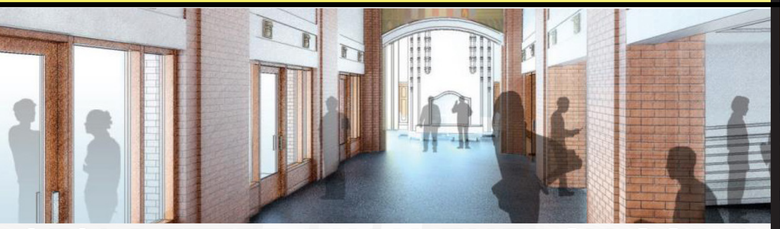
RENOVATION AND REUSE

WEST QUADRANGLE-CAMBRIDGE HOUSE RESIDENCE HALL



35% BETTER THAN ENERGY CODE

Better than the standards set by the American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Includes features such as standby buttons ⏻ on thermostats in student rooms. These allow students to set back the temperature and save energy when the rooms are not occupied.

3,758,000 GALLONS OF WATER SAVINGS

Water savings are due to the use of high efficiency plumbing fixtures and energy star appliances.

SUSTAINABLE LANDSCAPE

Heritage trees were preserved and new trees incorporated to enhance the landscape. The site was minimally impacted to limit the amount of storm water run off.

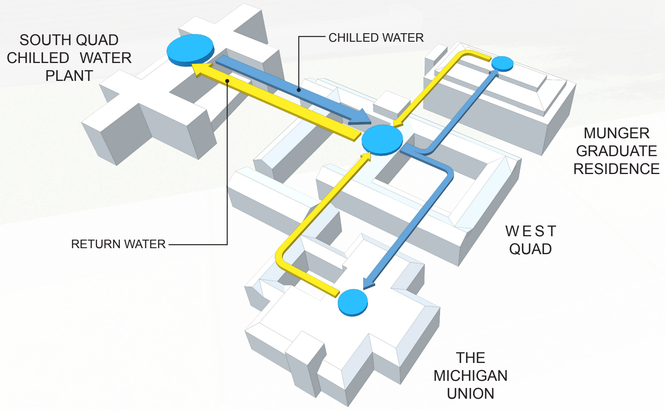
DAYLIGHT AND LIGHTING IMPROVEMENTS

Housing offices are located to take advantage of direct and borrowed sunlight. Light switching systems in public spaces, students rooms and outdoor lighting areas save energy through intelligent and automated controls.

REGIONAL CHILLER PLANT

Chilled water is provided from the South Quad Chilled Water Plant creating opportunities for:

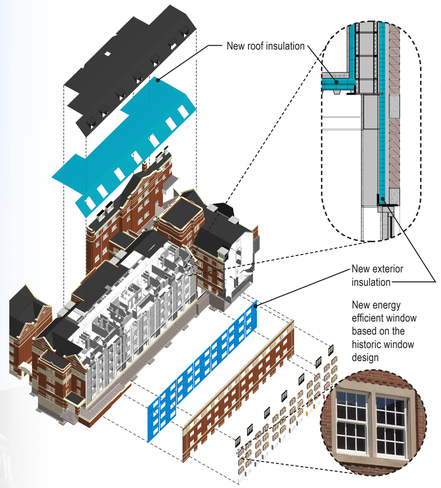
- Economies of scale, allowing for lower operating costs
- Less equipment to service and maintain
- Lower up front cost of a single chiller plant when compared to multiple chiller plants.



DESIGNED TO EARN THE ENERGY STAR

The estimated energy performance for this design meets US EPA criteria. The building will be eligible for ENERGY STAR after maintaining superior performance for one year.

IMPROVED BUILDING ENVELOPE



The existing building envelope was reused and brought above code requirements through the use of current construction techniques and materials, including thermal imaging. Thermal imaging was used to detect areas of heat loss in the existing building envelope.These areas were then targeted and a new layer of continuous insulation was introduced to increase the thermal performance of the exterior wall system. Original 1920's single pane windows were replaced with energy efficient and historically appropriate insulated windows, thereby cutting down on drafts and solar heat gain.

REUSED BUILDING ELEMENTS

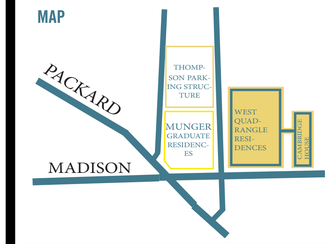
The Cambridge House canopy was given a new home on the front facade of West Quad, diverting construction waste while maintaining the buildings historic narrative.

RECYCLED MATERIALS

Courtyard benches are made from recycled milk jugs. Select carpeting in the housing office area is made from recycled fishing nets.

The renovation of West Quad sought to elevate the building infrastructure to University of Michigan standards for sustainability. Utilizing two key strategies, the team was able to meet and exceed this goal. The first strategy was one of renovation and the second, an act of reusing. The renovation integrated system upgrades to improve energy efficiency with flexible public spaces to promote collaboration among occupants. Through the reuse of an existing building, the team and University continue to be stewards of resource conservation. Also, many building materials and furnishings came from recycled sources. The resulting hybrid construction combines the historic qualities of the building's past with modern technologies and comforts. The renovation and reuse of West Quad has not only extended the life of the building but has also deepened its legacy.

MAP



Sustainability Facts

West Quadrangle - Cambridge House Residence Hall

Building Use		Student Housing
Location		Ann Arbor, Michigan
Size		369,237 Gross Square Feet
Number of Occupants		1076
ASHRAE 90.1 version		2007
Energy cost savings compared to ASHRAE baseline		35%
Total energy savings		$310, 728 / year
Total electrical savings		563, 046 KWh / year
Total gas savings		308, 288 Therms / year
CO2 emissions avoided		2,230 tons
Water fixture baseline		Energy Policy Act of 1992
Total water savings		30%
Insulation (R-Value)*	Existing	Project
Wall assembly - above grade	2.7	14.7
Wall assembly - below grade	8.4	13
Roof assembly	20.9	20.9
Glazing - Fixed assembly		
U-value**	1.1	0.22
Solar Heat Gain Coefficient (SHGC)**	0.88	0.38
Glazing - Visible Light Transmittance (VT)***		0.68
Project Team		
Owner		University of Michigan - Housing
Architect		Integrated Design Solutions & Hanbury Evans Wright Vlattas
Engineer		Integrated Design Solutions
Contractor		Walbridge
Commissioning Authority		U-M AEC
Project Management		U-M AEC

Design Period: 03/2013 - 03/2014
Construction Period: 05/2014 - 08/2015
* The higher the R-value the better the insulating quality
** The lower the U-value and SHGC the more energy efficient the window
*** The higher the VT value the more daylight in the space. VT is measured between 0 and 1

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West Quadrangle-Cambridge House Residence Hall

1000066
U-M Building Number

P00004992
U-M Project Number