



GREENSBURG
Green Town
GREEN TOUR

INTRODUCTION

On May 4, 2007 the community of Greensburg, Kansas was destroyed by a powerful EF-5 tornado. The twister leveled 95% of its homes and buildings and took 11 lives. Shortly after the storm, the people of Greensburg made the decision to come back as a national model of eco-friendly building practices and "green" living.

With the help of Greensburg GreenTown, a nonprofit organization, in partnership with other private and public entities, residents and local business owners have learned about their options for building back using energy efficient strategies and sustainable materials.

To see our spectacular work-in-progress, grab your walking shoes, bike, or car and use this guide* to learn why Greensburg is the greenest town around!

*Information in guide comes from our Sustainable Building database:
www.greensburg.buildinggreen.com



ENERGY
EFFICIENCY FEATURES



RENEWABLE
ENERGY FEATURES



WATER CONSERVATION
EFFORTS



SUSTAINABLE
SITE PREPARATION



CLEAN AIR
QUALITY FEATURES



SUSTAINABLE
MATERIAL USAGE

GREENSBURG MAP



GREENSBURG GREENTOWN RETAIL OFFICE & CUBES

Shortly after the tornado, Greensburg GreenTown was established to help the City of Greensburg rebuild in a sustainable fashion. The office serves many functions: as a green visitors' center for people interested in the green initiative; a retail space showcasing green products; and as a clearinghouse for residents interested in information about green building options. South of the office is "Greensburg Cubed", a cluster of four sustainable demonstration cubes (*Ice Cube*, *Watering Can*, *Green Haus* and *Recycling Bin*) which were conceived, designed and built by Kansas State University College of Architecture, Planning and Design students.

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- Office features structurally insulated panel wall system (R-23)
 - High performance windows in office
 - Natural ventilation system for office
 - *Green Haus* demonstrates alternative insulation options

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- Office's HVAC powered by PV panels
 - Office vehicle runs on natural gas
 - *Watering Can* has solar hot water
 - *Recycling Bin* features turbine

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- Office has a dual-flush low-flow toilet
 - *Ice Cube* collects water for drinking
 - *Watering Can* has composting toilet
 - Drought-resistant plants on site

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- Built on previously developed site
 - Site close to community resources
 - Native plants used in landscaping

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- Office ventilated during occupancy
 - Low VOC materials used

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- Materials have high recycled content
 - Materials sourced locally
 - Cubes prefabricated to reduce waste
 - Site has established recycling program

DILLONS KWIK SHOP

Just over a year after the storm, The Kroger Company broke ground on a prototype for rural grocery stores. Completed in February of 2009, the new Dillons' Kwik Shop is a hybrid between a grocery store and a convenience mart. Kroger Company hopes to learn whether this type of store could serve rural areas in need of a grocer. The facility was built to be LEED Certified equivalent.

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- Insulated concrete form walls (R-24)
 - Well insulated roof (R-24)
 - High albedo roof coating to reflect heat
 - Skylights for natural lighting
 - Photosensors and occupancy lighting sensors
 - Energy efficient appliances
 - Water heated with waste heat from mechanical systems
 - Freezer and dairy doors have LED lighting and are motion activated



- Built on previously developed site
- Site close to community resources
- Native plant restoration on site



- Low VOC materials used
- Indoor air ventilated during occupancy



- Drought-resistant plants on site
- Rock garden incorporated in landscaping to reduce irrigation



- Low-maintenance materials

KIOWA COUNTY MEMORIAL HOSPITAL

Greensburg's new hospital is designed to serve as a critical care facility, and community meeting place. The new critical access hospital will include a five-provider rural health clinic, a specialty clinic, an emergency room, a physical/occupational therapy department, a radiology department, a laboratory, and other support areas. By adapting a typical hospital design to include energy efficiency and green building strategies, Kiowa County is attempting to build the first LEED Platinum critical access hospital in the nation.

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- Well insulated wall system (R-25)
 - High performance windows
 - Southern windows for natural lighting
 - Light colored roof to reflect heat
 - Energy efficient heating and cooling
 - Energy efficient office equipment
 - Energy efficient lights with controls
 - Heat recovery system

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- One wind turbine (50 kW) will generate electricity for the facility

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- Water efficient fixtures
 - Rainwater collected for flushing toilets
 - Drought-resistant plants on site
 - Bioswale filtration system for waste

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- Built on previously developed site
 - Site close to community resources
 - Native plant restoration on site
 - Outdoor lighting minimizes light pollution

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- Low VOC materials used
 - Indoor air ventilated during occupancy
 - Demand-controlled ventilation system
 - Filmless x-ray reduces chemical use
 - Seamless surfaces reduce infection rates

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- Finishes have high recycled content
 - 30% of material cost is recycled
 - Many materials sourced locally
 - Site has established recycling program

5.4.7 ARTS CENTER

The 5.4.7 Arts Center, named after the date of the tornado on May 4th, 2007, serves to raise awareness about the fine arts, both visual and performing. The building is used as a gallery space for exhibitions as well as a meeting space for community organizations. Moreover, the 5.4.7 not-for-profit offers after-school and summer art programs for children, evening classes for adults, weekend workshops, and visiting artist demonstrations. It is the first building in Kansas to achieve a LEED Platinum rating.

