

South Dakota Bureau of Administration  
Office of the State Engineer

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# High-Performance Green Building Projects

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CY2015 Annual Project Report

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# 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.<sup>1</sup>

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.

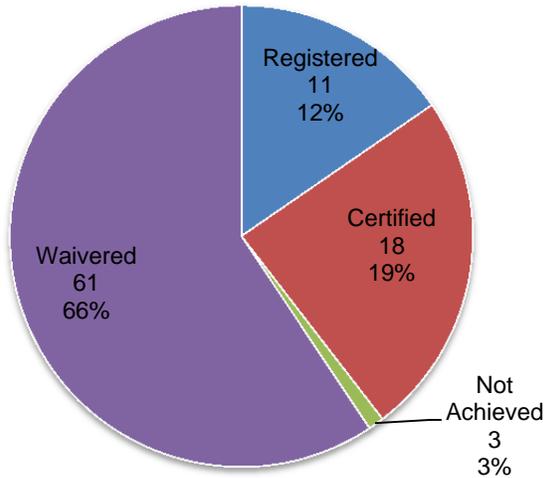
## High Performance Green Building Projects

### Project Summary

A total of 39 state building projects have been registered as LEED projects through CY2015. Twenty-nine of the projects are new buildings; ten are major renovations. Twenty-five state high performance green building projects have been completed and officially earned LEED certification to date.

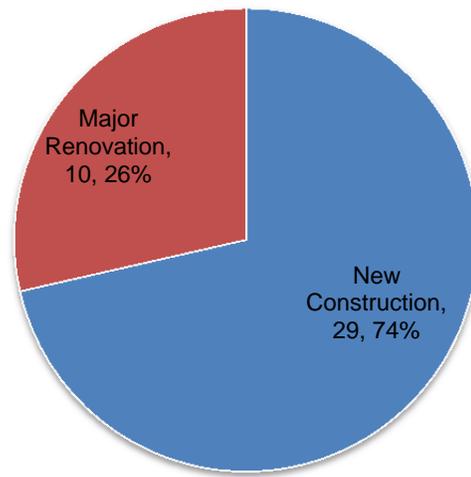
### Building Projects & LEED

July 1, 2008 - Present



### LEED Projects by Project Type

July 1, 2008 - Present



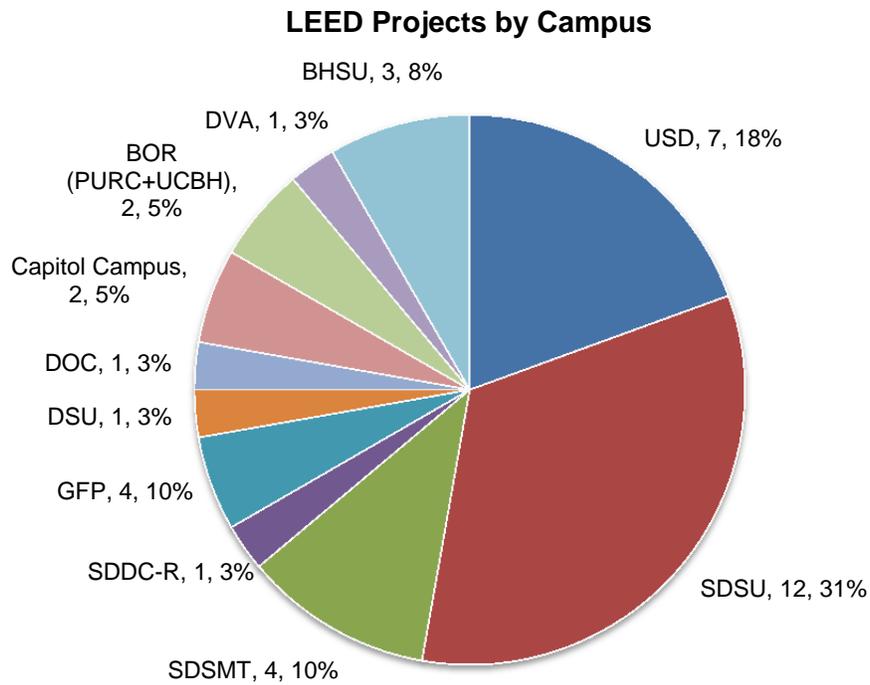
### LEED Registered Projects

State building projects registered as LEED projects through CY2015:

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
DSU	Beacom IT	✓		
DVA	Veterans Home	✓		
GFP	Outdoor Campus (Rapid City)	✓		Gold
GFP	Fisheries Building (Ft. Pierre)	✓		Silver
GFP	Visitor's Center (Custer State Park)	✓		
GFP	Visitor's Center (Good Earth 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	McCroly Gardens Building	✓		Silver
SDSU	Electrical Engineering & Computer Science Addition	✓		Silver

SDSU	Architecture, Math & Engineering Building	✓		Silver
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	✓		Silver
SDSU	Visual Arts Facility	✓		
SDSU	Indoor Practice Facility (SJAC)	✓		Silver
SDSU	Dykhouse Football Stadium	✓		
USD	School of Medicine	✓		Certified
USD	Churchill Haines Science Center		✓	Not Achieved
USD	Coyote Village Residence Hall	✓		Gold
USD	Wellness Center	✓		Silver
USD	Akeley Science Center		✓	Not Achieved
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 endnotes<sup>ii</sup>.



## Certification Earned in CY2015

Three building projects earned LEED certification in 2015:

### **Jackrabbit Grove, SDSU**

Silver certification was achieved for this new residence hall complex located on SDSU's campus. Each of the four buildings optimize energy efficiencies and water use reduction techniques and provide occupant comfort to the students.

### **Architecture, Math, and Engineering (J. Lohr) Building, SDSU**

The new J. Lohr engineering building achieved Silver certification in 2015. The building, located in the heart of campus, implements water use reduction techniques, optimizes energy efficiencies, and provides for a comfortable study environment for students.

### **Indoor Practice Facility (SJAC), SDSU**

Silver certification was achieved for the Sanford Jackrabbit Athletic Complex located on SDSU's campus. The building optimizes energy efficiencies and water reduction techniques, managed construction waste streams, incorporated regional materials, and provides for occupant comfort.

## Projects Registered in CY2015

Two building projects were newly registered as LEED projects in 2015:

### **Game, Fish, and Parks Park Visitor's Center, Good Earth State Park**

The new Good Earth State Park Visitor Center located near Sioux Falls will include an interpretative area as well as a 30 seat theatre and will optimize tourist comfort by focusing on energy efficiency, modern control and lighting systems, and environmental friendly materials.

### **Beacom IT, DSU**

The Beacom IT building will be the first state-owned building to be certified using the newest version of LEED, v4 with incorporation of the new administrative rules put in place in 2015. The focus of this building will be toward better energy efficiency of mechanical and electrical systems, improved wall, window, and roof insulation and will save taxpayers and students in long-term energy cost for years to come.

## 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 CY2015. There are a total of 61 state building projects that have been granted waivers through CY2015.

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

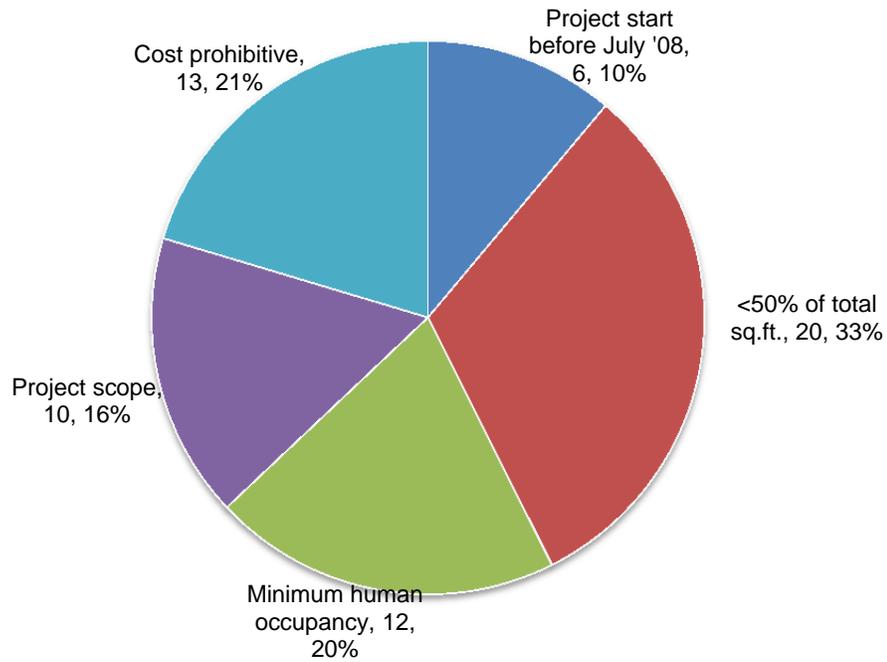
Campus	Building	Waiver Reason
BHSU	Woodburn Hall Renovation	Project Scope
BHSU	Jonas Science Renovation	Less than 50% of total building square footage
DHS	HSC Admissions Office (Yankton)	Less than 50% of total building square footage
DOA	Wildfire Office Building	Cost Prohibitive to include prerequisites
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
DSU	Future Residence Hall (former Madison Hospital)	Cost Prohibitive to Meet Prerequisites
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
GFP	Legion Lake Store	Minimum human occupancy/Extenuating Circumstances (seasonal)
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
NSU	Spafford Hall Renovation	Less than 50% of total building square footage
SDSMT	Surbeck Center	Project in design development before July 1, 2008
SDSMT	EE/Physics Bldg. Renovation	Less than 50% of total building square footage
SDSMT	Industrial Engineering 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
SDSU	Wecota Annex Renovation	Cost Prohibitive to include prerequisites
SDSU	Northern Plains Biostress HVAC Replacement	Project Scope
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
SDSP	Courtyard Addition	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 CY2015

