LEED for New Construction

How to Interpret this Report

Purpose  The Leadership in Energy and Environmental Design (LEED) Rating System was designed by the US Green Building Council to encourage and facilitate the development of more sustainable buildings.

Environmental Categories  The report is organized into five environmental categories as defined by LEED including: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environment.

LEED Prerequisites  Prerequisites must be achieved. Non-compliant prerequisites must be resolved before a certification can be awarded.

LEED Credits  The environmental categories are subdivided into the established LEED credits, which are based on desired performance goals within each category. An assessment of whether the credit is earned or denied is made and a narrative describes the basis for the assessment.

Achieved  The applicant has provided the mandatory documentation which supports the achievements of the credit requirements, achieving the associated points. Currently the project has scored the adjacent points in this category. 44

Denied  The applicant has applied for a point in a particular credit, but has misinterpreted the credit intent or cannot substantiate meeting the requirements. Currently the project has the adjacent points in this category. 0

Rating  This Project has achieved enough points for Gold Rating.

### Sustainable Sites

**Possible Points**: 14

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**Erosion and Sedimentation Control**  
Prerequisite 1-Version 2.1

**Construction Application**  
6/13/2008

The signed LEED Letter Template states that the local Best Management Practices meet or exceed the EPA BMPs. Measures include, but are not limited to inlet protection, silt fence, stacked hay bales, soil stockpile protection, dewatering facility and temporary vegetative controls.

### Site Selection

**Credit 1-Version 2.1**

**Design Application**  
6/14/2007

The signed LEED Letter Template declares that the site does not meet any of the prohibited criteria.

### Urban Redevelopment

**Credit 2-Version 2.1**

**Design Application**  
6/14/2007

This credit has been submitted based on a LEED-NC v2.2 compliance path. The LEED Submittal Template indicates that the project is located within a half mile of a residential zone or neighborhood with an average density of at least 10 units per acre net, and within a half mile of at least 10 basic services. A site vicinity drawing indicating the residential development and community services has been provided.

### Brownfield Redevelopment

**Credit 3-Version 2.1**

### Alternative Transportation, Public Transportation Access

**Credit 4.1-Version 2.1**

**Design Application**  
6/14/2007

The signed LEED Letter Template states that there are 5 bus lines within 1/4 mile of the project site. A scaled site map has been provided.

### Alternative Transportation, Bicycle Storage and Changing Rooms

**Credit 4.2-Version 2.1**

**Design Application**  
6/14/2007

The signed LEED Letter Template declares that 30 bicycle stalls and 60 showers are provided within 200 yards of the project for 524 occupants.
Alternative Transportation, Alternative Fuel Refueling Stations
Credit 4.3-Version 2.1

Alternative Transportation, Parking Capacity
Credit 4.4-Version 2.1
Design Application
6/14/2007
This credit has been submitted based on a LEED-NC v2.2 compliance path. The LEED Submittal Template declares that no new parking is provided for this project.

Reduced Site Disturbance, Protect or Restore Open Space
Credit 5.1-Version 2.1

Reduced Site Disturbance, Development Footprint
Credit 5.2-Version 2.1
Design Application
6/14/2007
A signed LEED Letter Template declares that there are no local zoning requirements for open space, so an area of open space has been allocated adjacent to the building which is equal in size to the building footprint. A site plan and calculations substantiate this claim.

Stormwater Management, Rate or Quantity
Credit 6.1-Version 2.1
Design Application
6/14/2007
The signed LEED Letter Template declares that the post-development 1.5 year, 24 hour peak discharge rate and quantity do not exceed pre-development conditions. Supporting calculations and a narrative have been provided.

Stormwater Management, Treatment
Credit 6.2-Version 2.1
Design Application
6/14/2007
The signed LEED Letter Template has been provided declaring that the local standard for stormwater treatment was followed, that this standard is more stringent than EPA standards, and that treatment results in at least an 80% reduction in TSS and a 40% reduction in TP.

Landscape and Exterior Design to Reduce Heat Islands, Non-Roof
Credit 7.1-Version 2.1
Construction Application
6/13/2008
The signed LEED Letter Template has been provided stating that a minimum of 30% of non-roof impervious surfaces areas are constructed with high-albedo materials.

Landscape and Exterior Design to Reduce Heat Islands, Roof
Credit 7.2-Version 2.1
Design Application
6/14/2007
The signed LEED Letter Template has been provided stating that roofing materials for 90.30% of the project's roof surface meet the emissivity, reflectivity and green roof requirements of the credit.

