



Building Green for the Future:

Case Studies of Sustainable Development in Michigan



Zeb Acuff, MS/MUP
Aaron Harris, MS/MBA
Bryan Magnus, MS/MBA
Allyson Pumphrey, MLA
Larissa Larsen, Advisor

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Outline of Presentation

- ✦ Urban Catalyst Associates
 - ✦ History of the group and project
- ✦ Green Development Handbook
 - ✦ Introductory topics
 - ✦ Case studies
- ✦ Current Status and Next Steps

Urban Catalyst Associates

Urban Catalyst Associates

- ✦ Interests of the group members
- ✦ Evolution of the project
- ✦ Funding
 - ✦ EPA, EFA, Erb Institute, Rackham
- ✦ Partnership development with the MDEQ

Green Development Handbook

Green Development Handbook

- ✦ First comprehensive handbook dedicated to green development projects in Michigan.
- ✦ Links the objectives of the MDEQ, the Cool Cities Initiative, and the EPA with the development community.
- ✦ Objectives of the Handbook:
 - ✦ Identify and address misconceptions of green development
 - ✦ Highlight and contextualize successful projects in Michigan
 - ✦ Easy to use resource
 - ✦ Provide inspiration to developers, policy makers, design professionals, environmental community for future green development projects

Green Development Handbook

Building Green for the Future: Case Studies of Sustainable Development in Michigan

- ✦ Introductory Topics
 - ✦ Approximately 35 pages
- ✦ Case Study Profiles
 - ✦ 11 Cases
 - ✦ Approximately 70 pages



Green Development Handbook

Introductory Topics

- ✦ User's Guide
- ✦ Benefits of Green Development
 - ✦ Perceptions and Realities
- ✦ Economic Case for Green Buildings
- ✦ Green Development Spectrum
- ✦ Importance of Integrated Design
- ✦ Market for Green Buildings
 - ✦ The Market in Michigan
- ✦ The USGBC and LEED

Green Development Handbook

Introductory Topics

- ✦ User's Guide
- ✦ **Benefits of Green Development**
 - ✦ Perceptions and Realities
- ✦ Economic Case for Green Buildings
- ✦ **Green Development Spectrum**
- ✦ **Importance of Integrated Design**
- ✦ Market for Green Buildings
 - ✦ **The Market in Michigan**
- ✦ **The USGBC and LEED**

Green Development Handbook

Benefits of Green Development

Social Benefits

- Stronger Social Networks
- Increased Environmental Awareness

Environmental Benefits

- Less impact on the natural environment
- Healthy environments and improved productivity

Financial Benefits

- Reduced Energy Consumption
- Emissions Reduction
- Water Consumption Savings
- Reduced Waste
- Operations and Maintenance Savings
- Reduced Risks and Liabilities



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Green Development Spectrum

	Simple Actions Smaller Commitment	Complex Action Larger Commitment	
Site Planning	<p>Cluster development to maximize density</p> <ol style="list-style-type: none"> 1. Bailey's Grove, p 56 	<p>Preserve and relocate trees</p> <ol style="list-style-type: none"> 1. Bailey's Grove, p 56 	<p>Pursue brownfield redevelopment opportunities</p> <ol style="list-style-type: none"> 1. East Hills Center, p 30 2. DEQ Southeast Michigan District Office, p 66
Stormwater Management	<p>Design functional landscaping</p> <ol style="list-style-type: none"> 1. Malletts Creek Branch Library, p 61 2. East Hills Center, p 30 3. IHM Motherhouse, p 47 4. Forest Hills School, p 42 5. Bailey's Grove, p 56 	<p>Reduce impervious surfaces, use porous pavements</p> <ol style="list-style-type: none"> 1. Bailey's Grove, p 56 	<p>Install green roofs and stormwater cisterns</p> <ol style="list-style-type: none"> 1. Helmus Building, p 23 2. East Hills Center, p 30 3. Malletts Creek Branch Library, p 61 4. DEQ Southeast Michigan District Office, p 66
Energy Consumption	<p>Install energy efficient fixtures and appliances</p> <ol style="list-style-type: none"> 1. Malletts Creek Branch Library, p 61 2. Helmus Building, p 23 3. Green Built Demonstration Home, p 51 4. Forest Hills School, p 42 5. DEQ Southeast Michigan District Office, p 66 	<p>Buy "green power" or use passive solar design</p> <ol style="list-style-type: none"> 1. Herman Miller MarketPlace, p 26 2. Zeeland West HS, p 39 3. Malletts Creek Branch Library, p 61 4. East Hills Center, p 30 5. Forest Hills School, p 42 6. DEQ Southeast Michigan District Office, p 66 	<p>Generate renewable energy on-site</p> <ol style="list-style-type: none"> 1. Zeeland West HS, p 39 2. Malletts Creek Branch Library, p 61 3. Forest Hills School, p 42

