

Building Green for the Future

Case Studies of Sustainable Development in Michigan

DEQ Southeast Michigan District Office, Warren



UrbanCatalystAssociates

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University of Michigan
Ann Arbor, Michigan

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M I C H I G A N
DEPARTMENT OF ENVIRONMENTAL QUALITY



Project type	Institutional
Project scale	Building & Site
Construction type	New Construction - Urban Infill
Date completed	January 2005
Address	27700 Donald Court, Warren, MI
Subjects	Energy Efficiency
	Materials
	Water Efficiency
	Development Processes
Total project costs	Not provided
Building square footage	68,150 sq. ft.; 35,926 sq. ft. occupied by MDEQ

Warren, Michigan

DEQ Southeast Michigan District Office

History

Since 1989, the Southeast Michigan District Office of the DEQ has been located in an office park in Livonia. When its lease expired, the agency—which serves St. Clair, Macomb, Oakland, and Wayne counties—began thinking about relocating to a more central location. The agency was also aware that it needed to “practice what it preaches” through sustainable development practices to build the first *green* state office building.

The current site for the District Office in Warren was formerly the site of the Warren Army Tank Plant grounds. In operation from 1941 to 1996 and the production site of Sherman tanks for World War II, the site’s residual contamination qualified the land as a **brownfield**. The contamination on the land had been cleaned up to meet development codes and standards, and the agency wanted to set an example for other state agencies and private organizations and saw this site as a prime opportunity to live by their own environmental standards.

The DEQ also chose to develop on the Warren Tank Plant site because of lower leasing costs and the centralized location in Warren. The DEQ pre-signed the lease with ProVisions LLC and hired a local architecture firm and contracting company to develop plans for the sustainable building. The new DEQ office is located within an office and manufacturing development on Van Dyke Avenue.

The Warren DEQ building utilizes green building techniques to conserve energy, reduce fossil fuel emissions, and use recyclable materials. These sustainable techniques range from simple actions with small commitments to complex actions with larger commitments. (See page 16 to view the green development spectrum.)

brownfield - Abandoned, idled, or under-used industrial and commercial facilities/sites where expansion or redevelopment is complicated by real or perceived environmental contamination.

Energy Efficiency

The simple actions the DEQ building utilizes include the use of natural daylighting and lighting fixtures that use zoned automatic sensors and timers. The open floor plan of the building with its minimal floor-to-ceiling partitions utilizes sunlight that penetrates the large windows on the exterior of the building. Other simple techniques for energy efficiency include automated controls for the HVAC systems and a tankless water heater that heats water only on demand, rather than continually, thereby saving energy.

A unique feature of the building is its white membrane-covered roof. The reflective nature of the **white roof** minimizes the need for air-conditioning on hot summer days by reflecting rather than absorbing the heat of sunlight. Although this feature cannot be easily seen by visitors and employees, the reduced energy bills are hard to ignore.

Examples of more complex energy efficient techniques used by the DEQ include the purchasing of green wind power and the use of hybrid fleet vehicles. Although sustainable energy sources such as wind power are not widely available yet in the state of Michigan, the DEQ has purchased wind power from utility companies in other regions of the country while still utilizing electricity through the existing power grid. The purchased wind power is then traded in for vouchers to use traditional energy without increasing the demand for traditional energy. By using clean energy sources the DEQ is promoting the use of sustainable energy sources rather than energy sources that consume fossil fuels.

The DEQ is participating in the testing and use of hybrid gasoline-electric motor vehicles in its roughly 30-vehicle fleet. Several of these vehicles are ethanol-85 capable, and a few of the vehicles are gas-electric.

Although the uninformed visitor will not detect most of the energy efficient technologies utilized by the DEQ building, the DEQ has already begun to see reduced energy usage and savings benefits. In total the DEQ expects to reduce their overall energy usage by 35%.

The rolling file system requires less space than a traditional filing system consuming less interior square footage.



“By using wind power to help supply electricity to the building, more than 1 million pounds of CO2 will be eliminated from the atmosphere over a two-year period.”

- Kevin King, office space administrator for the DEQ.

white roof - White roof, or 'cool roofs,' help to better reflect solar energy and thus radiate away absorbed heat. White roof applications have a smooth, bright white surface to reflect solar radiation, reduce heat transfer to the interior, and save on summertime air conditioning.

The large exterior windows allow more natural daylighting, improve the work environment inside, and lower electricity usage.