**Light Pollution Reduction**

**Design Application**

6/14/2007

The applicant submitted a signed LEED Letter Template, a narrative and a photometric site plan. Upon review of the photometric plan, it appears that the lighting for the existing parking lot was included in the photometric calculations. It is unclear if the parking area is included in the project or LEED site boundary, since other credit documentation excludes the parking area. If new lighting was installed in the parking area as a result of this project, then that area would need to be included in the LEED site boundary and be consistent across all credit. If this is the case, then it appears that the pole mounted fixtures (SC) are located within 2.5 times their mounting height to the project boundary. Since this is a campus environment, it appears that there may be light trespass and potential glare from fixture SC on the campus road. In addition, the pole mounted fixtures EA appear very close to Carson Hall and the Biotechnology Building and it is unclear if the light from these fixtures trespass into those buildings, resulting in potential glare.

TECHNICAL ADVICE: Please provide a line of site illuminance calculation for the SC fixtures that are located near the project boundary along the campus road. Please provide additional documentation demonstrating that the light from fixtures EA does not trespass into any adjacent buildings. Please refer to page 75-76 of the LEED-NC v2.1 Reference Guide for more information on the line of sight illuminance calculation methodology.

**Design Application**

9/13/2007

The applicant provided a revised photometric site plan, narrative, line-of-sight drawing for the EA fixtures adjacent to the Biotechnology Building, and information regarding the relocation of the EA fixtures adjacent to Corson-Mudd Hall. Additionally, the applicant provided clarification on the scope of the exterior lighting associated with the project. The documentation demonstrates that light from the EA fixtures does not trespass into any adjacent buildings and become a form of glare, and that the parking lot lighting is not to be included within the scope of this project.

**Water Efficiency**

**Water Efficient Landscaping, reduce by 50%**

**Design Application**

6/14/2007

The signed LEED Letter Template states that the project's landscape design uses native plantings which do not require a permanent irrigation system. A narrative describing the plant species and the watering protocol during their establishment period has been provided.

**Water Efficient Landscaping, No Potable Use or No Irrigation**

**Design Application**

6/14/2007

The applicant submitted a signed LEED Letter Template stating that the project's landscape design uses native plantings which do not require a permanent irrigation system. A narrative describing the plant species and the watering protocol during their establishment period has been provided.
Innovative Wastewater Technologies

Credit 2-Version 2.1

Water Use Reduction

Credit 3.1-3.2-Version 2.1

Design Application 6/14/2007
The signed LEED Letter Template and calculations have been provided demonstrating that water use has been reduced by 31.97% through the use of low-flow urinals, lavatories, kitchen sinks and showers. Fixture cut sheets have been provided for kitchen sinks, showers and urinals. However, the applicant has used a low-flow lavatory faucet in the design case and decreased the flow duration to 12 seconds from 15 seconds in the baseline case. This decrease is only applicable when using automatic faucet controls. In addition, the applicant has listed a 78,000 gallon graywater or stormwater reuse volume subtracted from the potable water use in the design case. As no mention of this reuse system is made in the stormwater or any other credits, more information is needed.

TECHNICAL ADVICE: Please provide a cut sheet or other manufacturer information indicating the automatic controls and flow rate for the lavatory faucets. Also, please provide a narrative describing the graywater or stormwater recovery system and provide cutsheets of the system components. Also provide calculations demonstrating that the recovery system can provide the volume indicated on an annual basis. For guidance, see the LEED-NC v2.1 Reference Guide calculation section for WEc2, page 96-97.

Design Application 9/13/2007
The applicant provided a revised LEED Letter Template, changing the lavatory duration to 15 seconds and the flow rate to 0.5 gpm. Documentation of the change order to replace lavatory aerators with 0.5 gpm aerators was provided. In addition, extensive explanation of the 78,000 gallon reuse volume was provided with narratives, calculations, plans and specifications for the Reverse Osmosis Deionization (RODI) reject water reuse system. Though the kitchen sink flow rate has been changed from 1.8 gpm to 1.5 gpm with no explanation, independent calculations confirm that even with the higher flow rate, a final potable water reduction of greater than 40% has been demonstrated.

Energy and Atmosphere

Possible Points 17

Fundamental Building Systems

Commissioning

Prerequisite 1-Version 2.1

Construction Application 6/13/2008
This prerequisite has been selected for audit.

