



MOORCROFT OFFICE RENOVATION

LEED SILVER

26 Oxford Street, Cambridge, MA 02138

The Moorcroft offices are located on the 4th floor of the Harvard Museum Building at 26 Oxford street in Cambridge, Massachusetts. The building is a five-story structure originally constructed in 1920. The building also houses the Harvard Museum of Natural History and Harvard University Museum of Comparative Zoology.

The new offices accommodate and enhance the research of Professor Paul Moorcroft, a professor of ecology in Harvard's Department of Organismic and Evolutionary Biology, and his lab group, who focus on understanding the structure, composition and functioning of terrestrial ecosystems. Much of their work involves computer-based simulations of ecological dynamics.



The space now has shared offices, support/conference areas with audio/visual support, a lounge area, copier and kitchenette facilities and centralized files and bookshelves.

The design of the suite encourages collaboration among the occupants, and reflects the architectural unity of the original space. The renovation offered an opportunity to upgrade the finishes, furniture, lighting and technological capabilities of the office to meet Professor Moorcroft's requirements. The renovation began in March 2008. The Harvard University Green Building Guidelines and the LEED-CI rating system helped the project team develop sustainability goals. The project team was committed to sustainability throughout the realization of the project, which achieved LEED-CI Silver certification.

Moorcroft Office Renovation
Photo: Harvard Green Building Services, 2010.

PROJECT HIGHLIGHTS

LEED® Facts

Moorcroft Office Renovation

Harvard Faculty of Arts and Sciences



2008

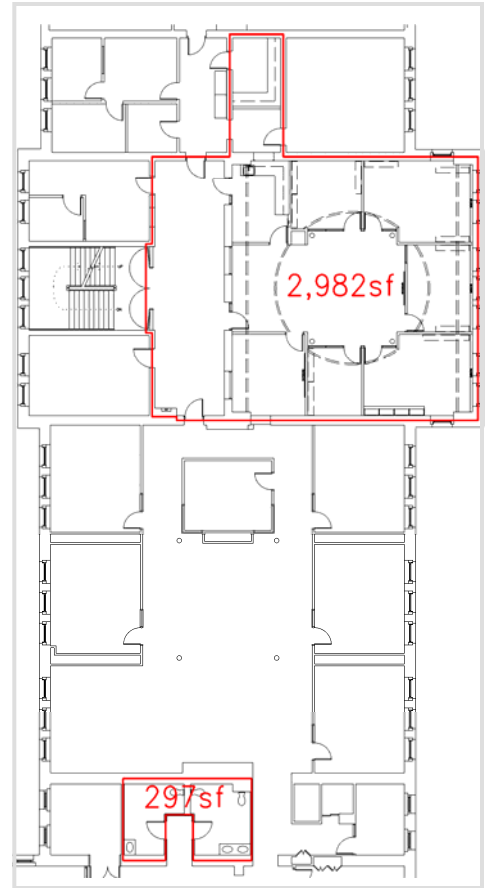
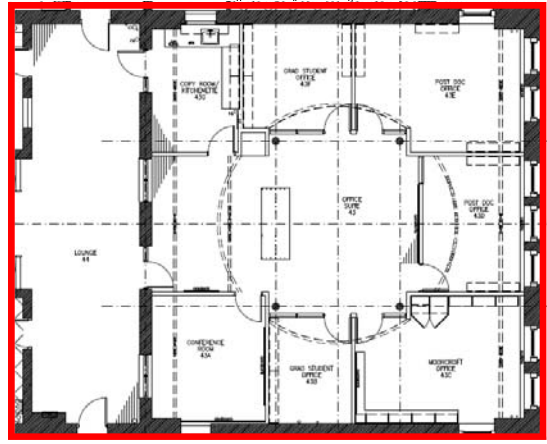
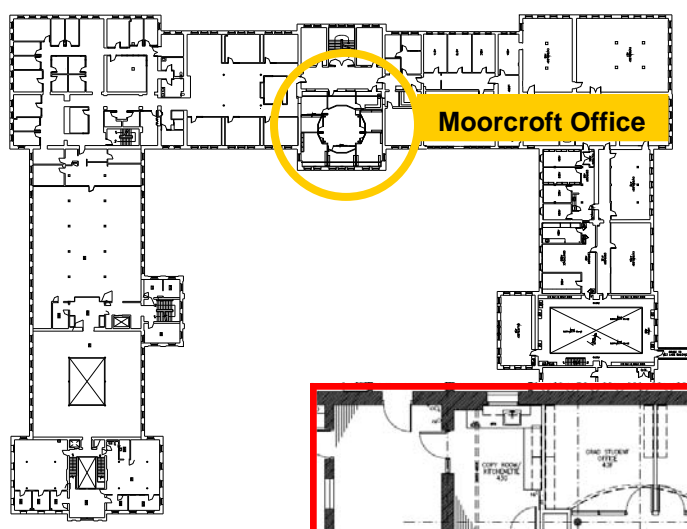
Table with 2 columns: Category and Score. Rows include Location (Cambridge, MA), Rating System (LEED-CI v.2), Certification Achieved (SILVER), Total Points Achieved (27/59), Sustainable Sites (4/7), Water Efficiency (2/2), Energy and Atmosphere (3/14), Materials and Resources (7/14), Indoor Environmental Quality (6/17), and Innovation and Design (5/5).

