

South Dakota Bureau of Administration
Office of the State Engineer

High-Performance Green Building Projects

CY2016 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.ⁱ

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.

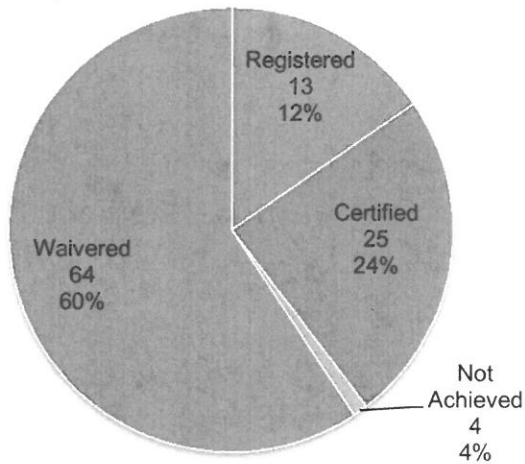
High Performance Green Building Projects

Project Summary

A total of 42 state building projects have been registered as LEED projects through CY2016. Thirty-two 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.

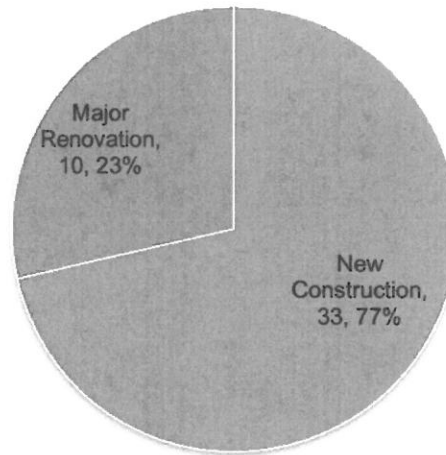
Building Projects & LEED

July 1, 2008 - Present



LEED Projects by Project Type

July 1, 2008 - Present



LEED Registered Projects

State building projects registered as LEED projects through CY2016:

| 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 | ✓ | | |
| NSU | Residence Hall | ✓ | | |
| 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 | McCrary Gardens Building | ✓ | | Silver |

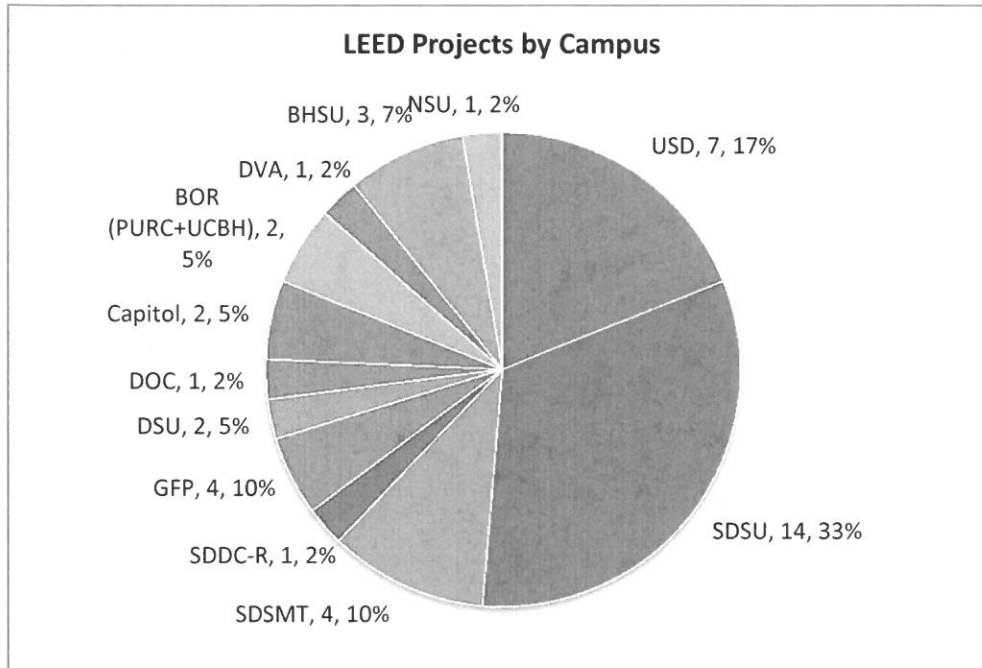
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|------|--|---|---|--------------|
| SDSU | Electrical Engineering & Computer Science Addition | ✓ | | Silver |
| SDSU | Architecture, Math & Engineering Building | ✓ | | Silver |
| SDSU | Dairy Microbiology Lab | | ✓ | Silver |
| SDSU | Jackrabbit Village Residence Halls | ✓ | | Silver |
| SDSU | New Dining Services | ✓ | | Not Achieved |
| SDSU | Dykhous Athletic Center | ✓ | | Gold |
| SDSU | Agricultural Hall Lab | | ✓ | Not Achieved |
| SDSU | Jackrabbit Grove Residence Halls | ✓ | | Silver |
| SDSU | Indoor Practice Facility (SJAC) | ✓ | | Silver |
| SDSU | Dykhous Football Stadium | ✓ | | |
| SDSU | Performing Arts Addition | ✓ | | |
| SDSU | Animal Disease Research and Diagnostic Lab | ✓ | | |
| SDSU | Wellness Center Addition | ✓ | | |
| 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 endnotesⁱⁱ.