TECHNICAL ADVICE: Please provide a narrative outlining the role of the commissioning agent and the
relationship of the commissioning agent to the project team. Provide evidence of the basis of design review. Please also provide a copy of the commissioning plan, prefunctional data, commissioning specs, and excerpts from the commissioning report or a commissioning report summary. If under contract, please provide an excerpt from the contract to demonstrate prerequisite achievement.

**Construction Application**

8/25/2008

The applicant provided the requested documentation to demonstrate that the required commissioning activities have been performed according to LEED standards.

**Minimum Energy Performance**

Prerequisite 2-Version 2.1

**Design Application**

6/14/2007

The signed LEED Letter Template declares that the project complies with ASHRAE 90.1-1999.

**CFC Reduction in HVAC and R Equipment**

Prerequisite 3-Version 2.1

**Design Application**

6/14/2007

The signed LEED Letter Template declares that the project’s HVAC and R systems do not contain CFC-based refrigerants.

**Optimize Energy Performance**

Credit 1.1-1.10-Version 2.1

**Design Application**

6/14/2007

The applicant submitted a signed LEED Letter Template, a quantitative model comparison summary table, and a signed energy cost budget (ECB) compliance form. The ECB form indicates a 30.55% energy savings over ASHRAE 90.1-1999. Upon further review of the documentation, various inconsistencies were identified that need further clarification.

1) The ASHRAE 90.1 exterior wall assembly listed indicates an overall u-value of 0.084, whereas Table B-17 indicates a u-value of 0.123.
2) It does not appear that the restrooms, dressing rooms and fitness rooms were included in the space-by-space LPD calculations. Also, the LPD of 1.5 W/sf used for the offices is for enclosed offices. It is unclear whether all offices are enclosed or if there are open type offices within the building.
3) The fan sets listed in the comparative summary table indicates that the design case was modeled with variable speed fans, while the baseline (ASHRAE) case was modeled as constant volume. This is not allowed per ASHRAE 90.1-1999 Section 11.4.3.
4) Differences were identified in the comparative summary table between the design supply air (52 deg. F) temperature and the budget supply air (55 deg. F). While this is allowed, further information is needed verifying that the temperature set points remain constant in both models.

TECHNICAL ADVICE: Please correct the inconsistencies listed above or provide narratives or additional documentation justifying the methods used. Please provide a revised energy model and ECB form, as well as excerpts from the energy model input file demonstrating that these issues have been addressed.
Design Application  
9/13/2007
The applicant submitted a narrative, a revised summary comparison table and an updated energy cost budget form indicating a 41.63% energy cost savings over baseline. The narrative addresses each of the issues raised in the preliminary review, and the documentation supports the claimed savings, corresponding to 6 EAc1 points.

Renewable Energy  
Credit 2.1-2.3-Version 2.1

Additional Commissioning  
Credit 3-Version 2.1
Construction Application  
6/13/2008
The signed LEED Letter Template declares that the required commissioning activities have been completed or are under contract. However, as EAp1 has been audited, this credit is pending.

Ozone Depletion  
Credit 4-Version 2.1
Design Application  
6/14/2007
The signed LEED Letter Template declares that the project’s HVAC and R systems do not contain HCFCs or Halons.

Measurement and Verification  
Credit 5-Version 2.1

Green Power  
Credit 6-Version 2.1

Materials and Resources  
Possible Points 13

Storage and Collection of Recyclables  
Prerequisite 1-Version 2.1
Design Application  
6/14/2007
The signed LEED Letter Template indicates that appropriate facilities for recycling have been provided. A plan has been included, locating the recycling area within the loading dock area. However, it is not clear how this
recycling area meets the requirement of an easily accessible area for building occupants to recycle materials during the work day.

TECHNICAL ADVICE: Please provide a narrative explaining the accessibility of the recycling area to building occupants, or provide documentation of other recycling areas inside the building with a description of their accessibility to occupants.

Design Application
9/13/2007
The applicant provided a narrative and University document explaining the recycling program and demonstrating that accessible receptacles are provided throughout the building.

Building Reuse
Credit 1.1-1.3-Version 2.1

Construction Waste Management
Credit 2.1-2.2-Version 2.1
Construction Application
6/13/2008
A signed LEED Letter Template declares that 61.25% of project construction waste was diverted from the landfill. A list of materials and where they were diverted to has been included.

Resource Reuse
Credit 3.1-3.2-Version 2.1

Recycled Content
Credit 4.1-4.2-Version 2.1
Construction Application
6/13/2008
The signed LEED Letter Template and supporting calculations have been provided declaring that the project has achieved a combined recycled content value of 18.26% of the total materials.

