This reference guide is intended to serve two purposes:

- To provide information on green home practices.
- To provide details on how to earn points for complying with the Florida Green Home Retrofit Designation Program.

**Note:**
It is possible to combine many submittals in one detailed plan. Letters or documented verbal communication from vendors can substitute for material and equipment cut sheets where required. No document produced by FGBC is intended to supersede or contradict the Florida Building Code or other regulatory requirements.

**Disclaimer**
The Florida Green Building Coalition (FGBC) Green Home Retrofit Designation does not constitute an endorsement nor guarantee any performance level. The sole purpose of the program is to provide tools for homeowners who wish to implement strategies that have the potential to make a home operate in a more efficient and healthy manner.

FGBC makes no warranties whatsoever to the homeowner or any other persons or entities regarding the efficacy of the FGBC Green Home Retrofit Designation methods covered by the Program.
CATEGORY 1: ENERGY

E1 Weatherize home

Procedure: Do ALL of the following:
- Replace weather-stripping on exterior doors
- Remove HVAC vent covers (diffusers) and install gaskets or caulk behind them and reinstall
- Remove trim around recessed can lighting and install gaskets or caulk behind them. Reinstall trim
- Remove electrical outlet covers on exterior walls and install gaskets or caulk behind them. Reinstall covers.

Intent: By weatherizing your home you decrease the uncontrolled air exchange between indoor conditioned air and outdoor unconditioned air. Weatherization will increase the comfort of your home while decreasing the energy usage to maintain that comfort.

Submittals: Pre- and post-installation pictures. Copy of receipts for materials.

Resources: http://www.energystar.gov/index.cfm?c=home_sealing.hm_improvement_sealing
http://www.nrel.gov/docs/fy01osti/28039.pdf

E2 Replace a minimum of 75% of installed light bulbs with Compact Fluorescents (CFL) or Light Emitting Diode (LED) light bulbs

Procedure: Count the number of light bulbs currently in fixtures and lamps, including bath fans with lights and ceiling fans with light kits. Install CFL or LED replacements for 75% of the light bulbs.

Intent: An ENERGY STAR® qualified Compact Fluorescent Light bulb (CFL) can save more than $40 in electricity costs over its lifetime, uses about 75% less energy than standard incandescent bulbs, lasts up to 10 times longer, and produces about 75% less heat, making it safer to operate and reducing energy costs associated with home cooling.

Submittals: Calculation of required number of bulbs with receipt for purchase of those bulbs. Picture of 3 replaced bulbs.

http://www.energystar.gov/index.cfm?c=cfls.pr_cfls_shapes
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=LB

E3 Replace thermostat with a programmable thermostat

Procedure: Replace existing non-programmable thermostat with a programmable thermostat.

Intent: According to the Department of Energy, “you can save around 10% a year on your heating and cooling bills by simply turning your thermostat back 10°–15° for eight hours. You can do this automatically without sacrificing comfort by installing an automatic setback or programmable thermostat.” The programmable thermostat is best suited for homeowners who are either gone a majority of each day or who want to have the temperature of their home adjusted after going to bed and before getting up the next morning.

Submittals: Picture of old thermostat, picture of installed programmable thermostat. Copy of receipt for new thermostat.

Resources: http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm
E4 Increase attic insulation to a minimum of R-38 at the ceiling

**Procedure:** Carefully measure your existing insulation with a wooden or plastic ruler to determine existing insulation thickness from the top of the ceiling to the average top of the insulation. The average R-value is between 3 and 3.5 per inch thickness of installed insulation, depending on the type of insulation used. Determine thickness, in inches, of insulation required to reach R-38 or better. Install according to manufacturer’s directions.

**Intent:** Increasing insulation levels (R-value) reduces the amount of heat gain from the outside and the amount of conditioned air that escapes from the house.

**Submittals:** Copy of product data sheet of material installed. Copy of receipt showing amount of insulation installed.

**Resources:**

This is one example of manufacturers’ web sites that contain valuable information for the do-it-yourselfer. There are others and this is not an endorsement of Owens Corning.

E5 Add a radiant barrier in the attic to the underside of the roof sheathing

**Procedure:** A radiant barrier is to be attached to the underside of the roof sheathing. This is most often done by a professional. If you are going to do it yourself, obtain the installation directions and follow them carefully.

**Intent:** A properly-installed radiant barrier will significantly reduce summer heat gain and thereby reduce cooling costs.

**Submittals:** Picture of roof sheathing prior to installation of radiant barrier, picture post installation. Receipt for the materials and installation, if applicable.

**Resources:**
- [http://www.insuladd.com/more-info.html](http://www.insuladd.com/more-info.html)
- [http://www.energysavers.gov/your_home/insulation_airsealing/index.cfm/mytopic](http://www.energysavers.gov/your_home/insulation_airsealing/index.cfm/mytopic)

E6 Add window tint film to decrease heat gain from the sun into your home

**Procedure:** Properly apply window tint film to existing windows to reduce solar heat gain. Before installing tint, windows must be thoroughly cleaned. After cleaning, follow the manufacturer’s installation directions carefully.

**Intent:** Window tinting allows up to 70% of visible light to pass through the window while rejecting up to 60% of heat gain. Properly installed tinting will reduce solar heat gain and reduce energy consumption, which will increase your comfort level while reducing electric bills. Window tinting may void some window warranties. Check with your window manufacturer before installing tint.

**Submittals:** Copy of product data sheet of material installed.

**Resources:** [http://www.energysavers.gov/tips/windows.cfm](http://www.energysavers.gov/tips/windows.cfm)

E7 Install/replace with motion/light sensors to all exterior lighting

**Procedure:** This is either a new installation of exterior lighting if you have none or an upgrade to your existing exterior lighting.
**Intent:** Light and motion sensors react automatically to decreasing or increasing daylight or to motion detected in the vicinity of the light. This provides lighting when needed and conserves energy by shutting off the light when it detects it is not needed.

**Submittals:** Picture of each light (or lack of lights) before replacement and a picture of each after replacement.

**Resources:** [http://www.energysavers.gov/your_home/lighting_daylighting/index.cfm/mytopic](http://www.energysavers.gov/your_home/lighting_daylighting/index.cfm/mytopic)

**E8 Replace an old refrigerator with a new ENERGY STAR® refrigerator**

**Procedure:** Buy a new ENERGY STAR® refrigerator and install it.

**Intent:** Appliances labeled with the EPA (Environmental Protection Agency) ENERGY STAR® label use less energy and water than other products, save money on utility bills and help protect the environment. Although energy-efficient models can cost more to purchase initially, any extra up-front cost can often be made up with savings on your utility bill. ENERGY STAR® appliances are significantly more energy-efficient than the Federal standards require.

From the ENERGY STAR® website:

- “ENERGY STAR® qualified refrigerators are 20% more energy efficient than the minimum federal standard.”
- “ENERGY STAR® qualified models are, on average, 10% more energy efficient than non-qualified models.”

In most homes the refrigerator is the second-largest user of electricity, right after the air conditioner. New refrigerators are incredibly more efficient – a 1986-era 18 cubic foot refrigerator uses 1400 kWh a year, while a modern energy-efficient model uses only 350 kWh – a whopping 75% reduction. At 15¢/kWh, trading in a pre-1986 refrigerator for a new efficient one would save about $158 a year in electricity costs. And some older refrigerators are even worse than the average.

**Submittals:** Picture of old refrigerator, picture of new installed refrigerator. Receipts for disposal of old refrigerator and installation (if applicable) of new refrigerator.


**E9 Replace an old dishwasher with a new ENERGY STAR® dishwasher**

**Procedure:** Buy a new ENERGY STAR® dishwasher and install it.

**Intent:** Appliances labeled with the EPA (Environmental Protection Agency) ENERGY STAR® label use less energy and water than other products, save money on utility bills and help protect the environment. Although energy-efficient models can cost more to purchase initially, any extra up-front cost can often be made up with savings on your utility bill. ENERGY STAR® appliances are significantly more energy-efficient than the Federal standards require.

