

# Acing the Test

A COLLEGE DORM BLENDS HISTORIC PRESERVATION WITH SUSTAINABLE DESIGN

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**W**HEN IT COMES TO PROACTIVE SUSTAINABLE DESIGN, common sense points to re-energizing an existing building into something exciting, functional and respectful of yesterday's history. An ongoing dialogue in the design and construction industry points to hundreds of logical overlaps between the huge historic-preservation field of U.S. buildings and sustainable-design strategies. At Hamilton College, Clinton, N.Y., one of the school's most popular residence halls is living proof that overlapping historic preservation, sustainable design, and modern technologies can make solid economic and environmental sense.



## BLENDING STRATEGIES

Built in 1922, the former Psi Upsilon Chapter fraternity house was rededicated in late 2004 as Skenandoa House in honor of the Oneida Indian chief and friend of Samuel Kirkland. Kirkland founded Hamilton-Oneida Academy, which became Hamilton College in 1812. The third college established in New York, Hamilton College today is among the oldest colleges in the nation.

By the year 2000, the fraternity house had taken a beating from years of ambitious male college students living inside its walls. After considering demolition, Hamilton College decided to renovate the fraternity house into a new college-operated residence hall to meet the growing needs of its student population. The revitalization of Skenandoa House is a strong example of re-energizing a historic building on an old college campus in a manner that preserved historic property while instituting the higher quality amenities today's residence halls must offer to student populations.

However, the rededication of this historic building is only part of the story. In February 2006, Skenandoa House received a Washington, D.C.-based U.S. Green Building Council LEED for New Construction, Version 2.1, Silver certification. The project was recognized for its commitment to integrating high-performance green technologies into the renovation. EwingCole, a multidisciplinary architecture, engineering and interiors firm, worked with Hamilton College's Facilities Group to overlap LEED strategies, historic preservation and sensitivity into the 200-year-old campus and this nearly 100-year-old building.

After more than two "college" years of occupancy, the results of that strategy blending are evident. In its first year, utility records demonstrated the positive results of improving the historic building's exterior envelope and constructing an 18-well geothermal heating and cooling system into the building. The efficiency of the geothermal system is its overwhelming advantage. While conventional heating and cooling devices must convert outside

temperatures to reach comfort levels, geothermal heating and cooling uses ground temperatures of around 55 F (13 C) to help moderate the temperature differential.

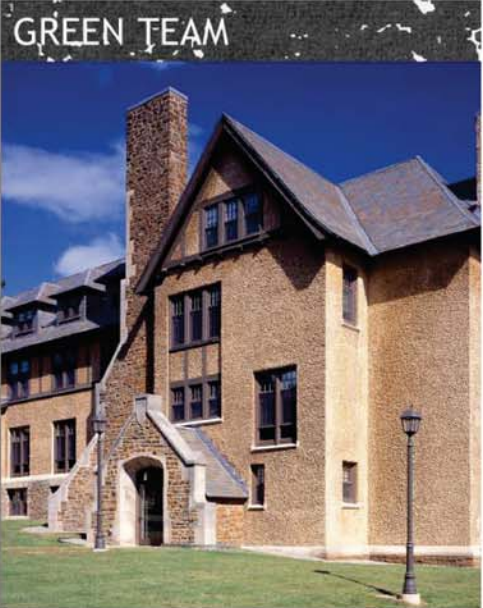
The process requires electricity to run a heat pump and small circulation pumps, eliminating the use of natural gas. This technology has allowed Skenandoa House to use 39 percent less energy per gross square foot compared with a standard gas-fired heating system typically used in comparable Hamilton College residence halls. Skenandoa House uses 47,900 Btus per gross square foot versus 114,600 Btus per gross square foot from a similar gas-fired heating system in another campus residence hall. (See "Building Comparison," page 55.)

Beyond the geothermal heating system, Hamilton College committed to 100 percent wind power for all additional electricity loads on the building. You could say the college reinvested its geothermal utility savings into clean-energy solutions. This reinvestment has reduced greenhouse-gas production per year in carbon dioxide by 107 tons (97 metric tons), nitrous oxide by 290 pounds (132 kg) and sulphur dioxide by 765 pounds (347 kg).

Steve Bellona, associate vice president for facilities and planning at Hamilton College, says: "Not only does Skenandoa House consume significantly less energy per square foot than our other relatively new residence halls, but our cost for renewable electrical energy, on a square-foot basis, is less than other residence halls using nonrenewable fossil fuels. This is an experiment for us, but so far we are very pleased with the payback."