Local/Regional Materials
Credit 5.1-5.2-Version 2.1
Construction Application
6/13/2008
MRc5.1
The signed LEED Letter Template and supporting calculations have been provided declaring that 23.23% of the total project’s materials, based on cost, were manufactured within 500 miles of the project site.

MRc5.2
This credit has been selected for audit.

TECHNICAL ADVICE: To support the calculations in the LEED Letter Template, please provide a product cut sheet, product literature, or letter from the manufacturer verifying the location of manufacture and extraction, harvesting, or recovery for each material.
The signed LEED Letter Template and calculations have been provided, declaring that of the locally manufactured materials based on cost, 22.5% were also locally harvested or extracted. The requested supporting documentation has been provided.

**Rapidly Renewable Materials**

Credit 6-Version 2.1

1 0

**Certified Wood**

Credit 7-Version 2.1

Construction Application 6/13/2008

The signed LEED Letter Template declares that 62.27% of wood based materials are certified in accordance with FSC Principles and Criteria. Wood products constitute 7.07% of the total value of all materials for the project.

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**Indoor Environmental Quality**

Possible Points 15

**Minimum IAQ Performance**

Prerequisite 1-Version 2.1

Design Application 6/14/2007

The signed LEED Letter Template has been provided stating that the requirements of ASHRAE 62-1999 have been met. Documentation describing the ventilation rate procedure has been provided.

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**Environmental Tobacco Smoke (ETS) Control**

Prerequisite 2-Version 2.1

Design Application 6/14/2007

The signed LEED Letter Template has been provided stating that no smoking is allowed in the building and outdoor smoking areas are located away from operable windows and entryways.

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**Carbon Dioxide (CO2) Monitoring**

Credit 1-Version 2.1

**Increase Ventilation Effectiveness**

Credit 2-Version 2.1

Design Application 6/14/2007

Construction IAQ Management Plan, During Construction

Construction Application - 6/13/2008
The signed LEED Letter Template has been provided stating that a construction IAQ plan was followed and implemented. Filters with a MERV 13 rating were installed after construction. Photographs and a description of the SMACNA approaches followed were included.

Construction IAQ Management Plan, Before Occupancy

Construction Application - 6/13/2008
A signed LEED Letter Template declares that a four week building flush out was conducted with 100% outside air from 4/14/08 - 5/14/08. A flush out plan is provided describing the use of MERV 13 filters, adjustments to the HVAC equipment to maintain maximum airflow through the building during flush out, and installation of new MERV 13 filters following flush out.

Low-Emitting Materials

Construction Application - 6/13/2008
EQc4.1
A signed LEED Letter Template declares the use of compliant adhesives and sealants. A list with associated VOC levels has been provided. However, the provided list does not indicate the product application and associated VOC limit.

TECHNICAL ADVICE: Please provide a revised list including the product name and application.

EQc4.2
A signed LEED Letter Template declares that all paints, including topcoats and primers, meet the VOC requirements of Green Seal. A list, with VOC content indicated, has been provided.

EQc4.3
A signed LEED Letter Template has been provided declaring that the project uses carpeting that complies with the CRI Green Label Program.

Construction Application - 8/25/2008
EQc4.1
A signed LEED Letter Template declares the use of compliant adhesives and sealants. A list with associated VOC levels has been provided.

Indoor Chemical and Pollutant Source Control

Design Application - 6/14/2007
This credit has been selected for audit.

TECHNICAL ADVICE: Please provide narratives, drawings and cut sheets supporting the declarations made in the LEED Letter Template. Document permanent entryway systems, construction methods (deck to deck partitions,
independent ventilation system etc.) in chemical use areas, and drainage systems appropriate for disposal of liquid waste in areas where water and chemical mixing occurs (i.e. janitors’ closets).

**Design Application**
9/13/2007

The applicant provided a narrative explanation and extensive plans and details demonstrating that the credit requirements have been met.

**Controllability of Systems**
Credit 6.1-6.2-Version 2.1

**Design Application**
6/14/2007

EQc6.1

The applicant is submitting this credit under LEED-NC v2.2. The LEED Submittal Template indicates that at least 90% of individual workstations and all shared multi-occupant spaces have lighting controls as required by this credit.

**Thermal Comfort, Comply with ASHRAE 55-1992**
Credit 7.1-Version 2.1

**Design Application**
6/14/2007

The signed LEED Letter Template declares that the project has been designed to maintain indoor comfort within the ranges established by ASHRAE 55-1992, Addenda 1995. Information on temperature and humidity control ranges has been provided.