From the ENERGY STAR® website, “ENERGY STAR® qualified models are, on average, 10% more energy efficient than non-qualified models.”

A dishwasher built before 1994 wastes more than 10 gallons of water per cycle compared to owning a new ENERGY STAR® qualified model. Replacing an old dishwasher with an ENERGY STAR® dishwasher saves enough water each week to wash 3 loads of laundry in an ENERGY STAR® qualified clothes washer.
Submittals: Picture of old dishwasher, picture of new installed dishwasher. Receipts for disposal of old dishwasher and purchase and installation (if applicable) of new dishwasher.


**E10 Replace an old clothes washer with a new ENERGY STAR® clothes washer**

**Procedure:** Buy a new ENERGY STAR® clothes washer and install it.

**Intent:** Appliances labeled with the EPA (Environmental Protection Agency) ENERGY STAR® label use less energy and water than other products, save money on utility bills and help protect the environment. Although energy-efficient models can cost more to purchase initially, any extra up-front cost can often be made up with savings on your utility bill. ENERGY STAR® appliances are significantly more energy-efficient than the Federal standards require.

From the ENERGY STAR® website:

- “ENERGY STAR® qualified clothes washers use about 37% less energy and use over 50% less water than regular washers. Many qualified clothes washers also have a greater capacity than conventional models, meaning fewer loads of laundry.”
- “ENERGY STAR® qualified models are, on average, 10% more energy efficient than non-qualified models.”

ENERGY STAR® clothes washers use superior designs that require less water to get clothes thoroughly clean. These machines use sensors to match the hot water needs to the load, preventing energy waste. ENERGY STAR® washers use nearly 50% less water and over 37% less energy per load. The washer design also causes less wear and tear on clothes. In addition, better water extraction means less drying time, which yields further energy savings. There are two designs, top-loading and front-loading. They are described in more detail as follows:

Front-loading ENERGY STAR® models are similar in design to washers used in laundromats. These horizontal-axis or tumble-action machines repeatedly lift and drop clothes, instead of moving clothes around a central axis.

Top-loading ENERGY STAR® washers use sensor technology to closely control incoming water temperature. To reduce water consumption they spray clothes with repeated high-pressure rinses to remove soap residues rather than soaking them in a full tub of rinse water.

Submittals: Picture of old clothes washer, picture of new installed clothes washer. Receipts for disposal of old clothes washer and purchase and installation (if applicable) of new clothes washer.


**E11 Install new ENERGY STAR® ceiling fans, replacing old ones if already existing, in the main living area and in 75% of the bedrooms**

**Procedure:** Count the number of bedrooms. Obtain ENERGY STAR® ceiling fans for 75% of the bedrooms, plus one for the main living area. Install fans.

**Intent:** According to the Department of Energy website, ceiling fans are considered the most effective fans. Using ceiling fans should allow the room temperature to be set about 4 degrees warmer
without causing loss of comfort. ENERGY STAR® fans are, on average, 20% more efficient than standard fans.

Submittals: Picture of each bedroom with fan. Picture of the main living area, with fan. Copy of receipt for fans and installation (if appropriate).

Resources:  
http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CF

E 12 In all bathrooms without exhaust fans, properly install new ENERGY STAR® bathroom exhaust fans

Procedure: Properly install ENERGY STAR® bath fans (high efficiency, low noise bathroom exhaust fans) for all bathrooms. Fans must vent to the exterior and must move 1 cubic foot per minute (cfm) of air per 0.30 Watts (e.g., a 50 cfm fan must use less than 15 Watts, a 70 cfm fan must use less than 21 Watts) and be HVI certified to produce less than 1.0 sones. Proper installation includes:

- Avoid elbows and bends whenever possible. When bends are necessary (and they often are), make the best of the situation by allowing a 2–3 foot straight run out of the fan before the first elbow. This approach allows airflow to be uniform before passing through the elbow. Conversely, an installation with a 90-degree elbow immediately after the fan exhaust port will cause air to flow back into the fan, both reducing performance and increasing noise.
- Use a wide-radius angle (not a sharp turn) to help ensure optimum performance and minimum noise. The goal is to achieve optimal fan performance, which means aiming for a smooth, inner surface duct with the least number of elbows.
- Although rigid metal duct is the best choice, flex duct is often used due to reduced cost and ease of installation. The flex duct should be extended fully to reduce as much air flow friction as possible.

Intent: Encourage removal of moisture generated within the bathrooms through proper installation of quiet, efficient exhaust fans.

The left photo is an example of very poor installation. Simply turning the fan around would have eliminated the need for the extreme bend in the ductwork. The photo to the right shows a well-thought-out installation.

Submittals: Picture of installed fixtures. Copy of receipt for fixtures.

Resources:  
E13 Install and set timer on water heater

Procedure: Install timer on existing water heater. Set timer to reflect the habits of your household members.

Intent: By setting the timer to heat water in anticipation of use, you avoid keeping it hot all day and night.

Submittals: Picture of installed timer and copy of receipt.


E14 Replace hot water heater with state certified solar or ENERGY STAR® hot water heating system

Procedure: Remove and properly dispose of an existing hot water heater. Install a properly sized state certified solar hot water system that has a solar fraction ≥ 0.5 OR a new ENERGY STAR® hot water heater.

Intent: According to the Department of Energy website, water heating can account for 14%–25% of the energy consumed in your home. You can reduce your monthly water heating bills by selecting the appropriate water heater for your home. A modestly sized solar water heating will provide 50-70% of an average household’s hot water needs at low cost.

Please note: contact your building department for local requirements regarding water heater replacement.

Submittals: Picture of old water heater and picture of new, installed water heater. Copy of receipt for purchase and installation, if applicable.


E15 Replace HVAC system with new, properly sized per current or manual J calculations, air conditioning system with SEER 15 and 8.5 HSPF minimum efficiency

Procedure: Have old air handler and compressor properly removed and disposed of. Have system sizing done, and new properly sized system installed. Provide Manual J showing HVAC Equipment installed does not exceed 15% more than the Manual J calculations require. Calculation inputs require interior set points must not be greater than 70° F for heating or lower than 75° F for cooling. House infiltration shall be based on “tight” or the equivalent term. Outdoor temperatures shall be the 99.0% design temperatures as published in the American Society of
Heating, Refrigeration, and Air Conditioned Engineers (ASHRAE) Handbook of Fundamentals for the home’s location or most representative city for which design temperature data are available.

**Intent:** When replacing your HVAC system, it is critical to do so with one of the correct size. This helps ensure you get the best efficiency and comfort, as well as lower maintenance and operating costs. DOE suggests that as many as 50% of all systems are oversized. This creates two problems: they are more expensive to buy and install than is necessary, and they run more inefficiently because they do not “fit” the house. The Air Conditioning Contractors Association (ACCA) Manual J Calculation is a calculation performed to determine the heating load for a residence or small commercial building. The calculation includes site-specific characteristics such as regional weather data, building framing materials, building insulation levels, building air infiltration levels and window area.

Equipment with a minimum SEER rating of 15 and an HSPF of at least 8.5 exceeds the current Florida building code and will provide more economical heat ing and cooling for your home.

**Submittals:** Copy of receipt for new equipment and installation.

**Resources:**
- [https://www.acca.org/Files/?id=186](https://www.acca.org/Files/?id=186)
- [http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12340](http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12340)

**E16 Seal ductwork and joints with mastic to prevent leaks**

**Procedure:** All ductwork must be sealed with mastic.

**Intent:** Reduce/eliminate duct leakage to unconditioned space. Duct leakage significantly contributes to excessive energy use and can cause pressure imbalances that lead to durability problems. Using mastic compound to seal all ductwork connections provides a seal that is much less prone to failure than tape alone.

