LEED for Homes Detailed Prerequisites

ID 1.1 LEED for Homes meeting
   Project Team members Green Rater and possible the Provider
   Create action plan identifying
   Targeted LEED award level
       Certified: 40-49 points
       Silver: 50-59 points
       Gold: 60-79 points
       Platinum: 80 points and above

   Selected LEED for Homes credits

   Identify party responsible for meeting the requirements of each credit

   **Aim to earn roughly five points more than necessary

ID 2.1 Durability Planning
   Prior to construction, the project team needs to:
   a) Complete Durability Risk Evaluation Form
      Identifies all moderate and high risk durability issues for
      building enclosure

   b) Develop specific measures to respond to those issues

   c) Identify/incorporate all applicable indoor moisture control
      measures

<table>
<thead>
<tr>
<th>Location or equipment</th>
<th>Required moisture control measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tub, showers, and spa areas</td>
<td>Use nonpaper-faced backer board on walls.</td>
</tr>
<tr>
<td>Kitchen, bathroom, laundry rooms, and</td>
<td>Use water-resistant flooring; do not install carpet.</td>
</tr>
<tr>
<td>spa areas</td>
<td></td>
</tr>
<tr>
<td>Entryway (within 3 feet of exterior</td>
<td>Use water-resistant flooring; do not install carpet.</td>
</tr>
<tr>
<td>door)</td>
<td></td>
</tr>
<tr>
<td>Tank water heater in or over living</td>
<td>Install drain and drain pan.</td>
</tr>
<tr>
<td>space</td>
<td></td>
</tr>
<tr>
<td>Clothes washer in or over living space</td>
<td>Install drain and drain pan, or install accessible single-throw supply</td>
</tr>
<tr>
<td></td>
<td>valve.</td>
</tr>
<tr>
<td>Conventional clothes dryer</td>
<td>Exhaust directly to outdoors.</td>
</tr>
<tr>
<td>Condensing clothes dryer</td>
<td>Install drain and drain pan.</td>
</tr>
</tbody>
</table>

   d) Incorporate measures from 2.1 b and c, above, into project
      documents (drawings, specifications, and/or scopes of work, as
      appropriate)

   e) List all durability measures and indicate their locations in the
LEED for Homes Detailed Prerequisites

project documents in a durability inspection checklist (include the checklist in project documents for use in verification)

ID 2.2 Durability Management
During construction, the building shall have a quality management process in place to ensure installation of the durability measures. Can be satisfied by having the builder inspect and check off each measure in the durability inspection checklist created for 2.1 (e).

SS 1.1 Erosion Controls During Construction
Prior to construction, design and plan appropriate erosion control measures. During construction, implement these measures. Erosion control measures must include the following:

a) Stockpile and protect disturbed topsoil from erosion (for reuse)
b) Control the path and velocity of runoff with silt fencing or comparable measures
c) Protect on-site storm sewer inlets, streams, and lakes with straw bales, silt fencing, silt sacks, rock filters, or comparable measures
d) Provide swales to divert surface water from hillsides
e) If soils in a sloped area (i.e., 25% or 4:1 slope) are disturbed during Construction, use tiers, erosion blankets, compost blankets, filter socks and berms, or some comparable approach to keep soil stabilized.

SS 2.1 No Invasive Plants
Introduce no invasive plant species into the landscape. Consult local Cooperative Extension Service or state agencies www.invasivespeciesinfo.gov/unitedstates/state.html

EA 1.1 Performance of ENERGY STAR for Homes
Meet performance requirements of ENERGY STAR for Homes. Include a third-party inspection.

EA 2.1 Basic Insulation
Meet these requirements:

a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code.
Alternative wall and insulation systems, such as structural insulated panels (SIPs) and insulated concrete forms (ICFs), must demonstrate a comparable R-value, but thermal mass or infiltration effects cannot be included in the R-value calculation.

b) Install insulation to meet the Grade II specifications set by the National Home Energy Rating Standards (Table 1).

Installation must be verified by an energy rater or Green Rater conducting a pre-drywall thermal bypass inspection, as summarized in figure 1.

Note: For any portion of the home constructed with SIPs or ICFs, the rater must conduct a modified visual inspection using the ENERGY STAR Structural Insulated Panel Visual Inspection Form.

---

**EA 3.1 Reduced Envelope Leakage**

Meet the air leakage requirements shown in Table 1.

Air leakage rate must be tested and verified by an energy rater.

