~~toward~~ which ~~a~~ ~~substantial majority of~~ occupants express no dissatisfaction with respect to odor and sensory irritation and in which there are not likely to be contaminants at concentrations that are ~~known~~ **likely** to pose a health risk.

~~ASHRAE Standard 62.2-2004~~ **Eric**

# Does Green Mean Good IAQ?

- Certified
- Bronze
- Silver
- Gold
- Platinum
- Emerald

?

?

?

# Other Green Attributes Competing with IAQ for Points

- Energy Efficiency
- Materials & Resources
- House Size
- Sustainable Sites
- *Indoor Air Quality*
- Water Efficiency
- Innovative Design

Which IAQ points  
will most “Green”  
builders choose?

# Non-Mandatory Measures?

- Bulk Moisture Control
  - Water managed wall, roof, foundation system
- Radon Control
- Effective Garage Isolation
- Low VOC Materials
  - Low formaldehyde materials (boards, carpets/pads)
- Sealed Combustion
- Efficient, Low-emission Fireplaces



# Building Tightness & IAQ?

- “How tight is too tight?”
- “A house has to breathe.”
- “I don’t want to build so tight that I have IAQ problems.”
- “I don’t want to be held reliable for IAQ.”

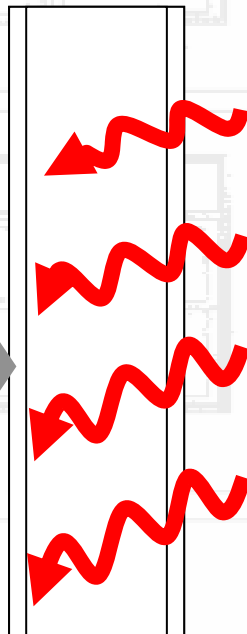
# *Why Air Leakage is Risky*

*All action happens at surfaces*

*Without Insulation:*

Outside:  
40°F

55°F  
Warm  
Surface



Inside:  
68°F, 43°F Dew Pt.

No  
Problem!

# *Why Air Leakage is Risky*

***All action happens at surfaces***

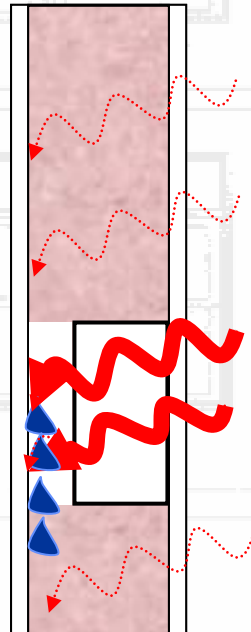
***With Insulation:***

***Potential Problem!***

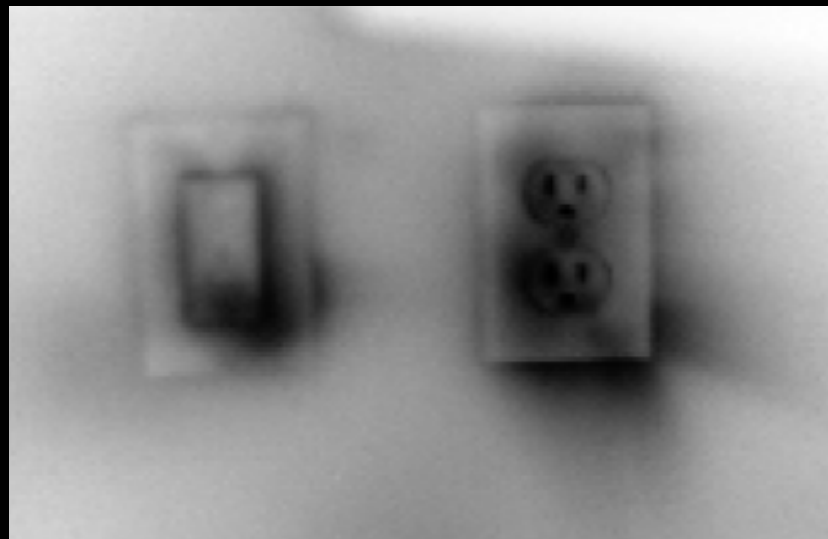
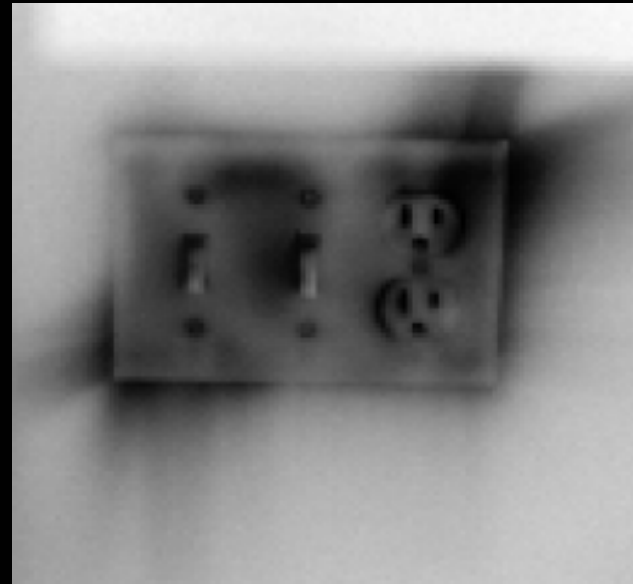
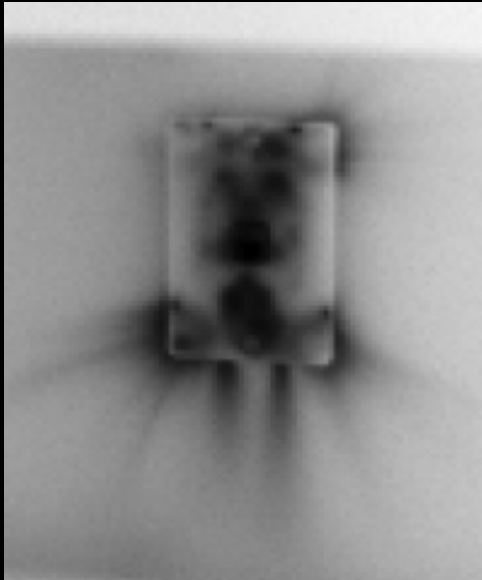
***Outside:  
40°F***

***Inside:  
68°F, 43°F Dew Pt.***

***43°F  
Cold  
Surface***



***Condensation  
Risk !!!***



# Why Control Airflow?



Courtesy of Building Science Corp.

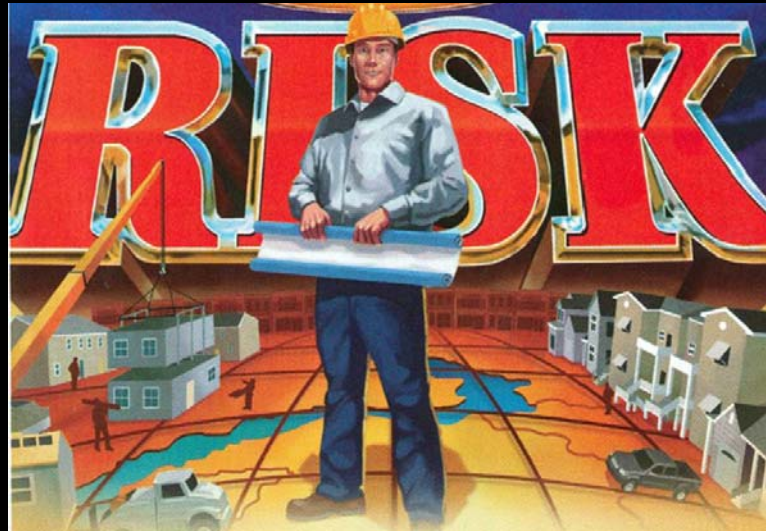
# Why Control Airflow?



Courtesy of Building Science Corp.



# What Will Motivate Builders to Add IAQ Features?



# Business Risks Related to IAQ

- Callback/Warranty costs of construction defects
- Litigation costs related to construction defects
- Lost revenue due to damaged reputation resulting from construction defects
- Lost revenue due to obsolescence (i.e. not Green enough)



Myth:



# Defects Out Of Sight, Out of Mind

Reality:

# Defects No Longer Invisible



This defect is not invisible



## Infrared Energy Auditing – How Home Inspectors Gain a Competitive Edge

According to the U.S. Department of Energy, the typical family spends close to \$2,500 a year on their home's utility bills, and unfortunately, a large portion of that energy is wasted due to insufficient insulation and a lack of weather stripping around doors and windows. Professional home inspectors and energy auditors have been using leading-edge infrared technology to perform energy auditing of homes and buildings to improve energy efficiency, thus leading to savings on energy costs.

Howard Vics of Building Performance Consulting in Schenectady, NY and Gary Goodman of Energy Construction, LLC in Ravenna, NY rely on their FLIR Systems EX320 infrared camera for home energy auditing assessments. Built for harsh environments, the EX320 is a rugged yet flexible infrared solution featuring interchangeable optics, high-resolution imaging and extreme thermal sensitivity. Feature-rich and affordable, the EX320 is the smallest, smartest infrared camera on the market today.

"We are thrilled to have this instrument," said Vics. "We use the EX320 on every job, whether it's for a comprehensive home energy audit, heat loss analysis or for a quality assurance check of installed insulation. As I complete the assessment, I can easily detect missing insulation in walls and ceilings, or air leakage around doors, windows and along the foundation. We

can then develop an insulation and air-sealing strategy to address the problem. By using an infrared camera, I am able to instantly see and diagnose the problem. We use a nondestructive method, which is a definite competitive edge for our business."

Both Vics and Goodman work with the New York State Energy Research and Development Authority (NYSERDA), and have been certified by the Building Performance Institute. The New York Energy SmartSM Program and Energy Star® have partnered together to develop a program to assist homeowners to make energy efficiency improvements. Having a qualified home performance inspector, who has been trained in Building Science, perform a comprehensive energy audit will reveal where there is energy being wasted, so improvements can be made to enhance safety and comfort.

"We also use our FLIR infrared camera for the Energy STAR® new homes program as well," Vics explains. First, I do an evaluation of the building plans, followed by two or three on-site inspections during critical stages of construction and heating system configuration. It is at the final stages (before and after drywall installation) that the ThermoCAM thermal imaging camera is key because I can "see" duct leakage and inconsistencies of insulation." The final energy audit takes place when the construction is complete, just before the owner gets their certificate. "We have found that the IR camera is an invaluable tool when doing building diagnostics of newer homes."

Goodman, who specializes in the application and installation of insulation and air sealing techniques, uses the infrared camera before starting a job and after installation of insulation as a final quality assurance check, to make sure he hasn't missed a bay or some other source of cold air.

Infrared thermography is a well-accepted method of imaging and evaluating the

thermal efficiency of home and building insulation, doors, windows, and other penetrations, along with the efficiency of heating and cooling systems. Home energy auditors have been able to proactively address the issue of wasted energy by using infrared cameras, and in turn help to make homes more energy efficient, saving money and natural resources.

### About FLIR Systems, Inc.:

FLIR Systems, Inc. (NASDAQ: FLIR) designs, manufactures and markets infrared imaging systems worldwide. Commercial product applications include non-destructive testing, research and development, manufacturing process control, predictive maintenance/condition monitoring, and broadcast imaging. With over 30 years experience and more than 30,000 of its IR systems in use, FLIR is the global leader in infrared cameras, software, service, training and support. FLIR ThermoCAM thermal imaging cameras are the most widely used IR non-contact temperature measurement systems worldwide. FLIR products also play pivotal roles in such diverse applications as public safety, defense, navigation and search and rescue. For more information, please visit our website at: [www.flirthermography.com](http://www.flirthermography.com) or call 1-800-454-4372.

*Howard Vics is certified by the Building Performance Institute in Building Analysis and is a Certified Thermographer with a specialty in Building Science. He formed Building Performance Consulting in 2004 and serves the greater Capital region performing home energy audits, infrared thermography and building diagnostics. Gary Goodman is "Triple Certified" by the Building Performance Institute with specialties in Building Analysis, Shell, and Heating Systems and has been installing and air sealing homes in the Capital region for over 25 years. For more information you can reach Howard Vics at (518) 388-4548 and Gary Goodman can be reached at (518) 750-8303.*



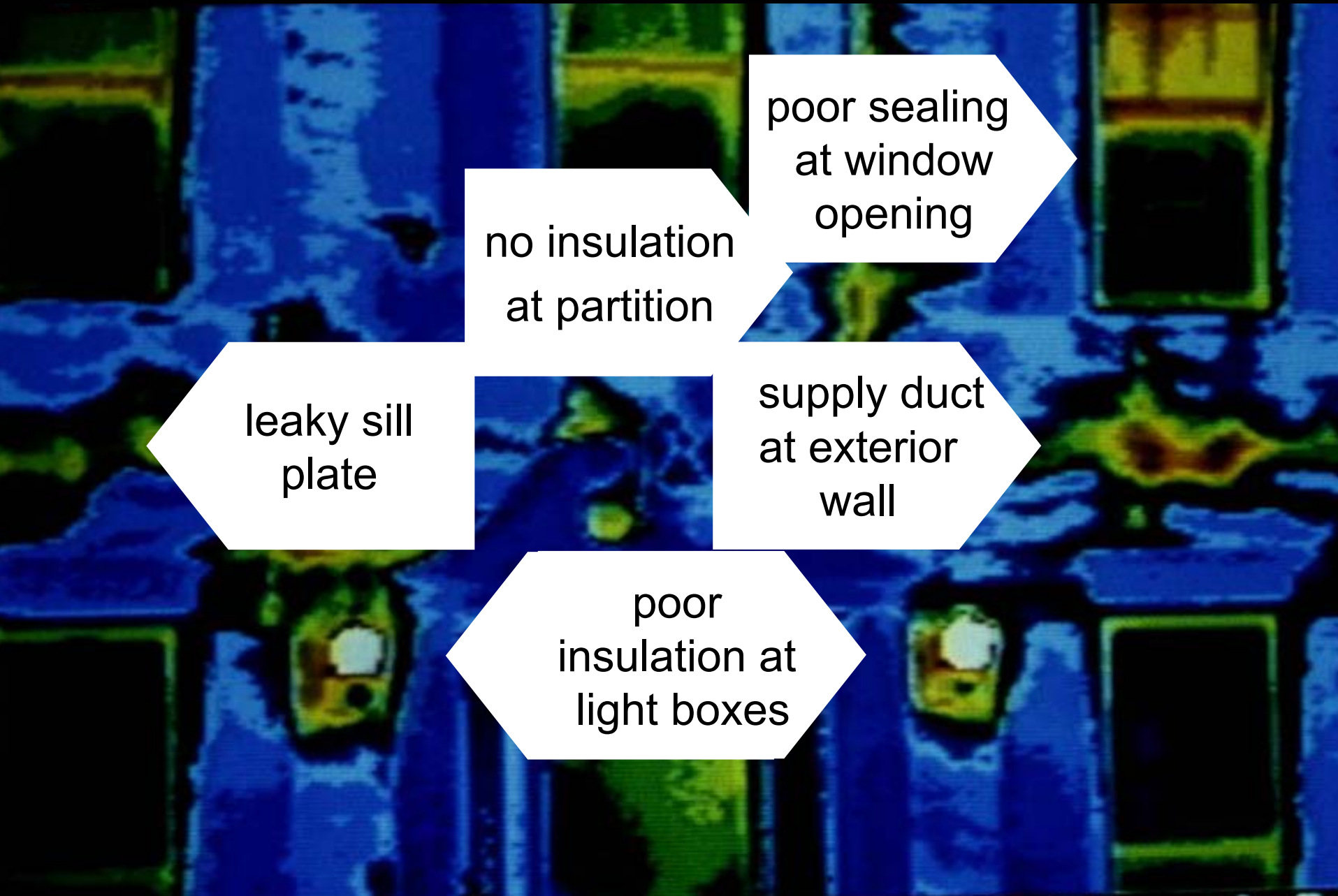
**FLIR**  
The Global Leader in Infrared Cameras