Certification Earned in CY2016

No building projects were certified in CY2016.

Projects Registered in CY2016



Four building projects were newly registered as LEED projects in 2016:

New Residence Hall, NSU

Northern State University's new residence hall is constructed using some commercial building materials as well as wood framing, making the hall feel more like a residential home. The building focuses on energy efficiency, modern lighting and control systems and environmentally friendly materials.

Performing Arts Addition, SDSU

The new addition includes a high-tech theatre to provide a 21st century entertaining experience. Optimum energy efficiency will be achieved by constructing a solid envelope system and lighting system.

Animal Disease Research and Diagnostic Laboratory, SDSU

The ADRDL project includes the construction of a new diagnostic lab addition and renovation of the existing laboratory into research space. The project will focus on improving the energy efficiency of the highly energy consumption laboratory space and occupant comfort improvements.

Wellness Center Addition, SDSU

The Wellness Center Addition will double the space of the existing center. The focus of the building will be toward better energy efficiency of mechanical and electrical systems, improved wall, window, and roof insulation.

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.

Three state building projects were granted waivers in CY2016. There are a total of 64 state building projects that have been granted waivers through CY2016.

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

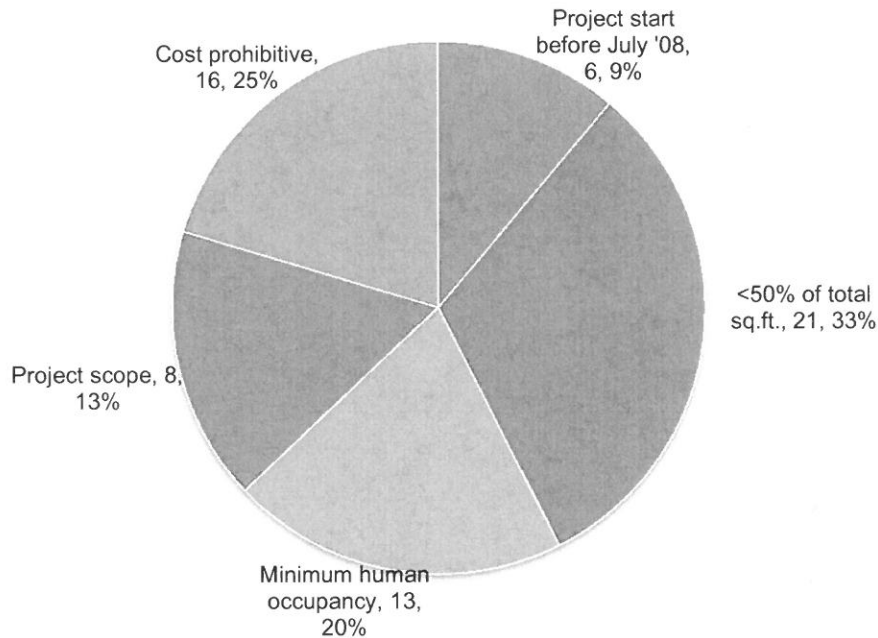
| Campus | Building | Waiver Reason |
|--------|--------------------------|--|
| BHSU | Woodburn Hall Renovation | Project Scope |
| BHSU | Jonas Science Renovation | Less than 50% of total building square footage |

| | | |
|---------|---|--|
| 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 |
| DSU | Trojan Center Renovation | Cost Prohibitive to include 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 |
| SDSMT | McLaury 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 | Cost Prohibitive to include prerequisites |
| 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 | Cost Prohibitive to include prerequisites |
| 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 |
| SDSU | Plant Science Research Facility | Minimum Human Occupancy |
| 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 CY2016

Three state building projects were granted waivers from the high performance green building requirement by the State Engineer in CY2016:

McLaury Building Renovation, SDSMT

The Office of the State Engineer granted a waiver to the SDSMT for the McLaury renovation on November 1, 2016 because less than 50% of the total building square footage was included in the project, making LEED certification impracticable.

Trojan Center Renovation, DSU Dakota State University was granted a waiver for the Trojan Center renovation on March , 2016. The increased costs of achieving LEED Silver in relation to the small occupant space could not be recovered in 15 years.

Plant Science Research Facility, SDSU – The campus was granted a waiver for the new plant science research center on February 19, 2016 because of minimal human occupancy.

Projects Not Achieving LEED

To date, only four 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.
- 4) The SDSU Agricultural Hall Laboratory 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 are:

- 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
Kristi Honeywell, P.E., State Engineer
523 E. Capitol Ave.
Pierre, SD 57501
P : 605-773-3466
F : 605-773-5980
<http://boa.sd.gov/divisions/engineer/>

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
SDSP: South Dakota State Penitentiary