- Southern windows and skylights for natural lighting

- High performance windows

- 4-inch concrete floor absorbs heat in winter

- Energy efficient lights with controls and occupancy sensors

- Tempered glass cools building

- Energy efficient appliances

- 3 turbines (600 watts each)

- Geothermal heating and cooling

- 8 PV panels on roof

- Low-flow toilet

- Rainwater collected for irrigation in 1500 gallon cistern

- Drought-tolerant plants on site

- Built on previously developed site

- Site close to community resources

- Topsoil conserved during construction

- Native prairie restoration on site

- Natural ventilation with sliding doors and operable skylights

- Low VOC materials used

- Exterior cladding is reclaimed lumber

- Insulation is recycled newspapers

- Carpeting and countertops are recycled

- 50% of lumber is FSC certified

- Site has established recycling program



GREENSBURG GREENTOWN SILO ECO-HOME

After the tornado, residents saw the grain silo standing tall on the northern horizon. The Greensburg Silo became a symbol of strength and history for the town. The silo design is a primary feature of this home; its precast concrete walls and cylindrical form represent longevity and durability against the elements. The Silo Eco-Home is a part of The Chain of Eco-Homes, a series of twelve green houses that will serve as "living laboratories". Each will be available both as an informational center and as eco-lodging where people can experience green living first-hand.



- Well insulated wall system and roof
- Southern windows and clerestory for natural lighting
- High performance windows
- Concrete floor absorbs heat in winter
- Energy efficient LED lighting
- Window overhangs block summer sun
- Energy efficient appliances



- Solar hot water system
- 2 kW PV array



- Low-flow dual-flush toilets
- Water efficient fixtures
- Rainwater collected for irrigation
- Intensive green roof to absorb water
- Drought-tolerant plants on site



- Built on previously developed site
- Site close to community resources
- Topsoil conserved during construction
- Native plants used in landscaping



- Natural stack ventilation with operable southern windows and attic fan
- Low VOC materials used



- 35% of concrete is recycled
- Countertops and decking are recycled
- Cabinetry is FSC certified
- Rapidly renewable bamboo for flooring
- Site has established recycling program



USD 422 GREENSBURG K-12 SCHOOL

The Greensburg school facility is designed to support Greensburg's newly adopted master plan and vision to be a model "eco-community". It is aimed at creating a student-focused academic environment that looks to the future of Greensburg, Kansas, and its community-wide commitment to sustainability. The design of the school is indeed a testament to the aspirations and commitment of the students, faculty and the school district leadership. The goal for the facility is LEED Platinum certification.

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- Well-insulated wall system and roof
 - Abundant southern windows for natural lighting
 - High performance windows
 - Energy efficient lights with contols
 - Natural ventilation system
 - Energy efficient office equipment

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- Geothermal heating and cooling
 - Hydrogen powered fuel cell for back-up energy generation

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- Natural bioswales for storm water
 - Rainwater collected for irrigation
 - Permeable pavement on site
 - Low water usage fixtures
 - Drought-resistant plants on site

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- Built on previously developed site
 - Close to community resources
 - Existing topsoil conserved
 - Native plants used in landscaping

- 
- Low VOC materials used
 - Ventilated during occupancy

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- Materials sourced locally
 - Materials have high recycled content
 - Salvaged materials used
 - Durable materials for low maintenance
 - Established recycling program

PRAIRIE POINTE TOWNHOMES

After a tornado destroyed most of Greensburg in 2007, the residents needed affordable housing. Prairie Pointe Townhomes is an affordable rental development in Greensburg, Kansas that was completed in July 2008. Eight of the sixteen units in this townhome complex were awarded the first residential LEED Platinum rating in Kansas and are estimated to use about 50% less energy than code.