# Realtor Sees a Charming Colonial ...





# Look What the IR Camera Sees ...



leaky sill  
plate

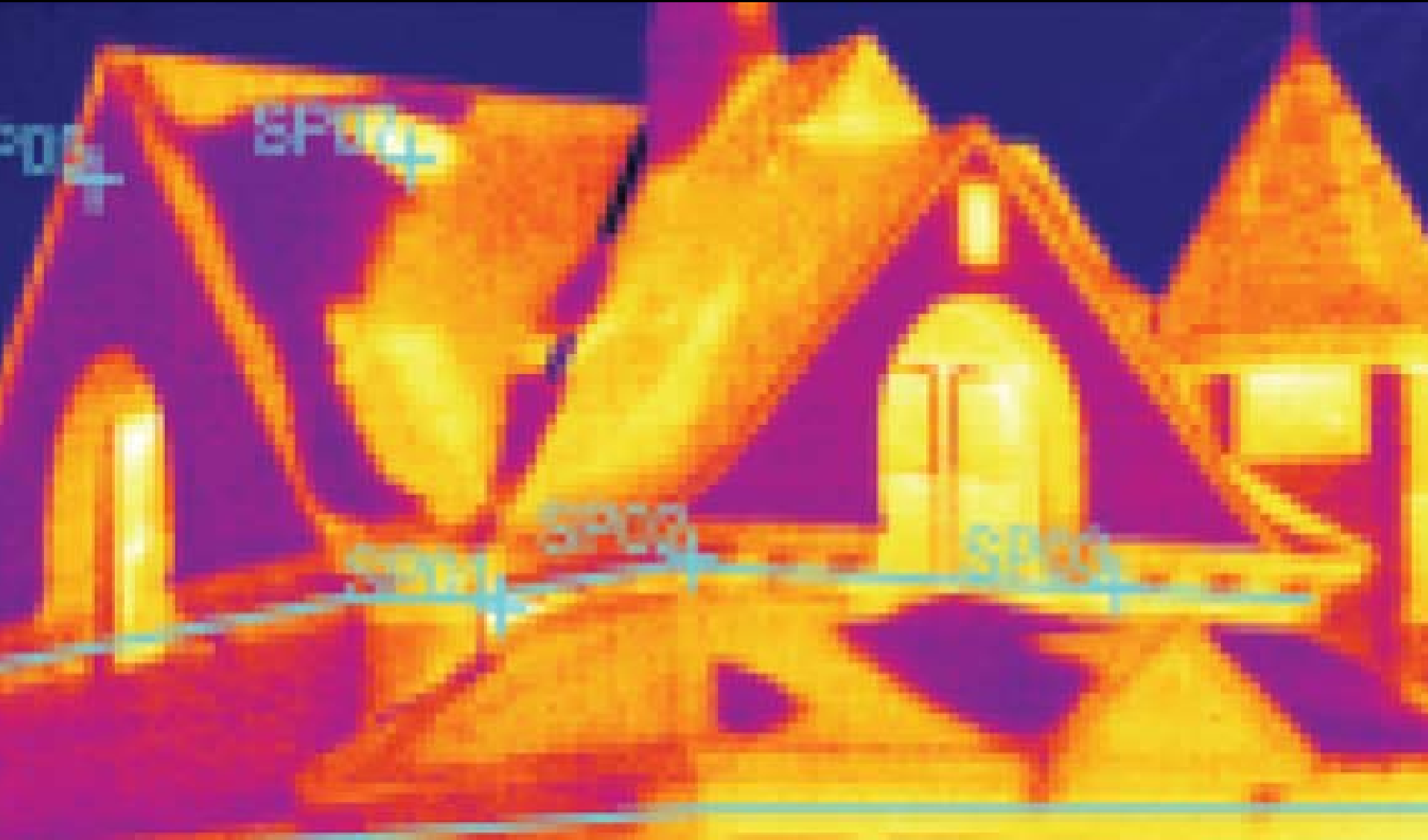
no insulation  
at partition

poor sealing  
at window  
opening

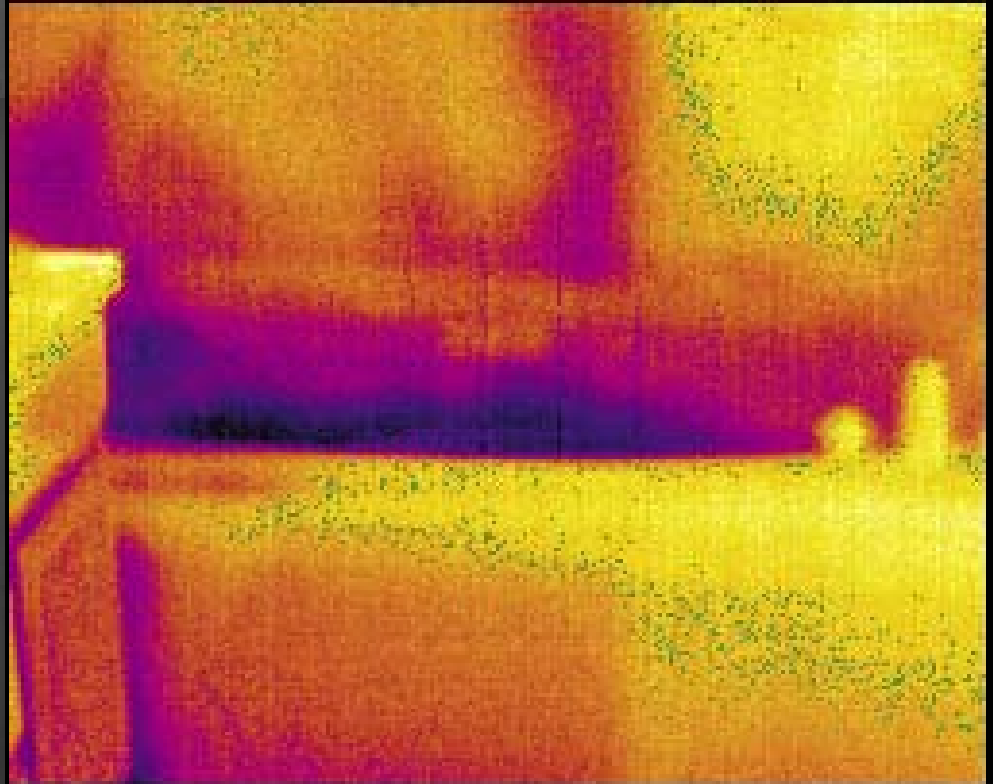
supply duct  
at exterior  
wall

poor  
insulation at  
light boxes

Owner Sees High Energy Bills,

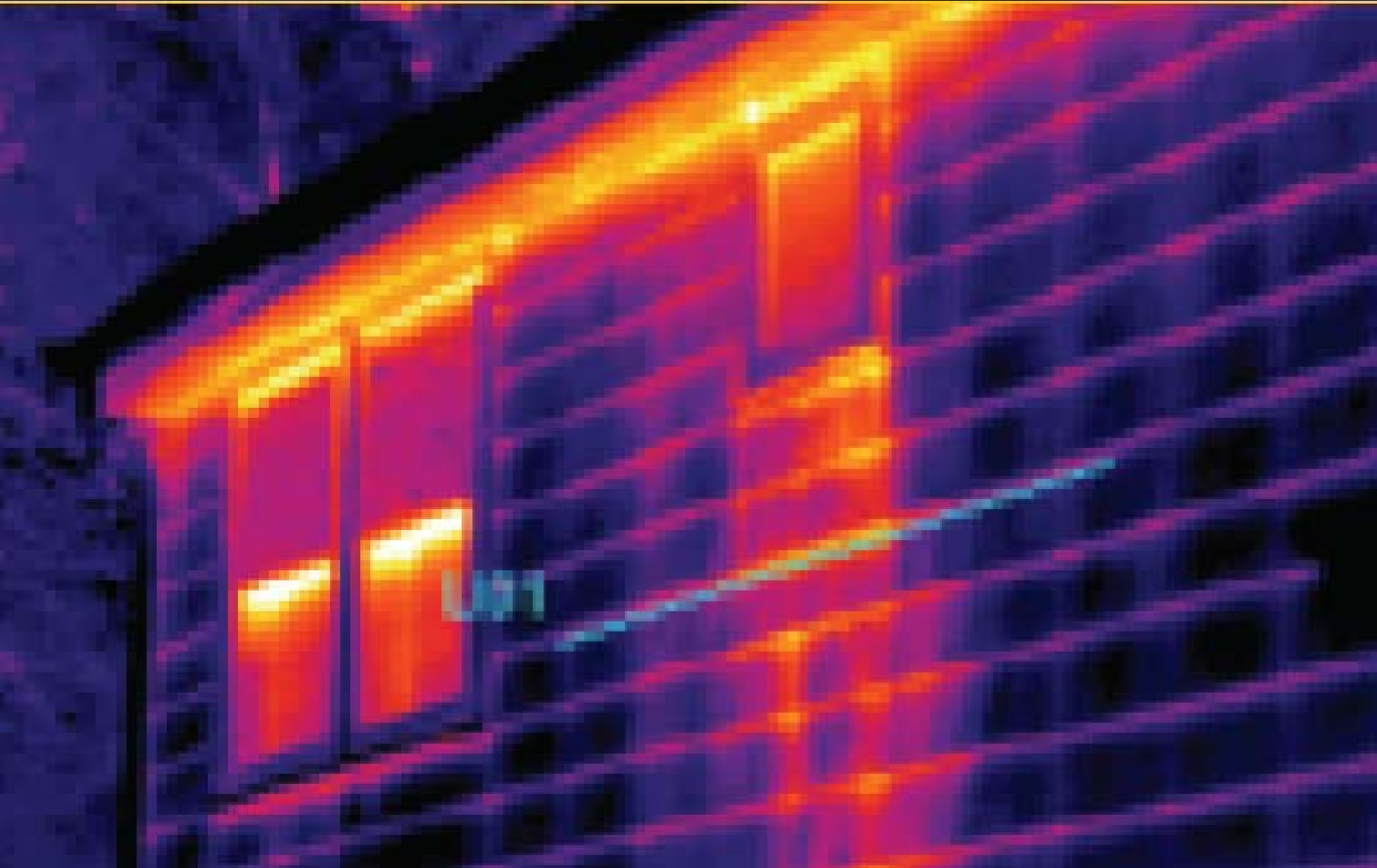


# *And Comfort Problems*



*Courtesy of Fort Collins Utilities*

# And Water Damage!





# Window Flashing Problem



# *Lawyers See Green*



***“CONSTRUCTION DEFECTS CAN DRAMATICALLY  
CHANGE THE COMFORT AND QUALITY OF YOUR  
HOME... WE CAN HELP!”***

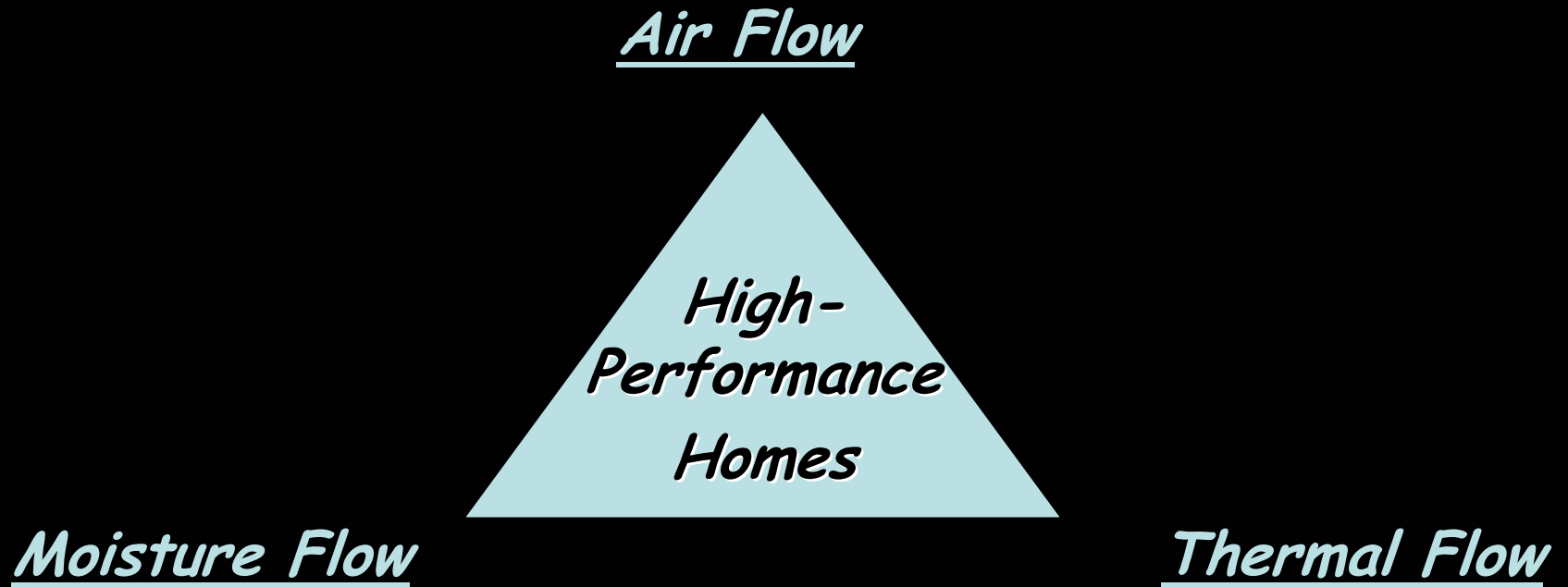
***“Over \$430,000,000 awarded to our Clients!!!”***

***Kasdan, Simonds, Riley & Vaughan LLP***

# IAQ RISK Management v1: Controlling Liability

***“... SHALL HAVE NO LIABILITY, AND HEREBY DISCLAIMS ANY RESPONSIBILITY FOR, CLAIMS, CAUSES OF ACTION, AND/OR DAMAGES RELATED TO THE DEVELOPMENT OF MOLD IN PURCHASER’S HOME, NOW OR IN THE FUTURE, KNOWN OR UNKNOWN, **REGARDLESS OF ITS CAUSE**, INCLUDING BUT NOT LIMITED TO PROPERTY DAMAGE, PERSONAL INJURY, EMOTIONAL DISTRESS, DEATH, LOSS OF VALUE, LOSS OF INCOME, AND ADVERSE HEALTH EFFECT.”***

