

018110 GREEN BUILDING GUIDELINES

PART 1: GENERAL

1.01 INTENT AND BACKGROUND

- A. Cornell is signatory to the American College and University Presidents Climate Commitment (PCC). By signing this document, Cornell has committed to reducing carbon emissions associated with campus energy use and transportation, with the ultimate goal of achieving a “carbon neutral” campus. Additional information regarding carbon neutrality goals can be obtained at <http://www.sustainablecampus.cornell.edu/climate/>. Significantly reducing energy use and source energy climate impact across campus is a major component for achieving this goal.
- B. For the purpose of this Guideline, a Green Building at Cornell is a building designed to minimize adverse environmental impacts and be sustainable as measured by the U.S. Green Building Council’s (USGBC’s) Leadership in Energy and Environmental Design (LEED) rating system, of which energy reduction is but a part.
- C. Cornell University has also instituted a LEED/30 policy which requires all new buildings and major renovations over \$5 million total project cost to be certified to at least LEED Silver level.
 - 1. Any projects where formal certification under this policy is judged impractical and desiring exclusion from the LEED/30 policy shall obtain written approval from an authorized Infrastructure, Properties and Planning representative, in consultation with Cornell’s senior administration.
- D. The requirements of the LEED/30 policy are minimum requirements. Many Cornell projects exceed these requirements, either by attaining a higher level of LEED certification (Gold or Platinum) and/or through a design which requires even lower energy use. Objectives for each project shall be determined by Cornell in consultation with the Consultant for each project.

1.02 RELATED SECTIONS

- A. Section 018130 – Energy Modeling Guidelines

1.03 RELATED RESOURCES

- A. Cornell University Life Cycle Costing Template

REVIEWED BY: EAK	REVISED BY: EAK	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	DATE: 11/16/2017		Page 1 of 8

1.04 OBJECTIVES

- A. Design buildings to maximize sustainability while meeting the architectural, educational, research, outreach, and fiscal needs of the University.
- B. Make sound capital investments during the design and construction of a structure to minimize operating costs. This shall be accomplished by using life cycle costing.
- C. The project shall, without consideration for our central efficient supply side energy systems and renewables, use not more than 70% of the ENERGY required for building operation as determined by the Option 1 modeling protocols described in Section 018130 – Energy Modeling Guidelines. Where cost effective, projects should strive to achieve a 50% energy savings using the same methodology. Project integrated renewable energy systems shall be considered part of achievement of this requirement.
- D. Energy utilization (use) intensity (EUI) targets shall be established on a project-by-project basis. EUI is the measure of the total energy consumed in a building, expressed as energy per gross square foot of building area, typically expressed in kbtu/sf/yr. These targets represent total metered energy inputs (chilled water, steam, electricity, and natural gas) for building heating, cooling, ventilation systems, service water heating, lighting, receptacle loads, and process energy use. Cornell expects the consultants to strive to meet these targets, and to exceed them where practical. At each design submission, the consultant will submit and update the energy model to test the energy performance of the design. See Section 018130 – Energy Modeling Guidelines for additional information. The following defines Cornell’s current EUI targets for typical space types encountered at Cornell:

1. Laboratories	150 kbtu/gsf/yr
2. Office and classrooms	50 kbtu/gsf/yr
3. Residence halls	50 kbtu/gsf/yr

- E. Each project shall consider, quantify, and document opportunities for incorporation of onsite renewable energy generation (if applicable) at the schematic design submission. The Cornell Project Manager shall discuss renewable energy system opportunities with the campus client, Energy and Sustainability, and Facilities Engineering representatives to determine whether any of the identified options should be pursued as part of the project or if enabling infrastructure for future renewable energy systems should be incorporated at the site.

1.05 LIFE CYCLE COSTING

- A. Because of the uncertainty of energy prices and the lifetime of typical components, life cycle costing for energy purposes should typically be done over a 20-30 year period. Contact Facilities Engineering for the current Life Cycle Costing Template.
- B. Simple payback can be used with flat energy costs to provide a QUICK CHECK on the applicability of energy saving measures. The generation of a life cycle cost analysis shall follow once the measure is determined to be viable for consideration. In general, Cornell accepts improvements which present the lowest life cycle cost and result in paybacks that are at least less than one-half the expected life of the product.
- C. The Architect and Engineer are expected to work together to optimize the design for the lowest life-cycle cost before the design reaches completion of the design development phase, utilizing the modeling efforts described in Section 018130 – Energy Modeling Guidelines to determine energy usages. In general, the designer shall be responsible for providing the best available cost and energy data from which the Cornell Project Manager may coordinate important energy-related design selections.
- D. The Engineer and Architect must work together to minimize life cycle costs due to energy use, and this effort shall be demonstrated in final reports at the end of each design phase. This includes the optimization of the building orientation, building envelope and fenestration systems to minimize losses/gains, use of natural light and window overhangs, passive solar design features to control and utilize solar gain, attention to materials selection, construction inspection, and commissioning. Integrate this reporting with modeling reports described in Section 018130 – Energy Modeling Guidelines.

