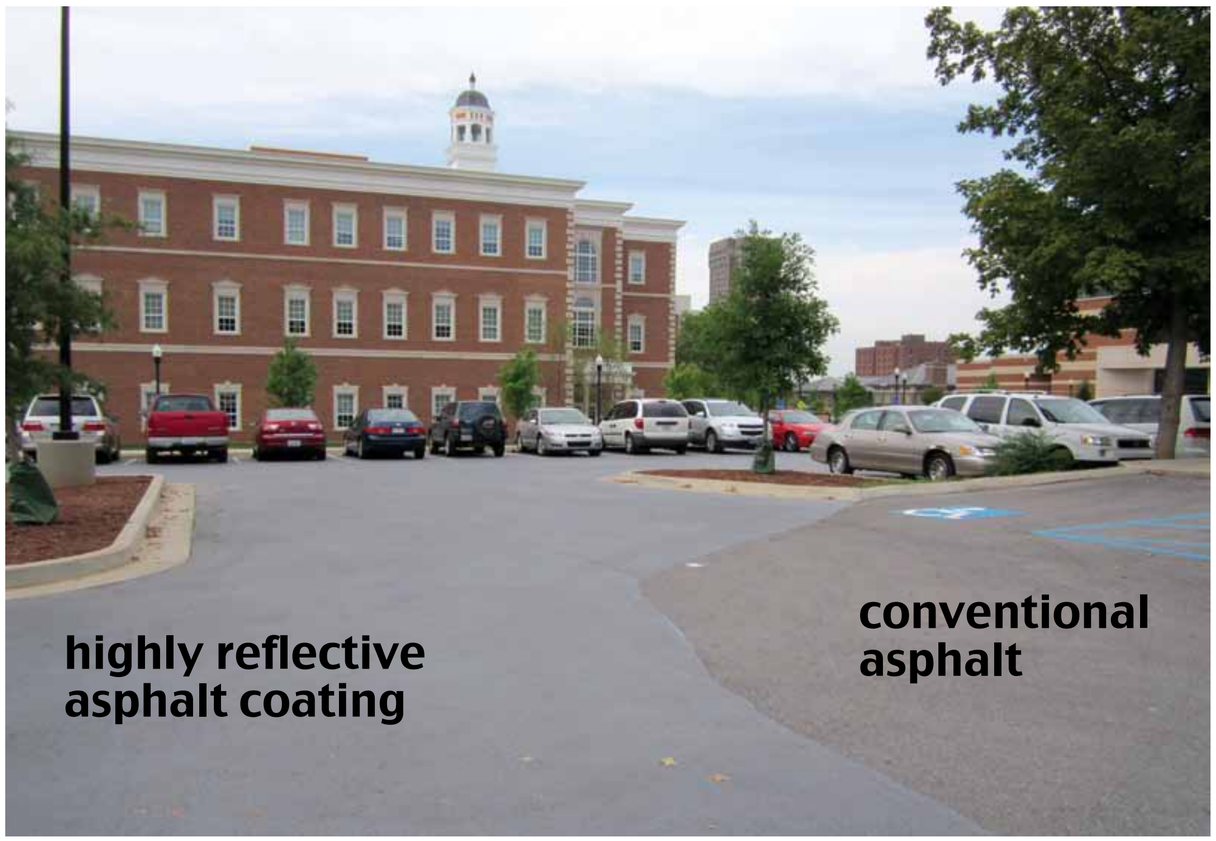
Mimosa Parking Lot



WKU Parking and Transportation Services is supporting sustainability efforts on campus by using design features in parking lots which reduce storm water run-off, the "heat island" effect, and energy consumption.

Reduce Heat Island Effect

The "heat island effect" is caused by asphalt absorbing heat of the sun during the day and releasing it at night. In urban areas, the heat island effect changes micro-climates, and in large urban areas, it can actually change weather patterns.

To reduce the heat island effect, a highly reflective coating is applied to the asphalt. The coating reflects the sun and heat energy so that it is not absorbed by the asphalt.

In 2010, the Mimosa and Minton parking lots were treated with a reflective coating to reduce the heat island effect. This contributed to the LEED status of Gary Ransdell Hall.

