

South Dakota Bureau of Administration
Office of the State Engineer

High-Performance Green Building Projects

CY2014 Annual Project Report

High Performance Green Buildings

State Building Projects Designed to Higher Standard

Background

Designing buildings to be resource-efficient can save energy, water, reduce waste and pollution, thereby reducing operating costs, improving the indoor quality for occupants, and benefit the environment.

Recognizing the opportunity to reduce costs, save resources, and make the indoor and outdoor environment better, the State of South Dakota began its green building initiative in 2008.

Green Building in State Law

Senate Bill 188 was introduced at the request of the Office of the Governor during the 2008 Legislative Session. As amended, the bill was passed by the Legislature and signed into law.

The new laws, codified as SDCL §§ 5-14-32 through 36, established requirements that any new construction or renovation of a state building with HVAC (heating, ventilation, and air conditioning systems) that has a cost of \$500,000 or more or includes 5,000 square feet or more of space shall meet or exceed a high-performance green building standard.

The law also recognizes that meeting a high-performance green building standard may not always be feasible and allows the requirement to be waived by the Office of the State Engineer. The circumstances which allow a waiver are described in the Building Project Waivers section of this report.

The law provides the option to select from three rating systems to meet the high-performance green building requirement:

- 1) A silver standard rating under the USGBC's Leadership in Energy and Environmental Design (LEED) rating system; or
- 2) A two globe rating under the Green Building Initiative's Green Globes rating system; or
- 3) A comparable numeric rating under a certification program recognized by the American National Standards Institute.

After a review of the different rating systems, the Bureau of Administration determined the LEED rating system best meets South Dakota's needs and now pursues LEED silver rating or higher for state building projects.

Administrative rules detailing the steps necessary to certify a project as a high performance building are found in ARSD Chapter 10:09:02.

House Bill 1011 was introduced in the 2010 Legislative Session on behalf of the Bureau of Administration to update the version of LEED referenced in SDCL 5-14-32 to the current version.

About LEED

LEED – Leadership in Energy and Environmental Design – is a voluntary rating system published by the non-profit organization United States Green Building Council (USGBC) that provides a framework for the design, construction and operation of green buildings.¹

LEED is an internationally recognized certification system that provides third-party verification that a building uses strategies to improve performance in key categories of: site sustainability, water efficiency, energy and atmosphere, materials and resources, indoor environmental quality, and innovation in design.

Credits within each category are earned for each building project, and the amount of credit points earned defines the certification level achieved. A building project must satisfy all prerequisites and earn a minimum number of points to be certified. There are four levels of certification possible: Certified, Silver, Gold, and Platinum.

LEED-certified buildings are designed to:

- 1) Lower operating costs and increase asset value;
- 2) Conserve energy and water;
- 3) Reduce waste sent to landfills; and
- 4) Be healthier and safer for occupants;

Annual Report

SDCL § 5-14-37 requires this annual report to the Legislature, including a list of state building projects granted a waiver or that failed to achieve a high performance green building standard.

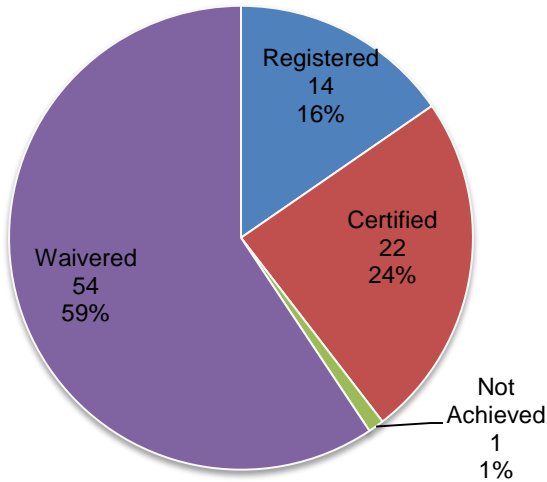
High Performance Green Building Projects

