U.S. DEPARTMENT OF ENERGY | Legacy Management

Fernald Preserve

Sustainability and Leadership in Energy and Environmental Design (LEED)

Lessons Learned from The Fernald Preserve Visitors Center

Background

- The Fernald Preserve is a former uranium manufacturing facility remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- During the decision-making process related to future land use, the U.S. Department of Energy (DOE) and the community agreed to an undeveloped park with an emphasis on wildlife
- DOE committed to establishing a visitors center to fulfill an informational and educational function within the community

Background – Why Green?

- Executive Orders 13123, *Greening the Government Through Efficient Energy Management*, and 13423, *Strengthening Federal Environmental, Energy, and Transportation Management* related to energy efficiency and environmental stewardship
- Alignment with DOE Orders and DOE Strategic Goals related to energy efficiency and sustainable practices
- Alignment with the purpose of the Fernald Preserve and its mission

Background – What Is Green?

- A green building incorporates sustainable design principles to reduce or minimize the impact to the environment and reduce energy and water consumption
- Sustainable design seeks to reduce negative impacts on the environment and the health and comfort of building occupants. The basic objectives are to reduce consumption of nonrenewable resources and minimize waste while creating a healthy and productive environment.

LEED

- U.S. Green Building Council
- LEED green building rating system

Certification Points

- LEED certification (points possible)
  - Platinum (52–69 points)
  - Gold (39–51 points)
  - Silver (33–38 points)
  - Certified (26–32 points)
- LEED categories (points earned/points possible)
  - Site planning (10/14)
  - Water efficiency (5/5)
  - Energy (13/17)
  - Materials and resources (8/13)
  - Indoor environmental quality (12/15)
  - Innovation and design (5/5)
  - 53 total points earned

Benefits

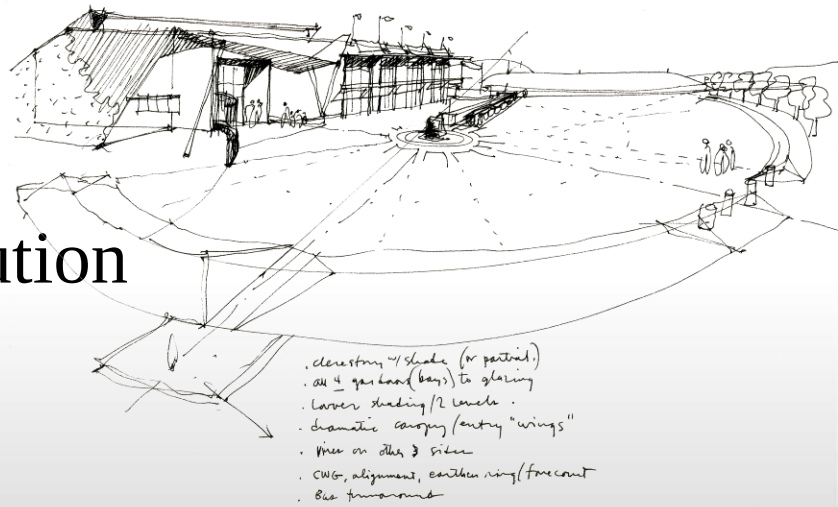
- Environmental
  - Enhances and protects ecosystems
  - Improves air and water quality
  - Reduces solid waste
  - Conserves natural resources
- Economic
  - Reduces operating costs
  - Enhances asset value and profits
  - Improves employee satisfaction
- Health and community
  - Improves air, thermal comfort, and acoustics
  - Minimizes strain on local infrastructure
  - Contributes to overall quality of life

Benefits

- Buildings account for
  - 72 percent of electric consumption
  - 40 percent of raw material use
  - 39 percent of energy use
  - 38 percent of carbon dioxide emissions
  - 30 percent of waste output
  - 14 percent of potable water consumption

