Harvard Department of
Chemistry & Chemical Biology

GREEN
is the new Crimson

Harvard Faculty of Arts and Sciences
Schreiber Lab Renovation
Naito building, 12 oxford st , Cambridge, MA 02138

LEED-CI v2.0
GOLD

Certified LEED-CI Gold in November, 2009, Schreiber Lab is a 1,700 square foot Chemistry Lab, located on the 1st floor of the Naito Laboratory Building at 12 Oxford Street in Cambridge, MA. The Naito Laboratory building, a four-story structure constructed in 2000, is one of the four buildings housing all 278,000 sq. ft of laboratories for Harvard's Department of Chemistry and Chemical Biology, located within the Cabot Science Complex.

Schreiber Lab
Photo: Ellenzweig. 2009

The Schreiber project, completed in the summer of 2008, is a renovation of an existing lab space, previously occupied by a different professor. In order to support the research activities of Professor Schreiber and his lab group, the space was renovated to accommodate four fume hoods, island and wall benches, write-up desks, chemical storage cabinets, a solvent purification system, and mechanical and electrical tie-ins. Two adjacent offices and an instrument room were also renovated as part of the project.

Sustainability was a focus throughout the project —with Harvard's Green Building Guidelines and the LEED-CI rating system guiding the selection of materials and the mechanical, electrical and plumbing (MEP) systems for the project.

Project Highlights

LEED® Facts

Schreiber Lab
Harvard Faculty of Arts and Sciences
2008 Renovation

Location……Cambridge, Massachusetts
Rating System……...Commercial Interiors v2.0
Certification Achieved…… **Gold**
Total Points Achieved…… **34 / 57**

Sustainable Sites……..4/7
Water Efficiency……..2/2
Energy and Atmosphere……..5/12
Materials and Resources……..3/14
Indoor Environmental Quality……..15/17
Innovation and Design……5/5

79.6% of on-site generated construction waste was diverted from landfills.

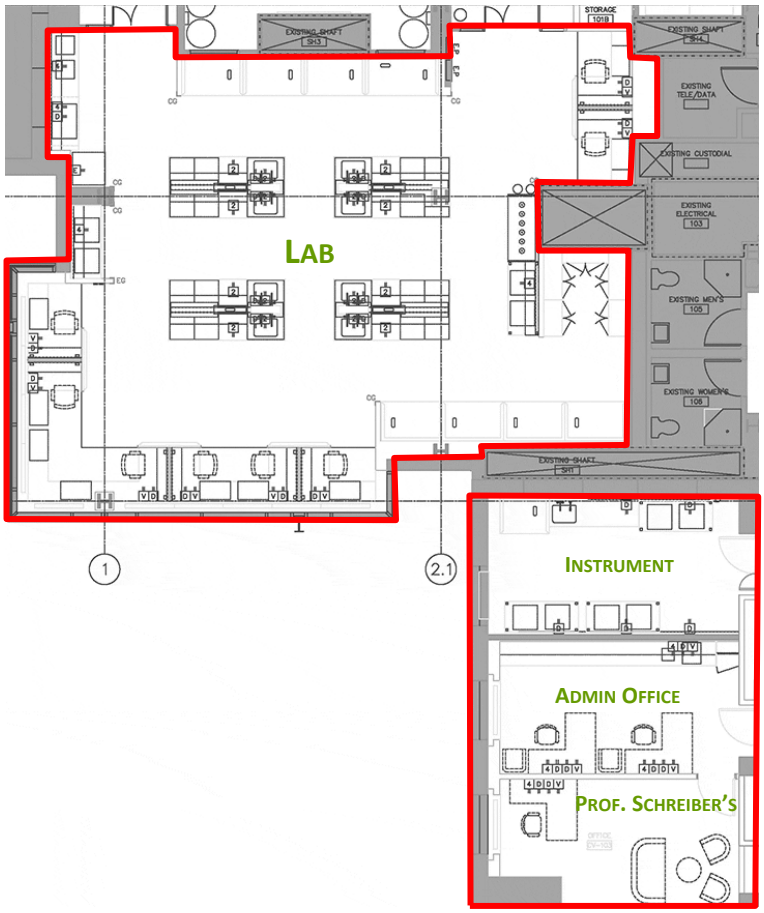
100% of the equipment and appliances are Energy Star® rated

