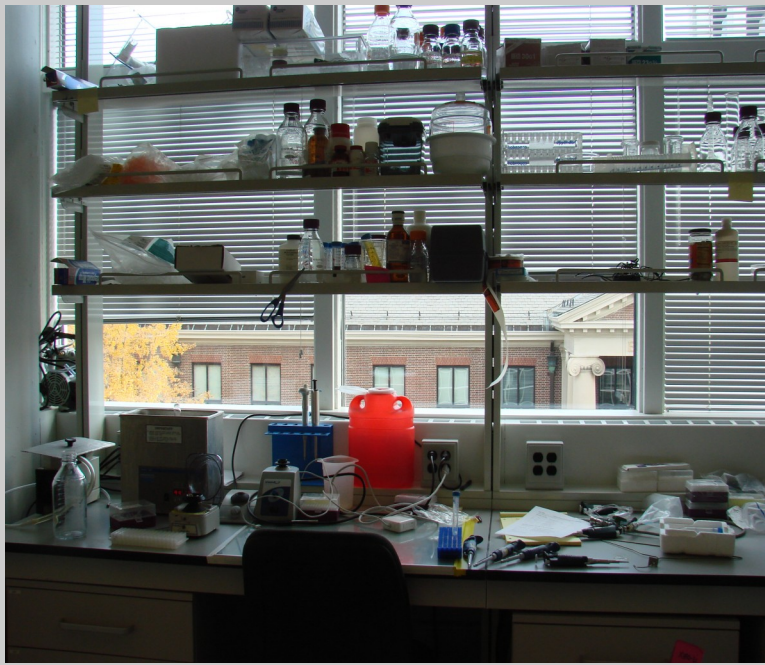




HARVARD SCHOOL OF ENGINEERING AND APPLIED SCIENCES  
WEITZ LABORATORY  
GORDON MCKAY LABS BUILDING, 9 OXFORD STREET, CAMBRIDGE, MA 02138

LEED-CIV3.0  
GOLD

The Gordon McKay Laboratory of Applied Science (McKay) building, occupied and operated by the School of Engineering of Applied Science (SEAS), is a seven-story glass, steel and concrete structure that provides research and office space to support efforts in fluidics, soft condensed matter and advanced sensor research.



The Weitz Laboratory project is a 4,071 square foot renovation and expansion of existing research space to accommodate the merging of two smaller lab groups into one. The project boundary is limited to the east wing of the fifth floor of the McKay Building. The renovation is also an opportunity to reconfigure spaces to best meet programmatic requirements for the researchers, update finishes and furnishings, and increase the efficiency and quality of the fifth floor lighting, heating, ventilation, and air conditioning controls.

In support of Harvard University's goal to reduce greenhouse gas emissions 30% below 2006 levels by 2016, inclusive of growth, Harvard SEAS and the project team were committed to sustainability throughout the duration of the project. This helped to guide decision making and inform the selection of materials, as well as the mechanical, electrical and plumbing (MEP) systems.

PROJECT HIGHLIGHTS

LEED® Facts

Weitz Laboratory  
Harvard School of Engineering  
& Applied Sciences  
2010 Renovation



Location.....	Cambridge, Massachusetts
Rating System.....	Commercial Interiors v3.0
Certification Achieved.....	Gold
Total Points Achieved .....	78/110
Sustainable Sites.....	17/21
Water Efficiency.....	6/11
Energy and Atmosphere.....	29/37
Materials and Resources.....	6/7
Indoor Environmental Quality.....	11/12
Innovation and Design.....	6/6
Regional Priority.....	3/4

88.2%

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

32%

reduction in overall water consumption compared to a code compliant base case.