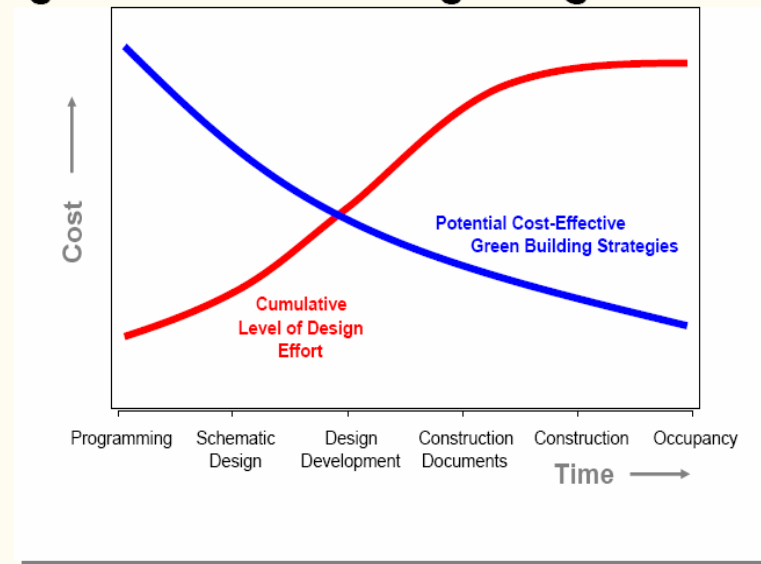
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Importance of Integrated Design

Benefits:

- ✦ Team Orientation
- ✦ Up-front cost savings
- ✦ Identification of obstacles prior to construction
- ✦ Improved operations of the building system

Integrated Green Building Design Process



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The Market for Green Buildings in Michigan

- ✦ Michigan ranks 8th nationally for green development projects in progress
- ✦ Michigan ranks 6th nationally for LEED-certified projects
- ✦ State-level initiatives:
 - ✦ All state funded capital projects over \$1M must be constructed to LEED certified level.
 - ✦ All commercial structures must comply with ASHRAE energy efficiency standards.

MI LEED-Registered & Certified

Project Type	Count
Commercial Office	29
K-12 Education	8
Higher Education	5
Industrial	4
Retail	3
Multi-unit Residential	3
Public Order & Safety	2
Laboratory	2
Interpretive Center	2
Healthcare	2
Assembly	2
Stadium	1
Library	1
Daycare	1
Other	3
Total	68

Case Studies

Case Studies

Research and the Process

Criteria for selecting case study projects:

- ✦ Diversity of project types
 - ✦ Commercial, Educational, Institutional and Residential
- ✦ Range of project size and scope
- ✦ Guidance from the MDEQ

Case Studies

The Case Matrix

		Commercial					Education			Residential		Institutional
		Helmus Building Grand Rapids	Herman Miller MarketPlace Zeeland	East Hills Center Grand Rapids	Everett Marshall Building Ypsilanti	Zeeland West High School Zeeland	Forest Hills High School Ada	Burton Forest Demonstration Home Grand Rapids	IHM Motherhouse Monroe	Bailey's Grove Kentwood	Malletts Creek Branch Library Ann Arbor	DEQ Southeast Michigan Dist Office Warren
Key Topics	Page Number	23	26	30	35	39	42	51	47	56	61	66
	Brownfield Redevelopment			X							X	X
	Stormwater Management			X		X			X	X	X	
	Materials Use	X	X	X	X		X	X	X		X	X
	Energy Efficiency	X	X		X	X	X	X	X		X	X
	Water Efficiency						X	X	X	X		X
	Social Benefits	X	X	X	X		X		X	X	X	
	Development Processes		X				X	X	X	X	X	X
	Cost-Benefit Analysis		X				X	X				
	Funding Sources			X	X	X					X	
	Benefits of Green Development	Reduced Capital Costs	X	X			X	X			X	
Lower Operating Costs		X	X	X		X	X	X	X		X	X
Reduced Risks & Liabilities			X	X				X		X		
Less Environmental Impact		X	X	X	X	X	X	X	X	X	X	X
Healthier Indoor Environment and Improved Productivity		X	X		X		X	X	X		X	X
Stronger Social Networks		X		X	X		X		X	X	X	
Increased Environmental Awareness			X		X	X	X		X	X	X	X
Project Cost	Under \$1 million			X				X				
	\$1 million - \$10 million	X									X	X
	\$10 million - \$50 million				X	X	X					
	Over \$50 million		X						X	X		

