

This document prioritizes the implementation of sustainable elements in the design of University facilities. It should be used in conjunction with our Design Standards and guide design consultants in the implementation of the requirement to attain LEED certification for our projects.

This document reinforces the fundamental idea of the LEED process that calls for an integrated, holistic approach to building design; one that yields the most energy efficient, comfortable, healthy, and ecologically responsible facility. It strives to prevent the random pursuit of credits for the sake of achieving a certain score.

In order to customize the LEED process for Penn State and focus on the issues that are most important to us a committee was formed with broad representation across the University's operational groups. Included are individuals representing:

- Engineering Services – MEP design
- Architecture
- Landscape
- Storm water management
- Transportation/Parking
- Purchasing
- Project mgmt
- Maintenance
- Janitorial
- Health and safety

Criteria

This committee established the criteria that are most important to Penn State. These are issues that are integrated within the LEED strategy anyway, but to us are the key drivers and guided the classification of each credit. We identified the following in no particular order:

- Energy conservation
- Natural resources conservation
- Prevention of environmental degradation
- People's health, well-being and comfort
- Total cost of ownership

Classification of LEED credits:

The committee established a ranking structure for each credit by establishing the following four priority levels:

Mandatory

Compliance will be required.

Significant effort

The design professional must show clear evidence that a serious attempt to achieve this credit has been made. If compliance is not achieved, reason for this failure must be shown by the design professional and accepted by the University.

Assessment of credits classified in this group will require careful consideration of factors such as first cost vs. life-cycle cost, maintenance, operational issues, and aesthetic issues.

Minimal effort

The design professional will investigate the possibility of accomplishing this credit. If circumstances are such that broad University policies or the project's programmatic requirements make a credit achievable, the design professional will provide the necessary documentation; however, no additional effort or resources will be dedicated towards it.

No effort

We will not pursue this credit and documentation will not be required.

Notes:

1. While not specifically addressed by this document, it should be obvious that all prerequisites are mandatory.
2. While each credit is addressed specifically as it relates to a particular project, it is evident that a number of credits will be impacted by broader campus-wide initiatives and institutional commitments; for example: transportation and parking issues, storm water issues, wastewater issues.
3. It is important to understand that this document is directed to the design professionals of a specific project and the level of effort assigned to a particular credit refers to the effort required from that professional within the scope of that specific project. It does not reflect the importance that the university attaches to the issue addressed by that specific credit outside the scope of the project. For example: SS Credit 4.1 Alternative Transportation: Public Transportation Access is classified in this document as minimal effort. That means that the design professional for the specific project will exert minimal effort in achieving this credit because typically a site for a project is established prior to the involvement of a professional and that is a determining factor in attaining this credit. The university puts forth a great deal of effort in providing public transportation to its

- constituents and addresses the issue globally; it is likely that most projects in the core campus at University Park will achieve this credit.
4. This policy applies to all projects exceeding a Total Project Cost of \$2,000,000 whether new construction or substantial renovation. Differences inherent between new construction and renovation projects are addressed in the specific description for each credit.
 5. This policy applies to all Penn State locations. Where local circumstances dictate a different requirement for University Park and other locations, such a difference is addressed in the specific description for each credit.
 6. If the design team for a project, including the OPP Project Manager, feels that there is a compelling reason to waive the requirement to certify that project or a credit classified as mandatory, they will submit a request and supporting documentation to the LEED Committee. The appropriate members of the Committee will formulate a recommendation and submit it to the Associate Vice President for Physical Plant who will make the ultimate decision.

Penn State classification of credits (LEED – NC 2.2)

Sustainable Sites

SS Credit 1 Site Selection

Minimal effort

Typically, site selection is addressed at the campus master planning level and is established by the University prior to beginning of design.

SS Credit 2 Development Density and Community Connectivity

Minimal effort

Typically site selection is addressed at the campus master planning level and is established by the University prior to beginning of design.

SS Credit 3 Brownfield Redevelopment

Minimal effort

Typically site selection is addressed at the campus master planning level and is established by the University prior to beginning of design.

SS Credit 4.1 Alternative Transportation: Public Transportation Access

Minimal effort

Typically site selection is addressed at the campus master planning level and is established by the University prior to beginning of design. Public transportation is addressed globally and is typically outside the purview of individual projects.

In addition, local public transportation circumstances may be dealt with differently in the various Penn State locations.

