

# **2016 LEED Equivalency Analysis for Stanford Campus**

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Office of Sustainability

Department of Sustainability & Energy Management

Stanford University

Category	Type	Credit/Prerequisite Name	Available Points	LEED Credit Requirements	Stanford Status	Points Earned
Location & Transportation	Credit	Alternative transportation	16	1) Transportation survey OR 2) Alternative transportation rate, starting at 3 points for 10% with one additional point awarded for each 5% increase in alternative transportation rate up to 70%	Stanford achieves 11 points for its 50% alternative transportation rate and for conducting an annual transportation survey	11
Sustainable Sites	Prerequisite	Site management policy	0	Create and implement a site management policy that employs best management practices to reduce harmful chemical use, energy waste, water waste, air pollution, solid waste, and/or chemical runoff for all operational elements of the building and grounds.	Stanford fulfills this credit through the BGM preventative maintenance plan, the Zones facilities renewal plan, and Grounds' IPM plan, construction pollution prevention plan, and landscape waste plan.	0
Sustainable Sites	Credit	Site development - protect or restore habitat	2	On-site restoration - native or adapted vegetation on 20% of total site area	Stanford proved compliance with this credit through Santa Clara County for LEED-NC in June 2011	2
Sustainable Sites	Credit	Rainwater management	3	Use LID practices to capture and treat water from 25% of the impervious surfaces for the 95th percentile storm event and conduct an annual inspection of rainwater management facilities	Stanford fulfills this credit through its water management infrastructure	3
Sustainable Sites	Credit	Heat island reduction	2	1) Nonroof strategies employed on 50% of site paving; 2) Roofing materials have minimum SRI or minimum of 75% of roofing area, or 50% of roofing area is vegetated roof; 3) 75% of parking is under cover	75% of Stanford's designated parking areas are under cover for 1 point. Stanford cannot fully determine the achievement of options 1 and 2 because we do not currently have campus-wide data on all hardscape materials or roofing materials.	1
Sustainable Sites	Credit	Light pollution reduction	1	1) Fixture shielding OR 2) Perimeter measurements to prevent backlight, uplight and glare	Stanford recently replaced its outdoor lighting fixtures with LED options that also fulfill the criteria for this credit	1
Sustainable Sites	Credit	Site management	1	Meet specified performance criteria for equipment, organic material disposal, and ongoing maintenance, and meet one of the following options: 1) Limited turf area OR 2) All manual or electric-powered equipment or 3) Reduction in emissinos from site management equipment	Fulfilled through the BGM preventative maintenance program, the Zones facilities renewal program, and Grounds' IPM program, construction pollution prevention, and landscape waste compost programs.	1
Sustainable Sites	Credit	Site improvement plan	1	Develop a five-year site improvement plan that includes hydrology, vegetation and soils and show that at least 5% of the site is vegetated	Fulfilled through Stanford's Habitat Conservation Plan	1
Water Efficiency	Prerequisite	Indoor Water Use Reduction	0	Reduce water consumption for fixtures and fittings to 120% of baseline for buildings constructed in 1995 or later and 150% of established baseline for buildings constructed before 1995. Baseline calculated assuming 100% of fixtures and fittings meet EPACT 1992 criteria for flow rates and flush rates.	Stanford fulfills this due to campus-wide fixture upgrades that meet EPACT 1992 requirements	0
Water Efficiency	Prerequisite	Building-level water metering	0	Have permanently installed water meters that measure total potable water use for each building and associated grounds and record or compile meter data on at least a monthly basis	Stanford has building-level water meters and records and compiles data in eDNA regularly	0
Water Efficiency	Credit	Outdoor water use reduction	2	Reduce outdoor water use through 1) landscape with no irrigation required OR 2) calculated or metered measurements show reduction compared to a baselines. Reduction of 30% recieves 1 point and 40% recieves 2 points.	Stanford has reduced overall potable water consumption by 47% compared to its internal baseline, most of which has been a reduction in irrigation water.	2