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WKU Green Tour

Chestnut Street North Parking Lot

Reduce Storm Water Run-Off

Storm water run-off from asphalt parking lots carries oils and other contaminants into area streams. It also contributes to erosion by increasing the volume and speed of water flowing into urban streams. By incorporating design elements into parking lots which reduce storm water run-off, we therefore reduce water pollution and erosion.

Design features which reduce storm water run-off include:

- **Permeable concrete –** Rain water infiltrates the concrete and is stored below the parking lot until it seeps into the groundwater.
- **Landscape islands** reduce the surface area in parking lots, replacing the impermeable asphalt with soil. Rain water can be stored in the soil, used by plants, and filtered on its way to the water table.
- **Rain gardens** or swales capture rainfall, store that water to nurture plants, and cleanse runoff. Rain gardens often feature native plants.

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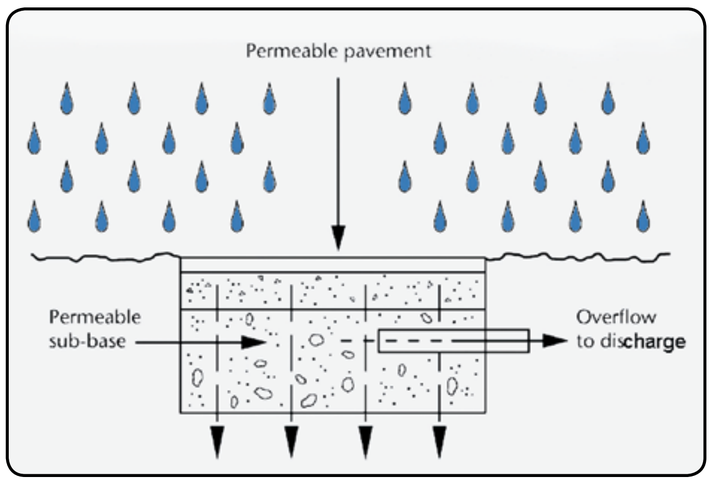
Photograph by WKU Photojournalism student Emily Twardowski



In 2009, the Chestnut Street North Lot was completely reconstructed. Storm water run-off was reduced by 47% through the use of Landscape Islands and Permeable Concrete.

Permeable Concrete, Landscape Islands and Rain Gardens were used to reduce storm water run-off in the Adams Street and University Boulevard lots as well.

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WKU Green Tour

Parking Structures

WKU Parking and Transportation Services is supporting sustainability efforts on campus by using design features in parking lots which reduce storm water run-off, the "heat island" effect, and energy consumption.

Reduce Energy Consumption:

While keeping parking lots well lit is important for personal safety, it is a significant consumer of electricity on campus. Energy consumption in parking lots is reduced by:

- Closing parking lots and turning off lights when they are not in use.
- Using high efficiency fluorescent and LED lighting systems.

In December 2008, as part of a "conservation vacation", several parking lots around campus were closed and lights turned off. This practice continues today when classes are not in session or when parking lots are not being used.

In 2010, lighting fixtures in Parking Structures 1 and 2 were replaced with high efficiency fluorescent, LED, and fiber optic lighting as part of the Energy Savings Performance Contract project across campus. The new lighting reduced the electrical usage by 54% saving 802,575 kWh annually. The project improved safety while using far less energy.

Photo credits to WKU Photojournalism student Emily Twardowski

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WKU Green Tour

Rainwater Collection

Rainwater Collection

This garden is irrigated with rainwater collected from the top level of Parking Structure One (PS1), as part of WKU's water conservation initiative. The cistern at the northeast corner of PS1 collects and stores the rainwater. A drip irrigation system delivers the rainwater to the garden.

Since 2010, rainwater collection systems have been installed at five locations, with more under development:

- **Parking Structure One**: a 550-gallon cistern collects rainwater from the top level.
- **Health Services**: a 550-gallon cistern collects rainwater from the roof.
- **WKU Farm**: two 1,300-gallon cisterns collect water from the Livestock Barn roof. Expo Center staff use this water to dampen the arena floor to reduce dust, wash livestock, and for other needs.
- **South Street Equipment Storage Barn**: six 2,600 gallon cisterns collect water from the roof. Facilities Management staff use this rainwater to fill the irrigation truck for campus trees and gardens.
- **Music Hall**: a subsurface detention system cleans and stores up to 40,000 gallons of water collected from the roof. This water will also be used in the irrigation truck.