Materials Use

All of the materials used in the construction of the new DEQ building have a sustainable component to them - whether from a local source or containing recycled content or materials. A tremendous effort was made to ensure a sustainable source for building materials. All materials were shipped from sources less than 500 miles away, reducing fossil fuel emissions and supporting the local economy.



Perhaps the most impressive materials-feat the DEQ performed that exemplifies their commitment to the environment is their reuse of office cubicle dividers and conference room seating. Old cubicle dividers were dismantled, cleaned, repainted, and reupholstered to provide new office spaces in the current building. In addition to diverting waste from a landfill, this process produced a savings of \$717,000 - a considerable amount for the state-funded agency. Conference room chairs were also rebuilt, saving the DEQ \$130 per chair.

The interior of the building was finished with low-VOC paints and adhesives to improve the indoor air quality for employees. Also, separate bins are located throughout the building for recycling several materials including white paper, newsprint, corrugated cardboard, batteries, and non-food polystyrene.

Water Efficiency

Water efficiency was a top priority in the design and development of the building, not only for environmental reasons but also for cost saving purposes. The technologies utilized inside the DEQ building reduce overall potable water usage by 20% and utilize stormwater for irrigation on the outside of the building.

Building technologies include motion-sensor controlled water faucets, waterless urinals, and air-assisted dual-flush toilets in the restrooms. These water-efficient technologies made for an interesting and educational transition for employees from the old office into the new office. A source of many laughs in the first few weeks of occupancy, the effectiveness of the technologies was soon taken seriously when evidence of lower water usage became apparent.

Outside the building, stormwater is collected from the roof and parking lot and stored in an underground stormwater retention vault. Some of this stormwater is utilized for irrigating the native landscape plants, which are adapted to hot, dry Michigan summers and therefore require less irrigation and maintenance. Using this stormwater for irrigation reduces the need for potable water and saves the DEQ money in reduced water bills.



The white roof minimizes the need for air conditioning by reflecting rather than absorbing the heat from sunlight.

VOC - Volatile organic compounds; Secondary petrochemicals which evaporate readily into the atmosphere at normal temperatures. They include light alcohols, acetone, trichloroethylene, perchloroethylene, dichloroethylene, benzene, vinyl chloride, toluene, and methyl chloride. These potentially toxic chemicals are used as solvents, degreasers, paint thinners, adhesives, and fuels and contribute significantly to photochemical smog production and certain health problems. Signs and symptoms of VOC exposure may include eye and upper respiratory irritation, nasal congestion, headache, and dizziness.

Development Processes

Because the site is located on a brownfield, restrictions have been placed on the type of use of the site. Office space for the DEQ fit the use requirements and the previous landowner had already cleaned up most of the site, making the site an ideal site for the new District Office.

In addition to the benefits of the site qualifying as a brownfield, its location along Van Dyke Avenue also meant access to existing utilities and infrastructure. By developing on previously-developed land, known as urban infill development, the project required minimal development costs, as opposed to suburban or greenfield development. These reduced development costs allowed the DEQ to direct funds to other sustainable infrastructure uses, such as the installation of the underground stormwater retention vault. This buried concrete vault stores collected stormwater for irrigation and slow release into the storm sewer system, thereby reducing the effects of **first flush** on urban waterways and downstream ecosystems.

Awards

- Currently applying for LEED Silver Rating

Extra office space controlled by energy-saving light fixtures on sensors allow for flexibility as the needs of the buildings' occupants change.



first flush - The condition, often occurring in storm sewer discharges, in which a disproportionately high pollutional load is carried to the first portion of the discharge or overflow.

“The new Southeast Michigan District Office is a demonstration of the DEQ’s commitment to being a leader in promoting environmentally sound business practices. I hope that we see many more of these green buildings being constructed not only by the state, but by private companies across Michigan.”

- Steven E. Chester, DEQ Director

The Bottom Line

The new DEQ building is successful in utilizing several green technologies - from simple to complex - to conserve the precious resources of energy, water, money, and the environment while living up to their own standards of environmental protection and stewardship. Because of the success and influence of the Warren DEQ building, the state plans to build an even more environmentally-friendly office building in Bay City in the next 18 months to two years, according to Kevin King, office space administrator for the DEQ. "The new Southeast Michigan District Office is a demonstration of the DEQ's commitment to being a leader in promoting environmentally sound business practices. I hope that we see many more of these green buildings being constructed not only by the state, but by private companies across Michigan" says Steven E. Chester, DEQ Director.



The DEQ took extra steps to recycle office furniture by dismantling, repainting, and reupholstering the cubicle dividers and office chairs.