1.06 ROLES AND RESPONSIBILITIES

- A. LEED certification is granted only after a third-party review process. Members of each project team shall collaborate to produce the design, construction, and post-construction documentation necessary to earn LEED certification.
- B. Cornell will assign a Cornell LEED Representative to each project to assist with Green Building process and certification. The roles and responsibilities of project consultants (Architects and Engineers) and the Cornell LEED Representative may vary from project to project as stipulated in the Architect/Engineer agreement. At a minimum, Cornell’s LEED Representative can help document campus-wide programs and practices which help earn LEED credits. On some projects, the Cornell LEED Representative provides the central coordination for

REVIEWED BY: EAK	REVISED BY: EAK	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	DATE: 11/16/2017		Page 3 of 8

LEED submittals and submits much of the information on behalf of the project. These roles must be clarified as part of the Owner agreement.

- C. Some LEED requirements are related to construction practices, which may not be under the control of the design Architect or Engineer. Construction managers and contractors therefore may share responsibility for attaining LEED certification.
- D. To clarify specific roles and responsibilities, Cornell uses a “Project Responsibility Matrix.” A “sample” matrix in the format provided for the Contractor is attached at the end of this Section for reference only. The Architect/Engineer shall collaborate with Cornell staff to clarify project-specific roles and responsibilities of each party participating in the project.

PART 2: GREEN BUILDING DESIGN REQUIREMENTS

2.01 DETERMINING GREEN BUILDING GOALS

- A. The expectations with regard to green building goals for the design team proposing work on a Cornell University building may vary from project-to-project. Specific contractual requirements will be inserted into the services contract of the design team before contract signing.
- B. EACH project shall incorporate at least one project-specific workshop (or “design charrette”) at the start of the project planning and design effort. This workshop shall provide background on the project purpose, scale, and broad building type and then work point-by-point through the LEED rating system to determine appropriate project criteria or goals for the project in each LEED strategy area. Multiple meetings may be appropriate for larger projects.
- C. The workshop shall include representatives of the Architect, Engineer, Cornell Project Manager, Cornell LEED Representative, Facilities Engineering, academic or facility user staff, and others as determined by the Cornell Project Manager.
- D. Immediately following the first green design workshop, the Architect/Engineer shall document the green building project goals in both narrative form and through a point-by-point tally of the LEED credits that the project is pursuing. This documentation shall be coordinated with the Cornell LEED Coordinator, shared with the broader Cornell project team, and revised as consensus is developed regarding the strategies that will be part of the project as the design is developed further.

REVIEWED BY: EAK	REVISED BY: EAK	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	DATE: 11/16/2017		Page 4 of 8

2.02 DOCUMENTING PROGRESS TOWARDS GREEN BUILDING GOALS

- A. See Section 018130 – Energy Modeling Guidelines regarding required documentation related to energy modeling.

- B. In addition to energy modeling, each formal design submittal stipulated in the Owner-Architect/Engineer agreement shall include updated information regarding the status of the green building/sustainability aspects of design. This information shall include, at a minimum, a revised narrative and completed LEED checklist indicating the LEED strategies and anticipated points that the project as designed and intended to be constructed will attain.
 - 1. As progress advances, update and clarify the project-specific goals and expectations, working with Cornell’s LEED Coordinator to identify LEED project limit lines and campus-earned LEED points and strategies in addition to building-specific points and strategies.
 - 2. Conceptual or pre-schematic submittals may identify LEED point expectations using terms like “expected, likely, possible, or not likely.” As the design moves into schematic and design development, however, the responsible Architect/Engineer shall identify all design-related points clearly as “design criteria” or “design goals” and update the Responsibility Matrix (or similar tool) so that the intent and responsibility is clear regarding the attainment of each LEED strategy point. At these latter stages in design, the use of phrasing such as “possible” or “likely,” if used, shall be minimized and restricted to those points which rely heavily on the construction process.
 - 3. Provide definitive estimates of the points expected to be obtained at each stage with all applicable calculations documented to show compliance with the respective LEED point criteria.