Project Summary

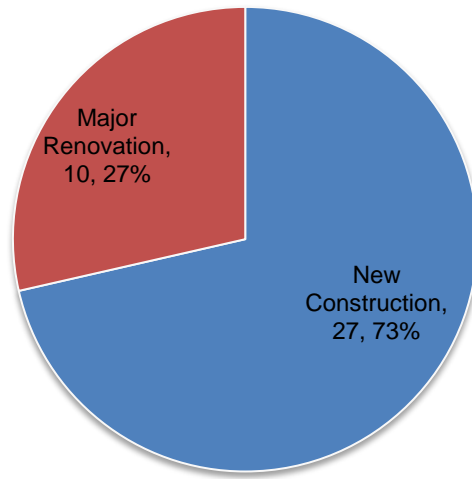
A total of 37 state building projects have been registered as LEED projects through CY2014. Twenty-seven of the projects are new buildings; ten are major renovations. Twenty-two state high performance green building projects have been completed and officially earned LEED certification to date.

One project earned LEED Silver certification during CY2014: the McCrory Gardens Building at SDSU.

Building Projects & LEED
July 1, 2008 - Present



LEED Projects by Project Type
July 1, 2008 - Present



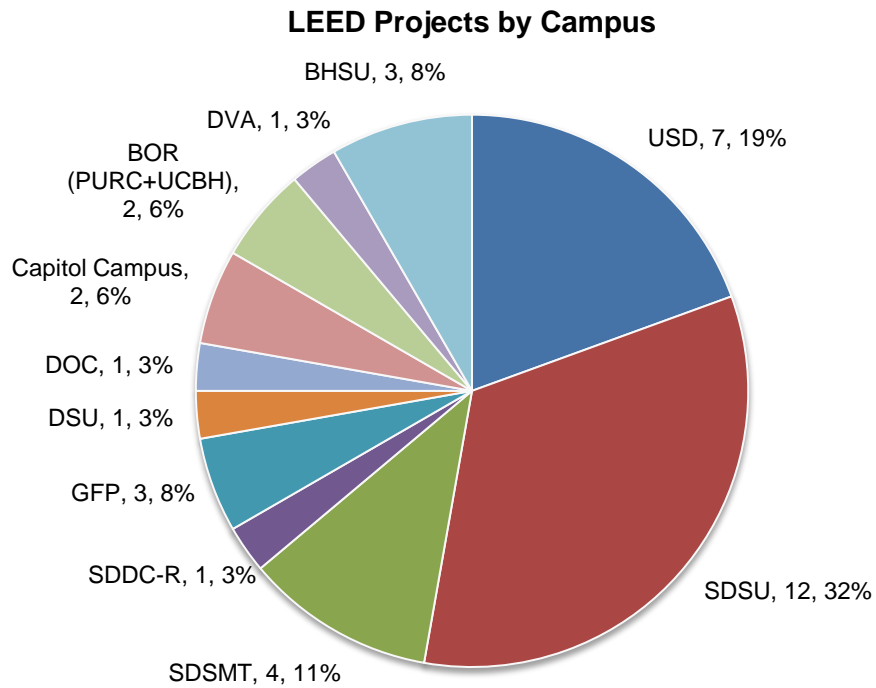
LEED Registered Projects

State building projects registered as LEED projects through CY2014:

Campus	Building	New Construction	Renovation	Certification Achieved
ACC	MacKay State Library		✓	Silver
ACC	Dolly-Reed Plaza (formerly Capitol Lake Plaza)		✓	Gold
BHSU	Student Union Building	✓		Gold
BHSU	New Science Building	✓		Silver
BHSU	New Residence Hall	✓		
DSU	Habeger Science Center		✓	Silver
DVA	Veterans Home	✓		
GFP	Outdoor Campus (Rapid City)	✓		Gold
GFP	Fisheries Building (Ft. Pierre)	✓		Silver
GFP	Visitor's Center (Custer State Park)	✓		
SDDEV	Damm & Norgello		✓	Silver
SDSMT	Chemistry/Chemical Engineering	✓		Gold
SDSMT	Paleontology Building	✓		Gold
SDSMT	Connolly Palmerton Dormitory		✓	Gold
SDSMT	Student Recreation Center	✓		
SDSU	McCrary Gardens Building	✓		Silver
SDSU	Electrical Engineering & Computer Science Addition	✓		Silver
SDSU	Architecture, Math & Engineering Building	✓		

