



HARVARD UNIVERSITY

**HARVARD LAW SCHOOL**



## Griswold Hall 2-South Suite and Main Entry Renovation

LEED-CI Platinum

September 2008



Griswold Hall is located at 1525 Massachusetts Avenue on the Harvard Law School (HLS) campus in Cambridge, Massachusetts. The 2-South Suite and Main Entry project is a 1655 square foot renovation that includes five office spaces, a conference room, a storefront, and a restroom on the second floor of Griswold. The space accommodates four faculty and two staff assistants in a mix of private offices and workstations and a campus meeting room. Renovations took place in the summer of 2008.

Throughout the design and construction process, HLS was committed to the Harvard Green Building Guidelines and to principles of sustainability. The team used an integrated design process to analyze materials and systems that were both sustainable and programmatically appropriate. As of March 2009, this is the first LEED for Commercial Interiors (LEED-CI) Platinum project in New England, first at any University, and only the 19th in the world.

### PROJECT HIGHLIGHTS

- > **First LEED-CI Platinum project in New England; first at a University; only the 19th LEED-CI project in the world**
- > **Daylight dimming integrated into light fixtures**
- > **Temperature setbacks tied to occupancy sensors**
- > **Low or zero-VOC materials**
- > **Comprehensive green cleaning program**
- > **99.3%** of the construction waste was diverted from the landfills.
- > **65.5%** of the furniture budget included salvaged/used furniture
- > **56.5%** of the total value of materials have recycled content
- > **38,600** gallons of water annually estimated to be saved over code-minimum fixtures

### LEED® Facts

Harvard Law School  
Griswold Hall 2-S Renovation  
Cambridge, Massachusetts

LEED for Commercial Interiors v2.0

**Platinum** 48\*

Sustainable Sites 5/7

Water Efficiency 2/2

Energy and Atmosphere 8/12

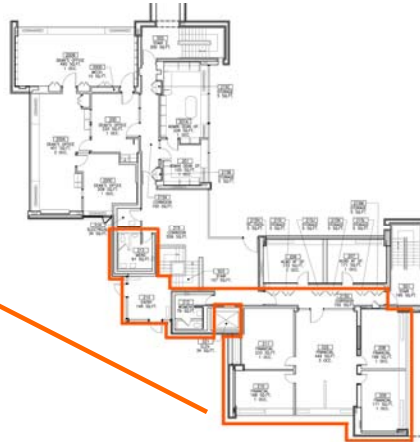
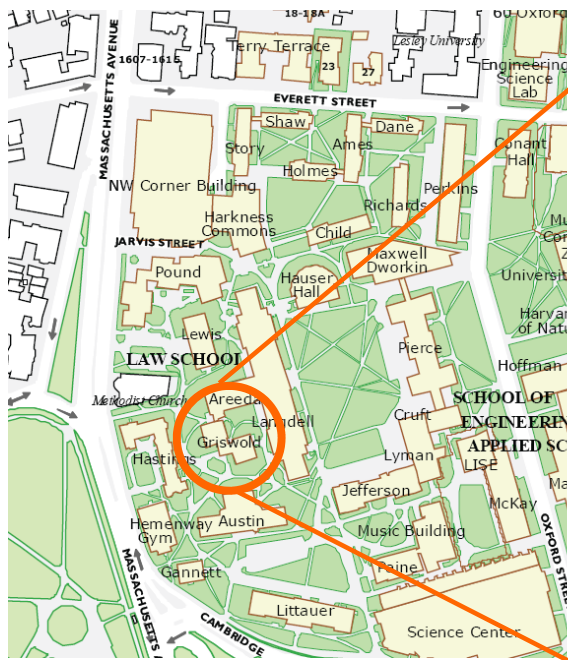
Materials and Resources 12/14

Indoor Environmental Quality 16/17

Innovation and Design 5/5

\*57 points available (42+ = Platinum)

# Location



The project is located on the second floor of Harvard Law School's Griswold Hall, at 1525 Massachusetts Avenue in Cambridge, Massachusetts.

# Project Team

**Project Manager**  
Gene O'Connor -  
HLS Facilities Management

**Architect**  
Sean Stewart Architects

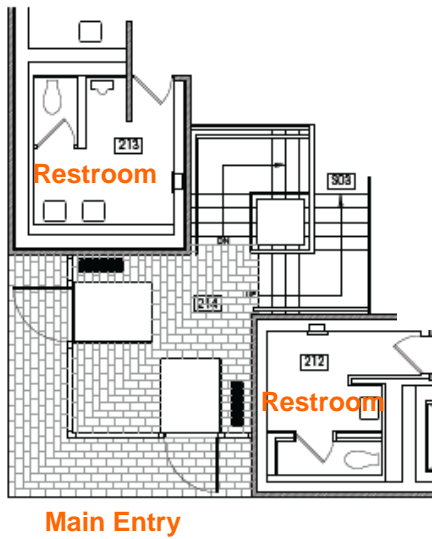
**Contractor**  
Lake Contracting Inc.