2.03 CONTRACT DOCUMENTS

- A. For projects with LEED goals, Contract Documents shall include the following:
 - 1. Clear description of LEED goals and contractor responsibilities as applicable for each specific LEED point, using a form similar to the Responsibility Matrix included as an attachment to this guidance standard.
 - 2. Specific submittal details and format needed by the Construction Management team to track and document achievement and progress of LEED submittals. A copy of a sample LEED submittal cover sheet is included as an attachment to this guideline standard.

REVIEWED BY: EAK	REVISED BY: EAK	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	DATE: 11/16/2017		Page 5 of 8

- 3. Individual specifications which specify materials which conform to the LEED design criteria (e.g., specifying low-VOC paints; conforming carpets and flooring; filter ratings; products of regional manufacture, etc. as applicable) and provide the LEED performance criteria that product substitutions or “as equals” must attain in order to be considered.

2.04 POST DESIGN RESPONSIBILITIES

- A. Architect/Engineer shall be responsible to verify products for applicable LEED criteria during the submittal process, and to reject products that do not meet established LEED project requirements.
 - 1. In the event of conflict between LEED goals and other project goals discovered after design, Architect/Engineer shall consult with Owner’s LEED Representative. Alternatives shall be submitted through the Project Manager for review by the University Engineer.
- B. Except where otherwise specified in the Agreement, the Architect/Engineer typically maintains responsibility for signing/certifying LEED submittals which document design-related LEED achievements. All formal submittals shall be coordinated with and reviewed by the Cornell LEED Representative prior to formal submittal.
 - 1. In collaboration with the Cornell LEED Representative, Architect/Engineer shall continue to support the LEED certification process through the successful achievement of the final LEED rating, including formal written responses to third-party reviewer’s questions and requests for additional information or clarification.

REVIEWED BY: EAK	REVISED BY: EAK	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	DATE: 11/16/2017		Page 6 of 8

LEED Credit	Task Description	Responsibility (indicated by an "X")				Contractor's Reference	Contractor Submittals or Data Required (USGBC primary submittals or audit submittal requirements)
		Cornell LEED Coordinator	Architect/Consultant	Contractor			
Category SS: Sustainable Sites							
Prerequisite: Erosion and Sediment Control	Incorporate Erosion and Sediment Control Specs in Design Package; reference Stormwater Pollution Prevention Plan (SWPPP)		X			No contractor submittals are required.	
	Implement Erosion and Sediment Control Measures; Sign and Implement Storm Water Pollution Prevention Plan (SWPPP)			X			
	Prepare submittal Template; gather and submit drawings to document point	X					
	Sign Submittal Template	X					
SS-1 Site Selection	Sign Submittal Template	X				No contractor submittals required	
SS-4.1: Alternative Transportation, Public	Prepare submittal Template; gather and submit drawings to document point	X				No contractor submittals required	
SS-4.2: Bicycle Storage and Changing Rooms	Design project to meet requirements		X			No contractor submittals required	
	Prepare submittal Template; gather and submit drawings to document point	X					
SS-4.3: Low Emitting and Fuel-Efficient Vehicles	Design project to meet requirements, prepare drawings to document.		X			No contractor submittals required	
	Prepare submittal Template; gather and submit drawings to document point	X					
SS-4.4: Parking Capacity	Design project to meet requirements, prepare drawings to document.		X			No contractor submittals required	
	Prepare submittal Template; gather and submit drawings to document point	X					
SS-5.1 Site Development, Protect or Restore Habitat	Prepare submittal Template; gather drawings and perform calculations; submit to document point	X				Provide plant listing and landscape plan	
SS-5.2 Site Development, Maximize Open Space	Design project to meet requirements		X			No contractor submittals required	
	Prepare submittal Template; gather drawings and perform calculations; submit to document point	X					
SS-6.1: Stormwater Management, Quantity Control	Prepare calculations to verify goal attainment		X			No contractor submittals required	
	Implement the measures shown on the Contract Drawings and in the SWPPP			X			
	Prepare submittal Template; gather and submit drawings and calculations to document point		X				
SS-6.2: Stormwater Management, Treatment	Prepare calculations to verify goal attainment		X			No contractor submittals required	
	Implement the measures shown on the Contract Drawings and in the SWPPP			X			
	Prepare submittal Template; gather and submit drawings and calculations to document point		X				
SS-7.1: Landscape and Exterior Design to Prevent Heat Islands, Non-Roof	Design project to meet requirements		X			Provide cut sheets/material analysis confirming that exterior hardscape features meet specified SRI (29)	
	Implement the measures shown on the Contract Drawings			X			
	Prepare submittal Template; gather and submit drawings and calculations to document point	X					
SS-7.2: Landscape and Exterior Design to Prevent Heat Islands, Roof	Implement the measures shown on the Contract Drawings, using the materials and methods specified.			X		Provide cut sheets showing roofing achieves specified SRI ratings (78 for low sloped roof, 29 for steep sloped roof)	
	Prepare submittal Template; gather and submit drawings and calculations to document point	X					
SS-8: Light Pollution Prevention	Specify fixtures which meet the full cutoff requirements; design interior lighting to prevent light trespass		X			Provide cut sheets of all exterior fixtures	
	Implement the measures shown on the Contract Drawings, using the materials (light fixtures) and methods specified.			X			
	Prepare a site photometric plan		X				
	Prepare submittal Template; gather and submit drawings to document point	X					
Category WE: Water Efficiency							
WE-1.1 and 1.2: Water Efficient Landscaping (2 points)	Provide design that does not include any permanent irrigation system.		X			Provide plant listing and landscape plan	
	Prepare submittal Template; gather and submit drawings to document	X					
	Submit Lists of Plants Used on Project			X			
WE-3.1 and WE-3.2: Water Use Reduction (30%) (2 points)	Design systems and specify fixtures which meet the water reduction goals; document design with calculations.		X			Cut sheets for all fixtures providing water use rates	
	Provide the plumbing systems shown on the Contract Drawings, using fixtures meeting the low usage specified.			X			
	Prepare submittal Template; gather and submit drawings to document point	X					