100% of the Lab occupants have task lights to allow individual control of their lighting to suit individual preferences and needs

GREEN is the new Crimson

PROJECT OVERVIEW

SCHREIBER LAB FLOOR PLAN & LEED BOUNDARY



Schreiber Lab
Photo: Ellenzweig. 2009

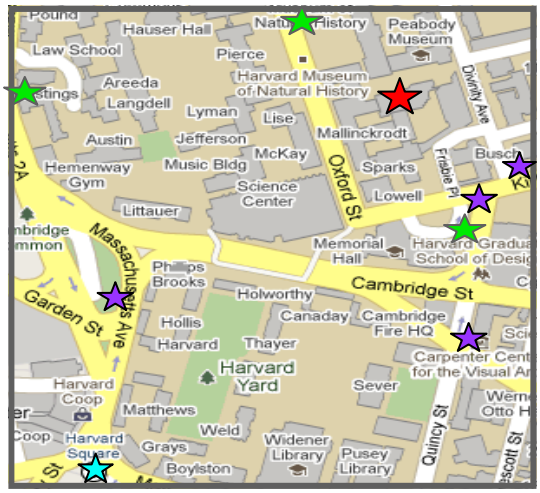
Schreiber Lab
Photo: Ellenzweig. 2009

PROJECT TEAM

Owner	Harvard Faculty of Arts and Sciences
Project Manager	Harvard University Department of Chemistry and Chemical Biology
Architect	Ellenzweig
Contractor	JBM General Contractors
HVAC Engineer	BR + A Consulting Engineers, LLC
Commissioning Authority	BR + A Consulting Engineers, LLC
Sustainability Consultant	Harvard University, Office for Sustainability Green Building Services

SITE

Naito Laboratory Building
12 Oxford Street, Cambridge, MA



- ➤ To encourage alternatives to driving, all occupants of the Naito Laboratory building have access to Harvard's comprehensive ***CommuterChoice Program***, which provides incentives and discounts for all modes of alternative transportation as well as carpooling and fuel efficient vehicles.
- ➤ The building is located within walking distance to the Harvard Square MBTA stop, several bus lines, and the Harvard University Shuttle.
- ➤ Three bicycle racks with a total capacity of 90 bicycles are located approximately 80 feet from the rear entrance of the Naito Laboratory building for use by the building's occupants. Showers and changing facilities are located on the first floor.
- ➤ 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.

★ Naito Laboratory Building
★ MBTA Bus Stops
★ Harvard University Shuttle Bus Stops
★ MBTA Subway Station

Bike Racks at the Naito Building
Photo: Jessica Eisenman Parks.
Harvard Office for Sustainability. 2009

WATER EFFICIENCY

Per LEED requirements, if a project boundary does not include bathrooms, calculations must be for the fixtures in the closest bathroom. The closest bathrooms to Schreiber Lab have water efficient fixtures, which **reduce domestic water consumption by 35% over standard EPAct 1992 fixtures.** This is the equivalent of saving over 80,000 gallons per year.

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

Fixture Type	Schreiber Lab Flush & Flow Rates	EPAct 1992 Standard Flush & Flow Rates
Water Closet [GPF]	Dual-Flush 1.6 & 1.1	1.6
Urinal [GPF]	1.0	1.0
Bathroom Sink [GPM]	0.5	2.5
Shower [GPM]	1.5	2.5
Kitchen Sink	1.5	2.5
GPF - Gallons Per Flush	GPM - Gallons Per Minute	

FIXTURES IN SCHREIBER PROJECT SCOPE

SLOAN UPPERCUT®
Dual-Flush Flushometer
(Up 1.1 gpf and Down 1.6 gpf)

Grohe Watercare Relexa®
Non-Adjustable Showerhead
(1.5 gpm)

Please print this project profile only if necessary.
If printing is required, please print double sided and recycle when finished. Thank you!

