

Shaker Heights Infill Housing Green Building Criteria

NOTE: The Cleveland Green Building Coalition, through the City of Shaker Heights, can provide consultation to the selected builder/developer to assist with the integration of green building strategies.

Green building is the design, construction and operation of buildings that reduce their impact on natural resources, save money and energy, and create healthy, comfortable living and working environments.

In order to achieve the City's recommended standards for green building:

- 1. Building Envelope MUST include:**
 - a. A blow door test (at builder's expense) to test for 0.35 Air Changes Per Hour or less.

- 2. Mechanical Systems MUST include:**
 - a. 90% or higher energy efficient furnace with sealed combustion air (or
 - b. other energy efficient system.)
 - c. Air conditioner has a Seasonal Energy Efficient Rating of 12 or higher
 - d. with R410A or other non-HCFC (hydrochlorofluorocarbon) refrigerants.
 - e. Gas water heater with an energy factor of 0.60 or greater.
 - f. No hot water or cold water lines in unconditioned spaces.
 - g. Install gas water heater within 20 pipe feet of dishwasher and clothes washer.

- 3. Appliances MUST include (When Applicable):**
 - a. Be ENERGY STAR labeled.
 - b. A refrigerator that uses R112 refrigerant.
 - c. Gas dryer and/or cook top with electronic ignition.

- 4. Lighting MUST include:**
 - a. 10% of all light fixtures should be fluorescent or have compact fluorescent bulbs.
 - b. No can lights in an insulated ceiling.

- 5. Foundation MUST include:**
 - a. Non-solvent.
 - b. Non-solvent based form release material used for poured concrete walls and or for based damp proofing.
 - c. If concrete is used, fly ash should be used for a minimum of 15% of the mix.

- 6. Structural Frame MUST include:**
 - a. Engineered alternative lumber replaces large dimension solid lumber (2 x 10 or greater) in 90% or more of the floor area and roof area.
 - b. Engineered lumber products for window or door headers.

- 7. Windows MUST include:**
 - a. Low-e windows that are National Fenestration Rating Council rated.

- 8. Doors MUST include:**
 - a. Exterior doors insulated to R-5 or greater.
 - b. No luan doors.

- 9. Exterior Wall Finishes MUST:**
 - a. Install window and door flashing.
 - b. Use recycled and/or recovered-content siding on 50% or more of the exterior.

- 10. Roof MUST include:**

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- a. Minimum 40 year roofing material.
- b. Recycled-content roofing material.

11. Flooring Must include:

- a. 25-100% recycled-content carpet, tacked not glued.
- b. Finger-jointed and/or medium density fiberboard trim.
- c. No luan underlayment used.

12. Health and Safety- Indoor Air Quality MUST include:

- a. American Lung Association Health House standards.
- b. A ventilation system that provides effective air-change.
- c. Subslab ventilation for radon mitigation.
- d. Finishes with least toxic treatments.
- e. Exhaust fan installed in garage.
- f. Formaldehyde free particle board used for countertops, cabinets, oriented strand board (the binder must be a low volatile organic compound) sheathing.
- g. Low toxicity, solvent free adhesives, sealants and paints used. throughout, including water-based urethane finishes on wood floors and on particle board. (Standard is less than 150 grams/liter or Volatile Organic Compound).
- h. Install hard-wired carbon monoxide detectors.
- i. 100% formaldehyde-free insulation throughout the house.
- j. Attached garage is isolated from house by extensive air sealing.
- k. Range hood directly to exterior.

1. Land Use:

- a. Protect trees now on site during construction.
- b. Save and reuse all topsoil.

2. Materials Reduction, Re-use, and Recycling- MUST:

- a. Specify salvaged, reclaimed or refurbished materials for 10% of structural materials and 10% of finish materials.
- b. House should not exceed 2,000 square feet of conditioned area.
- c. Minimize job site waste by using materials wisely and prohibit burying construction waste.
- d. Recycle most of the job site waste.

3. Water Conservation:

- a. Bathroom faucets fitted with aerator restricting flow to 1.8 gallons per minute-
Kitchen restricted to: 2.0 gallons per minute.

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Green Building Background Information

To foster a better understanding why these criteria have been selected, the following background information may be helpful:

What is green or sustainable building?

The first Green Builder Program in the United States was created in 1991 in Austin, Texas. Pliny Fisk, the man behind that program defined green building or sustainable building in a most helpful way when he wrote:

“Sustainability”, according to Webster’s American Heritage Dictionary, is to “keep in existence; maintain”. As it relates to the world we live in, sustainability means meeting our present needs without compromising the needs of future generations.”

Environmental Building News (EBN), the best journal on this subject available at this time, has generated the following list of goals of a green building project:

- Save Energy—design and build energy-efficient buildings
- Recycle Buildings---utilize existing buildings and infrastructure instead of developing virgin land
- Create Community---design communities to reduce dependence on the automobile to foster a sense of community
- Reduce Material Use—optimize design to make use of smaller spaces and utilize materials efficiently
- Protect and Enhance the Site---preserve or restore local ecosystems and biodiversity
- Select Low-Impact Materials---specify low-environmental impact, resource-efficient materials
- Maximize Longevity---design for durability and adaptability
- Save Water---design buildings and landscapes that are water efficient
- Make A Building Healthy---provide a safe and comfortable indoor environment
- Minimize Construction and Debris Waste---return, reuse and recycle jobsite waste.

EBN also has done extensive work creating criteria for choosing building materials by evaluating the entire life-cycle of building materials that will be considered for use in a green or sustainable building.

- Energy use—will the material in question have a measurable impact on building energy use?
- Occupant Health—might products in this application affect the health of building occupants?
- Durability and Maintenance---are products likely to need replacement, special treatment or repair multiple times during the life of the structure?
- Hazardous By-Products---are significant toxic or hazardous intermediaries or byproducts created during the manufacture?
- Energy Use—how energy intensive is the manufacturing process?
- Waste from Manufacturing---how much solid waste is generated in the manufacturing process?
- Resource Limitations---are any of the component materials from rare or endangered resources?
- Impacts of Resource Extraction---are there significant ecological impacts from the process of mining or harvesting raw materials?

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- Transportation---are the primary raw materials located a great distance from your site?
- Demolition waste---can the material be easily separated out for reuse or recycling after its useful life in the structure is over?
- Hazardous Materials for Demolition---might the material become a toxic or hazardous waste problem after the end of its useful life?
- Review of the Results---go over concerns that have been raised about the products under consideration, and look for other life-cycle impacts that might be specific to a particular material.