**Submittals:** Pre- and post-installation pictures of three joints. Copy of receipt for mastic.

**Resources:**
- [http://www.youtube.com/watch?v=N7Txi4oV5Rc&feature=related](http://www.youtube.com/watch?v=N7Txi4oV5Rc&feature=related)

**E17 Have duct work smoke tested for leaks and sealed by a professional if necessary**

**Procedure:** AC Contractor or Smoke Testing personnel administer a smoke test, identify leaks, and verify leaks are sealed. Verify leaks are sealed by visual inspection. Smoke identifies leaks visually. Leaks are sealed when there is no more smoke coming from leaks. AC contractor must be present to seal leaks. Smoke testing protocol as follows:
1. All boots are temporarily sealed by either the AC Contractor or Smoke Testing personnel.

2. Portable smoker or duct tester/fogger is connected to the supply and return sections of the duct work. All dampers, if installed, to be verified open by AC Representative.

3. AC Representative is present during Smoke Testing to seal observed leakages with approved materials.

4. Smoke Testing personnel note severity and location of leakages.

5. Smoke Testing personnel verify that all leaks have been sealed, provide the results of the test and a certificate attesting to that fact with date and signature of the Smoke Tester.

**Intent:** Smoke testing ductwork allows otherwise invisible leaks to be identified and sealed. **NOTE:** Smoke testing is not appropriate in homes with ductwork enclosed in soffits or between floors. It is also not appropriate when ductwork is located in the attic and under insulation. Ductwork must be both visible and accessible for this test to have value.

**Submittals:** Required - Signed affidavit by testing agent verifying smoke test and sealing of all leaks.

**Resources:**
- [http://www.youtube.com/watch?v=8rdA1yGSHSU](http://www.youtube.com/watch?v=8rdA1yGSHSU)

**E18** Spray foam, minimum R-19, to the bottom of the roof deck to create an unvented attic

**Procedure:** If the pitch of your roof and its construction is conducive to a grade 1 installation, have either open or closed cell spray foam applied to the roof deck.

**Intent:** Sealing an attic prevents much moisture intrusion, better “conditions” the space, and reduces energy usage.

**Submittals:** Pre- and post-pictures of attic. Copy of receipt for foam installation.


**E19** Re-roof: replace with roofing that is ENERGY STAR® labeled

**Procedure:** If your roof needs to be replaced, use an ENERGY STAR® labeled roofing product.

**Intent:** ENERGY STAR® roofing products reflect more of the sun’s rays than do traditional roofing products. This reduces the heat gain into the home by reducing the roof and attic temperatures.

**Submittals:** Copy of receipt for installed roof.
E20 Repaint home exterior in a color with light reflective value of greater than 50

Procedure: Properly prepare the exterior of your home for repainting. Make sure to seal and caulk any cracks or openings. Choose a paint color that has a reflective value of greater than 50. The LRV (Light Reflectance Value) should be listed on the back of individual paint chips or on the “fan” of multiple chips. Paint the entire exterior of your home.

If a documented reflectivity is not available this credit can only be given to “white” or “off white” re-painted homes.

Intent: Dark colors absorb more heat from sunlight; in contrast, light-colored surfaces have been shown to reduce cooling costs. Many paint colors are now available that offer adequate reflectance specs in colors other than “white.”

LRV runs on a scale of 0 to 100, with 0 being pure black, and 100 pure white. It is a measurement that tells you how much light and heat a color reflects, or conversely, absorbs. The more the exterior color reflects, the more economical it will be to cool your home.

Submittals: Cut sheet showing reflectance spec. Eight pictures of your home (one from each side). Four pictures taken at pre-repainting, four taken from the same angles post-repainting.

Copy of receipt for paint or for painting labor.

Resources: http://hirshfields.wordpress.com/tag/light-reflective-value/

E1 Change existing pool heater to solar

Procedure: If you have an existing pool heater, replace it with a solar pool heating system.

Intent: Reduce energy use and cost of heating a pool. The average yearly cost for heating a residential pool in Florida is approximately $1,450 using electrical resistance (electricity at $0.09/kWh), and often over $500 using an electric heat pump or using natural gas. Liquid propane costs about the same as electrical resistance. A solar pool heating system is appropriate in our Florida climate, and can pay for itself in as little as two years.

Submittals: Copy of the receipt for the installed solar pool heater.

Resources: For information on the State of Florida solar pool heating testing and certification program and a list of all certified manufacturers, visit:
http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13230
E22  Replace pool pump with ENERGY STAR® pool pump

**Procedure:** If you have a pool, replace the existing pool pump with an ENERGY STAR® pool pump.

**Intent:** Reduce energy use and cost of owning a pool. Efficient pool pumps can save pool owners 40% of the electricity used by an existing pool pump.

**Submittals:** Copy of the receipt for the installed pool pump.

**Resources:** For information on the State of Florida solar pool heating testing and certification program and a list of all certified manufacturers, visit: [http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13290](http://www.energysavers.gov/your_home/water_heating/index.cfm/mytopic=13290)

E23  Plant trees for shade East/West; in North Florida plant deciduous trees, based on coverage with 5 years in ground growth

**Procedure:** Compute the coverage your home will need to provide the required shade. Research the growth patterns, and the needs and requirements of the trees you would like to plant. Find those that fit the “right plant/right place” requirement, and that will provide the necessary coverage 5 years after planting. Use trees to shade a minimum of 25% of the total wall area within 45° of due east or west that separate the conditioned area from the outside (omitting garage and porch walls). Observe amount of wall area under full shade during the summer or use a sunpath tool. If trees are immature, no extrapolations are to be made to their adult size.

**Intent:** Shading reduces the heat gain and the energy usage of a building, making your home more comfortable with less expense. During the cooler seasons, a house can achieve a large solar heat gain during the morning and early evening hours as the sun rises and sets. These times also correspond to peak demand placed on utilities. By providing shade trees on the east and west sides of the house, cooling demand can be significantly reduced, since a single mature tree can avert as much heat from a home site as two residential size central air conditioners. Placing deciduous trees on the south side of the house is also beneficial, as they provide shade in the summer and let in winter sunlight. Foundation plantings of smaller shrubs are also beneficial to keep the ground next to the house cool and to block re-radiation from adjacent hot surfaces (however, no plants should be placed within 24” of the foundation to prevent excess moisture from accumulating). Trees can also be used to shade the air conditioner condenser, which can further reduce cooling costs. Shade produced by balconies and other overhangs are not included here.

**Submittals:** Picture(s) of the planted trees. Copy of the receipt for purchase. Copy of the research into choosing the appropriate trees.

**Resources:** [http://publicserver2.sjrwmd.com/waterwise/search.jsp](http://publicserver2.sjrwmd.com/waterwise/search.jsp)
CATEGORY 2: WATER

INTERIOR

W1  Change rubber hoses to reinforced hoses

Procedure: Replace existing rubber hoses to washing machines and dishwashers with reinforced hoses. Replace existing copper lines or plastic tubing to ice makers with reinforced hoses.

Intent: Rubber and copper hoses have a finite life and are likely to eventually fail, potentially causing flooding and unnecessary water use, especially if not discovered immediately.

Submittals: Pre and post change out pictures of hoses. Copy of receipt for hoses.

Resources: N/A

W2  Replace showerheads with 2.0 gallon per minute (gpm) or lower flow rate showerheads

Procedure: Replace existing showerheads with 2.0 gallons per minute (gpm) or less flow rate showerheads.

Intent: Low flow showerheads reduce water use, as well as energy use, because of the lower demand for hot water. The WaterSense® label is not required, but WaterSense® showerheads meet the Green Home Retrofit requirement for gpm.

The Florida Building Code and National Energy Policy Act of 1992 (EPACT) require that all installed showerheads and faucets be rated at a maximum flow rate of 2.5 gallons per minute at 80 psi water pressure. Laminar flow controls that deliver a precise volume of water at faucets, showerheads, and hose outlets may also be used. Unlike conventional water-saving fixtures that deliver varying flow rates in response to varying line pressure, fixtures equipped with laminar flow controls deliver a constant rate, lower than that mandated by EPACT.

Submittals: Pre- and post-installation pictures. Copy of receipt for showerheads and specifications showing flow rate

Resources: http://www.epa.gov/WaterSense/products/showerheads.html

W3  Install aerators for bathroom faucets (flow rate not to exceed 2 gpm)

Procedure: Install aerators for the bathroom faucets (flow rate not to exceed 2 gpm).