# Managing Business Risk includes Avoiding Known Problems



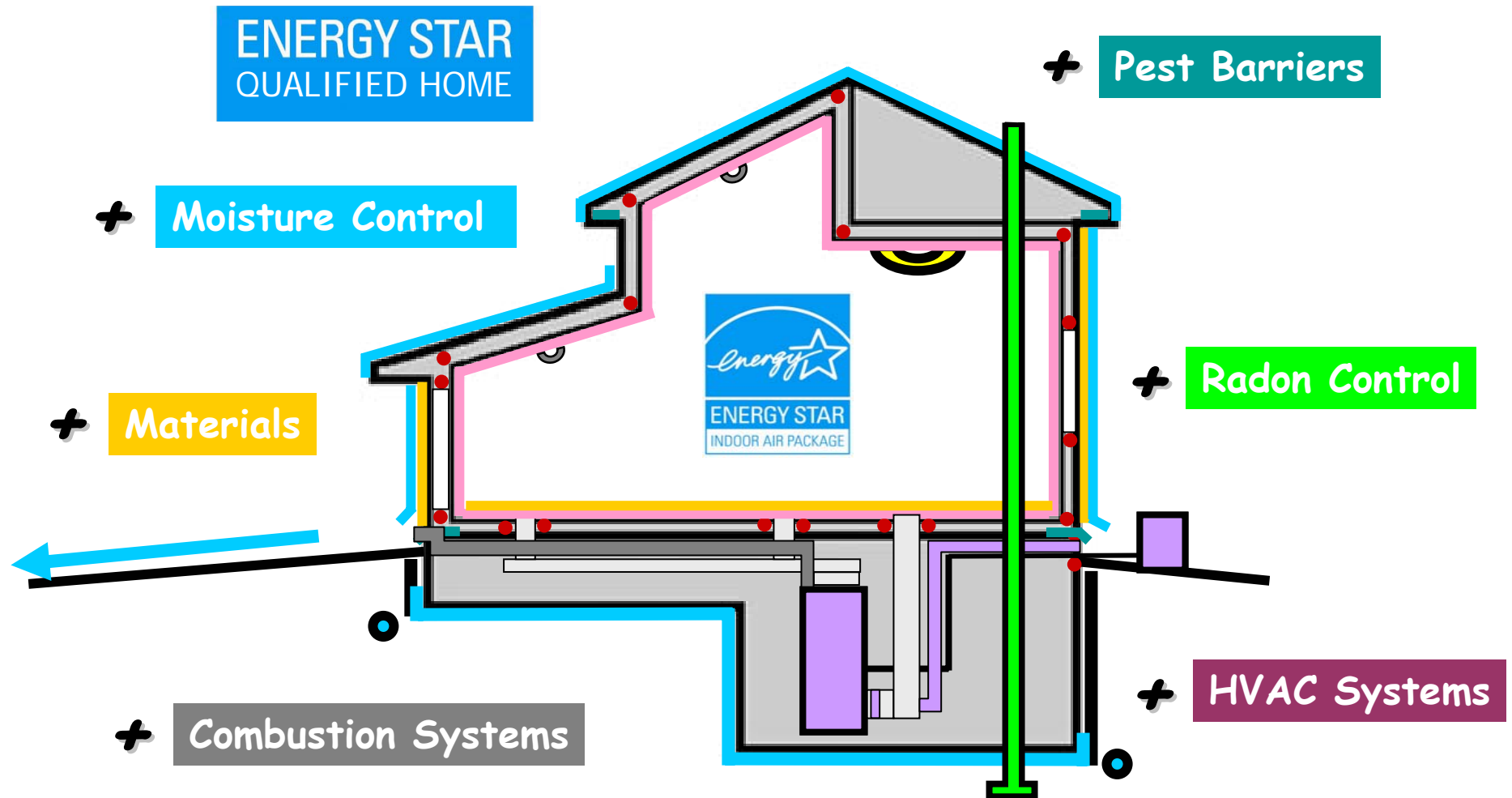
# IAQ Risk Management v2:

## Controlling Problems

<i>What</i>	<i>Why</i>	<i>How</i>
<input type="checkbox"/> High Utility Bills <input type="checkbox"/> Uneven Temperatures <input type="checkbox"/> Cold/Warm Drafts <input type="checkbox"/> Frequent Colds <input type="checkbox"/> Asthma / Allergies <input type="checkbox"/> Musty Smell <input type="checkbox"/> Presence of Mold <input type="checkbox"/> Wet Stains on Interior <input type="checkbox"/> Wet Basements <input type="checkbox"/> Peeling Exterior Paint <input type="checkbox"/> Window Condensation <input type="checkbox"/> Weathered Interior <input type="checkbox"/> Other_____	1. Uncontrolled: Thermal Flow Air Flow Moisture Flow 2. Known Pollutant Sources 3. Unknown Pollutants	<input type="checkbox"/> ENERGY STAR with ... <input type="checkbox"/> Thermal Bypass Checklist <input type="checkbox"/> Indoor Air Package




# Indoor Air Package Summary



# Indoor Air Package Details

turning Gray  
into  
Black &  
White

 <b>ENERGY STAR Indoor Air Package</b>		for Review Only		
<b>Verification Sheet - DRAFT</b>				
Address or Div/Lot#:		ST:	Verified	
City:				
Section	Requirements (see IAP Builder Guide for details)	N/A	Builder Rater	
Moisture Control	<b>Water Managed Site &amp; Foundation per EEBA Guide or equivalent, including:</b>			
	1.1	Site/foundation drainage: sloped grade, drain tile, & dampproofing	<input type="checkbox"/>	<input type="checkbox"/>
	1.2	Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>
	1.3	Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>
	1.4	No vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Water Managed Wall Assembly per EEBA Guide or equivalent, including:</b>			
	1.5	Continuous drainage plane, flashed to foundation	<input type="checkbox"/>	<input type="checkbox"/>
	1.6	Fully flash windows and doors	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Water Managed Roof Assemblies per EEBA Guide or equivalent, including:</b>			
	1.7	Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>
	1.8	Fully flash roof-wall intersections (step & kickout flashing) and all roof penetrations	<input type="checkbox"/>	<input type="checkbox"/>
	1.9	Bituminous membrane at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Interior Water Management, including:</b>				
1.11	No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	<input type="checkbox"/>	
1.12	1/2 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	
Radon	2.1	Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zones 1)	<input type="checkbox"/>	<input type="checkbox"/>
	2.2	Provide 2 radon test kits & instructions for use to homebuyer (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>
Pests	3.1	Air seal foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>
	3.2	Pest screens at all intentional openings (e.g. soffitt vents)	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	4.1	HVAC load calcs & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>
	4.2	Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>
	4.3	Duct system total leakage test <4 cfm/100 sf, OR no panned returns + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>
	4.4	No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>
	4.5	Rooms pressure balanced (individual room returns or jump/transfer grills)	<input type="checkbox"/>	<input type="checkbox"/>
	4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)	<input type="checkbox"/>	<input type="checkbox"/>
	4.7	Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
	4.8	Filtration system: min. MERV 8, tight fitting filter rack, no ozone generators	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Independent dehumidification control to 60% RH (Warm Humid climates only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	
Combustion Pollutants	<b>Combustion Source Controls:</b>			
	5.1	Gas heat direct vented; oil heat & hot water power vented; no unvented heating appliances	<input type="checkbox"/>	<input type="checkbox"/>
	5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency stds (see Guide)	<input type="checkbox"/>	<input type="checkbox"/>
	5.3	Certified CO alarms outside each sleeping area	<input type="checkbox"/>	<input type="checkbox"/>
	5.4	No smoking common areas/outside smoking areas >25' from openings (Multi-family only)	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Attached Garages Isolated &amp; Vented</b>			
5.5	Common walls/ceilings completely sealed & openings gasketed	<input type="checkbox"/>	<input type="checkbox"/>	
5.6	Continuously rated exhaust fan (min. 30 cfm) in attached garages	<input type="checkbox"/>	<input type="checkbox"/>	
Material	6.1	Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions	<input type="checkbox"/>	<input type="checkbox"/>
	6.2	Low-VOC Paints & Finishes (approved labels only)	<input type="checkbox"/>	<input type="checkbox"/>
	6.3	Carpet, cushion, & adhesives qualified for CRI Green Label	<input type="checkbox"/>	<input type="checkbox"/>
Home Commissioning	HVAC & ductwork commissioned: dry, clean, proper refrigerant charge, & airflow to all registers		<input type="checkbox"/>	<input type="checkbox"/>
	Ventilate home before occupancy, or advise buyer		<input type="checkbox"/>	<input type="checkbox"/>
	Provide home buyer with completed checklist		<input type="checkbox"/>	<input type="checkbox"/>
Rater/Provider:		Final Inspection Date:		
Company Name:		Builder Company Name:		
Signature:		Builder Signature:		

v3 - 1/3/2008      DRAFT - DO NOT DISTRIBUTE      www.energystar.gov/homes/iap

# Moisture Control

ENERGY STAR  
QUALIFIED HOME

+ Water Control




## IAQ Risks:

- Asthma triggers incl. Mold & Bugs
- Other respiratory effects
- Costly failures





# Water Managed Site & Foundation

 **ENERGY STAR Indoor Air Package** for Review Only  
**Verification Sheet - DRAFT**

Address or Div/Let# \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

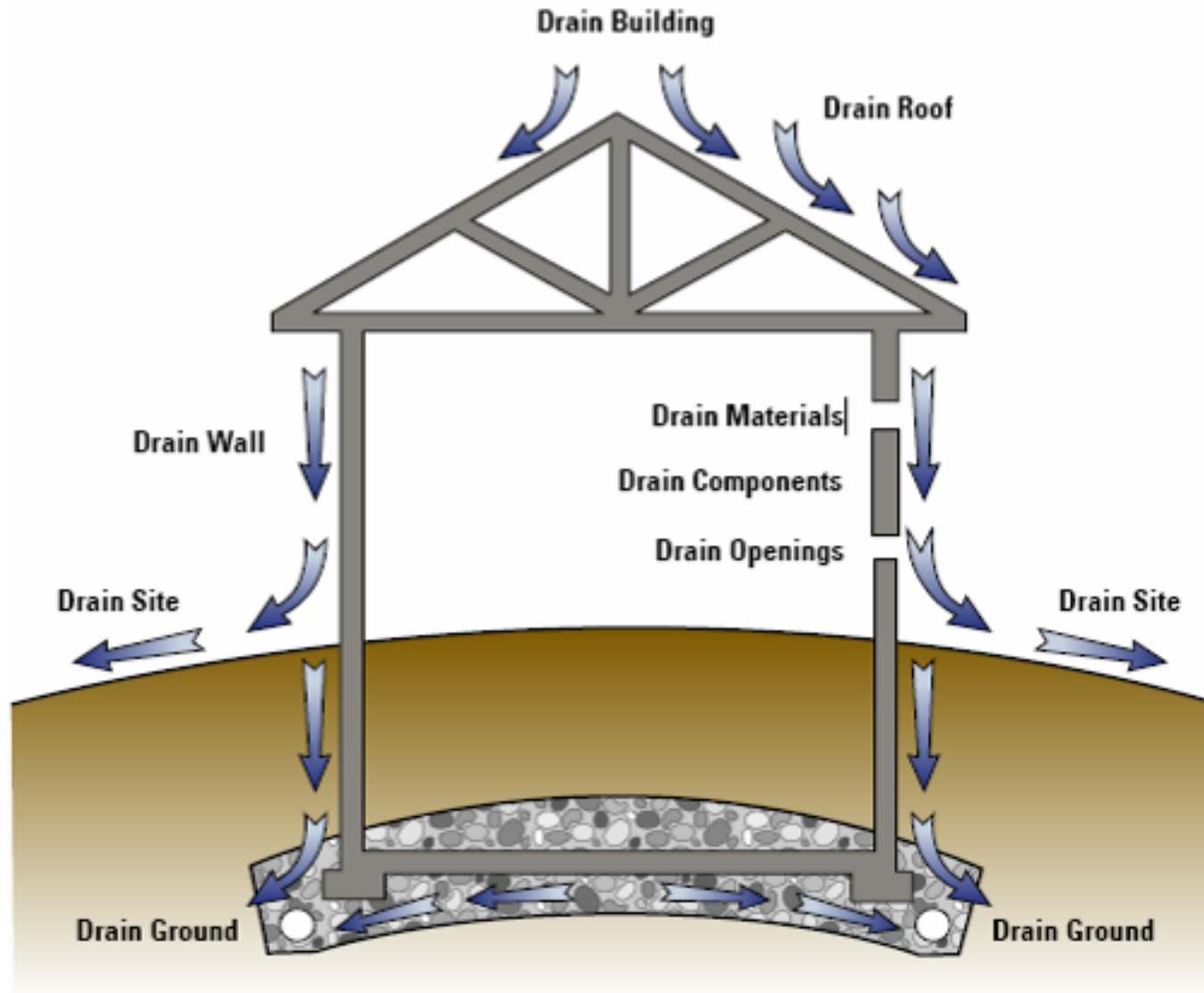
Section	Requirements (see IAP Builder Guide for details)	Verified	Not Verified	Builder
<b>Water Managed Site &amp; Foundation per EBBA (guide or equivalent, including:</b>	1.1 Site/foundation drainage: sloped grade, drain tile, & dampproofing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.2 Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.3 Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.4 No vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Managed Assembly per EBBA (guide or equivalent, including:</b>	1.5 Continuous drainage: perimeter drain & sump pump	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.6 Fully flush windows and doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Managed Roof Assemblies per EBBA (guide or equivalent, including:</b>	1.7 Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.8 Fully flush roof-wall intersections (step & kickout flashing) and all roof penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.9 Bituminous membranes at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.10 Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Interior Water Management, including:</b>	1.11 No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.12 1/8" Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Radon</b>	2.1 Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zones 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.2 Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Pests</b>	3.1 Air seal foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2 Pest screens at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1 HVAC load calcs & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2 Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.1	Site/foundation drainage: sloped grade, drain tile, & dampproofing
1.2	Capillary break below concrete slabs
1.3	Basements/crawlspaces unvented, insulated, conditioned
1.4	No vapor barrier on inside of basement/crawlspace walls

Company Name: \_\_\_\_\_ Builder Company Name: \_\_\_\_\_  
Signature: \_\_\_\_\_ Builder Signature: \_\_\_\_\_

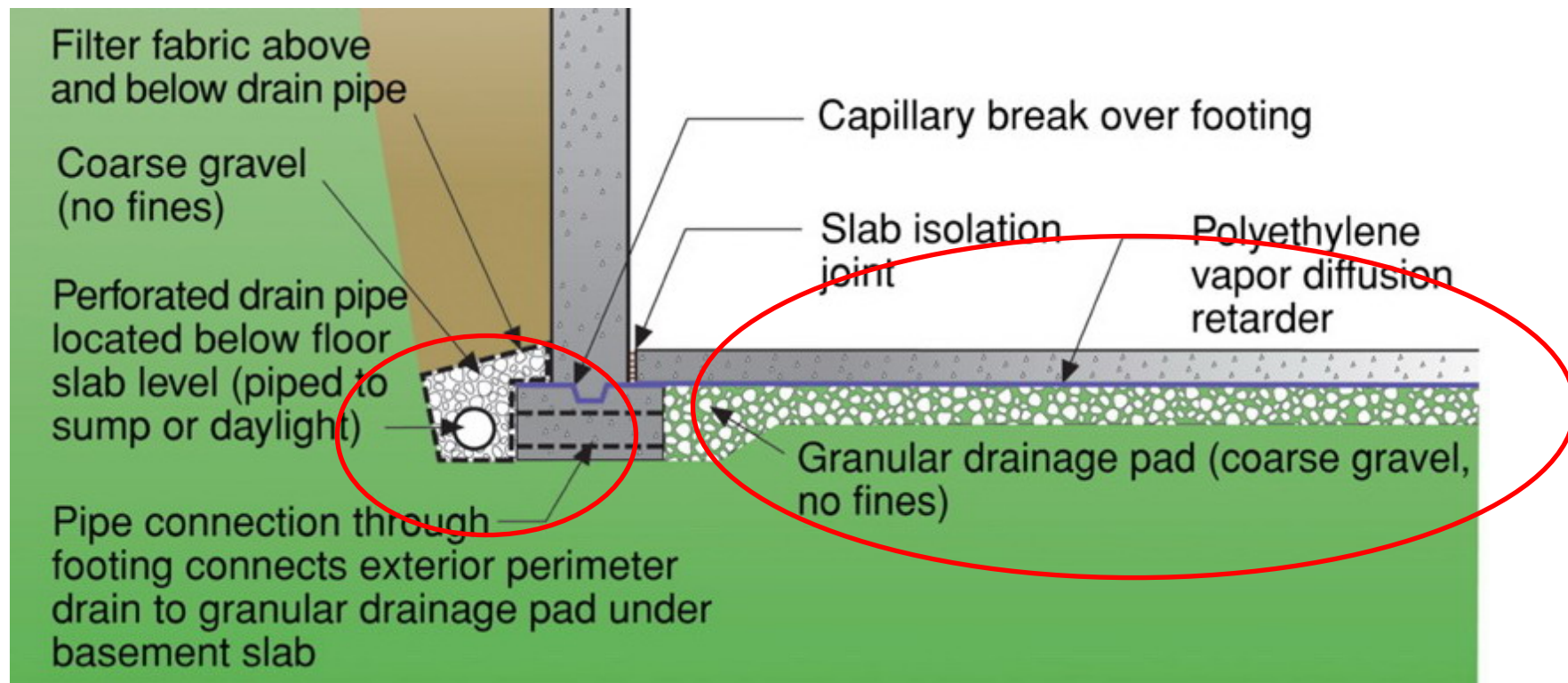
v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