SS Credit 4.2 Alternative Transportation: Bicycle Storage and Changing Rooms

Significant effort

At University Park, the University provides bicycle racks as part of its inter-modal transportation system and will continue to do so. If it makes programmatic sense to provide the necessary changing facilities in a project, we will do so but not require it.

At locations other than University Park, local circumstances related to bicycle use will dictate implementation of this credit

SS Credit 4.3 Alternative Transportation: Low Emitting and Fuel Efficient Vehicles

Minimal effort

This credit may be accomplished by implementation of comprehensive University policies dealing with parking and/or transportation at each location. It is not addressed by individual projects.

SS Credit 4.4 Alternative Transportation: Parking Capacity.

Minimal effort

This credit may be accomplished by implementation of comprehensive University policies dealing with parking and/or transportation at each location. It is not addressed by individual projects.

SS Credit 5.1 Site Development: Protect or Restore Habitat.

Minimal effort

This is addressed at the campus master planning level.

SS Credit 5.2 Site Development: Maximize Open Space.

Significant effort

It is important to maximize the efficient use of land (a finite resource). This will help with storm water infiltration and provide natural areas for informal use.

SS Credit 6.1 Stormwater Design: Quantity Control.

Mandatory

Regulatory compliance generally results in achieving this credit.

SS Credit 6.2 Stormwater design: Quality Control.

Significant effort

Storm water can have a significant impact on existing natural water resources. It is imperative that the quality of storm water be as high as possible before it leaves a project site.

SS Credit 7.1 Heat Island Effect: Non-Roof.

At University Park

No effort

Current design standards for exterior pavers do not comply with the requirements of this credit making it very difficult to attain. It is also not of significant impact when judged against our primary criteria.

At non-University Park locations

Minimal effort

Exterior paving material standards vary for different campuses and this credit should be considered on an individual project by project and campus by campus basis.

SS Credit 7.2 Heat Island Effect: Roof.

Significant effort

Current roofing materials technology (including vegetated roofs) makes this a worthwhile credit to pursue; however, careful analysis of longevity, performance, cost and maintainability must be performed.

SS Credit 8 Light Pollution Reduction.

At University Park

No effort

Current Penn State design standards for exterior light fixtures at University Park do not comply with the requirements of this credit.

At non-University Park locations

Significant effort

Many municipalities require compliance. The benefit of pursuing this credit must be based on the circumstances particular to each campus.

Water Efficiency

WE Credit 1.1 Water Efficient Landscaping: Reduce by 50%.

Minimal effort

Landscape design goals dictate attainment of this credit.

WE Credit 1.2 Water Efficient Landscaping: No Potable Water Use or No Irrigation.

Minimal effort

Landscape design goals dictate attainment of this credit.

WE Credit 2 Innovative Wastewater Technologies.

No effort

While we do implement a number of wastewater reduction initiatives such as use of low-flow fixtures, and some dedicated gray water riser systems, achieving this point would require a higher level of commitment and potential benefits do not justify the investment at this point.

WE Credit 3.1 Water Use Reduction: 20% Reduction.

Mandatory

This is attainable with current technology.

WE Credit 3.2 Water Use Reduction: 30% Reduction.

Significant effort

This credit will require consideration of multiple water-saving strategies including ultra low-flow or waterless urinals, no-touch or spring-loaded faucets and dual-flush toilets. It should be explored on a case by case basis.

Energy and Atmosphere

EA Credit 1.1-1.6 Optimize Energy Performance.

Mandatory

This is a key goal identified in the initial charge establishing the requirement to get LEED certification. As clarification to the initial charge, the goal is to achieve 30% energy savings over the “most recent” applicable version of the ASHRAE 90.1 standard for new construction. Compliance shall be achieved using the Energy Cost Budget Method as described in the LEED v2.2 Reference Manual utilizing a software energy simulation package. Utility rates must be those provided by OPP-Engineering Services. Designs with window/wall area ratios exceeding 0.50 are discouraged. If a ratio of 0.50 is exceeded, an envelope trade-off calculation must be performed as described in ASHRAE 90.1 *before* performing the Energy Cost Budget calculations.

In implementing this credit, it is important to note that the design team will be required to validate their envelope design vis-à-vis alternate concepts.

It should also be noted that expectations for this credit vary between new construction and renovation projects.

EA Credit 1.7-1.10 Optimize Energy Performance.

Significant effort

Beyond accomplishing 1.1 to 1.6, we should make every reasonable effort to go beyond that level since this is one of our central goals.

EA Credit 2.1 On-Site Renewable Energy.