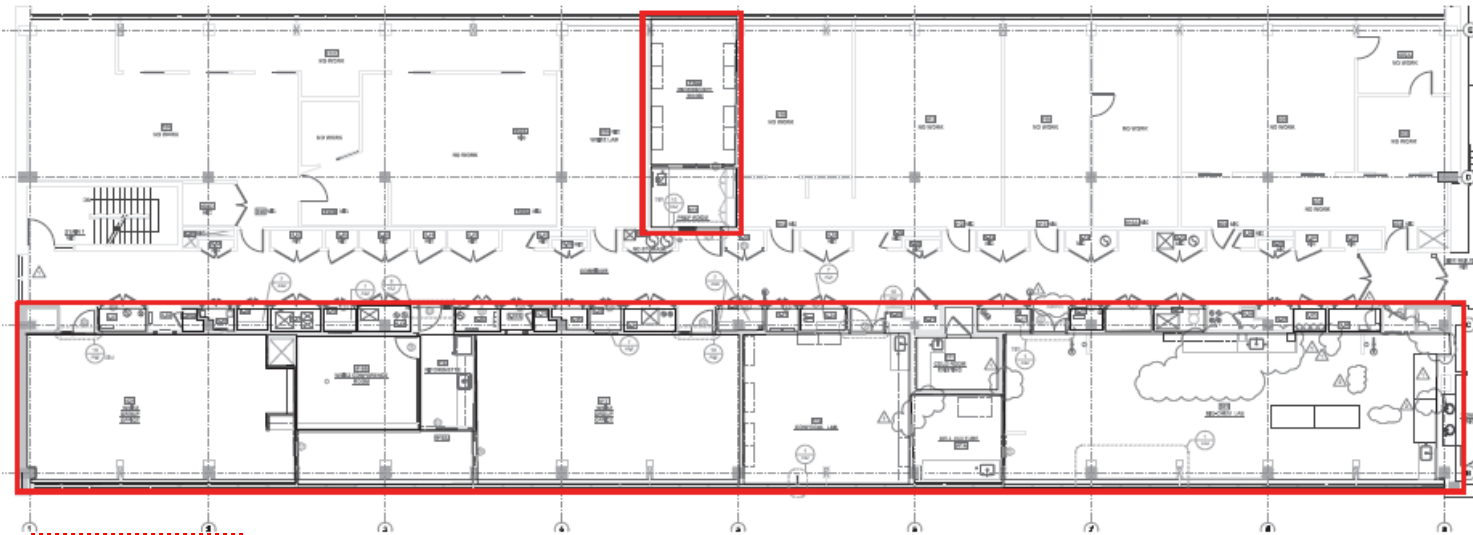
23%

reduction in lighting power density was achieved.

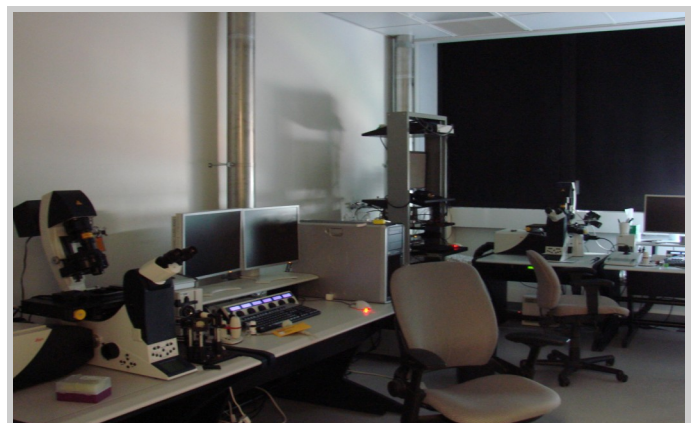




**PROJECT OVERVIEW**



LEED Boundary

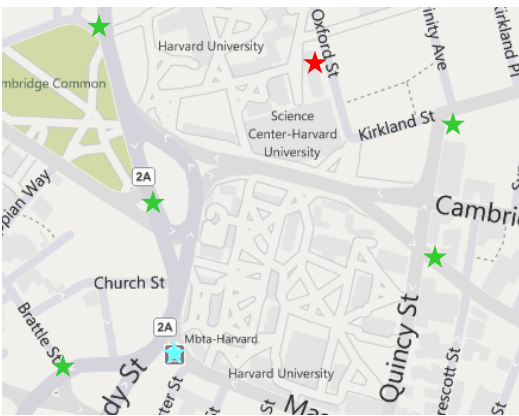


**PROJECT TEAM**

<b>Owner</b>	Harvard University, School of Engineering and Applied Sciences (SEAS)
<b>Architect</b>	Douglas Okun and Associates
<b>Construction Manager</b>	Lee Kennedy Co.
<b>FP/MEP Engineer</b>	R.G. Vanderweil Engineers
<b>Commissioning Agent</b>	Harvard Green Building Services
<b>Sustainability Consultant</b>	Harvard Green Building Services

