

## MISSION STATEMENT:

"As a community of learners committed to historic Christianity, Roberts Wesleyan College seeks to prepare thoughtful, spiritually mature, service-oriented people who will help transform society."

In the spirit of this transformation, the new Golisano Library has been built as an environmentally friendly building.



LEED NC, Version 2.1  
Innovation & Design Process,  
Credit 1.1

Welcome to our  
ECO-DISPLAY,  
Featuring the following:

- 1) An Introduction to LEED and the USGBC
- 2) Green Building Features of the Library
- 3) Resources available to learn more about Environmental Stewardship

Roberts Wesleyan College – Golisano Library

LEO A DAILY 



# LEED<sup>TM</sup>

LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN

Introduction to  
LEED<sup>®</sup>

The Golisano Library is  
designed according to  
LEED-NC-Version 2.1  
Silver Rating..

## Green Building Rating System

### LEED PRODUCTS

- LEED-NC Version 2.1: For new commercial construction & major renovations
- LEED-EB: For existing buildings
- LEED-CI: For commercial interiors
- LEED-CS: For core & shell development
- LEED-H: For homes
- LEED-ND: For neighborhood development

### USGBC:

- U.S. Green Building Council
- Formed in 1993
- Mission: to promote buildings that are environmentally responsible
- Developed the LEED<sup>®</sup> green building rating system under contract to the U.S. Department of Energy
- The first LEED<sup>®</sup> pilot program began in 1998



## PROBLEMS

- Rising energy costs
- Air pollution
- Water pollution
- Global warming
- Greenhouse gases
- Over-population
- Depletion of natural resources
- Rain forest destruction
- Species extinction
- Fossil fuel dependency



## SOLUTIONS

- Energy efficiency
- Water conservation
- Waste reduction
- Pollution prevention
- Recycling/reuse
- Renewable energy & materials

Introduction to  
LEED®

## GLOBAL CONCERNS

- World population:  
  
2.5 Billion in 1950  
6.1 Billion in 2000
- The USA:  
  
Has 4% of the world's population  
Uses 25% of the world's energy
- USA Population:  
  
1900: 75 Million  
1950: 150 Million  
2000: 300 Million

Buildings account for:

- 65.2% of total U.S. electricity consumption
- > 36% of total U.S. primary energy use
- 30% of total U.S. greenhouse gas emissions
- 153 million tons of construction and demolition waste in the U.S. (approx. 2.8 lbs/person/day)
- 12% of potable water use in the U.S.
- 40% of all raw materials use globally

Introduction to  
LEED®

IMPACT OF  
BUILDINGS

Buildings:

- Represent a significant use of land and resources
- Are major contributors to greenhouse gas emissions and global warming
- Generate pollution of land, air, and water
- Are primary users of energy resources

**SOURCE: LEED® Training Workshop**



## What are the benefits of Green Buildings?

- Improves quality of the environment (indoor & outdoor)
- Reduces energy use and costs
- Makes people feel better, do better and think better
- Improves the community
- Demonstrates responsibility & integrity
- Preserves our natural resources
- Doesn't pollute the air, water or land
- Promotes recycling and reuse

Introduction to  
LEED®

BENEFITS OF  
GREEN  
BUILDINGS

### A Green Building:

- Has a positive impact on the environment and the building occupants
- Is constructed of environmentally-friendly materials and methods
- Is energy efficient
- Uses sustainable operation and maintenance practices



1832 projects nationwide are currently “Registered” with LEED®, expressing intent to become LEED® Certified.

Introduction to  
LEED®

LEED® BUILDING  
CERTIFICATION

Score

**LEED® Certified Projects**

The New Dormitory for Pine Ridge School is designed to meet the requirements of a LEED Certified Project

