

# Sustainability

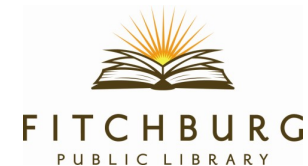
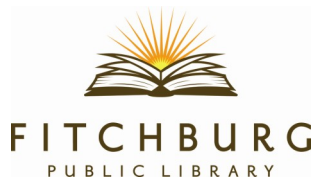
at the Fitchburg Public Library



## Sustainability

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A guide to the sustainable features of the Fitchburg Public Library.



# Sustainability

## at the Fitchburg Public Library

When designing and constructing the building, sustainability was a major concern. This means that the building was planned and built with future generations in mind, by conserving resources, limiting pollution and waste, and encouraging local sustainable growth.

Use this guide to see how the building accomplished these goals. You will see examples of materials, design elements and operating practices throughout the building that exemplify sustainable behavior. You are encouraged to use any of these techniques to inform your own sustainable behaviors.



# Construction

### On-site recycling

In order to decrease the amount of waste sent to the Dane County Landfill, special care was taken during construction to separate materials to be recycled. Over 77% of the debris created (including wood, cardboard, metal and drywall) was reused or recycled.

### Erosion Prevention

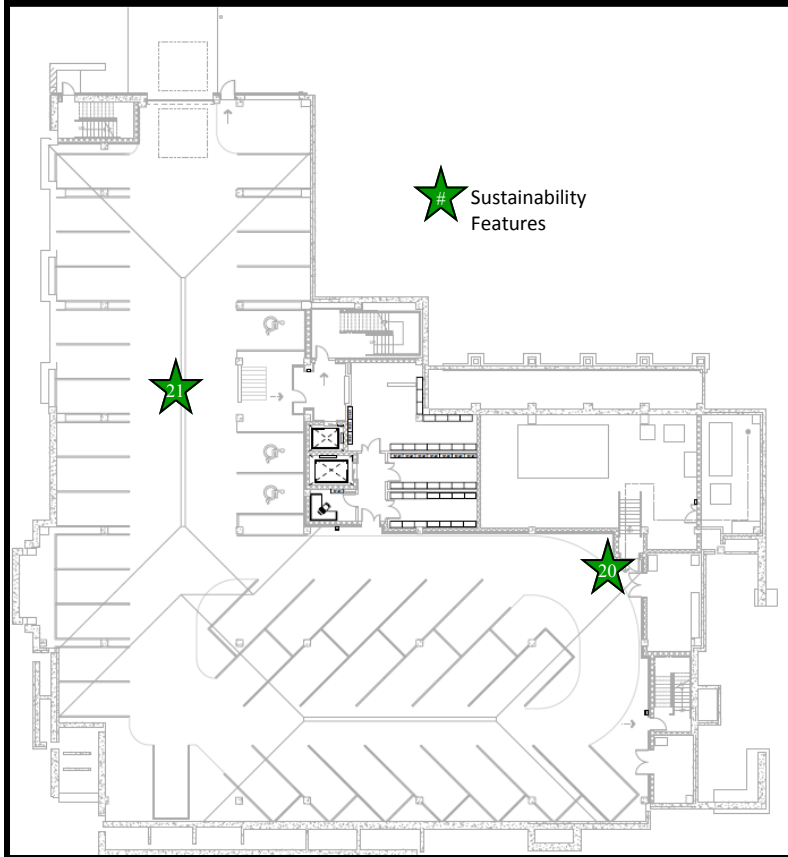
Erosion during construction can send sediment and pollutants to our natural waterways, which decreases water quality and increases the chances for floods. By protecting the boundaries of the site with check dams, much of the sediment that would have eroded into our local waterways was kept intact on site.

### Low-emitting materials

Materials with low emissions of Volatile Organic Compounds (VOCs) were used during construction to protect the health of construction workers and occupants of the building. For example, all of the composite wood used had no added Urea-Formaldehyde, which can cause respiratory problems, allergic reactions, and has been connected to cancer.



