

Implement this checklist in accordance with the Retrofit Challenge Current Best Practices: [www.ba-pirc.org/retrofit](http://www.ba-pirc.org/retrofit) *Note: Italicized items are optional.*

### 1 Heating, Ventilation, Cooling, and Air Conditioning (HVAC) Distribution Systems

Caution: Reference the Combustion Safety section (3.11) if a gas furnace exists or is planned.

#### 1.1 Existing HVAC Equipment Not Being Replaced

- Check/Service if needed: charge, condition of coils, condensate lines, exhaust flues, combustion air supply, gas lines, and other components.

#### 1.2 Full or Partial HVAC System Replacement

- ENERGY STAR heat pump
- ACCA Manual J calculations
- Seal accessible ducts.
- Modify AHU closets to create sealed return plenum with wall or ceiling return air grille.
- Duct Replacement: Install new ducts with R-value  $\geq 6$ .
- When equipment and ducts are replaced, relocate AHU into conditioned space.*
- Perform ACCA Manual S equipment selection.*
- Perform ACCA Manual D duct sizing.*
- Produce a schematic duct design for field crew.*
- Conduct rough-in inspection.*

#### 1.3 All Homes Regardless of HVAC System Replacement

- Seal all duct connections in supply and return runs, return plenum, connections to AHU.
- Duct airtightness test results  $Q_n \leq 0.06$  (6 cfm or less of leakage per 100 ft<sup>2</sup> of conditioned space.)
- Eliminate louvered doors that serve as returns. Eliminate metal AHU stands.
- Install and seal an air barrier to separate return from adjacent wall cavities.
- Provide partial door above return.
- Flex duct insulation covers all collar and boot connections.
- Flex duct runs should not be kinked or have sharp bends.
- Strap flex ducts to trusses ever 5'.
- Install MERV 6 filter.
- Bathroom, kitchen exhaust fans and dryer ducted to outside.
- Verify Bedroom Return Air per guidelines in Florida Mechanical Code Section 601.4.*
- Install a bath fan timer.*

### 2 Whole-House Airtightness

- Ensure whole-house air leakage of 6 or less ACH at the test pressure of 50 pascals ( $ACH_{50} \leq 6.0$ )
- Seal common air infiltration points with code-approved sealant

### 3 Roof Finish Replacement

- Choose light or white-colored finish, solar reflectance  $\geq 0.25$ .
- Ensure proper installation of roof flashing.
- Install roof drip edge.
- If replacing roof decking, install radiant-barrier roof decking.

## 4 Attic Insulation

### 4.1 Vented Attics

- Add insulation to achieve RESNET Grade I R-38 throughout.
- Prior to adding ceiling insulation, box-in or eliminate all recessed lighting fixtures not ICAT.
- Insulate interior attic hatches and stairs to R-19 and weather-strip edge.
- In attics over porches or garages, provide air barrier to prevent insulation spillage.
- Where floor cavities abut attic space, provide air barrier to keep attic air out of floor cavity.
- Install ventilation baffles at eaves.

### 4.2 Attic Knee Walls

- Insulate knee walls to RESNET Grade I R-13 or greater.

### 4.3 Unvented Attics

- Consult an energy rater regarding existing or planned unvented attics.

## 5 Windows

### 5.1 Window Replacement

- Install ENERGY STAR-labeled replacement windows.
- Retain National Fenestration Rating Council (NFRC) label.
- Ensure proper window flashing installation.
- Follow house wrap manufacturer instructions for cutting and wrapping at window openings.
- Air seal between window frame and rough opening with a sealant designed for windows.

### 5.2 All Homes Regardless of Window Replacement

- Replace rotted materials around window (e.g. rough opening, sheathing).
- Replace missing head flashing at wood siding.
- Caulk edges of window frame/trim on both interior and exterior.*
- For existing clear windows not being replaced, apply window tint to achieve SHGC  $\leq 0.5$ .*

## 6 Exterior Walls

- Eliminate vinyl wall paper.
- If painting, use light or white color.
- If replacing drywall in frame construction, install RESNET Grade I R-13 insulation.
- If replacing drywall in block construction, install a continuous layer of rigid insulation followed by furring strips for drywall attachment.
- If replacing siding, check for and replace rotted materials, install and integrate continuous drainage plane with window and door flashing, and if concrete masonry unit, assure weep holes at bottom of siding. Implement applicable criteria on the Thermal Enclosure System and Water Management System checklists of the Energy Star for New Homes:  
[http://www.energystar.gov/index.cfm?c=bldrs\\_lenders\\_raters.nh\\_v3\\_guidelines](http://www.energystar.gov/index.cfm?c=bldrs_lenders_raters.nh_v3_guidelines)

## 7 Floors

- In crawl spaces under conditioned space, repair or install 6 mil polyethylene ground cover, lapping joints 6", and continuing up stem wall and supports 2'. Add sump pump if potential for flooding.

## 8 Water Heating

Caution: Reference the Combustion Safety section (3.11) if a gas water heater exists or is planned.

### 8.1 Water Heater Replacement

### 8.2 All Homes Regardless of Water Heater Replacement

- Insulate accessible hot water pipes.
- Wrap tank with R-5 blanket (for gas units, follow manufacturer instructions carefully).

## 9 Appliances, Lighting, and Fans – All Homes

- Install ENERGY STAR-rated refrigerator upon replacement.
- Clean refrigerator coils, if not replacing.
- Install screw-in or pin-based compact fluorescent lamps (CFL) or light-emitting diode bulbs (LED).
- Box in all recessed fixtures not rated “ICAT”.
- Select ENERGY STAR-rated ceiling fans upon replacement.
- Install air barrier above soffit-mounted light fixtures to separate soffit from attic or floor cavity.

## 10 Site

- Remove moisture loading at walls and foundation (e.g. irrigation system, roof runoff, soil contact).
- Add pool cover to all pools.
- Set pool pump hours to no more than 5 hours per day.
- Plant drought-tolerant shade trees near east and west-facing windows (Deciduous trees in North Florida).

## 11 Combustion Safety

### 11.1 Combustion HVAC and Water Heating Equipment Replacement

- Do not install atmospheric combustion furnaces or water heaters inside the conditioned space. Consult the U.S. Department of Energy’s Technology Fact Sheet “COMBUSTION EQUIPMENT SAFETY” for additional information on combustion safety:  
[http://apps1.eere.energy.gov/buildings/publications/pdfs/building\\_america/26464.pdf](http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/26464.pdf)

### 11.2 All Homes With Combustion HVAC and Water Heating Equipment Regardless of Replacement

- Evaluate and devise a combustion safety plan to prevent accidentally back drafting exhaust fumes into the conditioned space before, during, and after renovation.
- During retrofit: Disable combustion furnaces and water heaters.
- Post-retrofit, prior to occupancy: Conduct post-renovation testing to verify no combustion exhaust gases entering the conditioned space.
- Install carbon monoxide (CO) detectors and post an action plan.

Implement this checklist in accordance with the Retrofit Challenge Current Best Practices: [www.ba-pirc.org/retrofit](http://www.ba-pirc.org/retrofit) (Available February 1, 2014). To discuss the Retrofit Challenge and Building America partnership opportunities, please contact:

Karen Sutherland  
ksutherland@fsec.ucf.edu  
321-638-1474

Janet McIlvaine  
janet@fsec.ucf.edu  
321-638-1434

Fax: 321-638-1419  
www.ba-pirc.org  
www.fsec.ucf.edu



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