- 86% of the construction waste was diverted from landfills
62% of the interior non-structural components were reused
36% reduction in water consumption over EPA 1992 compliant fixtures
17% of the total value of materials have post-consumer and pre-consumer recycled content.
22% of the total value of materials were manufactured within 500 miles of the project site.



PROJECT OVERVIEW

MOORCROFT OFFICE RENOVATIONS FLOOR PLAN & LEED BOUNDARY



Moorcroft Office Plans
Photo: Perry & Radford Architects, 2008.



Moorcroft Offices
Photo: Harvard Green Building Services, 2010.

PROJECT TEAM

Owner	Harvard Faculty of Arts and Sciences
Project Manager	Petrina Garbarini <i>Harvard Faculty of Arts and Sciences</i>
Architect	Oliver Radford <i>Perry and Radford Architects</i>
Contractor	Delta Construction
HVAC Engineer	Energy Planning, Inc.
Commissioning Authority	Steve Perry <i>Perry and Radford Architects</i>
Sustainability Consultant	Harvard University Green Building Services



SITE



- To encourage alternatives to driving, all occupants of the Museum 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.
- Bicycle Racks are located outside of the Museum Building, encouraging bicycle transportation.
- The building is located in a dense urban area, which allows occupants to walk and easily access amenities.

Harvard University Museum Building
26 Oxford Street, Cambridge, MA



- ★ Moorcroft Offices
- ★ MBTA Bus Stops
- ★ MBTA Subway Station



Bike Racks at the Harvard Museum Building
Photo: Harvard Green Building Services, 2010.

WATER EFFICIENCY

During the renovation of Moorcroft Office, restrooms located on the fourth floor of the building were retrofitted to improve water efficiency reducing the use of potable water. These measures reduce domestic water consumption **36%** over standard EPA-compliant fixtures.

Differences in the Flush & Flow Rates for EPA 1992 Standard Fixtures and the fixtures installed for the Moorcroft Offices Project

Fixture Type	Moorcroft Flush & Flow Rates	EPA 1992 Standard Flush & Flow Rates
Water Closet [GPF]	1.1	1.6
Urinal [GPF]	0.0	1.0
Bathroom Sink [GPM]	1.6	2.5
Shower [GPM]	1.6	2.5
Kitchen Sink	1.6	2.5

GPF - Gallons Per Flush

GPM - Gallons Per Minute



ENERGY EFFICIENCY

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

HVAC System: An efficient Daikin multi-zone split system was installed, which feeds to five indoor fan coil units. The EER and COP meet the requirements of Advanced Buildings: Energy Benchmarks for High Performance Buildings.

Cooling is provided by a multi-zone split heat-pump system with one “outdoor unit” located in the attic ducted to the outside through the roof and five indoor fan-coil units above the ceilings. Each fan-coil unit has a seven-day programmable thermostat.

OCCUPANCY SENSORS are employed to control both lighting and HVAC setbacks.

VENTILATION for the spaces is provided by operable windows. Outdoor air is ducted to the two fan-coil units that serve interior spaces. In extremely cool weather the cooling system can operate in its heat-pump mode to temper the outside air. A small exhaust fan located above the ceiling, controlled by a time clock, removes the ventilation air.

COMMISSIONING: The mechanical and electrical systems within the Moorcroft Offices were fully commissioned, which helps ensure that all energy-related systems were installed in accordance with the manufacturer’s specifications and operating efficiently prior to occupancy.

ELECTRICAL SYSTEMS

Efficient lighting systems were designed in order to reduce unnecessary energy consumption.

HIGH EFFICIENCY LIGHTING: To reduce energy consumption, fluorescent fixtures with integral daylight responsive sensors and continuous dimming ballasts are provided throughout the Moorcroft Office space.