SDSU	Dairy Microbiology Lab		✓	Silver
SDSU	Jackrabbit Village Residence Halls	✓		Silver
SDSU	New Dining Services	✓		Not Achieved
SDSU	Dykhouse Athletic Center	✓		Gold
SDSU	Agricultural Hall Lab		✓	
SDSU	Jackrabbit Grove Residence Halls	✓		
SDSU	Visual Arts Facility	✓		
SDSU	Indoor Practice Facility	✓		
SDSU	Dykhouse Football Stadium	✓		
USD	School of Medicine	✓		Certified
USD	Churchill Haines Science Center		✓	
USD	Coyote Village Residence Hall	✓		Gold
USD	Wellness Center	✓		Silver
USD	Akeley Science Center		✓	
USD	Muenster University Center Addition	✓		
USD	Dakota Dome Complex	✓		
PURC	Public University Research Center, 2	✓		Silver
PURC	University Center, Rapid City	✓		Silver
DOC	Minimum Security Prison, Rapid City		✓	Silver

• A key for the campus and agency abbreviations is included in the endnotesⁱⁱ.



Certification Earned in CY2014

One building project earned LEED certification in 2014:

McCrary Gardens Building, SDSU

Silver certification was achieved for this new visitor center located in the McCrary Gardens on the SDSU campus by optimizing energy efficiencies and water use reduction techniques, using regional materials and providing occupant comfort.

Projects Registered in CY2014

Two building projects were newly registered as LEED projects in 2014:

Game, Fish, and Parks Park Visitor's Center, Custer State Park

The new Custer State Park Visitor Center will include an interpretative area as well as a 100 seat theatre and will optimize tourist comfort by focusing on energy efficiency, modern control and lighting systems, and environmental friendly materials.

Dykhouse Football Stadium, SDSU

The new 19,000 seat stadium will include a new seating bowl, box suites, club space, kitchen, commissary and service areas, concessions, restrooms, a game-day retail location, ticket offices, storage and operation space, locker rooms, media space. The 161,000 square foot building space will be energy and water efficient, provide natural lighting, optimize occupant comfort, and use regional materials.

Building Project Waivers

Waiver Summary

SDCL § 5-14-34 allows waivers from the high performance green building standard to be granted by the Office of the State Engineer for state building projects if:

- 1) The building will have minimal human occupancy;
- 2) The increased costs of achieving a high-performance green building standard cannot be recouped from decreased operational costs within fifteen years;
- 3) A building is on the national register of historic places and achieving a high-performance green building standard would result in noncompliance with standards for historic preservation as set forth in the secretary of the interior's Standards for the Treatment of Historic Properties in effect as of January 1, 2008;
- 4) The square footage of the renovation project is less than fifty percent of the total square footage of the building being renovated. If the renovation project is being done in phases, the total square footage of all intended phases combined shall be used in making this calculation; or
- 5) The Bureau of Administration determines that extenuating circumstances exist to make impractical high-performance green building standard certification.

The conditions and procedures for granting waivers are detailed in ARSD Chapter 10:09:03.

Nine state building projects were granted waivers in CY2014. There are a total of 54 state building projects that have been granted waivers through CY2014.

A waiver does not mean that principles of sustainable design are ignored. State building projects are designed and constructed to be as energy and water efficient as feasible even if the project is not a LEED registered project.

