

**HMS QUAD REORGANIZATION**  
**77 AVENUE LOUIS PASTEUR**  
**PROJECT PROFILE**
**LEED FOR COMMERCIAL INTERIORS v.2009**  
**LEED GOLD**  
**AUGUST 2013**

The Harvard Medical School (HMS) Quad Reorganization project involves the relocation of the Microbiology Department and its merger with the Immunobiology Division faculty. The 60,500 square foot renovation of the 10th floor in the Harvard Institutes of Medicine (HIM) and the 8th, 9th and 10th floors in the New Research Building (NRB) was carried out under two packages (phases) over a two and one-half year period.

In setting the sustainability goals to guide the project's design and operation, the project team utilized the Harvard University Green Building Standards for Fit-outs and the LEED-CI v2009 Certification requirements. The main sustainability goals for the project include the following.

- > **Resource conservation** through the reuse of as much of the interior non-structural components as possible, including finish materials and existing lab benches.
- > **Lighting design** reduced energy demand through careful selection of fixtures and lamps, as well as the strategic use of occupancy sensors.
- > **Materials selection** focused on regionally manufactured items, maximizing recycled content, and choosing products with little or no potentially harmful chemical compounds traditionally found in some building materials.
- > **Enhanced commissioning** services were used to ensure that energy use and air quality goals were met and maintained.



Typical Lab Space

Photo: copyright Miller Dyer Spears, 2012

**LEED® Facts**

Harvard Medical School  
 Quad Reorganization



|                                   |               |
|-----------------------------------|---------------|
| Location.....                     | Boston, MA    |
| Rating System.....                | LEED-CI v2009 |
| Certification .....               | Gold          |
| Total Points Achieved.....        | 79/110        |
| <hr/>                             |               |
| Sustainable Sites.....            | 18/21         |
| Water Efficiency.....             | 11/11         |
| Energy and Atmosphere.....        | 22/37         |
| Materials and Resources.....      | 7/14          |
| Indoor Environmental Quality..... | 11/17         |
| Innovation and Design.....        | 6/6           |
| Regional Priority.....            | 4/4           |

**PROJECT METRICS**

- 55%** of non-structural building components reused (surface area)
- 40%** water use reduction when compared to EPA 1992 baseline
- 14%** lighting power reduction when compared to ASHRAE 90.1-2007 baseline
- 100%** of the project's adhesives, sealants, paints, and coatings are low-emitting
- 48%** regional materials (manufactured within 500 miles) value as a percentage of total materials value



## ENERGY EFFICIENCY

The Harvard Medical School (HMS) has committed, along with Harvard University as a whole, to reduce greenhouse gas emissions 30% below 2006 levels by 2016, inclusive of growth. Therefore, the following energy conservation measures (ECMs) were implemented as part of the Quad Reorganization project.

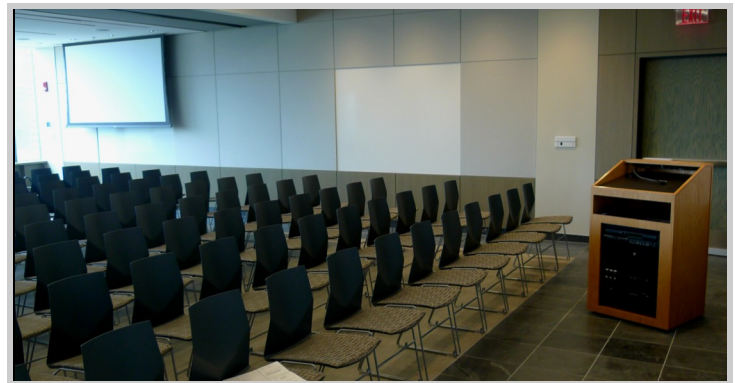
### MECHANICAL SYSTEMS

- ECM 1: Direct Digital Controls** - The system is comprised of a network of various independent stand-alone digital controllers, electric/electronic control equipment, thermostats, sensors, controllers, valves, dampers, actuators, panels and related hardware, software and other accessory equipment, along with a complete system of electrical control wiring, and software generation to provide for a complete and operable system.
- ECM 2: Variable Air Volume Control** - Air volume control by supply boxes (office) and air valves (lab) with hot water coils and cfm tracking exhaust boxes (office) and air valves (labs). The fan control associated with this type of HVAC system lends itself to significant cooling energy savings.
- ECM 3: Demand Controlled Ventilation with CO<sub>2</sub> Sensors** - CO<sub>2</sub> sensors monitor CO<sub>2</sub> levels in the air inside the building, while an air-handling system uses data from the sensors to regulate the amount of ventilation air admitted in order to avoid overheating and/or overcooling.
- ECM 4: Low Velocity Ductwork Design** - By increasing duct diameter, the friction associated with air passing through the duct is decreased, which leads to significant HVAC energy savings.
- ECM 5: Occupancy Sensors** - Occupancy sensors are installed in all spaces to set back the temperature to predetermined un-occupied set-points. The sensors also reduce ventilation rates and turn off the fan coil unit fans in un-occupied mode.