To reduce the amount of toxic material in the building, linear fluorescent lighting was chosen instead of compact fluorescent lighting wherever possible. Low mercury lamps were also specified and installed whenever this option was available.

TASK LIGHTING: A task light fixture (separately switched) is provided for each occupant in the space.

OCCUPANCY & DAYLIGHT SENSORS: .
In the project space, three offices are located within 15 feet of the exterior windows. Fluorescent fixtures with integral daylight response sensors and dimming ballasts are provided throughout these offices. The daylight sensors installed in the project are 0-10V Photosensors, Response Daylight sensors manufactured by Ledalite.



INDOOR ENVIRONMENTAL QUALITY

Harvard 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: During the renovation, the construction team implemented an Indoor Air Quality Management plan to ensure the health of the workers and the eventual inhabitants. Some of the aspects of the plan included walk-off mats to reduce the amount of debris tracked into the project, masking all return grills and ventilation with polyethylene sheets, green sweep practices, and storing all materials in cool, dry areas to prevent mold.

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 Moorcroft 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 do not have any added urea formaldehyde.
- > **CARPET SYSTEMS** that were installed are CIR Green Label Plus certified products.
- > **ADHESIVES AND SEALANTS | PAINTS AND COATINGS** Example products:

Product Category	Product & Manufacturer	VOC Content (g/l)	VOC Limit (g/l)	Standard
Paints & Coatings	> Benjamin Moore Eco Spec Interior Latex Flat	0	50	Green Seal Standard GS-11
	> Benjamin Moore Aura Semi-Gloss	50	150	Green Seal Standard GS-11
	> M.L. Campbell Aqualente Water Borne Pre-Cat Clear Lacquer	100	550	Green Seal Standard GS-11
Adhesives & Sealants	> Bondo Red Cream Hardener	0	250	SCAQMD Rule #1168
	> SpecSeal LCI Sealant (plumbing sealant)	0	250	SCAQMD Rule #1168

Construction IAQ Measures Implemented During Construction

[IAQ Measure Name]



Housekeeping Sticky Walk-off Mats



Moorcroft Offices

Photo: Harvard Green Building Services, 2010.

DAYLIGHT AND VIEWS: To provide a connection between indoor and outdoor environments, many of the occupied spaces have access to daylight and views.

SMOKING POLICY: In addition to prohibiting smoking in all facilities, FAS does not allow smoking within 25 feet of buildings with LEED certified spaces.

GREEN HOUSEKEEPING: FAS has made a commitment to using green cleaning processes in all of its buildings, including the Moorcroft Offices. This includes the use of Green Seal certified cleaning solutions, 100% recycled content toilet tissue and paper towels, portion control chemical dispensers, staff training.



MATERIALS & WASTE

Selecting environmentally preferable materials and minimizing the amount of construction waste sent to landfill was important to the project. For the additional materials purchased, the project gave preference to low-emitting materials with recycled content and local manufacturing.

22% of the total material value consists of products salvaged or manufactured locally.

86% of the on-site generated construction waste was diverted from the landfill.

17% of the total value of materials used in the project consist of materials with recycled content.

ENVIRONMENTALLY PREFERABLE MATERIALS IN THE MOORCROFT OFFICE RENOVATION

- > Nu Green Plywood (Uniboard)
100% pre-consumer, 0% post-consumer
- > EnviroDesign Particleboard Core Door (Lambton)
100% pre-consumer, 0% post-consumer
- > Gypsum Wall Board (USG)
94% pre-consumer, 5% post-consumer
- > Aeron Chair (Steelcase)
21% pre-consumer, 41% post-consumer

Examples of regional materials used in project:

Material Name	Manufacturer	Distance between project & Manufacturer (mi)
Particleboard Core Doors	Lambton	5
Metal studs	Marino	214
Hollow Metal Frames	De la Fontaine	256



Moorcroft Offices

Photo: Green Building Services, 2010.



ADDITIONAL RESOURCES

- > **HARVARD UNIVERSITY FACULTY OF ARTS AND SCIENCES (FAS):** <http://www.fas.harvard.edu/home>
- > **HARVARD UNIVERSITY DEPARTMENT OF ORGANISMIC AND EVOLUTIONARY BIOLOGY:** <http://www.oeb.harvard.edu/>
- > **HARVARD FACULTY OF ARTS AND SCIENCES GREEN PROGRAM:** <http://green.harvard.edu/fas>
- > **HARVARD GREEN BUILDING SERVICES:** <http://green.harvard.edu/green-building-services>
- > **HARVARD GREEN BUILDING RESOURCE:** <http://green.harvard.edu/theresource>