Water Efficiency	Credit	Indoor Water Use Reduction	5	Use less water than the baseline calculated for the prerequisite, starting at 1 point for 10% reduction and an additional point for each additional 5% reduction up to 30%	Stanford is performing at about the baseline level since it has all of the associated fixtures. There have been some additional savings efforts from replacing water-intensive indoor fixtures, but this will vary significantly from building to building, so no campus-wide points can be allocated.	0
Water Efficiency	Credit	Cooling tower water use	3	Conduct a potable water analysis that measures at least the five LEED control parameters, and calculate the number of cooling tower cycles OR use a minimum of 20% recycled nonpotable water	Stanford's minimal use of cooling towers through SESI and use of cooling tower blowdown water allow the campus to achieve this credit	3
Water Efficiency	Credit	Water Metering	2	Meter at least 80% of water subsystems, including irrigation, indoor plumbing fixtures and fittings, cooling towers, domestic hot water, reclaimed water, and other process water	Water submeters are integrated into new buildings at Stanford, but older buildings do not have them	0
Energy & Atmosphere	Prerequisite	Energy efficient best management practices	0	Conduct an energy audit that meets both the requirement of the ASHRAE preliminary energy use analysis and an ASHRAE Level 1 walkthrough assessment and prepare and maintain a current facilities requirements and operations and maintenance plan	Stanford Facilities Energy Management team has evaluated the energy use of all of Stanford's buildings through its energy-savings potential study and have worked with Zone Management to prepare facilities requirements and maintenance plans accordingly	0
Energy & Atmosphere	Prerequisite	Minimum energy performance	0	Achieve an Energy Star rating of at least 75 or demonstrate energy efficiency at least 25% better than average for typical buildings of similar type benchmarked against the national average	Median energy intensity for college/universities is 262.6 kBtu per square foot according to Energy Star, so at 287 kBtu per square foot overall, Stanford is 29% below average and achieves this prerequisite.	0
Energy & Atmosphere	Prerequisite	Building-level energy metering	0	Install building-level energy meters or submeters and compile meter data into monthly and annual summaries	Stanford maintains metered energy consumption data for all of its buildings and compiles it in eDNA regularly	0
Energy & Atmosphere	Prerequisite	Fundamental refrigerant management	0	Zero use of CFC-based refrigerants in base building systems. Phase-out plans in place are acceptable. Small units with less than 0.5 pounds of refrigerant are excluded.	Throughout the academic campus, R12 has been totally eliminated and R22 phase-out is in progress. In addition, all HVAC shop employees are universal class 4 certified regarding the use, disposal, and recovery of CFCs per the Montreal Protocol.	0
Energy & Atmosphere	Credit	Existing building commissioning - analysis	2	Develop a retrocommissioning, recommissioning, or ongoing commissioning plan for the building's major energy systems. Conduct analysis, document energy-use breakdown, list problems, and identify potential improvements. Alternatively, conduct a ASHRAE Level 2 energy audit.	All of Stanford's buildings have had their energy consumption evaluated, including major end-use breakdowns and opportunities for improvement. Through the Whole Building Energy Retrofit Program, audits are conducted of Stanford's most energy intensive buildings.	2
Energy & Atmosphere	Credit	Existing building commissioning - implementation	2	Implement no- or low-cost operational improvements and create a capital plan for major retrofits or upgrades. Provide training for management staff. Demonstrate observed and/or predicted savings. Updated operating plans as necessary.	Buildings that have participated in the Whole Building Energy Retrofit Program, which are Stanford's most energy-intensive buildings, meet this criteria, but it cannot be applied to all campus buildings.	0
Energy & Atmosphere	Credit	Ongoing commissioning	3	Implement an ongoing commissioning program including planning, testing, verification, corrective action response, measurement and documentation. Create a written plan for the commissioning cycle, complete 50% of the work by cost, and update building narratives with changes.	Buildings that have participated in the Whole Building Energy Retrofit Program, which are Stanford's most energy-intensive buildings, meet this criteria, but it cannot be applied to all campus buildings.	0
Energy & Atmosphere	Credit	Optimize energy performance	20	Achieve an Energy Star rating above 75, starting with 3 points for a 76 and one point for every Energy Star point thereafter up to 95 OR demonstrate energy performance that is at least 26% better than the median energy performance for typical buildings of similar type, starting at 1 point for 26% improvement and one additional point for each additional percentage improvement up to 45%.	Median energy intensity for college/universities is 262.6 kBtu per square foot according to Energy Star, so at 287 kBtu per square foot overall, Stanford is 29% below average and would earn 4 points.	4