**Engineer**  
R.W. Sullivan Engineering

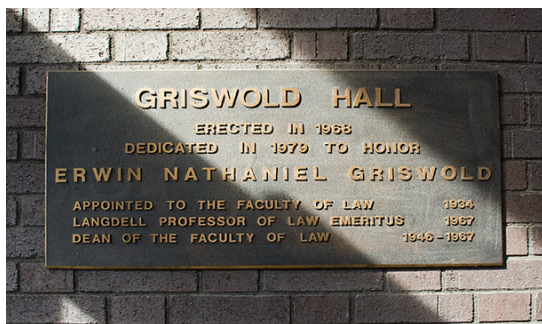
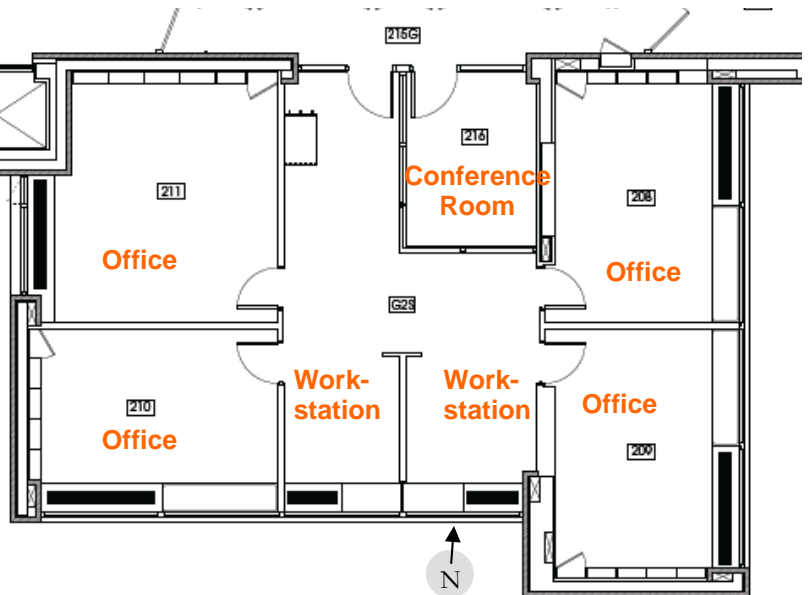
**Commissioning Authority**  
MAW Consulting, Inc.

**Waste Management Consultant**  
Institution Recycling Network

**Sustainability Consultant**  
Harvard Office for  
Sustainability—Green Campus  
Building Services



Griswold Hall 2-South Suite and Main Entry





# Sustainable Strategies

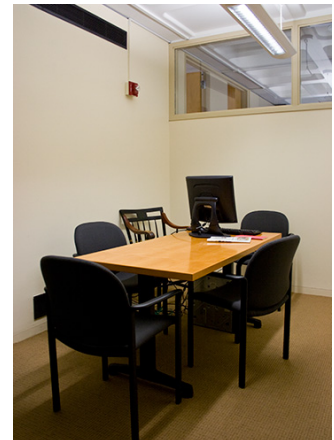


## Site

- > Griswold is in a densely developed urban area within walking distance to public transportation, campus shuttles, restaurants, banks, churches, retail stores, and other services
- > To encourage alternatives to driving, occupants benefit from Harvard's comprehensive Commuter Choice program, which provides carpooling incentives and discounts on public transportation.
- > Bicycle racks adjacent to the building and close proximity to showers in Hemenway Gymnasium allow the option for commuting via bicycle.
- > The roof is high-albedo Sarnafil G410 white membrane, which has 82 % reflectance and 92% emittance to reduce urban heat island effect.

## Water Efficiency

- > Second floor restrooms were retrofitted to reduce the use of potable water by an estimated 39.7% over Energy Policy Act of 1992 (EPAct) compliant fixtures. EPAct requires that water closets use no more than 1.6 gallons per flush, lavatories no more than 2.5 gallons per minute, and urinals no more than 1 gallon per flush..
- > Existing 1 gallon per flush (gpf) urinals were replaced with Zurn EcoVantage 0.125 gpf urinals. The sinks were retrofitted with 0.5 gpm aerators. The existing water closets already had Sloan dual-flush flushometers, with 1.6 gpf and 1.1 gpf options.
- > These measures are estimated to save over 38,600 gallons of water per year compared to EPAct-compliant fixtures.



