



BUILDING BETTER HOMES

~ THE ENERGY DESIGNED TOP TEN ~

(From the *ABCs of Energy Efficiency*, a 2003 OBBS approved course for Architects, Builders, and Code Officials)



With suggested construction techniques to help insure that
Your home will perform as intended

1. MANAGE WATER - KEEP IT OUT AND LET IT OUT!

- a. Develop drain planes, gutters, and grade; air flow and vapor retarder systems.
- b. More moisture is carried into wall cavities by air movement than by vapor transmission. *We need air flow retarders not vapor barriers.*
- c. Design wall assemblies to dry to both the inside and the outside.
 - i. Eliminate interior *and* exterior *vapor barrier* systems. Don't use poly. (Call if your local codes "require" polyethylene, Visqueen, or plastic wrap.)
See > <http://www.EnergyDesignedHomes.com/Papers/Vapor-AirBarriers.pdf>
- d. Develop an effective vapor retarder system
 - i. Insulation Kraft paper backing is an approved vapor retarder
 - ii. Drywall with two coats of paint can be an effective vapor retarder

2. INSULATE - THE ENTIRE SHELL, ATTIC TO FOOTER!

- a. Insulate the foundation, the walls, and the attic; do it now or pay forever.
 - i. Insulate crawl space walls, not the floor above. Water managed crawl spaces do not require ventilation. Call me if local codes "require" crawl vents.
See > <http://www.EnergyDesignedHomes.com/Papers/CrawlVenting.pdf>
- b. Keep insulation adjacent to warm surface – face staple fiberglass insulation
- c. Protect from air wash
 - i. Insulation loses effective R-value rapidly if open to air wash or if unconditioned air is allowed between it and the warm surface.
 - ii. Glue wall drywall at top plate adjacent to cold space
 - iii. Chute over exterior walls to soffit to protect attic perimeter insulation
 - iv. Block floor joist cavities open to kneewall attics (as in cape cod construction and in bonus rooms over garages)
See > <http://www.EnergyDesignedHomes.com/Papers/BonusRooms.pdf>
- d. Keep insulation dry AND allow to dry
 - i. Develop an effective air flow retarder for walls and ceiling
 - ii. Airflow retarders keep moist air out of wall cavities and the attic; vapor barriers keep moisture in wall cavities from drying to the living area inside
 - iii. Seal drywall by gluing cut edges: at top, bottom, door, and window openings

3. VENTILATE RIGHT - MECHANICALLY!

- a. Test air tightness before prescribing an "add more air" ventilation strategy. The home energy audit will give you a measure of air tightness. Ask your rater if more ventilation is required.

- b. Plan to use simple exhaust only ventilation unless testing demands more air exchange. One high quality bathroom fan can double as bath fan and as a whole house ventilator.

4. MAKE AIRTIGHT - REDUCE RANDOM AIR LEAKAGE!

- a. Random air leakage cannot be controlled
- b. Seal all penetrations *to the outside or to unconditioned space*
- c. Understand airflow dynamics; houses generally **ARE NOT TOO TIGHT**. (>3a)
See > <http://www.EnergyDesignedHomes.com/Papers/VentCalc.pdf>

5. RIGHT SIZE - MECHANICAL SYSTEMS!

- a. Bigger is not better; proper runtime is important for temperature and humidity control.
- b. Have contractor run ACCA Manual J, D, and S reports, get copies.
- c. 50% oversized is equivalent to about a 5 AFUE reduction in performance (a 90 becomes an 85 AFUE furnace)
- d. Consider the Combination Space and Hot Water Heater; the hot water tank can heat the properly insulated and properly built home; you don't need a furnace.
See > <http://www.EnergyDesignedHomes.com/Papers/Combo-Htrs.pdf>

6. ADD MASS - DAMPEN DAILY TEMPERATURE SWINGS!

- a. Insulating the foundation on the outside brings it into the thermal envelope, keeps it warm, and adds mass to the conditioned space.
- b. Warm walls don't condense moisture (no moisture, no mold).

7. ASK ... ALWAYS ASK ... DOES IT WORK?

- a. We've been doing so many things "that way" for so many years; we sometimes forget why.
- b. Codes are the legal minimum standard, let's make sure the house works to the intent of the code, preferably better.

8. TEST ... TO BE SURE!

- a. How can we prescribe the remedy without knowing the ailment?
- b. ENERGY STAR HOMES are tested.

9. LOOK for ENERGY STAR® Certified Homes!

- a. If the home is certified, someone has done his or her homework.
- b. ENERGY STAR® or HERS Raters are trained and certified in house diagnostics.

10. BECOME an ENERGY DESIGNED HOMESSM PARTNER!

- a. ENERGY DESIGNED HOMESSM is at the forefront of Ohio's new construction, and improved building performance initiatives.
- b. Partner with Ohio trained energy experts.
- c. Call or email me anytime
 - i. Phone: (614) 432-HOME (4663)
 - ii. Email: <mailto:Paul@Rimelspach.com>
 - iii. Web: <http://www.EnergyDesignedHomes.com>
- d. Partners make it happen!