

## Holy Wisdom Monastery Case Study

By **Vertegy** An Alberici Enterprise)

### INTRODUCTION

Benedictine Women of Madison is an ecumenical monastic community that seeks God through a life following the Gospel and Rule of Benedict. They weave prayer, hospitality, justice and care for the earth into daily life and ministry.



A primary mission of the Benedictine Women of Madison (BWM) is to work towards environmental solutions and to teach the importance of nature in religious and daily life. A prominent link on their website leads to

the following text: “Care for the earth comes out of our spirituality. Holy Wisdom Monastery includes acres of restored prairie and tree-covered land. The plants, the water, the birds and the wildlife are God’s gifts to us. People are inspired by their experiences here. They discover a spiritual connection with the land. Whether caring for it as an environmental volunteer, walking the trails or spending time on a bench reflecting on the mysteries around them, there is something wonderful and amazing about having a place preserved as nature intended. Our efforts and the commitment of all those who help us preserve, maintain and restore this place go beyond “green” trends. For us, it is a way of life. We strive to use only what we need so that resources can be preserved for others.” And so it was natural that the Sisters strove to go beyond conventional building practices when they concluded that Benedict House, originally designed to be a girls’ boarding school, needed to be decommissioned and replaced.

Their Capital Campaign brochure begins, “This effort to build a sustainable monastery building...builds upon a long-lived tradition of the monastic community that has deep roots in this local place.” The dilemma faced by the Sisters was that their campus included an obsolete, energy-wasteful facility that had become a financial burden costing over \$100,000 annually to operate. Preliminary estimates to renovate it totaled \$5 million. After considerable study and consultation, the decision was made to replace Benedict House with a building 50% smaller, built to the highest level of LEED certification and designed to ultimately achieve a “zero carbon footprint” through future renewable upgrades.

It was decided that the new monastery building would be built close to the site of the decommissioned Benedict House on the BWM site overlooking Lake Mendota just north of Madison, Wisconsin. Right from the start, the Sisters turned to an architecture firm with experience in both religious architecture as well as sustainability, Hoffman, LLC. They, in turn, tapped Vertegy, a St. Louis-based sustainability consultant to provide additional support throughout the LEED process. In addition, Hoffman engaged Fredericksen Engineering as the mechanical designer, Czarnecki Engineering for electrical design and LGD Engineering for plumbing design. Hoffman would also be the construction manager ensuring continuity throughout the entire project.

With a dynamic team in place, the project’s design started to take shape. The goal to have the building become certified by USGBC/GBCI quickly sharpened the team’s focus and design challenges became goals capable of being reached. Every member of the project team believed in the building and had a strong desire to achieve the full potential of this project: Platinum. The team found innovative ways to employ strategies that enhanced sustainability at little or no additional cost to construction. Through the combined design and construction knowledge of the team, and led by the vision of the Sisters, the team is now seeking a Platinum level certification for the building under the LEED for New Construction (LEED-NC) Rating System.

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### SCOPE

The 34,380 square foot, two-level building seeking LEED certification incorporates the following:

- > Main chapel, oratory and meditation chapel spaces for services and other group religious events
- > Offices and meeting rooms for Monastery staff
- > Dining areas for daily meals as well as special events
- > New library and archive spaces
- > Outdoor gathering spaces
- > Accessible green roof on a portion of the building over the garage



roof, high albedo paving surfaces, and a portion of permeable concrete to decrease the heat island effect on site. To promote alternative means of transportation, preferred parking has been provided for low-emitting and fuel-efficient vehicles as well as for those who carpool to the site.

