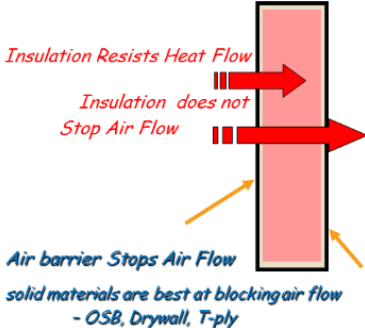
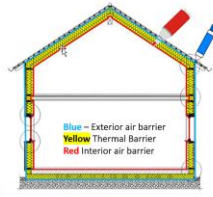
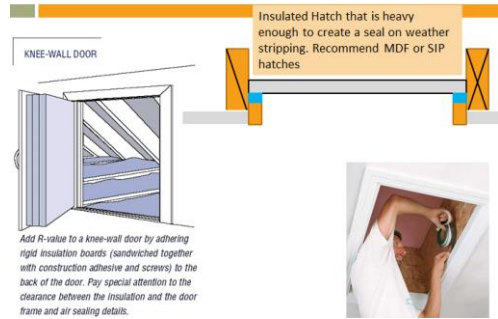
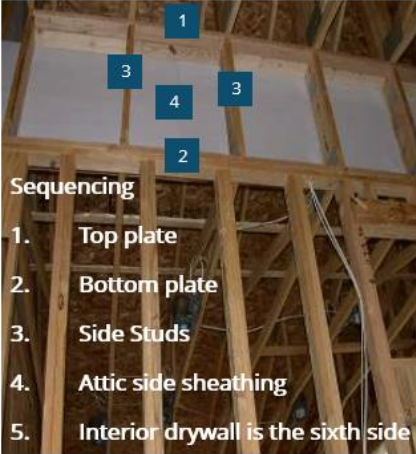
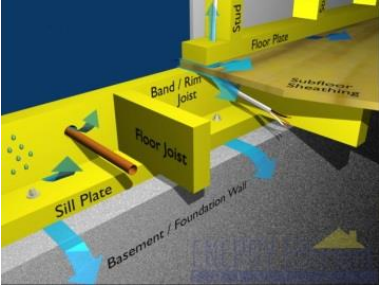
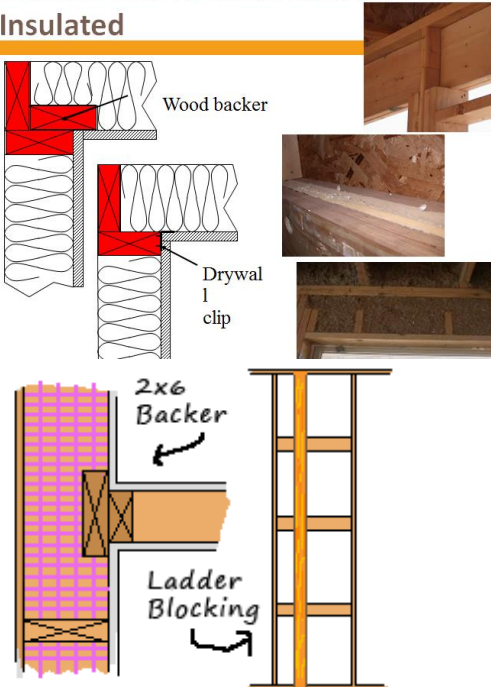
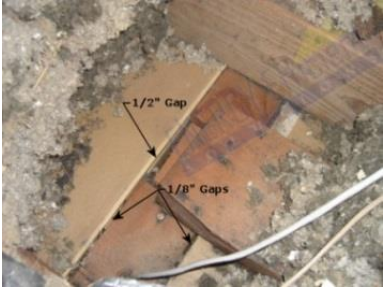


