HARVARD
Faculty of Arts and Sciences

HARVARD UNIVERSITY | Sustainability

Girguis Laboratory
16 Divinity Avenue, Cambridge, MA
Project Profile

LEED-CI v3
LEED GOLD
2016

Laboratories are typically regarded as an energy intensive building typology. Many of these buildings have extended occupancy periods, energy intensive equipment and machinery, and in some cases, strict air quality code requirements (high air changes per hour). These factors contribute to a high average energy use intensity value (National Average EUI of 370 kBtu/SF/year). Additionally, some laboratories consume significant amounts of water through process and HVAC equipment use. Nevertheless, there are many strategies that can be employed to make laboratories more energy and water efficient as well as healthy and productive spaces with minimal environmental impact. The Girguis Laboratory is a great example of the successful implementation of these strategies.

Photo: copyright Perkins + Will/Greg Premru Photography, 2016

The FAS Girguis Laboratory Renovation project scope includes renovations within the 3rd floor of the Bio Labs Building and includes select demolition and construction of new partitions, ceilings, and general finish upgrades as part of the total renovation of existing office, conference and laboratory spaces. Work also includes new lighting throughout and mechanical system upgrades and additions to support the new laboratory spaces. The renovation will encompass approximately 6,415 square feet. The project's goals were to create high performance lab spaces that optimize energy and the indoor environment, reduce resource consumption, and increase occupant engagement.

The project team was committed to sustainability from the onset and followed the Harvard Green Building Standards to make more informed decisions. These standards led to the inclusion of a number of progressive design strategies to meet aggressive energy targets and reduce water use without significant additional cost. The project achieved LEED-CI v3 Gold certification in June 2016.

LEED® Facts

Harvard University
Girguis Laboratory

Location	Cambridge, MA
Rating System	LEED-CI v3
Certification Anticipated	Gold
Total Points Anticipated	77/110
Sustainable Sites	18/21
Water Efficiency	11/11
Energy and Atmosphere	20/37
Materials and Resources	7/14
Indoor Environmental Quality	11/17
Innovation and Design	6/6
Regional Priority	4/4

Project Metrics

13% Material with recycled content

39% Material manufactured from less than 500 miles away

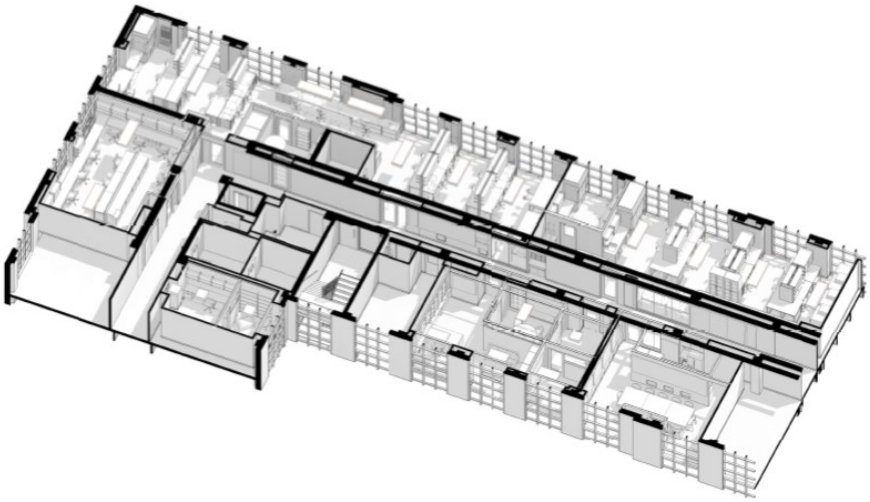
80% of on-site generated construction waste was diverted from landfills

100% of the project's adhesives, sealants, paints, coating, composite wood, and agrifiber products are low-emitting

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

PROJECT HIGHLIGHTS - LIGHTING DESIGN

The Girguis Laboratory space is expected to be occupied for extended periods through-out the year, therefore, it is crucial that the energy reduction strategies also focus on reducing lighting energy. The lighting system was designed to not only reduce energy use, but also to improve the indoor environmental quality of the space and provide optimal lighting. Some of the strategies employed include:



- Reduce lighting power density by 13.6% below the ASHRAE 90.1 baseline standard
- High performance T8 & LEDs installed throughout the project space
- Ceiling mounted daylight and occupancy sensors capable of managing lighting setbacks for lab, work spaces, and support rooms
- Lighting controls with multiple lighting levels to provide adequate illumination for a higher indoor environmental quality
- Over 90% of regularly occupied space within the project area was designed with access to daylight and views

Photo: copyright Perkins + Will/Greg Premru Photography, 2016

PROJECT TEAM

Owner	Harvard University
Project Manager	Harvard FAS Capital Project Management
Architect	Perkins + Will
MEP Engineer	Rist-Frost-Shumway Engineering
Contractor	Shawmut Design and Construction
Commissioning Authority	Harvard Green Building Services
Sustainability Consultant	Harvard Green Building Services

