



Harvard Green Campus Initiative

High Performance Building Resource

Hamilton Hall Case Study

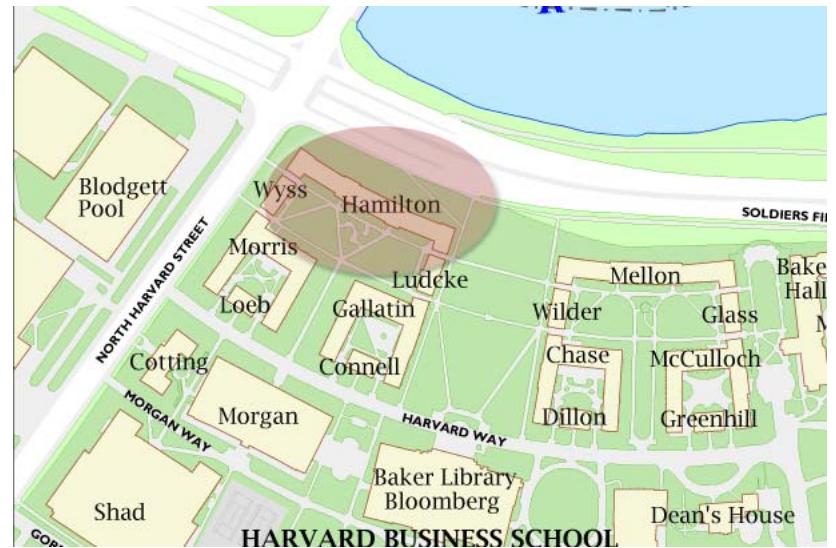


Summary

This major renovation of Hamilton Hall, a 48,000 square foot student dormitory at the Harvard Business School, is the first since the masonry building's construction in 1926. Construction was completed in the summer of 2006. The project used USGBC LEED version 2.1, and is awaiting USGBC Response to confirm certification. The project is a successful example of a green renovation project. The project was able to implement systems with significant energy, materials, and water savings.

Location

Hamilton Hall is located at 700 Soldiers Field Road, along the Charles River.



Client User Group

Harvard Business School

Project Team

Project Manager: William A. Berry & Sons, Inc.
Architect: Finegold Alexander + Associates
Structural: Boston Building Consultants
Mechanical: BLW Engineers
Civil: Judith Nitsch Engineering, Inc.
Code /Fire Protection: FIREPRO Incorporated
Interiors: Lucas Stefura Interiors
Hazardous Materials: Environmental Health, Inc.
Landscape: The Halvorson Company, Inc.
Construction Manager: Richard White Sons
Commissioning: Richard D Kimball Company, Inc.
Sustainability Consultant: Harvard Green Campus Initiative

Building Program

The building had not had a major renovation since its construction in 1926, and it was in need of mechanical, lighting, building envelope, and plumbing upgrades.....Dormitories for students at the Harvard Business School



Project Schedule

The project was completed in the summer of 2006.

Life Cycle Costing

Hamilton Hall was one of the first projects at Harvard to take advantage of the Green Campus Loan Fund for New Construction to implement a dual setback mechanical system. Analysis by BLW Engineers determined that the system would result in \$8,485 in annual savings, with a payback period of 10.02 years.



Sustainable Strategies

Site

- Close proximity to several public transportation options
- Bicycle storage for the inhabitants.
- Through a contract with ZipCar, there are hybrid vehicles in the area with preferred parking.
- The landscaping for the 0.7 acre site is designed to mitigate solar heat gain and heat island effect.



Water

- Water use for irrigation is being reduced by selecting more efficient sprinkler heads and through use of the Rain Bird system, a computer controlled irrigation system that determines irrigation rates based on data from an on-site weather station.
- Low-flow faucets, toilets and 2.0 gpm showerheads reduce water use by 30.88%
- Potable water used for irrigation is reduced by 64.83% by using efficient irrigation systems.



Energy

- Reduced mechanical load with a dual set-back system with occupancy sensors: After the space is unoccupied for 15 minutes, the system sets back +/- 5 degrees. After 8 hours, the temperature adjusts +/- 10 degrees. The sensors are in 85 rooms – 72 Dorm rooms, 4 Conference Rooms, and 9 Kitchen/Lounge areas.
- An independent commissioning agent was brought on the project early (before the Design Development phase) to review the design. The commissioning agent reviewed relevant contractor submittals provide a re-commissioning manual and the review building operation with staff after construction is completed.
- New insulation was added throughout the building: on the interiors of the exterior

masonry walls, at the attic ceiling, and glazing with a very low U-value, which reduces heat loss. The high efficiency glazing results in a window assembly with a 0.30 U-value, much lower than the 0.48 U-value suggested as a baseline in ASHRAE 90.1.

- Additional energy savings comes from reducing domestic hot water demand by 22% better than ENACT 1992, primarily the result of low-flow sinks and showers.
- Energy modeling was done using Visual DOE. Building performs 22.1% better than ASHRAE 90.1-1999.
- Renewable energy certificates for 100% of its projected energy use for a two-year period. The certificates will be for wind energy, purchased from Sterling Planet.



Materials and Waste

- The project is using nearly 100% of the existing shell, drastically reducing the need for virgin building materials. Use of materials with recycled content is further reducing the quantity of virgin materials used on site.
- Rapidly renewable materials: DSTALK Machinable Fiberboard MR, made from harvested wheat straw fiber and used for much of the millwork.
- 97.07% of the building's construction and demolition waste recycled, saving 337.3 metric tons of carbon dioxide or 544 barrels of oil
- 12% of materials cost extracted and manufactured within 500 miles
- 10.4% of materials cost consists of recycled content materials
- 23,418 tons of dorm furniture was donated to Food for the Poor, which will be re-used in Latin America.



Indoor Environmental Quality

- All of the dorm rooms receive daylight and have views out to the Business School campus or across the river to Cambridge.
- Low-emitting paints and primers, adhesives and sealants, and carpets are used for construction, composite wood with no added urea-formaldehyde
- During construction and after construction, an indoor air quality (IAQ) management plan was in place to ensure the health of the workers and the eventual inhabitants.