FACULTY OF ARTS AND SCIENCES

GREEN is the new Crimson

HARVARD FACULTY OF ARTS AND SCIENCES

LEED-CI v2.0

VANSERG/SHANNON CHILD CARE RENOVATION

LEED GOLD

29 Francis Avenue, Cambridge, MA 02138

2010

Two child care centers, the Harvard Yard Child Care Center (HYCCC) and the Oxford Street Daycare Cooperative (OSDC), located in Harvard's Vanserg and Shannon Hall, were renovated by the Harvard Faculty of Arts and Sciences and the Harvard Office of Work/Life. The Vanserg/Shannon renovation was an opportunity to reconfigure spaces to meet programmatic requirements and national standards for child care facilities while increasing energy efficiency and improving indoor air quality. The scope of work included upgrades to the mechanical (heating and cooling) and electrical systems, additional restrooms to meet building code requirements and NAEYC standards, new finishes and lighting, relocated directors' offices located near main entryways, and direct access to playgrounds.

Harvard Yard Child Care Center
Photo: Harvard Office of Work/Life, 2010

Vanserg and Shannon are connected two-story wood frame buildings which previously included these two child care centers as well as office space for various Harvard organizations. The renovated HYCCC space encompasses approximately 3,000 square feet, while the renovated OSDC space includes approximately 8,500 square feet, for a total of 11,500 square feet.

From the early stages of conceptual design, the project team was focused on achieving sustainability objectives by reducing energy use while maintaining occupant comfort within the space. Much of the success of the project can be attributed to early involvement and engagement from a wide range of stakeholders with a strong commitment to green building process and principles - with a particular focus on providing healthy indoor air quality for the project's little occupants. LEED for Commercial Interiors (LEED-CI) v2 Gold certification, which was achieved, was a primary project goal from the onset of the design.

PROJECT HIGHLIGHTS

LEED® Facts

Vanserg/Shannon Child Care
Harvard Faculty of Arts and Sciences
2011

Location	Cambridge, MA
Rating System	LEED-CI v2
Certification Achieved	Gold
Total Points Achieved	36/57
Sustainable Sites	4/7
Water Efficiency	2/2
Energy and Atmosphere	9/12
Materials and Resources	5/14
Indoor Environmental Quality	11/17
Innovation and Design	5/5

26% reduction in lighting power density (watts per square foot)

94% of equipment and appliances (by rated power) are Energy Star certified

94% of occupied spaces have access to daylight and views

36% reduction of potable water consumption below standard fixtures

100% of adhesives, sealants, paints, coatings, and carpet materials are low-emitting

41% of the total material value consists of products manufactured within 500 miles