Collection System at South Street

Collection Cisterns at WKU Farm

Subsurface collection cistern at Music Hall

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WKU Green Tour

Big Red Bikes

The Big Red Bikes bicycle lending program refurbishes abandoned or donated bicycles for loan to students, faculty, and staff at no cost. In 2007 GreenToppers started the program to promote bicycle use and awareness in Bowling Green and at WKU. Big Red Bikes remains a student-run project, and is managed by the Office of Sustainability.

Photograph by Helen Siewers

The program has many supporters who have contributed funds or made in-kind donations:

- Parking and Transportation Services
- Parents Advisory Council
- Outdoor Recreation and Activities Center
- Department of Environment, Health, and Safety
- Kentucky Bicycle and Bikeways Commission's Paula Nye Memorial Education Grant, funded by the sale of "Share the Road" license plates in Kentucky. The grant allowed for significant upgrades in the mechanic's shop and expansion of the program.

In addition to lending bicycles, the program spreads bicycle awareness and knowledge throughout the campus community through bicycle maintenance and safety workshops.

...destined to become Big Red Bikes

Photograph by WKU photojournalism student Emily Twardowski

Anyone interested in learning more about bicycles or helping the program can volunteer and help manage, restore, and maintain the bicycle fleet; no previous experience is required.

If you are interested in volunteering or have a bicycle to donate, please inquire with the Office of Sustainability.

If you would like to borrow a bike, please see the receptionist in the Department of Facilities Management.

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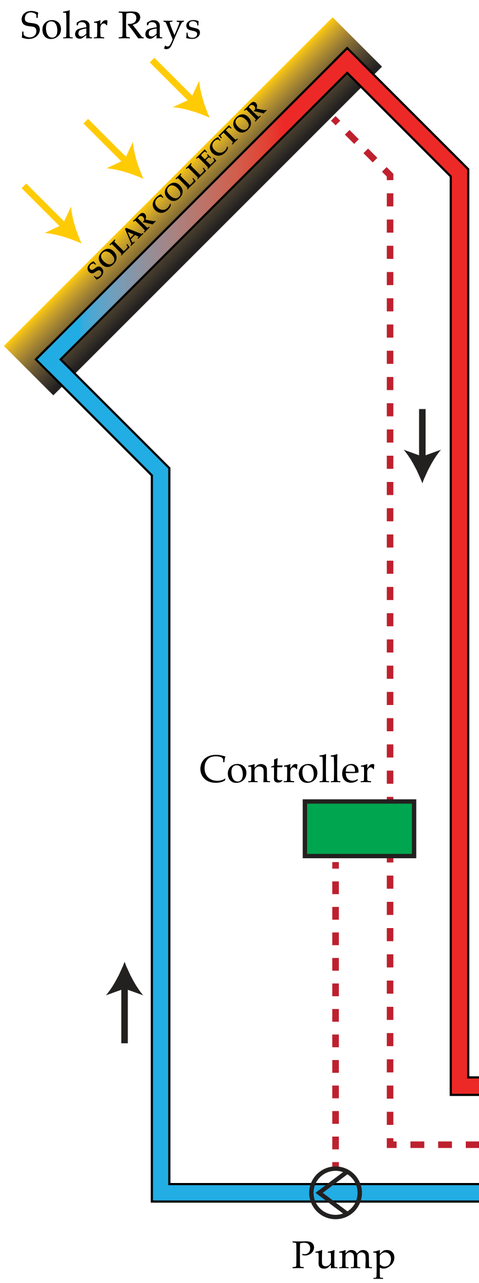
WKU Green Tour

Solar Thermal Array



Solar thermal collectors were installed in Fall, 2010. The collectors are manufactured by Heliocol and are distributed and installed by SunQuest Energy LLC.

Photograph by Cliinton Lewis

A solar thermal array on the Preston Activities Center roof uses the sun's radiant energy to pre-heat the indoor swimming pool. Each of the eighty-eight solar thermal collectors contain 3.7 gallons of glycol which transfers heat from the sun to the pool water via heat exchanger, keeping the pool a consistent 80°-83° Fahrenheit.

The collectors perform 10 months per year, as measured by Solar British Thermal Unit (BTU) output. BTU output calculations are estimates based on low wind conditions and historical averages of daytime air temperatures and solar insulation levels for our region. Reducing the amount of natural gas required for heating the pool benefits the university's carbon footprint and energy budget. With an initial project investment of $96,410, the annual savings result in a project payback of 8.8 years.

