A Rater's perspective from the field

Thomas H. Marston, February 21, 2007





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The checklist looks at the thermal envelope - the place where air sealing and insulation meet. Each of the items addresses a potential problem

If you understand this slide, you understand the checklist. We'll come back to this Shower/tub at exterior wall Exterior walls have been enclosed on all six sides and exterior walls have been fully insulated

First insulation is installed – note ladder framing - then a nailer is installed, then an airtight barrier. The barrier could be anything – OSB, sheetrock, Thermo-Ply, etc.

An easy method is to first insulate, then install a thin material such as Thermo-ply or TyveK so that the drywall overlaps the edges when it is installed.

Shower/tub at exterior wall

Equally important for comfort is to make sure there are no leaks in walls behind the tubs

5 foot tub in a 6 foot bathroom

Strips added to make sheetrock line up with tub flange $-\frac{1}{4}$ " slot at top of wall.

Insulated floor above garage

air dams under exterior wall of room above garage

air dams at ends and at interior wall under room over garage

Insulated floor above garage

Improper insulation - must touch the surface it is intended to insulate. Look on the bag the insulation came in for directions!

Attic Knee Walls

Continuous top and bottom plates are installed with an air barrier on an attic side of insulated walls, including exposed edges of insulation at joists and rafters, and insulation is in complete alignment with the interior finish and the attic side air barrier

Attic Knee Walls

6th side to keep insulation in contact with drywall, to keep it from falling off, and to prevent wind washing

Short kneewall

Tall kneewall

Odd kneewall

Could be OSB, sheetrock, Thermo-Ply, etc.

Attic Knee Walls The area below the kneewall is more important for comfort and bills

6th side on the wall above, but joists open below

Sealed Tight

Attic Knee Walls

No kneewall sheathing and cavity under kneewall open Open web joist cavity open to attic -sealed tight

Attic Knee Walls

Ducts running from the attic to below the kneewall

Sealed tight

Attic Access Panel/ Pull Down Stair Attic access panel or stair is fully gasketed for an airtight fit, and covered with insulation that is attached and fits snugly in the framed opening

Attic Access Panel/ Pull Down Stair

Insulation not touching the hatch - no alignment

Self-stick gasket and properly sized batt fastened to back of the hatch

Attic Access Panel/ Pull Down Stair Responsibility for this item may best belong to your job super

One solution – a gasketed stair cover, or for under \$200 you can buy a gasketed insulated unit

Air barrier spans cantilever and any exposed edges of insulation, and floor framing is completely filled with insulation or it is installed to maintain permanent contact with sub floor decking

Three bay windows and an overhang

Two bay windows, a fireplace, and an overhang

cantilevered floor not sealed and not insulated properly cantilever before siding – "j" channel will hide this but not seal it

Daylight showing air leaks

Sealed tight, ready for full depth insulation

Overhang sealed and insulated first, then air dam installed.

Duct, Piping, Flue Shaft Penetrations Opening is fully sealed with solid blocking, flashing foam and caulk, and clearance between flue and combustibles is properly closed with UL approved collars and sealed with firerated sealant

Chases open at attic

Duct, Piping, Flue Shaft Penetrations

The mother of all chases

plumbing, electrical, duct, gas line, condensate line, flue with hi-temp caulk

Dropped Ceiling / Soffit Air barrier is fully aligned with insulated framing and any gaps are sealed with caulk, foam, or tape

Dropped Ceiling / Soffit

Duct soffit sealed with styrofoam and foam

Kitchen soffit sealed with styrofoam and foam

Dropped Ceiling / Soffit

Kitchen soffit sealed at joist level with styrofoam & foam.

Archway between 2 rooms forming 'soffit' - sealed inside with foam.

Dropped Ceiling / Soffit

Very difficult soffit - under heated space and open to unheated space. Duct is insulated 'outside' and not 'inside', wire runs 'outside' to 'inside'. Where is the thermal envelope?

Air barrier is fully aligned with insulated framing in framed shaft behind fireplace, and any gaps are fully sealed with caulk foam, or tape

Typical fireplace chase. Treat this area like a little room with every surface sealed & insulated.

Thermo-Ply, sheet metal, drywall, or other rigid material cut to fit as a "ceiling", and installed with R-30 above

Seal every crack and hole in the chase

Insulate the walls - the ceiling is already done and under the floor will be insulated from the basement

Seal the flange to the framing

Seal the flue to the flange

This is a very critical part of the installation – the flange must be sealed to the framing and the flue must be sealed to the flange.

Your installer is the only one that can properly do this.

Another cold fireplace problem -Wood burning fireplace with 3/4" furring strips open to attic above

Recessed Lighting

Airtight IC-rated recessed light fixtures are sealed to drywall with gasket, caulk, or foam

Poor insulation of an IC light

Blower Door shows air leakage at drywall joint

This is already in most codes

Recessed Lighting

Unacceptable. Does not meet most codes because of multiple holes Washington State Energy Code Approved. Still need to gasket or caulk at drywall

Porch Roof

Air barrier is installed at the intersection of the porch roof and exterior wall

Cold air between heated floors - coming in from porch across front of house

Porch Roof

From outside, porch is open into 'Cape Cod' area of the second floor.

From inside, heated floor above is exposed to outside air.

Porch Roof

Air dams installed - ready for insulation.

Common Walls Between Dwelling Units Air barrier is installed to seal the gap between a gypsum shaft wall and the structural framing between units in duplex or townhouse construction

Air in first floor party wall of 2 story housebiggest energy problem in the house

Front door at party wall

Common Walls Between Dwelling Units

From the outside, corner between 2 units will get covered by 'J' channel, siding, but will still leak air.

Same gap from inside

Sealed party wall

Common Walls Between Dwelling Units

Double whammy – gap at block wall, another at double framing

Side is as important as top

Remember is?

A fireplace with a flue that goes through a kneewall, with a soffit above, with a chase to the right, and with open joist cavities below. Now what??

If you are not removing insulation to inspect these bypasses, you are missing them!

Sound batt in place

Party wall sealed

Wire hole sealed, but party wall is not

Insulation in place, can't see the end of the porch beam

Insulation in place

Wall sealed

Insulation in wrong place, area not sealed

Insulation in place

Band sealed

Who Does What

Builder's staff

Get the framer to complete

Air Sealer

Proper materials, installed before insulation Fireplace installer

Show him a leaky install

Electrician

Spec code compliant lights

Painter –

Caulking before trim pieces

Insulator

Fill the cavities

Each of these subs needs your guidance

What You Don't Want To See

Caulk where there is no leak – wasted time and money

What You Don't Want To See

Airtight foam on nonairtight rock wool.

Plenty of caulk, but no airtight back on insulation at the attic.

Questions?

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