Integrated design and a commitment to sustainability will make this 145-unit graduate student housing complex an enjoyable and healthy place to live, as well as lower the impact on the local and global environment.

Green Building Highlights

- Energy use: 28.2% reduction from code
- Natural Light: 20% of the wall area is glazing, all windows are energy efficient low-E, and double pane.
- Water Consumption: 10 dual flush toilets, as well as efficient showers and sinks reduce water use by 32.4%.
- Real Time Utility Displays– A monitor in the lobby will show tenants how much energy and water they are using, in real-time!
- 96.7% diversion of construction wastes away from landfills
- 32% recycled content of all materials in the building
Location
Located on the north side of Cowperthwaite St, this project is bounded by Banks, Cowperthwaite and Grant streets. The graduate residence is less than one block from the Charles River. Other amenities include a campus shuttle stop across the street from the entrance, and easy walking distance to Harvard Square, with shops, restaurants, and a subway station.

Program
The new Harvard Cowperthwaite Residence Hall provides the campus with new graduate student housing. The six story building includes 200 beds in 145 living units. The new building includes three levels of below-grade parking. The above-grade portion of the building is 109,720 square feet and the below-grade portion is 98,623 square feet, for a total of 208,343 square feet. This new building was constructed on the site of an existing grade level flat paved parking lot. The first floor has apartment units, a fitness center, common space, and the building office. Floors two through six are mostly apartment units, with a small common room and a central corridor.

The project used LEED for New Construction, version 2.1, to guide and certify green design elements. The pending Gold certification is a testament to the commitment of Harvard Real Estate

Project Team
Client: Harvard Real Estate Services
Development Manager: Jones, Lang, LaSalle
Architect: Elkus/Manfredi Architects Ltd
Construction Manager: John Moriarty & Associates
Landscape Architect: Halvorson Design Partnership
MEP Engineer and LEED Consultant: AHA Consulting Engineers
Civil Engineer: Green International
Environmental/Geotechnical Consultant: Haley & Aldrich, Inc
Sustainability Consultant: Harvard Green Campus Initiative
Technology Consultant: Cavan Group
Structural Engineer: McNamara Salvia
Sustainable Strategies

Site

5 Cowperthwaite expects to achieve 13 out of 14 Sustainable Sites credits in the LEED program. This includes:

Protecting open space – The portion of the parking garage that extends beyond the footprint of the building is covered with grass, creating an open space for residents to enjoy.

Reduced Commuting – All Harvard affiliates are offered 50% discounted parking permits for 2 person carpools and a 75% discount for 3 person carpools. The university subsidizes public transportation passes, offers a guaranteed ride home to carpool participants, reserves carpool parking spaces and more to further reduce the use of single occupant vehicles.

Public Transportation and Bicycling – In addition to promoting carpooling, Harvard provides a free shuttle service, assists bicyclists by identifying bike routes and providing adequate racks.

Campus Zipcar – Harvard provides a parking space at Five Cowperthwaite for a hybrid Zipcar. This shared vehicle can be rented by building occupants, reducing their need to own vehicles.

Storm Water – By reducing the amount of impervious paved surface on the site, storm water runoff will be reduced by more than 25%. In addition, a 32,800 gallon tank will collect storm water from the roof for use in irrigation.

Heat island effect – Harvard Real Estate wanted to reduce cooling costs and the heat island effect by installing a highly reflective roof, but also wanted to avoid the glare from a white roof. The solution was to install a custom green-color Fibertite PVC roof, which has an emissivity of greater than 90%.

Erosion and Sedimentation – Watering to keep down dust, washing wheels at site egresses, and building silt sacks on surrounding catch basins are some of the ways the project will control erosion and sedimentation on site.
**Energy**

An energy model was developed for Five Cowperthwaite, which aided in decisions regarding systems and equipment that affected both up-front costs and ongoing utility costs. By the end of design, the energy model showed that Five Cowperthwaite will use an impressive 28.2% less energy than a standard code compliant building. This was accomplished by incorporating a number of energy saving features, including:

- **CO Sensor Garage Ventilation** — Carbon monoxide sensors in the garage control the amount of ventilation air that is supplied. This reduces the amount of electricity used by the ventilation system by 80%.
- **Variable Speed Pumping** — Many pumps in the building are connected to variable speed drives. When full load is not required, these pumps slow down, greatly reducing energy consumption.
- **Quality Windows** — Because Five Cowperthwaite has so many windows, it was especially important to ensure that high-quality efficient windows were installed. The windows use low-e glass, which lets visible light in but lowers the amount of heat from solar radiation that enters the building, reducing cooling demand. The glass also has a high insulation value, more than twice the code requirement of 0.5 watts per square foot compared to 1.2 watts per square foot.
- **Efficient Indoor Lighting** — A combination of high efficient light fixtures, high efficient bulbs, and good lighting layout design allows apartment units to use less than half the power density of a standard building.
- **High-Efficiency Chiller** — The building’s 180 ton chiller includes variable speed drives, reducing energy consumption when demand is lower.
- **High R Value Roof** — While building codes required a roof with a minimum insulation of R-15, Five Cowperthwaite installed a roof with twice the insulating value with an R-30 roof, preventing twice the amount of heat from escaping during winter months.
- **High-Efficiency Boiler and Water Heater** — An 85% efficient boiler sends hot water throughout the building. The boiler is fully modulating, meaning that when its full capacity is not required, it can slow down and save energy. Variable speed pumps on the water distribution system also save energy when demand is low.
- **Premium Efficiency Motors** — All motors in the project meet NEMA (National Electric Manufacturers Association) requirements for premium efficiency.
- **Commissioning** — Five Cowperthwaite’s mechanical systems will be fully reviewed by an independent commissioning agent to ensure that they are running as they were designed.

**Irrigation**

The Harvard Riverside Housing irrigation system will utilize a rain sensor to automatically turn off the irrigation system when rainfall has occurred. When irrigation is needed, the Rainbird 1800-PRS system will provide water as efficiently as possible. A pressure regulator in the sprinkler stem will maintain a constant pressure of 30 psi. This reduced, but constant pressure also reduces the amount of water consumed and prevents wasted misting and fogging. Combined, these two systems will reduce the water used by irrigation by 31%. Much of the water that is used will come from a 32,800 gallon tank that will collect rainwater from the roof of the building.

**Domestic Water**

All units have shower heads that are designed to deliver a high velocity stream with a reduced water flow of only 1.6 gallons per minute. Bathroom sinks also have low flow fixtures that consume 0.5 gallons of water per minute. Combined, these measures will reduce domestic water consumption in the building by 32.4% when compared with a conventional building.
**Materials and Waste**

Careful attention was paid to both the disposal of construction waste and to the purchase of new materials, leading to some very impressive percentages:

- **96.7%** of construction and demolition waste was diverted from landfills to be either reused or recycled.
- **78%** of materials were manufactured within 500 miles of the project, greatly reducing the impacts of transportation.
- **52%** of materials were not only manufactured within 500 miles, but their raw materials were also extracted within 500 miles. This goes well beyond the rate achieved by previous Harvard projects.
- **32%** of all materials used in the project contain recycled content.

**Indoor Environmental Quality**

5 Cowperthwaite achieved 11 of 15 IEQ credits, by incorporating measures such as:

- **Operable windows**—installed in all units
- **Bathrooms exhaust fans**—that can remove 75 cubic feet of air per minute.
- **Clothes dryers**— By ducting dryers directly to the roof and controlling exhaust with pressure sensors, exhaust will be drawn outside only when needed.
- **Air Quality Management**— Measures taken include: sealing air ducts to keep out dust, protecting absorptive materials with plastic wrapping, keeping dust from spreading with plastic curtains, and scheduling painting to take place prior to the installation of absorptive materials such as furniture and carpet.
- **Low-Emitting Materials**—Volatile Organic Compounds (VOCs) were kept to a minimum, and below the LEED maximums for all adhesives, sealants, paints, and carpets.
- **User Control**—Lighting and temperature systems in common spaces, as well as individual units, can be individually controlled, so tenants can define their own comfort levels.
- **No Smoking** is allowed within 25 feet of the building. Smoking inside individual units is allowed, but smoke is prevented from migrating between units by careful sealing of any penetrations in the walls and by maintaining negative pressure within the units.
Innovations

Real-Time Utility Touchscreens—5 Cowperthwaite will be the first building at Harvard where tenants can see their electricity, gas and water consumption in real-time on a touch screen in the lobby just inside the front doors. These systems have proven at other Colleges such as Oberlin to dramatically reduce consumption, because tenants are constantly reminded of how much is being consumed and they can instantly see the results when they push to conserve.

Green Cleaning—The vendor who cleans hallways, stairwells and common spaces will only use Green Seal certified cleaning products, and will follow a set of practices designed to limit the amount of dirt entering the building, help to improve indoor air quality, and reduce impact on the environment. Building tenants are encouraged to follow suit. Each tenant will be given a six-month supply of certain green cleaning products, along with information on the advantages of green cleaning and the locations of local stores that carry green cleaning products.

Outstanding Material Purchases—5 Cowperthwaite greatly exceeded the LEED requirements for local manufacturing, local harvesting and recycled content.

LEED® Facts
Harvard Real Estate Services
5 Cowperthwaite - Cambridge, MA

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