**26-32 points**

**LEED® Silver Projects**

**33-38 points**

**LEED® Gold Projects**

**39-51 points**

**LEED® Platinum Projects**

**52-69 points**

**Nationwide  
(in 2005):**

72

47

51

10

180 Certified  
LEED® Projects

# 6 LEED® Categories

Introduction to  
LEED®

THE LEED® POINT  
SYSTEM

**69 LEED® points  
+7 prerequisites**

8 credits, 14 pts  
+1 prerequisite

3 credits, 5 pts

6 credits, 17 pts  
+3 prerequisites

7 credits, 13 pts  
+1 prerequisite

8 credits, 15 pts  
+2 prerequisites

2 credits, 5pts

SS

WE

Sustainable Sites

Water Efficiency

Energy & Atmosphere

Materials & Resources

Indoor Environmental  
Quality

Innovation & Design  
Process

EA

MR

EQ

ID

LEO A DAILY 

Roberts Wesleyan College – Golisano Library



**restore polluted sites**



**stop cities from sprawling**



**green roof**

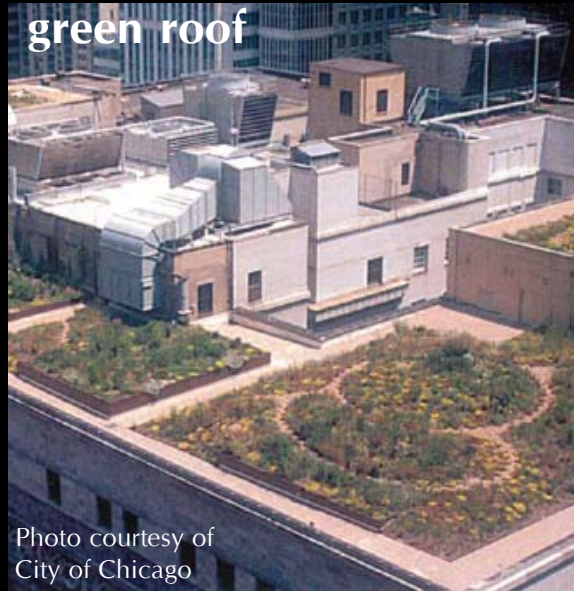


Photo courtesy of  
City of Chicago

**use  
alternative  
transportation**



Introduction to  
LEED®

**SS** SUSTAINABLE  
SITES

Reduce Erosion &  
Control Sedimentation

Site Selection

Encourage Urban  
Redevelopment

Encourage Brownfield  
Redevelopment

Encourage Alternative  
Transportation

Reduced Site  
Disturbance

Stormwater Management

Reduce Heat Island  
Effect

Reduce Light Pollution





Photo courtesy of Clivus  
Multrum Inc.



Xeriscaping at Thermal Conversion Test Facility, Golden, Colo.  
Photo by Warren Gretz, courtesy of DOE/NREL.

**use drought-tolerant plants**



Introduction to  
LEED®

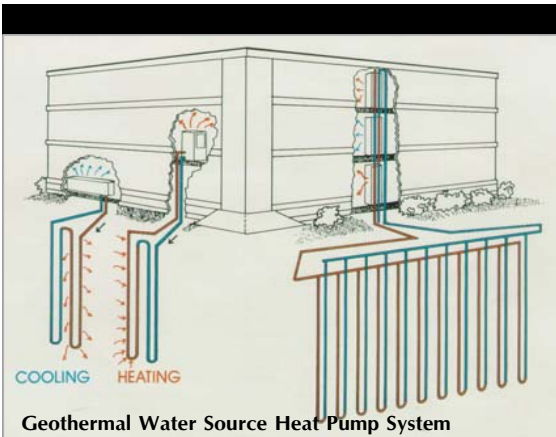
**WE** WATER  
EFFICIENCY

Minimize Lawn &  
Landscape Irrigation

Use Innovative  
Wastewater  
Technologies

Water Use Reduction

Plant drought-tolerant  
landscapes that use  
less water



Lincoln Electric System's wind turbines near Springview, Neb. Photo by Warren Gretz, courtesy of DOE/NREL.



Introduction to LEED®

**EA** ENERGY & ATMOSPHERE

Fundamental Building Systems Commissioning

Reduce Energy Use

Air Pollution & CFC Reduction

Encourage use of Renewable Energy

Additional Commissioning

Reduce Ozone Depletion

Measurement & Verification

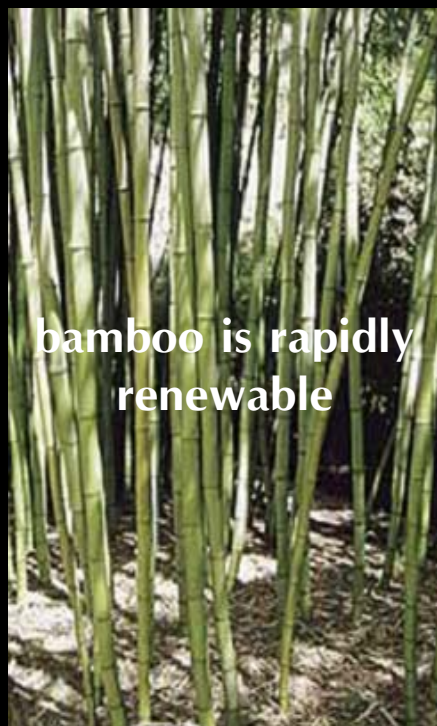
Use Green Power







Photo courtesy of [www.greenbeam.com](http://www.greenbeam.com).



