

Audubon National Wildlife Refuge
3275 11th Street NW
Coleharbor, ND 58531
701 / 442 5474
701 / 442 5546 fax
audubon@fws.gov
http://www.fws.gov/audubon/

For State relay service
TTY / Voice: 711

U.S. Fish & Wildlife Service
http://www.fws.gov

For Refuge Information
1 800 / 344 WILD

September 2011



U.S. Fish & Wildlife Service

Audubon National Wildlife Refuge

A "Green" Building Tour

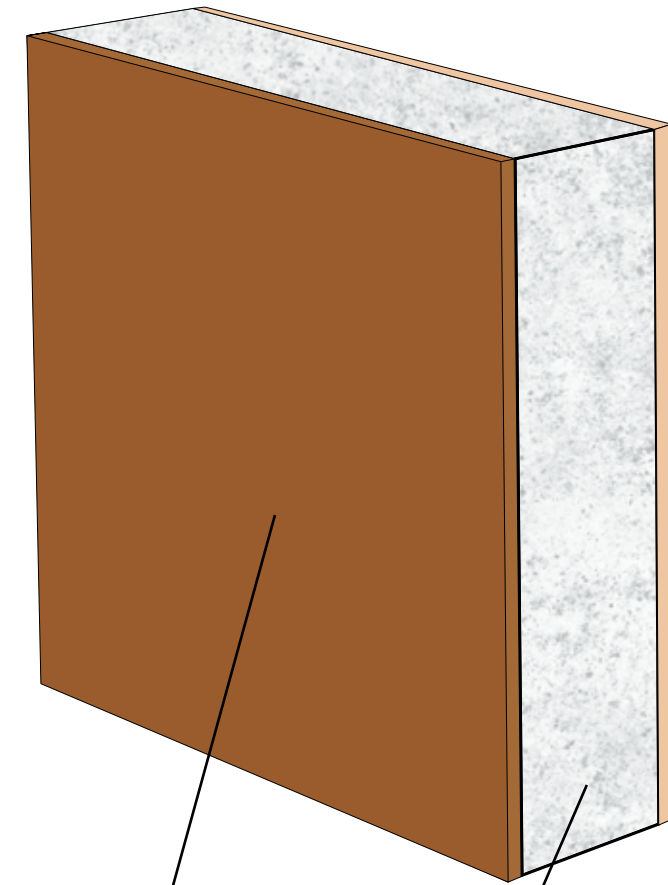
This building earned a Leadership in Energy and Environmental Design (LEED) certification from the U.S. Green Building Council. To earn its LEED certification, the building met a long list of standards for energy conservation, renewable energy production, water efficiency, the use of recycled materials, and indoor environmental quality and control.

Follow the numbered markers to discover the environmentally friendly "green" features of the Audubon National Wildlife Refuge Office and Visitor Center.



1 Structural Insulated Panels

The walls and ceiling of this building are made of structural insulated panels, or SIPs. These panels consist of a rigid foam core sandwiched between two sturdy wooden layers made of recycled wood chips. The panels are strong and quick to install—and they provide airtight, energy-efficient insulation. On the inside walls, the SIPs are covered with gypsum wallboard. On the outside walls, the SIPs are covered with exterior siding and masonry rock.



Exterior sheathing
(oriented strand board)

Rigid foam core
(expanded polystyrene)

2 Low VOC Paint

Many traditional paints and finishes release harmful chemicals into the air, even after they have dried. These volatile organic compounds, or VOCs, are a leading cause of air pollution and indoor toxins. The Audubon National Wildlife Refuge Office and Visitor Center is painted with a new generation of low-VOC paints that are much less harmful to people and the environment.

In addition to the paint, many other elements used in the building are also “low VOC,” including sealants, adhesives, carpeting, furniture, and pre-manufactured wood products such as the SIPs walls.

3 Saving Water

Outdoor landscaping includes the use of native plants that are adapted to the climate and soil conditions of the local area. These plants can thrive without water from an irrigation system. The technique of using native plants that consume less water is called “xeriscaping.”

Inside, all the restroom fixtures are designed to minimize the use of water, from low-flow toilets and urinals to low-flow automatic faucets.

4 A Green Roof

The green-colored metal roof on the Office and Visitor Center is also environmentally green. The roof contains up to 35 percent recycled metal. It is also designed as a “cool” roof that reduces the absorption of solar heat. This helps keep the building cool in the summer, which saves energy by decreasing the need for air conditioning.

5 Passive Solar Energy

Look up to see the large clerestory windows that run the length of the building. These windows allow passive solar energy into the building in the form of heat and light. Ceiling fans push the heat down to help warm the facility during the winter season.

6 Native Refuge Rock

The rocks located along the base of the building and on the large welcome sign in front of the building were gathered from Audubon National Wildlife Refuge and hand-split on site. These rocks were deposited on the landscape as glaciers retreated northward more than 10,000 years ago.