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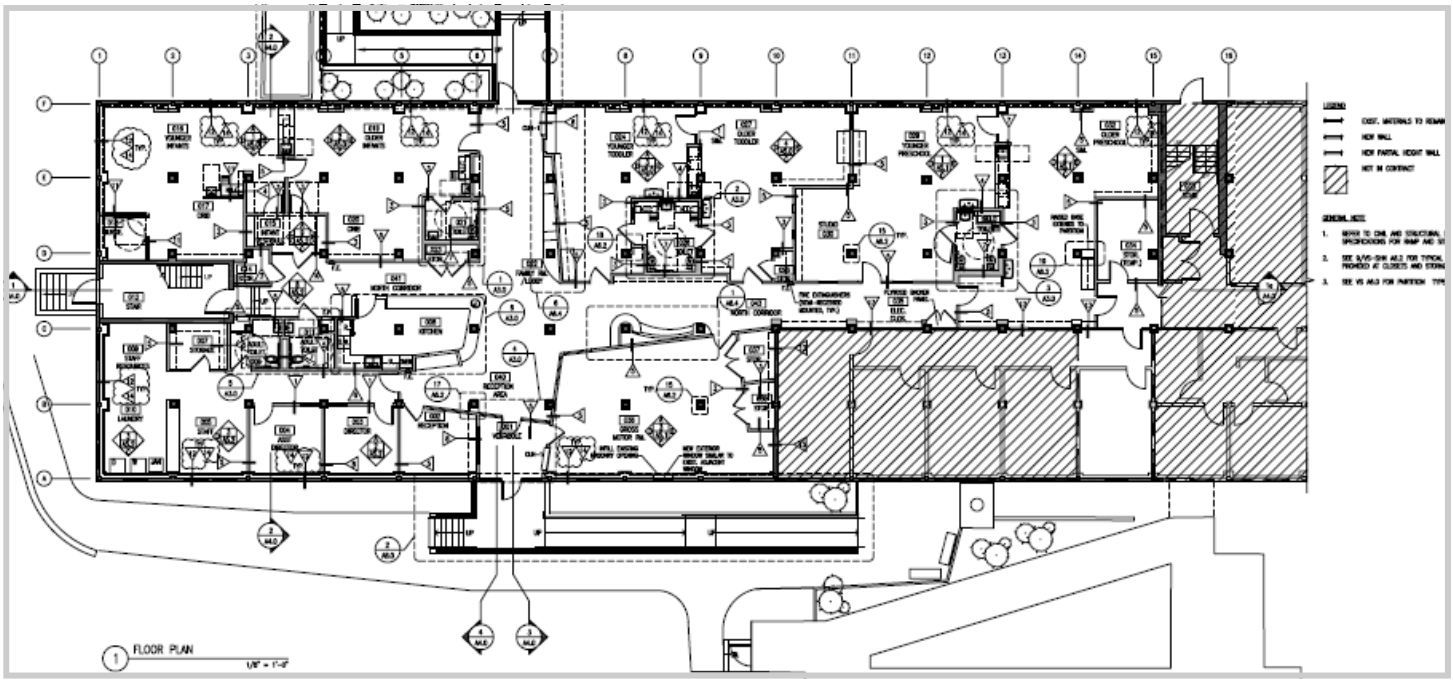
PROJECT OVERVIEW

VANSERG SHANNON FLOOR PLAN & LEED BOUNDARY



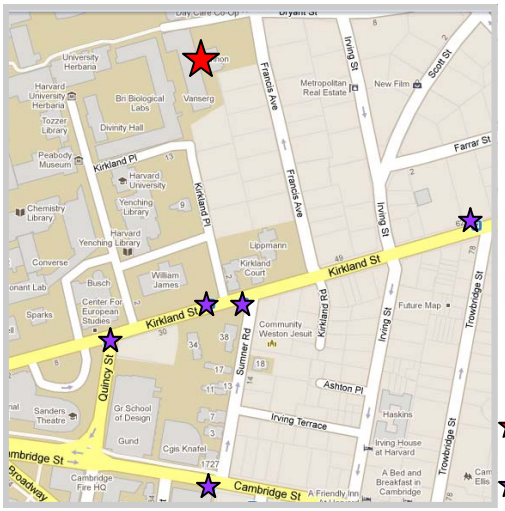
Harvard Yard Child Care Center
Photo: Harvard Office of Work/Life, 2010

PROJECT TEAM

Owner	Harvard Faculty of Arts and Sciences, Office of Work/Life
Owner's Rep	Daedalus Projects, Inc.
Project Manager	Harvard Faculty of Arts and Sciences
Architect	DW Arthur Associates Architects Kennedy Violich Architecture
Contractor	Wise Construction
HVAC Engineer	R.W. Sullivan Engineering
Commissioning Authority	Harvard Green Building Services
Sustainability Consultant	Harvard University Green Building Services

SITE

Shannon Hall—Harvard University, Cambridge, MA
Image from map.harvard.edu



- To encourage alternatives to driving, all occupants of the Vanserg/ Shannon Hall 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 provided on the east and north sides of Vanserg and Shannon Hall, encouraging bicycle transportation.
- The building is located in a dense urban area, which allows occupants to walk and easily access amenities such as restaurants, banks, churches, and retail stores.