ENERGY EFFICIENCY

The Faculty of Arts and Sciences (FAS) has committed, along with Harvard University as a whole, to reduce 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

An existing 100% outside air, variable volume air handling unit (AHU) provides fresh air to new variable volume terminal boxes and fan coil units (FCUs) in each of the four renovated spaces, allowing each space to be controlled independently.

Occupancy and Temperature Sensors: For each room within the project boundary, occupancy sensors tied to the building's control system modulate the supply air and maintain temperature set-points allowing both to be set back whenever spaces are unoccupied. The type of space and the activities carried out within it dictate the appropriate occupied and unoccupied set-points for temperature and ventilation.

High Performance Fume Hoods installed as part of the project include Variable Air Volume (VAV) fume hoods, which run at face velocity of 80 feet per minute instead of 100 feet per minute, thus reducing air flow by 20% and conserving the energy that would have been required to condition the air.

Real-time displays: Hood exhaust rates are displayed in real time, reminding occupants to keep hood sashes closed when not in use. **"Shut the Sash":** A competition between labs aimed at reducing the extreme energy consumption due to open fume hoods.

Commissioning: The mechanical and electrical systems have been fully commissioned by a third-party Commissioning Authority, which ensured that all energy-related systems were installed as designed, and operating efficiently prior to occupancy.

Renewable Energy: Renewable Energy Certificates (RECs) have been purchased from Sterling Planet (wind power) equivalent to 100% of the anticipated electricity over two years.

Real Time Display
Photo: Jessica Parks.
Harvard Office for Sustainability, 2009

ELECTRICAL SYSTEMS

Plug Loads: Energy Star equipment was selected for all equipment in the space, which includes computers and printers.

Light Fixtures: Energy-efficient and low-mercury fluorescent lighting fixtures and lamps were carefully chosen and strategically located within each space to reduce electricity consumption while maintaining adequate lighting levels for each type of space.

Lighting controls: Each space has overhead lighting controlled by multiple switches/zones and each desk has either under-counter task lights or desk lamps for multiple lighting levels based on different needs. The project's lighting design allows 91% of the occupants to adjust the lighting to suit their individual preferences, which not only increases occupant productivity and comfort, but also decreases energy use.

Light Sensors The two offices and the area above the student workstations have occupancy and daylight sensors that turn ceiling fixtures on and off based on the presence of people and the levels of natural light, respectively.

Task Lights at each desk in the Admin Office
Photo: Ellenzweig. 2009

INDOOR ENVIRONMENTAL QUALITY

FAS is committed to providing a healthy indoor environment for all occupants. The project team was careful to maintain healthy indoor air quality during construction and to also ensure the space is designed to promote healthy indoor air quality during occupancy.

Indoor Air Quality During Construction: The building maintained occupancy throughout construction. Thus, a comprehensive indoor air quality management plan was implemented during construction to maintain healthy indoor air quality. All grills and vents were sealed and a HEPA Filtration unit maintained negative pressure to keep any construction debris from migrating into occupied spaces.

Thermal Comfort Survey: Occupants will be surveyed about their thermal comfort once per season. The Operations team will adjust the heating or cooling in the project space as needed.

Only Materials with **Low or No VOC Content** were used in the Schreiber Lab project. Volatile Organic Compounds (VOCs) are chemical compounds and known carcinogens found in many construction materials that are considered detrimental to indoor air quality. Reducing the use of VOCs whenever possible improves indoor air quality and consequently occupant health and productivity.