**bamboo is rapidly renewable**



Introduction to LEED®



**MR** MATERIALS & RESOURCES

Storage & Collection of Recyclables

Building Reuse

Recycle Construction Waste

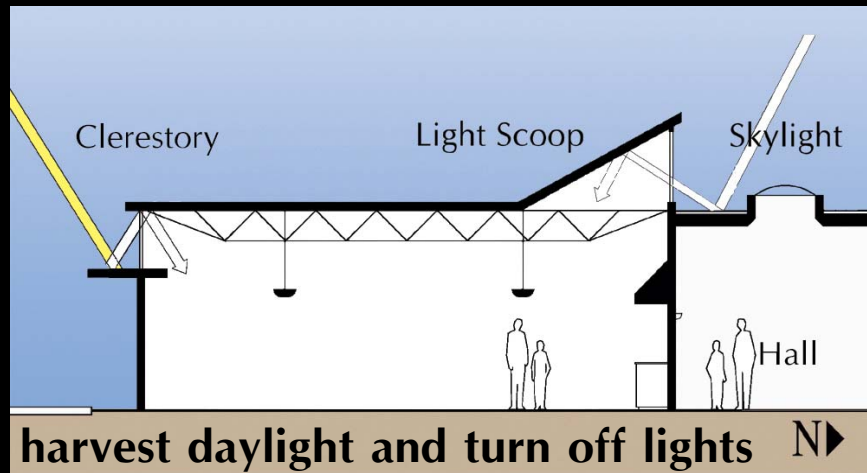
Resource Reuse

Use Building Materials with high Recycled Content

Use Local/Regional Materials

Use Rapidly Renewable Materials

Use Certified Wood



**beware  
of fumes**



Introduction to  
LEED®

**EQ** INDOOR  
ENVIRONMENTAL  
QUALITY

Maintain Indoor Air  
Quality

No Smoking in Building

Carbon Dioxide  
Monitoring

Ventilation Effectiveness

Construction IAQ  
Management Plan

Use Low-Emitting  
Materials

Reduce Indoor Chemical  
& Pollutants

Controllability of  
Systems

Maintain Thermal  
Comfort

Provide Daylight &  
Views

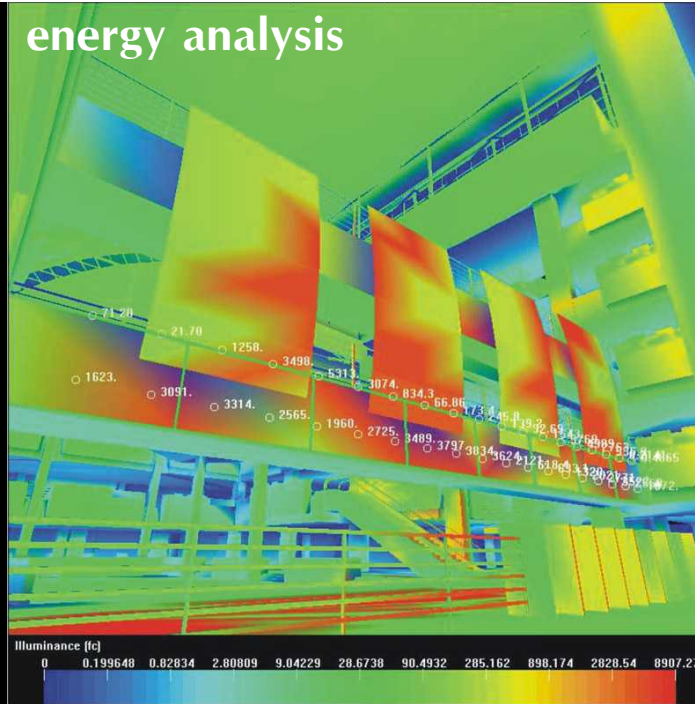






sustainable display

energy analysis



LEED design team

Introduction to  
LEED®

**ID** INNOVATION &  
DESIGN PROCESS

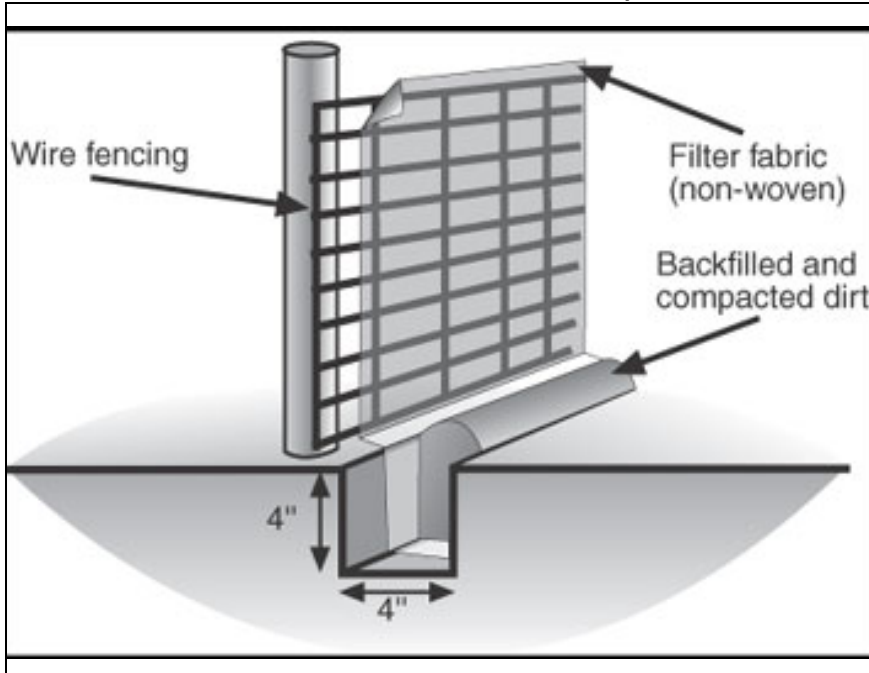
Encourage Innovation  
in Green Design

Educate the Public  
about Green Building

Use Green  
Housekeeping  
Methods

Hire a LEED®  
Accredited Professional

## Green Building Features of the Library



Pictured: Silt fences are used to control dirt from washing off the site.