---

**Table 1: Air Leakage Requirements**

<table>
<thead>
<tr>
<th>LEED Criteria</th>
<th>IECC Climate Zones 1–2</th>
<th>IECC Climate Zones 3–4</th>
<th>IECC Climate Zones 5–7</th>
<th>IECC Climate Zone 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA 3.1: Reduced Envelope Leakage (mandatory)</td>
<td>7.0</td>
<td>6.0</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>EA 3.2: Greatly Reduced Envelope Leakage (optional)</td>
<td>5.0</td>
<td>4.25</td>
<td>3.5</td>
<td>2.75</td>
</tr>
<tr>
<td>EA 3.3: Minimal Envelope Leakage (optional)</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>
EA 4.1 Good Windows – Meet all requirements

a) Design and install windows and glass doors that have NFRC ratings that meet or exceed the window requirements of the ENERGY STAR for Homes national Builder Option Package (see table)

b) The ratio of skylight glazing to conditioned floor area may not exceed 3%.

All skylights must meet the ENERGY STAR performance requirements for skylights, but are exempt from the requirements in table 1.

c) Homes in the Northern and/or North/Central climate zones that have a total window-to-floor area ratio (WFA) of 18% or more must meet a more stringent U-
factor requirement (also applicable to EA 4. And 4.3):
U-Factor = (.18 / WFA) * (U-factor from table 1)

d) Homes in the Southern or South/Central climate zones that have a total window-to-floor (WFA) of 18% or more must meet a more stringent heat gain coefficient (SHGC) requirement (also applicable to EA 4.2 and 4.3):
SHGC = (.18 / WFA) * (SHGC from Table 1)

Note: Up to .75% of the window-to-floor area may be used for decorative glass or skylight area that does not meet the U-factor and SHGC requirements above.

**EA 5.1 Reduced Distribution Losses**

a) Limit duct air leakage rate to outside the conditioned envelope. The tested duct leakage rate must be equal to or less then 4.0 cfm at 25 Pascals per 100 square feet of conditioned floor area (for each installed system), verified by the energy rater. Testing is waived if the home meets EA 5.3 (b) or (c)

EA 5.3 b) Locate the air-handler unit and all ductwork within the conditioned envelope and minimize envelope leakage (i.e., meet the requirements of EA 3.3)

**EA 3.3 Minimal Envelope Leakage**
Meet the air leakage requirements shown in Table 1. The air leakage rate must be tested and verified by an energy rater

<table>
<thead>
<tr>
<th>LEED Criteria</th>
<th>IECC Climate Zones 1–2</th>
<th>IECC Climate Zones 3–4</th>
<th>IECC Climate Zones 5–7</th>
<th>IECC Climate Zone 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>EA 3.1: Reduced Envelope Leakage (mandatory)</td>
<td>7.0</td>
<td>6.0</td>
<td>5.0</td>
<td>4.0</td>
</tr>
<tr>
<td>EA 3.2: Greatly Reduced Envelope Leakage (optional)</td>
<td>5.0</td>
<td>4.25</td>
<td>3.5</td>
<td>2.75</td>
</tr>
<tr>
<td>EA 3.3: Minimal Envelope Leakage (optional)</td>
<td>3.0</td>
<td>2.5</td>
<td>2.0</td>
<td>1.5</td>
</tr>
</tbody>
</table>

EA 5.3 c) Locate the air-handler unit and all ductwork visibly within conditioned spaces (i.e., no ductwork hidden in walls, chases, floors, or ceilings)

b) Do not install ducts in exterior walls unless extra insulation is added to maintain the overall UA for an exterior wall without ducts. Ducts may be run inside interior wall cavities but must be fully ducted (i.e., do not use the wall cavity as the duct).
c) Use at least R-6 insulation around ducts in unconditioned spaces

**EA 6.1 Good HVAC Design and Installation – meet all requirements**

a) Design and size HVAC equipment properly using ACCA Manual J, the ASHRAE 2001 Handbook of Fundamentals, or an equivalent computation procedure

b) Install HVAC equipment that meets the requirements of the ENERGY STAR for Homes national Builder Option Package (Table 1)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Central AC and air source heat pumps</th>
<th>Furnaces (gas, oil, or propane)</th>
<th>HVAC equipment</th>
<th>Ground-source heat pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>End use</strong></td>
<td><strong>Cooling</strong></td>
<td><strong>Heating</strong></td>
<td><strong>Boilers</strong></td>
<td><strong>Ground-source heat pumps</strong></td>
</tr>
<tr>
<td><strong>EA 6.2:</strong> High-efficiency HVAC (2 points)</td>
<td>≥ 13 SEER</td>
<td>≥ 8.2 HSPF</td>
<td>≥ 90 AFUE</td>
<td>≥ 17.5 EER</td>
</tr>
<tr>
<td><strong>EA 6.3:</strong> Very high-efficiency HVAC (heat pump, 4 points; other systems, 3 points)</td>
<td>≥ 15 SEER</td>
<td>≥ 8.6 HSPF</td>
<td>≥ 92 AFUE</td>
<td>≥ 87 AFUE</td>
</tr>
</tbody>
</table>

*Furnace with low electric energy use.

