United States Environmental Protection Agency

land revitalization

Region 5 Land Revitalization Technical Assistance Project

GREEN BUILDING AND HISTORIC PRESERVATION CASE STUDIES FOR MOLINE MULTI-MODAL STATION PROJECT (4 OF 5)

EPA provided technical assistance support to the City of Moline, Illinois in the areas of green building and historic preservation for the Moline Multi-Modal Station Project. This assistance was intended to strengthen the HUD-DOT-EPA Partnership for Sustainable Communities by providing the City of Moline access to technical resources and expertise. EPA's technical assistance activities focused on the development of five case studies on the renovation of existing/historic structures to meet Leadership in Energy and Environmental Design (LEED) standards for multi-modal transportation projects, where possible. These five case studies were presented at the Moline Developer Workshop held on October 18, 2011. This is the fourth case study in the series.

CHRISTMAN BUILDING
LANSING, MICHIGAN

Project Summary

An example of downtown revitalization, historic preservation and sustainable design, the rehabilitation of the 1928 Mutual Building into the Christman Building incorporates preservation and restoration of the building's historic fabric with "smart" systems for heating, cooling, safety and other high-performance building controls.

The building now serves as the national headquarters for the Christman Company, a General Contractor and real estate development company, with tenant space provided to the Michigan Municipal League and the lobbying firm of Kelley Cawthorne.

Historic Features

All of the preservation work on the building was approved by the State Historic Preservation Office and the National Park Service to ensure that standards protecting the building, individually listed on the National Register of historic places, were upheld. Restoration of historically significant building features included the main entrance doors and plaques, the mica shade light fixtures and Pewabic wall tiles in the main hall, and the light fixtures and verdigris bronze handrail finish in the stairwell and lower level. Other restored and reused building components included door hardware, wood trim, wood windows, and floors in the entry and historic staircase made of Bluestone or black and white linoleum.

Historic photograph of the Christman Building *(Source: The Christman Company)*

Project Description
Elements: Historic, Private Developer, Green
Size of Community Served: N/A
Current Owner: Christman Company
Square Footage: 64,190
Original Construction Date: 1928
Historic Designation: National Register of Historic Places
Project Completion Date: 2008
Construction and Project Costs: $12 million
LEED or Other Green Certification: LEED Core and Shell Platinum, LEED Commercial Interior Platinum, LEED Existing Building Platinum

Restored historic staircase
(Source: The Christman Company)

Bricks salvaged from the removal of the penthouse were used to patch exterior walls. Benign products, such as citrus strippers, wet grinding, and low VOC coatings, were used to restore historic finishes. All plaster walls were restored, using several restoration techniques.

Green Features

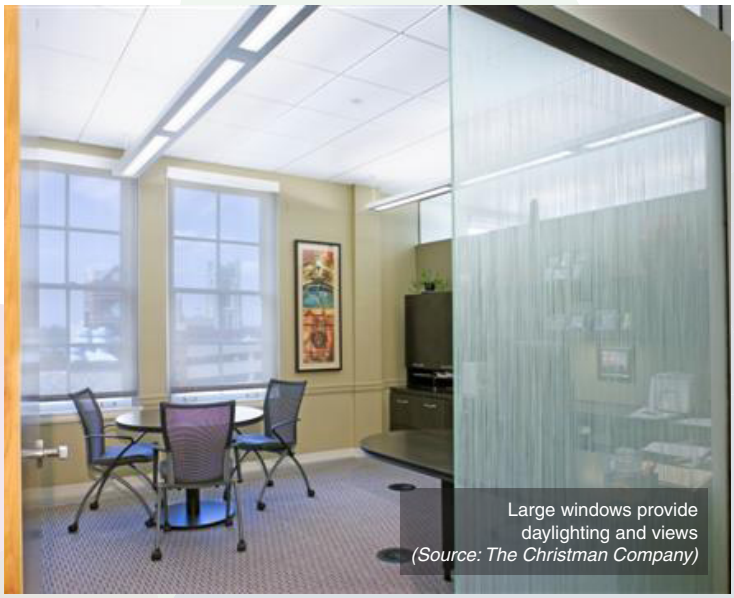
- The location allows use of existing public transportation and parking facilities
- Showers and locker rooms encourage walking and bicycling to work
- The white roof and reduced exterior lighting reduce heat island effects and light pollution
- Energy use is reduced by task lighting, occupancy sensors, programmed timers in common areas, daylighting for 92% of occupants, high efficiency windows and Energy Star office equipment and appliances
- High efficiency HVAC systems provide individually controlled comfort conditions
- Under floor air distribution system maximizes efficient, healthy ventilation
- Low flow fixtures reduce water consumption by 40%
- The design reused 92% of existing walls, roof and floors, and most of Christman Company's former office furnishings
- Recycled and regionally manufactured materials, and low emission sealants, paints, carpets, and furniture were used extensively
- All wood was Forest Stewardship Council certified
- The interior provides outdoor views to 90% of occupants
- Extensive recycling diverted 77% of construction debris from the landfill

