



## **HIGH PERFORMANCE BUILDING**

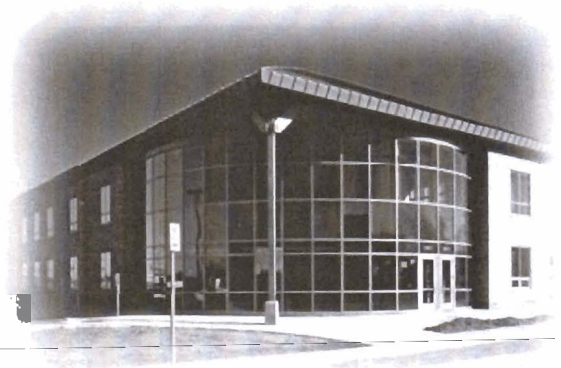


# Phillips Eco-Enterprise Center

The **Phillips Eco-Enterprise Center** in Minneapolis is a \$6 million, 64,000-square-foot state-of-the-art commercial and industrial facility that opened its doors in fall 1999.

## Whole Building

- Geo – Exchange heat pump system (no furnace)
- Low – emissivity, insulated windows
- Native prairie restoration
- 100 percent onsite storm water restoration
- Naturally enhanced biofiltration of runoff
- Fly ash in pre-cast concrete panels
- Window sills made from agricultural waste
- 80 percent of construction waste reused or recycled



## Staircase and Foyer

- Reused steel joists and brick
- Salvaged stair-treads
- 100 percent recycled content tile

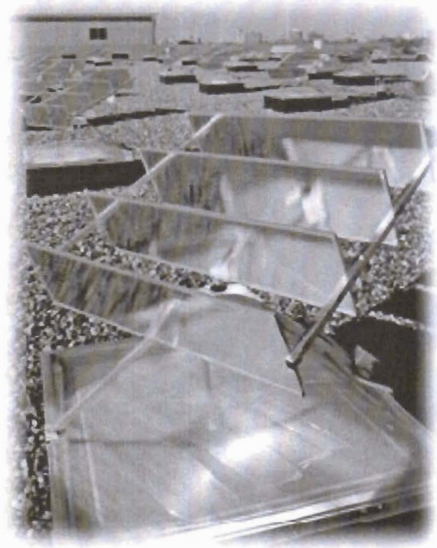
## Office interior

- Operable windows
- Energy recovery ventilation
- Low and no- emission coatings and adhesives
- Daylight and air-quality controls
- Showers and changing room
- High-efficiency light fixtures
- Energy management system
- World's first 100 recyclable carpet
- Salvaged sinks, carpet, cabinetry, decking and benches



### Roof

- Solar-tracking skylights
- Green roof with monolithic membrane, drainage and filter.



The Phillips Eco-Enterprise Center (PEEC) is the result of a cumulative effort to reinvest in the Phillips neighborhood of Minneapolis. After the challenges of EPA superfund cleanup and an incinerator was prevented from being constructed in the area, the Green Institute was formed with community advocates to develop a commercial office space and light industrial facility to house organizations sharing visions for addressing environmental and social justice issues. The building helped pioneer green building and renewable energy approaches in Minnesota. The 34 kW solar electric system installed on the building is one of the largest in the state. This solar electric system allows the Green Institute to provide site-generated renewable energy for a portion of the power used by the tenants. Along with several integrated strategies, the PEEC is operated by the Green Institute and has continued to serve as a demonstration site for educating visitors about sustainable practices and clean energy production.

### Building Performance

#### Effective Energy Use Solutions:

- Part of the design approach for the building was the sharing of facilities such as conference rooms and office equipment for the tenants. This reduction in systems and space reduced the energy use for climate control and power, as well space requirements of the building. Zoned systems for heating and cooling allowed for individual offices to maintain climate control isolated from the main corridor and other offices.
- Placement of a prominent stairway at the entrance with the elevator set further in the building was intended to encourage reduced use of the elevators for energy conserving purposes and to increase the health of occupants and visitors.
- Shared loading docks and a main corridor in the light industrial section of the building also reduced the number of bay doors opening and closing to the outside providing more controllable interior condition.

- Other strategies include Low-E glazing, solar-tracking skylights, high-efficiency lighting, geo-thermal heat pump system, energy recovery ventilation, and an energy management system.

**Orientation:** Main office spaces face northwest, light industrial wing faces southeast

**Daylighting Strategies:** The office spaces have a combined approach for bringing in natural daylight into the building, utilizing windows and white, reflective paints to reduce electric lighting. The front atrium allows light to penetrate into a portion of the open space plan offices through windows in the walls inside the building. Clerestory windows also bring natural light into the other office spaces. In the light industrial section of the building, solar-tracking skylights bring light deeper into the building. The main corridor is almost entirely naturally day-lit.

**Shading of Structure:** Solar array shades rooftop and upper western side windows

**Climate Control Systems:** A ground-source pump system provides heating/cooling for office space and natural-gas-powered forced air for the light industrial portion of the building.

**Backup Heating/Power:** 48-hour emergency systems battery backup

#### Renewable Energy System Information

**Solar System Description and Size:** After construction, the Weidt Group developed an energy study comparing the cabin with a code-based building.

- The 34 kW solar electric three-phase system is mounted both on the rooftop with a 30 kW array facing southeast, and with a smaller 4 kW array on the upper southwestern wall providing shading on the structure and windows. The net-metered, grid inter-tied system has a 48 volt battery backup. This system allows the Green Institute to sell back power to the utility company on weekends when power use is lower, as well as have an uninterrupted power source with the battery providing 600 amp-hours of backup power to computer, security, and phone systems.