Hi Harvard innovation lab

GREEN is the new Crimson

Harvard Business School

Batten Hall—Harvard Innovation Lab

LEED-NC v3 Gold

125 Western Avenue, Boston, MA 02163

Western Avenue Entrance
Photo: Green Building Services, 2013

Originally constructed in 1964 as studios for WGBH-TV, the Harvard Innovation Lab is a 75,648 square foot facility dedicated to fostering team-based and entrepreneurial activities and deepening interactions among students, faculty, entrepreneurs, and members of the Allston and Greater Boston communities. Classrooms are complemented by a range of spaces that accommodate business incubators and entrepreneurs in residence while welcoming the surrounding community with social spaces and business support.

The building at 125 Western Avenue sits on a 2 acre site at the intersection of Western Avenue and Batten Way framing the entrance to Harvard Business School. After WGBH's departure in 2007, it remained vacant and forlorn until it was added to the Harvard Business School Campus with the intent to make it a nucleus for entrepreneurial experimentation.

Although the project is primarily a renovation, there has been a considerable effort given to modernizing the systems, improving the thermal quality of the roof, cultivating its street presence with welcoming entries and expanding usable space by infilling some of the two story volumes. At the same time much of the existing building structure was retained to minimize the need for new building materials with high embodied energy. Significant remediation of known carcinogenic materials occurred to ensure that a healthy working and learning environment was provided for all occupants.

Project Highlights

LEED® Facts

Batten Hall
Harvard Business School
February 2013

Location	Boston, MA
Rating System	LEED-NC v3
Certification Achieved	Gold
Total Points Achieved	71/110
Sustainable Sites	22/26
Water Efficiency	6/10
Energy and Atmosphere	17/35
Materials and Resources	8/14
Indoor Environmental Quality	9/15
Innovation and Design	6/6
Regional Priority	4/4

42% Anticipated water savings compared to an Energy Policy Act of 1992 baseline

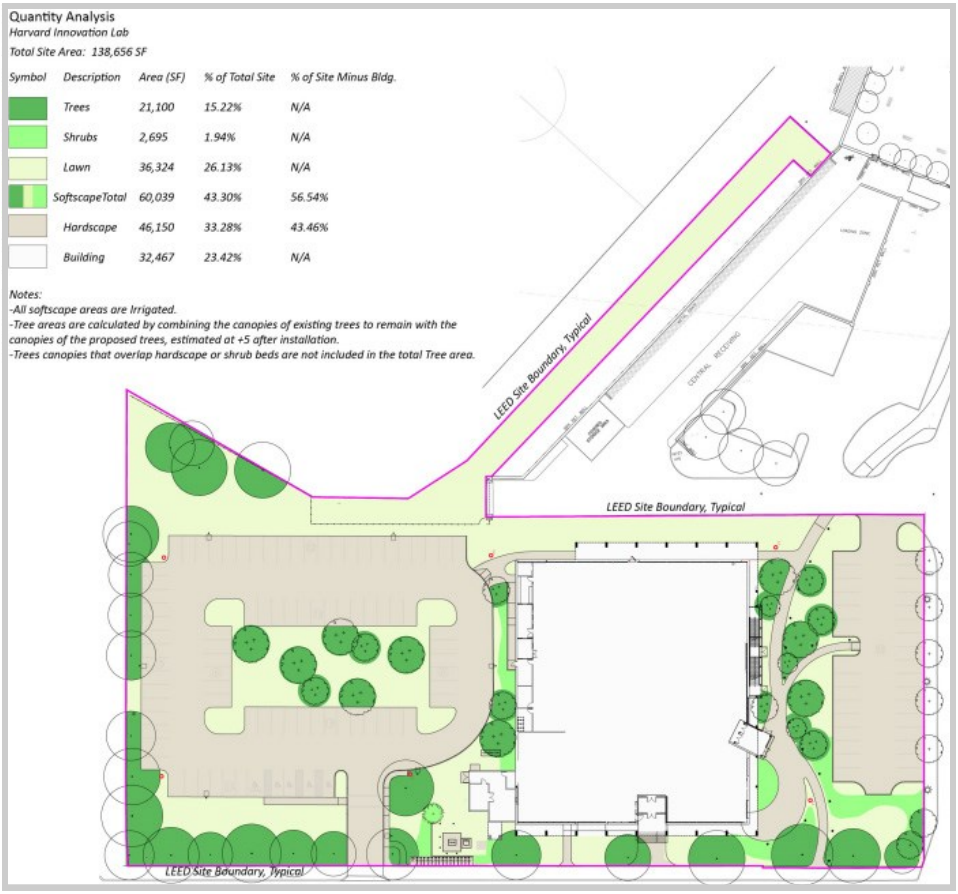
37% Anticipated energy cost savings compared to ASHRAE 90.1-2007 baseline.