Challenges and Solutions

Project Schedule Impact on Mechanical Systems Installation

The biggest challenge for the project was the short timeline required to achieve two million dollars' worth of tax credits, including a seven-month construction period. Delays also resulted from the Department of the Interior's historical preservation approval process. This dramatically impacted the installation and operation of the mechanical systems critical to meeting sustainability and comfort goals.

The last phase—controls work and commissioning—was completed in a period of a few weeks when it should have taken two months. This resulted in poorly performing systems in the first months of operation. Post occupancy review and re-commissioning of the systems dramatically improved their operation.



Large windows provide daylighting and views
(Source: The Christman Company)

Skylighted atrium
(Source: The Christman Company)

Using a re-commissioning and then an ongoing commissioning process after occupancy resulted in the ENERGY STAR score improving from 39 to 81 in a single year, providing a total annual net savings of $46,026 with a simple payback of total LEED for Existing Buildings: Operations & Maintenance Building Incremental Operating Cost of 1.4 years and a lifecycle net present value of $6.44 per square foot.

Daylighting and New Space

A skylighted atrium was created in the heart of the building and is accessible to floors 4 and 5 and the newly created floor 6, providing a social gathering area for occupants. The new 6th floor space is not visible from the street and offers outstanding views of the state capitol and cityscape.

Partnerships and Funding Strategies

Financing for the project utilized a number of economic incentives in order to make it feasible. These included federal programs such as New Market Tax Credits and Historic Tax Credits. The project also enjoys property tax relief through the Federal Obsolete Property Rehabilitation act, which freezes the taxable value on the building prior to improvements for 12 years.

The project is also an example of a public/private partnership. The City of Lansing, through the Brownfield Authority, has a development agreement with the project that enables the recapture of Michigan Single Business Tax Credits for eligible costs. The city also provided key economic information that supported requests for the New Market Tax Credits.

The specific economic incentives that supported the development of this project are:

State of Michigan Brownfield Single Business Tax (SBT) Credits	**$672,500**
Federal Historic Tax Credits	**$2,000,000**
State Historic Tax Credits	**$500,000**
Federal New Market Tax Credits Allocation	**$8,500,000**
Property Tax Relief through establishment of a Federal Obsolete Property Rehabilitation Act (OPRA) District	**$1.2 million** *($100,000/year for 12 years)*

Leverage Financing Opportunities

Christman, as building owner, has made long-term lease commitments with its tenants to reduce the future environmental costs associated with turnover. Green guidelines have been prepared for building tenant build-out.

Costs and Savings Attributed to LEED

For the core and shell project, the costs associated with achieving green goals represented 1.3% of the total budget. Two-thirds of those green costs were related to the LEED certification process. For the commercial interior project, the costs associated with achieving green goals represented 0.7% of the total budget. Of those green costs, 95% were related to LEED certification. In addition to the financial benefits of increased occupant comfort, health, and productivity, the owner expects to see a four-year return on their investment in green construction through the building's increased energy efficiency.

Energy modeling projections for this building show that it will exceed minimum energy efficiency requirements by 34%. Its lower natural gas and electricity consumption will reduce CO2 by 1,002,945 pounds per year, SO2 emissions by 4,524 gm per year, and NOx emissions by 2,148 gm per year. This is the equivalent of planting 4,112 trees or reducing driving by 1,094,212 miles. The underfloor air distribution system provides 200% to 300% more ventilation than required by ASHRAE Standard 62.1–2004. The computerized building management system (BMS), which has several

thousand control points, is used extensively for fine tuning the operation of HVAC and lighting systems to occupancy and climatic conditions. In addition, a 40% reduction in potable water and sewage use was achieved by careful selection of water-efficient plumbing.