# 1.1 Site/Foundation Drainage



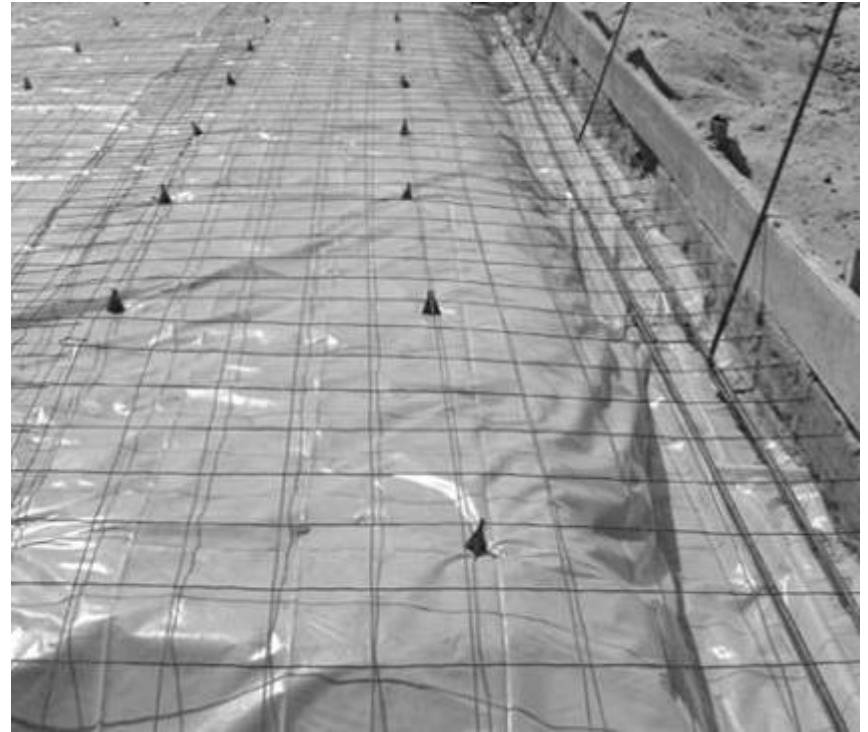
# 1.1 Foundation Drainage

## 1.2 Capillary Break below Slabs



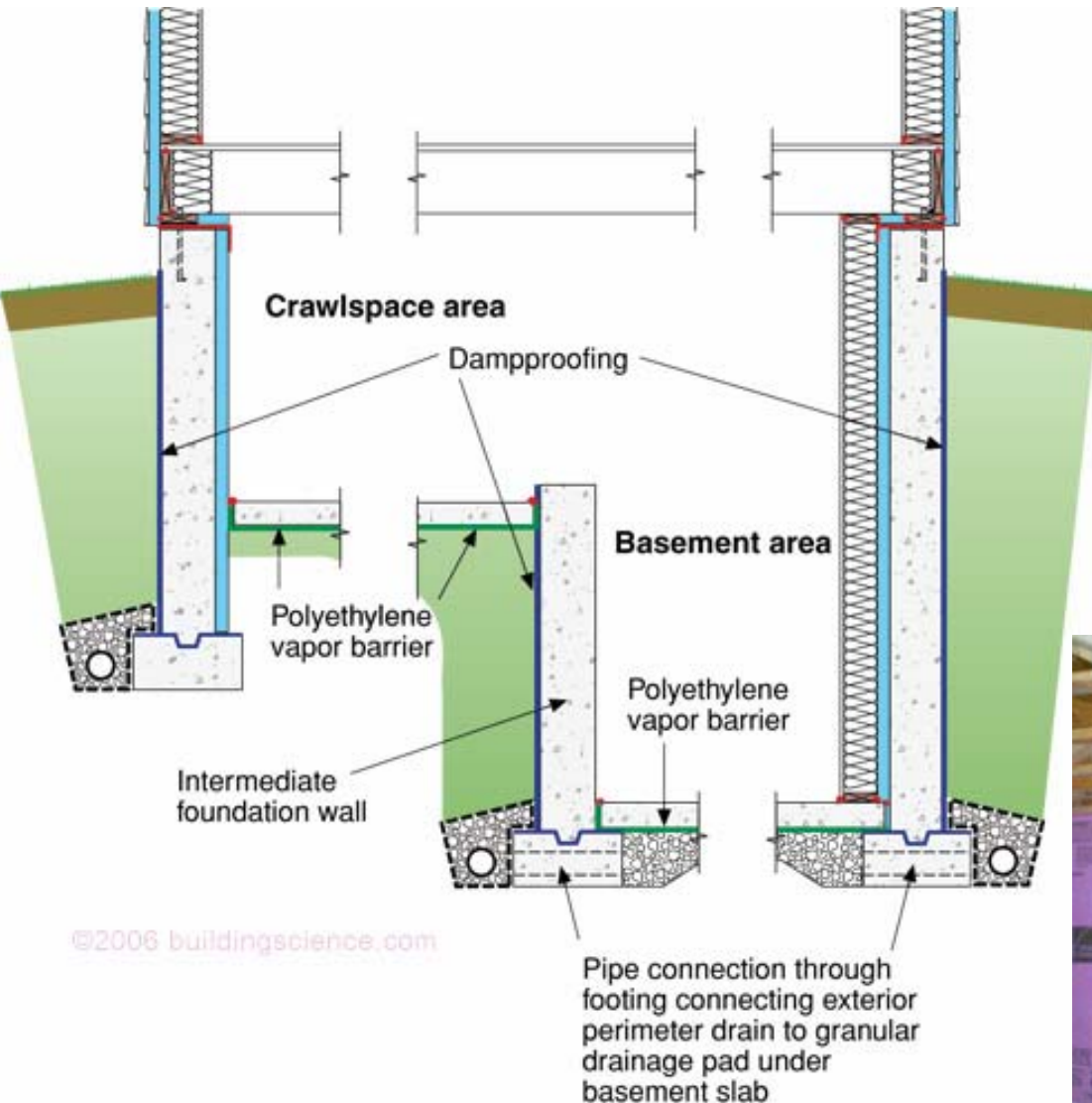
# 1.2 Capillary breaks

CRAWLSPACE  
VAPOR AND RADON BARRIER

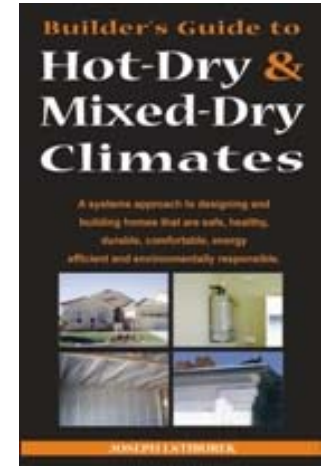


POLY UNDER SLAB  
VAPOR AND RADON BARRIER

# 1.3 Basements/crawlspaces inside



➔  
**More Details ...**





# Water Managed Wall Assemblies

**ENERGY STAR Indoor Air Package** for Review Only  
**Verification Sheet - DRAFT**

Address or Div/Let#:  
 City: ST: N/A Builder: Date:

Section	Requirements (see IAP Builder Guide for details)	Verified
<b>Water Managed Site &amp; Foundation per EBBA (guide or equivalent, including:</b>		
1.1 Site/foundation drainage: sloped grade, drain tile, & dampproofing	<input type="checkbox"/>	<input type="checkbox"/>
1.2 Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>
1.3 Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>
1.4 No vapor barrier/damp-proofing	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Managed Wall Assembly per EBBA (guide or equivalent, including:</b>		
1.5 Continuous drainage plane, flashed to foundation	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Fully flash windows and doors	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Managed Roof Assemblies per EBBA (guide or equivalent, including:</b>		
1.7 Structural Plywood (sheathing) - see Appendix A (pg 1)	<input type="checkbox"/>	<input type="checkbox"/>
1.8 Fully flash roof-wall intersections (step & bicloud flashing) and all roof penetrations	<input type="checkbox"/>	<input type="checkbox"/>
1.9 Bituminous membranes at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>
1.10 Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Interior Water Management, including:</b>		
1.11 No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	<input type="checkbox"/>
1.12 1/8" Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>
2.1 Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zone 1)	<input type="checkbox"/>	<input type="checkbox"/>
2.2 Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>
<b>Peels</b>		
3.1 Air seal foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>
3.2 Pest screens at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>	<input type="checkbox"/>
<b>4</b>		
4.1 MV/AC load calcs & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>
4.2 Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>
4.3 Duct system 1600 leakage test < 4 cfm/100 sf. OR no paired returns + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>
4.4 No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>

<b>5</b>	5.6 Continuously rated exhaust fan (min. 90 cfm) in attached garages	<input type="checkbox"/>
<b>6</b>	6.1 Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions	<input type="checkbox"/>
<b>6.2</b>	Low-VOC Paints & Finishes (approved labels only)	<input type="checkbox"/>
<b>6.3</b>	Carpet, cushion, & adhesives qualified for GREEN Label	<input type="checkbox"/>
<b>Home Commissioning</b>	MV/AC & ductwork commissioned: dry, clean, proper refig. charge, & airflow to all registers	<input type="checkbox"/>
	Ventilate home before occupancy, or advise buyer	<input type="checkbox"/>
	Provide home buyer with completed checklist	<input type="checkbox"/>
Rater/Provider: _____		Final Inspection Date: _____
Company Name: _____		Builder Company Name: _____
Signature: _____		Builder Signature: _____

v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

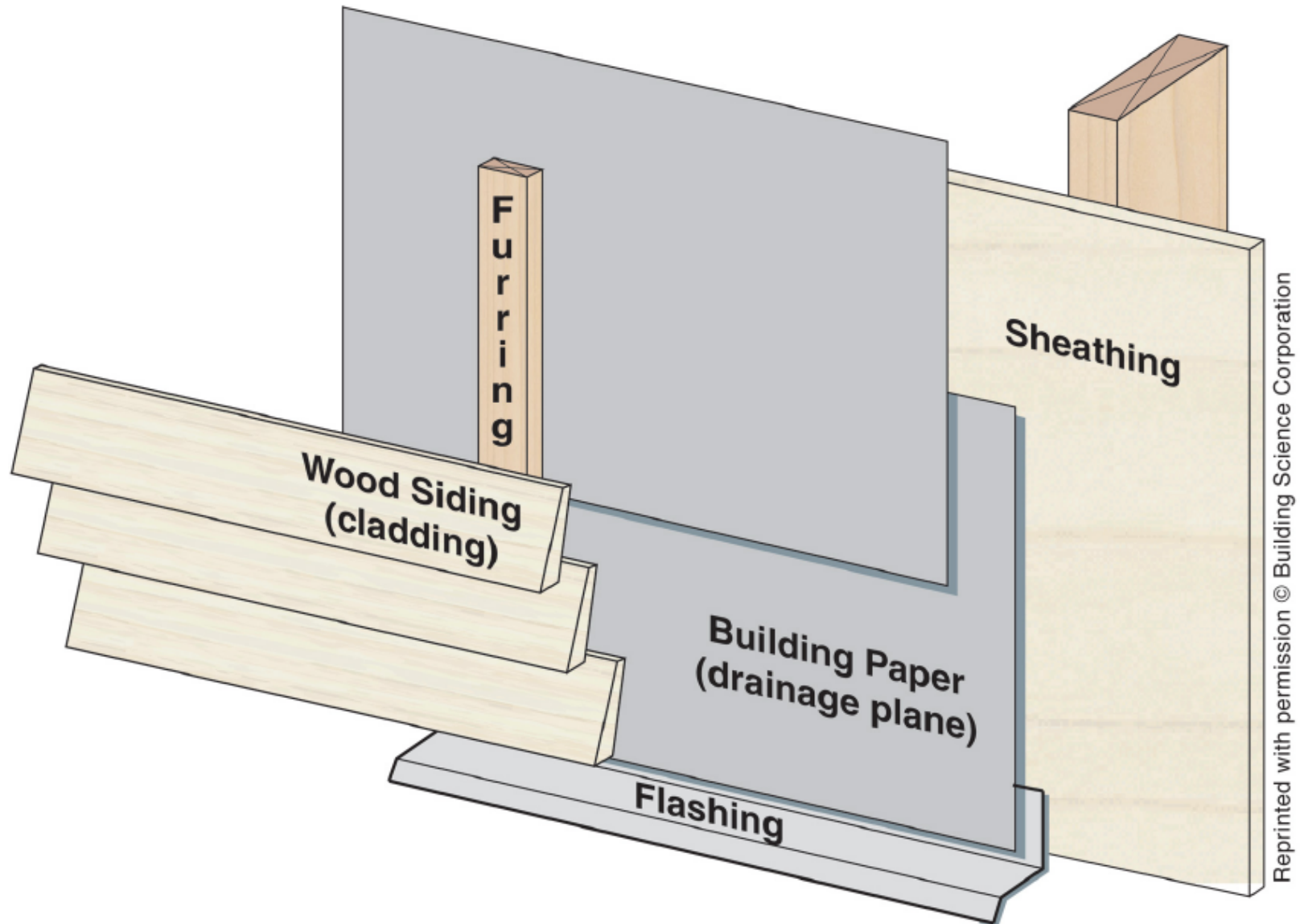
1.5

Continuous drainage plane, flashed to foundation

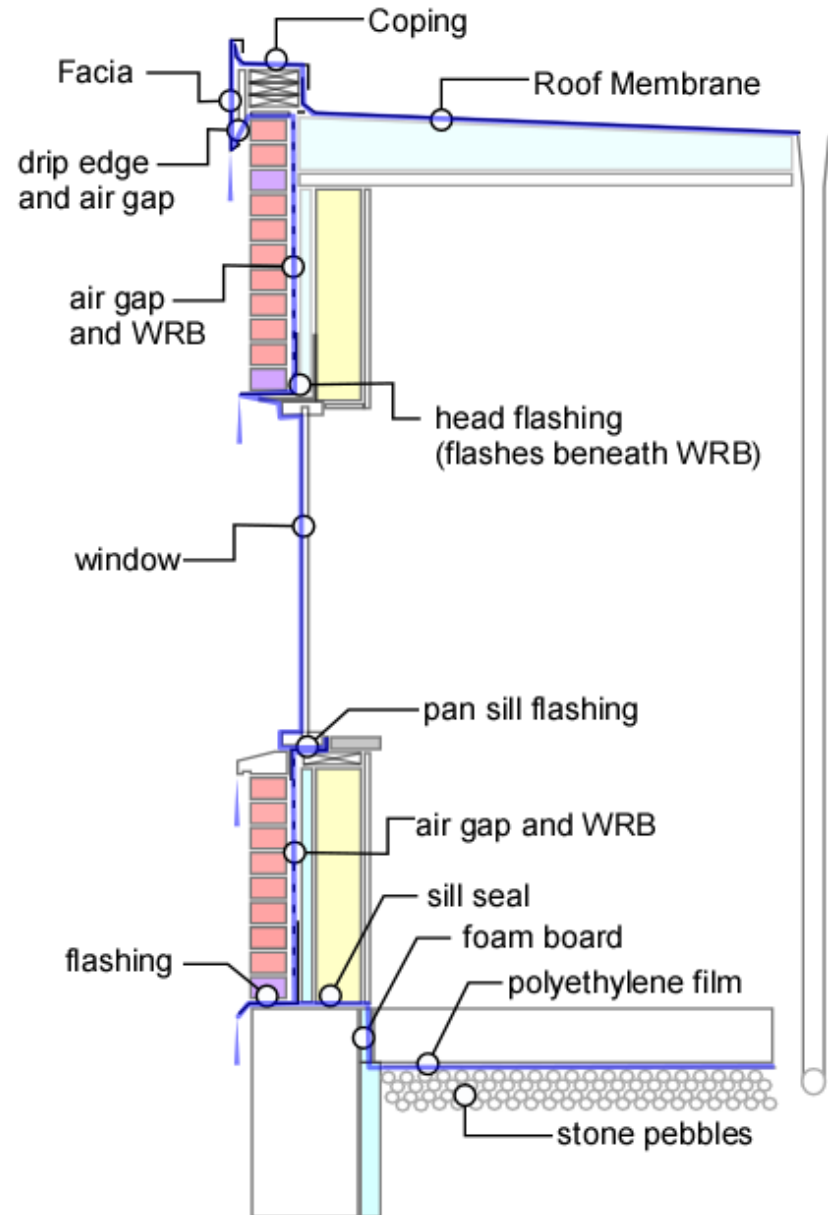
1.6

Fully flash windows and doors

# 1.5 Continuous Drainage Plane



# Drainage Plane: the “Pen Test”



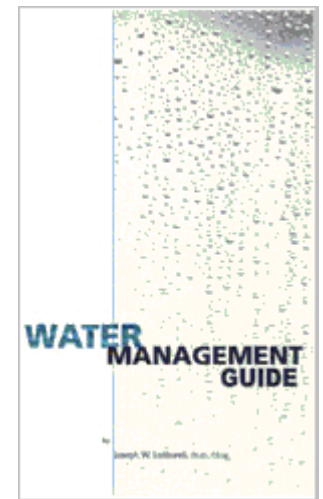
Source: Camroden Associates



# 1.6 Fully Flash Windows & Doors



More Details ...