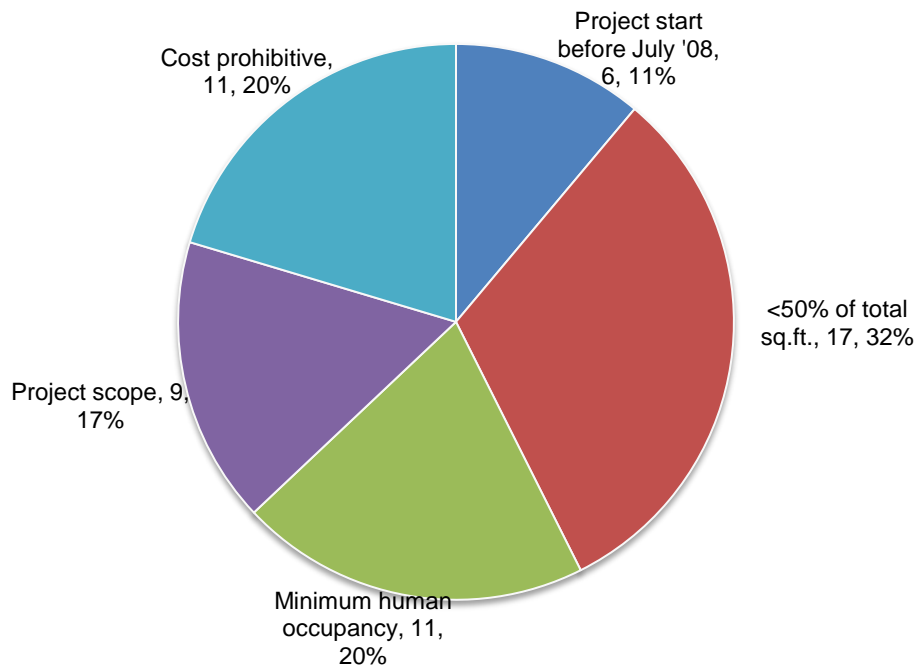
Waivers Granted to Building Projects

Campus	Building	Waiver Reason
BHSU	Woodburn Hall Renovation	Project Scope
BHSU	Jonas Science Renovation	Less than 50% of total building square footage
DHS	HSC Admissions Office (Yankton)	Less than 50% of total building square footage
DOA	Wildfire Office Building	Cost Prohibitive to include prerequisites
DOA	Clover Hall 4-H Exhibit, Huron	Minimum Human Occupancy
DOT	Pierre Regional Office	Less than 50% of total building square footage
DOT	Maintenance Shop, Clear Lake	Minimum Human Occupancy
DOT	Maintenance Shop, Martin	Minimum Human Occupancy
DOT	Maintenance Shop, Mobridge	Minimum Human Occupancy
DOT	Maintenance Shop, Highmore	Minimum Human Occupancy
DOT	Maintenance Shop, Kadoka	Minimum Human Occupancy
DOT	Maintenance Shop, Mission	Minimum Human Occupancy
DOT	Maintenance Shop, Rapid City	Minimum Human Occupancy
DPS	Highway Patrol Building, Rapid City	Cost Prohibitive to include prerequisites
DSU	Zimmerman/Emery Residence Halls	Project in design development before July 1, 2008
GFP	State Game Lodge (CSP)	Project in design development before July 1, 2008
GFP	Fisheries Storage Bldg. (Ft. Pierre)	Minimum human occupancy
GFP/DOT	Building Addition (Sioux Falls)	Minimum human occupancy
NSU	Kramer Hall	Project in design development before July 1, 2008
NSU	MeWaldt-Jensen Science	Less than 50% of total building square footage
NSU	Kirkac	Less than 50% of total building square footage
NSU	Lincoln & Graham Halls Renovations	Project Scope
NSU	Barnett Center Addition	Less than 50% of total building square footage
NSU	Student Center Addition/Renovation	Cost Prohibitive to Meet Prerequisites
NSU	Dacotah Hall	Less than 50% of total building square footage
NSU	Johnson Fine Arts	Cost Prohibitive to Meet Prerequisites
NSU	Greenhouse	Cost Prohibitive to Meet Prerequisites
SDSMT	Surbeck Center	Project in design development before July 1, 2008
SDSMT	EE/Physics Bldg. Renovation	Less than 50% of total building square footage
SDSU	NFA Bldg; Various Rooms	Less than 50% of total building square footage
SDSU	Administration	Project Scope
SDSU	Northern Plains Biostress Lab	Less than 50% of total building square footage
SDSU	Larson Commons	Less than 50% of total building square footage