Energy & Atmosphere	Credit	Advanced energy metering	2	Install advanced energy metering for all whole-building energy sources by building and major end uses that represent 20% or more of the total consumption of the building minus plug load use.	While Stanford's newer buildings do have energy submetering, this is not true of all buildings, so it cannot be achieved campus-wide.	0
Energy & Atmosphere	Credit	Demand Response	3	Participate in an existing demand response program for at least one year for at least 10% of annual peak electricity demand OR implement permanent load shifting for 10% of peak electrical demand.	Stanford achieves this credit through the Enterprise Optimization Solution software developed internally and in use at Stanford's Central Energy Facility (CEF). This software has allowed for permanent load shifting of more than 10% of Stanford's peak electrical demand and also allows for immediate demand response strategies for equipment at the CEF.	3
Energy & Atmosphere	Credit	Renewable Energy & Carbon Offsets	5	Meet at least some of the building's total energy use directly with renewable energy systems OR engage in a contract to purchase green power, carbon offsets or RECs.	Stanford achieves this through the renewable energy that will come online by the end of 2016.	5
Energy & Atmosphere	Credit	Enhanced refrigerant management	1	Do not use refrigerants in base building HVAC&R systems, or select refrigerants that minimize or eliminate ozone depletion compounds and calculate the impact of refrigerant use new and existing HVAC&R equipment	Stanford's base building HVAC&R systems do not use refrigerants since the chilled water comes from the central energy facility. There are some buildings with packaged units that do not receive chilled water from the plant, which use small amounts of the refrigerants considered least harmful. Stanford evaluates the impact of this refrigerant use in its annual greenhouse gas emissions inventory.	1
Materials & Resources	Prerequisite	Ongoing purchasing & waste policy	0	Have in place an environmentally preferable purchasing policy for products purchased during regular operations of the building that includes ongoing purchases and durable goods purchases. Establish storage locations for recyclable materials that addresses ongoing waste, durable goods waste, and hazardous waste. Maintain a high performing solid waste management program by conducting a waste stream audit of ongoing consumables at least once every five years or by diverting 75% of ongoing waste.	Stanford's achieves this prerequisite through the Sustainable Purchasing Policy, ongoing waste audits, and Zero Waste programs.	0
Materials & Resources	Prerequisite	Facility maintenance and renovation policy	0	Have in place a facility maintenance and renovation policy that includes a purchasing policy, a waste management policy, and an indoor air quality policy, each for maintenance and renovations.	Stanford fulfills this prerequisite through policies stated in the Project Delivery Process Manual	0
Materials & Resources	Credit	Purchasing - ongoing	1	Purchase at least 60%, by cost, of total ongoing consumables that meet at least one of several sustainable criteria. Purchase at least 40%, by cost, electric-powered equipment that meets one of several sustainable criteria.	Stanford's sustainable purchasing analysis of office supplies showed 24% sustainable purchases, so it is unlikely that Stanford would achieve this credit for all purchases.	0
Materials & Resources	Credit	Purchasing - lamps	1	Implement a lighting purchasing plan that specifies an overall building average of 70 picograms per lumen hour or less for all mercury-containing lamps purchased	Stanford's Facility Design Guidelines specify GE Lamps F32T8/XL/SPX41/HL/ECO, which have 42 picograms Hg per lumen hour. Therefore, lamps purchased on campus meet the requirement for this credit.	1
Materials & Resources	Credit	Purchasing - facility maintenance and renovation	2	Purchase at least 50%, by cost, of the total maintenance and renovation materials that meet at least one of several sustainable criteria. For furniture purchases, 75%, by cost, should have one of several sustainability attributes OR no alternations to furniture qualifies for full credit	Stanford achieves full credit for this based on policies in the Project Delivery Process Manual and the strict standards for renovation and new construction on campus, including in Student Housing.	2
Materials & Resources	Credit	Solid waste management - ongoing	2	Maintain a waste reduction and recycling program that reuses, recycles or composts at least 50% of ongoing waste and at least 75% of durable good waste, as well as safe disposal of batteries and mercury-containing lamps	Stanford's 66% diversion rate achieves this credit for ongoing consumables. Stanford has a 90% recycling rate for electronic goods and other durable goods and a battery and CFL recycling program.	2