# Lower Level



## 20. Geothermal Heat Pumps

These pumps run the propylene glycol through the geothermal field outside. The system is closed-loop, so all of the fluid leaving the building comes back.

## 21. Low-power Lighting

The lighting fixtures in the parking garage provide only what is necessary for the area. These low-power, LED lights conserve electricity.



## At a Glance

**The building will use 40% less water** than traditional libraries, thanks to high efficiency fixtures.

**The building will use 34% less energy** than traditional libraries because of a geothermal heat system, efficient appliances, and other design features.

**Over 77% of construction waste was recycled** because of high attention to detail and smart planning during the construction phase of the project.

**Over 22% recycled materials were used** in all of the building.

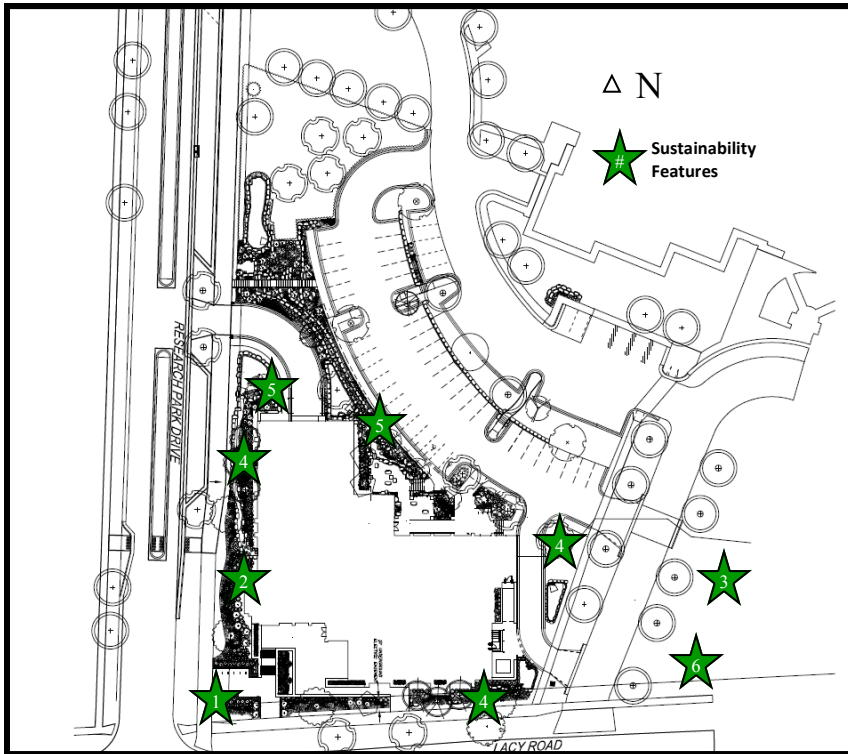
**Over 23% of the materials were local**, coming from 500 miles away or less.

**Over 94% of the wood use was FSC (Forestry Stewardship Council) Certified**, meaning it came from sustainably managed forests.

**No irrigation is needed** after 18 months of establishing plants, thanks to native and drought-tolerant landscaping.

**The building is designed to last 100 years or more**, and is designed to be a LEED Gold building.

# Site Conditions



## 1. Bike Access

The Library is a wonderful place to access by bike. There are 20 spots to park bikes within 25 yards of the building, and 10 spots in the underground parking. Visitors and workers can bike to the building from the Capital City Trail and Gunflint Trail.

## 2. Water-efficient Landscaping

Native and drought-tolerant plants were used in the landscaping so that irrigation won't be necessary after the first 18 months. Composted mulch contains moisture longer and reduces landfilled waste. These actions save water and money while keeping a beautiful landscape.

## 15. Ceiling Fans

The large ceiling fans keep air circulating in the high-ceiling atrium. This helps to regulate the temperature of the room and reduces the heating and cooling load for the room.