94% Construction and demolition waste diverted from the landfill.

223 Transit stops per day within 1/4 mile walking distance

PROJECT OVERVIEW

HARVARD INNOVATION LAB FLOOR PLAN & LEED BOUNDARY



Harvard Innovation Lab
Site Plan: Shepley Bulfinch, 2011
Image: Green Building Services, 2013

Harvard Innovation Lab –1st Floor Axonometric
Image: Shepley Bulfinch, 2011

PROJECT TEAM

Owner	Harvard Business School
Project Manager	CSL Consulting
Architect	Shepley Bulfinch
Contractor	Shawmut Design and Construction
HVAC Engineer	RDK Engineers
Commissioning Authority	MAW Consulting
Sustainability Peer Review	Green Building Services

SITE

Hubway Bike Sharing Station on Site
Photo: Harvard Green Building Services, 2011

- The Harvard Innovation Lab is participating in the Hubway Bicycle sharing program, which currently features four stations on the Harvard Business School Campus.
- The parking lot on site also features spaces reserved for cars that are part of the Zipcar vehicle sharing program.
- The building is located within walking distance multiple MBTA and Harvard bus stops, with service levels exceeding over 200 stops per day within 1/4 mile.
- The building is located in a dense urban area, which allows occupants to walk and easily access amenities such as restaurants, banks, churches, and retail stores.
- Efficient LED lighting used for parking lot lighting.

Site lighting designed to minimize light pollution
Photo: Green Building Services, 2011

WATER EFFICIENCY

The Harvard Innovation Lab is designed to reduce water consumption by over 42% when compared to Energy Policy Act of 1992 baseline fixture and flow rates. This was accomplished primarily through the use of pint flush (.125 gpf) urinals and EPA WaterSense labeled toilets. A weather controlled irrigation system ensures that landscaping irrigation does not occur immediately prior to a rain event.

Differences in the Flush & Flow Rates for EPAct 1992 Standard Fixtures and the fixtures installed for the Harvard Innovation Lab Project

Fixture Type	Harvard Innovation Lab Flush & Flow Rates	EPAct 1992 Standard Flush & Flow Rates
Water Closet [GPF]	1.28	1.6
Urinal [GPF]	0.125	1.0
Public Lavatory Sink [GPM]	0.5	0.5
Break Room Sink [GPM]	0.5	2.2

GPF - Gallons Per Flush GPM - Gallons Per Minute

FIXTURES IN HARVARD INNOVATION LAB

RainBird Smart Irrigation Controls

Toilet with Sloan HE Flush Valve
1.28 gpf

ENERGY EFFICIENCY

Harvard University is committed to reducing greenhouse gas emissions 30% below 2006 levels by 2016, inclusive of growth. Therefore energy efficiency was a main goal of this renovation project.

MECHANICAL SYSTEMS

Harvard Innovation Lab's mechanical systems rely on chilled water produced by a district plant serving much of the Harvard Business School campus and two high efficiency condensing boilers providing heating capacity.