# Water Managed Roof Assemblies

**ENERGY STAR Indoor Air Package** for Review Only  
**Verification Sheet - DRAFT**

Address or Div/Let# \_\_\_\_\_ ST: \_\_\_\_\_  
 City: \_\_\_\_\_ N/A Builder Date: \_\_\_\_\_

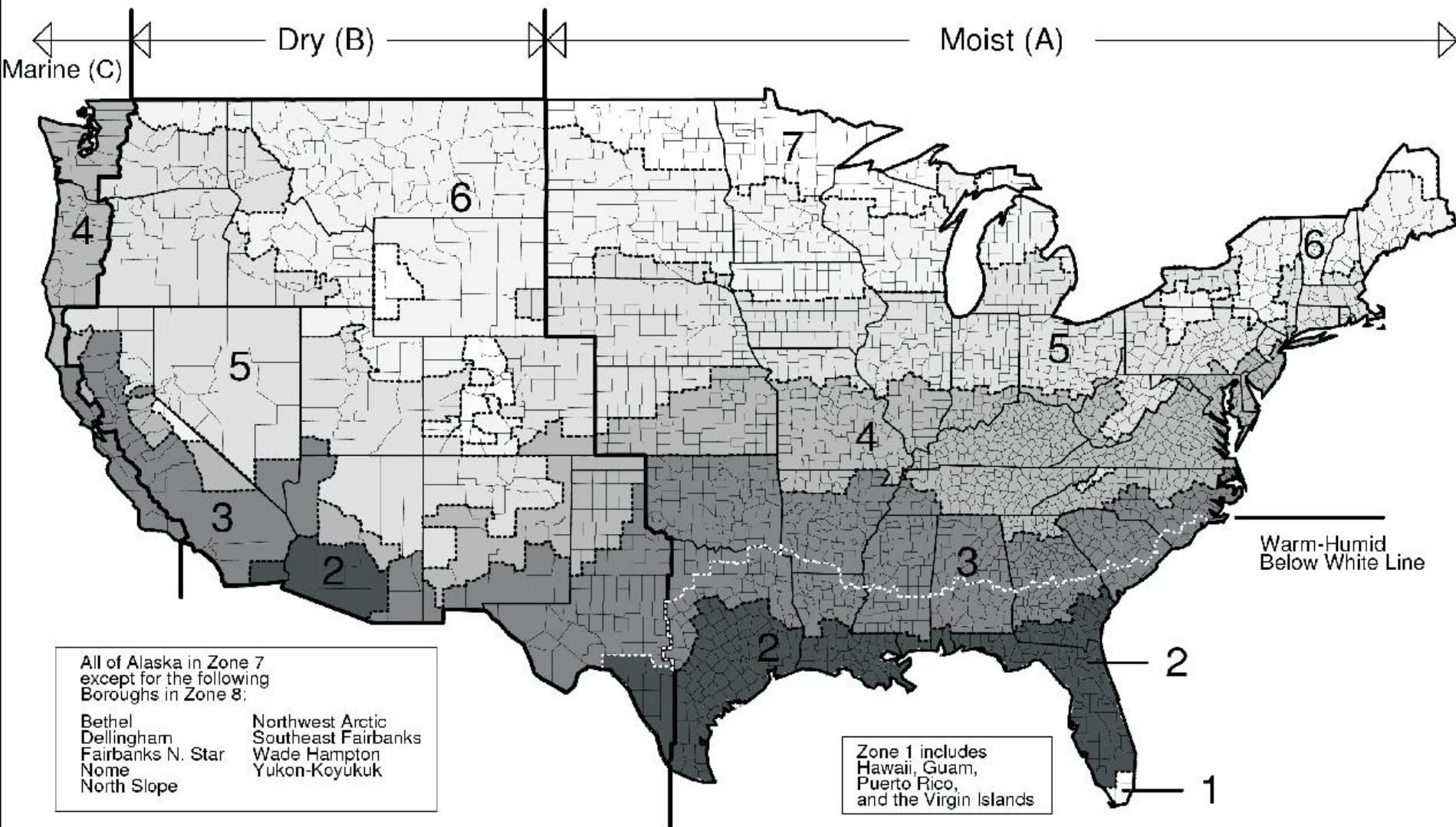
Section	Requirements (see IAP Builder Guide for details)	Verified
<b>Water Managed Site &amp; Foundation per EBBA (guide or equivalent, including:</b>	1.1 Site/foundation drainage: sloped grade, drain tile, & damp-proofing	<input type="checkbox"/>
	1.2 Capillary break below concrete slabs	<input type="checkbox"/>
	1.3 Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>
	1.4 6lb vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>
<b>Water Managed Wall Assembly per EBBA (guide or equivalent, including:</b>	1.5 Continuous drainage plane, flashed to foundation	<input type="checkbox"/>
	1.6 Fully flash windows and doors	<input type="checkbox"/>
<b>Water Managed Roof Assembly per EBBA (guide or equivalent, including:</b>	1.7 Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>
	1.8 Fully flash roof-wall intersections (step & kickout flashing) and all roof penetrations	<input type="checkbox"/>
	1.9 Bituminous membrane at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>
	1.10 Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>
<b>Interior Water Management, including:</b>	1.11 No wall-to-wall carpet in bathing areas	<input type="checkbox"/>
	1.12 1/8" Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>
	2.1 Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zones 1)	<input type="checkbox"/>
<b>Paints</b>	2.2 Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>
	2.3 Air seal foundation joints & penetrations	<input type="checkbox"/>
	2.4 Pest screens at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>
4.1 HVAC load calc & equipment design documented and/or performance tested	<input type="checkbox"/>	

2.1	Carpet, cushion, & adhesives qualified for GREEN Label	<input type="checkbox"/>
2.2	HVAC & ductwork commissioned dry, clean, proper refrigerant charge, & airflow to all registers	<input type="checkbox"/>
Home Commissioning	Ventilate home before occupancy, or advise buyer	<input type="checkbox"/>
	Provide home buyer with completed checklist	<input type="checkbox"/>
Rater/Provider: _____		Final Inspection Date: _____
Company Name: _____		Builder Company Name: _____
Signature: _____		Builder Signature: _____

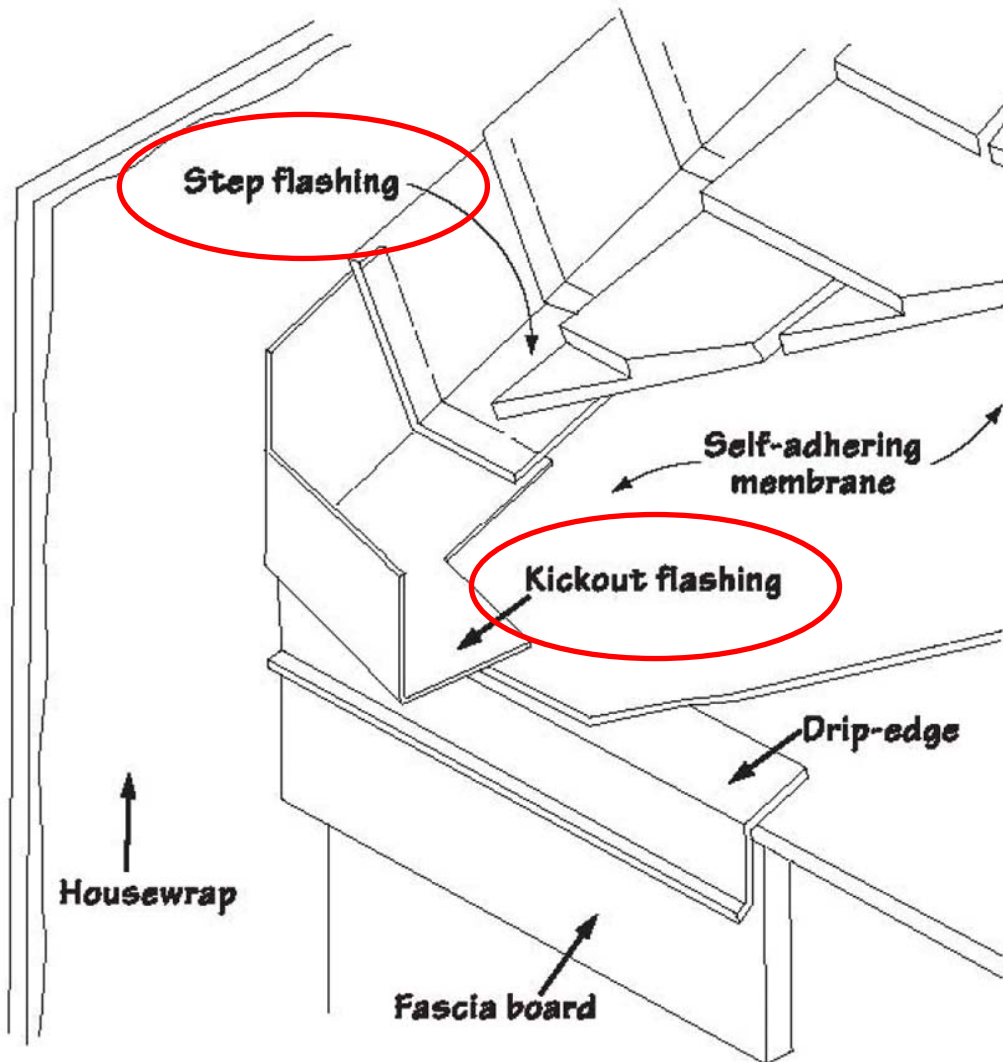
v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

1.7	Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)
1.8	Fully flash roof-wall intersections (step & kickout flashing) and all roof penetrations
1.9	Bituminous membrane at valleys & penetrations (Except Dry (B) climates - map pg 2)
1.10	Ice flashing at eaves (Except climates 1-4 - map pg 2)



# 1.7 Rainwater runoff (e.g., gutters)

## 1.8 Flash roof/wall intersections



Kickout Flashing





# 1.9 Bituminous membrane at valleys ...

## 1.10 Ice flashing at eaves



# Interior Water Management

**ENERGY STAR Indoor Air Package** for Review Only  
**Verification Sheet - DRAFT**

Address or Div/Let# \_\_\_\_\_ ST: \_\_\_\_\_  
 City: \_\_\_\_\_ N/A Builder Date: \_\_\_\_\_

Section	Requirements (see IAP Builder Guide for details)	Verified	
Water Managed Site & Foundation per EBBA (guide or equivalent, including:	1.1 Site/foundation drainage: sloped grade, drain tile, & damp-proofing	<input type="checkbox"/>	
	1.2 Capillary break below concrete slabs	<input type="checkbox"/>	
	1.3 Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>	
	1.4 No vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>	
	Water Managed Wall Assembly per EBBA (guide or equivalent, including:	1.5 Continuous drainage plane, flashed to foundation	<input type="checkbox"/>
		1.6 Fully flush windows and doors	<input type="checkbox"/>
		Water Managed Roof Assemblies per EBBA (guide or equivalent, including:	1.7 Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)
	1.8 Fully flush roof-wall intersections (step & biclouse flashing) and all roof penetrations		<input type="checkbox"/>
	1.9 Bituminous membranes at valleys & penetrations (Except Dry (B) climates - map pg 2)		<input type="checkbox"/>
	1.10 No thru-roof penetrations (Except Dry (B) climates - map pg 2)		<input type="checkbox"/>
Water Management, including:	1.11 No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	
	1.12 >1 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	
	2.1 Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>	
	2.2 Air seal foundation joints & penetrations	<input type="checkbox"/>	
Pests	3.1 Pest screens at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>	
	4.1 HVAC load calc & equipment design documented and/or performance tested	<input type="checkbox"/>	
	4.2 Duct system design documented and/or performance tested	<input type="checkbox"/>	
	4.3 Duct system leakage test <4 cfm/100 sf, OR no parallel returns & sealed air handler	<input type="checkbox"/>	
4.4 No air handler or ducts in garage	<input type="checkbox"/>		

**Attached Ganges Isolated & Vented**

5.5 Common walls/ceilings completely sealed & openings gasketed	<input type="checkbox"/>
5.6 Continuously rated exhaust fan (min. 90 cfm) in attached ganges	<input type="checkbox"/>
6.1 Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions	<input type="checkbox"/>
6.2 Low-VOC Paints & Finishes (approved labels only)	<input type="checkbox"/>
6.3 Carpet, cushion, & adhesives qualified for GREEN Label	<input type="checkbox"/>
Home Commissioning	<input type="checkbox"/>
HVAC & ductwork commissioned: dry, clean, proper refrig. charge, & airflow to all registers Ventilate home before occupancy, or advise buyer Provide home buyer with completed checklist	<input type="checkbox"/>

Rater/Provider: \_\_\_\_\_ Final Inspection Date: \_\_\_\_\_  
 Company Name: \_\_\_\_\_ Builder Company Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_ Builder Signature: \_\_\_\_\_

v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

1.11

No wall-to-wall carpet in bathing areas

1.12

>1 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)