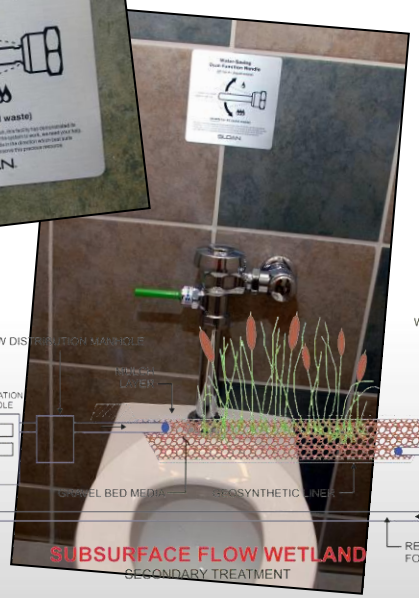
Site Planning

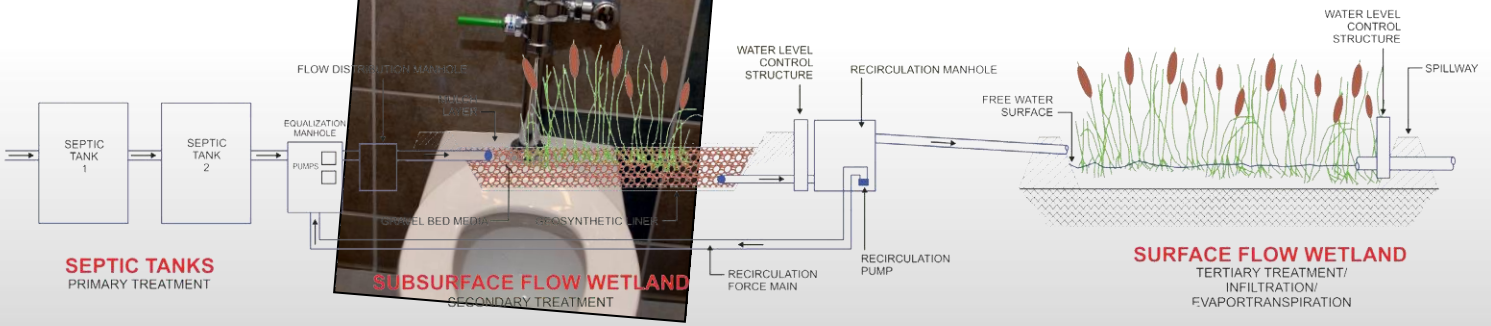
- Brownfield reclamation
- Retained 91 percent of existing structure
- Bike racks and showers
- Hybrid car parking
- Native plants make up 77 percent of the landscaping
- Rain garden
- Light-colored roof
- Reduced light pollution



Water Efficiency

- Native and drought-resistant plants
- High-efficiency plumbing fixtures
- Biowetland





Energy and Atmosphere

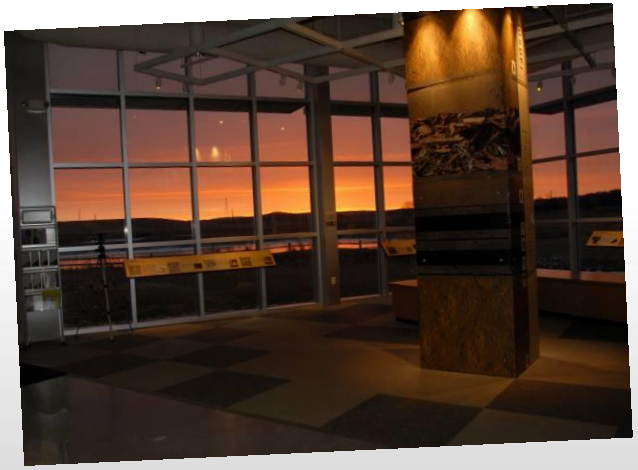
- Ground-source heat pump
- Renewable energy
- Energy usage is 48 percent less than a similar conventional building

Materials and Resources

- 75 percent of waste was recycled or salvaged
- 23 percent of construction costs were for recycled materials
- 43 percent of material costs were for items sourced within 500 miles
- 51 percent of wood-based materials were made of recycled content
- Rapidly renewable materials were used
- Paper, cardboard, metal, plastic, and glass are recycled

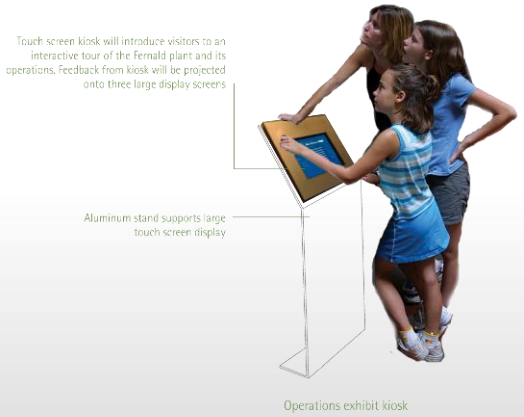
Indoor Environmental Quality

- Natural light and views of the outdoors
- No odorous or irritating building materials
- Heat-producing rooms are ventilated
- Reduced indoor chemicals and pollutants
- Occupancy sensors control lighting



Innovation and Design

- Summer solstice
- Green cleaning program
- Biowetland wastewater system
- Education outreach
- Oversight by a LEED Accredited Professional during construction



Lessons Learned

- Quality control checks by three people resulted in receiving the majority of the credits
- Quality of documentation and service from low-tier subcontractors was problematic
- Instances of lacking specific engineering disciplines necessary to secure LEED credit
- Certification costs were high

Lessons Learned

- Facilities management staff must be a part of the commissioning team from the outset
- Maintenance contracts may be appropriate initially for specialized equipment or operations
- Experiencing approximately a 36 percent reduction in electric usage compared to conventional building construction
- Experiencing approximately a 30 percent reduction in water usage compared to design basis