ECM 1: **Variable Frequency Drives**—The Innovation Lab's air handler units are equipped with variable frequency drives that enable the fans the capability of efficiently ramping up or down in line with the load required.

ECM 2: **Demand Controlled Ventilation**—Occupancy and CO_2 sensors in the project spaces control whether a space is provided with fresh air, allowing the systems to be shut down when no one is present.

ECM 3: **Instant Water Heaters—**While bathroom hot water loads are provided by a tank storage water heater, break rooms and other remote areas with very limited hot water demand are provided with small, instantaneous water heaters adjacent to the tap that will incur no distribution and storage losses.

ELECTRICAL SYSTEMS

The building's electrical system efficiency is driven in large part by the use of LED and high efficiency fluorescent lighting fixtures and controls.

ECM 1: **LED Lighting**—The project features multiple fixtures that take advantage of the efficiencies offered by solid state lighting systems. Linear 'tape' style fixtures, cylindrical pendants, and MR16 style track lighting all feature LED lamps.

ECM 2: **Lutron Occupancy and Dimming Controls**—Most of the small meeting spaces and areas that aren't always occupied (e.g. classrooms, offices, bathrooms) are controlled by occupancy sensors, and ambient fluorescent lighting is controlled by digital dimming control systems when adjacent to areas with natural light.

ECM 3: **Task Lighting—**All areas with open office workstations are outfitted with individual task lamps to allow reduced ambient lighting levels that run full time.

Occupancy Sensors Controlling Ventilation/Lighting
Photo: Harvard Green Building Services, 2011

LED Exterior Lighting
Photo: Harvard Green Building Services, 2011

PROJECT SCORECARD

LEED for New Construction and Major Renovations (v2009)

GOLD, AWARDED FEB 2013

SUSTAINABLE SITES — AWARDED: 22 / 26

SSc1	Site selection	1 / 1
SSc2	Development density and community connectivity	5 / 5
SSc3	Brownfield redevelopment	1 / 1
SSc4.1	Alternative transportation - public transportation access	6 / 6
SSc4.2	Alternative transportation - bicycle storage and changing rooms	0 / 1
SSc4.3	Alternative transportation - low-emitting and fuel-efficient vehicles	3 / 3
SSc4.4	Alternative transportation - parking capacity	2 / 2
SSc5.1	Site development - protect or restore habitat	0 / 1
SSc5.2	Site development - maximize open space	1 / 1
SSc6.1	Stormwater design - quantity control	1 / 1
SSc6.2	Stormwater design - quality control	1 / 1
SSc7.1	Heat island effect - nonroof	0 / 1
SSc7.2	Heat island effect - roof	1 / 1
SSc8	Light pollution reduction	0 / 1

WATER EFFICIENCY — AWARDED: 6 / 10

WEc1	Water efficient landscaping	2 / 4
WEc2	Innovative wastewater technologies	0 / 2
WEc3	Water use reduction	4 / 4

ENERGY & ATMOSPHERE — AWARDED: 17 / 35

EAc1	Optimize energy performance	10 / 19
EAc2	On-site renewable energy	0 / 7
EAc3	Enhanced commissioning	2 / 2
EAc4	Enhanced refrigerant Mgmt	2 / 2
EAc5	Measurement and verification	3 / 3
EAc6	Green power	0 / 2

MATERIAL & RESOURCES — AWARDED: 8 / 14

MRc1.1	Building reuse - maintain existing walls, floors and roof	2 / 3
MRc1.2	Building reuse - maintain interior nonstructural elements	0 / 1
MRc2	Construction waste Mgmt	2 / 2
MRc3	Materials reuse	0 / 2
MRc4	Recycled content	2 / 2
MRc5	Regional materials	1 / 2