# Radon Control

## IAQ Risk:

- Lung Cancer



**ENERGY STAR Indoor Air Package**  
Verification Sheet - DRAFT

Address or Div/Let# \_\_\_\_\_ ST: \_\_\_\_\_  
City: \_\_\_\_\_

Section	Requirements (see IAP Builder Guide for details)	ST	N/A	Builder	Verifier
<b>Water Managed Site &amp; Foundation per EBBA (guide or equivalent, including:</b>					
1.1	Site/foundation drainage: sloped grade, drain tile, & dampproofing		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2	Capillary break below concrete slabs		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.3	Basements/crawlspaces vented, insulated, conditioned		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.4	No vapor barrier on inside of basement/crawlspaces walls		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Managed Wall Assembly per EBBA (guide or equivalent, including:</b>					
1.5	Continuous drainage plane, flashed to foundation		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6	Fully flush windows and doors		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Water Managed Roof Assemblies per EBBA (guide or equivalent, including:</b>					
1.7	Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.8	Fully flush roof-wall intersections (step & kickout flashing) and all roof penetrations		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9	Bituminous membranes at valleys & penetrations (Except Dry (B) climates - map pg 2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.10	Ice flashing at eaves (Except climates 1-4 - map pg 2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Interior Water Management, including:</b>					
2.1	No wall-to-wall carpet in bathrooms		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	15 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.3	Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zones 1)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.4	Provide 2 radon test kits & instructions for use to homebuyer (EPA Zones 1 & 2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Permeation, Infiltration, &amp; Sealing</b>					
3.1	Seal all exterior cracks & penetrations		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Seal screens at all intentional openings (e.g. soffits/vents)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IAQ</b>					
4.1	IAQ/AC load calc & equipment design documented and/or performance tested		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Duct system design documented and/or performance tested		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Duct system MTD leakage test < 4 cfm/100 sf, OR no joined returns + sealed air handler		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	No air handler or ducts in garage		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Room pressure balanced (individual room returns or jump/transfer grille)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Filtration system: min. MERV 8, high filtering filter rack, no ozone generators		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Independent dehumidification control to 60% RH (Warm Humid climates only - map pg 2)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Combustion Source Controls:</b>					
5.1	Gas heat direct vented; oil heat & hot water power vented; no unvented heating appliances		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Pellets & wood/pellet stoves certified to appropriate emissions/efficiency standards (see Guide)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Certified CO alarms outside each sleeping area		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	No smoking common areas/outside smoking areas >25' from openings (Multi-family only)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2.1 Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zones 1)

2.2 Provide 2 radon test kits & instructions for use to homebuyer (EPA Zones 1 & 2)

Company Name: \_\_\_\_\_ Builder Company Name: \_\_\_\_\_  
Signature: \_\_\_\_\_ Builder Signature: \_\_\_\_\_

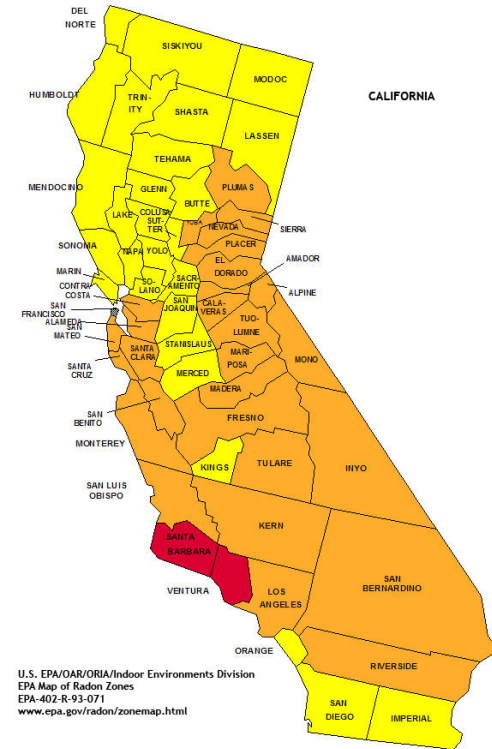
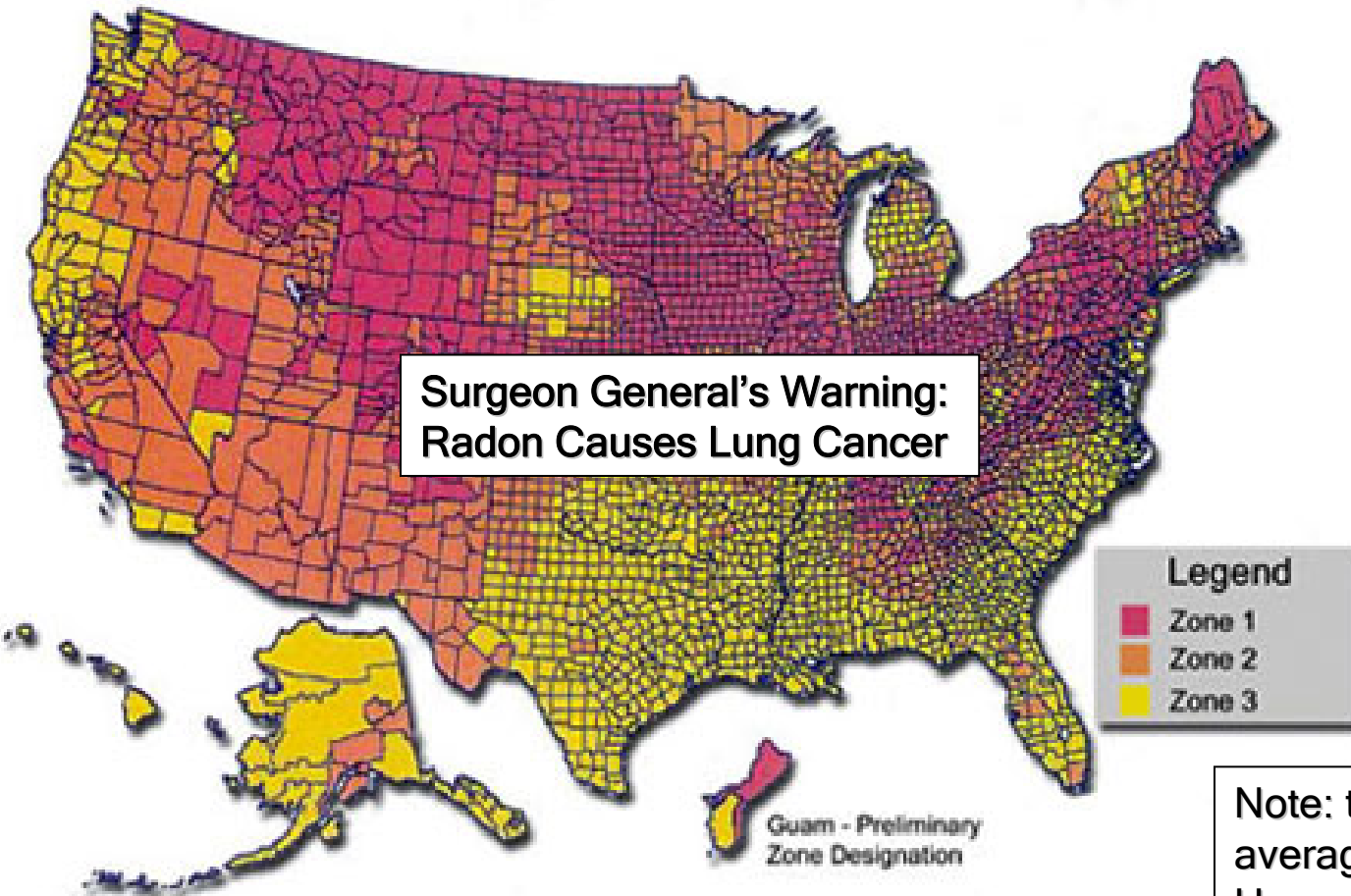
v3 - 1/3/2008

DRAFT - DO NOT DISTRIBUTE

www.energystar.gov/homes/iaq

# *EPA Radon Zones*

## EPA Map of Radon Zones

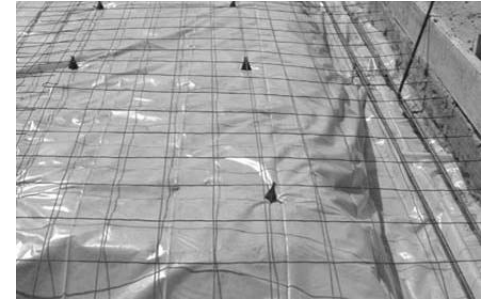


Note: these maps indicate average risk by county. However, High levels of Radon can be found in any home.

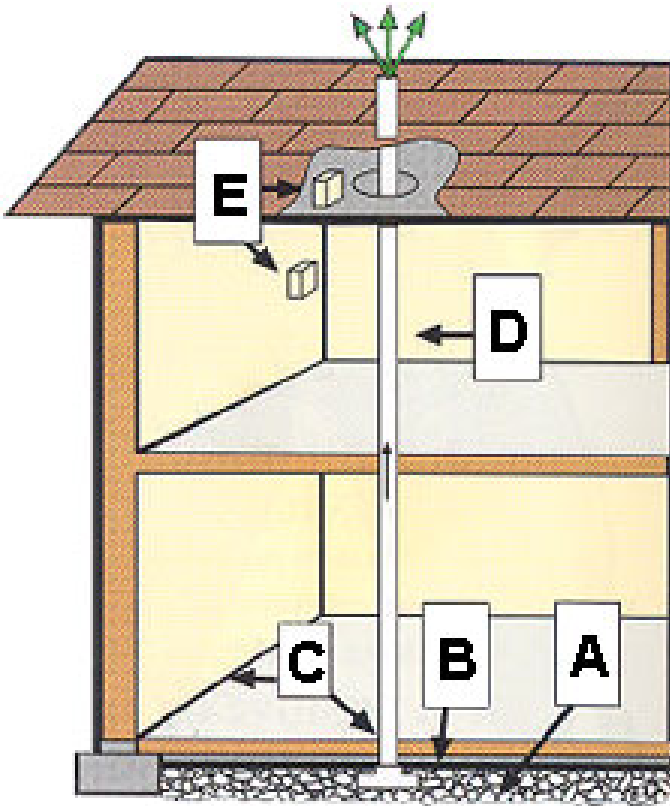


# 2.1 Radon Resistant New Construction

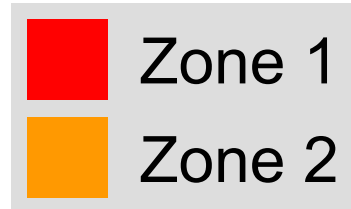
 Zone 1



- A. Gas Permeable Layer  
(4" clean gravel)*
- B. Plastic Sheetting  
(under slab or over crawl space)*
- C. Sealing and Caulking  
(all openings in concrete floor)*
- D. Vent Pipe  
(3 or 4 inch PVC pipe)*
- E. Junction Box  
(if fan needed later)*



## 2.2 Provide buyer 2 Radon test kits



**Long Term  
Test Kits  
(Alpha  
Track)**



**Short Term  
Test Kits  
(Charcoal)**

<http://www.epa.gov/radon/radontest.html>

# Pest Barriers

## IAQ Risks:

- Asthma triggers
- Other “vectors”

ENERGY STAR Indoor Air Package  
Verification Sheet - DRAFT

Address or Div/Let#:  
City: ST: Verified

Section	Requirements (see IAP Builder Guide for details)	N/A	Builder	Verifier
Water Managed Site & Foundation per EBBA (guide or equivalent, including:	1.1 Site/foundation drainage: sloped grade, drain tile, & dampproofing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.2 Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.3 Basements/crawlspaces unvented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.4 No vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Managed Wall Assembly per EBBA (guide or equivalent, including:	1.5 Continuous drainage plane, flashed to foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.6 Fully flush windows and doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Managed Roof Assemblies per EBBA (guide or equivalent, including:	1.7 Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.8 Fully flush roof-wall intersections (step & kickout flashing) and all roof penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.9 Bituminous membrane at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.10 Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interior Water Management, including:	1.11 No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.12 1/2 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air Seal	2.1 Radon resistant features per ASTM E1465, TEC, or equiv. (EPA Zone 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.2 Provide a radon test kit & instructions for use to homeowner (EPA Zone 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	3.1 Air seal foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	3.2 Pest screens at all intentional openings (e.g. soffitt vents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1 Duct & vent seals & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.2 Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3 Duct system MERV leakage test at cfm/100 sf. OR no parallel returns + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4 No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5 Return pressure balanced (individual room returns or jump/transfer grille)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6 Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Combustion Source Controls:	4.7 Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.8 Filtration system: min. MERV 8, high filtering filter rack, no ozone generators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.9 Independent demand/flow control to 60% RH (Warm Humid climates only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.1 Gas heat direct vented: all heat & hot water power vented: no unvented heating appliances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Company Name: Builder Company Name:  
Signature: Builder Signature:  
v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

3.1

Air seal foundation joints & penetrations

3.2

Pest screens at all intentional openings (e.g. soffitt vents)

# 3.1 Air seal foundation joints/penetrations

## 3.2 Pest screens



Air  
Sealing

# HVAC Systems

## IAQ Risks:

- Asthma/allergy
- Other respiratory
- Comfort

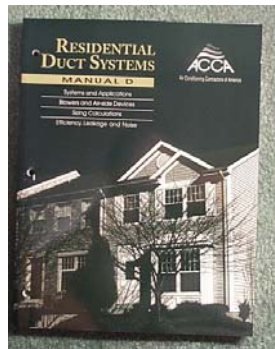
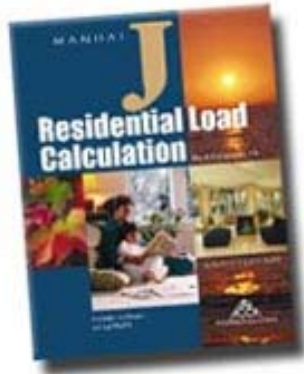
ENERGY STAR Indoor Air Package  
Verification Sheet - DRAFT

Address or Div/Lot#: \_\_\_\_\_ ST: \_\_\_\_\_  
City: \_\_\_\_\_

Section	Requirements (see IAP Builder Guide for details)	ST	N/A	Builder	Verifier
Water Managed Site & Foundation per EBBA (guide or equivalent, including:					
1.1	Site/foundation drainage: sloped grade, drain tile, & dampproofing				
1.2	Capillary break below concrete slabs				
1.3	Basements/crawlspaces vented, insulated, conditioned				
1.4	No vapor barrier on inside of basement/crawlspace walls				
Water Managed Wall Assembly per EBBA (guide or equivalent, including:					
1.5	Continuous drainage plane, flashed to foundation				
1.6	Fully flush windows and doors				
Water Managed Roof Assemblies per EBBA (guide or equivalent, including:					
1.7	Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)				
1.8	Fully flush roof-wall intersections (step & kickout flashing) and all roof penetrations				
1.9	Bituminous membrane at valleys & penetrations (Except Dry (B) climates - map pg 2)				
1.10	Ice flashing at eaves (Except climates 1-4 - map pg 2)				
Interior Water Management, including:					
1.11	No wall-to-wall carpet in bathing areas				
1.12	3-Piece finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)				
2.1	Baden resistant features per ASTM E1455, IRC, or equiv. (EPA Zone 1)				
2.2	Provide 2 radon test kits & instructions for use to homeowner (EPA Zone 1 & 2)				
3.1	Air seal foundation joints & penetrations				
3.2	Peel screens at all intentional openings (e.g. soffits/vents)				
4.1	HVAC system & equipment design documented and/or performance tested				
4.2	Duct system design documented and/or performance tested				
4.3	Duct system WHL leakage test <4 cfm/100 sf, OR no panned returns + sealed air handler				
4.4	No air handler or ducts in garage				
4.5	Rooms pressure balanced (individual room returns or jump/transfer grills)				
4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)				
4.7	Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)				
4.8	Filtration system: min. MERV 8, tight fitting filter rack, no ozone generators				
4.9	Independent dehumidification control to 60% RH (Warm Humid climates only - map pg 2)				
Combustion Source Controls:					
5.1	Gas heat direct vented: all heat & hot water power vented: no unvented heating appliances				
5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency standards (see Guide)				

4.1	HVAC load calcs & equipment design documented and/or performance tested
4.2	Duct system design documented and/or performance tested
4.3	Duct system <b>total</b> leakage test <4 cfm/100 sf, OR no panned returns + sealed air handler
4.4	No air handler or ducts in garage
4.5	Rooms pressure balanced (individual room returns or jump/transfer grills)
4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)
4.7	Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)
4.8	Filtration system: min. MERV 8, tight fitting filter rack, no ozone generators
4.9	Independent dehumidification control to 60% RH (Warm Humid climates only - map pg 2)

