

Sterling Hall of Medicine C4



Yale University renovated the Sterling Hall of Medicine C4 Laboratory in alignment with the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system at the Gold certification level for Commercial Interiors.

ENERGY EFFICIENCY

Fossil fuel-based energy generation contributes to global climate change. According to the Environmental Information Administration, buildings consume about 40% of the energy and 72% of the electricity produced in the United States. The C4 Laboratory renovation utilizes energy-conserving technologies that also lower the annual operating cost. Occupancy sensors in offices, equipment rooms, and lavatories provide automatic switching when these areas are not occupied. During unoccupied hours, temperature set points expand to reduce energy consumption. A heat recovery system recovers energy from the main exhaust system and uses it to preheat or pre-cool the outdoor supply air seasonally. Ventilation fans have variable frequency drives that allow fan motors to reduce speed in response to reduced airflow requirements.

INDOOR ENVIRONMENTAL QUALITY

On average, Americans spend 90% of their time indoors, and it is estimated that indoor pollutant levels can exceed outdoor levels by two to five times. Given the importance of indoor environmental quality, ventilation rates, temperature and lighting controls, and ample views to the outdoors have been carefully designed to ensure occupant well-being. Carbon dioxide sensors ensure that fresh air is supplied when CO₂ concentration levels are

68.5% of the wood used in the renovation was certified by the Forest Stewardship Council

95.2% of construction debris was diverted from landfills

20.4% of materials installed were manufactured from recycled materials

28.8% of construction materials were manufactured within 500 miles of the project site, and 8.4% were both extracted and manufactured within 500 miles

35.6% of the materials installed were manufactured from rapidly renewable sources

high. Finishes, such as interior paints, sealants, and adhesives, as well as the office systems furniture, have low volatile organic compound (VOC) content to reduce toxicity and noxious odors. Post-construction, new air filters were installed to ensure a dust-free environment during occupancy. In addition, the renovated space was air-tested to ensure that VOC, particulate, and carbon monoxide levels were well below acceptable thresholds.

MATERIALS

This project diverted a large portion of its construction waste from landfills through a rigorous recycling program. To reduce the environmental impact created from the processing and distribution of virgin materials, care was taken to specify locally manufactured materials with high recycled content. Such materials include steel, concrete, and FSC-certified wood used for the laboratory casework. Rapidly renewable materials, such as bamboo in laboratory casework and millwork, were selected to minimize the use of nonrenewable and long-term renewable resources. In addition, the furniture in the offices is GREENGUARD-certified and has met the low-emitting products test requirements. The renovation also includes a built-in recycling center for such daily waste materials as plastics, metal, office paper, equipment, and corrugated cardboard.

WATER EFFICIENCY

In the United States more than 340 billion gallons of fresh water are withdrawn daily from rivers, reservoirs, and streams to support industrial, commercial, residential, and agricultural needs. After use, this water is discharged back into these water bodies. To conserve water, ultra-low-flow lavatories and urinals and dual-flush toilets were provided in the project. With these water-saving measures, there is an anticipated 46.4% annual reduction in potable water use.

SITE AND TRANSPORTATION

The Sterling Hall of Medicine is regularly serviced by the Yale Shuttle and CT Transit bus lines, which also connect the facility to New Haven's Union Station for those traveling by train. In addition, its central location is within walking distance of many local amenities. Yale's parking policy incentivizes carpooling with discounted rates for two-person carpools and free parking for carpools of greater than three persons. To further discourage automobile use, however, no new parking spaces were added for this project.

INNOVATION IN DESIGN

The innovations in design for this renovation include the use of low-flow laboratory sink faucets to reduce water usage and the installation of an educational display showcasing the project's sustainable features. In addition, the project achieved innovative levels of construction waste reuse and recycling, with more than 95% of construction waste diverted from landfills.



Architect

Svigals + Partners

Total floor area

7,635 sq ft

Opening date

July 2009

Yale