



Herman Miller MarketPlace

Zeeland, Michigan

Rooftop Comfort System Contributes to LEED Gold Rating

"This was a real team effort, that's all I can say." In this way, Douglas Brant, the president/CEO of Beta Design Group describes the development of the engineering design for the award-winning Herman Miller MarketPlace building in Zeeland, Michigan. His firm was responsible for the design of the mechanical plant for the building. The western Michigan facility recently received the Gold rating under the Leadership in Energy and Environmental Design (LEED) program of the U.S. Green Building Council. The recognition was given for the building's environmental and financial building design and performance.

Herman Miller, Inc. is a leading global provider of office furniture and services for the workplace. In business since 1936, the publicly-traded firm (MLHR) has pioneered many of the design concepts of today's office. Products include office furniture, storage equipment, office architecture components, and systems for information management. With its headquarters in Zeeland, 20 miles southwest of Grand Rapids, Michigan, Herman Miller serves a worldwide market for quality office appointments. The firm also has a longstanding commitment to green building design, being one of the original sponsors of the U.S. Green Building Council.





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Firm has Commitment to Green Buildings

Many of the firm's buildings have been designed and built to meet high building environmental goals, and when plans were made for a new facility, the Herman Miller organization asked that it be designed and built to the newest Green Building standards. The minimum goal was to achieve the LEED Silver standard as set by the Green Building Council. The Herman Miller MarketPlace would be owned by the Granger Group of Companies, a large for-profit real estate corporation headquartered in Grand Rapids. The building would consolidate Herman Miller employees from five different sites.

The goal of the project was to create a prototype office environment that showcases practical applications of Herman Miller products and systems, while also serving as a working office for 450 Herman Miller employees during a 40 hour work week. The

Granger Group's intellisys™ process was used for the entire project. This approach emphasizes the value of assembling known components on a precisely orchestrated schedule.

The intellisys™ process is a systemized approach to procuring and delivering a building from pre-construction planning to tenant move in. It combines the latest building technologies, a kit-of-parts assembly process and the USGBC's LEED™ building requirements. Intellisys delivers smart buildings that are "healthy" and offer clients significant value in overall economic terms, including initial construction costs, operational costs and human productivity.

The principal architect for the MarketPlace building was Integrated Architecture of Grand Rapids, and the interior designer was Interior Architects of Chicago. A key part of the design was the mechanical plant. Beta Design Group of Grand Rapids led the effort to develop a system to



The new system features air treatment with Semco Pinnacle™ desiccant units.

meet or exceed the LEED Silver level. To do so, it would be necessary to achieve at least a 40% reduction in energy use over ASHRAE Standard 90.1-1999.

Tenant, Owner Define Building Goals

The building design encompasses 100,000 square feet of floor space, with a very open, two-story interior design. Over 65% of the wall area is glazing, providing daylighting for much of the office area through the day.

The approach taken by Doug Brant from Beta Design Group was to involve the intellisys team extensively in defining the comfort goals of the building. Brant points out that the Herman Miller and Granger organizations not only wanted a high level of performance for the building, but stressed the need to contain costs in equipment to achieve this goal. Trane's Grand Rapids office was also deeply involved in the design process, helping to select the optimum equipment for the application.





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The rooftop comfort system also features two Semco Pinnacle™ air-to-air ventilation air treatment units. The Semco units feature dual desiccant wheels that pretreat air going to the rooftop units. Brant indicates that both the rooftop units and the dehumidification modules are important to plant efficiency. “The Pinnacle units reduce the necessary size of the rooftops because they reduce the latent load from the incoming outdoor air. In this way, they allowed us to install smaller rooftop units and reduce first cost as well as system energy use.”

Protecting the Work Environment

In addition to operating efficiency, the Herman Miller organization also placed a priority on indoor air quality. The Trane rooftops, along with the Pinnacle units, control the humidity of incoming air. Brant notes that humidity control is a prime element of indoor air quality.

The system also uses CO2 sensors to adjust ventilation rates to building occupancy. The Herman Miller products as showcased in the building were designed to produce minimal emissions from their construction materials, and the building itself is designed for efficient and effective ventilation.

The design and construction process for the building was on a very fast track, with less than 14 months from the beginning of design to building occupancy. Brant says, “It’s a myth that to have an energy-efficient design, you need to take a lot of time. What you do need to do is to assemble proven systems, using clearly-understood design goals.” Brant also points out that another myth is that all manufacturers are equal. “This is less true today than ever. Trane understood our need for speed, and the requirement that all the drawing be right the first time. We didn’t have time to do drawings twice.”

The approach ultimately taken by Beta Design Group was to use package rooftop units for heating and cooling, with VAV distribution. Brant notes, “We knew rooftops would lower the first cost, and VAV distribution would help assure system efficiency and good comfort throughout the building.” The rooftop system selected was four Trane IntelliPak™ rooftop units rated at 50 cooling tons each.

Trane Rooftop Systems Chosen

The rooftop units use electrically-driven scroll compressors for cooling, with a design that allows the cooling units to operate at 100%, 80%, 60% or 30% of capacity. The Trane rooftops chosen have two-stage gas heating sections with long-life stainless heat exchangers. According to Brant, the tight building envelope and the internal heat gains mean that the heating sections operate relatively few hours yearly. The rooftop units are equipped with Trane’s IntelliPak controls package that interfaces with the building controls.

The building design features exposed cabling and ductwork. This was done to facilitate rapid changes in building systems to accommodate future needs.



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Building Controls Part of Fast-Track Approach

The control systems specified for the MarketPlace facility were Trane Tracer unit controls with a Tracer Summit™ system, which controls the entire comfort system. An advantage to using Tracer unit controls was that they allowed installation and testing of controls to be done in the Trane factories, significantly decreasing field installation time and increasing the high level of confidence that they would smoothly interconnect with the building controls. "This was the only way we could meet this schedule," emphasizes Brant. The factory mounting of controls included both the rooftop units and the Trane VariTrane™ VAV terminals.

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Trane IntelliPak rooftop units were selected because of their low first cost and adaptability to VAV distribution systems.

Construction of the facility began in May, 2001 and was completed in November of that year, taking an astonishingly short 6.5 months. According to Brant, this achievement was possible because of the effort that went into project planning, using the Granger intellisys process. An independent commissioning agent reviewed the entire building after startup, and documented facility operation.

Building Meets Gold Standard

It soon became apparent that the building was actually operating at levels better than the LEED Silver level that had originally been set. Ultimately, the review of the entire building including the types of

materials used, the operating economy and the emphasis on environmental consciousness in the design resulted in the building receiving the LEED Gold level certification.

According to Brant, there are numerous site visitors, and many questions about the mechanical design of the facility. "I tell people that the most important thing is to assemble a good team in the beginning," he stresses. "And it's important to keep an open mind on options, to be inquisitive." In the MarketPlace building, the successful use of this approach has resulted in an award-winning building, as well as a very comfortable place to work.



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