Summary of LEED-EB: O&M Project Quantified Costs, Benefits, and Payback

Total Incremental Costs of Implementation:	**$22,280**
Total LEED-EB: O&M Certification Process Costs:	**$41,925**
Total LEED-EB: O&M Building Project Incremental Operating Costs:	**$64,205**
Total Annual Net Savings:	**$46,026**
Simple Payback of Total LEED-EB: O&M Building Incremental Operating Costs:	**1.4 years**
Floor Area of LEED-EB Building:	**64,190 sq. ft.**
Total LEED-EB: O&M Building Project Incremental Operating Costs per Square Foot:	**$1.00**
Total Annual Net Savings per Square Foot:	**$0.72**
Life Cycle Net Present Value:	**$413,529**
Life Cycle Net Present Value per Square Foot:	**$6.44**

Renovated Christman Building
(Source: The Christman Company)

Project Effect on Neighborhood

The Christman Company has been a major downtown anchor in Lansing for 80 years, and the Mayor attributes the company's investment in the building and the community as inspiration to other businesses. A 2009 economic study by the Lansing Economic Development Corporation reports that Downtown Lansing is experiencing an economic boom not seen in fifty years. Recent and planned private sector investments total nearly $600 million including commercial and residential development.

Sources for Additional Information

For more information on this restoration project, please see the Christman Building website: www.christmanco.com/portfolio.asp?id=106&cat_id=25.

Project Contact

For more information on the Christman Building restoration, please contact:

Owner, Developer & Contractor

Gavin Gardi, Sustainable Programs Manager
The Christman Company
(517) 702-3414
Gavin.gardi@christmanco.com

Architect, Engineering & Lighting Design

Brooke Smith, Principal
SmithGroup
(313) 983-3600
Brooke.smith@smithgroup.com

Awards

2008 CAM Green Project of the Year Award

2008 XL Insurance Green Contractor Award

2008 AGC Build Michigan Award

2008 SBIC Beyond Green High Performance Building Award

2008 NAIOP/SIOR High Performance / Green Design Excellence Award

2009 AGC Build America Merit Award

2009 Governor's Award for Historic Preservation

2009 Michigan Historic Preservation Network Tax Credit Project Award

LEED Scorecard

Core and Shell LEED v2

LEED RATING
Displays LEED level which is based on number of points attempted. *

49	**Points Documented**						**Points Available: 61**	
9	Sustainable Sites						Possible Points: 15	
Yes	SS	Prerequisite 1	Construction Activity Pollution Prevention		Landscape Architect	Earned	0	
1	SS	Credit 1	Site Selection	★	Project Team Administrator	Earned	1	
1	SS	Credit 2	Development Density & Community Connectivity	★	Project Team Administrator	Earned	1	
1	SS	Credit 3	Brownfield Redevelopment	★	Project Team Administrator	Earned	1	
1	SS	Credit 4.1	Alternative Transportation, Public Transportation Access	★	Project Team Administrator	Earned	1	
1	SS	Credit 4.2	Alternative Transportation, Bicycle Storage & Changing Rooms	★	Project Team Administrator	Earned	1	
1	SS	Credit 4.3	Alternative Transportation, Low-Emitting & Fuel-Efficient Vehicles	★	Project Team Administrator	Earned	1	
1	SS	Credit 4.4	Alternative Transportation, Parking Capacity	★	Project Team Administrator	Earned	1	
	SS	Credit 5.1	Site Development, Protect or Restore Habitat		Not Attempted		1	
	SS	Credit 5.2	Site Development, Maximize Open Space		Not Attempted		1	
	SS	Credit 6.1	Stormwater Design, Quantity Control		Not Attempted		1	
	SS	Credit 6.2	Stormwater Design, Quality Control		Not Attempted		1	
	SS	Credit 7.1	Heat Island Effect, Non-Roof		Not Attempted		1	
1	SS	Credit 7.2	Heat Island Effect, Roof	★	Project Team Administrator	Earned	1	
0	SS	Credit 8	Light Pollution Reduction		Lighting Designer	Denied	1	
1	SS	Credit 9	Tenant Design and Construction Guidelines		Assist. LEED Coordinator	Earned	1	