Break Room

Photo: copyright Miller Dyer Spears, 2012



Seminar Room

Photo: copyright Miller Dyer Spears, 2012

### ELECTRICAL SYSTEMS

- ECM 1: Occupancy Sensors** - Installed in all spaces to turn the lights on, or off, based on actual occupancy.
- ECM 2: Vacancy Sensors** - Vacancy sensors are manual on and automatic off when the sensor does not sense occupancy. This can reduce electric consumption more than occupancy sensors, as occupants do not always turn on the lights when entering a room if there is enough natural light or they are only briefly occupying the room.
- ECM 3: Reduction in Lighting Power Density** - 14% reduction in Lighting Power Density (watts/square foot) when compared to ASHRAE 90.1-2007 baseline. Reduction was achieved through the use of LEDs, high efficiency linear fluorescent lamps, efficient fixtures and ballasts.
- ECM 4: Plug Loads** - When available, ENERGY STAR equipment and appliances were purchased instead of less efficient models. This includes the refrigerators and LCD screens.

## PRODUCTS AND MATERIALS

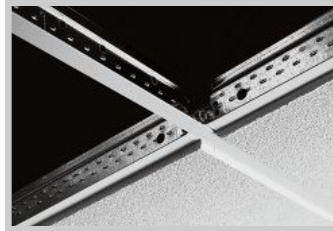
### Highlights

- **15% Recycled Content** value as a percentage of total materials cost.
- **48% Regionally Manufactured** value as a percentage of total materials cost.
- **37% Regionally Extracted** value as a percentage of total materials cost.
- **Only Low-VOC, or No-VOC** adhesives, sealants, paints and coatings were used.



**Viperstud**  
MarinoWare

- ✓ Recycled Content
  - 25.5% Post-consumer
  - 6.8% Pre-consumer
- ✓ Regionally Extracted
  - S. Plainfield, NJ - 211 miles



**ACT/HRC Superfine Steel Ceiling Grid**  
Armstrong

- ✓ Recycled Content
  - 50% Post-consumer
  - 11% Pre-consumer
- ✓ Regionally Extracted/Manufactured
  - Aberdeen, MD - 331 miles



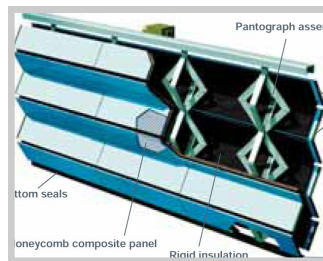
**Firetype X Gypsum Wallboard**  
LaFarge

- ✓ Recycled Content
  - 3% Post-consumer
  - 96% Pre-consumer
- ✓ Regionally Extracted
  - Buchanan, NY - 413 miles
- ✓ Regionally Manufactured
  - Newburg, MD - 164 miles



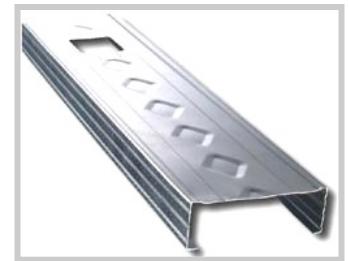
**Super Adjustable 2™  
Super Erecta® Shelving**  
Metro

- ✓ Recycled Content
  - 25% Post-consumer
- ✓ Regionally Extracted/Manufactured
  - Wilkes-Barre, PA - 226 miles



**Metal Split [Door] Frame**  
de La Fontaine

- ✓ Recycled Content
  - 20% Post-consumer
  - 38% Pre-consumer
- ✓ Regionally Manufactured
  - Sherbrooke, Quebec, CA - 212 miles



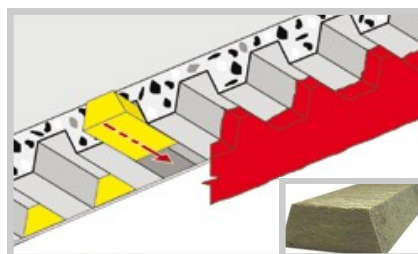
**ProStud Steel**  
ClarkDietrich

- ✓ Recycled Content
  - 25.9% Post-consumer
  - 5.9% Pre-consumer
- ✓ Regionally Extracted
  - Bristol, CT - 107 miles
- ✓ Regionally Manufactured
  - Fairless Hills, PA - 247 miles



