Malone Engineering Center

Yale University designed and built the Malone Engineering Center in alignment with the U.S. Green Building Council's LEED (Leadership in Energy and Environmental Design) rating system at the Gold certification level.

ENERGY EFFICIENCY

The Malone Center was designed to use 7% less energy than allowed by the State Energy Code. Extensive computer modeling was used to evaluate and compare energy savings strategies during design. Steam for heating and chilled water for cooling are produced efficiently in Yale's Central Power Plant and piped to the building. The ventilation system recovers heat from the exhaust air, returning that heat to the building. And the tinted glass of the northeast-facing curtain wall filters out ultraviolet rays to keep the heat from accumulating in the warmer months, and to gain and store heat in the winter. Malone is outfitted with occupancy sensors, which switch off lights and reduce ventilation rates when labs or offices are unoccupied. When the light through the north-facing glass and other windows is sufficient, the artificial lighting dims to maintain a constant light level in the building. A process called commissioning was used to verify that all of the mechanical and electrical systems were integrated and working correctly before the building was occupied. And the installation of a monitoring system to collect operations data ensures that Yale can continue to make improvements to these systems in the future.

INDOOR ENVIRONMENTAL QUALITY

On average, Americans spend 90% of their time indoors, and it is estimated that indoor pollutant levels can be two to five times higher than outdoor

75% of the wood used in the project was certified by the Forest Stewardship Council

90% of construction debris was recycled

20% of total building materials (by cost) were manufactured within 500 miles of the project site

87% reduction in annual potable water use in comparison to a conventionally equipped building is anticipated

90% of workspaces offer direct views to the outdoors

100% of site stormwater is infiltrated and filtered on-site via catch basins and bioswales

levels. Achieving a high level of indoor environmental quality was a significant focus of this project. Offices were moved to the perimeter of the floor plan to maximize direct views to the outdoors. As a result, more than 90% of workspaces have such access. In addition to the pleasure people receive from being able to see outside, this feature adds to the natural daylighting of the workspace and reduces the need for artificial lighting. Care was taken during construction to prevent the introduction of contaminants, dirt, and moisture into the HVAC system. In addition, carbon dioxide sensors control ventilation in order to ensure comfort and maintain excellent air quality.

MATERIALS

Materials within the Malone Center were carefully researched and selected according to several environmental criteria, including high recycled content; whenever possible, locally extracted and manufactured materials were used. Additionally, more than 75% of the building's woodwork was sourced from sustainably managed forests. The polished concrete floors were selected for durability and ease of cleaning; no harsh chemicals or wax is required to maintain them. Paints, sealants, and adhesives were selected for low emission of contaminants likely to lead to "sick building syndrome," in which building occupants experience acute health and comfort effects that appear to be linked to time spent indoors.

WATER EFFICIENCY

Water conservation is an important feature of the building. Potable water usage has been greatly reduced by reusing the waste stream of the lab water purification system for toilet flushing. In combination with low-flow faucets, this use of gray water results in an 87% decrease in potable water use over a conventionally equipped building, which equates to potable water savings of 95,000 gallons per year.

SITE AND LANDSCAPE

Most plants on the site are native or adapted species, eliminating the need for irrigation. The plants provide habitat on multiple stories and reduce stormwater runoff. All stormwater is retained and filtered on site, ensuring that the project does not add water to the municipal stormwater system. In order to reduce the urban heat island effect, the building was constructed with reflective roofing materials.

TRANSPORTATION

The Malone Center is located in an area with ample access to public transportation. The site—a former parking lot with some soil contamination—is adjacent to the historic Farmington Canal Greenway. A statewide effort to restore this 84-mile canal and rail line as a multi-use trail was launched in the 1990s, and the restoration of the segment of the trail running through the Yale campus was included in the scope of the Malone Center project. The University anticipates that the restoration will attract wildlife and encourage alternative modes of transportation for commuters, such as biking and rollerblading.

Architect
Pelli Clarke Pelli Architects

Total floor area
64,786 sq ft

Opening date
October 2005

Yale

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