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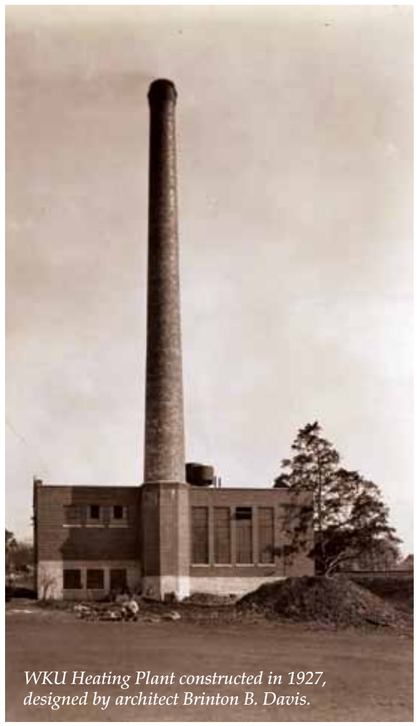
WKU Green Tour

Central Heating Plant

The WKU Central Heating Plant has been providing steam to the main campus since 1927. High pressure steam is generated by boilers and distributed to buildings through approximately 3 miles of steam lines that loop around campus. Historically, steam has been produced through the combustion of coal, which is mostly sourced from deep mines in Eastern Kentucky. Utility savings resultant from energy conservation and efficiency initiatives across campus have been re-invested in upgrades to the Central Heating Plant. Two natural gas boilers were installed, one in 2010 and the other in 2011. These two boilers are capable of providing steam to the entire campus allowing for WKU to idle the two remaining coal boilers, which has greatly reduced WKU's carbon footprint.



WKU Heating Plant constructed in 1927, designed by architect Brinton B. Davis.

Installation of natural gas boiler, Spring 2011. Photograph by Clinton Lewis.

Xeriscape Garden

The unique micro-climate of the Central Heat Plant is created by a combination of site features: the solar gain of the building, prevailing winds, and elevation. This micro-climate provided the opportunity to create a native Xeriscape garden (derived from the Greek "xeros" or dry). Xeriscape gardens use no supplemental irrigation, and typically use gravel or sand, rather than mulch, to cover the soil. This garden has numerous drought-tolerant native plants including:

- *Yucca filamentosa* (Adam's Needle)
- *Helianthus mollis* (Downy Sunflower)
- *Silphium terebinthinaceum* (Prairie Dock)

Xeriscapes present the opportunity to create beautiful, native gardens that require minimal annual maintenance.

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WKU Green Tour

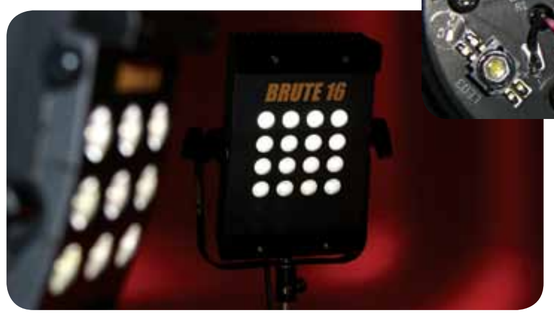
WKYU-PBS Studio Lighting

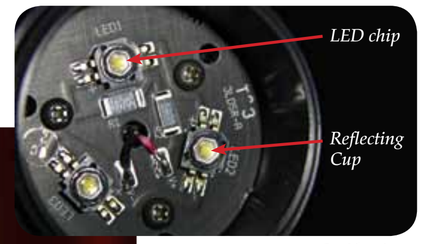
WKYU-PBS Studio One is on the cutting edge of lighting technology. In 2010, an LED (light emitting diode) lighting system replaced an aging, 40 year old incandescent system that regularly malfunctioned, required expensive specialized bulb replacement, wasted energy, and generated much unnecessary heat. The LEDs reduce energy consumption by 97% and last tens of thousands of hours.

The instruments should never need to be replaced and produce only a small amount of heat. Most importantly, WKU broadcast production students have the opportunity to use the most innovative lighting technology found in a television studio. WKYU-PBS was honored to receive a Regional Emmy® Award in technical achievement for this installation, the first in this category to any Kentucky organization in the history of the chapter.