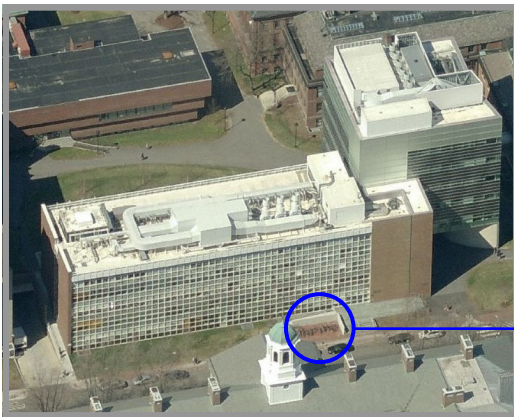


## SITE



- ★ Gordon McKay Building
- ★ MBTA Subway Station
- ★ Bus Stop Location

- To encourage alternatives to driving, all occupants of Weitz Lab have access to Harvard's **CommuterChoice Program**, which provides incentives, such as discounts, for all modes of alternative transportation as well as carpooling and fuel efficient vehicles. The Program is promoted through informational kiosks in building common areas and an extensive website. ([www.commuterchoice.harvard.edu](http://www.commuterchoice.harvard.edu))
- The McKay Building is located in a dense urban area which allows occupants to easily access amenities such as restaurants, banks, churches and retail stores that are within walking distance.
- The building is located within walking distance to the Harvard Square Subway Stop, and several bus lines.
- Two existing bicycle racks are accessible to occupants of the McKay Building, providing storage for 20 bicycles. Four shower and changing facilities are located within 200 yards of the building for bicycle commuters.



**Gordon McKay Building**  
Cambridge, MA 02138



**Bike Racks at Oxford Street Entrance**  
Photo: Harvard Green Building Services, 2010

## WATER EFFICIENCY

Per LEED requirements, if a project does not include bathrooms, calculations must be for the fixtures in the nearest bathrooms.

Water efficient plumbing fixtures were chosen for all applicable plumbing fixtures within the scope, and are in place at the nearest bathrooms to Weitz Lab.

Overall, these fixtures reduce domestic water consumption by **32%** over standard EPAAct 1992 fixtures.

**Differences in the Flush & Flow Rates for EPAAct 1992 Standard fixtures and the fixtures utilized by Weitz Lab Occupants:**

Fixture Type	Weitz Lab Flush & Flow Rates	EPAAct 1992 Standard Flush & Flow Rates
Water Closet [GPF]	Dual-Flush 1.6 & 1.1	1.6
Bathroom Faucet [GPM]	0.5	1.0
Shower [GPM]	1.5	2.5
Kitchen Faucet [GPM]	1.5	2.5
Urinal	0.125	1.0
GPF - Gallons Per Flush		GPM - Gallons Per Minute



## ENERGY EFFICIENCY

Harvard School of Engineering and Applied Sciences (SEAS) 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 focus.

### MECHANICAL SYSTEMS

- **Enthalpy Wheel Energy Recovery:** Exhaust air is run through a heat recovery (enthalpy) wheel, which transfers both heat and moisture to incoming fresh air, reducing the amount of energy needed to condition the air by up to 75%.
- **Demand Control Ventilation:** CO<sub>2</sub> sensors in all high density spaces control the amount of outdoor air supplied. If there are fewer people occupying the space then less air is required, ultimately saving energy.
- **Occupancy and Temperature Sensors:** 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.
- **Condensing Boiler:** The gas fired boiler is an 88% efficient condensing-type boiler, meaning that heat is recovered from the flue gasses before they are exhausted. This is 10% more efficient than the code complaint base case.
- **High Efficiency Chiller:** The York high efficiency air cooled chiller has a Coefficient of Performance of 2.8, which is 3% more efficient than the base case.
- **Premium Efficiency Pumps:** All new pumps are rated by NEMA to be premium efficiency. Pumps that distribute hot water have variable frequency drives, further reducing energy consumption when full load is not required.



