Yale University renovated 43 Hillhouse Avenue in alignment with the U.S. Green Building Council’s LEED (Leadership in Energy and Environmental Design) rating system at the Silver certification level.

**HISTORY AND SUSTAINABLE DESIGN GOALS**

Built in 1871, 43 Hillhouse Avenue has served as the primary or secondary residence of Yale University presidents since 1937. The building provides formal meeting space for significant University events and serves also as a guest house for distinguished visitors and dignitaries. The renovation included an upgrade to the infrastructure (e.g., vertical circulation), office and catering spaces, restrooms, guest and living accommodations, and accessibility, with the goals of improving thermal performance and energy efficiency and reducing potable water consumption.

**ENERGY EFFICIENCY**

Yale’s sustainable design requirements require that all major building renovations achieve significant energy savings compared to the ASHRAE-90.1-2007 standard baseline building. At 43 Hillhouse Avenue, performance-based energy modeling demonstrates a predicted HVAC energy cost savings of 56.32% compared to a baseline building. The lighting design includes high-efficiency fixtures where possible, and the lighting power density is 19% below the ASI/ASHRAE/IESNA Standard 90.1. Additionally, a third-party commissioning agent was engaged in the design and construction process, including development of a comprehensive commissioning plan, to ensure that all equipment was installed and functions as designed.

- **67.45%** of all new wood-based building materials were certified by the Forest Stewardship Council
- **88.86%** of demolition and construction debris was recycled or reused
- **10.99%** of materials and products (based on cost) used in the project were manufactured and extracted regionally
- **26.31%** reduction in water use in comparison to a conventionally equipped building is anticipated
INDOOR ENVIRONMENTAL QUALITY

A high-quality interior environment was an important priority for this project. The first floor is mechanically ventilated, while the upper-level floors are naturally ventilated through operable windows. Indoor comfort and quality are provided with thermal and lighting controls for regularly occupied spaces. More than 95% of regularly occupied spaces have views to the outdoors. Low-emitting adhesives, sealants, and interior finishes were specified to maintain high indoor air quality; following construction and prior to occupancy, air-quality testing was completed to ensure that the air quality remained high.

MATERIALS

The project team set several targets regarding building material usage and environmentally responsible disposal practices for the renovated portions of the building. Targets for materials and products included at least 10% manufactured and extracted regionally; and, for all new wood purchased for the project, a minimum of 66% FSC-certified, sourced from sustainably harvested forests. The construction waste management plan achieved 88% recycling or reuse of demolition and construction debris, thus diverting it from the municipal solid waste stream.

WATER MANAGEMENT

Early coordination with the manufacturers ensured that aerators were designed into fixtures wherever possible. Despite diverse and complex building occupancy and user groups, the proposed plumbing fixture usage exceeds the LEED WP1 minimum required savings of 20%, better than EPAct 2005 standards.

SITE AND LANDSCAPE

The project included modest improvement of the surrounding landscape, grounds, and driveway to accommodate new equipment, an exterior trash/recycling enclosure, and low-maintenance plantings. Vegetated areas were designed to minimize environmental impact, with native species that require no additional irrigation incorporated into existing plant beds.

TRANSPORTATION

Located in the heart of the Yale campus and just blocks from downtown New Haven, the building is within walking distance of many local services and businesses. The campus shuttle and four New Haven public bus lines provide more than 200 stops within a quarter-mile of the site each day.

Architects
Charney Architects
John B. Murray Architects

Total floor area
20,444 sq ft

Opening date
August 2014

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