4		Water Efficiency				Possible Points:	5
2	WE	Credit 1	Water Efficient Landscaping		Landscape Architect	Earned	2
	WE	Credit 2	Innovative Wastewater Technologies		Not Attempted		1
2	WE	Credit 3	Water Use Reduction		HVAC Engineer	Earned	2
11		Energy and Atmosphere				Possible Points:	14
Yes	EA	Prerequisite 1	Fundamental Commissioning of the Building Energy Systems		Commissioning Agent	Earned	0
Yes	EA	Prerequisite 2	Minimum Energy Performance		HVAC Engineer	Earned	0
Yes	EA	Prerequisite 3	Fundamental Refrigerant Management		HVAC Engineer	Earned	0
8	EA	Credit 1	Optimize Energy Performance		HVAC Engineer	Earned	8
	EA	Credit 2	On-Site Renewable Energy		Not Attempted		1
	EA	Credit 3	Enhanced Commissioning		Not Attempted		1
1	EA	Credit 4	Enhanced Refrigerant Management		HVAC Engineer	Earned	1
	EA	Credit 5.1	Measurement & Verification, Base Building		Not Attempted		1
1	EA	Credit 5.2	Measurement & Verification – Tenant Sub-metering	★	Project Team Administrator	Earned	1
1	EA	Credit 6	Green Power	★	Project Team Administrator	Earned	1
9		Materials and Resources				Possible Points:	11
3	MR	Credit 1	Building Reuse		Architect	Earned	3
Yes	MR	Prerequisite 1	Storage & Collection of Recyclables	★	Project Team Administrator	Earned	0
1	MR	Credit 2	Construction Waste Management		Contractor	Earned	2
1	MR	Credit 3	Materials Reuse, 1%	★	Project Team Administrator	Earned	1
2	MR	Credit 4	Recycled Content	★	Project Team Administrator	Earned	2
2	MR	Credit 5	Regional Materials	★	Project Team Administrator	Earned	2
0	MR	Credit 6	Certified Wood	★	Project Team Administrator	Denied	1

11		Indoor Environmental Quality					Possible Points:	11
Yes	EQ	Prerequisite 1	Minimum IAQ Performance		HVAC Engineer		Earned	0
Yes	EQ	Prerequisite 2	Environmental Tobacco Smoke (ETS) Control	★	Project Team Administrator		Earned	0
1	EQ	Credit 1	Outdoor Air Delivery Monitoring		HVAC Engineer		Earned	1
1	EQ	Credit 2	Increased Ventilation		HVAC Engineer		Earned	1
1	EQ	Credit 3	Construction IAQ Management Plan, During Construction		Contractor		Earned	1
3	EQ	Credit 4	Low-Emitting Materials	★	Project Team Administrator		Earned	3
1	EQ	Credit 5	Indoor Chemical & Pollutant Source Control	★	Project Team Administrator		Earned	1
1	EQ	Credit 6	Controllability of Systems, Thermal Comfort		HVAC Engineer		Earned	1
1	EQ	Credit 7	Thermal Comfort, Design		HVAC Engineer		Earned	1
1	EQ	Credit 8.1	Daylight & Views, Daylight 75% of Spaces		Lighting Designer		Earned	1
1	EQ	Credit 8.2	Daylight & Views, Views for 90% of Spaces		Lighting Designer		Earned	1
5		Innovation and Design Process					Possible Points:	5
1	ID	Credit 1.1	Innovation in Design	★	Project Team Administrator		Earned	1
1	ID	Credit 1.2	Innovation in Design	★	Project Team Administrator		Earned	1
1	ID	Credit 1.3	Innovation in Design	★	Project Team Administrator		Earned	1
1	ID	Credit 1.4	Innovation in Design	★	Project Team Administrator		Earned	1
1	ID	Credit 2	Innovation in Design	★	Project Team Administrator		Earned	1