- **Composite Wood and Laminate Adhesives** used in the renovation do not have any added Urea Formaldehyde
- **Carpet System** Karastan Contract - Quillen MacCarthy Broadloom *(Carpet and Rug Institute's Green Label Plus)* with NU Broadlok Premium Plus Carpet Adhesive *(SCAQMD Rule #1168)*
- **Adhesives and Sealants and Paints and Coatings** Examples of the products used:

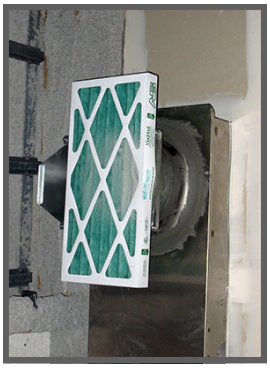
Product Category	Product & Manufacturer	VOC Content (g/l)	VOC Limit (g/l)	Standard
Paints & Coatings	Eco Spec Latex Flat, Benjamin Moore	0	50	Green Seal GS-11
	Eco Spec Interior Latex Eggshell Enamel, Benjamin Moore	0	150	Green Seal GS-11
	Fresh Start All Purpose Primer, Benjamin Moore	49.5	200	SCAQMD Rule #1113
Adhesives & Sealants	DP 1010 Water Based Duct Sealant	<30	250	SCAQMD Rule #1168
	Dow Corning 732 Multi-purpose sealant	36	250	SCAQMD Rule #1168

Construction IAQ Measures Implemented During Construction

Photos: Harvard Office for Sustainability. 2008

Pathway Interruption:
Isolated work areas

HVAC Protection:
Duct equipment sealed with filter



Schreiber Lab
Photo: Jessica Eisenman Parks. Harvard Office for Sustainability. 2009

Green Housekeeping: Schreiber Lab participates in Harvard's Facilities and Maintenance Operations (FMO) Green Cleaning Program, which uses 100% recycled paper products and Green Seal certified cleaning solutions, among other green housekeeping practices.

Daylight and Views: In 96% of the regularly occupied spaces occupants have direct line of sight to the outside.

MATERIALS & WASTE

Selecting environmentally preferable materials and minimizing the amount of construction waste sent to landfill was important to the project. The project was able to use a large percentage of salvaged office and classroom furniture from storage areas within the Cabot Chemistry Complex. For the additional materials purchased, the project gave preference to low-emitting materials with recycled content and local manufacturing.

46% **of the total material value consists of products salvaged or manufactured locally.**

80% **of the on-site generated construction waste was diverted from the landfill.**

38% **of the total value of materials used in the project consist of materials with recycled content.**

ENVIRONMENTALLY PREFERABLE MATERIALS IN SCHREIBER LAB, NAITO BUILDING

- 1912 Ultima Tegular Ceiling Tile (Armstrong) **3%** pre-consumer, **67%** post-consumer
- Medite II MDF (Sierra Pine) **100%** pre-consumer
- Ultra Touch Natural Cotton Fiber Building Insulation (John Manville): **85%** post-consumer
- Drywall (USG): **95%** pre-consumer

Examples of regional materials used in project:

Product Name	Manufacturer	Distance between project & Manufacturer (mi)
Millwork	New England Lab	13
Fiberglass Insulation	Guardian Fiberglass Inc.	419
Drywall	USG	253

Prof. Schreiber's Office

Schreiber Lab
Photo: Ellenzweig. 2009

ADDITIONAL RESOURCES

- Harvard FAS, Dept. of Chemistry and Chemical Biology: http://www.chem.harvard.edu
- Harvard FAS, Green Program: http://green.harvard.edu/fas
- Harvard FAS, Green Labs Program: http://green.harvard.edu/fas/green-labs
- Harvard OFS - Green Building Services: http://green.harvard.edu/green-building-services
- Harvard OFS - Green Building Resource: http://green.harvard.edu/theresource