LEED, or Leadership in Energy and Environmental Design, is an internationally-recognized green building certification system. Developed by the U.S. Green Building Council (USGBC) in March 2000, LEED provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.
**Project Summary**
The Barbara Greenbaum House at Newcomb Lawn is a residence hall and Living Learning Community located on the edge of Tulane University’s historic uptown campus. The building is home to 256 students living in 144 rooms, and also includes a faculty-member-in-residence apartment and Housing Director’s apartment on the first floor. Some of the building’s notable features include a demonstration kitchen, a 35 seat classroom, social lounges, study lounges, and a living room and commons. A quad-facing courtyard with seating planters gives students a welcoming place to sit, study, and gather.

Barbara Greenbaum House is Tulane University’s sixth project to be designed and built following the U.S. Green Building Council’s LEED Green Building Standard, and the second Tulane University residence hall to pursue LEED certification. Through the project, the team followed Tulane University’s “Green Building Design and Construction Standards and Guidelines,” which identify key actions and environmental goals for all major Tulane construction and renovation projects. The guidelines address energy and water efficiency, protection of indoor air quality, and construction waste recycling. Beyond these goals, the university uses the LEED standard to identify sustainability goals specific to each project, striving to reduce environmental impact and enhance the comfort of residents and occupants. This case study details the green features of Barbara Greenbaum House.

**What’s New?**
Greenbaum House has a number of sustainable features new to Tulane University buildings.

- The design encourages physical activity by with an inviting main staircase off the lobby and other features that make using the stairs more inviting.
- A Building Energy Kiosk, available next to the elevator and online, makes real-time and historic building energy use data available for research and education projects.
- Permeable pavement was used for the walkways leading to the main entrance.
- Renewable energy credits equal to 35% of the building’s expected electricity use have been purchased for the first two years of operation.
- A covered bicycle storage area is integrated into the building design.

**Energy Efficiency**
Greenbaum House’s energy bills are expected to be 23% lower than a similar building built with average systems. The HVAC system for the building is provided by two types of systems, Variable Air Volume (VAV) and Constant Air Volume (CV). The building has Demand Ventilation Control, which uses CO2 sensors to monitor occupancy (basically measuring breathing!) and then adjust the fresh air supplied to a room. This improves indoor air quality for occupants and saves energy when rooms are unoccupied. Condensing boilers with 95% thermally efficient boilers are used to provide heating hot water to the building. Efficient lighting with occupancy sensors also contribute to the building’s energy savings.

A Building Energy Kiosk is installed in the lobby next to the elevator, making the building’s energy use visible to students every day. A Tulane student and staff member worked with the vendor Johnson Controls to revise their standard kiosk for a student audience. The kiosk shows recent trends in energy use and helps students understand the magnitude of their energy use by showing it in terms of dollars, CO2 emissions, and “equivalencies” such as slices of pizza purchased and gallons of gasoline burned. Through the kiosk, the data are also available online for student sustainability research and education projects.

Tulane typically hires an outside Commissioning Authority to watch over the design, installation, and operations training for a new building’s energy-using systems. For the Greenbaum House project, the scope of work was expanded to include development of a plan to measure and verify the energy use of the building in its initial years of operation.

Although Tulane cannot purchase renewable energy directly from our utility, we can
support the development of renewable energy projects by purchasing Renewable Energy Credits (RECS). Renewable Energy Credits equal to 35% of the building’s electricity use have been purchased for the first two years of operation.

**Efficient Water Use**
The use of low-flow fixtures is expected to reduce the water use of Greenbaum House by 44%. Dual-flush toilets help to conserve water by allowing the user to choose between a small flush (.8 gallons of water) and a large flush (1.6 gallons of water). Low-flow fixtures were chosen for the showerheads (1.5 gallons/minute), lavatory faucets (.35 gallons/minute), and kitchen faucets (1 gallon/minute). Outside the building, a water-efficient irrigation system was installed to provide water as the plantings are established. The components were chosen for their efficiency and use controls that allow the irrigation system to be adjusted seasonally. Moisture sensors shut off the system if there has been sufficient rainfall.

**Landscaping**
Preserving the magnificent live oaks on the site was a given for the project, with the footprint of the building determined by the existing trees on the east edge of the lot. Additionally, Tulane has a tree policy that outlines stringent measures to protect the health of campus trees during construction. For this project, Gravel-Lok Porous Stone Paving was used for the walkways that run across the site under the oak trees. The estimated porosity of the pavement is 20 gallons/minute/square foot, which is about the same as gravel. The choice of porous paving should minimize changes to the flow of water on the site, reducing the impact of site changes on the live oaks.

**Indoor Environmental Air Quality**
As with all Tulane LEED projects, the contractor was required to take proactive measures to protect the future indoor air quality inside the building, such as protecting the HVAC system from dirt and dust and protecting materials from moisture. All paints, primers, adhesives, sealants, and coatings were screened to ensure that they meet low-VOC standards. (Volatile organic compounds or VOCs vaporize at room temperature and can be harmful to both installers and occupants.) Air quality testing was done at the end of construction to ensure that a high standard of indoor air quality was achieved.