**Soil Wash-off & Dust During Construction:** (LEED Sustainable Sites, Prerequisite 1)  
During construction of a new facility, grass and roots are removed from the site, and bare earth is exposed to the elements, causing erosion and sedimentation. Rain storms can wash earth away as muddy run-off to pollute local streams and sewers. Winds can blow away dust to pollute the air. To prevent these problems, several measures were taken during construction of the library.

1. A Stormwater Pollution and Prevention Plan was used.
2. Silt fences were used to keep dirt from washing off of the site.
3. In the streets, curb inlets were protected by filter-barriers.
4. The amount of bare earth was kept to a minimum.
5. Dry dirt was watered to keep the dust down.
6. The period of time that bare earth was exposed to the weather was kept to a minimum.



Pictured: A portion of the site prior to building erection was a surface parking lot.

**Careful Site Selection:** (LEED Sustainable Sites, Credit 1)  
The site that was chosen for the new facility had several environmentally friendly features:

1. The site was not prime farmland.
2. The site is located high above the 100 year flood plain.
3. The land was not habitat for any endangered wildlife.
4. The site is not located near any wetlands.
5. The land was not previously used as parkland.



## Green Building Features of the Library



Pictured: Bicycle racks located around campus for students to use.

### Use Bicycles More:

(LEED Sustainable Sites, Credit 4.2)

Staff and students are encouraged to use bicycles, for a healthier life & to reduce car exhaust pollution & fuel consumption :

1. A secure bicycle storage rack is provided.
2. Showers and clothes changing areas are available within 200 yards of the building.
3. These bicycle accommodations are provided for more than 5% of the building occupants.



Pictured: Reserved parking for carpools

### Use Cars Less:

(LEED Sustainable Sites, Credit 4.4)

To reduce air pollution, gasoline usage and land use devoted to parking lots, we must reduce the use of cars and maximize carpooling and vanpooling:

1. The number of car parking stalls provided is kept to a minimum and parking lots are shared with adjacent buildings.
2. Preferred carpool/vanpool parking stalls are provided for 5% of the building occupants.

## Green Building Features of the Library



Pictured: Open space on campus adds to the beauty of the campus and reduces the environmental impact.

### Greenspace Is Good :

(LEED Sustainable Sites, Credit 5.2)

Natural greenspace and landscaped areas occupy over 50% of the library property.

1. Hard surfaces, buildings & paving have been kept to a minimum on the property.
2. The open spaces and green spaces on the library property have been designated and will be conserved for the life of the building.



Pictured: Stormwater from the library is diverted to a storm water detention basin similar to this one.

### Minimize Stormwater Runoff and Remove Pollutants:

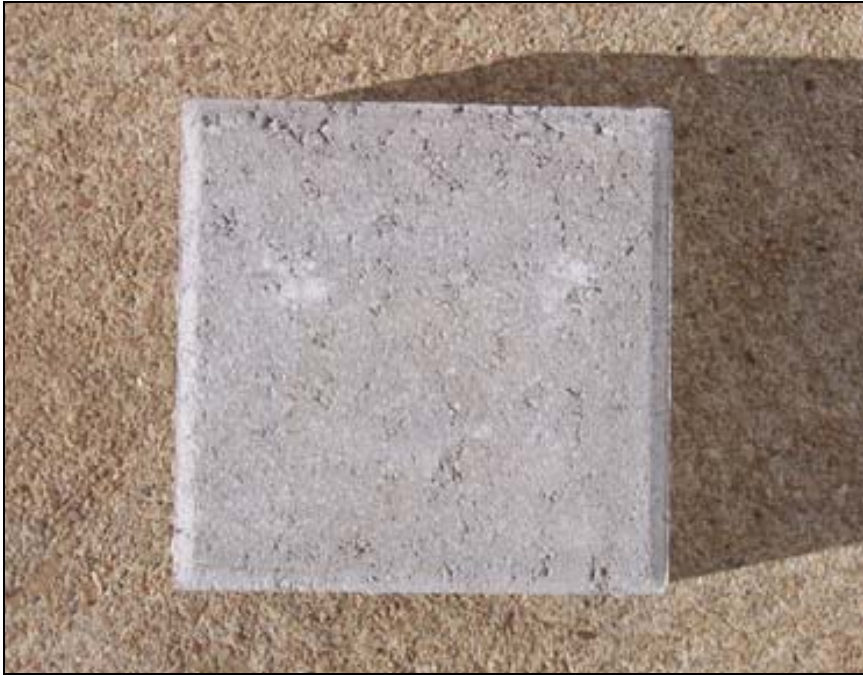
(LEED Sustainable Sites, Credit 6.1& 6.2)

With the construction of the new library facility, stormwater runoff from the site is reduced in rate and quantity.