- 4.1 HVAC load calcs documented
- 4.2 Duct design documented
- 4.3 Duct system tested
- 4.4 No HVAC in garages



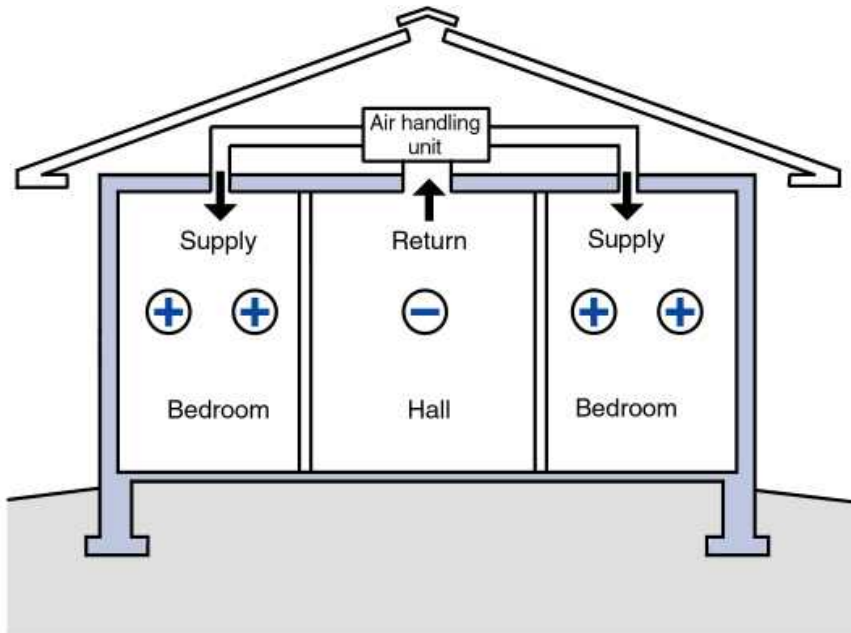
Documented



Field  
Verified



# 4.5 Rooms pressure balanced



JUMP DUCT

**OR Pressure Tested  $\leq 3$  Pa**



TRANSFER GRILLE



# 4.6 Ventilation Systems per Std 62.2

## 4.7 Local Exhaust Ventilation

LOCAL EXHAUST



BALANCED VENTILATION  
& HRV/ERV's



FRESH AIR  
DAMPER

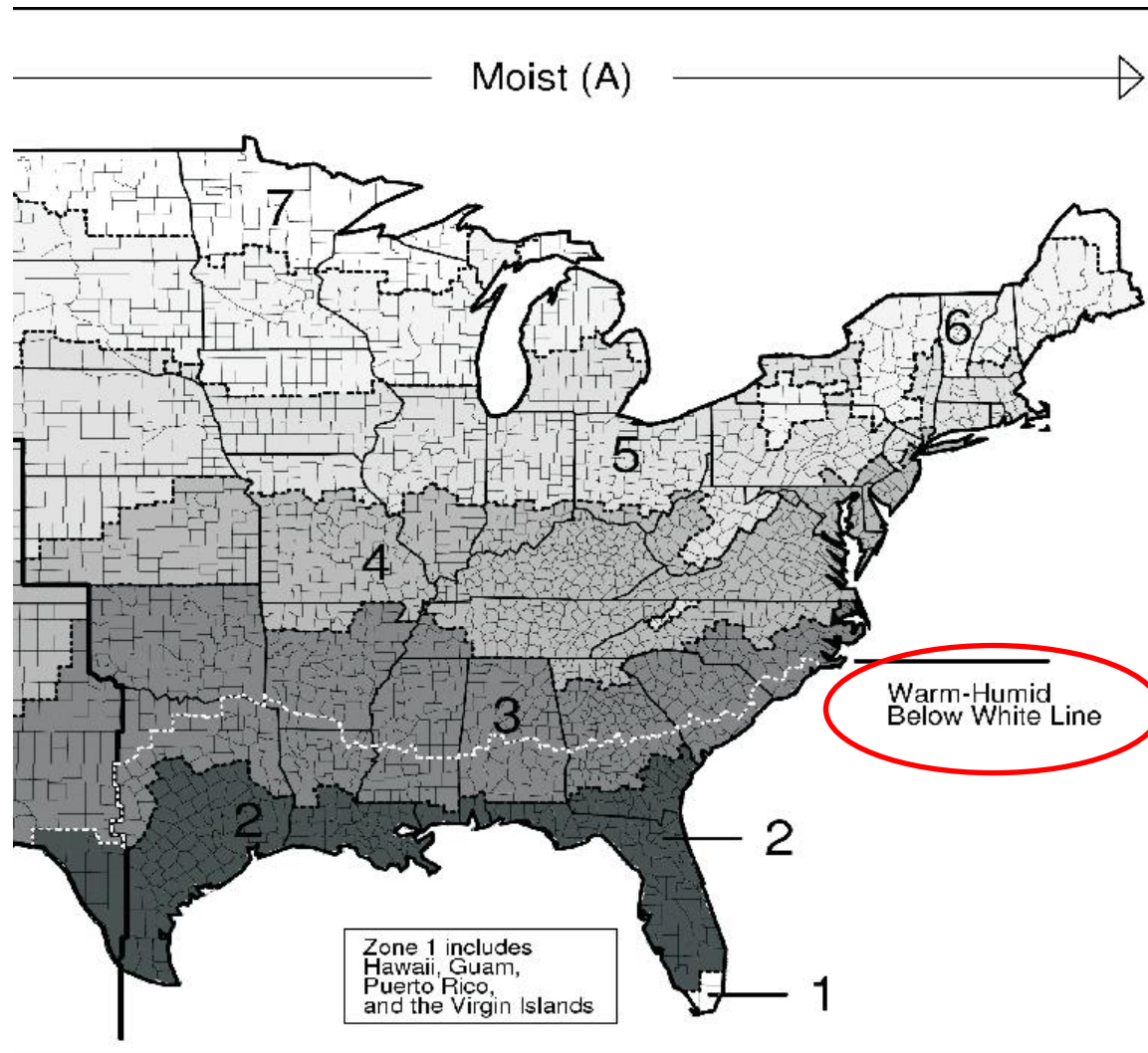


DUCTED FRESH AIR SUPPLY

## 4.8 MERV 8 Filter



# 4.9 Independent dehumidification control in warm humid climates



➡ Controlled to  $\leq 60\%$  RH

# Combustion Source Controls

ENERGY STAR Indoor Air Package Verification Sheet - DRAFT				
Address or Div/Let#:		ST:	Verified	
City:	Requirements (see IAP Builder Guide for details)	N/A	Builder	Date
Section	Water Managed Site & Foundation per DEBA Guide or equivalent, including:			
1.1	Site/Foundation drainage: sloped grade, drain tile, & dampproofing			
1.2	Capillary break below concrete slab			
1.3	Basement/crawlspaces: unvented, insulated, conditioned			
1.4	Basement/crawlspaces: vented, insulated, conditioned			

5.1	Gas heat direct vented; oil heat & hot water power vented; no unvented heating appliances
5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency stds (see Guide)
5.3	Certified CO alarms outside each sleeping area
5.4	No smoking common areas/outside smoking areas >25' from openings (Multi-family only)

4.2	Unit system design documented and/or performance tested				
4.3	Unit system #100: leakage test <4 cfm/100 sf. OR no paired returns + sealed air handler				
4.4	No air handler or ducts in garage				
4.5	Boots pressure balanced (individual room returns or jump/transfer grille)				
4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)				
4.7	Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)				
4.8	Filtration system: min. MERV 8, high filtering filter rack, no ozone generators				
4.9	Independent demand furnace control in cold hot/cold water demand climates only - map 29.2				
5.1	Gas heat direct vented; oil heat & hot water power vented; no unvented heating appliances				
5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency stds (see Guide)				
5.3	Certified CO alarms outside each sleeping area				
5.4	No smoking common areas/outside smoking areas >25' from openings (Multi-family only)				
6.1	Pressured wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions				
6.2	Low-VOC Paints & Finishes (approved labels only)				
6.3	Carpet, cushion, & adhesives qualified for CRI Green Label				
7.1	MEAC & ductwork commissioned: dry, clean, proper refrig. charge, & airflow to all registers				
7.2	Provide home buyer with completed checklist				
Rater/Provider:		Final Inspection Date:			
Company Name:		Builder Company Name:			
Signature:		Builder Signature:			

## IAQ Risks:

- CO poisoning
- Asthma triggers
- Other respiratory



## *5.1 Power Venting & Direct Venting*

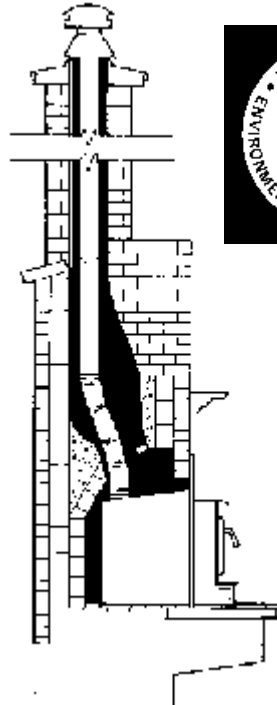


POWER VENTED WATER HEATER

DIRECT VENTED FURNACE



## 5.2 Fireplaces & Stoves Certified



## 5.3 Certified CO Alarms

## 5.4 No Smoking (multifamily)



CO ALARM



COMBINED CO & SMOKE  
ALARM



Enforceable policy in  
Multi-family buildings



# Attached Garages Isolated & Vented

**ENERGY STAR Indoor Air Package** for Review Only  
**Verification Sheet - DRAFT**

Address or Div/Let# \_\_\_\_\_ ST: \_\_\_\_\_  
City: \_\_\_\_\_

Section	Requirements (see IAP Builder Guide for details)	N/A	Builder	Inspector
Water Managed Site & Foundation per EBBA Guide or equivalent, including:	1.1 Site/foundation drainage: sloped grade, drain tile, & dampproofing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.2 Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.3 Basements/crawlspaces vented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.4 No vapor barrier on inside of basement/crawl space walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Water Managed Wall Assembly per EBBA Guide or equivalent, including:			
	1.5 Continuous drainage plane, flashed to foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.6 Fully flush windows and doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

5.5

Common walls/ceilings completely sealed & openings gasketed

5.6

Continuously rated exhaust fan (min. 50 cfm) in attached garages

## IAQ Risks:

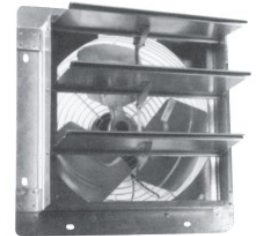
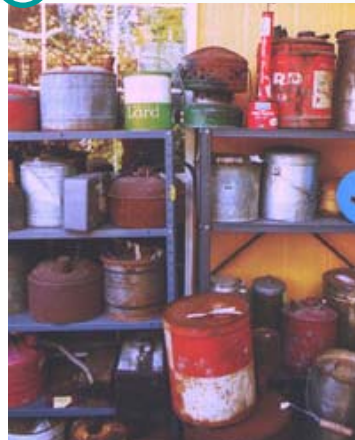
- CO poisoning
- Cancer
- Asthma triggers

HVAC	2.2	Test screens at all intentional openings (e.g. attic vents)	<input type="checkbox"/>	<input type="checkbox"/>	
	4.1	HVAC load calc & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	
	4.2	Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	
	4.3	Duct system 100% leakage test < 4 cfm/100 sf. OR no joined returns + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>	
	4.4	No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>	
	4.5	Room pressure balanced (individual room returns or jump/transfer grille)	<input type="checkbox"/>	<input type="checkbox"/>	
Combustion Source Controls	5.1	Gas heat direct vented; oil heat & hot water power vented; no unvented heating appliances	<input type="checkbox"/>	<input type="checkbox"/>	
	5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency standards (see Guide)	<input type="checkbox"/>	<input type="checkbox"/>	
	5.3	Certified CO alarm outside each sleeping area	<input type="checkbox"/>	<input type="checkbox"/>	
	5.4	No solid fuel combustion in attached garages (see Guide)	<input type="checkbox"/>	<input type="checkbox"/>	
	Attached & Isolated & Vented	5.5	Common walls/ceilings completely sealed & openings gasketed	<input type="checkbox"/>	<input type="checkbox"/>
		5.6	Continuously rated exhaust fan (min. 50 cfm) in attached garages	<input type="checkbox"/>	<input type="checkbox"/>
Interior	6.1	Refrigerated wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions	<input type="checkbox"/>	<input type="checkbox"/>	
	6.2	Low-VOC Paints & Primers (approved manufacturer)	<input type="checkbox"/>	<input type="checkbox"/>	
	6.3	Carpet, cushion, & adhesive qualified for GREEN Label	<input type="checkbox"/>	<input type="checkbox"/>	
Home Commissioning	7.1	HVAC & ductwork commissioned: dry, clean, proper refrig. charge, & airflow to all registers	<input type="checkbox"/>	<input type="checkbox"/>	
	7.2	Ventilate home before occupancy, or advise buyer	<input type="checkbox"/>	<input type="checkbox"/>	
Provide home buyer with completed checklist		<input type="checkbox"/>	<input type="checkbox"/>		
Rater/Provider: _____		Final Inspection Date: _____			
Company Name: _____		Builder Company Name: _____			
Signature: _____		Builder Signature: _____			


v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

# 5.5 Garage common walls/ceilings sealed

## 5.6 Exhaust fan (>50 cfm)



# Material Source Control

 <b>ENERGY STAR Indoor Air Package</b> <small>for Review Only</small> <b>Verification Sheet - DRAFT</b>			
Address or Div/Let#:		ST:	Verified
City:	Requirements (see IAP Builder Guide for details)	N/A	Builder Date:

6.1	Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions
6.2	Low-VOC Paints & Finishes (approved labels only)
6.3	Carpet, cushion, & adhesives qualified for CRI Green Label

2.1	Basement moisture barrier or exterior foundation waterproofing (see pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Basement moisture barrier per ASTM E1455, IRC, or equiv. (EPA Zone 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.2	Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.1	Air seal foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3.2	Peel screens at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.1	HVAC load calc & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.2	Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.3	Duct system MFR leakage test < 4 cfm/100 sf. OR no joined returns + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.4	No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.5	Room pressure balanced (individual room returns or jump/transfer grille)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.6	Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.7	Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryer, central vac, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.8	Filtration system: min. MERV 8, high filtering filter rack, no ozone generators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4.9	Independent demand/location control to 50% RH (Warm Humid climates only - see pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Combustion Source Controls:</b>				
5.1	Gas heat direct vented: all heat & hot water power vented; no unvented heating appliances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2	Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency standards (see Guide)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.3	Certified CO alarms outside each sleeping area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.4	No smoking common areas/outside smoking areas > 25' from openings (Multi-family only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Attached Garages: Isolated &amp; Vented</b>				
5.5	Common walls/ceilings completely sealed & openings gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.6	Common walls/ceilings sealed with 1/4" (min. 90 cfm) in attached garages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.1	Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.2	Low-VOC Paints & Finishes (approved labels only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6.3	Carpet, cushion, & adhesives qualified for CRI Green Label	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>IAQ &amp; Air Quality: Ventilation &amp; Filtration</b>				
Ventilate home before occupancy, or advise buyer				
Provide home buyer with completed checklist				
Rater/Provider:		Final Inspection Date:		
Company Name:		Builder Company Name:		
Signature:		Builder Signature:		

v3 - 1/3/2008

DRAFT - DO NOT DISTRIBUTE

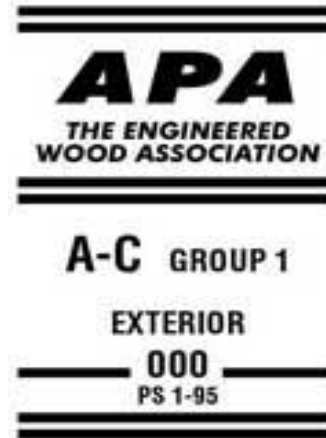
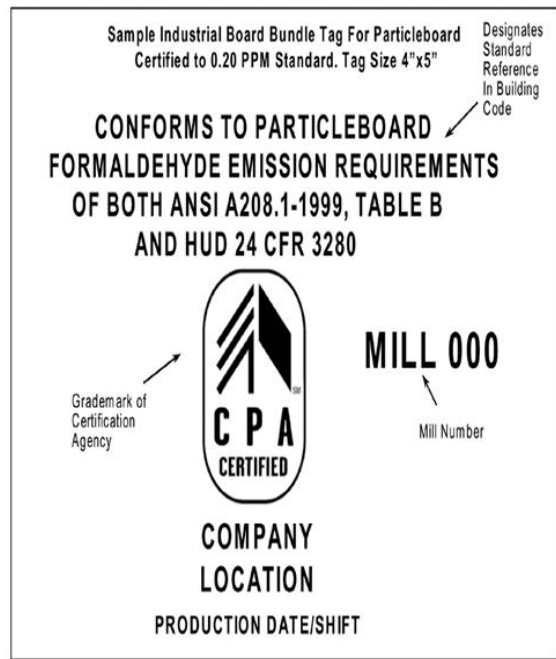
www.energystar.gov/homes/iaq

## IAQ Risks:


- Cancer
- Asthma triggers
- Other respiratory

# 6.1 Pressed wood materials – certified low formaldehyde

## MDF & Particleboard



## Plywood

HARDWOOD PLYWOOD & VENEER ASSOCIATION		
FORMALDEHYDE EMISSION 0.30 PPM CONFORMS TO HUD REQUIREMENTS	INDUSTRIAL PLYWOOD  MILL 000	GLUE BOND TYPE II ANSI/HPVA HP-1-2004

## *6.2 Low-VOC paints*

## *6.3 Low emitting carpets, pads*



Or other approved label ...

