

# 101 Ways We Are Building Green



*Habitat for Humanity of Greater Lowell*

Committed to our volunteers, our partner families, our community and our Earth.

“Green construction” means choosing products, materials, and building processes to a specific design and site to minimize environmental impact. For Habitat for Humanity, this must be accomplished while meeting an overall goal of building affordable homes. For builds, we seek a 40 percent savings in energy usage while keeping our overall cost less than 5 percent more than the cost of conventionally built home. In addition, we seek to reduce solid waste by more than 50 percent leaving the construction site. These goals, show that it is possible to build responsibly without major cost implications. It can be affordable AND greener.

## Design

1. Lighting, ventilation, space heating and domestic hot water system designed with a whole house energy model	6. House is planned to minimize construction waste through efficient use of materials
2. Compact building form reduces environmental footprint	7. Climate-appropriate building design
3. Building oriented for solar access, south-facing roof for future solar energy systems	8. Participation in DOE Building America advanced house research program
4. Durability planning to extend building life and reduce maintenance costs	9. Third-party certified LEED for Homes rating
5. House is designed to be easily adapted for accessibility	10. Third-party certified ENERGY STAR for Homes qualification

## Framing and Insulation

11. Thermal insulation exceeds building code - R65 roofs, R45 walls, R20 foundation, R10 basement floor	24. Third-party inspection of insulation installation
12. Insulating exterior sheathing to reduce wood consumption and increase thermal performance	25. 2x6 framing at 24" spacing (advanced framing) to reduce wood consumption and increasing R value
13. Use of blown cellulose insulation – better filled wall cavities and reduced sound transmission	26. Use of two stud corners to reduce wood consumption and increase overall R value
14. Unvented, cathedralized roof design to maximize interior living space	27. Advanced framing to eliminate unnecessary use of wood - drywall clips, "right-sized" headers, and single top plates
15. Increased airtightness of building assemblies	28. Low expansion foam air seal between window and door unit and their rough openings
16. All penetrations through plane of air tightness to be sealed with caulking or spray foam	29. Third-party testing of building airtightness
17. Larger roof overhangs reduce summer heat by shading walls and windows	30. Double hung windows – designed for cross ventilation, allows air out at the top and in at the bottom
18. ENERGY STAR qualified high performance windows	31. Pan flashing installed below every window and door to ensure water is directed to the exterior
19. "Vapor-open" wall and roof design to minimize hidden moisture problems	32. Ground sloped away from building to direct water away from structure
20. Capillary break between foundation wall and sill plate to block water rising through the concrete foundation	33. Non-toxic pest controls including insect and rodent screens and anti-termite measures
21. Low maintenance fiber cement siding and exterior trim	34. Furring to drain and back-ventilate siding extends siding service life
22. Third-party verification of durability management measures	35. Construction waste management plan to reduce waste sent to landfill
23. Recycling program for waste building materials	

## Landscaping

36. No invasive plants allowed in landscape design	41. Building site located near existing services and community resources
37. Soil erosion controls in place during construction	42. Gravel edging around house for rain water collection
38. Rain water retention garden	43. Permanent drainage swales to manage storm water
39. House is sited close to main roadway reducing paved surface and impact on virgin environment	44. Permeable paving used where possible to reduce storm water run-off
40. Water intensive grass limited to less than 20% of the soft landscaped area	45. Native planting used to reduce water use

## Air Handling and Mechanical

46. Increased level of thermal insulation reduces heating and cooling equipment size and operating costs	59. Heating system is a high efficiency 95% AFUE sealed combustion furnace
47. Sealed combustion appliances to keep combustion gases safely out of the indoor environment	60. Programmable thermostat to minimize energy use
48. Dedicated outdoor air intake for ventilation system	61. Location of intake and exhaust vents on building exterior planned to prevent intake of pollutants
49. Controlled ventilation system to provide reliable supply of ventilation air to all rooms in the home	62. Improved filtering of ventilation air (MERV 10 filters)
50. Ventilation system protected from dust and debris during construction	63. Detached garage to minimize occupant exposure to pollutants
51. Selection of low off-gassing interior finishes	64. Carbon monoxide detectors placed on each floor
52. Timers on all bathroom exhaust fans	65. Ability to create an active radon mitigation system without major construction
53. Duct work placed inside home's thermal enclosure with all joints sealed to increase system performance	66. Passive radon mitigation system - installation of sub-slab to roof vent with rough-in for future fan
54. No air conditioner needed but ducted system allows for future installation	67. Compact, energy efficient plumbing distribution system
55. High efficiency, sealed combustion hot water heater	68. Insulation used on exposed hot water piping to reduce energy loss
56. Home flushed with outdoor air for one week prior to occupancy	69. Third-party testing of exhaust equipment
57. Mechanical systems commissioned after installation to ensure proper operation	70. Third-party testing of outdoor air flow rates after equipment installation
58. Third-party confirmation of mechanical system commissioning	

## Products

71. Fly ash additive to reduce cement content of concrete	82. Post consumer recycled content composite decking materials
72. Locally-sourced aggregate	83. Interior wallboard with recycled content as well as flash content
73. Engineered wood floor joists and rafters means more efficient use of wood, fewer mature trees used	84. Low VOC Sealants and Adhesives
74. Formaldehyde-free lower VOC MDI Resin OSB Sheathing Products	85. Cellulose insulation - high recycled content
75. Low-maintenance pre finished fiber cement siding	86. Low Maintenance, Low VOC Natural Linoleum Floor Tiles
76. 100% natural untreated wool padding with 80% post-industrial waste	87. All Natural Plant Based Low VOC Adhesives for Flooring Products
77. Post consumer recycled-content carpet	88. Low VOC Paint Finishes
78. Locally sourced wood trim for interiors	89. Lower VOC -All plywood boxes for cabinets and vanities
79. ENERGY STAR-qualified kitchen appliances	90. ENERGY STAR qualified washer and dryer
80. Energy efficient compact fluorescent lighting	91. Ultra low water dual-flush toilets
81. Exterior lights equipped with motion sensors	92. Ultra low water use faucets and showerheads throughout house

## Education

93. Green building training sessions for volunteers, site supervisors and contractors	98. Homeowner's manual provided to explain house operation and green features
94. Green building information sessions provided for local building inspectors	99. Complete tour of home given to new green home owners
95. On-site technical support for construction by DOE Building America research team	100. Public tours given to increase awareness of green building practices
96. Post occupancy monitoring of energy use and house performance	101. Sustainable living information package and resources provided to homeowner
97. Project is to become an example of affordable green housing with national impact	

# The Green Team

The following companies have assisted with the construction of our Westford Greener Build.



## WESCON INC.



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