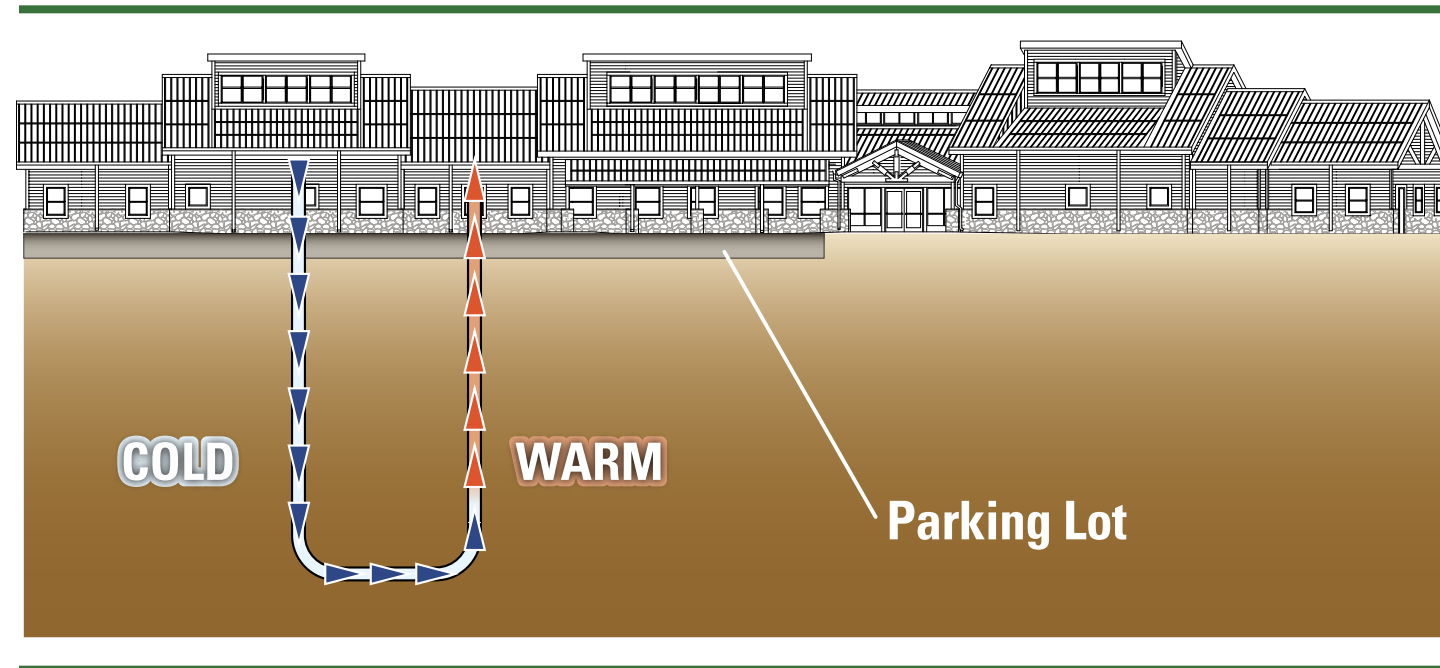


7 Geothermal Heating and Cooling

This building is heated and cooled by an innovative geothermal system. Thirty-two geothermal wells were drilled 200 feet deep and are located under the parking lot. Special piping loops into each well and connects all 32 wells to heat pump units in the building. A mixture of water and propylene glycol is pumped through the plastic piping deep into the ground where the temperature remains at about 40 degrees Fahrenheit throughout the year.

The diagram below shows the geothermal system operating in the winter when the fluid absorbs heat from the warmer ground below and transfers it into the building. During the summer, the system removes heat from indoors and releases it to the cooler ground below.

The geothermal system, combined with the photovoltaic solar panel array system, produce enough renewable energy to cut the buildings’ consumption of energy generated by fossil fuels by more than 25%. They also produce approximately 25% of the buildings’ energy needs.



Accessibility Information

Equal opportunity to participate in and benefit from programs and activities of the U.S. Fish and Wildlife Service is available to all individuals regardless of physical or mental ability. Dial 711 for a free connection to the State relay service for TTY and voice calls

to and from the speech and hearing impaired. For information or to address accessibility needs, please contact the Refuge staff at 701 / 442 5474, or the U.S. Department of the Interior, Office of Equal Opportunity, 1849 C Street, NW, Washington, DC 20240.

8 Photovoltaic Solar Panel Array

Photovoltaics is a method of generating electrical power by converting solar radiation into direct current electricity.

A photovoltaic solar panel array (PV array) is located approximately 300 feet northwest of the office and visitor center. A total of 48 solar panels are mounted on four steel poles and are equipped with tracking systems that adjust the angle and direction of the solar panels to maximize solar energy collection. The energy produced from this PV array is monitored within the building and allows a separate heater to warm the propylene glycol and water mixture for the buildings’ underground geothermal system. This helps the system heat the building at maximum efficiency.

During times when the building uses little electricity, power from the PV array flows back into the power grid. A separate electric meter records this power and provides a power credit for the building.