Materials & Resources	Credit	Solid waste management - facility maintenance and renovation	2	Divert at least 70% of the waste generated by facility maintenance and renovation activities	Stanford recycled 89% of its construction waste in 2015	2
Indoor Environmental Quality	Prerequisite	Minimum indoor air quality performance	0	Meet ASHRAE 62.1 ventilation rates under all normal operating conditions for outside air intake or complete assessment of maximum air delivery rate. Show compliance through measurements, implement and maintain an HVAC system maintenance program, and test and maintain operation of exhaust systems.	Most of Stanford's buildings are slightly pressurized and most exceed the ASHRAE 62.1 requirements. Stanford has an ongoing preventative maintenance program and EH&S verifies that proper ventilation rates are maintained.	0
Indoor Environmental Quality	Prerequisite	Environmental tobacco smoke control	0	Prohibit smoking within buildings and within 25 feet of entries, outdoor air intakes, and operable windows.	All university buildings are smoke-free. Outdoor smoking is prohibited 30 feet from entries, air intakes, and operable windows. There are also specific stipulations for covered areas and courtyards. The School of Medicine's grounds are also smoke free.	0
Indoor Environmental Quality	Prerequisite	Green Cleaning Policy	0	Establish a green cleaning policy that addresses floor care, equipment, operating procedures, hygiene, chemical handling and storage, training, and feedback.	C&W uses their "GreenClean" program on Stanford's campus that follows a customized green cleaning policy for the campus.	0
Indoor Environmental Quality	Credit	Indoor air quality management program	2	Develop and implement an ongoing IAQ management program based on I-BEAM from the EPA to enhance air quality and correct no- to low-cost problems when they occur.	Stanford satisfies the intent of this credit through Zone Management, EH&S, and the HVAC shop.	2
Indoor Environmental Quality	Credit	Enhanced indoor air quality strategies	2	Have in place permanent entryway systems at least 10 feet long that are maintained on a weekly basis OR implement enhanced IAQ strategies, such as filtration for mechanically ventilated spaces, measuring outdoor air flow to occupied spaces for natural ventilation systems, and/or CO2 monitors.	Stanford achieves one point for this credit for complying with requirements for entryway systems and two points for complying with all requirements for both mechanically and naturally ventilated spaces.	2
Indoor Environmental Quality	Credit	Thermal comfort	1	Have a system for continuous tracking and optimization of air temperature, humidity, air speed, and radiant temperature within occupied spaces. Ensure compliance with ASHRAE 55-2010.	Stanford's EMCS provides this level of monitoring for some buildings, but not the entire campus.	0
Indoor Environmental Quality	Credit	Interior lighting	2	Provide lighting control for at least 50% of building occupants and ensure optimal lighting quality through an assortment of possible strategies	Many buildings will achieve the intent of this credit, but it is not necessarily applicable campus-wide	0
Indoor Environmental Quality	Credit	Daylight and quality views	4	1) Daylight measurement: 50% of occupied floor area must achieve between 300 and 3,000 lux; 2) Quality views: 50% of occupied floor area must achieve two of four possible views with high view factors	Many buildings will achieve the intent of this credit, but it is not necessarily applicable campus-wide.	0
Indoor Environmental Quality	Credit	Green cleaning - custodial effectiveness assessment	1	Conduct an APPA Leadership in Educational Facilities audit to determine custodial effectiveness and score 3 or above.	Custodial effectiveness studies are not undertaken in this manner on campus.	0
Indoor Environmental Quality	Credit	Green cleaning - products and materials	1	Purchase 75%, by cost, green cleaning materials and products, such as floor finishes and strippers, disposable janitorial paper products, and trash bags, according to set standards.	82% of cleaning purchases on Stanford's campus are considered sustainable per STARS data, which fulfills this credit.	1
Indoor Environmental Quality	Credit	Green cleaning - equipment	1	Create an inventory of existing interior and exterior equipment, including what is brought onsite by vendors. At least 40% of all powered janitorial equipment (purchased, leased, or used by contractors) must meet several sustainable criteria.	C&W uses their "GreenClean" program on Stanford's campus, which includes green cleaning equipment.	1