Residents of Greenbaum House have a thermostat to control the temperature of their room (within ranges set by Facilities Services). Occupant surveys will regularly check on the comfort of the building residents, with follow-up to address problems.

The building design proactively promotes health by encouraging residents to use the stairs. An inviting main staircase leads from the lobby to all floors. The entrance to the staircase is more convenient and more inviting than the elevator. A number of subtle features encourage residents to choose the stairs, such as magnetic door holds, which hold the doors to the staircase open, but release in emergencies so the doors can provide fire protection.

**Recycling and Sustainable Materials**
Many materials were selected for the building because of their reduced environmental impact. Measured by cost, 27% of the materials used for construction were recycled materials. Measured by cost, 19% of the materials used came from within 500 miles of New Orleans, cutting down on emissions produced from transporting materials over long distances. Also measured by cost, 55% of the wood used in the project is certified by the Forest Stewardship Council, ensuring that it is from a sustainably-managed forest.

During construction, 366 tons of materials were recycled, including metals, drywall, wood and concrete. The project had an overall recycling rate of 48%. Trash and Recycling rooms are located on every floor of the building and help to encourage occupants to recycle as much paper, cardboard, plastic bottles and metal cans as possible.
Prerequisites

- **C** R SSp1 Construction Activity Pollution Prevention
- **D** R Wep1 Water Use Reduction, 20% Reduction
- **C** R EAp1 Fundamental Commissioning of the Building Energy Systems
- **D** R EAp2 Minimum Energy Performance
- **C** R EAp3 Fundamental Refrigerant Management
- **D** R Mrp1 Storage and Collection of Recyclables
- **D** R IEQp1 Minimum Indoor Air Quality Performance
- **D** R IEQp2 Environmental Tobacco Smoke (ETS) Control

Earned Points - 60

- **D** 1 SSc1 Site Selection
- **D** 5 SSc2 Development Density & Community Connectivity
- **D** 6 SSc4.1 Alternative Transportation - Public Transportation Access
- **D** 1 SSc4.2 Alternative Transportation - Bicycle Storage and Changing Rooms
- **D** 2 SSc4.4 Alternative Transportation - Parking Capacity
- **C** 1 SSc5.1 Site Development - Protect or Restore Habitat
- **C** 1 SSc5.2 Site Development - Maximize Open Space
- **C** 1 SSc7.1 Heat Island Effect, Non-roof
- **D** 1 SSc7.2 Heat Island Effect - Roof
- **C** 1 WeC1 Water Efficient Landscaping
- **D** 4 WeC3 Water Use Reduction (32% reduction)
- **D** 6 EA1 Optimize Energy Performance
- **D** 2 EA3 Enhanced Commissioning
- **C** 3 EA5 Measurement and Verification
- **C** 2 EA6 Green Power
- **C** 2 MrC4 Recycled Content (12% by cost)
- **C** 1 MrC5 Regional Materials
- **C** 1 MrC7 Certified Wood
- **D** 1 IEQc1 Outdoor Air Delivery Monitoring
- **C** 1 IEQc3.1 Construction IAQ Management Plan - During Construction
- **C** 1 IEQc3.2 Construction IAQ Management Plan - Before Occupancy
- **C** 1 IEQc4.1 Low-Emitting Materials - Adhesives and Sealants
- **C** 1 IEQc4.2 Low-Emitting Materials - Paints and Coatings
- **C** 1 IEQc4.3 Low-Emitting Materials - Flooring Systems
- **C** 1 IEQc4.4 Low-Emitting Materials - Composite Wood and Agrifiber Products
- **D** 1 IEQc6.2 Controllability of Systems - Thermal Comfort
- **D** 1 IEQc7.1 Thermal Comfort - Design
- **D** 1 IEQc7.2 Thermal Comfort - Verification
- **D** 1 IEQc8.1 Daylight and Views - Daylight
- **D** 1 IEQc8.2 Daylight and Views - Views
- **C** 1 IdC1.1 Innovation in Design
- **D** 1 IdC1.2 Innovation in Design
- **C** 1 IdC1.3 Innovation in Design - Education
- **C** 1 IdC1.4 Innovation in Design
- **C** 1 IdC1.5 EqPc78 - Design for Active Occupants
- **C** 1 IdC2 LEED Accredited Professional

LEED Certification Thresholds


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**PROJECT TEAM**

Architect: Architecture Research Office, New York, NY
Local Architect: Waggoner Ball Architects, New Orleans, LA
Landscape Architect: Towers Golde, New Haven, CT
Structural and Civil Engineer: Schrenk, Endom & Flanagan, LLC, New Orleans, LA
Mechanical, Electrical, Plumbing: Huseman & Associates, Metairie, LA
Acoustic Consultant: Threshold Acoustics, LLC, Chicago, IL
Lighting Designer: Tillotson Design Associates, New York, NY
Construction: The Lemoine Company, New Orleans, LA

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