Attachment 1: SAMPLE LEED Responsibility Matrix

REVIEWED BY: EAK	REVISED BY: EAK	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	DATE: 11/16/2017		Page 7 of 8

ATTACHMENT 2: SAMPLE Submittal Cover Form

SUBMITTAL COVER FORM		Cornell University - Example project			
Green Building Materials Certification		Owner - Cornell University			
		Architect - xxx			
GENERAL PRODUCT INFORMATION		PRODUCT COMPONENT INFORMATION			
Subcontractor:		Product Component ⁵	Location of Extraction of Raw Materials	% Weight ⁶	Distance to Manufacturer
Date					
Submittal Register Number:					
Product:					
Manufacturer:					
Supplier:					
Total Product Cost:					
PRODUCT SPECIFIC INFORMATION		Does this product contain wood? (Y / N)			
		If so, is there FSC content?			
		If so, provide COC # (attach invoice & COC)			
VOC Content (g/L) ¹		If so, are there added urea formaldehyde resins?			
Location of Manufacture (City/State): ²		Is this product a flooring material? (Y / N)			
% Post-Consumer Recycled Content		If so, is it floorscore, CRI or equivalent certified?			
% Post-Industrial Recycled Content					
Interior or Exterior product use?					
Supporting Document Type Attached ⁴					
<small>** Note 1: VOC Content required for adhesives, sealants, paints, coatings, flooring. ** Note 2: "Manufacture" refers to the final assembly of components into the building product that is furnished and installed by tradesmen. For example, if the hardware comes from Dallas, TX; the lumber from Keene, NH; and the joist is assembled in Syracuse, NY; then the Location of Keene, NH; and the joist is assembled in Syracuse, NY; then the Location of Manufacture is Syracuse, NY. ** Note 3: Only required on composite wood/agnifiber products (plywood, OSB, door cores, etc.) ** Note 4: Examples of supporting document types include: Letter from Manufacturer, MSDS, Chain of Custody, Floorscore/CRI Green Label Plus certificates ** Note 5: This information to be provided for any product manufactured (See Note 2) within 500 miles of the project. Consult Matt Kozlowski of Cornell (MDK39@cornell.edu) to clarify locations within that radius if necessary. ** Note 6: % Weight = (Weight of Component / Weight of Product) * 100</small>					
Brief Description of Product Use & Location of Use:					
SUBCONTRACTOR CERTIFICATION					
We hereby certify that the material information contained herein is an accurate representation of the material qualifications to be provided by us, as components of the final project construction. Furthermore, we understand that any change in such qualifications during the purchasing period will require prior written approval from the General Contractor and the Owner.					
Reviewed By:		Date:			

REVIEWED BY: EAK	ISSUE NO.:	GREEN BUILDING GUIDELINES	018110
DATE: 11/16/2017	1		Page 8 of 8