1. A detention basin has been constructed which collects stormwater from the site and discharges it slowly over a period of time.
2. Stormwater runoff from the site has been decreased by 25%.
3. This, in turn, reduces pollution and flooding of our natural water flows, streams and rivers.
4. Our detention basin catches stormwater and temporarily holds it to allow for the settlement of solid pollutants out of the water.



## Green Building Features of the Library



Pictured: Light colored concrete pavers installed at front entry walk.

### **Avoid Heat Build-up:**

(LEED Sustainable Sites, Credit 7.1)

People and wildlife habitat can be hurt by heat build-up caused by man-made surfaces that absorb heat and make the surroundings hotter than normal. Light-colored materials reflect heat away, while dark-colored materials absorb heat. The new library project was designed to minimize this heat build-up problem by using the following strategies:

1. Light colored concrete sidewalks and driveways were installed.
2. Trees were planted to provide shade.



Pictured: Exterior lighting does not up light the library.

### **Stop Light Pollution at Night:**

(LEED Sustainable Sites, Credit 8)

Lights that shine into the night-sky and onto neighboring properties can hurt nocturnal animal habits, and night-time bird migratory paths. The new library project addressed this problem:

1. The project's exterior lights are designed to shine light down onto the property. These lights do not shine up into the night-sky or out onto neighboring properties.

## Green Building Features of the Library



Pictured: Once established the landscaping, including this Doublelife Shasta Viburnum, will not require regular watering or a permanent irrigation system.

**Water Efficient Landscaping:** (LEED Water Efficiency, Credits 1.1 and 1.2)  
The new library does not use water for irrigation of any planted landscape areas on the property.

1. All plantings were selected to be either drought resistant or native species.
2. No permanent landscape irrigation system is installed.
3. This has resulted in a dramatic reduction of potable water use for the project.



Pictured: Dual flush fixture reduces water usage.

**Reduced Indoor Water Use:** (LEED Water Efficiency, Credits 3.1 and 3.2)  
Water efficient plumbing fixtures have been used throughout the interior of the new library. This has resulted in dramatic reduction in the amount of water use, and also reduced amounts of waste-water generated by the facility.

1. Waterless urinals are installed.
2. Water efficient dual-flush toilets are installed.
3. All lavatories and sinks have photo-sensor automatic water turn-off valves and low-flow aerator faucets.
4. All janitor sinks are low-flow.



## Green Building Features of the Library



Pictured: A person checking over the mechanical equipment.

### Check The Mechanical System:

(LEED Energy & Atmosphere, Prerequisite 1)

Checking over the building's mechanical system is important to ensure that it is running properly. This is called "Commissioning" the building systems. Just like a car engine that is running badly because it is not "tuned-up", the building systems can run poorly if they are not adjusted properly for peak energy efficiency. Commissioning the new library systems included the following:

1. Review of the building systems to see that they were installed properly.
2. Keeping a record of the operating instructions for the building systems.
3. Putting together a commissioning plan & report.
4. Doing tests to make sure that the building systems were running properly & saving energy.



Pictured: Rigid insulation helps insulate the building and lowers the energy demand for heating and cooling the library.

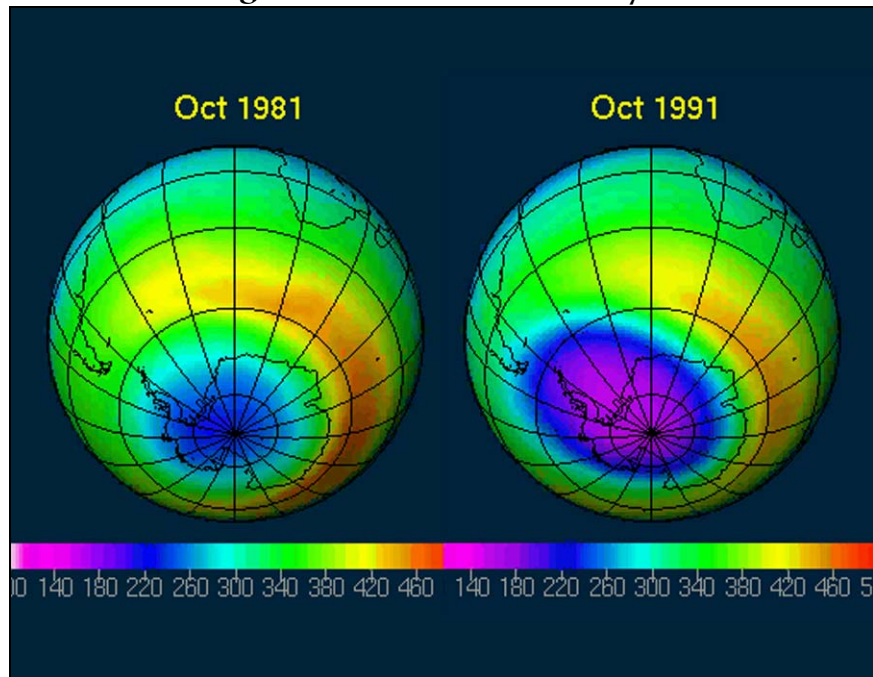
### A Building that Saves Energy:

(LEED Energy & Atmosphere, Prerequisite 2)

Just like a gas-guzzler car that gets 10 Miles Per Gallon, a poorly designed building can waste a lot of energy. Just like an energy efficient car that gets 45 miles per gallon, the new library building is very energy efficient. A major energy saving feature that has been built into the new library is that it is well insulated. This insulation keeps heat inside the building during the cold winter, and keeps the cool air-conditioned air inside during the hot summer.

1. The roof has 25% more insulation than a typical building.
2. The outside walls have twice the insulation of a typical wall.
3. The windows have twice the insulating value of standard windows.

## Green Building Features of the Library



Pictured: The growing ozone hole in the atmosphere at the South Pole.

### An Air Pollution Problem:

(LEED Energy & Atmosphere, Prerequisite 3)

A world-wide problem is partly caused by the way we build our buildings. Ozone in our atmosphere is an important gas that helps to keep our planet healthier. By acting just like a giant pair of sun-glasses, ozone prevents the sun's harmful ultra-violet radiation from entering our atmosphere and hurting people and wildlife. A common building practice has been to use a harmful gas, called CFC (chlorofluorocarbon) in refrigeration equipment. CFC's are air pollutants that are causing the ozone to disappear from our atmosphere. Our new dormitory was built to reduce the ozone depletion in our atmosphere.

1. No harmful CFC gasses are used in the new library. All are environmentally friendly.



Pictured: The geothermal well during installation.

### More Energy Savings:

(LEED Energy & Atmosphere, Credit 1)

By saving energy, new buildings can reduce the use of natural gas, coal, and other fossil fuels. This also means that there is less pollution of our air, water, & land. An added benefit is that an energy efficient building costs less to operate. The new library building is 35% more energy efficient than a typical building, and here are more reasons why:

1. Energy efficient mechanical equipment went into the building.
2. A geothermal well field was installed, which borrows energy from deep underground, to help heat the building in the winter, and to help cool the building in the summer.
3. Before construction began, the energy efficiency of the building was compared to a typical building with a computer simulation test.



## Green Building Features of the Library



Pictured: A wind-powered electric generator.

### **Green Power:**

(LEED Energy & Atmosphere, Credit 6)

“Green Power” is electricity derived from solar, wind, geothermal, bio-mass or low-impact hydro sources. These electricity sources make use of renewable energy strategies that are non-polluting and are not generated from fossil fuels.

1. The university has contracted with the local utility company to purchase 50% of the new library’s electricity needs from a “Green Power” source.



Pictured: Convenience locations of recycle bins encourages recycling.

### **Recycling:**

(LEED Materials and Resources, Prerequisite 1)

Recently, we have become aware that many of the things that we throw away have value & can be re-used, or recycled. There are many benefits to recycling. Garbage waste can be reduced, which reduces pollution of our land. Our factories can reduce the mining and reduce harvesting of our natural resources if they can use recycled materials to make new products. Energy can be saved.

1. In the new library, students recycle glass, paper, corrugated cardboard, plastics, and metals.
2. A specific storage room area in the library is designated as a collection point, and storage bins are provided for each recycled material.
3. Recycling baskets are provided in public spaces, study rooms, and staff rooms.

## Green Building Features of the Library



Pictured: A construction waste recycling dumpster.

### **Recycle Construction Waste:**

(LEED Materials & Resources, Credit 2.1)

Building constructions generate a large amount of construction waste. In the past, this construction waste was taken directly to landfills, contributing greatly to the pollution of our land and the continued depletion of our natural resources. New strategies now exist to recycle construction waste.

1. During the construction of the new library, a construction waste management plan was implemented.
2. More than 50% of the construction waste generated was either recycled or salvaged for other use.



Pictured: Much of the building structure is made from recycled steel.

### **Building with Recycled Materials:**

(LEED Materials and Resources, Credit 4.1)

Many construction products are made from recycled materials. Second-hand steel is melted down and re-used to manufacture new steel beams and columns. Aluminum pop cans can be melted down and used to make aluminum window frames and door frames. Ash from coal burned in power plants can be reused as part of the wet mix for concrete footings and floors, sidewalks and streets. These and other recycled materials can dramatically reduce our need for mining and harvesting of new raw materials that are used to make new construction products.

1. 5% of our new library is made from recycled materials.



## Green Building Features of the Library



Pictured: Local materials are manufactured within a 500 mile radius of the project site.