- Well-insulated 2x6 wall system (R-22.5)
- Well-insulated roof (R-38)
- Energy efficient windows and doors
- High efficiency air source heat pumps
- Energy efficient lights (CFLs)
- Energy efficient appliances



- Low-flow water fixtures
- Aerated water fixtures
- Water efficient irrigation system
- Drought-tolerant plants on site



- Built on previously developed site
- Site close to community resources
- Topsoil conserved during construction
- Native plants used in landscaping
- Clustered building design preserves open space



- Ventilated during occupancy
- Low VOC materials used



- Insulation is recycled newspapers
- Carpeting and window frames are environmentally preferable products
- Bio-based tile in kitchen and bathrooms
- Low-maintenance materials
- Many materials sourced locally
- Site has established recycling program



KIOWA COUNTY COMMONS

Among county facilities destroyed in the May 4th tornado were the Greensburg branch of the Kiowa County Library and the Kiowa County Historical Museum. The office for Kansas State Research and Extension Services were damaged inside the county courthouse. These essential entities will come together in The Kiowa County Commons. To support and extend these services, The Commons will also house The Kiowa County Media Center providing Internet-based television and radio studios, a sound studio, video editing stations, an HDTV remote broadcast trailer, and a robust Web Portal with 24-7-365 real-time area news and county calendar.



- Insulated concrete form walls (R-22)

- Energy efficient windows and doors

- Southern windows for natural lighting

- Light monitors for natural lighting

- Trees and awnings for proper shading

- Energy efficient office equipment



- Rooftop PV panels

- Pair of wind turbines

- Geothermal heating and cooling



- Low-flow water fixtures

- Rainwater collected for irrigation

- Drought-tolerant plants on site



- Built on previously developed site

- Site close to community resources

- Native plants in landscaping



- Ventilated during occupancy

- Low VOC materials used



- Low-maintenance materials

- Many materials sourced locally

- Materials with high recycled content

- Established recycling program on site

GREENSBURG CITY HALL

The new 4,700-square-foot City Hall is the symbol of Greensburg's vitality and leadership in becoming a model sustainable community where social, environmental, and economic concerns are held in balance. It will house the City's administrative offices and council chambers, and serve as a gathering space for town meetings and municipal court sessions. The goal for the facility is LEED Platinum certification.



- Insulated concrete form wall system (R-22)
- Roof angled to maximize natural lighting
- East/west-facing windows minimized to reduce heat gain and glare
- Energy efficient office equipment



- Rooftop PV array supplies electricity



- Rainwater collected and directed to landscaped area
- Low water usage fixtures
- Drought-resistant plants on site



- Built on previously developed site
- Close to community resources
- Existing topsoil conserved
- Native plants used in landscaping



- Low VOC materials used



- Salvaged exterior bricks
- Materials sourced locally
- Materials have high recycled content
- Established recycling program



GREENSBURG STATE BANK

Fortunately for Greensburg State Bank, not all was lost in the 2007 tornado. Under piles of debris, employees uncovered the bank's original vault. With the vault remarkably unscathed, a decision was made to rebuild the bank on the same footprint and to use the original plan from when the bank was designed in 1989 as inspiration for the current design. Almost a year after this decision was made, the new Greensburg State Bank reopened its doors for business, being the second commercial building to build back in Greensburg.



- Insulated concrete form wall system (R-22)
- Southern windows for natural lighting
- Southern facade shaded in summer
- Energy efficient office equipment
- Energy efficient lights and control system



- Low-flow toilets
- Water efficient fixtures
- Drought-tolerant plants on site



- Built on previously developed site
- Site close to community resources
- Topsoil conserved during construction
- Native plants used in landscaping



- Indoor air ventilated during occupancy
- Low VOC materials used



- Part of original structure used
- Many materials sourced locally
- Recycled plastic benches
- Site has established recycling program

SUN CHIPS BUSINESS INCUBATOR

The Business Incubator building is designed to offer space to Main Street businesses displaced by the 2007 tornado, which destroyed Greensburg's downtown district. This 9,580-square-foot facility offers a temporary home to local businesses at an affordable rental rate, giving merchants several years to regain solid financial footing. The energy saving goal for the facility is 50% with a LEED Platinum certification, by making use of key energy efficiency technologies and water reuse systems.

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- Insulated concrete form walls (R-22)
 - Southern windows, clerestories and skylights for natural lighting
 - High performance windows
 - Overhangs and lightshelves for daylighting control
 - Energy efficient lights with controls and occupancy sensors

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- Rooftop PV panels (6.8 kW) provide 10% of energy needs
 - Geothermal heating and cooling (57% energy savings)

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- Low-flow showerheads and toilets
 - Sink water recycled to flush toilets
 - Rainwater collected (95% water savings)
 - Rain gardens for storm water management



- Built on previously developed site
- Site close to community resources
- Topsoil conserved during construction



- A demand-controlled ventilation system monitors indoor air quality
- Low VOC materials used

- 419,600 lbs of construction waste diverted from landfill



- Durable exterior cladding made up of rain screen and fiber cement panels
- Salvaged bricks used
- 25% Recycled building material content

DWANE SHANK MOTORS

After the May 4th tornado completely destroyed the Greensburg GM dealership, Ron, Dwane, and Esther Shank decided not only to rebuild, but to do so in an environmentally-friendly manner. The new facility has become a model for affordable sustainable design, paving the way for other local businesses to rebuild. The dealership is comprised of a sales room and a mechanics shop. The facility was built to be LEED Certified equivalent.