Significant effort

Due to the pace of technological advances in this field, every effort should be made to utilize new technologies that help reduce the consumption of fossil fuels.

EA Credit 2.2- 2.3 On-Site Renewable Energy.

Minimal effort

At this point, pursuing the second and third points for this credit should be investigated but may be beyond reasonable expectation.

EA Credit 3 Enhanced Commissioning.

Mandatory

We already do this in an effort to attain the most efficient systems and operation. Future PSU contracts for new building commissioning services will include the scope of work required by the Enhanced Commissioning credit.

EA Credit 4 Enhanced Refrigerant Management.

Mandatory

At University Park the central chilled water plant already complies. A calculation documenting the central plant refrigerant management will be provided by PSU for all buildings connected to the central plant. Individual systems at University Park and at other locations should be designed to meet this requirement and documentation provided by the design consultant.

EA Credit 5 Measurement and Verification.

No effort

We cannot justify implementing the specific strategies required to accomplish this credit, including staffing commitment. Accountability of building energy consumption is valuable and can be accomplished in other ways that are more manageable but will not satisfy the requirements of this credit.

EA Credit 6 Green Power.

Mandatory

The University has made a commitment to the use of renewable energy in the form of Renewable Energy Certificates. It will be necessary to implement a documentation process as we continue to add LEED certified projects.

Materials and Resources

MR Credit 1.1 Building Reuse: Maintain 75% of Existing Walls, Floors and Roof.

Minimal effort

Master planning, programmatic and aesthetic decisions will take precedence regarding the scope of reuse of existing facilities.

MR Credit 1.2 Building Reuse: Maintain 95% of Existing Walls, Floors and Roof.

Minimal effort

Master planning, programmatic and aesthetic decisions will take precedence regarding the scope of reuse of existing facilities.

MR Credit 1.3 Building Reuse: Maintain 50% of Interior Non-Structural elements.

Minimal effort

Programmatic and aesthetic decisions will take precedence regarding the scope of reuse of existing facilities.

MR Credit 2.1 Construction Waste Management: Divert 50% From Disposal.

Mandatory

The University has made a broad commitment to recycling in general. At this point it is reasonable to expect from construction managers a waste collection and removal process that accomplishes this.

MR Credit 2.2 Construction Waste Management: Divert 75% From Disposal.

Mandatory

The University has made a broad commitment to recycling in general. At this point it is reasonable to expect from construction managers a waste collection and removal process that accomplishes this.

MR Credit 3.1 Materials Reuse: 5%.

Minimal effort

Potential benefit may not justify level of effort

MR Credit 3.2 Materials Reuse: 10%.

Minimal effort

Potential benefit may not justify level of effort

MR Credit 4.1 Recycled Content: 10% (post-consumer +1/2 pre-consumer)

Mandatory

This is achievable given the amount of recycled material currently being used in basic construction products such as steel, carpeting, etc.

MR Credit 4.2 Recycled Content: 20% (post-consumer +1/2 pre-consumer)

Significant effort

A strong effort to exceed the requirements of 4.1 is desirable.

MR Credit 5.1 Regional Materials: 10% Extracted, Processed and Manufactured Regionally.

Mandatory

We are conveniently located within a 500-mile radius of sources for numerous building materials. The challenge for this credit is the documentation.

MR Credit 5.2 Regional Materials: 20% Extracted, Processed and Manufactured Regionally.

Mandatory

We are conveniently located within a 500-mile radius of sources for numerous building materials. The challenge for this credit is the documentation.

MR Credit 6 Rapidly Renewable Materials.

Minimal effort

At this point our facilities do not lend themselves to the use of these materials to the extent required.

MR Credit 7 Certified Wood.

Mandatory

The type of wood products we typically use in our buildings lends itself to achieving this credit.

Indoor Environmental Quality

EQ Credit 1 Outdoor Air Delivery Monitoring.

Mandatory

This is a very important strategy that helps control the amount of ventilation, thus reducing the potential waste of energy to temper outside air. It requires very careful design to be effective and cost efficient.

EQ Credit 2 Increased Ventilation.

No effort

Good air quality is mandated by prerequisite 1. Additional ventilation requires energy to condition and the benefit does not justify the effort.

EQ Credit 3.1 Construction IAQ Management Plan: During Construction.

Mandatory

This is an important strategy in addressing the health and well being of building occupants.

EQ Credit 3.2 Construction IAQ Management Plan: Before Occupancy.

Mandatory

This is an important strategy in addressing the health and well being of building occupants.

EQ Credit 4.1 Low-Emitting Materials: Adhesives and Sealants.