**S-515 Clear,  
Thin-Spread Adhesive**  
Armstrong

- ✓ VOC Content = 0 g/L  
vs. 65 g/L VOC Limit



**CP 767 & 777 Speed Strips and Plugs**  
Hilti

- ✓ VOC Content = 0 g/L  
vs. 420 g/L VOC Limit



**Pro-Cryl Universal Primer**  
Sherwin Williams

- ✓ VOC Content = 100 g/L  
vs. 250 g/L VOC Limit

\* Please note that while many products are described in this project profile, these are provided for informational purposes only, to show a representative sample of what was included in this project. Harvard University and its affiliates do not specifically endorse nor recommend any of the products listed in this project profile and this profile may not be used in commercial or political materials, advertisements, emails, products, promotions that in any way suggests approval or endorsement of Harvard University.



## PRODUCTS AND MATERIALS

### LIGHTING AND CONTROLS

- **14% Reduction** in lighting power density (watts/square foot).
- **Occupancy Sensors** for 94% of the connected lighting load .



**Wave 1x4 + VL Optics**  
Axis Wave

- ✓ The VL Optics diffuser creates a softer, indirect light with a 92% transmission rate.
- ✓ Equipped with a dimmable ballast, this fixture allows a higher level of controllability and creates an opportunity for energy savings.



**CI-200/CI-205 Series Passive Infrared Ceiling Sensors**  
WattStopper

- ✓ Compatible with all types of lighting loads.
- ✓ Light-level output can create bi-level lighting for convenience and energy savings.



**DW-100 Dual Technology Wall Switch Sensor**  
WattStopper

- ✓ Combines the benefits of passive infrared (PIR) and ultrasonic technologies.
- ✓ Manual-ON/Auto-OFF capability.

### ENERGY EFFICIENT EQUIPMENT

- **89%** of the equipment purchased for the project is **ENERGYSTAR RATED** (by rated power).



**Stainless Top-Freezer Refrigerator**  
Model #GTH21SCXSS  
GE

- ✓ ENERGY STAR®
- ✓ Easily Removable Door Gaskets
- ✓ NeverClean Condenser
- ✓ Deluxe Quiet Design



**Sidekicks® 18 cu. ft. All-Refrigerator**  
Model #EL88TRRWS  
Whirlpool

- ✓ ENERGY STAR®
- ✓ Adjustable Storage
- ✓ Frost Free



**Stainless Steel Built-In Bottom Freezer Refrigerator**  
Model #BI36USTHRH  
Sub-Zero

- ✓ ENERGY STAR®
- ✓ Dual refrigeration system

### WATER EFFICIENCY

- **40% Reduction** in annual water use (223,290 gallons/year) when compared to EPAAct 1992 baseline standard.



**Marathon Kitchen Sink Faucet**  
Model 2300-E2605ABCP  
with 0.35 gpm aerator  
Chicago

- ✓ **0.35 gallons per minute (gpm)**  
vs. EPAAct baseline of 2.2 gpm.



**Brevity 421**  
Mansfield

- ✓ **0.125 gallons per flush (gpf)**  
vs. EPAAct baseline of 0.5 gpf.



**Earth Massage Chrome Showerhead**  
Niagara Conservation

- ✓ **1.5 gallons per minute (gpm)**  
vs. EPAAct baseline of 2.5 gpm.

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## MULTIPLE SPACES, ONE LEED PROJECT - PROJECT BOUNDARY

This project is unique in that the project boundaries are informed by the department space program and extend over three floors in two buildings. Spaces are located within the New Research Building on levels 8, 9, and 10, and within the Harvard Institutes of Medicine building on level 10.



Break Room

Photo: copyright Miller Dyer Spears, 2012

## PROJECT TEAM

|  |                                 |
|--|---------------------------------|
| <b>Owner</b>                           | Harvard Medical School          |
| <b>Architect</b>                       | Miller Dyer Spears              |
| <b>MEP Engineer</b>                    | BR+A Consulting Engineers       |
| <b>Construction Manager (Phase #1)</b> | Suffolk Construction            |
| <b>Construction Manager (Phase #2)</b> | Shawmut Construction and Design |
| <b>Commissioning Authority</b>         | Synergy Consultants             |
| <b>Sustainability Consultant</b>       | Harvard Green Building Services |

## MORE INFORMATION

- > Harvard Medical School: <http://hms.harvard.edu/>
- > Harvard Medical School Green Program: <http://green.harvard.edu/hms/green-program>
- > Harvard - Green Building Services: <http://green.harvard.edu/green-building-services>
- > Harvard - Green Building Resource: <http://green.harvard.edu/theresource>
- > Follow Green Building Services: <http://www.facebook.com/HarvardGBS> or @Harvard\_GBS