Intent: Faucets account for more than 15 percent of indoor household water use. According to the EPA, by installing low-flow bathroom sink faucets or faucet accessories, an average household can save more than 500 gallons each year.

To make it easy to find and select water-efficient products with good performance, the EPA has introduced its WaterSense® program, a label that's backed by independent testing and certification. WaterSense® labeled products perform their intended functions as well as or better than their less-efficient counterparts.

Submittals: Picture of bathroom faucets. Copy of receipt for aerators.

Resources: For a list of bathroom faucets and aerators that have earned the WaterSense® label, visit http://www.epa.gov/watersense/pp/lists/find_faucet.htm, http://www.epa.gov/WaterSense/products/bathroomSinkFaucets.html
W4 Replace dishwasher with ENERGY STAR® labeled appliance using less than or equal to 5.8 gpc

Procedure: Replace existing older dishwasher with ENERGY STAR® labeled appliance using less than or equal to 5.8 gallons per cycle (gpc).

Intent: ENERGY STAR® dishwashers save energy and water, using over 10 gallons per cycle less than dishwashers purchased before 1994.

Submittals: Pre- and post-installation pictures of dishwashers. Copy of receipt for new dishwasher, showing proper disposal of old unit.

Resources: http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=DW

W5 Replace clothes washer with ENERGY STAR® labeled water saving clothes washer

Procedure: Replace existing clothes washer with an ENERGY STAR® clothes washer with a minimum WF less than 6.0.

Intent: ENERGY STAR® washers use nearly 50% less water and over 37% less energy per load. The washer design also causes less wear and tear on clothes.

The Water Factor (WF) is a metric that allows for comparison of clothes washer water consumption independent of clothes washer capacity. The WF equals the total weighted per-cycle water consumption divided by the capacity of the washer. Since energy savings in an efficient clothes washer are primarily governed by the amount of water that needs to be heated, conserving water also conserves energy. Manufacturers must submit their water consumption factors with their ENERGY STAR® qualified clothes washers.

Submittals: Copy of receipt for new washer, showing proper disposal of old unit.

Resources: The WF may not be found on the Energy Guide label, and should be identified through the ENERGY STAR® website for a particular model: http://www.energystar.gov/index.cfm?c=clotheswash.pr_clothes_washers

W6 Re-plumb residence with PEX manifold type system

Procedure: If you are going to re-plumb your home, use a PEX manifold type system for compact hot water distribution.

Intent: Heat losses can be reduced by minimizing piping runs. One method of doing this is to install a manifold system with individual small diameter water lines dedicated to each fixture.

Submittals: Plumbing plan. Copy of receipt for installation of system.

Resources: N/A

W7 Add on demand (button or switch triggered) water recirculation pump to existing system

Procedure: Add an on demand recirculation pump to your existing system.

Intent: Heat losses can also be minimized by installing an on-demand circulation loop. Only switch or button type pumps are allowed for this requirement. Motion sensor types are not as efficient, and therefore not allowed.

Submittals: Plumbing plan. Copy of receipt for purchase and installation of system.

Resources: N/A

W8 Remove existing garbage disposal

Procedure: Remove and properly dispose of your existing garbage disposal.
Intent: Although a popular item that increases the convenience of food cleanup, garbage disposals are notorious for wasting water and adding to the load placed on waste water treatment plants. A much better choice for disposal of food scraps is composting.

Submittals: Pre- and post-pictures

Resources: N/A

W9 Replace all toilets with WaterSense® labeled toilets OR toilets with a minimum MaP rating of 350 and either dual flush or a maximum of 1.28 gallons per flush

Procedure: Replace older existing toilets with new ones that do not exceed 1.28 gallons per flush (gpf).

Intent: Toilets represent the largest source of indoor water use in the home, accounting for up to 30%-40% of water demand. The Florida building code and National Energy Policy Act of 1992 (EPACT) require that all installed toilets be rated at a maximum flow rate of 1.6 gallons/flush. There are toilets on the market today that exceed these standards.

To make it easy to find and select water-efficient products with good performance, the EPA has introduced its WaterSense® program, a label that’s backed by independent testing and certification. WaterSense® labeled products perform their intended functions as well as or better than their less-efficient counterparts. And generally speaking, they’re about 20 percent more water-efficient. WaterSense® toilets are required to have a MaP rating of at least 350.

Toilets are tested and receive Maximum Performance (MaP) ratings from 250 to 1,000, with a higher rating indicating a stronger flushing power.

Submittals: Pre- and post-installation pictures. Copy of receipt for new toilet(s) and installation, if applicable.

Resources: MaP ratings and WaterSense® labeled toilets:
http://www.map-testing.com/
http://www.epa.gov/WaterSense/pubs/toilets.html

W10 Install grey water collection on bathroom sinks to reuse for toilet flushing

Procedure: Install an under-vanity water reservoir system that refills the toilet. Please check on all permitting and code compliance before choosing to use this criteria.

Intent: Conservation of water through reuse of “grey” water. “Black” water is not suitable for this use.

An under-vanity water reservoir system used for the collection of vanity sink water to later be used for the flushing of the adjacent toilet is also another source of greywater and can save a significant amount of water each year especially in homes with families.

Greywater is generally defined as domestic wastewater from any source except toilets and the kitchen sink—this includes laundry, shower/bath, faucets, and dishwasher. It can also include air conditioner condensate. Statistics show that 50-75% of the water consumption in an average Florida home is for exterior landscape irrigation, and generally our precious potable water resource is used for this purpose. Greywater is rich in nutrients, and many landscape plants and grasses will thrive when watered with greywater. In turn, the terrestrial environment acts to naturally purify this waste stream without chemicals or added energy, and returns the water to its natural cycle.

Greywater differs from blackwater (water from toilets and kitchen sink), in that it is free of pathogens and solids. Greywater only contains 1/10 the amount of nitrogen as blackwater, and the organic content of greywater typically decomposes much faster than that of
blackwater. Although inherently safer than blackwater, greywater cannot be considered as potable; therefore landscape application must take place subsurface and cannot be used with sprayers or rotors. To utilize greywater from household fixtures, plumbing in the home must separate drains from blackwater and greywater sources. For new construction, a reuse system should be planned during the design stage. Since laundry equipment generally has drain hoses that are not fixed, washing machines are an excellent source of reuse water.

**Submittals:**
Schematic of system design. Pre- and post-pictures.

**Resources:**
N/A

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**WATER - EXTERIOR**

**Installed landscape and irrigation**

Select plants to minimize the level of maintenance that will be required, the amount of money you will be spending on water or electricity to run a sprinkler pump, and the amount of fertilizer or pesticide needed. Stormwater runoff carries pollutants such as fertilizers, pesticides, soil, and petroleum products. Fertilizers and pesticides from residential areas can be serious threats to the health of Florida’s waters. Plant selection will also determine how long your landscape will last. Fast-growing plants often have a shorter life span than slower-growing species. More people are conserving water both inside and outside the home, and interest is growing in landscaping with native and other beneficial trees, shrubs, and ground covers. Many of these benefits to the environment also save time and money while enhancing our special Florida lifestyle. For more information consult *A Guide to Environmentally Landscaping: Florida Yards and Neighborhoods Handbook* or visit [http://fyn.ifas.ufl.edu/](http://fyn.ifas.ufl.edu/).

Another good source of information on this subject is the Waterwise Florida Landscapes publication from Florida’s water management districts. An electronic version is available for download at [http://floridaswater.com/waterwiselandscapes/](http://floridaswater.com/waterwiselandscapes/).

For homes taking credit for existing landscape material, some of the criteria in this section require inspection by a Florida Yards and Neighborhoods (FY&N) Professional, Master Gardener, or Florida Water Star Certifier. If one of these three specialists cannot be utilized, an individual may use another professional pending the professional submits their qualifications and FGBC deems them as qualified.