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If printing is required, please print double sided and recycle when finished. Thank you!

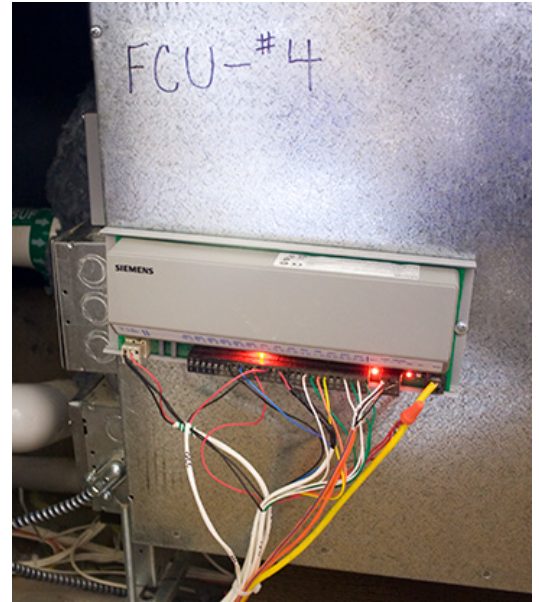


## Energy Efficiency

- > New through-wall four-pipe fan coil units (FCU) were installed in each space, which are controlled and monitored by the Building Management System (BMS). To reduce energy consumption, these FCUs are connected to occupancy sensors to allow the HVAC system to turn down or turn off when the space is unoccupied.
- > Carbon dioxide sensors in each space provide demand control ventilation, which means the space is ventilated based on actual occupancy. During unoccupied mode the outside air damper modulates closed. During occupied mode, the outside air damper modulates to provide the minimum outside air. The damper further modulates based on the carbon dioxide sensors.
- > Each office space has a thermostat with +/- 5 degree setpoint, three fan speed option, and on/off control. This allows occupants to individually control their thermal comfort.
- > Occupants will be surveyed about their thermal comfort at least once per season. HLS Facilities will provide corrective action as necessary.
- > The Griswold Hall office uses only Energy Star rated office equipment: Lenovo monitors and computers, a Hewlett Packard LaserJet copier, and two Canon Image Runner Copiers. The Energy Star program certifies products with the best efficiencies in their particular product category.
- > The HVAC, BAS, lighting, and lighting control systems were 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 Certificates (RECs) were purchased from Sterling Planet (wind power) equivalent to 100% of the anticipated electricity use of a typical 1655 square foot office over a two year period. The project purchased RECs for 33,248 kWh.

### LIGHTING

- > The existing dark concrete coffered ceiling was painted white to increase reflectivity in the space.
- > Pendant-mounted direct/indirect Focal Point Verve III light fixtures along the perimeter have built-in daylight sensors and automatically dim the lights when there is sufficient daylight in the space. These lighting strategies resulted in \$2400 worth of NSTAR rebates.
- > Local controls in each space consist of a dual-level switch with an integral occupancy sensor. Occupancy sensors turn the lights off when the space is unoccupied.



*Pictured from top to bottom:*

- 1) Fan coil units
- 2) Carbon dioxide sensors
- 3) Thermostat and occupancy sensor
- 4) Daylight dimming sensor built into light fixture
- 5) Light fixtures with white ceiling and built-in daylight sensors





## Materials and Resources

- > 99.35% of the construction waste (24.47 tons) was recycled and diverted from landfills.
- > 74% of the existing interior non-structural components were retained and reused.
- > The majority of the furniture is salvaged from elsewhere on the HLS campus, which accounts for 65% of the project's furniture budget. Built-in millwork shelves were also salvaged and refurbished.
- > Selecting materials with recycled content was important to the project team. 56% of the total value of materials consists of materials with post-consumer and/or pre-consumer recycled content. Some of the materials with high recycled content include Nucor steel, Dietrich metal studs, Uniboard Nu Green particleboard, Ultratouch Bonded Logic insulation (recycled denim), de la Fontaine steel doors and frames, Boylu carpet, USG drywall, and Herman Miller furniture.
- > Materials were sourced locally when possible. Materials sourced within 500 miles include glazing, metal studs, steel doors and frames, drywall, and glazing. 10% were regionally extracted and 28 % were regionally manufactured, as a percentage of the total cost of materials used in the project.
- > The majority of the wood (96.7% by cost) is Forest Stewardship Council certified, which ensures that the wood was sustainability harvested.