**Thermal Comfort, Permanent Monitoring System**
Credit 7.2-Version 2.1

**Design Application**
6/14/2007

The signed LEED Letter Template has been provided declaring that a permanent temperature and humidity monitoring system that operates during all seasons has been installed. The system permits control of individual building zones to maintain thermal comfort within the ranges defined in ASHRAE 55-1992, Addenda 1995. The Letter Template further declares that these systems were commissioned as part of the scope for EA P1, Fundamental Building Systems Commissioning.

**Daylight and Views, Daylight 75% of Spaces**
Credit 8.1-Version 2.1

**Daylight and Views, Views for 90% of Spaces**
Credit 8.2-Version 2.1

**Innovation and Design Process**
Possible Points 5
Innovation in Design 1.1
Credit 1-Version 2.1

Design Application
Green Building Education
The applicant has submitted an innovation credit based on the merits of having a green educational outreach program in place for the project. This innovation credit is based on established CIRs. The project has instituted a comprehensive program that educates building occupants as well as visitors, using a project manual, presentations and tours. These collective measures demonstrate compliance to the established criteria for an innovation credit based on a green educational outreach program. For future reference please refer to IDc1.1 CIR ruling dated 9/24/2001 for guidance as to the options for demonstrating compliance.

Innovation in Design 1.2
Credit 1-Version 2.1

Design Application
Lake Source Cooling
The applicant has submitted an innovation credit for Lake Source Cooling (LSC), based on energy savings, zero use of refrigerants, water savings and educational benefits to the project. While this strategy is commendable, some of the benefits identified can contribute towards achievement of existing credits. The building specific energy savings resulting from the LSC project can be applied to EAc1 Optimized Energy Performance using the guidance provided by the Combined Heat and Power Methodology (CHP) set forth by the USGBC. Please see the USGBC website, under the LEED-NC v2.1 Resources section for an explanation of this methodology. The avoidance of refrigerants is already recognized by EAc4, and exemplary performance is not available for that credit. The educational benefits identified can also contribute towards the IDc1.1 Green Building Education credit.

However, the water savings identified represent process water savings, which may warrant consideration as an innovation credit for the LSC project. Please see IDc1.1 CIR ruling dated 8/31/2004 and the LEED-NC v2.2 Reference Guide, page 143 for guidance on submitting an innovation credit based on process water loads.

TECHNICAL ADVICE: Please provide calculations demonstrating the process water savings for this project, based on the guidance provided by the cited CIR and LEED-NC v2.2. Documentation for this may include information on the building specific cooling load and the quantity of water saved from the elimination of cooling towers. Also include a list of all buildings served by the LSC project with cooling loads for each and this building highlighted.

Design Application
Lake Source Cooling
The applicant provided a narrative and calculations demonstrating a process water savings of 884,000 gallons, which greatly exceeds the required 10% of regulated water use. Compliance with the criteria for innovation credit for process water reduction has been demonstrated. As a side note and as the applicant points out, the project would also be eligible for an innovation credit for exemplary performance of WEc3.

Innovation in Design 1.3
Credit 1-Version 2.1

Design Application
Transportation Demand Management Program
The applicant submitted an innovation credit for a Transportation Demand Management Program. There is an established innovation credit for a comprehensive transportation management program based on IDc1.1 CIR ruling dated 5/9/2003. The applicant provided a narrative that outlines the measures implemented in order to reduce automobile use on the Cornell campus. Such measures include: subsidized transit passes, a ride share program, an emergency ride home program, campus courier service, and parking fees to encourage the use of alternative transportation. The narrative also includes data about the reduction in CO2 emissions as a result of the programs in place and information about a transportation study Cornell is doing in conjunction with the City of Ithaca. The program meets the requirements outlined in the referenced CIR.

**Innovation in Design 1.4**

**Credit 1-Version 2.1**

**Design Application**

ISO 14001 Certified Construction Manager

The applicant is pursuing an innovation credit for an ISO 14001 Certified Construction Manager. A LEED Letter Template, Innovation credit description, a copy of the project-specific Environmental Management System, a copy of the relevant CIR, ISO audits and a certificate of registration have been provided. This innovation credit is based on IDc1.4 CIR ruling dated 7/10/2003. Conformance to the CIR requirements has been demonstrated.

**LEED Accredited Professional**

**Credit 2-Version 2.1**

**Design Application**

The signed LEED Letter Template and the LEED Accredited Professional Certificate have been provided for Steve Beyers.