Case Studies

Residential Projects

- ✦ Green Built Demonstration Home
 - ✦ Grand Rapids, MI
- ✦ Bailey's Grove
 - ✦ Kentwood, MI
- ✦ IHM Motherhouse
 - ✦ Monroe, MI

Green Built Home



IHM Motherhouse



Bailey's Grove



Case Study: IHM Motherhouse

Monroe, MI



- ✦ 3 year renovation of 376,000 sq.ft. building
- ✦ Residence for 210 retired IHM sisters
- ✦ “Spiritual mandate” of ecological responsibility
- ✦ Energy & water efficient
- ✦ Recycled and reused building materials

Case Study: IHM Motherhouse

Monroe, MI

- ✦ Reuse of 1930s-era light fixtures → now efficient
- ✦ Diverted construction wastes from landfill
- ✦ Installed graywater recycling system
- ✦ Installed 232-loop geothermal energy harvesting system

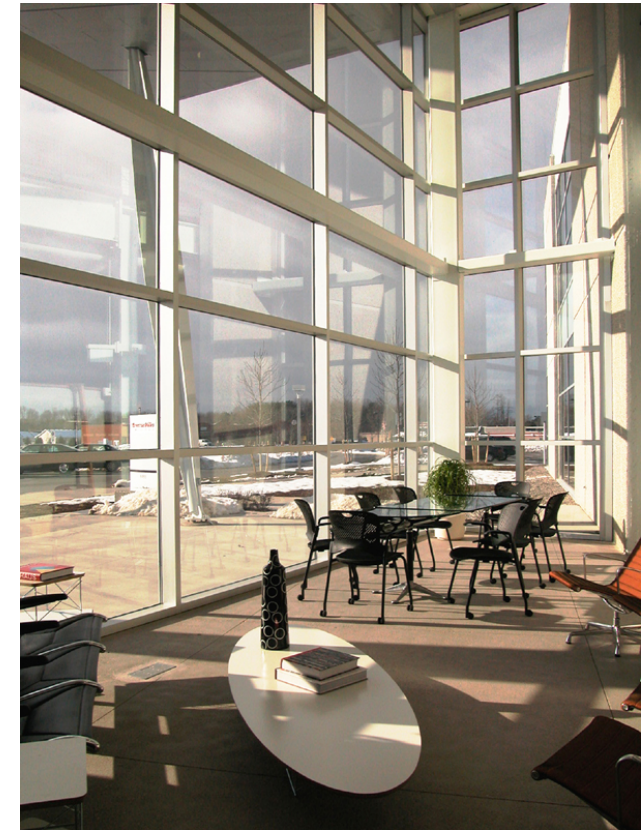


Case Studies

Commercial Projects

- ✦ Herman Miller MarketPlace
 - ✦ Zeeland, MI
- ✦ East Hills Center
 - ✦ Grand Rapids, MI
- ✦ Helmus Building
 - ✦ Grand Rapids, MI

