

## 1. Air Tightness

- 1.1. Tightness shall be less than or equal to .20 CFM50 per square foot of conditioned envelope area.  
Air sealing details on [www.systemvision.org](http://www.systemvision.org)

## 2. Moisture Management

- 2.1. Finished grade shall be sloped away from foundation walls or slab.  
2.2. Slabs: Vapor retarder with 100% coverage, and overlapped seams, shall be installed under the slab.  
2.3. Crawl Spaces: Shall be closed and have the following components:  
2.3.1. A sump pump or drain to daylight with a backflow preventer shall be located at the low point of the crawlspace.  
2.3.2. All air leakage paths from the home to the crawlspace, and from the crawlspace to outside shall be air sealed.  
2.3.3. Vapor Barrier  
2.3.3.1. Walls- vapor barrier shall be sealed, mechanically fastened, and run up walls to within 3" of mudsill.  
2.3.3.2. Floors- vapor barrier shall be sealed at all seams, penetrations and to wall vapor barrier.  
2.3.4. Drying Mechanism- A stand-alone dehumidifier or supply register with backflow preventer that provides 1 CFM/30SF of floor area.  
2.3.5. Crawl spaces during construction shall have at least one of the following: (1) crawl space vents or (2) a vapor retarder covering the ground.

## 3. Framing and Insulation

- 3.1. Roof framing shall allow for 10" of vertical space from exterior of top-plate to roof sheathing.  
3.2. Insulation shall be installed to manufacturer's specifications, with no gaps, voids, compression or wind intrusion. Insulation and the air barrier shall be installed in physical contact with each other.  
3.3. Attic accesses shall be insulated to a minimum of R-30. This will require an insulated, air sealed and weather stripped box to be constructed for attic pull-down stairs.  
3.4. Insulation levels shall, at minimum, equal those in the following table or meet the 2015 IECC Total UA alternative.

Climate Zone	Slab	Walls	Ceiling	Floors*	Crawl Space Walls*
3	NA	R-19 or R-15 + 3 cont	R-38	R-19	R-5 cont
4	R-10	R-19 or R-15 + 3 cont	R-49	R-19	R-10 cont
5	R-10	R- 21 or R-15 + 5 cont	R-49	R-30	R-15 cont

To locate climate zone, go to <https://energycode.pnl.gov/EnergyCodeReqs/?state=North%20Carolina>

\*Closed crawl spaces only require the floor or the crawl space walls to be insulated.

## 4. Heating, Air Conditioning, and Ventilation.

- 4.1. Equipment Minimums  
4.1.1. Furnaces/AC – 90% efficient, 14 SEER  
4.1.2. Heat Pumps- 14 SEER, 8.2 hspf  
4.2. All duct connections shall be sealed with a UL listed "bucket" mastic product.  
4.3. Duct leakage, measured in cubic feet per minute at 25 Pascals, shall not exceed 3% of the conditioned square footage.  
4.4. Mechanical systems shall be sized to within 6000 Btuh (or closest available size) of the whole home ACCA Manual J total load. ACCA Manual J room-by-room load calculations, including all inputs, shall be submitted for each plan to verify sizing. Physical copy of the load calculation with the AHRI certificate shall be attached to AHU unit or submitted to the rater prior to the final inspection.

- 4.5. Heat pumps shall have an outdoor thermostat installed to prevent supplementary heater operation when the heat pump is capable of meeting the load. The lockout shall be set no lower than 35F and no higher than 40F.
- 4.6. The measured airflow for each room shall be within +/- 20% or 25 CFM of the ACCA Manual J calculation. This will require supply dampers to be installed for bedrooms and bathrooms.
- 4.7. Total system airflow shall be set between 300-400 CFM per ton in cooling, or set to total system airflow as specified by the manufacturer.
- 4.8. Whole House Ventilation: There shall be a filtered whole-house mechanical fresh air ventilation system that is capable of meeting the current version of ASHRAE 62.2 that complies with one of the following options:

Option 1: Supply Ventilation - Air Handler cannot have a PSC motor. System shall be designed to operate intermittently and automatically based on a timer (e.g., air cyclor) and to restrict outdoor air intake when not in use (e.g., motorized damper). Ventilation at a minimum shall occur 10% of every 24 hours.

Option 2: Balanced Ventilation

- 4.9. Spot Ventilation: All ventilation ducts shall terminate beyond the exterior skin of the building.
  - 4.9.1. All bathrooms shall have a fan vented to the outside that exhausts 50 CFM intermittently. (Requires a min. fan rating of 70 CFM).
  - 4.9.2. All kitchens shall have a fan vented to the outside that exhausts 100 CFM. (Requires a min. fan rating of 120 CFM).
- 4.10. All ventilation ducts, excluding kitchen exhaust ducts, shall be insulated.

## 5. Pressure Balancing

- 5.1. All rooms within the conditioned space, except baths and laundry, shall not exceed +/- 3 Pascals pressure differential with respect to the main body when interior doors are closed and the air handler is operating. Returns, transfer grilles or jump ducts shall be used to balance each room in addition to door undercuts.

## 6. Plumbing

- 6.1. Electric water heaters shall have an energy factor (EF) of at least .94. Gas water heaters shall have an EF of at least .61.
- 6.2. From the water heater, the first three feet of hot and cold pipes shall be insulated to  $\geq$  R-4.
- 6.3. Toilets shall be 1.3 GPF or less (including dual-flush models). Showerheads shall be 2.25 GPM or less. Kitchen faucets shall be 2.2 GPM or less. Bath faucets shall be 1.5 GPM or less.

## 7. Appliances & Lighting

- 7.1. Dishwashers and refrigerators, if provided by the builder, shall be ENERGY STAR rated.
- 7.2. Home shall not have any incandescent lights.

## 8. Combustion Safety

- 8.1. Any combustion appliance inside the conditioned space, other than gas ranges and wood fireplaces, shall be direct vent or power vented. Vent free gas logs are not allowed.
- 8.2. One hard-wired carbon monoxide (CO) detector shall be installed per 1,000 sq. feet of living space in homes that have any combustion appliance within the conditioned space, or which have an attached garage (minimum one per floor).