Indoor Environmental Quality	Credit	Integrated pest management	2	Develop and implement an indoor integrated pest management plan.	Stanford has an indoor IPM program for academic and residential buildings run by Crane Pest Control.	2
Indoor Environmental Quality	Credit	Occupant comfort survey	1	Administer at least one occupant comfort survey to collect anonymous responses regarding acoustics, building cleanliness, indoor air quality, lighting, and thermal comfort. Develop and implement a corrective action plan to address comfort issues if the results indicate that more than 20% of occupants are dissatisfied.	Stanford has occupant feedback mechanisms in place, but there is not a campus-wide survey that meets this criteria.	0
Innovation	Credit	Exemplary Performance	1	Additional point for Renewable Energy & Carbon Offsets credit for having at least 10% of electricity produced from renewables	Stanford fulfills this with 65% renewable electricity by the end of 2016	1
Innovation	Credit	Exemplary Performance	1	Additional point for Enhanced indoor air quality strategies credit for employing additional IAQ strategies	Stanford complies with all requirements for both mechanically ventilated systems and natural ventilation systems	1
Innovation	Credit	Green building education	1	A comprehensive signage program built into the building's spaces; a manual, design or case study to inform the design of other buildings; or an educational outreach program or guided tour	Stanford offers all of the above to promote its green buildings across campus, as well as a comprehensive sustainability outreach program	1
Innovation	Credit	Occupant engagement	1	Implement one or more modes of communication to inform building occupants about the actual energy consumption of their building and/or work space	Stanford offers real-time energy and water dashboards for 135 of its buildings, along with an internally-developed, public sustainability building rating system. Other buildings can have other engagement tools, such as plug load reports and recommendations that were distributed to all buildings, and the My Cardinal Green action network, which provides tangible recommendations and savings data regarding particular actions for the entire campus community.	1
Innovation	Credit	LEED Accredited Professional	1	Have a LEED accredit professional on the project	Stanford has many employees who are LEED accredited professionals	1
Regional Priority	Credit	Alternative Transportation	1	Meet threshold of 11 points	Stanford achieves 12 points	1
Regional Priority	Credit	Solid waste management - ongoing	1	Meet threshold of 2 points	Stanford achieves 2 points	1
Regional Priority	Credit	Cooling tower water use	1	Meet threshold of 3 points	Stanford achieves 3 points	1
<b>Total</b>			<b>109</b>			<b>63</b>
<b>LEED for Existing Buildings: Operations and Maintenance Certification Level for Stanford Campus:</b>						<b>Gold</b>