### Use Local Building Materials: (LEED Materials and Resources, Credits 5.1 and 5.2)

Local products were used to build the new library, including bricks, concrete, wood, & windows. This has provided a much needed boost to the local economy. Also, the reduced amount of gasoline required to transport local building materials to the site has resulted in reduced exhaust pollution & protection of our natural resources. For the library, the project team set a goal of:

1. 20% of the building materials that have come to the site were manufactured within a 500 mile radius.
2. 50% of the library project's building materials make use of raw materials that were either extracted, harvested or recovered from within a 500 mile radius of the site.



Pictured: Only the bark of the tree is harvested for cork.

### Rapidly Renewable Materials:

(LEED Materials & Resources, Credit 6)

More than 5% of the construction materials used in the new library are “rapidly renewable” materials. We are running out of our “finite” raw materials (example: aluminum produced from mined bauxite) and harvested materials with long growth cycles (example: old growth hardwoods). Rapidly renewable materials come from plants that have short growth cycles (examples: bamboo, wool, wheat, straw, linseed, poplar wood, cotton and others). Rapidly renewable materials and products that have been used in our new library building include:

1. Floors made from cork.
2. Cabinetry made from sunflower seed shells.
3. Linoleum counter tops made from linseed.

## Green Building Features of the Library



Pictured: Fresh air, clouds and blue sky

### Indoor Air Quality:

(LEED Indoor Environmental Quality, Prerequisite 1)

The comfort and well-being of the students and staff of the new library depends upon having plenty of fresh air available inside the building.

1. A ventilation system is installed in the building that provides the required amount of fresh air into the interior of the building to keep everyone comfortable.



Pictured: A person crumpling up a pack of cigarettes.

### No Smoking!

(LEED Indoor Environmental Quality, Prerequisite 2)

Smoking in the building is harmful to yourself and to others.

1. The new library has a NO SMOKING policy inside the building. A designated smoking area is provided outside the building for people 18 years of age or older. This area is located well away from the Entrance doors.



## Green Building Features of the Library



Pictured: Installed duct work is protected from construction dust.

### **Clean Construction Air:** (LEED Indoor Environmental Quality, Credit 3.1 & 3.2)

It was important to keep the air clean inside during the building construction.

1. The contractor followed the guidelines to accomplish this during construction, including: provision of face mask protection from fumes for workers, provision of fresh air to the building interior, and regular filter changes for the ventilation system.
2. Also, before the new building was occupied, it was thoroughly cleaned and flushed-out with fresh air to remove contaminants from the interior and air.



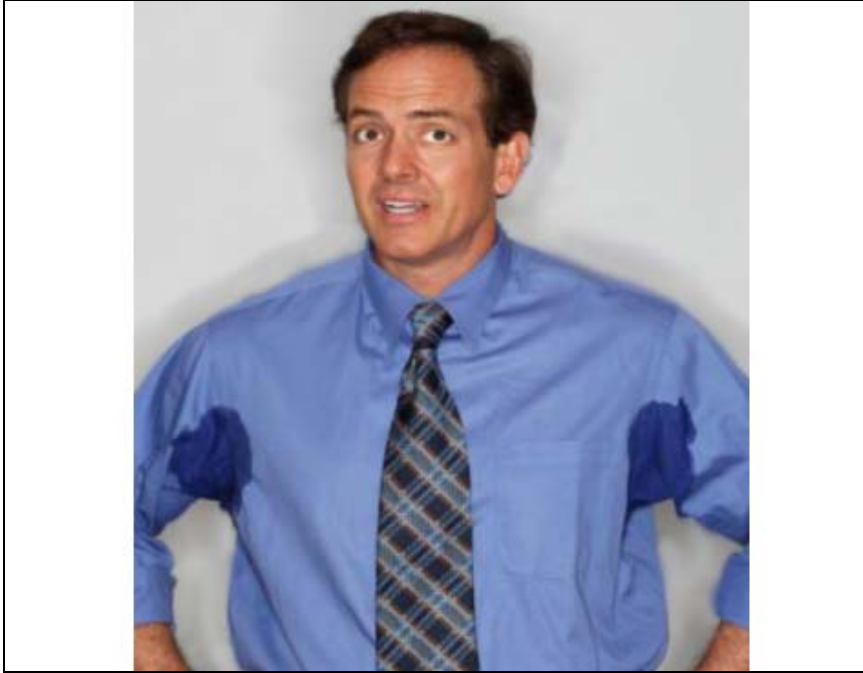
Pictured: Paints and glues can pollute the air with fumes.

### **Harmful Odors:** (LEED Indoor Environmental Quality, Credit 4)

Many materials that are installed in the interior of a build can give-off odors and pollutants into the air. These contaminants can sometimes irritate and harm your eyes, lungs, throat and skin. Measures were taken to minimize these pollutants in the library building.

1. Glues, paints & sealants, used in the new dorm were chosen that did not have harmful off-gasses.
2. Carpets and plywoods were also carefully chosen so as to not add harmful fumes to the indoor air.

## Green Building Features of the Library



Pictured: An uncomfortable person in a hot and humid environment.