Homeowners in some parts of Florida are becoming accustomed to restrictions that limit irrigation to certain days and times. Still, most of us are watering too much. Overwatering depletes our water supply, often makes plants pest prone, and adds to stormwater runoff that pollutes our natural waters. By choosing and
operating an irrigation system correctly, you can reduce water bills, fungal diseases, and maintenance requirements. Coupled with appropriate plant selection, implementing efficient irrigation techniques can reduce outdoor water use anywhere from 20% - 60%.

The St. Johns River Water Management District; the Southwest Florida Water Management District and the University of Florida have developed a Water Star certification program for homes. Irrigation is one component of this program. A number of individuals knowledgeable in irrigation system design, installation, and efficiency developed a list of measures that will ensure irrigation systems not only fulfill their intended purpose, but do so effectively and efficiently. Some of these items are integrated into the FGBC standards specified below.

**W11 Install a rain sensor that will shut off irrigation during rain events**

**Procedure:** Install a rain sensor that will not allow the irrigation system to run if it is raining.

**Intent:** Conserve water by not allowing the irrigation system to run while it is raining.

**Submittals:** Picture of device installed. Copy of receipt for device installed.

**Resources:** [http://fyn.ifas.ufl.edu/FFL/water-efficiently.html](http://fyn.ifas.ufl.edu/FFL/water-efficiently.html); [http://edis.ifas.ufl.edu/ae221](http://edis.ifas.ufl.edu/ae221)

**W12 Update irrigation controller to a programmable controller**

**Procedure:** Remove existing traditional controller and replace with programmable controller.

**Intent:** A programmable controller allows the homeowner to differentiate watering zones based on differing needs of plants and of turf.

**Submittals:** Picture of device removed. Picture of device installed. Copy of receipt.

**Resources:** [http://www.sjrwmd.com/waterwiselandscapes/index.html](http://www.sjrwmd.com/waterwiselandscapes/index.html)

**W13 Install cistern(s), minimum 250 gallons total capacity, for irrigation**

**Procedure:** Installed collection and storage system minimum 250 gallons total capacity with a dedicated outdoor use.

**Intent:** Irrigation can account for as much as 50% of household potable water use. Recapturing and storing rain water for use in irrigation will greatly reduce that percentage.

With an average rainfall of 54 inches/year in the state of Florida (compared to the national average of 27 inches/year), harvested rainwater is an excellent source of water for landscape irrigation. Rainwater harvesting is now mandated for new construction in Bermuda and the U.S. Virgin Islands. Rainwater is generally harvested from a roof surface, and system components include properly designed gutters, piping, roof washers, screens, and a storage tank/cistern. System capacities can range from trashcan-sized rain barrels to thousands of gallons. Harvested rainwater is also a good source for toilet flushing.

**Submittals:** Schematic of system design. Copy of work order for completed cistern.

**Resources:** For more information consult *A Guide to Environmentally Landscaping: Florida Yards and Neighborhoods Handbook* or visit: [http://floridayards.org/](http://floridayards.org/)
Additional information on rainwater harvesting can be found at:
www.greenbuilder.com/sourcebook/Rainwater.html#contents

W14 Turf area less than 50% of landscape

Procedure: Calculate the total area of your lot that is landscaped and covered with turf (grass). Do not include “natural” areas that have not been disturbed. If turf exceeds 50% of your calculation, remove some grass and replace with mulch, groundcover, or “right place/right plants” landscape.

Intent: Lawns are generally the largest consumers of water in the landscape. Minimizing the amount of turf in a yard by confining it to play, pet, or entertainment areas will greatly reduce the yard’s burden on Florida’s limited freshwater resource.

Submittals: Landscaping plan and plant characteristics.

Resources: http://www.sjrwmd.com/floridawaterstar/landscaping.html
http://fyn.ifas.ufl.edu/homeowner.htm

W15 50% of all landscape plants are on the Florida Friendly Plants list

Procedure: Identify all of the plantings in your yard. Reference the Florida Friendly Plants List to confirm which ones are on that list. Calculate the percentage of your existing plants that are on the list. If more than 50% of your plants are not on the list, you can remove the plants that cause the overage and mulch those areas, or replace the plants with ones from the list. Remember to put the “right plant” in the “right place”.

Intent: Florida friendly plants will perform much better in our climate. This list excludes exotic invasives that should not be in Florida

Submittals: Copy of receipt and plant list.
Suggested submittal - For new landscape: Landscaping plan and source of drought-tolerant plant list.

Resources: To obtain a list of plants and trees for your area, contact your local water management district, consult the Waterwise Florida Landscapes publication, or consult with a Master Gardener, or Florida Water Certifier.

Helpful websites:
http://fyn.ifas.ufl.edu/homeowner.htm
http://www.sjrwmd.com/floridawaterstar/landscaping.html
W16  Replace a minimum of 200 square feet of turf with Florida Friendly Plants

Procedure:  Remove at least 200 sq. ft. of turf and replace removed turf with Florida Friendly Plants that meet the “Right Plant/Right Place” definition.

Intent:  Plants, properly sited, require much less water than properly-sited turf.


Resources:  http://www.sjrwmd.com/waterwiselandscapes/index.html
           http://www.floridayards.org/fyplants/index.php
           http://fyn.ifas.ufl.edu/FFL/right-plant-right-place.html

W17  Install rain barrels for rainwater harvesting

With an average rainfall of 54 inches/year in the state of Florida (compared to the national average of 27 inches/year), harvested rainwater is an excellent source of water for landscape irrigation. Rainwater harvesting is now mandated for new construction in Bermuda and the U.S. Virgin Islands. Rainwater is generally harvested from a roof surface and system components include properly-designed gutters, piping, roof washers, screens, and a storage tank/cistern. System capacities can range from trashcan-sized rain barrels to thousands of gallons. Harvested rainwater is also a good source for toilet flushing.

Procedure:  Install gutter and simple-collection rain barrel system to collect rain water for use in irrigation.

Intent:  A properly-installed rain barrel will collect water for use in potted plants or landscape areas. Care must be taken that the collected water does not overflow the barrel and soak the foundation of the building.

Submittals:  Schematic of system design.

Resources:  http://www.swfwmd.state.fl.us/conservation/rainbarrel/
           http://www.protectingourwater.org/watersheds/get_wet/protectwater/rainbarrels/

W18  Add a pool cover to an existing pool

Procedure:  If your pool does not have a cover, install one.

Intent:  Reduce heat loss, chemical evaporation, keep water clean and lengthen swimming season by using a cover. Depending on materials and the amount of time the cover is used, temperature increases of 5°F to 10°F may be expected from a cover. A 5°F increase is reasonable when the
cover is used 12 hours a day and a 10°F increase could be expected when it is used 20 hours a day. Transparent or lightly translucent covers work best because they allow solar energy to pass through and be absorbed by the pool water, and they also prevent heat loss at night. Opaque covers are best used in Florida at night to prevent heat loss. Various types of pool covers are available at your local pool supply store.

**Submittals:** Pre- and post-picture of pool with cover. Copy of receipt for cover.

**Resources:**

The below photos are only shown to represent the type of equipment you may see on the jobsite during inspections. Note: FGBC does not endorse any products.

### W19 Have an irrigation professional perform a “check up” on existing irrigation system

**Procedure:** Have an irrigation professional check your system for leaks, proper spray patterns, and proper volume of water and proper zoning.

**Intent:** If you are going to have an irrigation system, make sure it is working properly and that your turf and bed areas are getting the proper amount of water.

**Submittals:** Report from the irrigation professional.

**Resources:** N/A

### W20 Permanently abandon existing irrigation system

**Procedure:** Permanently abandon your existing irrigation system.

**Intent:** A system that has an interrupted water supply can not be used.

The most effective outdoor water conservation strategy to employ is to design the landscape in such a way that it exists primarily on natural rainfall, and no permanent irrigation system is required. A temporary irrigation system may be set up during establishment of the new landscape.

