

## **Air Infiltration and Insulation Installation (QII) – Framing Stage (Air-Sealing) – Part I**

- QII – Quality Insulation Installation
- An air barrier is required in all thermal envelope assemblies to limit air movement between unconditioned/outside spaces and conditioned/inside spaces
- Below are the areas that make-up the thermal envelope. The intent is to air-seal prior to insulating
- I included some examples, but the entire checklist is attached (ENV-21 and ENV-22)



2016-CF3R-ENV-21- 2016-CF3R-ENV-22-  
HERS-QII-FramingSt.CeilingAirBarrier.doc

### **Raised Floor Air Barrier - (If applicable)**

- All gaps in the raised floor are sealed
- All chases sealed at floor level using a hard cover and the hard cover is sealed.
- All plumbing and electrical wires that penetrate the floor are sealed.
- Subfloor sheathing is glued or sealed at all exterior panel edges to create a continuous air tight subfloor.

### **Walls/Knee Wall Air Barrier – (Some examples below. Full checklist attached)**

- All penetrations through the exterior wall air barrier are sealed to provide an air-tight envelope to unconditioned spaces such as the outdoors, attic, garage, and crawl space.
- Exterior wall air barrier is sealed to the top plate and bottom plate in each stud bay.
- All electrical boxes including knockouts that penetrate the air barrier to unconditioned space are sealed.
- All openings in the top and bottom plate, including all interior and exterior walls, to unconditioned space are sealed; such as holes drilled for electrical and plumbing.
- Exterior bottom plates (all stories) are sealed to the floor using the appropriate sealing method.
- All gaps around windows and doors are sealed. The sealant used follows window manufacturer specifications.

### **Ceiling/Attic Air Barrier– (Some examples below. Full checklist attached)**

- For vented attics much of the ceiling air barrier is verified after the ceiling drywall is installed using the ENV-22.
- For unvented attics ensure all penetrations through the roof deck and gable ends are sealed and airtight.
- All eave/soffits vents are covered with a rigid ventilation baffle that maintains the net free ventilation area.
- All dropped ceilings are covered with hard covers and sealed to framing.

### **Conditioned Space Above or Adjacent to Garage Air Barrier– (Some examples below. Full checklist attached)**

- All penetrations in the subfloor above the garage into conditioned space must follow the raised floor air barrier requirements above.

**Walls for Attached Porch, Attic, Double Wall Air Barrier– (Some examples below. Full checklist attached)**

- An exterior wall air barrier is required at the intersection of the porch and exterior wall when there is conditioned space on the other side. The exterior wall includes an air barrier where the attic attaches to the conditioned space.

**Cantilevered Floor Air Barrier– (Some examples below. Full checklist attached)**

- Exterior sheathing is installed to the bottom of the cantilever so that there is a continuous air and weather barrier for the cantilever. The cantilevered joist must be insulated to the same R-value as would be required for the subfloor prior to closing.

**Multifamily Air Barrier– (Some examples below. Full checklist attached)**

- Multifamily buildings must meet all air sealing requirements for single family buildings listed above.

**Ceiling Inspection – Vented Attics– (Some examples below. Full checklist attached)**

- There is a continuous air barrier at the ceiling level. All openings into walls, drops, chases, or double walls are sealed. Examples are below.
- Chimneys and flues require sheet metal flashing. The flashing shall be sealed to the chimney/flue with fire rated caulk. The flashing shall be sealed to the surrounding framing.
- All penetrations through the top plate of interior and exterior walls are sealed.
- All penetrations shall be sealed to the surrounding drywall or have a secondary air barrier created around the fixture; with the exception of fire sprinklers.

**Roof Inspection – Unvented attics– (Some examples below. Full checklist attached)**

- There is a continuous air barrier at the roof deck and gable ends.

**Insulation Installation – Part II**

- This part covers installation of the insulation
- I included some examples, but the entire checklist is attached (ENV-23)
- Also include are the requirements for SIP/ICF construction (ENV-24)



2016-CF3R-ENV-23- 2016-CF3R-ENV-24-  
HERS-QII-Insulation!HERS-QII-FramingSt:

### **Quality of All Installed Insulation– (Some examples below. Full checklist attached)**

- Installed insulation R-values is the same or greater than specified on the CF1R.
- No gaps or voids between the insulation and framing.
- Gaps between studs shall be filled with insulation.
- Batt - ensure the ends are cut so there are no gaps.
- Batt - insulation is cut around obstructions like electrical boxes and no gaps exist.
- Batt - insulation is not compressed (no stuffing of the insulation into the cavity).
- Batt insulation is delaminated around all plumbing and electrical lines in ceilings, walls and floors.

### **Ceiling/Roof Insulation– (Some examples below. Full checklist attached)**

- Insulation extends to the outside edge of the exterior top plates and is flush against any ventilation dams/baffles.
- Insulation is in direct contact with ceiling so there are no gaps between the ceiling and the insulation.
- Attic access doors are insulated to the same R-value required by the CF1R for roof insulation and the insulation is permanently attached using adhesive or mechanical fasteners. Preferred method is rigid insulation.
- Attic access forms airtight seal from conditioned space to unconditioned space. Vertical attic access requires mechanical compression using screws, or latches.

### **Wall Insulation– (Some examples below. Full checklist attached)**

- Batts, loose fill mineral fiber, mineral and natural wool, and cellulose: fills cavity and is in contact with air barrier on six sides.
- Double walls and bump-outs - insulation fills the cavity, or additional air barrier is installed so the insulation fills the cavity and is in contact with the insulation on all six sides unless SPF is used. Insulation shall be installed on the exterior of the double walls/bump-outs.
- Low expanding foam used around windows and doors, if allowed by the manufacturer. If not allowed fill cavity with insulation. Batts are not allowed to be stuffed into space.
- Electrical panel in exterior insulated wall the panel is air tight and insulation is installed behind the panel.

### **Raised Floor Insulation Quality / Floor Above Garage Insulation Quality -(Some examples below. Full checklist attached)**

- Insulation is in full contact with subfloor.
- Insulation hangers are spaced at 18 inches or less, insulation hangers do not compress insulation.
- Netting, or mesh, can be used if the cavity under the floor is filled and in contact with the subfloor.

**Cantilevered Floor Insulation Quality-(Some examples below. Full checklist attached)**

- Insulation is in full contact with cantilevered subfloor. Insulation hangers are spaced at 18 inches or less, insulation hangers do not compress insulation. Netting or mesh can be used if the cavity under the floor is filled and in contact with the subfloor.
- Sealed Blocking shall be installed between joists where the wall rim joist would have been located in the absence of a cantilever. Insulation shall be placed on both sides of this block.

**Attached Porch Roof Insulation Quality-(Some examples below. Full checklist attached)**

- Exterior wall at the intersection of the porch roof is fully insulated above, below and behind the roof line.
- Where truss framing is used, airtight blocking is used at the top and bottom of each wall/roof section and insulated.