### **Thermal Comfort:**

(LEED Indoor Environmental Quality, Credits 7.1 and 7.2)

A thermally comfortable environment supports the productivity and well-being of a building's occupants

1. This is accomplished in our new library through the installation of properly controlled and monitored HVAC (Heating, Ventilation and Air Conditioning) systems and equipment.
2. Both temperature and humidity controls are in place to keep the interior environment of the new library within the established boundaries of human comfort.



Pictured: A nice view to the outdoors through a window.

### **Views to the Outdoors:**

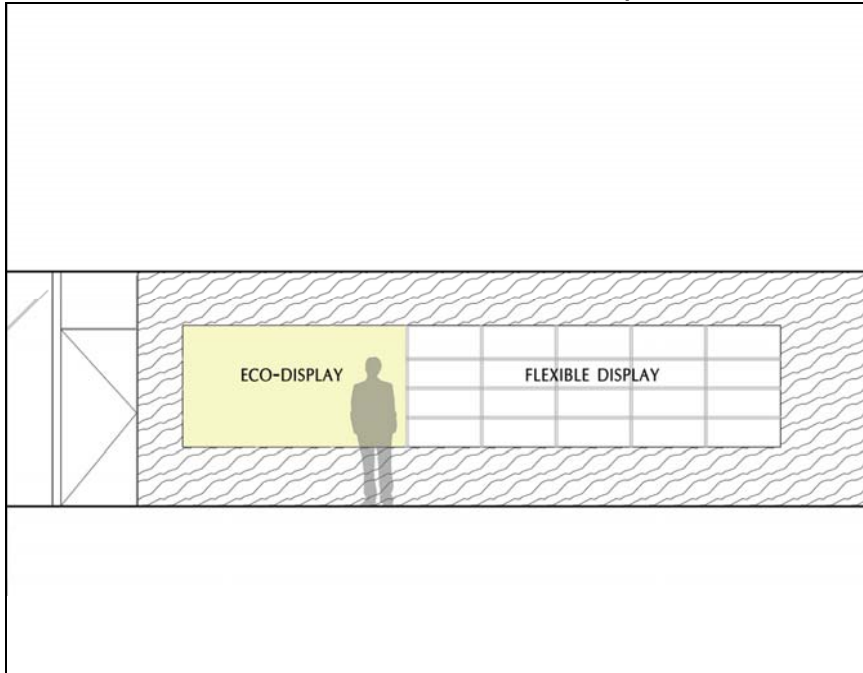
(LEED Indoor Environmental Quality, Credit 8.2)

It has been statistically proven that building occupants that have access to windows, daylight and views to the outside perform their tasks 10 to 20% better than people who are in windowless environments.

1. More than 90% of the regularly occupied spaces in the new library have been provided with exterior windows that provide daylight and views to the outdoors.



## Green Building Features of the Library



Pictured: Concept sketch of the Eco-Display.

### **Spread the Good News!**

(LEED Innovation & Design Process, Credit 1.1)

Now that you have a new GREEN building on your campus, it is important to use your building as a teaching tool to promote environmental awareness.

1. That is why you have a new Eco-Display in the lobby.
2. The Eco-Display describes the LEED & GREEN BUILDING programs.
3. The GREEN features of your building are described.
4. The Eco-Display also has a panel describing what new information sources, books, and publications are available to those who wish to explore and research environmental and sustainability issues more thoroughly.



Pictured: Re-use of existing conference table and chairs.

### **Sustainable Furnishings:**

(LEED Innovation & Design Process, Credit 1.2)

Environmental concerns were a vital part of the interior design strategies that went into the selection of the furnishings for the new library.

1. Previously used furniture was re-used including table and chairs in the cafeteria and historical conference room
2. All manufacturing plants that supplied the library with new furniture were required to be Green Build certified.
3. Environmental friendly materials were used in the construction of all new furniture, including fabrics and frames made from recycled materials, fabrics made from natural fibers, and new furniture made from durable long-life products.

## Green Building Features of the Library



Pictured: A GREEN janitorial clean-up in progress.

### **Green Housekeeping:**

(LEED Innovation & Design Process, Credit 1.3)

Cleaning and Housekeeping have traditionally been done with harsh chemicals that are hazardous to touch or breathe.

1. Your new library is now conducting a Green-Clean housekeeping program which uses cleaning products & chemicals that are environmentally friendly and not toxic.



Pictured: The Leo A Daly LEED Accredited building design team.

### **The Green Team:**

(LEED Innovation and Design Process, Credit 2)

1. Your new library has been designed by a team of LEED Accredited Professionals, working with the Contractors and the staff of Roberts Wesleyan College - Golisano Library.



Interested in more information on Green Building?

Visit [www.USGBC.org](http://www.USGBC.org)

Join your local USGBC chapter

Subscribe to Environmental Design & Construction Magazine - it's FREE

- See [www.EDCmag.com](http://www.EDCmag.com)

Introduction to  
LEED®

LEED® & You