ENERGY EFFICIENCY AND INDOOR ENVIRONMENTAL QUALITY

ENERGY EFFICIENCY

ECM 1: High Efficiency Fans and Motors

ECM 2: Occupancy Sensors

ECM 3: High Efficiency Fan Coil Units

ECM 4: Variable Air Volume Control (VAV)

ECM 5: Temperature Sensors

ECM 6: Chilled Beam Conditioning

The overall strategy of the HVAC system design was to reduce energy use through the installation of high efficiency equipment and controls. The project includes the installation of a new 100% outside air handling unit including high-efficiency filtrations and a variable air volume supply fan. Additionally, the spaces are conditioned with a combination of high efficiency fan coil units and two-pipe chilled beams which use campus central plant chilled water as the cooling energy source.

All space temperatures and set-points are mapped to the building automation system, which uses temperature and occupancy sensors to adjust HVAC system operation to further maximize energy efficiency.

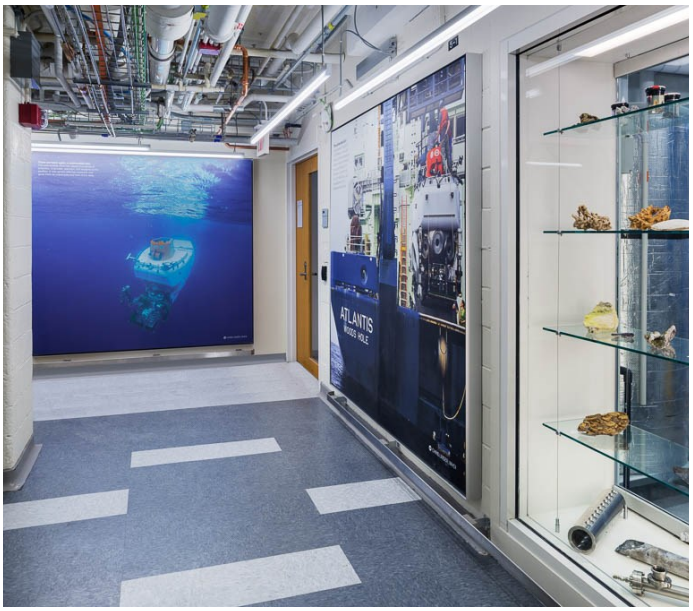


Photo: copyright Perkins + Will/Greg Premru Photography, 2016

Photo: copyright Perkins + Will/Greg Premru Photography, 2016

INDOOR ENVIRONMENTAL QUALITY

The high indoor environmental quality of the Girguis Laboratory renovation was a significant focus of the project. An indoor Air Quality Management Plan was enacted to ensure the protection of building systems, building occupants, construction related occupants, and interior building materials from air pollutants, excessive moisture exposure, and moisture damage during construction.

The selection of low chemical-emitting construction and finish materials was an important driving force in the design phase. The project includes low VOC adhesives, sealants, paints, coatings, primers, and flooring systems. All wood and agrifiber products are also free of urea-formaldehyde.

All chemical use spaces have auto closing doors as well as compliant exhaust systems. To reduce contaminants brought in from the outdoors, all main entryways have grills or floor mats.

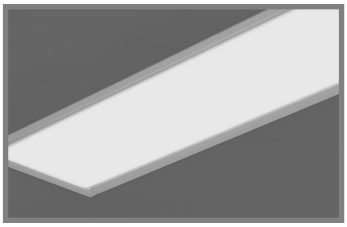
PRODUCTS AND MATERIALS

LIGHTING AND CONTROLS

- **13% reduction** in lighting power density (watts/square foot)

LED Downlight
Gotham
- ✓ LED Fixture
- ✓ Total fixture wattage = 25 watts
- ✓ Life: 50,000 hours

LED Troffer
Omni-Lite
- ✓ LED Fixture
- ✓ Total fixture wattage = 34 Watts
- ✓ Life: 50,000 hours



Recessed Linear LED
Focal Point
- ✓ High Efficiency Fluorescent
- ✓ Total fixture wattage = 12 Watts
- ✓ Life: 50,000 hours

LOW-EMITTING MATERIALS

- **100%** of the project's adhesives, sealants, paints, coatings, and engineered wood are **low-emitting.**

Latex Paint
Eco Spec—Eggshell Finish
Benjamin Moore
- ✓ No VOCs

Wood Flooring Adhesive
Bostik's Best
Bostik
- ✓ Low VOCs

Engineered Hardwood
Imagine Collection
Mirage
- ✓ Less than 0.1 ppm formaldehyde emissions

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.