**Submittals:** Documentation of how the system was abandoned.

**Resources:**
http://www.doityourself.com/stry/removing-a-sprinkler-system
CATEGORY 3: HEALTH

Ventilation

Tight construction of homes can be beneficial in terms of energy efficiency, as less exchange occurs between the conditioned air inside the home and unconditioned air outside of the home. From a health aspect however, tighter homes do not allow enough air exchange to provide adequate ventilation and removal of various indoor air pollutants such as VOC’s, allergens, etc. A home must not only permit enough air exchange, but in addition, the exchange must take place in a controlled fashion, either through mechanical or natural means. For health and durability concerns, it is imperative that air entering the home should travel through a desired, predefined pathway. This will ensure that the air remains clean and, depending on the strategy, can often be conditioned for temperature and humidity concerns.

Source Control

Volatile organic compounds (VOCs), especially formaldehyde, and other chemical substances contained within building materials can be injurious to lung health and can be odorous. The best strategy is to select materials with low to zero quantities of such chemicals to minimize the source of emission. In selecting low-VOC materials, good rules of thumb are to choose water-based products and products with a low odor. Pet dander, dust mites, and other allergens can be of concern to sensitive persons and persons with asthma. Regular cleaning practices with effective equipment and the minimization of materials where such contaminants can accumulate can alleviate potential problems.

Combustion

Certain techniques can be used to prevent dangerous products of combustion from entering into the conditioned environment of the home. Combustion takes place in gas appliances as well as automobiles, which are often running in the garage of the home.

H1 Use Green cleaning products

Procedure: Use eco-friendly products when cleaning your home. Avoid harsh chemicals, those that contain carcinogens, or that are toxic to aquatic life. Look for products that are biodegradable. When choosing green cleaning products, look for ones that have been tested and that have been certified by an independent third party, such as Green Seal. Be careful of products that use “greenwashing”.

Intent: Make your home healthier for you, your family and for the environment by switching to green cleaning products.

Submittals: Picture of 3 green cleaning products, showing the “seal of approval”.

Resources: [http://www.greenseal.org/GreenLiving/WhereToFindTheGreenSeal/CaringForTheHome.aspx](http://www.greenseal.org/GreenLiving/WhereToFindTheGreenSeal/CaringForTheHome.aspx)

H2 If there are bathrooms in the home without exhaust fans, install ENERGY STAR® labeled bathroom exhaust fans, each with a timer or humidistat and exhausted to the house exterior

Procedure: Properly install ENERGY STAR® exhaust fans (high efficiency, low noise bathroom exhaust fans) with timers or humidistats in each bathroom throughout the home. Fans must vent to the exterior and must move 1 cfm of air per 0.30 Watts (e.g., a 50 cfm fan must use less than 15
Watts, a 70 cfm fan must use less than 21 Watts) and be HVI certified to produce less than 1.0 sones. Proper installation includes:

- Avoid elbows and bends whenever possible. When bends are necessary (and they often are), make the best of the situation by allowing a 2–3 foot straight run out of the fan before the first elbow. This approach allows airflow to be uniform before passing through the elbow. Conversely, an installation with a 90-degree elbow immediately after the fan exhaust port will cause air to flow back into the fan, both reducing performance and increasing noise.

- Use a wide-radius angle (not a sharp turn) to help ensure optimum performance and minimum noise. The goal is to achieve optimal fan performance, which means aiming for a smooth, inner surface duct with the least number of elbows.

- Although rigid metal duct is the best choice, flex duct is often used due to reduced cost and ease of installation. The flex duct should be extended fully to reduce as much air flow friction as possible.

**Intent:**

Encourage removal of moisture generated within the bathrooms through proper installation of quiet, efficient exhaust fans.

The left photo is an example of very poor installation. Simply turning the fan around would have eliminated the need for the extreme bend in the ductwork. The photo to the right shows a well-thought-out installation.

In addition to utilizing efficient fans, advanced controls are important, as often times fans are not left on long enough to remove sufficient moisture, and other times fans are inadvertently left on for long periods of time due to their quiet operation. If the bath fan is not controlled by a built-in humidistat, it must be placed on a timer.

**Submittals:** Picture and copy of receipt for purchase and installation.


H3 Use low-VOC paints, stains, and finishes on all interior walls, ceilings, and trim

**Procedure:** All paint, stains, and other finish coatings used in the interior of the home are certified as having low VOCs to comply with the below table.

**Intent:** Use of low VOC paints only pertains to paint used on the interior of the home.

<table>
<thead>
<tr>
<th>Item</th>
<th>VOC Content</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paints applied to Flats: 50 g/l</td>
<td>Green Seal Standard GS-11,</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>-------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Clear Wood Finishes</td>
<td>Varnish: 350 g/l</td>
<td>Lacquer: 550 g/l</td>
</tr>
<tr>
<td>Floor Coatings</td>
<td>100 g/l</td>
<td>South Coast Air Quality Management District Rule 1113, Architectural Coatings</td>
</tr>
<tr>
<td>Sealers</td>
<td>Waterproofing: 250 g/l</td>
<td>Sanding: 275 g/l</td>
</tr>
<tr>
<td>Shellacs</td>
<td>Clear: 730 g/l</td>
<td>Pigmented: 550 g/l</td>
</tr>
<tr>
<td>Stains</td>
<td>250 g/l</td>
<td></td>
</tr>
</tbody>
</table>

**Submittals:** Pre- and post-pictures. Copy of receipt for paint.

**Resources:** [http://www.greenseal.org/findaproduct/paints_coatings.cfm](http://www.greenseal.org/findaproduct/paints_coatings.cfm)

**H4 Replace at least 50% of existing carpet with healthy flooring**

**Procedure:** 50% of existing carpet to be replaced with green certified finished flooring, or hard surface flooring as listed below:

- Carpet and cushion with Carpet and Rug Institute (CRI) green seal of approval ([www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label.cfm](http://www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label.cfm)) and low-VOC or no adhesives are used for installation.
- Flooring certified under the Floor Score® program ([www.rfci.com/int_FloorScore.htm](http://www.rfci.com/int_FloorScore.htm))
- Linoleum or cork tile/sheet with water-based adhesive.
- Ceramic tile.
- Hard surface flooring (wood, bamboo, etc) that is mechanically fastened or attached with a water-based adhesive. Engineered wood flooring or bamboo must be a no-added formaldehyde product.
- Laminate flooring (wood, cork, etc.), with no urea-formaldehyde, and glueless or water-based glue installation.
- Concrete (stamped, stained, etc.).

**Intent:** Certain types of carpet, carpet pad, tack strips, and carpet glues emit VOCs that can contribute to poor indoor air quality. Carpets also have been found to accumulate various allergens unless frequently vacuumed with high efficiency equipment.

**Submittals:** Listing of types of flooring, installation methods, and accessories (glues, etc.) used for installation. Pre- and post-pictures. Copy of receipt for purchase and installation.

**Resources:** A good reference on carpet can be found on Green Seal's website: [http://www.greenseal.org/resources/reports/CGR_carpet.pdf](http://www.greenseal.org/resources/reports/CGR_carpet.pdf).

**H5 Seal wall/openings between garage and conditioned residence**

**Procedure:** Seal wall/openings in home with attached garage to restrict passage of fumes into conditioned space (include a barrier at attic).
**Intent:**
Oftentimes, toxic fumes from automobiles and chemicals stored in the garage can be transferred into the living space of a home when it has an attached garage. An air barrier must be created to restrict air exchange between the garage and conditioned living space. This can be accomplished by caulking and sealing of the top and bottom wall plates of the shared garage-living space walls, constructing an airtight partition between the garage attic space and the attic space over the living area, and weather stripping the garage door. An automatic door closer should also be added for the door that connects the living space to the garage. Sealing of walls and attic partition can be accomplished with open cell expanding foam insulation.

**Submittals:** Pre- and post-pictures. Copy of receipt for materials used.

**Resources:** N/A

**H6 Install fixed exhaust fan with motion sensor and timer in garage**

**Procedure:** Install exhaust fan on motion sensor and timer in garage capable of fully exchanging the garage air with the outside air in 15 minutes or less and if the air handler/return ducts are not located in the garage. A typical 20ft x 20ft x 8ft garage would require a 220 cfm fan. The fan must run for a sufficient amount of time to fully exchange the garage air every four hours on a timer or when activated via a motion sensor, to exhaust carbon monoxide fumes from automobiles. Fan must exhaust to the outside.