## LEED AND HISTORICAL PRESERVATION

LEED provided the framework to encourage and motivate follow-through on other environmental parameters that became part of the facility. To preserve the historic elements of the building, 100 percent of the existing building shell and 50 percent of the interior walls, doors, floor coverings and ceiling systems were maintained in the building



- **OWNER / HAMILTON COLLEGE**, Clinton, N.Y., [www.hamilton.edu](http://www.hamilton.edu)
- **ARCHITECT / EWINGCOLE**, Cleveland, [www.ewingcole.com](http://www.ewingcole.com)
- **ENGINEERS / EWINGCOLE**, Philadelphia
- **GEOHERMAL-WELL FIELD ENGINEER / EARTH SENSITIVE SOLUTIONS**, Skaneateles, N.Y., (315) 253-3779
- **GENERAL CONTRACTOR / MURNANE BUILDING CONTRACTORS**, Whitesboro, N.Y., [www.murnanebuilding.com](http://www.murnanebuilding.com)
- **LANDSCAPE ARCHITECT / SARATOGA ASSOCIATES**, Saratoga Springs, N.Y., [www.saratogaassociates.com](http://www.saratogaassociates.com)
- **COMMISSIONING AGENT / ARAMARK FACILITY SERVICES**, Madison, Conn., (203) 245-9600



▶ WITH THE ACHIEVEMENT OF LEED-NC, THE RESIDENCE HALL BECAME ONE OF ONLY 20 BUILDINGS THROUGHOUT NEW YORK AND THE FIRST HISTORIC STRUCTURE IN THE STATE TO RECEIVE THIS CERTIFICATION.

renovation. This strategy exceeds the Standards and Guidelines for Historic Structures established by the U.S. secretary of the interior for historic-preservation projects.

The new layout facilitates 20,000 square feet (1858 m<sup>2</sup>) of residence-hall facilities for 55 Hamilton College students. New materials included 6 percent recycled content; 28 percent regional; and 14 percent extracted regionally, all of which contributed to LEED credits.

The facility has daylighting in all major living spaces, energy-efficient lighting systems and multiple alternative-transportation amenities, such

as easy pedestrian access to the Utica Public Transit and Hamilton Campus Jitney Line, both of which are within a college student's budget. The building also was designed with natural ventilation to provide proper IAQ throughout the facility.

With the achievement of LEED-NC, the residence hall became one of only 20 buildings throughout New York and the first historic structure in the state to receive this certification.

#### PRESERVING VALUE

When it comes to resource reuse, the historic-preservation movement revolves around

preserving the value of existing buildings that may be tired from extensive use. In fact, it is possible to revitalize a highly used and abused building on a 200-year-old campus, integrate today's building science and sustainable-design technologies, and create a new facility that performs well for the 21st-century college student. That revitalization also may allow a liberal-arts college to find operations and maintenance finances that can be reinvested in other areas of facilities development.

The future of our fossil-fuel-based economy is being challenged by higher costs that will impact any facility's growth plan. New technologies (even when used in old buildings) provide an opportunity to lessen the burden of increasing utility costs. Hamilton College has been able to decrease its energy consumption for Skenandoo House by 61 percent in one year. This model demonstrates that we can look at the historic elements of our past, add the building technologies of today, produce an updated facility that balances conservation technology and fiscal responsibility, and create a college campus that is destined for success. ♻️

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## MATERIALS AND SOURCES

NATURAL-SLATE ROOF / [Vermont Structural Slate Co.](http://www.vermontstructuralslate.com), Fairhaven, Vt., [www.vermontstructuralslate.com](http://www.vermontstructuralslate.com)

ROOF MEMBRANE / Ice and Water Guard from [Johns Manville](http://www.jm.com), Denver, [www.jm.com](http://www.jm.com)

COPPER STANDING-SEAM METAL ROOF / [Revere Copper Products](http://www.reverecopper.com), Rome, N.Y., [www.reverecopper.com](http://www.reverecopper.com)

HIGH-PERFORMANCE WINDOWS / [Eagle Windows and Doors](http://www.eaglewindow.com), Dubuque, Iowa, [www.eaglewindow.com](http://www.eaglewindow.com)

RECYCLED GYPSUM WALLBOARD / [USG Corp.](http://www.usg.com), Chicago, [www.usg.com](http://www.usg.com)

LOW-VOC PAINTS / Eco Spec from [Benjamin Moore](http://www.benjaminmoore.com), Montvale, N.J., [www.benjaminmoore.com](http://www.benjaminmoore.com)

QUARRY TILE FLOORING / [Dal-Tile Corp.](http://www.daltile.com), Dallas, [www.daltile.com](http://www.daltile.com)