Seven state building projects were granted waivers from the high performance green building requirement by the State Engineer in CY2015:

### **Industrial Engineering Renovation, SDSMT**

The Industrial Engineering Renovation was granted a waiver on June 26, 2015 because less than 50% of the total building square footage was included in the project, making LEED certification impracticable.

**Spafford Hall Renovation, NSU** – NSU was granted a waiver for the Spafford Hall renovation on March 4, 2015. The increased costs of achieving LEED Silver in relation to the small occupant space could not be recovered in 15 years.

**Residence Hall (former Madison Hospital), DSU** – Renovation of the former Madison Hospital building was granted a waiver on November 10, 2015. The increased costs of achieving LEED Silver certification could not be recovered in 15 years.

**Legion Lake Store, GFP** – The new Legion Lake Store was granted a waiver on July 10, 2015 because of minimal human occupancy and the extenuating circumstance being the store is only opened on a seasonal basis.

**Courtyard Addition, SDSP** – The proposed penitentiary courtyard addition was granted a waiver on October 28, 2015 because the addition is much less than 50% the total square footage of the building.

**Northern Plains Biostress HVAC Replacement, SDSU** – This building was granted a waiver on April 20, 2015 because the size and scope of the project precludes achieving LEED Silver certification.

**Wecota Annex Renovation, SDSU** – Wecota Annex renovation was granted a waiver on November 17, 2015 because the increased costs of achieving LEED Silver certification could not be recovered in 15 years.

## Projects Not Achieving LEED

To date, only three projects have not achieved LEED Silver certification when a waiver was not granted by the State Engineer.

- 1) 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.
- 2) Design of the USD Churchill Haines renovation project began in 2010. While LEED was initially considered, the square footage was not large enough in relation to the existing building and the scope of the project precluded the ability to achieve LEED Silver certification.
- 3) The USD Akeley Science renovation project was registered in 2010. While LEED was initially attempted, the square footage was not large enough in relation to the existing building and the scope of the project precluded the ability to achieve LEED Silver certification.

## Changes Made to the Green Building State and Administrative Rules

During the 2015 legislative session, HB1029 was passed into law which does the following:

- 1) Required the implementation of the newest USGBC standard, v4.
- 2) Increased the threshold from \$500,000 / 5,000 square feet to \$1 million and 10,000 square feet for buildings that must meet the standard. This was done because 29% of all waivers were for building projects within the range differences and not projects within the range differences achieved LEED Silver certification.

In addition to this, the administrative rules ARSD 10:09 were amended to ensure state government building projects using LEED focus on energy efficiency. These:

- 1) Require a minimum energy performance that exceeds the LEED v4 prerequisite by a 5%;
- 2) Require enhanced commissioning that includes building envelope commissioning;
- 3) Require architects/engineers verify project design prior to completion of construction documents;
- 4) Prohibit the use of green power and carbon offset credits, green parking credits, and limits use of bicycle facilities credits so design focus remains on better building construction to increase energy efficiency;
- 5) Requires the Owner's Project Requirements (OPR) to state energy efficiency goal the building;

- 6) Requires the 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; and
- 7) Deletes obsolete sections of administrative rules.

## More Information

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

Office of the State Engineer  
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Pierre, SD 57501  
P : 605-773-3466  
F : 605-773-5980  
<http://boa.sd.gov/divisions/engineer/>

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<sup>i</sup> Information about the USGBC and the LEED rating system is available at [www.usgbc.org](http://www.usgbc.org)

<sup>ii</sup> 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  
SDSP: South Dakota State Penitentiary