Sustainability

ARCHITECTURE

REDOOR FENESTRATION

• Features installed to prevent solar heat gain in the summer include roof overhang, pier spacing, motorized sun shading.
• Spacing of the piers and the size of the roof overhang were coordinated through computer simulation of sun travel.
• Solar heat gain in winter is optimized through thermal mass (masonry walls within the Reading Room interior can reduce heating load).
• Insulated glazing with solar tint to minimize heat-gain and UV penetration in summer.
• Extensive external natural lighting reduces energy requirements for artificial illumination.

NEW BUILDING INSULATION

• All existing exterior walls are insulated.

PARTIALLY EMBEDDED IN GROUND

• Nearly 80% of the building addition’s first level has below-grade exterior walls to reduce heating and cooling loads.

NEW INSULATED WINDOWS

• All existing single-pane window glazing were replaced with insulated double-pane glazing with a low-E coating.
• All new windows are insulated, double-pane, and low-E coated.

ASBESTOS ABATEMENT

• All existing fire-proofing and flooring with asbestos material were removed.

REHABILITATION OF EXISTING BUILDING

• Less “new” construction by salvaging the existing building’s structure and exterior walls.
• Less impact on College’s existing context; maintains continuity of campus.

Upjohn Library Commons

Sustainability Initiatives
Sustainability Initiatives

**LANDSCAPE DESIGN**
- Planted hardy, native vegetation that has adapted to the local climate and rainfall.
- Using mulch around plants and trees to retain moisture.
- Existing trees, shrubs and ground covers preserved and protected when possible.
- Planted trees and shrubs that require minimal pruning.
- Landscaped with slow growing, drought tolerant, and native plants.
- Provided shade from vegetation on the east and west sides to cool the building.
- Watering plants during the cooler parts of the day (before 10 a.m. and after 5 p.m.) to minimize evaporation loss.
- Used drip and other high efficiency irrigation devices in lieu of sprinklers.
- Used a vegetative wall for its unique aesthetics and thus minimized the impact of a large poured concrete structure.
- A micro-processor based building management system (BMS) employing direct digital controls (DDC) is provided to monitor, control and optimize the operation of the HVAC systems.

**INTERIOR DESIGN**
- Existing carpet in the facility was “reclaimed” rather than dumped in a landfill.
- All paint products are water-based rather than oil- or solvent-based to minimize VOC’s (volatile organic compounds).
- Woods selected are lyptus and cherry, both harvested from non-endangered forests.

**MECHANICAL ENGINEERING**
- Equipment and systems designed for low life-cycle cost, durability and ease of maintenance.
- The source for building cooling is chilled water produced in the central chiller plant, which utilizes highly efficient electric centrifugal chillers and an ice storage chilled water system.
- Mechanical system is designed with an “economizer” capability, which can reduce or eliminate the need for chilled water during favorable outside air conditions.
- Chilled water and hot water heating are distributed by pumps with high efficiency motors and variable speed drives, and they are ramped up or down to deliver the actual chilled or hot water required to meet cooling or heating demand.
- Outside air ventilation rates meet or exceed ASHRAE Standard 62-1999 “Ventilation for Acceptable Indoor Air Quality.”
- The building energy efficiency meets or exceeds the requirements of ASHRAE Standard 90.2-1999.

**ELECTRICAL ENGINEERING**
- Lighting systems are highly energy efficient, including state of the art T5 and Biax fluorescent lamps and electronic ballasts.
- Daylight control provides for lighting via the campus daylight control.
- Two level lighting switching provides lighting controls in classrooms.
- Occupancy sensors turn off lights automatically when no occupant is present in rest rooms, conference rooms, high-density book storage areas and other areas with a similarly low level of occupant density.
- Lighting panels controlled with motorized breakers for automatic control of lighting circuits.

**CIVIL ENGINEERING**
- Grassed drainage ways along the west end of the building. The Stormceptor helps to reduce water pollution.

**STRUCTURAL ENGINEERING**
- Recycled steel framing, recycled steel rods, and fly ash used in lieu of a certain amount of Portland cement.