CARPET SQUARES / EcoWorx from [Shaw](http://www.shawfloors.com), Dalton, Ga., [www.shawfloors.com](http://www.shawfloors.com)

RUBBER FLOORING / [nora](http://www.norarubber.com), Lawrence, Mass., [www.norarubber.com](http://www.norarubber.com)

GEOHERMAL WATER-SOURCE HEAT PUMP / [McQuay International](http://www.mcquay.com), Auburn, N.Y., [www.mcquay.com](http://www.mcquay.com)

TEMPERATURE CONTROLS / [Siemens](http://www.usa.siemens.com), New York, [www.usa.siemens.com](http://www.usa.siemens.com)

LOW-CONSUMPTION TOILET FIXTURES / [Kohler Co.](http://www.kohler.com), Kohler, Wis., [www.kohler.com](http://www.kohler.com)

FLUORESCENT LIGHTING FIXTURES / [Lightolier](http://www.lightolier.com), Fall River, Mass., [www.lightolier.com](http://www.lightolier.com)

**EELLS HOUSE** 70 BEDS, 29,235 GROSS SQ. FEET (CONSTRUCTION COMPLETION 2000)

Month	Demand kw	Supply kwh	Gas Therms	Electric Utility Cost	Gas Utility Cost
Jul-05	18.8	10,572	118	\$1,279.21	\$146.51
Aug-05	25.7	15,329	90	\$2,069.42	\$123.25
Sep-05	38.8	13,756	197	\$2,008.38	\$283.62
Oct-05	41.1	14,614	296	\$2,148.26	\$510.20
Nov-05	42.8	25,912	2399	\$3,083.53	\$4,203.37
Dec-05	40.1	13,122	4722	\$1,837.08	\$8,559.58
Jan-06	39.8	15,494	4112	\$1,766.32	\$7,469.03
Feb-06	45.5	17,581	4522	\$2,267.95	\$8,276.68
Mar-06	39.3	15,277	4647	\$1,619.36	\$5,658.12
Apr-06	42.5	18,838	3330	\$2,486.62	\$4,068.74
May-06	40.5	16,713	2139	\$2,155.98	\$3,019.68
Jun-06	40.5	7,759	626	\$1,062.98	\$910.18
<b>TOTAL</b>	<b>455.3</b>	<b>184,967</b>	<b>27198</b>	<b>\$23,785.07</b>	<b>\$43,228.96</b>

MBTU Used Per Gross sf: 114.6  
 Energy Cost Per Bed: \$ 1,030.99  
 Energy Cost Per Gross sf: \$ 2.29

**SKENANDOA HOUSE** 52 BEDS, 21,034 GROSS SQ. FEET (CONSTRUCTION COMPLETION 2004)

Month	Demand kw	Supply kwh	Gas Therms	Electric Utility Cost	Gas Utility Cost
Jul-05	28.8	9,760	119	\$1,245.01	\$147.65
Aug-05	27.2	10,880	133	\$1,435.32	\$173.21
Sep-05	41.6	12,640	189	\$1,755.29	\$272.79
Oct-05	36.8	14,080	281	\$1,973.77	\$486.84
Nov-05	40.0	14,080	323	\$1,955.25	\$609.41
Dec-05	49.6	23,040	408	\$3,062.65	\$780.38
Jan-06	57.6	19,200	180	\$2,821.19	\$365.52
Feb-06	54.4	23,520	407	\$3,714.07	\$790.81
Mar-06	67.2	24,640	371	\$3,681.12	\$498.09
Apr-06	41.6	15,360	319	\$2,323.13	\$435.34
May-06	43.2	16,960	418	\$2,399.10	\$630.97
Jun-06	32.0	12,480	220	\$1,826.58	\$344.88
<b>TOTAL</b>	<b>520.0</b>	<b>196,640</b>	<b>3368</b>	<b>\$28,192.48</b>	<b>\$5,535.89</b>

MBTU Used Per Gross sf: 47.9  
 Energy Cost Per Bed: \$ 648.62  
 Energy Cost Per Gross sf: \$ 1.60

▲ Clinton, N.Y.-based Hamilton College's Physical Plant assesses energy performance monthly for its campus buildings. Eells House uses a standard gas-fired furnace for heating with no air conditioning and features energy-efficient electrical systems. Utilities' costs include site lighting and all building utility expenses. Skenandoa House uses geothermal heating and cooling with energy-efficient electrical systems. Electricity costs include additional costs for 100 percent renewable energy credits. The tables provide actual utility costs for the residence halls during the 2005-06 school year. Both buildings were designed and engineered by EwingCole's Cleveland and Philadelphia offices.