PROJECT SCORECARD

Girguis Laboratory - Harvard FAS

Project ID	1000051842
Rating system & version	LEED-CI v2009
Project registration date	11/04/2014

CERTIFIED SILVER **GOLD** PLATINUM

Certified (Gold)

CERTIFIED: 40-49, SILVER: 50-59, GOLD: 60-79, PLATINUM: 80+

DOWNLOAD SCORECARD

LEED FOR COMMERCIAL INTERIORS (V2009)

ATTEMPTED: 77, DENIED: 0, PENDING: 0, AWARDED: 77 OF 110 POINTS

SUSTAINABLE SITES	18 OF 21
SSc1 Site Selection	2 / 5
SSc2 Development Density and Community Connectivity	6 / 6
SSc3.1 Alternative Transportation-Public Transportation Access	6 / 6
SSc3.2 Alternative Transportation-Bicycle Storage and Changing Room	2 / 2
SSc3.3 Alternative Transportation-Parking Availability	2 / 2

WATER EFFICIENCY	11 OF 11
WEp1 Water Use Reduction-20% Reduction	Y
WEc1 Water Use Reduction	11 / 11

ENERGY AND ATMOSPHERE	20 OF 37
EAp1 Fundamental Commissioning of the Building Energy Systems	Y
EAp2 Minimum Energy Performance	Y
EAp3 Fundamental Refrigerant Mgmt	Y
EAc1.1 Optimize Energy Performance-Lighting Power	0 / 5
EAc1.2 Optimize Energy Performance-Lighting Controls	1 / 3
EAc1.3 Optimize Energy Performance-HVAC	5 / 10
EAc1.4 Optimize Energy Performance-Equipment and Appliances	4 / 4
EAc2 Enhanced Commissioning	5 / 5
EAc3 Measurement and Verification	0 / 5
EAc4 Green Power	5 / 5

MATERIALS AND RESOURCES	7 OF 14
MRp1 Storage and Collection of Recyclables	Y
MRc1.1 Tenant Space-Long-Term Commitment	1 / 1
MRc1.2 Building Reuse	0 / 2
MRc2 Construction Waste Mgmt	2 / 2
MRc3.1 Materials Reuse	0 / 2
MRc3.2 Materials Reuse-Furniture and Furnishings	0 / 1
MRc4 Recycled Content	1 / 2
MRc5 Regional Materials	2 / 2
MRc6 Rapidly Renewable Materials	0 / 1
MRc7 Certified Wood	1 / 1

INDOOR ENVIRONMENTAL QUALITY	11 OF 17
IEQp1 Minimum IAQ Performance	Y
IEQp2 Environmental Tobacco Smoke (ETS) Control	Y
IEQc1 Outdoor Air Delivery Monitoring	1 / 1
IEQc2 Increased Ventilation	1 / 1
IEQc3.1 Construction IAQ Mgmt Plan-During Construction	1 / 1
IEQc3.2 Construction IAQ Mgmt Plan-Before Occupancy	0 / 1
IEQc4.1 Low-Emitting Materials-Adhesives and Sealants	1 / 1
IEQc4.2 Low-Emitting Materials-Paints and Coatings	1 / 1
IEQc4.3 Low-Emitting Materials-Flooring Systems	0 / 1
IEQc4.4 Low-Emitting Materials-Composite Wood and Agrifiber Products	1 / 1
IEQc4.5 Low-Emitting Materials-Systems Furniture and Seating	0 / 1
IEQc5 Indoor Chemical and Pollutant Source Control	1 / 1
IEQc6.1 Controllability of Systems-Lighting	0 / 1
IEQc6.2 Controllability of Systems-Thermal Comfort	0 / 1
IEQc7.1 Thermal Comfort-Design	1 / 1
IEQc7.2 Thermal Comfort-Verification	1 / 1
IEQc8.1 Daylight and Views-Daylight	1 / 2
IEQc8.2 Daylight and Views-Views for Seated Spaces	1 / 1

INNOVATION IN DESIGN	6 OF 6
IDc1.1 Occupant Education w/ Case Study	1 / 1
IDc1.1 Innovation in Design	0 / 1
IDc1.2 Low-Mercury Lighting	1 / 1
IDc1.2 Innovation in Design	0 / 1
IDc1.3 Exemplary Performance EAc1.4	1 / 1
IDc1.3 Innovation in Design	0 / 1
IDc1.4 Innovation in Design	0 / 1
IDc1.4 IDc1.4: Exemplary Performance EAc4	1 / 1
IDc1.5 Exemplary Performance SSc3.1	1 / 1
IDc1.5 Innovation in Design	0 / 1
IDc2 LEED® Accredited Professional	1 / 1

REGIONAL PRIORITY CREDITS	4 OF 4
SSc3.2 Alternative Transportation-Bicycle Storage and Changing Room	1 / 1
WEc1 Water Use Reduction	1 / 1
EAc1.1 Optimize Energy Performance-Lighting Power	0 / 1
EAc1.3 Optimize Energy Performance-HVAC	1 / 1
MRc3.1 Materials Reuse	0 / 1
MRc5 Regional Materials	1 / 1

TOTAL	77 OF 110

MORE INFORMATION

- Harvard Faculty of Arts and Sciences: http://www.fas.harvard.edu/home/
- Girguis Lab: http://www.oeb.harvard.edu/faculty/girguis/
- Harvard - Green Building Resource: http://green.harvard.edu/theresource