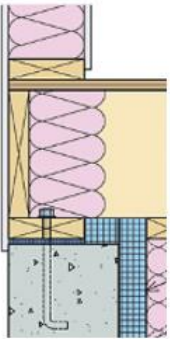
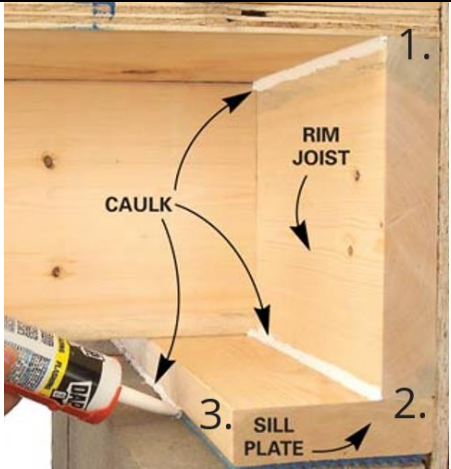
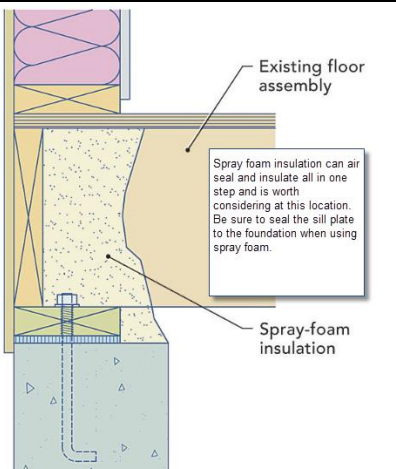
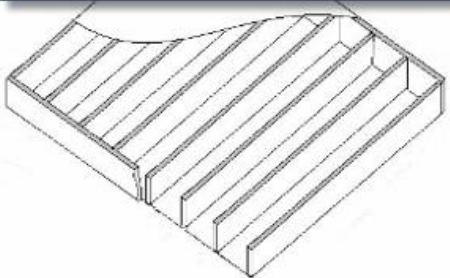
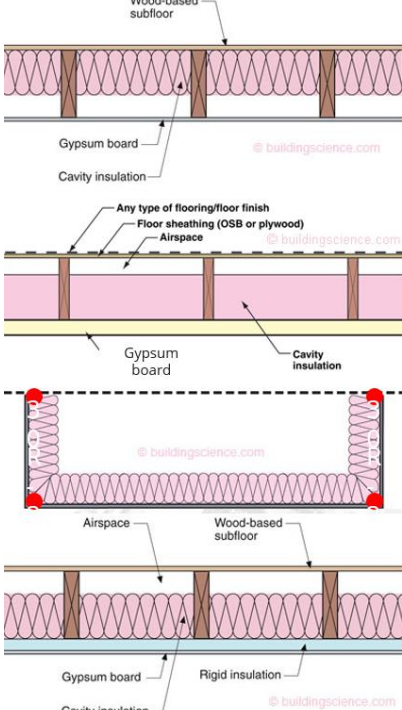
2018 IECC Mandatory Table R402.4.1.1

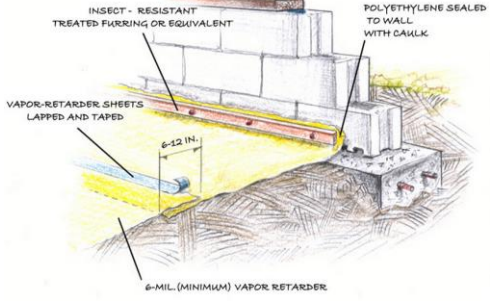
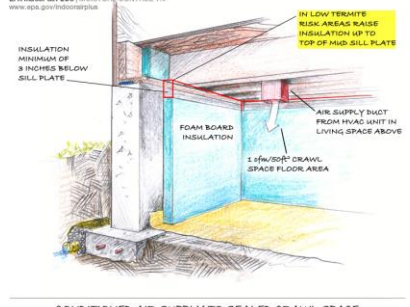
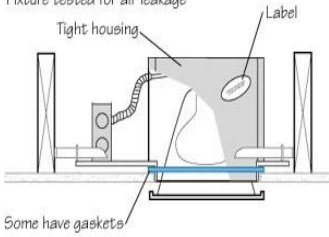
AIR BARRIER AND INSULATION INSTALLATION ^a

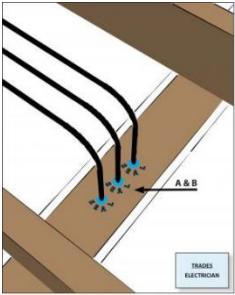
This mandatory section of the code has been adapted into a checklist and interpreted to best illustrate how to achieve the air tightness requirements of the IECC.