SDSU	Binnewies Hall Bathroom	Less than 50% of total building square footage
SDSU	Seed Technology	Project in design development before July 1, 2008
SDSU	Briggs Library Renovation	Project Scope
SDSU	Dairy Manufacturing Addition	Specialty requirements for project precluded LEED certification
SDSU	Student Union Addition	Less than 50% of total building square footage
SDSU	Young Hall bathroom Renovation	Less than 50% of total building square footage
SDSU	DEH Cleanroom	Project Scope
SDSU	Enrollment Services Center Renovation	Cost Prohibitive to Meet Prerequisites
SDSU	Frost Arena HVAC Upgrade	Project Scope
SDSU	Headhouse/Greenhouse	Specialty requirements for project precluded LEED certification
SDSU	Olson Biochemistry Renovation	Less than 50% of total building square footage
SDSU	Wagner Simulation Lab	Less than 50% of total building square footage
SDSU	Cow/Calf Unit	Cost Prohibitive to include prerequisites
SDSU	North Chiller Plant Building	Minimum Human Occupancy
SDSU	Swine Unit	Cost Prohibitive to include prerequisites
SDSU	Brown Hall Renovation	Cost Prohibitive to include prerequisites
USD	Slagle Hall Renovation	Project in design development before July 1, 2008
USD	Delzell Renovation	Project Scope
USD	North Commons Renovation	Cost Prohibitive to include mechanical system
USD	Patterson Hall Renovation	Cost Prohibitive to include prerequisites
PURC	Classroom Renovation	Less than 50% of total building square footage

- A key for the campus and agency abbreviations is included in the endnotes.

LEED Waivers by Type



Waivers Granted by the State Engineer in CY2014

Nine state building projects were granted waivers from the high performance green building requirement by the State Engineer in CY2014:

Jonas Science Renovation, BHSU

The Jonas Hall science renovation was granted a waiver on February 25, 2014, because only 21% of the total building square footage was included in the project, making LEED certification impracticable.

Clover Hall 4-H Exhibit, Huron

The construction of the Clover Hall 4-H Exhibit at the State Fair in Huron was granted a waiver on June 13, 2014 because of minimal human occupancy. A maximum of eight permanent employees will occupy the space during the 40 hour work week.

Department of Public Safety, Highway Patrol Building, Rapid City

The new highway patrol building was granted a waiver on July 30, 2014. The increased costs of achieving LEED Silver in relation to the small occupant space could not be recovered in 15 years.

Greenhouse, NSU

NSU's Greenhouse construction project was granted a waiver on December 22, 2014. Greenhouses are very energy intensive with minimum human occupancy; therefore the specialty requirements necessary to achieve certification were cost prohibitive.

Cow/Calf Unit, SDSU

The Cow/Calf Unit project at SDSU was granted a waiver on April 14, 2014. The increased cost of achieving LEED Silver in relation to the small occupant space and the attached animal confinement unit could not be recovered in 15 years.

North Chiller Plant Building, SDSU

The construction of a new Chiller Plant building was granted a waiver on April 14, 2014 because of minimal human occupancy and construction type precludes achieving a LEED certification.

Swine Unit, SDSU

The Swine Unit project at SDSU was granted a waiver on October 27, 2014. The increased cost of achieving LEED Silver in relation to the small occupant space and the attached animal confinement unit could not be recovered in 15 years.