Mandatory

This is an important strategy in addressing the health and well being of building occupants. Current industry standards make this relatively easy to attain.

EQ Credit 4.2 Low-Emitting Materials: Paints and Coatings.

Mandatory

This is an important strategy in addressing the health and well being of building occupants. Current industry standards make this relatively easy to attain.

EQ Credit 4.3 Low-Emitting Materials: Carpet Systems.

Mandatory

This is an important strategy in addressing the health and well being of building occupants. Current industry standards make this relatively easy to attain.

EQ Credit 4.4 Low-Emitting Materials: Composite Wood and Agrifiber Products.

Mandatory

This is an important strategy in addressing the health and well being of building occupants. Current industry standards make this relatively easy to attain.

EQ Credit 5 Indoor Chemical and Pollutant Source Control.

Mandatory

This is a relatively easy requirement to address and has substantial impact on the well-being and comfort of occupants as well as the maintainability of a facility.

EQ Credit 6.1 Controllability of Systems: Lighting.

Mandatory

Current practice makes it reasonable to expect achieving this credit.

EQ Credit 6.2 Controllability of Systems: Thermal Comfort.

Significant effort

This is an important goal with significant benefit to the well-being and productivity of occupants; considerable thought must be given to the relationship between programmatic demands, cost, and benefit of the occupants.

EQ Credit 7.1 Thermal Comfort: Design.

No effort

This requires humidification and de-humidification that is not part of our standard practice. We can reach adequate comfort levels without this requirement.

EQ Credit 7.2 Thermal Comfort: Verification.

Mandatory

The documentation required to achieve this credit will be incorporated into the bond inspection process.

EQ Credit 8.1 Daylight and Views: 75 % of Spaces.

Significant effort

This is a very worthwhile goal with a potentially significant benefit to the well being of occupants; however, in some instances it may not be achievable without programmatic compromise.

EQ Credit 8.2 Daylight and Views: 90 % of Spaces.

Minimal effort

Same reasoning as previous credit but harder to achieve. Requirements are very prescriptive.

Innovation and Design Process

ID Credit 1.1-1.2 Innovation in Design

Mandatory

ID Credit 1.3-1.4 Innovation in Design

Significant effort

There are several strategies that can be implemented to achieve between 1 and 4 points; several include incorporating educational and informational initiatives that can be readily accomplished and can be very beneficial.

ID Credit 2 LEED Accredited Professional

Mandatory

The inclusion of a LEED accredited professional in the design team is standard procedure.

SUMMARY

Sustainable Sites

Mandatory	Significant effort	Minimal effort	No effort
Credit 6.1	Credit 4.2	Credit 1	Credit 7.1*
	Credit 5.2	Credit 2	Credit 8**
	Credit 6.2	Credit 3	
	Credit 7.2	Credit 4.1	
	Credit 8**	Credit 4.3	
		Credit 4.4	
		Credit 5.1	
		Credit 7.1*	

* Credit 7.1 is classified as “Minimal effort” at non-University Park locations and as “No effort” at University Park.

** Credit 8 is classified as “Significant effort” at non-University Park locations and as “No effort” at University Park.

Water Efficiency

Mandatory	Significant effort	Minimal effort	No effort
Credit 3.1	Credit 3.2	Credit 1.1	Credit 2
		Credit 1.2	

Energy and Atmosphere

Mandatory	Significant effort	Minimal effort	No effort
Credit 1.1-1.6	Credit 1.7-1.10	Credit 2.2-2.3	Credit 5
Credit 3	Credit 2.1		
Credit 4			
Credit 6			

Materials and Resources

Mandatory	Significant effort	Minimal effort	No effort
Credit 2.1	Credit 4.2	Credit 1.1	
Credit 2.2		Credit 1.2	
Credit 4.1		Credit 1.3	
Credit 5.1		Credit 3.1	
Credit 5.2		Credit 3.2	
Credit 7		Credit 6	

Indoor Environmental Quality

Mandatory	Significant effort	Minimal effort	No effort
Credit 1	Credit 6.2	Credit 8.2	Credit 2
Credit 3.1	Credit 8.1		Credit 7.1
Credit 3.2			
Credit 4.1			
Credit 4.2			
Credit 4.3			
Credit 4.4			
Credit 5			
Credit 6.1			
Credit 7.2			

Innovation and Design

Mandatory	Significant effort	Minimal effort	No effort
Credit 1.1-1.2	Credit 1.3-1.4		
Credit 2			