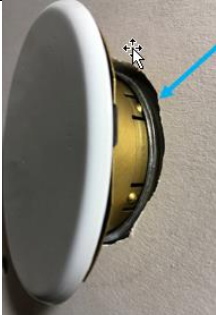
COMPONENT	AIR BARRIER AND AIR SEALING CRITERIA	INSULATION INSTALLATION CRITERIA		
General requirements	☐ A continuous air barrier shall be installed in the building envelope. ☐ The exterior thermal envelope contains a continuous air barrier. ☐ Breaks or joints in the air barrier shall be sealed. (Continuity of the primary exterior air barrier, sheathing materials like OSB, and the interior air barrier, usually drywall, create the codes air barrier assemblies' belts and suspenders approach; working together to create an airtight house. This table points out areas where supplemental air barrier are often needed.)	☐ Air-permeable insulation shall not be used as an air sealing material. 	IECC and the Building Thermal Envelope R103.2.1 Building thermal envelope depiction. - The building thermal envelope shall be represented on the construction documents.  BUILDING THERMAL ENVELOPE. - The basement walls, exterior walls, floors, ceiling, roofs and any other building element assemblies that enclose conditioned space or provide a boundary between conditioned space and exempt or unconditioned space.	5 Key Air Barrier Attributes Continuity: The most important element in 3D structures with so many different components Impermeability: The ABS must be impermeable to Air flow Strength: The ABS must be designed to transfer the full designed wind load and continue to be impermeable Durability: The ABS must continue to be impermeable throughout its service life Stiffness: The ABS must be stiff enough so that irregularities do not change its permeance
Ceiling/attic	☐ The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier shall be air sealed. ☐ Access openings, drop downstairs or knee wall doors to unconditioned attic spaces shall be air sealed. (Install the air barrier 1st and then do the over framing for the drop ceiling. This brings the drop ceiling into the building envelope. Thing about sequencing of construction and that many of the air barrier systems are the responsibility of the framing crew not the insulation crew)	☐ The insulation in any dropped ceiling/soffit shall be aligned with the air barrier. (Insulation must be in contact with the surface it is intended to insulate. That surface is often also the air barrier)	Ceiling Access Openings 	

Walls	☐ The junction of the foundation and sill plate shall be sealed. ☐ The junction of the top plate and the top of exterior walls shall be sealed. ☐ Knee walls shall be air sealed.  Sequencing 1. Top plate 2. Bottom plate 3. Side Studs 4. Attic side sheathing 5. Interior drywall is the sixth side	☐ Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, <i>R</i>-value, of not less than R-3 per inch. ☐ Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. 	Corners and Headers shall be Insulated 	 Top Plate to drywall connection 
Windows, skylights and doors	☐ The space between framing and skylights, and the jambs of windows and doors, shall be air sealed.	(Backer rod, low expansion foam, and other air impermeable materials should be used to insulate and seal the gap between windows, doors, and the framing material. Ensure that the material and installation promote drying and drainage to the outside.)		

Rim joists	☐ Rim joists shall include an <i>air barrier</i>. (With the wall requirements above the following should be air sealed: 1. Sill plate to foundation 2. Rim board to sill plate 3. Rim board to subfloor Then insulation needs to be in permanent contact with the rim board. The code does not mandate air impermeable insulation to installation is crucial at this location.)	☐ Rim joists shall be.  If used, batts must be placed in complete contact with the rim board.	 1. RIM JOIST 2. SILL PLATE 3. CAULK	 Existing floor assembly Spray foam insulation can air seal and insulate all in one step and is worth considering at this location. Be sure to seal the sill plate to the foundation when using spray foam. Spray-foam insulation
Floors, including cantilevered floors and floors above garages	☐ The air barrier shall be installed at any exposed edge of insulation. (The 2018 IECC allows alternative for how insulation is installed in the floor system. Reference Section R402.2.7 Floors in the 2021 IECC which offers clarity for what is expressed in the 2018 IECC. Same requirements but better written. If you choose not to place the insulation in permanent contact with the subfloor or to fill the framed floor cavity completely fill, which is the easiest way to ensure performance, then the system MUST be airtight. Concentrate on air sealing the perimeter rim joist of the floor system.)	☐ Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. ☐ Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing; and shall extend from the bottom to the top of all perimeter floor framing members.	Floors are walls laid flat and should be six-sided enclosures. 	 Wood-based subfloor Gypsum board Cavity insulation Any type of flooring/floor finish Floor sheathing (OSB or plywood) Airspace Gypsum board Cavity insulation Airspace Wood-based subfloor Gypsum board Rigid insulation Cavity insulation