Barbara Deeb interviews Governor Steve Beshear for Outlook. The Governor was the first guest to be interviewed under the new lights in the WKYU-PBS studio.

Set of Outlook, weekly public affairs program for WKYU-PBS.





Inside view

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WKU Green Tour — *Karst and Stormwater Management*

You are standing on a distinctive landscape known as "karst." These landscapes are formed over time as water slowly dissolves bedrock such as limestone. This dissolving action eventually creates a network of sinkholes, springs, caves, and aquifers. Water and pollution can flow easily and rapidly through the karst system.

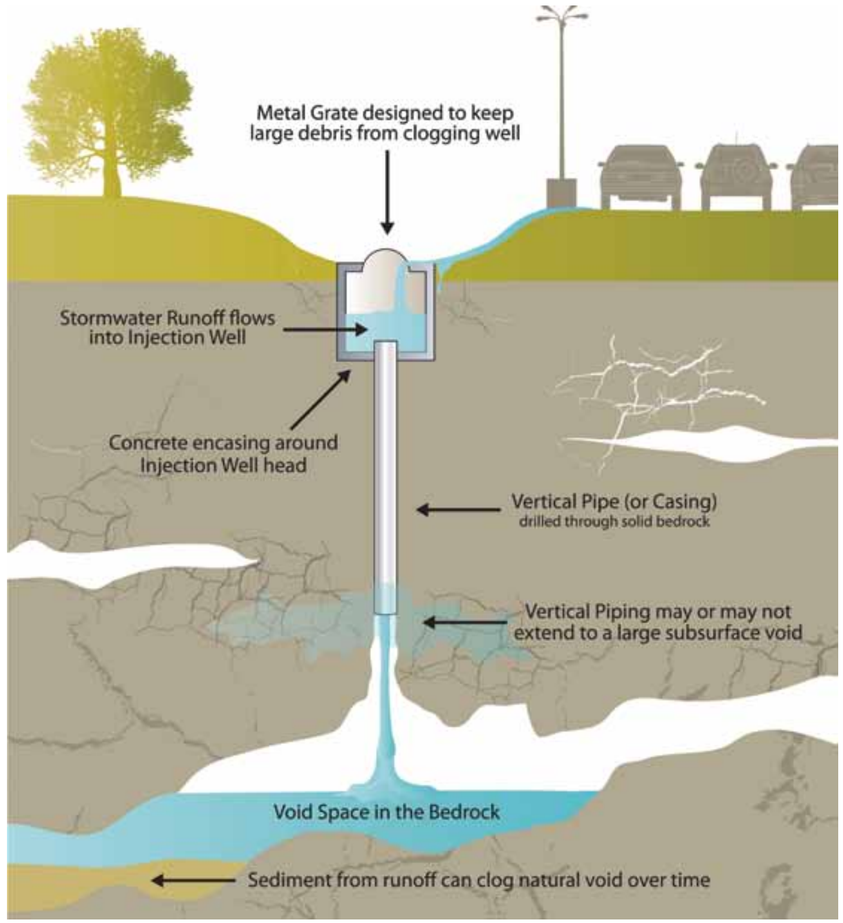
Stormwater flooding is common in urban areas, such as Bowling Green, that are built on a karst landscape dominated by sinkholes. Sinkholes serve as natural drainage features in karst areas. However, urban development frequently alters natural water drainage:

- sinkholes are filled
- water drainage pathways are altered
- paved surfaces prevent water from easily seeping into the ground.

As a result of these changes, stormwater can quickly overwhelm any remaining drainage features.

On the WKU campus, injection wells play an important role in preventing flooding. Injection wells consist of large vertical pipes, or casings, that permit stormwater to quickly drain in to voids in the ground and be diverted away from the surface. However, injection wells must be constructed carefully to minimize groundwater pollution.

If an injection well is clogged with debris or sediment, or develops cracks in the vertical piping, the well can fail and cause sudden sinkhole development. When this happens, the well should be cleaned or repaired, and the land around the sinkhole stabilized.



Where you are standing, the ground adjacent to the injection well has collapsed, creating a small sinkhole. The site was identified as an educational exhibit in 2008 by the graduate students in ENVE 560, who recommended the nearby rain garden and grass waterway, two measures to slow the runoff entering the well. Bowling Green Public Works continues to monitor the well.

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