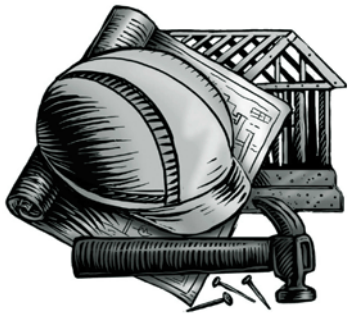
GREEN BUILDING RESIDENTIAL

casestudy

BARRETT GARDEN HOUSE



Specifics

- Barrett Garden House
  1734 Hawthorne
  Boulder, CO
- Built: 2001
- Square Feet: 2,500

Architect

- David and Betzi Barrett
  Barrett Studio Architect
  1944 20th Street
  Boulder, CO 80302
  303.449.1141
  www.barrettstudio.com

Contractor

- Dominique Gettliffe
  Gettliffe Architecture
  2970 Washington Street
  Boulder, CO 80304
  303.449.9155
  www.gettliffe.com

Features

- Cempo wall construction-
  R-32 recycled polystyrene
- Active solar water heating
- Highly efficient appliances
- Cork flooring
- Low-E windows
- Xeriscape Landscaping
- Low flow toilets

The Barrett Residence in North Boulder, known as the "Garden House," is located at the northeast boundary of the Community Gardens. The house wraps around a courtyard and apple tree. The courtyard has vegetable and flower gardens, grape vines and fruit trees, forming outdoor rooms intertwined with a landscape and gardens.

The Barrett Garden House was designed by architects David and Betzi Barrett and constructed by Dominique Gettliffe. As a design-builder, Dominique welcomed the opportunity to explore the use of alternative building systems, such as the Cempo recycled polystyrene and cement wall system. The 2500 sq. ft. Garden House uses site orientation, high insulation, thermal mass, high performance glass and active solar hot water as the energy responsive design strategies. The Garden House attempts to fit into an existing neighborhood while expressing new materials that speak of balance, permanence, and harmony.

SPECIFIC PRODUCTS AND DESIGN FEATURES

Water Efficiency

Xeriscape Landscaping – *www.xeriscape.org*
Landscape watering represents nearly half of treated water consumed by residential users in the summer months. Xeriscape landscaping reduces home water use dramatically.

Low Flow Toilets – Toto toilets • *www.totousa.com*
As toilet flushing is the largest single use of water in residential buildings, accounting for up to 40% of indoor water use, low flow toilets can offer considerable contributions to water efficiency.

Energy & Atmosphere

Windows – Eagle windows • *www.eaglewindow.com*
Low-E film blocks most solar heat gain during the summer while transmitting the most visible light. Windows treated with low-E film help save energy during both the winter and summer. Little heat leaks inside on a hot summer day, or escapes out in the winter. This mitigates unnecessary heating and cooling.

Energy & Atmosphere (continued)

Insulation – Insulation rated at R-44 was used in the attic. During the heating season, a significant amount of heat can be lost through a poorly insulated ceiling due to its size and overhead position. During the cooling season, attics can reach high temperatures. This heat radiates once the sun goes down. Cellulose insulation is preferred over fiberglass because of its recycled content and low toxicity, and ease of installation.

Clothes Washers – Fisher Paykel • *www.fisherpaykel.com*
Water heating can account for 90% of a clothes washer's energy use. Energy Star® washers use 30-40% less energy than conventional washers. These units can save up to $100 per year. Front-loading models (also know as tumble washers or horizontal axis machines) typically get clothes cleaner, use 36% less water, are gentler, and can partially dry clothes more than conventional washers. *www.energystar.gov*

Clothes Dryers – Fisher Paykel • *www.fisherpaykel.com*
As with most appliances, gas dryers tend to cost more to purchase, but less to operate. Electric dryers are just the opposite. Look for models that have moisture and/or temperature sensors with an automatic shut-off. *www.energystar.gov*

Dishwasher – Asko • *www.askousa.com*
Energy efficient dishwashers use on average 25% less energy than the alternative. Most of the energy is used in heating the water. Installing and energy efficient dishwasher can save $30 a year compared to a ten-year old dishwasher.

Thermal mass – The purpose of the thermal mass is to absorb direct or indirect sunlight and then release it when the outside temperature cools down. While some heat storage capacity, or thermal mass, is present in conventional construction, passive solar design calls for additional thermal mass as well as its proper placement. Examples of thermal mass are concrete slabs, masonry walls, tile, and even extra layers of drywall.

Active solar hot water – Most active solar hot water systems preheat water for a standard hot water heater which in turn increases the water temperature further when needed. These systems ensure that hot water is always available. Active solar systems can provide up to 80% of the annual hot water needed.

Proper orientation – For solar benefits of light and heat gain, a house's longest facade should be within 5 degrees of true south. Orientation within 15 degrees of true south still provides significant gain and 30 degrees still provides adequate gain.

Materials & Resources

Wall Materials – Cempo • *www.cempo.com*
Cempo is a building system that consists of Portland cement and recycled polystyrene. Using the Cempo building system creates a structure that is naturally fire and pest resistant, energy efficient, and sound absorbing. The recycled polystyrene used to make the forms helps create a wall with a high insulation value of R-32. These walls are an excellent example of thermal mass in design.

Cork flooring – Cork comes from the bark of the cork oak tree, and can be harvested sustainably every ten years. This makes cork a rapidly renewable product. Additional benefits of cork include durability, rot and fire-resistance, sound absorption qualities, and almost no material waste in the manufacturing process. Less toxic than urea formaldehyde, a common binder in flooring, cork products use urea melamine, phenol-formaldehyde and polyurethane as the typical binders. Cork flooring is available in many different styles, shades and tile sizes.

For More Information

Visit the city of Boulder's Planning & Development Services' web site at *www.ci.boulder.co.us/pwplan/index.htm*

For information on the city of Boulder's green building program, Green Points – visit *www.ci.boulder.co.us/buildingservices/codes/energycode.htm*

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