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Central AC and air source heat pumps</th>
<th>Furnaces (gas, oil, or propane)</th>
<th>HVAC equipment</th>
<th>Ground-source heat pumps</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>End use</strong></td>
<td><strong>Cooling</strong></td>
<td><strong>Heating</strong></td>
<td><strong>Boilers</strong></td>
<td><strong>Ground-source heat pumps</strong></td>
</tr>
<tr>
<td><strong>EA 6.2:</strong> High-efficiency HVAC (2 points)</td>
<td>≥ 13 SEER</td>
<td>≥ 8.2 HSPF</td>
<td>≥ 80 AFUE</td>
<td>≥ 15 EER</td>
</tr>
<tr>
<td><strong>EA 6.3:</strong> Very high-efficiency HVAC (heat pump, 4 points; other systems, 3 points)</td>
<td>≥ 15 SEER</td>
<td>≥ 8.6 HSPF</td>
<td>≥ 90 AFUE</td>
<td>≥ 85 AFUE</td>
</tr>
</tbody>
</table>

*Furnace with low electric energy use.

**c) Install ENERGY STAR labeled programmable thermostat (except heat pumps and hydronic systems)**

**EA 8.1 ENERGY STAR Lights**

Install at least four ENERGY STAR labeled light fixtures or ENERGY STAR labeled compact fluorescent light bulbs (CFLs) in high-use rooms (Kitchen, dining room, living room, family room, hallways).

**EA 11.1 Refrigerant Charge Test**

Provide proof of proper refrigerant charge of the air-conditioning system (Unless home has no mechanical cooling system)

**MR 1.1 Framing Order Waste Factor Limit**
Limit the overall estimated waste factor to 10% or less. If the waste factor on any portion of the framing order exceeds 10%, calculate the overall waste factor as shown in Table 1.

<table>
<thead>
<tr>
<th>Framing component</th>
<th>Total cost</th>
<th>Waste factor</th>
<th>Waste cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Random lengths</td>
<td>$1,000</td>
<td>15%</td>
<td>$150</td>
</tr>
<tr>
<td>Studs</td>
<td>$2,000</td>
<td>5%</td>
<td>$100</td>
</tr>
<tr>
<td>Beams and headers</td>
<td>$500</td>
<td>20%</td>
<td>$100</td>
</tr>
<tr>
<td>Roof deck</td>
<td>$2,000</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td>Wall sheathing</td>
<td>$0</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td>Rafter</td>
<td>$2,000</td>
<td>0%</td>
<td>$0</td>
</tr>
<tr>
<td>Ceiling joists</td>
<td>$1,500</td>
<td>10%</td>
<td>$150</td>
</tr>
<tr>
<td>Cornice work</td>
<td>$3,000</td>
<td>10%</td>
<td>$300</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$12,000</strong></td>
<td><strong>8.3%</strong></td>
<td><strong>$1,000</strong></td>
</tr>
</tbody>
</table>

Waste factor is defined as the percentage of framing material ordered in excess of the estimated material needed for construction.

MR 2.1 FSC-Certified Tropical Wood – meet the two requirements as applicable

a) Provide all wood product suppliers with a notice (figure 1)

i. a statement that the builder’s preference is to purchase products containing tropical wood only if it is FSC-Certified

ii. a request for the country of manufacture of each product supplied;

iii. a request for a list of FSC-certified tropical wood products the vendor can supply

b) If tropical wood is intentionally used (i.e., specified in purchasing documents), use only FSC-certified tropical wood products. Reused or re-claimed materials are exempt

Note: A species of wood is considered tropical for the purposes of this prerequisite if it is grown in a country that lies between the Tropics of Cancer and Capricorn

MR 3.1 Construction Waste Management Planning – complete the following tasks related to management of construction waste:

a) Investigate and document local options for diversion (e.g., recycling, reuse) of all anticipated major constituents of the project waste stream, including cardboard packaging and household recyclables (e.g., beverage containers).

www.alliancees.org

Info@alliancees.org
b) Document the diversion rate for construction waste. Record the diversion rate for land clearing and/or demolition, if applicable (e.g., on gut rehab project), separately from the rate for the new construction phase of the project.