**Intent:** Oftentimes, toxic fumes from automobiles and chemicals stored in the garage can be transferred into the living space of a home when it has an attached garage. Exhausting the fumes to the exterior will decrease the chance of fumes entering the residence.

**Submittals:** Picture and copy of receipt.

**Resources:** N/A

**H7 Install carbon monoxide alarms: entrances to garage and to all sleeping areas**

**Procedure:** Install carbon monoxide alarms at entrances, sleeping areas, and if the home has an attached garage, one on the living area side of garage door entrance to living area within the conditioned space. One detector can be used for adjacent bedrooms. The detectors must be line-powered with a battery backup.

**Intent:** Carbon monoxide alarms provide advanced warning to the homeowner of any intrusion of carbon monoxide to the living area of the home before becoming dangerously toxic. Carbon monoxide is a product of the combustion of fuel used for appliances, as well as automobile exhaust. Carbon monoxide detectors are available at most local hardware stores.

**Submittals:** Picture and copy of receipt.

**Resources:** N/A

**H8 Install dehumidifier in HVAC system**

**Procedure:** The home shall be equipped with a central dehumidification system, installed by a local HVAC contractor, which works in conjunction with the home’s HVAC system.

**Intent:** In addition to controlling humidity and comfort, most central dehumidification equipment also permits the intake of fresh, outside air, thereby improving ventilation in the home. By managing moisture properly the potential for growth of mold, mildew, and dust mites will be reduced. The durability of the home will also improve.

**Submittals:** Photo or cut sheet of equipment and copy of installation receipt.
Resources: N/A

H9  Install make-up air source to laundry room located within the conditioned envelope

Procedure: Laundry rooms contained inside conditioned space must have a make-up air source. The make-up air source can be any of the following: through-the-wall vent, jump duct from adjoining room in home, louvered door(s), or pressure-activated fan to bring in air as pressure drops in room when dryer is activated.

Intent: When a clothes dryer is running, it pulls a great quantity of air from the interior of the home. Maintain equalized air pressure in the laundry room when dryer is running even when the laundry room door is closed. If the laundry room is separated from the main portion of the home by an insulated wall and has no ducted supply of conditioned air, it is considered outside of the conditioned space.

Submittals: Picture of air source.

Resources: N/A

H10  Replace range hood with exterior ducted, ENERGY STAR® labeled range hood

Procedure: Home equipped with ENERGY STAR® (high-efficiency, low-noise exhaust fans) labeled range hood vented to the exterior of the home. Hood ducting must be of building code-approved materials and completely sealed to prevent leakage. Exterior of vent must also contain building code-approved termination cover.

Intent: Improve indoor air quality by exhausting humidity and odors.

Submittals: Copy of invoice for purchase and installation.

Resources: N/A

H11  Tape and mastic any air handler located in unconditioned space

Procedure: Air handler located in unconditioned space must be taped and sealed with mastic.

Intent: Reduce air leakage at the air handler and reduce intake of contaminants from the attic or garage.

Submittals: Picture of sealed air handler.

Resources: N/A

H12  Make or install a mud room or otherwise usable entry area

Procedure: Provide a well-defined entry area in the garage and/or main entry where shoes and outerwear can be removed and stored. This area should include a track off mat, a bench, and shoe and
outerwear storage. Alternately, the shoe and outerwear storage can be located in a nearby closet.

**Intent:** Dust and pollen tracked indoors on shoes and outerwear is a major source of allergen. The best strategy is to prevent it from entering the home, or keep it contained to a particular area that can be cleaned frequently. A home that is easily cleaned is not only less maintenance for the homeowner, but the indoor air quality can be improved due to less accumulation of allergens and pollutants.

**Submittals:** Picture of usable entry area.

**Resources:** N/A
CATEGORY 4: MATERIALS

The criteria in this section give examples on the use of resource efficient materials and techniques. Such materials’ characteristics include rapidly renewable content, recycled content, ease of recyclability, and minimal waste production.

M1 Dedicated recycling bins in place
Procedure: Dedicated recycling bins in place. These can be built-in or receptacles provided by the municipality for curbside pick-up.
Intent: Reduce waste.
Submittal: Photo.
Resources: http://www.bestgreenhometips.com/tag/recycling-bins/
           http://www.epa.gov/osw/conserve/rrr/recycle.htm

M2 Use locally-sourced materials
Procedure: When making improvements to your home, look for locally-sourced materials such as those that contain recycled content or that are certified as sustainable.
Intent: Reduce environmental impacts associated with the transportation of materials.
Submittal: Cut sheets from materials used.
Resource: Local building supply companies.

M3 Use non-cypress mulch
Procedure: No cypress mulch in beds or on property.
Intent: Cypress mulch used to be produced mainly as a by-product of lumber operations but the increasing demand for mulch has led to the use of whole trees for nothing but mulch. Cypress trees are not being replanted, resulting in the loss of the cypress forest, its wetland, and wildlife. Acceptable alternative types of mulch include melaleuca, pine straw, pine bark, recycled, and eucalyptus. Note that Brazilian pepper, Australian pines, and palms should not be used as mulch.
Submittal: Landscaping plan.
Resource: http://pasco.ifas.ufl.edu/gardening/mulches.shtml
           http://buildgreen.ufl.edu/Fact_sheet_Resource_Efficient_Landscapes_and_Irrigation.pdf

M4 Develop a construction and demolition waste management plan
Procedure: Develop a construction and demolition waste management plan.
The plan should include the following:
• Estimated amount of waste and types of materials from project.
• Names/locations of waste disposal companies, recyclers, reuse centers for waste materials from project located within the project’s county or neighboring county.
• Estimated costs of hauling and disposal, recycling, and revenues from reuse and recycling for major waste materials from project.
• Goals for waste diversion by amount (weight or volume) and types of materials.
Intent: Encourage minimization and recycling of construction waste.
Submittal: Copy of plan.
Resources: http://www.wbdg.org/resources/cwmgmt.php

M5  Implement a recycle, reuse and repurpose plan for construction

Procedure: Implement a recycle, reuse and repurpose plan for construction.
Intent: Encourage minimization and recycling of construction waste.
Submittals: Pictures of implemented plan.

M6  Engineered/alternative materials for outdoor living

Procedure: Use engineered or alternative materials for outdoor living spaces. The greater of 100 square feet or 50% of all outdoor structures shall be of a product using 50% or more recycled content material.

Intent: Engineered or alternative materials such as recycled plastic lumber utilize less virgin lumber and are generally more durable than wood products.
Submittals: Photo or material cut sheet.
Resources: N/A
CATEGORY 5: DURABILITY

The criteria in this section address the durability of the home and disaster preparedness for the occupants.

D1 Have a hurricane plan and a hurricane kit available

Procedure: Have a plan and the necessary supplies to make your family as safe as possible before an emergency occurs. Go to http://www.floridadisaster.org/family/ or a similar planning tool and create your plan. Stock necessary supplies.

Intent: According to the State Emergency Response Team web site “In a major disaster, emergency workers may not be able to reach everyone right away, and in some cases it may take 3 or more days for help to arrive. What would you do if you had no electricity, no gas, no water and no telephone service? Having a plan for your family and their needs will help ensure their safety and comfort during these difficult times.”

Submittal: Receipt for supplies, synopsis of plan.

Resources: http://www.floridadisaster.org/family/

D2 Attic sealed to prevent water intrusion and to mitigate uplift

Procedure: Seal attic.

Intent: The risk of air infiltration, which has been proven to increase the risk of roof uplift during a hurricane, can be minimized by an unvented attic. Creating an unvented attic can be achieved by extending a home’s air and thermal barrier to the underside of the roof deck, creating an attic that is sealed from the outside environment, with no venting. This design also allows all of the HVAC duct systems to be housed in “conditioned” space.