References

The Detroit News article by Gene Schabath: Michigan Saves By Going Green, March 16, 2005

DEQ Press Release: DEQ Moves in to New Warren Office, March 1, 2005, revised by Pat Watson

Interview with Edward Girodat, ProVisions LLC

Contact Information

Client	Robert McCann, Michigan Department of Environmental Quality, Press Secretary, (517) 241-7397, mccannr@michigan.gov
Contractor	Joe Newood, Cunningham-Limp, Project Manager, (248) 489-2300, j.newood@cunninghamlimp.com
Architect	Gillett Associates, (248) 489-2345
Developer	Edward Girodat, ProVisions LLC, Project Executive, (248) 988-9341, egirodat@provisions.ws

Resources for further information

www.michigan.gov/deq

Urban Catalyst Associates

Urban Catalyst Associates

Urban Catalyst Associates (UCA) is an interdisciplinary team of recent University of Michigan graduate students who have combined their experiences, interests, and educations to create a positive impact on the future of the State of Michigan. The team holds a strong passion for fostering innovative, sustainable development that will shape the evolution of the new urban environment.

In collaboration with the Michigan Department of Environmental Quality, Urban Catalyst Associates developed this handbook to serve as inspiration and ready reference to the development community and other interested groups. As the State furthers its investment in green development, the UCA team hopes that this handbook will encourage developers to infuse elements of environmental sustainability into their planning and development processes.

Urban Catalyst Associates can be contacted via email at uca@uca-michigan.com. See the contact information below for information on contacting individual team members.

Zeb Acuff

Zeb holds Master's degrees from the School of Natural Resources and Environment and the Taubman College of Architecture and Urban Planning, both at the University of Michigan in Ann Arbor. He is also a 2001 graduate of the College of Agriculture and Natural Resources at the University of Delaware. Zeb has extensive experience in farmland preservation and local planning research, as well as familiarity working with demographic and social science media. His professional interests include parks and recreation planning, non-motorized transportation, trails and greenway development, and public transit systems. Zeb and his wife currently reside in Dexter, Michigan. Zeb can be contacted via email at zeb@theacuffs.com.

Bryan Magnus

Bryan graduated from the University of Michigan in April, 2005, with an MBA from the Ross School of Business and a MS from the School of Natural Resources. His undergraduate degree is in Finance and Actuarial Math from Bryant University in Smithfield, Rhode Island. Bryan has extensive knowledge of socially and environmentally responsible business with an emphasis on renewable energy and alternative transportation. He has interned with General Motors' Fuel Cell Activities Group as well as Honeywell's Transportation Systems, and is currently employed by Honeywell TS as a Marketing Analyst. Bryan, his wife Lynn, and their "child" Meadow (dog) live in Ann Arbor, Michigan. Bryan can be contacted via email at magnusb@umich.edu.

Aaron Harris

Aaron will complete his final year at the University of Michigan in spring 2006 with both an MBA from the Ross School of Business and an MS from the School of Natural Resources and Environment. Prior to Michigan, Aaron co-founded Harris Brothers LLC, a real estate development/management company based in Chicago and focused on green building design and environmentally sensitive renovation projects. Upon completion of graduate studies, Aaron plans to return to the real estate field to pursue urban brownfield redevelopment projects. Aaron graduated from the University of Wisconsin-Madison with a BA in Sociology (Honors) and a Certificate in Environmental Studies. Aaron can be contacted via email at aaronmh@umich.edu.

Allyson Pumphrey

Allyson graduated from the School of Natural Resources & Environment with a Master's degree in Landscape Architecture in April 2005. Prior to attending the University of Michigan, she received her BS in Landscape Horticulture & Design from Purdue University in West Lafayette, Indiana. Allyson has experience in residential site design and urban redevelopment projects. Her professional interests include urban trails and greenways, brownfield redevelopment, and urban design. Allyson is employed by InSite Design Studio, Inc. in Ann Arbor, Michigan. Allyson can be contacted via email at apumphrey@insite-studio.com.

Larissa Larsen

Larissa Larsen, Ph.D., is an assistant professor with positions in both the School of Natural Resources and Environment and the Urban Planning Program at the University of Michigan. Larissa has a Master's in Landscape Architecture degree from the University of Guelph in Canada and a Ph.D. in regional planning from the University of Illinois at Urbana-Champaign. Prior to becoming a professor, Larissa practiced landscape architecture and urban planning in Chicago. Her current research investigates the ecological and social impacts of urban settlement patterns. Larissa can be contacted via email at larissal@umich.edu.