Herman Miller



Helmus Building

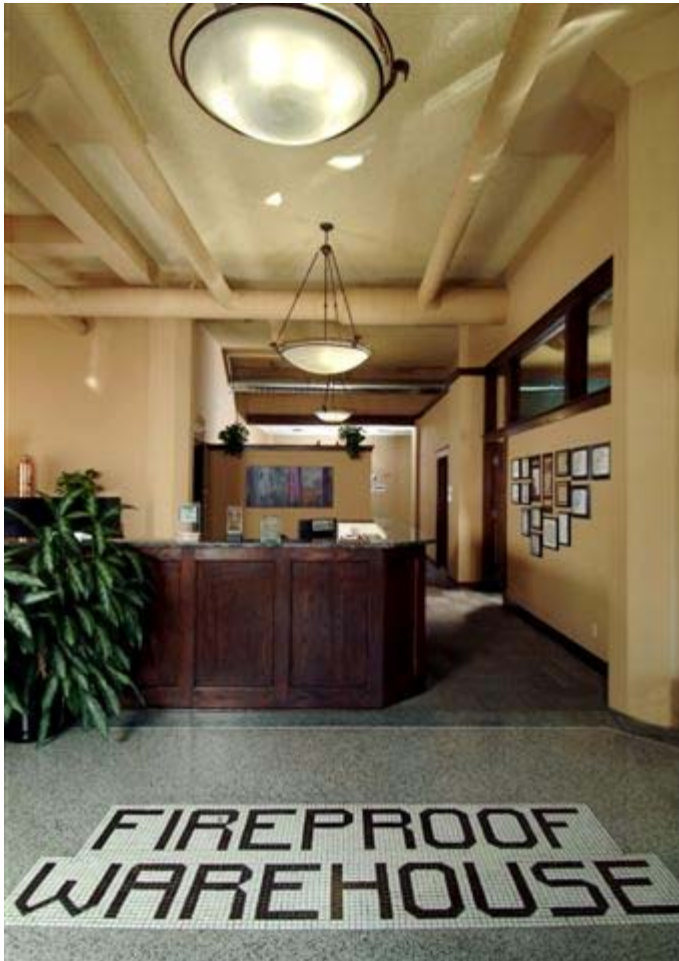


East Hills Center



Case Study: Helmus Building

Grand Rapids, MI



- ✦ Built in 1918
- ✦ Commercial / Dry Storage
- ✦ 9,480 sq. ft.
 - ✦ \$1,042,800 soft costs (\$110/sf)
 - ✦ \$249,000 building (\$136/sf)
- ✦ Historic Rehab
- ✦ Purchased in 1999
- ✦ Completed in 2002

Case Study: Helmus Building

Grand Rapids, MI



- ✦ Energy Efficiency
 - ✦ Super insulated
 - ✦ Green roof
 - ✦ Residential HVAC
- ✦ Materials Use
 - ✦ Reuse shell and interior
 - ✦ Low-VOC carpet, ceiling, paint
- ✦ Social Benefits
 - ✦ Mixed-use
 - ✦ Revitalization catalyst
 - ✦ Local economy

Case Studies

Educational Projects

- ✦ Everett Marshall Building
 - ✦ Ypsilanti, MI
- ✦ Zeeland West High School
 - ✦ Zeeland, MI
- ✦ Forest Hills High School
 - ✦ Grand Rapids, MI

Everett Marshall



Forest Hills



Zeeland West



Case Study: Forest Hills High School

Grand Rapids, MI

- ✦ 214,000 sq ft., \$25M High School
- ✦ Completed August, 2004
- ✦ One of only two LEED certified schools in Michigan
- ✦ Extensive energy efficient lighting
- ✦ On-site irrigation retention pond eliminates traditional well



Case Study: Forest Hills High School

Grand Rapids, MI

✦ Social Benefits:

- ✦ Elaborate common areas support collaboration
- ✦ Abundant natural daylight enhances student performance
- ✦ Focus on sustainability as a learning objective.

✦ Energy Efficiency

- ✦ Lighting
- ✦ Energy management system



Case Studies

Institutional Projects

- ✦ DEQ Southeast Michigan District Office
 - ✦ Warren, MI
- ✦ Malletts Creek Branch Library
 - ✦ Ann Arbor, MI

Malletts Creek Branch Library



DEQ Southeast Michigan District Office



Case Study: Malletts Creek Branch Library

Ann Arbor, MI



- ✦ New construction: 14,000 sq. ft.
- ✦ Completed January 2004
- ✦ Replaces Loving Branch
- ✦ Named after local creek
- ✦ Goals motivated by stormwater regulations
- ✦ Life cycle cost analysis proved energy savings
- ✦ Highly visible example of sustainable design

Case Study: Malletts Creek Branch Library

Ann Arbor, MI



Bioswale in parking lot

- ✦ Energy Efficiency
 - ✦ Natural lighting
 - ✦ Convection cooling
- ✦ Sustainable Materials
 - ✦ Renewable materials
 - ✦ Recyclable materials
- ✦ Stormwater Management
 - ✦ Bioswales
 - ✦ Green roof

Current Status and Next Steps

Current Status and Next Steps

- ✦ Completion of design phase and production
- ✦ Presentation to the EPA in Washington D.C. on May 16-17, 2005
- ✦ Presentations to MDEQ and Cool Cities Initiative

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