Submittal: Pre- and post-pictures of attic. Receipt for sealing

Resources: http://www.energystar.gov/index.cfm?c=diy.diy_index

D3 Exterior structures properly anchored

Procedure: Exterior structures, such as pool equipment and other pumps, generators, sheds, etc., are properly anchored to a foundation or the building itself.

Intent: Increase durability of the home.

Submittal: Pre- and post-pictures. Copy of receipt for anchoring.

Resources: http://www.floridadisaster.org
http://www.fema.gov/about/regions/regionvii/protect.shtm

D4 Improve tie downs of house trusses and foundation

Procedure: Have your trusses and foundation assessed by a building professional to ascertain the need for improving the holding capacity of the existing tie downs. Make improvements based on the assessment.

Intent: Increased durability of the home.

Submittal: Building professional’s report. Invoice for work performed.

Resources: http://www.floridadisaster.org
http://www.fema.gov/about/regions/regionvii/protect.shtm
D5  Brace gable roofs

Procedure:  Have a building professional assess the current bracing for your gable roof, and recommend if additional bracing is necessary.

Intent:  Increased durability of the home.

Submittal:  Building professional’s report. Invoice for work performed.

Resources:  http://www.floridadisaster.org

D6  Add a hurricane system, other than plywood or OSB, for window and door protection

Procedure:  All windows, skylights, sliding glass doors, and other doors comprised of at least 60% glass in the home are protected with shutter or screen product rated as impact resistant.

Intent:  Improve durability and safety of the home.

Submittal:  Photos of installed shutters or product.

Resources:  www.buildingcodeonline.com
            www.floridadisaster.org
            www.floridabuilding.org/pr/pr_app_srch.aspx
            If unsure whether a particular product is approved, you may want to consult the manufacturer.  Strengthening of existing skylights may include repair of surrounding roof.

D7  Replace garage door and tracks with hurricane resistant system

Procedure:  Attached garage doors must be classified as impact resistant or be reinforced (braced) according to Dade County specifications.

Intent:  Improve durability and safety of home.

Submittal:  Invoice for purchase and installation of garage door and tracks.

Resources:  http://www.floridadisaster.org

D8  Re-roofing:  Install secondary water protection

Procedure:  Install secondary water protection on the roof. Secondary water protection can be achieved if the entire roof has self-adhering polymer bitumen roofing underlayment (thin rubber or asphalt sheets with peel and stick underside installed beneath the roof covering and on top of the sheathing). Alternately, joints may be sealed with a self-adhering polyethylene or rubberized asphalt tape that has a minimum width of 6 inches (prior to installation of felt or other type of roof underlayment). Roofing felt or similar paper based products alone are not eligible for this requirement.

Intent:  Wind damage accounts for only a fraction of the destruction in homes hit by hurricanes. The greatest destruction is caused by water infiltration. Should the shingles or other roofing material fail during a hurricane, secondary water protection will offer defense against bulk water intrusion.

Submittal:  Copy of invoice for material and installation

Resources:  N/A

D9  Install gutters and downspouts to divert water at least 3’ away from the foundation

Procedure:  If rain gutters have been installed, the downspouts must discharge 3 or more feet from the building.
Intent: To keep moisture away from the building’s foundation.
Submittal: Picture showing downspouts terminating at least 3’ away from building.
Resources: N/A
A NOTE ABOUT GREEN WASHING:

A product can be labeled “green,” “sustainable,” low-VOC,” “organic,” or any other number of descriptives, but unless they are certified, the labels don’t ensure anything. Make sure that you do research on product labels before believing them. Use the product labeling glossary below to read about certified labels and definitions.

PRODUCT LABELING GLOSSARY

CRI– The Carpet and Rug Institute

Seal of Approval
The seal identifies effective carpet cleaning solutions and equipment that clean carpet right the first time.

Green Label and Green Label Plus
Certifies that carpet, carpet backings, cushions, and adhesives have low-VOC (volatile organic compound) emissions.
www.carpet-rug.org/residential-customers/selecting-the-right-carpet-or-rug/green-label.cfm
EnergyGuide Label

The EnergyGuide label is important for showing the estimated yearly operating cost and electricity usage, as well as showing if the appliance is ENERGY STAR® certified. EnergyGuide requires that the appliances meet the Appliance Standards Program set by the US Department of Energy (DOE). The label is on all clothes washers, dishwashers, refrigerators, freezers, water heaters, window air conditioners, central air conditioners, furnaces, boilers, heat pumps, and pool heaters.

ENERGY STAR® label
The label certifies that a product meets energy efficiency requirements. ENERGY STAR® is backed by the US Environmental Protection Agency (EPA) and the US Department of Energy (DOE).
http://www.energystar.gov/index.cfm?c=products_pr_how_earn

FloorScore® Seal
This seal tells you that the products have been independently certified by SCS to comply with the volatile organic compound emissions criteria of the California Section 01350 standard. Any product that has met these stringent standards is a product that will contribute to good indoor air quality. FloorScore® was developed by the Resilient Floor Covering Institute (RFCI) Flooring.

GREENGUARD Indoor Air Quality Certified® Mark
The mark certifies that the product meets strict chemical emissions limits. GREENGUARD Indoor Air Quality Certification is backed by a third-party organization and applies to building materials, finishes, interior furnishings, furniture, cleaning products, and electronic equipment.
Green Seal
The seal certifies that the products, services, and companies meet the criteria for life cycle-based sustainability standards.

http://www.greenseal.org/FindGreenSealProductsAndServices.aspx

LRV - Light Reflectance Value
LRV runs on a scale of 0 to 100, with 0 being pure black, and 100 pure white. The measurement indicates how much light and heat a color reflects, or conversely, absorbs. Dark colors absorb more heat from sunlight; in contrast, light-colored surfaces have been shown to reduce cooling costs. The more the exterior color reflects, the more economical it will be to cool your home.

Manual J
The Air Conditioning Contractors Association (ACCA) Manual J Calculation is performed to size heating and cooling systems. The calculation determines the heating load for a residence or small commercial building. The calculation includes site-specific characteristics such as regional weather data, building framing materials, building insulation levels, building air infiltration levels and window area.

MaP – Maximum Performance
Toilets are tested and receive MaP ratings from 250 to 1,000, with a higher rating indicating a stronger flushing power. WaterSense® toilets are required to have a MaP rating of at least 350.

http://www.map-testing.com/
**NFRC - National Fenestration Rating Council**

**R-Value**

Measures conductivity and resistance to heat loss. R-value is used for floors, walls, and roofs. The average R-value is between 3 and 3.5 per inch thickness of installed insulation. Increasing insulation levels (R-value) reduces the amount of heat gain from the outside and the amount of conditioned air that escapes from the house.

**SHGC - Solar Heat Gain Coefficient**

Measures how well a product blocks heat caused by sunlight. Windows are rated from 0 to 1, with a lower SHGC score indicating less solar heat transmission.

**U-Factor/U-Value**

Measures how well a product prevents heat from escaping. U-factor measures rate of heat transfer and is the inverse of the R-value. Windows are generally rated within 0.20 and 1.20, with a lower U-factor indicating greater resistance to heat flow and better insulation.

http://www.nfrc.org/label.aspx

http://www.energystar.gov/index.cfm?c=windows_doors.pr_anat_window

An NFRC energy performance label showing U-factor and SHGC values for a window.

EPA Performance criteria for windows and skylights based on climate zones.
**WaterSense® label**

The label certifies that products meet EPA criteria for water efficiency and performance by following testing and certification protocols specific to each product. Generally, WaterSense® labeled products are about 20 percent more water-efficient.

[http://www.epa.gov/WaterSense/about_us/product_certification_labeling.html](http://www.epa.gov/WaterSense/about_us/product_certification_labeling.html)

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**WF – Water Factor**

Measures the efficiency of a clothes washer based on the total weighted per-cycle water consumption divided by the capacity of the washer. The lower the WF, the more efficient the clothes washer is. ENERGY STAR® certified clothes washers include the WF in the product information.