Crawl spaces walls	☐ Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped. <i>(The vapor retarder over the dirt floor is also an air barrier. Seal it to the foundation walls, overlap seams and seal it, seal to mono posts, seal it, seal it, seal it)</i>	☐ Crawl space insulation, where provided instead of floor insulation, shall be permanently attached to the walls. <i>(Insulation should cover the top of the foundation wall and come down to the dirt floor when installed on the inside. If a vinyl drape insulation is installed ensure it is perforated so that there is some drying potential through the material)</i>		
Shafts, penetrations	☐ Duct shafts, utility penetrations, flue shafts openings, to the exterior or unconditioned space shall be air sealed.	<i>(Again, sequencing of the installation of the air barrier is important in this location. Install the air barrier between conditioned space and unconditioned space and then cut a right size hole to pass through wiring, duct, etc. Best practice is to cut one hole per item penetrating the air barrier.)</i>		
Narrow cavities	<i>(When a batt is cut to fit a narrow cavity, the likely hood is increased that it will be poorly installed. Consider using blown insulation products that install more consistently in narrow cavities and cavities that have obstruction within them.)</i>	☐ Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.		
Garage separation	☐ Air sealing shall be provided between the garage and conditioned spaces.	<i>(Continuity of the air barrier system includes addressing the walls and floor systems that separate the conditioned space of the house from the unconditioned space of the garage. If the garage is drywalled the drywall on the garage side and the drywall on the house side must have continuity and be airtight. In addition, the floor system must be blocked off and air sealed to separate the house from the garage.)</i>		
Recessed Lighting	☐ Recessed light fixtures installed in the building thermal envelope shall be air sealed to the finished surface.	☐ Recessed light fixtures installed in the building thermal envelope shall be airtight, IC rated. <i>(Best practice is to use airtight can lighting everywhere a can light is specified. This ensures that unintended air leakage is does not occur and that moisture carried with air does not enter floor systems over kitchens or other areas.)</i>		

Plumbing and Wiring	(One wire one hole, one pipe one hole, one penetration one hole. Is the best practice to ensure air sealing creates a tight house.) 	☐ In exterior walls, batt insulation shall be cut neatly to fit around wiring and plumbing, or insulation, that on installation readily conforms to available space, shall extend behind piping and wiring.		
Shower/tub on exterior wall	☐ The air barrier installed at exterior walls adjacent to showers and tubs shall separate the wall from the shower or tub. (Behind tubs, shower pans, and shower seats are good examples of the idea of adding a supplemental air barrier to achieve the continuous air barrier required by the IECC. In this case thermos ply is used.)	☐ Exterior walls adjacent to showers and tubs shall be insulated. 		
Electrical/phone box on exterior walls	☐ The air barrier shall be installed behind electrical and communication boxes. ☐ Alternatively, air-sealed boxes shall be installed. (Airtight boxes or air sealed boxes are required. In addition, the box should be sealed to the drywall it is penetrating. Insulation needs to be installed behind and around the box.)			

HVAC Register boots	☐ HVAC supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering, or ceiling penetrated by the boot.	(This is an example of a specific case being called out that reflects back to the general section that states that all breaks or joints in the air barrier shall be sealed. So, fan housing, can lights, electrical boxes, all holes through the building thermal envelope are required to be sealed.)		
Concealed sprinklers	☐ Where required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. ☐ Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	(More air sealing is allowed that is realized with fire sprinkler heads that penetrate the building thermal envelope. Just ensure that air sealing does not interfere with the ability of the escutcheon plate to drop and reveal the sprinkler head.)		

a. In addition, inspection of loq walls shall be in accordance with the provisions of the IECC-400.