Brown Hall Renovation, SDSU

The Brown Hall project was granted a waiver on December 4, 2014 based on the project scope and because of extensive measures that would be necessary to reconstruct the building envelope. The increased cost of achieving LEED Silver could not be recovered in 15 years.

Patterson Hall Renovation, USD

The Patterson Hall was granted a waiver on October 24, 2014 based on project scope and because of extensive measures that would be necessary to reconstruct the building envelope. The increased cost of achieving LEED Silver could not be recovered in 15 years.

Projects Not Achieving LEED

To date, only one project has not achieved LEED Silver certification when a waiver was not granted by the State Engineer. The SDSU Dining Hall expansion project was registered in 2009. While LEED was initially attempted, the square footage of the addition was not large enough in relation to the existing building to achieve LEED certification. Energy efficiency measures were taken to the extent practicable.

Energy Standard Workgroup Report

During CY2014, Governor Daugaard tasked an internal workgroup to evaluate the current green building standard for state building projects. The goal was to ensure the state's policies focused efforts on energy efficiency and constructing better buildings.

Members of the workgroup met with architects and engineers across the state; analyzed the use and outcomes of applying LEED to state building projects to date; reviewed changes included in the latest version of LEED; and studied other green building and energy efficiency codes.

The workgroup recommended continuing to use LEED as its building standard, with the following changes to existing law:

- 1) Updating state law to reflect the industry-wide implementation of LEED v4;
- 2) Eliminating sections of state law allowing use of Green Globes or comparable ANSI numeric rating system since LEED has become the industry standard and the only one used in state government building projects; and
- 3) Increasing the statutory threshold of building projects to which LEED is applied from 5,000 square feet / \$500,000 to 10,000 square feet / \$1,000,000 after finding that 29% of all waivers were for building projects within the range differences and no projects within the range differences achieved LEED Silver certification.

The workgroup also recommended administrative rules be amended to ensure state government building projects using LEED focused on energy efficiency:

- 4) Requiring a minimum energy performance that exceeds the LEED v4 prerequisite by a percentage to be determined in further discussion with industry stakeholders;
- 5) Requiring enhanced commissioning that includes building envelope commissioning;
- 6) Requiring architects/engineers verify project design prior to completion of construction documents;

- 7) Prohibiting use of green power and carbon offset credits, green parking credits, and limiting use of bicycle facilities credits so design focus remains on better building construction to increase energy efficiency; and
- 8) Deleting obsolete sections of administrative rules.

Other workgroup recommendations were designed to facilitate better construction outcomes and communication between building design and construction phases:

- 9) Modifying the construction specifications to require the contractor to construct a “mock-up” of a building envelope assembly for final approval by the design firm prior to wall construction;
- 10) Requiring the Owner’s Project Requirements (OPR) to state energy efficiency goal for the building;
- 11) Requiring a Basis of Design (BOD) document to reflect the Owner’s energy goals and requirements for the building as stated in the OPR prior to design development.

Implementation of these recommendations is expected to begin in CY2015.

More Information

Information about the State’s high performance green building projects is available from:

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ⁱ Information about the USGBC and the LEED rating system is available at www.usgbc.org

ⁱⁱ Campus and Agency Abbreviation Key:
ACC: Bureau of Administration/Capitol Complex (Pierre)
BHSU: Black Hills State University
DHS: Dept. of human Services
DOC: Dept. of Corrections
DOT: Dept. of Transportation
DSU: Dakota State University
DVA: Dept. of Veterans Affairs
GFP: Dept. of Game, Fish & Parks
NSU: Northern State University
PURC: Public University Research Center (Board of Regents, Sioux Falls)
SDDEV: South Dakota Developmental Center (Redfield)
SDSMT: School of Mines & Technology
SDSU: South Dakota State University
USD: University of South Dakota