### Water Efficiency

Water efficiency has always been a primary concern for BWM. They currently maintain large prairie restorations and other gardens around the site. It was of utmost importance that any landscaping created through the course of the development of the new Monastery would not require any permanent irrigation from potable water. Water for use in the plant care room is collected in four rain barrels which capture stormwater off of the Monastery roof. Water efficient flush and flow fixtures were also specified and installed in the project, including the following choices:

- > 1.0 gallon per flush toilets
- > Waterless urinals
- > Low-flow lavatory and kitchen faucets

### PROJECT

#### Sustainable Sites

The development team chose to build on the previously developed site and parking where Benedict House once stood. The team worked diligently to limit the amount of site disturbance to the existing property. Though no green or open space was required by local zoning ordinance, the design incorporated open areas for close to 70% of the project's site area, much of which has been restored to native prairie habitat. The team carefully specified and installed a white membrane



#### Energy & Atmosphere

The design of the mechanical system reflects the team's utmost attention to energy efficiency. The facility uses a ground sourced heat pump HVAC system featuring 39 wells installed under the parking lot. In addition, an initial phase of the PV renewable energy system has been installed providing about 13% of the estimated annual energy need. As fund raising proceeds, the vision is to add additional PV to provide 100% of the energy need on a net annual basis. This is a realistic goal given the projected low-energy usage of the building. The team worked to design a highly efficient envelope, while remaining within a conventional budget. A whole-building simulation was completed

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using DOE-2 energy modeling software to help provide information about the energy efficiency of the building. The commissioning process implemented by a third party, CDH Energy, ensured the building's systems were functioning optimally and as designed. In addition, a comprehensive measurement and verification program has been instituted to provide meaningful data on the building's performance. Refrigerants were carefully chosen with regard to their ozone-depleting and global warming potentials to allow for achievement of both Fundamental and Enhanced Refrigerant Management.



### Materials & Resources

Environmentally sensitive material choices were a part of the project team's core beliefs. Over 99% of the construction and demolition waste was carefully diverted from the landfill by way of recycling centers, reuse and donations. Concrete, asphalt, cardboard, drywall, and scrap wood were recycled. In addition, nearly all

of the building materials and finishes from Benedict House were diverted from the landfill. Recycled materials were found in many of the products specified and installed in the building including insulation, steel, concrete and doors, as well as many of the finishes. Regional products were also highly valued by the team and close to 30% of the construction materials were sourced and extracted within a 500-mile radius of the site. Bamboo flooring and agrifiber board in the casework provided much of the rapidly renewable content within the project and over 50% of all new wood-based materials are FSC certified.

### Indoor Environmental Quality

The design and construction team focused on providing the future building users and occupants with exceptional indoor environmental quality. The ventilation system has been designed to incorporate an outdoor air delivery monitoring system. The incorporation of high performance glazing allowed for the provision of views to the outdoors and a comfortable level of natural daylight for the building's occupants, while having a positive effect on the energy efficiency of the building. All of the contractors working on site followed a stringent no/low-emitting VOC policy and Construction Indoor Air Quality Management program during construction. Only no/low-emitting adhesives, sealants, paints, coatings, carpet systems and composite woods were utilized by the team. The project team also scrutinized possible sources of indoor chemicals and pollutants, designing and building the project to minimize these contaminants. Indoor air quality was validated by air quality testing. Thermal comfort as well as lighting control for the future occupants was of primary importance to the team. To verify that the steps taken to optimize thermal comfort have been successful, the owners will utilize a survey of the occupants within eighteen months of move-in, as well as subsequent and appropriate corrective action should more than 20% show dissatisfaction. The team is confident the indoor environmental quality provided for the Monastery's users is the freshest and healthiest possible.

### Innovation

The one thing this project team had no shortage of was innovation. The Sisters invite all interested groups to come and learn about the building and sustainability. Educational information about the building has been incorporated into signage explaining the sustainable features of the space. To preserve the exceptional indoor air quality achieved during design and construction, the owners are committed to the inclusion of a green cleaning management program that addresses both cleaning products and procedures. Additional innovation credits are sought through the project's exemplary performance in Water Use Reduction and inclusion of Rapidly Renewable materials.