- Well insulated wall system
- Southern windows for natural lighting
- Light tubes and skylights for lighting
- Energy efficient lights with controls
- Radiant floor heating
- Energy efficient appliances



- Site close to community resources
- Native plant restoration on site



- Low VOC materials used
- Indoor air ventilated during occupancy



- Low-flow toilets
- Sink water recycled to flush toilets
- Rainwater collected for irrigation and car washing
- Drought-resistant plants on site



- Job site recycling during construction
- Low maintenance materials
- Recycled steel framing
- Reusable building materials
- Building materials minimized when possible



KIOWA COUNTY COURTHOUSE

The Kiowa County Courthouse, originally built in 1914, was severely damaged in the 2007 tornado and was one of the only historic buildings to not be completely destroyed. The tornado broke the glass block windows. A vehicle from the Police impound lot across the street was hurled into the roof, allowing rain to damage the interior finishes. The 17-inch concrete wall structure of the building remains intact and is being reused. The new building will retain the original design and beauty of the 1914 building, but it will include energy savings and sustainable features to make it more comfortable and affordable to operate. The goal for the facility is LEED Gold.



- Spray foam insulation added to walls
- Daylighting provided to exterior space
- High performance windows
- Lighting occupancy sensors and dimming controls reduce energy use



- Geothermal heating and cooling system with 32 wells



- Water efficient fixtures
- Rainwater collected for flushing toilets
- Stormwater collected for irrigation
- Drought-resistant plants on site



- Site close to community resources
- Native plant restoration on site
- Parking minimized



- Low VOC materials used
- Indoor air ventilated during occupancy



- Materials have high recycled content
- Materials sourced locally
- Many materials salvaged from original building
- Site has established recycling program

GREENSBURG GREENTOWN SOLAR ECO-HOME

The University of Colorado at Denver donated their winning home from the 2005 Solar Decathlon to Greensburg GreenTown. The Decathlon is a competition sponsored by the U.S.-Department of Energy which challenges 20 universities from around the world to build state-of-the-art, sustainably designed residences. The Solar Eco-Home is a part of The Chain of Eco-Homes—a series of twelve green houses that serve as "living laboratories". Each will be available both as an informational center and as eco-lodging where people can experience green living first-hand.

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- Well insulated wall panels (R-30+)
 - Southern windows and clerestories for natural lighting
 - Energy efficient clerestories (R-14)
 - High performance windows (R-8)
 - Radiant floor heating
 - Energy efficient appliances

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- 34 rooftop PV panels at 200 watts each
 - Solar hot water heater

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- Low-flow water fixtures
 - Drought-resistant plants on site



- Built on previously developed site
- Site close to community resources



- A demand-controlled ventilation system monitors indoor air quality
- Low VOC materials used



- Waste paper and soy insulation walls
- Agricultural by-products used
- Materials have high recycled content
- Sustainably harvested wood
- Recycled steel framing

BTI GREENSBURG-JOHN DEERE DEALERSHIP

BTI Greensburg is a 4th generation John Deere Dealership in Southwestern Kansas. BTI's four locations serve the region with large parts departments, fully-equipped service shops, and retail sales and merchandise departments. After the May 4th tornado completely destroyed the Greensburg store, the Estes family decided to not only rebuild the store, but to do so as a model of sustainability. The goal for the facility is LEED Platinum certification.

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- Well insulated wall panels (R-16)
 - Well insulated roof (R-38)
 - Radiant floor heating
 - High efficiency HVAC (SEER 16)
 - 12 light tubes and 24 skylights
 - Waste oil fired boiler for heating
 - Light colored surfaces to reduce heat island effect
 - Energy efficient lighting with occupancy sensors and detectors
 - Ongoing energy monitoring

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- Two wind turbines (5 and 1.8kW) produce electricity for the building
 - Run-off collected for irrigation
 - Low water usage toilets and faucets
 - Drought-resistant plants on site



- Existing topsoil conserved
- Native plants used in landscaping
- Reduced light pollution
- Open space preserved to encourage biodiversity



- Demand-controlled ventilation system
- Low VOC materials used



- All wood is FSC certified
- Steel framing salvaged from old facility
- 15% flyash used in concrete mixture
- Recycled concrete salvaged from tornado debris used for parking lot
- 50%+ construction waste diverted from landfill

GREENTOWN ANCHOR SPONSORS

The following companies are helping to build Greensburg as America's model green community. Each of them has generously donated green products, services and/or funding to Greensburg GreenTown to aid in the rebuilding effort. GreenTown is deeply grateful to each of our partners and aims to promote visibility of their commitment.



**ARMOUR
HOMES**

**SCHOLFIELD
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**MOTHER
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THE ORIGINAL GUIDE TO LIVING WISELY



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