MATERIAL & RESOURCES — CONTINUED

MRc6	Rapidly renewable materials	0 / 1
MRc7	Certified wood	1 / 1

INDOOR ENVIRONMENTAL QUALITY — AWARDED: 9 / 15

EQc1	Outdoor air delivery monitoring	1 / 1
EQc2	Increased ventilation	1 / 1
EQc3.1	Construction IAQ Mgmt plan - during construction	1 / 1
EQc3.2	Construction IAQ Mgmt plan - before occupancy	1 / 1
EQc4.1	Low-emitting materials - adhesives and sealants	1 / 1
EQc4.2	Low-emitting materials - paints and coatings	1 / 1
EQc4.3	Low-emitting materials - flooring systems	0 / 1
EQc4.4	Low-emitting materials - composite wood and agrifiber products	1 / 1
EQc5	Indoor chemical and pollutant source control	0 / 1
EQc6.1	Controllability of systems - lighting	0 / 1
EQc6.2	Controllability of systems - thermal comfort	0 / 1
EQc7.1	Thermal comfort - design	1 / 1
EQc7.2	Thermal comfort - verification	1 / 1
EQc8.1	Daylight and views - daylight	0 / 1
EQc8.2	Daylight and views - views	0 / 1

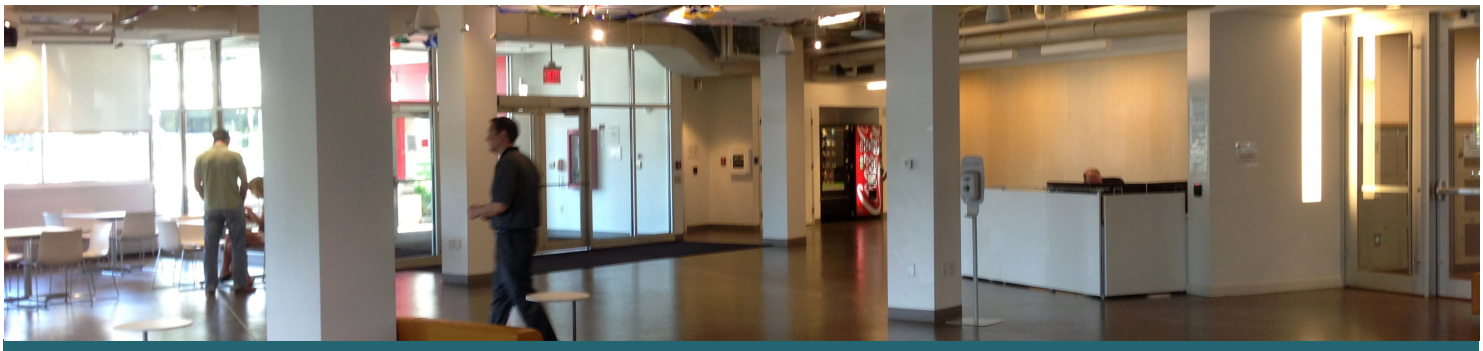
INNOVATION — AWARDED: 5 / 6

IDc1	Innovation in design	4 / 5
IDc2	LEED Accredited Professional	1 / 1

REGIONAL PRIORITY — AWARDED: 4 / 4

EAc2	On-site renewable energy	0 / 1
MRc1.1	Building reuse - maintain existing walls, floors and roof	1 / 1
SSc3	Brownfield redevelopment	1 / 1
SSc6.1	Stormwater design - quantity control	1 / 1
SSc7.1	Heat island effect - nonroof	0 / 1
SSc7.2	Heat island effect - roof	1 / 1

TOTAL 71 / 110



ADDITIONAL RESOURCES

- Harvard Innovation Lab: http://i-lab.harvard.edu/
- Follow Harvard Innovation Lab: Facebook | Twitter
- Harvard Green Building Services: http://green.harvard.edu/green-building-services
- Harvard Green Building Resource: http://green.harvard.edu/theresource
- Follow Harvard Green Building Services: Facebook | Twitter