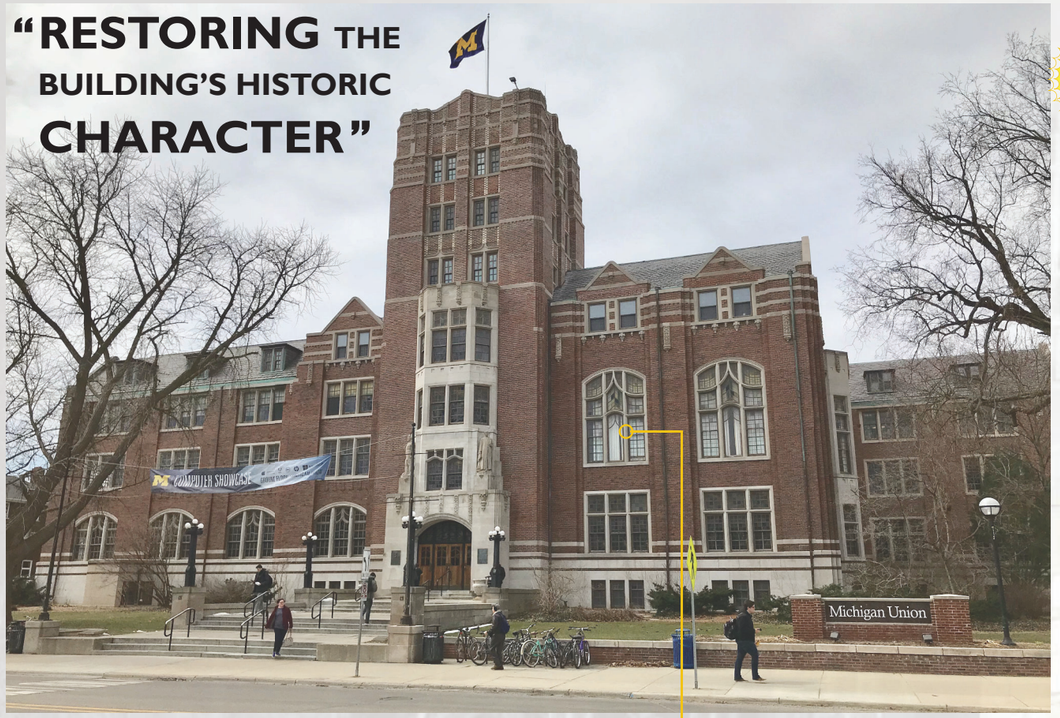
Michigan Union Renovation

DESCRIPTION: The Michigan Union Renovation project updates infrastructure and addresses contemporary programmatic needs for student spaces that enable collaboration and encourages involvement. The project maximizes social space, creates a setting for wellness and counseling, and enhances meeting and event spaces, while restoring the building's historic character. Infrastructure upgrades include improvements in building accessibility, plumbing, wired and wireless networks, lighting, and increased fire protection throughout the building. The project restoration efforts include expanding the Willis Ward Lounge to its original size; restoring the third level east/west corridor and ballroom overlooks; the placement of the Campus Information Desk will be restored to its original location; and the masonry and windows on the iconic historical facade will be restored, repaired, or replaced.



WINDOW REPLACEMENT/RESTORATION

- Historic wood windows are refinished, wood frames and glass are repaired, sealants and weather-stripping are replaced.
- Interior storm windows are added to all restored wood windows to improve the thermal performance while respecting the historic fabric.
- New replacement windows are installed in non-public spaces to provide superior thermal performance. The new windows are designed to match the historic wood windows in appearance, complete with colored glass and simulated lead cames.

22% **WATER USE REDUCTION**
Low-flow plumbing fixtures and automatic sensor faucets provide a 22% water use reduction when compared to the Michigan Plumbing Code.

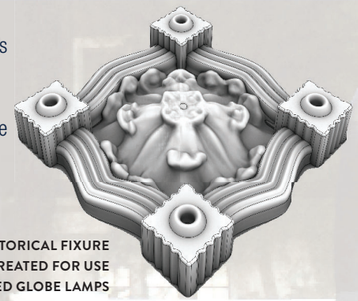
COURTYARD DAYLIGHTING

- The skylight is made of low-E coated, insulated glass which allows the courtyard to stay cooler in the summer and warmer in the winter.
- Ceramic frit on skylights reduces summer solar heat gain while minimizing glare.
- Daylight sensors adjust lighting based on the amount of daylight in the space.
- Natural daylight improves occupant comfort by providing a connection to the outdoors.

31% **ENERGY SAVINGS**
The building's design and systems include energy efficient features that provide an estimated 31% energy savings compared with a code compliant building per ASHRAE 90.1-2007 Appendix G

LIGHTING REPLACEMENT

- LED lighting with occupancy sensors throughout the building, and daylight controls in the Courtyard, help reduce the building's electrical energy usage.
- Main and second level's lighting, along with the tower stair lighting, will feature historically recreated fixtures with LED globe lamps.
- 75% of existing flourescent and incandescent fixtures will be replaced with new LED type fixtures and/or LED lamps.



HISTORICAL FIXURE TO BE RECREATED FOR USE WITH LED GLOBE LAMPS

Sustainability Facts

Michigan Union Renovation

Building Use	Student Life
Location	Ann Arbor, Michigan
Size	246,839 Square Feet
Number of Occupants	3,968

ASHRAE 90.1 version	2007
Energy cost savings compared to ASHRAE baseline	30.5%
Total energy savings	$158,460 / year
Total electrical savings	527,948 KWh / year
Total gas savings	26,526 Therms / year
CO2 emissions avoided	207.84 metric tons
Water fixture baseline	2012 Michigan Plumbing Code
Total water savings	21.7%

Insulation (R-Value)*	Code	Project
Roof assembly - Sloped	19	29.4
Roof assembly - Flat	19	37.0
Glazing - Courtyard Skylight		
U-value**	0.69	0.225
Solar Heat Gain Coefficient (SHGC)**	0.39	0.15
Visual Light Transmission (VLT)		15%
Glazing - Replacement Windows		
U-value**	0.45	0.35
Solar Heat Gain Coefficient (SHGC)**	0.4	0.41

Project Team	
Owner	University of Michigan
Architect	Integrated Design Solutions with Workshop and Hartman Cox
Engineer	Integrated Design Solutions
Contractor	Walbridge
Commissioning Authority	U-M AEC

Design Period: 02/2016 - 02/2018
Construction Period: 06/2018 - 12/2019
*The higher the R-value the better the insulating quality. R-value is based on a 4" increase of insulation.
** 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

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

Chilled water is used at the Union for air handlers, fan coils and chilled beams.

planet blue UNIVERSITY OF MICHIGAN
iDS WORKSHOP WORKSHOP ARCHITECTS, INC HARTMAN-COX ARCHITECTS

FACILITIES & OPERATIONS
ARCHITECTURE, ENGINEERING AND CONSTRUCTION
UNIVERSITY OF MICHIGAN

Michigan Union Renovation

0120
U-M Building Number

P00007758
U-M Project Number