**EQ 2.1 Basic Combustion Venting Measures – meet the requirements**

a) No unvented combustion appliances (e.g., decorative logs) are allowed

b) A carbon monoxide (CO) monitor must be installed on each floor

c) All fireplaces and woodstoves must have doors

d) Space and water heating equipment that involves combustion must meet one of the following. Space heating systems in homes located in IECC-2007 climate zone 1 or 2 are exempt

   i. it must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting);

   ii. it must be designed and installed with power-vented exhaust; or

   iii. it must be located in a detached utility building or open-air facility

**EQ 4.2 Enhanced Outdoor Air Ventilation**

Design and install a whole building ventilation system that complies with ASHRAE Standard 62.2-2007. A summary of alternatives is provided below, but the HVAC contractor should review and follow the requirements of ASHRAE Standard 62.2-2007, Sections 4 and 7

a) Mild climate exemption. A home built in a climate with fewer than 4,500 infiltration degree-days is exempt from this prerequisite

b) Continuous ventilation. Meet the ventilation requirements in Table 1
c) Intermittent ventilation. Use Equation 4.2 of ASHRAE Standard 62.2-2007 to demonstrate adequate ventilation airflow

d) Passive ventilation. Have a passive ventilation system approved and verified by a licensed HVAC engineer as providing ventilation equivalent to that achieved by continuous ventilation systems as described in Table 1

EQ 5.1 Basic Local Exhaust
a) Design and install local exhaust systems in all bathrooms (including half-baths) and the kitchen to meet the requirements of Section 5 of ASHRAE Standard 62.2-2007. Sample requirements that relate to minimum intermittent local exhaust flow rates are shown in Table 1

<table>
<thead>
<tr>
<th>Location</th>
<th>Minimum air flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kitchen</td>
<td>100 cfm; vented range hood required if exhaust fan flow rate is less than 5 kitchen air changes per hour.</td>
</tr>
<tr>
<td>Bathroom</td>
<td>50 cfm</td>
</tr>
</tbody>
</table>

b) Design and install the fans and ducts to meet the requirements of Section 7 of ASHRAE Standard 62.2-2007

c) Exhaust air to the outdoors (i.e., exhaust to attics or interstitial spaces is not permitted)

d) Use ENERGY STAR labeled bathroom exhaust fans (except for exhaust fans serving multiple bathrooms)

EQ 6.1 Room-by-Room Load calculations
Perform design calculations (using ACCA Manuals J and D, the ASHRAE Handbook of Fundamentals, or an equivalent computation procedure) and install ducts accordingly.

EQ 7.1 Forced-Air Systems:
Good Filters
Install air filters with a minimum efficiency reporting value (MERV) greater or equal to 8 and ensure that air handlers can maintain adequate pressure and airflow. Air filter housing must be airtight to prevent bypass or leakage

EQ 7.1 Nonducted HVAC Systems (e.g., Hydronic Systems):
Good Filters
Install air filters greater or equal to MERV 8 and maintain adequate pressure and air flow in any mechanical ventilation systems. A home in a climate with fewer than 4,500 infiltration degree-days or a home that uses only passive or exhaust-only ventilation is exempt from this requirement.
EQ 9.1 Radon-Resistant Construction in High-Risk Areas
If the home is in EPA Radon Zone 1, design and build the home with radon-resistant construction
techniques as prescribed by EPA, the International Residential Code, Washington State Ventilation
and Indoor Air Quality Code, or some equivalent code or standard.

EQ 10.1 No HVAC in Garage
Place all air-handling equipment and ductwork outside the fire-rated envelope of the garage

AE 1.1 Basic Operations training
Provide the home’s occupant(s) with the following:

a) An operations and maintenance manual or binder that includes all the following items:

i. The completed checklist of LEED for Homes features
ii. A copy of each signed Accountability Form
iii. A copy of the durability inspection checklist
iv. The product manufacturers’ manuals for all installed equipment,
furnitures, and appliances
v. General information on efficient use of energy, water, and natural
resources
vi. Operations and maintenance guidance for LEED for Homes-related
equipment installed in the home, including

   space heating and cooling equipment
   mechanical ventilation equipment
   humidity control equipment
   radon protection system
   renewable energy system
   irrigation, rainwater harvesting, and or graywater system

vii. Guidance on occupant activities and choices, including the
following:

   cleaning materials, methods, and supplies
   water-efficient landscaping
   impacts of chemical fertilizers and pesticides
   irrigation
   lighting selection
   appliance selection

viii. Educational information on “green power”

b) A minimum one-hour walk-through of the home with the occupant(s), featuring the following:
i. identification of all installed equipment
ii. instruction in how to use the measures and operate the equipment
iii. information on how to maintain the measures and equipment