*Pictured:*

- Ultratouch recycled denim insulation
- Salvaged furnishings

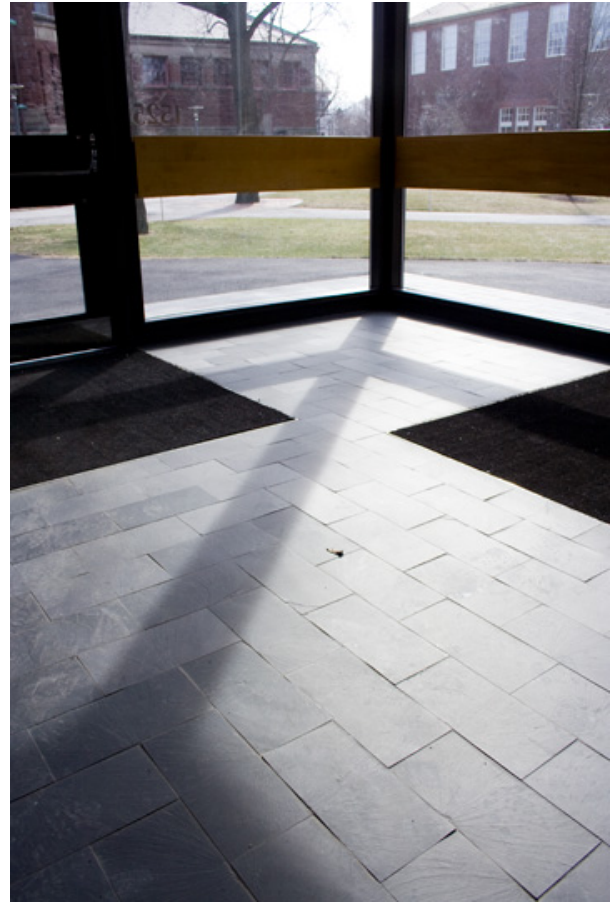


*Photos by Harvard Office for Sustainability and Sean Stewart Architects*



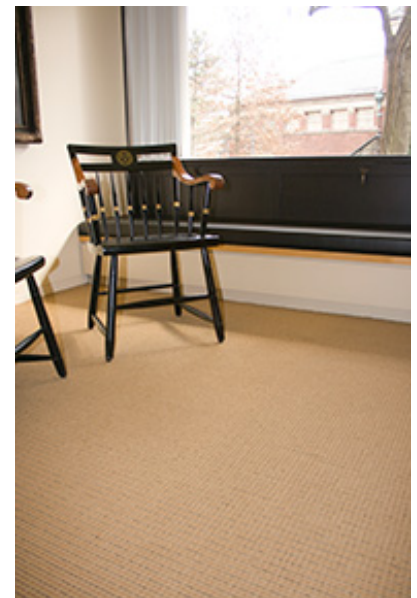
## Indoor Environmental Quality

- > The interior layout was designed so that all occupants have access to daylight and views out of the perimeter operable windows.
- > The ventilation rates exceed ASHRAE 62.1-2004 requirements by over 30%. Carbon dioxide monitors ensure adequate ventilation is provided and reduce ventilation when the space is unoccupied.
- > The project implemented a comprehensive Indoor Air Quality plan during construction to provide a healthy environment for both the construction team and other occupants elsewhere in Griswold Hall.
- > All adhesives, sealants, paints and coatings used for construction were low-VOC emitting (volatile organic compounds) to ensure healthy indoor air quality. Benjamin Moore Ecospec paint and adhesives such as Chicago Solvent Free Multi Purpose Adhesive, Titebond Solvent Free Acoustical Ceiling Tile Adhesive were used.
- > The carpet is Carpet and Rug Institute Green Label Plus certified. All of the systems furniture and seating is Greenguard certified.
- > All composite wood and agrifiber products are free of added urea formaldehyde.
- > Indoor air quality testing after construction and before occupancy confirmed that healthy air quality before occupants moved into the space. It tested for total VOCs, formaldehyde, carbon monoxide, and particulates.
- > The Harvard Law School uses Harvard's Facilities Maintenance Operations for custodial services, which employs a comprehensive green cleaning program.



*Pictured:*

- Ample daylight and views
- Carpet and Rug Institute Green Label Plus certified carpet
- Greenguard certified furniture



*For more information, contact:*

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