

**15 HAWTHORN STREET  
CAMBRIDGE, MA  
COMPLETE RENOVATION OF SYSTEMS AND FINISHES**

**LEED FOR HOMES 2009 EDITION  
GOLD  
2012**

The 15 Hawthorn Street property in Cambridge, Massachusetts, is a three story 6,400 square foot Victorian style historic home. It was originally constructed in 1896. In 2012, the property was completely renovated. The renovation project team followed green building principles which earned the project a LEED Gold certification under the 2009 LEED for Homes green building rating system.



Photo: copyright Bruce Martin Photography, 2012

Throughout planning, design, and construction, the project team was committed to sustainability. Building systems were completely replaced to optimize occupant comfort and energy efficiency. The building envelope was repaired and reconstructed to improve thermal performance and minimize infiltration. Materials and resources were selected with the intent of mitigating the environmental impacts of harvesting, extraction and manufacturing. The resulting project demonstrates the project team’s respect for the historical integrity of the original residence, while providing modern amenities which support occupant health and comfort.

**LEED® Facts**  
**Harvard University**  
**15 Hawthorn Street**



|   |                     |
|---|---------------------|
| Location.....                           | Cambridge, MA       |
| Rating System.....                      | 2009 LEED for Homes |
| Certification Achieved.....             | <b>GOLD</b>         |
| Total Points Achieved.....              | 92.5/136            |
| <hr/>                                   |                     |
| Innovation & Design Process (ID).....   | 10                  |
| Location & Linkages (LL).....           | 10                  |
| Sustainable Sites (SS).....             | 13                  |
| Water Efficiency (WE).....              | 9                   |
| Energy & Atmosphere (EA).....           | 23                  |
| Materials & Resources (MR).....         | 10.5                |
| Indoor Environmental Quality (IAQ)..... | 16                  |
| Awareness & Education.....              | 1                   |

**PROJECT METRICS**

- 48%** Energy use reduction below the 2006 IECC baseline.
- 13%** Energy use reduction below the Massachusetts Stretch Code
- 83%** Demolition debris diversion from landfills and incinerators
- 86%** Construction debris diversion from landfills and incinerators
- 58%** Irrigation system potable water use reduction
- 7%** Framing order waste factor
- 76%** Vegetative landscape with native plants



## PROJECT HIGHLIGHTS

A third-party was contracted to assess the energy performance and sustainability of the 15 Hawthorn Street property. The “Green Rater” was responsible for field verification of sustainability features and measurement of operational performance. Product data and measured performance, including Infiltration and duct leakage testing, is analyzed by the Green Rater using computer software to rate the home using the Home Energy Rating System (HERS) Index. The rating is a predictive indicator of thermal envelope performance, and the efficiency of heating, cooling, and lighting systems.

The 15 Hawthorn Street project achieved a HERS rating of 52. A typical home known as the *HERS Reference*, based on the 2006 International Energy Conservation Code (IECC), scores a 100 on the HERS Index. Increases or decreases from the HERS 100 baseline indicate a proportional deviation from the HERS reference. A home with a HERS rating of 65 uses 35% less energy than the HERS reference (HERS 100). The 15 Hawthorn Street residence will consume 48% less energy than the baseline reference. This is an impressive achievement given the existing conditions and historic preservation project constraints.



Photo: copyright Bruce Martin Photography, 2012

## PROJECT TEAM

|                                   |  |
|-----------------------------------|--|
| <b>Owner</b>                      | Harvard University Housing             |
| <b>Project Manager</b>            | Northstar Project Real Estate Services |
| <b>Architect</b>                  | Boyes-Watson Architects                |
| <b>MEP Engineer</b>               | Building Engineering Resources         |
| <b>Contractor</b>                 | Richard White Sons                     |
| <b>LEED for Homes Green Rater</b> | Conservation Services Group            |
| <b>Sustainability Consultant</b>  | Harvard Green Building Services        |

The LEED Gold target was established early in the planning process. The design team was careful to consider the environmental impact of building energy systems and future utility demands. The project incorporated several energy conservation strategies.

### Enhanced Thermal Envelope

Sealection 500 open-celled, spray-applied, semi-rigid polyurethane foam insulation was applied to exterior walls and the roof. Using spray foam, R-Values of 21 and 26.5 were achieved at the exterior walls and roof respectively.

### Energy Recovery Ventilation

Three RenewAire EV130 heat recovery ventilators (ERVs) were installed to supply pre-conditioned ventilation air. The system reduces the energy required to condition ventilation air. The units are capable of transferring 70% of the sensible heat from the exhaust to the supply airstream via a static plate energy exchange core.

### Programmable Thermostat Control

The HVAC system is regulated by a Carrier Infinity Control module. The system controls temperature, ventilation air flow, humidity, and fan speed. The system has been programmed to setback temperature set points strategically to save energy while maintaining occupant comfort.

### Efficient Hot Water Heating

Navien condensing hot water heaters were used to serve three zones with domestic hot water. The tankless gas-fired units are 98% efficient.

### Low Flow Plumbing Fixtures

Low flow lavatory faucets (1.5 gpm), low flow toilets (1.28 gpf) and low flow shower heads (1.5 gpm) were installed to support potable water conservation.