## 16. Clerestory Windows

These windows are triple-paned, giving them a lower "U-Factor\*," which means they let out little heat while still letting in daylight to light the room. Having high windows allows light to come in without gaining too much heat.

## 17. Sustainability Collection

We have a special collection of books on sustainability and environmental issues. Come here for sustainable living tips for cooking, home improvement, and other lifestyle elements or to learn about sustainability in general.

## 18. Watt-meters

The library has a limited amount of watt-meters available for borrowing. Use a watt-meter to find devices in your home that you might want to shut off more frequently or upgrade to be more energy efficient.

## 19. White Roof Pavers

These white pavers reflect sunlight rather than absorbing it like traditional black asphalt or tar roofs. This reduces cooling costs in the summer. Elsewhere on the building, white roofing material does the same job as these pavers and will reflect sunlight to increase the efficiency of future solar panels going on the roof.

### \*U-Factor?

The "U-Factor" of windows shows how fast heat is lost through the windows. The lower the U-Factor, the better the window is at insulating. Typical windows at the Library have U-Factors of ~0.4, and the clerestory windows have a U-Factor of 0.22.

# Upper Level



## 13. Occupancy Sensors

The occupancy sensors in this room allows the lights to be turned off and the temperature of the room less conditioned while no one is using it, saving energy and money.

## 14. Radiant Heat Floor

The heat from the geothermal system is transferred through the floors of the entry and upper levels to heat the building. Heat rises through the floor to where the people are, on top of the floor, rather than out through heating vents in the walls and directly to the ceilings. This also evens out the heat, making it more comfortable. This system is also used on the Entry Level.

## 3. Open Space

40% of the site area is vegetated or open space. For many buildings, this is below 20%. Having more open space allows more water to infiltrate the ground rather than running off to storm sewers.

## 4. Rain Gardens

These rain gardens help catch storm water before it runs off to the sewer system, and also remove the sediment in the water. A variety of plants were chosen, and their deep root systems allow water to infiltrate 10-20 feet into the ground.

## 5. Bio-retention Ponds

The two bio-retention basins gather large amounts of storm water and allow sediments to settle out instead of allowing the water to run onto the streets and into the sewers and eventually to natural water bodies.

## 6. Geothermal Wells

This system uses the constant underground temperature of the earth (around 55°F) to help heat and cool the building. A set of pumps in the basement sends a special liquid called ethylene glycol through a series of heat wells on the site. The wells were bored 400 feet into the ground. During the winter, cold liquid is sent down to be warmed up by the earth, and during the summer the warm liquid is sent down to be cooled by the earth. The returned liquid then helps to either cool or heat the building.



# Entry Level



## 7. High Efficiency Fixtures

The toilets, urinals and sinks in the restrooms are high efficiency fixtures. These simple measures and others reduce water consumption for fixtures by 40% compared to using conventional fixtures.

## 8. View of Pervious Asphalt

The parking spaces on Research Park Dr. are made with pervious asphalt. This material allows water to percolate down into the ground instead of running off directly to the street sewers. The spaces are also angled to take up less space. Check out this view during a storm to see it in action!

## 9. Daylighting Controls

These windows have shades on the outside that block the sun when it is high in the sky in the summer but allow the sun to come in when it is low in the sky during the winter. This helps to reduce heating and lighting costs.

## 10. Concrete Deck Floors

By using concrete deck floors instead of steel joist floors, heat gained during the day from sunlight is released to rooms more slowly and helps keep the building warmer at night.

## 11. View of Electric Vehicle Charging Station

This electric vehicle charging station, donated by Madison Gas and Electric, allows visitors and employees with hybrid or electric vehicles to charge their cars. Multiple cars can be charged at once.

## 12. View of City Hall Solar Installations

Though not part of the Library project, this spot is one of the best views of the solar installations on City Hall. There are 12 solar thermal panels, which are upright. These panels help to heat hot water for the building and reduce the use of natural gas. Below those panels, flat on the roof, are 64 solar PV (photo-voltaic) panels that produce electricity.