### ELECTRICAL SYSTEMS

- **Lighting Controls:** A digital addressable lighting interface (DALI) system allows for sweep controls, time of day control, daylight harvesting, off hours zone control, occupancy sensors and dimming.
- **Lighting Fixtures:** Energy-efficient and low-mercury fluorescent lamps were carefully chosen and strategically placed to reduce electricity consumption while maintaining adequate lighting levels for each type of space.
- **Plug Loads:** Energy Star equipment was selected for all new equipment in the space.
- **Commissioning:** The mechanical and electrical systems have been fully commissioned, ensuring that all energy-related systems were installed as designed and operate efficiently prior to occupancy.



## INDOOR ENVIRONMENTAL QUALITY

SEAS 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:** A comprehensive indoor air quality management plan was implemented during construction to maintain healthy indoor air quality for workers and future occupants. All grills and vents were sealed and ductwork remained sealed until it was installed and covered. Fans were used to exhaust air directly to the outdoors, and building materials were kept sealed and off the grounds until they were installed.

**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 Weitz Lab Renovation. 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 have no added Urea Formaldehyde.

➤ **ADHESIVES AND SEALANTS | PAINTS AND COATINGS** Examples of the products used:

Category	Product & Manufacturer	VOC Content (g/l)	VOC Limit (g/l)	Standard
Paints & Coatings	➤ Benjamin Moore Super Spec HP Acrylic	54	200	Green Seal GS-11
	➤ Benjamin Moore WB Interior Paint	0	200	Green Seal GS-11
	➤ Benjamin Moore Latex Block Filler 285	45	200	Green Seal GS-11
Adhesives & Sealants	➤ Mapei Eco 575	40	50	SCAQMD Rule #1168
	➤ Dricon Fire Treated Wood	0	420	SCAQMD Rule #1168

### Construction IAQ Measures Implemented During Construction

Photos: Harvard Green Building Services

#### HVAC Protection



#### Negative Air Machines



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

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



## MATERIALS & WASTE

Selecting environmentally preferable materials and minimizing the amount of construction waste sent to landfill was important in Weitz Lab. The project team gave preference to low-emitting materials with recycled content and local manufacturing.

**18.1% of the total value of materials used in the project consist of materials with recycled content.**

**88.2% of the on-site generated construction waste was diverted from landfills.**

### ENVIRONMENTALLY PREFERABLE MATERIALS IN WEITZ LAB

- › Wood Doors (Lambton Doors)  
Recycled Content: **70% pre-consumer**
- › Door Locks (Yale)  
Recycled Content: **66% post-consumer**
- › Gypsum Board (USG)  
Recycled Content: **94% pre-consumer, 3% post-consumer**
- › Batt Insulation (Certain Teed)  
Recycled Content: **49% pre-consumer, 19% post-consumer**
- › Marker Boards (Clarkridge)  
Recycled Content: **49% pre-consumer, 12% post-consumer**

Examples of Regional materials used in the project:

Product Name	Manufacturer	Distance (Mi) between project and Manufacturer
Glass Windows	PPG/Sigco	111
Epoxy Flooring	Duraflex	96



## ADDITIONAL RESOURCES

- › HARVARD SCHOOL OF ENGINEERING AND APPLIED SCIENCES (SEAS): <http://seas.harvard.edu/>
- › SUSTAINABILITY EFFORTS AT SEAS: <http://intranet.seas.harvard.edu/audience/sustainability>
- › HARVARD GREEN BUILDING SERVICES: <http://green.harvard.edu/green-building-services>
- › HARVARD GREEN BUILDING RESOURCE: <http://green.harvard.edu/theresource>