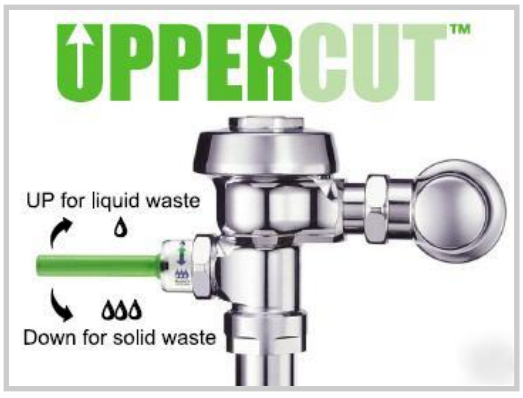
Bike racks at Vanserg/Shannon Hall
Photo: Harvard Green Building Services, 2010

WATER EFFICIENCY

Water-efficient and low-flow fixtures were installed in the Vanserg/Shannon renovation in order to achieve an anticipated **36%** reduction of potable water consumption below standard fixtures.

Differences in the flush & flow Rates for EPAct 1992 Standard Fixtures and the fixtures installed for the Vanserg/Shannon project

Fixture Type	Flush & Flow Rates	EPAct 1992 Standard Flush & Flow Rates
Water Closet [GPF]	0.8	1.6
Urinal [GPF]	0	1.0
Bathroom Sink [GPM]	1.8	2.5
Shower [GPM]	1.8	2.5
Kitchen Sink	0.5	2.5
GPF - Gallons Per Flush	GPM - Gallons Per Minute	



Sloan Uppercut®
Dual-flush flushometer

ENERGY EFFICIENCY

Harvard Faculty of Arts and Sciences has committed, along with Harvard University as a whole, to reduce greenhouse gas emissions 30% below 2006 levels by 2016, inclusive of growth. Energy efficiency was a primary goal of this renovation project.

MECHANICAL SYSTEMS

New HVAC systems will be installed to improve comfort and provide healthy indoor air to the occupants. As a result of a project sustainability charrette held in June 2009, a number of basic HVAC requirements were identified.

OCCUPANCY-BASED VENTILATION: Occupancy sensors installed in each room reduce exhaust and makeup air rates when a room is unoccupied for a minimum or 60 minutes.

COMMISSIONING: The mechanical and electrical 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.

DEMAND CONTROL VENTILATION: Sensors located in the project take real time, continuous carbon dioxide measurements throughout the day and adjusts ventilation rates depending on the readings. This ensures that the HVAC only provides the actual of ventilation necessary based on occupancy level.

Wall-mounted room controls
Photo: Harvard Green Building Services, 2010

ELECTRICAL SYSTEMS

New lighting was installed to reduce electricity use in the space. New energy efficient fixtures were selected for each area considering ceiling height, lighting levels, use and maintenance.

OCCUPANCY SENSORS: All rooms within the project scope have occupancy sensors that turn the lights in a space off when sensors have not been activated by motion for set periods of time. These occupancy controls sensors also control the ventilation setbacks.

LIGHT FIXTURES: Energy-efficient LED and fluorescent lighting fixtures and lamps were carefully chosen and placed to reduce electricity consumption, resulting in a 26% reduction in lighting power density (watts per square foot).

RENEWABLE ENERGY: Renewable Energy Certificates (RECs) were purchased from 3Degrees (wind power), equivalent to 100% of the anticipated electricity use over 2 years, equal to 366,000kWhs.

LIGHTING CONTROLS: The lighting design consists of lighting controlled by multiple switches/zones. This design allows occupants to adjust the lighting to suit their individual preferences, which not only increases productivity and comfort, but also decreases energy use. Additionally, daylight sensors are installed in perimeter spaces to reduce overhead lighting when sufficient daylight is present.

Harvard Yard Child Care Center
Photo: Harvard Yard Child Care Center, 2010

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INDOOR ENVIRONMENTAL QUALITY

Harvard 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.

Only materials with **LOW OR NO VOC CONTENT** were used in the Shannon/Vanserg renovation 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.

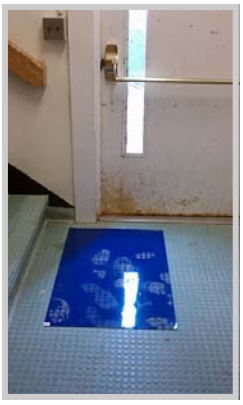
- **COMPOSITE WOOD AND LAMINATE ADHESIVES** used in the renovation do not have any added urea formaldehyde
- **CARPET SYSTEM** is Green Label Plus certified (Shaw Brilliance Tile)
- **ADHESIVES AND SEALANTS | PAINTS AND COATINGS** examples of low VOC products used:

Product Category	Product & Manufacturer	VOC Content (g/l)	VOC Limit (g/l)	Standard
Paints & Coatings	Fresh Start Primer	50	100	SCAQMD
	Natura Primer 511	0	50	SCAQMD
	Aqualante Lacquer	33	275	SCAQMD
Adhesives & Sealants	Econe Egrip III Adhesive	0	60	SCAQMD
	Johnsonite Linoleum Adhesive	20	50	SCAQMD

Construction IAQ Measures Implemented During Construction

HVAC Protection
Covering new HVAC ductwork

Housekeeping
Walk-off mats



Construction in progress
Photo: Harvard Green Building Services, 2010

GREEN HOUSEKEEPING: FAS participates in Harvard's Facilities and Maintenance Operations (FMO) Green Cleaning Program, which uses 100% recycled paper products and Green Seal certified cleaning solutions, among other green housekeeping practices.

DAYLIGHT AND VEIWS The project's architecture and fenestration provides a connection between indoor and outdoor environment by introducing daylight and views to the space - **94%** of the space has 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.

MATERIALS & WASTE

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

41% of the total material value consists of products manufactured within 500 miles.

75% of the on-site generated construction waste was diverted from the landfill.

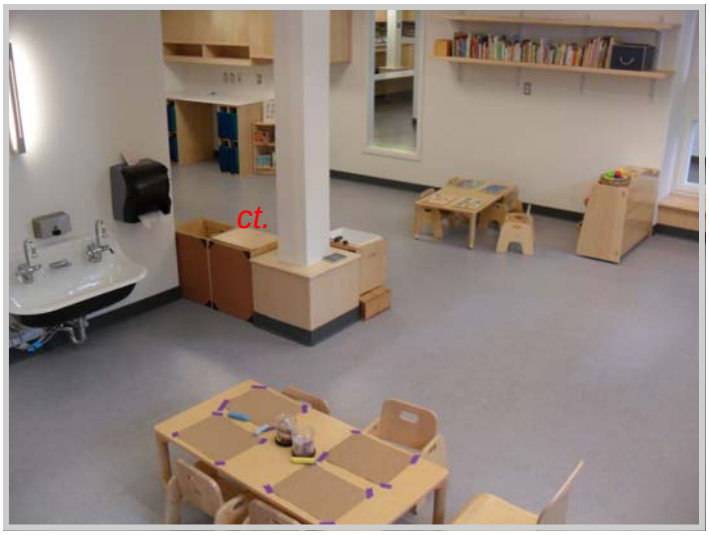
16% of the total value of materials used in the project consist of materials with recycled content

ENVIRONMENTALLY PREFERABLE MATERIALS IN VANSERG AND SHANNON CHILDCARE RENOVATION

- Iron Pipe (John Hoadly & Sons Inc)
  90% pre-consumer, **5%** post-consumer
- Wood Doors (VT Industries)
  0% pre-consumer, **90%** post-consumer
- Steel Pipe (ArcelorMittal)
  60% pre-consumer, **40%** post-consumer
- Rebar & Wire Mesh (Barker Steel LLC)
  13% pre-consumer, **87%** post-consumer

Examples of regional materials used in project:

Material Name	Manufacturer	Distance between project & Manufacturer (mi)
Concrete Mixes	Aggregate Industries	6
Aluminum Windows	Coastal Industries	20
Drain MH Cover/CB/Hood	East Jordan Ironworks	20



Harvard Yard Child Care Center
Photo: Harvard Yard Child Care Center, 2010

Common kitchen area
Photo: Harvard Green Building Services, 2010

ADDITIONAL RESOURCES

- **HARVARD FACULTY OF ARTS AND SCIENCES (FAS):** http://www.fas.harvard.edu/home
- **HARVARD OFFICE OF WORK/LIFE:** http://www.employment.harvard.edu/benefits/worklife/
- **OXFORD STREET DAYCARE:** http://www.oxfordstcoop.org
- **HARVARD YARD CHILD CARE CENTER:** http://www.hyccc.org
- **HARVARD GREEN BUILDING SERVICES:** http://green.harvard.edu/green-building-services
- **HARVARD GREEN BUILDING RESOURCE:** http://green.harvard.edu/theresource