# Home Commissioning



**ENERGY STAR Indoor Air Package** for Review Only  
**Verification Sheet - DRAFT**

Address or Div/Lot#: \_\_\_\_\_ ST: \_\_\_\_\_  
 City: \_\_\_\_\_

Section	Requirements (see IAP Builder Guide for details)	Verified	Builder	Inspector
Water Managed Site & Foundation per EBBA (guide or equivalent, including:	1.1 Site/foundation drainage: sloped grade, drain tile, & damp-proofing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.2 Capillary break below concrete slabs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.3 Basements/crawlspaces: vented, insulated, conditioned	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.4 No vapor barrier on inside of basement/crawlspace walls	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Water Managed Wall Assembly per EBBA (guide or equivalent, including:</b>			
	1.5 Continuous drainage plane, flashed to foundation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.6 Fully flush windows and doors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Water Managed Roof Assembly per EBBA (guide or equivalent, including:</b>			
	1.7 Stormwater runoff system (e.g. gutters/downspouts) (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.8 Fully flush roof-wall intersections (step & kickout flashing) and all roof penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.9 Bituminous membranes at valleys & penetrations (Except Dry (B) climates - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1.10 Ice flashing at eaves (Except climates 1-4 - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Interior Water Management, including:	1.11 No wall-to-wall carpet in bathing areas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.12 1/2 Perm finish on inside of exterior walls (Climates 1, 2, 3A only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	1.13 Radon resistant features per ASTM E1465, IRC, or equiv. (EPA Zone 1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bath	2.2 Provide 2 radon test kits & instructions for use to homeowner (EPA Zones 1 & 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	2.3 Air seal foundation joints & penetrations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pests	3.2 Pest screens at all intentional openings (e.g. soffits/vents)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.1 HVAC load calc & equipment design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
HVAC	4.2 Duct system design documented and/or performance tested	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.3 Duct system MFR leakage test < 4 cfm/100 sf, OR no joined returns + sealed air handler	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.4 No air handler or ducts in garage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.5 Return pressure balanced (individual room returns or jump/transfer grille)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.6 Ventilation systems compliant with ASHRAE Std 62.2 (bath/kitchen exhaust + whole house)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.7 Known pollutant sources vented outdoors (i.e. baths, kitchen, clothes dryers, central vac, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.8 Filtration system: min. MERV 8, high filtering filter rack, no ozone generators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	4.9 Independent demand/feature control to 50% RH (Warm Humid climates only - map pg 2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>Combustion Source Controls:</b>			
	5.1 Gas heat direct vented: all heat & hot water power vented; no unvented heating appliances	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5.2 Fireplaces & wood/pellet stoves certified to appropriate emissions/efficiency standards (see Guide)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.3 Certified CO alarm outside each sleeping area	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5.4 No smoking common areas/outside smoking areas > 25' from openings (Multi-family only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Attached Garages Isolated & Vented	5.5 Common walls/ceilings completely sealed & openings gasketed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	5.6 Continuously rated exhaust fan (min. 90 cfm) in attached garages	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interior	6.1 Pressed wood materials (plywood, OSB, MDF) certified low-formaldehyde emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.2 Low-VOC Paints & Finishes (approved labels only)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	6.3 Carpet: available	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home Commissioning	HVAC & ductwork commissioned: dry, clean, proper refrigerant charge, & airflow to all registers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ventilate home before occupancy, or advise buyer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Provide home buyer with completed checklist		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Rate/Inspector: \_\_\_\_\_ Final Inspection Date: \_\_\_\_\_  
 Company Name: \_\_\_\_\_ Builder Company Name: \_\_\_\_\_  
 Signature: \_\_\_\_\_ Builder Signature: \_\_\_\_\_

v3 - 1/3/2008 DRAFT - DO NOT DISTRIBUTE www.energystar.gov/homes/iap

Home Commissioning	HVAC & ductwork commissioned: dry, clean, proper refrigerant charge, & airflow to all registers
	Ventilate home before occupancy, or advise buyer
	Provide home buyer with completed checklist

# STEPS to Start Building With the ENERGY STAR INDOOR AIR PACKAGE

1. Work with a HERS Rater to evaluate your homes, just like your first ENERGY STAR qualified home
2. Build IAP qualified homes
3. Rater verifies during 2 ENERGY STAR inspections & labels homes
4. Market & sell homes with stronger promise of good IAQ
5. Tell us your story, so we can recognize your company




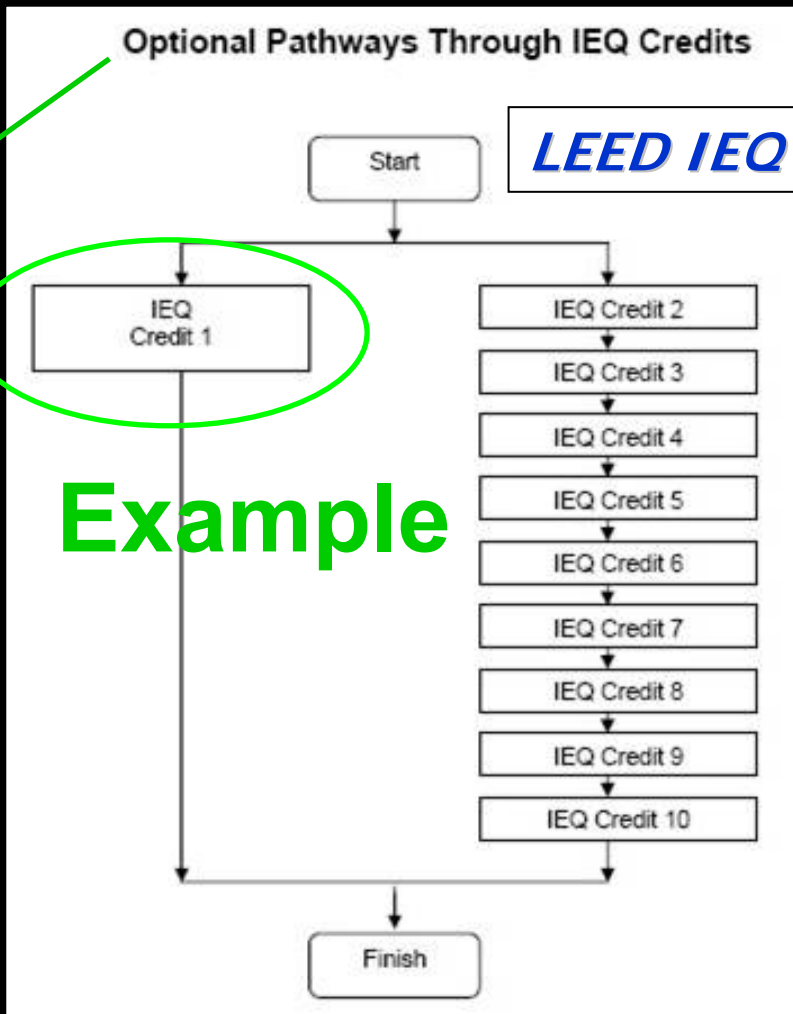
[www.energystar.gov/homes/iap](http://www.energystar.gov/homes/iap)

Werling.eric@epa.gov



# Green Programs?

 <b>LEED</b> for HOMES		<b>Project Checklist</b> Project ID: _____ Project Name: _____	<b>Maximum Points =</b> 100
<b>Address:</b> _____ <b>Address:</b> _____ <b>City/State/Zip:</b> _____		<b>LEED for Homes Version:</b> 4.0	<b>Doc. Number:</b> _____ <b>Date:</b> _____
<b>Part 1: General Information</b> (10 Points)			
1.1	1.1.1	1.1.1.1	1.1.1.1
1.2	1.2.1	1.2.1.1	1.2.1.1
1.3	1.3.1	1.3.1.1	1.3.1.1
1.4	1.4.1	1.4.1.1	1.4.1.1
1.5	1.5.1	1.5.1.1	1.5.1.1
1.6	1.6.1	1.6.1.1	1.6.1.1
1.7	1.7.1	1.7.1.1	1.7.1.1
1.8	1.8.1	1.8.1.1	1.8.1.1
1.9	1.9.1	1.9.1.1	1.9.1.1
1.10	1.10.1	1.10.1.1	1.10.1.1
1.11	1.11.1	1.11.1.1	1.11.1.1
1.12	1.12.1	1.12.1.1	1.12.1.1
1.13	1.13.1	1.13.1.1	1.13.1.1
1.14	1.14.1	1.14.1.1	1.14.1.1
1.15	1.15.1	1.15.1.1	1.15.1.1
1.16	1.16.1	1.16.1.1	1.16.1.1
1.17	1.17.1	1.17.1.1	1.17.1.1
1.18	1.18.1	1.18.1.1	1.18.1.1
1.19	1.19.1	1.19.1.1	1.19.1.1
1.20	1.20.1	1.20.1.1	1.20.1.1
1.21	1.21.1	1.21.1.1	1.21.1.1
1.22	1.22.1	1.22.1.1	1.22.1.1
1.23	1.23.1	1.23.1.1	1.23.1.1
1.24	1.24.1	1.24.1.1	1.24.1.1
1.25	1.25.1	1.25.1.1	1.25.1.1
1.26	1.26.1	1.26.1.1	1.26.1.1
1.27	1.27.1	1.27.1.1	1.27.1.1
1.28	1.28.1	1.28.1.1	1.28.1.1
1.29	1.29.1	1.29.1.1	1.29.1.1
1.30	1.30.1	1.30.1.1	1.30.1.1
1.31	1.31.1	1.31.1.1	1.31.1.1
1.32	1.32.1	1.32.1.1	1.32.1.1
1.33	1.33.1	1.33.1.1	1.33.1.1
1.34	1.34.1	1.34.1.1	1.34.1.1
1.35	1.35.1	1.35.1.1	1.35.1.1
1.36	1.36.1	1.36.1.1	1.36.1.1
1.37	1.37.1	1.37.1.1	1.37.1.1
1.38	1.38.1	1.38.1.1	1.38.1.1
1.39	1.39.1	1.39.1.1	1.39.1.1
1.40	1.40.1	1.40.1.1	1.40.1.1
1.41	1.41.1	1.41.1.1	1.41.1.1
1.42	1.42.1	1.42.1.1	1.42.1.1
1.43	1.43.1	1.43.1.1	1.43.1.1
1.44	1.44.1	1.44.1.1	1.44.1.1
1.45	1.45.1	1.45.1.1	1.45.1.1
1.46	1.46.1	1.46.1.1	1.46.1.1
1.47	1.47.1	1.47.1.1	1.47.1.1
1.48	1.48.1	1.48.1.1	1.48.1.1
1.49	1.49.1	1.49.1.1	1.49.1.1
1.50	1.50.1	1.50.1.1	1.50.1.1
1.51	1.51.1	1.51.1.1	1.51.1.1
1.52	1.52.1	1.52.1.1	1.52.1.1
1.53	1.53.1	1.53.1.1	1.53.1.1
1.54	1.54.1	1.54.1.1	1.54.1.1
1.55	1.55.1	1.55.1.1	1.55.1.1
1.56	1.56.1	1.56.1.1	1.56.1.1
1.57	1.57.1	1.57.1.1	1.57.1.1
1.58	1.58.1	1.58.1.1	1.58.1.1
1.59	1.59.1	1.59.1.1	1.59.1.1
1.60	1.60.1	1.60.1.1	1.60.1.1
1.61	1.61.1	1.61.1.1	1.61.1.1
1.62	1.62.1	1.62.1.1	1.62.1.1
1.63	1.63.1	1.63.1.1	1.63.1.1
1.64	1.64.1	1.64.1.1	1.64.1.1
1.65	1.65.1	1.65.1.1	1.65.1.1
1.66	1.66.1	1.66.1.1	1.66.1.1
1.67	1.67.1	1.67.1.1	1.67.1.1
1.68	1.68.1	1.68.1.1	1



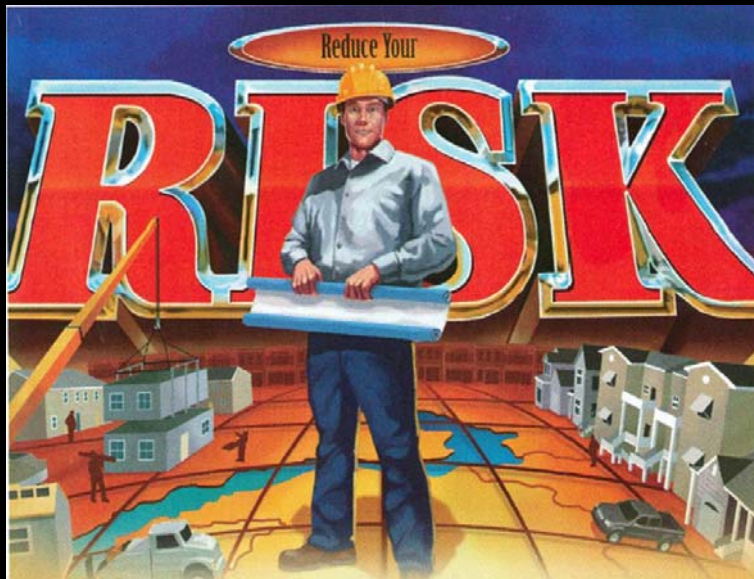
**LEED IEQ Credit 1 = IAP**

**PLUS**

*Over 20  
durability  
features not  
required in  
LEED*

# IAQ RISK Management Summary

1. Control Known Problems
2. Tell Your Story



What's the name going to be?  
Help us decide ...

“Indoor Air Plus” logo concept



Option 1a



Option 1b

# What's the name?

“Indoor Air Care” logo concept



Option 2



Option 3